

TECHNICAL MANUAL

**AVIATION UNIT AND AVIATION
INTERMEDIATE MAINTENANCE MANUAL**

CH-47D HELICOPTER

This copy is a reprint which includes current
pages from Changes 1 through 71.

HEADQUARTERS, DEPARTMENT OF THE ARMY

10 MAY 1983

URGENT

TM 55-1520-240-23-1
C 77

CHANGE
NO. 77

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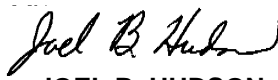
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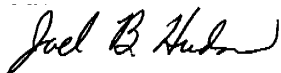
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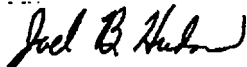
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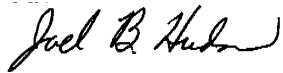
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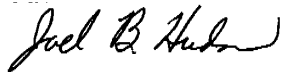
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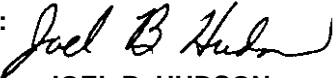
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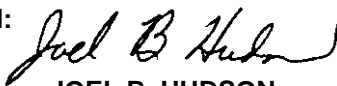
A through D
i and ii
1-2.3 and 1-2.4
1-27 and 1-28
1-44.1 and 1-44.2
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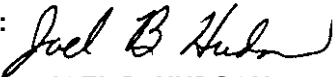
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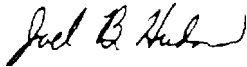
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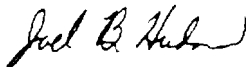
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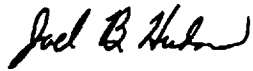
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1-167 and 1-168
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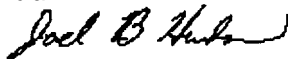
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C61**

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1-283 and 1-284
1-286.3 and 1-286.4
1-291 and 1-292
1-312.3/(1-312.4 blank)
1-312.5/(1-312.6 blank)
1-351/(1-352 blank)

Insert pages

1-273 and 1-274
1-283 and 1-284
1-286.3 and 1-286.4
1-291 and 1-292
1-312.3/(1-312.4 blank)
1-312.5/(1-312.6 blank)
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1-284.1 and 1-284.2

1-303 and 1-304
1-312.3/(1-312.4 blank)

Insert pages

1-283 and 1-284
1-284.1 and 1-284.2
1-284.3/(1-284.4 blank)
1-303 and 1-304
1-312.3/(1-312.4 blank)
1-312.5/(1-312.6 blank)

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Maintenance Manual

CH-47D HELICOPTER

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Remove pages

i and ii
1-1 and 1-2
1-2.1 through 1-2.3/(1-2.4 blank)
1-27 and 1-28
1-31 through 1-43/(1-44 blank)
1-44.1/(1-44.2 blank)

1-45 and 1-46
1-49 and 1-50
1-87 and 1-88
1-109 and 1-110
1-167 and 1-168
1-183 and 1-184
1-184.1 and 1-184.2
1-191 and 1-192
1-193 through 1-196
1-221 and 1-222
1-225 and 1-226
1-233 through 1-236
1-239 and 1-240
1-243 and 1-244
1-269 and 1-270
1-286.3 and 1-286.4
1-291 through 1-294

Insert pages

i and ii
1-1 and 1-2
1-2.1 through 1-2.3/(1-2.4 blank)
1-27 and 1-28
1-31 through 1-44
1-44.1 and 1-44.2
1-44.3/(1-44.4 blank)
1-45 and 1-46
1-49 and 1-50
1-87 and 1-88
1-109 and 1-110
1-167 and 1-168
1-183 and 1-184
1-184.1 and 1-184.2
1-191 and 1-192
1-193 through 1-196
1-221 and 1-222
1-225 and 1-226
1-233 through 1-236
1-239 and 1-240
1-243 and 1-244
1-269 and 1-270
1-286.3 and 1-286.4
1-291 through 1-294

TM 55-1520-240-23-1
C 57

Remove pages

1-301 through 1-304
1-309 and 1-310
1-313 and 1-314
1-317 through 1-324
1-345 through 1-351/(1-352 blank)

Insert pages

1-301 through 1-304
1-309 and 1-310
1-313 and 1-314
1-317 through 1-324
1-345 through 1-351/(1-352 blank)

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Remove pages

i and ii

1-33 through 1-40

1-43/(1-44 blank)

Insert pages

i and ii

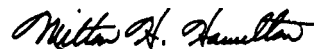
1-33 through 1-40

1-43/(1-44 blank)

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1-2.3/(1-2.4 blank)
1-15 and 1-16
1-19 through 1-24
1-27 and 1-28
1-33 through 1-42
1-137 and 1-138
1-165 and 1-166
1-186.1 and 1-186.2
1-187 and 188
1-188.1/(1-188.2 blank)
1-189 through 1-192
1-195 and 1-196
1-283 and 1-284
1-284.1 and 1-284.2
1-285 and 1-286
1-291 and 1-292
1-303 and 1-304
1-329 and 1-330
1-335 through 1-338
1-345 and 1-346
1-349 and 1-350

Insert pages

1-2.3/(1-2.4 blank)
1-15 and 1-16
1-19 through 1-24
1-27 and 1-28
1-33 through 1-42
1-137 and 1-138
1-165 and 1-166
1-186.1 and 1-186.2
1-187 and 188
1-188.1/(1-188.2 blank)
1-189 through 1-192
1-195 and 1-196
1-283 and 1-284
1-284.1 and 1-284.2
1-285 and 1-286
1-291 and 1-292
1-303 and 1-304
1-329 and 1-330
1-335 through 1-338
1-345 and 1-346
1-349 and 1-350

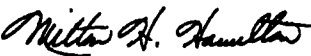
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1-281/(1-282 blank)
1-284.1 and 1-284.2
1-285 and 1-286
1-286.3 and 1-286.4
1-291 and 1-292
1-309 and 1-310

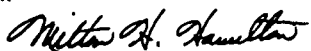
Insert pages

1-281/(1-282 blank)
1-284.1 and 1-284.2
1-285 and 1-286
1-286.3 and 1-286.4
1-291 and 1-292
1-309 and 1-310

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1-33 and 1-34
1-37 and 1-38
1-45 and 1-46
1-51 and 1-52

Insert pages

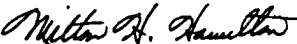
1-2.3/(1-2.4 blank)
1-33 and 1-34
1-37 and 1-38
1-45 and 1-46
1-51 and 1-52

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Remove pages

1-2.1 and 1-2.2
1-87 and 1-88
1-165 through 1-168
1-183 and 1-184
1-184.1 and 1-184.2
1-185 and 1-186
1-237 and 1-238
1-309 through 1-312


Insert pages

1-2.1 and 1-2.2
1-87 and 1-88
1-165 through 1-168
1-183 and 1-184
1-184.1 and 1-184.2
1-185 and 1-186
1-237 and 1-238
1-309 through 1-312

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Remove pages

1-291 through 1-294
1-305 and 1-306

Insert pages

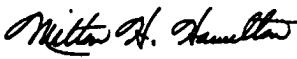
1-291 through 1-294
1-305 and 1-306

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1-35 and 1-36
1-39 through 1-42
1-273 and 1-274
1-291 through 1-294
1-311 and 1-312
1-312.1 and 1-312.2

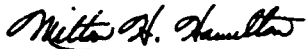
Insert pages

1-35 and 1-36
1-39 through 1-42
1-273 and 1-274
1-291 through 1-294
1-311 and 1-312
1-312.1 and 1-312.2

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Remove pages

1-285 and 1-286

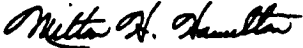
Insert pages

1-285 and 1-286

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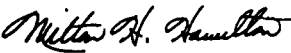
Remove pages	Insert pages
1-2.1 and 1-2.2	1-2.1 and 1-2.2
1-37 and 1-38	1-37 and 1-38
----	1-198.1 and 1-198.2
----	1-200.1 and 1-200.2
----	1-202.1 and 1-202.2
1-205 through 1-208	1-205 through 1-208
----	1-208.1/(1-208.2 blank)
1-209 and 1-210	1-209 and 1-210
1-213 and 1-214	1-213 and 1-214
----	1-214.1/(1-214.2 blank)
1-215 through 1-218	1-215 through 1-218
1-283 and 1-284	1-283 and 1-284
1-284.1 and 1-284.2	1-284.1 and 1-284.2
1-301 and 1-302	1-301 and 1-302
1-345 and 1-346	1-345 and 1-346

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TM 55-1520-240-23-1
C 47

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NO. 47

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Remove pages

Insert pages

1-284.1 and 1-284.2
1-285 and 1-286

1-284.1 and 1-284.2
1-285 and 1-286

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Remove pages

1-167 and 1-168
 1-191 and 1-192
 1-207 and 1-208
 1-211 and 1-212
 1-273 and 1-274

Insert pages

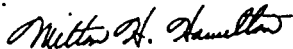
1-167 and 1-68
 1-191 and 1-192
 1-207 and 1-208
 1-211 and 1-212
 1-273 and 1-274

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TM 55-1520-240-23-1
C 45

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NO. 45 }

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Remove pages

1-291 and 1-292

Insert pages

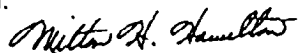
1-291 and 1-292

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C 44

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NO. 44 }

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Remove pages

1-289 through 1-302
1-303 through 1-312
1-312.1 through 1-312.3/
1-312.4

Insert pages

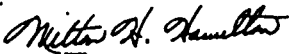
1-289 through 1-302
1-303 through 1-312
1-312.1 through 1-312.3/
1-312.4

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Remove pages	Insert pages
1-2.1 and 1-2.2	1-2.1 and 1-2.2
1-2.3/1-2.4	- - - - -
1-27 and 1-28	1-27 and 1-28
1-30.1/1-30.2	1-30.1/1-30.2
1-33 through 1-42	1-33 through 1-42
1-45 and 1-46	1-45 and 1-46
1-49 and 1-50	1-49 and 1-50
1-165 and 1-166	1-165 and 1-166
1-169 through 1-172	1-169 through 1-172
1-177 and 1-178	1-177 and 1-178
1-183 and 1-184	1-183 and 1-184
1-184.1 and 1-184.2	1-184.1 and 1-184.2
1-185 and 1-186	1-185 and 1-186
1-195 and 1-196	1-195 and 1-196
1-199 through 1-202	1-199 through 1-202
1-217 and 1-218	1-217 and 1-218
1-231 and 1-232	1-231 and 1-232
1-235 and 1-236	1-235 and 1-236
1-273 and 1-274	1-273 and 1-274
1-283 and 1-284	1-283 and 1-284
1-284.1 and 1-284.2	1-284.1 and 1-284.2
1-345 and 1-346	1-345 and 1-346
1-349 through 1-351/1-352	1-349 through 1-351/1-352

2. Retain this sheet in front of manual for reference purposes.

TM 55-1520-240-23-1
C43

By Order of the Secretary of the Army:

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General, United States Army
Chief of Staff

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
01427

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TM 55-1520-240-23-1
C 42

CHANGE }
D. 42 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 12 December 1990

Aviation Unit and Aviation Intermediate Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-283 and 1-284
1-284.1 and 1-284.2
1-285 and 1-286
1-286.3 and 1-286.4
1-293 through 1-296
1-301 and 1-302
- - - - -
1-312.3/1-312.4

Insert pages

1-283 and 1-284
1-284.1 and 1-284.2
1-285 and 1-286
1-286.3 and 1-286.4
1-293 through 1-296
1-301 and 1-302
1-302.1/1-302.2
1-312.3/1-312.4

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TM 55-1520-240-23-1
C 41

CHANGE }
NO. 41 }

HEADQUARTERS
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Aviation Unit and Aviation
Intermediate Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-273 and 1-274
1-283 and 1-284
1-284.1 and 1-284.2
1-285 and 1-286
1-293 through 1-298

Insert pages

1-273 and 1-273
1-283 and 1-284
1-284.1 and 1-284.2
1-285 and 1-286
1-293 through 1-298

2. Retain this sheet in front of manual for reference purposes.

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Intermediate Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

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Remove pages

e and f
vii through x
1-2.3/1-2.4
1-33 through 1-36
1-39 through 1-43/1-44
1-45 through 1-54
1-179 through 1-184
1-184.1 and 1-184.2
1-184.3/1-184.4
1-185 and 1-186
1-235 and 1-236
1-239 and 1-240
1-285 and 1-286
1-286.3 and 1-286.4
1-305 and 1-306
1-330.1 and 1-330.2
2028s and envelopes

Insert pages

e and f
vii through x
1-2.3/1-2.4
1-33 through 1-36
1-39 through 1-43/1-44
1-45 through 1-54
1-179 through 1-184
1-184.1 and 1-184.2
- - - - -
1-185 and 1-186
1-235 and 1-236
1-239 and 1-240
1-285 and 1-286
1-286.3 and 1-286.4
1-305 and 1-306
1-330.1 and 1-330.2
2028s and envelopes

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*TM 55-1520-240-23-1
C 39

CHANGE }
NO. 39 }

HEADQUARTERS
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WASHINGTON, D.C., 6 June 1990

Aviation Unit and Aviation Intermediate Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-35 and 1-36
1-167 and 1-168
1-283 and 1-284
1-284.1 and 1-284.2
1-291 and 1-292
1-295 and 1-296

Insert pages

1-35 and 1-36
1-167 and 1-168
1-283 and 1-284
1-284.1 and 1-284.2
1-291 and 1-292
1-295 and 1-296

2. Retain this sheet in front of manual for reference purposes.

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TM 55-1520-240-23-1

C 38

CHANGE }
NO. 38 }

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WASHINGTON, D.C., 19 March 1990

Aviation Unit and Aviation Intermediate Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-283 and 1-284
1-291 through 1-312
1-312.1 through 1-312.4
1-312.5/1-312.6

Insert pages

1-283 and 1-284
1-291 through 1-312
1-312.1 through 1-312.3/1-312.4
- - - -

2. Retain this sheet in front of manual for reference purposes.

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C 37

CHANGE }
NO. 37 }

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CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

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Remove pages

1-33 and 1-34
1-39 through 1-42
1-271 and 1-272
1-284.1 and 1-284.2
1-286.3 and 1-286.4
1-312.5/1-312.6

Insert pages

1-33 and 1-34
1-39 through 1-42
1-271 and 1-272
1-284.1 and 1-284.2
1-286.3 and 1-286.4
1-312.5/1-312.6

2. Retain this sheet in front of manual for reference purposes.

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C 36

CHANGE }
NO. 36 }

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Aviation Unit and Aviation Intermediate Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-285 and 1-286
1-289 through 1-310
1-311/1-312
1-312.1 through 1-312.4
1-312.5/1-312.6
1-312.7 through 1-312.28

Insert pages

1-285 and 1-286
1-289 through 1-310
1-311 and 1-312
1-312.1 through 1-312.4
1-312.5/1-312.6

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CHANGE }
NO. 35 }

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TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-69 and 1-70

1-71 and 1-72

1-312.19 and 1-312.20

Insert pages

1-69 and 1-70

1-70.1/1-70.2

1-71 and 1-72

1-312.19 and 1-312.20

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CHANGE }
NO. 34 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 November 1989

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CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-273 and 1-274
1-283 and 1-284
- - - -
1-285 and 1-286
1-293 and 1-294
1-312.9 and 1-312.10
1-312.11 and 1-312.12

Insert pages

1-273 and 1-274
1-283 and 1-284
1-284.1 and 1-284.2
1-285 and 1-286
1-293 and 1-294
1-312.9 and 1-312.10
1-312.11 and 1-312.12

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TM 55-1520-240-23-1
C 33

CHANGE }
NO. 33 }

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Aviation Unit and Aviation
Intermediate Maintenance Manual

CH-47D HELICOPTER

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

Insert pages

1-312.7 through 1-312.12

1-312.7 through 1-312.12

2. Retain this sheet in front of manual for reference purposes.

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 NO. 32 }

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Aviation Unit and Aviation Intermediate
 Maintenance Manual

CH-47D HELICOPTER

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Remove pages

1-2.3/1-2.4
 1-29 and 1-30
 1-31 through 1-40
 1-43/1-44
 1-115 and 1-116
 1-165 through 1-174
 1-177 and 1-178
 1-205 through 1-208
 1-239 and 1-240
 1-291 and 1-292

 1-297 and 1-298
 1-312.9 and 1-312.10
 1-312.15 and 1-312.16
 1-345 and 1-346

Insert pages

1-2.3/1-2.4
 1-29 and 1-30
 1-31 through 1-40
 1-43/1-44
 1-115 and 1-116
 1-165 through 1-174
 1-177 and 1-178
 1-205 through 1-208
 1-239 and 1-240
 1-291 and 1-292
 1-292.1/1-292.2
 1-297 and 1-298
 1-312.9 and 1-312.10
 1-312.15 and 1-312.16
 1-345 and 1-346

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C 31

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10. 31 }

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Aviation Unit and Aviation Intermediate Maintenance Manual

CH-47D HELICOPTER

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-273 and 1-274
1-283 and 1-284
1-287 through 1-292
1-293 and 1-294
1-295 through 1-310
- - -
- - -
1-312.3/1-312.4

Insert pages

1-273 and 1-274
1-283 and 1-284
1-287 through 1-292
1-293/1-294
1-295 through 1-310
1-311/1-312
1-312.1 and 1-312.2
1-312.3 through 1-312.29/
1-312.30

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C 30

CHANGE }
NO. 30 }

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CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

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Remove pages

1-273 and 1-274
1-287 through 1-310
1-311 through 1-312.1/1-312.2

Insert pages

1-273 and 1-274
1-287 through 1-310
- - -

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C 29

CHANGE }
NO. 29 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
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Aviation Unit and Aviation
Intermediate Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-2.1 and 1-2.2
1-273 and 1-274
1-289 and 1-290
1-301 and 1-302

Insert pages

1-2.1 and 1-2.2
1-273 and 1-274
1-289 and 1-290
1-301 and 1-302

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TM 55-1520-240-23-1

C 28

CHANGE

NO. 28

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Intermediate Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-30.1/1-30.2
1-39 and 1-40
1-189 and 1-190
1-283 and 1-284
1-289 and 1-290
1-303 and 1-304
1-312.1/1-312.2

Insert pages

1-30.1/1-30.2
1-39 and 1-40
1-189 and 1-190
1-283 and 1-284
1-289 and 1-290
1-303 and 1-304
1-312.1/1-312.2

2. Retain this sheet in front of manual for reference purposes.

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NO. 27 }

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TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
1-2.1 and 1-2.2	1-2.1 and 1-2.2
---	1-2.3/1-2.4
1-30.1/1-30.2	1-30.1/1-30.2
1-31 through 1-36	1-31 through 1-36
1-77 through 1-80	1-77 through 1-80
1-87 and 1-88	1-87 and 1-88
1-167 and 1-168	1-167 and 1-168
1-309 and 1-310	1-309 and 1-310
1-349 and 1-350	1-349 and 1-350
1-351/1-352	1-351/1-352

2. Retain this sheet in front of manual for reference purposes.

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TM 55-1520-240-23-1
C 26

CHANGE }
NO. 26 }

HEADQUARTERS
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CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-31 through 1-34
1-45 and 1-46
1-179 and 1-180
1-185 and 1-186
1-285 and 1-286
1-289 and 1-290
1-293 and 1-294
1-311 and 1-312

Insert pages

1-31 through 1-34
1-45 and 1-46
1-179 and 1-180
1-185 and 1-186
1-285 and 1-286
1-289 and 1-290
1-293 and 1-294
1-311 and 1-312

2. Retain this sheet in front of manual for reference purposes.

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C 25

CHANGE }
NO. 25 }

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TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

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Remove pages

1-273 and 1-274
1-283 and 1-284
1-289 and 1-290

Insert pages

1-273 and 1-274
1-283 and 1-284
1-289 and 1-290

2. Retain this sheet in front of manual for reference purposes.

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CHANGE }
NO. 24 }

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Aviation Unit and Aviation
Intermediate Maintenance Manual

CH-47D HELICOPTER

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Remove pages

i through iv
ix and x
1-2.1 and 1-2.2
1-27 and 1-28
1-31 through 1-38
1-41 and 1-42
1-77 through 1-80
1-85 through 1-90
1-93 and 1-94
1-107 and 1-108

1-193 through 1-198
1-239 and 1-240
1-289 and 1-290
1-303 and 1-304
1-309 and 1-310
1-313 and 1-314
1-347 and 1-348

Insert pages

i through iv
ix and x
1-2.1 and 1-2.2
1-27 and 1-28
1-31 through 1-38
1-41 and 1-42
1-77 through 1-80
1-85 through 1-90
1-93 and 1-94
1-107 and 1-108
1-108.1 through 1-108.3/
(1-108.4 Blank)

1-193 through 1-198
1-239 and 1-240
1-289 and 1-290
1-303 and 1-304
1-309 and 1-310
1-313 and 1-314
1-347 and 1-348

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TM 55-1520-240-23-1
C 23

CHANGE }
NO. 23 }

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WASHINGTON, D.C., 8 July 1987

Aviation Unit and Aviation Intermediate Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-283 and 1-284
1-289 and 1-290
1-301 and 1-302

Insert pages

1-283 and 1-284
1-289 and 1-290

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Chief of Staff

Official:

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Brigadier General, United States Army
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Aviation Unit and Aviation
Intermediate Maintenance Manual

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Remove pages

1-2.1 and 1-2.2
1-285 and 1-286
1-286.3 and 1-286.4
1-289 and 1-290
1-311 and 1-312

Insert pages

1-2.1 and 1-2.2
1-285 and 1-286
1-286.3 and 1-286.4
1-289 and 1-290
1-311 and 1-312

2. Retain this sheet in front of manual for reference purposes.

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CH-47D HELICOPTER

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Remove pages

1-11 through 1-14
1-77 and 1-78
1-85 through 1-88
1-93 and 1-94
1-273 and 1-274
1-283 through 1-286
1-289 and 1-290
1-301 through 1-306
1-309 through 1-312.1/1-312.2
1-339 and 1-340
1-345 through 1-351/1-352

Insert pages

1-11 through 1-14
1-77 and 1-78
1-85 through 1-88
1-93 and 1-94
1-273 and 1-274
1-283 through 1-286
1-289 and 1-290
1-301 through 1-306
1-309 through 1-312.1/1-312.2
1-339 and 1-340
1-345 through 1-351/1-352

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C 20

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Intermediate Maintenance Manual

CH-47D HELICOPTER

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Remove pages

1-299 and 1-300

- - -

Insert pages

1-299 and 1-300

1-300.1/1-300.2

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C 19

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NO. 19 }

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Remove pages

1-283 and 1-284
1-289 and 1-290

Insert pages

1-283 and 1-284
1-289 and 1-290

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C 18

CHANGE }
NO. 18 }

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-111 and 1-112
- - -
1-113 and 1-114
- - -
1-286.3 and 1-286.4
1-289 and 1-290
1-301 and 1-302

Insert pages

1-111 and 1-112
1-112.1/1-112.2
1-113 and 1-114
1-114.1/1-114.2
1-286.3 and 1-286.4
1-289 and 1-290
1-301 and 1-302

2. Retain this sheet in front of manual for reference purposes.

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Remove pages

g/h
ix and x
1-1 and 1-2

1-7 and 1-8
1-11 and 1-12
1-27 through 1-30
1-30.1/1-30.2
1-31 through 1-43/1-44
1-45 and 1-46
1-49 and 1-50
1-93 through 1-98
1-107 and 1-108
1-169 through 1-172
1-177 and 1-178
1-186.1/1-186.2
1-187 and 1-188

1-189 through 1-192

1-193 and 1-194
1-205 and 1-206
1-219 through 1-228
1-243 and 1-244
1-271 through 1-274
1-277 and 1-278
1-293 and 1-294
1-303 through 1-306
1-311 and 1-312
1-312.1/1-312.2
1-313 and 1-314
1-330.1 and 1-330.2
1-331 and 1-332

Insert pages

g/h
ix and x
1-1 and 1-2
1-2.1 and 1-2.2
1-7 and 1-8
1-11 and 1-12
1-27 through 1-30
1-30.1/1-30.2
1-31 through 1-43/1-44
1-45 and 1-46
1-49 and 1-50
1-93 through 1-98
1-107 and 1-108
1-169 through 1-172
1-177 and 1-178
1-186.1 and 1-186.2
1-187 and 1-188
1-188.1/1-188.2
1-189 through 1-192
1-192.1/1-192.2
1-193 and 1-194
1-205 and 1-206
1-219 through 1-228
1-243 and 1-244
1-271 through 1-274
1-277 and 1-278
1-293 and 1-294
1-303 through 1-306
1-311 and 1-312
1-312.1/1-312.2
1-313 and 1-314
1-330.1 and 1-330.2
1-331 and 1-332

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NO. 16 }

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Remove pages

1-285 and 1-286
1-309 and 1-310

Insert pages

1-285 and 1-286
1-309 and 1-310

2. Retain this sheet in front of manual for reference purposes.

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Remove pages

1-35 and 1-36
1-178.1 and 1-178.2
1-179 and 1-180
1-183 and 1-184
1-184.1 and 1-184.2

1-185 and 1-186
1-289 and 1-290

Insert pages

1-35 and 1-36
1-178.1 and 1-178.2
1-179 and 1-180
1-183 and 1-184
1-184.1 and 1-184.2
1-184.3/1-184.4
1-185 and 1-186
1-289 and 1-290

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Remove pages

1-12 and 1-13
1-41 and 1-42
1-285 and 1-286
1-312.1/1-312.2
1-349 and 1-350

Insert pages

1-12 and 1-13
1-41 and 1-42
1-285 and 1-286
1-312.1/1-312.2
1-349 and 1-350

2. Retain this sheet in front of manual for reference purposes.

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Intermediate Maintenance Manual

CH-47D HELICOPTER

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-31 through 1-34
1-285 and 1-286
1-312.1/1-312.2

Insert pages

1-31 through 1-34
1-285 and 1-286
1-312.1/1-312.2

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-31 through 1-38
1-41 through 1-43/1-44

Insert pages

1-31 through 1-38
1-41 through 1-43/1-44

2. Retain this sheet in front of manual for reference purposes.

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Brigadier General, United States Army
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NO. 11 }

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TM 55-1520-240-23-1, 10 May 1983, is changed as follows:

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Remove pages

1-179 through 1-184
1-283 through 1-286
1-289 and 1-290
1-295 and 1-296
1-312.1/1-312.2

Insert pages

1-179 through 1-184
1-283 through 1-286
1-289 and 1-290
1-295 and 1-296
1-312.1/1-312.2

2. Retain this sheet in front of manual for reference purposes.

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CH-47D HELICOPTER

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-31 through 1-43/1-44
1-77 and 1-78
1-87 and 1-88
1-167 and 1-168
1-289 and 1-290
1-313 and 1-314

Insert pages

1-31 through 1-43/1-44
1-77 and 1-78
1-87 and 1-88
1-167 and 1-168
1-289 and 1-290
1-313 and 1-314

2. Retain this sheet in front of manual for reference purposes.

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-241 through 1-244
1-283 and 1-284
1-286.3 and 1-286.4
1-289 and 1-290
1-312.1/1-312.2

Insert pages

1-241 through 1-244
1-283 and 1-284
1-286.3 and 1-286.4
1-289 and 1-290
1-312.1/1-312.2

2. Retain this sheet in front of manual for reference purposes.

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General, United States Army
Chief of Staff

Official:

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Brigadier General, United States Army
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Remove pages

1-285 and 1-286
1-307 through 1-310

Insert pages

1-285 and 1-286
1-307 through 1-310

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Remove pages

1-35 and 1-36
1-39 and 1-40
1-301 and 1-302
1-311 and 1-312
1-312.1/1-312.2
- - -

Insert pages

1-35 and 1-36
1-39 and 1-40
1-301 and 1-302
1-311 and 1-312
1-312.1/1-312.2
1-312.3/1-312.4

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

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Remove pages

1-289 and 1-290
1-311 and 1-312

Insert pages

1-289 and 1-290
1-311 and 1-312

2. Retain this sheet in front of manual for reference purposes.

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Intermediate Maintenance Manual

CH-47D HELICOPTER

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

1-39 and 1-40
1-285 and 1-286

Insert pages

1-39 and 1-40
1-285 and 1-286

2. Retain this sheet in front of manual for reference purposes.

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NO. 4 }

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CH-47D HELICOPTER

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Remove pages

1-285 and 1-286
1-286.1/1-286.2

Insert pages

1-285 and 1-286
1-286.1 through 1-286.5/1-286.6

2. Retain this sheet in front of manual for reference purposes.

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NO. 3 }

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CH-47D HELICOPTER

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Chief of Staff

Official:

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The Adjutant General

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WASHINGTON, D.C., 22 MARCH 1985

Aviation Unit and Aviation
Intermediate Maintenance Manual

CH-47D HELICOPTER

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NO. 1 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 18 April 1984

Aviation Unit and Aviation
Intermediate Maintenance Manual

CH-47D HELICOPTER

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Chief of Staff

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Major General, United States Army
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DISTRIBUTION:

To be distributed in accordance with DA Form 12-31, Organizational Maintenance requirements for CH-47B/C & D aircraft.

URGENT

WARNING AND FIRST AID DATA.

For artificial respiration and other first aid data, refer to FM 21-11.

Personnel performing instructions involving operations, procedures, and practices which are included or implied in this technical manual shall observe the following instructions. Disregard of these warnings and precautionary information can cause serious injury, illness, death, or an aborted mission.

WARNING

An operating procedure, practice, etc., which if not correctly followed, could result in personal injury or loss of life.

CAUTION

An operation procedure, practice, etc., which if not strictly observed, could result in damage to or destruction of equipment.

NOTE

An operating procedure, condition, etc., which is essential to highlight.

WARNING

Cleaning Solvents

- Those areas of skin and clothing that come in contact with cleaning solvents should be thoroughly washed immediately.
- Saturated clothing should be removed immediately.
- Areas in which cleaning solvents are used should be adequately ventilated to keep vapors to a minimum.
- If cleaning solvents contact the eyes, nose, or ears, flush them with generous quantities of water, and then seek medical attention immediately.

WARNING

Electrical and Electronic Equipment Maintenance

- Do not wear rings, watches, or metal jewelry when working around electrical equipment. Serious burns can result.
- Be careful when working on 150- and 300-volt dc circuits and on ac generator 115- and 200-volt ac outputs. Serious burns can result.

WARNING

Dangerous Static Charges

Ground the helicopter during parking, fueling, or defueling. Sparks can cause fuel vapor to ignite.

WARNING

Dangerous Voltages at Antenna Terminals

Be careful when working near antenna or antenna terminals. Radio frequency (rf) voltages exist at these points when transmitters are operating. Contact with radiating antennas can cause serious rf burns.

WARNING

Poisonous Carbon Monoxide Fumes

Toxic carbon monoxide fumes may be present inside the helicopter whenever engines or apu are operating with cargo ramp open. Ventilate the cockpit.

WARNING

Corrosive Battery Electrolyte
(Potassium Hydroxide)

- The electrolyte used in nickel-cadmium batteries contains potassium hydroxide which, is a caustic substance.
- Contact with skin or eyes will cause burns.
- Use rubber gloves, rubber apron, and protective eye covering or face shield when handling battery.
- If personal contact with electrolyte occurs, flush immediately with large amounts of clean water. Get medical attention immediately.

WARNING

Explosive Battery Hazard

- Before removing or installing battery, make sure battery switch is OFF and battery has cooled down if overheated.
- Connecting or disconnecting battery connector while battery is under load may cause explosion or electrical arcing resulting in injury to personnel.

WARNING

Electrolyte Contamination

- Separate nickel-cadmium batteries and lead-acid type batteries as far as possible from each other.
- Do not let anything associated with a lead-acid battery, including air, come in contact with a nickel-cadmium battery or its electrolyte. Sulfuric acid fumes from a lead-acid battery could result in damage to a nickel-cadmium battery leading to battery failure and a hazard to personnel.
- Do not use same tools or protective clothing for both types of batteries.
- If sulfuric acid has been somehow mixed with electrolyte in the battery, the upper areas of the battery cells will appear green in color indicating battery failure or damage and potential danger to personnel unless replaced.

WARNING

Acids and Alkalines

- Do not add water to acid. A violent action will result. Add acid to water in small quantities.
- Rust stripper is an alkaline solution.
- Avoid skin contact. Wear protective clothing. Wash thoroughly after using.

WARNING

Windshield Rain Repellent

- Do not let windshield rain repellent contact open flame. Deadly hydrogen fluoride gas could be generated.
- Wash hands with soap and water after handling repellent.

WARNING

Antiseize Compounds

- Some antiseize compounds are irritants. Avoid inhaling fumes and contact with skin.
- Wear protective clothing. Wash thoroughly after using.

WARNING

Paints, Varnishes, Dopes, Thinners, and Lubricants

- These materials are generally highly flammable and may be irritants. Work in a well-ventilated area away from open flames.
- Avoid inhaling fumes and prolonged contact with skin. Wash thoroughly after using.

WARNING

Epoxy Resins, Cements, and Adhesives

- These materials may contain toxic or irritating substances. They may also be flammable. Work in a well-ventilated area away from open flames.
- Wear protective clothing. Avoid contact with skin. Wash thoroughly after using.

WARNING

Radiation Hazard

- Some instruments contain radioactive material. Do not try to disassemble these instruments. They present no radiation hazard unless seal is broken.
- If you think seal is broken, do not remove instrument from helicopter before consulting Base Radioactive Protection Officer (AR 40-15).
- Use a beta-gamma radiac meter AN/PDR-27 or equivalent to determine if instrument contains radioactive material (radium).

WARNING

Fire Extinguishing Agents

- Monobromotrifluoromethane (CF_3Br) is highly volatile but is not easily detected by smell. It is not toxic, but reduces oxygen available for proper breathing.
- If liquid CF_3Br contacts skin, it can cause frostbite or low temperature burns.
- If agent touches eyes or skin, immediately flush affected area with running water. Get medical attention.

WARNING

N o i s e

- Sound pressure levels in this helicopter during some operating conditions exceed the Surgeon General's hearing conservation criteria (TBMED251).
- Hearing protection devices, such as aviator helmet or ear plugs, shall be worn by all personnel in and around the helicopter during operation.

WARNING

F O D

- Make sure area is clear of foreign objects before closing access doors, panels, and fairings.
- If area is not clear, damage to components or systems could result in personal injury or death.

WARNING

JP-4/JP-5 Fuel
MIL-T-5624

- Fuel is flammable. Do not use near welding areas, open frames, or on very 'hot surfaces.
- Use only with adequate ventilation.
- Avoid prolonged or repeated contact with skin. Prolonged contact may cause drying and irritation of skin.
- Remove saturated clothing immediately.
- Do not smoke when handling fuel.
- Do not take internally.
- Store in approved, metal safety containers.

WARNING

Lubricating Oils
MIL-L-23699 or MIL-L-7808

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

WARNING

Lifting Components With Hoist

- Lifting or hoisting of components shall be done only by designated personnel,
- The load capacity rating shall be clearly marked on hoist. Do not exceed load rating.
- Inspection and testing for cracks or defects in hoist system shall be performed on a regular basis.
- Before lifting, alert personnel in immediate areas.
- Before lifting, balance the load.
- Do not stand under load while it is being moved from one area to another on a hoist.
- Do not stand under load to do maintenance work.

WARNING

Hydraulic Pressures

- High pressures used in testing hydraulic components can cause line rupture or component failure.
- Only qualified personnel shall operate, service, and maintain hydraulic test equipment.
- Use heavy plastic shielding at least 1/2-inch thick when applying pressures over 250 psi to prevent injury to personnel.

WARNING

Hydraulic Fluid

- Hydraulic fluid is toxic. It can irritate skin and eyes and cause burns. When fluid is decomposed by heating, it releases toxic gases.
- Avoid inhaling. Use only with adequate ventilation. If prolonged contact with mist is likely, wear an appropriate respirator.
- Avoid contact with skin, eyes, or clothing. Wear rubber gloves if handling liquid.
- In case of contact with skin, immediately wash skin with soap and water. In case of contact with eyes, flush them immediately with clear water and get medical attention.
- If liquid is swallowed, do not induce vomiting; get immediate medical attention.

WARNING

Alcohol With Hydraulic Fluid Impairment

- Do not use alcohol to clean components which contact hydraulic fluids. Residue can form which could impair operation of the component.

WARNING

Compressed Air

- Do not use more than 30 psi compressed air for cleaning purposes. Debris propelled under pressure can cause injury to eyes.
- Use eye protection to prevent injury to personnel.

WARNING

Flare Dispenser

- Flares can accidentally fire, sometimes from stray voltage. Injury or death can result.
- Remove all electrical power from helicopter before installing loaded payload module on dispenser assembly.
- Keep hands and face away from end of payload module during installation.

WARNING

Maintenance Platforms/Workstands

- Use only appropriate maintenance platforms/workstands illustrated in TM 55-405-10, or other approved locally procured stands and restraint equipment, when working above 10 feet on helicopters in a nontactical environment. Otherwise, personnel injury could result from accidental falls.

WARNING

- Do not wear eyeglasses having light sensitive lenses while performing magnetic particle (black light) or fluorescent penetrant inspections.
- Such lenses have a 16 to 45 percent light transmission loss.
- Wearing them can result in failure to detect flaws and cracks under ultraviolet light.

WARNING

Cadmium-Plated Tools

- Use only chrome-plated or unplated steel tools when working on the helicopter.
- Cadmium or zinc-plated tools are not permitted, since these platings are prone to chipping and flaking. The chips and flakes could cause corrosion or fluid contamination.
- All tools, regardless of plating type, shall be serviceable and free of chipping.

LIST OF EFFECTIVE PAGES

Insert latest changed pages; dispose of superseded pages in accordance with regulations.

NOTE: On a changed page, the portion of the text affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

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TECHNICAL MANUAL

NO. 55-1520-240-23

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC., 10 May 1983

Aviation Unit and Aviation Intermediate
Maintenance Manual
CH-47D HELICOPTER

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of any 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 the back of this manual direct to: Commander U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-LS-LP, Redstone Arsenal. AL, 35898-5230. A reply will be furnished to you. You may also send in your comments electronically to our e-mail address: ls-lp@redstone.army.mil or by fax 205-842-6546/DSN 788-6546. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028.

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HOW TO USE THIS MANUAL (TM 55-1520-240-23)

This manual has 17 chapters and 3 appendixes.

1. Chapter 1 has instructions on servicing, ground handling, and other tasks that apply to the entire helicopter.
2. Chapters 2 thru 17 have descriptions and maintenance instructions for major systems of the helicopter. They are arranged as follows:
 - SYSTEM DESCRIPTION, with locator figure.
 - MAINTENANCE TASKS, with step-by-step procedures and figures.
3. The appendixes contain general reference information.

HOW TO FIND WHAT YOU NEED.

Troubleshooting. Refer to TM 55-1520-240-T.

Operational Tests. Part of troubleshooting procedures. Refer to TM 55-1520-240-T.

Wiring and Schematic Diagrams. Refer to TM 55-1520-240-T.

Inspections. Refer to Chapter 1. There are three kinds of inspection requirements listed:

1. **Calendar Inspections/Maintenance Actions.** This category includes scheduled inspections based on elapsed calendar time.
2. **Operating Time Special Inspections/Actions.** This category includes inspections and maintenance actions based on aircraft operating time which are not compatible with phased inspection intervals.
3. **Inspections/Maintenance Actions as a Result of Specific Conditions or Incidents.** This category covers actions/inspections required as a result of overspeed, overtorque, hard landing, unusual environmental conditions, etc. It also covers items such as retorque of attaching hardware a certain number of hours after installation.

Maintenance. To find a task, use the alphabetical index in the back of each manual. Each task is listed to enable the user to find important items under those names most likely to be looked for.

TASK PREPARATION.

Each task begins with INITIAL SETUP information. Read it carefully before starting. It tells what you will need and what you have to know to do the job.

1. **Applicable Configurations.** Tells you what configurations or effectivity the task applies to.
2. **To ols.** If any tools from your tool kit are needed, just the kit is listed. Tools needed that are not in the kit are called for by name. Special tools, containers, and test equipment are listed by tool number (TXX). Find these items in Chapter 1, Section IV.
3. **Materials.** Materials needed are listed by expendable number (EXX). Find these items in Chapter 1, Section IV.

4. **Parts.** New parts required, such as gaskets, packings, and washers, are listed by name only.
5. **Personnel Required.** Each MOS and skill level needed to do the task is listed. When more than one person of any MOS is needed, the number of persons is shown in parentheses. The assigned skill level should not be construed as the only skill level authorized to accomplish that task. (Refer to Appendix B.) The Maintenance Allocation Chart (MAC) assigns maintenance functions to the authorized maintenance level without regard to the MOS skill level.
6. **References.** Lists applicable maintenance manuals. Lists the TM 55-1520-240-23P if it supports installation, assembly, and/or replacement of maintenance-significant components. Also lists related tasks or texts which are references in Task steps.
7. **Equipment Condition.** Procedures which must be done before starting the task are listed and task numbers are given. Install tasks and assembly tasks do not normally list Equipment Conditions.
8. **General Safety Instructions.** These are safety precautions that must be observed throughout the task. Warnings include basic first aid instructions.
9. **Locator Figure.** The area of the helicopter where the task will be performed is shown, with components to be worked on called out. On off-helicopter tasks, the component to be worked on is shown.

TASK PERFORMANCE.

1. Before starting, read the entire task. Familiarize yourself with the entire procedure before beginning the task. The task heading at the top of each page specifies the task to be performed and the lowest maintenance level authorized to perform that task. Tasks to be accomplished by the Aviation Intermediate Maintenance level only, will be reflected by the term (AVIM) at the end of the task heading. If the term AVIM is not at the end of the task heading, then either the Aviation Unit or Aviation Intermediate Maintenance (AVUM or AVIM) level can accomplish that task.
2. As you read, pay attention to **WARNINGS**, **CAUTIONS**, and **NOTES**.
WARNINGS are used when there is danger of injury or death.
CAUTIONS are used when there is danger of damage to equipment.
NOTES are used to bring special attention to a step or subject.
3. When critical torques and dimensions are underlined, you will not see the word inspect; however, an inspector must ok the completed step.
4. Tasks are written in detail for inexperienced personnel. Major steps and key words are printed in **boldface** for experienced repairers.
5. The GLOSSARY lists special words and terms used in this manual and gives their meaning.
6. When the special tool is used or a common tool is used in an unusual way, the use of the tool will be shown.
7. When the word **INSPECT** is in a task, an inspector must approve the completed steps.

STANDARD MAINTENANCE PRACTICES.

The following are considered standard maintenance practices. Instructions about these practices will not normally be included in Task steps. Task steps will tell you when standard maintenance practices do not apply.

1. Tag tubes, hoses, and wires before they are disconnected. Tubes will be capped and open ports will be plugged when tubes or hoses are disconnected.

2. Discard used preformed packings and retainers. Install new packings and retainers. Packings, retainers, and thread of fittings are coated with system lubricant before they are installed.
3. Tie tubes, hoses, and related parts out of the way with twine, not lockwire.
4. Disassembly procedures reflect the total breakdown of a part as it is provisioned. 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 replace worn or damaged parts.
- 4.1. Use judgment when performing Follow-On-Maintenance. Depending on the nature of the task performed, it may only be necessary to perform certain relevant parts of the referenced follow-on task to ensure that the affected system is working properly. This is especially true of Follow-On requirements for extensive tasks such as rigging and operational checks.
5. Before inspecting a component or the disassembled parts of a component, clean them if required.
6. Inspect components and installation area for condition before installation.
 - a. Inspect procedures **do not** assume failure. Procedures are written as passing inspection.
 - b. There will be no references or direction in inspection procedures to repair, replace, or adjust.
 - c. Should a part fail inspection, either a repair, replacement, or adjust task in maintenance manual will determine what has to be done.
7. Use guide lines when any item is hoisted overhead.
8. Make-item specifics are listed in Appendix E.
9. When a nut is tightened or loosened on a bolt, hold the bolthead with a wrench.
10. A special torque will be cited when the words **torque to** are used. A standard torque is required when word **install** is used.
11. When torquing hardware, observe compliance with friction torque as required (TM 55-1500-204-25/1).
12. Task 1-13 contains tables of standard torque limits for threaded fasteners, hose and tube coupling nuts, and pipe thread fittings. Included in the torque tables are the applicable torque wrenches. These standard torques apply only when special torques are not specified in procedures. In the instances where additional tools are required, as a duplication of tools found in the Army tool kits, those tools shall be listed individually in the INITIAL SETUP.
13. Task 1-13 also contains tables of standard torque limits for positive retention and impedance bolts. Included in the torque tables are the applicable torque wrenches. These standard torques apply only when special torques are not specified in procedures.

Task 1-13 also contains a table of standard torque limits for general type nuts and bolts. These standard torques apply only when special torques are not specified in procedures. Included in the torque tables are the applicable torque wrenches.

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14. When cotter pin is required, torque nuts to lowest value of allowable torque range, Continue tightening only as needed to align cotter pin holes. Do not exceed maximum value of allowable range.
15. Following installation, paint will be touched up as needed. Components which are issued with a primer coat will be painted.
16. Following maintenance, work area will be inspected for foreign objects.
17. Testing hydraulic components in OFF HELICOPTER tasks shall be conducted behind a protective shield, 5/8-inch plexiglass or equivalent.
18. Test setups are shown as schematics. Specific attaching hardware is not listed to allow you flexibility in using equivalent equipment.
19. Dissimilar Metal Protection:
 - a. Where dissimilar metal protection is required in a procedure involving three or more steps, you will see the following note preceding the first step of the task.

NOTE

All dissimilar metal parts are coated with primer.

- b. Then each time you see a part where (dissimilar metal) follows the part name, you must apply primer to that item. For example:
 1. Install bellcrank (dissimilar metal) (12), etc.

This bellcrank requires a coat of primer applied before it is installed.
 - c. The type of primer you will need will be listed in each task, as required.
20. "Replace" means remove old part and install serviceable part.
 21. When it is required to hold components, tubing, or fittings made of aluminum or other soft material a vise, a soft-jawed vise shall be used. All components, tubing, and fittings used in the hydraulic systems shall also be held in a soft-jawed vise.
 22. To ensure a good grounding bond, make sure all electrical components and mating surfaces are clean and free of paint before installation. Make sure all wire contact points are clean.

CHAPTER 1

INTRODUCTION AND HELICOPTER GENERAL

SECTION I GENERAL INFORMATION

1-1. SCOPE

This manual is for the use of AVIM and AVIM personnel in maintaining the CH-47D medium-lift helicopter.

1-2. MAINTENANCE, FORMS, RECORDS, AND REPORTS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-751, The Army Maintenance System -Aviation (TAMMS-A).

1-3. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE.

For destruction of Army material to prevent enemy, use refer to TM 750-244-1-5.

1-4. PRERARATION FOR STORAGE OR SHHIPMENT.

Storage requirements for the helicopter are in Chapter 1. Refer to TM 1-1500-204-23 for general storage information.

1-5. QUALITY ASSURANCE/ QUALITY CONTROL.

Quality assurance /quality control personnel shall verify the dimensions and tolerances contained in this manual are met. Qualified personnel shall inspect completed work for full compliance with technical requirements of instructions. Inspection shall be in accordance with an approved prescribed inspection system to be determined at at work site.

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your manual need improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put on a SF 368 (quality Text Deficiency Report). Mail it to us at:

**Commander, USA AMCOM
ATTN: AMSAM-MMC-RE-FD
Redstone Arsenal, AI 35898-5230**

Well send you a reply.

1-7. AUTHORITY FOR SUBSTITUTION.

Substitution or interchange of items of material for maintenance of Department of the Army aircraft shall not be authorized, nor shall orders be issued for shipment. Substitution or interchangeability shall be only by US. Army Aviation and Missile Command.

1-8. CALIBRATION.

Within the scope of this manual there are no helicopter components, accessories, or instruments that require calibration. Special tools and test equipment shall be calibrated as specified in TB 750-25, Army Metrology and Calibration System/

1-9. EXPLANATION OF CHANGE SYMBOLS

Changes, except as noted below, to the text and table and including new material on added pages, are indicated by a vertical line in the outer margin extending close to the entire area of the material affected. An exception is that pages with emergency markings, which consists of black diagonal lines around the edges, may have the vertical line or change symbol placed along the inner margins. Symbols show current pages only. A miniature pointing hand symbol is used to denote a change to an illustration. However, a vertical line in our outer margin, rather than miniature pointing hands, is used if the illustration is new, or when there have been extensive changes made. Change symbols are not used to indicate changes in the following:

- a. Introductory material.
- b. Indexes and tabular data where the changes cannot be identified.
- c. Blank space resulting from the deletion of text, an illustration, or a table.
- d. Correction of minor inaccuracies, such as spelling, punctuation, relocation of material, etc. unless such correction changes the meaning of instructive information and procedures.

1-9.1. AIRCRAFT MODIFICATION (ECP/MWO) RETROFIT INFORMATION

Throughout this manual, black squares containing white numerals are used to distinguish information relating to helicopters modified by by an MWO or ECP. Refer to Helicopter Configuration Legend on the following pages for specific modifications and effectivities relating to each numeral. A list of delivered helicopters serial numbers is included with the legend.

Information pertaining only to unmodified helicopters is identified by the appropriate effectivity symbol preceded by WITHOUT. For example, WITHOUT **4** indicates that the information that follows is applicable only to helicopters not modified by ECP D018. Information pertaining only to helicopters that have been modified by ECP D018 is preceded by WITH **4**. All information not preceded by an effectivity symbol is common to all helicopters.

The following helicopter Designation Legend pages are solely for user convenience. They have no official status.

DELIVERED HELICOPTER SERIAL NUMBERS

al -23382	82-23762	83-24102	84-24152	85-24322
through	through	through	through	through
81-23389	82-23780	83-24125	84-24187	85-24336

HELICOPTER CONFIGURATION LEGEND

CODE	ECP/MWO NO.	TITLE	EFFECTIVITY	
			PRODUCTION (Serial Number)	RETROFIT
1	ECP DO03R1	Improved Synch Shaft Vibration Mount	84-24108 and on	Attrition
2	ECP DO10R2C1	Fuel Cell Manifold Control Bracket	82-23389 and on	Attrition
3	ECP DO008	Rotor Hub Protective Cover Enlargement	85-24322 and on	Attrition
4	ECP DO18R2	Composite Fuel Pods	84-24162 and on	Attrition
5	ECP DO006	Removable Support Structure Pylon Hyd. Module	81-23385 and on	By Kit all D
6	ECP D037R2	Shorter 114C1014 Yaw Connecting Link	85-24322 and on	Attrition
7	ECP D034	Pilot and Co-pilot Seat Armor	81-23386 and on	Attrition
8	ECP D042	Redesign Link Assy for Increased Parked Blade Loads	83-24105 and on	Attrition
9	ECP D048C1	Flare Dispenser Blanket Mod and Stowage Provision	83-24107 and on	None
10	ECP D061 R	Floor Former/Fuselage Bilge Paint Special paint for 14 aircraft	83-24107 and on (Interior) 83-24105 thru 83-24118 (Exterior)	None
11	ECP D065R1	Second Source 114PS494 Fuel Shutoff Valve (Motorized)	82-23776 and on	Attrition
12	ECP DO71	2-Inch Dia. Fuel Breakaway Fittings	83-24110 and on	Attrition
13	ECP DO74C1	Install Steel Control Rods Aft Pylon	83-24103 and on	81-23381 thru 83-24102 by Tech Bulletin
14	ECP DO15C2	Install Bubble Windows	85-24322 and on	Attrition
15	ECP DO51C1	Rainshield Redesign	84-24158 and on	Attrition
16	ECP D075	Heater Modification	85-24322 and on	Attrition
17	ECP DO27R1C1	Night Vision Goggles (NVG)	85-24322 and on	MWO 55-1520-240-50-3
18	ECP D036R1	Improved N1 System	85-24322 and on	Attrition
19	ECP D069R4	Ferry Fuel Provisions	90-0180 and on	MWO 55-1520-240-50-6
20	ECP DO064R1	Aft Pylon Work Platform Redesign	85-24322 and on	Attrition
21	ECP DO29C1	Ilca Actuator and Manifold Seal Change	85-24322 and on	Attrition
22	ECP DO60R1	Ramp Skin and Ramp End Former	85-24322 and on	Attrition
23	ECP DO01 R1	Improved N2 Control Box	84-24156 and on	Attrition
24	ECP D056R2	Redesigned Droop Stop Arm to Increase Clearance With Shroud; Modify Spring Limiter	85-24322 and on	Contractor Kit
25	ECP D081 R2	Radar Altitude Hold/Ground Contact Annunciator	87-0069 and on	MWO 55-1520-240-55-1
26	ECP D11 8C1	Improved Heat Resistance of Flight Control System Bellcranks and Connecting Rods	85-24353 and on	MWO 55-1520-240-50-38

HELICOPTER CONFIGURATION LEGEND (Continued)

CODE	ECP/MWO NO.	TITLE	PRODUCTION (Serial Number)	EFFECTIVITY
				RETROFIT
27	ECP DO54R1	Combining Transmission Support Fitting Redesign	8424154 and on	Attrition
28	ECP D126C1	Accumulator Apu/Flight Control Modules	86-1635 and on	Attrition
29	ECP DO85C1	Reduced Length Servo-Cylinder Safety Blocks	GSE	MWO 55-1520-240-50-16
30	ECP 712R7	Portable Calculator and Hardware for Vibrex	OBSOLETE	-----
31	ECP D108A	Aft Transmission Torque Reactor Improvement	GSE	MWO 55-1730-240-50-1
32	ECP D111	Deletion of KY-28 Secure Voice Control Panel	87-0069 and on	AVSCOM MSG.
33	ECP D133	Install New UH60/CH-47D Common Apu in CH-47D	86-1650 and on	-----
34	ECP D122	Change Droop Stop Shroud from Installed to Flyaway Equipment	85-24361 and on	N/A
35	ECP D016R1	Single Handle Cargo Hook Release	88-0079 and on	MWO 55-1520-240-50-15
36	ECP D113	Hook Release Button Ring Guard on Cyclic Grip	88-0085 and on	MWO 55-1520-240-50-23
37	ECP D11 5	Transmission and Engine Chip Burnoff System	89-0139 and on	MWO 55-1520-240-50-24
38	ECP D154R1 (Phase 1)	Installation of Stainless Steel Flight Control Connecting Links	88-0091 and on	MWO 55-1520-240-50-39
39	ECP D069R4	Ramp Extension/Center Skid Pad Modification for Compatibility With HICHS	90-0180 and on	Attrition
40	ECP D121 R2	Fine Mesh Inlet Screen	88-0095 and on	Retrofit
41	ECP D1 05R1	Shotpeen Horizontal Hinge Pins	88-0107 and on	MWO 55-1 520-240-55-6
42	ECP D1 35	Improved Rotor Blade Grounding Strap	88-0103 and on	MWO 55-1520-240-50-32
43	ECP D089	Delete Engine Anti-Ice System	87-0077 and on	MWO 1-1520-240-50-22
44	ECP D101	Engine Oil Pressure Transmitter Vib Isolation Mounts	90-0180 and on	MWO 55-1520-240-50-17
45	ECP DO92R1 (Phase 1)	Elastomeric Lag Damper and Pitch Link Bearings	90-0180 and on	-----
46	ECP D114C2	Drive Scissors Positive Locking Bolts	90-0180 and on	MWO 1-1520-240-50-51
47	ECP D095R1	Airframe Structural Improvements	90-0180 and on	Attrition
48	ECP D1 73	Combining Transmission Sync Shaft Shielding Baffle	88-0099 and on	MWO 55-1520-240-50-45
49	ECP D131 R1	Transmission Drip Pan Material Change	90-0214 and on	Attrition
50	ECP D145R1 C1	Bolt/Bushing Assembly Improvements	90-0180 and on	MWO 1-1520-240-50-37

HELICOPTER CONFIGURATION LEGEND (Continued)

CODE	ECP/MWO NO.	TITLE	EFFECTIVITY	
			PRODUCTION (Serial Number)	RETROFIT
51	ECP D157R1	One Piece Engine Drive Shaft	90-0180 and on	MWO 55-1520-240-50-43
52	ECP D190R1	Improved Clamshell Door Latch	92-0282 and on	MWO 1-1520-240-50-62
53	ECP D164	Incorporation of Dome Light Positive Locking Lever Switch	91-0252 and on	MWO 55-1520-240-50-50
54	ECP D154R1 (Phase 2)	Control System Hardening and Smoke Containment	81-23381 thru 89-0177	MWO 1-1520-240-50-40
55	ECP D185R1	Separate Fuel Control Relay Box Ground Connections	90-0202 and on	MWO 1-1520-240-50-58
56	ECP D183	Helicopter Internal Cargo Handling System (HICHS)	81-23381 thru 91-0277	MWO 1-1520-240-50-59
57	ECP D175	Ramp Centerline Attachment Engine Aft Mount Adjustable Link	81-23381 thru 92-0302	MWO 1-1520-2450-50-60
58	ECP D145R2	Improved Bolt/Bushing Connection	N/A	MWO 1-1520-2450-50-69
59	ECP D198A1	Polyurethane Paint for CH-47D Aircraft	-	Attrition
60	ECP A098	Heads Up Display System (HUD) AN/AVS-7	81-23381 thru 91-0271	MWO 1-1520-240-50-56
61	ECP A0027	Global Positioning System (GPS) AN/ASN-149(V)	81-23381 thru 92-0302	MWO 1-1520-240-50-68
62	ECP AEEMH- 03009	Altitude Voice Warning System Radar Altimeter AN/APN-209(V)	81-23381 thru 93-0934	MWO 1-1520-240-50-61
63	ECP D200 (Phase 2)	Replace Lower Pitch Link Elastomeric Bearing	90-0180 and on	MWO 1-1520-2450-50-64 and MWO 1-1520-240-50-63 MWO 1-1520-240-50-65
64	ECP D194R1	Stainless Steel Bellcranks in Combining Transmission Area	81-23381 and on	MWO 1-1520-240-50-65
65	ECP D168R1	Cockpit Remote Emergency Ramp Extension System	81-23381 thru 92-0309	MWO 1-1520-240-50-48
66	ECP D199	Non-Metallic Spline Adapters for Combining Transmission Cooling Fan Drive Shaft	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-67
67	ECP D214R1	Aft Position Lights Switch	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-75
68	ECP D216	Pressure Refueling Vacuum Relief Valve	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-81
69	ECP D215	NVG Bezel	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-71
70	ECP D210R1	Easily Replaceable Cabin Escape Hatch	76-18479 and 81-3381 thru 93-00934	MWO 1-1520-240-50-76
71	ECP END HO30015	Installation of AN/ASN-128B Doppler GPS Navigation System	76-18479 and on	MWO 1-1520-240-50-73

HELICOPTER CONFIGURATION LEGEND (Continued)

CODE	ECP/MWO NO.	TITLE	PRODUCTION (Serial Number)	EFFECTIVITY
				RETROFIT
72	ECP D209 (Pending)	Installation of Radar Altimeter in Center Hook Compartment	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-72
73	EJCH007016	ARC-220/KY-100	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-74
74	ECP D218	714/FADEC	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-83
75	ECP D219	Pylon Clamshell Door Latch	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-80
76	ECP D220	Pylon Platform Latch	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-77
77	ECP D221 (Pending)	Improved Engine Cross Shaft Adapters	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-XX
78	ECP D223	Cargo Hatch Handhold	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-79
79	ECP D225	Cad Bolts	76-18479 and 81-23381 thru 93-00934	Attrition
81	ECP D229	Transmission Bushings	76-18479 and 81-23381 thru 93-00934	Attrition
82	ECP D230	Extended Range Fuel System (ERFS II)	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-84
83	ECP D227	Upper Swashplate Dust Seal	76-18479 and 81-23381 thru 93-00934	Attrition
84	ECP D226 (Pending)	Installation of Sealed Lead Acid Storage Battery	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-XX

SECTION II EQUIPMENT DESCRIPTION AND DATA

1-10. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

The CH-47D is a tandem rotor cargo helicopter. It is powered by two T55-L-712 engines in nacelles on the aft cabin fuselage section.

Torque from engines is transmitted to rotary-wing blades through a series of mechanical transmissions. These transmissions are interconnected by a system of synchronizing drive shafts.

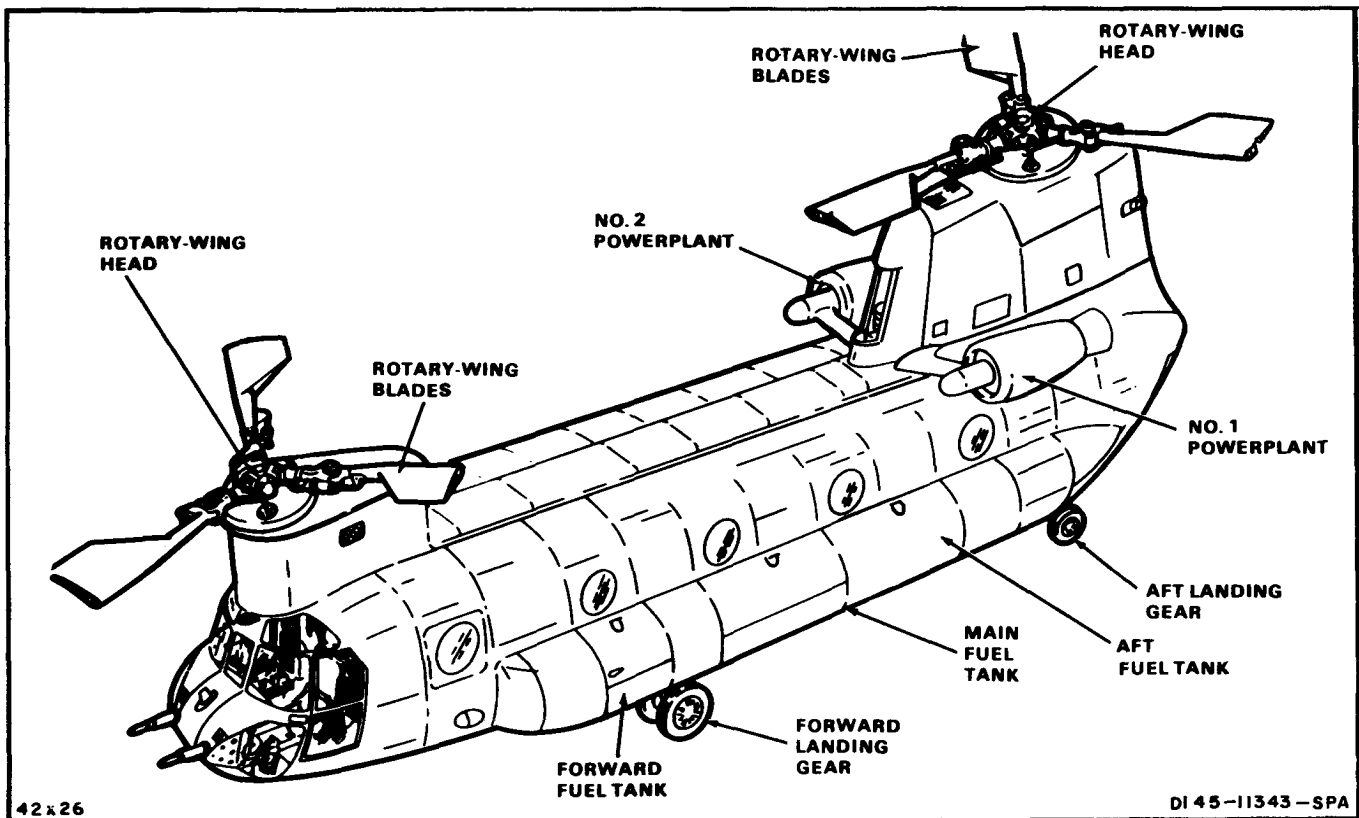
Each rotor system consists of a rotary-wing head and three rotary-wing blades. Rotor systems are controllable from the cockpit by both pilot and co-pilot through dual hydraulic-boosted control systems.

The helicopter is equipped with four landing gear, with dual wheels on each forward landing gear and a single wheel on each aft landing gear. Each aft gear can swivel 360°. Power steering is connected to the right aft gear.

A hydraulically operated cargo ramp and door is incorporated in the aft end of the fuselage. A hydraulically operated rescue and cargo handling winch is located in the forward cabin area.

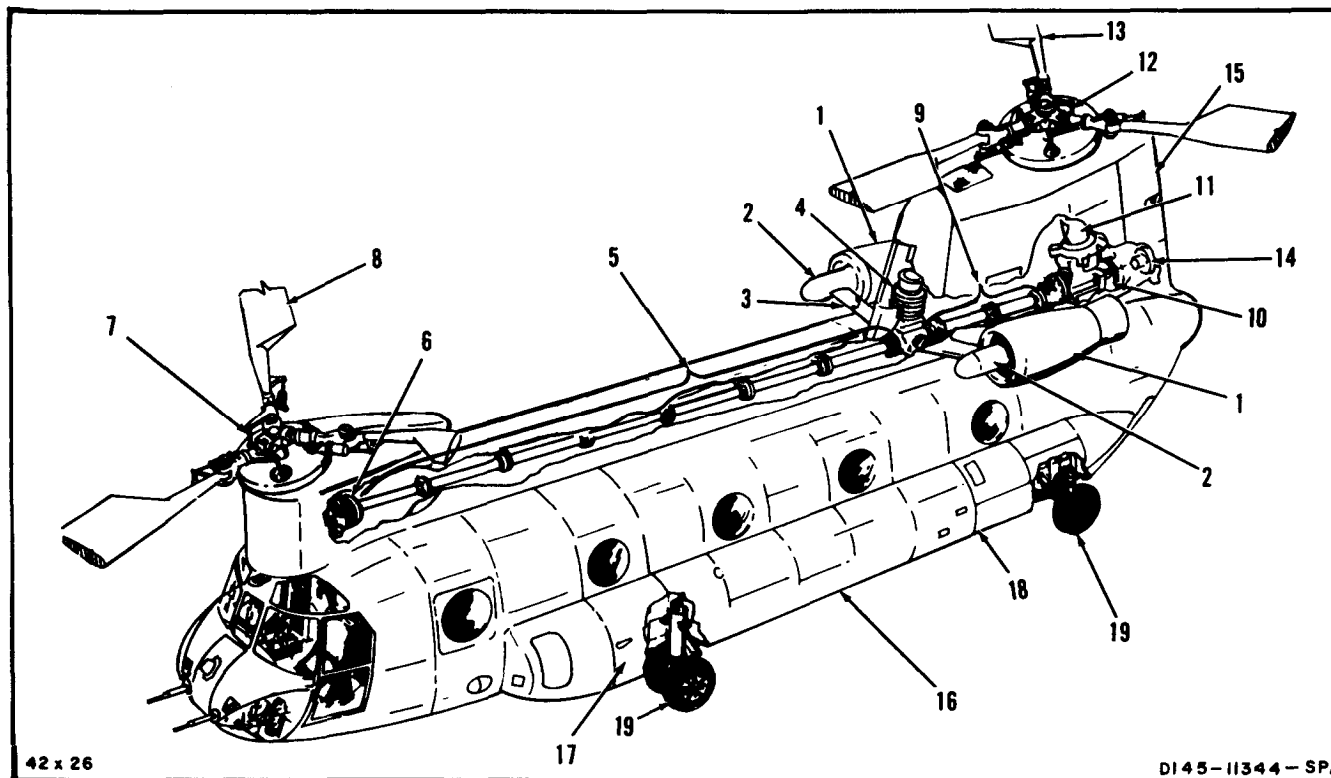
An auxiliary power unit mounted above the cargo ramp area in the aft pylon permits operation of all helicopter systems without the use of a ground power source.

Additional descriptive and operational data can be found in Operator's Manual TM 55-1520-240-10.



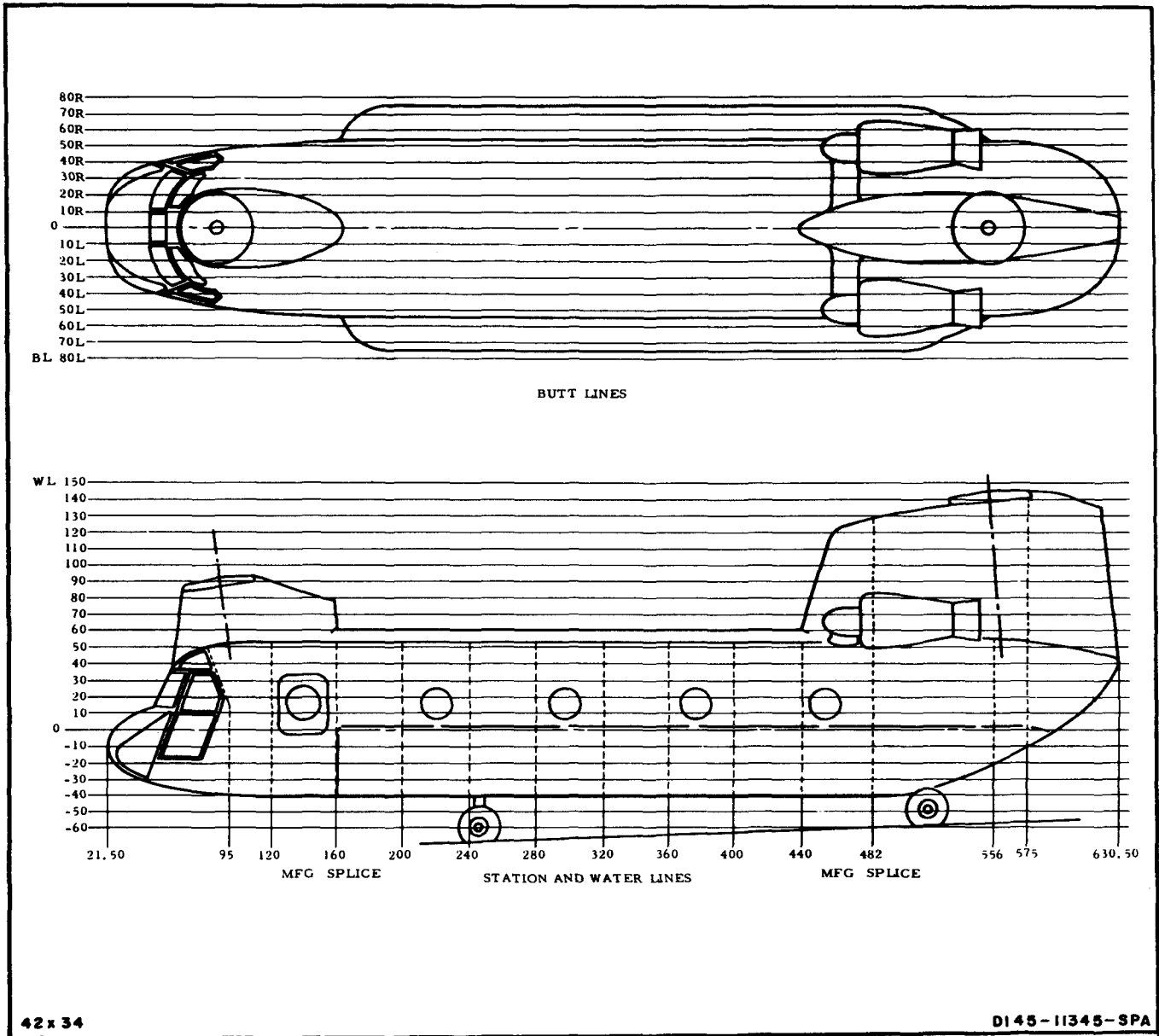
1-11. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

- | | |
|-------------------------------|--|
| 1. Powerplant | — Provides power to helicopter. |
| 2. Engine Transmission | — Directs power from engine to combining transmission. |
| 3. Engine Shaft | — Transmits power from engine transmission to combining transmission. |
| 4. Combining Transmission | — Combines power from two engines. |
| 5. Forward Drive Shafting | — Transmits power from combining transmission to forward transmission. |
| 6. Forward Transmission | — Transmits power to forward rotor head, |
| 7. Forward Rotary-Wing Head | — Transmits power and flight control input to forward blades. |
| 8. Forward Rotary-Wing Blades | — Provide lift to helicopter. |
| 9. Aft Drive Shafting | — Transmits power from combining transmission to aft transmission |
| 10. Aft Transmission | — Transmits power to aft rotor shaft. |
| 11. Aft Rotor Shaft | — Transmits power to aft rotary-wing head. |
| 12. Aft Rotary-Wing Head | — Transmits power and flight control input to aft blades. |
| 13. Aft Rotary-Wing Blades | — Provide lift to helicopter, |
| 14. Auxiliary Power Unit | — Provides power for ground operation and powerplant starting. |
| 15. Pylon | — Encloses aft drive system components. |
| 16. Main Fuel Tank | |
| 17. Forward Fuel Tank | — Holds fuel for powerplants and apu. |
| 18. Aft Fuel Tank | |
| 19. Landing Gear | — Supports and allows ground movement of helicopter. |



1-12. HELICOPTER DIMENSIONS AND DETAILS.

The locations of primary fuselage stations, water lines, and butt lines are shown. Station numbers in inches are marked at four places on the aft side of cabin frames. Water line 0.0 is marked at each side of the cabin along a beam below windows.



SECTION III
MAINTENANCE DATA

1-13 STANDARD TORQUE LIMIT APPLICATION**1 - 13**

This task provides standard torque limits for threaded fasteners, hose and tube coupling nuts, bulkhead fittings, and pipe thread fittings, and the minimum breakaway torque values for determining reusability of self-locking nuts. These standard torque values apply only when special torque values are not specified in procedures. General instructions for installation and fit of threaded fasteners are as follows:

1. Thread shall not be in bearing when thickness of sheet or fitting is 3/32-inch or less. If thickness is more than 3/32-inch, a maximum of two threads in bearing is permissible.
2. In shear applications, thread shall not be in bearing regardless of material thickness.
3. Washers are used for the following purposes:
 - a. To compensate for differences in bolt grip length and material thickness due to manufacturing tolerances, protective coating, and other surface variances.
 - b. To distribute bearing load over a greater area to prevent damage to material under a bolt head or nut.
 - c. To protect the material surface when a bolt or nut is tightened.
 - d. Prevent galling of aluminum or other soft material when bolt or nut is tightened.
 - e. To insulate dissimilar metals to prevent corrosion. The washer material should be similar to the material on which it rests rather than the bolt or nut material. This insures that if corrosion occurs, it will be between the bolt and washer, which can be replaced.
4. When nut-bolt assemblies are installed, the nut shall not engage the first incomplete thread next to the bolt shank.
5. Nuts are properly installed when all threads are engaged and the bolt chamfer extends thru the nut. When flat-end bolts are used, the threaded end must extend at least 1 /32-inch thru the nut.
6. Threads shall be clean and dry before installation. If threads are lubricated, torque limits are reduced by 30 percent.
7. The tightening sequence in multiple fitting installation is as follows:
 - a. Finger tighten all bolts or nuts.
 - b. Snug up opposite bolts or nuts all around.
 - c. Tighten opposite bolts or nuts all around to proper torque. Do not torque adjacent bolts or nuts in sequence.
8. All-metal self-locking nuts shall be replaced with new identical parts at each installation. If new nuts are not available, all metal self-locking nuts may be reused. The reused nuts must meet the required minimum friction torque. See "Friction Torque in Inch-Pounds for Threaded Fasteners" in this task.

GO TO NEXT PAGE**Change 17**

1-13 STANDARD TORQUE LIMIT APPLICATION (Continued)

Standard Torque Limits in Inch-Pounds for Threaded Fasteners

CAUTION

Overtightening fasteners can cause equipment damage or failure of fastener.

BOLT & NUT MATERIAL		STEEL & CORROSION RESISTANT STEEL					ALUMINUM		
NUT TYPE	SELF-LOCKING NUTS, PLATENUTS, CASTELLATED NUTS, 12 POINT NUTS								
	TENSION		SHEAR		TENSION	SHEAR	SHEAR	TENSION	SHEAR
NUT PART NUMBER EXAMPLES	AN310, AN315, MS20161 MS21069 MS21071 MS20365 MS21072 MS21044 MS21073 MS21045 NAS679 MS20500 NAS1021 MS21055 NAS1068 MS21056 BACN10MK MS21059 BACN10JZ MS21060 BACN10FX MS21076 BACN10HY		AN320 AN316 AN315C MS21083 NAS1022 MS51967 MS51968 MS51971		MS17825	MS17826 MS21224	MS21244	AN310 AN315 MS21044	AN320 MS21083
TORQUE LIMITS (INCH-POUNDS)									
THREAD SIZE	SEE NOTE 1	SEE NOTE 3	SEE NOTE 1	SEE NOTE 3	SEE NOTE 5	SEE NOTE 5			
8-32	12-15	20	7-9	12			—	—	
10-32	20-25	40	12-15	25	25-35	15-20	15-20	—	—
1/4-28	50-70	100	30-40	60	55-80	30-45	35-50	35-40	20-25
5/16-24	100-140	225	60-85	140	120-170	60-90	70-100	95-100	55-65
3/8-24	160-190	390	95-110	240	230-325	85-125	130-190	150-165	90-100
7/16-20	450-500	840	270-300	500	370-530	155-220	210-300	225-250	135-150
1/2-20	480-690	1100	290-410	660	580-830	195-280	315-450	300-375	180-225
9/16-18	800-1000	1600	480-600	960	770-1100	280-400	460-660	400-500	240-300
5/8-18	1100-1300	2400	660-780	1400	1120-1600	420-600	660-940	550-650	300-390
3/4-16	2300-2500	5000	1300-1500	3000	1400-2500	950-1100	1310-1560	1150-1250	690-750
7/8-14	2500-3000	7000	1500-1800	4200	2300-3000	1500-1800	2075-2500	1750-2000	1050-1200
1-120 or 1-14	3700-5500	10000	200-3300	6000	3400-5500	2000-3000	2275-3410	2325-3000	1400-1800
1/8-12	5000-7000	15000	3000-4200	9000	5000-7000	—	—	2900-3900	1740-2340

TORQUE WRENCHES

5-50 Inch-Pounds
 30-150 Inch-Pounds
 100-750 Inch-Pounds

700-1600 Inch-Pounds
 0-600 Foot-Pounds

GO TO NEXT PAGE

1-13 STANDARD TORQUE LIMIT APPLICATION (Continued)

1-13

NOTES

1. Torque limits apply to nut tightening only. When tightening bolt, the higher limit ±10 percent is used.
2. Torque values are for dry (unlubricated) threads. If threads are lubricated, limit is 70 percent of unlubricated value.
3. Maximum torque allowed for cotter pin hole alignment. If limit is exceeded, discard nut and bolt and inspect parts secured by the nut and bolt.
4. Torque limits apply only to tightening nut on stud.
5. When tightening self-locking castellated nuts MS21224, MS17825, and MS17826, first tighten to minimum torque. if slot in nut is aligned with cotter pin hole in bolt, tighten nut an additional 60 degrees (one castellation) and install cotter pin. If slot in nut is not aligned with cotter pin hole in bolt, tighten nut until aligned and install cotter pin. In either case, maximum torque must not be exceeded.
6. Apply a coating of antiseize compound (E75) or equivalent to the bushing OD on bolts 114R3650 series only.

CAUTION

Do not apply antiseize Compound to bolt or nut threads.

GO TO NEXT PAGE

Friction Torque in Inch-Pounds for Threaded Fasteners

THREAD SIZE	MINIMUM FRICTION TORQUE
8-32	1.5
10-32	2.0
1/4-28	3.5
5/16-24	6.5
3/8-24	9.5
7/16-20	14.0
1/2-20	18.0
9/16-18	24.0
5/8-18	32.0
3/4-16	50.0
7/8-14	70.0
1-12	90.0
1-1/8-12	117.0
1-1/4-12	143.0

NOTE

To determine friction torque, thread the nut onto the screw or bolt until at least two threads protrude. The nut shall not make contact with a mating part. Stop the nut. The torque necessary to begin turning the nut again is the breakaway torque. Do not reuse self-locking nuts that do not meet minimum friction torque.

TORQUE WRENCHES

5 to 50 Inch-Pounds

30 to 150 Inch-Pounds

GO TO NEXT PAGE

1-13 STANDARD TORQUE LIMIT APPLICATION (Continued)

Standard Torque Limits in Inch-Pounds for Hose and Tube Coupling Nuts

TUBE OD	HOSE SIZE	NUT HEX	A	B	C	D	E
1/4	- 4	9/16	105-115	135-145	50-65	135-150	100-120
3/8	- 6	11/16	160-180	255-285	100-125	270-300	210-250
1/2	- 8	7/8	265-295	475-525	210-250	450-500	340-420
5/8	- 10	1	355-375	665-735	300-350	650-700	400-480
3/4	- 12	1 1/4	430-470	855-945	425-500	900-1000	725-850
1	- 16	1 1/2	715-785		600-700	1200-1400	900-1150
1 1/4	- 20	2	855-945		680-800	1200-1400	950-1150

Overtightening of hose and tube coupling nuts will cause thread and seal damage resulting in fitting leakage. Torque values are for threads lubricated with hydraulic fluid (E197), antiseize compound (E75), petrolatum (E274), or aircraft and instrument grease (E 189), as applicable.

NOTE

This table not applicable to permaswage nuts coupled to Rosan fittings.

TORQUE WRENCHES

30 to 150 Inch-Pounds
100 to 750 Inch-Pounds

700 to 1600 Inch-Pounds

KEY

A—Aluminum Permaswage tube coupling nuts.

B—Steel Permaswage tube coupling nuts.

C—Steel or aluminum flared fitting nuts, AN818, AN924, NAS591-593, and NAS594-596: used on aluminum tube¹

D—Steel or aluminum flared fitting nuts, AN818, AN924, NAS591-593, and NAS594-596: used on steel tube¹

E—Steel or aluminum flared fitting hose coupling nuts¹

¹Where use of a torque wrench would be difficult, use a conventional wrench to tighten coupling nuts. Tighten until a distinct increase in the torque required is noted. Continue tightening an additional 1/6 of a turn. Back off the nut. Again tighten until a distinct increase in the torque required is noted. Continue tightening an additional 1/6 to 1/3 of a turn.

**Standard Torque Limits in Inch-Pounds for
Connecting Coupling Nuts to Rosan Fittings**

TUBE OD	HOSE SIZE	NUT HEX	STEEL	ALUMINUM
1/4	- 4	9/16	140-150	140-150
3/8	- 6	11/16	290-300	250-260
1/2	- 8	7/8	525-575	410-430
5/8	- 10	1	735-805	530-550
3/4	- 12	1 1/4	960-1000	660-690
1	- 16	1 1/2	1360-1400	1110-1150

NOTES

1. Rosan fittings are used on the following hydraulic system components:

- | | |
|---------------------------------|-------------------------------------|
| Utility Pressure Module | Flight Control Power Control Module |
| Utility Return Module | Lower Controls Module |
| Apu Start Module | ILCA Manifold |
| Apu Start Accumulator | Apu Motor Pump |
| Utility Cooler Reservoir | |
| Flight Control Cooler Reservoir | |

2. Torque values are for fittings lubricated with hydraulic fluid (E197).

TORQUE WRENCHES

30 to 150 Inch-Pounds 700 to 1600 Inch-Pounds
100 to 750 Inch-Pounds

GO TO NEXT PAGE

1-13 STANDARD TORQUE LIMIT APPLICATION (Continued)

Standard Torque Limits in Inch-Pounds for Pipe Thread Fittings

CAUTION

Be careful when tightening fitting. Overtightening causes distortion, cracking, and leaks.

THREAD SIZE	WORKING TORQUE ¹	MAXIMUM TORQUE ¹
1/8-27	100	175
1/4-18	150	300
3/8-18	225	450

TORQUE WRENCHES

30 to 150 Inch-Pounds

100 to 750 Inch-Pounds

¹Antiseize compound (E75) shall be used on threads to prevent seizing and to aid in sealing. The compound shall be applied to the male fitting so that it does not contaminate the fluid in the system. Male and female fittings should be of different materials.

Bulkhead Fitting Hole Diameter, Washer Thickness, and Nut Torque Limits

CAUTION

Be careful when tightening fittings. Overtightening causes distortion, cracking, and leaks.

TUBE SIZE	TUBE FITTING OD (IN.)	TUBE FITTING THREAD	BULKHEAD HOLE DIA (IN.)		WASHER THICKNESS (IN.)	TORQUE (IN.-LB) AN924 NUT	
			MIN	MAX		MIN	MAX
-4	1 / 4	7/16-20	.443	.463	.063	85	105
-5	5/16	1/2-20	.505	.525	.063	105	125
-6	3 / 8	9/16-16	.566	.588	.063	120	150
-8	1 / 2	3/4-16	.755	.775	.090	240	280
-10	5 / 8	7/8-14	.880	.880	.090	320	380
-12	3 / 4	1-1/16-12	1.068	1.068	.090	500	600
-16	1 . 0	1-5/16-12	1.318	1.338	.090	720	880
-20	1-1/4	1-5/8-12	1.630	1.650	.090	960	1200

END OF TASK

1-14 SELF-RETAINING BOLTS INSTALLATION

WARNING

Standard bolts must not be substituted for self-retaining bolts at any connection where self-retaining bolts are installed. Loss of a bolt from any one of these flight control connections could result in the loss of the helicopter.

Two types of self-retaining bolts are used. They are positive retention bolts and impedance bolts. Both types have a fail-safe feature which prevents loss of bolt, if nut comes off. A nut, safetied with a cotter pin, must be installed on each self-retaining bolt.

Positive retention bolts have a pawl at threaded end of bolt shank. The pawl is spring loaded to an extended position. When extended, the pawl prevents the nut from being removed. Finger pressure compresses the pawl for removal of the nut and for removal of the bolt from the parts. Some of the bolts contain a heat shrunk bushing which replaces the sliding bushing in the fastener build-up. This prevents installation of the bolt without the bushing being installed. Placards are installed at each location for positive retention bolts.

Impedance bolts have either spring-loaded balls, or a spring ring on the bolt shank above the threads. These retaining elements extend beyond the diameter of the bolt and prevent it from sliding from the parts.

1. Remove positive retention bolts as follows:
 - a. Remove cotter pin.
 - b. Backoff nut until it is next to pawl.
Depress pawl and backoff nut from bolt.
Depress pawl and remove washer.
 - c. Pull bolt out until pawl is next to lug.
Depress pawl and pull bolt out until pawl is inside lug.
 - d. Hold parts stack-up together and pull bolt out.

N O T E

If stack-up separates while removing bolt, pawl may extend and catch on edge of fastener, bearing, or bushing. If pawl extends while removing bolt, use a thin piece of metal such as knife edge or rule to depress pawl. Do not hammer bolt out.

- e. On bolts with integral bushings, examine the bushing for galling. If there is galling, rework the bait to reduce bushing diameter.
2. Rework of Positive Retention Bolts. If the bushing of a removed bolt is galled, rework it as follows:
 - a. Measure the diameter of the bushing. If it is greater than the diameter after rework shown in Table below, reduce the diameter by machine turning or grinding. Maintain a surface finish of 63 microinches or less.

*Positive Retention Bolt Assembly Rework
D i a m e t e r s*

Bolt assembly Part No.	Bushing diameter		Bushing Diameter
	Before	Rework	After Rework
114R3650-3	0.8744	or 0.8749	0.8708 to 0.8713
114R3650-4	0.8744	to 0.8749	0.8708 to 0.8713
114R3650-6	0.6244	to 0.6249	0.6218 to 0.6223
114R3650-7	0.7806	to 0.7811	0.7774 to 0.7779
114R3650-9	0.9382	to 0.9387	0.9343 to 0.9348
114R3650-11	0.7507	to 0.7512	0.7476 to 0.7481
114R3650-13	0.6244	to 0.6249	0.6218 to 0.6223
114R3650-15	0.6244	to 0.6249	0.6218 to 0.6223

All Diminisions In Inches

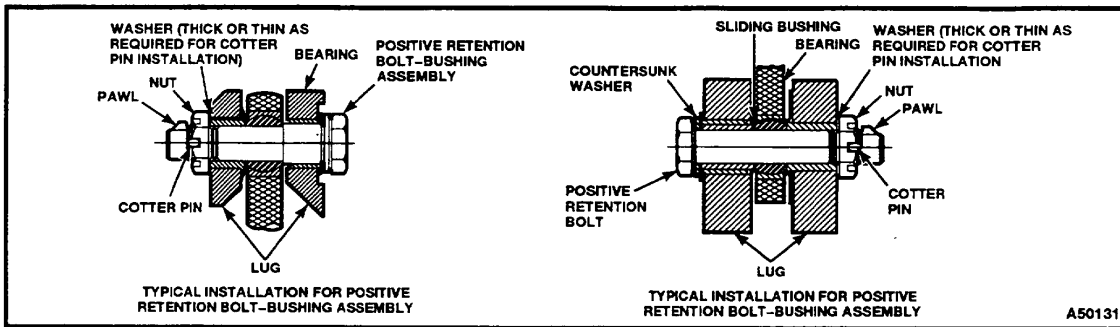
- b. If galling extends below the reduced diameter, discard the bait.
- c. Inspect the reworked bolt assembly. Use magnetic particle inspection per MIL-I-6868. Use circular magnetization thru the ends of the assembly at 800 to 1000 amperes. Use longitudinal inspection, charged coil, at 800 to 1200 amperes.
3. Install positive retention bolts as follows:
 - a. Place countersunk washer under bolt head. Make sure countersink is next to bolt head. The positive retention bolt-bushing assembly does not have a washer under the head.

GO TO NEXT PAGE

- c Inspect the reworked bolt assembly Use magnetic particle inspection per MIL-1-6868. Use circular magnetization thru the ends of the assembly at 800 to 1000 amperes Use longitudinal inspection, charged coil, at 800 to 1200 amperes.
- 3 Install positive retention bolts as follows:
 - a Place countersunk washer under bolt head. Make sure countersink is next to bolt head. For helicopters with **46**, the positive retention bolt-bushing assembly does not have a washer under the head.
 - b Apply a light coat of antiseize compound (E75) to OD of bushing and bolt shank of 114R3650 series bolts Wear gloves (E184.1).
 - c Align bearing, lugs, bolt, and bushing Install bolt.
 - d Place washer(s) on the bolt Use thick or thin washers as necessary for cotter pin installation.
 - e Install nut Torque it to minimum applicable torque If cotter pin holes are not aligned, tighten nut to align holes Do not exceed maximum torque.
 - f Install cotter pin.
 - g Make sure pawl on bolt is extended Make sure placards are installed near fastener installation.

CAUTION

Do not apply antiseize compound on thread of bolt or nut.



Torque for Nuts Used With Positive Retention Bolts

CAUTION

Do not exceed maximum torque for cotter pin hole alignment.

NUT AN320	MINIMUM TORQUE (INCH-POUNDS)	MAXIMUM TORQUE (INCH-POUNDS) (SEE CAUTION)
-5	60	140
-6	95	240
-7	270	500
-8	290	660
-9	480	960
-10	660	1400
-12	1300	3000

TORQUE WRENCHES

<u>30 to 150 Inch-Pounds</u>	<u>700 to 1600 Inch-Pounds</u>
<u>100 to 750 Inch-Pounds</u>	<u>0 to 600 Foot-Pounds</u>

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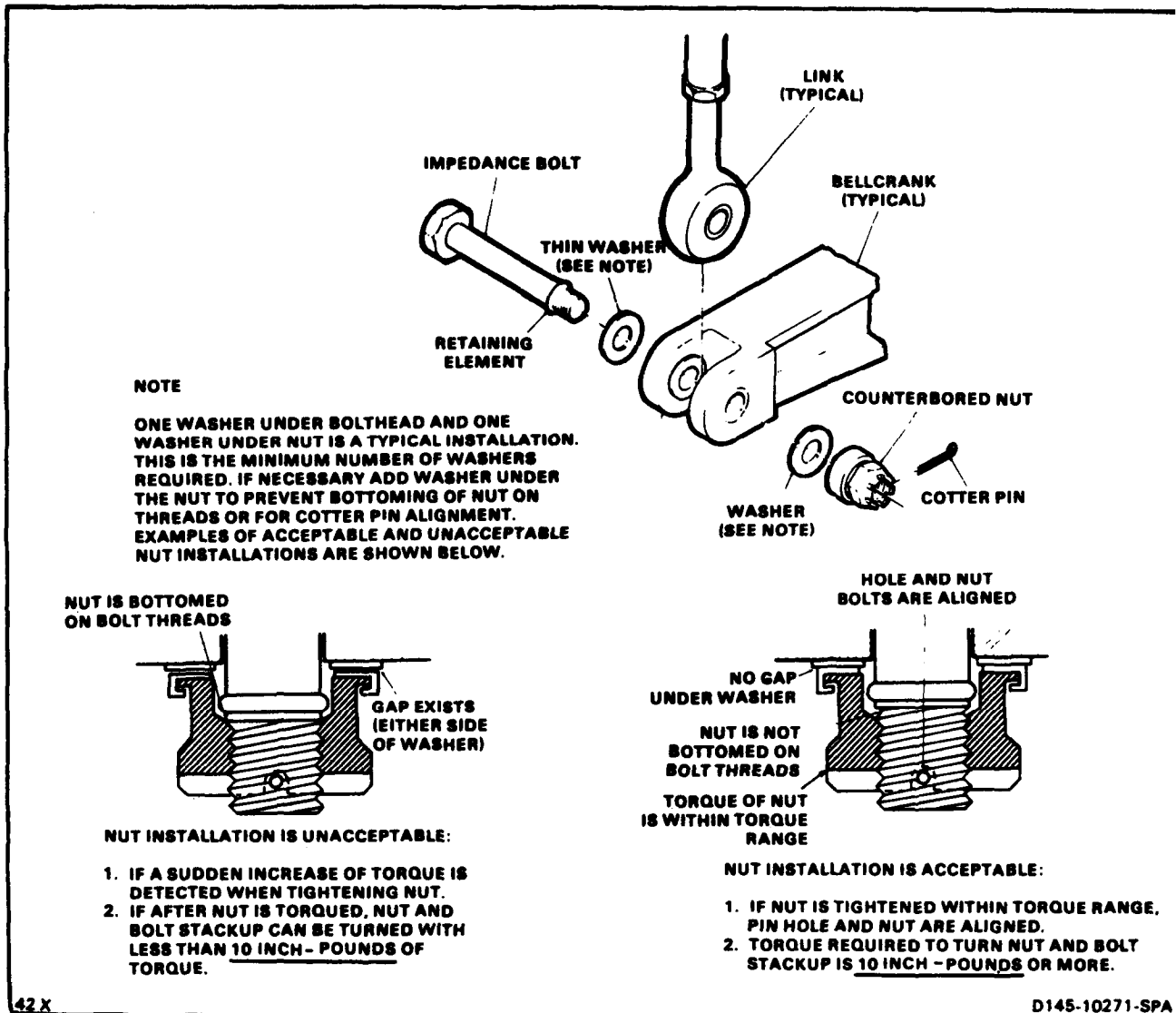
1-14 SELF-RETAINING BOLTS INSTALLATION (CONTINUED)

3. Remove impedance bolts as follows:
 - a. Remove cotter pin and nut.
 - b. Push bolt shank in removal direction until retaining element is compressed. Do not hammer on bolt.
 - c. Grasp bolthead and pull bolt out of parts.
4. Install impedance bolts as follows:

NOTE

No lubricant shall be applied to bolt shank or threads.

- a. When a washer is required under bolthead, place washer on bolt shank.
- b. Push bolt thru parts until retaining element protrudes beyond connected parts.



GO TO NEXT PAGE

1-14 SELF-RETAINING BOLTS INSTALLATION (Continued)

- c. Place washer(s) on bolt.
- d. Install nut as follows:

CAUTION

If a thin washer is used under the nut, do not let the inner diameter of the washer become caught on the bolt retaining element. False torque readings and damage to the hardware can result.

- (1) Torque nut to the minimum applicable torque. Check that no axial looseness exists in bolt-nut stackup. CHECK THAT MINIMUM TORQUE OF 10 INCH-POUNDS IS REQUIRED TO ROTATE BOLT-NUT STACKUP. Correct low rotation torque or axial looseness by adding a washer under nut, repeat torquing.

- (2) Install cotter pin if nut castellations are aligned with pin hole. If castellations are not in line with pin hole, tighten nut as required for alignment. Install cotter pin. Do not exceed maximum allowable torque.

NOTE

Abrupt increases in torque required to tighten nut is an indication of bottomed thread or jammed washer. Remove nut and examine hardware if such damage is suspected.

Torque in Inch-Pounds for Nuts Used With Impedance Bolts

NUT	MINIMUM TORQUE	MAXIMUM TORQUE
MS21224-3	15	20
MS21224-4	30	45
MS21224-5	60	90
MS21224-6	85	125
MS21224-7	155	220
MS21224-8	195	280
MS21224-9	280	400
MS17826-4	30	45
MS17826-9	280	400

TORQUE WRENCHES

- 5 to 50 Inch-Pounds 100 to 750 Inch-Pounds
- 30 to 150 Inch-Pounds

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Machine Shop Set,
 NSN 4920-00-405-9279
 Rosan Tool Kit,
 NSN 5180-00-778-3789
 Plier Wrench
 Source of Low Pressure Compressed Air
 (30 Psi or Less)
 Goggles

Materials:

Barrier Material (E80)
 Tape (E388)
 Epoxy Primer (E292.1)
 Gloves (E184.1)

Parts:

Lock Ring

Personnel Required:

Machinist
 Inspector

References:

TM 43-0104
 TM 55-1520-240-23P

Equipment Condition:

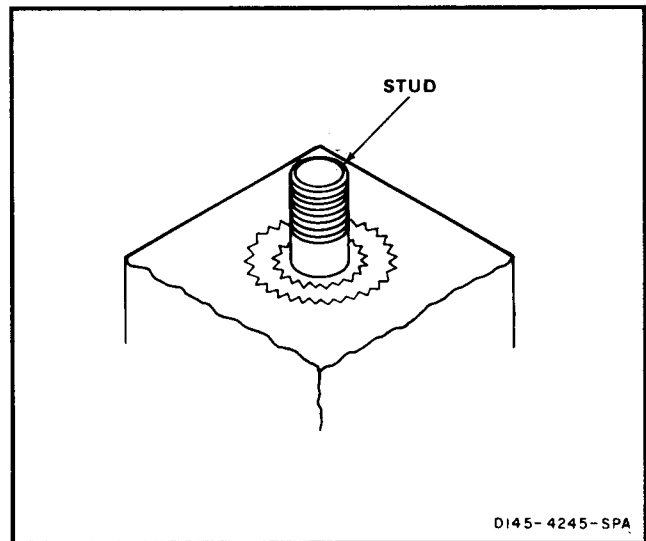
Off Helicopter Task

NOTE

Task can be done on installed
 component if stud is accessible.

General Safety Instructions:**WARNING**

Epoxy primer (E292.1) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.



D145-4245-SPA

1-15 REPLACE LOCKED-IN STUD (AVIM) (Continued)

1-15

NOTE

- Procedure is same to replace any locked-in stud. Typical stud shown here.
- For more information on locked-in studs. refer to TM 43-0104.
- If stud is broken off close to mounting surface, or if drill with speed below 700 rpm is not available. go to step 8.

REMOVE STUD WITH REMOVAL TOOLS

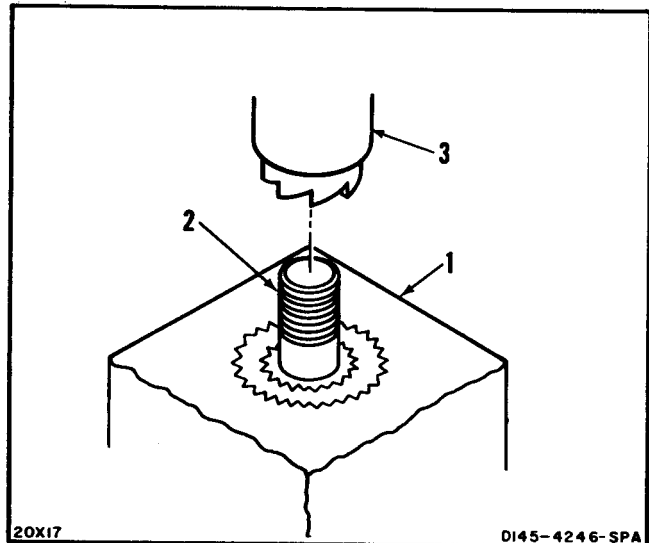
1. Cover openings in component housing (1) in area of stud (2). Use barrier material (E80) and tape (E388).
2. Install removal tool (3) in drill or drill press.

For Stud:

MS51989-104
 MS51989-105
 MS51989-106
 SM51989-107
 MS51992B-504-13
 SHF101-9SA(8)A
 ST-10045

Use Tool:

SM91-16
 SM101-18
 SM111-20
 SM121-22
 B1575
 SM101-18
 SM101-18



GO TO NEXT PAGE

3. Measure and record thickness of replacement lock ring (4).
4. Position removal tool (3) over stud (2) and against lock ring (4).

WARNING

Do not operate removal tool above 700 rpm. Make sure tool is against lock ring before operating. Otherwise, personal injury could result. If 700-rpm drill is not available, go to step 9.

NOTE

Interlock area need not be cut away to full depth. Three-quarters depth is enough.

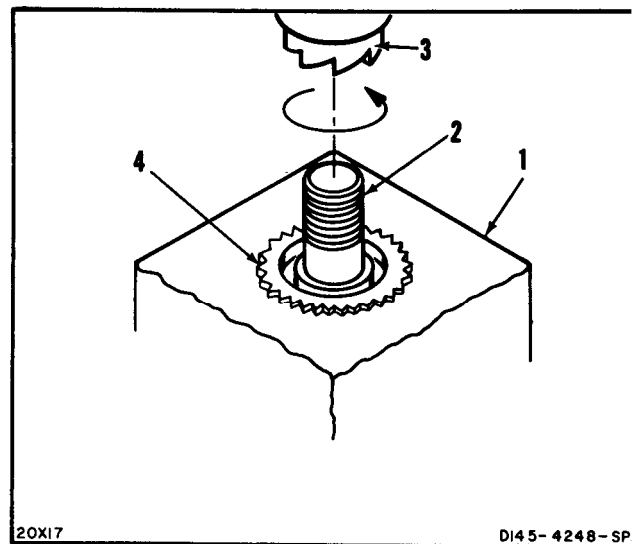
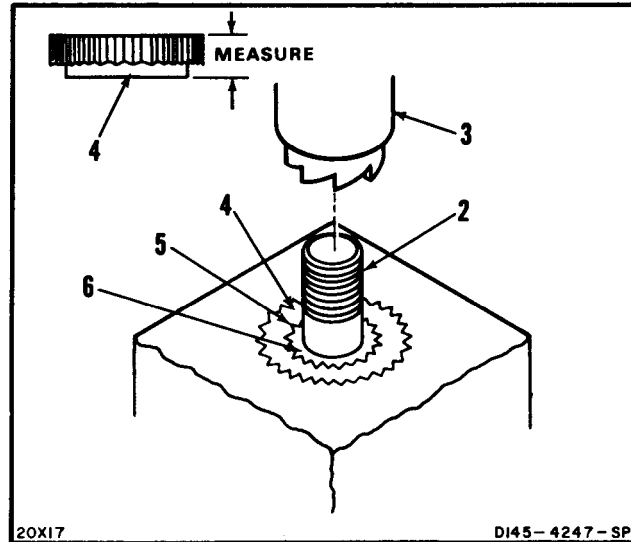
5. Cutaway interlock area (5) between stud flange (6) and lock ring (4) with tool (3). Do not drill deeper than lock ring thickness recorded in step 3. Use several light cuts. Pull back tool between cuts to clear chips and check depth.

6. Turn and remove stud (2) and remaining part of lock ring (4) from housing (1). Use plier wrench.

NOTE

As stud comes out, it will lift out remaining lock ring. If it does not, use punch to collapse and remove remaining part of ring.

7. Remove tool (3) from drill or drill press.
8. Go to step 15.



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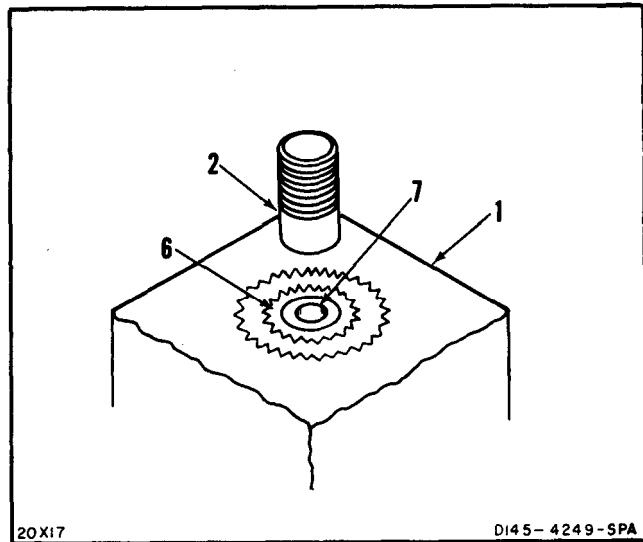
1-15 REPLACE LOCKED-IN STUD (AVIM) (Continued)

REMOVE STUD WITH SCREW EXTRACTOR

NOTE

Use screw extractor when stud is broken off or if drill with speed below 700 rpm is not available.

- 9. Cut off stud (2) flush with housing (1).
- 10. Drill pilot hole (7) in center of stud flange (6) for screw extractor. Use drill smaller in diameter than stud (2). Do not drill through bottom of stud.



- 11. Install twist drill in drill or drill press.

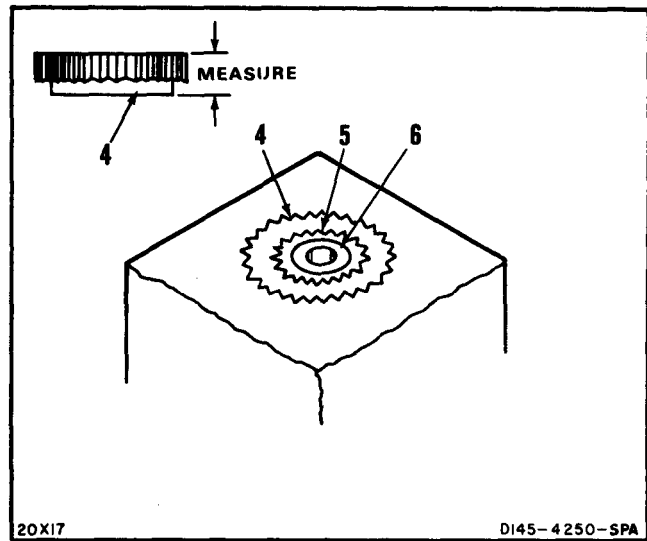
For Stud:	Use Drill:
MS51989-104	7 (0.201 Inch)
MS51989-105	F (0.257 Inch)
MS51989-106	5/16 (0.312) Inch
MS51989-107	U (0.368 Inch)
MS519928-504-13	0.4375 Inch
SHF101-9SA(8)A	F (0.257 Inch)
ST-10045	F (0.257 Inch)

- 12. Measure and record thickness of replacement lock ring (3).

NOTE

Interlock need not be cut away to full depth. Three-quarters depth is enough.

- 13. Drill out interlock (5) between stud flange (6) and lock ring (4). Do not drill deeper than lock ring thickness recorded in step 12. Use several light cuts. Pull back drill between cuts to clear chips.

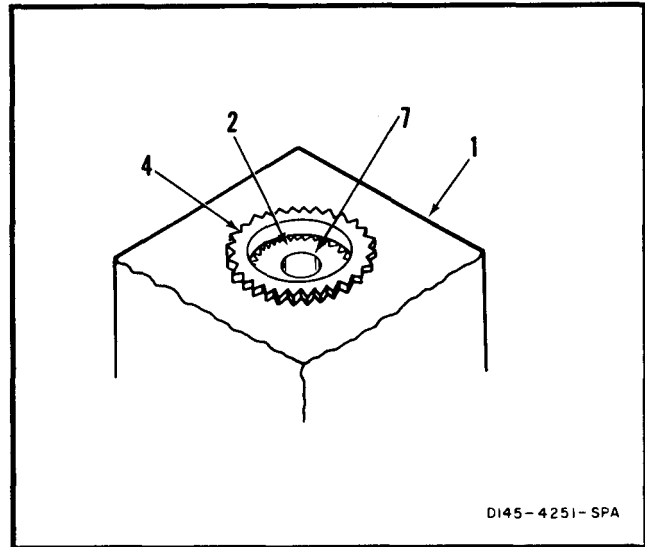


GO TO NEXT PAGE

14. Turn and remove stud (2) and remaining part of lock ring (4) from housing (1). Use screw extractor in pilot hole (7).

NOTE

As stud comes out, it will lift out remaining lock ring. If it does not, use punch to collapse and remove remaining ring.

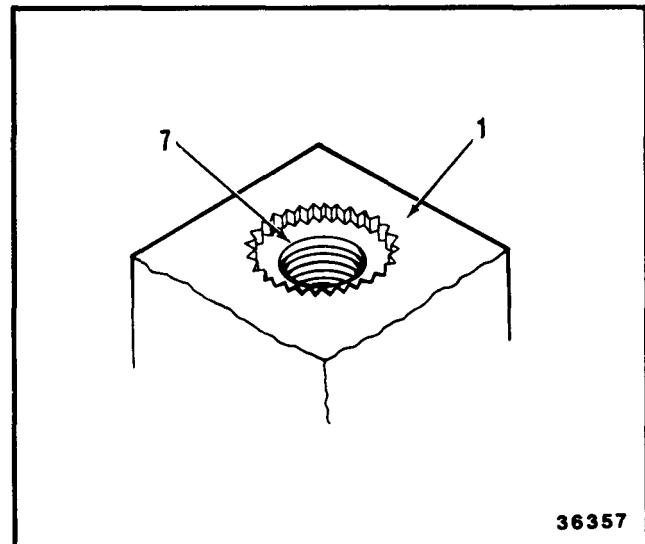


INSTALL STUD

CAUTION

When cleaning with compressed air, debris thrown by pressure can injure eyes. Do not use pressure over 30 psi. Wear eye protection.

15. Clean any debris from hole (7) in housing (1). Use low-pressure compressed air.



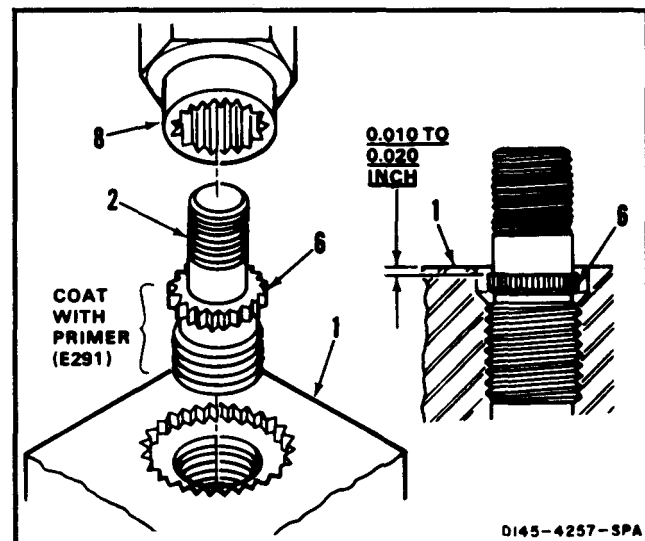
CAUTION

Stud can be damaged if not installed to correct depth.

NOTE

Install same size stud as removed.

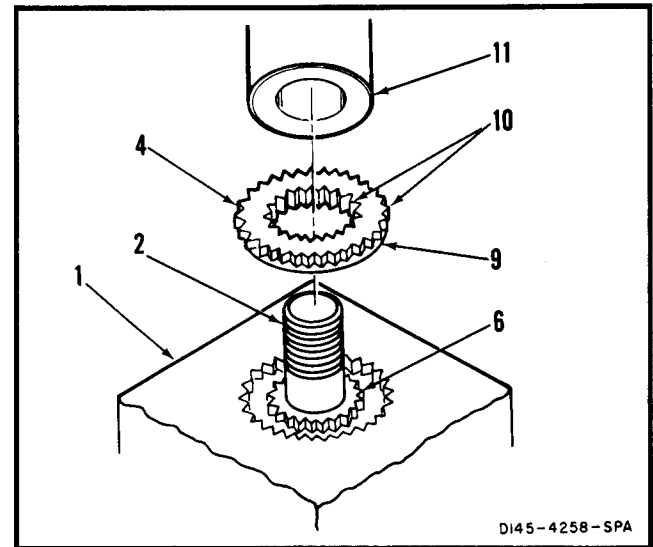
16. Coat flange (6) and large thread of stud (2) with primer (E292.1). Wear gloves (E184.1).
17. Install stud (2). Use special wrench (8). Make sure top of flange (6) is 0,010 to 0,020 inch below surface of housing (1).



GO TO NEXT PAGE

18. Coat lock ring (4) with primer (E292.1). Wear gloves (E184.1).
19. **Position lock ring (4)** over stud (2), undercut (9) toward housing (1). Align serrations (10) with serrations on housing and flange (6) as much as possible.
20. **Drive lock ring (4)** around flange (6) and **into housing (1)**. Use special drive tool (11).

For Stud:	Use Tool:
MS51989-104	S91D-10
MS51989-105	S101D-12
MS51989-106	S111D-12
MS51989-107	S121D-12
MS51992B-504-13	SF5902-4D
SHF101-9SA(8)A	S101D-12
ST-10045	S101D-12



21. Remove any protective covering from area of stud (2) installation.

INSPECT**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Machine Shop Set,

NSN 4920-00-405-9279

Rosan Tool Kit,

NSN 5180-00-778-3789

Source of Low Pressure Compressed Air

(30 Psi or Less)

Goggles

Materials:

Barrier Material (E80)

Tape (E388)

Epoxy Primer (E292.1)

Gloves (E184.1)

Parts:

Lock Ring

Personnel Required:

Machinist

Inspector

References:

TM 43-0104

TM 55-1520-240-23P

Equipment Condition:

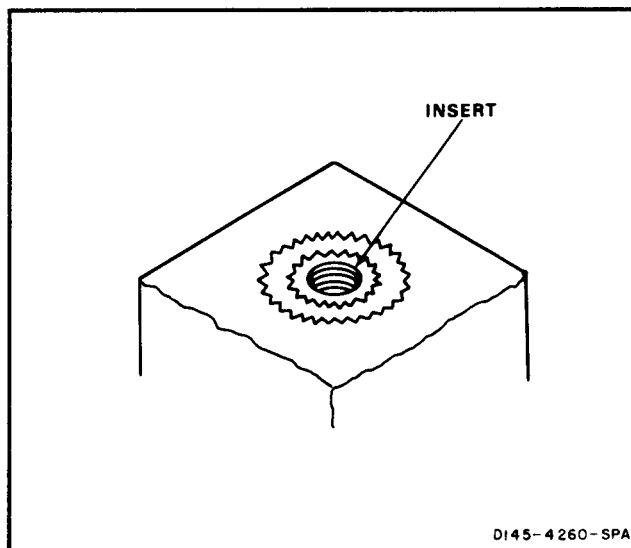
Off Helicopter Task

NOTE

Task can be done on installed component if insert is accessible.

General Safety Instructions:**WARNING**

Epoxy primer (E292.1) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

**GO TO NEXT PAGE**

1-22 Change 55

**1-16 REPLACE SCREW-THREAD INSERT (AVIM)
(Continued)**

NOTE

- Procedure is same to replace any screw-thread insert. Typical insert shown.
- For more information on screw-thread inserts, refer to TM 43-0104.

1. Cover openings in housing (1) in area of insert (2). Use barrier material (E80) and tape (E388).

NOTE

Use drill press if possible.

2. Install drill in drill or drill press. Use 5/16-inch drill for inserts MS51991-206 and MS51991-206L. Use 29/64-inch drill for insert MS51991-208.
3. Measure and record thickness of replacement lock ring (3).

NOTE

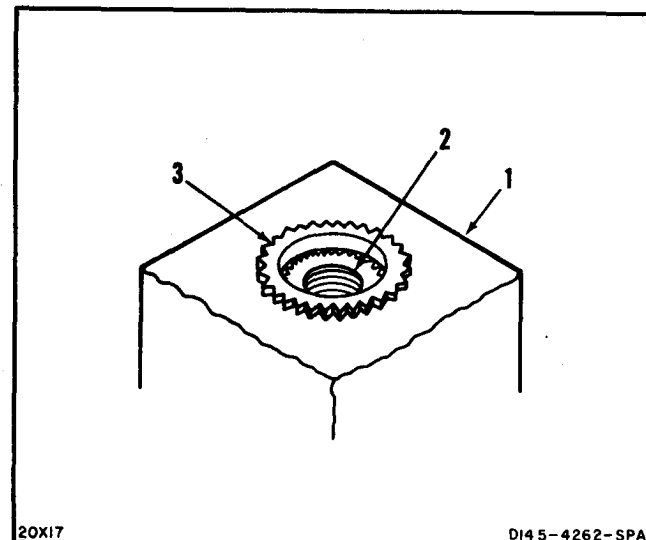
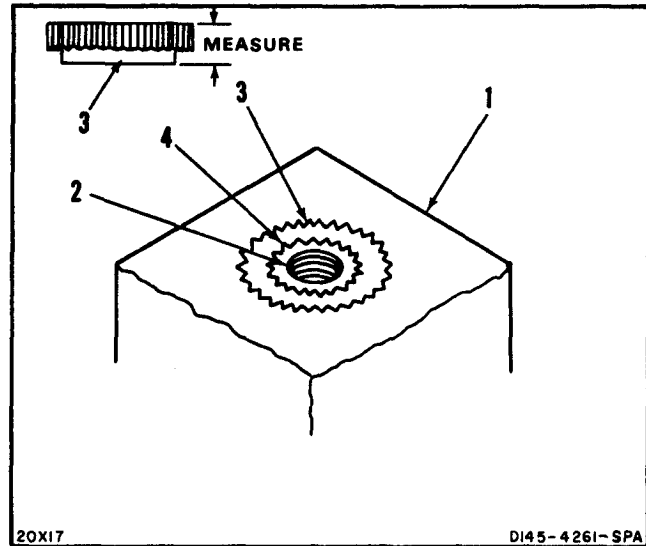
Interlock need not be drilled away to full depth. Three-quarters depth is enough.

4. **Cut away interlock area (4)** between insert (2) and lock ring (3) by drilling through center of insert. Do not drill deeper than lock ring thickness recorded in step 3. Use several light cuts. Pull back drill between cuts to clear chips and check depth.

5. **Turn and remove insert (2)** and remaining part of lock ring (3) **from housing (1)**. Use screw extractor.

NOTE

As insert comes out, it will lift out remaining part of lock ring. If it does not, use punch to collapse and remove remaining part of ring,



GO TO NEXT PAGE

CAUTION

When cleaning with compressed air, debris thrown by pressure can injure eyes. Do not use pressure over 30 psi. Wear eye protection.

- Clean debris from hole (5) in housing (1). Use low-pressure compressed air.

NOTE

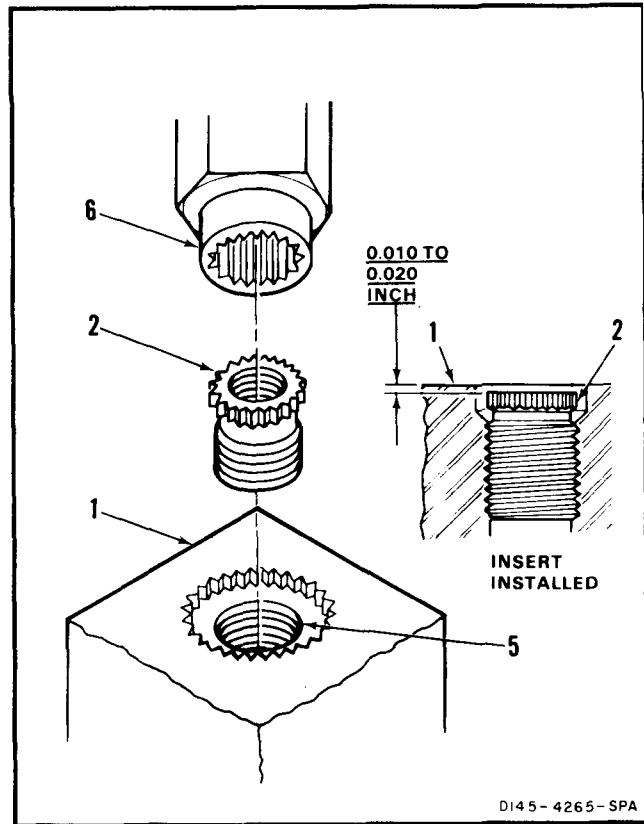
Install same size insert as removed.

- Coat outside of insert (2) with primer (E292.1). Wear gloves (E184.1).

CAUTION

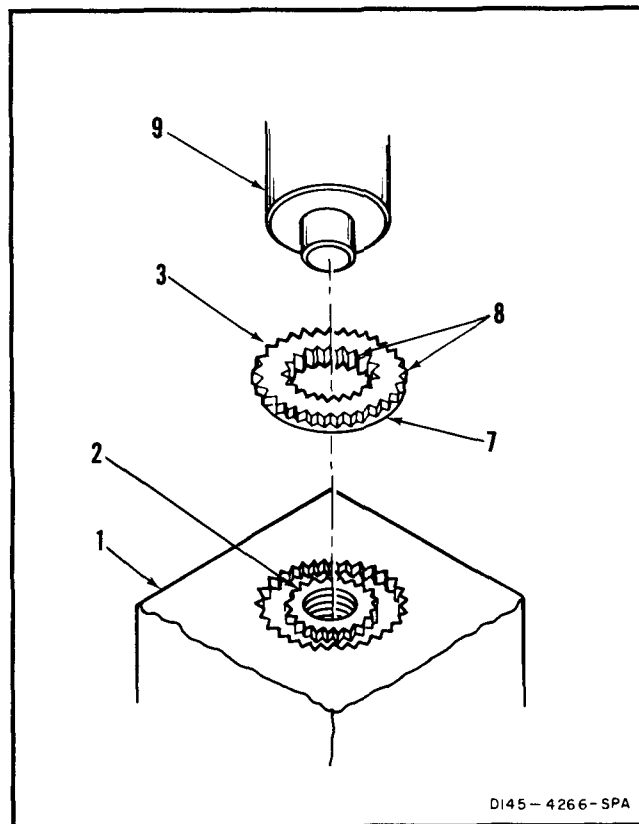
Insert can be damaged if not installed to correct depth.

- Insert insert (2) with special wrench (6). Use wrench R1106W for inserts MS51991-206 and MS51991-206L. Use wrench R1108W for insert MS51991-208. Make sure top of insert is 0.010 to 0.020 inch below surface of housing (1)



- Coat lock ring (3) with primer (E292.1). Wear gloves (E184.1).
- Install lock ring (3) around insert (2) undercut (7) toward housing (1). Align serrations (8) with serrations on housing and insert as much as possible.
- Drive lock ring (3) around insert (2) and into housing (1) with special drive tool (9). Use tool R-206D for inserts MS51991-206 and MS51991-206L. Use tool R208-D for insert MS51991-208.
- Remove any protective covering from area of insert (2) installation.

INSPECT

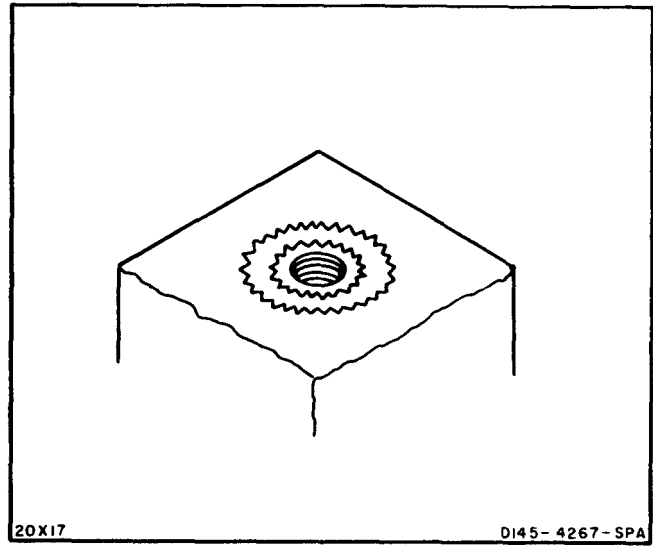


1-16 REPLACE SCREW-THREAD INSERT (AVIM)
(Continued)

1-16

FOLLOW-ON MAINTENANCE:

None



END OF TASK

SECTION IV
TOOLS AND MATERIALS

1-17 SPECIAL TOOLS AND TEST EQUIPMENT**1-17**

Special tools, containers, and test equipment are listed below. Each tool or piece of test equipment has an item number assigned for ease of location and reference. When an item number is unknown, locate special tools and test equipment by the alphanumeric arrangement within the table. When an item is referenced in the manual, locate the item by its T designator and item number. T designators are used only with special tools

and test equipment. The special tools and test equipment table is found only within this chapter: therefore, the table number is not referenced within the text. A complete listing of all special tools, containers, and test equipment authorized for use to perform maintenance on CH-47D helicopter/accessories is in the helicopter parts manuals.

ITEM NO.	PART NO.	NOMENCLATURE
1	145G003-1	Container, Aft Vertical Shaft
2	145GS279-1	Torque Applicator
3	114E5903-1	Sling Assembly, Engine Transmission
4	114E5128-3	Hoisting Unit
5	145G0035-1	Socket, Horizontal Hinge Pin, Locknut (End Cap)
6	114E5803-1	Pusher, Rotor Head
7	Deleted	
8	114E5809-1	Puller, Outboard Seal
9	114E5813-6	Puller, Bearing, Rotor Head
10	114E5814-7	Puller, Bearing and Seal, Rotor Hub
11	234G0096-1	Drift, Outboard Seal Installation
12	114E5824-4	Guide Set, Roller Bearing Seals, Rotor Hub
13	114E5840-1	Adapter, Rotor Head Assembly
14	114E5852-16	Sling, Rotor Head Controls
15	145E5871-1	Adapter, Forward Transmission
16	114E5872-35	Adapter, Powerplant
17	145E5874-1	Adapter, Aft Transmission
18	114E5878-60	Adapter, Vertical Shaft Assembly
19	114G0020-1	Adapter, Rotary-Wing Set
20	114E5888-1	Adapter, Combining Transmission
21	114G1025-1	Heater Exhaust Cover
22	114E5897-11	Pin Set, Blade Folding Pitch Lock
23	PD1220	Torque Pack, Rotor Hub Retaining Nut
24	114E5909-8	Ring Assembly, Forward Transmission and Aft Vertical Shaft
25	114G0039-1	Tool Set (Easy-Out), Replacement, Tiedown Receiver
26	LTCT 23980-01	Portable Cleaning and Preservation Unit
27	AN/PSM-45A	Digital Multimeter
28	145G0037-1	Reaction Adapter
29	145G0141-1	Socket, Hub Nut
30	114E5899-19	Lifting Device, Rotor Head Assembly

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Item		
NO.	PART NO.	NOMENCLATURE
31	114E5900-17	Safety Blocks
32	145E5902-1	Hoisting Eye, Forward Transmission and Aft Shaft
33	145G1471-1	Guide, Lip Seal, Vertical Hinge Pin
34	145E5903-1	Sling Assembly, Combining Transmission
35	145E5911-101	Sling, Handling, Rotary-Wing Assembly
36	145G0024-1	Container, Combining Transmission
37	145G0023-1	Container, Aft Transmission
38	114E5918-8	Container, Engine Transmission
39	145E5941-11	Rigging Set, Controls
40	114E5060-1	Line Tiedown
41	114E5998-1	Rate Table, Aircraft Displacement (AN/ASM-120 equiv)
42	145G5002-1	Dummy Link Assembly (Dash Actuator), pro 145E5941-11 (T39)
43	Deleted	
44	145G5004-1	Rigging Pin A, First Stage Mixing Linkage, p/o 145E59411 (T39)
45	145G5004-2	Rigging Pin B, First Stage Mixing Linkage, p/o 145E59411 (T39)
46	145G5004-3	Rigging Pin C, First Stage Mixing Linkage, pro 145E59411 (T39)
47	PD1434	Reaction Adapter Set, Vertical Hinge Pin
48	PD1201	Torque Wrench
49	114E51192	Sling, p/o 114E5124-1 (T85)
50	145E5996-1	Securing Device, Aft Vertical Shaft
51	145GO009-1	AFCS Line Test Set
52	145GO008-1	AFCS Bench Test Set
53	145GS278-1	ILCA Bench Test Set
54	114E5855-2	Sling, Aft Pylon
55	114E5856-22	Skid, Aft Pylon
55.1	1730CH47-002	Outrigger, Aft Pylon Skid
56	145G0054-1	Test Manifold
57	Deleted	
58	114G1023-25	Rotary-Wing Head Covers Forward and Aft
59	114G1024-1	Heater Inlet Cover
60	145G0004-1	Hydraulic Cooler Exhaust Cover
61	145G0005-1	Apu Exhaust Cover
62	114GS215-1	Spark Plug Thimble Gag
63	114GS216-1	Feeler Gage
64	114GS225-1	Spanner Wrench, Viscous Damper
65	114G0019-1	Accessory Kit, Track and Balance (VIBREX)
66	145G0001-1	Oil Cooler Inlet Cover
67	145G0002-5	Oil Cooler Exhaust Cover
68	145GO002-6	Oil Cooler Exhaust Cover
69	114G0021-1	Replacement Fixture, Nickel Erosion Cap
70	114G0017-1	Protective Cap, Vertical Pin
71	114G1013-1	Sling Assembly, Aircraft Housing

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1-17 SPECIAL TOOLS AND TEST EQUIPMENT (Continued)**1-17**

ITEM NO.	PART NO.	NOMENCLATURE
72	114G1014-17	Rigging Tool, Lead-Lag Damper
73	114G1017-70	Shipping Container, Rotary-Wing Head
74	145G0022-1	Shipping Container, Forward Transmission
75	114G1034-46	Steering Bar, Aft Landing Gear
76	145G0003-1	Air Inlet Cover
77	114G1049-14	Attachment Fittings, Transport Tiedown
78	114G1102-11	Assembly Fixture, Pitch Link
79	114G1137-10	Puller, Vertical Pin, Rotor Head
80	114G1323-1	Engine Outlet Cover
81	114E5040-33	Pitot Tube Cover
82	Deleted	
83	Deleted	
84	114G1354-1	Adapter, Handling
85	114E5124-1	Hoist, Aft Transmission
86	114G0015-65	Container, Shipping and Storage, Rotor Blade
87	114G1185-1	Pusher, Horizontal Hinge Pin
88	BH22231	Heater Probe
89	145G0059-1	Bracket Locating Fixture
90	114G1038-86	Test Set, Hydraulic System
91	Deleted	
92	Deleted	
93	145G0140-1	Adapter, Socket, Forward Transmission Mounting Bolts
94	114G1200-1	Drift, Bearing, Aft Landing Gear
95	Deleted	
96	Deleted	
97	114G1203-1	Drift Bearing, Aft Landing Gear
98	114G0018-6	Puller/Pusher Damper Bracket Bushing
99	Deleted	
100	114G1208-1	Test Set, Viscous Damper
101	BH112JB-53	Jetcal Analyzer, Temperature Tester
102	114G1236-1	Puller Assembly, Bearing, Pitch Housing
103	145G0006-1	Protective Cover, Cockpit
104	BH22101	Test Harness, Engine PIT Indicator System and Power
105	114G1263-1	Swaging Tool, Pitch Link
106	114G1306-1	Setting Fixture, Blade Shock Absorber
107	114G1322-1	Container, Blade Lag Shock Absorber
108	114G1334-1	Staking Die, Shock Absorber Mount
109	114G1359-1	Staking Tool, Aft Engine Mount
110	114G1373-1	Fixture, Locating, Sliding Bearing, Rotor Head Controls
111	BH22223	Tempcal Probe, Temperature Transmitter Chip Detector

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ITEM NO.	PART NO.	NOMENCLATURE
112	114G0188-1	Test Harness, Self-Tuning Dynamic Absorber
113	114G1410-1	Locating and Drill Fixture, Brackets, Sync Shaft
114	114G1411-1	Locating and Drill Fixture, Brackets, Sync Shaft
115	145G1414-1	Test Harness Set, NI Actuator System
116	145G1004-1	Repair Fixture, Rotor Blade Trailing Edge
117	145G0055-1	Test Block, Flight Control Power Control Module Accumulator
118	145G0056-1	Test Block, Ptu Motor Shaft Seal
119	145G5310-1	Yaw Travel Quadrant, p/o 145E5941-11 (T39)
120	145G5310-5	Roll Travel Quadrant, p/o 145E5941-11 (T39)
121	145G5310-8	Pitch Travel Quadrant, p/o 145E5941-11 (T39)
122	114E5941-4	Thrust Rig Pin, p/o 145E5941-11 (T39)
123	114E5941-21	Cockpit Rig Fixture, p/o 145E5941-11 (T39)
124	114E5941-26	Pointer Assembly, p/o 145E5941-11 (T39)
125	114E5941-57	Control Stick Yoke, p/o 145E5941-11 (T39)
126	114E5941-73	Pedal Pointer, p/o 145E5941-11 (T39)
127	114E5941-74	Pedal Rig Pin, p/o 145E5941-11 (T39)
128	114E5941-108	Transfer Bellcrank Rig Pin, p/o 145E5941-11 (T39)
129	Deleted	
130	145G5306-1	Dash Actuator Rigging Tool, p/o 145E5941-11 (T39)
131	219G1001-1	Engine Inlet Cover (Helicopter with Screens)
132	114G1206-1	Engine Inlet Cover (Helicopter without Screens)
133	114E5941-4	Pallet Rig Pin, p/o 114E5941-11 (T39)
134	LTCT14700	Sling, Engine
135	114E5985-9	Second Stage Rig Pin, p/o 114E5941-11 (T39)
136	D12102C01-1	Repair Kit, Hydraulic Tube, p/o D12102C-15-H10 (T181)
137	D12102C06-06	Repair Kit, Hydraulic Tube, p/o D12102C-15-H 10 (T181)
138	D12102C09-04	Repair Kit, Hydraulic Tube, p/o D12102C-15-H10 (T181)
139	D12025-001	Power Supply, Hydraulic Tube Repair, p/o D12102C-15-H11 (T172)
140	KM13	Tool Kit, Rosan Adapter
141	KM14	Tool Kit, Rosan Adapter
142	KM18	Tool Kit, Rosan Adapter
143	KM19	Tool Kit, Rosan Adapter
144	KM30	Tool Kit, Rosan Adapter
145	KM31	Tool Kit, Rosan Adapter
146	130-8500800	Bender Set, Hydraulic Tube
147	REA048D	Drive Tool, Clinch Nut, Aft Transmission
148	REA064D	Drive Tool, Clinch Nut, Aft Transmission
149	RF12LPDE	Removal Tool, Rosan Adapters
150	RF16LPDE	Removal Tool, Rosan Adapters
151	RF9812DW	Drive Tool, Rosan Adapters
152	RF9816DW	Drive Tool, Rosan Adapters
153	TD428L	Insertion Tool, Cargo Hook
154	TD1032L	Insertion Tool, Cargo Hook

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1-30 Change 32

1-17 SPECIAL TOOLS AND TEST EQUIPMENT (Continued)

1-17

ITEM NO.	PART NO.	NOMENCLATURE
155	TKNC0G	Insertion Tool, Cargo Hook
156	Deleted	
157	34-151	Spanner Wrench - Spring Return Assembly Cargo Hook
158	2TE414P0200-8	Test Set, Fuel Vent Check
159	145G0051-1	Torque Reactor, Fwd Transmission Mounting Bolts
160	145G0034-1	Torque Plate, Aft Transmission
161	PD1612	Tee Handle, p/o PD1220 (T23)
162	1323TF100-1	Test Fixture, Accumulator
163	114E5924-1	Sling, Handling, Aft Transmission (alternate, use with T3)
164	Deleted	
165	114E6058-23	Tackle Block
166	Aero 14C	Bomb Hoist, (NSN 1730-00-685-5626)
167	756460/756461	Seal and Window Retainer Installation Tool, (NSN 5120-00-366-5065), p/o KIT CS1154
168	756470/756476	Seal Filler Installation Tool, (NSN 5120-00-075-8307), p/o Kit CS1154
169	114G1425-1	Roller Staking Kit
170	MMM8897	Spray Gun
171	145G1019-29	Trim Tab Fixture
172	D12102C-15-H10	Tool Set, Hydraulic Tube
173	T-1FA13043-007	Seal Installation Tool, Ramp Control Valve (Cage 26437)
174	T-1FA13043-007A	Seal Sizing Tool, Ramp Control Valve (Cage 26437)
175	T-1FA1305592	Seal Installation Tool, Ramp Control Valve (Cage 26437)
176	T-1FA1305593	Seal Sizing Tool, Ramp Control Valve (Cage 26437)
177	T-1FA1305594	Seal Sizing Tool, Ramp Control Valve (Cage 26437)
178	TF-1FA1304375	Thermal Relief Valve Test Fixture, Ramp Control Valve (Cage 26437)
179	TP-1FA1304375	Plug, Thermal Relief Valve Test, Ramp Control Valve (Cage 26437)
180	Deleted	
181	130-850080	Tube Bending Set, Acro
182	234SK033-3	Tool Kit, Combining Transmission Support Fitting Replacement
183	PSD60-1AF	Fuel Quantity Test Set
184	PSDAF-106	Fuel Quantity System Test Cable

END OF TASK

Change 62

1-30.1/(1-30.2 blank)

1-18 EXPENDABLE MATERIALS

1-18

Expendable maintenance supplies and materials used in this manual are listed in the table. An item number is assigned to each expendable for ease of location and reference. Wherever they appear in the manual,

item numbers are preceded by an E to identify them as expendable. For instance, dry cleaning solvent, type II has the number E162. All expendable numbers in this manual refer to the table in this task.

ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
1	Abrasive cloth, aluminum oxide, grade 600 to 800	P-C-451	-
2	Abrasive pad, Scotch Brite type A, Minnesota Mining and Mfg Co (or equiv)	-	7910-00-753-5242
3	Abrasive mat, fine grade	MIL-A-9962	5350-00-967-5093
4	Deleted		
5	Abrasive paper, silicone carbide, waterproof 60-grit	P-P-101	5350-00-619-9168
6	Abrasive paper, silicone carbide, waterproof 80-grit	P-P-101	5350-00-619-9167
7	Abrasive paper, silicone carbide, waterproof 120-grit	P-P-101	5350-00-721-8115
8	Abrasive paper, silicone carbide, waterproof 180-grit	P-P-101	5350-00-721-8117
9	Abrasive paper, silicone carbide, waterproof 240-grit	P-P-101	5350-00-224-7207
10	Abrasive paper, silicone carbide, waterproof 280-grit	P-P-101	5350-00-224-7205
11	Abrasive paper, silicone carbide, waterproof 320-grit	P-P-101	5350-00-192-5080
12	Abrasive paper, silicone carbide, waterproof 360-grit	P-P-101	5350-00-224-7202
13	Abrasive paper, silicone carbide, waterproof 400-grit	P-P-101	5350-00-224-7201
14	Abrasive paper, silicone carbide, waterproof 500-grit	P-P-101	5350-00-224-7216
15	Abrasive paper, silicone carbide, waterproof 600-grit	P-P-101	5350-00-224-7215
16	Accelerator and cement, 1895C, Goodyear Tire and Rubber Co (or equiv)	-	8040-01-028-9866
17	Accelerator, 1465C, for 1462C cement, Goodyear Tire and Rubber Co (or equiv)	-	2640-00-856-7153
18	Accelerator, 611, for 610 filler Resin, Palmer Products Co Inc. (or equiv)	-	-
19	Adhesive, 80C29 Goodyear Tire and Rubber Co (or equiv)	-	8040-00-518-3455
20	Acetone, technical	O-A-51	6810-00-184-4796
21	Acid, acetic, glacial technical	O-A-76D	6810-00-275-1215
22	Acid, nitric, technical, MS36047	O-N-350	6810-00-237-2918
23	Acid, sulfuric, technical	O-S-809	6810-00-251-8007
24	Activator, Scotchcal A-2, Minnesota Mining and Mfg Co (or equiv)	-	8040-00-028-7098
25	Adhesive, air-drying, silicone rubber	MIL-A-25457	
26	Adhesive, bonding	MMM-A-121	8040-00-273-8716
27	Adhesive, EC2216, parts A and B, type 38	MMM-A-132	8040-01-035-2845
28	Adhesive, epoxy resin, metal-to-metal structural bonding	MMM-A-134	8040-00-900-6295
29	Adhesive, S1006, Raychem Corp (or equiv)	-	8040-01-127-9256
30	Adhesive, polyurethane, EC-3549 B/A (2 parts), Minnesota Mining and Manufacturing Co (or equiv)	-	8040-01-016-4726
31	Adhesive, Pliogrip No 3, Goodyear Tire and Rubber Co. (or equiv)	-	8040-00-018-7581
32	Adhesive, Proseal 590M, Hexcel Corp.	-	-
33	Adhesive consisting of: Component AB, Hysol 4405; and Component CD, Hysol 3538, Hysol Corp (or equiv)	-	8040-00-104-9505 8040-00-104-5292

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
34	Adhesive consisting of: Component AB, Sa Co 2862 (Component 1); and Component CD, Sa Co 2862 (Component 2), Union Oil Co., Inc. (or equiv)	-	-
35	Adhesive consisting of: Component AB, XS-1173625A; and Component CD, XS-1173625B, Minnesota Mining and Mfg. Co (or equiv)	-	-
36	Adhesive consisting of: Component AB, 183-C-417; and Component CD, 183-C-418, W.P Fuller Paint Co (or equiv)	-	-
37	Adhesive consisting of: Compound AB, 522; and Compound-CD, 542, Technical Research Co (or equiv)	-	-
38	Adhesive consisting of: 190-H-1 Resin and 191-B-10 Catalyst, W.P Fuller and Co (or equiv)	-	-
39	Adhesive consisting of: 190-H-1 Resin and 191-C-21 Catalyst, W.P Fuller and Co	(or equiv)	
40	Deleted, replaced by (E41)		
41	Adhesive EA 9309.NA, Dexter Corp	(Note A)	-8040-01-163-3481
41.1	Adhesive, EA 934 NA, Hysol Corp	MMM-A-132	8040-00-123-6954
42	Adhesive, EC1239B-1/2 and EC1239B-4, Minnesota Mining and Mfg Co (or equiv)	MIL-S-8802 8030-00-850-0759	8030-00-753-5004
43	Adhesive, EC-2216, Parts A and B, Minnesota Mining and Materials Mfg Co (or equiv)	MMM-A-132 8040-00-145-0019	
44	Adhesive, EC-776, Minnesota Mining and Mfg Co (or equiv)	-	8040-00-664-0439
45	Adhesive, EPON VI	MMM-A-134	8040-00-200-4390
46	Adhesive, EPON VIII	MMM-A-134	8040-00-531-8030
47	Adhesive, Epocast 50-A, M & T Chemicals, Inc (or equiv)		
47.1	Adhesive, EPON 828, Shell Chemical Co (or equiv)	-	8030-00-086-1506
48	Adhesive, EPON 901, Shell Chemical Co (or equiv)	-	8040-00-831-3403
49	Adhesive, fuel cell repair	MIL-A-9117B	8040-00-262-9060
49.1	Adhesive, oil resistant fluorosilicone, Q4-2817 Dow Corning or equiv	-	-
50	Adhesive pack, No 8055-63, Fenwal Laboratories (or equiv)	-	-
50.1	Adhesive, Permabond 910	MIL-A-46050	-
51	Adhesive, ProSeal 719B-1/2, 719B-2, and 719B-4, Hexcel Co (or equiv)	-	8040-01-105-9100
52	Adhesive, ProSeal 501, Hexel Co (or equiv)	-	8040-00-126-7798
53	Adhesive, PR1710, Products Research Corp (or equiv)	-	8040-00-142-9721
54	Adhesive, PR9021-B-2 and PR9021-B-4, Products Research Co (or equiv)	-	8030-01-058-9968
55	Adhesive, room temp curing SRC-18 catalyst, General Electric Corp (or equiv)	-	8040-01-115-4715
56	Adhesive, room temp curing SR529 resin, General Electric Corp (or equiv)	-	8040-00-149-0136
57	Adhesive, RTV108, General Electric Corp (or equiv)	MIL-A-46106	8040-00-843-0802
58	Adhesive, RTV102, General Electric Corp (or equiv)	MIL-A-46106	8040-00-877-9872
59	Adhesive, Tereco No 68, Technical Research Co (or equiv)	-	-
59.1	Adhesive, TJE-614 3-1/2 oz tube TJ Electronics, Arlington, TX	-	-

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1-18 EXPENDABLE MATERIALS (Continued)

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
60	Adhesive, Uralane 5716, Parts A and B, Furane Plastics (or equiv)	-	8040-00-828-4936
61	Adhesive, Uralane 8089, Parts A and B, Furane Plastics (or equiv)	-	8040-00-828-4936
62	Adhesive, 6263A, Minnesota Mining and Manufacturing Co.	-	8040-01-004-6194
63	Adhesive	MIL-A-46050	8040-01-090-9320
63.1	Adhesive, 730 RTV Dow Corning Co. (or equiv.)	-	8040-00-251-2312
63.2	Adhesive, Repair, Two Part Set 82C18, Goodyear Tire & Rubber Co.	-	8040-01-129-2559
63.3	Adhesive Barrier, 82C12, Goodyear Tire & Rubber Co.	-	8040-01-129-2558
63.4	Adhesive, 82C16, Goodyear Tire & Rubber Co.	-	-
63.5	Adhesive, 82C17, Goodyear Tire & Rubber Co.	-	-
64	Alcohol, isopropyl, commercial grade	TT-I-735	6810-00-855-6160
65	Alodine 1200 powder, American Chemical Co. (or equiv)	MIL-C-81706	8030-00-057-2354
66	Aluminum foil	QQ-Q-1876	9535-00-752-9061
66.1	Aluminum plate, 2024-T3	QQ-A-250/5	9535-00-167-2173
67	Aluminum plate, 0.375 inch thick	-	-
68	Aluminum bar, 1 inch square	-	-
69	Aluminum rod, 2024, 0.25 in. dia	QQ-A-225/6	9530-00-228-9312
70	Aluminum sheet, 0.032 inch thick	QQ-A-250	-
71	Aluminum sheet, 0.040 inch thick	QQ-A-250	-
71.1	Aluminum tubing, 0.250 inch outside diameter, 0.022 inch wall thickness	MIL-T-7081	4710-00-993-0482
71.2	Aluminum Sheet, 2024-T3 0.050 inch thick	QQ-A-250/5	-
72	Aluminum wool, types II and III	MIL-A-4864	5350-00-286-4851
73	Ammonium hydroxide, technical	O-A-451	6810-00-222-9643
74	Anti-icing and deicing-defrosting fluid	MIL-A-8243	6850-00-558-1248
75	Antiseize compound, molybdenum disulfide-petrolatum	MIL-T-83483	8030-00-087-8630
76	Antiseize thread compound	MIL-T-22361	8030-00-292-1102
77	Antiseize and thread sealing compound	MIL-T-5542	8030-00-530-5234
78	Bag, plastic, 6 in. X 9 in.	A-A-1668	8105-00-579-9285
79	Bake coating, EV-6174, Bee Chemical Co. (or equiv)	-	-
80	Barrier material, grade A	MIL-B-121	8135-00-753-4661
81	Barrier material, water vapor proof, class I	MIL-B-131	8135-00-282-0565
81.1	Battery, AA Alkaline	-	-
82	Box, shipping, fiberboard	PPP-B-636	8115-00-222-3022
82.1	Bottle, Oil Sampling	MIL-B-44054	8125-01-082-9697
83	Boric acid, ACS	MIL-STD-1218	6810-00-264-6535
83.1	Brazing alloy, silver	MIL-8-15325	3434-01-089-9014
84	Brush, cleaning - for bore, chamber and firing pin hole of small arms	MIL-B-20100	-
85	Brush, non-metallic, type 3, size 5 3/8 diameter, round	MIL-B-23958	7920-00-051-4384
85.1	Brush, stencil	H-B-00621	7920-00-223-7998
85.2	Brush, scrub, pot and pan	H-B-1490-6	-
86	Brush, acid swabbing	H-B-643	7920-00-514-2417
87	Buffing and polishing compound	MIL-B-16909	5350-00-240-2213
88	Buffing compound, Learock No. 5-30, Lee Mfg. Co. (or equiv)	-	-
89	Buffing compound, Learock No. 888, Lee Mfg. Co. (or equiv)	-	5350-00-165-7145

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
90	Calcium fluoride, powder reagent, MS36117	MIL-STD-1218/1222	6810-00-262-8574
91	Calcium sulphate, technical grade	-	-
92	Carbon dioxide, technical, solid (dry ice)	BB-C-104A	6830-01-011-7848
93	Castor oil	JJJ-C-86	9150-00-261-7455
94	Catalyst B1, for EPON 901, Shell Chemical Co. (or equiv)	-	8040-00-831-3403
95	Catalyst B3, for EPON 903, Shell Chemical Co. (or equiv)	-	-
96	Catalyst, PS-18, Component B	MIL-A-8576	8040-00-266-0215
97	Catalyst, PS-30, component B	-	8040-01-152-2312
98	Cellophane, sheet, commercial grade	L-C-110	8135-00-582-5170
99	Cement, EC1128, Minnesota Mining and Mfg Co. (or equiv)	-	8040-00-917-9932
100	Cement, EC826 (or equiv)	MMM-A-1617	8040-00-262-9011
101	Cement, M6249, US Rubber Co. (or equiv)	-	-
102	Cement, PS-18	MIL-A-25055	8040-00-266-0815
103	Cement, ProSeal 590M, Hexcel Corp. (or equiv)	-	8030-00-714-3013
104	Deleted		
105	Cement resin, PS-18, component A	MIL-A-8576	8040-00-526-1910
106	Cement, Scotch-Grip 1357	-	8040-00-262-9005
107	Cement, 00063, Goodyear Tire and Rubber Co. (or equiv)	-	-
108	Cement, 1942C, Goodyear Tire and Rubber Co. (or equiv)	-	-
109	Cement, 80027, Goodyear Tire and Rubber Co. (or equiv)	-	-
110	Chalk, marking	SS-C-266	7510-00-164-8893
111	Chamois leather, sheepskin, oil-tanned	KK-C-300	8330-00-823-7545
112	Cheesecloth, type 2, class B	CCC-C-440	8305-00-267-3015
113	Chemical films and chemical film materials for aluminum and aluminum alloys, class 1A	MIL-C-5541	8030-00-811-3723
114	Chromic acid (chromium trioxide), technical grade	O-C-303	6810-00-264-6517
115	Cleaner, glass, liquid, type 1, class 1	P-G-406	7930-00-664-6910
116	Cleaner, Ultrasene, Atlantic Refining Co. (or equiv)	-	-
117	Cleaning compound, aircraft surface, alkaline water base	MIL-C-25769	6850-00-935-0995
117.1	Cleaning compound, aircraft exterior, water sol	MIL-C-87936	-
118	Cleaning compound, windshield, Indosil 21, Indosil Co. (or equiv)	P-C-438	6850-00-935-0985
119	Cleaning compound, aircraft surface	MIL-C-43616	6850-01-045-7929
120	Cloth, cleaning	CCC-C-46A	8305-00-753-2967
121	Cloth, cotton, airplane	MIL-C-5646	8305-00-191-3977
122	Cloth, crocus	P-C-458	5350-00-221-0872
123	Cloth, emery, No. 120 grit, commercial grade	GGG-C-520	5350-00-865-5688
124	Cloth, emery, No. 180 grit, commercial grade	GGG-C-520	5350-00-854-6989
125	Cloth, emery, No. 220 grit, commercial grade	GGG-C-520	5350-00-174-1000
126	Cloth, emery, No. 520 grit, commercial grade	GGG-C-520	5350-00-174-0997
127	Cloth, emery, No. 600 grit, commercial grade	GGG-C-520	5350-00-174-0985
128	Cloth, flannel, cotton (or equiv)	CCC-C-458	8305-00-222-2460
129	Cloth, glass, No. 128	MIL-C-9084	8305-01-007-2670
130	Cloth, glass, No. 181	MIL-C-9084	8305-00-530-0109
131	Cloth, glass, No. 181-75	MIL-C-9084	-
132	Deleted. Use Item 130	-	-

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
132.1	Cloth, glass, 181-150	MIL-C-9084	-
132.2	Cloth, glass, 181-77	MIL-C-9084	-
133	Cloth, glass finished, for polyester resin laminates	MIL-C-9084B	-
134	Cloth, Holland, 3-ounce minimum weight per square yard	MIL-C-17564	8305-00-286-5050
135	Cloths	DDD-R-30	7930-00-205-1711
135.1	Maintenance Kit, rotor, anti-static, Task Research, Inc	-	1615-01-180-2624
135.2	Coating, anti-static (p/o kit 135.1 NSN 1615-01-180-2624), Task Research, Inc.	-	1615-01-205-6138
135.3	Coating, Base, ALBI107A-15X0100-01	-	8010-01-327-5404
135.4	Coating, Top, ALBI1144-15X0410-01 (Gray)	-	8010-01-327-5403
135.5	Maintenance Kit, blade erosion	-	1615-01-180-2624
135.6	Coating, Top, ALBI 144-15X0400-01 (White)	BMS 10-21	8010-01-327-5405
135.7	Coating, anti-static, type III	BMS 10-21	TBD
136	Coating, epoxy, color No 16081	MIL-C-22750	8010-00-112-0724
137	Coating, epoxy, color No 37038	MIL-C-22750	8010-00-145-0538
137.1	Finish coating	MIL-F-7179	
138	Coating, sprayable, strippable, protective	MIL-C-6799	8030-00-721-9380
139	Core material, aluminum, 2.3-3/8-15N5052	MIL-C-7438	
140	Core material, aluminum, 3.0-3/8-20N5052	MIL-C-7438	-
141	Core material, aluminum, 3.4-1/4-15N5052	MIL-C-7438	5680-01-283-0092
142	Core material, aluminum, 4.3-1/4-20N5052	MIL-C-7438	
143	Core material, aluminum, 4.3-3/8-50N5052	MIL-C-7438	5680-00-926-4637
144	Core material, aluminum, 22.1-1/8-60N5052	MIL-C-7438	5680-00-106-9415
145	Core, honeycomb, Nomex, 1/8-inch cell, gr 3.0, full depth, 36 inches long	-	5680-01-122-8726
146	Core, honeycomb, Nomex, 3/16-inch cell, gr 2.0, full depth, 36 inches long	-	5680-01-084-3900
147	Core, honeycomb, Nomex, 1/8-inch cell, gr 3.0, 1/2 x 17 x 36 inches	-	-
148	Core, honeycomb, Nomex, 3/16-inch cell, gr 2.0 1/2 x 17 x 36 inches	-	-
149	Core, honeycomb, Nomex, 1/8-inch cell, gr 3.0 1/4 x 17 x 36 inches	-	-
150	Core, honeycomb, Nomex, 3/16-inch cell, gr 2.0 1/4 x 17 x 36 inches	-	-
150.1	Core, honeycomb, Nomex, HRH-10-3/16-4.0, Hexcel Corp (or equiv)	-	5680-01-303-4041
150.2	Core, honeycomb, Nomex, HRH-10/OX-3/16-4.0, Hexcel Corp (or equiv)	-	5680-01-303-4042
150.3	Core, Honeycomb, Glass HRP 3/16-3.5 Hexcel Corp (or equiv)	-	-
151	Cord, glass, class EC-6	MIL-Y-1140	4020-00-530-2757
152	Corrosion-preventive compound, type I and III, aircraft engine	MIL-C-6529	6850-00-281-2031
153	Corrosion-preventive compound, cold application, grade 2	MIL-C-16173	8030-00-244-1297
154	Corrosion-preventive compound, hot application, grade 3	MIL-C-1 1796	8030-00-576-8360
154.1	Corrosion-preventive compound, WD-40, LPS-2 (or equiv)	-	8030-00-838-7789

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
155	Corrosion-preventive compound, water displacing, clear, Amguard, class A, type I, aerosol spray	MIL-C-85054	8030-01-044-1596
155.1	Corrosion-preventive compound, water displacing, clear, Amguard, class B, type II, qt container	MIL-C-85054	8030-01-045-4780
155.2	Corrosion-preventive compound, water displacing, ultra-thin film, type II, class 1, 5 gal	MIL-C-81309	8030-00-262-7358
155.3	Corrosion-preventive compound, water displacing, ultra-thin film, type II, class 2, 55 gal	MIL-C-81309	8030-00-524-9487
155.4	Corrosion-preventive compound, water displacing, ultra-thin film, type II, class 2, 16 oz aerosol spray	MIL-C-81309	8030-00-938-1947
155.5	Corrosion-preventive compound, water displacing, ultra-thin film, type III, class 2, 16 oz aerosol spray	MIL-C-81309	8030-00-546-8637
155.6	Corrosion-preventive compound, solvent cutback, cold application, grade 4, pt	MIL-C-16713	8030-00-903-0931
155.7	Corrosion-preventive compound, solvent cutback, cold application, grade 4, gal	MIL-C-16173	8030-00-062-5866
155.8	Corrosion-preventive compound, solvent cutback, cold application, grade 4, 5 gal	MIL-C-161738030-00-526-1605	
156	Cotton, grade BJJJ-C-5616810-00-201-4000		
157	Cup, Polyethylene		
158	Curing agent DTA	O-D-1271	6810-00-995-4804
158.1	Curing agent polyamide versamid 140, Henkel Corp (or equiv)	-	8040-00-105-0826
159	Descaling compound, alkaline, hot section jet engine parts	MIL-D-26549	6850-00-597-1528
159.1	Detergent, general purpose	MIL-D-16791	7930-00-527-1237
160	Desiccant	MIL-D-3464	6850-00-274-5421
160.1	Dowel, hardwood, 0.855 inch dia., 3 inches long	-	-
160.2	Dowel, hardwood, 1.0 inch dia., 3 inches long	-	-
160.3	Dowel, nylon or Delrin, 3/4 inch dia., 9 inches long, FM1001, Polymer Corp (or equiv)	-	9390-00-973-5227
160.4	Doubler, nose cap repair (Blade)	-	1560-01-318-8603
161	Dry cleaning solvent, type I	P-D-680	6850-00-264-9037
162	Dry cleaning solvent, type II	P-D-680	6850-00-285-8011
163	Ease-Off 990, Texacone Co	(or equiv)	-8030-00-778-4277
164	Enamel, electrical insulating, Glyptal 1201	MIL-E-22118	5970-00-161-7421
165	Enamel, exterior gray	MIL-E-15936	8010-00-079-2455
166	Epoxy topcoat, gray, parts A & B color No 16081 gloss, Fed STD 595	MIL-C-22750	8010-01-082-3060
166.1	Epoxy topcoat, glossy orange-yellow, No 13538	MIL-C-22750	8010-01-053-2650
166.2	Epoxy topcoat, glossy white, No 17875	MIL-C-22750	8010-01-141-2459
166.3	Epoxy, clear overcoating	MIL-C-22750	-
166.4	Epoxy coating, flat gray, No 36231	MIL-C-22750	
167	Ethyl alcohol (denatured)	O-E-760	6810-00-823-8003
168	Fiberglass laminate, 0.018 inch thick (Narmco 5216)	-	-
168.1	Fiberglass laminate, A02R1753-1	-	-
168.2	Fiberglass Repair Kit	-	1560-00-169-9222
169	Fabreeka, Fabreeka Products Co (or equiv)	-	-
170	Fabric, Teflon-impregnated	-	8305-01-034-3563

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1-18 EXPENDABLE MATERIALS (Continued)

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
170.1	fuel Cell Repair Kit	-	1560-01-288-2332
170.2	Item 170.2 Replaced by 170.1	-	-
170.3	Fabric, Organic Fiber (Kelvar)	-	1680-01-196-8355
170.4	Fiberglass Repair Kit	-	1560-00-169-9222
171	Filler, Cabo-Sil , Godfrey L Cabot Inc (or equiv)	-	8010-00-060-3253
172	Filler, Corfil 615, Bloomingdale Rubber Co (or equiv)	-	8030-00-149-0137
172.1	Filler, foam, Isofoam PE2, res PEW	MIL-F-83671	9330-00-904-7951
173	Filler, EA934 B/A, Hysol Div., Dexter Co	-	8040-00-016-8662
174	Film, type I (Transparent Barrier Material)	MIL-F-22191	
175	Fingerprint Remover, corrosion preventive	MIL-C-15074	8030-00-252-8301
176	Fluid, damping, type DC510, viscosity 500 cstk, Dow-Corning Corp.	-	9150-01-056-9047
177	Fluid, damping, type DC510, viscosity 1, 000 cstk, Dow-Corning Corp.	-9150-00-024-9623	
178	Flux, type I, soldering (liquid)	-	3439-00-250-2635
178.1	Flux, welding	-	3943-00-262-4292
178.2	Flux, brazing	-	3434-01-191-3477
179	Foam, G-300, Napco Chemical Co	(or equiv)	
180	Foam, G-506, Napco Chemical Co	(or equiv)	-9330-01-006-5310
181	Foam, Polyurethane, sheet, density V-2	-	9330-01-008-7428
182	Fuel, turbine, grade JP-4, or JP-5	MIL-T-5624	9130-01-256-8613
182.1	Fuel, turbine, grade JP-8	MIL-T-83133	
182.2	Fuel, turbine, grade Jet A or Jet A-1	ASTM.D 1655-70	-
183	Gauze	CCC-G-101	-
184	Gauze sponges, surgical, class A, Textile Division, Kendall Co	-	
184.1	Gloves, Chemical and Oil Protective	MIL-G-87066	-
185	Gloves, wire handling	MIL-G-43411	8415-00-926-1674
186	Gloves, anti contact	MIL-G-10902	
186.1	Gloves	ZZ-G-381 Type 3	-
187	Gloves, kelvar		
188	Glycerol, technical, high gravity	O-G-491	6810-00-264-6548
189	Grease, aircraft and instrument, gear and helicopter screw	MIL-G-23827	9150-00-985-7247
189.1	Grease, aircraft	MIL-G-4343	9150-00-269-8255
190	Grease, acft, gen purpose, wide temp range	MIL-G-81322	9150-00-145-0268
190.1	Grease, Syn-Tech	-	9150-00-506-8497
191	Hardener, Aroldite 957, Ciba Products Corp	(or equiv)	-8040-00-701-9514
192	Hardener, Epocast 9816 (p/o Epocast 1835)	-	8040-00-148-9849
193	Hardener, Epoxide 206, Union Carbide Corp	(or equiv)	-
194	Hardener, N, N, dimethylbenzylamine, Eastman Chemical Products, Inc (or equiv)	-	-
194.1	Hardener, Versamid 125-8030-00-893-4224		
195	Heat sink compound, Dow Corning No 340 (or equiv)	-	-
196	Helium, commercial	-	-
196.1	Hinge, MS2001P8	-	-
197	Hydraulic fluid, petroleum base, aircraft	MIL-H-5606	9150-00-223-4134
198	Hydraulic fluid, petroleum base, preservative	MIL-H-6083	9150-00-935-9808
199	Hydraulic fluid, fire-resistant	MIL-H-83282	9150-00-149-7431
200	Hydrofluoric acid, anhydrous	MIL-H-10925	-

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
201	Hydrofluoric acid, technical	u-H-t956810-00-543-4012	
202	Inconel sheet, 0.025 inch thick	AMS5599	
202.1	Indicator, humidity	-	6885-00-833-1223
203	Insulation, electrical, synthetic resin composition, non-rigid	MIL-1-631	5970-00-556-2710
204	Insulation sleeving, electrical, flexible	MIL-1-7444	5970-00-051-6514
205	Ink, marking, stencil, opaque, for non-porous surface	TT--1-1795	7510-00-224-6732
206	Jacket (moulded shape), neoprene, type BN, class II	MIL-S-6855	
207	Kant fray, Aero Leather Products Co	(or equiv)	
208	Kerosene	W-K-211	9140-00-242-6748
209	Kelvar fabric, style 285 or 281	-	8305-01-319-6022
210	Lacquer, acid-resistant	TTr-L-54	8010-00-582-5382
211	Lacquer, aluminized	MIL-L-19537	
212	Lacquer, outside fuel cell, 1875C, Goodyear Tire and Rubber Co (or equiv)		
213	Lacquer, clear	MIL-L-19537	8010-00-527-1508
214	Lacquer, black, color No 37038	TT-L-20	8010-00-664-7651
214.1	Lacquer, black, low reflective	MIL-L-46159	
215	Lacquer, lusterless black, color No 37038	MIL-L-19538 or	8010-00-527-2884
		MIL-L-81352	8010-00-664-7651
216	Lacquer, glossy black	MIL-L-19537	8010-00-527-2507
217	Lacquer, glossy blue	MIL-L-19537	8010-00-551-7933
218	Lacquer, gray, color No 36231	TT-L-20	8010-00-515-1568
219	Lacquer, light green, color No 14187	MIL-L-19537	8010-00-527-2483
219.1	Lacquer, black, color No 37038	MIL-L-19538	8010-00-527-2884
220	Lacquer, lusterless olive-drab, color No X34087	MIL-L-19538	8010-00-082-2479
221	Lacquer, glossy orange (yellow), color No 13537	MIL-L-19538	8010-00-527-2496
222	Lacquer, glossy, insignia red, color No 11136	MIL-L-19538	8010-00-551-7934
223	Lacquer, glossy white, color No 17875	MIL-L-19537	8010-00-527-2493
224	Lacquer, lusterless white, color No 27875	MIL-L-19538	8010-00-530-6387
225	Lacquer, glossy yellow, color No 13538	MIL-L-19537	8010-00-527-2496
225.1	Lacquer, flat black, color No 37038	MIL-L-46159	8010-01-211-1106
225.2	Lacquer, white, color No 37875	MIL-L-19538	8010-00-543-2085
226	Leak detection compound, type I	MIL-L-25567	6850-00-631-1820
227	Lockwire	MS20995C20	9505-00-596-5105
228	Lockwire	MS20995CY20	9525-01-047-6455
229	Lockwire	MS20995NC20	9525-00-618-0257
230	Lockwire	MS20995C32	9505-00-293-4208
231	Lockwire	MS20995NC32	9525-00-803-3044
232	Lockwire	MS20995C40	-
233	Lockwire	MS20995NC40	9525-00-990-7799
234	Lockwire	MS20995NC51	9525-00-529-9196
235	Lubricant, molybdenum disulfide powder	MIL-M-7866	6810-00-264-6715
236	Lubricant, penetrating, Type I	W-P-216	9150-00-261-7899
237	Lubricant, solid film, air drying, Type I	MIL-L-23398	9150-00-754-0064
238	Lubricant, solid film	MIL-L-8937	9150-00-834-5608
238.1	Super O-Lube, Parker Seal Co., silicone damping fluid	W-D-1078A	-
239	Lubricant, surgical	-	-

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1-18 EXPENDABLE MATERIALS (Continued)

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
240	Lubricant (grease, ball bearing) Lubriplate, Fiske brothers Refinery Co	9150-00-0/6-15/4 (or equiv)	
241	Material, cushioning	PPP-3-843	8135-00-183-8814
242	Metal conditioner and rust remover (phosphoric acid base)	MIL-M-10578	6850-00-656-1292
243	Methanol (methyl alcohol)	O-M-232	6810-00-174-5190
244	Methyl-ethyl-ketone	TT-M-261	6810-00-281-2785
245	Naphtha, aliphatic, type II	TT-N-95	6810-00-238-8117
246	Naphtha, aromatic	TT-N-97	6810-00-223-9067
247	Nitrogen, Propellant pressuring agent	MIL-P-27401/BB-N-411	9135-00-823-8115
247.1	Nitrogen, Aircraft Servicing 0-3000 psi	---	6830-00-880-1838
248	Nitrogen, technical	BB-N-411	6830-01-028-9402
248.1	Nylon sheet, 0.002 to 0.005-inch thick	-	-
249	Oakite, No 24, 36, 61, and M-3, Oakite Products Inc	P-C-436	6850-00-664-7530
250	Oil, general purpose, preservative	W-L-800	9150-00-231-6689
251	Oil, lubricating (Grade 1010)	MIL-L-6081	9150-00-231-6676
252	Oil, lubricating, aircraft reciprocating engine, grade 1065	MIL-L-6082	9150-01-007-9134
253	Oil, lubricating, aircraft turbine engine	MIL-L-23699	9150-00-985-7099
254	Oil, lubricating, aircraft turbine engine, synthetic base	MIL-L-7808	9150-00-782-2627
254.1	Oil, lubricating, Aircraft Transmission Systems	DOD-L-85734	9150-01-209-2684
255	Oil, lubricating, corrosion preventive, synthetic base	MIL-C-8188	6850-00-273-2395
256	Oil, lubricating, gear, multi-purpose	MIL-L-2105	9150-01-035-5392
257	Oil, lubricating, instrument	MIL-L-6085	9150-00-223-4129
258	Oil, lubricating, preservative B.10 type 1, grade 3	MIL-L-21260	-
258.1	Organic fiber fabric (Kevlar)	-	1680-01-196-8355
259	Paint, non-skid, Epolux 100E6AS (or equiv)	-	8010-00-866-6810
260	Paint, 80029, Goodyear Tire and Rubber Co (or equiv)	-	-
261	Paint remover	TT-R-248	8010-00-515-2258
261.1	Paint remover	TT-R-251 Type IV, Class B	8010-00-926-4727
261.2	Paint, low reflecting, green, color no 34031	MIL-L-46159	8010-01-211-1107
262	Paint system, fluorescent, removable, daylight, color No 633	MIL-P-21600	8010-00-082-2421
262.1	Paper, printer, EA150OP, Sharp Electronics Corp (or equiv)	-	-
263	Paper, wrapping, untreated, Kraft	UU-P-268	8135-00-160-7759
264	Paper tag	UU-T-81	8135-00-292-2345
265	Deleted	Use item 307	
266	Deleted	Use item 307	
267	Paste, lapping, grade 388-900A	SS-L-1682	5350-00-587-3410
268	Patch, inside, FT-136, Goodyear Tire and Rubber Co., P/N 5200-5187-5194 (Uniroyal) (or equiv)	-	8305-00-350-5592
	269Patch, outside, FT-132, Goodyear Tire and Rubber Co., P/N 5240-5241 (Uniroyal) (or equiv)		
270	Peel ply, style No 661, Miltex Industries, Inc	-	9535-00-684-4140
270.1	Pencil, marking	-	7510-00-465-0994
271	Pencil, spiral paper form, wax, glass, and china marking	SS-P-196C	7510-00-240-1525
271.1	Pens, printer, EA-850B, Sharp Electronics Corp (or equiv)	-	-
272	Perchloroethylene (tetrachloroethylene)	O-T-236	6810-00-819-1128
273	Permatex, No 1372, Permatex Co., Inc (or equiv)	-	8030-00-599-7753

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
274	Petrolatum, technical, 2 class V Type	W-P-236	9150-00-250-0926
274.1	Phenolic microballons Bakelite Div of Union Carbide Co (or equiv)	-	-
275	Phenolic sheet, laminated, type FBM	MIL-P-15035	9330-00-585-8678
276	Phenolphthalein crystals, commercial grade	O-C-265	6810-00-223-7612
277	Pigment, iron-blue, dry	TT-P-385	8010-00-007-8164
278	Plastic, nylon, flexible, molded or extruded	MIL-N-18352	-
279	Plastic sheet, weather-resistant	MIL-P-81598	9330-00-819-8499
280	Plastilube, Moly No 3, Warren Refining Co (or equiv)	-	9150-00-141-4481
281	Polish kit, glass RS-69	-	1560-00-450-3622
282	Polish, plastic	PP-560	7930-00-634-5340
283	Polyamide, nylon, plastic, rigid, rods and flats	L-P-410	-
284	Deleted Use 248.1	-	-
285	Polycarbonate sheet, Lexan, General Electric Co (or equiv) or Merlon, Mobay Chemical Co (or equiv) 0.0440- and 0.050-inch thick	L-P-393	-
285.1	Polyurethane paint, black	MIL-C-46168	8010-00-482-5671
285.2	Polyurethane paint, green	MIL-C46168	8010-01-141-2420
286	Potassium dichromate	O-P-559	6810-00-264-6525
287	Powder, gypsum buff, commercial grade	-	-
288	Primer A-4014, for A-4000 adhesive	MIL-A-25457	8040-00-936-4672
289	Deleted	-	-
290	Primer coating, vinyl-zinc chromate	MIL-P-15930	8010-00-064-0018
291	Deleted, Use E292.1	-	-
291.1	Primer, base 513-707; curing solution 910-787 DeSoto Co (or equiv)	-	-
292	Primer, epoxy	MIL-P-23377	8010-00-082-2450
292.1	Primer, yellow epoxy	MIL-P-85582	8010-00-218-0856
292.2	Primer, epoxy, waterborne, type I	MIL-P-85582	-
293	Primer, epoxy	MIL-P-52192	8010-00-082-1714
294	Primer, fast-drying	MIL-P-7962	8010-00-526-2523
295	Primer, grade T	MIL-S-22473	8030-00-963-0930
295.1	Primer, Locquic T	MIL-S-22473	8030-00-082-2508
296	Primer H, for Uralane 5716 or 8099 (or equiv)	-	8040-00-104-8225
297	Primer J, for Uralane 5716 or 8099 (or equiv)	-	-
298	Primer, PR1711, Products Research Corp (or equiv)	-	-
299	Primer, RTV1200, for 730RTV adhesive, Dow Corning Corp. (or equiv)	-	8040-00-845-4304
300	Primer SS4004 for RTV102 adhesive, General Electric Corp. (or equiv)	-	8010-00-701-9616
301	Primer, wash	MIL-C-15328	8030-00-251-2726
302	Primer, wash	MIL-C-8514	8030-00-015-6104
303	Primer, 90-198 Dow Corning Corp (or equiv)	-	-
304	Promoter, PS-18, component CMIL-A-8576	8040-00-270-8148	-
305	Protective coating, EC1103, Minnesota Mining and Mfg Co (or equiv)	-	8030-00-264-3886
306	PumiceSS-P-8215350-00-161-9033	-	-

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1-18 EXPENDABLE MATERIALS (Continued)

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
307	Rain repellant and/or parting agent, Vydax-550, Du Pont, E.I. De Nemours (or equiv)	MIL-W-006882	6850-00-139-5297
308	Release agent, fluorocarbon dry lube, part S-122, Miller-Stephenson Chemical Co. or Rulon Spray, Connecticut Hard Rubber Co. (or equiv)	-	8030-01-064-4951
309	Repair material, inside, Uniroyal, 5200/5187 (cured) (or equiv)	-	-
310	Repair material, outside, Uniroyal, 5200 (cured) (or equiv)	-	-
311	Resin compound, 611 Palmer Products Co., Inc., (or equiv)	-	8030-00-086-1506
312	Resin, Epon 812, Shell Chemical Co. (or equiv)	MMM-A-187	8040-01-138-2190
313	Resin, paraplex (P-43) (or equiv)	MIL-R-7575	-
313.1	Resin, celanese plastic (or equiv)	-	8030-00-949-6707
313.1	Resin, celanese plastic (or equiv.)	-	8040-00-949-6707
314	Rod, Inconel No. 62 (or equiv)	-	-
314.1	Rod, welding	AMS-5756	-
315	Rod, Welding, aluminum and aluminum alloys	QQ-R-566	3439-00-269-9654
316	Rouge, No. 0000	-	5350-00-223-5581
317	Rubber, cellular, chemically blown, type II Medium, grade A	MIL-R-6130	9320-00-618-3180
318	Rubber, silicone, Class III, grade 50, color: light to medium gray	MIL-R-5847	-
319	Rubber, sheet, sponge, silicone	AMS3195	9320-00-088-1147
320	Rubber sheet, silicone	AMS3320L	9320-01-157-9069
321	Rubber sheet, silicone	AMS3345 OR 3346	9390-00-289-8702
322	Rust inhibitor and preservative, LPS-2	MIL-C-81309	8030-00-838-7789
323	Screen 0.040-inch perforated grill, diamond pattern, 0.5-inch wide x 0.75-inch long, Diamond Mfg. Co. (or equiv)	MIL-S-12875	9535-00-416-8553
324	Screen 0.063-inch, woven wire mesh, 0.187-inch openings, double crimp, type I, class I	RR-W-440	-
325	Scrim cloth, HS-32, FMC91775, Hess and Goldsmith (or equiv)	-	8305-00-443-5601
326	Scrim cloth, nylon, EP-15, Travis Mills Corp (or equiv)	-	8305-00-175-6825
327	Sealant	MIL-S-22473	-
328	Sealant, retaining, single component, anaerobic	MIL-S-22473	-
329	Sealant, electrical insulating, PR1337, Products Research Co. (or equiv)	-	-
300	Sealant, gasket, hydrocarbon fluid, water resistant	MIL-S-45180	8030-00-252-3391
331	Sealant, elastomeric, aircraft structure	MIL-S-7124	8030-00-024-9634
332	Sealant, integral fuel tanks and fuel cavities, high adhesion, accelerator required	MIL-S-7502/MIL-S-8802	8030-00-723-2746
332.1	Sealant, 3145 RTV, Dow Corning (or equiv)	MIL-A-46146	8040-00-144-9774
332.2	Sealant, 162 RTV, Dow Corning (or equiv)	MIL-A-46146	8040-01-227-6153
333	Deleted	-	-
334	Sealant, EC-801B-A, class A, Minnesota Mining and Mfg. Co. (or equiv)	-	8030-00-687-8246
334.1	Sealant, MMM-08874	-	-
335	Sealant, Epoweld 9143, Hardman Inc.	-	-
336	Sealant, ProSeal 890, Hexcel Corp. (or equiv)	MIL-S-8802	8030-00-685-0915
337	Sealant, ProSeal 719A-2, Hexcel Corp. (or equiv)	-	-
338	Sealant, ProSeal 896, Hexcel Corp. (or equiv)	MIL-S-8802	8030-00-104-9321
339	Sealant, ProSeal 700, Hexcel Corp. (or equiv)	-	8030-00-723-5345

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
340	Sealant, GE RTV102 or Dow Corning 732	MIL-A-46106	8040-06-877-9872
340.1	Sealant, GE RTV103 (or equiv)	-	-
340.2	Sealant, GE RTV106 (or equiv)	-	8040-00-941-9984
340.3	Sealant, GE FRV1106 (Suitable sub for 730 RTV)	-	-
341	Sealant, PR1201-Q, Products Research Corp.	-	8030-00-616-7696
342	Sealant, PR9021 A-1, A-2, and A-4, Products Research Corp. (or equiv)	-	-
342.1	Sealant, type 2, class B-1/2	MIL-S-8802	8030-00-080-1549
342.2	Sealing Compound	MIL-S-81733C	8030-00-008-7198
342.3	Sealing Compound, grade O, thread lock, Loctite 262	MIL-S-46163	8030-01-142-9830
343	Loctite 404	-	-
344	Sealant, grade C, Loctite Corp. (or equiv)	MIL-S-22473	8030-00-823-7917
345	Sealant, grade E, Loctite Corp. (or equiv)	MIL-S-22473	8030-00-081-2339
345.1	Sealant, Loctite 601	-	8030-00-180-6222
345.2	Sealant, Loctite No. 635	MIL-R-46082	8030-00--181-7603
346	Sealant, Sylgard 186, Dow Corning Co. (or equiv)	-	5790-00-163-1153
347	Sealant (Viscous coating VC-3) Nylock-Detroit Corp., Midland Park, NJ	-	-
348	Sealant Tape EC1202, Minnesota Mining and Mfg. Co. (or equiv)	-	9320-00-019-0351
348.1	Sealant Tape 1202-T-NS, Minnesota Mining and Mfg. Co. (or equiv)	-	-
349	Sealer, polysulfide	MIL-S-8802	8030-01-048-3772
349.1	Sealing and coating compound, corrosion inhibitive, Type II, for extrusion application	MIL-S-81733	-
350	Sealing compound, EC776SR, topcoat, fuel tank, BUNA-N type	MIL-S-4383B	8030-00-664-4019
350.1	Skin, Light Weight (Blade)	-	1615-01-078-4634
351	Soap, high-foaming (potassium oleate) commercial grade	-	-
352	Soap, toilet, liquid and paste	P-S-624	8520-00-228-0598
353	Soap, toilet, white, floating, type I	P-S-620	8520-00-531-6484
354	Soapstone, powdered or mica, commercial grade	-	8510-00-817-0295
355	Sodium acid fluoride	-	8510-00-231-3006
356	Sodium bicarbonate, technical	O-S-576	6810-00-264-6618
357	Sodium dichromate (sodium bichromate), technical	O-S-595	6810-00-143-2000
358	Sodium hydroxide, technical	O-S-598	6810-00-270-8177
359	Solder, silver	QQ-S-561	-
360	Solder, tin alloy, lead-tin alloy, and lead alloy, 50/50, 63/37	QQ-S-571	3439-00-141-8244
361	Solution, cadmium alkaline plating, Sifco Metachemical Inc. (Dalic); Marlane Development Corp. (Selectron) (or equiv)	-	-
362	Solution, cadmium cleaning, Sifco Metachemical Inc. (Dalic); Marlane Development Corp. (Selectron) (or equiv)	-	-
363	Solution, ruststripper, grade 2, type 2, Oakite Products Inc. (or TT-C-490 equiv)	-	6850-00-810-1762
364	Solution, zinc-cleaning, Dalic, Sifco Metachemical Inc. (or equiv)	-	6850-01-067-6670
365	Solution, zinc-plating, Dalic, Sifco Metachemical inc. (or equiv)	-	6850-01-066-5614
366	Squeeze bottle, plastic	-	6640-01-306-5499

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1-18 EXPENDABLE MATERIALS (Continued)

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
366.1	Steel Bar, 4130 CRES, 1.5 in. dia	MIL-S-5000	-
367	Steel bar, 4130 CRES	MIL-S-18732	-
368	Steel, CRES, type 304	-	-
368.1	Steel plate, CRES, Type 301 or 304, 1/4 hard or annealed	-	-
369	Steel plate, 0.50-inch thick	-	-
369.1	Steel rod, 1/8 in. dia	-	-
370	Steel, sheet, CRES, 0.040-inch thick, type 301	MIL-S-5059	9515-00-596-1727
371	Steel, sheet, 4130, 0.032-inch thick	MIL-S-18729	9515-00-640-4146
372	Steel, sheet, 4130, 0.060-in thick	-	-
373	Steel wool, fine, commercial grade	FF-S-740	5350-00-240-2920
374	Strap, plastic, line supporting, 0.190 X 6.50 X 0.055-inch		
375	Strap	MS3367-3-4	5975-00-368-8648
376	Strap	MS3367-1-6	5975-00-935-3942
377	Strap	MS3367-4-2	5975-00-903-2288
378	Strip, gum, 0.020-inch thick, 0.050-inch wide, No. 52904	-	-
378.1	Switch, Rotary PA100	-	5930-01-216-2252
379	Syringe, hypodermic	-	6515-00-514-2395
380	Syringe, hypodermic	MIL-S-36157	6915-00-264-7739
381	Tape, anti-chafing, Y9265, Minnesota Mining and Mfg. Co.(or equiv)	-	-
382	Tape, anti-chafing, Permacel 306, 2.0 inches wide	-	7510-01-009-8023
383	Tape, anti-chafing, Y5425, 0.5 inch wide, Minnesota Mining and Mfg. Co. (or equiv)	-	7510-01-221-3335
383.1	Tape, anti-chafing, Y8561, 1.0 inch wide, 3M Co. (or equiv)	-	9330-01-101-7505
384	Tape, conductive, X1170 or X1181, Minnesota Mining and Mfg Co. (or equiv)	-	7510-00-421-6449
385	Tape, plastic, electrical pressure-sensitive, insulating	MIL-1-24391	5970-00-419-4291
385.1	Tape, pressure-sensitive adhesive plastic, for electroplating	HH-T-0025	
386	Tape, Fabseal, Pittsburgh Plate Glass Co. (or equiv)	-	7510-00-846-8674
387	Tape, glass	MIL-T-4053	7510-00-515-0319
388	Tape, masking	PPP-T-42	7510-00-266-6707
389	Tape, Mylar (or equiv) TY-1, 1/2 inch	L-T-100	7510-00-721-9756
390	Tape, No. 428, type A, Minnesota Mining and Mfg. Co. (or equiv)	-	-
390.1	Tape, nylon, high temperature, No. 855, Minnesota Mining and Mfg. Co. (or equiv)	-	-
391	Tape, pressure-sensitive adhesive, aluminum-backed	L-T-80	7500-00-720-7516
392	Tape, hook, No. 80, slate grey 320	-	-
393	Tape, insulation, spiral wrap, 0.006-inch X 1.0 inch	MIL-I-18746	-
394	Tape, pressure-sensitive	-	7510-00-579-8492
395	Tape, pressure-sensitive adhesive, waterproof type IV	PPP-T-60	7510-00-074-5124
395.1	Tape self-vulcanizing silicone	MIL-I-46852B	5970-00-955-9976
396	Tape, vacuum bag sealing, 1 to 2 inches wide, General Sealing or Pressite	-	8030-00-601-9496
396.1	Tape, sealant, EC1202/ See item 348	-	-
397	Tape, silver reflective, 3870, Minnesota Mining and Mfg. Co (or equiv)	-	-
398	Tape, teflon spiral, Tireflex Co., Inc. (or equiv)	-	-
399	Tape, teflon, self-adhesive	MIL-I-23594	5970-00-848-8683
400	Tape, teflon, glass, Warren Wire Co. (or equiv)	MIL-I-18746	5970-00-181-0306
401	Tape, teflon	MIL-T-27730	5970-01-212-5820

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ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
402	Tape, velcro, SA-0140A, Hartwell Corp. (or equiv)	-	8315-00-926-4931
402.1	Tape, velcro (pile)	-	8315-00-926-4930
403	Tape, lacing, Type 5, Size 3, Finish C, Stype	-	4020-00-823-7331
404	Tape, yellow	L-T-90	7510-00-550-7125
405	Tape, red	L-T-90	7510-00-550-7126
406	Tape, white	L-T-90	7510-00-550-7127
407	Tape, green	L-T-90	7510-00-550-7129
408	Tape, blue	L-T-90	7510-00-634-3267
409	Tape, black	PPP-T-0066A1	8135-00-880-7351
410	Tarpaulin, weather-resistant	K-P-146E	8340-00-841-8456
411	Tedlarfilm 100 GB30TR, E.I. DuPont, De Nemours (or equiv)	L-P-1040	-
412	Teflon sheet	MIL-P-22241	-
413	Temperature indicating strips, Model 110-2, 140-190°F	-	6685-01-344-0752
413.1	Temperature indicating strips, Model 110-3, 180-230°F	-	6685-01-323-0671
413.2	Temperature indicating strips, Model 110-4, 220-270°F	-	6685-01-477-7443
413.3	Temperature indicating strips, Model 110-5, 260-310°F	-	6685-01-062-5499
413.4	Tetra-Etch, Gore Co.	-	6850-00-431-8662
414	Thinner, dope and lacquer, cellulose nitrate	TT-T-266	8010-00-160-5787
415	Thinner, lacquer	MIL-T-19544	8010-00-160-5789
416	Thinner, aliphatic polyurethane coating	MIL-T-81772	8010-00-181-8080
417	Thinner, logo, R-277, Bee Chemical Co. (or equiv)	-	-
418	Thinner, paint	TT-T-291	8010-00-242-2089
419	Thinner, toluene-methyl-isobutyl-ketone	MIL-T-19588	6810-00-286-0458
419.1	Thinner, ALBI	-	8010-01-327-5406
419.2	Thinner, ALBI	-	8010-01-327-9982
420	Thread, cotton, 4-ply, size 10-3	V-T-276	8310-00-197-7695
421	Thread, nylon, tape 1 K, size 1 B, class II, gray	V-T-295	-
422	Toluene	JAN-T-171	-
423	Toluene, technical	tt-t-548	6810-00-281-2002
424	Tongue depressor (wood spatula)	LLL-S-007.29	6515-00-7534533
425	Topcoat, gray polyurethane, isocyanate, part A an part B Pigment-Fed Std 595, table 8, gloss 16081 and 16089	MIL-C-27227	-
425.1	Trailing edge material	-	1560-01-318-8604
426	Trichloroethylene, technical	O-T-634	6810-00-184-4800
427	Tubing, aluminum, 1/4-inch id	-	-
427.1	Tubing, aluminum alloy, 6061-T6, 1/4 X 0.035 inch	MIL-T-7081	4710-00-289-2781
427.2	Tubing, aluminum alloy, 6061-T6, 3/8 X 0.035 inch	MIL-T-7081	4710-00-684-5074
427.3	Tubing, aluminum alloy, 6061-T6, 1/2 X 0.035 inch	MIL-T-7081	4710-00-142-3010
427.4	Tubing, aluminum alloy, 6061-T6, 5/8 X 0.035 inch	MIL-T-7081	4710-00-279-0020
427.5	Tubing, aluminum alloy, 6061-T6, 3/4 X 0.035 inch	MIL-T-7081	4710-00-289-3038
427.6	Tubing, aluminum alloy, 6061-T6, 1 X 0.049 inch	MIL-T-7081	4710-00-289-2537
428	Tubing (extruded shape), synthetic rubber, 9/16 X 0.063-inch	MIL-S-6855	-
429	Tubing, aluminum, 1/2-inch diameter	-	-
429.1	Tubing, CRES, 1/4 X 0.028 inch	MIL-T-6845	4710-00-278-3294
429.2	Tubing, CRES, 3/8 X 0.028 inch	MIL-T-6845	4710-01-148-9345
429.3	Tubing, CRES, 1/2 X 0.042 inch	MIL-T-6845	4710-00-420-4789

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1-44 Change 57

1-18 EXPENDABLE MATERIALS (Continued)

1-18

ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
429.4	Tubing, CRES, 5/8 x 0.049 inch	MIL-T-6845	4710-00-278-3302
429.5	Tubing, CRES, 3/4 x 0.049 inch	MIL-T-6845	4710-00-443-4773
430	Tubing (extruded shape), synthetic rubber, 9/16 x 0.063-inch	MIL-T-6845	4720-00-246-5354
431	Tubing, electrical insulation, heat shrinkable	MIL-T-47051	-
432	Tubing, Teflon, 0.263 inch id	AMS 3654	-
433	Twine, impregnated, lacing and typing	MIL-T-713	4720-00-247-1737
434	Varnish, electrical-insulating, type AN, grade CB	MIL-I-24092	5970-00-296-2129
435	Varnish, moisture- and fungus-resistant	MIL-V-713	5970-00-285-0271
436	Vinegar	Z-V-401	8950-00-609-2720
437	Vinyl film, KDA 2917, Union Carbide Plastics Co. (or equiv)	-	8135-00-123-6985
438	Walkway material, type I (smooth) black, color No. 37038	MIL-W-5044	5610-00-641-0429
439	Walkway material, type I (smooth) gray, color No. 36231	MIL-W-5044	5610-00-641-0428
440	Walkway material, type II (rough) black, color No. 37038	MIL-D-23003	5610-00-857-4393
441	Walkway material, type II (rough) gray, color No. 36231	MIL-W-5044	5610-00-641-0426
442	Wax, aircraft liquid	MIL-W-18723	7930-00-267-5588
443	Welding rod	AMS5794	3439-00-882-7350
444	Welding rod	AMS5679	3439-00-204-0204
445	Welding rod (AWS NO. ERN7W)	-	-
446	Window tinting compound, Windotint Green, Windotint Corp., Glazetone Green, National Glass Center, Inc. (or equiv)	-	-
447	Wire, electrical, insulating copper, class I	MIL-W-22759	-
448	Wire, electrical, 600-volt, aluminum, aircraft	MIL-W-7072	6145-00-583-9988
449	Wire, electrical, chromel and/or alumel, thermocouple	MIL-W-5846	-
450	Wire, electric, nylon jacket, tin-coated copper conductor, 600 volt, #20	MIL-W-5086/1	6145-00-851-8505
451	Wire, electric, PVC-glass-nylon, tin-coated copper conductor, 600 volt, #20	MIL-W-5086/2	-
452	Wire, electrical, type B, 105°C, 600 volts, insulated, high temperature	MIL-W-16878/1	-
452.1	Wire, non-electrical	MS20995-022	9505-00-293-4208
453	Wire mesh, 120 mesh, Metex Corp.	-	5335-01-306-9677
453.1	Wire cloth, 200 mesh, 0.0021 inch dia. 5056 AL alloy	-	5335-01-306-9678
454	Wire rope 0.375-inch diameter	-	-
455	Xylene	TT-X-916	6810-00-584-4070
456	Zinlac, Wm. Zinsler Co. (or equiv)	-	-
457	Gun blue, instant, formula 44-40	-	-
458	Grease, plug valve, grease and oil resistant, Type I	MIL-G-6032	9150-00-257-5360
459	See item 192	-	-
460	Aluminum sheet, 0.125 inch thick	QQ-A-250	9535-00-084-4558
461	Silicon grease, Dow Corning No. 7 (or equiv)	MIL-G-46886	9150-00-145-0161

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1-18 EXPENDABLE MATERIALS (Continued)

1-18

ITEM NO.	NOMENCLATURE	MILITARY SPECIFICATION	NSN
462	Lacquer, low reflective, black	MIL-L-46159	8010-01-042-9438
463	Dope, clear	MIL-D-5549	8010-00-223-4037
464	Powder, solvent, TA 58056, Mine Safety Appliance Co. (or equiv)	MIL-C-372	6850-00-224-6658
465	Shim	BACS40R13B28F	—
466	Water Soluble Cleaner	BB3100	—
467	Water Soluble Cleaner	TURCO 5884	—
468	Bag, Anti-static, plastic; 15 x 18; Minnesota Mining and Mfg. (V17325)	—	8105-01-353-8808

NOTE A. Adhesive (E41) is preferred for rotor blade repairs. (E41) does not require the use of scrim cloth to prevent squeeze out. (E41) contains beads which prevent it from being squeezed below the thickness of the beads.

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SECTION V

GROUND HANDLING

Change 57 1-44.3/(1-44.4 blank)

1-19 TOW HELICOPTER (NORMAL METHOD)

1-19

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-3234692
Aircraft Tow Bar
Tow Tractor Capable of Towing
45,000 Pounds

Materials:

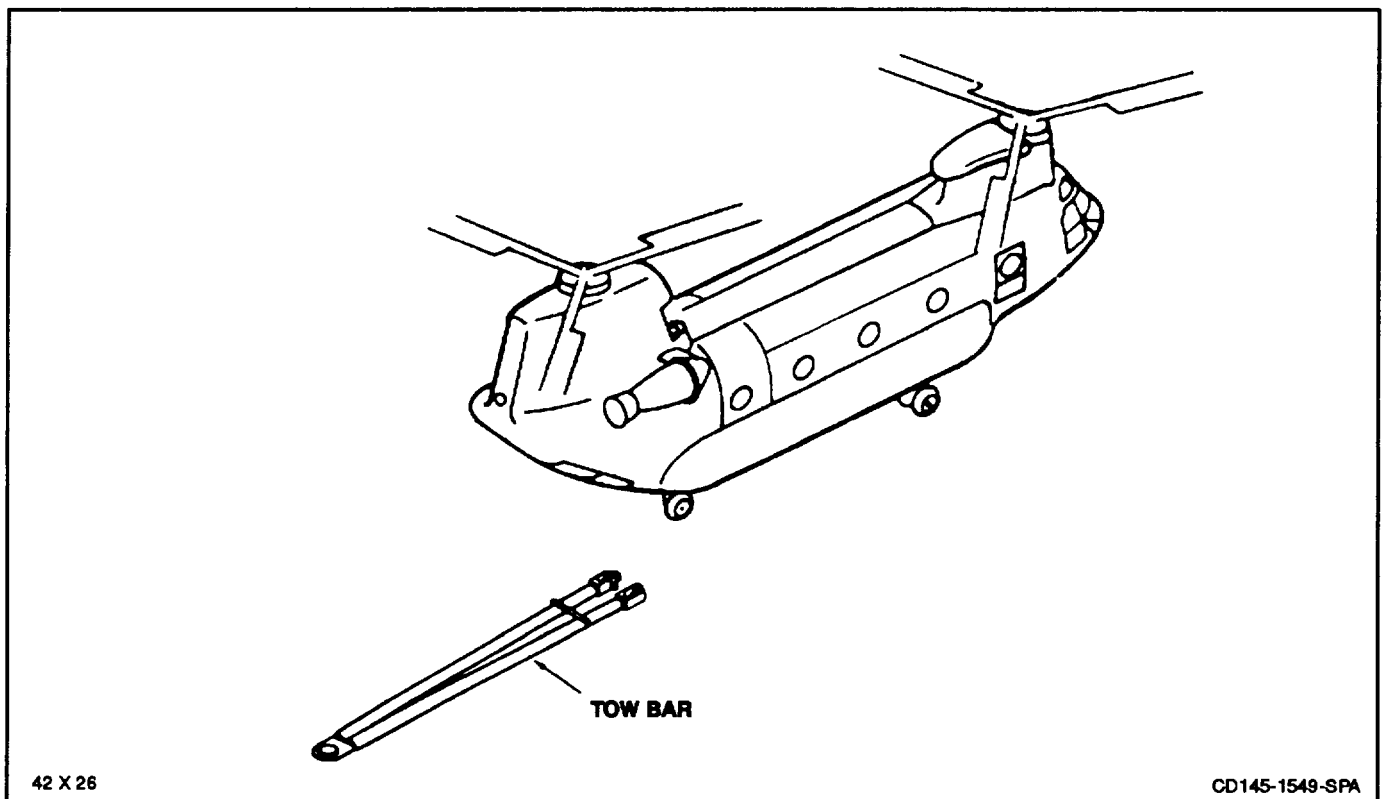
None

Personnel Required:

Medium Helicopter Repairer (As Required)

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Utility System Apu Start Accumulator Charged to
3,000 Psi (Task 1-64)
Aft Wheels in Trailing Position
Emergency utility hydraulic valve open



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Change 57 1-45

CAUTION

Wait at least 20minutes after shutting down or removing electrical power before moving helicopter. Otherwise, vertical gyros can be damaged.

CAUTION

Towing with swivel locks engaged will damage landing gear.

CAUTION

It is not recommended to tow aircraft from the aft left wheel because damage to the aft right landing gear may occur. If you have to tow from the left wheel have a steering bar attached with personnel steering the aft right wheel. Tow helicopter slowly.

1. Check that swivel lock (1) on each aft landing gear is raised clear of detents (2).

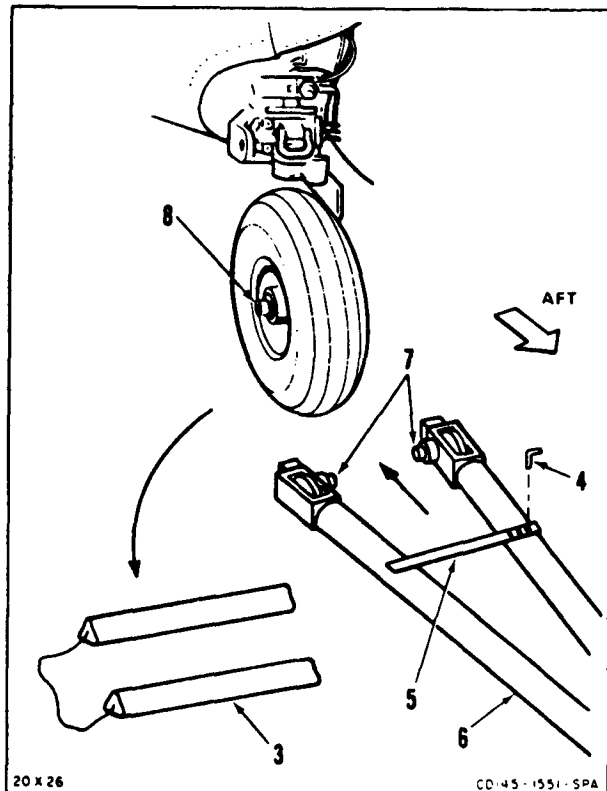
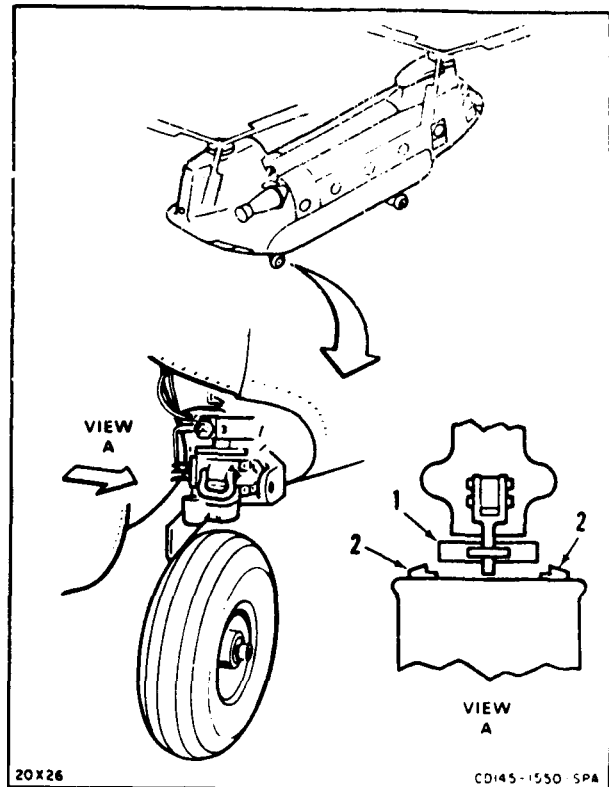
SWIVEL WHEEL

NOTE

Do steps 2. through 7. only if towing aft.

2. Remove chocks (3), if installed, from aft left wheel.
3. Remove pin (4) securing spreader (5) to tow bar (6).
4. Fit tow bar pins (7) into ends of axle (8) of aft left wheel.
5. Secure tow bar (6) to axle (8) by installing pin (4) through one of the holes in spreader (5).

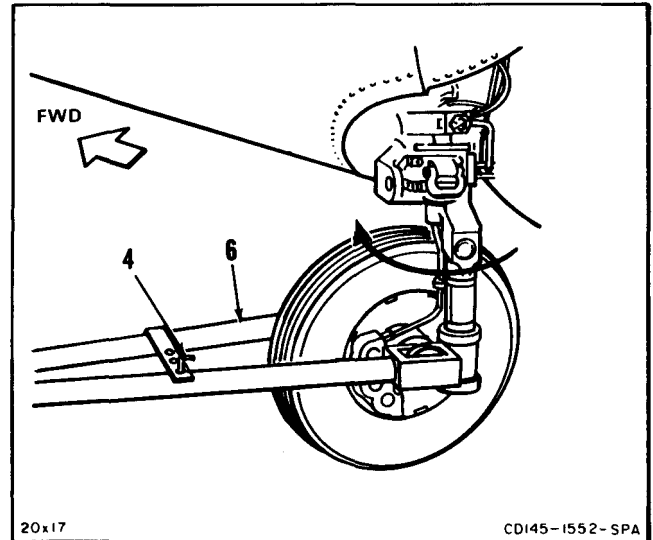
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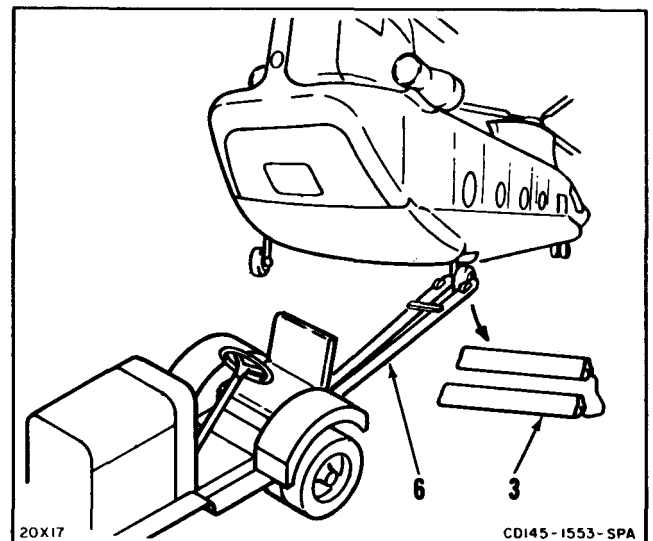
CAUTION

Left wheel and gear can be damaged if wheel is not turned around before towing aft.

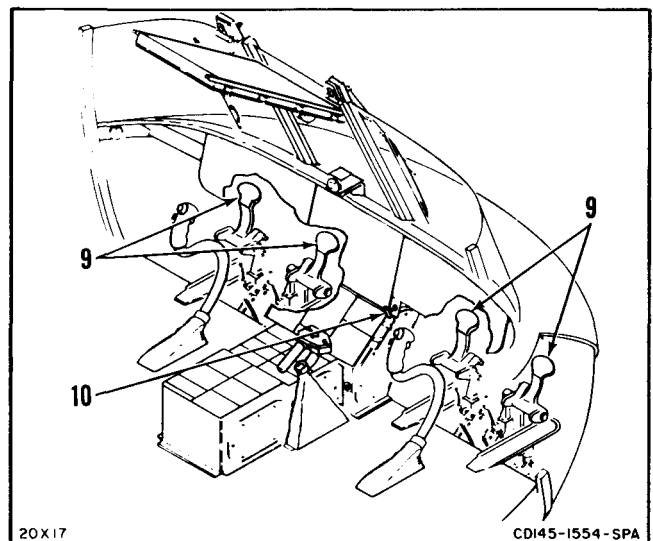
- 6 Use tow bar (6) to swivel the wheel around about 120 degrees.
- 7 Remove pin (4). Remove tow bar (6) from wheel.

**INSTALL TOW BAR**

8. Remove chocks (3), if installed, from aft right wheel.
9. Install tow bar (6) on aft right wheel (Steps 4. and 5.).
10. Connect tow bar (6) to towing tractor.

**TOW HELICOPTER**

11. Have helper sit in cockpit. Helper will apply brakes if needed during towing.
12. Have helper **release parking brakes** by pressing on pilot or copilot brake pedals (9). Brake handle (10) will release.

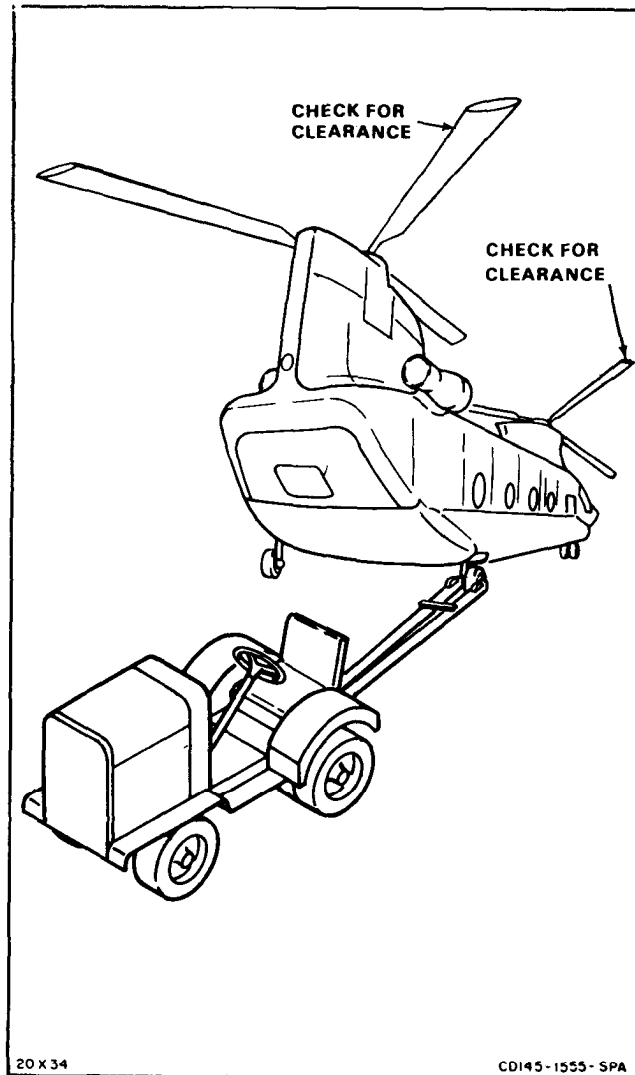


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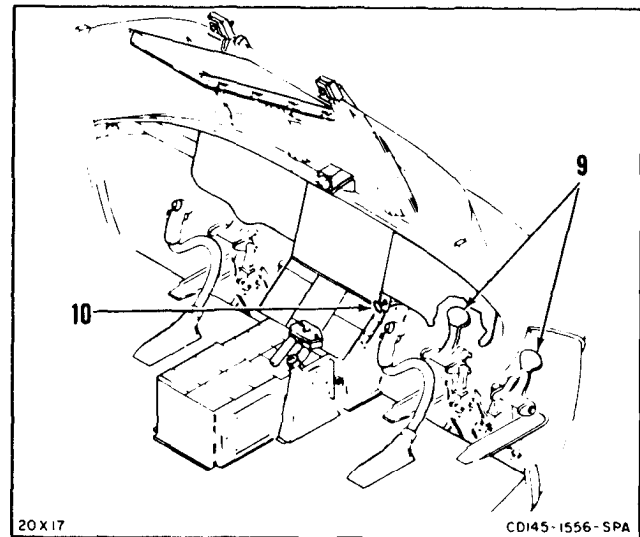
CAUTION

Blades can be damaged if observers do not check for clearance.

13. Station observers at each side of helicopter to make sure blades have clearance during towing. Turn rotor heads as needed for clearance.
14. Tow helicopter slowly. Avoid sudden starts and stops. Turn rotor heads as needed for blade clearance as observers report.



15. When towing is done, have helper set parking brakes by pressing pilot's brake pedals (9) and pulling handle (10).



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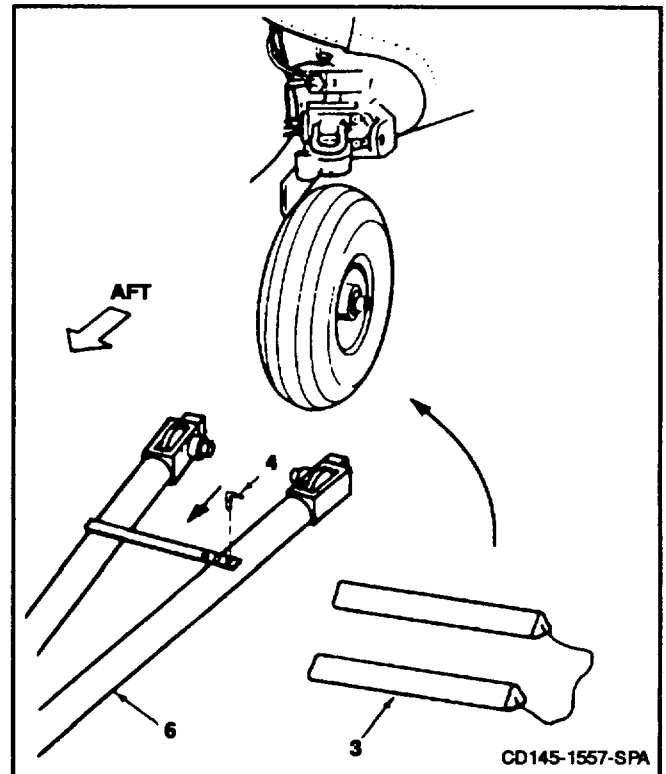
1-19 TOW HELICOPTER (NORMAL METHOD (Continued))

1-19

16. Remove pin (4). Remove tow bar (6) from wheel.
17. Install chocks (3).

RETURN WHEEL**NOTE**

Do steps 18. thru 20. only if helicopter was towed aft.

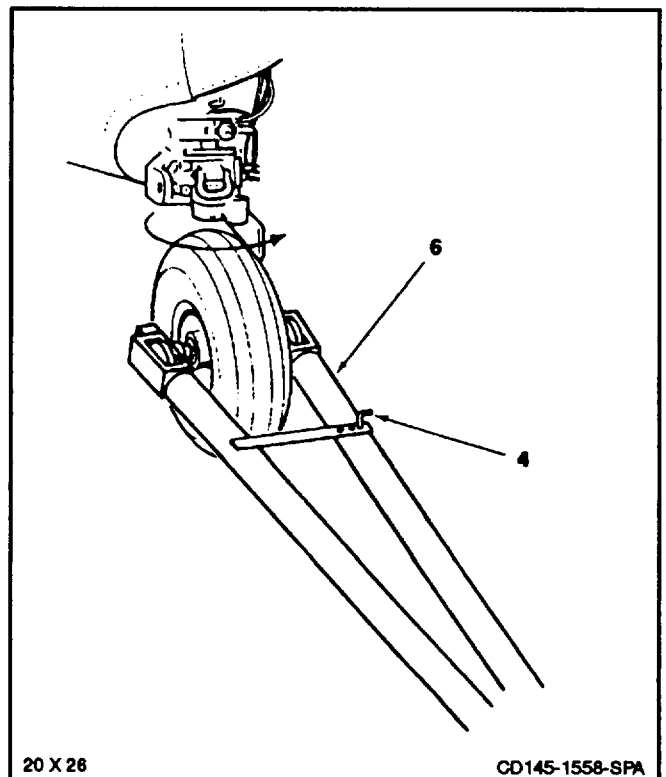


18. Install tow bar (6) on aft left wheel (Steps 4. and 5.).
19. Use tow bar (6) to turn wheel around to normal position.
20. Remove pin (4). Remove tow bar (6) from wheel.

FOLLOW ON MAINTENANCE:

Park helicopter (Task 1-25).

Check emergency utility hydraulic valve - closed.



END OF TASK

Change 57 1-49

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Towing Bridle
- Steering Bar (175)
- Wheel Chocks
- Tow Tractor

Materials:

None

Personnel Required:

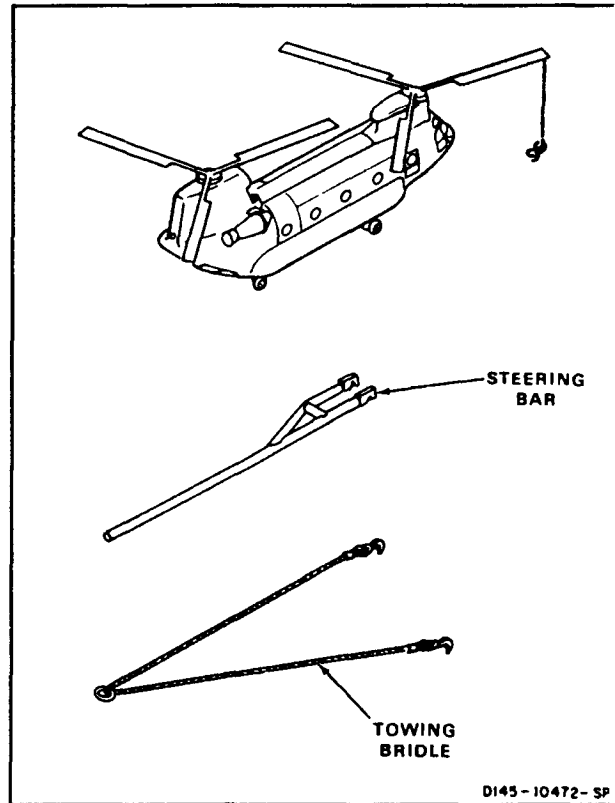
Medium Helicopter Repairer (As Required)

References:

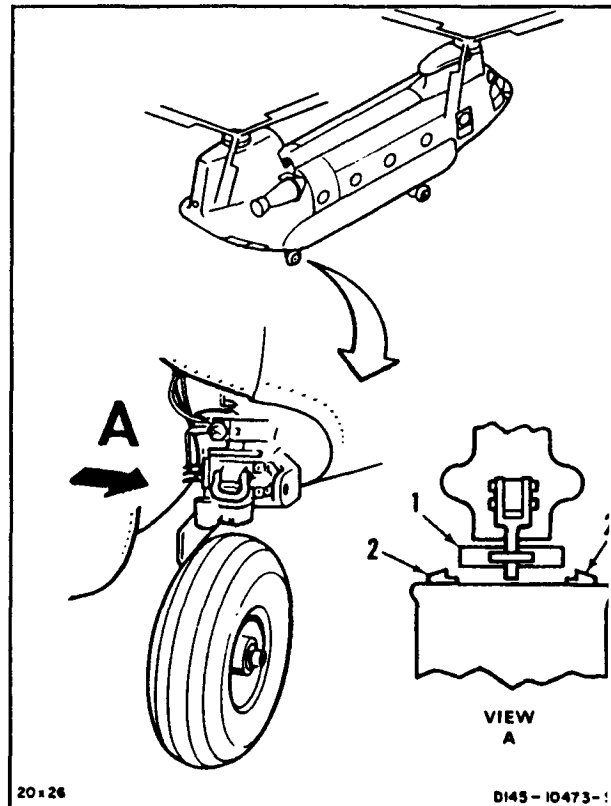
Task 1-64

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Utility System Apu Start Accumulator Charged to 3,000 Psi (Task 1-64)
- Emergency Utility Pressure Valve Open (TM 55-1520-240-T)



- Wait at least 20 minutes after shutting down or removing electrical power before moving helicopter. Otherwise, vertical gyros can be damaged.
 - Towing with swivel locks engaged will damage landing gear.
1. Check that swivel lock (1) on each aft landing gear is raised clear of detents (2).



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1-20 ALTERNATE TOWING (Continued)

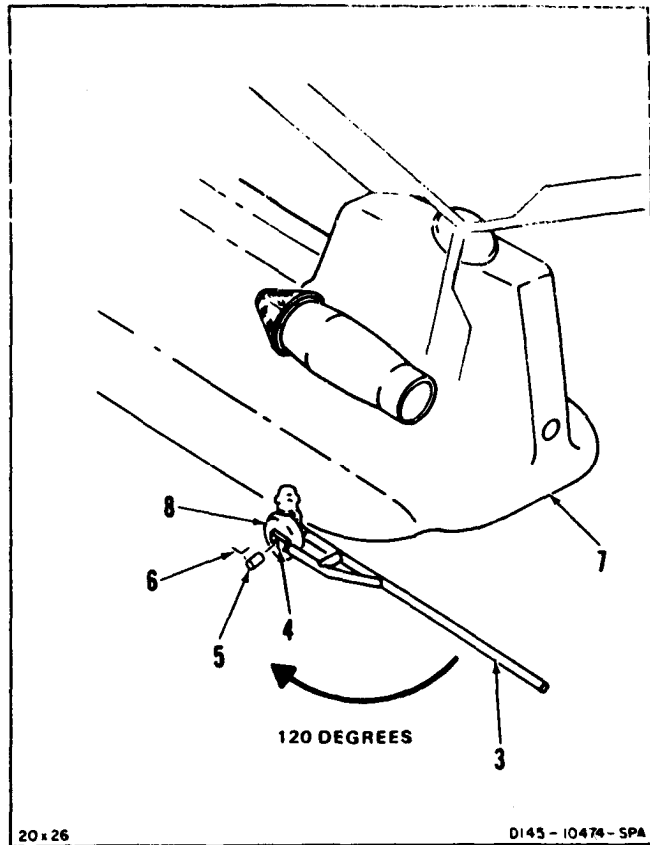
1-20

2. **Attach steering bar (175) (3) to left aft landing gear axle (4) as follows**
 - a. Insert steering bar pin (5) in outboard end of axle (4).
 - b. Position steering bar (175) (3) on axle (4).
 - c. Insert pin (6) in steering bar pin (5).
 - d. If helicopter (7) will be towed forward, go to step 5.

CAUTION

Left wheel and gear can be damaged if wheel is not turned around before towing aft.

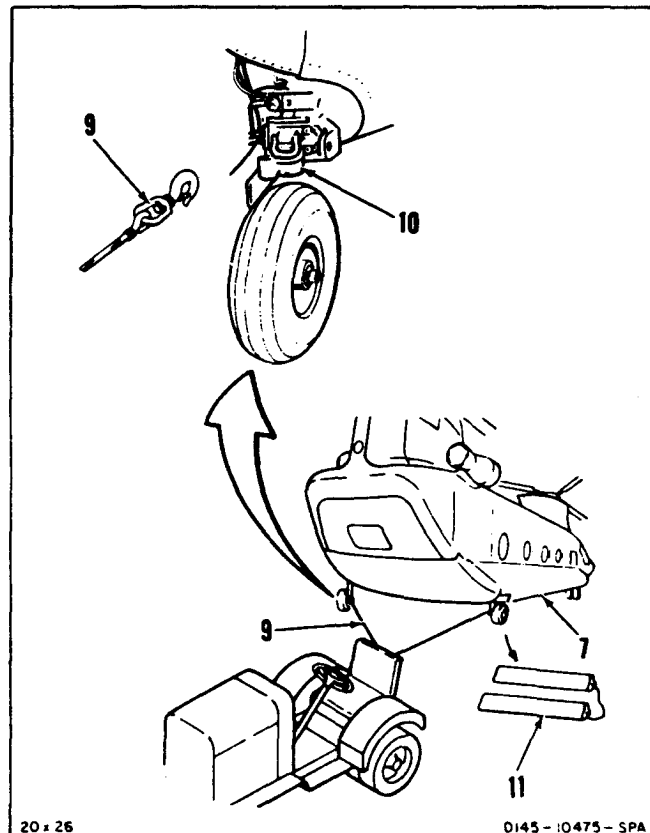
3. If helicopter (7) will be towed aft, turn left wheel (8) 120 degrees to one side. Use steering bar (T75) (3).
4. Remove L pin (6), steering bar pin (5), and steering bar (T75) (3).



CAUTION

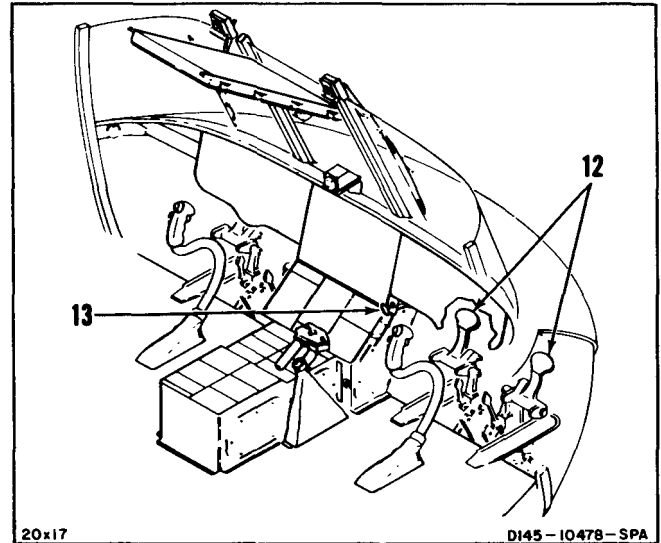
Damage to the aft right landing gear may occur if a steering bar is not attached and used on the aft right wheel when towing bridal is hooked to aft landing gear shackles Swivel the aft left wheel and tow the helicopter slowly. After towing ensure aft left wheel is returned to proper position.

5. Hook towing bridle (9) onto two forward or two aft landing gear shackles (10).
6. Connect towing bridle (9) tow the tractor. Position tractor just far enough away from helicopter (7) to take-up slack in bridle.
7. Remove chocks (11), if installed.



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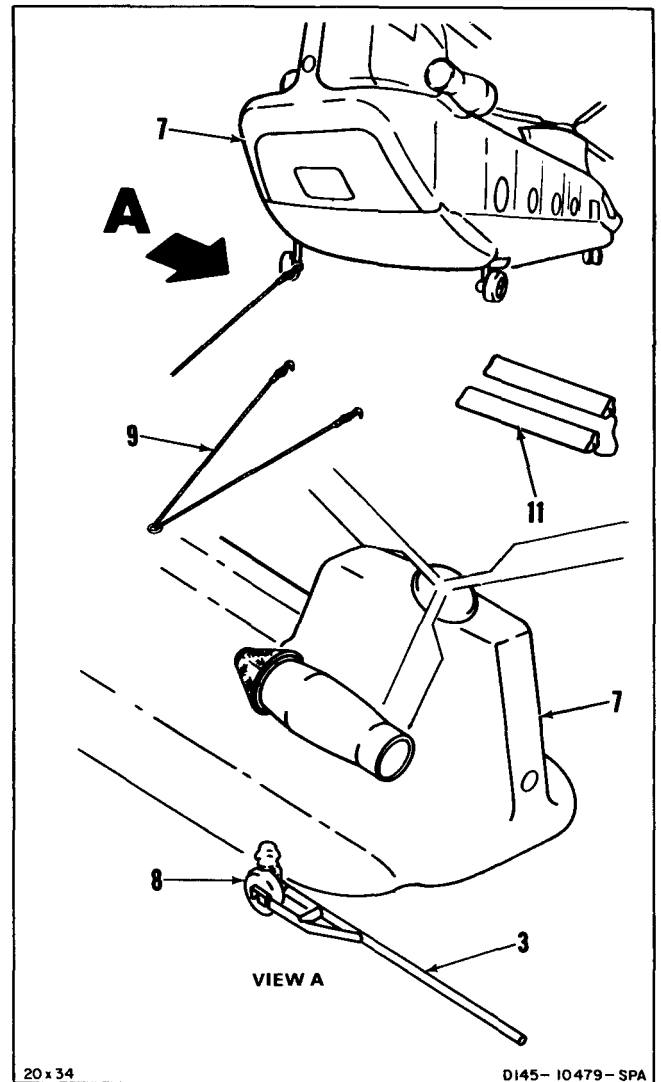
13. When towing is done, have helpers **set parking brakes** by pressing pilot brake pedals (12) and pulling handle (13).



14. Remove towing bridle (9).
15. If helicopter (7) was towed forward, go to step 17.
16. If helicopter (7) was towed aft, **return left aft wheel (8) to trailing position**. Use steering bar (T75) (3). Follow steps 2 and 3.
17. Repeat step 4.
18. Install chocks (1 1).

FOLLOW-ON MAINTENANCE:

Set emergency utility pressure valve to NORMAL (TM55-1520-240-T)



END OF TASK

1-21 JACK ENTIRE HELICOPTER

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Jack 1228-31 or Equal
- Jack 1214-151 or Equal (2)
- Tiedown Chains (2)

Materials:

None

Personnel Required:

- 67U10 Medium Helicopter Repairer (2)
- 67U20 Medium Helicopter Repairer

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Fuel Tanks Drained (Task 10-34 or 10-35)
- Helicopter On Hard Level Surface

Both Forward Landing Gear Shock Struts Deflated (Task 1 -71)

Both Aft Landing Gear Access Panels Open (Task 2-2)

Helicopter Roped Off and Signs Posted to Restrict Access

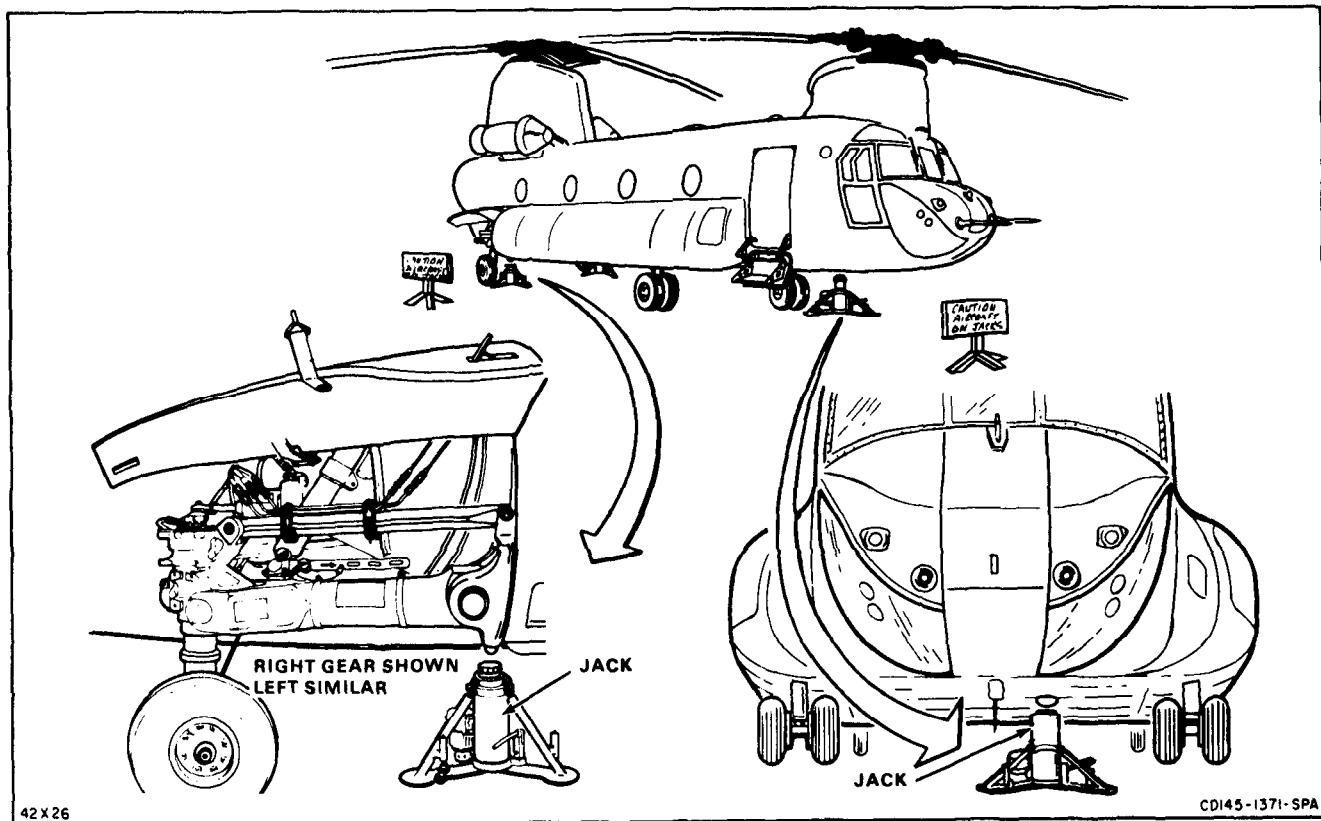
General Safety Instructions:

WARNING

Jacking on soft or uneven surface, or in winds or gusts over 20 knots, can cause helicopter to fall. Personal injury and damage to equipment can result.

WARNING

Jacking when helicopter weight is over limit can damage structure and injure personnel. Do not jack if weight is over limit.



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1-21 JACK ENTIRE HELICOPTER (Continued)

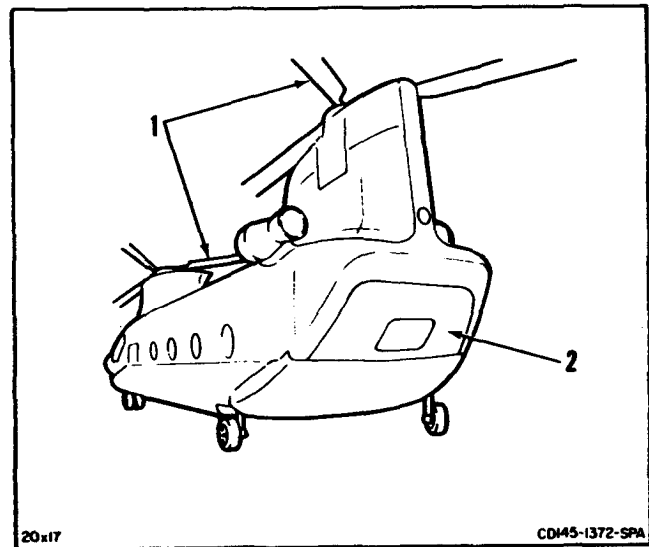
1-21**RAISE HELICOPTER**

- 1 Check that helicopter gross weight is less than 24,500 pounds (TM 55-1520-240- 10).

CAUTION

Blades or ramp can be damaged if there is not enough clearance.

2. Make sure there will be clearance for blades (1) after jacking. Make sure cargo ramp (2) will not hit ground during jacking.

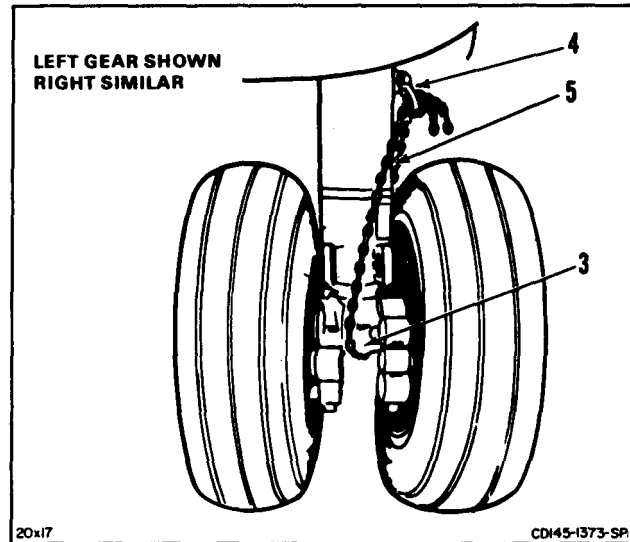
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1-21 JACK ENTIRE HELICOPTER (Continued)

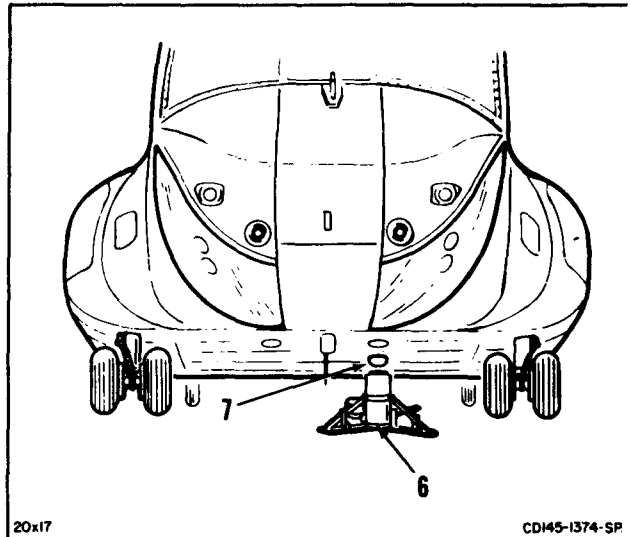
CAUTION

Do not let tiedown chain press against brake tubing. Tubing can be damaged.

- Secure both forward landing gear shock struts in deflated position. Tie axle housing (3) to towing shackle (4). Use tiedown chain (5).



- Set jack (6) under forward fuselage jack pad (7). Raise jack until it just begins to support some weight.



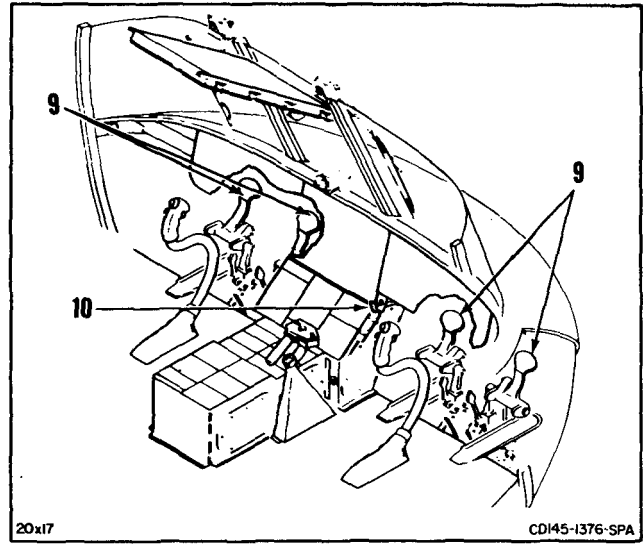
- Remove chocks (8).



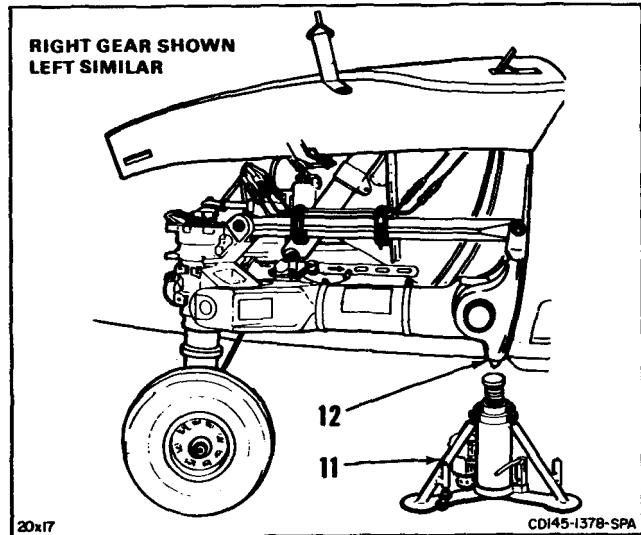
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1-21 JACK ENTIRE HELICOPTER (Continued)

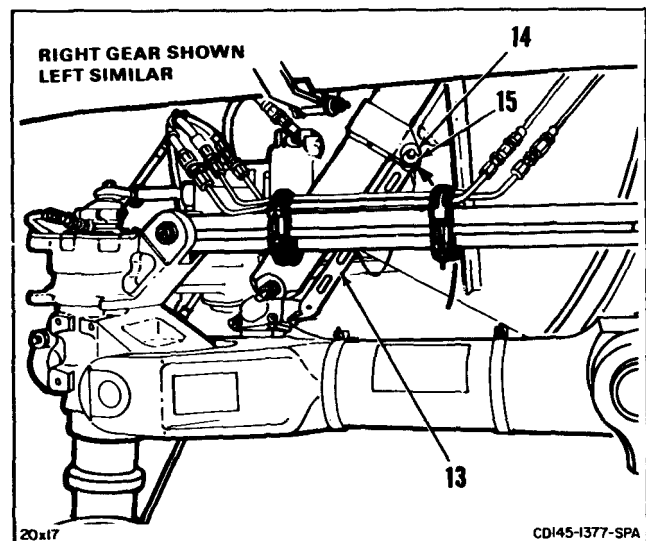
6. **Release parking brake** by pressing pilot's or copilot's brake pedals (9). Brake handle (10) will release.



7. Set jack (11) under jack pad (12) at each aft gear. Raise jacks just enough to support some weight.



8. **Release static lock (13)** from stowed position on each aft landing gear. **Secure it to lug (14)** with pin (15). If needed, jack gear until lock can be secured.



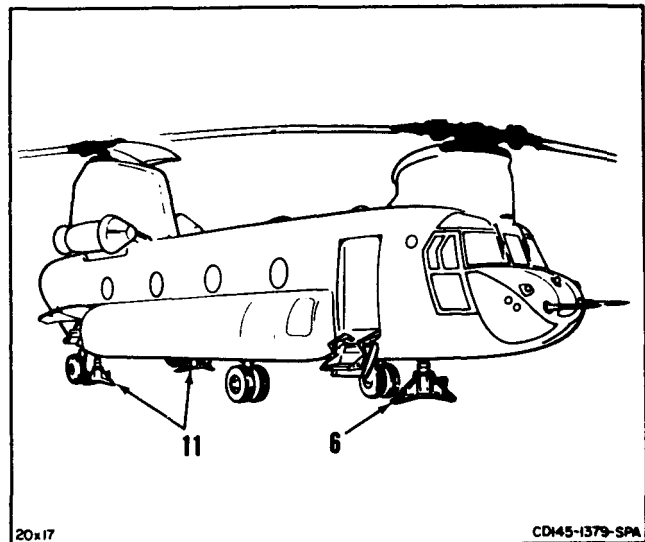
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1-21 JACK ENTIRE HELICOPTER (Continued)

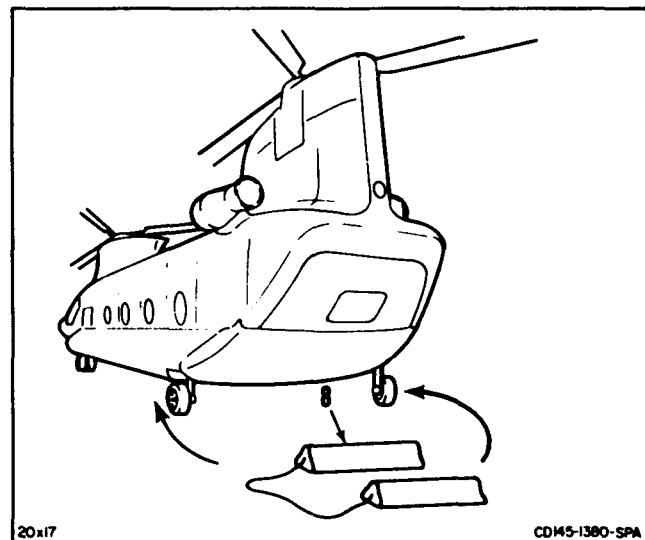
9. Jack helicopter as high as needed. Raise all three jacks evenly, a little at a time.

LOWER HELICOPTER

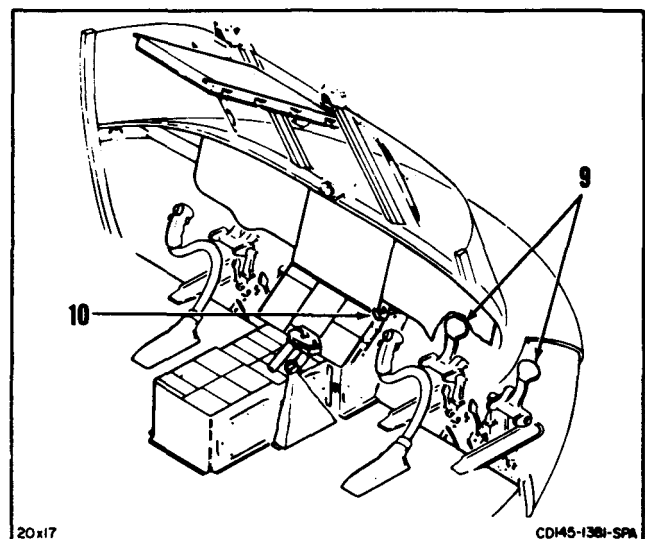
10. Lower all three jacks (6 and 11) evenly, a little at a time until forward wheels are firmly on the ground and aft wheels are touching ground. **Do not remove jacks.**



11. Place chocks (8) at either aft wheel.



12. Set parking brakes by pressing pilot's brake pedals (9) and pulling handle (10). Release pedal.



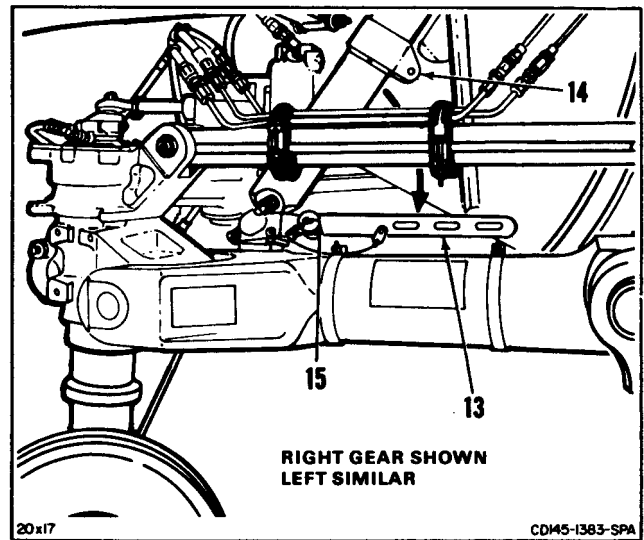
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1-21 JACK ENTIRE HELICOPTER (Continued)

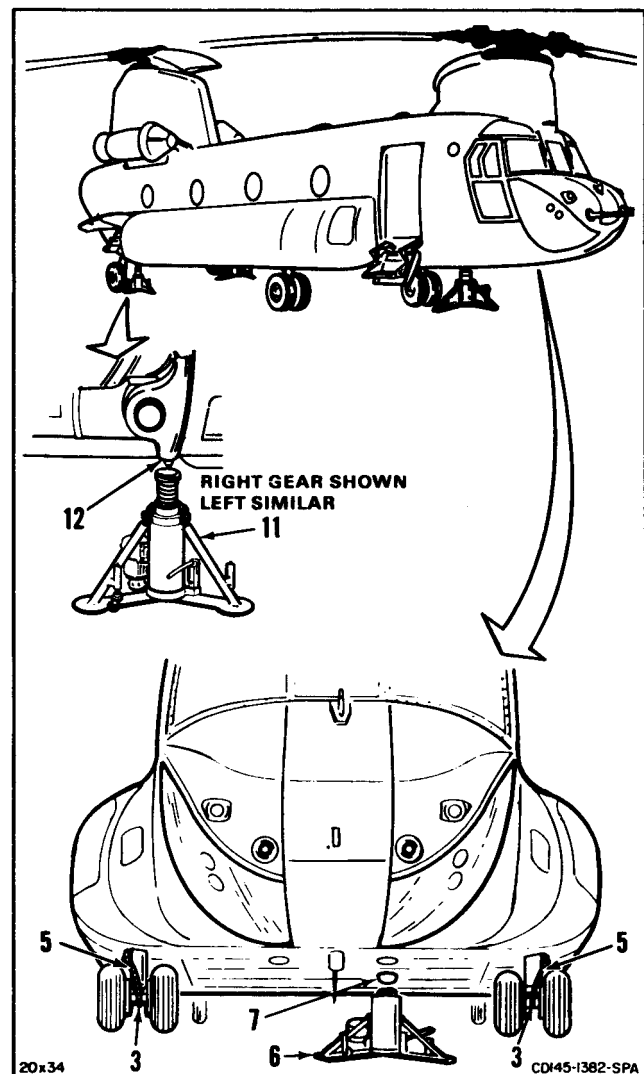
CAUTION

Aft landing gear can be damaged if static locks are not released and stowed before lowering all the way.

13. Lower aft landing gear until wheel touches ground. Release static lock (13) from lug (14) on each aft landing gear. Secure in stowed position with pin (15).



14. Lower all three jacks (6 and 11) evenly until free of pads (7 and 12). Remove jacks.
15. Remove tiedown chains (5) from axle housings (3).



FOLLOW-ON MAINTENANCE:

- Remove ropes and signs from around helicopter.
- Service forward landing gear shock struts with air (Task 1-71).
- Service fuel tanks (Task 1-51).

END OF TASK

1-22 JACK AT FORWARD FUSELAGE JACK PAD

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN5180-00-323-4692
- Jack 1228-31 or Equal
- Tiedown Chain (2)

Materials:

None

Personnel Required:

- 67U10 Medium Helicopter Repairer
- 67U20 Medium Helicopter Repairer

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Fuel Tanks Drained (Task 10-34 or 10-35)
- Helicopter on Hard, Level Surface
- Forward Landing Gear Shock Struts Deflated (Task 1-71)
- Helicopter Roped Off and Signs Posted to Restrict Access

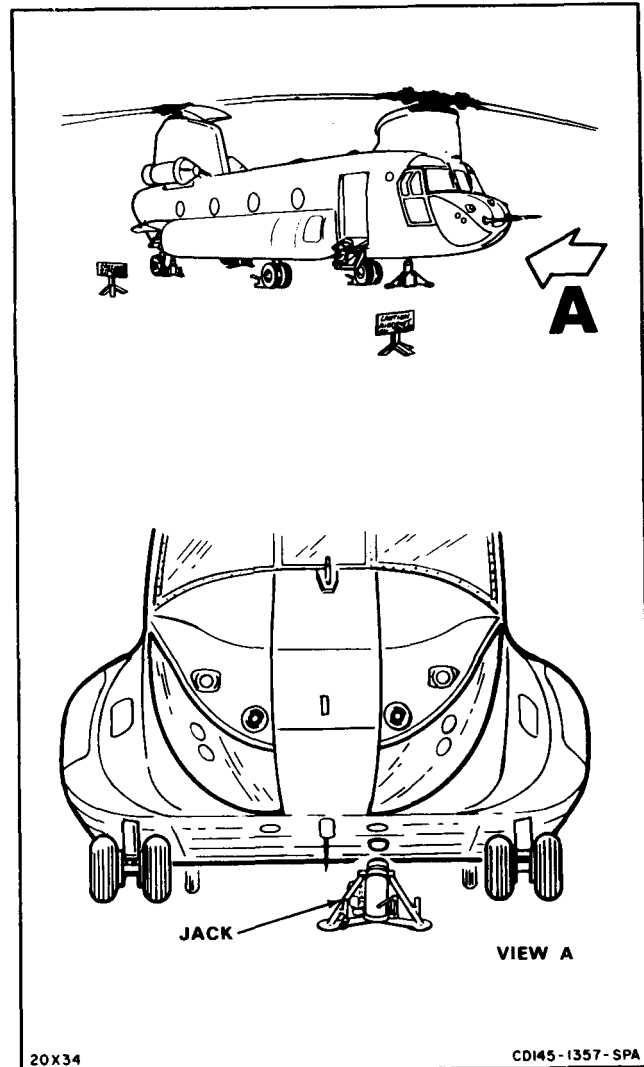
General Safety Instructions:

WARNING

Jacking on soft or uneven surface or in winds or gusts over 20 knots can cause helicopter to fall. Personal injury and damage to equipment can result.

WARNING

Jacking when helicopter weight is over limit can damage structure and injure personnel. Do not jack when weight is over limit.



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1-22 JACK AT FORWARD FUSELAGE JACK PAD (Continued)

1-22

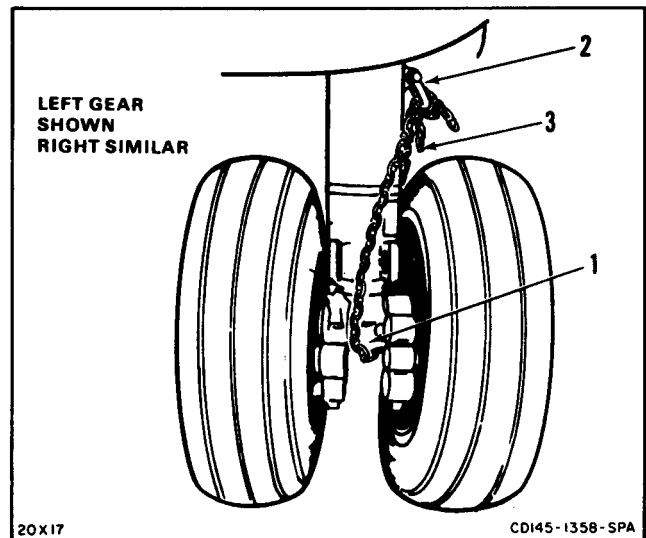
RAISE HELICOPTER

1. Check that helicopter gross weight is less than 24,500 pounds (TM 55-1520-240-10).

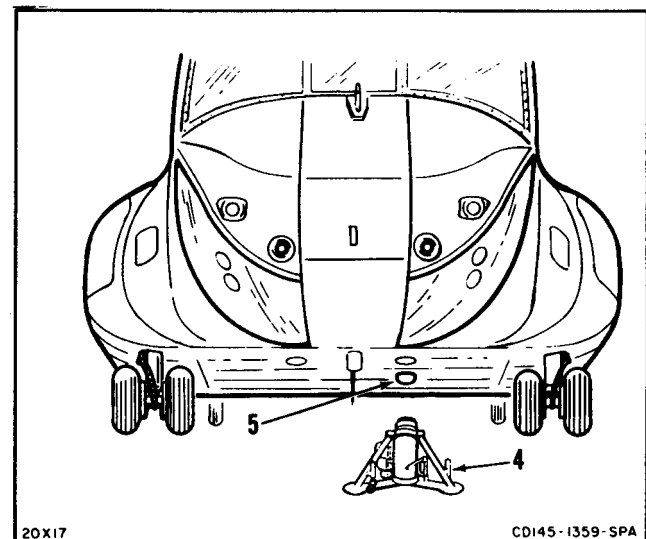
CAUTION

Do not let tiedown chain press against brake tubing. Tubing can be damaged.

2. Secure both forward landing gear shock struts in deflated position. Tie axle housing (1) to towing shackle (2). Use tiedown chain (3).



3. Set jack (4) under jack pad (5). Raise jack until it just begins to support sores weight.



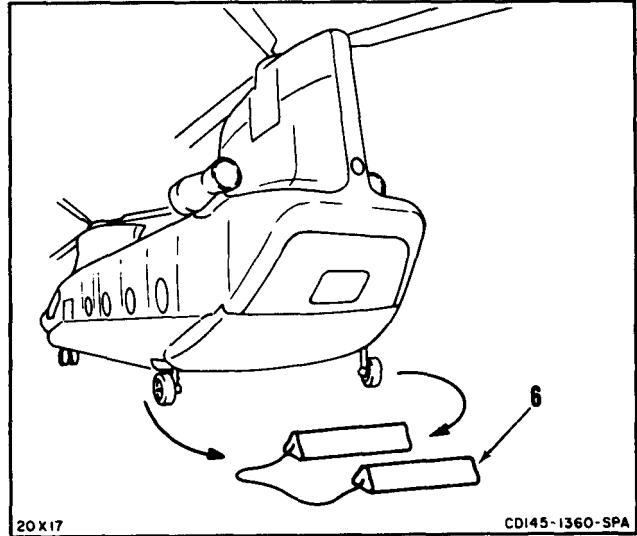
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1-22 JACK AT FORWARD FUSELAGE JACK PAD (Continued)

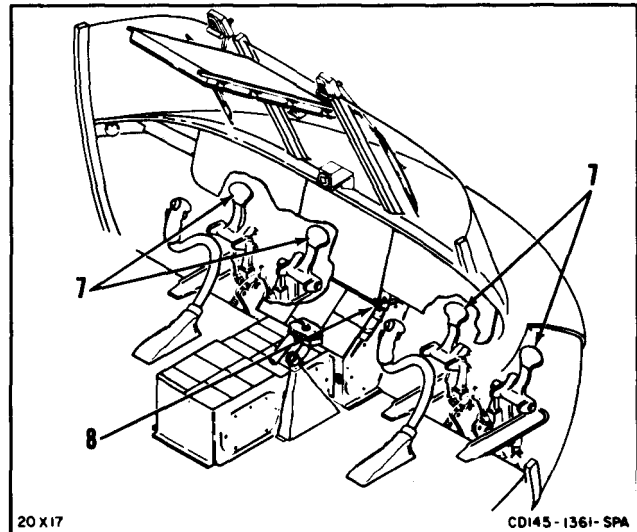
WARNING

All wheels must be free to move during forward fuselage jacking. If they are not, injury to personnel and damage to structure can result.

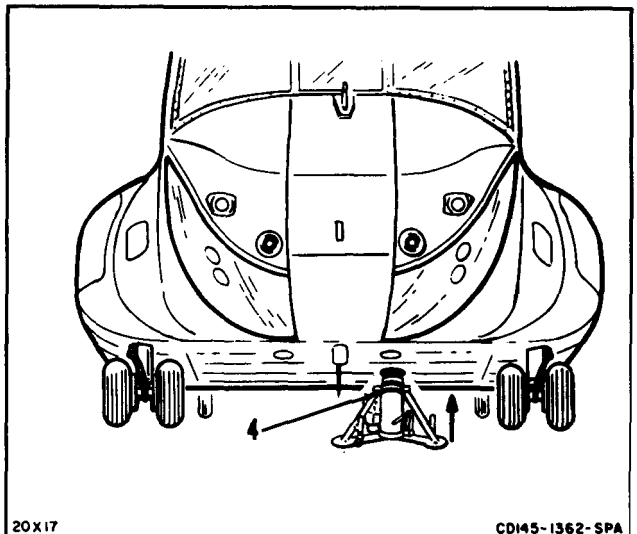
4. Remove chocks (6).



5. Release parking brakes by pressing pilot's or copilot's brake pedals (7). Brake handle (8) will release.



6. Raise jack (4) to lift helicopter as high as needed.

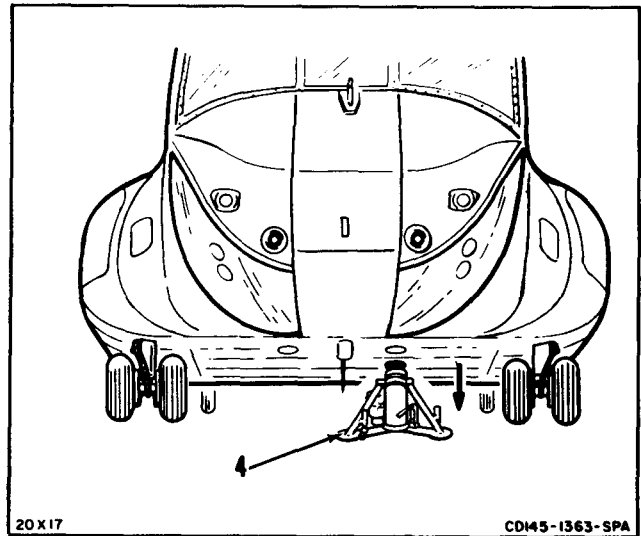


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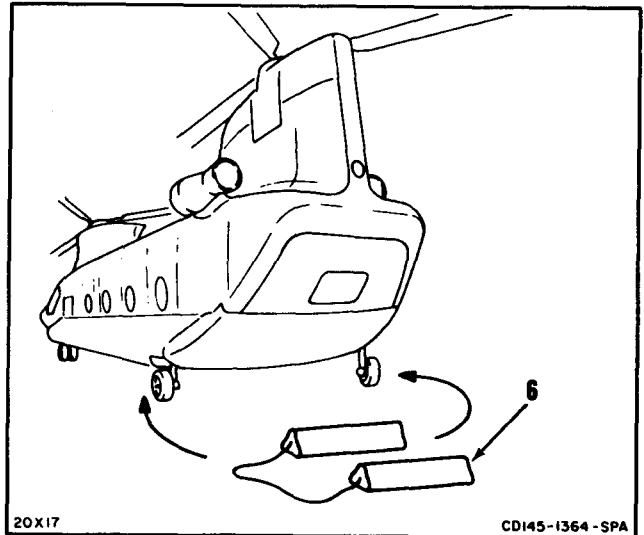
1-22 JACK AT FORWARD FUSELAGE JACK PAD (Continued)

LOWER HELICOPTER

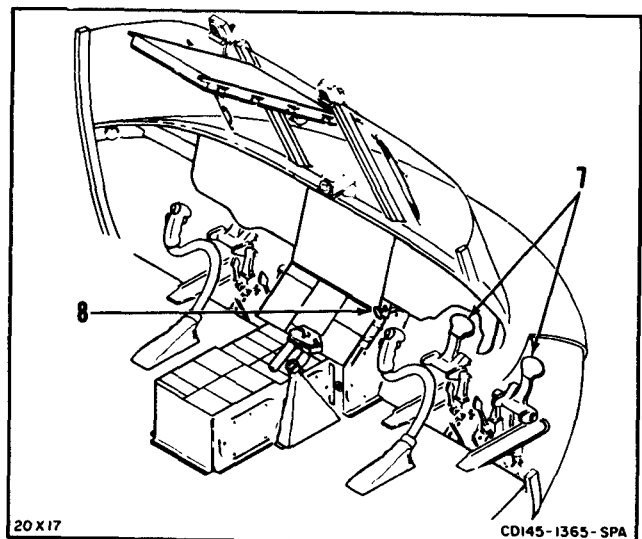
7. Lower jack (4) until forward landing gear wheels are firmly on the ground. Do not remove jack.



8. Place chocks (6) at either aft wheel.



9. **Set parking brakes** by pressing pilot's brake pedals (7) and pulling handle (8). Release pedal.



GO TO NEXT PAGE

1-22 JACK AT FORWARD FUSELAGE JACK PAD (Continued)

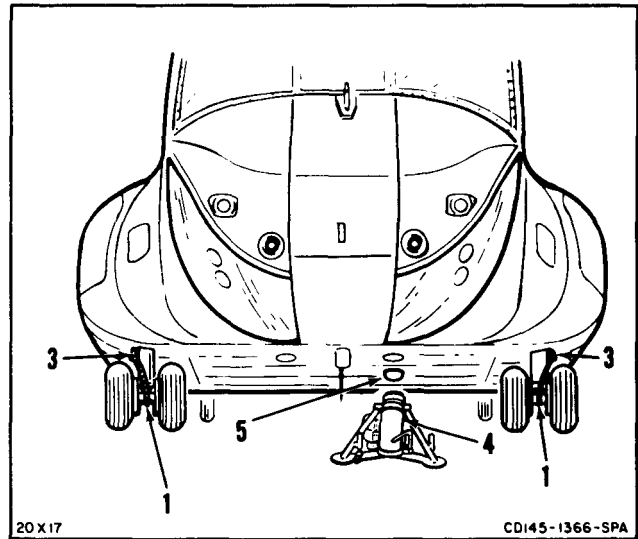
10. Lower jack (4) clear of jack pad (5).
Remove jack.
11. Remove tiedown chain (3) from axle housings (1).

FOLLOW-ON MAINTENANCE:

Remove ropes and signs from around helicopter,

Service forward landing gear shock struts with air (Task 1-71).

Service fuel tanks (Task 1-51).



END OF TASK

1-23 JACK AT FORWARD LANDING GEAR JACK PAD

1-23

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Jack A5 or Equal

Materials:

None

Personnel Required:

- 67U10 Medium Helicopter Repairer
- 67U20 Medium Helicopter Repairer

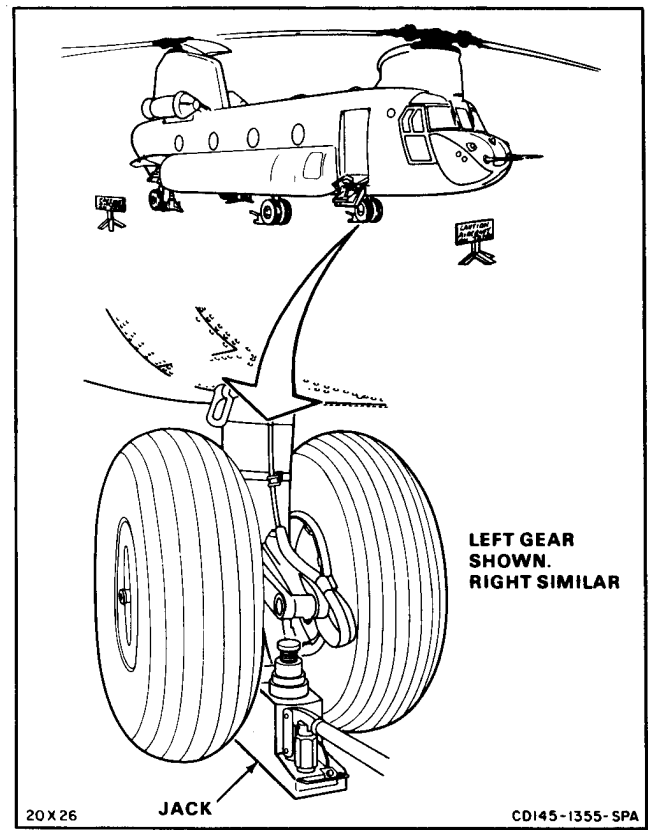
Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Helicopter on Hard Level Surface
- Helicopter Roped Off and Signs Posted to Restrict Access

General Safety Instructions:

WARNING

Jacking on soft or uneven surface, or in winds or gusts over 20 knots, can cause helicopter to fall. Personal injury and damage to equipment can result.



NOTE

Jacking is same at either forward landing gear. Left gear is shown here.

RAISE HELICOPTER

1. set jack (1) under jack pad (2).
2. Jack as high as needed. If jacking both sides, raise both jacks evenly, a little at a time.

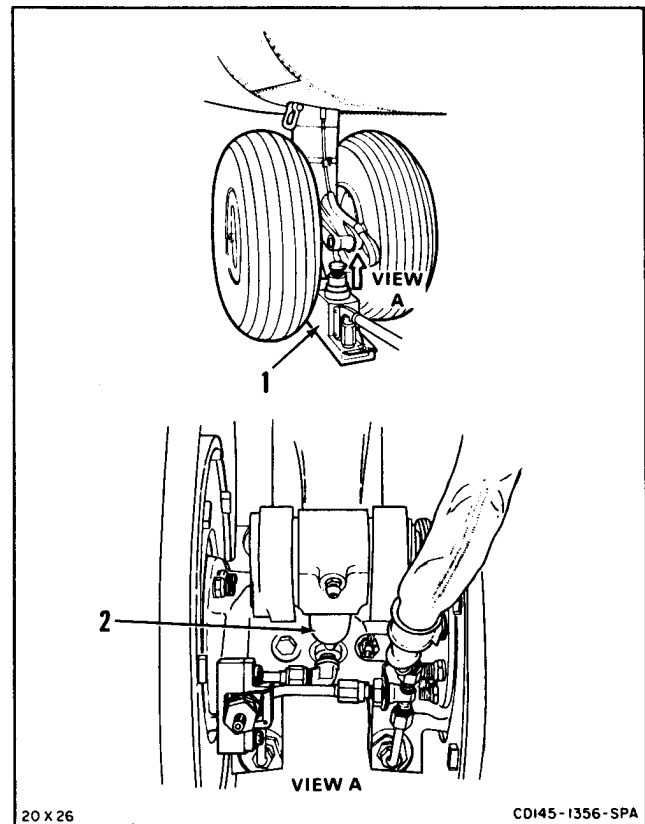
LOWER HELICOPTER

3. Lower jack (1) slowly and smoothly until free of pad (2). If both sides are jacked, lower both jacks evenly, a little at a time.
4. Remove jack (1) from under pad (2).

FOLLOW-ON MAINTENANCE:

None

END OF TASK



1-24 JACK AFT END OF HELICOPTER

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN5180-00-323-4692
Jack 1214-151 or Equal

Materials:

None

Personnel Required:

67U10 Medium Helicopter Repairer
67U20 Medium Helicopter Repairer

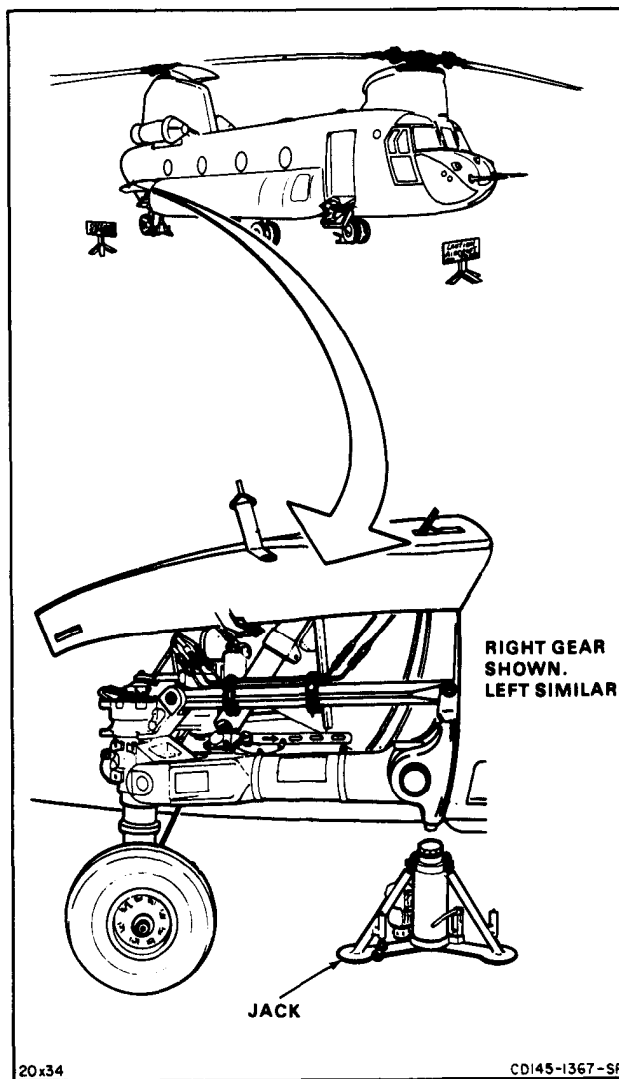
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Both Aft Landing Gear Access Panels Open
(Task 2-2)
Helicopter Roped Off and Signs Posted to
Restrict Access

General Safety Instructions:

WARNING

Jacking on soft or uneven surface
or in winds or gusts over 20 knots
can cause helicopter to fall.
Personal injury and damage to
equipment can result.

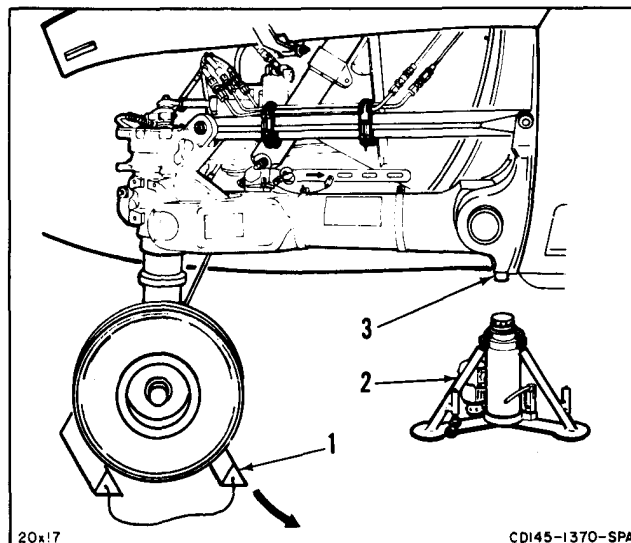


NOTE

Jack at either aft jack pad in same
way. Right pad is shown here.

RAISE HELICOPTER

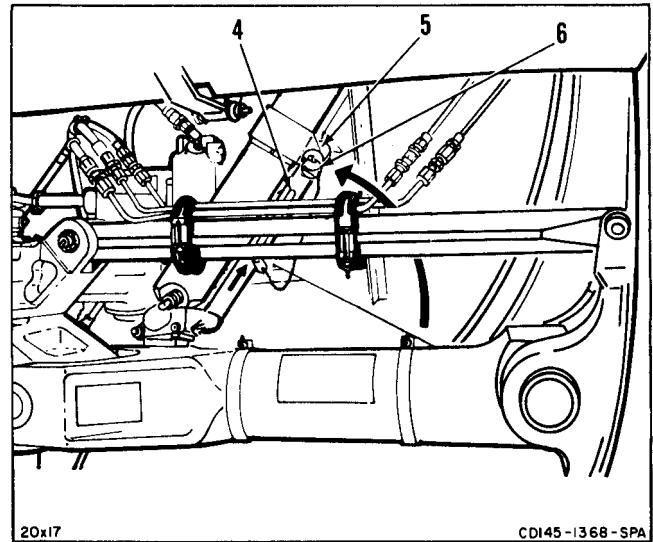
1. Remove chocks (1).
2. Set jack (2) under jack pad (3). Raise jack until it just begins to support some weight.



GO TO NEXT PAGE

1-24 JACK AFT END OF HELICOPTER (Continued)**1-24**

3. Release static lock (4) from stowed position on side being jacked. Secure to lug (5) with pin (6). If needed, raise jack until lock can be secured.
4. Jack as high as needed. If jacking both sides, raise both jacks evenly, a little at a time.

**LOWER HELICOPTER**

5. Lower jack (2) smoothly and slowly until wheel touches ground. If both sides are jacked, lower both sides evenly, a little at a time.
6. Install chocks (1), if removed.

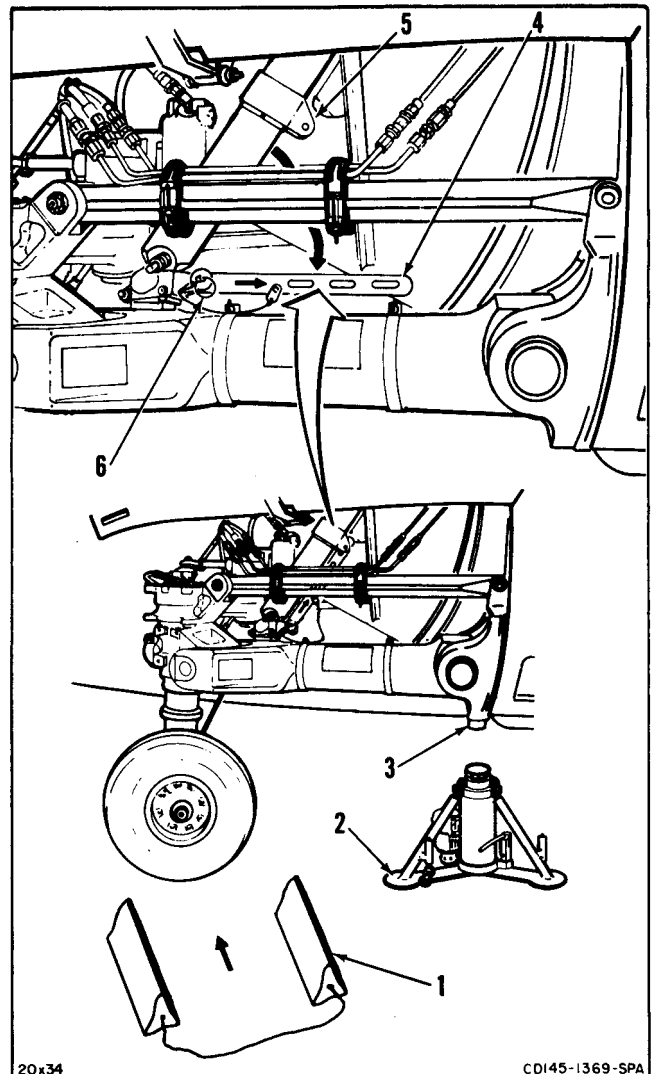
CAUTION

Landing gear can be damaged if static lock is not released and stowed before lowering helicopter.

7. Release static lock (4) from lug (5). Secure in stowed position with pin (6).
8. Lower jack (2) until clear of pad (3).

FOLLOW-ON MAINTENANCE:

Close aft landing gear access panels (Task 2-2).

**END OF TASK**

1-25 PARK HELICOPTER

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

None

Personnel Required:

67U10 Medium Helicopter Repairer

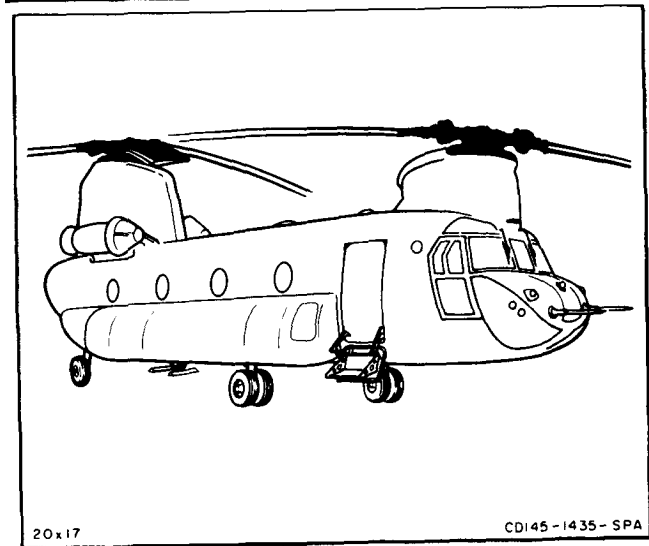
References:

Task 2-2

Equipment Condition:

Battery Disconnected (Task 1-39)

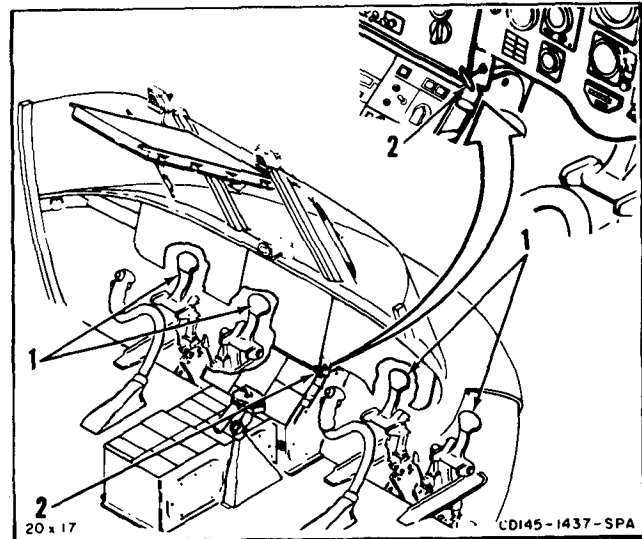
Electrical Power Off



NOTE

If helicopter will be moored at a hardstand, park it with landing gear next to hardstand fittings.

1. **Set parking brakes** by pressing pilot's or copilot's brake pedals (1) and pulling handle (2). Release pedals.



GO TO NEXT PAGE

1-25 PARK HELICOPTER (Continued)

1-25

2. Place chocks (3) at either aft wheel.

WARNING

Injury to personnel or damage to equipment can occur if blades move unexpectedly while being turned.

CAUTION

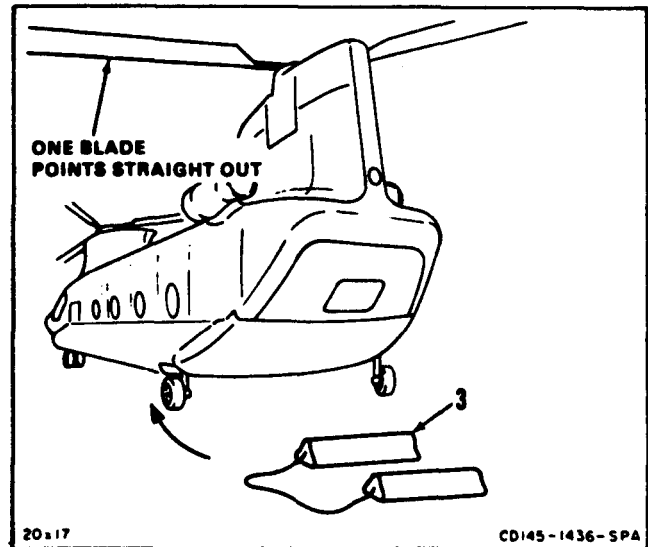
If blades are not turned off-centerline, they can hit the fuselage. This can damage fuselage and blade.

3. Turn blades so that one aft blades points straight out (90 degrees) from fuselage centerline.

4. Lock all doors and hatches (Task 2-2).

FOLLOW-ON MAINTENANCE:

Moor helicopter, if needed (Task 1-26 or 1-27).



END OF TASK

1-26 TIEDOWN AND MOOR HELICOPTER TO PAVED SURFACE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Polyester Rope, 1/2 inch diameter (A/R)
- NSN4020-00-630-4673
- Chain Adjuster, MB-1 (8)
- NSN1670-00-212-1149
- Chain With Hook for MB-1 (16)
- NSN4010-00-516-8405

Personnel Required:

Medium Helicopter Repairer (2)

References:

- Task 1-32
- TM 1-1520-250-23-1

Equipment Condition:

- Battery Disconnected (Task 1 -39)
- Electrical Power Off
- Helicopter Parked (Task 1 -25)

General Safety Instructions:



Rotor blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before turning blades.

NOTE

The mooring hardware is not considered flyaway equipment. All active mooring pads shall be equipped with this hardware. For additional information refer to TM 1-1520-250-23-1.



In winds of 39 to 65 knots, tie down blades and fuselage to prevent damage. In winds over 65 knots, evacuate helicopter or store in hangar. If evacuation or storage is not possible, remove blades and tie fuselage down. The lee of a large building is the best tiedown location.

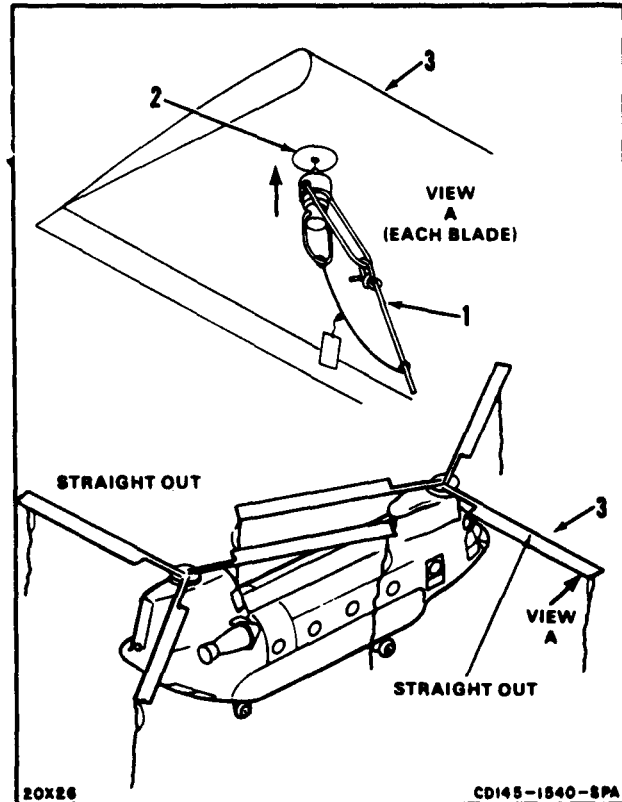
NOTE

Tiedown is not needed in winds under 39 knots, except when blades will be in rotor wash of other helicopters.

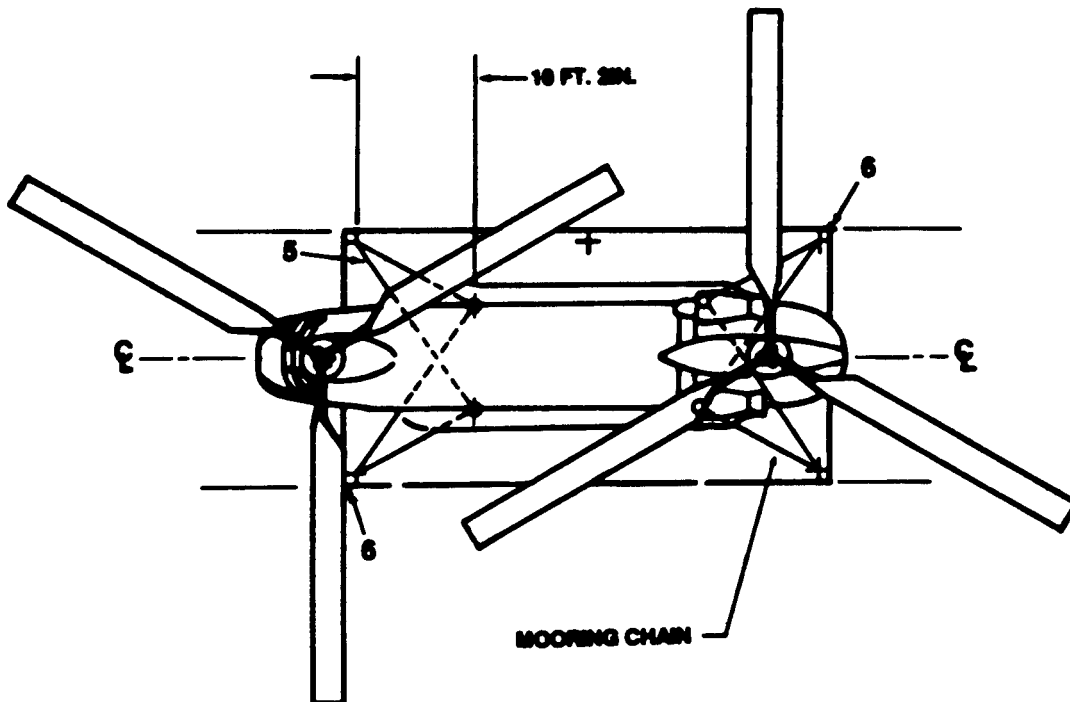
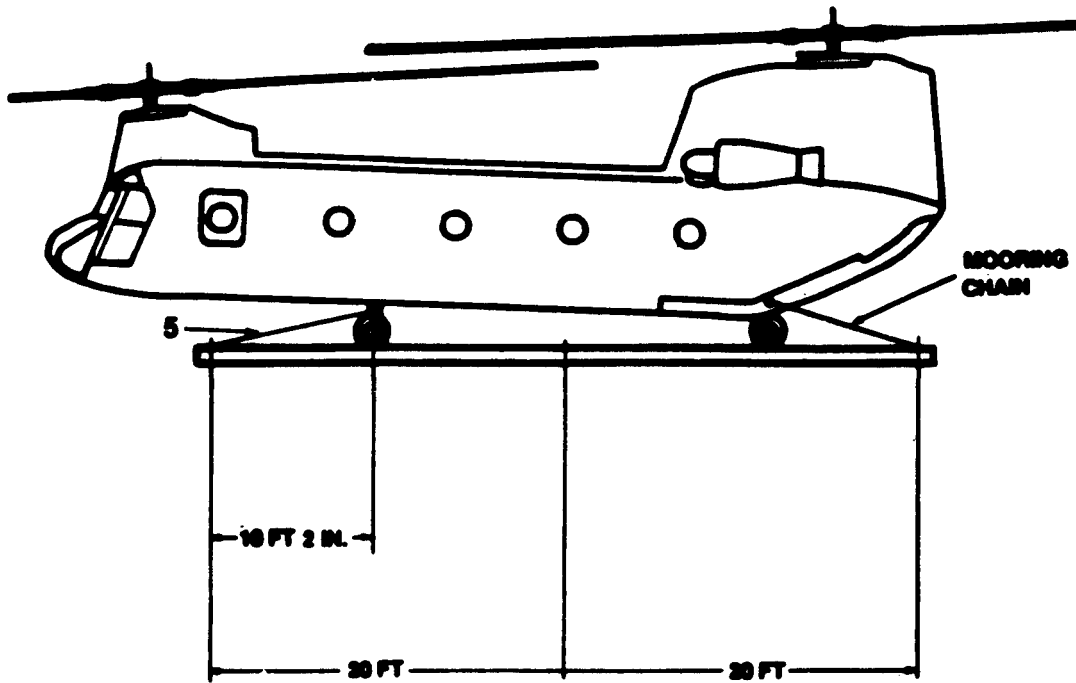
TIEDOWN AND MOORING

1. Install polyester rope (1) in fitting (2) of each blade (3). Work from walkway on top of fuselage. Pull blades around with tiedown lines as needed to reach all six blades.

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1-26 TIEDOWN AND MOOR HELICOPTER TO PAVED SURFACE (CONTINUED) 1-26



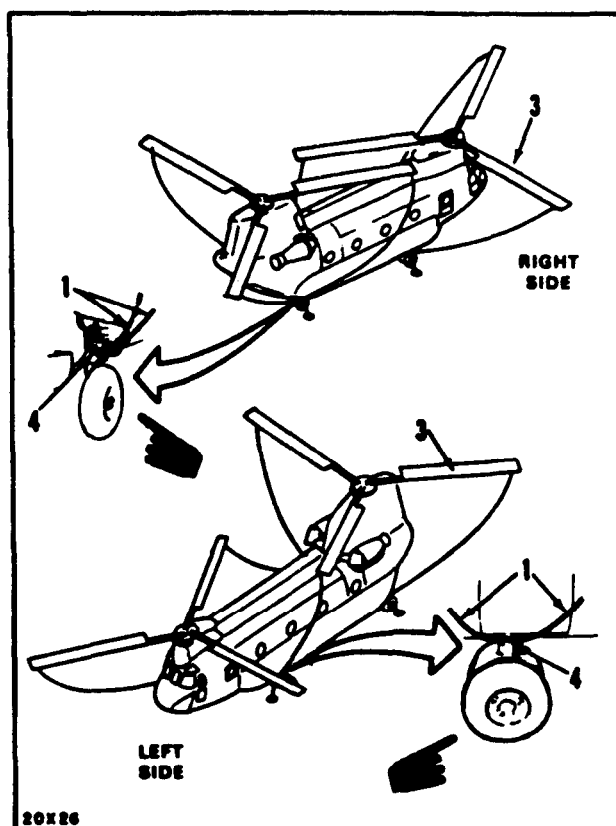
"CH-47 Paved Surface Mooring Configuration"

1-26 TIEDOWN AND MOOR HELICOPTER TO PAVED SURFACE (CONTINUED) 1-26

2. Pull blades (3) around so that one forward blade and one aft blade point straight out (90 degrees) from fuselage.
3. Position the helicopter on the mooring surface with the longitudinal centerline of the aircraft directly above and parallel to the longitudinal axis of the mooring area.
4. Position the helicopter on the mooring surface so that the mooring shackles (4) located on the main (front) landing gear are 10 feet 2 inches aft of the pad forward mooring points (6).
5. **Secure Polyester rope (1)** from each blade (3) **to towing shackle (4)** on nearest forward or aft landing gear.
6. Place the hookends of four chains into the mooring fittings (4) on the forward landing gear struts (TM 1-1520-250-23-1).
7. Adjust the four chains using the MB-1 chain adjusters provided on the mooring pad. Chains should be adjusted to the point where the slack has been removed.
8. Repeat the procedure for the chains and MB-1 chain adjusters which engage the mooring rings (4) on the aft landing gear, struts, and mooring points (6) (TM 1-1520-250-23-1).
9. **Install protective covers** (Task 1-32).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

1-27 MOOR HELICOPTER TO UNPAVED AREA

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Tiedown Line 114E5060-1 (6)
- Mooring Kit AN8015-2
- Tiedown Chain (4)

Personnel Required:

67U10 Medium Helicopter Repairer (2)

References:

Task 1-32

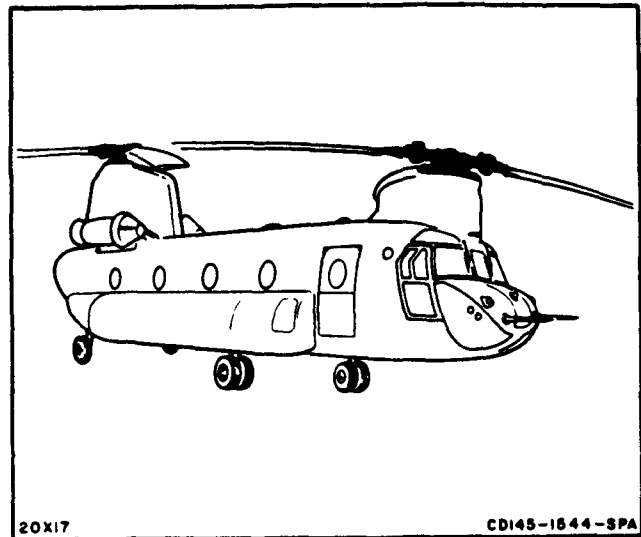
Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Helicopter Parked (Task 1 -25)
- Mooring Kit Installed

General Safety Instructions:

WARNING

Rotor blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before turning blades.



CAUTION

In winds of 39 to 65 knots, tie down blades and fuselage to prevent damage. In winds over 65 knots, evacuate helicopter or store in hangar. If evacuation or storage is not possible, remove blades and tie fuselage down. The lee of a large building is the best tiedown location.

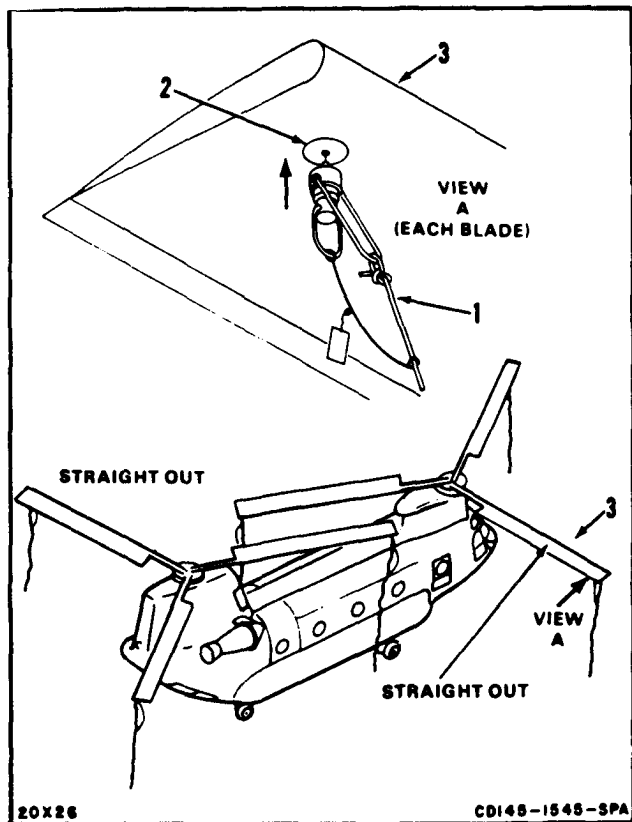
NOTE

No tiedown is needed in winds under 39 knots, except when blades will be in rotor wash of other helicopters.

MOOR

1. Install tiedown line (1) in receiver (2) of each blade (3). Work from walkway on top of fuselage. Pull blades around with tiedown lines as needed to reach all six blades.
2. Pull blades around so that one forward blade and one aft blade point straight out (90 degrees) from fuselage.

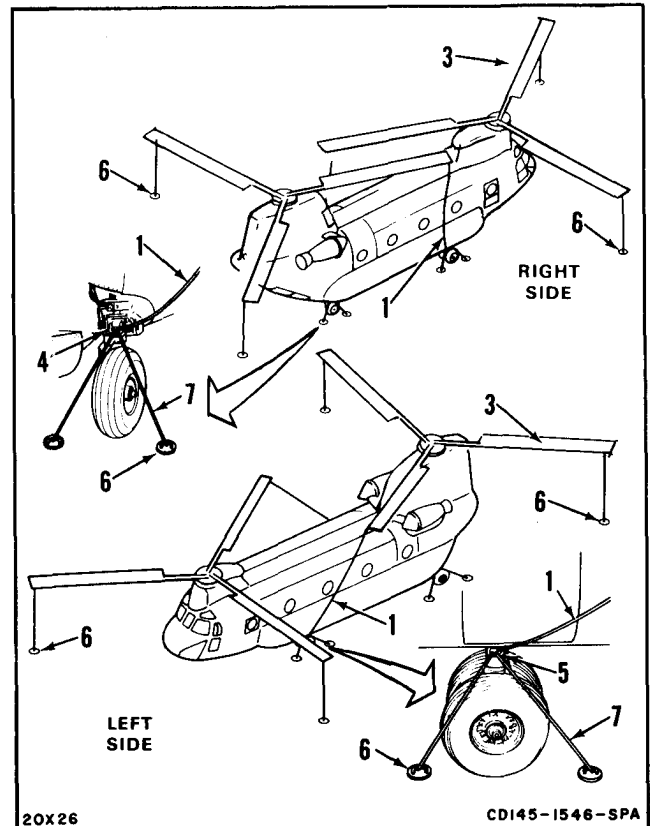
GO TO NEXT PAGE



1-27 MOOR HELICOPTER TO UNPAVED AREA (Continued)

1-27

3. Tie line (1) from most aft blade of forward head to towing shackle (4) on aft landing gear.
4. Tie line (1) from most forward blade of aft head to shackle (5) on forward landing gear.
5. Tie lines (1) on other four blades (3) to nearest tiedown fittings (6) of mooring kit.
6. Tie each of four shackles (4 or 5) to nearest tiedown fittings (6) of mooring kit. Use tiedown chain (7).
7. Install protective covers (Task 1-32).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

1-28 INSTALL HELICOPTER SECURITY LOCKING DEVICES

1-28

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

None

Personnel Required:

67U10 Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)

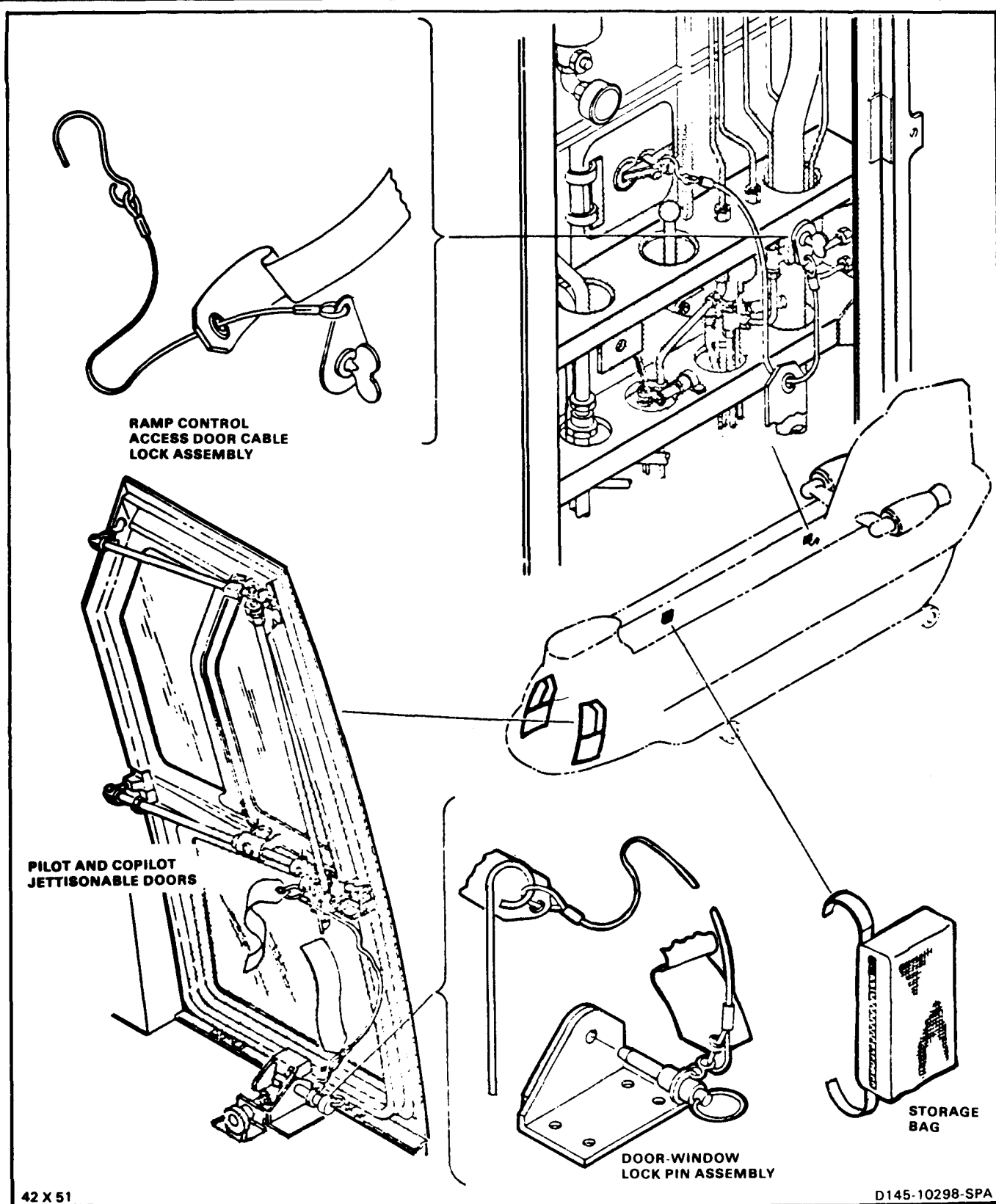
Helicopter Parked (Task 1-25)

NOTE

Helicopter is equipped with door, window, and escape hatch security locking devices to prevent entry by unauthorized persons,

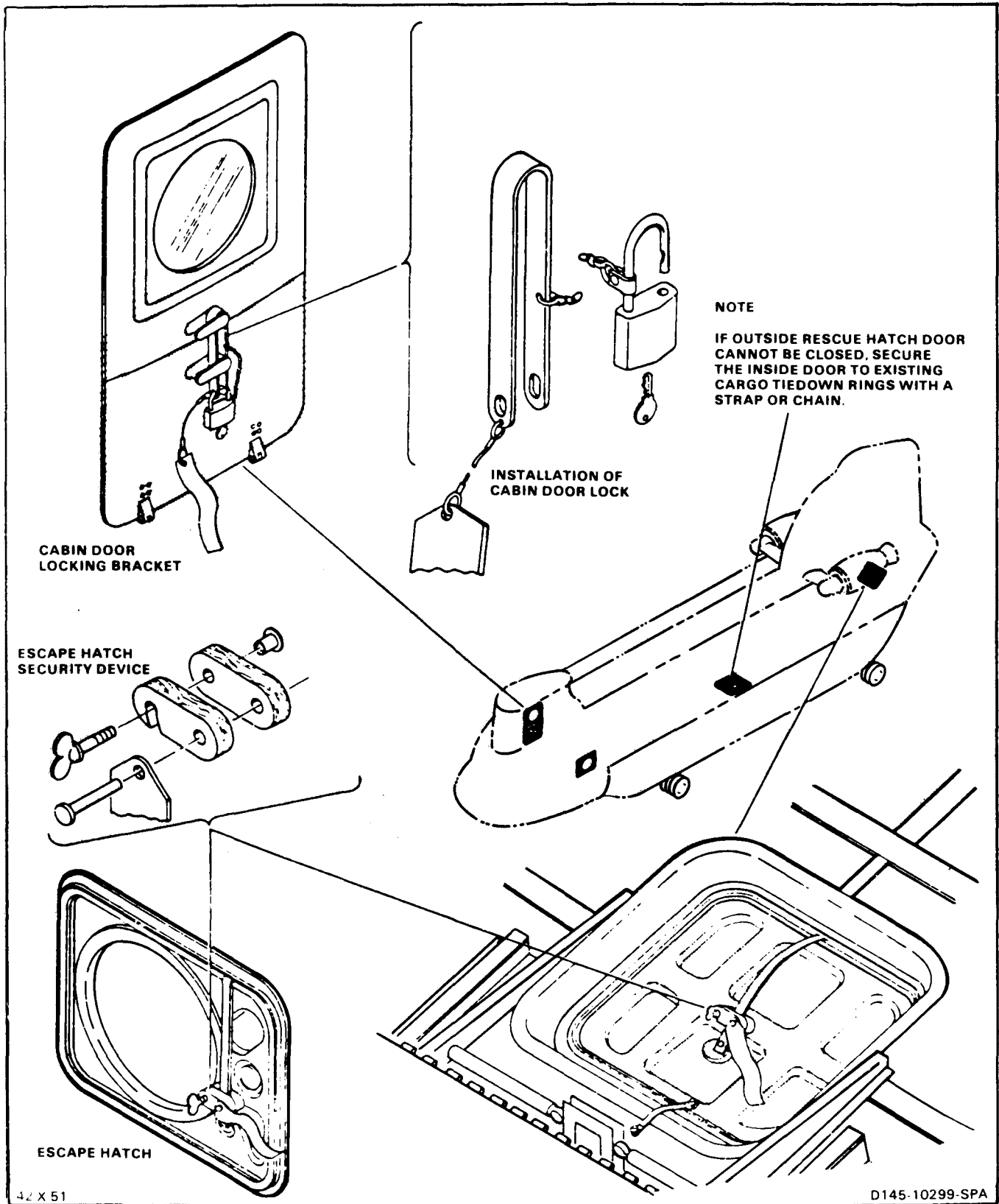
1. Install lock pins through pilot and copilot window latches. Insert quick-release pin through floor bracket and into door latch plate. Check that warning streamers are clearly visible.
2. Secure release straps of forward cabin escape hatches and cargo door escape hatch. Use restraining clamps. Locate clamps as close as possible to release grommet. Check that warning streamers are clearly visible.
3. Check that ramp is in full up position, Install cable hook through ramp controls access door latch. Install fastener at other end of cable to bracket on structure, Check that warning streamer is clearly visible.
4. Close lower rescue hatch door. If door cannot be closed, secure inside door to tiedown ring with cargo strap.
5. Close cabin doors, Install bracket on door handles, Secure bracket with padlock.

1-28 INSTALL HELICOPTER SECURITY LOCKING DEVICES (Continued) 1-28



Installation of Helicopter Security Devices (Sheet 1 of 2)

1-28 INSTALL HELICOPTER SECURITY LOCKING DEVICES (Continued) 1-28



FOLLOW-ON MAINTENANCE:

As required.

Installation of Helicopter Security Devices (Sheet 2 of 2)

END OF TASK

1-29 STATIC GROUNDING DURING GROUND OPERATION**1-29****INITIAL SETUP****Applicable Configurations:**

All

Tools:Red Cloth Strips
Grounding Cable**Materials:**

As Required

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)

Helicopter Parked (Task 1-25)

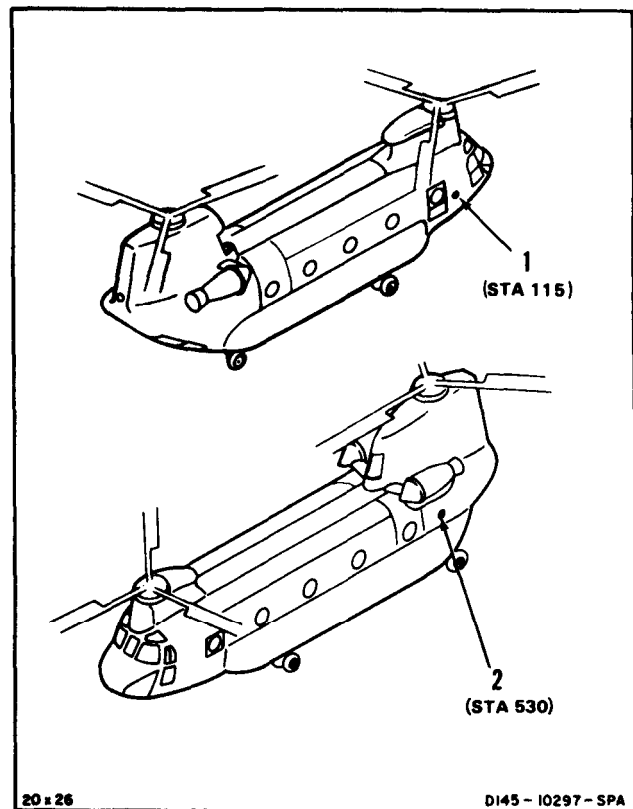
General Safety Instructions:**WARNING**

Personal injury and damage to equipment can result if helicopter is not electrostatically grounded on flight line, in hangars, or on apron, and helicopters in maintenance or painting.

1. Immediately after helicopter is in position, connect end of grounding cable to grounding jack (1 or 2) on fuselage. Jacks are at sta 115 rh and sta 530 lh.
2. Check that cable has no broken strands. Check that clips or plugs are attached securely to grounding points.
3. Attach red cloth strips to cable for personnel safety.
4. Disconnect cable from ground rod first, then from helicopter.

