

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 11,

HEADQUARTERS, DEPARTMENT OF THE ARMY

10 MAY 1983

CHANGE

NO. 19

**HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 July 2000**

Aviation Unit and Aviation Intermediate
Maintenance Manual

CH-47D HELICOPTER

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Remove pages

A through D
4-2.1 and 4-2.2

4-3 and 44

4-5 and 4-6
4-6.1/(4-6.2 blank)
4-7 and 4-8
4-8.1 and 4-8.2
4-14.1 and 4-14.2
4-15 through 4-20

4-21 through 4-24

4-31 and 4-32
4-40.1 through 4-40.14

4-41 through 4-44

4-45 through 4-54
4-54.1/(4-54.2 blank)
4-57 and 4-58
4-65 through 4-68
4-71 and 4-72

4-73 and 4-74

4-75 through 4-78

4-79 through 4-82
4-89 and 4-90
4-93 and 4-94

4-107 through 4-110

Insert pages

A through E/(F blank)
4-2.1 and 4-2.2
4-2.2.1/(4-2.2.2 blank)
4-3 and 4-4
4-4.1/(4-4.2 blank)
4-5 and 4-6
4-6.1 and 4-6.2
4-7 and 4-8
4-8.1 and 4-8.2
4-14.1 and 4-14.2
4-15 through 4-20
4-20.1 through 4-20.3/(4-20.4 blank)
4-21 through 4-24
4-30.1 through 4-30.7/(4-30.8 blank)
4-31 and 4-32
4-40.1 through 4-40.14
4-40.15 through 4-40.24
4-41 through 4-44
4-44.1 through 4-44.6
4-45 through 4-54
4-54.1 and 4-54.2
4-57 and 4-58
4-65 through 4-68
4-71 and 4-72
4-72.1 and 4-72.2
4-73 and 4-74
4-74.1/(4-74.2 blank)
4-75 through 4-78
4-78.1 and 4-78.2
4-79 through 4-82
4-89 and 4-90
4-93 and 4-94
4-94.1 through 4-94.6
4-107 through 4-110
4-112.1 through 4-112.7/(4-112.8 blank)

Remove pages

4-121 and 4-122

4-123 through 4-126
4-126.1 through 4-126.4
4-128.1/(4-128.2 blank)
4-129 through 4-134
4-139 and 4-140
4-189 and 4-190
4-193 and 4-194
4-194.1/(4-194.2 blank)

4-197 and 4-198

4-213 through 4-220
4-225 through 4-230
4-233 through 4-242
4-247 and 4-248
4-252.1 and 4-252.2
4-255 through 4-266
4-271 through 4-278
4-283 through 4-288
4-291 through 4-306
4-309 through 4-322

Insert pages

4-121 and 4-122
4-122.1 through 4-122.5/(4-122.6 blank)
4-123 through 4-126
4-126.1 through 4-126.4
4-128.1/(4-128.2 blank)
4-129 through 4-134
4-139 and 4-140
4-189 and 4-190
4-193 and 4-194
4-194.1 and 4-194.2
4-194.3 and 4-194.4
4-194.5/(4-194.6 blank)
4-197 and 4-198
4-198.1 through 4-198.5/(4-198.6 blank)
4-213 through 4-220
4-225 through 4-230
4-233 through 4-242
4-247 and 4-248
4-252.1 and 4-252.2
4-255 through 4-266
4-271 through 4-278
4-283 through 4-288
4-291 through 4-306
4-309 through 4-322
4-331/(4-332 blank)
4-333 through 4-352
4-353/(4-354 blank)
4-355/(4-356 blank)
4-357 through 4-390

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JOEL B. HUDSON
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TM 55-1520-240-23-3
C18

**CHANGE
NO. 18**

**HEADQUARTERS
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WASHINGTON, D.C., 1 September 1999**

**Aviation Unit and Aviation Intermediate
Maintenance Manual**

CH-47D HELICOPTER

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Remove pages

- - -
i and ii
4-197 and 4-198

Insert pages


A through D
i and ii
4-197 and 4-198

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NO 17

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CH-47D HELICOPTER

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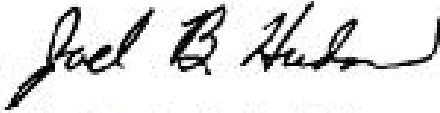
Remove pages
i and ii
4-183 through 4-186

Insert pages
i and ii
4-183 through 4-186

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*Administrative Assistant to the
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DENNIS J REIMER
General, United States Army
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Maintenance Manual

CH-47D Helicopter

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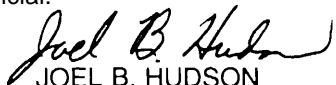
1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
3-24.1 and 3-24.2	3-24.1 and 3-24.2
3-41 and 3-42	3-41 and 3-42
3-93 through 3-96	3-93 through 3-96
3-101 and 3-102	3-101 and 3-102
3-133 through 3-136	3-133 through 3-136
3-159 and 3-160	3-159 and 3-160
3-163 and 3-164	3-163 and 3-164
3-171 through 3-174	3-171 through 3-174
3-191 and 3-192	3-191 and 3-192
4-8.1 and 4-8.2	4-8.1 and 4-8.2
4-15 and 4-16	4-15 and 4-16
4-43 and 4-44	4-43 and 4-44
4-54.1/(4-54.2 blank)	4-54.1/(4-54.2 blank)
4-57 and 4-58	4-57 and 4-58
4-97 through 4-100	4-97 through 4-100
4-116.1/(4-116.2 blank)	4-116.1/(4-116.2 blank)
4-121 and 4-122	4-121 and 4-122
4-125 through 4-126.4	4-125 through 4-126.4
4-223 and 4-224	4-223 and 4-224
4-283 and 4-284	4-283 and 4-284
4-287 through 4-290	4-287 through 4-290
4-307 and 4-308	4-307 and 4-308

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*Administrative Assistant to the
Secretary of the Army*
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DENNIS J. REIMER
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CH-47D HELICOPTER

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Remove pages	Insert pages
3-24.1 and 3-24.2	3-24.1 and 3-24.2
3-25 and 2-26	3-25 and 2-26
3-26.1/(3-26.2 blank)	3-26.1/(3-26.2 blank)
3-27 and 3-28	3-27 and 3-28
3-85 and 3-86	3-85 and 3-86
3-86.1 and 3-86.2	3-86.1 and 3-86.2
3-95 through 3-98	3-95 through 3-98
3-103 and 3-104	3-103 and 3-104
3-104.1 and 3-104.2	3-104.1 and 3-104.2
3-133 through 3-136	3-133 through 3-136
3-185 through 3-192	3-185 through 3-192
4-2.1 and 4-2.2	4-2.1 and 4-2.2
4-3 and 4-4	4-3 and 4-4
4-23 through 4-26	4-23 through 4-26
4-29 and 4-30	4-29 and 4-30
4-53 through 4-56	4-53 through 4-56
4-96.1/(4-96.2 blank)	4-96.1/(4-96.2 blank)
4-97 through 4-102	4-97 through 4-102
4-125 and 4-126	4-125 and 4-126
4-126.3 and 4-126.4	4-126.3 and 4-126.4
4-1 26.7/(4-1 26.8 blank)	4-1 26.7/(4-126.8 blank)
4-127 and 4-128	4-127 and 4-128
4-128.1 /(4-1 28.2 blank)	4-128.1/(4-128.2 blank)
4-129 and 4-130	4-129 and 4-130
4-194.1/(4-194.2 blank)	4-1 94.1/(4-194.2 blank)
4-281 and 4-282	4-281 and 4-282
4-285 and 4-286	4-285 and 4-286

Remove pages

4-289 and 4-290

4-311 and 4-312

4-323 and 4-324

4-329/(4-330 blank)

Insert pages

4-289 and 4-290

4-311 and 4-312

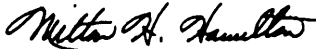
4-323 and 4-324

4-329/(4-330 blank)

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Official:



MILTON H. HAMILTON

Administrative Assistant to the

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Aviation Unit and Aviation
Intermediate Maintenance Manual

CH-47D HELICOPTER

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Remove pages

i and ii
3-25 and 3-26

3-29 through 3-32
3-34.1 and 3-34.2
3-81 and 3-82

3-89 and 3-90
4-53 and 4-54
4-57 and 4-58
4-61 and 4-62
4-109 and 4-110
4-113 and 4-114

4-115 and 4-116

4-117 and 4-118

4-119 and 4-120

4-131 and 4-132
4-151 and 4-152
4-156.1/(4-156.2 blank)
4-279 and 4-280

Insert pages

i and ii
3-25 and 3-26
3-26.1/(3-26.2 blank)
3-29 through 3-32
3-34.1 and 3-34.2
3-81 and 3-82
3-86.3 through 3-86.7/
(3-86.8 blank)
3-89 and 3-90
4-53 and 4-54
4-57 and 4-58
4-61 and 4-62
4-109 and 4-110
4-113 and 4-114
4-114.1/(4-114.2 blank)
4-115 and 4-116
4-116.1/(4-116.2 blank)
4-117 and 4-118
4-118.1 through 4-118.4
4-119 and 4-120
4-120.1 and 4-120.2
4-131 and 4-132
4-151 and 4-152
4-156.1/(4-156.2 blank)
4-279 and 4-280

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By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

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CHANGE
NO. 13HEADQUARTERS
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Intermediate Maintenance Manual

CH-47D HELICOPTER

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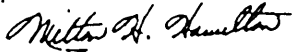
1. Remove and insert pages as indicated below. New or change text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
3-6.1/3-6.2	3-6.1/3-6.2
3-7 and 3-8	3-7 and 3-8
3-15 through 3-18	3-15 through 3-18
3-37 through 3-42	3-37 through 3-42
3-95 and 3-96	3-95 and 3-96
3-103 and 3-104	3-103 and 3-104
3-125 and 3-126	3-125 and 3-126
3-177 and 3-178	3-177 and 3-178
3-181 and 3-182	3-181 and 3-182
3-191 and 3-192	3-191 and 3-192
4-13/4-14	4-13/4-14
4-25 and 4-26	4-25 and 4-26
4-29 and 4-30	4-29 and 4-30
4-49 and 4-50	4-49 and 4-50
4-57 and 4-58	4-57 and 4-58
4-115 through 4-118	4-115 through 4-118
4-129 through 4-132	4-129 through 4-132
4-278.1/4-278.2	4-278.1 and 4-278.2
4-279 through 4-282	4-279 through 4-282
4-289 and 4-290	4-289 and 4-290
4-321 and 4-322	4-321 and 4-322

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MILTON H. HAMILTON
Administrative Assistant to the
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General, United States Army
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NO. 12 }HEADQUARTERS
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Intermediate Maintenance Manual

CH-47D HELICOPTERS

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Remove pages	Insert pages
3-19 and 3-20	3-19 and 3-20
---	3-20.1/3-20.2
3-21 and 3-22	3-20.3 and 3-20.4
---	3-21 and 3-22
3-35/3-36	3-34.1 through 3-34.5/3-34.6
3-57 and 3-58	3-35/3-36
3-73 and 3-74	3-57 and 3-58
3-77 and 3-78	3-73 and 3-74
3-115 and 3-116	3-77 and 3-78
3-119 through 3-122	3-115 and 3-116
3-129 and 3-130	3-119 through 3-122
3-137 and 3-138	3-129 and 3-130
3-157 and 3-158	3-137 and 3-138
3-167 through 3-170	3-157 and 3-158
3-170.1/3-170.2	3-167 through 3-170
3-171 and 3-172	3-170.1/3-170.2
4-2.1 and 4-2.2	3-171 and 3-172
4-3 through 4-6	4-2.1 and 4-2.2
4-7 and 4-8	4-3 through 4-6
4-40.1 and 4-40.2	4-7 and 4-8
4-43 and 4-44	4-40.1 through 4-40.14
4-53 and 4-54	4-43 and 4-44
4-57 and 4-58	4-53 and 4-54
4-109 through 4-112	4-57 and 4-58
4-119 and 4-120	4-109 through 4-112
4-123 and 4-124	4-119 and 4-120
4-133 and 4-134	4-123 and 4-124
4-177 and 4-178	4-133 and 4-134
4-178.13/4-178.14	4-177 and 4-178
4-179 through 4-188	4-178.13 and 4-178.14
4-191 through 4-194	4-179 through 4-188
4-194.1/4-194.2	4-191 through 4-194
4-195 and 4-196	4-194.1/4-194.2
4-201 through 4-204	4-195 and 4-196
4-205 through 4-208	4-201 through 4-204
	4-205 through 4-208

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Brigadier General, United States Army
The Adjutant General

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General, United States Army
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URGENT

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TM 55-1520-240-23-3
C 11

CHANGE }
NO. 11 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 12 September 1989

Aviation Unit and Aviation
Intermediate Maintenance Manual

CH-47D HELICOPTER

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4-11 and 4-12

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CHANGE }
 NO. 10 }

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Aviation Unit and Aviation Intermediate
 Maintenance Manual

CH-47D HELICOPTER

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Move pages	Insert pages
3-23 and 3-24	3-23 and 3-24
3-25 through 3-28	3-25 through 3-28
3-69 and 3-70	3-69 and 3-70
3-99 and 3-100	3-99 and 3-100
3-189 through 3-192	3-189 through 3-192
4-8.1 and 4-8.2	4-8.1 and 4-8.2
4-40.1 and 4-40.2	4-40.1 and 4-40.2
4-51 through 4-54	4-51 through 4-54
---	4-96.1/4-96.2
4-97 through 4-100	4-97 through 4-100
4-103 through 4-106	4-103 through 4-106
4-119 and 4-120	4-119 and 4-120
---	4-126.1 through 4-126.7/4-126.8
4-127 and 4-128	4-127 and 4-128
4-137 and 4-138	4-137 and 4-138
4-171 and 4-172	4-172

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Official:

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General, United States Army
Chief of Staff

WILLIAM J. MEEHAN H
Brigadier General, United States Army
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Aviation Unit and Aviation
Intermediate Maintenance Manual

CH-47D HELICOPTER

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Remove pages

4-6.1/4-602
4-7 and 4-8
4-8.1/4-8.2

4-141 and 4-142
4-252.1 through 4-252.8

Insert pages

4-6.1/4-6.2
4-7 and 4-8
4-8.1/4-8.2
4-64.1 and 4-64.2
4-141 and 4-142
4-252.1 through 4-252.8
4-252.9/4-252.10

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General, United States Army
Chief of Staff

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CHANGE }
NO. 8 }

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WASHINGTON, D.C., 8 December 1987

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
i through iv	i through iv
3-24.1 and 3-24.2	3-24.1 and 3-24.2
3-25 and 3-26	3-25 and 3-26
---	3-90.1 and 3-90.2
3-115 through 3-118	3-115 through 3-118
3-135 and 3-136	3-135 and 3-136
3-169 and 3-170	3-169 and 3-170
---	3-170.1/3-170.2
3-181 and 3-182	3-181 and 3-182
3-191 and 3-192	3-191 and 3-192
4-49 and 4-50	4-49 and 4-50
4-53 and 4-54	4-53 and 4-54
4-57 and 4-58	4-57 and 4-58
4-63 and 4-64	4-63 and 4-64
4-87 and 4-88	4-87 and 4-88
4-123 through 4-128	4-123 through 4-128
4-141 and 4-142	4-141 and 4-142
4-143 and 4-144	4-143 and 4-144
4-179 and 4-180	4-179 and 4-180
4-189 through 4-194	4-189 through 4-194
---	4-194.1/4-194.2
4-195 and 4-196	4-195 and 4-196
4-197 and 4-198	4-197 and 4-198
4-203 and 4-204	4-203 and 4-204

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

CHANGE }
 NO 7 }

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 WASHINGTON, D.C., 6 July 1987

Aviation Unit and Aviation Intermediate
 Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-3, 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

4-115 and 4-116
 4-123 and 4-124
 4-321 and 4-322

Insert pages

4-115 and 4-116
 4-123 and 4-124
 4-321 and 4-322

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TM 55-1520-240-23-3
C 6

CHANGE }
NO. 6 }

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Aviation Unit and Aviation Intermediate
Maintenance Manual

CH-47D HELICOPTER

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Remove pages

4-8.1/4-8.2
4-9 through 4-12

4-13 and 4-14

Insert pages

4-8.1/4-8.2
4-9 through 4-12
4-12.1/4-12.2
4-13/4-14

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CHANGE }
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Aviation Unit and Aviation Intermediate
 Maintenance Manual

CH-47D HELICOPTER

TM 55-1520-240-23-3, 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

g/h
 3-23 and 3-24

 3-25 through 3-28
 3-51 and 3-52
 3-67 and 3-68
 3-80.1 and 3-80.2

 3-85 and 3-86

 3-93 and 3-94
 3-97 and 3-98
 3-103 and 3-104

 3-121 and 3-122
 3-133 and 3-134
 3-163 and 3-164
 4-11 and 4-12
 4-19 and 4-20
 4-29 and 4-30
 4-49 and 4-50

 4-55 through 4-58
 4-77 through 4-82
 4-89 and 4-90
 4-93 and 4-94
 4-107 through 4-110
 4-115 and 4-116

 4-129 and 4-130
 4-133 through 4-138

 4-151 and 4-152
 4-157 and 4-158
 4-165 through 4-170

Insert pages

g/h
 3-23 and 3-24
 3-24.1 and 3-24.2
 3-25 through 3-28
 3-51 and 3-52
 3-67 and 3-68
 3-80.1 and 3-80.2
 3-80.3 and 3-80.4
 3-85 and 3-86
 3-86.1 and 3-86.2
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 3-97 and 3-98
 3-103 and 3-104
 3-104.1 through 3-104.3/
 3-104.4
 3-121 and 3-122
 3-133 and 3-134
 3-163 and 3-164
 4-11 and 4-12
 4-19 and 4-20
 4-29 and 4-30
 4-49 and 4-50
 4-54.1/4-54.2
 4-55 through 4-58
 4-77 through 4-82
 4-89 and 4-90
 4-93 and 4-94
 4-107 through 4-110
 4-115 and 4-116
 4-128.1/4-128.2
 4-129 and 4-130
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 4-151 and 4-152
 4-156.1/4-156.2
 4-157 and 4-158
 4-165 through 4-169/4-170

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4-175 through 4-178

4-179 and 4-180
4-187 through 4-196

4-197 through 4-200
4-203 and 4-204

4-205 and 4-206
4-211 and 4-212
4-221 and 4-222

4-223 and 4-224
4-225 and 4-226
4-247 and 4-248
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4-279 and 4-280
4-283 and 4-284
4-287 through 4-300
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Insert pages

4-175 through 4-178
4-178.1 through 4-178.13/
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4-197 through 4-200
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4-204.1 and 4-204.2

4-205 and 4-206
4-211 and 4-212
4-221 and 4-222
4-222.1/4-222.2

4-223 and 4-224
4-225 and 4-226
4-247 and 4-248

4-251 and 4-252
4-252.1 through 4-252.8
4-278.1/4-278.2

4-279 and 4-280
4-283 and 4-284

4-287 through 4-300
4-311 and 4-312

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TM 55-1520-240-23-3
C 4

CHANGE }
NO. 4 }

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WASHINGTON, D.C., 3 June 1986

Aviation Unit and Aviation Intermediate
Maintenance Manual

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TM 55-1520-240-23-3, 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

4-141 through 4-144

4-141 through 4-144

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C 3

CHANGE }
NO. 3 }

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Maintenance Manual

CH-47D HELICOPTER

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Remove pages

Insert pages

4-265 and 4-266

4-265 and 4-266

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C 2

CHANGE }
NO. 2 }

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Aviation Unit and Aviation Intermediate
Maintenance Manual

CH-47D Helicopter

TM 55-1520-240-23-3, 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

4-289 and 4-290

4-289 and 4-290

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Aviation Unit and Aviation Intermediate
Maintenance Manual

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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
3-9 and 3-10	3-9 and 3-10
3-13 and 3-14	3-13 and 3-14
---	3-14.1/3-14.2
3-15 through 3-20	3-15 through 3-20
3-25 through 3-36	3-25 through 3-35/3-36
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3-113 and 3-114	3-113 and 3-114
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3-123 through 3-126	3-123 through 3-126
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3-139 and 3-140	3-139 and 3-140
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3-161 through 3-174	3-161 through 3-174
3-177 and 3-178	3-177 and 3-178
3-181 and 3-182	3-181 and 3-182
3-187 and 3-188	3-187 and 3-188
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4-6.1/4-6.2	4-6.1/4-6.2
4-7 and 4-8	4-7 and 4-8
---	4-8.1/4-8.2
4-9 through 4-14	4-9 through 4-14
----	4-14.1 and 4-14.2

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4-25 and 4-26
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4-329/4-330

Insert pages

4-25 and 4-26
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4-35 and 4-36
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4-183 through 4-188
4-197 and 4-198
4-209 and 4-210
4-213 and 4-214
4-225 and 4-226
4-233 through 4-236
4-247 through 4-252
4-257 and 4-258
4-269 and 4-270
4-283 and 4-284
4-301 and 4-302
4-329/4-330

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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 in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands.

Dates of issue for original changed pages are:

Original	10 May 1983	Change 11	12 September 1989
Change 1	4 March 1985	Change 12	17 October 1990
Change 2	6 November 1985	Change 13	30 April 1992
Change 3	17 April 1986	Change 14	4 April 1994
Change 4	3 June 1986	Change 15	23 January 1995
Change 5	14 October 1986	Change 16	20 June 1996
Change 6	1 December 1986	Change 17	23 December 1996
Change 7	6 July 1987	Change 18	1 September 1999
Change 8	8 December 1987	Change 19	15 July 2000
Change 9	1 May 1988		
Change 10	1 November 1989		

Page No.	*Change No.	Page No.	*Change No.
Title	0	3-25.....	8
A- E/F blank	19	3-26.....	15
a-f	0	3-26.1 - 3-26.2 blank	15
g - h blank	5	3-27 - 3-28.....	15
i.....	18	3-29.....	1
ii - iv	8	3-30 - 3-31.....	14
v - vi blank.....	0	3-32.....	1
Chap.3, 3-1 - 3-2 blank.....	0	3-33.....	0
3-2.1-3-2.2.....	0	3-34.....	1
3-3 -3-6.....	0	3-34.1 - 3-34.2	14
3-6.1 - 3-6.2 blank	13	3-34.3 - 3-34.4	12
3-7	13	3-34.5 - 3-34.6 blank	12
3-8	0	3-35 - 3-36 blank	12
3-9	1	3-37 -3-40	13
3-10-3-13.....	0	3-41.....	16
3-14.....	1	3-42.....	13
3-14.1 - 3-14.2 blank	1	3-43 - 3-44.....	1
3-15.....	13	3-45.....	0
3-16.....	1	3-46.....	1
3-17 - 3-18.....	13	3-47 - 3-50.....	0
3-19 - 3-20.....	12	3-51.....	5
3-20.1 - 3-20.2 blank	12	3-52 - 3-55.....	0
3-20.3 - 3-20.4.....	12	3-56.....	1
3-21.....	12	3-57.....	0
3-22.....	0	3-58.....	12
3-23.....	10	3-59 - 3-61.....	0
3-24.....	4	3-62.....	1
3-24.1 - 3-24.2	16	3-63 - 3-66.....	0

*Zero in this column indicates an original page.

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3-67.....	1
3-68.....	5
3-69.....	10
3-70 - 3-71.....	0
3-72 - 3-73.....	1
3-74.....	0
3-75.....	1
3-76.....	0
3-77.....	12
3-78 - 3-80.....	0
3-80.1 - 3-80.4.....	5
3-81.....	14
3-82 - 3-84.....	0
3-85 - 3-86.2.....	15
3-86.3 - 3-86.8 blank.....	14
3-87 - 3-89.....	0
3-90.....	14
3-90.1 - 3-90.2.....	8
3-91 - 3-92.....	0
3-93.....	5
3-94 - 3-95.....	16
3-96- 3-97.....	15
3-98.....	5
3-99.....	10
3-100.....	1
3-101 -3-102.....	16
3-103 -3-104.....	15
3-104.1.....	5
3-104.2.....	15
3-104.3 - 3-104.4 blank ..	5
3-105.....	1
3-106.....	0
3-107.....	1
3-108.....	0
3-109.....	1
3-110 - 3-113.....	0
3-114 - 3-114.2.....	1
3-114.3 - 3-114.2 blank ..	1
3-115.....	12
3-116.....	8
3-117.....	0
3-118.....	8
3-119.....	0
3-120.....	12
3-121.....	0
3-122.....	12
3-123.....	1
3-124.....	0
3-125 - 3-126.....	13
3-127 - 3-129.....	0
3-130.....	12
3-131 - 3-132.....	0
3-133.....	15
3-134.....	16
3-135.....	15

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3-136.....	16
3-137.....	12
3-138.....	0
3-139.....	1
3-140 - 3-151.....	0
3-152.....	1
3-153 - 3-156.....	0
3-157 - 3-158.....	12
3-159.....	16
3-160.....	0
3-160.1 - 3-160.2 blank ..	0
3-161.....	1
3-162.....	0
3-162.1 - 3-162.2 blank ..	0
3-163 - 3-164.....	16
3-165 - 3-167.....	1
3-170.....	12
3-170.1 - 3-170.2 blank ..	12
3-171.....	12
3-172 - 3-173.....	16
3-174.....	1
3-175 - 3-176.....	0
3-177 - 3-178.....	13
3-179 - 3-180.....	0
3-181.....	1
3-182.....	13
3-183 - 3-184.....	0
3-185 - 3-187.....	15
3-188.....	1
3-189.....	10
3-190 - 3-191.....	15
3-192.....	16
Chap. 4, 4-1 - 4-2 blank ..	0
4-2.1 - 4-2.2.....	19
4-2.2.1 - 4-2.2.2 blank.....	19
4-3-4-4.....	19
4-4.1 - 4-4.2 blank.....	19
4-5-4-6.....	19
4-6.1 - 4-6.2.....	19
4-7.....	9
4-8.....	19
4-8.1.....	9
4-8.2.....	19
4-9.....	1
4-10.....	6
4-11 - 4-12.....	11
4-12.1 - 4-12.2 blank.....	6
4-13 - 4-14 blank.....	13
4-14.1.....	1
4-14.2.....	19
4-15.....	16
4-16 - 4-18.....	19
4-19.....	0
4-20.....	19
4-20.1 - 4-20.2 blank.....	19

*Zero in this column indicates an original page.

Page No.	*Change No.	Page No.	*Change No.
4-20.3 - 4-20.4 blank	19	4-95 - 4-96	0
4-21 - 4-24	19	4-96.1 - 4-96.6	19
4-25	0	4-97	16
4-26	15	4-98	15
4-27 - 4-29	0	4-99	0
4-30	15	4-100	16
4-30.1 - 4-30.8 blank	19	4-101 - 4-102	15
4-31	19	4-103	0
4-32 - 4-34	0	4-104 - 4-105	10
4-35 - 4-36	1	4-106	0
4-37 - 4-40	0	4-107 - 4-109	19
4-40.1 - 4-40.24	12	4-110 - 4-111	0
4-41 - 4-42	19	4-112	12
4-42	0	4-112.1 - 4-112.8 blank	19
4-43	16	4-113 - 4-114	14
4-44	19	4-114.1 - 4-114.2 blank	14
4-44.1 - 4-44.6	19	4-115 - 4-116	14
4-45 - 4-50	19	4-116.1 - 4-116.2 blank	16
4-47 - 4-48	0	4-117 - 4-118.4	14
4-49	1	4-119 - 4-120.2	14
4-50	13	4-121	19
4-51	10	4-122	0
4-52- 4-54	19	4-122.1 - 4-122.6 blank	19
4-54.1 - 4-54.2	19	4-123 - 4-126	19
4-55	5	4-126.1 - 4-126.4	19
4-56	15	4-126.5 - 4-126.6	10
4-57-4-58	19	4-126.7 - 4-126.8 blank	15
4-59 - 4-60	0	4-127	15
4-61	14	4-128	0
4-62 - 4-63	0	4-128.1 - 4-128.2 blank	19
4-64	8	4-129 - 4-133	19
4-64.1 - 4-64.2	9	4-134	12
4-65	19	4-135 - 4-137	5
4-66 -4-67	19	4-138	10
4-68	19	4-139 - 4-140	19
4-69 - 4-70	0	4-140.1 - 4-140.2 blank	0
4-71 - 4-72	19	4-141	0
4-72.1 - 4-72.2	19	4-142	9
4-73	0	4-142.1 - 4-142.2	5
4-74	19	4-143	8
4-74.1 - 4-74.2 blank	19	4-144 - 4-151	0
4-75 -4-78	19	4-152	14
4-78.1 - 4-78.2	19	4-153 - 4-155	0
4-79 - 4-81	19	4-156	1
4-82 - 4-86	0	4-156.1 - 4-156.2 blank	14
4-87	8	4-157	5
4-88	0	4-158 - 4-160	0
4-89	19	4-160.1 - 4-160.2	1
4-90	5	4-161 - 4-162	0
4-91 - 4-92	0	4-163 - 4-164 blank	0
4-93	5	4-164.1 - 4-164.2 blank	0
4-94	19	4-165 - 4-168	5

*Zero in this column indicates an original page.

Page No.	*Change No.	Page No.	*Change No.
4-169 - 4-170 blank	5	4-242	0
4-170 - 4-171 deleted	5	4-242.1 - 4-242.2 blank	0
4-172 - 4-175	0	4-243 - 4-246	0
4-177	12	4-246.1 - 4-246.2 blank	0
4-178 - 4-178.12	5	4-247	19
4-178.13 - 4-178.14	12	4-248	5
4-179	12	4-249	1
4-180	0	4-250	0
4-181	12	4-251	5
4-182	0	4-252	0
4-183	12	4-252.1	19
4-184 - 4-186	17	4-252.2 - 4-252.8	9
4-187	5	4-252.9 - 4-252.10 blank	9
4-188	12	4-253 - 4-255	0
4-189	0	4-256 - 4-258	19
4-190	19	4-259	0
4-191 - 4-192	12	4-260 - 4-263	19
4-193	8	4-264	0
4-194	19	4-265	19
4-194.1 - 4-194.6 blank	19	4-266	3
4-195	8	4-267 - 4-268	0
4-196	12	4-269 - 4-270	1
4-196.1 - 4-196.2 blank	5	4-271	19
4-197	8	4-272	0
4-198	19	4-273 - 4-275	19
4-198.1 - 4-198.6 blank	19	4-276	0
4-199	0	4-277	19
4-200	5	4-278	0
4-201	0	4-278.1 - 4-278.2	13
4-202	12	4-279	13
4-203	5	4-280	14
4-204	12	4-281	13
4-204.1 - 4-204.2	5	4-282	15
4-205	5	4-283 - 4-284	19
4-206 - 4-208	12	4-285	0
4-209	0	4-286	19
4-210	1	4-287	16
4-211	5	4-288	19
4-212	0	4-289	16
4-213	1	4-290	13
4-214 - 4-215	19	4-291	19
4-216	0	4-292	0
4-217 - 4-219	19	4-293	19
4-220	0	4-294	5
4-220.1 - 4-220.2 blank	0	4-295	19
4-221 - 4-222	5	4-296	0
4-222.1 - 4-222.2 blank	5	4-297	19
4-223	5	4-298	5
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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.

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 only 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**Noise**

Sound pressure levels in this helicopter during some operating conditions exceed the Surgeon General's hearing conservation criteria (TB MED251).

Hearing protection devices, such as aviator helmet or ear plugs, shall be worn by all personnel in and around the helicopter during operation.

WARNING**FOD**

- 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 flames, 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 only be done 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**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.
- 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.

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

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, Please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to:Commander, US Army Aviation end Missile Command, ATTN: AMSAM-MMC-LS-LP, Redstone Arsenal, AI 35898-5230. A reply will be furnished to you.

You may also send in your comments electrically to our e-mail address: ls-lp@redstone.army.mil or by fax 205-842-6546/DSN 788-6546. Electronic DA Form 2028 instructions are shown in the back of this manual.

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CHAPTER 3

ALIGHTING GEAR

SECTION I

LANDING GEAR

DESCRIPTION AND OPERATION

3-1 LANDING GEAR

3-1

There are four high-flotation landing gear assemblies, two forward and two aft. The two forward assemblies have dual wheels. Each aft assembly has a full-swivel single wheel. The aft wheels can be locked in trailing position. A power steering unit is installed on the aft right landing gear assembly

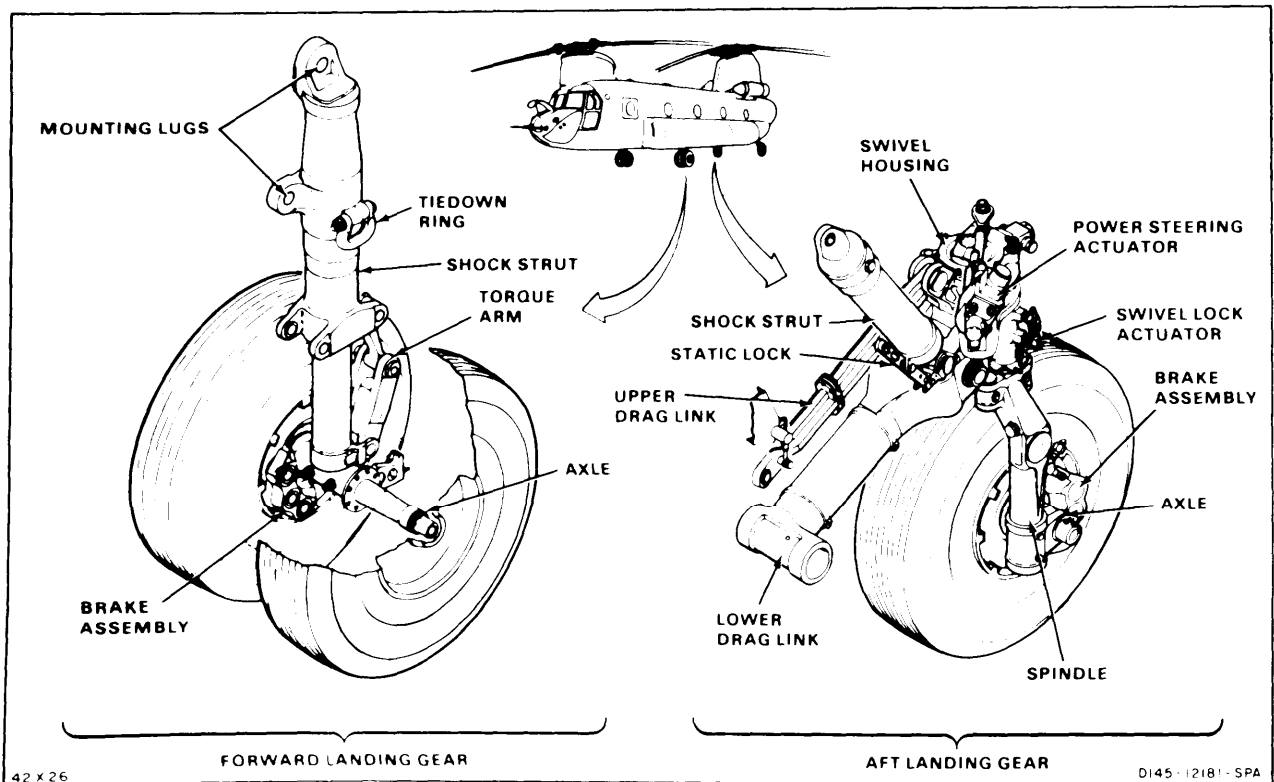
FORWARD LANDING GEAR

The forward landing gear dual wheels are installed on a fixed axle. The axle is mounted on an air-oil shock strut bolted to the fuselage support structure. A torque arm keeps the assembly aligned. A disk and brake unit are provided for each wheel. Hinged panels allow access to the forward landing gear assemblies. Each assembly has a towing and tiedown fitting. The wheels can be raised at jacking points on the lower torque arms. Left and right landing gear assemblies can be converted for use in either forward position.

AFT LANDING GEAR

An aft landing gear assembly is installed on each side of the fuselage. Each aft wheel is mounted on an axle supported by a spindle. The spindle rides

on bearings in the swivel housing. Upper and lower drag links support the swivel housing. Both drag links are connected to fuselage fittings. A shock strut is mounted between the lower drag link and a fuselage fitting. The shock strut has a static lock mechanism to prevent strut extension during helicopter jacking. A disk and brake unit are installed on each wheel. The aft wheels can be free to swivel, or they can be locked in trailing position. A centering cam in the swivel housing centers each wheel in trailing position. A hydraulically-operated swivel lock secures the wheel in this position. The power steering actuator is connected to the aft right landing gear swivel housing. A towing and tiedown fitting is also attached to this housing. Static ground wires are installed on each landing gear axle housing. A proximity switch is mounted on the forward bulkhead of each aft landing gear compartment. Linkage from the upper drag link is connected to a target which is sensed by each switch. The switches are operated as the helicopter takes off or lands. Extensions on the aft axles are used for connecting a tow bar. An aft landing gear assembly can be installed on either side of the helicopter. This requires disassembly and repositioning of certain components.



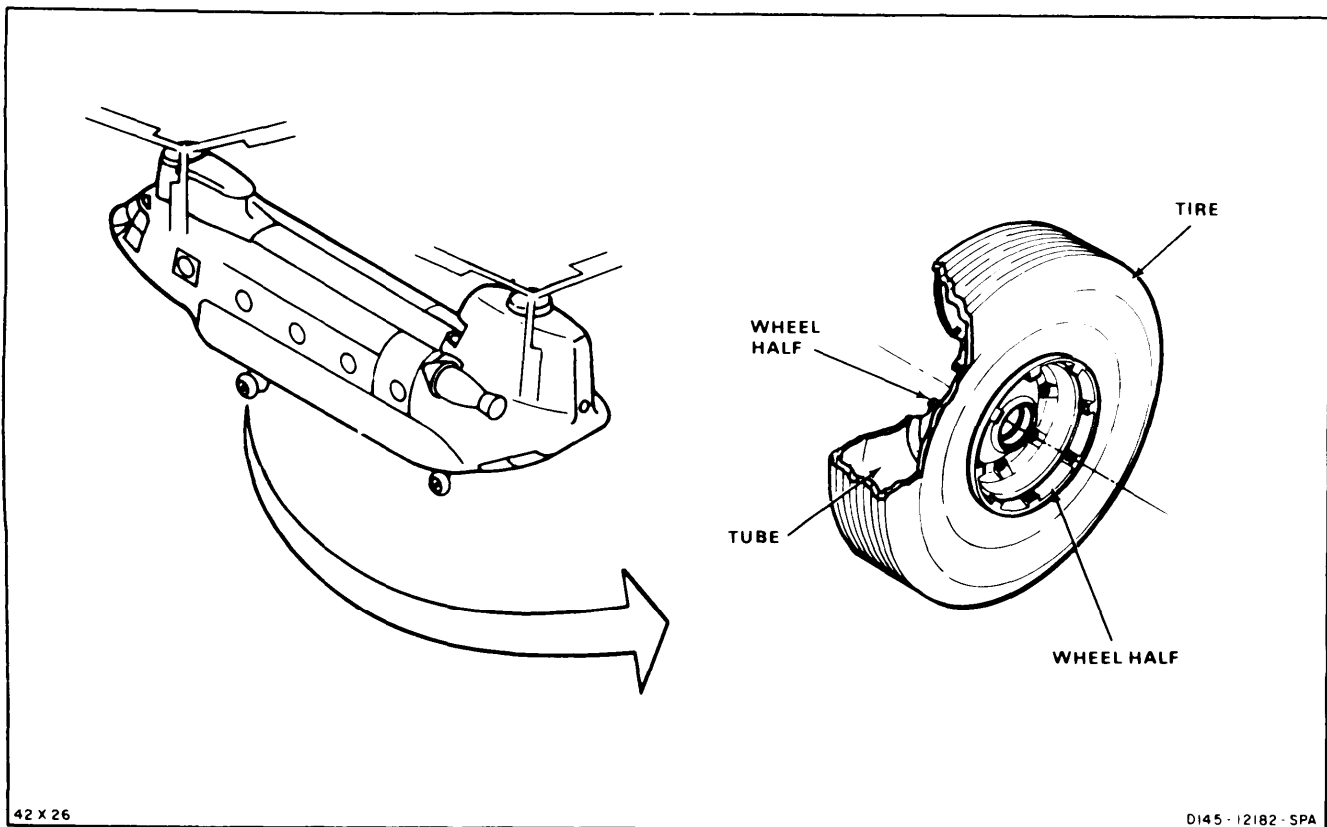
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TIRES AND TUBES

Tires are interchangeable on all six wheels. The tires are 10 ply or 10-ply rating. Tubes are required for both tubeless and tube-type tires.

WHEELS

The wheels consist of two halves. Moisture-proof seals protect the bearings. Wheels are separated for removing or mounting tire or tube.



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AXLES

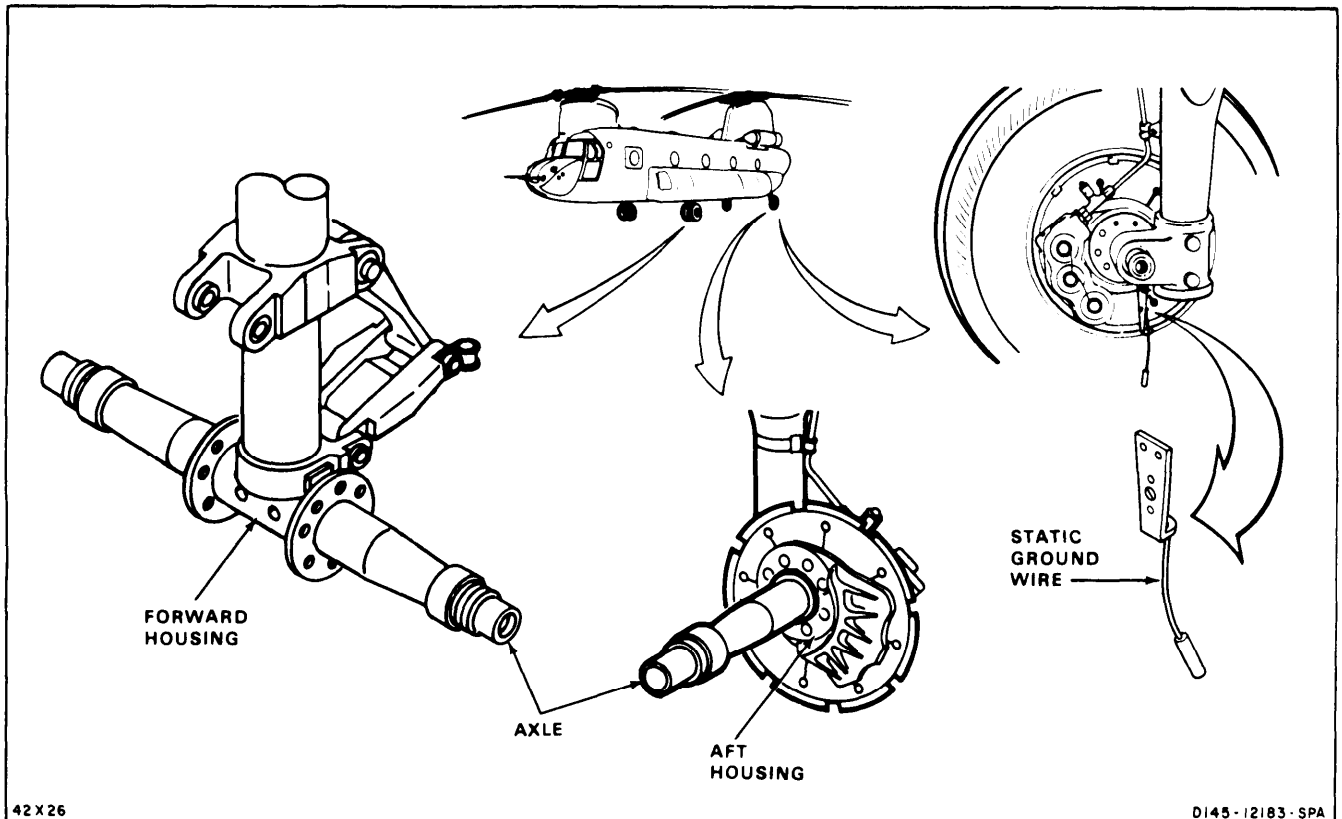
Forward and aft axles are removable and can be used on either forward or aft landing gear. Each axle is secured to the axle housing by a bolt which passes thru the axle.

SHOCK STRUTS

All landing gear shock struts are air-oil units. Compressed air absorbs shock, and hydraulic fluid dampens up and down movements,

STATIC GROUND WIRE

A static ground wire is installed on the aft left landing gear. The wire consists of a cable and tube attached to a mounting bracket. Three holes on the mounting bracket provide for wire length adjustment. The mounting bracket is installed on a clip on the axle housing.



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3-1 LANDING GEAR (Continued)**3-1****PROXIMITY SWITCHES**

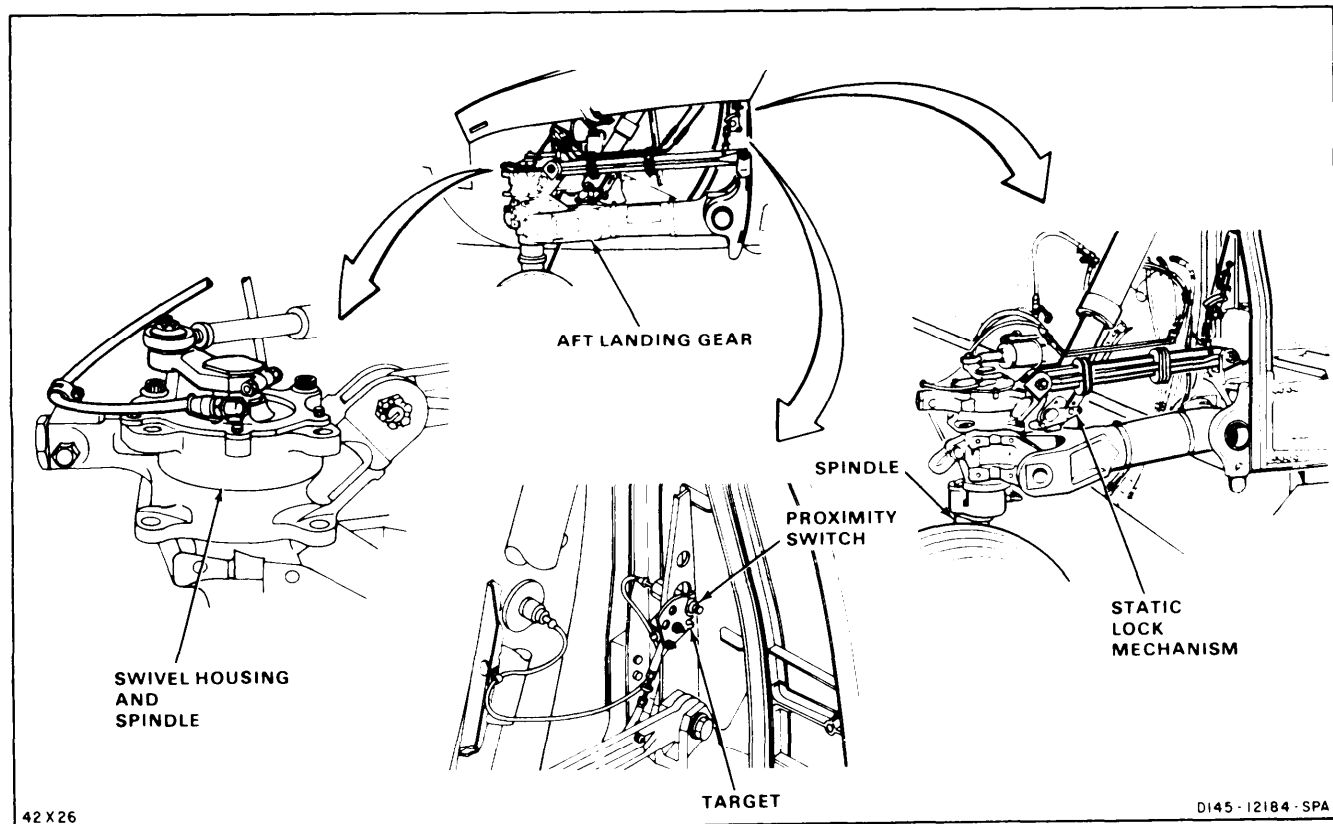
Linkage from the aft landing gear upper drag link is connected to a target. The target is set so the proximity switch is open when the helicopter is in flight. When the helicopter is on the ground, the switch is closed. The switches prevent DASH actuator input during lift-off to hover. They also reduce AFCS sensitivity 50 percent until lift-off. The right switch turns off the IFF when the helicopter is on the ground.

STATIC LOCK MECHANISM

The static lock mechanism is a link attached to aft landing gear shock strut. It is operated by hand to lock the shock strut in the up position when the helicopter is jacked.

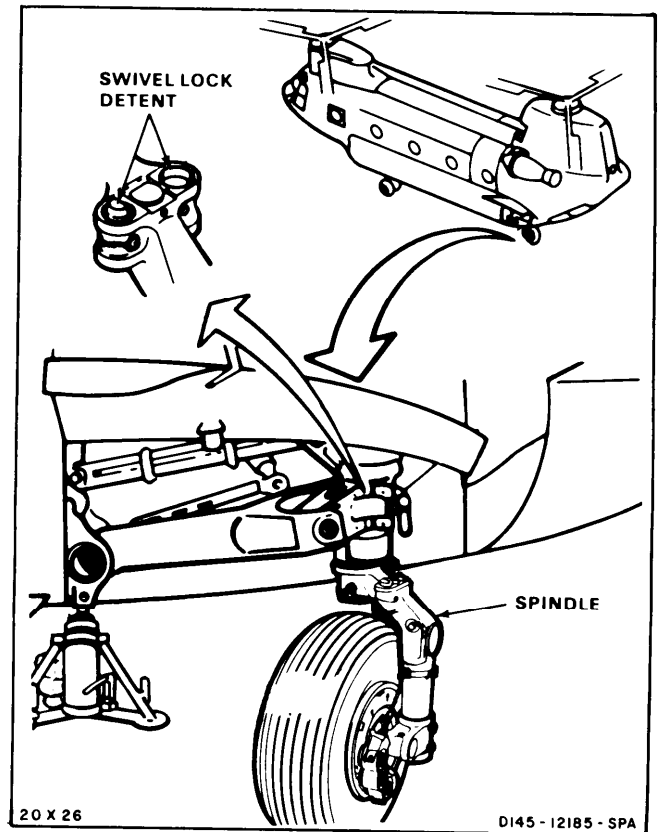
SWIVEL HOUSING AND SPINDLE

A swivel housing is supported by the two drag links and shock strut of each aft landing gear. The housing allows the spindle and wheel to swivel 360 degrees. A centering cam in the housing centers the wheel in the trailing position for taxiing or flight. The swivel locking pin can lock the wheel in this position.

**GO TO NEXT PAGE**

3-1 LANDING GEAR (Continued)**3-1****SWIVEL LOCK DETENTS**

Two spring-loaded swivel lock detents are mounted in each spindle. The spring permits the detent to move down allowing the swivel locking pin to pass for centering.

**END OF TASK**

SECTION II
LANDING GEAR

3-2 REMOVE FORWARD LANDING GEAR**3-2****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit

NSN 5180-00-323-4692

Jack 1228-31

1 3/16-inch Socket

1 3/8-inch Socket

1 1/16-inch Socket

9-inch Extension

Breaker Bar, 3/4-inch Drive

Tiedown Chain

Container, Two Quart

Materials:

Cloths (E135)

Personnel Required:

Medium Helicopter Repairer (2)

References:

Task 2-2

Task 1-22

Task 10-88.1

Equipment Condition:

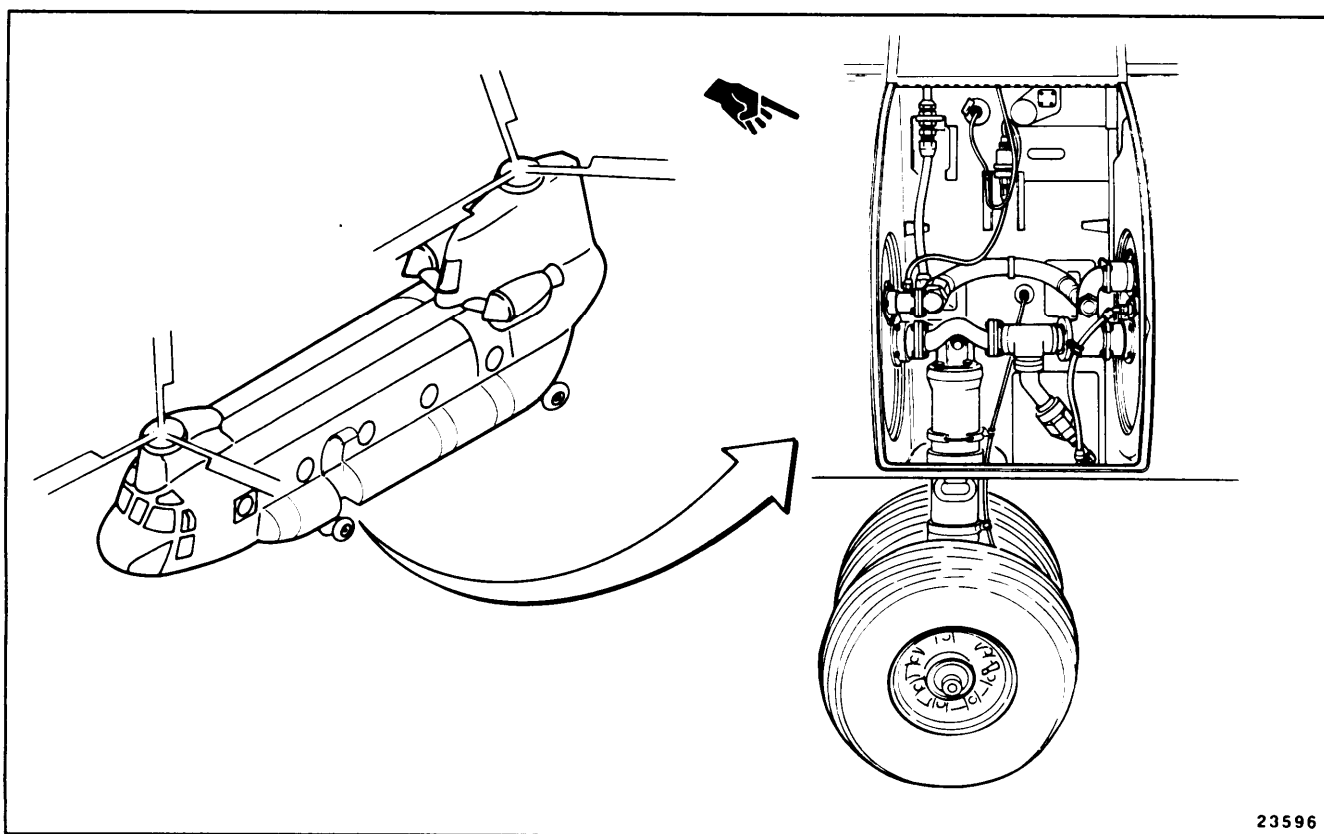
Battery Disconnected (Task 1-39)

Electrical Power Off

Landing Gears Chocked

Parking Brake Released

Defuel Helicopter (Task 10-35)



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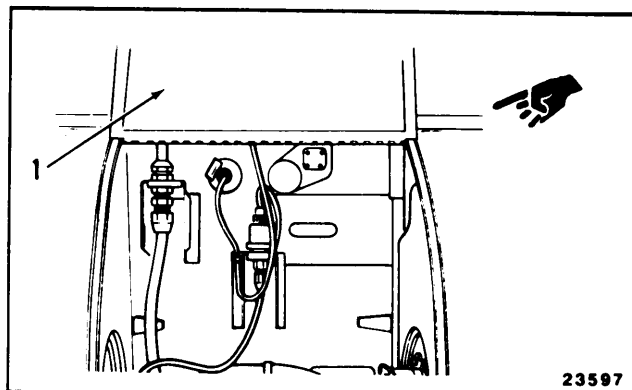
3-2 REMOVE FORWARD LANDING GEAR (Continued)

3-2

REMOVE ACCESS PANELS**NOTE**

Forward landing gear can be removed with wheels and brakes installed or removed. This procedure is shown with wheels and brakes installed,

1. Open hinged access panel (1) (Task 2-2).

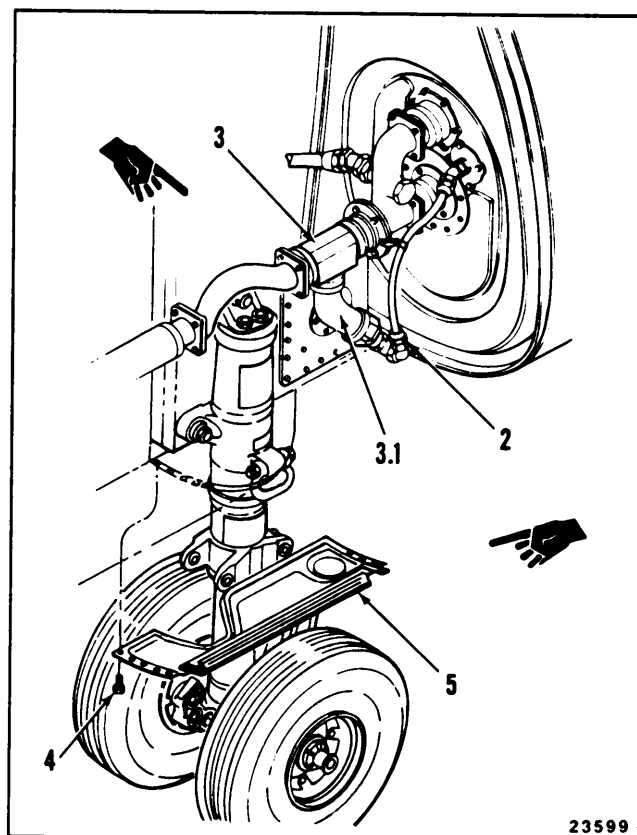


2. Disconnect fuel fitting (2) and install protective caps.

3. Remove 10 screws (4).

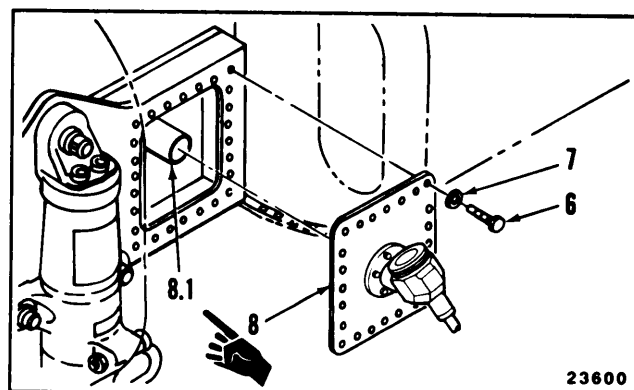
4. Remove lower panel (5).

- 4.1. Remove tee (3) and elbow (3.1). Refer to Task 10-88.1.



- 4.2. Disconnect cross over hose (8.1). Refer to Task 10-88.1.

5. Remove 26 bolts (6) and washer seals (7). Take off panel (8).

**GO TO NEXT PAGE**

3-2 REMOVE FORWARD LANDING GEAR (Continued)

3-2

CAUTION

Do not use masking tape or gum backed paper of any type to plug or seal any hydraulic brake line or hose. Gummy particles can block small hydraulic passageways.

6. **Disconnect brake hose (9) at brake fitting (10).**
7. Catch leaking fluid in a container or cloths. Use cloths (E 135).
8. **Remove two nuts (11), washers (12), and screws (13) from clamps (14).**
9. **Remove two clamps (14) from hose (9).**
10. **Pull brake hose (9) through ferrule (15).**
11. **Remove chocks and place jack at forward fuselage jack pad (Task 1-22).**

CAUTION

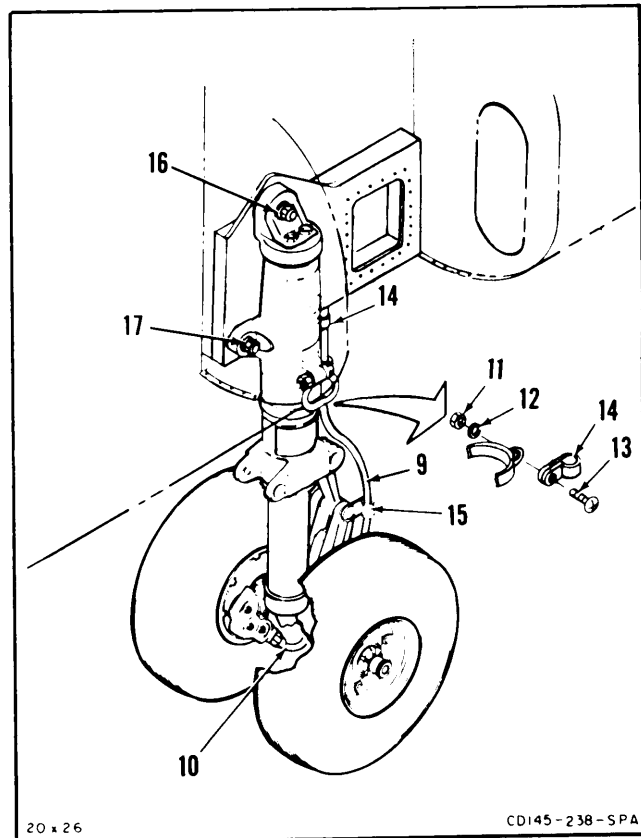
Jacking can cause structural damage if gross weight exceeds **24,500 pounds**. Before jacking helicopter make sure gross weight does not exceed this limit.

12. **Extend jack** until it begins to take weight of helicopter (Task 1-22). Turn down jack locking collar.

NOTE

Torque is broken at this point to avoid rocking helicopter when wheels are off ground.

13. **Break torque on nuts (16 and 17).**

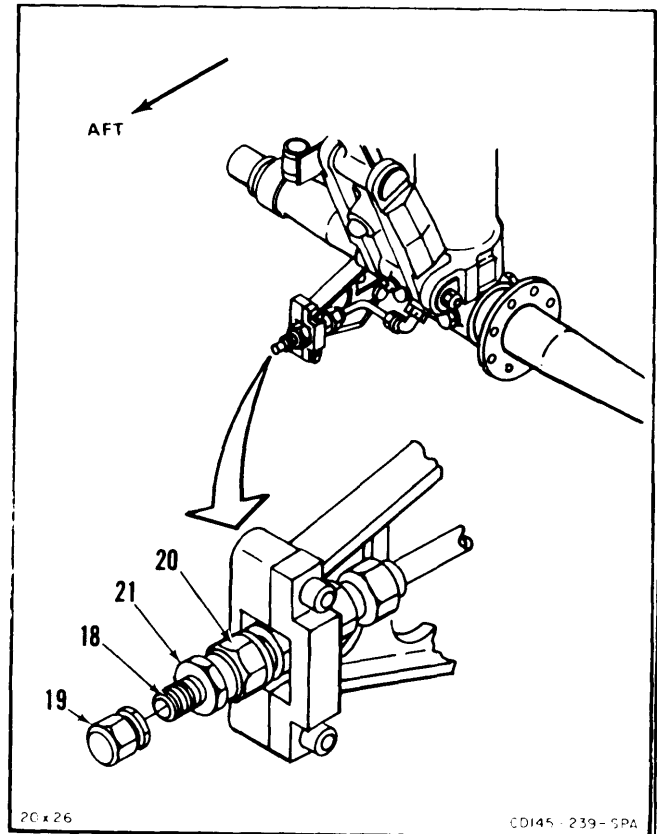
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3-2 REMOVE FORWARD LANDING GEAR (Continued)**3-2****REMOVE BOLTS****WARNING**

High pressure air valve cap can be blown off causing injury to personnel. Loosen cap one or two turns to allow trapped air to escape before removing cap.

14. Release air pressure from shock strut through high pressure air valve (18) as follows:

- a. Remove cap (19) from high pressure air valve (18).
- b. Hold valve body (20) with wrench and turn out nut (21) counterclockwise 1/2 to 1-1/2 turns.
- c. Allow air pressure to discharge completely.

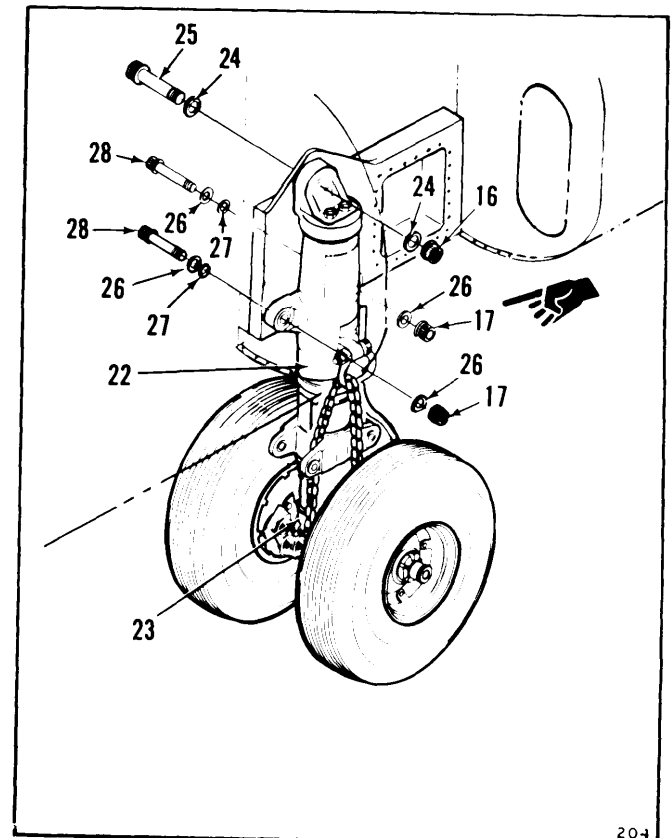
**WARNING**

Position tiedown chain clear of tubing. Otherwise, damage to tubing can cause a malfunction.

15. Collapse shock strut and tie upper cylinder (22) to lower piston (23) in collapsed position. Use tiedown chain.
16. Lower jack slowly until wheels touch floor.
17. Have assistant support shock strut.
18. Remove nut (16) two washers (24) and bolt (25).
19. Remove two nuts (17), four washers (26), two seals (27), and bolts (28).
20. Move landing gear away from helicopter.

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

3-3 CONVERT FORWARD LANDING GEAR

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit
NSN 5180-00-323-4692
- Torque Wrench, 30 to 150 Inch-Pounds

Materials:

None

Personnel Required:

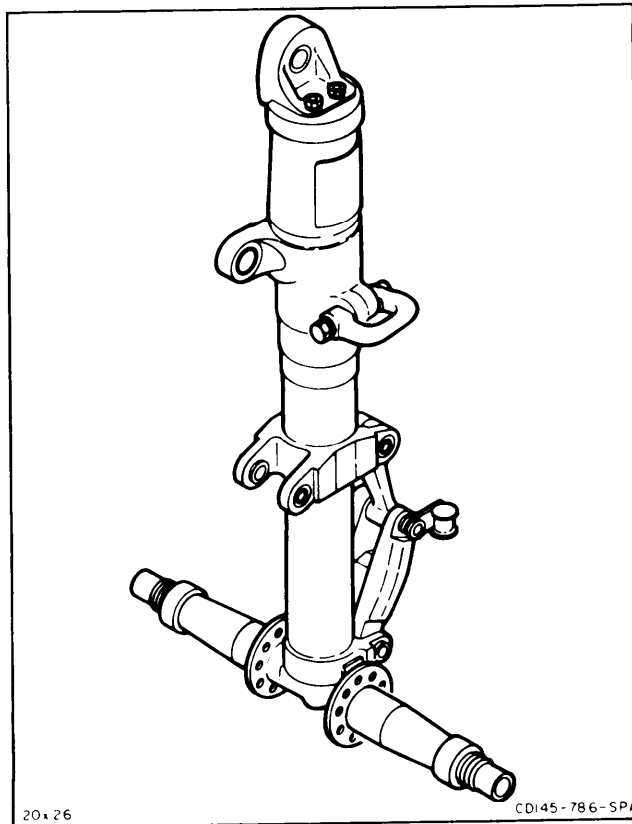
- 67U20 Medium Helicopter Repairer
- 67U30 Inspector

References:

- Task 1-70
- Task 1-72

Equipment Condition:

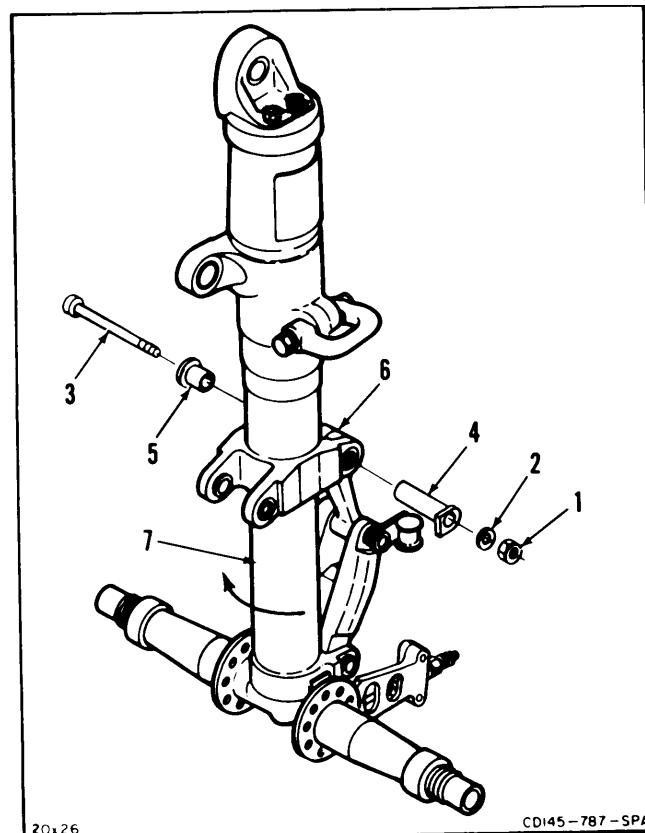
Off Helicopter Task



NOTE

Procedure shown is for converting issued forward left gear to a forward right gear.

1. Remove nut (1), washer (2), bolt (3), shaft (4), and bushing (5) from upper end of torque arm (6).
2. Move torque arm (6) away from shock strut (7).
3. Rotate lower end of strut (7) 180 degrees.



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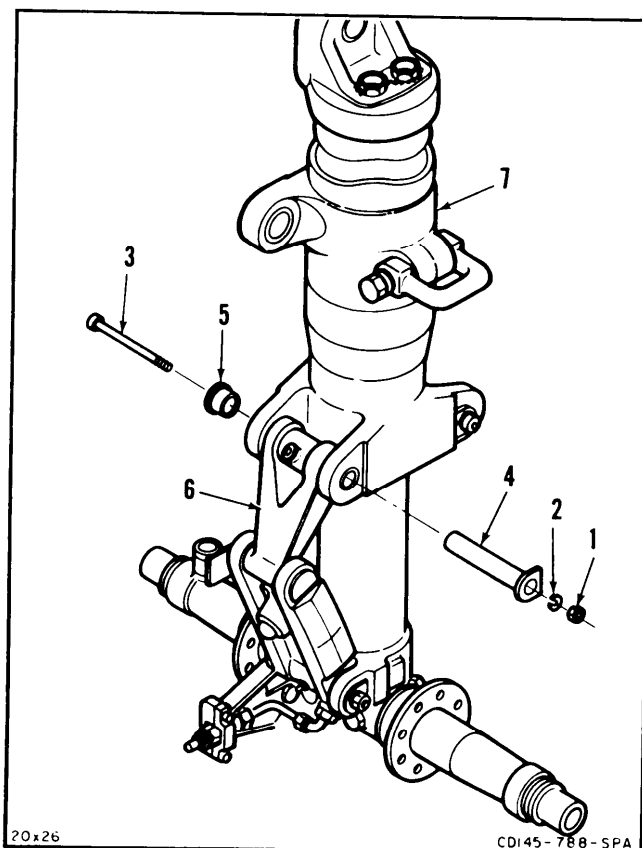
3-3 CONVERT FORWARD LANDING GEAR (Continued)**3-3**

4. Position upper end of torque arm (6) on strut (7).
5. Install shaft (4), bushing (5), bolt (3), washer (2), and nut (1).
6. Torque nut (1) to 60 inch-pounds.
7. Service shock strut (Task 1-70 and 1-72).

INSPECT

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

3-4 DISASSEMBLE FORWARD LANDING GEAR**3-4**

INITIAL SETUP

Applicable Configurations:

All

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

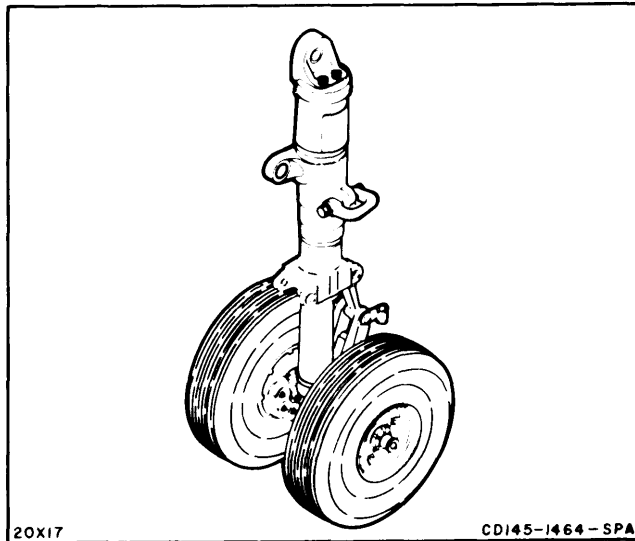
None

Personnel Required:

67U20 Medium Helicopter Repairer

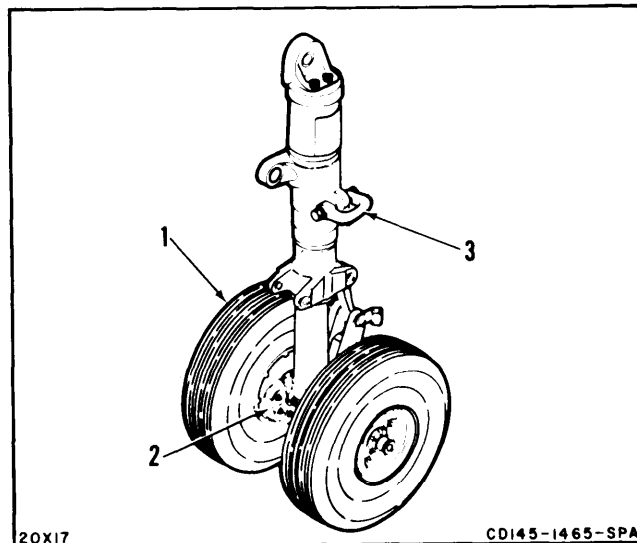
References:Task 3-9
Task 3-14
Task 3-17
Task 3-25
Task 3-77**Equipment Condition:**

Off-Helicopter Task

**NOTE**

Procedure is same for left and right gear.

1. Remove both wheels (1) (Task 3-9).
2. Remove both brakes (2) (Task 3-77)
3. Remove shackle (3) (Task 3-25).

**GO TO NEXT PAGE**

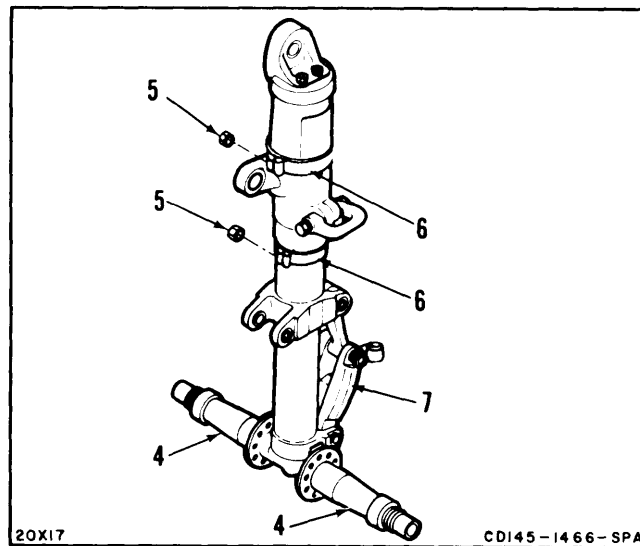
3-4 DISASSEMBLE FORWARD LANDING GEAR
(Continued)

3-4

4. Remove both axles (4) (Task 3-14).
5. Remove lockwire and two nuts (5).
6. Remove two clamps (6).
7. Remove torque arm (7) (Task 3-17).

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit

NSN 5180-00-323-4692

Tiedown Chain

Materials:

Lockwire (E231)

Personnel Required:

Medium Helicopter Repairer

Inspector

References:

TM 55-1520-240-23P

Task 3-12

Task 3-15

Task 2-18

Task 3-26

Task 3-83

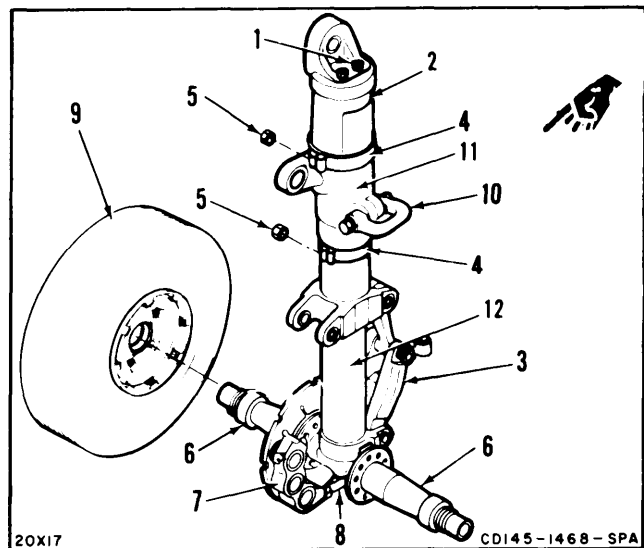
Equipment Condition:

Off-Helicopter Task

NOTE

- Procedure is same for left and right gear. Left gear is shown here.
- If a replacement gear is being installed, drain preservative fluid from shock strut.

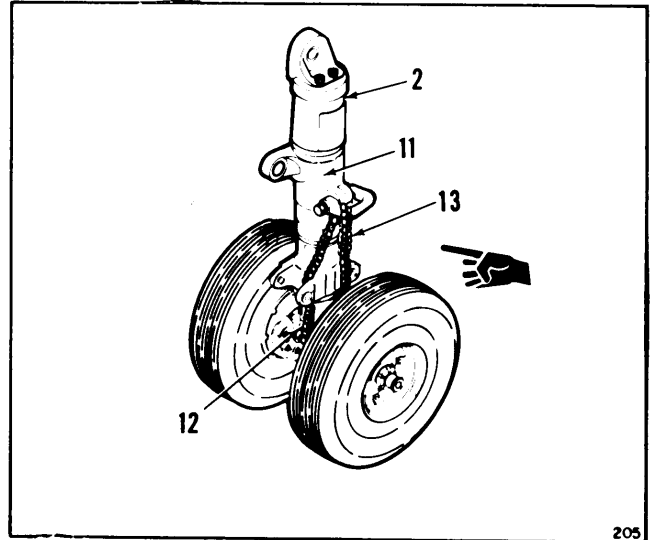
1. **Remove lockwire and filler plug (1).**
Turn shock strut (2) upside down to drain fluid from strut.
2. **Install torque arm (3) (Task 3-18).**
3. **Install two clamps (4) with nuts (5).**
Safety wire nuts with lockwire (E231).
4. **Install both axles (6) (Task 3-15).**
5. **Install both brakes (7) (Task 3-83).**
6. **Install tube (8) in brake (7).**
7. **Install both wheels (9) (Task 3-12).**
Install shackle (10) (Task 3-26).

**GO TO NEXT PAGE**

3-14 Change 1

3-5 ASSEMBLE FORWARD LANDING GEAR (Continued)**3-5**

9. With shock strut (2) collapsed, tie upper cylinder (11) to lower piston (1 2). Use tiedown chain (13).

INSPECT**FOLLOW-ON MAINTENANCE:**

Lubricate torque arm (Task 1-89).

END OF TASK

3-6 INSTALL FORWARD LANDING GEAR**3-6****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Floor Hoist
Torque Wrench, 0 To 600 Foot-Pounds
1 3/16-inch Socket
1 3/8-inch Socket
1 1/16-inch Socket
9-Inch Extension

Materials:

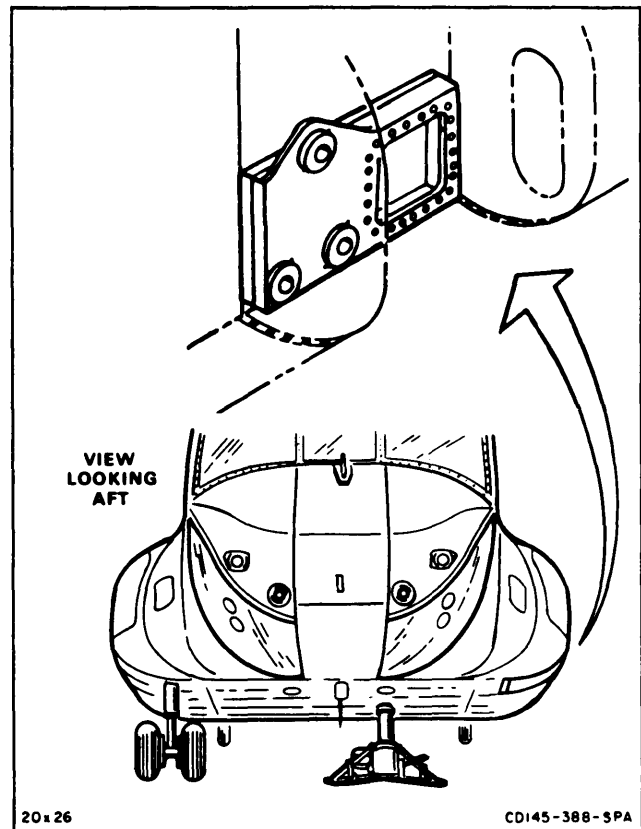
Antiseize Compound (E75)
Cloth (E120)
Dry Cleaning Solvent (E162)
Gloves (E186)

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

TM 55-1520-240-23P
Task 10-88.2

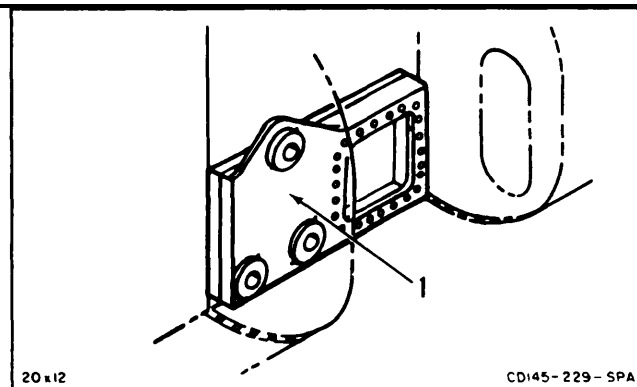
**INSTALL LEFT OR RIGHT GEAR****WARNING**

Dry cleaning solvent (E162) is flammable and gives off toxic fumes. It may 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 water for at least 15 minutes. Get medical attention for eyes.

NOTE

To convert a forward landing gear to an opposite assembly, refer to Task 3-3.

1. Clean landing gear support structure (1) with solvent (E162). Wear gloves (E186).

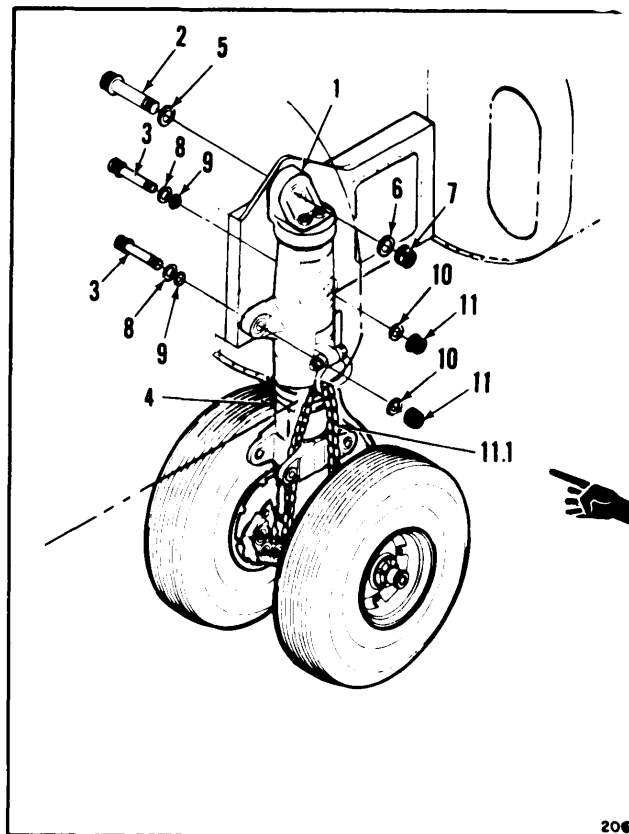
**GO TO NEXT PAGE**

2. Inspect structure for cracks, corrosion, and distortion. If structure is defective, refer to Task 2-8 for repair.

WARNING

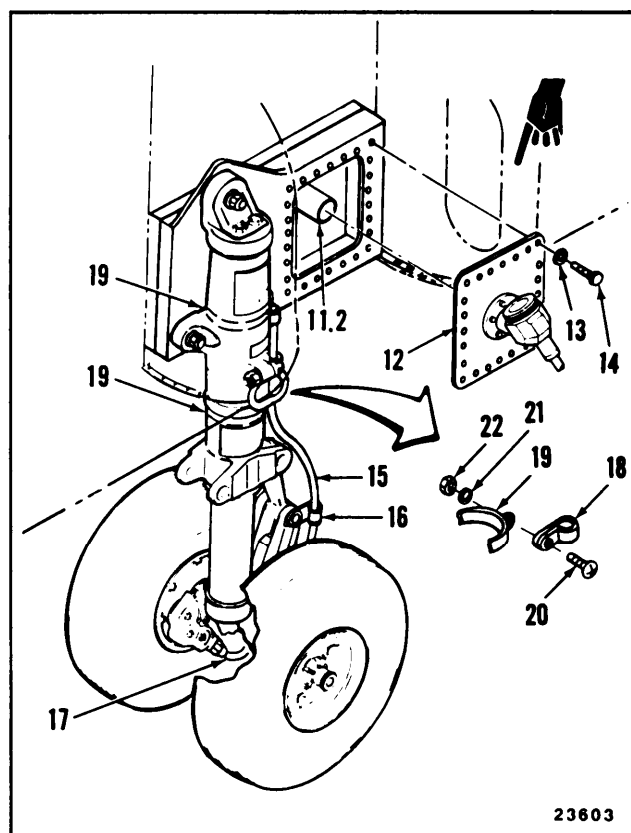
Antiseize compound (E75) may form toxic vapors if exposed to flame. Use in well-ventilated area away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

3. Lubricate thread and shank of attaching bolts (2 and 3) with antiseize compound (E75).
4. Using a helper, position landing gear (4) on structure (1) using portable floor hoist.
5. Install bolt (2), head inboard, with countersunk washer (5) under bolt head and washer (6) under nut (7).
6. Install two lower bolts (3), heads inboard with countersunk washers (8) and seals (9) under bolt head, and washer (10) under nuts (11).
7. Torque nut (7) to 540 foot-pounds. Torque nuts (11) to 430 foot-pounds.
8. Remove tiedown chain (11.1).

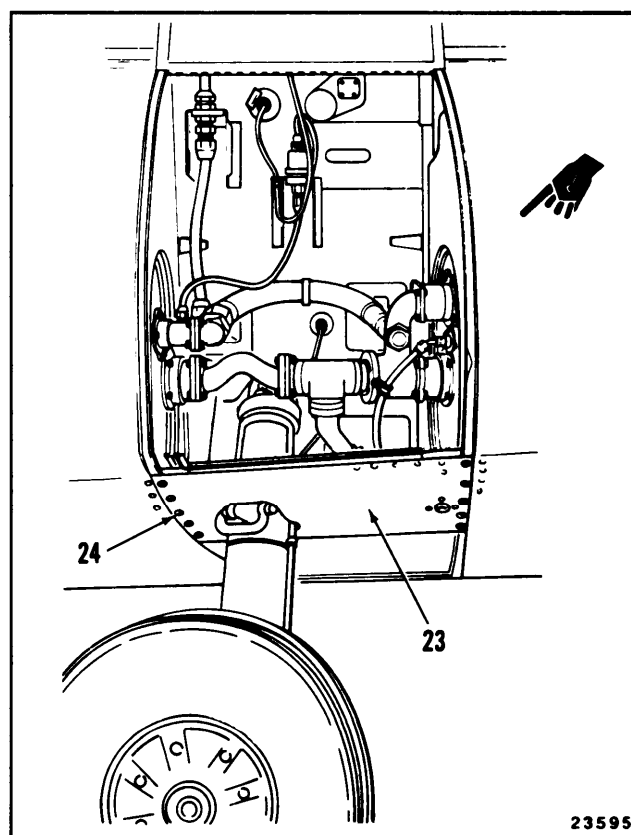
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INSTALL PANELS AND BRAKE HOSE

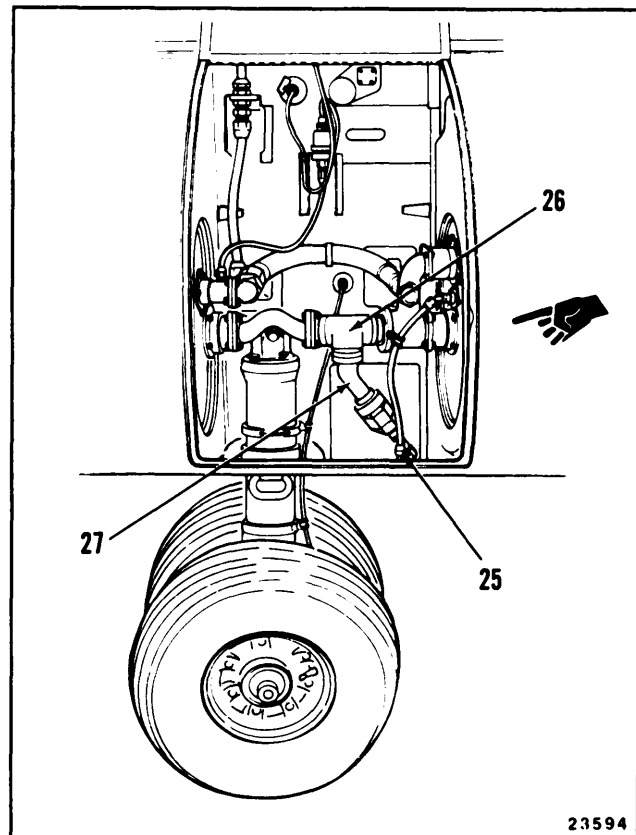
- 8.1. Install cross over hose (11.2). Refer to Task 10-88.2.
9. Install panel (12). Secure with washer seals (13) and bolts (14).
10. Remove protective caps and plugs from brake port and hose.
11. Route hose (15) through torque link ferrule (16) and connect hose to brake connection (17).
12. Install two clamps (18) on hose (15).
13. Install two clamps (18) to two clamps (19) with screws (20), washers (21), and nuts (22).



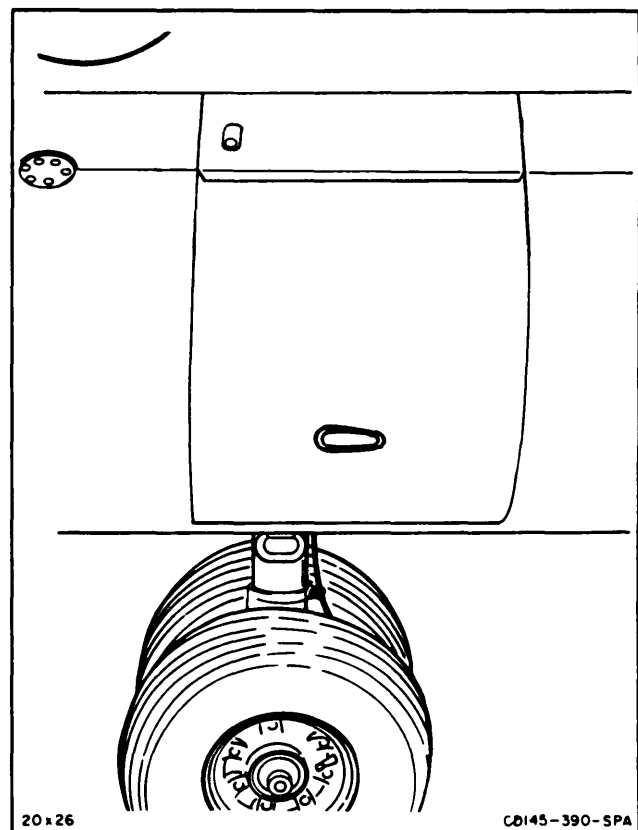
14. Install lower panel (23) with 10 screws (24).

**GO TO NEXT PAGE**

15. Connect fuel fitting (25).
- 15.1. Install tee (26) and elbow (27). Refer to Task 10-56.
16. Bleed brakes. (Task 7-330).
17. Service shock strut (Task 1-70 and 1-72).
18. If required, refer to Task 7-7 for leakage.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Lower and remove jack (Task 1-22).
- Close access panel (Task 2-2).
- Fuel helicopter (Task 1-51) as required.

**END OF TASK**

3-7 REMOVE FORWARD LANDING GEAR WHEEL AND TIRE ASSEMBLY

3-7

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit
 NSN 5180-00-323-4692
 Pneumatic Tire Valve Repair Tool
 Crowfoot wrench, 2 Inch
 Retaining Ring Pliers

Materials:

Cloth (E 120)
 Dry Cleaning Solvent (EI 62)
 Gloves (EI 86)

Personnel Required:

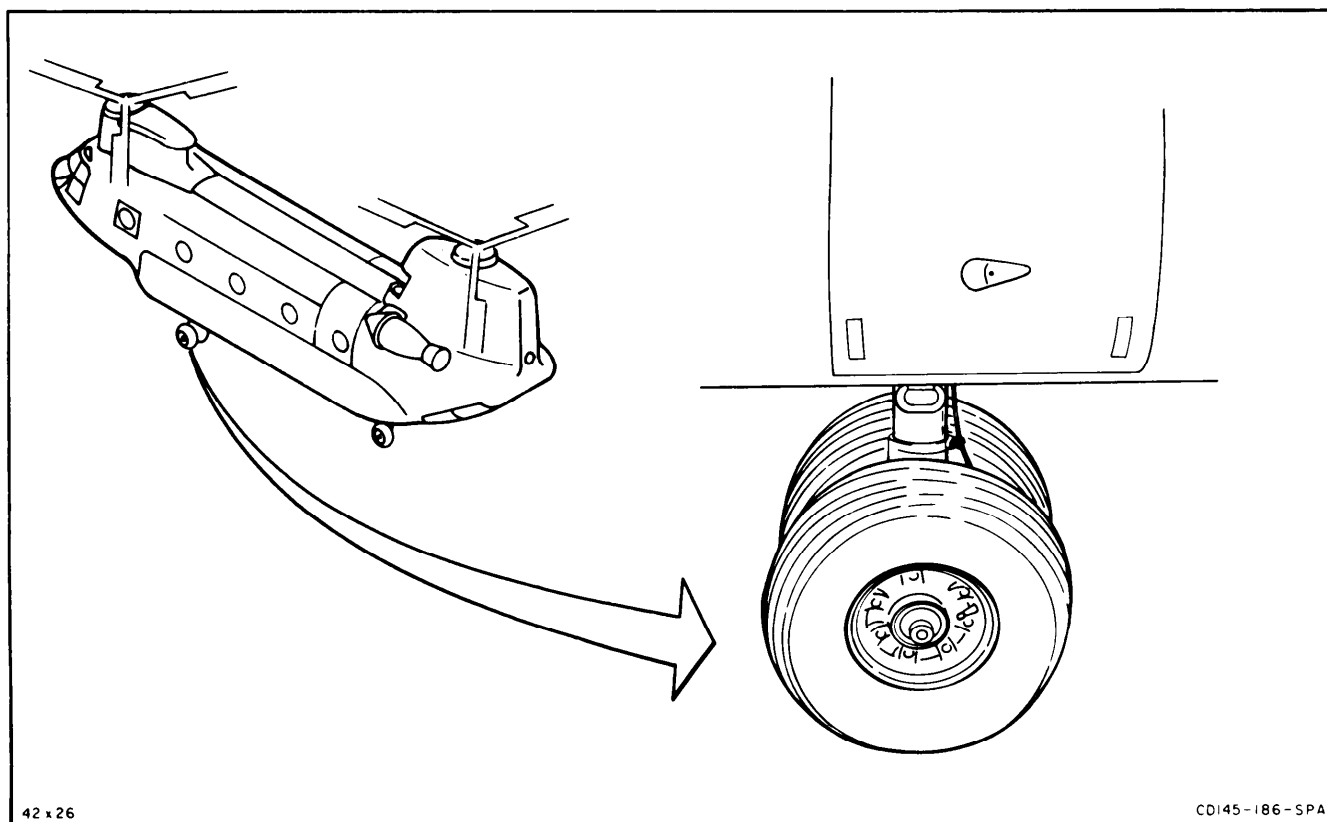
Medium Helicopter Repairer (2)

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Parking Brake Released (Task 7-239)
 Jack Helicopter at Forward Landing Gear Jack Pad (Task 1-23)

References:

TM 55-1 500-204-25/1
 TM 55-1500-322-24



42 x 26

CDI45-186-SPA

GO TO NEXT PAGE

Change 12

3-19

WARNING

Wheel can explode if axle nut is removed while tire is inflated. Deflate tire fully before starting removal procedure.

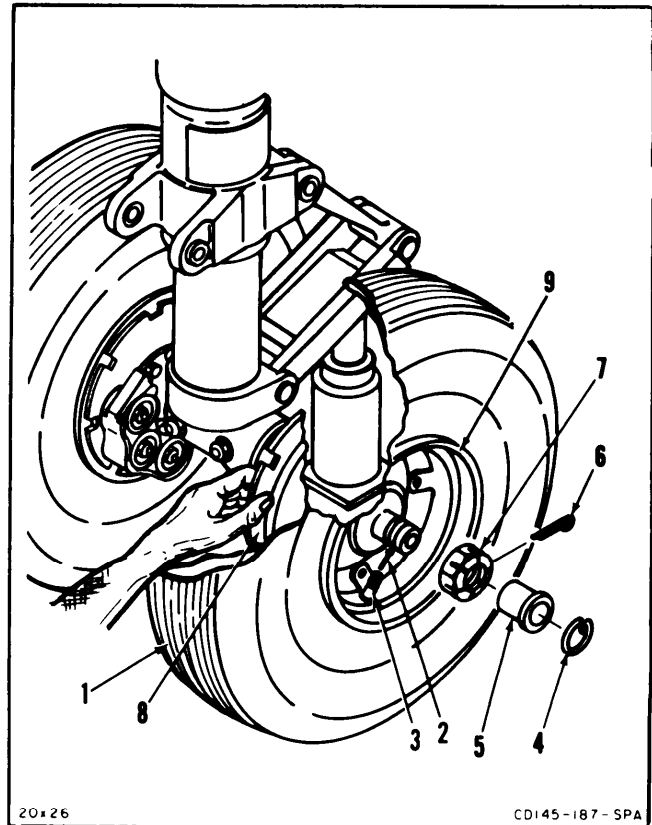
NOTE

Procedure is same for removing inboard or outboard wheels on right or left gear. Left forward outboard wheel is shown here.

1. **Let air out of tire (1)** by slowly removing valve core (2) from valve (3).
2. Remove retaining ring (4), sleeve bushing (5), cotter pin (6), and axle nut (7).

CAUTION

- Seal can be cut on axle thread. Do not drag seal on thread while removing wheel.
 - Bearing and seal may fall out when wheel is removed.
3. Hold brake disk (8) so it does not drop. **Remove wheel (9).**

**GO TO NEXT PAGE**

3-7 REMOVE FORWARD LANDING GEAR WHEEL AND TIRE ASSEMBLY (Continued)

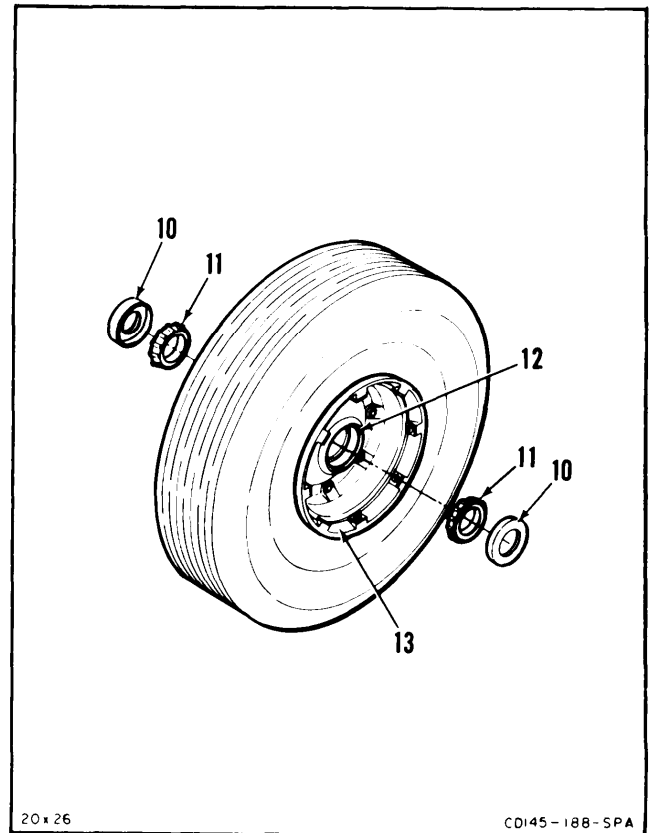
3-7

4. Remove two seals (10) and bearings (11).
5. Clean two seals (10) with dry cloths (EI 20).

WARNING

Solvent (E162) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.

6. Clean bearings (11) and two cups (12) in wheel (1 3). Use dry cleaning solvent (EI 62). Dry with cloth (E 120).
7. Check bearings (11) and cups (12) for corrosion, nicks, burrs and cracks (TM 55-1 500-204-25/1 , TM 55-1500-322-24).
8. Check seals (10) for damaged sealing lip.



20x26

CD145-188-SPA

FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit
 NSN 5180-00-323-4692
 Pneumatic Tire Valve Repair Tool
 Crowfoot wrench, 2 Inch
 Retaining Ring Pliers

Materials:

Cloth (E 120)
 Dry Cleaning Solvent (E162)
 Gloves (EI 86)

Personnel Required:

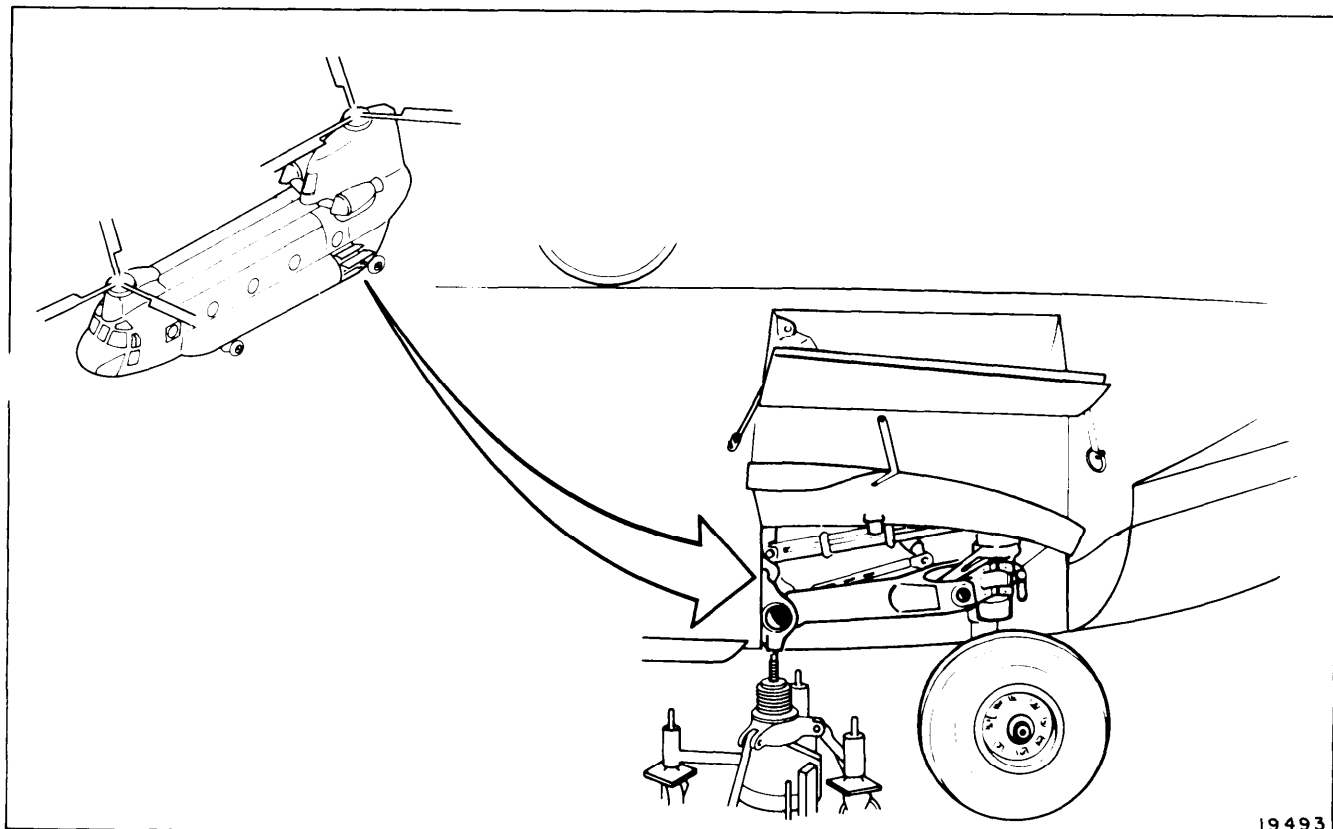
Medium Helicopter Repairer (2)

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Parking Brake Released (Task 7-236)
 Jack Helicopter at Aft Fuselage Jack Pad (Task 1-24)

References:

TM 55-1500-204-25/1
 TM 55-1500-322-24



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WARNING

Wheel can explode if axle nut is removed while tire is inflated. Deflate tire fully before starting removal procedure.

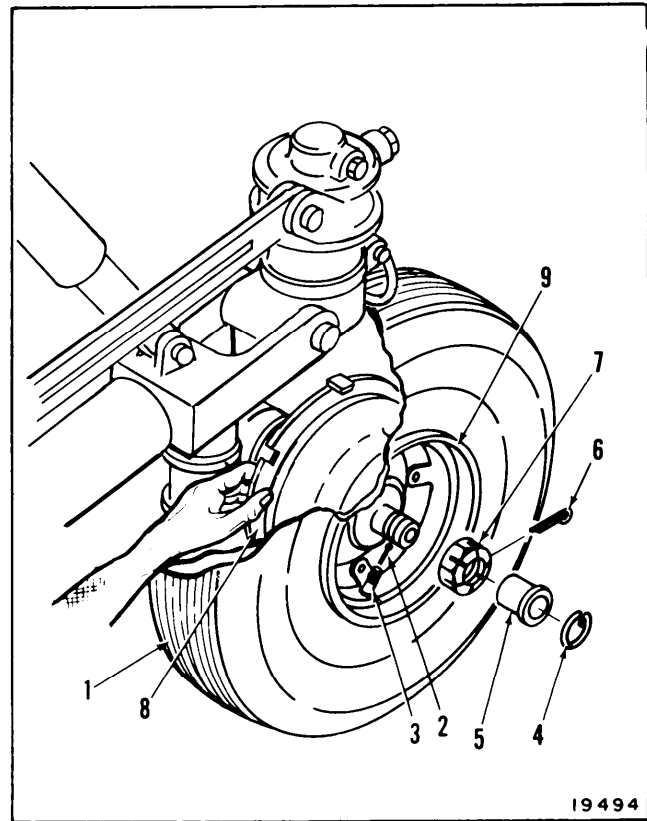
NOTE

Procedure is same for removing wheel from left or right gear. Left wheel is shown here.

1. Let air out of tire (1) by slowly removing valve core (2) from valve (3).
2. Remove retaining ring (4), sleeve bushing (5), cotter pin (6), and axle nut (7)

CAUTION

- Seal can be cut on axle thread. Do not drag seal on thread while removing wheel.
 - Bearing and seal may fall out when wheel is removed.
3. Hold brake disk (8) so it does not drop. Remove wheel (9).



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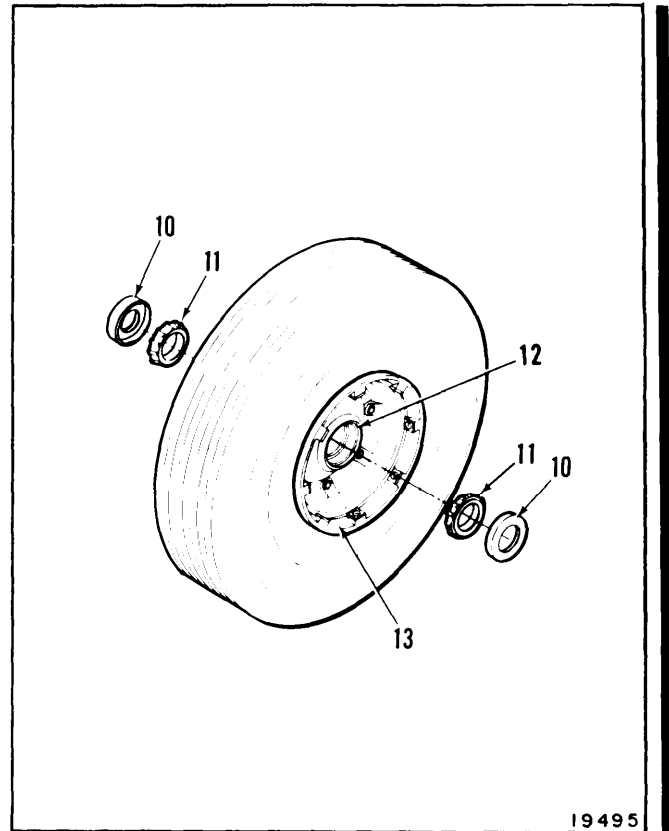
3-7.1 REMOVE AFT LANDING GEAR WHEEL AND TIRE ASSEMBLY 3-7.1 (Continued)

4. Remove two seals (10) and bearings (11).
5. Clean two seals (10) with dry cloths (E120).

WARNING

Solvent (E162) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.

6. Clean bearings (11) and two cups (12) in wheel (1 3). Use dry cleaning solvent (E162). Dry with cloth (E120).
7. Check bearings (11) and cups (12) for corrosion, nicks, burrs and cracks (TM 55-1500-204-25/1 , TM 55-1500-322-24).
8. Check seals (10) for damaged sealing lip.



FOLLOW-ON MAINTENANCE:

None

END OF TASK

3-8 REMOVE LANDING GEAR TIRE AND TUBE**3-8**

INITIAL SETUP

Applicable Configurations:

All

Equipment Condition:

Off Helicopter Task

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Tire Bead Breaker
Pneumatic Tire Valve Repair Tool

Materials:

None

Personnel Required:

67U10 Medium Helicopter Repairer

General Safety Instructions:**WARNING**

Tire and wheel can explode if air pressure is not released, causing injury to personnel and damage to equipment. Do not attempt to work on tire, tube and wheel before releasing pressure.

NOTE

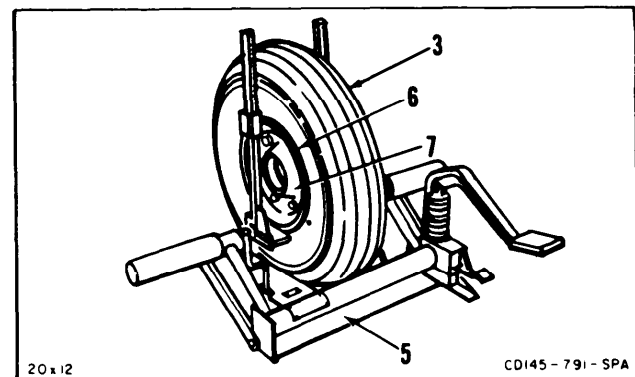
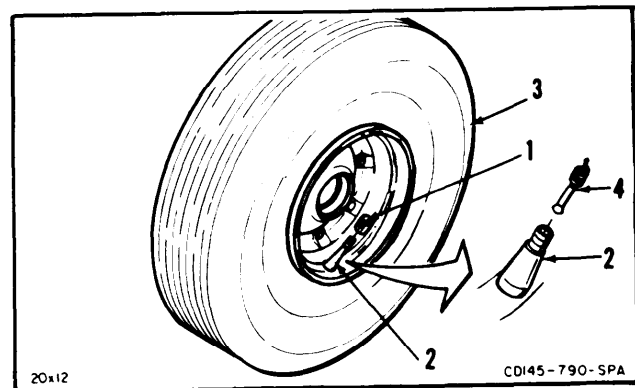
Procedure is same for removing all landing gear tires and tubes.

1. Remove cap (1) from valve (2).
2. **Let all air out of tire (3)** by removing core (4) from valve (2).

CAUTION

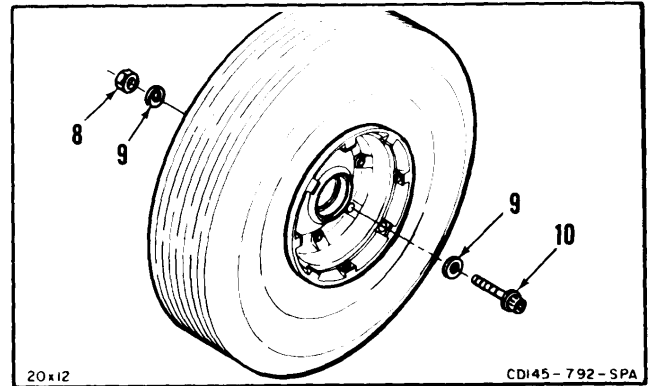
Do not pry with sharp tool between wheel rim and tire bead. Damage to tire and wheel can result. Use bead breaker with care. Make sure that valve is not damaged by bead breaker.

3. Install tire (3) in tire bead breaker (5).
4. **Break tire bead (6)** from wheel (7).
5. Remove tire (3) from tire bead breaker (5).

GO TO NEXT PAGE

3-8 REMOVE LANDING GEAR TIRE AND TUBE (Continued)**3-8**

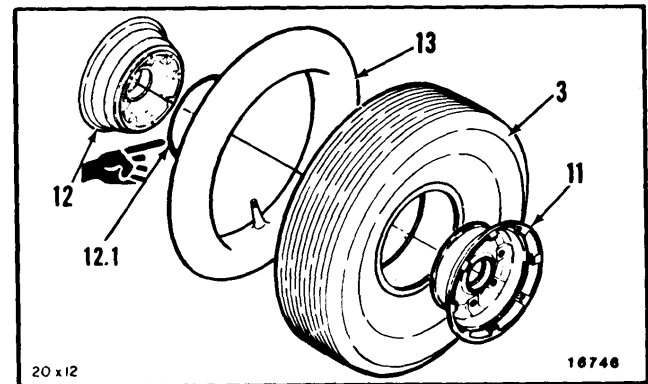
6. Remove sealant and remove eight nuts (8), 16 washers (9), and eight bolts (10).



7. **Separate wheel halves (11 and 12).**

- 7.1. Remove packing (12.1).

8. **Remove tube (13) from tire (3).**



FOLLOW-ON MAINTENANCE:

None

END OF TASK

3-9 REMOVE LANDING GEAR WHEEL CUPS AND KEYS**3-9****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit

NSN 5180-00-323-4692

Container 10 Hold Wheel and Boil Water

Source of Heat to Boil Water, or Oven

Kevlar Gloves (E 187)

Materials:

Carbon Dioxide (Dry Ice) (E92)

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Off Helicopter Task

Tire and Tube Removed From Wheel (Task 3-8)

1. Remove eight screws (1) and keys (2) from inboard wheel half (3).

WARNING

Carbon dioxide (dry ice) (E92) causes severe burns (frost bite) and gives off toxic fumes. Use only in well-ventilated area. Do not get in eyes, on skin, or clothing. In case of contact, immediately flush with plenty of water. Get medical attention for eyes.

WARNING

Wear Kevlar gloves when handling heated or chilled parts. Injury to personnel can result.

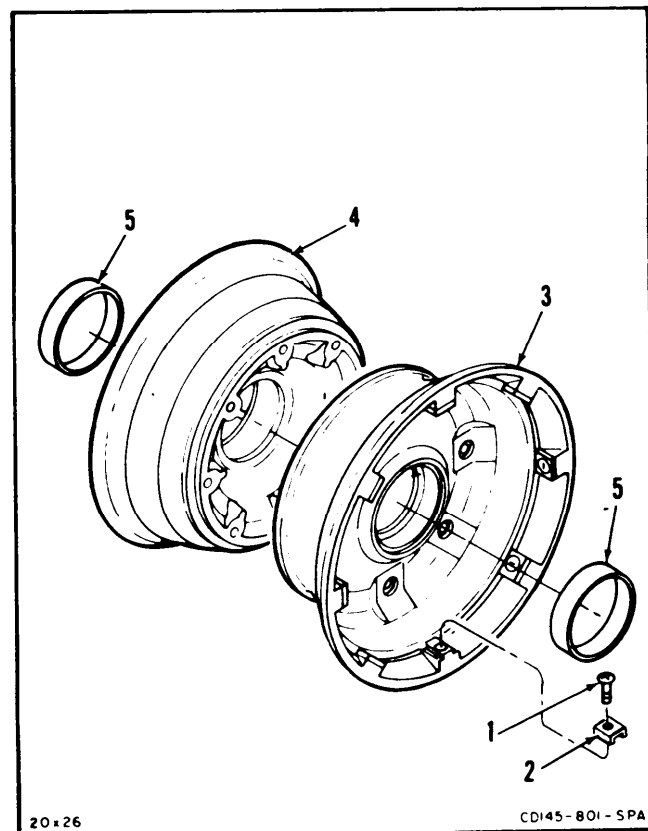
NOTE

Bearing cups are a shrink fit. Wheel must be expanded to remove them.

2. Expand wheel halves (3 and 4) by boiling in water for 30 minutes or heating in an oven. Do not exceed 300 degrees F (149°C) in oven. Pack cups (5) with dry ice (E92).
3. Remove bearing cups (5).

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

3-24 Change 5

3-10 INSTALL LANDING GEAR WHEEL CUPS AND KEYS

3-10

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Torque Wrench, 30 to 150 Inch-Pounds
- Container to Hold Wheel and Boil Water
- Oven, or Source of Heat to Boil Water
- Kevlar Gloves (E187)
- Ball Staking Tool, 3/32 Inch., Rockwell
Hardness C60, 32 RMS Finish

Materials:

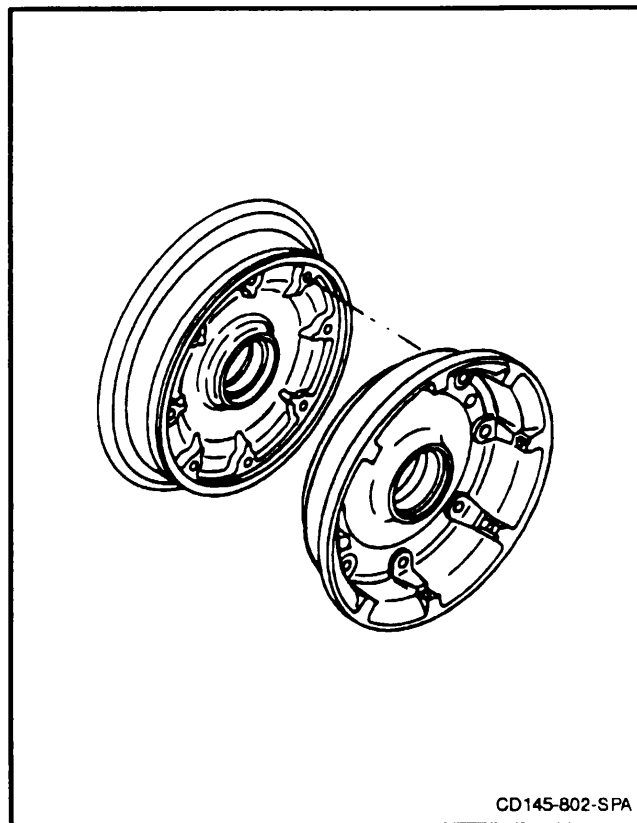
- Gloves (E186)
- Antiseize Compound (E77)
- Acetone (E20)
- Sealant (E336)

Personnel Required:

- Medium Helicopter Repairer
- Inspector

References:

TM 55-1520-240-23P

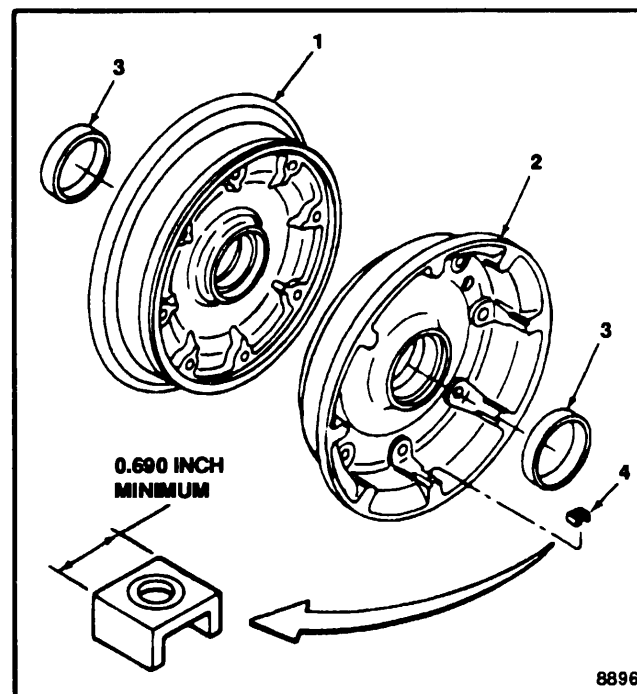


WARNING

Wear Kevlar gloves when handling heated or chilled parts. Injury to personnel can result.

NOTE

- Bearing cups are a shrink fit. Wheel must be expanded to install them
 - Ž Keep bearing cups in refrigerator or freezer until needed.
1. **Expand wheel halves (1 and 2)** by boiling in water for 30 minutes or heating in an oven. Do not exceed 300°F (149°C) in oven.
 2. **Install two bearing cups (3).**
 - 2.1. Allow wheel halves (1 and 2) to cool.
 - 2.2. **Measure width of eight wheel keys (4).** Width of key shall not be less than 0.690 inch.



GO TO NEXT PAGE

3-10 INSTALL LANDING GEAR WHEEL CUPS AND KEYS (Continued)

3. Install eight wheel keys (4) on bosses (5) in wheel half (2). Tap each key lightly if needed to firmly seat it on boss.

WARNING

Acetone (E20) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. 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

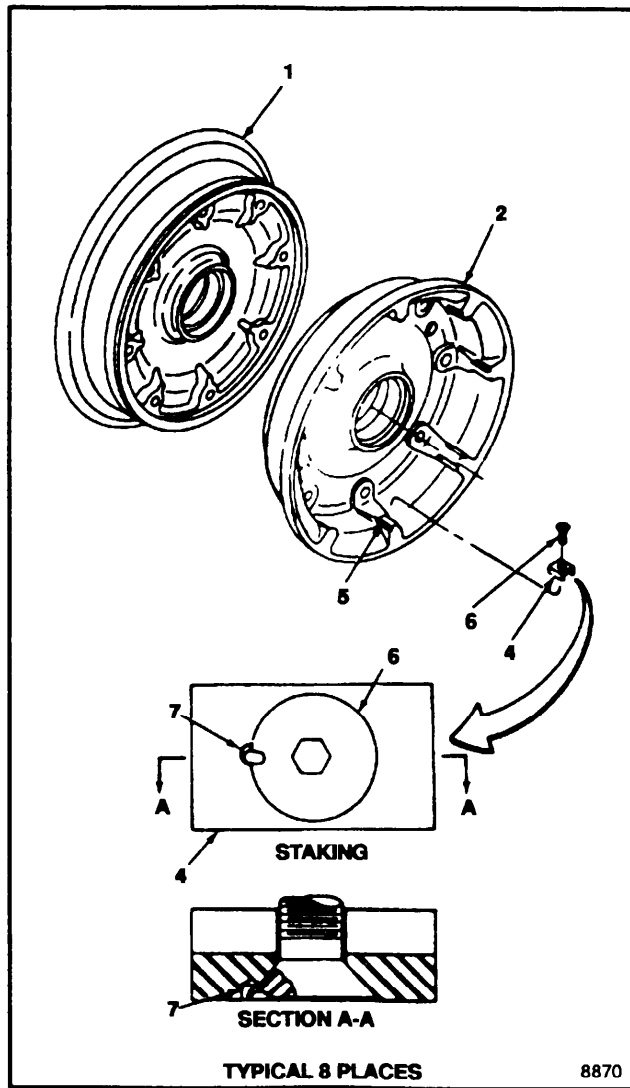
4. Clean screws (6) and keys (4). Use acetone (E20). Wear gloves (E186).

WARNING

Antiseize compound (E77) is extremely 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.

5. Lubricate thread of eight screws (6). Use anti-seize compound (E77).
6. Install screws (6) in keys (4). **Torque screws to 70 inch-pounds.**

7. Using a 3/32 (0.0937) inch (2.38 mm) ball staking tool with a hardness of Rockwell C60 and surface finish of 32 rms or item E-312, stake each screw (6) to slot (7) in key (4) as follows: Start the stake on the outboard side of the screw centerline. Initially hold the staking tool vertically and apply a series of sharp blows with a hammer. The screw material should flow outward toward the slot. Once a clean ball depression is established, angle the staking tool to provide a 15 to 20 degree outboard component to complete the stake. Insure enough material is displaced on the



screwhead to resist loosening. The staked lip will fill approximately (1/3) of the staking slot.

8. Deleted.

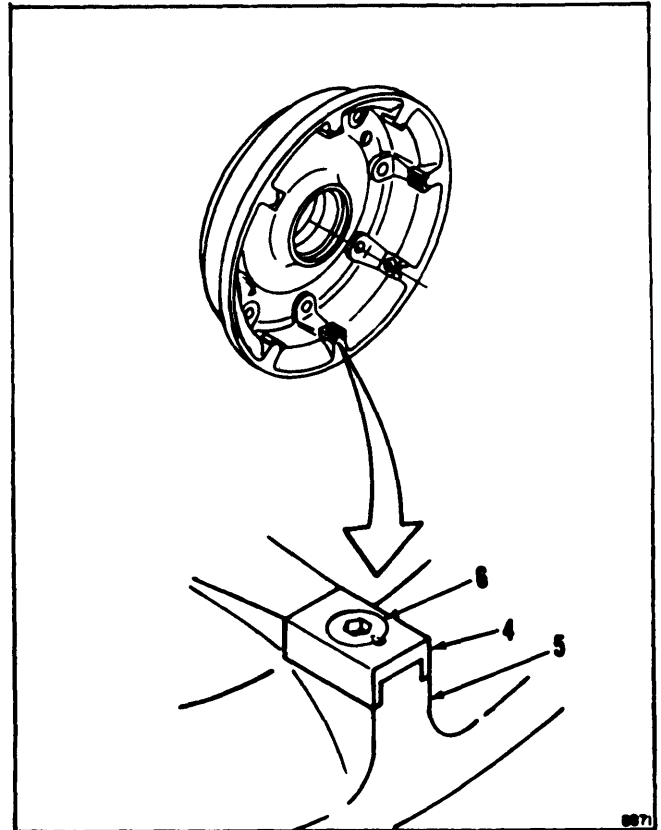
9. Deleted.

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3-10 INSTALL LANDING GEAR WHEEL CUPS AND KEYS (Continued) 3-10**WARNING**

Sealant E336 can irritate skin and cause burns. 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.

10. Apply a fillet of sealant (E336) around outside joint edges of each key (4) and key boss (5). Coat entire head of each screw (6) with sealant.

INSPECT

FOLLOW-ON MAINTENANCE:

END OF TASK

INITIAL SETUP**Applicable Configurations:**

All

Tools:Aircraft Mechanic's Kit,
NSN 5180-00-323-4692Inflator Kit,
NSN 6685-00-124-4336

Torque Wrench, 100 to 750 Inch-Pounds

Pneumatic Tire Valve Repair Tool

Materials:

Antiseize Compound (E75)

Cloth (E120)

Dry Cleaning Solvent (E162)

Naphtha (E245)

Parting Agent (E307)

Sealant (E336)

Gloves (E184.1)

Personnel Required:

Medium Helicopter Repairer

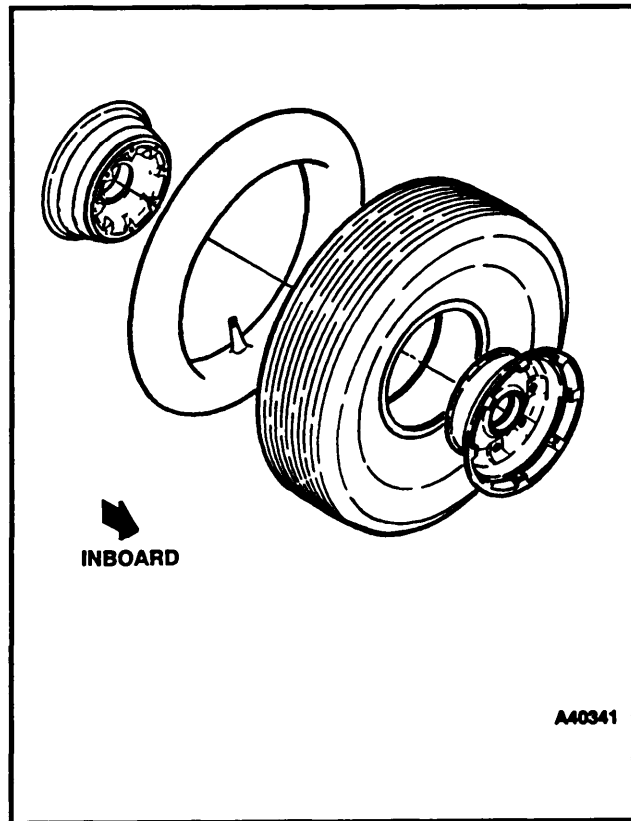
Inspector

References:

TM 55-1520-240-23P

TM 1-1500-204-23

Task 1-73



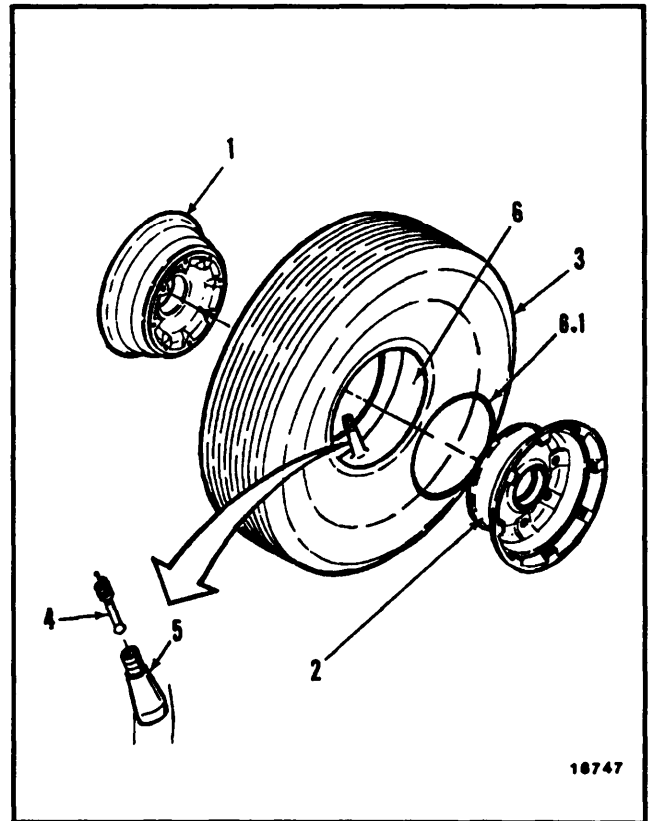
WARNING

Dry cleaning solvent (E162) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.

NOTE

Procedure is same for installing all landing gear tires and tubes.

1. Clean wheel halves (1) and (2) with solvent (E162) and cloths (E120). Wear gloves (E184.1). Wipe rims dry.
2. Clean dust and foreign materials from inside of tire (3). Use cloths (E120).
3. Install valve core (4) in valve (5).
4. **Inflate tube (6) part way.** Insert tube in tire (3).
- 4.1. Install packing (6.1) in groove of inner wheel half (2).



GO TO NEXT PAGE

3-11 INSTALL LANDING GEAR TIRE AND TUBE (Continued)**3-11****CAUTION**

Make sure tube is clear at wheel halves. Tube can be pinched causing damage to tube.

5. Place tire (3) and tube (6) between outer wheel half (1) and inner wheel half (2). Do not pinch tube.

WARNING

Antiseize compound (E75) can form toxic vapors if exposed to flame. Use in well-ventilated area, 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.

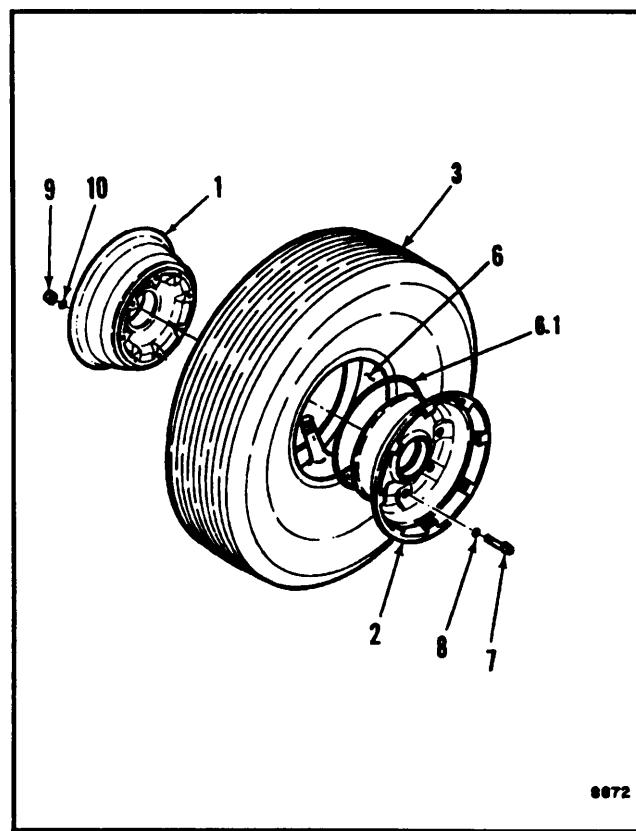
6. Lubricate thread and shank of bolt (7) and washers (8 and 10). Use antiseize compound (E75). Wear gloves (E184.1).

NOTE

Brake keys are on inner wheel half.

7. **Install four bolts (7) and washers (8), with countersunk side toward bolt head, 90 degrees apart in inner wheel half (2). **Compress both wheel halves (1 and 2) with packing (6.1) and install four washers (10) and nuts (9) (TM 1-1 500-204-23).****
8. Install other four bolts (7) and washers (8), countersunk side toward bolt head, through inner wheel half (2). Install four washers (10) and nuts (9). Tighten nuts (9) evenly until wheel halves seat.
9. **Torque eight nuts (9) in a criss-cross pattern to 120 inch-pounds.**
10. **Maintaining criss-cross pattern, torque eight nuts (9) again to 200 inch-pounds.**
- 10.1. **Apply final torque of 300 inch-pounds to nuts (9).**

INSPECT



0072

GO TO NEXT PAGE

WARNING

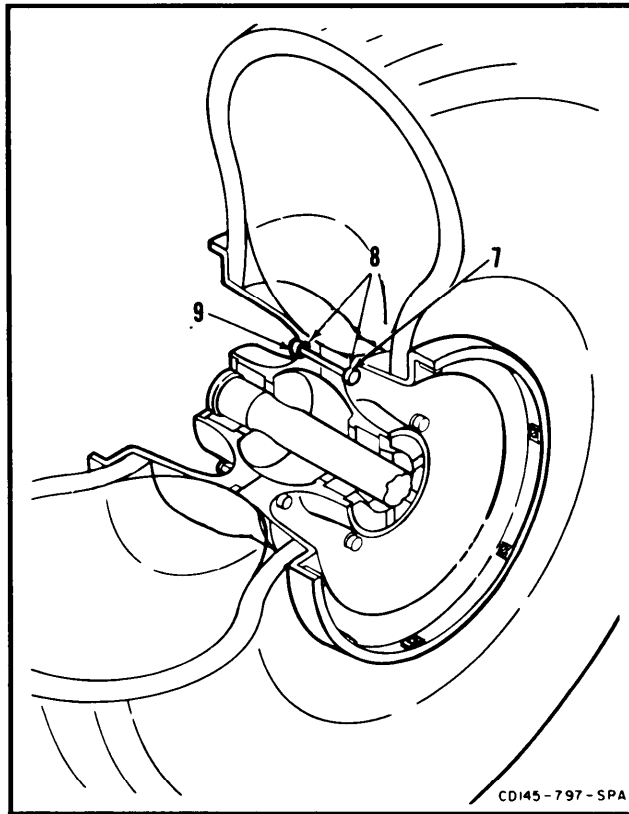
Naphtha (E245) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

11. Clean bolt heads (7), washers (8), nuts (9), and nearby surface with naphtha (E245). Wear gloves (E184.1).

WARNING

- Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes and clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.
- Parting agent (E307) can form toxic vapors if exposed to flame. Use in well-ventilated area 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.

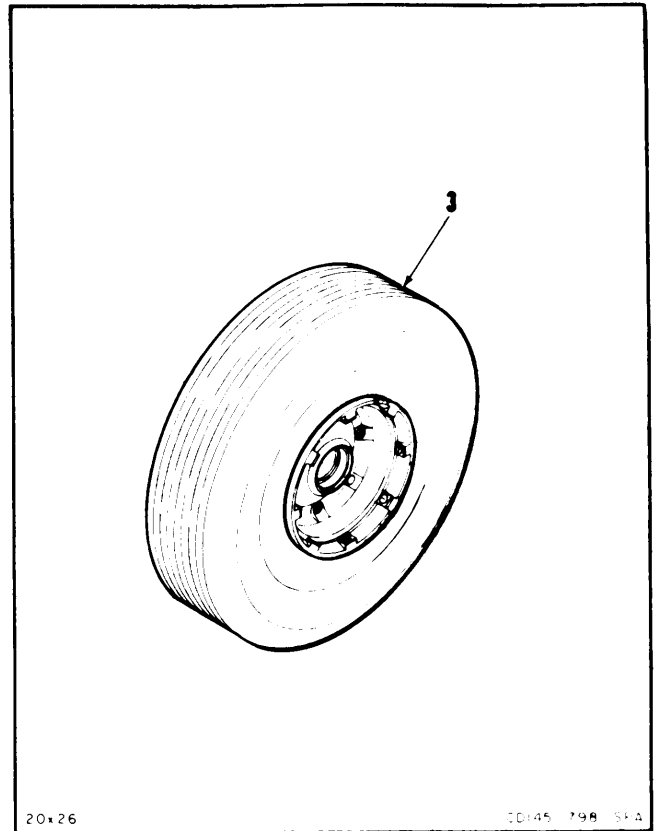
12. Coat exposed surfaces of bolts (7), washers (8), and nuts (9) with parting agent (E307). Cover coated area with sealant (E336). Wear gloves (184.1).
13. Apply sealant (E336) around head of bolt (7) and washer (8). Wear gloves (E184.1).

INSPECT

WARNING

Tires can explode when being inflated, causing injury to personnel and damage to equipment. Inflate tire in safety cage. Use a remote tire inflator.

14. Inflate tire (3) to 88 psi. Remove tire inflator (Task 1-73).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

3-12 INSTALL FORWARD LANDING GEAR WHEEL AND TIRE ASSEMBLY 3-12**INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit

NSN 5180-00-323-4692

Inflator Kit

NSN 6685-00-124-4336

Torque Wrench, 100 to 750 Inch-Pounds

Crowfoot Wrench, 2 Inch

Retaining Ring Pliers

Materials:

Acetone (E20)

Cleaning Cloth (E120)

Dry Cleaning Solvent (E162)

General Purpose Grease (E190)

Lubricating Oil (E254)

Parting Agent (E307)

Sealant (E336)

Sealing Compound (E350)

Gloves (E186)

Parts:

Cotter Pin

Spacer

Personnel Required:

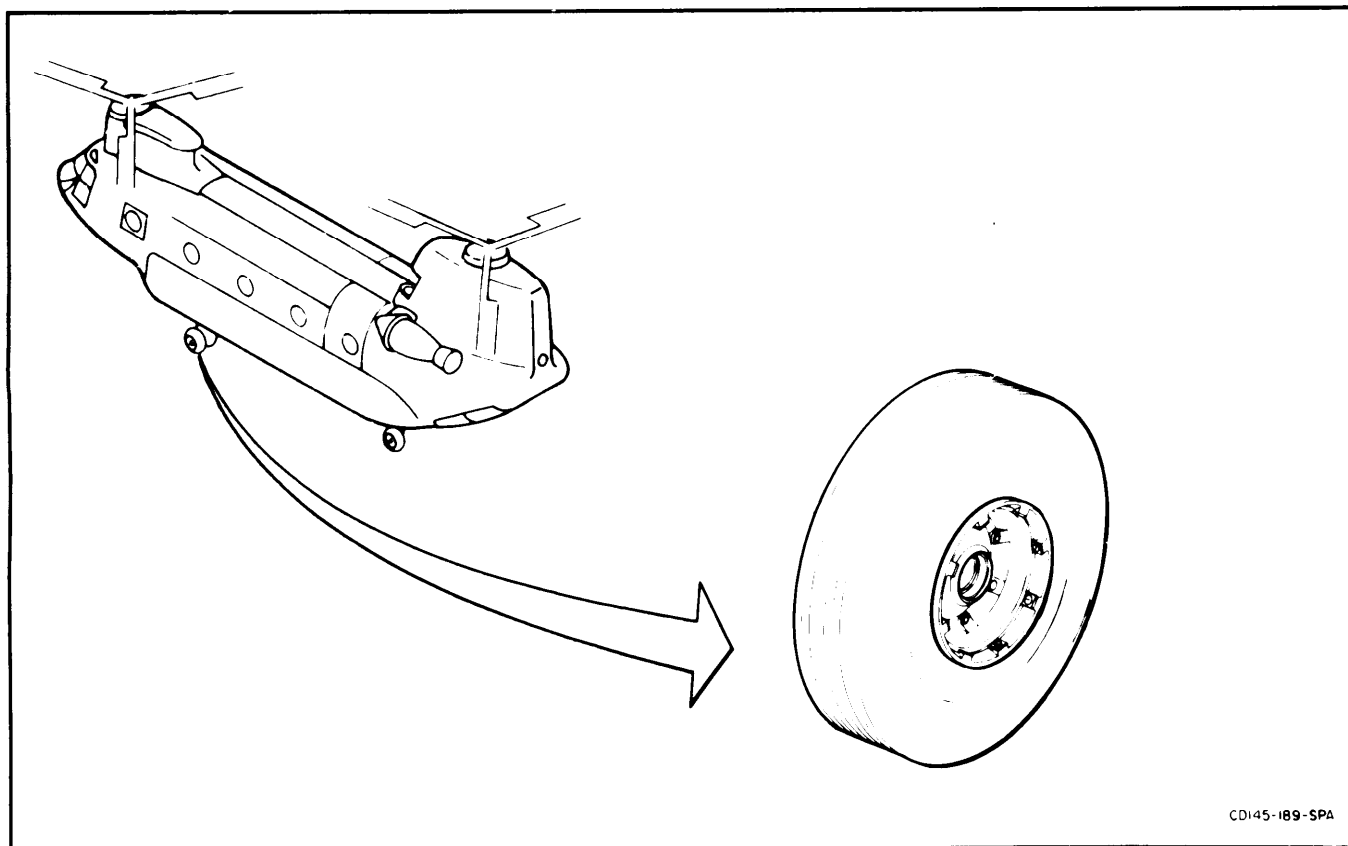
Medium Helicopter Repairer (2)

Inspector

References:

TM 55-1520-240-23P

Task 1-73



CD145-189-SPA

GO TO NEXT PAGE

3-30 Change 14

3-12 INSTALL FORWARD LANDING GEAR WHEEL AND TIRE ASSEMBLY (Continued)

3-12

WARNING

- Dry cleaning solvent (E162) is flammable and gives off toxic fumes. It may 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 water for at least 15 minutes. Get medical attention for eyes.
- Never stand facing sidewall of tire being serviced. Stand facing tire tread.

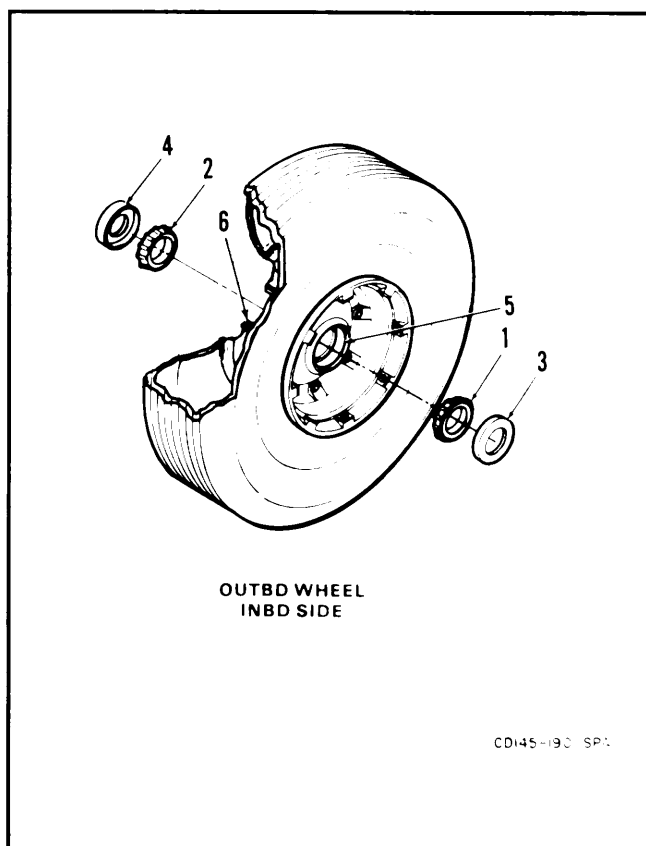
CAUTION

Dirt and mixed greases on bearings and bearing surfaces can cause damage to wheels. Clean bearings and surfaces before packing.

NOTE

Procedures are same for installing in-board and outboard wheels. Outboard wheel is shown here,

1. Clean bearings (1 and 2), and wheel surfaces thoroughly with dry cleaning solvent (E162). Wear gloves (E186).
2. Clean seals (3 and 4) with dry cloths (E120).
3. Pack bearings (1 and 2) with grease (E190).
4. Install bearing (1) in bearing cup (5).
5. Insert seal (3) over bearing (1).
6. Install bearing (2) in bearing cup (6).
- 6.1. Install seal (4) over bearing (2).



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3-12 INSTALL FORWARD LANDING GEAR WHEEL AND TIRE ASSEMBLY (Continued)

3-12

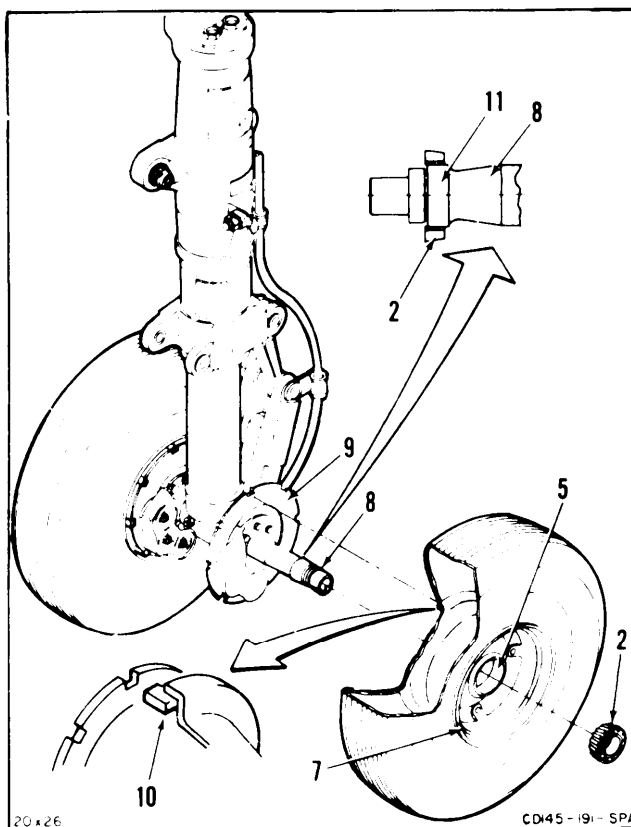
7. Install wheel (7) on axle (8). Align brake disk (9) with keys (10) on wheel. Seat wheel on axle.

8. Check that outboard bearing (2) hangs over edge of journal (11) on axle (8)

9. If bearing (2) hangs over journal (11), go to step 11

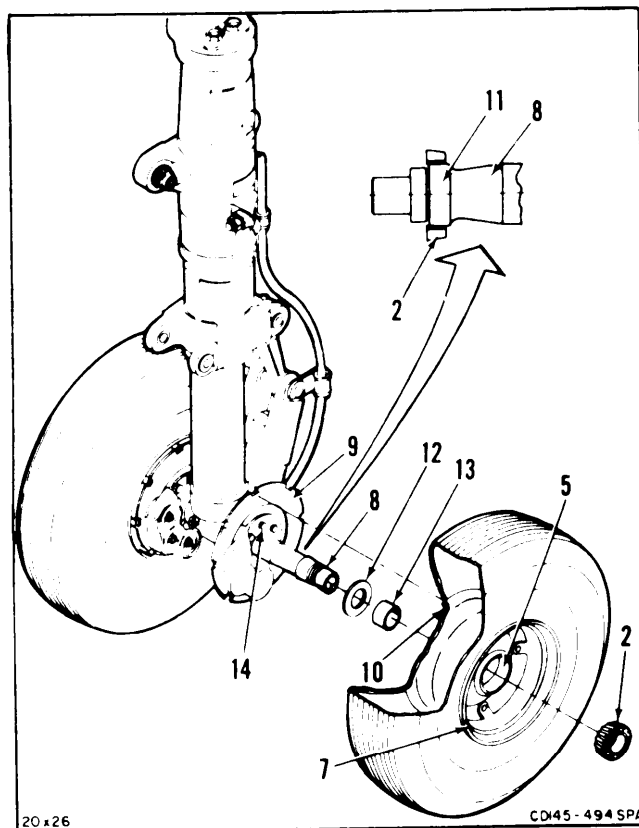
WARNING

Sealing compound (E350) is flammable and gives off toxic fumes. It 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 water for at least 15 minutes. Get medical attention for eyes.



10. If bearing (2) does not hang over edge of journal (11) add spacer (12) as follows:

- Remove bearing (2), wheel (7), and sleeve bushing (13).
- Install spacer (12) between sleeve bushing (13) and axle housing (14). Do not use more than one spacer per wheel.
- Apply sealing compound (E350) to bore of sleeve (13). Install sleeve bushing on axle (8) while sealant is still wet. Wear gloves (E 1861).
- Install wheel (7) on axle (8). Align brake disk (9) with keys (10) on wheel. Seat wheel on axle.
- Install bearing (2) in bearing cup (5).



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3-12 INSTALL FORWARD LANDING GEAR WHEEL AND TIRE ASSEMBLY (Continued)

3-12

WARNING

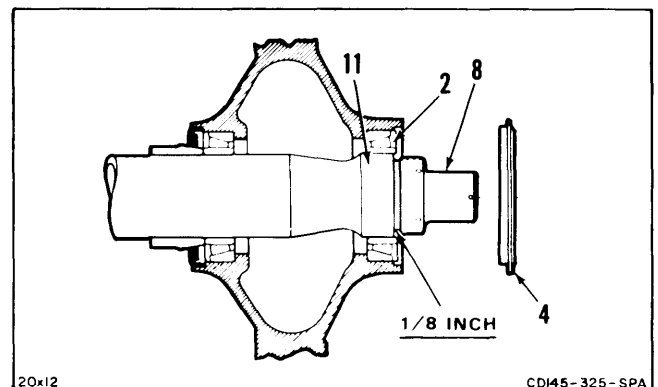
Acetone (E20) is flammable and gives off toxic fumes. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

11. Clean around axle (8) and in gap formed where bearing (2) hangs over journal (11). Use acetone (E20). Wear gloves (E186).

WARNING

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

12. Apply 1/8-inch bead of sealant (E336) around axle (8) in gap formed where bearing (2) hangs over journal (11).
13. Install seal (4) over outboard bearing (2).



GO TO NEXT PAGE

3-12 INSTALL FORWARD LANDING GEAR WHEEL AND TIRE ASSEMBLY (Continued)

3-12

14. Apply grease (E190) or oil (E254) to threads and bearing surface of nut (15).
15. Install wheel bearing nut (15) as follows:
 - a. Install nut (15) on axle (8).
 - b. Have helper turn wheel and **torque nut (15) to 300 inch-pounds.**
 - c. Back off nut (15) to 0 inch-pounds. Make sure nut and outer bearing (2) are still in contact.
 - d. Turn wheel and torque nut (15) to a minimum of 120 inch-pounds. Continue torqueing until first slot aligns with hole in axle (8). Do not exceed 300 inch-pounds.
 - e. Install new cotter pin (16).
16. Install sleeve (17) and retaining ring (18).

WARNING

Tires can explode or wheel halves can separate under pressure. Injury to personnel can result. Use remote tire inflator.

CAUTION

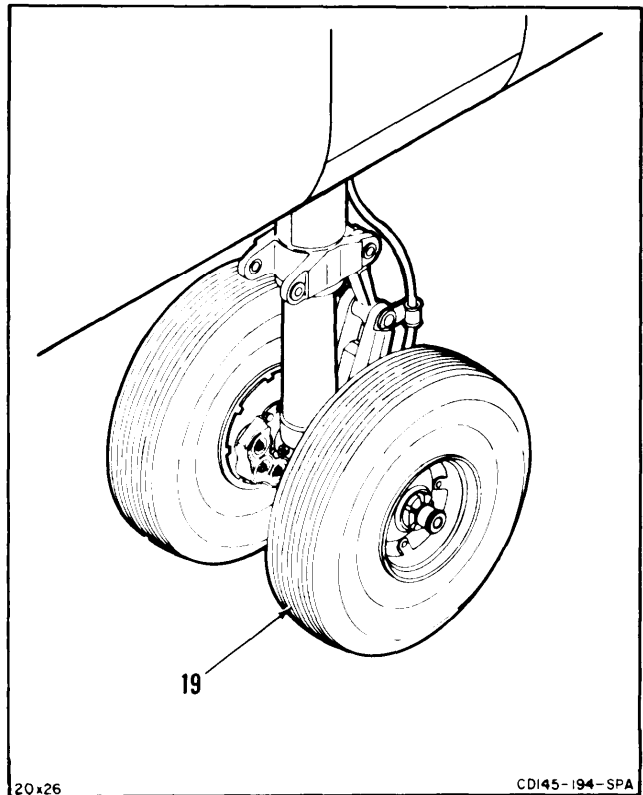
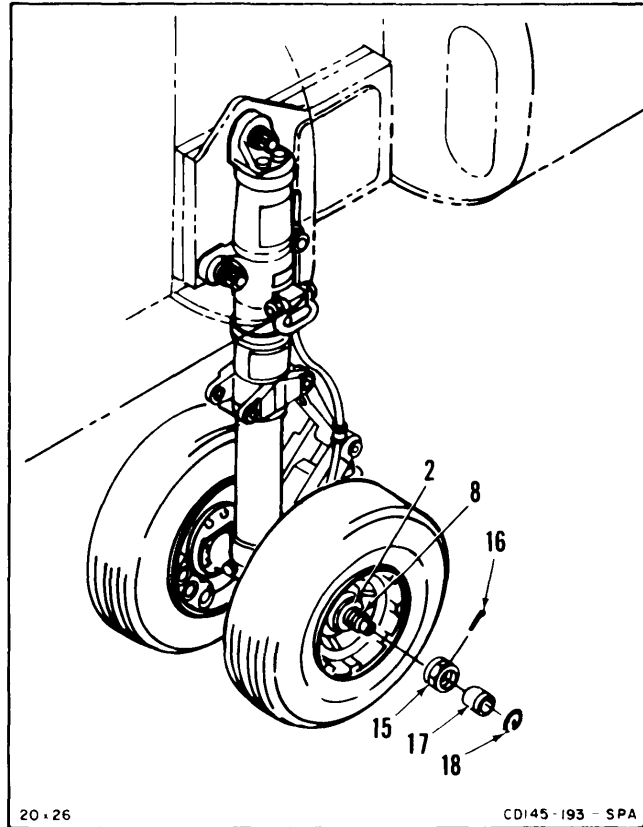
Inflate tire before lowering jack. Helicopter can be damaged by lowering too far.