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Hydraulic Jack 1228-31 or Equal
- Hydraulic Jack 1214-151 or Equal (2)
- Aircraft Weighing Kit
- Tiedown Chain (2)

Materials:

None

Personnel Required:

- Medium Helicopter Repairer (5)
- Inspector

References:

TM55-1500-342-23

Equipment Condition:

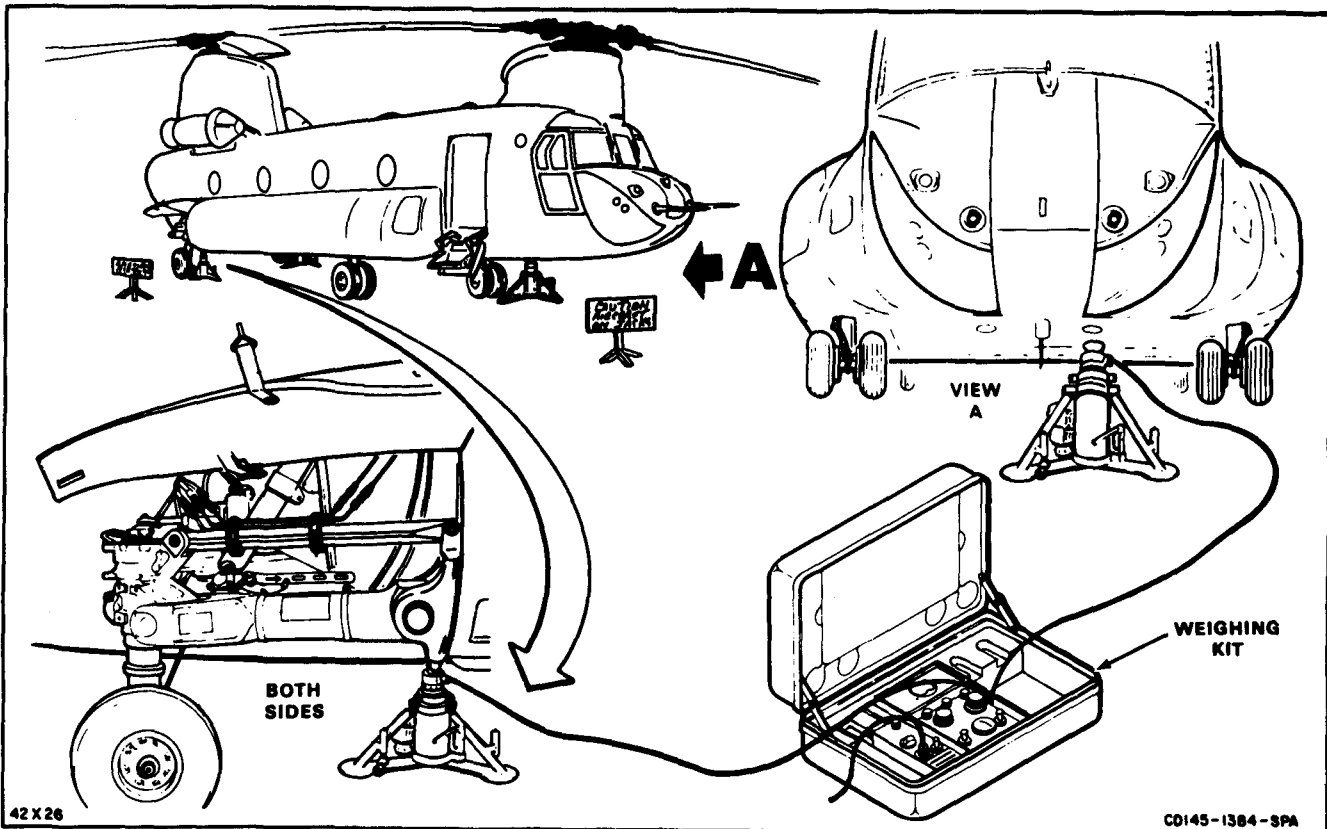
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Fuel Tanks Drained (Task 10-34 or 10-35)
- Engine Oil Tanks Serviced to Full (Task 1-52)
- All Transmissions Serviced to Full (Task 1-54)

- Hydraulic System Reservoir Serviced to Full (Task 1-50 or 1-62)
- Helicopter Washed (Task 1-76)
- Helicopter Inside Closed Hangar on Level Surface
- Helicopter Inventory Complete
- Helicopter Roped Off and Signs Posted to Restrict Access
- Both Forward Landing Gear Shock Struts Deflated (Task 1-71)
- Both Aft Landing Gear Access Panels Open (Task 2-2)
- Servocylinder Safety Blocks Installed (Task 11-28)

General Safety Instructions:

WARNING

Jacking on uneven surface can cause helicopter to fall. Personal injury and damage to equipment can result.



1-30 LEVEL AND WEIGH HELICOPTER (3-POINT) (AVIM) (Continued) 1-30

WARNING

Jacking when helicopter weight is over limit can damage structure and injure personnel. Do not jack when weight is over limit.

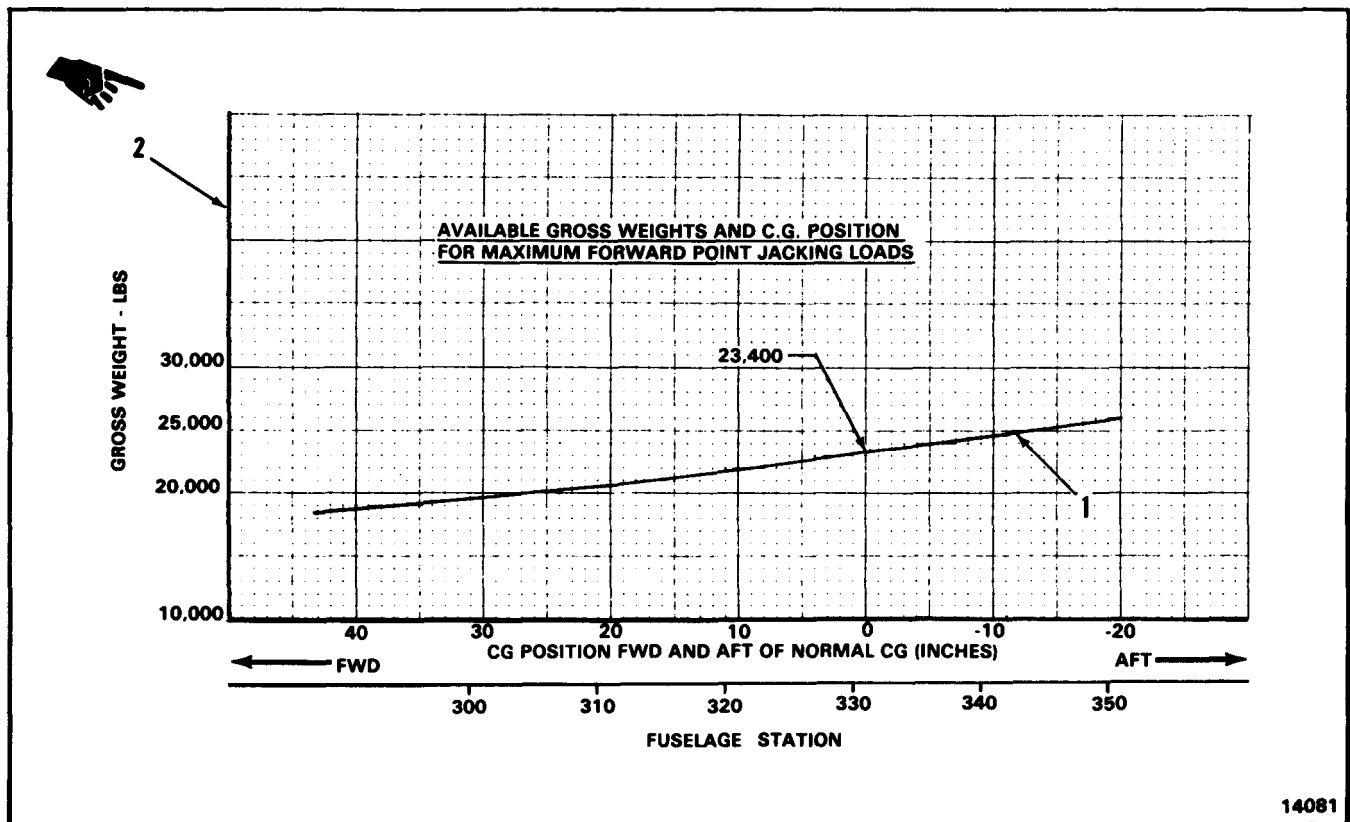
CAUTION

Blades can be damaged if there is not enough clearance.

2. Make sure there will be clearance for blades after jacking. Make sure cargo ramp is closed.

RAISE HELICOPTER

1. Determine the estimated gross weight and cg position from the last weighing and information on DD Form 365-3. This data will be necessary in determining the allowable gross weight and cg position for maximum forward point jacking loads from curve (1) on graph (2) below.



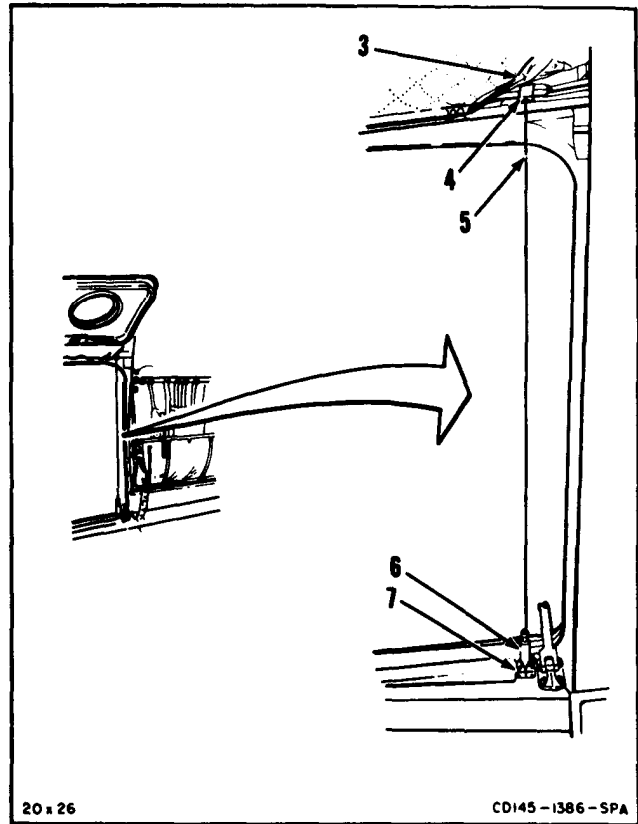
14081

NOTE

Refer to TM 55-1500-342-23 for additional information on helicopter weighing.

SECURE PLUMB BOB

3. Pull back acoustic blanket (3) above upper aft corner of cabin doorway to expose bracket (4).
4. Tie plumb bob string (5) around bracket (4) so that plumb bob (6) hangs from V-notch point of bracket, slightly above plate (7).

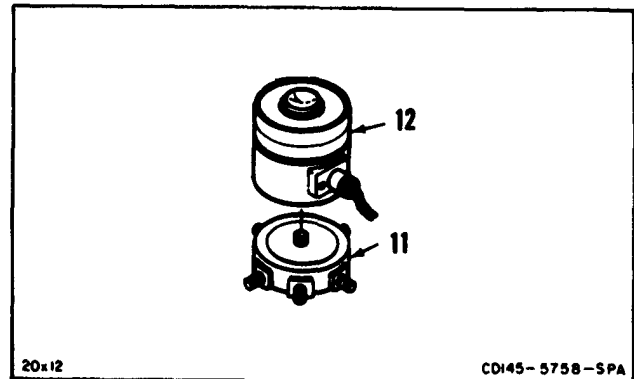
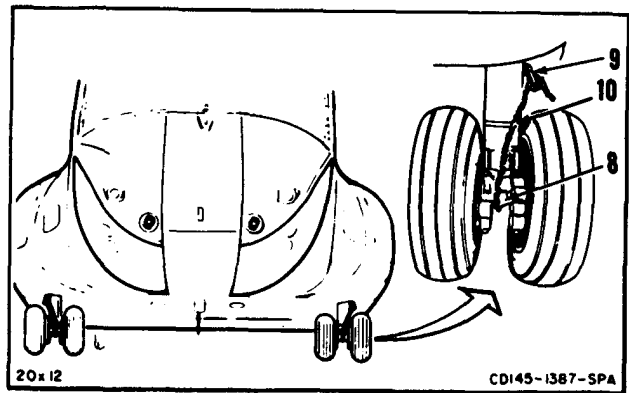


POSITION JACKS

CAUTION

Do not let tiedown cable press against brake tubing. Tubing can be damaged.

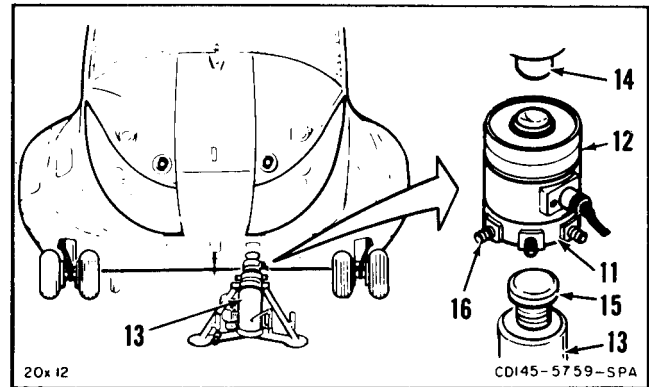
5. Secure both forward landing gear shock struts in deflated position. Tie Axle housing (8) to towing shackle (9). Use tiedown chain (10).
6. Install adapter (11) on each of three weighting cells (12). Adapters and cells are parts of weighing kit.



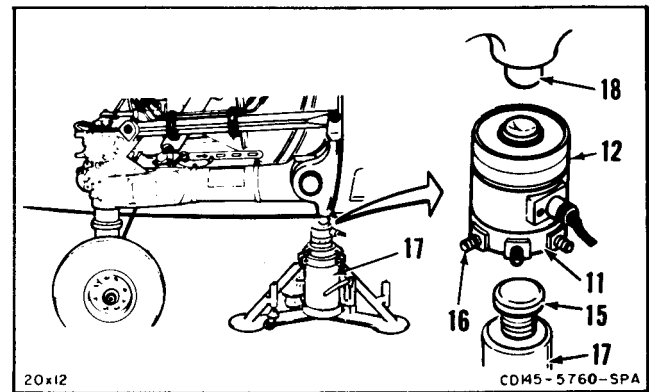
1-30 LEVEL AND WEIGH HELICOPTER (3-POINT) (AVIM) (Continued)

1-30

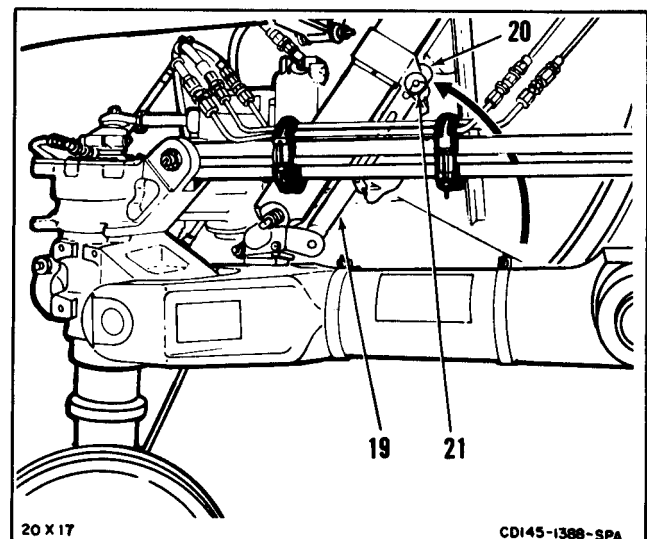
7. Set jack (13) under forward fuselage jack pad (14). Set adapter (11) and cell (12) on jack.
8. Secure adapter (11) to threaded extension (15) with six screws (16). Raise threaded extension by hand to put cell (12) against pad (14).



9. Set a jack (17) under each aft fuselage jack pad (18). Set adapter (11) and cell (12) on each jack.
10. Secure adapter (11) to threaded extension (15) with six screws (16). Raise threaded extension by hand to put cell (12) against pad (18).



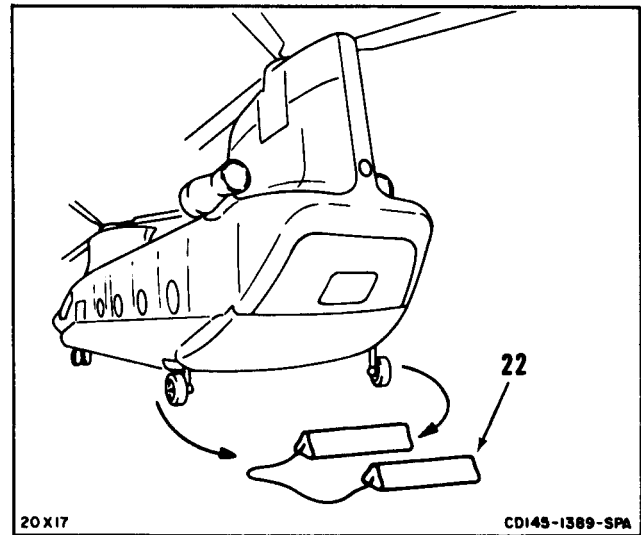
11. Release static lock (19) from stowed position on each aft landing gear. Secure it to lug (20) with pin (21). If needed, jack gear until lock can be secured.



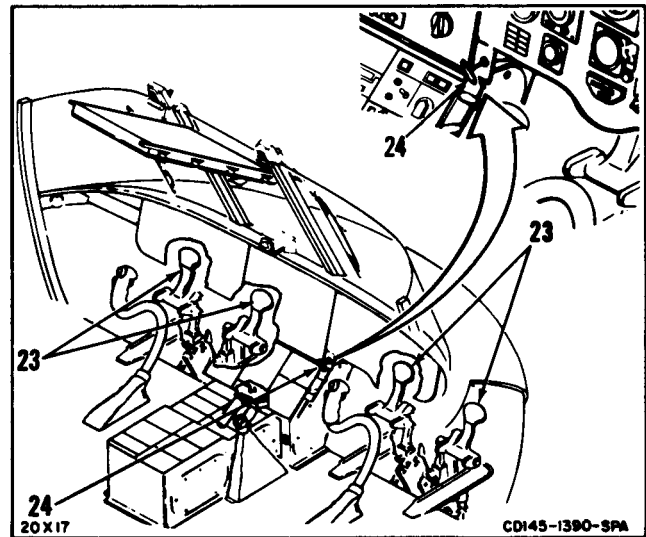
GO TO NEXT PAGE

**1-30 LEVEL AND WEIGH HELICOPTER (3-POINT) (AVIM)
(Continued)**

12. Remove chocks (22) from aft wheel.



13. Release parking brakes by pressing pilot's or copilot's brake pedals (23). Brake handle (24) will release.



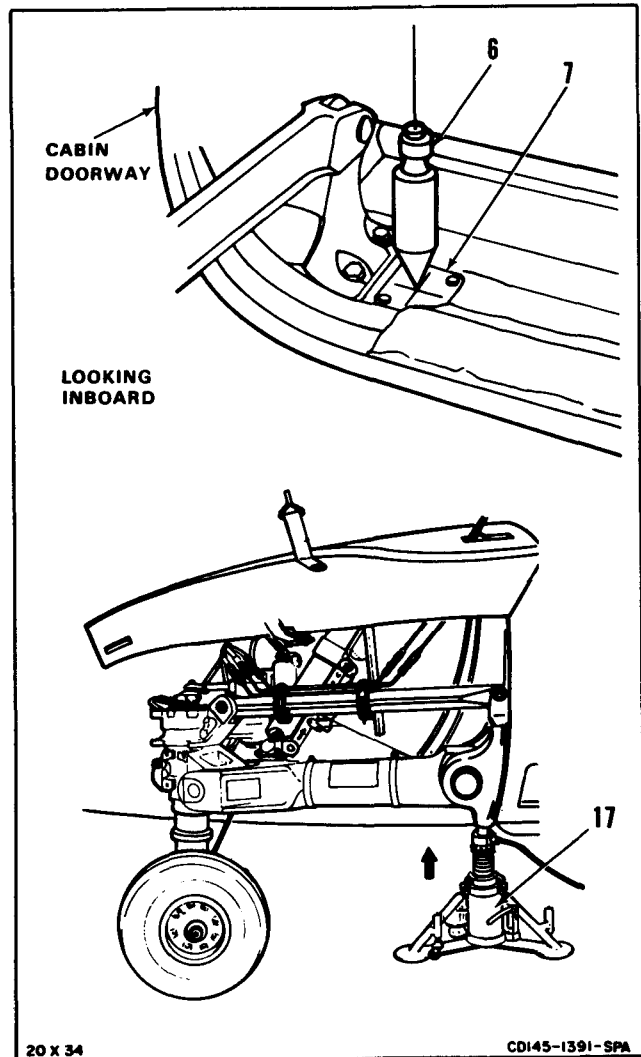
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1-30 LEVEL AND WEIGH HELICOPTER (3-POINT) (AVIM) (Continued)

1-30

WEIGH HELICOPTER

14. Have helper stand outside the cabin doorway to watch plumb bob (6) and plate (7).
15. **Raise both aft jacks (17) together 1 inch** at a time. **Raise them until helicopter is level.** Helicopter is level when point of plumb bob (6) is directly over cross point of guide lines on plate (7).
16. **Record weight** supported by each load cell. Refer to instructions in weighing kit.



GO TO NEXT PAGE

1-83

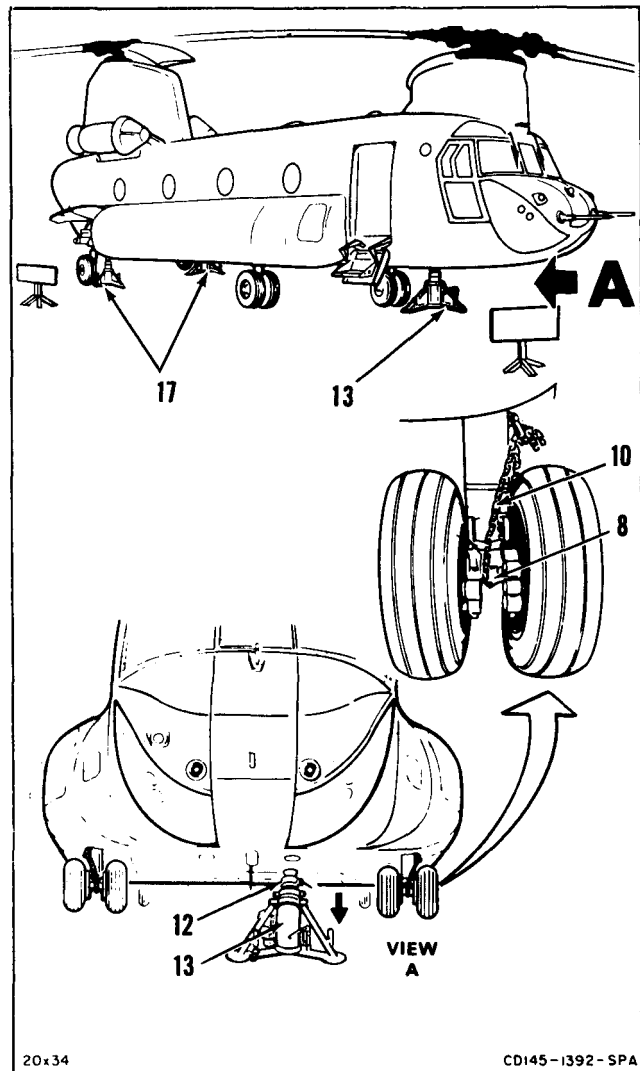
**1-30 LEVEL AND WEIGH HELICOPTER (3-POINT) (AVIM)
(Continued)**

LOWER HELICOPTER

CAUTION

Do not lower aft jacks first.
Damage to structure can result.

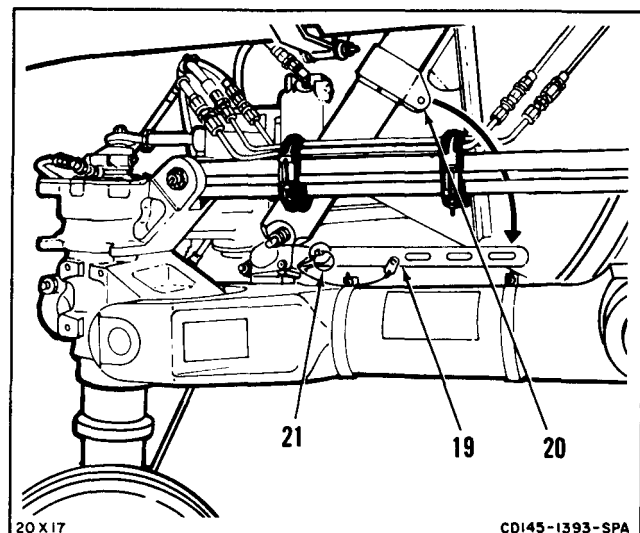
17. Lower all three jacks (13 and 17) together, 1-inch at a time. Lower them until cell (12) on forward jack is clear of pad. **Move jack and cell clear of helicopter.**
18. Remove tiedown chain (10) from axle housings (8) on each side of helicopter.



CAUTION

Aft landing gear can be damaged if static locks are not released and stowed before gear are lowered all the way.

19. Lower both aft landing gear evenly until wheels touch ground. **Release static gear lock (19)** from lug (20) on each gear. Secure in stowed position with pin (21).

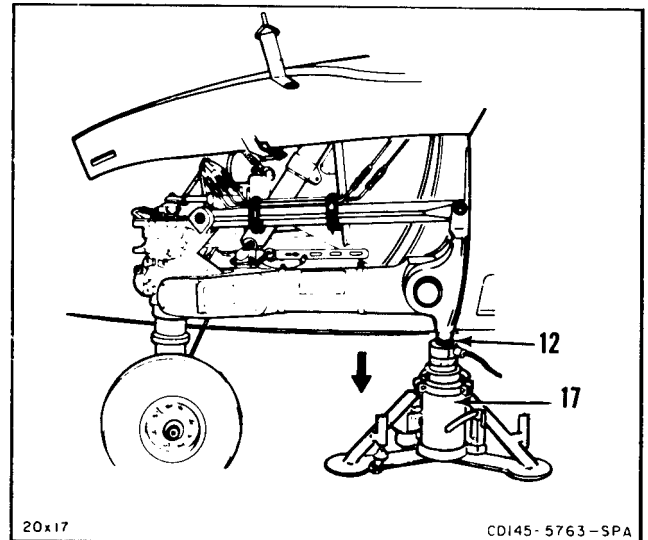


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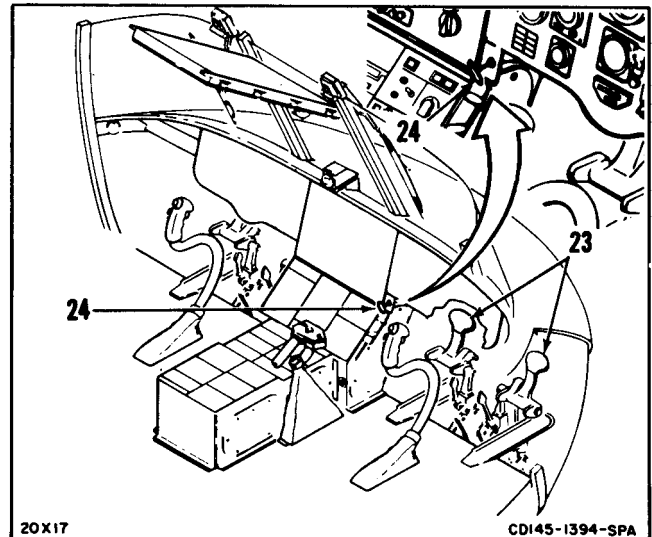
1-30 LEVEL AND WEIGH HELICOPTER (3-POINT) (AVIM) (Continued)

1-30

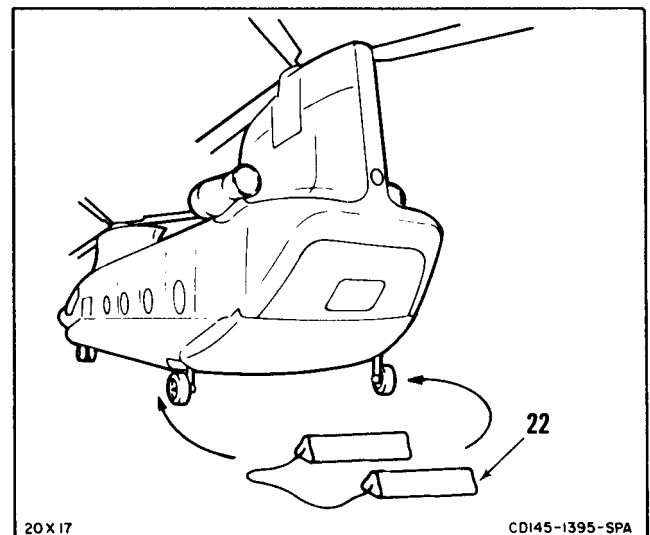
20. Lower both aft jacks (17) evenly, 1-inch at a time. Lower them until cells (12) are clear of pads. Remove jacks and calls.



21. Set parking brakes by pressing pilot's brake pedals (23) and pulling handle (24). Release pedal.

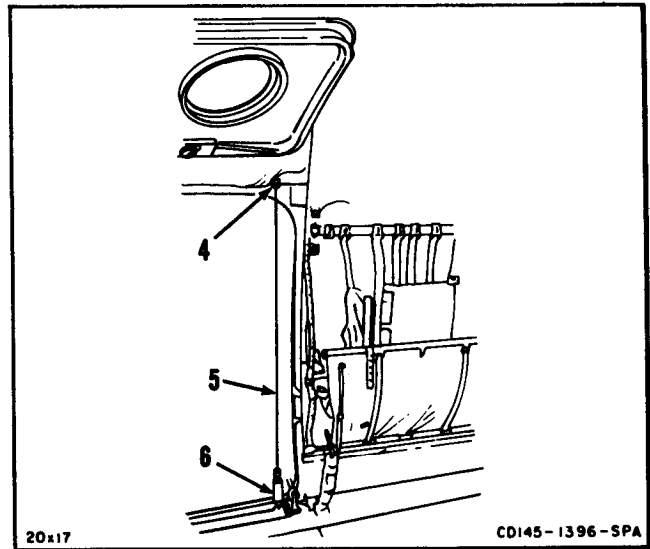


22. Place chocks (22) at either aft wheel.



GO TO NEXT PAGE

23. Remove plumb bob (6) and string (5) from bracket (4) in cabin doorway.



FOLLOW-ON MAINTENANCE:

Remove ropes and signs from around helicopter.

Service forward landing gear shock struts with air (Task 1-71).

Close aft landing gear access panels (Task 2-2).

Remove servocylinder safety blocks (Task 11-29).

Service fuel tanks (Task 1-51).

END OF TASK

1-86 Change 24

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Hydraulic Jack A5 of Equal (2)
- Hydraulic Jack 1214-151 or Equal (20)
- Aircraft Weighing Kit (2)

Materials:

None

Personnel Required:

- Medium Helicopter Repairer (5)
- Inspector

References:

TM 55-1500-342-23

Equipment Condition:

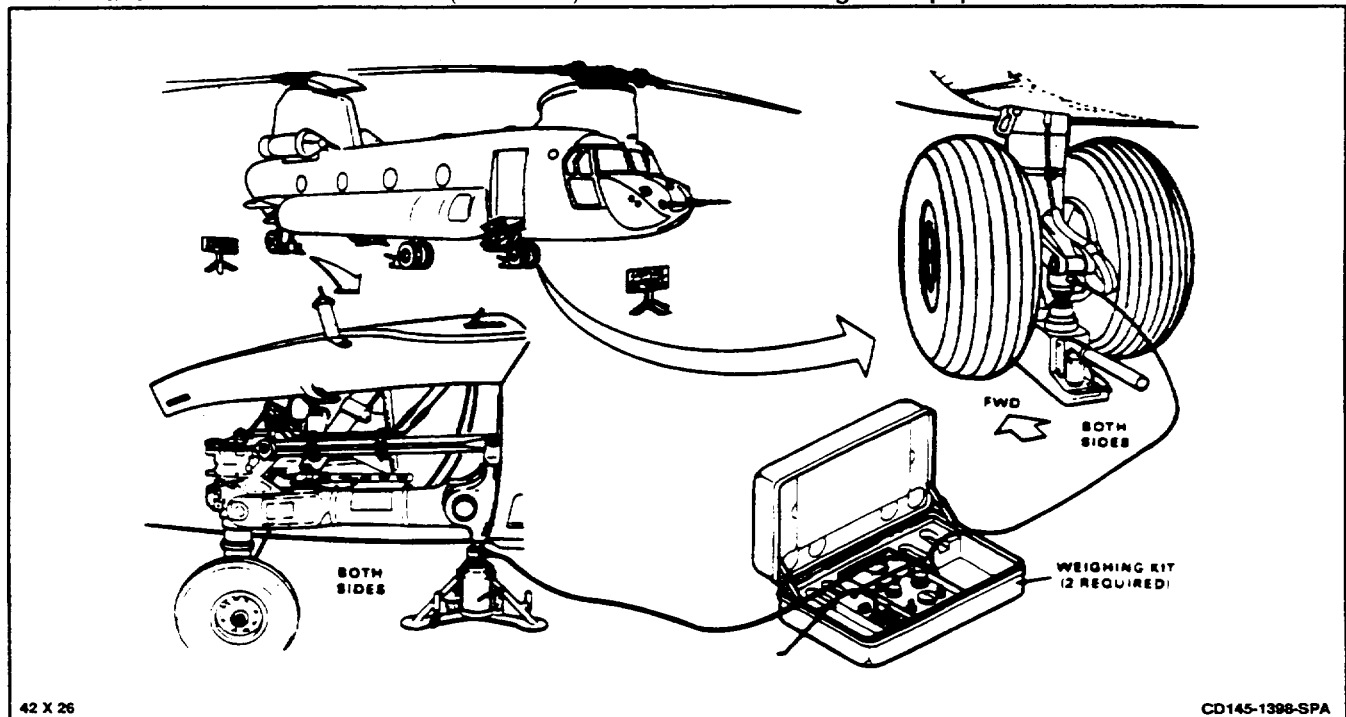
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Gravity Refueling (Task 1-51.1)
- Engine Oil Tanks Serviced to Full (Task 1-52)
- All Transmissions Serviced to Full (Task 1-54)

- Hydraulic System Reservoir Serviced to Full (Task 1-59 or 1-62)
- Helicopter Washed (Task 1-76)
- Helicopter Inside Closed Hanger or on Level Surface With Winds Below 5 Knots
- Helicopter Inventory Complete
- Helicopter on Level Surface
- Helicopter Roped Off and Signs Posted to Restrict Access
- Both Forward Landing Gear Shock Struts Deflated (Task 1-71)
- Both Aft Landing Gear Access Panels Open (Task 2-2)
- Both Aft Landing Gear Shock Struts Inflated (Task 1-72)
- Servocylinder Safety Blocks Installed (Task 11-28)

General Safety Instructions:

WARNING

Jacking on uneven surface or in winds or gusts over **20 knots** can cause helicopter to fall. Personal injury and damage to equipment can result.



GO TO NEXT PAGE

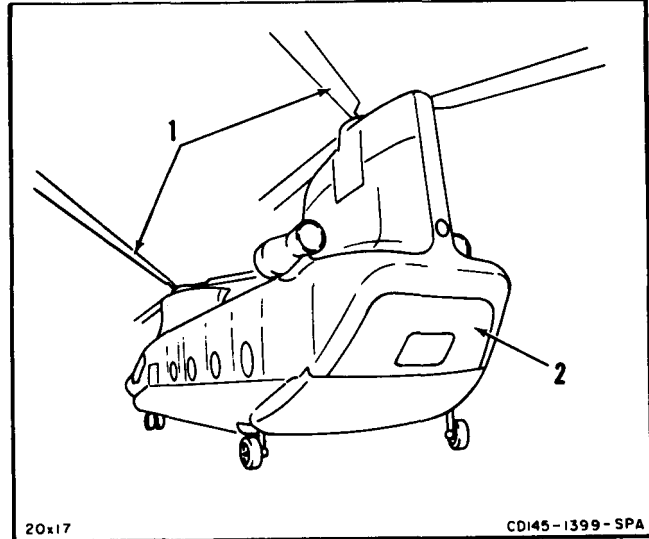
WARNING

The maximum gross weight for 4 point weighing is 33,000 pounds. Jacking when helicopter weight is over limit can damage structure and injure personnel. Do not jack when weight is over limit.

CAUTION

Blades can be damaged if there is not enough clearance.

1. Make sure there will be clearance for blades (1) after jacking. Make sure cargo ramp (2) is closed.



20x17

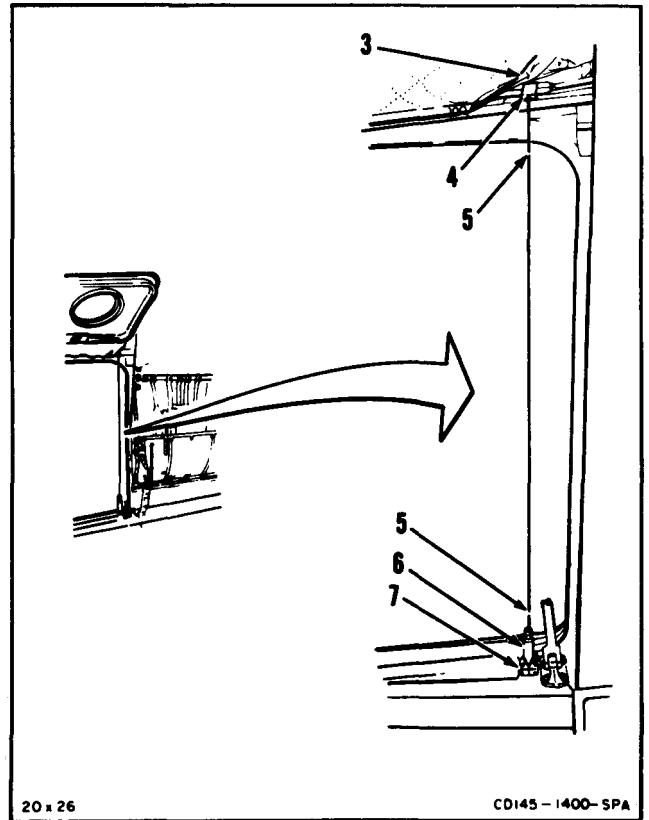
CDI45-1399-SPA

SECURE PLUMB BOB

2. Pull back insulation (3) above upper aft corner of cabin doorway for access to bracket (4).
3. Tie plumb bob string (5) around bracket (4) so that plumb bob (6) hangs from V-notch of bracket, slightly above (7).

NOTE

Refer to TM 55-1500-342-23 for additional information on helicopter weighing.



20x26

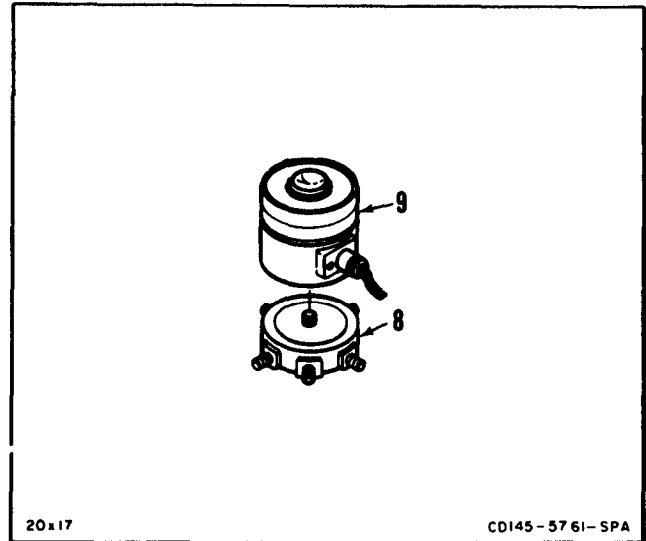
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1-31 LEVEL AND WEIGH HELICOPTER (4-POINT) (AVIM) (Continued) 1-31

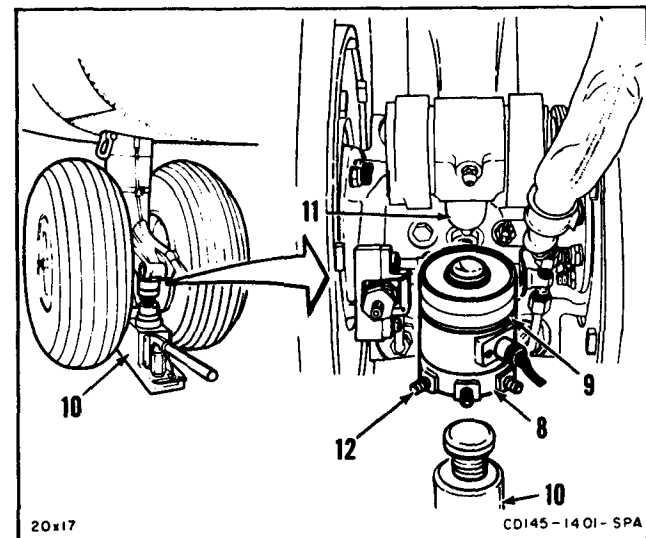
POSITION JACKS

4. Install an adapter (8) on each of four weighing cells (9). Adapters and cells are part of weighing kit.



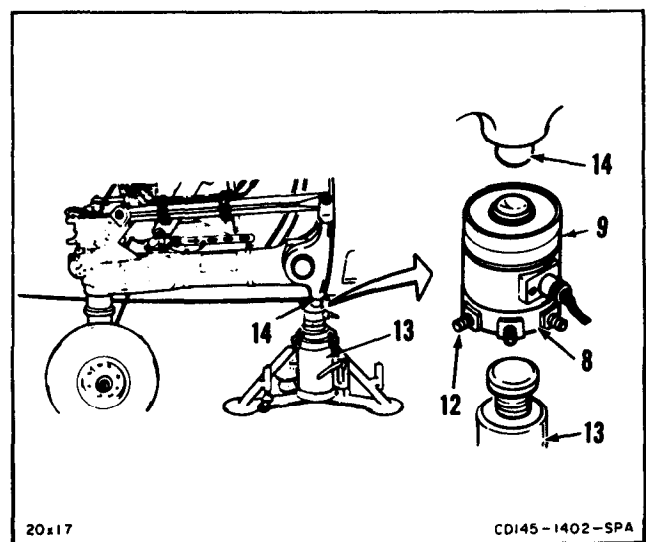
5. Set a jack A5 (10) under each forward landing gear jack pad (11). Set adapter (8) and cell (9) on each jack.

6. Secure adapter (8) to threaded extension of jack (10) with six screws (12). Raise extension by hand to put cell (9) against pad (11).



7. Set a jack 1214-151 (13) under each aft fuselage jack pad (14). Set an adapter (8) and cell (9) on each jack. Raise threaded extension on each jack by hand to put cell against pad.

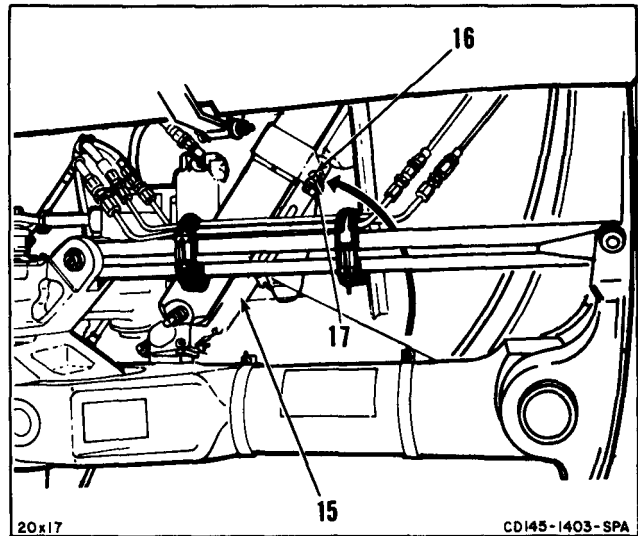
8. Secure adapter (8) to threaded extension of each jack (13) with six screws (12). Raise extension by hand to put cell (9) against pad (14).



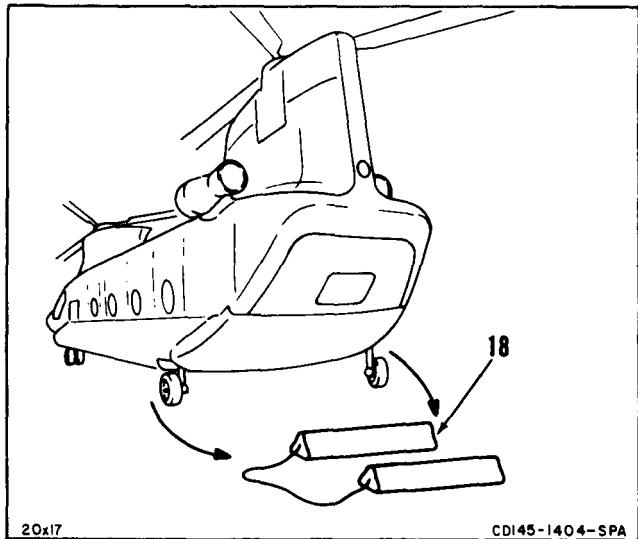
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**1-31 LEVEL AND WEIGH HELICOPTER (4-POINT) (AVIM)
(Continued)**

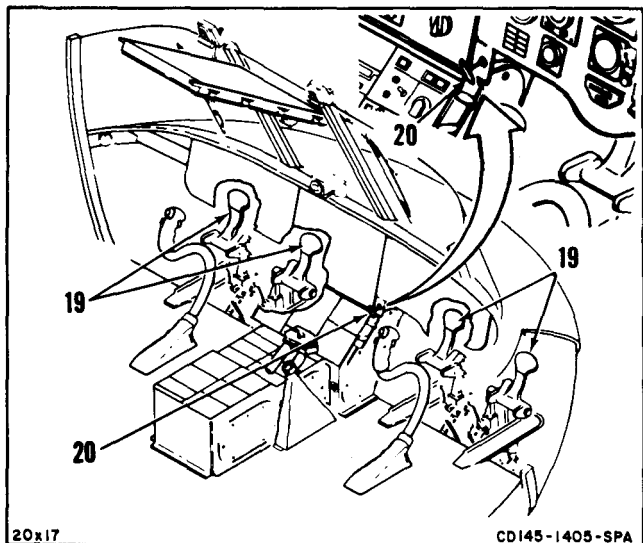
9. **Release static lock (15)** on each aft landing gear from stowed position. **Secure it to lug (16)** with pin (17). If needed, jack gear until lock can be secured.



10. **Remove chocks (18)** from wheels.



11. **Release parking brakes** by pressing pilot's or copilot's brake pedals (19). Brake handle (20) will release.



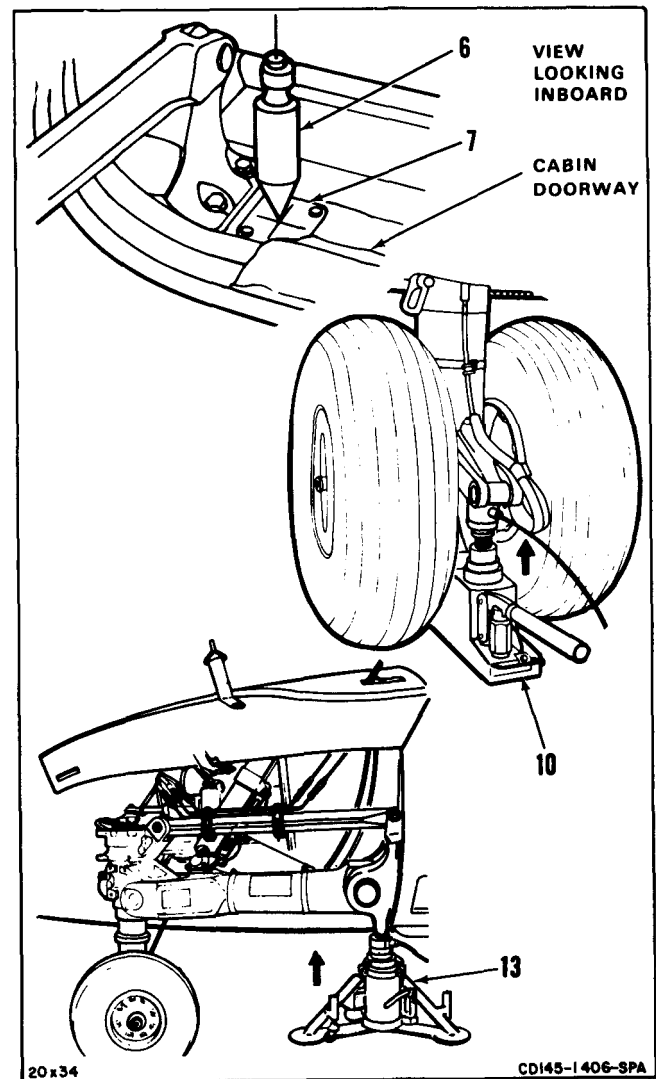
GO TO NEXT PAGE

1-31 LEVEL AND WEIGH HELICOPTER (4-POINT) (AVIM) (Continued)

1-31

WEIGH HELICOPTER

12. Have a helper stand outside cabin doorway to watch plumb bob (6) and plate (7).
13. **Raise both forward jacks (10) and both aft jacks (13) together.** Raise them 1 inch at a time, until all tires are off the ground.
14. **Raise each jack (10 and 13) as needed to level helicopter.** Helicopter is level when point of plumb bob (6) is directly over cross point of lines on plate (7).
15. **Record weight** supported by each load cell. Refer to instructions in weighing kit.



GO TO NEXT PAGE

1-31 LEVEL AND WEIGH HELICOPTER (4-POINT) (AVIM)
(Continued)

LOWER HELICOPTER

CAUTION

Do not lower aft jacks first.
 Damage to structure can result.

16. Lower all four jacks (10 and 13) together. Lower them 1 inch at a time, until cells (9) on forward jacks (10) are clear of jacks pads. Remove forward jacks and cells.

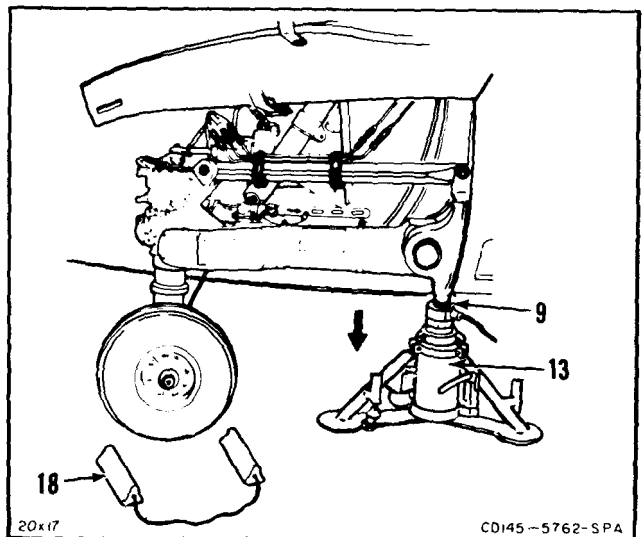
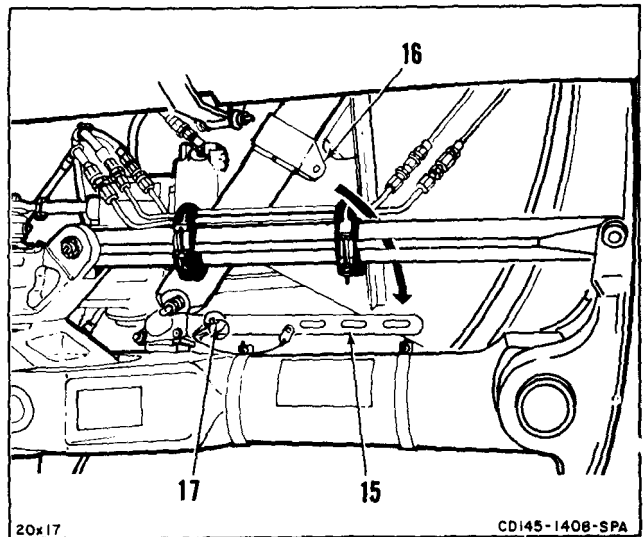
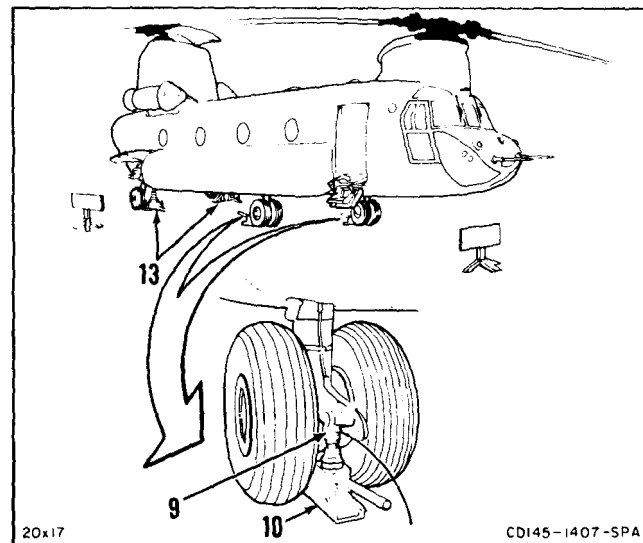
CAUTION

Aft landing gear can be damaged if static locks are not released and stowed before gear are lowered all the way.

17. Lower both aft landing gear evenly until wheels touch ground. Release static lock (15) from lug (16) on each gear. Secure in stowed position with pin (17).

18. Lower both aft jacks (13) evenly. Lower them 1 inch at a time, until cells (9) are clear of pads. Move jacks and cells away from helicopter.

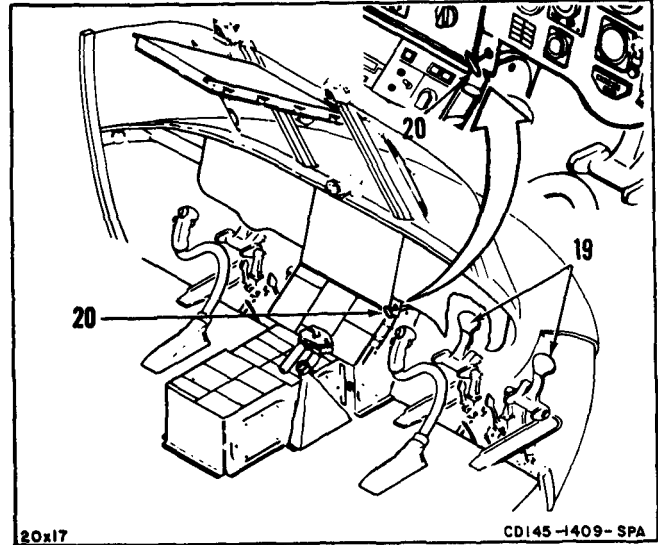
19. Place chocks (18) at either aft wheel



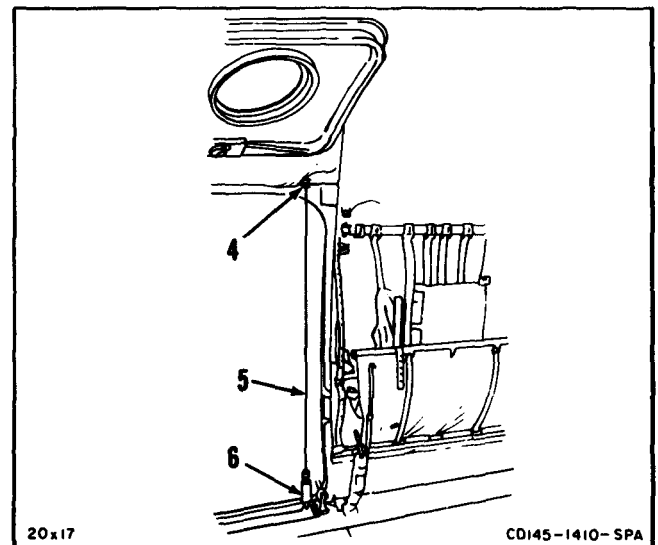
GO TO NEXT PAGE

1-31 LEVEL AND HELICOPTER (4-POINT) (AVIM) (Continued) 1-31

20. **Set parking brakes** by pressing pilot's brake pedals (19) and pulling handle (20). Release pedal.



21. **Remove plumb bob (6) and string (5) from bracket (4) in cabin doorway.**

**FOLLOW-ON MAINTENANCE:**

- █ Remove ropes and signs.
- Service forward landing gear shock struts with air (Task 1-71).
- Remove servocylinder safety blocks (Task 11-29).
- Close aft landing gear access panels (Task 2-2).
- Service fuel tanks (Task 1-51).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Cockpit Enclosure Cover (T103)
- Heater Exhaust Cover (T21)
- Rotary-Wing Head Cover, Forward and Aft (T58)
- Heater Inlet Cover (T59)
- Hydraulic Cooler Exhaust Cover (T60)
- Apu Exhaust Cover (T61)
- Oil Cooler Inlet Cover (T66)
- Oil Cooler Exhaust Cover (T67)
- Oil Cooler Exhaust Cover (T68)

- Air Inlet Cover (T76)
- Engine Inlet Covers (Helicopters with Screens) (T131)
- Engine Inlet Covers (Helicopter without Screens) (T132)
- Engine Outlet Covers (T80)
- Pitot Tube Covers (T81)
- Workstand

Materials:

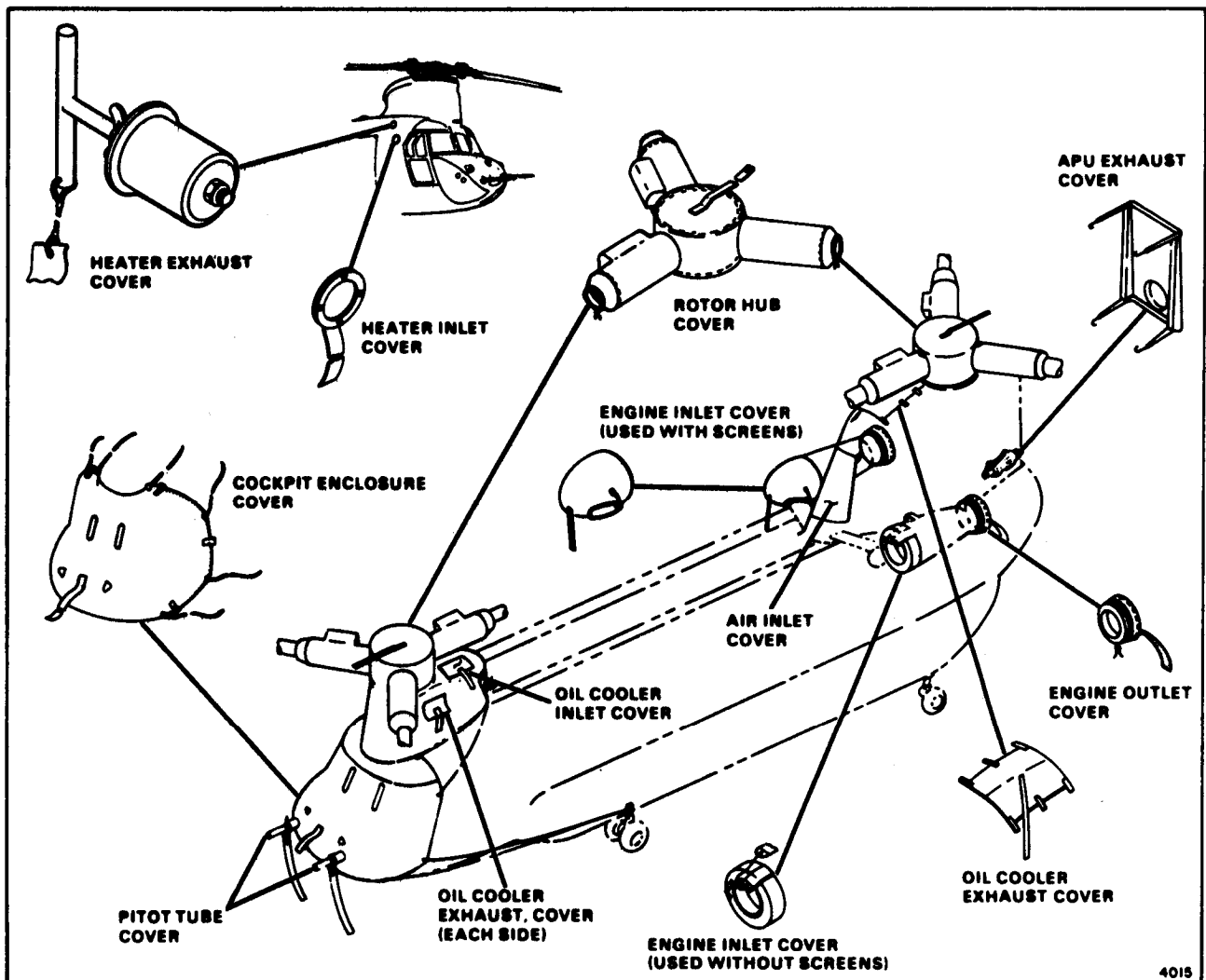
None

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:

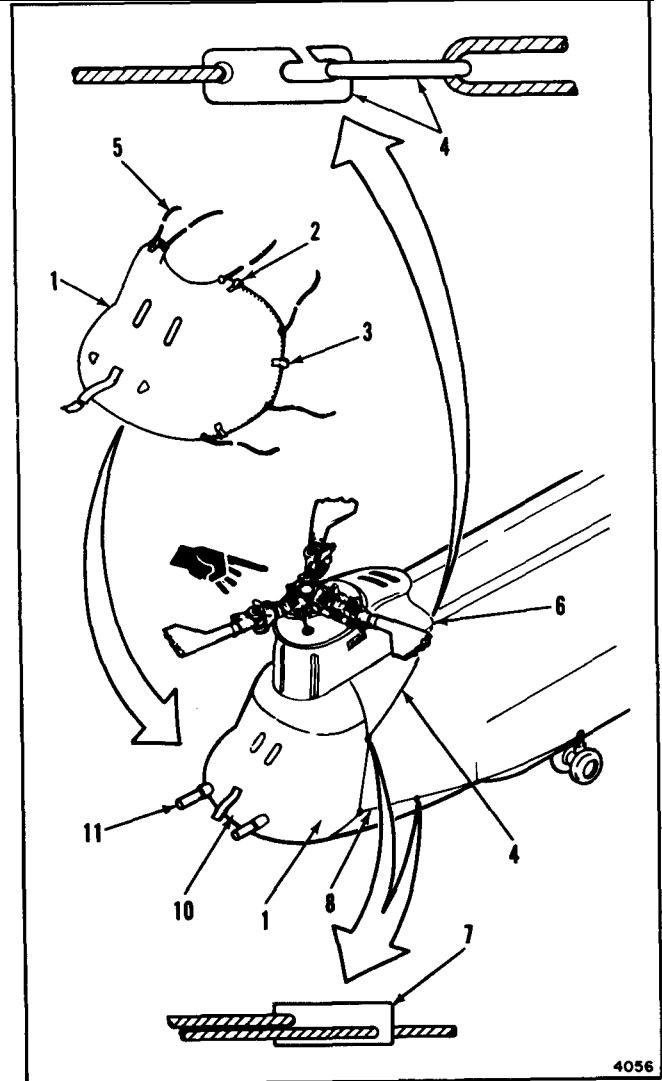
As Required



4015

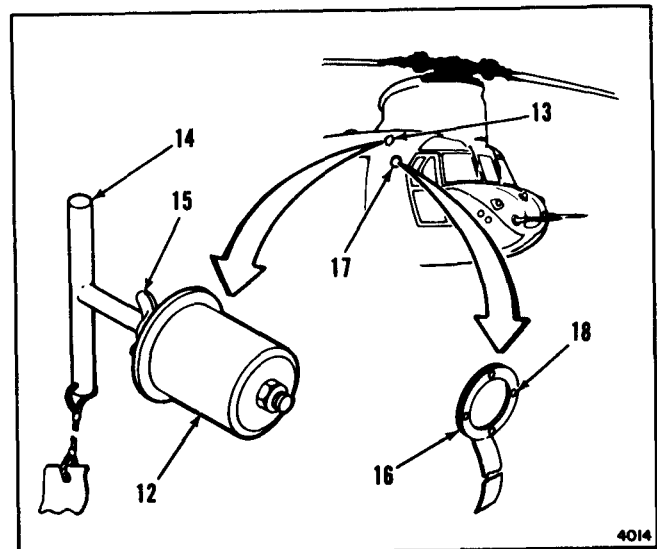
1-32 INSTALL PROTECTIVE COVERS (Continued)

1. Install cockpit enclosure protective cover (T103) (1) as follows:
 - a. Position cover (1) on helicopter. Fit cover over raised areas (2). Use tabs (3) to adjust cover position.
 - b. Hook fasteners (4) on four top ropes (5) together behind fairing (6). Tighten ropes. Use four sliding fasteners (7).
 - c. Hook fasteners (4) on four bottom ropes (8) to landing gear tiedown fittings (9).
 - d. Tighten bottom ropes (8). Use sliding fasteners (7).
 - e. Secure flap (10) between pitot tubes (11). Use two snap fasteners and hook-and-pile tape.



4056

2. Install heater exhaust protective cover (T21) as follows:
 - a. Insert plug (12) into heater exhaust (13).
 - b. Prevent handle (14) from turning.
 - c. Tighten wing nut (15) to expand plug (12).
3. Position cover (T59) (16) on heater inlet (17). Secure four fasteners (18).



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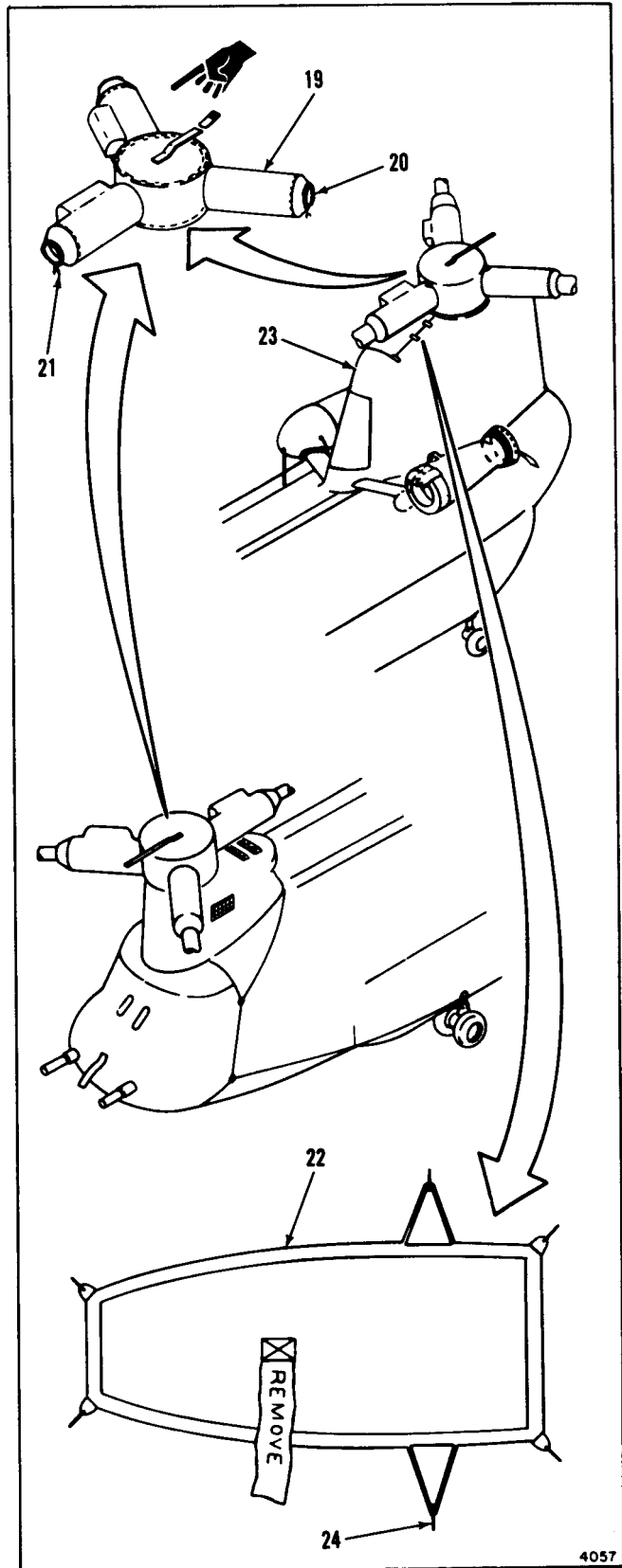
1-32 INSTALL PROTECTIVE COVERS (Continued)

4. Position forward and aft rotary-wing head covers (T58) (19) on helicopter. Close slide fasteners (20). Tie draw cords (21).

NOTE

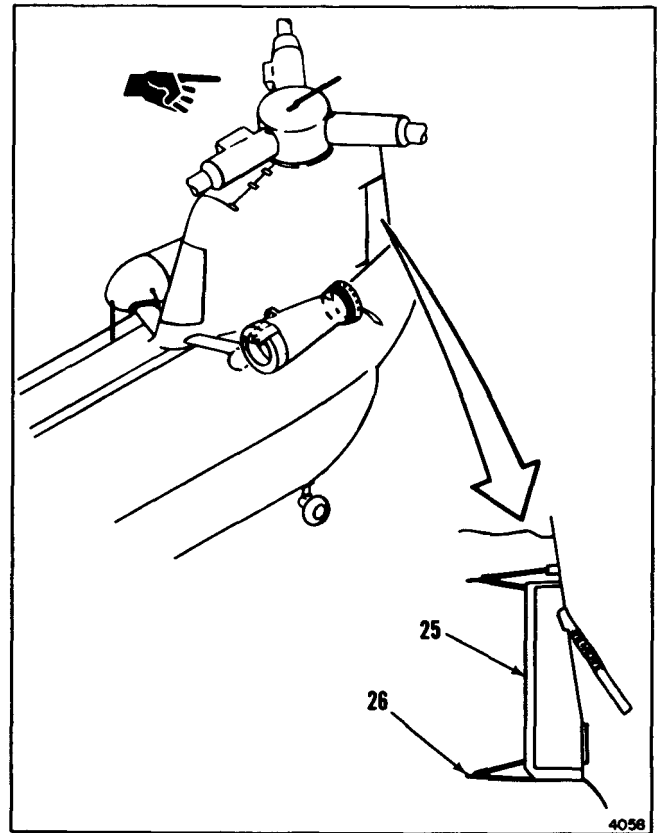
Arms of covers may be installed on arms of rotary-wing head in any position.

5. Position hydraulic cooler exhaust cover (T60) (22) on pylon (23). Secure cover. Use six hooks (24).

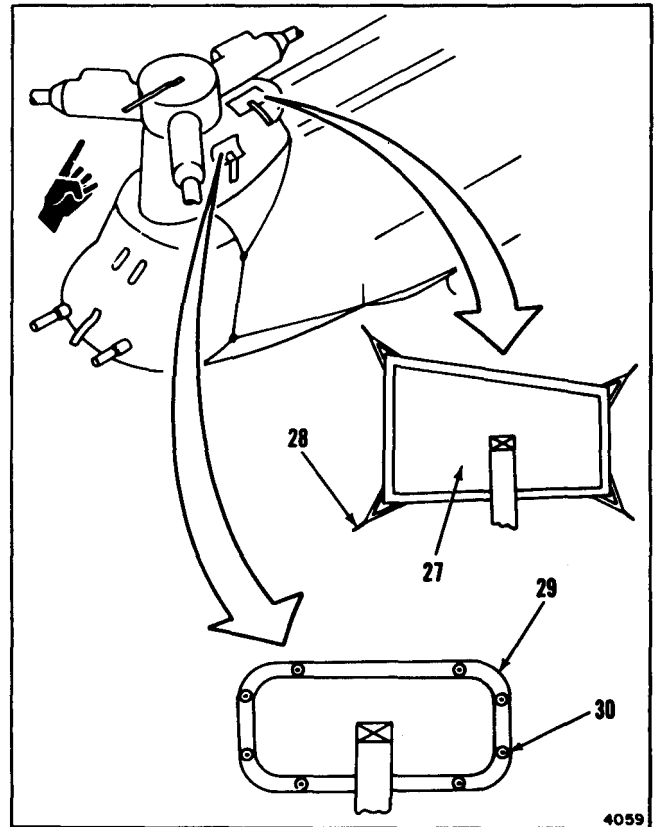


1-32 INSTALL PROTECTIVE COVERS (Continued)

6. Install apu exhaust cover (T61) (25). Secure cover. Use four hooks (26).

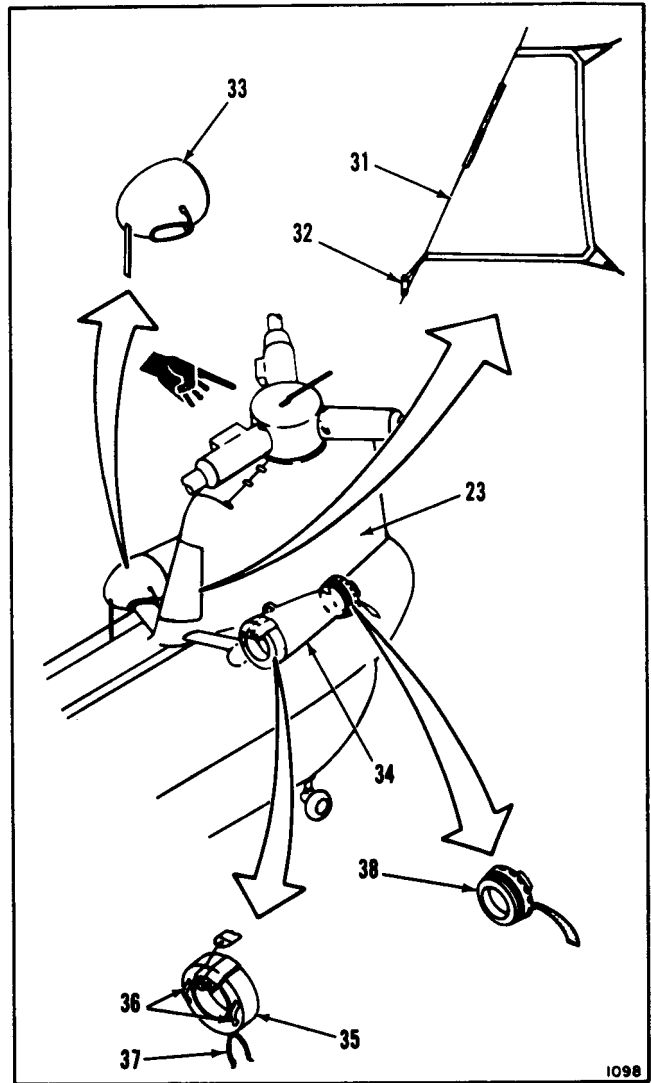


7. Install oil cooler inlet cover (T66) (27). Secure cover. Use four hooks (28).
8. Install oil cooler exhaust covers (T67 and T68) (29). Secure covers. Use eight snap fasteners (30).



GO TO NEXT PAGE

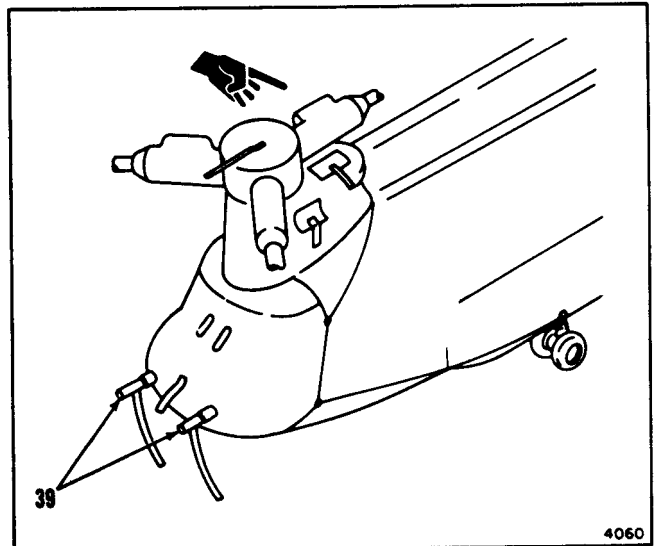
9. Install air inlet cover (T76) (31) on pylon (23). Secure cover. Use five hooks (32),
10. Install engine inlet covers (33) or (35) as follows:
 - a. Install covers (T131) (33) if helicopter has inlet screens. Position cover over inlet of engine (34).
 - b. Install covers (T132) (35) if helicopter does not have inlet screens. Use two handles (36) to position cover over inlet of engine (34). Secure draw cords (38).
11. Install two engine outlet covers (T80) (37).



12. Install two pitot tube covers (T81) (39).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

1-33 INSTALL TRANSPORTATION TIEDOWN KIT

1-33

INITIAL SETUP

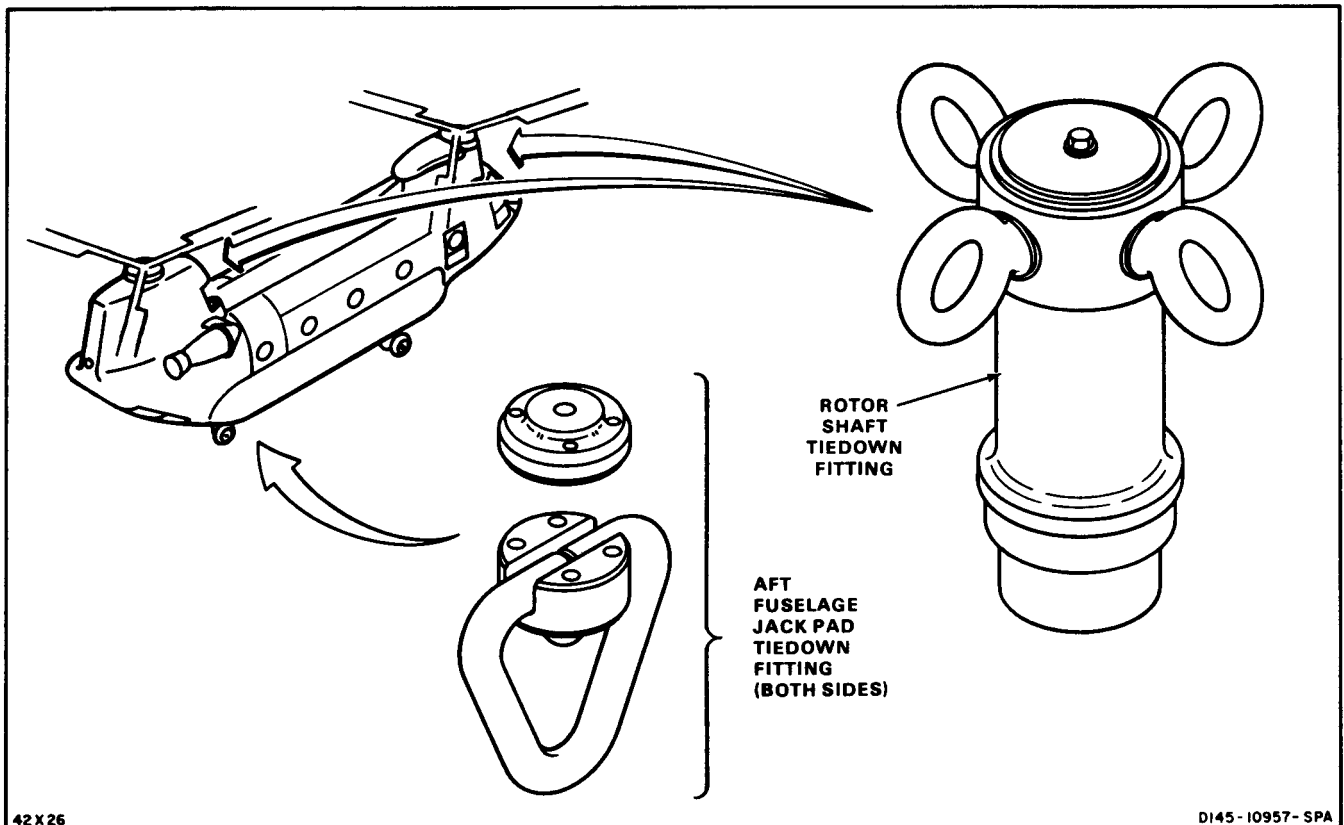
Applicable Configurations:
All

Tools:
Aircraft Mechanic's Tool Kit,
NSN5180-00-323-4692
Transportation Tiedown Fitting Set (T77)
Spanner Wrench

Materials:
None

Personnel Required:
67U10 Medium Helicopter Repairer
67U30 Inspector

Equipment Condition:
Battery Disconnected (Task 1-39)
Electrical Power Off
Forward Transmission Fairing Work Platforms
Open (Task 2-2)
Aft Pylon Work Platforms Open (Task 2-2)



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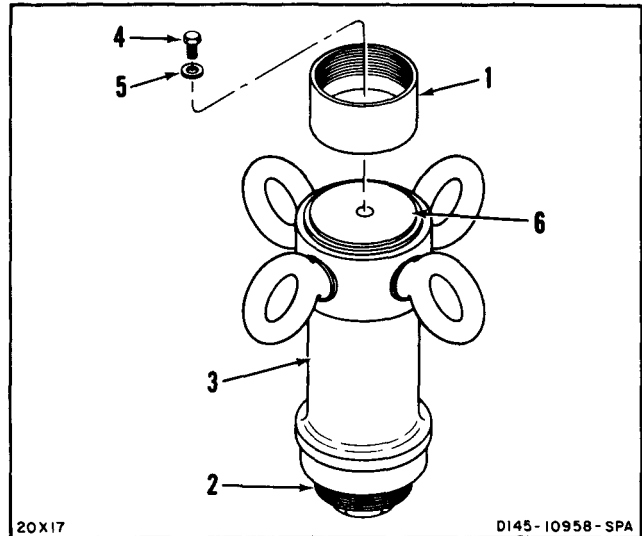
**1-33 INSTALL TRANSPORTATION TIEDOWN KIT
(Continued)**

INSTALL ROTOR SHAFT FITTINGS

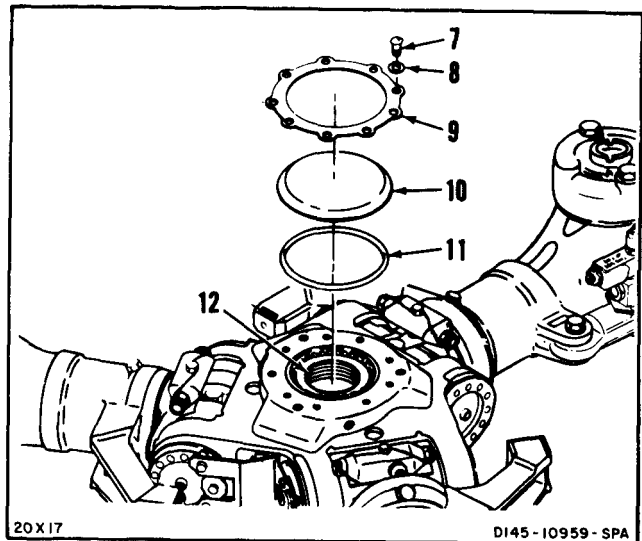
NOTE

Install fittings on forward or aft rotor shaft in same way.

1. Remove cover (1) from threads (2) at bottom of fitting (3).
2. Remove bolt (4) and washer (5) from top of fitting (3).
3. Install cover (1) on plate (6) at top of fitting (3). Install bolt (4) and washer (5).

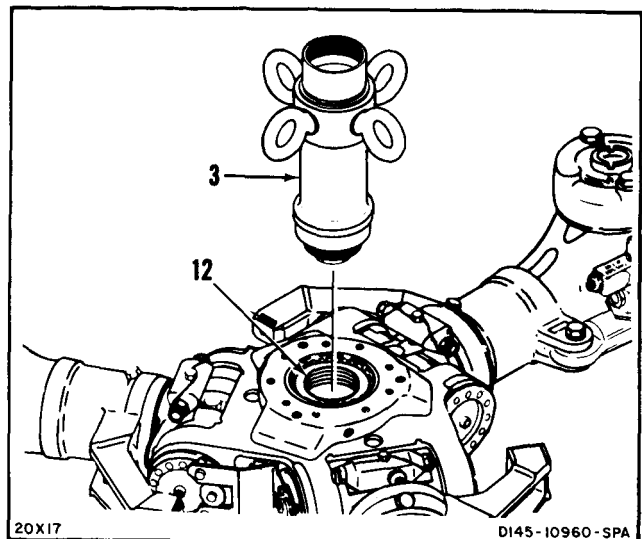


4. Remove nine screws (7) and washers (8) from retainer (9). Remove retainer cover (10) and packing (11) from top of rotor shaft (12).



5. Install fitting (3) in rotor shaft (12).

INSPECT



GO TO NEXT PAGE

1-33 INSTALL TRANSPORTATION TIEDOWN KIT (Continued)

1-33

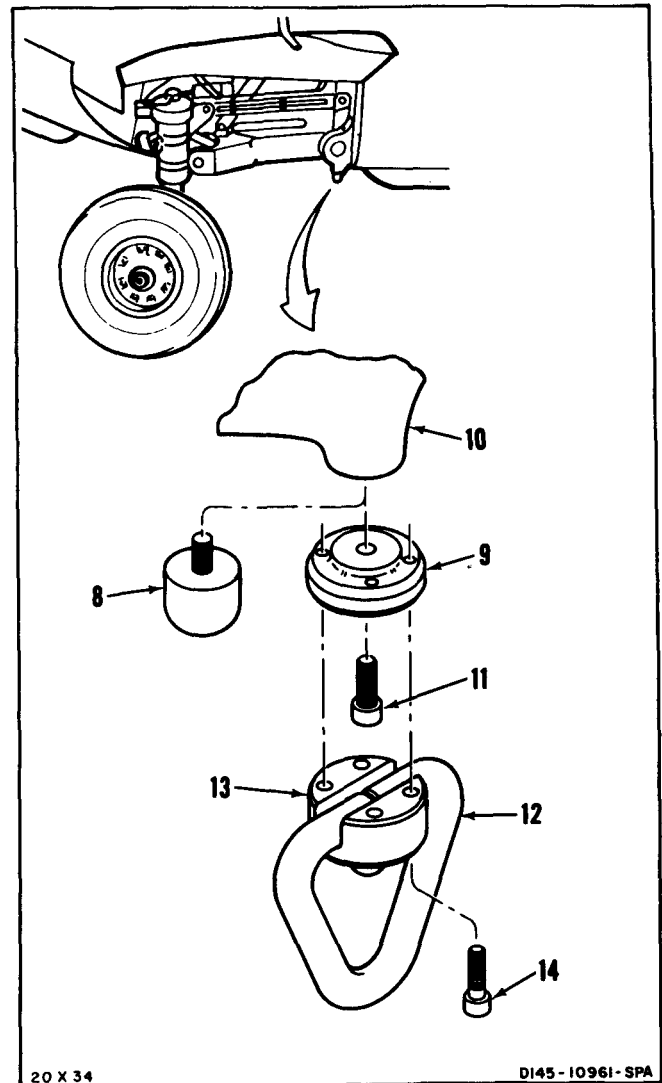
INSTALL JACK PAD FITTINGS

NOTE

Install fittings on left or right aft fuselage jack pad base in same way. Right side shown.

6. Remove fuselage jack pad (8). Use wanner wrench.
7. Install adapter (9) on jack pad base (10) with bolt (11).
8. Install ring (12) in groove of fitting (13). install fitting on adapter (9) with four screws (14).

INSPECT



FOLLOW-ON MAINTENANCE:

Close forward transmission fairing work platforms (Task 2-2).

Close aft pylon work platforms (Task 2-2).

END OF TASK

1-101

1-34 REMOVE TRANSPORTATION TIEDOWN KIT

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN5180-00-323-4692
- Spanner Wrench
- Torque Wrench, 5 to 50 Inch-Pounds

Materials:

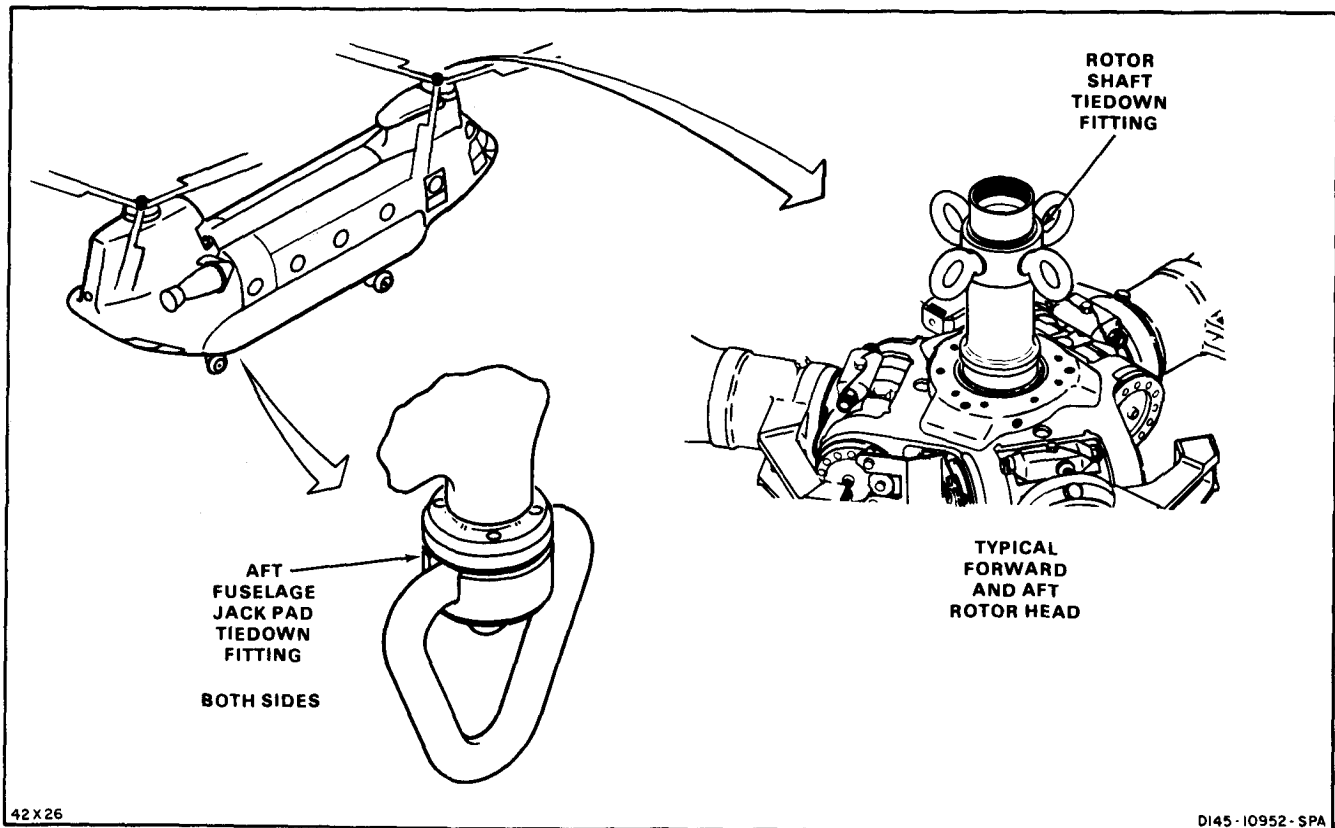
None

Personnel Required:

- 67U10 Medium Helicopter Repairer
- 67U30 Inspector

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Forward Transmission Fairing Work Platforms
Open (Task 2-2)
- Aft Pylon Work Platforms Open (Task 2-2)



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1-34 REMOVE TRANSPORTATION TIEDOWN KIT (Continued)

1-34

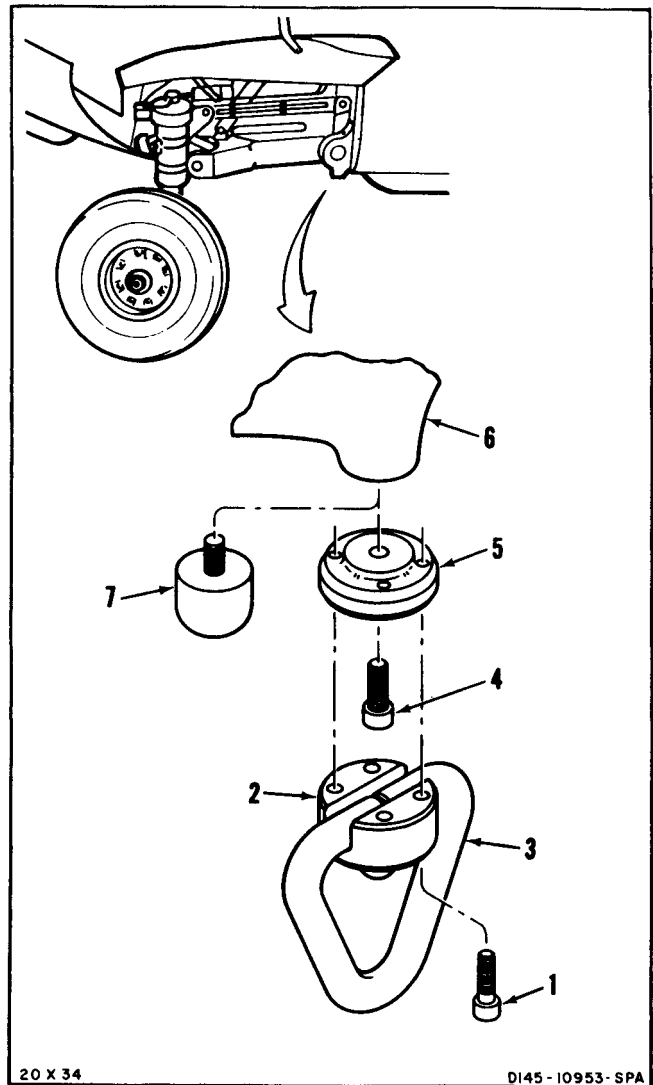
REMOVE JACK PAD FITTINGS

NOTE

Remove fitting from left or right aft fuselage jack pad base in same way. Right side shown.

1. Remove four bolts (1). Remove fitting (2) and ring (3).
2. Remove bolt (4) and adapter (5).
3. Install fuselage jack pad (6) on jack pad base (7). Use a spanner wrench.

INSPECT

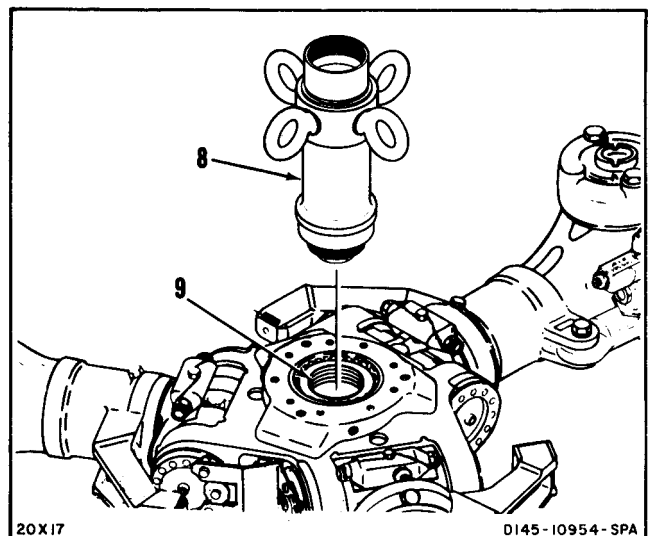


REMOVE ROTOR SHAFT FITTINGS

NOTE

Remove fitting from forward or aft rotor shaft in same way.

4. Remove fitting (8) from rotor shaft (9).



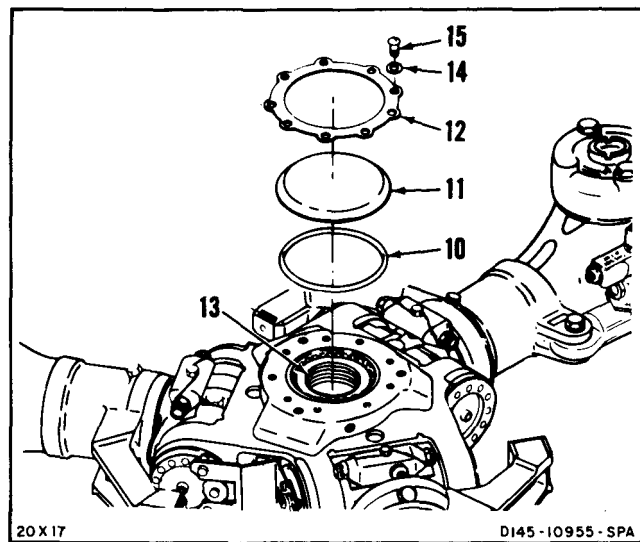
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1-34 REMOVE TRANSPORTATION TIEDOWN KIT (Continued)

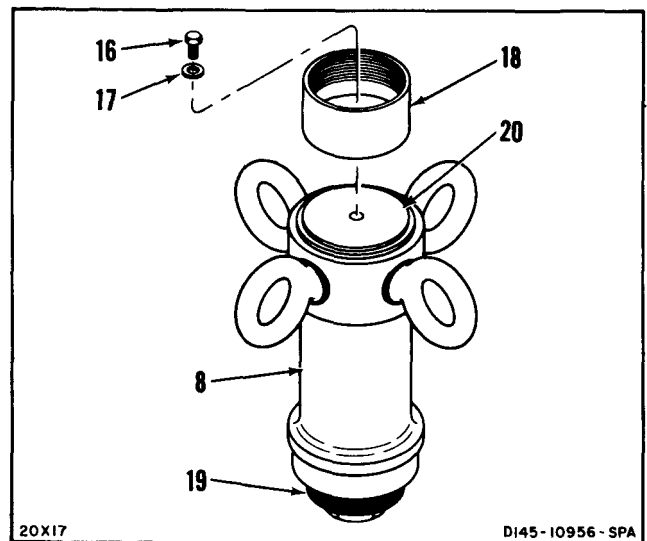
1-34

5. Install packing (10), cover (11), and retainer (12) over rotor shaft (13). Install nine washers (14) and screws (15). **Torque screws to 20 inch-pounds.**

INSPECT



6. Remove bolt (16) and washer (17). Remove cover (18).
7. Install cover (18) on threads (19) at bottom of fitting (8).
8. Install bolt (16) and washer (17) through plate (20) on top of fitting (8).



FOLLOW-ON MAINTENANCE:

Close forward transmission fairing work platforms (Task 2-2).

Close aft pylon work platforms (Task 2-2).

END OF TASK

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN5180-00-323-4692
Hoist Capacity 24,000 Pounds
Sling (T71)
Warning Streamers (2)
Guide Lines (2)

Materials:

Tape (E388)
Lubricant (E237)

Personnel Required:

67U10 Medium Helicopter Repairer (3)
67U20 Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Servocylinder Safety Blocks (T31) Installed
(Task 11-28)
Rotary-Wing Blades Removed (Task 5-64)
Helicopter Defueled (Task 10-34 or 10-35)
Forward Work Platform Open (Task 2-2)
Pylon Clamshell Doors Open (Task 2-2)
Pylon Leading Edge Fairing Open (Task 2-2)
Aft End of Forward Connecting Link Discon-
nected (Task 11-194)
Upper Outboard Rigid Link in Second Stage
Mix Disconnected (Task 11-190)
Forward Transmission Aft Fairing Removed
(Task 2-63)

GO TO NEXT PAGE

1-35 HOISTING HELICOPTER — 23,900 POUND GROSS WEIGHT (Continued)

1-35

1. Apply coat of lubricant (E237) on four sling pins(1).
2. Working from aft tunnel position AFT sling legs (2) on lifting lugs (3) at sta 475.3. Install pins (1) in lugs. Do not twist legs together.

NOTE

Sling legs are marked FWD and AFT.

3. Work from forward tunnel, position FWD sling legs (4) of lifting lugs (5) at sta 122.25. Install pins (1) in lugs, Do not twist legs together.
4. Install warning streamers (6) on links (7 and 8).
5. When lifting helicopter with pylon (9) installed, position loop (10) on hoist hook (11). Go to step 7.
6. When lifting helicopter without pylon (9), position loop (12) on hook (11).

WARNING

Personnel must be clear of area under helicopter during hoisting.

7. Attach guide line (13) to forward landing gear (14). Have helper hold guide line.
8. Attach guide line (15) to aft landing gear (16). Have helper hold guide line.
9. Slowly take up sling slack with hoist. Be sure legs (2 and 4) are clear of components.

10. Slowly raise helicopter to clear ground. Check helicopter is level and steady. If not level lower helicopter to ground, add ballast load and repeat step 8.
11. Hoist and move helicopter slowly and carefully to desired place. Operate hoist without sudden starts, stops, drops, or sharp turns that could start helicopter swinging.
12. Check area where helicopter will be positioned. Area must be clear of equipment and other objects.
13. Lower helicopter slowly until full weight of helicopter is on wheels, and legs (2 and 4) of sling are slack,
14. Lower hoist hook (11). Remove loop (10 or 12) and lower slowly to drive tunnel (17).
15. Remove four pins (1). Remove sling (T71) (18).
16. Remove two warning streamers (6).

FOLLOW-ON MAINTENANCE:

Connect aft end of forward connecting link (Task 11-195).

Connect upper outboard rigid link in second stage mix (Task 11-191).

Close pylon leading edge fairing (Task 2-2).

Close pylon clamshell doors (Task 2-2).

Install rotary-wing blades (Task 5-84).

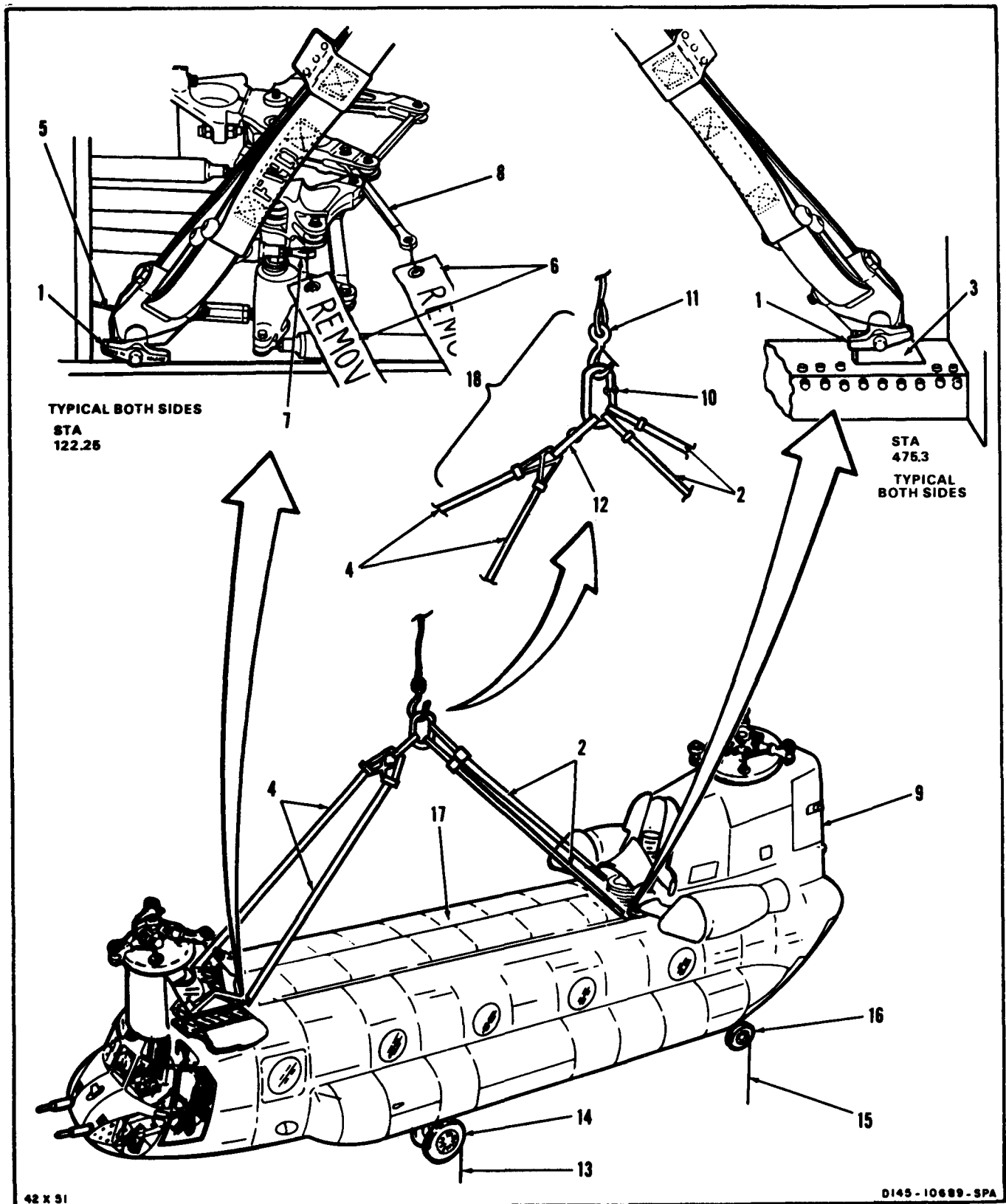
Remove servocylinder safety blocks (Task 11-29).

Install forward transmission aft fairing (Task 2-68).

Close forward work platform (Task 2-2).

GO TO NEXT PAGE

1-35 HOISTING HELICOPTER — 23,900 POUND GROSS WEIGHT
(Continued)



42 X 91

D145-10689-SPA

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
 NSN5180-00-323-4692
 Hoist, 33,000 Pounds Capacity
 Ring Assembly (T24) (2)
 Sling Cable, 93 Feet Long Minimum (2)
 Guide Lines (2)
 Torque Wrench, 0 to 150 Inch-Pounds

Materials:

None

Personnel Required:

Medium Helicopter Repairer (3)

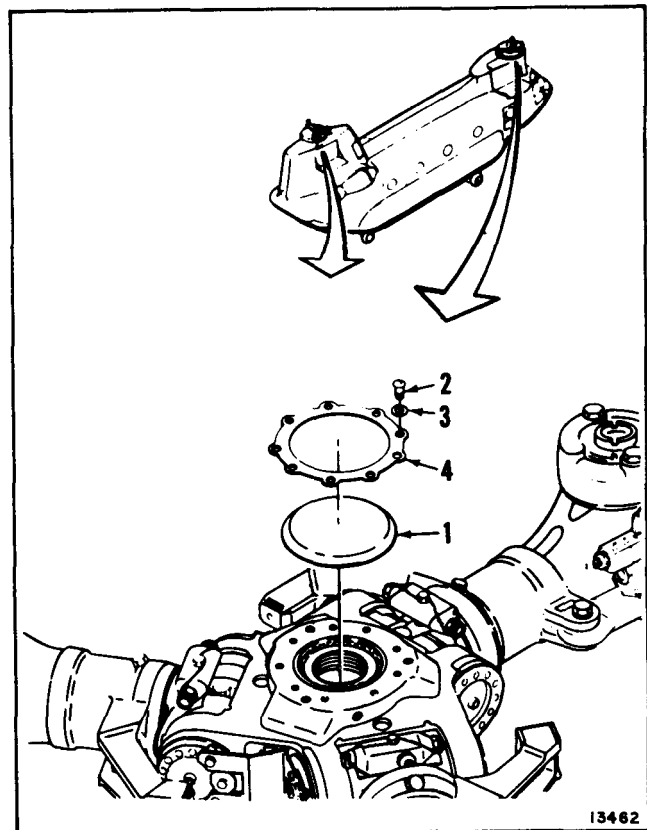
Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Rotary-Wing Blades Removed (Task 5-64)
 Helicopter Defueled (Task 10-34 or 10-35)
 Forward Work Platform Open (Task 2-2)
 Aft Work Platform Open (Task 2-2)

INSTALL LIFT RING ASSEMBLY**NOTE**

Procedure is same to install ring on forward or aft rotor head. Forward head shown.

1. Remove cover (1) from forward and aft rotor head as follows:
 - a. Remove nine screws (2) and washers (3).
 - b. Remove retainer (4) and cover (1).



13462

1-35.1 HOISTING HELICOPTER — 33,000 POUND GROSS WEIGHT 1-35.1

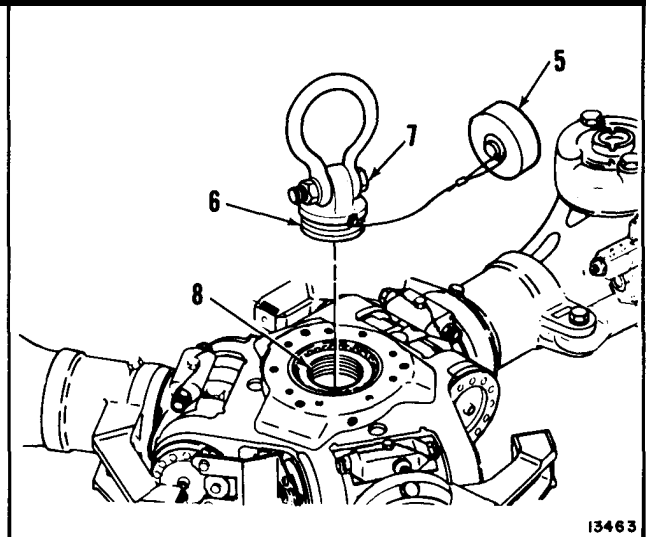
Continued

WARNING

Make sure ring is fully seated in shaft. Otherwise, injury to personnel or loss of helicopter could result.

- Remove cover (5) from thread (6) of ring (7).
Install ring in rotor shaft (8).

INSPECT



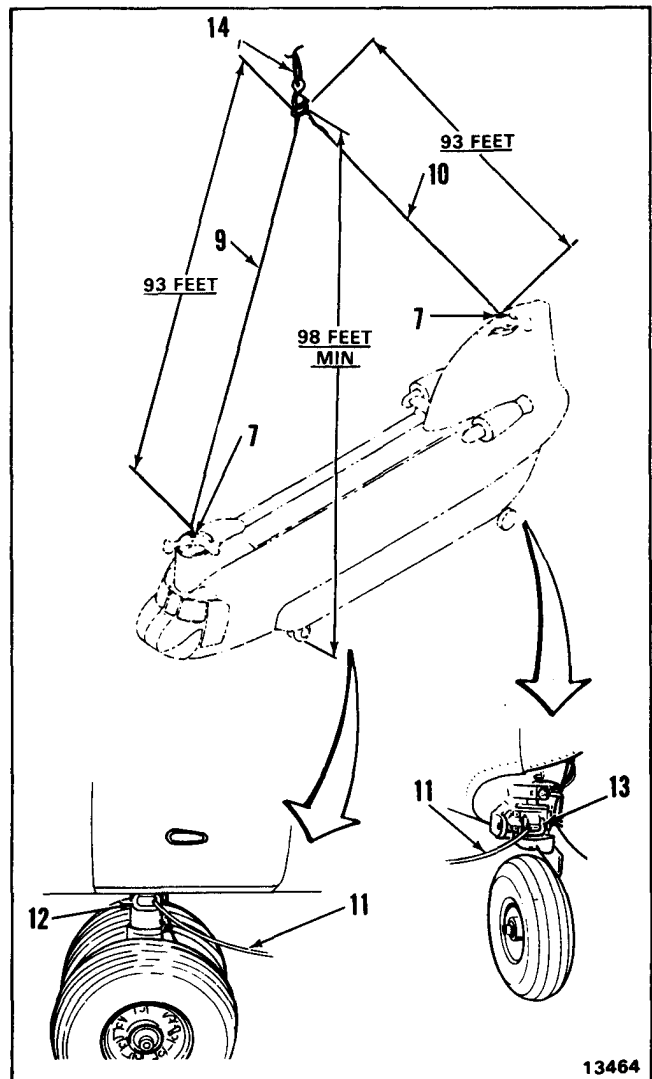
HOIST HELICOPTER

- Attach cable (9) at least 93 feet long to ring (7) on forward rotor head. Attach cable (10) at least 93 feet long to ring on aft rotor head.

WARNING

Guide lines must be long enough to let personnel keep clear of area under helicopter during hoisting.

- Attach guide lines (11) to shackles (12 and 13) at forward and aft landing gear. Have helpers hold lines.
- Attach cables (9 and 10) to hoist (14). Slowly take up cable slack with hoist.
- Slowly raise helicopter from ground. Hold it steady with guide lines (11).
- Move helicopter slowly to desired place. Avoid sudden motions that could start it swinging.
- Check that area where helicopter will be lowered is clear of obstructions.
- Lower helicopter slowly until all weight is on landing gear and cables (9 and 10) are slack. Remove cables from hoist (14) and rings (7). Remove guide lines (11) from shackles (12 and 13).

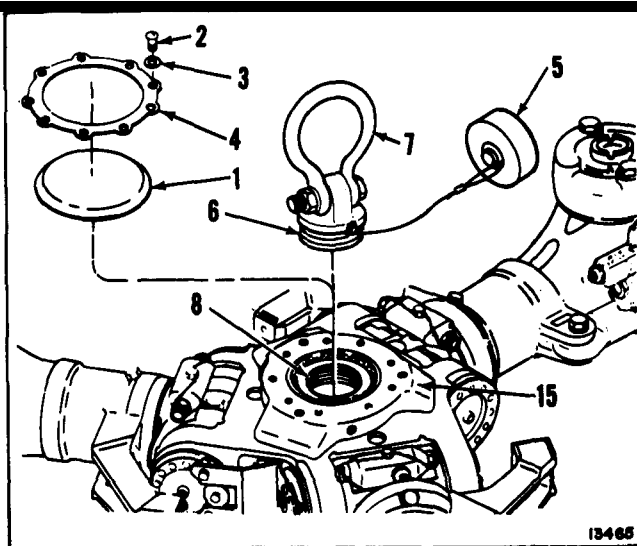


GO TO NEXT PAGE

1-35.1 HOISTING HELICOPTER—33,000 POUND GROSS WEIGHT 1-35.1
(Continued)
REMOVE LIFT RING ASSEMBLY**NOTE**

Procedure is same to remove ring on forward or aft rotor head. Forward head shown.

10. Screw ring (7) out of rotor shaft (8). Install cover (5) on ring thread (6).
11. Position cover (1) on oil tank (15). Position retainer (4) on cover.
12. Install nine screws (2) and washers (3). Torque screws to 23 Inch-pounds.



13465

FOLLOW-ON MAINTENANCE:

None

END OF TASK

1-108.2 Change 24

1-36 APPLY POWER USING APU

INITIAL SETUP

Applicable Configurations:

Tools:

Ear Plugs

Materials:

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:

Helicopter not Positioned Tail into Wind

Battery Connected (Task 1-39)

Battery Switch OFF

Hydraulic Power OFF

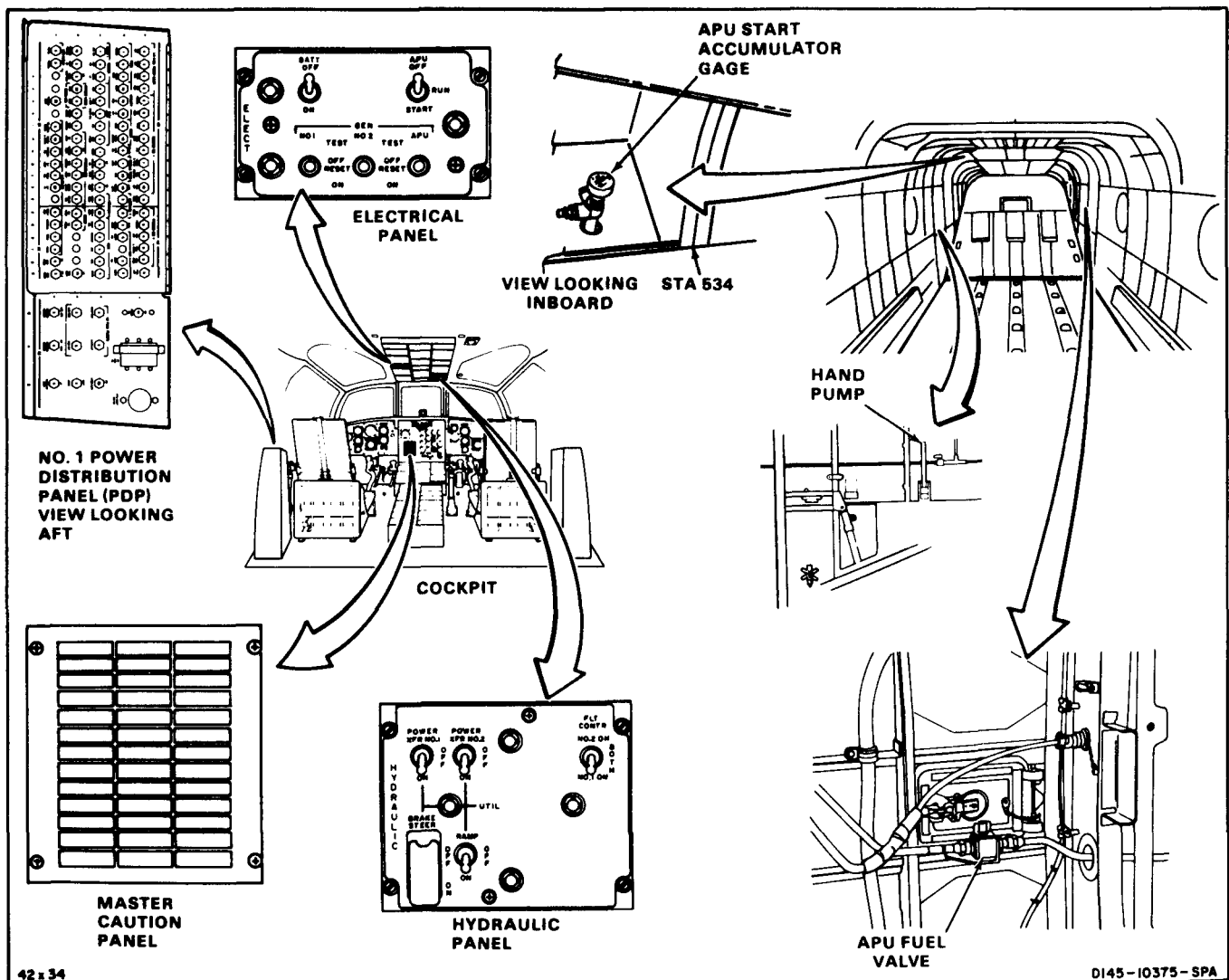
CAUTION

Service life of gyroscopes can be reduced under power. Open the following circuit breakers when applying power, unless noted:

- PDP NO. 1
- COMPASS (2)
- COPILOT VGI
- AFCS NO. 1
- PDP NO. 2
- PILOT VGI
- AFCS NO. 2

WARNING

Wear ear plugs when working around helicopter when apu is running. Otherwise, hearing can be damaged.



42 x 34

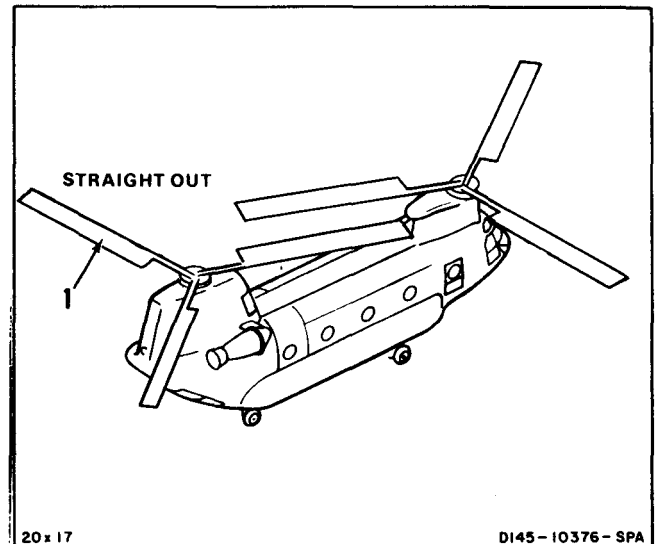
D145-10375-SPA

1-36 APPLY POWER USING APU (Continued)

1 -36

START APU

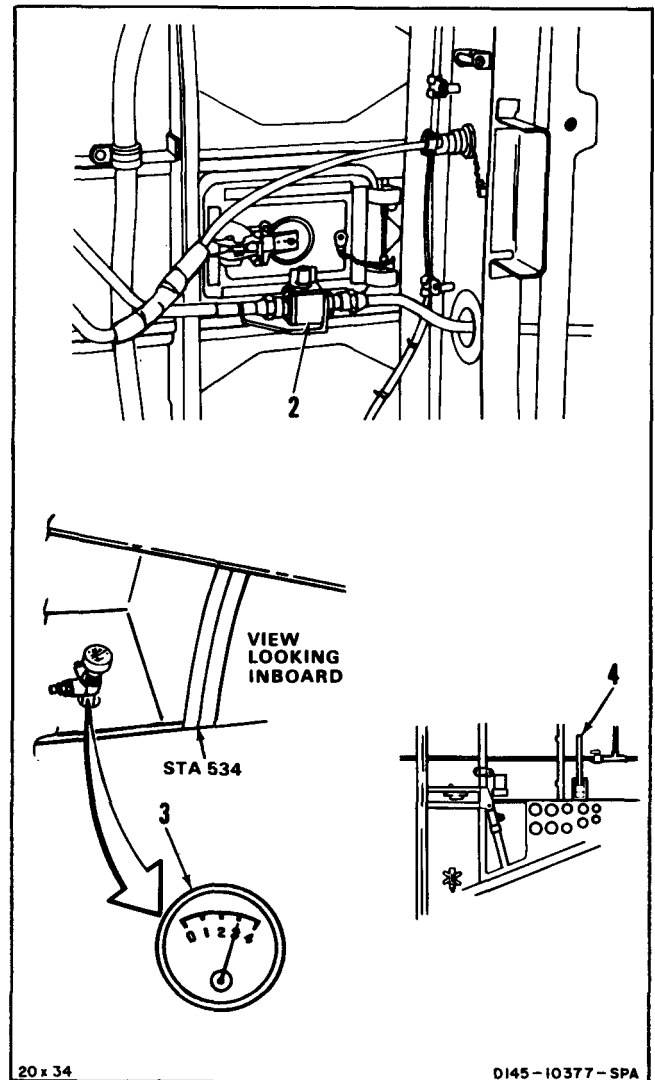
1. Pull rotor blades (1) around so that one aft or forward blade points straight out (90 degrees) from fuselage.



2. Check that apu fuel shutoff valve (2) is OPEN.
3. Check that apu start accumulator gage (3) reads at least 3.000 psi. If gage reads less, operate hand pump (4) to increase reading to 3.000 psi or until pressure stabilizes.

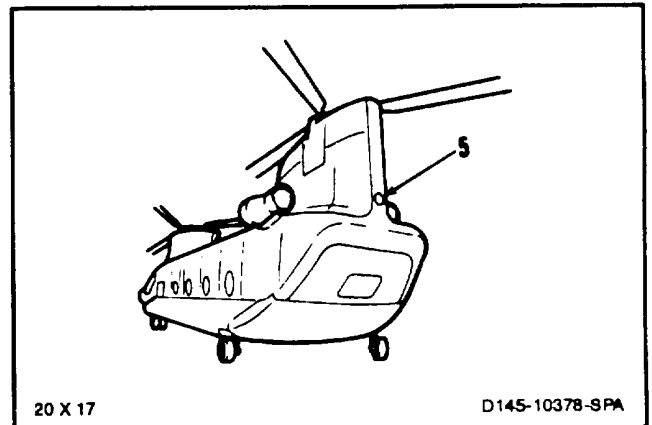
NOTE

If pressure stabilizes at less than 3.000 psi it indicates a bottomed piston in the accumulate. A stabilized pressure of 2.700 psi or more is enough to start the apu.

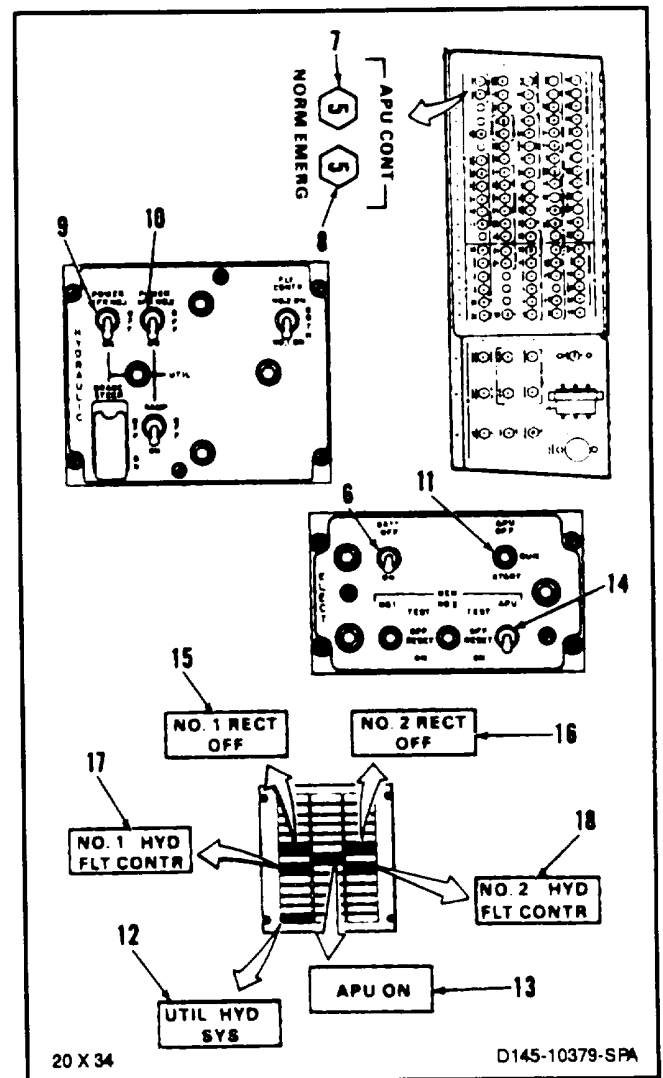


GO TO NEXT PAGE

4. Have helper stand behind helicopter to watch for fire at apu exhaust (5) during start



5. **Check** that APU CONT NORM and EMERG circuit breakers (7 and 8) are closed.
6. **Check** that POWER XFR NO. 1 and POWER XFR NO. 2 switches (9 and 10) are at OFF.
7. **Set** BATT SWITCH (6) to ON.
8. **Set** APU switch (11) to **RUN** for 3 to 5 seconds, then to **START** for at least 2 seconds. **Release** switch to **RUN**. APU ON capsule (13) shall come on in 10 to 12 seconds. UTIL HYD SYS capsule (12) should go out within 30 seconds.
9. **Set** APU GEN switch (14) to ON. NO. 1 RECT OFF and NO. 2 RECT OFF capsules (15 and 16) shall go out.
10. **Set** PWR XFR NO. 1 and PWR XFR NO. 2 switches (9 and 10) to ON. NO. 1 HYDR FLT CONTR and NO. 2 HYDR FLT CONTR capsules (17 and 18) shall go out.



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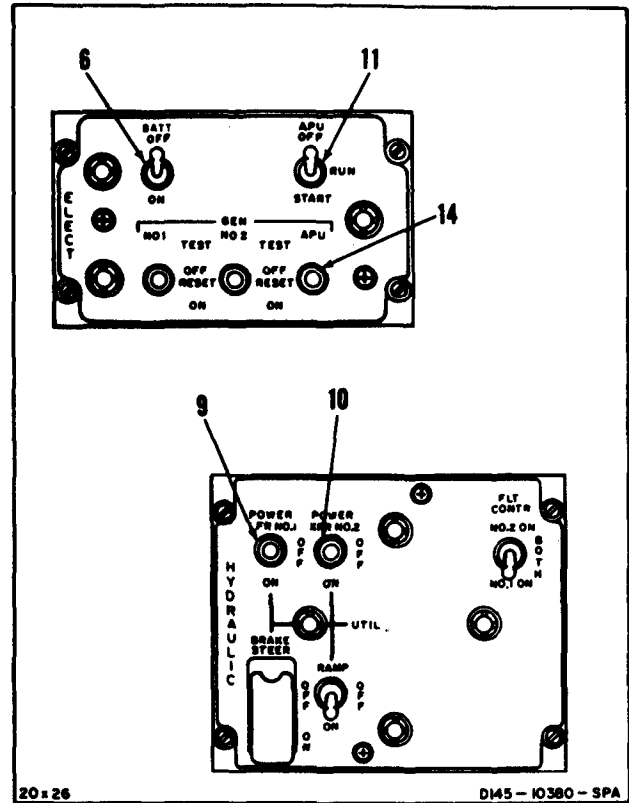
1-110 Change 57

1-36 APPLY POWER USING APU (Continued)

1-36

SHUT DOWN APU

11. Set PWR XFR NO.1 and PWR XFR NO. 2 switches (9 and 10) to OFF.
12. Set APU GEN switch (14) to OFF.
13. Set APU switch (11) to OFF.
14. Set BATT switch (6) to OFF.

**FOLLOW-ON MAINTENANCE:**

- Disconnect battery (Task 1-39).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Power Supply 28 Vdc
- Electrical Power Supply, 115/200 Volt, 3-Phase, Grounded Neutral, 400-Hz Ac
- Aviation Ground Power Unit (AGPU)

Materials:

None

Personnel Required:

Aircraft Electrician

References:

- TM 55-1730-229-12
- TM 55-1730-229-34

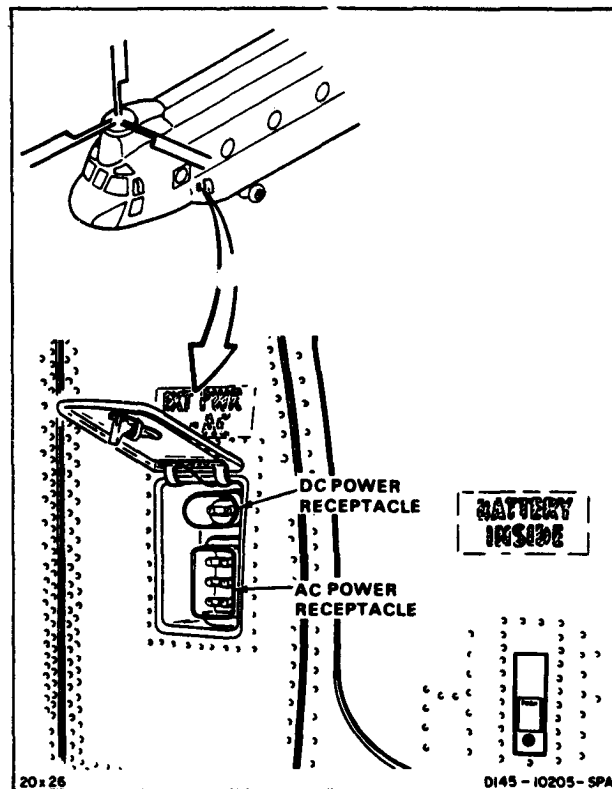
Equipment Condition:

- battery Connected (Task 1-39)
- External DC-AC Power Receptacle Access Door Open (Task 2-2)

CAUTION

Service life of gyroscopes can be reduced under power. Open the following circuit breakers when applying power unless noted

- | | |
|-------------|------------|
| PDP NO. 1 | PDP NO. 2 |
| COMPASS (2) | PILOT VGI |
| COPILOT VGI | AFCS NO. 2 |
| AFCS NO. 1 | |



GO TO NEXT PAGE

1-112 Change 18

1-37 APPLY EXTERNAL ELECTRIC POWER (Continued)**1-37***CONNECT POWER***CAUTION**

Ensure maintenance personnel are qualified/experienced in operating and connecting external power.

1. Apply ac power by **connecting ac power supply cable to receptacle (1)** at forward end of left pod. Operate power supply. (Refer to applicable technical manual.)

NOTE

Dc power is automatically supplied whenever ac power is applied

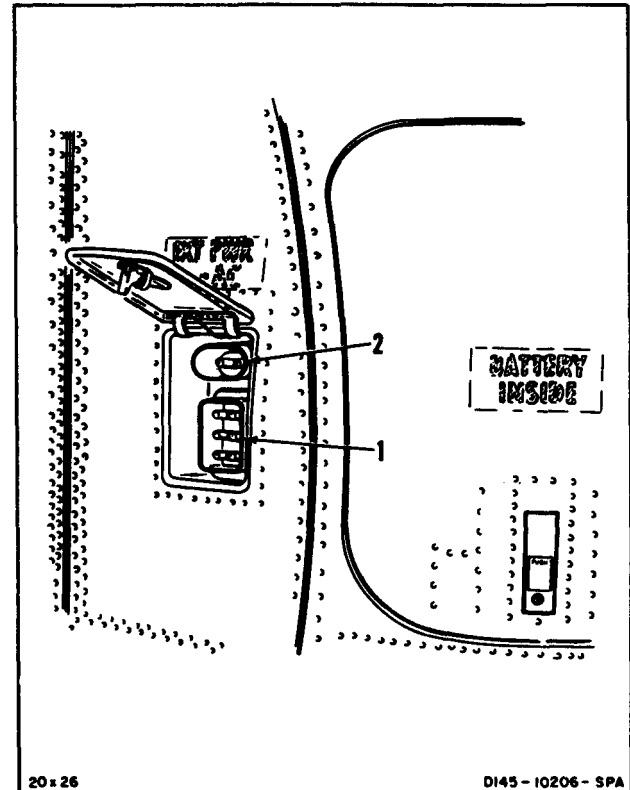
2. Apply only dc power by **connecting dc power supply cable to receptacle (2)** at forward end of left pod. Operate power supply.

DISCONNECT POWER

3. **Shut down power supply.** (Refer to applicable technical manual.)
4. **Disconnect power supply cable** from receptacle (1) or (2).

FOLLOW-ON MAINTENANCE:

Disconnect battery (Task 1-39).
Close external dc-ac power receptacle door (Task 2-2).

**END OF TASK**

1-38 APPLY EXTERNAL HYDRAULIC POWER

1-38

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Systems Test Stand, Equipped with Three-Micron Filter

Aviation Ground Power Unit (AGPU)

Materials:

None

Personnel Required:

68H20 Aircraft Pneudraulics Repairer

References:

TM 55-1730-229-12

TM 55-1730-229-34

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Ground Test Connection Access Cover

Removed for No. 1 Flight Control Hydraulic System and Panel Open for No. 2 Flight Control and Utility Hydraulic Systems as Needed (Task 2-2)

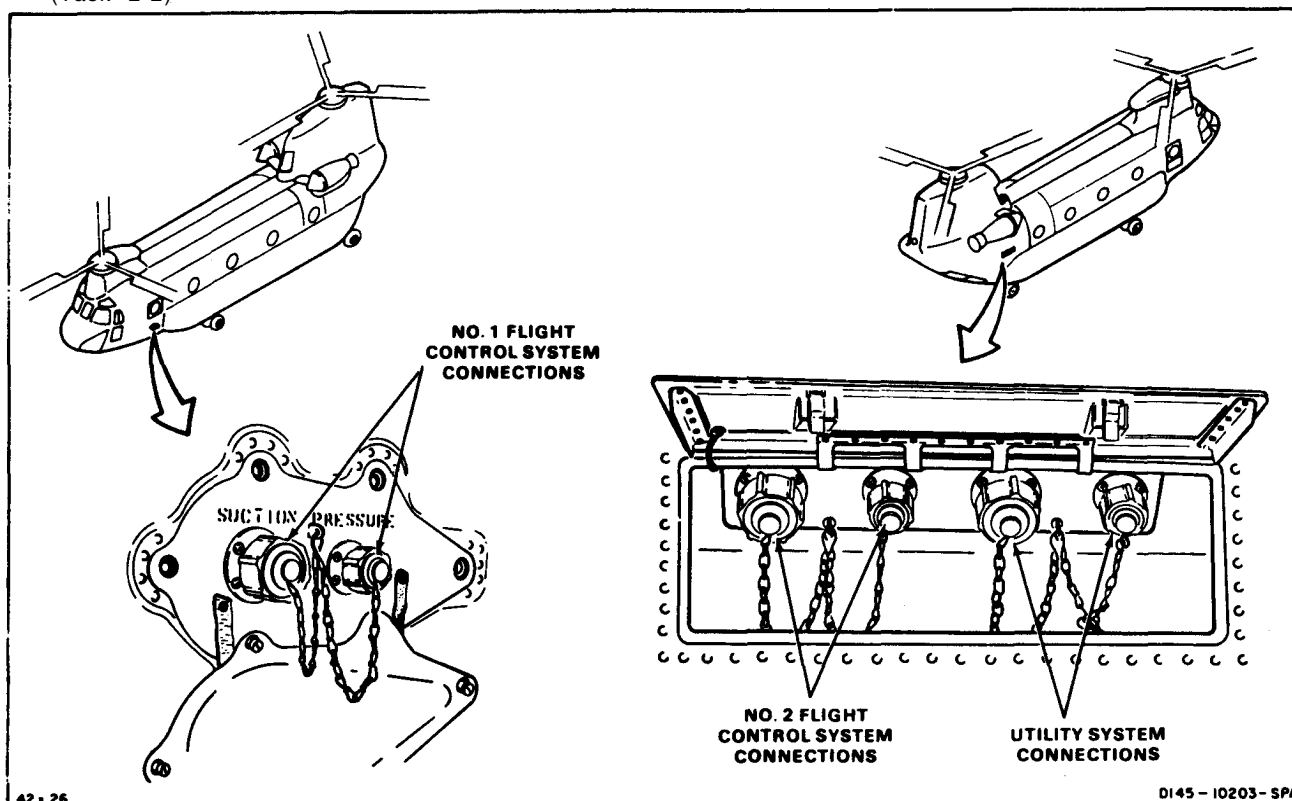
General Safety Instructions:

WARNING

If applying power to flight controls, keep hands away from controls. Application of hydraulic power will cause controls to move and rotor blades to flap. Injury to personnel can occur.

CAUTION

Test stand pressure hose must have coupling nut 3205-8 or 3305-8 installed. Return hoses must have coupling nut 3205-12 or 3305-12 installed. Series 3205 are for flared fittings, and 3305 are for flareless fittings (Aeroquip or equivalent). Wrong fittings can damage connections.



42-26

DI45-10203-SPA

GO TO NEXT PAGE

Change 18 1-113

CONNECT POWER

CAUTION

Ensure maintenance personnel are qualified/experienced in operating and connecting external power.

1. Remove caps from proper test connections (1, 2, or 3) on helicopter. **Connect** pressure and suction hoses to test connections.
2. If applying power to flight control test connections (1 or 2), **adjust test stand** as follows: (Refer to applicable technical manual.)
 - a. Set tank pressurizing valve to 50 psi.
 - b. Set relief valve to 3,750 psi.
 - c. Set volume output to 8 gpm.
 - d. Set pressure compensator to 3,000 psi.

NOTE

If pressurizing both flight control systems at once, use two test stands

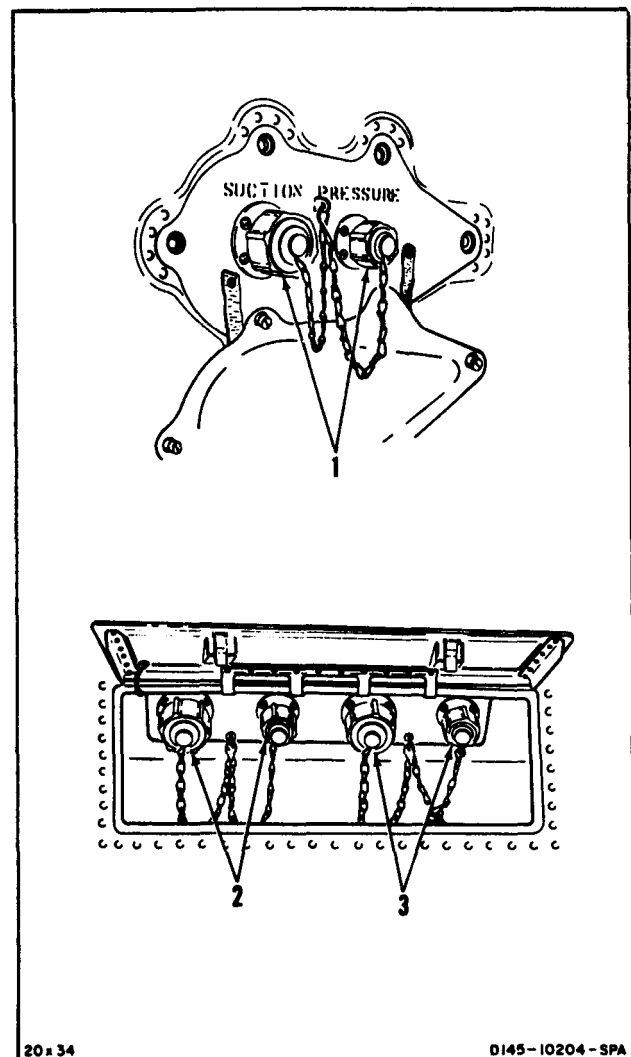
3. If applying power to utility system test connections (3), adjust test stand as follows: (Refer to applicable technical manual.)
 - a. Set tank pressurizing valve to 50 psi.
 - b. Set relief valve to 3,750 psi.
 - c. Set volume output to 12 gpm.
 - d. Set pressure compensator to 3,000 psi. If starting main engines, set compensator to 3,350 psi.

DISCONNECT POWER

4. **Shut down test stand.** (Refer to applicable technical manual.)
5. **Disconnect hoses** from test connections (1, 2, or 3). Install caps on connections.

GO TO NEXT PAGE

1-114 Change 18



1-38 APPLY EXTERNAL HYDRAULIC POWER (Continued)

1-38**FOLLOW-ON MAINTENANCE:**

Install access cover on No. 1 flight control connections and close panel on No. 2 flight control and utility hydraulic system connections, as needed (Task 2-2).

END OF TASK

1-39 DISCONNECT AND CONNECT BATTERY**1-39**

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

None

Personnel Required:

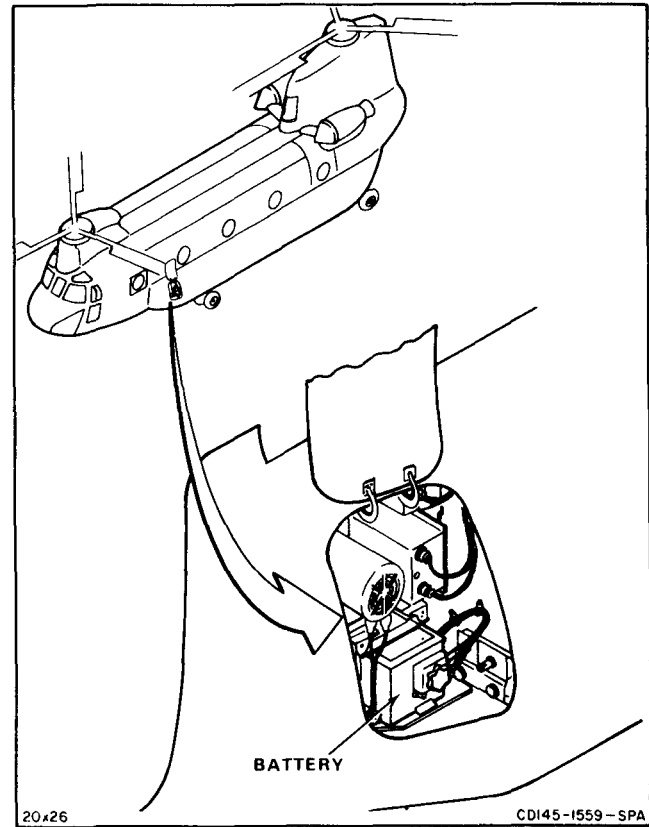
Medium Helicopter Repairer

Equipment Condition:

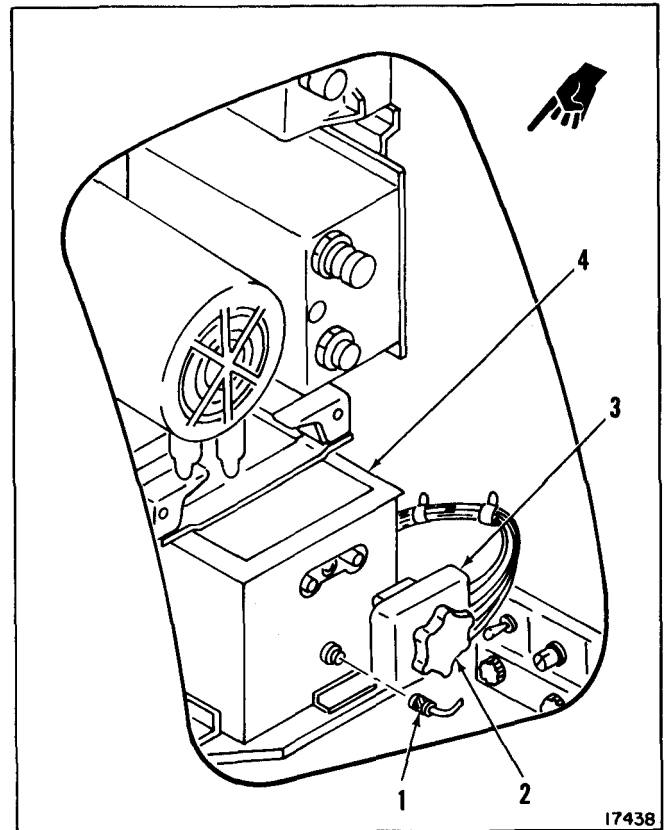
Electrical Power Off

Electrical Equipment Access Door Open

(Task 2-2)

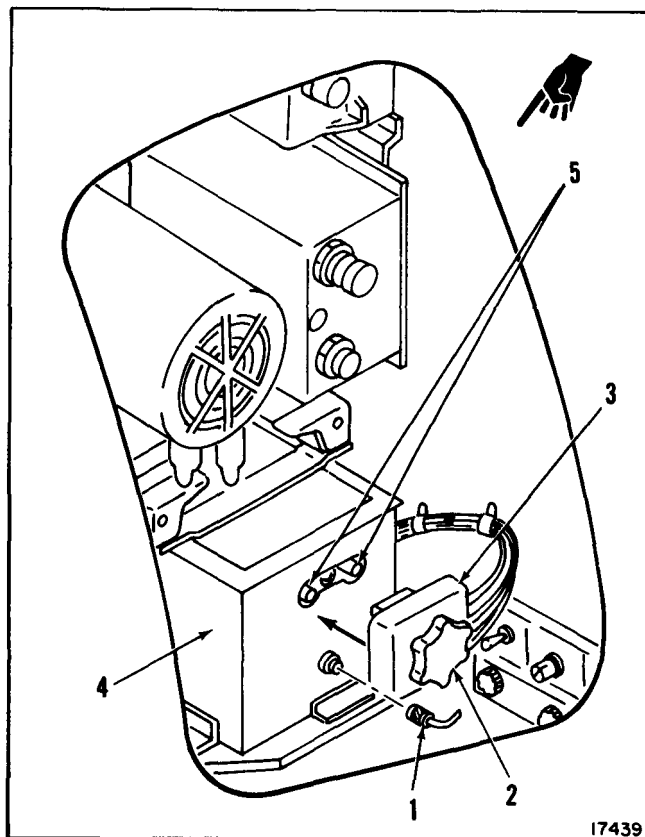
**DISCONNECT**

1. Disconnect battery charger plug (1).
2. Turn knob (2) counterclockwise several turns to release connector (3).
3. Pull connector (3) from battery (4). Place it on shelf in front of battery.

**GO TO NEXT PAGE**

CONNECT

4. When battery power is needed, align connector (3) with pins (5). **Push connector into battery (4).** Secure by turning knob (2) clockwise until tight.
5. Connect battery charger plug (1).

**FOLLOW-ON MAINTENANCE:**

Close electrical equipment access door
(Task 2-2).

1-40 INSTALL HOISTING UNIT**1-40**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
 NSN5180-00-323-4692
 Hoisting Unit (T4)
 Rope Guide Lines (2)
 Workstand
 Loop, 8 to 12 Inches Diameter, Made of Nylon
 or Wire Cable, 1/4-inch Diameter

Materials:

None

Personnel Required:

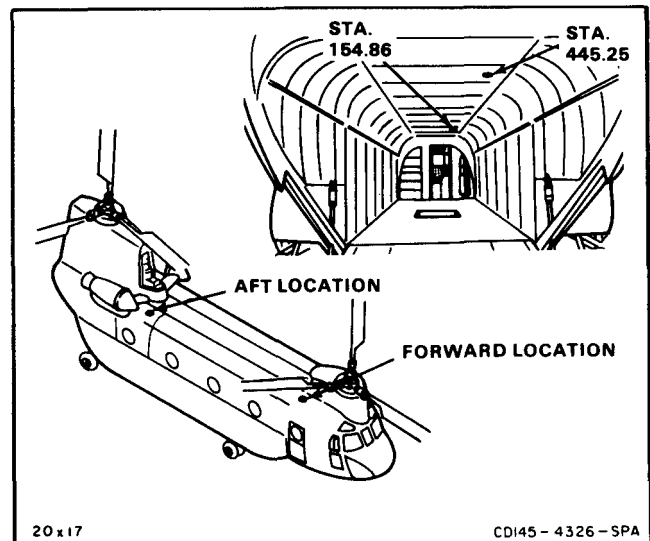
67U10 Medium Helicopter Repairer (4)
 67U20 Medium Helicopter Repairer
 67U30 Inspector

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Troop Seats Stowed (Task 2-233)
 Upper Cabin Door Removed For Forward in-
 stallation (Task 2-150)
 Cabin Acoustic Blanket Removed (Task 2-208)

References:

TM 55-1520-240-23 P



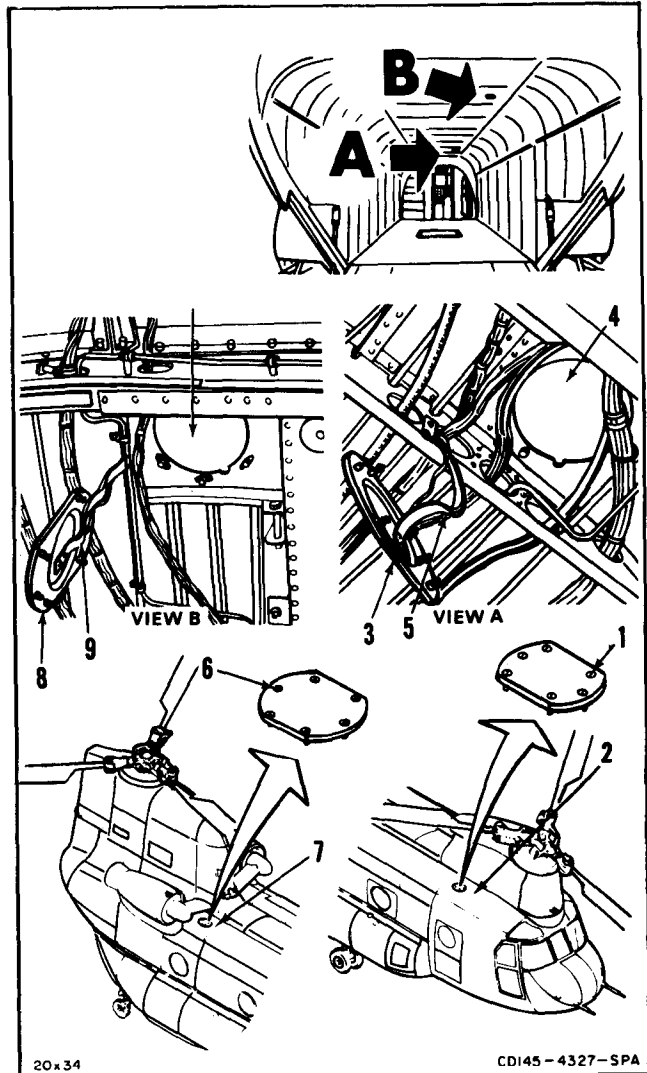
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1-40 INSTALL HOISTING UNIT (Continued)

NOTE

Procedure is similar for installing hoisting unit in forward and aft positions. Differences are noted in task steps. Forward installation is shown here.

1. For forward installation, release six fasteners (1) on top of fuselage (2). Remove unit access cover (3) from hole (4) and let it hang from attached strap (5).
2. For aft installation, release six fasteners (6) on top of fuselage (7). Remove unit access cover (8) and let it hang from attached strap (9).

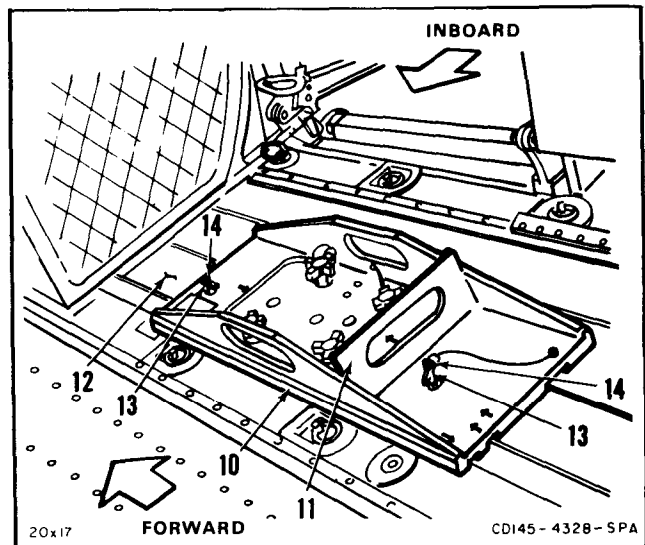


3. Position base plate (10) on cabin floor at station 154.86 for forward installation. Position base plate at station 445.25 for aft installation. Position plate so that support (11) is facing aft.

WARNING

Crane can fall if quick-release pins NAS1334A2C14 on base plate are not locked in cabin floor. Injury to personnel and damage to equipment can occur.

4. Secure plate (10) to floor (12) by installing two quick-release pins (13). Pull pins without pressing release buttons (14) to make sure pins are locked in floor.



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1-40 INSTALL HOISTING UNIT (Continued)**1-40****NOTE**

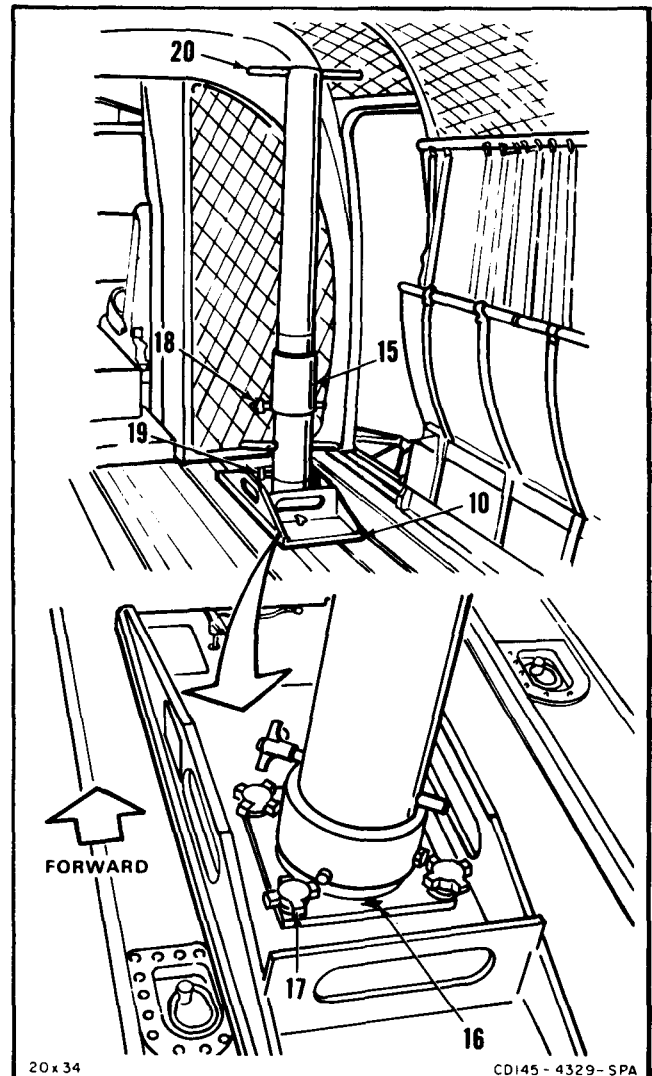
Upper and lower tubes make up cabin upright.

5. Have helpers **position cabin upright (15)** on base plate (10), arrow (16) pointing aft.

WARNING

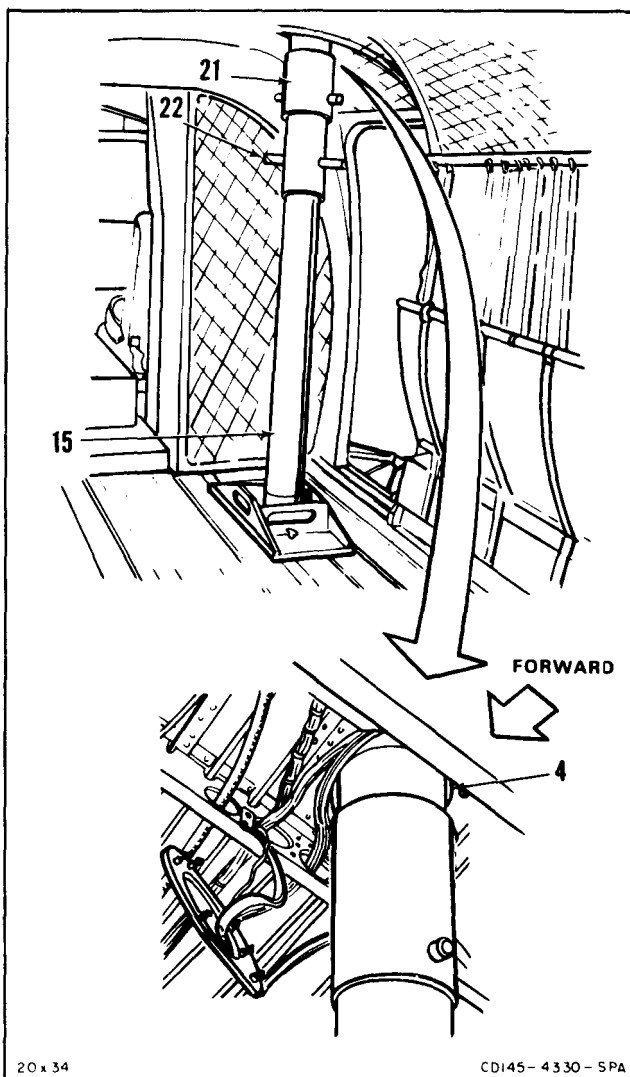
Do not align holes in cabin upright with fingers. Injury can occur. Use hand knobs.

6. Align holes in upright (15) with holes in base plate (10).
7. **Install four hand knobs (17)** and hand tighten.
8. **Remove quick-release pins (18 and 19)** from upright (15).
9. **Remove handle (20)** from upright (15).

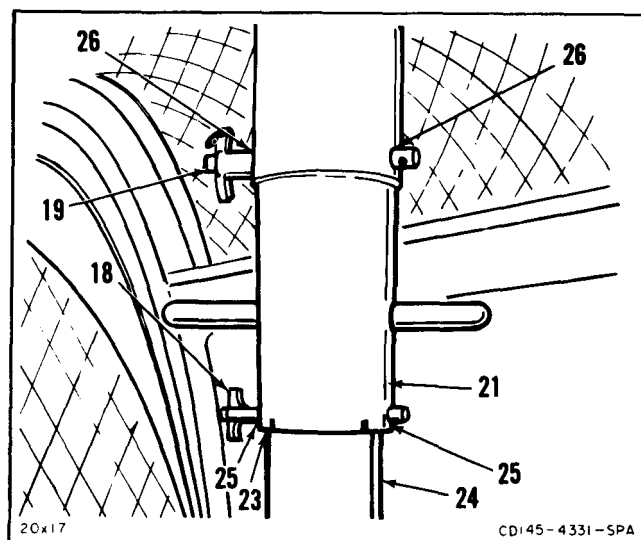
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1-40 INSTALL HOISTING UNIT (Continued)

10. Have two helpers raise upper tube (21) of upright (15) through access hole (4), using handle (22). Have other two helpers guide and steady upper tube while raised.



11. Raise tube (21) to the marked (CH-47A) position (23) on lower tube (24).
12. Install pin (18) in lower tube (24) in hole of position (23).
13. Align two slots (25) in upper tube (21) over pin (18). Let slots in tube rest on pin.
14. Install pin (19) through holes (26) of upper tube (21) and lower tube (24).



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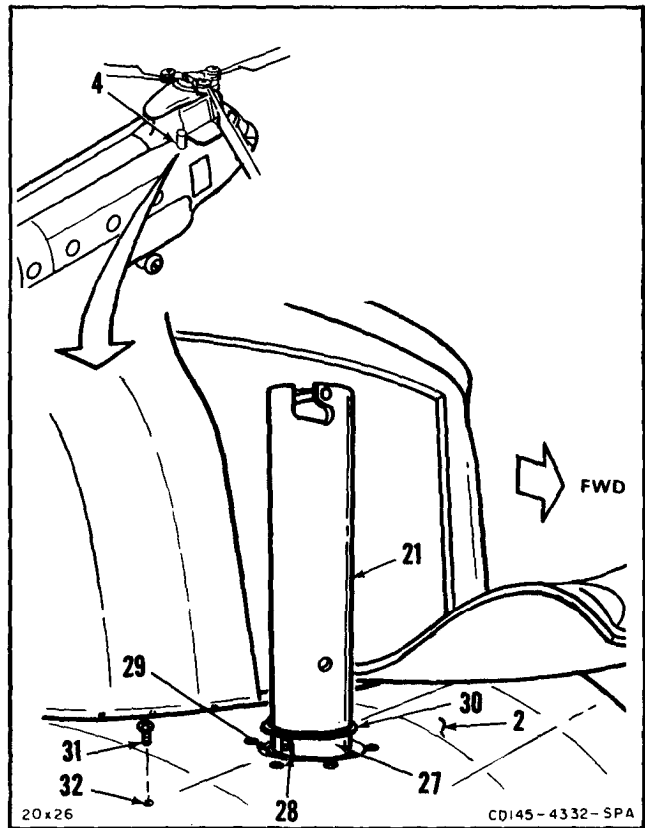
1-40 INSTALL HOISTING UNIT (Continued)

15. **Position sleeve (27)** over upper tube (21). Align guide bars (28) on sleeve with slots (29) in hole (4). Push sleeve in hole until lip (30) is against fuselage (2).

NOTE

Hole is marked sta 179.7 at forward location. It is marked 419.5 at aft location.

16. Remove screw (31) from hole (32) in fuselage.

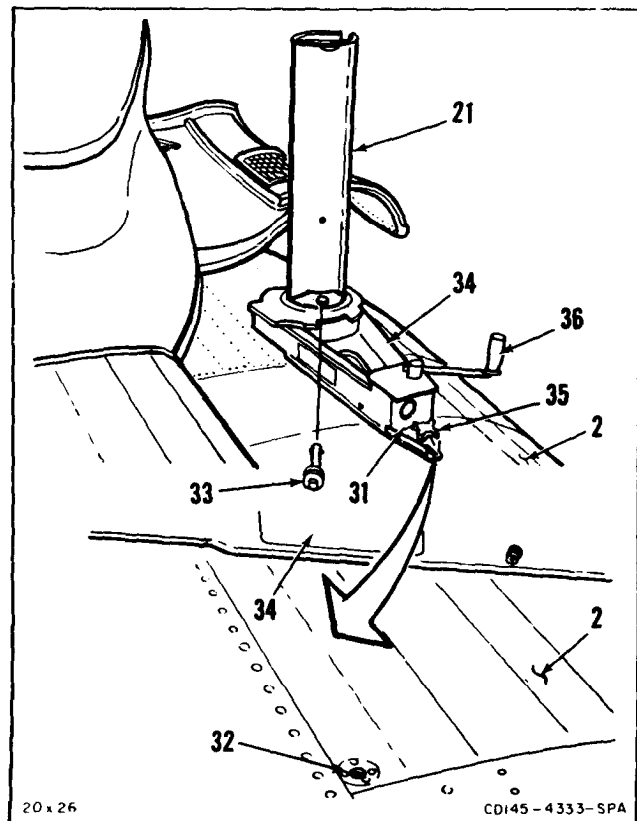


17. Remove quick-release pin (33) from azimuth control (34).
18. **Position control (34)** over tube (21) and lower control to fuselage (2).
19. **Install quick-release pin (33)** through control (34) and tube (21).
20. **Position aft end of control (34)** over threaded hole (32). **Install captive screw (35)** in hole and hand tighten.
21. Stow screw (32) in stowage place in azimuth control (34).

CAUTION

Upper tube must be returned to original position to ensure secure mast and boom installation. If tube is not in original position, mast and boom can slip out. Damage to equipment will result.

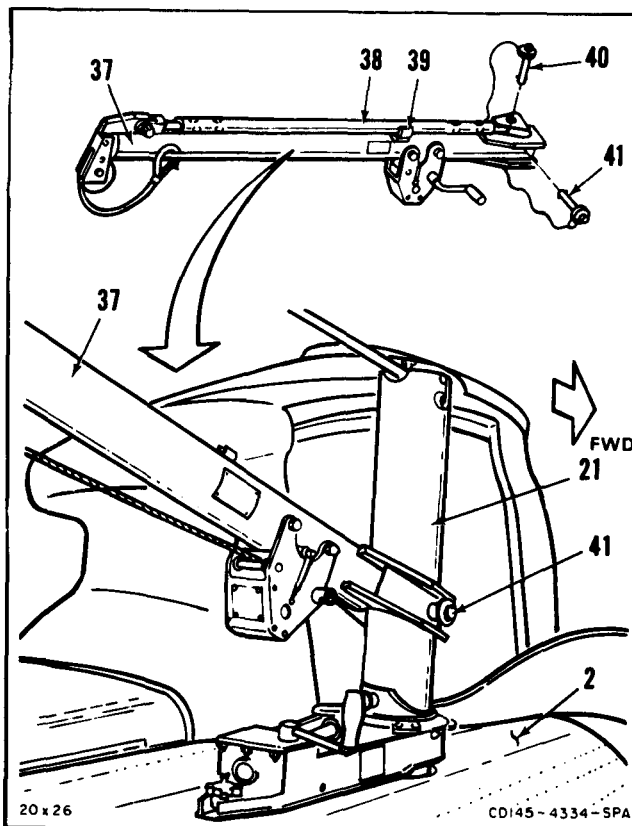
22. Rotate upper tube (21) by turning handle (36) on azimuth control (34) clockwise and counterclockwise several times to make sure control is functioning.



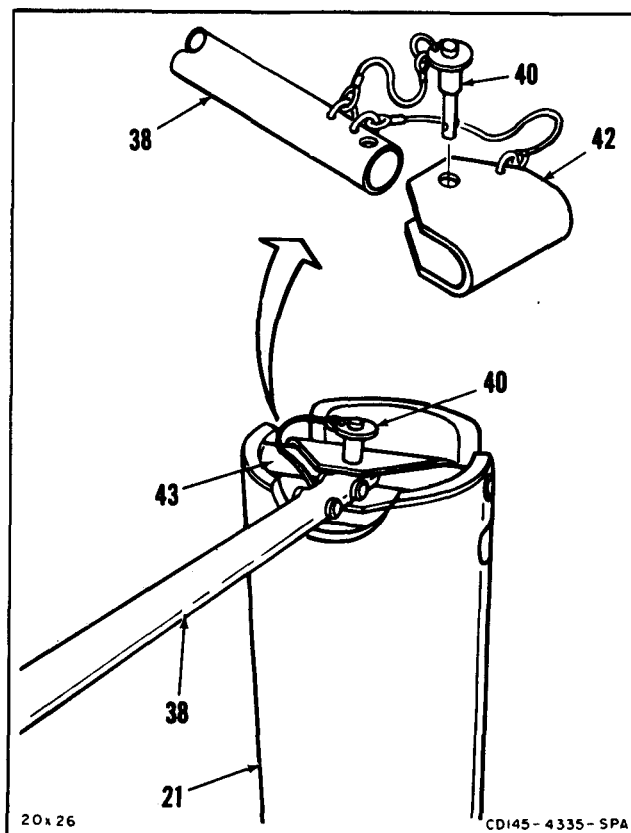
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1-40 INSTALL HOISTING UNIT (Continued)

- 23. Have two helpers place jib boom (37) on top of fuselage (2).
- 24. Remove jib boom support tube (38) from bracket (39) on boom (37). Remove quick-release pin (40).
- 25. Remove quick-release pin (41).
- 26. **Position boom (37) over upper tube (21).** Align holes in boom and upper tube. **Install quick-release pin (41).**

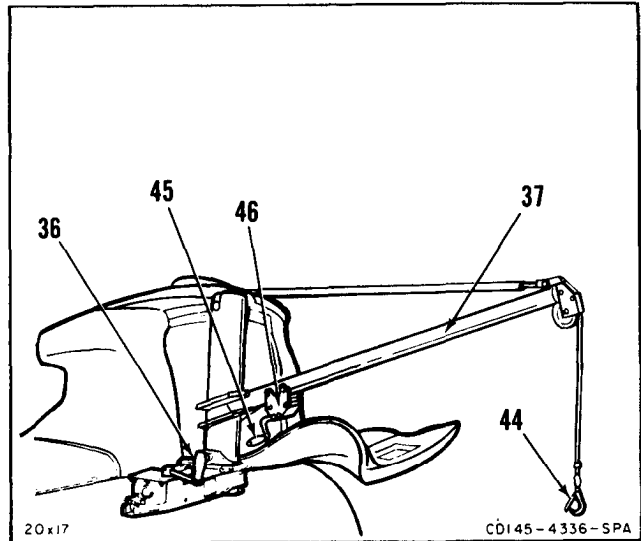


- 27. Remove strap (42) from support tube (38).
- 28. **Position support tube (38)** on top of upper tube (21). **Position strap (42) over tube (43)** in upper tube (21).
- 29. **Install pin (40).**

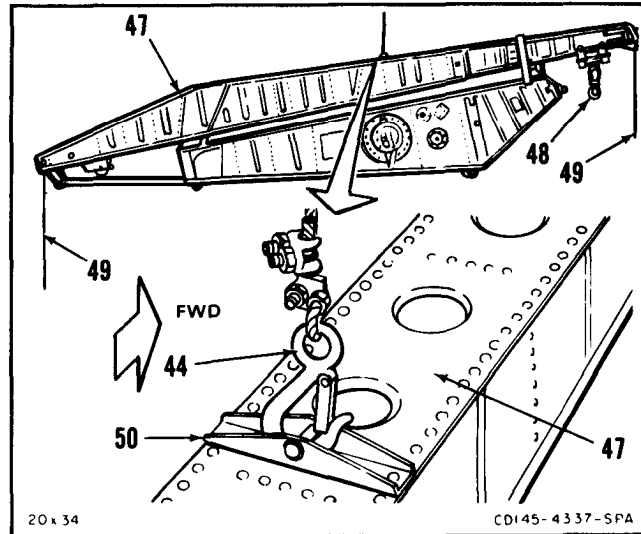


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- 30. Remove hook (44) from stowed position.
- 31. **Turn azimuth control handle (36) and position jib boom (37) over right side of helicopter.**
- 32. Turn winch handle (45) **DOWN** and **lower hook (44) about three feet from ground.** Down direction is indicated on winch handle (46).



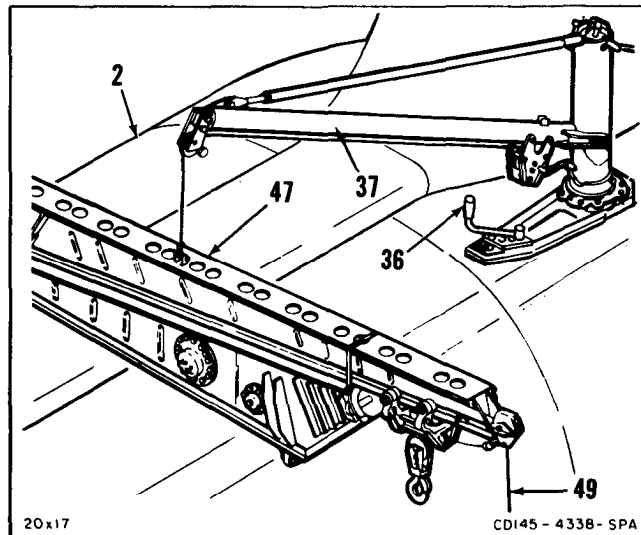
- 33. Have helpers **position mast and boom (47)** on ground beside helicopter under jib boom with trolley and hook (48) forward.
- 34. Attach rope guide lines (49) to both ends of mast and boom (47).
- 35. Attach jib boom hook (44) to bracket (50) on mast and boom (47). If hook does not fit, use a nylon or wire cable loop between hook and bracket.



CAUTION

Raise mast and boom slowly and carefully to prevent damage which otherwise might result from mast and boom hitting helicopter.

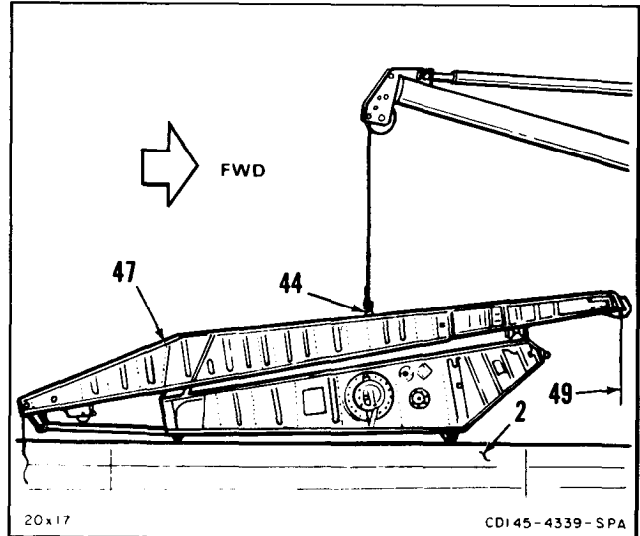
- 36. Hoist (raise) mast and boom (47) above helicopter. **Have two helpers guide mast and boom with guidelines (49).**
- 37. **Rotate jib boom (37) with azimuth control handle (36) until mast and boom (47) is positioned directly over center of fuselage (2).**



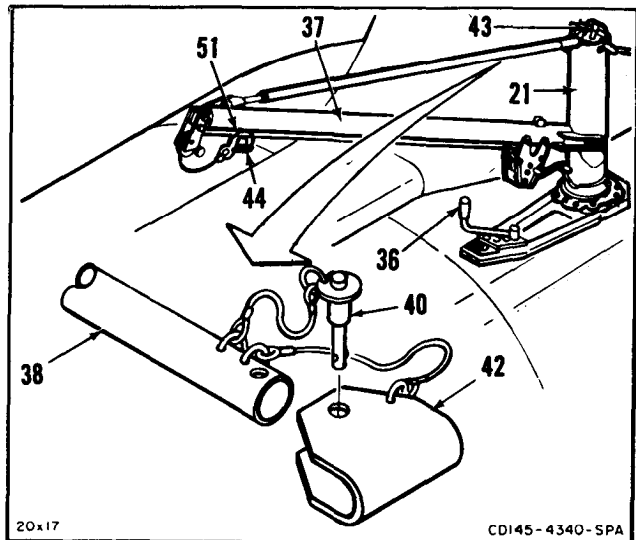
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1-40 INSTALL HOISTING UNIT (Continued)

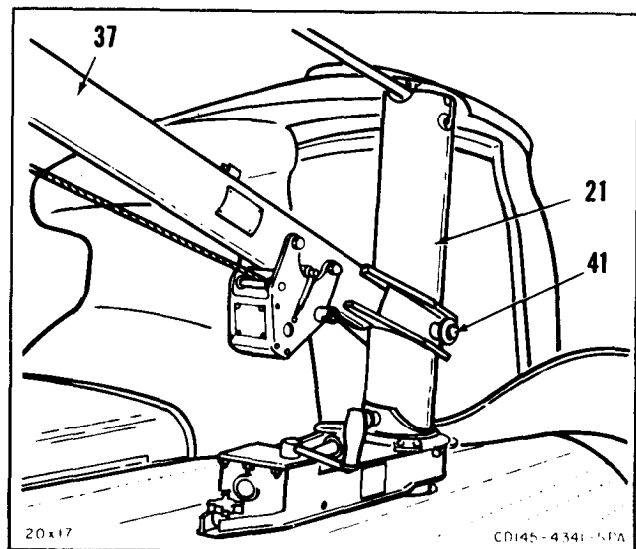
- 38. Lower hook (44). Set mast and boom (47) on fuselage (2).
- 39. Remove guide lines (49). Remove hook (44).



- 40. Raise hook (44) and place in stowed position (51) on jib boom (37).
- 41. Remove pin (40), support tube (38) and strap (42) from tube (43) on upper tube (21).
- 42. **Position strap (42) over tube (38).**
- 43. **Install pin (40).**
- 44. Rest support tube (38) on tube (21).



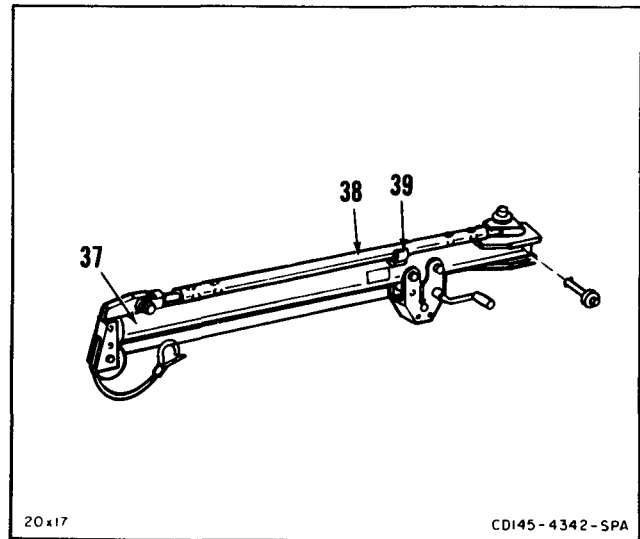
- 45. Have helpers support jib boom (37).
- 46. Remove pin (41) from jib boom (37) and upper tube (21).
- 47. Raise and **remove boom (37)** from tube (21).



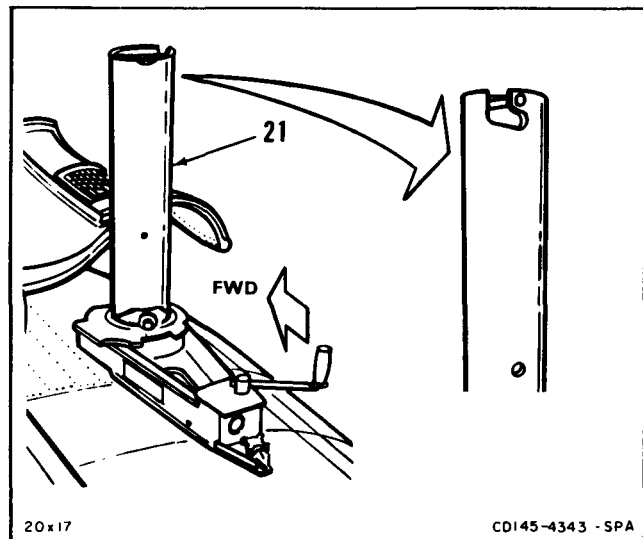
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1-40 INSTALL HOISTING UNIT (Continued)

48. Stow support tube (38) in bracket (39) and set boom (37) on workstand, away from work area.



49. Rotate upper tube (21) 180 degrees.



NOTE

Mast and boom can support itself in horizontal position on upper tube.

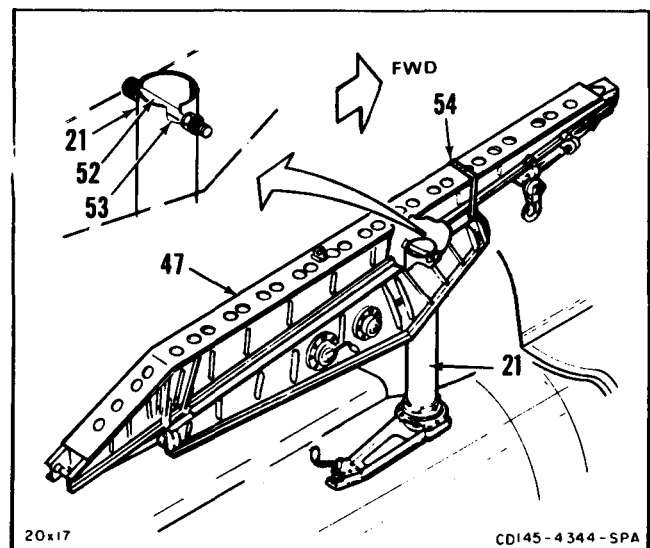
50. Have helpers position mast and boom (47) over upper tube (21).

WARNING

Mast and boom will slip out if pivot bolt is not fully seated in upper tube of cabin upright. Injury to personnel and damage to equipment can occur.

51. Check that pivot bolt (52) is in slot (53) of upper tube (21).
 52. Remove strap (54) from mast and boom (47).

GO TO NEXT PAGE



- 53. Unstow trolley and hook (48). **Attach guideline (49) to trolley and hook.**
- 54. **Remove quick-release pin (57) from tension rod (58) and mast (55).**
- 55. Remove handle (59) from stowed position. **Install handle** on hook winch (60). Remove handle (61) from stowed position. **Install handle** on trolley winch (62).

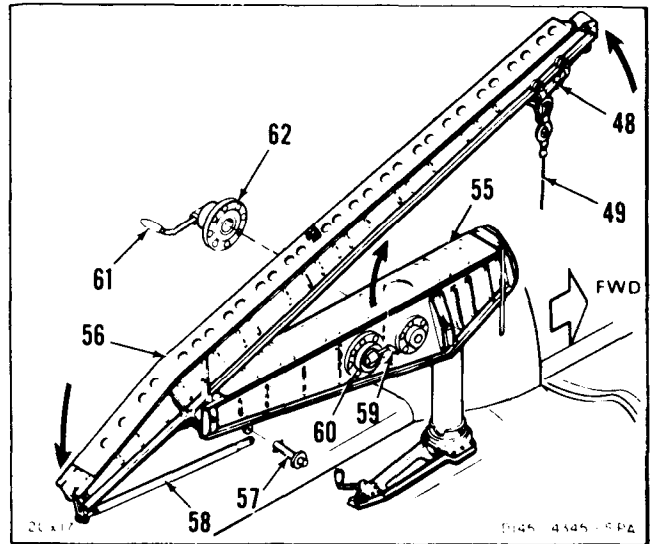
NOTE

Up and down directions are shown on winches.

CAUTION

Cable will tangle if slack is not taken up when mast and boom are raised.

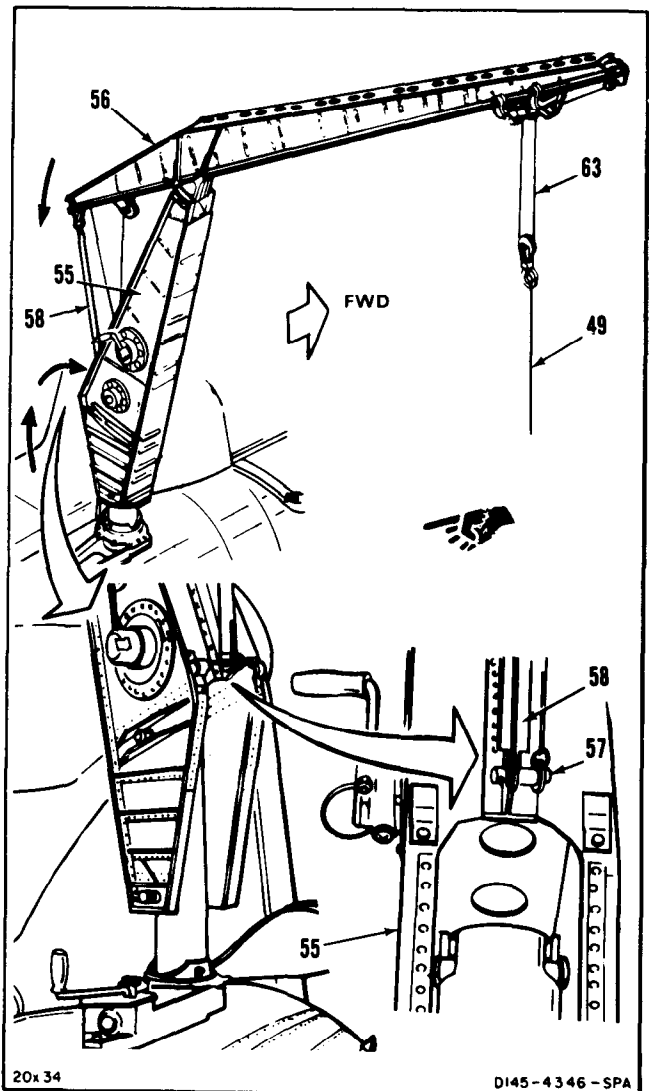
- 56. Have two helpers **raise mast (55)**. At the same time, have one helper pull down on rod (58) to **raise boom (56)**.



- 57. Have helper pull guideline (49) to **take slack from cable (63)**.

- 58. Raise mast (55) and boom (56) high enough to align hole in **tension rod (58) with bottom hole in mast (55)**.

- 59. **Install pin (57)** into tension rod (58) and mast (55).



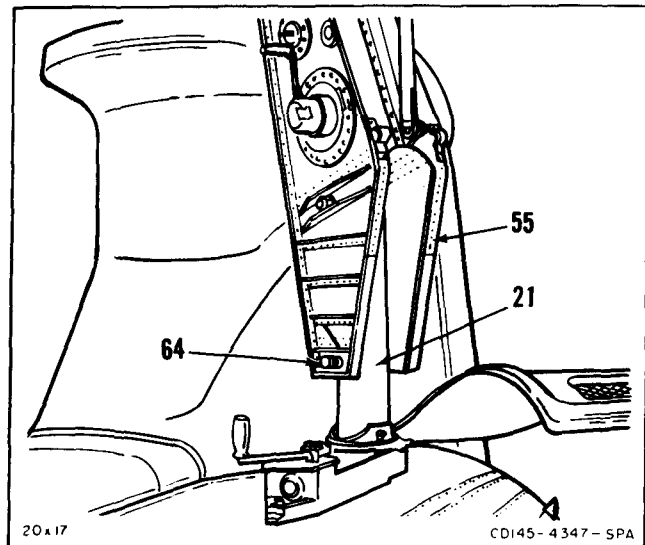
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1-40 INSTALL HOISTING UNIT (Continued)**1-40**

60. **Align** holes in **mast (55)** and **upper tube (21)**.

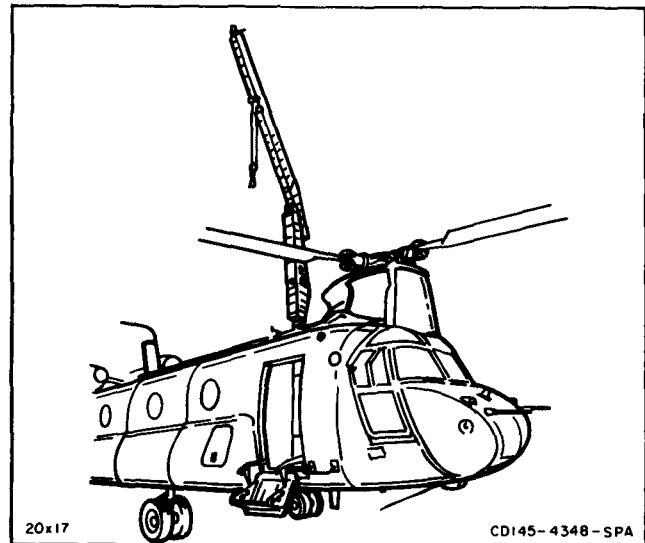
61. **Install pin (64)** into mast (55) and upper tube (21).

INSPECT



FOLLOW-ON MAINTENANCE:

None



END OF TASK

1-127

1-41 REMOVE HOISTING UNIT

INITIAL SETUP

Applicable Configurations:

All

Tools:

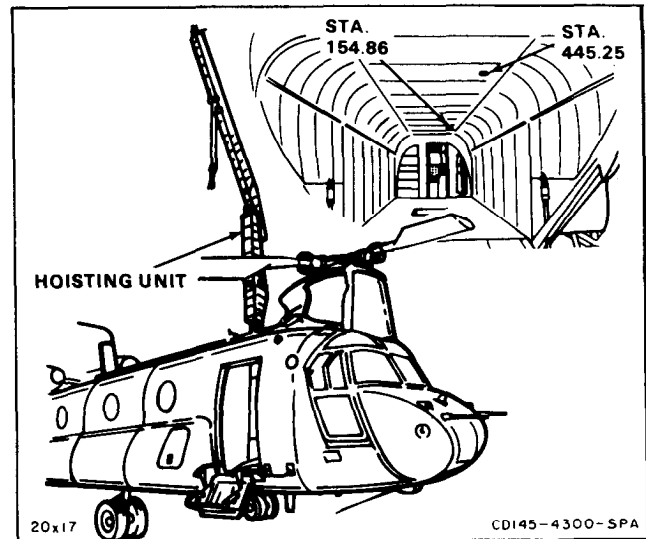
Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Workstand

Materials:

Rope Guidelines (2)

Personnel Required:

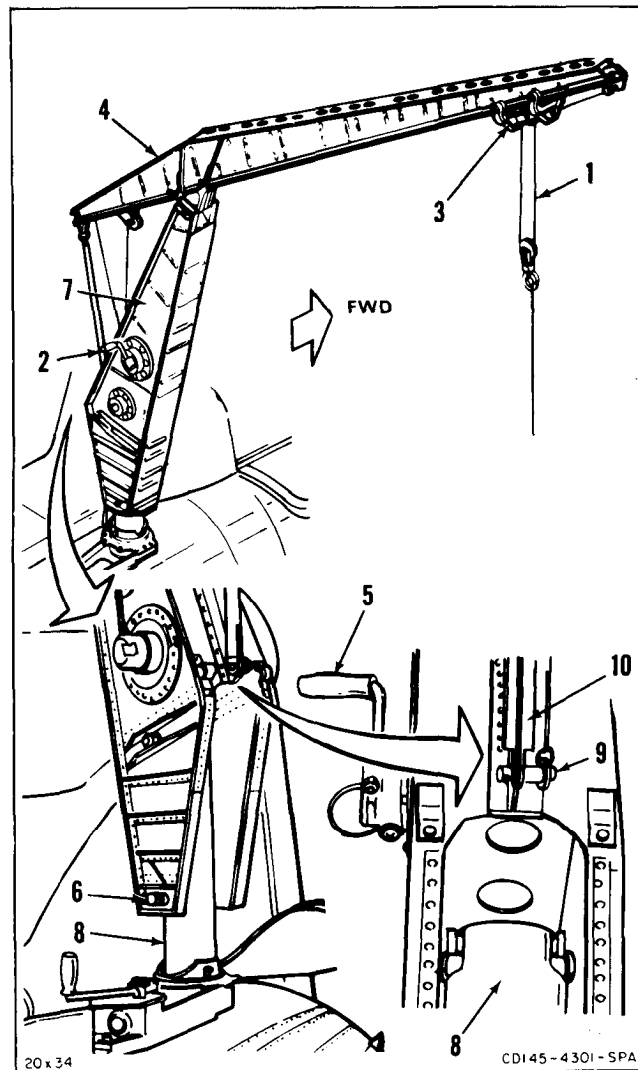
67U10 Medium Helicopter Repairer (4)
67U20 Medium Helicopter Repairer
67U30 Inspector



NOTE

- Procedure is similar for removing unit at forward and aft positions. Differences are noted in task steps. Forward removal is shown here.
- Cable will tangle if slack is not taken up when mast and boom are raised.

1. **Take up slack in cable (1)** by turning hook winch handle (2) in UP direction.
2. **Position trolley (3) at end of boom (4)** by turning trolley winch handle (5) in OUT direction.
3. **Remove quick-release pin (6)** from mast (7) and upper tube (8).
4. **Remove quick-release pin (9)** from mast (7) and tension rod (10).



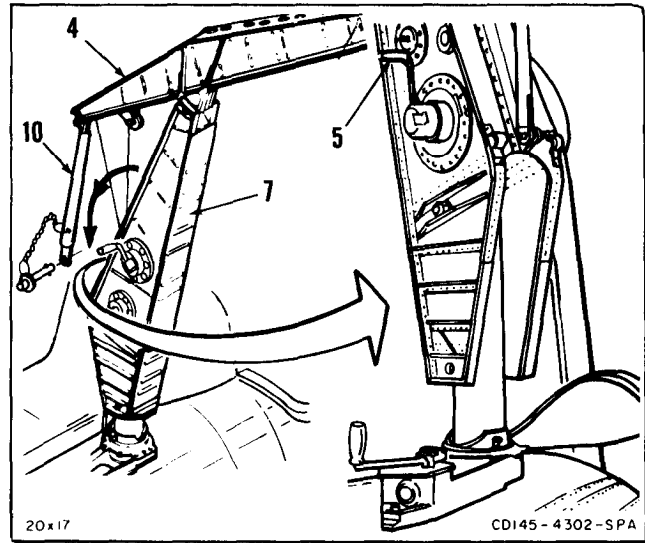
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1-41 REMOVE HOISTING UNIT (Continued)

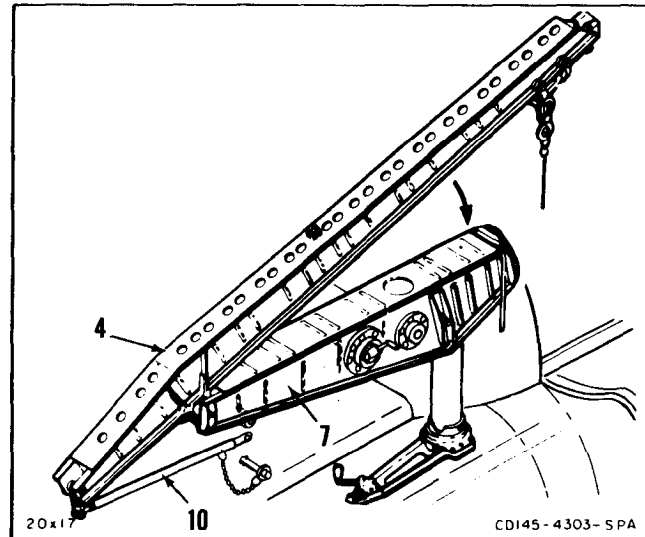
1-41

5. Lower boom (4) and mast (7) as follows:

- a. Have one helper support boom (4) by holding rod (10).
- b. Have other helpers lower mast (7) by hand. At same time, turn trolley winch handle (5) to IN direction to lower boom (4).

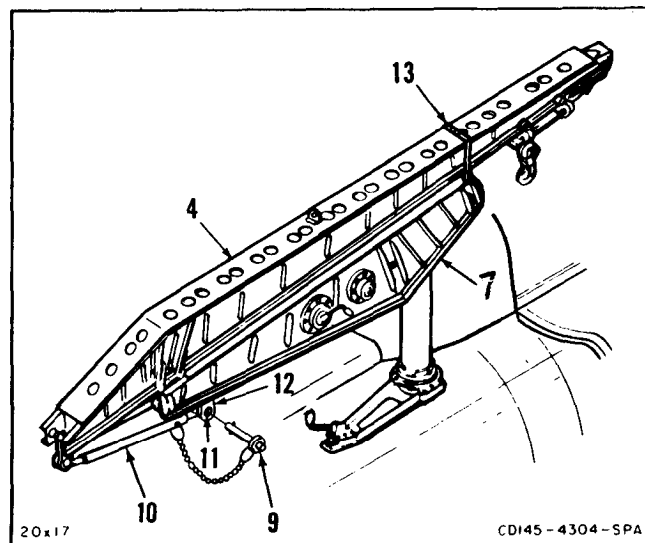


- c. Have helper holding rod (10), support and guide boom (4) until boom is lowered.
- d. Lower mast (7) and boom (4) into folded position.

**NOTE**

Upper tube can support mast and boom in folded position.

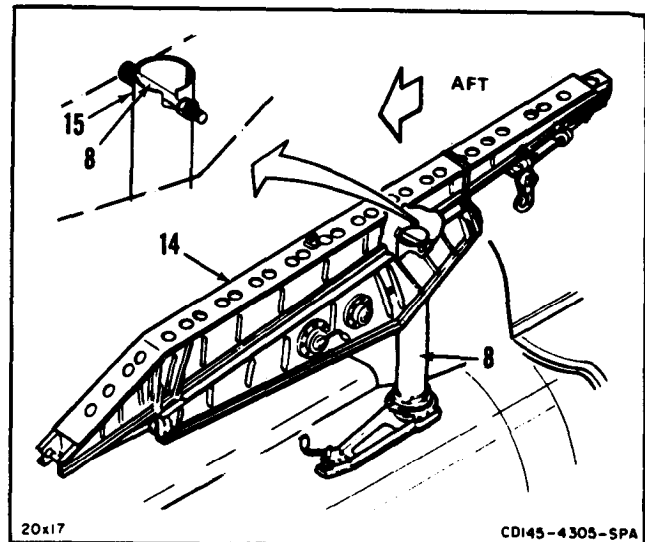
6. Align holes (11) in rod (10) and bracket (12).
7. Install pin (9) through rod (10) and bracket (12).
8. Install strap (13) to secure mast (7) and boom (4).

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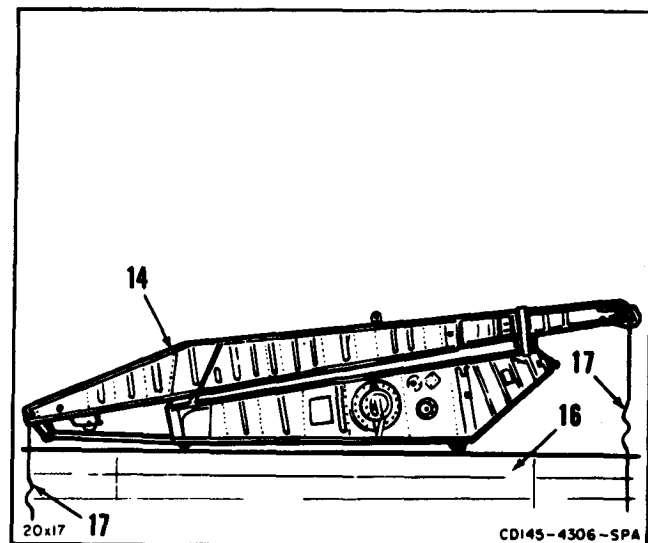
1-41 REMOVE HOISTING UNIT (Continued)

1-41

9. Slide mast and boom (14) aft so that pivot bolt (15) clears slot in cabin upright upper tube (8).
10. With four helpers lift and remove **mast and boom (14)** from upper tube (8).



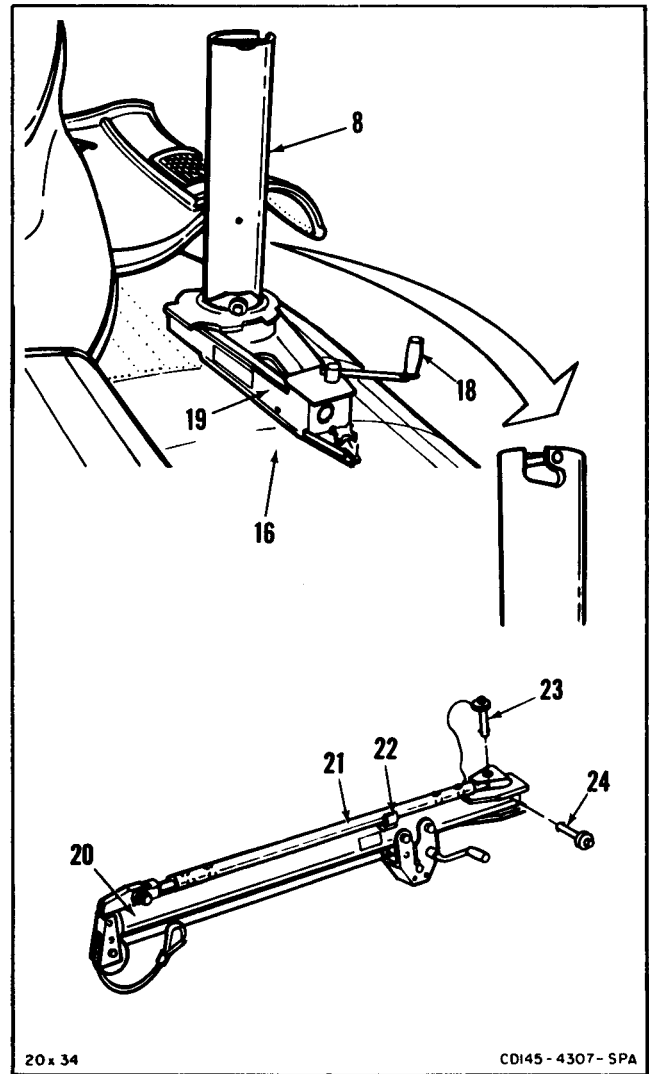
11. Set mast and boom (14) on top of fuselage (16).
12. Attach guidelines (17) to both ends of mast and boom (14).

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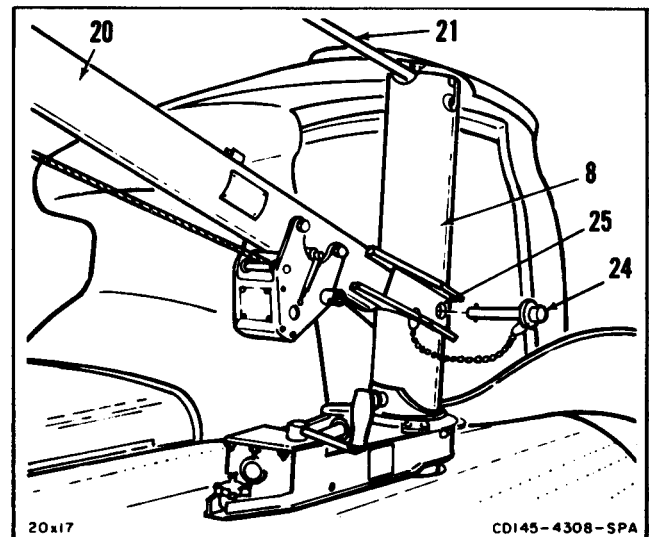
1-41 REMOVE HOISTING UNIT (Continued)

1-41

13. **Rotate upper tube (8) 180 degrees** by turning handle (18) of azimuth control (19).
14. Have helpers place jib boom (20) on top of fuselage top (16), aft of upper tube (8) for forward location. Place jib boom forward of upper tube for aft location.
15. Remove jib boom support tube (21) from stowed position on bracket (22).
16. Remove quick-release pins (23 and 24).



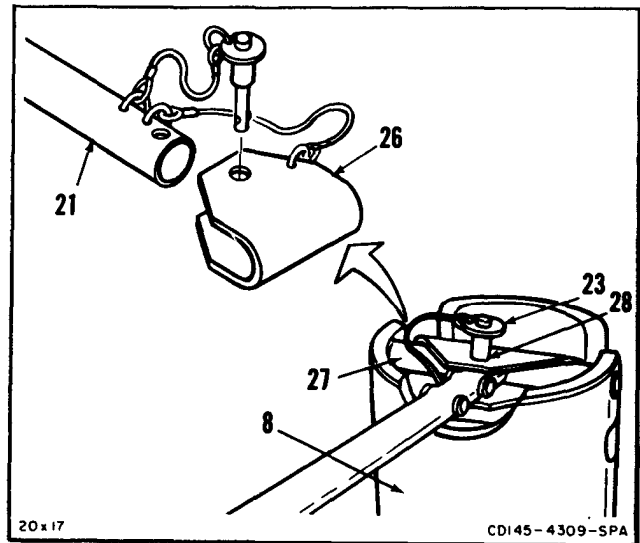
17. Have helpers **position boom (20)** over top of upper tube (8). **Position support tube (21)** on top of upper tube.
18. Align holes in boom (20) and upper tube (8). **Install pin (24)** through holes (25).

**GO TO NEXT PAGE**

1-131

1-41 REMOVE HOISTING UNIT (Continued)

- 19. Remove strap (26) from support tube (21).
- 20. **Position strap (26)** over tube (27) in upper tube (8).
- 21. **Position support tube (21) in strap (26).** **Install pin (23)** into holes (28).

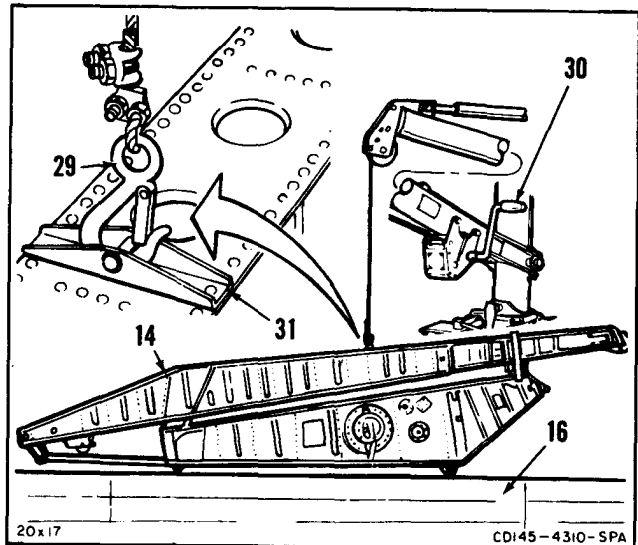


- 22. Have helpers **position mast and boom (14) under jib boom hook (29).**
- 23. Lower hook (29) by turning jib boom winch handle (30) in DOWN direction.
- 24. **Attach hook (29) to bracket (31).**

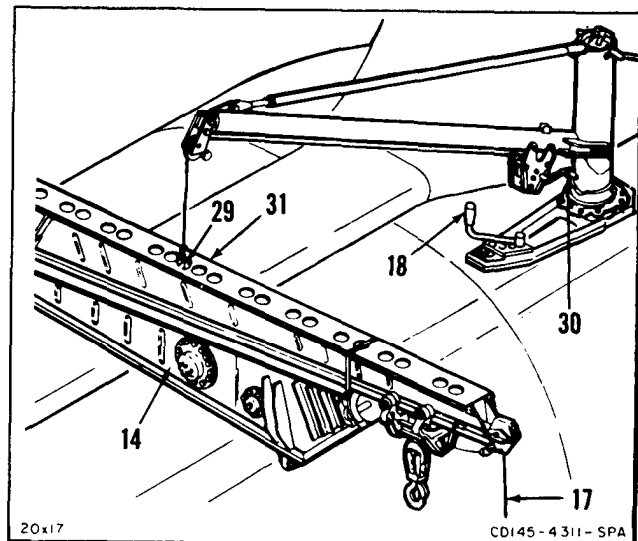
CAUTION

Helpers must guide mast and boom while it is lowered from fuselage to prevent it from hitting helicopter.

- 25. **Hoist (raise) mast and boom (14) off fuselage (16).**



- 26. Have helpers steady mast and boom (14) with guidelines (17).
- 27. Position mast and boom (14) over right side of helicopter by turning azimuth control handle (18).
- 28. **Lower mast and boom (14) to ground** by turning winch handle (30) in DOWN direction.
- 29. **Remove hook (29) from bracket (31) and rewind** by turning winch handle (30) in UP direction. **Remove guidelines (17).**

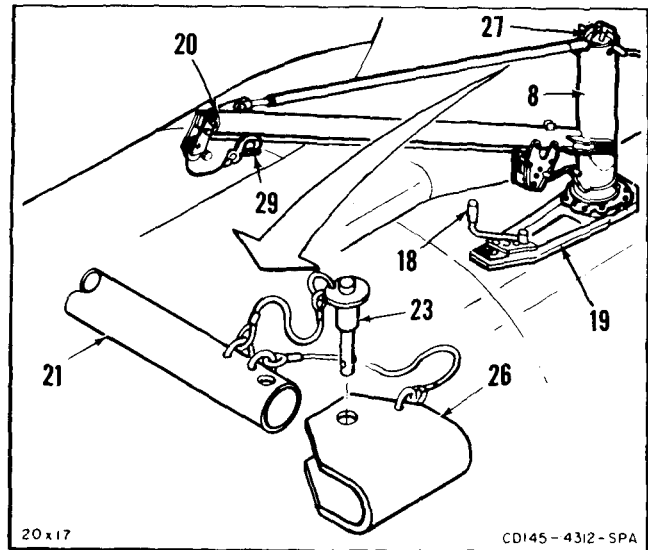


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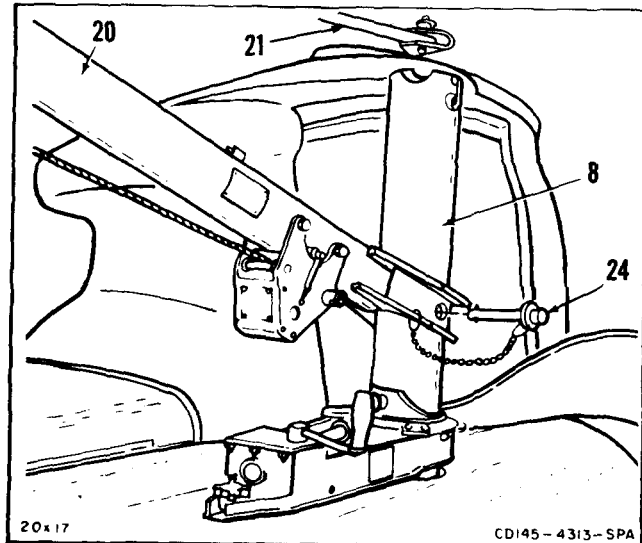
1-41 REMOVE HOISTING UNIT (Continued)

1-41

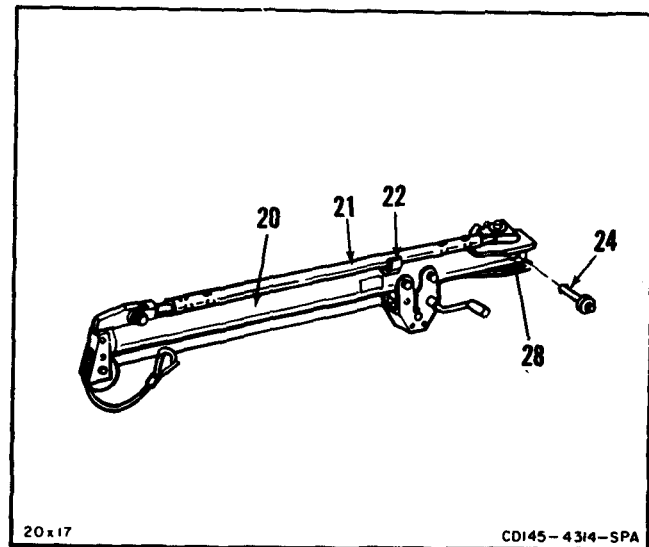
30. **Rotate boom to original position** over azimuth control (19) by turning control handle (18).
31. Place hook (29) in stowed position on boom (20).
32. **Remove pin (23), support tube (21), and strap (26) from tube (27)** in upper tube (8).
33. Install pin (23) in holes in strap (26) and tube (21). Position support tube (21) on top of upper tube (8).



34. Have helpers support jib boom (20).
35. Remove quick-release pin (24) from boom (20) and upper tube (8).
36. **Remove boom (20) and support tube (21) from upper tube (8).** Place boom (20) on workstand.



37. Stow support tube (21) in bracket (22).
38. Stow pin (24) in hole (28) in boom (20).

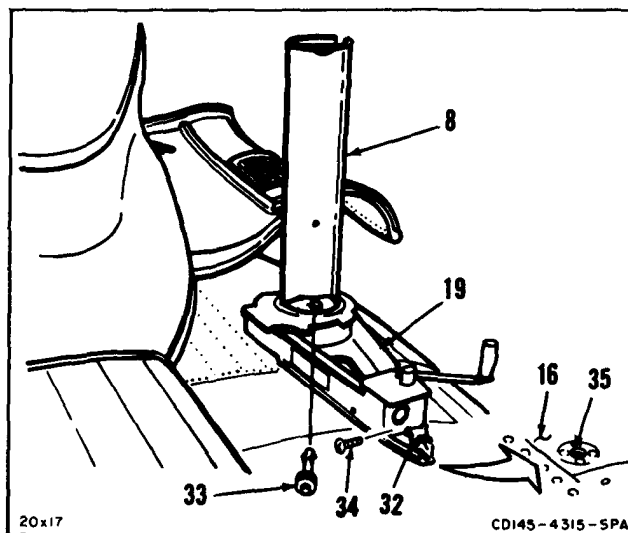


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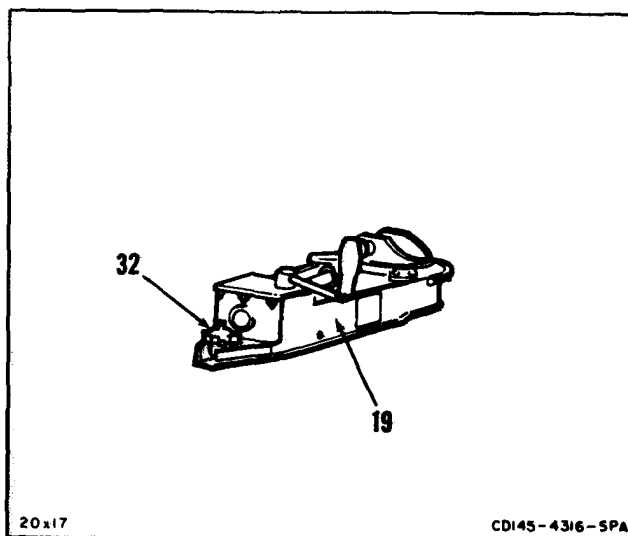
1-41 REMOVE HOISTING UNIT (Continued)

1-41

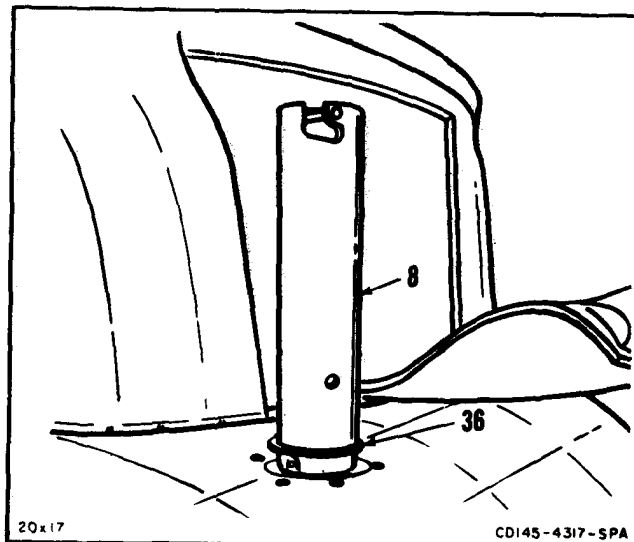
39. Remove captive screw (32).
40. Remove pin (33) from azimuth control (19) and upper tube (8).
41. **Remove azimuth control (19)** by lifting it from upper tube (8). Remove screw (34) stowed in azimuth control.
42. Install screw (34) in hole (35) in top of fuselage (16).
43. Install pin (33) in azimuth control (19).



44. Stow captive screw (32) on azimuth control (19).



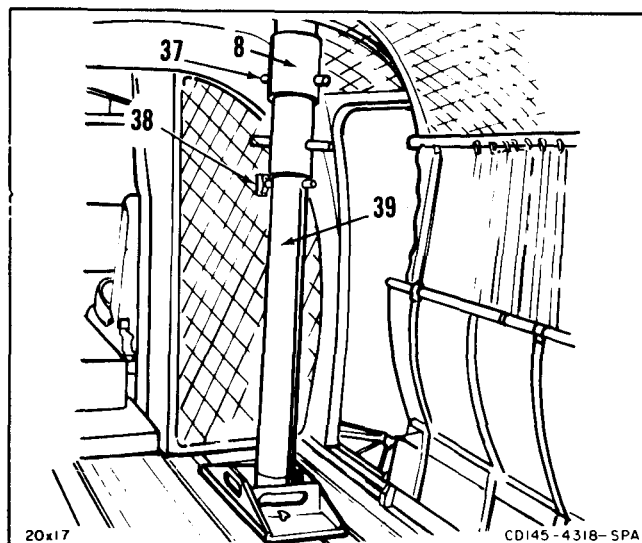
45. **Remove sleeve (36)** from upper tube (8).

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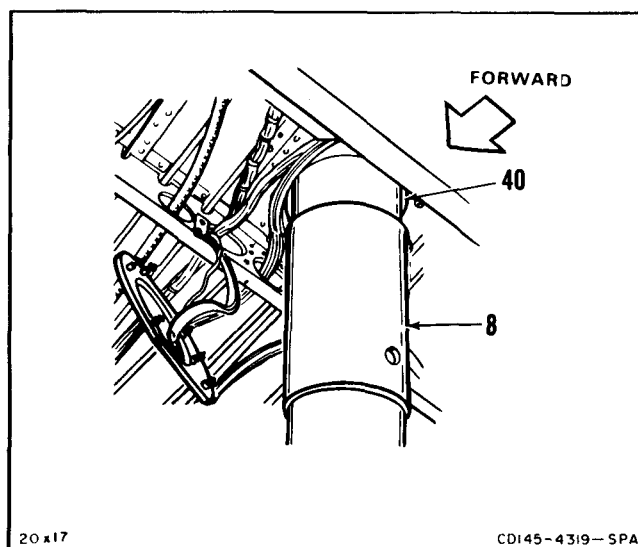
1-41 REMOVE HOISTING UNIT (Continued)

1-41

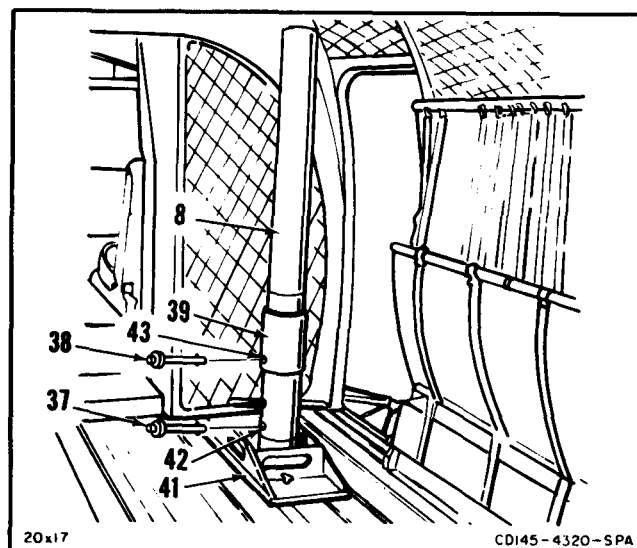
46. Have two helpers support upper tube (8).
47. Remove pins (37 and 38).
48. Have other two helpers **lower upper tube (8) over lower tube (39)**.



49. Have two helpers steady tube (8) down through hole (40).



50. Let tube (8) rest on base plate (41).
51. Align holes (42 and 43) in upper and lower tubes (8 and 39).
52. **Install pin (37)** in hole (42).
53. **Install pin (38)** in hole (43).

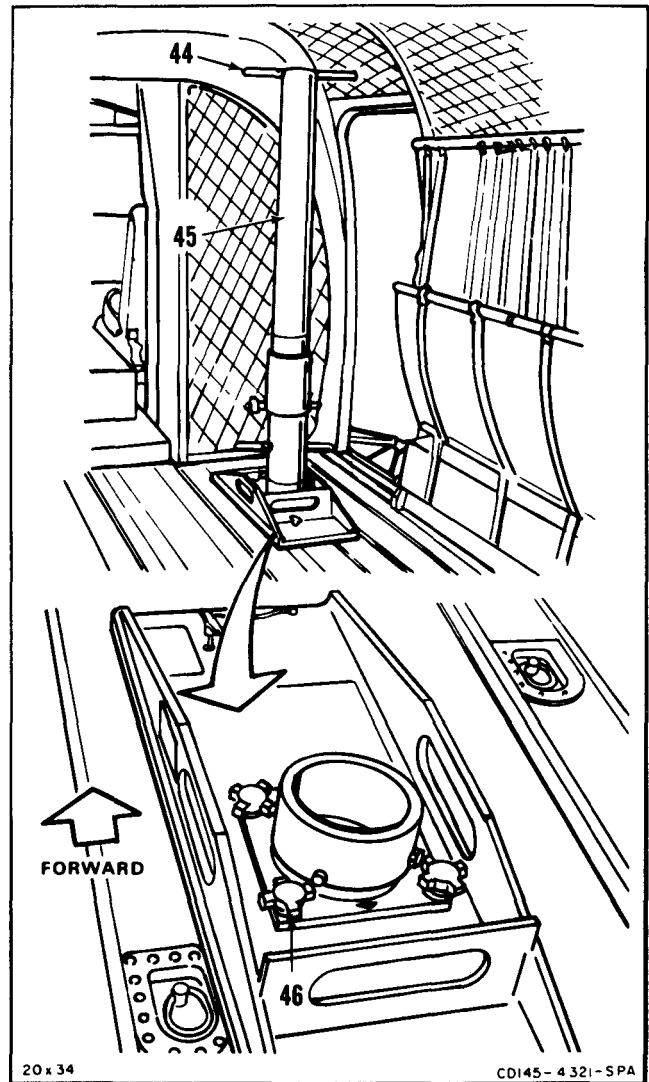
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1-41 REMOVE HOISTING UNIT (continued)

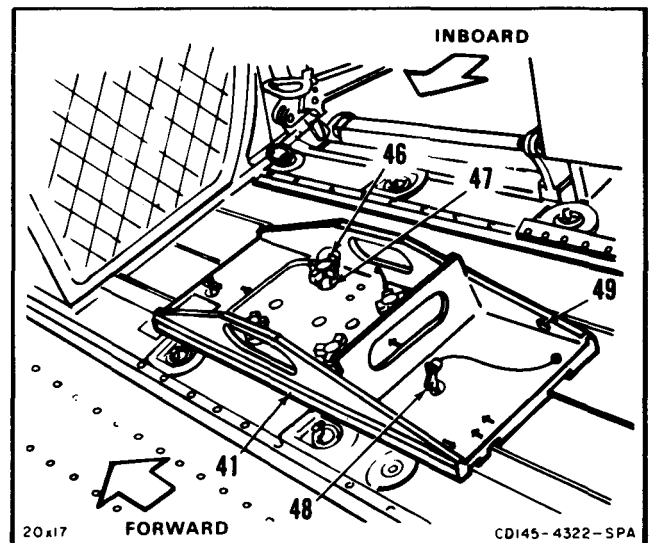
NOTE

Upper and lower tubes make up cabin upright.

- 54. Install handle (44) in cabin upright (45).
- 55. Have two helpers support upright (45).
- 56. **Remove four hand knobs (46).**
- 57. Have four helpers **remove upright (45).**



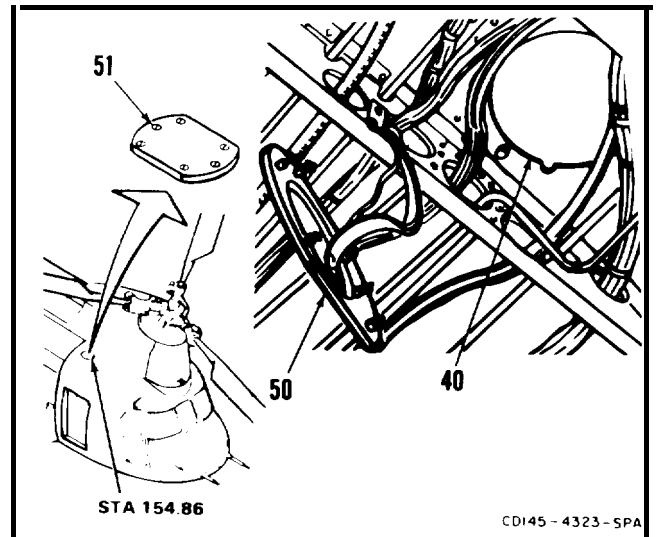
- 58. Stow knobs (46) in holes (47).
- 59. Remove quick-release pins (48) and stow in holes (49).
- 60. **Remove base plate (41).**



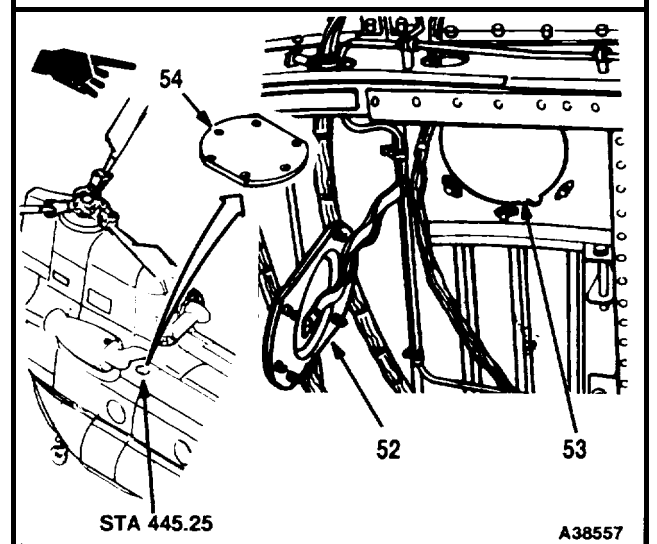
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1-41 REMOVE HOISTING UNIT (Continued)

- 61. At forward location, pull access cover (50) up through hole (40). Position cover at station 154.86 and tighten six fasteners (51).

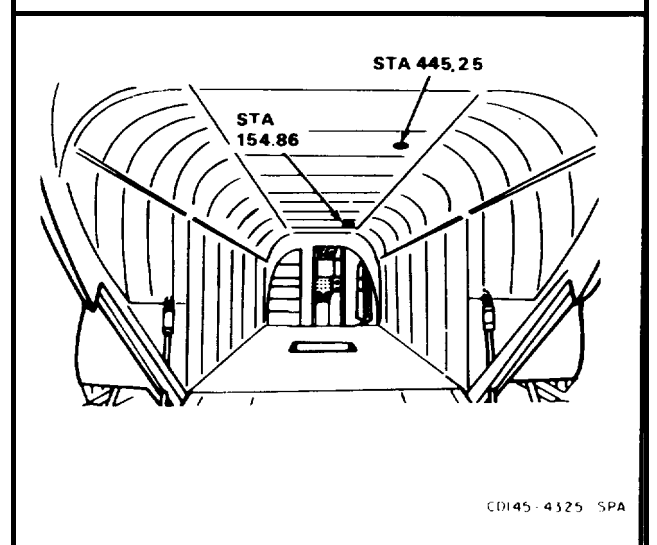


- 62. At aft location, pull access cover (52) up through hole (53). Position cover (52) at station 445.25 and tighten six fasteners (54).



FOLLOW-ON MAINTENANCE:

- Install upper cabin door (Task 2-158).
- Install cabin acoustic blanket (Task 2-210).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Aluminum Drift, 1-Inch Diameter X 6-Inches
Long

Materials:

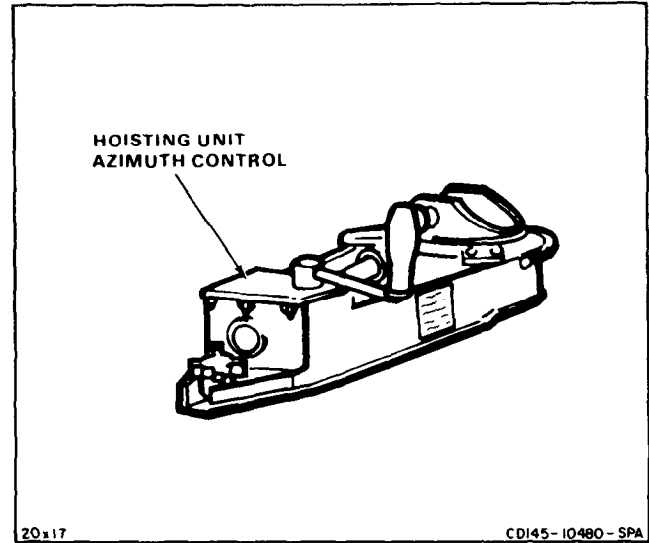
None

Personnel Required

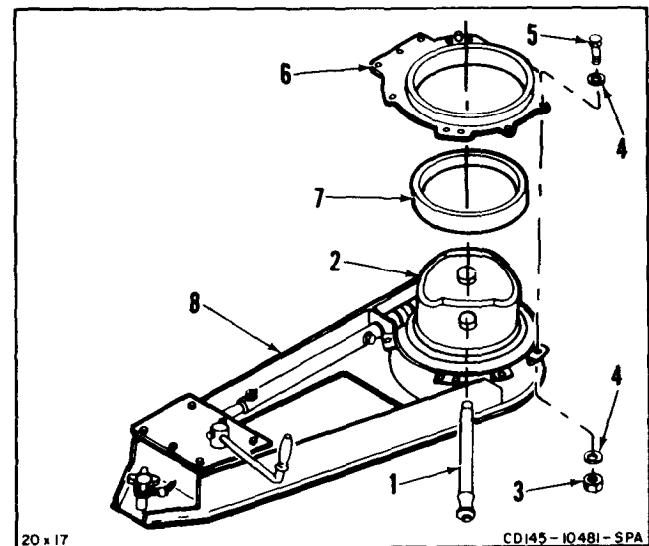
67U10 Medium Helicopter Repairer

Equipment Condition:

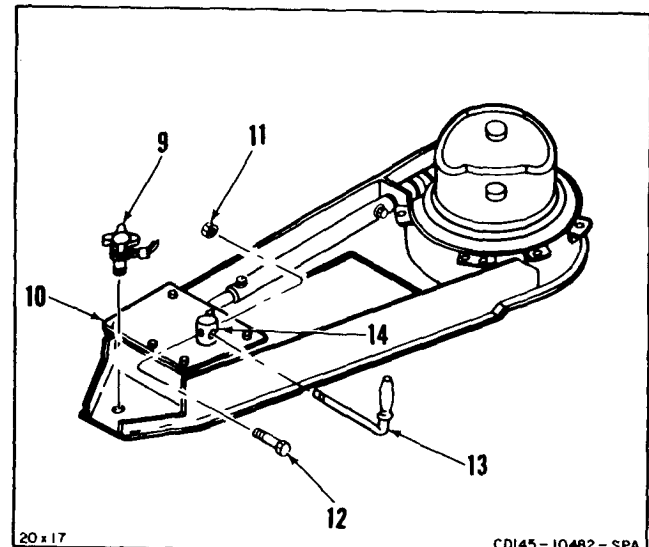
Off Helicopter Task



1. **Remove quick-release pin (1)** from worm gear (2).
2. **Remove 9 nuts (3), 18 washers (4), 9 bolts (5), worm gear cap (6)** and spacer (7) from azimuth drive housing (8).



3. **Remove captive screw (9)** from helical gear cap (10).
4. **Remove nut (11), bolt (12) and handle (13)** from pinion shaft (14).

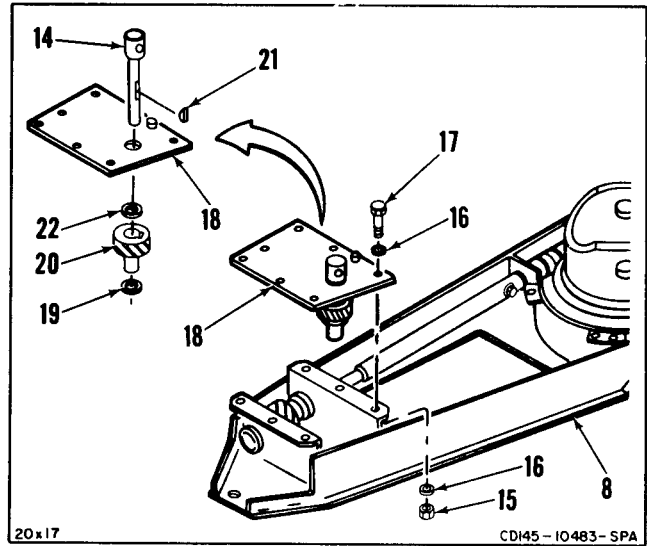


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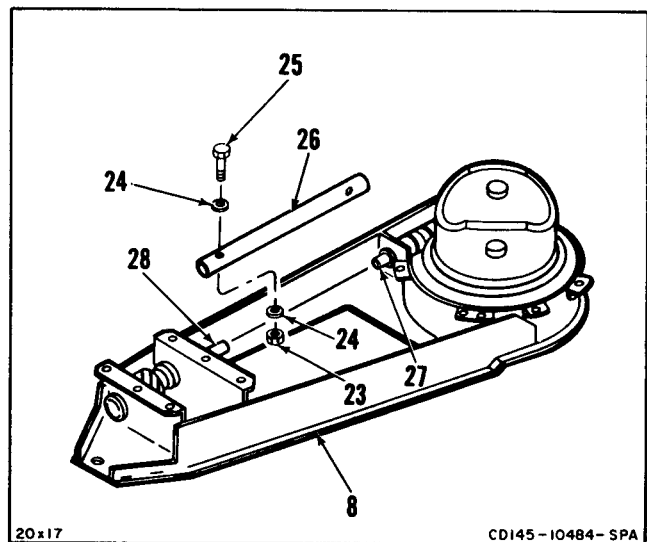
1-42 DISASSEMBLE HOISTING UNIT AZIMUTH CONTROL (Continued)

1-42

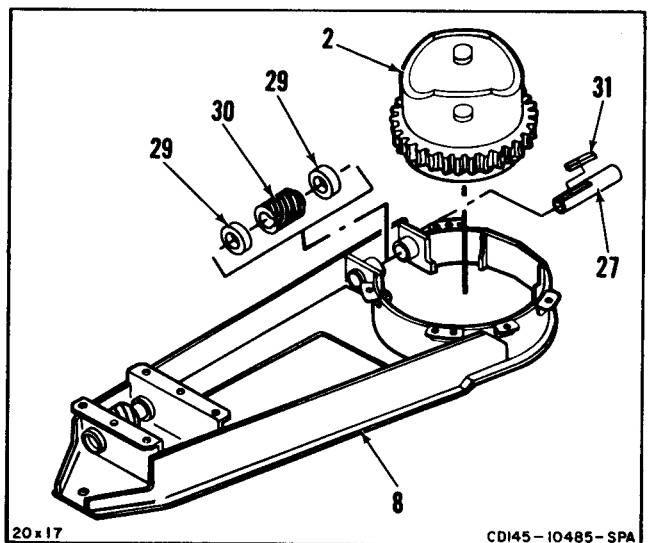
5. **Remove** 6 nuts (15), 12 washers (16), **6 bolts (17) and helical gear cap (18)** from azimuth drive housing (8).
6. **Remove** thrust washer (19), **helical gear (20)**, key (21) and thrust washer (22) from pinion shaft (14).
7. **Remove pinion shaft (14)** from helical gear cap (18).



8. **Remove** nut (23), two washers (24), and **bolt (25)**, from each end of shaft connector (26).
9. **Push azimuth drive shaft (27) and pinion drive shaft (28) into housing (8) enough to clear shaft connector (26).**
10. **Remove shaft connector (26).**



11. Push azimuth drive shaft (27) from housing (8). Use drift. **Remove azimuth drive shaft, two bearings (29), worm (30) and key (31)** from housing (8).
12. **Remove worm gear (2).**



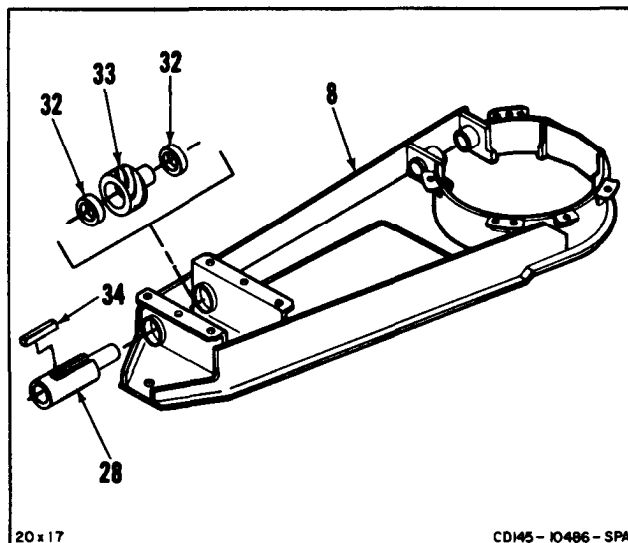
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1-42 DISASSEMBLE HOISTING UNIT AZIMUTH CONTROL

(Continued)

1-42

13. Push pinion drive shaft (28) from housing (8). Use drift. **Remove pinion drive shaft, two bearings (32), helical drive gear (33), and key (34) from housing (8).**

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

1-43 ASSEMBLE HOISTING UNIT AZIMUTH CONTROL

1-43

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Aluminum Drift, 1-Inch Diameter X 6-Inches
Long

Materials:

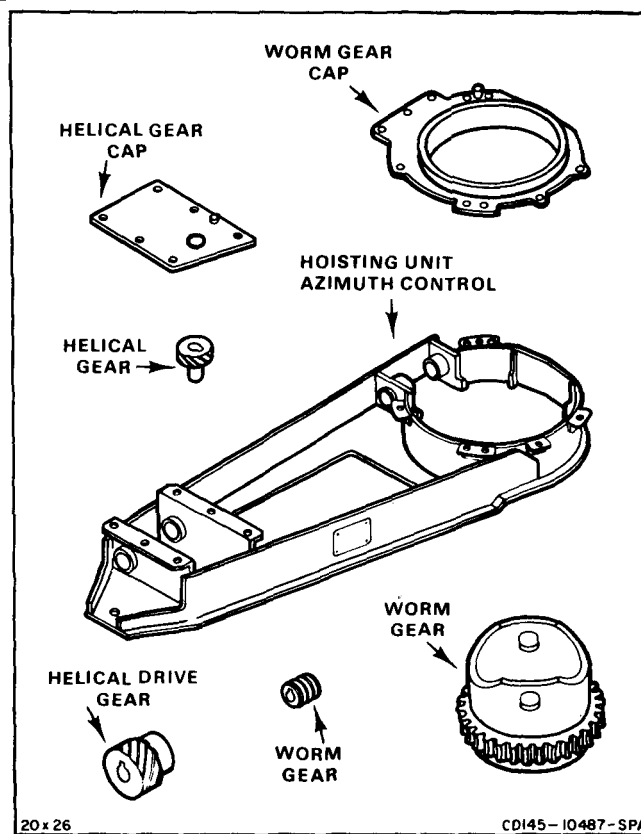
Grease (E190)

Personnel Required:

67U10 Medium Helicopter Repairer
67U30 Inspector

References:

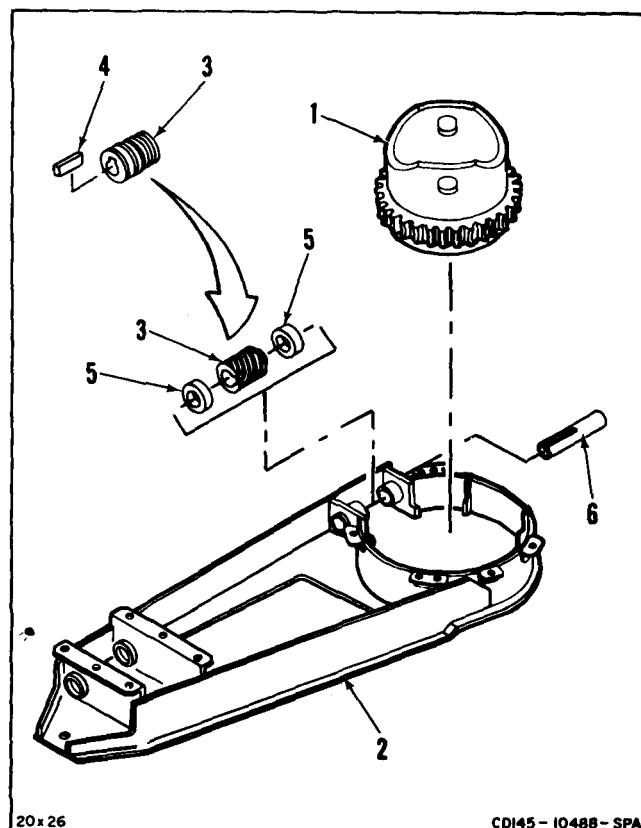
TM 55-1520-240-23P



20x26

CDI45-10487-SPA

1. **Apply** coat of **grease (E190)** to **worm gear (1)**.
2. **Install** **worm gear (1)** in azimuth drive housing (2).
3. **Apply** coat of **grease (E190)** to **worm gear (3)**.
4. **Install** **key (4)** in groove in worm gear (3).
5. **Position** **worm gear (3)** and two bearings (5) in housing (2). **Slide** **azimuth drive shaft (6)** into housing (2) until slot in shaft engages key (4) in worm.
6. **Install** **shaft (6)**.



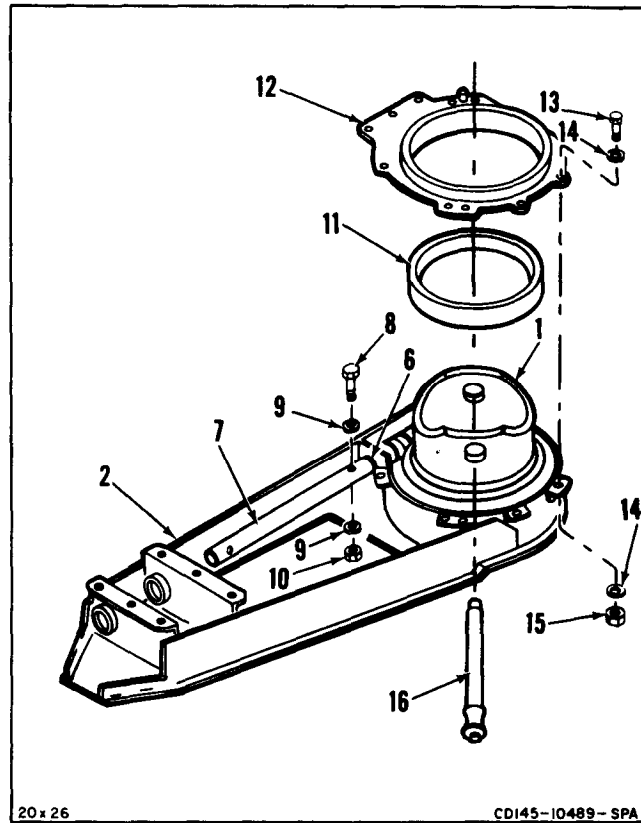
20x26

CDI45-10488-SPA

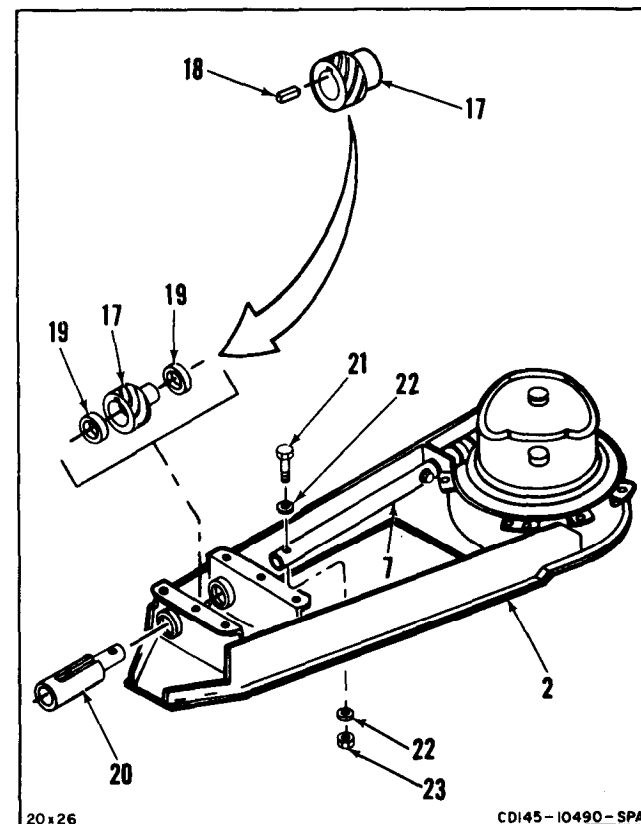
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1-43 ASSEMBLE HOISTING UNIT AZIMUTH CONTROL
(Continued)

7. Slide shaft connector (7) on shaft (6). **Align holes in shaft connector and shaft. Install bolt (8), two washers (9) and nut (10).**
8. **Install spacer (11), worm gear cap (12), 9 bolts (13), 18 washers (14), and 9 nuts (15) on housing (2).**
9. **Install quick-release pin (16) in worm gear (1).**



10. **Apply coat of grease (E190) to helical drive gear (17).**
11. **Install key (18) in helical drive gear (17).**
12. **Position helical drive gear (17), and two bearings (19) in housing (2). Slide pinion drive shaft (20) into housing (2) until slot in shaft engages key (18) in gear. Install pinion drive shaft.**
13. **Align hole in shaft connector (7) and shaft (20). Install bolt (21), two washers (22) and nut (23).**

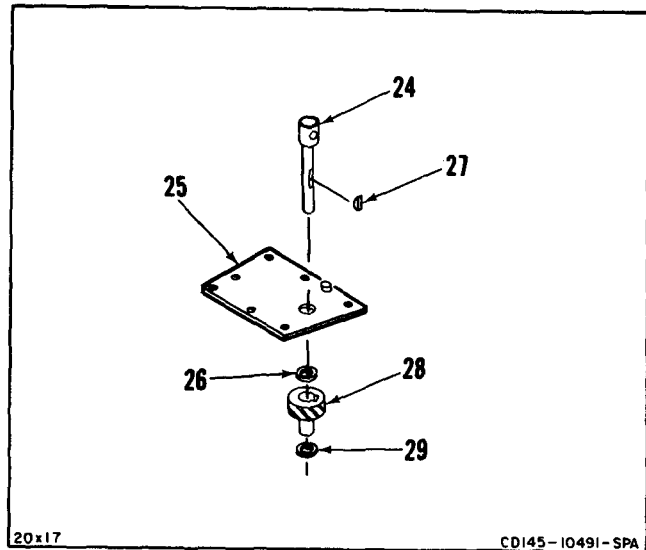


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1-43 ASSEMBLE HOISTING UNIT AZIMUTH CONTROL
(Continued)

1-43

- 14. **Install pinion shaft (24)** in helical gear cap (25).
- 15. **Install thrust washer (26), key (27), helical gear (28)** and thrust washer (29) on pinion shaft (24).



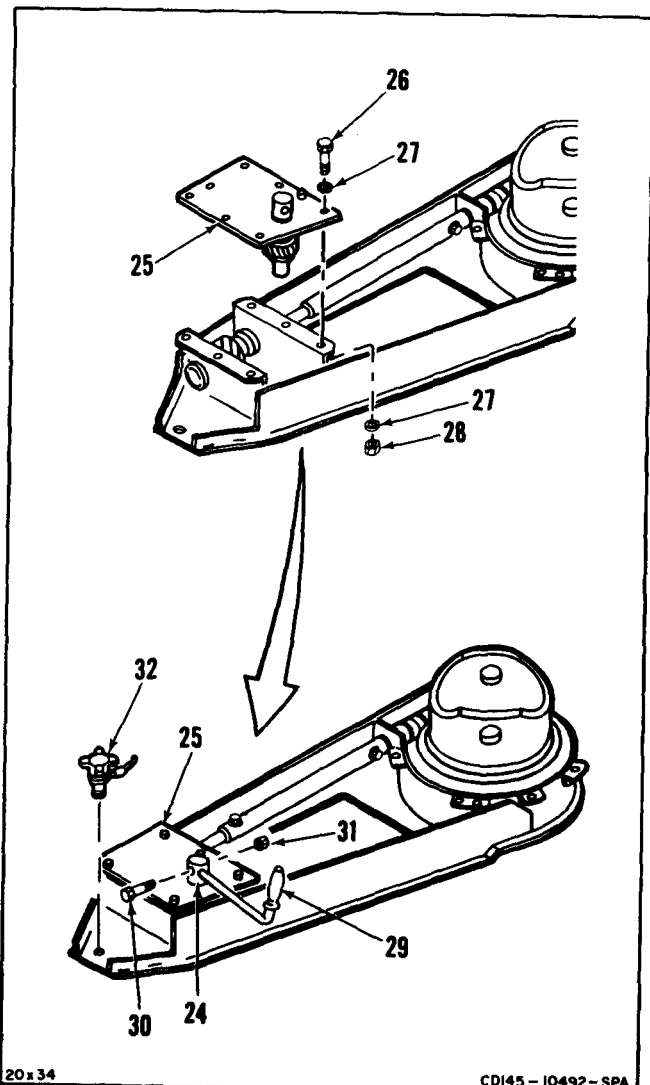
- 16. **Install helical gear cap (25), 6 bolts (26), 12 washers (27) and 6 nuts (28)** on housing (2).
- 17. **Position handle (29)** in pinion shaft (24). **Install bolt (30) and nut (31).**
- 18. **Install captive screw (32)** in helical gear cap (25).

INSPECT

FOLLOW-ON MAINTENANCE:

None

END OF TASK



INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692

Materials:

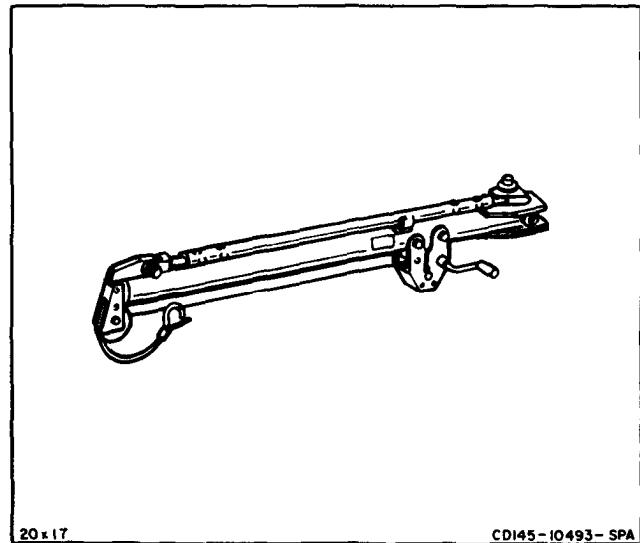
None

Personnel Required:

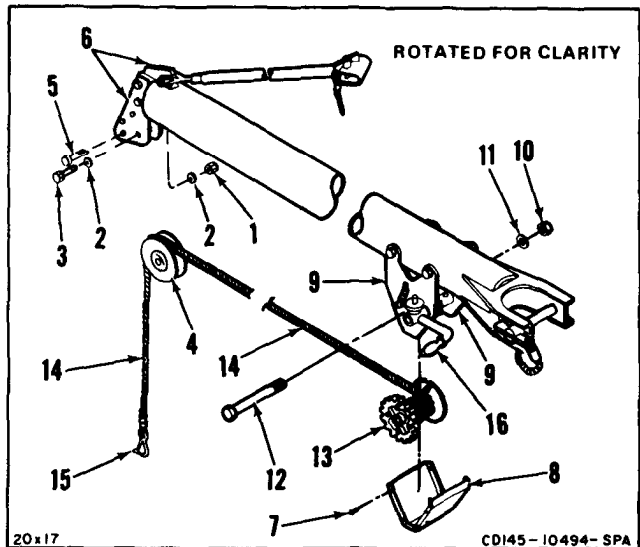
67U10 Medium Helicopter Repairer

Equipment Condition:

Off Helicopter Task



1. **Remove nuts (1), washers (2), bolts (3), pulley (4) and spring pin (5) from plates (6).**
2. **Remove two plates (6).**
3. **Remove screws (7), and cover (8) from winch side plates (9).**
4. **Remove nut (10), washer (11), bolt (12), and spur gear drum (13).**
5. **Remove knot from nylon rope (14). Remove rope (14) from drum (13) and pulley (4). Remove hook (15).**
6. Remove winch handle (16).

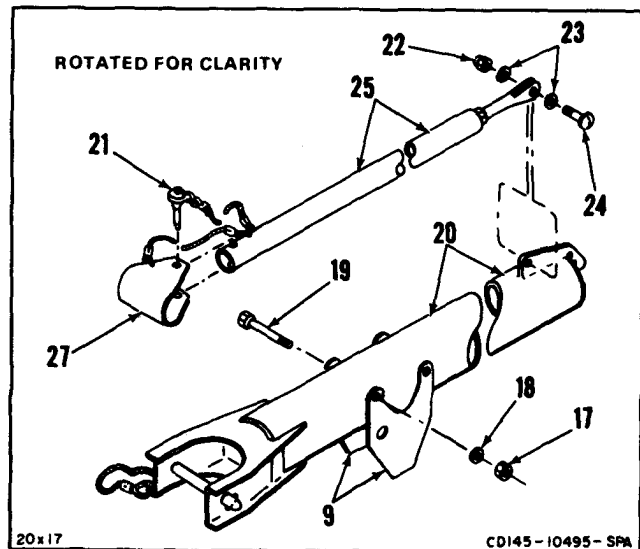


7. **Remove nut (17), washer (18) and bolt (19) from side plates (9) and jib boom (20).**
8. **Remove side plates (9).**
9. Remove quick-release pin (21).
10. **Remove nut (22), washers (23) and bolt (24) from boom (20) and tension tube (25).**
11. Remove quick-release pin (21) from tube (25) and strap (27).
12. **Remove strap (27).**

FOLLOW-ON MAINTENANCE:

None

END OF TASK



1-45 ASSEMBLE HOISTING UNIT JIB BOOM

1-45

INITIAL SETUP

Applicable Configurations:
All

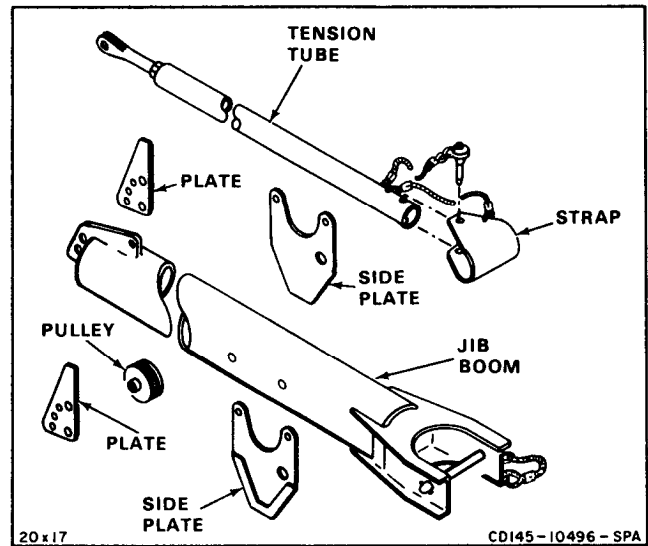
Tools:
Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692

Materials:
None

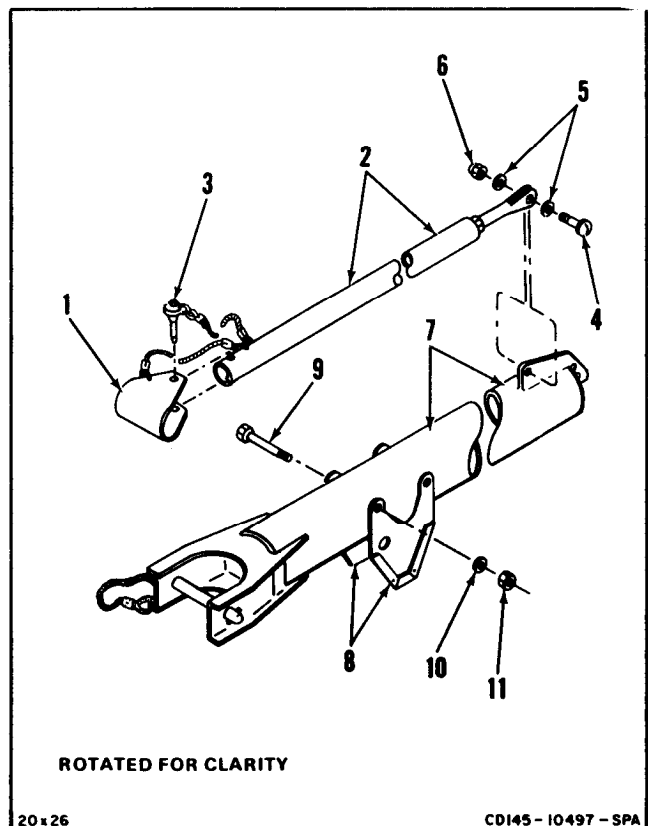
Personnel Required:
67U10 Medium Helicopter Repairer
67U30 Inspector

References:
TM 55-1520-240-23P

Equipment Condition:
Off Helicopter Task



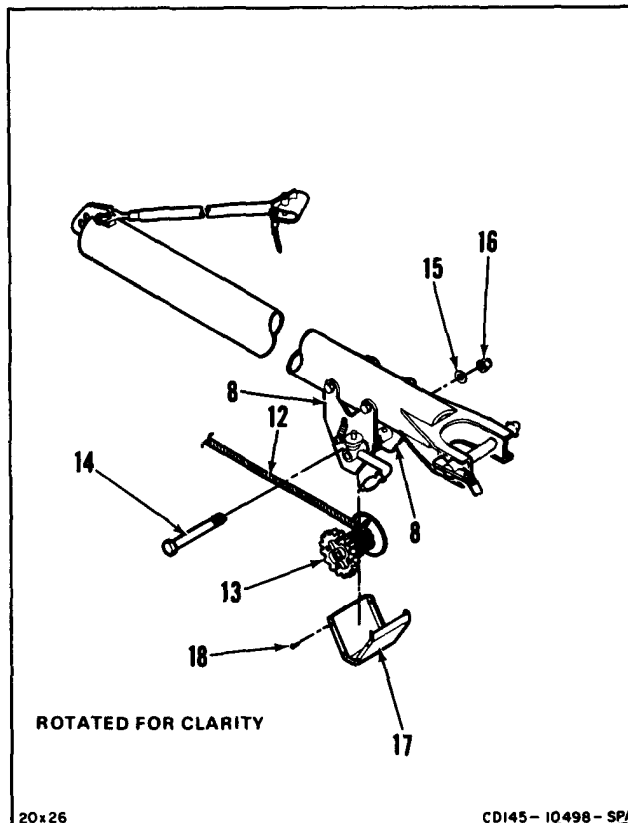
1. **Install strap (1) on tension tube (2).** Align holes in strap and tube, and install quick-release pin (3).
2. **Install bolt (4), washers (5), and nut (6) in tension tube (2) and jib boom (7).**
3. Align holes in boom (7) and winch side plates (8). **Install two bolts (9), washers (10) and nuts (11) in boom and plates.**



GO TO NEXT PAGE

1-45 ASSEMBLE HOISTING UN IT JIB BOOM
 (Continued)

4. **Install rope in spur gear drum (13). Tie knot in rope to prevent it from dropping out of drum.**
5. **Position spur gear drum (13) between plates (8). Install bolt (14) through plates and drum. Install washer (15) and nut (16) on bolt.**
6. **Position cover (17) on bottom of plates (8). Install 10 screws (18) in cover (17) and plates (8).**



20x26

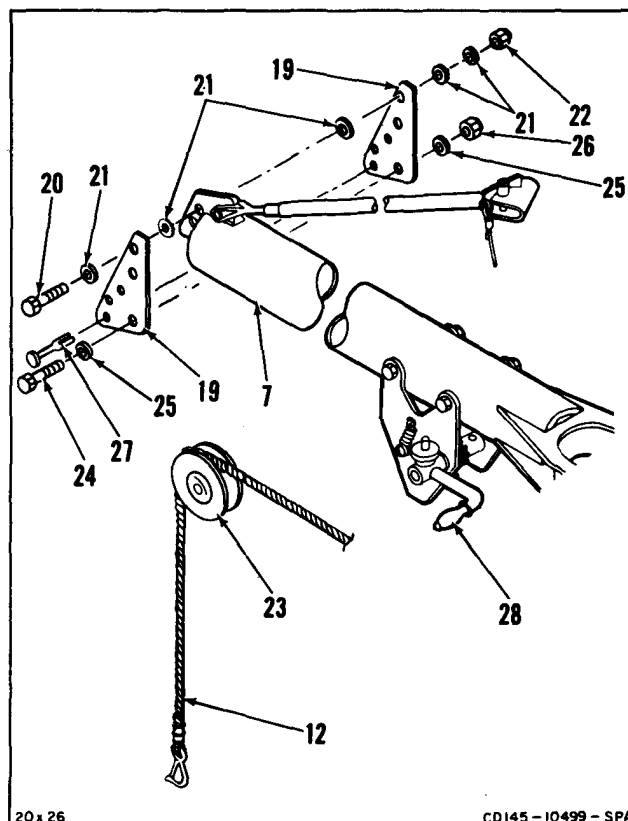
CD145-10498-SPA

7. **Position plates (19) on boom (7). Install top bolt (20), washers (21) and nut (22).**
8. **Place rope (12) on pulley (23). Position pulley and rope between plates (19) and install four bolts (24), washers (25) and nuts (26).**
9. **Install spring pin (27) in plates (19).**
10. **Install handle (28).**

INSPECT

FOLLOW-ON MAINTENANCE:

None



20x26

CD145-10499-SPA

END OF TASK

1-46 DISASSEMBLE HOISTING UNIT BOOM

1-46

INITIAL SETUP

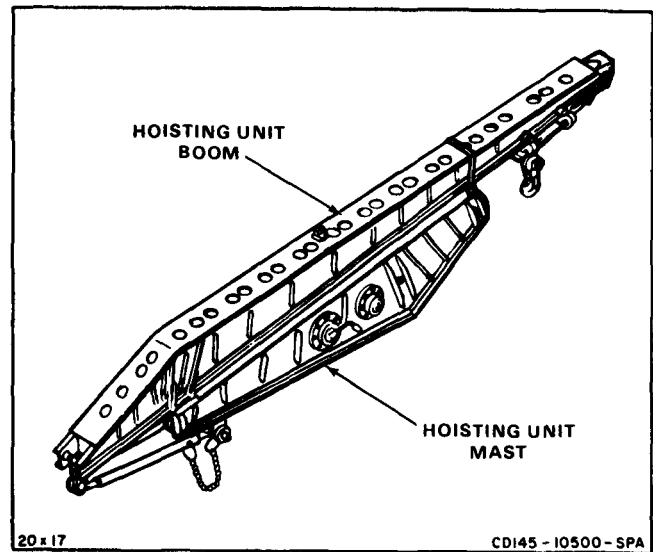
Applicable Configurations:
All

Tools:
Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Bushing Removal Tool,
NSN 5120-00-566-2845

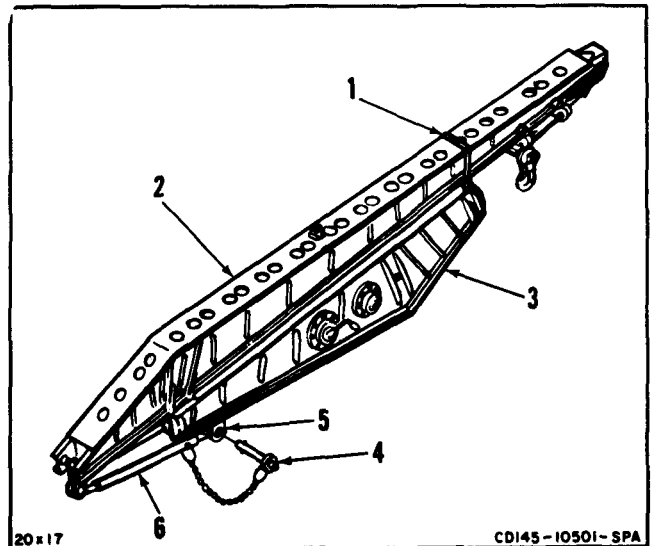
Materials:
None

Personnel Required:
67U10 Medium Helicopter Repairer (2)

Equipment Condition:
Off Helicopter Task

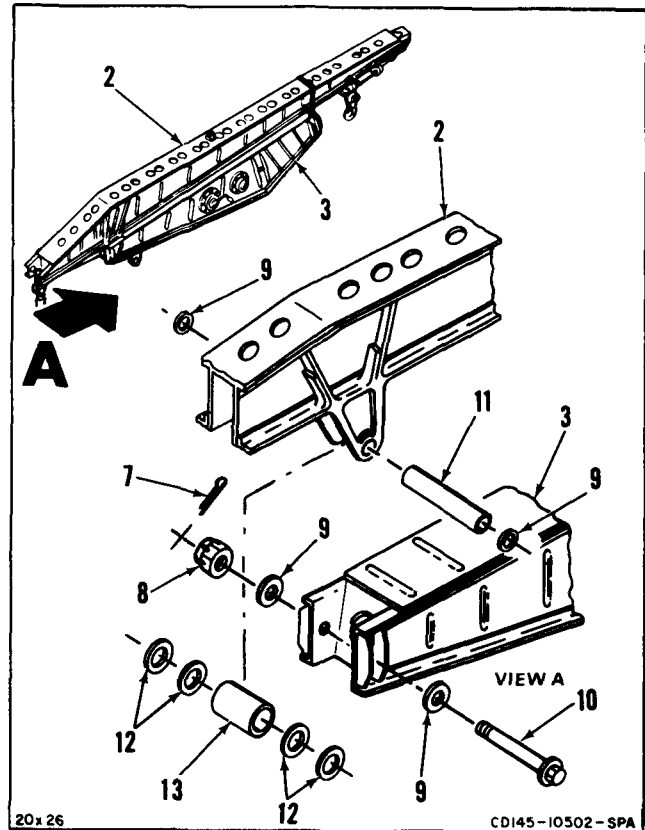


1. **Remove strap (1)** securing boom (2) to mast (3).
2. **Remove quick-release pin (4)** from bracket (5). **Remove tension rod (6)** from bracket.

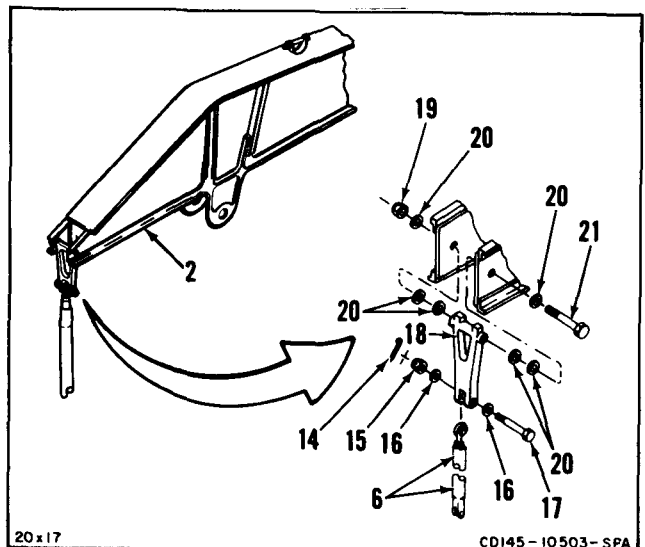


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3. **Remove** cotter pin (7), nut (8), four washers (9) and **bolt (10)** from boom (2) and mast (3). **Separate boom (2) and mast (3).**
4. **Remove spacer (11),** four washers (12), **and spacer (13)** from boom (2).

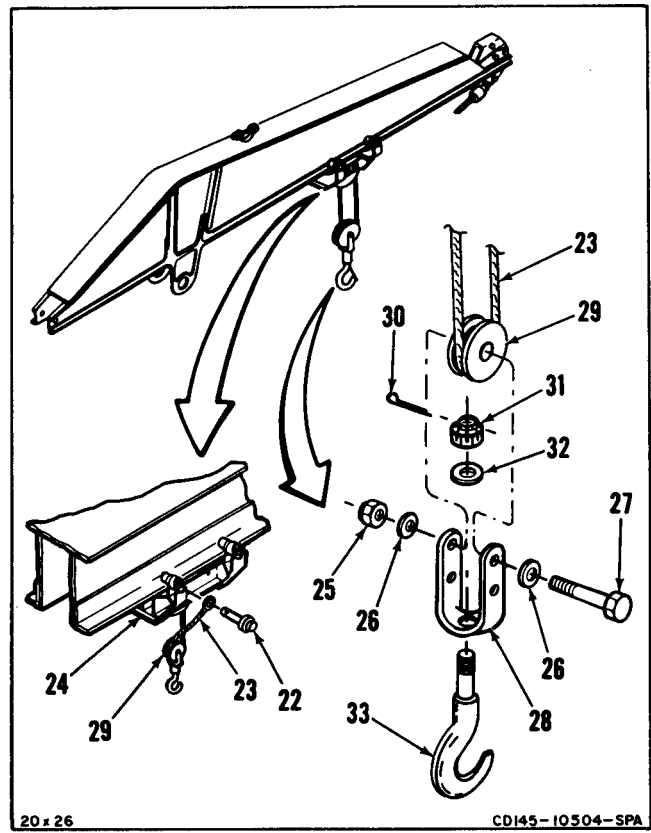


5. **Remove** cotter pin (14), **nut (15),** two washers (16), **bolt (17) and tension rod (6),** from link (18).
6. **Remove nut (19),** six washers (20), bolt (21) **and link (18)** from boom (2).

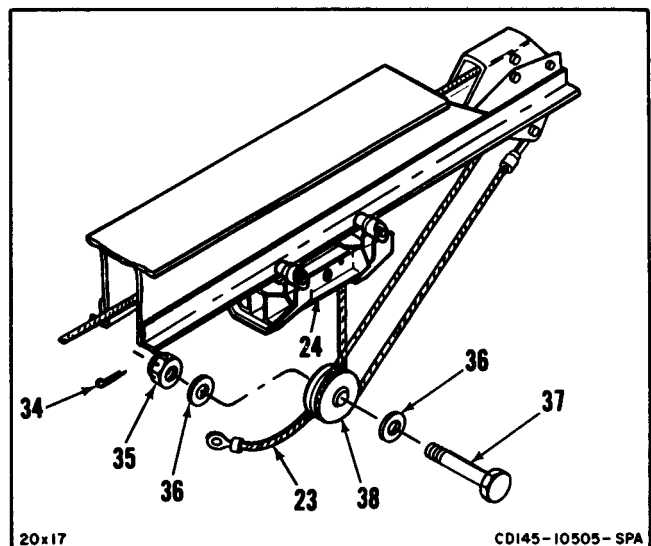


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7. **Remove quick-disconnect (22) and cable (23) from trolley (24).**
8. **Remove nut (25), two washers (26), bolt (27) and hook strap (28) from hook pulley (29). Remove cable (23) from hook pulley.**
9. **Remove cotter pin (30), nut (31), washer (32) and hook (33) from hook strap (28).**



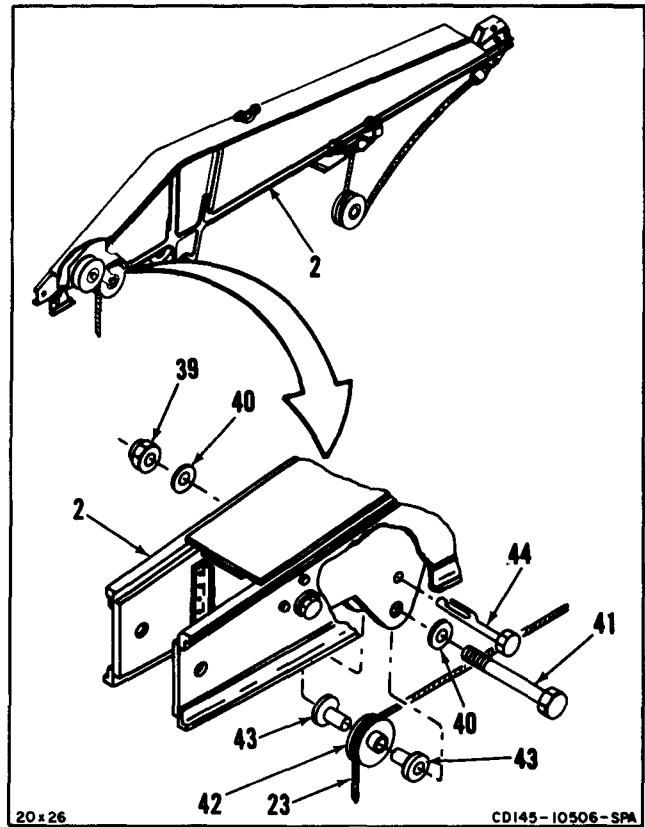
10. **Remove cotter pin (34), nut (35), two washers (36), bolt (37), and trolley pulley (38) from trolley (24). Remove cable (23) from pulley.**



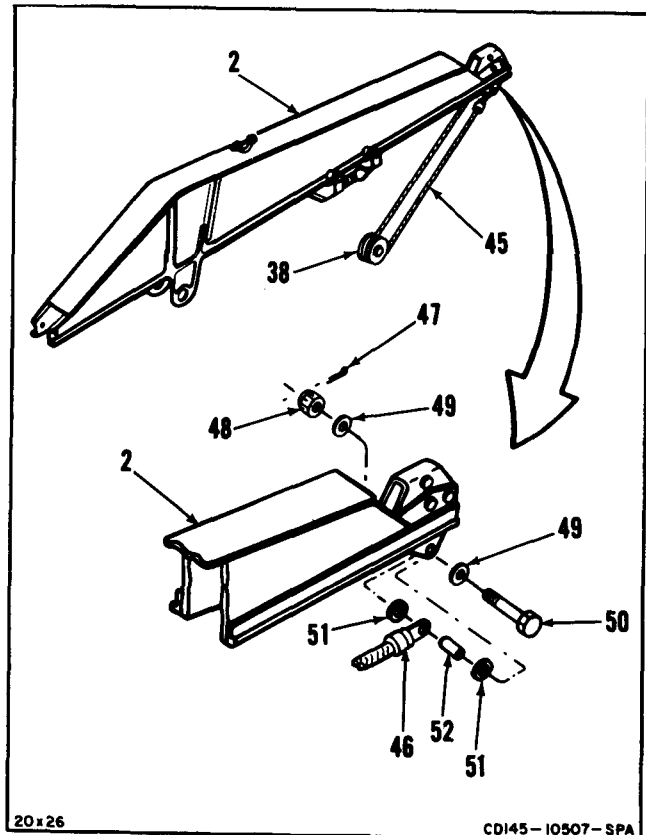
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1-46 DISASSEMBLE HOISTING UNIT BOOM (Continued)

11. **Remove nut (39), two washers (40), and bolt (41) from boom (2).**
12. **Remove pulley (42) and two bushings (43) from boom (2). Use bushing removal tool. Remove cable (23) from pulley.**
13. **Remove spring pin (44) from boom (2).**



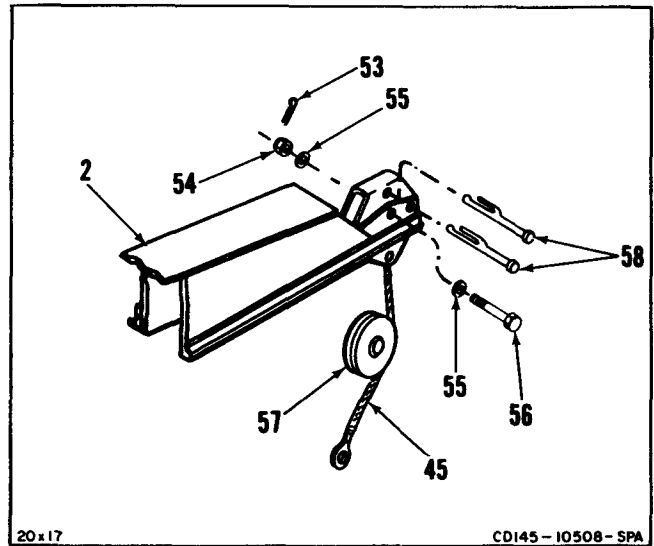
14. **Release cable (45) at cable lock (46). Remove cable from trolley pulley (38).**
15. **Remove cotter pin (47), nut (48), two washers (49), and bolt (50). Remove cable lock (46), two washers (51) and bushing (52) from boom (2).**



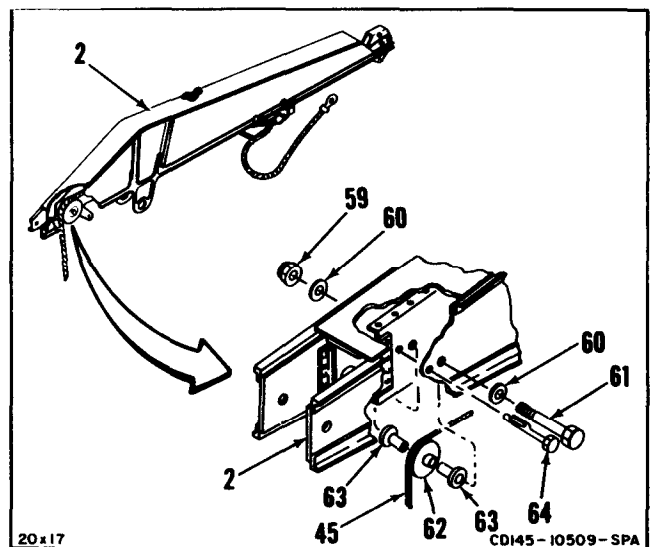
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1-46 DISASSEMBLE HOISTING UNIT BOOM (Continued)

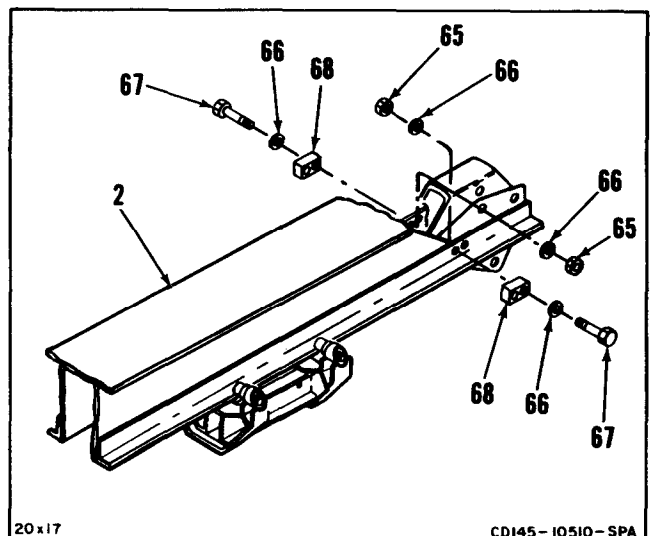
16. **Remove** cotter pin 53, **nut (54)**, two washers (55), **bolt (56)** and **boom pulley (57)**. **Remove cable (45) from pulley.**
17. **Remove two spring pins (58)** from boom (2).



18. **Remove nut (59)**, two washers (60) and **bolt (61)**.
19. **Remove pulley (62)** and two bushings (63) from boom (2). Use bushing removal tool. **Remove cable (45) from pulley.**
20. **Remove spring pin (64)** from boom (2).
21. **Remove cable (45) from boom (2).**



22. **Remove four nuts (65)**, washers (66), **bolts (67)** and **two stops (68)** from boom (2).

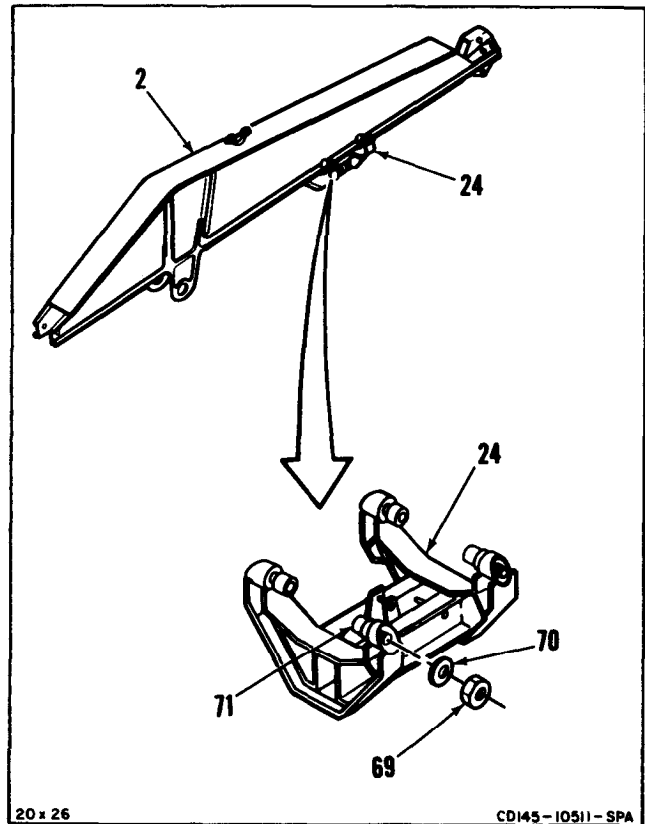


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- 23. **Remove trolley (24)** from boom (2).
- 24. **Remove four nuts (69), washers (70), and cam followers (71)** from trolley (24).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

1-47 ASSEMBLE HOISTING UNIT BOOM

1-47

INITIAL SETUP

Applicable Configurations:
All

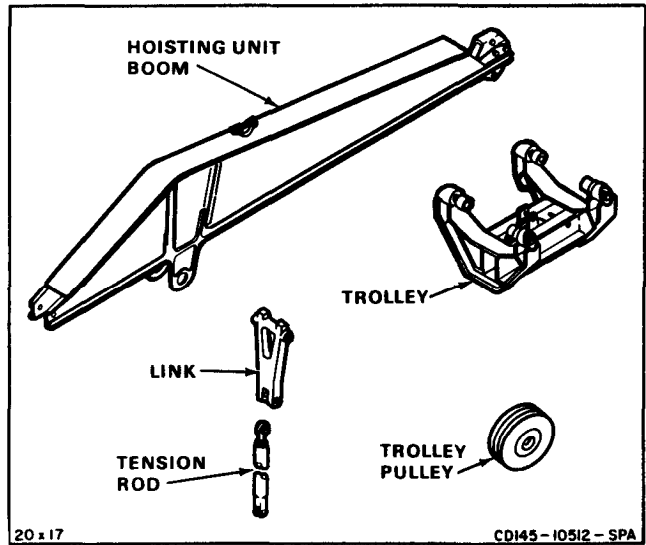
Tools:
Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692

Materials:
None

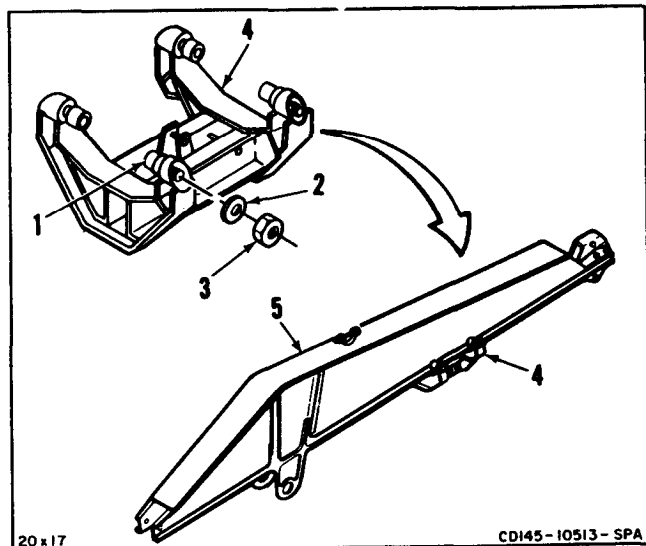
Parts:
Cotter Pins

Personnel Required:
67U10 Medium Helicopter Repairer (2)
67U30 Inspector

References:
TM 55-1520-240-23P



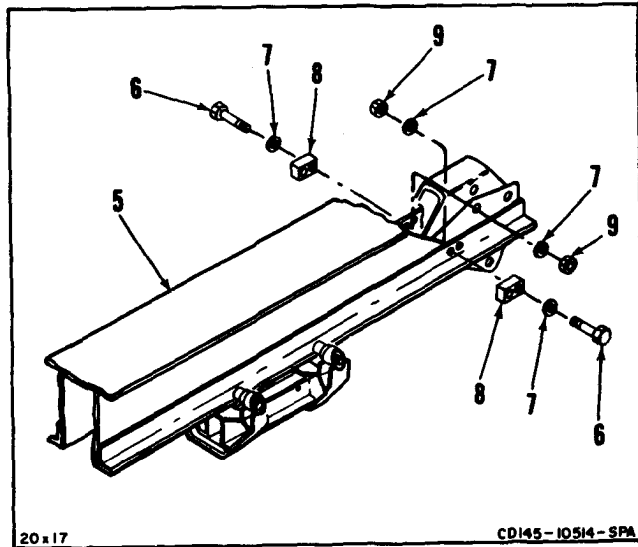
1. **Install four cam followers (1), washers (2) and nuts (3) on trolley (4).**
2. **Install trolley (4) on boom (5).**



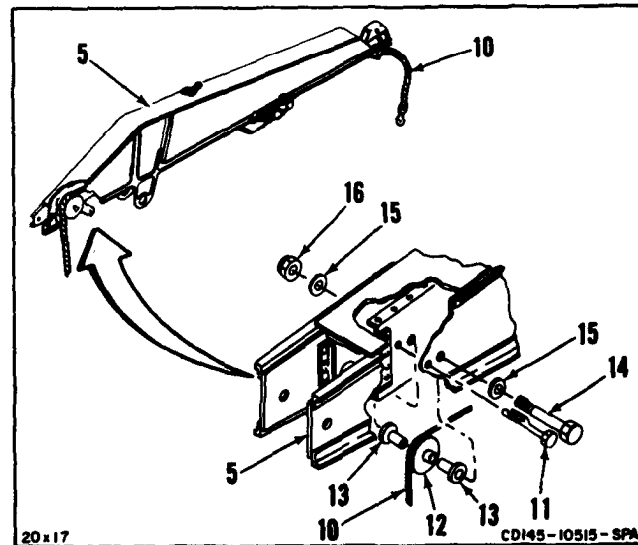
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1-47 ASSEMBLE HOISTING UNIT BOOM (Continued)

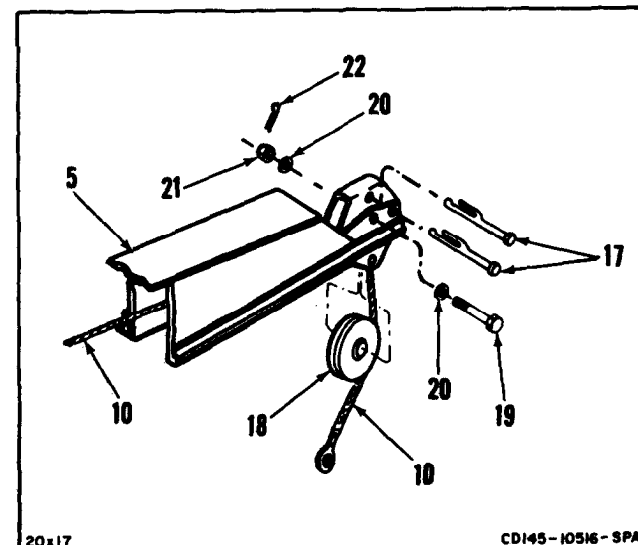
3. **Install four bolts (6), eight washers (7), two stops (8), and four nuts (9) on boom (5).**



4. **Thread end of cable (10) through boom (5).**
5. **Install spring pin (11) in boom (5).**
6. **Install cable (10) in groove of pulley (12).**
7. **Position pulley (12) and two bushings (13) in boom (5). Install bolt (14), two washers (15) and nut (16).**



8. **Install two spring pins (17) in boom (5).**
9. **Install cable (10) in groove of boom pulley (18).**
10. **Position boom pulley (18) in boom (5). Install bolt (19), two washers (20), nut (21) and cotter pin (22).**

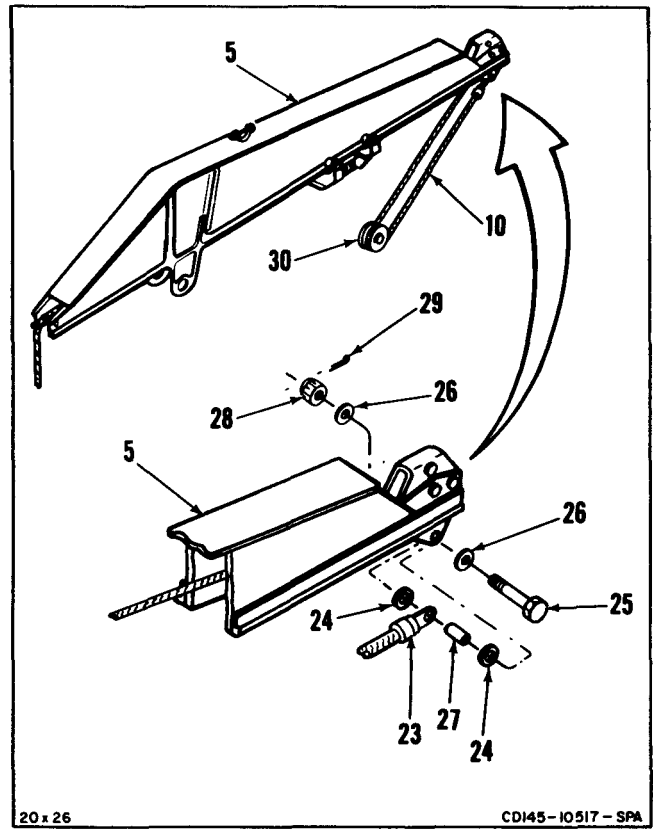


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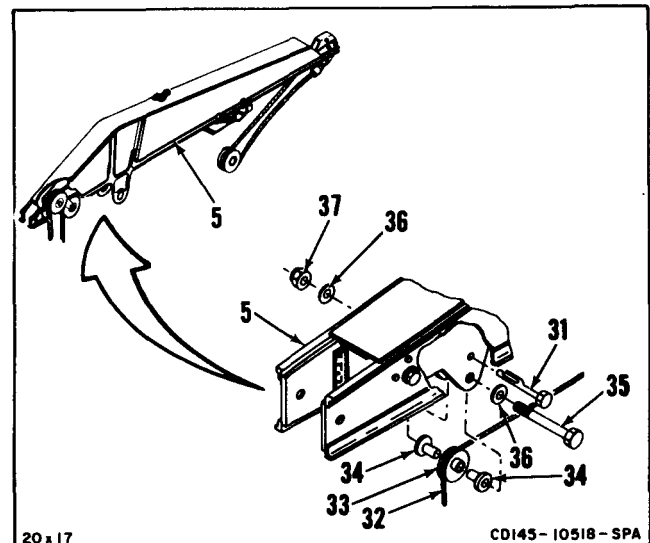
1-47 ASSEMBLE HOISTING UNIT BOOM (Continued)

1-47

11. **Position cable lock (23),** and two washers (24) in boom (5).
12. **Install bolt (25),** two washers (26), bushings (27), nut (28) and cotter pin (29).
13. **Route cable (10) over trolley pulley (30).** **Install end of cable (10) in cable lock (23).**

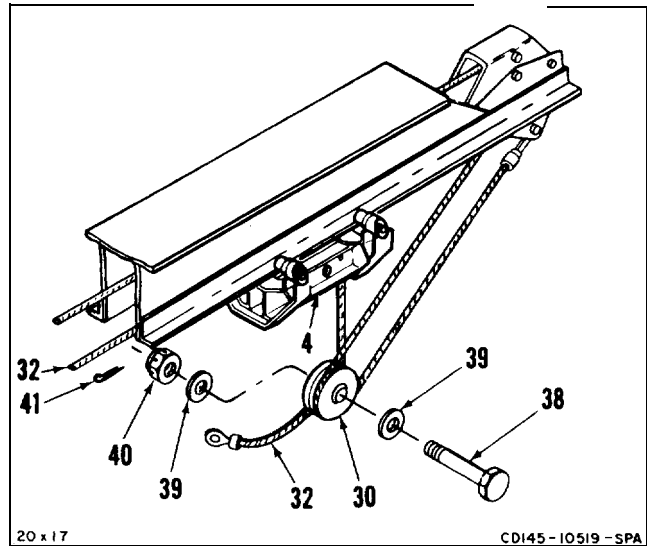


14. **Install spring pin (31)** in boom (5).
15. **Install cable (32)** in groove in pulley (33).
16. **Position pulley (33)** and two bushings (34) in boom (5). **Install bolt (35),** two washers (36) and nut (37).

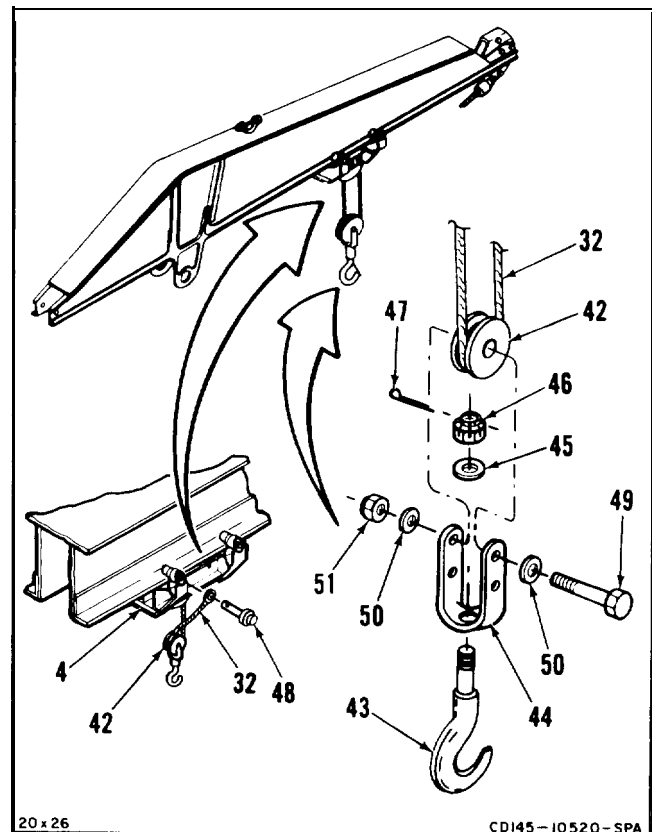


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17. Route cable (32) through trolley (4) and over trolley pulley (30).
18. Position trolley pulley (30) in trolley (4). Install bolt (38), two washers (39), nut (40) and cotter pin (41)

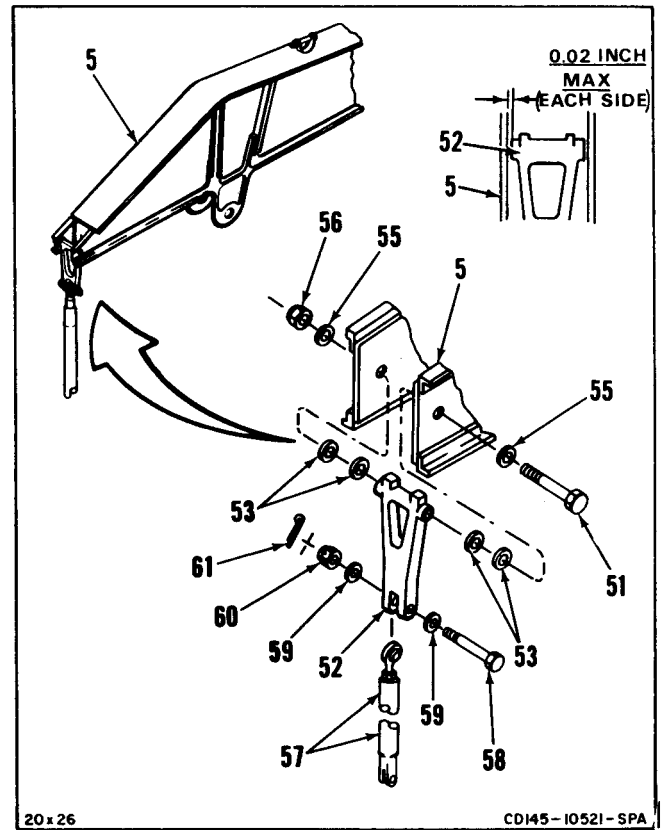


19. Route cable (32) around hook pulley (42).
20. Push hook (43) into hook strap (44). Install washer (45), nut (46) and cotter pin (47).
21. Align hole in end of cable (32) and trolley (4). Install quick-release pin (48).
22. Align hole in hook strap (44) and hook pulley (42). Install bolt (49), two washers (50), and nut (51).

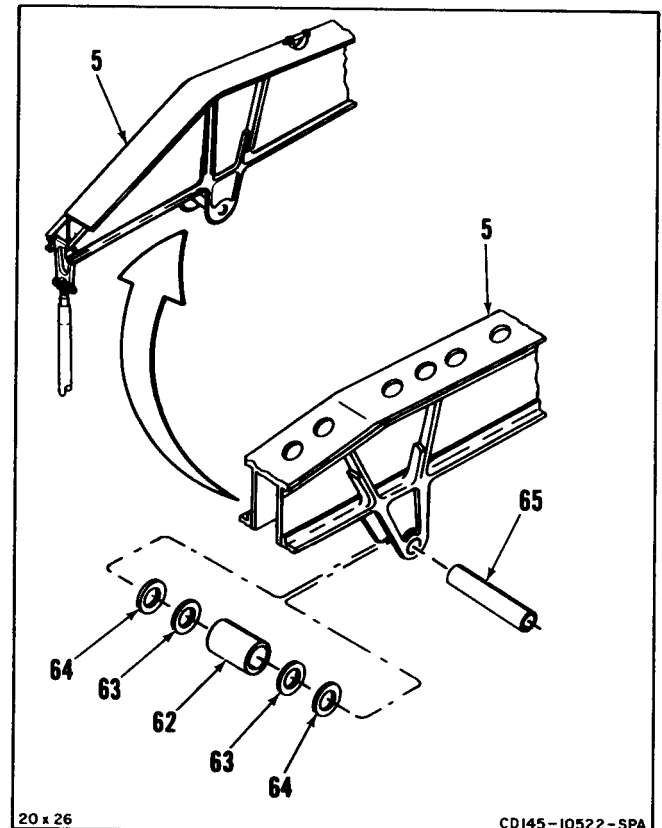


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23. **Position link (52) in boom (5). Check that gap between link and boom is less than 0.02 inch. If gap is more than 0.02-inch, install a maximum of two washers (53) on each side of link to close gap.**
24. **Install bolt (54), two washers (55) and nut (56).**
25. **Align holes in link (52) and tension rod (57). Install bolt (58), two washers (59), nut (60) and cotter pin (61).**

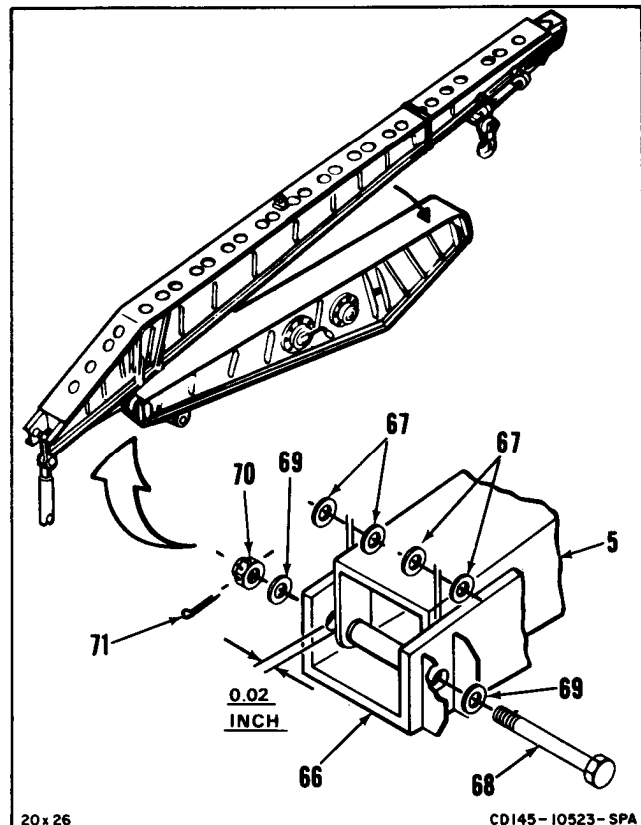


26. **Position spacer (62) and two washers (63) in boom (5). Check that gap between washers and boom is less than 0.02-inch. If gap is more than 0.02-inch, install washers (64) as needed to close gap.**
27. Install spacer (65).



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28. **Position boom (5) in mast (66). Check that gap between boom and mast is less than 0.02-inch. If gap is more than 0.02-inch, install a maximum of two washers (67) on each side of boom to close gap.**
29. **Install bolt (68), two washers (69), nut (70) and cotter pin (71).**

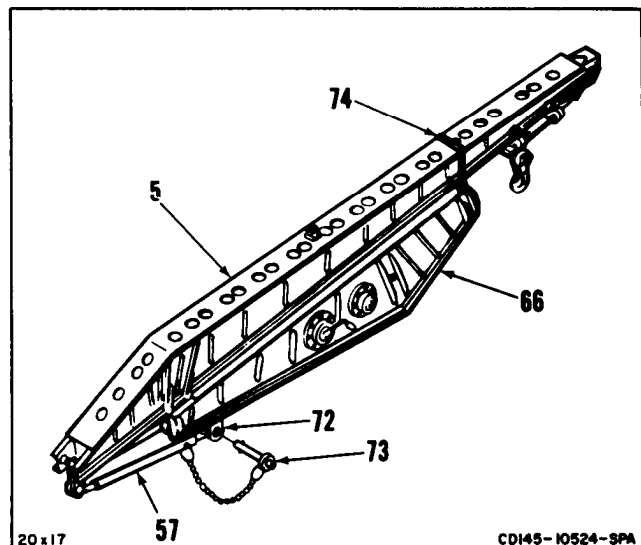


30. **Align hole in tension rod (57) and bracket (72) on mast (66). Install quick-release pin (73).**
31. **Install strap (74) securing boom (5) to mast (66).**

INSPECT

FOLLOW-ON MAINTENANCE:

None



END OF TASK

1-48 DISASSEMBLE HOISTING UNIT MAST

1-48

INITIAL SETUP

Applicable Configurations:

All

Tools:Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692**Materials:**

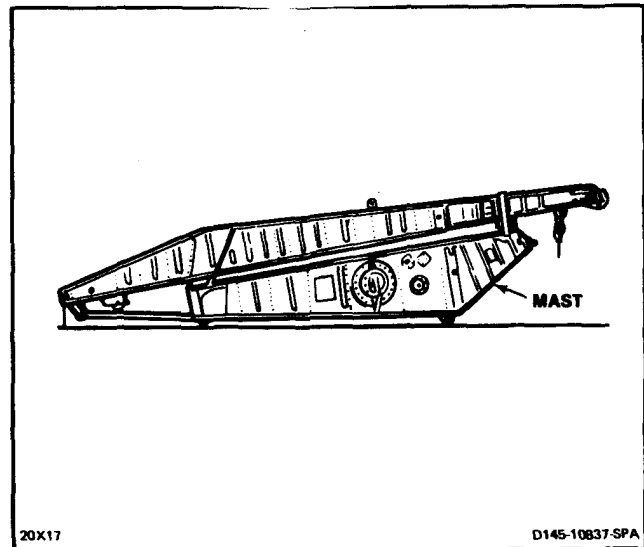
None

Personnel Required:

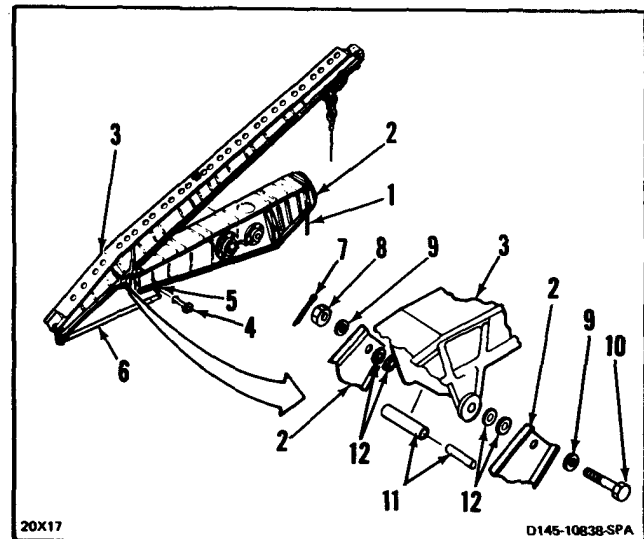
67U10 Medium Helicopter Repairer (2)

Equipment Condition:

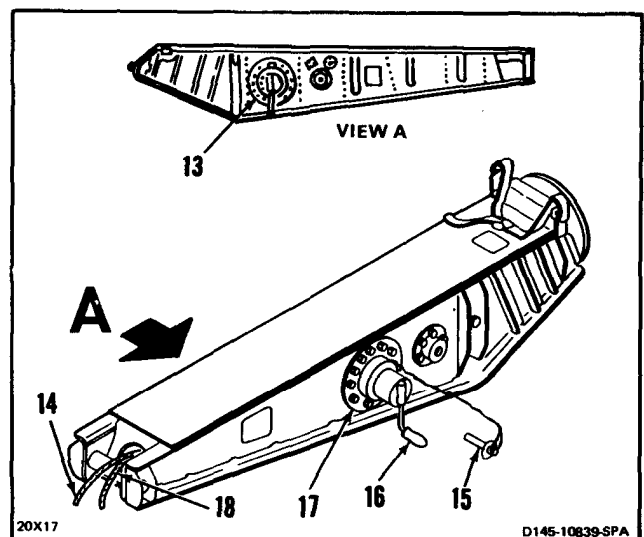
Off Helicopter Task



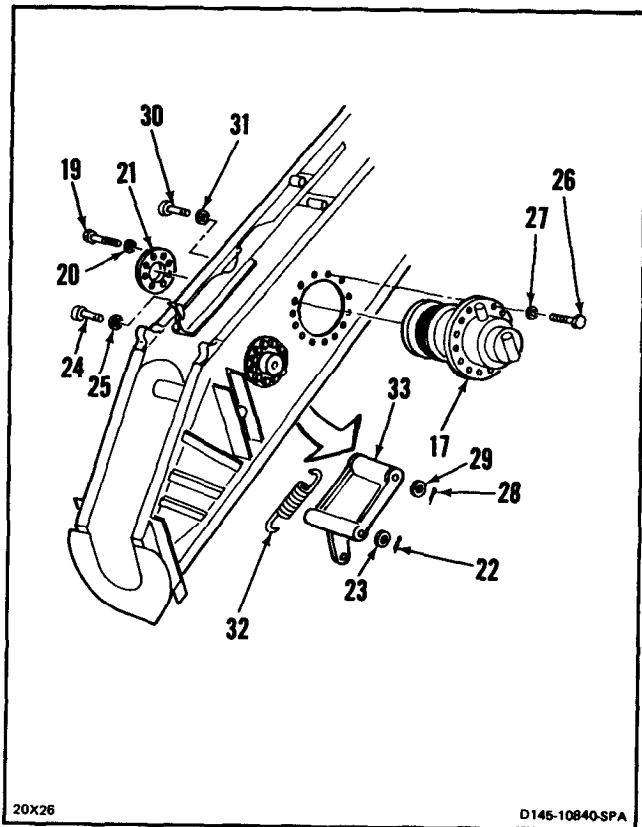
1. Remove strap (1) securing mast (2) to boom (3).
2. Remove quick release pin (4) from bracket (5). Remove tension rod (6) from bracket (5).
3. **Remove cotter pin (7), nut (8), two washers (9), and bolt (10)** from mast (2) and boom (3).
4. Separate mast (2) and boom (3).
5. **Remove two spacers (11) and four washers (12) from boom (3).**



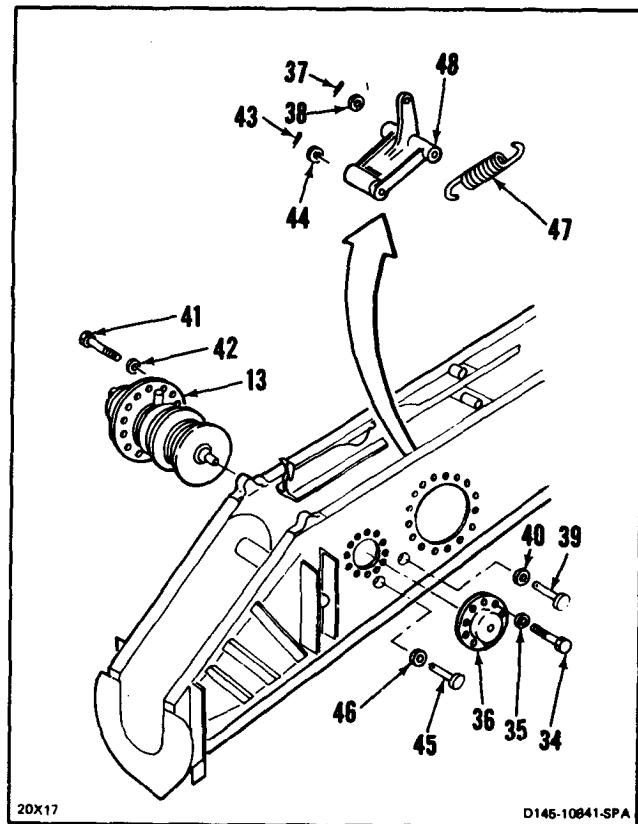
6. **Turn trolley winch (13) counter-clockwise to unwind trolley cable (14).**
7. Remove quick-release pin (15) and handle (16) from hook winch (17). **Pull cable (18) from hook winch (17).**

**GO TO NEXT PAGE**

8. **Remove six bolts (19) and washers (20) from hook winch hub (21).**
9. **Remove cotter pin (22) and washer (23) from clevis pin (24).**
10. **Remove clevis pin (24) and washer (25).**
11. **Remove 20 bolts (26) and washers (27) from hook winch (17). Remove hook winch.**
12. **Remove cotter pin (28) and washer (29) from clevis pin (30).**
13. **Remove clevis pin (30) and washer (31).**
14. **Remove tension spring (32) and tension bracket (33).**



15. **Remove six bolts (34), and washers (35) from trolley winch hub (36).**
16. **Remove cotter pin (37) and washer (38) from clevis pin (39).**
17. **Remove clevis pin (39) and washer (40).**
18. **Remove 20 bolts (41) and washers (42) from trolley winch (13). Remove trolley winch.**
19. **Remove cotter pin (43) and washer (44) from clevis pin (45).**
20. **Remove clevis pin (45) and washer (46).**
21. **Remove tension spring (47) and tension bracket (48).**

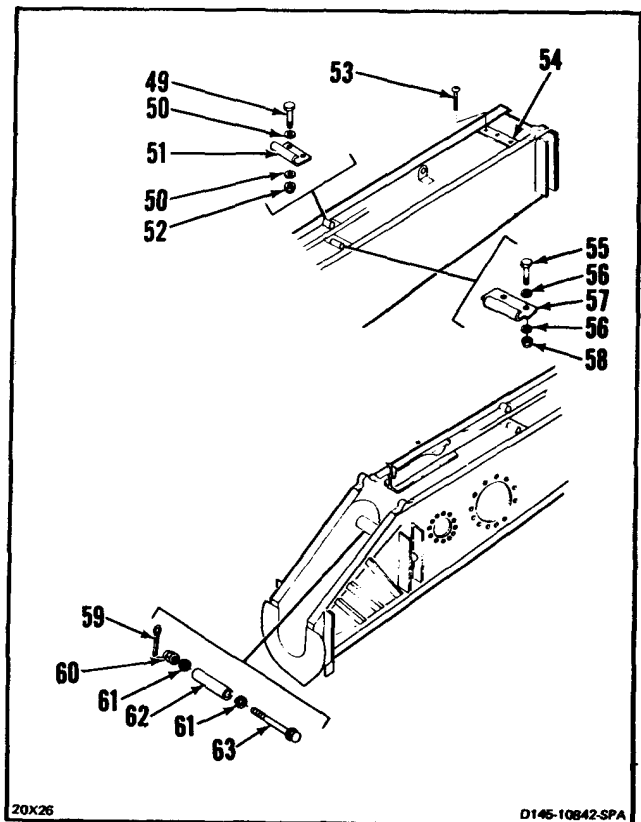


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1-48 DISASSEMBLE HOISTING UNIT MAST (Continued)

1-48

22. Remove bolts (49), washers (50), rubbing strip (51), and nuts (52).
23. Remove four screws (53) and rubbing strip (54).
24. Remove two bolts (55), washers (56), rubbing strip (57), and nut (58).
25. Remove cotter pin (59), nut (60), washers (61), spacer (62), and bolts (63).