17. Inflate tire (19) to correct pressure (Task 1-73). Use remote tire inflator.

INSPECT

FOLLOW-ON MAINTENANCE:

- Lower and remove jack (Task 1-23 or 1-24).
- Set parking brake (Task 7-239).
- Install access panel (Task 2-2).



END OF TASK

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit
NSN 5180-00-323-4692
Inflator Kit,
NSN 6685-00-124-4336
Torque Wrench, 100 to 750 Inch-Pounds
Crowfoot Wrench, 2 Inch
Retaining Ring Pliers

Materials:

Acetone (E20)
Cleaning Cloth (E120)
Dry Cleaning Solvent (E162)
General Purpose Grease (E190)
Lubricating Oil (E254)
Parting Agent (E307)
Sealant (E336)
Sealing Compound (E350)
Gloves (E186)

Parts:

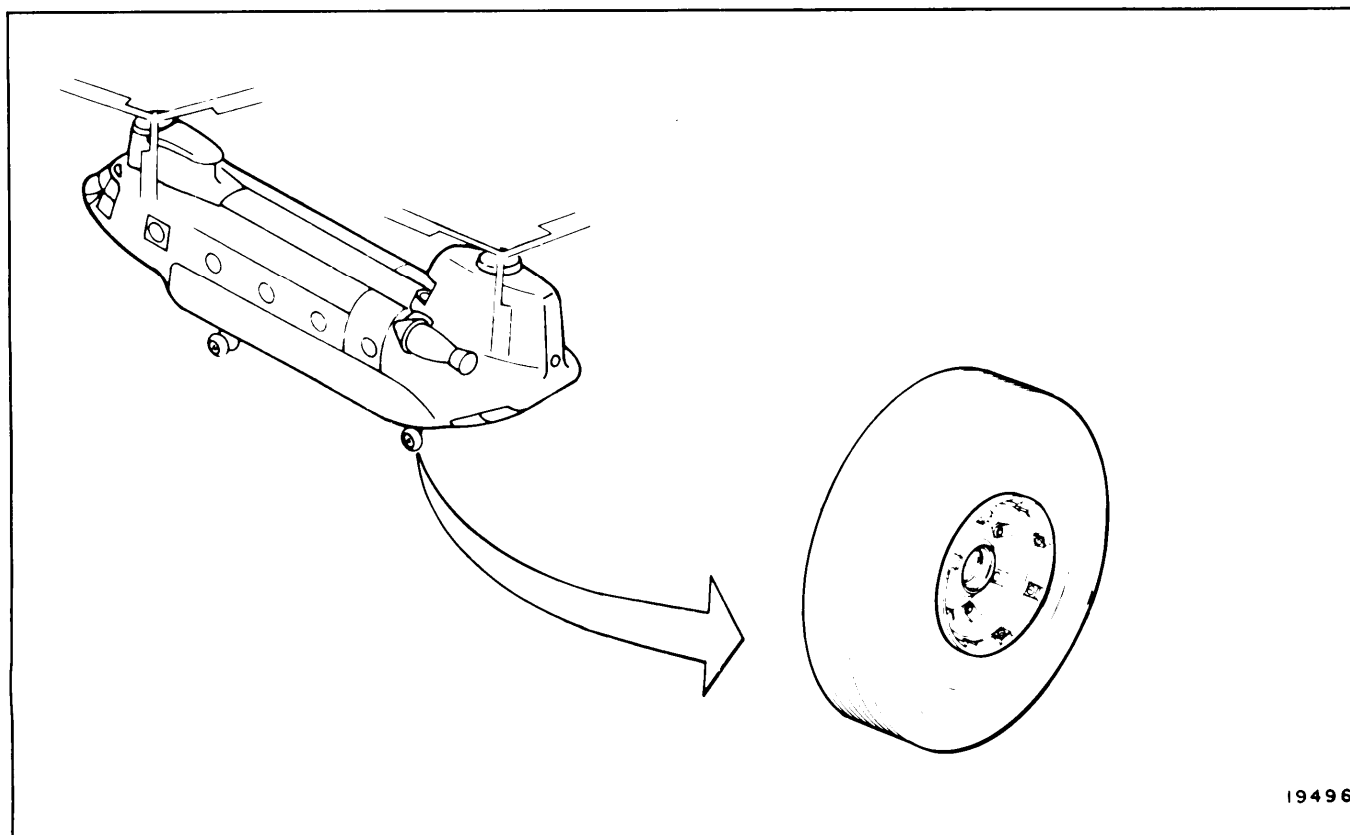
Cotter Pin
Spacer

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

TM 55-1520-240-23P
Task 1-73

**GO TO NEXT PAGE**

WARNING

- Dry cleaning solvent (E162) is flammable and gives off toxic fumes. It may 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 water for at least 15 minutes. Get medical attention for eyes.
- Never stand facing sidewall of tire being serviced. Stand facing tire tread.

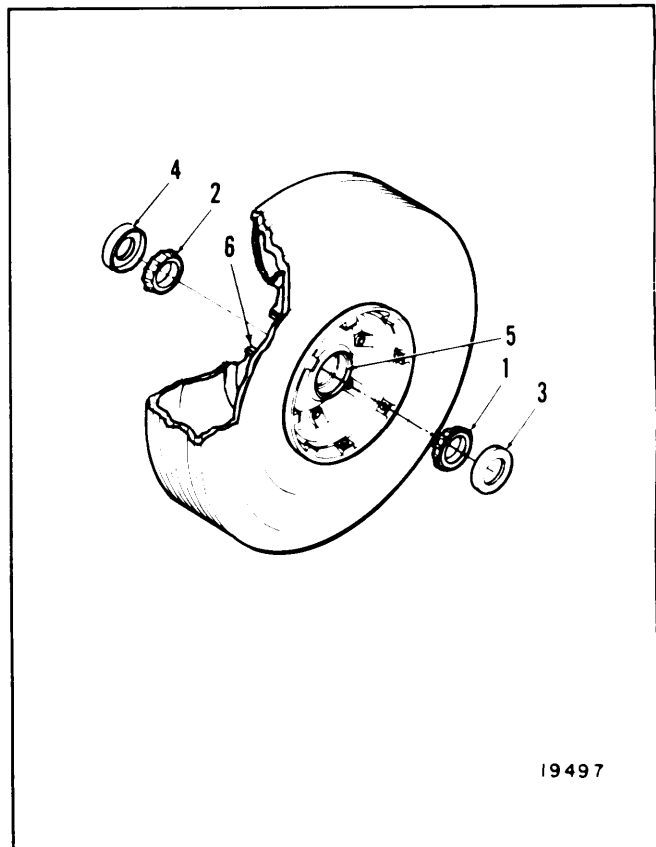
CAUTION

Dirt and mixed greases on bearings and bearing surfaces can cause damage to wheels. Clean bearings and surfaces before packing.

NOTE

Procedures are same for installing left or right wheel. Left wheel is shown here.

1. Clean bearings (1 and 2) and wheel surfaces thoroughly with dry cleaning solvent (E162). Wear gloves (E186).
2. Clean seals (3 and 4) with dry cloths (E120).
3. **Pack bearings (1 and 2) with grease (E190).**
4. **Install bearing (1) in bearing cup (5).**
5. **Insert seal (3) over bearing (1).**
6. **Install bearing (2) in bearing cup (6).**
7. **Insert seal (4) over bearing (2).**



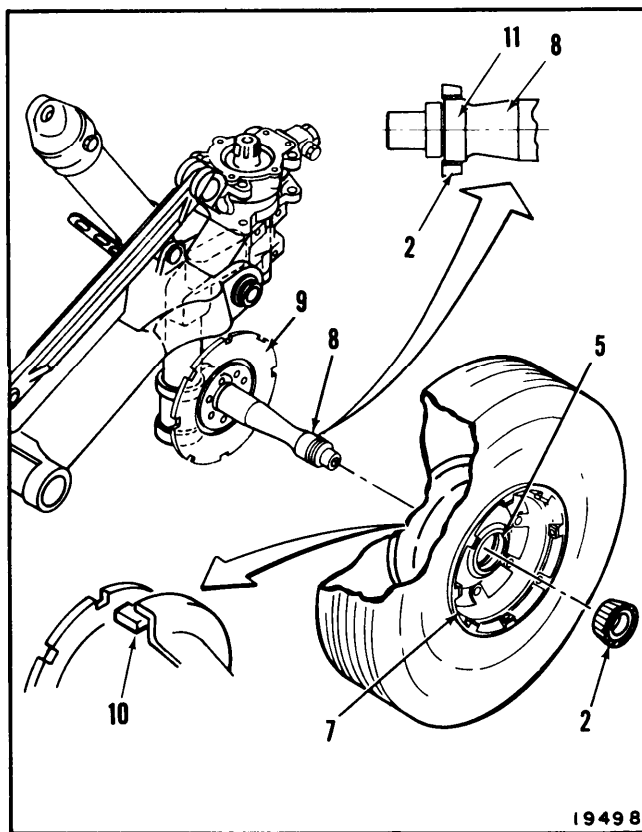
19497

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3-34.2 Change 14

3-12.1 INSTALL AFT LANDING GEAR WHEEL AND TIRE ASSEMBLY 3-12.1 (Continued)

8. Install wheel (7) on axle (8). Align brake disk (9) with keys (10) on wheel. Seat wheel on axle.
9. Check that outboard bearing (2) hangs over edge of journal (11) on axle (8).
10. If bearing (2) hangs over journal (11), go to step 11.

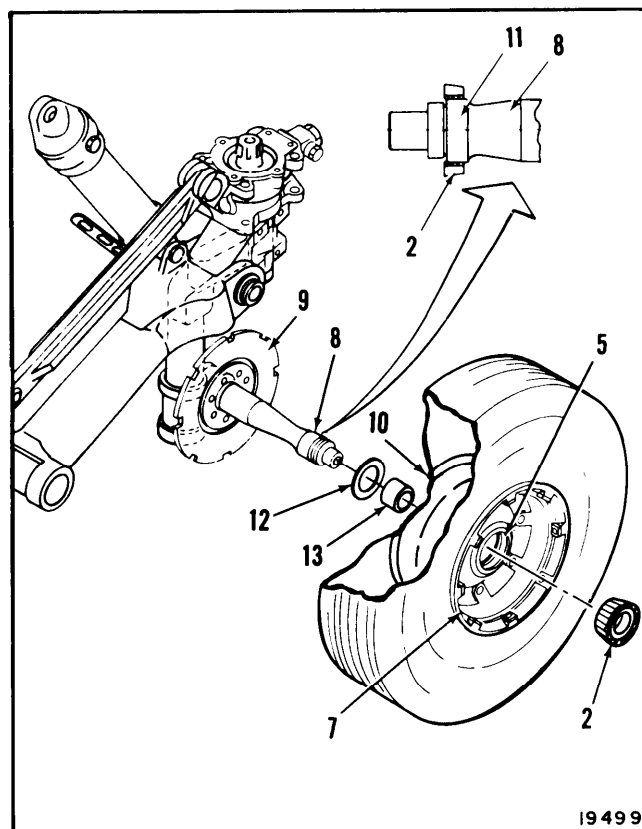


11. If bearing (2) does not hang over edge of journal (11) add spacer (12) as follows:
 - a. Remove bearing (2), wheel (7), and sleeve bushing (13).
 - b. Install spacer (12) between sleeve bushing (13) and axle (8). Do not use more than one spacer per wheel.

WARNING

Sealing compound (E350) is flammable and gives off toxic fumes. It 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 water for at least 15 minutes. Get medical attention for eyes.

- c. Apply sealing compound (E350) to bore of sleeve bushing (13). Install sleeve bushing on axle (8) while sealant is still wet. Wear gloves (EI 86).
- d. Install wheel (7) on axle (8). Align brake disk (9) with keys (10) on wheel. Seat wheel on axle.
- e. Install bearing (2) in bearing cup (5).



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3-12.1 INSTALL AFT LANDING GEAR WHEEL AND TIRE ASSEMBLY 3-12.1 (Continued)

WARNING

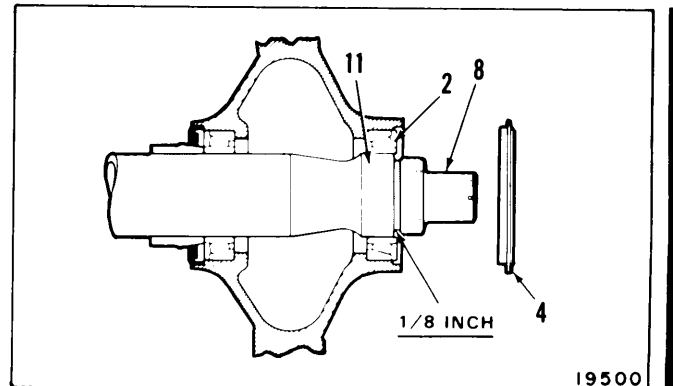
Acetone (E20) is flammable and gives off toxic fumes. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

12. Clean around axle (8) and in gap formed where bearing (2) hangs over journal (11). Use acetone (E20). Wear gloves (E 186).

WARNING

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

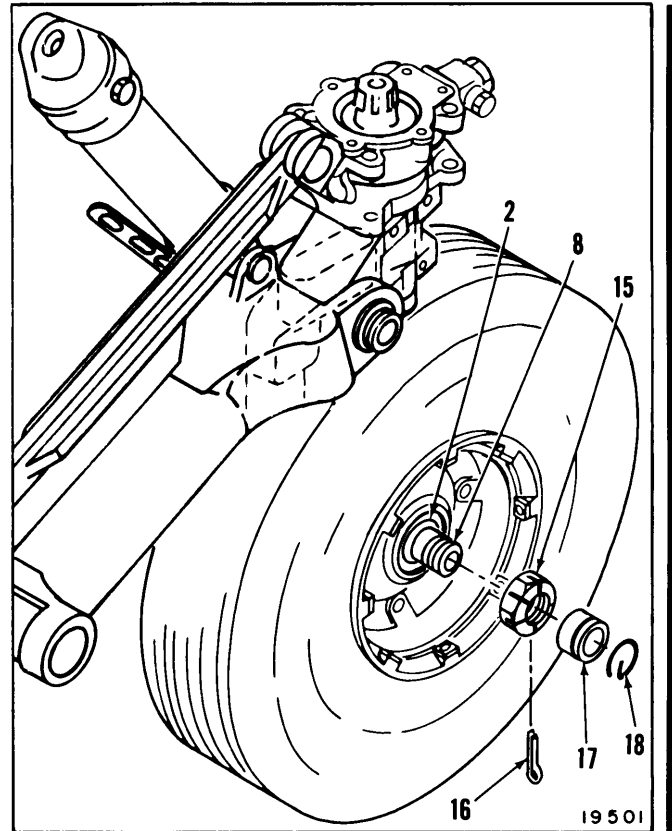
13. Apply 1/8-inch bead of sealant (E336) around axle (8) in gap formed where bearing (2) hangs over journal (11).
14. Install seal (4) over outboard bearing (2).



GO TO NEXT PAGE

13-12.1 INSTALL AFT LANDING GEAR WHEEL AND TIRE ASSEMBLY 3-12.1 (Continued)

15. Apply grease (E190) or oil (E254) to threads and bearing surface of nut (15).
16. **Install wheel bearing nut (15) as follows:**
 - a. Install nut (15) on axle (8).
 - b. Have helper spin wheel and torque nut (15) to **300 inch-pounds**.
 - c. Back off nut (15) to 0 inch-pounds. Make sure nut and outer bearing (2) are still in contact.
 - d. Spin wheel and torque nut (15) to a minimum of **120 inch-pounds**. Continue torquing until first slot aligns with hole in axle (8). Do not exceed **300 inch-pounds**.
 - e. Install new cotter pin (16).
17. **Install sleeve (17) and retaining ring (18).**



WARNING

Tires can explode or wheel halves can separate under pressure. Injury to personnel can result. Use remote tire inflator.

CAUTION

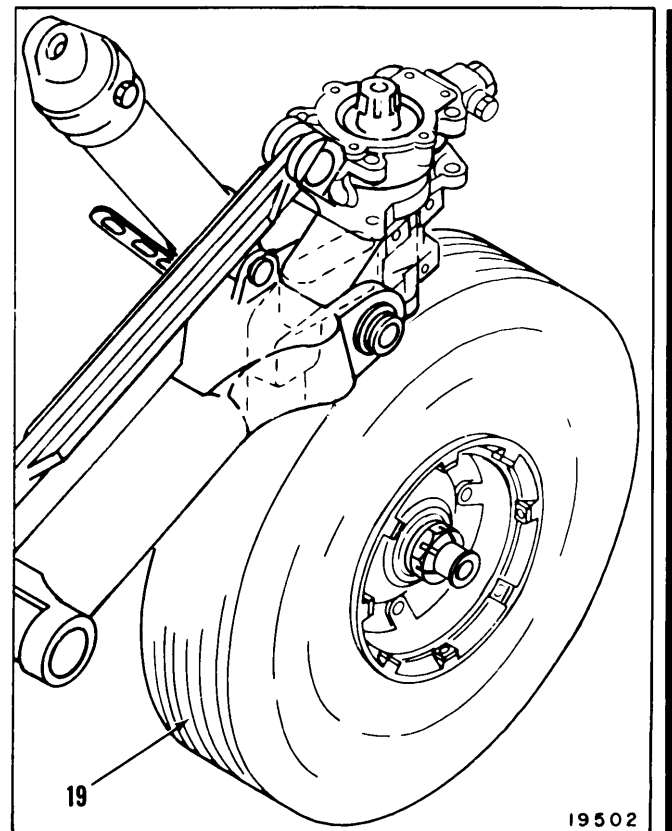
Inflate tire before lowering jack. Helicopter can be damaged by lowering too far.

18. **Inflate tire (19) to correct pressure** (Task 1-73). Use remote tire inflator.

INSPECT

FOLLOW-ON MAINTENANCE:

- Lower and remove jack (Task 1-24).
- Set parking brake (Task 7-239).
- Install access panel (Task 2-2).



END OF TASK

3-13 INSPECT LANDING GEAR AXLE**3-13****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Outside Micrometer, 1 to 2 Inch
Depth Gage 0 to 0.125 Inch

Materials:

None

Personnel Required:

Inspector

Equipment Condition:

Off Helicopter Task

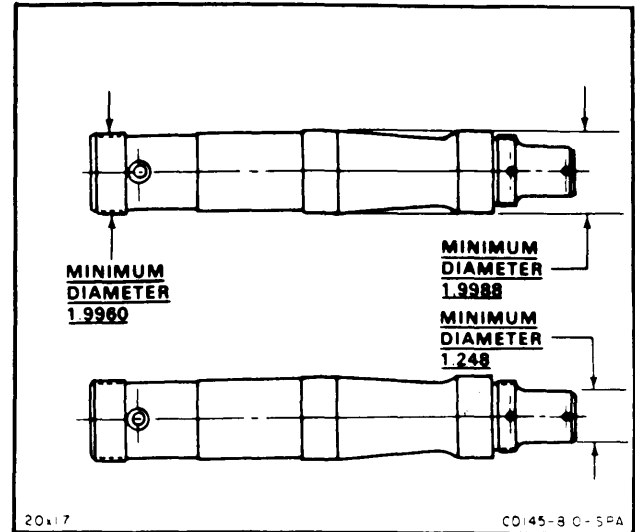
NOTE

- Procedure is same for all axles.
- Replace axle if criteria is not met.

1. **Check axle for cracks and bends.** There shall be no bends or cracks.
2. **Check axle for corrosion.**
3. **Check axle for wear.** Measure axle as shown. Dimensions shall be no less than 1.9960 inch diameter shown at axle housing end, or 1.9988 inch diameter and 1.248 inch diameter at the wheel nut end.
4. **Check axle for scratches.** Accept a maximum of four scratches up to **0.015 inch wide, 0.015 inch deep and 1 inch long.** Blend smoothly within 0.03 inch on either side of scratch.

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

Change 12

3-35/(3-36 blank)

3-14 REMOVE FORWARD LANDING GEAR AXLE**3-14**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit
 NSN 5180-00-323-4692
 Soft-Faced Mallet

Materials:

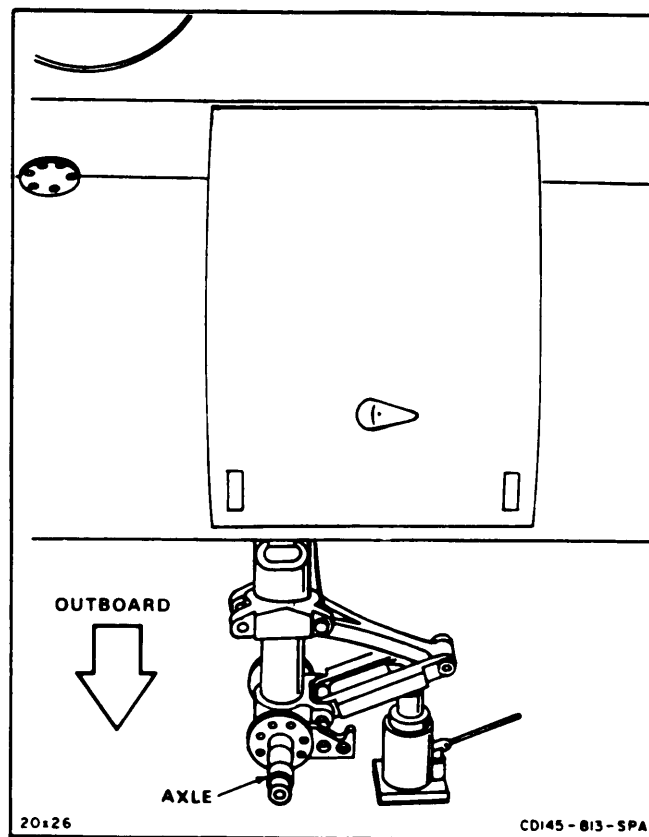
Cloth (120)
 Dry Cleaning Solvent (EI 62)
 Gloves (EI 86)

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected Task 1-39)
 Brake Removed (Task 3-77)
 Helicopter Jacked at Forward Landing Gear
 (Task 1-23)
 Electrical Power Off
 Hydraulic Power Off
 Forward Landing Gear Wheel and Tire
 Assembly Removed (Task 3-9)

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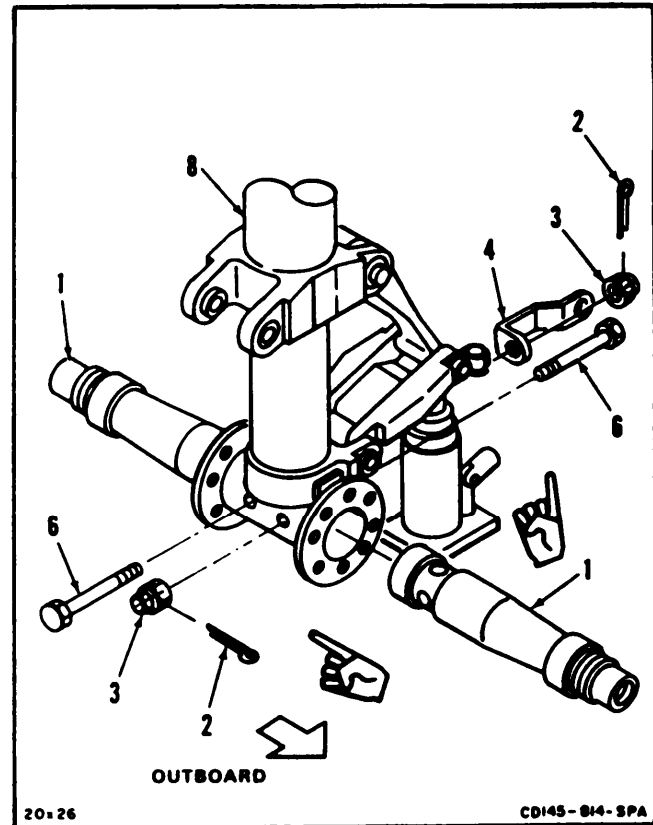
WARNING

Dry cleaning solvent (E162) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.

NOTE

Procedure is same for removing left or right, inboard or outboard forward landing gear axle. Left side outboard is shown here.

1. Clean grease from axle (1) with solvent (E 162) and cloths (EI 20). Wear gloves (E 186).
2. Remove two rotter pins (2) and nuts (3).
3. **Remove bracket (4)** from inboard axle (1).
4. Remove bolts (6).
5. **Remove two axles (1)** from shock strut (8). Use mallet.

**FOLLOW-ON MAINTENANCE:**

Inspect axle (Task 3-1 3).

END OF TASK

3-15 INSTALL FORWARD LANDING GEAR AXLE**3-15**

INITIAL SETUP

Applicable Configurations:

All

Tools:Aircraft Mechanic's Tool Kit
NSN 5180-00-323-4892**Materials:**

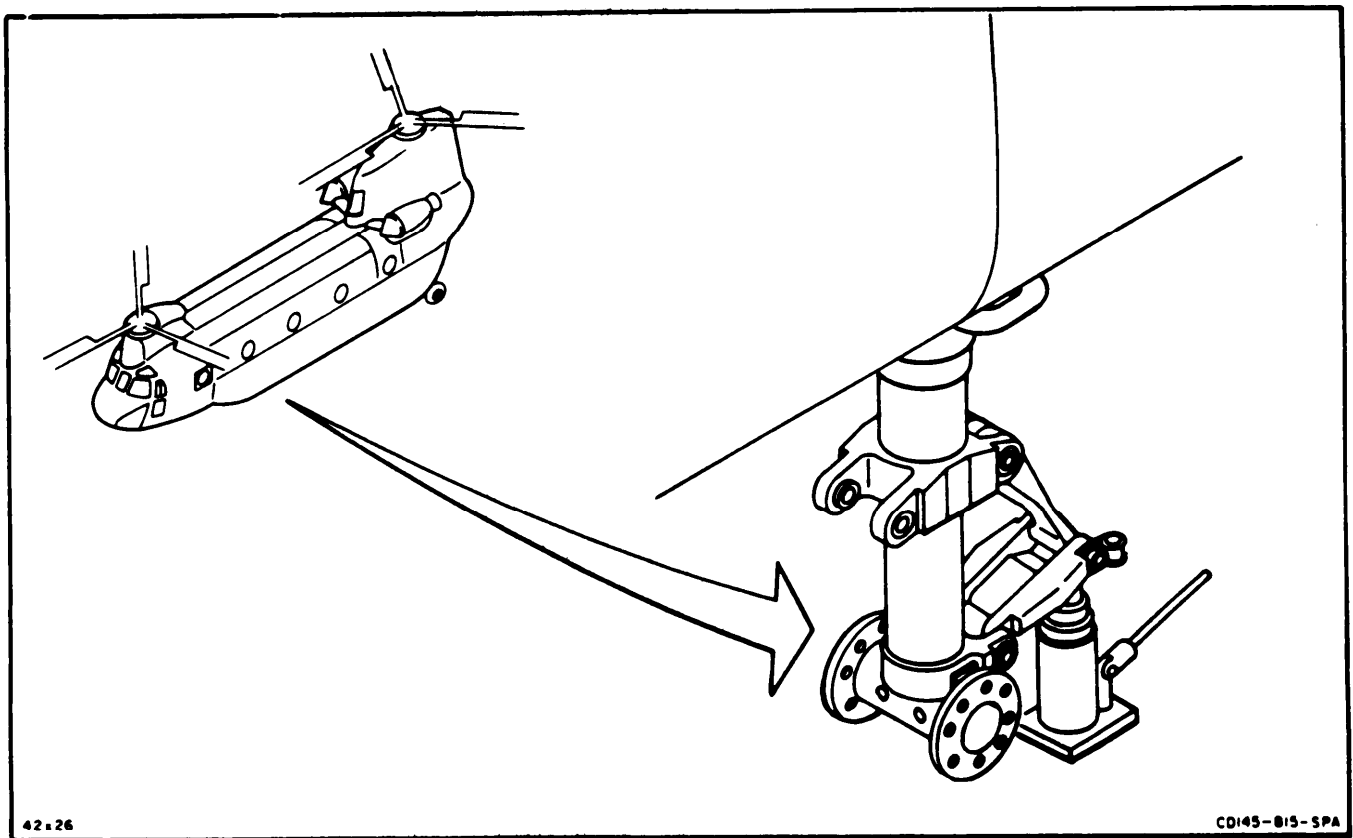
None

Parts:

Cotter Pins

Personnel RequiredMedium Helicopter Repairer
Inspector**Reference:**

TM 55-1520-240-23P



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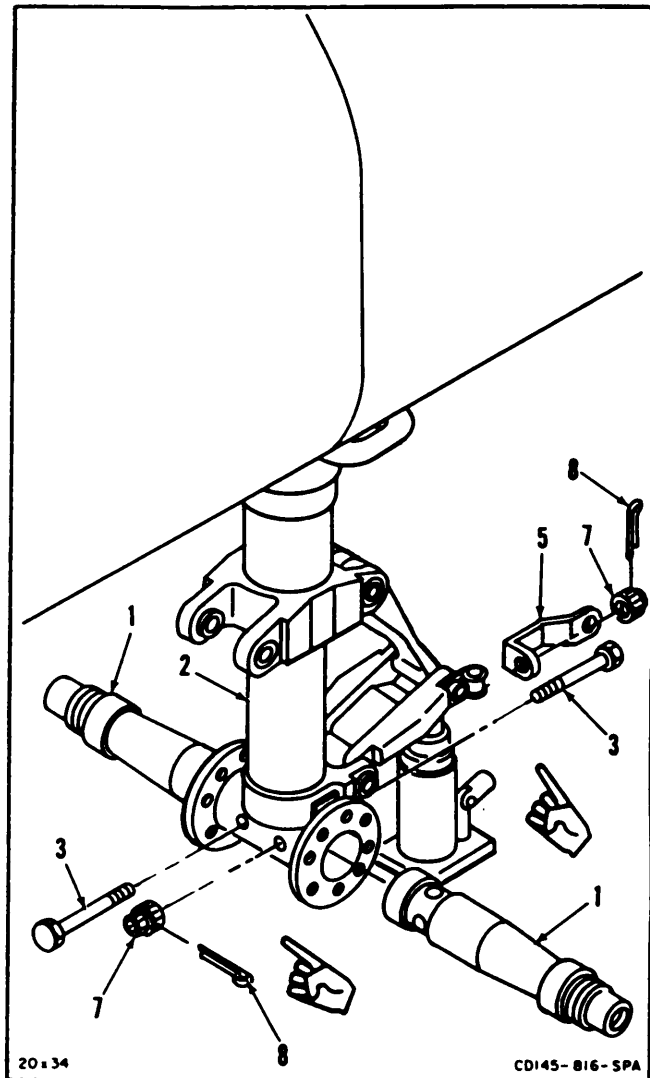
CD145-815-SPA

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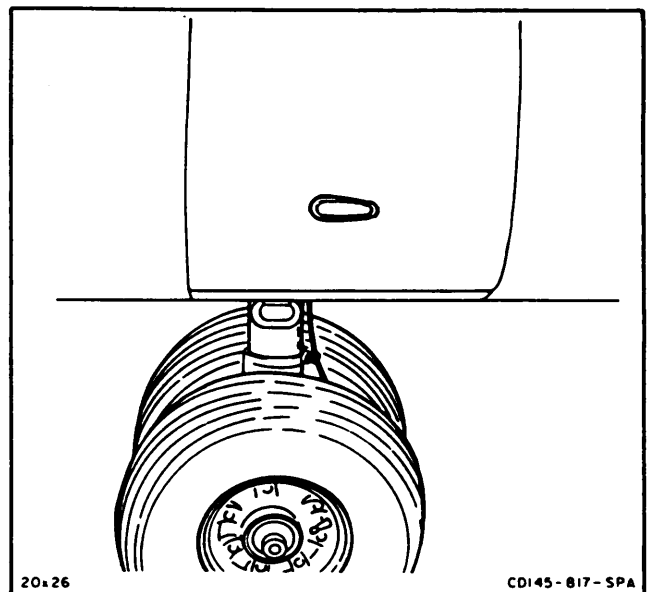
3-15 INSTALL FORWARD LANDING GEAR AXLE (Continued)**3-15****NOTE**

Procedure is same for installing left or right inboard or outboard landing gear axle. Left side outboard is shown here.

1. Install two axles (1) and align bolt hole with bolt hole in shock strut (2).
2. Install two bolts (3) through shock strut (2) and axle (1).
3. Install bracket (5), on inboard axle (1).
4. Install two nuts (7) and cotter pins (8).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Install brake (Task 3-83).
- Bleed brakes (Task 7-330).
- Install landing gear wheels (Task 3-1 2).
- Lower and remove jack (Task 1-23).

END OF TASK

3-16 INSPECT FORWARD LANDING GEAR

3-16

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Technical Inspection Tool Kit,
NSN 5180-00-323-5114

Materials:

None

Personnel Required:

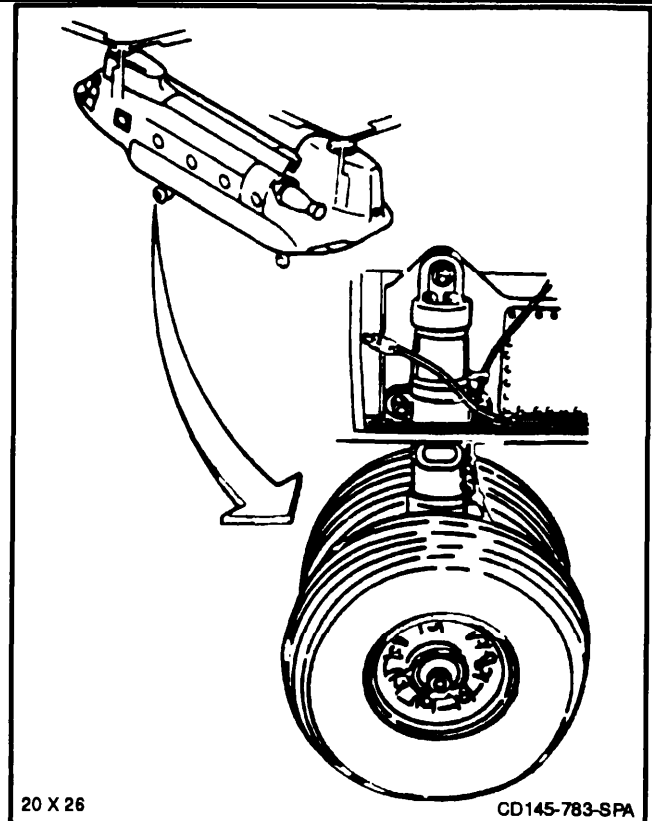
Inspector

References:

Task 1-72

Equipment Conditions:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Access Panel Open (Task 2-2)

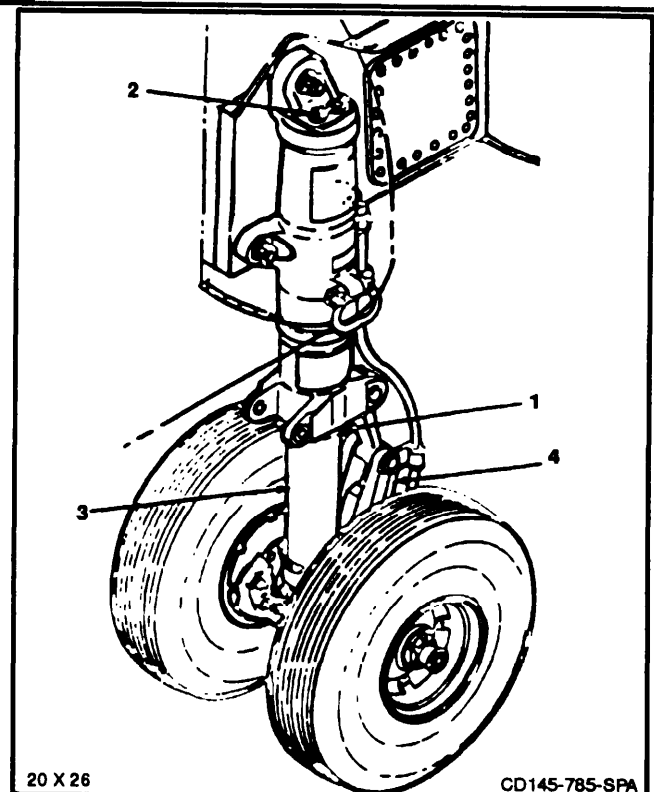
**NOTE**

This procedure is same for left or right forward gear.

1. **Check seal of shock strut (1) for hydraulic leaks. There shall be no leaks.**
2. Check shock strut (1) air pressure and extension (Task 1 -72).
3. **Inspect shock strut piston tube (3) for corrosion.**
4. **Inspect tube (3). There shall be no cracks, scoring or pitting.**
5. **Inspect torque arm (4). There shall be no cracks or excessive play. Permit up to 0.015 inch axial play after lubrication. This play will not affect the normal operation of the landing gear.**

FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Tiedown Chain
- Aircraft Towbar AA 1730-1251

Materials:

Barrier Material (E81)

Personnel Required:

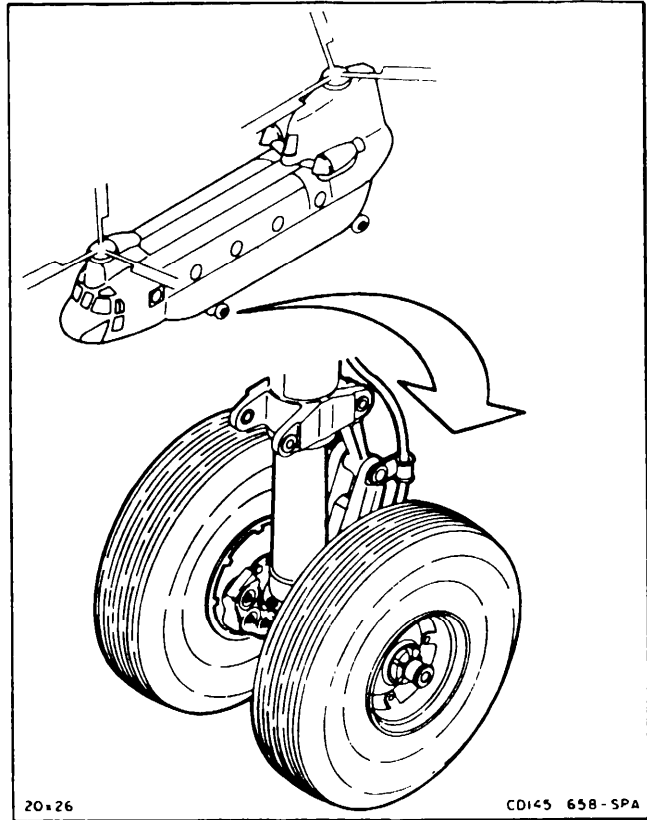
Medium Helicopter Repairer (2)

References:

- Task 3-9
- Task 3-77

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Release Air Pressure From Both Forward Shock Struts (Task 1-71)
- Helicopter Jacked at Forward Fuselage Point (Task 1-22)



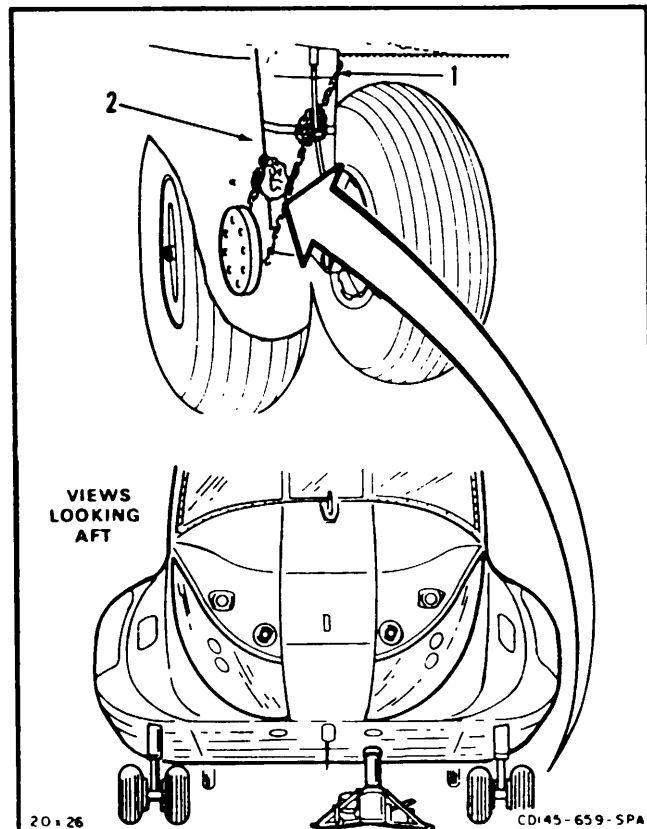
20x26

CDI45 658-SPA

NOTE

Procedure is same for removing left or right landing gear torque arm. Left torque arm is shown here.

1. Tie up shock strut (1) from shackle to axle flange with chain (2). Position barrier material between chain (2) and shock strut (1).



VIEWS
LOOKING
AFT

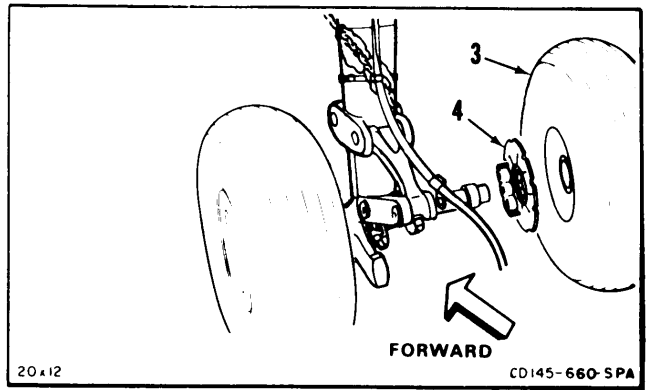
20x26

CDI45-659-SPA

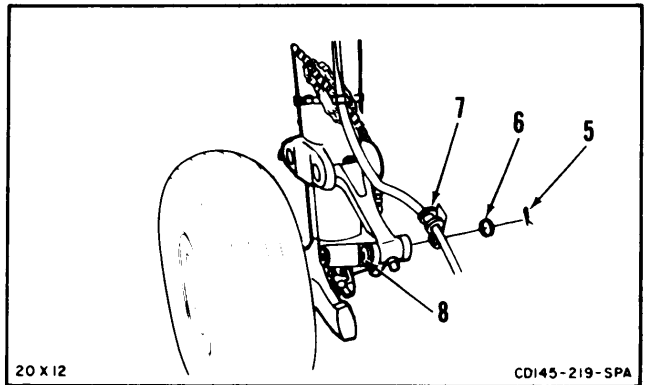
GO TO NEXT PAGE

**3-17 REMOVE FORWARD LANDING GEAR TORQUE ARM
(Continued)**

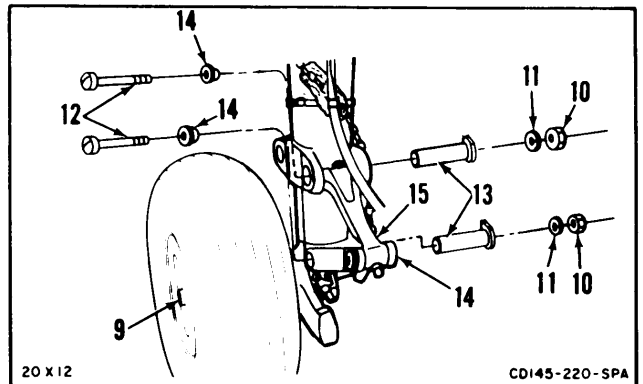
- 2. Remove inboard forward landing gear wheel (3) (Task 3-9).
- 3. Remove inboard forward brake (4) (Task 3-77).



- 4. Remove cotter pin (5), washer (6) and guide (7) from hinge bolt (8).



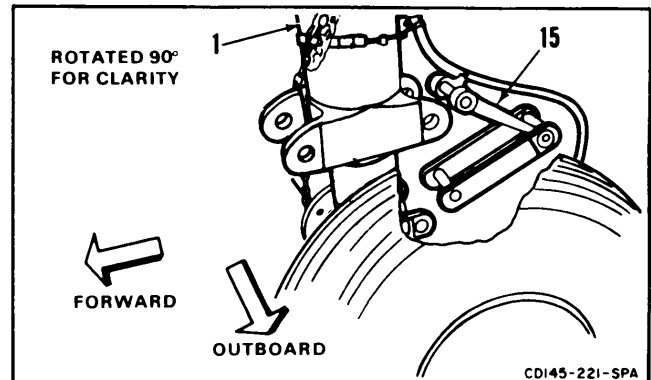
- 5. Prevent axle (9) from moving. Use helicopter towbar. Remove two nuts (10), washers (11), bolts (12), shafts (13), and bushings (14) from both ends of torque arm (15).



- 6. Remove torque arm (15) from shock strut (1).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Torque Wrench, 30 to 150 Inch-Pounds
- Aircraft Towbar AA1730-1251

Materials:

None

Parts:

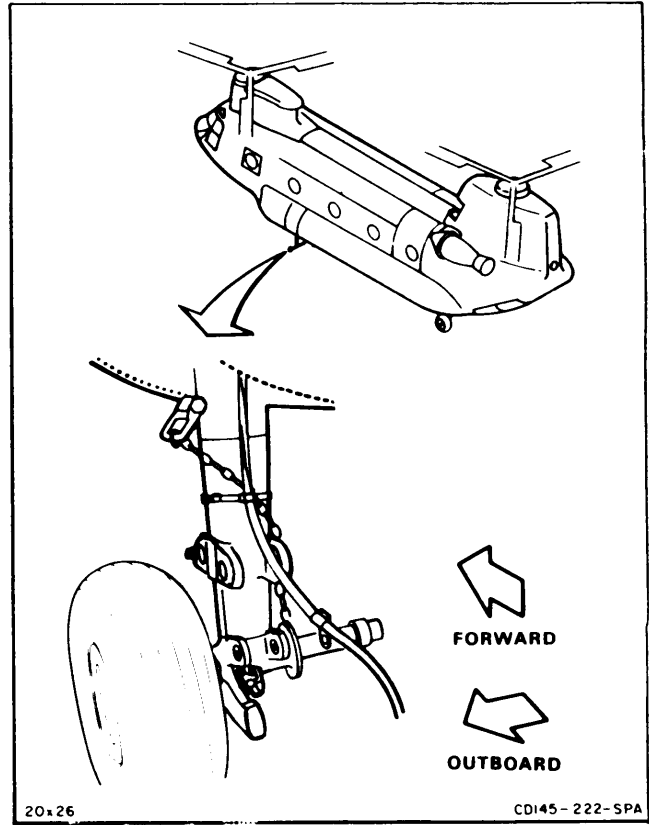
Cotter Pin

Personnel Required:

- Medium Helicopter Repairer (2)
- Inspector

References:

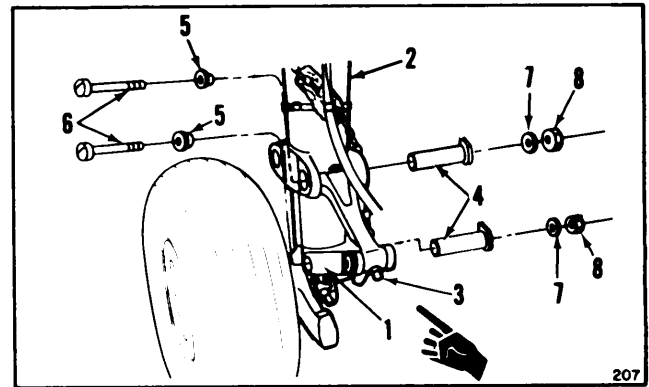
- TM 55-1520-240-23P
- Task 3-12
- Task 3-83
- Task 1-89



NOTE

Procedure is same for installing left or right landing gear torque arm. Left torque arm is shown here.

1. Position torque arm (1) on shock strut (2).
2. Check that jack pad (3) is on bottom of torque arm (1).
3. **Align torque arm (1). Use helicopter towbar.** Install two shafts (4), bushings (5), bolts (6), washers (7), and nuts (8) on both ends of torque arm (1).
4. **Torque nuts (8) to 60 inch-pounds.**



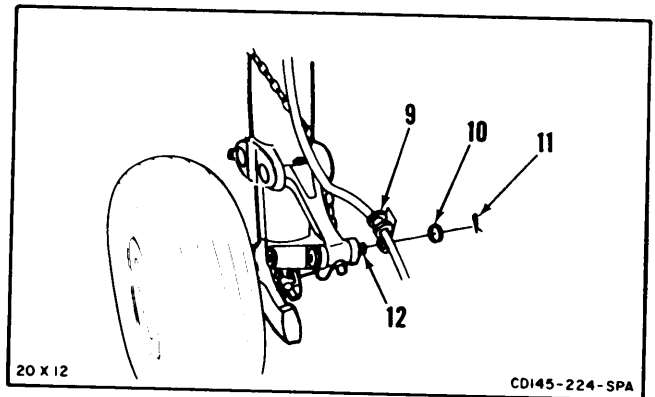
INSPECT

GO TO NEXT PAGE

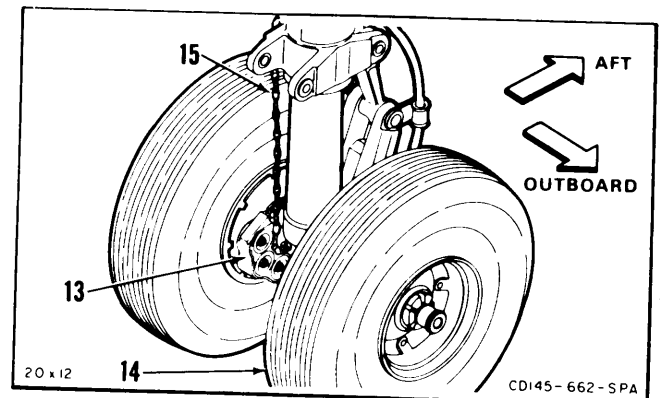
3-18 INSTALL FORWARD LANDING GEAR TORQUE ARM (Continued)

3-18

5. Install guide (9), washer (10), and cotter pin (11) on center hinge bolt (12).



6. Install forward brakes (13) (Task 3-83).
7. Install forward landing gear wheels (14) (Task 3-12).
8. Remove chain (15) and barrier material.
9. Lubricate torque arm (Task 1-89).



FOLLOW-ON MAINTENANCE:

- Lower jack (Task 1-23).
- Service both forward shock struts (Task 1-72).

END OF TASK

3-19 REMOVE FORWARD LANDING GEAR AIR VALVE SUPPORT BRACKET

3-19

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Forward Landing Gear Jacked (Task 1-23)

Inboard Wheel Removed (Task 3-7)

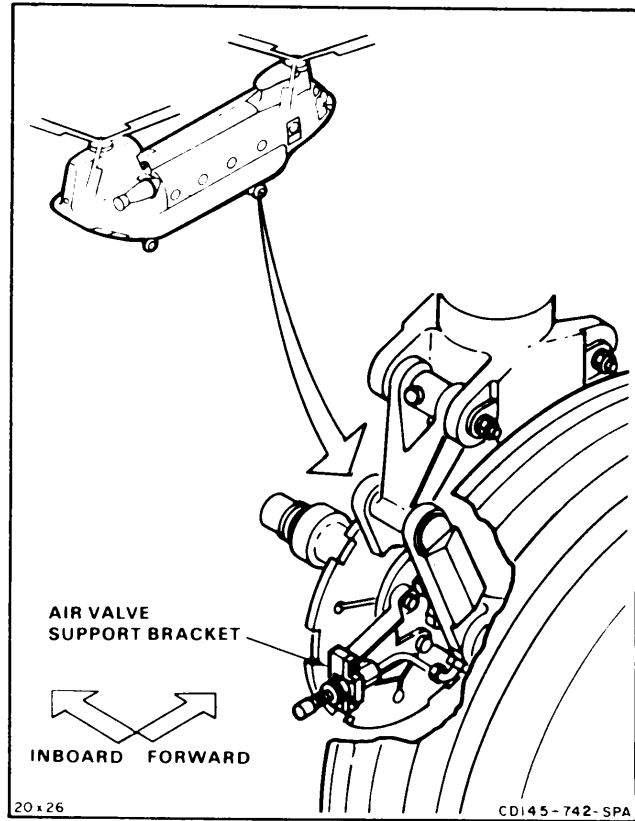
To Access Right Landing Gear Air Valve Bracket (Shown Here)

or

Outboard Wheel Removed (Task 3-7)

To Access Left Landing Gear Air Valve Bracket

Forward Brakes Removed (Task 3-77)



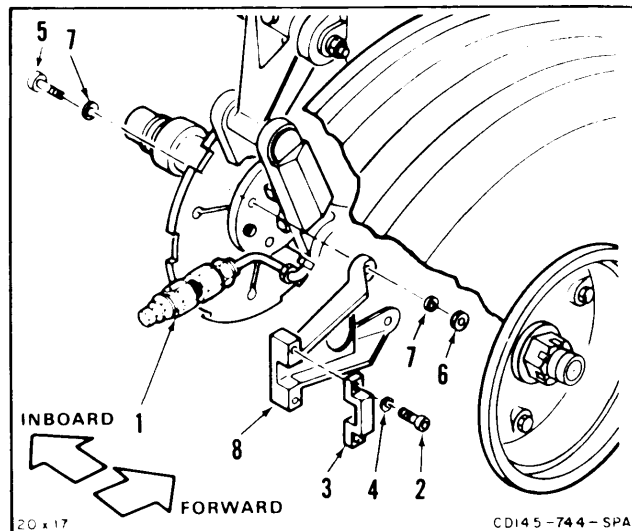
NOTE

Procedure is same for removing left or right air valve bracket. Right bracket is shown here.

1. Remove lockwire from air valve (1), screws (2), and clamp (3).
2. Remove two screws (2) and washers (4).
3. Remove clamp (3).
4. Remove two bolts (5), nuts (6), and four washers (7).
5. Remove bracket (8).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-20 INSTALL FORWARD LANDING GEAR AIR VALVE SUPPORT BRACKET

3-20

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

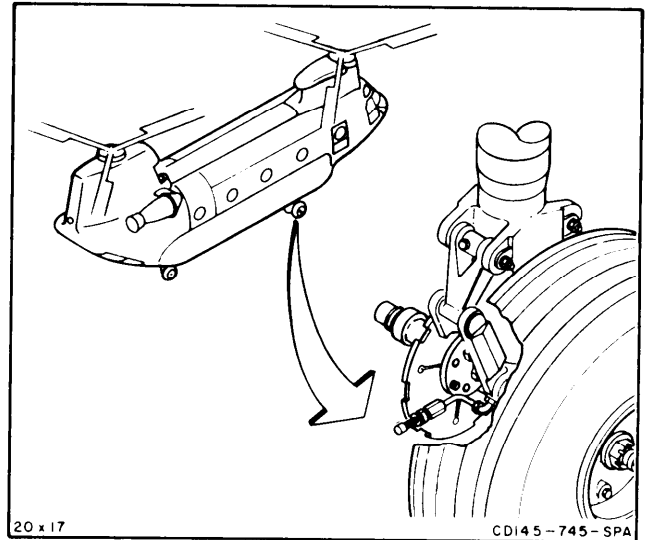
Lockwire (E231)

Personnel Required:

67U10 Medium helicopter Repairer
67U30 Inspector

References:

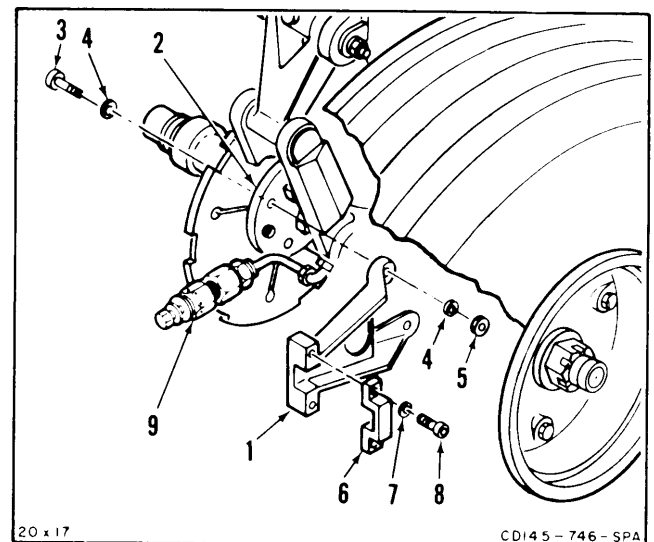
TM 55-1520-240-23P



NOTE

Procedure is same for installing left or right air valve bracket. Right bracket is shown here.

1. Position air valve bracket (1) on axle flange (2).
2. Install two bolts (3), four washers (4), and two nuts (5).
3. Torque nuts (5) to 107 inch-pounds.
4. Position clamp (6).
5. Install two washers (7) and screws (8).
6. Lockwire screws (8) to clamp (6). Lockwire air valve (9) to screw. Use lockwire (E231).

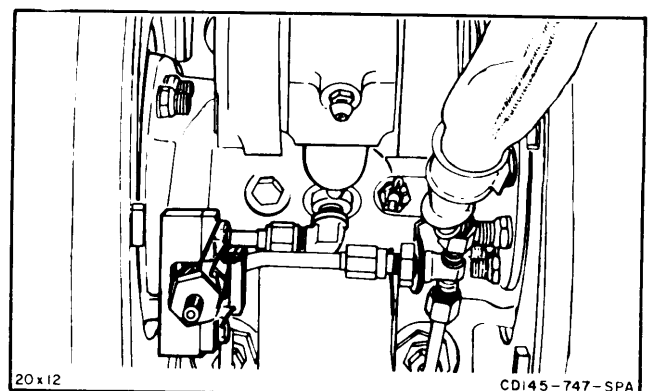


FOLLOW-ON MAINTENANCE:

Install forward brake (Task 3-83).

Install wheel (Task 3-12),

END OF TASK



3-21 REMOVE FORWARD LANDING GEAR AIR VALVE

3-21

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

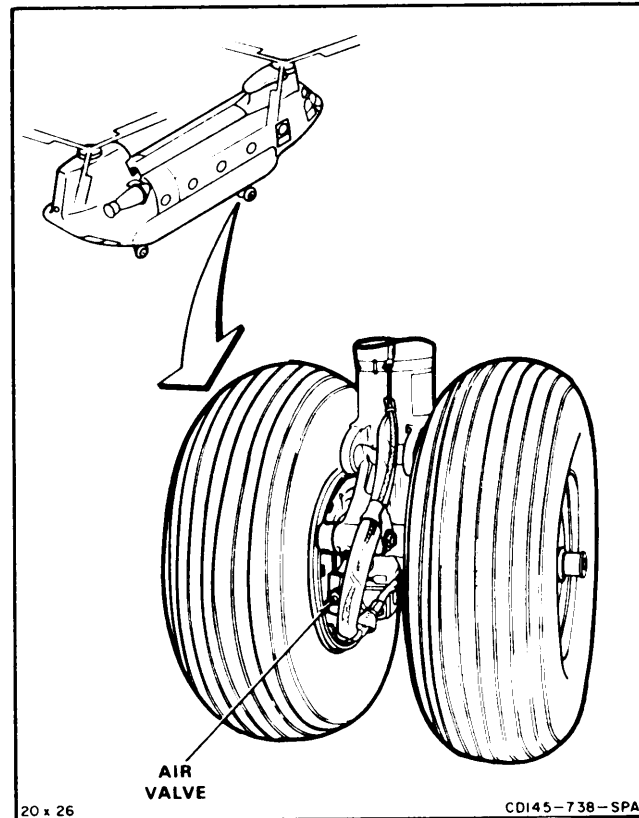
None

Personnel Required:

67U10 Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Deflate Shock Strut (Task 1-72)



20 x 26

CDI45-738-SPA

NOTE

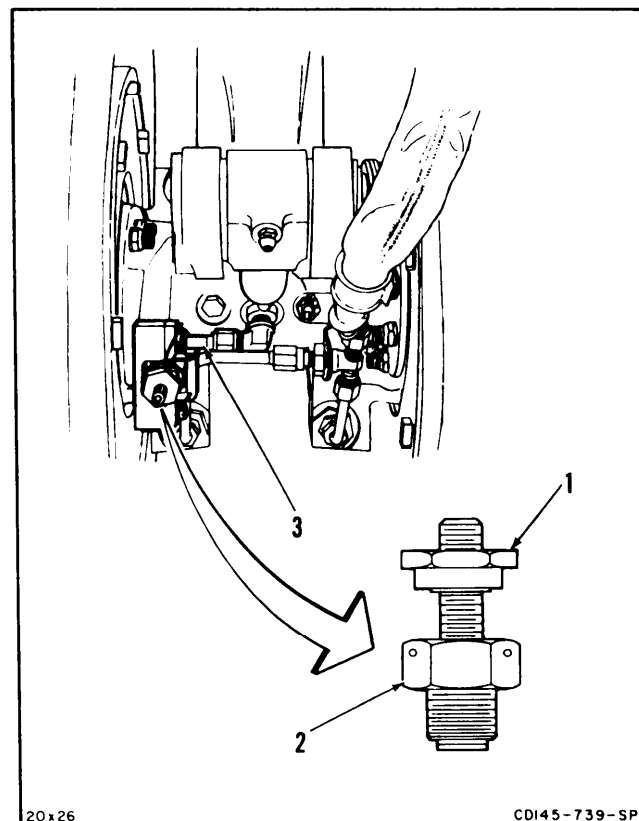
Procedure is same for removing left and right forward landing gear air valve. Right air valve is shown here.

1. Remove lockwire from high pressure air valve (1).
2. Remove body (2) of valve (1) from tube (3).

FOLLOW-ON MAINTENANCE:

None

END OF TASK



20 x 26

CDI45-739-SPA

3-22 INSTALL FORWARD LANDING GEAR AIR VALVE

3-22

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds
Crowsfoot, 3/4-Inch

Materials:

Lockwire (E231)

Parts:

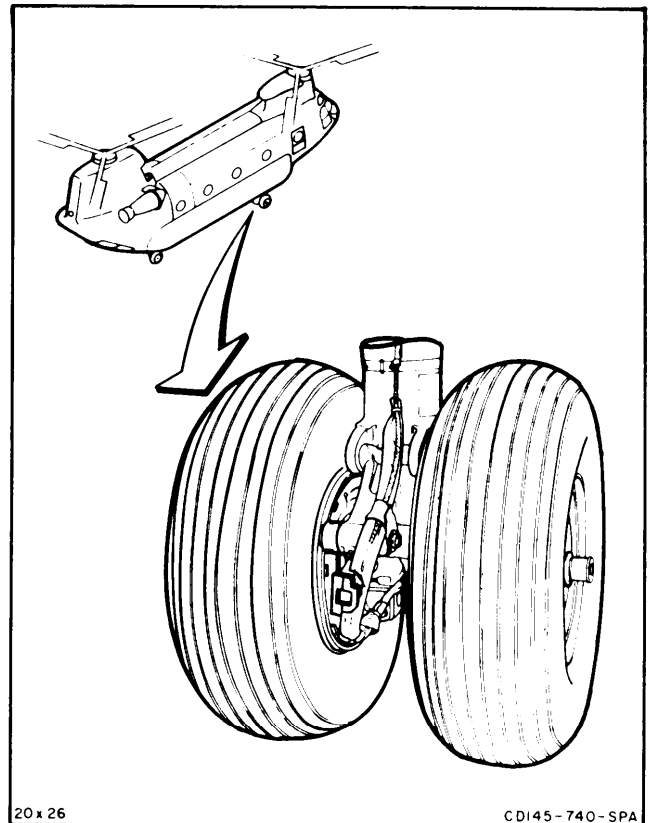
Preformed Packing

Personnel Required:

67U10 Medium Helicopter Repairer
67U30 Inspector

References:

TM 55-1520-240-23P-1



20 x 26

CDI45-740-SPA

NOTE

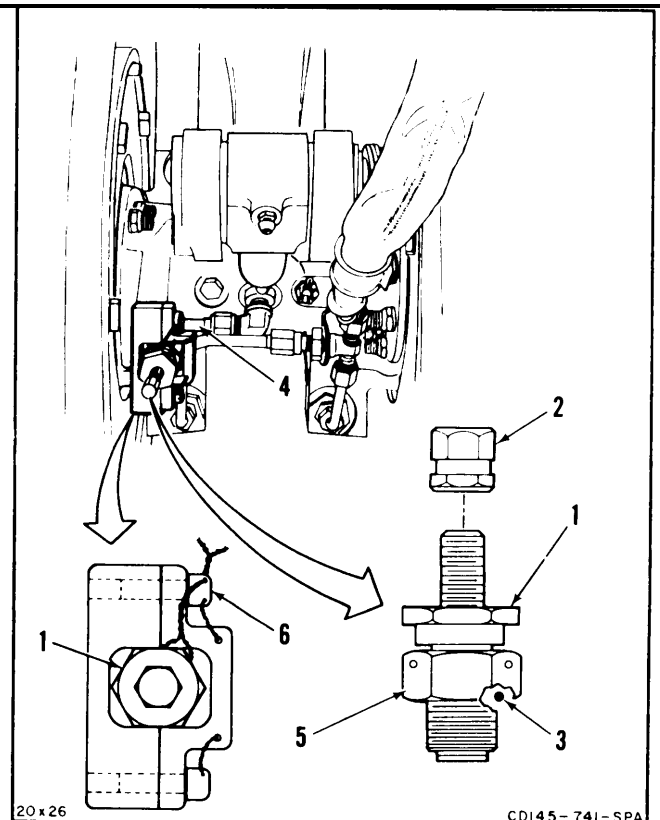
Procedure is same for installing left and right forward landing gear air valve. Right valve is shown here.

1. Check that air valve (1) has cap (2) and packing (3).
2. **Install air valve (1)** into tube (4).
3. Torque valve body (5) of valve (1) to 115 inch-pounds.
4. **Lockwire valve (1) to screw (6)**. Use lockwire (E231).

INSPECT

FOLLOW-ON MAINTENANCE:

Service shock struts with air (Task 1-72).



20 x 26

CDI45-741-SPA

END OF TASK

3-23 REMOVE FORWARD LANDING GEAR LUBRICATION FITTING 3-23

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

None

Personnel Required:

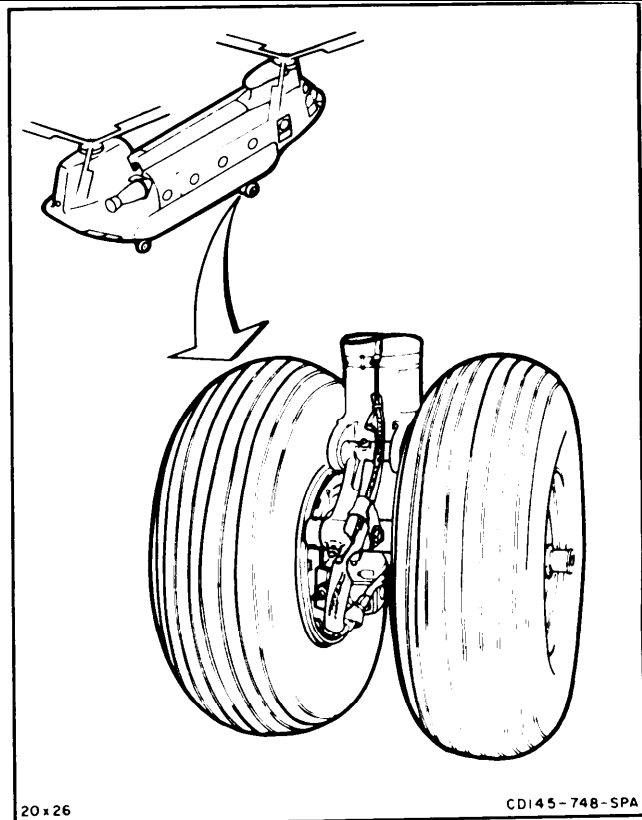
67U10 Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Hydraulic Power Off



20 x 26

CDI45-748-SPA

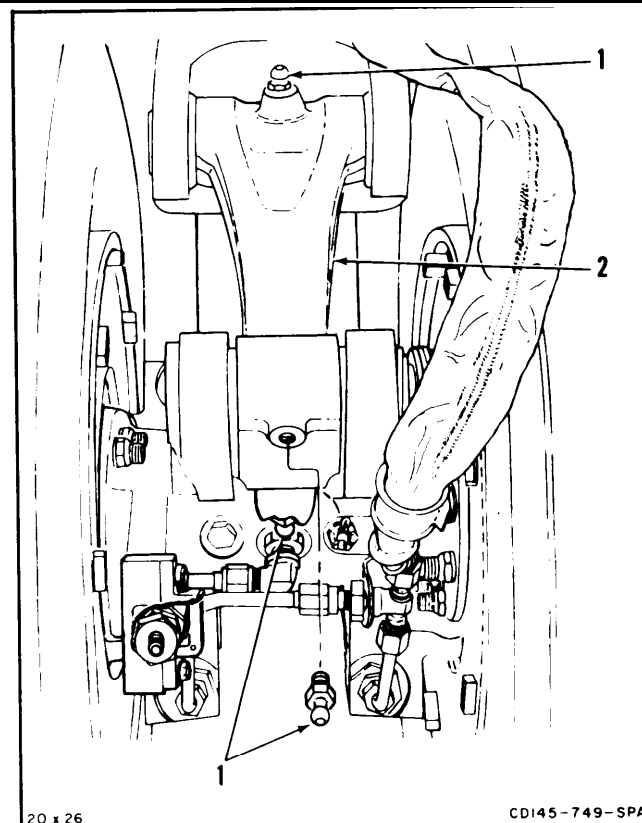
NOTE

There are three lubrication fittings on each forward landing gear torque arm. All forward landing gear lubrication fittings are removed in the same way.

1. Remove fitting (1) from torque arm (2).

FOLLOW-ON MAINTENANCE:

None



20 x 26

CDI45-749-SPA

END OF TASK

3-24 INSTALL FORWARD LANDING GEAR LUBRICATION FITTING**3-24**

INITIAL SETUP

Applicable Configurations:

All

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

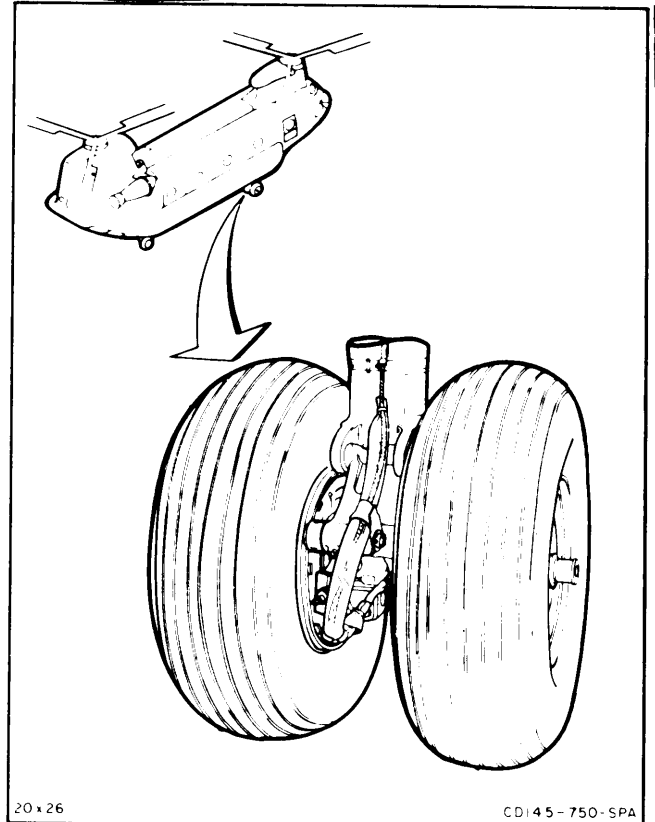
None

Personnel Required:

■ Medium Helicopter Repairer

References:

TM 55-1520-240-23P

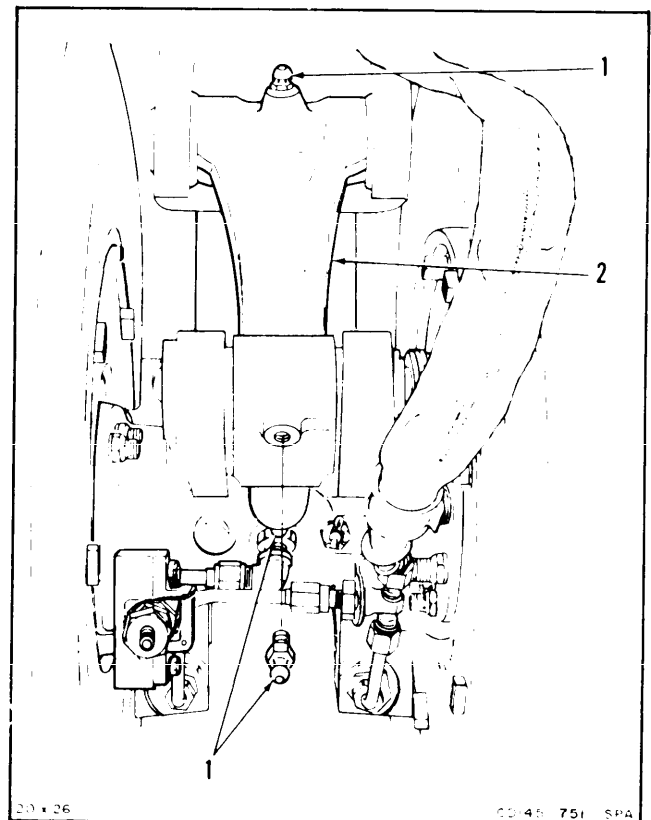
**NOTE**

There are three lubrication fittings on each forward landing gear torque arm. All forward landing gear lubrication fittings are installed in the same way.

1. Install fitting (1) in torque arm (2).

FOLLOW-ON MAINTENANCE:

Lubricate torque arm (Task 1-88).

**END OF TASK**

3-25 REMOVE FORWARD LANDING GEAR TOWING SHACKLE**3-25**

INITIAL SETUP

Applicable Configurations:

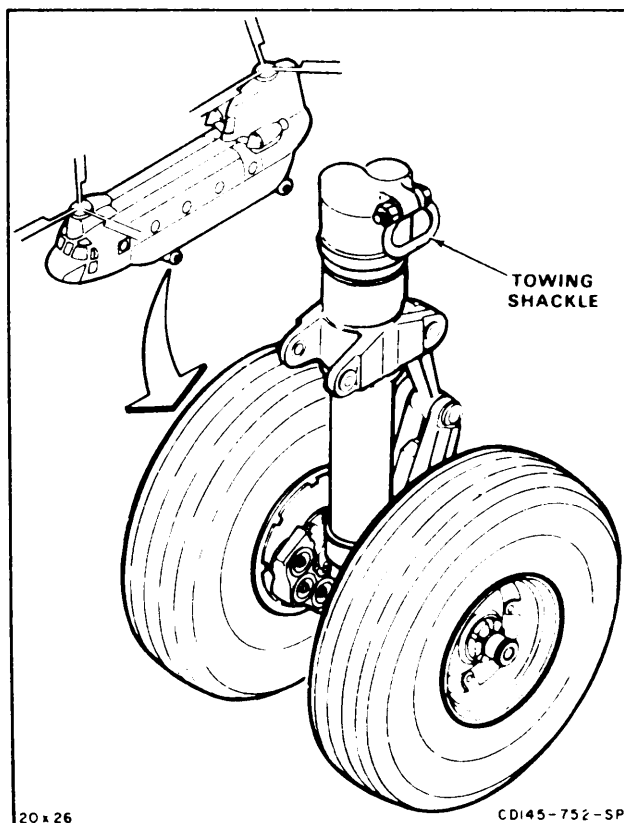
All

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

None

Personnel Required:

67U10 Medium Helicopter Repairer

Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

20 x 26

CD145-752-SPA

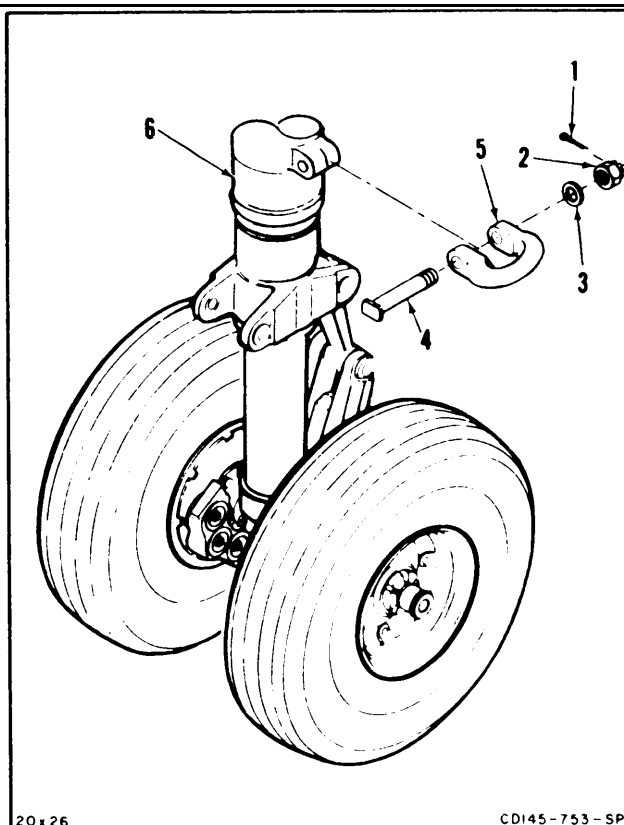
NOTE

Procedure is same for removing left or right forward landing gear towing shackle. Left shackle is shown here.

1. Remove cotter pin (1), nut (2), washer (3), and bolt (4).
2. **Remove towing shackle (5) from shock strut (6).**

FOLLOW-ON MAINTENANCE:

None



20 x 26

CD145-753-SPA

END OF TASK

3-26 INSTALL FORWARD LANDING GEAR TOWING SHACKLE

3-26

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 100 to 750 Inch-Pounds

Materials:

None

Parts:

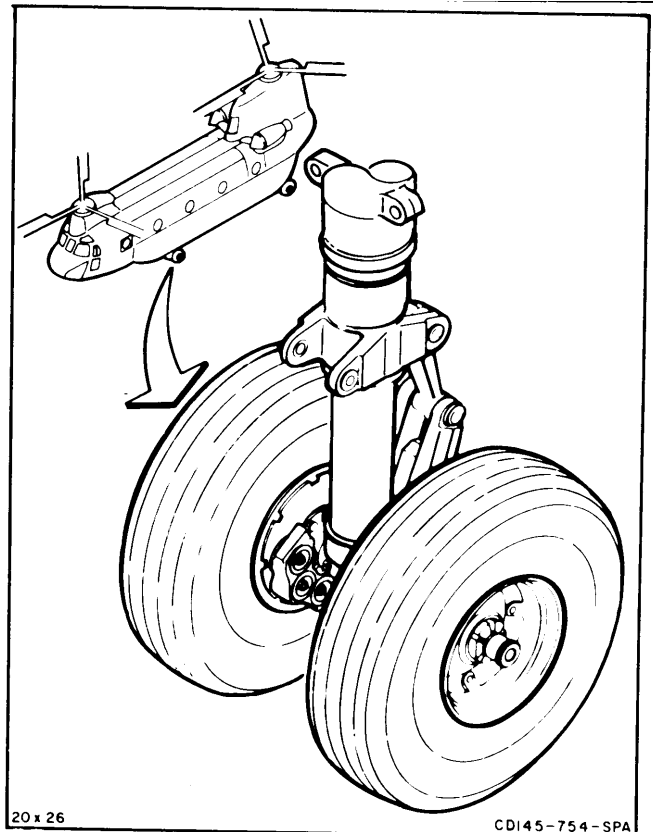
Cotter Pin

Personnel Required:

67U10 Medium Helicopter Repairer

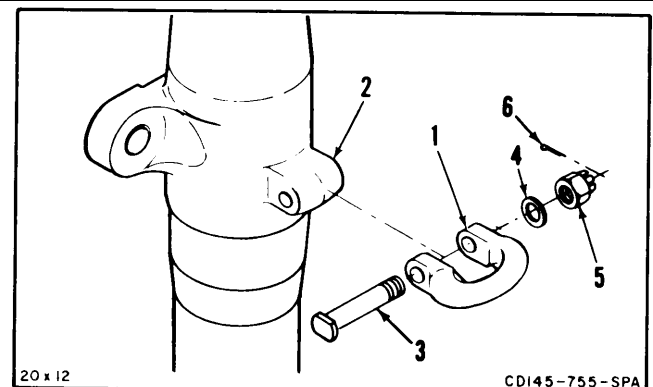
References:

TM 55-1520-240-23P

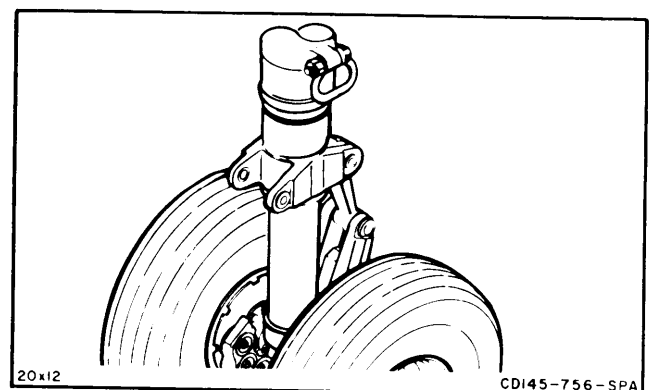
**NOTE**

Procedure is same for installing left or right forward landing gear towing shackle. Left shackle is shown here.

1. Place towing shackle (1) over shock strut mounting lug (2).
2. Install bolt (3), washer (4) and nut (5).
3. Torque nut (5) to 480 to 600 inch-pounds.
4. Install new cotter pin (6).

**INSPECT****FOLLOW-ON MAINTENANCE:**

None

END OF TASK

3-27 REMOVE AFT LANDING GEAR

3-27

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Socket, 1 1/16-inch
- Socket, 1 1/8-inch
- Socket, 1 1/2-inch
- Slide Hammer
- Container, Two Quart

Materials:

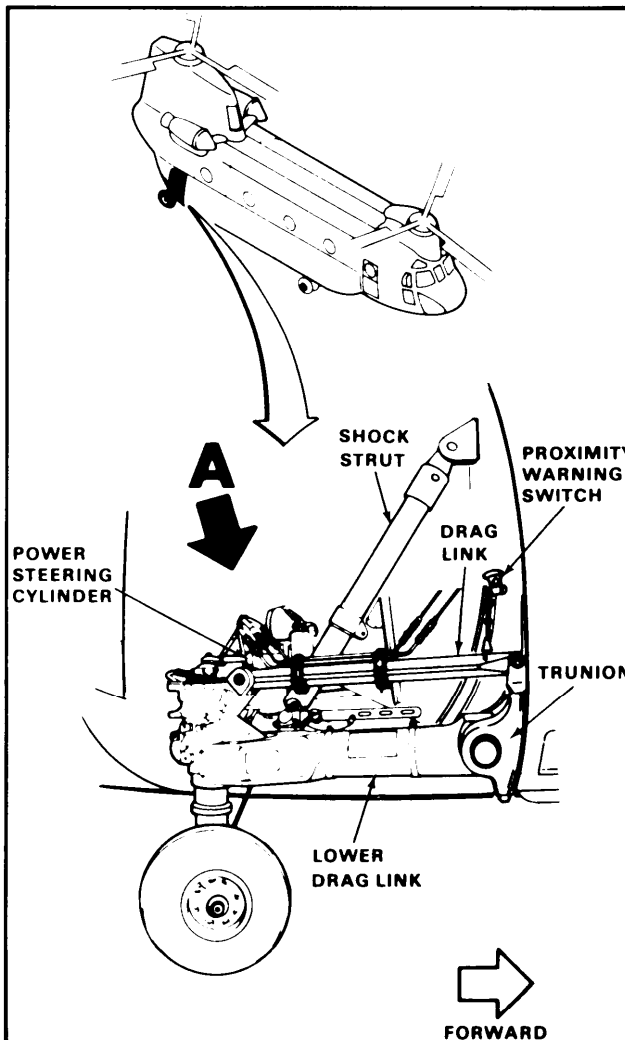
- Cleaning Cloth (E120)
- Chock Blocks

Personnel Required:

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

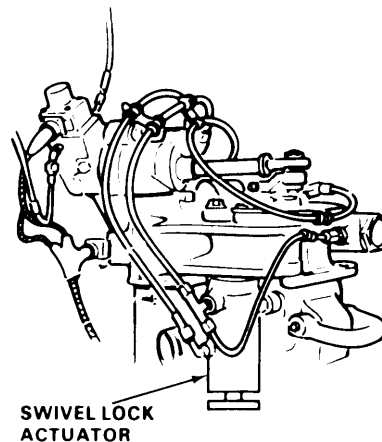
Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Utility Hydraulic Pressure Released
(TM 55-1520-240-T)
- Access Panels Opened (Task 2-2) (Left or
Right as Needed)
- Helicopter Jacked at Aft Fuselage
Jack Pad (Task 1-24)
- Shock Strut Deflated (Task 1-72)



NOTE

- This procedure can be used for left and right gears, except for differences noted in task. Right gear is shown here.
- If aft left gear is being removed, go to step 5. If aft right gear is being removed, do steps 1. thru 4.



20x51

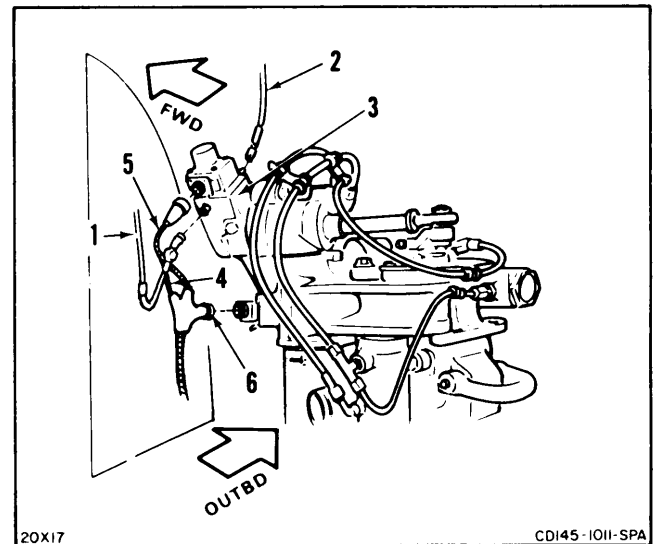
DETAIL A

CDI45-1008-SPA

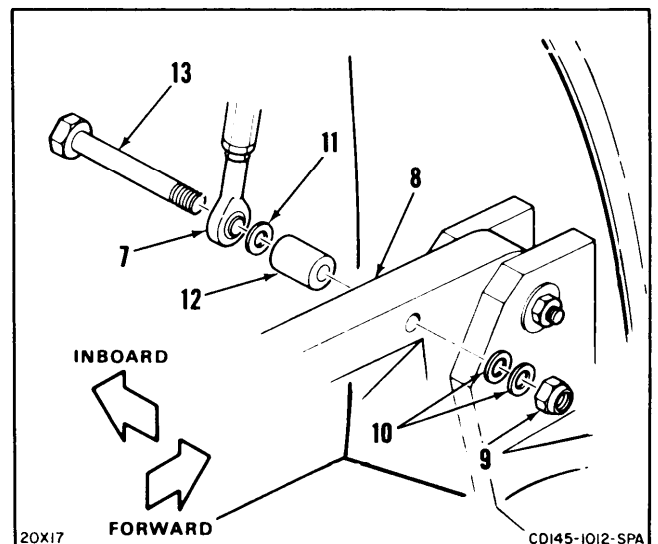
GO TO NEXT PAGE

3-27 REMOVE AFT LANDING GEAR (Continued)**3-27**

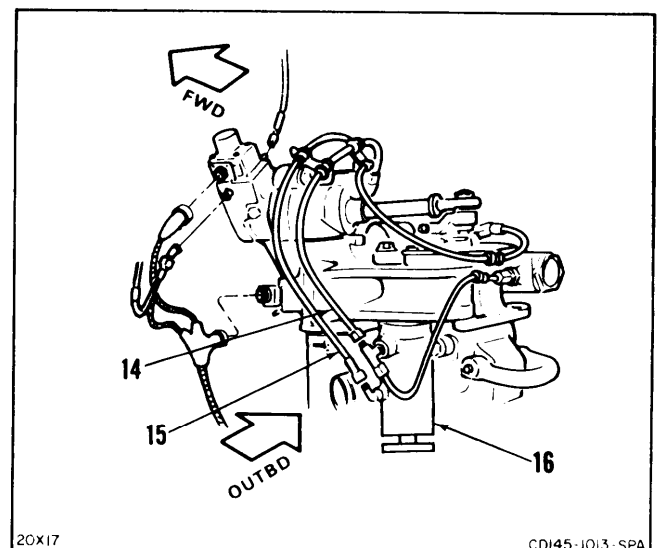
1. **Disconnect two hydraulic hoses (1 and 2) from power steering actuator (3).** Use container to catch fluid.
2. **Disconnect three cables (4, 5 and 6) from power steering actuator (3).**



3. **Disconnect proximity switch rod end (7) from upper drag link (8).** Remove nut (9), washers (10 and 11), spacer (12) and bolt (13).
4. **Move rod end (7) free of drag link (8).**



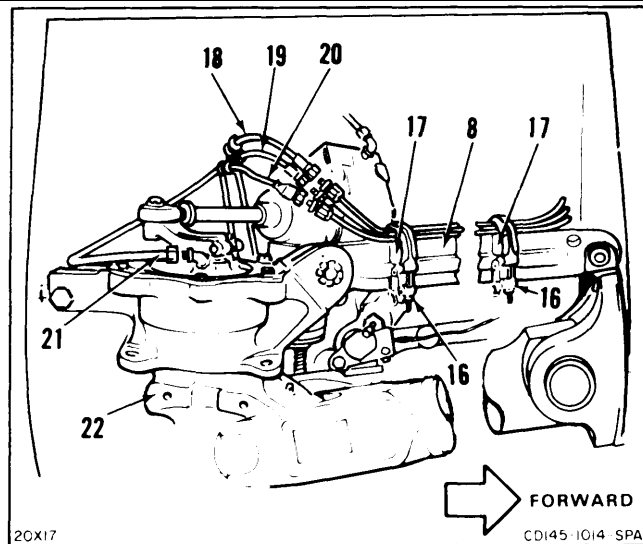
5. **Disconnect two hydraulic hoses (14 and 15) from swivel lock actuator (16).**

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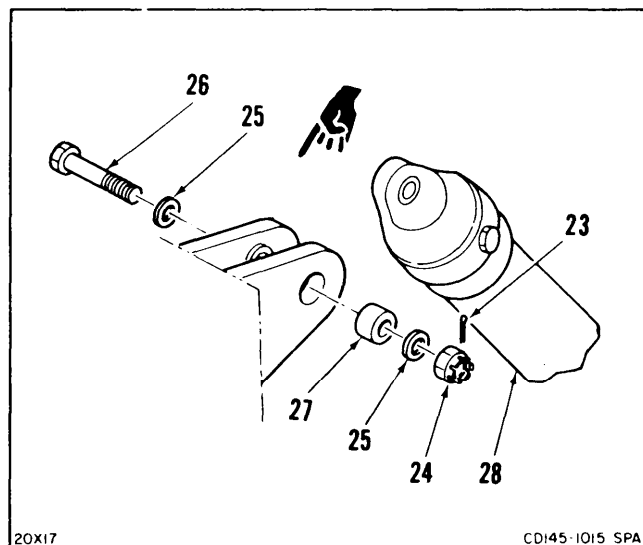
3-27 REMOVE AFT LANDING GEAR (Continued)

3-27

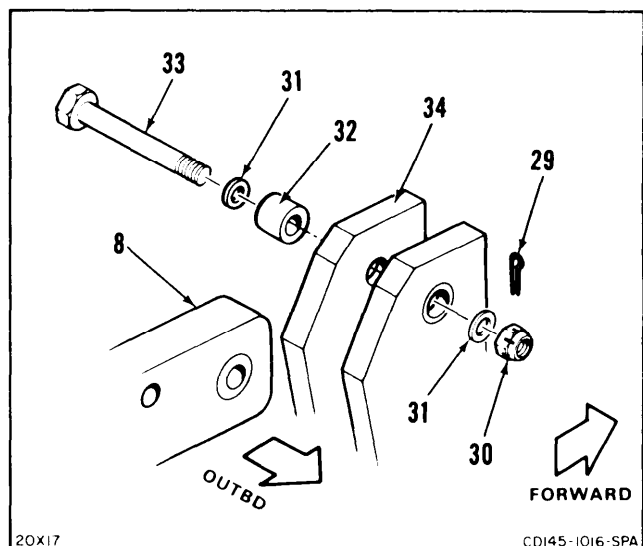
6. Remove lockwire from clamps (16).
7. **Remove clamps (16), support blocks (17), and hydraulic hoses and tubing (18, 19, and 20)** from drag link (8).
8. Disconnect brake hydraulic hose (21) from elbow at top of landing gear (22).



9. **Remove** cotter pin (23), nut (24), two washers (25), **bolt (26)**, and bushing (27) from top of shock strut (28) at fuselage attach point.



10. **Have helper chock and support** gear so it will not move when components are removed.
11. **Remove** cotter pin (29), nut (30), washers (31), bushing (32), and **bolt (33)** from upper drag link (8) at fuselage attach point (34).



GO TO NEXT PAGE

3-56 Change 1

3-27 REMOVE AFT LANDING GEAR (Continued)

3-27

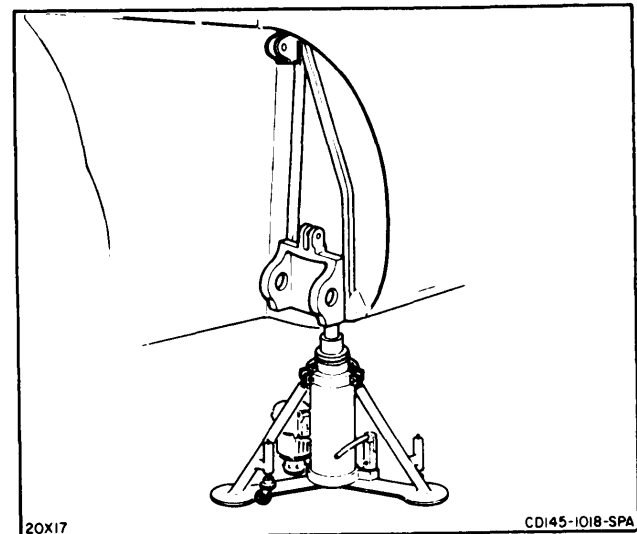
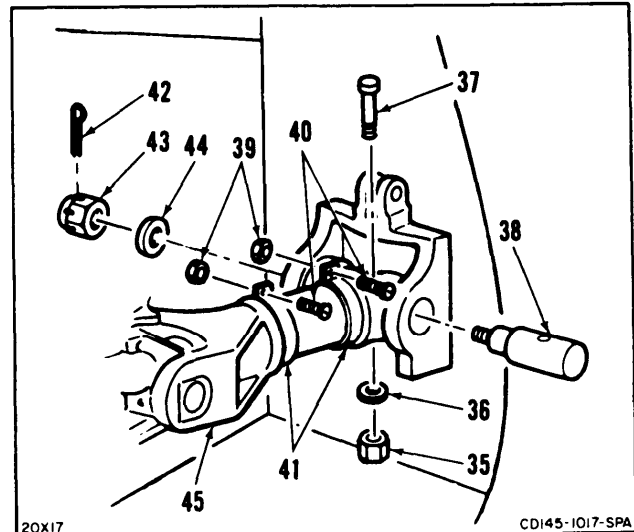
NOTE

To remove bolt, it maybe necessary to jack aircraft higher.

12. **Remove** nut (35), washer (36), and **bolt (37) from lower drag link trunnion pin (38).**
13. If a right gear is being removed, **remove** two nuts (39), screws (40), and **clamps (41).**
14. Remove cotter pin (42), nut (43), and washer (44) from trunnion pin (38).
15. **Drive trunnion pin (38) outboard** while helper supports lower drag link (45). Use slide hammer.
16. **Remove lower drag link (45)** from fuselage attach point,
17. Remove blocks and **roll landing gear away from helicopter** with aid of helper.

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Screwdriver, 0 to 25 Inch-Pounds

Materials:

Lockwire (E231)

Parts:

Cotter Pin
Packing

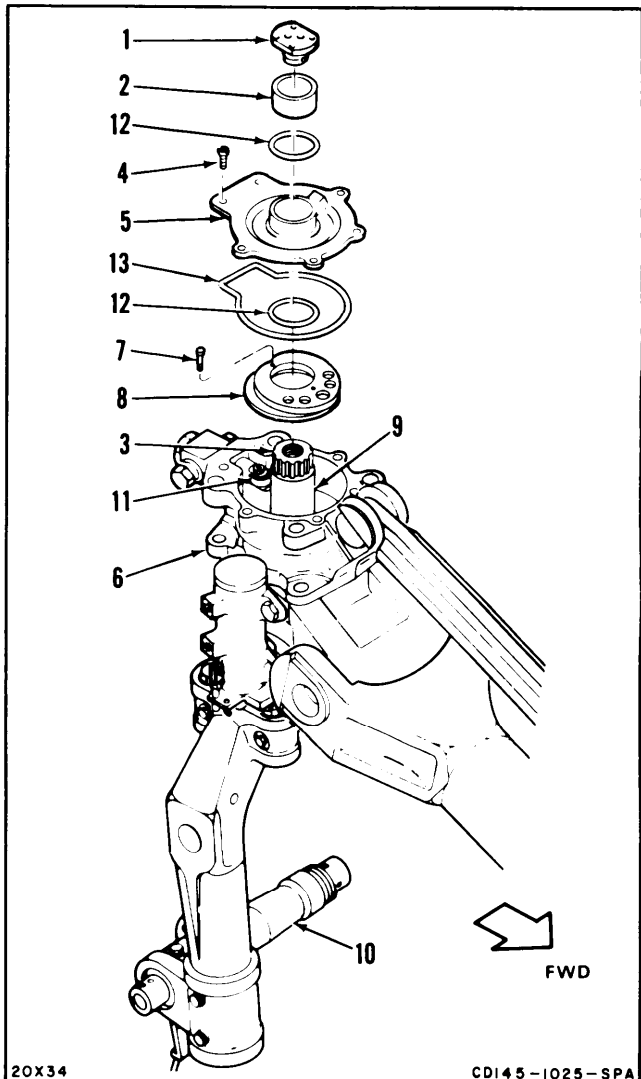
Personnel Required:

Medium Helicopter Repairer
inspector

Equipment Condition:

Off Helicopter Task
Aft Landing Gear Disassembled (Task 3-30)

1. Remove end cap (1) and sleeve spacer (2) from spindle spline (3).
2. Remove lockwire. Remove six screws (4) and cover plate (5) from top of housing (6).
3. Remove lockwire. Remove two screws (7) from cam control (8).
4. Rotate spindle (9) 180 degrees so axle (10) points outboard. Make sure cam (8) does not turn. Make sure holes for screws (7) are aligned.
5. Check that cam follower (11) rides in cam recess. Secure cam (8) to spindle (9) with two screws (7). Torque screws to 35 inch-pounds. Secure screws with lockwire (E231).
6. Install new packings (12 and 13). Make sure they are correctly installed in grooves of cover plate (5).
7. Position plate (5) on swivel housing (6). install six screws (4). Install lockwire (E231).
8. Install sleeve spacer (2) and end cap (1) over spindle spline (3). Do not engage end cap insert with spindle.



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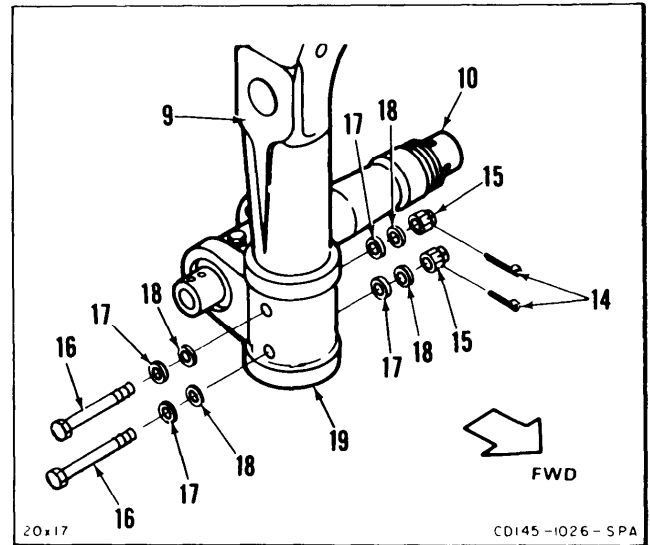
3-58

Change 12

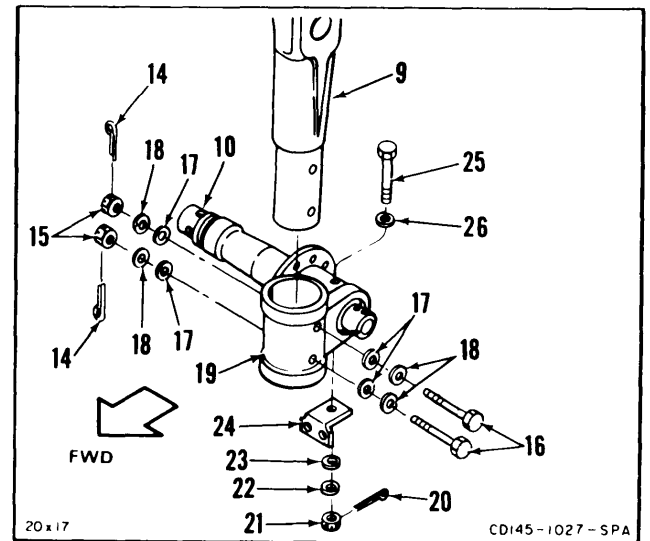
**3-28 CONVERT AFT LEFT TO AFT RIGHT LANDING GEAR
(Continued)**

3-28

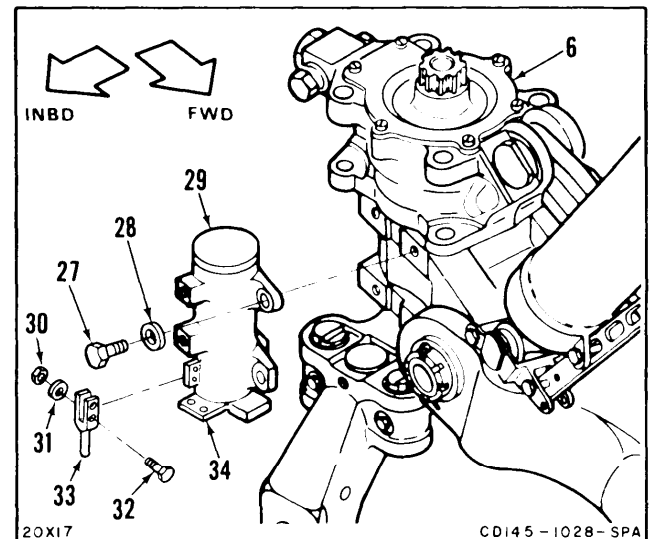
9. Remove two cotter pins (14), nuts (15), bolts (16), packing retainers (17), and washers (18) from axle housing (19).
10. Remove axle housing (19) from spindle (9).



11. Rotate axle housing (19) 180 degrees so axle (10) is on aft side of spindle (9).
12. Position axle housing (19) on spindle (9). Make sure bolt holes are aligned.
13. Install two bolts (16), four packing retainers (17), four washers (18), nuts (15), and two cotter pins (14).
14. Remove cotter pin (20), nut (21), washer (22), packing retainer (23), bracket (24), bolt (25) and packing retainer (26).
15. Rotate bracket 180 degrees and install bolt (25), new packing retainers (26), bracket (24), new packing retainer (23), washer (22), nut (21) and cotter pin (20).



16. Remove four bolts (27) and washers (28). Remove swivel lock actuator (29).
17. Remove two nuts (30), washers (31), and bolts (32). Remove clevis rod end (33).
18. Position clevis rod end (33) in other hole in actuating piston rod (34). Install two bolts (32), washers (31), and nuts (30).



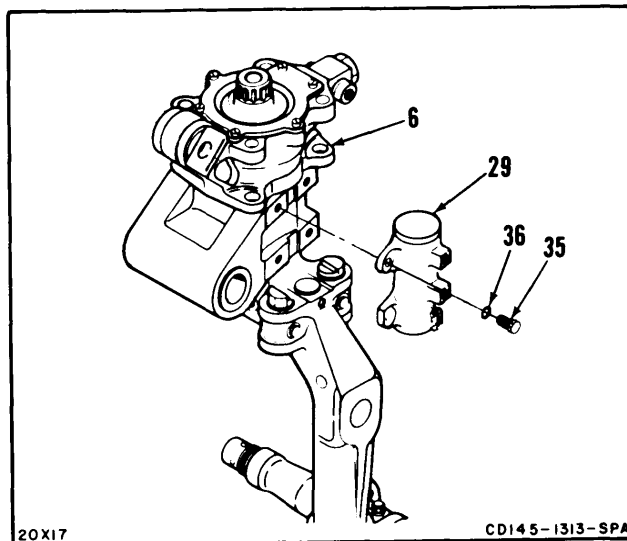
GO TO NEXT PAGE

3-28 CONVERT AFT LEFT TO AFT RIGHT LANDING GEAR
(Continued)

3-28

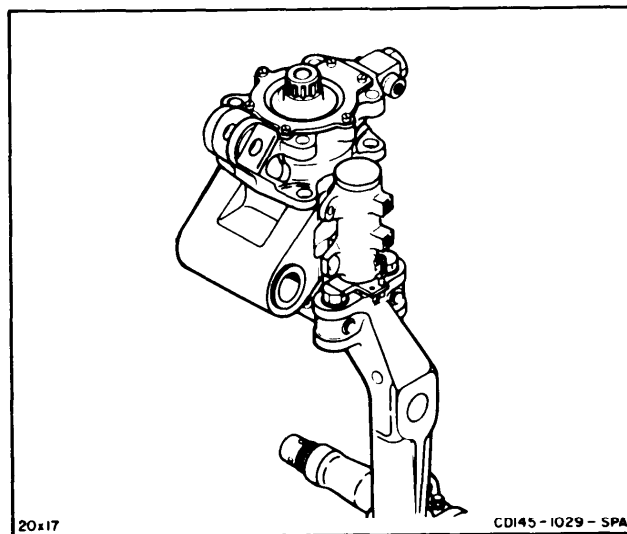
19. Position swivel lock actuator (29) on inboard side of swivel housing (6). Secure with four bolts (35) and washers (36).

INSPECT



FOLLOW-ON MAINTENANCE:

Assemble aft landing gear (Task 3-31).



END OF TASK

3-29 CONVERT AFT LEFT TO AFT RIGHT SHOCK STRUT**3-29****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 100 to 750 Inch-Pounds

Materials:

None

Personnel Required:

67U10 Medium Helicopter Repairer
67U30 Inspector

Equipment Condition:

Off Helicopter Task

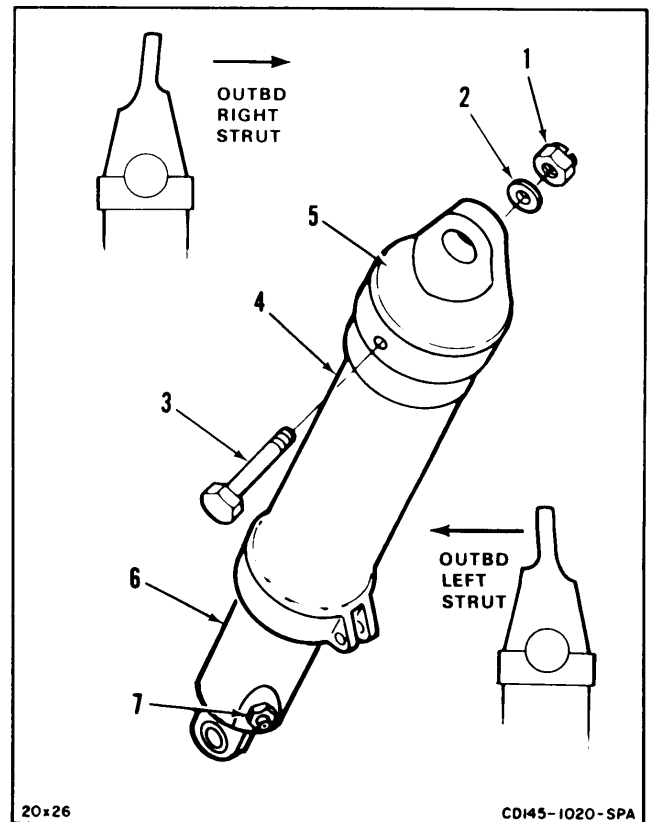
NOTE

Procedure converts left shock strut, as issued, for use in right installation.

1. **Remove** nut (1), washer (2), and bolt (3) from upper end of shock strut (4).
2. **Turn cap (5) 180 degrees** on shock strut (4).
3. **Install bolt (3), washer (2), and nut (1).** **Torque nut to 225 inch-pounds.**
4. **Rotate piston (6) 180 degrees** in shock strut (4) so air valve (7) is outboard when strut is installed.

INSPECT**FOLLOW-ON-MAINTENANCE:**

None

END OF TASK

3-30 DISASSEMBLE AFT LANDING GEAR**3-30****INITIAL SETUP****Applicable Configurations:**

All

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

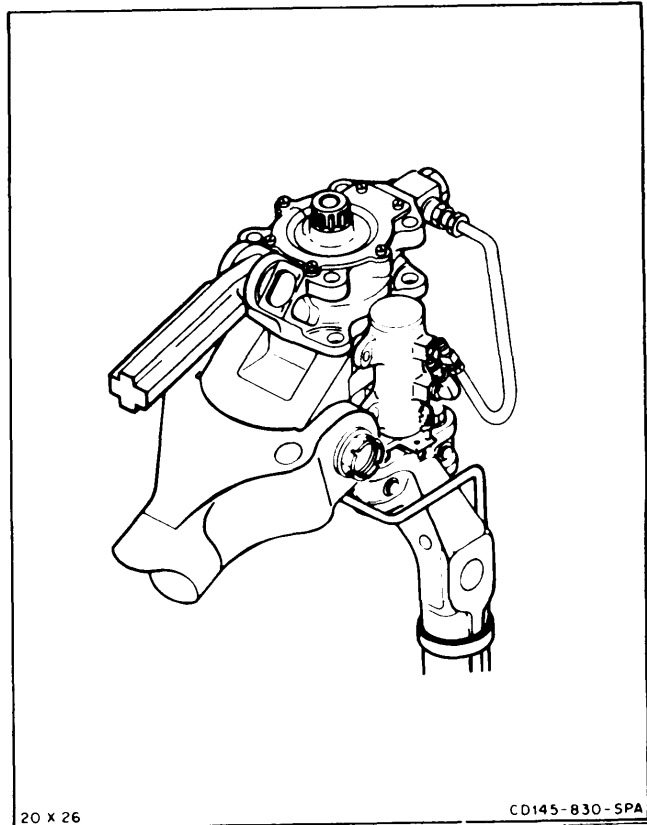
None

Personnel Required:

Medium Helicopter Repairer

References:Task 3-37
Task 7-296**Equipment Condition:**

Off Helicopter Task

**NOTE**

Power steering is installed on right gear only.

- 1 **Remove power steering (1)** (Task 7-299 if removing right gear)

NOTE

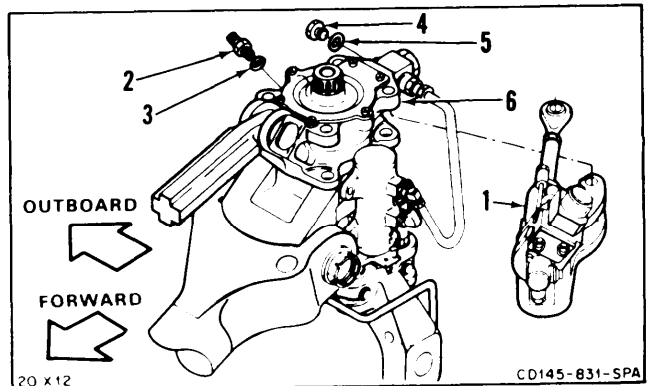
Procedure is same for disassembling right and left gear. Right gear is shown here.

- 1.1 Remove landing gear wheel and tire assembly (Task 3-7).

NOTE

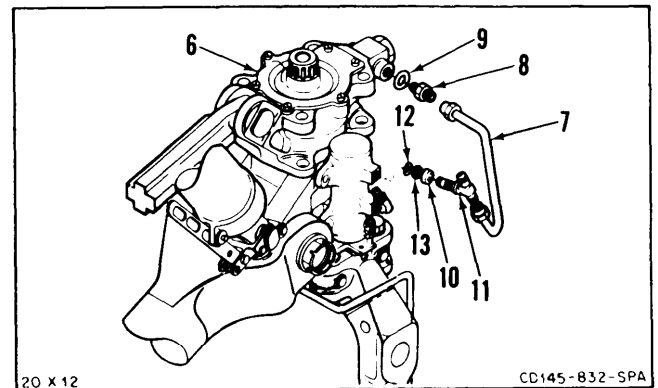
Procedure is same for removing forward or aft wheel,

2. **Remove union (2), packing (3), plug (4), and packing (5)** from swivel housing (6).

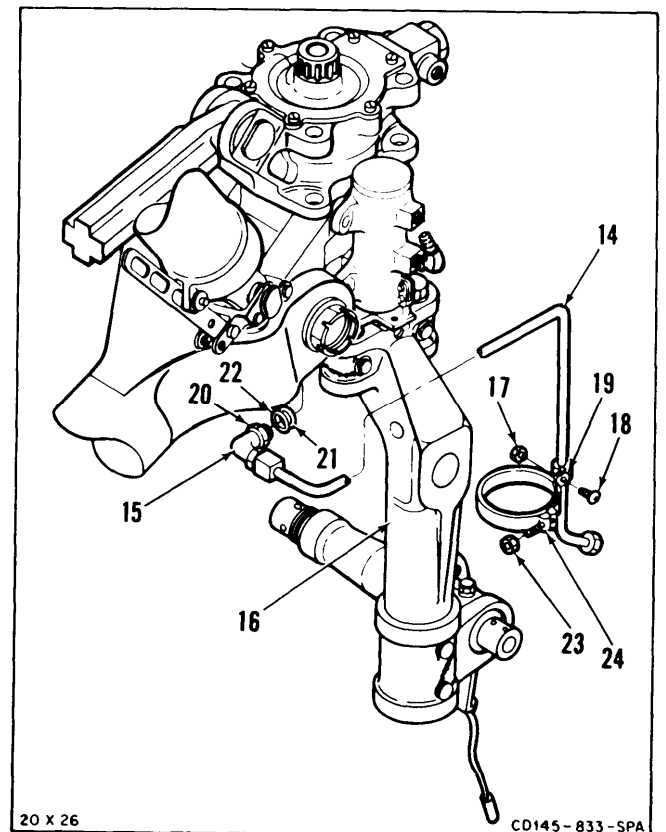
**GO TO NEXT PAGE**

3-30 DISASSEMBLE AFT LANDING GEAR (Continued)**3-30**

3. Remove pressure line (7), union (8), and packing (9) from housing (6).
4. Loosen nut (10) and remove tee (11), packing (12) and retainer (13).
5. Remove nut (10) from tee (11).



6. Remove brake line (14) from elbow (15) on spindle (16).
7. Remove nut (17), screw (18), and clip (19).
8. Loosen nut (20) and remove elbow (15), packing (21) and retainer (22).
9. Remove nut (20) from elbow (15).
10. Remove nut (23) and clamp (24).

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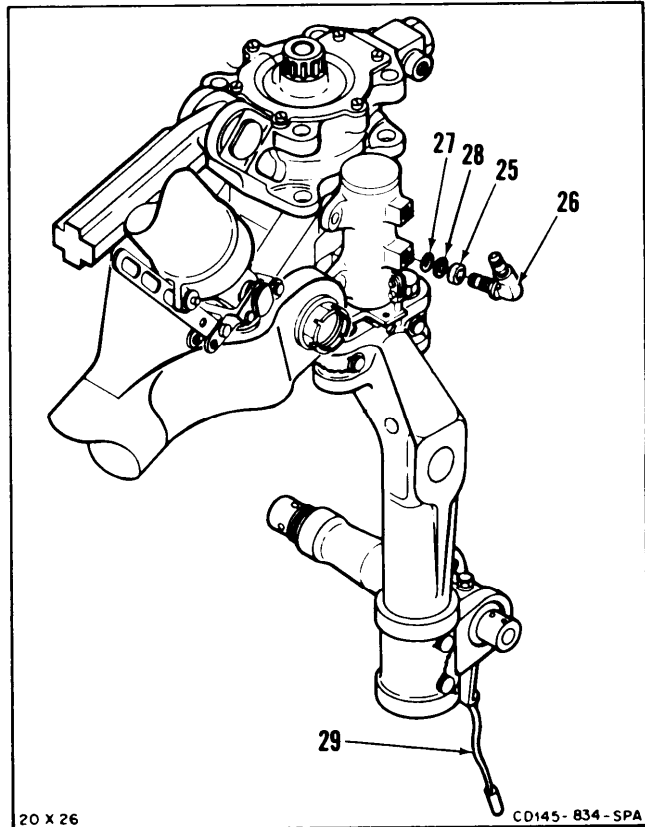
3-30 DISASSEMBLE AFT LANDING GEAR (Continued)**3-30**

11. Loosen nut (25) and remove elbow (26), packing (27), and retainer (28).
12. Remove nut (25) from elbow (26).

NOTE

Static ground wire is installed on left gear only.

13. Remove static ground wire (29) if working on left gear (Task 3-37).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

3-31 ASSEMBLE AFT LANDING GEAR**3-31**

INITIAL SETUP

Applicable Configurations:

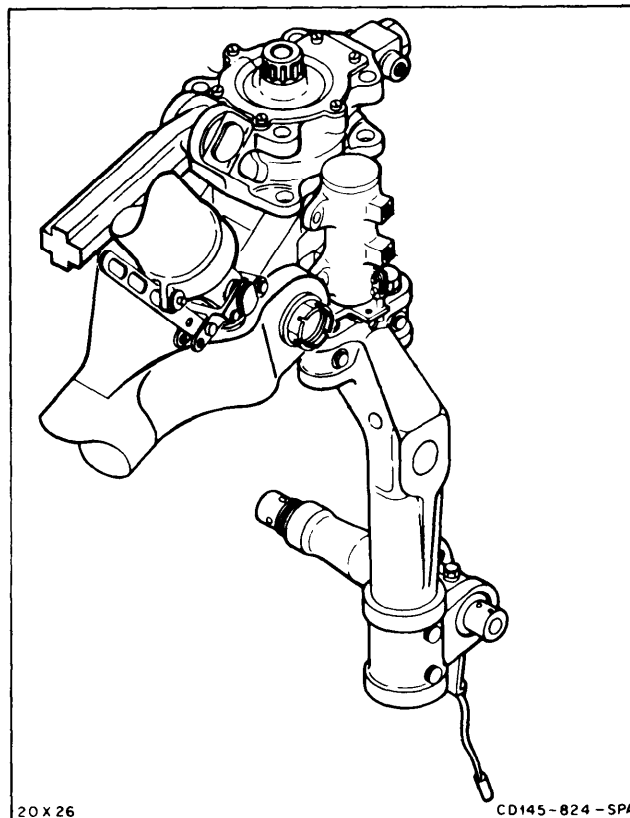
All

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

None

Parts:

Preformed Packing

Personnel Required:67U20 Medium Helicopter Repairer
67U30 Inspector**References:**TM 55-1520-240-23P
Task 3-38
Task 7-297**NOTE**

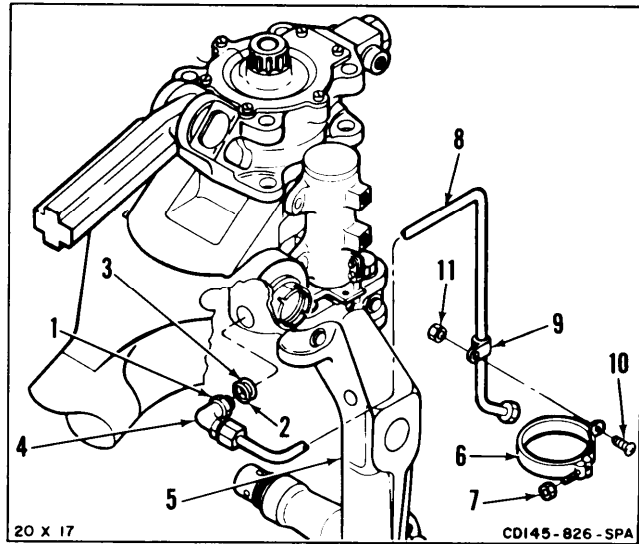
This procedure is same for left or right landing gear except as noted in steps 15. and 16.

1. Drain preservative hydraulic fluid from any new landing gear components to be installed.

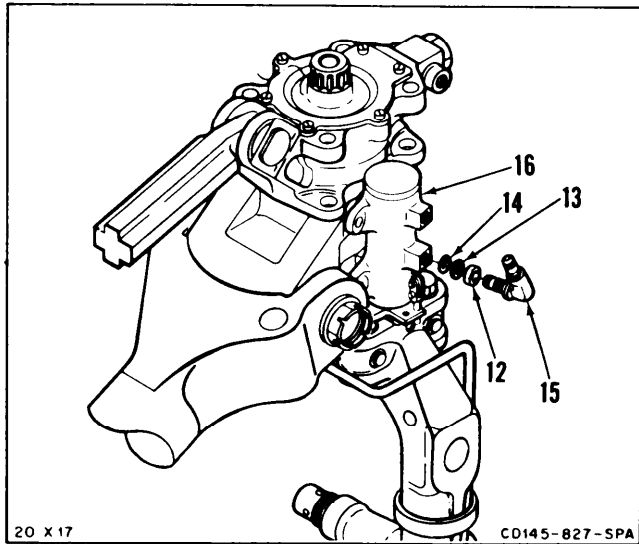
GO TO NEXT PAGE

3-31 ASSEMBLE AFT LANDING GEAR (Continued)

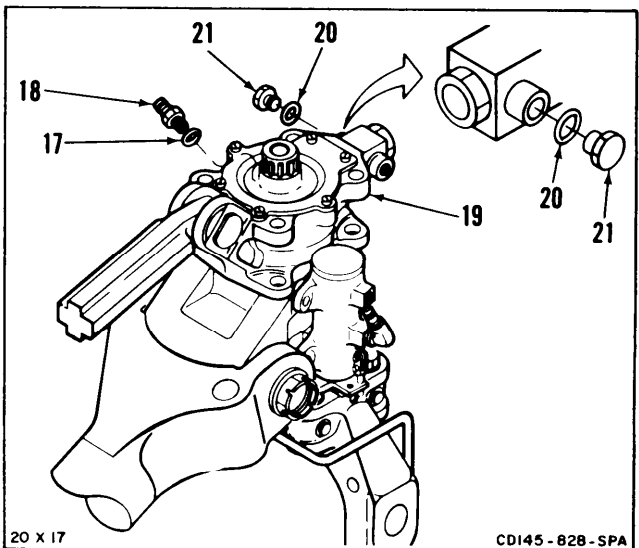
2. Install nut (1) retainer (2), and packing (3) on elbow (4).
3. **Install elbow (4)** on spindle (5).
4. Install clamp (6) and nut (7).
5. **Connect brake tube (8)** on elbow (4).
6. **Install clip (9)** on brake tube (8) and secure to clamp (6) with screw (10) and nut (11).



7. Install nut (12), retainer (13), and packing (14) on elbow (15).
8. **Install elbow (15)** in swivel lock actuator (16).



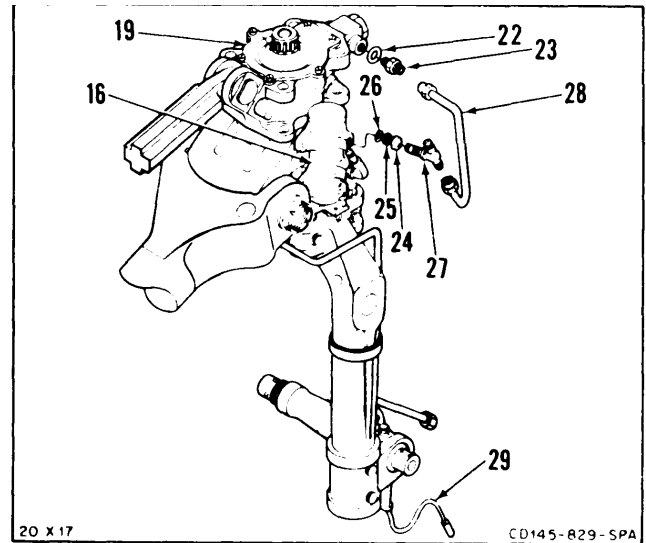
9. Install packing (17) on union (18).
10. **Install union (18)** in swivel housing (19).
11. Install packing (20) on plug (21). Install plug in swivel housing (19).



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3-31 ASSEMBLE AFT LANDING GEAR (Continued)**3-31**

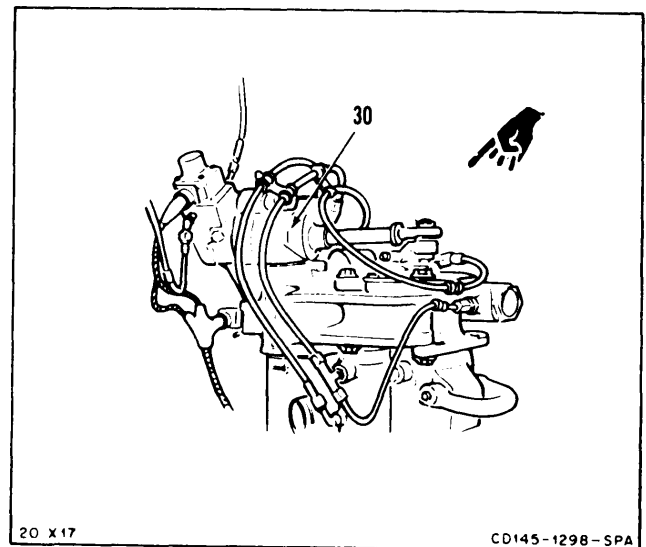
12. Install packing (22) and union (23) in swivel housing (19).
13. Install nut (24), retainer (25) and packing (26) on tee (27). Install tee in actuator (16).
14. **Install swivel housing pressure tube (28)** on union (23) and tee (27).
15. **Install static ground wire (29)** on left gear (Task 3-38).



16. **Install power steering assembly (30)** on right gear (Task 7-300).

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,

NSN 5180-00-323-4692

Torque Wrench, 0 to 160 Foot-Pounds

Torque Wrench, 30 to 150 Inch-Pounds

Torque Wrench, 100 to 750 Inch-Pounds

Socket, 1 1/16-inch

Socket, 1 1/8-inch

Socket, 1 1/2-inch

Blocks

Materials:

Dry Cleaning Solvent (E 162)

Grease (E 190)

Cleaning Cloth (E 120)

Gloves (E 186)

Parts:

Cotter Pins

Personnel Required:

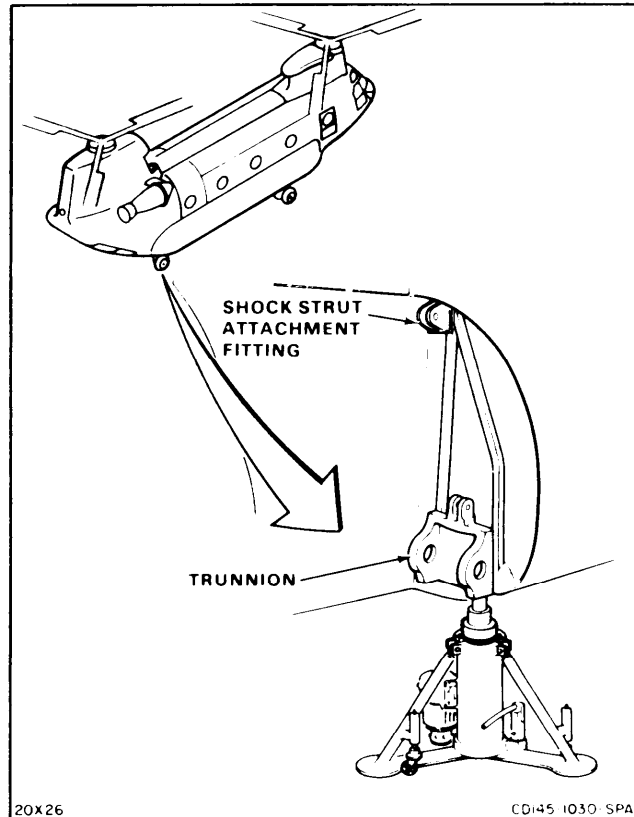
Medium Helicopter Repairer (2)

Inspector

References:

TM 55-1520-240-23P

Task 1-24

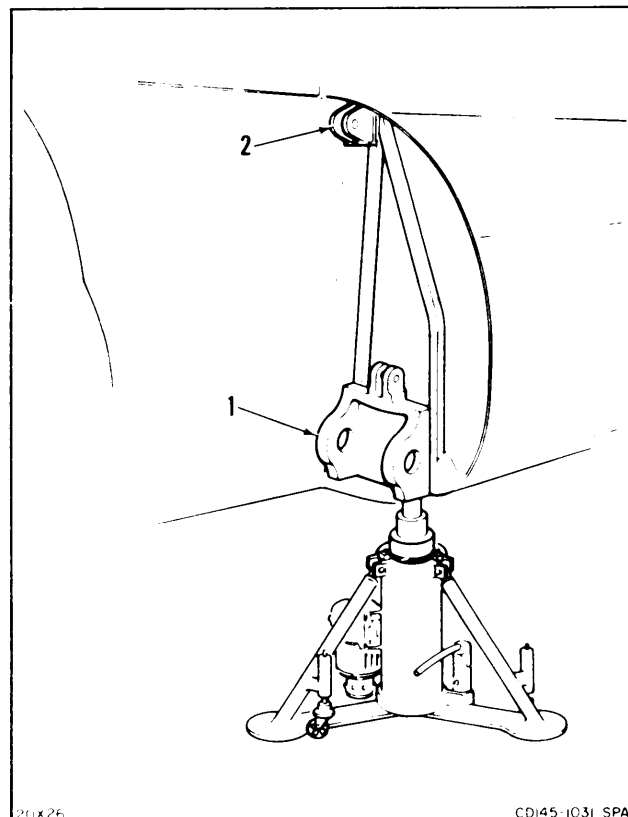
**NOTE**

This procedure can be used for left and right gear. Except for differences noted in task. Right gear is shown here.

WARNING

Dry cleaning solvent (E162) is flammable and gives off toxic fumes. It may 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 water for at least 15 minutes. Get medical attention for eyes.

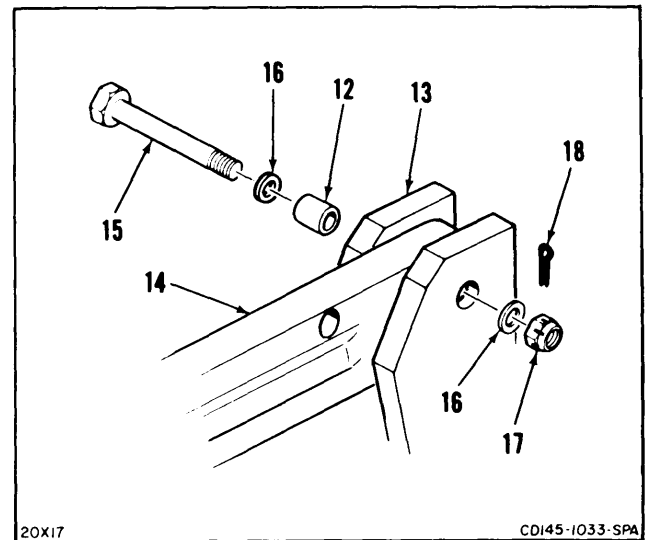
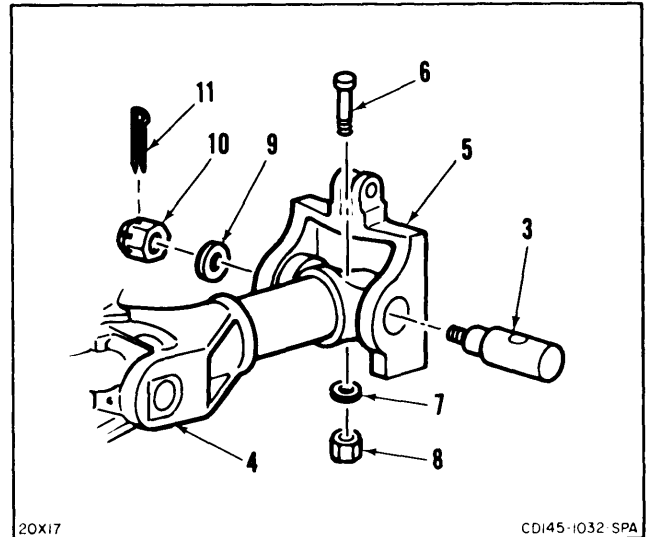
- 1 Clean trunnion (1) and shock strut attachment fitting (2). Use cloth (E 120) damp with dry cleaning solvent (E 162). Use gloves (E 186).

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3-68 Change 5

3-32 INSTALL AFT LANDING GEAR (Continued)**3-32**

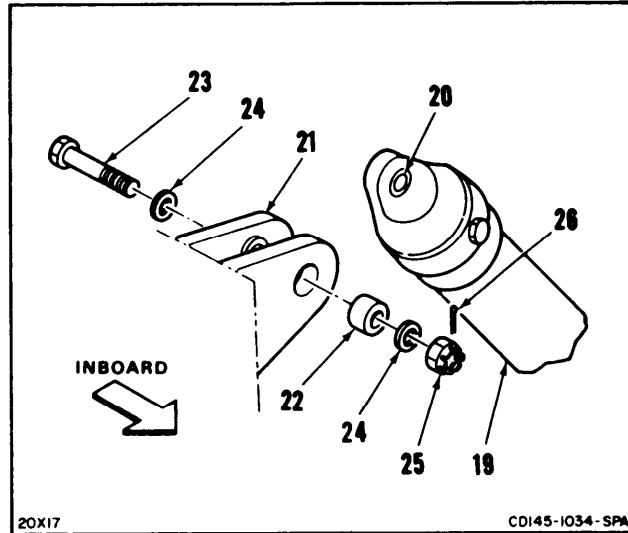
2. **Inspect structure** for cracks, corrosion, and distortion. If structure is damaged, repair it.
3. **Lubricate trunnion pin (3)** with grease (E 190).
4. **Have helper, using blocks, support aft landing gear** in wheel well and position lower drag link (4) in trunnion (5).
5. **Install pin (3)** through trunnion (5) and drag link (4).
6. **Install bolt (6) through drag link (4) and pin (3)**. Secure bolt with washer (7) and nut (8). Torque nut to **100 inch-pounds**.
7. Install washer (9) and nut (10) on pin (3). **Torque nut to 50 to 500 inch-pounds**. Install cotter pin (11).
8. **Install bushing (12) in fitting (13)**.
9. **Align link (14) with fitting (13)**. Install bolt (15), washers (16), and nut (17). **Torque nut to 50 to 100 foot-pounds**. install cotter pin (18).

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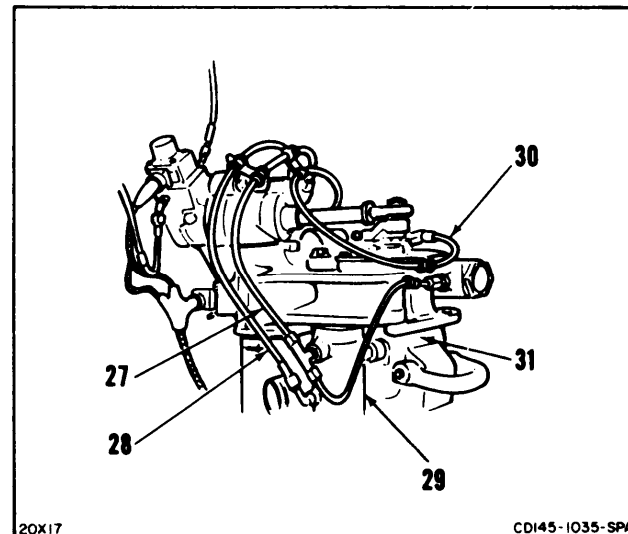
3-32 INSTALL AFT LANDING GEAR (Continued)

3-32

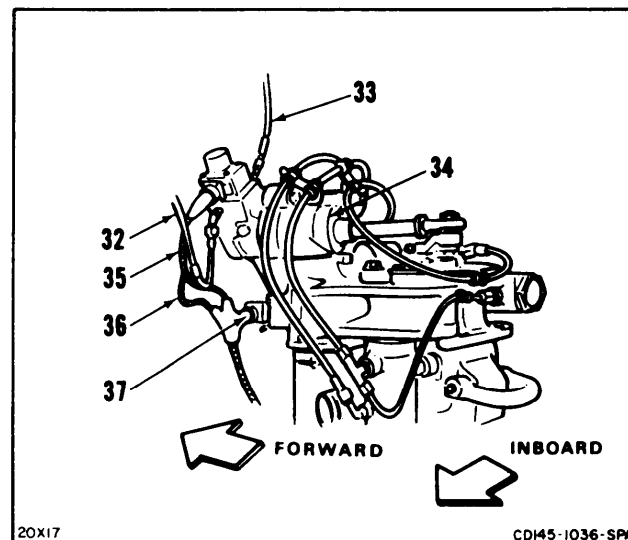
10. Extend shock strut (19).
11. Align bearing (20) in strut (19) with holes in fitting (21).
12. Position bushing (22), and bearing (20) in fitting (21). Install bolt (23), two washers (24), and nut (25). Torque nut to 50 to 100 foot-pounds. Install cotter pin (26).



13. Connect two hydraulic hoses (27 and 28) to swivel lock actuator (29).
14. Connect hydraulic brake tube (30) to elbow on top of landing gear (31).



15. For a right gear, connect two hydraulic hoses (32 and 33) to power steering assembly (34).
16. For a right gear plug electrical connectors (35, 36 and 37) into power steering assembly (34).

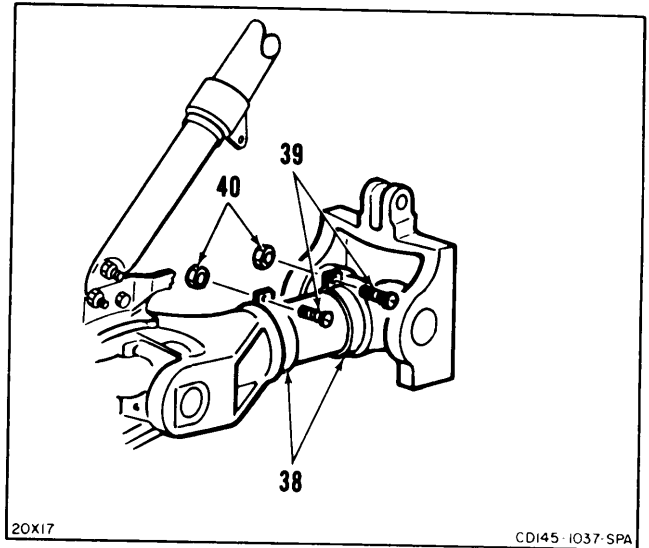


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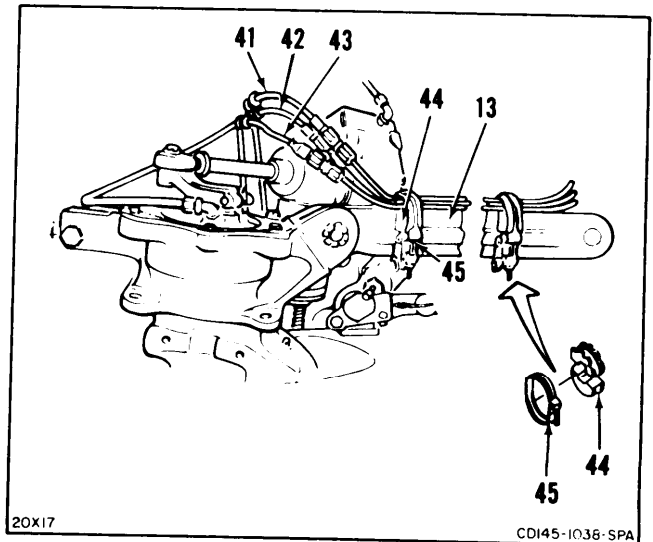
3-32 INSTALL AFT LANDING GEAR (Continued)

3-32

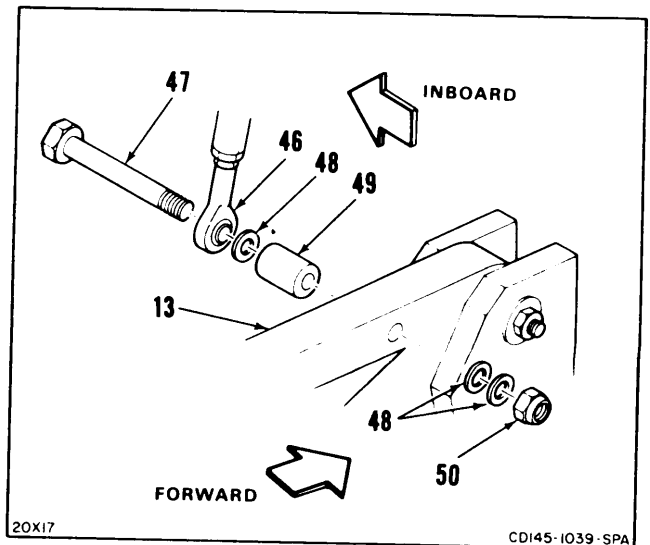
- 17. **Secure two wire harness clamps (38) to lower drag link with screws (39) and nuts (40).**
- 18. **Remove landing gear chock blocks and lower helicopter (Task 1-24).**



- 19. **Secure hydraulic tubes (41, 42 and 43) to upper drag link (13) with support blocks (44) and clamps (45).**



- 20. **Connect proximity switch rod end (46) to upper drag link (13). Use bolt (47), washer (48), spacer (49), and nut (50).**



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3-32 INSTALL AFT LANDING GEAR (Continued)**3-32****FOLLOW-ON MAINTENANCE:**

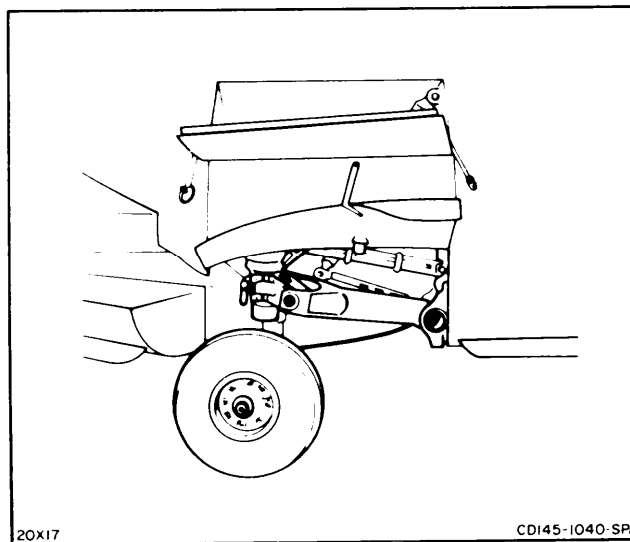
Service shock strut (Task 1-71 and 72).

Bleed aft brakes (Task 7-330).

Functionally test aft landing gear system components (TM 55-1520-240-T).

Functionally test power steering (TM 55-1520-240-T) (right gear only).

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

**END OF TASK**

3-33 INSPECT LANDING GEAR WHEEL BEARINGS**3-33**

INITIAL SETUP

Applicable Configurations:

All

Tools:Aircraft Inspector's Tool Kit,
NSN 5180-00-323-5114**Materials:**

Cloths (E 120)

Personnel Required:

Inspector

References:

TM 55-1500-322-24

Equipment Condition:

Off Helicopter Task

Wheel Bearings Removed and Cleaned (Task 3-7, 3-9 and 3-10)

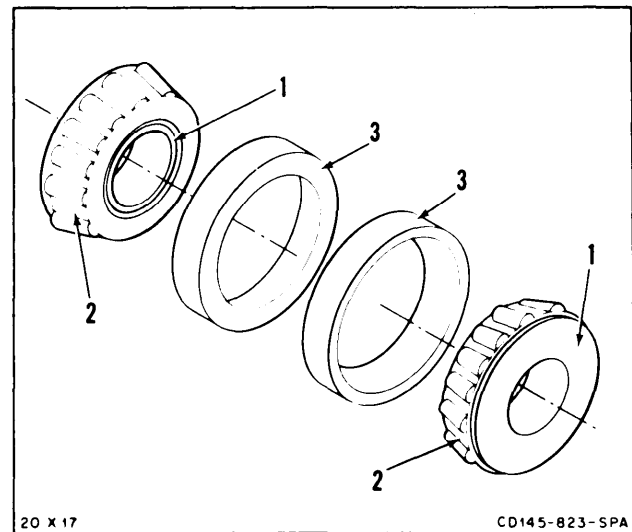
NOTE

- Procedure is same for all landing gear wheel bearings.
- Replace bearings if any of conditions in steps 1 and 2 are found.

1. **Check bearings (1)** for corrosion, nicks, burrs, cracked cage (2), and free rotation (TM 55-1 500-322-24).
2. **Check bearing inner cups (3)** for corrosion, nicks, burrs, and cracks.
3. **Cover bearings (1) and cups (3)** with a cloth (E 120) until needed.

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

3-34 REMOVE AFT LANDING GEAR AXLE

3-34

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

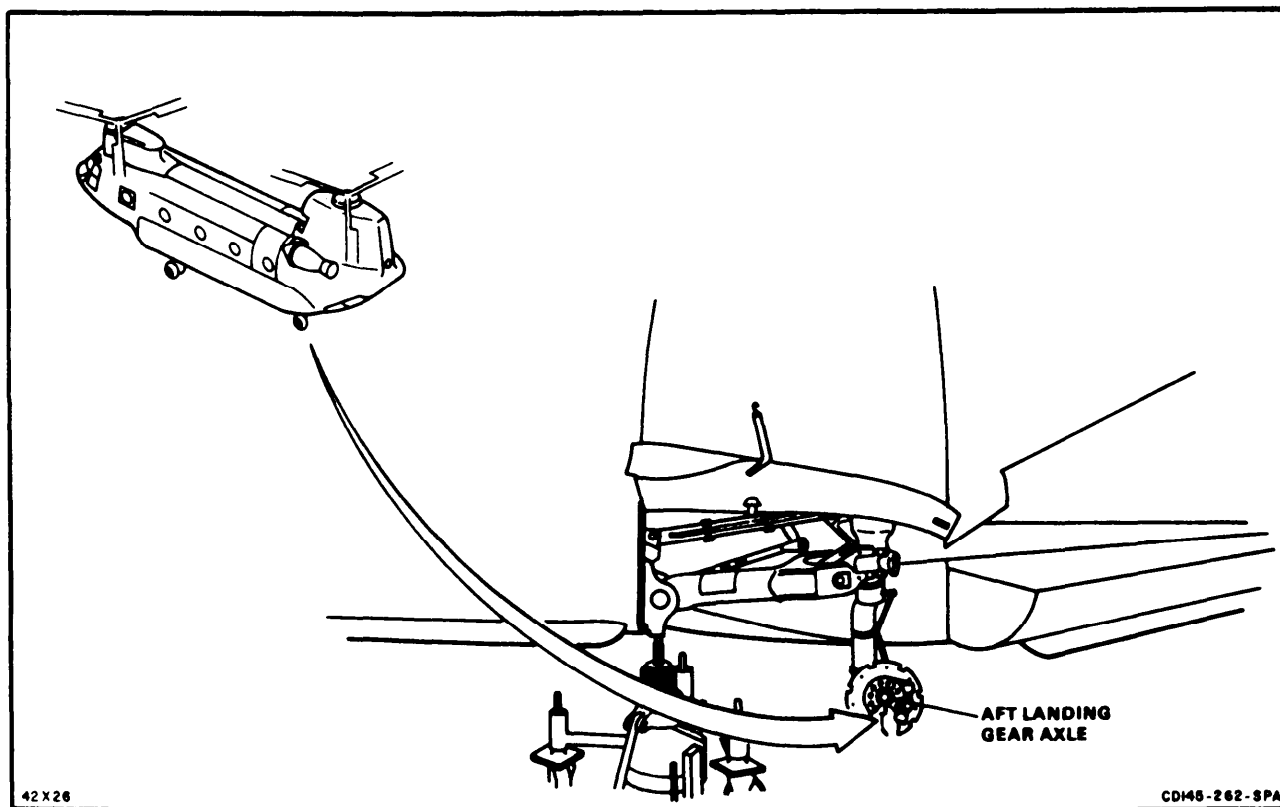
None

Personnel Required:

67U10 Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Access Panel Opened (Task 2-2)
Helicopter Jacked at Aft Fuselage (Task 1 -24)
Wheel Removed (Task 3-7)



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3-34 REMOVE AFT LANDING GEAR AXLE (Continued)

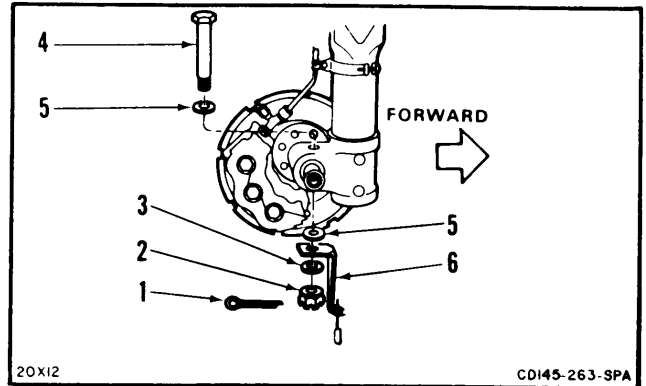
3-34

REMOVE AXLE

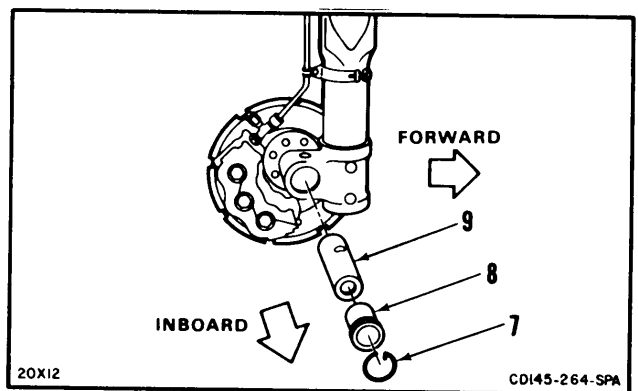
NOTE

Procedure is same for left or right axle. Left side is shown here. Static ground wire is installed on left side only.

1. Remove cotter pin (1), nut (2), washer (3), bolt (4), two packings (5), and bracket (6).



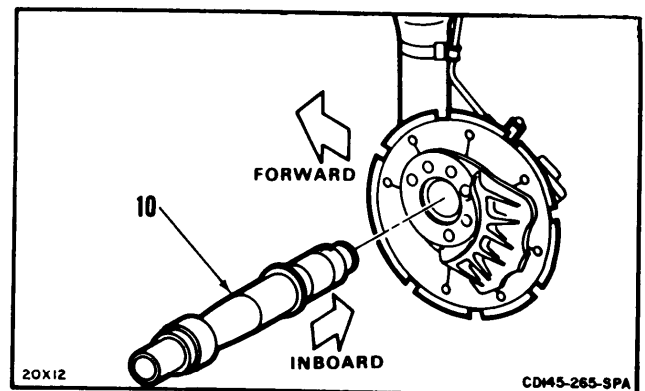
2. Remove retaining ring (7) and sleeve (8).
3. Remove axle extension (9).



4. Remove axle (10).

FOLLOW-ON MAINTENANCE:

- Inspect axle (Task 3-13).



END OF TASK

3-35 INSTALL AFT LANDING GEAR AXLE

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

None

Parts:

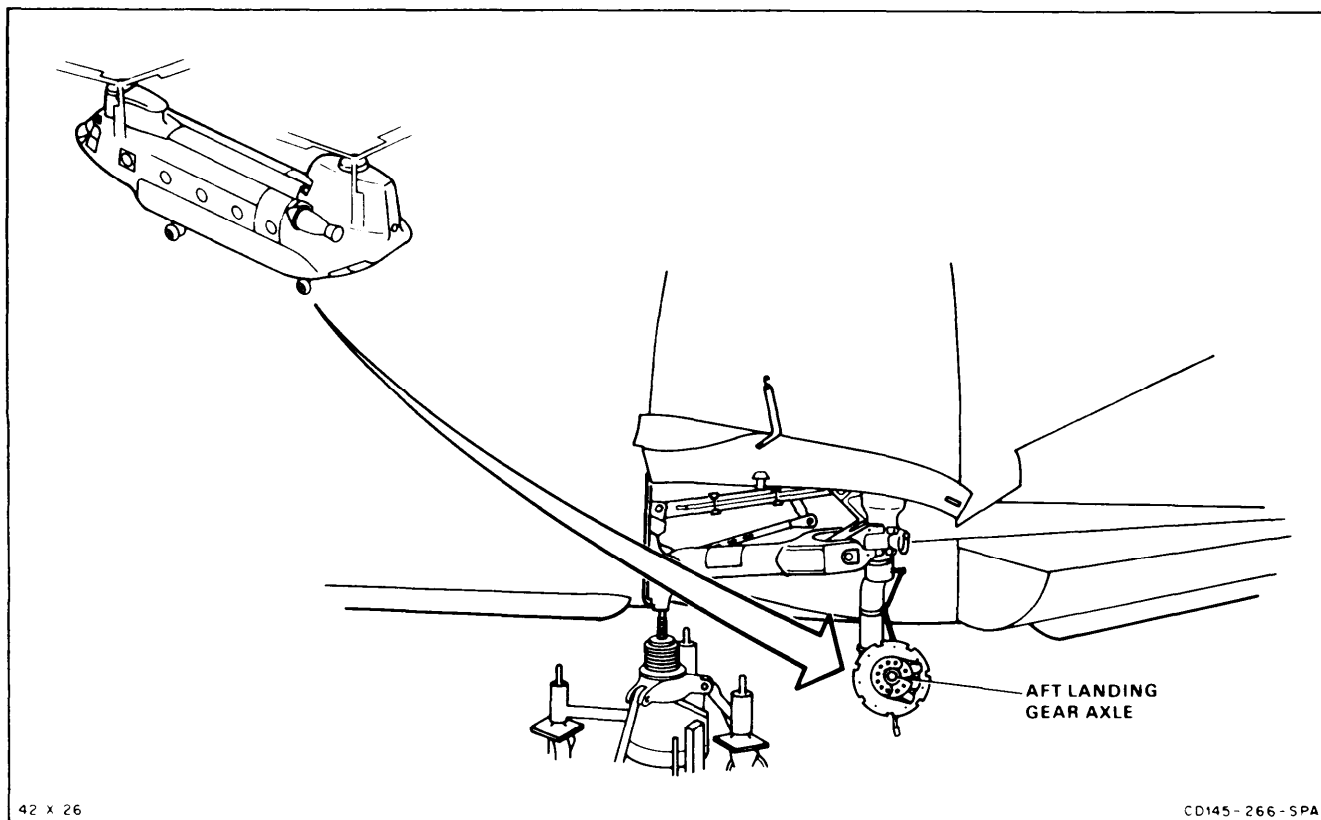
Cotter Pin
Preformed Packing

Personnel Required:

67U10 Medium Helicopter Repairer
67U30 Inspector

References:

TM 55-1520-240-23P



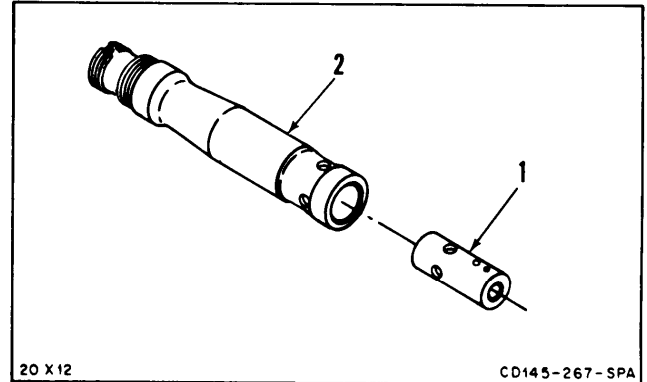
GO TO NEXT PAGE

INSTALL AXLE

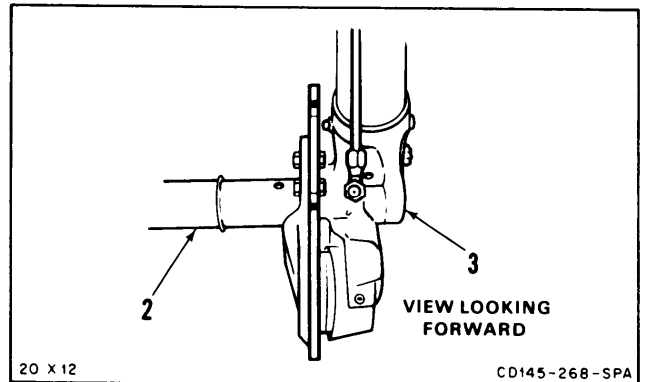
NOTE

Procedure is same for left and right axle.
Left side is shown. Static ground wire is installed on left side only.

1. Install axle extension (1) in axle (2) and align bolt holes.

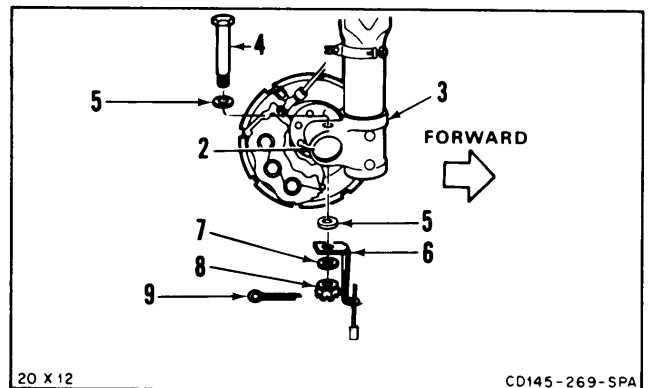


2. Install axle (2) in housing (3) and align bolt holes.



3. Install bolt (4) with packing (5) through axle (2) and housing (3).

4. Install packing (5), bracket (6), washer (7), nut (8), and new cotter pin (9).

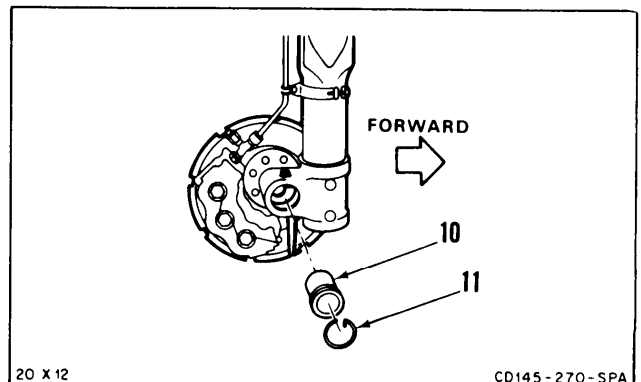


5. Install sleeve (10) and retaining ring (11).

INSPECT

FOLLOW-ON MAINTENANCE:

- Install wheel (Task 3-12.1).
- Lower and remove jack (Task 1-24).



END OF TASK

3-36 INSPECT AFT LANDING GEAR STATIC GROUND WIRE

3-38

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

None

Personnel Required:

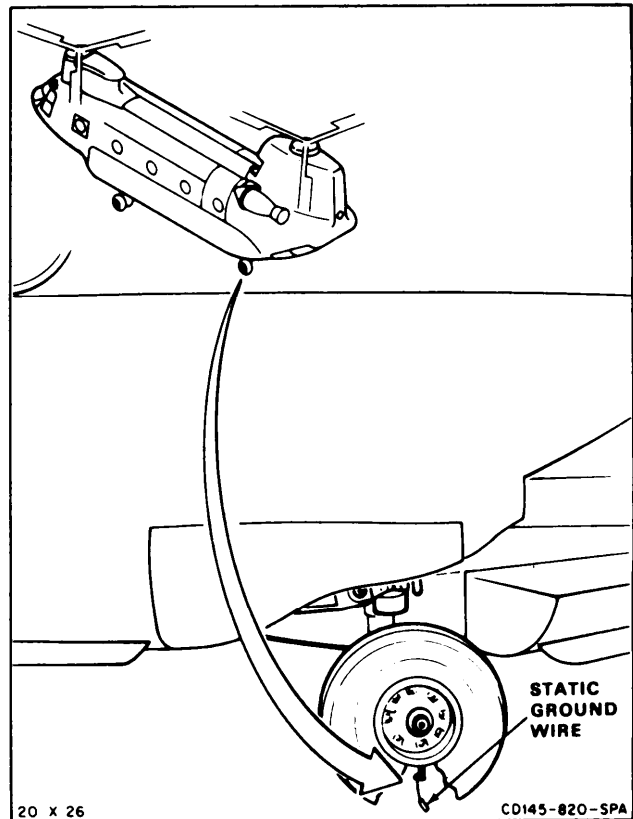
67U20 Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1 -39)

Electrical Power Off

Hydraulic Power Off



NOTE

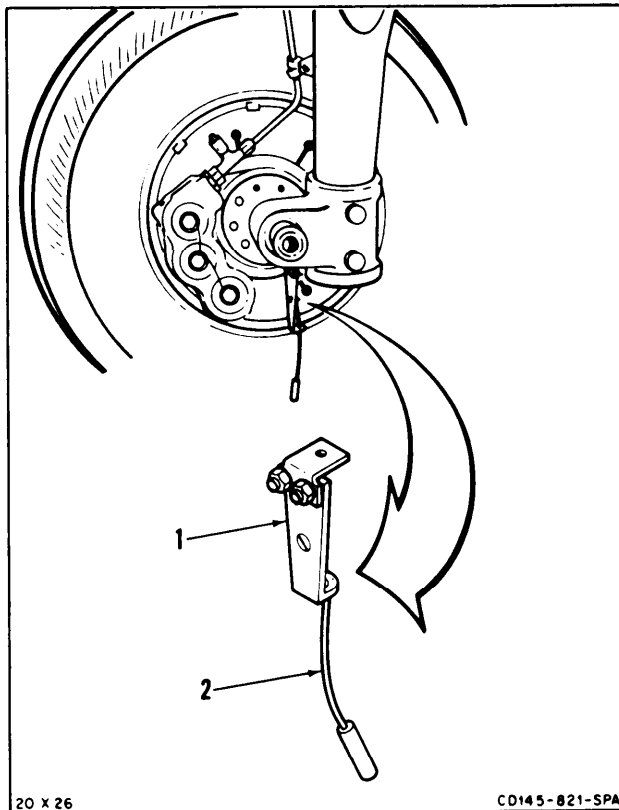
This procedure is for left gear only.

1. Check bracket (1) and attaching hardware for cracks and corrosion.
2. Check wire (2) for fraying and positive ground contact.
3. Replace wire which is frayed. Replace wire which does not contact ground. Chock wire (2) for pitting and burn marks from lightning strike damage.

FOLLOW-ON MAINTENANCE:

None

END OF TASK



3-37 REMOVE AFT LANDING GEAR STATIC GROUND WIRE**3-37**

INITIAL SETUP

Applicable Configurations:

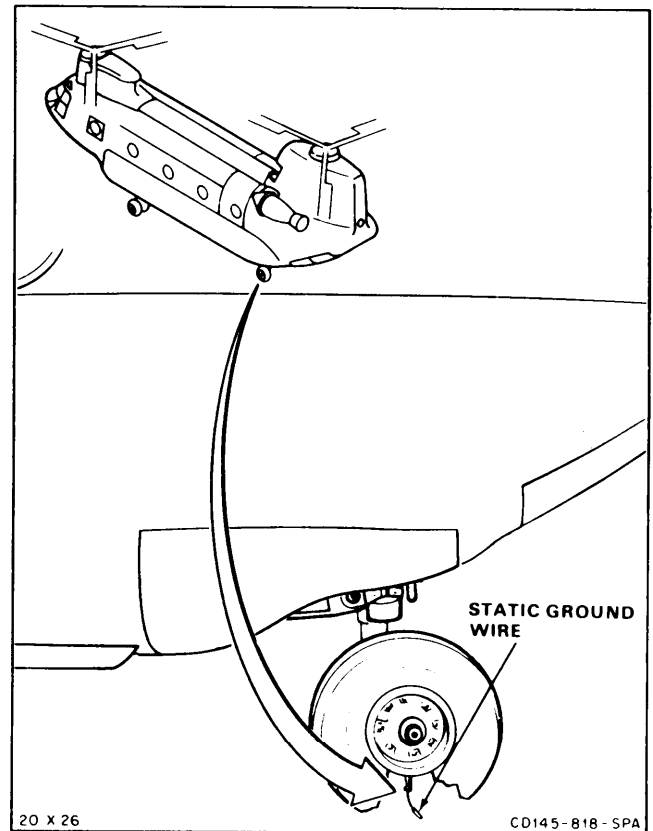
All

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

None

Personnel Required:

67U10 Medium Helicopter Repairer

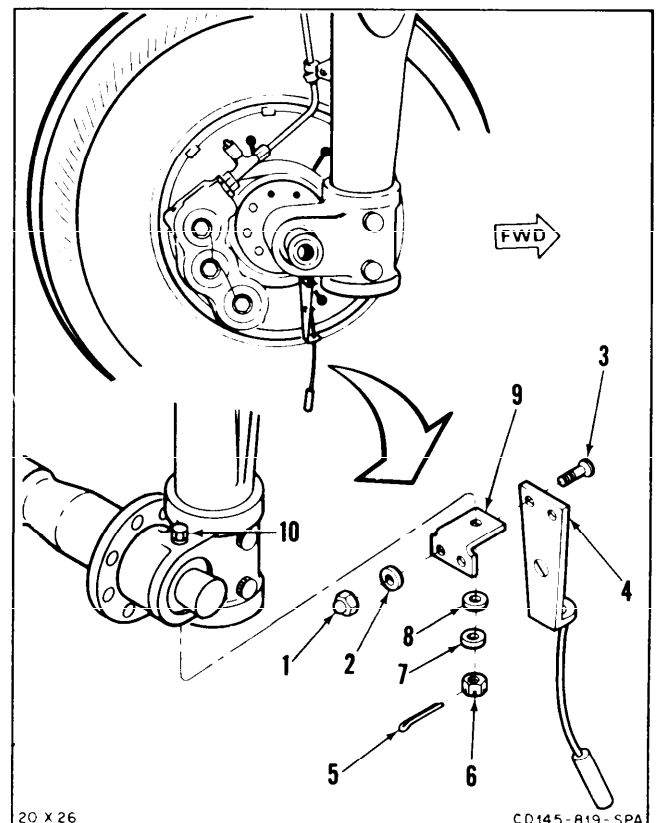
Equipment Condition:Battery Disconnected (Task 1 -39)
Electrical Power Off
Hydraulic Power Off**NOTE**

This procedure is for aft left gear only.

1. Remove nuts (1), lockwashers (2), and screws (3).
2. **Remove static ground wire assembly (4).**
3. **Remove** cotter pin (5), nut (6), lockwasher (7), washer (8) and **clip (9)**. Do not remove bolt (10).

FOLLOW-ON MAINTENANCE:

None

END OF TASK

3-38 INSTALL AFT LANDING GEAR STATIC GROUND WIRE

3-38

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

None

Parts:

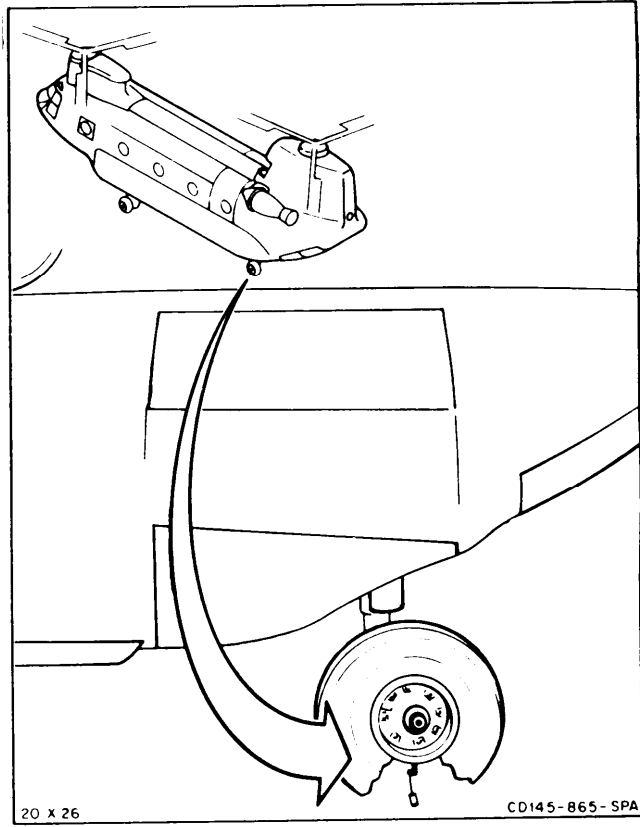
Cotter Pin

Personnel Required:

67U10 Medium Helicopter Repairer
67U30 Inspector

References:

TM 55-1520-240-23P



NOTE

procedure is for left gear only.

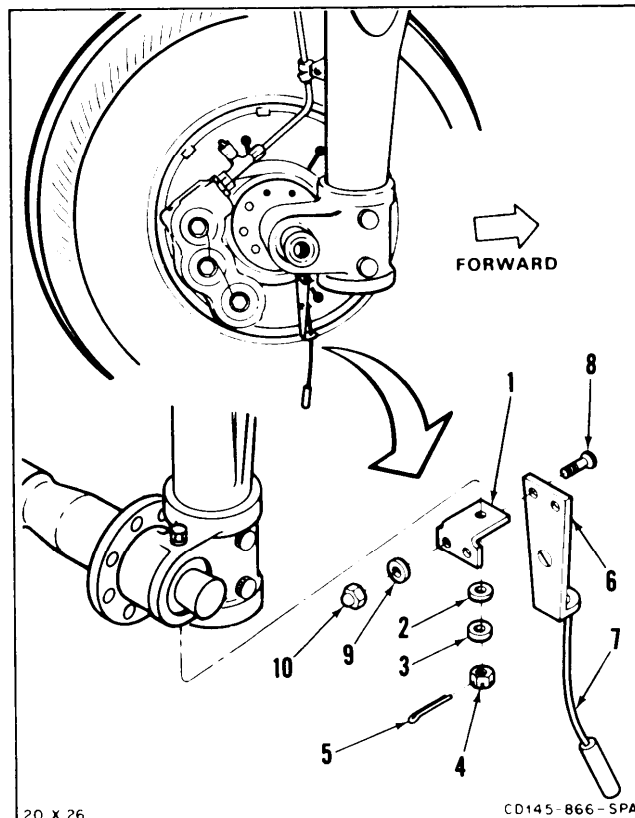
1. Install clip (1), retainer (2), washer (3), nut (4) and new cotter pin (5).
2. Install static ground wire assembly (6). Make sure ground wire (7) is bent by its contact with the ground.
3. Install screws (8), washers (9), and nut (10).

INSPECT

FOLLOW-ON MAINTENANCE:

None

END OF TASK



3-38.1 REMOVE AFT LANDING GEAR LUBRICATION FITTING**3-38.1****INITIAL SETUP****Applicable Configurations:**

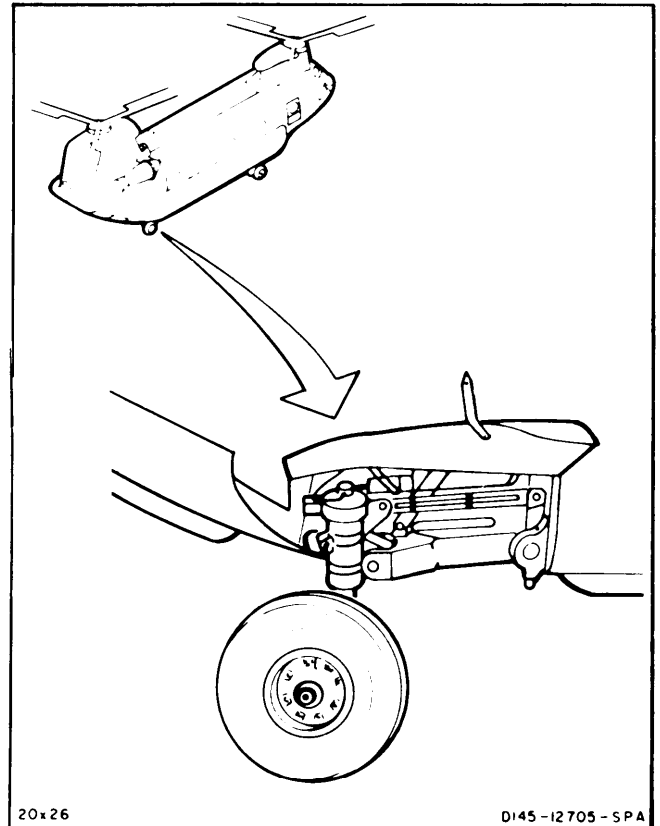
All

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

None

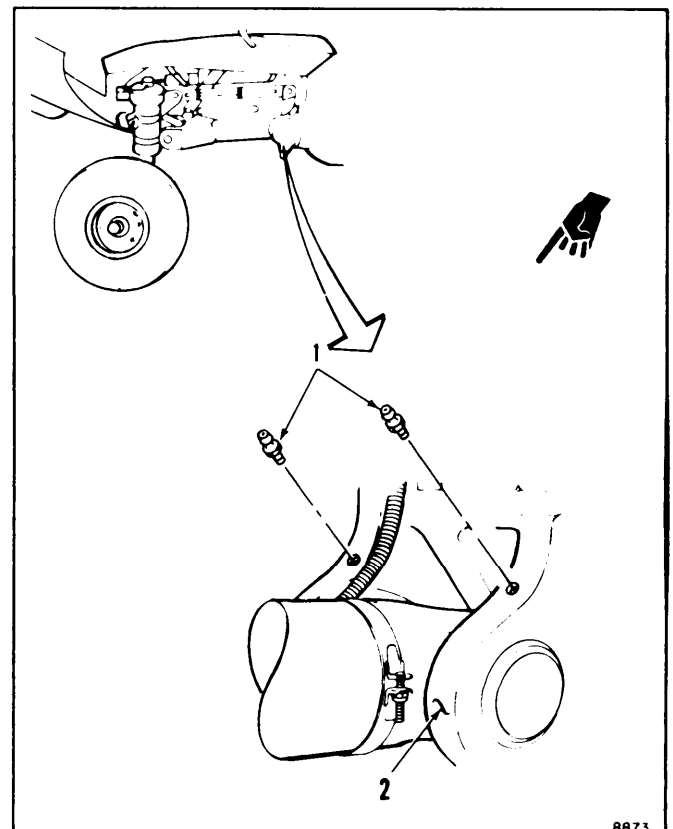
Personnel Required:

Medium Helicopter Repairer

Equipment Condition:Battery Disconnected (Task
Electrical Power Off
Hydraulic Power Off
Aft Landing Gear Access
Panel Open (Task 2-2)**NOTE**

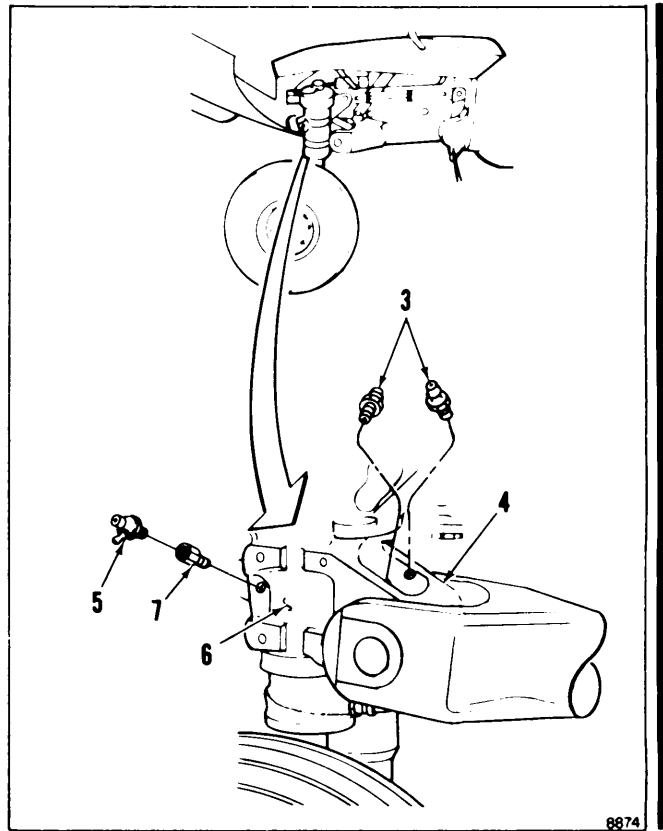
There are five lubrication fittings on each aft landing gear assembly. All fittings are removed in the same way.

1. Remove two fittings (1) from forward trunnion (2).

**GO TO NEXT PAGE**

**3-38.1 REMOVE AFT LANDING GEAR LUBRICATION FITTING
(Continued)****3-38.1**

2. Remove two fittings (3) from aft trunnion (4).
3. Remove fitting (5) from swivel housing (6).
4. If fitting (5) is broken off or adapter (7) is defective, remove adapter from swivel housing (6).

**FOLLOW-ON MAINTENANCE:**

None

3-38.2 INSTALL AFT LANDING GEAR LUBRICATION FITTINGS

3-38.2

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

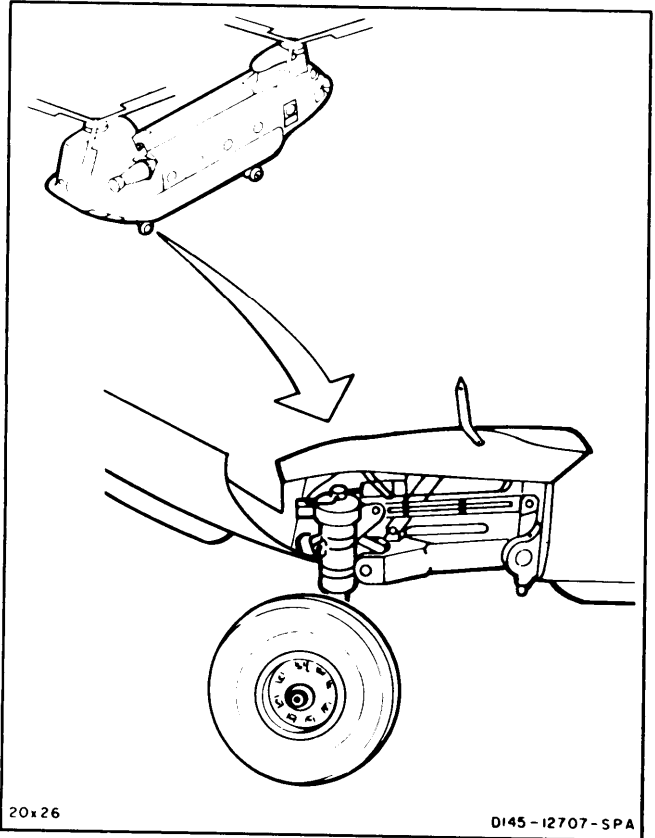
Sealant (E345.1)

Personnel Required:

Medium Helicopter Repairer

References:

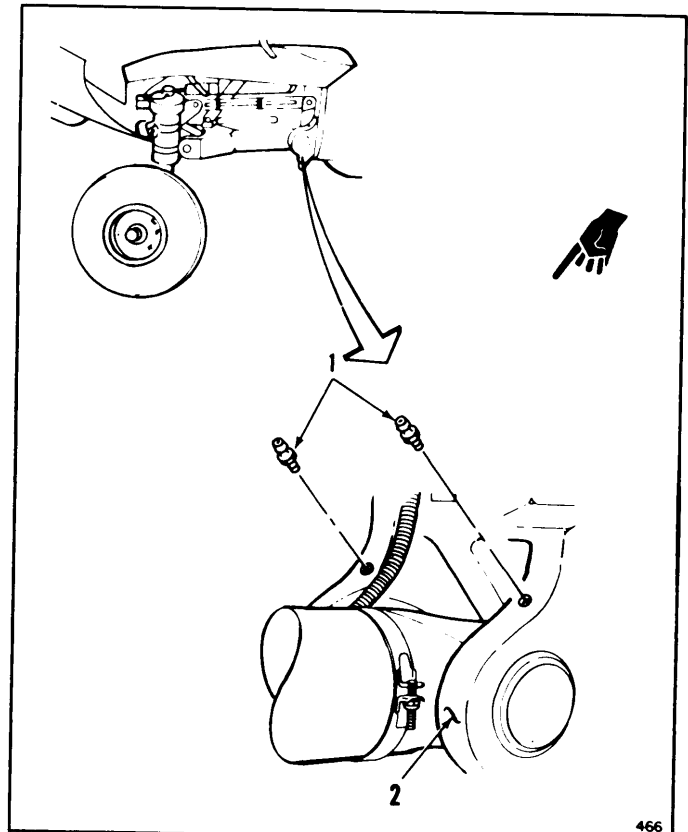
TM 55-1520-240-23P



NOTE

There are five lubrication fittings on each aft landing gear assembly. Four are installed in the same way.

1. **Install two fittings (1)** on forward trunion (2).



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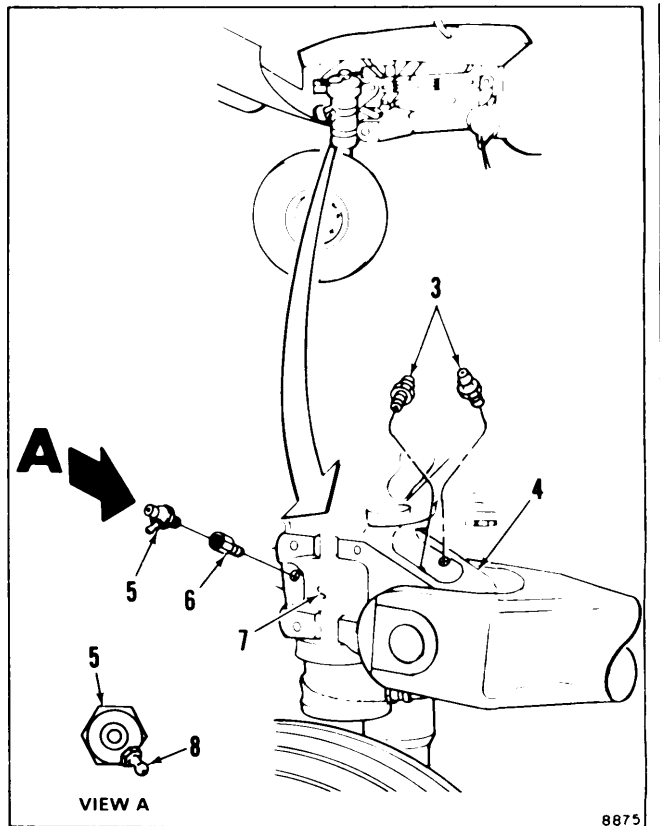
3-38.2 INSTALL AFT LANDING GEAR LUBRICATION FITTINGS (Continued)

3-38.2

- 2 Install two fittings (3) in aft trunnion (4).

Sealant (E345.1) can irritate skin and cause burns. 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.

- 3 **Apply sealant (E345.1) to thread of fitting (5) and, if being installed, adapter (6).**
4. If required, install adapter (6) in swivel housing (7).
5. Hold adapter (6) with wrench. **Install fitting (5) In adapter.** Final position of fitting shall leave nipple (8) between 4 and 5 o'clock position.



FOLLOW-ON MAINTENANCE:

- Lubricate aft landing gear (Task 1-88)
- Close aft landing gear access panel (Task 2-2)

END OF TASK

3-80.4 Change 5

3-39 INSPECT AFT LANDING GEAR SHOCK STRUT**3-39****INITIAL SETUP****Applicable Configurations:**

All

Tools:

None

Materials:

None

Personnel Required:

Inspector

References:

Task 1-70

Task 2-18

Task 2-19

Task 2-343

TM 55-1520-240-23P

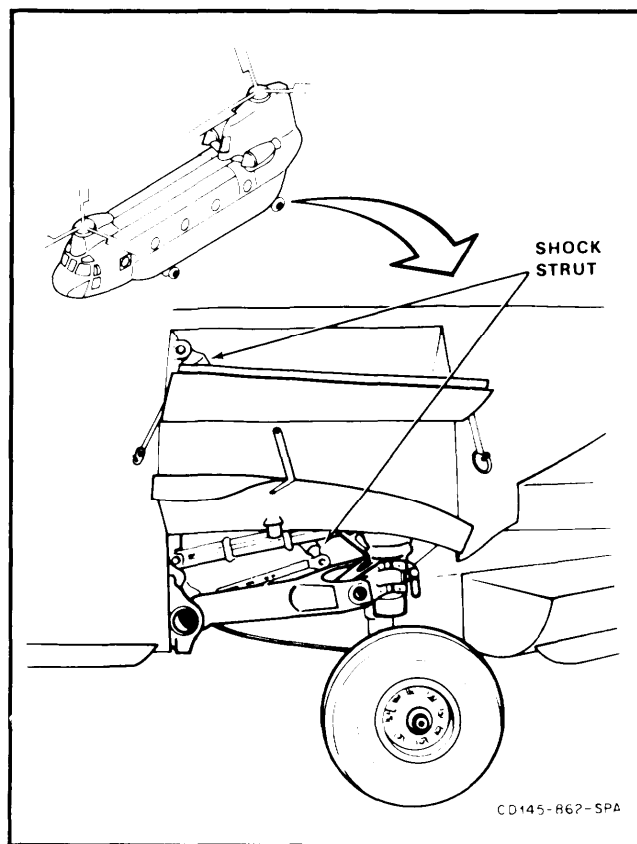
Equipment Condition:

Battery Disconnected (Task 1-39)

Electric Power Off

Hydraulic Power Off

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

**NOTE**

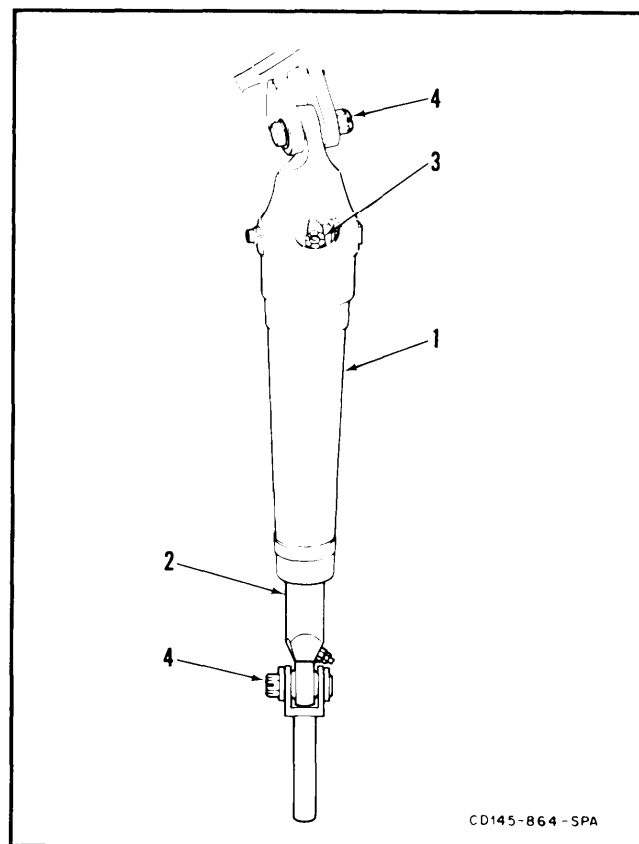
- Damage other than minor requires replacement of attachment fitting (Task 2-78 and 2-19).

- Procedure is same for left and right gear, Left gear is shown,

1. **Inspect shock strut (1) for leaking seals.** Fluid will be visible on piston (2), or use hand to feel for fluid.
2. **Inspect shock strut (1), and piston (2) for corrosion.** If there is corrosion, clean or repair as needed. (Task 2-343),
3. **Inspect shock strut (1), and piston (2) for fluid level at filler plugs (3)** (Task 1-70).
4. **Check piston (2) is extended and not bottomed in strut (1).**
5. **Inspect attaching bolts (4) at both ends of strut (1) for looseness.**

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

3-40 REMOVE AFT LANDING GEAR SHOCK STRUT

INITIAL SETUP

Applicable Configurations:

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Socket, 1 -Inch
- Wrench, 1 1/16-inch
- Wrench, 1 1/8-inch

Materials:

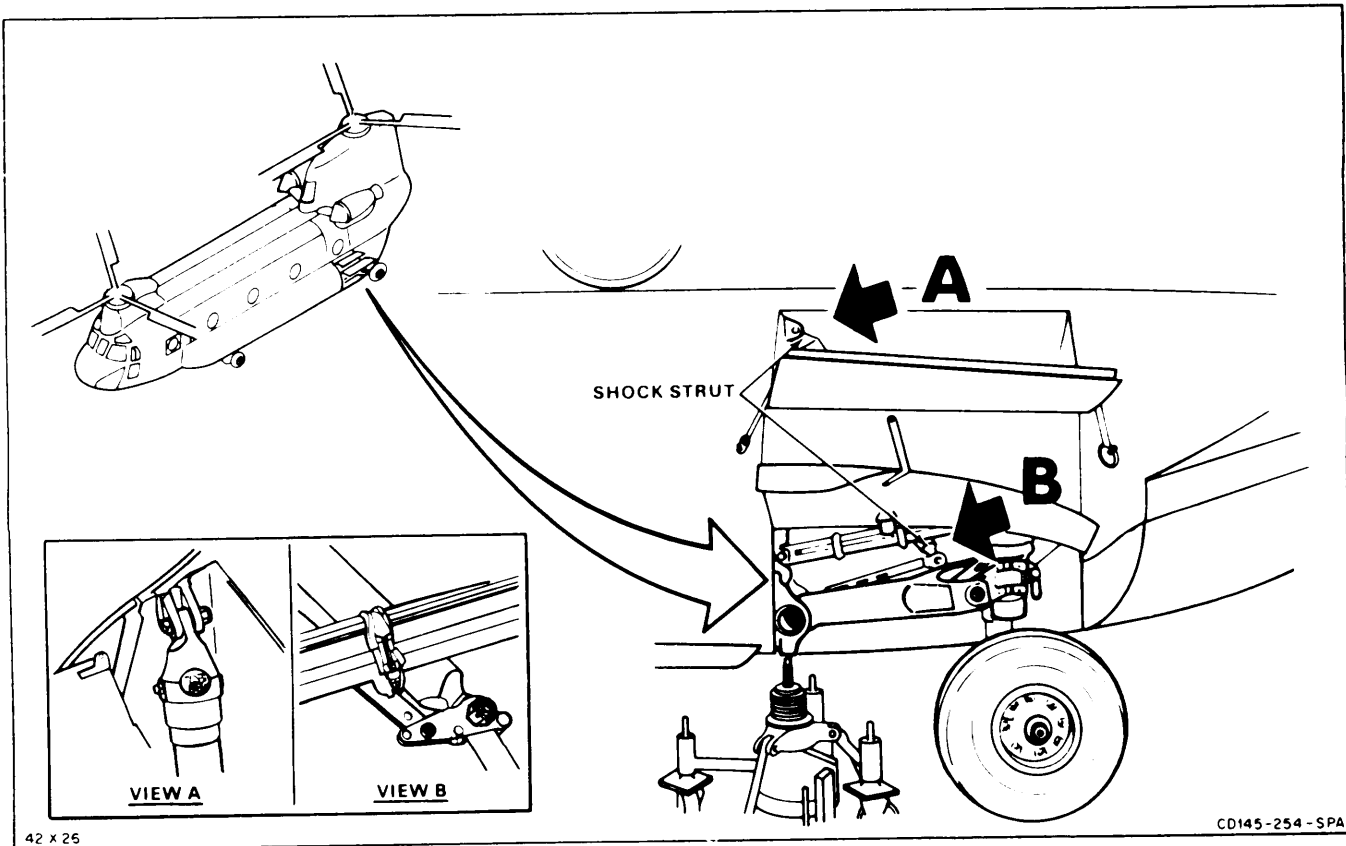
None

Personnel Required:

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

Equipment Condition:

- Battery Disconnected Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Aft Landing Gear Access Panel Open (Task 2-2)
- Shock Strut Deflated (Task 1-72)
- Helicopter Jacked At Aft Fuselage Jack Pad
(Task 1-24)
- Engine Work Platform Opened (Task 2-2)



42 x 25

CD145-254-SPA

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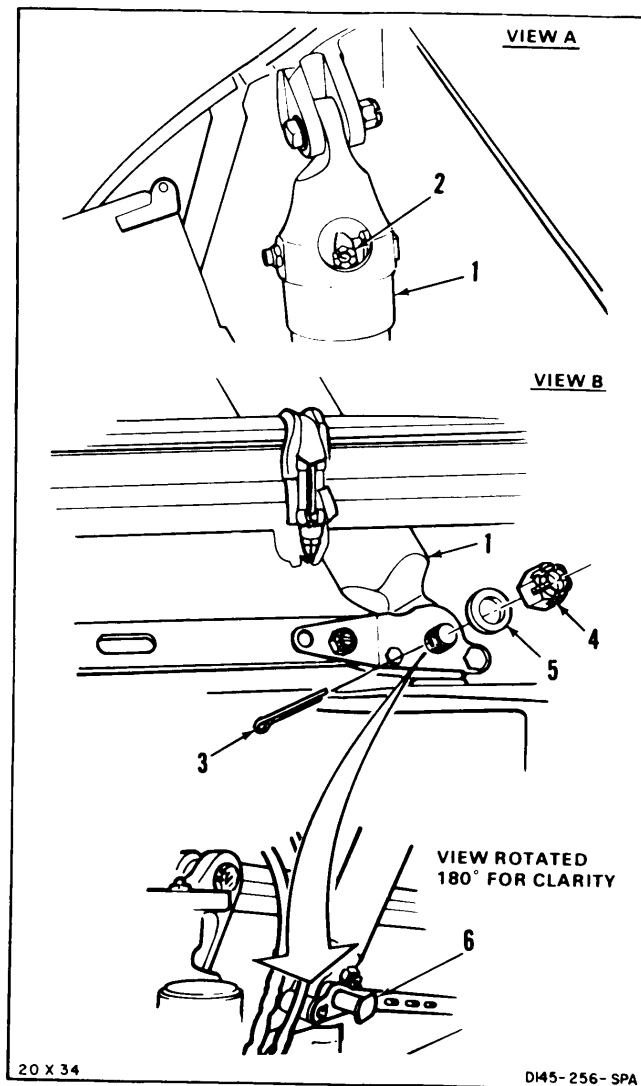
3-40 REMOVE AFT LANDING GEAR SHOCK STRUT (Continued)**3-40****NOTE**

Procedure is same for left or right strut. Left strut is shown here.

1. Make sure weight is off shock strut (1). Do not lock shock strut.
2. Remove lockwire and **loosen filler plug (2)** at top of shock strut (1). Leave plug loose until strut can be compressed enough to remove bolt (6). Do not remove filler plug (2).

REMOVE LOWER ATTACHING BOLT

3. With aid of helper, remove cotter pin (3), nut (4), and washer (5) at bottom of shock strut (1).
4. Remove **lower bolt (6)**.

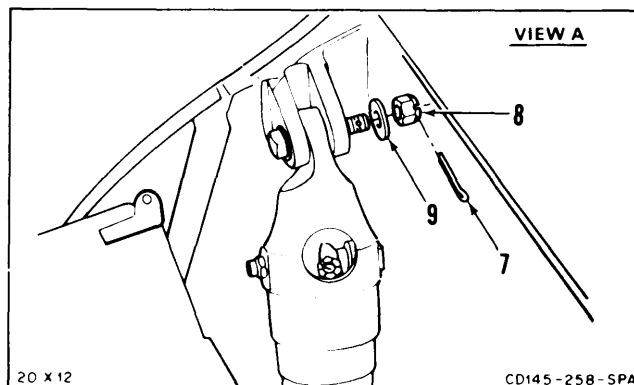
**GO TO NEXT PAGE**

3-40 REMOVE AFT LANDING GEAR SHOCK STRUT (Continued)

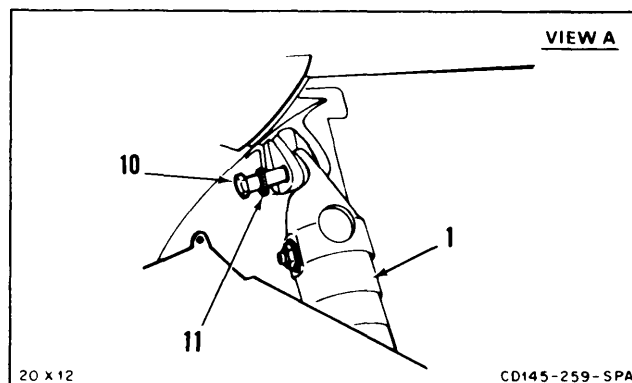
3-40

REMOVE UPPER ATTACHING BOLT

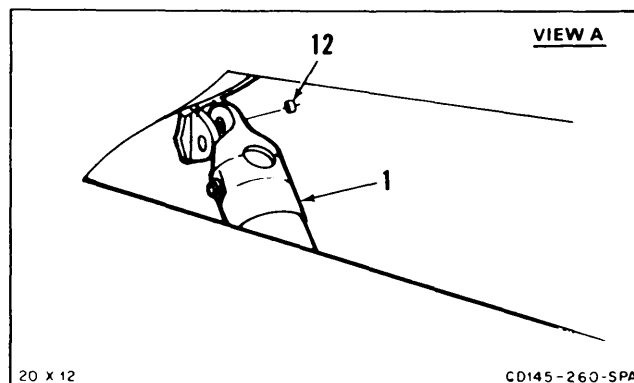
5. Remove cotter pin (7), nut (8), and washer



6. With aid of helper, **remove bolt (10)** and washer (11) holding upper end of strut (1) to structure.



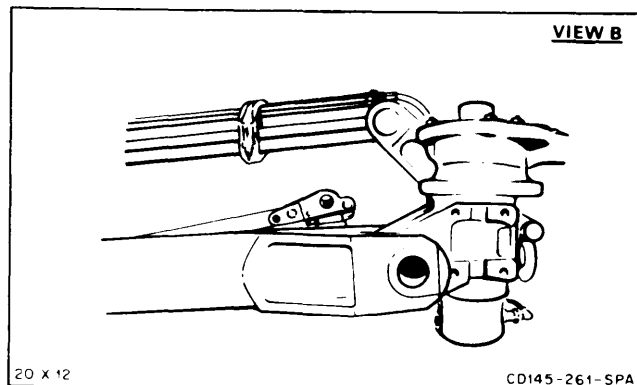
7. Remove shock strut (1) and bushing (12).



FOLLOW-ON MAINTENANCE:

None

END OF TASK



INITIAL SETUP

Applicable Configurations:

All

Tools:

Machine Shop Set,
NSN 4920-00-405-9279
Arbor Press
Roller Staking Kit (T169)

Materials:

Crocus Cloth (E122)
Epoxy Primer (E292)
Polyurethane Paint (E285.3)
Acetone (E20)
Gloves (E184.1)
Sealant (E345.1)

Parts:

Bearings
Liners (Appx E-53)

Personnel Required:

Machinist
Inspector

References:

TM 55-1520-240-23P
TM 55-1500-322-24
MIL-R-46082

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

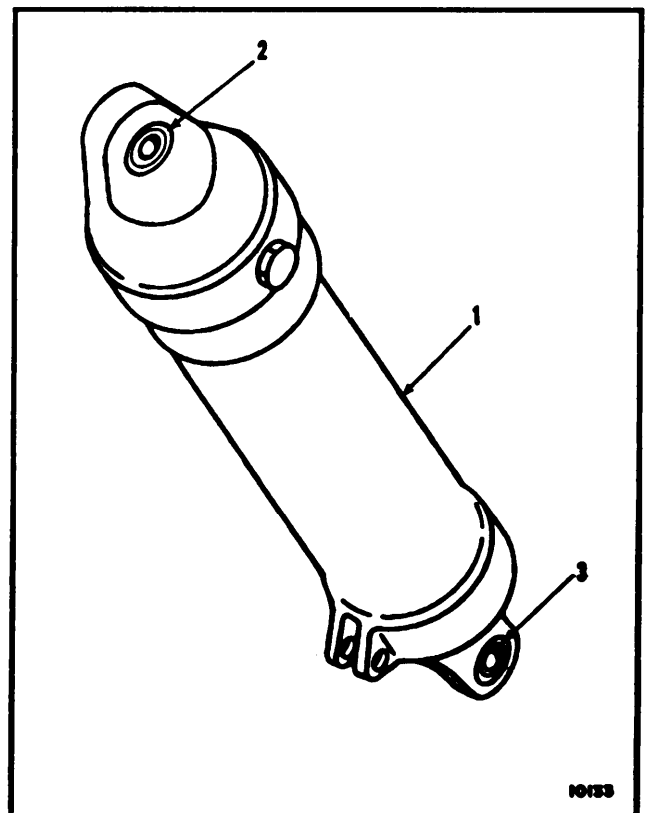
Acetone (E20), epoxy primer (E292) and polyurethane paint (E285.3) are flammable and toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Same procedure is used to repair left or right shock strut.

REPAIR STRUT SURFACE

1. Remove minor nicks, burrs, scores, scratches and pits on shock strut (1). Use crocus cloth (E122).
2. Touch up reworked areas with primer (E292) and polyurethane paint (E285.3). Wear gloves (E184.1).
3. **Check condition of bearings (2 and 3).** If bearings are good, go to Follow-On Maintenance. If either bearing must be replaced, go to step 4.



GO TO NEXT PAGE

REMOVE BEARINGS

4. Place strut (1) in an arbor press. Use the press to remove bearing (2 or 3) (TM 55-1500-322-24). Note that cap bore (4) has a shoulder (5) that requires bearing (2) to be removed in one direction only.
5. Clean cap bore (4) and piston bore (6). Use acetone (E20) and clean cloths (E120). Wear gloves (E184.1),

REPAIR BEARING BORE

6. Measure diameter of bore (4) at several places. If all measured diameters of bore are 1.3745 inches or less, go to step 9. If diameter at any one place is over 1.3745 inches, repair bore as in step 8.
7. Measure diameter of bore (6) at several places. If all measured diameters of bore are 1.4378 inches or less, go to step 9. If diameter at any one place is over 1.4378 inches, reject strut (1).
8. Repair cap bore (4) as follows:
 - a. Drill out cap bore (4) to 1.4940 to 1.4945 inches.
 - b. Chamfer both sides of bore (4) 0.022 to 0.042 inch by 45 degrees.

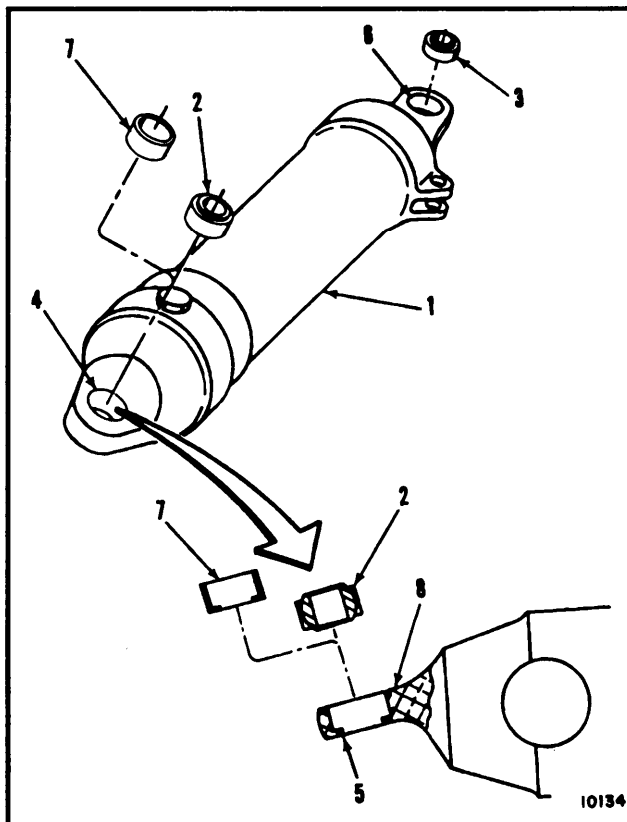
INSPECT

- c. Coat liner (7) (E-55) with epoxy primer (E292). Wear gloves (E184.1).

CAUTION

Liner must be installed as shown. Otherwise, it may fail in use.

- d. Install liner (7) wet with primer in bore (4), with shoulder (5) as shown. Use arbor press, (TM 55-1 500-322-24). Press liner in flush with cap lug (8).



3.41 REPAIR AFT LANDING GEAR SHOCK STRUT (AVIM) (Continued)

3-41

INSTALL BEARINGS**NOTE**

Cap lug bearing may be installed within liner or directly within cap lug bore. Piston bearing is installed directly within piston lug bore.

9. **Clean bearings (2 and 3) and mating surfaces** of cap bore (4) or liner (7) and piston bore (6). Use acetone (E20). Wear gloves (E184.1).

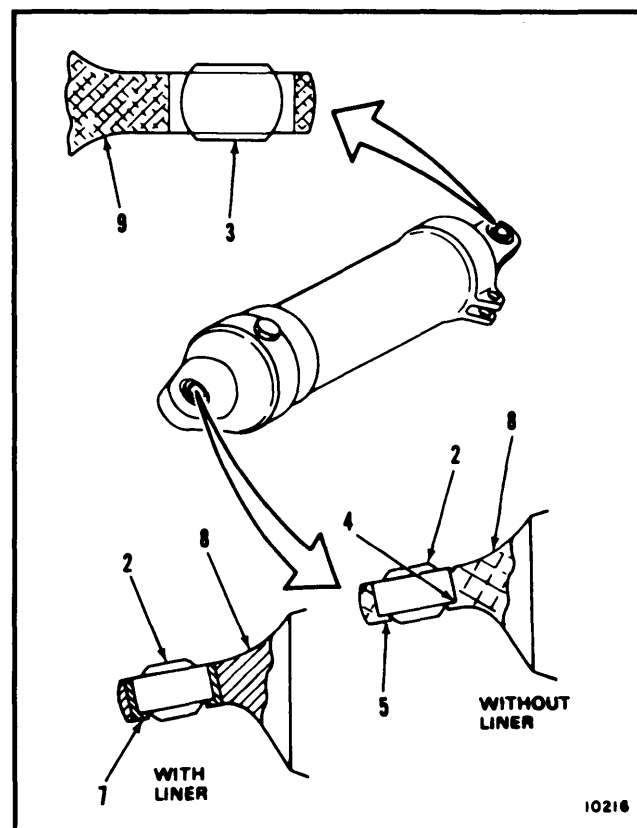
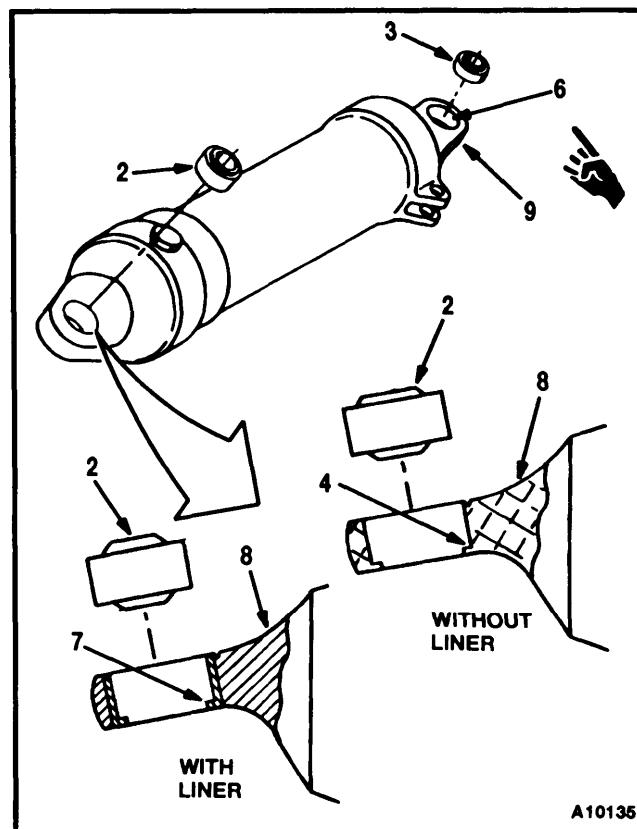
WARNING

Sealant (E345.1) can irritate skin and cause burns. 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.

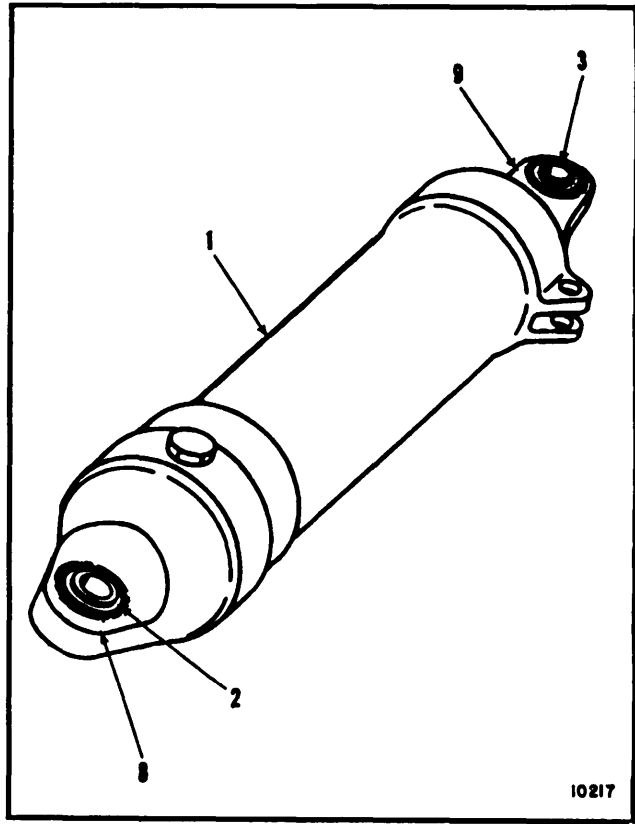
10. **Apply sealant (E345.1)** to mating surfaces of bearings (2 and 3), bore (4) or liner (7) and bore (6) (MIL-R-46082). Wear gloves (E184.1).
11. **Install bearing (2)** in bore (4) or liner (7). install bearing (3) in bore (6). Use arbor press (TM 55-1500-322-24). Installed bearings shall be flush with lugs (8 and 9).

INSPECT

12. **Stake bearing (2) or liner (7) to cap lug (8)** as follows:
 - a. Bearing (2) in bore (4): Roller stake cap lug (8) over bearing on side opposite shoulder (5) only. Use Roller Swaged Housing Staking method (TM 55-1500-322-24). Use roller staking kit (T169).
 - b. Bearing (2) in liner (7): **Roller or impression stake liner to cap lug (8) on side with shoulder in liner (7). On opposite side, swage liner to both bearing and cap lug.** Use Roller Swage Sleeve Staking method or Circumferential Line Impression staking method (TM 55-1500-322-24). Use roller staking kit (T169) where applicable.
13. **Stake bearing (3) to piston lug (9)** with Outer Ring Groove Staking method (TM 55-1500-322-24).

INSPECT**GO TO NEXT PAGE**

14. If bearing (2 or 3) was staked directly into lug (8 or 9), stamp an "X" into the lug near the staking.
15. **Touch up reworked areas** of strut (1). Use primer (E292) and polyurethane paint (E285.3). Wear gloves (E184.1).



FOLLOW-ON MAINTENANCE:
None

END OF TASK

3-86.2 Change 15

3-41.1 REMOVE BUSHING FROM UPPER AFT LANDING GEAR MOUNT 3-41.1 STRUCTURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Bushing Removal/Installation
Tools (Appx E-40)

Materials:

None

Personnel Required:

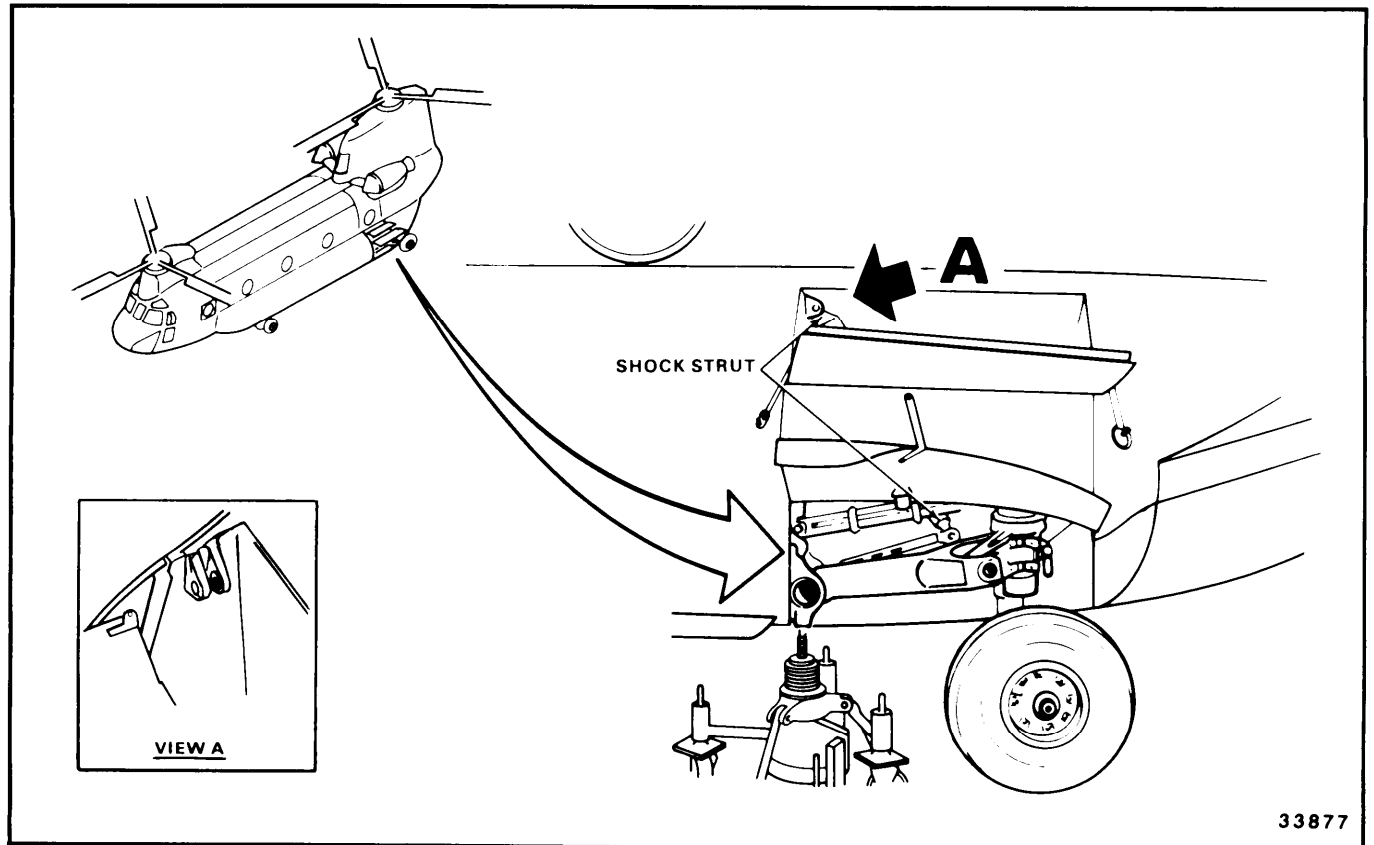
Medium Helicopter Repairer

References:

None

Equipment Condition:

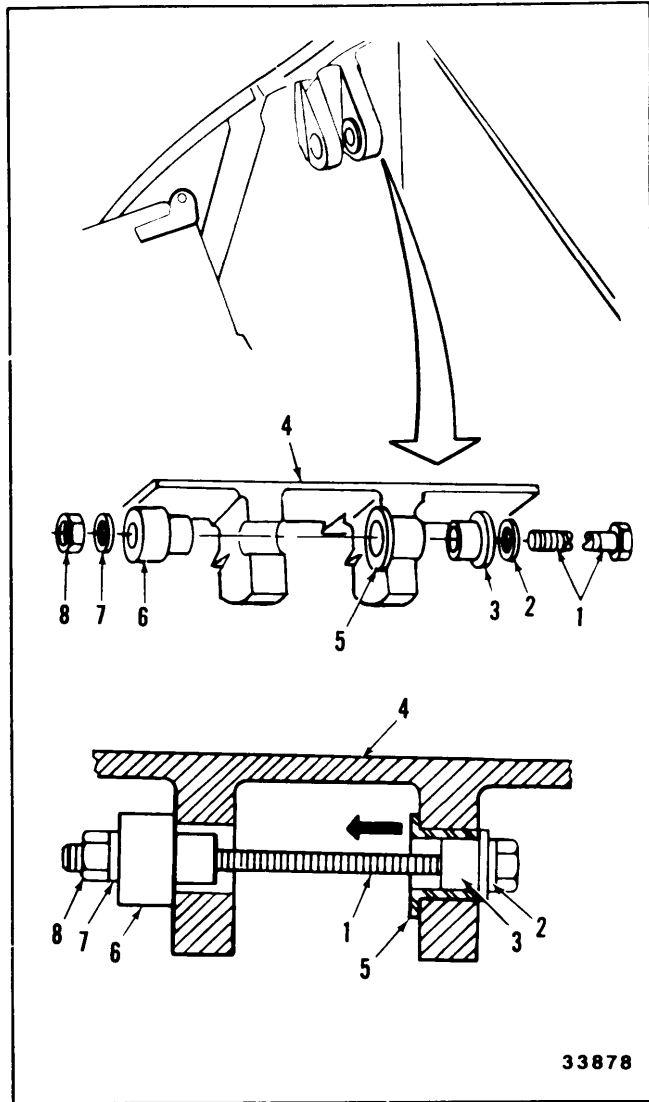
Battery Disconnected (Task 1-39)
Electrical Power Off
Aft Landing Gear Shock Strut Removed
(Task 3-40)



GO TO NEXT PAGE

3-41.1 REMOVE BUSHING FROM UPPER AFT LANDING GEAR MOUNT 3-41.1 STRUCTURE (Continued)

1. Install removal tool bolt (1), with washer (2) and sleeve plate (3) through fitting (4) at lug with bushing (5) to be removed.
2. Install spacer (6), washer (7), and nut (8) on bolt (1).
3. Hold bolt (1) from turning. Turn nut (8) to **pull bushing (5) out of fitting (4).**



FOLLOW-ON MAINTENANCE:

None

END OF TASK

3-86.4 Change 14

3-41.2 INSTALL BUSHING IN UPPER AFT LANDING GEAR MOUNT STRUCTURE

3-41.2

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Bushing Removal/installation
Tool (Appx E-40)
Container, 2-Quart

Materials:

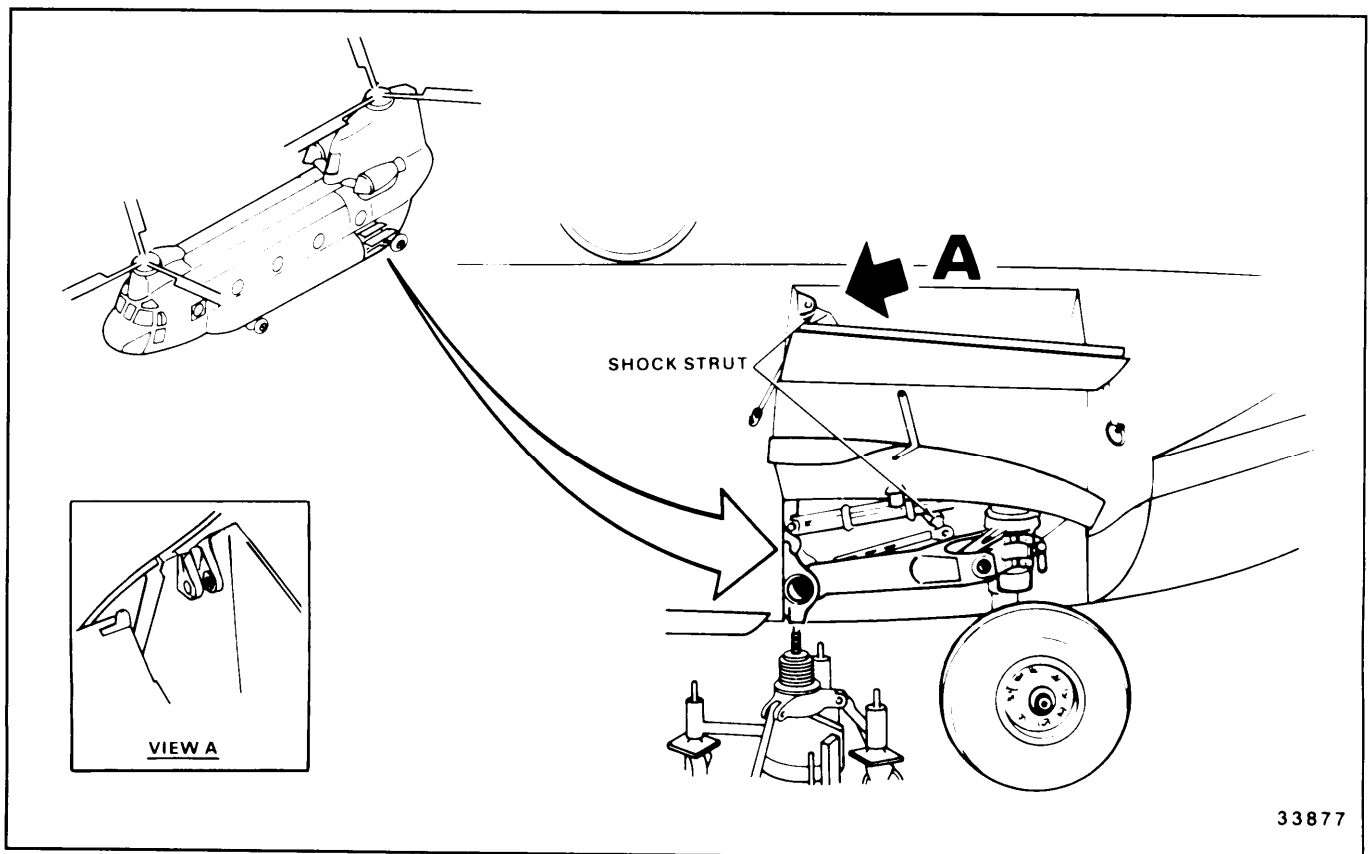
Cloths (E120)
Gloves (E186)
Methanol (E243)
Kevlar Gloves (E187)
Dry Cleaning Solvent (E162)
Zinc Chromate Primer (E291)
Carbon Dioxide (Dry Ice) (E92)

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P

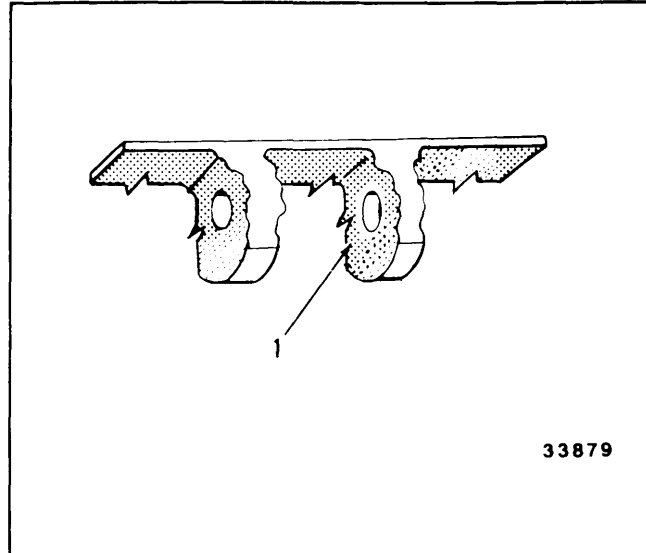


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PREPARE BEAM AND BUSHING**WARNING**

Dry cleaning solvent (E162) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.

1. Clean bushing mating surfaces of fitting (1). Use solvent (E162) and cloths (E120). Wear gloves (E186).

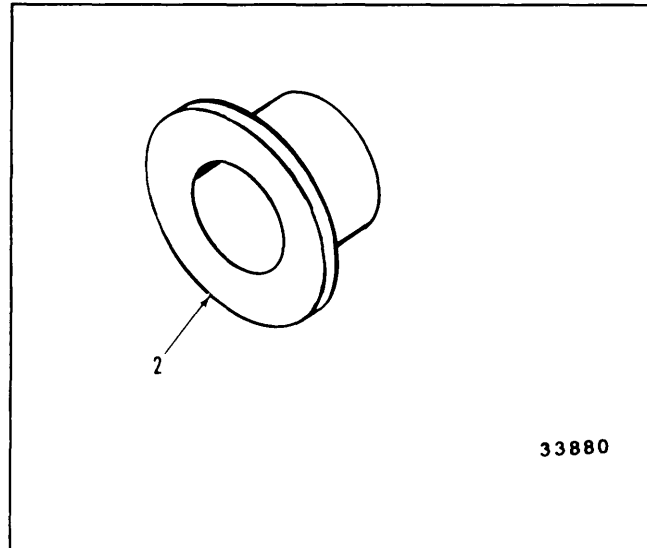
**WARNING**

- Carbon dioxide (dry ice) (E92) causes severe burns (frost bite) and gives off toxic fumes. Use only in well-ventilated area. Do not get in eyes, on skin, or clothing. In case of contact, immediately flush with water. Get medical attention for eyes.

- Methanol (E243) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.

- Dry ice (E92) in methanol (E243) has a temperature of 120°F (49°C). Observe all safety measures when working with dry ice (E92) and methanol (E243), and when handling chilled parts. Avoid breathing carbon dioxide vapor.

2. Place bushing (2) in carbon dioxide (dry ice) (E92) and methanol (E243). Wear gloves (E187). Wear goggles to protect eyes. Allow bushing to cool.

**GO TO NEXT PAGE**

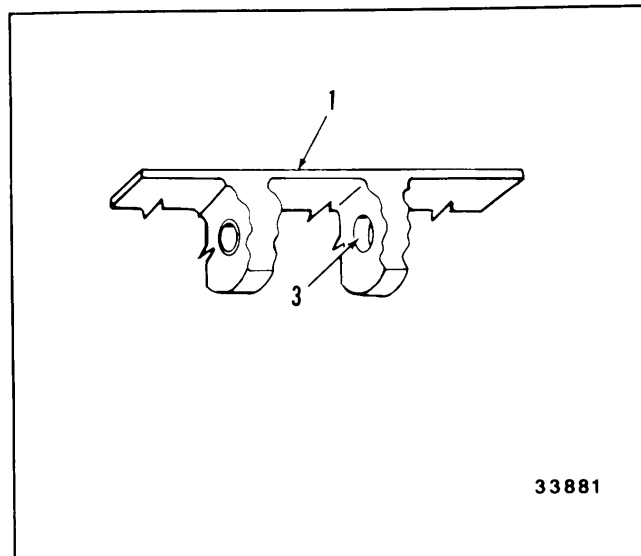
3-41.2 INSTALL BUSHING IN UPPER AFT LANDING GEAR MOUNT STRUCTURE (Continued)

3-41.21

WARNING

Zinc chromate primer (E291) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

3. Coat bushing bore (3) of fitting (1) with zinc chromate primer (E291). Wear gloves (E186).



INSTALL BUSHING

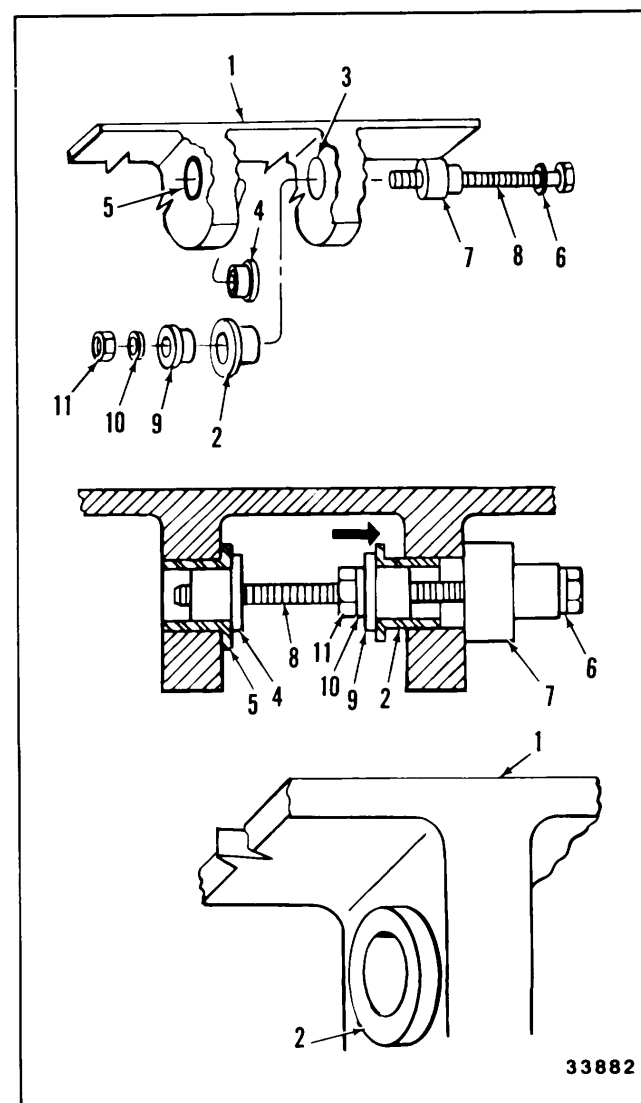
WARNING

Wear gloves (E187) when handling chilled bushing.

NOTE

Work quickly with chilled bushing. Bushing must be installed before it warms.

4. Remove bushing (2) from dry ice. Wear gloves (E187). Wear goggles to protect eyes.
5. While primer is wet, press bushing (2) into fitting (1) as follows:
 - a. Install one sleeve plate (4) in bore of bushing (5). Install washer (6) and spacer (7) on bolt (8), small end of spacer toward bolt head.
 - b. Install bolt (8) through bore (3). Install new bushing (2) and second sleeve plate (9) over bolt. Install washer (10) and nut (11) on bolt.
 - c. Insert end of bolt (8) in sleeve plate (4).
 - d. Hold bolt (8) from turning. Turn nut (11) to press bushing (2) into fitting (1) until shoulder touches fitting (1).
6. Remove nut (11), washers (6 and 10), spacer (7), sleeve plates (9 and 4), and bolt (8).



FOLLOW-ON MAINTENANCE:

Install Aft Landing Gear Shock Strut (Task 3-42).

END OF TASK

3-41 REPAIR AFT LANDING GEAR SHOCK STRUT (AVIM)**3-41****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Machine Shop Set,
NSN 4920-00-405-9279
Arbor Press
Roller Staking Kit (T169)

Materials:

Crocus Cloth (E 122)
Zinc Chromate Primer (E291)
Lacquer (E220)
Gloves (E 186)
Sealant (E345.1)

Parts:

Bearings
Liners (Appx E-53)

Personnel Required:

Machinist
Inspector

References:

TM 55-1520-240-23P
TM 55-1500-322-24
MIL-R-46082

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

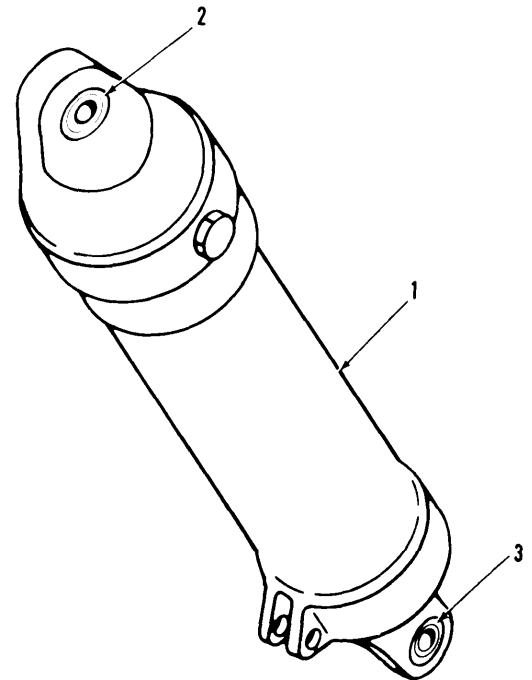
Acetone (E20), zinc chromate primer (E291) and lacquer (E220) are flammable and give off toxic fumes. They can irritate skin and cause burns. Use only in well-ventilated area away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Same procedure is used to repair left or right shock strut

REPAIR STRUT SURFACE

- 1 Remove minor nicks, burrs, scores, scratches and pits on shock strut (1). Use crocus cloth (E 122),
- 2 Touch up reworked areas with primer (E291) and lacquer (E220). Wear gloves (E 186).
3. **Check condition of bearings (2 and 3).** If bearings are good, go to Follow-On Maintenance. **If either bearing must be replaced, go to step 4.**



10133

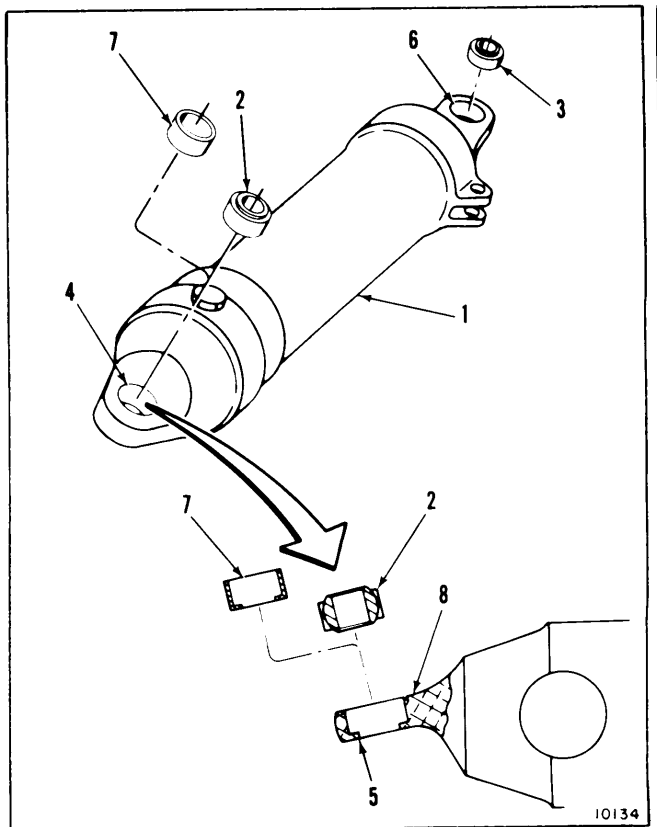
GO TO NEXT PAGE

REMOVE BEARINGS

4. Place strut (1) in an arbor press. Use the press to remove bearing (2 or 3) (TM 55-1500-322-24). Note that cap bore (4) has a shoulder (5) that requires bearing (2) to be removed in one direction only.
5. Clean cap bore (4) and piston bore (6). Use acetone (E20) and clean cloths (E 120).

REPAIR BEARING BORE

6. Measure diameter of bore (4) at several places. If all measured diameters of bore are 1.3745 inches or less, go to step 9. If diameter at any one place is over 1.3745 inches, repair bore as in step 8.
7. Measure diameter of bore (6) at several places. If all measured diameters of bore are 1.4378 inches or less, go to step 9. If diameter at any one place is over 1.4378 inches, reject strut (1).
8. Repair cap bore (4) as follows:
 - a. Drill out cap bore (4) to 1.4940 to 1.4945 inches.
 - b. Chamfer both sides of bore (4) 0.022 to 0.042 inch by 45 degrees.

**INSPECT**

- c. Coat liner (7) (E-55) with zinc chromate primer (E291). Wear gloves (E186).

CAUTION

Liner must be installed as shown. Otherwise, it may fail in use.

- d. Install liner (7) wet with primer in bore (4), with shoulder (5) as shown. Use arbor press, (TM 55-1 500-322-24). Press liner in flush with cap lug (8).

GO TO NEXT PAGE

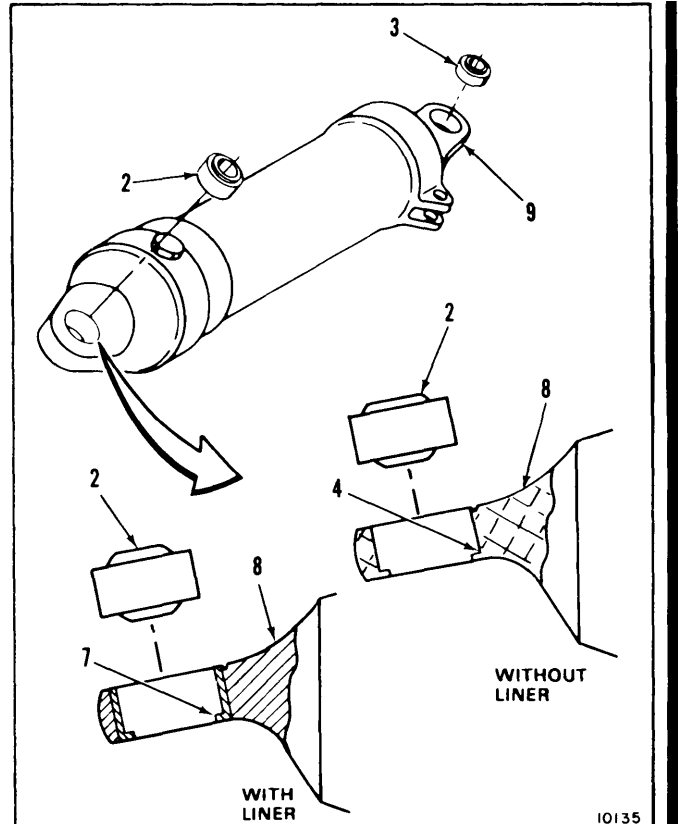
INSTALL BEARINGS

NOTE

Cap lug bearing may be installed within liner or directly within cap lug bore. Piston bearing is installed directly within piston lug bore.

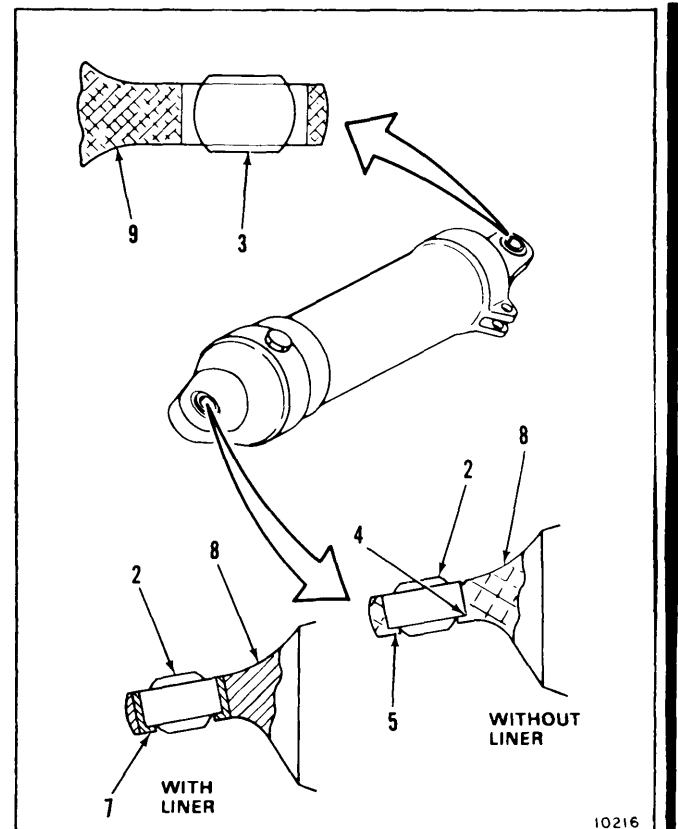
9. **Clean bearings (2 and 3) and mating surfaces** of cap bore (4) or liner (7) and piston bore (5). Use acetone (E20).
10. **Apply sealant (E345.1)** to mating surfaces of bearings (2 and 3), bore (4) or liner (7) and bore (5) (MIL-R-46082).
11. **Install bearing (2)** in bore (4) or liner (7). Install bearing (3) in bore (5). Use arbor press (TM 55-1500-322-24). Installed bearings shall be **flush with lugs (8 and 9)**.

INSPECT



12. **Stake bearing (2) or liner (7) to cap lug (8)** as follows:
 - a. Bearing (2) in bore (4): Roller stake cap lug (8) over bearing on side opposite shoulder (5) only. Use Roller Swaged Housing Staking method (TM 55-1500-322-24). Use roller staking kit (T 169).
 - b. Bearing (2) in liner (7): **Roller or impression stake liner to cap lug (8) on side with shoulder in liner (7). On opposite side, swage liner to both bearing and cap lug.** Use Roller Swage Sleeve Staking method or Circumferential Line Impression staking method (TM 55-1500-322-24). Use roller staking kit (T 169) where applicable.
13. **Stake bearing (3) to piston lug (9)** with Outer Ring Groove Staking method (TM 55-1500-322-24).

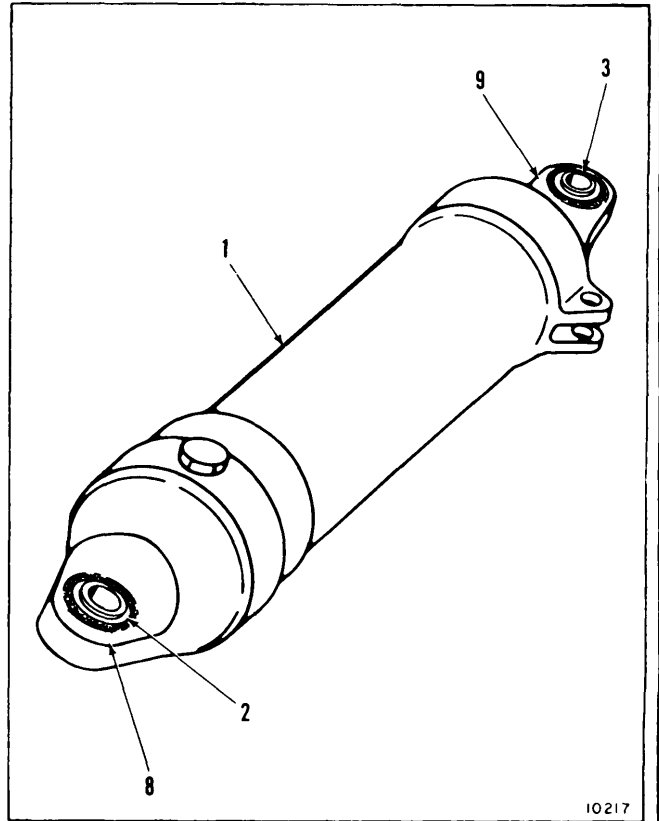
INSPECT



GO TO NEXT PAGE

3-41 REPAIR AFT LANDING GEAR SHOCK STRUT (AVIM) (Continued) 3-41

14. If bearing (2 or 3) was staked directly into lug (8 or 9), stamp an "X" into the lug near the staking.
15. **Touch up reworked areas** of strut (1). Use primer (E291) and lacquer (E220). Wear gloves (E 186).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

3-86.2 Change 5

3-42 INSTALL AFT LANDING GEAR SHOCK STRUT

3-42

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Torque Wrench, 0 to 160 Foot-Pounds
- Torque Wrench, 100 to 750 Inch-Pounds
- Socket, 1 -Inch
- Wrench, 1 1/16-inch
- Wrench, 1 1/8-inch
- Container, Two Quart

Materials:

None

Parts:

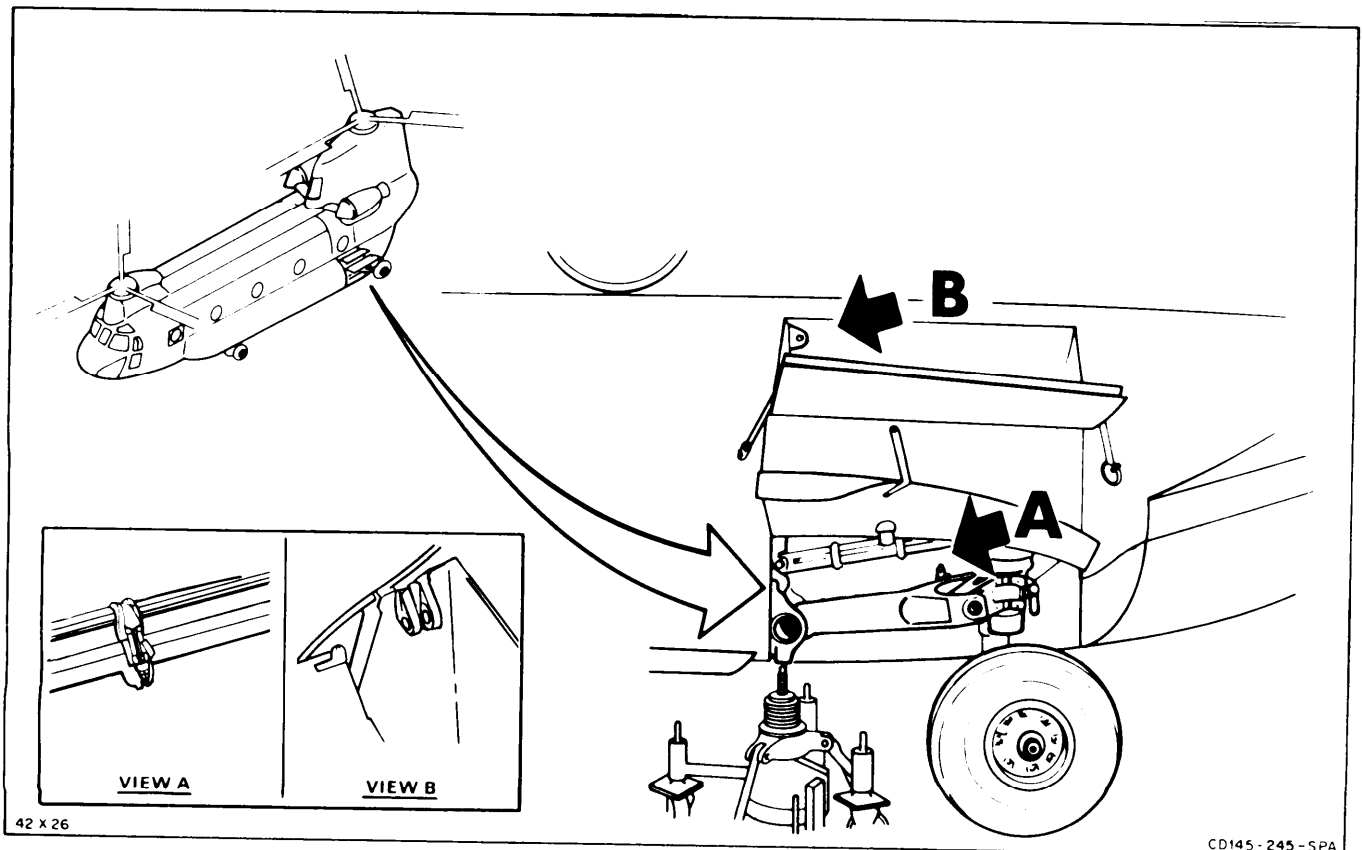
Cotter Pins

Personnel Required:

- 67U10 Medium Helicopter Repairer
- 67U20 Medium Helicopter Repairer
- 67U30 Inspector

References:

TM 55-1520-240-23P



42 x 26

CD145-245-SPA

GO TO NEXT PAGE

3-42 INSTALL AFT LANDING GEAR SHOCK STRUT (Continued)

NOTE

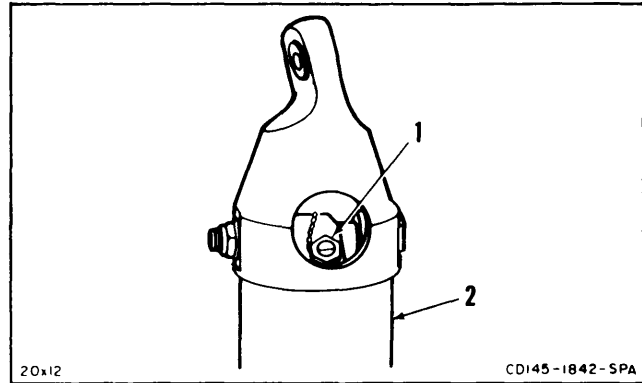
Procedure is same for left or right shock strut. Left strut is shown here.

PREPARE SHOCK STRUT

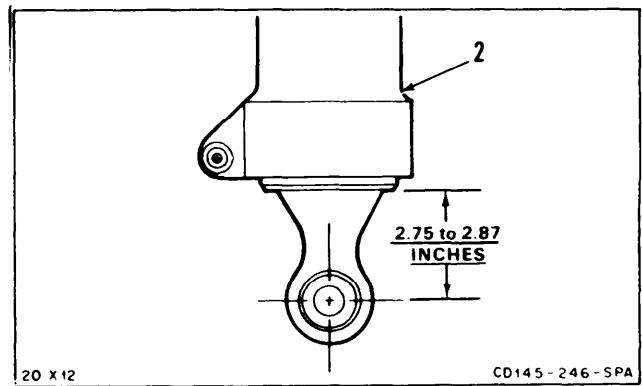
NOTE

If replacement shock strut is to be installed, drain preservative fluid from strut.

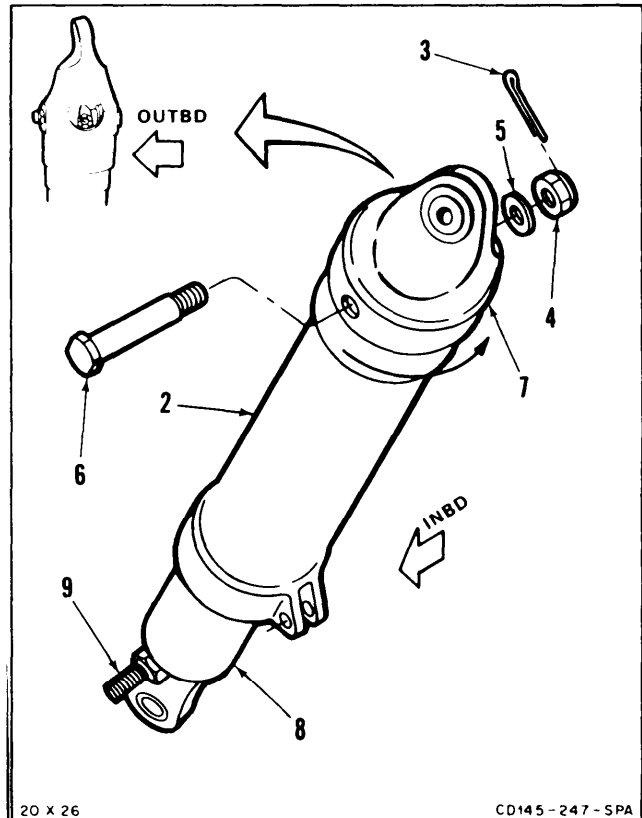
1. Remove lockwire and filler plug (1). Turn shock strut (2) upside down to drain fluid from strut. Use container for fluid.



2. Collapse shock strut (2) to be installed. Check dimension of strut as shown. Dimension of strut shall be within 2.75 to 2.87 inches.



3. If shock strut (2) is to be installed on right gear, remove cotter pin (3), nut (4), washer (5), and bolt (6) from cap (7). Turn cap 180 degrees on shock strut.
4. Install bolt (6), washer (5), and nut (4). Torque nut to 200 to 250 inch-pounds. Install new cotterpin (3).
5. On left gear, turn piston (8) in strut (2) so air valve (9) is on inboard side with strut installed.
6. On right gear, turn piston (8) in strut (2) so air valve (9) is on outboard side with strut installed.



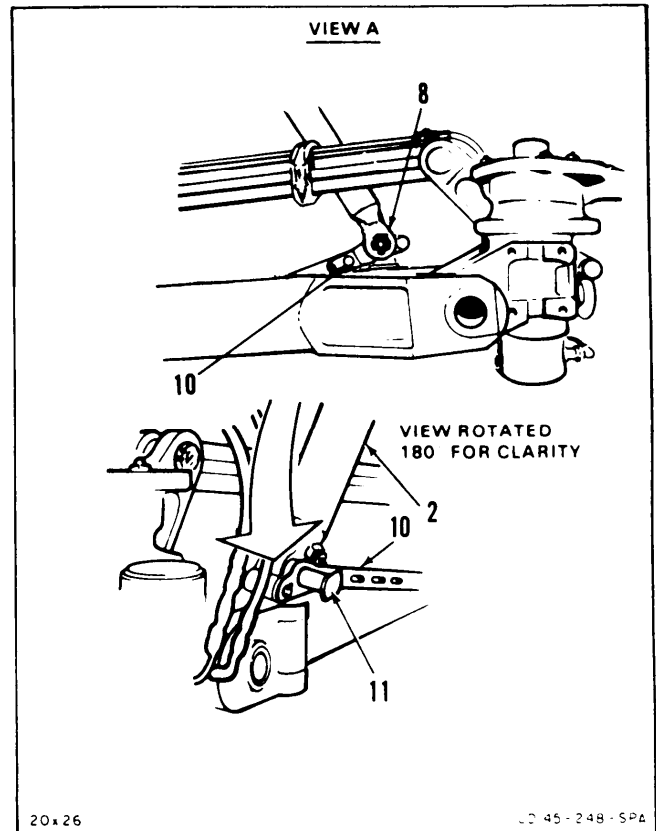
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3-42 INSTALL AFT LANDING GEAR SHOCK STRUT (Continued)

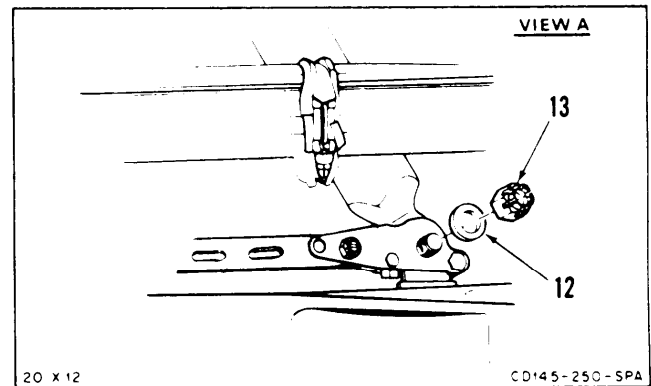
7. Install piston (8) in static lock mechanism (10).

INSTALL SHOCK STRUT BOLTS

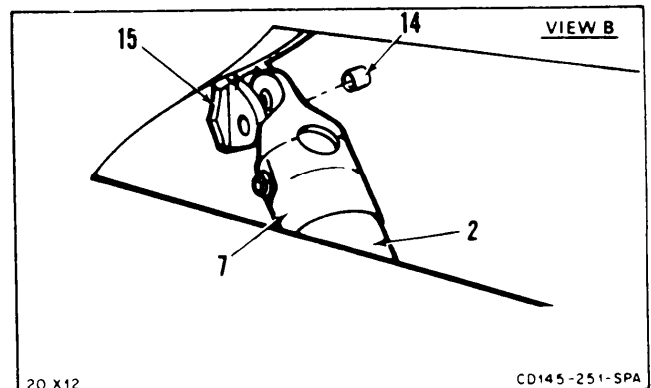
8. Install bolt (11) through static lock mechanism (10) and strut (2) from inboard side.



9. Install washer (12) and nut (13). Do not tighten nut.

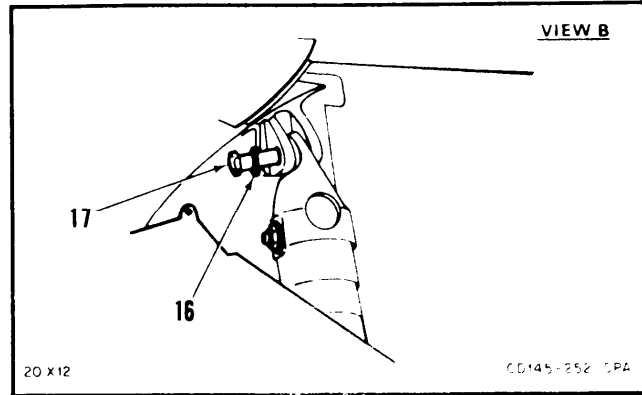


10. Install bushing (14) in upper attach fitting (15).
11. Extend strut (2). Align cap (7) with upper attach fitting (15).



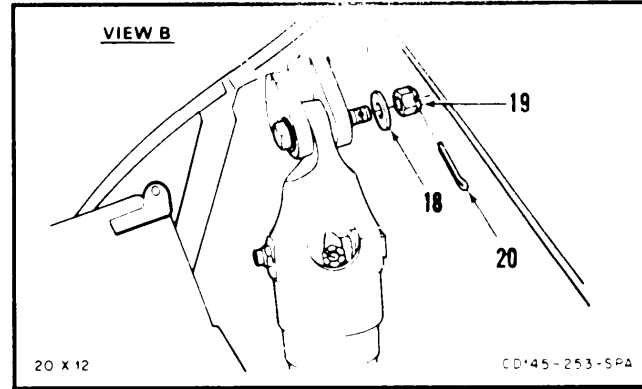
GO TO NEXT PAGE

12. Install washer (16) and bolt (17).



INSTALL AND TORQUE NUTS

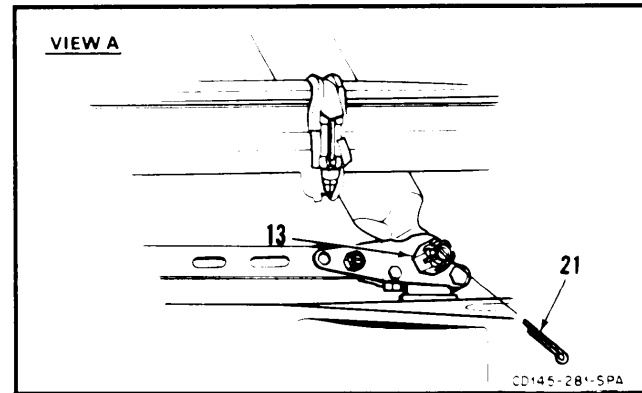
13. Install washer (18) and upper nut (19).
 14. Torque upper nut (19) to 50 to 100 foot-pounds.
 15. Install cotter pin (20).



NOTE

Clearance must exist between shock strut and attachment fitting. Damage other than minor requires replacement of fitting.

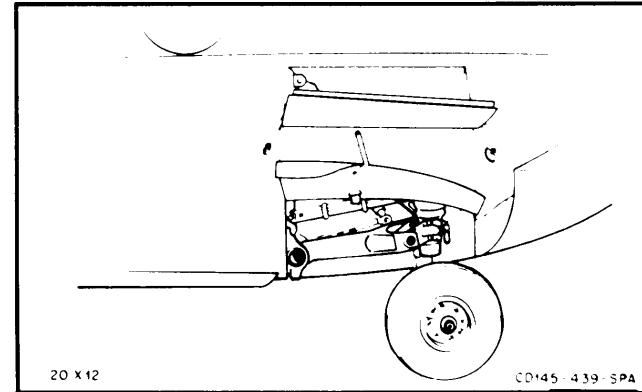
16. Torque lower nut (13) to 350 to 500 inch-pounds.
 17. Install cotter pin (21).



INSPECT

FOLLOW-ON MAINTENANCE:

- Service shock strut (Task 1-72).
- Lower and remove jack (Task 1-24)
- Close access panels (Task 2-2).
- Close engine work platform (Task 2-2),



END OF TASK

3-42.1 REPLACE AFT LANDING GEAR SHOCK STRUT VALVE**3-42.1****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

Lockwire (E231)

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

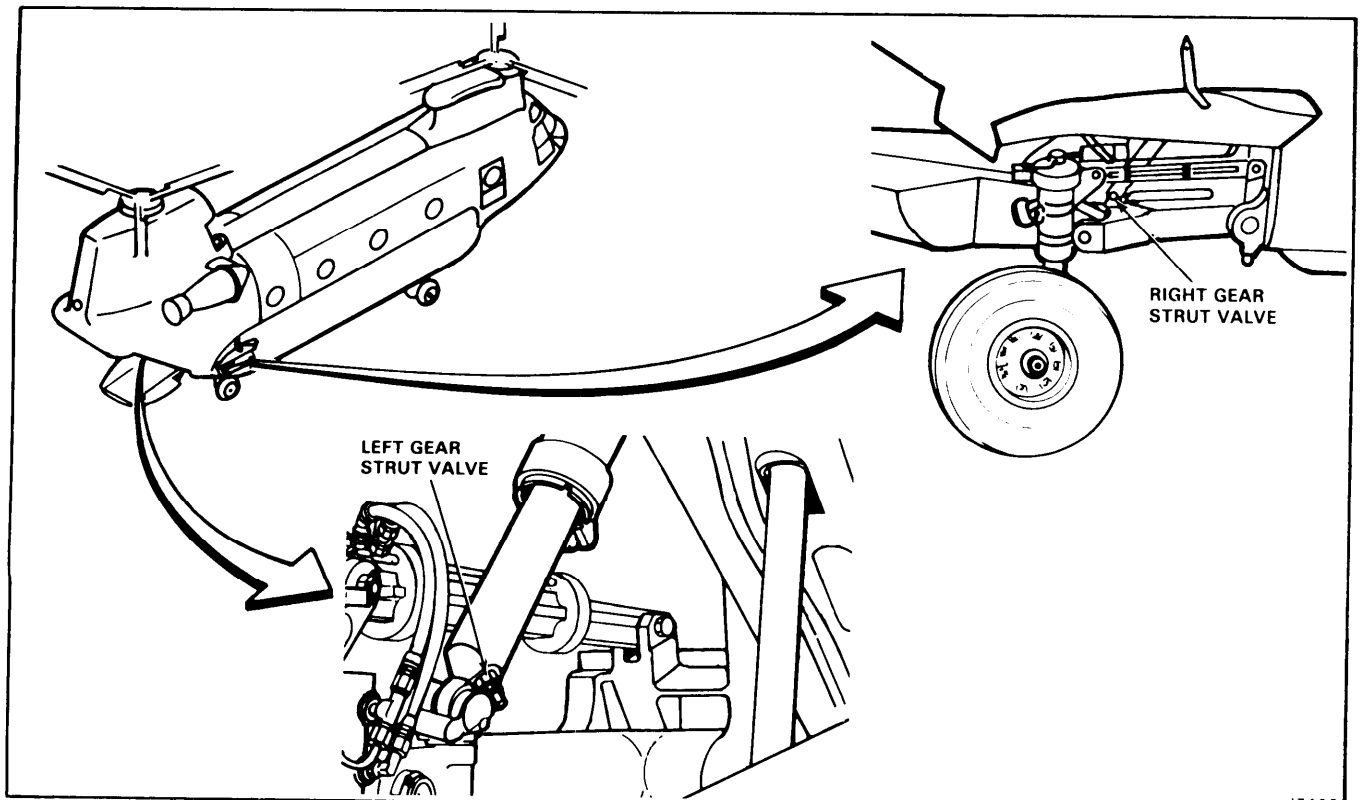
TM 55-1520-240-23P

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Cargo Ramp Open (TM 55-1520-240-T)
Aft Right Landing Gear Access Panel Open
(Task 2-2)
Weight Supported on Jack and Static Lock
Mechanism Engaged (Task 1-24)

NOTE

Procedure is same for aft left and
right shock strut valves.



13409

GO TO NEXT PAGE

Change 8

3-90.1

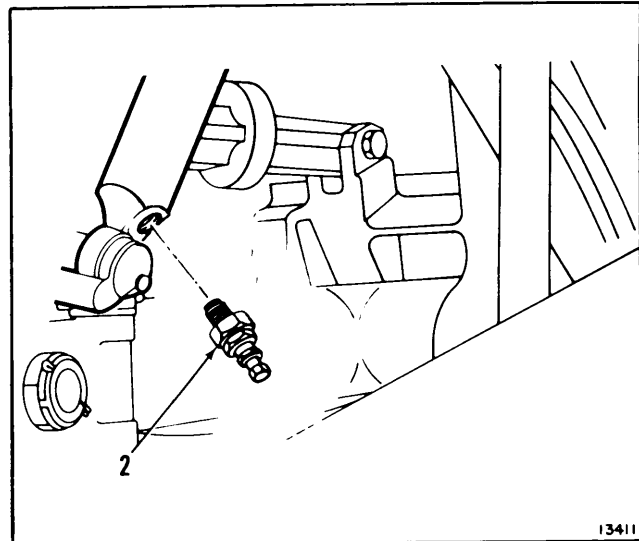
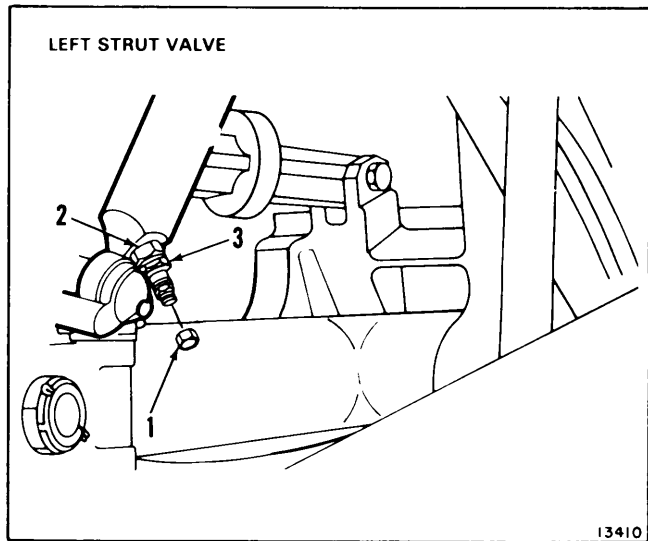
3-42.1 REPLACE AFT LANDING GEAR SHOCK STRUT VALVE
(Continued)

3-42.1

WARNING

High pressure air trapped under valve cap can be a hazard. Remove cap slowly or it may pop off and cause injury.

1. Loosen valve cap (1) slowly. Remove cap from valve (2).
2. Hold body of valve (2) stationary with wrench. Turn nut (3) counterclockwise one half to one and one half turns.
3. Allow air pressure to discharge completely.
4. Remove lockwire from valve (2).
5. Turn valve (2) counterclockwise and remove.



NOTE

Check that replacement valve contains packing in groove next to thread.

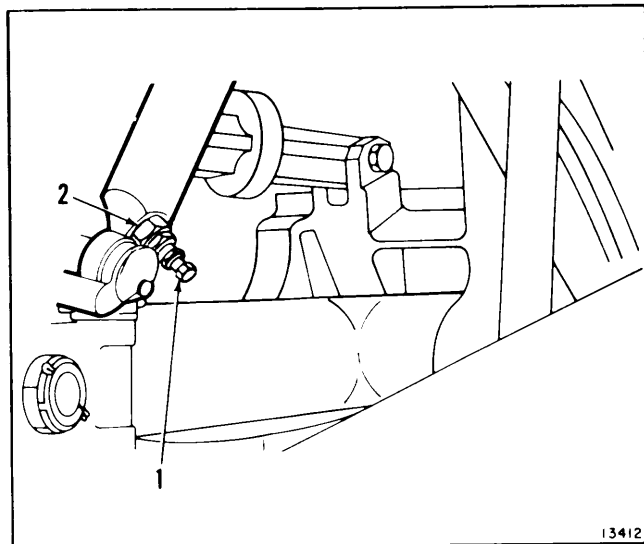
6. Install replacement valve (2).
7. **Torque valve (2) to 115 inch-pounds.**
8. Lockwire (E231) valve (2).
9. Install cap (1).

INSPECT

FOLLOW-ON MAINTENANCE:

Service aft landing gear shock strut (air)
 (Task 1-72)

Disengage static lock mechanism and remove jack (Task 1-24).



END OF TASK

3-43 REMOVE LOWER DRAG LINK**3-43****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Slide Hammer
Socket, 2 1/8-inch
Socket Wrench Handle, 3/4-inch Drive
1 1/2-inch Box End Wrench

Materials:

Chock Blocks

Personnel Required:

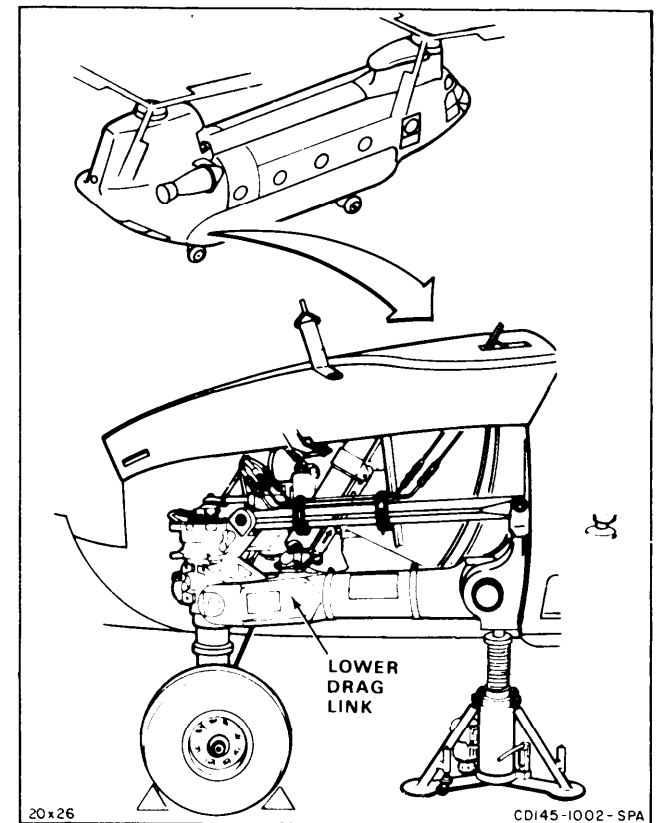
67U10 Medium Helicopter Repairer (2)

References:

Task 3-61

Equipment Condition:

Battery Disconnected (Task 1-39)
Aft Landing Gear Access Panels Open (Task 2-2)
Electrical Power Off
Hydraulic Power Off
Helicopter Jacked at Aft Fuselage Jack Pad
(Task 1-24)
Shock Strut Deflated (Task 1-72)
Static Lock Unlocked



20x26

CDI45-1002-SPA

NOTE

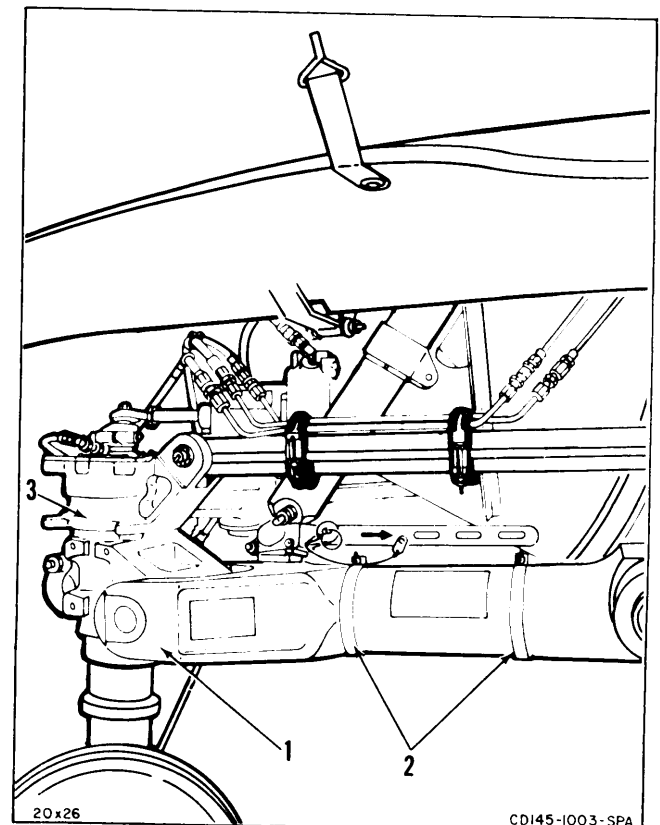
Procedure is same for left or right gear except for differences noted in task. Right gear is shown here.

1. **Chock wheels** fore and aft to prevent any movement.
2. If a right drag link (1) is being removed, **remove two clamps** (2).

NOTE

Do not remove wheel or brake for this procedure,

3. **Remove swivel housing and spindle** (3) (Task 3-61).



20x26

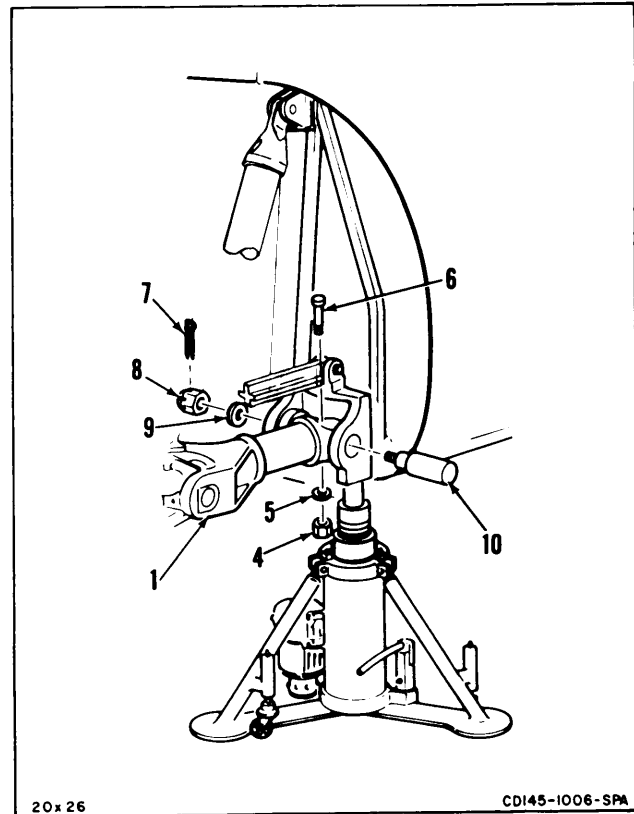
CDI45-1003-SPA

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3-43 REMOVE LOWER DRAG LINK (Continued)

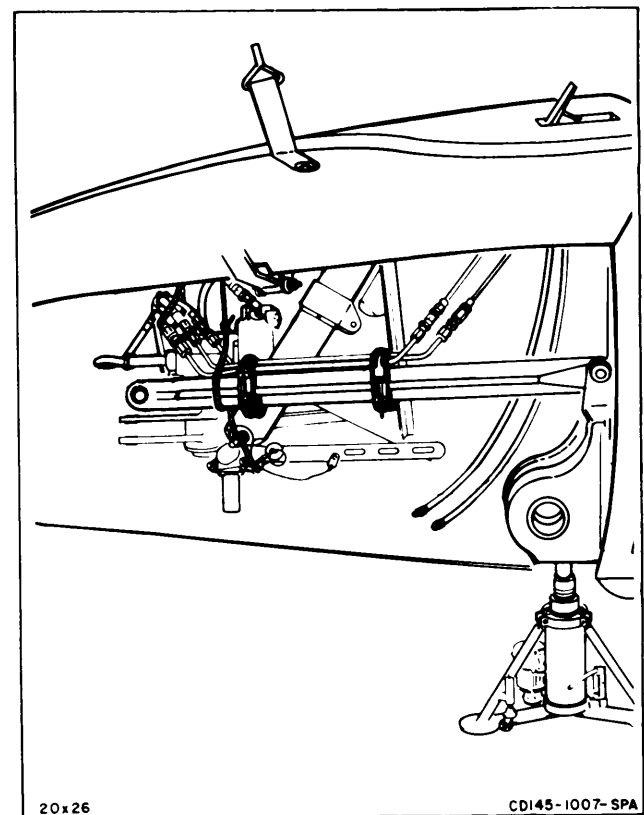
3-43

4. Remove nut (4), washer (5), and bolt (6).
5. Remove cotter pin (7), nut (8), and washer (9) from trunnion pin (10).
6. Have a helper hold link (1).
7. Using a slide hammer, drive trunnion pin (10) from link (1). Remove link.



FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-44 DISASSEMBLE LOWER DRAG LINK (AVIM)**3-44****INITIAL SETUP****Applicable Configurations:**

All

Tools:Machine Shop Set,
NSN 4920-00-405-9279

Arbor Press

■ Kevlar Gloves (E187)

Gun Heater

Materials:

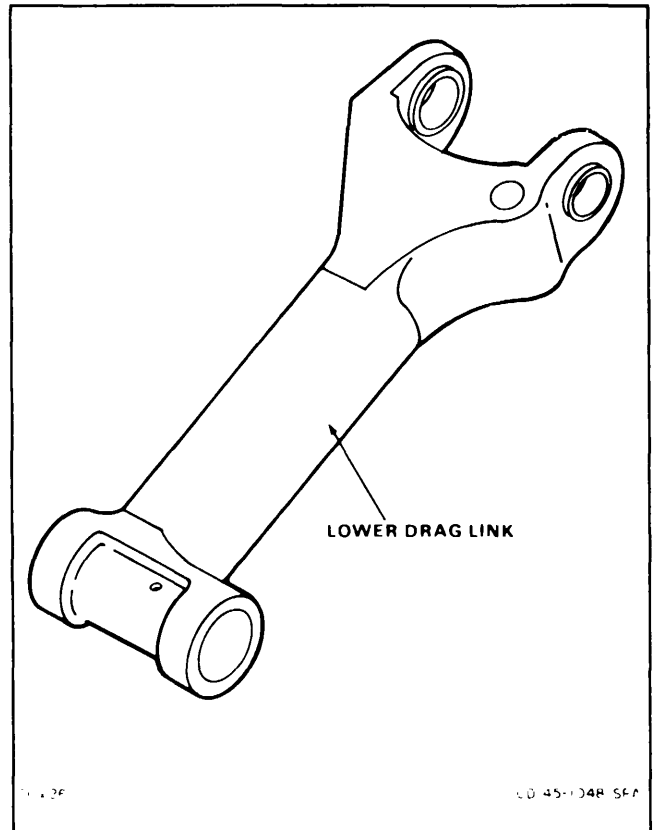
Temperature Indicating Strips (E413)

Personnel Required:

■ Machinist

Equipment Condition:

Off Helicopter Task

**NOTE**

Procedure is same for left or right landing gear lower drag link.

1. Position lower drag link (1) in arbor press. Press bushings (2) from link.

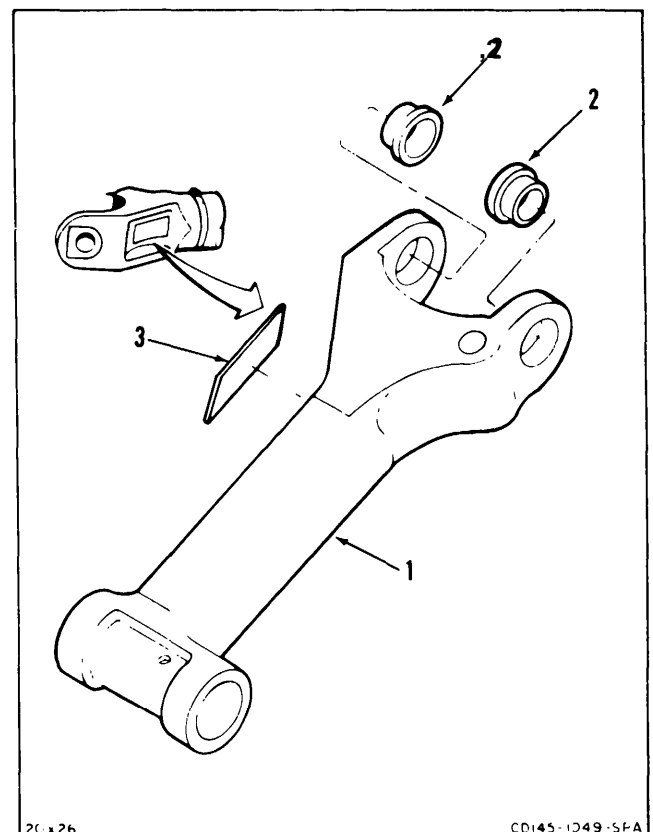
WARNING

■ Wear Kevlar gloves when handling heated parts. Injury to personnel can result. If burned, flush with water. Get medical attention.

2. If press is not available, heat link (1) to 230 to 250°F (110 to 120°C). Use gun type heater. Monitor temperature. Use temperature indicating strips (E413).
3. If necessary, drive bushings (2) from link, use hammer and blunt punch.
4. If instruction plate (3) is damaged or plate cannot be read, **remove plate from strut.**

FOLLOW-ON MAINTENANCE.

None

END OF TASK

3-45 INSPECT LOWER DRAG LINK PARTS (AVIM)

3-45

INITIAL SETUP

Materials:

Applicable Configurations:

None

All

Personnel Required:

Inspector

Tools:

Equipment Conditions:

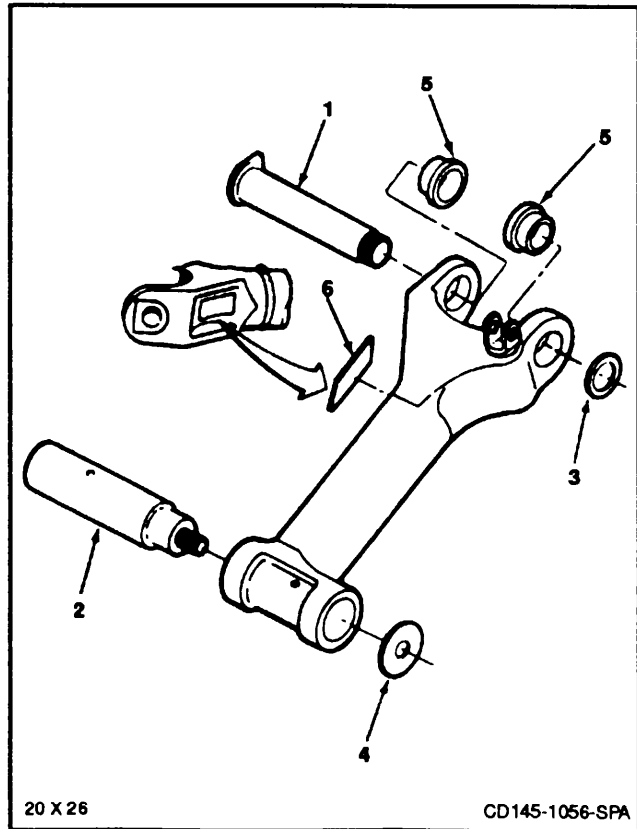
Technical Inspection Tool Kit,
NSN 5180-00-323-5114

Off Helicopter Task
Lower Drag Link Disassembled (Task 3-44)

NOTE

Inspection is same for left or right lower drag link. Right link is shown here.

1. **Check fulcrum pin (1) and trunnion pin (2).** There shall be no distortion, cracks, severe nicks, scoring, or damaged thread.
2. **Check washers (3 and 4) and two bushings (5).** There shall be no cracks, scratches, nicks, scoring, or pitting.
3. **Check Instruction plate (6).** If plate is damaged or cannot be read, replace plate.

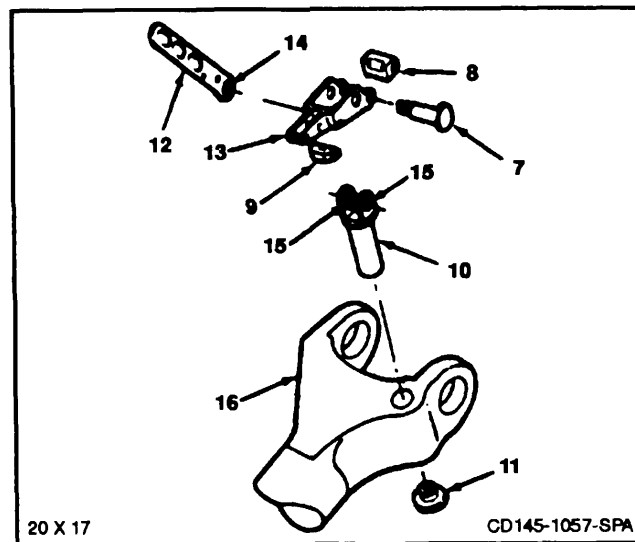


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3-45 INSPECT LOWER DRAG LINK PARTS (AVIM) (Continued)

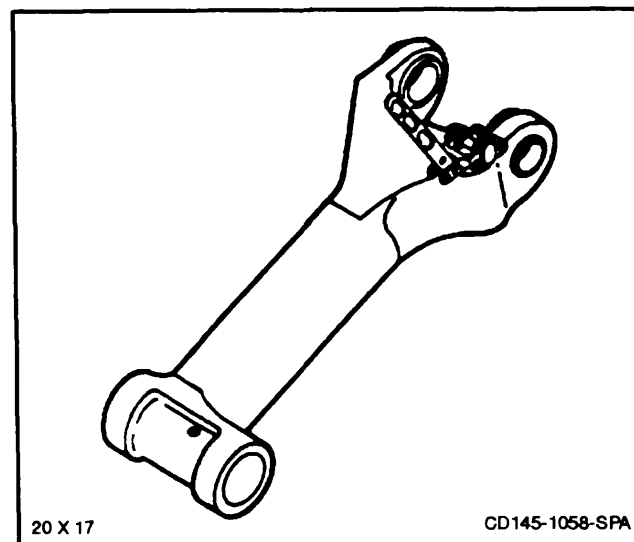
3-45

4. **Check bolt (7).** There shall be no distortion, cracks, nicks, scoring, or damaged thread.
5. **Check shock strut attachment spacer (8) and static lock spacer (9).** There shall be no cracks, distortion, scratches, nicks, scoring, or pitting.
6. **Check fitting (10), and retainer (11).** There shall be no cracks, scratches, scoring, or damaged thread.
7. Check static lock mechanism (12) and fork (13). There shall be no cracks or distortion.
8. **Check bearing (14) and bushing (15).** There shall be no cracks, scratches, nicks, or scoring.
9. **Check lower link (16).** There shall be no cracks, scratches, nicks, or scoring, or excessive play. Play that will not affect the normal operation of the landing gear is acceptable.



FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Machine Shop Set,
NSN 4920-00-405-9279

Materials:

Crocus Cloth (E122)
Epoxy Primer (E292.1)
Polyurethane Paint (E285.3)
Gloves (E184.1)

Personnel Required:

Machinist
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Off Helicopter Task

NOTE

Procedure is same to repair left or right lower drag link.

1. Remove minor nicks, burrs, scoring, scratches, or pitting on parts (1 thru 10) with crocus cloth (E122).

WARNING

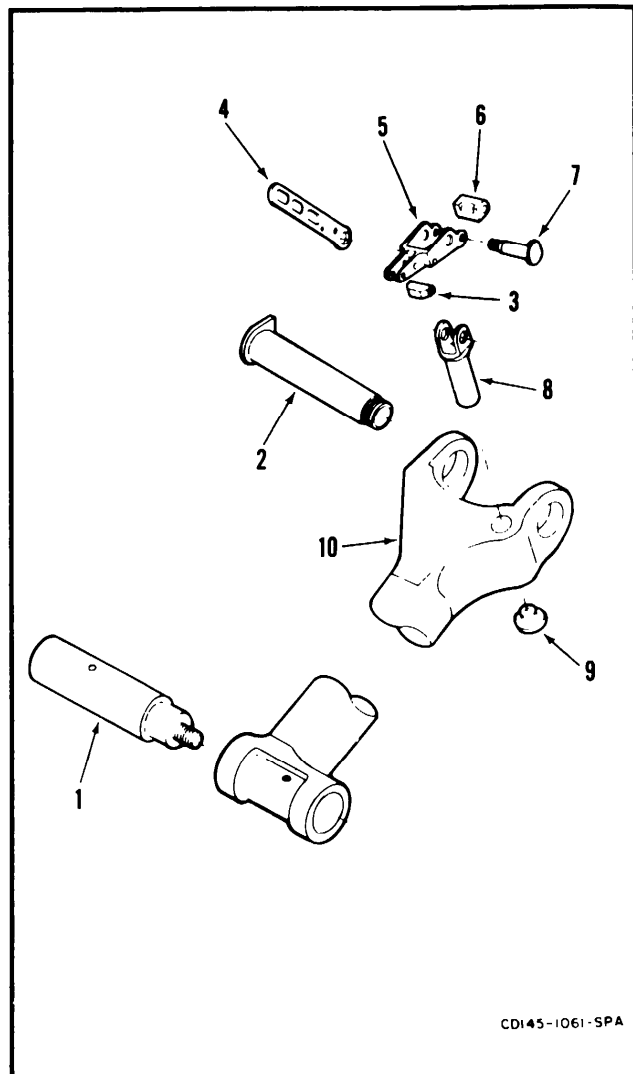
Epoxy primer (E292.1) and polyurethane paint (E285.3) are flammable and toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, and open flame. In case of contact immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

2. Touch up damaged finish with primer (E292.1) and polyurethane paint (E285.3). Wear gloves (E184.1).

INSPECT

FOLLOW-ON MAINTENANCE:

None



CD145-1061-SPA

END OF TASK

3-47 ASSEMBLE LOWER DRAG LINK (AVIM)**3-47****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Machine Shop Set
 NSN 4920-00-405-9279
 Arbor Press
 Reamer with 1.876 to 1.877 Inch Capability
 Vernier Caliper, 244-Inch
 Gun Type Electric Heater

Materials:

- Epoxy Primer (E292)
 Adhesive (E43)
 Temperature Indicating Strips (E413)
- Gloves (E184.1)
 Kevlar Gloves (E187)

Parts:

Bushings
 Instruction Plate

Personnel Required

Machinist
 Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Off Helicopter Task

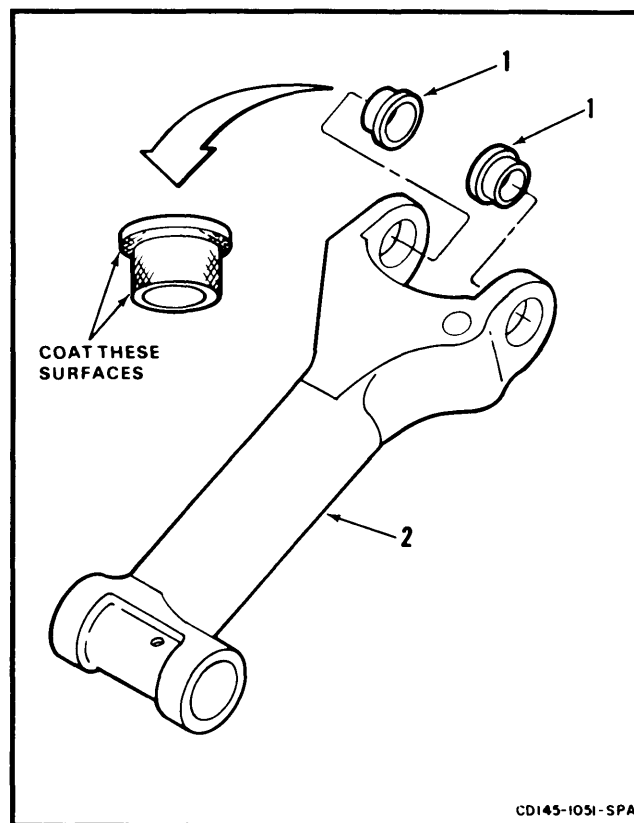
WARNING

Epoxy primer (E292) 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.

NOTE

Procedure is same for left or right landing gear lower drag link.

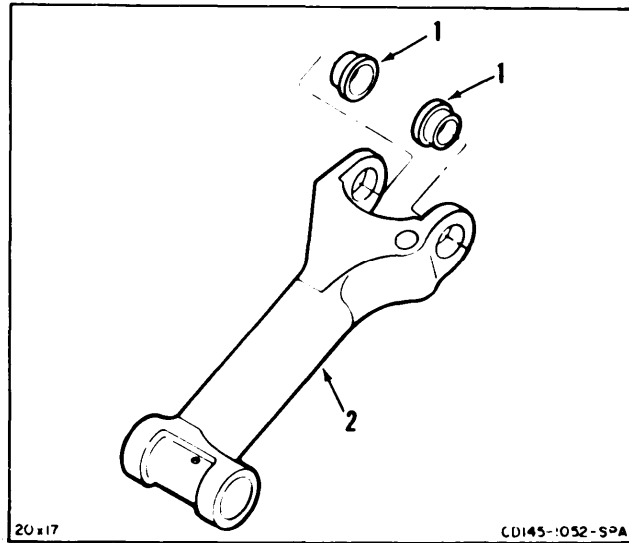
1. Coat contact surfaces of new bushings (1) with primer (E292). Wear gloves (E184.1).
2. While primer is wet, **install bushings (1) in drag link (2)**. Use arbor press.

**GO TO NEXT PAGE**

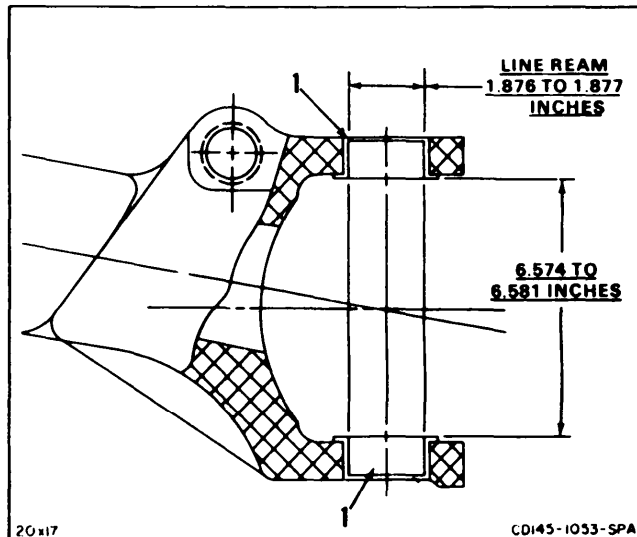
WARNING

Wear Kevlar gloves when handling heated parts. In case of burn immediately flush with plenty of water. Get medical attention immediately.

3. If a press is not available, heat lower link (2) to 230 to 250°F (110 to 120° C). Use gun type heater. Monitor temperature. Use temperature indicating strips (E413). Install bushings (1) in drag link (2). Use hammer and blunt punch.



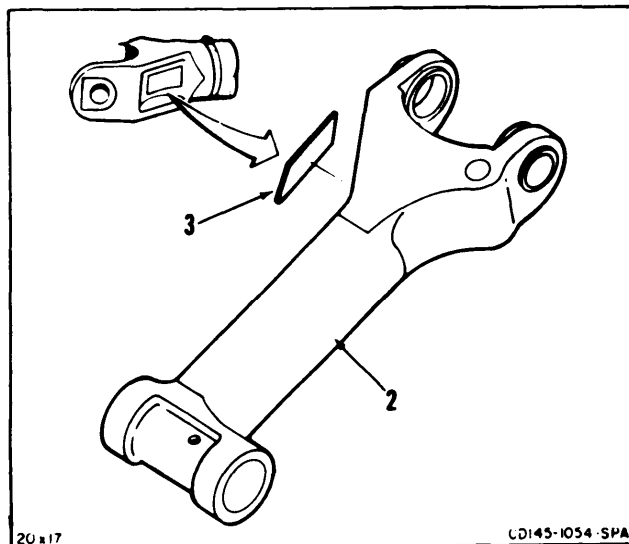
4. Line ream bushings (1) to an inside diameter of 1.876 to 1.877 inches.
5. Check that measurement of 6.574 to 6.581 inches is maintained between bushings (1).



6. If instruction plate (3) has been removed, install on lower link (2) using adhesive (E43).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-48 INSTALL LOWER DRAG LINK**3-48**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds
Torque Wrench, 100 to 750 Inch-Pounds
Socket Wrench Handle, 3/4-inch Drive
Socket, 2 1/8-inch

Materials:

Grease (E 190)

Parts:

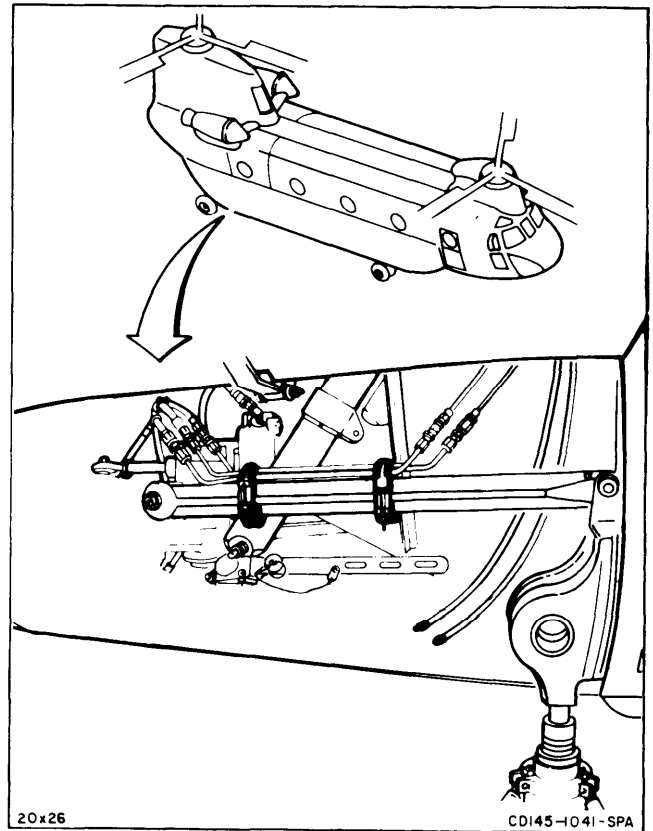
Cotter Pins

Personnel Required:

■ Medium Helicopter Repairer (2)

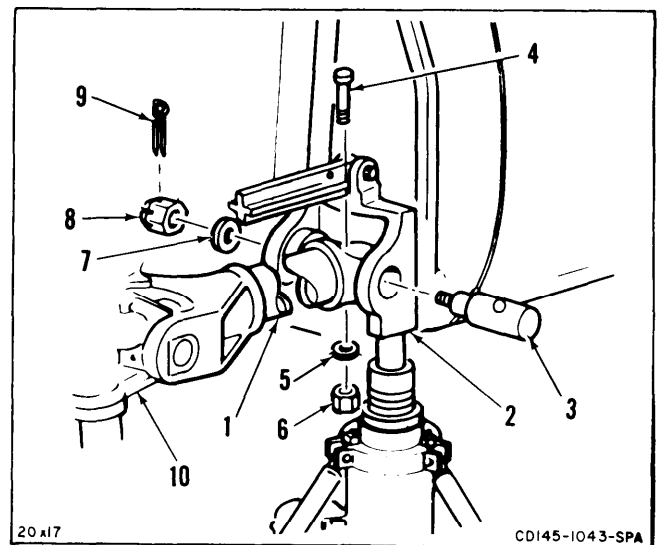
References:

TM 55-1520-240-23P
Task 3-66

**NOTE**

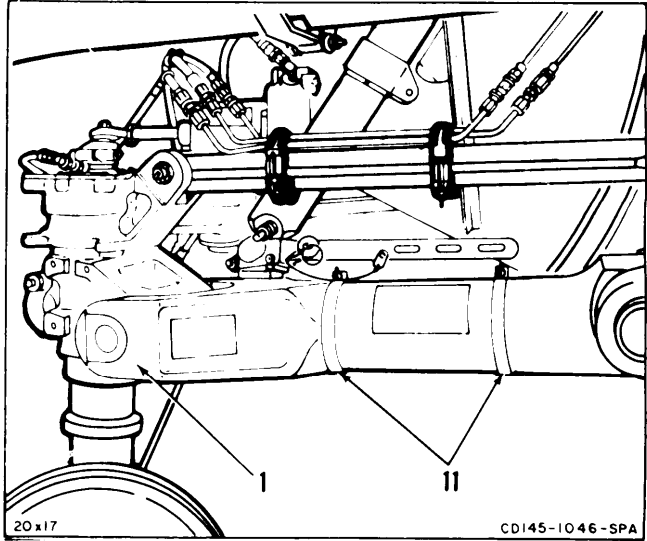
Procedure is same for left and right gear except for differences noted in task.

1. Have helper **position lower drag link (1)** in trunnion (2).
2. **Lubricate trunnion pin (3)** using grease (E 190). Install pin through trunnion (2) and link (1).
3. Have helper lift and support link (1) at angle required to install bolt (4). **Install bolt** through link (1) and trunnion pin (3). Secure bolt with washer (5) and nut (6). **Torque nut to 100 inch-pounds.**
4. **Install washer (7) and nut (8)** on pin (3). Torque nut to **50 to 500 inch-pounds.** Install cotter pin (9).
5. **Install swivel housing and spindle (10)** (Task 3-66).

**GO TO NEXT PAGE**

3-48 INSTALL LOWER DRAG LINK (Continued) **3-48**

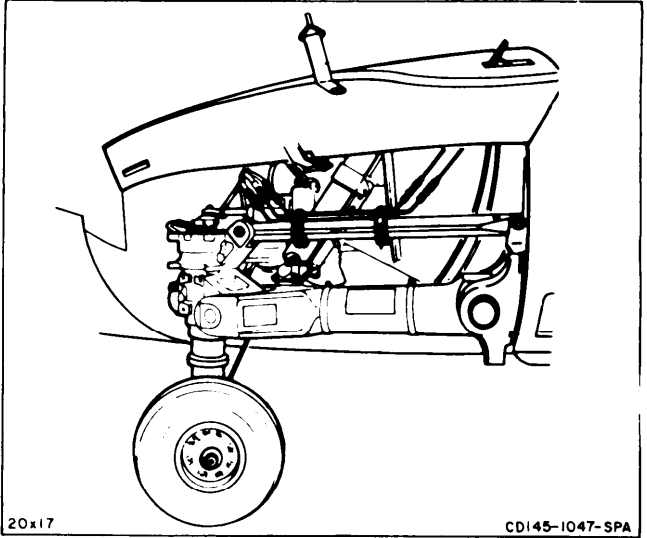
- 6 If right drag link (1) is being installed, **install two clamps (11)** and wiring harness on link (1),
- 7 **Remove chocks from wheel.**



INSPECT

FOLLOW-ON MAINTENANCE:

- Remove jack (Task 1-24).
- Inflate shock strut (Task 1-71 and 1-72).
- Lubricate lower drag link (Task 1-88).



END OF TASK

3-49 REMOVE UPPER DRAG LINK

3-49

INITIAL SETUP**Applicable Configurations:**

All

Tools:

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

Materials:

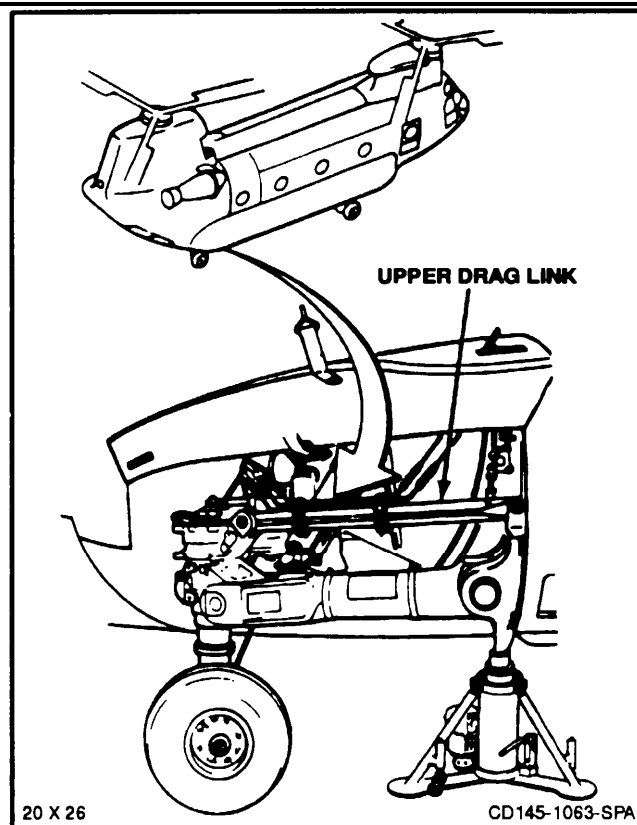
Twine (E433)

Personnel Required:

■ Medium Helicopter Repairer

Equipment Conditions:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Helicopter Jacked At Aft Jack Pad (Task 1-24)
Access Panels Open (Task 2-2)

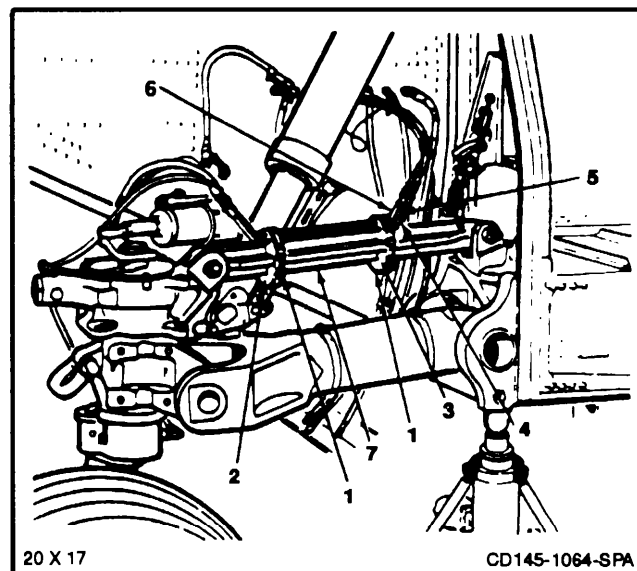
**NOTE**

Procedure is same for aft left or right landing gear except for differences noted in task. Right gear is shown here.

NOTE

Do not disconnect hydraulic tubes.

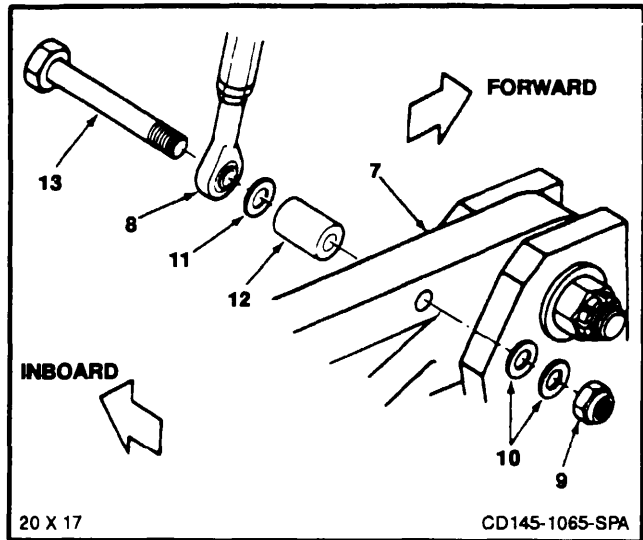
1. **Remove two clamps (1)** and support blocks (2 and 3) securing hydraulic tubes (4, 5, and 6) to upper drag link (7).
2. Tie hydraulic tubes (4, 5, and 6) out of way. Use twine (E433).

**GO TO NEXT PAGE**

3-49 REMOVE UPPER DRAG LINK (Continued)

3-49

- 3. **Disconnect switch rod end (8) from drag link (7) by removing nut (9), washers (10 and 11), spacer (12), and bolt (13).**



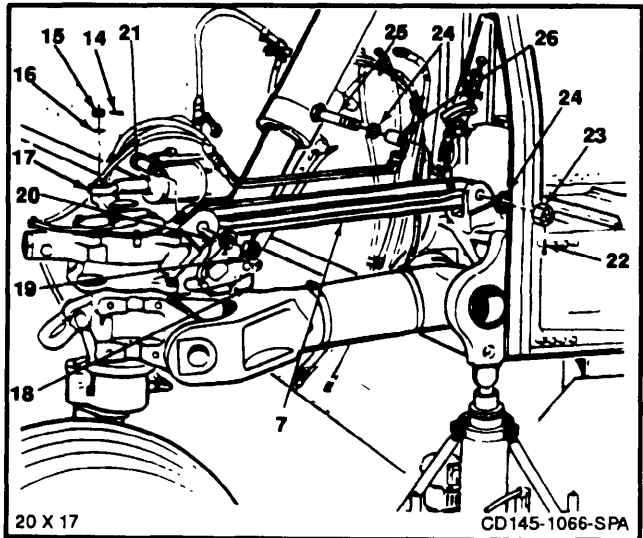
- 4. On right gear only, remove cotter pin (14), nut (15), and washer (16).

- 5. On right gear only, lift rod end (17) and move away from drag link (7).

- 6. **Remove cotter pin (18), nut (19), washer (20), and bolt (21).**

- 7. **Remove cotter pin (22), nut (23), washers (24), bolt (25), and bushing (26).**

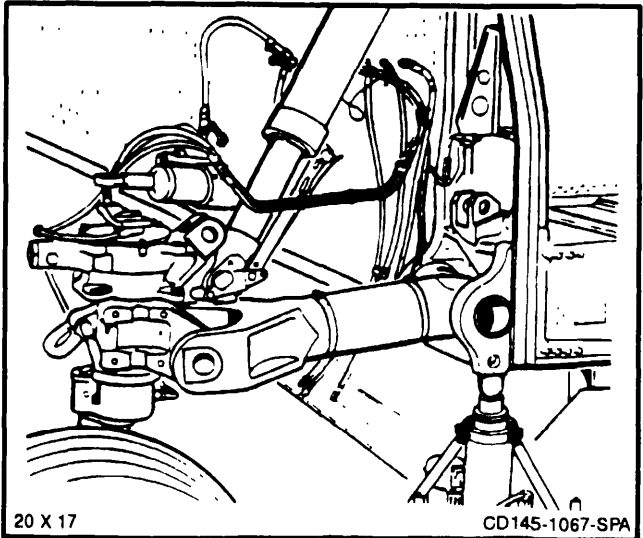
- 8. **Remove drag link (7).**



FOLLOW-ON MAINTENANCE:

None

END OF TASK



3-50 REPAIR UPPER DRAG LINK (AVIM)**3-50****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Machine Shop Set,
NSN 4920-00-405-9279
Roller Staking Kit (T169)

Materials:

Abrasive Cloth (E1)
Epoxy Primer (E292)
Polyurethane Paint (E285.3)
Acetone (E20)
Gloves (E184.1)
Cloths (E120)
Sealant (E345.1)

Parts:

Bearings
Liners (Appx E-53)

Personnel Required:

Machinist
Inspector

References:

TM 55-1520-240-23P
TM 55-1500-322-24
MIL-R-46082

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

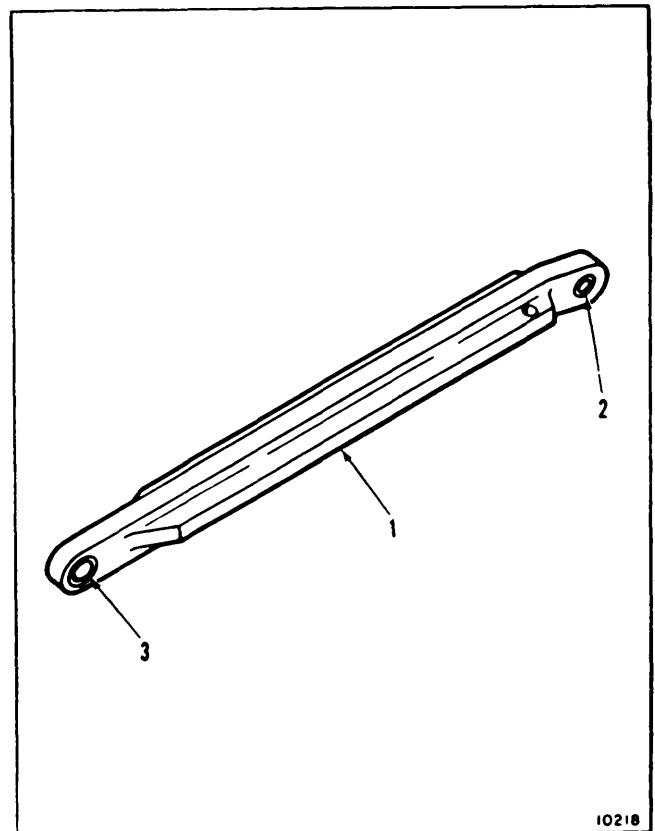
Acetone (E20), epoxy primer (E292) and polyurethane paint (E285.3) are flammable and toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

Same procedure is used to repair left or right upper drag link.