FOLLOW-ON MAINTENANCE:
None

END OF TASK

INITIAL SETUP

Applicable Configurations:

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692

Materials:

None

Parts:

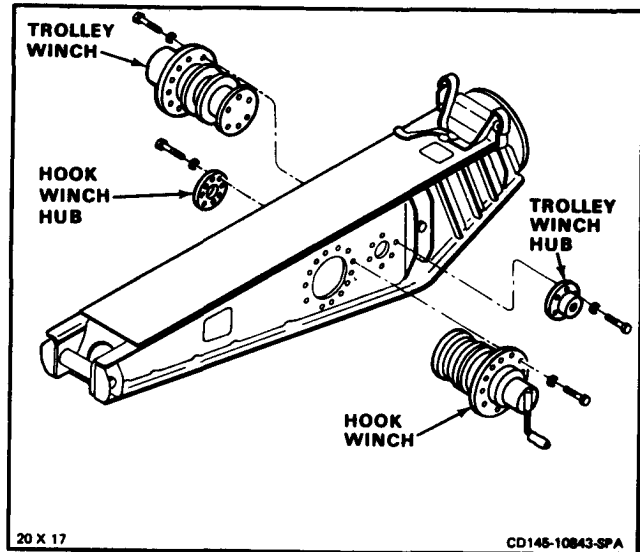
Cotter Pins

Personnel Required:

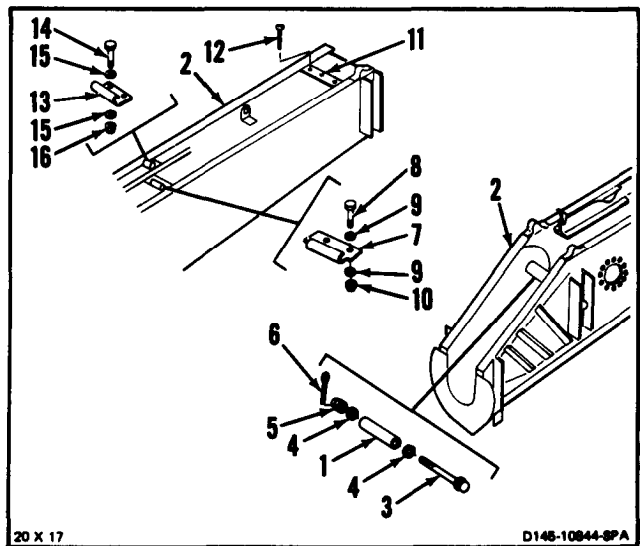
67U10 Medium Helicopter Repairer (2)
67U30 Inspector

References:

TM 55-1520-240-23P



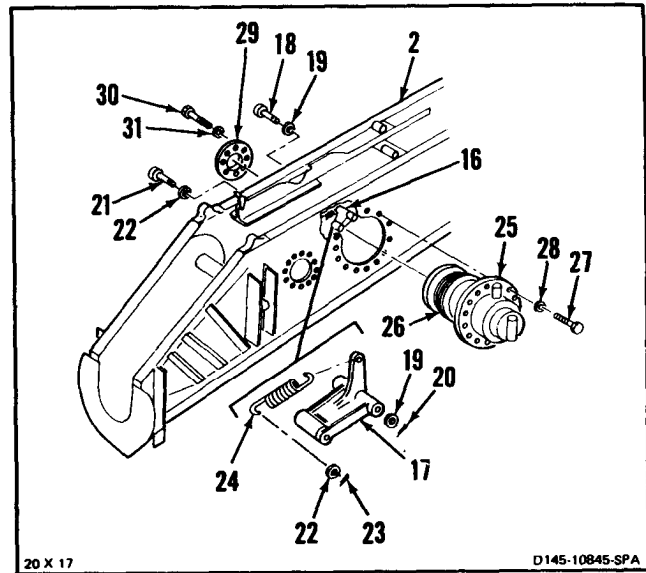
1. Position spacer (1) in mast (2). **Install bolt (3), washers (4), nut (5), and cotter pin (6).**
2. Position rubbing strip (7) on mast (2). **Install two bolts (8), four washers (9), and two nuts (10).**
3. Position rubbing strip (11). **Install four screws (12).**
4. Position rubbing strip (13) on mast (2). **Install two bolts (14), four washers (15), and two nuts (16).**



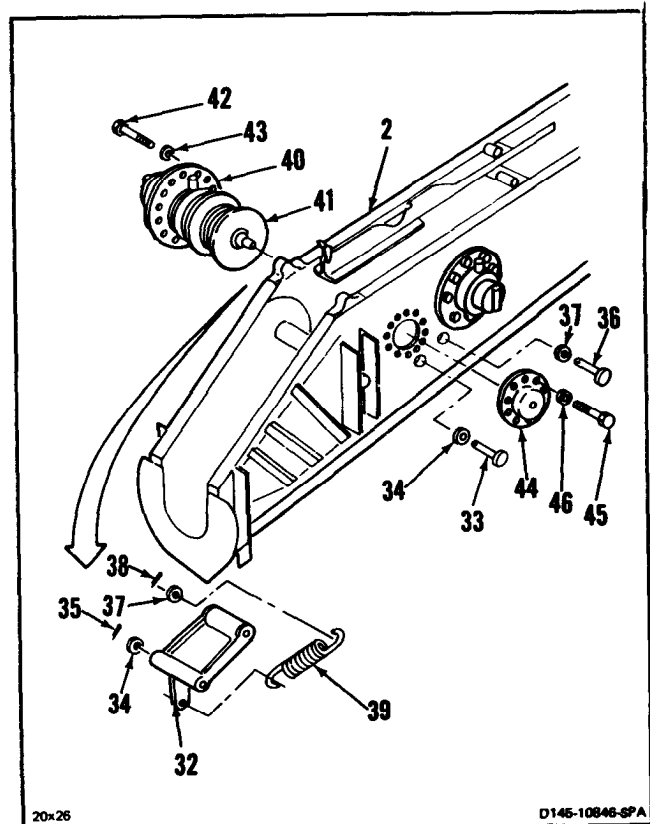
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1-49 ASSEMBLE HOISTING UNIT MAST (Continued)

5. Position tension bracket (17) in mast (2). **Install clevis pin (18)** in mast (2) through bracket (17). Install washers (19) and cotter pin (20).
6. **Install clevis pin (21), washers (22), and cotter pin (23)** in mast (2).
7. **Install tension spring (24)** on bracket (17) and clevis pin (21).
8. Position hook winch (25) in mast (2). **Make sure tension bracket (17) is against drum (26) of winch (25)**. Install 20 bolts (27) and washers (28).
9. Position winch hub (29) on mast (2). **Install six bolts (30) and washers (31)**.

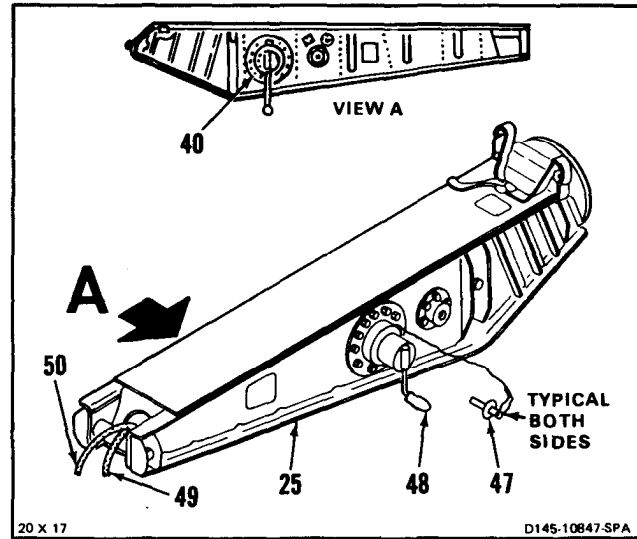


10. Position tension bracket (32) on mast (2). **Install clevis pin (33)** in mast (2) through bracket (32). **Install washers (34) and cotter pin (35)** on clevis pin (33).
11. **Install clevis pin (36)** in mast (2). Install washers (37) and cotter pin (38) on clevis pin (36).
12. **Install tension spring (39)** on bracket (32) and clevis pin (36).
13. Position trolley winch (40) in mast (2). **Make sure tension bracket (32) is against drum (41) of winch (40)**. Install 20 bolts (42) and washers (43).
14. Position trolley winch hub (44) on mast (2). **Install six bolts (45) and washers (46)**.

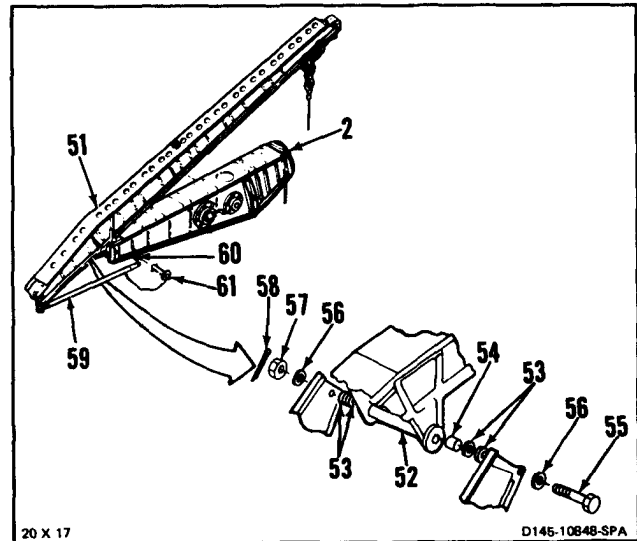


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15. **Install quick-release pin (47) and handle (48) on hook winch (25) and trolley winch (40). Wind cable (49) on to winch (25).**
16. **Turn trolley winch (40) IN and wind cable (50) on to winch.**



17. Position mast (2) on boom (51). **Install spacer (52), four washers (53) and spacer (54).**
18. **Install bolt (55), two washers (56), nut (57) and cotter pin (58).**
19. **Install tension rod (59) on bracket (60).**
20. **Install quick-release pin (61) on bracket (60) and tension rod (59).**



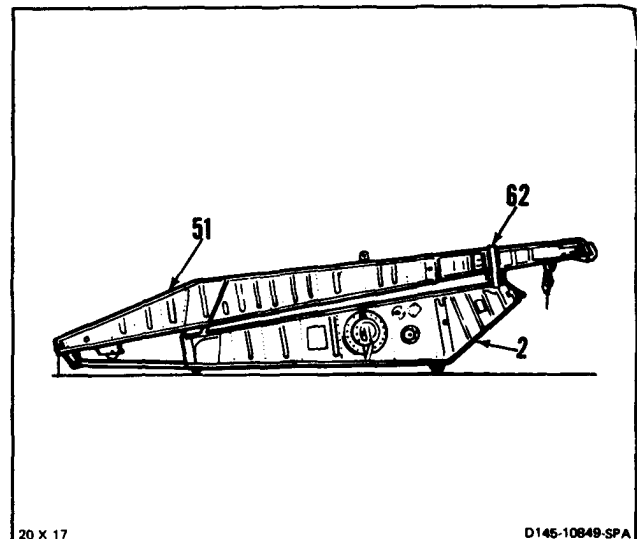
21. Install strap (62) securing mast (2) to boom (51).

INSPECT

FOLLOW-ON MAINTENANCE:

None.

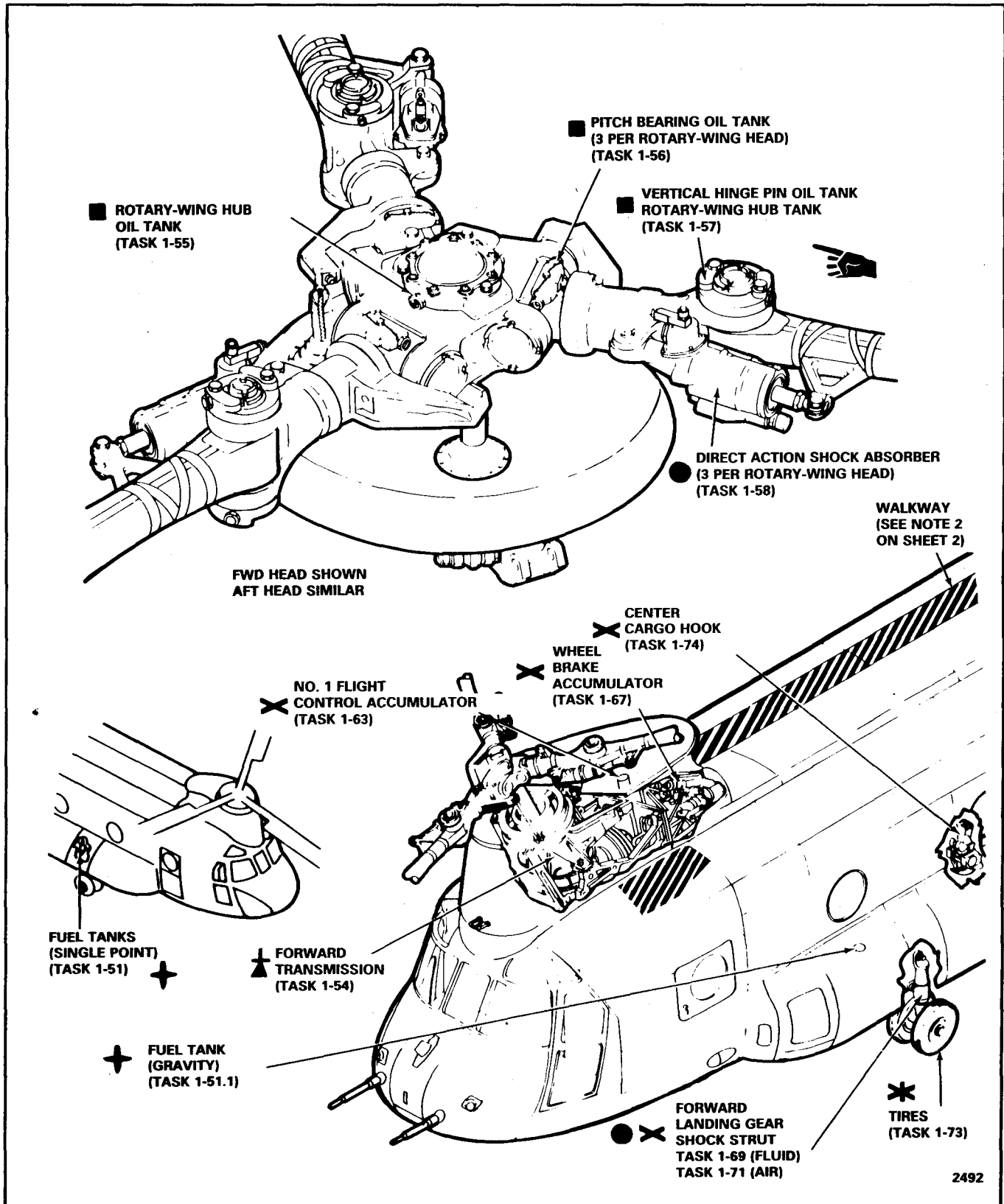
END OF TASK



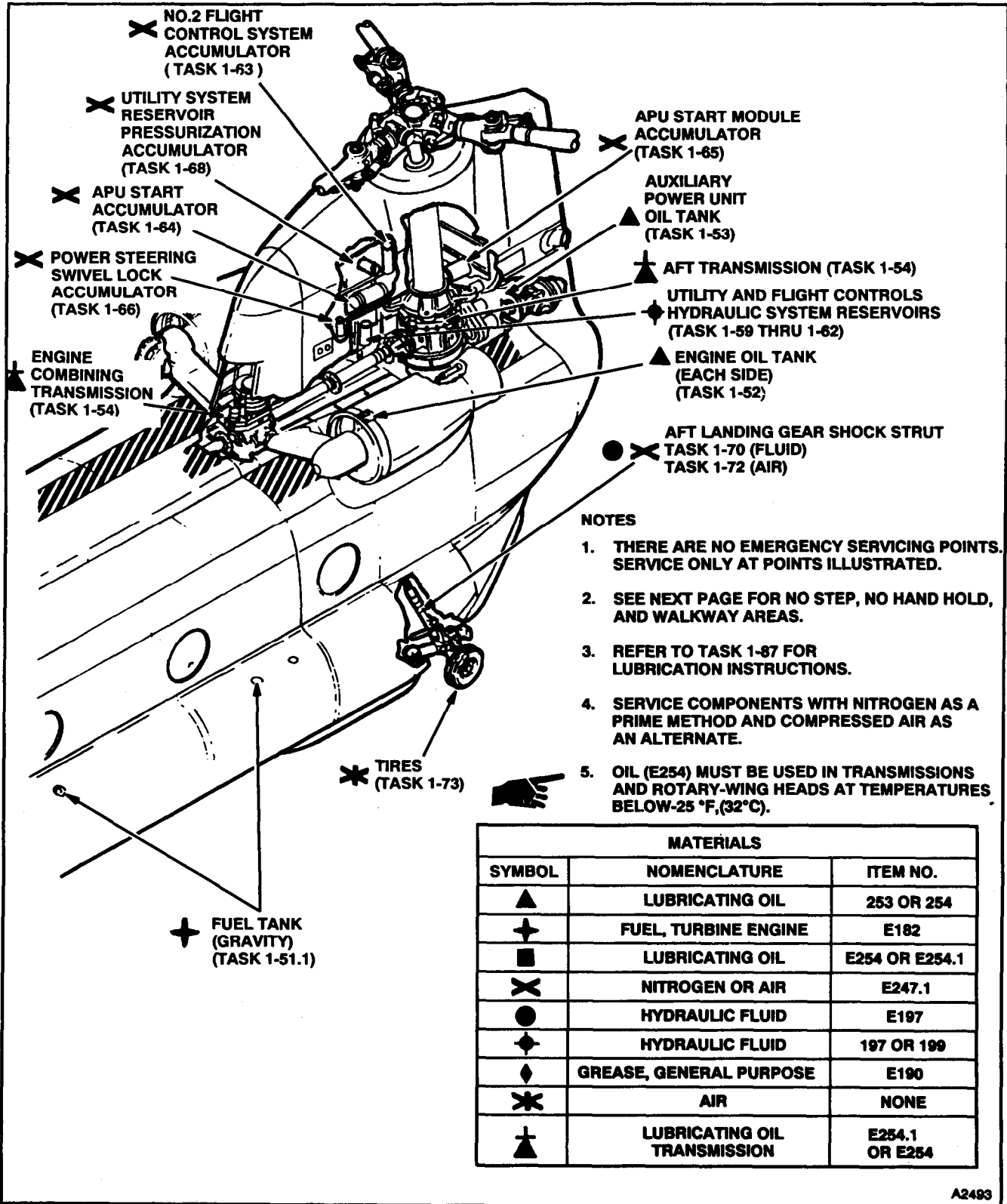
SECTION VI
SERVICING AND LUBRICATION

Sheets 1 and 2 illustrate servicing points on the helicopter, with references to specific tasks. Sheet 3 indicates No Step, Handhold, and Walkway

areas. Sheet 4 has a table of servicing materials and unit capacities for systems that require servicing.



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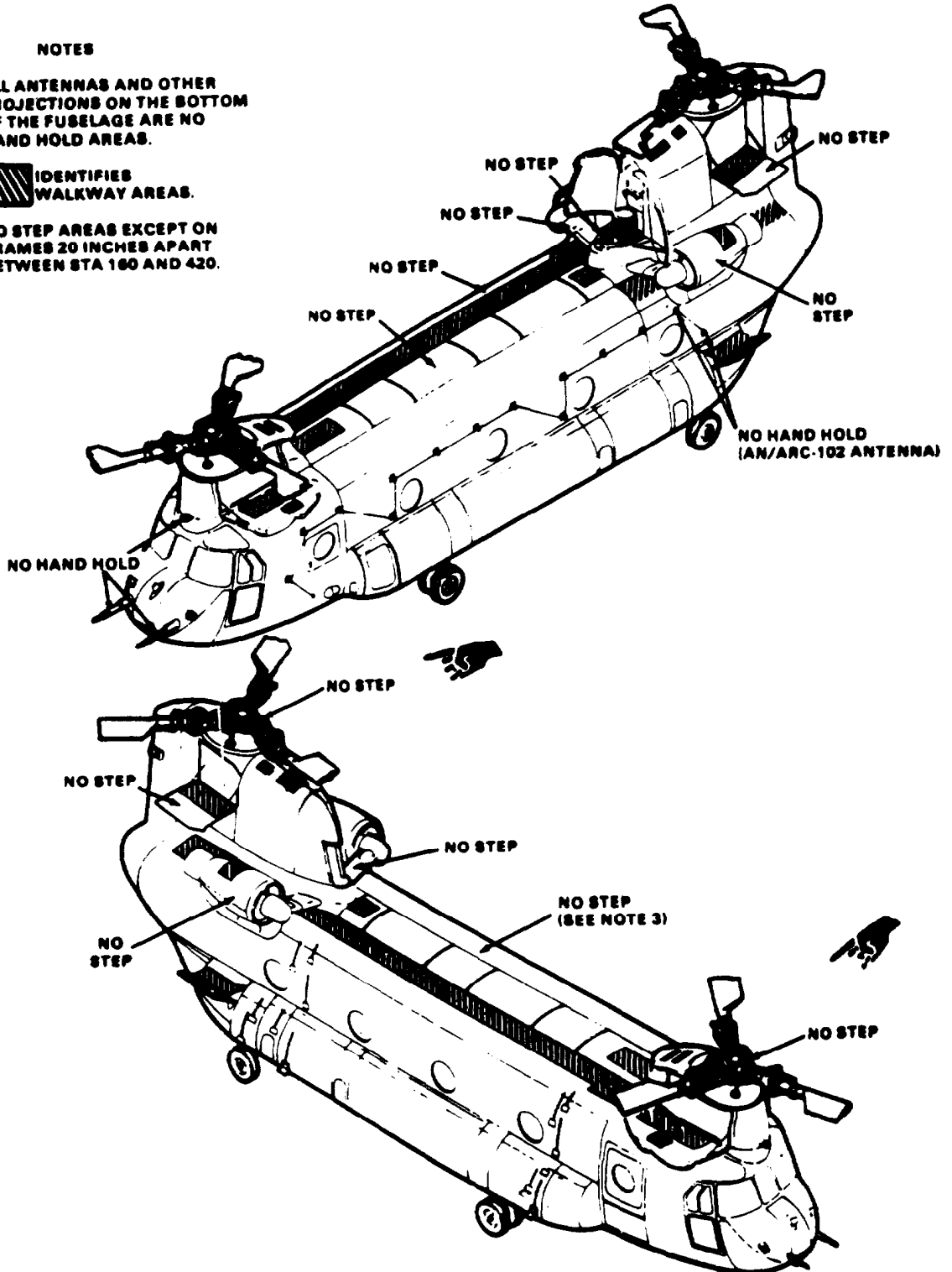
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1-166 Change 55

NOTES

- 1. ALL ANTENNAS AND OTHER PROJECTIONS ON THE BOTTOM OF THE FUSELAGE ARE NO HAND HOLD AREAS.
- 2.  IDENTIFIES WALKWAY AREAS.
- 3. NO STEP AREAS EXCEPT ON FRAMES 20 INCHES APART BETWEEN STA 160 AND 420.



1408C

1-50 GENERAL SERVICING INFORMATION (Continued)

1-50

UNIT OR SYSTEM	MATERIAL	ITEM	UNIT	CAPACITY	
				US	IMP
Fuel Tank Main	Jet Fuel	E182	GAL	Left 278 Right 274	231.5 228.1
Fuel Tank Auxiliary, Forward	Jet Fuel	E182	GAL	Left 122 Right 119	101.6 99.1
Fuel Tank Auxiliary, Aft	Jet Fuel	E182	GAL	Left 118 Right 117	96.3 97.4
Engine, Each	Lubricating Oil	E253 or E254 (Refer to Task 1-53)	GAL	3.00	3.11
Apu	Lubricating Oil	E253 or E254 (Refer to Task 1-53)	QT	3.00	2.50
Forward Transmission	Lubricating Oil Transmission	E254 or E254.1 (Refer to Task 1-54)	QT	22.0	23.0
Aft Transmission	Lubricating Oil Transmission	E254 or E254.1 (Refer to Task 1-54)	QT	32.0	25.0
Engine Transmission System (Each)	Lubricating Oil Transmission	E254 or E254.1 (Refer to Task 1-54)	QT	5.0	5.8
Combining Transmission System	Lubricating Oil Transmission	E254 or E254.1 (Refer to Task 1-54)	QT	13.5	17.5
Pitch-Varying Housing and Oil Tank	Lubricating Oil	E254 or E254.1	QT	0.37	0.30
Rotary-Wing Hub and Oil Tank	Lubricating Oil	E254 or E254.1	QT	1.00 (calculated)	0.83
Vertical Hinge Pin Bearings and Oil Tank	Lubricating Oil	E254 or E254.1	QT	0.34	0.28
Rotary-Wing Shock Absorber	Hydraulic Fluid	E197 (Refer Task 1-58)	QT	0.74	0.62
Landing Gear Shock Strut Forward	Hydraulic Fluid	E197 (Refer Task 1-69)	QT	3.20	2.65
Landing Gear Shock Strut Aft	Hydraulic Fluid	E197 (Refer to Task 1-70)	QT	1.30	1.04
Flight controls Hydraulic Fluid Reservoir, Each	Hydraulic Fluid	E197 or E199 (Refer to Task 1-59)	QT	2.40	2.00
Utility Hydraulic Fluid Reservoir (Ramp up)	Hydraulic Fluid	E197 or E199 (Refer to Task 1-59)	QT	5.60	4.66

NOTE

E254.1 is the preferred lubricant. Use E254.1 is not available.

Hydraulic System Servicing

1. Use fire-resistant hydraulic fluid MIL-H-83282 (E199) (if installed), to service the utility and flight control hydraulic systems. Its higher flash point provides a greater margin of safety than hydraulic fluid MIL-H-5606 (E197). The two fluids are fully compatible; however, the presence of more than 3 percent MIL-H-5606 will reduce the fire resistance of MIL-H-83282 proportionately.
2. The viscosity of MIL-H-83282 increases as temperature decreases. Because of this, it should not be used below -50°F (-46°C). If temperature drops below this limit, control motions may become stiff and sluggish. If this happens, cycle the controls to agitate the fluid. This along with radiant heat from engines and transmissions, may warm the fluid enough to permit satisfactory operation.
3. If the controls remain sluggish after cycling and warming, drain the system and service with MIL-H-5606.

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Refueling Vehicle With D1 Nozzle—Grounded
Protective Clothing/Goggles

Materials:

Cloths (E120)
Fuel JP4, or JP5, (182) or JP8 (E182.1) or
JET A/A-1 (182.2) As Required
Gloves (E186)

Personnel Required:

Petroleum Supply Specialist
Medium Helicopter Repairer

References:

TM 55-1520-240-T
Task 1-37

Equipment Condition:

Helicopter Parked on Level Ground at Least 50
Feet from Hangar or Structure (Task 1-25)
Battery Connected (Task 1-39)
Electrical Power Off
Forward Right Landing Gear Access Panel Open
(Task 2-2)

Helicopter Grounded (Task 1-29)

Refueling Vehicle Grounded to Helicopter

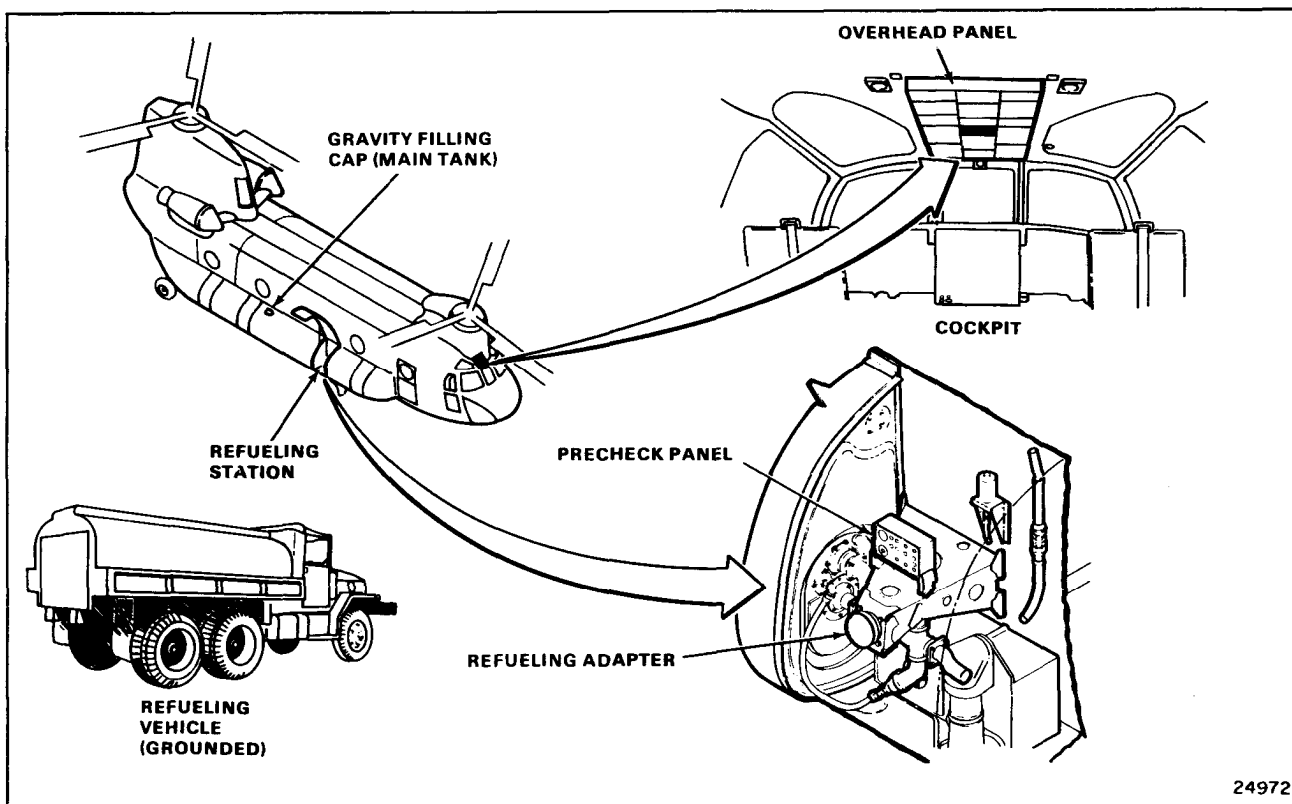
General Safety Instructions:**WARNING**

Proper electrical grounding is essential to prevent damage to equipment and injury to personnel.

All regulations and instructions for handling fuels shall be strictly observed.

Do not remove gravity filling cap from any fuel tank after single point fueling. Fuel spillage could result.

Fuel JET A-1 shall not be added to tanks containing JP-4 unless it can be assured that JET A-1 contains conductivity additive in the correct proportions. Otherwise, vapor ignition could result. No additive is needed when mixing JET A-1 with JP-5.



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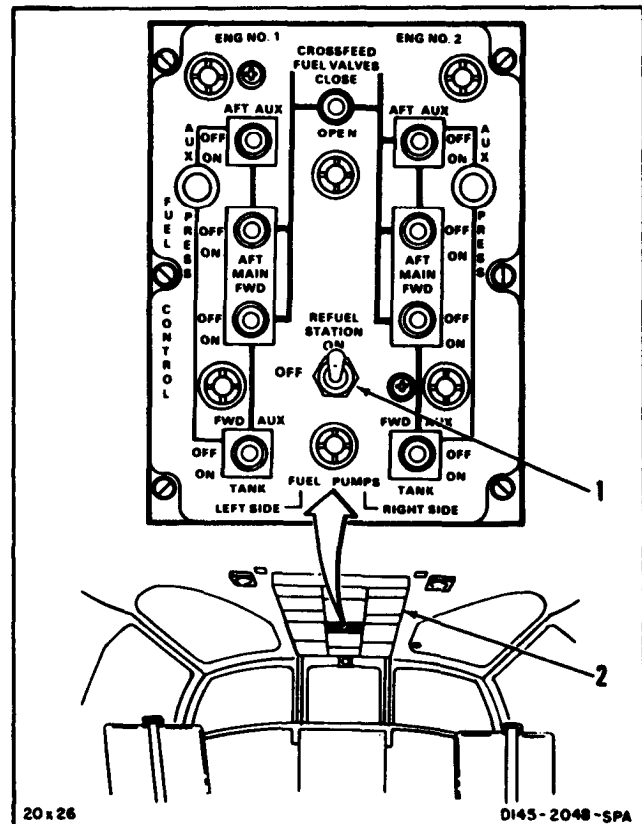
Change 43

1-169

1. Inside cockpit, **set REFUEL STATION switch (1) to ON** on overhead panel (2).

NOTE

Cockpit fuel level gages will not operate until REFUEL STATION switch is set back to OFF.



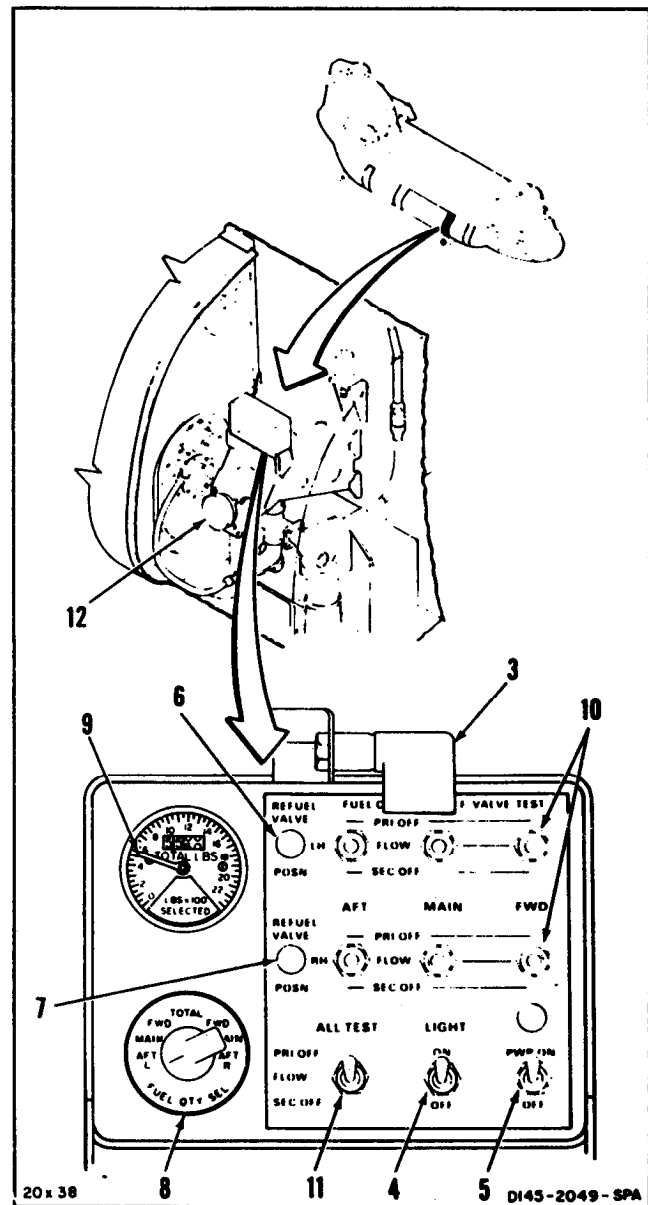
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2. If panel light (3) at refueling station is required, set LIGHT switch (4) to ON.
3. Set PWR switch (5) to PWR ON. LH REFUEL VALVE POSN light (6) and RH REFUEL VALVE POSN light (7) shall come on and go off.

WARNING

If refueling panel or system does not function as detailed in this procedure, do not continue. Go to step 25. Troubleshoot system (TM 55-1520-240-T).

4. To check fuel level in any left tank, set FUEL QTY SEL switch (8) to L AFT, L MAIN, or L FWD, as required. Pointer (9) shall indicate fuel level in tank. Pointer shall be steady.
5. To check fuel level in any right tank, set FUEL QTY SEL switch (8) to R FWD, R MAIN, or R AFT, as required. Pointer (9) shall indicate fuel level in tank. Pointer shall be steady.
6. Set FUEL QTY SEL switch (8) to TOTAL.
7. Set six FUEL CELL SHUTOFF VALVE TEST switches (10) to FLOW.
8. Set ALL TEST switch (11) to PRI OFF.
9. Remove cap (12).



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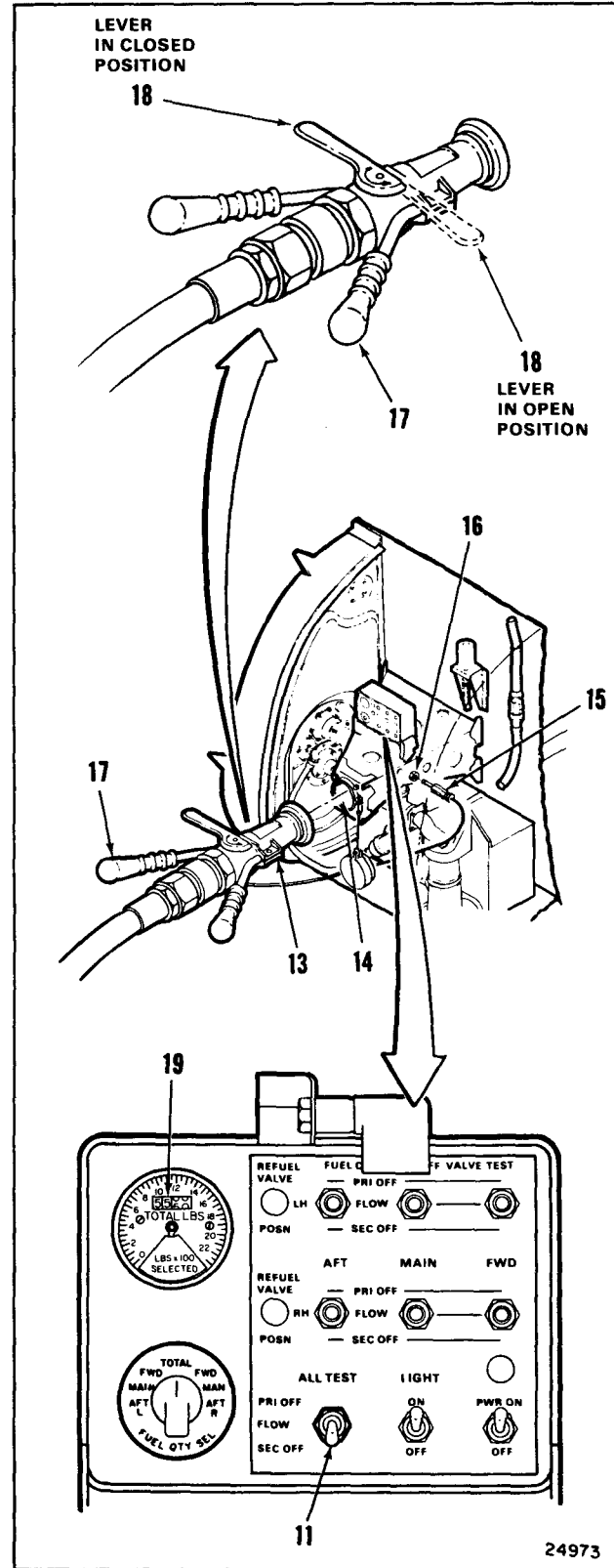
10. Position fueling nozzle (13) near fueling adapter (14).
11. **Install grounding wire plug (15) on receptacle (16).**
12. **Install fuel nozzle (13) in adapter (14).**
Hold grips (17) tightly and rotate grips and nozzle (13) clockwise to lock

CAUTION

Damage to fuel system could result if refueling hose pressure exceeds 55psi.

NOTE

- If possible, observe the refueling truck gauges for fuel flow indication.
 - The system is designed to restrict fuel flow to 300 gpm during pressure refueling at a nozzle pressure of 55 psi.
13. **Swing flow control lever (18) counter-clockwise to open position.** Fuel will start to flow (as indicated by totalizer (19)) and then stop within 4 seconds. Valve closing will be indicated by a sudden drop at the fuel truck flowmeter to near zero. However, a small amount of fuel will continue to flow through the open secondary pilot ports. As much as 15 gallons per minute may flow.
 - 13.1. **Reset ALL TEST switch (11) to flow, observe totalizer (19) to verify fuel starts flowing again.**
 14. **Set ALL TEST switch (11) to SEC OFF.**
Fuel will start to flow (as indicated by totalizer (19)) and then stop within 4 seconds. A small amount of fuel will continue to flow through the open primary pilot ports.
 - 14.1. If both primary and secondary checks are successful proceed to refuel aircraft.



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21. To add fuel to left forward fuel tank:

- a. Set FUEL QTY SEL switch (8) to L FWD.
- b. Set FUEL CELL SHUTOFF VALVE TEST LH REFUEL FWD switch (10) to FLOW.
- c. Set FUEL CELL SHUTOFF VALVE TEST LH REFUEL FWD switch (10) to PRI OFF when pointer (9) indicates fuel level desired.

22. To add fuel to aft right fuel tank:

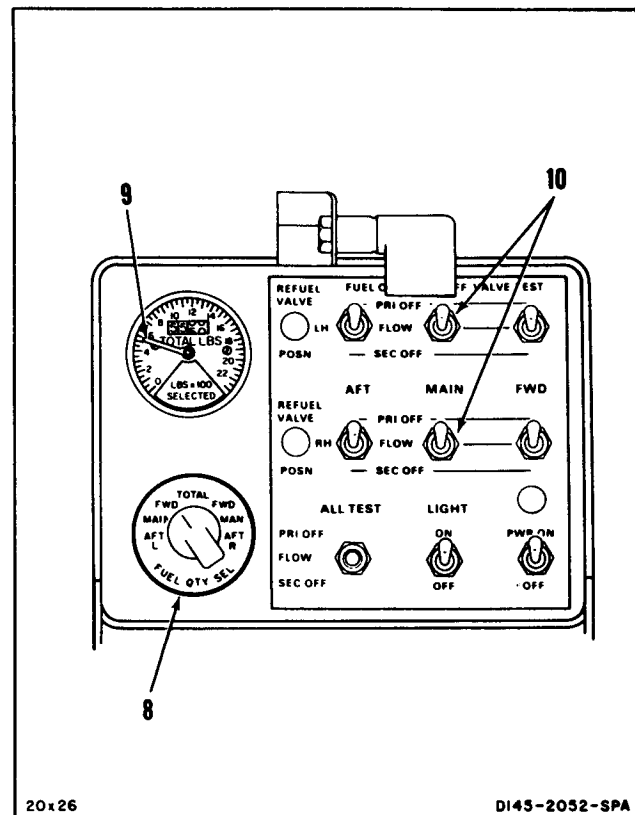
- a. Set FUEL QTY SEL switch (8) to R AFT.
- b. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL AFT switch (10) to FLOW.
- c. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL AFT switch (10) to PRI OFF when pointer (9) indicates fuel level desired.

23. To add fuel to right main fuel tank:

- a. Set FUEL QTY SEL switch (8) to R MAIN.
- b. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL MAIN switch (10) to FLOW.
- c. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL MAIN switch (10) to PRI OFF when pointer (9) indicates fuel level desired.

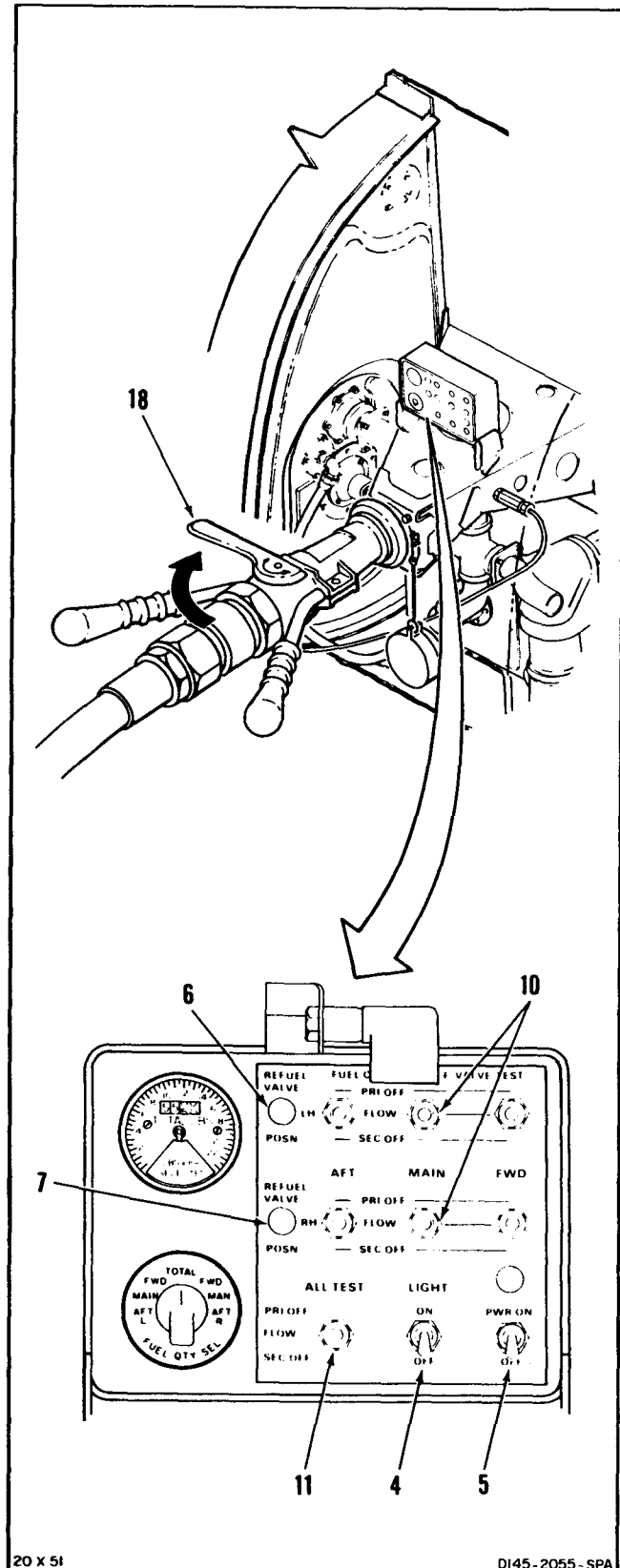
24. To add fuel to right forward fuel tank:

- a. Set FUEL QTY SEL switch (8) to R FWD.
- b. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL FWD switch (10) to FLOW.
- c. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL FWD switch (10) to PRI OFF when pointer (9) indicates fuel level desired.

**GO TO NEXT PAGE**

HUTDOWN

5. **Set flow control lever (18) clockwise to closed position.**
6. **Set power switch (5) to OFF.** VALVE POSN lights (6 and 7) shall come on and go off.
7. **Set six FUEL CELL SHUTOFF VALVE switches (10) to FLOW.**
8. **Set ALL TEST switch (11) to FLOW.**
9. **Set LIGHT switch (4) to OFF.**

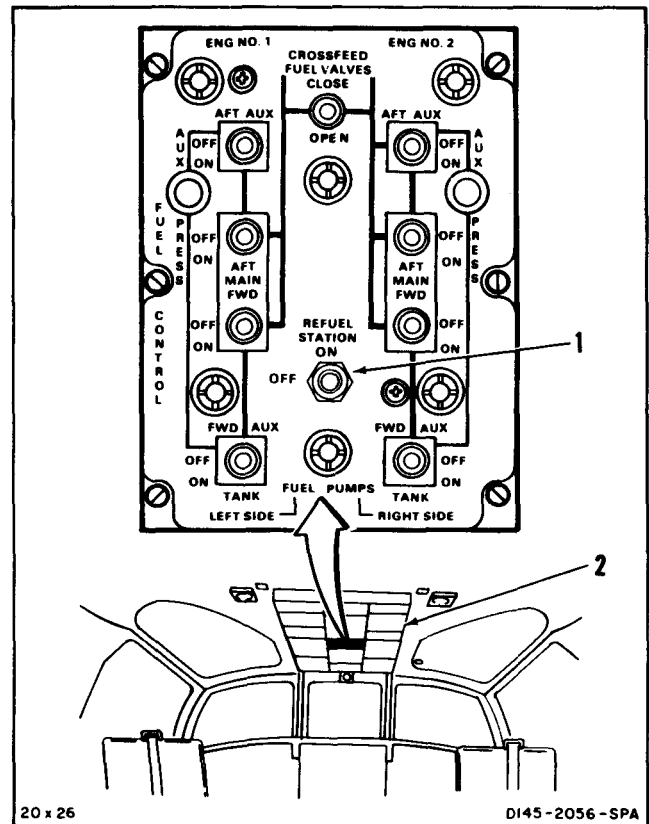


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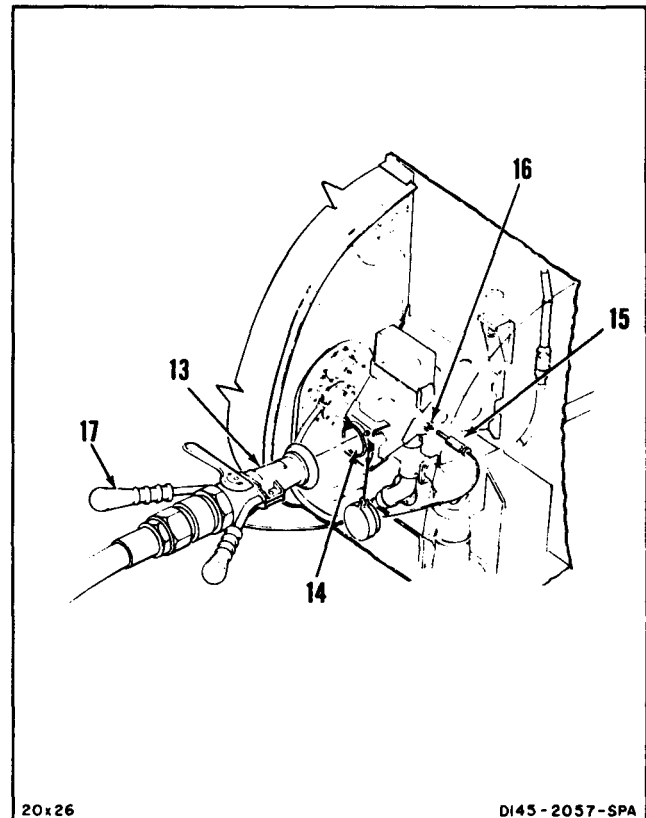
30. Inside cockpit, **set REFUEL STATION switch (1) to OFF** on overhead panel (2).

NOTE

Cockpit fuel gages will now register fuel tank contents.



31. At refuel station, hold grips (17) tightly and rotate grips and fuel nozzle (13) counter-clockwise to unlock. **Remove nozzle (13)** from adapter (14).
32. Support nozzle (13) and **disconnect grounding wire plug (15)** from receptacle (16).



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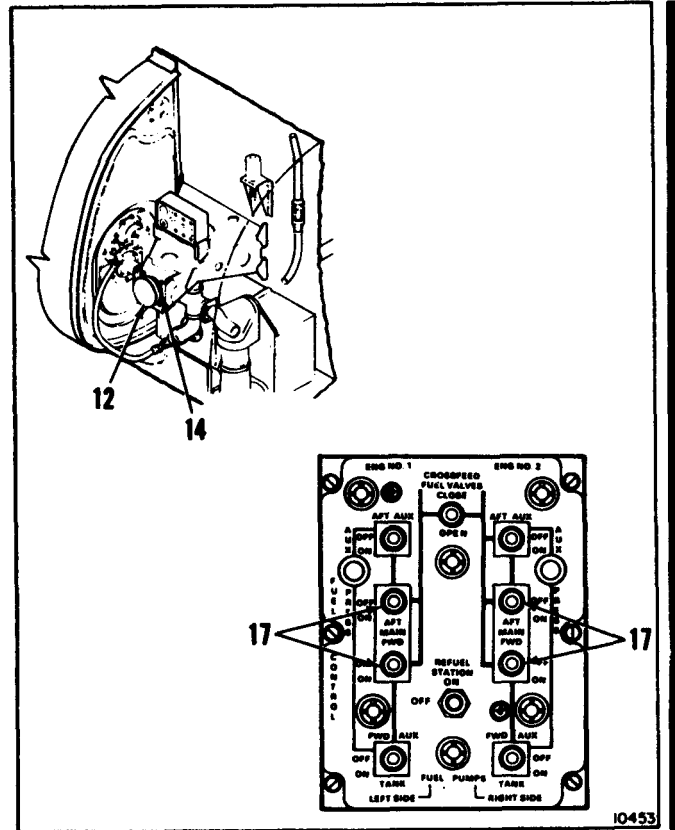
33. Install cap (12) on adapter (14).

CAUTION

If pressure is not relieved, fuel may seep or spill when refueling is completed.

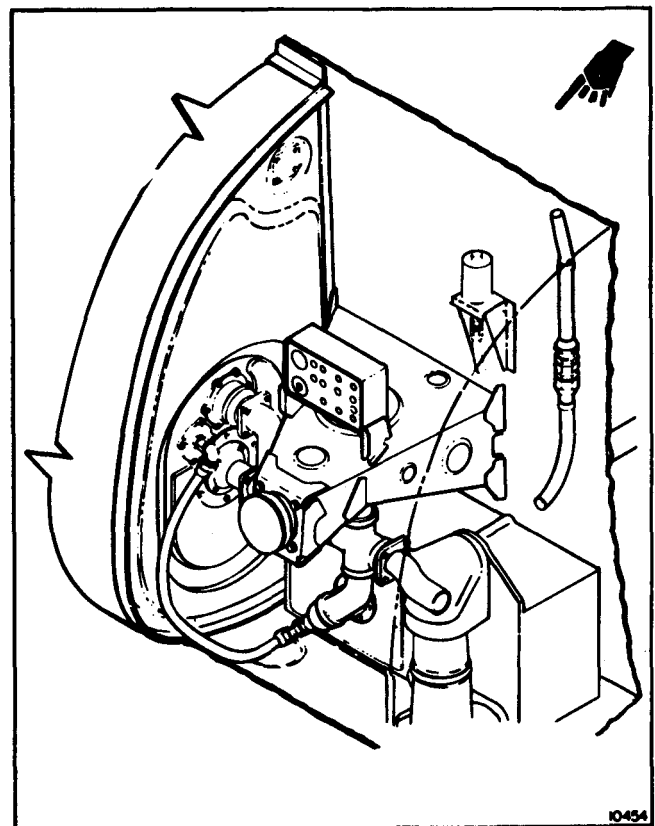
34. Relieve fuel pressure in the lines by evacuating fuel as follows:

- a. Apply ac power to the helicopter (Task 1-37).
- b. Operate any of the main tank boost pumps for about two minutes. Use switches (17).
- c. Remove ac power (Task 1-37).



FOLLOW-ON MAINTENANCE:

Close forward right landing gear access panel (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Refueling Vehicle—Parked At Least 10 Feet From Helicopter and Grounded

Materials:

Fuel JP4 or JP5 (182) or JP8 (E182.1) or JET A/A-1 (182.2) (As Required)

Personnel Required:

Petroleum Supply Specialist
Medium Helicopter Repairer

Equipment Condition:

Helicopter Parked on Level Ground At Least 50 Feet From Hangar or Structure (Task 1-25)
Battery Connected (Task 1-39)
Electrical Power Off
Helicopter Grounded (Task 1-29)
Refueling Vehicle Grounded to Helicopter

General Safety Instructions:

WARNING

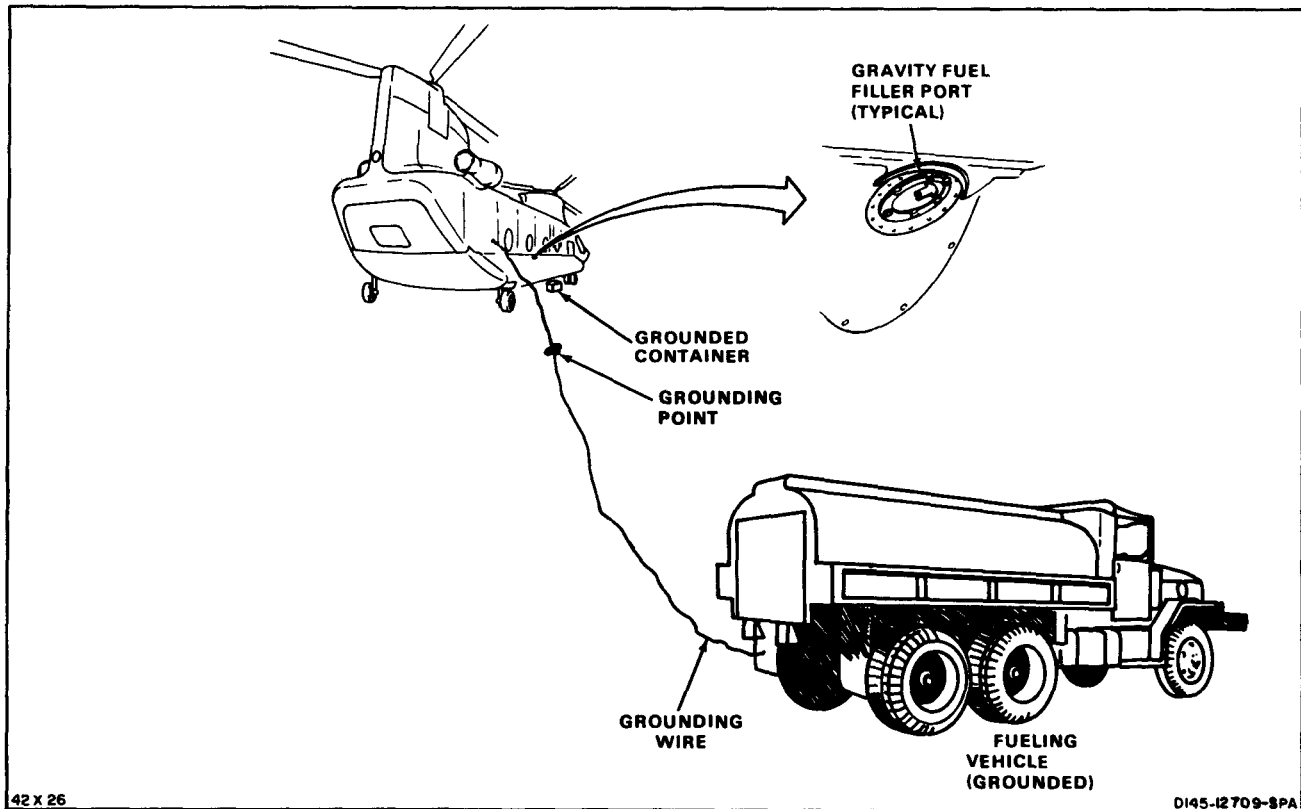
Proper electrical grounding is essential to prevent damage to equipment and injury to personnel.

WARNING

All regulations and instructions for handling fuels shall be strictly observed.

WARNING

Fuel JET A-1 shall not be added to tanks containing JP-4 unless it can be assured that JET A-1 contains conductivity additive in the correct proportions. Otherwise, vapor ignition could result. No additive is needed when mixing JET A-1 with JP-5.



42 X 26

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1-178 Change 43

1-51.1 GRAVITY REFUELING (Continued)

1-51.1

NOTE

If servicing with engines running, fuel boost pumps shall be left on during servicing.

NOTE

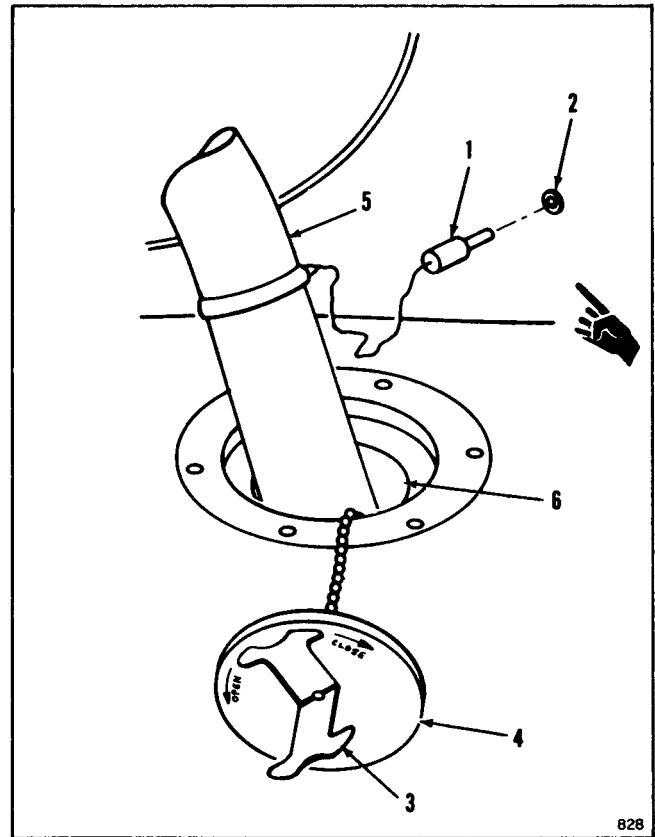
Service main and auxiliary tanks on each side of helicopter in same way. Service main tanks before auxiliary. Left main tank shown here.

1. **Connect** hose grounding lead (1) to ground socket (2).

WARNING

If checking fuel level inside the tank, use an explosion-proof flashlight. Other flashlights could cause a spark that ignites fumes. Injury to personnel can result.

2. Raise filler cap latch (3). **Remove cap (4)** by rotating it counterclockwise.
3. **Insert** hose nozzle (5) into filler opening (6). **Fill tank** to desired level.
4. Remove hose nozzle (5) from opening (6).

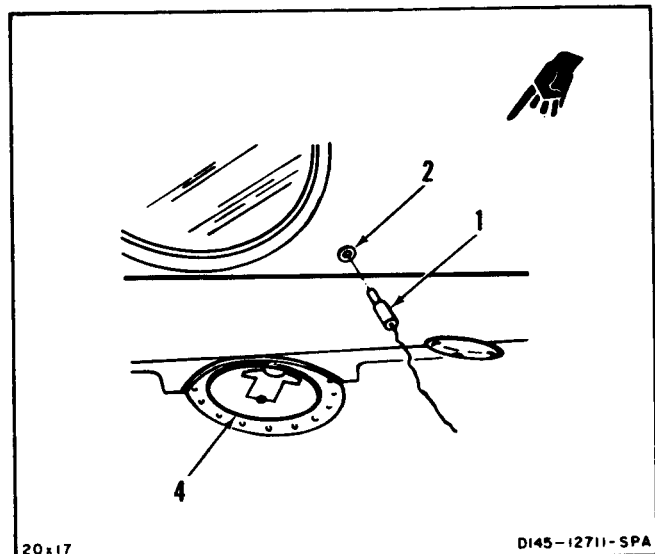


5. **Install** and lock **filler cap (4)**.
6. **Disconnect** hose grounding lead (1) from ground socket (2).

INSPECT

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692

Materials:

Cloths (E120)
Lubricating Oil, Aircraft Turbine Engine (E253)
(Temperature Above -25 Degrees F)
Lubricating Oil, Aircraft Turbine Engine (E254)
(Temperature Below -25 Degrees F) Gloves
(E186)

Personnel Required:

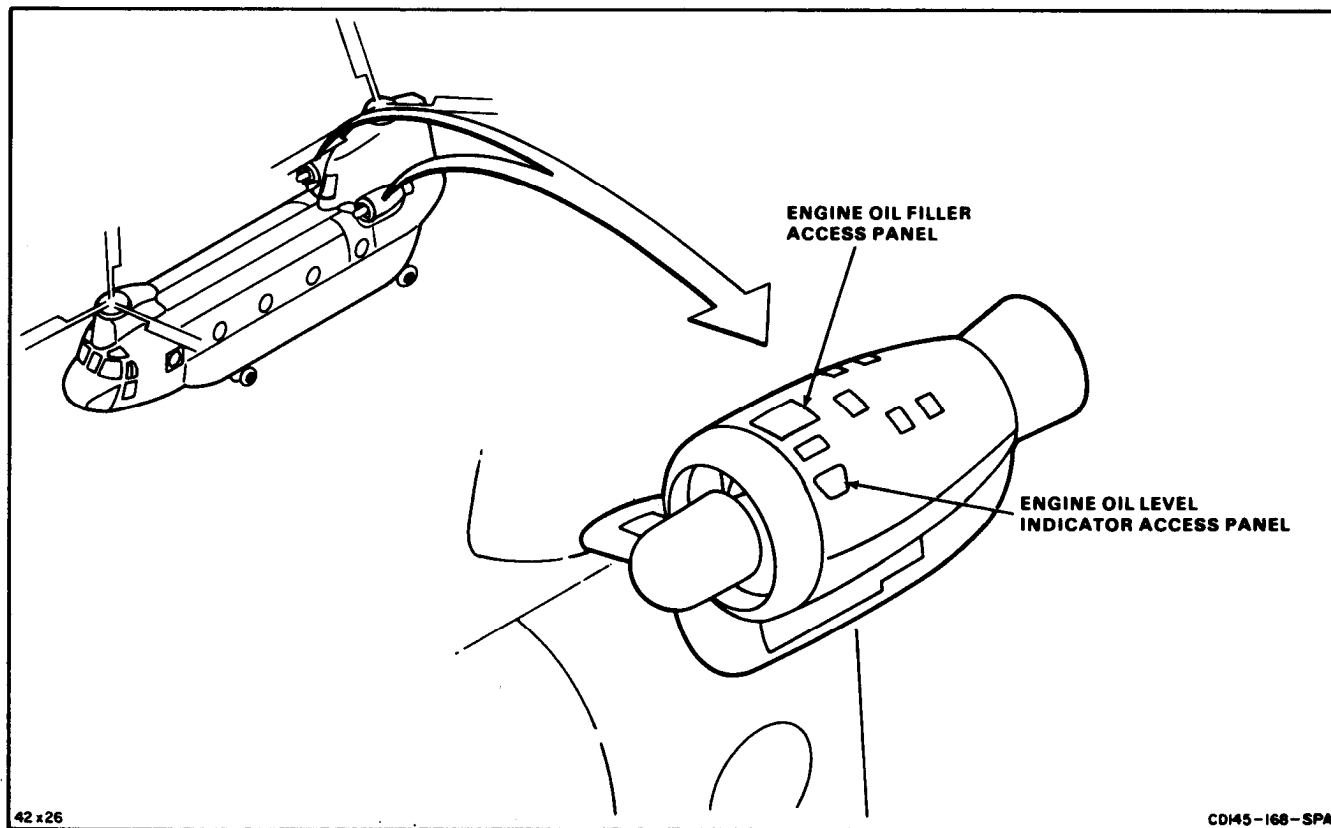
Medium Helicopter Repairer

References:

Task 2-2

Equipment Condition:

Engine Operated Within Past 24 Hours



42 x 26

COM5-168-SPA

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1-178.2 Change 15

CAUTION

Under normal conditions, engine shall be serviced with only one type of oil (E253 or E254). Oil (E253) is preferred for temperature above -25°F (-32°C). Oil (E254) must be used for temperature below -25°F (-32°C). In an emergency, if one type of oil is in engine but is not available, the other type may be used. If the two types of oil are mixed, the oil system shall be drained and serviced as soon as possible, but no later than 6 hours, after engine operation.

NOTE

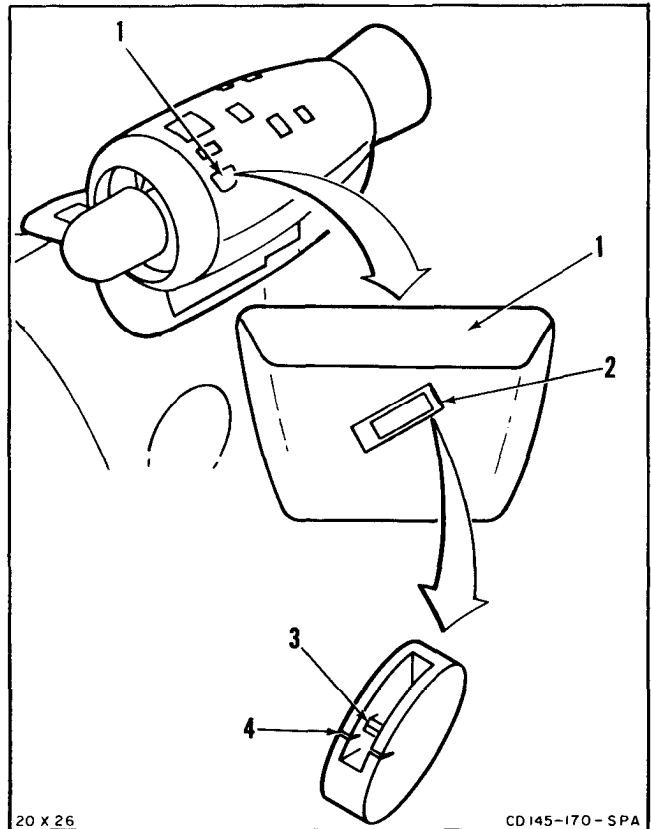
- Oil tanks on No. 1 engine and No. 2 engine are serviced in same way.
- If engine has not been operated within 24 hours, cooler oil can cause an incorrect oil level reading. For correct reading, check oil after engine operation.

1. Check aircraft log book for type of oil used in engine.
2. Push open engine oil access panel (1).

NOTE

Indicator is about 6 inches below access panel opening.

3. Check oil level on indicator (2). If pointer (3) aligns with white line (4), servicing is not required. If pointer is below white line, go to step 4.



4. **Open oil filler access panel (5) (Task 2-2).**
5. **Lift and twist handle (6) to left.**
6. **Remove filler cap (7) from tank (8).**

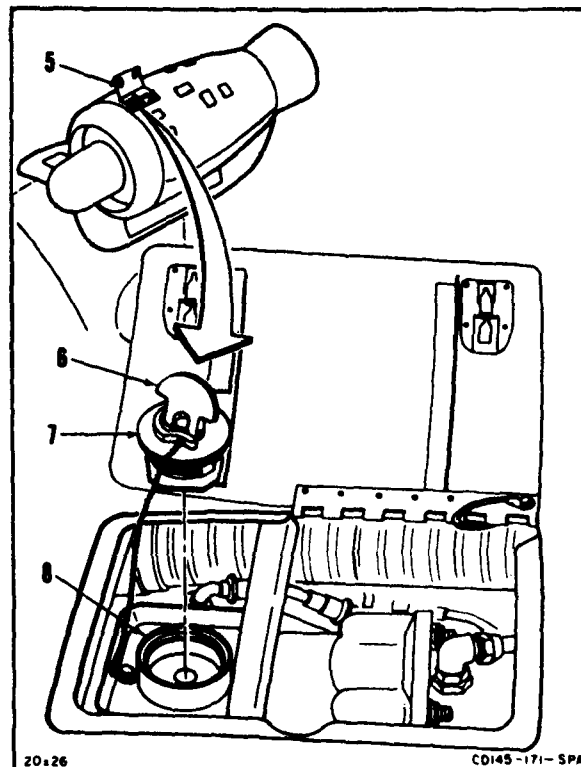
WARNING

- **Oil (E253 or E254) is a skin irritant. If oil gets on skin, wash thoroughly. If oil soaks into clothes, change clothes immediately.**
- **Oil (E253 or E254) gives off fumes that can cause injury to personnel. Use oil in a well-ventilated area.**

CAUTION

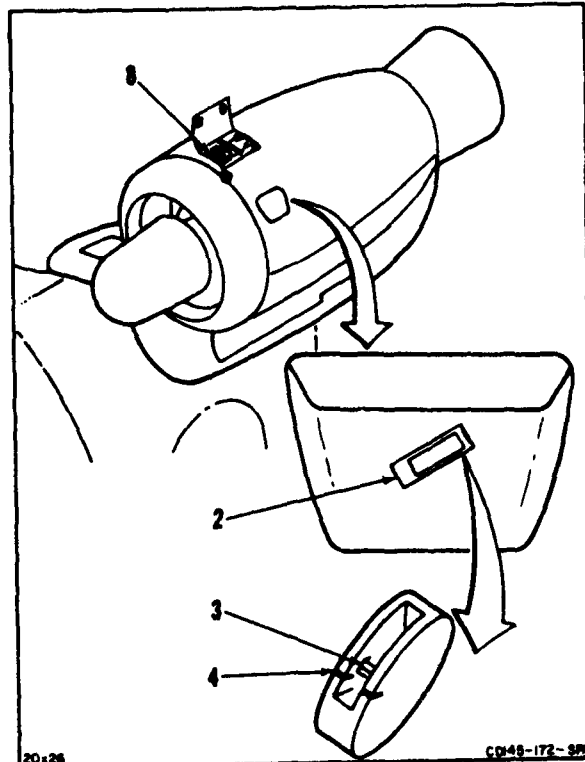
Oil (E254) can soften paint. If oil drips on painted surface of helicopter, wipe up immediately with clean cloths.

7. **Fill oil tank (8) with oil (E253 or E254) until pointer (3) on indicator (2) aligns with white line (4). Wear gloves (E186).**



20x26

CD145-171-SPA



20x26

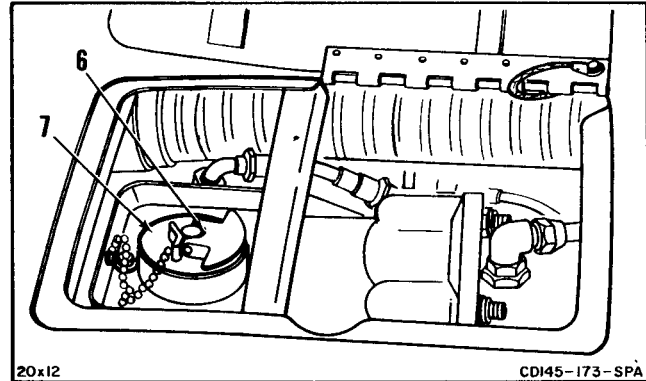
CD145-172-SPA

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CAUTION

Filler cap must be installed correctly and locked in place on oil tank. If not, cap can come loose during flight and cause loss of engine oil.

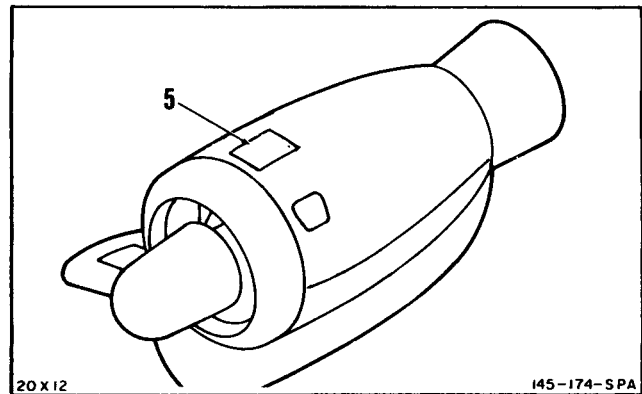
8. **Install filler cap (7).** Turn handle (6) to right and lock flat.



9. **Close filler access panel (5) (Task 2-2).**

FOLLOW-ON MAINTENANCE:

If oil was changed from one type to another, change the stencil on engine cover to show type of oil used (TM 55-1500-204-25/1).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Workstand
- Funnel

Materials:

Oil (E253 or E254)

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Cargo Ramp Open and Level (TM 55-1520-240-T)



Do not use drip pan as a handhold. Drip pan may be damaged.

1. Remove filler cap (1) from top of tank (2) above left side of drip pan (3).



- Do not overfill apu. Damage can result.
- Under normal conditions, the apu shall be serviced with only one type of oil (E253 or E254). Oil (E253) is preferred for temperature above -25°F (-32°C). Oil (E254) must be used for temperature below -25°F (-32°C). In an emergency, if one type of oil is in the apu but is not available, the other type may be used. If the two types of oil are mixed, the oil system shall be drained and serviced as soon as possible, but no later than 6 hours, after apu operation.

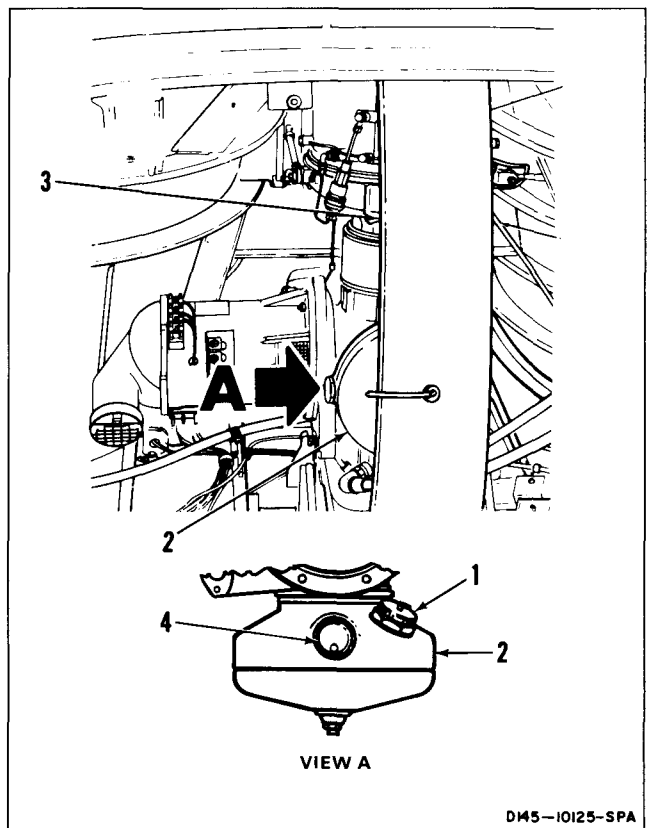
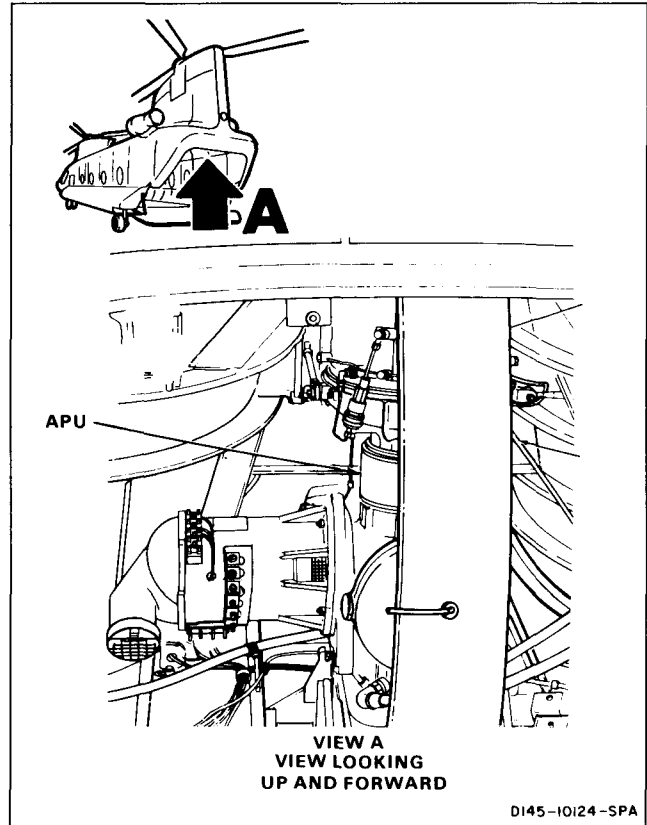
2. Add oil (E253 or E254) to tank (2) to center of sight gage (4). Install cap (1).

FOLLOW-ON MAINTENANCE:

Close cargo ramp (TM 55-1520-240-T).

END OF TASK

1-182 Change 40



INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

- Cloths (E120)
- Lubricating Oil, Transmission Systems (E254.1)
(Temperature Above -25°F/-32°C)
- Lubricating Oil, Aircraft Turbine Engine (E254)
(Temperature Below -25°F/-32°C)
- Gloves (E186)

Personnel Required:

Medium Helicopter Repairer

References:

TM 55-1520-240-10 Task 6-37.1

TM 55-1520-240-T Task 6-71.1

Task 2-2 Task 6-81.1

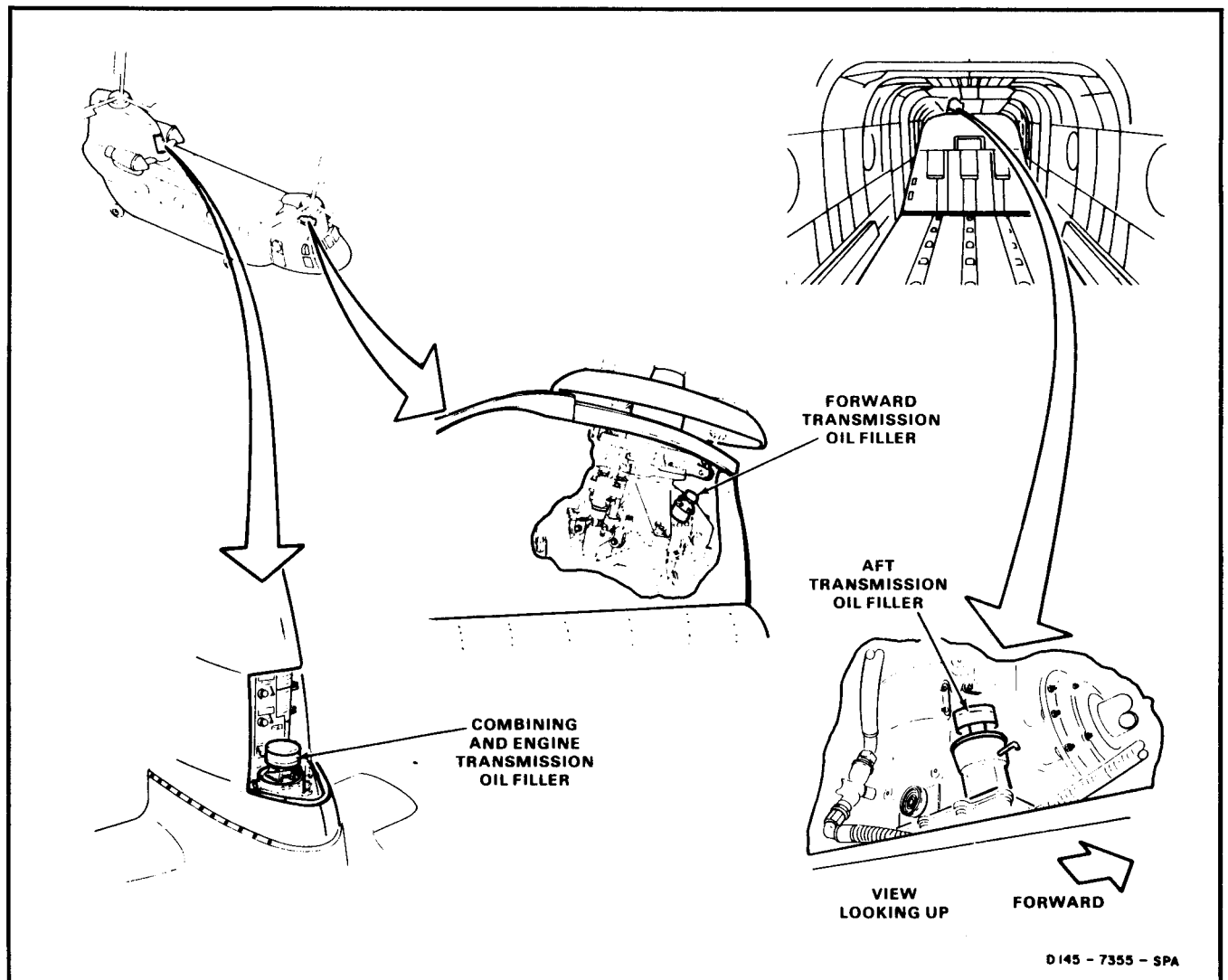
Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Helicopter on Level Surface

General Safety Instructions:

WARNING

Oil (E254.1 or E254) is toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.



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SERVICE FORWARD TRANSMISSION

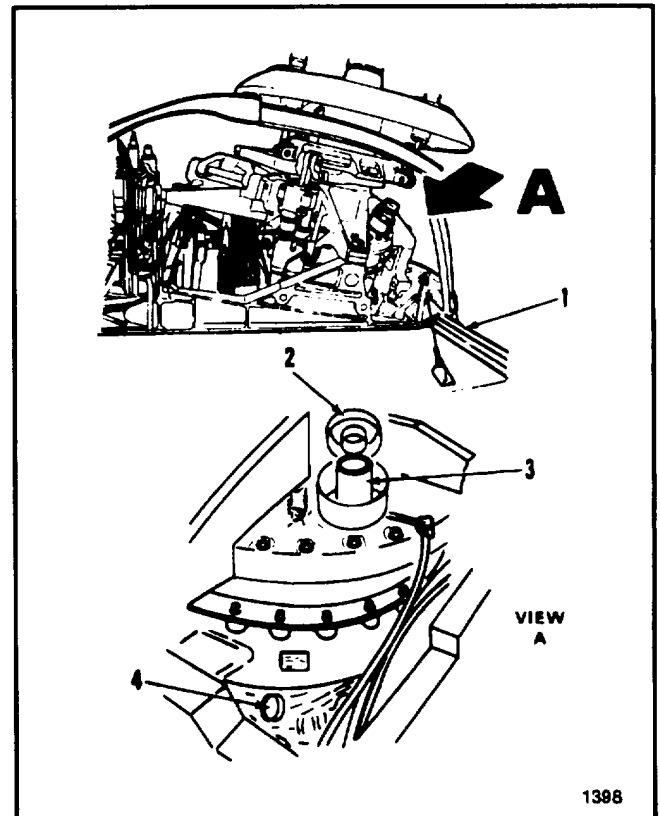
CAUTION

Under normal conditions, transmission shall be serviced with only one type of oil (E254.1 or E254.011 (E254) must be used for temperatures below -25IF (3°0C). In an emergency, if one type of oil is in the transmission but not available, the other type may be used. If the two types of oil are mixed, the transmission oil system shall be drained and serviced as soon as possible, but no later than 6 hours, after transmission operation with mixed oils.

NOTE

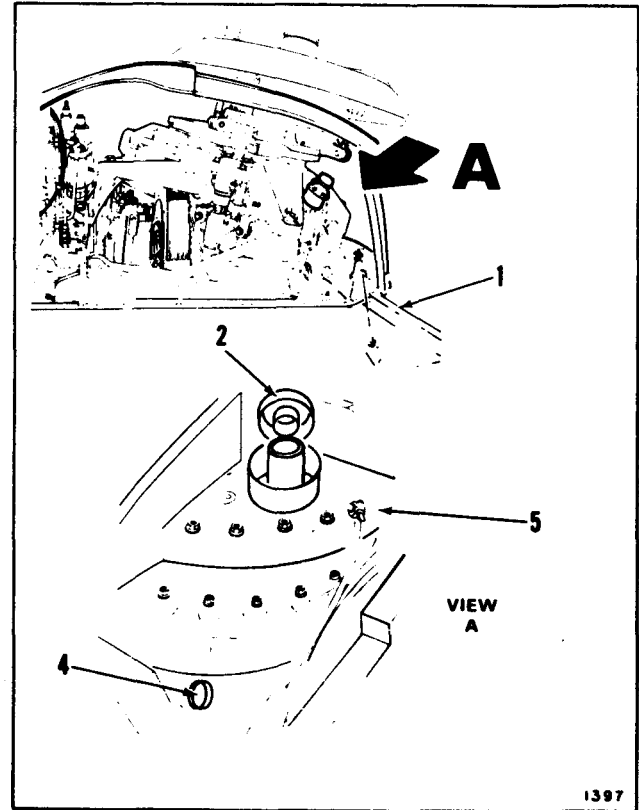
If transmission has been operated within the past 30 minutes, wait 30 minutes prior to servicing transmission.

1. Open forward transmission fairing right work platform (1) (Task 2-2).
2. Open oil filler cap (2).
- 2.1. Inspect filler screen (Task 6-37.1).
3. Add oil (E254.1 or E254) through filler (3) until oil level in sight gage (4) is at FULL Use funnel.



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4. Close oil filler cap (2).
5. After refilling a drained transmission (5), perform a 5-minute ground run (TM 55-1520-240-10). Check oil level at sight gage (4). Repeat steps 2 thru 4 as needed.
6. Close work platform (1) (Task 2-2).
7. Go to FOLLOW-ON MAINTENANCE.



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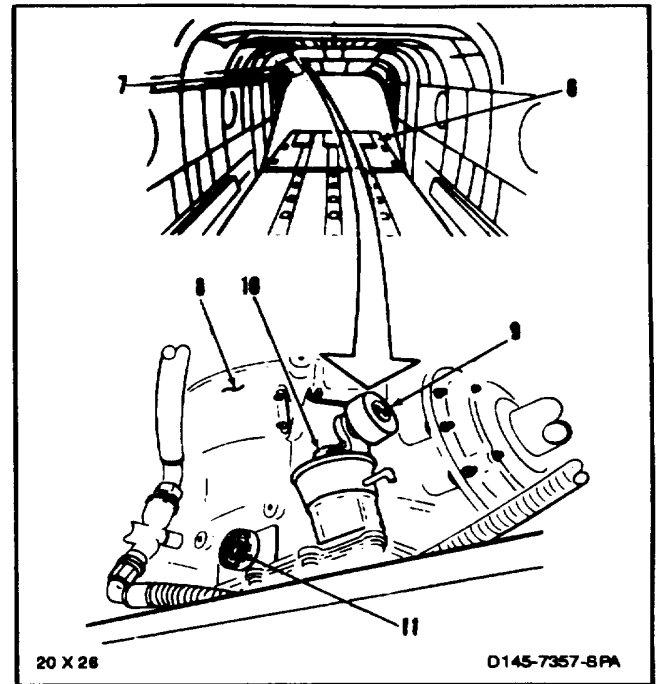
SERVICE AFT TRANSMISSION

CAUTION

Under normal conditions, transmission shall be serviced with only one type of oil (E254.1 or E254). OU (E254) must be used for temperature below -25°F (-32°C). In an emergency, if one type of oil is in the transmission but is not available, the other type may be used. If the two types of oil were mixed, the transmission oil system shall be drained and serviced as soon as possible, but not later than 6 hours, after transmission operation with mixed oils.

NOTE

If transmission has been operated within the past 30 minutes, wait 30 minutes prior to servicing transmission.



8. Lower cargo ramp (6) to level position (TM 55-1520-240-T).
9. Open right baffle (7) under aft transmission (8) (Task 2-2).
- 10.1. Inspect filler screen. (Task 6-81.1)
11. Add oil (E254.1 or E254) through filler (10) until oil level at sight gage (11) is at FULL.
12. Close oil filler cap (9).
13. After refilling a drained transmission (8), perform a 5-minute ground run (TM 55-1520-240-10). Check oil level at sight gage (11). Repeat steps 10 thru 12 as needed.
14. Close right baffle (7) under aft transmission (8) (Task 2-2).
15. Close cargo ramp (6) (TM 55-1520-240-T).
16. Go to FOLLOW-ON MAINTENANCE.

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1-1842 Change 57

SERVICE ENGINE AND COMBINING TRANSMISSIONS**CAUTION**

Under normal conditions, transmission shall be serviced with only one type of oil (E254.1 or E254). Oil (E254) must be used for temperatures below -25°F (-32°C). In an emergency, if one type of oil is in the transmission but is not available, the other type may be used. If the two types of oil are mixed, the transmission oil system shall be drained and serviced as soon as possible, but not later than 6 hours, after transmission operation with mixed oils.

NOTE

If transmission has not been operated during the past 30 minutes, perform a 5-minute ground run (TM 55-1520-240-10). (Not applicable if transmission is drained.)

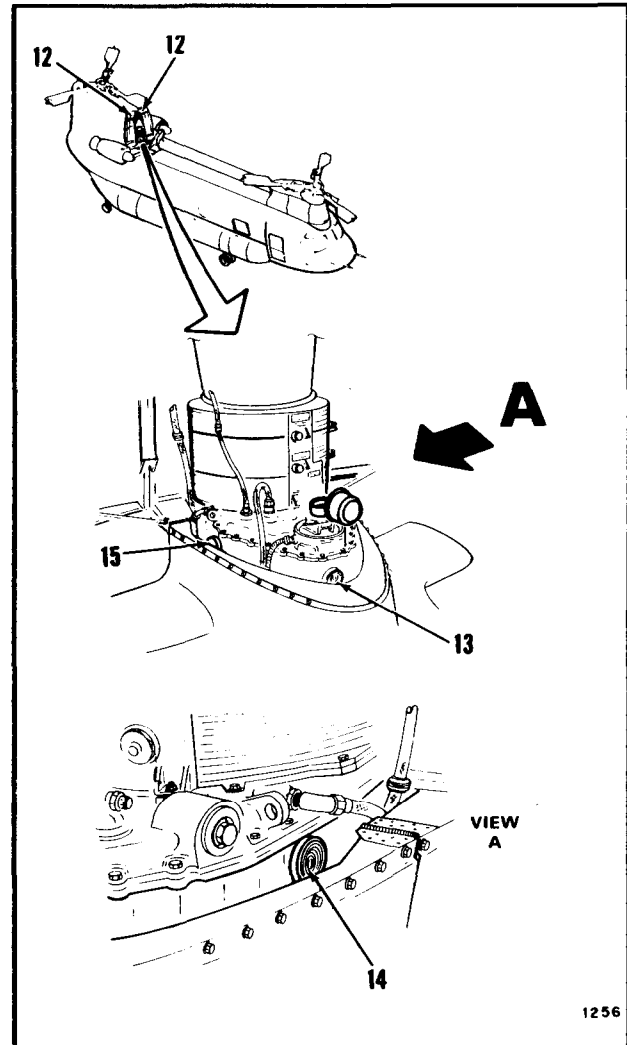
Combining transmission and left and right engine transmissions are serviced at the same time through same oil filler.

17. Open aft pylon access doors (12) (Task 2-2).

NOTE

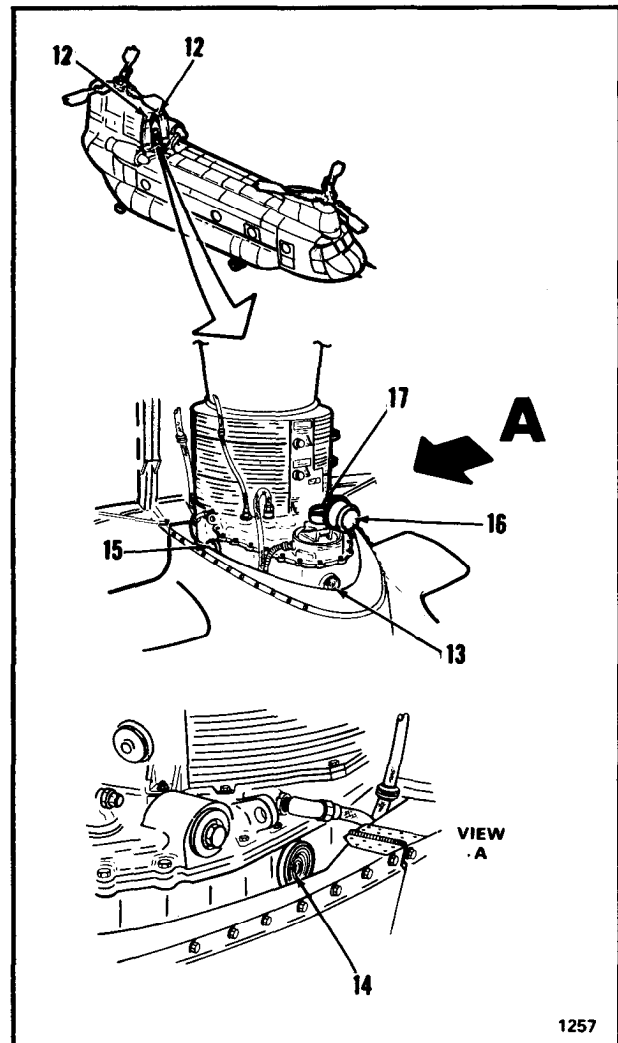
Combiner oil can drain down from oil reservoir to combiner main housing.

18. **Check combiner sight gage (13).** If oil appears in gage go to step 24. If oil does not appear go to step 19.
19. **Check engine transmission sight gages (14 and 15).** If oil appears in gages, perform 5-minute ground run (TM 55-1520-240-10), and repeat step 18. If oil does not appear, go to step 20.



GO TO NEXT PAGE

20. Open oil filler cap (16)
- 20.1. **Inspect** filler screen (Task 6-71.1).
21. **Add oil (E254.1 or E254) through filler (17) until oil level at sight gage (13) is at FULL. Check that oil is visible in sight gages (14 and 15).**
22. Close oil filler cap (16).
23. After refilling a drained transmission, perform a 5-minute ground run (TM 55-1520-240-10). Check oil level at sight gage (13, 14, and 15). Repeat steps 20 thru 23 if needed.
24. Close aft pylon access doors (12) (Task 2-2).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

1-186 Change 52

1-55 SERVICE ROTARY-WING HUB OIL TANK**1-55****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Hand Oiler, 4 to 6 Ounce Capacity
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

Cloths (E120)
Lockwire (E231)
Lubricating Oil (E254 or 254.1)
Gloves (E184.1)

Parts:

Packings

Personnel Required:

Medium Helicopter Repairer
Rotary-Wing Aviator (2)
Inspector

References:

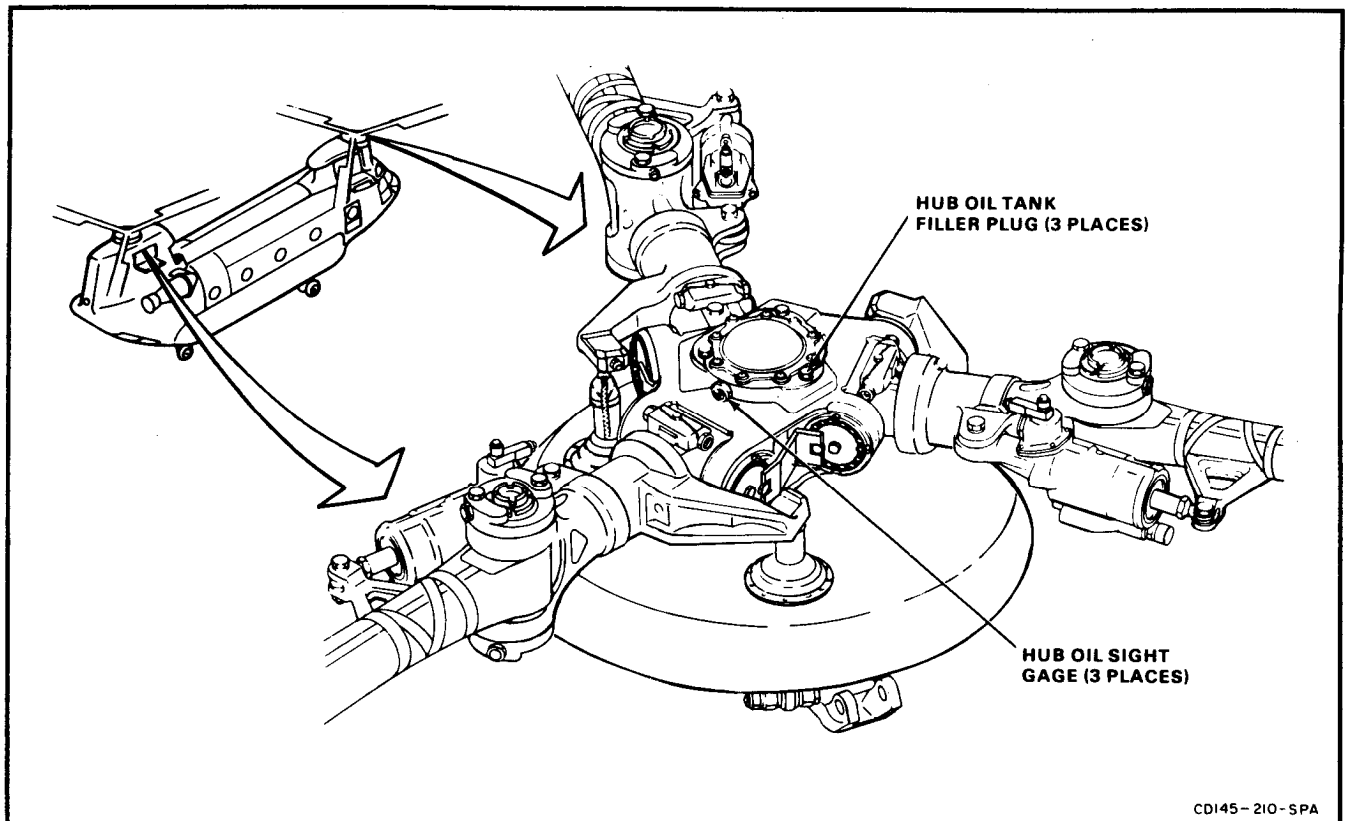
Task 1-26
Task 1-39
Task 2-2
TM 55-1520-240-23P

Equipment Condition:

Helicopter Parked on Level Ground (Preferred)
Battery Disconnected (Task 1-39)
Electrical Power Off
Tiedown Line Installed on One Forward Blade
(Task 1-26)
Aft Pylon Work Platforms Open (Task 2-2)
Forward Transmission Fairing Work Platforms
Open (Task 2-2)

General Safety Instructions:**WARNING**

Rotor blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before moving rotor blades.

**GO TO NEXT PAGE**

NOTE

- Rotary-wing hub oil tanks on aft and forward rotors are serviced the same way.
- Rotor blades must be positioned as shown to get a correct reading of hub oil level.

CAUTION

Under normal conditions rotary heads shall be serviced with only one type of oil (E254 or E254.1). Oil (E254) must be used for temperatures below -25°F (-32°C).

1. Using tiedown line (1), turn rotor blades (2) so one blade is positioned at a 90 degree angle to left or right side of helicopter.

WARNING

Prolonged oil leakage can damage finish and create a work hazard by making the fuselage slippery. It can also affect other systems in the helicopter. Therefore, good judgment must be used when determining allowable leakage.

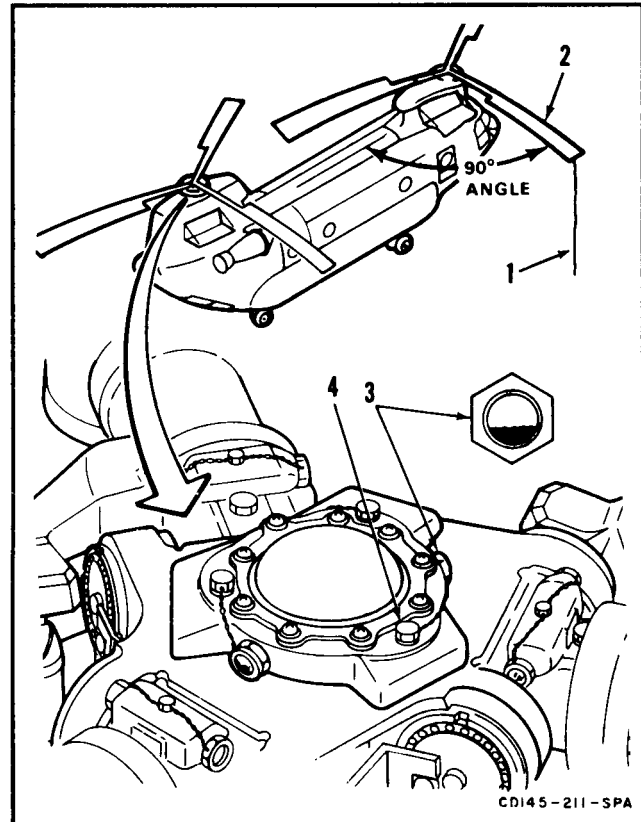
NOTE

If oil level in sight gage drops from full (half-way) mark to bottom of glass in two hours of operation, leakage is too great. Check for source of leakage. Repair as required.

2. **Check oil level in sight gage (3) next to the blade that is positioned at 90 degree angle.** If oil level is half full or more, servicing is not required. If oil level is less than half full, go to step 3.
3. Remove lockwire from highest filler plug (4).

NOTE

There are three filler plugs for the hub oil tank.



4. Remove filler plug (4) and packing (5).

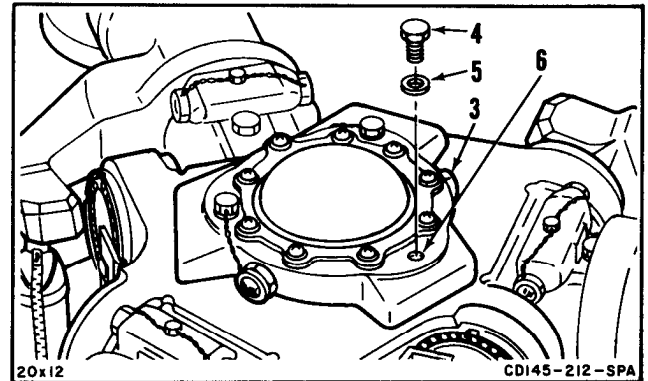
WARNING

- Oil (E254 or 254.1) is a skin irritant. If oil gets on skin, wash thoroughly. If oil spills on cloths, change clothes immediately.
- Oil gives off fumes that can cause injury to personnel. Use oil (E254 or 254.1) in a well-ventilated area.

CAUTION

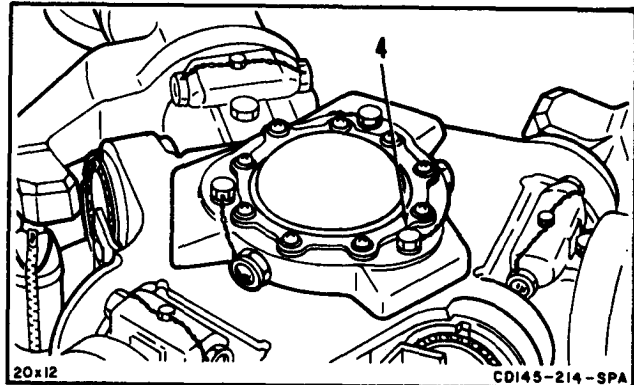
Oil (E254 or 254.1) can soften paint. If oil drips on painted surface of helicopter, wipe up immediately with clean cloths.

5. Add oil (E254 or 254.1) to oil tank (6) until sight gage (3) is half full. Wear gloves (E184.1)
6. Install filler plug (4) and packing (5).
Torque to 85 inch-pounds .



7. Lockwire filler plug (4). Use lockwire (E231).

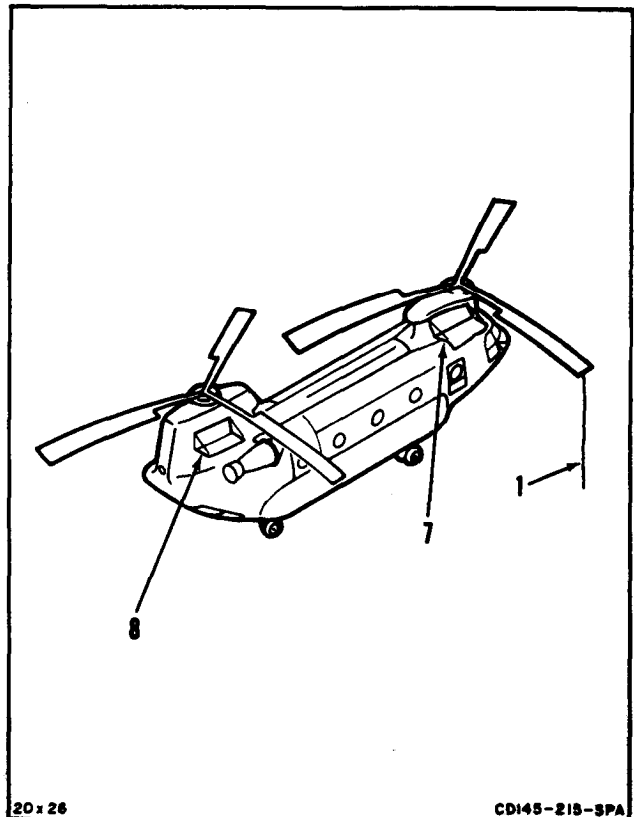
INSPECT



8. **If rotary-wing hub oil tank was drained before tank was serviced, continue with steps 9. thru 14.** If tank was not drained, go to FOLLOW-ON MAINTENANCE.
9. **Remove tiedown line (1) (Task 1-26) and close work platforms (7 and 8) (Task 2-2).**
10. Connect battery (Task 1-39).
11. **Have pilot run engine for 5 minutes; then shut down engine.**
12. Disconnect battery (Task 1-39).
13. Install tiedown line (1) (Task 1-26). Open work platforms (7 and 8) (Task 2-2).
14. Repeat steps 1. and 2.

FOLLOW-ON MAINTENANCE:

- Remove tiedown line (Task 1-26).
- Close work platforms (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 5 to 50 Inch-Pounds
Funnel

Materials:

Lubricating Oil (E254 or E254.1)
Lockwire (E231)
Cloth (E120)
Gloves (E184.1)

Parts:

Packings

Personnel Required:

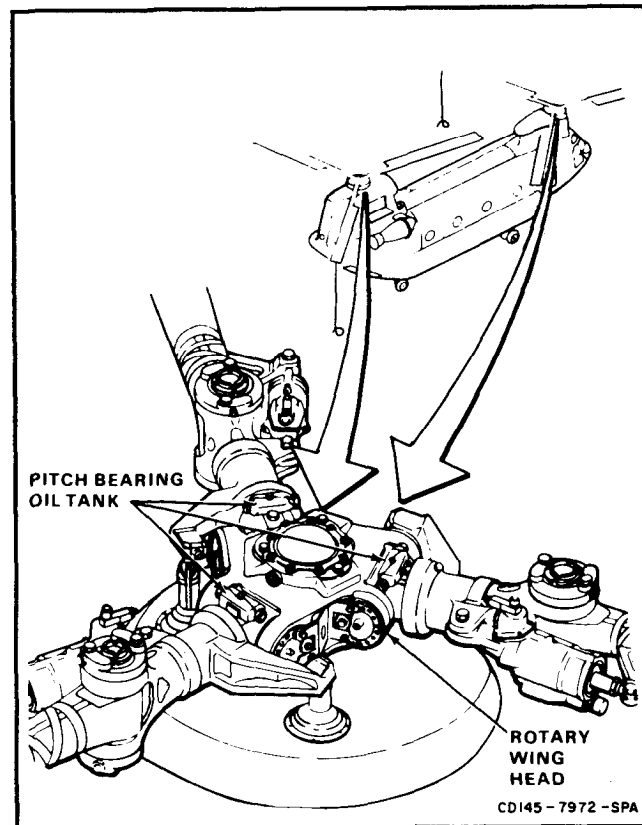
Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
One Forward and One Aft Rotary-Wing Blade
Tied Down (Task 1-26)
Forward or Pylon Work Platform Open
(Task 2-2)



GO TO NEXT PAGE

WARNING

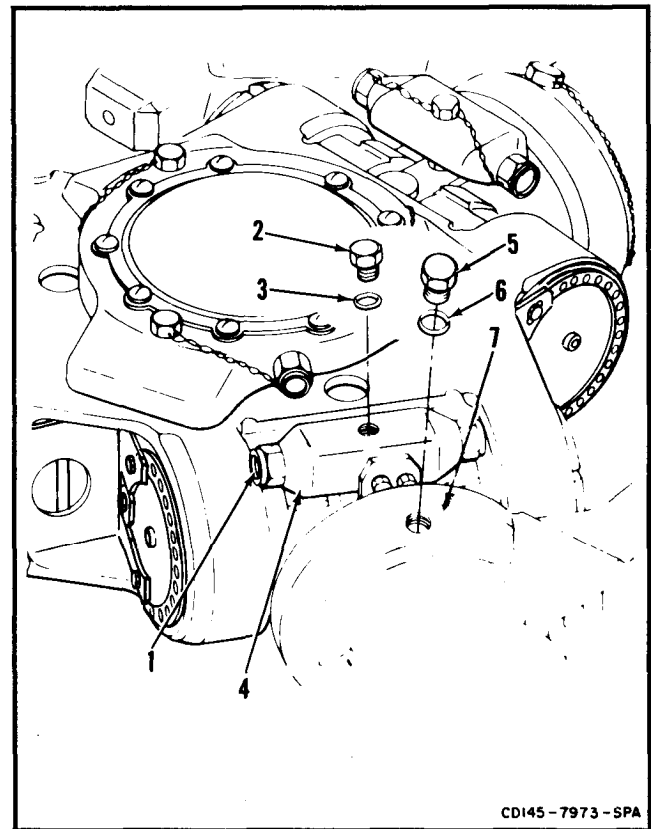
- Prolonged oil leakage can damage finish and create a work hazard by making the fuselage slippery. It can also affect other systems in the helicopter. Therefore, good judgment must be used when determining allowable leakage.
- Oil (E254 or E254.1) is a skin irritant. If oil gets on skin, wash thoroughly. If oil soaks into clothes, change clothes immediately. Oil gives off fumes that can cause injury to personnel. Use in well-ventilated area.

CAUTION

- Oil (E254 or E254.1) can soften paint. If oil drips on painted surface of helicopter, wipe up immediately with clean cloths.
- Under normal conditions rotary heads shall be serviced with only one type of oil (E254 or E254.1). Oil (E254) must be used for temperatures below -25° F (-32° C).

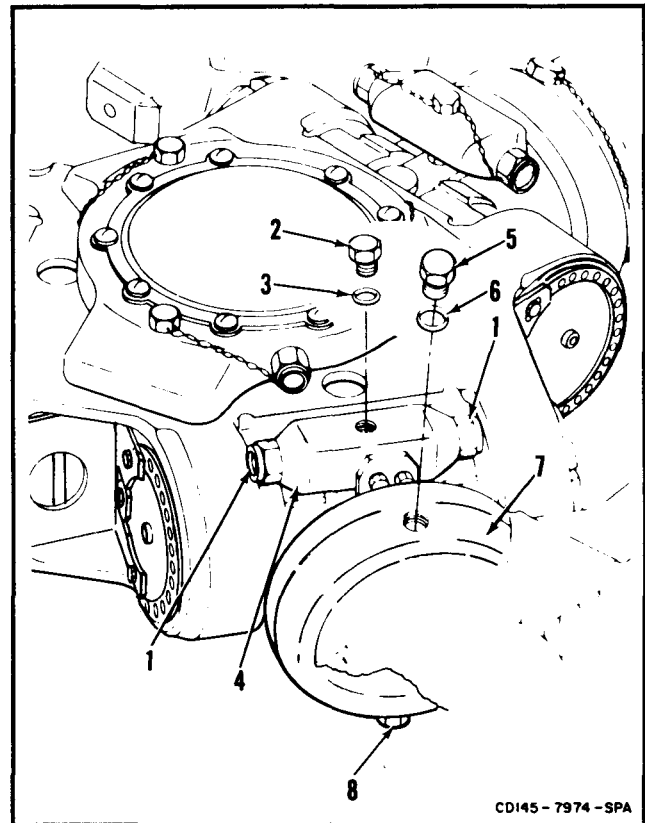
NOTE

- If oil level in sight gage drops from full (half-way) mark to bottom of glass in two hours of operation, leakage is too great. Check for source of leakage. Repair as required.
 - Procedure is same to service any pitch bearing oil tank.
 - Blade must be over tunnel.
1. Check average oil level in two sight indicators (1).
 2. Remove lockwire. Remove plug (2) and packing (3) from tank (4).
 3. Remove plug (5) and packing (6) from housing (7).



GO TO NEXT PAGE

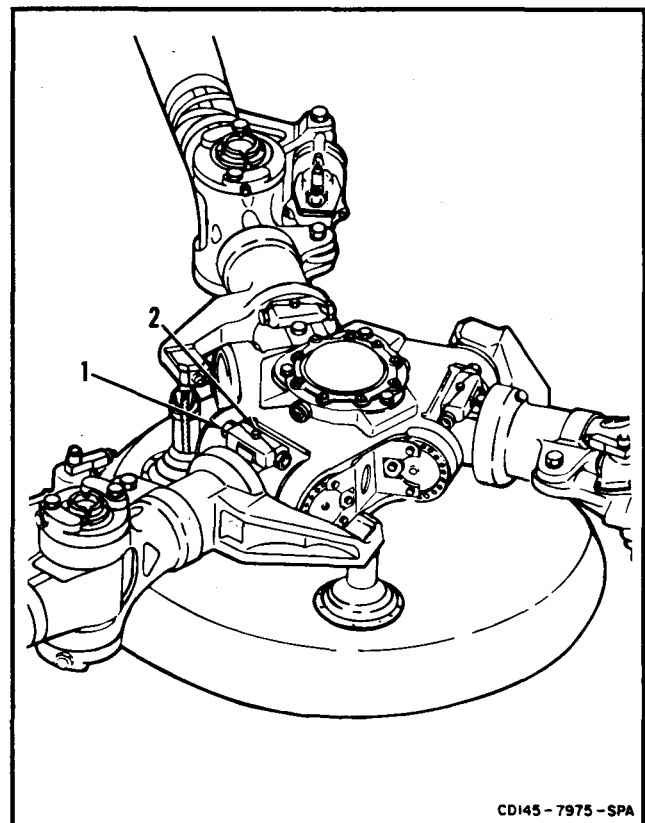
4. **Service pitch bearing oil tank (4) until oil reaches top of housing (7).** Use lubricating oil (E254 or E254.1) and funnel. Wear gloves (E184.1).
5. Install packing (6) and plug (5). **Torque plug to 24 inch-pounds.** Lockwire plug to lower plug (8). Use lockwire (E231).
6. **Continue servicing pitch bearing oil tank (4) until average oil level reaches center of sight indicators (1).** Use lubricating oil (E254 or E254.1) and funnel. Wear gloves (E184.1).
7. **Install packing (3) and plug (2). Torque plug to 24 inch-pounds.**



8. **Lockwire plug (2) to two sight indicators (1).** Use lockwire (E231).

INSPECT**FOLLOW-ON MAINTENANCE:**

Close work platforms (Task 2-2).

**END OF TASK**

1-57 SERVICE VERTICAL HINGE PIN OIL TANKS**INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds
Funnel

Materials:

Lubricating Oil (E254 or E254.1)
Lockwire (E231)
Gloves (E184.1)

Parts:

Packings

Personnel Required:

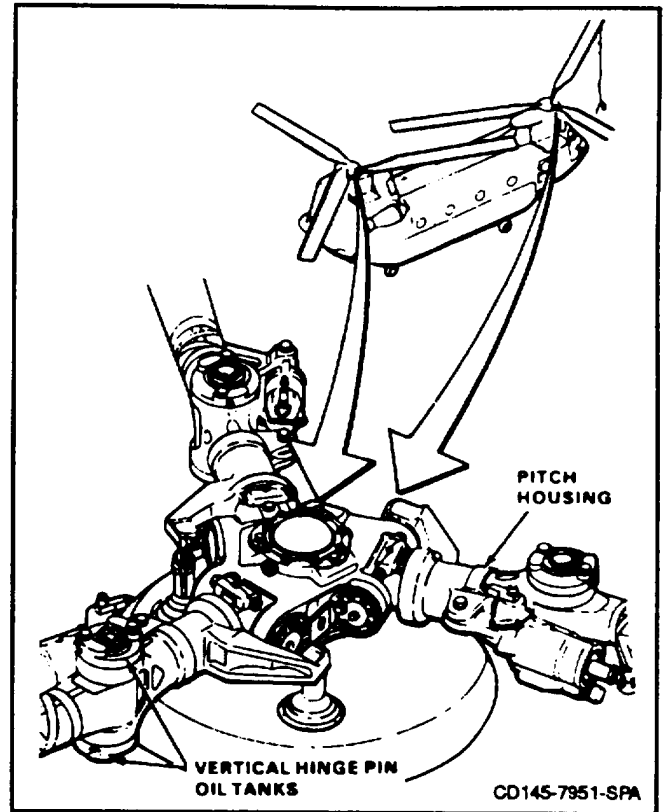
Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Tiedown Lines On One Forward and One Aft
Rotary-Wing Blade Tied Down (Task 1-26)
Forward or Pylon Work Platform Open (Task 2-2)

**WARNING**

Oil (E254 or E254.1). Is a skin irritant. If oil gets on skin, wash thoroughly. If oil soaks into clothes, change clothes immediately. Oil gives off fumes that can cause injury to personnel. Use in well-ventilated area.

CAUTION

Oil (E254 or E254.1) can soften paint. If oil drips on painted surface of helicopter, wipe up immediately with clean cloths.

GO TO NEXT PAGE**Change 57 1-191**

CAUTION

Under normal conditions rotary heads shall be serviced with only one type of oil (E254 or E254.1). Oil (E254) must be used for temperatures below -25° F (-32° C).

NOTE

Procedure is same to service vertical hinge pin oil tanks on any pitch varying housing. Upper and lower tanks are connected by manifold tube and are serviced together.

1. Position blade (1) to level sight indicators (2). Tie down one forward and one aft blade (1).

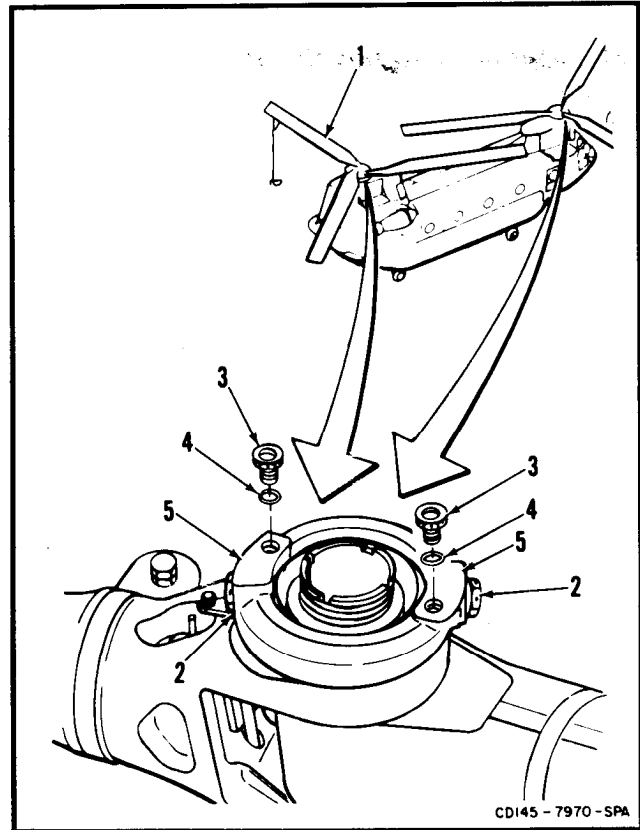
WARNING

Prolonged oil leakage can damage finish and create a work hazard by making the fuselage slippery. It can also affect other systems in the helicopter. Therefore, good judgment must be used when determining allowable leakage.

NOTE

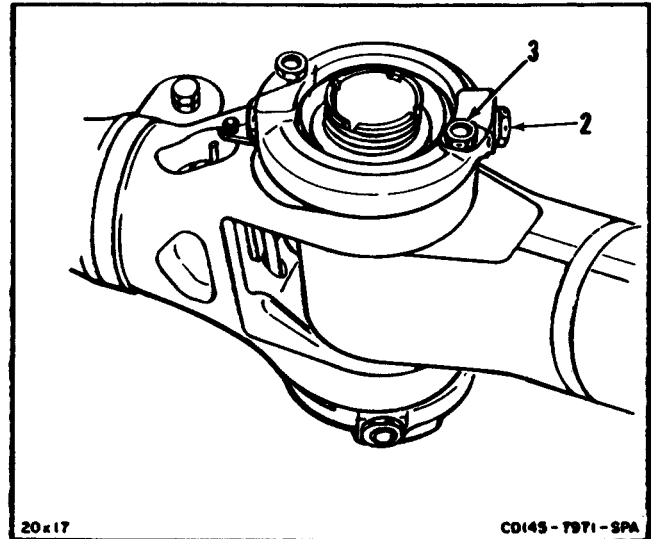
If oil level in sight gage drops from full (half-way) mark to bottom of glass in two hours of operation, leakage is too great. Check for source of leakage. Repair as required.

2. Check oil level in two sight indicators (2).
3. Remove lockwire. Remove two filler/drain plugs (3) and packings (4) from upper tank (5).
4. Service tank (5) until oil reaches center of sight indicators (2). Use lubricating oil (E254 or E254.1) and funnel. Wear gloves (E184.1).
5. Install packings (4) and plugs (3). Torque plugs to 85 inch-pounds.



GO TO NEXT PAGE

6. Lockwire plugs (3) to sight indicators (2).
Use lockwire (E231).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Close work platforms (Task 2-2).
- Remove tiedown lines from blades (Task 1-26).

END OF TASK

1-58 SERVICE ROTARY-WING SHOCK ABSORBER**1-58****INITIAL SETUP****Applicable Configurations:**

All

TOOLS

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Hand Oiler, 4 to 6 Ounce Capacity

Materials:

Hydraulic Fluid (E1 97)
Lockwire (E231)
Cloths (E120)
Gloves (E166)

Personnel Required:

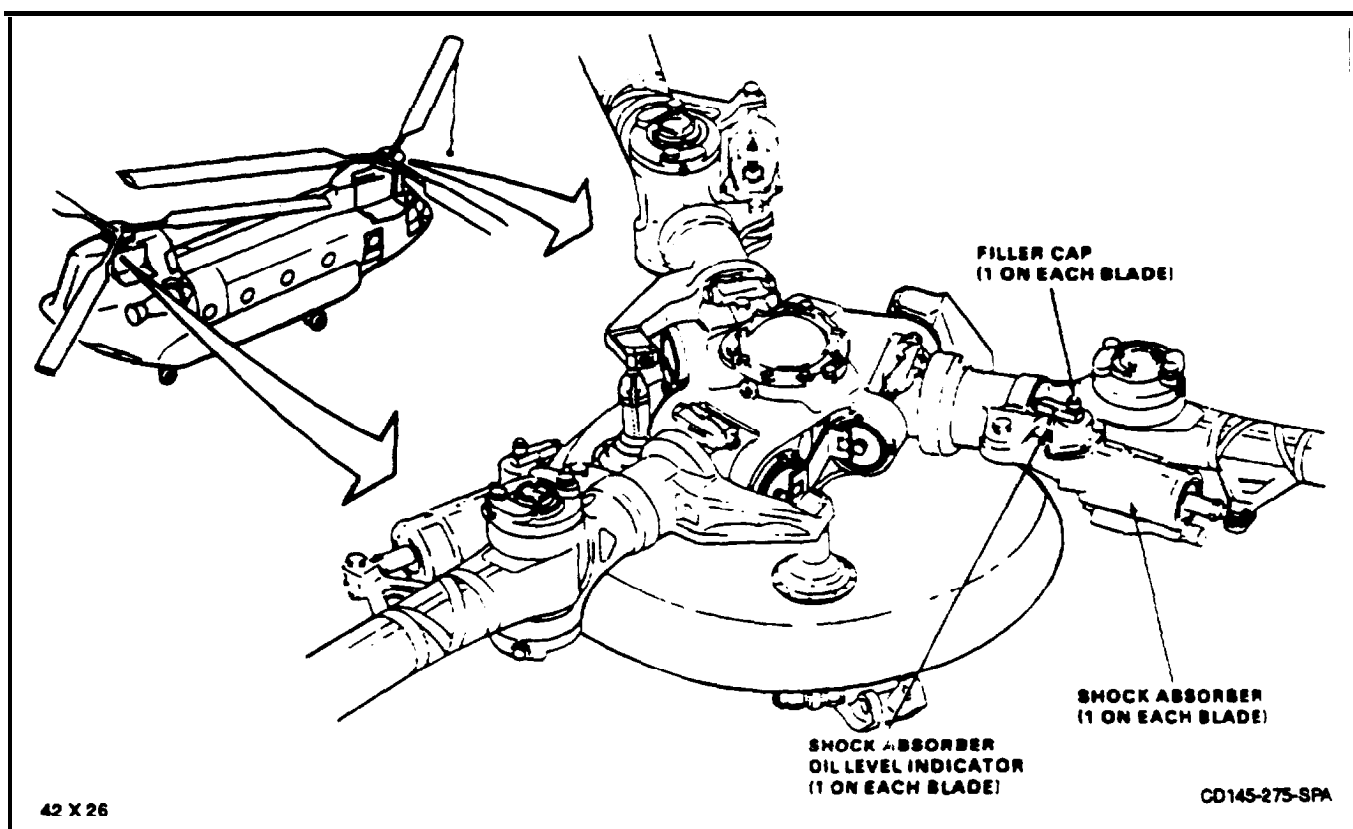
Medium Helicopter Repairer
Inspector:

References:

Task 5-92

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Tiedown Line Installed on One Forward Blade
(Task 1-26)
Aft Pylon Work Platform Open (Task 2-2)
Forward Transmission Faking Work Platform Open
(Task 2-2)

**GO TO NEXT PAGE**

Change 64 1-193

NOTE

Any of the three rotary-wing shock absorbers on the aft and forward rotor heads are serviced the same way.

WARNING

Moving blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before moving rotor blades.

NOTE

Rotor blades must be positioned as shown to get correct reading of shock absorber fluid level.

Using tiedown line (1), turn rotor blades (2) so one blade is 90 degrees to left or right side of helicopter.

WARNING

Prolonged oil leakage can damage finish and create a work hazard by making the fuselage slippery. It can also affect other systems in the helicopter. Therefore, good judgment must be used when determining allowable leakage.

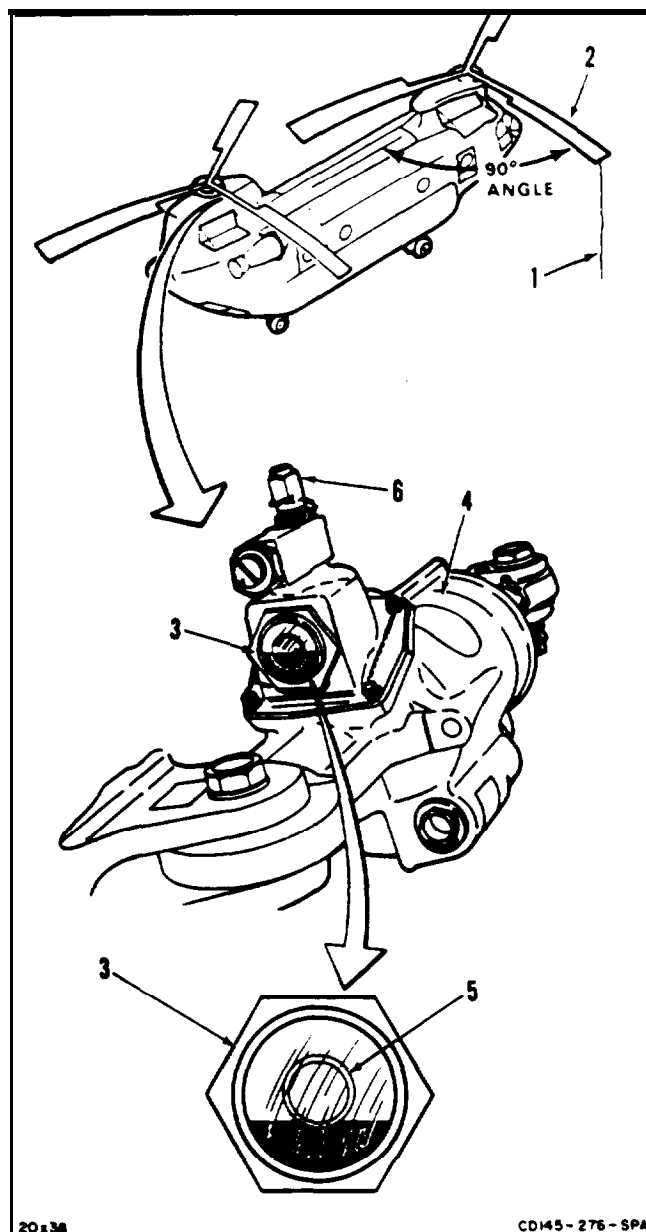
NOTE

If oil level in sight gage drops from full (half-way) mark to bottom of glass in two hours of operation, leakage is too great. Check for source of leakage. Repair as required.

2. Check fluid level on indicator (3) on shock absorber (4) of the positioned blade. If fluid level is within bull's-eye (5), servicing is not required. If fluid level is below bull's-eye, go to step 3.
3. Remove lockwire from cap (6)
4. Remove cap (6).

WARNING

Hydraulic fluid (E197) is a skin irritant. If fluid gets on skin, wash immediately with soap and water.

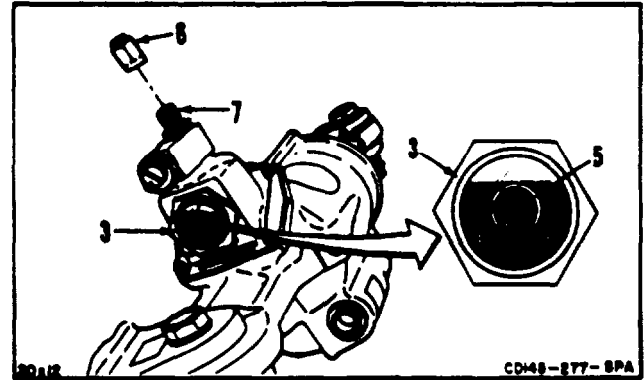


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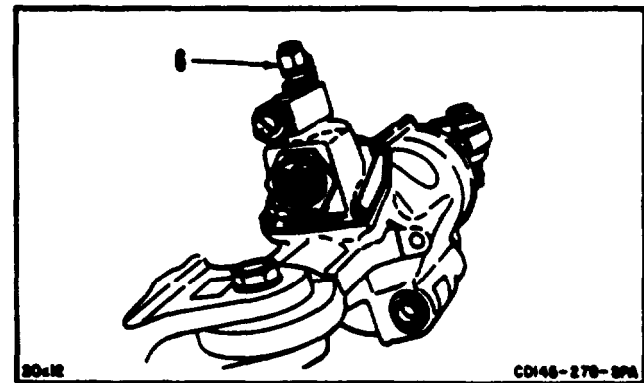
1-58 SERVICE ROTARY-WING SHOCK ABSORBER (Continued)**1-58**

5. **Add hydraulic fluid (E197) through filter (7).** Wear glove, (E186).
6. **Check fluid level in indicator (3) again.**
 - a. If added fluid remains in indicator, add more fluid (E197) until fluid level is at top of bull's-eye (5).
 - b. If added fluid disappears from indicator, add fluid (E187) at filler (7) to top of bull's-eye (6). Then bleed shock absorber (Task 5-92).



7. **Install cap (6)**

8. Lockwire cap (8). Use lockwire (E231).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Remove tiedown line (Task 1-26).
- close work platforms (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

TOOLS:

Hydraulic Test Stand or, AGPU
Thermometer

Materials:

Hydraulic Fluid (E199)

Personnel Required:

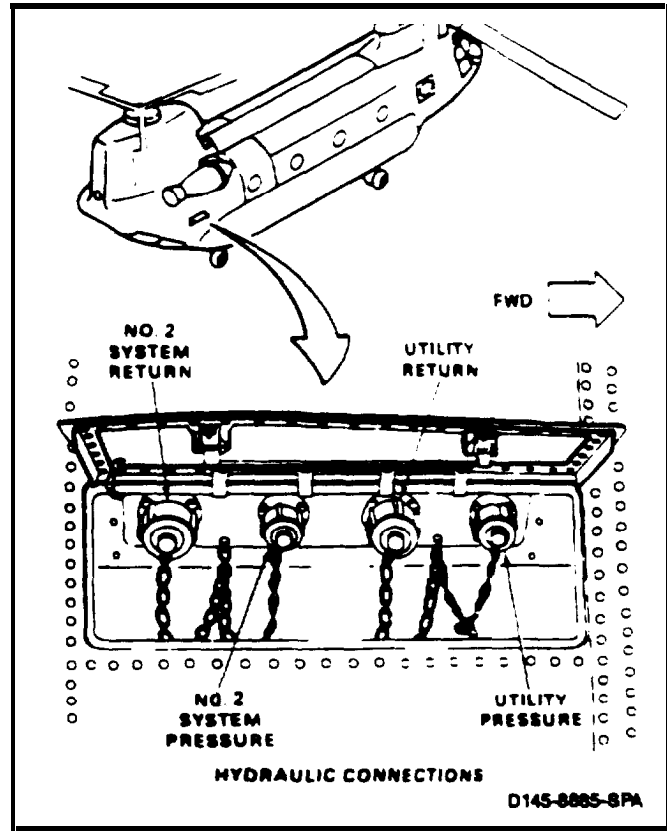
Medium Helicopter Repairer
Aircraft Pneudraulics Repairer

References:

TM 55-4920-335-14 OR
TM 55-4920-373-14 & P
TM 55-1520-240-10
TM 55-1730-229-12

Equipment Condition

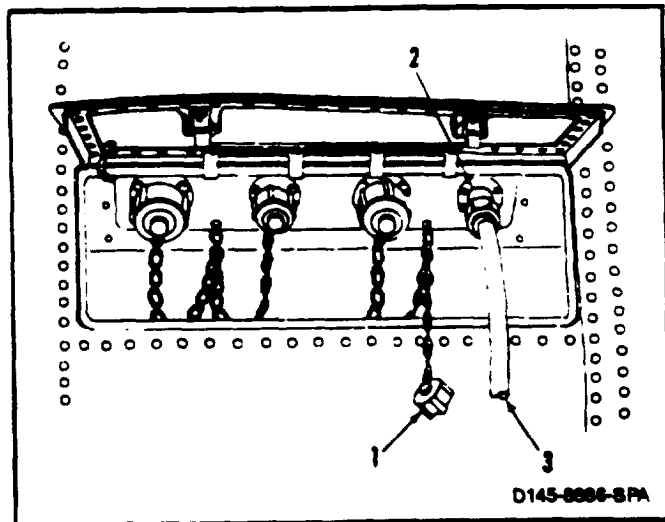
- Battery Connected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Hydraulic Connection Access Panel Open (Task 2-2)
- Cargo Ramp Fully Up or Full Down (TM 55-1520-240-T)
- Utility Hydraulic System Depressurized. (Task 7-135.1)



WARNING

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

1. Remove dust cover (1) from utility system pressure connection (2).
2. Connect test stand pressure line (3) to utility pressure connection (2).



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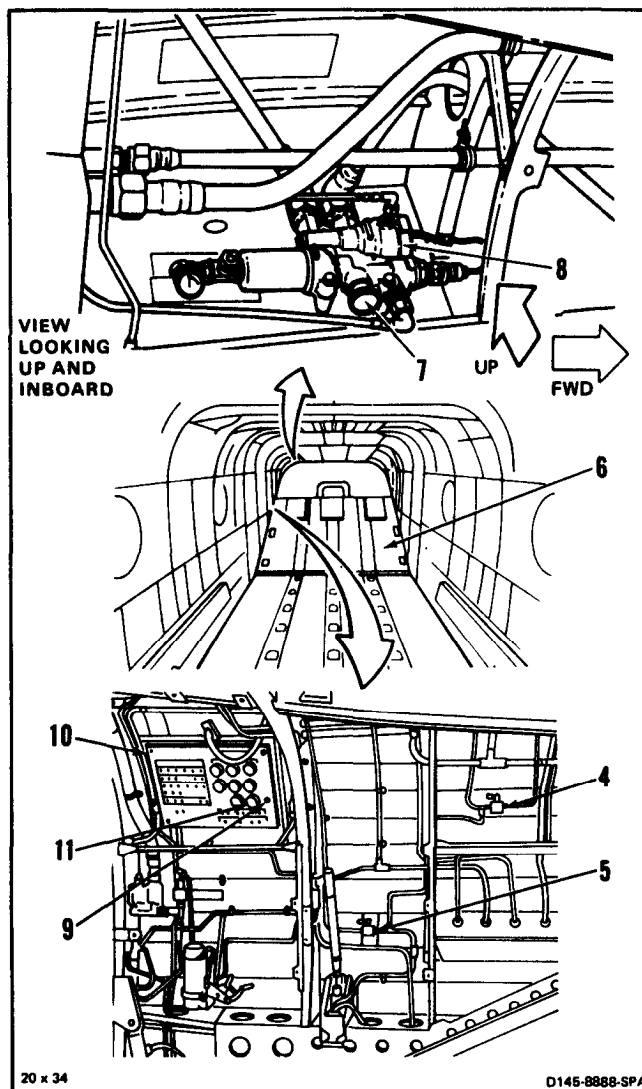
1-59 POWER SERVICE UTILITY HYDRAULIC SYSTEM RESERVOIR
(Continued)

3. Make sure UTILITY RESERVOIR DEPRESSURIZE valve (4) and EMERG UTIL PRESS valve (5) are set to NORMAL.
4. **Press and hold depressurization valve (7) on APU start module (8) until accumulators have discharged completely.**
5. **Release valve (7).**
6. **Turn valve (4) to OPEN.**

NOTE

Be sure to read correct scale on gage according to whether ramp is full up or fully down.

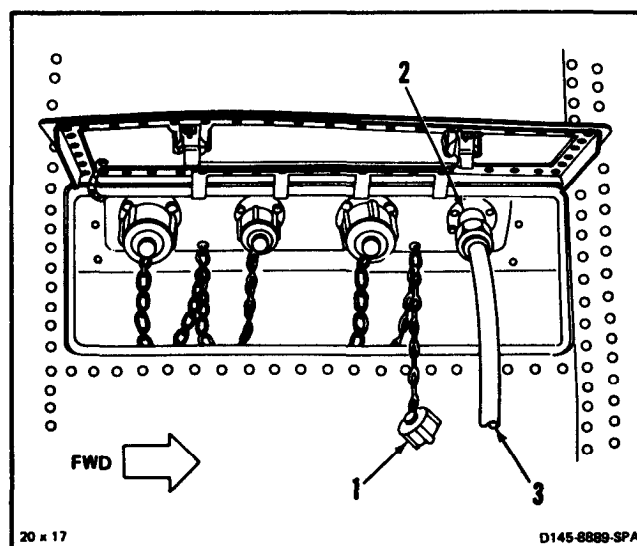
7. Press and hold LEVEL CHECK button (9) on MAINTENANCE PANEL (10). **Read reservoir fluid level on gage (11).**
8. Have helper operate test stand. Set test stand flow limits to minimum flow position. Turn on test stand. Set stand pressure between 500 and 1000 psi (TM 55-4920-335-14 or TM 55-4920-373-14 & P).
9. **Have helper press and hold valve (7). Press button (9) and read gage (11).**
10. **When gage (11) indicates FULL, release valve (7) and button (9). Turn valve (4) to NORMAL.**



20 x 34

D145-8888-SPA

11. Shut down test stand.
12. Disconnect test stand pressure line (3) from utility pressure connection (2).
13. Replace dust cover (1) on utility pressure connection.



20 x 17

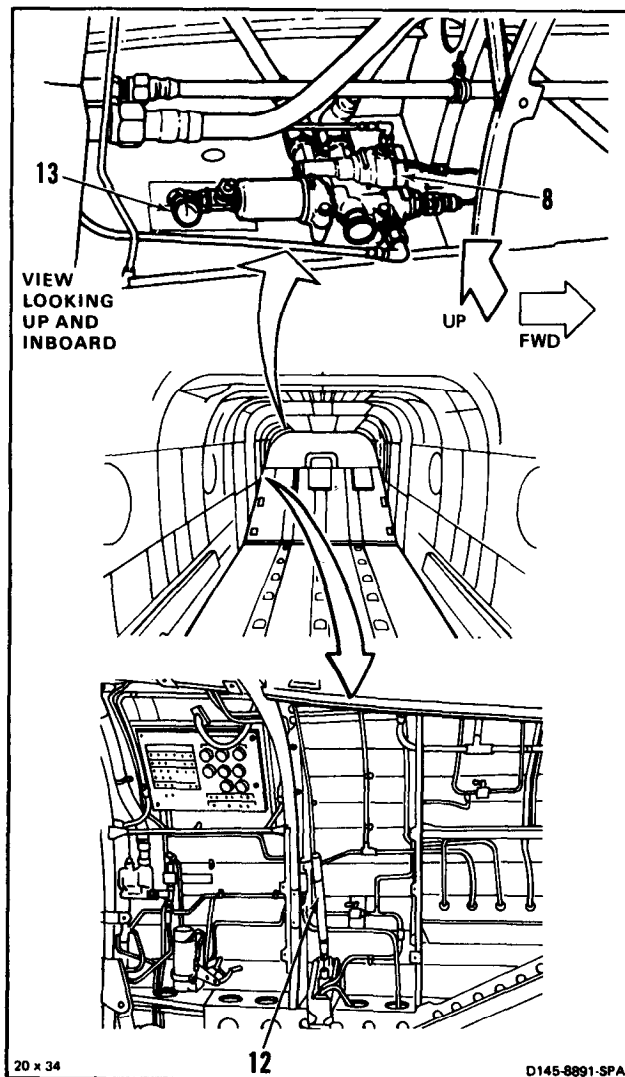
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1-59 POWER SERVICE UTILITY HYDRAULIC SYSTEM RESERVOIR (Continued)

1-59

14. **Charge accumulators.** Use hand pump (12). Read pressure on accumulator gage (13) of module (8). **If temperature is above -25°F (-30°C), charge accumulator to 3000 psi. If temperature is below -25°F (-30°C), charge accumulator to 3350 psi or until pointer of accumulator gage stops moving, whichever occurs first.**



FOLLOW-ON MAINTENANCE:

Disconnect battery (Task 1-39).

Close hydraulic connection access panel (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Test Stand

Materials:

None

Personnel Required:

Medium Helicopter Repairer
Aircraft Pneudraulics Repairer

References:

TM 55-4920-335-14 OR
TM 55-4920-373-14 & P
TM 55-1520-240-10

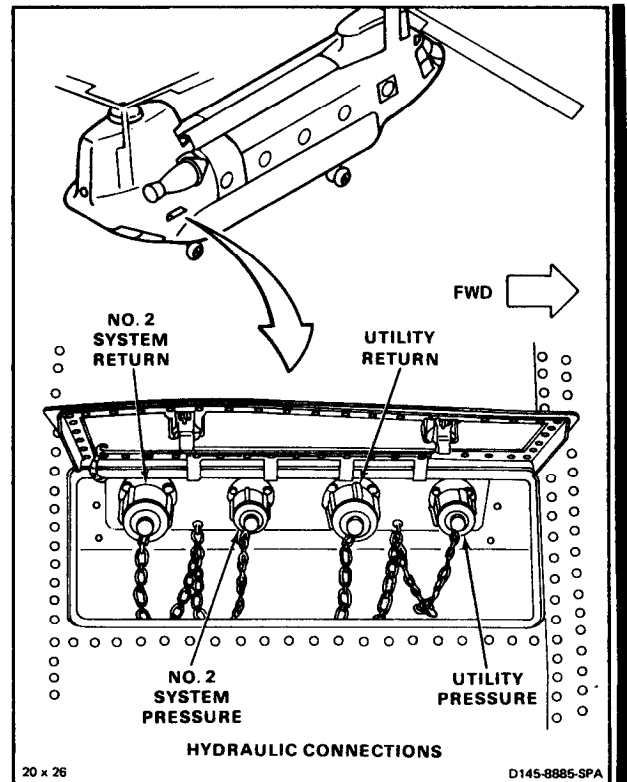
Equipment Condition:

Battery Connected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Hydraulic Connection Access Panel Open (Task 2-2)
Cargo Ramp Fully Up or Fully Down (TM 55-1520-240-T)

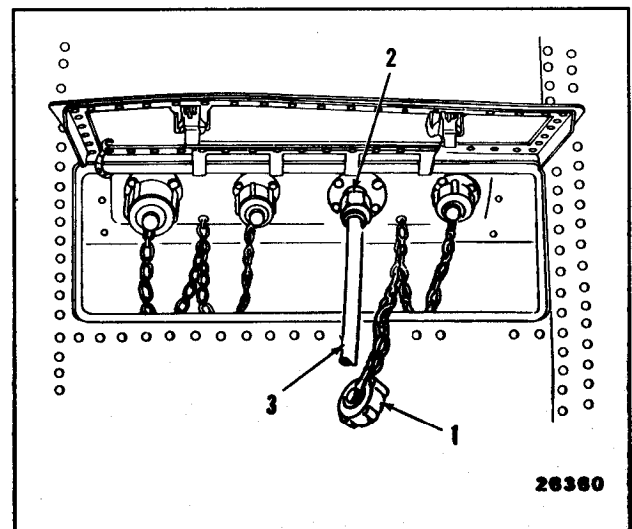
General Safety Instructions:

WARNING

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.



1. Remove dust cover (1) from utility system RETURN connection (2).
2. Connect test stand return line (3) to utility RETURN connection (2).



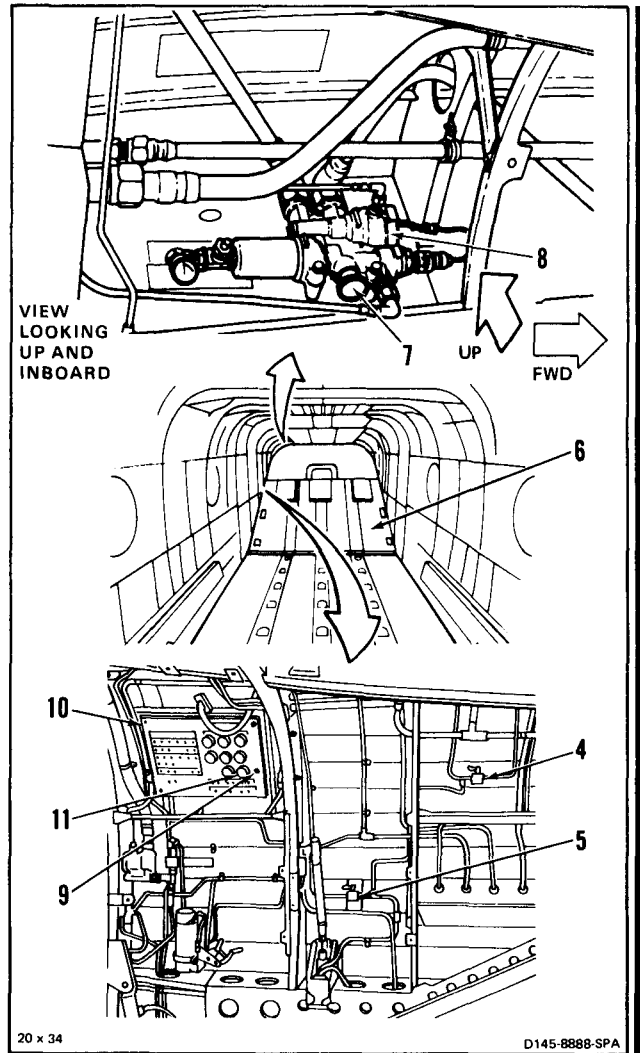
GO TO NEXT PAGE

3. Make sure UTILITY RESERVOIR DEPRESSURIZE valve (4) and EMERG UTIL PRESS valve (5) are set to NORMAL.
4. **Press and hold depressurization valve (7)** on APU start module (8) until accumulators deplete to precharge.
5. **Release valve (7).**
6. **Turn valve (4) to OPEN.**

NOTE

Be sure to read correct scale on gage according to whether ramp is fully up or fully down.

7. Press and hold LEVEL CHECK button (9) on MAINTENANCE PANEL (10). **Read reservoir fluid level on gage (11).**
8. Have helper operate test stand. Turn on test stand (TM 55-4920-335-14 or TM 55-4920-373-14 & P).
9. **Have helper press and hold valve (7).** Press button (9) and **read gage (11).**
10. **When gage (11) indicates EMPTY, release valve (7) and button (9). Turn valve (4) to NORMAL.**



20 x 34

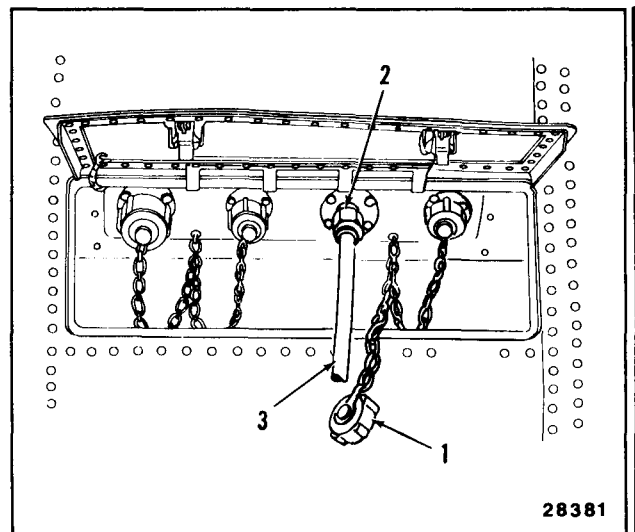
D145-8888-SPA

11. Shut down test stand.
12. Disconnect test stand return line (3) from utility RETURN connection (2).
13. Replace dust cover (1) on utility RETURN connection.

FOLLOW-ON MAINTENANCE:

Disconnect battery (Task 1-39).

Close hydraulic connection access panel (Task 2-2).



28381

END OF TASK

1-60 POWER SERVICE NO. 1 FLIGHT CONTROL HYDRAULIC SYSTEM
RESERVOIR

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Test Stand or,
AGPU

Materials:

Hydraulic Fluid (E199)

Personnel Required:

Medium Helicopter Repairer
Aircraft Pneudraulics Repairer

References:

TM 55-4920-335-14 OR
TM 55-4920-373-14 & P
TM 55-1730-229-12

Equipment Condition:

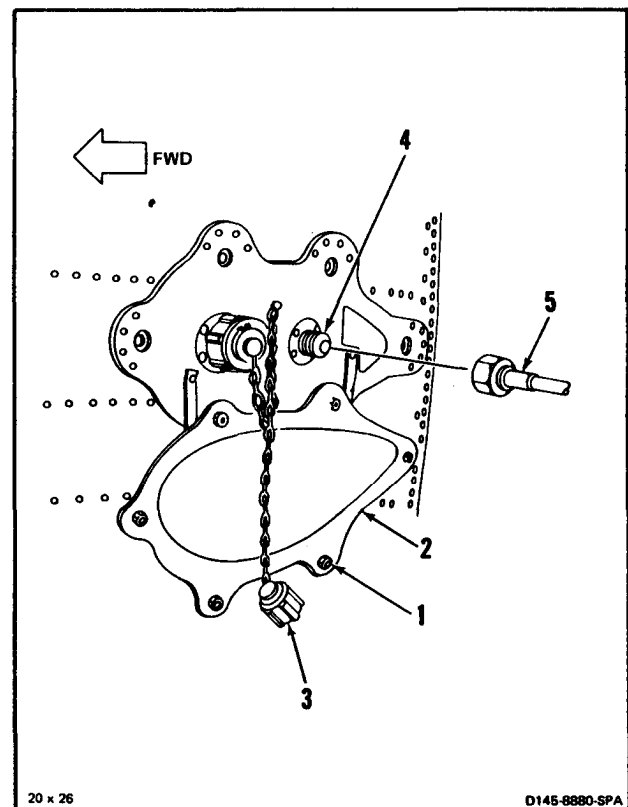
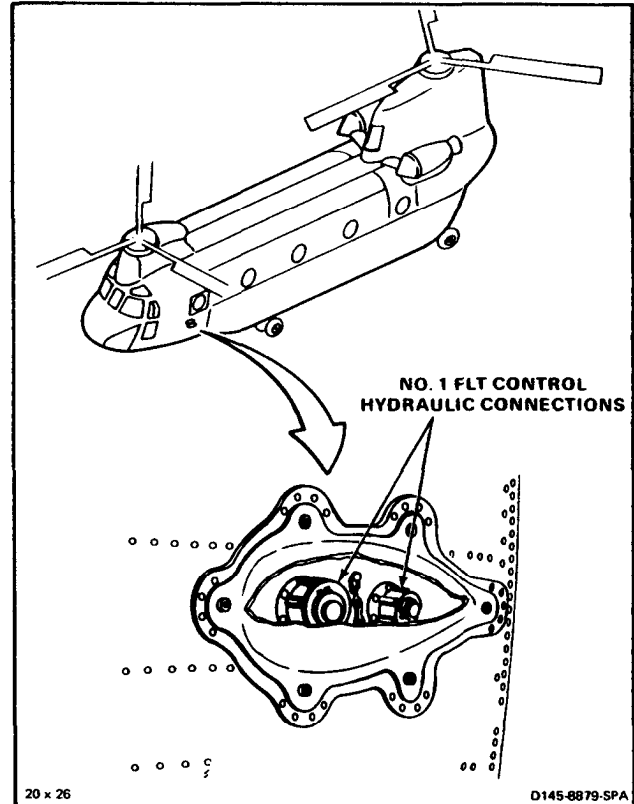
Battery Connected (Task 1-39)
Hydraulic Power Off
Electrical Power Off

General Safety Instructions:

WARNING

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

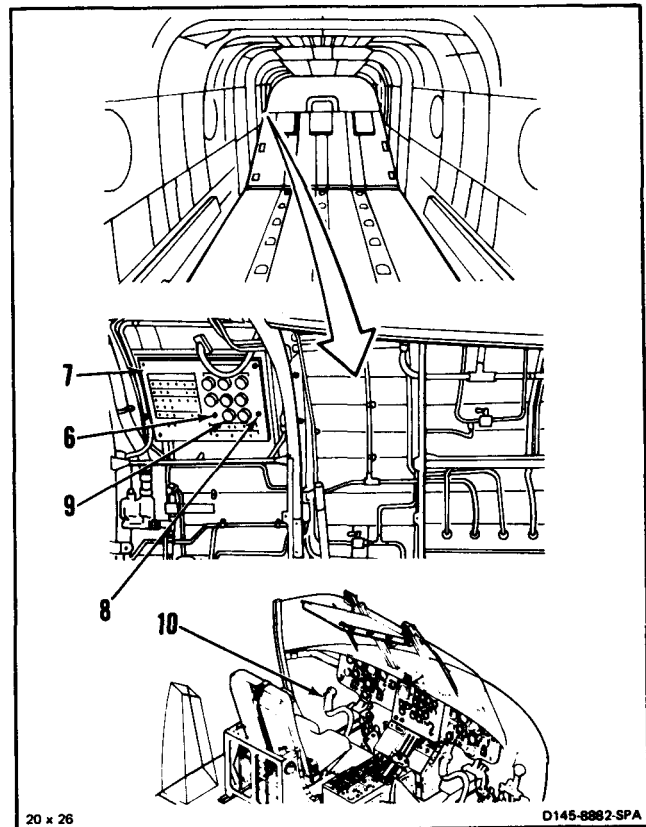
1. Release six fasteners (1) and remove cover (2).
2. Remove dust cover (3) from PRESSURE connection (4).
3. **Connect test stand pressure line (5) to PRESSURE connection (4).**



GO TO NEXT PAGE

**1-60 POWER SERVICE NO. 1 FLIGHT CONTROL
HYDRAULIC SYSTEM RESERVOIR (Continued)**

4. **Set FLT CONT switch (6) on MAINTENANCE PANEL (7) to No. 1.**
5. Press and hold LEVEL CHECK button (8). **Read reservoir fluid level on gage (9).**
6. Have helper operate test stand. Set test stand pressure between 1500 and 2000 psi.
7. **Observe gage (9) while helper cycles cockpit control stick (10).**
8. **When gage (9) indicates FULL, stop cycling control stick (10) and shutdown test stand.** Release button (8).

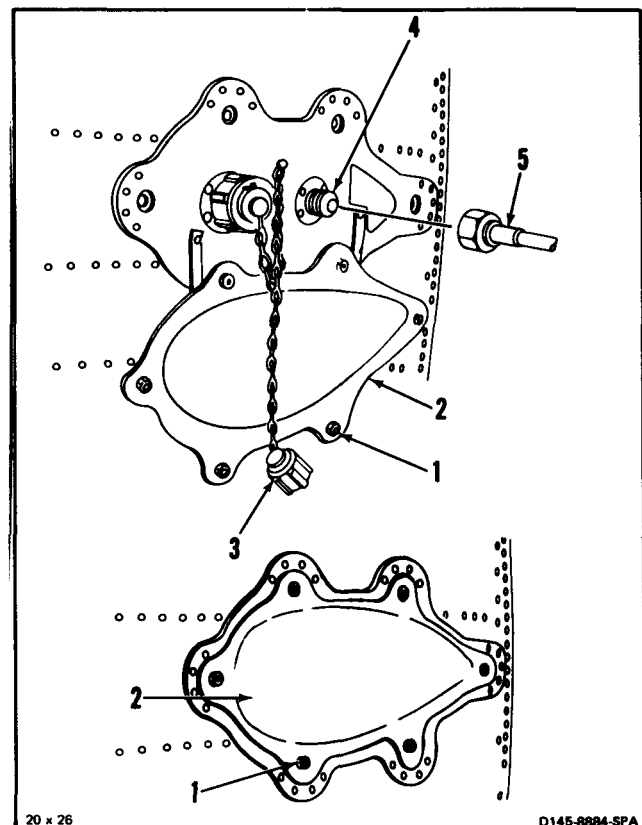


9. Disconnect test stand pressure line (5) from pressure connection (4).
10. Replace dust cover (3) on PRESSURE connection (4).
11. Install cover (2) and tighten six fasteners (1).

FOLLOW-ON MAINTENANCE:

Disconnect battery (Task 1-39).

END OF TASK



1-60.1 POWER DRAIN NO. 1 FLIGHT CONTROL HYDRAULIC SYSTEM RESERVOIR

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Test Stand

Materials:

None

Personnel Required:

Medium Helicopter Repairer
Aircraft Pneudraulics Repairer

References:

TM 55-4920-335-14 or
TM 55-4920-373-14 & P

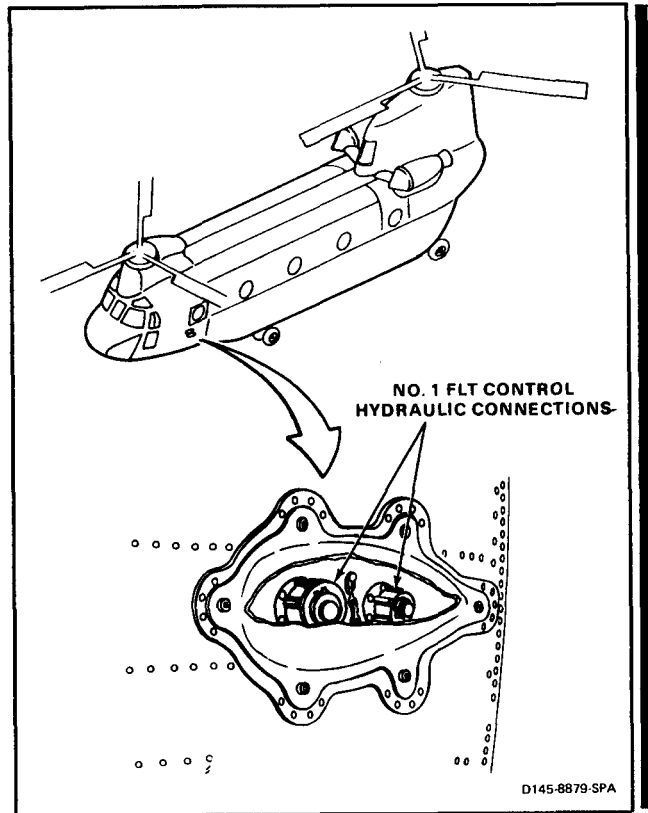
Equipment Condition:

Battery Connected (Task 1-39)
Hydraulic Power Off
Electrical Power Off

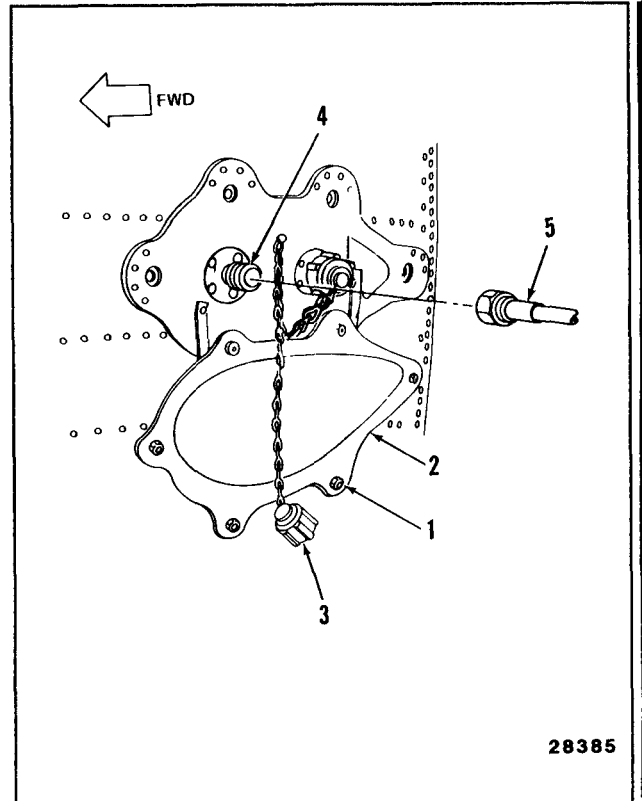
General Safety Instructions:

WARNING

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.



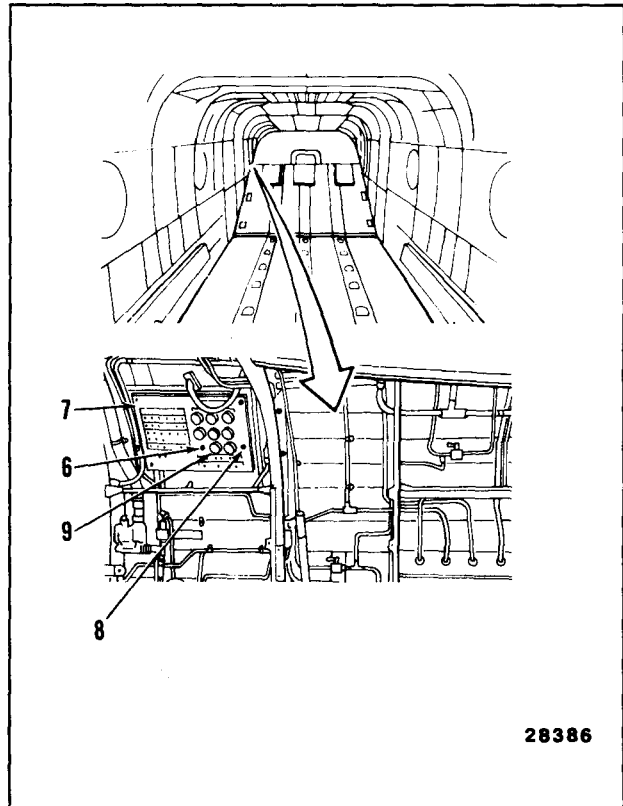
1. Release six fasteners (1) and remove cover (2).
2. Remove dust cover (3) from RETURN connection (4).
3. Connect test stand return line (5) to RETURN connection (4).



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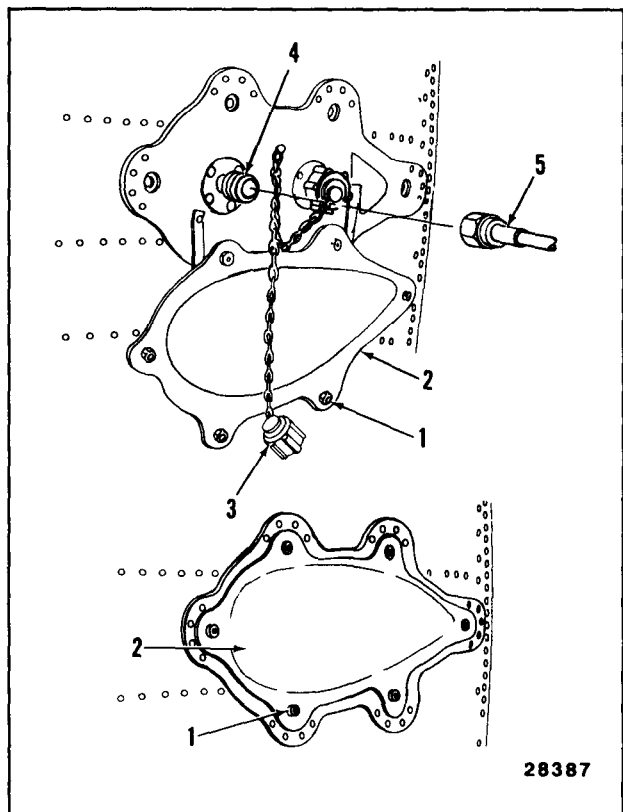
**1-60.1 POWER DRAIN NO.1 FLIGHT CONTROL HYDRAULIC SYSTEM 1-60.1
RESERVOIR (Continued)**

4. **Set FLT CONT switch (6) on MAINTENANCE PANEL (7) to No. 1.**
5. Press and hold LEVEL CHECK button (8). **Read reservoir fluid level on gage (9).**
6. Have helper operate test stand. Set test stand to reservoir (TM 55-4920-335-14 or TM 55-4920-373-14 & P).
7. **When gage (9) indicates EMPTY, shut dqwn test stand.** Release button (8).



8. Disconnect test stand return line (5) from RETURN connection (4).
9. Replace dust cover (3) on RETURN connection (4).
10. Install cover (2) and tighten six fasteners (1).

FOLLOW-ON MAINTENANCE:
Disconnect battery (Task 1-39).



1-61 POWER SERVICE NO. 2 FLIGHT CONTROL HYDRAULIC SYSTEM RESERVOIR

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Test Stand or,
AGPU

Materials:

Hydraulic Fluid (E199)

Personnel Required:

Medium Helicopter Repairer
Aircraft Pneudraulics Repairer

References:

TM 55-4920-335-14 or
TM 55-4920-373-14 & P
TM 55-1730-229-12

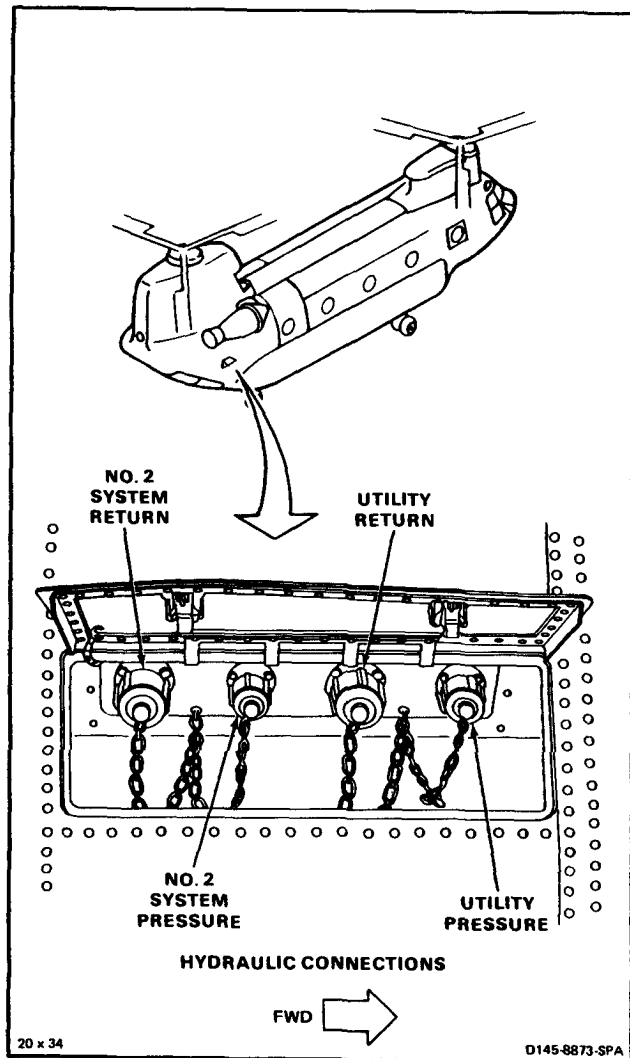
Equipment Condition:

Battery Connected (Task 1-39)
Hydraulic Power Off
Electrical Power Off
Hydraulic Connection Access Panel Open (Task 2-2)

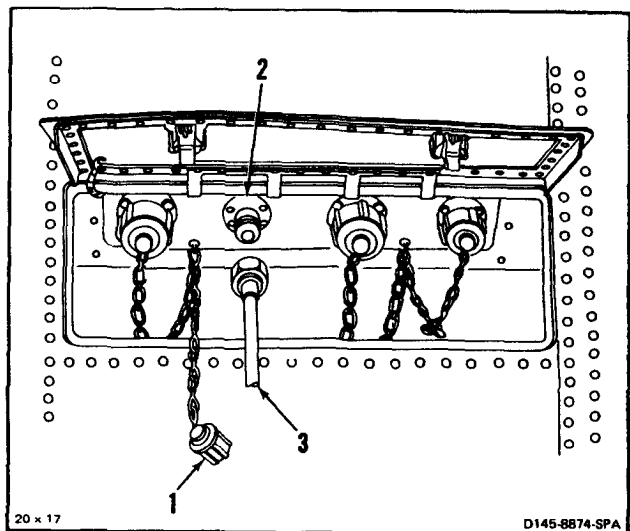
General Safety Instructions:

WARNING

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.



1. Remove dust cover (1) from PRESSURE connection (2).
2. Connect test stand pressure line (3) to PRESSURE connection (2).

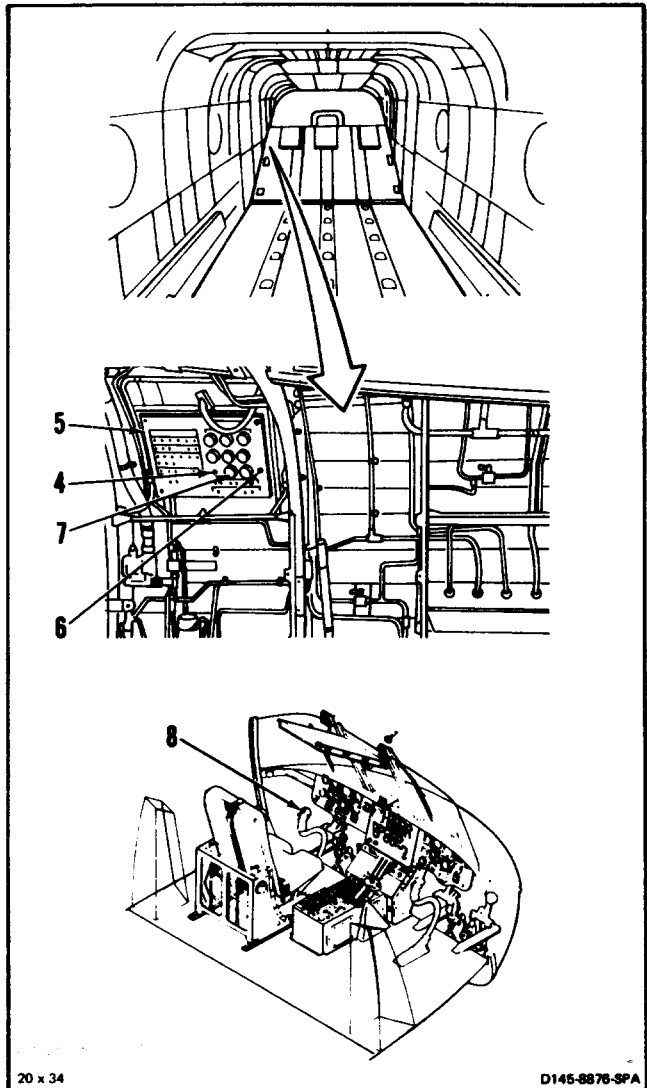


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1-61 POWER SERVICE NO. 2 FLIGHT CONTROL HYDRAULIC SYSTEM RESERVOIR (Continued)

1-61

3. **Set FLT CONT switch (4) on MAINTENANCE PANEL (5) to NO. 2.**
4. Press and hold LEVEL CHECK button (6). **Read reservoir fluid level on gage (7).**
5. Have helper operate test stand. Set test stand pressure between 1500 and 2000 psi.
6. **Observe gage (7) while helper cycles cockpit control stick (8).**
7. **When gage (7) indicates FULL, stop cycling control stick (8) and shut down test stand.** Release button (6).



8. Disconnect test stand pressure line (3) from PRESSURE connection (2).
9. Replace dust cover (1) on PRESSURE connection (2).

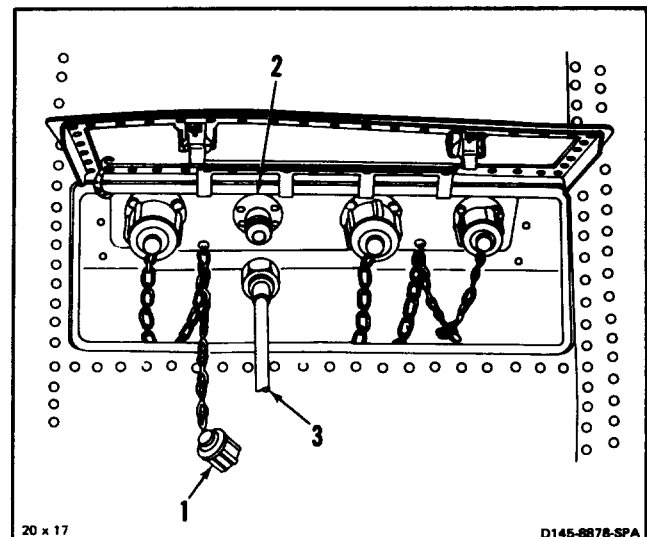
FOLLOW-ON MAINTENANCE:

Disconnect battery (Task 1-39).

Close hydraulic connection access panel (Task 2-2).

END OF TASK

1-202



1-61.1 POWER DRAIN NO. 2 FLIGHT CONTROL HYDRAULIC SYSTEM RESERVOIR 1-61.1

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Test Stand

Materials:

None

Personnel Required:

Medium Helicopter Repairer
Aircraft Pneudraulics Repairer

References:

TM 55-4920-335-14 or
TM 55-4920-373-14 & P

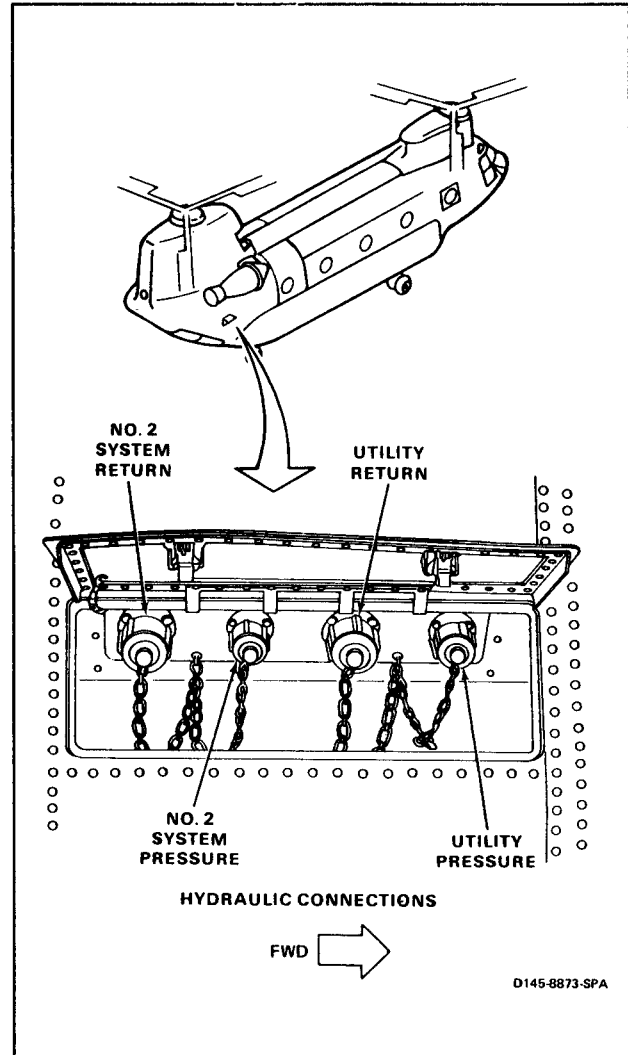
Equipment Condition:

Battery Connected (Task 1-39)
Hydraulic Power Off
Electrical Power Off
Hydraulic Connection Access Panel Open (Task 2-2)

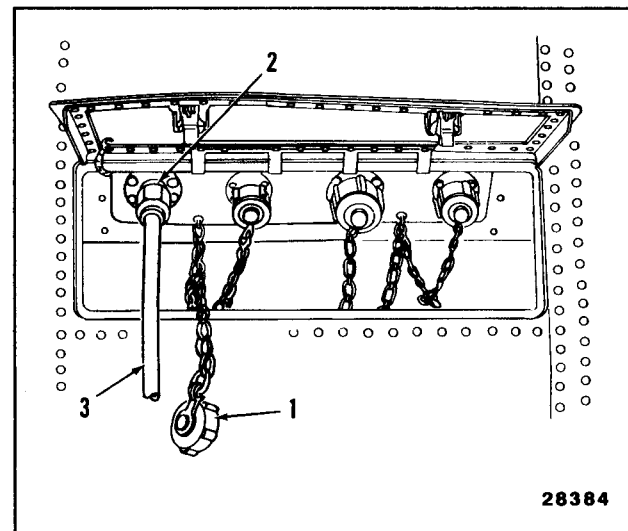
General Safety Instructions:

WARNING

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.



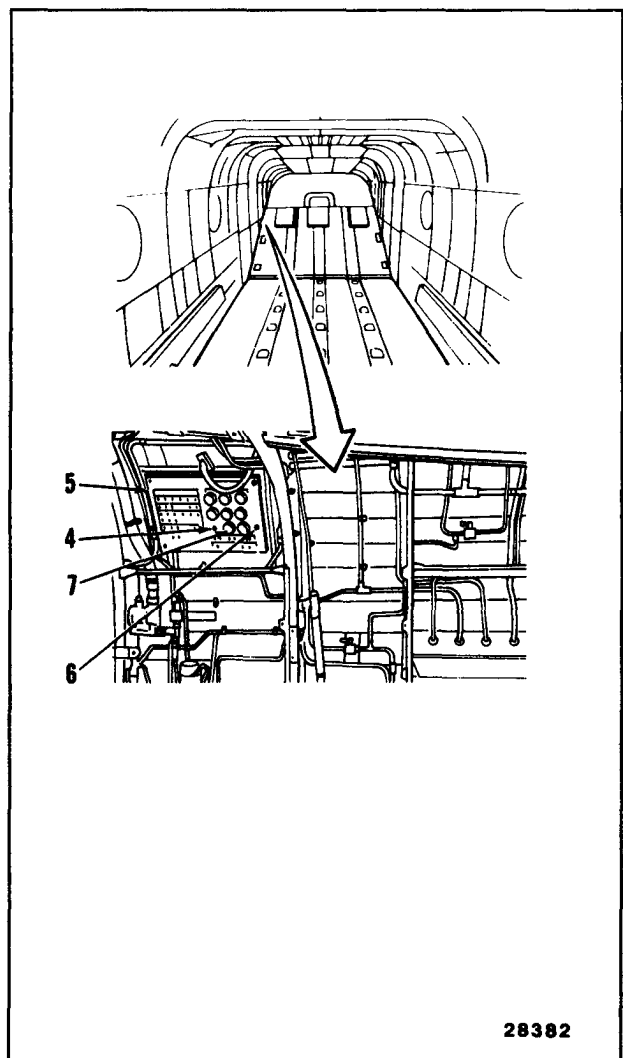
1. Open hydraulic connection access panel (Task 2-2).
2. Remove dust cover (1) from RETURN connection (2).
3. Connect test stand return line (3) to RETURN connection (2).



GO TO NEXT PAGE

1-61.1 POWER DRAIN NO. 2 FLIGHT CONTROL HYDRAULIC SYSTEM RESERVOIR (Continued) 1-61.1

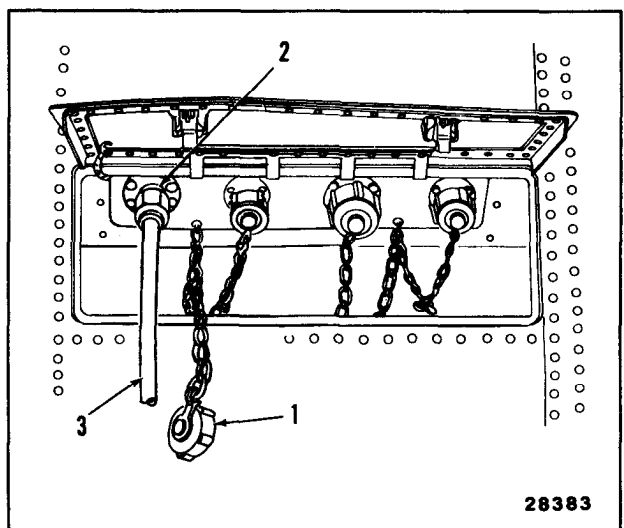
4. Set **FLT CONT** switch (4) on **MAINTENANCE PANEL (5)** to **NO. 2**.
5. Press and hold **LEVEL CHECK** button (6). **Read reservoir fluid level on gage (7).**
6. Have helper operate test stand. Set test stand to reservoir (TM 55-4920-335-14 or TM 55-4920-373-14 & P).
7. **When gage (7) indicates EMPTY, shut down test stand.** Release button (6).



8. Disconnect test stand return line (3) from **RETURN** connection (2).
9. Replace dust cover (1) on **RETURN** connection (2).

FOLLOW-ON MAINTENANCE:

- Disconnect battery (Task 1-39).
- Close hydraulic connection access panel (Task 2-2).



END OF TASK

1-62 MANUAL SERVICE HYDRAULIC SYSTEM
RESERVOIR

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

Hydraulic Fluid (E199)

Cloths (E120)

Personnel Required:

Medium Helicopter Repairer

References:

TM 55-1520-240-T

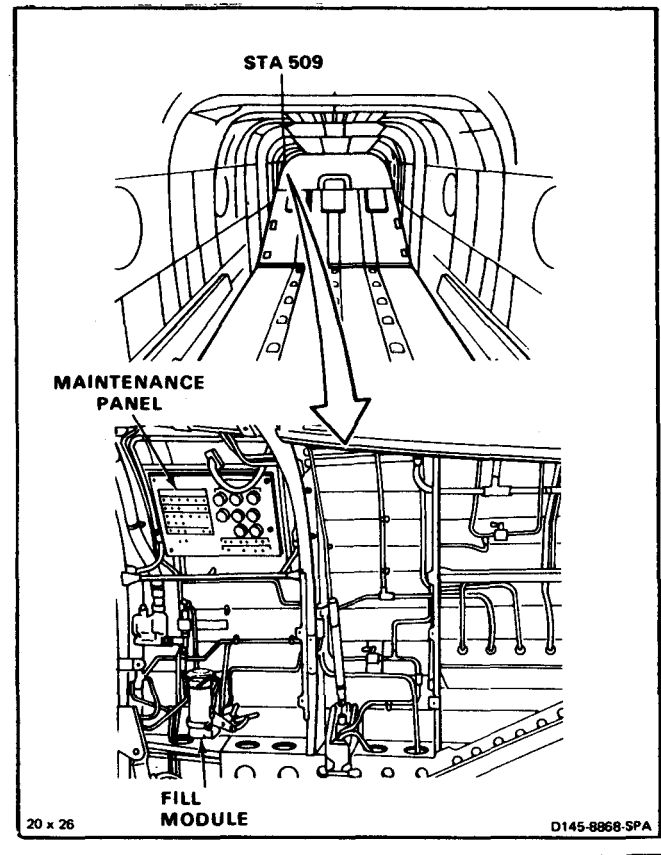
Equipment Condition:

Battery Connected (Task 1-39)

Electrical Power Off

Hydraulic Power Off

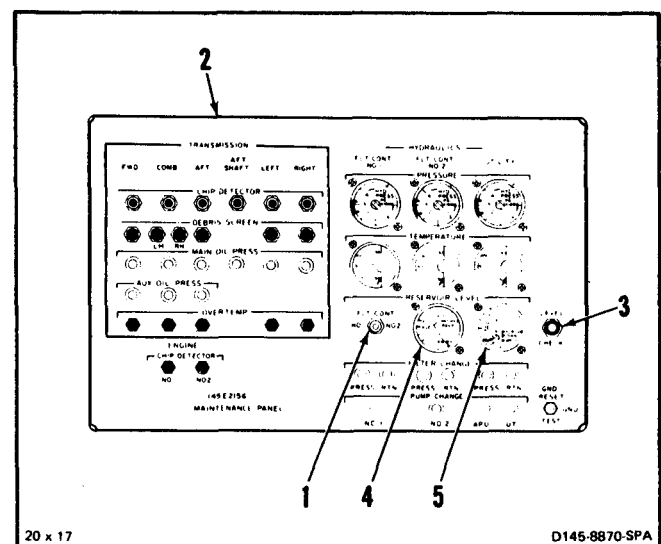
Cargo Ramp Full Up or Fully Down (TM 55-1520-240-T)



NOTE

This procedure applies to utility hydraulic system and both flight control hydraulic systems.

1. In aft cabin, set FLT CONT switch (1) on MAINTENANCE PANEL (2) to No. 1.
2. Press and hold LEVEL CHECK button (3). Read No. 1 flight control system reservoir fluid level on gage (4). Read utility system reservoir fluid level on gage (5).
3. Set switch (1) to No. 2. Read No. 2 flight control system reservoir fluid level on ramp-up scale of gage (4).
4. Release button (3). If all fluid level indications are FULL, go to FOLLOW-ON MAINTENANCE.

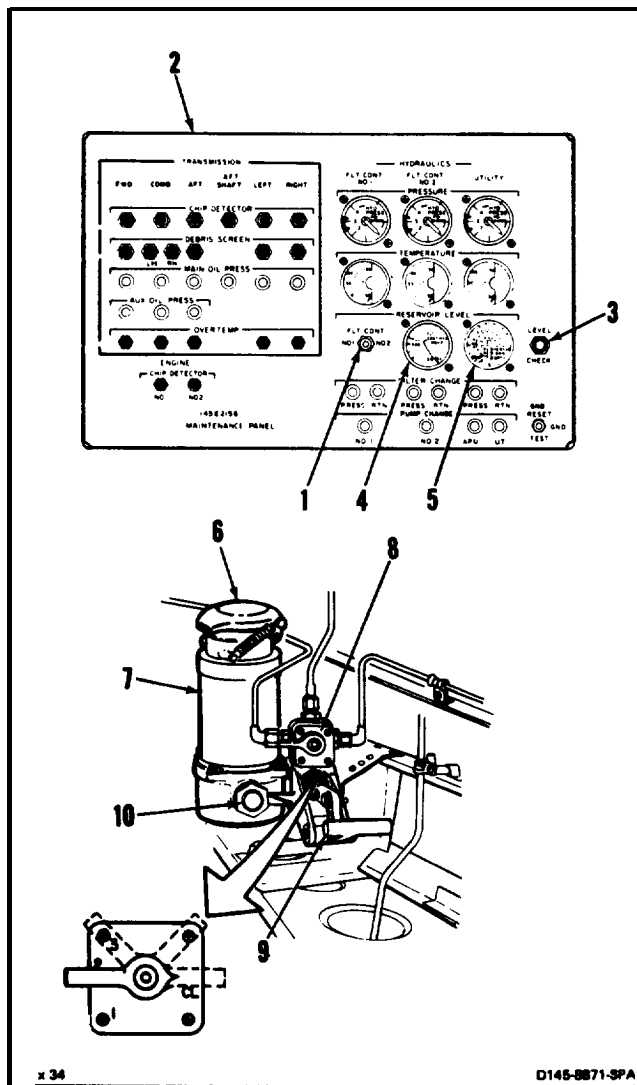


**1-62 MANUAL SERVICE HYDRAULIC SYSTEM
RESERVOIR (Continued)**

5. Open cap (6) on fill module (7). Fill with hydraulic fluid (E199).
6. Set selector valve (8) on fill module (7) to system to be filled.
7. Press and hold button (3) on panel (2). Observe fluid level on applicable gage (4 or 5). Make sure selector switch (1) is set to correct position if filling flight control system. Operate fill module pump (9) until gage (4 or 5) reads FULL.
8. Observe fluid level gage (10) while operating pump (9). Keep gage full of fluid (E199) at all times while pumping.
9. Repeat steps 6 thru 8 for other systems as required.
10. Release button (3) on panel (2).
11. Close cap (6) on fill module (7).
12. Set fill module selector valve (8) to CL.

FOLLOW-ON MAINTENANCE:

Disconnect battery (Task 1-39).



END OF TASK

1-63 SERVICE FLIGHT CONTROL SYSTEM ACCUMULATOR

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic Tool Kit,
NSN 5180-00-323-4692
- Source of High-Pressure Compressed Air or
Nitrogen, with 0-3000 Psi Air Gage and
Pressure Regulator
- Torque Wrench, 30 to 150 Inch-Pounds

Materials:

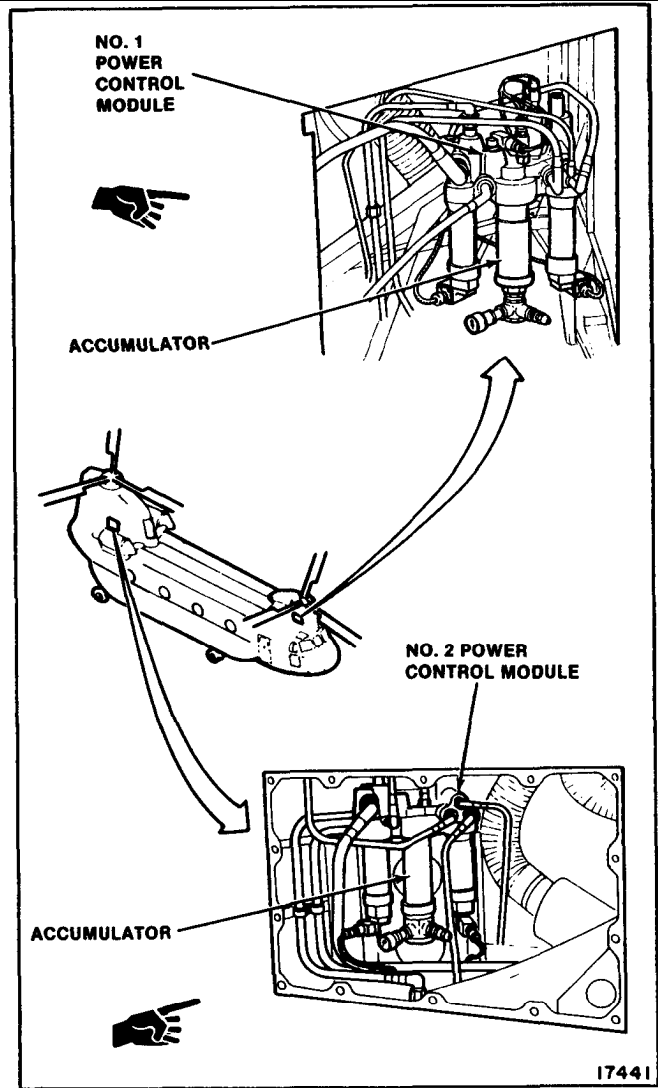
None

Personnel Required:

- Medium Helicopter Repairer
- Inspector

Equipment Condition:

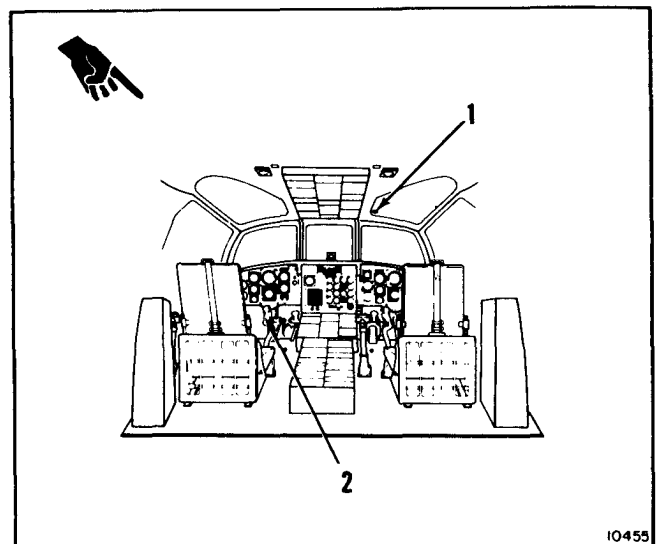
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Right Forward Work Platform Open (Task 2-2)
- Pylon Right Access Door Open (Task 2-2)



NOTE

There are two accumulators, one in No. 1 and one in No. 2 module. Procedure is same for servicing either accumulator.

1. **Measure and record outside air temperature.** Use fat gage (1) in cockpit.
2. **Cycle cockpit control stick (2)** until it becomes more difficult to move.



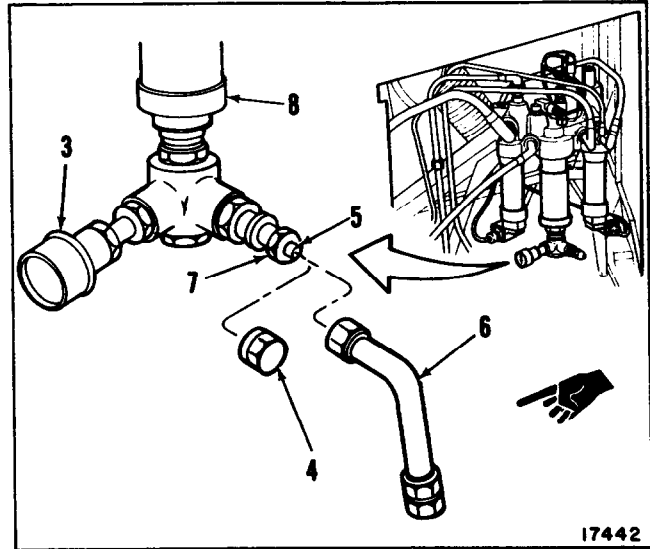
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3. **Read accumulator gage (3).** If indicated pressure is within maximum and minimum limits shown in chart below, go to FOLLOW-ON MAINTENANCE. If pressure is not within limits go to Step 4.

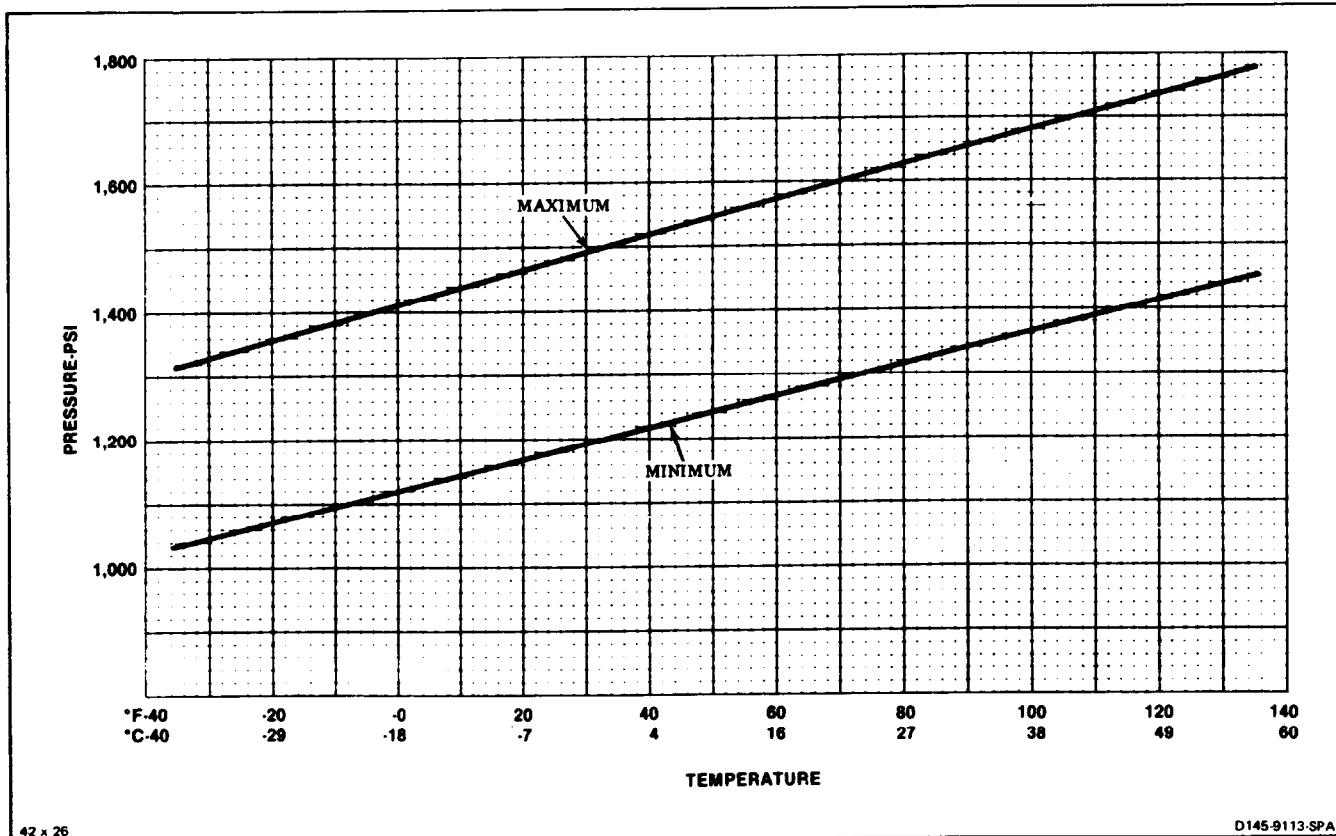
WARNING

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

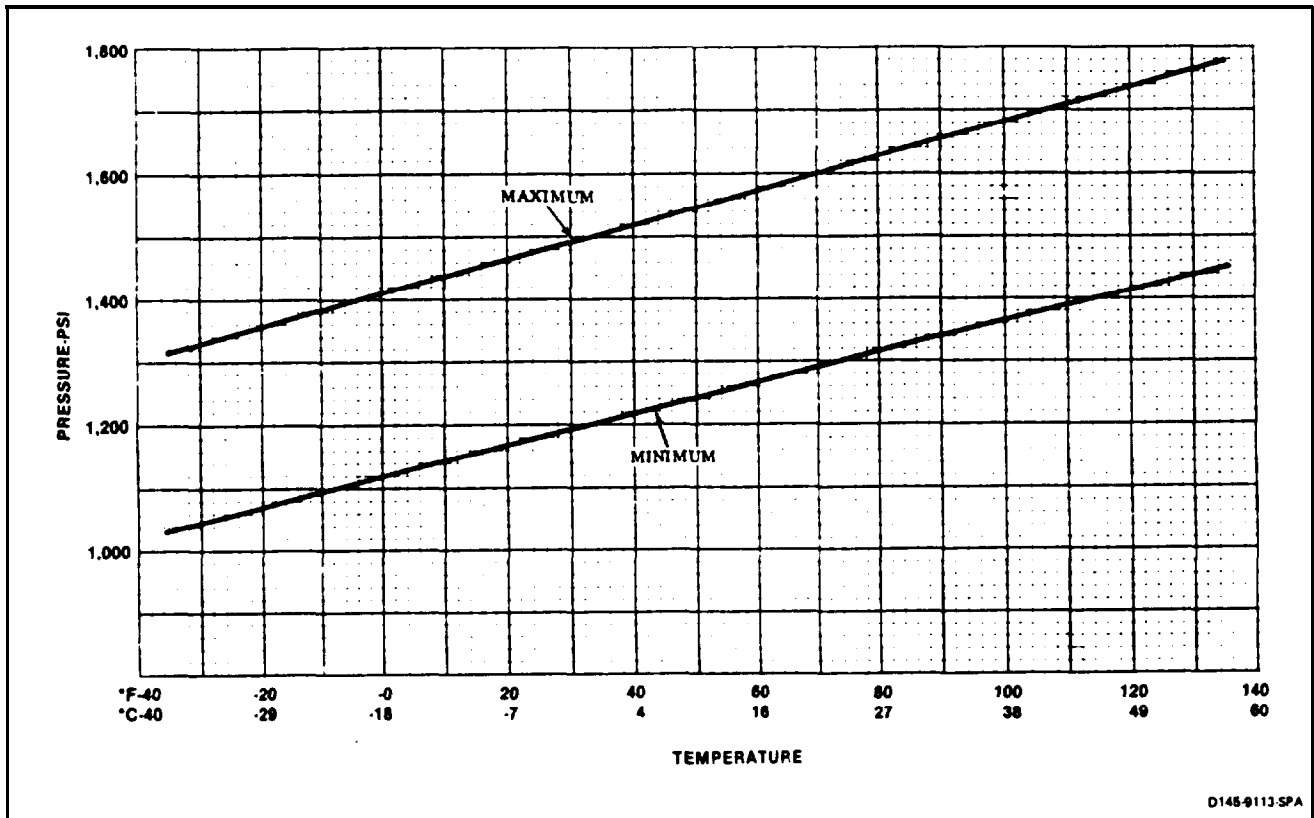
4. **Loosen cap (4) on charging valve (5) one or two turns.** Allow any trapped air to escape.
5. Remove cap (4). **Connect chuck (6) from air source to valve (5).**
6. **Turn valve outer nut (7) completely counterclockwise to open valve.**



7. **Charge accumulator (8) with dry air or nitrogen to pressure indicated in chart, below.** Read pressure on gage (3).



GO TO NEXT PAGE



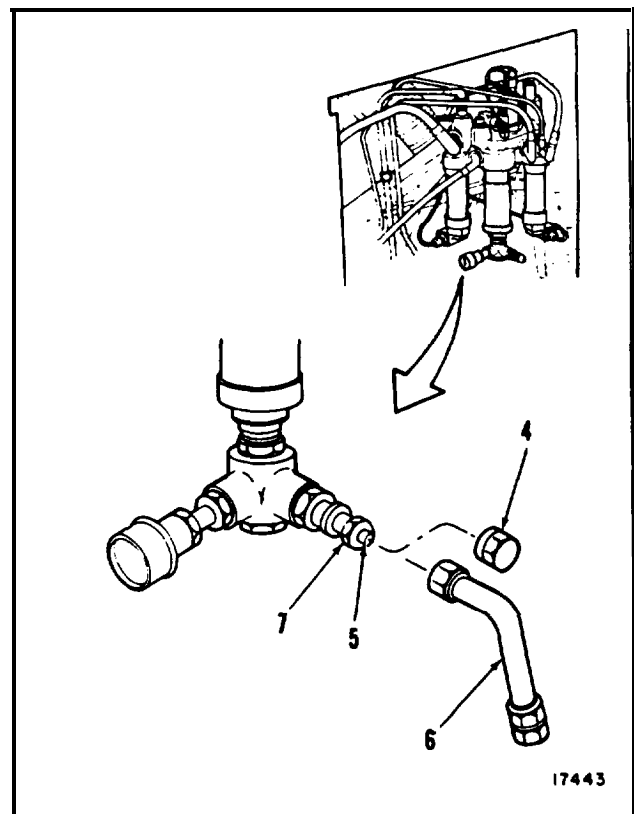
D146-9113-SPA

8. Tighten nut (7).
9. Shut off air source. Remove chuck (6).
10. Torque nut (7) to 60 inch-pounds.
11. Install cap (4) on valve (5).

INSPECT

FOLLOW-ON MAINTENANCE:

- Close right forward work platform (Task 2-2).
- Close right pylon access door (Task 2-2).



17443

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Source of High-Pressure Compressed Air or Nitrogen, With 0-3000 Psi Air Gage and Pressure Regulator
- Torque Wrench, 30 to 150 Inch-Pounds

Materials:

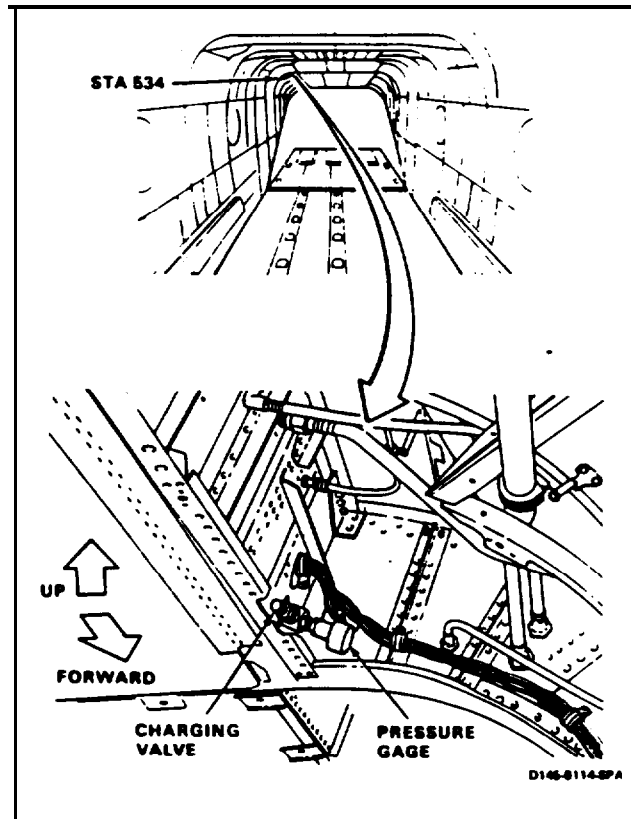
None

Personnel Required:

- Medium Helicopter Repairer
- Inspector

Equipment Condition:

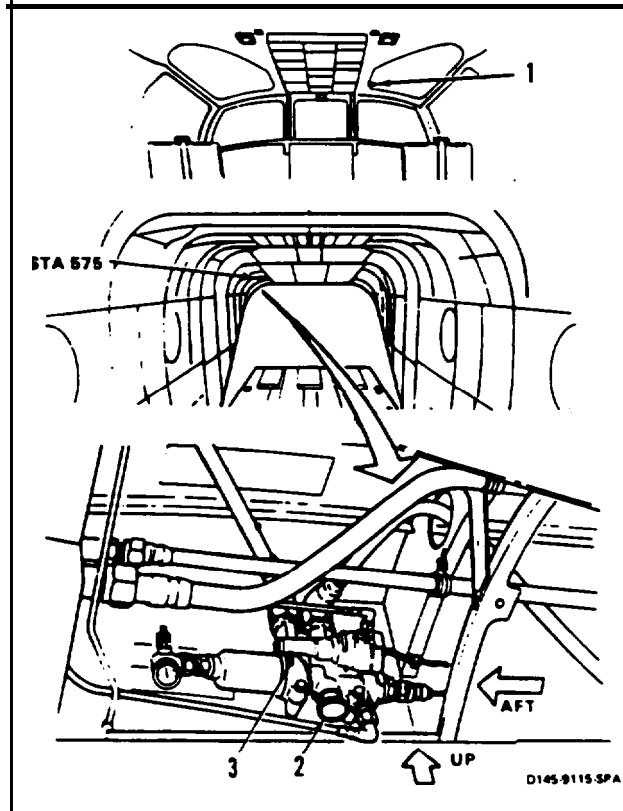
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Emergency Utility Pressure Valve at Normal (TM 55-1520-240-T)
- Cargo Ramp Open and Level (TM 55-1520-240-T)



WARNING

Prior to checking or servicing APU start Accumulator, visually check to ensure pressure gauge vent hole is free of all obstructions. There shall not be anything covering vent hole.

1. Measure and record outside air temperature. Use fat gage (1) in cockpit.
2. Press depressurization valve (2) on apu start module (3). Hold valve until sound of depressurizing has stopped.



GO TO NEXT PAGE

1-64 SERVICE UTILITY SYSTEM APU START ACCUMULATOR (Continued)

1-64

3. **Read accumulator gage (4).** If indicated pressure is within maximum and minimum limits shown in chart below, go to step 12. If pressure is not within limits or your need is to depressurize the accumulator, go to step 4.

WARNING

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

4. **Loosen cap (5) on charging valve (6) one or two turns.** Allow any trapped air to escape.

WARNING

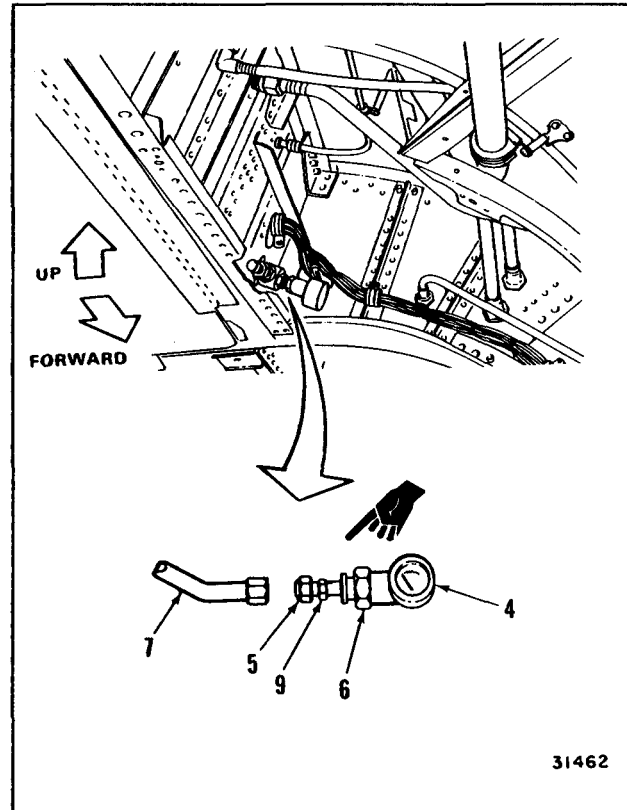
When depressurizing the accumulator, high pressure air will be released from the accumulator charging valve. Ensure body parts are well clear of high pressure air or injury will result.

5. **Remove cap (5).** To depressurize system accumulator, go to and complete step 6 and stop. To service system accumulator, **connect chuck (7)** from air source to valve (6) before going to step 6 and on.

CAUTION

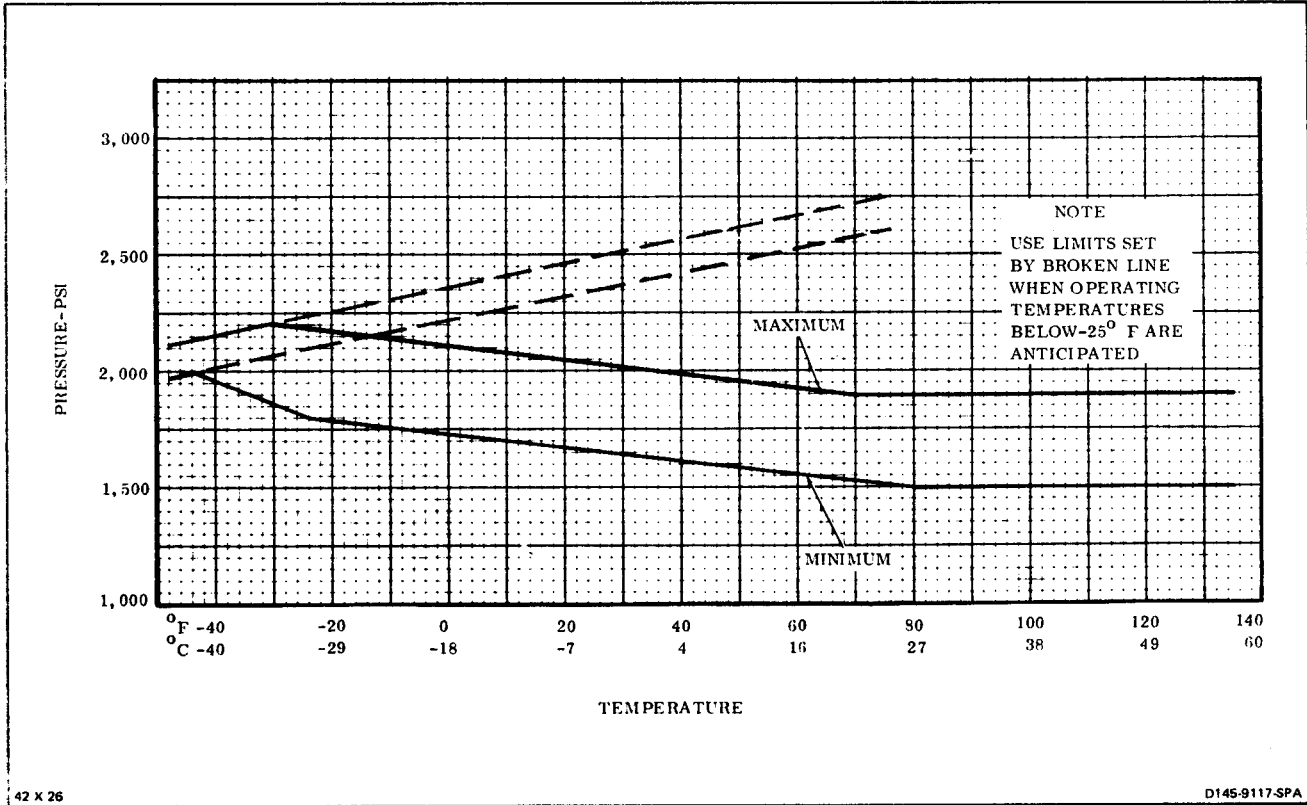
Depressurize accumulator slowly. Fast depressurization will result in internal damage to accumulator.

6. **Hold body of valve (6) with wrench. Turn valve outer nut (9) to left one or two turns to open valve.**
7. **Charge accumulator** with dry air or nitrogen to pressure indicated in the following chart. Read pressure on gage (4).
8. **Tighten nut (9).**



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1-64 SERVICE UTILITY SYSTEM APU START ACCUMULATOR
(Continued)

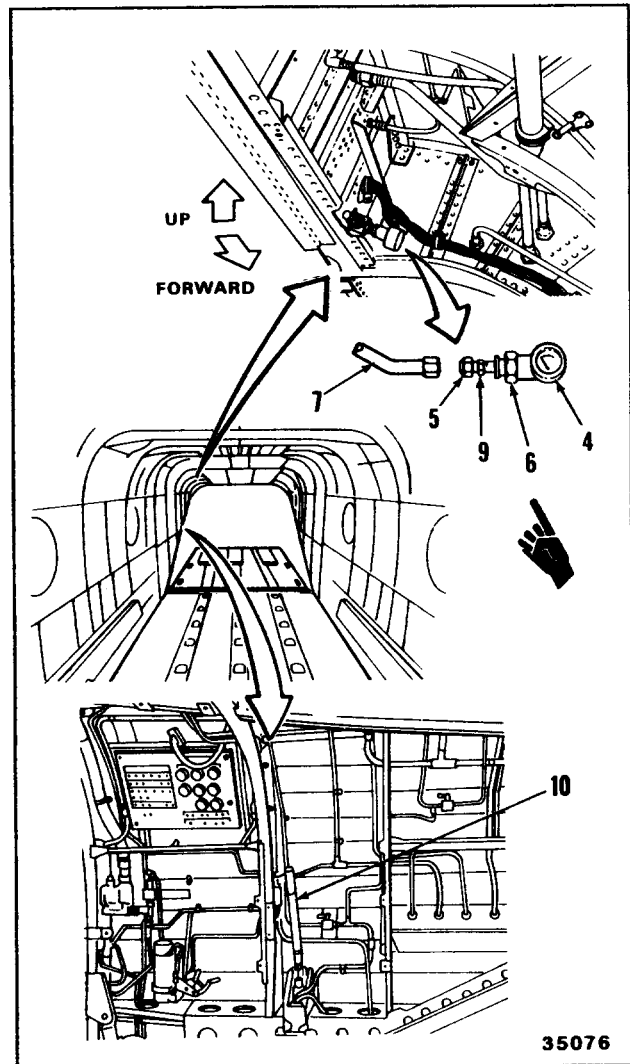


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9. Shut off air source. Remove chuck (7).
10. **Torque nut (9) to 60 inch-pounds.**
11. Install cap (5) on valve (6).

INSPECT

12. **Charge accumulator.** Use hand pump (10). Read pressure on accumulator gage (4). **If temperature is above 25°F (30°C), charge accumulator to 3000 psi. If temperature is below 25°F (30°C), charge accumulator to 3350 psi or until pointer of accumulator gage stops moving, whichever occurs first.**

**FOLLOW-ON MAINTENANCE:**

Check utility hydraulic reservoir level (Task 1-62).

END OF TASK

1-65 SERVICE UTILITY SYSTEM APU START MODULE ACCUMULATOR

INITIAL SETUP

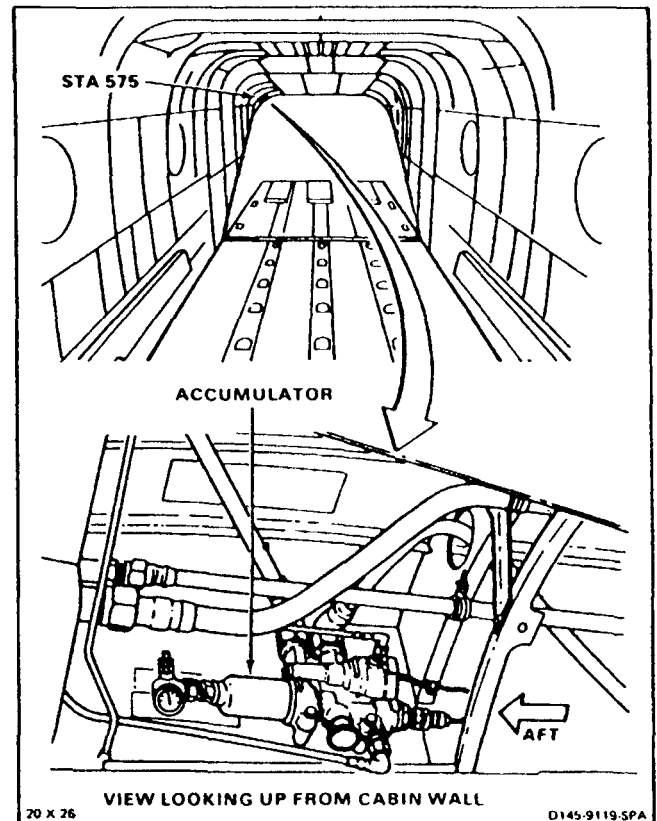
Applicable Configurations:
All

Tools.
Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Source of High-Pressure Compressed Air or
Nitrogen with 0-3000 Psi Air Gage and
Pressure Regulator
Torque Wrench, 30 to 150 Inch-Pounds

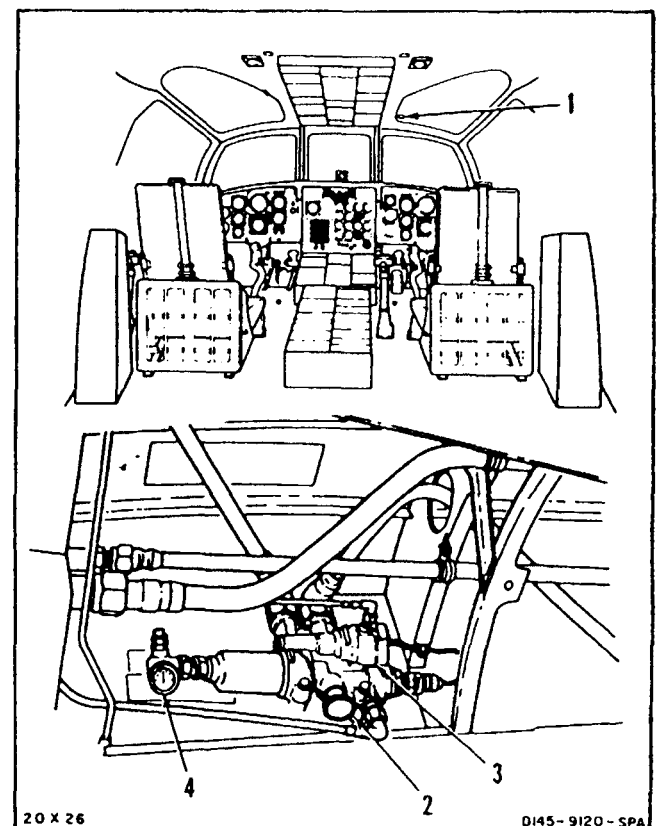
Materials:
Lockwire (E231)

Personnel Required:
Medium Helicopter Repairer
Inspector

Equipment Condition:
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Emergency Utility Pressure Valve to Open
(TM 55-1520-240-T)
Cargo Ramp Open and Level (TM 55-1520-240-T)



1. **Measure and record outside air temperature.** Use fat gage (1) in cockpit.
2. **Press depressurization valve (2) on apu start module (3).** Hold valve until sound of depressurizing has stopped.
3. **Read accumulator gage (4).**



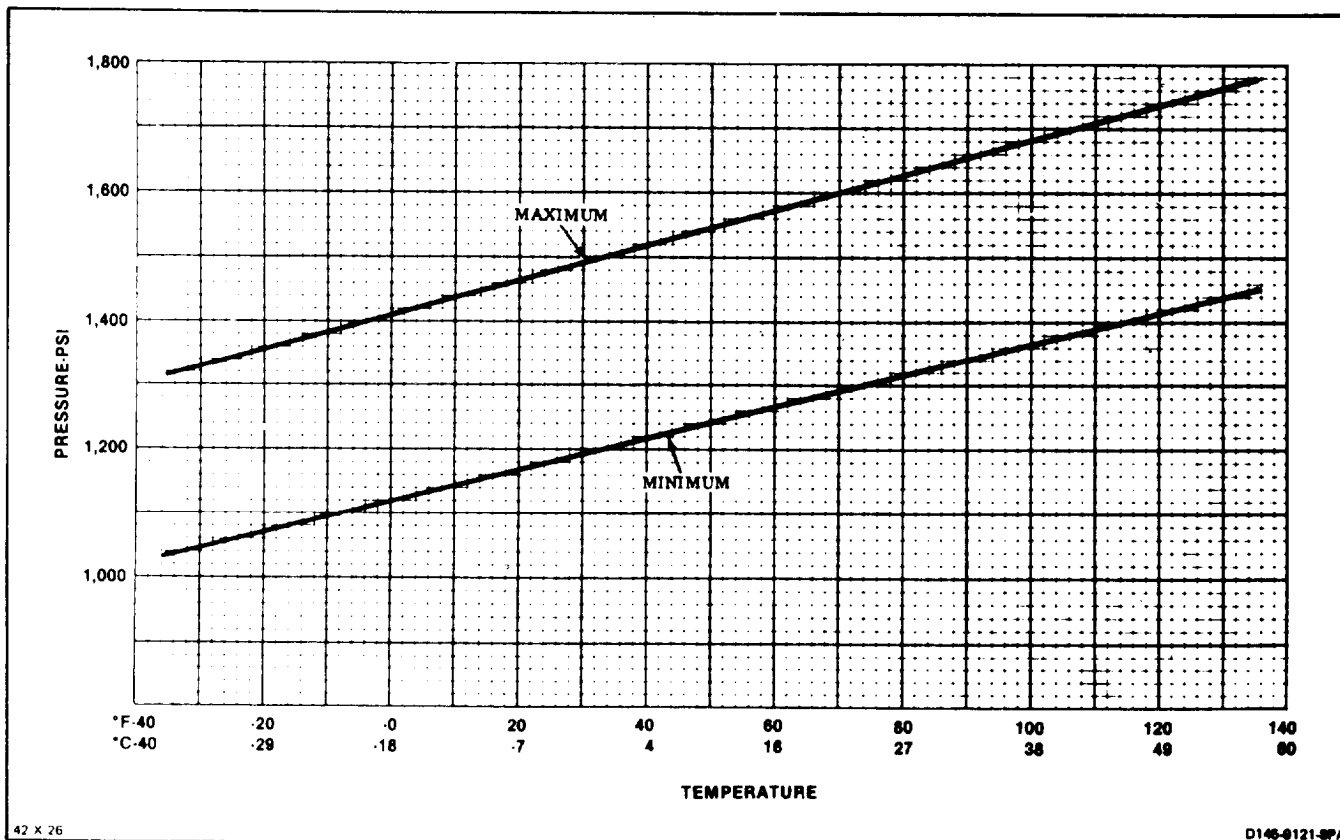
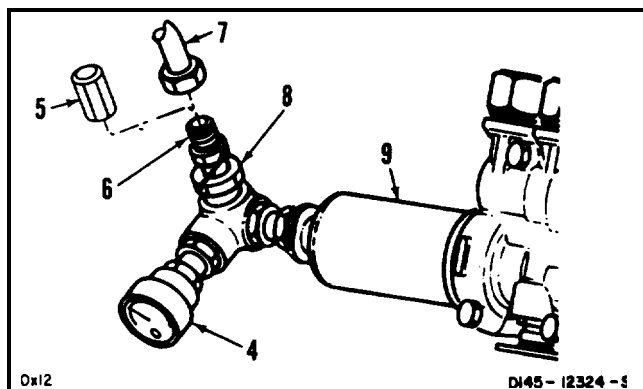
GO TO NEXT PAGE

4. If pressure indicated on gage (4) is within maximum and minimum limits shown in chart, go to step 12. If pressure is not within limits, go to step 5.

WARNING

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

5. Loosen cap (5) on charging valve (6) one or two turns. Let any trapped air escape.
6. Remove cap (5), Connect chuck (7) from air source to valve (6).
7. Remove lockwire from outer nut (8). Hold body of valve (6) with wrench. Turn valve outer nut to left one or two turns to open valve.
8. Charge accumulator (9) with dry air or nitrogen to pressure indicated in chart. Read pressure on gage (4).
9. Tighten nut (8).
10. Shut off air source. Remove chuck (7).



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1-65 SERVICE UTILITY SYSTEM APU START MODULE ACCUMULATOR (Continued)

1-65

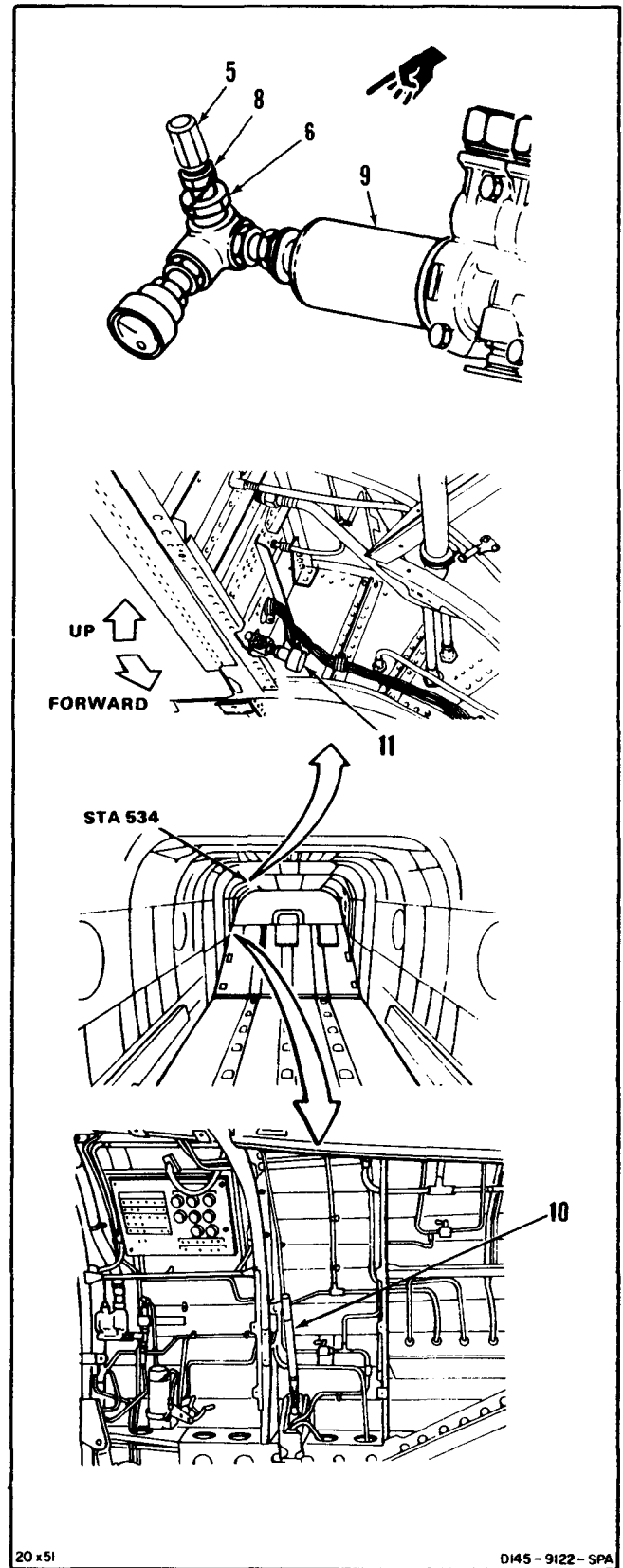
11. **Torque nut (8) to 60 inch-pounds.** Install lockwire (E231).
12. Install cap (5) on valve (6).

INSPECT

13. **Charge accumulator (9).** Use hand pump (10). Read pressure on accumulator gage (11). **If temperature is above -25°F (-30°C), charge accumulator to 3000 psi. If temperature is below -25°F (-30°C), charge accumulator to 3350 psi or until pointer of accumulator gage stops moving, whichever occurs first.**

FOLLOW-ON MAINTENANCE:

Check utility hydraulic reservoir level (Task 1-62).



END OF TASK

Change 2

1-213

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Thermometer
- Source of High-Pressure Compressed Air or Nitrogen, With 0-3000 Psi Air Gage and Pressure Regulator
- Torque Wrench, 30 to 150 Inch-Pounds

Materials:

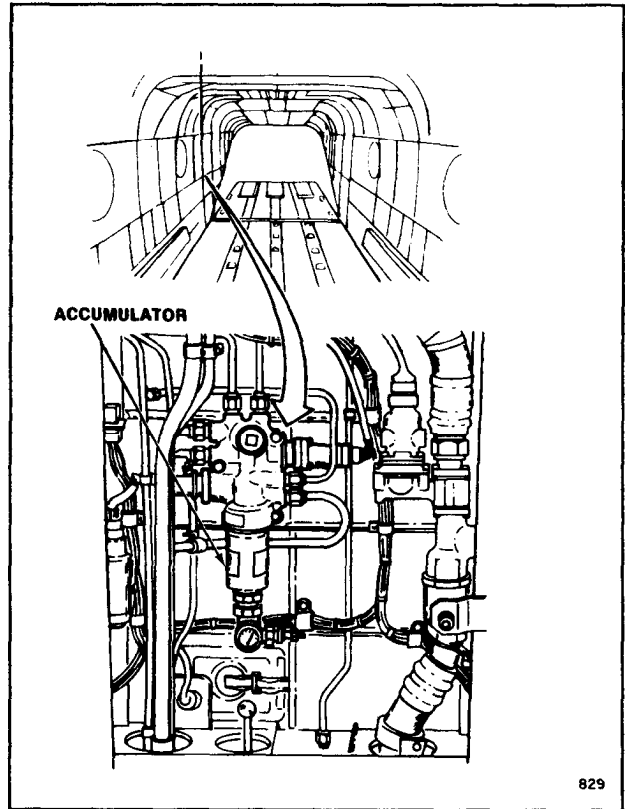
None

Personnel Required:

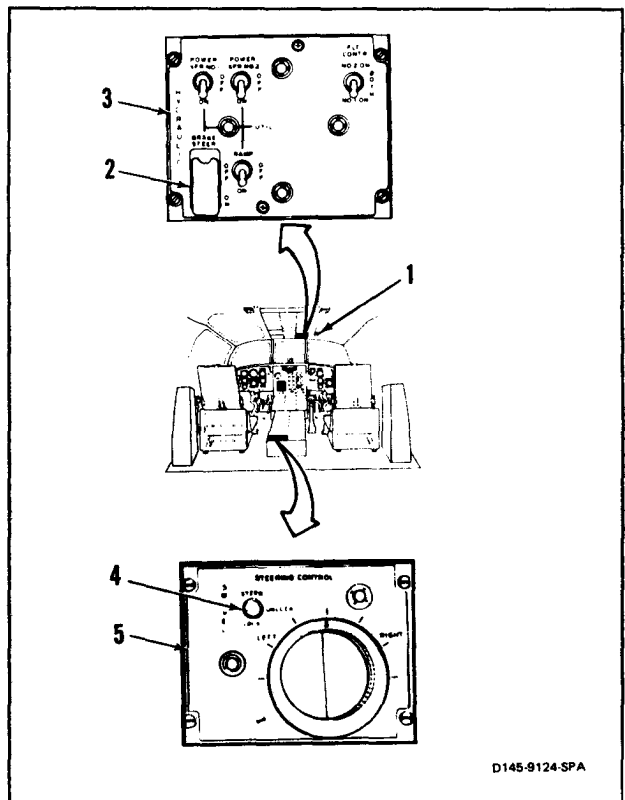
- Medium Helicopter Repairer
- Inspector

Equipment Condition:

- Battery Connected (Task 1-39)
- Electrical Power On
- Hydraulic Power Off
- Emergency Utility Pressure Valve Normal (TM 55-1520-240-T)



1. Measure and record outside air temperature. Use fat gage (1) in cockpit.
2. Set BRAKE STEER switch (2) on cockpit HYDRAULIC panel (3) to OFF.
3. Cycle SWIVEL switch (4) on cockpit STEERING CONTROL panel (5) five times between LOCK and UNLOCK positions.
4. Remove electrical power.



GO TO NEXT PAGE

5. **Read accumulator gage (6).** If indicated pressure is within maximum and minimum limits shown on chart below, go to FOLLOW-ON MAINTENANCE. If pressure is not within limits or your need is to depressurize the accumulator, go to step 6.

WARNING

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

6. **Loosen cap (7) on charging valve (8) one or two turns.** Allow any trapped air to escape.

WARNING

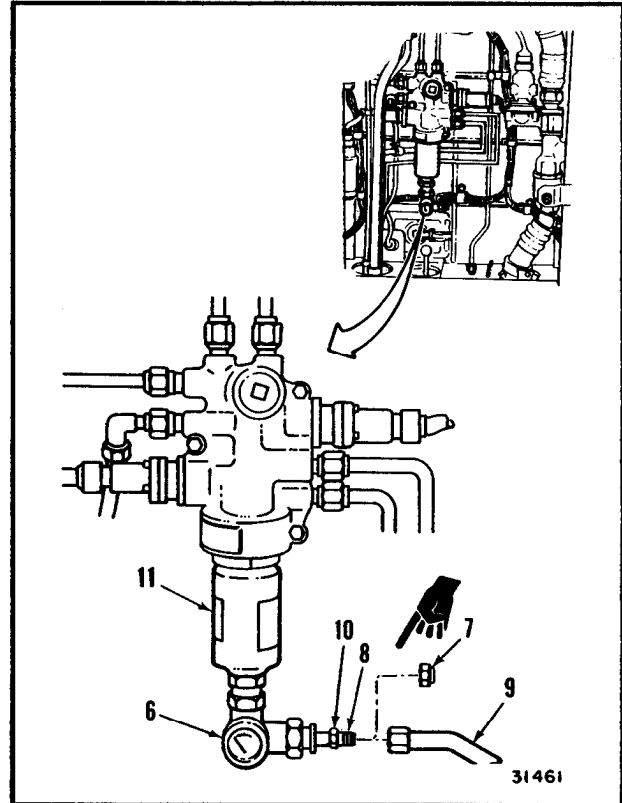
When depressurizing the accumulator, high pressure air will be released from the accumulator charging valve. Ensure body parts are well clear of high pressure air or injury will result.

7. **Remove cap (7).** To depressurize system accumulator, go to and complete step 8 and stop. To service system accumulator, **connect chuck (9)** from air source to valve (8) before going to step 8 and on.

CAUTION

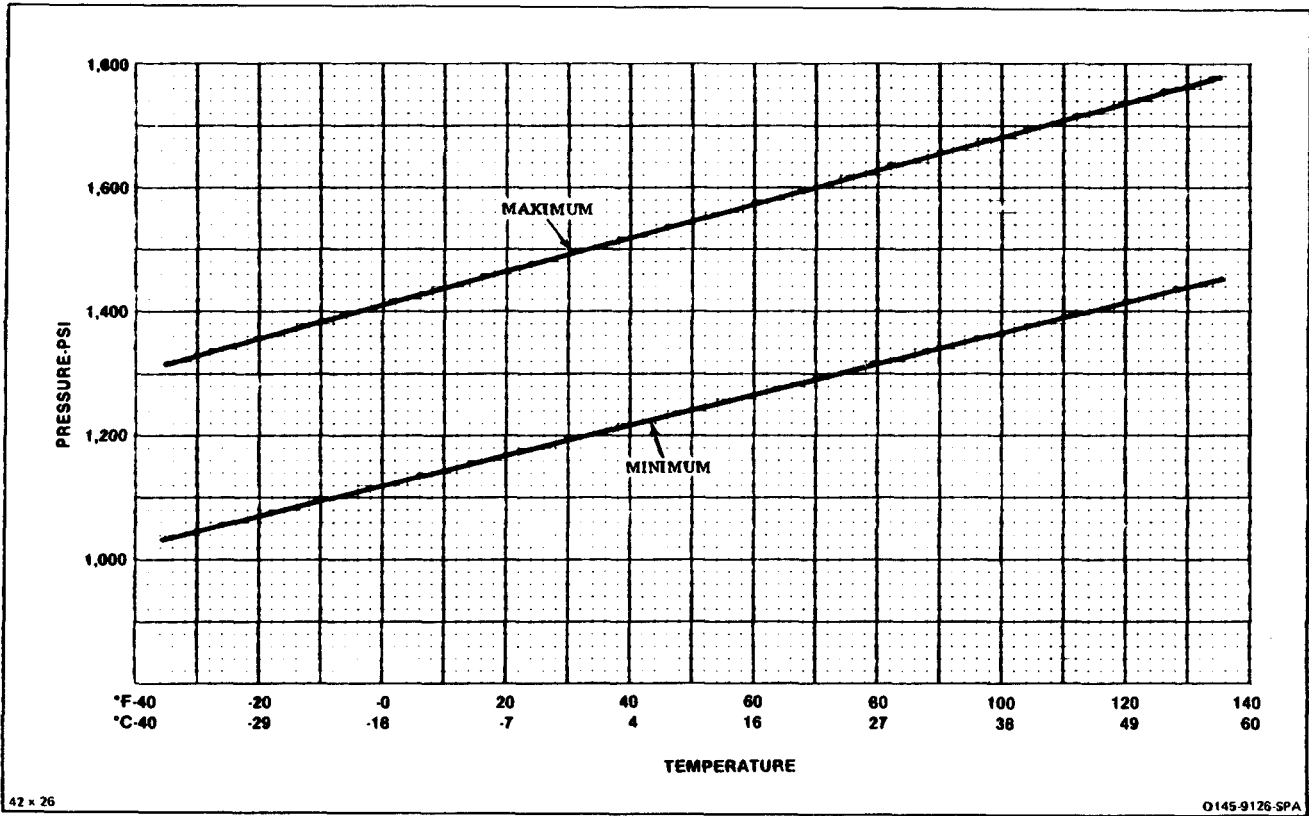
Depressurize accumulator slowly. Fast depressurization will result in internal damage to accumulator.

8. **Hold body of valve (8) with wrench. Turn valve outer nut one or two turns to open valve.**
9. **Charge accumulator (11) with dry air or nitrogen to pressure indicated in the following chart. Read pressure on gage (6).**



GO TO NEXT PAGE

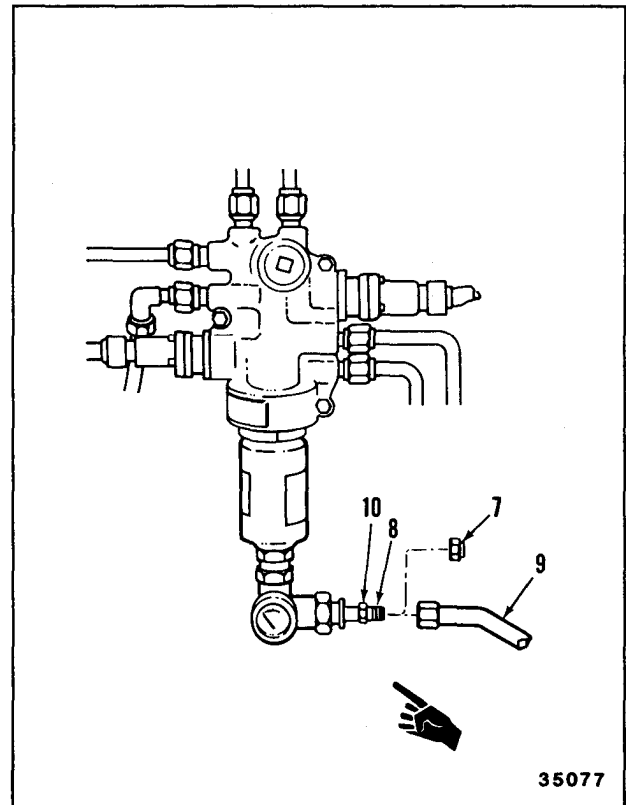
1-66 SERVICE UTILITY SYSTEM POWER STEERING/SWIVEL LOCK ACCUMULATOR (Continued)



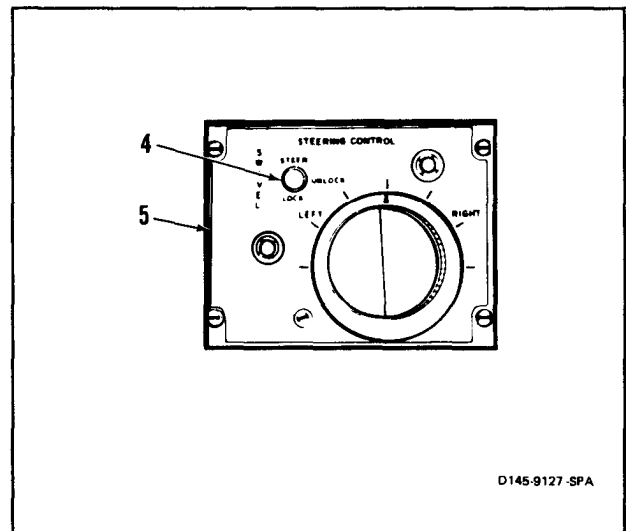
GO TO NEXT PAGE

- 10. **Tighten nut (10).**
- 11. Shut off air source. Remove chuck (9).
- 12. **Torque nut (10) to 60 inch-pounds.**
- 13. Install cap (7) on valve (8).

INSPECT



- 14. **Set SWIVEL switch (4) on cockpit STEERING CONTROL panel (5) to UNLOCK position.**



- FOLLOW-ON MAINTENANCE:
- 1. Disconnect Battery (Task 1-39)

END OF TASK

1-67 SERVICE UTILITY SYSTEM WHEEL BRAKE ACCUMULATOR ACCUMULATOR (Continued)

1-66

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Source of High Pressure Compressed Air or Ni-
trogen, With 0-3000 Psi Air Gage and Pressure
Regulator
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

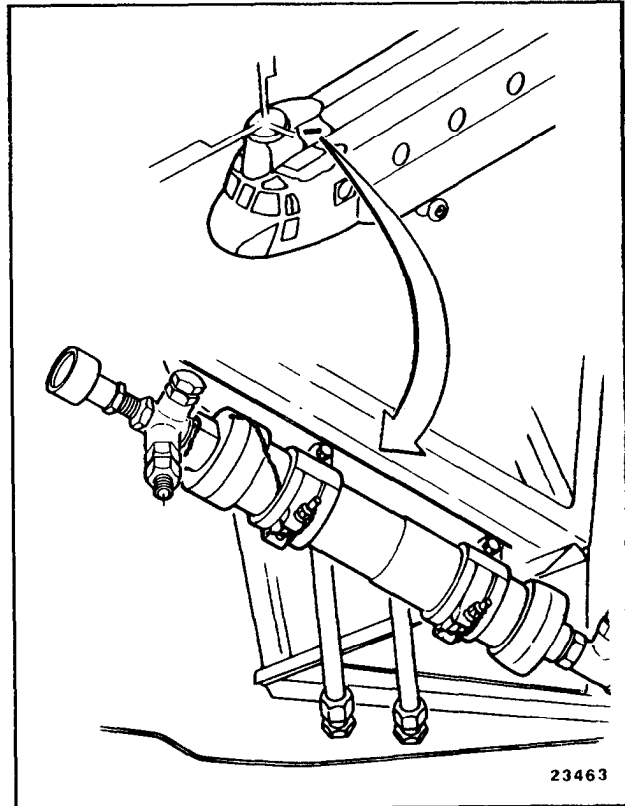
None

Personnel Required:

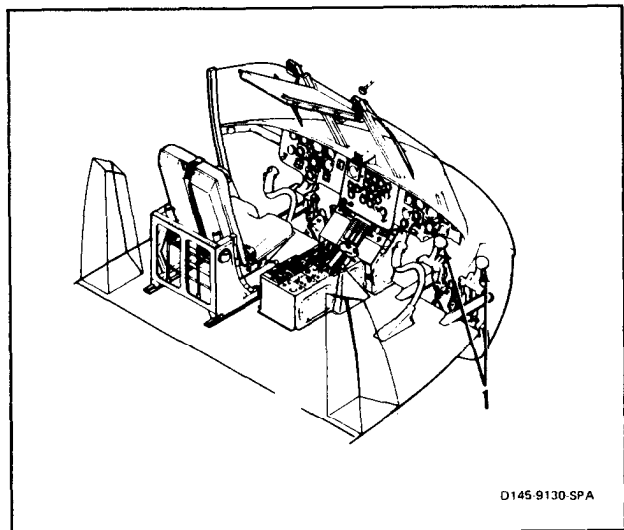
Medium Helicopter Repairer
Inspector

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Forward Fairing Left Work Platform Open (Task
2-2)
Emergency Utility Pressure Valve at Normal (TM
55-1520-240-T)



1. Operate cockpit foot brake pedals (1) ten times to relieve system pressure.



GO TO NEXT PAGE

2. Read accumulator gage (2). If indicated pressure is greater than 600 psi and less than 850 psi, go to FOLLOW-ON MAINTENANCE. If indicated pressure is less than 600 psi or greater than 850 psi, go to step 3.

WARNING

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

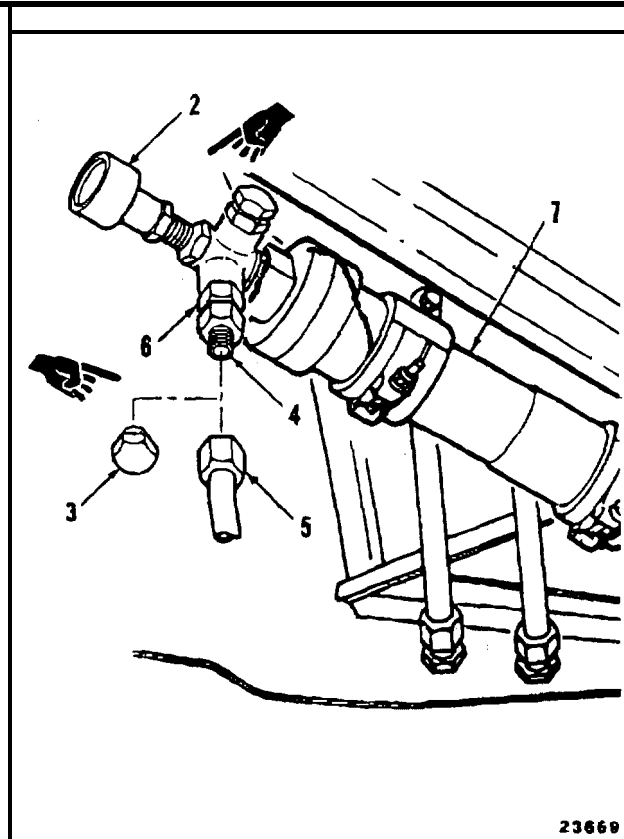
3. Loosen cap (3) on charging valve (4) one or two turns. Allow any trapped air to escape.
4. Remove cap (3). Connect chuck (5) from air source to valve (4).
5. Remove lockwire from outer nut (6). Hold body of valve (4) with wrench. Turn valve outer nut completely counterclockwise to open valve.
6. Charge accumulator (7) with dry air or nitrogen to 700 Psi.
7. Tighten nut (6). Torque to 60 Inch-pounds.
8. Lockwire nut (6). Use lockwire (E231).

INSPECT

9. Shut off air source. Remove chuck (5).
10. Install cap (3) on valve (4).

FOLLOW-ON MAINTENANCE:

Close forward fairing left work platform (Task 2 - 2) .



23669

1-68 SERVICE UTILITY SYSTEM RESERVOIR PRESSURIZATION ACCUMULATOR

1-68

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Source of High Pressure Compressed Air or
Nitrogen, with 0-3000 Psi Air Gage and
Pressure Regulator
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

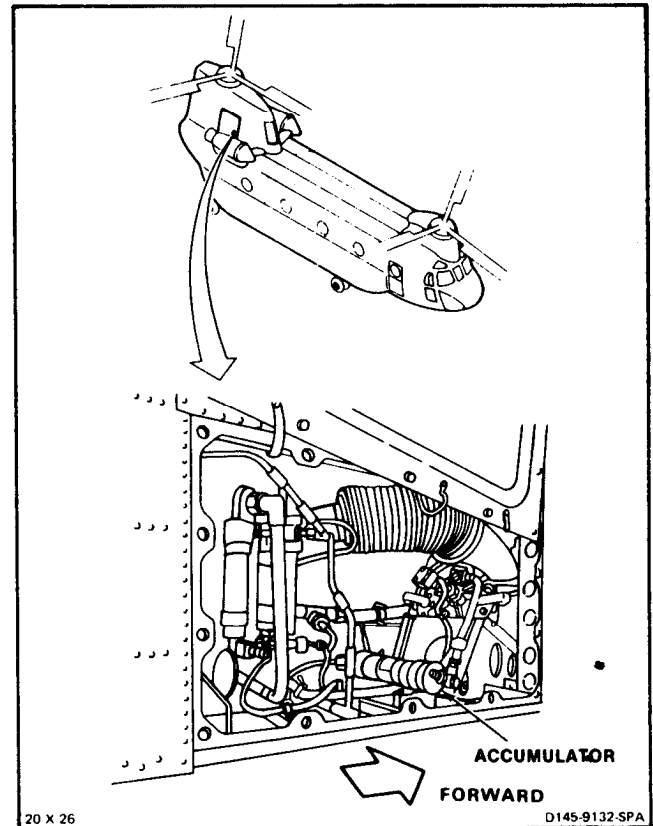
Lockwire (E231)

Personnel Required:

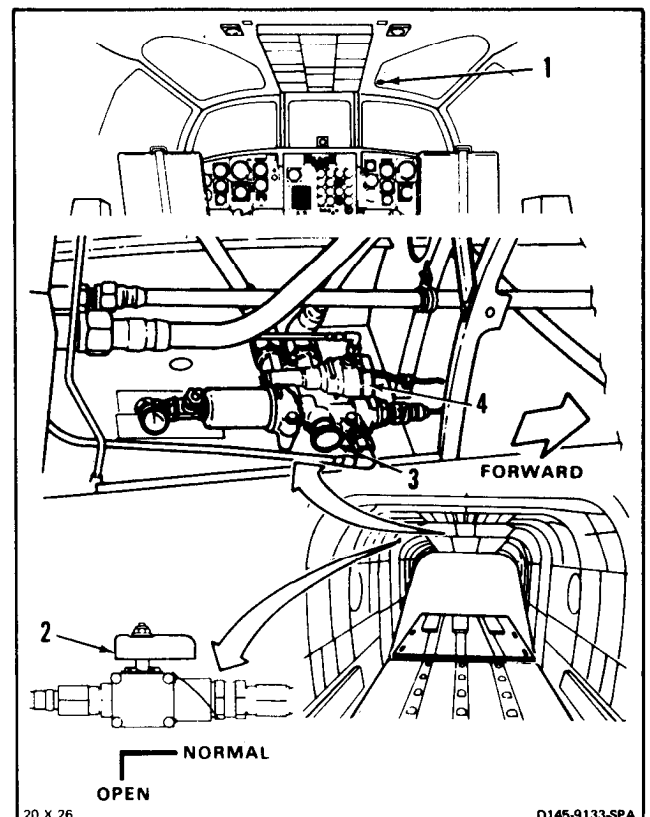
Medium Helicopter Repairer
Inspector

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Pylon Right Access Door Open (Task 2-2)
Cargo Ramp Open and Level (TM 55-1520-
240-T)



1. **Measure and record outside air temperature.** Use fat gage (1) in cockpit.
2. **Set UTILITY RESERVOIR DEPRESSURIZE valve (2) to OPEN.**
3. **Press and hold depressurization valve (3)** on apu start module (4) until accumulators have discharged completely.
4. Release valve (3).
5. **Set UTILITY RESERVOIR DEPRESSURIZE valve (2) to NORMAL.**



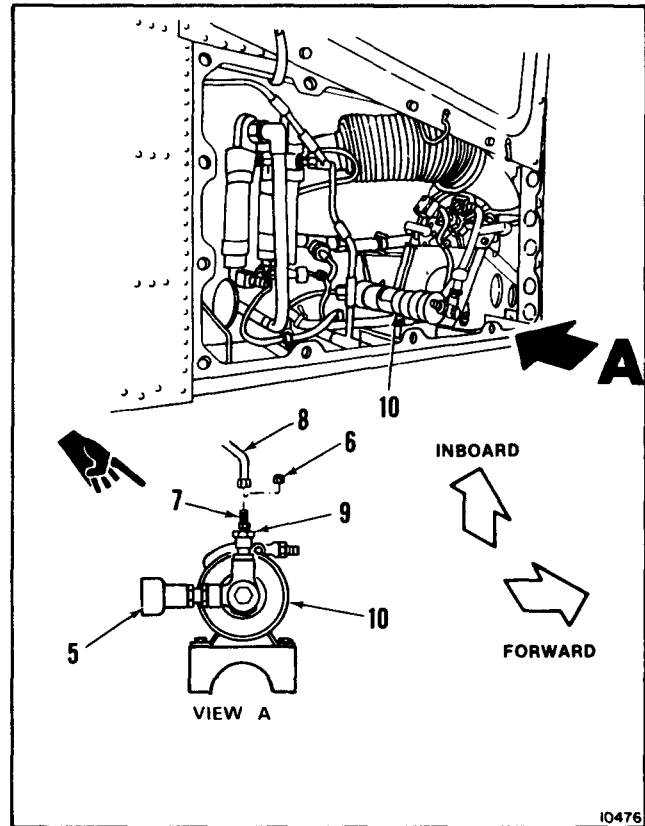
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6. **Read accumulator gage (5).** If indicated pressure is within maximum and minimum limits shown in chart below, go to step 15. If pressure is not within limits, go to step 7.

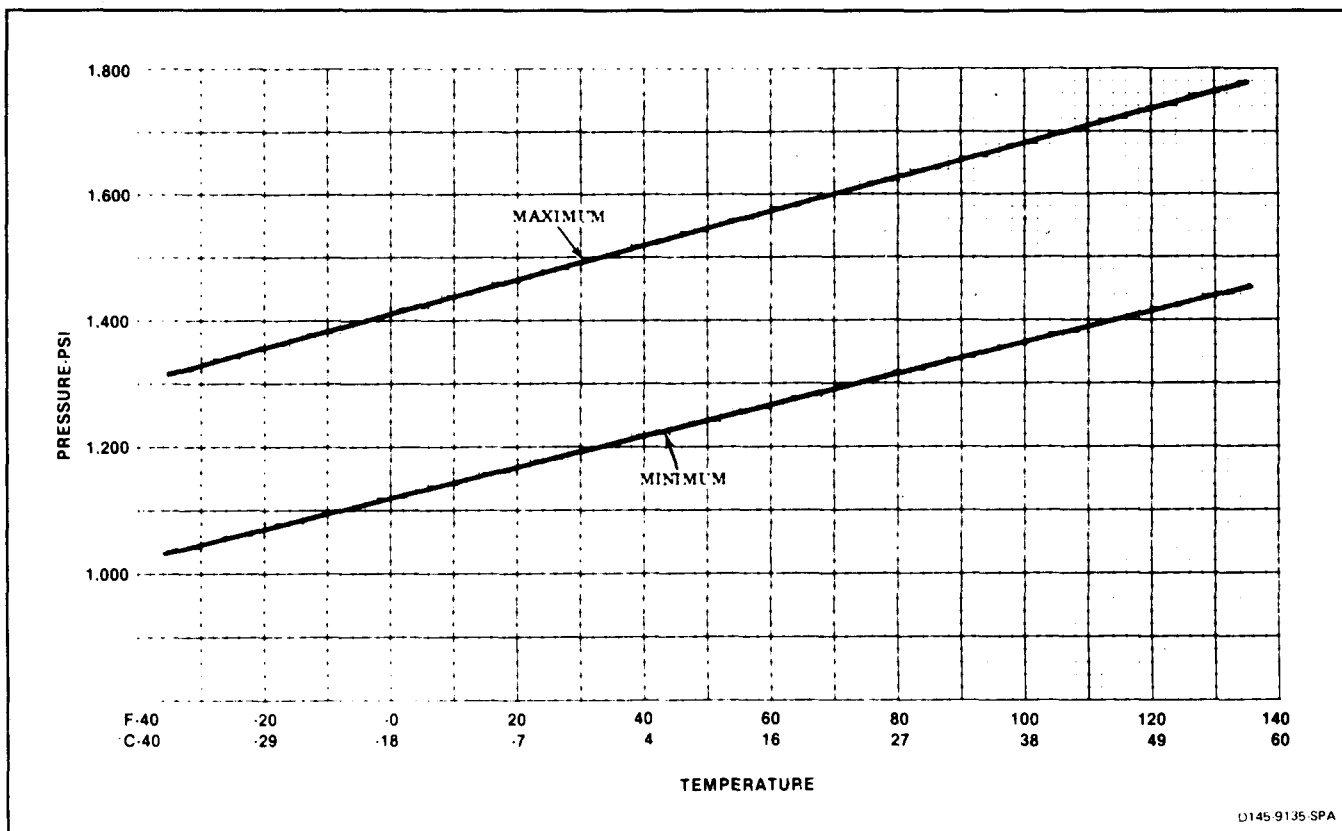
WARNING

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

7. **Loosen cap (6) on charging valve (7) one or two turns.** Allow any trapped air to escape.
8. Remove cap (6). **Connect chuck (8) from air source to valve (7).**
9. Remove lockwire from outer nut (9). Hold body of valve (7) with wrench. **Turn outer nut one or two turns to open valve.**
10. **Charge accumulator (10)** with dry air or nitrogen to pressure indicated in chart below. Read pressure on gage (5).
11. **Tighten nut (9).**



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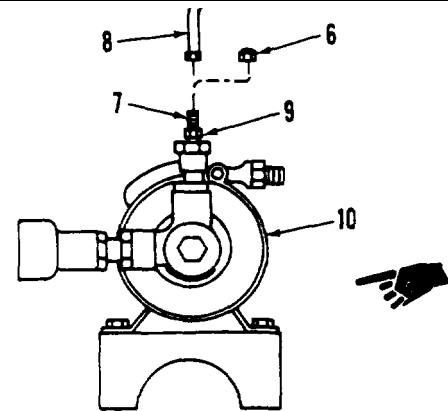
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1-68 SERVICE UTILITY SYSTEM RESERVOIR PRESSURIZATION ACCUMULATOR (Continued)

1-68

12. Shut off air source. Remove chuck (8).
13. **Torque nut (9) to 60 inch-pounds.** Install lockwire (E231).
14. Install cap (6) on valve (7)

INSPECT

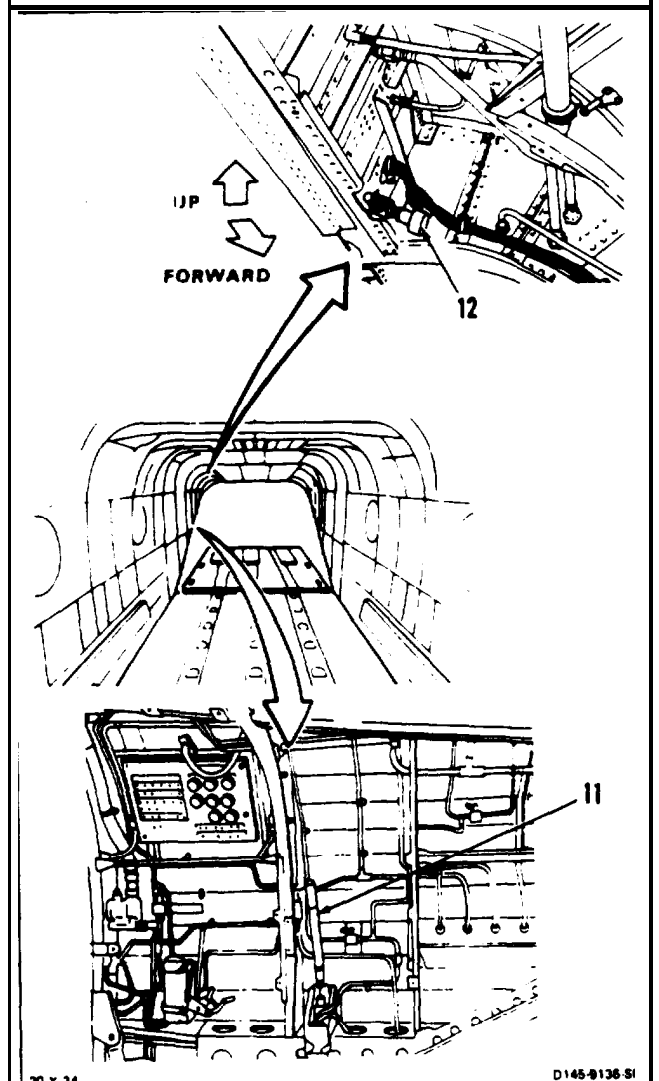


10477

15. **Charge accumulators.** Use hand pump (1 1). Read pressure on apu start accumulator gage (12). **If temperature is above -25°F (-30°C), charge accumulator to 3000 psi.** **If temperature is below -25°F (-30°C), charge accumulator to 3350 psi or until pointer of accumulator gage stops moving, whichever occurs first.**

FOLLOW-ON MAINTENANCE:

- Close pylon right access door (Task 2-2).
- Check utility hydraulic reservoir level (Task 1-62)



END OF TASK

Change 17

1-221

1-69 SERVICE FORWARD LANDING GEAR SHOCK STRUT (FLUID)

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4690
- Funnel
- Source of Compressed Air
- Torque Wrenched, 100 to 750 Inch-Pounds
- Crowfoot Attachment, 1-inch

Materials:

- Cloths (E120)
- Hydraulic Fluid (E197)
- Lockwire (E231)

Parts:

Packings

Personnel Required:

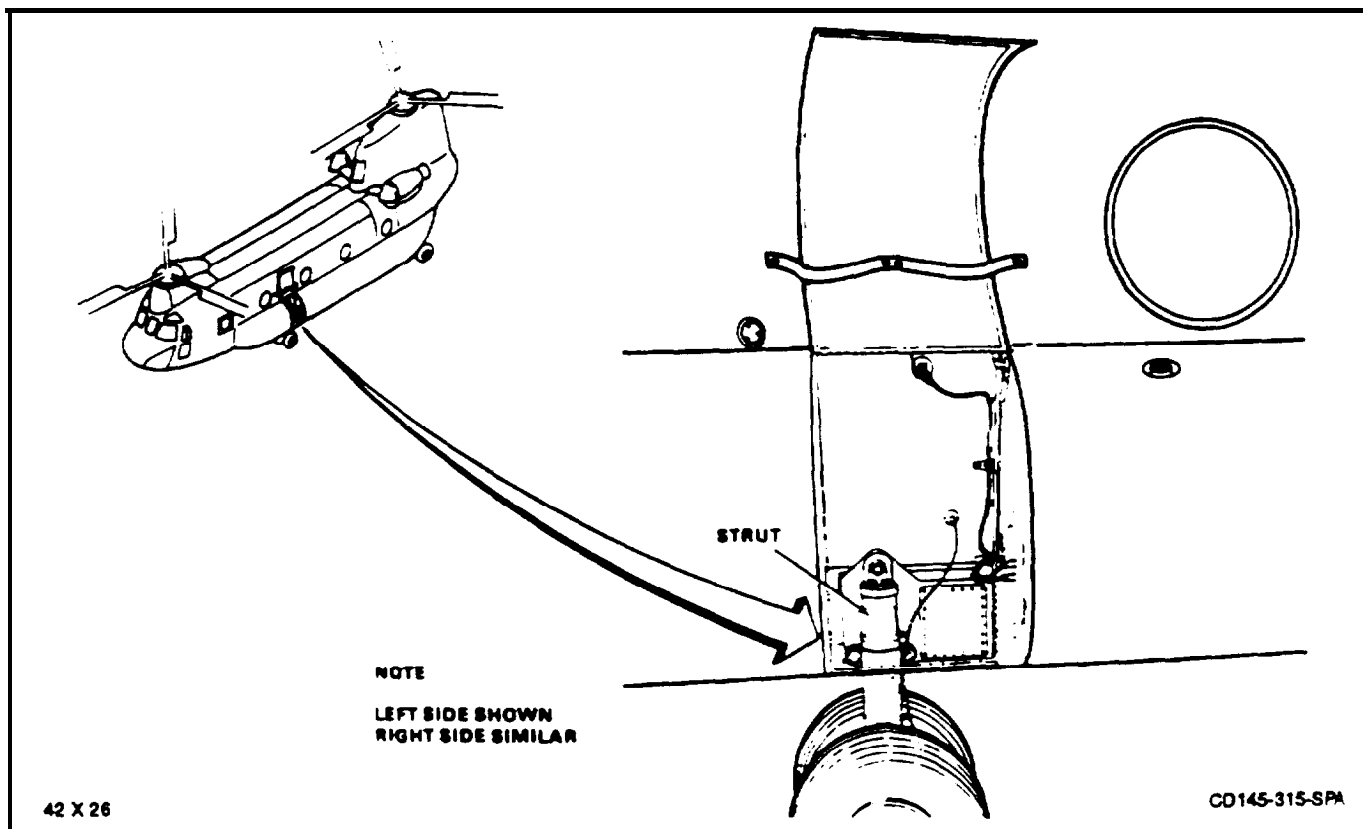
Medium Helicopter Repair (2)
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Poweroff
- Hydraulic Power Off
- Both Forward Gear Access Panels Open (Task 2-2)
- Both Forward Landing Gear Shock Struts Deflated (Task 1-71)



GO TO NEXT PAGE

1-69 SERVICE FORWARD LANDING GEAR SHOCK STRUT (FLUID) 1-69

(Continued)

NOTE

Service left and right shock struts in same way. Left strut is shown here.

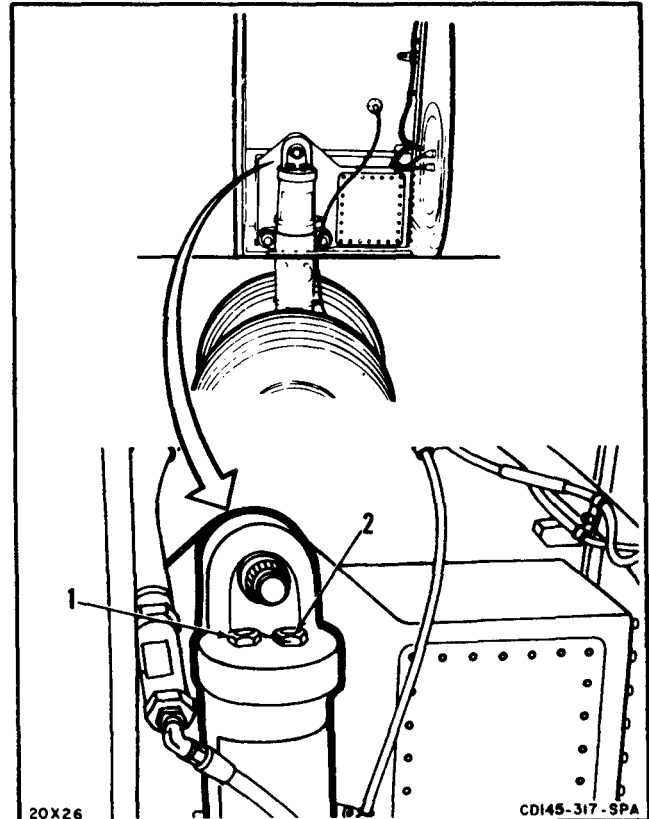
1. Remove lockwire from two filler plugs (1 and 2).

WARNING

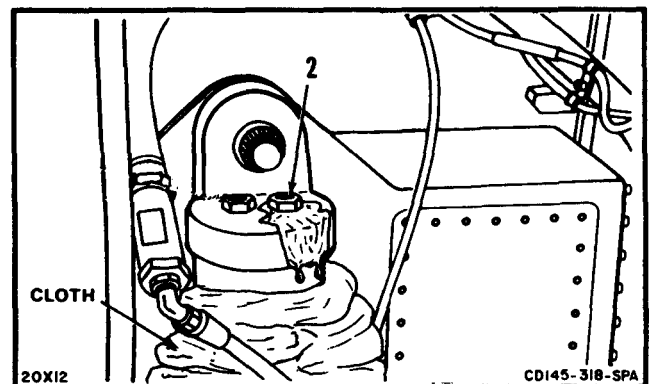
Strut fluid may be under pressure. Loosen plug slowly to allow any pressurized fluid out safely. Otherwise, personal injury can result. If hit by fluid, flush skin with water. Get medical attention for eyes.

NOTE

Placing cloths around strut before loosening plugs will absorb released fluid.



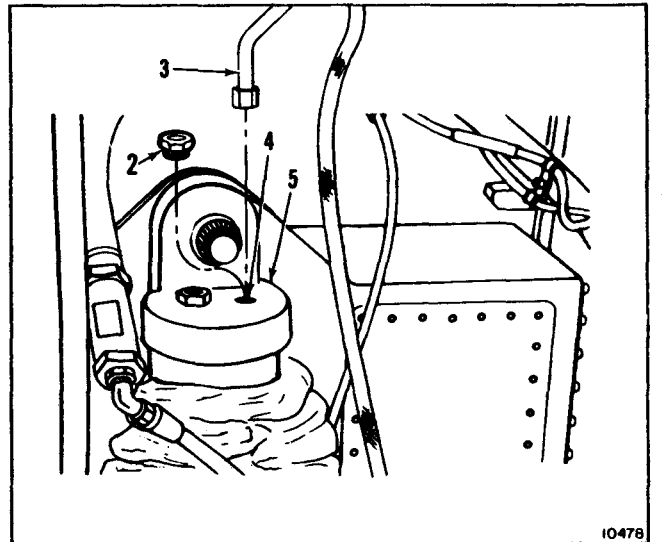
2. Loosen plug (2) slowly. Wait for pressure to bleed off.



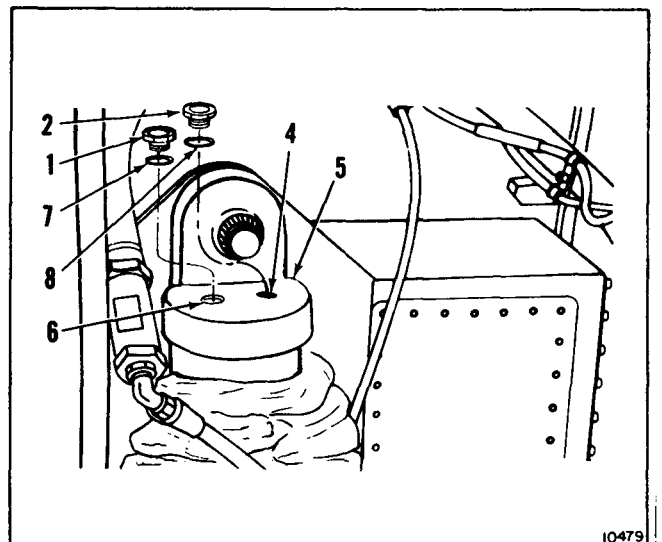
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1-69 SERVICE FORWARD LANDING GEAR SHOCK STRUT (FLUID)
(Continued)

3. Remove aft plug (2). Hold air chuck (3) from source of compressed air over open port (4). Pressurize strut (5) through port at 50 to 100 psi for 5 seconds.



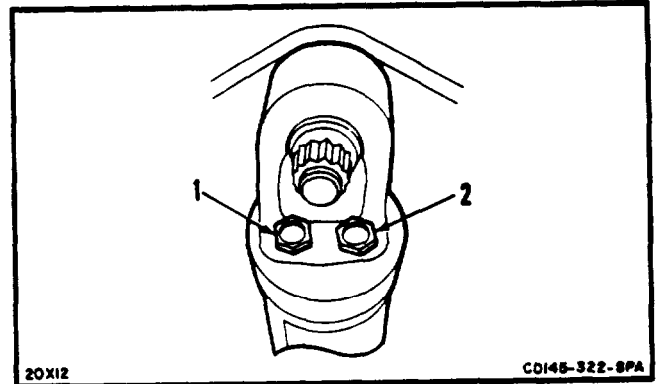
4. Remove forward plug (1).
5. Hand-fill strut (5) with hydraulic fluid (E197) through aft port (4). Fill until bubble-free fluid begins to flow from forward port (6).
6. Coat new packing (7) with hydraulic fluid (E197). Install packing on plug (1). Install plug in forward port (6).
7. Continue to fill strut (5) through aft port (4) until port is filled with bubble-free fluid.
8. Coat new packing (8) with hydraulic fluid (E197). Install packing on plug (2). Install plug in aft port (4).
9. Remove cloths, if used. Clean fluid from strut as needed. Use cloths (E120).



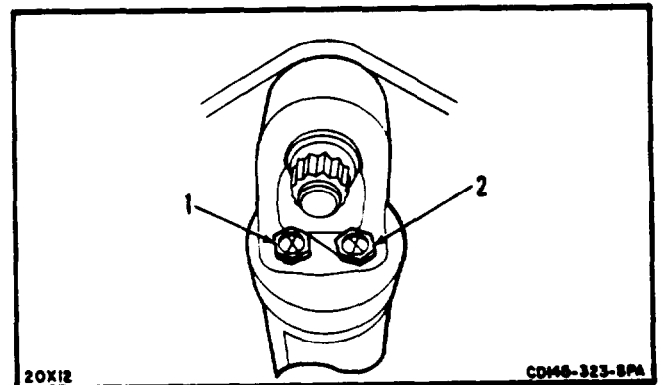
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**1-69 SERVICE FORWARD LANDING GEAR SHOCK STRUT (FLUID)
(Continued)**

10. Torque plugs (1 and 2) to 250 inch-pounds. Use 1-inch crowfoot attachment.



11. Lockwire plugs (1 and 2) together. Use lockwire (E231).



NOTE

Task is not done until both forward struts are serviced in same way.

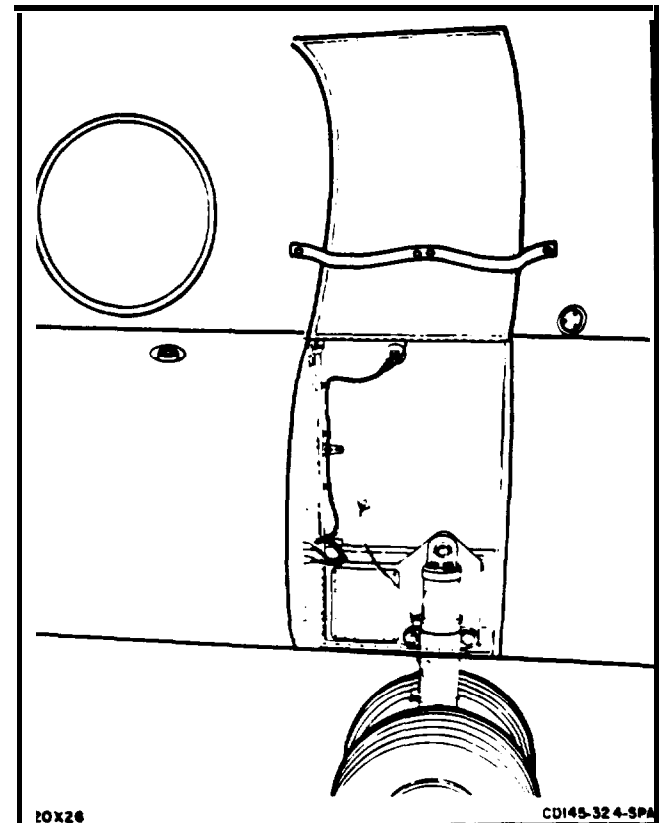
12. Repeat steps 1. thru 11. for right gear.

INSPECT

FOLLOW-ON MAINTENANCE:

Service both forward landing gear shock struts with air (Task 1-71).

Close both forward landing gear access panels (Task 2-2).



END OF TASK

1-70 SERVICING AFT LANDING GEAR SHOCK STRUT (FLUID)

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Funnel
- source of compressed Air
- Torque Wrench, 100 To 750 Inch-Pounds

Materials:

- Cloths (E120)
- Hydraulic Fluid (E197)
- Lockwire (E231)

Parts:

- Packings

Personnel Required:

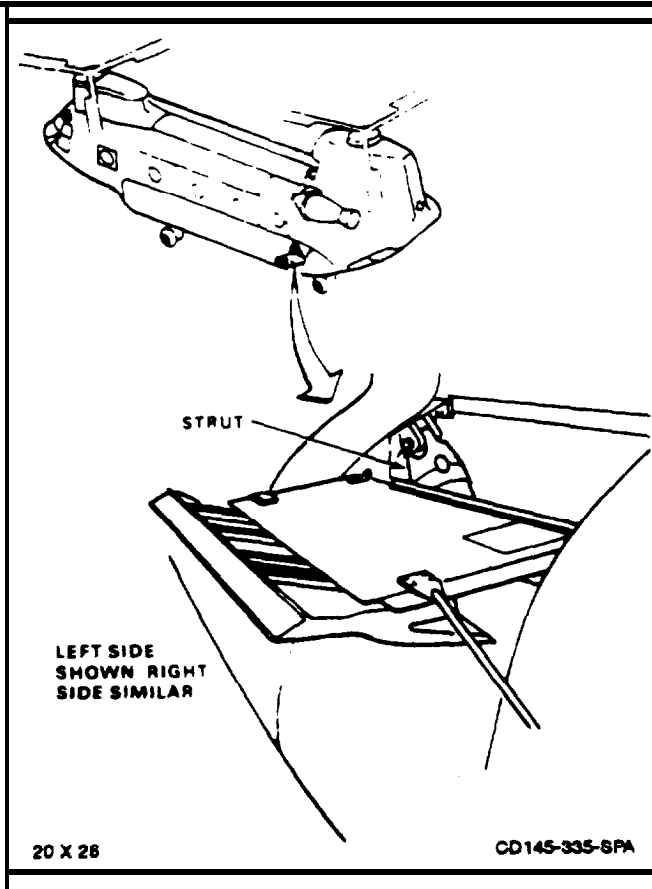
- Medium Helicopter Repairer (2)
- Inspector

References:

- TM 55-1520-240-23P

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Both Aft Work Platforms Opened (Task 2-2)
- Both Aft Landing Gear Shock Struts Deflated (Task 1-72)



NOTE

Service left and right struts in same way. Left strut is shown here.

1. Remove lockwire from two filter plugs (1 and 2).

WARNING

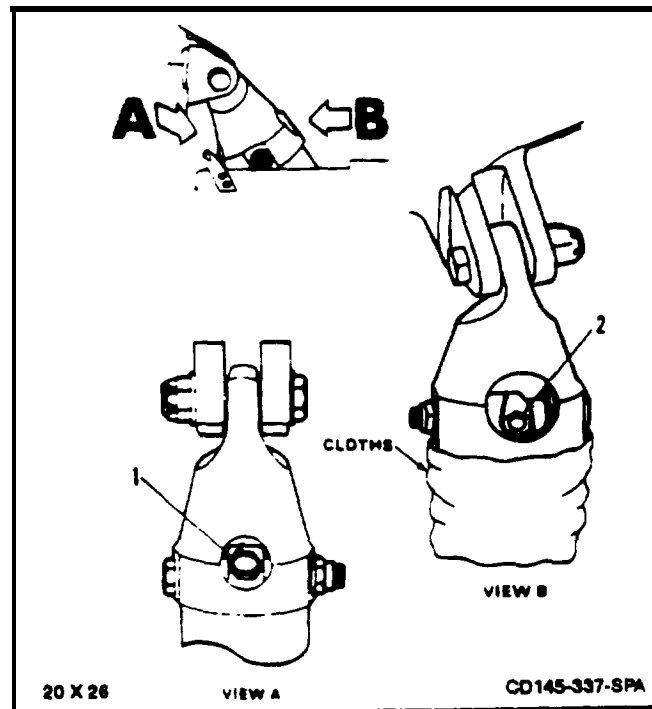
Strut fluid may be under pressure. Loosen plug slowly to allow pressurized fluid out safely. Otherwise, personal injury can result. If hit by fluid, flush side with water. Get medical attention for eyes.

NOTE

Placing cloths wound strut before loosening plug will absorb, released fluid.

2. Loosen aft (upper) plug (2) slowly. wait for pressure to bleed off.

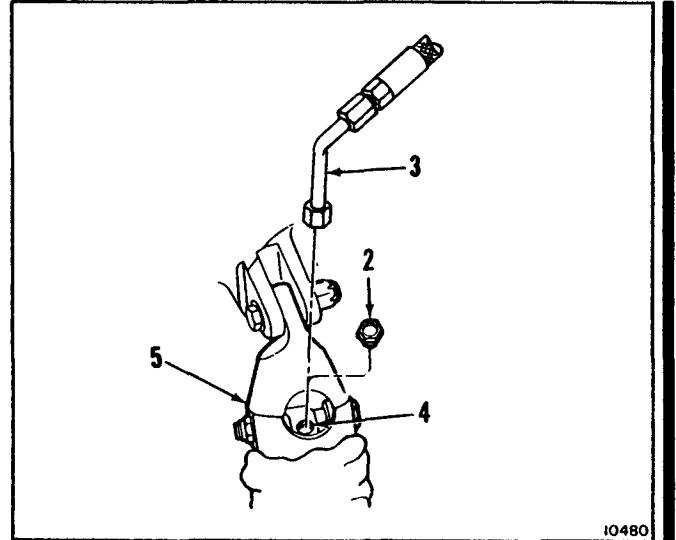
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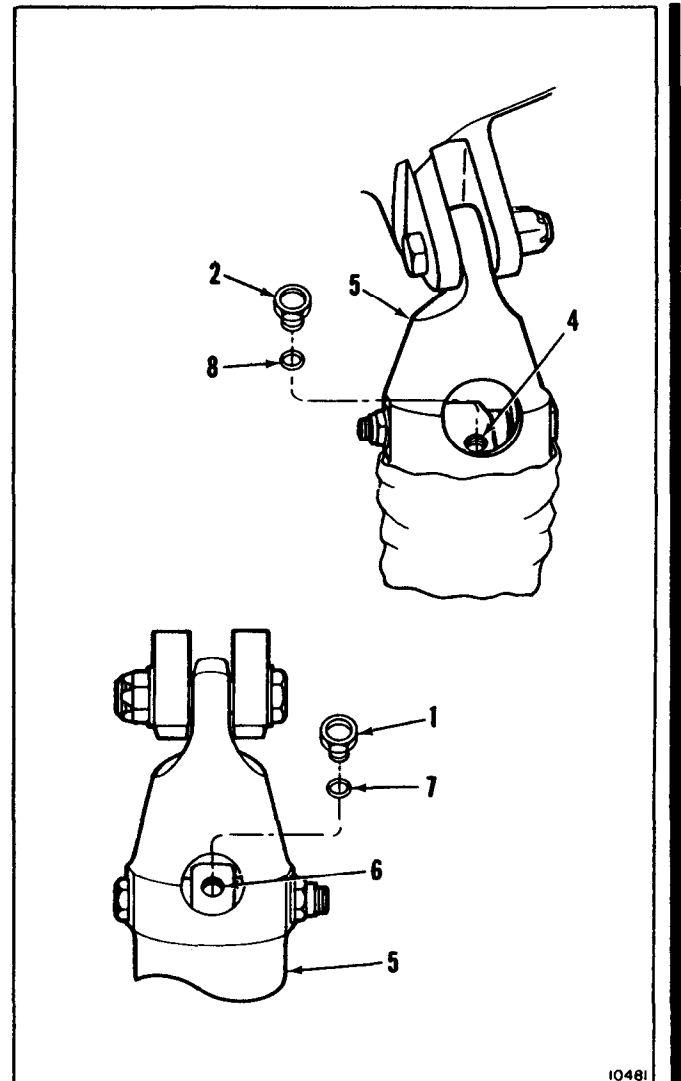
1-70 SERVICE AFT LANDING GEAR SHOCK STRUT (FLUID) (Continued)

1-70

3. Remove aft (upper) plug (2). Hold air chuck (3) from source of compressed air over open port (4). Pressurize strut (5) through port at 50 to 100 psi for 5 seconds.

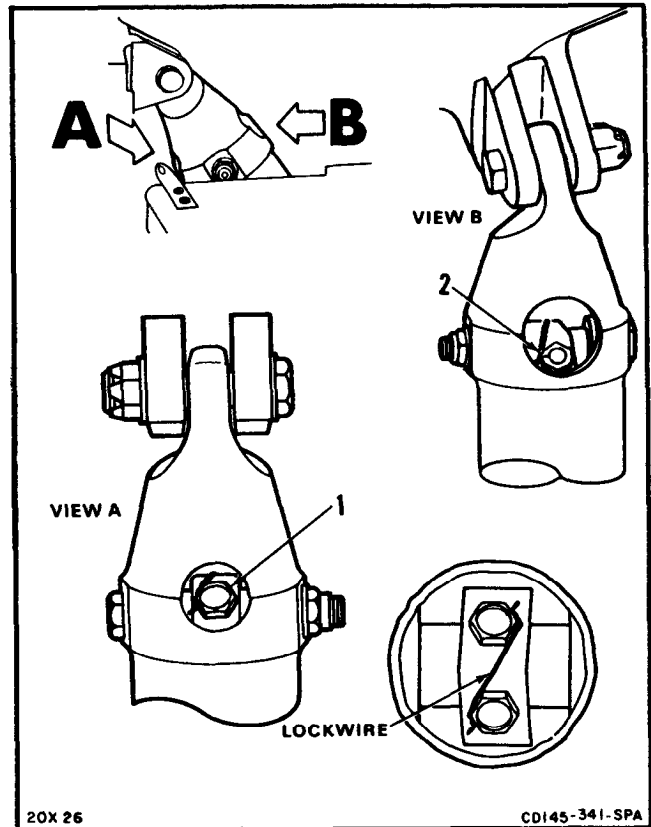


4. Remove forward (lower) plug (1).
5. Fill strut (5) with hydraulic fluid (E197) through aft port (4). Fill until bubble-free fluid begins to flow from forward port (6).
6. Coat new packing (7) with hydraulic fluid (E197). Install packing on plug (1). Install plug in forward port (6).
7. Continue to fill strut (5) through aft port (4) until port is filled with bubble-free fluid.
8. Coat new packing (8) with hydraulic fluid (E197). Install packing on plug (2). Install plug in aft port (4).
9. Remove cloths, if used. Clean fluid from strut as needed. Use cloths (E120).



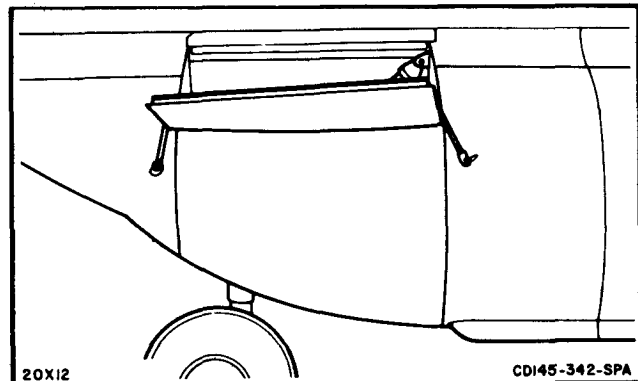
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10. **Torque plugs (1 and 2) to 250 inch-pounds.**
11. **Secure plugs (1 and 2) together with lockwire (E231).**

**NOTE**

Task is not done until both aft struts are serviced in same way.

12. **Repeat steps 1. thru 11. for aft right strut.**

INSPECT**FOLLOW-ON MAINTENANCE:**

Service both aft landing gear shock struts with air (Task 1-72).

Close both aft work platforms (Task 2-2).

END OF TASK

1-71 SERVICE FORWARD LANDING GEAR SHOCK STRUT (AIR)

1-71

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Source of High-Pressure Compressed Air, with
0-3000 Psi Pressure Gage and Pressure
Regulator
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

None

Personnel Required:

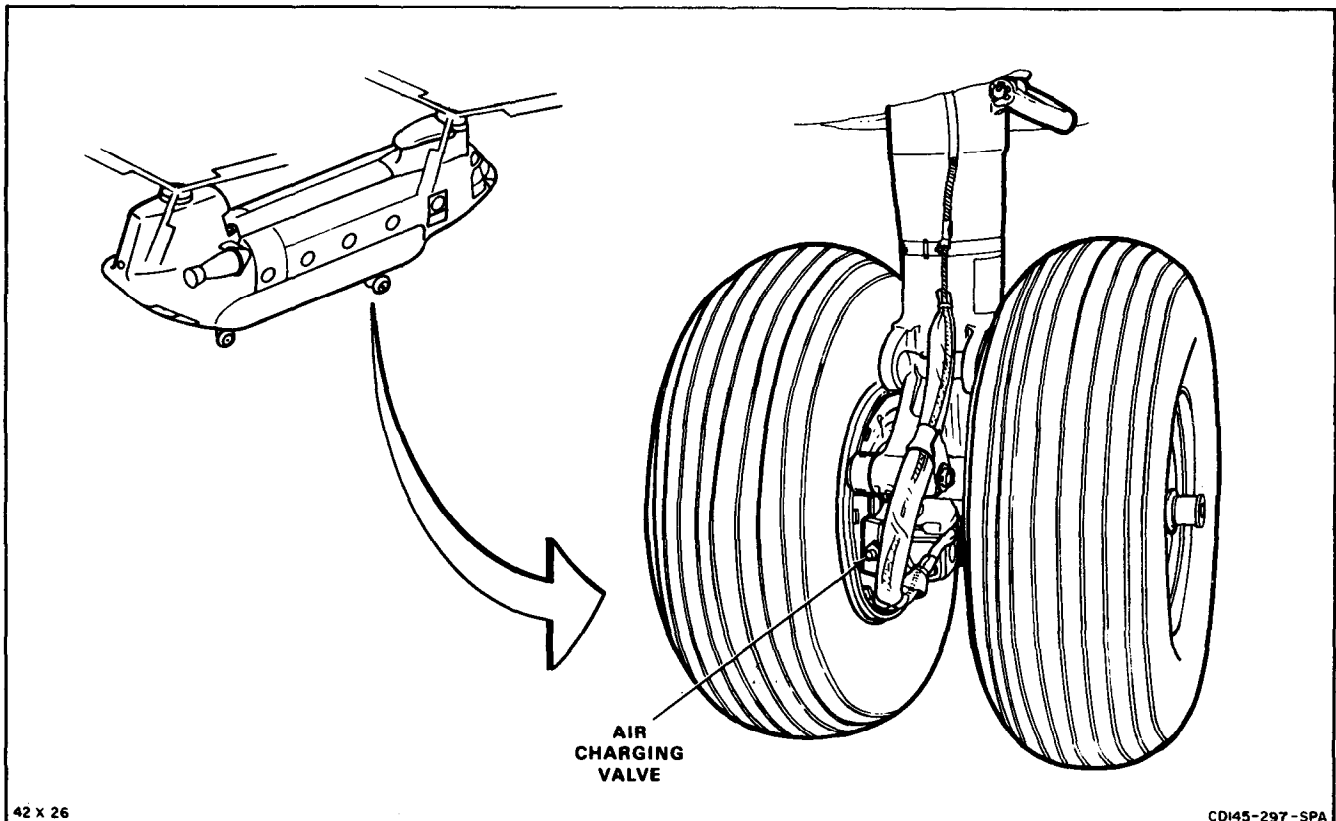
67U10 Medium Helicopter Repairer
67U20 Medium Helicopter Repairer
67U30 Inspector

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Shock Strut Serviced with Fluid (Task 1-69)

General Safety Instructions:**WARNING**

Left and right forward landing gear shock struts must be serviced together to prevent uneven strut inflation. Uneven inflation can cause ground resonance.

**GO TO NEXT PAGE**

1-71 SERVICE FORWARD LANDING GEAR SHOCK STRUT (AIR) (Continued)

1-71

NOTE

Service both struts in same way and at same time. Right strut is shown here.

DEFLATE STRUT**WARNING**

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

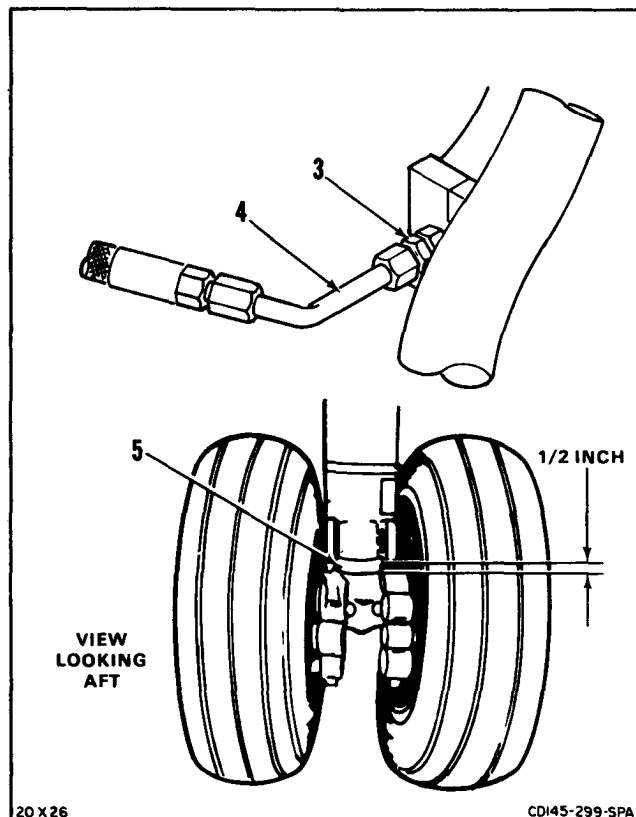
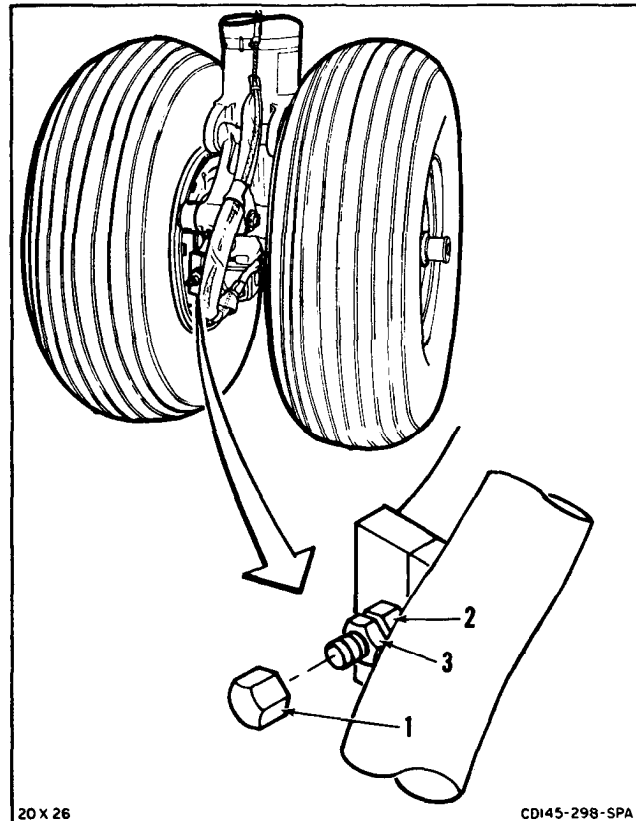
NOTE

Steps 1. thru 3. are done on left and right struts at same time. One repairer works on each strut.

1. Loosen cap (1) slowly. Remove it from valve (2).
2. Hold body of valve (2) with wrench. **Turn outer valve nut (3) to left one or two turns to release air.**
3. **Rock helicopter** from side to side as air is released. This makes sure strut is deflated.
4. Turn nut (3) fully to right to close valve (2).

INFLATE STRUT

5. Connect chuck (4) from air source to valve of one strut.
6. Open valve by turning outer valve nut (3) to left.
7. **Add air until 1/2 inch of shiny surface shows on strut (5).** Record air pressure required.
8. Shut off air by turning outer valve nut (3) to right. Disconnect chuck (4).
9. **Repeat steps 5. thru 8. for other forward gear.**
10. **Deflate first strut.** (Steps 1. and 2.)
11. **Inflate first strut again to 1/2 inch.** (Repeat steps 5. thru 8.; then go to step 12.)

GO TO NEXT PAGE

1-71 SERVICE FORWARD LANDING GEAR SHOCK STRUT (AIR)
(Continued)

12. Note recorded pressure needed to inflate second strut. Note lower of two recorded pressures required to inflate first strut.

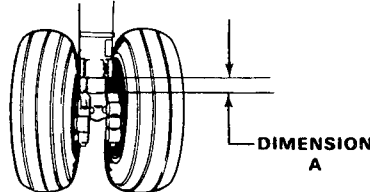
NOTE

Chart dimension A for both struts should be same within 1/2 inch. If off by more, service struts with fluid (Task 1-69).

13. **Find noted pressures on chart. If pressures fall between chart blocks, go to closest block.** Read chart DIMENSION A next to pressure

NOTE

Only nominal pressure readings are shown on landing gear servicing plate.

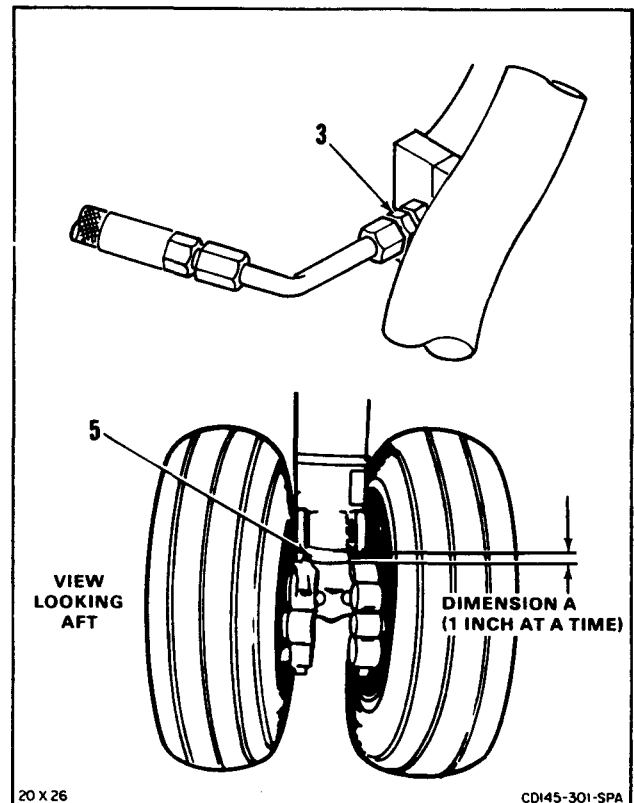


AIR PRESSURE (PSIG)	NOMINAL PRESSURE	DIMENSION A (INCHES)
2,305-2,355	2,330	1/2
1,763-1,813	1,788	1
1,425-1,475	1,450	1-1/2
1,196-1,245	1,221	2
1,025-1,075	1,050	2-1/2
897-947	919	3
789-848	814	3-1/2
685-735		4
625-675		4-1/2
595-645		5
540-590		5-1/2
511-561		6
575-525		6-1/2
450-500		7
415-465		7-1/2
385-435		8
365-415		8-1/2
350-400		9
335-385		9-1/2
315-365		10
300-350		10-1/2
274-324		11 (FULLY EXTENDED)

19146

NOTE

- Turn outer valve nut (3) left to add air. Turn nut right to shut off air.
 - Step 14. requires going back and forth between landing gear. If two air sources are available, service both struts at same time.
14. **Add as much air as needed to each strut (5) in turn to increase extension of strut about 1 inch at a time.** Stop when each strut extension equals required DIMENSION A.



GO TO NEXT PAGE

1-71 SERVICE FORWARD LANDING GEAR SHOCK STRUT (AIR)
(Continued)

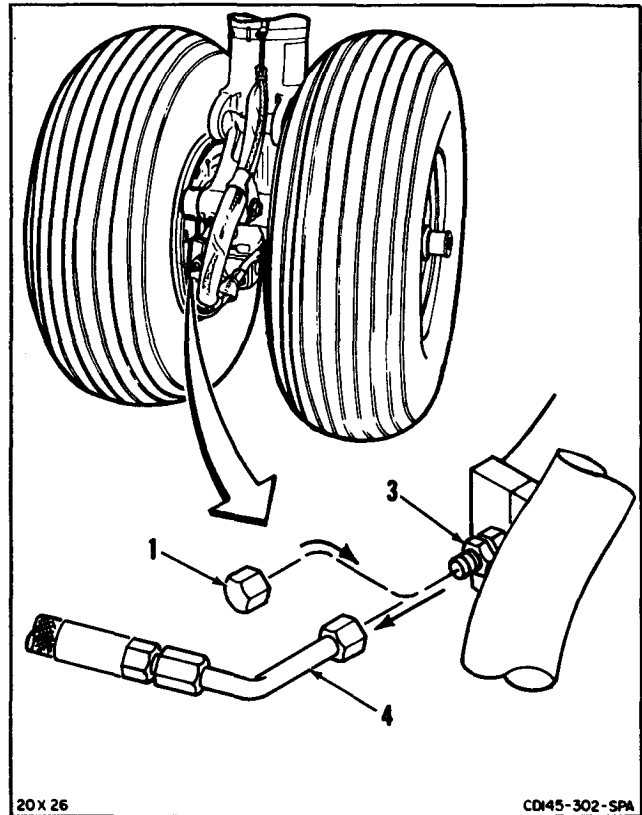
1-71

SECURE STRUT

15. **Tighten outer valve nut (3) on left and right struts** when both struts are at DIMENSION A. Hold body of valve with wrench. Torque nut (3) to 60 inch-pounds.
16. Remove air chuck (4). Install cap (1).