REPAIR LINK SURFACE

1. Remove minor nicks, burrs, scores, scratches or pits on shock strut (1). Use abrasive cloth (E1).
2. Touch up reworked areas with primer (E292) and polyurethane paint (E285.3). Wear gloves (E184.1).
3. **Check condition of bearings (2 and 3).** If bearings are good, go to Follow-On Maintenance. **If either bearing must be replaced, go to step 4.**

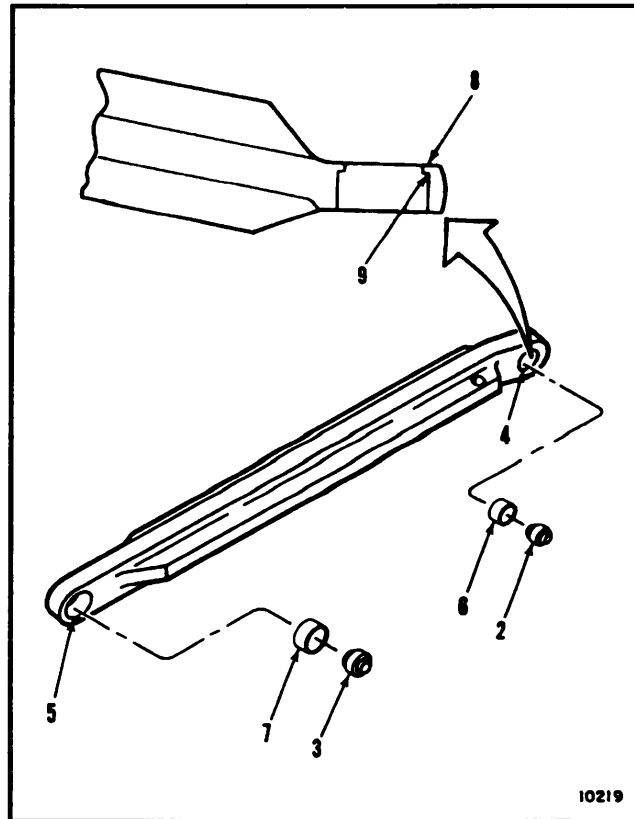
**GO TO NEXT PAGE**

REMOVE BEARINGS

4. Place link (1) in an arbor press. Use the press to remove bearing (2 or 3) (TM 55-1500-322-24).
5. Clean bores (4 and 5) of link (1). Use acetone (E20) and clean cloths (E120). Wear gloves (E184.1).

REPAIR BEARING BORE

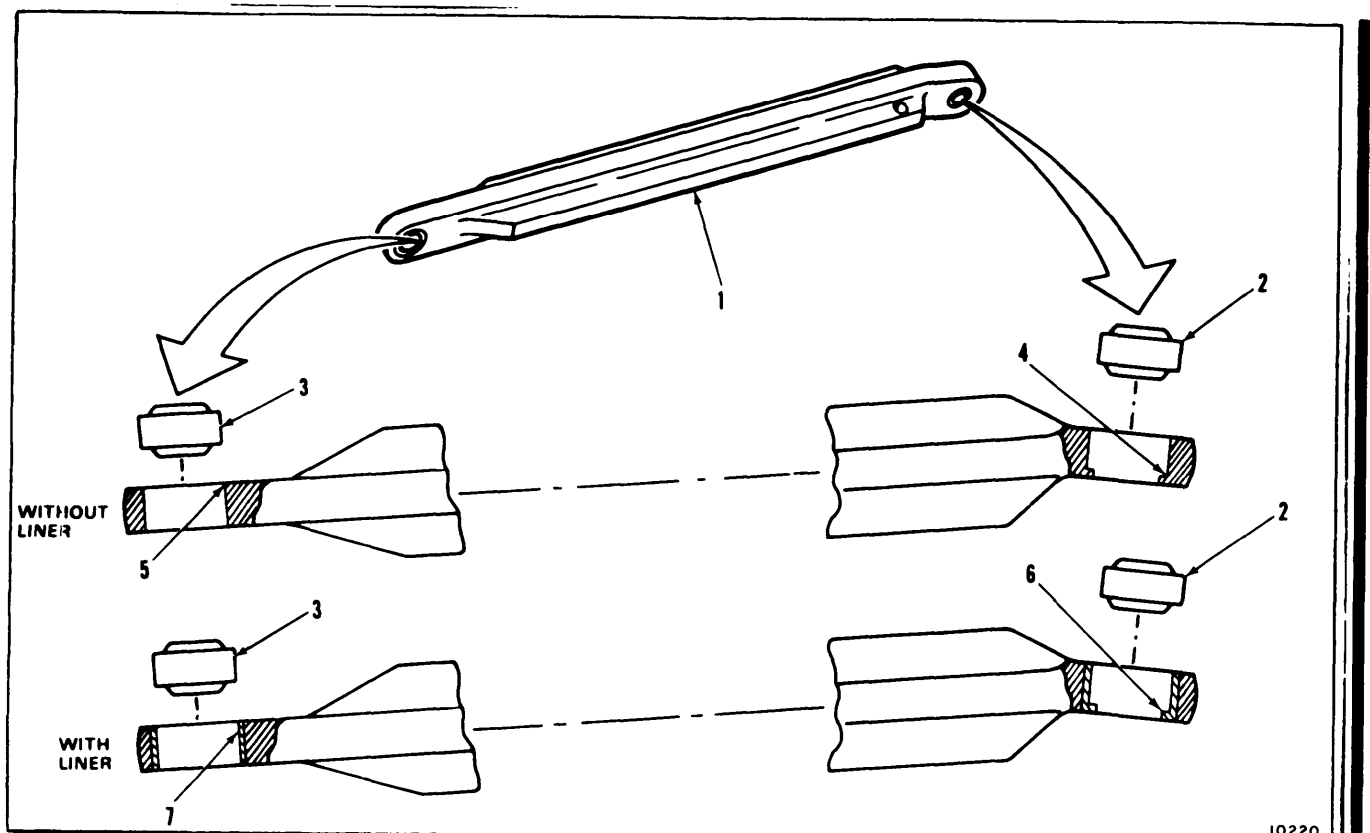
6. Measure diameter of bore (4 and 5) at several places. If all measured diameters are 1.376 inches or less, go to step 7. **If diameter at any one place is greater than 1.376 inches, replace bearing** as follows:
 - a. Enlarge bore (4 or 5) to 1.4995 to 1.5000 inches.
 - b. **Counterbore bore (4) to 1.4995 to 1.5000 inches**, to within 0.005 inch of shoulder (8). Radius (9) at shoulder shall be 0.010 to 0.015 inch.
 - c. **Chamfer edges** of enlarged bore (5) and counterbore end of bore (4) 0.032 inch by 45 degrees.
- d. **Coat liner (E-53) (6 or 7)** with epoxy primer (E292). Wear gloves (E184.1).
- e. **Install liner (6 or 7)**, wet with epoxy primer (E292), in bore (4 or 5). Use arbor press (TM 55-1 500-322-24). Press liner in flush with link (1).



3-50 REPAIR UPPER DRAG LINK (AVIM) (Continued)**3-50****INSTALL****NOTE**

Bearing may be installed within liner
or directly against bearing bore.

7. **Clean bearings (2 and 3) and mating surfaces** of bore (4 or 5) or liner (6 or 7). Use acetone (E20) and cloths (E 120).
8. **Apply sealant (E345.1)** to mating surface of bearings (2 or 3), bore (4 or 5) or liner (6 or 7) (MIL-R-46082).
9. **Install bearing (2 or 3)** in bore (4 or 5) or liner (6 or 7). Use arbor press (TM 55-1500-322-24). Installed bearings shall be flush with link (1).



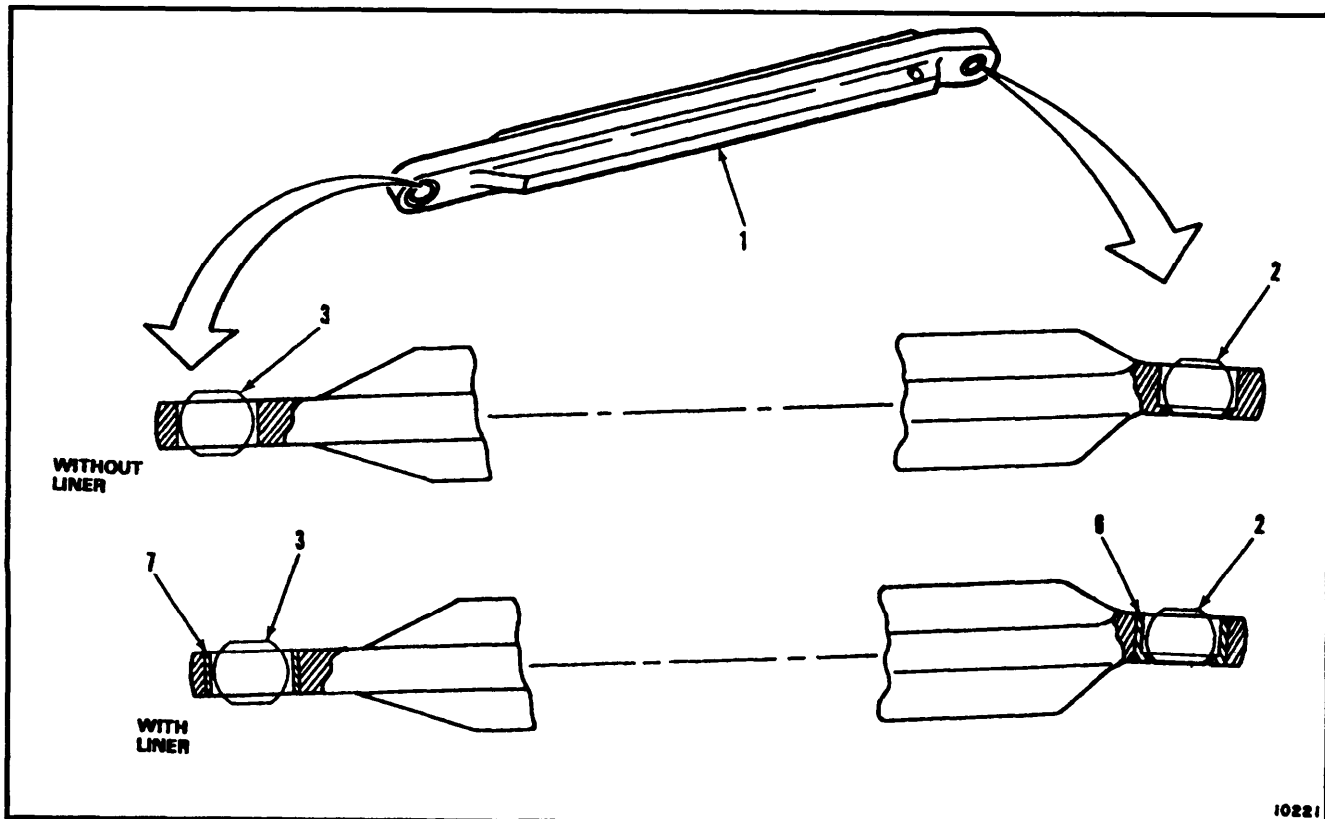
10220

GO TO NEXT PAGE

10. Stake link (1) to bearing (3) or liner (7) to link (1) and bearing (3), as applicable, on both sides. Use roller or impression method (TM 55-1 500-322-24). Use roller staking kit (T169), where applicable.
11. Stake link (1) to bearing (2) or liner (6) to link (1) and bearing (2), as applicable, on one side only. Use roller or impression method (TM 55-1500-322-24). Use roller staking kit (T169), where applicable.

INSPECT

12. Touch up reworked areas of link (1) with primer (E292) and polyurethane paint (E285.3). Wear gloves (E184.1).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

3-51 INSTALL UPPER DRAG LINK**3-51****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 0 to 160 Foot-Pounds
Torque Wrench, 100 to 750 Inch-Pounds

Materials:

None

Parts:

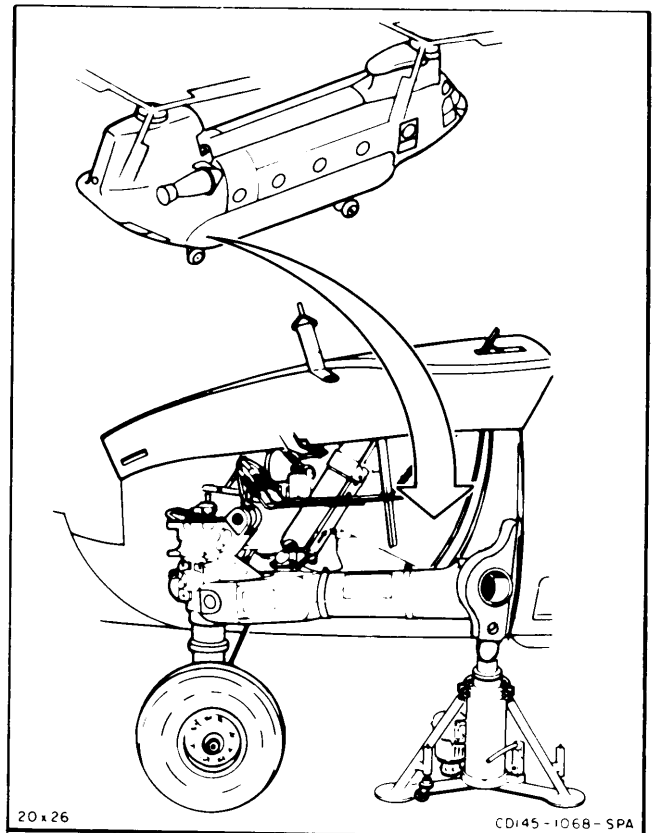
Cotter Pins

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P
Task 3-54



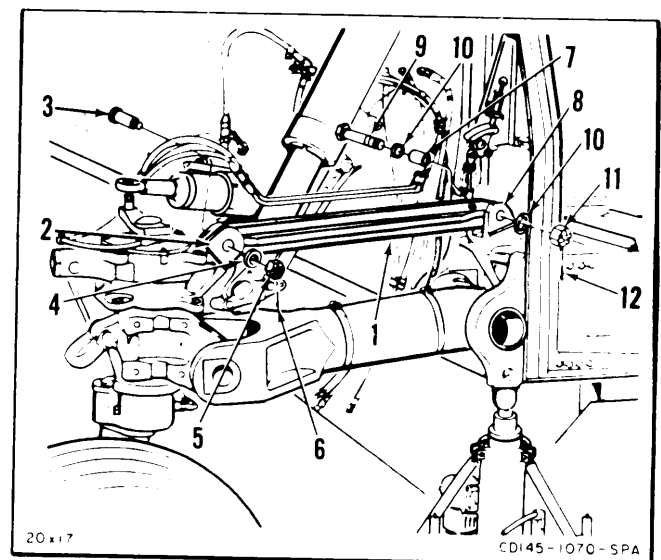
20x26

CDI45-1068-SPA

NOTE

Procedure is same for left and right upper drag link.

1. **Position offset end of upper drag link (1)** into swivel housing fitting (2).
2. **Install bolt (3)** (head inboard with flat of head matching flat of fitting), washers (4), and nut (5). **Torque nut (5) to 350 to 500 inch-pounds.** Install cotter pin (6).
3. **Install bushing (7)** In trunnion fork (8).
4. **Position straight end of link (1)** in structure and align with trunnion fork (8).
5. **Install bolt (9), washers (10), and nut (11).** **Torque nut (11) to 50 to 100 foot-pounds.** Install cotter pin (12),



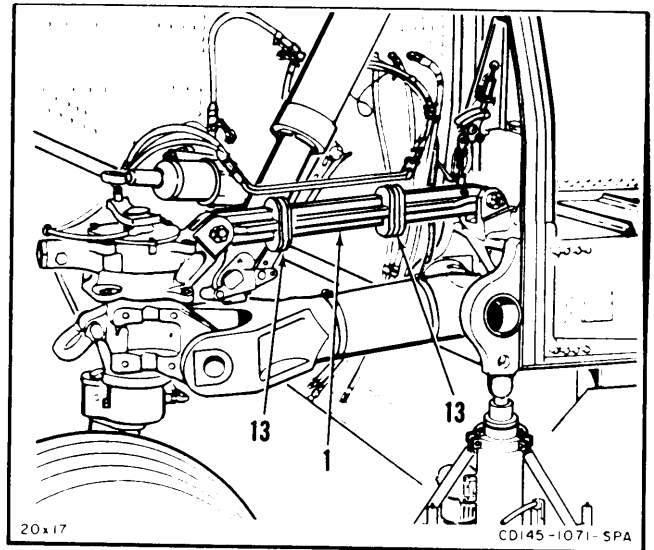
20x17

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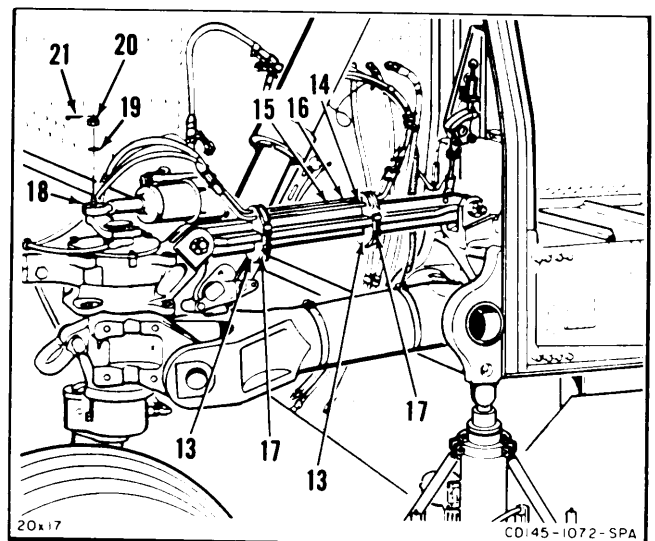
3-51 INSTALL UPPER DRAG LINK (Continued)**3-51**

6. Place support blocks (13) on drag link (1).



7. Untie hydraulic tubes. Place tubes (14, 15, and 16) on support blocks (13). Secure to support blocks with two clamps (17).

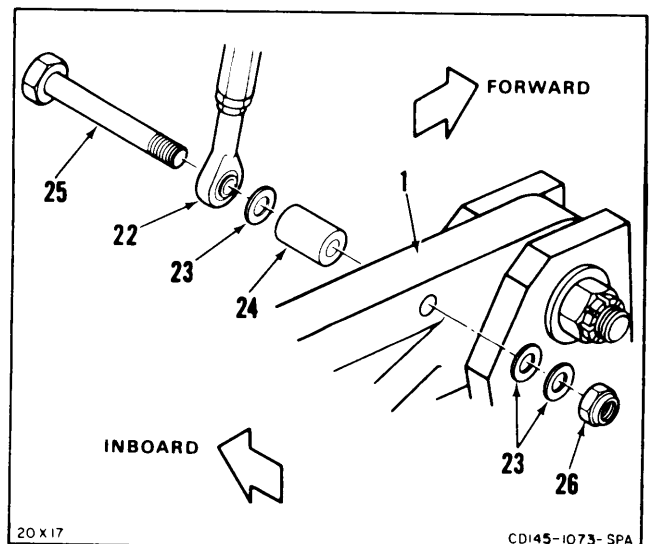
8. Connect rod end (18). Use washer (19), and nut (20). Torque nut to 290 to 410 inch-pounds. Install cotter pin (21).



9. Connect switch rod end (22), to drag link (1), with washers (23), spacer (24), bolt (25) and nut (26).

10. Check adjustment of switch (Task 3-56).

11. Remove chock blocks from wheel.



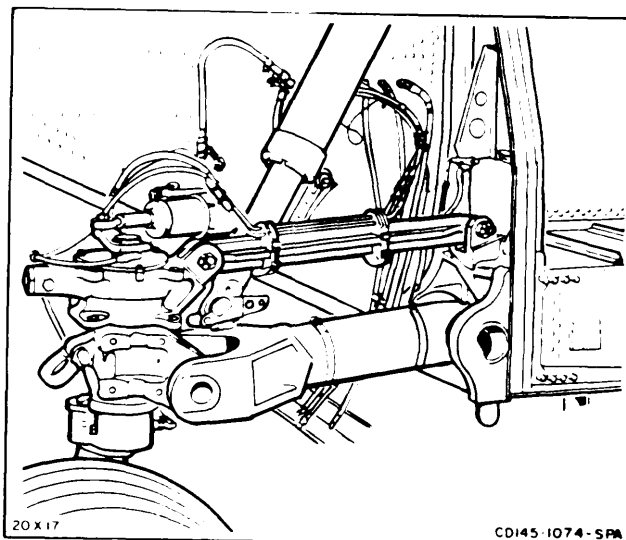
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3-51 INSTALL UPPER DRAG LINK (Continued)

INSPECT

FOLLOW-ON MAINTENANCE:

Lower and remove jack (Task 1-24).



END OF TASK

3-52 REMOVE STATIC LOCK MECHANISM

3-52

INITIAL SETUP

Applicable Configuration:

All

Tools:

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

Materials:

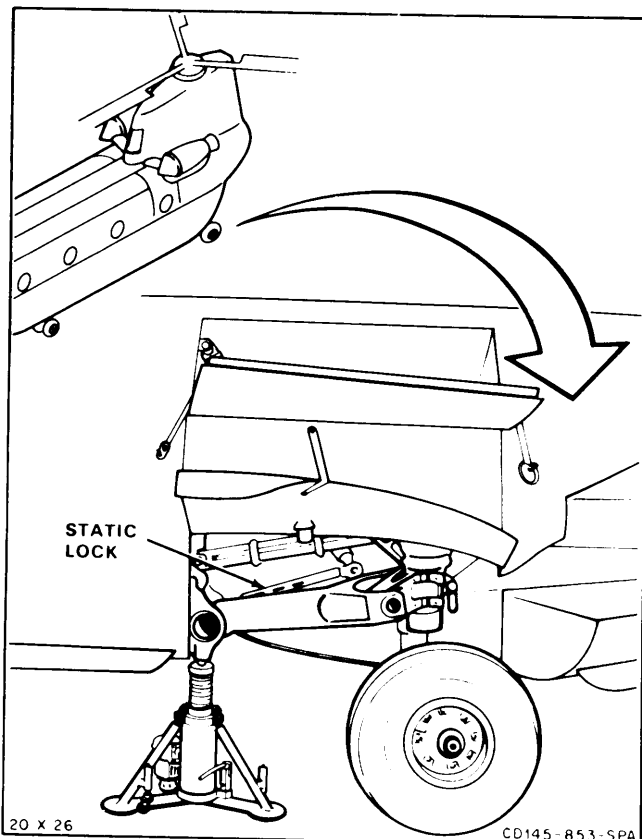
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

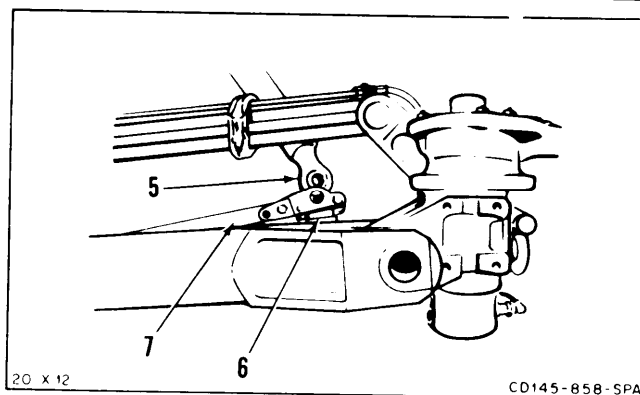
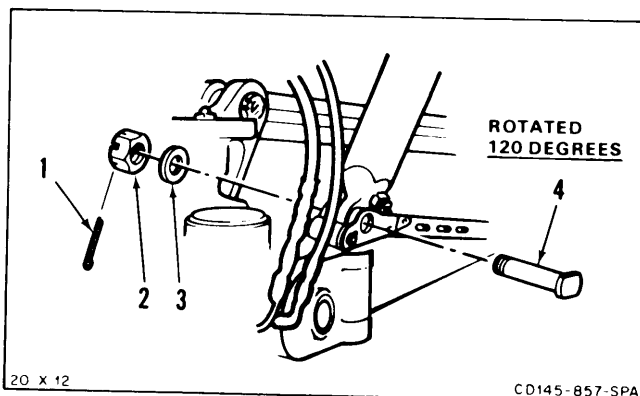
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Access panels open
- Helicopter Jacked at Aft Fuselage Jack Pad (Task 1-24)
- (Static Lock Not Engaged)
- Shock Strut Deflated (Task 1-72)



NOTE

This procedure is same for left or right gear. Left gear is shown here.

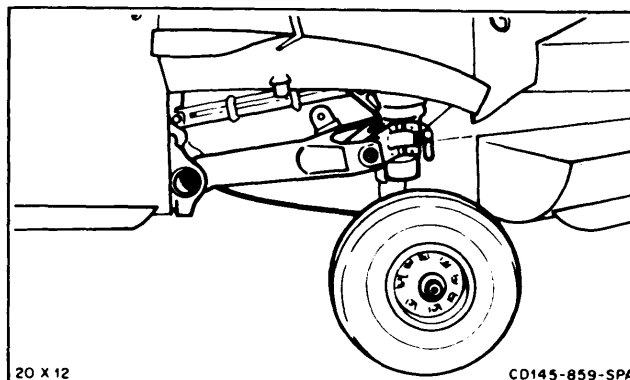
1. Remove cotter pin (1), nut (2), and washer (3).
2. **Remove bolt (4).**
3. Collapse shock strut (5) to **remove strut from lower attach fitting (6).**
4. **Remove static lock mechanism (7).**



GO TO NEXT PAGE

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-53 INSTALL STATIC LOCK MECHANISM**3-53**

INITIAL SET UP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
 NSN 5180-00-323-4692
 Torque Wrench, 100 to 750 Inch-Pounds
 Socket, 1-Inch

Materials:

None

Parts:

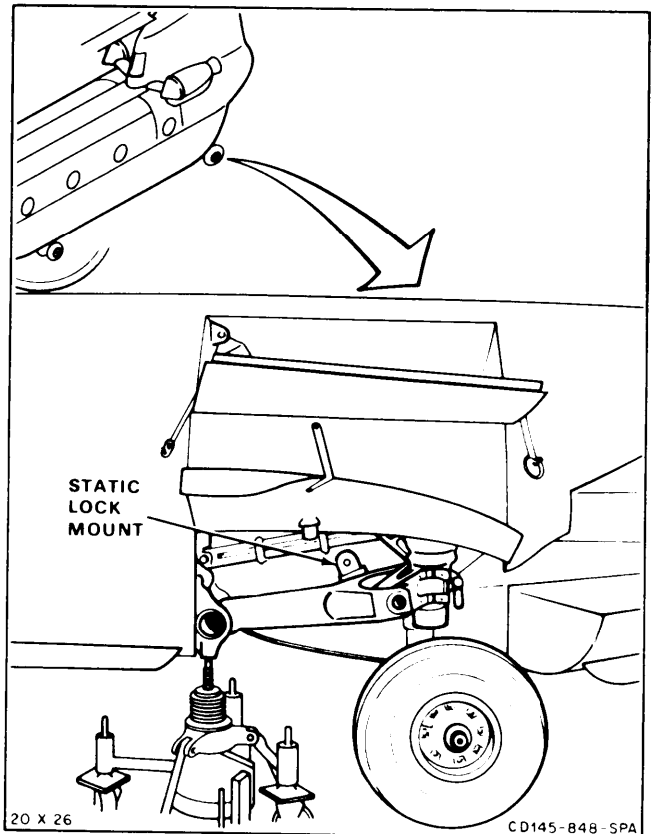
Cotter Pin

Personnel Required:

Medium Helicopter Repairer
 Inspector

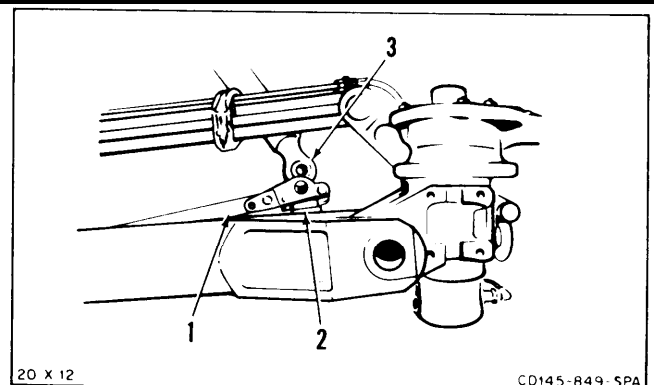
References:

TM 55-1520-240-23P

**NOTE**

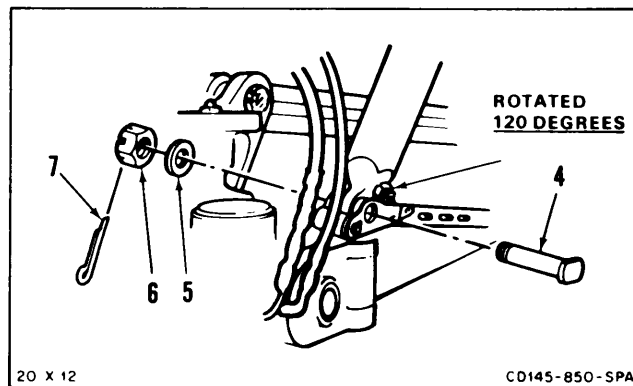
This procedure is same for left or right gear. Left gear is shown here.

1. **Position static lock mechanism (1) over lower attach fitting (2).**
2. **Place shock strut (3) in fitting (2)**

**GO TO NEXT PAGE**

3-53 INSTALL STATIC LOCK MECHANISM (Continued)**3-53**

3. Install bolt (4), washer (5), and nut (6).
4. Torque nut (6) to 350 to 500 inch-pounds.
5. Install cotter pin (7).

**INSPECT****FOLLOW-ON MAINTENANCE:**

- Lower and remove jack (Task 1-24).
- Service shock strut (Task 1-71 and 1-72).
- Close access panels (Task 2-2).

END OF TASK

3-54 REMOVE AFT LANDING GEAR PROXIMITY SWITCHES, TARGET, AND ADJUSTER LINK

3-54

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

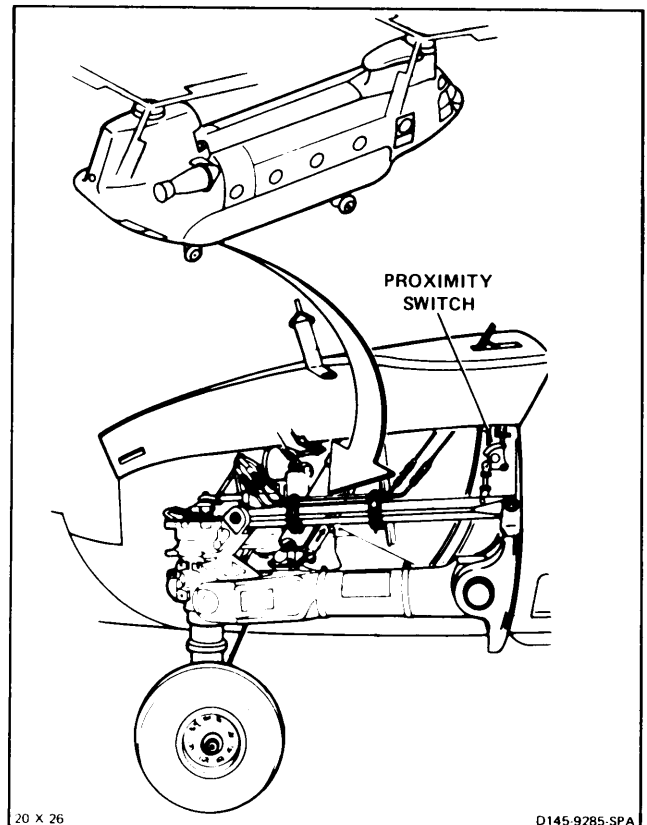
None

Personnel Required:

67U20 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)

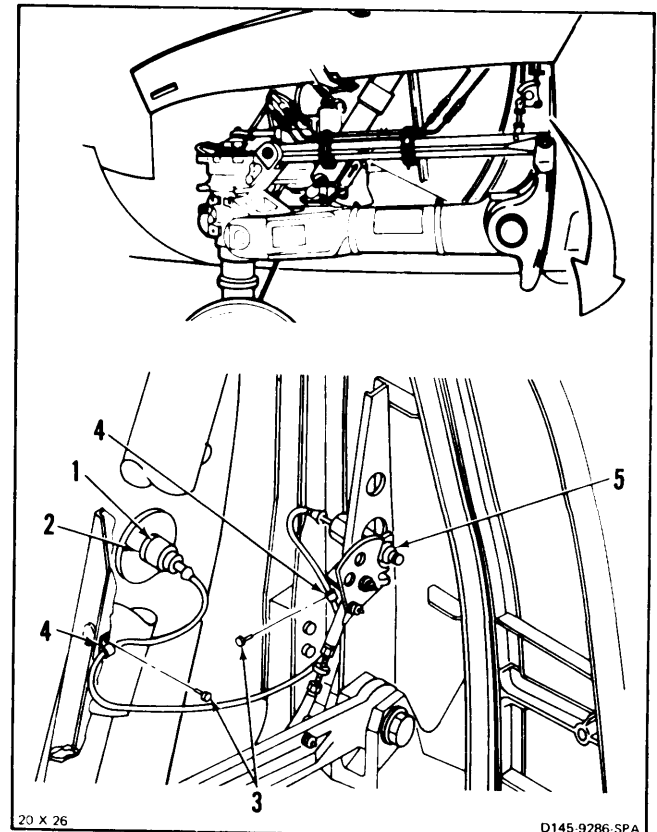


NOTE

Procedure is same for left or right proximity switch. Right switch is shown, here.

REMOVE PROXIMITY SWITCH

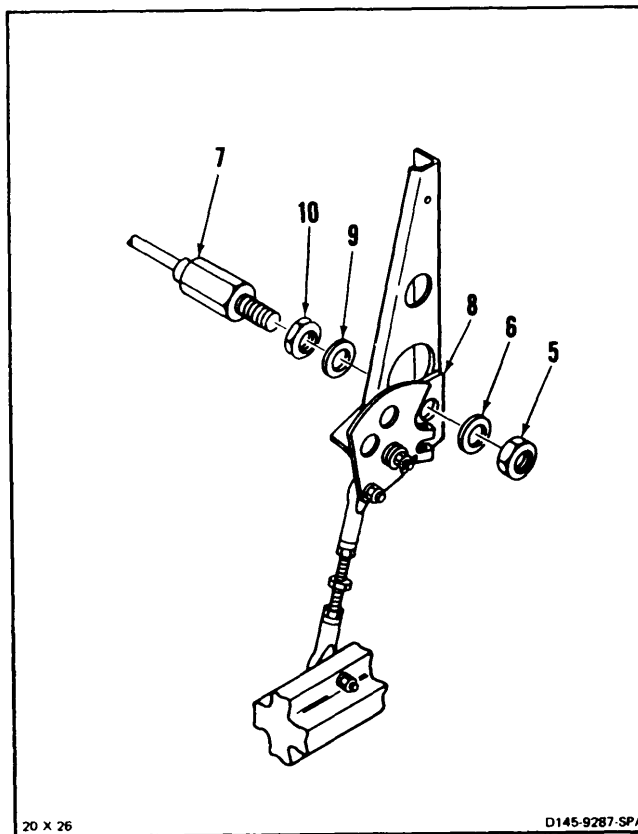
1. Remove lockwire from connector (1).
2. **Disconnect connector (1)** from bulkhead receptacle (2).
3. Remove two screws (3) and two cable clamps (4).
4. Remove lockwire from switch adjuster nut (5).



GO TO NEXT PAGE

3-54 REMOVE AFT LANDING GEAR PROXIMITY SWITCHES, TARGET, AND ADJUSTER LINK (Continued)

5. Remove outer nut (5) and washer (6) from switch (7).
6. **Remove switch (7) from bracket (8).**
Remove washer (9) and nut (10) from switch

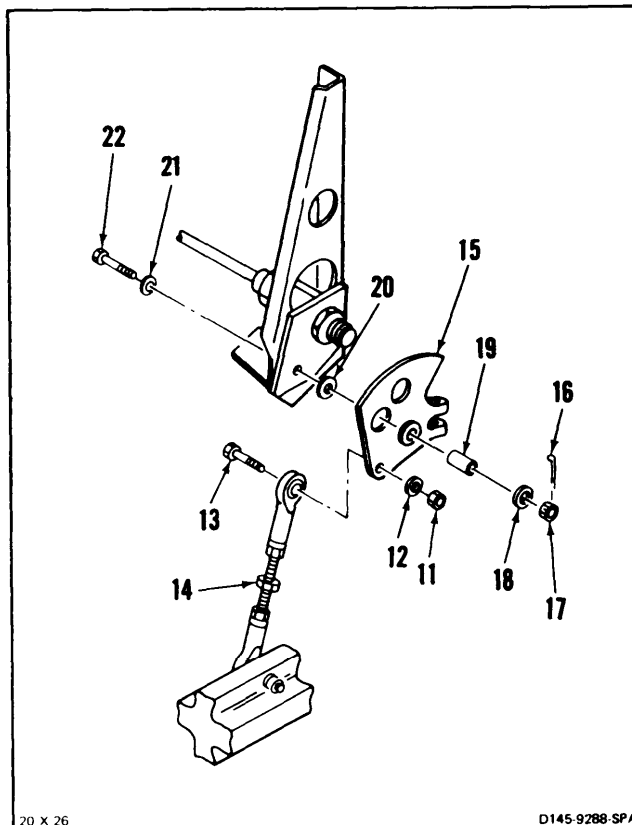


20 X 26

D145-9287-SPA

REMOVE TARGET

7. Remove nut (11), washer (12), and bolt (13). Move target adjuster link (14) away from target (15).
8. Remove cotter pin (16), nut (17), and washer (18).
9. **Remove target (15),** bushing (19), washers (20 and 21), and bolt (22).



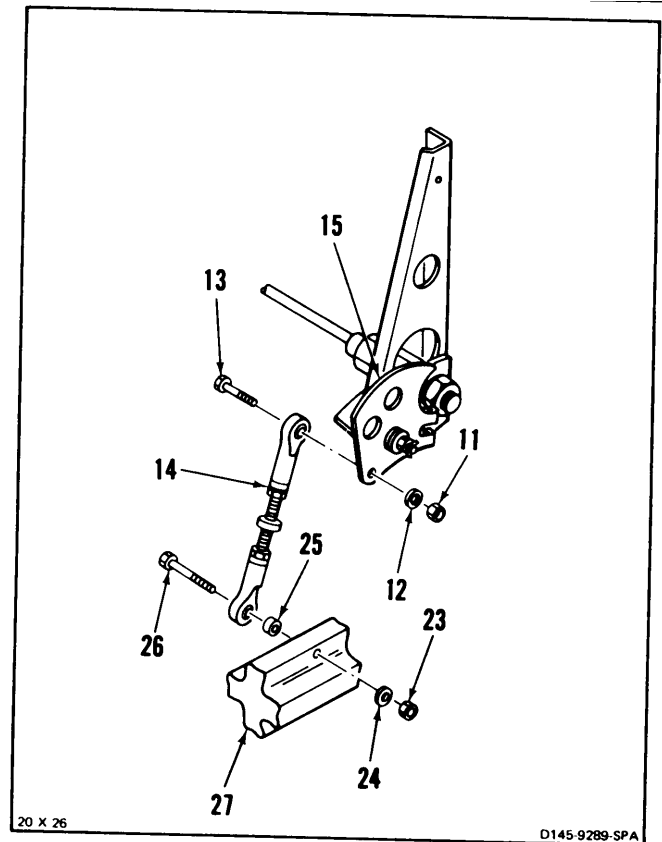
20 X 26

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3-54 REMOVE AFT LANDING GEAR PROXIMITY SWITCHES, TARGET, AND ADJUSTER LINK (Continued)**3-54****REMOVE ADJUSTER LINK**

10. Remove nut (11), washer (12), and bolt (13) from adjuster link (14) and target (15).
11. Remove nut (23), washer (24), spacer (25), and bolt (26) from upper drag link (27).
12. **Remove link (14).**



FOLLOW-ON MAINTENANCE:

None

END OF TASK

3-54.1 REPLACE AFT LANDING GEAR PROXIMITY SWITCH BRACKET

3-54.1

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Repairer's Tool Kit,
NSN 5180-00-323-4876
- Bracket Locating Fixture 145G0059-1

Materials:

None

Parts:

Rivets

Personnel Required:

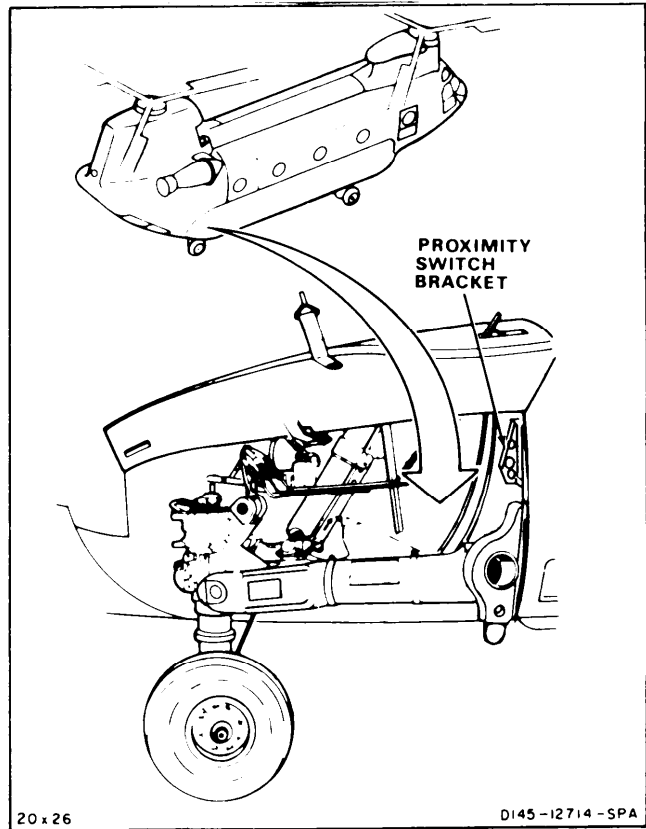
- Aircraft Structural Repairer
- Inspector

References:

TM 55-1520-240-23P

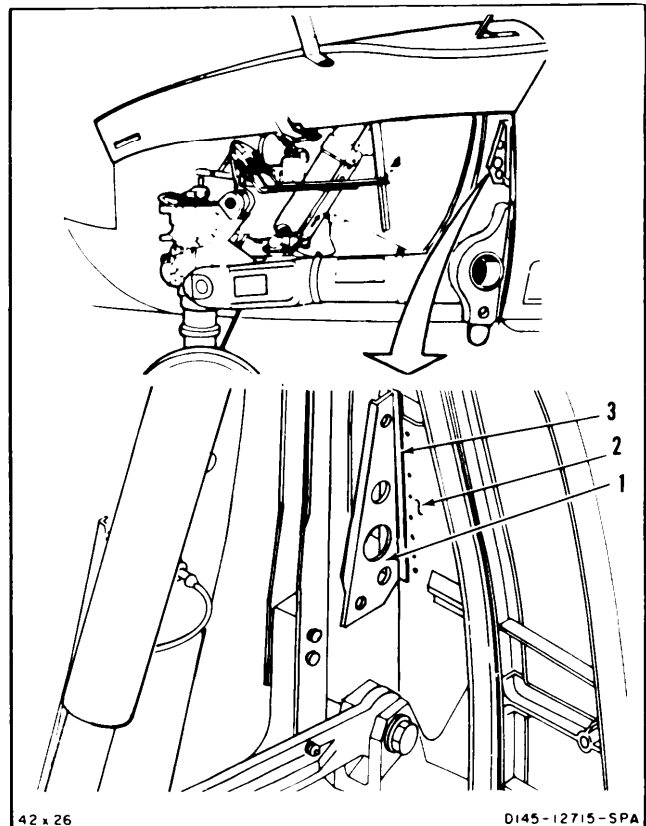
Equipment Condition:

- Proximity Switch Removed (Task 3-54)
- Upper Drag Link Removed (Task 3-49)
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hvdraulic Power Off



REMOVE BRACKET

1. Remove rivets holding bracket (1) to airframe (2).
2. Remove bracket (1) and filler (3).



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3-54.1 REPLACE AFT LANDING GEAR PROXIMITY SWITCH BRACKET (Continued)

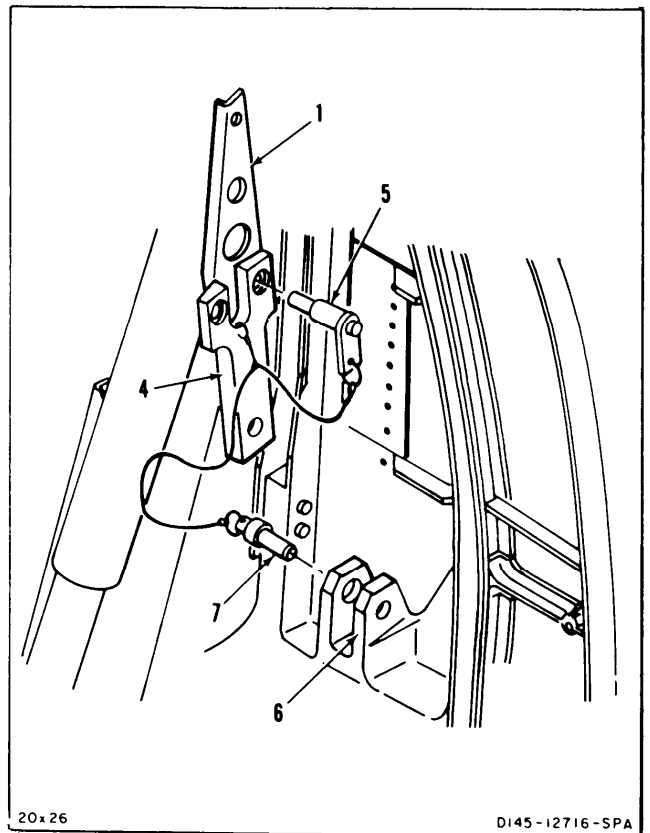
3-54.1

INSTALL BRACKET

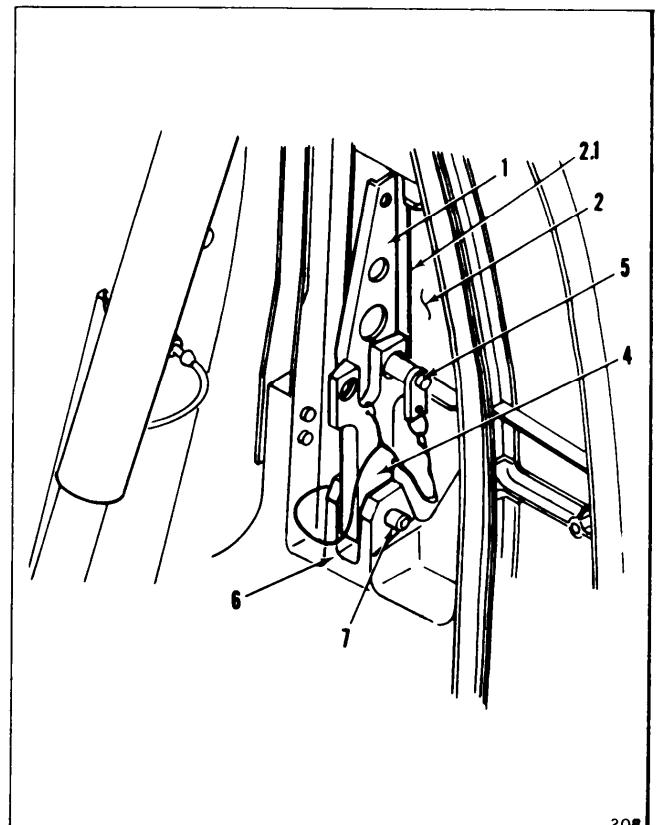
NOTE

Procedure for installing left or right bracket is similar. Right side shown here.

3. **Align hole in fixture 145GO059-1 (4) marked RIGHT SIDE with 0.624 inch hole in bracket (1). Install pin (5) through holes.**
4. **Align lower hole in fixture (4) with two holes in trunnion (6). Install pin (7) through holes.**



5. **Pivot bracket (1) against airframe (2). Drill holes in bracket (1) and filler (2.1) to match holes in airframe (2).**
6. **Remove pin (5) from fixture (4) and bracket (1). Remove bracket.**
7. **Remove pin (7) from trunnion (6) and fixture (4). Remove fixture.**



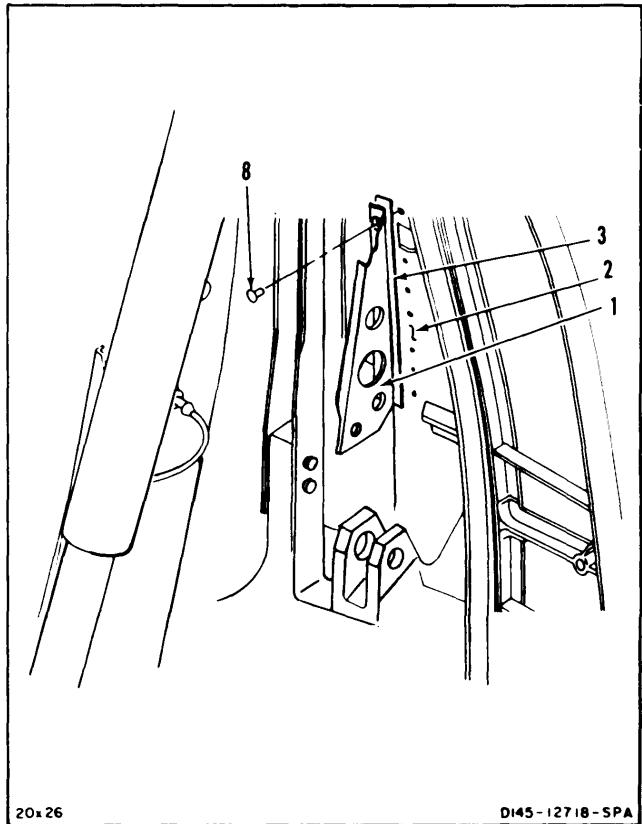
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**3-54.1 REPLACE AFT LANDING GEAR PROXIMITY SWITCH
BRACKET (Continued)****3-54.1**

8. Align holes in bracket (1), filler (3), and airframe (2). Install rivets (8).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Install upper drag link (Task 3-51).
- Install proximity switch (Task 3-55).

**END OF TASK**

3-114.2 Change 1

3-55 INSTALL AFT LANDING GEAR PROXIMITY SWITCHES, TARGET, AND ADJUSTER LINK

3-55

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 5 to 50 Inch-Pounds

Materials:

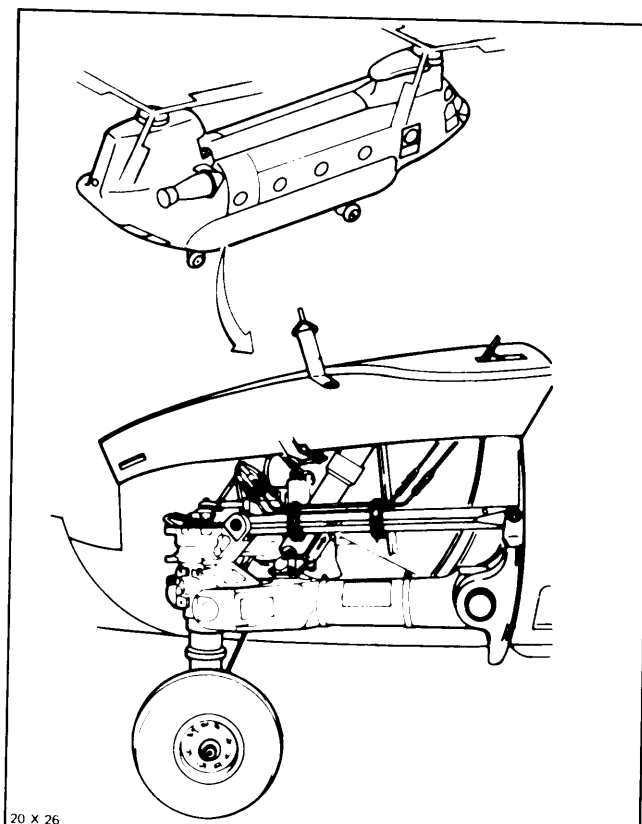
Lockwire (E231)

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P
Task 3-56



20 X 26

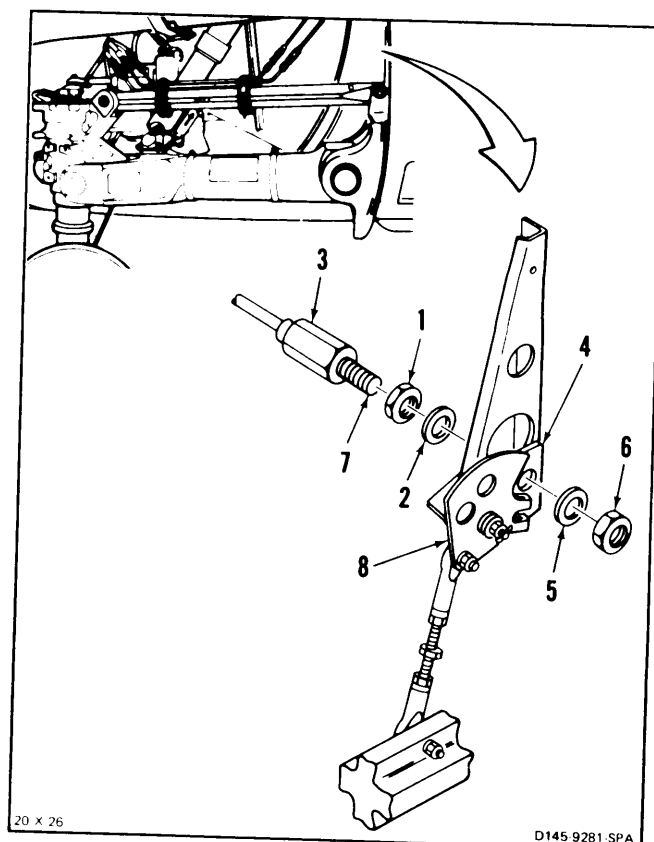
D145 9280 SPA

NOTE

Procedure is same for left or right proximity switch. Right switch is shown here.

INSTALL PROXIMITY SWITCH

1. Install nut (1) and lockwasher (2) on proximity switch (3).
2. **Position switch (3) in bracket (4).** Install keying washer (5) and nut (6).
3. **Adjust gap between switch face (7) and face of target (8) to .030-inches to .035-inches.** Use thickness gage (3-56).
4. Tighten nuts (1 and 6). Check gap.
5. Install lockwire (E231) between nuts (1 and 6).



20 X 26

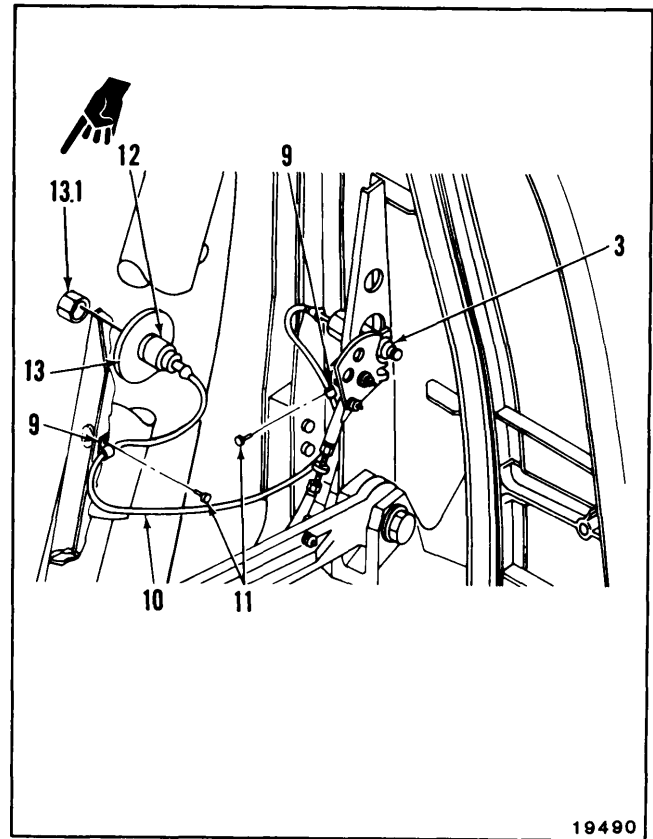
D145 9281 SPA

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3-55 INSTALL AFT LANDING GEAR PROXIMITY SWITCHES, TARGET, 3-55 AND ADJUSTER LINK (Continued)

6. Position two cable clamps (9) on cable (10) of proximity switch (3).
7. **Attach clamps (9)** to structure with two screws (11).
8. **Connect connector (12)** to receptacle (13). Lockwire receptacle retaining nut (13.1). Use lockwire (E231).

INSPECT



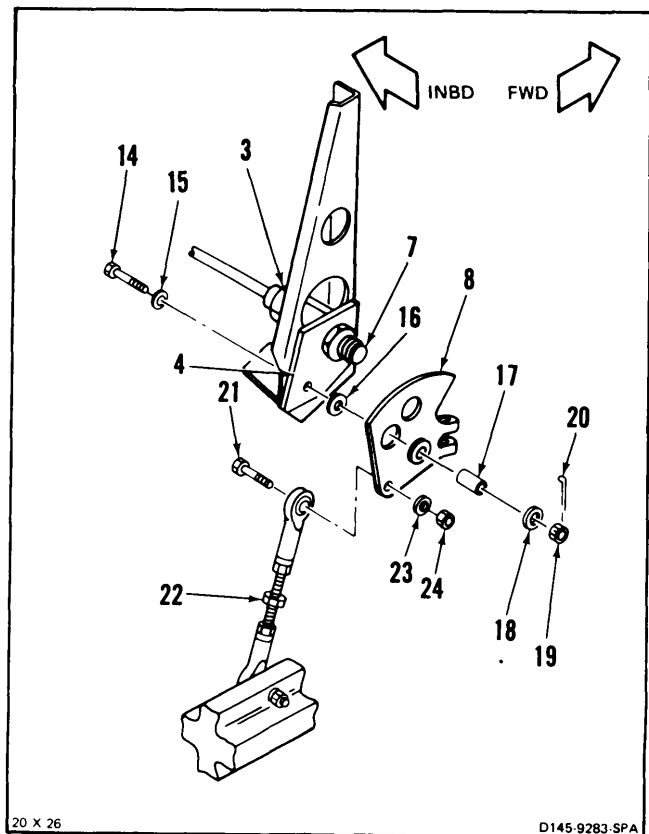
INSTALL TARGET

9. Install bolt (14), head inboard, and washer (15) through bracket (4).
10. **Install** washer (16), bushing (17), target (8), washer (18), and nut (19) on bolt (14).
11. **Torque nut (19) to 25 to 35 inch-pounds.** Install cotter pin (20).

INSPECT

12. Rotate target (8) past face (7) of switch (3). **Measure gap between switch face and target. If gap is not .030 to .035-inch, adjust switch** (Task 3-56).
13. Install bolt (21) through adjuster link (22) and target (8). Install washer (23) and nut (24).

INSPECT



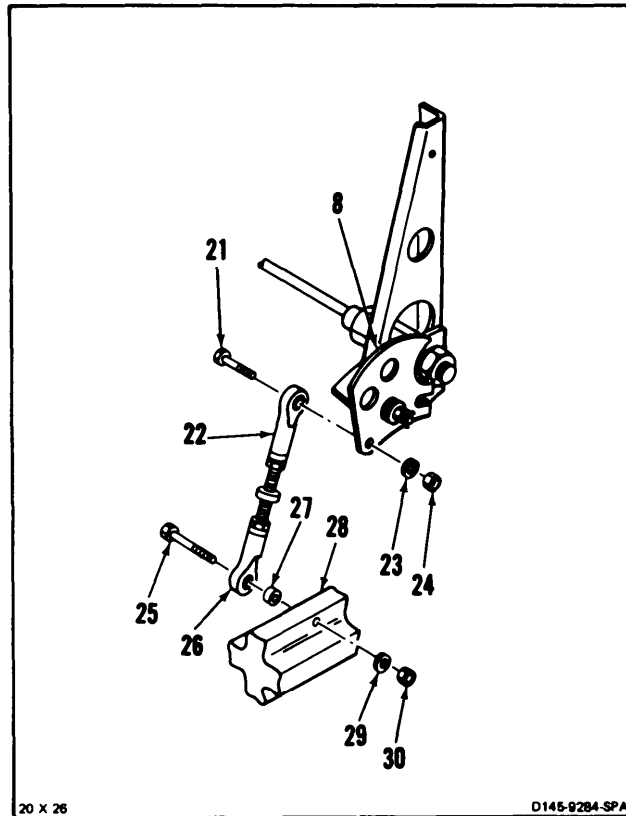
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3-55 INSTALL AFT LANDING GEAR PROXIMITY SWITCHES, TARGET, 3-55 AND ADJUSTER LINK (Continued)

INSTALL ADJUSTER LINK

14. **Install bolt (21)**, head inboard, through adjuster link upper rod end (22) and target (8). Install washer (23) and nut (24).
15. **Install bolt (25)**, head inboard through adjuster link lower rod end (26), spacer (27), and upper drag link (28). Install washer (29) and nut (30).

INSPECT



FOLLOW-ON MAINTENANCE:

- Adjust aft landing gear proximity switch (Task 3-56).
- Close aft landing gear access panel (Task 2-2).
- Proximity switch operational check (TM 55-1520-240-T).
- Perform AFCS interface test (Task 11-280, Tests 25 and 26).

END OF TASK

3-56 ADJUST AFT LANDING GEAR PROXIMITY SWITCH

3-56

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

Lockwire (E231)

Personnel Required:

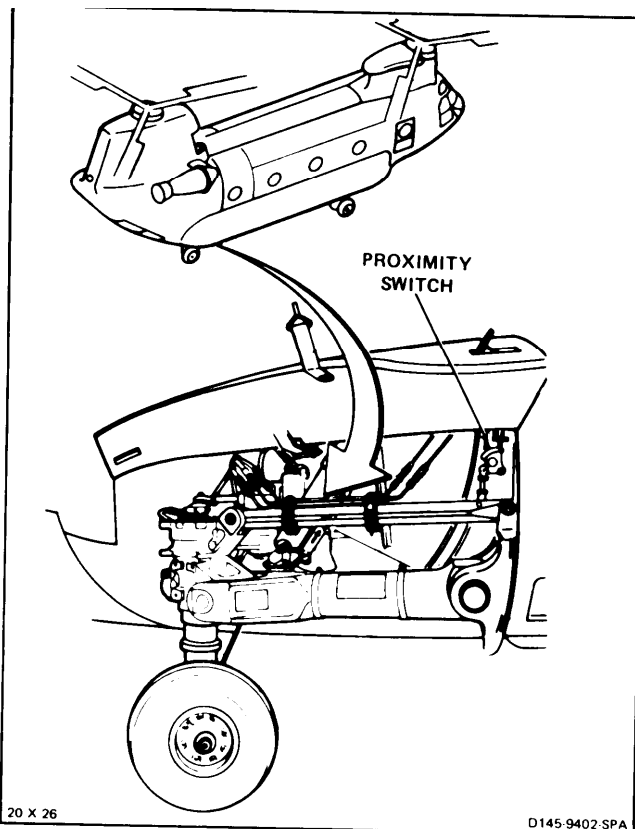
67U20 Medium Helicopter Repairer
35K20 Avionics Mechanic
67U30 Inspector

References:

Task 1-24

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Aft Landing Gear Access Panels Open (Task 2-2)



NOTE

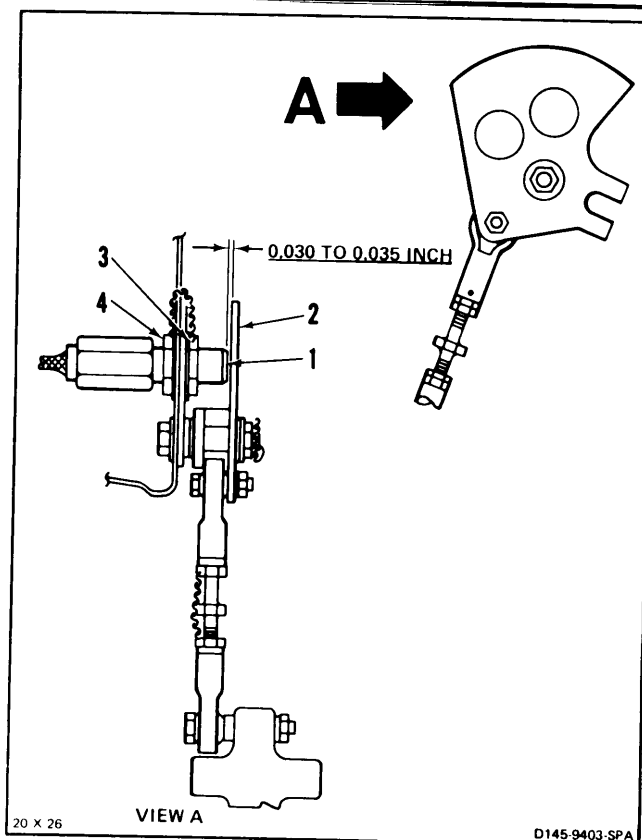
Procedure is same for left or right proximity switch. Right switch is shown here.

1. Measure gap between face of switch (1) and target (2). Use thickness gage.
 - a. If gap is less than .030-inch or greater than .035-inch, go to step 2.
 - b. If gap is not less than .030 -inch and not greater than .035-inch, go to step 6.
2. Remove lockwire from nuts (3 and 4).
3. Loosen nuts (3 and 4). Adjust gap to correct dimension.
4. Tighten nuts (3 and 4). Check gap is within correct limits.

INSPECT

5. Install lockwire (E231) between nuts (3 and 4).

GO TO NEXT PAGE



3-56 ADJUST AFT LANDING GEAR PROXIMITY SWITCH (Continued) 3-56

6. Raise aft end of helicopter (Task 1-24), but do not install static lock (5). Jack helicopter until wheel (6) is off ground and shock strut (7) is fully extended.
7. Measure distance from edge of target (9) to edge of proximity switch (1).
 - a. If distance is less than 0.56 inch or greater than 0.62 inch, go to step 8.
 - b. if distance is 0.56 inch to 0.62 inch, go to step 15.
8. Remove lockwire from jam nuts (10 and 11) and rod-end locks (12 and 13). Loosen jam nuts until rod-end locks are disengaged from slots in rod-ends (14 and 15) of adjuster link (16).
9. Turn stud (17) until distance from edge of target (9) to edge of switch (1) is 0.56 to 0.62 inch.
10. Tighten jam nuts (10 and 11) until rod-end locks (12 and 13) engage in slots in rod-ends (14 and 15).
11. Check 0.56 to 0.62-inch dimension.
12. Lower jack (8) until shock strut (7) retracts about 1.0 inch.
13. Repeat steps 6 and 7.

INSPECT

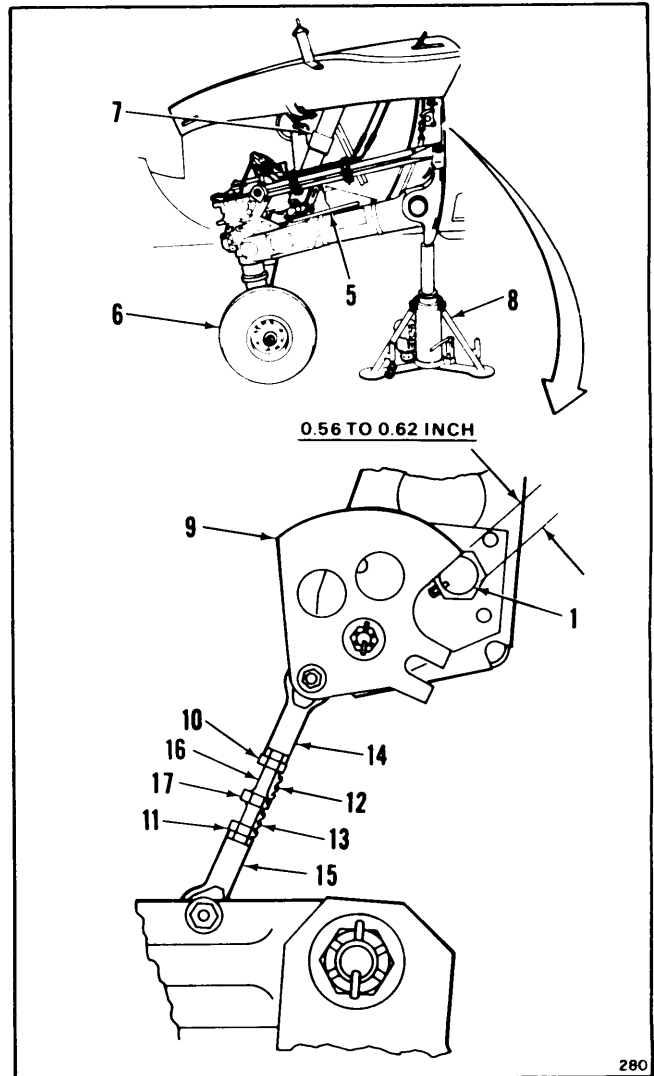
14. Tighten jam nuts (10 and 11). Install lockwire (E231).
15. Lower jack (8) until clear of helicopter (Task 1-24). Remove jack.

FOLLOW-ON MAINTENANCE:

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

Proximity switch operational check (TM 55-1520-240-T).

Perform AFCS interface test (Task 11-280, Tests 25 and 26).

**END OF TASK**

3-57 REMOVE SWIVEL HOUSING SEALS**3-57**

INITIAL SETUP

Applicable Configurations:

All

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

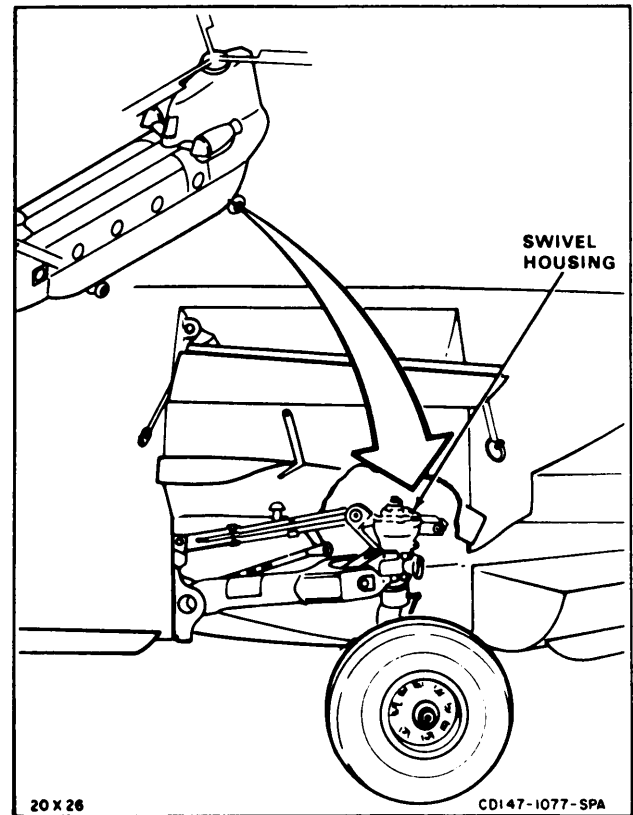
None

Personnel Required:

67U20 Medium Helicopter Repairer

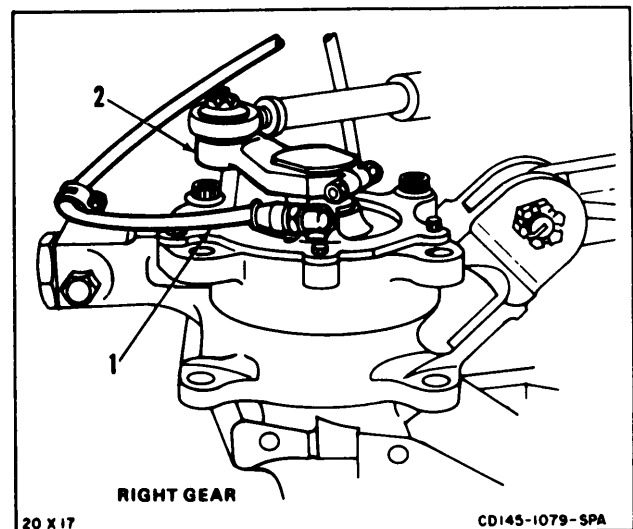
References:

Task 3-69

Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Utility Hydraulic System Repressurized (TM 55-1520-240-T)
Parking Brake Released
Access Panels Opened (Task 2-2)**NOTE**

Except as noted, seal removal
for left or right gear.

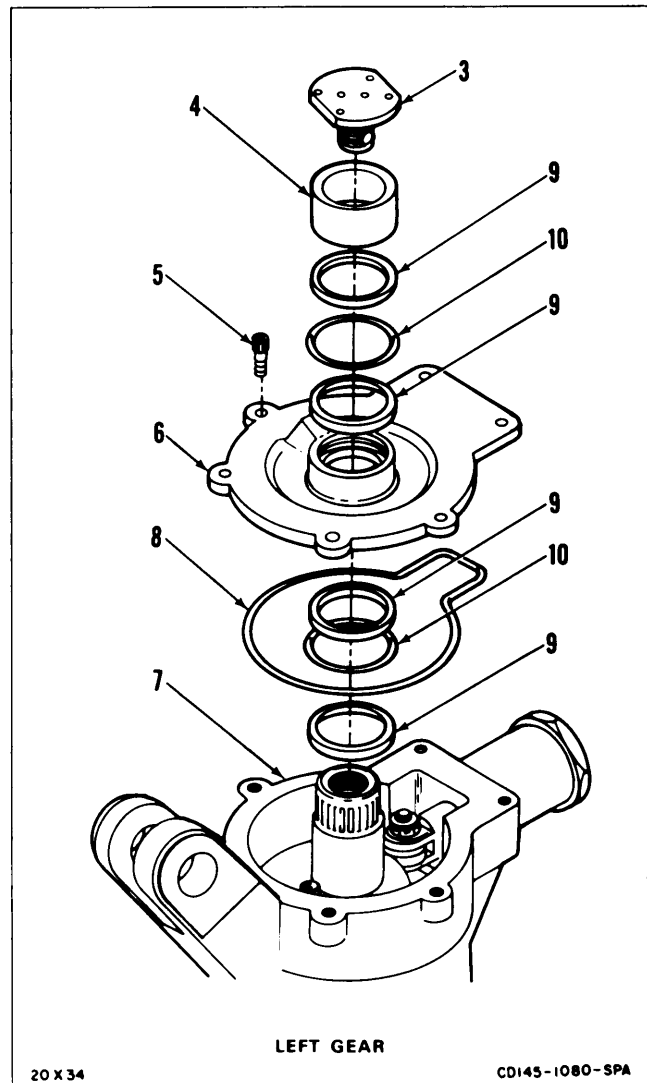
1. Use container to catch hydraulic fluid. Disconnect hydraulic tube (1).
2. For an aft right landing gear remove steering lever (2) (Task 3-69).

**GO TO NEXT PAGE**

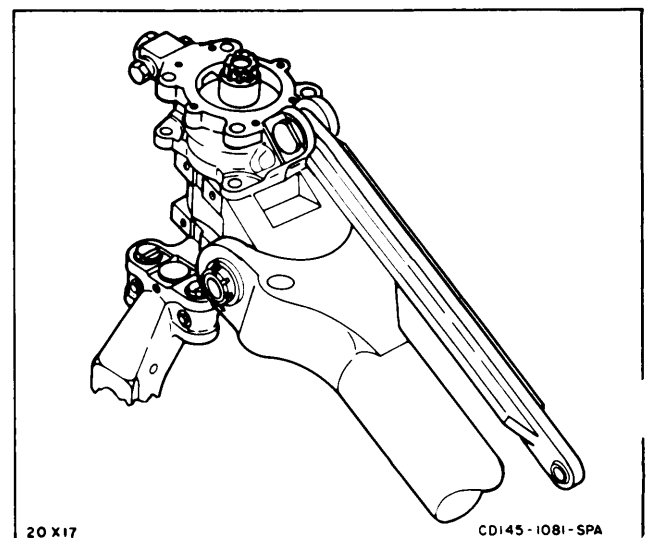
NOTE

Right gear has steering lever in place of spacer.

3. Remove end cap (3) and sleeve spacer (4).
4. Remove lockwire and six screws (5) and cover plate (6) from swivel housing (7).
5. Remove packing (8), retainers (9), and seals (10).

**FOLLOW-ON MAINTENANCE:**

None

**END OF TASK**

3-58 INSTALL SWIVEL HOUSING SEALS

3-58

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

Cleaning Cloth (E120)
Grease (E190)
Hydraulic Fluid (E199)
Lockwire (E231)

Parts:

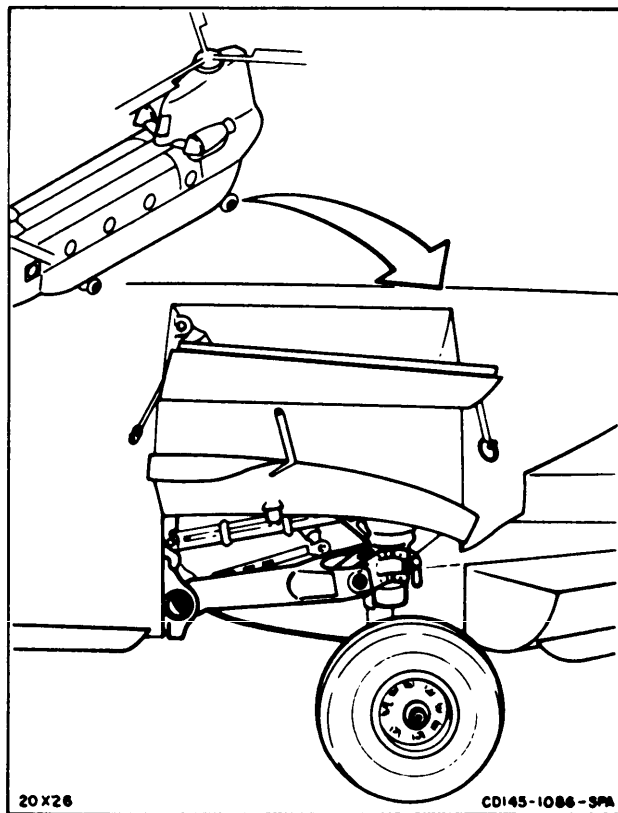
Packings
Seals

Personnel Required

67U20 Medium Helicopter
67U30 Inspector

References:

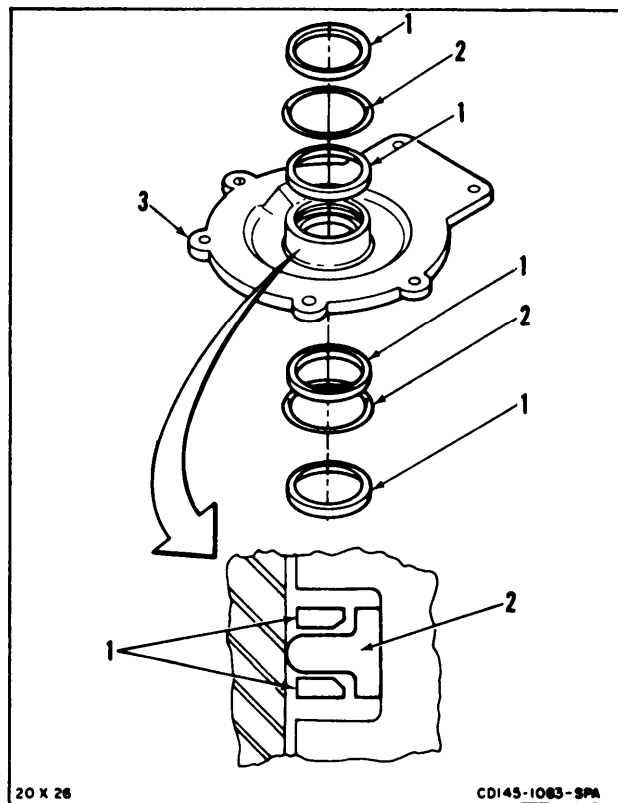
TM 55-1520-240-23P
Task 3-70



NOTE

Spindle seal assembly is a set consisting of a rubber seal and two retainers.

1. Coat retainers (1) and seals (2) with hydraulic fluid (E190).
2. Install retainers (1) and seals (2) in grooves of plate (3). Make sure chamfer on retainers is against seals. (See detail.)



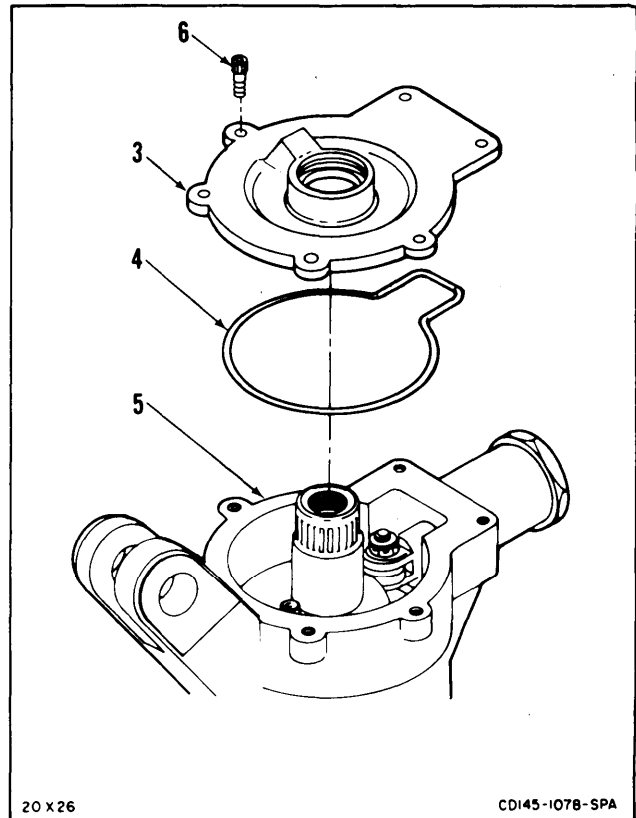
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3. **Coat packing (4) with grease (E 190). Install packing in groove of plate (3).**

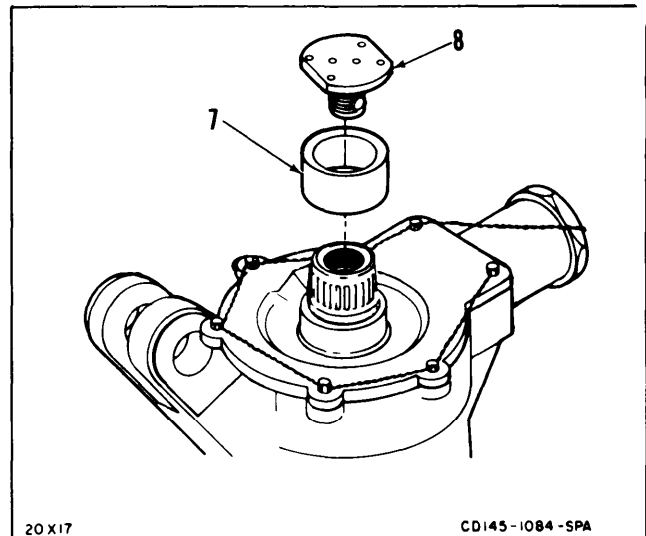


Moisture in swivel housing can cause corrosion and lead to cracks.

4. **Wipe inside of swivel housing (5) dry.** Use cloth (E120).
5. **Position plate (3) on housing (5).** Make sure packing, retainers, and seals stay in place.
6. **Install six screws (6) to secure plate.** Lock-wire screws together. Use lockwire (E231).



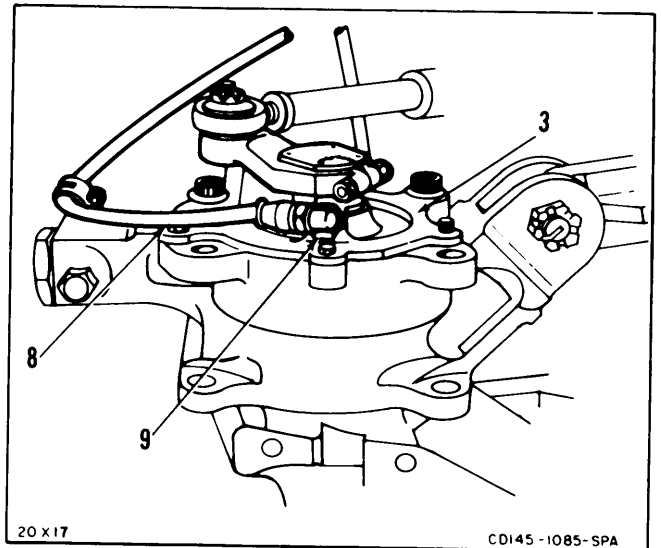
7. For an aft left gear, **install sleeve spacer (7), and end cap (8).** Torque end cap to 31 to 37 inch-pounds. Check that sleeve spacer has slight end play.
8. For an aft right gear, **install steering lever** (Task 3-70).



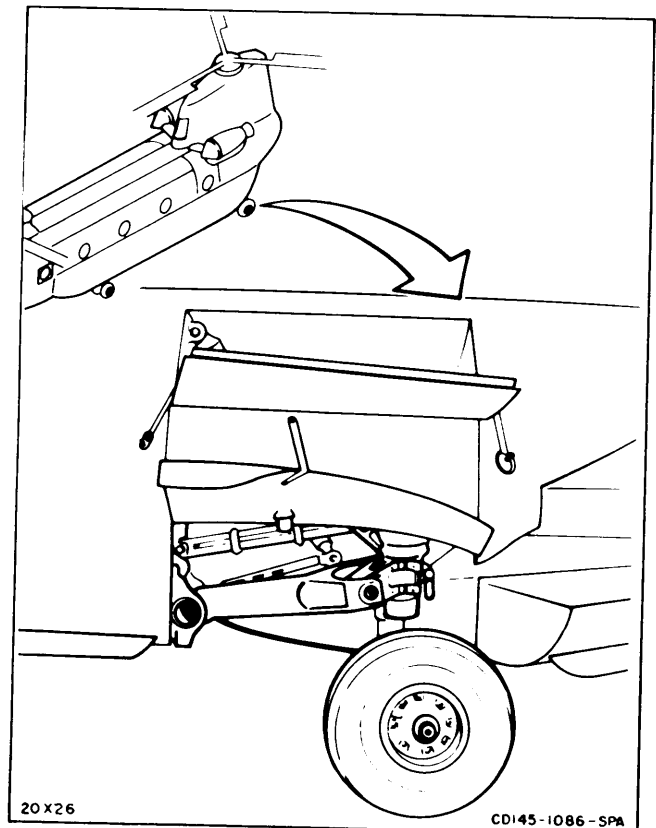
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3-58 INSTALL SWIVEL HOUSING SEALS (Continued)**3-58**

- 9! **Connect hydraulic hose (8) to union (9) on plate (3).**

**INSPECT****FOLLOW-ON MAINTENANCE:**

- █ Bleed swivel lock system (Task 7-331),

**END OF TASK**

3-59 REMOVE AFT LANDING GEAR TOWING SHACKLE**3-59****INITIAL SETUP****Applicable Configurations:**

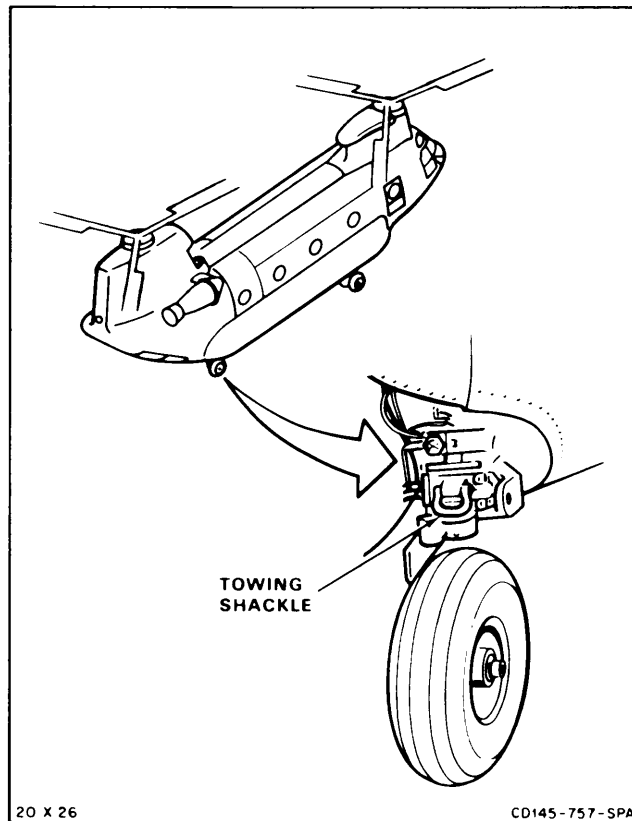
All

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

None

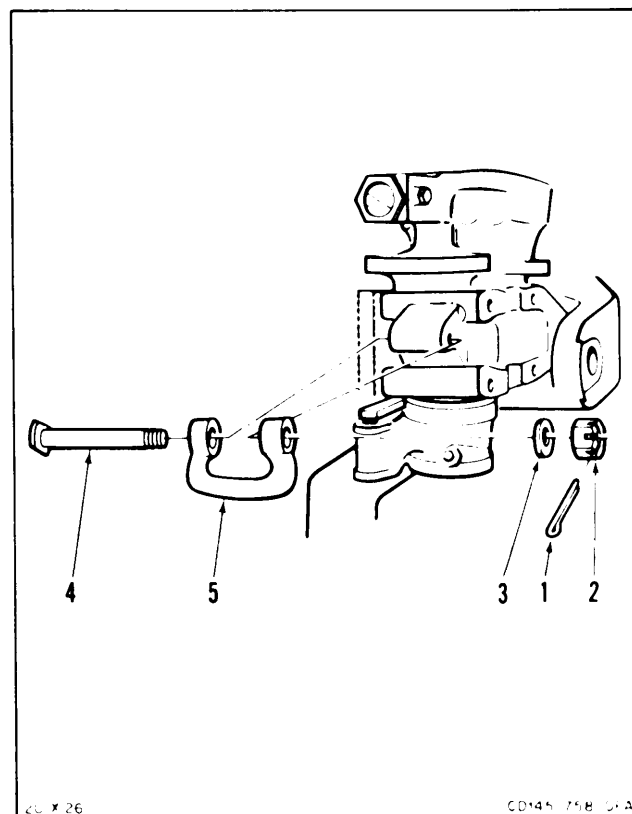
Personnel Required:

67U10 Medium Helicopter Repairer

Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off**NOTE**

Procedure is same for removing right or left aft landing gear towing shackle. Right shackle is shown here.

1. Remove cotter pin (1), nut (2), washer (3), and bolt (4).
2. **Remove towing shackle (5).**

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

3-60 INSTALL AFT LANDING GEAR TOWING SHACKLE

3-60

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 100 to 750 Inch-Pounds

Materials:

None

Parts:

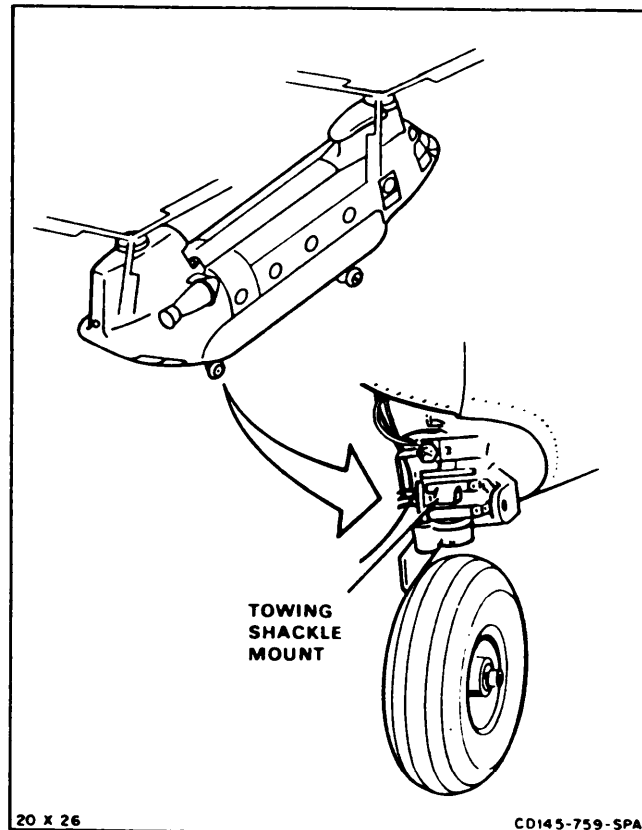
Cotter Pin

Personnel Required

Medium Helicopter Repairer
Inspector

References:

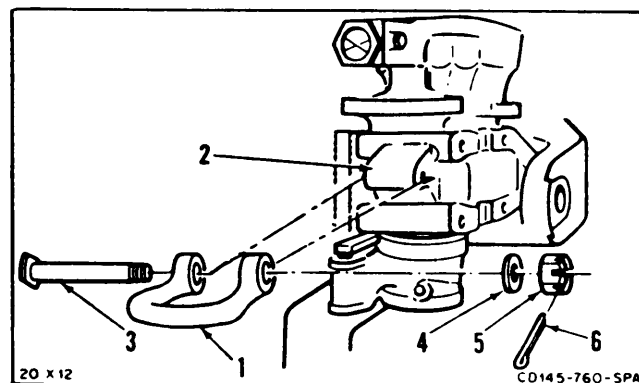
TM 55-1520-240-23P



NOTE

Procedure is same for installing left or right aft landing gear towing shackle. Right shackle is shown here.

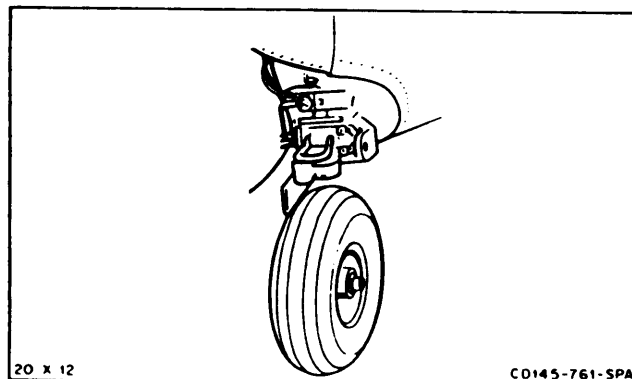
1. Place towing shackle (1) over mounting lug (2) in trailing position.
2. Install bolt (3), washer (4), and nut (5).
3. Torque nut (5) to 480 to 600 inch-pounds.
4. Install new cotter pin (6).



INSPECT

FOLLOW-ON MAINTENANCE

None



END OF TASK

3-61 REMOVE SWIVEL HOUSING AND SPINDLE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Socket, 1 Inch
- Socket, 2 1/8-inch

Materials:

Twine (E433)

Personnel Required:

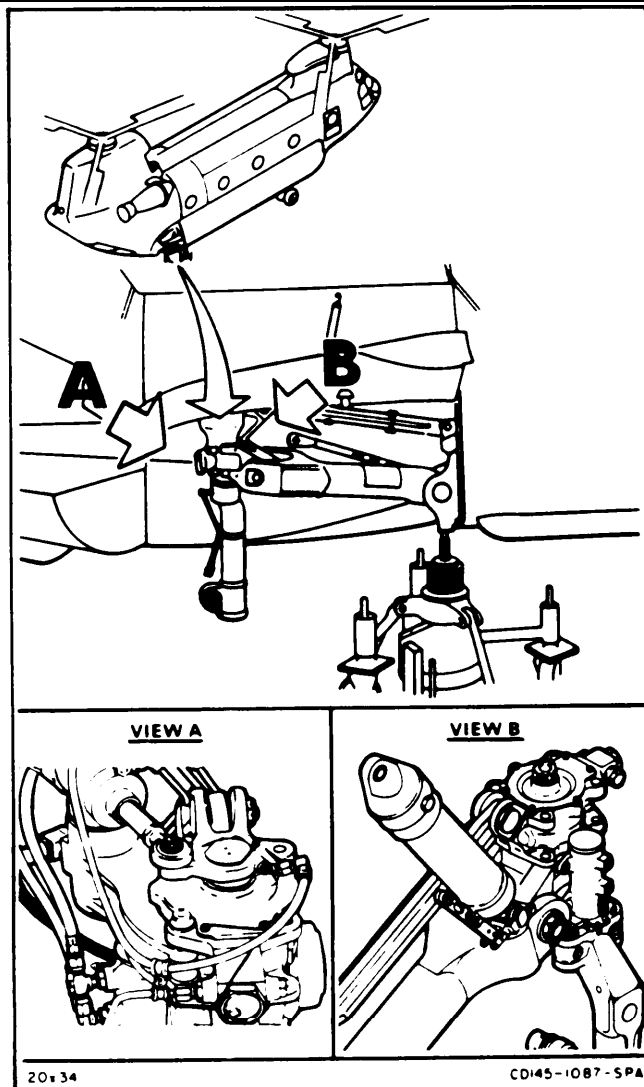
Medium Helicopter Repairer (2)

References:

- Task 3-37
- Task 3-69

Equipment Condition:

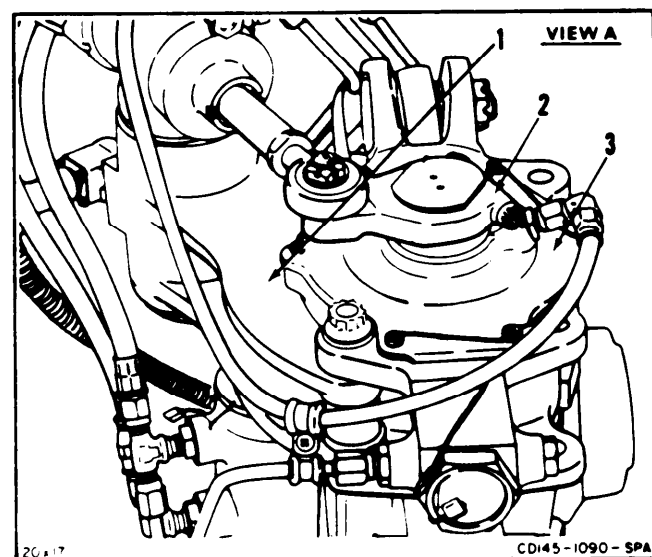
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Access Panels Opened (Task 2-2)
- Repressurize Utility Hydraulic System (Task 7-135.1)
- Helicopter Jacked at Aft Fuselage Jack Pad (Task 1-22)
- Wheel Removed (Task 3-7)
- Brake Removed (Task 3-84)



NOTE

Procedure is same for aft right or aft left landing gear except as noted in task.

1. On right gear only, **remove steering assembly (1) and steering lever (2)** from swivel housing (3) (Task 3-69).

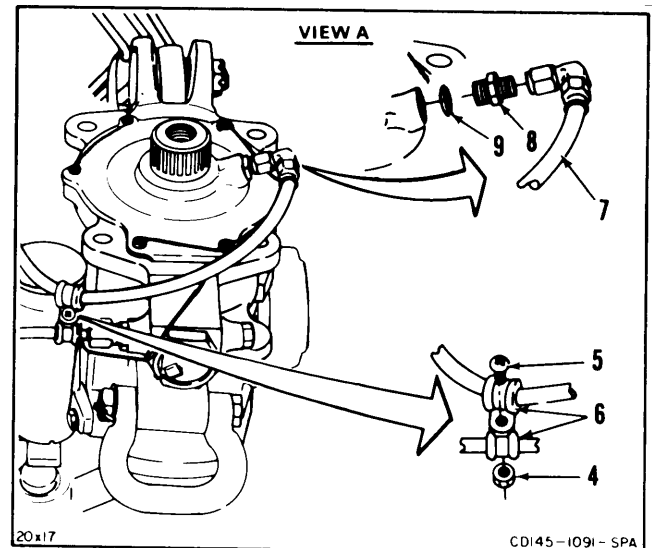


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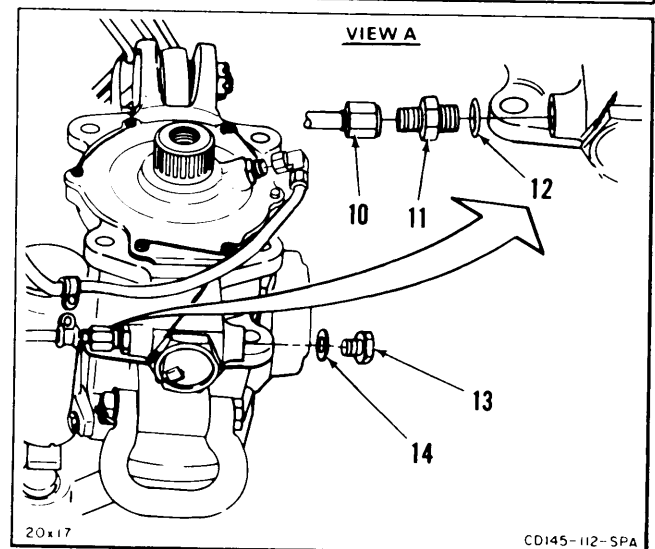
3-61 REMOVE SWIVEL HOUSING AND SPINDLE (Continued)

3-61

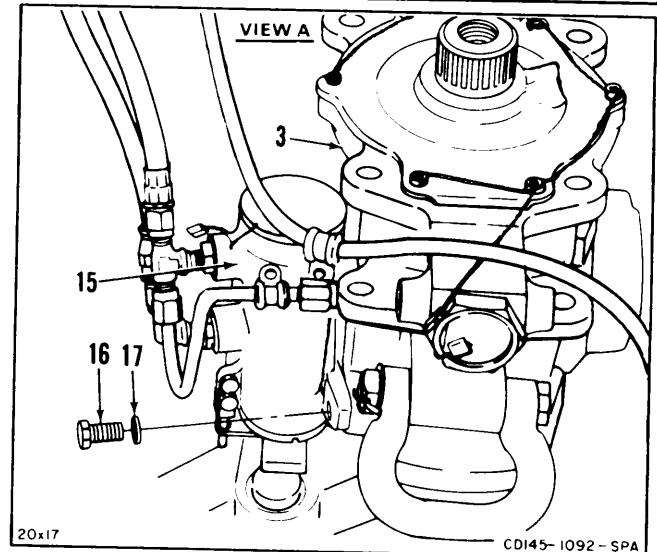
2. Remove nut (4) and screw (5) from two clamps (6). **Disconnect clamps.**
3. **Disconnect brake tube (7)** from union (8).
4. **Remove union (8)** and packing (9).



5. **Disconnect swivel actuator pressure tube (10)** from union (11).
6. **Remove union (11)** and packing (12).
7. **Remove plug (13)** and packing (14).



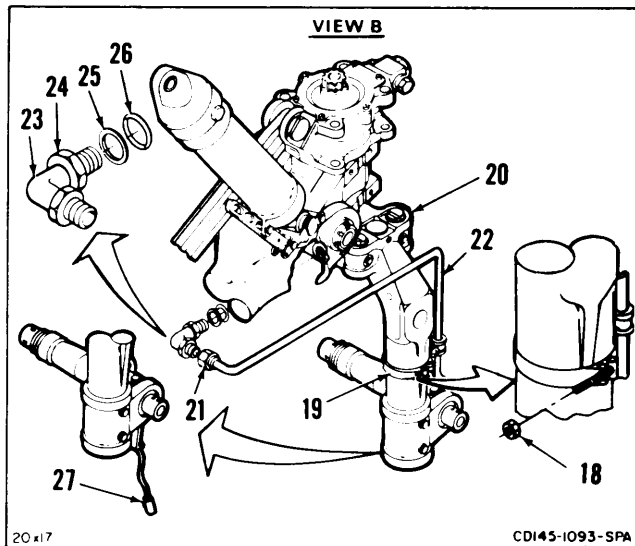
8. Remove lockwire from support swivel lock actuator (15). Remove four bolts (16) and washers (17). **Disconnect actuator (15)** from swivel housing (3).
9. Tie actuator (15) out of way. Use twine (E433).



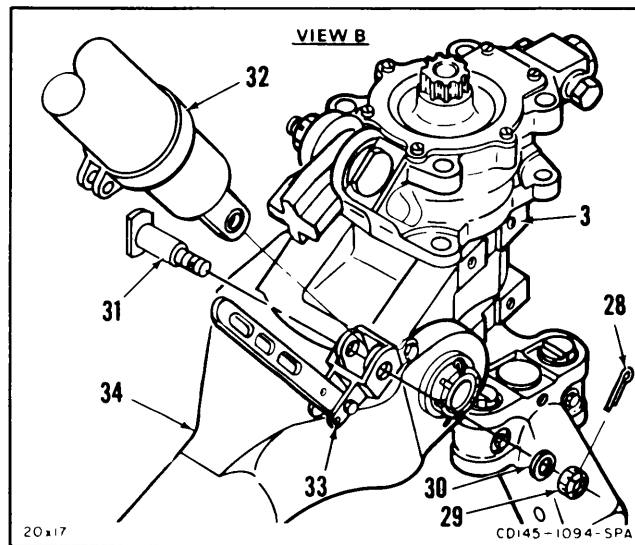
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**3-61 REMOVE SWIVEL HOUSING AND SPINDLE
(Continued)**

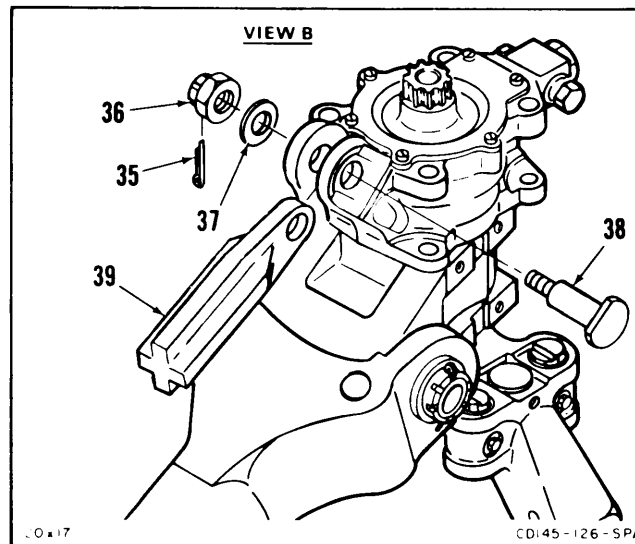
10. Remove lockwire, nut (18) and clamp (19) from spindle (20).
11. Loosen nut (21), and disconnect brake tube (22) from elbow (23).
12. Loosen nut (24) and remove elbow (23), retainer (25), and packing (26).
13. On left gear only, remove static ground wire (27) (Task 3-37).



14. Have helper hold swivel housing (3).
15. Remove cotter pin (28), nut (29), washer (30), and bolt (31). Remove shock strut (32) from fitting (33) on lower drag link (34).



16. Remove cotter pin (35), nut (36), washer (37), and bolt (38) from upper drag link (39).
17. Disconnect and tie drag link (39) out of way. Use twine (E433).

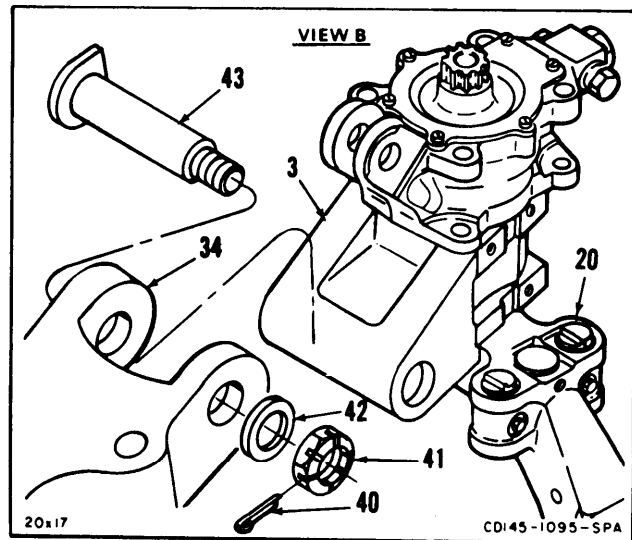


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3-61 REMOVE SWIVEL HOUSING AND SPINDLE (Continued)

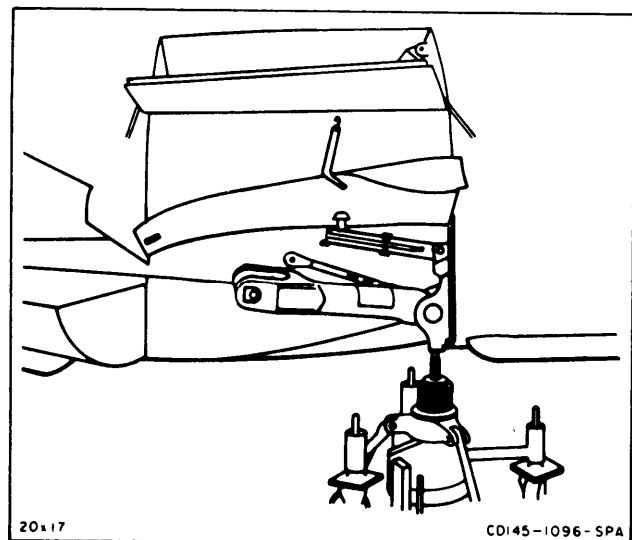
3-61

18. Have helper hold swivel housing (3), spindle (20), and lower drag link (34).
19. **Remove** cotter pin (40), nut (41), washer (42), and pin (43).
20. **Remove swivel housing (3) and spindle (20)** from lower drag link (34). Tie link out of way.



FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Twist Drill Set,
NSN 5133-00-293-0983
Aft Landing Gear Bearing Drift (T97)
Arbor Press
Electric Drill

Materials:

None

Personnel Required:

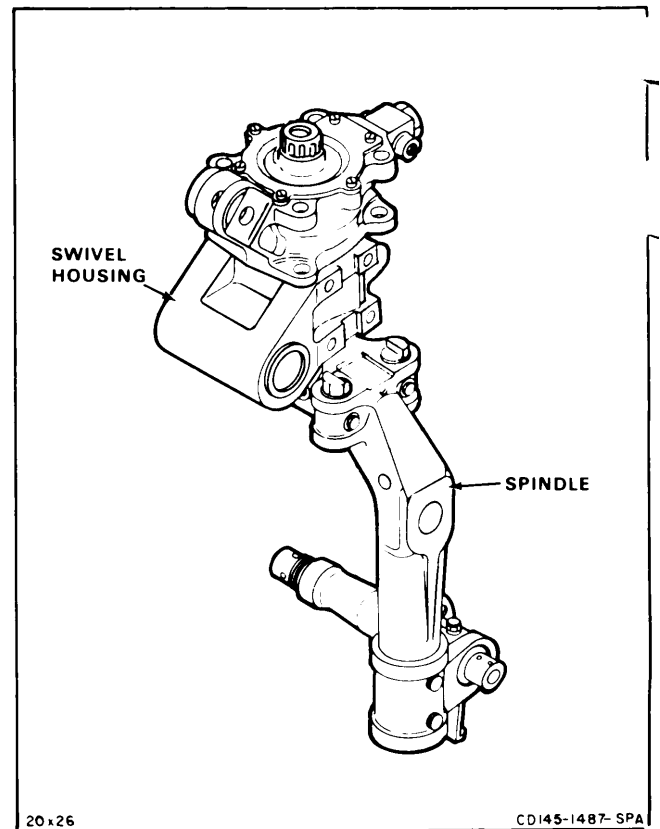
Machinist
Medium Helicopter Repairer (2)

References:

Task 3-34
Task 3-57
Task 3-59
Task 3-65
Task 3-66

Equipment Condition:

Off Helicopter Task

**NOTE**

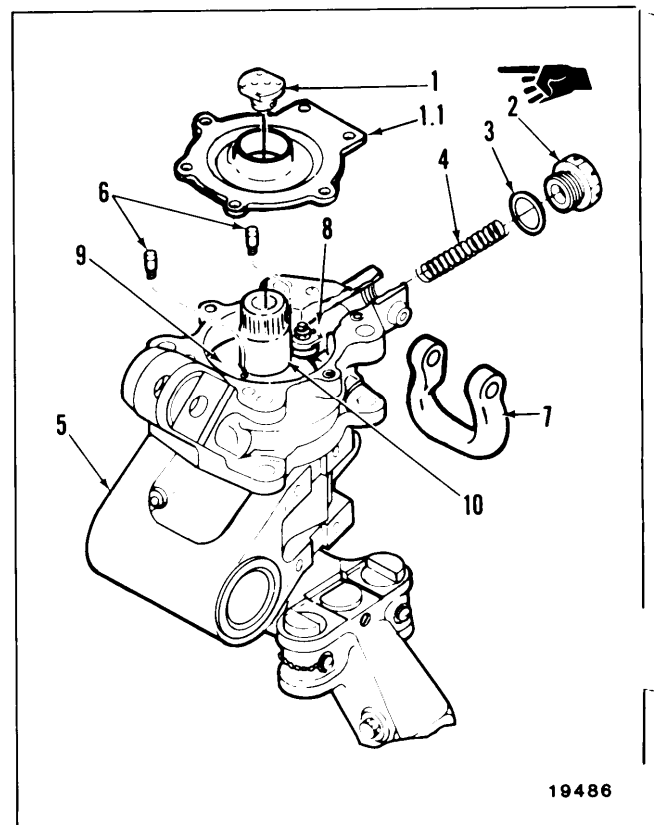
Procedure is same for left or right gear.
Right gear is shown here.

1. Remove end cap (1) and cover plate and seals (1.1) (Task 3-57).

WARNING

Plug is spring loaded. Remove plug carefully to prevent injury to personnel.

2. Remove lockwire, plug (2), packing (3), and cam centering spring (4) from swivel housing (5).
3. Remove lockwire and two shoulder screws (6).
4. Remove towing shackle (7) (Task 3-59).
5. Push cam follower piston (8) away from control cam (9) and remove swivel housing (5) from spindle (10).



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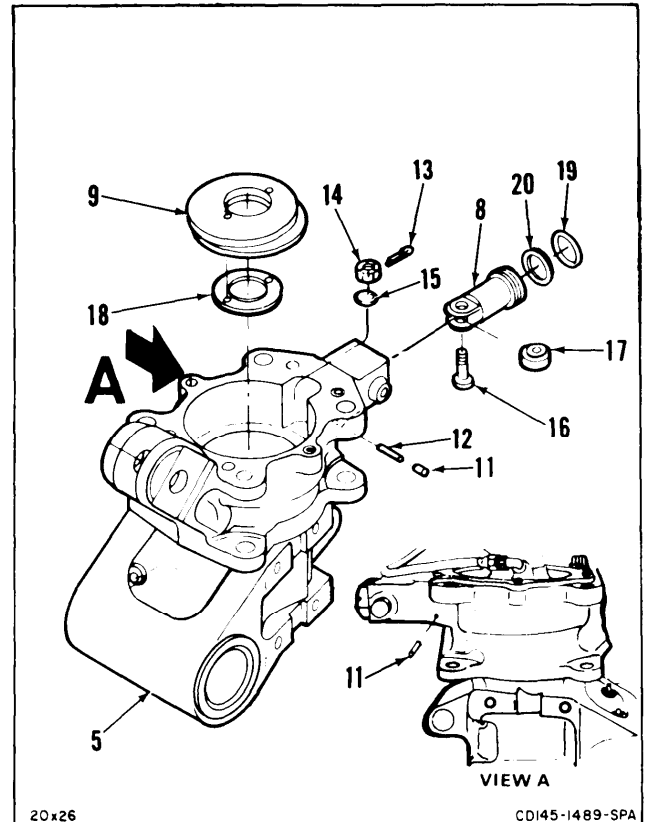
3-130

Change 12

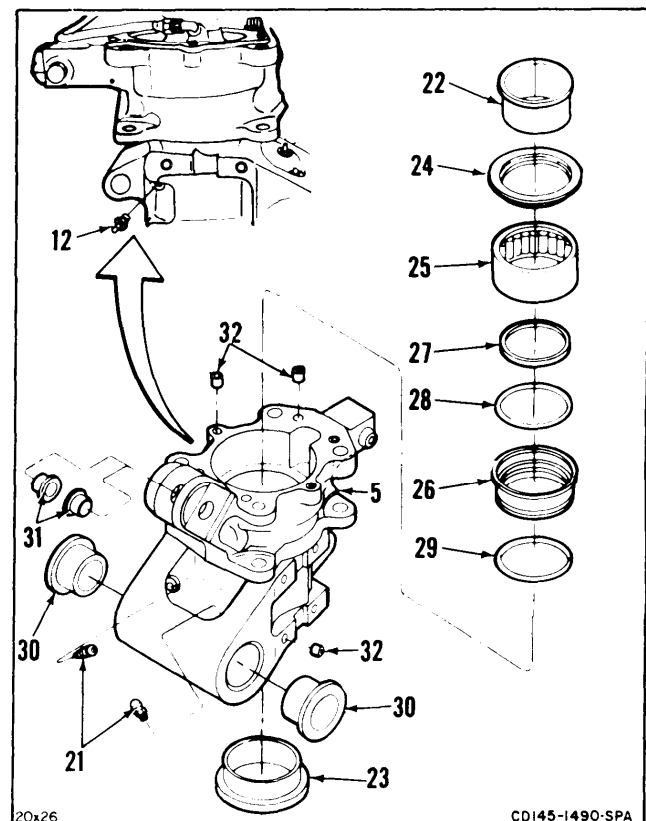
3-62 DISASSEMBLE SWIVEL HOUSING AND SPINDLE (AVIM) (Continued)

3-62

6. Have machinist **remove two plugs (11) and pin (12)** as follows:
 - a. Drill out plug (11) on one side of housing (5).
 - b. Drive out pin (12) and other plug (11).
7. Rotate piston (8) and attached parts so cotter pin (13), nut (14), and washer (15) can be removed.
8. **Remove** cotter pin (13), **nut (14)**, and washer (15).
9. Rotate piston (8) 180 degrees. Remove bolt (16).
10. Push piston (8) in and remove bearing (17).
11. **Remove piston (8).**
12. Remove packing (19) and retainer (20) from piston (8).
13. **Remove control cam (9) and Washer (18).**



14. **Remove three lubrication fittings (21).**
15. **Remove sleeve bushing (22).**
16. **Remove sleeve bushing (23).**
17. **Remove shouldered washer (24), needle bearing (25), and sleeve (26) as follows:**
 - a. Position swivel housing (5) upside-down on support of bearing drift (T97).
 - b. Insert drift pin of bearing drift in swivel housing (5) until shoulder of drift pin contacts sleeve (26).
 - c. Position bearing drift and swivel housing (5) in an arbor press and push shouldered washer (24), bearing (25), and sleeve (26) from housing (5).
18. Remove special packing (27) and packing (28) from inside of sleeve (26).
19. Remove packing (29) from outside of sleeve (26).
20. **Remove two sleeve bearings (30), and two sleeve bushings (31).** Use arbor press.
21. **Remove 14 thread inserts (32).**

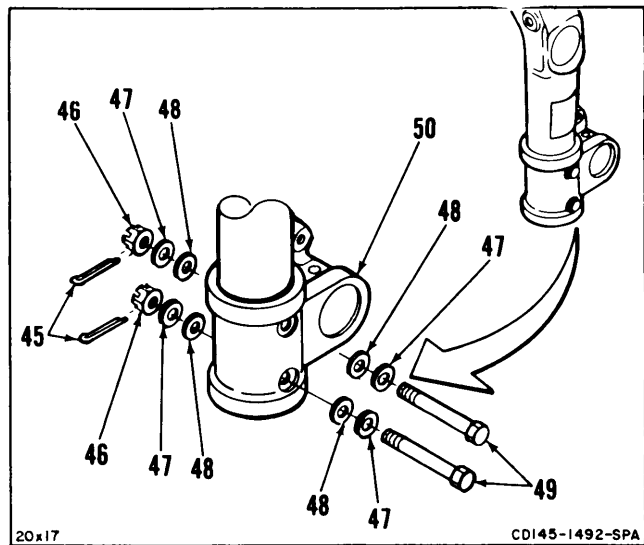
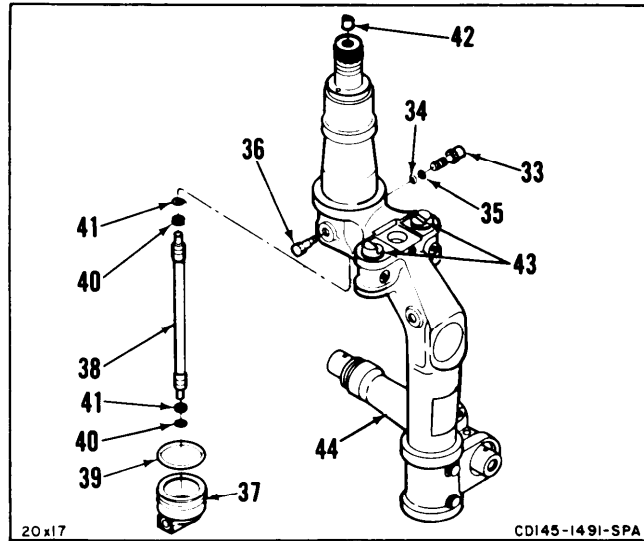


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**3-62 DISASSEMBLE SWIVEL HOUSING AND SPINDLE (AVIM)
(Continued)**

3-62

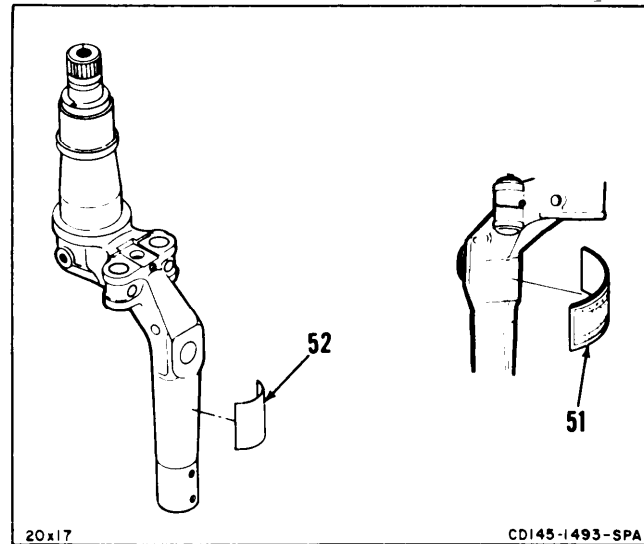
- 22. Remove lockwire and **remove spindle fitting (33)**.
- 23. Remove packing (34) and retainer (35).
- 24. Remove shoulder bolt (36). **Remove lower spindle fitting (37) and brake tube (38)**.
- 25. Remove packing (39).
- 26. Remove two packings (40) and retainers (41).
- 27. **Remove healing plug (42)**.
- 28. **Remove two spindle locks (43)** (Task 3-66).
- 29. **Remove axle (44)** (Task 3-34).
- 30. **Remove** cotter pins (45), nuts (46), washers (47), packing (48), and **bolts (49)**.
- 31. **Remove axle housing (50)**.



- 32. **Remove identification plate (51)**, if damaged or illegible (Task 3-65).
- 33. **Remove instruction plates (52)**, if damaged or illegible (Task 3-65).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-63 ASSEMBLE SWIVEL HOUSING AND SPINDLE (AVIM)**INITIAL SETUP***Applicable Configurations:*

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Machine Shop Set,
NSN 4920-00-405-9279
Vernier Caliper, 0 to 24-Inches
Aft Landing Gear Bearing Drift (T94)
Hand Lubricating Gun
Arbor Press or Oven

Materials:

Grease (E190)
Lockwire (E231)
Epoxy Primer (E292)
Gloves (184.1)
Kevlar Gloves (E187)

Parts:

Packings
Cotter Pins
Retainers

Personnel Required:

Machinist
Medium Helicopter Repairer (2)
Inspector

References:

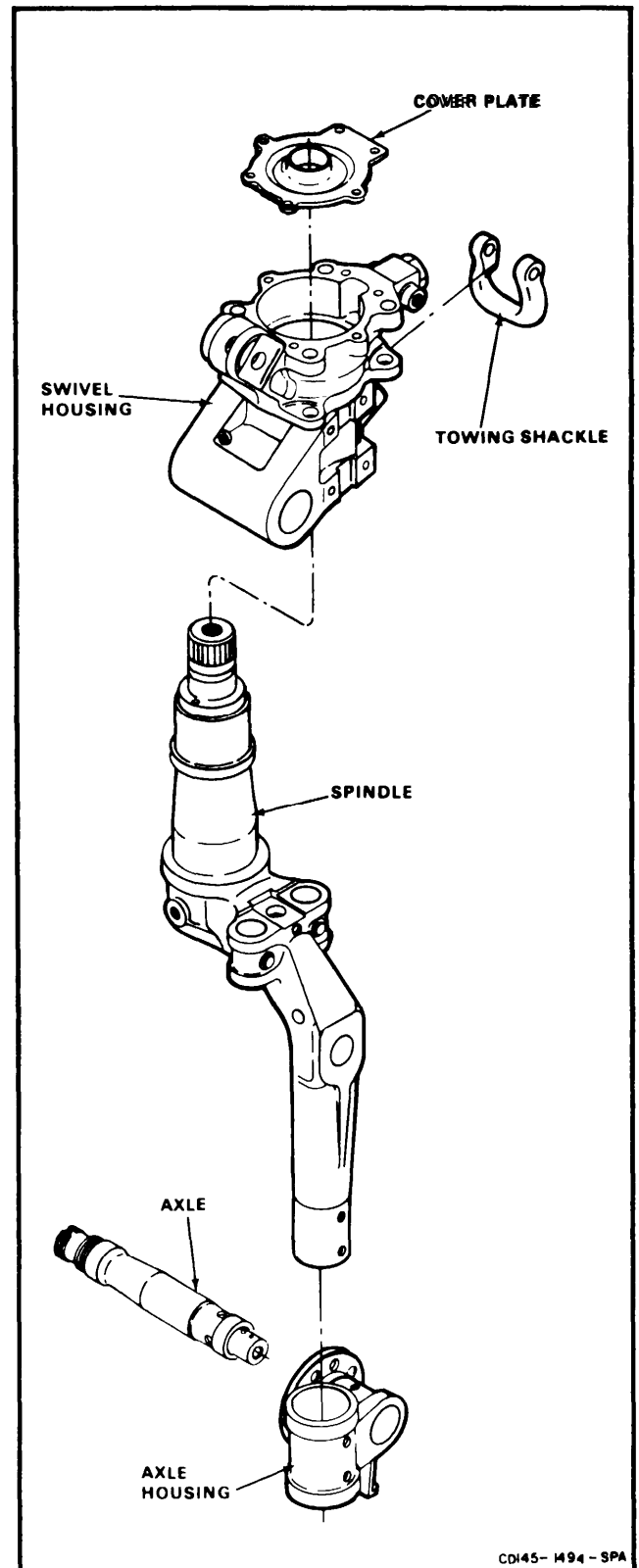
TM 55-1520-240-23P
Task 3-35 Task 3-65
Task 3-58 Task 3-68
Task 3-60

General Safety Instructions:**WARNING**

Wear Kevlar gloves (E187) when handling heated parts. Injury to personnel could result.

WARNING

Epoxy primer (E292) 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.

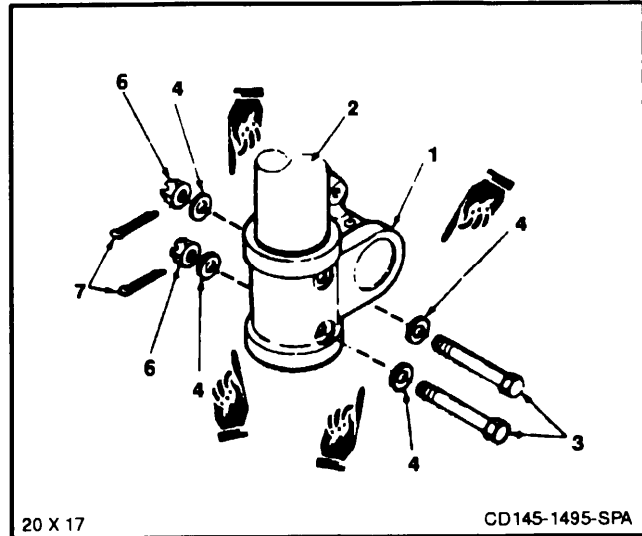
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3-63 ASSEMBLE SWIVEL HOUSING AND SPINDLE (AVIM) (Continued)

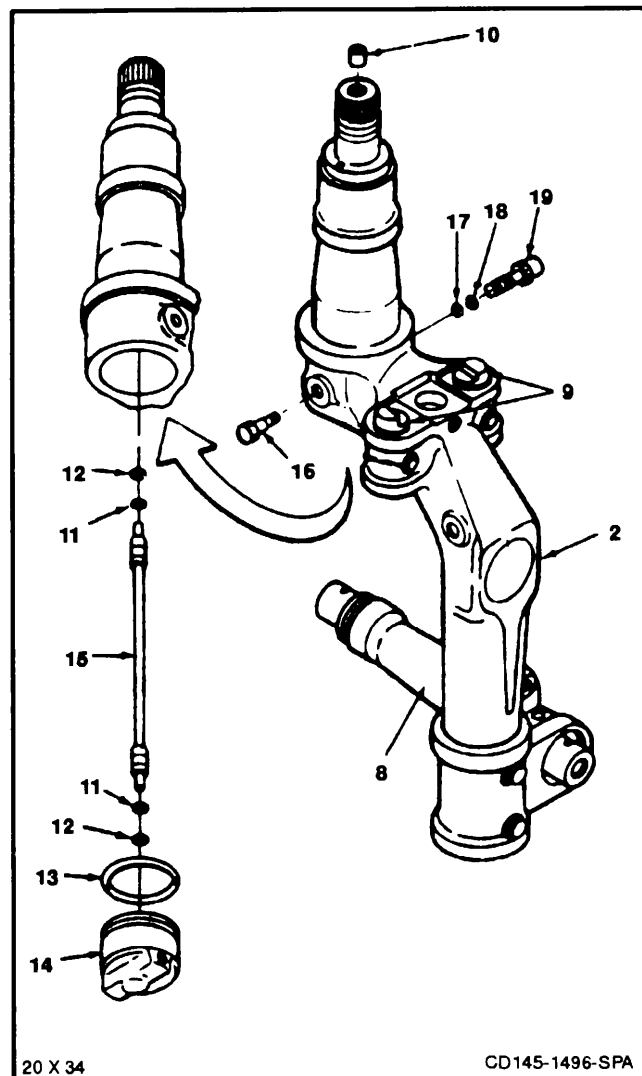
NOTE

Procedure is same for left or right gear.
Right gear is shown here.

1. **Install axle housing (1)** on spindle (2).
2. **Install bolts (3)**, washers (4), nuts (6), and cotter pins (7).



3. **Install axle (8)** (Task 3-35).
4. **Install two swivel locks (9)** (Task 3-68).
5. Deleted.
6. Install two packings (11) and retainers (12).
7. Install packing (13) on lower spindle fitting (14).
8. **Install brake tube (15) and lower spindle fitting (14)**, into spindle (2).
9. **Install shoulder bolt (16)**, packing (17), retainer (18), and **spindle fitting (19)**. Install lockwire on bolt and spindle fitting. Use lockwire (E231).

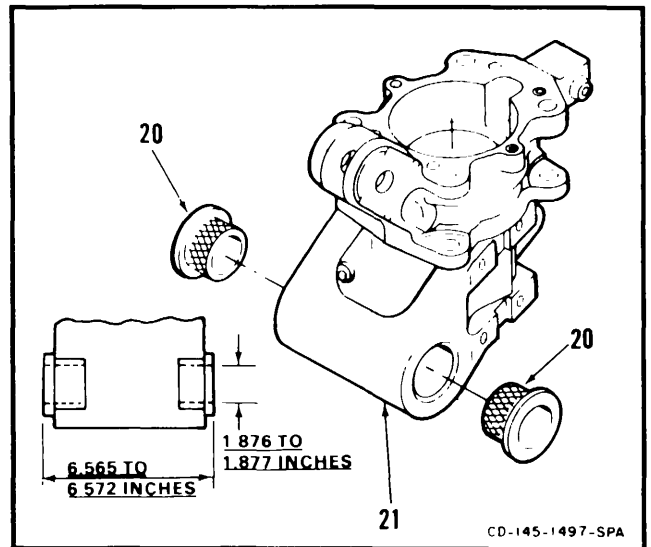


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3-63 ASSEMBLE SWIVEL HOUSING AND SPINDLE (AVIM) (Continued) 3-63

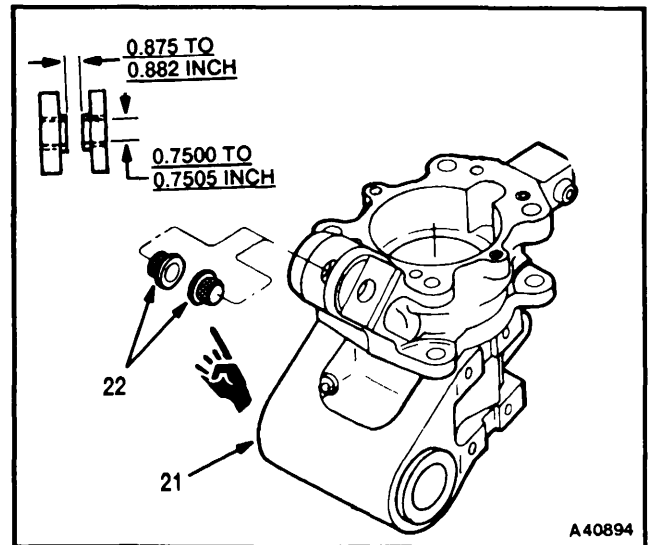
10. Install two sleeve bearings (20) in housing (21) as follows:

- a. Coat contact surfaces (shaded area) of bearings (20) with primer (E292). Wear gloves (184.1).
- b. While primer is still wet, install bearings (20). Use arbor press.
- c. If arbor press is not available, heat housing (21) in an oven to 230° to 250°F (110° to 120°C). Using driftpin and light force, install bearings (20).
- d. Line ream bearings (20). Inside diameter shall be 1.876 to 1.877 inches.
- e. Measure across faces of bearings (20). Distance shall be 6.565 to 6.572 inches.



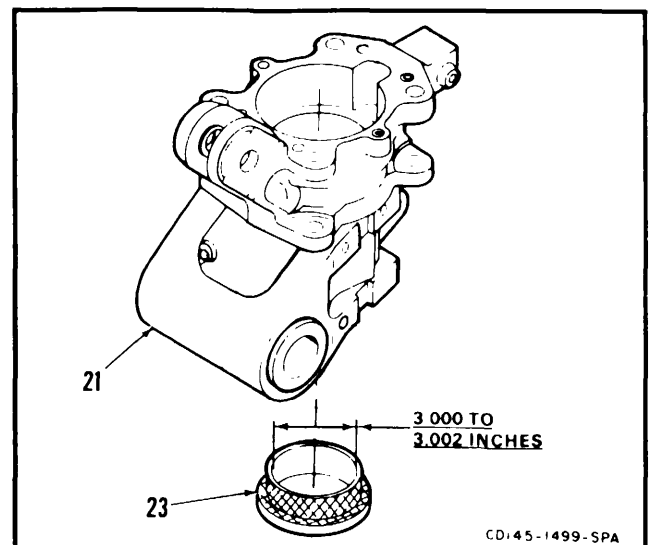
11. Install two sleeve bushings (22) in housing (21) as follows:

- a. Coat contact surfaces (shaded area) of bushing (22) with primer (E292). Wear gloves (184.1).
- b. While primer is still wet, install bushings (22). Use arbor press.
- c. If arbor press is not available, heat housing (21) in an oven to 230° to 250°F (110° to 120°C). Using driftpin and light force, install bushings (22).
- d. Line ream bushings (22). Inside diameter shall be 0.7500 to 0.7505 inch.
- e. Measure between flange at sleeve bushing (22). Distance shall be 0.875 to 0.882 inch.



12. Install sleeve bushing (23) in housing (21) as follows:

- a. Coat contact surfaces (shaded area) of bushing (23) with primer (E292). Wear gloves (184.1).
- b. While primer is still wet, install bushing (23). Use arbor press.
- c. If arbor press is not available, heat housing (21) in an oven to 230° to 250°F (110° to 120°C). Using driftpin and light force, install bushing (23).
- d. Measure sleeve bushing (23). Bushing shall have an inside diameter of 3.000 to 3.002 inches. Bushing shall be concentric with existing bore within 0.001 inch.



3-63 ASSEMBLE SWIVEL HOUSING AND SPINDLE (AVIM) (Continued)

13. Install packing (24) and retainer (25) on cam-follower piston (26).
14. **Install piston (26).**
15. Install packing (27) on swivel housing sleeve (28). Install sleeve in swivel housing (21).
16. Install packing (29) and special packing (30).
17. Pack needle bearing (31) with grease (E190).

NOTE

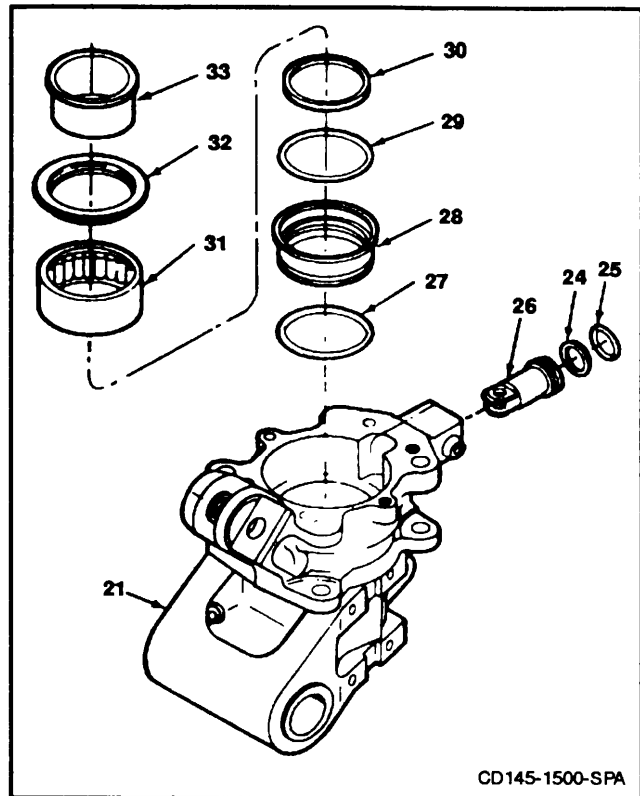
Install bearing with standard bearing numbers facing up.

18. **Install shouldered washer (32) and bearing (31) in swivel housing (21).** Use bearing drift (T94).
19. **Install sleeve bushing (33) in swivel housing (21) as follows:**
 - a. Coat contact surfaces of shoulder washer (32) with primer (E292). Wear gloves (184.1).
 - b. While primer is still wet, install bushing (33). Use arbor press.
 - c. If arbor press is not available, heat housing (21) in an oven to 230 to 250°F (110 to 120°C). Using driftpin and light force, install bushing (33).
20. **Install swivel housing (21) on spindle (2).**
21. **Install washer (34) and control cam (35) on spindle (2).** Install two shoulder screws (36). Lockwire screws with lockwire (E231).

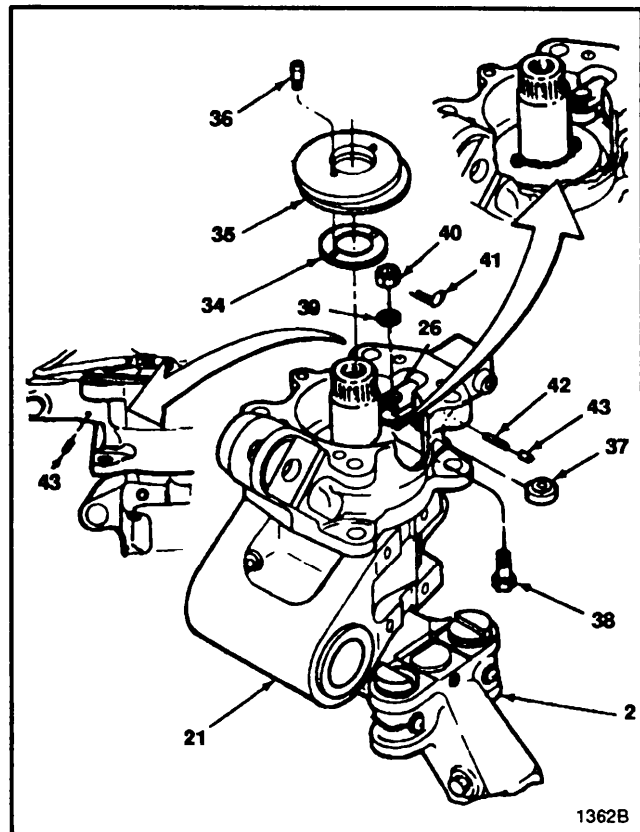
INSPECT

22. Pack bearing (37) with grease (E190).
23. Rotate piston (26) so that flat side of piston is up.
24. **Install bearing (37) and bolt (38).**
25. Rotate piston (26) until thread of bolt (38) is up (bolthead down) and flat side of piston is down.
26. Install washer (39), nut (40), and cotter pin (41).
27. **Install pin (42) and two plugs (43) in swivel housing (21).**

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CD145-1500-SPA



1362B

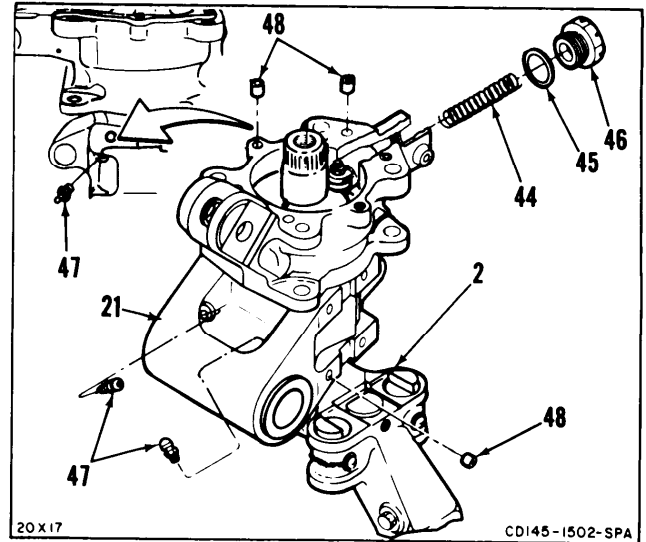
3-63 ASSEMBLE SWIVEL HOUSING AND SPRINDLE (AVIM) 3-63 (Continued)

28. Install cam centering spring (44) in swivel housing (21).

WARNING

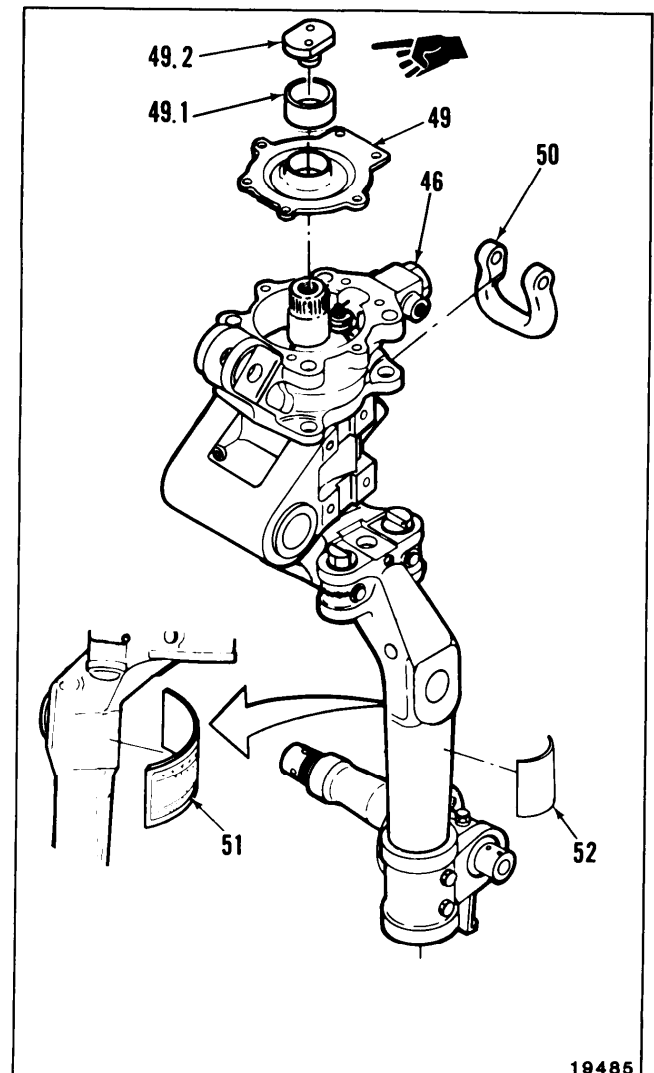
Plug will be under pressure and should be installed carefully to prevent injury to personnel.

29. Install packing (45) and plug (46). Lockwire plug with lockwire (E231).
30. Install three lubrication fittings (47).
31. Install 14 thread inserts (48).
32. Lubricate fittings (47). Use grease (E 190). Force grease into fittings until bead of grease appears between swivel housing (21) and spindle (2).



33. Install cover plate and seals (49). Lockwire plug (46) to cover plate (Task 3-58).
- 33.1. For an aft left gear, install sleeve spacer (49.1), and end cap (49.2). Torque end cap to 31 to 37 inch-pounds. Check that sleeve spacer has slight end play.
34. Install towing shackle (50) (Task 3-60).
35. Install identification plate (51) if removed (Task 3-65).
36. Install instruction plate (52) if removed (Task 3-65).

INSPECT



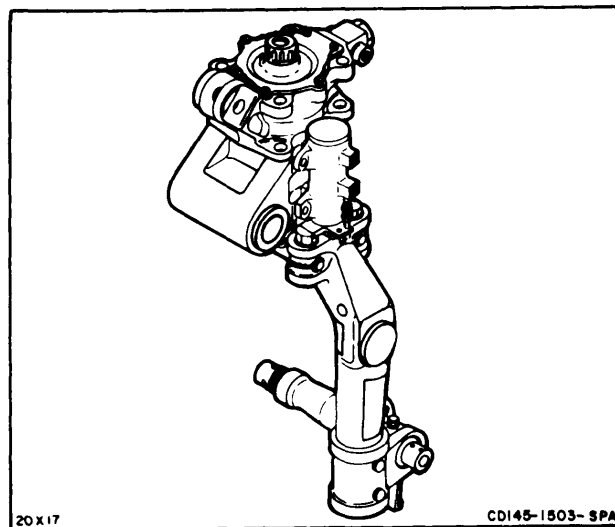
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**3-63 ASSEMBLE SWIVEL HOUSING AND SPINDLE (AVIM)
(Continued)**

3-63

FOLLOW-ON MAINTENANCE:

Test swivel housing and spindle (Task 3-64).



END OF TASK

3-64 TEST SWIVEL HOUSING AND SPINDLE (AVIM)

3-64

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Repairer's Tool Kit,
NSN 5180-00-323-4891
Hydraulic Test Stand, Type D6A,
D5A, or equivalent 0 to 4500 psi,
3-micron filter
Shatterproof Shield
Technical Inspection Tool Kit,
NSN 5180-00-323-5114
Pressure Restrictor Valve
Hydraulic Pressure Gage 0 to 500 psi
Shutoff valve

Materials:

None

Parts:

Packings
Seals

Personnel Required:

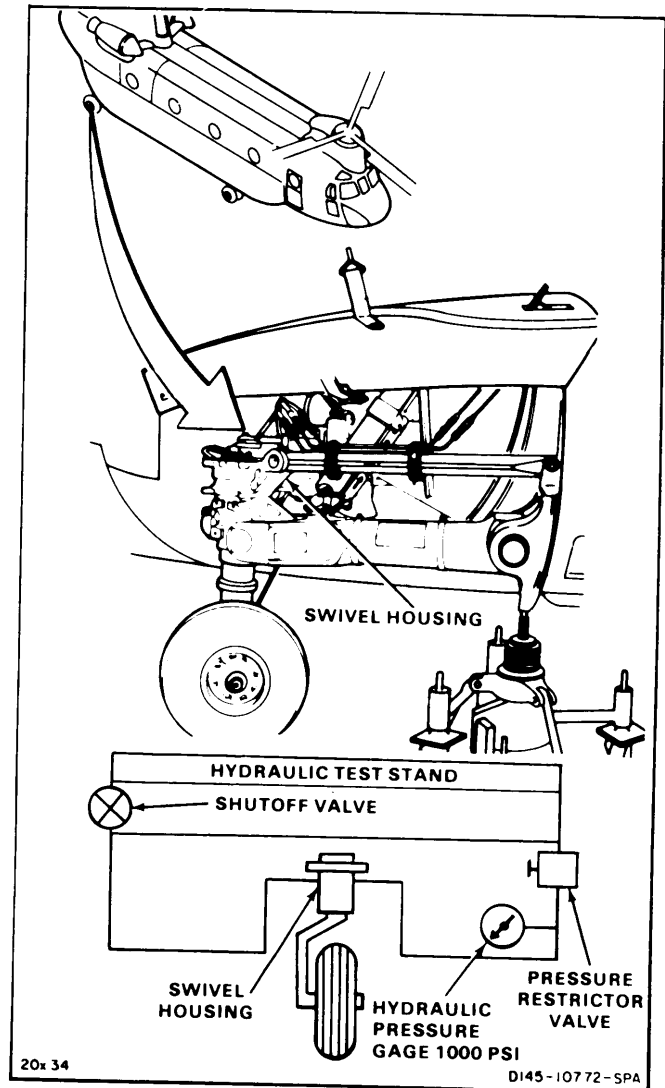
Aircraft Pneudraulics Repairer
Aircraft Pneudraulics Repairer
Inspector

References:

Task 3-58
Task 3-70

Equipment Condition:

Battery Disconnected (Task 1 -39)
Electrical Power Off
Hydraulic Power Off
Access Panels Opened (Task 2-2)
■ Bleed Brake and Utility System (Task 7-330)
Helicopter Jacked at Aft Landing Gear (Task 1-24) Test Setup
Steering Lever Removed (Task 3-69)
Swivel Housing Cover Removed (Task 3-57)



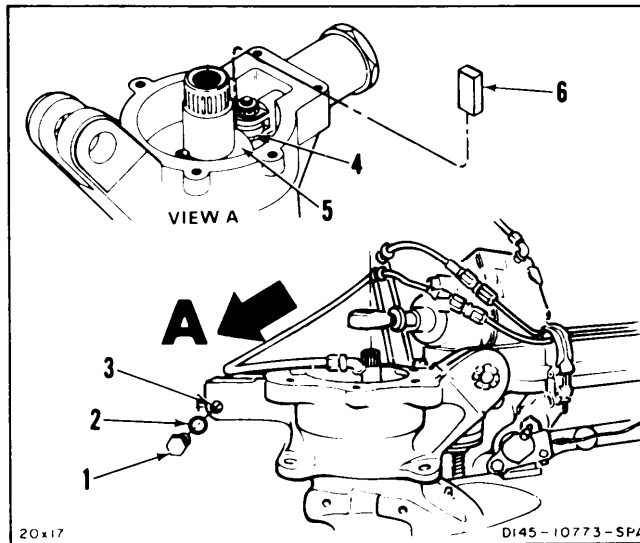
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3-64 TEST SWIVEL HOUSING AND SPINDLE (AVIM) (Continued)

WARNING

Do not test until all connections are checked for security, and component is properly assembled. Use shatterproof shield to protect personnel. Hydraulic fluid sprayed under high pressure can cause serious injury to personnel.

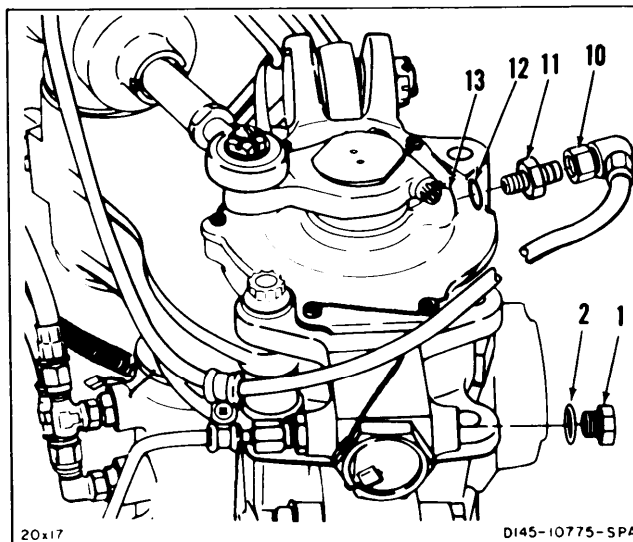
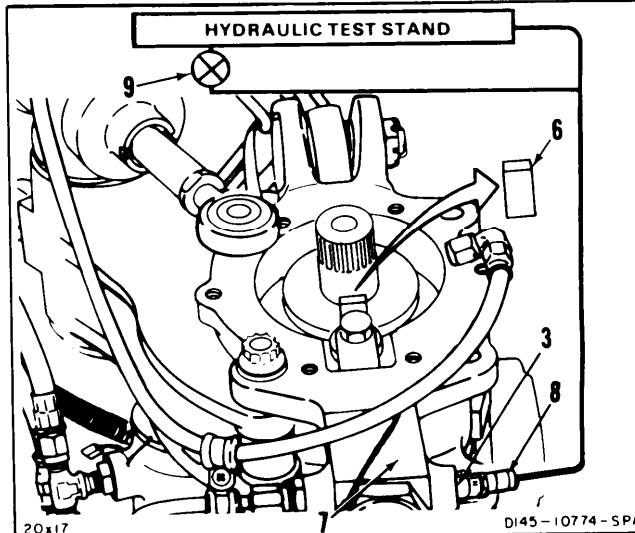
1. Remove plug (1) and packing (2) from cam follower port (3).
2. Have helper move bearing (4) away from cam (5) far enough to install aluminum bar (6). Position bar between cam and bearing. Release bearing.



NOTE

To operate hydraulic test stand, refer to applicable manual.