INSPECT**FOLLOW-ON MAINTENANCE:**

None

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Source of High-Pressure Compressed Air, with
0-3,000 Psi Air Gage and Pressure Regulator
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

None

Personnel Required:

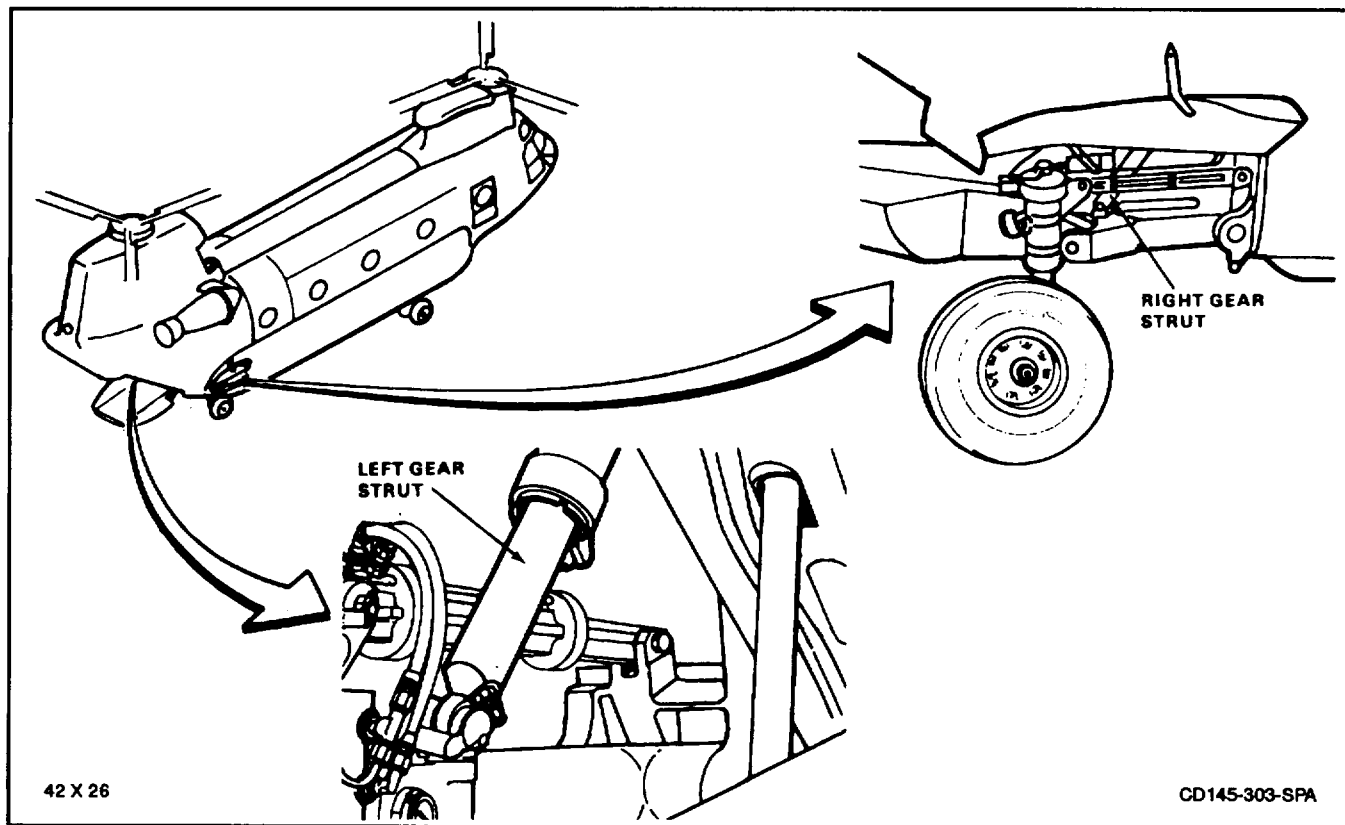
Medium Helicopter Repairer (2)
Inspector

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Cargo Ramp Open Halfway on Level Ground
(TM 55-1520-240-T)
Aft Right Landing Gear Access Panel Open
(Task 2-2)
Shock Struts Serviced with Fluid (Task 1-70)

General Safety Instructions:**WARNING**

Left and right aft landing gear shock struts must be serviced together to prevent uneven strut inflation. Uneven inflation can cause ground resonance.



GO TO NEXT PAGE

Change 57 1-233

DEFLATE STRUTS

WARNING

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

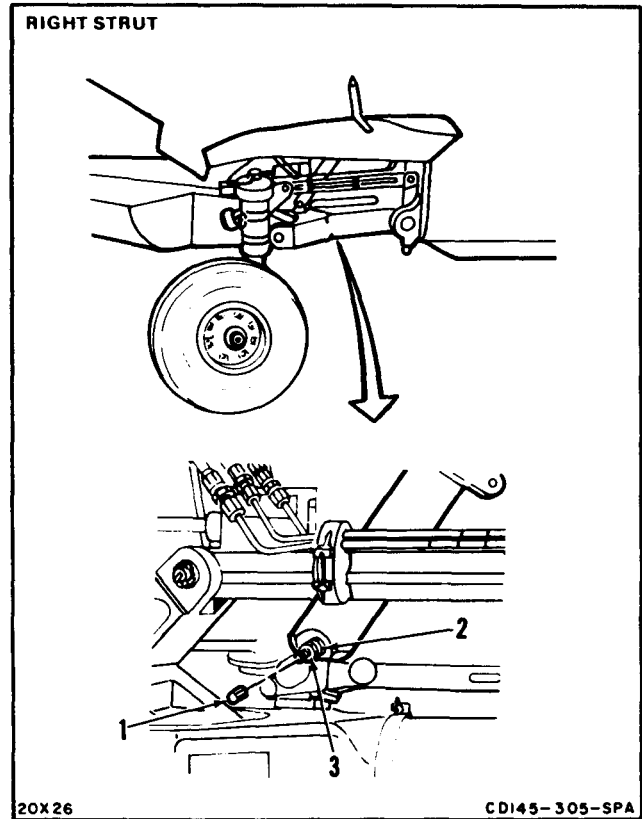
NOTE

Left and right aft strut must be serviced together. Do steps 1. thru 3. on each gear at same time. One repairer works on each strut.

1. **Loosen cap (1) slowly.** Remove it from valve (2).

NOTE

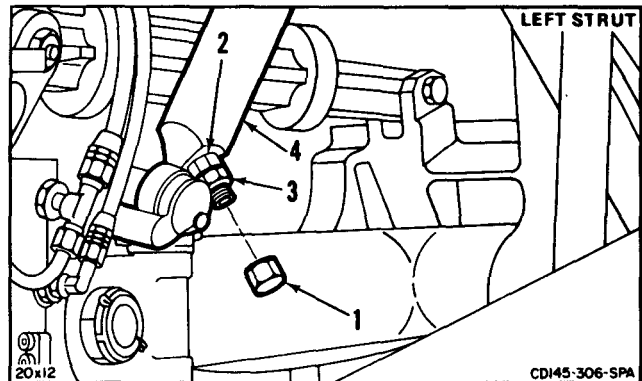
Reach cap on left strut through open ramp.



2. Hold body of valve (2) with wrench. **Turn outer valve nut (3) to left one or two turns** to release air.
3. **Rock helicopter** from side to side as air is released. This makes sure piston (4) is fully compressed.

NOTE

A completely deflated strut will still have 1 inch of piston showing.



GO TO NEXT PAGE

INFLATE STRUTS

NOTE

Service both struts at same time if two compressors are available.

4. **Connect chuck (5)** from air source to valve (2) of right strut.
5. **Add air until 1-1/2 Inch of piston (2) shows.** Record air pressure needed.

NOTE

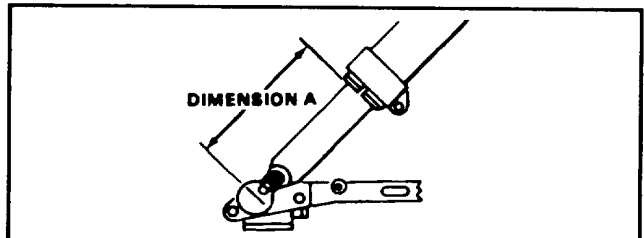
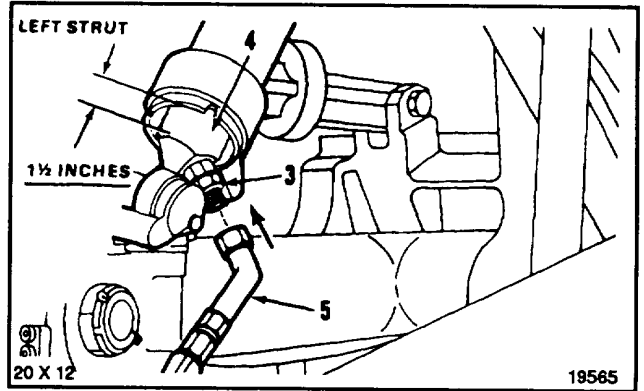
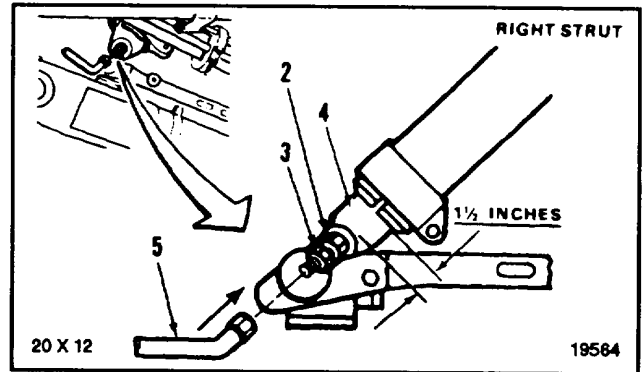
1-1/2 inch of piston, measured from top of machined arc, equals 1/P inch strut extension. Measurement to top of arc is for initial extension only.

6. Shut off air by turning outer valve nut (3) to right. Disconnect chuck (5).
7. **Repeat** steps 4. thru 6. for left strut.
8. **Deflate right strut** (Steps 1. and 2.).
9. **Inflate right strut again to 1-1/2 inch.** (Repeat steps 4. thru 6.; then go to step 10.)
10. Note recorded pressure needed to inflate left strut. Note lower of two recorded pressures needed to inflate right strut.

NOTE

- Only **NOMINAL** pressure readings are shown on the landing gear servicing plate.
- Chart dimension A for both struts is measured from top of exposed portion of strut to center of pin. It should be the same within 1/P inch. If difference is more, service struts with fluid (Task 1-70).

11. **Find noted pressures on chart** Read chart DIMENSION A next to pressure.



AIR PRESSURE AT 1-1/2 INCHES (PSIG)	NOMINAL PRESSURE	DIMENSION A (INCHES)
1,725 - 1,800	1,750	5
1,548 - 1,598	1,573	5-1/2
1,405 - 1,455	1,430	6
1,285 - 1,335	1,310	6-1/2
1,183 - 1,233	1,208	7
1,096 - 1,146	1,111	7-1/2
1,020 - 1,070	1,045	8
954 - 1,004	979	8-1/2
896 - 946		9
844 - 894		9-1/2
805 - 855		10
775 - 825		10-1/2
735 - 785		11
700 - 750		11-1/2
645 - 685		12 (FULLY EXTENDED)

19147

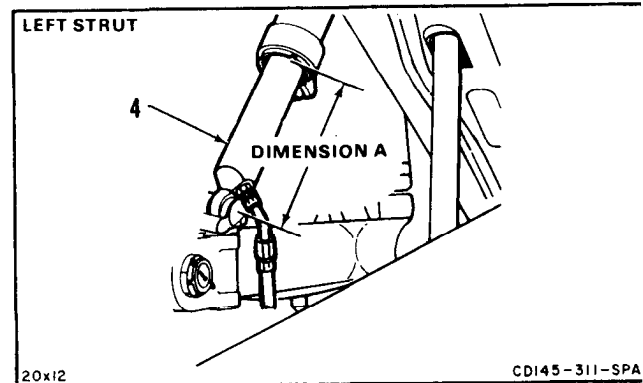
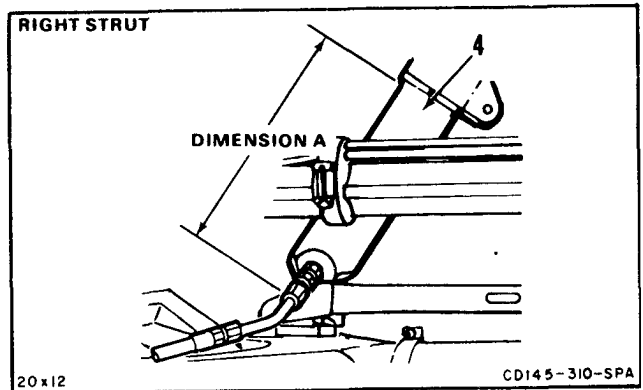
GO TO NEXT PAGE

1-72 SERVICE AFT LANDING GEAR SHOCK STRUT (AIR)
(Continued)

NOTE

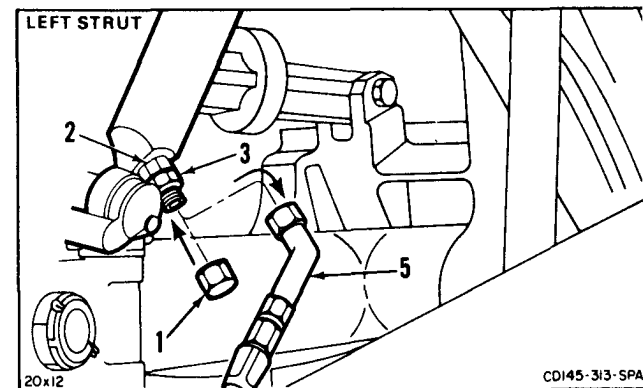
- Turn outer valve nut left to add air. Turn nut right to shut off air.
- Step 12. requires going back and forth between landing gear. If two air sources are available, service both struts at same time.

12. **Add as much air as needed to each strut in turn** to increase extension of piston (4) about 1 inch at a time. Stop when each extension equals required DIMENSION A.



13. Hold body of valve (2) on left strut with wrench. **Torque outer valve nut (3) to 60 inch-pounds.**

14. Shut off air at air source. Remove air chuck (5) if installed. Install valve cap (1).



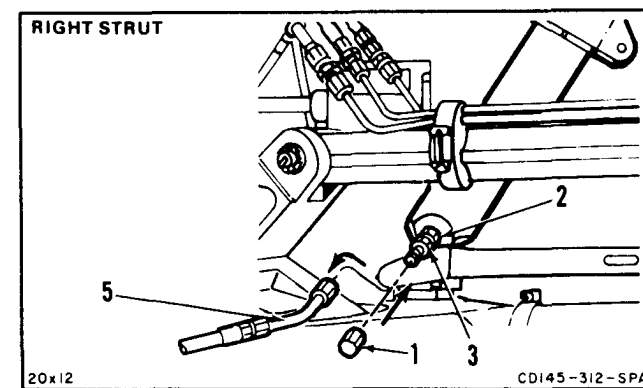
15. Repeat steps 13. and 14. for right strut.

INSPECT

FOLLOW-ON MAINTENANCE:

- Adjust proximity switches (Task 3-56).
- Close aft right landing gear access panel (Task 2-2).
- Raise cargo ramp (TM 55-1520-240-T).

END OF TASK



INITIAL SETUP**Applicable Configurations:**

All

Tools:Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692Inflator Kit,
NSN 6685-00-124-4336

Tire Pressure Gage G6-G-91, Type II

Source Of Compressed Air

Materials:

None

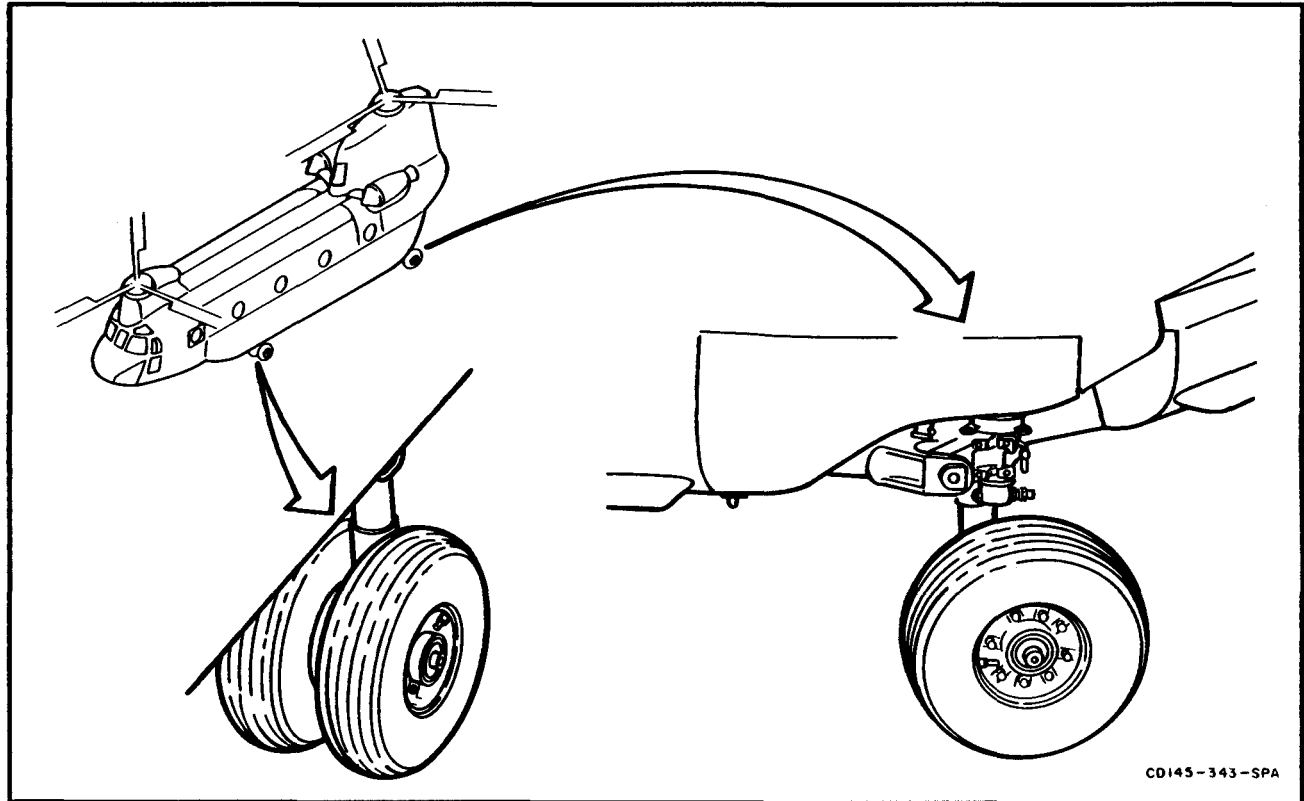
Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off



GO TO NEXT PAGE

Change 52

1-237

WARNING

Never stand facing sidewall of tire being serviced. Stand facing tire tread.

NOTE

Service all tires in same way. Aft left tire is shown here.

1. **Remove valve cap (1).****NOTE**

A 5°F change in temperature will affect tire pressure 1 psi. Check pressure when tires are cool. High temperature increases pressure. A false pressure reading results.

2. **Check tire pressure** with gage (2). If pressure is 88 psi, task ends here.**WARNING**

Stand away from tire when inflating. Tires can explode under pressure. Always use remote tire inflator when servicing tires.

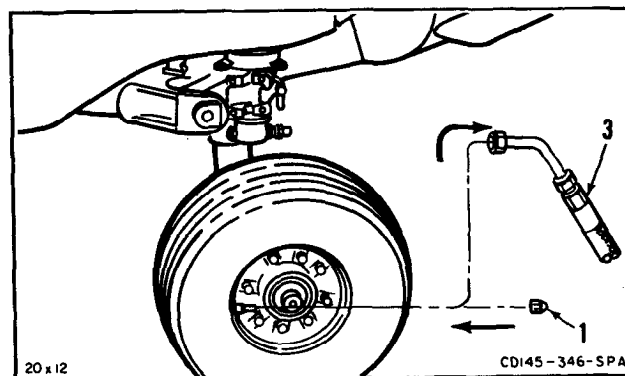
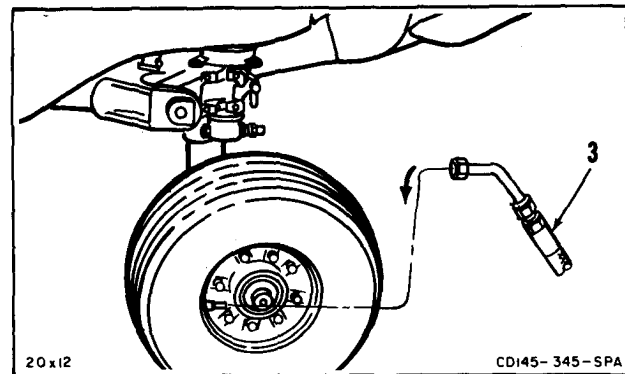
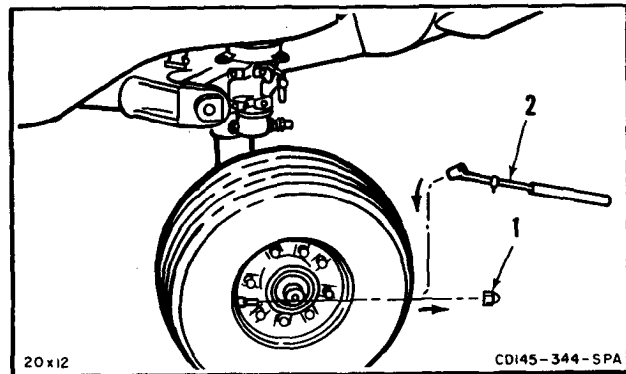
NOTE

If tire repeatedly loses more than 4 psi in 24 hours, it is faulty. Repair or replace it (Task 3-8 and 3-11).

3. If pressure is less than 88 psi, connect remote safety chuck (3) of tire inflator. **Inflate tire to 88 psi.**4. **Disconnect safety chuck (3).** Install cap (1).

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

1-238 Change 52

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic Tool Kit,
NSN 5180-00-323-4692
- Source of High-Pressure Compressed Air or
Nitrogen (at least 3,000 Psi)
- Torque Wrench, 0 to 150 Inch-Pounds

Materials:

None

Personnel Required:

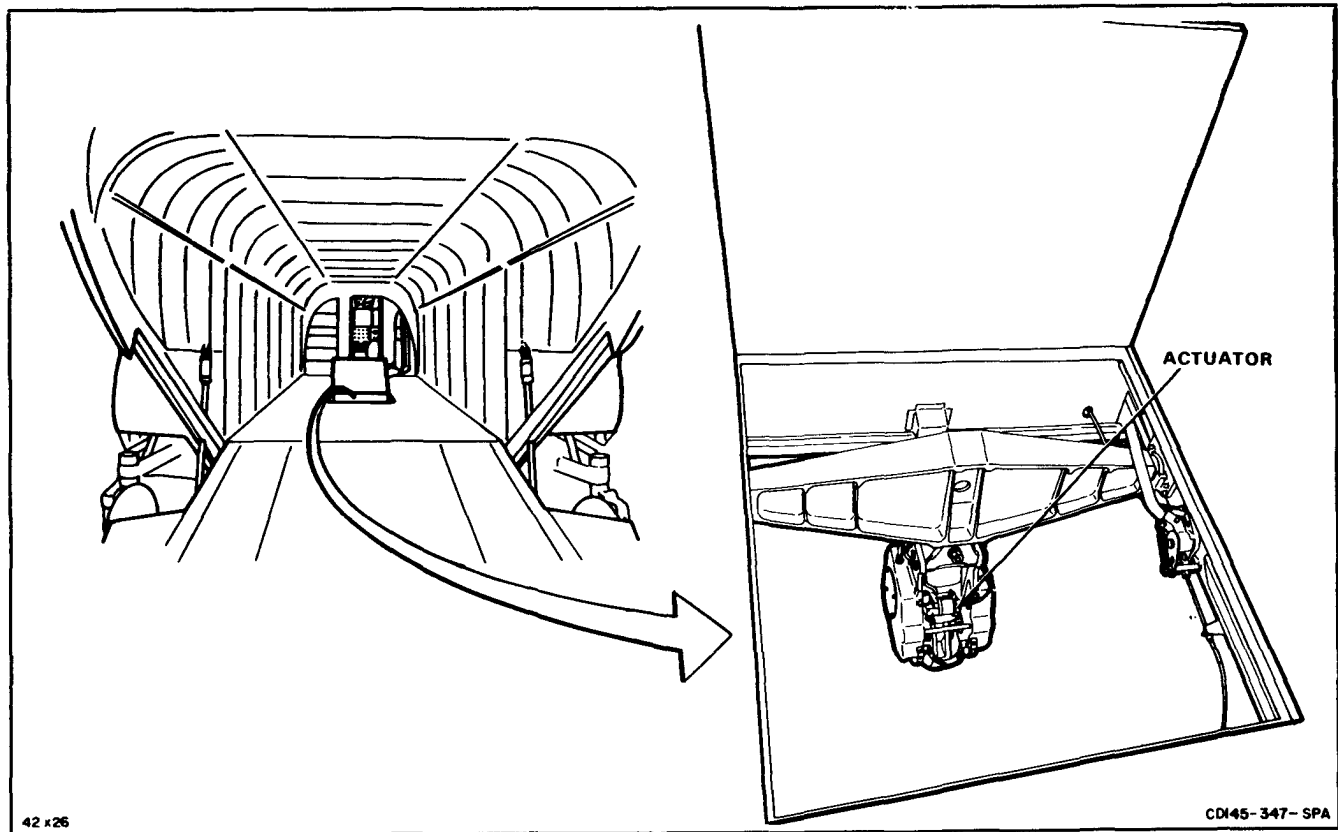
Medium Helicopter Repairer (2)

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Cargo Hook Unstowed (TM 55-1520-240-10)

References:

TM 55-1520-240-10



WARNING

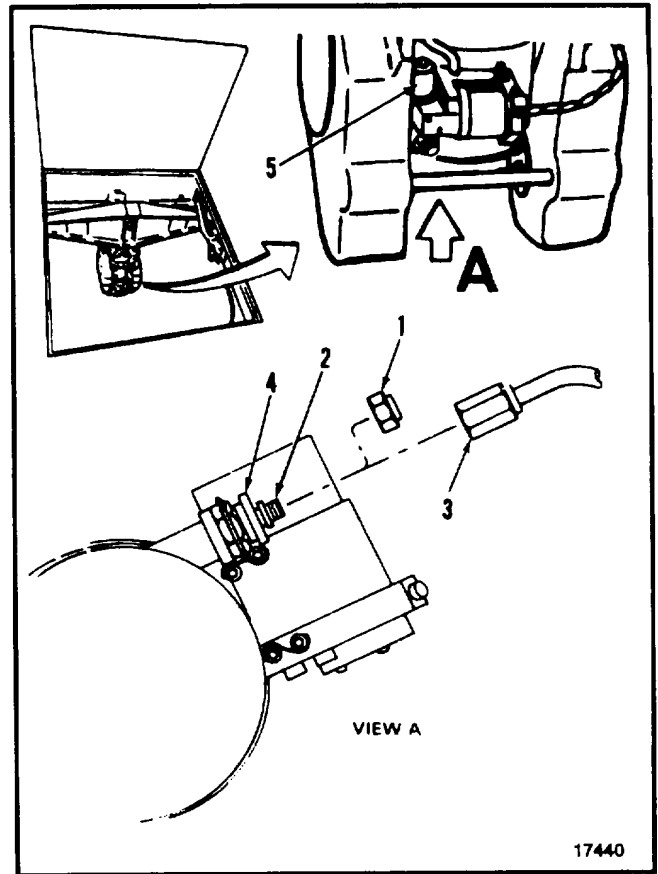
High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

1. Loosen valve cap (1) slowly. Remove it from valve (2). **Connect chuck (3)** from air source to valve.
2. **Loosen nut (4)** two turns with wrench.

NOTE

Actuator must be serviced to at least 2000 psi or it will not work right. Do not exceed 2,200 psi.

3. **Have helper operate air source to charge actuator to between 2,000 psi and 2,100 psi**, as marked on gage (5). Use inspection mirror to read gage.
4. Tighten nut (4) firmly against valve body.
5. **Disconnect chuck (3)** from valve (2). Continue tightening nut (4) until air leakage stops.
6. Install valve cap (1).
7. If hook will not be used right away, stow it before dosing door (TM 55-1520-240-10).

**INSPECT**

FOLLOW-ON MAINTENANCE: None
None

END OF TASK

1-240 Change 57

1-75 SERVICE HOIST CABLE CUTTER

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Long Driftpin SK15241-15, 0.365 inch dia.
- Short Driftpin SK15241-21, 0.365 inch dia.
- Squib Tester, American Standard Model 115 or equal

Materials:

- Cleaning Brush (E84)
- Cotton Flannel Cloth (E128)
- Lockwire (E231)
- Powder Solvent (E464)

Parts:

- Cartridge (As Required)
- Cutter (As Required)

Personnel Required:

- Medium Helicopter Repairer
- Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off

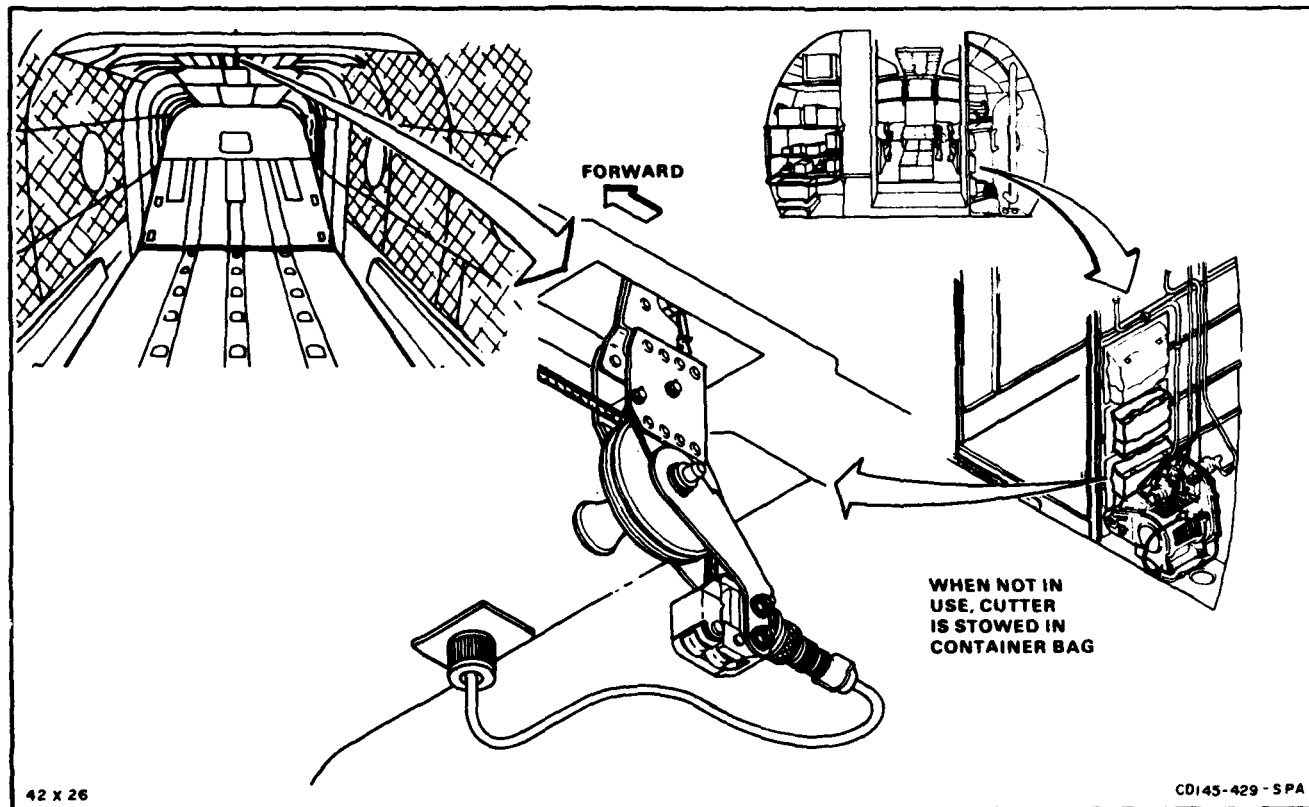
General Safety Instructions:

WARNING

Do not service or handle with power on. The cartridge could fire. Severe personal injury could result.

NOTE

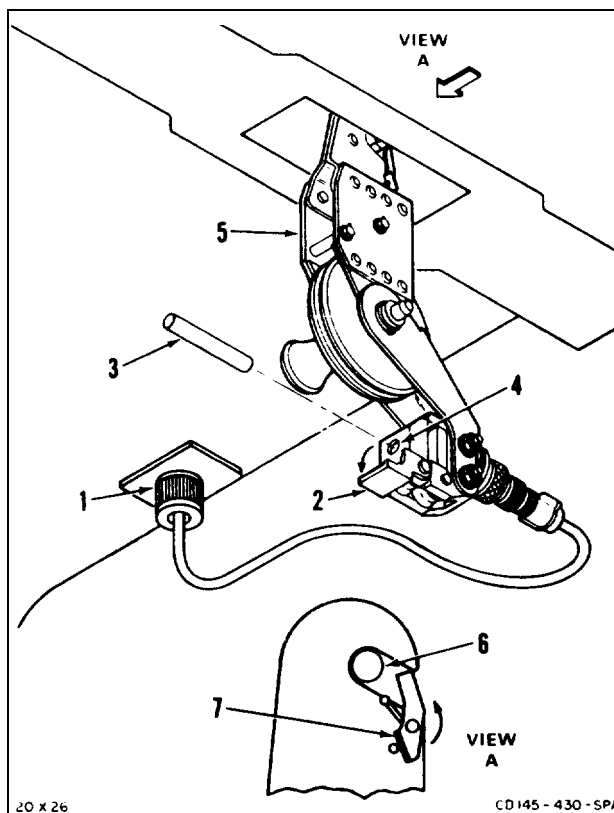
Dispose of unserviceable live cartridges by placing in the can used to pack the replacement cartridge and returning to the Ammunition Supply Activity. The cartridge should be tagged UNSERVICEABLE with the reason for removal and the date of installation and removal.



GO TO NEXT PAGE

CUTTER RELEASE FIRED CARTRIDGE

1. **Unplug electrical connector (1).**
2. Lower guard (2). Insert short driftpin (3) in cartridge chamber (4). Tap driftpin to **release fired cutting punch and trapped cable.** Remove driftpin.
3. **Remove cable block (5)** from overhead hook (6) by pressing keeper tab (7) and lifting cable block.

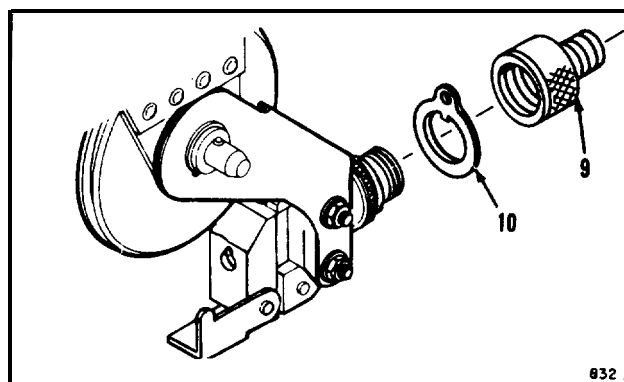
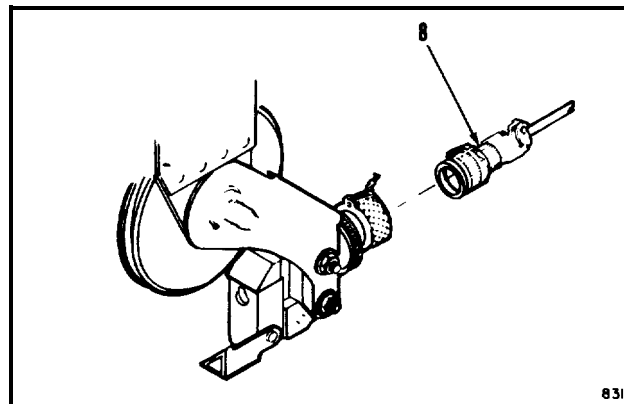


CARTRIDGE REMOVAL

WARNING

If not handled properly, an out-of-date cartridge can fire. Personal injury can result.

4. Remove lockwire from electrical connector (8). **Remove connector.**
5. Remove adapter (9). Remove key washer (10).

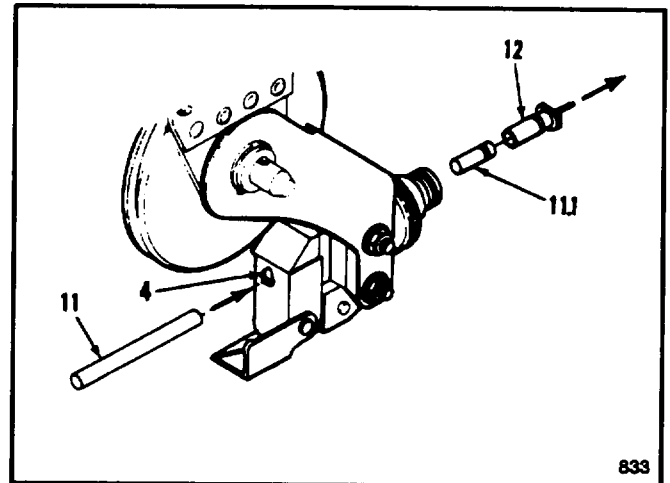


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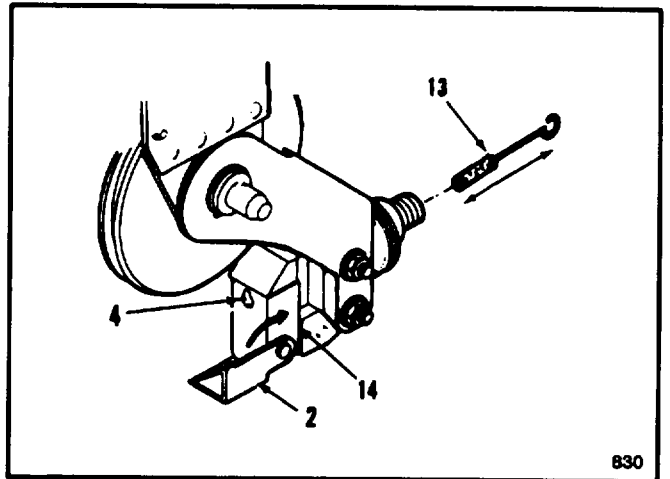
6. Insert a long driftpin (11) in chamber (4). Tap driftpin to drive out punch (11.1) and cartridge (12).

CAUTION

Cutter can be damaged if pieces of cut cable remain in cutter body.



7. **Clean chamber (4).** Use powder solvent (E464) and bristle brush (E84) (13). Make sure all pieces of cut cable are removed. Close guard (2).
8. Clean cutter (14) with soft cloth (E128). Check for cracks and distortion. Replace damaged cutter.



CARTRIDGE INSTALLATION

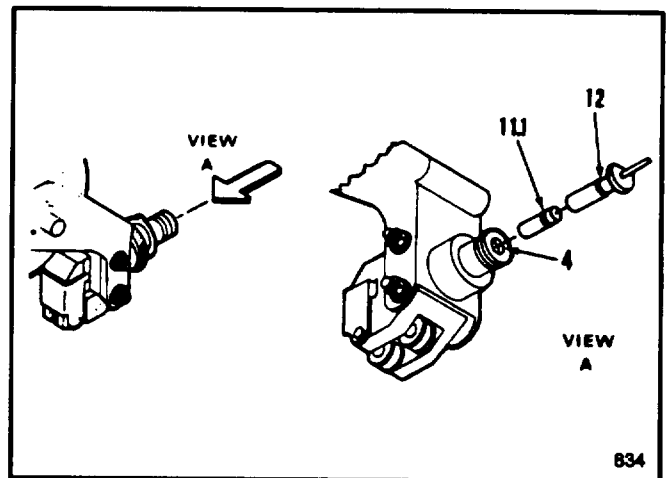
WARNING

A loaded cutter is a hazard. Insert cartridge only if cutter is to be used. Do not insert if cutter will be stowed.

9. **Insert punch (11.1) and new cartridge (12) in chamber (4).** Align flats in cartridge and cutter.

NOTE

The cartridge first number, installation date, and required date of removal shall be recorded on DA Form 2408-18 for maintenance planning.

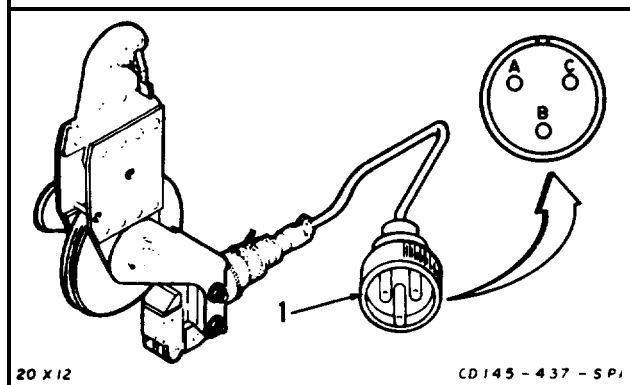
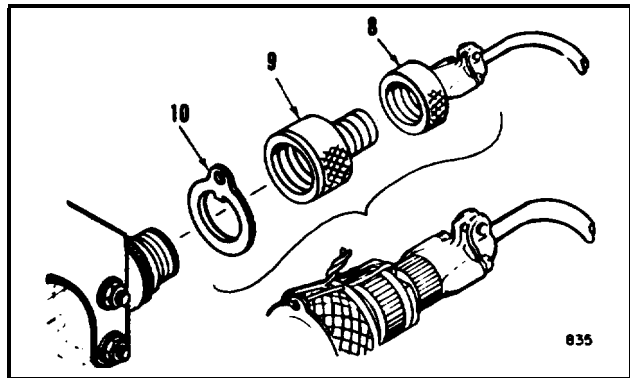


GO TO NEXT PAGE

Change 57 1-243

1-75 SERVICE HOIST CABLE CUTTER (Continued)

- 10. Install key washer (10). Install adapter (9).
- 11. Connect electrical connector (8). Secure it to washer (10) with lockwire (E231).



INSPECT

CUTTER INSTALLATION

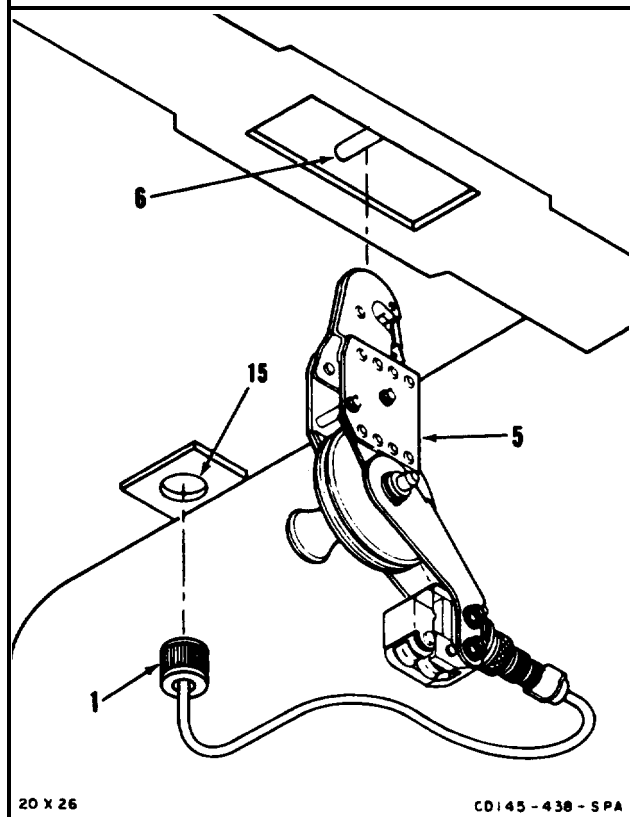
NOTE

Install cutter only if it is to be used.
Stow cutter in container if it will not be used.

- 13. Hook cable block (5) on overhead hook (6). Plug connector (1) in receptacle (15).

FOLLOW-ON MAINTENANCE:

None



1-76 CLEAN FUSELAGE EXTERIOR

1-76

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Maintenance Stand

Materials:

Barrier Material (E80)
Cleaning Compound (E117)
Hydraulic Fluid (E197 or E199)
Masking Tape (E388)
Nonmetallic Brush (E85)
Cloth (E120)

Personnel Required:

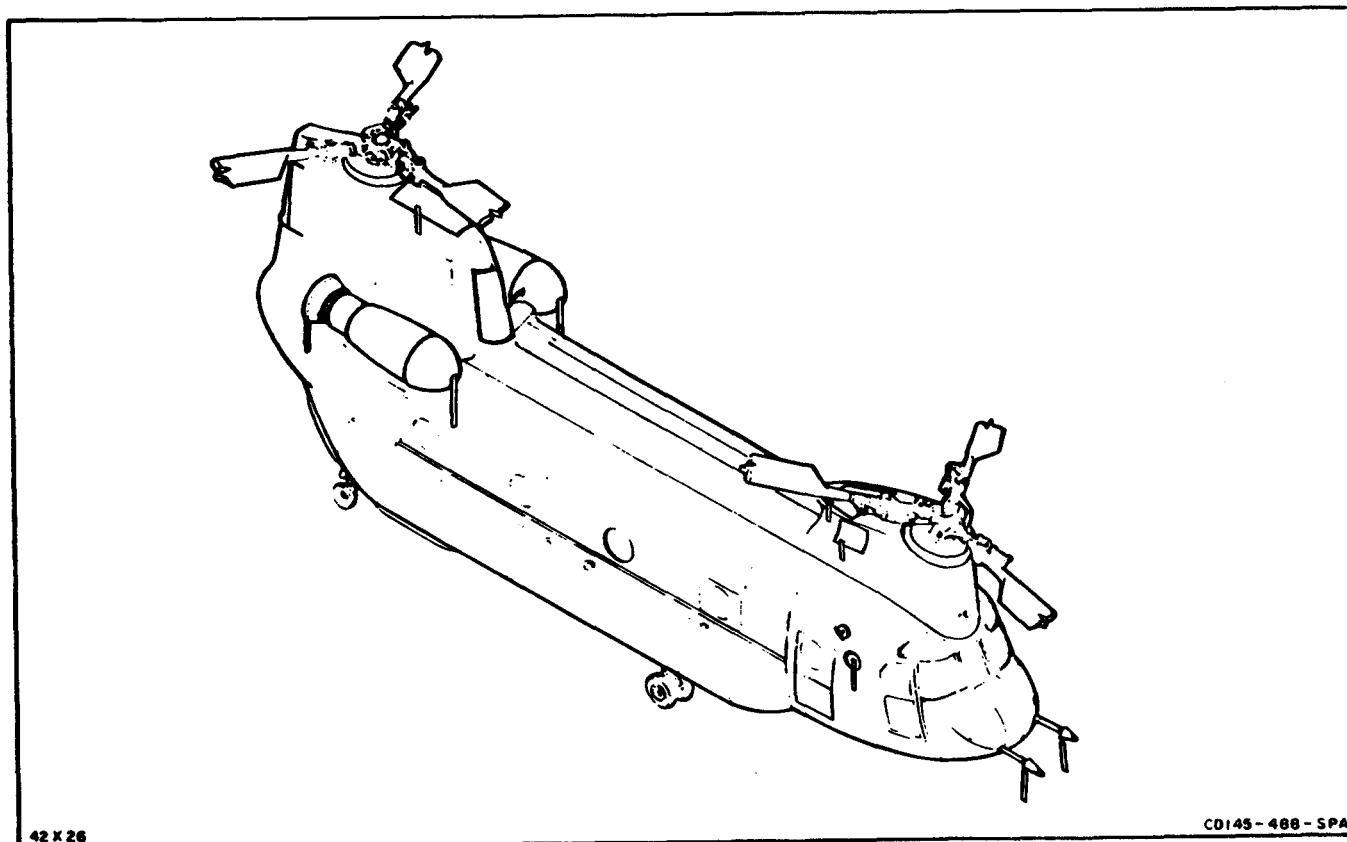
Medium Helicopter Repairer

References:

TM 55-1500-333-24

Equipment Condition:

Battery Disconnected (Task 1-39)
Drain Plugs Open (Task 2-214)
Protective Covers Installed on Following Areas
(Task 1-32):
Apu Exhaust
Engine Exhaust (2)
Engine Inlet (2)
Heater Exhaust
Heater Inlet
Oil Cooler Exhaust (2)
Oil Cooler Inlet (2)
Pitot Tube (2)
Pylon Air Inlet



42 X 26

CD145-488-SPA

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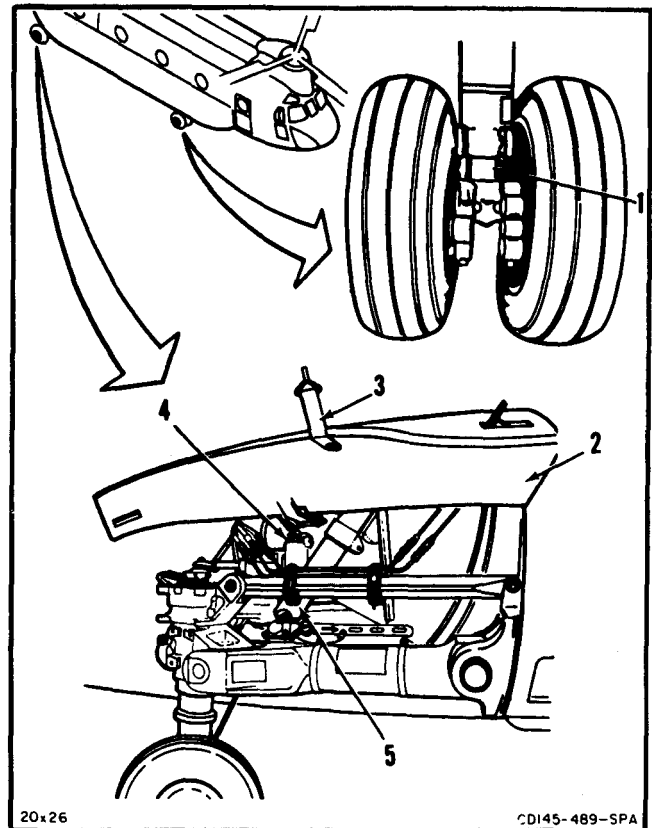
Change 2

1-245

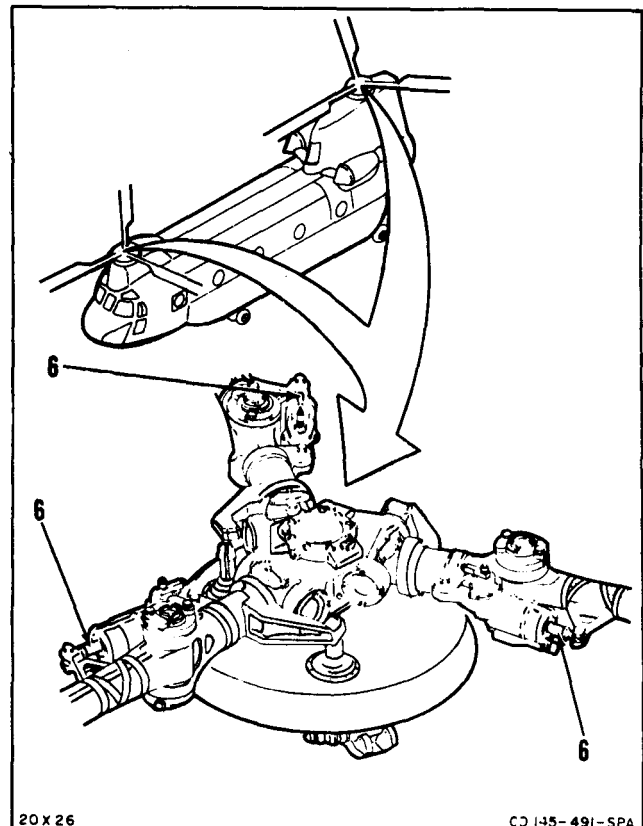
PREPARE HELICOPTER**NOTE**

Parts must be covered to keep them dry.

1. **Cover shock strut pistons (1)** on both forward landing gear. Use barrier material (E80) and tape (E388).
2. **Open both aft landing gear access panels (2).** Secure with strap (3).
3. **Cover power steering electrical connector (4)** on right gear. Cover shock strut pistons (5) on both gear. Use barrier material (E80) and tape (E388).
4. **Release strap (3).** Close panels (2).



5. **Cover six blade shock absorber pistons (6)** on both rotor heads. Use barrier material (E80) and tape (E388).



GO TO NEXT PAGE

6. **Cover sideslip ports (7)** on both sides of nose. **Cover static ports (8)** on both sides of fuselage. Use barrier material (E80) and tape (E388).

CLEAN HELICOPTER

NOTE

TM 55-1500-333-24 contains more information on cleaning Army aircraft.

7. **Mix 1 part cleaning compound (E117) in 5 parts water.** Use 2 or 3 parts water for very dirty areas.

NOTE

The size of the area cleaned depends on how quickly it dries.

8. **Apply plenty of solution** to small area of fuselage. Use a soft bristle brush (E85).

CAUTION

Cleaning solution can damage paint and make clear plexiglass hazy if left on too long. Rinse with clear water before solution dries.

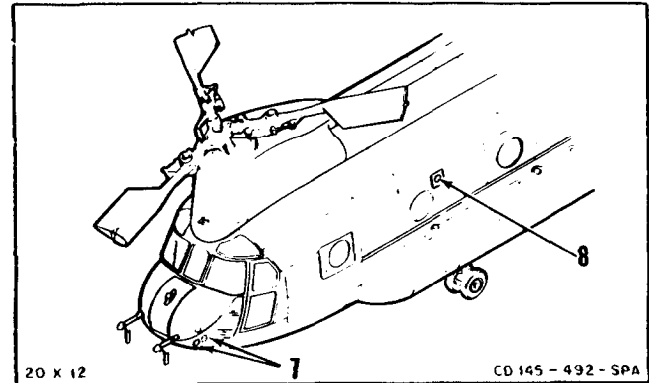
9. **Let solution stay on surface for 5 to 10 minutes.** During this time, scrub very dirty areas with soft brush (E85). Do not let solution dry.

CAUTION

- **If solution is not rinsed off completely, it can damage paint and plexiglass.**

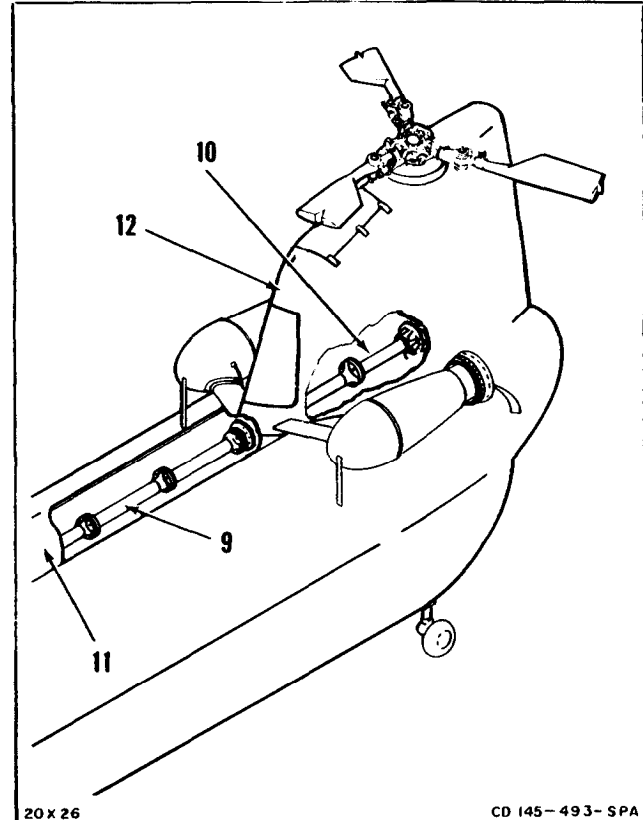
10. **Rinse solution** from cleaned surface. Water heated to 120 to 140°F (50 to 60°C) is best. Take care to keep water out of forward and aft drive shafts (9 and 10) when rinsing tunnel (11) and pylon (12).

11. Repeat steps 7. thru 10. as needed.



20 X 12

CD 145 - 492 - SPA



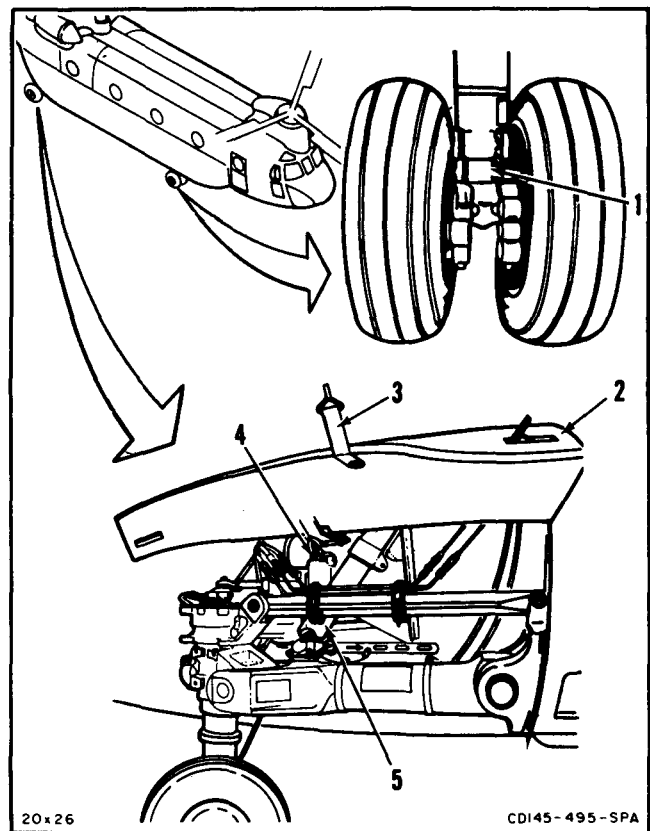
20 X 26

CD 145 - 493 - SPA

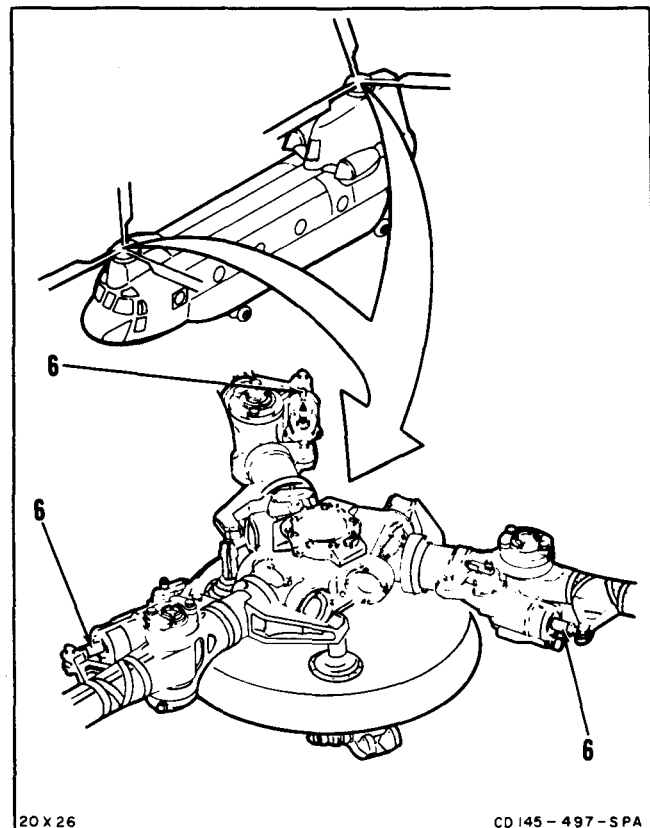
GO TO NEXT PAGE

REMOVE PROTECTIVE COVERINGS

12. Remove covering from each forward landing gear shock strut piston (1). Wipe piston with cloth (E120) dipped in hydraulic fluid (E197 or E199).
13. Open each aft landing gear access panel (2). Secure with strap (3).
14. Remove covering from connector (4) on right gear.
15. Remove covering from shock strut pistons (5). Wipe pistons with cloth (E120) dipped in hydraulic fluid (E197 or E199).
16. Release strap (3). Close panels (2).

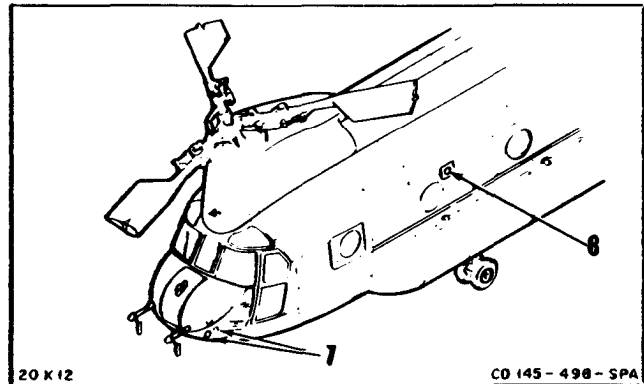


17. Remove covering from six blade shock absorber pistons (6). Wipe pistons with cloth (E120) dipped in hydraulic fluid (E197 or 199).



GO TO NEXT PAGE

- 18. Remove covering from sideslip ports (7) on each side of nose. Remove covering from static ports (8) on each side of fuselage.**



FOLLOW-ON MAINTENANCE:

Close drain plugs (Task 2-215).

Remove protective covers (Task 1-32).

END OF TASK

1-77 CLEAN PLASTIC- IMPREGNATED GLASS CLOTH PARTS

1-77

INITIAL SETUP

Applicable Configurations:

All

Tools:

Maintenance Stand

Materials:

Soap (E352)
 Naphtha (E245) or
 Dry Cleaning Solvent (E162)
 Cloth (E 120)
 Flannel Cloth (E128)
 Gloves (E186)

Personnel Required:

67U10 Medium Helicopter Repairer

General Safety Instructions:

WARNING

Naphtha (E245) and solvent (E162) are combustibile and toxic. They can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

- . Following steps contain information on routine cleaning where abrasive polishing for removal of scratches is not required.
- Naphtha (E245) or solvent (E162) may be substituted for soap and water solution.

1. Prepare mild solution of soap (E352) and water.

CAUTION

Do not use dirty or gritty cloths, unapproved cleaning fluids, compounds, solvents, etc., as they can damage the surface.

2. Saturate cloths (E120) with solution and lightly rub surface. wear gloves (E186) if using naphtha (E245) or solvent (E162).
3. If soap and water solution is used, rinse surfaces with a clean, water-soaked, flannel cloth (E128). Wipe surface dry with clean flannel cloth.

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

1-77.1 CLEAN WINDSHIELD

1-77.1

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Workstand

Materials:

Chamois (E111)
 Cloth, Cleaning (E120)
 Cloth, Flannel (E128)
 Glass Cleaner (E115)
 Naphtha (E245) or Cleaner (E116)
 Cotter Pin, 1/8-Inch Diameter x 2-Inches Long
 Soap (E352 or E353)
 Water Hose
 Gloves (E186)

Parts:

Cotter Pin

Personnel Required:

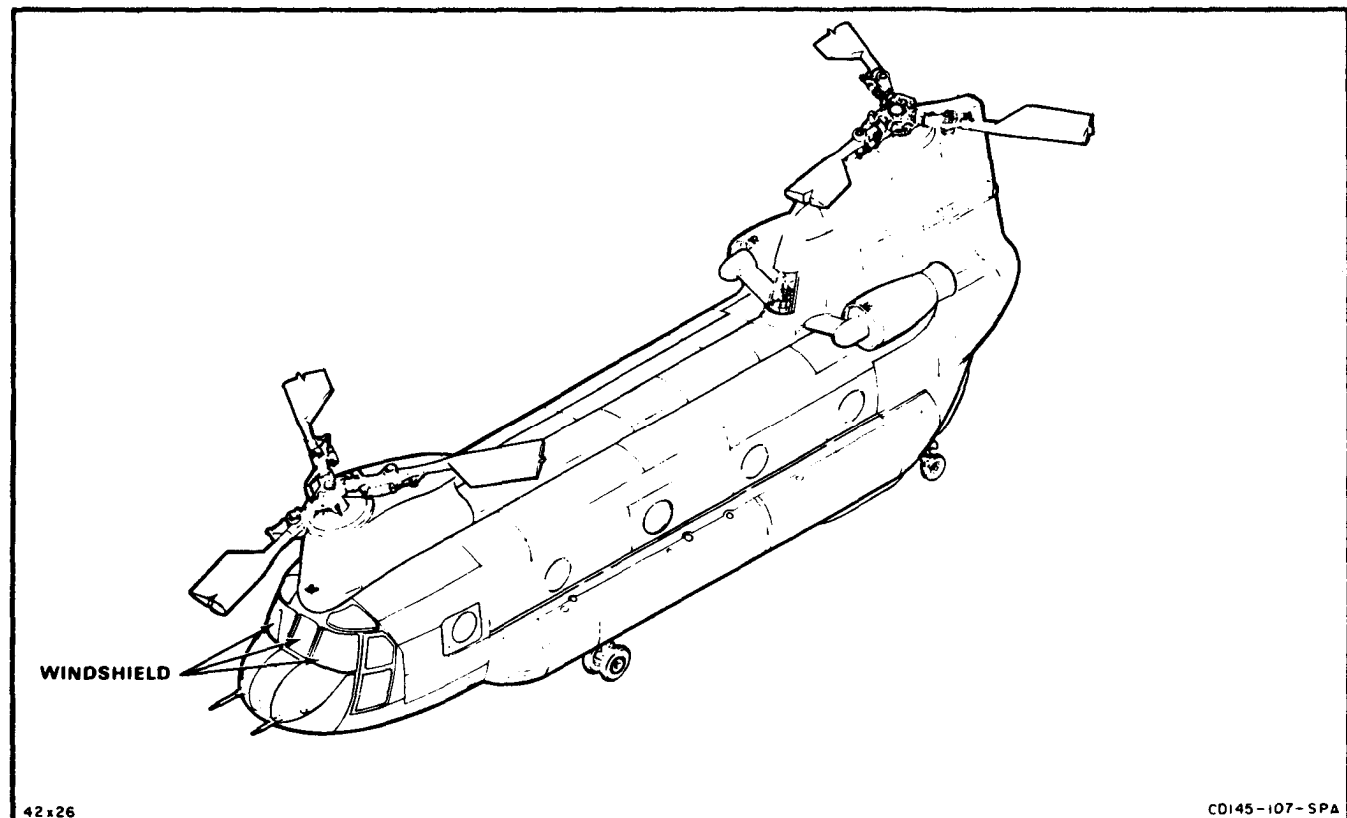
Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Helicopter Parked In Well-Ventilated Area
 Where Clean Running Water Is Available
 Jettisonable Door Sliding Windows Closed

General Safety Instructions:**WARNING**

Naphtha (E245) and cleaner (E116) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. Get medical attention for eyes.



42x26

CDI45-107-SPA

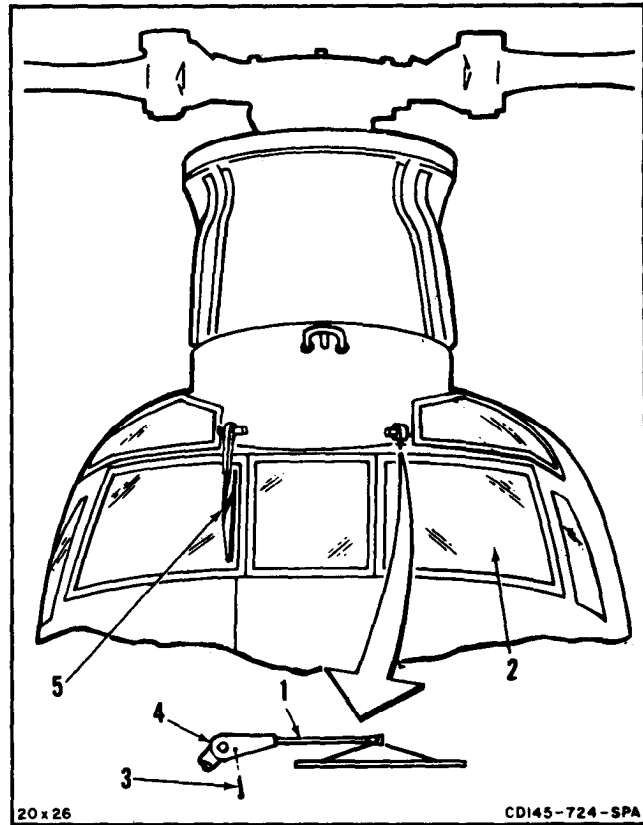
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 Change 2 1-250.1

CLEAN OUTSIDE SURFACE

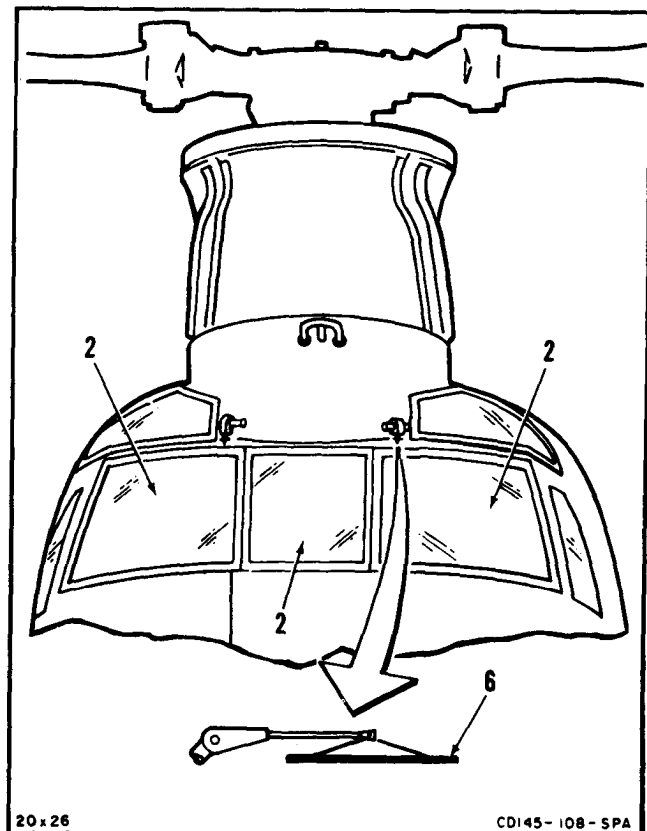
1. Raise and hold wiper arm (1) away from surface of windshield (2).
2. Put cotter pin (3) through hole in wiper arm (1) near hub (4).
3. Do steps 1. and 2. for other wiper arm (5).
4. **Flush outside of windshield (2)** with clean running water to remove loose dirt.

CAUTION

Do not use chamois to rub off dirt from windshield. Surface of windshield can be damaged. Use chamois only to apply soap and water solution to windshield.



5. Put soap (E352 or E353) and water solution on outside surface of windshield (2), using chamois (E111).
6. **Wash outside surface of windshield (2)** with soap (E352 or E353) and water solution. Use bare hand to rub off dirt.
7. **Rinse outside surface of windshield (2)** with clean water until all soap solution and dirt are gone.
8. **Let outside surface of windshield (2) dry completely.**
9. **Wipe off all dirt and foreign material from rubber of blades (6),** using clean cloth (E120) damp with water.



GO TO NEXT PAGE

CAUTION

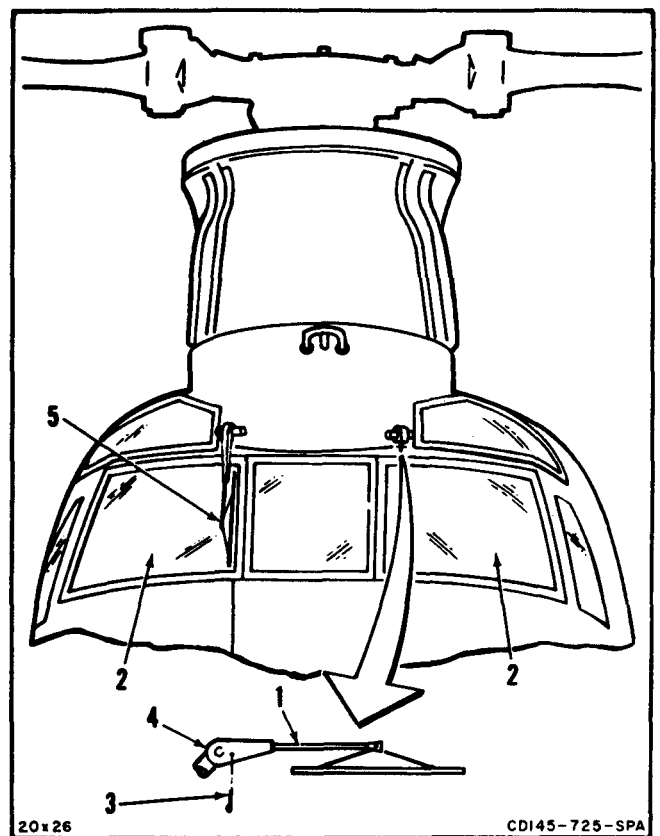
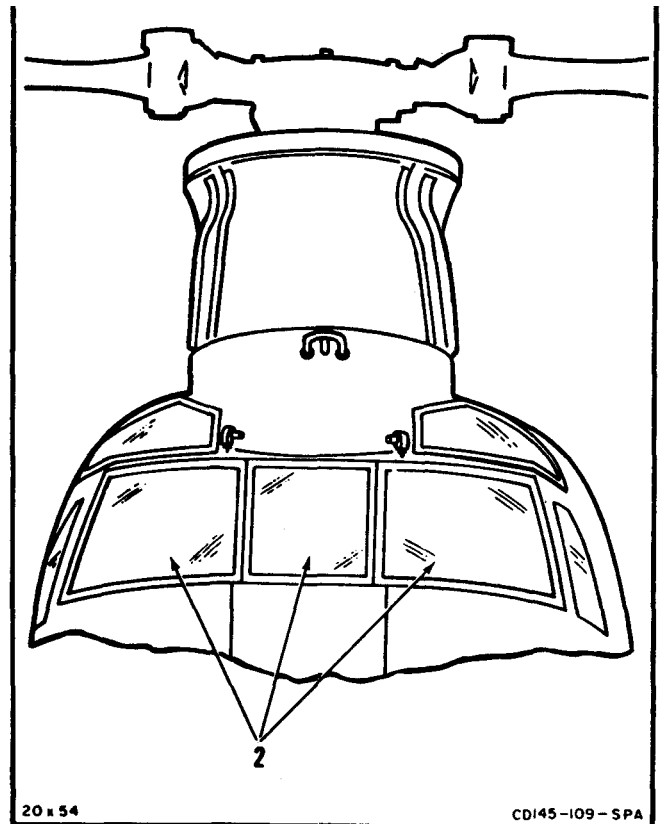
Do not use anything except naphtha (E245) or cleaner (E116) to wipe oil and grease off windshield (2). Surface will be damaged.

10. Wipe off all oil and grease from outside of windshield (2). Use clean cloth (E120) damp with naphtha (E245) or cleaner (E116). Wear gloves (E186).
11. Wipe off outside surface of windshield (2). Use clean cloth (E128) damp with water.
12. Put glass cleaner (E115) on outside surface of windshield (2) with clean cloth (E120).

CAUTION

Stop polishing surface of windshield (2) as soon as surface is dry. Surface can be damaged, if dry windshield is rubbed with cloth.

13. Polish outside surface of windshield (2) with another clean cloth (E120) until all of outside surface is clear and dry. Stop rubbing as soon as surface of windshield (2) is dry.
14. Hold wiper arm (1) to free cotter pin (3).
15. Remove cotter pin (3) from hole near hub (4).
16. Lower wiper arm (1) against windshield (2).
17. Do steps 14. thru 16. for other wiper arm (5).



GO TO NEXT PAGE

CLEAN INSIDE SURFACE

Do not use anything except naphtha (E245) or cleaner (E116) to clean windshield (2). Surface will be damaged.

18. **Wipe off all oil, grease, dirt, and other foreign material from inside surface of windshield (2).** Use clean cloth (E120) damp with naphtha (E245) or cleaner (E116). Wear gloves (E186).
19. **Wipe off inside surface of windshield (2) with clean cloth (E128) damp with water.**
20. **Put glass cleaner (E115) on inside surface of windshield (2) with clean cloth (E120).**

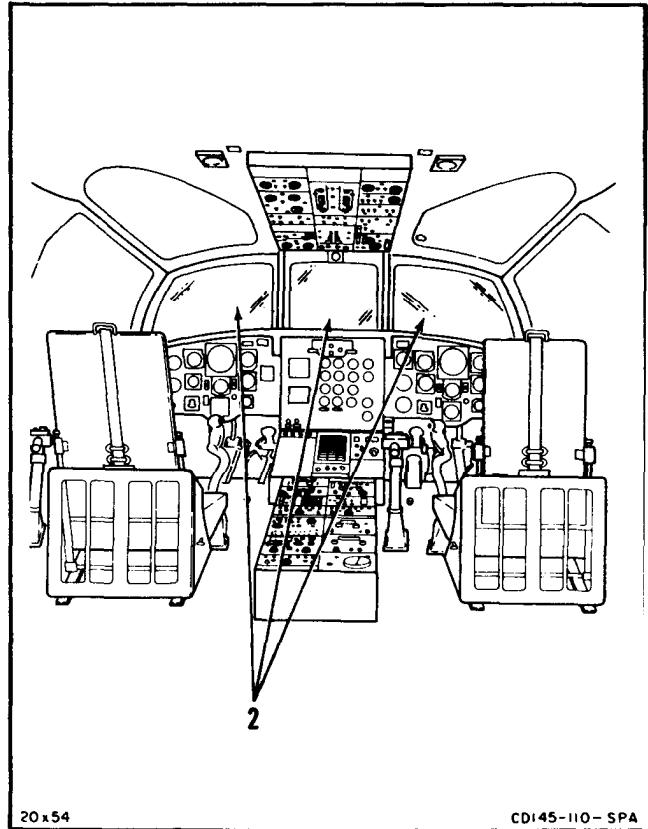


Stop polishing surface of windshield as soon as surface is dry. If windshield is rubbed with cloth when dry, surface will be damaged.

21. **Polish inside surface of windshield (2) with another clean cloth (E120) until all of inside surface of windshield is clear and dry. Stop rubbing as soon as surface of windshield is dry.**

FOLLOW-ON MAINTENANCE:

Inspect windshield (Task 2-41).

**END OF TASK**

1-78 CLEAN HYDRAULIC PISTONS

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692

Materials:

Barrier Material (E80)
Cloths (E120)
Hydraulic Fluid (E197 or E199)

Personnel Required:

67U10 Medium Helicopter Repairer

References:

Task 2-2
TM 55-1520-240-T

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

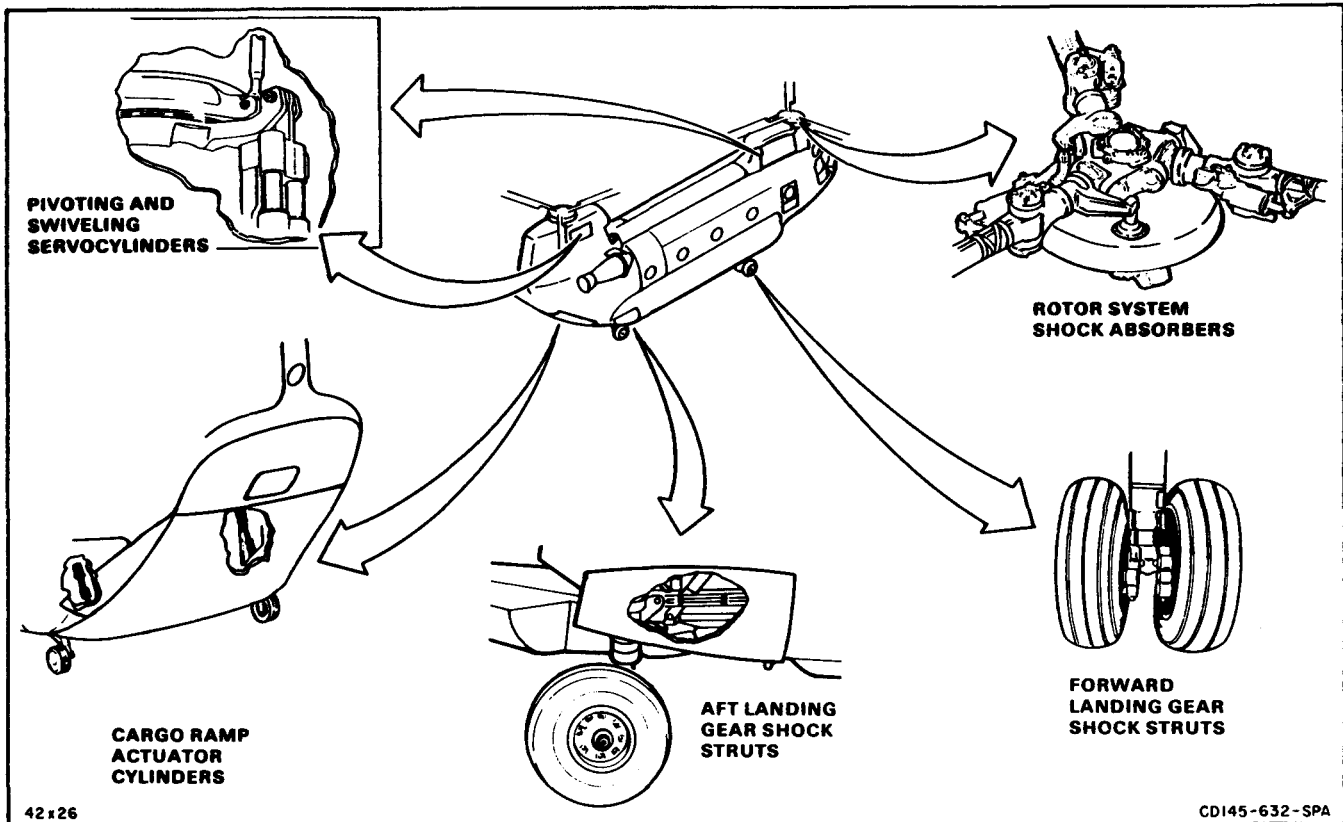
General Safety Instructions:

CAUTION

Hydraulic fluid can damage rubber. Do not let fluid get on seals or rubber parts.

CAUTION

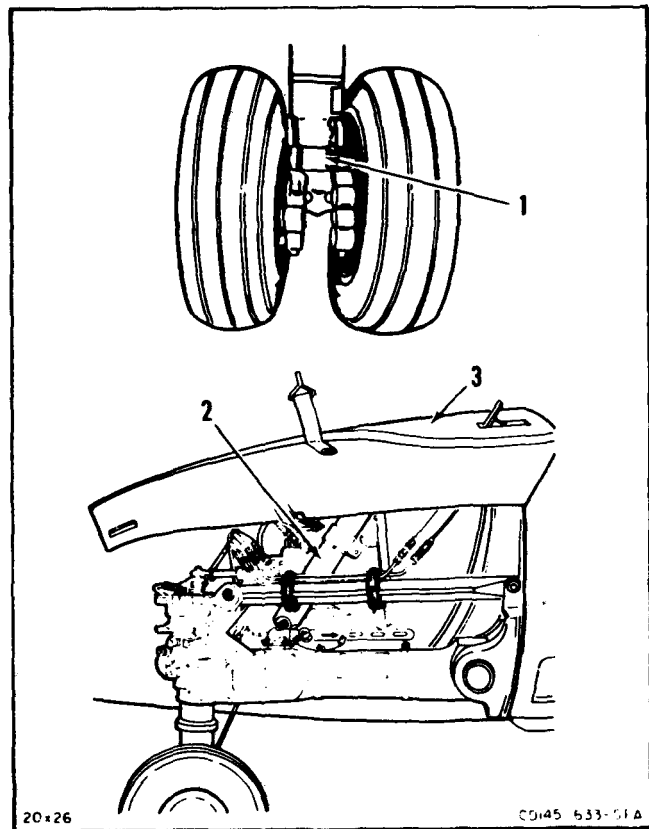
Do not rub pistons. Hard rubbing can cause grit to scratch pistons. Change cloths often to get rid of grit.



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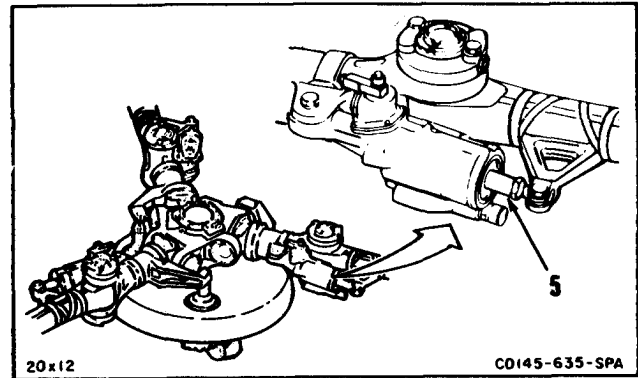
CLEAN LANDING GEAR SHOCK STRUT PISTONS

1. Gain access to forward pistons (1) from front of each gear. Gain access to aft gear (2) by opening access panel (3) (Task 2-2).
2. Cover tires with barrier material (E80) to protect from hydraulic fluid.
3. Dip a clean cloth (E120) in hydraulic fluid (E197 or E199). Wipe piston (1 or 2) with wet cloth to flush away grit. Leave a thin film of fluid on pistons.
4. Wipe up any spilled fluid.
5. Remove covers from tires.
6. Close access panel (3) (Task 2-2).

**GO TO NEXT PAGE**

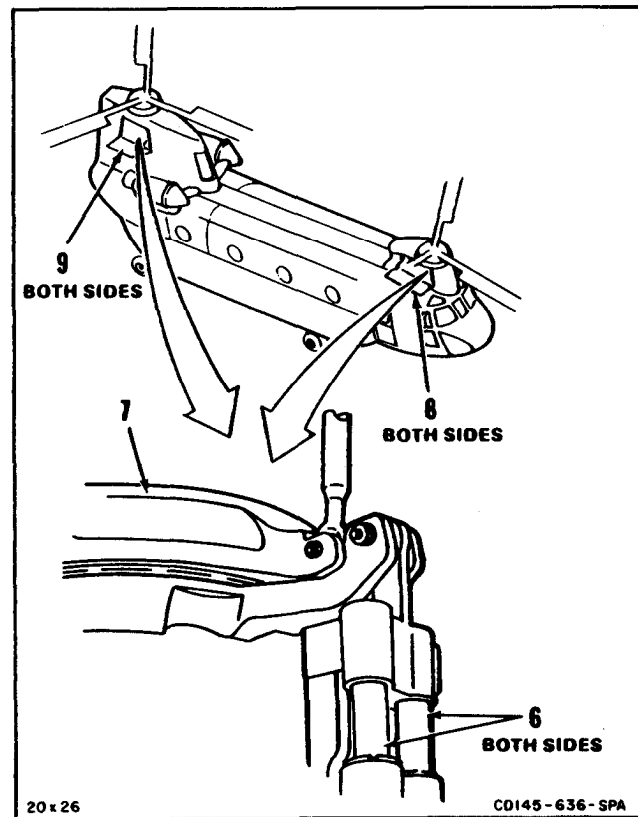
CLEAN ROTOR SYSTEM SHOCK ABSORBER PISTONS

7. Dip a clean cloth (E120) in hydraulic fluid (E197 or 199). Wipe pistons (5) with wet cloth to flush away grit. Leave a thin film of fluid on pistons.
8. Wipe up any spilled fluid.

**CLEAN PIVOTING AND SWIVELING SERVOCYLINDER PISTONS****NOTE**

There is a servocylinder at each side of each swashplate.

9. Gain access to servocylinder pistons (6) on swashplate (7) of forward rotor by opening forward work platforms (8) (Task 2-2). Gain access to aft pistons by opening pylon work platforms (9) (Task 2-2).
10. Dip a clean cloth (E120) in hydraulic fluid (E197 or E199). Wipe pistons (6) with wet cloth to flush away grit. Leave a thin film of fluid on pistons.
11. Wipe up any spilled fluid.
12. Close forward work platforms (8). Close pylon work platforms (9) (Task 2-2).

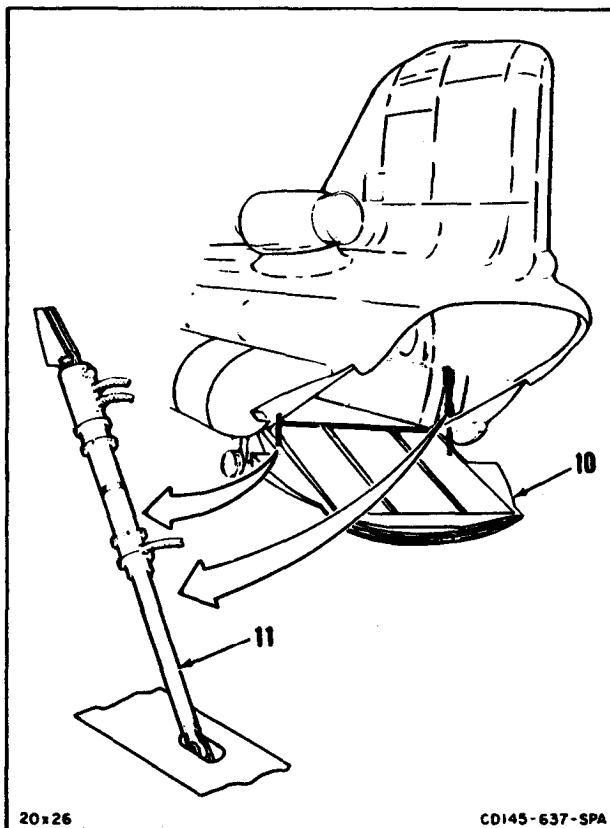


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CLEAN RAMP ACTUATOR CYLINDER PISTONS**NOTE**

Ramp must be lowered to expose full length of piston.

13. Lower cargo ramp (10) (TM 55-1520-240-T).
14. Dip a clean cloth (E120) in hydraulic fluid (E197 or E199). Wipe pistons (11) with wet cloth to flush away grit. Leave a thin film of fluid on pistons.
15. Wipe up any spilled fluid.
16. Raise cargo ramp (TM 55-1520-240-T).



20x26

CD145-637-SPA

FOLLOW-ON MAINTENANCE:

None

END OF TASK

1-79 CLEAN AFTER SALT WATER LANDING OR IMMERSION

1-79

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692

Materials:

Barrier Material (E80)
Corrosion Preventive Compound (E153)
Masking Tape (E388)

Personnel Required:

67U10 Medium Helicopter Repairer
67U30 Inspector

References:

TB 746-93-2
TM 55-1520-240-T

Task 1-78
Task 1-88
Task 2-204
Task 2-207
Task 3-7
Task 3-12

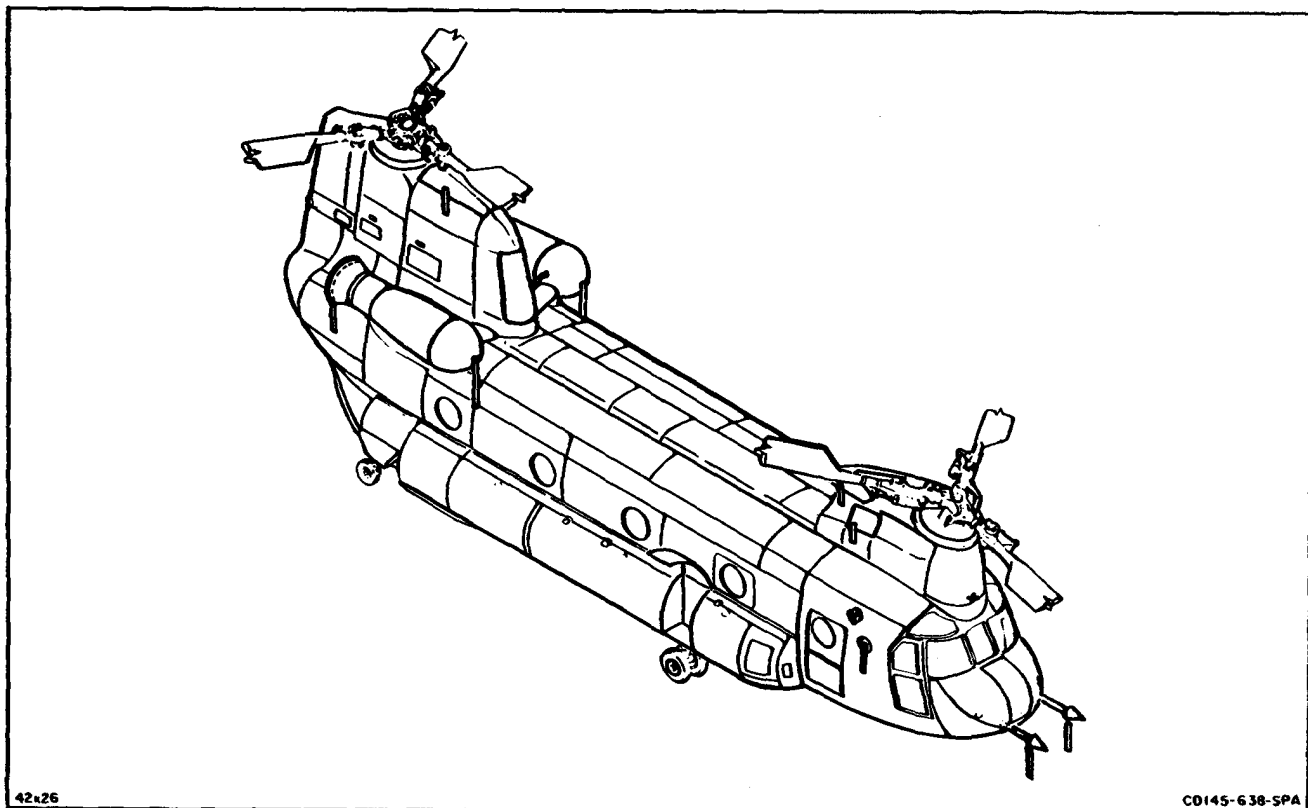
Equipment Condition:

Drain Plugs Open (Task 2-214)

Protective Covers Installed on Following Areas
(Task 1-32):

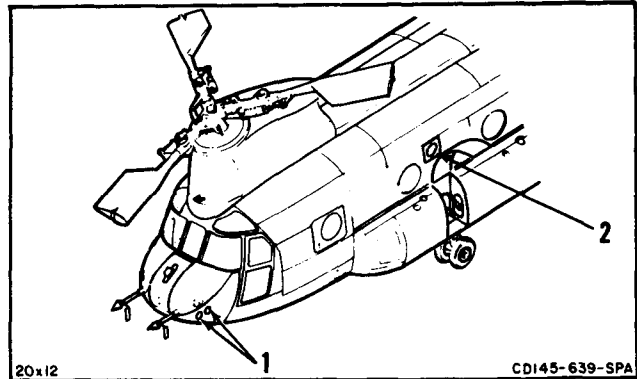
Apu Exhaust
Engine Inlet (2)
Heater Exhaust
Heater Inlet
Oil Cooler Exhaust (2)
Oil Cooler Inlet (2)
Pitot Tube (2)
Pylon Air Inlet

Forward and Aft Landing Gear Access Panels
Open (Task 2-2)

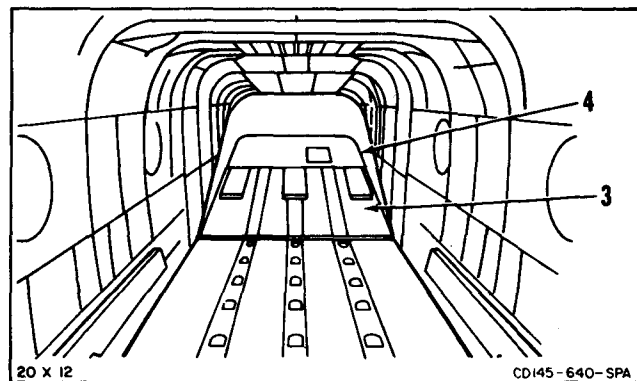
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1-79 CLEAN AFTER SALT WATER LANDING OR IMMERSION
(Continued)

1. **Cover sideslip ports (1)** on both sides of nose. **Cover static ports (2)** on both sides of fuselage. Use barrier material (E80) and masking tape (E388).
2. **Rinse all areas** exposed to salt water or spray. **Use fresh water.**

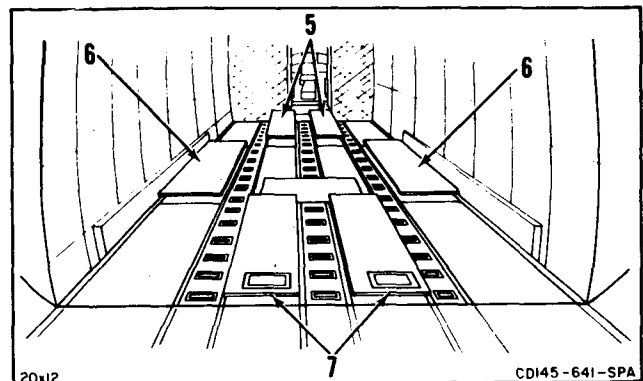


3. **Open cargo ramp (3)** half way (TM 55-1520-240-T). Leave door (4) extended.

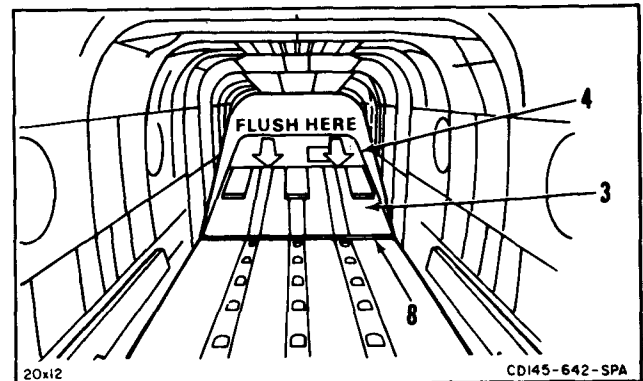


4. **Remove following cabin floor panels** (Task 2-204):

- Forward inboard (5)
- Center outboard (6)
- Aft inboard (7)



5. **Flush underfloor areas** with fresh water.
6. **Flush between cargo ramp (3) and door (4)** with fresh water. **Flush ramp hinge fittings (8).**

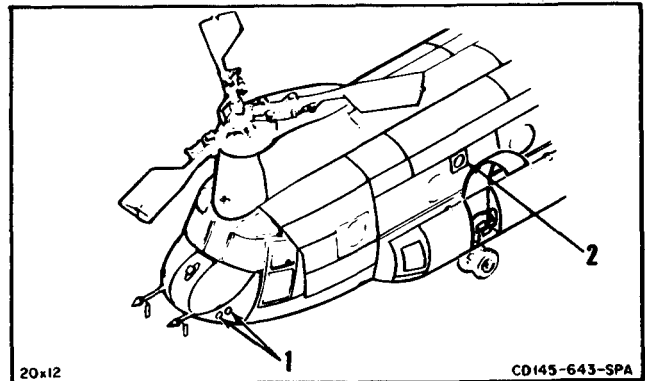


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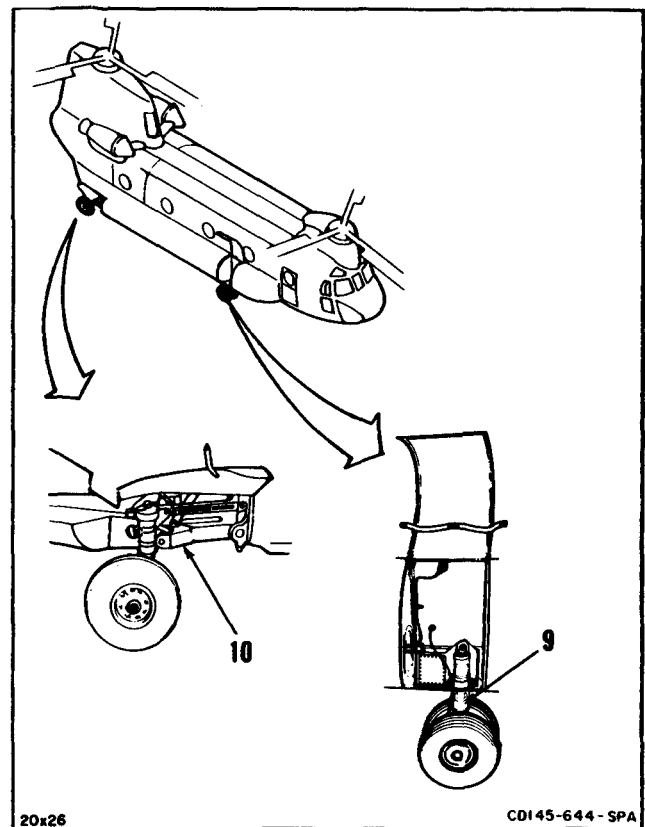
1-79 CLEAN AFTER SALT WATER LANDING OR IMMERSION (Continued)

1-79

7. **Remove covering** on sideslip ports (1) and static ports (2) at both sides of helicopter.



8. **Look for paint missing** on forward landing gear (9), aft landing gear (10) and surrounding structure. Touch up as needed (TB 746-93-2.)
9. **Clean hydraulic pistons** (Task 1-78).
10. **Lubricate landing gear** (Task 1-88).
11. **Lubricate wheel bearings** (Task 3-7 and 3-12).

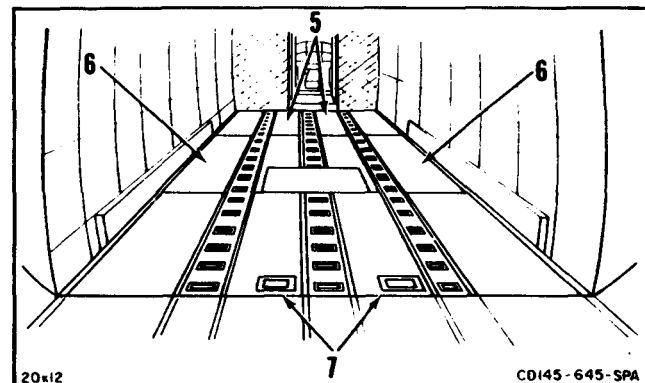


NOTE

Check that underfloor areas have drained and dried before installing floor panels.

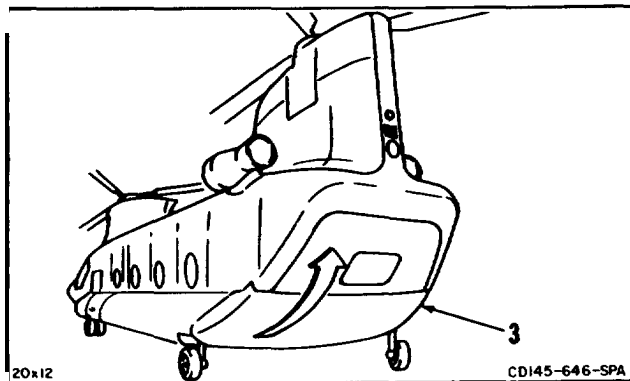
INSPECT

12. **Install floor panels** (5, 6, and 7) removed in step 4 (Task 2-207).



GO TO NEXT PAGE

13. Close cargo ramp (3) (TM 55-1520-240-T).



NOTE

Do step 14. only if more salt water landings will be made soon.

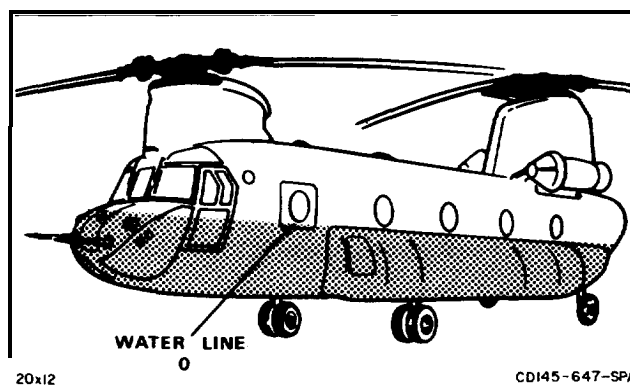
14. **Coat outside painted surfaces** up to water line 0 with exterior surface corrosion preventive compound (E153).

FOLLOW-ON MAINTENANCE:

Remove protective covers

Close drain plugs (Task 2-215).

Close forward and aft landing gear access panels (Task 2-2).



END OF TASK

1-80 MATERIALS CLEANING

1-80**INITIAL SETUP***Personnel Required:*

68G20 Structural Repairer

Applicable Configurations:

All

Tools:

As Required

Materials:

As Required

References:

Task 1-76

Task 1-77

Task 1-81

Task 1-82

Task 1-83

-
1. This task provides general information for cleaning all materials used in the construction of the helicopter.
 2. The following table, along with Task 1-76, 1-77, 1-81, 1-82, and 1-83, provides recommended cleaning solutions.

3. If the recommended cleaning solutions or compounds are not available, a cleaning procedure using approved materials can be used at the Maintenance Officer's discretion. However, the recommended cleaning procedures should be used as soon as the materials are available.

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1-80 MATERIALS CLEANING (Continued)

Cleaning and Treating Corroded Parts

METAL	FORM	CLEANING	TREATMENT
Aluminum unfinished surfaces only	Mild surface pitting, staining, and superficial etching	Apply metal conditioner (E242), type III, with stiff bristle brush. Rinse with fresh water.	Apply brush touchup conversion treatment of alodine 1200 (E65) in accordance with requirements of MIL-C-5541
Aluminum	Heavy surface pitting	Hand rub with aluminum wool (E72) and naphtha (E245). Apply metal conditioner (E242), type 111. Rinse with fresh water.	See above
Aluminum Alclad unfinished surfaces	Mild or heavy surface pitting, staining, and superficial etching	Apply metal conditioner (E242), type 111. Rinse with fresh water. Do not use abrasives.	See above
Aluminum	Intergranular corrosion	Remove corroded areas with routing tools. Burnish parts to remove all sharp edges	See above
Aluminum	Stress corrosion (Cracking)	Repair or replace parts in accordance with applicable repair figure	Not applicable
Magnesium	Surface pitting	Small parts. (Refer to Task 1-82.)	(Refer to Task 1-82.)
Magnesium	Surface pitting	Large, nonremovable parts — remove corrosion products with a stiff bristle brush	Apply type J chrome-pickle solution or type VI chromic acid solution in accordance with MIL-M-3171 for <u>1 to 3 minutes</u> . Wash with fresh water
Magnesium	Stress corrosion (Cracking)	Repair or replace parts in accordance with applicable repair figure	Not applicable
Steel	Severely rusted	Replace parts	Not applicable
Steel	Lightly rusted parts (No deep pitting)	Use steel wool (E373) to remove rust and clean as necessary	Cadmium-plate removable parts in accordance with QQ-P-416. Brush cadmium plate local bare areas in accordance with MIL-STD-865. If post chromate treatment is not applied to cadmium plate, apply one coat of wash primer (E302) in accordance with MIL-C-8507. Then apply primer (E291) or primer (E292)

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

1-81 CLEAN METAL PARTS (AVIM)

1-81**INITIAL SETUP**

Applicable Configurations:
All

Tools:
Goggles

Materials:
Perchloroethylene (E272)
Gloves (E186)

Personnel Required:
67U10 Medium Helicopter Repairer

References:
Task 1-80

Equipment Condition:
Off Helicopter Task

General Safety Instructions:

WARNING

Perchloroethylene (E272) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

-
1. Clean metal parts with a vapor degreaser such as perchloroethylene (E272). Follow these general procedures when cleaning parts in a vapor degreaser. Wear gloves (E 186) and goggles.
 2. Lower parts slowly into vapor area.
 3. Suspend parts from hooks, racks, or in baskets, so that condensed liquid can drain. When vapor stops condensing on parts, they are ready for removal.
 4. Remove parts slowly from the vapor area. If foreign matter remains on parts, hold them briefly above vapor to allow cooling. After parts have been cooled, return them to vapor.
 5. Repeat until all foreign matter is removed.

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK**1-261**

1-82 CLEAN AND TREAT MAGNESIUM ALLOY PARTS (AVIM)

INITIAL SETUP

Applicable Configurations:

All

Tools:

Steel Container (2 gallon)
Lead-Line 2S Aluminum Container
Lead or Rubber Lined Container
Steel Container
Goggles
Protective Clothing

Other Tools:

As Required

Materials:

Alkaline Cleaner (E117)
Chromic Acid (E114)
Hydrofluoric Acid (E201)
Sodium Acid Flouride (E355)
Sodium Bichromate (E357)
Nitric Acid (E22)
Calcium Fluoride (E90)
Cloths (E120)
Naphtha (E245)
Calcium Sulphate (E91)
Gloves (E1 86)

Personnel Required:

Aircraft Structural Repairer

References:

Task 1-80
Task 1-81
MIL-M-3171, Type IV
MIL-M-45202, Type 1

Equipment Condition:

Off Helicopter Task

General Safety Instructions:

WARNING

Do not add water to acids. A violent action will result. Acids should be added to water in small quantities. Wear gloves (E186).

WARNING

Chemical materials used in this task are extremely toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

1. Galvanic anodize parts containing Dowmetal M, EK30A, and EK41A magnesium alloys in accordance with MIL-M-3171, type IV.
2. Anodize parts made from ZK60 magnesium alloy in accordance with MIL-M-45202, type 1. When this treatment is used, do not allow anodic coating to build up excessively.
3. Clean and treat all parts not noted in steps 1 and 2 as follows:
 - a. Prepare each of the cleaning and treating solutions as follows:

GO TO NEXT PAGE

1-82 CLEAN AND TREAT MAGNESIUM ALLOY PARTS (AVIM) (Continued)

1-82

- (1) Mix 6 to 10 ounces of alkaline cleaner (E117) to water, in a steel container, to make 1 gallon of alkaline cleaning solution.
- (2) Mix 10 to 20 percent, by weight, of chromic acid (E114) to water in a lead-line or 2S aluminum container, to make a chromic acid solution.
- (3) Mix 15 to 25 percent, by weight, of hydrofluoric acid (E201) to water in a lead or rubber lined container to make a hydrofluoric acid solution.
- (4) Mix 4 to 6 percent, by weight, of sodium acid fluoride (E355) to water in a lead or rubber lined container to make a sodium acid fluoride solution.
- (5) Mix 10 to 20 percent, by weight, of sodium bichromate (E357) and 0.1 to 0.25 percent by weight of calcium fluoride (E90) to water, in a steel container to make a bichromate solution.

b. Clean and treat parts as follows:

- (1) Clean parts with cloths (E120) soaked in naphtha (E245) or equivalent.
- (2) Immerse parts in alkaline cleaning solution, maintained at 180° to 210° F (82° to 99°C) for 5 to 15 minutes or until all visible soil is removed.
- (3) Rinse parts thoroughly with cold water and inspect for breaks in the water film. If breaks occur, repeat step (2).
- (4) Immerse parts in solution of chromic acid (E114), maintained at 165° to 210° F (74° to 99°C), for 10 to 15 minutes. Rinse parts thoroughly with cold water. If necessary, the chromic acid solution may be maintained at 70°F (21°C), however, longer immersion times may be necessary.

NOTE

Newly applied pretreatments can be removed by this procedure. Very old pretreatments may require additional alternate immersion in solutions of alkaline cleaner (E117) and chromic acid (E114) for complete removal of finish.

- (5) Immerse parts in solution of hydrofluoric acid (E201). Immerse sheet stock for approximately 30 seconds. Immerse all other parts for 5 minutes. If parts contain aluminum inserts, immerse them for 5 to 15 minutes in solution of sodium acid fluoride (E335) instead of hydrofluoric acid. Rinse all parts thoroughly in cold running water.
- (6) Immerse parts in solution of sodium bichromate (E357), maintained at 200° to 220°F (93° to 104°C), for approximately 30 minutes.
- (7) Rinse parts thoroughly. Dip them in hot water to let them dry faster.

GO TO NEXT PAGE

**1-82 CLEAN AND TREAT MAGNESIUM ALLOY PARTS
AVIM (Continued)**

NOTE

The bichromate treatment makes magnesium alloys corrosion resistant and serves as a base for paint.

- (8) Refinish cleaned and treated parts as soon as possible.

4. Parts requiring touchup only can be chrome-pickle treated as follows:

- a. Clean parts with cloths (E120) soaked in naphtha (E245) or equivalent.
- b. Prepare one of the following chrome-pickle solutions.
 - (1) Solution I. Mix 1-1/2 pounds of sodium bichromate (E357) and 1-1/2 Pints of nitric acid (E22) to a sufficient amount of water to make 1 gallon of solution. Use polyethylene, stainless steel, glass, or vinyl-lined container.
 - (2) Solution II. Mix 1-1/3 ounces of chromic acid (E114) and 1 ounce of calcium sulphate (E91) to a sufficient amount of water to make 1 gallon of solution. Use stainless steel, glass, or aluminum container. Apply solution by brushing. Allow solution to remain on surface for 1 to 2 minutes. Gently wash part with a cloth (E120) soaked with water.

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

1-83 CLEAN ALUMINUM AND ALUMINUM ALLOY PARTS (AVIM)

1-83

INITIAL SETUP

Applicable Configurations:

All

Tools:

Steel Tank
 Source of Heat
 Goggles
 Protective Clothing
 Measuring Cup, Calibrated in Ounces
 Respirator
 Other Tools As Required

Materials:

Gloves (E186)
 Sulfuric Acid (E23)
 Sodium Bichromate (E357)
 Oakite 61 (E249)
 Cloths (E120)
 Naphtha (E245)
 Barrier Material (E80)

Personnel Required:

Aircraft Structural Repairer

Equipment Condition:

Off Helicopter Task

References:

Task 1-81

General Safety Instructions:

WARNING

Do not add water to acids. A violent action will result. Acids shall be added to water in small quantities.

WARNING

Sulfuric acid (E23) and sodium bichromate (E357) are extremely toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

GO TO NEXT PAGE

1-83 CLEAN ALUMINUM AND ALUMINUM ALLOY PARTS (AVIM) (Continued)

1-83

NOTE

This procedure is used when an extremely clean surface is necessary, such as prior to welding, or when bonding large areas of aluminum. Separate solutions must be used for parts to be welded and parts to be bonded.

1. Prepare solution of sulfuric acid (E23) and sodium bichromate (E357) as follows:
 - a. Pour cold water into a tank.
 - b. Add 40 ounces of sulfuric acid (E23) to each gallon of water in tank.
 - c. Add 4 1/2 ounces of sodium bichromate (E357) to each gallon of water in tank.
 - d. Stir solution until sodium bichromate dissolves.
2. Prepare solution of Oakite no. 61 (E249) as follows:
 - a. Add 7 ounces of Oakite 61 (E249) crystals to each gallon of water used. Stir water while adding crystals.
 - b. Heat solution to 175° to 185°F (70.5° to 85°C) to dissolve crystals.

WARNING

Naphtha (E245) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

3. Before cleaning parts, degrease them with cloths (E120) soaked in naphtha (E245) or equivalent.
4. Clean parts as follows:
 - a. Immerse part in solution of Oakite 61 (E249) 5 to 10 minutes. Maintain a solution temperature of 160° to 210°F (71° to 99°C) for this period.
 - b. Remove part from solution. Rinse with water.
 - c. Inspect for breaks in water film. If break occurs, repeat degreasing procedure step 3. Then repeat steps 4.a., 4.b., and 4.c.
 - d. Immerse parts in solution of sulfuric acid (E23) and sodium bichromate (E357) 10 to 20 minutes. Maintain solution temperature of 150° to 170°F (66° to 77°C) for this period.
 - e. Remove part from solution, rinse thoroughly with water. Dry with clean, dry filtered hot air. Do not exceed 140° F (60°C).
 - f. Handle clean parts with clean gloves. Wrap part with barrier material (E80).
 - g. If recleaning is necessary, repeat step 4. However, in step a., immerse part only 2 1/2 to 5 minutes. Also, in step d., immerse part only 5 to 10 minutes.

FOLLOW-ON MAINTENANCE:

None

END OF TASK

1-84 HOT ENVIRONMENT MAINTENANCE

1-84**INITIAL SETUP**

Applicable Configurations:
All

Tools:
None

Materials:
None

Personnel Required:
67U10 Medium Helicopter Repairer

References:
TM55-1500-204-25/1
TM55-410

CAUTION

Sliding windows shall be opened to allow air circulation through helicopter parked in direct sun or where extremely hot climate conditions exist.

NOTE

Humidity in closed helicopter can be extremely high, even when outside humidity is low.

Refer to TM 55-1500-204-25/1 and TM 55-410 for hot weather maintenance procedures.

FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Brush
- Compressed Air Source

Materials:

- Cloth (E120)
- Solvent (E161)
- Gloves (E186)

Personnel Required:

67U10 Medium Helicopter Repairer

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Forward Transmission Fairing Work Platforms Open (Task 2-2)
- Aft Pylon Work Platforms Open (Task 2-2)
- Drive Shaft Tunnel Access Covers Open (Task 2-2)
- Aft Landing Gear Access Panels Open (Task 2-2)

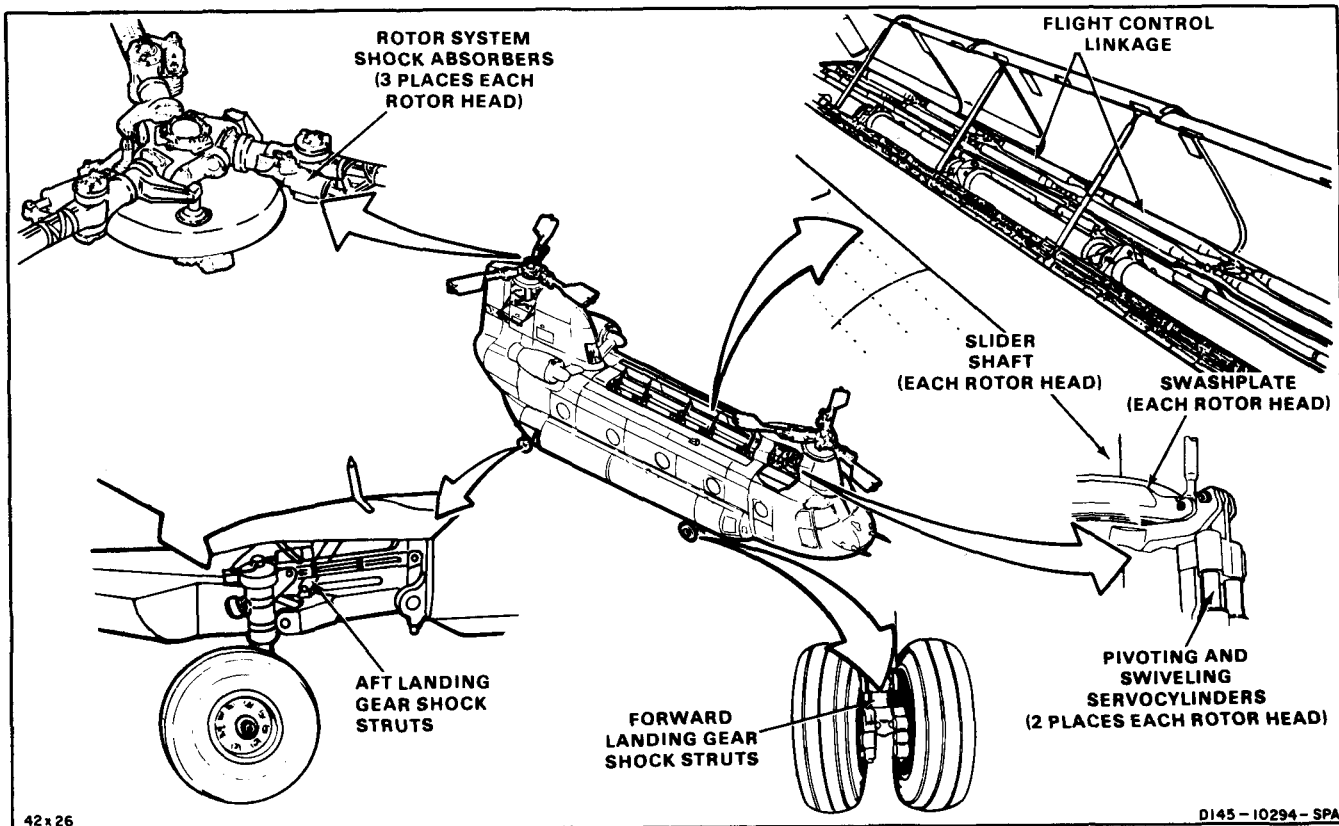
General Safety Instructions:

WARNING

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

WARNING

Do not use more than 30 psi compressed air for cleaning purposes. Debris propelled under pressure can cause injury to eyes. Use source of compressed air under 30 psi and eye protection to prevent injury to personnel.



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1-85 DUSTY ENVIRONMENT MAINTENANCE (Continued)**1-85****CAUTION**

Do not saturate cloth (E120) with solvent (E161) for removal of solid deposits on flight control componenta. Contaminants can be washed into bearings resulting in injury to personnel and damage to equipment.

- 1 Clean flight control linkage in drive shaft tunnel area as required. Use dry brush or low-pressure compressed air. If necessary, use cloth (E120) damp with solvent (E161). Remove dirt, sand, and grit from bellcrank, idler, and connecting link bearing areas. Wear gloves (E186)

- 2 Clean swashplates in area of slider shaft
Clean upper boost actuator piston
Clean rotary wing shock absorber piston
Clean landing gear shock absorber pistons
Use dry brush or low-pressure compressed air if necessary. use cloth (E120) damp with solvent (E161)
Wear gloves (E186)

FOLLOW-ON MAINTENANCE

- Close forward transmission fairing work platforms (Task 2-2)
- Close aft pylon work platforms (Task 2-2)
- Close drive shaft tunnel access covers (Task 2-21)
- Close aft landing gear access panels (Task 2-2,
- Install protective covers (1-32)

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit
NSN 5180-00-323-4692
- Zone Heater With Duct

Materials:

- Cloth (E120)
- Hydraulic Fluid (E197)
- Release Agent (E308)
- Deicing-Defrosting Fluid (E74)
- Dry Cleaning Solvent (E162)
- Cleaning and Polishing Compound
(E118 or E282)

Personnel Required:

Medium Helicopter Repairer

Reference:

- TM 1-1500-204-23
- Task 1-64
- Task 1-78
- Task 2-2
- Task 4-64
- Task 4-76
- TM 55-410
- Task 2-40
- Task 5-93
- Task 9-25

Equipment Conditions:

As Required

General Safety Instructions:

As Required

NOTE

Refer to TM 1-1500-204-23 for cold weather maintenance information.

1. **Follow cold weather maintenance procedures for engines as described:**
 - a. Remove snow and ice from air inlet housings before starting engines.
 - b. **Remove bypass panels from engine air inlet screens for operation at temperatures below 40°F (4°C) (Task 4-64).**
 - c. Open screen access panel (Task 2-2).
 - d. Check that compressor rotor turns freely.

NOTE

Condensed moisture will freeze engine parts when engine cools to 32°F (0°C) After shutdown

CAUTION

Do not use starter to free frozen compressor rotor. Engine damage will result.

- e. Free frozen compressor rotors. Use heater and duct at air inlet housing.
- f. Close engine air inlet screen access panel (Task 2-2).
2. Follow cold weather maintenance practices for battery as described:
 - a. If helicopter will be parked overnight at -40°F (-4°C) or below, remove battery (Task 9-25). Store battery in warm place.
 - b. Keep electrical loads to minimum before starting apu-
3. Wipe exposed shafts of landing gear shock struts daily during cold weather operation (Task 1-78). This prevents accumulation of ice and dirt which damages seals and packings. Use cloth (E120) damp with hydraulic fluid (E197).

GO TO NEXT PAGE

WARNING

If closed, vent valves on rotary-wing blade shock absorbers must be open at temperatures below 0°F (-18°C). Dangerous ground and flight reactions can result.

NOTE

Vent valve may be open or closed at temperatures between 0°F (-18°C) and 30°F (-1°C).

4. Open vent valves on rotary-wing shock absorbers (Task 5-93).
5. Wipe exposed pistons of rotor system shock absorbers and pivoting and swiveling servocylinders (Task 1-78). This prevents accumulation of ice and dirt which damages seals and packings. Use cloth (E120) damp with hydraulic fluid (E198).
6. Follow cold weather maintenance procedures for utility hydraulic system accumulator (Task 1-65).
7. Follow cold weather maintenance procedures for windshields as described:

CAUTION

Do not scrape ice or frost from windshields. Surface will be scratched. Do not use wipers before heating windshield. Scratches or damaged wipers will result.

- a. Soften ice and frost by operating windshield heater before using wipers.
8. Maintain exterior surfaces covered with ice and snow as follows:

CAUTION

Do not chip or scrape ice or frost from any helicopter surface. Surface will be damaged.

- a. Brush all loose snow or frost from helicopter surfaces. Pay special attention to rotor blades.

WARNING

Anti-icing and deicing-defrosting fluid (E74) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

CAUTION

Fluid (E74) must be mixed with water. Strong solutions can damage painted surfaces.

NOTE

Fluid (E74) will not damage fiberglass surfaces.

- b. Remove remaining ice. Use anti-icing and deicing defrosting fluid (E74) diluted as shown. Work from upper surfaces downward.

NOTE

Fluid (E74) can be heated to 150°F (66°C).

Ambient Temp	Fluid (E74)	Water
30°F (0°C)	20%	80%
20°F(17°C)	30%	70%
10°F(12°C)	40%	60%
0°F(18°C)	45%	55%
-10°F(23°C)	50%	50%
-20°F(29°C)	55%	45%
-30°F(35°C)	60%	40%

WARNING

Release agent (E308) can form toxic vapors if exposed to flame. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

WARNING

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

- c. Clean surfaces of cabin door handle latch (1) and handle recess (2) in latch body of door. Use cloth (E120) damp with solvent (E162). Apply release agent (E308) to these surfaces.

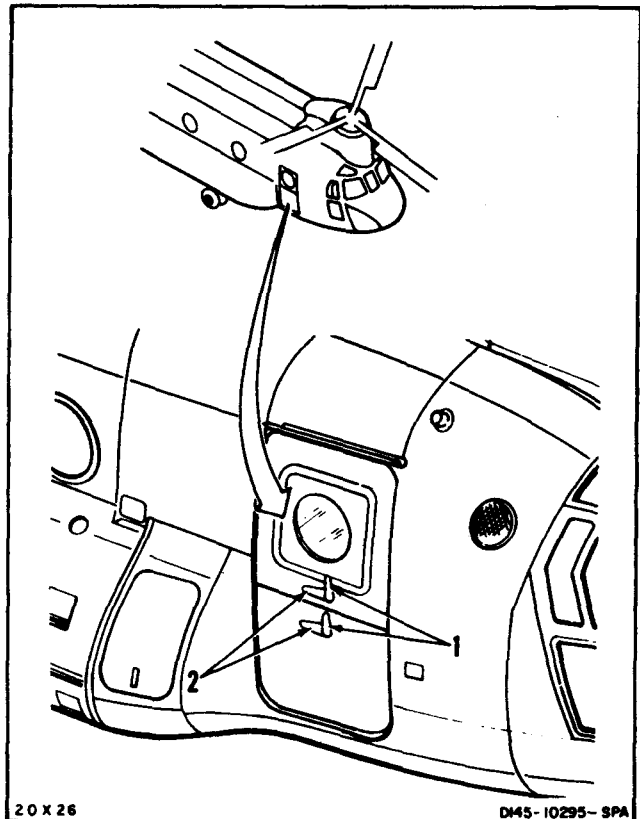
NOTE

Do not lubricate coated surfaces.

- d. Renew coating when latches and handle release mechanisms become difficult to operator.
9. Clean transparent plastic when temperature is below 32°F (0°C). Use cleaning and polishing compound (E118 or E282) (Task 2-40.)

FOLLOW-ON MAINTENANCE:

None

END OF TASK

Sheet 1 illustrates lubrication points on the helicopter, with reference to specific tasks. Sheet 2 illustrates oil change requirements.

NOTE

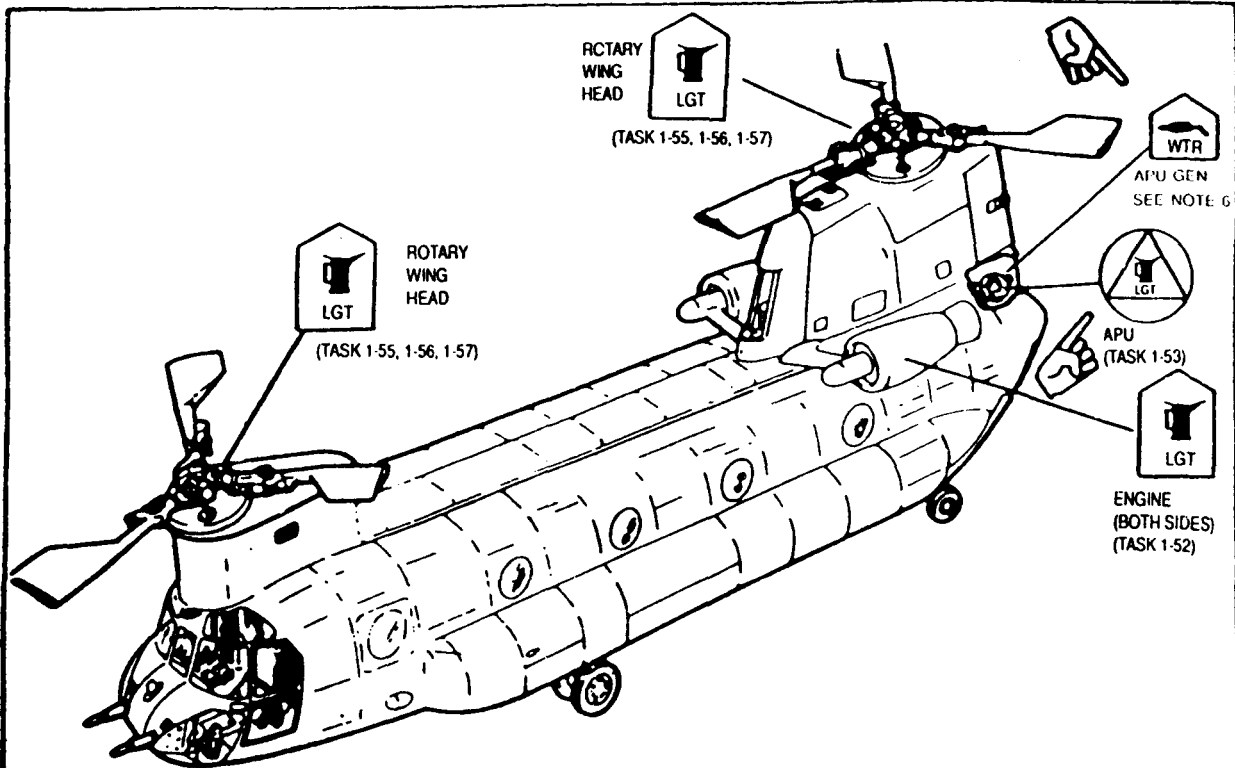
1. REPACK WHEEL BEARINGS EACH TIME THE WHEEL ASSEMBLY IS REMOVED FOR ANY REASON.
2. AFTER A WATER LANDING, NO MORE THAN THREE (3) DAYS SHALL ELAPSE WITHOUT HAVING WHEEL BEARINGS REPACKED.
3. LUBRICATION INTERVAL SHOWN IS FOR AVERAGE CONDITIONS. MORE FREQUENT LUBRICATION MAY BE NECESSARY UNDER EXTREMELY DUSTY CONDITIONS.
4. DO NOT OVERGREASE THE FAN ASSEMBLY. DO NOT BLOCK THE VENT FITTING WHILE APPLYING GREASE.
5. WHEEL BEARINGS, FORWARD LANDING GEAR TORQUE LINKS, AFT LANDING GEAR TRUNNION, AND AFT LANDING GEAR SWIVEL HOUSING LUBRICATION ARE CONTAINED IN TM-55-1520-240-PM.
6. REGREASE NOT REQUIRED FOR 145D5319-7 SHAFT.

TABLE OF LUBRICANTS			SYMBOLS	FREQUENCY	METHOD OF APPLICATION
IDENTIFICATION LETTER	SPECIFICATION	TYPE OF LUBRICANT			
WTR	MIL-G-81322 (E190)	GREASE, AIRCRAFT GENERAL PURPOSE, WIDE TEMPERATURE RANGE		100 HOURS	GREASE GUN
ST	(E190.1)	GREASE, SYN-TECH		200 HOURS	HAND

SHEET 1 OF 2





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NOTE
 6. APPLIES TO LELAND GENERATOR (AGH942-1) ONLY.

SHEET 2 OF 2

TABLE OF LUBRICANTS			SYMBOLS	FREQUENCY	METHOD OF APPLICATION
IDENTIFICATION LETTER	SPECIFICATION	TYPE OF LUBRICANT		200 HOURS	 OIL CAN
LGT	MIL-L-7808 (E254) OR MIL-L-23699 (E253) (REFER TO SERVICING INSTRUCTIONS FOR USAGE LIMITATIONS)	LUBRICATING OIL AIRCRAFT TURBINE ENGINE SYNTHETIC BASE		400 HOURS	
WTR	MIL-G-81322 (E190)	GREASE AIRCRAFT GENERAL PURPOSE WIDE TEMPERATURE RANGE	NOTE ROTARY WING HEAD AND ENGINE OIL CHANGES ARE DONE DURING SPECIFIC INSPECTIONS. (REFER TO TM 55-1520-240-PM).		 GREASE GUN

END OF TASK

1-88 LUBRICATE LANDING GEAR

1-88

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Hand Lubricating Gun
Flexible Grease Gun Coupling

Materials:

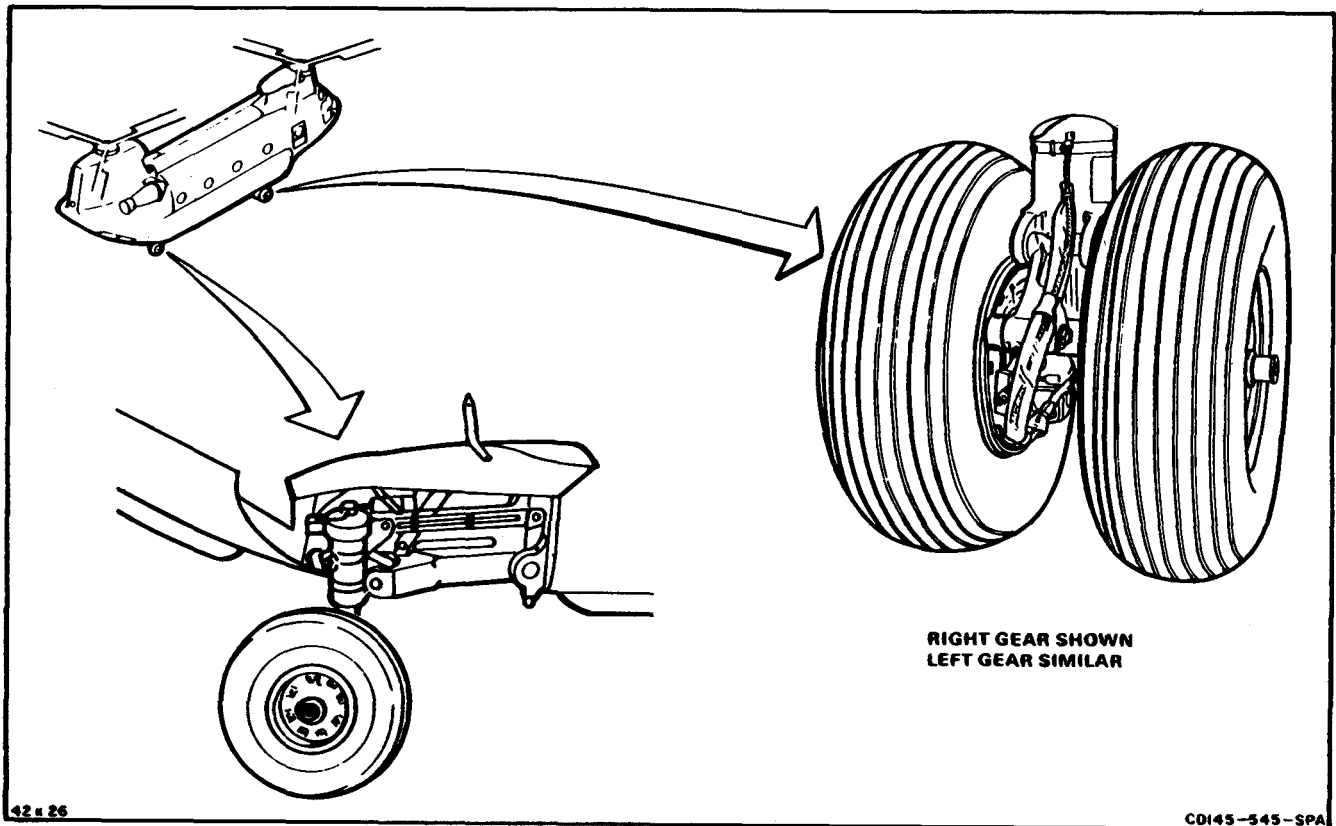
Cloths (E120)
Grease (E190)

Personnel Required:

67U10 Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Aft Landing Gear Access Panels Open (Task 2-2)

**GO TO NEXT PAGE**

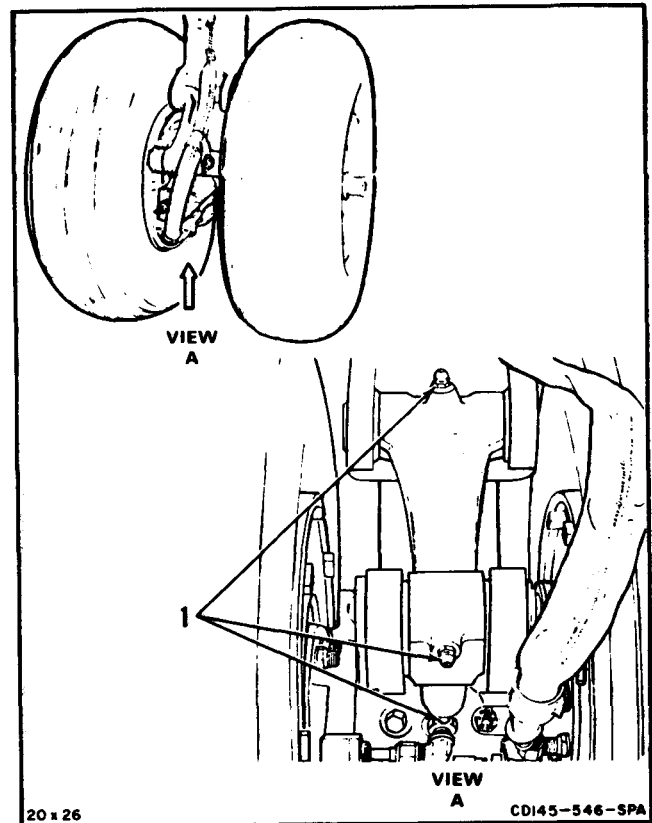
1-275

NOTE

Lubricate left and right gear in same way.

LUBRICATE FORWARD GEAR

1. **Wipe three fittings (1)** at aft end of gear with clean cloth (E120).
2. **Apply grease (E190)** at each fitting (1) until old grease is forced out and new grease appears.
3. Wipe off old grease with cloth (E120)



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LUBRICATE AFT GEAR

4. **Wipe fittings clean** with clean cloth (E120):
 - a. Two fittings (4) at forward end of drag link (3).
 - b. Two fittings (2) at aft end of drag link.
 - c. Fitting (5) at aft end of swivel housing (6).
5. **Apply grease (E190)** at fittings (2 and 4) until old grease is forced out and new grease appears.

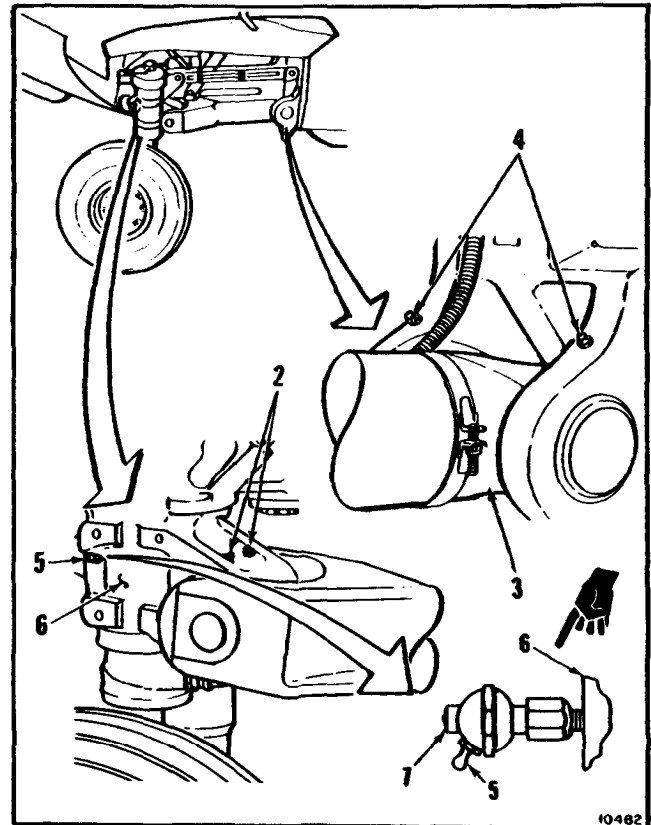
CAUTION

High pressure at swivel housing fitting can damage gear. If high pressure is needed to force out grease, remove fitting and check for restriction.

6. **Apply grease (E190)** at swivel housing fitting (5). **Use very low pressure.** Apply grease until old grease is forced out and new grease appears at relief tip (7).
7. Wipe off old grease with cloth (E120).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hand Lubricating Gun

Materials:

Cloths (E120)

Grease (E190)

Personnel Required:

67U10 Medium Helicopter Repairer (2)

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Forward Drive Shaft Tunnel

Access Doors Open (Task 2-2)

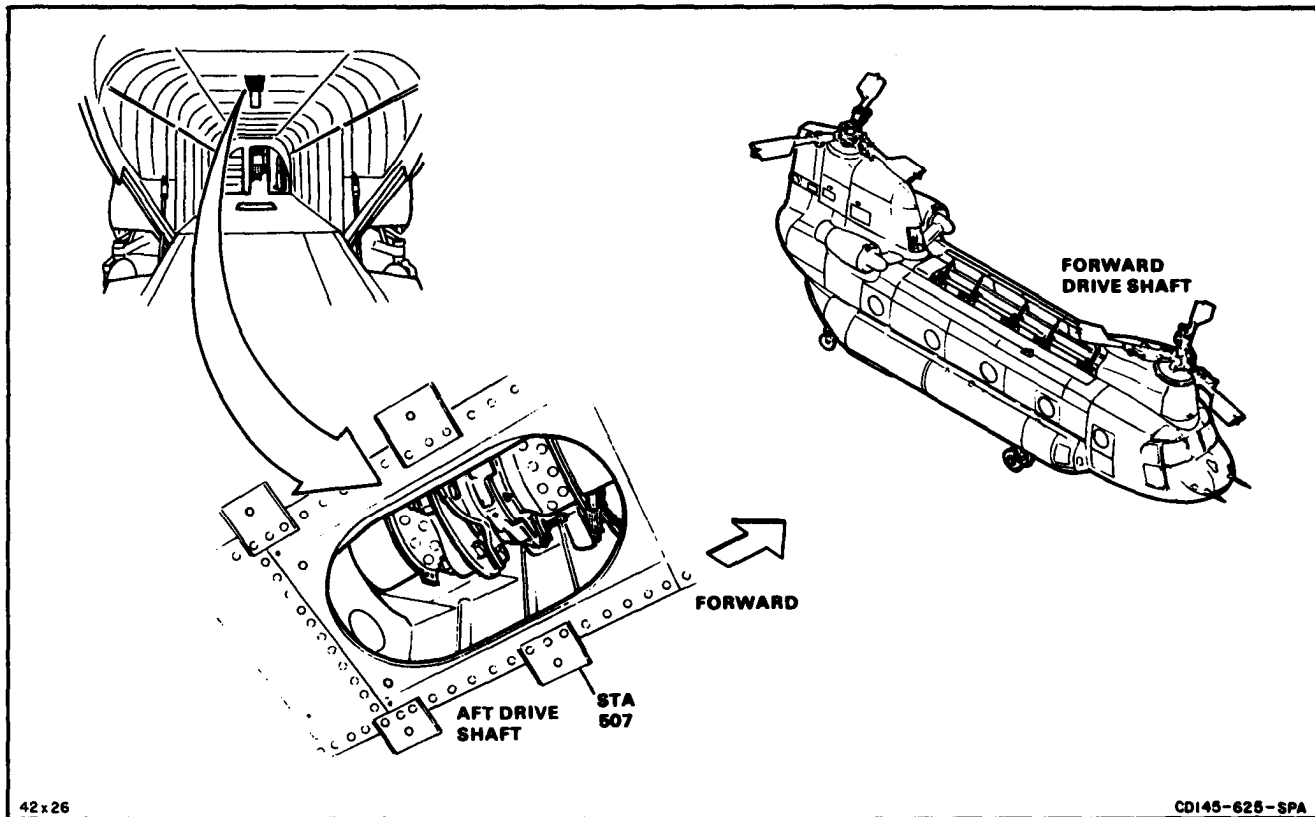
Aft Drive Shaft Access Panel Open (Task 2-2)

Tiedown Line Installed on One Forward Rotor Blade (Task 1-26)

General Safety Instructions:

WARNING

Rotary-wing blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before turning blades.

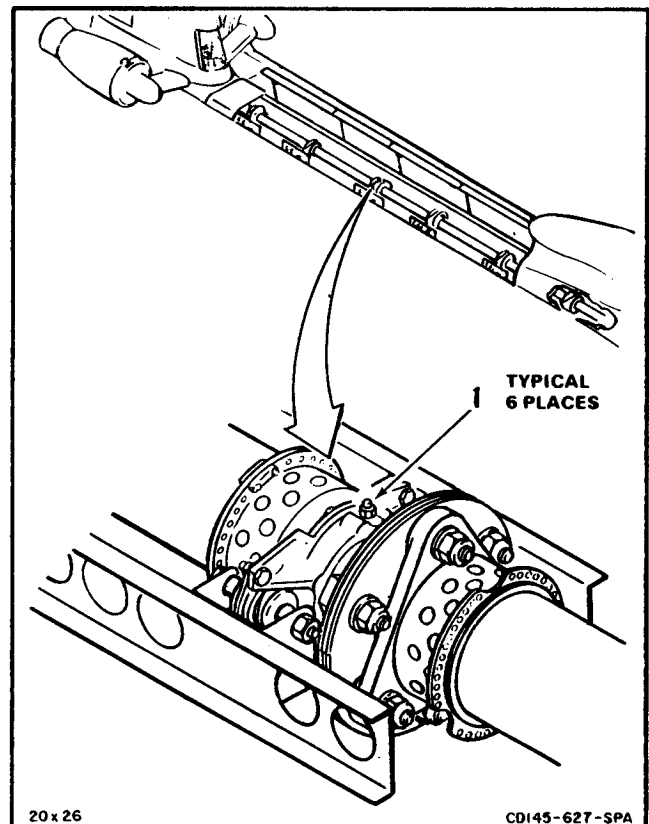


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LUBRICATE FORWARD SHAFT BEARINGS**NOTE**

There are six bearings on the forward drive shafting. Lubricate each the same way.

1. **Wipe fitting (1)** with a clean cloth (E120).
2. Have helper rotate shaft by slowly pulling rotor blades around with tiedown line. As shaft rotates, **apply grease (E190)** at fitting (1) until old grease is forced out and new grease appears. Use a grease gun.
3. Wipe off old grease with cloths (E120).
4. Repeat steps 1. thru 4. for each fitting (1).

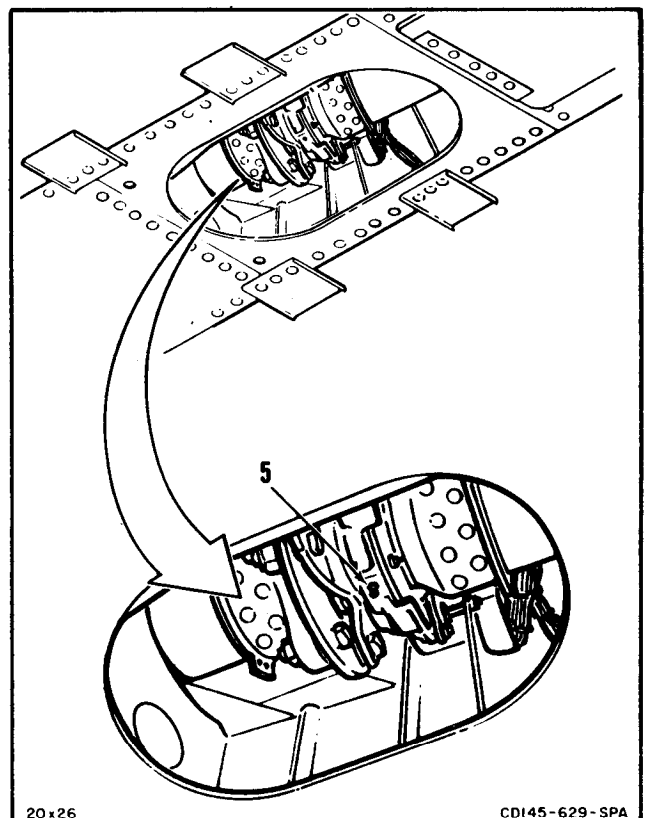
**LUBRICATE AFT SHAFT BEARINGS**

5. **Wipe fitting (5)** with a clean cloth (E120).
6. Have helper rotate shaft by slowly pulling rotor blades around with tiedown line. As shaft rotates, **apply grease (E190)** at fitting (5) until old grease is forced out and new grease appears. Use a grease gun.
7. Wipe off old grease with cloths (E120).

FOLLOW-ON MAINTENANCE:

Close aft drive shaft access panel (Task 2-2).

Close forward drive shaft tunnel access doors (Task 2-2).

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Hand Lubricating Gun
- Grease Gun Coupling

Materials:

- Cloths (E120)
- Grease (E190)

Personnel Required:

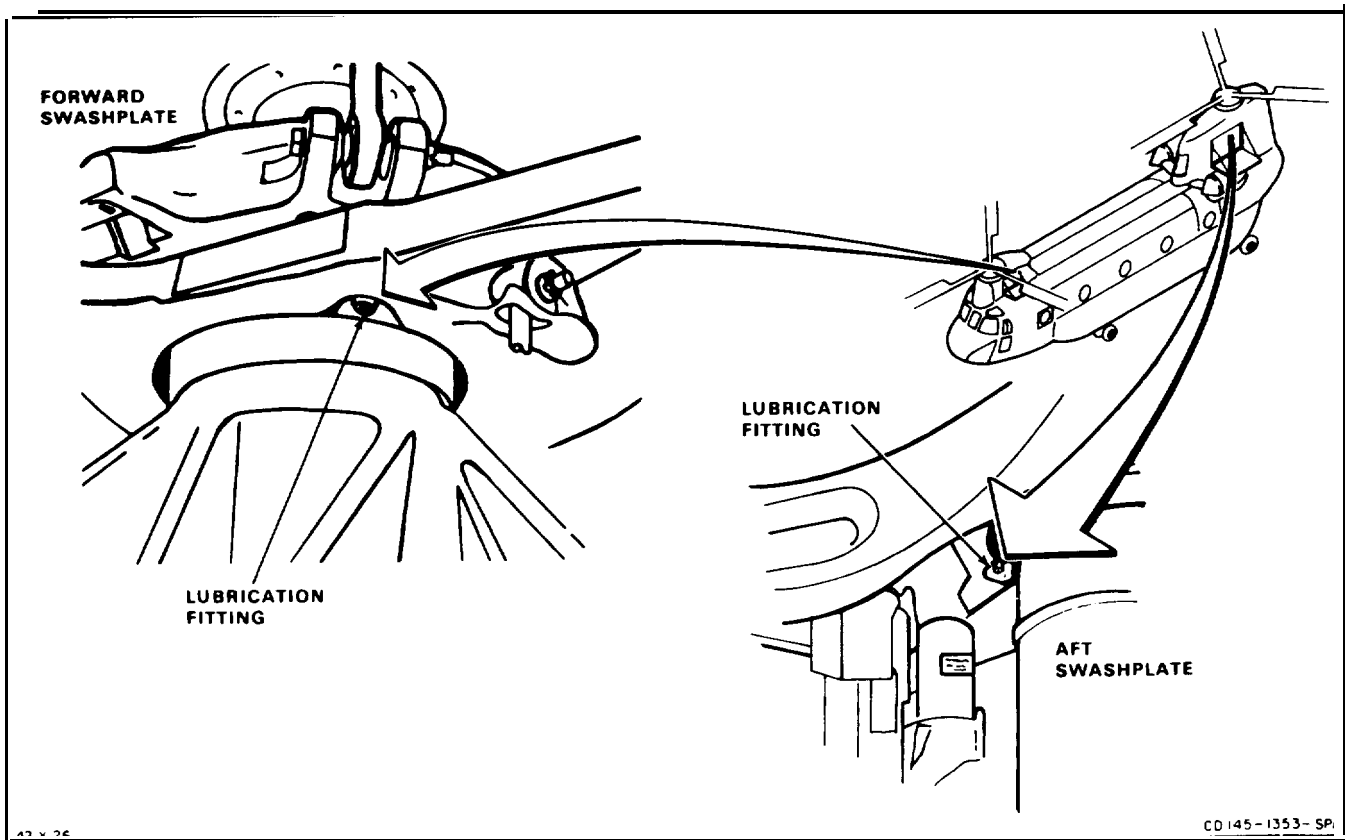
- Medium Helicopter Repairer (2)

References:

- Task 5-115
- Task 5-132
- Task 5-116
- Task 5-133

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Left Forward Transmission Fairing Open (Task 2-2)
- Left Pylon Work Platform Open (Task 2-2)
- Tiedown Line Attached to One Forward Blade (Task 1-26)



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1-90 LUBRICATE SWASHPLATE (Continued)

1-90

NOTE

Lubricate forward or aft swashplate in the same way.