3. **Proof pressure test cam follower (7)** as follows:
 - a. Connect test stand hose fitting (8) to cam follower port (3).
 - b. Close shutoff valve (9).
 - c. Apply 4500 psi to cam follower port (3) for 5 minutes.
 - d. Check cam follower (7). There shall be no external leakage, distortion, or malfunction.
 - e. Open shutoff valve (9).
 - f. Remove aluminum bar (6).
4. Install packing (2) and plug (1).
5. **Install swivel housing cover** (Task 3-58).
6. **Install steering lever** (Task 3-70).
7. Install packing (2) and plug (1).
8. Remove elbow (10), union (11), and packing (12) from brake pressure port (13).



GO TO NEXT PAGE

3-64 TEST SWIVEL HOUSING AND SPINDLE (AVIM) (Continued)

3-64

9. **Proof pressure test swivel housing (14)
at brake pressure port (13) as follows:**

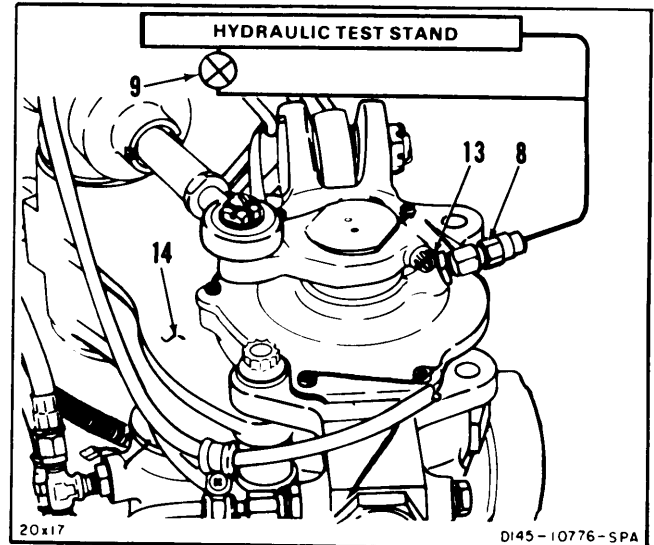
- a. Connect test stand hose fitting (8) to brake pressure port (13).
- b. Close shutoff valve (9).
- c. Apply 4500 psi hydraulic pressure to brake pressure port (13) for 2 minutes.
- d. Check test stand gage. There shall be no pressure drop.

NOTE

Leakage is indicated by gradual pressure drop.

- e. Open shutoff valve (9).

10. Remove test stand hose fitting (8).



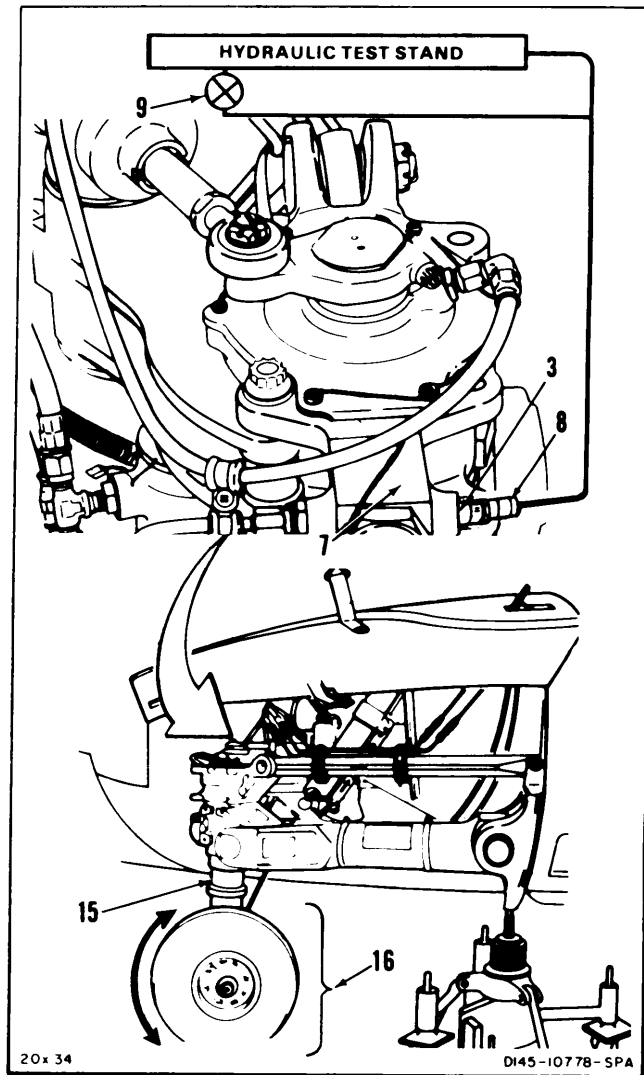
11. Install packing (12), union (11), and elbow (10) in brake pressure port (13).
12. Remove plug (1) and packing (2) from cam follower port (3).

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3-64 TEST SWIVEL HOUSING AND SPINDLE (AVIM) (Continued)

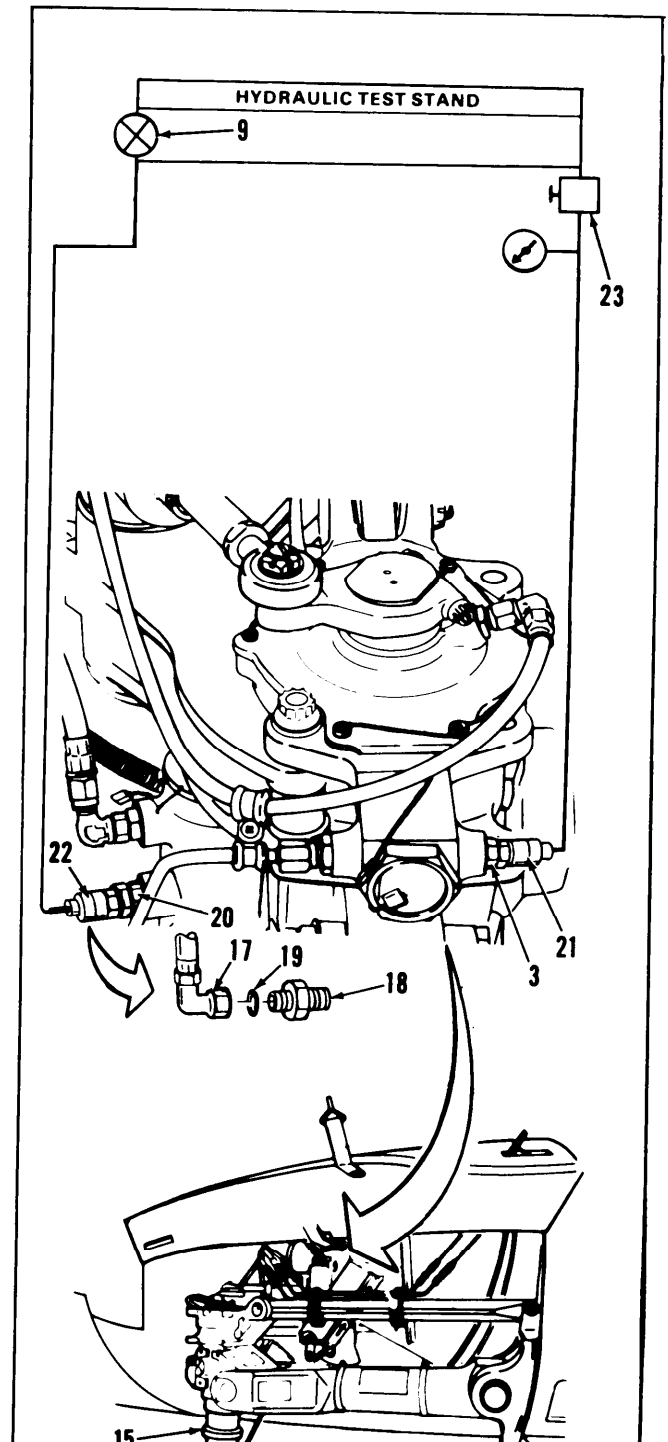
3-64

13. Check that cam follower (7) returns spindle (15) to center as follows:
- Connect test stand hose fitting (8) to cam follower port (3).
 - Check that aft landing gear (16) is centered and trailed aft.
 - Close shutoff valve (9).
 - Apply 300 psi hydraulic pressure to cam follower port (3).
 - Turn spindle (15) through 38 degrees in either direction. Release spindle. Check that spindle returns to center.
 - Open shutoff valve (9).
 - Remove test stand fitting (8) from port (3).



GO TO NEXT PAGE

14. Remove elbow (17), union (18), and packing (19) from lower locking actuator port (20).
15. **Check locking and centering** as follows:
 - a. Connect test stand to test setup.
 - b. Connect fitting (21) on test setup reduced pressure hose to cam follower port (3).
 - c. Connect fitting (22) on other test setup hose to lower locking actuator port (20).
 - d. Close pressure restrictor (23).
 - e. Close shutoff valve (9).
 - f. Apply 3000 psi pressure to lower port (20). This unlocks aft landing gear (16). Open restrictor (23) slowly and apply 300 psi pressure to cam follower port (3).
 - g. Turn spindle (15) through 30 degrees. Release spindle. Check that spindle returns to center smoothly without binding.
 - h. Open shutoff valve (9).

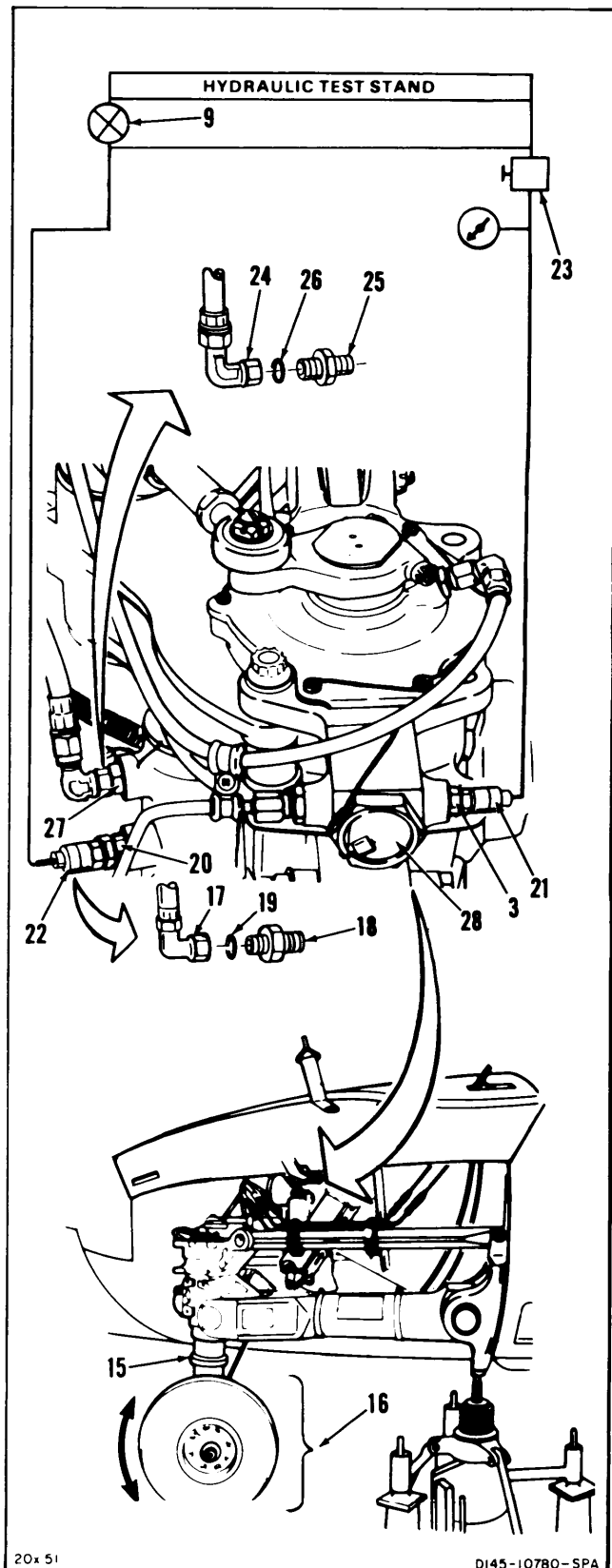


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3-64 TEST SWIVEL HOUSING AND SPINDLE (AVIM) (Continued)

3-64

- l. Remove elbow (24), union (25), and packing (26) from upper port (27) of locking actuator (28).
 - j. Remove fitting (22) from lower port (20), and install in upper port (27).
 - k. Install packing (19), fitting (17), and elbow (18) in unlock port (20).
 - i. Close shutoff valve (9).
 - m. Apply 3000 psi hydraulic pressure to upper port (27) to lock aft landing gear (16).
 - n. Open shutoff valve (9).
16. **Remove test setup hose fittings (21) and (22) from upper port (27) and cam follower port (3).**



20x 51

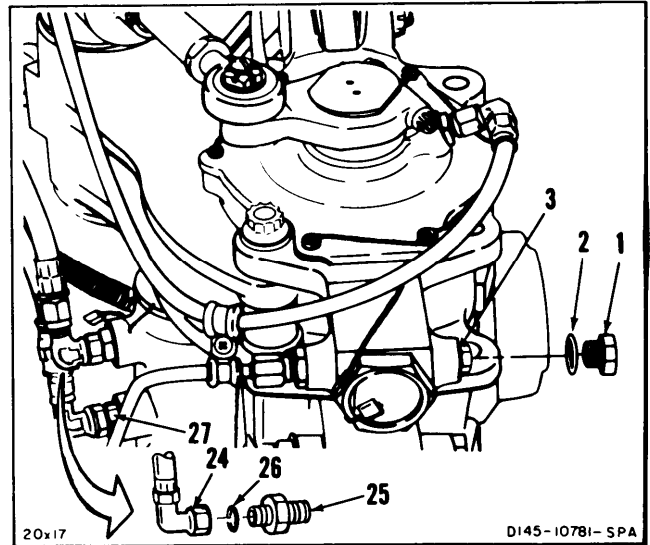
DI45-10780-SPA

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**3-64 TEST SWIVEL HOUSING AND SPINDLE
(AVIM) (Continued)**

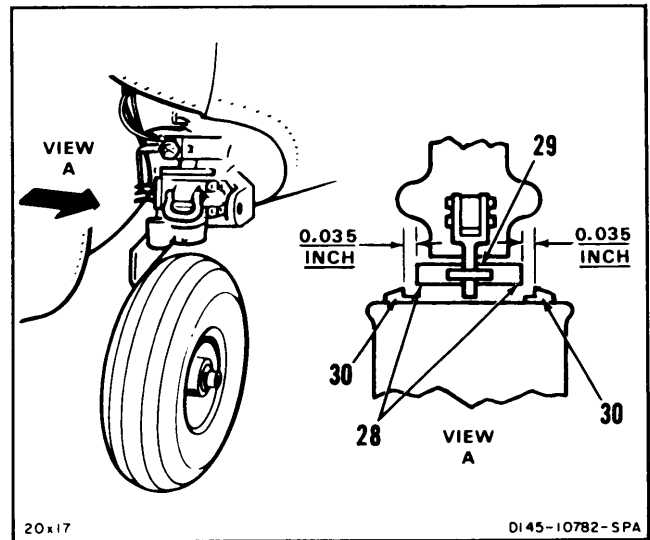
3-64

- 17. Install packing (2) and plug (1) in cam follower port (3).
- 18. Install union (25), packing (26), and elbow (24) in upper port (27).



- 19. Measure distance between faces (28) of swivel lock (29) and swivel lock detents (30). Distance shall not exceed 0.035-inch.

INSPECT



FOLLOW-ON MAINTENANCE:

- Remove jack (Task 1-24).
- Close access panels (Task 2-2).

END OF TASK

3-65 REPLACE LANDING GEAR DATA PLATE (AVIM)

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Metal Stamp Die Sets (Alphabetic and Nu-
meric)

Materials:

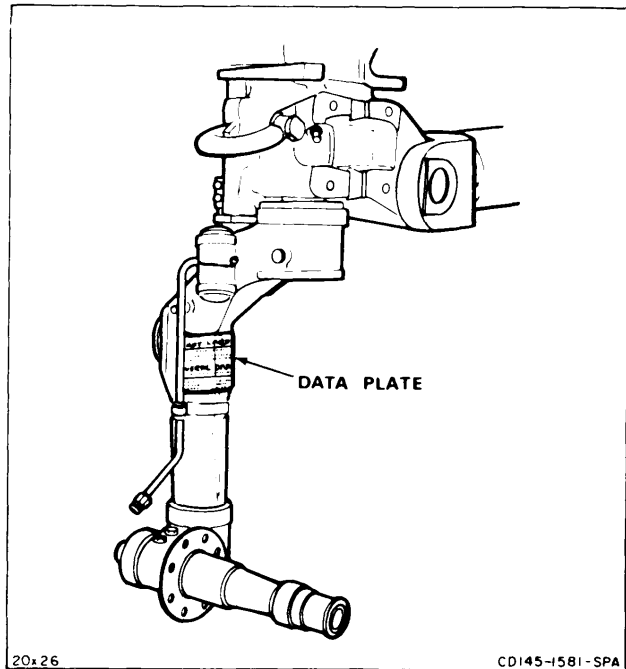
- Cloths (E120)
- Methyl-Ethyl-Ketone (E244)
- Gloves (E186)

Personnel Required:

67U20 Medium Helicopter Repairer

Equipment Condition:

Off Helicopter Task



CAUTION

Scraping actions may scratch, nick or gouge spindle. Do not damage spindle when removing data plate.

NOTE

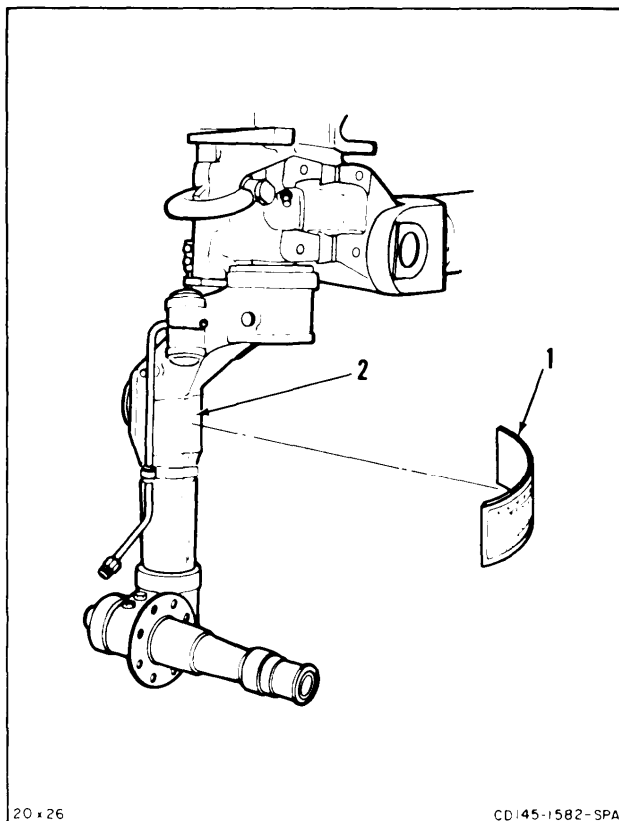
Procedure is same for left or right aft landing gear.

- 1 Remove data plate (1) from spindle (2) Lift up corner of data plate with a knife or equivalent sharp Instrument Peel data plate off with pliers.

WARNING

Methyl-ethyl-ketone (E244) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.

- 2 Wearing gloves (E 186), clean area of spindle (2) where data plate (1) Will be installed Wipe spindle dry Use cloths (E120) and methyl-ethyl-ketone (E244)

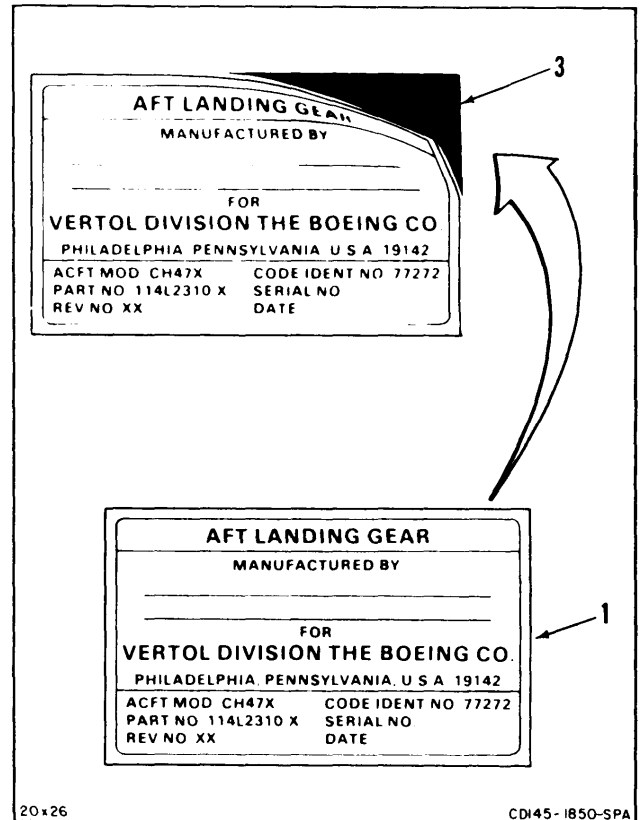


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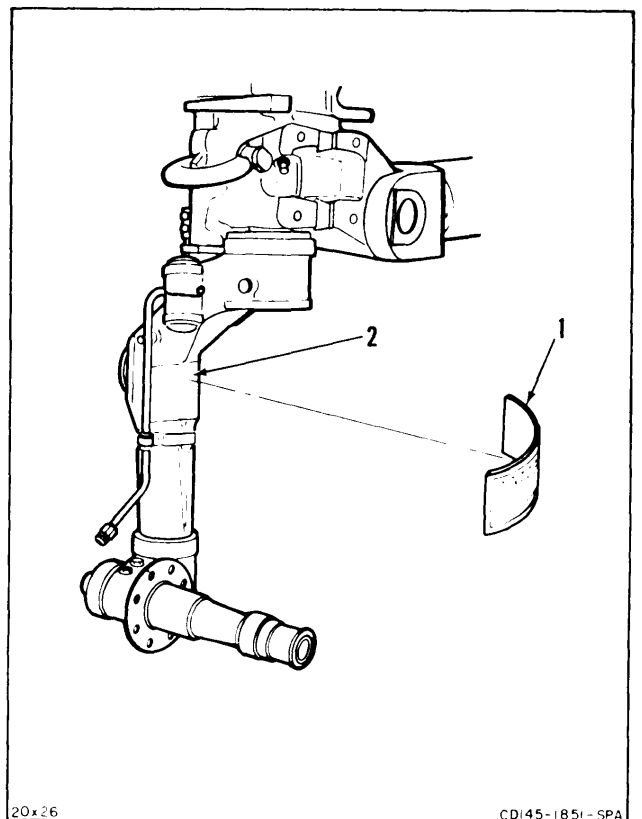
3-65 REPLACE LANDING GEAR DATA PLATE (AVM)
(Continued)

3-65

3. Transfer information from removed data plate to new data plate (1).
4. Remove paper backing (3) from data plate (1). Remove moisture, if present, from adhesive on back of data plate.



5. Position data plate (1) on spindle (2). **Press data plate onto spindle** so that all edges of plate adhere to spindle.



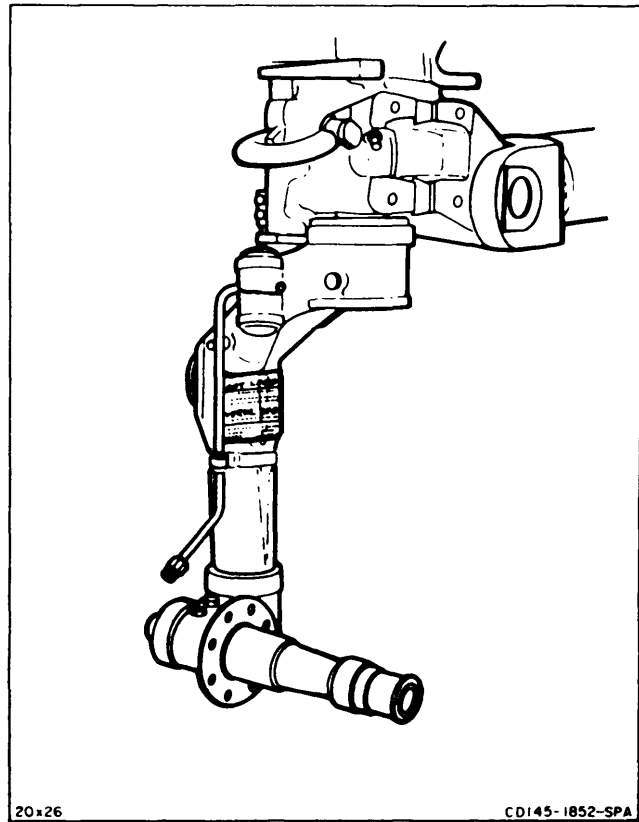
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3-65 REPLACE LANDING GEAR DATA PLATE (AVIM)
(Continued)

3-65

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-66 INSTALL SWIVEL HOUSING AND SPINDLE**3-66****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 100 to 750 Inch-Pounds
Socket, 1 Inch
Socket, 2-1/8 Inch

Materials:

Grease (E190)
Lockwire (E231)

Parts:

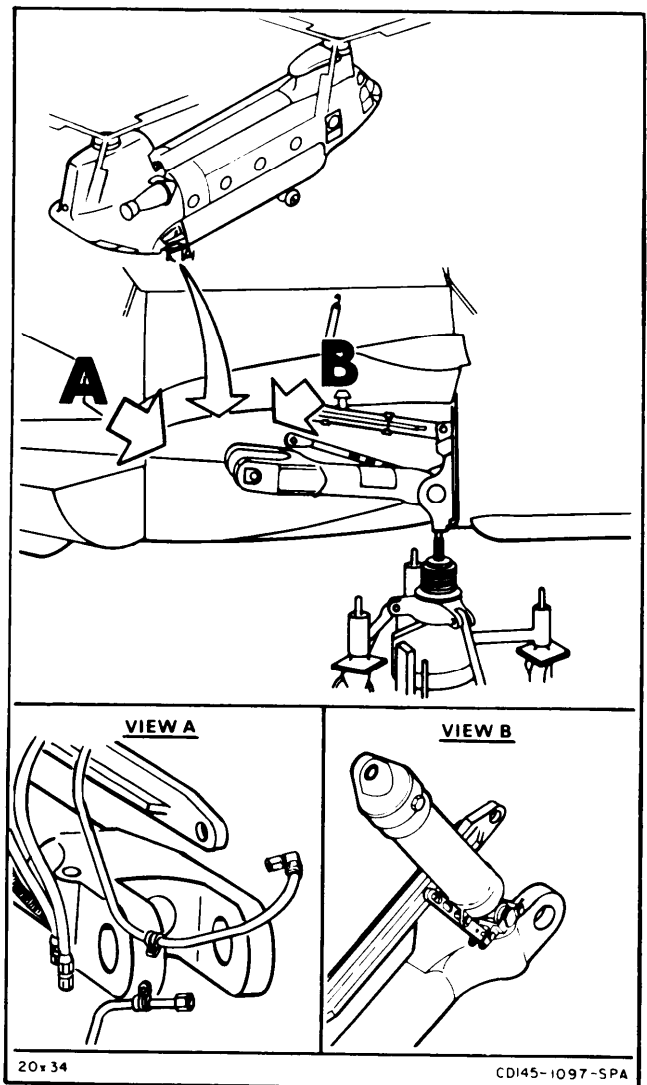
Cotter Pins

Personnel Required:

67U10 Medium Helicopter Repairer
67U20 Medium Helicopter Repairer
67U30 Inspector

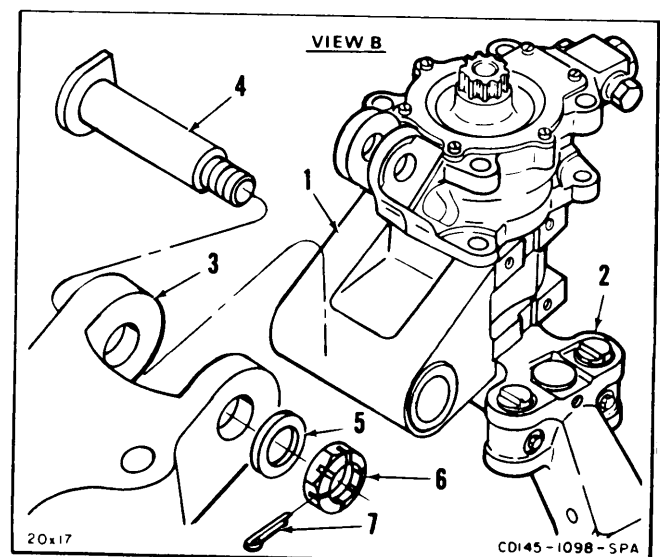
References:

TM 55-1520-240-23P
Task 3-38
Task 3-70

**NOTE**

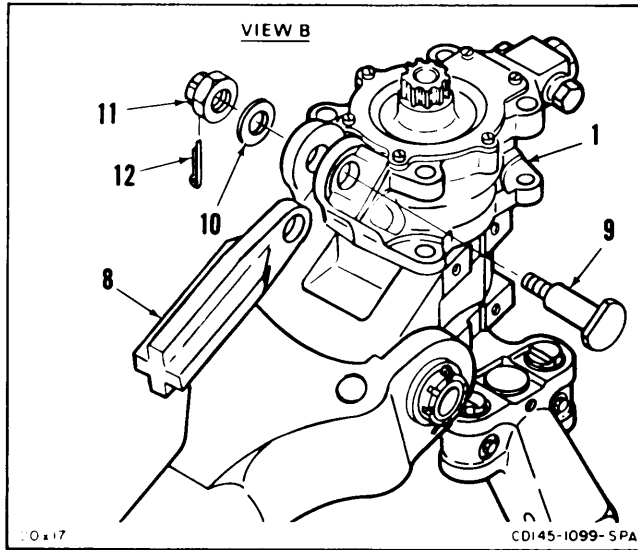
Procedure is same for aft right or aft left landing gear except as noted in task.

1. Have helper align swivel housing (1) and spindle (2) with lower drag link (3). Untie drag link.
2. Coat pin (4) with grease (E1 90). **Install pin** through housing (1) and drag link (3).
3. Install washer (5) and nut (6). **Torque nut to 350 to 500 inch-pounds.** Install cotter pin (7).

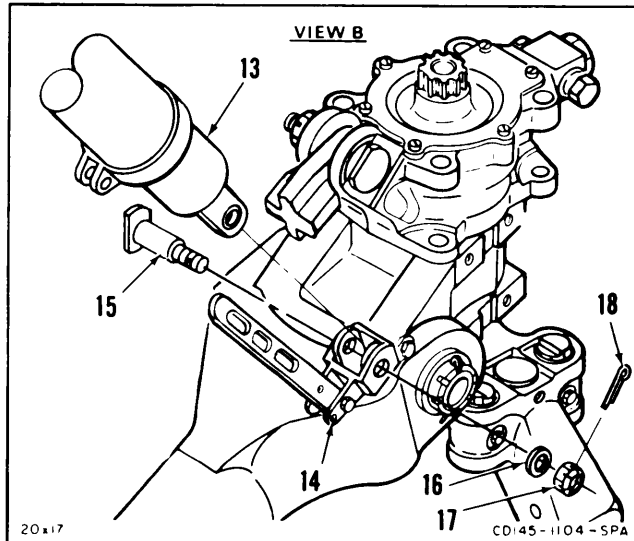
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3-66 INSTALL SWIVEL HOUSING AND SPINDLE (Continued)

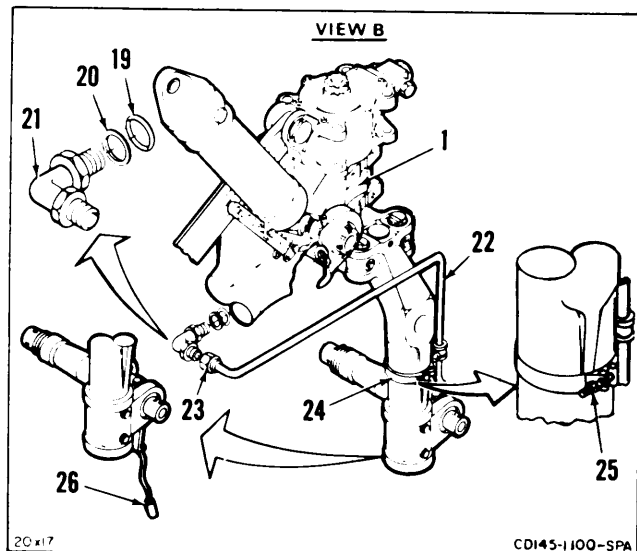
4. Untie drag link (8). **Position drag link in housing (1)** as shown.
5. **Install bolt (9)**, washer (10) and nut (11). **Torque nut to 350 to 500 inch-pounds.** Install cotter pin (12).



6. Pull down shock strut piston (13) and **align hole in piston with hole in attach fitting (14)**.
7. **Install bolt (15)**, washer (16), and nut (17). **Torque nut to 350 to 500 inch-pounds.** Install cotter pin (18).



8. **Install packing (19)**, retainer (20), and **elbow (21)** on swivel housing (1).
9. **Connect brake tube (22)** to elbow (21). Tighten nut (23).
10. **Install clamp (24)**, and nut (25). Lockwire clamp with lockwire (E231).
11. On left gear only, **install static ground wire (26)** (Task 3-38).

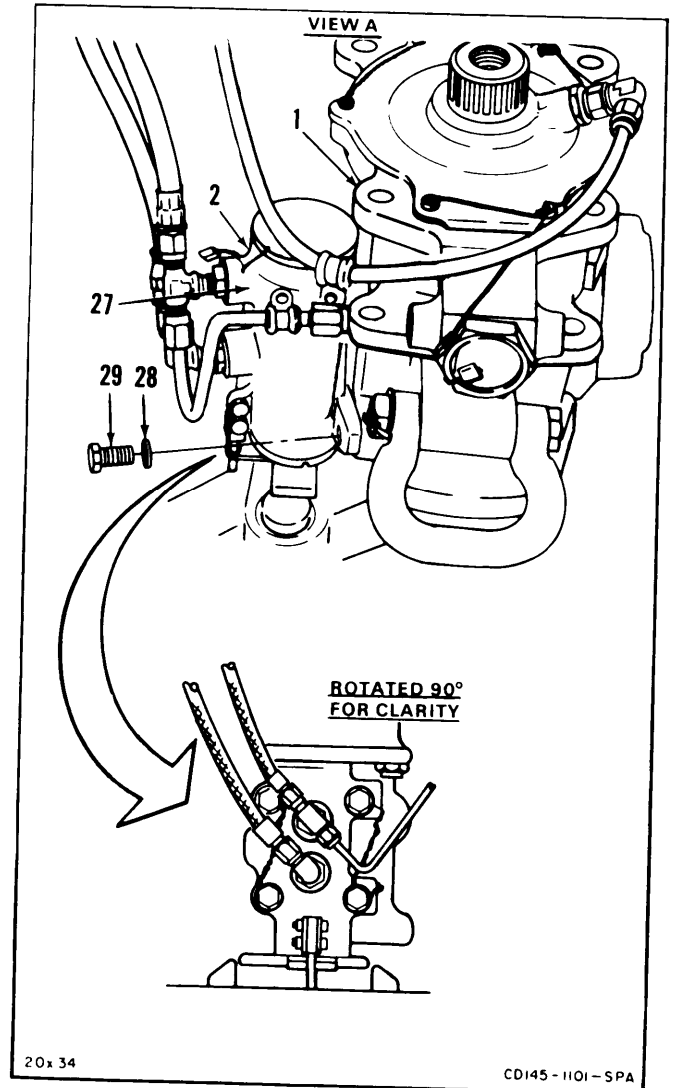


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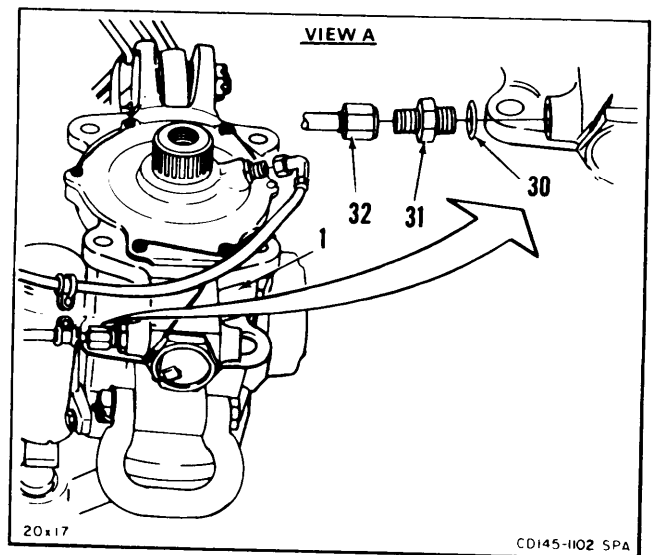
3-66 INSTALL SWIVEL HOUSING AND SPINDLE (Continued)

3-66

- 12. Untie swivel lock actuator (27). **Position actuator** on swivel housing (1).
- 13. **Install four washers (28) and bolts (29).** Lockwire four bolts as shown with lockwire (E231).



- 14. **Install packing (30) and union (31)** in swivel housing (1).
- 15. **Connect swivel actuator pressure tube (32) to union (31).**



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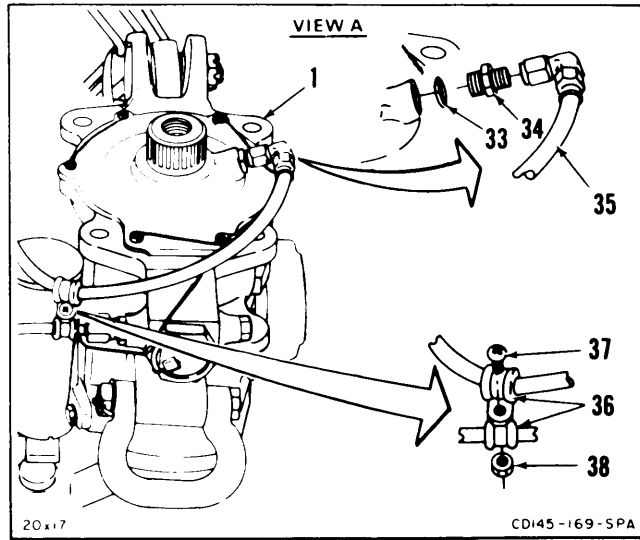
3-66 INSTALL SWIVEL HOUSING AND SPINDLE (Continued)

16. Install packing (33) and union (34) in swivel housing (1).

CAUTION

Elbow end of brake tube must be horizontal on right landing gear. Otherwise, it can interfere with steering and brake tube can be damaged.

17. **Connect brake tube (35) to union (34).**
Make sure elbow end of brake tube is horizontal.
18. **Position two clamps (36) as shown. install screw (37) and nut (38).**

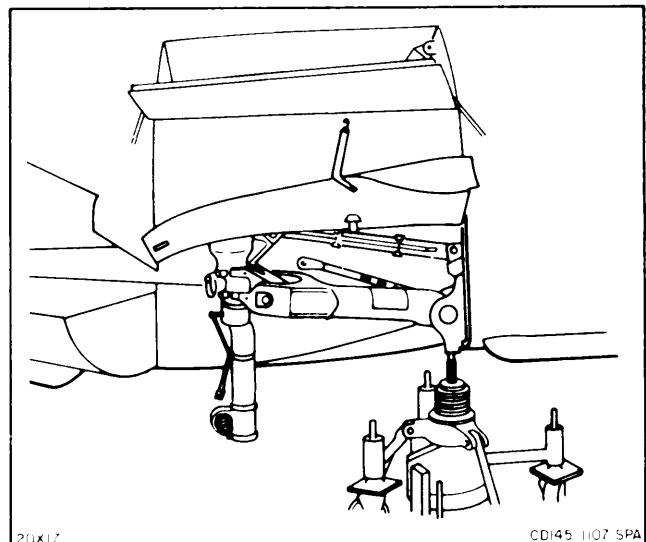
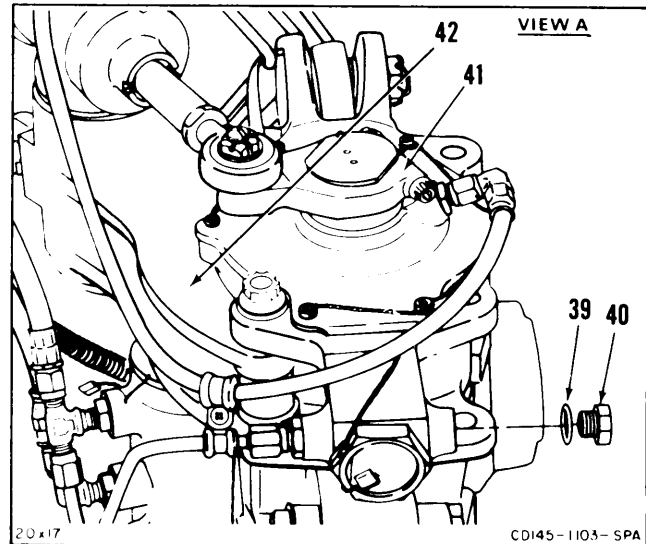


19. **Install packing (39) and plug (40).**
20. On right gear only, **install steering lever (41) and power steering assembly (42)** (Task 3-70).

INSPECT

FOLLOW-ON MAINTENANCE,

- Install brake (Task 3-85).
- Install wheel (Task 3-1 2).
- Service shock strut (Task 1-71 and 1-72),
- Lubricate lower drag link (Task 1-88).
- Bleed swivel lock system (Task 7-331),
- Bleed power steering (right gear only) (Task 7-332).
- Perform functional test of swivel and spindle housing (Task 3-64).
- Perform functional test of power steering (TM 55-1520-240-T Right gear only).
- Close access panels (Task 2-2).



END OF TASK

3-67 REMOVE SWIVEL LOCK

3-67

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanics Tool Kit,
NSN 5180-00-323-4692

Materials:

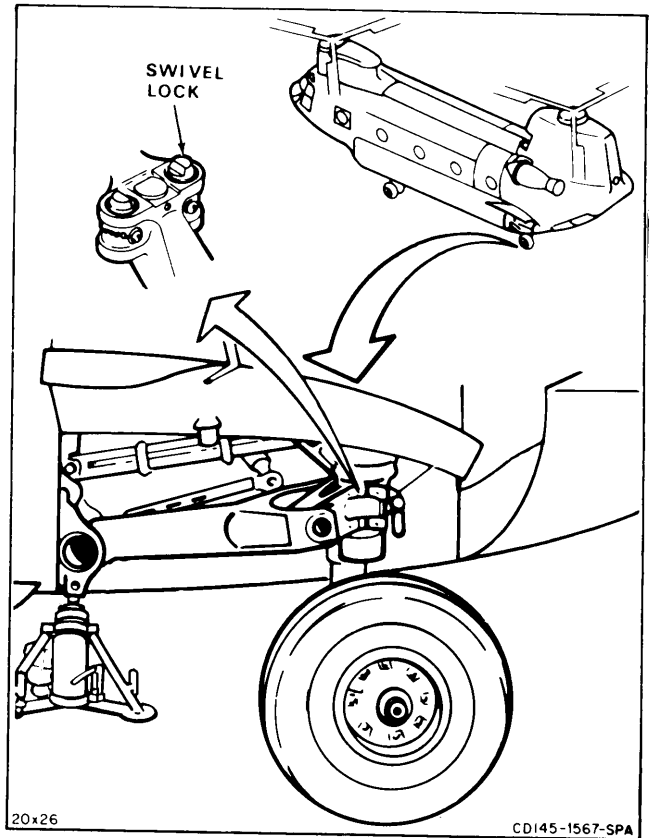
None

Personnel Required:

67U10 Medium Helicopter Repairer

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Helicopter Jacked at Aft Fuselage Jack Pad (Task 1-24)
- Aft Landing Gear Access Panels Open (Task 2-2)
- Utility Hydraulic System Depressurized (TM 55-1520-240-T)



NOTE

Procedure is same for both locks on aft left and right gear. Left gear is shown here.

1. **Position wheel (1) 90 degrees** from swivel locked position as shown.

NOTE

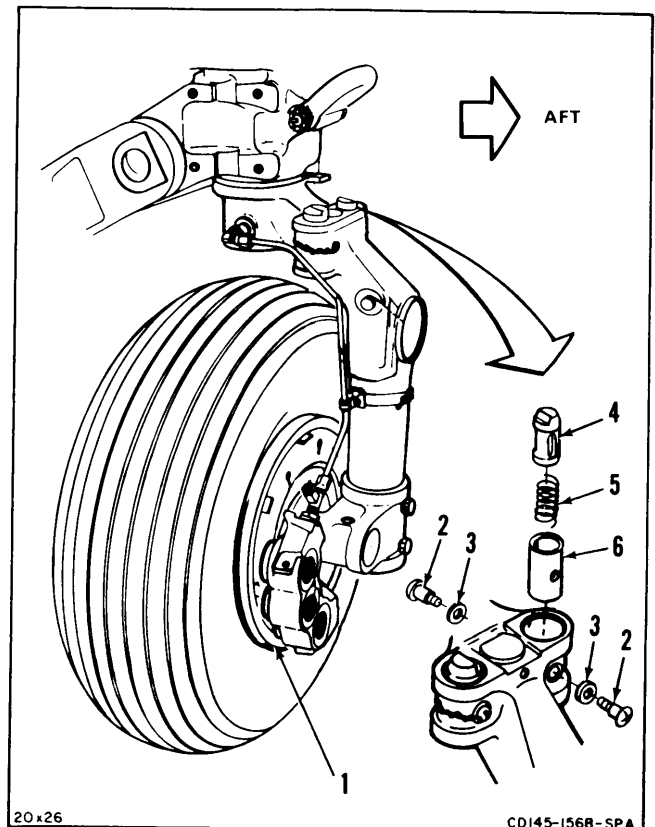
Lock can drop out of bottom. Hold hand under opening to catch spacer.

2. Remove lockwire. Remove two screws (2) and washers (3).
3. **Remove lock (4), spring (5), and sleeve spacer (6).**

FOLLOW-ON MAINTENANCE:

None

END OF TASK



3-68 INSTALL SWIVEL LOCK

3-68

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

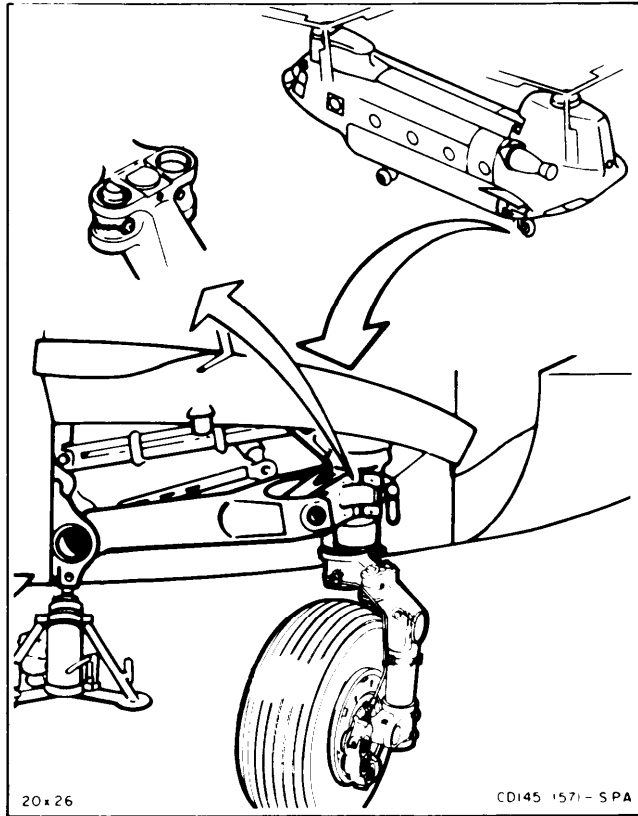
Lockwire (E231)

Personnel Required:

67U10 Medium Helicopter Repairer
67U30 Inspector

References:

TM 55-1520-240-23P



20x26

CDI45-1571-SPA

NOTE

Procedure is same for both locks on aft left and right gear. Left gear is shown here.

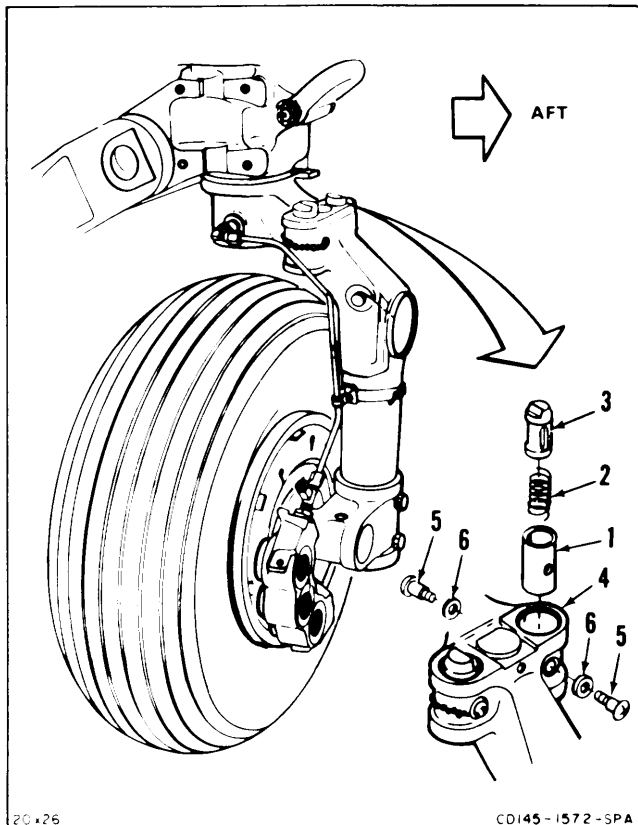
NOTE

Lock can drop out of bottom. Hold hand under opening to catch spacer.

1. **Install sleeve spacer (1), spring (2), and lock (3) in spindle (4).** Align holes With threaded holes in spindle. Make sure flats of lock face each other.
2. **install two screws (5) and washers (6) in spindle (4).** Lockwire screws with lockwire (E231).
3. **Depress lock (3).** Make Sure lock springs back.

INSPECT

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20x26

CDI45-1572-SPA

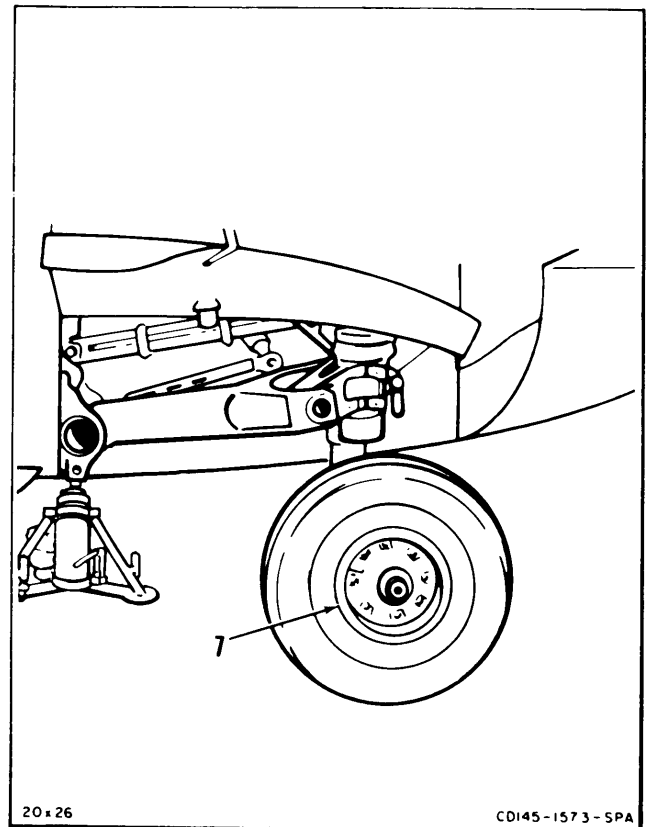
3-68 INSTALL SWIVEL LOCK (Continued)**3-68**

4. Position wheel (7) 90 degrees to swivel locked position.

FOLLOW-ON MAINTENANCE:

Lower and remove jack from aft fuselage jack pad (Task 1-24).

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

**END OF TASK**

3-69 REMOVE STEERING LEVER

3-69

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

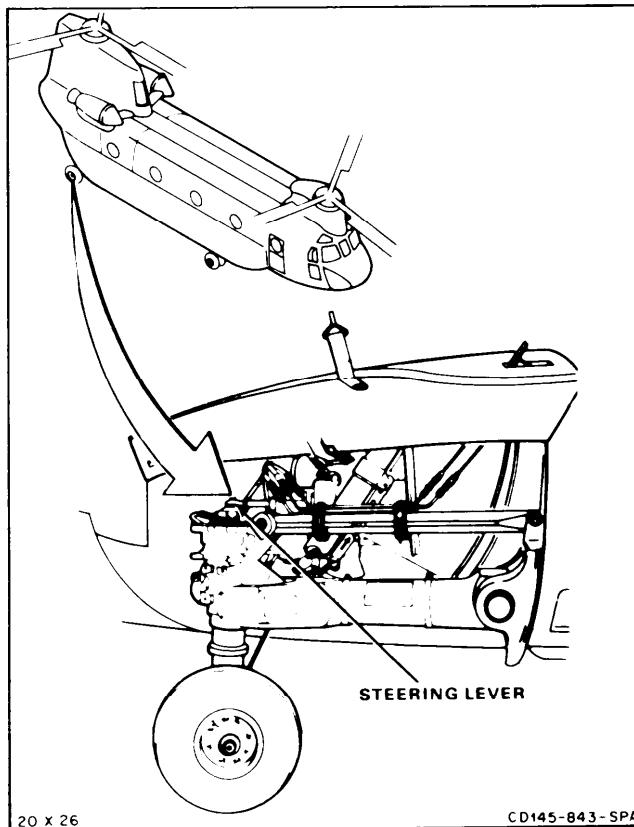
None

Personnel Required:

67U10 Medium Helicopter Repairer
67U20 Medium Helicopter Repairer

Equipment Condition:

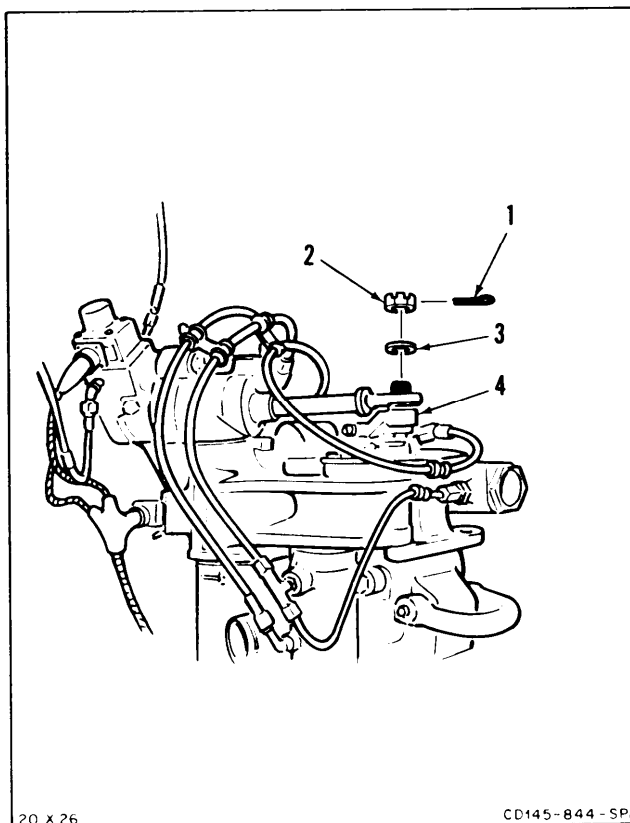
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Aft Landing Gear Access Panels Open (Task 2-2)



20 X 26

CD145-843-SPA

1. Remove cotter pin (1), nut (2), and washer (3), from stud on steering lever (4).



20 X 26

CD145-844-SPA

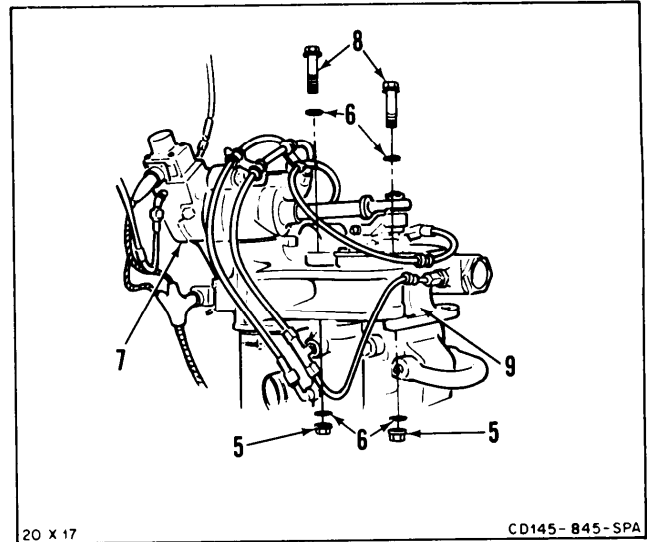
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3-69 REMOVE STEERING LEVER (Continued)

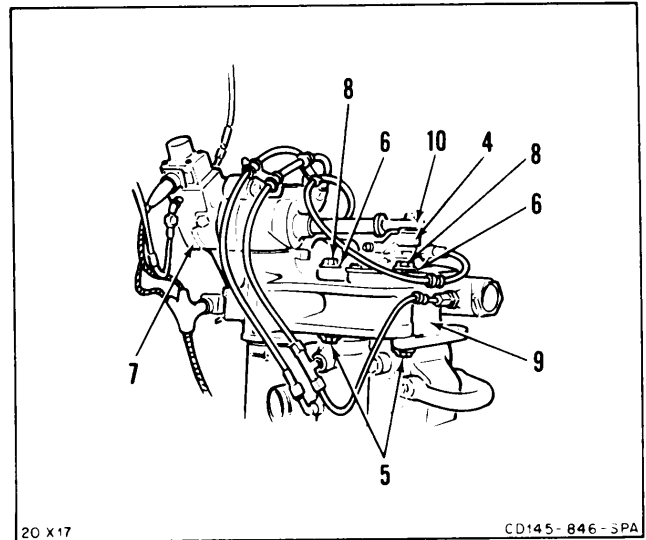


Do not let power steering assembly fall when attaching bolts are removed. Equipment could be damaged.

2. Remove two nuts (5) and lower washers (6).
3. Have helper hold power steering assembly (7) in place. **Remove two bolts (8)** and upper washers (6).
4. Move power steering assembly (7) out of lugs on swivel housing (9).



5. **Lift power steering actuator rod-end (10)** off stud on lever (4). Push rod-end (10) into power steering assembly (7).
6. Position power steering assembly (7) in lugs on swivel housing (9). Install bolts (8), washers (6) and nuts (5) loosely to hold it in place.

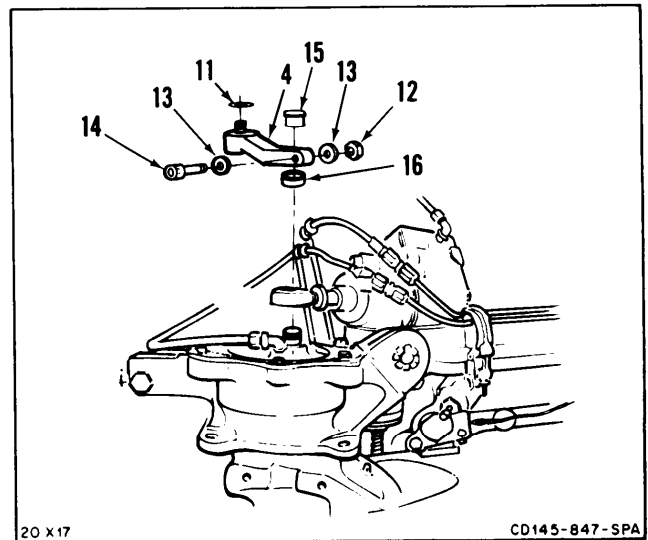


7. Remove spacer (11) from steering lever (4).
8. Remove nut (12), two washers (13) and bolt (14).

9. Remove end cap (15).
10. **Remove steering lever (4)** and spacer (16).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Torque Wrench, 700 to 1600 Inch-Pounds
- Torque Wrench, 100 to 750 Inch-Pounds

Materials:

Antiseize Compound (E75)

Parts:

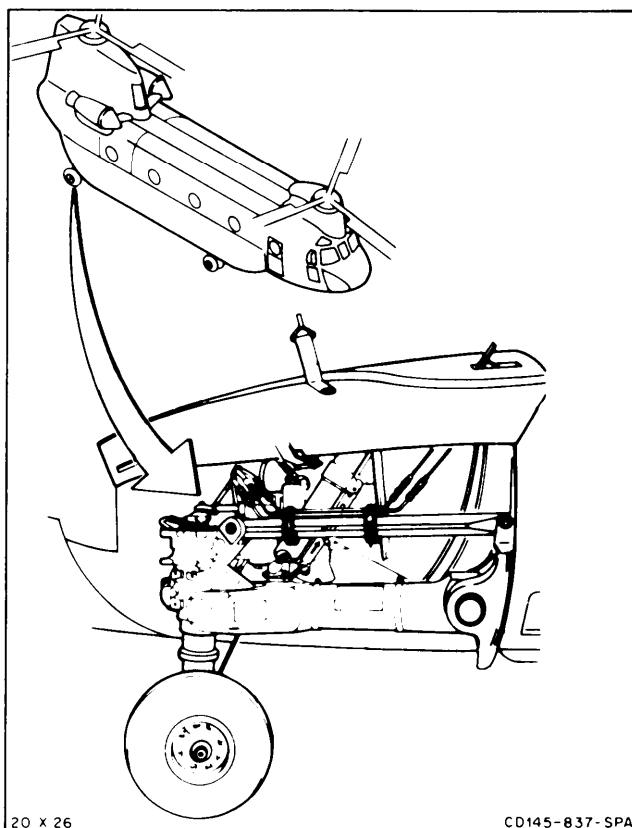
Cotter Pin

Personnel Required:

- Medium Helicopter Repairer (2)
- Inspector

References:

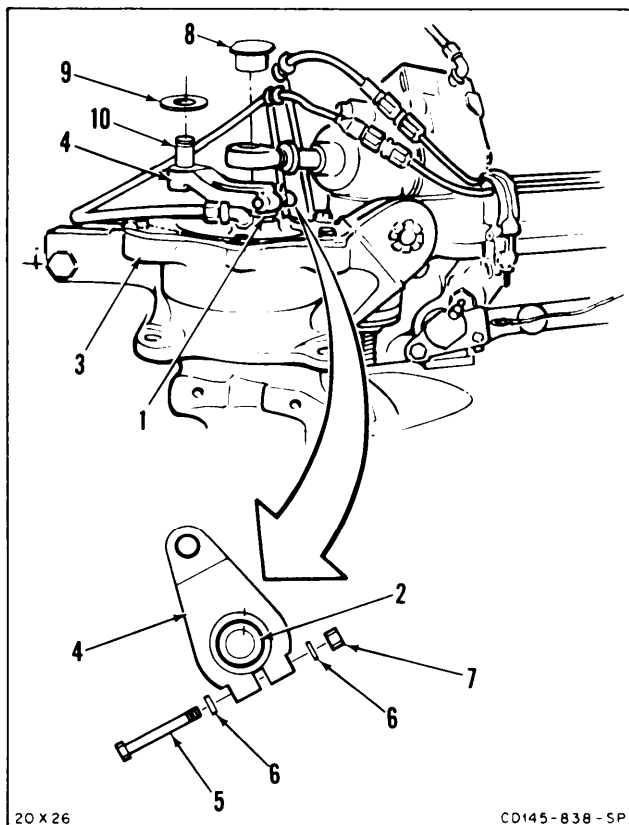
TM 55-1520-240-23P



20 X 26

CD145-837-SPA

1. **Install spacer (1)** over spline (2) on swivel housing (3),
2. **Align index marks** on steering lever (4) and spline (2). Install lever on spline.
3. Install bolt (5), two washers (6), and nut (7).
4. Install end cap (8).
5. **Install spacer (9)** on steering lever stud (10).



20 X 26

CD145-838-SP

GO TO NEXT PAGE

3-70 INSTALL STEERING LEVER (Continued)

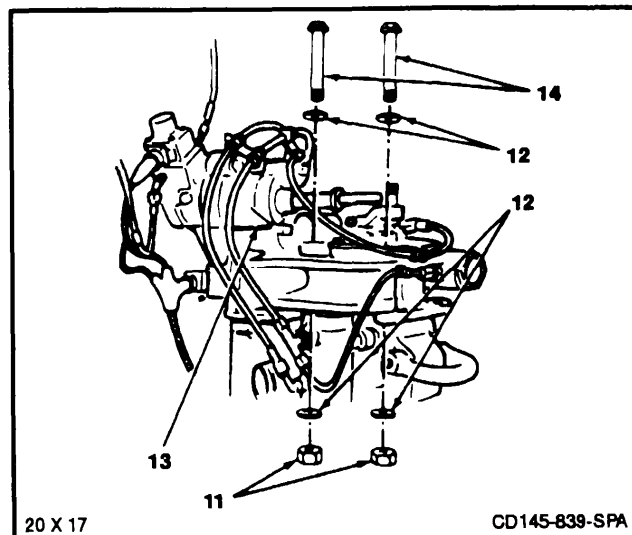
3-70

6. Remove two nuts (11) and lower washers (12).

CAUTION

Do not let power steering assembly fall when attaching bolts are removed. Equipment could be damaged.

7. Have helper hold power steering assembly (13). Remove two bolts (14) and washers (12).

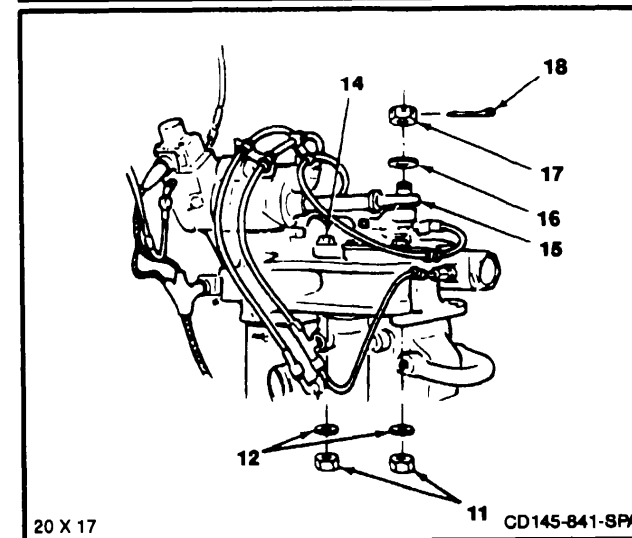
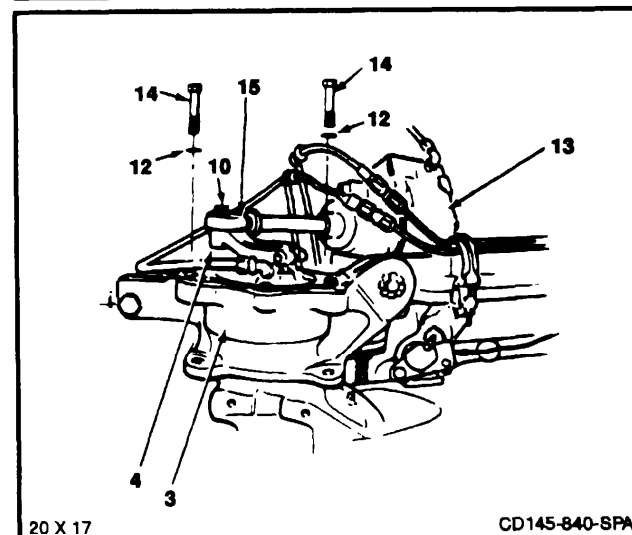


8. Install power steering rod-end (15) over stud (10) on steering lever (4).

WARNING

Antiseize compound (E75) can form toxic vapors if exposed to flame. Use in well-ventilated area 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.

9. Apply antiseize compound (E75) to shank of bolts (14). Align holes in power steering assembly (13) and swivel housing (3). Install two bolts (14) and washers (12)
10. Install two washers (12) and nuts (11) on bolts (14).
11. **Torque two nuts (11) to 35 inch-pounds above run-on torque.**
12. Install washer (16) and nut (17).
13. **Torque nut (17) 290 to 410 inch-pounds.**
14. Install cotter pin (18).
15. Make sure rod-end (15) is free on stud and that rod is not bent.

**INSPECT****GO TO NEXT PAGE**

3-70 INSTALL STEERING LEVER (Continued)

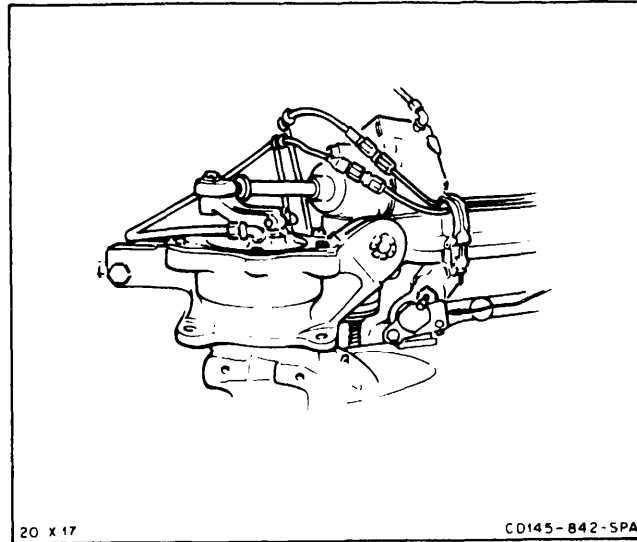
3-70

INSPECT

FOLLOW-ON MAINTENANCE:

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

Perform operational check of power steering
(TM 55-1520-240-T).



END OF TASK

SECTION III
BRAKES
DESCRIPTION AND OPERATION

3-71 BRAKES

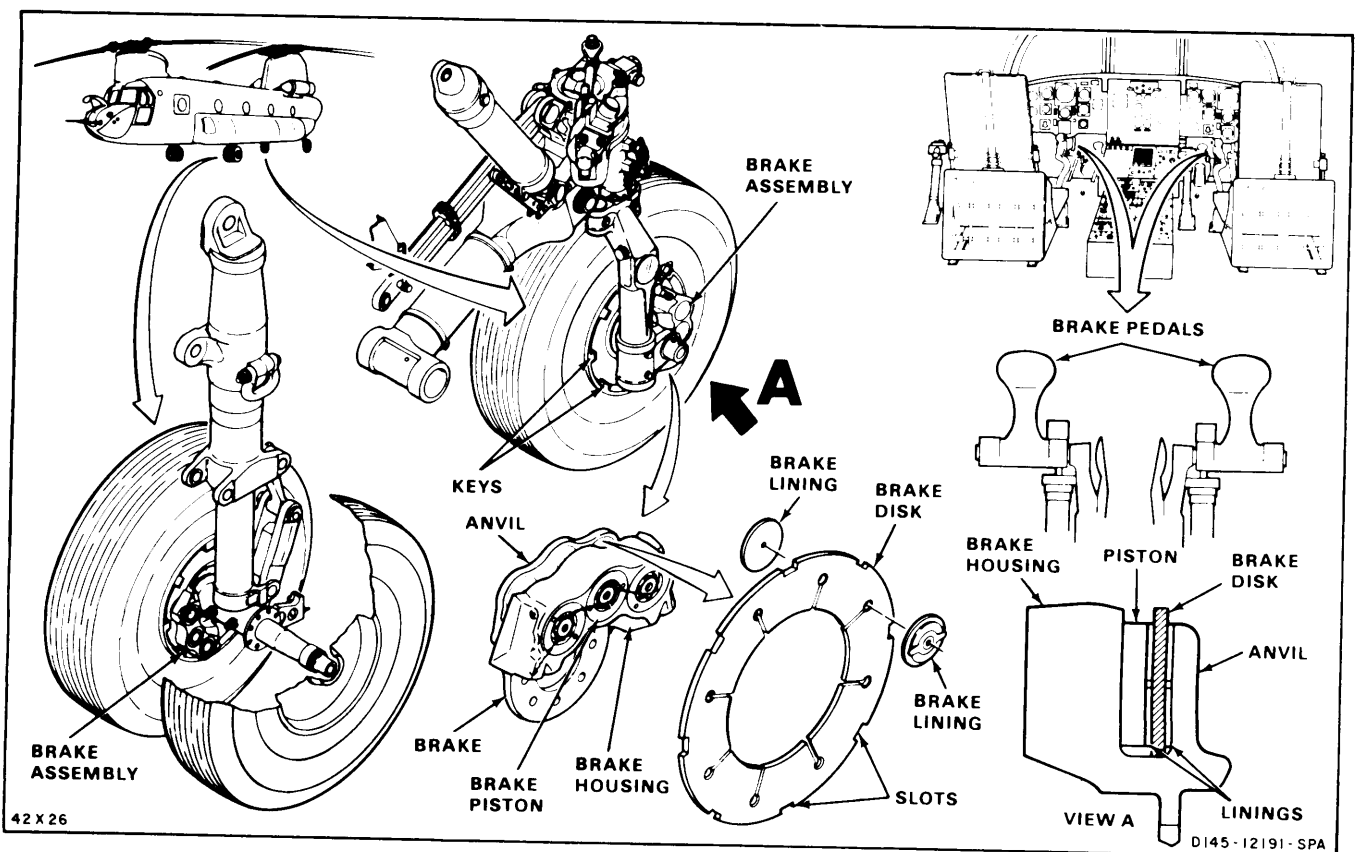
A brake is installed on the axle flange of each of the six wheels. All wheels are equipped with a single brake disk and a three-piston brake unit.

The brake unit does not move. The disk floats inside of the wheel rim, and rotates between the brake linings when the wheel is turning. Keys inside the wheel rim match with key slots in the brake disk. When the wheel turns, the keys drive the disk around with the wheel. The brakes are operated by hydraulic pressure applied by toe pedals. When the right and left pedals are pressed at the same time, hydraulic pressure pushes the

pistons and brake linings against the brake disk. The linings trap the disk and slow it down on all wheels. When the right pedal or left pedal only is pressed, brakes are applied only to that side of the helicopter. This aids ground maneuvering.

BRAKE ASSEMBLY

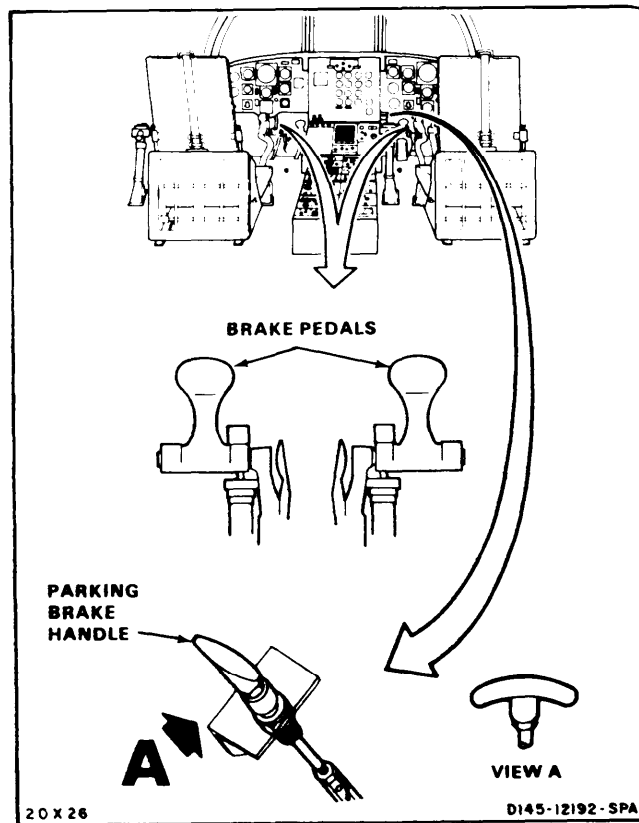
The brake is made up of a housing, three pistons, three brake linings, and parts to seal, adjust, and bleed the brake. Three brake linings are on the pistons, and three are on the anvil part of the housing.



GO TO NEXT PAGE

PARKING BRAKES

All landing gear assemblies have parking brakes. These are applied mechanically by a handle at the pilot's side of the console. Pressure is trapped in the brake by the parking brake valve when it is applied. An advisory light on the caution/advisory panel comes on to indicate that the parking brake is engaged.



END OF TASK

SECTION IV
BRAKES

3-72 INSPECT BRAKES (DISKS AND LININGS)**3-72****INITIAL SETUP****Applicable Configurations:**

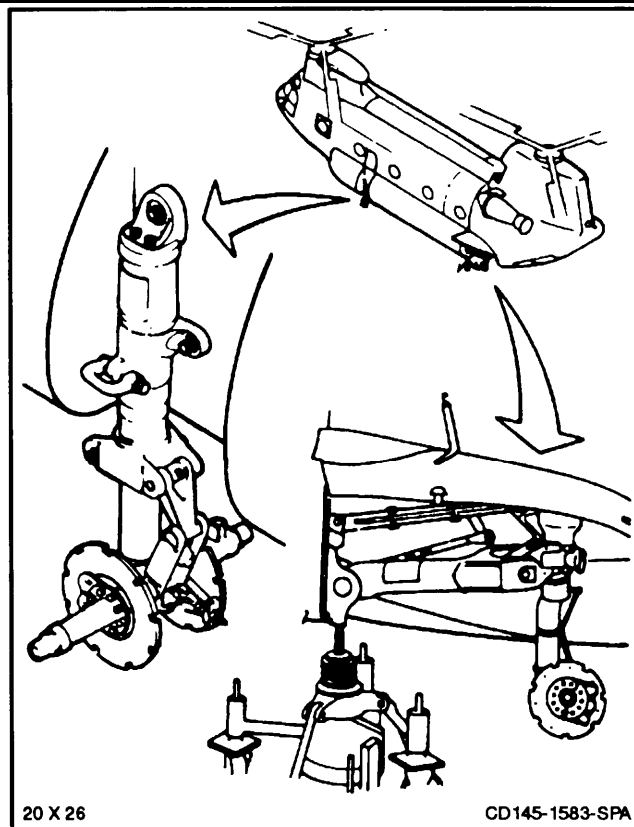
All

Tools:Aircraft Inspection Tool Kit,
NSN 5180-00-323-5114**Materials:**

None

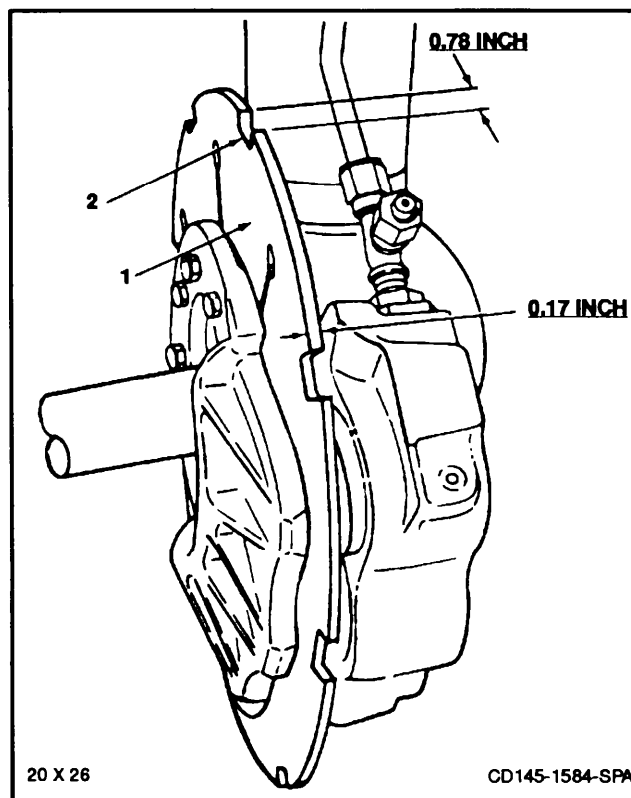
Personnel Required:Medium Helicopter Repairer
Inspector**Equipment Conditions:**

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Forward or Aft Landing Gear Jacked As Required
 (Task 1-23 and 1-24)
 Wheel Removed (Task 3-7 or 3-7.1)

**NOTE**

Procedure is same for all brakes except as noted in task. Aft brake is shown here.

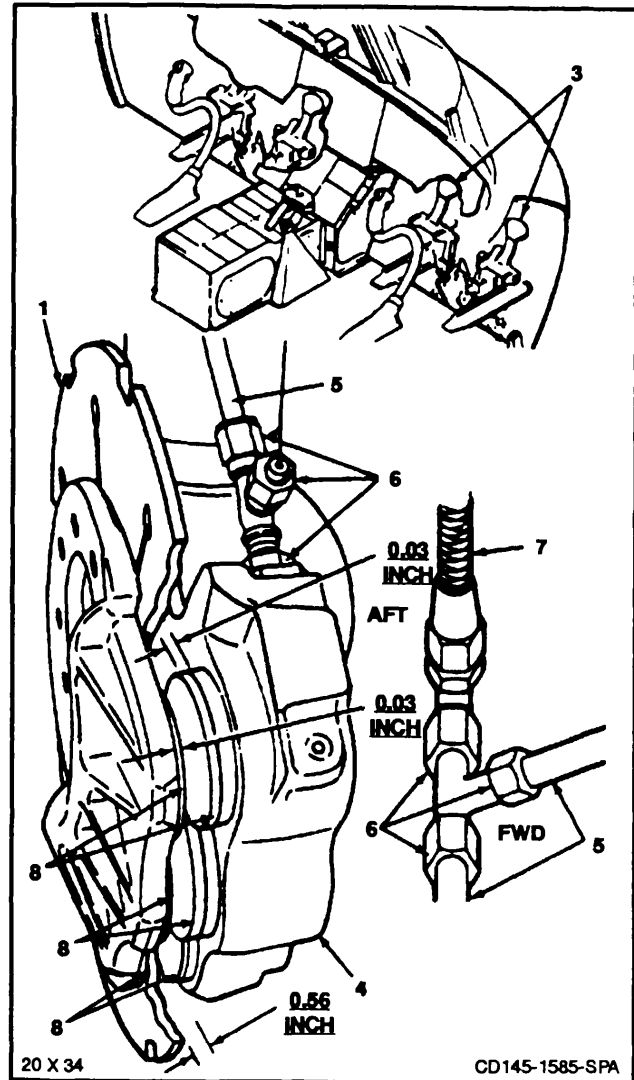
1. **Measure thickness of brake disk (1).** Disk shall not measure less than 0.17 inch.
2. **Measure width of key slots (2).** Slots shall not measure more than 0.78 inch.
3. **Check brake disk (1) for distortion.** Disk shall not be dished so that brake drags.

**GO TO NEXT PAGE**

3-72 INSPECT BRAKES (DISKS AND LININGS) (Continued)

3-72

4. Have helper apply pressure to brake pedals (3).
5. **Measure distance between brake housing (4) and disk (1).** The distance shall not be greater than 0.56 inch.
6. **Check for leaks.** There shall be no leaks at housing (4), tube (5), fittings (6), or forward brake hose (7).
7. Have helper release brake pedals (3).
8. **Check tube (5), fittings (6), and forward brake hose (7) for damage.** There shall be no gouges, pinching, and chafing.
9. **Measure outer edge thickness of each brake lining (8).** No measurement shall be less than 0.03 inch.

**FOLLOW-ON MAINTENANCE:**

- Install wheels (Task 3-12 or 3-12.1).
- Remove jacks from helicopter (Task 1-23 or 1-24).
- Close access panels (Task 2-2).

END OF TASK

3-73 REMOVE BRAKE DISKS**3-73****INITIAL SETUP****Applicable Configurations:**

All

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

■ Spanner (Appx E-35)

Materials:

None

Personnel Required:

Medium Helicopter Repairer

References:

Appendix E

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

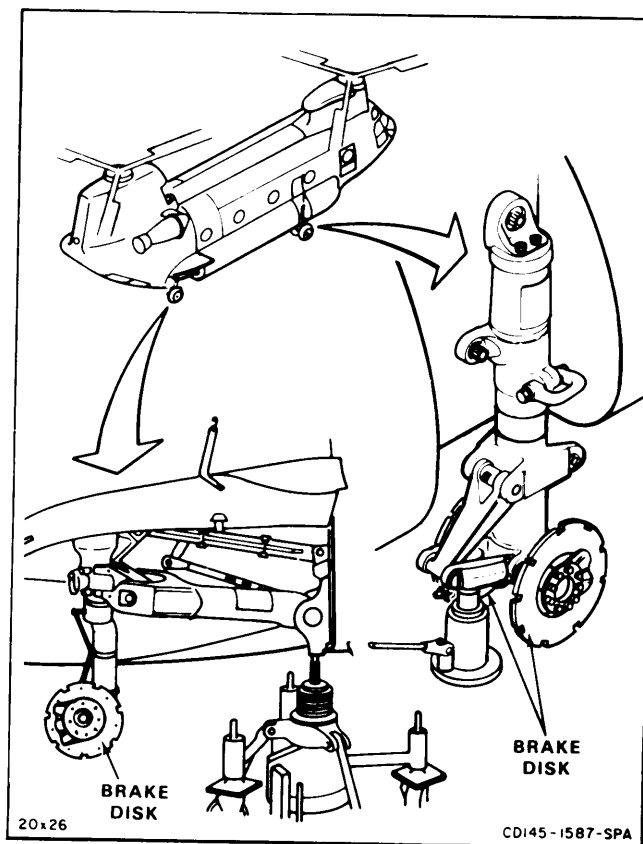
Utility Hydraulic System Depressurized (TM 55-
1520-240-T)

Parking Brake Released

Forward or Aft Landing Gear Jacked as Re-
quired (Task 1-23 or 1-24)

■ Wheel Removed (Task 3-7)

Axle Removed (Task 3-14 or 3-34)

**NOTE**

Procedure is same for all brake disks.

1. Remove lockwire from nuts (1).

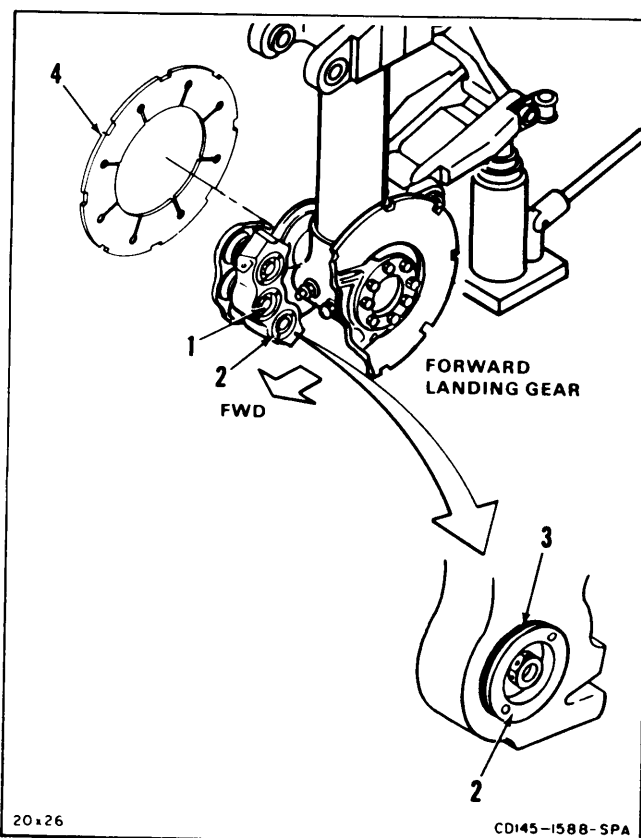
CAUTION

Do not back out cylinder head to expose more than half of packing. Damage to packing can result when heads are turned in.

2. Back out each cylinder head (2) full turns until half of packing (3) is exposed. Use spanner (Appx E-35).
3. Remove brake disk (4).

FOLLOW-ON MAINTENANCE:

None

END OF TASK

3-74 INSTALL BRAKE DISKS

3-74

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Spanner (Appx E-35)

Materials:

Lockwire (E231)

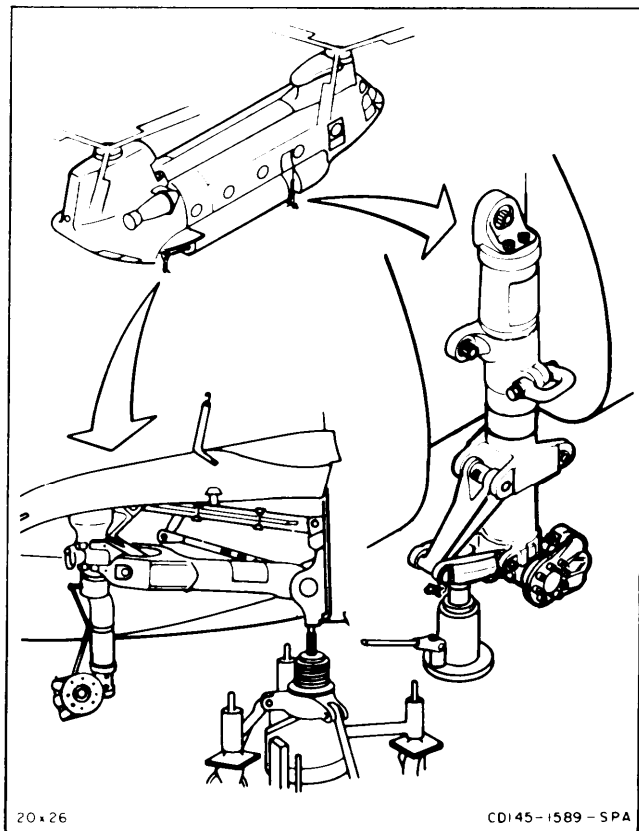
Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P

Appendix E



20x26

CDI45-1589-SPA

NOTE

Procedure is same for all brake disks.

1. **Position brake disk (1)** between brake linings (2) in brake (3).
2. **Turn cylinder head (4) into brake (3)** until head is flush with brake. Use spanner (Appx E-35).
3. **Lockwire nuts (5)**. Use lockwire (E206).

INSPECT

FOLLOW-ON MAINTENANCE

Install axle (Task 3-15 or 3-35)

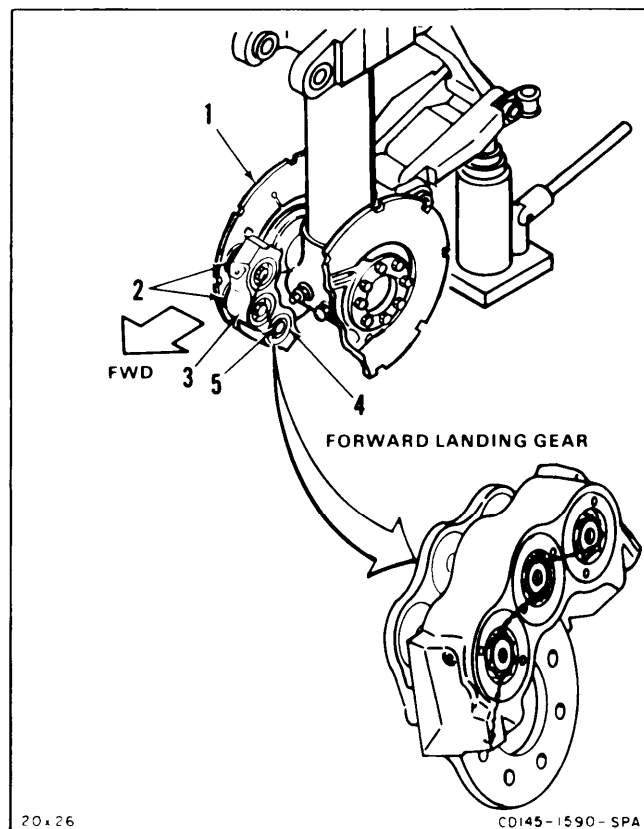
Install wheel (Task 3-12)

Lower and remove jack Task 1-23 or 1-24)

Pressurize utility hydraulic system (TM 55-1520-240-T)

Set parking brake

END OF TASK



20x26

CDI45-1590-SPA

3-75 REMOVE BRAKE LINING

3-75

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

■ Spanner (Appx E-35)

Materials:

Dry Cleaning Solvent
Cloths (E 120)
Gloves (E 186)

Personnel Required:

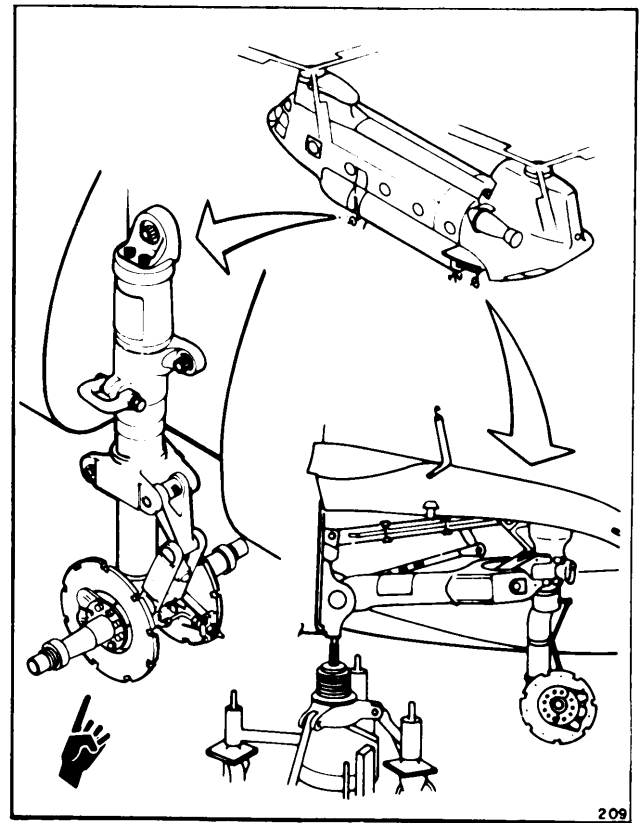
■ Medium Helicopter Repairer

References:

Appendix E

Equipment Condition:

- Battery Disconnected (Task 1 -39)
- Electrical Power Off
- Utility Hydraulic System Depressurized (TM 55-1520-240-T)
- Parking Brake Released
- Forward or Aft Landing Gear Jacked As Required (Task 1-23 or 1 -24)
- Wheel Removed (Task 3-7)



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NOTE

Procedure is same for all brakes.

WARNING

Dry cleaning solvent (E162) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.

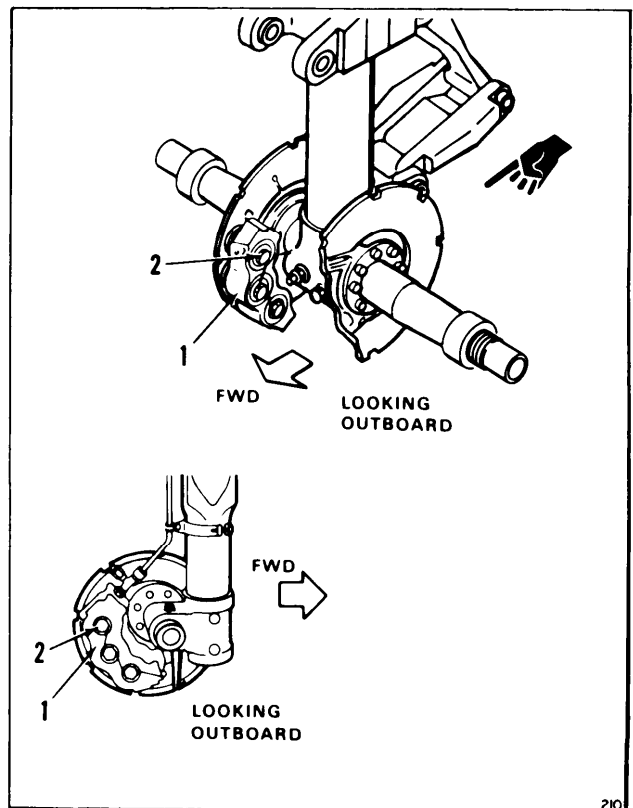
1. Clean brake (1). Use solvent (E 162). Dry with cloth (E 120). Wear gloves (E 186).

CAUTION

Do not loosen locknuts. Loosening of locknuts could change adjustment of bushing and cause brake to lock.

2. Remove lockwire from locknuts (2).

GO TO NEXT PAGE

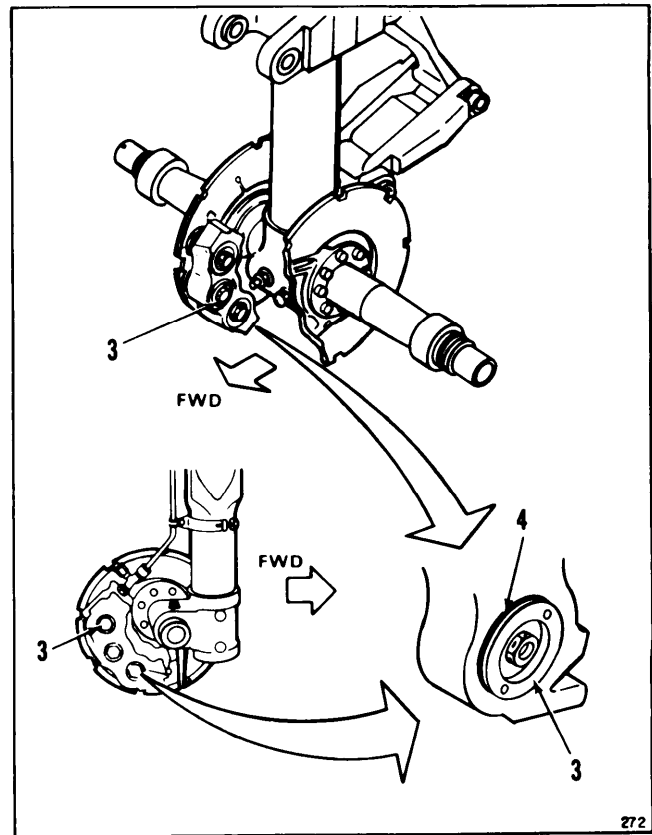


210

CAUTION

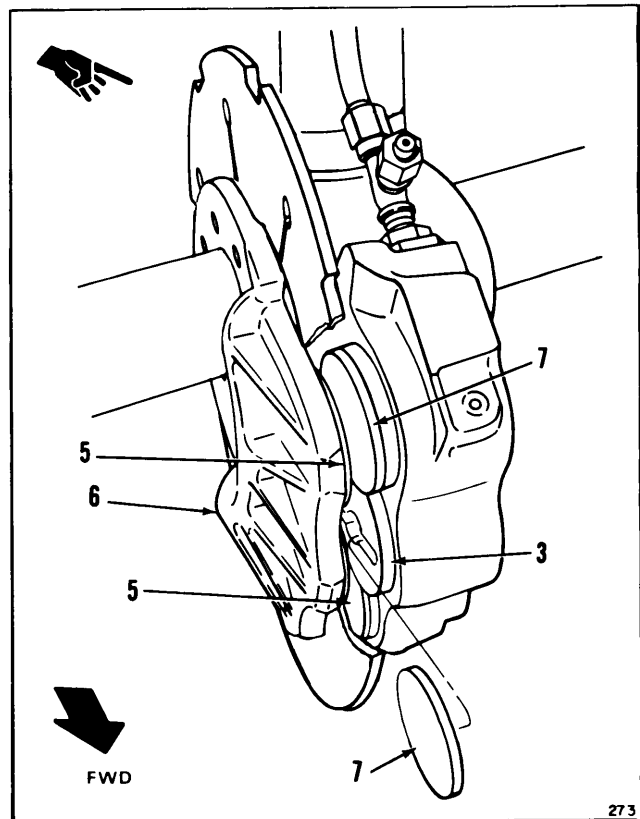
Do not back out cylinder head to expose more than half of packing. Damage to packing could result when heads are turned in.

3. Back out three cylinder heads (3) two full turns until half of packing (4) is exposed. spanner (Appx E-35).



4. Remove three inboard linings (5) from anvil (6).
5. Remove three remaining brake linings (7) from brake pistons (3).

FOLLOW-ON MAINTENANCE:
None



END OF TASK

3-76 INSTALL BRAKE LINING**3-76****INITIAL SETUP****Applicable Configurations:**

All

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

■ Spanner (Appx E-35)

Materials:Adhesive (E31)
Cloths (E 120)
Gloves (E 186)
Lockwire (E231)
Methyl-Ethyl-Ketone (E244)**Parts:**

Shim 0.040-inch Thick

Personnel Required:Medium Helicopter Repairer
Inspector**References:**

TM 55-1520-240-23P

Task 3-12

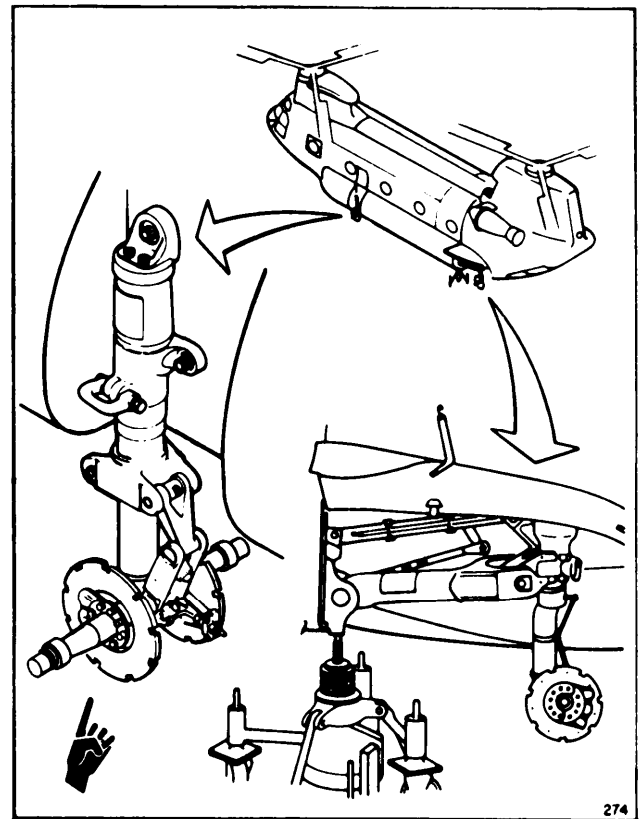
Task 1-38

Task 7-330

Appendix E

General Safety Instructions:**WARNING**

Adhesive (E31) and methyl-ethyl-ketone (E244) 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 water for at least 15 minutes. Get medical attention for eyes.

**GO TO NEXT PAGE**

NOTE

Procedure is same for all brakes.

1. Clean old adhesive from anvil (1) and piston (2). Use methyl-ethyl-ketone (E244). Wipe anvil dry with cloth (E120). Wear gloves (E186).

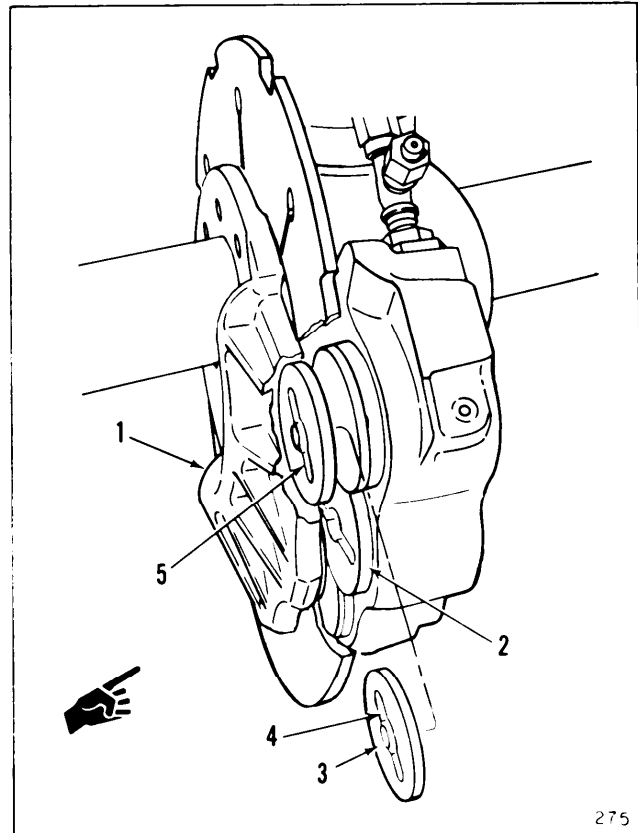


- Replace brake linings as complete set of six. Partial replacement will result in uneven wear and make brakes unreliable.
- Use all asbestos or all non-asbestos brake linings in any single brake assembly. Brake assemblies containing asbestos linings and brake assemblies containing non-asbestos linings may be used on the same aircraft.

NOTE

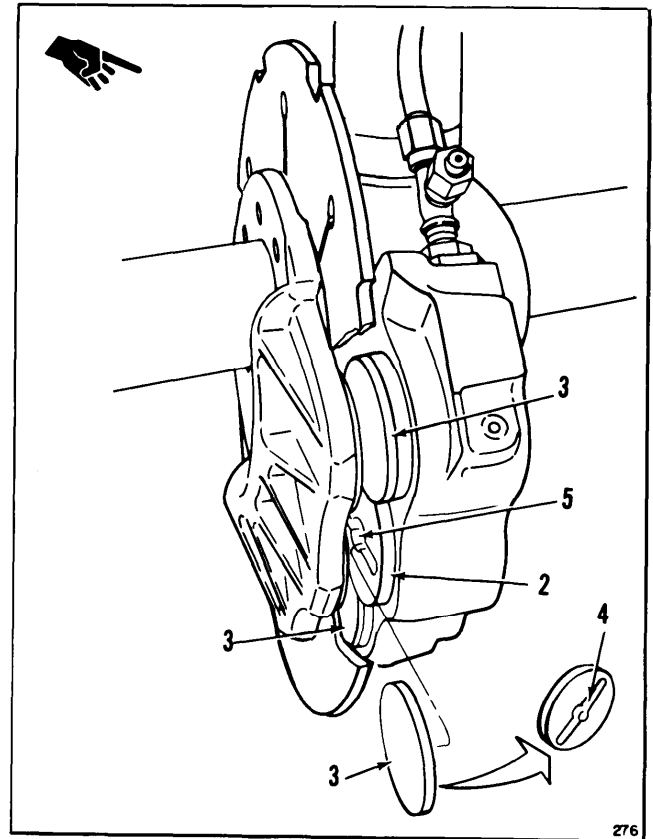
Adhesive will hold lining in place during assembly.

2. Apply adhesive (E31) to back of three new linings (3) around raised key (4). Wear gloves (E186).
3. Install three linings (3) in anvil (1). Make sure keys (4) on linings fit keyway (5) in anvil.



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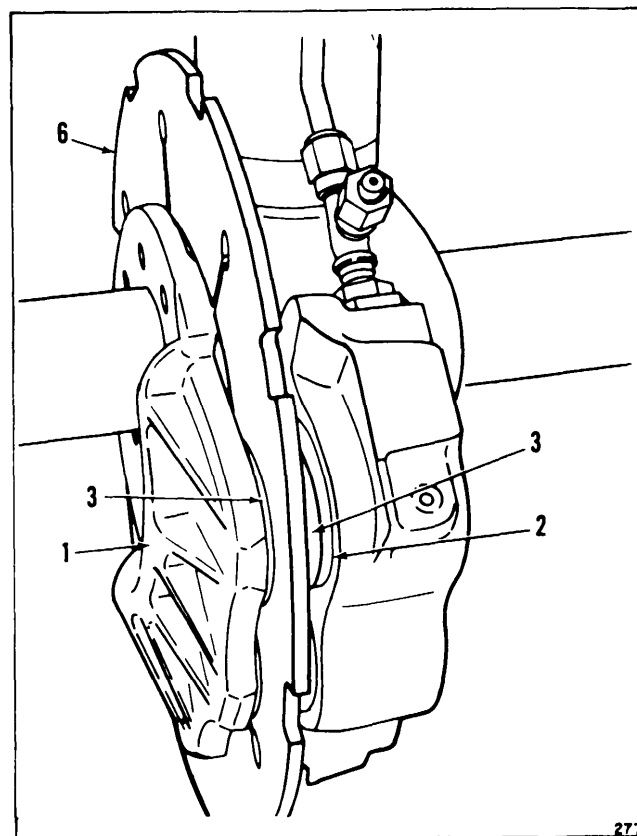
4. Apply adhesive (E31) to back of one new lining (3) around raised key (4). Wear gloves (E186).
5. **Install lining (3) in piston (2).** Make sure key (4) on lining fits keyway (5) of piston.
6. Repeat steps 4 and 5 to install two remaining linings (3).



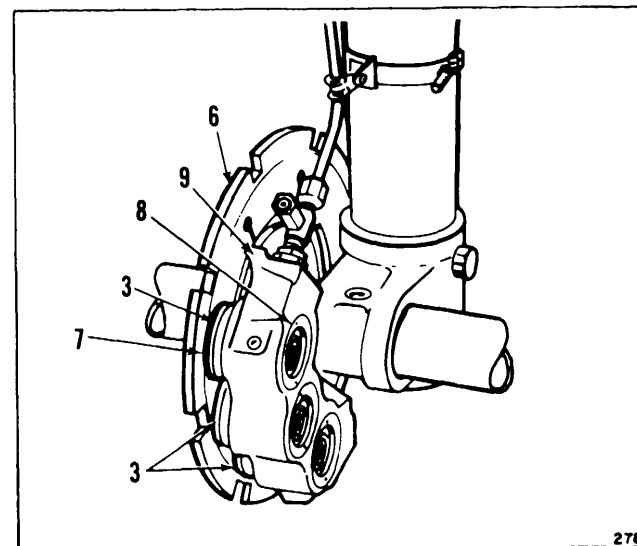
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3-76 INSTALL BRAKE LINING (Continued)**3-76**

7. Check that linings (3) are correctly positioned in keyway. Check for 0.040 inch maximum clearance without backing out cylinder heads more than two full turns (Task 3-75).



8. Insert 0.040-inch shim (7) between disk (6) and lining (3).
9. Turn cylinder head (8) into housing (9) until head is flush with housing.
10. Back out cylinder head (8) until shim (7) can be removed. Use spanner (Appx E-35).
11. Repeat steps 8 thru 10 for two remaining linings (3).
12. Turn cylinder heads (8) into housing (9) until heads are flush with housing.

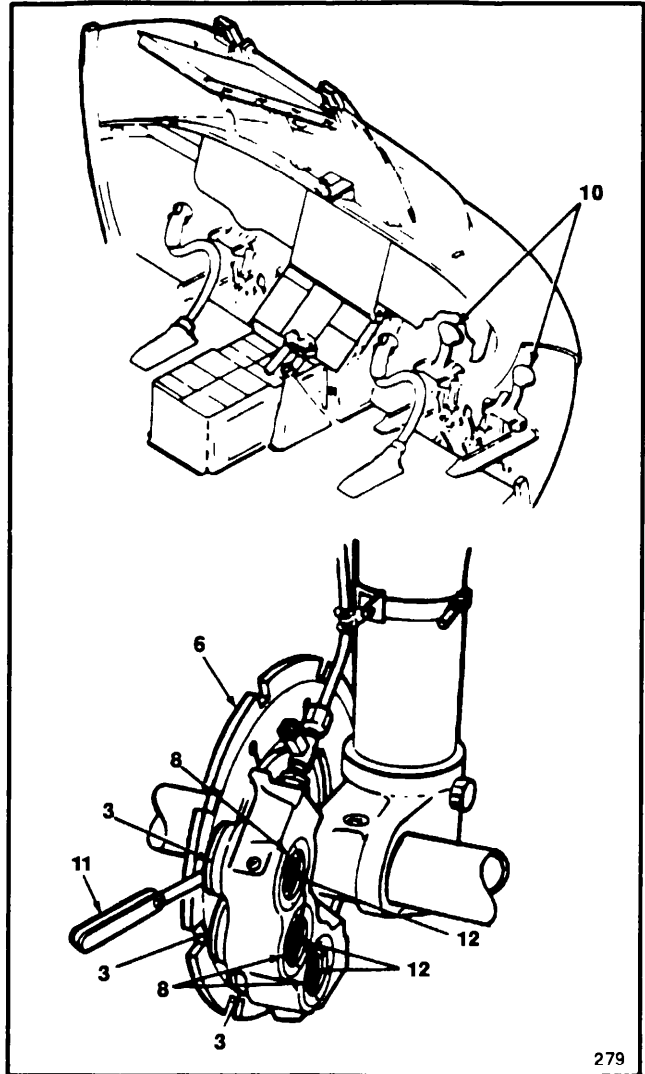


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3-76 INSTALL BRAKE LINING (Continued)

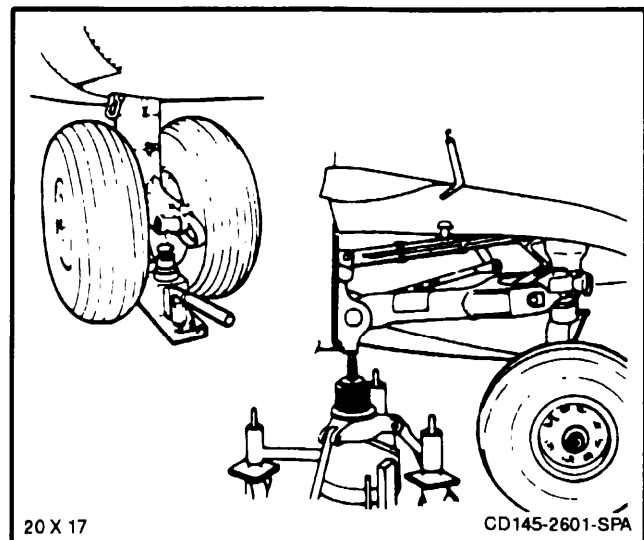
3-76

13. Pressurize utility hydraulic system (Task 1-38).
14. Bleed brakes (Task 7-330).
15. **Press brake pedals (10)** fully and hold.
16. **Check clearance** between linings (3) and disk (6). There shall be no clearance and no lateral play.
17. Release brake pedals (10).
18. **Insert feeler gage (11) between disk (6) and lining (3)**. Clearance shall be 0.010 to 0.033 inch.
19. **Lockwire nuts (12)** on cylinder heads (8). Use lockwire (E231).



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■ 20. Deleted.

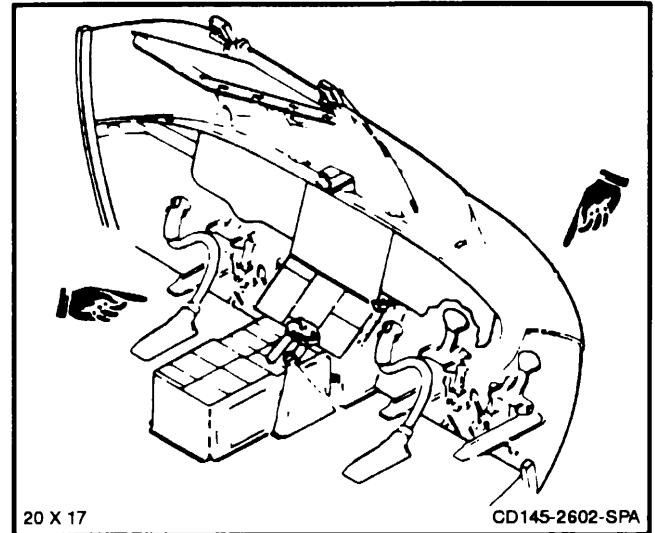


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3-76 INSTALL BRAKE LINING (Continued)

3-76

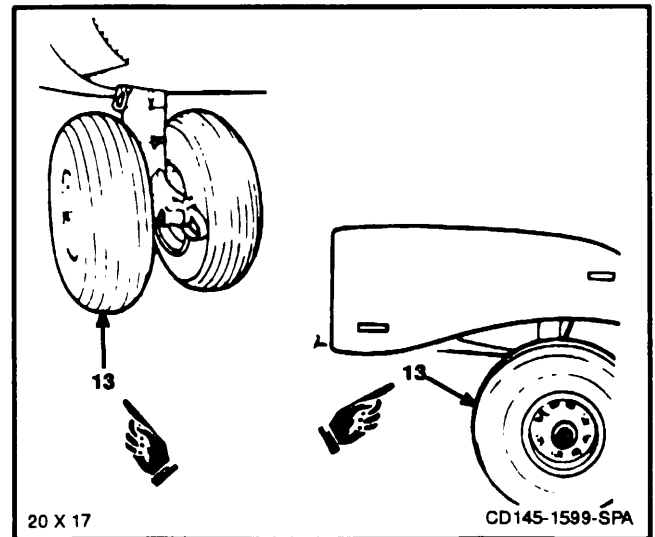
- 21. Deleted.



INSPECT

FOLLOW-ON MAINTENANCE:

- Install wheels (13) (Task 3-12).
- Remove jack from helicopter (Task 1-23 or 1-24).
- Closed access panels (Task 2-2).



END OF TASK

3-77 REMOVE FORWARD BRAKES**3-77****INITIAL SETUP***Applicable Configurations:*

All

Tools:

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

Materials:

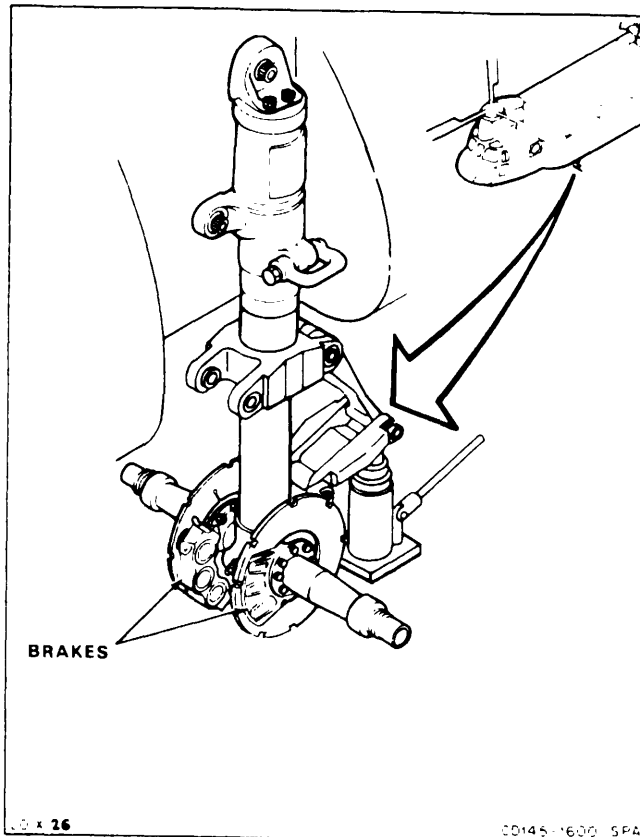
Cloths (E120)

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Utility Hydraulic System Depressurized (TM 55-
1520-240-T)
Helicopter Jacked at Forward Landing Gear
(Task 1-23)
Forward Wheels Removed (Task 3-7)
Parking Brake Released

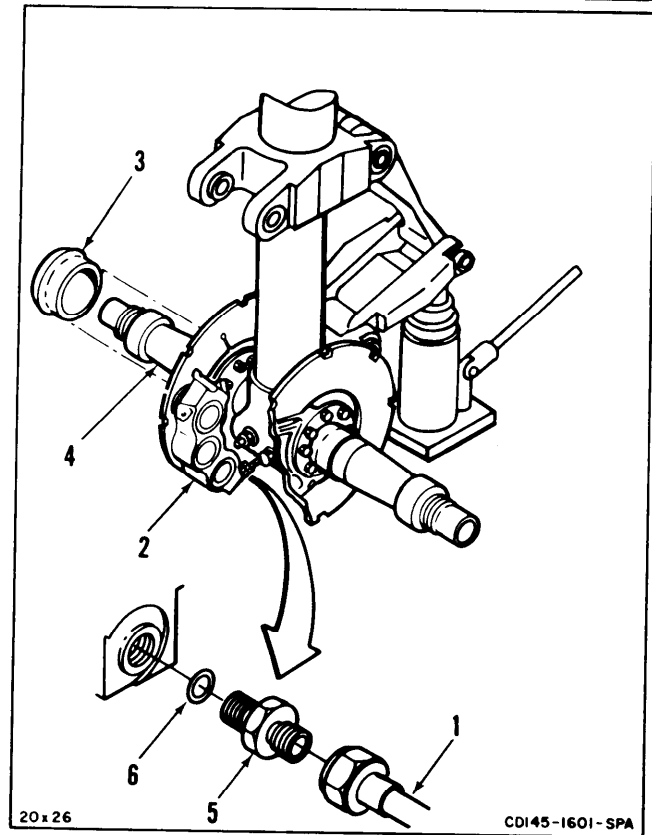
**NOTE**

Procedure is same for left and right
Inboard and outboard brakes. Left for-
ward landing gear is shown here.

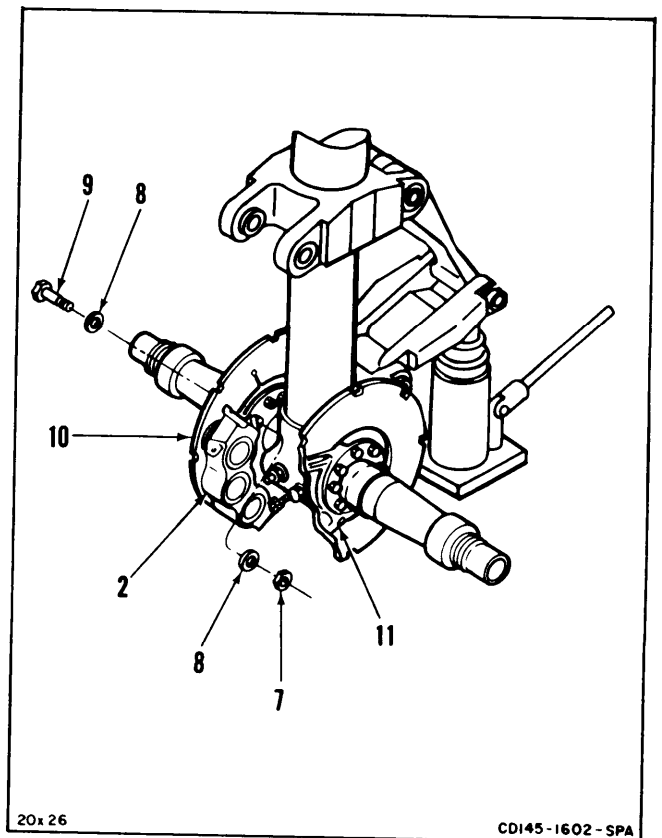
GO TO NEXT PAGE

3-77 REMOVE FORWARD BRAKES (Continued)**3-77**

1. **Disconnect hydraulic tube (1) at brake (2).**
Use container and cloth (E120) to catch hydraulic fluid.
2. **Remove bushing (3) from axle (4).**
3. **Remove nipple (5) and packing (6).**

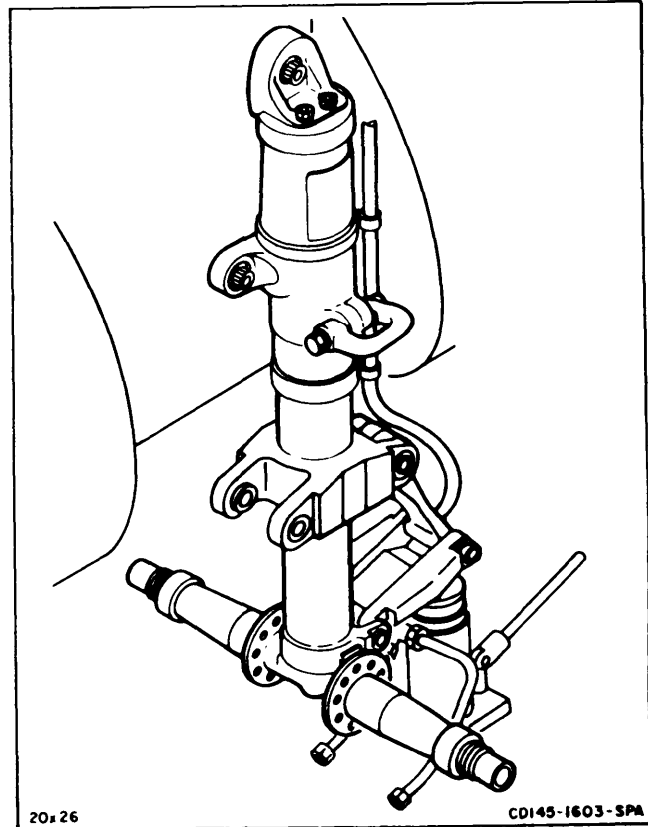


4. **Remove eight nuts (7), 16 washers (8), and eight bolts (9).**
5. **Remove brake (2) with brake disk (10).**

**GO TO NEXT PAGE**

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-78 DISASSEMBLE BRAKES**3-78****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-3234692
Spanner (Appx E-35)
Arbor Press

Materials:

None

Personnel Required:

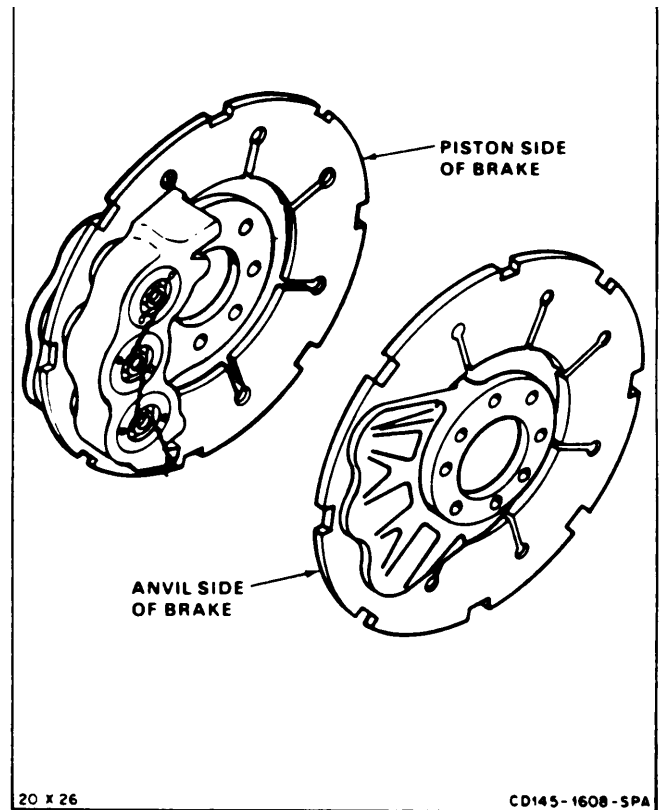
Medium Helicopter Repairer

References:

Appendix E

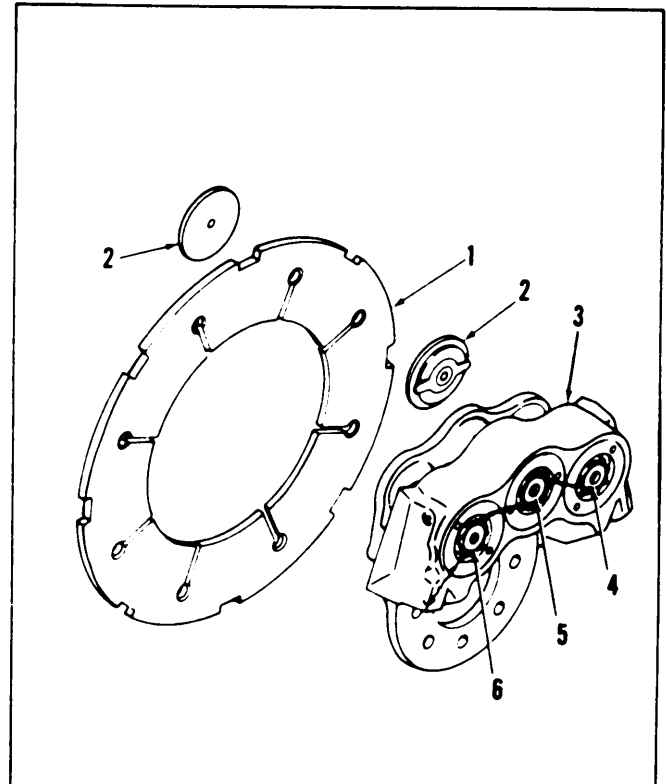
Equipment Condition:

Off Helicopter Task

**NOTE**

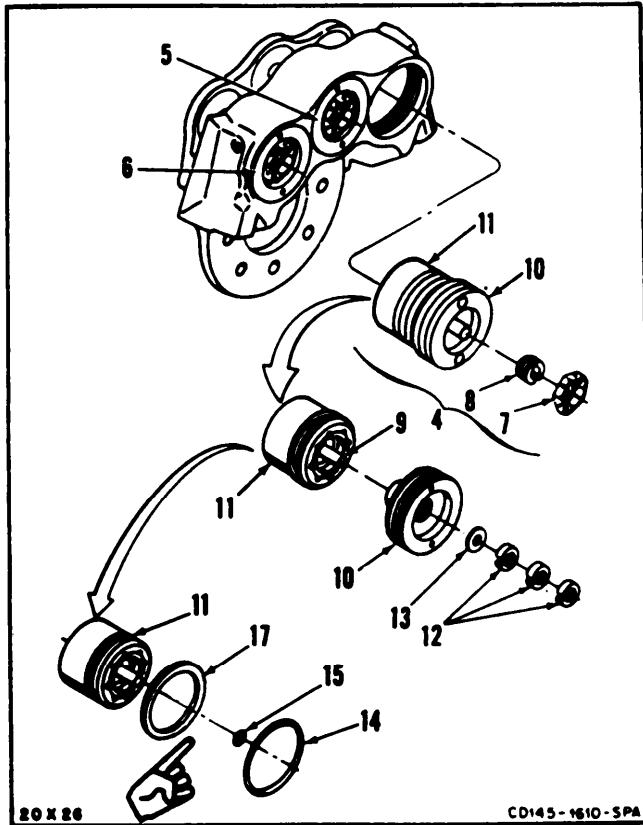
Procedure is same for all brakes.

1. **Remove disk (1) and linings (2)** from brake housing (3).
2. Remove lockwire from cylinder head assemblies (4, 5 and 6).
3. **Remove cylinder head assemblies (4, 5, and 6)** from brake housing (3). Use spanner (Appx E-35).

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3-78 DISASSEMBLE BRAKES (Continued)

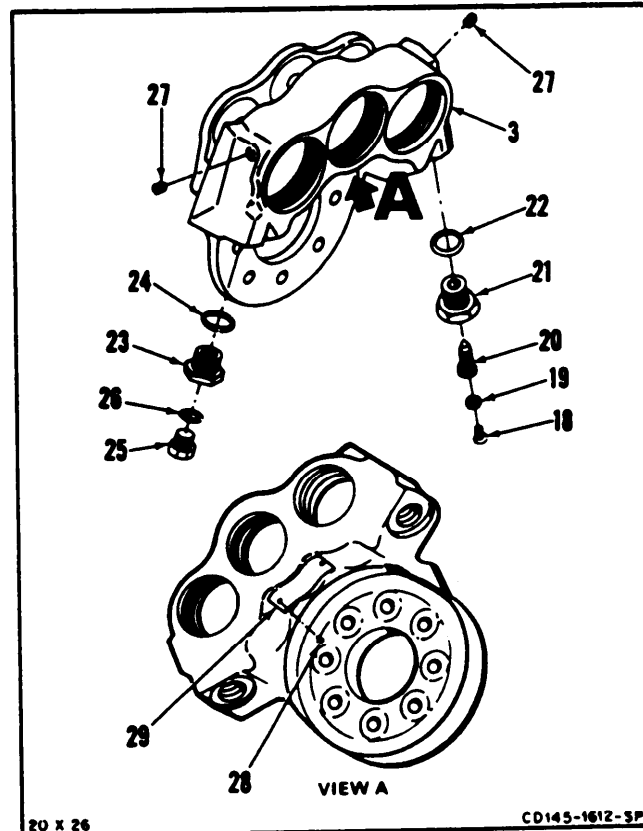
4. Remove nut (7) and bushing (8).
5. Apply pressure to adjustment pin (9) and remove cylinder head (10) from piston (11). Use arbor press.
6. Remove three grips (12) and washer (13) from cylinder head (10).
7. Remove packings (14 and 15) and retainer (17) from piston (11).
8. Repeat steps 4 and 5 for two cylinder head assemblies (5 and 6).



9. Remove screw (18), washer (19), valve (20), adapter (21) and packing (22) from brake housing (3).
10. Remove lockwire, bushing (23) and packing (24).
11. Remove plug (25) and packing (26) from bushing (23).
12. Remove two expansion plugs (27) from brake housing (3).
13. Remove two drive screws (28) and plate (29) from brake housing (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-79 CLEAN BRAKE PARTS**3-79****INITIAL SETUP****Applicable Configurations:**

All

Tools:

None

Materials:

Cleaning Solvent (EI 62)

Cloth (E120)

Gloves (E186)

Personnel Required:

67U10 Medium Helicopter Repairer

References:

TM 55-1520-240-23P

Equipment Condition:

Brake Disassembled (Task 3-78)

Off Helicopter Task

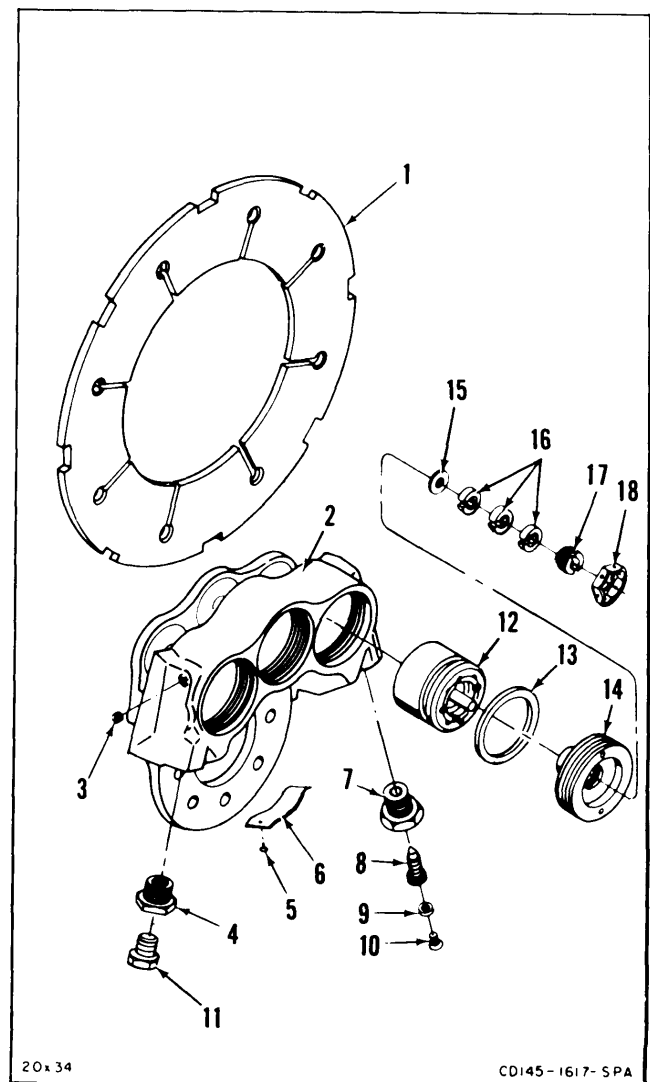
WARNING

Dry cleaning solvent (E162) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.

1. Clean all metal parts (1 thru 18) with cleaning solvent (EI 62). Wear gloves (E186).
2. Wipe all parts dry with cloth (E120).

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

3-80 INSPECT BRAKE PARTS**3-80****INITIAL SETUP****Applicable Configurations:**

All

Tools:Aircraft Inspection Tool Kit
NSN 5180-00-323-5114**Materials:**

None

Personnel Required:

67U30 Inspector

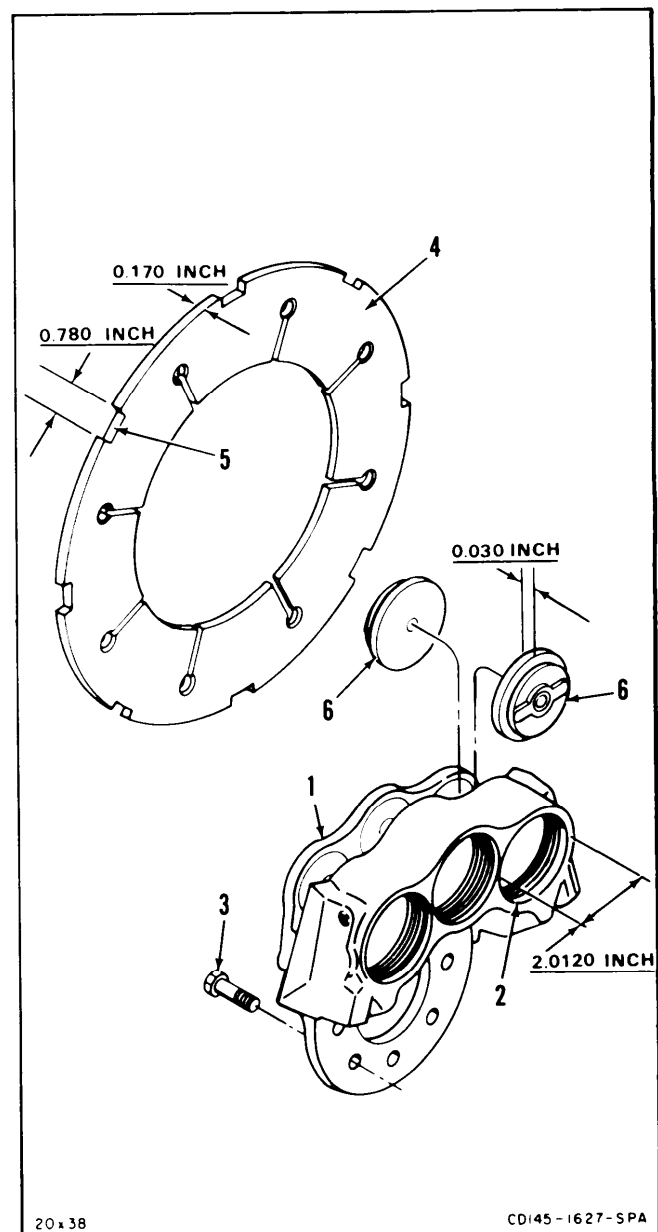
References:TM 55-1520-240-23P
TM 55-1500-204-25/1**Equipment Condition:**Off Helicopter Task
Brake Parts Cleaned (Task 3-79)**NOTE**

Procedure is same for all brakes.

1. **Check housing (1).** There shall be no cracks (TM 55-1500-204-25/1).
2. **Check housing cylinder walls (2)** for wear or scoring. Diameter shall not be greater than 2.0120-inches. There shall be no scoring.
3. **Check bolts (3).** There shall be no stripped thread.
4. **Check brake disk (4)** for thickness. Disk thickness shall not be less than 0.170-inch.
5. Measure key slots (5). Slots shall not be worn to width greater than 0.780-inch.
6. **Check brake lining (6)** for thickness. Lining shall not be less than 0.030-inch.

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

3-81 ASSEMBLE BRAKES

3-81

INITIAL SETUP

Applicable, Configurations:

All

Tools:

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

Spanner (Appx E-35)
Arbor Press

Materials:

Lockwire (E230)

Parts:

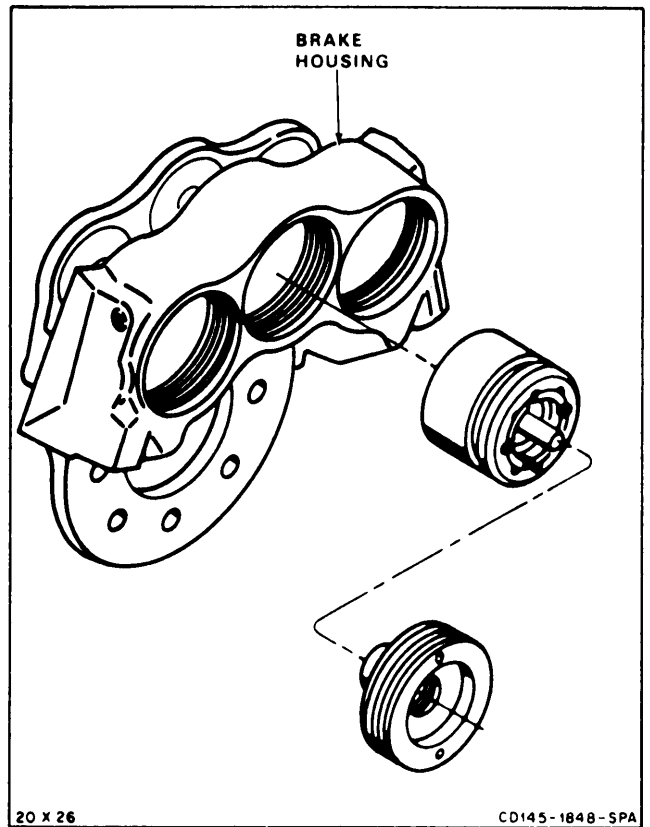
Packing
Brake Linings (6)

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

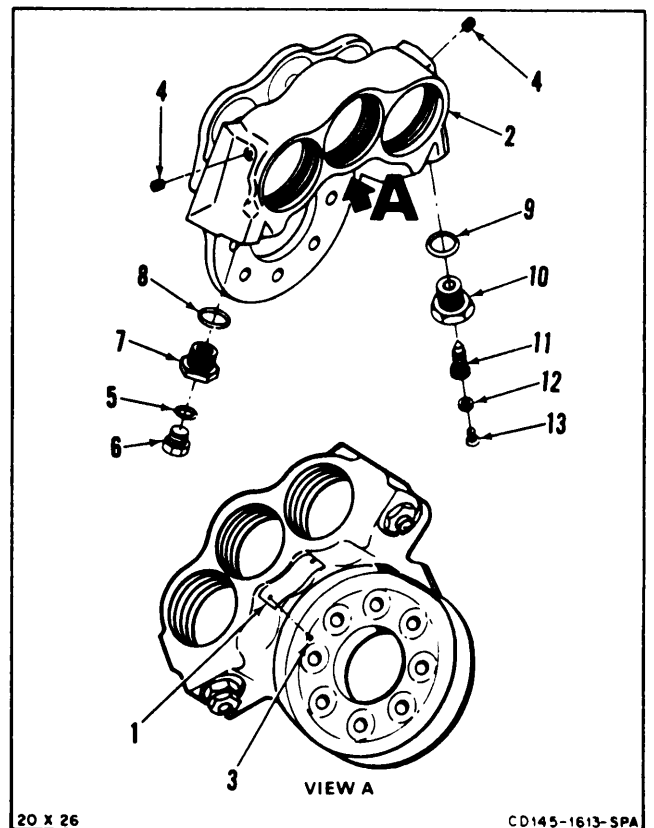
TM 55-1520-240-23P
Task 3-74
Task 3-76
Appendix E



NOTE

Procedure is same for all brakes.

1. **Position plate (1)** on brake housing (2), **install two drive screws (3)**.
2. **Install two expansion plugs (4)**.
3. **Install packing (5) and plug (6)** into bushing (7). Install bushing and packing (8) into brake housing (2).
4. **Install packing (9), adapter (10), valve (11), washer (12) and screw (13)** into brake housing (2).



GO TO NEXT PAGE

3-81 ASSEMBLE BRAKES (Continued)

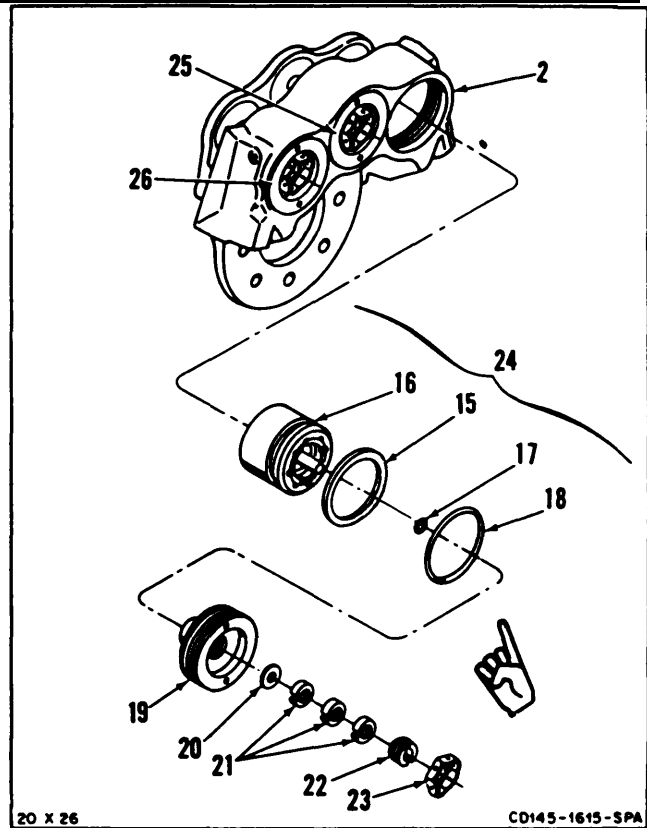
3-81

5. Install retainer (15) on piston (16).
6. Install packings (17 and 18) on cylinder head (19).
7. **Position and hold cylinder head (19) against piston (16).** Using arbor press **install washer (20) and three grips (21)** on pin of piston. Make sure grips are against cylinder head.

NOTE

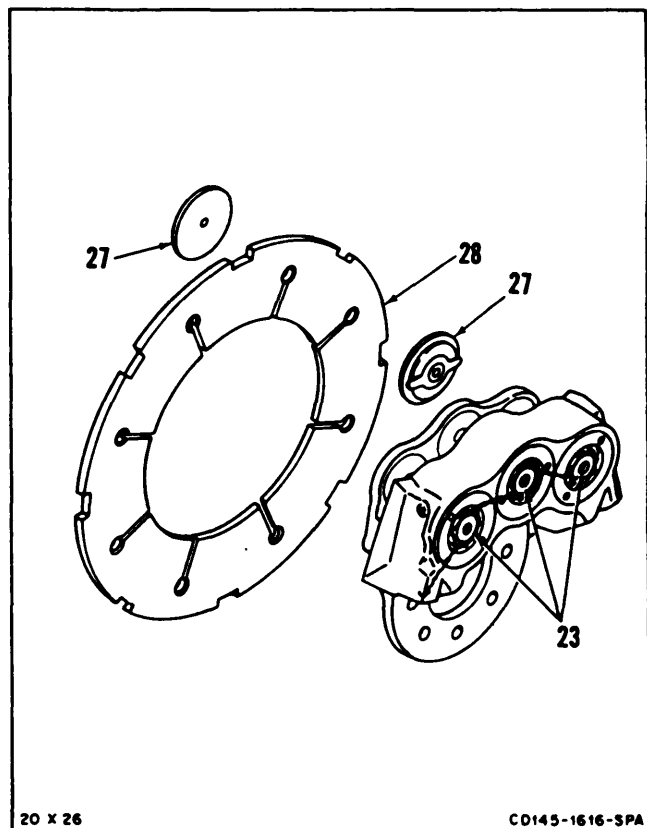
Hold cylinder head in position on piston until nut is installed.

8. **Install bushing (22) on cylinder head (19). When bushing bottoms, back off 1/2 turns.**
9. Install nut (23) on pin of piston (16).
10. **Install cylinder head assembly (24) in brake housing (2) with cylinder head flush with housing.** Use spanner (Appx E- 35).
11. Repeat steps 5 thru 10 for the remaining two cylinder head assemblies (25 and 26).

**CAUTION**

Use all asbestos or all non-asbestos brake linings in any single brake assembly. Brake assemblies containing asbestos linings and brake assemblies containing non-asbestos linings may be used on the same aircraft.

12. Install linings (27) (Task 3-76).
13. Install disk (28) (Task 3-74).
14. Lockwire nuts (23) together. Use lockwire (E230).

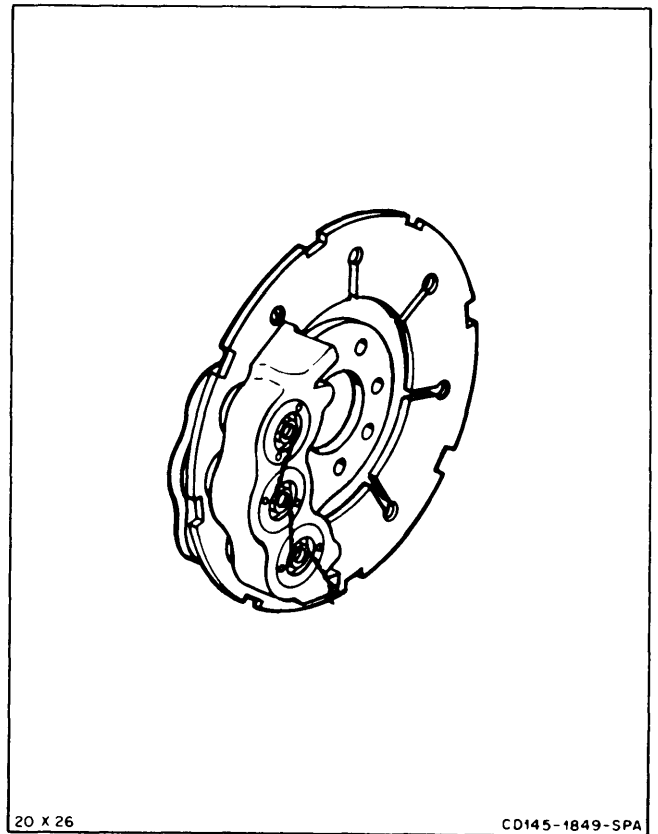
INSPECT**GO TO NEXT PAGE**

3-81 ASSEMBLE BRAKES (Continued)

3-81

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-82 TEST BRAKES (FUNCTIONAL TEST)**3-82**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Test Stand Type D6A, D5B, or Other
Source of 1000 Psi

Materials:

None

Personnel Required:

67U20 Medium Helicopter Repairer

References:

Task 3-74

Equipment Condition:

Off Helicopter Task

WARNING

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, 1/2-inch thickness or more, when applying pressures over 250 psi, to prevent injury to personnel.

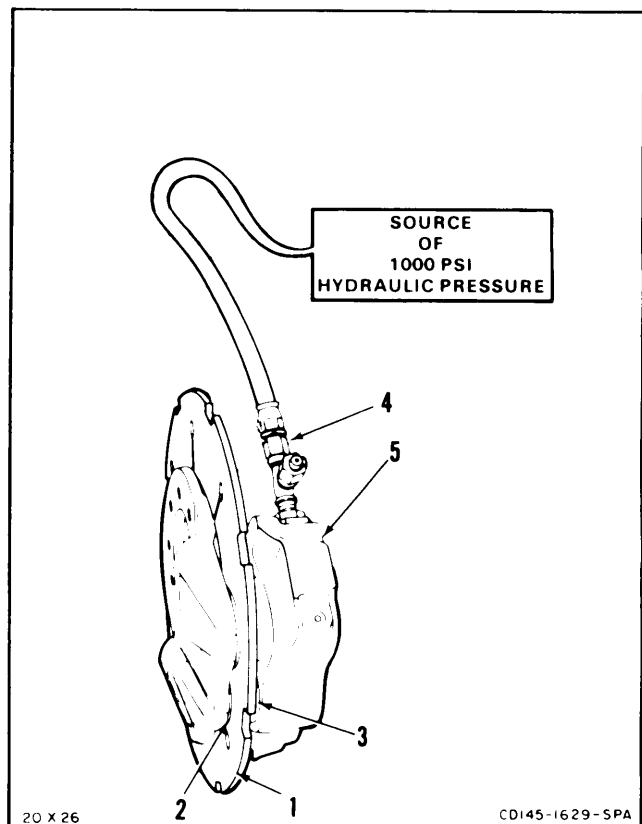
NOTE

Procedure is same for all brakes

- 1 **Install brake disk (1)** between brake linings (2 and 3) (Task 3-74).
- 2 **Connect test stand hose fitting (4)** to brake (5).
- 3 **Apply 935 psi** to brake (5) for 2 minutes. There shall be no leaks,
- 4 **Apply and release pressure 10 times**. Check that brake disk is free when pressure is released.
- 5 **Keep brake in static condition** for 2 minutes. There shall be no static leaks.
- 6 Disconnect test stand hose fitting (4) from brake (5).

FOLLOW-ON MAINTENANCE

None

END OF TASK

3-83 INSTALL FORWARD BRAKES**3-83**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

Antiseize Compound (E75)
Acid Swabbing Brush (E86)
Sealing Compound (E350)
Epoxy Primer (E292.1)
Gloves (E184.1)

Parts:

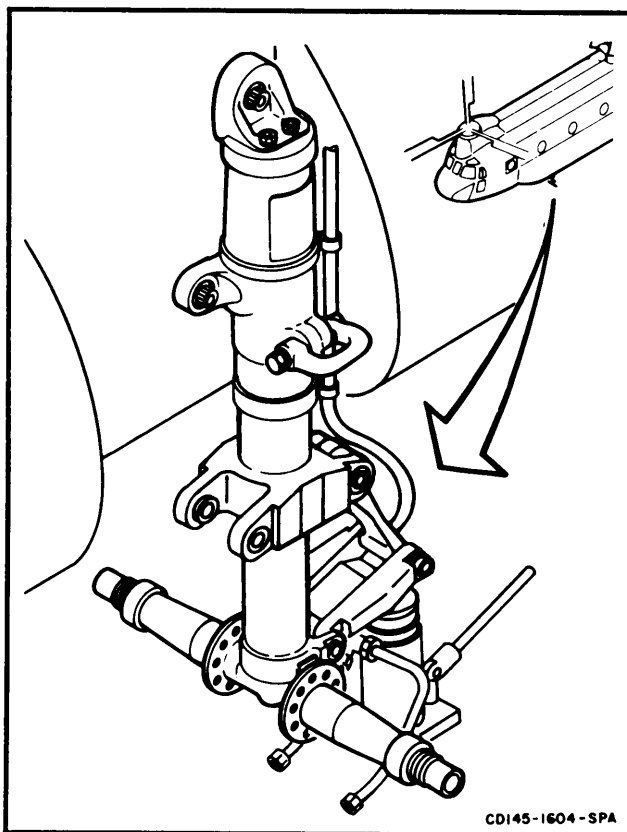
Packing

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P



CDI45-1604-SPA

NOTE

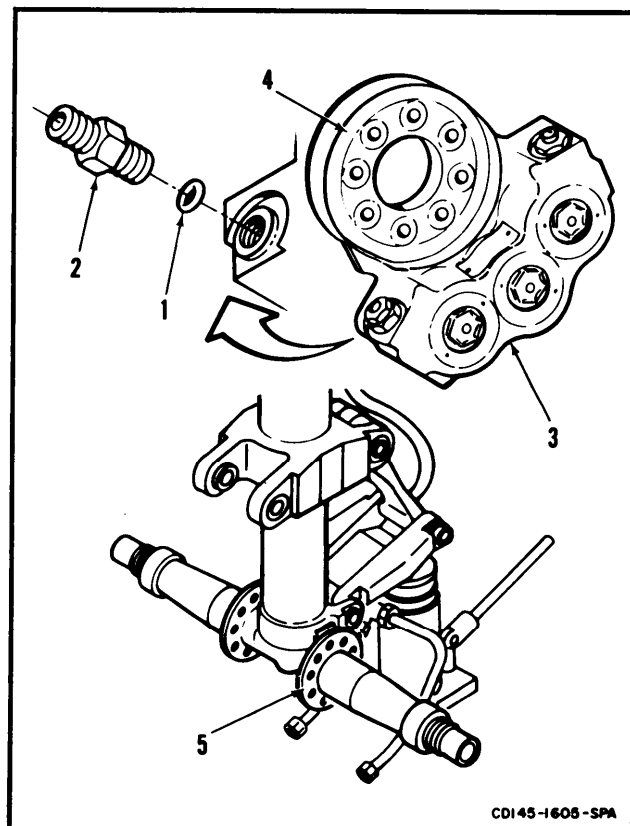
Procedure is same for left and right in-board and outboard brakes except as noted. Left forward landing gear is shown here.

1. Install packing (1) and union (2) on brake (3) if brake is being replaced.

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.

2. Apply epoxy primer (E292;1) to brake mating surface (4) and axle flange (5). Wear gloves (E184.1).



CDI45-1606-SPA

GO TO NEXT PAGE

3. **Position brake (3)** with brake disk (6) on **axle flange (5)** as follows:
 - a. Brake (3) must be on forward side of axle (7).
 - b. Union (2) must be horizontal.
 - c. Brake (3) bolt holes must align with holes in axle flange (5).

WARNING

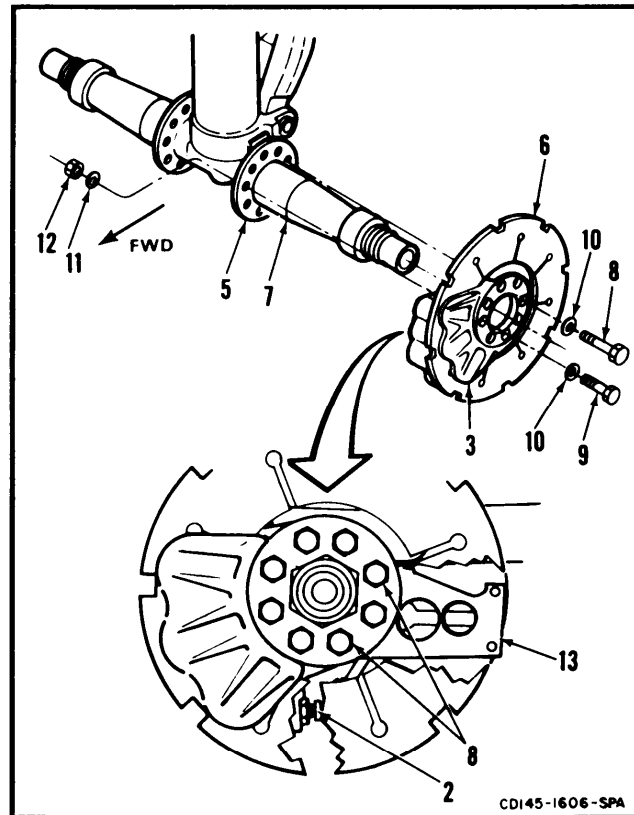
Antiseize compound (E75) can form toxic vapors if exposed to flame. Use in well-ventilated area away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

4. Apply antiseize compound (E75) to shanks of bolts (8 and 9). Use brush (E86). Wear gloves (E184.1).

NOTE

Longer bolts are installed on forward left outboard and right inboard brakes. To install bolts in left outboard or right inboard brakes, do steps 5. and 7. To install bolts in left inboard or right outboard brakes, do steps 6. and 7.

5. **Install two long bolts (8), six shorter bolts (9)**, 16 washers (10 and 11), and eight nuts (12) on forward left outboard or right inboard brake (3) only. Make sure long bolts go through air valve bracket (13).
6. **Install eight bolts (9)**, washers (10), washers (11), and nuts (12) on forward left inboard or right outboard brake (3) only.
7. Torque eight nuts (12) to **105 inch-pounds**.



WARNING

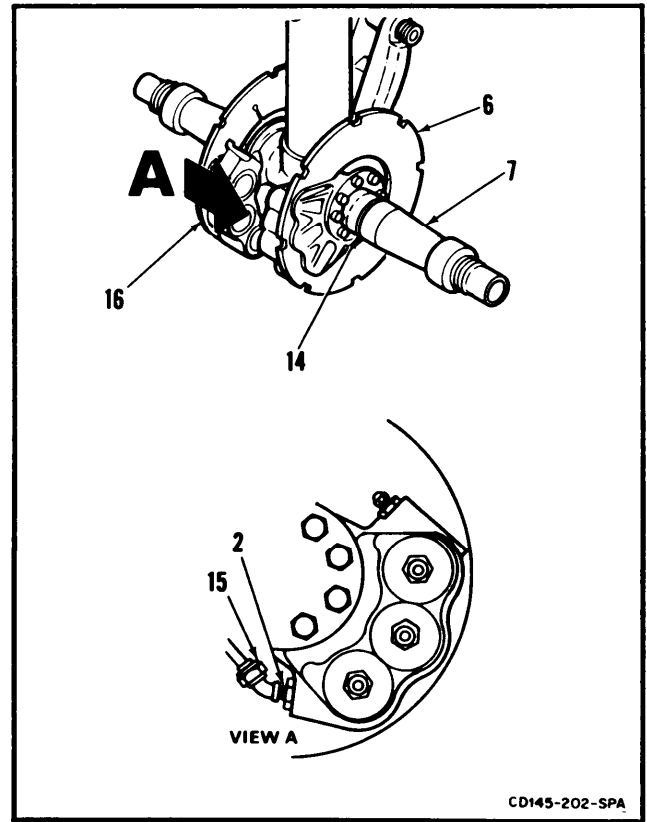
Sealing compound (E350) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

8. Apply sealing compound (E350) to bore of bushing (14). **Install bushing** on axle (7) while sealant is wet. Make sure shoulder of bushing faces away from disk (6). Wear gloves (E164.1).
9. if axle (7) was removed, install axle (Task 3-15).
10. **Connect tube (15)** to union (2).
11. **Repeat steps 1. thru 10. to install other brake (16).**

INSPECT

FOLLOW-ON MAINTENANCE:

- Install forward wheels (Task 3-12).
- Remove jack from forward landing gear (Task 1-23).
- Bleed brake system (Task 7-330).



END OF TASK

3-84 REMOVE AFT BRAKE

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

Cloths (E120)

Personnel Required

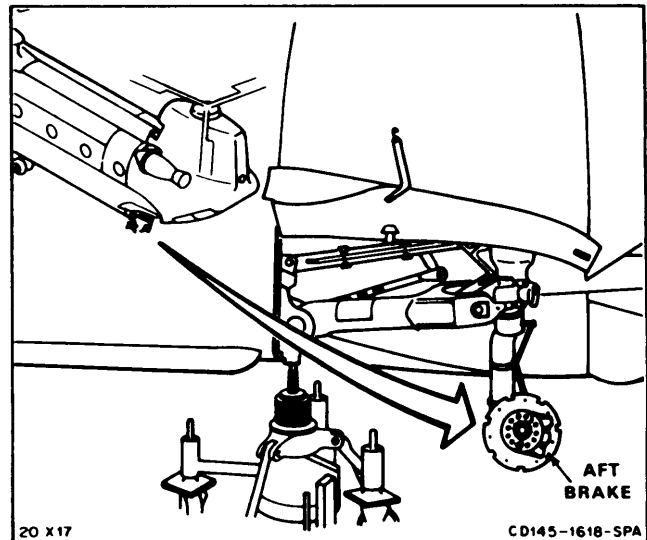
Medium Helicopter Repairer

References:

Task 3-34

Equipment Condition:

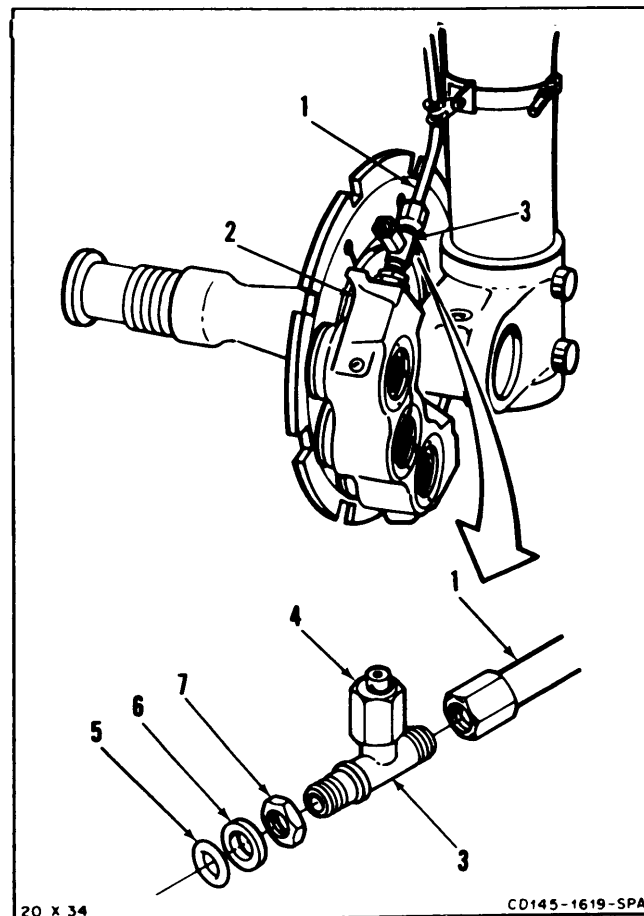
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Parking Brake Released
- Utility Hydraulic System Depressurized (TM 55-1520-240-T)
- Helicopter Jacked at Aft Fuselage Jack Pad (Task 1-24)
- Wheel Removed (Task 3-7)
- Swivel Locks Unlocked (TM 55-1520-240-T)



NOTE

Procedure is same for left or right gear. Left gear is shown here.

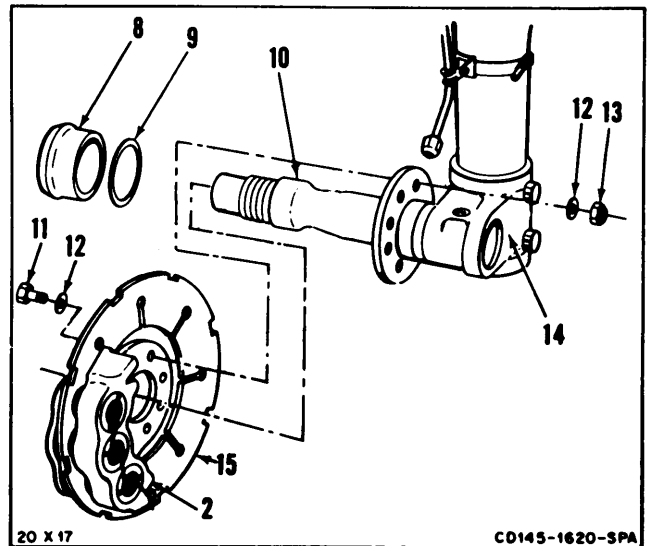
1. **Disconnect hydraulic tube (1)** from tee (2). Use container to catch hydraulic fluid when fittings are disconnected. Use cloths (E120) to wipe up spilled fluid.
2. If brake (2) is to be replaced, **remove tee (2)**, with cap (4), packing (5), washer (6), and locknut (7).



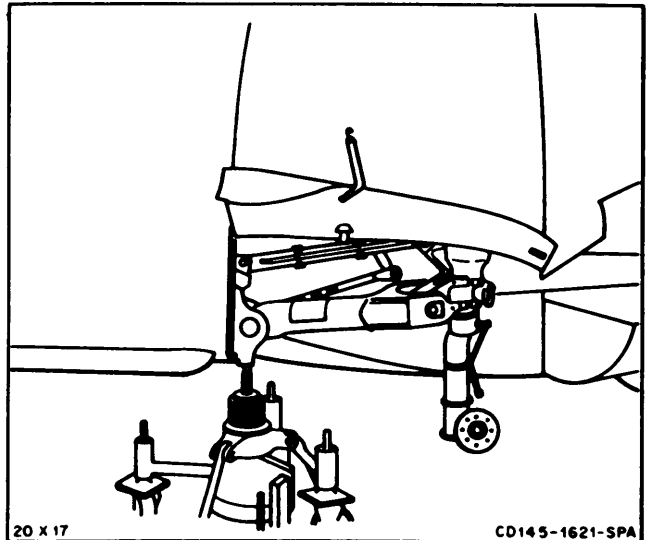
GO TO NEXT PAGE

3-84 REMOVE AFT BRAKE (Continued)**3-84**

3. Remove sleeve bushing (8) and one or two spacers (9), if installed, from axle (10). If sleeve bushing is tight on the axle, remove axle from housing. Remove sleeve over opposite end of axle (Task 3-34).
4. Remove six bolts (11), 12 washers (12), and six nuts (13) securing brake (2) to housing (14).
5. Remove brake (2) and brake disk (15).

**FOLLOW-ON MAINTENANCE:**

None

**END OF TASK**

Change 10

3-189

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5160-00-323-4692
Torque Wrench, 100 to 750 Inch-Pounds

Materials:

Antiseize Compound (E75)
Sealing Compound (E336)
Epoxy Primer (E292.1)
Gloves (E164.1)

Parts:

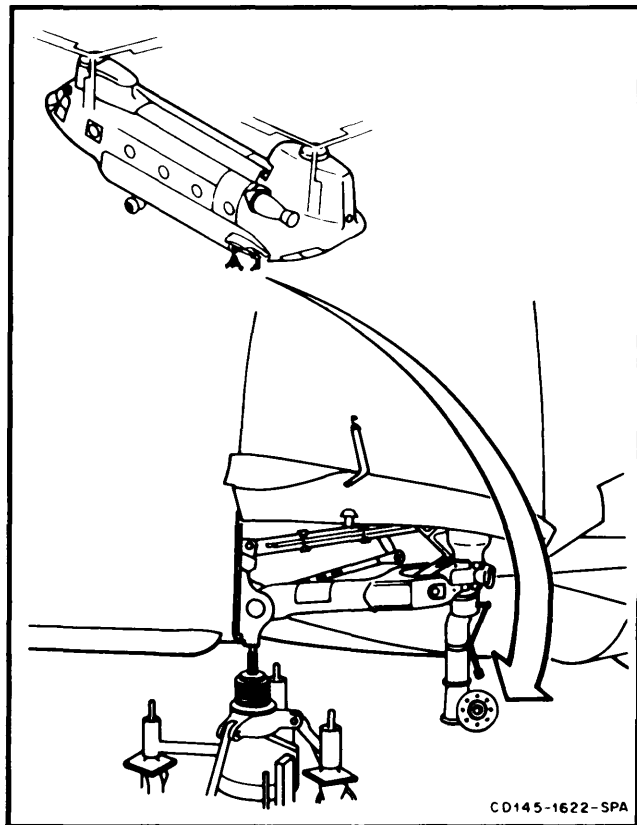
Packing

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P
Task 3-35



CD145-1622-SPA

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.

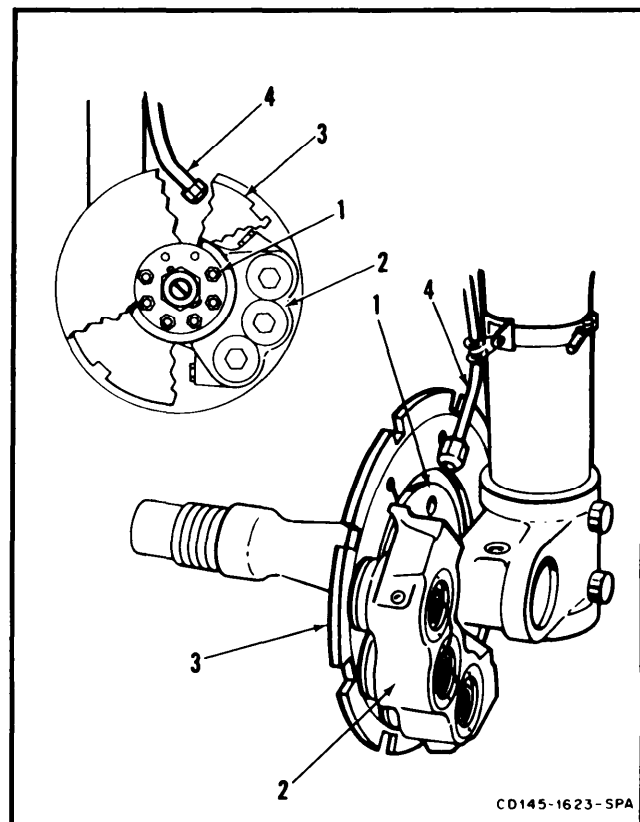
NOTE

Procedure is same for left and right brakes. Left gear shown here.

Apply primer (E292.1) to mating surfaces of axle flange (1) and brake (2). Wear gloves (E164.1).

Position brake (2) with disk (3) on axle flange (1).

Align bolt holes of brake (2) and flange (1). Make sure brake is in position to match brake tube (4).



CD145-1623-SPA

GO TO NEXT PAGE

3-190 Change 15

WARNING

Antiseize compound (E75) can form toxic vapors if exposed to flame. Use in well-ventilated area, 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

Use only high-shear bolts for this installation.

NOTE

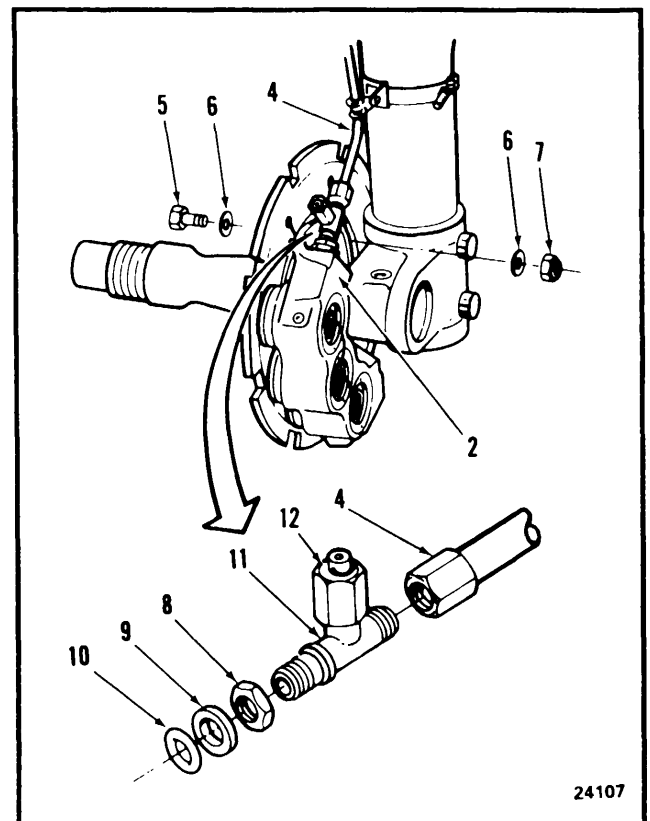
The axle flange has eight boltholes but only six are used.

4. **Apply antiseize compound (E75)** to shanks of six shear bolts (5). Install six bolts (5), 12 washers (6), and six nuts (7). Wear gloves (E184.1).
5. **Torque six nuts (7) to 190 inch-pounds.**

NOTE

If a new brake is being installed, do step 6. If not, go to step 7.

6. **Install nut (8), washer (9), packing (10), and tee (11) with cap (12) in brake (2).** Tighten nut.
7. **Connect tube (4) to tee (11).**



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3-85 INSTALL AFT BRAKE (Continued)

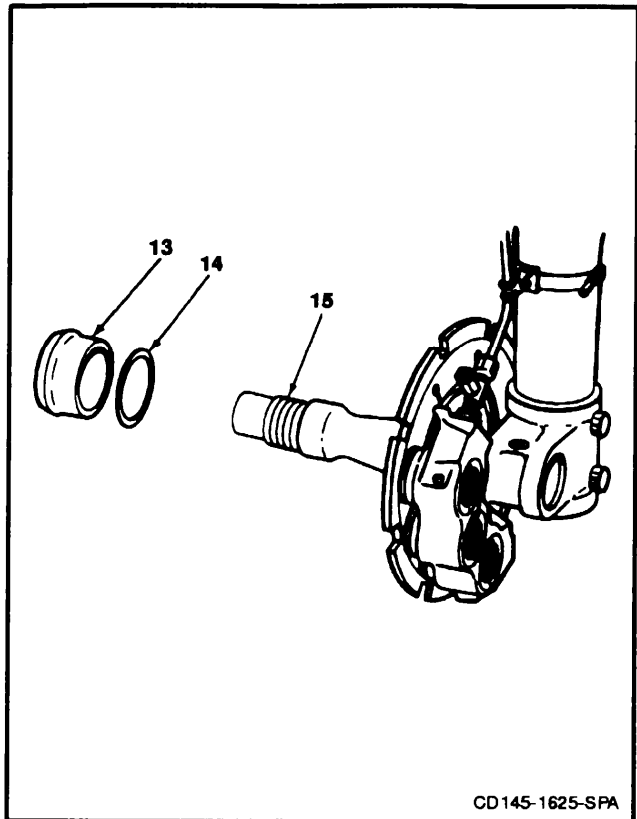
8. If axle (15) was removed, install axle (Task 3-35).

WARNING

Sealing compound (E336) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.

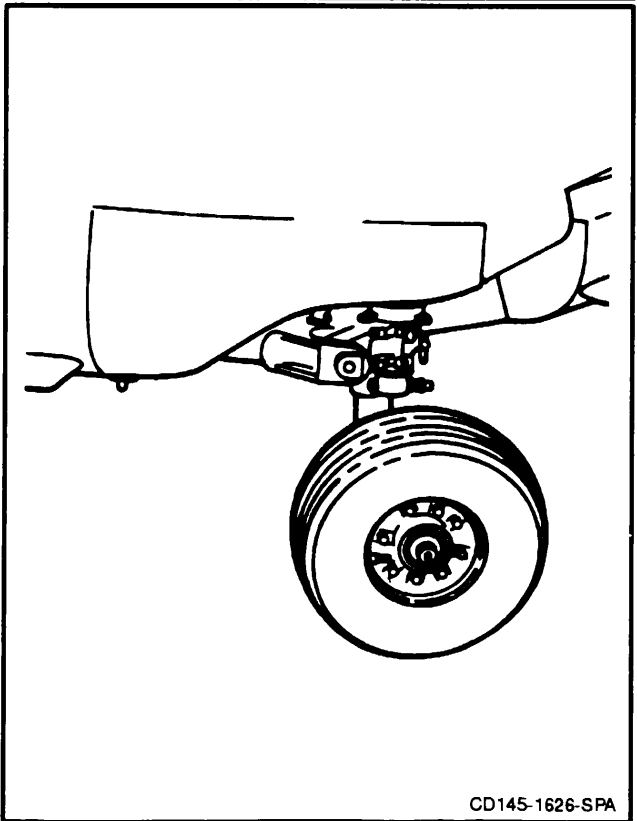
9. Apply a coat of sealing compound (E336) to the bore of sleeve bushing (13) and one or two spacers (14).
10. Install one or two spacers (14) if removed, and sleeve bushing (13). Install bushing while sealant is still wet. Wear gloves (E184.1).

INSPECT



FOLLOW-ON MAINTENANCE:

- Install wheel (Task 3-12).
- Bleed brakes (Task 7-330).
- Remove jacks (Task 1-24).
- Set parking brake.



END OF TASK

CHAPTER 4

POWERPLANT

SECTION I

POWERPLANT DESCRIPTION

AND OPERATION

There are two powerplant assemblies, one mounted externally on each side of the pylon. They supply torque to power the drive and rotor systems.

Accessories on each powerplant include a starter, tachometer generator, fire detection system, tubing, engine controls, forward and aft engine mount adapter, engine transmission and fairing, air inlet fairing, with **74** a water wash system, powerplant cover, exhaust cone, electrical cable, and an air inlet screen. Powerplants on helicopters without **43** also have an anti-icing valve.

Fuel, hydraulic, and electrical connections to the powerplant have quick-disconnect couplings at the fuselage for ease in changing powerplants.

Each engine has two sections, a gas producer section consisting of a compressor and compressor turbine, and a power turbine section. Hot combustion gases flow from one section to the other although the sections are not mechanically connected.

The powerplant is started by a hydraulically powered starter. The starter provides power to motor the seven-stage compressor section. Air is inducted at the front of the engine through the air inlet housing.

The housing is protected by an air inlet fairing and an air inlet screen.

Inducted air is compressed, mixed with fuel, and ignited in the combustion chamber. Combustion gases drive four rotors. The first two rotors drive the sevenstage compressor turbine after the engine is started.

The last two rotors drive the power turbine output shaft with the final power output taken off the front of the engine by the engine transmission.

Exhaust gases are expelled through the exhaust cone at the rear of the powerplant.

The powerplant assembly includes the following systems:

Ignition

Air Induction

Engine wash (with **74**)

Oil

Anti-Icing (without **43**)

Cooling

Engine Power Controls

FADEC Power Controls (with **74**)

Exhaust

IGNITION SYSTEM

Separate start and ignition systems are provided for each engine. The ignition system consists of an ignition

GO TO NEXT PAGE

lockswitch, ignition unit, igniter plugs, ignition lead assembly, engine start switch, start caution lights, start fuel solenoid valve, engine start solenoid, and two relays.

AIR INDUCTION SYSTEM

The air induction system is made up of the engine transmission fairing, air inlet screen and bypass panels, air inlet fairing, and air inlet housing. The air inlet screen protects the engine from inducting foreign objects. Aircraft with **40** are also equipped with fine mesh screen mounted over the coarse screen material of the air inlet screen only. The bypass panels are not equipped with fine mesh screen material and are removed when flight in icing conditions is anticipated, to make sure that proper air flow to the engine is maintained.

ENGINE COMPRESSOR CLEANING AND PRESERVATION SYSTEM (HELICOPTERS WITH **74**)

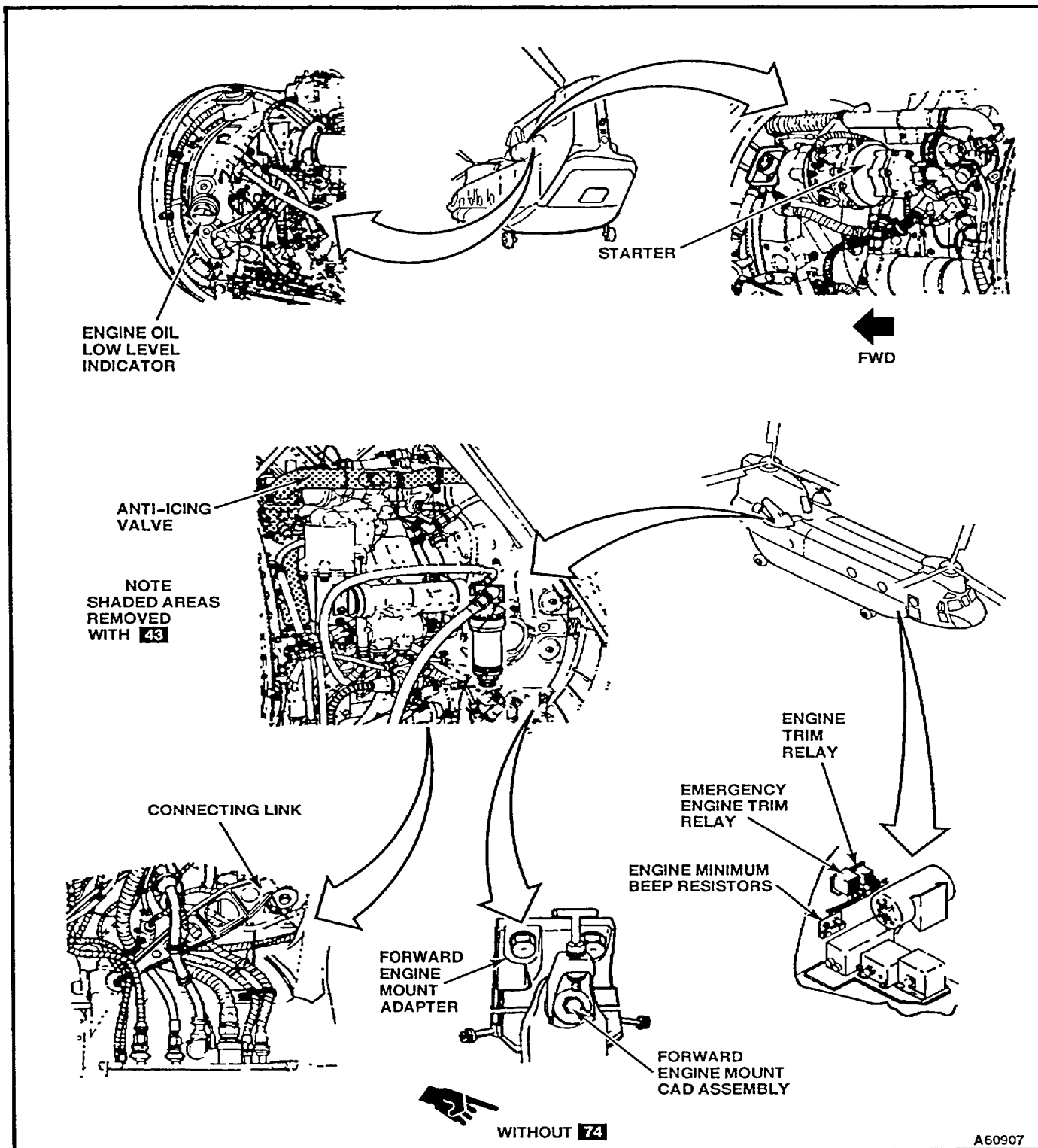
The helicopter is equipped with an engine compressor cleaning system for each engine. Fluid and air line connections are installed inboard of each engine work platform. Fluid lines and hoses are installed for solvent and rinse delivery to a series of spray nozzles that are installed on the engine air inlet fairing. Air lines and hoses are routed to the bleed band, to open and close the bleed band during engine cleaning and preservation. The engine wash system is controlled by a universal cleaning and corrosion prevention ground unit. This unit provides solvent, water rinse, preservation and air for engine cleaning and preservation procedures. The engine compressor cleaning and preservation procedures consist of:

- a. Spraying the compressor with a cleaning solvent.
- b. Washing the solvent off the compressor.
- c. Preserving the compressor to prevent corrosion.

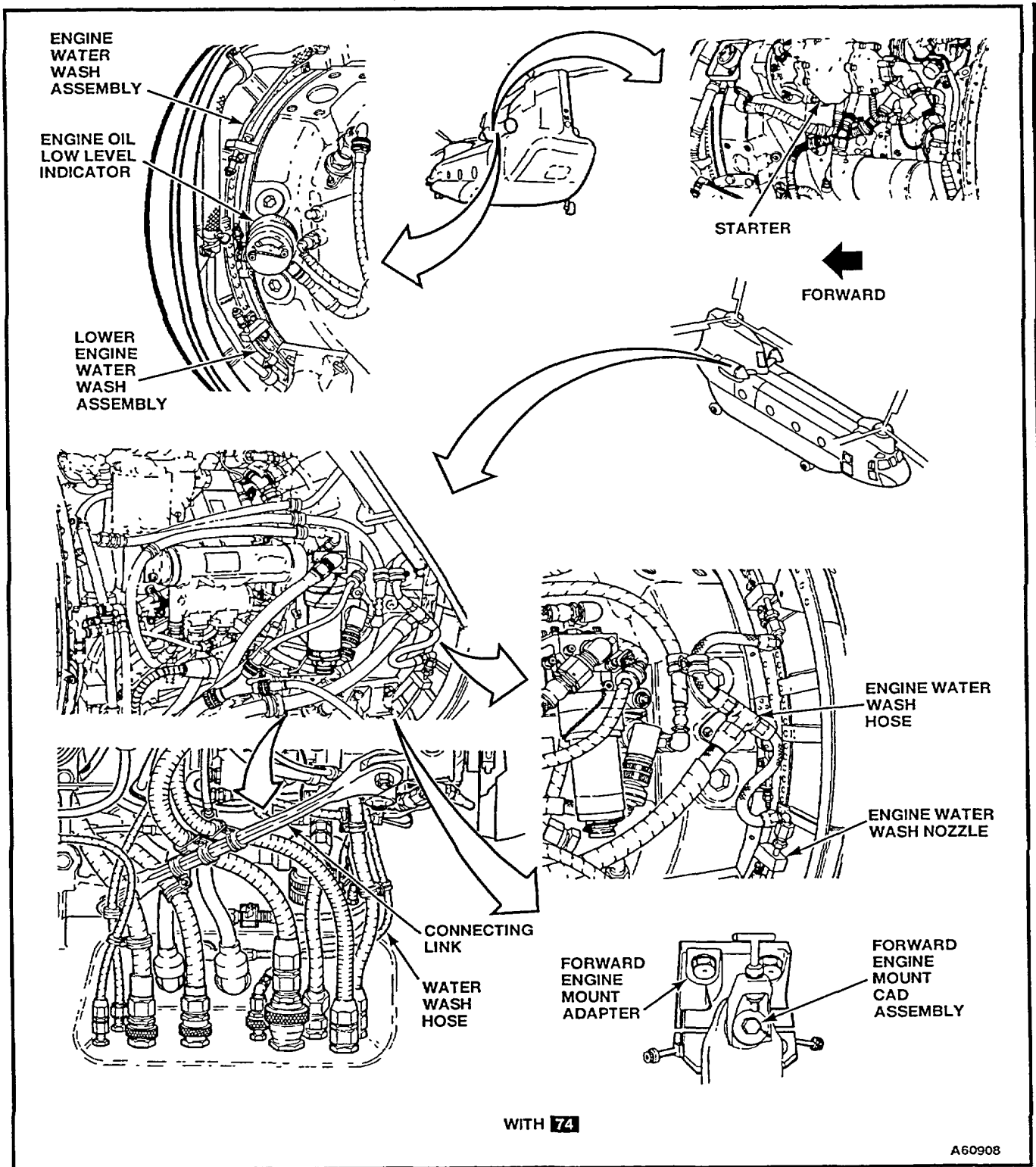
The use of engine compressor cleaning and preservation procedures will extend the life of the engine compressor and Internal components.

OIL SYSTEM

The oil system is an integral part of the engine with no external tank. System protection is provided by chip detectors, oil temperature indicator, filters, and a low oil level warning system.



GO TO NEXT PAGE
4-2.2 Change 19



GO TO NEXT PAGE

Change 19 4-2.2.1/(4-2.2.2 blank)

ANTI-ICING SYSTEM (HELICOPTERS WITHOUT 43)

The anti-icing system has a solenoid-operated valve which is mounted on the top right side of the compressor section. The valve controls the flow of hot air from the anti-icing gallery to the air inlet fairing, engine transmission fairing, and drive shaft fairing. The valve has a secondary inlet which cools the hot air before it enters the fairing areas. The valve is normally open. Setting the ENGINE ANTI-ICE switch to OFF closes the valve. The valve is powered by 28 volts dc. On helicopters with 43, the anti-icing valve is removed.

COOLING SYSTEM

The powerplant cooling system is a three-part cover which protects the powerplant and directs the flow of air through the powerplant compartment. Two side covers are hinged to the upper cover and fit flush to the lower access door when latched. The third cover is an upper cover supported by two hinge link assemblies at the front and at the aft end by a former which also serves as a firewall. Lower access door covers the quick-disconnect shelf and is hinged to the fuselage.

POWER CONTROL SYSTEM (HELICOPTERS WITHOUT 74)

The engine power or engine condition control system has two subsystems. The compressor or gas producer (N1) system, and the combustor, or power turbine (N2) systems. Both systems are powered by 28 volts dc.

1. The N1 system controls the gas producer section of the powerplant. It has two circuits in the engine condition control quadrant, a control box, a control actuator, linkage, and ENG N1 COND light.
2. The N2 control system controls the power turbine section of the powerplant. The system includes two ENGINE BEEP TRIM switches, two EMERG ENG TRIM switches, two droop eliminator resistors, two engine trim relays, two emergency engine trim relays, two remote positioning control boxes, a control actuator, and linkage.

FADEC CONTROL SYSTEM (HELICOPTERS WITH 74)

Each engine is controlled by a separate power control system. This power system, Full Authority Digital Electronic Control system (FADEC), provides:

- a. Twin engine load sharing.
- b. Power turbine speed governing.

GO TO NEXT PAGE

- c. Transient load anticipation.
- d. Transient torque smoothing.
- e. Emergency power capability.
- f. Acceleration and deceleration control.
- g. Engine temperature limiting.
- h. Surge avoidance.
- i. Compressor bleed valve control.
- j. Fuel flow limiting.
- k. Engine fail detection.
- l. Power Assurance Test (PAT).
- m. Engine history/fault recording.
- n. Engine to engine communication.
- o. Automatic switchover to reversionary backup in event of primary error.

The FADEC system incorporates a digital electronic control unit (DECU), a hydromechanical fuel metering unit (HMU), a thrust control position transducer, Np and Ng speed pickups, and a signal conditioning unit. Cockpit controls for the FADEC are mounted in the overhead console. The overhead console consists of the engine condition control quadrant and FADEC control panel.

Engine historical data can be uploaded and downloaded from the DECU using EMC-32T-2, Engine Historical Recording Terminal (EHRT).

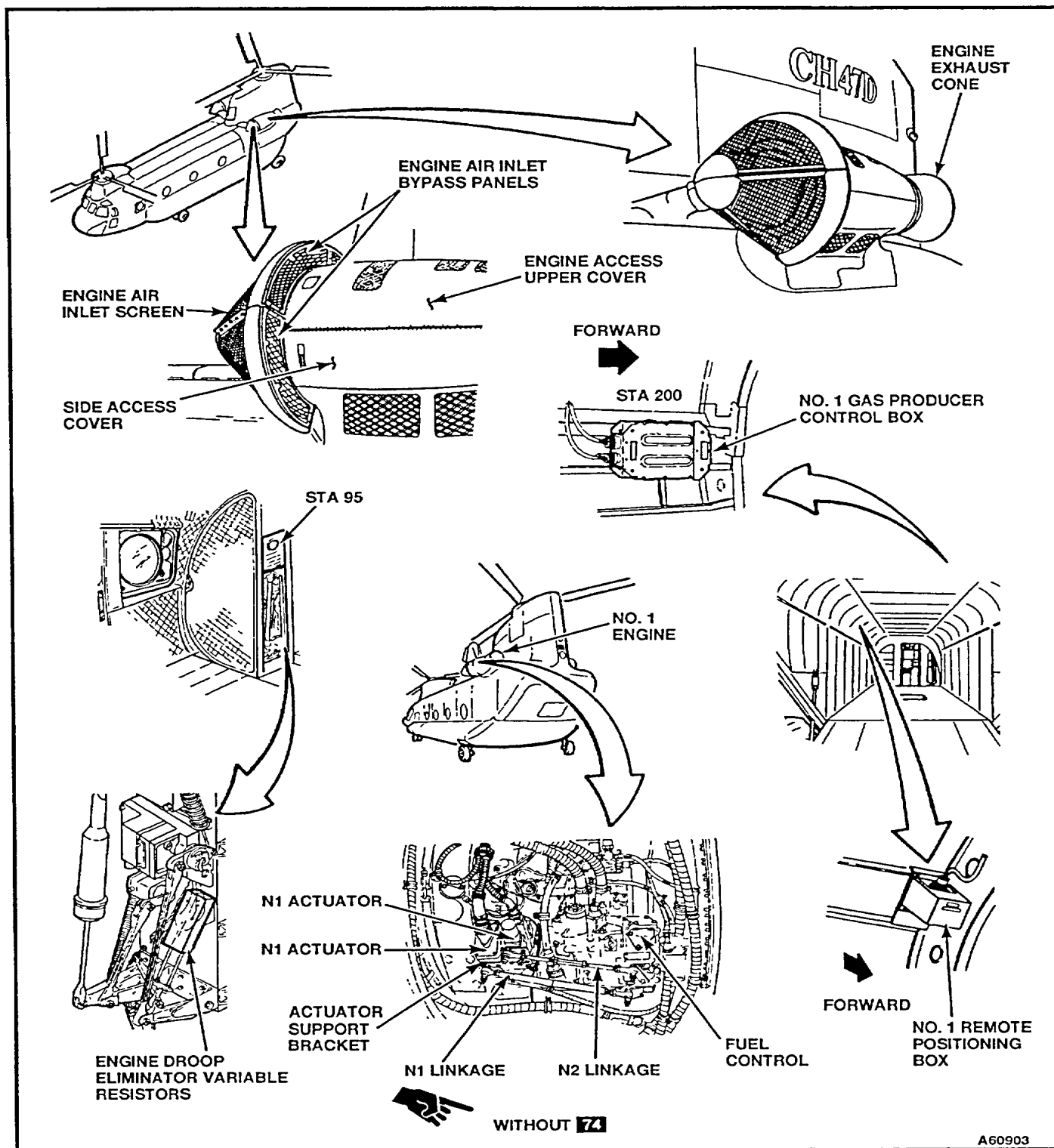
ENGINE MOUNTS

The engine mounts provide a 3-point support, two forward and one aft. A connecting link on the outboard side of each powerplant provides restraint in the event of an impact. Engine mount adapters are bolted to the engine and fit the three structural mounts.

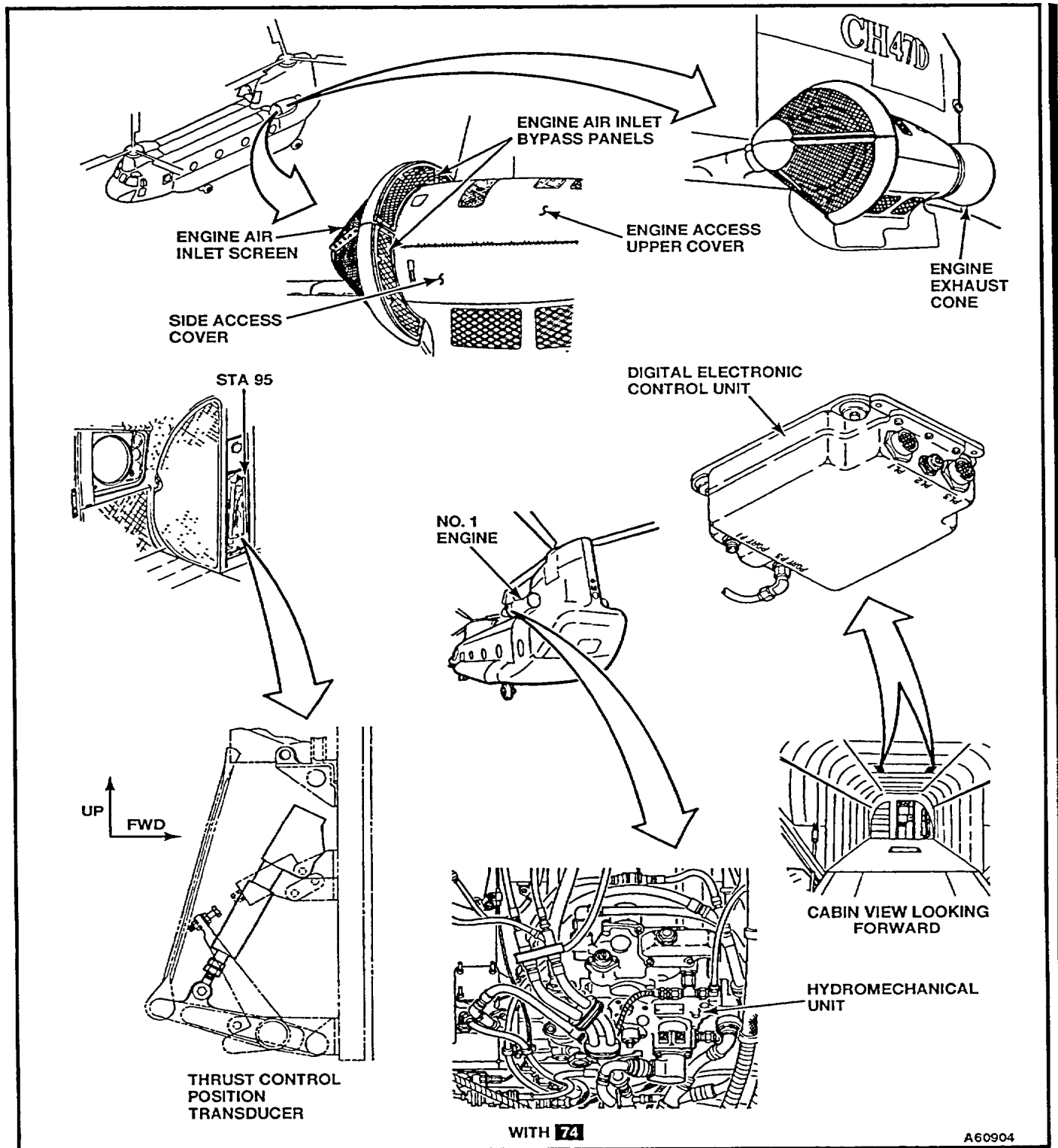
Refer to: Chapter 6 for engine transmission
Chapter 7 for engine starter
Chapter 8 for tachometer generator (without 74)
Chapter 12 for fire detection system
TM 55-2840-254-23 for basic engine (without 74)
TM 1-2840-265-23 for basic engines (with 74)

EXHAUST SYSTEM

The exhaust system conducts the exhaust gases in a smooth flow from the engine to the atmosphere. This smooth flow is desirable for efficient engine operation. The exhaust cone (tailpipe) is connected to the aft end of the engine by a coupling.

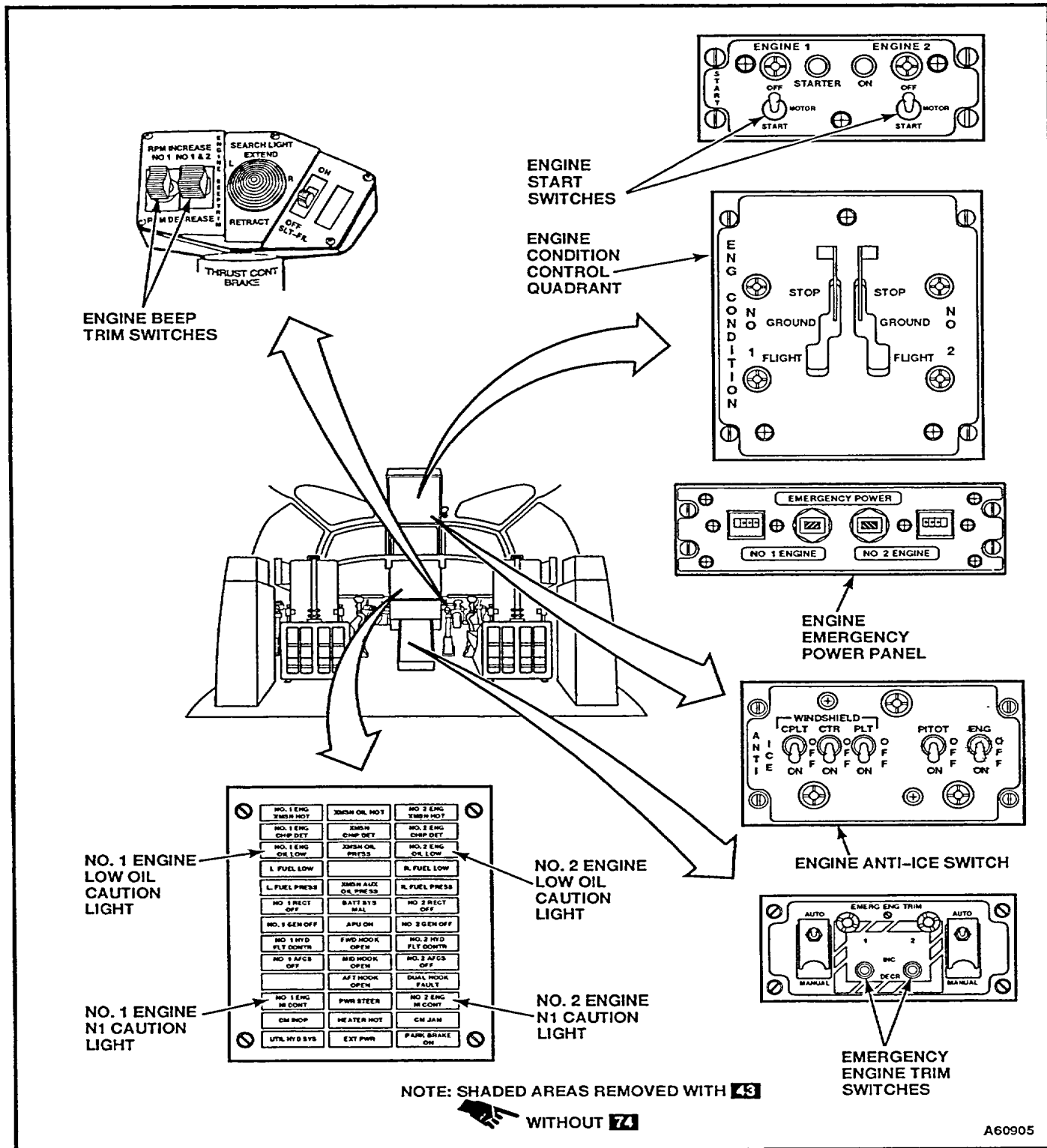


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4-4 Change 19



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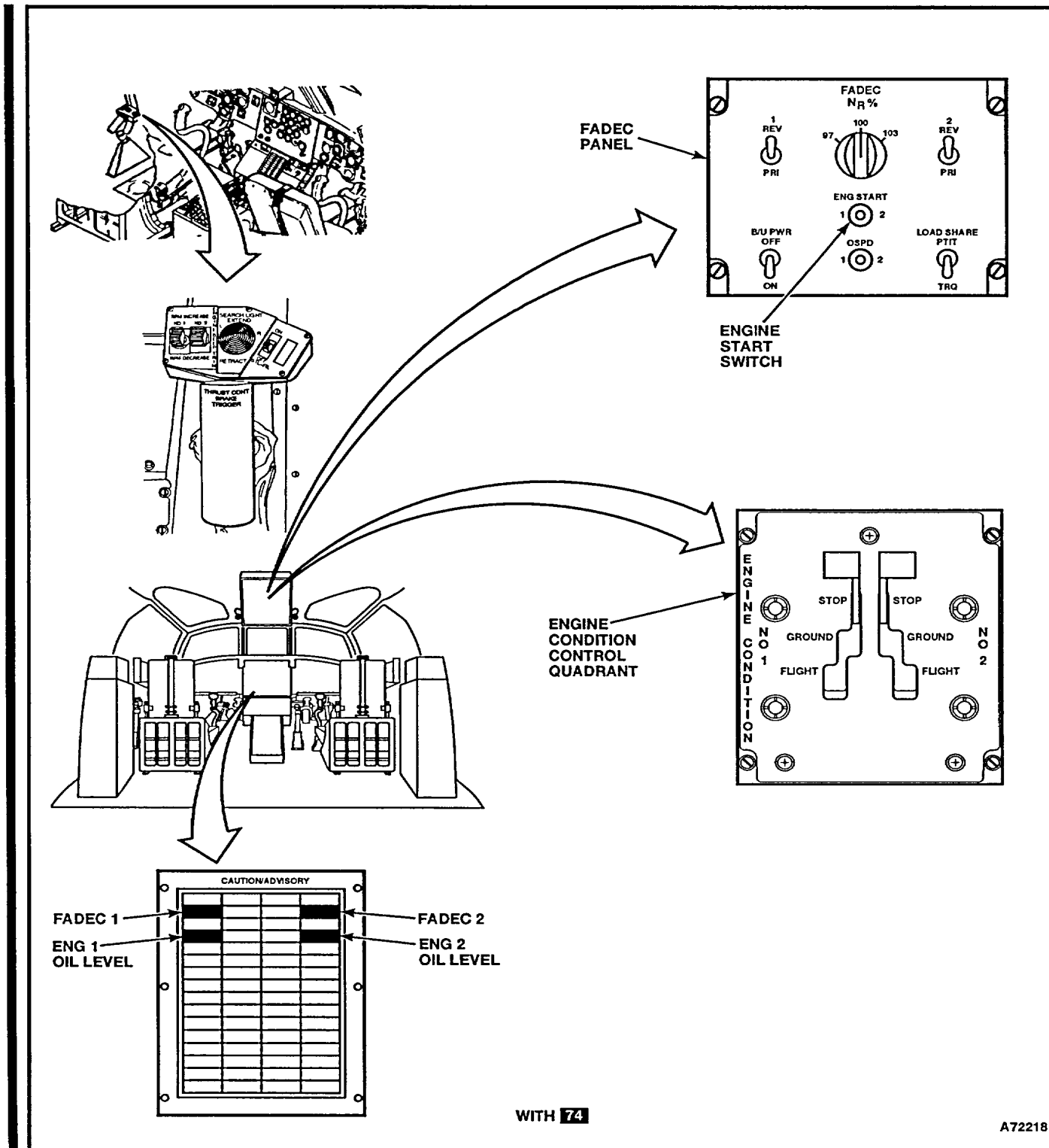
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Change 19 4-5



A72218

END OF TASK
4-6 Change 19

SECTION II
POWERPLANT

4-2 PERFORM HEALTH INDICATOR TEST (HIT)

4-2

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Stopwatch

Materials:

None

Personnel Required:

Inspector

Army Rotary Wing Aviator (2)

References:

TM 55-1520-240-MTF

TM 55-1520-240-T

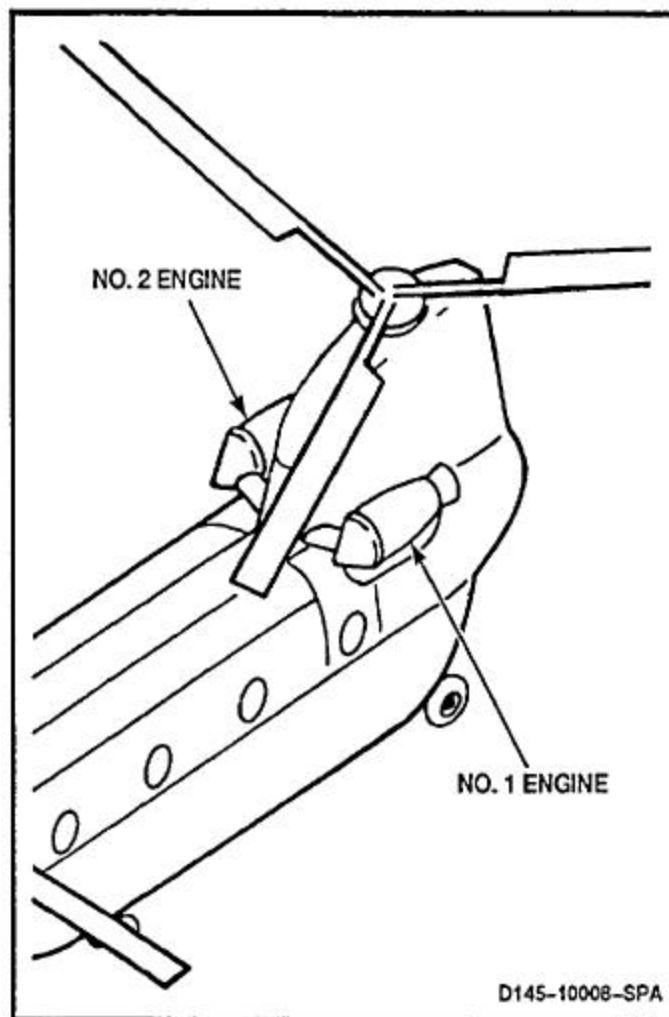
Equipment Condition:

Battery Connected (Task 1-39)

HIT Baseline PTIT Established (Worksheet)
(Task 4-2.1)**NOTE**

A new baseline Health Indicator Test (HIT) is required following replacement of a major engine component that affects airflow/ performance (such as a hot end).

1. Face aircraft into wind and operate engines until ptit and oil temperature have stabilized.
2. Record free air temperature (fat).
3. Set NO. 2 ENGINE CONDITION lever to GROUND.
4. Maintain 100 percent rotor rpm.
5. Ensure ENG ANTI-ICE switch is OFF (if applicable).
6. Read temperature in FAT °C which is closest to fat recorded in step 2 (HIT PTIT LOG).
7. Set N1 percent to number in N1% column next to at found in step 6.
8. Read temperature in BASELINE PTIT column next to N1 percent found in step 7.
9. Allow indicated ptit to stabilize for 2 minutes.
10. Record indicated ptit and compare with BASELINE PTIT found in step 8.
11. **Record aircraft hours** in ACFT row and difference between indicated ptit and BASELINE PTIT found in step 10 in difference from BASELINE PTIT row.

**GO TO NEXT PAGE**

4-6.2 Change 19

4-2.1 ESTABLISH HIT BASELINE

4-2.1

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

None

Materials:

None

Personnel Required:

Inspector

Army Rotary Wing Aviator (2)

References:

TM 55-1520-240-MTF

TM 55-1520-240-T

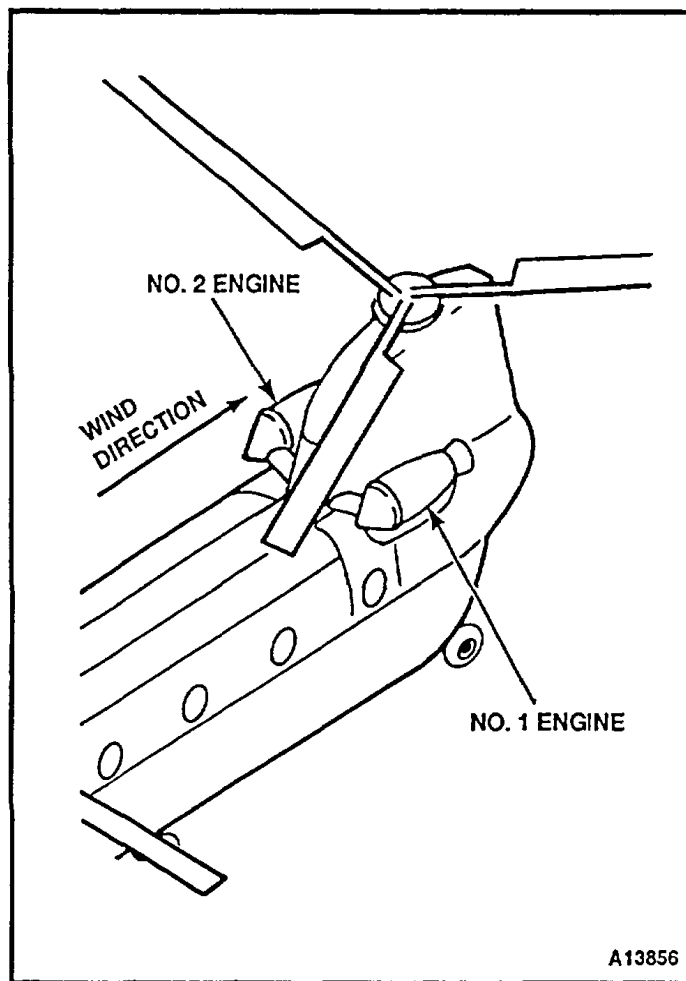
Equipment Condition:

Battery Connected (Task 1-39)

NOTE

A new baseline Health Indicator Test (HIT) is required following replacement of a major engine component that affects airflow/ performance (such as a hot end).

1. Face aircraft into wind and turnoff all bleed air. Insure that PTIT temperatures have stabilized.
2. Adjust engine not being **HIT** checked to **GROUND**.
3. Trim rotor speed to 100%.
4. Enter line 1 at FAT nearest free air temperature.
5. Set N1% at value indicated in line 2.
6. Stabilize instruments while maintaining rotor speed set in step 3 above.
7. Read **PTIT** from indicator.
8. Apply -- **PTIT A** correction factor in line 3 to indicated **PTIT** and record result in open space in line 4.
9. Apply -- **PTIT B** correction factors in line 5 to **PTIT** in line 4 and record result in line 8 for corresponding columns.
10. Enter baseline information in the respective columns of the **HIT PTIT LOG** (Task 4-2).
11. Enter aircraft or engine hours and word "**BASELINE**" in log section at bottom of **HIT PTIT LOG** (Task 4-2).

**GO TO NEXT PAGE**

4-8 Change 19

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Powerplant Repairer Tool Kit, NSN 5180-00-323-4944
Stopwatch

Materials:

Lockwire (E320)

Personnel Required:

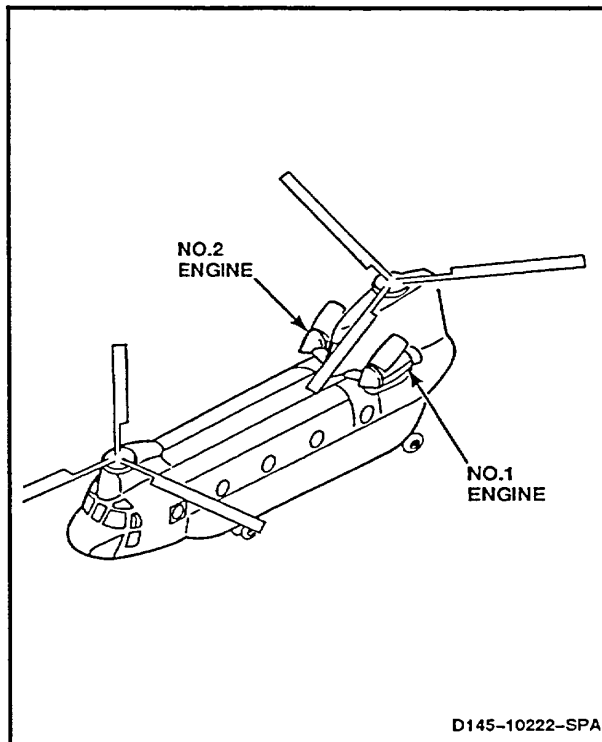
Aircraft Powerplant Repairer Army Rotary
Wing Aviator (2)

References:

- TM 55-1520-240-10
- TM 55-1520-240-T
- TM 55-2840-254-23
- Task 4-49
- Task 4-50
- Task 2-2
- Task 1-39

Equipment Condition:

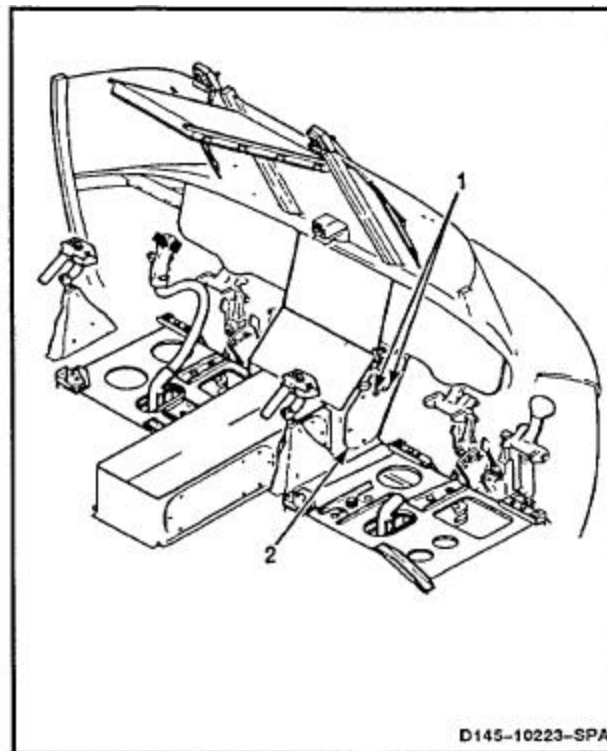
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



NOTE

Verify accuracy of engine indicating systems prior to performance of TEAC.

1. Remove lockwire from two stops (1). **Remove stops** from panel (2).

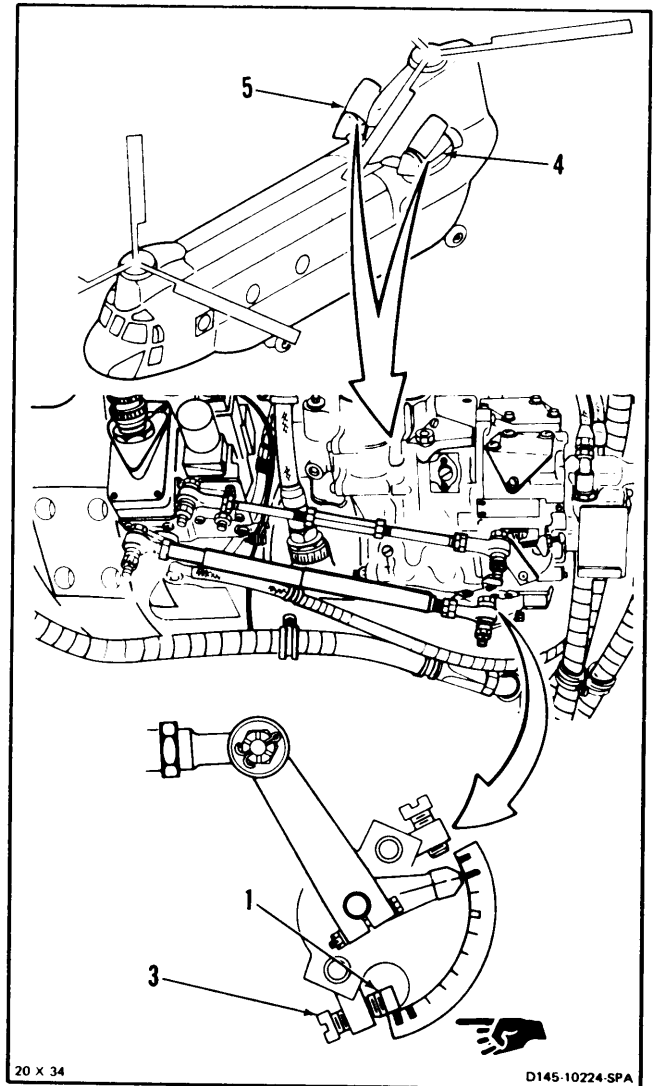


GO TO NEXT PAGE
4-8.2 Change 19

4-3 TURBINE ENGINE ANALYSIS CHECK (TEAC) (Continued)

4 - 3

2. Install two stops (1) on two screws (3) on No. 1 engine (4) and No. 2 engine (5).
3. Connect battery (Task 1-39).



GO TO NEXT PAGE

4. Have pilot **set copilot's altimeter to 29.92 inches** (TM 55-1520-240-10).
- 10 Have pilot maintain airspeed of **120 kias**, in level flight.

5. Have pilot **select altitude** where TEAC can be performed at **120 kias (not to exceed vne) at 98 percent** rotor rpm.

NOTE

Below 5°C FAT it may be impossible to conduct a TEAC without exceeding 10,000 feet pressure altitude. During cold weather periods, precise trimming of the fuel control is less critical since considerable reserve power exists due to low ambient temperature. When the above condition occurs, enter a red dash in the aircraft forms and accomplish the TEAC as soon as conditions permit.

6. Have pilot **take off** and climb to height selected in step 5.
7. Have pilot **make sure engine anti-icing system is off.**
8. Deleted
9. Have pilot **set rotor speed to 100 percent rpm** using NO. 1 & 2 ENGINE BEEP TRIM switch.

WARNING

Do not use thrust control to reduce engine power during teat. Engine overspeed can occur unless power is first reduced with **NO. 1 & 2 ENGINE BEEP TRIM switch.**

CAUTION

Do not allow EMERG PWR light to stay on longer than **5 seconds**. After **5 seconds**, indicator trips and timer starts.

- 11 If an emergency occurs or if it becomes necessary to maneuver the helicopter during teat, do the following:
- Reduce engine power using NO. 1 & 2 ENGINE BEEP TRIM switch.
 - When rotor rpm begins to decline, use thrust control to decrease engine power. Do not use thrust control until rotor rpm begins to decrease.

GO TO NEXT PAGE

4-3 TURBINE ENGINE ANALYSIS CHECK (TEAC) (Continued)

12. Raise thrust lever slowly.
13. Set ENGINE CONDITION LEVER (ecl) engine not being teaced to GROUND. Maintain 100 percent rotor rpm using ENGINE BEEP TRIM switch.
14. Continue increasing thrust and increasing NO. 1 & NO. 2 BEEP TRIM switch until gas producer (N1) speed for engine being TEACed stabilizes at maximum and rotor rpm falls to 98 percent. Maintain N1 and 98 percent rotor rpm using thrust control and NO. 1 & NO. 2 ENGINE BEEP TRIM switch.
15. Stabilize rotor rpm at 98 percent for 2 to 3 minutes, then record the following:
 - a. N1 speed
 - b. Rotor rpm
 - c. Fat
 - d. Ptit
 - e. Torque
 - f. Pressure altitude
16. Determine corrected N 1 speed.
 - a. Enter c. from step 15 on chart (6) at fat (7).
 - b. Enter a. from step 15 on chart (6) at N1 speed (9). Note intersection of lines.
17. Determine Torque Available.
 - a. Enter c from step 15 on chart (10) at FAT. Draw line vertically to f from step 15 (recorded pressure altitude).
 - b. Draw line horizontally from point determined in step 17a left to the torque available scale. Determine torque available.

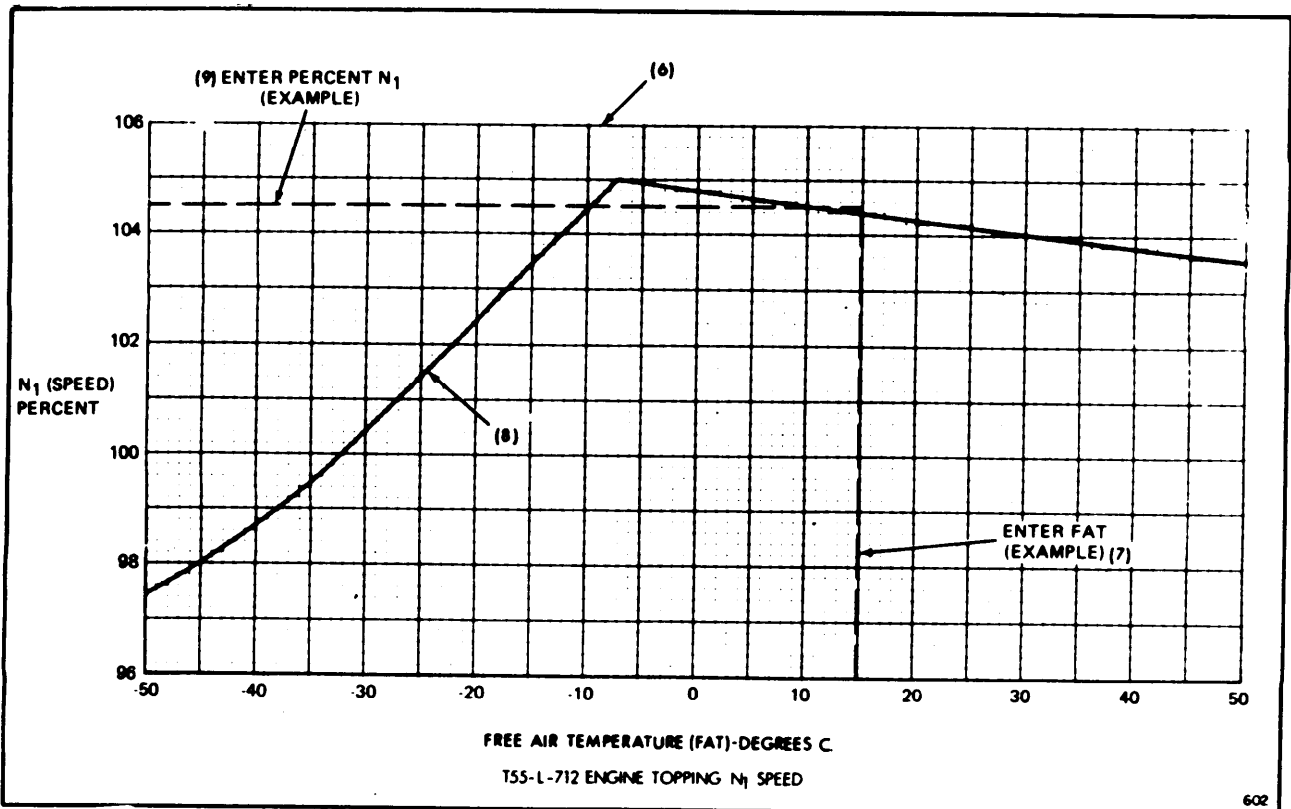
WARNING

Do not adjust thrust until rotor rpm begins to decrease. An engine overspeed can occur if thrust is adjusted before rotor rpm begins to decrease.

CAUTION

Do not exceed following limits:

- a. Power turbine inlet temperature (ptit) 890°C.
- b. N1 — 105 percent.



GO TO NEXT PAGE

4-3 TURBINE ENGINE ANALYSIS CHECK (TEAC) (Continued)

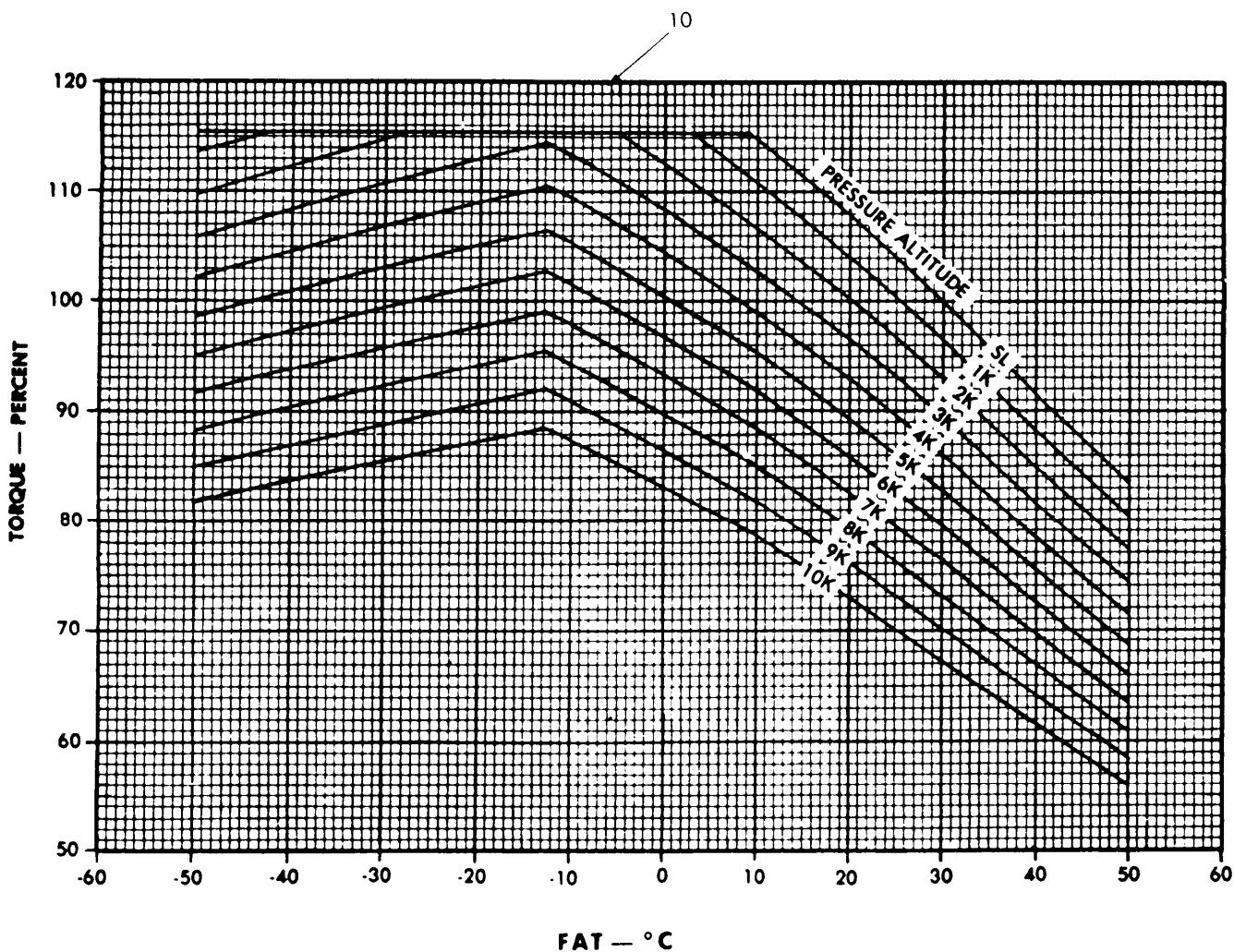
18. Engine trim is acceptable as all conditions below are met:
 a. PTIT is between 860°C and 890°C

the power turbine inlet temperature system per TM 55-1520-240-T, Task 8-5. This engine is acceptable if no discrepancies are observed and PTIT indicator reading is at least 840 degrees C.

NOTE

This note applies only to engines with serial numbers of LE 71850 or greater. If PTIT is below 860 degrees C, but between 840 degrees C and 860 degrees C, do the following: (1) check the thermocouple harness assemblies per TM 55-2840-254-23, Task 4-24; (2) check the power turbine inlet temperature indicator per TM 55-1520-254-23, Task 8-2; (3) check

- b. N1 and FAT lines entered on chart in step 16 must be within 5 percent but not exceed the N1 curve.
 c. Recorded torque exceeds the value determined in step 17b.
 d. If engine trim is acceptable, do steps 19 thru 26, then go to step 29. If not accepted, do steps 19 thru 28.



**Engine Torque Available
 Maximum Power Rotor Speed = 98%**

4-3 TURBINE ENGINE ANALYSIS CHECK (TEAC) (Continued)**4-3**

19. Set NO. 1 & 2 ENGINE BEEP TRIM switch to RPM DECREASE until rotor rpm begins to decrease.
20. Then **lower thrust control** to decrease N1, rotor rpm, and engine torque.

CAUTION

Do not move ecl of engine until speed and torque have decreased.

21. **Set ecl** of engine not being teaced **slowly** to FLIGHT.
22. Repeat step 11 through 20 on other engine.
23. Land aircraft and shut down engines.
24. Disconnect battery (Task 1-39).
25. Open engine work platform (Task 2-2).
26. Open engine access cover (Task 4-49).

CAUTION

Do not trim engine to exceed ptit limits.

NOTE

N1 or PTIT deficiencies require troubleshooting before trim adjustment. (TM 55-2840-254-23- 1.)

27. **Trim engine** as follows:
 - a. To increase N1 or ptit, turn N1 screws (6) clockwise.
 - b. To decrease N1 or ptit, turn N1 screw (6) counterclockwise.

NOTE

1/4 turn of screw is approx 1% change in **N1**, and 25°C change in **ptit**.

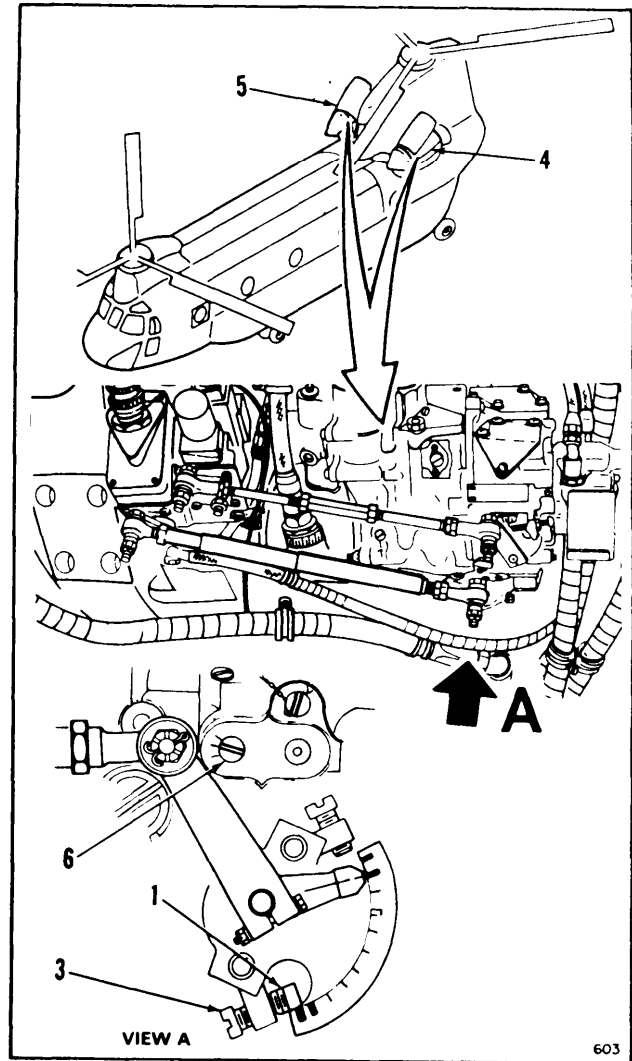
28. Repeat steps 4 thru 18.

WARNING

Stops must be removed from both engines, otherwise the aircraft will not be able to operate with emergency power.

29. Remove two stops (1) from two screws (3) on No. 1 engine (4) and No. 2 engine (5).
30. Close engine access cover (Task 4-50).
31. Close engine work platform (Task 2-2).

GO TO NEXT PAGE



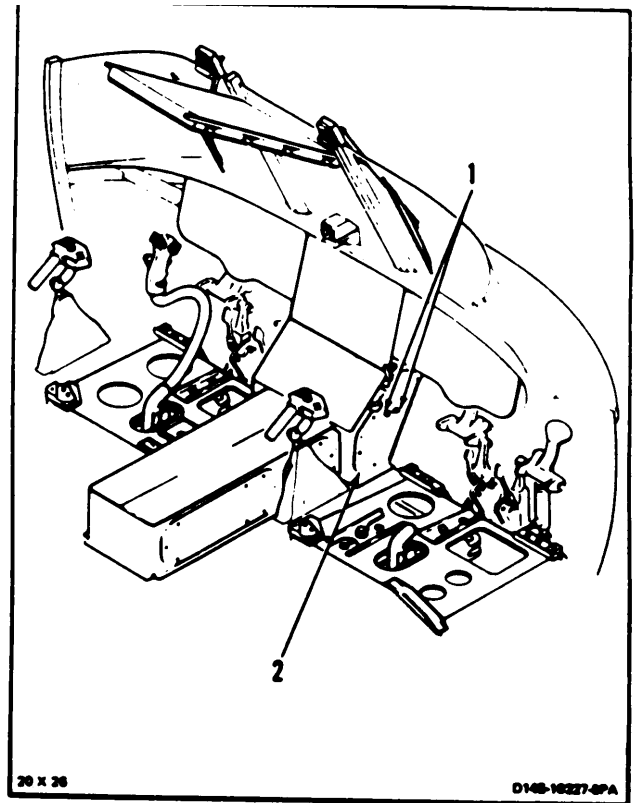
4-3 TURBINE ENGINE ANALYSIS CHECK (TEAC) (Continued)**4-3**

32. **Install stops (1) on panel (2)** in cockpit. Lockwire stops. Use lockwife (E230).

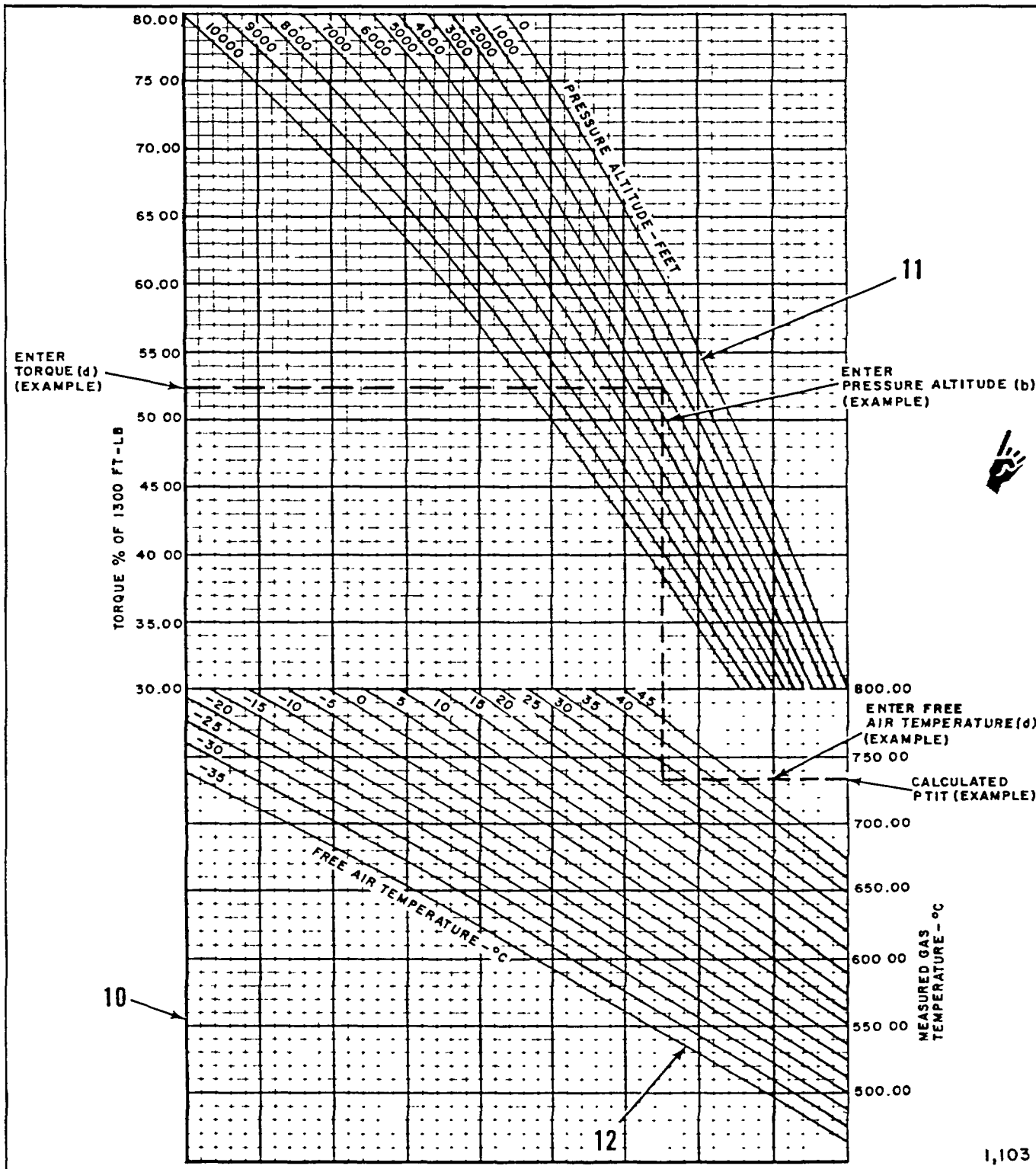
Steps 33 thru 42 deleted

FOLLOW-ON MAINTENANCE:

Establish new HIT baseline for the applicable engine (Task 4-2.1).



GO TO NEXT PAGE



END OF TASK

Change 1 4-14.1

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
Stopwatch

Materials:

None

Personnel Required:

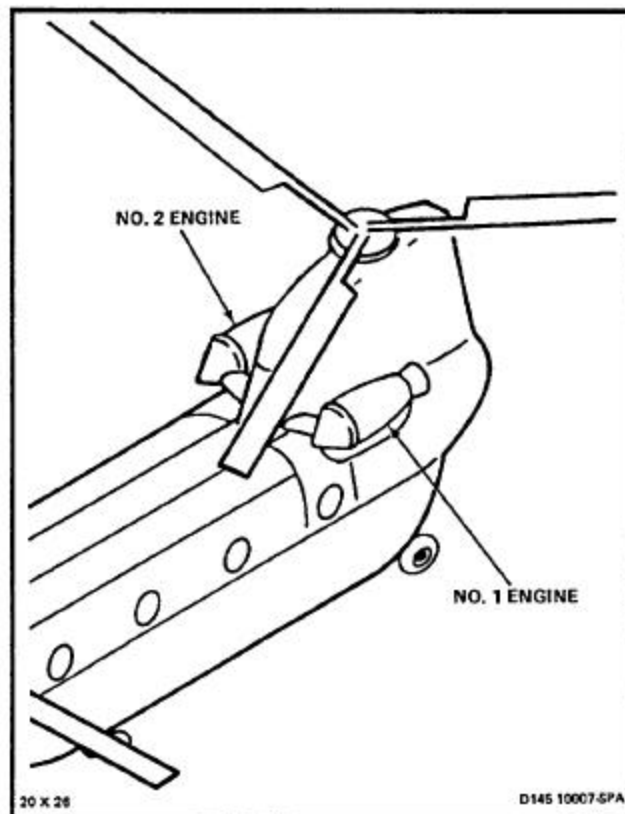
Aircraft Powerplant Repairer
Inspector
Army Rotary Wing Aviator (2)

References:

TM 1-2840-265-23 (With 74)
TM 55-1520-240-10
TM 55-1520-240-MTF
TM 55-2840-254-23 (Without 74)
Task 2-2
Task 4-49
Task 4-50

Equipment Condition:

Inspect Main Oil Filter (TM 55-2840-254-23)
(Without 74)
Inspect Main Oil Filter (TM 1-2840-265-23)
(With 74)
Fuel Control Primed (TM 55-2840-254-23)
(Without 74)
Fuel Control Primed (TM 1-2840-265-23)
(With 74)
Powerplant Depreserved (Task 4-159) (With
74)

**NOTE**

- Engine must be depreserved prior to initial runup (Task 4-159).
- Procedure is same for initial runup on No. 1 or No. 2 engine.

1. Operate engine at GROUND for 10 minutes.
2. Shut engine down.
3. Open engine work platform (Task 2-2).
4. Open engine access cover (Task 4-49).
5. **Inspect engine** as follows:
 - a. There shall be no leaks at plumbing connections.
 - b. Hoses and accessories shall be secure.
 - c. Engine mounts shall be secure.

GO TO NEXT PAGE
4-14.2 Change 19

6. Close engine access cover (Task 4-50).
7. Close engine work platform (Task 2-2).
8. Operate both engines in FLIGHT with thrust control at ground detent. Maintain 100 percent rotor rpm until ptit and oil temperatures stabilize.
9. Move NO. 1 ENGINE CONDITION lever to GROUND. After ptit stabilizes, shut down both engines.
10. **Repeat steps 3 thru 5.**
11. Inspect main oil filter (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
12. Inspect chip detectors (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
13. Inspect fuel control filters, main line fuel filter, and inline fuel filter (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
14. Repeat steps 6 and 7.

FOLLOW-ON MAINTENANCE:

None

END OF TASK

Change 19 4-15

4-5 CHECK ENGINE COASTDOWN TIME

4-5

INITIAL SETUP

Applicable Configurations:

All

Tools:

Stopwatch

Materials:

None

Personnel Required:

Inspector

Army Rotary Wing Aviator

References:

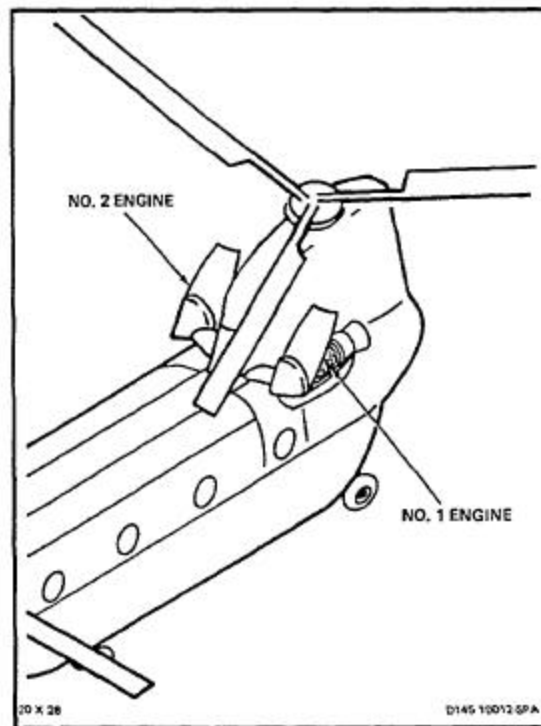
TM 55-1520-240-10

TM 55-2840-254-23 (Without **74**)TM 1-2840-265-23 (With **74**)**Equipment Condition:**

Battery Connected (Task 1-39)

Engine Work Platform Open (Task 2-2)

Engine Access Cover Open (Task 4-49)

**NOTE**

Procedure is same to check coastdown time on No. 1 or No. 2 engine.

1. Have pilot operate engine until pitot and oil temperature has stabilized (TM 55-1520-240-10).
2. Set ENGINE CONDITION lever to GROUND.
3. After engine rpm has stabilized, set ENGINE CONDITION lever to STOP.
4. Watch N1 indicator and check time required to reach 0 rpm. If coastdown time is more than 25 seconds, go to FOLLOW-ON MAINTENANCE. If coastdown time is less than 25 seconds, go to step 5.
5. **Inspect chip detectors** (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

GO TO NEXT PAGE

4-16 Change 19

6. For engines with **74**, inspect oil system for contamination (TM 1-2840-265-23).
7. For engines without **74**, if there are no particles on chip detectors, repeat steps 1 thru 4.
8. For engines with **74**, if there are no particles on the chip detectors or in the filters, repeat steps 1 thru 4, then go to step 10.
9. For engines without **74**, engine is acceptable if second inspection of chip detectors reveals no particles.
10. For engines with **74**, if coastdown time is less than 25 seconds after engine run, troubleshoot engine (TM 1-2840-265-23).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).

END OF TASK

Change 19 4-17

INITIAL SETUP

Applicable Configurations:

Without fl

Tools

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

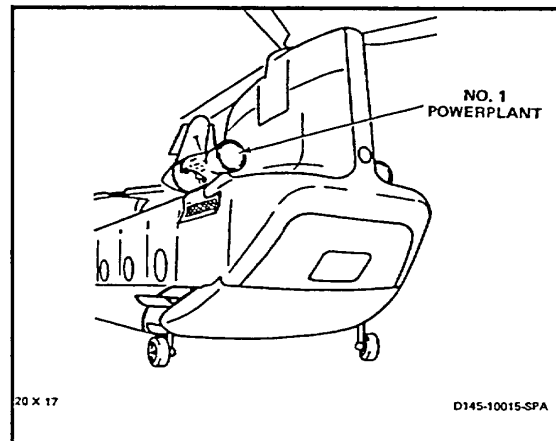
Aircraft Powerplant Repairer
Inspector

References:

TM 55-2840-254-23

Equipment Condition:

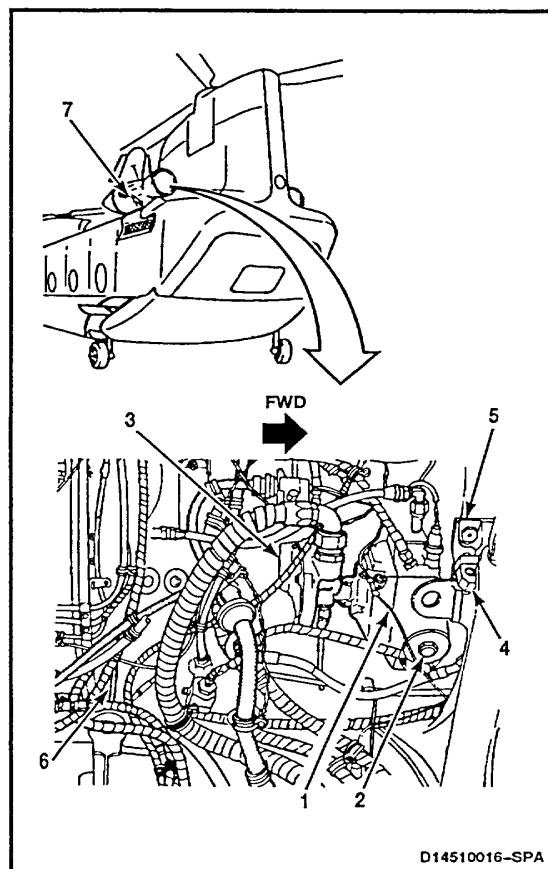
Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)



NOTE

Procedure is same to check No. 1 or No. 2 engine. No. 1 engine check is shown here.

1. Check accessory gearbox (1) for cracked flanges.
2. Remove and inspect main oil filter (2) (TM 55-2840-254-23).
3. Check oil pump (3) for cracked flanges.
4. Check engine mount caps (4), adapters (5), and aft link (6) for cracks.
5. Check connecting link (7) for cracks.



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**4-6 CHECK ENGINE AFTER EXCESSIVE G-FORCE LOAD
(Continued)**

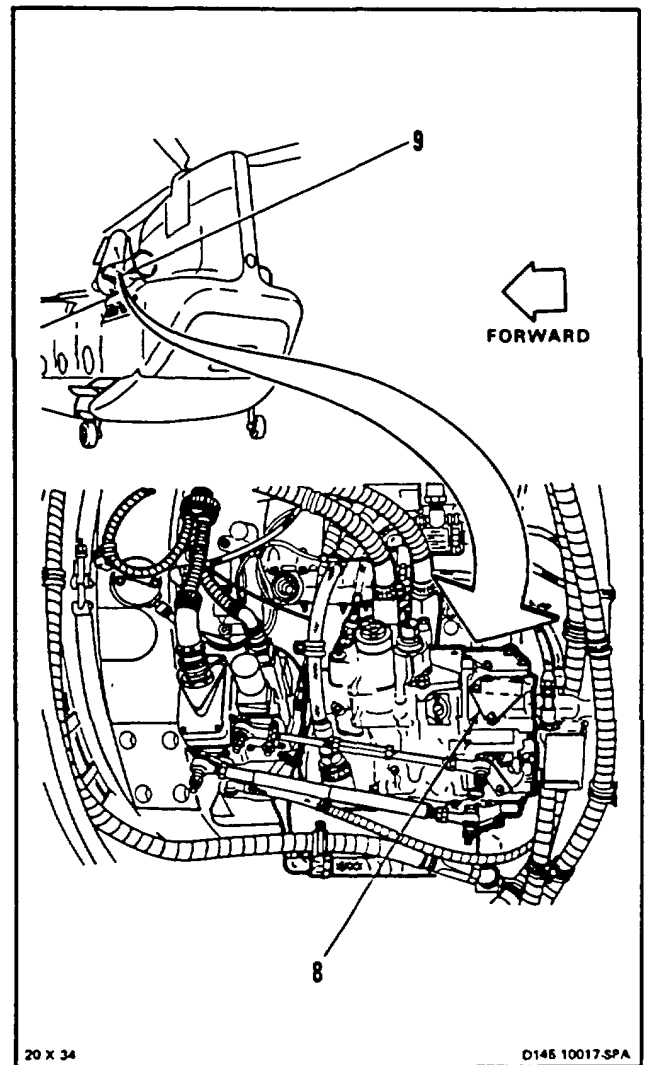
4-6

6. **Check fuel control (8)** for cracked flanges.
7. **Check** security of all **hose connections** on powerplant (9).
8. **Check** security of **hardware** on powerplant (9).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).

**END OF TASK**

4-6.1 CHECK ENGINE AFTER EXCESSIVE G-FORCE LOAD

4-6.1

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

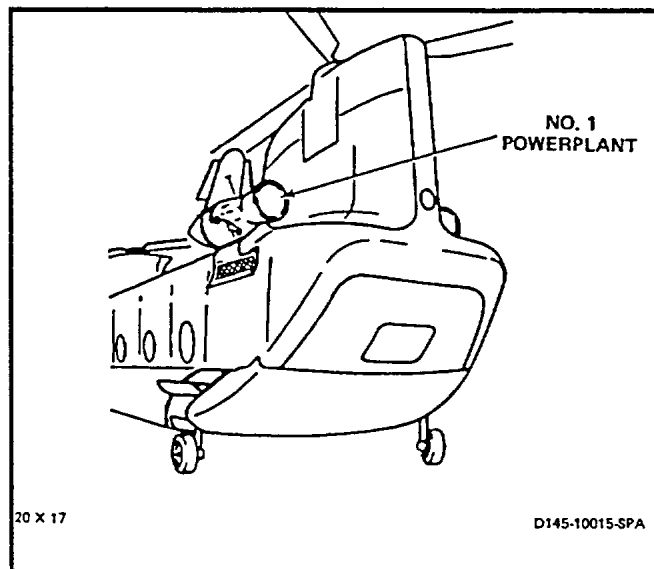
Aircraft Powerplant Repairer
Inspector

References:

TM 1-2840-265-23

Equipment Condition:

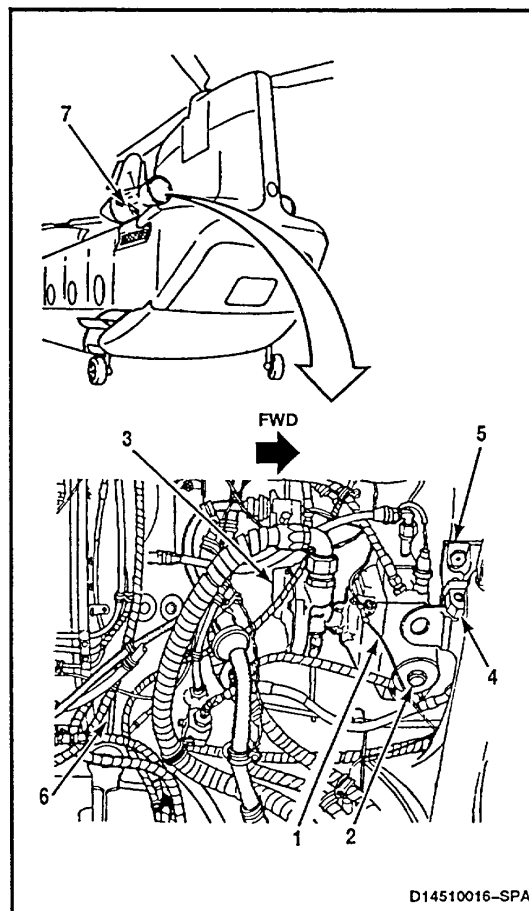
Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)



NOTE

Procedure is same to check No. 1 or No. 2 engine. No. 1 engine check is shown here.

1. Check accessory gearbox (1) for cracked flanges.
2. Remove and inspect main oil filter (2) (TM 1-2840-265-23).
3. Check oil pump (3) for cracked flanges.
4. Check engine mount caps (4), adapters (5), and aft link (6) for cracks.
5. Check connecting link (7) for cracks.



4-6.1 CHECK ENGINE AFTER EXCESSIVE G-FORCE LOAD (Continued)

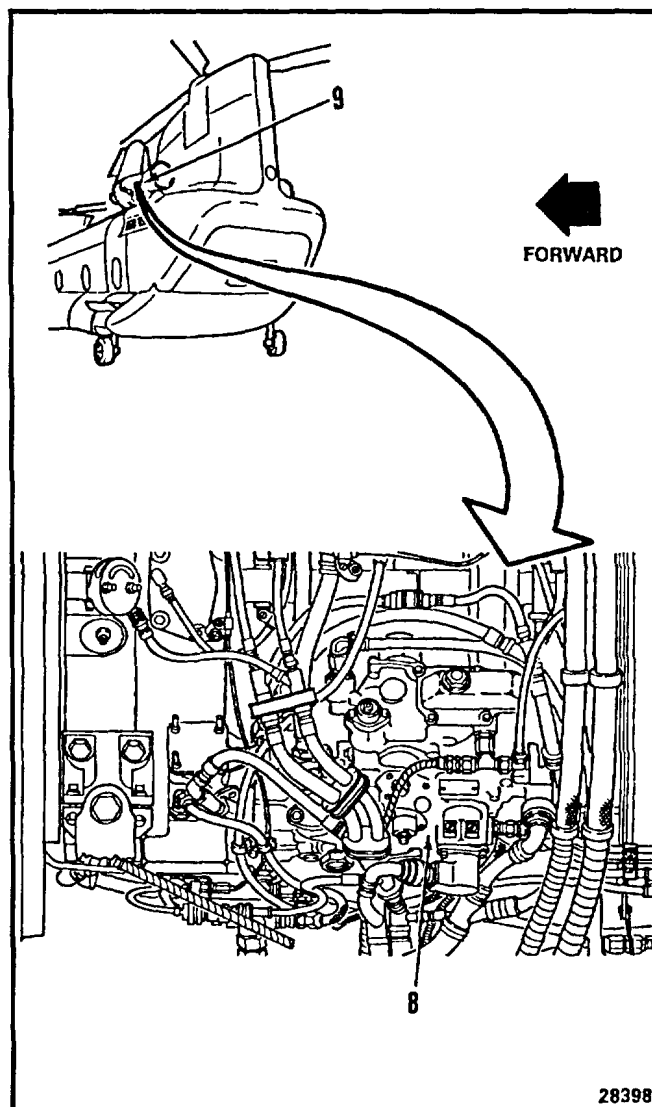
4-6.1

6. Check hydromechanical unit (8) for cracked flanges.
7. Check security of all hose connections on powerplant (9).
8. Check security of hardware on powerplant (9).
9. Check all powerplant (9) mounted accessories for loose bolts, nuts, connections, or cracked flanges.
10. Check powerplant (9) inlet housing, compressor housing, and combustor housing for cracks and loose bolts (TM 1-2840-265-23).
11. Check powerplant (9) mounting pads for cracks or damage.
12. Perform Inspect contaminated oil system (TM 1-2840-265-23).
13. Inspect output shaft seal and seal housing for damaged splines (TM 1-2840-265-23).
14. Service scavenge oil screen (TM 1-2840-26523).
15. Check security of all connectors on powerplant (9).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).



END OF TASK

Change 19 4-20.1

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

None

Materials:

None

Personnel Required:

Inspector

References:

TM 55-2840-254-23

Equipment Condition:

As Required

-
1. Power turbine (N2) overspeed occurs if, during POWER ON conditions:
 - a. Rotor rpm is 107 to 112 percent for more than 12 seconds, or
 - b. Rotor rpm is greater than 112 percent.
 2. If N2 overspeed occurs, perform overspeed inspection (TM 55-2840-254-23).

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

4-20.2 Change 19

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

None

Materials:

None

Personnel Required:

Inspector

References:

TM 1-2840-265-23

Equipment Condition:

As Required

-
1. Power turbine (N2) overspeed occurs if, during POWER ON conditions, N2 rpm is **greater than 111.5 percent**.
 2. If N2 overspeed occurs, perform overspeed inspection (TM 1-2840-265-23).

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

Change 19 4-20.3/(4-20.4 blank)

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

Inspector

References:

TM 55-2840-254-23 (Without 74)

TM 1-2840-265-23 (With 74)

TM 55-1520-240-T

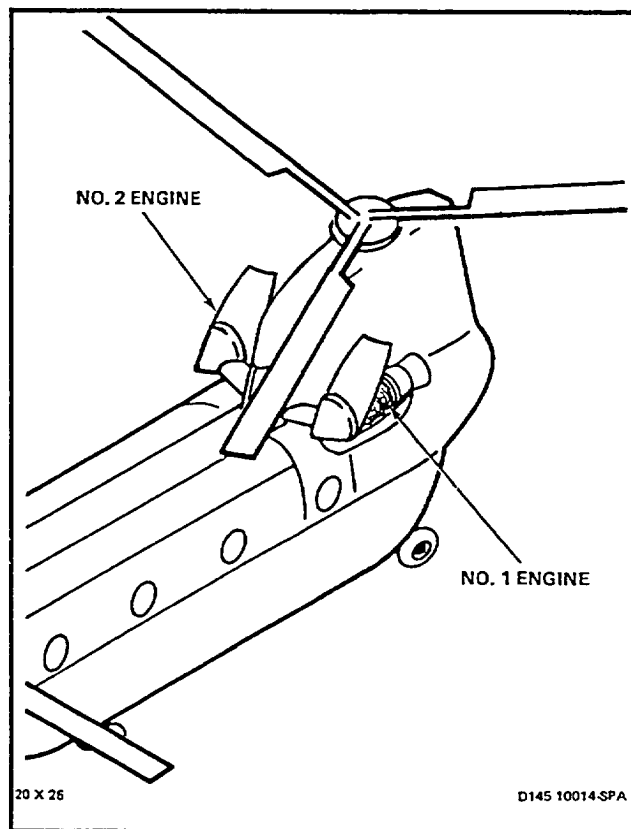
Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Work Platform Open (Task 2-2)

Engine Access Cover Open (Task 4-49)

**NOTE**

Procedure is same to check No. 1 or No. 2 engine for suspected compressor stall.

1. **Determine circumstances** at time of suspected compressor stall.
2. **Check aircraft and engine log** for any history relating to reported stall.
3. **Determine N1 speed** at time of reported stall.
4. **Check compressor rotor blades and stators** (TM 55-2840-254-23 without 74, TM 1-2840265-23 with 74).
5. For engines without 74, if stall occurs during starting when rotor rpm is 35 to 42 percent or N2 is below 50 percent, **do the following:**
 - a. Perform operational check of fairing hot air valve (TM 55-1520-240-T without 74).

GO TO NEXT PAGE

4-8 CHECK FOR SUSPECTED COMPRESSOR STALL (Continued)

- b. Adjust bleed band, bleed band actuator, and fuel control (TM 55-2840-254-23 without **74**)
6. For engines with **74** perform a compressor stall inspection (TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

None

Personnel Required:

Inspector

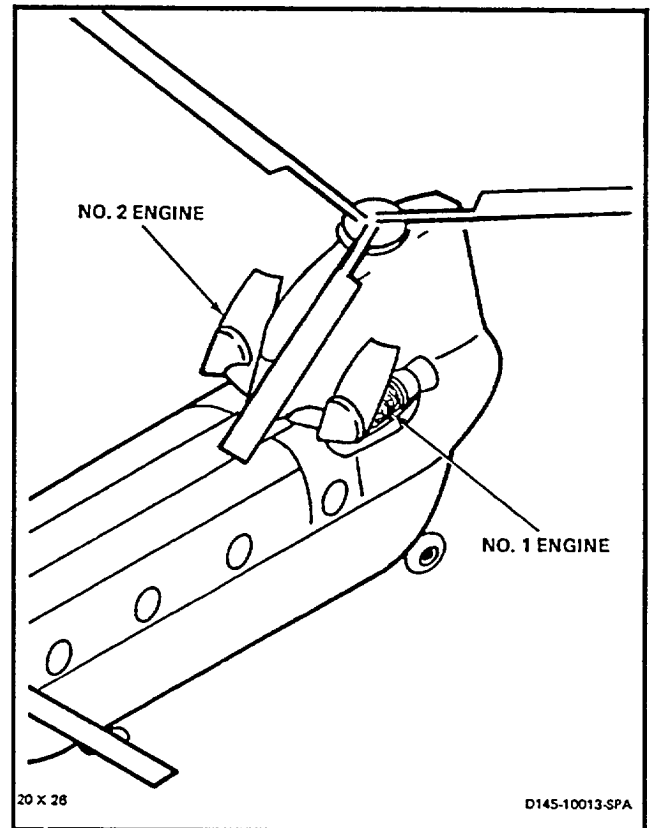
References:TM 55-2840-254-23 (Without **74**)TM 1-2840-265-23 (With **74**)**Equipment Condition:**

Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Work Platform Open (Task 2-2)

Engine Access Cover Open (Task 4-49)

**NOTE**

Procedure is same to inspect No. 1 or No. 2 engine after check runs.

1. Inspect engine as follows:
 - a. There shall be no leaks at plumbing connections.
 - b. Hoses and accessories shall be secure.
 - c. Engine mounts shall be secure.
2. Inspect main oil filter (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-49).

Close engine work platform (Task 2-2).

END OF TASK

4-10 REMOVE POWERPLANT

4-10

INITIAL SETUP**Applicable Configurations:**

Without 74

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

Transportation Trailer

Trailer Adapter (T16)

Sling (T134)

Hoist

Rope Guide Lines

Container, 2-Quart

Materials:

Tape (E388)

Cloths (E135)

Paper Tags (E264)

Personnel Required:

Medium Helicopter Repairer (4)

References:

Task 6-101

TM 55-2840-254-23

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Hydraulic Power Off

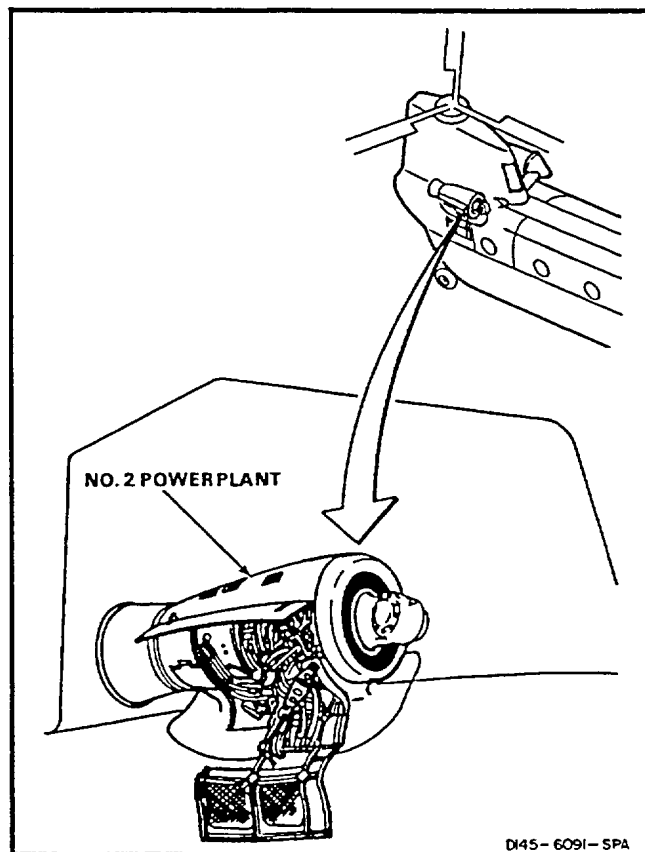
Engine Work Platform Open (Task 2-2)

Engine Air Inlet Screens Removed (Task 4-65)

Engine Side and Lower Access Covers Open
(Task 4-49)

Engine Transmission Fairing Removed (Task 4-70)

Engine Drive Shaft Removed (Task 6-30)

**GO TO NEXT PAGE**

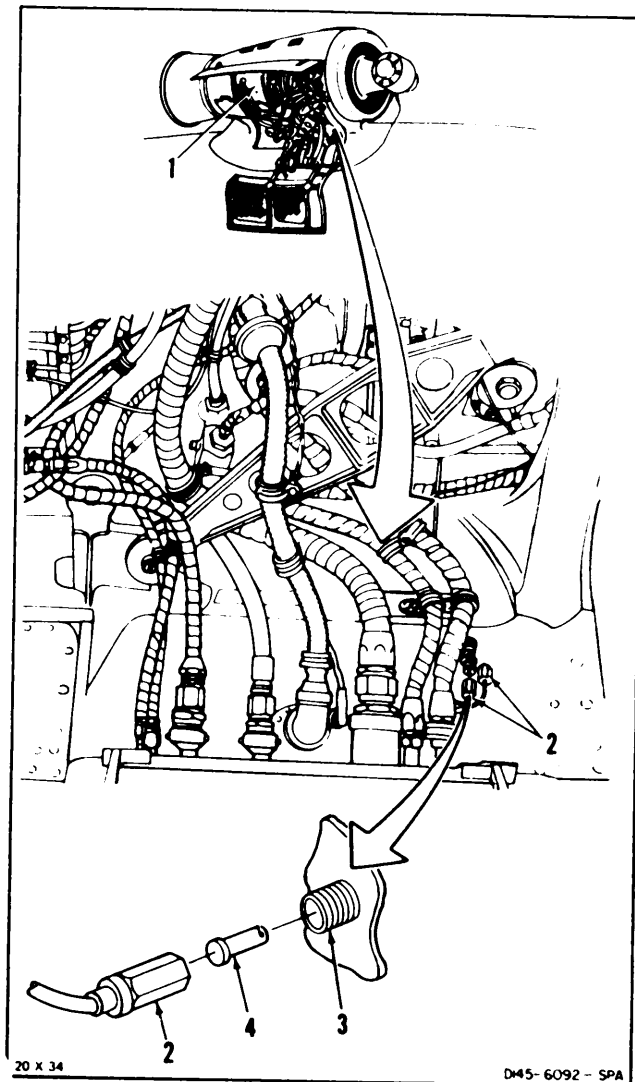
4-24 Change 19

4-10 REMOVE POWERPLANT (Continued)**4-10****NOTE**

- Procedure is same for removing No. 1 or No 2 powerplant Removal of No 2 powerplant is shown here
- Trailer adapter (T16) is recommended If powerplant is to be transported over rough ground

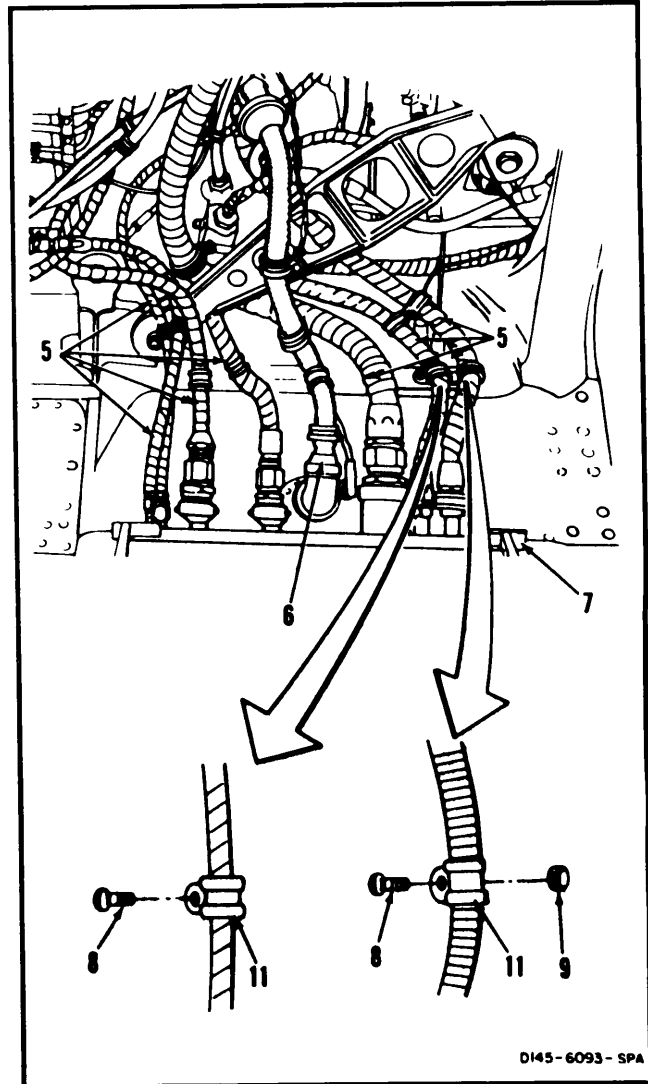
REMOVE POWERPLANT WITH ENGINE TRANSMISSION INSTALLED

1. If powerplant (1) is to be stored, prepare for storage before removal (TM 55-2840-254-23).
2. **Disconnect two fire detection elements (2) from receptacles (3) on fuselage.** Make sure Insert (4) stays in receptacles. Cap connectors

**GO TO NEXT PAGE**

4-10 REMOVE POWERPLANT (Continued)

3. Tag and disconnect seven hoses (5) and two cable connectors (6) from shelf (7).
4. Remove two screws (8) and nut (9). Remove two clamps (11). Mark clamp locations. Use tape (E388).

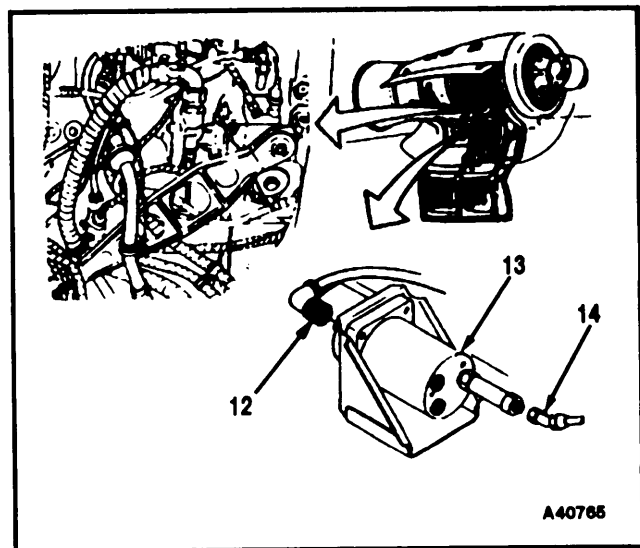


5. Remove lockwire and **disconnect cable plug (12)** from oil pressure transmitter (13). **Disconnect oil hose (14)**.

CAUTION

Fuel boost pump inlet fitting must be loosened before engine removal.

5.1. Deleted.

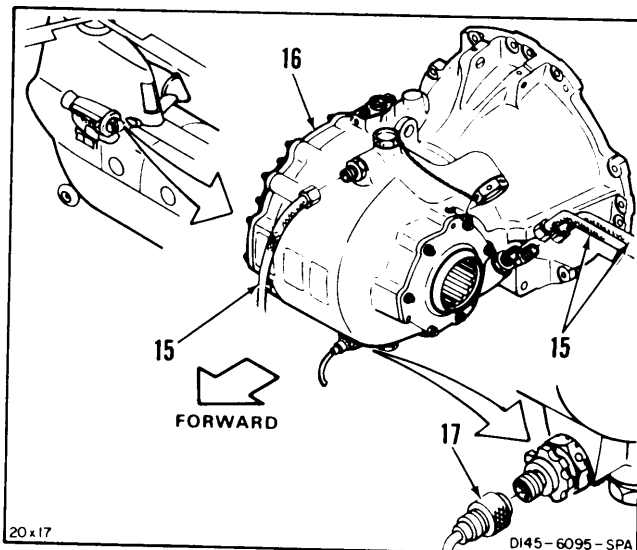


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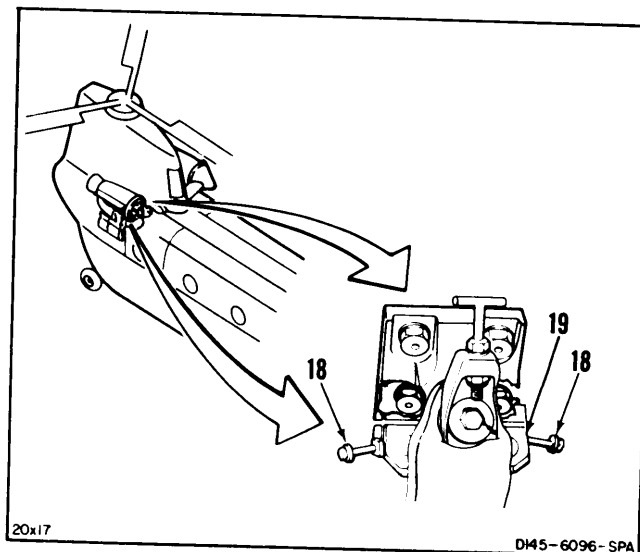
4-10 REMOVE POWERPLANT (Continued)

4-10

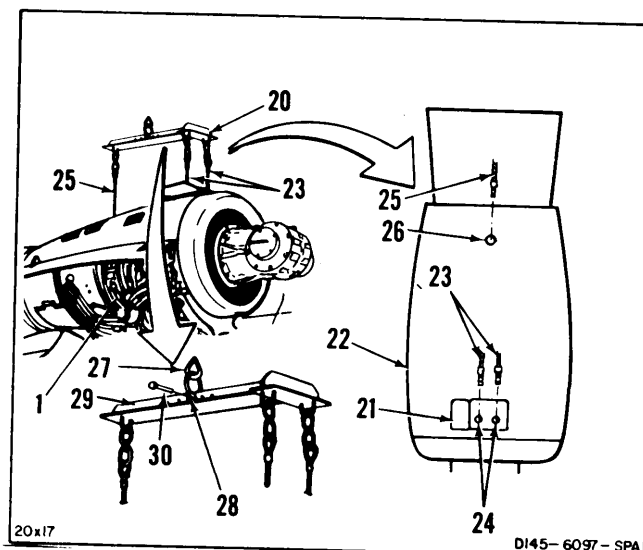
6. Tag and **disconnect three hoses (15)** at transmission (1 6). Drain oil into container. Wipe up any spilled oil. Use cloths (E135),
7. **Disconnect cable plug (17).**



8. Remove lockwire from two bolts (18) on two forward engine mount caps (19). **Loosen bolts and push down.**



9. **Install ding (20)** as follows:
 - a. Open access door (21) in engine access cover (22).
 - b. Connect two cables (23) to forward fittings (24) on powerplant (1).
 - c. Connect cable (25) into aft fitting (26) through cover (22).
 - d. Adjust sling (20) until eye (27) is over center hole (28) in sling bar (29).
 - e. Install pin (30) through bar (29).

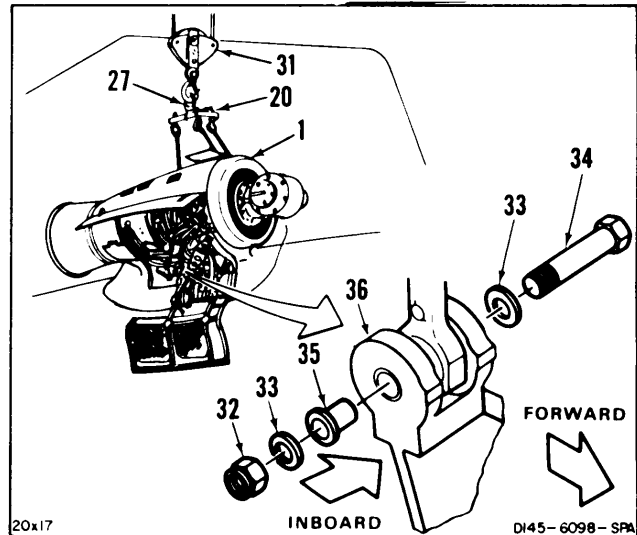


GO TO NEXT PAGE

4-10 REMOVE POWER PLANT (Continued)

4-10

10. Connect hoist (31) to eye (27) of sling (20). Absorb weight of powerplant (1) with hoist.
11. Remove nut (32), two washers (33), bolt (34) and bushing (35) from aft engine mount (36).



12. Install rope guide lines (37).

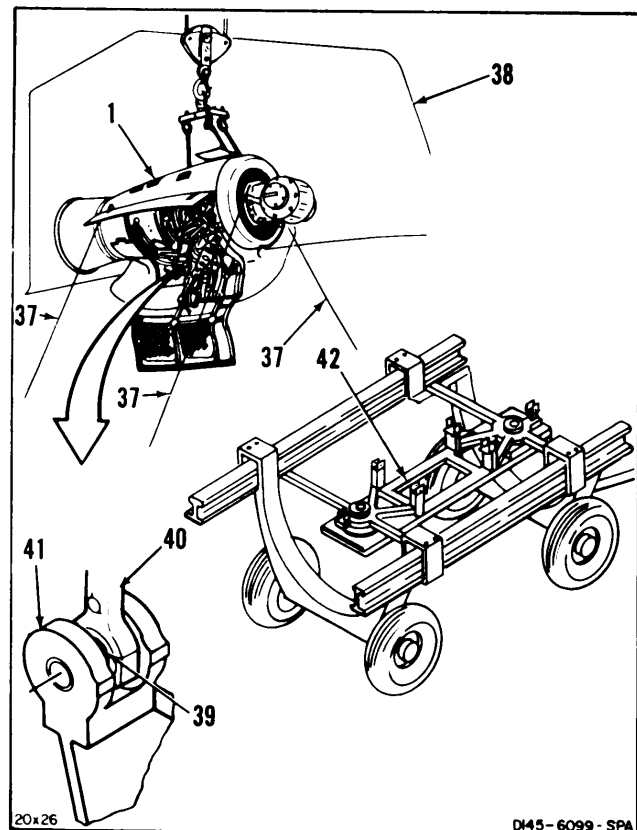
WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear when powerplant is being moved by hoist.

CAUTION

During raising and lowering of powerplant to adapter, make sure bearing in aft engine mount link does not tilt in clevis. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

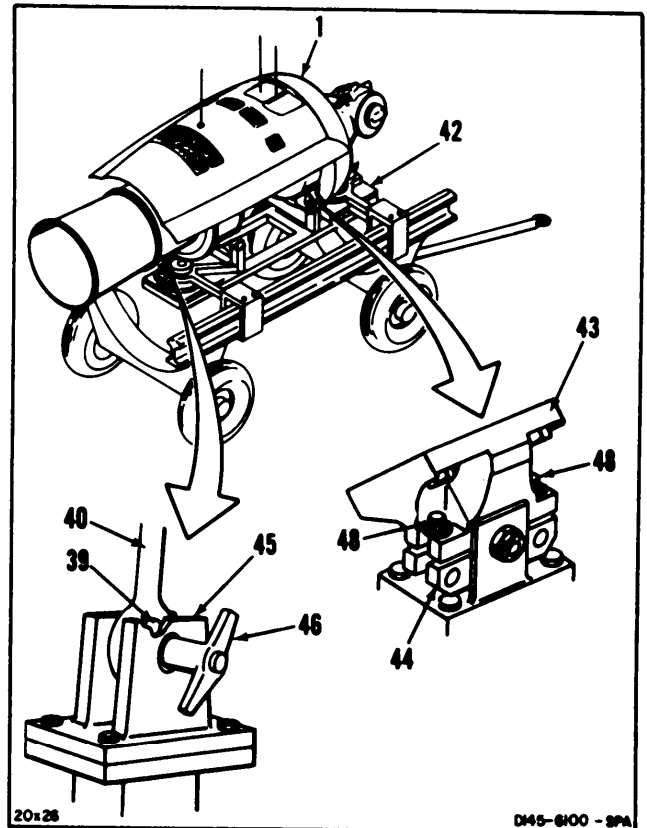
13. Raise powerplant (1) enough to clear helicopter (38). Make sure bearing (39) in aft mount link (40) does not tilt or wedge in clevis (41).
14. Lower powerplant (1) to trailer adapter (T16) (42). Have helper guide powerplant with rope guide lines (37).

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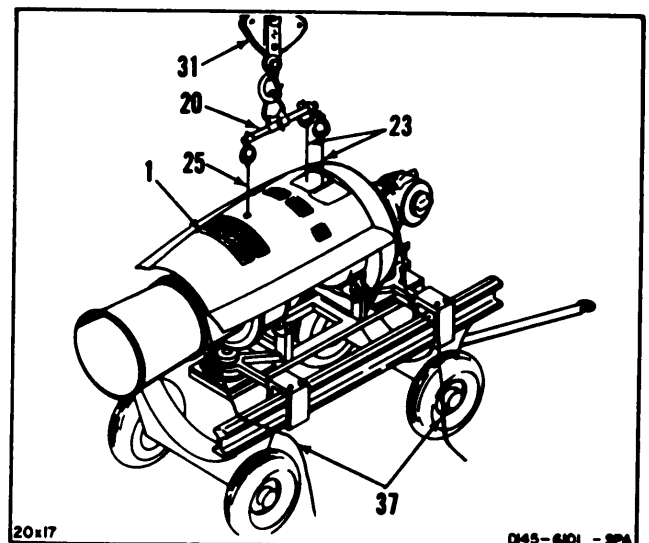
4-10 REMOVE POWERPLANT (Continued)

4-10

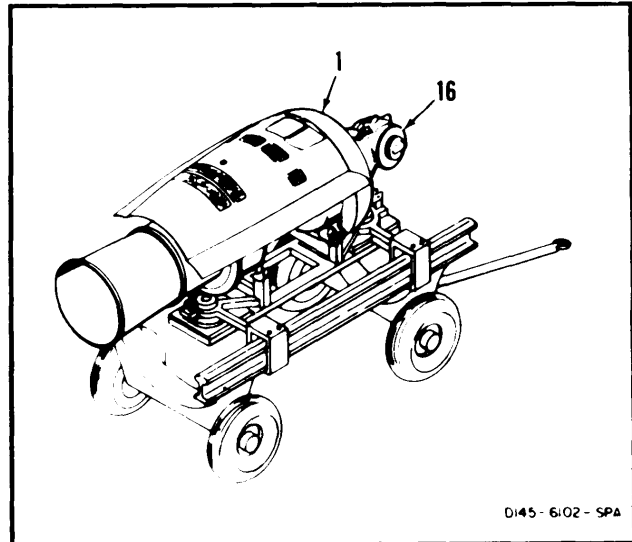
15. Position powerplant (1) on trailer adapter (T16) (42). Make sure forward engine mount adapter (43) and aft link (40) align with adapter fittings (44 and 45). Make sure bearing (39) does not tilt or wedge in adapter fitting (45).
16. Install pin (46) through link (40) and fitting (45) on adapter (42).
17. Raise four bolts (48) over engine mount adaptor (43). Tighten bolts.



18. Disconnect hoist (31) from sling (20).
19. Remove sling (20) from powerplant (1) by disconnecting three cables (23 and 25).
20. Remove rope guidelines (37).

**GO TO NEXT PAGE**

21. Remove engine transmission (16) from powerplant (1) (Task 6-100).

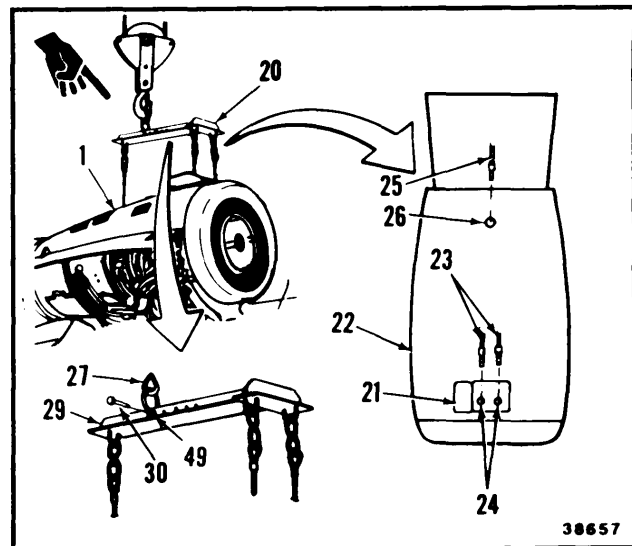


REMOVE POWERPLANT WITH ENGINE TRANSMISSION REMOVED

NOTE

Art for steps 22 and 24 is referenced to Remove Powerplant with Engine Transmission Installed section. Referenced art shows engine transmission installed but will not affect task performance.

22. Perform steps 1 through 5 and 8. Go to step 23.
23. Install sling (20) as follows:
- Open access door (21) in engine access cover (22),
 - Connect two cables (23) to forward fittings (24) on powerplant (1).
 - Connect cable (25) into aft fitting (26) through cover (22).
 - Adjust sling (20) until eye (27) is over aft hole (49) in sling bar (29).
24. Perform steps 10 through 20. Go to follow-on maintenance.



FOLLOW-ON MAINTENANCE:

Record any accumulated Emergency Power Time in DA Form 2408-15.

Perform AT TIME OF ENGINE REMOVAL FOR ANY REASON inspection (Task 1-92).

END OF TASK

4-10.1 REMOVE POWERPLANT

4-10.1

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Transportation Trailer
Trailer Adapter (T16)
Sling (T134)
Hoist
Rope Guide Lines
Container, 2-Quart

Materials:

Tape (E388)
Cloths (E135)
Paper Tags (E264)
Gloves (E184.1)

Personnel Required:

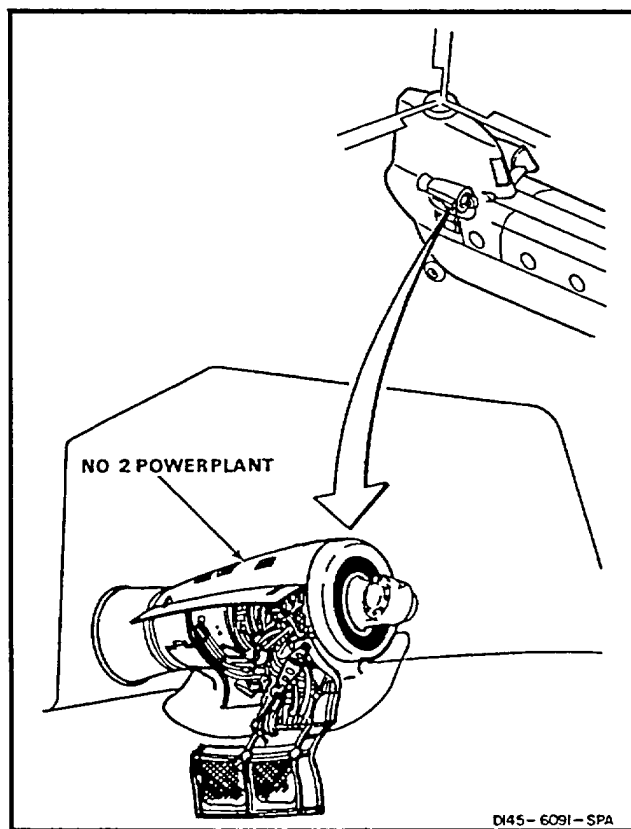
Medium Helicopter Repairer (4)

References:

Task 6-100
TM 1-2840-265-23

Equipment Condition:

DECU Downloaded (Task 4-149)
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Engine Work Platform Open (Task 2-2)
Engine Air Inlet Screens Removed (Task 4-65)
Engine Access Covers Open (Task 4-49)
Engine Transmission Fairing Removed
(Task 4-70)
Engine Drive Shaft Removed (Task 6-30)



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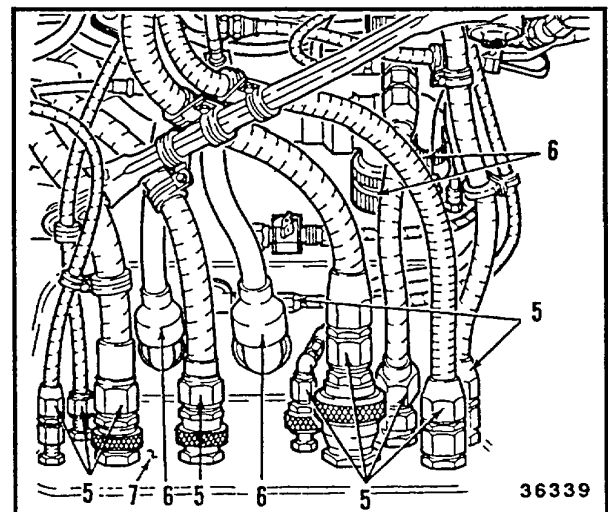
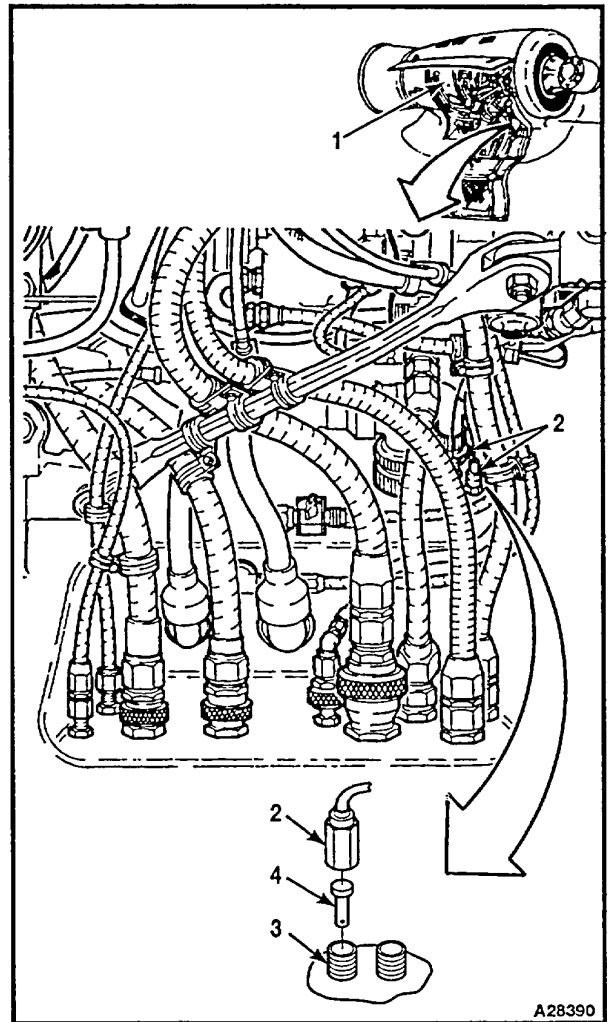
Change 19 4-30.1

NOTE

- Procedure is same for removing No. 1 or No. 2 powerplant except as noted. Removal of No. 2 powerplant is shown here.
- Trailer adapter (T16) is recommended if powerplant is to be transported over rough ground.
- All points of engine disassembly for engine removal must be painted international orange with a band of paint not exceeding 1.00 inch in width.

REMOVE POWERPLANT WITH ENGINE TRANSMISSION INSTALLED

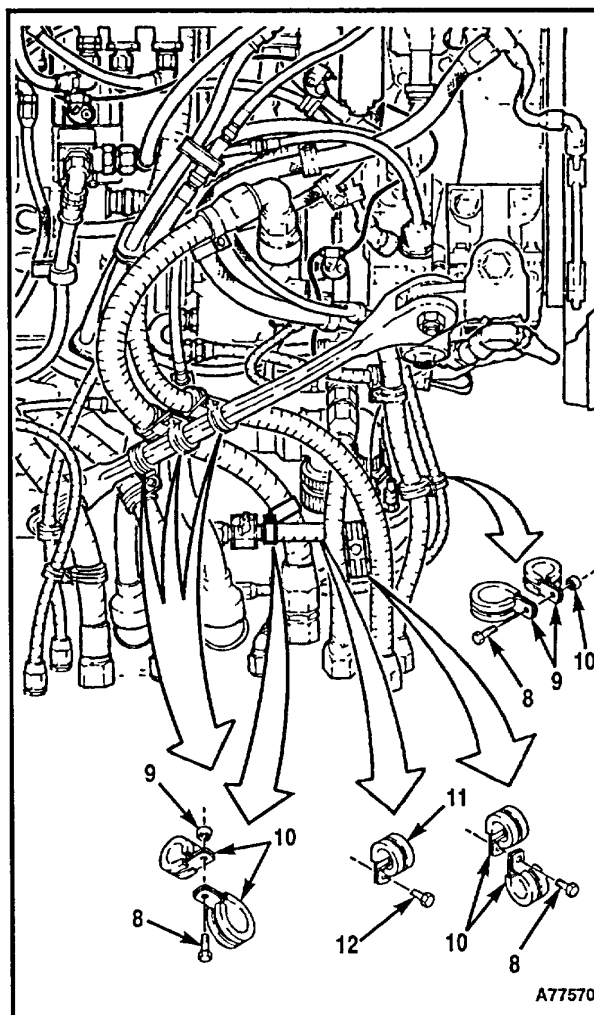
1. If powerplant (1) is to be stored, prepare for storage before removal (TM 1-2840-265-23).
2. **Disconnect two fire detection elements (2)** from receptacles (3) on fuselage. Make sure insert (4) stays in receptacles. Cap elements and receptacles.
3. Tag (E264) and **disconnect ten hoses (5) and four cable connectors (6)** from shelf (7).



4-10.1 REMOVE POWERPLANT (Continued)

4-10.1

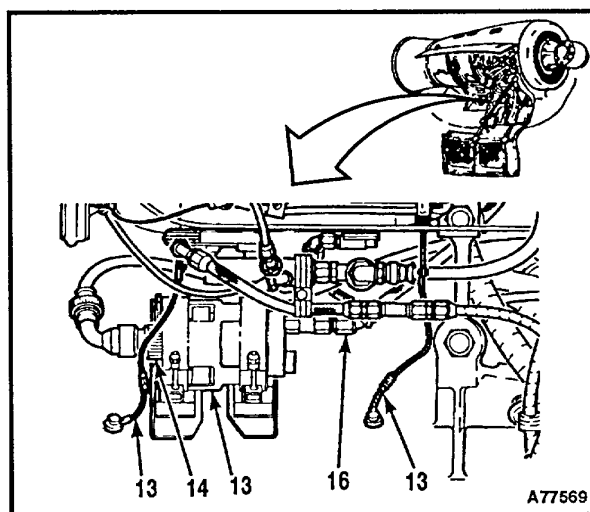
4. Remove six screws (8) and six nuts (9). **Remove twelve clamps (10).** Mark clamp locations. Use tape (E388).
5. **On No. 2 engine only:**
 - a. Remove clamp (11) and bolt (12).
 - b. Mark clamp (11) location with tape (E388).



6. **Disconnect two bonding jumpers (13).**
7. **Disconnect cable plug (14) from oil pressure transmitter (15). Disconnect oil hose (16). Drain oil into container. Wipe up any spilled oil. Use cloths (E135).**

CAUTION

Fuel boost pump inlet fitting must be loosened before engine removal.



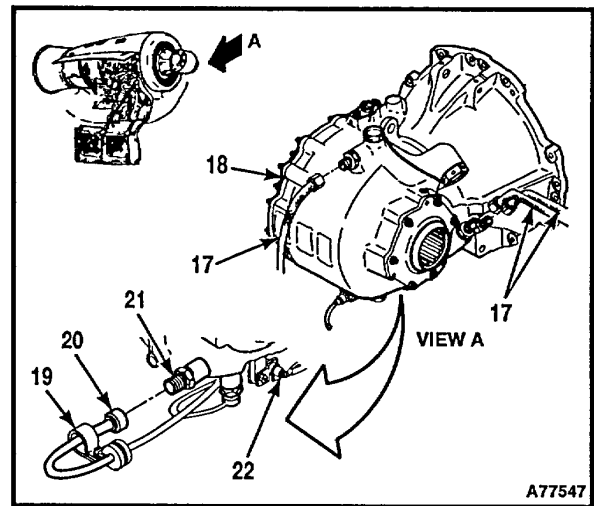
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Change 19 4-30.3

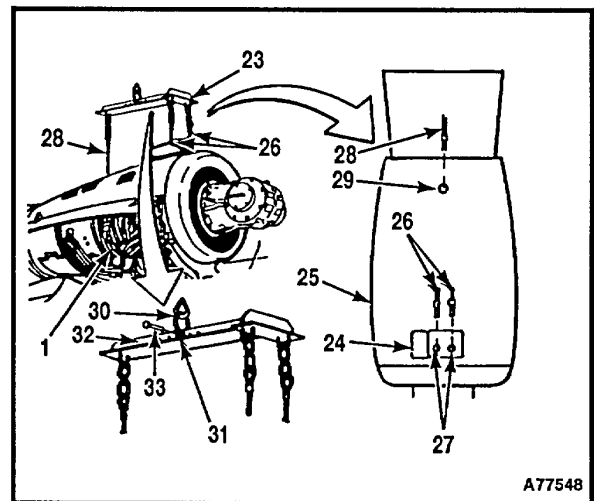
4-10.1 REMOVE POWERPLANT (Continued)

4-10.1

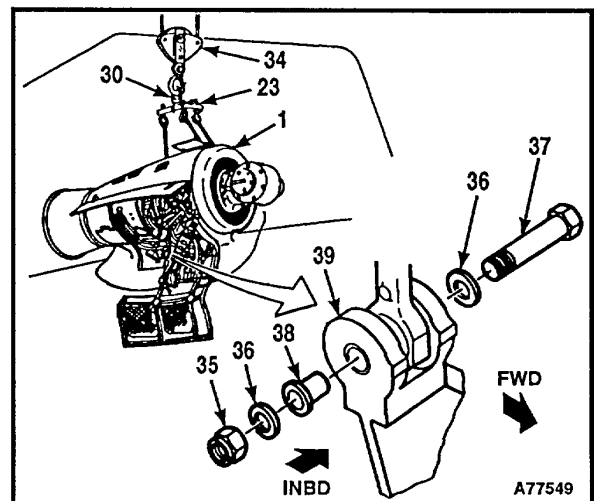
8. Tag (E264) and **disconnect three hoses (17)** at transmission (18). Drain oil into container. Wipe up any spilled oil. Use cloths (E135). Wear gloves (E184.1).
9. **Loosen strain relief (19) and disconnect cable plug (20)** from temp switch (21).
10. **Disconnect plug at remote connector (22)** from chip detector.



11. **Install sling (23)** as follows:
 - a. Open access door (24) in engine access cover (25).
 - b. Connect two cables (26) to forward fittings (27) on powerplant (1).
 - c. Connect cable (28) into aft fitting (29) through cover (25).
 - d. Adjust sling (23) until eye (30) is over center hole (31) in sling bar (32).
 - e. Install pin (33) through sling bar (32).



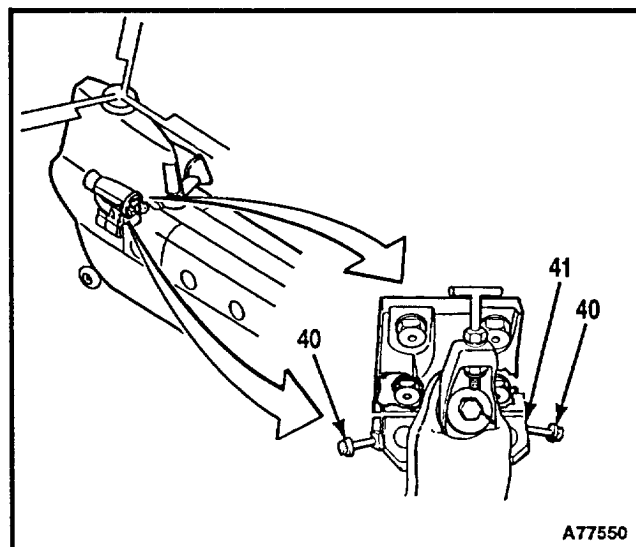
12. **Connect hoist (34)** to eye (30) of **sling (23)**. **Absorb weight of powerplant (1)** with hoist.
13. **Remove nut (35), two washers (36), bolt (37), and bushing (38)** from aft engine mount (39).



4-10.1 REMOVE POWERPLANT (Continued)

4-10.1

14. Remove lockwire from two bolts (40) on two forward engine mount caps (41). Loosen bolts (40) and push down.



15. Install rope guide lines (42).

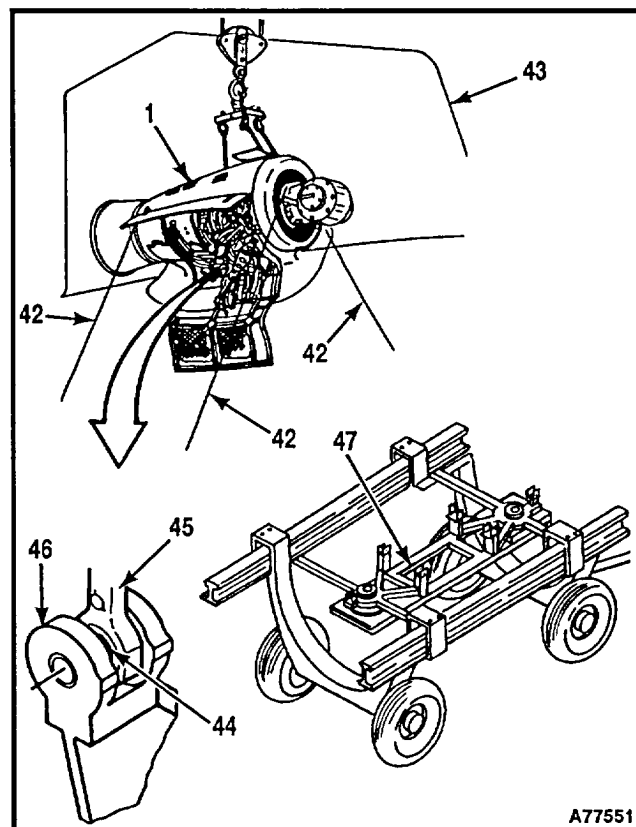
WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear when powerplant is being moved by hoist.

CAUTION

During raising and lowering of powerplant to adapter, make sure bearing in aft engine mount link does not tilt in clevis. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

16. Raise powerplant (1) enough to clear helicopter (43). Make sure bearing (44) in aft mount link (45) does not tilt or wedge in clevis (46).
17. Lower powerplant (1) to trailer adapter (T16) (47). Have helpers guide powerplant with rope guide lines (42).



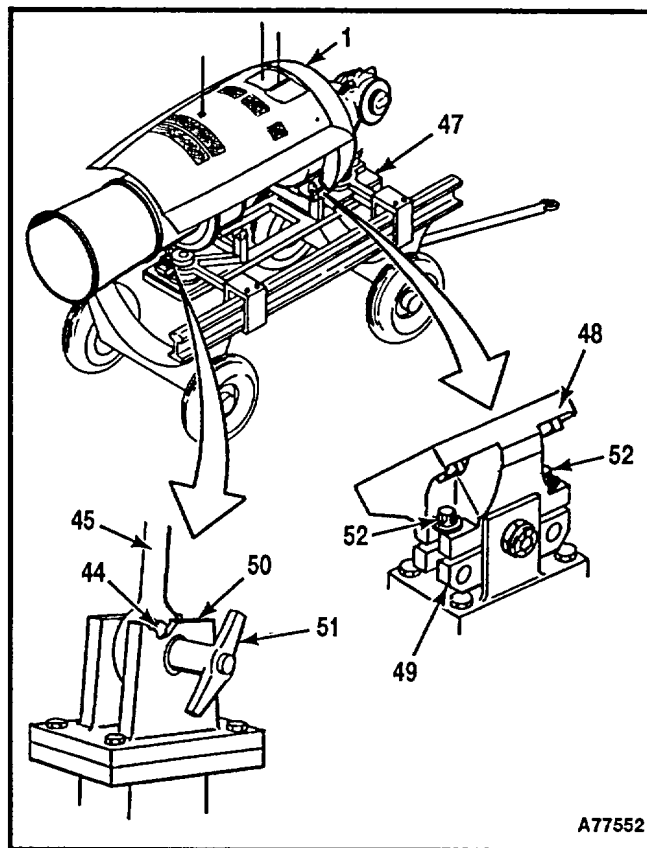
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Change 19 4-30.5

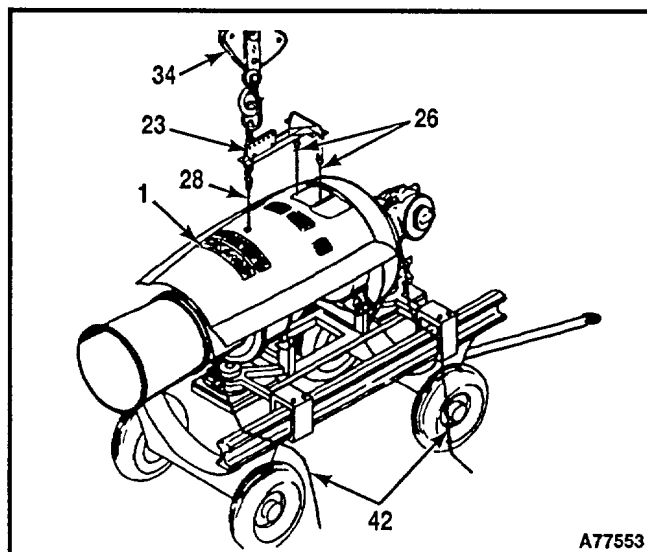
4-10.1 REMOVE POWERPLANT (Continued)

4-10.1

18. **Position powerplant (1) on trailer adapter (T16) (47).** Make sure forward engine mount adapter (48) and aft link (45) align with adapter fittings (49 and 50). Make sure bearing (44) does not tilt or wedge in adapter fitting (50).
19. **Install pin (51) through link (45) and fitting (50) on adapter (47).**
20. **Raise four bolts (52) over engine mount adapter (48). Tighten bolts.**



21. **Disconnect hoist (34) from sling (23).**
22. **Remove sling (23) from powerplant (1) by disconnecting three cables (26 and 28).**
23. **Remove rope guidelines (42).**

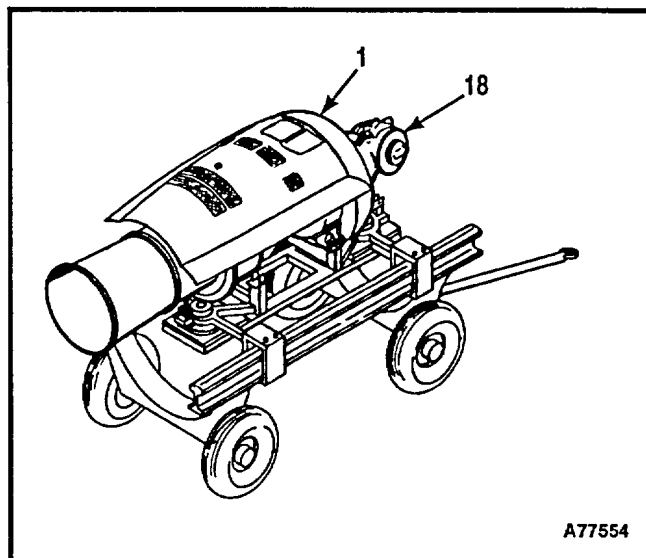


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4-30.6 Change 19

4-10.1 REMOVE POWERPLANT (Continued)

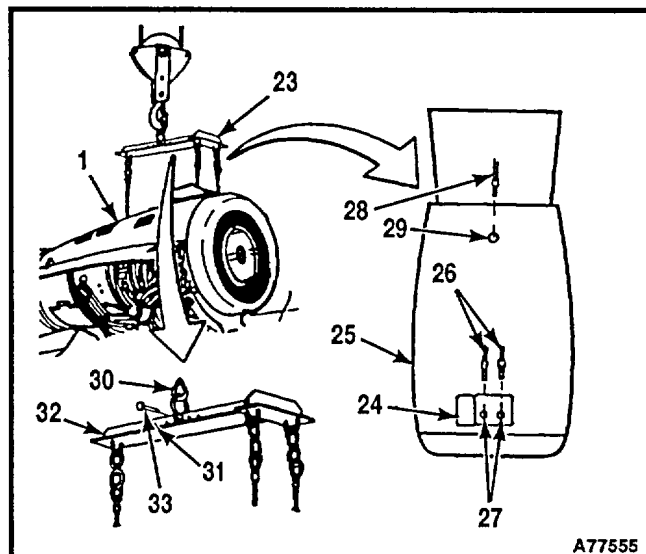
4-10.1

24. Remove engine transmission (18) from powerplant (1) (Task 6-100). Go to Follow-on maintenance.



REMOVE POWERPLANT WITH ENGINE TRANSMISSION REMOVED

25. Perform steps 1 through 6 and 9, then go to step 26.
26. Install sling (23) as follows:
- Open access door (24) in engine access cover (25).
 - Connect two cables (26) to forward fittings (27) on powerplant (1).
 - Connect cable (28) into aft fitting (29) through cover (25).
 - Adjust sling (23) until eye (30) is over aft hole (31) in sling bar (32).
 - Install pin (33) through bar (32).
27. Perform steps 12 through 22. Go to Follow-on maintenance.