1. Wipe dirt and grease from lubrication fitting (1) and seals (2 and 3). Use cloths (E120).

WARNING

Rotary-wing blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before turning blades.

CAUTION

Pumping grease into swashplate without turning rotating ring can result in bearing damage.

NOTE

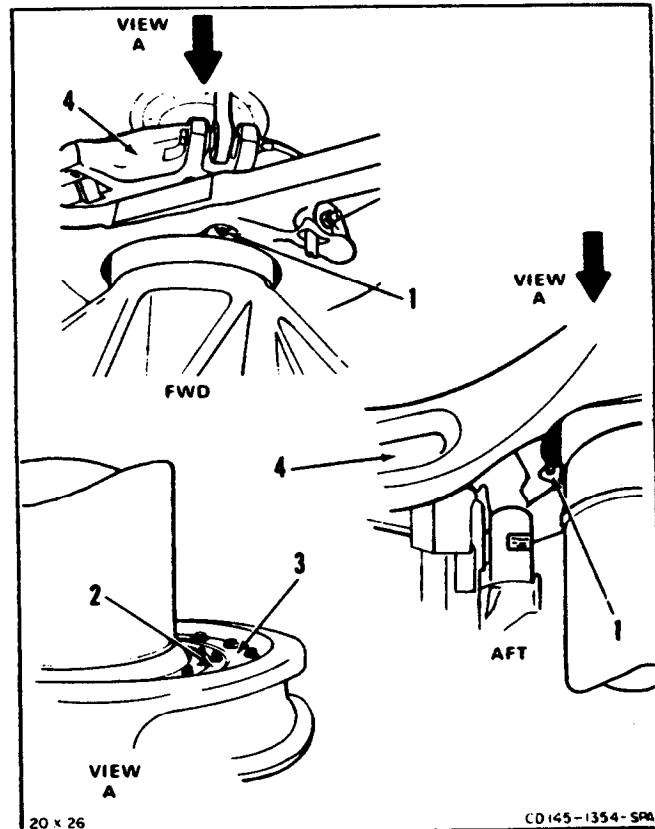
If you cannot pump and turn at the same time, turn ring in 12 equal steps, 30 degrees each step. Pump in grease between steps.

2. Have helper rotate ring (4) by pulling blades around with tiedown line. As ring rotates, pump grease (E190) into fitting (1). Use a hand lubricating gun with a flexible coupling.
3. Pump until clean grease appears all the way around the line between stationary seal (2) and rotating seal (3).
4. Wipe grease from fitting (1) and between seals (2 and 3).
5. Feel for metal chips in seal grease. If there are chips, replace swashplate (Task 5-115 and 5-132 or Task 5-116 and 5-133).

FOLLOW-ON MAINTENANCE

Close left forward transmission fairing (Task 2-2).

Close left pylon work platform (Task 2-2).

END OF TASK

1. This section lists parts or components of the helicopter. These items shall be removed from the helicopter for overhaul or retirement at the period specified. Removal of equipment for overhaul may be accomplished at the inspection nearest the time when overhaul is due unless otherwise specified in TM 1-1500-328-25.

DEFINITIONS

- a. **Overhaul Interval**
The maximum authorized operating time or calendar interval of parts prior to removal for overhaul at category of maintenance authorized in accordance with the Maintenance Allocation Chart.
 - b. **Retirement Schedule**
The operating time or calendar interval specified for removal, condemnation, and disposal of parts in accordance with applicable directives.
2. List the items replaced on a calendar basis for overhaul or retirement on DA Form 2408-18.

Equipment Inspection List, for scheduling purposes.

NOTE

Do not list items on DA Form 2408-16, Component Installation and Removal Record for items replaced on a calendar basis.

3. Bolts with an assigned retirement interval.
 - a. Whenever a bolt with an assigned retirement interval is replaced (not reinstalled) it shall be immediately mutilated and locally scrapped. The replacement bolt shall be a new (zero time) item.
 - b. Several bolts in the upper rotor controls are assigned a 4,000 hours aircraft retirement interval. Upon reaching 4,000 hours aircraft time and every 4,000 aircraft hours thereafter, the bolts listed in table 1-91 shall be replaced with new life items.

NOTE

All Retirement Life Items will have a Demil Code of "L" and will be mutilated in accordance with DOD 4160.21-M-1, DEFENSE DEMILITARIZATION MANUAL.

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CH-47D Components with Fatigue Lives Less than 10,000 Hours

COMPONENT	PART NO.	RETIREMENT SCHEDULE HOURS
Rod End Bearing, Aft LCT & Fixed Link	114CS123-1	4000
Upper Vertical Pin Bearing	114RS214-2	2400 (Note A)
	114RS214-6	2400 (Note A)
Lower Vertical Pin Bearing	114RS214-1	2400 (Note A)
	114RS214-5	2400 (Note A)
Horizontal Pin Leading Bearing	114RS213-3	2400 (Note A)
	114RS225-1	2400 (Note A)
Horizontal Pin Trailing Bearing	114RS213-4	2400 (Note A)
	114RS226-1	2400 (Note A)
Pitch Bearing	114R2130-2	2700
Pitch Bearing	114R2131-1	2700
Swashplate Bearing	114RS308-1	1200
Swashplate Bearing	114RS308-2	1200
Aft Pitch Link to Pitch Arm Bolt	114R3650-13	4000
Aft Pitch Link to Swashplate Bolt	114R3650-15	4000
Pitch Link Bolts (Upper) Fwd/Aft	114R3650-16	4000
Pitch Link Bolts (Lower) Fwd/Aft	114R3650-17	4000
Fwd Pivoting and Swiveling Actuator to Swashplate Bolt (Stationary Ring)	114R3650-3	4000
Aft Pivoting and Swiveling Actuator to Swashplate Bolt (Stationary Ring)	114R3650-1	4000
Forward Drive Shaft Assembly	145D3400-23	7285
	145D3400-24	7285
	145D3400-32	7285
	145D3400-31	7285
Aft Drive Shaft	145D3400-25	5783
	145D3400-26	5783
Aft Rotor Shaft	145D3300-3	4030
	145D3300-5	4030
	145D3300-6	4030
Engine Drive Shaft	145D3500-8	4800
	145D3500-12	4800
	145D3500-15	4800
	145D3504-2	2000
Adapter Assy Engine Drive Shaft	145D3500-10	7100
	145D3500-11	7100
	145D3500-13	7100
	145D3500-14	7100
	145D3500-16	4581 (Note F)
	145D3500-17	4581 (Note G)
Bolt, Swiveling Actuator to Lower Attachment (Aft).,	BACB30ST8-31	4000
Bolt, Pivoting Actuator to Lower Attachment (Aft).,	BACB30ST8-31	4000
Bolt, Pivoting Actuator to Lower Attachment (Aft).,	BACB30ST8-35	4000
Aft Pitch Shaft	114R2088-14	1025 (Note B)
	114R2088-16	1025 (Note B)
	234R2088-2	On Condition
Forward Pitch Shaft	114R2088-7	1185 (Note B)
	114R2088-15	1185 (Note B)
	234R2088-1	On Condition
Forward and Aft-Tie Bar Assembly	114R2155-1	4800
Fwd Xmsn Rotor Shaft	145D1301-3	6761 (Note E)

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1-91 OVERHAUL AND RETIREMENT SCHEDULE (Continued)

1-91

CH-47D Components with Fatigue Lives Less than 10,000 Hours

COMPONENT	PART NO.	RETIREMENT SCHEDULE HOURS	
Forward Rotor Hub	114R2050-17	3661 (Note C)	
	114R2050-19	3661 (Note C)	
	114R2050-21	3661 (Note C)	
	114R2050-23	3661 (Note C)	
	114R2050-27	2887	
	114R2050-29	2887	
	114R2050-31	2887	
	114R2050-35	2887	
	114R2050-37	2439	
	114R2050-39	2439	
	114R2050-41	2439	
	114R2050-43	2439	
	Aft Rotor Head	114R2050-18	3661 (Note C)
		114R2050-20	3661 (Note C)
114R2050-22		3661 (Note C)	
114R2050-24		3661 (Note C)	
114R2050-28		1995	
114R2050-30		1996	
114R2050-32		1995	
114R2050-36		1995	
114R2050-38		1603	
114R2050-40		1603	
114R2050-42	1603		
114R2050-44	1603		
Bolt, Horizontal Hinge Pin	114R2201-1	1200 (Note D)	
Combining Transmission Cooling Fan	114DS518-5	125	

NOTES

- A. To reach full retirement life it is mandatory that bearings be rotated 180 degrees at 1200 hours. Bearings are to be rotated only once to their unloaded side, regardless of time remaining when bearings were rotated. At no time will "time since new" in block H of rotorhead components/parts, DA Form 2408-16, exceed 2400 hours.
- B. Retirement hours shown are for shafts that have operated only on CH-47D models. Retirement hours for shafts with prior usage on other CH-47 models have been individually calculated and dictate the allowable time for rotor head assemblies listed on pages 1-286 through 1-286.3.
- C. Rotor hubs with unmodified splines require inspection after 300 flight hours have accrued and reinspection at subsequent intervals of 100 flight hours.
- D. Replace horizontal hinge pin bolt at each 1200 hour horizontal hinge pin inspection (rotation or replacement).
- E. Two separate DA Forms 2408-16, one for forward transmission reporting on condition and one for reporting RC retirement hours for forward transmission rotor shaft.

F. The following serial numbered cross shaft adapter assemblies (P/N 145D5300-16) have a finite life of 3048 hours. Replace cross shaft adapter assemblies if finite life exceeds 3048.

A-6055	A-6080	A-6088	A-6111	A-6117	A-6456
A-6487	A-6508	A-6550	A-6571	A-6592	A-6657
A-6664	A-669	A-6708	A-6732	A-6775	A-6786

G. The following serial numbered cross shaft adapter assemblies (P/N 145D5300-17) have a finite life of 3048 hours. Replace cross shaft adapter assemblies if finite life exceeds 3048.

A-2705	A-3049	A-4001	A-4370	A-466	A-4731
A-4734	A-6098	A-6420	A-6421	A-6522	A-6566
A-6607	A-6611	A-6614	A-6631	A-6688	A-6692

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1-91 OVERHAUL AND RETIREMENT SCHEDULE (Continued)

1-91

CH-47D Component Overhaul Interval

COMPONENT	PART NO.	TBO - HOURS	
Forward Rotor Head Assembly	145R2003-1	(Note A)	
	145R2003-3	2400 (Note B)	
	145R2003-4	(Note A)	
	145R2003-5	2400 (Note B)	
	145R2004-6	2400 (Note B)	
	145R2003-9	2400 (Note B)	
Aft Rotor Head Assembly	145R2003-10	2400 (Note B)	
	145R2004-2	(Note A)	
	145R2004-6	2400 (Note B)	
	145R2004-8	(Note A)	
	145R2004-10	2400 (Note B)	
	145R2004-12	2400 (Note B)	
Horizontal Pin	145R2004-18	2400 (Note B)	
	145R2004-20	2400 (Note B)	
	114R2196-2	1200 (Note C)	
	114R2197-1	1200 (Note C)	
Forward Head Swashplate Assembly	114R2197-5	1200 (Note C)	
	114R2197-7	1200 (Note C)	
	145R3551-1	1200	
	145R3551-5	1200	
Aft Head Swashplate Assembly	145R3551-11	1200	
	145R3551-17	1200	
	145R3551-2	1200	
	145R3551-6	1200	
Engine, Gas Turbine	145R3551-12	1200	
	145R3551-18	1200	
	2-001-020-23	2400	
	Forward Transmission	145D1300-4	On Condition (Note E)
145D1300-5		On Condition (Note E)	
145D1300-6		On Condition (Note E)	
145D1300-7		On Condition (Note E)	
145D1300-8		On Condition (Note E)	
145D1300-9		On Condition (Note E)	
Aft Transmission		145D2300-2	On Condition (Note D)
		145D2300-3	On Condition
		145D2300-4	On Condition
	145D2300-5	On Condition	
Combining Transmission	145D2300-6	On Condition	
	145D2300-7	On Condition	
	145D5300-3	On Condition (Note D)	
	145D5300-5	On Condition	
	145D5300-9	On Condition	
	145D5300-10	On Condition	
	145D5300-11	On Condition	
	145D5300-12	On Condition	
145D5300-13	On Condition		

CH-47D Component Overhaul Interval

COMPONENT	PART NO.	TBO - HOURS
Engine Transmission	145D6300-2	On Condition
	145D6300-3	On Condition
	145D6300-5	On Condition
	145D6300-6	On Condition
	145D6300-7	On Condition
	145D6300-8	On Condition
	145D6300-9	On Condition
	145D6300-10	On Condition
	145D6300-11	On Condition
	145D6300-12	On Condition
	145D6300-13	On Condition

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CH-47D Component Overhaul Interval

COMPONENT	PART NO.	TBO-HOURS
Servocylinder, Pivoting	145H6600-9	1200 (Note F, G, H)
	145H6600-10	1200 (Note F, G, H)
	145H6600-11	1200 (Note F, G, H)
	145H6600-12	1200 (Note F, G, H)
	145H6600-19	On Condition (Note G, H)
	145H6600-20	On Condition (Note G, H)
Servocylinder, Swiveling	145H6700-8	1200 (Note F, G, H)
	145H6700-9	1200 (Note F, G, H)
	145H6700-10	1200 (Note F, G, H)
	145H6700-11	1200 (Note F, G, H)
	145H6700-18	On Condition (Note G, H)
	145H6700-19	On Condition (Note G, H)

NOTES

- A. Refer to table beginning on page 1-286.
- B. Rotate horizontal pins and horizontal and vertical pin bearings at 1200 hours.
- C. Horizontal Pins:
 - 1. If a pin has been shotpeened, it may be operated an additional 1200 hours provided it is rotated 180 degrees. The following pins have been shot-peened by the manufacturer:
 - A356 thru A367
 - A380 thru A403
 - A440 and subsequent with "A" prefix.
 - YZ1 35 and subsequent with "YZ" prefix
 - 114R2197-7
 Other pins have not been shotpeened unless they have the letters "SP" (shotpeened) etched next to their serial number. All pins with part number 114R2196-6, 114R2197-5 or-6 also have been shotpeened.
 - 2. If a pin has not been shotpeened, it must be replaced at 1200 hours.
- D. Do not use these transmissions if "FO" does not appear following the S/N on the nameplate. This part

number transmission is an element of the U.S. Army Right Safety Parts Surveillance Program which requires the mandatory input of these transmissions samples on a selected basis at 500-hour intervals.

E. Two separate DA Forms 2408-16, one for forward transmission reporting on condition and one for reporting RC retirement hours for forward transmission rotor shaft.

F. Compute hours from time of installation.

G. Do not use servocylinders if the letter "A" does not appear following the serial number on the metal decal, installed during inspection/replacement of eight (8) actuator screws, per SOF CH-47-93-02 (TB 1-1520-240-20-63). Contact the CH-47 Product Management Office for disposition instructions DSN 693-1440 or commercial 314-263-1440.

H. All overhauled actuators must have a suffix "N" behind the serial number. (Suffix N indicates the actuator has been adjusted in accordance with TB 1-1520-240-20-85; this is not required on new actuators.)

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Change 61 1-285

OPERATING TIME FOR ROTOR HEAD ASSEMBLIES

Component	Serial Number	Removal Time (Max Allowable Fit Hrs-CH-47D)
Forward Rotor Head Assembly 145R2003-1 and -4	A4-34	796
	A4-39	807
	A4-50	741
	A4-67	787
	A4-73	782
	A4-88	775
	A4-92	1185
	A4-104	755
	A4-106	741
	A4-108	1185
	A4-139	741
	A4-171	741
	A4-217	1185
	A4-221	741
	A4-229	874
	A4-243	741
	A4-245	781
	A4-255	868
	A4-285	749
	A4-299	762
	A4-301	911
	A4-303	1185
	A4-312	894
	A4-336	778
	A4-343	837
	A4-374	790
	A4-378	866
	A4-393	815
	A4-407	758
	A4-428	783
A4-459	846	
A4-465	741	
A4-504	847	
A4-506	741	
A4-516	741	
A4-565	741	
A4-576	741	

OPERATING TIME FOR ROTOR HEAD ASSEMBLIES

Component	Serial Number	Removal Time (Max Allowable Flt Hrs-CH-47D)
Forward Rotor Head Assembly 145R2003-1 and -4	A4-632	741
	A4-633	1053
	A4-635	1108
	A4-644	1064
	A4-651	741
	A4-662	1185
	A4-671	741
	A4-681	741
	A4-704	741
	A4-712	1185
	A4-714	741
	A4-771	741
	A4-785	741
	A4-789	745
	A4-792	1092
	A4-802	741
	A4-810	741
	A4-830	741
	A4-834	741
	A4-843	741
	A4-852	741
	A4-1016	741
	A4-1030	741
	A4-1087	741
	A4-1138	741
	A4-1143	741
	A4-1160	741
	A4-1165	743
	A4-1259	1175
	A4-1463	1185
A4-1467	1185	
A4-1468	1185	
A4-1470	1185	
A4-1471	1185	
A4-1472	1185	

OPERATING TIME FOR ROTOR HEAD ASSEMBLIES

Component	Serial Number	Removal Time (Max Allowable Flt Hrs-CH-47D)
Aft Rotor Head Assembly 145R2004-2 and -8	A5-36	821
	A5-42	647
	A5-45	647
	A5-49	620
	A5-71	647
	A5-105	647
	A5-108	647
	A5-140	647
	A5-183	647
	A5-219	647
	A5-221	647
	A5-248	1025
	A5-262	647
	A5-276	716
	A5-295	848
	A5-336	530
	A5-343	647
	A5-344	647
	A5-372	712
	A5-382	680
	A5-418	835
	A5-464	1025
	A5-466	747
	A5-476	840
	A5-479	886
	A5-495	477
	A5-496	900
	A5-497	704
	A5-500	647
	A5-509	647
A5-515	647	
A5-523	490	
A5-527	859	
A5-571	643	
A5-581	874	
A5-594	647	

**1-91 OVERHAUL AND RETIREMENT SCHEDULE
(Continued)**

1-91

OPERATING TIME FOR ROTOR HEAD ASSEMBLIES

Component	Serial Number	Removal Time (Max Allowable Flt Hrs-CH-47D)
Aft Rotor Head Assembly 145R2004-2 and -8	A5-605	847
	A5-665	689
	A5-695	741
	A5-712	764
	A5-716	813
	A5-741	647
	A5-763	1025
	A5-771	647
	A5-780	647
	A5-817	853
	A5-834	647
	A5-835	787
	A5-866	843
	A5-867	737
	A5-908	603
	A5-931	800
	A5-936	863
	A5-980	742
	A5-993	791
	A5-1062	864
	A5-1065	875
	A5-1113	758
	A5-1129	709
	A5-1146	1025
	A5-1156	556
	A5-1158	611
	A5-1171	922
	A5-1179	820
	A5-1246	647
	A5-1276	648
A5-1515	1025	
A5-1519	1025	
A5-1520	1025	
A5-1522	1025	
A5-1523	1025	

Change 4

1-286.3

Calendar Overhaul and Removal Schedule

COMPONENTS	PART NO.	OVERHAUL INTERVAL	RETIREMENT INTERVAL
Winch Cable Cutter Cartridge	2518426		1 year*
Engine Fire Extinguisher Cartridge	30903824-1 (Use with 30402103 bottle)		4 years**
	30903824 (Use with 30402103 bottle)		4 years**
	895408 (Use with 892868-02 bottle)		4 years***

NOTES

- Shelf life is computed from the date of manufacture until current date.
- Service life begins upon opening the sealed cartridge container.
- Shelf life and service life are not to be added.
- Early replacement of obsoleted cartridge P/N 13083-5 is not required. Retirement interval remains 42 months.
- TB 9-1300-385 contains the current information for retirement interval and shelf life for these cartridges. If TM 9-1300-385 is not available, use the printed information of this table.

* Life not to exceed 8 years of shelf life or 1 year of service life, whichever occurs first.

** Life not to exceed 7 years of shelf life or 4 years of service life, whichever occurs first.

*** Life not to exceed 6 years of shelf life or 4 years of service life, whichever occurs first.

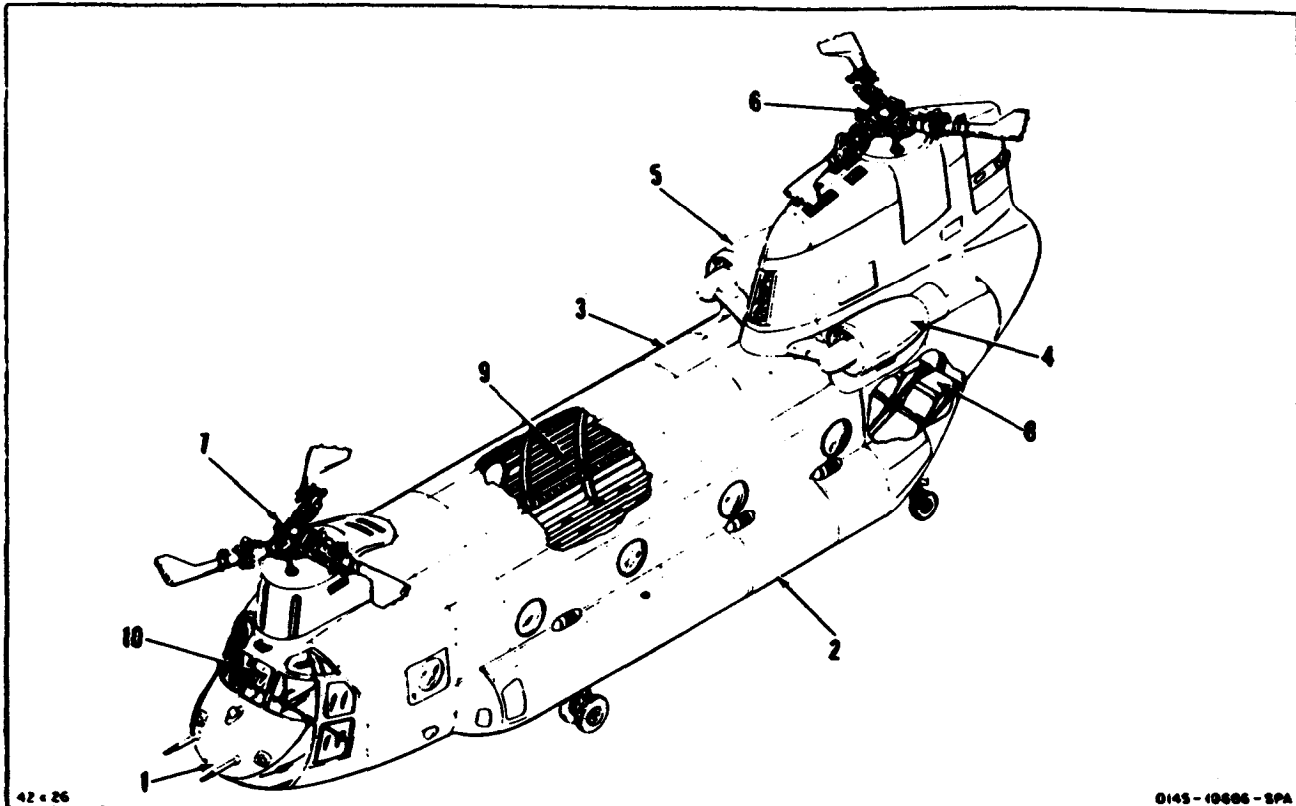
FOLLOW-ON MAINTENANCE:

None

END OF TASK

1-286.4 Change 59

SECTION VIII
SPECIAL INSPECTION/MAINTENANCE ACTIONS

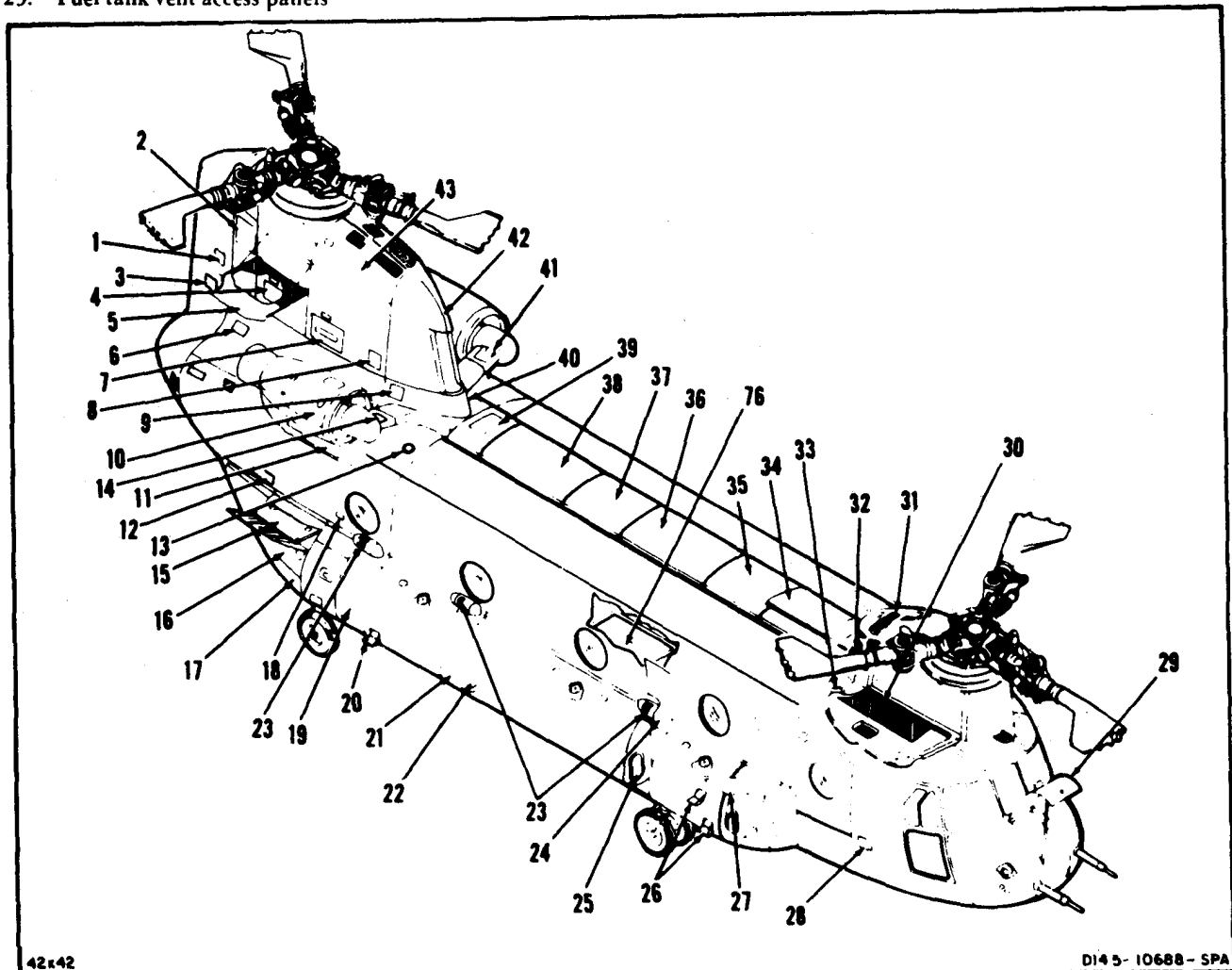


Inspection Area Diagram

Area No. 1	Nose	External fuselage from sta 120 RH to sta 120 LH, excluding area No. 7, but including those internal areas visible or accessible from outside.
Area No. 2	Left Fuselage	External fuselage from sta 120 LH aft to sta 630.5, including bottom of fuselage, but excluding areas 6 and 7.
Area No. 3	Right Fuselage	External fuselage from sta 630.5 forward to sta 120 RH, including bottom of fuselage, but excluding areas 6 and 7.
Area No. 4	No. 1 Engine	Left hand engine installation including transmission, cowling, fairings and engine driveshaft.
Area No. 5	No. 2 Engine	Right hand engine installation including transmission, cowling, fairings and engine driveshaft.
Area No. 6	Aft Rotor and Pylon	Internal and external areas of aft pylon from sta 630.5 forward to sta 440, excluding areas 2 and 3.
Area No. 7	Forward Rotor, Crown and Tunnel	Internal and external areas of upper fuselage from sta 440 forward to sta 62, excluding areas No. 1, 2, and 3.
Area No. 8	Ramp	Internal fuselage from sta 630.5 forward to sta 482.
Area No. 9	Cabin	Internal fuselage from sta 482 forward to sta 120.
Area No. 10	Cockpit	Internal fuselage from sta 120 forward to sta 21.5 excluding area No. 1.

GO TO NEXT PAGE

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Radar warning antenna access door 2. Upper pylon access panel 3. Pylon removal access panel 4. Aft transmission access cover 5. Work platform 6. Generator access door 7. Access cover 8. Hydraulic module inspection access cover 9. Combining transmission access door 10. Engine upper cover 11. Lower access door 12. Aft hydraulic service panel 13. Maintenance crane installation access panel 14. Lower hinged access panel 15. Work platform 16. Aft landing gear fairing 17. Aft landing gear access panel 18. Aft interphone jack and ramp control access panel 19. Aft pod access panel 20. Fuselage foldout step 21. Center pod access panel 22. Main tank aft fuel boost pump access panel 23. Fuel tank vent access panels | <ol style="list-style-type: none"> 24. Forward landing gear access panel 25. Main tank forward fuel boost pump access panel 26. Fuselage foldout steps 27. Electrical compartment access door 28. Interphone jack access door 29. Nose compartment access door 30. Work platform 31. Forward transmission fairing hydraulic module access door 32. Forward transmission fairing hydraulic module access cover 33. Maintenance crane installation access panel 34. Cabin crown access tunnel cover 35. Tunnel access cover 36. Tunnel access cover 37. Tunnel access cover 38. Tunnel access cover 39. Aft crown tunnel access cover 40. Pylon leading edge lower hinged fairing 41. Upper hinged access panel 42. Aft pylon leading edge hinged fairing 43. Aft pylon forward hinged crown fairing |
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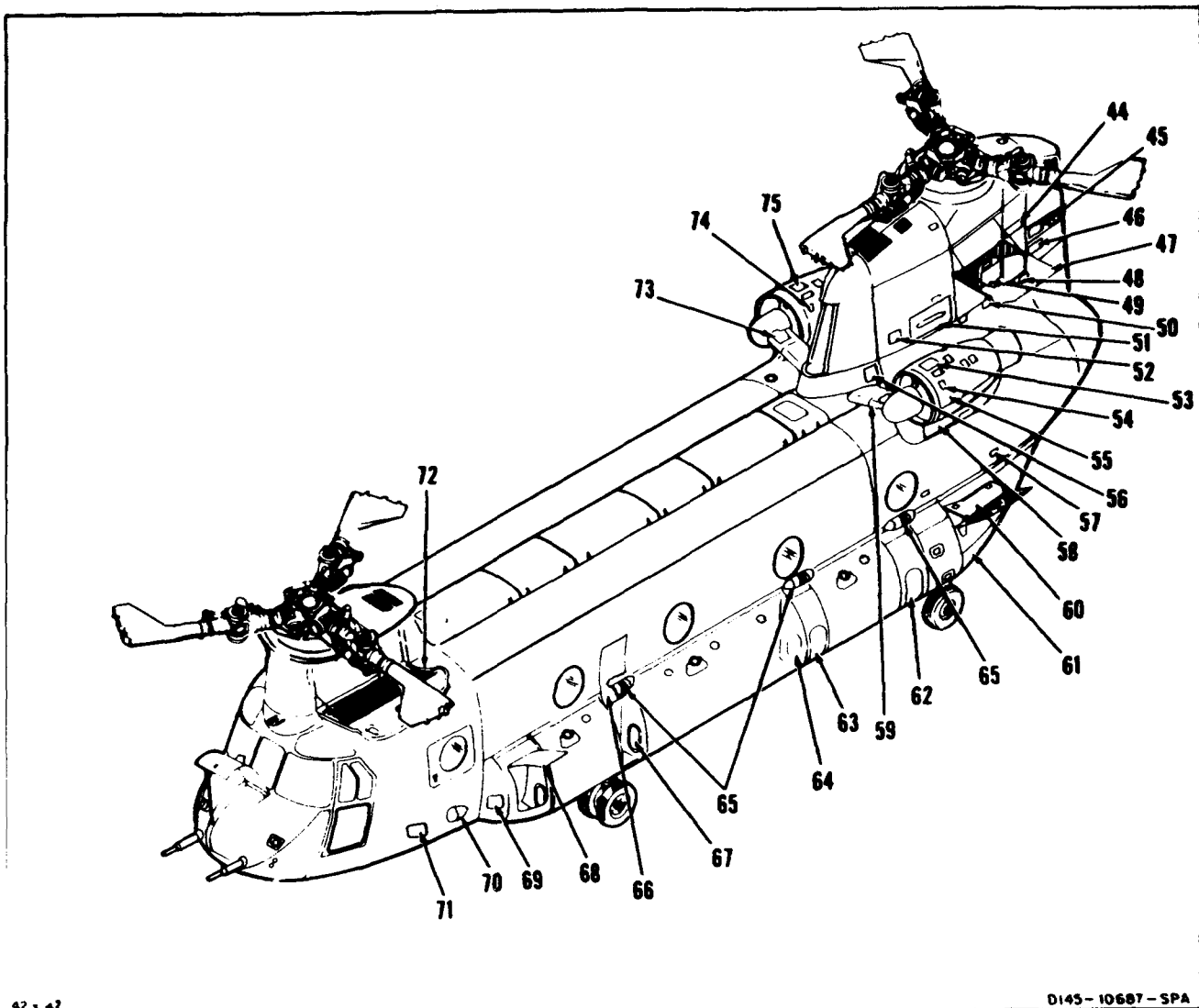


42x42

D145-10688-SPA

GO TO NEXT PAGE Access Doors, Covers, and Panels (Sheet 1 of 2)

- 44. Access panel
- 45. Radar warning antenna access door
- 46. Pylon removal access panel
- 47. Work platform
- 48. Utility hydraulic pump access panel
- 49. Aft transmission access panel
- 50. Aft transmission oil filler access door
- 51. Access cover
- 52. Hydraulic module inspection access cover
- 53. Engine oil filler access door
- 54. Engine oil quantity indicator access door
- 55. Engine upper cover
- 56. Combining transmission access door
- 57. Apu emergency fluid shutoff access panel
- 58. Lower access door
- 59. Lower hinged access panel
- 60. Work platform
- 61. Aft landing gear access panel
- 62. Aft pod access panel
- 63. Center access panel
- 64. Main tank aft fuel boost pump access panel
- 65. Fuel tank vent access panels
- 66. Forward landing gear access panel
- 67. Main tank forward fuel boost pump access panel
- 68. Electrical compartment access door
- 69. External power receptacles access door
- 70. Hydraulic ground test access cover
- 71. Antenna coupler access panel
- 72. Work platform
- 73. Upper hinged access panel
- 74. Engine oil quantity indicator access door
- 75. Engine oil filler access door
- 76. Rescue hatch lower door



GENERAL INFORMATION

1. This section contains complete requirements for calendar inspections, operating time special inspections, and conditional inspections which apply to the aircraft. The inspections given in this task shall be carried out at specific periods by Aviation Unit Maintenance (AVUM) activities in addition to the inspection requirements contained in TM 55-1520-240-PM, Phase Maintenance, and TM 55-1520-240-PMD, Preventive Maintenance Daily.

a. Calendar Inspections are all the inspections based upon elapsed calendar time.

b. Operating Time Special Inspections are all the inspections and maintenance actions based on aircraft operating time which are not compatible with scheduled inspection intervals.

c. Conditional Inspections are all the inspections required when the occurrence of a specific incident or set of conditions mandates immediate inspections.

NOTE

This manual does not contain specific tasks for each inspection requirement contained in the MAC. Only those inspection tasks which contain measurable criteria (bearing damage) are presented. When no specific inspection task exists, the term "inspect" refers to a general visual inspection to look for security, cracks, leaks, loose or missing hardware, obvious damage, and general condition and serviceability.

2. The inspection requirements indicate which items require inspection, when they are to be inspected, and what to look for during the inspection. The PM and the PMD and the requirements of this task must be carried out to make sure faults are found and corrected before a malfunction or a serious failure results. Inspections are arranged in the order they should be carried out and are divided into groups under headings which locate the area of the aircraft that covers the group.

3. Inspection conditions and skills required are extremely variable and may require changes in the order in which the inspections are carried out; however, it is important that all inspections are covered.

4. This manual may contain inspection requirements applicable to specific equipment not installed in individual aircraft. When the situation is encountered, disregard the requirements which are not applicable.

5. Standards of serviceability to be used in day-to-day inspection and maintenance of the aircraft can be found as fits, tolerances, wear limits, and specifications elsewhere in this manual. Standard of serviceability for transfer of aircraft are contained in TM 55-1500-328-25.

1-92 INSPECTION (Continued)

1-92

CALENDAR INSPECTIONS

REF. NO.	FREQUENCY	INSPECTION REQUIREMENTS
1.	VARIABLE	REFER TO TASK 2-370 FOR INSPECTION INTERVALS BASED UPON ENVIRONMENTAL AREAS (SEVERE, MODERATE, OR MILD).
2.	120 DAYS	PERFORM PREVENTIVE MAINTENANCE ON THE AIRCRAFT BATTERY. REFER TO TM 11-6140-203-14-2.
3.	6 MONTHS	PORTABLE FIRE EXTINGUISHERS FOR WEIGHT. REFER TO TM 55-1500-204-25/1.
4.	6 MONTHS	AIRCRAFT WITH MWO 55-1520-240-50-39 INSTALLED. INSPECT TWO IDLER ARMS AND ONE BELLCRANK LOCATED ADJACENT TO THE COMBINER TRANSMISSION FOR DAMAGE AND DETERIORATION OF ALBI PAINT. REFER TO TASK 11-10.1.
5.	12 MONTHS	ENGINE FIRE EXTINGUISHER SYSTEM BOTTLES FOR WEIGHT. VISUALLY INSPECT FOR GENERAL CONDITION AND PRESSURE CHANGE. SYSTEM TUBING AND ELECTRICAL CONNECTION FOR CORROSION AND OBVIOUS DAMAGE. CHECK DA FORM 2408-18 AND THE RETIREMENT SCHEDULE FOR REPLACEMENT REQUIREMENTS.
6.	12 MONTHS	PERFORM AN INVENTORY CHECK. REFER TO DA FORM 2408-17 AND TASK 1-109.
7.	12 MONTHS	MAGNETIC STANDBY COMPASS FOR CORRECT READING ON ALL CARDINAL HEADINGS. REFER TO TM 1-1500-204-23.
8.	12 MONTHS	HSI/RMI FOR CORRECT READING ON ALL COORDINATE HEADINGS. REFER TO TM 1-1500-204-23.
8.1	24 MONTHS	IF THE AIRCRAFT HAS NOT BEEN THROUGH A PHASE INSPECTION WITHIN THE LAST 24 MONTH PERIOD, INSPECT THE HORIZONTAL HINGE PINS AND BEARINGS PER TM 55-1520-240-23-4, TASK 5-40.1.
9.	36 MONTHS	WEIGH THE AIRCRAFT AND PERFORM WEIGHT AND BALANCE RECORDS. CHECK AT NEAREST PHASE INSPECTION BUT NOT TO EXCEED 36 MONTHS. REFER TO TM 55-1500-342-23.

1-92 INSPECTION (Continued)

1-92

OPERATING TIME SPECIAL INSPECTION FOR AIRCRAFT ON PW/PMD

REF. NO.	FREQUENCY	INSPECTION REQUIREMENTS				
1.	PRIOR TO FIRST FLIGHT OF EACH DAY	PERFORM ILCA JAM TEST, PHASE 1. REFER TO TM 55-1520-240-23-6, TASK 7-104.1.				
1.1	AFTER FIRST FLIGHT	ANYTIME AN ENGINE DRIVESHAFT IS INSTALLED, ALL BOLTS SHALL HAVE A TORQUE CHECK PERFORMED AFTER FIRST FLIGHT.				
2.	AFTER FIRST FLIGHT	AFTER REMOVAL/REINSTALLATION/REPLACEMENT, CHECK TORQUE ON HYDRAULIC PUMP (PM 145HS100-3) MOUNT BOLTS. FWD AND AFT XMSN.				
3.	10 FLIGHT HOURS	VISUALLY INSPECT FOR CRACKS THE EXPOSED PORTIONS OF PITCH SHAFTS 1141R2088 ON THE FOLLOWING ROTARY WING HEADS: <table style="margin-left: 40px; border: none;"> <tr> <td style="padding-right: 20px;">FORWARD HEADS</td> <td>145R2003-1, -4</td> </tr> <tr> <td>AFT HEADS</td> <td>145R2004-2, -8</td> </tr> </table>	FORWARD HEADS	145R2003-1, -4	AFT HEADS	145R2004-2, -8
FORWARD HEADS	145R2003-1, -4					
AFT HEADS	145R2004-2, -8					
4.	10 FLIGHT HOURS	ANYTIME PITCH CHANGE LINK MOUNT BOLTS ARE REINSTALLED OR REPLACED, TORQUE MUST BE CHECKED WITHIN 10 FLIGHT HOURS. IF DURING TORQUE CHECK RETORQUEING IS REQUIRED, THE TORQUE CHECK WILL BE REPEATED AFTER SUBSEQUENT FLIGHT, BUT NOT TO EXCEED 10 FLIGHT HOURS.				
4.1	10 FLIGHT HOURS/ 14 DAY BASIS	VISUALLY INSPECT ALL THREE HYDRAULIC PUMPS FOR BROKEN SCREWS ON THE PUMP BODY (NOT THE MOUNTING BOLTS), AND FOR EVIDENCE OF LEAKS. REFER TO TM 55-1520-240-23P-1.				
5.	25 FLIGHT HOURS	PERFORM PREVENTIVE MAINTENANCE ON BATTERY. REFER TO TM 11-6140-203-14-2.				
5.1	25 FLIGHT HOURS	INSPECT OUTBOARD DRIVE SHAFT LUGS AND ADAPTER LUGS. REFER TO TM 55-1520-240-23-5, TASK 6-30.2				
6.	25 FLIGHT HOURS (IF INSTALLED)	AIRCRAFT WITH EAPS INSTALLED, SLIDE NO. 1 AND NO. 2 EAPS FORWARD AND VISUALLY INSPECT INSIDE OF EAPS FOR DIRT, OIL, SECURITY OF BY-PASS DOOR ACTUATORS AND ELECTRICAL WIRING. VISUALLY INSPECT COMPRESSOR FOR SIGNS OF DAMAGE. LIFT ENGINE COWLINGS AND INSPECT FOR LEAKS AND CHAFING OF THE FUEL LINES, OIL LINES. ELECTRICAL LINES, AND FIRE DETECTION ELEMENTS.				
7.	25 FLIGHT HOURS (IF INSTALLED)	INSPECT ELASTOMERIC, LAG DAMPER AND LOWER PITCH LINK BEARINGS FOR CONDITION. (DO NOT REMOVE LAG DAMPER OR PITCH CHANGE LINK TO PERFORM THIS INSPECTION). REFER TO TASK 5-97.2, TM 55-520-240-23-4.				
7.1	25 FLIGHT HOURS	VISUALLY INSPECT UPPER DAMPNER ATTACHING LUG BUSHINGS PN 145R3116-10 FOR SLIPPING/LOOSENESS. (THIS INSPECTION ONLY REQUIRED IF BUSHING WAS FOUND LOOSE OR SUPPING DURING INITIAL				
8.	50 HOURS	VISUALLY INSPECT COMBINER TRANSMISSION SUPPORT FITTINGS PN 114S3820-1 AND -5 FOR CRACKS.				

NOTE

AIRCRAFT 84-24152 AND SUBSEQUENT WITH COMBINER TRANSMISSION SUPPORT FITTINGNS 234S3820-1 AND -2 INSTALLED DO NOT REQUIRE INSPECTION.

OPERATING TIME SPECIAL INSPECTION FOR AIRCRAFT ON **PM/PMD**

REF. NO.	FREQUENCY	INSPECTION REQUIREMENTS
9.	50 HOURS	ENGINE NO.1 AND ENGINE NO.2 DUAL CHIP DETECTORS FOR CONTINUITY. IF READING IS 400 OHMS OR LESS, REMOVE, INSPECT, AND CLEAN CHIP DETECTOR. IF CHIPS ARE NOTED, PERFORM OIL CONTAMINATION INSPECTION. REFER TO TM 55-2840-254-23.
10.	50 HOURS	PERFORM VIBRATION TEST ON COMBINING AND AFT TRANSMISSION COOLING FAN ASSEMBLIES.
10.1	50 FLIGHT HOURS	VISUALLY INSPECT UPPER DAMPNER ATTACHING LUG BUSHINGS PN 145R3116-10 FOR SLIPPING/LOOSENESS. (THIS INSPECTION ONLY REQUIRED IF BUSHING WAS FOUND LOOSE OR SLIPPING DURING INITIAL INSPECTION).
10.2	50 FLIGHT HOURS OR 100 CALENDAR DAYS	TAKE A THREE OUNCE HYDRAULIC FUEL SAMPLE FROM THE AIRCRAFT'S NUMBER ONE AND NUMBER TWO FLIGHT BOOST AND UTILITY HYDRAULIC SYSTEMS (TASK 7-8.1). SEND SAMPLES TO THE UNIT DESIGNATED ARMY OIL ANALYSIS PROGRAM (AOAP) LABORATORY FOR ANALYSIS.
NOTE		
CORRECT HYDRAULIC SAMPLING PROCEDURES ARE PARAMOUNT TO A SUCCESSFUL SAMPLING PROGRAM. THE MAJORITY OF BAD SAMPLES ARE THE RESULT OF IMPROPER SAMPLINGS, INADEQUATE DRAINING AND TAKING OF SAMPLES.		
10.3	50 FLIGHT HOURS OR 100 CALENDAR DAYS	PERFORM INSPECTION OF THE NUMBER ONE AND NUMBER TWO FLIGHT BOOST AND UTILITY HYDRAULIC SYSTEMS.
11.	100 HOURS	ALL FORWARD AND AFT ROTOR HEADS. CHECK TORQUE ON PITCH LINK BOLTS (TASK 5-99.1).
12.	100 HOURS	NO. 1 AND NO. 2 ENGINE TRANSMISSION FAIRING (FAIRING REMOVED) FOR CHAFING, CRACKS, DENTS, TWISTING, AND LOOSE OR MISSING HARDWARE. DUCTS FOR CHAFING, CRACKING, AND SECURITY. AT INSTALLATION, CHECK FOR SECURITY AND INTERFERENCE.
13.	100 HOURS	RETORQUE FWD AND AFT ROTARY WING FIXED DROOP STOP RETAINING BOLTS.
14.	100 HOURS	IF AIRCRAFT IS OPERATED WITH DROOP STOP SHROUDS INSTALLED, INSPECT DROOP STOP STOP BOLTS AND LUGS. (TASK 5-53).
15.	100 HOURS	PERFORM LUBRICATION REQUIREMENTS IAW LUBRICATION CHARTS.
16.	100 HOURS	VISUALLY INSPECT COMBINING TRANSMISSION COOLING FAN ASSY FOR EVIDENCE OF CONTACT BETWEEN THE IMPELLER TIPS AND FAN HOUSING (TIP RUB INSPECTION). DO NOT REMOVE THE FAN FOR THIS INSPECTION.
17.	100 HOURS	PERFORM PREVENTIVE MAINTENANCE ON AIRCRAFT BATTERY. REFER TO TM 11-6140-203-14-2.
17.1	100 FLIGHT HOURS	VISUALLY INSPECT UPPER DAMPNER ATTACHING LUG BUSHINGS PN 145R3116-10 FOR SLIPPING/LOOSENESS. (THIS INSPECTION ONLY REQUIRED IF BUSHING WAS FOUND LOOSE OR SLIPPING DURING INITIAL INSPECTION).

NOTE

IF AFTER COMPLETING THE 25, 50, AND 100 HOUR BUSHING (PIN 145R3116-10) INSPECTIONS AND THE BUSHING HAS NOT SLIPPED OR LOOSENED NO FURTHER INSPECTIONS ARE REQUIRED.

OPERATING TIME SPECIAL INSPECTION FOR AIRCRAFT ON PM/PMD

REF. NO.	FREQUENCY	INSPECTION REQUIREMENTS
17.2	100 FLIGHT HOURS	INSPECT THE COMBINING TRANSMISSION COOLING FAN SHAFT PER TASK 6-182.1.
17.3	100 FLIGHT HOURS	CHECK THE COMBINING TRANSMISSION COOLING FAN SHAFT OUTPUT GEAR SPLINE FOR WEAR USING THE SPLINE WEAR (GO-NO-GO) GAGE, P/N SK33330-018.
18.	200 HOURS OF ENGINE OPERATION AND EVERY 50 HOURS THEREAFTER	INSPECT AFT CONNECTING LINK (TASK 4-37).
NOTE		
AFTER COMPLIANCE WITH MWO 1-1520-240-50-60, 50 HOUR INSPECTION REQUIREMENTS IS CHANGED TO 200 HOURS OR NEAREST PHASE.		
19.	300 HOURS AND EVERY 100 HOURS THEREAFTER	PERFORM EDDY CURRENT INSPECTION OF HUB SPLINES OR FLUORESCENT PENETRANT INSPECT A <u>ONE INCH</u> WIDE ANNULAR STRIP AROUND THE SPLINE HOLE ON THE BOTTOM SURFACE OF THE HUB OF THE FOLLOWING ROTOR WING HEADS: FORWARD HEAD 145R2003-1 AFT HEAD 145R2004-2
20.	DELETED	
21.	1200 HOURS ROTARY WING HEAD OPERATION SINCE NEW OR OVERHAUL	INSPECT ROTARY-WING HEAD HORIZONTAL HINGE PINS AND BEARINGS FOR SPALLING AND DAMAGE. ROTATE SERVICEABLE PINS AND BEARINGS <u>180 DEGREES</u> AND REINSTALL THEM. INSPECT AND ROTATE SERVICEABLE VERTICAL PIN BEARING <u>180 DEGREES</u> AND REINSTALL ON ALL HEAD ASSEMBLIES <u>EXCEPT</u> FOR HEAD ASSEMBLIES (145R2003-1&4) AND (145R2004-2&8) LISTED ON PAGES 1-286 THRU 1-286.3. INSPECT ROTORY-WING HEAD TIE BAR ASSEMBLIES PER TASK 5-23.1.1.
22.	1200 HOURS	INSPECT FUEL TANK ASSEMBLIES. REFER TO TM 55-1520-240-23-8, TASK 10-4.

1-92 INSPECTION (Continued)

1-92

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
1.	ALL	UPON TRANSFER AND UPON RECEIPT OF AN AIRCRAFT; UPON PLACING AN AIRCRAFT IN STORAGE; AND UPON REMOVAL OF AIRCRAFT FROM STORAGE (AIRCRAFT NEED NOT BE INVENTORIED WHILE IN STORAGE):	Perform an inventory check. Refer to DA Form 2408-17 and Task 1-109.
2.	ALL	PRIOR TO TRANSFER AND IMMEDIATELY UPON ASSIGNMENT OF AIRCRAFT:	Accomplish standard of serviceability requirements. Refer to TM 55-1500-328-25.
3.	ALL	WHEN OVERHAULS, MAJOR MODIFICATIONS, OR MAJOR AIRFRAME REPAIRS ARE ACCOMPLISHED; WHEN ANY SPECIAL EQUIPMENT HAS BEEN ADDED OR REMOVED FROM THE BASIC AIRFRAME; OR WHEN WEIGHT AND BALANCE DATA ARE SUSPECTED TO BE IN ERROR:	Weigh the aircraft and perform a weight and balance records check. Refer to TM 55-1500-342-23.
4.	ALL	WHEN AN AIRCRAFT DOES NOT FLY OR THE ENGINES ARE INOPERABLE FOR 14 CONSECUTIVE CALENDAR DAYS:	Perform a Daily inspection in accordance with TM 55-1520-240-PMD and perform an engine ground run.
5.	ALL	WHEN WATER LANDINGS HAVE BEEN PERFORMED, AFTER THE LAST FLIGHT OF THE DAY:	<p>a. Right and left pod compartments, cargo loading ramp, and fuselage bilge for liquids. Open drain valves on underside of fuselage (Task 2-214). Close valves after draining (Task 2-215).</p> <p>b. Lower cockpit enclosures for cracks.</p>

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
			<p>c. Landing searchlights and lower anticollision light for cracked lenses. Open drain plug in lower anticollision light. Check for trapped fluid. Close drain plug.</p> <p>d. Underside antennas and cargo hooks for damage and security.</p> <p>e. Forward and aft cargo hooks. Remove drain plugs from solenoid covers. Check for water inside cover.</p> <p>f. Ramp hinge cover for damage.</p> <p>g. Drain pitot static and AFCS yaw sensing systems.</p> <p>h. Purge landing gear lubrication fittings with grease. Clean the shock struts. Apply hydraulic fluid to the exposed areas of the shock strut pistons. (Use a clean cloth.)</p> <p>i. Wheel bearings (removed) for condition. Clean and lubricate the wheel bearings not later than <u>3</u> days after the initial water landing (Task 3-33).</p>
6.	ALL	WHEN SALT WATER LANDINGS HAVE BEEN PERFORMED AFTER THE LAST FLIGHT OF THE DAY:	<p>a. Perform conditional inspection no. 5.</p> <p>b. Wash aircraft (Task 1-76).</p> <p>c. Clean engines. Refer to TM 55-2840-254-23.</p> <p>d. Clean APU compressor. Refer to TM 55-2835-205-23).</p>

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
7.	1,10		<p>WHEN A LANDING IN MUD OR SWAMPY TERRAIN IS MADE OR DIFFICULT STARTING OR TORCHING OF THE CABIN HEATER OCCURS:</p> <p>Inspect and clean cabin heater drain line (Task 13-9).</p>
8.	ALL		<p>WHEN THE AIRCRAFT IS STRUCK BY LIGHTNING:</p> <p>Perform lightning strike inspection (Task 2-5).</p>
9.	2,3,7		<p>WHEN AN AIRCRAFT HAS BEEN WASHED OR SUBJECTED TO HEAVY RAIN:</p> <p>a. Right and left pod compartments, cargo loading ramp, and fuselage bilge for liquids. Open drain valves on the underside of fuselage (Task 2-214). Close valves after draining (Task 2-215).</p> <p>b. Open drain plug in lower anti-collision light. Check for fluid.</p> <p>c. Check synchronizing drive shafting for water. Clear water drains as required.</p>
10.	2,3		<p>WHEN A LANDING GEAR WHEEL ASSEMBLY HAS BEEN REMOVED:</p> <p>Remove, clean, inspect, and repack landing gear wheel bearings (TM 55-1500-204-25/1 and TM 55-1500-322-24).</p>

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
11.	2,3		<p>WHEN LANDING GEAR WHEELS HAVE BEEN SUBMERGED IN WATER OR MUD:</p> <p>a. Purge landing gear lubrication fittings with grease. Clean the shock struts. Apply hydraulic fluid to the exposed areas of the shock strut pistons. (Use a clean cloth.)</p> <p>b. Wheel bearings (removed) for condition. Clean and lubricate the wheel bearings not later than <u>3 days</u> after the wheels were submerged (Task 3-33).</p>
12.	2,3		<p>WHEN FUEL VENTS OVERBOARD OR UNEVEN TANK DEPLETION RATE OCCURS FROM AN AUXILIARY FUEL TANK DURING NORMAL OPERATION:</p> <p>a. Determine if fuel boost pump is functional and is delivering at least <u>22 psig</u> pressure.</p> <p>b. Check for loose connections in affected fuel cell manifold.</p> <p>c. Perform pressure refueling precheck.</p> <p>d. Inspect tank outlet check valve (breakaway valve) is closed in affected tank.</p>
13.			<p>IF FUEL VENTS OVERBOARD FROM A MAIN FUEL TANK DURING NORMAL FLIGHT OPERATIONS:</p> <p>a. Perform pressure refueling precheck.</p> <p>b. Perform pressure check of <u>2-inch</u> pressure refueling/auxiliary fuel transfer hose.</p> <p>c. Perform pressure check of vent system for affected tank.</p>

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
14.			WHEN AN AIRCRAFT HAS BEEN SUBJECTED TO A HARD LANDING OR WHEN EMERGENCY EXIT LIGHTS (IF INSTALLED) ARE ACTUATED DURING LANDING:
	2,3		a. Landing gear attachment fittings for misalignment and cracks. Fluorescent inspect in accordance with TM 55-1500-335-23.
	2,3, 8,9		b. Support frames and skin (internal and external) for distortion.
	6,7,8 9,10		c. Fuselage and transmission support members for cracks and distortion.
	4,5,8		d. No. 1 and No. 2 engine support structure for cracks, distortion, and loose rivets.
	4,5		e. Perform excessive G-Load inspection on engines. Refer to TM 55-2840-254-23.
	4, 5		f. Engine mounting pads for cracks and loose bolts.
	8		g. APU support structure for cracks, distortion, and loose rivets.
	2,3		h. Wheels for cracks and distortion. Fluorescent inspect in accordance with TM 55-1500-335-23.
	2,3		i. Shock struts for leakage and distortion.
	2,3		j. Fluorescent inspect shock strut mount fittings for cracks. Refer to TM 55-1500-335-23.
	2,3		k. Tires for damage.
	6,7		l. Droop stops and hub for distortion.
	1,10		m. Dynamic absorbers support structure for cracks, distortion, and loose rivets.
	2,3		n. Fuel pod support structure for cracks and distortion.
	2,3		o. Perform inspection on crash resistant fuel system (Task 10-4).

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
15			WHEN HARD LANDING INSPECTION SHOWS MISALIGNMENT OR CRACKS IN LANDING GEAR, OR DISTORTION AND/OR LOOSE OR MISSING RIVETS IN SUPPORTING FRAMES OR SKIN:
	2,3		a. Wheels (disassembled) for cracks. Fluorescent inspect wheel forgings, welded areas, axles, and attaching bolts in accordance with TM 55-1500-335-23. Wheel bearings for condition.
	4,5		b. No. 1 and No. 2 engine supports for cracks. Fluorescent inspect in accordance with TM 55-1500-335-23.
	8		c. Ramp for proper operation and alignment of pins in sockets.
	2,3		d. Fuel cells and components for damage and loose attachment fittings (pod lowered).
16.	2,7		WHENEVER SKIS ARE INSTALLED:
			a. Daily - Axial shaft attaching points, trailing wheel and attaching points, and springs actuator attaching points for security.
			b. Every 24 Hours - Ski (around wheel well) for cracks and delaminations. Bungee cords and guide lines for condition and security, lubricate 3 fittings per ski with grease (E190).
17.	4,5		WHEN AN ENGINE IS DROPPED DURING HANDLING:
			Perform an engine dropped inspection. Refer to TM 55-2840-254-23.

1-92 INSPECTION (Continued)

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CONDITIONAL INSPECTIONS

REF NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
18.	DELETED		
19.	4, 5	WHEN ENGINE OIL CONSUMPTION EXCEEDS <u>2 QUARTS</u> PER HOUR:	Perform a hot end inspection and a high oil consumption check at the next inspection phase. Refer to TM 55284025423.
20.	4, 5	WHEN AN ENGINE IS SUBJECTED TO SUDDEN STOPPAGE OR A SUDDEN REDUCTION IN RPM:	Perform an overtorque inspection. Refer to TM 55-2840-254-23.
21.	4, 5	WHEN AN ENGINE OVERTEMPERATURE IS EXPERIENCED AS SPECIFIED IN TM 55-1520-240-1 0.	Perform a hot end inspection. Refer to TM 55-2840-254-23.

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Conditional Inspections (Continued)

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
22.	4, 5	WHEN AN N2 OVERSPEEDS AS SPECIFIED IN TM 55-1520-240-10:	<p>a. Compute to find if actual overspeed occurred (Task 4-7).</p> <p>b. If overspeed occurred, perform an overspeed inspection. Refer to TM 55-2840-254-23.</p>
23.	4, 5	WHEN AN ENGINE COMPRESSOR STALL (SURGE) IS EXPERIENCED:	<p>Perform compressor stall inspection. Refer to TM 55-2840-254-23.</p>
24.	4,5	AT TIME OF ENGINE REMOVAL FOR ANY REASON:	<p>a. Forward airframe support engine mount lugs (visually) for cracks, nicks, scratches, and elongated holes.</p> <p style="text-align: center;">NOTE</p> <p>The inspections in paragraphs b and c are required at engine removal <u>only</u>. Do not remove engines just to perform these inspections.</p> <p>b. Remove the bolts through the spherical bearings. Remove the slip fit bushings and the spherical bearings (do not remove the press fit bushings). Fluorescent penetrant inspect or eddy current inspect forward airframe support engine mount lugs. Check all parts for wear (Task 4-28). (Not required if it has been performed in the last <u>600 hours</u> or aircraft operation.)</p>
24.1	4,5	ANYTIME AN ENGINE IS INSTALLED:	<p>On aircraft with T55-GA-714A engines only. Perform Aviation Vibration Analyzer (AVA) check IAW TM 1-2840-265-23 and AVA procedures.</p>

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 CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
19.	4,5	PRIOR TO FIRST FLIGHT EACH DAY:	
	6,7,8		<p>a. Perform a health indicator test (HIT) (Task 4-2).</p> <p>b. Visually inspect all transmission and aft rotor shaft pressure switches and surrounding areas for oil leakage.</p> <p>(1) If evidence of oil leakage is observed, remove the switch and inspect the o-ring for damage.</p> <p>(2) If the o-ring is serviceable, perform a fluorescent penetrant inspection of the switch body with special attention to the three circumferential welds.</p> <p>(3) Any indication of weld failure is cause for rejection.</p>

Conditional Inspections (Continued)

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
25.	4,5	WHEN THE ENGINE OIL FILTER BUTTON IS EXTENDED:	<p>c. Inspect engine drag link IAW Task 4-41. (Not required if it has been performed in the last <u>600 hours</u> of aircraft operation.)</p> <p>Replace filter element and perform with Task No. 1-99, TM 55-2840-254-23-1.</p>
26.	4, 5	WHEN EMERGENCY POWER REACHES <u>30 MINUTES</u> CUMULATIVE TIME:	<p>a. Perform engine hot end inspection. Record number of hot end inspections on DA Form 2408-15. Record the computed elapsed time spent in emergency power on DA Form 2408-15.</p> <p>b. Record cumulative engine emergency power minutes, time since last hot end inspection, and total engine operating hours on DA Form 2408-15.</p>
27.	4, 5, 10	WHEN THE ENGINE OR TIMER/EMERGENCY POWER PANEL IS REMOVED OR INSTALLED:	<p>a. Record the total reading on the digital timer for the installed engine on DA Form 2408-15. Record next hot end inspection due on DA Form 2408-18.</p> <p>b. Reset the black and white indicator flag using switch in nose compartment while helicopter is on ground.</p>

CONDITIONAL INSPECTIONS

REF NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
28.	4,5		<p>WHEN AN ENGINE NEW TO THE AIRCRAFT IS INSTALLED, AFTER REPLACEMENT OF A MAJOR ENGINE COMPONENT (SUCH AS A HOT-END), OR AFTER REPLACEMENT OF THE FUEL CONTROL AND AFTER ADJUSTMENT OF GROUND IDLE SPEED OR COMPRESSOR ROTOR MAXIMUM SPEED.</p> <p>Perform a turbine engine analysis check (TEAC) (Task 4-3).</p>
29.	4,5		<p>WHEN A NEW, OVERHAULED, OR PERMANENT STORAGE ENGINE IS INSTALLED:</p> <p>Perform activation check run on the engine. Refer to TM 55-2840-254-23.</p>
30.	4,5		<p>WHEN A ROTATING GAS PRODUCER COMPONENT OR POWER TURBINE ASSEMBLY IS REPAIRED OR REPLACED OR IF EXCESSIVE ENGINE VIBRATION IS SUSPECTED:</p> <p>Perform engine vibration check. Refer to TM 55-2840-254-23</p>
31.	4,5 6,7		<p>WHEN AN ENGINE DRIVE SHAFT OR SYNCHRONIZING DRIVE SHAFT IS INSTALLED:</p> <p>Retorque (do not remove) the adapter bolts and nuts at each end of the shaft which had not been removed.</p>
32.	4,5		<p>WHEN A CONE ASSEMBLY (TAILPIPE) IS INSTALLED OR REPLACED:</p> <p>After initial engine ground run, <u>RETORQUE COUPLING NUT TO 30 POUND-INCHES ABOVE RUN-ON TORQUE.</u></p>

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
33.	4, 5	WHEN STARTING OR BEEPING ENGINES, IF LOUD NOISES OR SHOCKS ARE FOLLOWED BY SUDDEN HIGH INCREASES IN ENGINE TORQUE, OR IF A TORQUE-METER IS STATIONARY AT HIGH VALUE AFTER SHUTDOWN:	Do not restart affected engine. Troubleshoot engine in accordance with Chapter 4 and engine transmission in accordance with Chapter 6 of TM 55-1520-240-T. If cause cannot be determined, remove and replace engine and engine transmission. Perform an engine over-torque/sudden engagement inspection in accordance with TM 55-2840-254-23. Remove two electrical generators on aft transmission and inspect shafts for evidence of damage.
34.	4, 5	WHEN AN ENGINE HOT END INSPECTION HAS BEEN PERFORMED OR AFTER A HOT END SECTION, POWER TURBINE SHAFT, OR OUTPUT SHAFT HAS BEEN REPLACED:	Confirm that the output shaft and play inspection has been performed. Refer to TM 55-2840-254-23.
35.	4, 5	WHEN AN ENGINE IS INSTALLED:	Retorque forward engine mount bolts after first flight. Do not exceed <u>4 flight hours</u> . (TASK 4-35)
36.	4, 5	WHEN STARTING ENGINES, IF EITHER ENGINE FAILS TO ACCELERATE TO FLIGHT SPEED:	Restart suspect engine first, followed by the good engine. If either engine will not engage, always shut down the engine that will not engage first. Troubleshoot in accordance with TM 55-1520-240-T. If it is determined that the engine is not the problem, the engine transmission(s) may have a defective clutch. Replace engine transmissions which failed to engage during the first and second starting sequence.

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
37.	4,5	WHEN CO2 IS APPLIED TO THE ENGINE:	<p>a. If CO2 is applied into the air inlet while the engine is hot or rotating, perform a hot end inspection. Refer to TM 55-2840-254-23. Inspect the area subjected to CO2 for cracks.</p> <p>b. If CO2 is applied into the tailpipe or other engine areas while the engine is hot or rotating, inspect the area subjected to CO2 for cracks.</p>
38.	4,5,6 7,8	WHEN STEADY STATE TORQUE LIMITS HAVE BEEN EXCEEDED FOR <u>10 SECONDS</u> OR MORE:	<p>a. Replace any engine transmission if <u>150 percent</u> torque is exceeded on that transmission.</p> <p>b. Replace the combining transmission if <u>150 percent</u> torque is exceeded on either engine or <u>260 percent</u> total torque from both engines is exceeded.</p> <p>c. Inspect engine if <u>154 percent</u> torque is exceeded on that engine. Refer to TM 55-2840-254-23.</p> <p>d. Replace the forward and aft transmissions if <u>260 percent</u> total torque from both engines is exceeded.</p>
39.	4,5,6 7,8	WHEN TRANSIENT (NEVER EXCEED) TORQUE LIMITS HAVE BEEN EXCEEDED:	<p>a. Replace any engine transmission if <u>154 percent</u> torque is exceeded on that transmission.</p> <p>b. Replace the combining transmission if <u>154 percent</u> torque is exceeded on either engine.</p>

1-92 INSPECTION (Continued)

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CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
			<p>c. Inspect any engine if <u>154 percent</u> torque is exceeded on that engine. Refer to TM 55-2840-254-23.</p> <p>d. Replace the forward and aft transmissions if <u>300 percent</u> total torque from both engines is exceeded.</p>
40.	6		<p>AT INSPECTION PHASE NEAREST <u>300 HOURS</u> OF AIRCRAFT OPERATION SINCE INITIAL OR SUBSEQUENT AFT PYLON INSTALLATION:</p> <p>Retorque bolts NAS628 and nuts in the aft pylon-to-airframe splice (backed off and retightened) to specified torque.</p>
41.	4,5,6 7,8, 10		<p>WHEN THE TRANSMISSION OIL TEMPERATURE EXCEEDS <u>140 C</u> OR THE #1 OR #2 ENGINE XMSN HOT INDICATOR LIGHTS:</p> <p>a. Functionally check the affected oil temperature indicating system. Refer to TM 55-1520-240-T .</p> <p>b. If the indicating system is satisfactory, replace the transmission (Tasks 6-46, 6-51, 6-72, 6-77, 6-92, 6-97, 6-100, 6-107.)</p> <p>c. Determine the cause of overheating.</p>
42.	6, 7		<p>WHEN ANY MAJOR HYDRAULIC SYSTEM MAINTENANCE ACTION HAS BEEN PERFORMED THAT REQUIRED A SIGNIFICANT REPLACEMENT OR EXCHANGE OF FLUID:</p> <p>Perform an oil leak tolerance check (Task 6-109).</p>
42.1.	6, 7, 8		<p>WHENEVER A MAJOR HYDRAULIC COMPONENT (FOR EXAMPLE: THE PUMP, CHECK VALVE, ETC.) HAS FAILED, OR WHENEVER THE HYDRAULIC SYSTEM IS SUSPECT OF A FAULT, A SPECIAL HYDRAULIC FLUID SAMPLE MUST BE TAKEN.</p>
42.2.	6, 7, 8		<p>WHENEVER ANY HYDRAULIC FLUID FILTER ELEMENTS ARE REMOVED FROM THE AIRCRAFT DURING PHASE INSPECTION OR FOR NORMAL MAINTENANCE REPLACEMENT, SEND ELEMENTS TO THE UNITS DESIGNATED AOAP LABORATORY FOR ANALYSIS.</p> <p>Perform a hydraulic fluid contamination check (Task 7-8.1).</p>
43.	6, 7, 8, 10		<p>WHEN A TRANSMISSION LUBRICATION SYSTEM HAS BEEN CONTAMINATED:</p> <p>Perform an oil system contamination inspection (Tasks 6-112, 6-140, 6-170, 6-198).</p>

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
44.	6,7 8,10		<p>WHEN A TRANSMISSION, AFT ROTARY WING SHAFT, OR TRANSMISSION OIL COOLER IS REPLACED OR INACTIVE FOR <u>30 DAYS</u>:</p> <p>a. Perform a <u>30 minute</u> ground run at normal rotor rpm.</p> <p>b. After ground run and prior to first flight, inspect applicable filter(s) for extended indicator buttons.</p> <p>c. After first flight, inspect applicable filter(s) for extended indicator buttons.</p>
45.	6,7 8,10		<p>WHEN CONTAMINATION IS FOUND ON A TRANSMISSION OR AFT ROTARY WING DRIVE SHAFT, CHIP DETECTOR, DEBRIS DETECTION SCREEN, MAIN INLET SCREEN, OR AUXILIARY OIL FILTER:</p> <p>Check the quantity, source, form, and type of material. Determine serviceability or necessity for replacement of component (Tasks 6-108, 6-136, 6-166, and 6-194).</p>
46.	6		<p>WHEN AN AFT TRANSMISSION HAS BEEN REPLACED DUE TO METAL CONTAMINATION:</p> <p>Remove, inspect, and clean aft rotary wing drive shaft filter and chip detector. If the chip detector is contaminated, replace the aft rotary wing drive shaft (Tasks 6-56 or 6-57 and 6-62 or 6-63).</p>
47.	6,7 8,10		<p>WHEN THE TRANSMISSION FILTER BYPASS BUTTON IS EXTENDED:</p> <p>Replace filter element. Check in accordance with Tasks 6-108, 6-136, 6-166, and 6-194.</p>

1-92 INSPECTION (Continued)

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CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
48.	6, 7, 8, 10	WHEN AN ENGINE TRANSMISSION IS REMOVED:	Inspect the quill shaft nylon snubber (Task 6-101). If the snubber is cracked, distorted, or disconnected, from the shaft shoulder, replace with new like item. If the snubber is disintegrated, replace engine transmission (Task 6-107).
48.1	6	PRIOR TO ENGINE TRANSMISSION BEING INSTALLED:	Conduct records check of the engine transmission DA Form 2408-16 to determine the serial numbers of the input pinion spiral bevel gearshaft (145D6301) and spiral bevel gearshaft (145D6302) for prefix letter of "P" in the serial number. Engine transmissions with this prefix letter "P" in the serial number of these gear shafts are considered unserviceable.
49.	6	WHEN AN ENGINE TRANSMISSION HAS BEEN REMOVED BECAUSE OF A SUSPECTED INTERNAL FAILURE AND THE OIL FILTER OR CHIP DETECTOR SHOW SIGNS OF METAL CONTAMINATION:	<p>a. If filter shows signs of being bypassed or if the filter warning indicator is extended, inspect inlet screen for contamination.</p> <p>b. If inlet screen is contaminated, replace oil cooler and inlet screen and flush hose between cooler and inlet screens. Perform serviceability check (Task 6-108).</p>
50.	6, 7, 8, 10	WHEN A TRANSMISSION IS SUSPECTED OF EXCESSIVE OIL LEAKAGE:	Perform an oil leak tolerance check (Task 6-109).
51.	6, 7, 8, 9	UPON REACHING <u>25 HOURS</u> ON A NEW, OVERHAULED, OR REWORKED AIRCRAFT:	Torque check mount bolts (forward transmission) and nuts (aft transmission, combining transmission, and aft rotary wing drive shaft) to specified torque (Tasks 6-51, 6-62, 6-77 and 6-97).
52.	6, 7, 8, 9	UPON REACHING 25 HOURS FOLLOWING INSTALLATION OF A FORWARD, AFT, OR COMBINING TRANSMISSION OR AN AFT ROTARY WING DRIVE SHAFT:	Retorque (back off and retighten) mount nuts to specified torque (Tasks 6-51, 6-62, 6-77 and 6-97).

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CONDITIONAL & INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
53.	6,7	PRIOR TO INSTALLATION OF A REPLACEMENT	ROTARY WING BLADE: Insure letter E or F appear in identification plate,
54.	6,7	WHEN A ROTARY WING BLADE HAS MADE CONTACT WITH A FOREIGN OBJECT OR WHEN THE POWER TRAIN HAS BEEN SUBJECTED TO A SUDDEN REDUCTION IN RPM:	a. Inspect all six rotary wing blades as follows: (1) Blade leading edge for dents, buckles, tears, and unbonding. (2) Blade upper and lower surfaces for dents, delaminations, buckles, wrinkles, and tears. (3) Blade spar roots for distortion and delamination. (4) Blade trailing edges for cracks, delaminations, and distortion. (5) Tip cover and rib closure for damage. Remove tip cover and inspect visible portion of blade interior for damage. check tip weight hardware for security and damage. (6) Shock absorber attachment brackets and filament windings for cracks, delaminations, and distortion. b. Inspect blade shock absorber for leakage, distortion, cracks (giving particular attention to threaded area of rod end), and unrestricted travel. Shock absorber attachment brackets on rotary wing head for cracks, distortion, and elongated holes. c. If inspection of blades and shock absorbers reveals damage or if a sudden reduction of power train occurs, inspect the following:

Conditional Inspections (Continued)

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
			<p>(1) Aft rotor shaft center (aluminum) section and all power train drive shafting for buckling. If buckling is detected, remove all power train transmission and drive shafting.</p> <p>(2) If there is no buckling, proceed to step (4).</p> <p>(3) If buckling is found and power train components have been removed, proceed to step (7).</p> <p>(4) Power train shafting, adapters, and plate assemblies for cracks and security of attachment.</p> <p>(5) Bearing housing shock mounts for freedom of fore-and-aft movement on support bushings, torn or unbonded rubber, and security.</p> <p>(6) Drive system for freedom of rotation.</p> <p>(7) Transmission and drive shafting supports for distortion, cracks, and security. Adjacent structure for damage.</p> <p>(8) Rotary wing heads, pitch links, and controls for cracks, nicks, and distortion.</p> <p>(9) Upper dual boost actuators for leakage. Attachment fittings for a cracks and security.</p>
55	6, 7	WHEN ROTOR RPM EXCEEDS <u>115 PERCENT</u> :	<p>a. Replace the forward and aft rotary wing heads, including vertical hinge pins. Identify heads as overspeeding. Return to depot.</p> <p>b. Inspect each blade for obvious damage (Task 5-63.1). If any damage is evident, blade is not acceptable for flight. If no damage is evident, blade is acceptable for flight.</p>
55.1	6, 7	WHEN ROTOR RPM EXCEEDS <u>111 PERCENT</u> , BUT DOES NOT EXCEED <u>115 PERCENT</u> RPM:	<p>Inspect the rotor head tie-bar assemblies per task 5-23.1.1 at the next rotor head removal, but no later than completion of next phased maintenance.</p>

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Conditional Inspections (Continued)

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
56.	6, 7	WHEN A ROTARY WING BLADE HAS BEEN STRUCK BY LIGHTNING:	Perform lightning strike inspection (Tasks 2-5 and 5-63.2)
57.	6, 7	WHEN A ROTARY WING BLADE HAS BEEN FLAPPING DUE TO HIGH WINDS:	Inspect rotor system (Task 5-63.3)
57.1	6, 7	TO INSTALLATION OF ROTARY WING HEAD ASSEMBLY PN 145R2003-9 (FWD) AND/OR PN 1452004-18 (AFT):	Visually inspect bushings PN 145R3116-10 for slipping/looseness.
57.2	6, 7	PRIOR TO INSTALLATION OF ROTARY WING HEAD ASSEMBLIES:	Rotor hubs with lightening holes only, perform eddy current inspection and inspect the area surrounding the verticle web.
58.	6, 7	WHEN A ROTARY WING HEAD IS SUSPECTED OF EXCESSIVE OIL LEAKAGE:	Perform an oil leakage tolerance check (Task 5-5).
59.	6, 7	WHEN A ROTARY WING HEAD IS REPLACED OR REINSTALLED AFTER THE FIRST FLIGHT:	<ol style="list-style-type: none"> a. Tang washer and lock-ring for proper installation and security (Task 5-9). b. Retaining nut for specific torque Task 5-9.1).
60.	6, 7	WHEN THE AIRSPEED LIMITATION, WITH LONGITUDINAL CYCLIC TRIM ACTUATORS RETRACTED AS SPECIFIED IN TM 55-150-240-10, CHAPTER 5, HAS BEEN EXCEEDED:	<ol style="list-style-type: none"> a. With forward actuator retracted, inspect forward rotor head and droop stops for damage. b. With aft actuator retracted, replace the aft rotary wing driveshaft only if gross weight exceeds 40,000 pounds (Tasks 6-56 or 6-57 and 6-62 or 6-63).
61.	7, 10	WHEN THE FLIGHT CONTROLS HAVE BEEN MOVED OR THE HYDRAULIC PRESSURE IS REMOVED WHILE RIGGING PINS ARE INSTALLED:	Perform the inspection for damage following movements of flight controls with rigging pins installed (Tasks 11-19 and 11-20).

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
62.	6, 7	WHEN A FORWARD OR AFT LCT ACTUATOR IS REPLACED:	Perform LCT actuator operational check (affected system only). Task 11-3.34.1 for forward and Task 3-3.34.2 for aft.
63.	6, 7	WHEN THE ROTOR BLADES ARE POUNDING AGAINST THE DROOP STOPS, OR HAVE EXPERIENCED VIOLENT AND HEAVY FLAPPING:	<ul style="list-style-type: none"> a. Droop stops, pitch links, rotor blades and rotary wing heads for distortion and visible damage. (Task 5-63.3) b. Damage to droop stops, pitch links, or rotary wing head requires replacement of only the affected blades. (Task 5-63.3). c. Identify the removed blades as having experienced excessive flapping.
64.	8, 10	WHEN INTERNAL FAILURE (METAL CONTAMINATION) OF A FLIGHT CONTROL OR UTILITY HYDRAULIC PUMP OR MOTOR OCCURS:	Flush the affected system. Use a hydraulic test stand equipped with a <u>3-micron</u> filter (Tasks 7-9 thru 7-15 or 7-315 thru 7-326).
65.	8	AFTER 50 HOURS OF HELICOPTER OPERATION FOLLOWING APU INSTALLATION:	APU mounting bolts for specified torque (<u>75 to 85 inch-pounds</u>).
66.	10	WHEN THE COMPASS IS SUSPECTED OF BEING IN ERROR:	Magnetic standby compass indicator for correct reading on all cardinal headings. Refer to TM 55-1500-204-25/1.

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
67.	10		<p>PRIOR TO INSTALLATION OF FREE AIR TEMPERATURE (FAT) GAGE:</p> <p>Each time the FAT gage is replaced, test the replacement gage. Refer to TM 55-1500-204-25/1.</p>
68.	9		<p>AFTER EVERY THIRD MANUAL RELEASE OF THE CENTER CARGO HOOK UNDER LOAD:</p> <p>Remove hook and perform a special inspection (Task 16-3).</p>
69.	2,3,9		<p>UPON COMPLETION OF FIRST PRESSURE REFUELING:</p> <p>Inspect for fuel leakage after installation of fuel transfer hose P/N 145PS498-1.</p>
70.	4,5		<p>USE OF EMERGENCY FUEL:</p> <p>Emergency fuel 100LL (low lead) AVGAS is authorized for use with operation not to exceed 6 hours cumulative time, after which the engine shall be removed and returned to depot maintenance. All engine operation using emergency fuel shall be recorded on DA Form 2408-13.</p>
71.	6		<p>WHENEVER REPLACEMENT AND/OR MAINTENANCE IS DONE ON AFT TRANSMISSION COOLING FAN ASSEMBLY OR FAN DRIVE SHAFT:</p> <p>Perform Vibration Test.</p>
72.	6		<p>WHENEVER REPLACEMENT AND/OR MAINTENANCE IS DONE ON COMBINING TRANSMISSION AND/OR DRIVE TRAIN COMPONENTS:</p> <p>Perform Vibration Test.</p>
73.	4,5		<p>30 DAYS OR 25 OPERATING HOURS WHICHEVER OCCURS FIRST</p> <p>WHENEVER AN AIRCRAFT IS OPERATED IN SALT LADEN ENVIRONMENT OR WITHIN 200 MILES OF VOLCANIC ACTIVITY:</p> <p>Wash engine - refer to TM 55-2840-254-23</p>

CONDITIONAL INSPECTIONS

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
74	6,7	PRIOR TO INSTALLATION OF ANY ROTOR HEAD RECEIVED FROM THE SUPPLY SYSTEM.	PERFORM INSPECTION TO ENSURE FLOW OF LUBRICATING OIL TO THE HORIZONTAL HINGE PIN BEARINGS.
75	6,7	WHENEVER A SWASHPLATE IS INSTALLED.	PERFORM SWASHPLATE PULL TEST IN ACCORDANCE WITH TASKS 5-114, 5-114.1, AND 5-115.
76	10	WHENEVER A FORWARD TRANSMISSION IS INSTALLED.	<p>PRIOR TO INSTALLATION, INSPECT FORWARD TRANSMISSION MAIN LUBRICATION PUMP FOR THE FOLLOWING SERIAL NUMBERS:</p> <p>V534, V535, V539, V541, V545, V557, V561, V564, V566, V569, V574, V575, V577 THROUGH V581, AND V589 THROUGH V598.</p> <p>IF THE ABOVE SERIAL NUMBERS ARE FOUND, CONTACT SFAE-AV-CH-L. IF THE ABOVE SERIAL NUMBERS ARE NOT FOUND, RECORD THE SERIAL NUMBER OF THE PUMP IN THE REMARKS BLOCK OF THE FORWARD TRANSMISSION DA FORM 2408-16.</p>
77	4,5	ANYTIME THE ENGINE AIR INLET SCREENS ARE REMOVED.	CHECK BOND LINE OF THE SILICONE RUBBER PAD ON STRAP ASSEMBLIES 114P8079-2 AND -3 FOR LOOSENESS.
78	6,10	PRIOR TO INSTALLATION OF A FORWARD OR AFT TRANSMISSION.	CHECK THE FORWARD OR AFT TRANSMISSION SERIAL NUMBERS FOR A "MG". A "MG" AFTER THE SERIAL NUMBER IS REQUIRED ON THE FORWARD AND AFT TRANSMISSIONS FOR NON RESTRICTIVE FLIGHT.
79	6,7	PRIOR TO INSTALLATION OF A HORIZONTAL HINGE PIN ASSEMBLY.	PERFORM VISUAL INSPECTION OF THE HORIZONTAL HINGE PIN PER TASK 5-45.

**SECTION IX
STORAGE OF AIRCRAFT**

Change 58 1-312.5/(1-312.6 blank)

NOTE

CH-47D helicopters are prepared for shipment as directed in TM 55-1520-241 -S.

1. Storage includes corrosion control by preventing moisture from contacting exposed metal surfaces using preservatives.
2. There are two main types of corrosion: direct chemical and electrochemical.
3. Direct chemical corrosion occurs when airborne chemicals erode or etch metal surfaces.
4. Galvanic corrosion occurs between dissimilar metals when moisture is present.
5. Preservation consists of providing clean, moisture-free surfaces, which are protected with a barrier from corrosion conditions.
6. Inspect for corrosion during storage.
7. If wet weather conditions exist, perform the following:
 - a. Keep fabrics, rubber, and other materials as dry as possible.
 - b. Keep fabric in aircraft clean.
 - c. Treat all visible corrosion (TM 43-0105).
 - d. If salty air is present, wash aircraft regularly and lubricate moving parts.
 - e. Check drain valves are open, covered with screening, and not blocked.
 - f. Keep fuel tanks full for flyable and short term storage.
 - g. Surrounding conditions must be considered when selecting storage category.

STORAGE CATEGORIES

8. Storage categories are as follows:
 - a. Flyable storage (no limit) (Tasks 1-96 thru 1-100). Helicopters in flyable storage will have a 1 -day Progressive Phase Maintenance (PPM) inspection and runup performed at least once every 14 days.
 - b. Short term storage (from 1 to 45 days) (Tasks 1-101 thru 1-104).
 - c. Intermediate storage (from 46 to 180 days) (Tasks 1-105 thru 1-108).
 - d. Storage of aircraft undergoing maintenance (no time limit). This category of maintenance will include general requirements of storage of aircraft undergoing any maintenance action which causes the aircraft to be inactive for more than fourteen days. Due to the wide range of maintenance actions that may create this situation, some storage procedures will not be required and a degree of latitude is given to the local maintenance officer on the storage measures needed for the particular situation. The fourteen day limit is a guideline and variances are allowed at the discretion of the maintenance officer.

FOLLOW-ON MAINTENANCE:

None

END OF TASK

Change 57 1-313

INITIAL SETUP**Applicable Configurations:**

All

Tools:

As Required

Materials:

As Required

Personnel Required:

As Required

References:

TM 38-230

TM 55-1500-333-24

TM 43-0105

Task 1-76

Task 1-77

Task 1-78

Task 1-81

Task 1-82

Task 1-83

Task 1-88

Task 1-89

Task 1-90

Task 1-20

Task 1-19

Task 1-25

Task 1-26

Task 1-27

NOTE

Process aircraft and components for storage in accordance with applicable methods described, or included by reference, in this section. Methods include cleaning, drying, preservative application, and use of wrappings or coverings when required. Accomplish preservation in an uninterrupted series of operations. When periods of interruption are necessary, provide temporary protection for partially processed items, as required, to avoid contamination. For components removed from aircraft, preservation and packaging instructions generally are in that section which carries instructions for removing the component. For additional information on preservation methods, refer to TM 38-230. Preservation, Packaging and Packing of Military Supplies and Equipment.

TOWING

1. Normal towing (Task 1-19).
2. Alternate towing (Task 1-20).

CLEANING

3. Clean interior and exterior (TM 55-1500-333-24, TM 43-0105, Tasks 1-76, 1-77, 1-78, 1-81, 1-82, and 1-83).

PARKING

4. Use standard parking procedures (Task 1-25). If aircraft is parked outside, observe fire regulations (TM 43-0105).

MOORING

5. Mooring helicopter to hard stand (Task 1-26).
6. Mooring helicopter to mooring kit (Task 1-27).

LUBRICATION

7. Lubricate helicopter before storage (Tasks 1-88, 1-89, and 1-90).

FOLLOW-ON MAINTENANCE:

None

END OF TASK

**1-95 STORE AIRCRAFT — GENERAL INSPECTION
PROCEDURES**

1-95

INITIAL SETUP**Applicable Configurations:**

All

Tools:

As Required

Thermometer -20 to +110°C

Materials:

As Required

Personnel Required:

67U30 Inspector

As Required

References:

TM 43-0105

TM 11-1520-240-20

TM38-750

Task 1-73

Equipment Condition:

As Required

General Safety Instructions:

As Required

NOTE

General inspection procedures apply to all categories of storage.

1. Check aircraft is ventilated.
2. Check preservation procedures have been performed.
3. Check fuselage, ramp, and pool drain valves are open, operable, covered with screening and free from obstructions.
4. Check covers if installed as follows:
 - a. If water is collecting on cover, provide drains.
 - b. Replace damaged covers.
 - c. Replace deteriorated covers.
5. Measure temperature inside aircraft at 30 minute intervals during hottest part of day. Use thermometer. If temperature is more than 57°C (135°F), ventilate the aircraft to prevent condensation. If temperature cannot be reduced, use forced ventilation.

6. Check for corrosion as follows:

- a. Check for moisture collecting areas.
- b. Check painted surfaces for blisters or flaking.
- c. Treat corroded areas (TM 43-0105).

NOTE

Perform step 7 after winds more than 35 knots.

7. Check security and condition of static ground wires, rotor tiedown straps, mooring devices, (ropes, cables, rods or eyes), and landing gear tiedown rings. Make frequent checks.

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CAUTION

Do not remove or package antennas.

8. Check communication equipment (TM 11-1520-240-20).
9. Check tire pressure. Pressure must be normal during flyable storage. Pressure must be at least 75 percent of normal during short term and intermediate storage (Task 1-73).

CAUTION

Tires must be rotated every 30 days. Do not rotate to original position; otherwise sets or flat spots will damage tires.

10. Move aircraft every 30 days, or jack up aircraft and rotate tires 1/3 turn.
11. Check hydraulic system for leaks. Repair all leaks.

LOG BOOK ENTRIES

13. Enter this data in log book as follows:
 - a. Preservation data.
 - b. Date aircraft was placed in storage.
 - c. Data from Aircraft Inspection and Maintenance Record (DA form 2408-13).
 - d. Data from Historical Record for Aircraft (DA form 2408-15) (TM 38-750).

FOLLOW-ON MAINTENANCE:

None.

END OF TASK

1-96 INSPECT BEFORE FLYABLE STORAGE1-96

INITIAL SETUP**Applicable Configurations:**

All

Personnel Required:

Medium Helicopter Repairer

Inspector

Tools:

None

References:

TM 55-1520-240-PPM

TM 38-750

Materials:None

1. Maintain helicopter in serviceable condition.
2. Perform 14 Day Inspection (TM 55-1520-240-PPM).
3. Record date and type of storage on DA forms 2408-13 and 2408-15 in helicopter log book (TM 38-750).

FOLLOW-ON MAINTENANCE:

None

END OF TASK

Change 2 1-317

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

Hydraulic Preservative Fluid (E198)
 Barrier Material (E81)
 Tape (E388)
 Cloth (E1 20)
 Dry Cleaning Solvent (E162)
 Cheesecloth (E112)
 Gloves (E186)

Personnel Required:

Medium Helicopter Repairer (2)
 Inspector
 Army Rotary-Wing Aviator (2)

References:

TM 38-750
 TM 55-1520-240-T
 TM 55-1520-240-10
 TM 11-6140-203-23
 Task 1-51
 Task 1-53
 Task 1-54
 Task 1-55
 Task 1-56
 Task 1-57
 Task 1-59 or 1-62
 Task 1-64
 Task 1-65
 Task 1-66
 Task 1-67
 Task 1-68
 Task 1-69
 Task 1-70
 Task 1-71
 Task 1-72
 Task 1-73
 Task 1-89
 Task 1-90
 Task 1-32
 Task 1-26 or 1-27

Equipment Condition:

As Required

General Safety Instructions:**WARNING**

Hydraulic fluid (E198) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

WARNING

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

1-97 PREPARE HELICOPTER FOR FLYABLE STORAGE — GENERAL PROCEDURES (Continued)

1-97

PREPARE DRIVE SYSTEM

1. Check drive system lubrication and sight gages.
2. Service drive system (Task 1-54 and 1-89).

AUXILIARY POWER UNIT

3. Check apu oil level. Service apu, if needed (Task 1-53).
4. Start and operate apu (TM 55-1520-240-T).
5. Shut down apu (TM 55-1520-240-T).
6. Install apu exhaust cover (Task 1-32).
7. Seal apu inlet. Use cover or barrier material (E81) and tape (E388).

PREPARE ENGINES

8. Preserve engines as follows:
 - a. Keep engines and accessories clean. Observe all precautions.

WARNING

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

- b. Clean intake air ducts, plenum chambers, and compressor inlet screens clean and free from foreign materials. Use cloth (E120) damp with solvent (E162) on external parts. Wear gloves (E186).

NOTE

Steps c and d may be omitted if engines have been operated recently and are moisture-free.

- c. Have pilot start engines. Perform engine ground runup to circulate engine lubricants throughout engine (TM 55-1520-240-10). Operate engines at 75 percent rpm. Do not fly helicopter. Check that engine temperature and hydraulic pressures are within normal ranges.
- d. Shut down engines (TM 55-1520-240-10).
- e. Install engine inlet and exhaust protective covers (Task 1-32).
- f. Cover other engine cowling openings. Use barrier material (E81). Secure barrier material with tape (E388).
- g. Record, in aircraft log book on forms DA 2408-13 and DA 2408-15, date engines were placed in flyable storage. (Refer to TM 38-750.)

PREPARE HYDRAULIC SYSTEMS

9. Check hydraulic systems for leaks. Repair leaks.
10. Service flight control and utility hydraulic system tanks (Task 1-59 or 1-62). Check that accumulators are pressurized (Tasks 1-64, 1-65, 1-66, 1-67, and 1-68).
11. Clean exposed areas of hydraulic actuator pistons. Use cloth (E120) soaked in hydraulic preservative fluid (E197). Wipe dry. Use clean cloth. Apply coat of fluid (E197). Wear gloves (E186).

PREPARE ROTARY-WING BLADES

12. Tie down blades (Task 1-26).

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PREPARE ROTOR SYSTEM

13. Check sight indicators on shock absorbers, vertical hinge pin bearing oil tanks, pitch varying bearing oil tanks, and hub oil tanks. Service if required (Task 1-55 and 1-58).
14. Lubricate swashplate (Task 1-90)

PREPARE FUEL SYSTEM

15. Drain water from fuel tanks. Fill tanks (Task 1-51). Keep tanks full and free of water through complete storage period.

PREPARE ELECTRICAL SYSTEM

16. Check that EMER EXIT LTS switch is set to DISARM.
17. Unplug battery. Wrap plug. Use barrier material (E81). Wrap barrier material, and secure wrapped plug to airframe. Use tape (E388).
18. Keep battery in helicopter if temperature is above -40° F (-40 C). Remove battery from helicopter and store if temperature is below 40 F (-40°C). (Refer to TM 11-6140-203-23).
19. Clean and service battery (TM 11-6140-203-23).

PREPARE LANDING GEAR

20. Service tires (Task 1-73).
21. Service shock struts (Task 1-69, 1-70, 1-71, and 1-72).
22. Clean exposed polished surfaces of shock strut. Use cloth (E120) soaked with hydraulic preservative fluid (E197). Wipe dry. Apply fluid

(E197) to cleaned area of strut. Wear gloves (E186).

CAUTION

Do not allow tape (E38) to contact polished piston.

23. Wrap polished pistons. Use barrier material (E81). Secure barrier material. Use tape (E388).

PREPARE AIRFRAME

24. Close doors, windows, and ramp unless ventilation is required.
25. Cover all fuselage openings to prevent entry of water, dust, or other foreign materials. Use protective covers (Task 1-32). Use barrier material (E81) for openings where covers are not provided. Secure barrier material. Use tape (E388).
26. Open drain plugs on underside of fuselage, ramp, and pod sections. Install cheesecloth (E112) over plugs to prevent entry of insects and small vermin. Secure cheesecloth with tape (E388).
27. Moor helicopter (Task 1-26 or 1-27).

MAKE LOG BOOK ENTRIES

28. In helicopter log book, on forms DA 2408-13 and DA 2408-15, record data and date placed in flyable storage. (Refer to TM 38-750).

INSPECT**FOLLOW-ON MAINTENANCE:**

Inspect during storage (Task 1-98).

END OF TASK

1-98 INSPECT HELICOPTER DURING FLYABLE STORAGE

1-98

INITIAL SETUP**Applicable Configurations:**

All

Tools:

As Required

Materials:

Rust Inhibitor and Preservative (E322)

Personnel Required:

Inspector

Others As Required

References:

TM 55-1520-240-PPM

TM 55-1520-240-10

TM 55-2840-254-23

Task 1-32

Equipment Condition:Store Aircraft — General Inspection Procedures
(Task 1-95)

Inspect Before Flyable Storage (Task 1-96)

-
1. Perform 14 day inspection. (Refer to TM 55-1520-240-PPM.)
 2. Remove covers as required (Task 1-32). Start and operate apu once every 14 days (TM 55-1520-240-10).
 3. Remove covers as required (Task 1-32). Start and operate engines, at 100 percent rpm, once every 14 days. Do not fly helicopter. Check that engine transmission and hydraulic pressures and temperatures are within normal range (TM 55-1520-240-10).
 4. Clean and preserve engine compressor blades every 14 days. Use rust inhibitor and preservative (E322). (Refer to TM 55-2840-254-23).
 5. Shut down engines and apu (TM 55-1520-240-10).

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

Cloths (E1 20)

Dry Cleaning Solvent (E161)

Hydraulic Fluid (E197)

Gloves (E1 86)

Personnel Required:

Medium Helicopter Repairer

Inspector

Others As Required

References:

TM 38-750

TM 11-1520-240-20

TM 11-6140-203-23

TM 55-1520-240-10

Task 1-26 or 1-27

Task 1-39

Task 1-51

Task 1-52

Task 1-53

Task 1-54

Task 1-55

Task 1-56

Task 1-57

Task 1-58

Task 1-59

Task 1-60

Task 1-61

Task 1-62

Task 1-63

Task 1-64

Task 1-65

Task 1-66

Task 1-67

Task 1-68

Task 1-88

Task 1-89

PREPARE AIRFRAME

1. Remove tape and barrier material from fuselage openings. Wipe dean. Use cloth (E120) damp with solvent (E161).

2. Remove cheesecloth screens from drains. Close drain plugs in fuselage, ramp, and pod sections. Remove

Equipment Condition:

Tiedown Lines Removed (Task 1-26 or 1-27)

Protective Covers Removed (Task 1-32)

Clean Fuselage (Task 1-76)

General Safety Instructions:**WARNING**

Dry cleaning solvent (E161) is combustible and toxic, It can irritate skin and cause burns Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minute. Get medical attention for eyes.

CAUTION

Do not perform system or operational checks until systems or components are depreserved and serviced. Equipment can be damaged

tape. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).

3. Open doors, windows, and ramp to ventilate helicopter.

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4. Record date aircraft was prepared for service on forms DA 2408-13 and 2408-15 in aircraft log book (TM 38-750).

PREPARE LANDING GEAR

5. Remove covering.
6. Service tires (Task 1-73).
7. Clean landing gear. Do not dean polished pistons of shock struts. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
8. Remove tape and barrier material. Clean polished pistons of shock struts. Use cloth (E120) damp with hydraulic fluid (E197). Wipe pistons dry. Apply hydraulic fluid to pistons.
9. Lubricate landing gear (Task 1-88).

PREPARE ELECTRICAL SYSTEM

10. Set EMER EXIT LTS switch to DISARM.
11. If removed, install battery (TM 11-1520-240-20). Service battery, if needed (TM 11-6140-203-23).
12. Connect battery (Task 1-39).

PREPARE FUEL SYSTEM

13. Drain water from fuel tanks. Fill tanks (Task 1-51).

PREPARE ROTARY-WING BLADES

14. Remove tiedown lines from blades (Task 1-26 or 1-27).

PREPARE ROTOR SYSTEM

15. Check sight indicators in shock absorbers, vertical hinge pin bearing oil tanks, pitch varying bearing oil tanks, and hub oil tanks. Service if required (Task 1-54 thru 1-58).

PREPARE HYDRAULIC SYSTEMS

16. Service flight control and utility hydraulic system tanks (Tasks 1-59 thru 1-62). Check that accumulators are pressurized (Tasks 1-63 thru 1-68).
17. Operate flight control and utility hydraulic systems (TM 55-1520-240-10).
18. Check hydraulic systems for leakage (Task 7-7).

PREPARE DRIVE SYSTEM

19. Check drive system lubrication.
20. Service drive system (Tasks 1-54 and 1-89).

PREPARE AUXILIARY POWER UNIT

21. Remove barrier material and tape from apu inlet.
22. Clean inlet area. Use cloth (E120) damp with solvent (E161).
23. Service apu (Task 1-53).
24. Start and operate apu. Check that apu operates normally C(TM 55-1520-240-10).
25. Shut down apu (TM 55-1520-240-10).
26. Record date apu was prepared for service on DA forms 2408-13 and 2408-15 of aircraft log book C(M 38-750).

PREPARE ENGINES

27. Remove barrier material and tape from engine cowls.
28. Clean cowls. Use cloth (E120) damp with solvent (E161). Wear gloves (EI 86).
29. Remove foreign matter from engine cowls, air intakes, and exhausts.
30. Check that lines, hoses, dampers, electrical wires, and components are secured.
31. Service engine oil tanks (Task 1-52).
32. Start engines. Operate engines at GROUND. Check that engine instruments indicate normal conditions (TM 55-1520-240-10).
33. Set ENGINE CONDITION levers to FLIGHT. Operate engines until temperatures are stable.
34. Shut down engines (TM 55-1520-240-10).
35. Record date engine was prepared for service on DA forms 2408-13 and 2408-15 of aircraft log book

INSPECT

FOLLOW-ON MAINTENANCE:
None

END OF TASK**Change 57 1-323**

1-100 INSPECT HELICOPTER AFTER SERVICING FROM
FLYABLE STORAGE

1-100

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

None

References:

TM 38-750

TM 55-1520-240-PPM

Aircraft Log Book

Task 1-99

Equipment Condition:

Service After Flyable Storage (Task 1-99)

Personnel Required:

Inspector

-
1. Check that all removal parts are installed or connected on helicopter. Refer to Aircraft Log Book.
 2. Check that Aircraft Log Book has been posted (Task 1-99 and TM 38-750).
 3. Perform 14 Day Inspection (TM 55-1520-240-PPM).

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

1-101 INSPECT HELICOPTER BEFORE SHORT TERM STORAGE

1-101

INITIAL SETUP

Personnel Required:

Medium Helicopter Repairer
Inspector

Applicable Configurations:

All

References:

TM 38-750

Tools:

None

Materials:

None

-
1. Check all removed parts are preserved and stored in helicopter.
 2. Check all removed or disconnected parts are recorded in aircraft log book on DA forms 2408-13,-15,-16, and -17 (TM 38-750).
 3. Check for leakage of fuel, oil, and hydraulic lines and hoses,
 4. Deleted.

FOLLOW-ON MAINTENANCE:

None

END OF TASK

1-102 PREPARE HELICOPTER FOR SHORT TERM STORAGE

INITIAL SETUP	Task 1-67
	Task 1-68
<i>Applicable Configurations:</i>	Task 1-69
All	Task 1-70
	Task 1-58
<i>Tools:</i>	
As Required	Task 1-77
	Task 1-76
<i>Materials:</i>	Task 1-78
Tape (E388)	Task 1-80
Oil (E254)	Task 1-81
Lubricating Oil (E251)	Task 1-82
Cloths (E120)	Task 1-83
Dry Cleaning Solvent (E161)	Task 1-84
Corrosion-Preventive Compound (E153 or E154)	Task 1-90
Barrier Material (E81)	Task 1-29
Metal Conditioner and Rust Remover (E242)	Task 1-32
Preservation Fluid (E198)	Task 1-88
Gloves (E186)	Task 1-26
Corrosion Preventive Compound (E465)	Task 1-27
	Task 1-39
<i>Personnel Required:</i>	Task 1-106
Medium Helicopter Repairer (2)	Task 5-64
Inspector	Task 5-65
	Task 5-87
	Task 5-2
	Task 5-91
<i>References:</i>	Task 17-4
TM11-6140-203-15-2	
TM55-1500-333-24	
TM55-1520-240-10	
TM55-2835-205-23	
TM55-2840-254-23	
TM38-750	
Task 1-5	
Task 1-37	
Task 1-38	
Task 1-53	
Task 1-54	
Task 1-55	
Task 1-56	
Task 1-57	
Task 1-59 or 1-62	
Task 1-60	
Task 1-61	
Task 1-63	
Task 1-64	
Task 1-65	
Task 1-66	

Equipment Condition:
As Required

General Safety Instructions:

WARNING

Lubrication oil (E254) and hydraulic fluid (E1 98) are toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

GO TO NEXT PAGE

1-102 PREPARE HELICOPTER FOR SHORT TERM STORAGE (Continued)

1-102

DRIVE SYSTEM

1. Prepare system for storage as follows:
 - a. Fill transmissions with oil (E254) (Task 1-54).
 - b. Start engines (TM 55-1520-240-10).
 - c. Set ENGINE CONDITION levers to FLIGHT, and operate engines until indicated temperatures are steady (TM 55-1520-240-10).
 - d. Shut down engines (TM 55-1520-240-10).

WARNING

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

- e. Clean drive system exterior surfaces. Use cloths (E120) and solvent (E161). Wear gloves (E186).

WARNING

Corrosion preventive compound (E153 or E154) is flammable and toxic. Avoid inhaling. Use only with adequate ventilation. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

- f. Coat exposed (unpainted) surface of drive system. Use compound (E153 or 154). Wear gloves (E186).
- g. Tag ENGINE CONDITION levers and mark on tag TRANSMISSIONS PRE-SERVED DO NOT OPERATE.

HYDRAULIC SYSTEM

2. Prepare system for storage as follows:
 - a. Check for leaks.
 - b. Repair leaks.
 - c. Fill flight control and utility hydraulic system tanks (Tasks 1-59 thru 1-61 or 1-62).
 - d. Lower air pressure in accumulators to 250 psi (Tasks 1-63 thru 1-68).
 - e. Seal hydraulic line and tank vents. Use tape (E388).
 - f. Clean exposed polished surfaces of actuator pistons. Use cloths soaked in fluid (E198). Wipe surfaces with clean cloth. Apply coat of fluid (E198) to surfaces. Use cloths (E120).

ROTARY-WING BLADES

3. Prepare rotary-wing blades for storage as follows:
 - a. Identify blade with aircraft serial number.
 - b. Identify blade with its pitch housing color band.
 - c. Remove blades from aircraft (Task 5-64).
 - d. Prepare blades for storage (Task 5-65).
 - e. Fill shock absorbers (Task 1-58).
 - f. Remove absorbers (Task 5-87).
 - g. Prepare absorbers for storage (Task 5-91). Store in aircraft.

ROTARY-WING HEAD

4. Prepare rotary-wing heads for storage as follows:
 - a. Service hub, pitch bearings, and vertical hinge pin bearings oil tanks (Tasks 1-55 thru 1-57).

1-102 PREPARE HELICOPTER FOR SHORT TERM STORAGE (Continued)

1-102

- b. Clean vertical hinge pins, pitch housings, and bearing inner race surfaces. Use cloths (E120) moist with solvent (E161).
- c. Wipe vertical hinge pins and bearing inner race surface dry. Use dry cloth (E120).



Do not use metal conditioner and rust remover on vertical hinge pins or bearing inner race surfaces. Damage to surface hardness could result.

- d. Remove fretting corrosion from pitch housing. Use metal conditioner and rust remover (E242).
- e. Wipe pitch housings dry of solvent or metal conditioner. Use dry cloth (E120).
- f. Coat vertical hinge pins and bearing inner race surfaces. Use compound (E154).
- g. Install vertical hinge pins in pitch housing (Task 5-2).
- h. Install rotor hub protective covers (Task 1-32).
- i. If protective covers are not available use barrier (E81), and hold with tape (E388).
- j. If rotor hub nut is not installed, cover end of forward or aft transmission drive shaft. Use barrier (E81) and hold with tape (E388).

ROTARY-WING HEAD CONTROLS

5. Prepare controls for storage as follows:
 - a. Lubricate swashplate (Task 1-90).



Do not use corrosion-preventive compounds on rotary-wing head controls. Removal of compounds with solvent will damage dry-type bearings.

- b. Clean controls. Use cloth (E120).

FUEL SYSTEM

6. Prepare fuel system for storage as follows:
 - a. If helicopter is stored with fuel in tanks, keep tanks full for duration of storage.
 - b. If aircraft is stored with tanks drained, perform Task 1-106.

ELECTRICAL SYSTEM

7. Prepare electrical system for storage as follows:
 - a. Set EMER EXIT LTS switch to DISARM.
 - b. Disconnect battery (Task 1-39).
 - c. Do not remove battery unless air temperature is -40°C (-40°F) or less. If battery is removed refer to TM 11-6140-203-15-2.
 - d. Clean battery (TM 11-6140-203-14-2).
 - e. Wrap battery plug. Use barrier (E81). Secure plug to airframe. Use tape (E388).
 - f. Remove emergency exit lights (Task 17-4).

INSTRUMENTS

NOTE

Only pitot-static system requires preparation for storage.

8. Install cover on pitot-static tube (Task 1-32).

COMMUNICATION EQUIPMENT

9. Prepare communication equipment for storage as follows:
 - a. Tag equipment to be removed.
 - b. Remove, protect, and return classified equipment to appropriate storage facility as directed in applicable directives.

NOTE

Do not remove unclassified communication equipment from aircraft unless it needs repair. Repaired equipment must be installed immediately upon delivery from repair.

GO TO NEXT PAGE

1-102 PREPARE HELICOPTER FOR SHORT TERM STORAGE (Continued)

1-102

LANDING GEAR

10. Prepare landing gear for storage as follows:
- Clean landing gear. Use cloths (E120) and solvent (E161).
 - Remove dirt, mud, and foreign matter from tires. Use stiff brush and mild soap solution. Rinse with water.
 - Clean exposed shock strut polished surfaces (Task 1-78).
 - Deflate shock struts (Tasks 1-69 and 1-70).
 - Lubricate landing gear (Task 1-88).
 - Tag shock strut SHOCK STRUT PRESERVED.
 - If aircraft is not stored on paved surface, install planking or equivalent between tire and ground.
 - Maintain 75 percent normal tire pressure during storage.

NOTE

Do not permit tire pressure to drop below 15 psi for aircraft stored on blocks. Inflate tires to 75 percent of normal tire pressure when pressure drops to 15 psi.

- Install covers on tires.

AIRFRAME

11. Prepare airframe for storage as follows:
- Clean interior and exterior of aircraft (TM 55-1500-333-24, Tasks 1-76, 1-77, 1-78, 1-80, 1-81, 1-82, and 1-83).
 - Install ground wire (Task 1-29).
 - Close doors, windows, and ramp unless ventilation is required.

CAUTION

Make sure scrim (printed) side of barrier material is away from windshield or damage to windshield could occur.

- Cover windshields and windows. Use barrier (E81). Hold barrier with tape (E81).
- Cover fuselage openings (Task 1-32).
- Moor helicopter to hardstand (Task 1-26) or mooring kit (Task 1-27).

OPERABLE ENGINES

12. Ref TM 55-2840-254-23.

INOPERABLE ENGINES

13. Preserve each inoperable engine (cannot be motored) as follows:

CAUTION

As a precaution, keep engines and accessories clean. Keep air intake duct, plenum chamber, and compressor inlet screens clean and free of foreign materials. When external cleaning is necessary, use solvent (E161).

NOTE

Do not treat engines for corrosion if they have been involved in an accident where engine failure or malfunction is known or suspected to have been a factor. These engines must be held for shipment to an overhaul depot or designated investigation area and should not be treated for corrosion prevention. (Refer to TM 55-2840-254-23.)

- Disconnect electrical wires, fuel lines, and drain plugs from the fuel control.
- Drain all fuel from pump pressure fittings, pump inlet, pressure tap, fuel inlet port, main and starting fuel outlet ports, and drain port.
- Remove and clean fuel strainers and filters. Use solvent (E161).
- Install filters and strainers.
- Allow fuel to drain from fuel control.

- f. Install high pressure caps on all disconnected fuel lines and on open ports and fittings on fuel control, except the fuel inlet port.
- g. Install high pressure caps on fuel boost pump open ports and fittings, except the fuel inlet port.
- h. Pour lubricating oil (E251) into fuel control inlet port. Cap port.
- i. Pour lubricating oil (E251) into fuel control inlet port. Cap port.
- j. Spray corrosion preventive compound (E154) in the areas between the inlet housing struts for 30 seconds. Direct the spray evenly on all compressor blades.
- k. Spray 1/2-pint of lubricating oil (E251) into inlet housing and exhaust diffuser openings. Move spray gun constantly to cover all internal parts.
- l. Inspect engine to be sure that visible unplated or unpainted metal surfaces are coated with lubricating oil (E251). Pay par-

ticular attention to combustor housing, exhaust diffuser, air diffuser, and internal and external threads.

- m. Make sure that parts, assemblies, and accessory components are complete and secure.
- n. Seal engine holes or ports. use protective caps, plugs, barrier material (E81), or tape (E388).
- o. Close engine cowl. Seal all louvered openings in cowl. Use barrier material (E81) and tape (E388).
- p. Install engine air inlet and exhaust protective covers (Task 1-32).
- q. Place a tag on the ENGINE START switch in the cockpit stating: ENGINE PRE-SERVED, MAINTENANCE REQUIRED, DO NOT OPERATE.

AUXILIARY POWER UNIT

- 14. Prepare apu for storage as follows:
 - a. Disconnect battery (Task 1-39).
 - b. Service apu oil sump to full (Task 1-53).

1-103 SERVICE HELICOPTER AFTER SHORT TERM STORAGE (Continued)

1-103

- c. Clean forward and aft landing gear. Use cloth (E120) soaked in fluid (E197). After cleaning dry with clean cloth and apply coat of fluid.
- d. Lubricate landing gear. (Refer to Task 1-88.)
- e. Inflate shock struts (Tasks 1-71 and 1-72).
- f. Remove PRESERVED tag from shock struts.

COMMUNICATIONS EQUIPMENT

3. Prepare communication equipment for service as follows:
 - a. Protection and installation of classified equipment must be in accordance with applicable directives.
 - b. Remove tags from equipment.

INSTRUMENTS

4. Prepare pitot-static system for service as follows:
 - a. Remove protective covers as located in Task 1-32.
 - b. Remove barrier material from sideslip ports.
 - c. Remove tape mark. Use cloth (E120) moist with solvent (E161). Wear gloves (E186).

ELECTRICAL SYSTEM

5. Prepare electrical system for service as follows:
 - a. Install emergency exit lights (Task 17-8).
 - b. If removed, install battery (Task 9-27).
 - c. Service battery (TM 11-6140-203-14-2).
 - d. Connect battery (Task 1-39).

FUEL SYSTEM

6. Prepare fuel system for service as follows:
 - a. If stored with fuel tanks drained, refer to Task 1-107.

- b. If stored with fuel in tanks, drain water from tanks. (Refer to Task 10-1 for location of drain valves.)

ROTARY-WING HEADS

7. Prepare rotary-wing system heads for service (Task 5-4).

ROTARY-WING HEAD CONTROLS

CAUTION

**Do not wash flight control components with solvent (E161).
Dirt may be carried into bearings.**

8. Lubricate swashplates (Task 1-90).
9. Place pitch links in service (Task 5-96).

ROTARY-WING BLADES

10. Prepare rotary-wing blades for service as follows:
 - a. Place shock absorbers in service (Task 5-93).
 - b. Service shock absorbers (Task 1-58).
 - c. Install shock absorbers on blades (Task 5-93).
 - d. Install blades (Task 5-84).

HYDRAULIC SYSTEM

11. Prepare hydraulic system for service as follows:
 - a. Clean hydraulic pistons (Task 1-78).
 - b. Remove tape from hydraulic tank vents.
 - c. Service accumulators (Task 1-64 thru 1-68).
 - d. Service flight control and utility hydraulic system tanks (Tasks 1-59 and 1-62).
 - e. Check hydraulic system for leaks. Repair leaks.

DRIVE SYSTEM

12. Prepare drive system for service as follows:

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Change 17 1-331

- a. Remove, clean, and inspect filter screens (Tasks 6-130 thru 6-132, 6-155, 6-156, 6-180, 6-181, and 6-209 thru 6-211).
- b. Clean drive system outside surfaces (Task 1-76).
- c. Service transmission oil (Task 1-54).
- d. Remove TRANSMISSION PRESERVED tag from ENGINE CONDITION levers.

AUXILIARY POWER UNIT

13. Prepare apu for service as follows:

- a. Remove electrical power from aircraft.
- b. Remove apu exhaust protective cover, and stow it.



Make sure solvent does not enter apu air inlet. The presence of solvent could cause the apu to explode during initial operation.

- c. Remove tape (E388) and barrier material (E81) from apu air inlet. Remove tape residue. Use solvent (E161).
- d. Service apu oil sump to FULL (Task 1-53).
- e. Remove cap from fuel filter inlet port. Remove plug from fuel filter inlet line.
- f. Connect fuel filter inlet line to fuel filter inlet port.
- g. Disconnect fuel lines from main fuel manifold and start fuel nozzle.
- h. Connect drain hoses to each disconnected line. Place free ends of drain hoses into a 1-quart container.



If the following operation is not carried out, the apu will be motored, and ignition might occur.

- i. Unplug power supply connector from ignition exciter.

- j. Remove APU PRESERVED tag from apu switch.
- k. Apply external dc power to aircraft (Task 1-37).
- l. Have helper, in cockpit, hold apu switch to START.
- m. Observe flow from drain hoses into 1-quart container.
- n. After preserving oil has been purged from system and a steady flow of clear air-free fuel is observed coming from drain hoses, have helper, in cockpit, set apu switch to OFF.
- o. Remove external dc power from aircraft.
- p. Remove drain hoses.
- q. Connect fuel lines to main fuel manifold and start fuel nozzle.
- r. Connect power supply connector to the ignition exciter.



To prevent accessory gearbox damage, make sure aft transmission is serviced before apu is started.

- s. Check that aft transmission is serviced with oil (E254) (Task 1-54).



The apu can be seriously damaged if the intake or exhaust airflow is restricted.

- t. Make sure the apu air inlet and exhaust openings are free from obstructions.
- u. Make sure turbine fuel drain valve is not restricted. (Refer to TM 55-2835-205-23.)
- v. Make sure residual unburned fuel is drained from the turbine section.
- w. Apply external dc power to aircraft (Task 1-37).
- x. Start and operate apu. (Refer to TM 55-1520-240-T.)

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1-103 SERVICE HELICOPTER AFTER SHORT TERM STORAGE
(Continued)

1-103

- y. Shut down apu. (Refer to TM 55-1520-240-T.)
- z. Check apu oil sump level. Service if necessary (Task 1-53).

ENGINES

- 14. Ref TM 55-2840-254-23.

LOG BOOK ENTRIES

- 15. Enter in aircraft log book date aircraft and component were prepared for service. Use forms DA 2408-13 and 2408-15 (TM 38-750).

FOLLOW-ON MAINTENANCE:

None

END OF TASK

Change 2

1-332.1/(1-332.2 blank)

**1-104 INSPECT HELICOPTER AFTER SERVICING FROM
SHORT TERM STORAGE**

1-104**INITIAL SETUP**

Applicable Configurations:
All

Tools:
As Required

Materials:
As Required

Personnel Required:
67U30 Inspector
As Required

References:
TM55-1520-240-PMS
Task 1-103

Equipment Condition:
Helicopter Serviced (Task 1-103)

1. Inspect helicopter as follows:
 - a. Check all removed components have been installed.
 - b. Check entries have been made in aircraft log book (Task 1-103).
 - c. Check servicing tasks have been performed (Task 1-103).
 - d. Perform pms inspection (TM 55-1520-240-PMS).

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

1-105 INSPECT HELICOPTER BEFORE INTERMEDIATE STORAGE 1-105

INITIAL SETUP

Applicable Configurations:
All

Personnel Required:
Inspector

Tools:
As Required

References:
TM55-1520-240-PPM
TM38-750

Materials:
As Required

Task 1-87
Task 7-7

1. Check that all removed parts are preserved for storage and stowed in helicopter (TM 38-750).
2. Check that removed or disconnected parts are recorded in aircraft log book on DA forms 2408-13, 2408-15, 2408-16, and 2408-17 (TM 38-750).
3. Check hydraulic system for leakage (Task 7-7).
4. Perform 14 day inspection (TM 55-1520-240-PPM).
5. Lubricate helicopter for 100-hour requirements (Task 1-87).
6. Check that aircraft log book has been posted (TM 38-750).

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Copper Tube, Annealed, 1/4-Inch Diameter, 5
Feet Long
Siphon Pump
Sprayer
Brush
Goggles

Materials:

JP4 Turbine Fuel (E182)
Cloths (E120)
Dry Cleaning Solvent (E161)
Gloves (E184.1)
Tape (E388)
Preservative Hydraulic Fluid (E198)
Soap (E352)
Preservative Compound (E153)
Grease (E190)
Epoxy Primer (E292.1)

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-2840-254-23
Task 1-102
Task 10-34 or 10-35
Task 10-2

Task 10-3
Task 10-8
Task 10-18
TM 11-1520-240-20
Task 17-4
Task 1-71
Task 1-72
Task 1-39
Task 2-343
Task 3-7
Task 3-12
Task 1-88
Task 1-73
Task 1-76
Task 1-29
Task 12-39
Task 1-32
Task 1-26
TM 38-750

General Safety Instructions:**WARNING**

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes . Get medical attention for eyes.

PREPARE DRIVE SYSTEM

1. Prepare drive system for storage (Task 1-102).

PREPARE ENGINE

2. Refer to TM 55-2840-254-23.

PREPARE AUXILIARY POWER UNIT

3. Prepare apu for storage. (Task 1-102.)

PREPARE HYDRAULIC SYSTEMS

4. Prepare hydraulic systems for storage (Task 1-102).

PREPARE ROTARY-WING BLADES

5. Prepare rotary-wing blades for storage (Task 1-102).

PREPARE ROTARY-WING SYSTEM HEADS

6. Prepare rotor system for storage (Task 1-102).

PREPARE ROTARY-WING SYSTEM HEAD CONTROLS

7. Prepare rotary-wing system head control for storage (Task 1-102).

PREPARE FUEL SYSTEM

8. Defuel helicopter (Task 10-34 or 10-35).
9. Purge each fuel cell (Task 10-2 or 10-3).
10. Clean fuel cell (Task 10-8).

WARNING

JP4 turbine fuel (E182) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes . Get medical attention for eyes.

CAUTION

Spraying must be done using low-pressure air equipment to prevent damage to fuel cells. Ground spray equipment to airframe.

11. Spray inside of cells (Task 10-18). Use about 1 pint of JP4 fuel (E182). Use dehumidified air for spraying.
12. Drain fuel and oil mixture left in tank. Wipe up remaining fluid. Use cloths (E120).
13. Install access doors on fuel cells (Task 2-2).
14. Preserve fuel cells (Task 10-18).

PREPARE ELECTRICAL SYSTEM

15. Set EMER EXIT LTS switch to DISARM.
16. Disconnect battery (Task 1-39).
17. Clean battery and accessories. (Refer to TM 11-1520-240-20.)
18. Remove battery to shop.
19. Install accessories.
20. Seal battery drain and vent lines. Use tape (E388).
21. Wrap battery plug. Use barrier material (E81). Tape plug to airframe. Use tape (E388).
22. Remove emergency exit lights (Task 17-4).
23. Wrap emergency exit lights. Use barrier material (E81). Store lights in fiberboard box in helicopter.

PREPARE INSTRUMENTS

24. Remove two clocks. Tag clocks with statement of condition and return to storage facility.

25. Clean pitot-static system as follows:
 - a. Clean pitot tube. Use cloth (E120) damp with solvent (E161). Wear gloves (E184.1).
 - b. Install pitot tube covers (Task 1-32).
26. Wipe dust from static and sideslip ports. Use cloth (E120).
27. Seal static and sideslip ports. Use barrier material (E81). Overlay ports by at least 1/4-inch . Seal edges with tape (E388).

PREPARE COMMUNICATION EQUIPMENT

28. Remove classified communication equipment, protect, and store equipment in approved storage facility. (Refer to applicable directives.)

NOTE

Unclassified equipment shall not be removed from helicopter unless equipment requires repair.

29. Wrap disconnected connectors. Use barrier material (E81) and tape (E388).
30. Clean antenna masts and related equipment. Use cloth (E120) damp with solvent (E161). Wear gloves (E184.1).

WARNING

Corrosion preventive compound (E153) is flammable and toxic. Avoid inhaling. Use only with adequate ventilation. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

31. Apply corrosion-preventive compound (E153) to cleaned areas.
32. Remove and treat corroded parts (Task 2-343).

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1-106 PREPARE HELICOPTER FOR INTERMEDIATE STORAGE

(Continued)

1-106

33. Preserve package, and store mechanical items with equipment from which removed.

LANDING GEAR

34. Deflate shock struts (Task 1-71 and 1-72).
 35. Remove hydraulic fluid filler plug.
 36. Insert 1/4-inch annealed copper tube all the way into filler port.

WARNING

Hydraulic fluid (E198) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes . Get medical attention for eyes.

37. Remove hydraulic fluid. Use siphon pump in tube.
 38. Fill struts to port level. Use preservative hydraulic fluid (E198).
 39. Install filler plugs.
 40. Clean landing gear. Do not clean tires or polished areas of shock struts. Use cloth (E120) damp with solvent (E161). Wear gloves (E184.1).
 41. Clean tires. Use stiff brush and soap solution (E352). Rinse with clear water.
 42. Clean exposed polished surfaces of shock struts. Use cloth (E120) damp with preservative hydraulic fluid (E198). Dry surfaces. Use cloth (E120). Coat polished surfaces with fluid (E198).
 43. Remove wheels (Task 3-7).
 44. Clean wheels and disk brakes. Use soft brush and solvent (E161). Wear gloves (E184.1) and goggles.
 45. Touch up all chipped spots on wheels. Use paint similar to original finish.
 46. Coat wheel with preservative compound (E153). Be sure to coat disk brake keys.
 47. Lubricate wheel bearings. Use grease (E190).

WARNING

Epoxy primer (E292.1) is flammable and toxic. Avoid inhaling. Use only with adequate ventilation, away from heat or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes . Get medical attention for eyes.

48. Apply epoxy primer (E292.1) to brake disks. Wear gloves (E184.1).
 49. Install wheels (Task 3-12).
 50. Lubricate landing gear (Task 1-88).
 51. Secure tag marked SHOCK STRUT PRESERVED.
 52. Rest tires on planks if helicopter will not rest on paving or blocks.
 53. Service tires to 66 psi (Task 1-73). Maintain at least 15 psi pressure throughout storage period.
 54. Cover tires. Use covers or barrier material (E81) and tape (E388).

PREPARE UTILITY ITEMS

55. Remove condition tag from fire extinguishers. Return extinguishers to storage.
 56. Remove condition tags from life rafts, parachutes, AN/CRT-3 radio and other items that can be damaged by climate conditions. Place items in storage.
 57. Wrap cargo hooks. Use barrier material (E81) and tape (E388).

PREPARE AIRFRAME

58. Clean fuselage (Task 1-76).
 59. Open drain valves under fuselage, ramp, and pods. Install cheesecloth (E112) on valves. Secure to fuselage. Use tape (E388).
 60. Ground helicopter (Task 1-29).
 61. Remove windshield wiper arms and blades (Task 12-39).
 62. Store arms and blades in fiberboard box. Tag box and store in helicopter.

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63. Close doors, windows, and ramp unless continuous ventilation is required. If ramp actuating cylinders and removed, or if ramp cannot be locked, secure ramp using tiedown straps. Connect ratchet hooks to tiedown rings and loop straps over aft transmission lugs.



Do not position printed side of barrier material against windshields. Windshield can be damaged.

64. Cover windshields and windows. Use barrier material (E81). Use tape (E388) to secure barrier material.
65. Cover fuselage openings. Use protective covers (Task 1-32). Use barrier material (E81) to cover unprotected openings. Use tape (E388) to secure barrier material.
66. Moor helicopter (Task 1-26).
67. Record preservation date and date aircraft was placed in storage on DA Forms 2408-13 and 2408-15 of aircraft log book. (Refer to TM 38-750.)

FOLLOW-ON MAINTENANCE:

Inspect helicopter (Task 1-95).

END OF TASK

1-338 Change 2

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Tube, Annealed Copper, 1/4-Inch Diameter
 Siphon Pump
 Container, 5 Gallons
 Protective Clothing
 Respirator
 Facepiece
 Source of Compressed Air

Materials:

Dry Cleaning Solvent (E161)
 Cloth (E120)
 Hydraulic Fluid (E197)
 Lockwire (E231)
 Grease (E190)
 Fuel (E182)
 Boric Acid Solution (E83)
 Gloves (E186)

Personnel Required:

Medium Helicopter Repairer (2)
 Inspector

References:

TM 11-6140-203-15-2
 Task 1-64
 Task 1-65
 Task 1-66
 Task 1-67
 Task 1-68
 Task 1-76
 Task 12-36
 Task 12-41
 TM 38-750
 Task 1-73
 Task 3-7
 Task 3-12
 Task 1-69
 Task 1-70
 Task 1-71
 Task 1-72
 Task 1-88
 Task 1-59

Task 1-60
 Task 1-61
 Task 1-62
 Task 1-63
 Task 1-103
 Task 17-7
 Task 17-8
 Task 10-8
 Task 10-36
 Task 1-51
 Task 7-7
 Task 1-39
 Task 9-27

Equipment Condition:

Helicopter Lubricated—100 Hour Requirement
 (Task 1-87)
 Tiedown Lines Removed, Location per Task 1-26
 Protective Covers Removed, Location per Task 1-32

General Safety Instructions:**WARNING**

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

WARNING

Hydraulic fluid (E197) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

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PREPARE AIRFRAME

1. Remove barrier material and tape from fuselage openings.
2. Clean areas around openings. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
3. Remove preservation compounds from fuselage surfaces. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
4. Remove barrier material and tape from window areas.
5. Clean fuselage around windows. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
6. Clean fuselage (Task 1-76).
7. Open doors, windows, and ramp to ventilate helicopter.
8. Remove screening from all fuselage, ramp, and pod drain valves or plugs.
9. Remove windshield wiper arms and blades from box stowed in helicopter. Inspect and clean blades.
10. Install wiper arms and blades (Task 12-36 and 12-41).
11. Remove static ground wire before moving helicopter.
12. Record data helicopter was prepared for service on DA Forms 2408-13 and 2408-15 of helicopter log books. (Refer to TM 38-750.)

PREPARE UTILITY ITEMS

13. Replace or install fire extinguishers, life rafts, parachutes, AN/CRT-3 radio (if applicable) and other items removed from helicopter for storage.
14. Remove tags from utility items installed on helicopter.
15. Remove barrier material from cargo hooks.

PREPARE LANDING GEAR

16. Remove covering from tires.

17. Service tires (Task 1-73).
18. Clean landing gear. Do not clean polished pistons of shock struts. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
19. Remove lockwire from hydraulic fluid filler plugs. Remove plugs.
20. Insert annealed copper tube into shock strut cylinder until it bottoms.
21. Remove preservative hydraulic fluid from struts. Use siphon pump and tube.
22. Service shock struts with hydraulic fluid (E197) (Task 1-69 and 1-70).
23. Remove SHOCK STRUT PRESERVED tag from air valve.
24. Service shock struts with air (Tasks 1-71 and 1-72).
25. Lubricate landing gear (Task 1-88).
26. Clean polished pistons. Use cloth (E120) damp with hydraulic fluid (E197).
27. Remove wheels (Task 3-7).
28. Clean wheels. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
29. Lubricate bearings. Use grease (E190).
30. Install wheels (Task 3-12).

PREPARE COMMUNICATION EQUIPMENT

31. Remove packaged preserved mechanical items stowed in helicopter. Install items on equipment from which removed.
32. Remove corrosion preventive compound from antenna mountings. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
33. Remove barrier material and tape from connectors.

1-107 SERVICE HELICOPTER AFTER INTERMEDIATE STORAGE
(Continued)

1-107

34. Clean connector areas. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
35. Remove classified communication equipment from approved storage facility. Install and protect equipment in accordance with applicable directives.
36. Remove tags from communication equipment.

PREPARE INSTRUMENTS

37. Remove two clocks from storage. Install in helicopter.
38. Remove tags from clocks.

PREPARE ELECTRICAL SYSTEM

39. Remove tape from battery drain and vent lines.
40. Clean drain and vent lines. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
41. Remove barrier material if installed on battery plug.
42. Service battery sump jar. Use boric acid solution (E83).
43. Install battery in helicopter (Task 9-27).
44. Service battery. (Refer to TM 11-6140-203-14-2.)

45. Connect battery plug (Task 1-39).
46. Install emergency lights (Task 17-8). Charge batteries if needed (Task 17-7).

PREPARE FUEL SYSTEM

47. Remove access doors to inspect fuel cells.

WARNING

To prevent asphyxiation from fuel, oil, and other fumes, wear protective clothing, a respirator, a full facepiece, and rubber gloves. Use an air compressor to continuously pump air into the tank when personnel are in the tank. Ground the air hose to the airframe. Assign a man to monitor the person in the tank in case he is overcome by fumes.

CAUTION

To prevent damage to fuel cell, remove all sharp object from pockets. Remove shoes or wear covers over shoes.

GO TO NEXT PAGE

1-107 SERVICE HELICOPTER AFTER INTERMEDIATE STORAGE
(Continued)

1-107

48. Check inside of each fuel cell for fungus. Remove any fungus by cleaning (Task 10-8).
49. Install access doors.
50. Flush airframe fuel system (Task 10-36).
51. Service fuel tanks (Task 1-51).
52. Remove preservation tag from filler cap.

PREPARE HYDRAULIC SYSTEMS

53. Clean exposed surfaces of actuators. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
54. Coat exposed surfaces of actuators. Use hydraulic fluid (E197).
55. Remove tape from hydraulic tank vents.
56. Clean area around tank vents. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
57. Service hydraulic systems (Task 1-59 thru 1-61 or 1-62).
58. Pressurize accumulators (Task 1-63 thru 1-68).
59. Check hydraulic system for leakage (7-7).

PREPARE AUXILIARY POWER UNIT

60. Prepare apu for service (Task 1-103).

PREPARE DRIVE SYSTEM

61. Prepare drive system for service (Task 1-103).

PREPARE ENGINES

62. Prepare engines for service (Task 1-103).

PREPARE ROTARY-WING SYSTEM HEADS

63. Prepare rotary-wing system heads for service (Task 1-103).

PREPARE ROTARY-WING SYSTEM HEAD CONTROLS

64. Prepare rotary-wing system head controls for service (Task 1-103).

PREPARE ROTARY-WING BLADES

65. Prepare rotary-wing blades for service (Task 1-103).

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

**1-108 INSPECT HELICOPTER AFTER SERVICING FROM
INTERMEDIATE STORAGE**

1-108

INITIAL SETUP**Personnel Required:**

Inspector

Applicable Configurations:

All

References:

TM 55-1520-240-PPM

Task 1-107

Tools:

As Required

Materials:

As Required

Equipment Condition:

Helicopter Serviced (Task 1-107)

-
1. Check that removed parts have been installed and disconnected parts have been connected. Refer to aircraft log book.
 2. Check that all procedures in Task 1-107 have been completed.
 3. Check that aircraft log book has been properly posted (TM 38-750).
 4. Perform 14 day Inspection. (Refer to TM 55-1520-240-PPM.)

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

1-109 AIRCRAFT INVENTORY MASTER GUIDE**1-109**

This is a list of those items of installed or loose equipment required by and authorized for using organizations to accomplish their primary or alternate mission. This list will serve to standardize present inventory procedures by using the inventory master guide to determine the inventoriable items of installed and loose equipment. Insofar as possible, items of equipment are listed in the sequence of their physical location within the aircraft area.

Aircraft inventory is subject to change as a result of authorized changes and additions or deletions of property for special missions requirements; therefore, the selection of items of inventory from the inventory master guide may or may not provide a complete inventory list. When it is known that the master guide does not provide a complete inventory list, it will be necessary to research authorized changes and local command directives in order to compile an accurate and exact inventory list.

When the compilation of the inventory list is accomplished, this list will be entered on DA Form 2408-17, Aircraft Inventory Record. Refer to DA PAM 738-750 for applicable forms and records.

SECURITY

It is desired that aircraft inventory records be unclassified. However, when equipment bearing a security classification or the installation of classified equipment is of a confidential or secret nature, accomplishment of the classification will be in accordance with existing security regulations.

INVENTORIABLE ITEMS

The listing is made without regard to the agency, governmental or contractual, furnishing the items.

1. Items listed are as follows:
 - a. Those essential to the execution of the designated mission of the aircraft, such as electronic, photographic, armament, special mission instruments, and safety and comfort equipment.
 - b. Loose equipment delivered with the aircraft and items subject to pilferage or readily converted to personal use.

- c. Modification kits which are issued or distributed to using organizations for installation and which are not immediately placed in work will be recorded on the affected aircraft DA Form 2408-17 (Aircraft Inventory Record) and identified as loose equipment until the modification is completed.

- d. Equipment required for operation in special environment.

2. Items not listed are as follows:

- a. Nonaccountable items coded as expendable in the applicable stock lists.
- b. Personal issue or furnished on unit allowance or other authority.
- c. Those items or components considered basic or integral parts of the airframe or basic aircraft such as engines, rotary wings, wheels, and standard instruments.
- d. Technical publications, checklists, and aircraft forms.
- e. Items coded CPO (Complete Provisions Only) are not to be inventoried unless the equipment is actually installed.

PERIODS OF INVENTORY

Inventoriable items will be checked against the Aircraft Inventory Record (DA Form 2408-17) at the following periods:

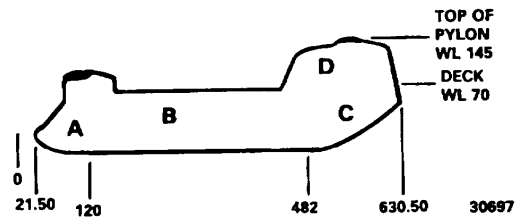
1. Upon receipt of the aircraft.
2. Prior to transfer of the aircraft to another organization.
3. Upon placing the aircraft in storage and upon removing it from storage. The aircraft need not be inventoried while in storage.
4. Twelve months elapsed time since the last inventory.
5. Loose equipment shipped under separate cover is inventoried upon transfer by the sending activity and immediately upon receipt by the receiving activity.

INVENTORY ITEMS LIST

The following is a list of all CH-47D helicopter inventoriable items.

GO TO NEXT PAGE

- A - COCKPIT
Sta 0 to 120
- B - CABIN AREA
Sta 120 to 482
- C - RAMP AREA
Sta 482 to 630.50
- D - ENGINE AND AFT PYLON
Sta 440 to 630.50



ITEM NOMENCLATURE	Aircraft Series and Configuration by Theater (See Note)				LOCATION OR REMARKS
	CH-47D				
	H	J	K	L	
SECTION A - COCKPIT	NOTE Letters at top of columns denote theater configuration as follows: H - Conus K - Alaska J - Europe L - Far East				
Free Air Temperature Bulb 114E2177		1			Lower Left Corner of Upper Right Cockpit Window
Compass, Magnetic Standby, 60-1447		1			Centerline of Nose Enclosure Above Console Glare Shield
Compass Correction Card		1			To the Side of the Standby Compass
Compass Correction Holder		1			To the Side of the Standby Compass
Interphone Control C-6533 (yARC		3			On Center Lower Console
Antenna, FM, AS-1 703/AR or S65-8280-30 (Section B)		2			About Sta 110 at the Bottom Centerline of the Fuselage
Clock 60-1201 Digital Chronometer M880A		2			Right and Left Side Instrument Panel
Light, Utility, C-4A		2			Right and Left Side Cockpit Aft
Aircraft Manufacturer's Data Plate BACN12MIVS		1			Left Side Cockpit Below Floorline
Doppler Navigation System					
1. RT-1193/ASN-128		1			About Sta 106 at BL10.86 Bottom of Fuselage
2. CV-3338/ASN128		1			Elect Comp. Sta 120 2nd Shelf Down Right Side
3. CP-1252/ASN 128		1			Upper Console, Center

GO TO NEXT PAGE

ITEM NOMENCLATURE	Aircraft Series and Configuration by Theater (See Note)				LOCATION OR REMARKS
	CH-47D				
	H	J	K	L	
Doppler Navigation System					
1. RT-1193A/ASN-128B	1				About Sta 106 at BL 10.86 Bottom of Fuselage
2. CV-3338A/ASN-128B	1				Elect Comp. Sta 120 2nd Shelf Down Right Side
3. CP-1252C/ASN-128B	1				Upper Console, Center
4. Doppler Antenna	1				Upper Access Door No. 2

ITEM NOMENCLATURE	Aircraft Series and Configuration by Theater (See Note)				LOCATION OR REMARKS
	CH-47D				
	H	J	K	L	
Fire Extinguisher FSN 4210-555-8837/CF ₃ Br	1				Aft Right Side of Copilot Seat on Floor
First Aid Kit, Aeronautic	1				Upper Right Side Cockpit Entrance
Belt, Lap Safety, MD-2 Shoulder Harness G-1	2				Pilot and Copilot Seats
Cushions, Pilot and Copilot 1. Seat 114E4080-18	2				Pilot and Copilot Seats
2. Back 114E4080-17	2				Pilot and Copilot Seats
Searchlight, Grimes	2				Bottom of Fuselage, Right and Left Sides of the Centerline at about Sta 67
Spare Lamp Box	1				Aft of Copilot Seat, at Left Side, on the Bulkhead
Map and Flight Record Holder 114E4032-20	1				Right Side of Cockpit Entrance
UHF Radio AN/ARC-164	1				Console
Directional Gyro CN-998()/ASN-43	1				Electronic Compartment at about Sta 120, Left Side, Second Shelf Down
Vertical Gyro CN-811()/ASN or 9000F	2				Electronic Compartment at about Sta 120, Left Side, Second and Third Shelf Down
Attitude Gyro Relay	1				Electronic Compartment at about Sta 120, Left Side, Second Shelf Down
Radio Receiving Set AN/ARN-123 (VOR/ILS)	1				Electronic Compartment at about Sta 120, Left Side, Second Shelf Down
Direction Finder AN/ARN-89 Receiver R-1496/ARN-89	1				Electronic Compartment at about Sta 120, Left Side, Third Shelf Down
VHF Radio Set AN/ARC-186	1				Console

ITEM NOMENCLATURE	Aircraft Series and Configuration by Theater (See Note)				LOCATION OR REMARKS
	CH-47D				
	H	J	K	L	
Transponder Set AN/APX-100 (IFF)	1				Console
Altimeter Set AN/APN-209	1				Pilot's and Copilot's Instrument Panels
Troop Commander Seat 114ESO11-3	1				Cockpit Entrance
Troop Commander Seat Cushion 114E4088	1				Cockpit Entrance
Troop Commander Belt, Safety Rescue Hoist Winch	1				Cockpit Entrance
1. Winch 114E6040-2	1				Right Side Closet Area at Sta 120
2. Tackle Block 114E6058-23	2				Stored at Sta 120 Right Side of Cabin Area
3. Hook and Cable Assembly 114E6042-15	1				Stored at Sta 120, Right Side of Cabin Area
4. Rescue Block 114E6050-39, MA-1	1				Stored at Sta 120, Right Side of Cabin Area
5. Hoist Operator's Harness	1				Stored at Sta 120, Right Side of Cabin Area
6. Guard Assembly	1				Stored at Sta 120, Right Side of Cabin Area
7. Cable Cutter Cartridge	1				Loose Equipment
8. Heater	1				Right Side Closet Area at Sta 120
SECTION B - CABIN AREA					
Door and Exit Locks (Set)	1				Right Side of Cabin Area Sta 140
Troop Warning Signal (System)	1				Left Side of Cabin Area Sta 120
Fire Extinguisher FSN 4210-555-8837/CF ₃ Br	1				Left Side of Cabin Area Sta 120

GO TO NEXT PAGE

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1-109 AIRCRAFT INVENTORY MASTER GUIDE (Continued)

1-109

ITEM NOMENCLATURE	Aircraft Series and Configuration by Theater (See Note)				LOCATION OR REMARKS
	CH-47D				
	H	J	K	L	
Antenna AS-2595/APN-194(V)	2				Right and Left Side About Sta 150, Bottom of Fuselage
AFCS Computer (2)	2				Electronic Compartment Left Side, Third Shelf Down
Emergency Exit Light	3				Right and Left Side Cabin Sta 120 and Ramp Area Sta 482
Anchor Line Assembly 114E5139	1				Stowed at Sta 170, Right Side
Interphone Control C-6533()/ARC	2				Overhead Cabin Area Sta 170
Foot Switches, Gunner	2				Sta 170
VHF-UHF Antenna AT-1108()/ARC	1				Bottom Centerline of Fuselage Sta 146
Antenna AT-256()/ARC	1				Bottom Fuselage at Sta 170 Left Side
Antenna ADF AS-2108/ARN-89 (Loop) 114E3082 (Sense)	1				Bottom Centerline of Fuselage Sta 180
Antenna S65-8280-30	1 1				Bottom Fuselage at Sta 146 Top Fuselage at Sta 296 Right Side
Antenna AS-1922()/ARC	1				Bottom Fuselage at Sta 130
Antenna AT-640/ARN, Marker Beacon	1				Bottom Centerline of Fuselage Sta 227
Troop Seat (3 Man)	10				Cabin Area
Troop Seat (1 Man)	3				Cabin Area
Probe Pole, Cargo Hookup	1				Right Side of Cabin Area Sta 325 to 390, Stowed

GO TO NEXT PAGE

Change 57 1-349

ITEM NOMENCLATURE	Aircraft Series and Configuration by Theater (See Note)				LOCATION OR REMARKS
	CH-47D				
	H	J	K	L	
First Aid Kit, Aeronautic	6				Cabin Ceiling
Belt, Troop Safety, Davis FDC-1650-27MI	33				Cabin Area
Tiedown Fittings, Outboard 48B7796 (4 each side) (10,000 lb)	8				Cabin Area Right and Left Side
Battery 145E2089-1	1				Left Pod Sta 190
Winch Control Grip and Cord Assembly	1				Stowed on Right Side of Cabin Area Sta 330
Blade Anchor 114E5060	6				Loose Equipment
Crank Assy, Emergency, Ramp and Rescue Hatch	1				Stowed at Sta 340 on Left Side
Cover, Oil Cooler Inlet, 145G0001-1	1				Loose Equipment
Cover, Engine Air Outlet 114G1323-1	2				Loose Equipment
Cover, Oil Cooler Exhaust 145G0002-5	1				Loose Equipment
Cover, Pitot Tube 114E5040-33	2				Loose Equipment
Cover, Oil Cooler Exhaust 145G0002-6	1				Loose Equipment
Cover, Cockpit Enclosure 145G0006-1	1				Loose Equipment
Cover, Hydraulic Cooler Exhaust 145G0004-1	1				Loose Equipment
Cover, Rotor Hub, Fwd and Aft 114G1023-25	2				Loose Equipment
Cover, Heater, 114G1024-1	1				Loose Equipment
Cover, Apu Exhaust, 145G0005-1	1				Loose Equipment
Cover, Heater, Exhaust, 114G1025-1	1				Loose Equipment
Cover, Air Inlet, 145G0003-1	1				Loose Equipment
Cover, Engine Inlet (T55-L-712) 219G1001-1 (W/Screens) 114E1206-1 (W/O Screens)	2				Loose Equipment
Droop Stop Shroud, 114R2215-1	3				Loose Equipment
Droop Stop Base, 114R2215-4	3				Loose Equipment
Droop Stop Shield, 114R2215-11	3				Loose Equipment
Ramp Extension 1560CH-47-400-1 (3 ea) 1560CH-47-398-1	2 1				Loose Equipment Loose Equipment
Tiedown Chains MB-1	8				Loose Equipment
Tiedown Straps CGU1/B	32				Loose Equipment

GO TO NEXT PAGE

1-109 AIRCRAFT INVENTORY MASTER GUIDE (Continued)

1-109

ITEM NOMENCLATURE	Aircraft Series and Configuration by Theater (See Note)				LOCATION OR REMARKS
	CH-47D				
	H	J	K	L	
Signal Data Converter					Electronic Compartment Sta 120. Left Side, at about Second Shelf Down
Air Data Transducer					Electronic Compartment Sta 120, Left Side, at about Third Shelf Down
Inclinometer					Electronic Compartment Sta 120, Left Side, at about Second Shelf Down
Converter Control					On Canted Console
SECTION C - RAMP AREA					
Fire Extinguisher. FSN 4210-55-8837/CF38r	1				Left Side Sta 490 on Frame Aft
Static Ground Wire	1				Bottom of Left Aft Landing Gear
Interphone Control C-6533()/ARC	1				Ramp Area Left Side Sta 488
Transmitter Remote Compass with Compensator CN-405()/ASN	1				Romp Area Left Side Sta 575
Troop Warning Signal	1				Left Side of Bulkhead Sta 535
SECTION D - ENGINE AND AFT PYLON					
Fire Extinguisher System Bottles 114PS203-3	2				Overhead Sta 482 and 502
Axe, Emergency Escape 56 D 6221	1	1	1	1	Sta 120
HF Radio Set Control C12436/URC	1				Console
HF Radio Receiver-Transmitter RT-1749/URC	1				Electronic Compartment at about Sta 120, Left Side, Sixth Shelf Down
HF Power Amplifier-Coupler AM-7531/URC	1				Electronic Compartment at about Sta 120, Left Side, First Shelf Down
TSEC-KY-100 Processor	1				Electronic Compartment at about Sta 120. Left Side, Under Fifth Shelf Down
TSEC-KY-100 Control	1				Console

END OF TASK

Change 64 1-351/(1 -352 blank)

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-31, AVUM and AVIM Maintenance requirements for CH-47D Helicopter, Cargo Transport.

These are the instructions for sending an electronic 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however, only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" whomever@avma27.army.mil
To: 2028@redstone.army.mil
Subject DA Form 2028

1. **From:** Joe Smith
2. **Unit:** home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** MO
6. **Zip:** 77777
7. **Date Sent:** 19-OCT-93
8. **Pub no:** 55-2840-229-23
9. **Pub Title:** TM
10. **Publication Date:** 04-JUL-85
11. **Change Number:** 7
12. **Submitter Rank:** MSG
13. **Submitter FName:** Joe
14. **Submitter MName:** T
15. **Submitter LName:** Smith
16. **Submitter Phone:** 123-123-1234
17. **Problem:** 1
18. **Page:** 2
19. **Paragraph:** 3
20. **Line:** 4
21. **NSN:** 5
22. **Reference:** 6
23. **Figure:** 7
24. **Table:** 8
25. **Item:** 9
26. **Total:** 123
27. **Text:**

This is the text for the problem below line 27.



THEN ... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

PFC John DOE
CO 4 3rd Engineer Bn
Ft. Leonardwood, MD 63108

DATE SENT

10 January 1999

PUBLICATION NUMBER

TM 55-1520-240-23-1

PUBLICATION DATE

30 December 1998

PUBLICATION TITLE

Operator's manual CH-47 Helicopter

BE EXACT PIN-POINT WHERE IT IS

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
6	2-1 a		
B1		4-3	

In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.

Callout 16 in figure 4-3 is pointed at a bolt. In key to figure 4-3, item 16 is called a shim. Please correct one or the other

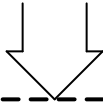
PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

JOHN DOE, PFC (268) 317-7111

SIGN HERE

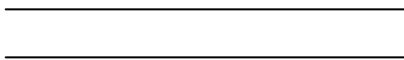
JOHN DOE *John Doe*

FILL IN YOUR
UNITS ADDRESS



FOLD BACK

DEPARTMENT OF THE ARMY

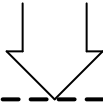


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COMMANDER
U.S. ARMY AVIATION AND MISSILE COMMAND
ATTN: AMSAM-MMC-MA-NP
REDSTONE ARSENAL, AL 35898-5230

TEAR ALONG PERFORATED LINE

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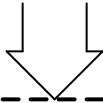
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TEAR ALONG PERFORATED LINE

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 decagram = 10 grams = .35 ounce
 1 hectogram = 10 decagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	C
---	---------------------------	-------------------------------	------------------------	---