FOLLOW-ON MAINTENANCE:

Record any accumulated Emergency Power Time in DA Form 2408-15.
 Perform AT TIME OF ENGINE REMOVAL FOR ANY REASON inspection (Task 1-92).
 Download the DECU (Task 4-149).

END OF TASK

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Hoist

Sling (T134)

Open End Wrench, 1-1/2 Inch

Container, Engine Storage

Container, 2-Quart

Materials:

Cloth (E135)

Tape (E388)

Paper Tags (E264)

Personnel Required:

Aircraft Powerplant Repairer

References:

TM 55-2840-254-23

Equipment Condition:

Off Helicopter Task

Engine Access Cover Removed (Task 4-52)

Engine Air Inlet Fairing Removed (Task 4-74)

Fire Detection Sensing Element Removed (Task
12-12)

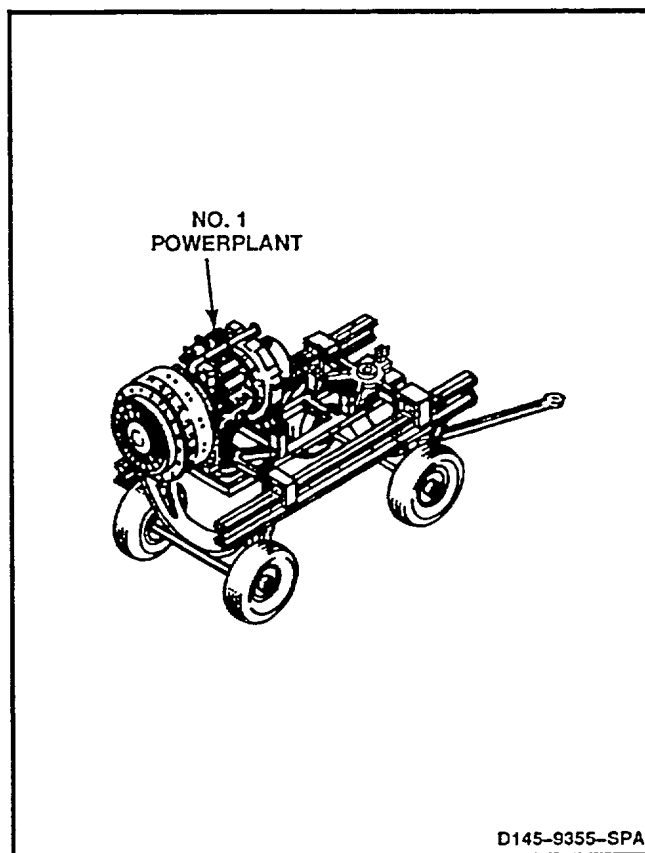
Exhaust Cone Removed (Task 4-88)

Engine Cover Former Removed (Task 4-45)

Starter Removed (Task 7-141)

Gas Producer Control Linkage Removed (Task
4-112)Power Turbine Control Linkage Removed (Task
4-132)Gas Producer Control Actuator Removed (Task
4-108)Power Turbine Control Actuator Removed (Task
4-138)Gas Producer Control Actuator Support Bracket
Removed (Task 4-110)

Fairing Hot Air Valve Removed (Task 4-78)

Gas Producer Tachometer Generator Removed
(Task 8-9 or 8-10)

D145-9355-SPA

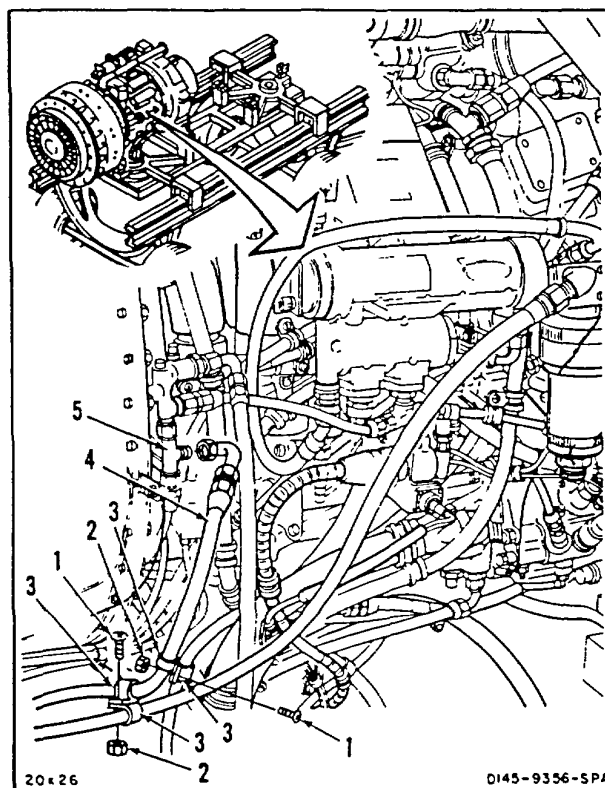
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Change 19 4-31

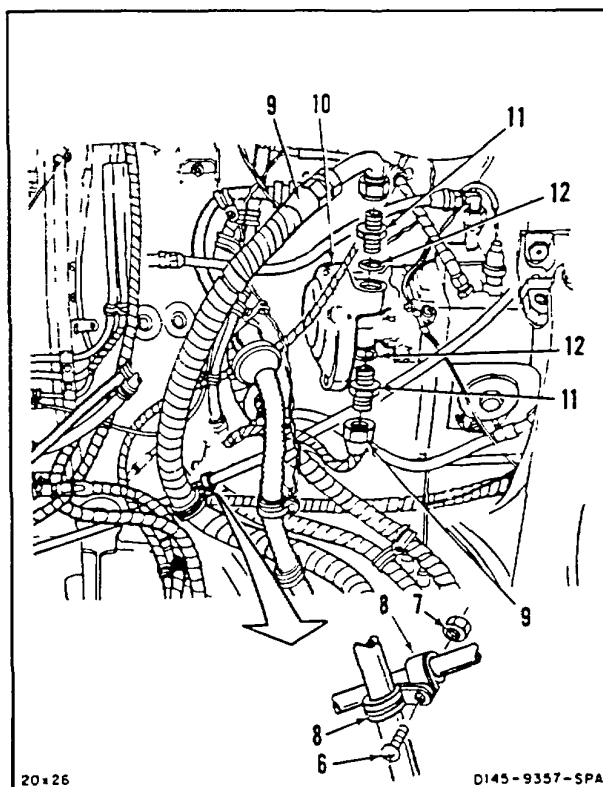
NOTE

Procedure is same to disassemble No. 1 or No 2 powerplant, except as noted Disassembly of No 1 power plant is shown here

1. Remove two screws (1) and nuts (2) and **remove four clamps (3)**. Use tape (E388) to mark clamp locations.
2. **Disconnect hose (4)** at fitting (5) Tag and **remove hose**.



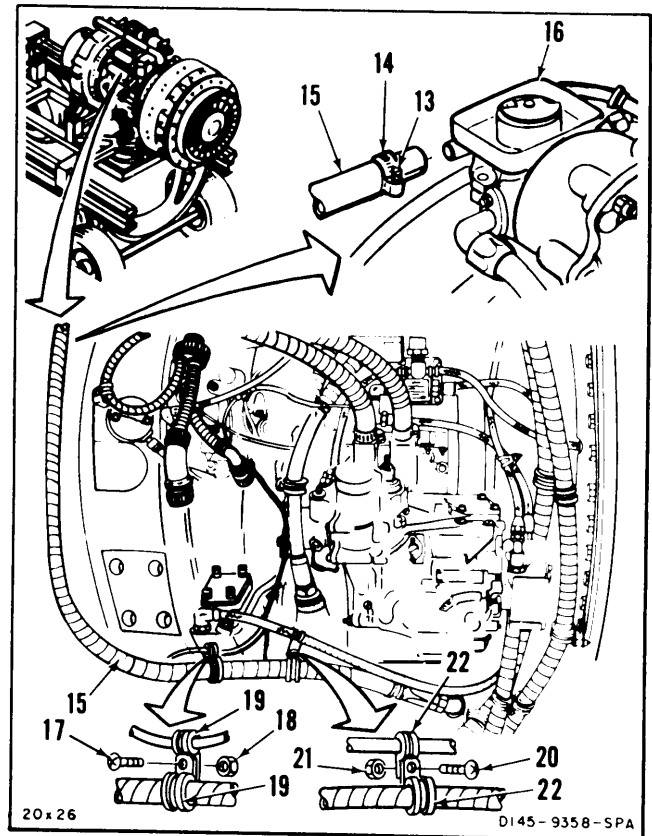
3. Remove screw (6) and nut (7) and **remove two clamps (8)**. Use tape (E388) to mark clamp locations Tag, **disconnect, and remove two hoses (9)** from fuel pump 110). **Remove two reducers (11) and packings (12)**.



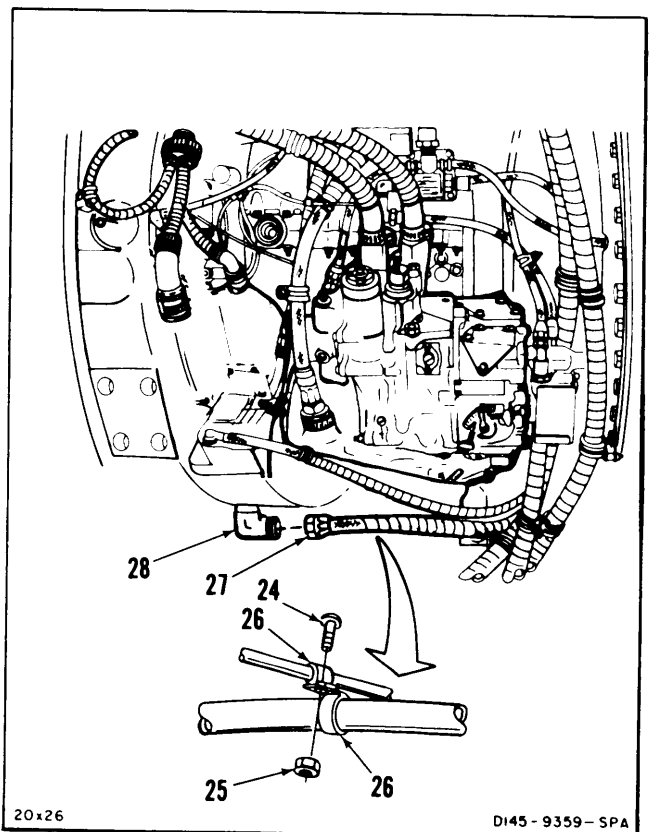
4-11 DISASSEMBLE POWERPLANT (Continued)

4-11

4. Loosen screw (13) on clamp (14). Tag and **disconnect hose (15) from oil filler (16)**.
5. Remove screw (17) and nut (18) and remove **two clamps (19)**. Use tape (E388) to mark clamp location.
6. Remove screw (20) and nut (21) and **remove two clamps (22)**. Use tape (E388) to mark clamp location. Remove hose (15).



7. Remove screw (24) and nut (25). **Remove two clamps (26)**. Use tape (E388) to mark clamp location.
8. **Disconnect hose (27) at elbow (28)**. Tag and **remove hose**. Use container and cloths (E135) for spilled fluid.

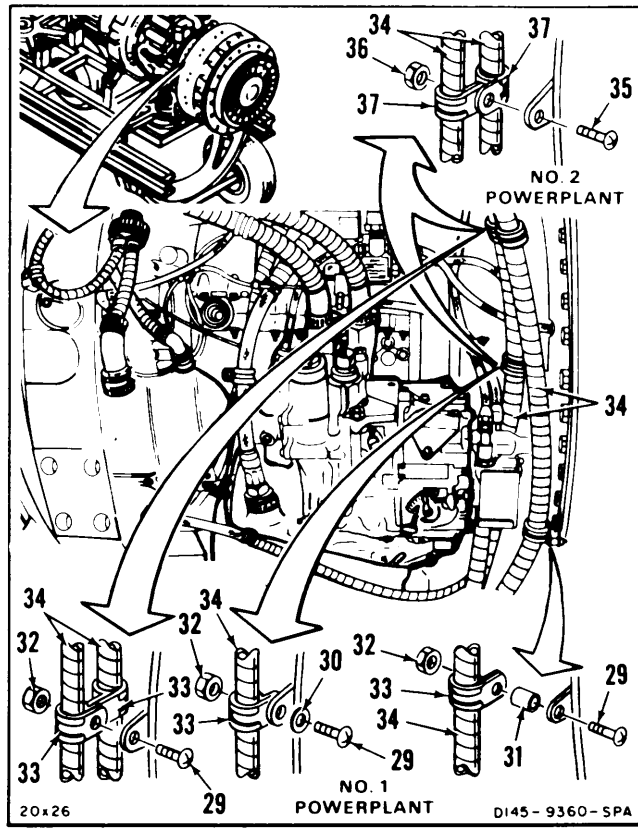


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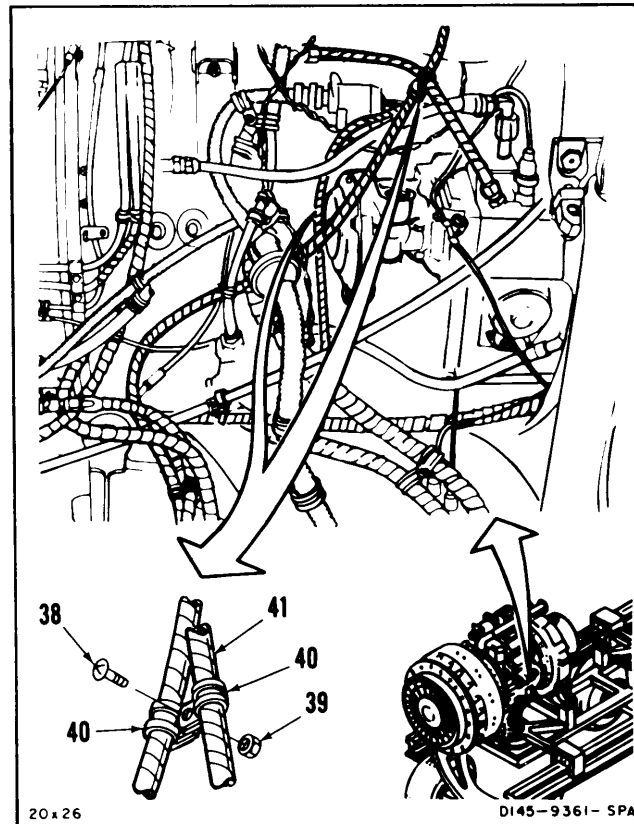
4-11 DISASSEMBLE POWERPLANT (Continued)

9 On No. 1 powerplant, remove three screws (29), washer (30), spacer (31), and three nuts (32). Remove four clamps (33). Tag and remove two hoses (34). Use tape (E388) to mark clamp locations.

10. On No. 2 powerplant, remove two screws (35) and nuts (36). Remove four clamps (37). Tag and remove two hoses (34). Use tape (E388) to mark clamp locations.



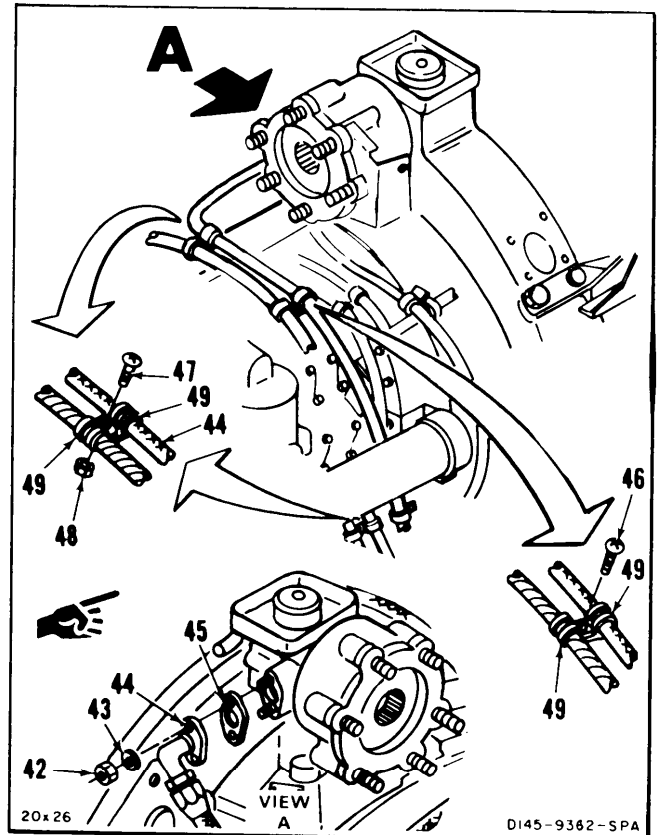
11, Remove two screws (38) and nuts (39), and remove four clamps (40). Use tape (E388) to mark clamp locations. Tag and remove hose (41).



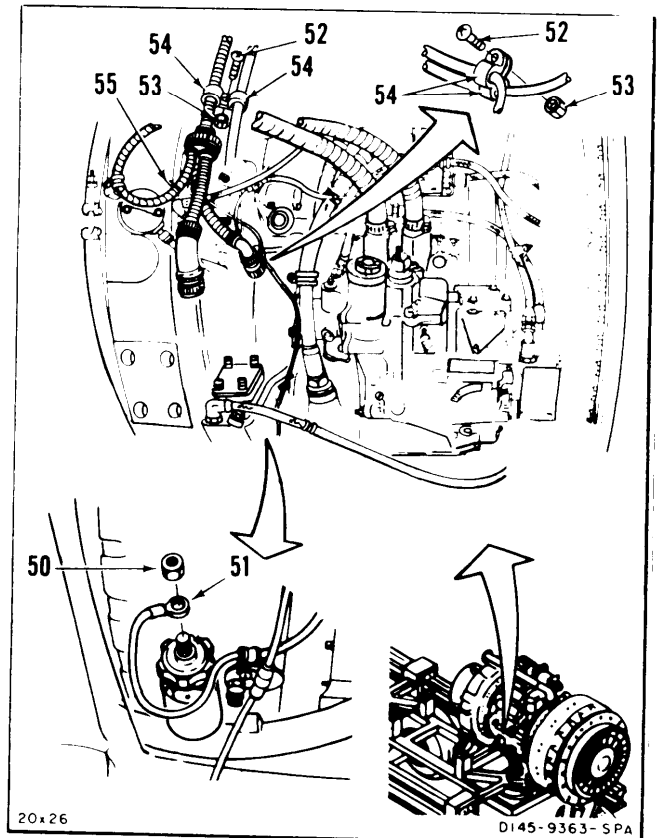
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4-11 DISASSEMBLE POWERPLANT (Continued)

12. Remove two nuts (42) and washers (43).
Tag and disconnect hose (44). Remove packing (45).
13. Remove lockwire from screw (46). Remove three screws (46 and 47), two nuts (48), and remove **six clamps (49)**. Use tape (E388) to mark clamp locations. Remove hose (44).

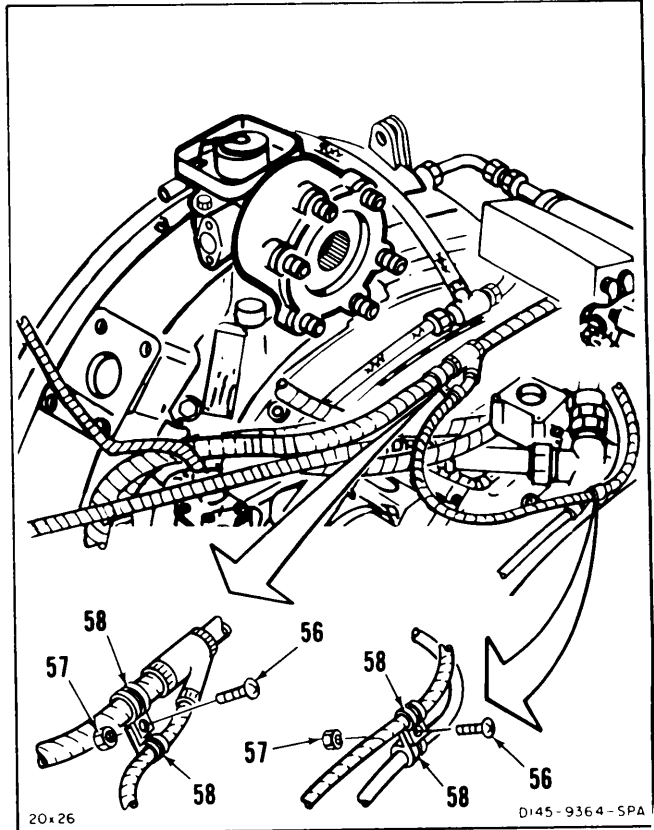


14. Remove nut (50) and **disconnect wire (51)**.
15. Remove two screws (52) and nuts (53) and **remove four clamps (54)**. Use tape (E388) to mark clamp locations.
16. **Remove strap (55)**.

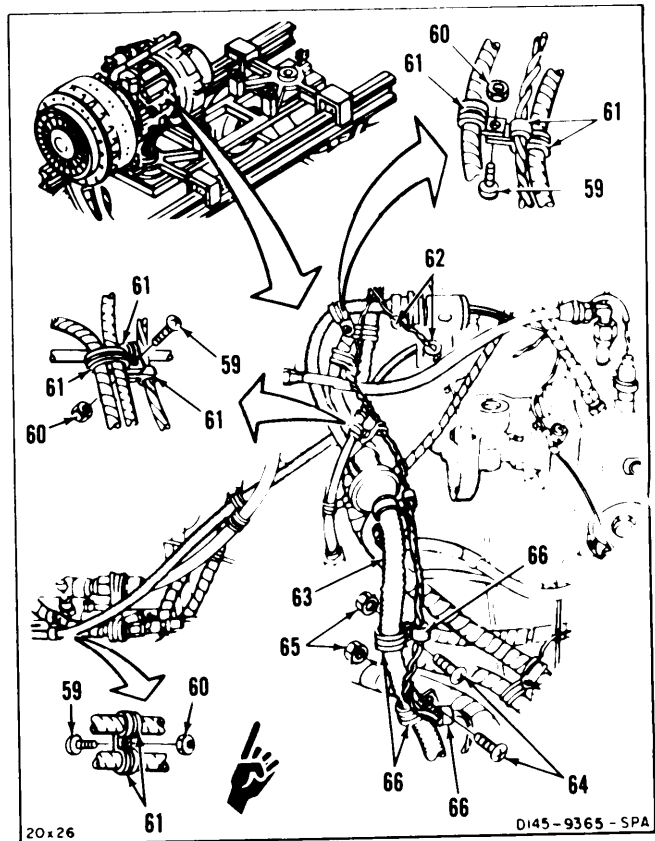


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17. Remove two screws (56) and nuts (57) and **remove four clamps (58)**. Use tape (E388) to mark clamp locations.



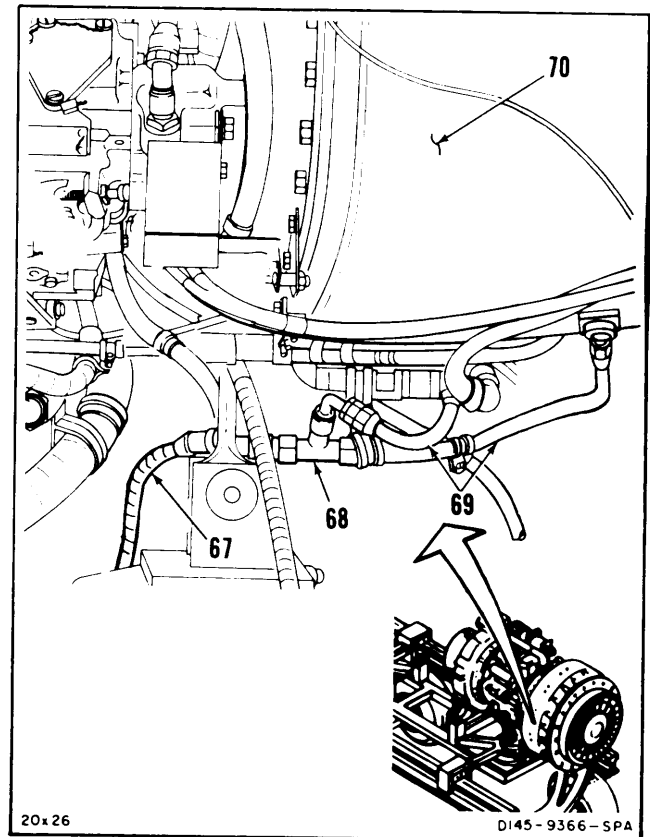
18. Remove five screws (59) and nuts (60) and **remove nine clamps (61)**. Use tape (E388) to mark clamp locations.
19. Disconnect two plugs (62). Tag and **remove electrical harnesses (63)**.
20. Remove two screws (64) and nuts (65) and **remove four clamps (66)**.



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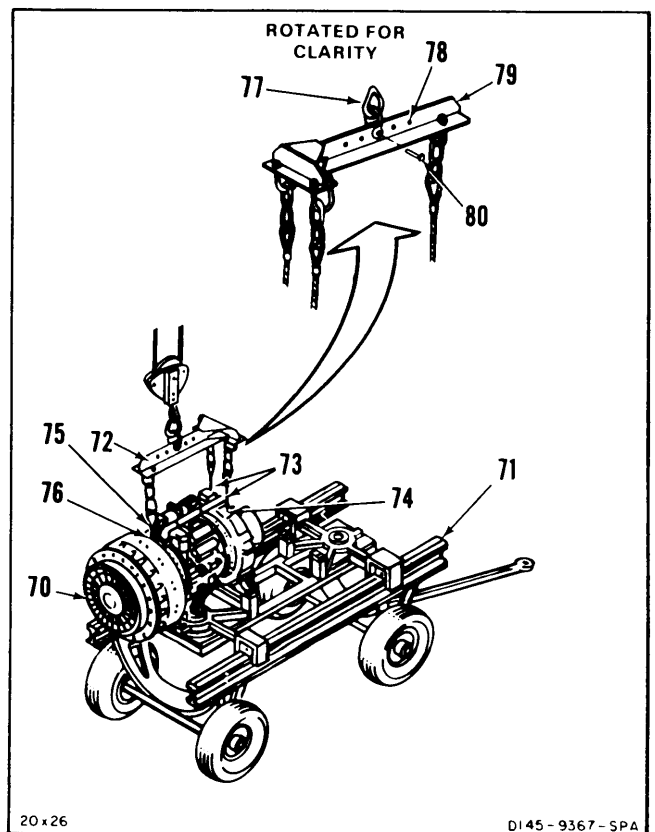
4-11 DISASSEMBLE POWERPLANT (Continued)**4-11**

21. **Disconnect hose (67) at tee (68). Tag and remove hose.**
22. **Disconnect and remove tee (68) from two hoses (69). Tag, disconnect, and remove two hoses from powerplant (70).**

**NOTE**

Engine mount adapters and aft mount link must not be removed if powerplant is to be stored on adapter.

23. **If powerplant (70) is to be stored on adapter (71) go to follow on maintenance. If powerplant is to be stored in container, go to step 24.**
24. **install sling (72) as follows:**
 - a. Connect two cables (73) to forward fittings (74) on powerplant (70).
 - b. Connect cable (75) into aft fitting (76) on powerplant (70).
 - c. Adjust sling (72) until eye (77) is over aft hole (78) in sling bar (79).
 - d. Install pin (80) through bar (79).

**GO TO NEXT PAGE**

4-11 DISASSEMBLE POWERPLANT (Continued)

4-11

25. **Connect hoist (81) to eye (77) of sling (72).**
26. **Loosen four bolts (82) on adapter fitting (83) and push down to side.**
27. **Raise hoist (81) to support weight of powerplant (70). Remove pin (84) from adapter fitting (85) and aft mount link (86)**

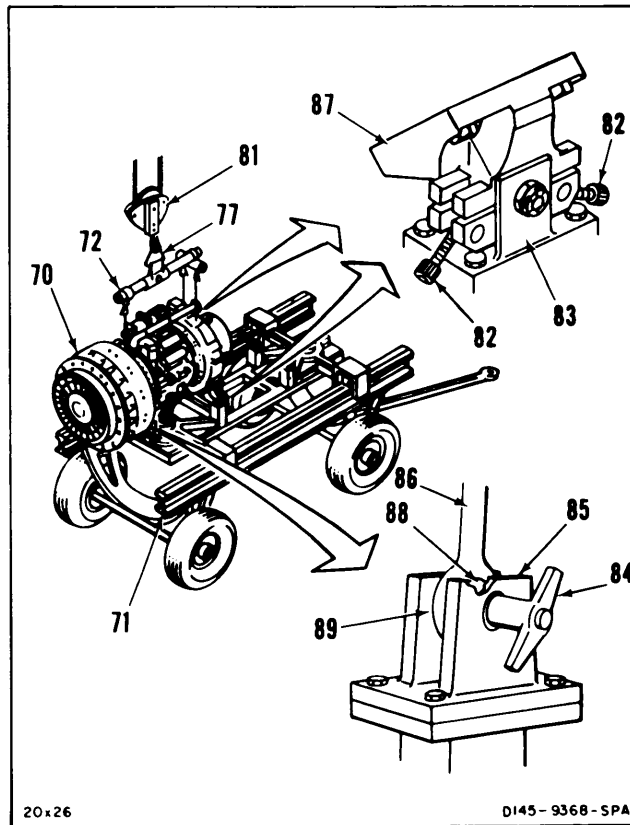
WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear when powerplant is raised.

CAUTION

Make sure bearing in lower end of aft support link does not tilt in clevis, while weight of engine is supported. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

28. **Raise hoist (81) so forward engine mount adapters (87) and aft engine mount link (86) are clear of adapter (71). Make sure bearing (88) in aft engine mount link (86) does not tilt in clevis (89).**



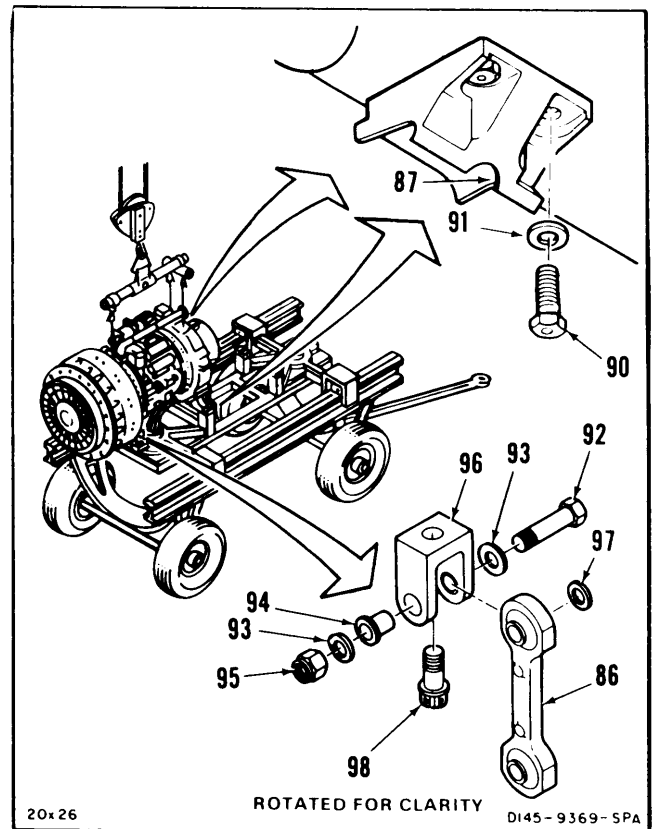
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D145-9368-SPA

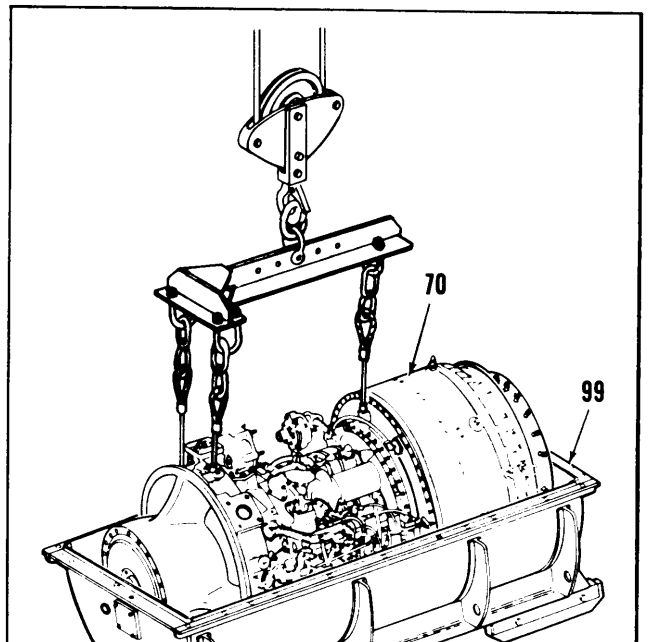
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4-11 DISASSEMBLE POWERPLANT (Continued)**4-11**

29. Remove lockwire from eights bolts (90).
Remove eight bolts and washers (91) and remove two adapters (87).
30. Remove bolt (92), two washers (93), bushing (94), and nut (95) from adapter (96).
Remove link (86) and spacer (97).
31. Remove lockwire and bolt (98) and **remove adapter (96).**



32. **Prepare powerplant (70)** for storage container (99) (TM 55-2840-254-23).
33. Lower powerplant (70) into storage container (99).

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4-11 DISASSEMBLE POWERPLANT (Continued)

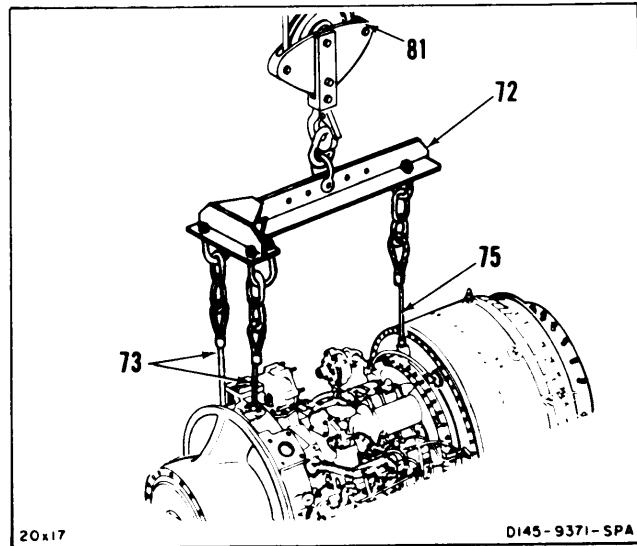
4-11

3 4 Disconnect three cables (73 and 75).

35. Disconnect hoist (81) from sling (72).

FOLLOW-ON MAINTENANCE:

Prepare powerplant for storage (TM 55-2840-254-23).

**END OF TASK**

4-11.1 DISASSEMBLE POWERPLANT

4-11.1

INITIAL SETUP

Applicable Configurations:With **74****Tools:**Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Hoist

Sling (T134)

Open End Wrench, 1-1/2 Inch

Container, Engine Storage

Container, 2-Quart

Materials:

Cloth (E135)

Tape (E388)

Paper Tags (E264)

Personnel Required:

Aircraft Powerplant Repairer

References:

TM 1-2840-265-23

Equipment Condition:

Off Helicopter Task

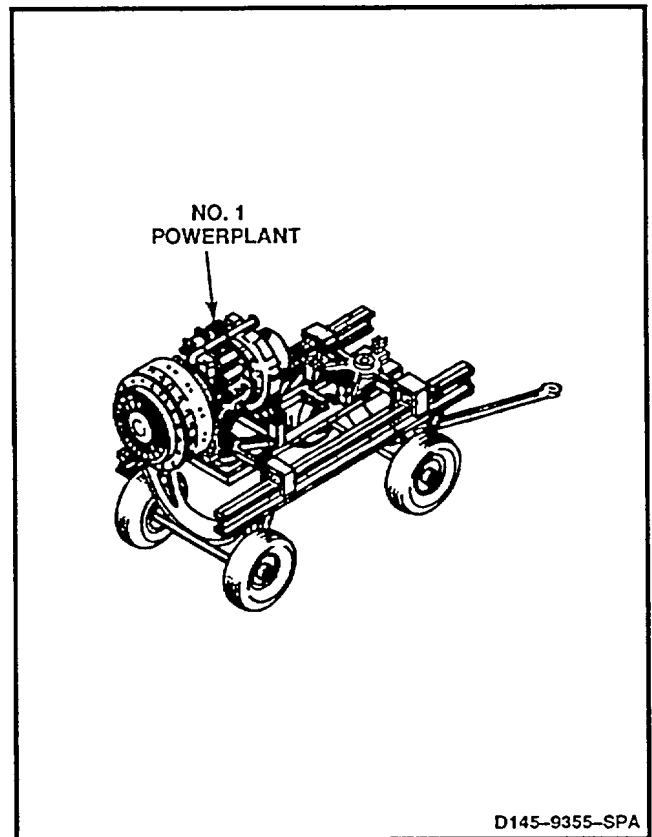
Engine Access Cover Removed (Task 4-52)

Engine Air Inlet Fairing Removed (Task 4-74)

Fire Detection Sensing Element Removed (Task
12-12)

Starter Removed (Task 7-141)

Exhaust Cone Removed (Task 4-88)



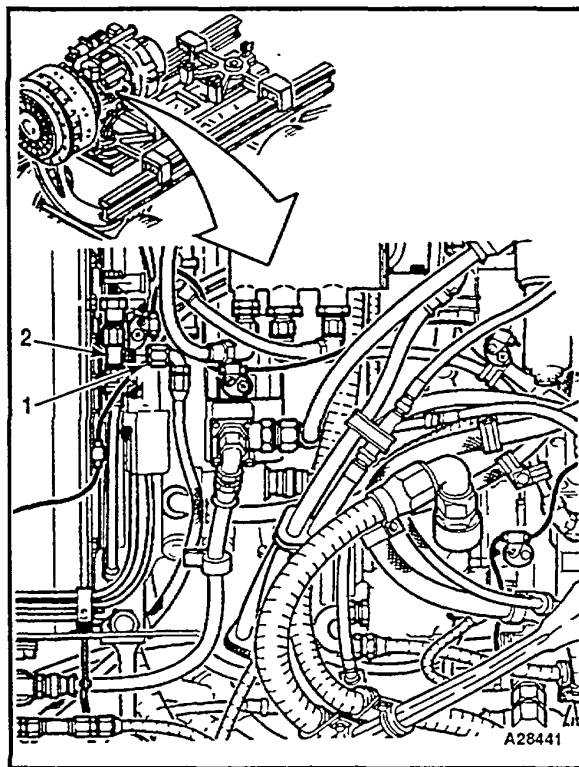
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Change 19 4-40.1

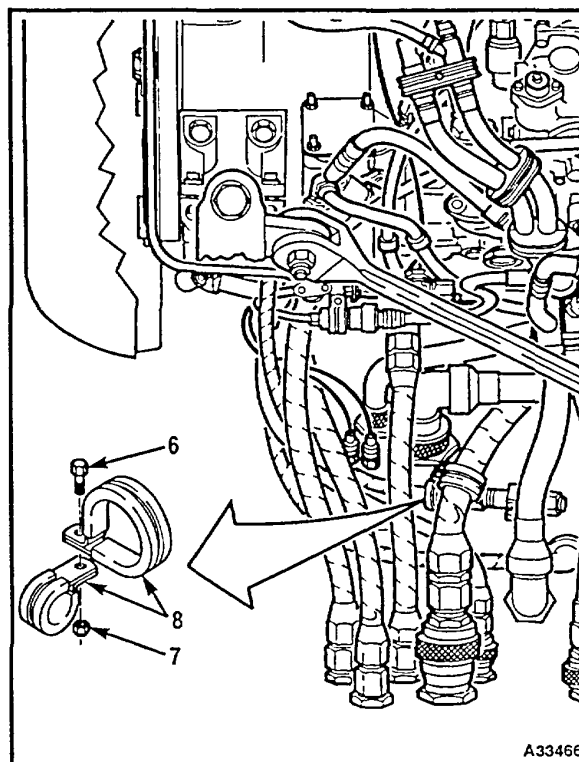
NOTE

Procedure is same to disassemble No. 1 or No. 2 powerplant, except as noted. Disassembly of No. 1 powerplant is shown here.

1. Disconnect hose (1) at fitting (2). Tag and remove hose (1). Use tags (E264).



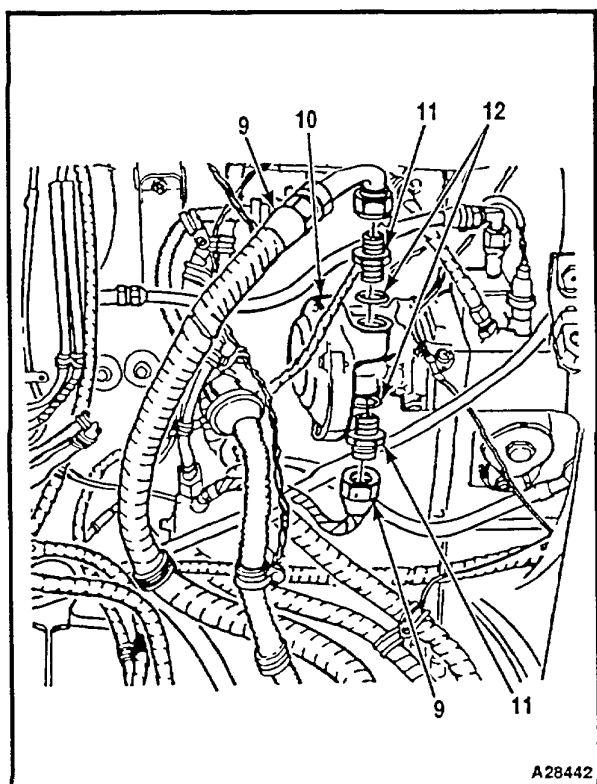
2. On No. 1 powerplant only. Remove screw (6) and nut (7) and remove clamps (8). Use tape (E388) to mark clamp locations.



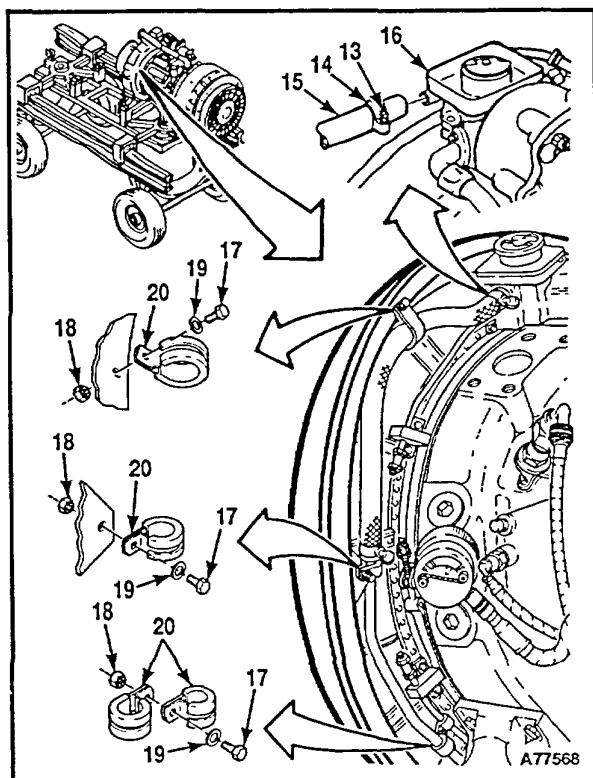
4-11.1 DISASSEMBLE POWERPLANT (Continued)

4-11.1

3. Tag, disconnect, and remove two hoses (9) from fuel pump (10). Use tags (E264). Remove two reducers (11) and packings (12).



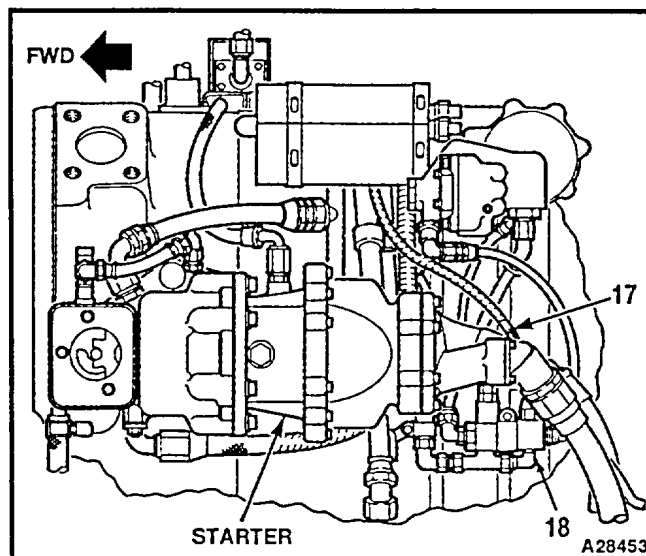
4. Loosen screw (13) on clamp (14). Tag and disconnect hose and line assembly (15) from oil filler (16). Use tags (E264).
5. Remove three screws (17), nuts (18), and washers (19). Remove four clamps (20). Use tape (E388) to mark clamp locations.
6. Remove hose and line assembly (15).



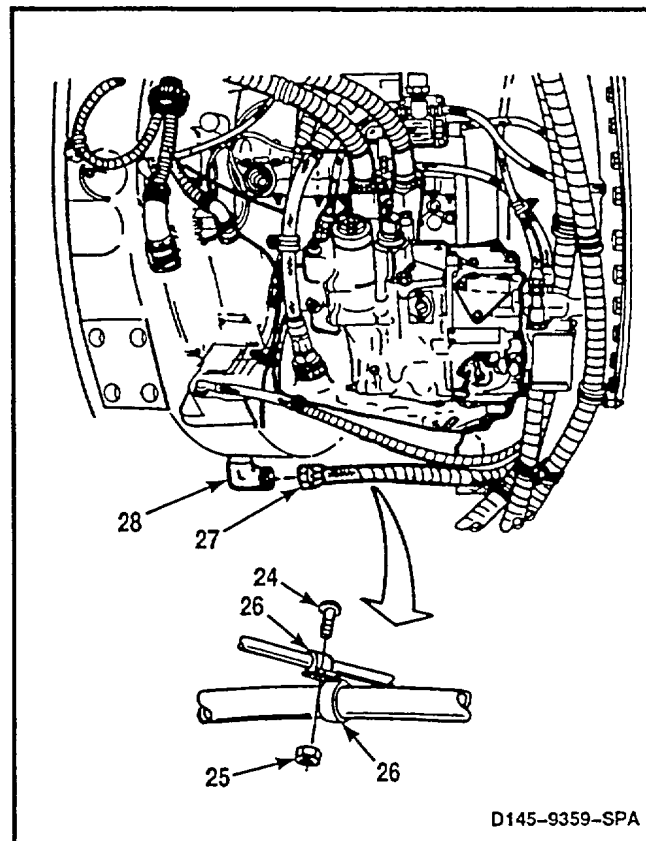
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Change 19 4-40.3

7. Tag and remove line (17) and fitting (18). Use tag (E264).



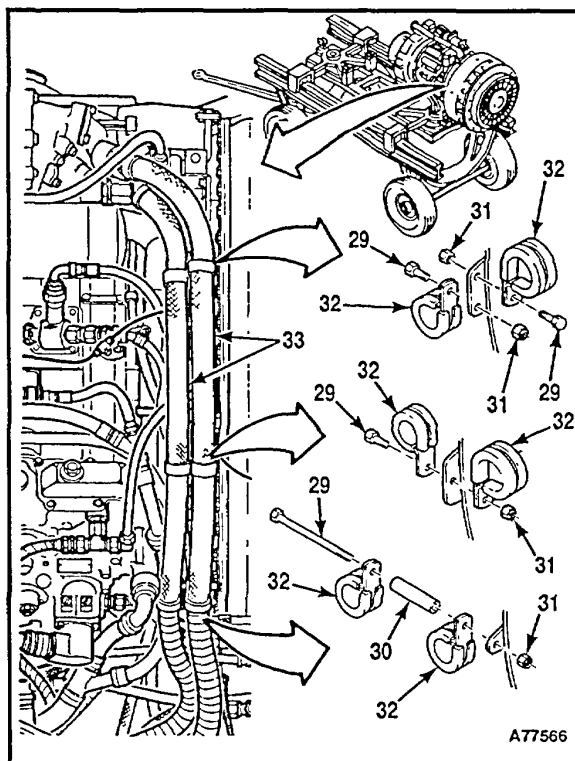
8. Remove screw (24) and nut (25). Remove two clamps (26). Use tape (E388) to mark clamp location.
9. Disconnect hose (27) at elbow (28). Tag and remove hose. Use tag (E264). Use container and cloths (E135) for spilled fluid.



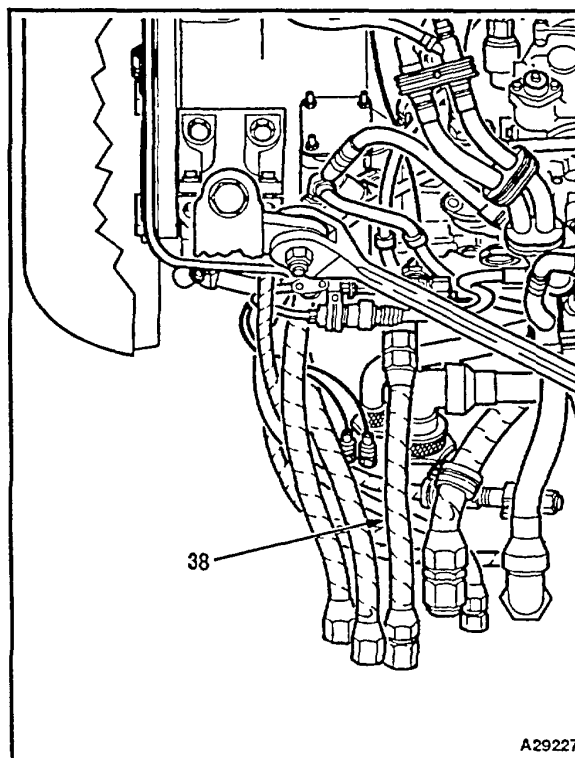
4-11.1 DISASSEMBLE POWERPLANT (Continued)

4-11.1

10. Remove four screws (29), spacer (30), and four nuts (31). **Remove six clamps (32).** Disconnect, tag, and **remove two hoses (33).** Use tags (E264). Use tape (E388) to mark clamp locations.



11. Tag and **remove hose (38).** Use tag (E264).



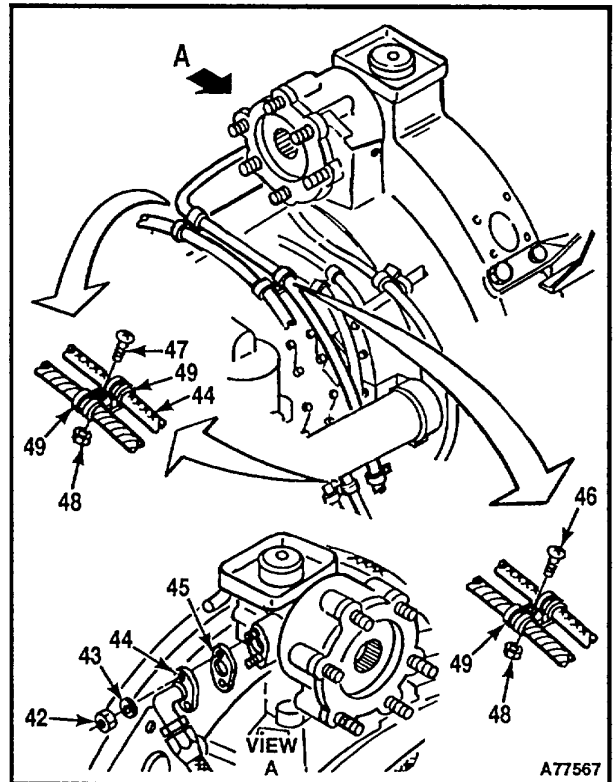
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Change 19 4-40.5

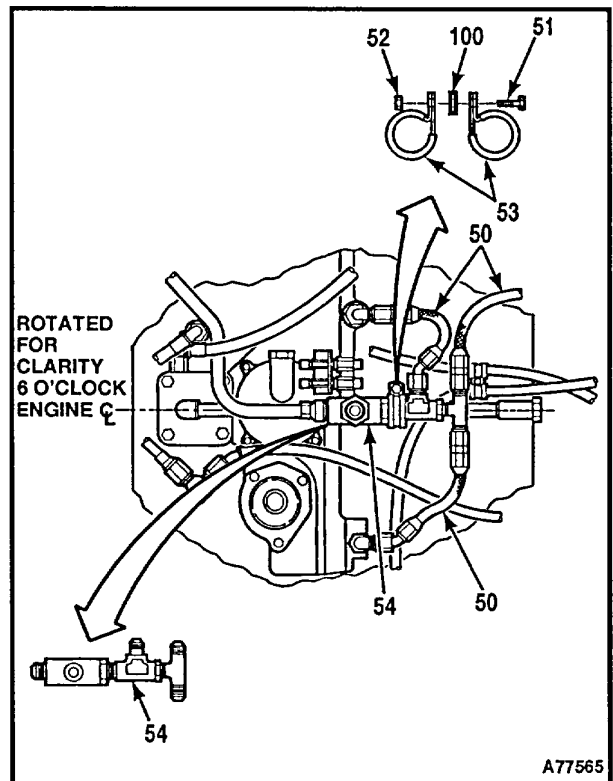
4-11.1 DISASSEMBLE POWERPLANT (Continued)

4-11.1

12. Remove two nuts (42) and washers (43). **Tag and disconnect hose (44).** Use tag (E264). **Remove packing (45).**
13. Remove lockwire from screw (46). **Remove** three screws (46 and 47), three nuts (48), and **six clamps (49).** Use tape (E388) to mark clamp locations. **Remove hose (44).**

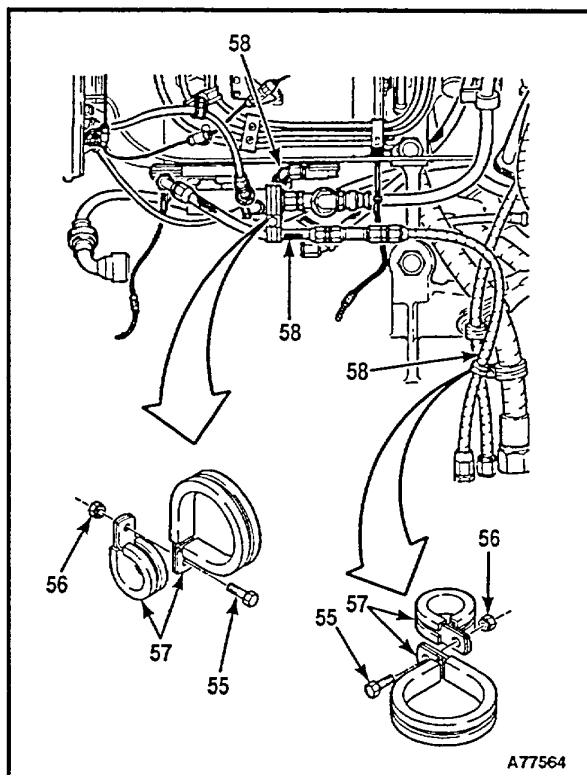


14. Tag and **remove three hoses (50).** Use tags (E264).
15. **Remove** screw (51), spacer (100), nut (52) and **two clamps (53).** Use tape (E388) to mark location.
16. **Remove fitting (54).**

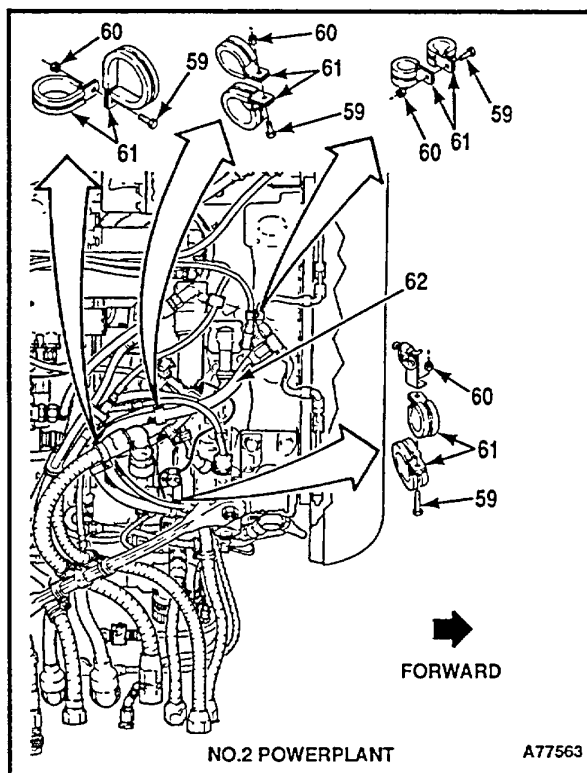


4-11.1 DISASSEMBLE POWERPLANT (Continued)

- 17. Remove two screws (55) and nuts (56) and **remove four clamps (57)**. Use tape (E388) to mark clamp locations.
- 18. Tag and **remove three hoses (58)**. Use tags (E264). Use a container and cloths (E135) to catch spilled liquid.



- 19. **Remove** four screws (59) and nuts (60) and **eight clamps (61)**. Use tape (E388) to mark clamp locations.
- 20. Tag and **remove hose (62)**. Use tags (E264).



GO TO NEXT PAGE

NOTE

Engine mount adapters and aft mount link must not be removed if powerplant is to be stored on adapter.

21. If powerplant (70) is to be stored on adapter (71), go to follow-on maintenance. If powerplant is to be stored in container, go to step 22.
22. Install sling (72) as follows:
 - a. Connect two cables (73) to forward fittings (74) on powerplant (70).
 - b. Connect cable (75) into aft fitting (76) on powerplant (70).
 - c. Adjust sling (72) until eye (77) is over aft hole (78) in sling bar (79).
 - d. Install pin (80) through bar (79).
23. Connect hoist (81) to eye (77) of sling (72).
24. Loosen four bolts (82) on adapter fitting (83) and push down to side.
25. Raise hoist (81) to support weight of powerplant (70). Remove pin (84) from adapter fitting (85) and aft mount link (86).

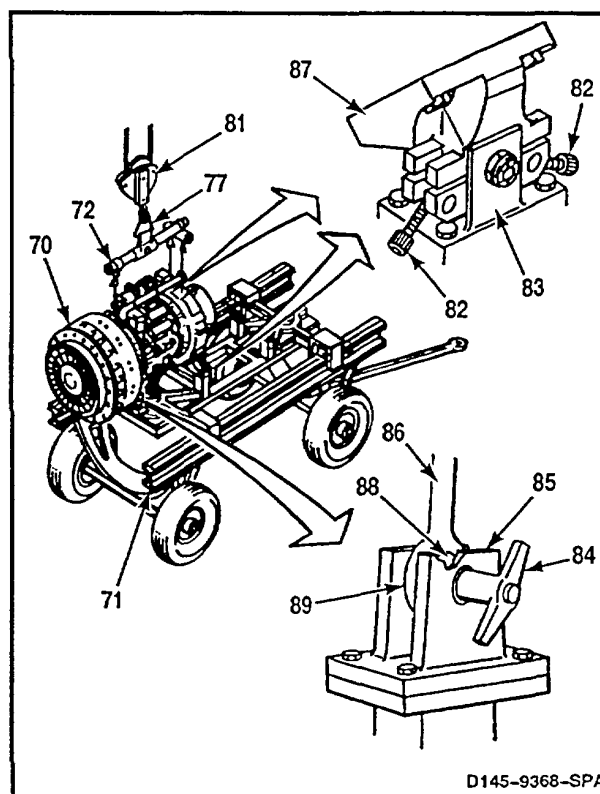
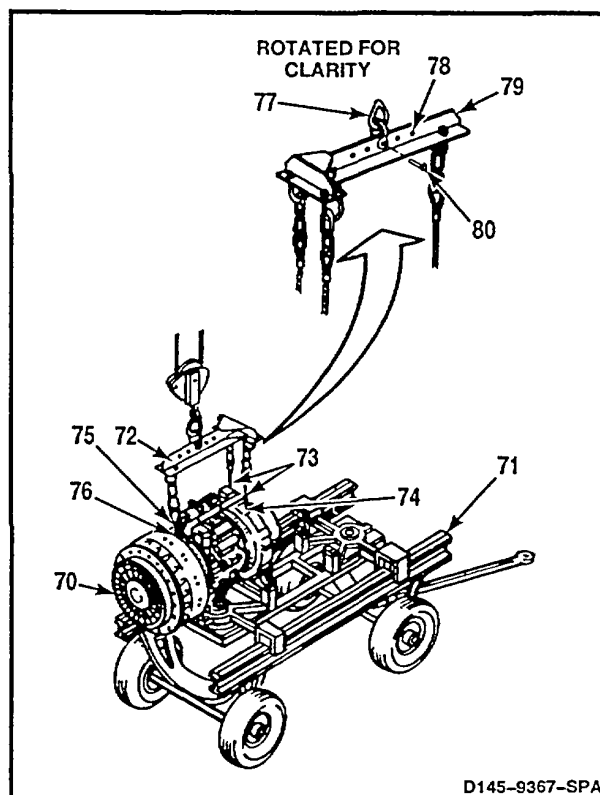
WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear when powerplant is raised.

CAUTION

Make sure bearing in lower end of aft support link does not tilt in clevis, while weight of engine is supported. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

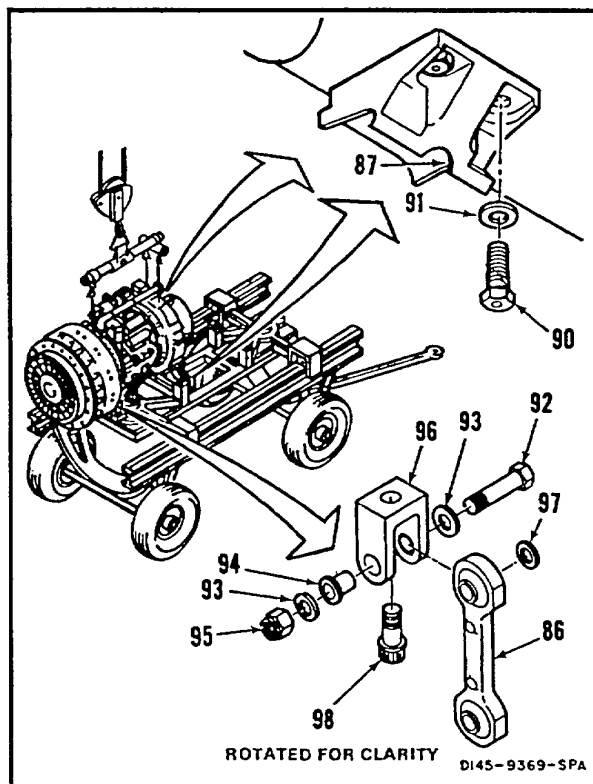
26. Raise hoist (81) so forward engine mount adapters (87) and aft engine mount link (86) are clear of adapter (71). Make sure bearing (88) in aft engine mount link (86) does not tilt in clevis (89).



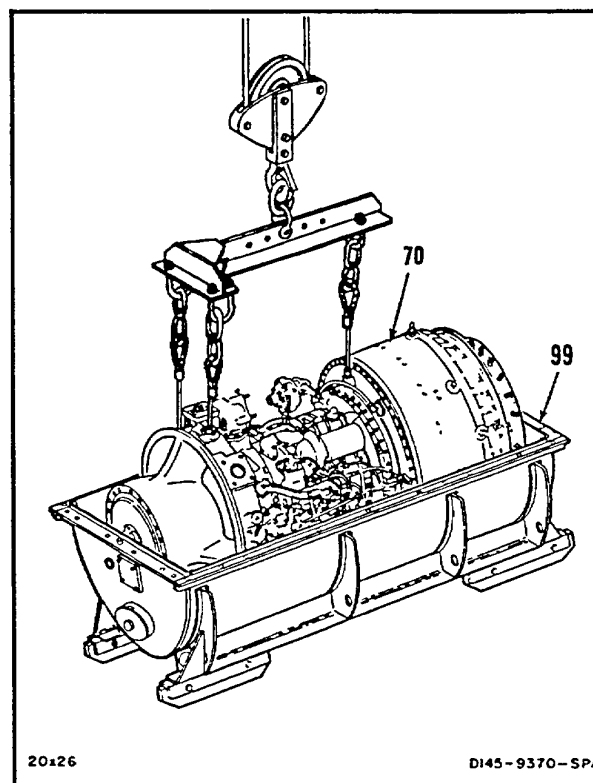
4-11.1 DISASSEMBLE POWERPLANT (Continued)

4-11.1

27. Remove lockwire from eight bolts (90). **Remove eight bolts and washers (91) and remove two adapters (87).**
28. Remove bolt (92), two washers (93), bushing (94), and nut (95) from adapter (96). **Remove link (86) and spacer (97).**
29. Remove lockwire and bolt (98) and **remove adapter (96).**



30. **Prepare powerplant (70)** for storage container (99) (TM 1-2840-265-23).
31. Lower powerplant (70) into storage container (99).



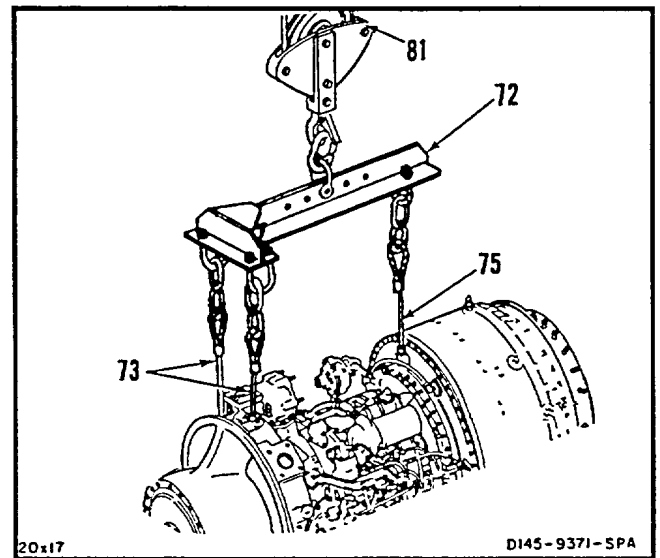
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Change 19 4-40.9

4-11.1 DISASSEMBLE POWERPLANT (Continued)

4-11.1

32. Disconnect three cables (73 and 75).
33. Disconnect hoist (81) from sling (72).



FOLLOW-ON MAINTENANCE:
Prepare powerplant for storage (TM
1-2840-265-23).

4-11.2 INSPECT AND TEST ENGINE ELECTRICAL HARNESS (AVIM)

4-11.2

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

- Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
- Multimeter
- Insert/Extraction Tool
- Insulation Resistance Test Set
- Stopwatch

Materials:

- Tags (E264)
- Other Materials as Required

Personnel Required:

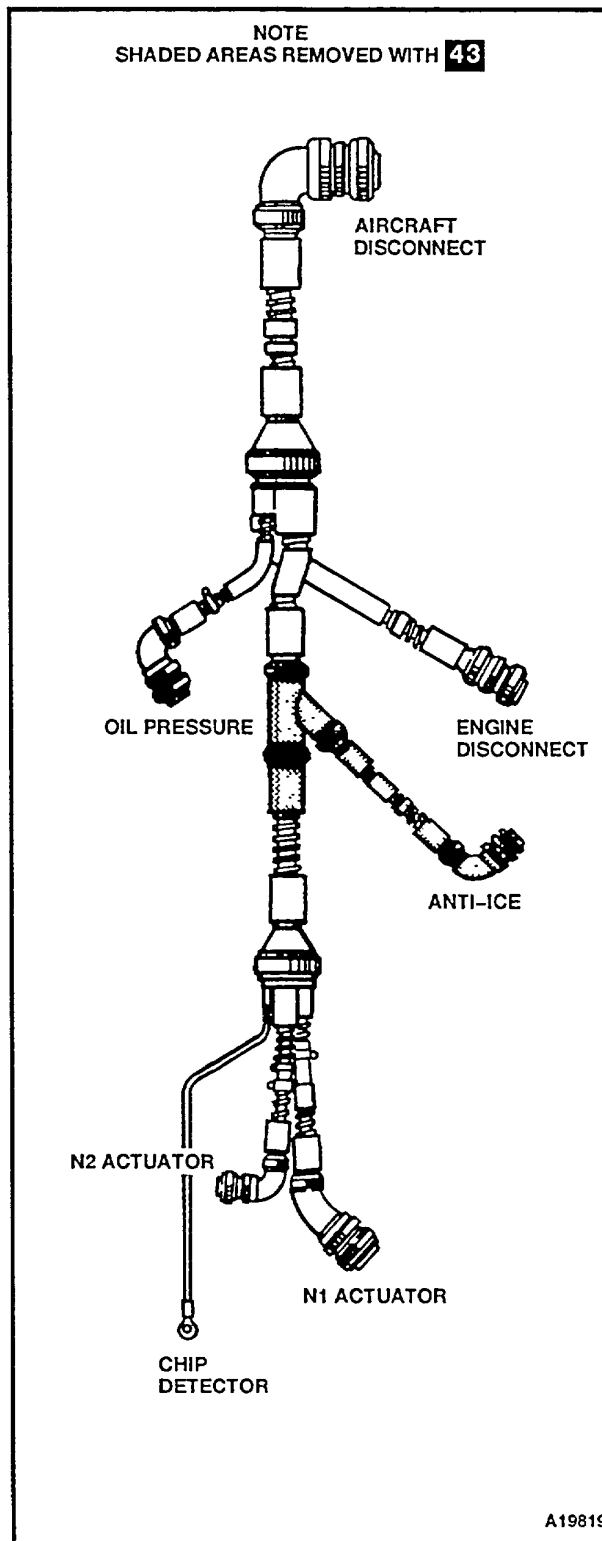
- Aircraft Electrician
- Inspector

References:

TM 55-1500-323-24

Equipment Condition:

Off Helicopter Task



GO TO NEXT PAGE

Change 19 4-40.11

4-11.2 INSPECT AND TEST ENGINE ELECTRICAL HARNESS (AVIM)
 (Continued)

4-11.2

NOTE

A connector must be replaced if damage will not allow it to fit with its mating connector.

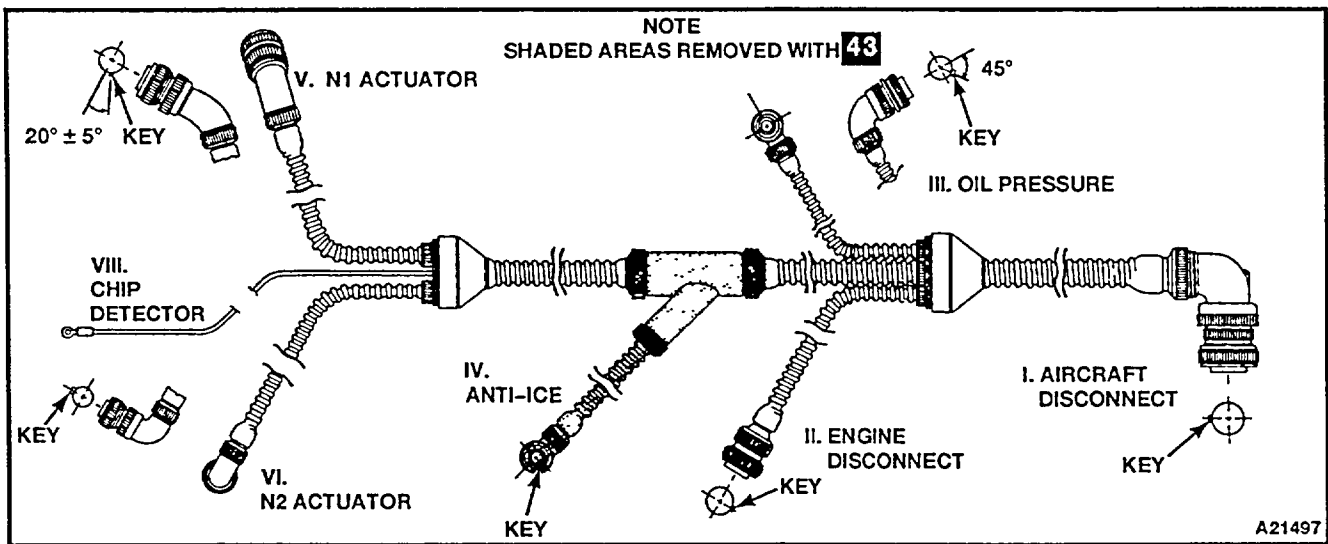
CAUTION

Cracks, pinholes, or other openings in the harness will admit fluids causing damage to engine components.

1. Visually inspect harness.

- a. Check harness connectors and housings for cracks, damaged or broken pins, and deteriorated connector inserts.

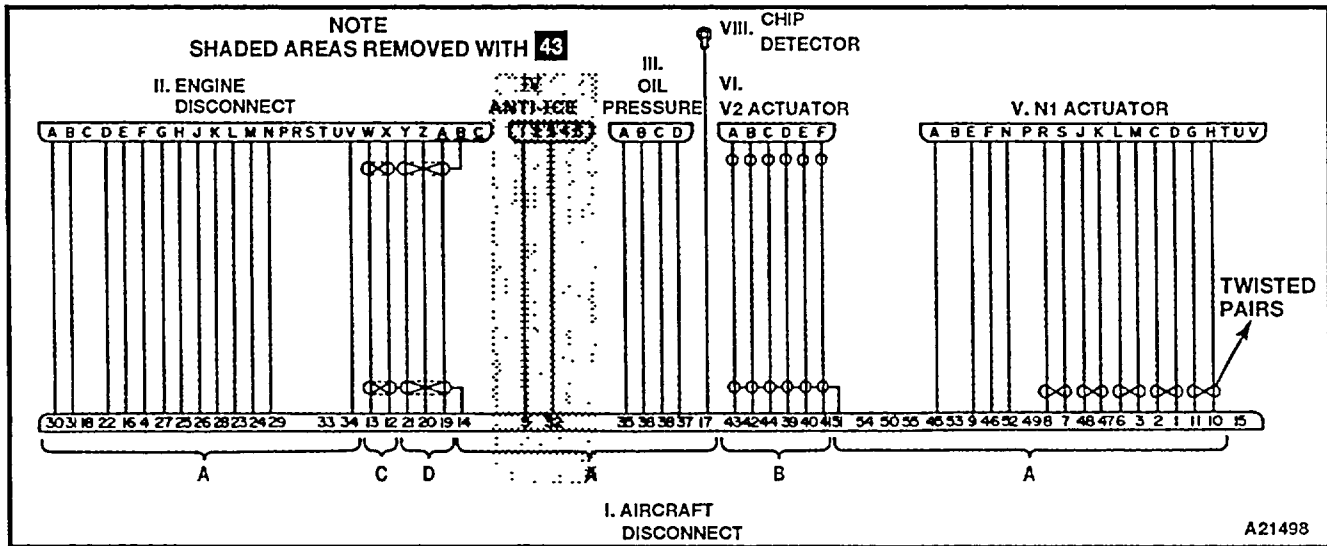
- b. Inspect harness conduit assemblies for holes, cracks, crushing, burns, or deterioration.
- c. Repair any conduit assembly that has a minor hole or crack (Task 4-11.12).
- d. Replace any conduit assembly that is severely crushed or damaged (Task 4-11.12).



4-11.2 INSPECT AND TEST ENGINE ELECTRICAL HARNESS (AVIM)
(Continued)

4-11.2

2. Check continuity of the harness per TM 55-1500-323-24. of one minute using an insulation resistance test set (TM 55-1500-323-24). Resistance shall be a minimum of 200 megohms at 500 vdc.
3. Measure insulation resistance between each contact and connector shell for a maximum



WIRE AND CABLE CHART

NOTE
SHADED AREAS REMOVED WITH 43

ITEM	PART NUMBER	DESCRIPTION	LENGTH (IN)	QTY	CONNECTORS
A	MS22759/8-20	WIRE	36	13	ITO II
			51	4	ITO III
			70	2	ITO IV
			79	14	ITO V
			95	1	ITO VIII
B	MIL-C-27500-20TA1N6	CABLE	79	6	ITO VI
C	MIL-C-27500-20TA2N6		36	1	ITO II
D	MIL-C-27500-20TA3N6		36	1	ITO II

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FOLLOW-ON MAINTENANCE:
None

END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

- Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
- Engine Harness Coned
Junction Retention Tool (Appx E-228)
- Multimeter
- Insert/Extraction Tool
- Insulation Resistance Test Set
- Strap Wrench
- NSN 5120-01-231-5723
- Stiff Bristle Fiber Brush
- Other Tools as Required

Materials:

- Detergent (E159.1)
- Sealant (E340.2)
- Tags (E264)
- Tape (E388)
- Tape, Silicone Self Vulcanizing (E395.1)
- Tape, Teflon (E399)
- Tubing (E431)

Parts:

- Cable
- Sealing Plugs (MS27488)
- Wires
- Other parts as required

Personnel Required:

- Aircraft Electrician (2)
- Inspector

References:

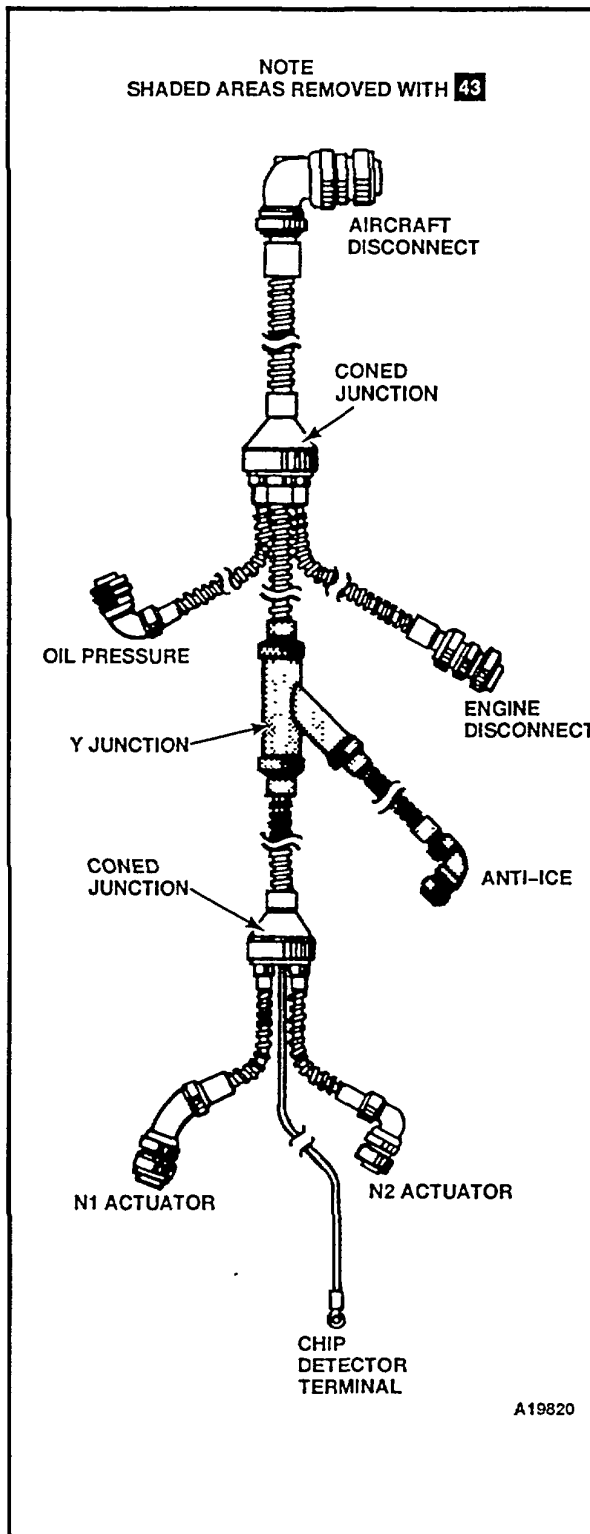
- TM 55-1520-240-23P
- TM 55-1500-323-24

Equipment Condition:

- Off Helicopter Task
- General Safety Instructions:

WARNING

Sealant (E340.2) can irritate skin and cause burns. 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.



GENERAL

The following cautions and notes are common and applicable to all procedures of this task.

CAUTION

- Use only conduit (plastic jaw) pliers and strap wrenches when working with harness connecting hardware, or damage to assemblies and adjacent hardware may result. If coned junction conduit connections are too tight to be loosened as described, standard connector pliers can be used if coned conduit coupling nuts are first wrapped with masking tape (E388). Use Engine Harness Retention Tool (Appx E-228) to restrain coned sections whenever possible; otherwise damage could occur.
- Do not use solvent when cleaning conduit assemblies; damage to material will result.
- When removing conduit material, grasp harness around wiring as much as possible. This helps prevent unnecessary strain on wiring that could cause damage at connections elsewhere in the harness especially at corresponding engine accessory connectors.
- Make sure to apply silicone sealant (E340.2) to threads before installing conduit coupling nuts and connector fittings. Sealant not only seals harness, but also secures fitting and coupling nuts because lockwire is not used.

NOTE

- Maintenance described in this task is typical and may be applied to entire harness. Illustrations are typical and used

as reference when repairing other parts of the harness.

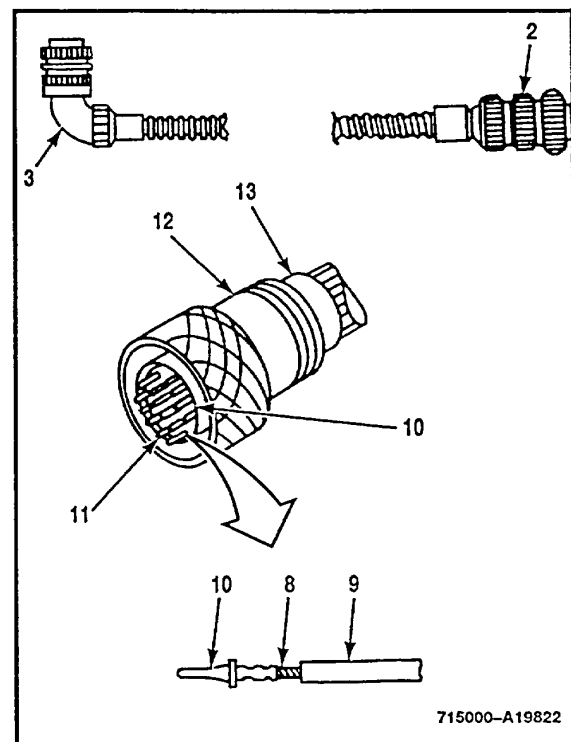
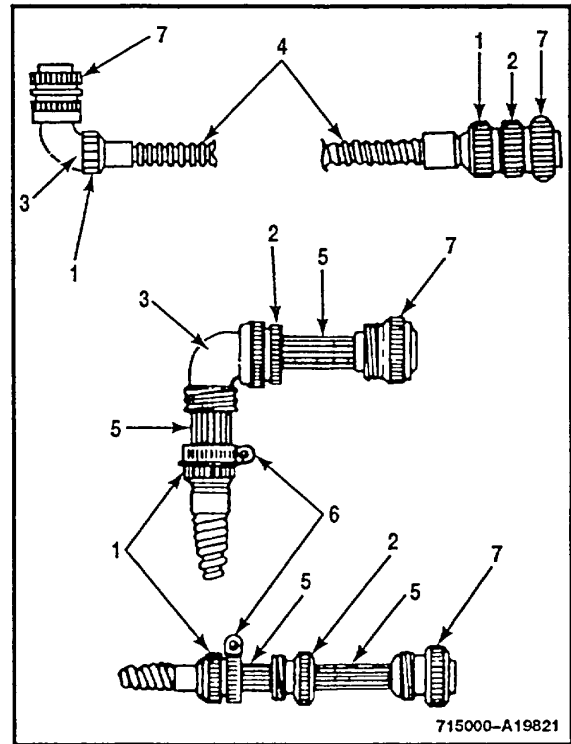
- Harness conduit material and junctions only provide protection and routing of internal wiring. Junction connectors attach only conduit material, not wiring. Internal wiring runs directly from aircraft disconnect to appropriate connectors with separation and distribution of wiring provided by Y and coned junctions.
- With **43**, Y junction and conduit sections preceding and following Y junction are replaced by a single conduit between two coned junctions.
- When performing maintenance on connectors and adjacent fittings where access to wiring and back of connectors is necessary, conduit should be restrained away from connector hardware with a clamp or other material.
- Check condition of connector insert and housing whenever maintenance is performed on a connector or adjacent hardware. Replace connector insert or housing if either is damaged so that secure, sealed connections cannot be made.
- When repairing or replacing harness wiring, make sure new wiring is long enough to avoid strain on itself or rest of harness after repairs have been made.
- Replace entire shielded cable if its internal wire is damaged or defective.
- Make sure water or other fluids that may have entered conduit, are completely drained before repairing conduit or other parts of the harness.
- Make sure hands are free of dirt and oil when applying silicone self vulcanizing tape (E395.1).

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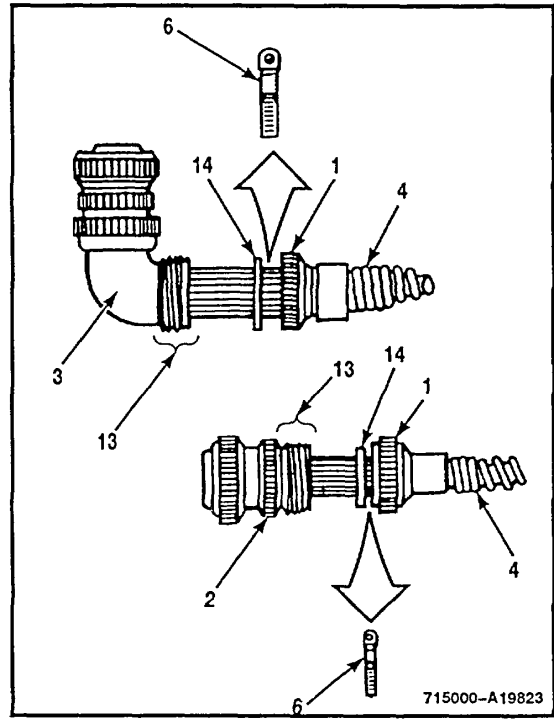
Change 19 4-40.15

REPLACEMENT OF CONNECTORS

1. **Loosen conduit nut (1)** from adapter (2), or elbow (3) (TM 55-1500-323-24). Use a strap wrench and conduit pliers.
2. **Pull conduit (4) back from adapter (2) or elbow (3)** to expose wires (5).
3. Have helper hold back conduit (4) and install clamp (6) around wiring to restrain conduit.
4. **Loosen and pull back adapter (2) or elbow (3) from rear of connector (7).**
5. **Identify and tag (E264) each wire** with its contact identifier (TM 55-1500-323-24).
6. **Remove wire contacts.** Use extraction tool. (TM 55-1500-323-24).
7. **Check wire strands (8) and insulation (9) at contact (10) for damage** (TM 55-1500-323-24). Replace any contact (10) if damage is found (step 20).
8. **Replace insert (11) and/or housing (12) (TM 55-1500-323-24) as necessary.**
9. **Install contacts (10)** in insert (11) as identified by their tags (TM 55-1500-323-24).
10. **Install sealing plugs** in unused contact positions of insert (11) (TM 55-1500-323-24).
11. **Clean old sealant from threads (13)** of housing (12) and adjacent fittings using hard bristle fiber brush.
12. **Apply sealant (E340.2) to threads (13)** of housing (12) and adjacent adapter (2) or elbow (3).
13. **Assemble adapter (2) or elbow (3) to connector** using a strap wrench and conduit pliers.

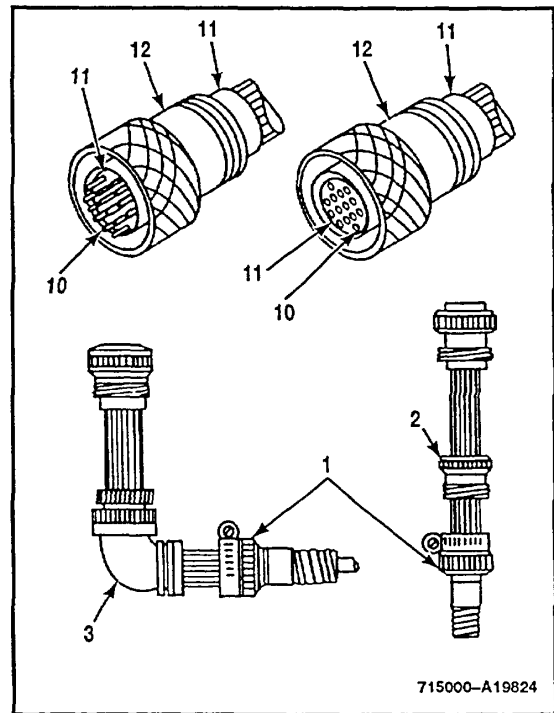


14. Remove clamp (6) restraining conduit (4) and allow conduit to expand.
15. Apply coat of sealant (E340.2) to threads (13) of adapter (2) or elbow (3).
16. Carefully position nylon washer (14) and tighten conduit nut (1) to adapter (2) or elbow (3), using a strap wrench or conduit pliers (TM 55-1500-323-24).



CONNECTOR CONTACT REPLACEMENT

17. Gain access to back of connector by removing conduit nut (1), adapters (2), or elbow (3) (steps 1. through 6.).
18. Remove damaged contact (10) from insert (11). Use extraction tool (TM 55-1500-323-24).
19. Check condition of connector insert (11) when removing contacts (10). Replace insert or entire connector, if insert or housing (12) is damaged so that a secure and sealed connection cannot be made.



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Change 19 4-40.17

20. Replace contact as follows. When removing wire contacts (10), check wire strands (8) and insulation (9) for damage.

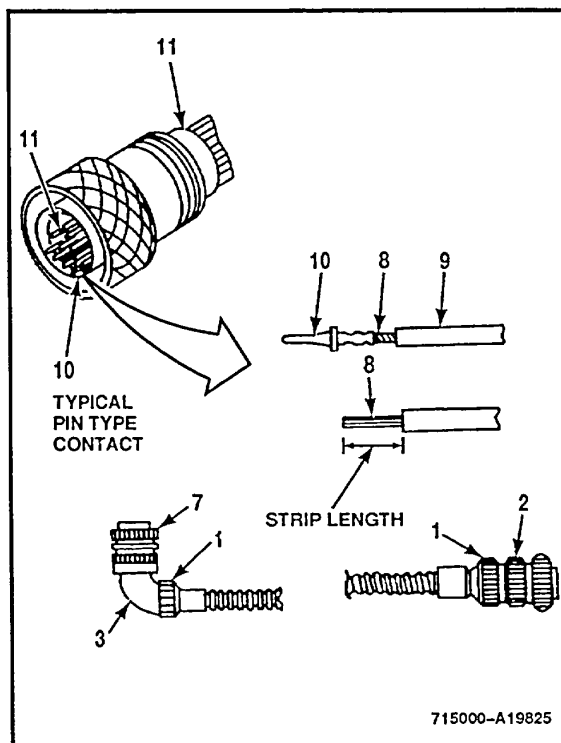
- a. Cut wire flush with rear of contact (10), and strip insulation from end of wire using following criteria:

Contact Size (Gage)	Strip Length	
	Inches	Millimeters
20	0.157 to 0.186	4 to 5
16	0.250 to 0.284	6 to 7

- b. Crimp new contact (10) to wire (8) (TM 55-1500-323-24).

- c. Insert new contact (10) into insert (11) (TM 55-1500-323-24).

21. Reassemble connector (7), adapter (2) or elbow (3), and conduit nut (1) (steps 11. through 16.).



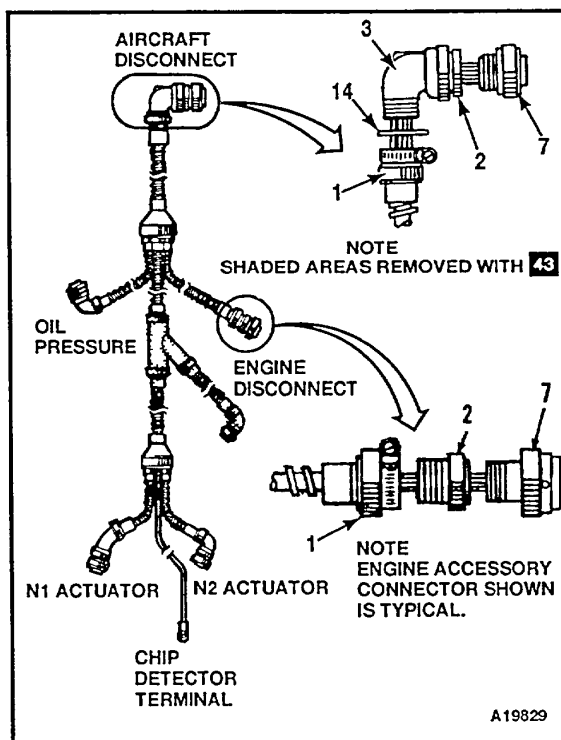
WIRE REPLACEMENT

- 22. Identify which contacts and connectors are affected.
- 23. Loosen conduit nuts (1) and adapter (2) or elbow (3) from affected connectors (7).
- 24. Pull back and restrain conduit to gain access to back of each connector.
- 25. Identify contacts at both ends of wire to be replaced (TM 55-1500-323-24).

CAUTION

Do not remove wire at this time.

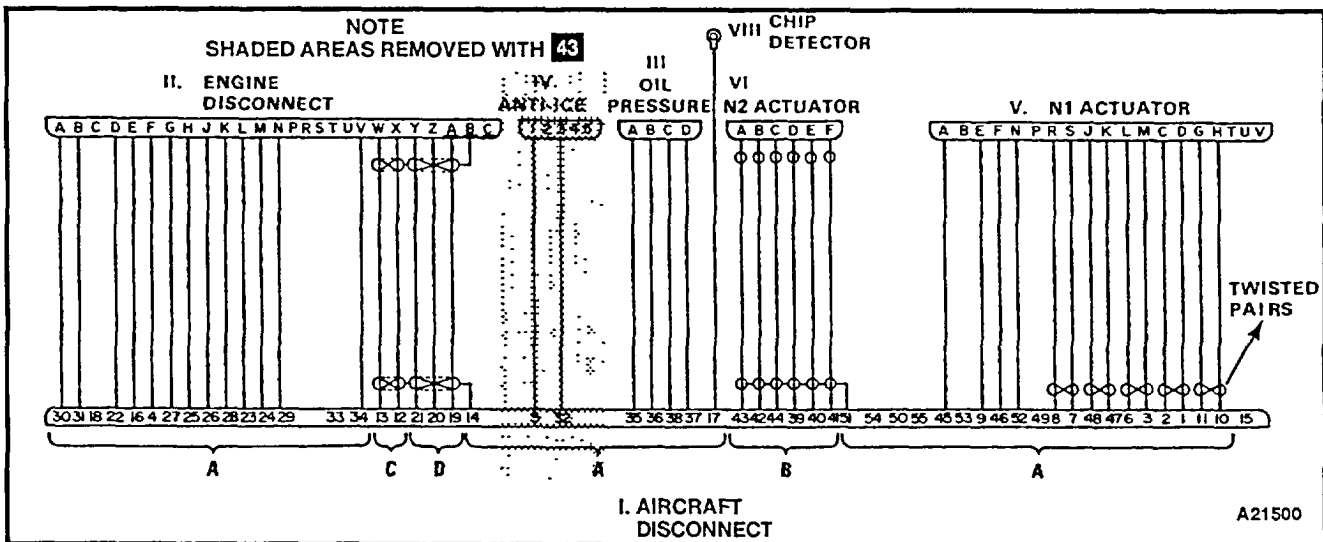
- 26. Remove contacts of defective wire or cable from connectors (7). Cut off contacts.



4-11.3 REPAIR OF ENGINE ELECTRICAL HARNESS (Continued)

4-11.3

27. Solidly attach length of new wire to either end of defective wire and wrap joint thinly with Teflon tape (E399).
28. If replacing shielded cable perform the following:
 - a. Form shield of wire into a pig tail. Due to tight fit of conduit on harness, make sure pigtailed ends are small enough that completed cable assembly may be pulled through conduit.
 - b. Wrap shield pigtailed ends with Teflon adhesive tape (E399).
29. Carefully pull out defective wire or cable, pulling new wire with it.
30. Cut defective wire from new wire and trim new wire to length.
31. Install contacts on new wire (TM 55-1500-323-24).
32. Install contacts into their inserts (TM 55-1500-323-24).
33. Apply sealant (E340.2) to threads of adapters, elbows, and conduit nuts.
34. Tighten fittings and conduit nuts. Use strap wrench and conduit pliers.



WIRE AND CABLE CHART

NOTE
SHADED AREAS REMOVED WITH 43

ITEM	PART NUMBER	DESCRIPTION	LENGTH (IN)	QTY	CONNECTORS
A	MS22759/8-20	WIRE	36	13	ITO II
			51	4	ITO III
			70	2	ITO IV
			79	14	ITO V
			95	1	ITO VIII
B	MIL-C-27500-20TA1N6	CABLE	79	6	ITO VI
C	MIL-C-27500-20TA2N6		36	1	ITO II
D	MIL-C-27500-20TA3N6		36	1	ITO II

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CONDUIT REPAIR**NOTE**

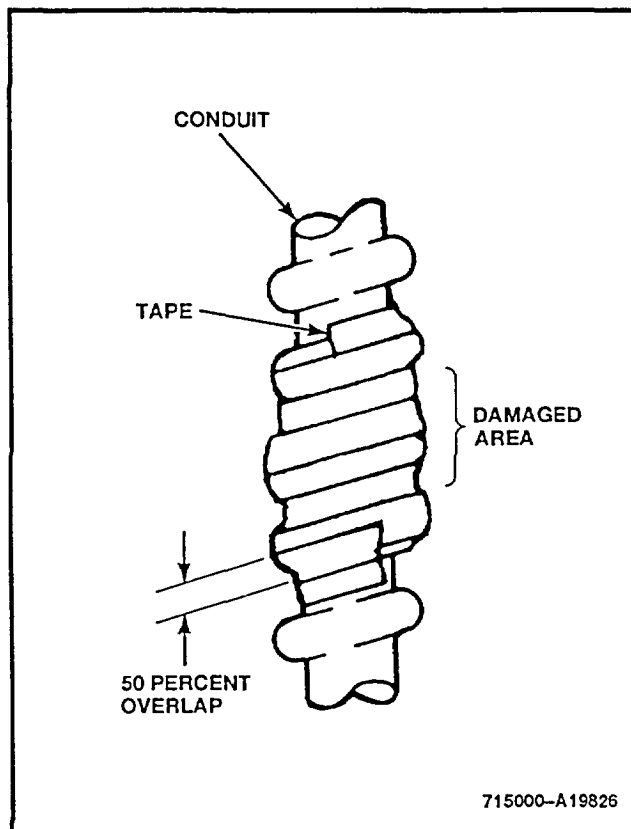
This procedure applies only to minor damage of Teflon convoluted tubing.

35. Clean damaged area of tubing with cloth and detergent (E159.1).

NOTE

When applying silicone self vulcanizing tape, do not keep tape under tension.

36. Wrap damaged area of tubing with silicone tape (E395.1). Assure 50 percent overlap. Cover damaged area and make one full width overlap past each end of damaged area.
37. Allow repair to stand undisturbed for at least 24 hours to allow tape to vulcanize.

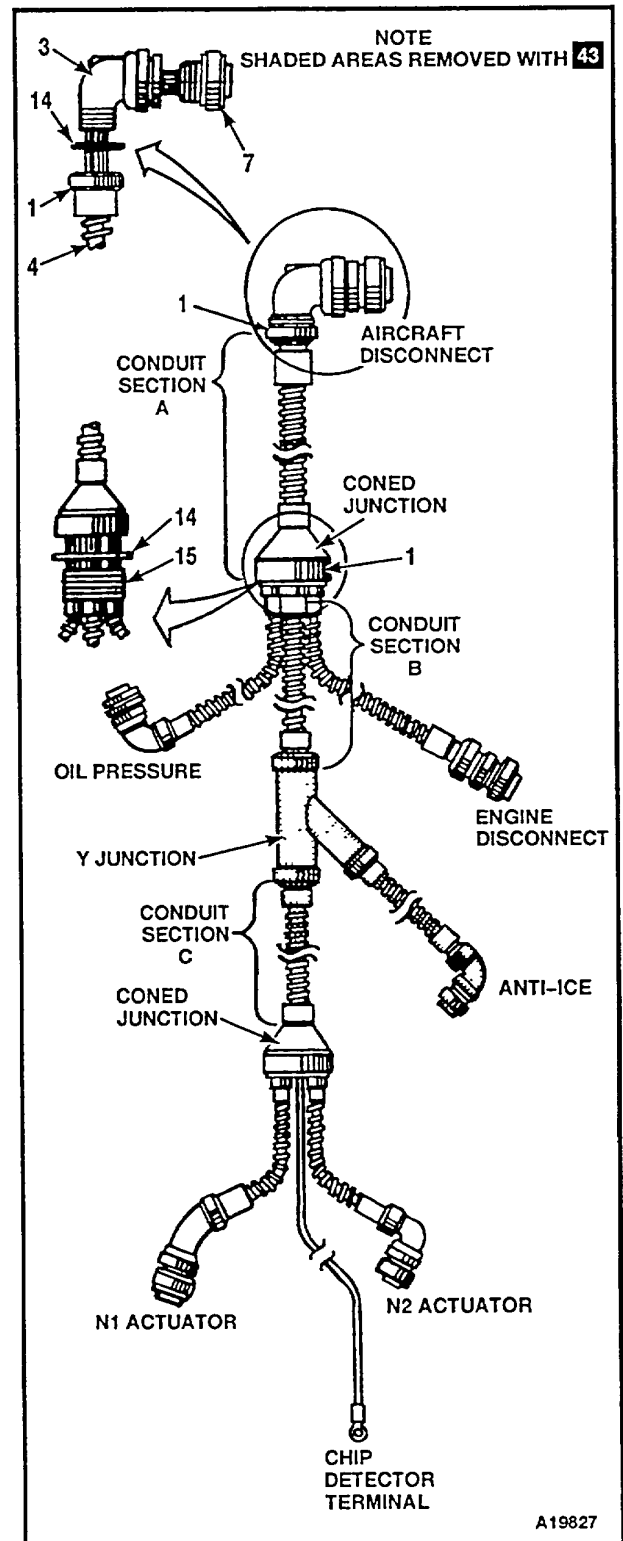


CONDUIT ASSEMBLY REPLACEMENT**NOTE**

- For identification, conduit sections are referred to as sections A through H. Steps 38, 39, and 40 cover sections A, B, and C. Step 41 covers sections D through H.
- With **43**, Y junction and conduit sections preceding and following Y junction are replaced by a single conduit between two coned junctions.
- Use Engine Harness Retention Tool (Appx E228) to secure legs of harness when loosening coned junctions.
- Fill each end of newly installed conduit and connector fittings with sealant (E340.2) to assure proper sealing of harness.

38. Replace conduit section A as follows:

- a. Loosen conduit nuts (1) at coned junction and elbow (3).
- b. Disconnect elbow (3) from aircraft disconnect (7). Leave adapter in elbow.
- c. Push elbow (3) and conduit away from aircraft disconnect (7).
- d. Tag (E264) and remove wiring (TM 55-1500-323-24) from aircraft disconnect (7).
- e. Slide off elbow (3) and conduit (4).
- f. Wrap wiring with Teflon tape (E399).
- g. Slide new conduit section A and elbow (3) over harness wiring.
- h. Connect wiring as tagged to aircraft disconnect (TM 55-1500-323-24). Discard tags.
- i. Apply sealant (E340.2) around wiring in each end of conduit (4) and to threads of elbow (3) and coned junction plate (15).
- j. Position nylon washers (14) and tighten conduit nuts (1) to coned junction and elbow (3) of aircraft disconnect.
- k. Apply sealant (E340.2) to threads of elbow (3) and around wiring in elbow.
- l. Connect elbow (3) to aircraft disconnect (7).



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Change 19 4-40.21

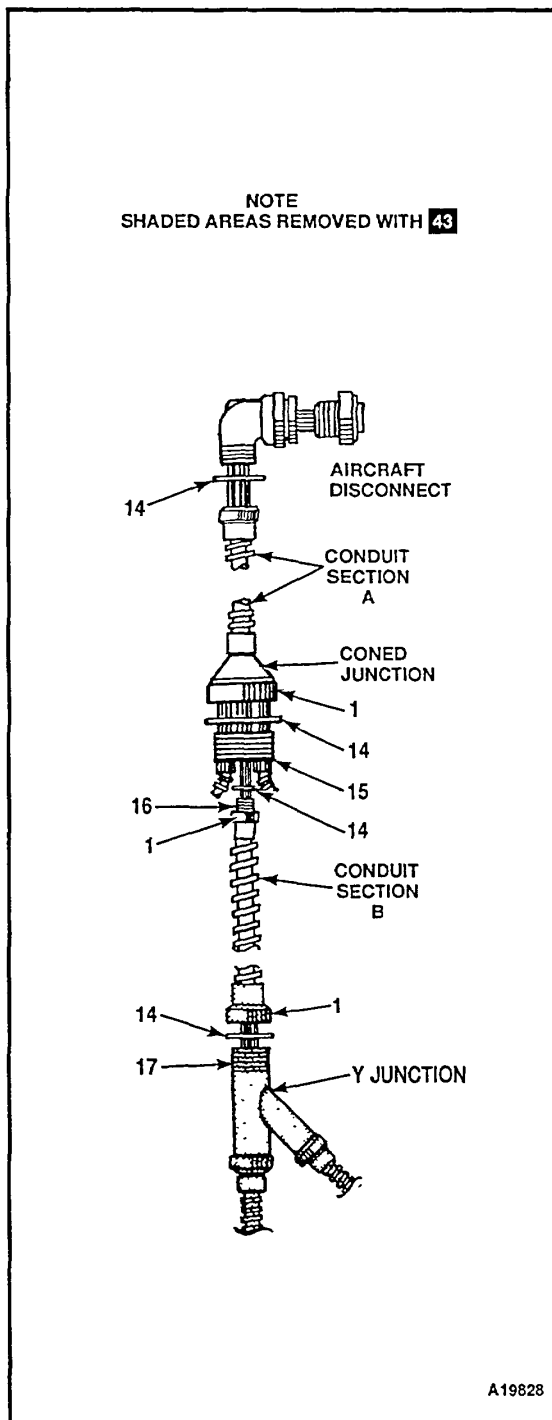
39. Replace conduit section **B** as follows;

- a. **Remove conduit section A** (step 38).
- b. **Identify wires** which travel through conduit section **B** and separate them from taped harness covered by conduit section **A**.

NOTE

With **43**, **Y junction** and **conduit sections preceding and following Y junction** are replaced by a **single conduit between two coned junctions**.

- c. **Loosen section B conduit nuts (1)** at plate (15) and Y junction.
- d. Pull back conduit at coned junction and carefully **pull section B** wiring through coned junction plate (15).
- e. **Pull off conduit section B**.
- f. Clean wiring as necessary and wrap with Teflon tape (E399) where covered by conduit section **B**.
- g. **Slide wires through new conduit section B** and existing coned junction plate (15).
- h. **Apply a generous coat of sealant (E340.2)** to threads (16) of coned junction plate, threads (17) of Y junction, and around wiring at each end of conduit.
- i. **Position nylon washers (14)** and **tighten conduit section B coupling nuts (1)**.
- j. **Install conduit section A** (step 38).

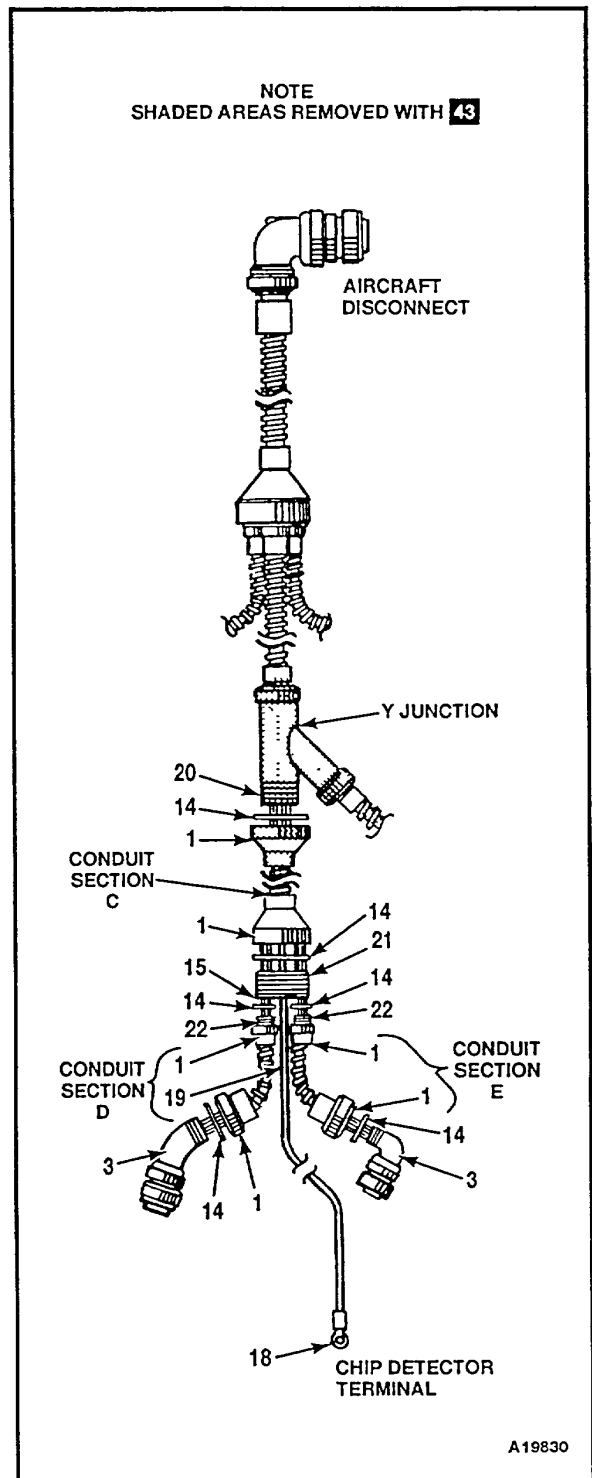


40. Replace conduit section **C** as follows;
- Remove connectors (7) (steps 1. through 6.).
 - Tag wires for each connector (TM 55-1500-323-24).
 - Disconnect conduit sections **D** and **E** nuts (1) from coned junction plate (15).
 - Pull connector elbows (3) and conduit sections **D** and **E** off wiring.

NOTE

With **43**, Y junction and conduit sections preceding and following Y junction are replaced by a single conduit between two coned junctions.

- Disconnect nuts (1) of conduit section **C** from coned junction plate (15) and Y junction.
- Remove chip detector terminal (18).
- Slide plate (15) and conduit section **C** off wiring.
- Slide on new conduit section **C**.
- Feed wiring as tagged, through coned junction plate (15).
- Apply shrink tubing (E431) to chip detector wire (19) where it goes through junction plate (15). Apply sealant (E340.2) to wire on section **C** side of plate.
- Apply sealant (E340.2) to threads (20) of Y junction, and threads (21) of coned junction.
- Position nylon washers (14) and connect conduit section **C** conduit nuts (1) to Y junction threads (20) and coned junction threads (21).
- Install conduit sections **D** and **E** over wiring.
- Install conduit nuts (1), elbows (3), and connectors (7) (steps 7. through 17.).



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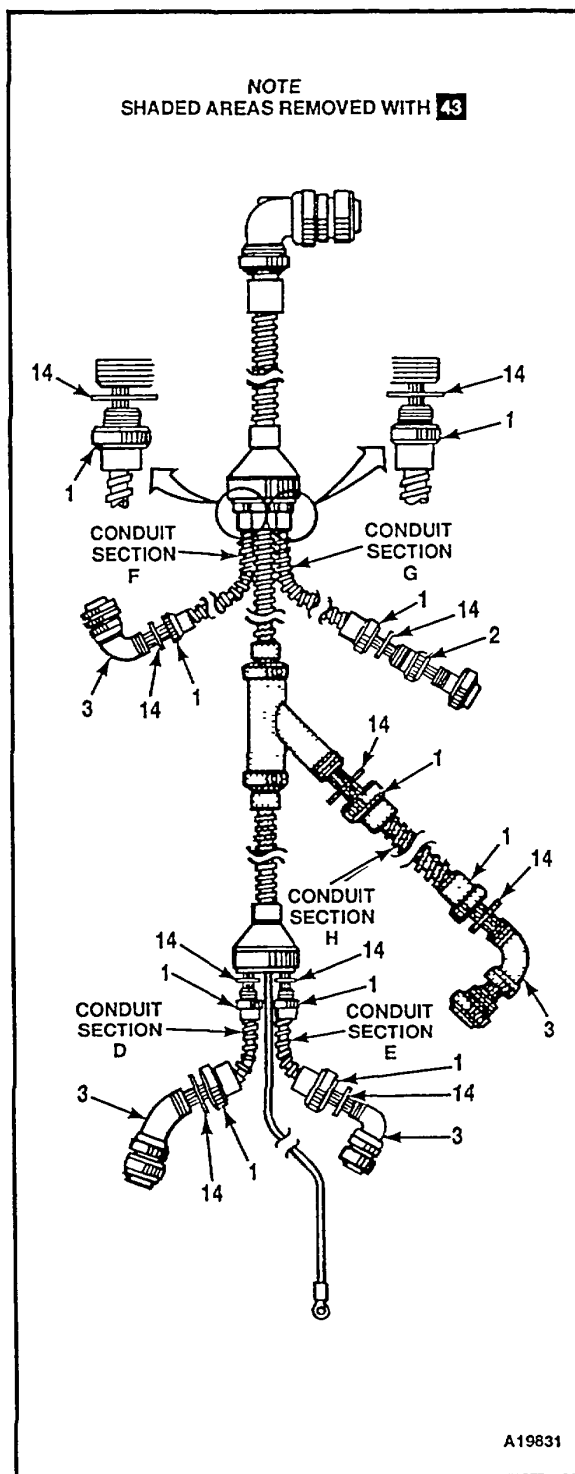
Change 19 4-40.23

4-11.3 REPAIR OF ENGINE ELECTRICAL HARNESS (Continued)

4-11.3

41. Replace conduit sections D, E, F, G, or H as follows:

- a. Loosen conduit nuts (1) from affected junction and connector elbow (3) or adapter (2).
- b. Loosen elbow (3) or adapter (2) from connector.
- c. Pull elbow (3) or adapter (2) back, and remove connector from end of affected branch of harness (steps 1. through 6.).
- d. Slide off damaged conduit assembly.
- e. Slide on new conduit assembly, with applicable ID tag.
- f. At connector end of conduit, pull back conduit to gain access to end of wires. Make sure enough wire extends from conduit to allow installation of connector fitting and connector.
- g. Slide elbow (3) or adapter (2) over wiring and install wiring in connector (TM 55-1500-323-24). Remove tags.
- h. Apply sealant (E340.2) to threads of affected elbow (3) or adapter (2) and connector; and, around wiring at each end of conduit.
- i. Position nylon washers (14) and tighten conduit nuts (1) at elbow (3) or adapter (2) and at other end of conduit.
- j. Tighten elbow (3) or adapter (2) at connector.



INSPECT

FOLLOW-ON MAINTENANCE:

Test harness (Task 4-11.11).

END OF TASK

4-40.24 Change 19

4-12 ASSEMBLE POWERPLANT

4-12

INITIAL SETUP

Applicable Configurations:

All

Tools:Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Hoist

Sling (T134)

Open End Wrench 1-1/2 Inch

Torque Wrench, 30 to 150 Inch-Pounds

Torque Wrench, 100 to 750 Inch-Pounds

Transportation Trailer

Powerplant Adapter (T16)

Materials:

Lockwire (E231)

Petrolatum (E274)

Strap (E376)

Parts:

Gasket

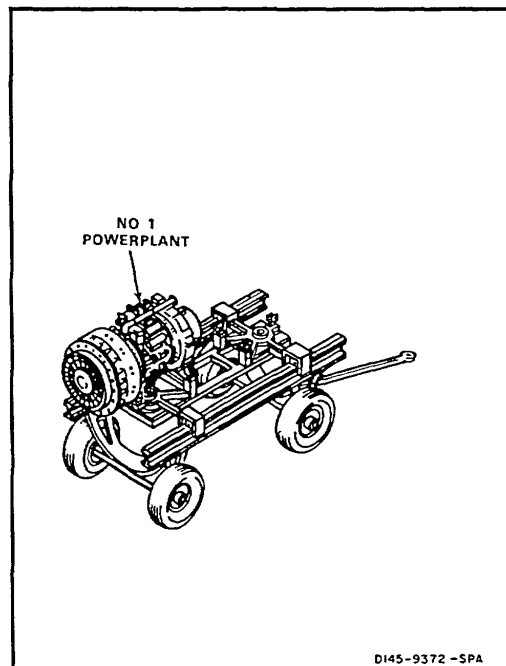
Personnel Required:

Aircraft Powerplant Repairer

Inspector

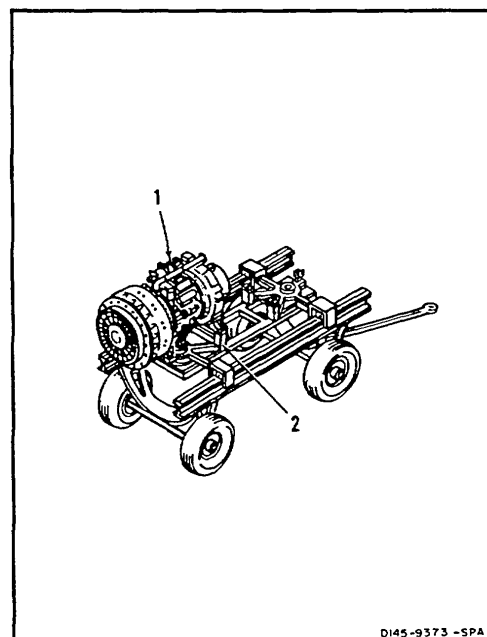
References:

TM 55-1520-240-23P

TM 55-2840-254-23 (Without **74**)TM 1-2840-265-23 (With **74**)

D145-9372 -SPA

1. If powerplant (1) is stored on trailer adapter (2), go to step 15. If not, go to step 2.

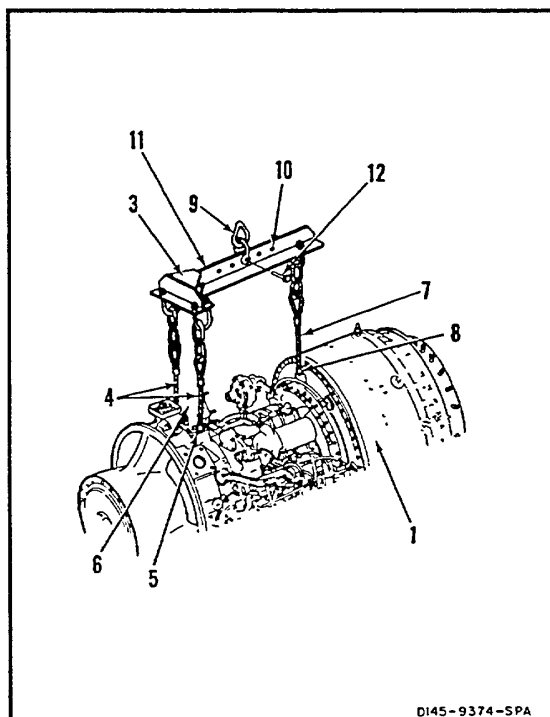


D145-9373 -SPA

GO TO NEXT PAGE

Change 19 4-41

2. Install sling (3) as follows:
 - a. Connect two cables (4) to forward fittings (5) on starter drive housing (6).
 - b. Connect cable (7) to aft fitting (8) on powerplant (1).
 - c. Adjust sling (3) until eye (9) is over aft hole (10) in sling bar (11).
 - d. Install pin (12) through bar (11).

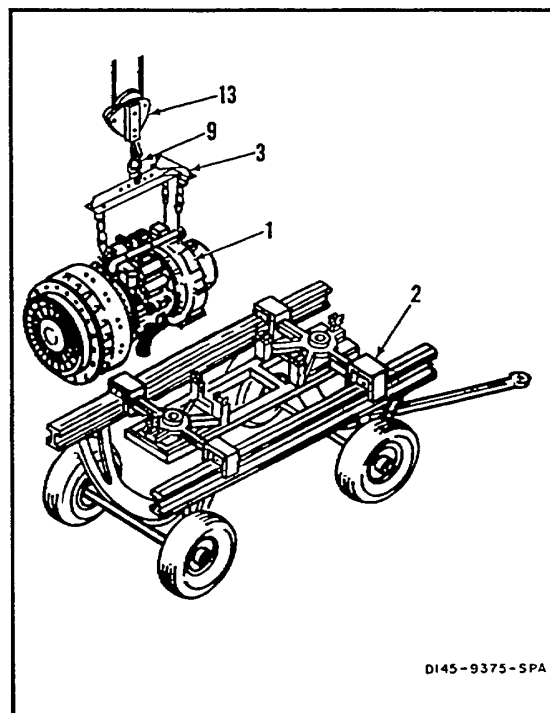


3. Connect hoist (13) to eye (9) of sling (3).

WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear when powerplant is raised.

4. Raise hoist (13) to lift powerplant (1) and prepare powerplant for installation on trailer adapter (2) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



4-12 ASSEMBLE POWERPLANT (Continued)

4-12

5. Position two adapters (14) so holes in adapters align with holes in powerplant (1). Make sure curved surfaces (15) of adapters are down.

WARNING

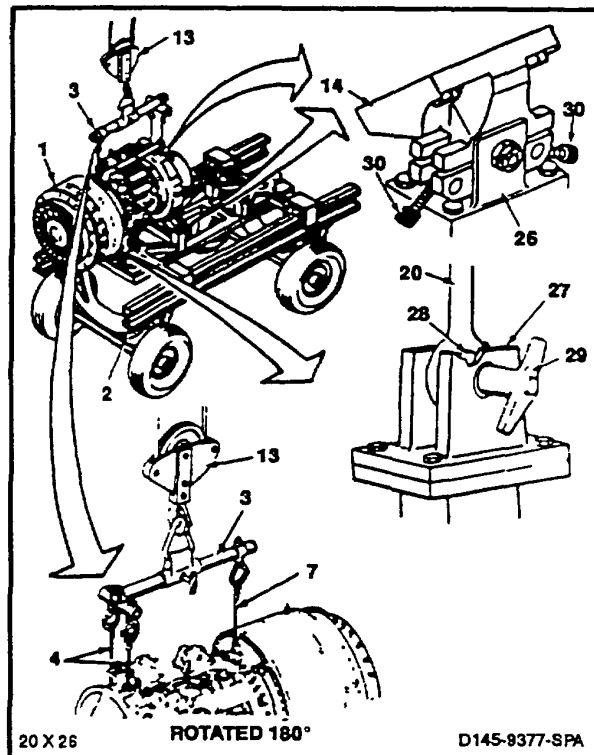
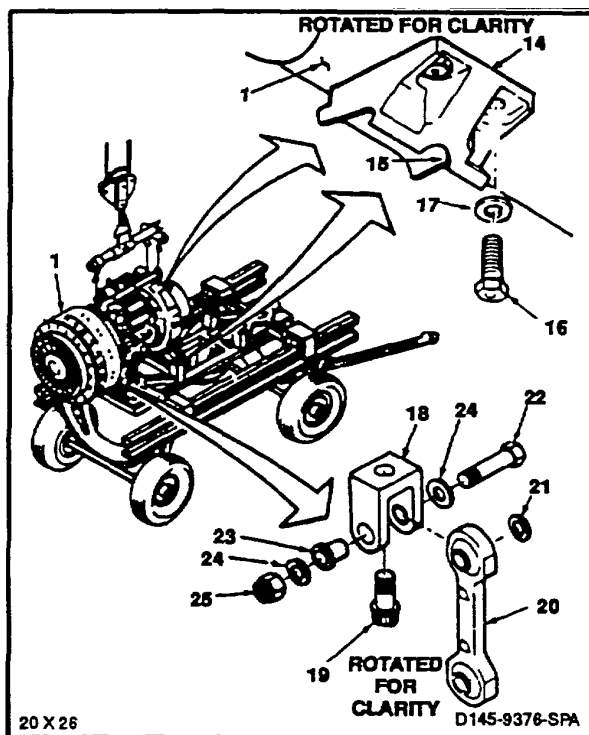
Shipping and mounting hardware are similar. Ensure correct hardware is used during powerplant assembly. Otherwise, damage to powerplant and aircraft as well as injury to personnel may occur.

6. Install eight bolts (16) and washers (17). Torque bolts to 375 inch-pounds. Lockwire bolts. Use lockwire (E231).
7. Position adapter (18) on powerplant (1) and install bolt (19). Torque bolt to 400 inch-pounds. Lockwire bolt. Use lockwire (E231).
8. Align hole in link (20) and spacer (21) with holes in adapter (18). Install bolt (22), bushing (23), two washers (24), and nut (25). Torque nut (25) to 375 inch-pounds to seat bushing. Loosen nut and retorque to 20 inch-pounds above run on torque. Not to be less than 70 inch-pounds.
9. Position powerplant (1) over powerplant adapter (T16). Make sure forward engine mount adapters (14) and aft link (20) align with adapter fittings (26 and 27).

CAUTION

During lowering of powerplant to adapter, make sure bearing in aft engine mount link does not tilt in clevis of adapter fitting. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

10. Lower hoist (13) slowly until powerplant (1) weight is on adapter (2). Make sure bearing (28) in aft mount link (20) does not tilt or wedge in clevis of adapter fitting (27).
11. Install pin (29) through link (20) and adapter fitting (27).
12. Raise four bolts (30) over engine mount adapters (14). Tighten bolts.
13. Disconnect hoist (13) from sling (3).
14. Disconnect three cables (4 and 7) and remove sling (3).

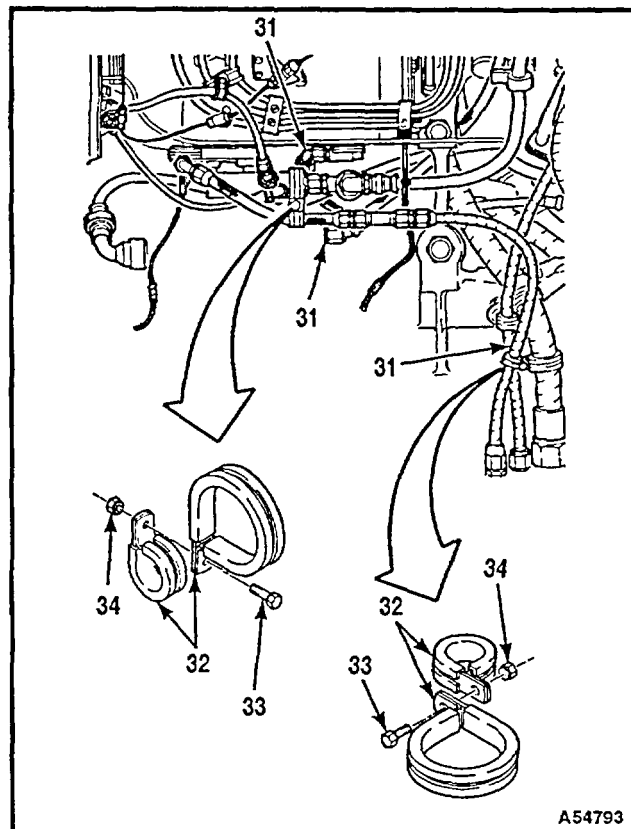


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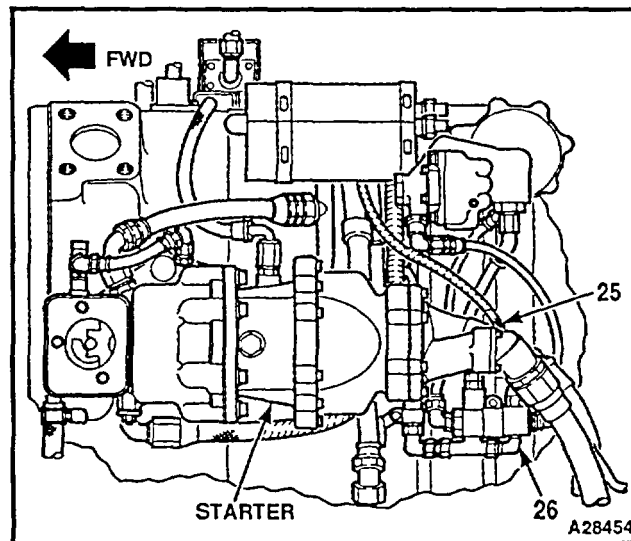
Change 16 4-43

NOTE
Steps 15 thru 32 are with **74**.

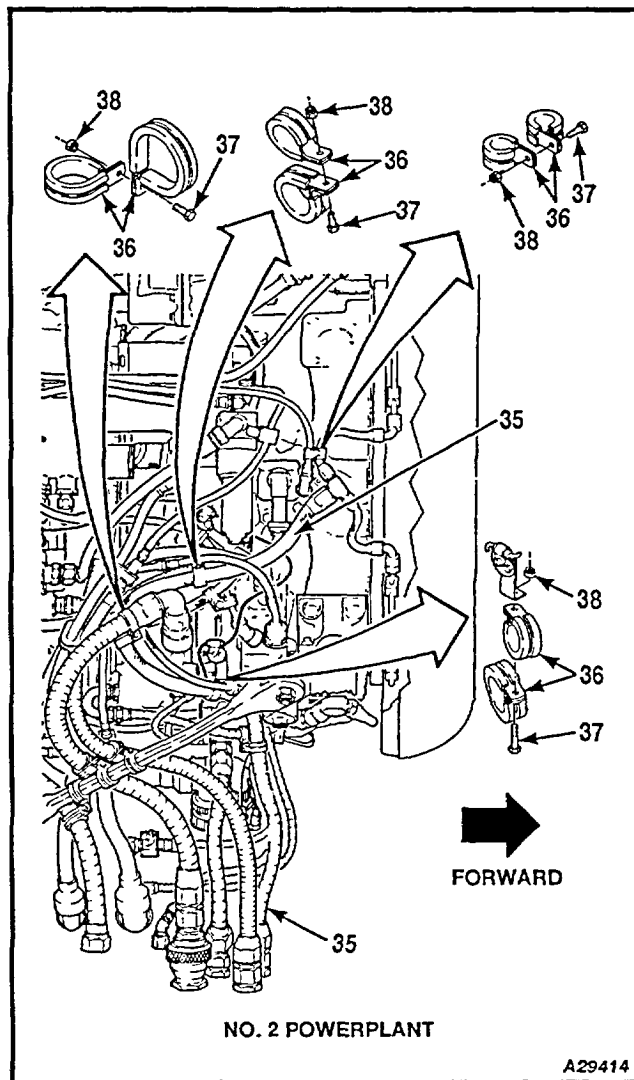
15. Position and install three hoses (31).
16. Install four clamps (32), with two screws (33), and nuts (34). Remove tags and tape from hoses (31).



17. Install line (25) and fitting (26).



18. Position and install two hoses (35).
19. **Install eight clamps (36)** with four screws (37) and nuts (38). Remove tags and tape from hoses (35).



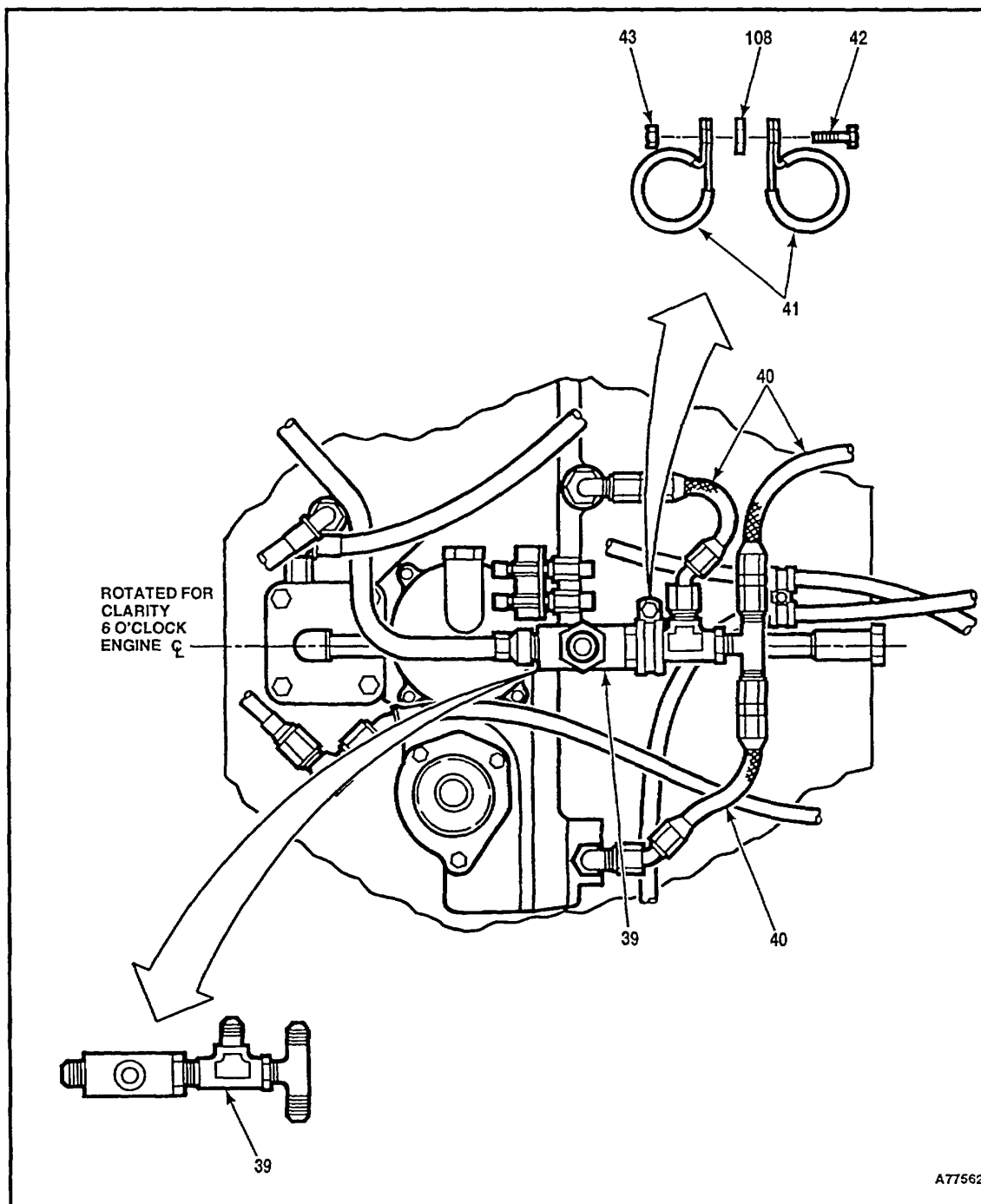
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Change 19 4-44.1

20. Install fitting (39).

21. Position and install three hoses (40).

22. Install two clamps (41) with screw (42), spacer (108), and nut (43).



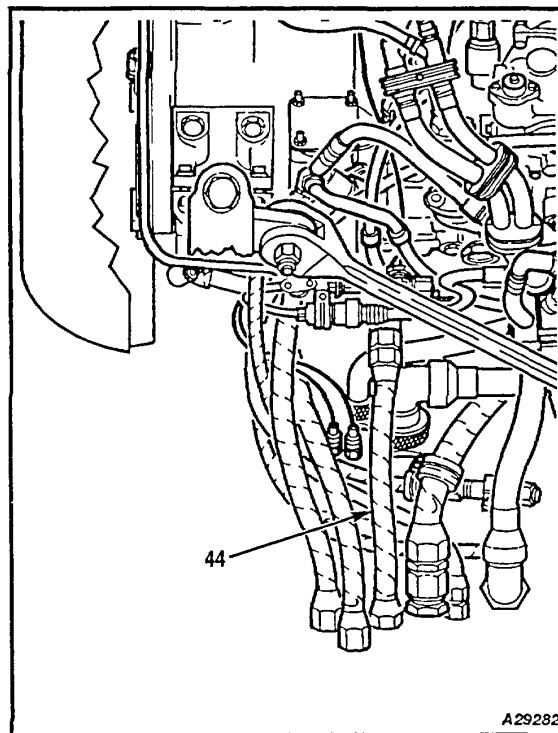
4-12 ASSEMBLE POWERPLANT (Continued)

4-12

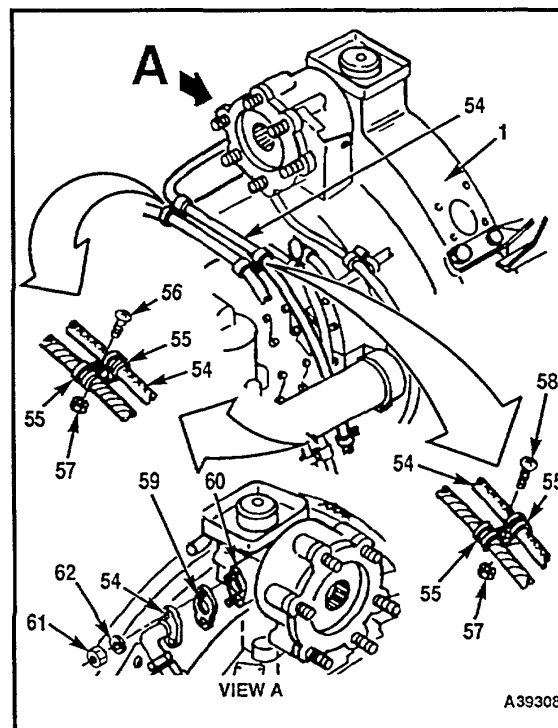
23. Position and install hose (44). Remove tag from hose (44).

24. Position hose (54) on powerplant (1) and install **six clamps (55)**. Install two screws (56) and nuts (57). Install screw (58). Remove tag.

25. Install **serviceable gasket (59)** on starter drive housing. Position hose (54) on housing (60) and install two nuts (61) and two washers (62). Remove tag and tape.



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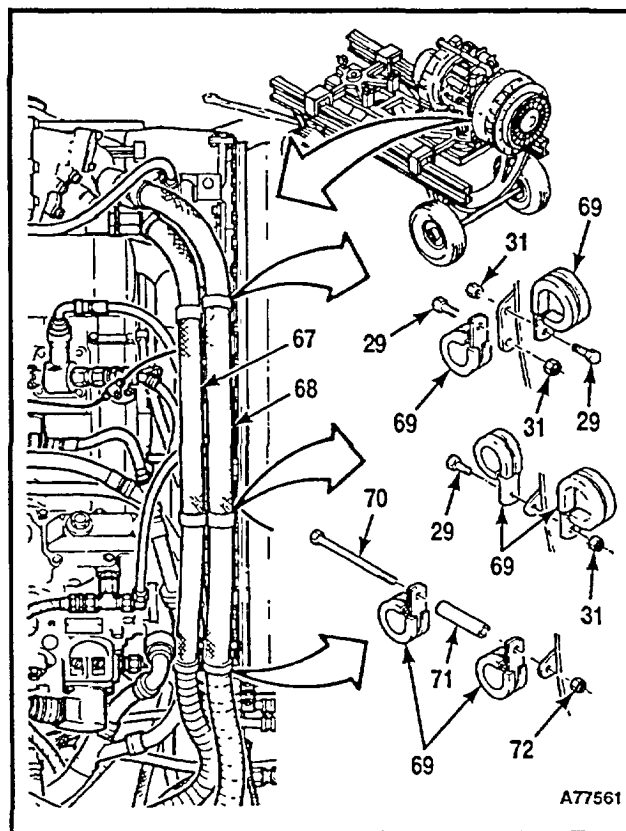


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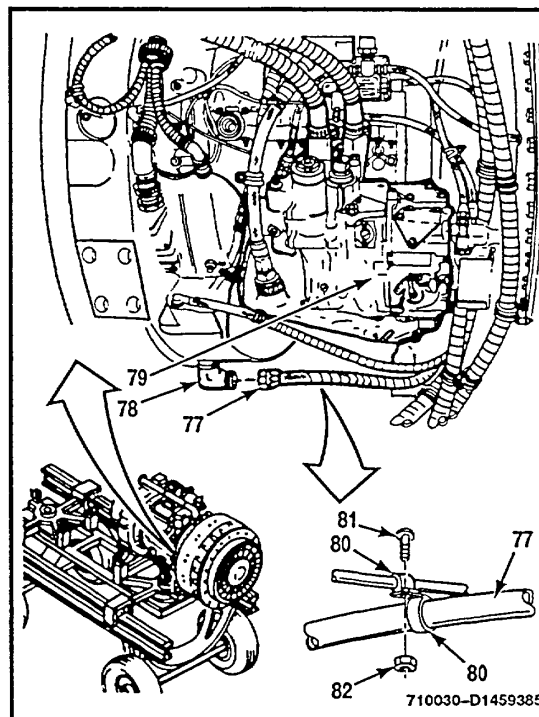
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Change 19 4-44.3

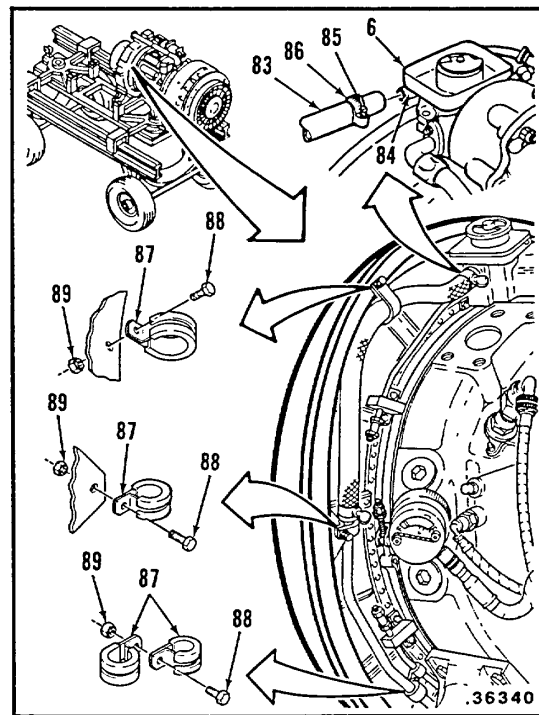
26. Position two hoses (67 and 68) on powerplant.
27. Install six clamps (69) on two hoses (67 and 68).
28. Install one screw (70), one spacer (71), and one nut (72). Remove tags and tape from hoses (67 and 68).
29. Install three screws (29) into three clamps (69) and three nuts (31). Remove tags and tape from hoses (67 and 68).



- 30. Connect hose (77) to elbow (78). Remove tag.
- 31. Install two clamps (80) and install screw (81) and nut (82). Remove tape from hose (77).



- 32. Install hose and line assembly (83) on fitting (84) on oil filler (6). Tighten screw (85) on clamp (86).
- 33. Install four clamps (87) and install three screws (88), and nuts (89). Remove tags and tape from hose (83).



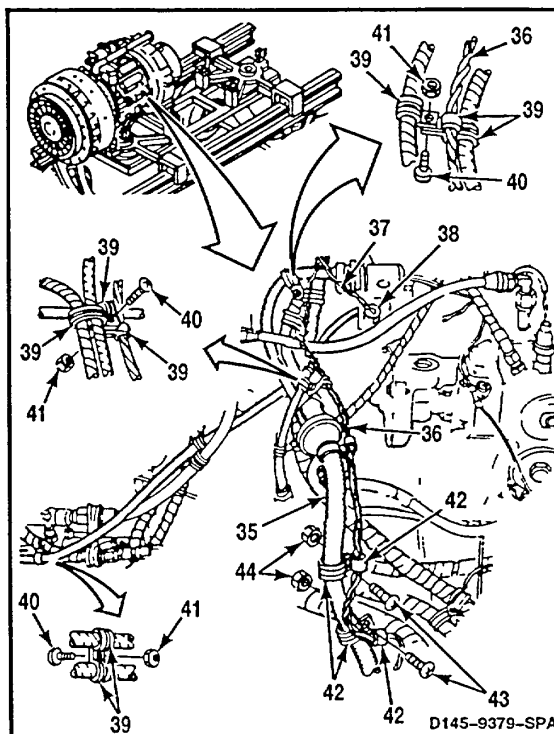
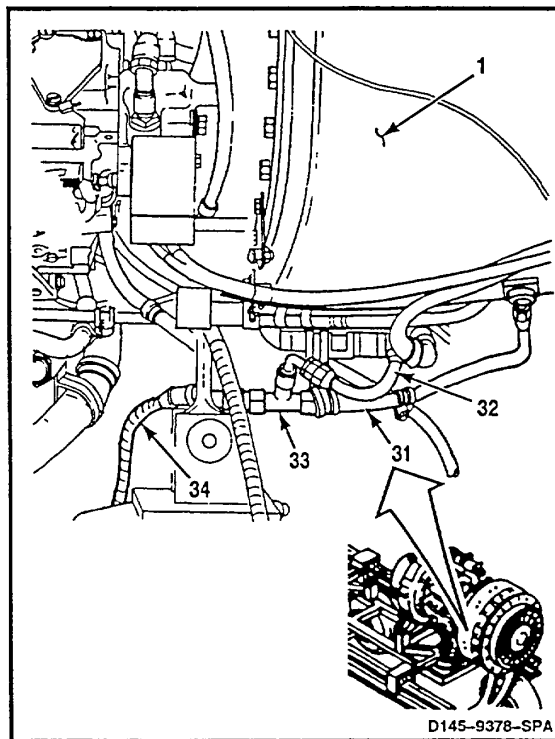
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4-12 ASSEMBLE POWERPLANT (Continued)

4-12

NOTESteps 34 thru 55 are without **74**.

34. **Connect hose (31)** to powerplant (1). Remove tags.
35. **Connect hose (32)** to powerplant (1). Remove tag.
36. **Connect tee (33)** to two hoses (31 and 32). Remove tag.
37. **Connect hose (34)** to tee (33). Remove tag.
38. **Position two electrical harnesses (35 and 36)** on powerplant (1) and **connect two plugs (37 and 38)**.
39. **Install nine clamps (39)** and **install five screws (40)** and nuts (41).
40. **Install four clamps (42)** and **install two screws (43)** and nuts (44).

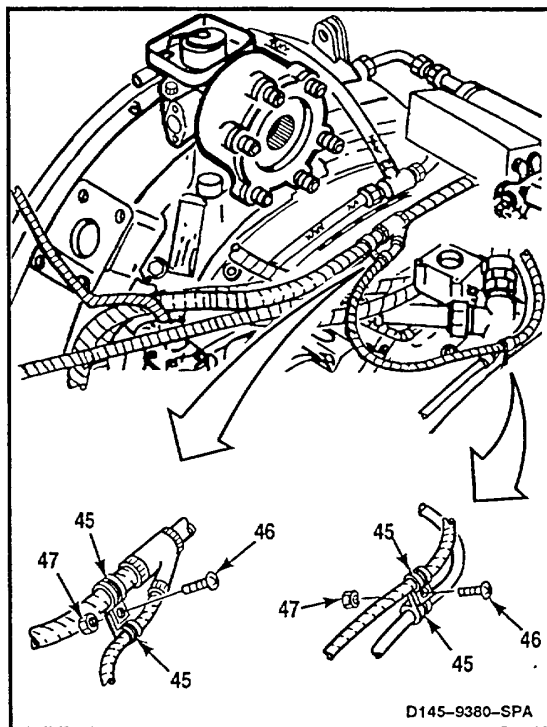


41. Install four clamps (45) and install two screws (46) and nuts (47).

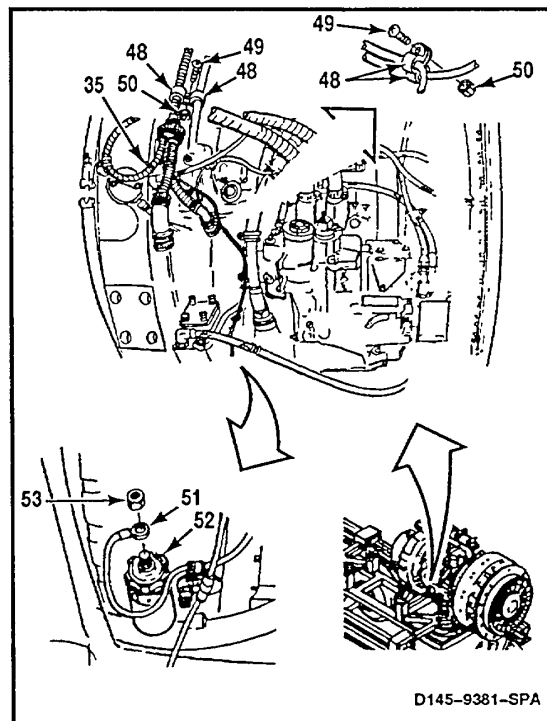
42. Install four clamps (48) and install two screws (49) and two nuts (50). Remove tape from harness (35).

43. Secure chip detector wire (51) to harness (35). Use strap (E376).

44. Connect wire (51) to chip detector (52). Install nut (53).



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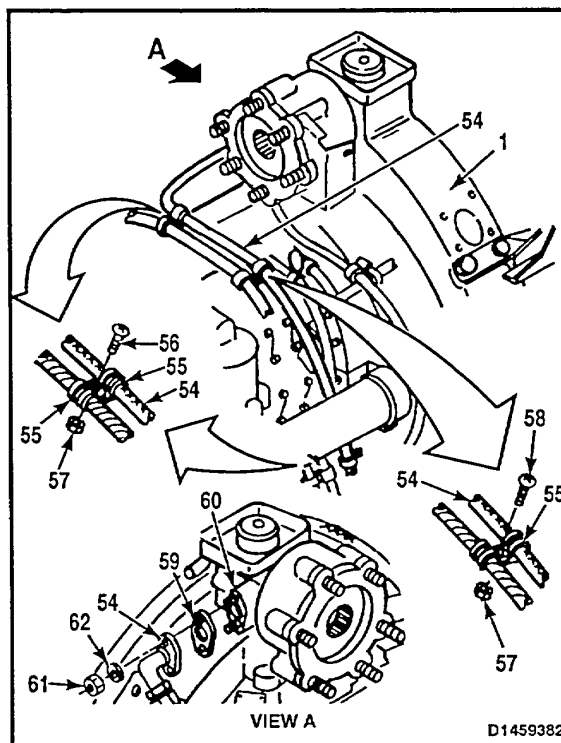


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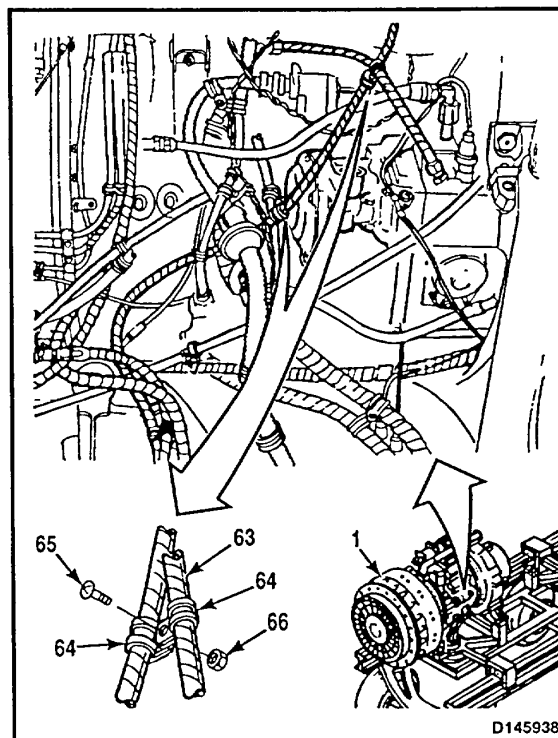
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Change 19 4-45

- 45. Position hose (54) on powerplant (1) and install six clamps (55). Install two screws (56) and two nuts (57). Install and lockwire screw (58). Use lockwire (E231). Remove tag.
- 46. Install serviceable gasket (59) on starter drive housing (60). Position hose (54) on housing and install two nuts (61) and two washers (62). Remove tag

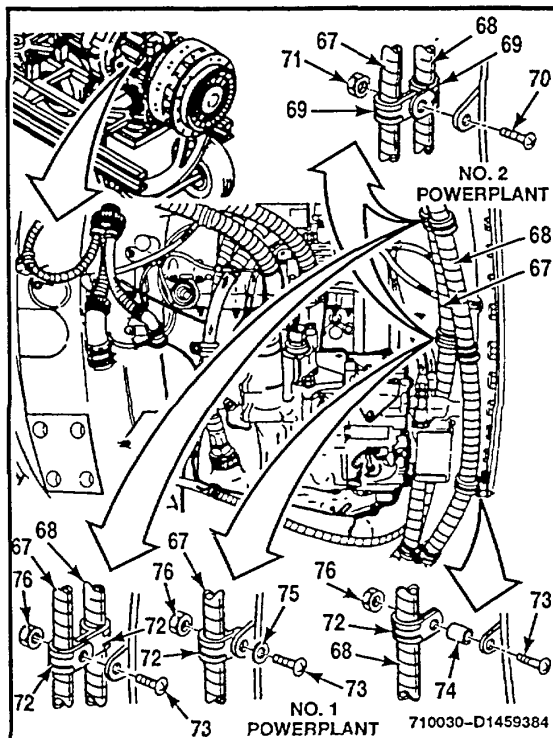


- 47. Position starter drain hose (63) on powerplant (1). Install four clamps (64) and install two screws (65) and two nuts (66). Remove tag and tape from hose.

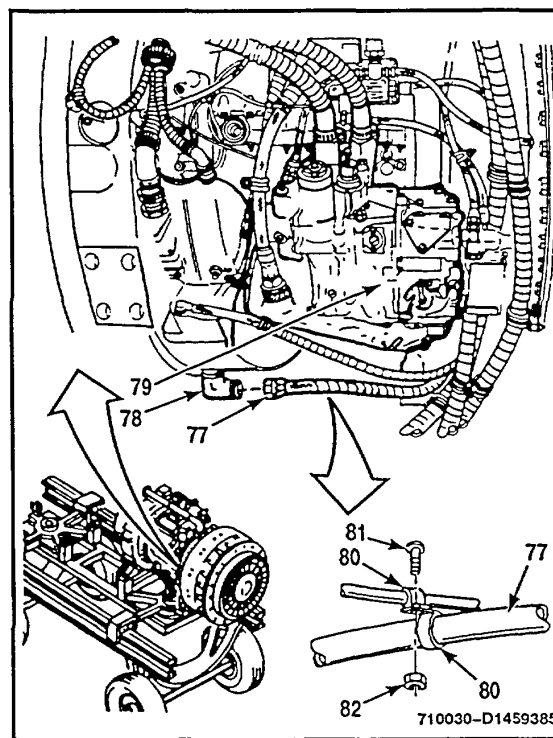


4-12 ASSEMBLE POWERPLANT (Continued)

- 48. Position two hoses (67 and 68) on powerplant (1).
- 49. On No. 2 powerplant, install four clamps (69) and install two screws (70). Install two nuts (71) on screws (70). Remove tag and tape from hoses (67 and 68).
- 50. On No. 1 powerplant, install four clamps (72) on two hoses (67 and 68). Install three screws (73), spacer (74), washer (75), and two nuts (76). Remove tag and tape from hoses.



- 51. Connect hose (77) to elbow (78) on fuel control (79). Remove tag.
- 52. Install two clamps (80) and install screw (81) and nut (82). Remove tape from hose (77).

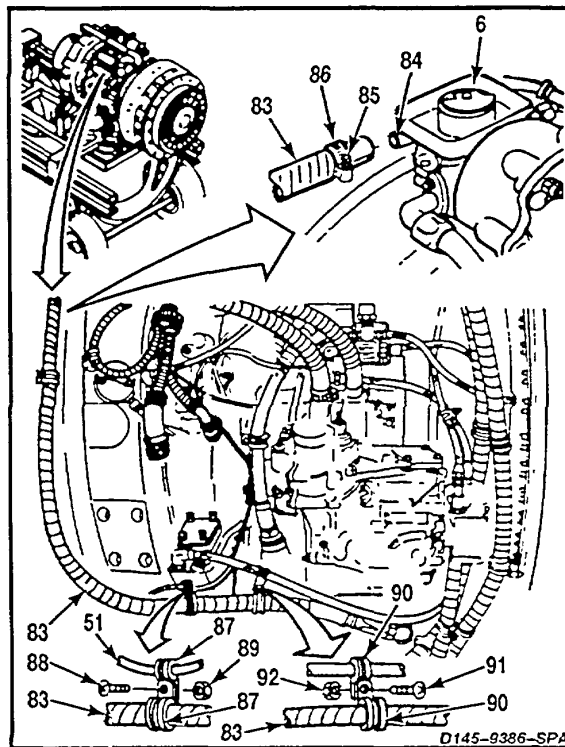


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53. Install hose (83) on fitting (84) on oil filler (6). Tighten screw (85) on clamp (86).

54. Install two clamps (87) and install screws (88) and nut (89). Remove tags and tape from hose (83) and wire (51).

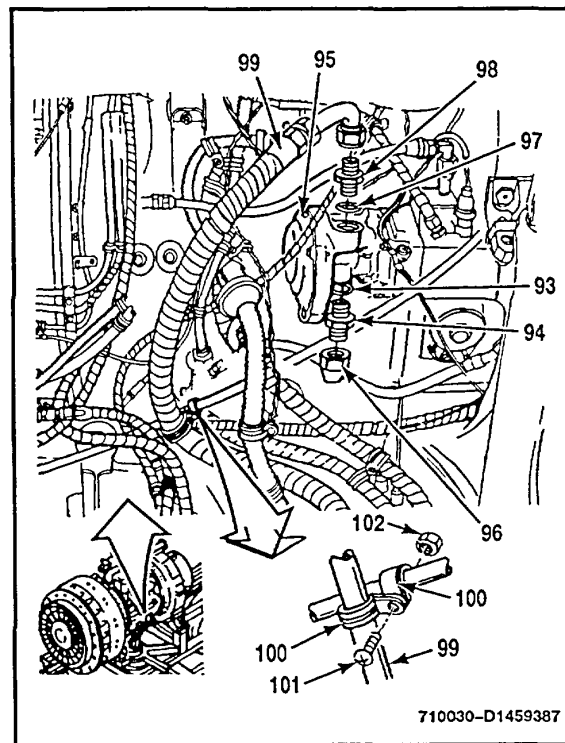
55. Install two clamps (90) and install screw (91) and nut (92). Remove tag and tape from hose (83).



56. Lubricate packing (93) with petrolatum (E274). Install packing on union (94). Install union on fuel pump (95). Connect hose (96) to union. Remove tag.

57. Lubricate packing (97) with petrolatum (E274). Install packing on reducer (98). Install reducer in fuel pump (95). Connect hose (99) to reducer. Remove tag.

58. Install two clamps (100) and install screw (101) and nut (102). Remove tape from hose (99).



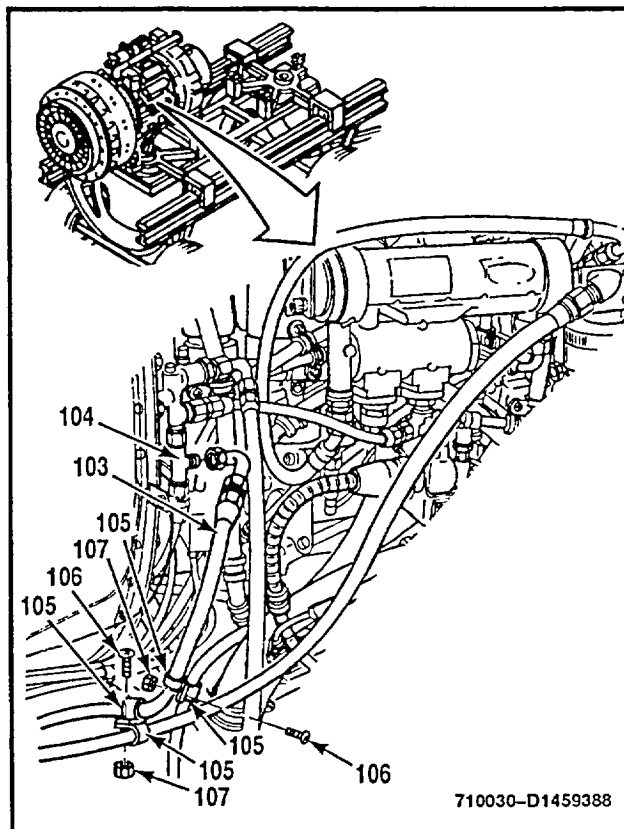
4-12 ASSEMBLE POWERPLANT (Continued)

4-12

59. Connect hose (103) at fitting (104).
60. Install four clamps (105). Install two screws (106) and nuts (107). Remove tag and tape from hose (103).

INSPECT**FOLLOW-ON MAINTENANCE:**

- For engines without **74**.
 - Install fairing hot air valve (Task 4-79).
 - Install gas producer control actuator support bracket (Task 4-111).
 - Install power turbine control actuator (Task 4-139).
 - Install gas producer control actuator (Task 4-109).
 - Install and rig power turbine control linkage (Task 4-140).
 - Install and rig gas producer control linkage (Task 4-113).
- For all engines:
 - Install gas producer tachometer generator (Task 8-12 or 8-13) (without **74**).
 - Install starter (Task 7-142).
 - Install fire detection sensing element (Task 12-13).
 - Install engine cover former (Task 4-46).
 - Install exhaust cone (Task 4-90).
 - Install engine air inlet fairing (Task 4-75).
 - Install engine access cover (Task 4-59).



END OF TASK

Change 19 4-49

4-13 INSTALL POWERPLANT

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Torque Wrench, 0 to 150 Inch-Pounds
- Torque Wrench, 100 to 750 Inch-Pounds
- Rope Guide Lines
- Hoist
- Crowfoot Attachment, 3/8-Inch
- Sling (T134)

Materials:

- Lockwire (E229)
- Lockwire (E231)
- Petrolatum (E274)

Personnel Required:

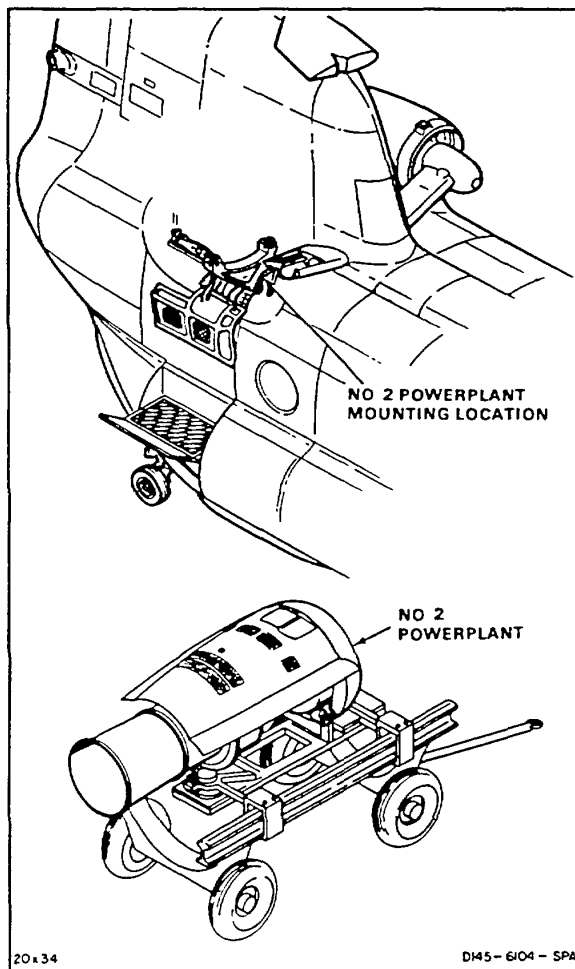
- Medium Helicopter Repairer (3)
- Inspector

References:

- TM 55-1520-240-23P
- Task 4-44
- Task 6-107

Equipment Condition:

- Aft Engine Mount Link and Adapter Parts Inspected (Task 4-37)

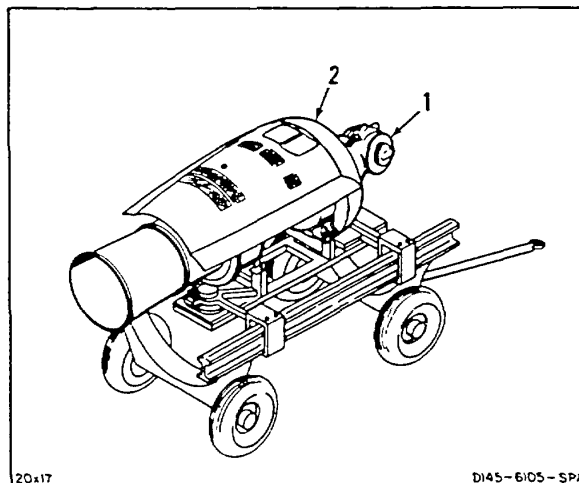


NOTE

Procedure is same to install No. 1 or No. 2 powerplant. Installation of No. 2 powerplant is shown here.

INSTALL POWERPLANT WITH ENGINE TRANSMISSION INSTALLED

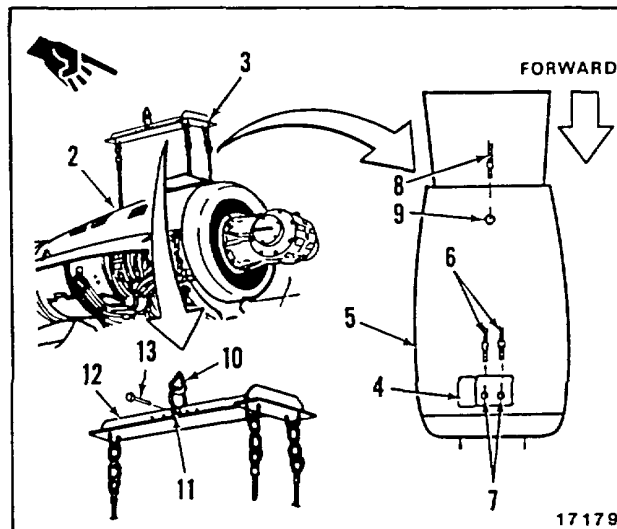
1. Install engine transmission (1) on powerplant (2) (Task 6-107).



4-13 INSTALL POWERPLANT (Continued)

4-13

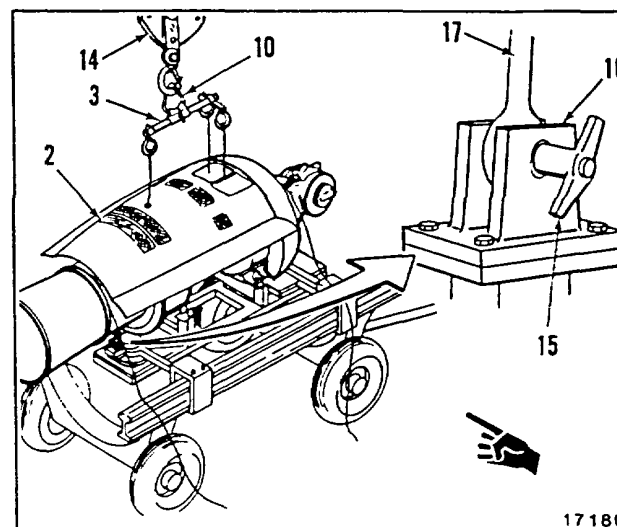
2. **Install sling (3)** as follows:
 - a. Open access door (4) in engine access cover (5).
 - b. Connect two cables (6) into forward fittings (7) on powerplant (2).
 - c. Connect cable (8) into aft fitting (9) through cover (5).
 - d. Adjust sling (3) until eye (10) is over center hole (11) in sling bar (12).
 - e. Install pin (13) through bar (12).



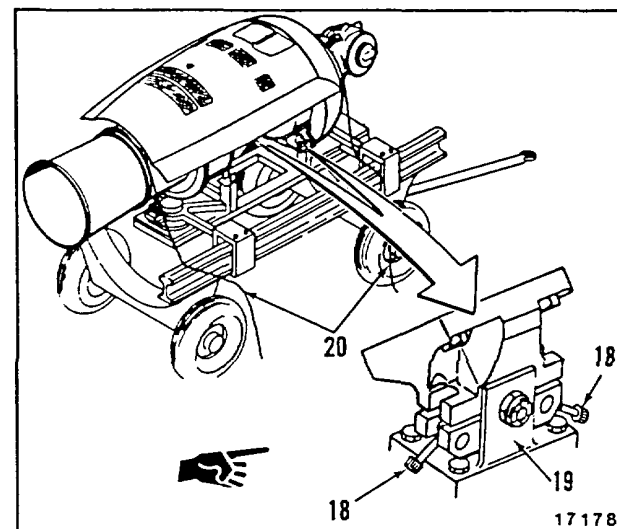
3. **Connect hoist (14)** to eye (10) of sling (3). **Absorb weight of powerplant (2) with hoist.**
4. **Remove pin (15)** from adapter fitting (16) and aft mount link (17).

WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear while powerplant is being moved by hoist.



5. **Loosen four bolts (18)** on trailer adapter (T19) and push down to side.
6. Install rope guide lines (20).



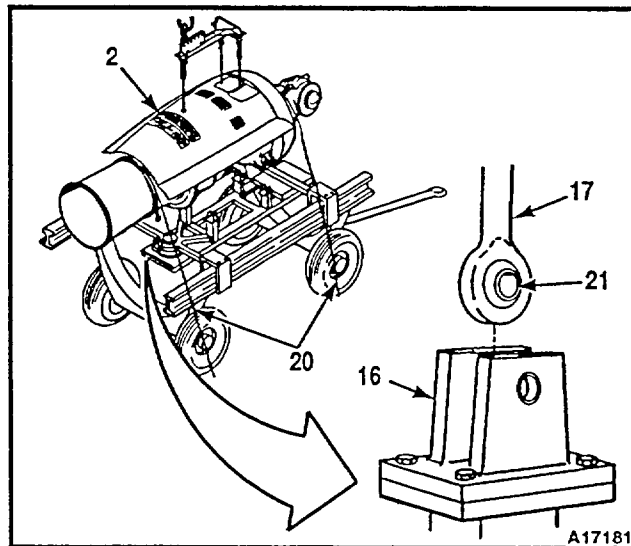
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Change 10 4-51

CAUTION

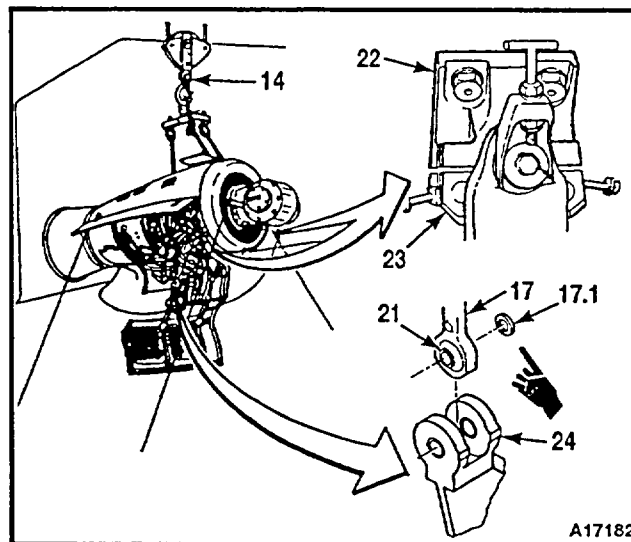
During raising of powerplant, make sure bearing in lower end of aft engine mount link does not tilt in clevis of trailer adapter (T16). If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

7. **Raise powerplant (2).** Make sure bearing (21) in aft mount link (17) does not tilt or wedge in fitting (16). Have helpers guide powerplant (2) with rope guide lines (20).

**CAUTION**

- During lowering of powerplant, make sure bearing in lower end of aft support link does not tilt in engine mount clevis. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.
- Make sure all hydraulic, fuel, and electrical cables are routed behind connecting link on No. 1 powerplant.

8. Slowly lower hoist (14) until forward adapters (22) rest on caps (23).
- 8.1. Align holes in aft link (17) with spacer (17.1) with holes in aft engine mount (24). Lower hoist (14) until aft link (17) fits in aft engine mount (24). Make sure bearing (21) does not tilt in aft engine mount (24).



CAUTION

Make sure powerplant weight is on aft support link and not on firewall former. Damage to powerplant and former can occur if weight is not on support link.

9. Install slip fit bushing (25), shoulder outboard, in clevis (24).
10. Install bolt (26), two washers (27), and nut (28). Raise or lower powerplant (2) as needed for clearance.
11. Adjust firewall former (29) (Task 4-44).
12. Relax tension on hoist (17).
13. Torque nut (28) to 375 inch-pounds to seat bushing. Loosen nut and retorque to 20 inch-pounds above run-on torque. Not to be less than 70 inch-pounds.

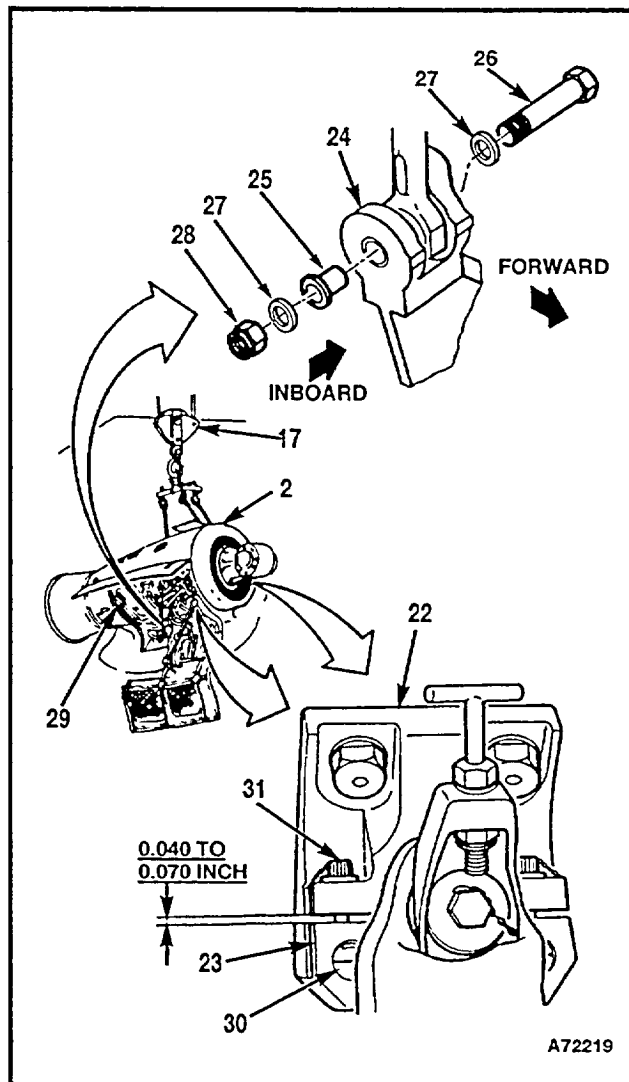
INSPECT

14. Check barrel nuts (30). Breakaway torque shall not be less than 7 inch-pounds.
15. Push four bolts (31) up and over adapter (22) and tighten evenly.
16. Torque bolts (31) to 20 inch-pounds above friction torque.

NOTE

It is acceptable for clearances to vary inboard to outboard and/or forward to aft providing the clearance at any point is within the defined limits.

17. Measure gap between adapters (22) and caps (23). Gap shall measure 0.040 to 0.070 inch.
18. Torque bolts (31) to 105 inch-pounds.
19. Measure gap between adapters (22) and caps (23). Gap shall measure 0.040 to 0.070 inch.

**NOTE**

It is acceptable for clearances to vary inboard to outboard and/or forward to aft providing the clearance at any point is within the defined limits.

20. Check bolts (31). Bolts shall protrude a minimum of two threads through barrel nuts (30), but shall not bottom out. Add washers under bolthead if bolt is bottoming out. Lockwire bolts. Use lockwire (E231).

INSPECT

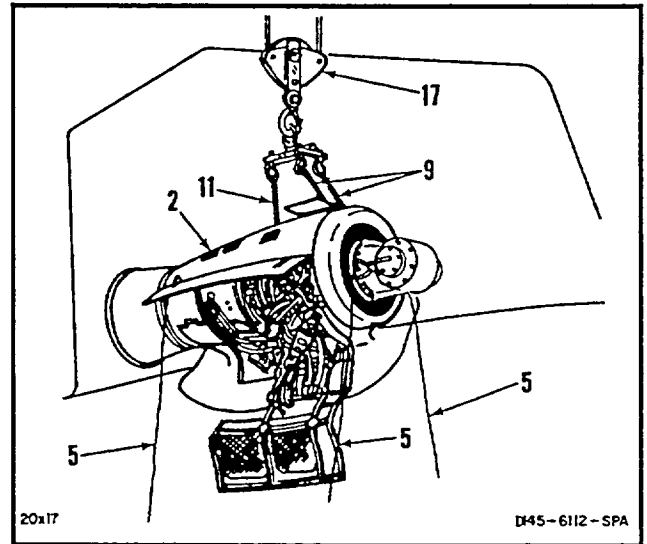
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Change 19 4-53

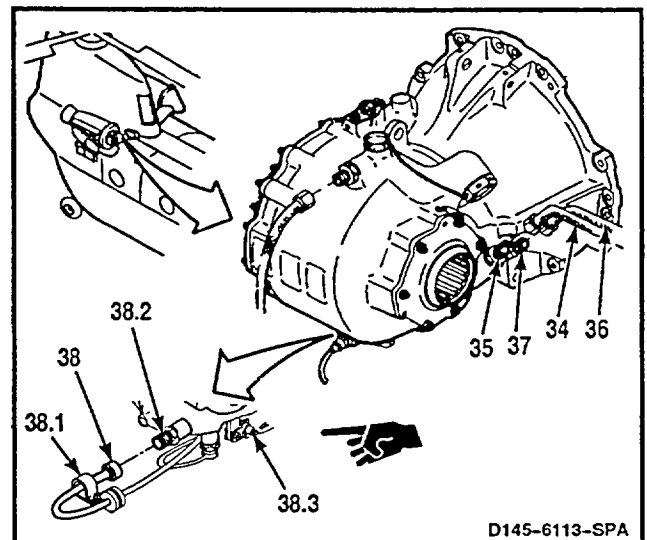
4-13 INSTALL POWERPLANT (Continued)

4-13

21. **Disconnect three cables (9 and 11) from powerplant (2).**
22. Lift sling, with cables (9 and 11), away from powerplant (2). Remove cables from hoist (17).
23. **Remove rope guide lines (5).**



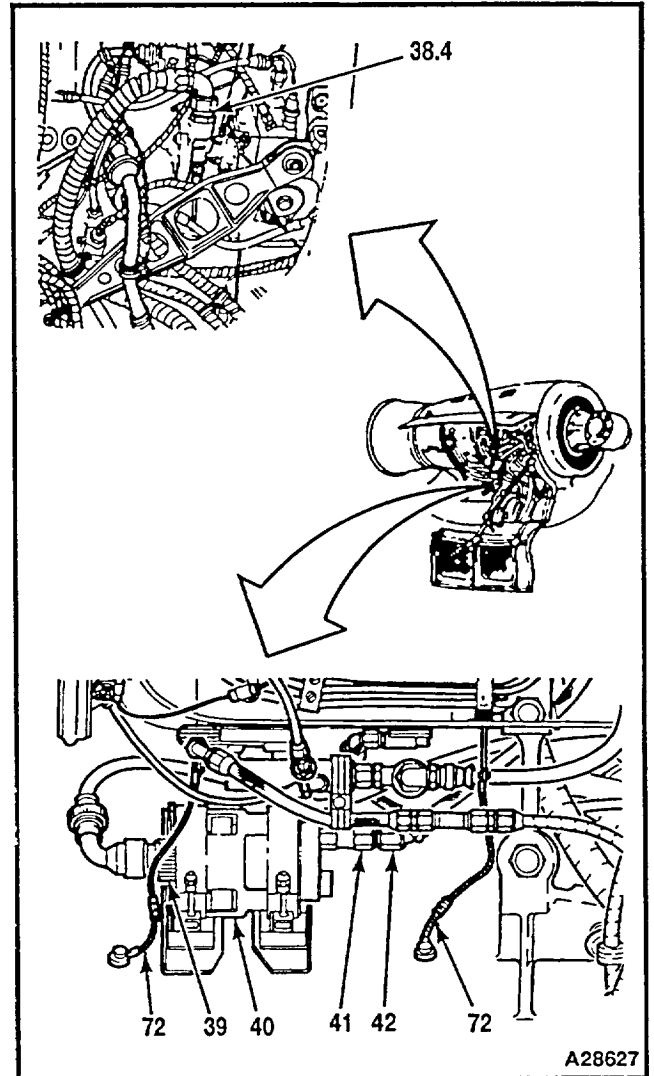
24. **Connect hose (32) to port (33) in transmission (1).** Remove tag from hose.
25. **Connect hose (34) to port (35).** Remove tag from hose.
26. **Connect hose (36) to port (37).** Remove tag from hose.
27. **Connect cable plug (38) to temp switch (38.2). Tighten strain relief (38.1) to properly secure cable to plug.**
- 27.1 Connect cable plug to remote connector (38.3) for transmission chip detector.



4-13 INSTALL POWERPLANT (Continued)

4-13

- 27.2. Tighten fuel boost pump inlet fitting (38.4).
- 27.3. Connect bonding jumpers (72) with **74**.
28. **Connect cable plug (39)** to oil pressure transmitter (40). Lockwire plug. Use lockwire (E229).
29. Lubricate thread of fitting (41). Use petrolatum (E274). **Connect hose (42)**.



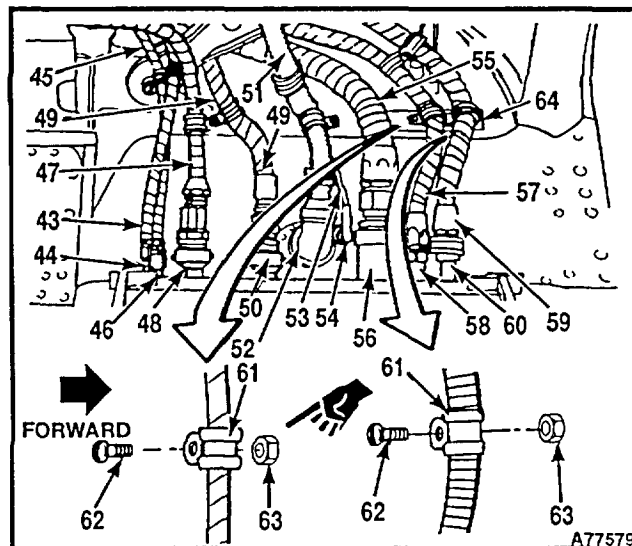
GO TO NEXT PAGE

Change 19 4-54.1

NOTE

In order to minimize or alleviate chafing, the following actions may be taken with no change of routing allowed:

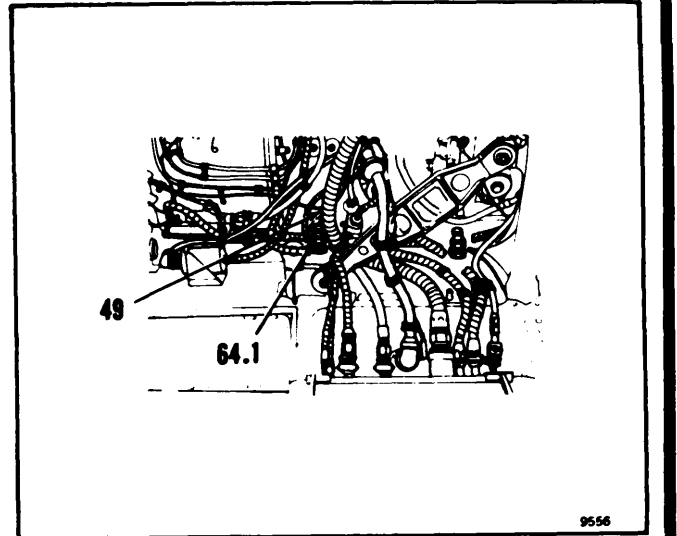
- a. Installation of spiral wrap.
- b. Minor repositioning of existing clamps.
- c. Minor reshaping of fire detection sensing wires.
- d. Reclocking of hose connections.
- e. Minor reclocking of electrical connectors. (This should be done only when all previous methods have been tried.)



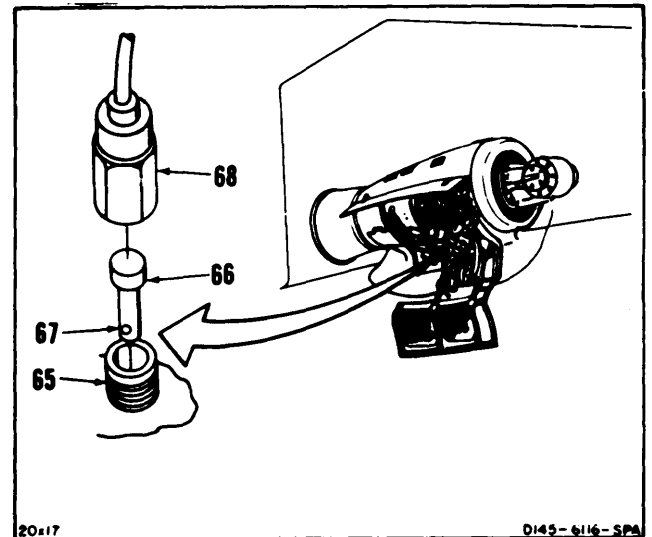
30. Connect hose (43) to port (44). Remove tag.
31. Connect hose (45) to port (46). Remove tag.
32. Connect hose (47) to port (48). Remove tag.
33. Connect hose (49) to port (50). Remove tag.
34. Connect cable connector (51) to receptacle (52). Remove tag.
35. Connect cable connector (53) to receptacle (54). Remove tag. Lockwire connector. Use lockwire (E229).
36. Connect hose (55) to port (56). Remove tag.
37. Connect hose (57) to port (58). Remove tag.
38. Connect hose (59) to port (60). Remove tag
39. Connect two clamps (61). Install two screws (62) and nut (63) in bracket (64). Remove tape.

4-13 INSTALL POWERPLANT (Continued)**4-13**

- 39.1 Make sure hose (49) cannot chafe on aft nozzle (64.1).



40. Remove caps from receptacles (65). Make sure inserts (66) are in receptacles (65). White dot (67) first.
41. **Connect two connectors (88)** to receptacles (65) at fuselage.

**GO TO NEXT PAGE**

42. Torque connectors (68) to 65 inch-pounds.

CAUTION

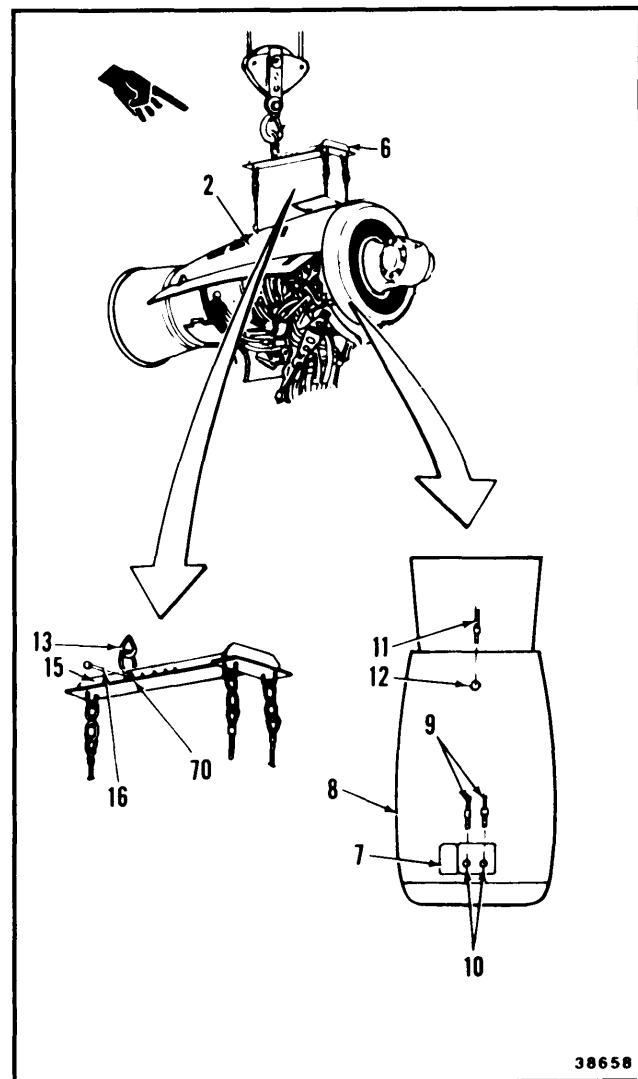
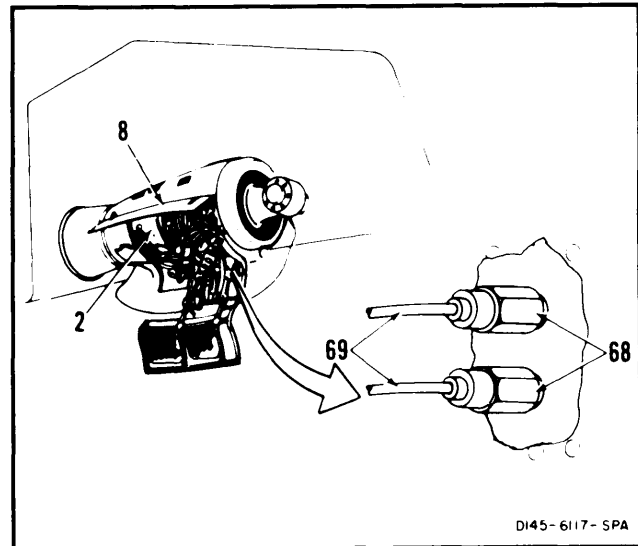
Make sure fire detection sensing element cannot chafe on powerplant or cover. Chafing can result in a false fire indication or an inoperative fire detection system.

43. Make sure fire detection sensing element (69) cannot chafe on powerplant (2) or cover (8).

INSPECT**INSTALL POWERPLANT WITH ENGINE TRANSMISSION REMOVED****NOTE**

Art for steps 44, 46 and 47 is referenced to Install Powerplant with Engine Transmission Installed section. Referenced art shows engine transmission installed but will not affect task performance.

44. Perform step 2 and 3. Then go to step 45.
45. Install sling (6) as follows:
- Open access door (7) in engine access cover (8).
 - Connect two cables (9) into forward fittings (10) on powerplant (2).
 - Connect cable (11) into aft fitting (12) through cover (8).
 - Adjust sling (6) until eye (13) is over aft hole (70) in sling bar (15).
 - Install pin (16) through bar (15).
46. Perform steps 5 through 23. Then go to step 47.
47. Perform steps 28 through 43. Then go to follow-on maintenance.

**GO TO NEXT PAGE**

4-13 INSTALL POWERPLANT (Continued)

4-13

FOLLOW-ON MAINTENANCE:

Install engine transmission (if not already installed) (Task 6-107).

Install engine drive shaft (Task 6-32).

Install engine transmission fairing (Task 4-73).

Install engine air inlet screens (Task 4-76).

Perform operational check of gas producer control system (TM 55-1520-240-T, without 74).

Perform operational check of power turbine control system (TM 55-1520-240-T, without 74).

Close engine side and lower access covers (Task 4-50).

Close engine work platform (Task 2-2).

Perform initial run-up (Task 4-4).

Check powerplant plumbing for leaks.

Perform operational check of engine oil low level warning system (TM 55-1520-240-T).

Retorque exhaust cone coupling nuts after initial ground run. (Task 4-90).

Perform operational check of engine torquemeter indicating system (TM 55-1520-240-T).

Perform operational check of PTIT indicating system and resistance check of the harness assembly (TM 55-1520-240-T, TM 55-2840-254-23 (without 74), TM 1-2840-265-23 (with 74), and Task 4-24).

Check forward engine mounts for proper clearance. Do not exceed 4 flight hours. Torque forward engine mount adapter bolts (Task 4-35).

Adjust engine droop eliminator variable resistors (Task 4-188, without 74).

Install and rig power turbine control linkage (Task 4-140, without 74).

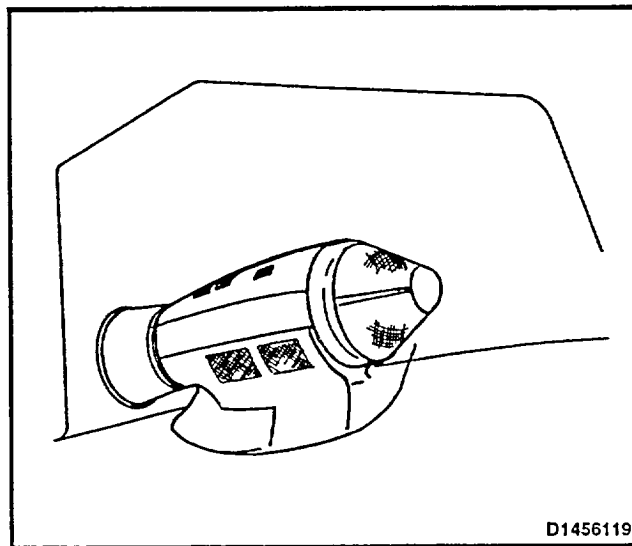
Rig thrust control position transducer assembly (Task 4-154, with 74).

Upload DECU with new engine data (Task 4-149, with 74).

Perform operational check of FADEC system (TM 55-1520-240-T, with 74).

Depreserve the powerplant (Task 4-159, with 74).

Perform P3 leak check (Task 4-160, with 74).

**END OF TASK****Change 19 4-57**

4-14 PERFORM ENGINE VIBRATION TEST

4-14

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
Vibration Mounting Kit,
NSN 4920-00-879-0331
Electrical Power Cable Assembly
Torque Wrench, 30 to 150 Inch-Pounds
Stopwatch
AC Power Supply, 115 Volts, 400 Hz
Adapter, Appx E-1

Materials:

Tape (E399)

Parts:

Keywashers, Bolts

Personnel Required:

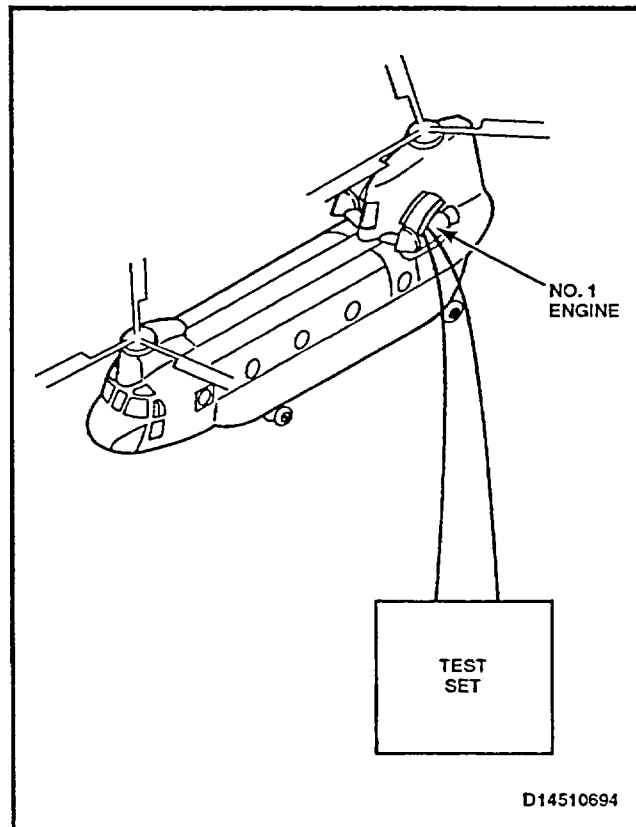
Aircraft Powerplant Repairer
Inspector
Army Rotary-Wing Aviator (2)

References:

TM 55-1520-240-10
TM 55-4920-243-15
Task 1-36
Task 2-2
Task 4-49
Task 4-50

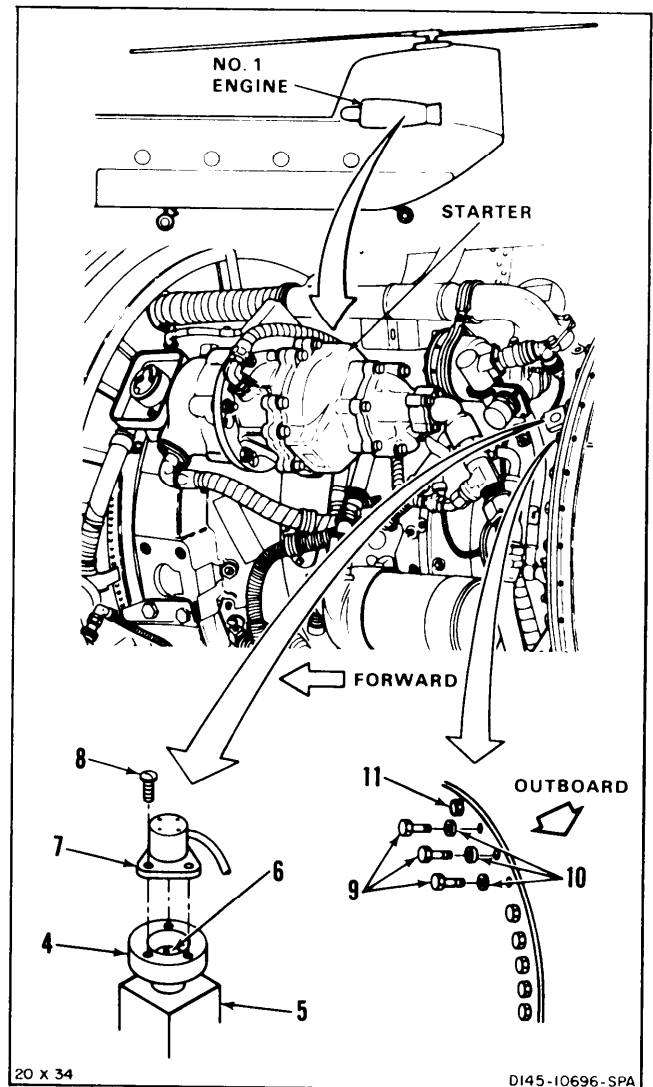
Equipment Condition:

Battery Connected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

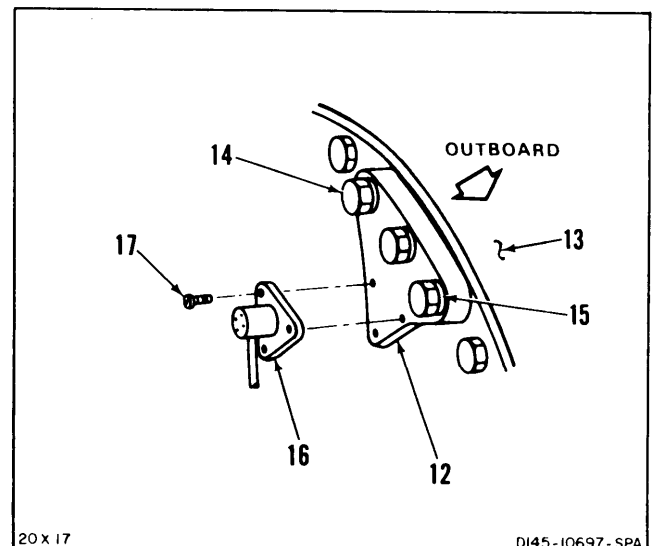


4-14 PERFORM ENGINE VIBRATION TEST (Continued)**4-14****INSTALL TEST SET**

3. **Position adapter (4) in fitting (5) and secure with screw (6).**
4. **Position transducer (7) on adapter (4) and secure with three screws (8).**
5. **Remove three bolts (9) and keywashers (10), outboard from top bolt (11).**



6. **Position adapter (12) on powerplant (13) and install three bolts (14) and keywashers (15).**
7. **Position transducer (16) on adapter (12) and secure with three screws (17).**

**GO TO NEXT PAGE**

4-14 PERFORM ENGINE VIBRATION TEST (Continued)

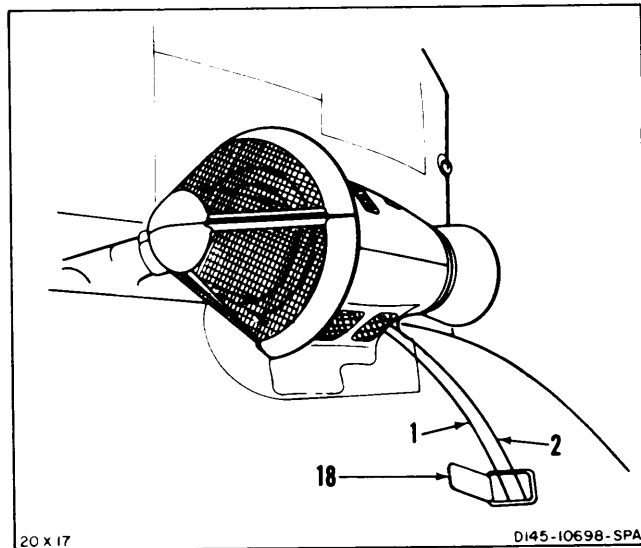
8. **Secure cables (1 and 2)** to fuselage and route cables inside cabin through EM ERG APU FUEL SHUTOFF access door (18). Use tape (E399).
9. On No. 2 engine, cables (1 and 2) will be routed through ACCESS RAMP CONTROL panel.
10. Close engine access cover (Task 4-50).
11. Close engine work platform (Task 2-2).

12. **Apply aircraft electrical power** (Task 1-36).

NOTE

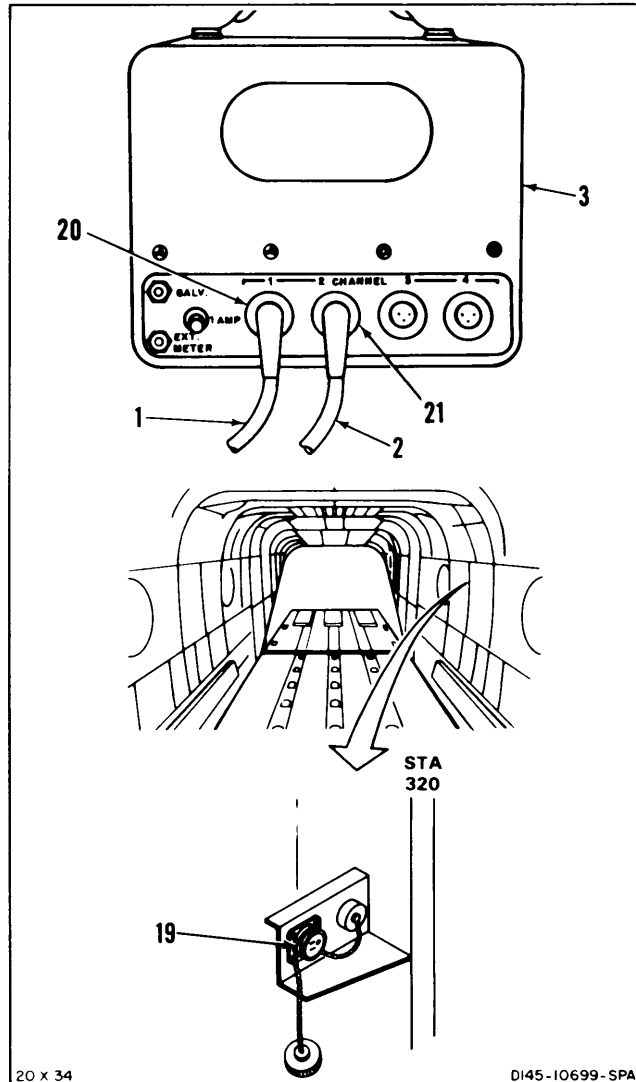
Do not allow meter to be without power for more than two minutes when moving to aircraft electrical system.

13. **Disconnect meter (3)** from Power source and **connect to aircraft 115V, 1Ph, 15 AMP receptacle (19)** at Sta 320
14. **Connect No. 1 transducer cable (1)** to meter (3) at CHANNEL 1 socket (20).
15. **Connect No. 2 transducer cable (2)** to meter (3) at CHANNEL 2 socket.



20 x 17

DI45-10698-SPA



20 x 34

DI45-10699-SPA

GO TO NEXT PAGE

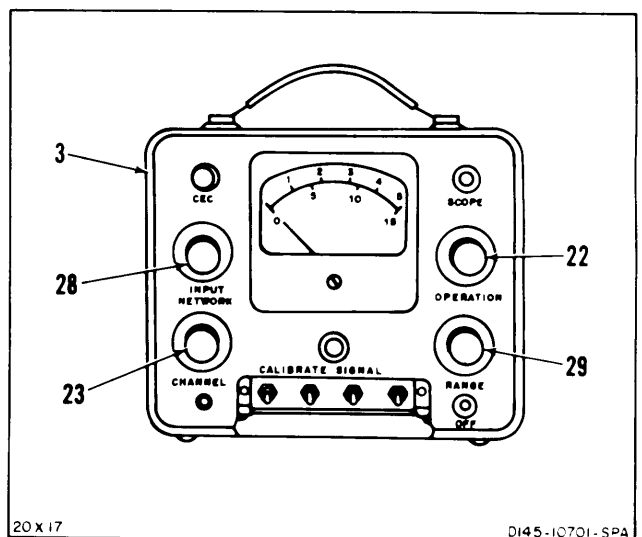
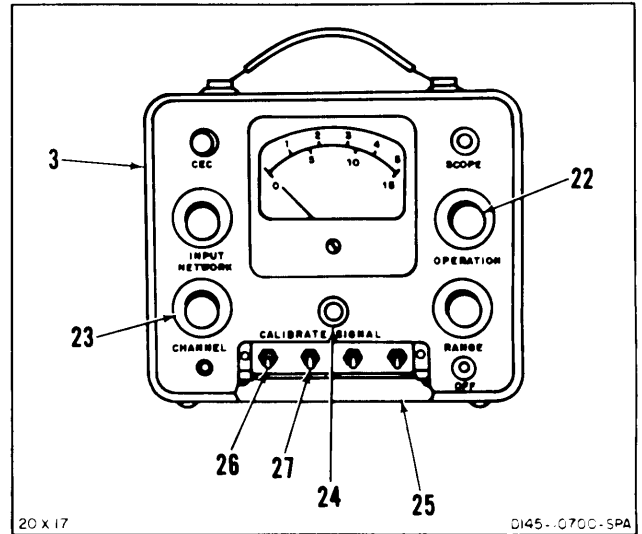
ADJUST METER**NOTE**

Vibration pickup transducer part number CFC4-118-0107 is calibrated at 10.5. If vibration pickup transducer part number CEC4-128-0101 is used, calibrate it at 6.0.

16. Set OPERATION selector (22) to C. Pointer shall move toward right side of scale.
17. Set CHANNEL selector (23) to 1.
18. Push in CALIBRATE SIGNAL control (24). Adjust control until meter (3) indicates 10.5.
19. Slowly release control.
20. Open panel (25). Adjust SENSITIVITY 1 control (26) until meter indicates 15.0.
21. Push in CALIBRATE SIGNAL control (24). Meter shall indicate 10.5.
22. Slowly release control (24). Meter shall indicate 15.0.
23. Set CHANNEL selector (23) to 2.
24. Repeat steps 19 and 20.
25. Adjust SENSITIVITY 2 control (27) until meter (3) indicates 15.0.
26. Push CALIBRATE SIGNAL control (24). Meter (3) shall indicate 10.5.
27. Release control (24). Meter (3) shall indicate 15.0.

PERFORM TEST

28. Set INPUT NETWORK selector (28) to 70.
29. Set OPERATION selector (22) to VX1.0.
30. Set RANGE selector (29) to 5.
31. Set CHANNEL selector (23) to 1.
32. Observe meter (3) during test. Average velocity shall not exceed 1.2 inch per second.



GO TO NEXT PAGE

4-14 PERFORM ENGINE VIBRATION TEST (Continued)

- 33 Have pilot operate engines in **GROUND**
(TM 55 1520-240-10) Allow engines to stabilize for 30 seconds
- 34 Record data on chart
- 35 Set CHANNEL selector (23) to 2.
- 36 Record data on chart
- 37 Set CHANNEL selector (20) to 1.
- 38 Have pilot trim engines to minimum rpm.
- 39 Have pilot increase engines to **FLIGHT**.
Allow engines to stabilize for 30 seconds
- 40 Record data on chart
- 41 Set CHANNEL selector (23) to 2.
- 42 Record data on chart
- 43 Set CHANNEL selector (23) to 1.
- 44 Have pilot trim engines to 100 percent rotor rpm.
- 45 Have pilot set n1 to 92 percent. Allow engines to stabilize for 30 seconds
- 46 Record data on chart
- 47 Set CHANNEL selector (23) to 2.
- 48 Record data on chart

ENGINE VIBRATION TEST DATA SHEET

ENGINE SERIAL NO. _____ (TSN) _____

LAST OVERHAUL LOCATION _____ (TSLO) _____

AIRCRAFT SERIAL NO. _____ A/C TIME _____

TEST LOCATION _____ DATE _____

TESTED BY _____ OBSERVER _____

Engine Passed Test – Accepted Engine Failed Test

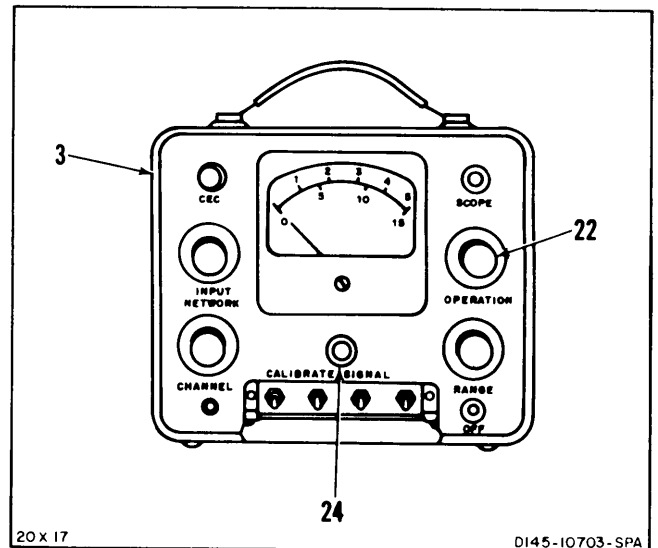
CONDITION	N1 (%)	NR (%)	NO. 1 PICKUP 70 Hz	N1 (%)	NR (%)	NO. 2 PICKUP 70 Hz
Ground Idle						
Minimum Beep						
Maximum	92	100		92	100	

1. Engine does does not exceed 1.2 ips average velocity during acceleration
2. Engine does does not exceed 1.2 ips average velocity during deceleration
3. Record average velocities at steady state speeds indicated
4. The maximum acceptable average velocity for all pickups under all conditions is 1.2 inches per second using 70 Hz filter.

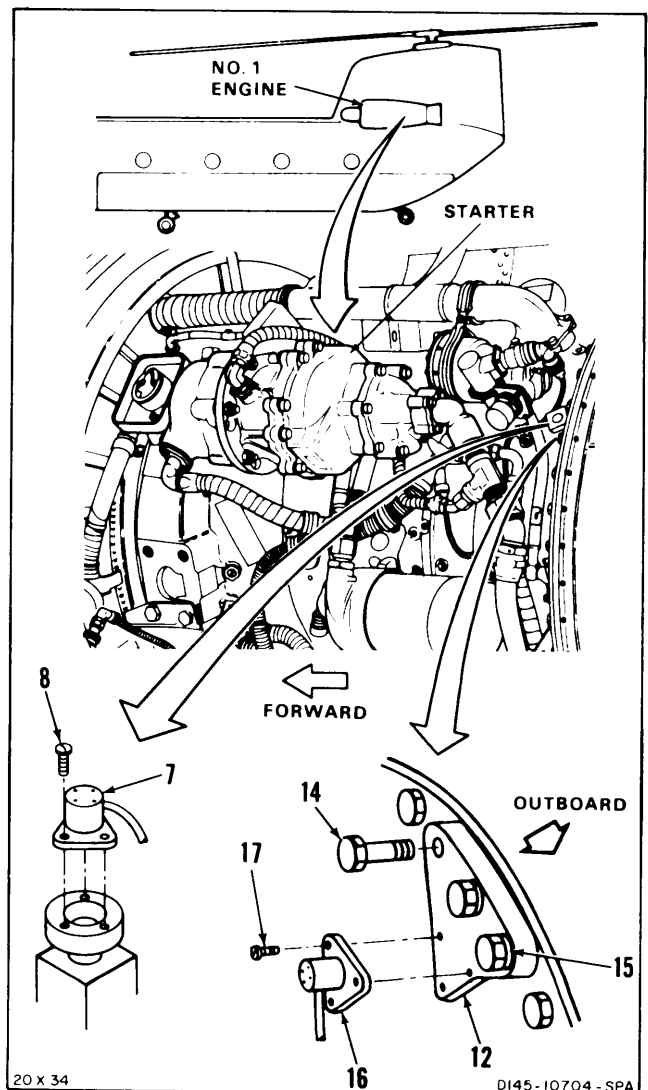
GO TO NEXT PAGE

4-14 PERFORM ENGINE VIBRATION TEST (Continued)**4-14**

49. Set **OPERATION** selector (22) to **C**. **Meter (3)** shall indicate between 14.0 and 1/16-inch beyond full scale.
50. Push **CALIBRATE SIGNAL** control (24). **Meter (3)** shall indicate 10.5. Release control.
51. Test must be performed again if meter (3) does not indicate readings in steps 50 and 51.
52. **Have pilot land helicopter** and shut down engines.

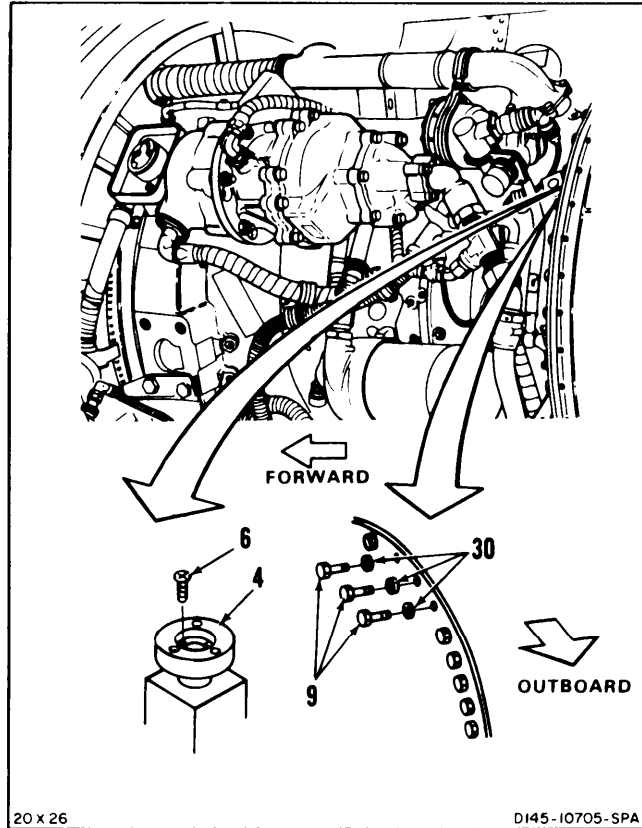
**REMOVE TEST SET**

53. **Disconnect meter (3)** from power source.
54. Disconnect battery (Task 1-39).
55. Open engine work platform (Task 2-2).
56. Open engine access cover (Task 4-49).
57. Remove six screws (8 and 17).
58. **Remove two transducers (7 and 16).**
59. **Remove** three bolts (14), washers (15), and **adapter (12).**

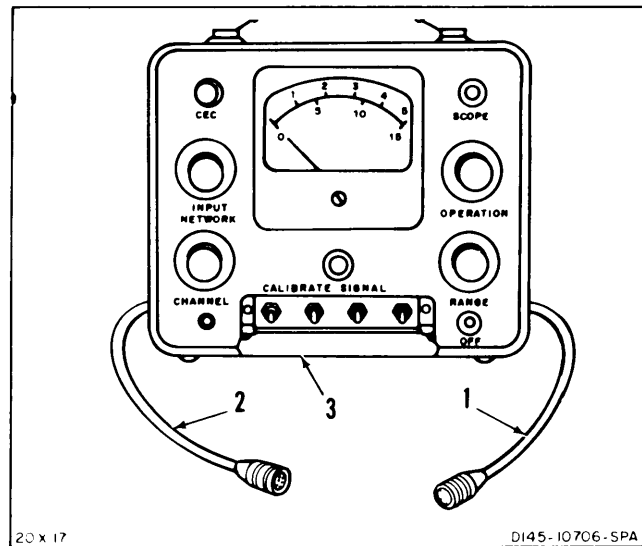
**GO TO NEXT PAGE**

4-14 PERFORM ENGINE VIBRATION TEST (Continued)

- 60. Install three bolts (9) and new washers (30). Torque bolts (9) to 85 inch-pounds.
- 61. Remove screw (6) and adapter (4).



- 62. Disconnect and remove two cables (1 and 2).
- 63. Remove tape from cables and fuselage. Remove meter (3).



FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

4-14.1 REMOVE POWER TURBINE INLET TEMPERATURE (PTIT) WIRE HARNESS

4-14.1

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Mechanic Tool Kit,
NSN 5180-00-323-4944

Materials:

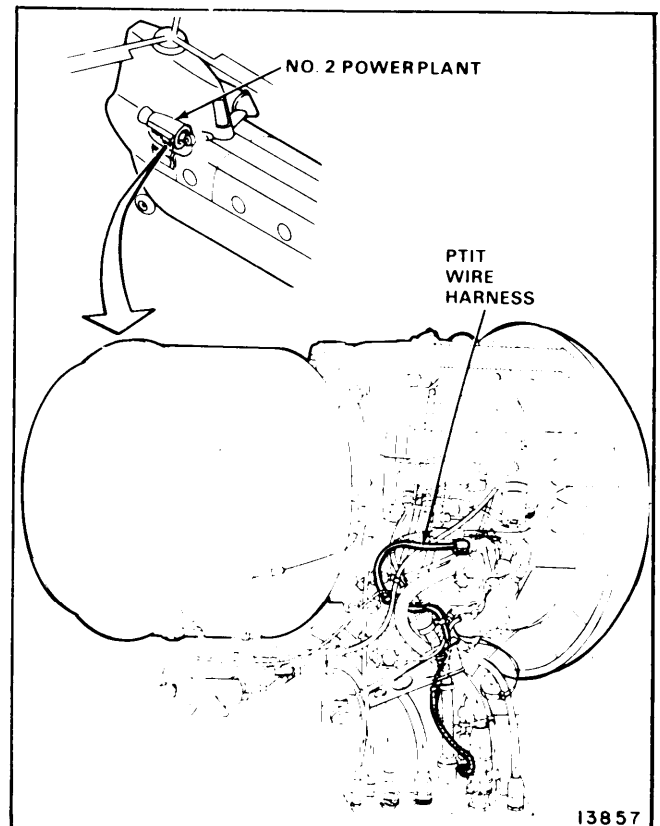
None

Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:

Battery Disconnect (Task 1-39)
Electrical Power Off
Engine Access Cover Open (Task 4-49)



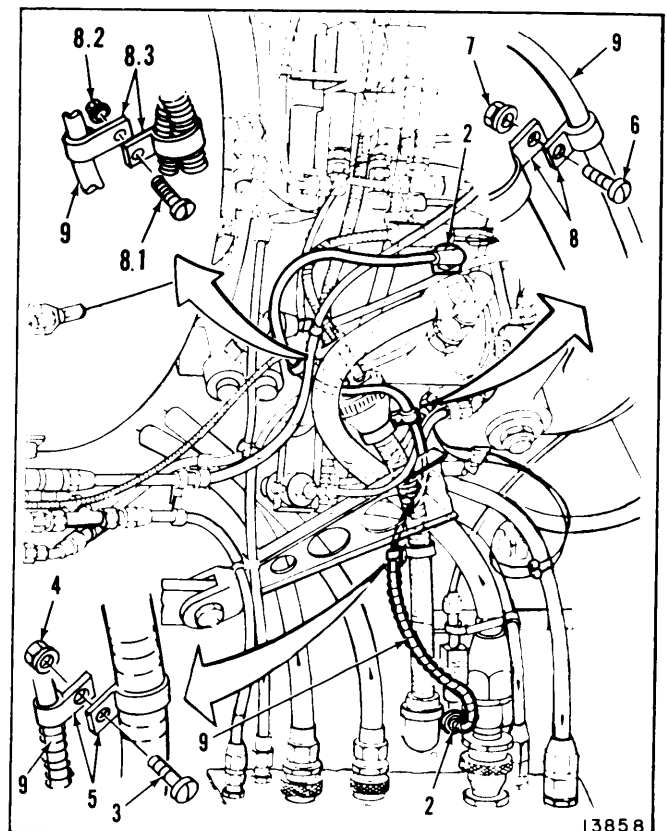
NOTE

Procedure is same to remove PTIT wire harness from No. 1 or No. 2 engine. No. 2 engine is shown here.

1. **Disconnect connectors (1 and 2).**
2. Remove screw (3), nut (4), and clamps (5).
3. Remove screw (6), nut (7), and clamps (8).
- 3.1 Remove screw (8.1), nut (8.2), and clamps (8.3).
4. **Remove PTIT wire harness (9).**

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-14.2 INSTALL POWER TURBINE INLET TEMPERATURE (PTIT) WIRE HARNESS

4-14.2

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Mechanic's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

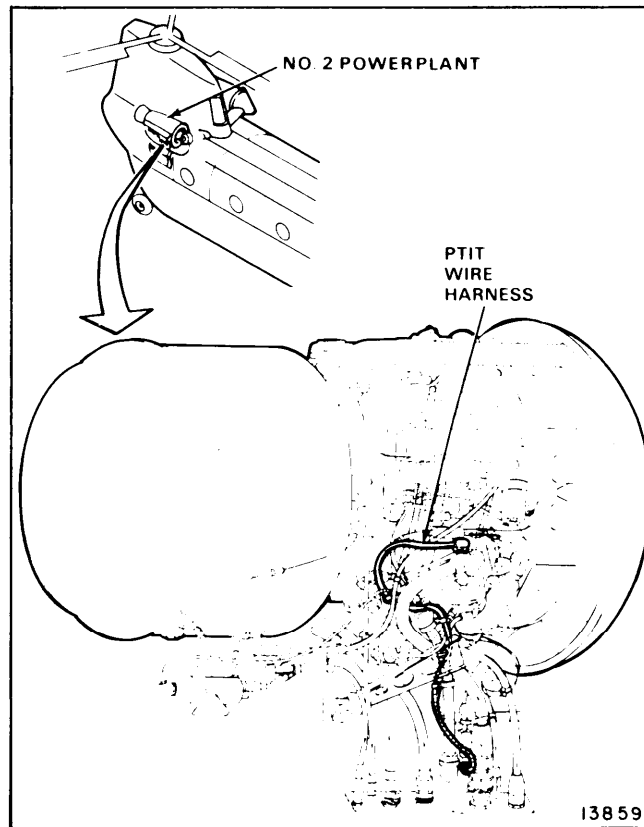
Aircraft Powerplant Repairer

References:

TM 55-1520-240-23

Equipment Condition:

Battery Disconnect
Electrical Power Off



13859

NOTE

Procedure is same to install PTIT wire harness in No. 1 or No. 2 engine. No. 2 engine is shown here.

NOTE

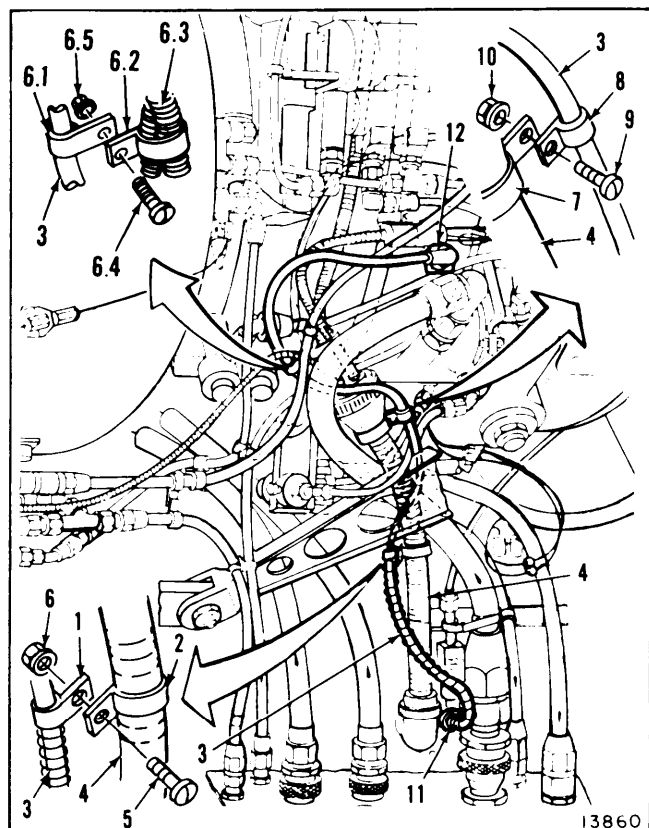
Ensure that harness does not chafe against clamps or other engine components.

- 1 Install clamps (1 and 2) on PTIT wire harness (3) and flexible hose (4). Secure clamps (1 and 2) with screw (5) and nut (6).
- 2 Install clamps (7 and 8) on PTIT wire harness (3) and flexible hose (4). Secure clamps (7 and 8) with screw (9) and nut (10).
- 2.1 Install clamps (6.1 and 6.2) on PTIT wire harness (3) and flexible hoses (6.3). Secure clamps (6.1 and 6.2) with screw (6.4) and nut (6.5).
- 3 Install connectors (11 and 12).

FOLLOW-ON MAINTENANCE:

Battery connected (Task 1-39).

Close engine access cover (Task 4-50).



13860

END OF TASK

4-64.2 Change 9

4-15 REMOVE ENGINE FUEL CONTROL

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

Paper Tags (E264)
Tape (E388)

Personnel Required:

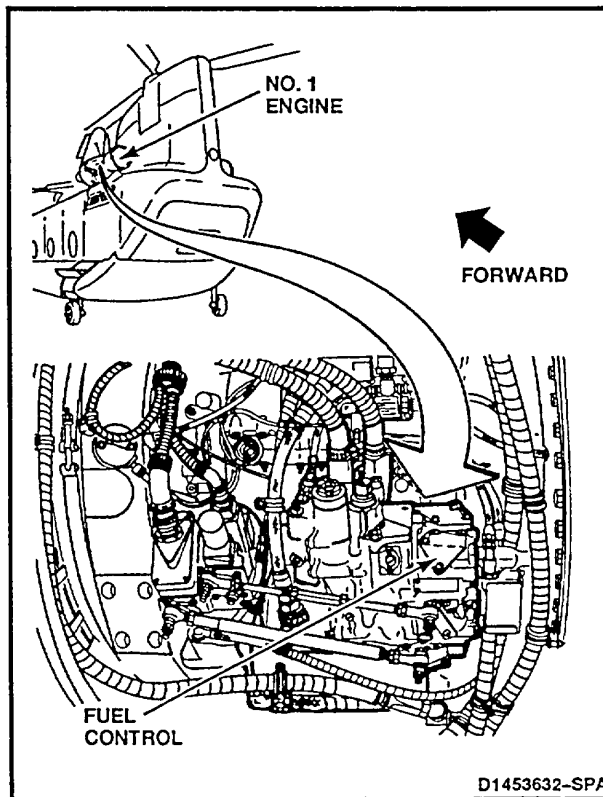
Aircraft Powerplant Repairer (2)

References:

TM 55-2840-254-23

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

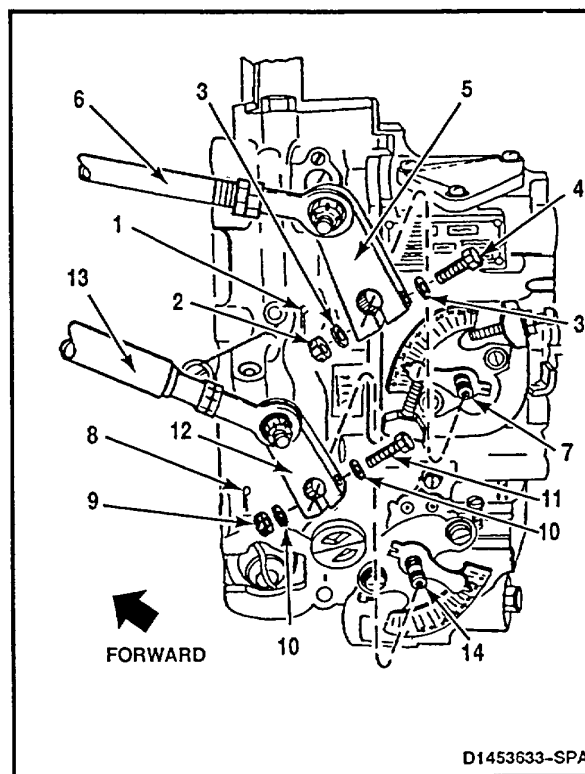


D1453632-SPA

NOTE

Procedure is same to remove fuel control on No. 1 or No. 2 engine. Fuel control on No. 1 engine is shown here.

1. Remove cotter pin (1), nut (2), two washers (3), and bolt (4) from lever (5). **Move rod (6) off shaft (7), up and forward.**
2. Remove cotter pin (8), nut (9), two washers (10), and bolt (11) from lever (12). **Move rod (13) off shaft (14), up and forward.**

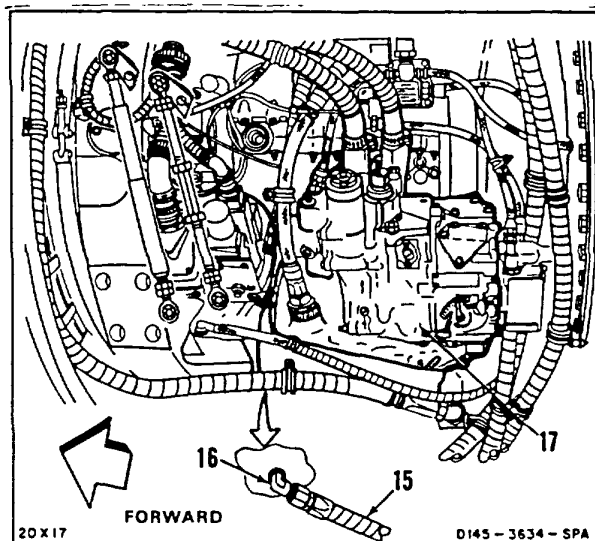


D1453633-SPA

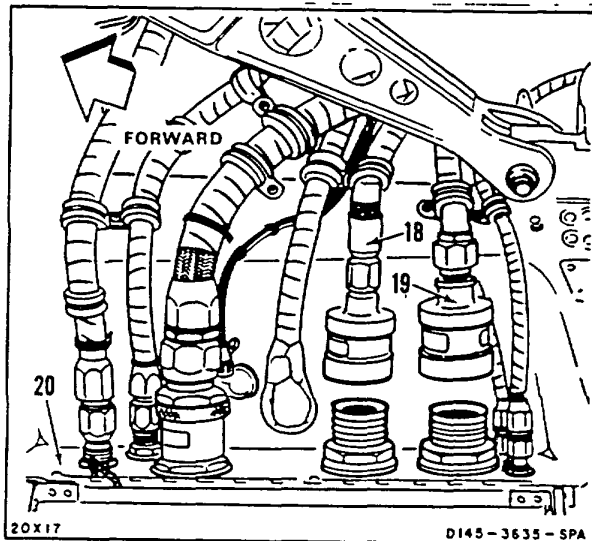
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4-15 REMOVE ENGINE FUEL CONTROL (CONTINUED)

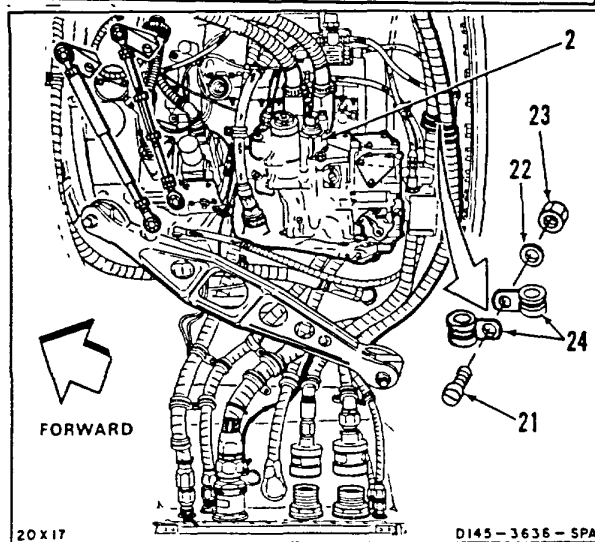
3. Tag and **disconnect drain hose (15)** from elbow (16) on bottom of fuel control (17).



4. Tag and **disconnect two hoses (18 and 19)** at shelf (20).



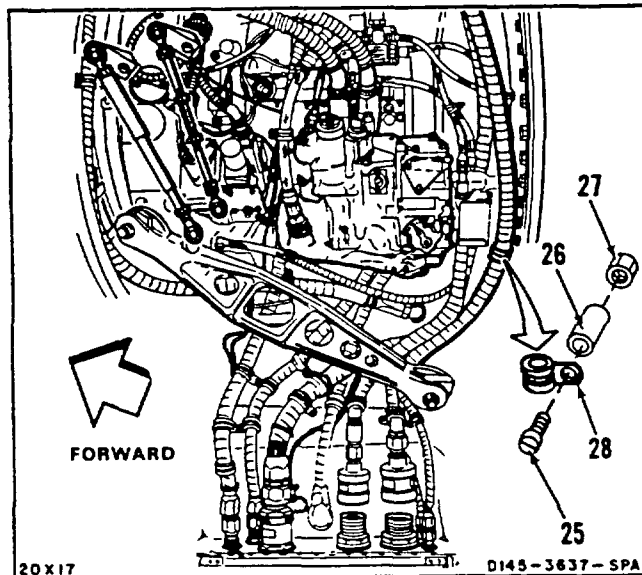
5. Remove screw (21), washer (22), and nut (23). **Disconnect two clamps (24)**. Mark clamp location. Use tape (E388).



4-15 REMOVE ENGINE FUEL CONTROL (CONTINUED)

4-15

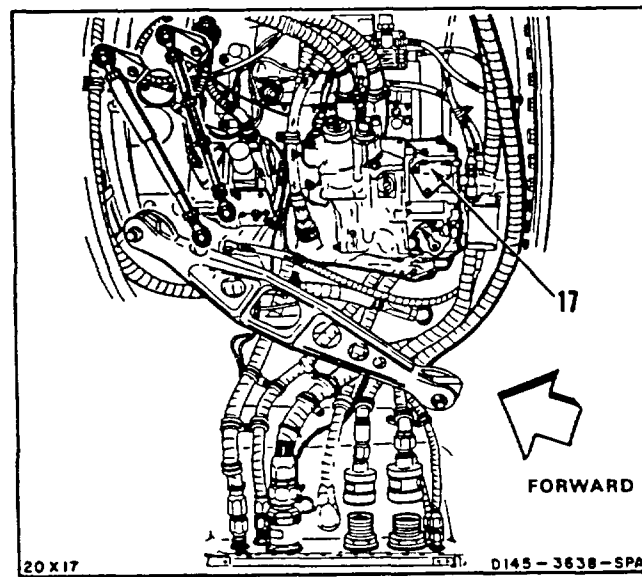
6. Remove screw (25), spacer (26, and nut (27). **Disconnect clamp (28).** Mark clamp location. Use tape (E388).



7. Remove fuel control (17) (TM 55-2840-254-23).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-67

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Parts:

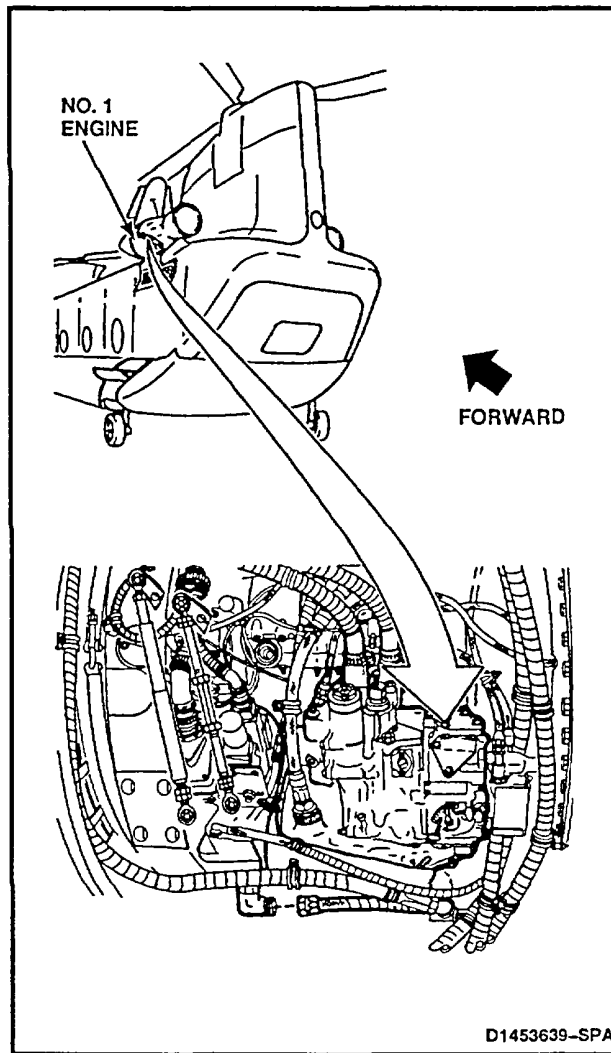
Cotter Pins

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

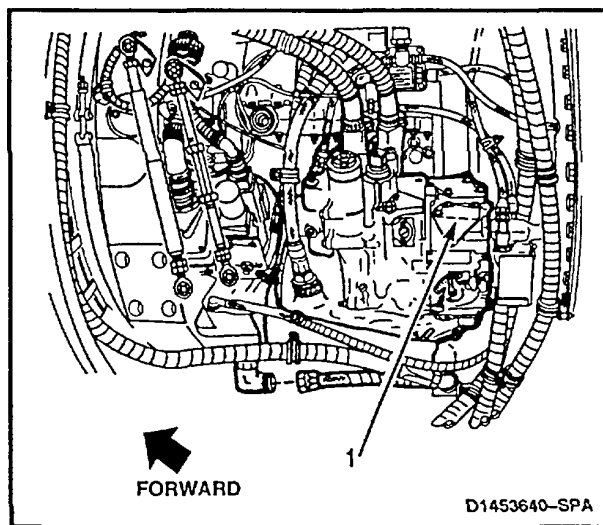
TM 55-2840-254-23
TM 55-2840-254-23P
TM 55-1520-240-23P



NOTE

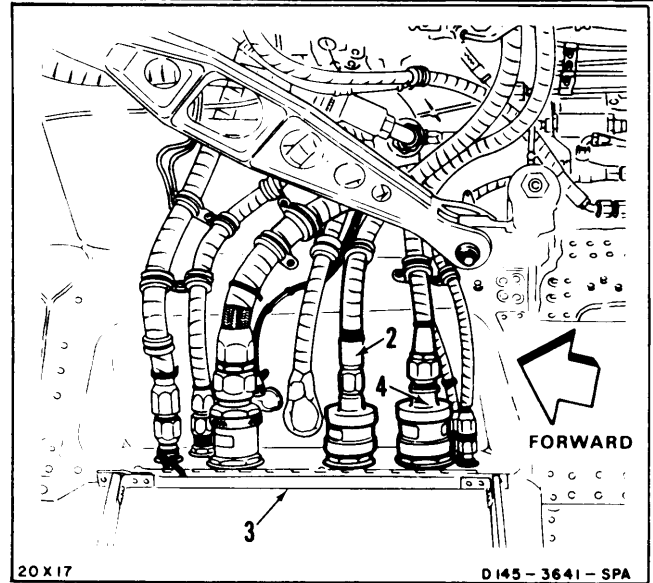
Procedure is same to install fuel control on No. 1 or No. 2 engine. Fuel control on No. 1 engine is shown here.

1. Install fuel control (1) (TM 55-2840-254-23).

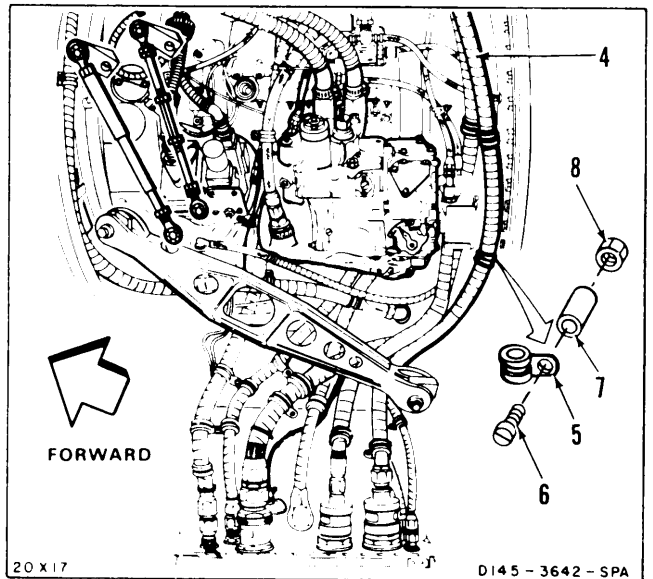


4-16 INSTALL ENGINE FUEL CONTROL (Continued)

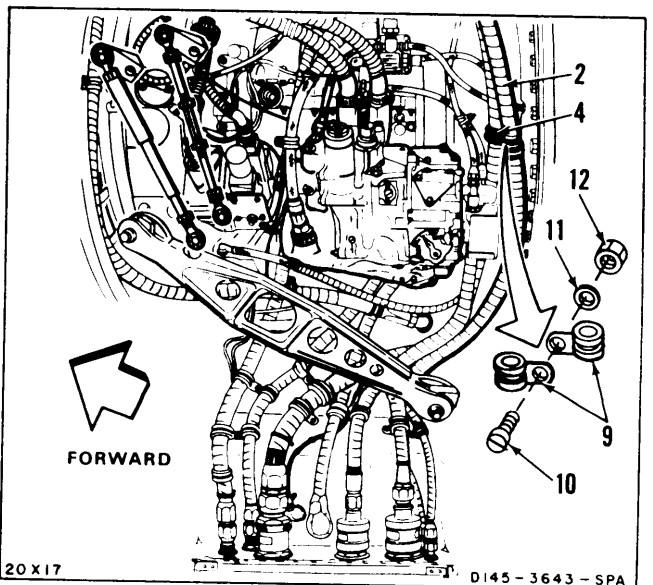
- 2. Connect hose (2) at shelf (3). Remove tag.
- 3. Connect hose (4) at shelf (3). Remove tag.



- 4. Position clamp (5) around hose (4). Install screw (6), spacer (7), and nut (8).



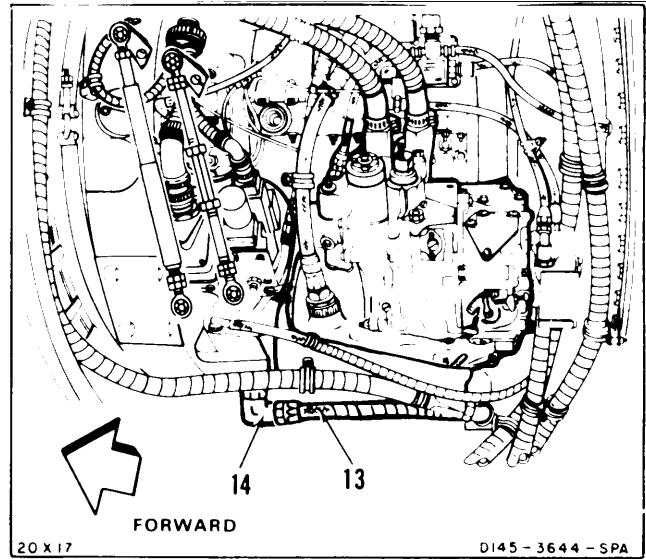
- 5. Position clamps (9) on two hoses 2 and 4. Install screw (10), washer (11), and nut (12).



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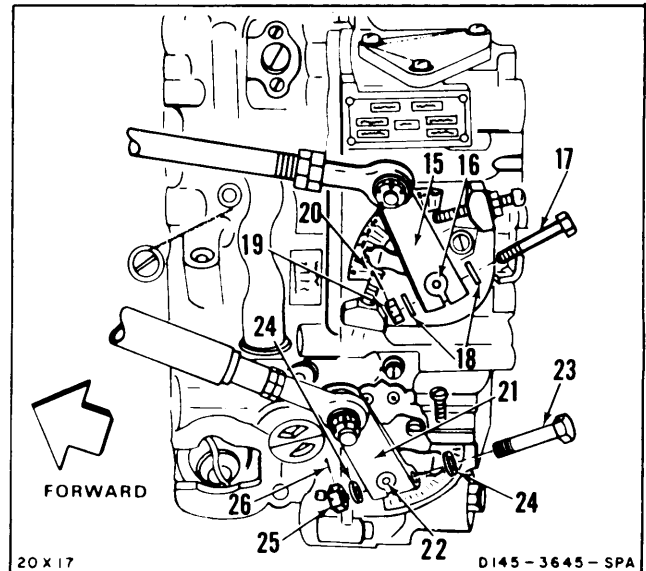
4-16 INSTALL ENGINE FUEL CONTROL (Continued)

6 Connect hose (13) to elbow (14)



7. Position lever (15) on shaft (16) Install bolt (17), two washers (18), nut (19), and cotter pin (20).

8. Position lever (21) on shaft (22). Install bolt (23), two washers (24), nut (25), and cotter pin (26).



INSPECT

FOLLOW-ON MAINTENANCE:

Perform operational check of gas producer control system (TM 55-1520-240-T).

Perform operational check of power turbine control system (TM 55-1520-240-T).

Prime fuel control (TM 55-2840-254-23).

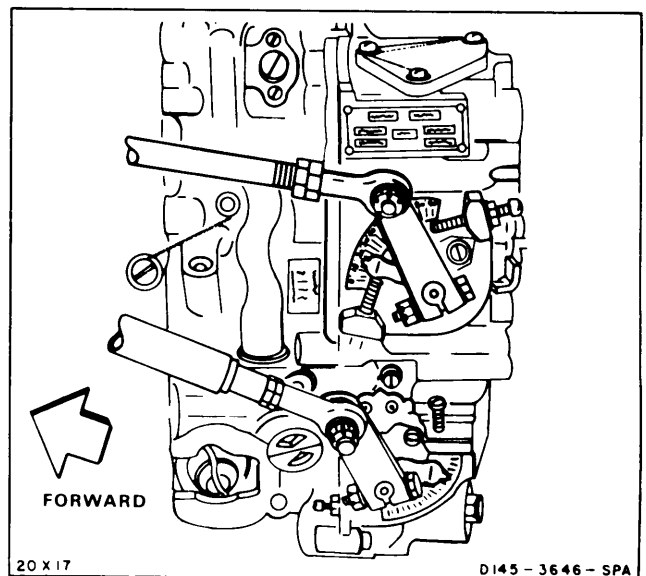
Adjust fuel control (TM 55-2840-254-23).

Perform engine test check (Task 4-3).

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).

END OF TASK



4-17 REMOVE ENGINE FUEL BOOST PUMP

4-17

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
Open End Wrench, 1-1/2 Inch
Container, 2-Quart

Materials:

Cloths (E135)

Personnel Required:

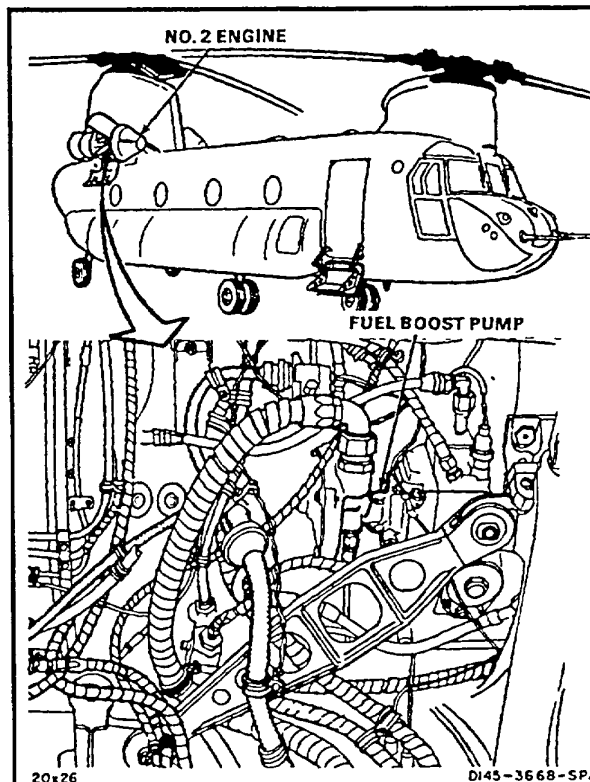
Aircraft Powerplant Repairer

References:

TM 55-2840-254-23

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

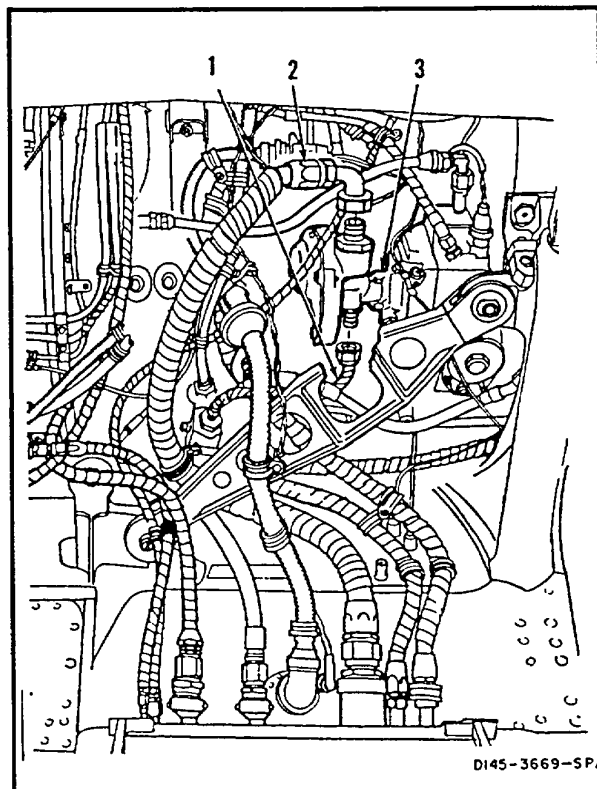
**NOTE**

Procedure is same to remove fuel boost pump from No. 1 or No. 2 engine. No. 2 fuel boost pump is shown here.

1. Disconnect two hoses (1 and 2) from pump (3). Use container to catch spilled fuel. Plug hoses. Clean up any spilled fuel. Use cloths (E135).
2. Remove pump (3) (TM 55-2840-254-23).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

Change 19 4-71

4-17.1 REMOVE ENGINE FUEL BOOST PUMP

4-17.1

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Powerplant Repairer's Tool Kit,
NSN 5180-00-33-4944
Open End Wrench, 1-1/2 Inch
Container, 2-Quart

Materials:

Cloths (E121)
Gloves (E184.1)

Personnel Required:

Aircraft Powerplant Repairer

References:

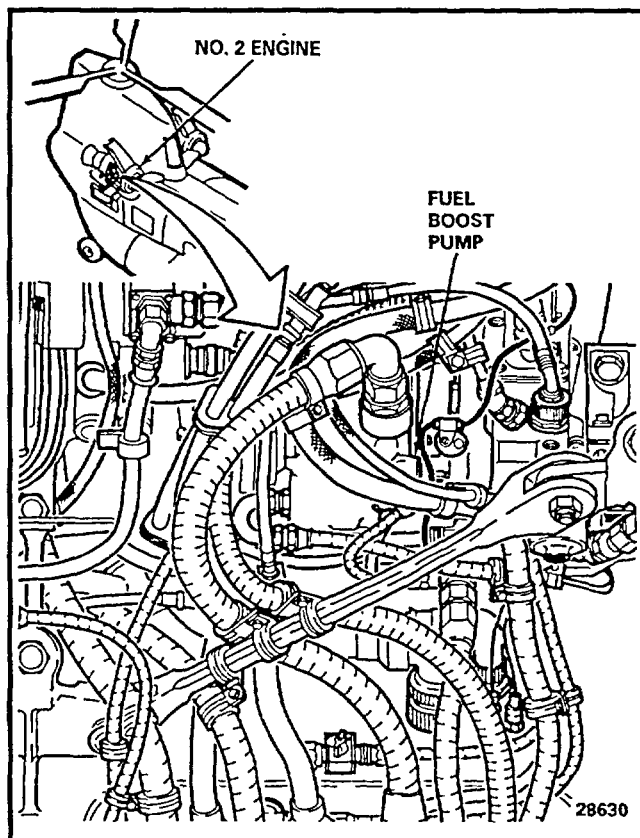
TM 1-2840-265-23

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

General Safety Instructions:**WARNING**

Fuels (JP4-JP5) (E182) are combustible 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.



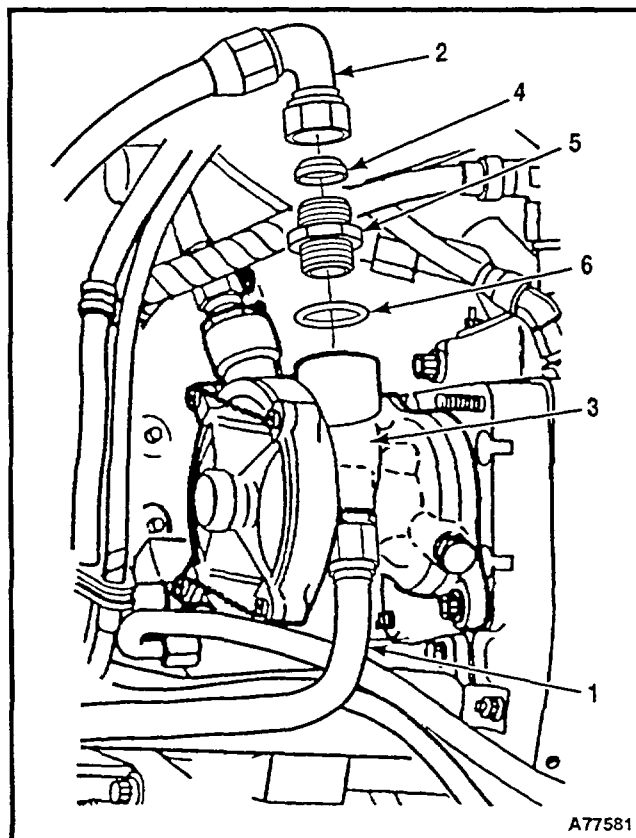
4-17.1 REMOVE ENGINE FUEL BOOST PUMP (Continued)

4-17.1

NOTE

Procedure is same to remove fuel boost pump from No. 1 or No. 2 engine. No. 2 fuel boost pump is shown here.

1. **Disconnect hoses (1 and 2)** from pump (3). Remove and **discard conical seal (4)**. Use container to catch spilled fuel. Plug and tag hoses. Clean up any spilled fuel. Use rags (E121). Wear gloves (E184.1).
2. **Remove union (5) and packing (6)**. Discard packing.
3. **Remove pump (3)** (TM 1-2840-265-23).



FOLLOW-ON MAINTENANCE:
None

END OF TASK

Change 19 4-72.1

4-18 INSTALL ENGINE FUEL BOOST PUMP **4-18**

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
Open End Wrench, 1-1/2 Inch

Materials:

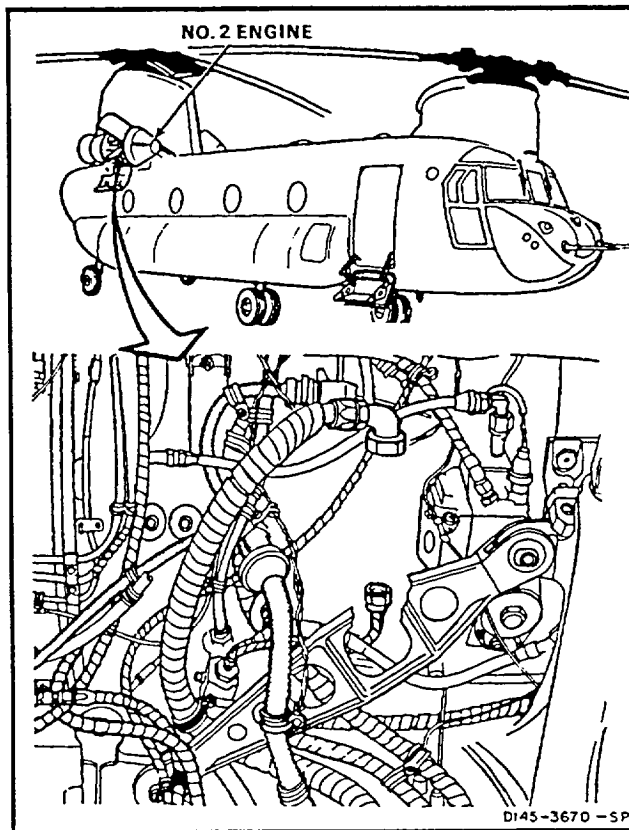
None

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

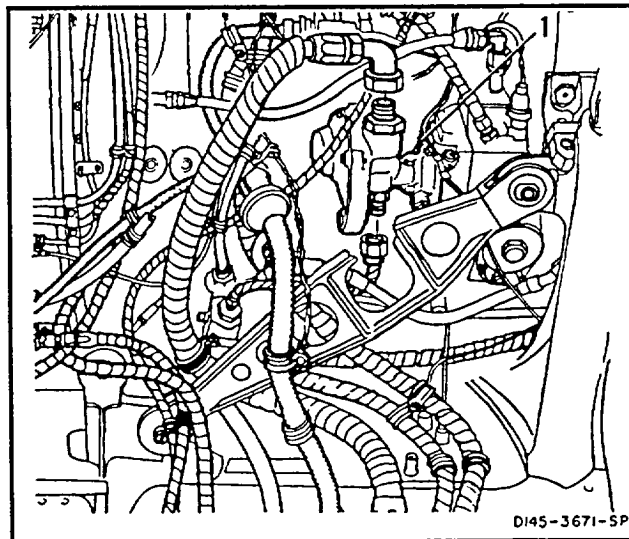
TM 55-2840-254-23
TM 55-2840-254-23P
TM 55-1520-240-23 P



NOTE

Procedure is same to install fuel boost pump on No. 1 or No. 2 engine. No. 2 fuel boost pump is shown here.

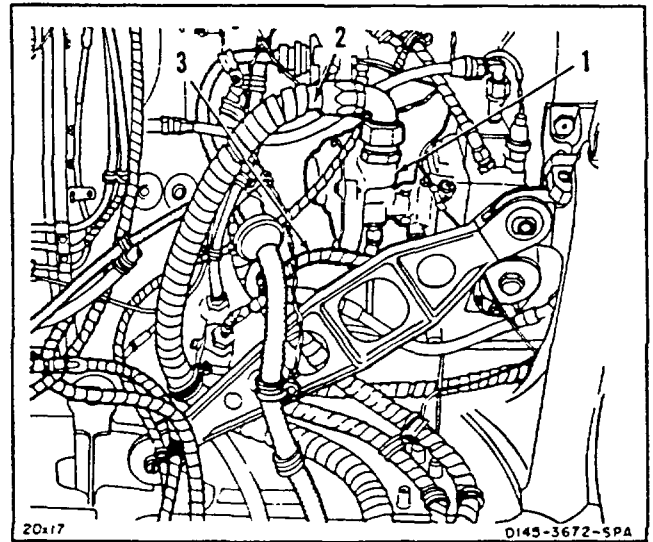
1. Install pump (1) (TM 55-2840-254-23).



2. Connect two hoses (2 and 3) to pump (1).

INSPECT**FOLLOW-ON MAINTENANCE.**

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

**END OF TASK**

4-18.1 INSTALL ENGINE FUEL BOOST PUMP

4-18.1

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Powerplant Repairer's Tool Kit,
NSN 5180-00-3234944
Open End Wrench, 1-1/2 Inch

Materials:

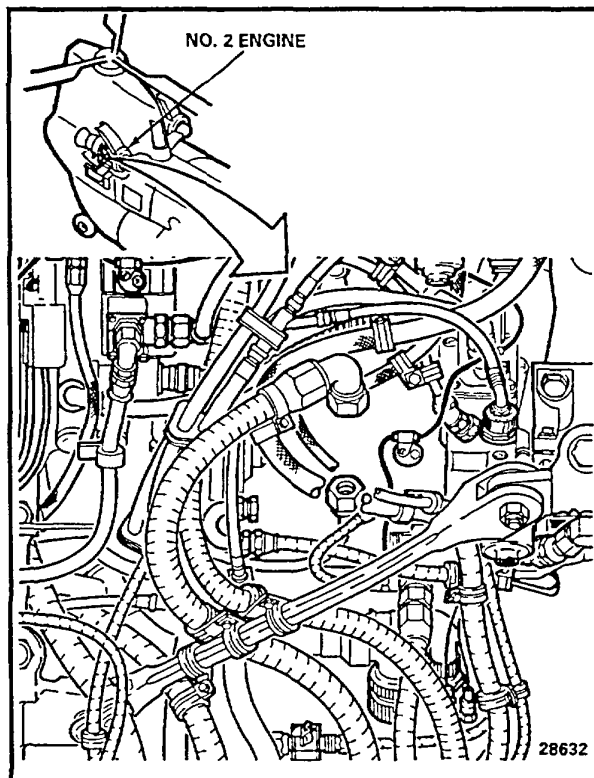
Conical Seal
Packing
Petrolatum (E274)

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

TM 1-2840-265-23
TM 1-2840-265-23P

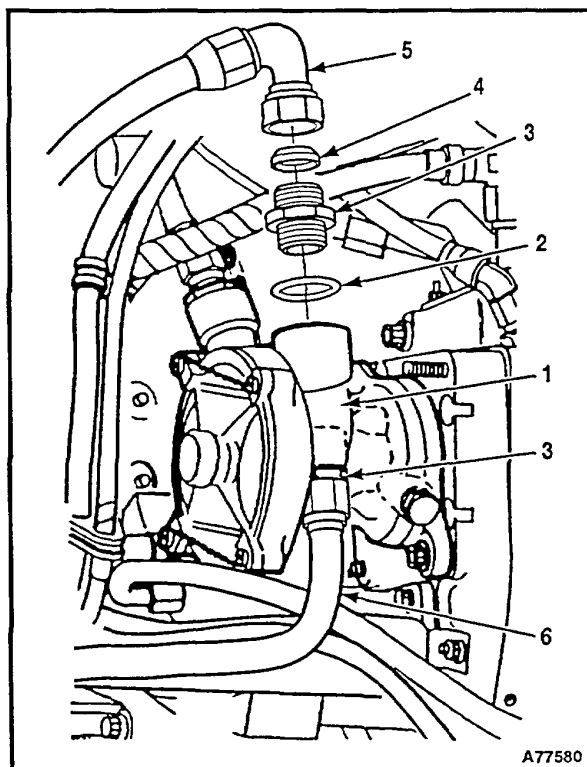
**NOTE**

Procedure is same to install fuel boost pump on No. 1 or No. 2 engine. No. 2 fuel boost pump is shown here.

1. Install pump (1) (TM 1-2840-265-23).
2. Use petrolatum (E274) to lubricate and install new packing (2) and unions (3) into fuel pump (1).
3. Install new conical seal (4) and connect hoses (5 and 6) to unions (3).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).



END OF TASK
4-74 Change 19

4-19 REPLACE INLINE FUEL FILTER ELEMENT **4-19**

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4962
- Strap Wrench

Materials:

Cloths (E135)

Personnel Required:

- Medium Helicopter Repairer
- Inspector

References:

- TM 55-2840-254-23 (Without 74)
- TM 55-2840-254-23P (Without 74)
- TM 1-2840-265-23 (With 74)
- TM 1-2840-265-23P (With 74)

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)

NOTE

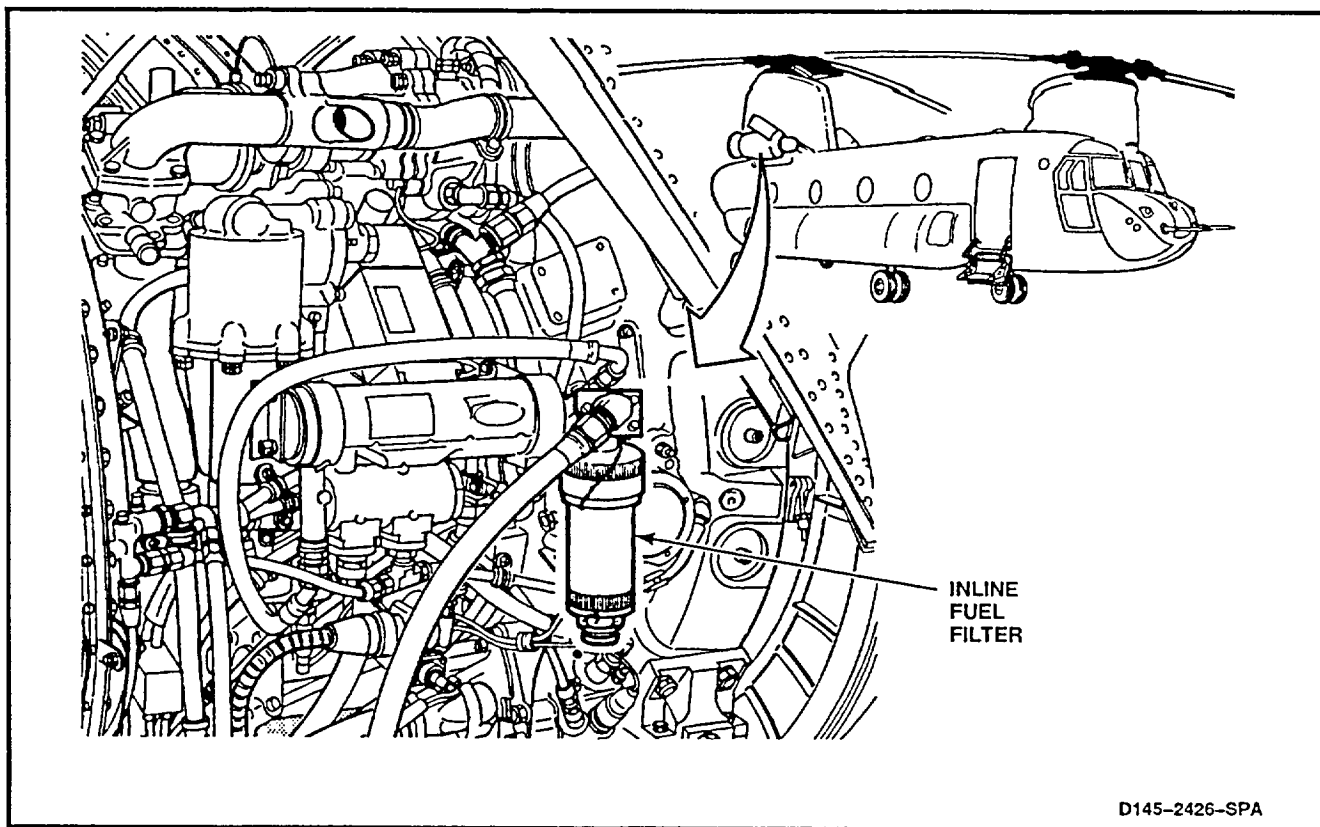
Procedure is same for No. 1 and No. 2 engine. No. 2 engine is shown.

1. Replace inline fuel filter (TM 55-2840-254-23 without 74, TM 1-2840-265-23 with 74).

INSPECT

FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



D145-2426-SPA

END OF TASK

Change 19 4-74.1/(4-74.2 blank)

4-20 REPLACE FLOW DIVIDER 4-20

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer

References:

- TM 55-2840-254-23 (Without 74)
- TM 55-2840-254-23P (Without 74)
- TM 1-2840-265-23 (With 74)
- TM 1-2840-265-23P (With 74)

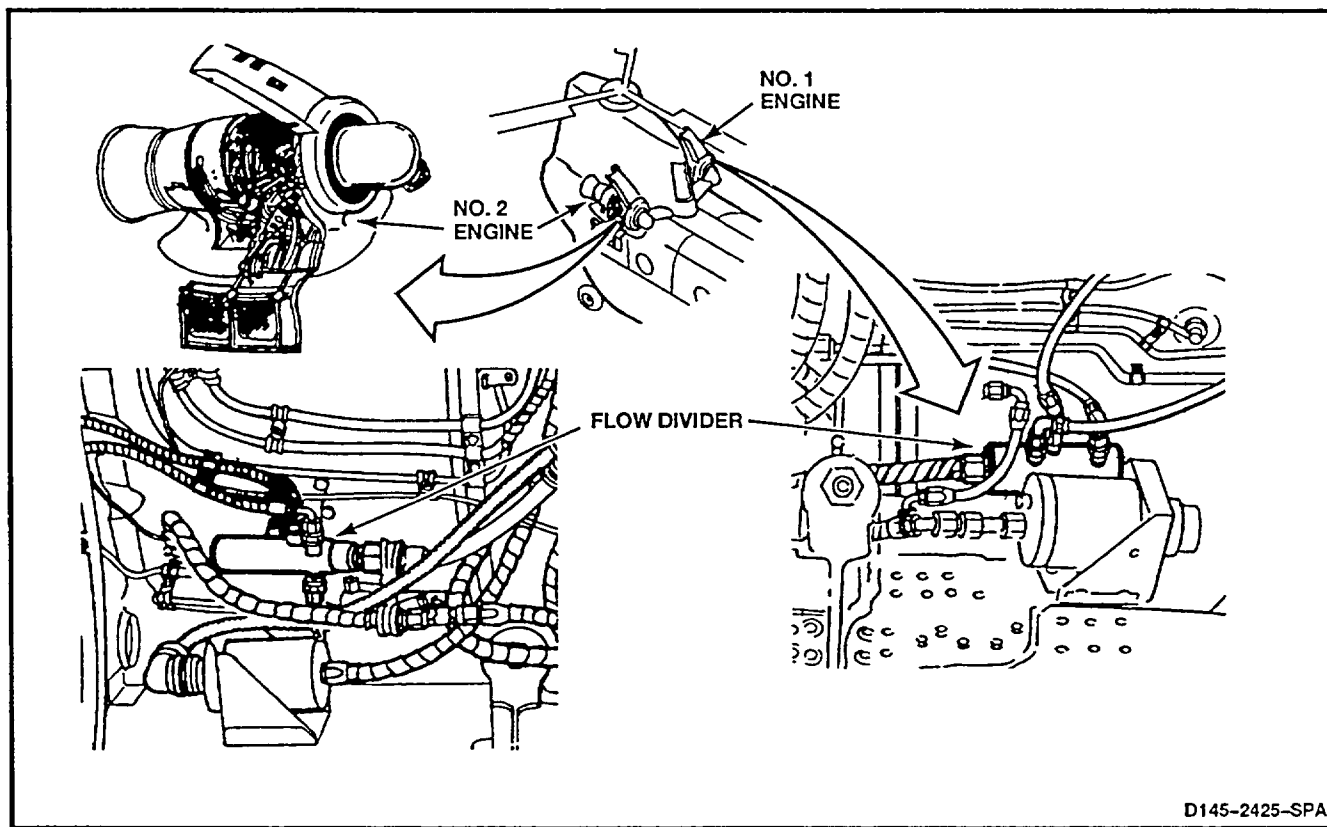
Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)

1. **Replace flow divider** (TM 55-2840-254-23 without 74, TM 1-2840-265-23 with 74).

FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

4-21 REMOVE ENGINE ACCESSORY GEARBOX CHIP DETECTOR

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4962

Materials:

None

Personnel Required:

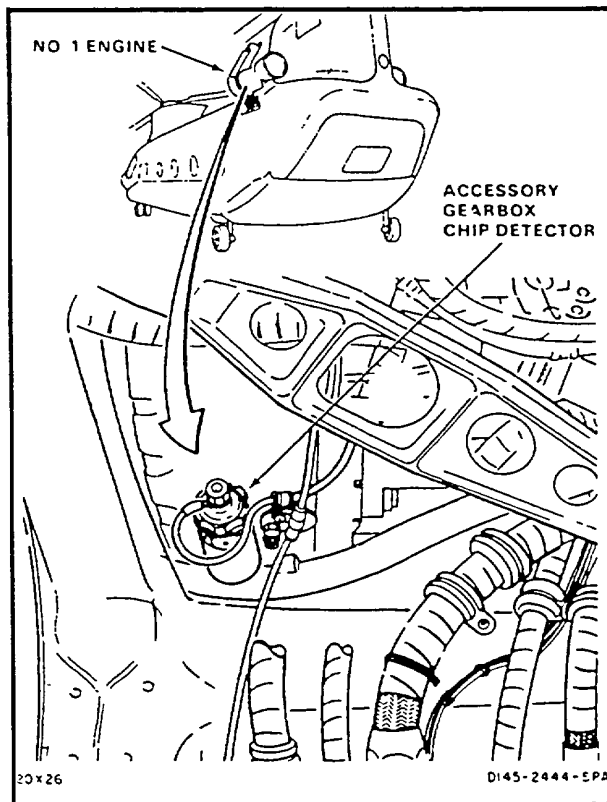
Medium Helicopter Repairer

References:

TM 55-2840-254-23

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



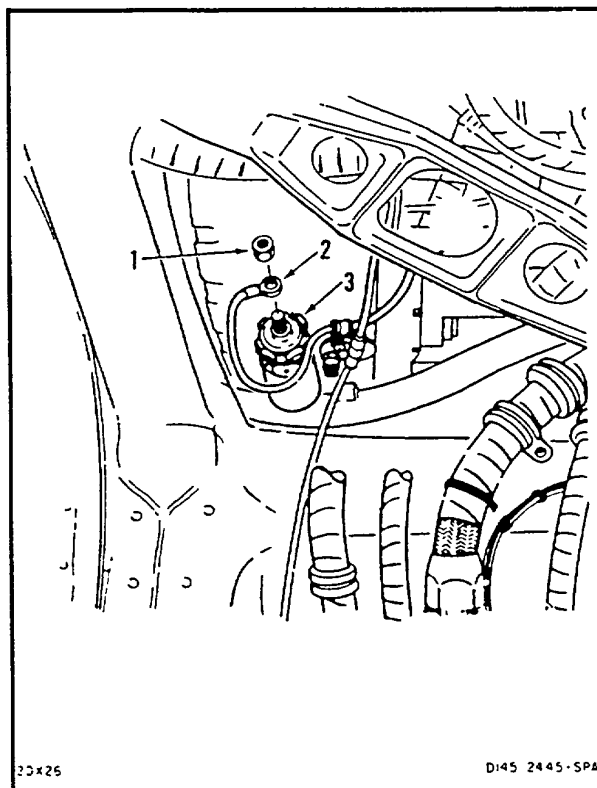
NOTE

Procedure is same to remove No. 1 or No. 2 gearbox chip detector. No. 1 gearbox chip detector is shown here.

1. Remove nut (1). Disconnect wire (2).
2. Remove chip detector (3) (TM 55-2840-254-23).

FOLLOW-ON MAINTENANCE:

None



4-22 INSTALL ENGINE ACCESSORY GEARBOX CHIP DETECTOR

4-22

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4962

Materials:

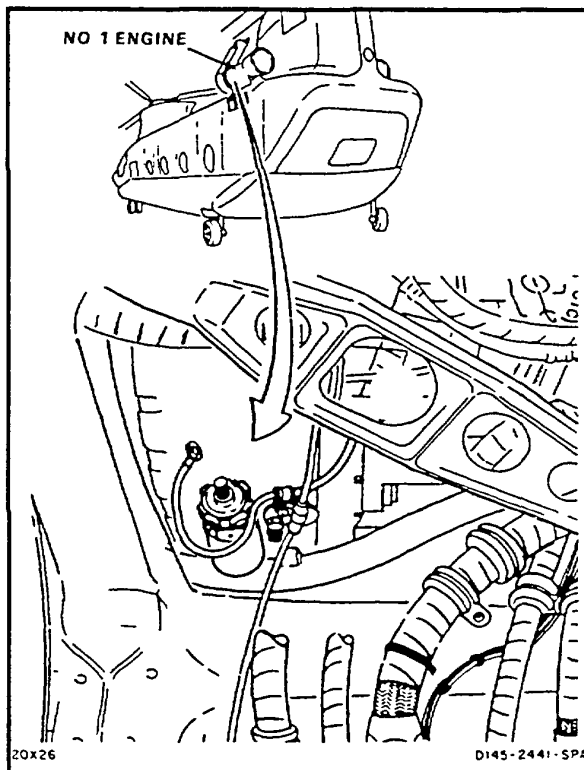
None

Personnel Required:

Medium Helicopter Repairer

References:

TM 55-2840-254-23
TM 55-2840-254-23P



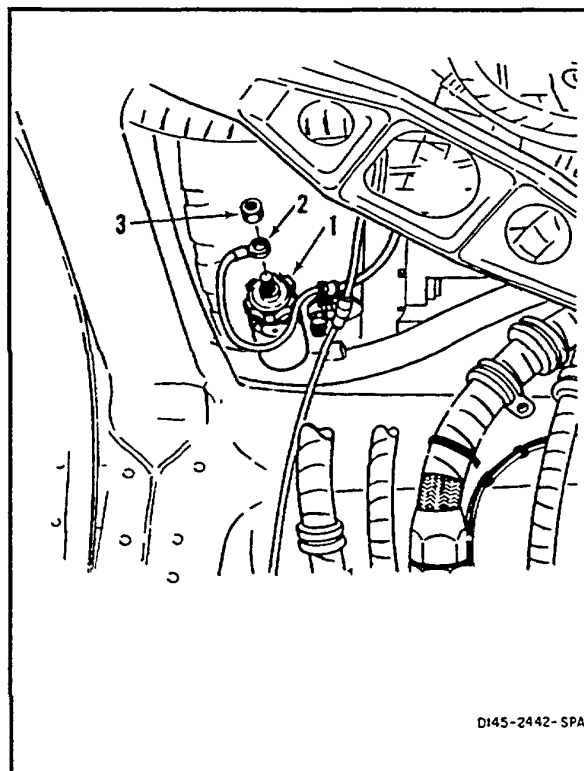
NOTE

Procedure is same to install No. 1 or No. 2 gearbox chip detector. No. 1 gearbox chip detector is shown here.

1. Install chip detector (1) (TM 55-2840-254-23).
2. Connect wire (2) to detector (1). Install nut (3).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).



END OF TASK

4-22.1 REPLACE ENGINE ACCESSORY GEARBOX CHIP DETECTOR

4-22.1

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4962

Materials:

Tape (E388)
Lockwire (E231)

Personnel Required:

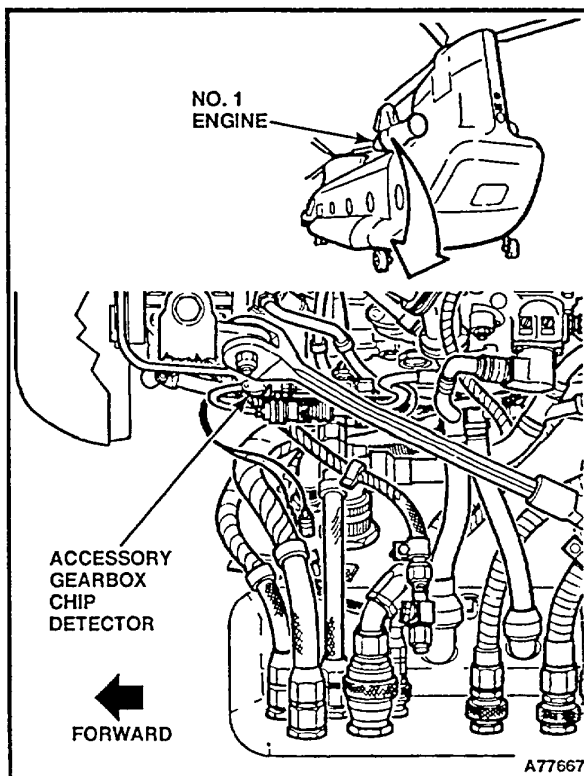
Medium Helicopter Repairer

References:

TM 1-2840-265-23
TM 1-2840-265-23P

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

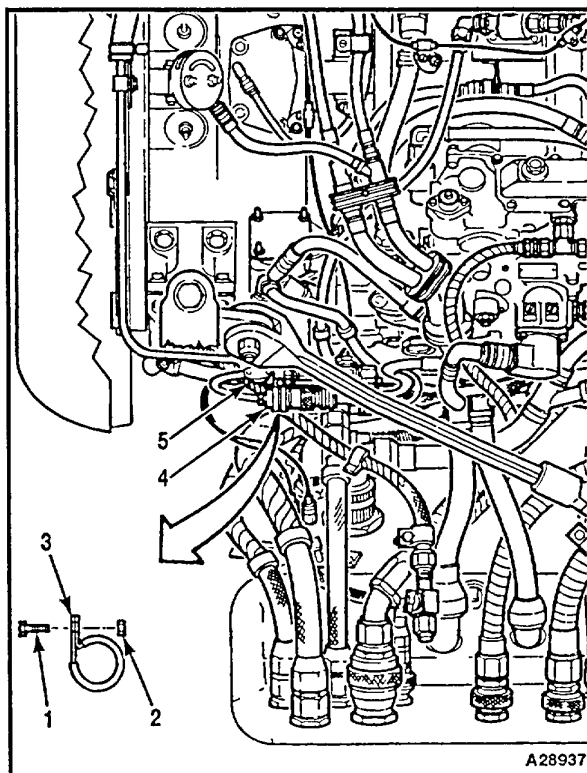


NOTE

Procedure is same to remove No. 1 or No. 2 engine gearbox chip detector. No. 1 engine gearbox chip detector is shown here.

REMOVE

1. Remove bolt (1) and nut (2) from clamp (3). **Remove clamp (3).** Use tape (E388) to mark clamp location.
2. Remove lockwire and **disconnect connector (4).**
3. **Remove chip detector (5)** (TM 1-2840-265-23).

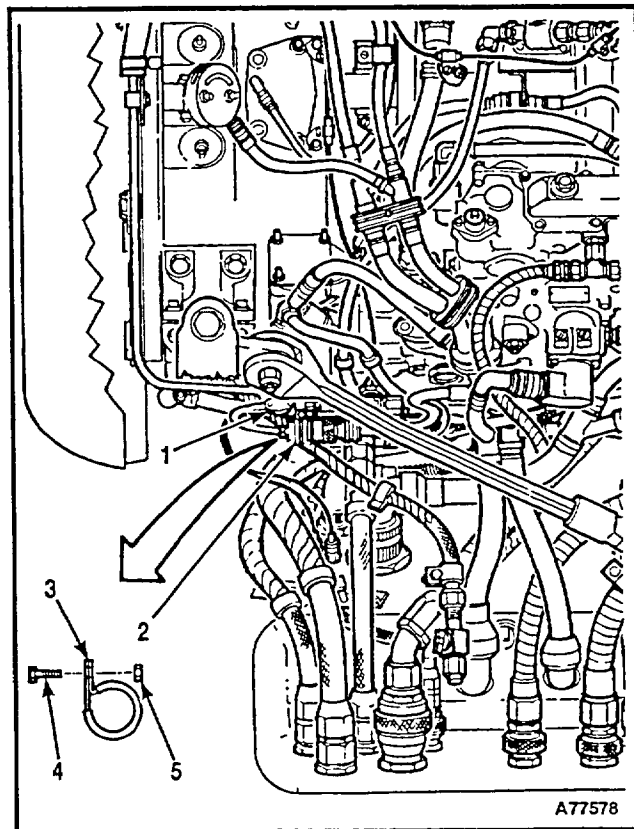


4-22.1 REPLACE ENGINE ACCESSORY GEARBOX CHIP DETECTOR (Continued)

4-22.1

INSTALL

4. Install chip detector (1) (TM 1-2840-265-23).
5. Install connector (2). Lockwire (E231).
6. Remove tape. Install clamp (3), with bolt (4) and nut (5).

**FOLLOW-ON MAINTENANCE**

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

Change 19 4-78.1

4-23 REPLACE OUTPUT SHAFT SEAL **4-23**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer (2)

References:

- TM 55-2840-254-23 (Without 74)
- TM 55-2840-254-23P (Without 74)
- TM 1-2840-265-23 (With 74)
- TM 1-2840-265-23P (With 74)

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Transmission Removed (Task 6-100)
- Engine Work Platform Open (Task 2-2)

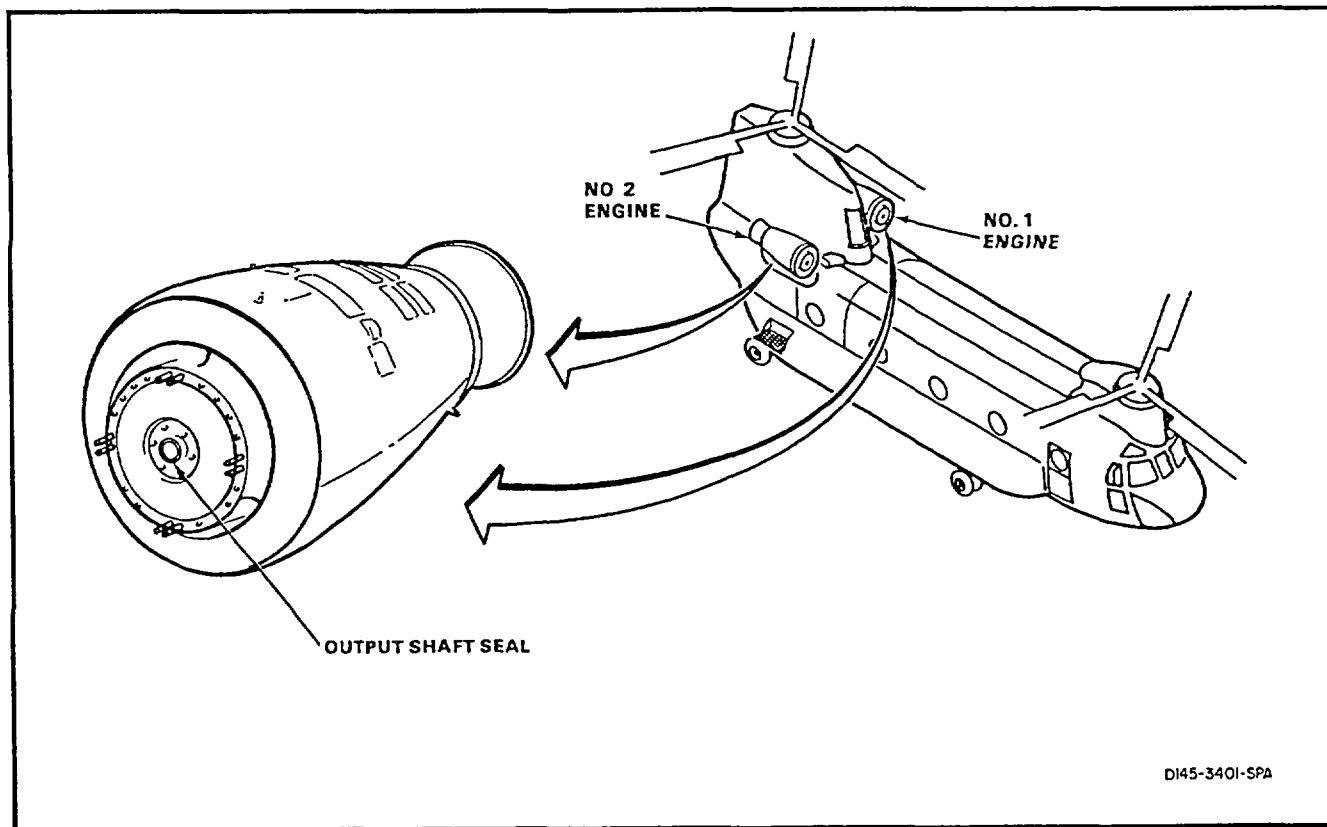
NOTE

Procedure is same to replace output shaft seal on No. 1 or No. 2 engine.

1. **Replace output shaft seal** (TM 55-2840-254-23 without 74, TM 1-2840-265-23 with 74).

FOLLOW-ON MAINTENANCE:

- Install engine transmission (Task 6-107).
- Close engine work platform (Task 2-2).



DI45-340I-SPA

4-24 REPLACE STARTER DRIVE SHAFT SEAL

4-24

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer (2)

References:

- TM 55-2840-254-23 (Without 74),
- TM 55-2840-254-23P (Without 74)
- TM 1-2840-265-23 (With 74)
- TM 1-2840-265-23P (With 74)

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)
- Starter Removed (Task 7-141)

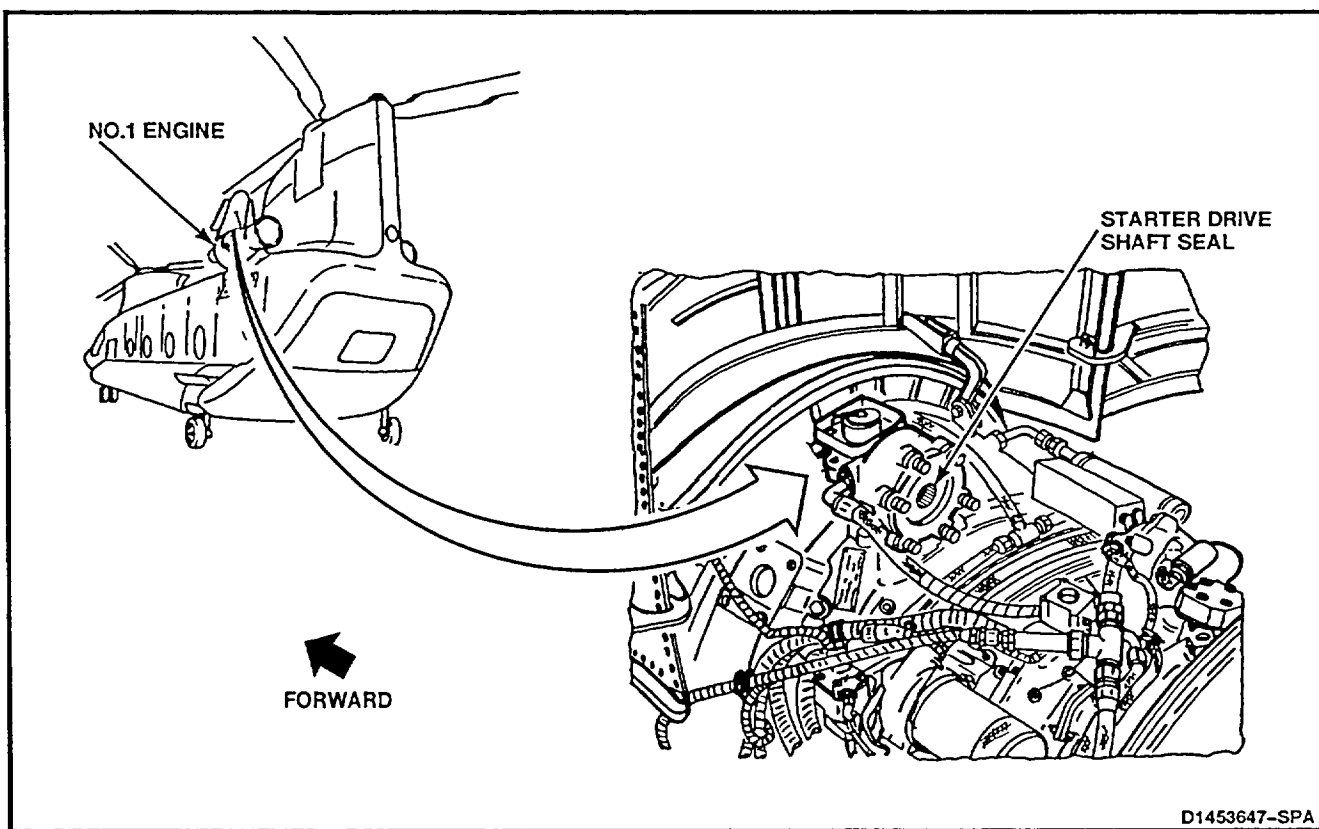
NOTE

Procedure is same to replace starter drive shaft seal on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Replace starter drive shaft seal (TM 55-2840-254-23 without 74, TM 1-2840-265-23 with 74).

FOLLOW-ON MAINTENANCE:

- Install starter (Task 7-142).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

Change 19 4-79

4-25 REMOVE STARTER DRIVE HOUSING

4-25

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer (2)

References:

TM 55-2840-254-23 (Without **74**)

TM 1-2840-265-23 (With **74**)

Equipment Condition:

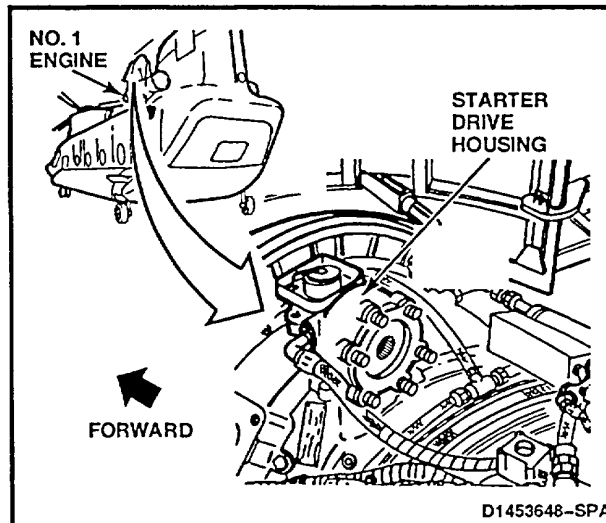
Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Work Platform Open (Task 2-2)

Engine Access Cover Open (Task 4-49)

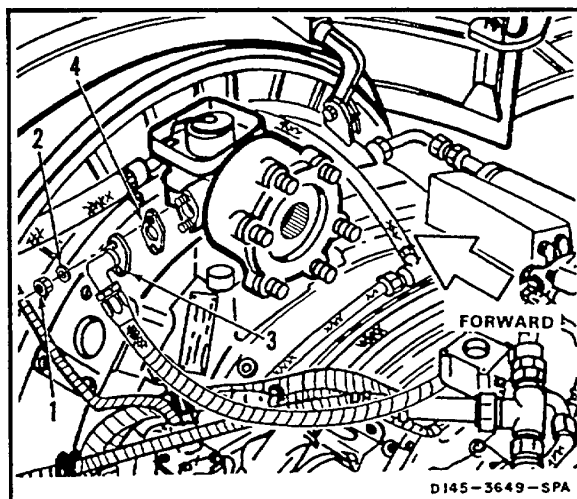
Starter Removed (Task 7-141)



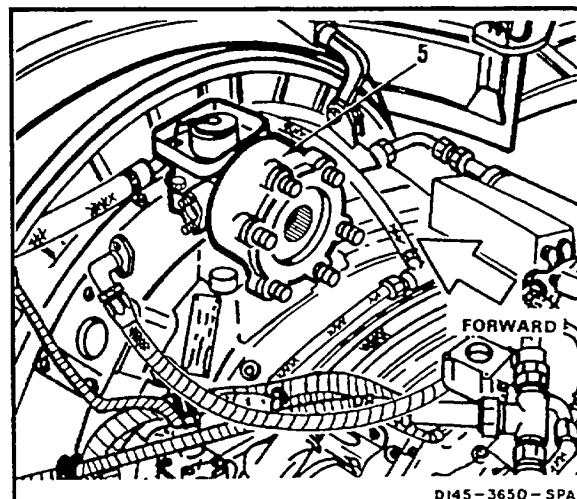
NOTE

Procedure is same to remove starter drive housing on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Remove two nuts (1) and washers (2). Remove hose (3) and gasket (4).



2. Remove starter drive housing (5) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



FOLLOW-ON MAINTENANCE:

None

4-26 INSTALL STARTER DRIVE HOUSING

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

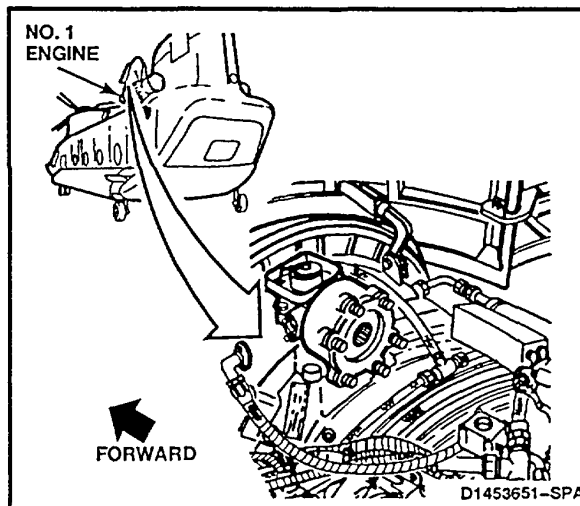
None

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

- TM 55-2840-254-23 (Without 74)
- TM 55-2840-254-23P (Without 74)
- TM 1-2840-265-23 (With 74)
- TM 1-2840-265-23P (With 74)



NOTE

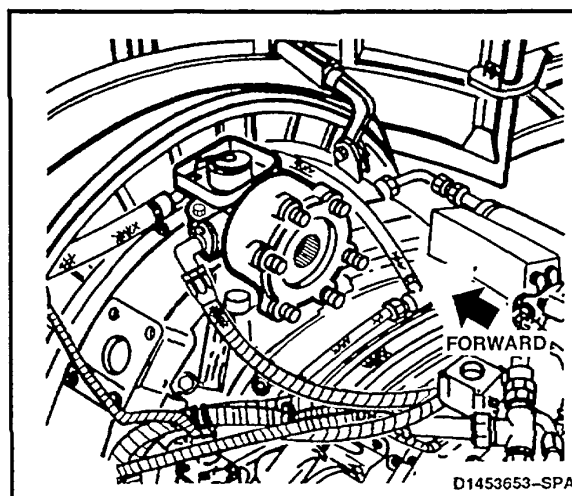
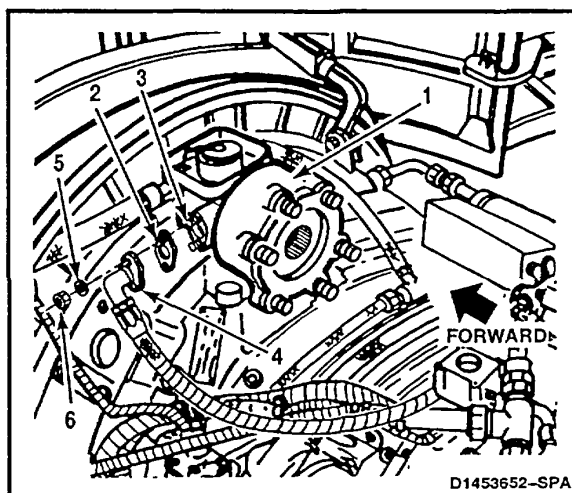
Procedure is same to install starter drive housing on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Install starter drive housing (1) (TM 55-2840-254-23 without 74, TM 1-2840-265-23 with 74)
2. Install gasket (2) on port (3).
3. Position hose (4) over gasket (2) and install two washers (5) and nuts (6).

INSPECT

FOLLOW-ON MAINTENANCE:

- Install starter (Task 7-142).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

4-27 REMOVE FORWARD ENGINE MOUNT CAP ASSEMBLY

4-27

INITIAL SETUP**Applicable Configurations:**

All

Tools:Aircraft Mechanic's Tool Kit,
NSN 5 180-00-323-4692

Puller

Materials

None

Parts

Nuts (2)

Personnel Required:

67U10 Medium Helicopter Repairer

67U20 Medium Helicopter Repairer

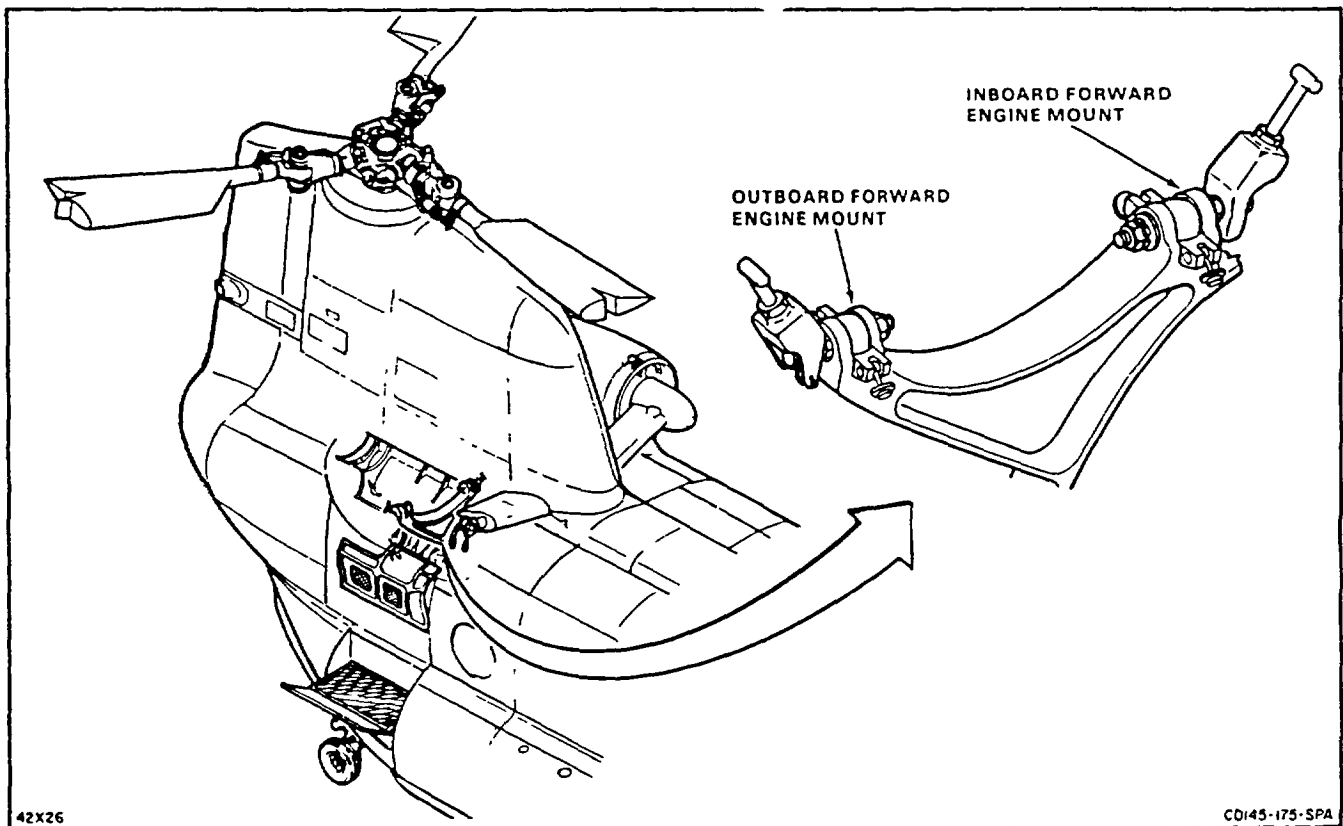
Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Work Platform Open (Task 2-2)

Powerplant Removed (Task 4-10)

**GO TO NEXT PAGE**

4-82

4-27 REMOVE FORWARD ENGINE MOUNT CAP ASSEMBLY (Continued)

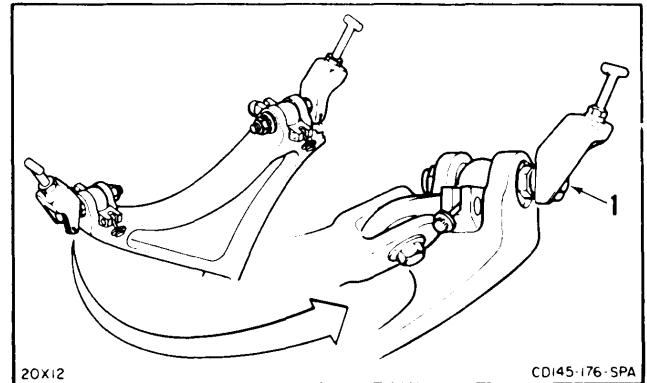
4-27

NOTE

This procedure can be used to remove forward engine mounts on No. 1 or No. 2 engine. Forward engine mounts for No. 2 engine are shown here.

REMOVE OIJTBOARD MOUNT CAP ASSEMBLY

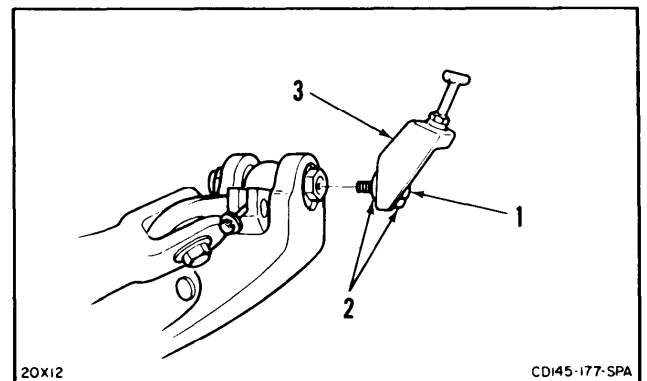
1. Remove lockwire from bolt (1).
2. Loosen bolt (1).



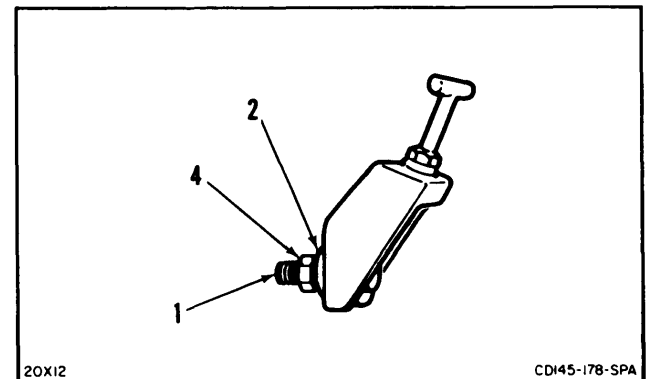
NOTE

When removing bolt, keep washers together on bolt in exact order. Placement of washers affects adjustment of engine covering.

3. Remove bolt (1), six washers (2), and latch bracket (3) together as one piece.

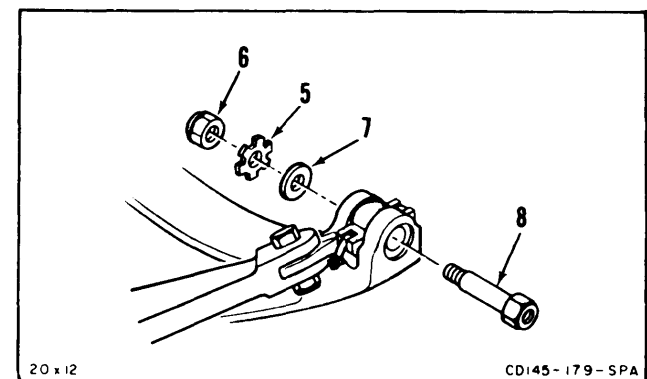


4. Install spare nut (4) on bolt (1) to keep washers (2) in place.



5. Bend tabs on lockwasher (5), away from nut. Remove nut (6), lockwasher (5), and washer (7).

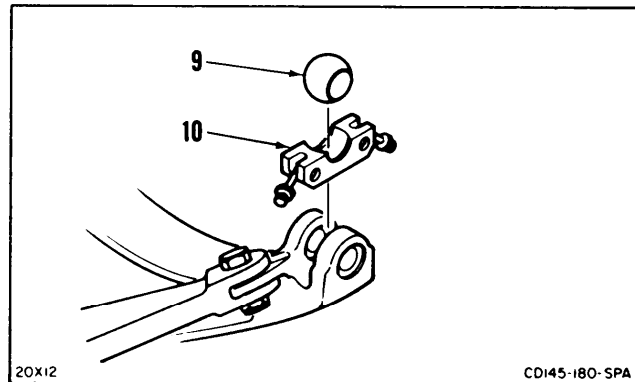
6. Remove bolt (8).



GO TO NEXT PAGE

**4-27 REMOVE FORWARD ENGINE MOUNT CAP ASSEMBLY
(Continued)**

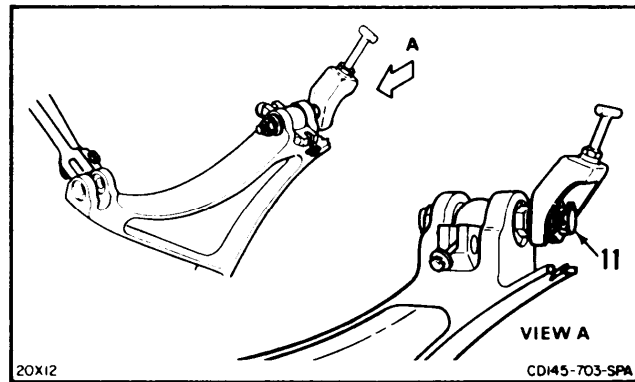
7 Remove bearing (9) and cap (10).



REMOVE INBOARD MOUNT CAP ASSEMBLY

8. Remove lockwire from bolt (11).

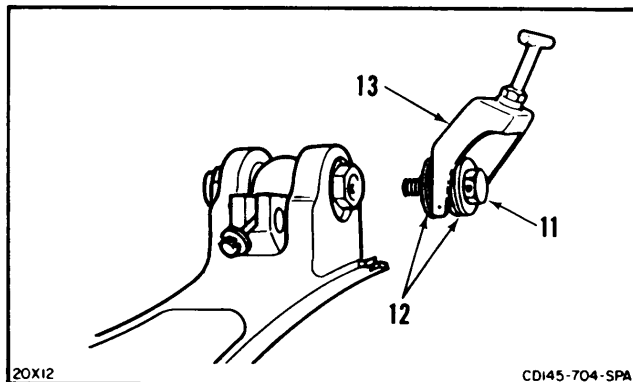
9. Loosen bolt (11).



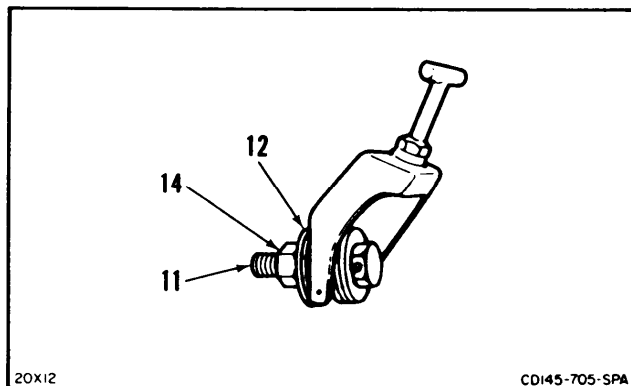
NOTE

When removing bolt, keep washers together on bolt in exact order. Placement of washers affects adjustment of engine covering.

10. Remove bolt (11), six washers (12), and latch bracket (13) together as one piece.



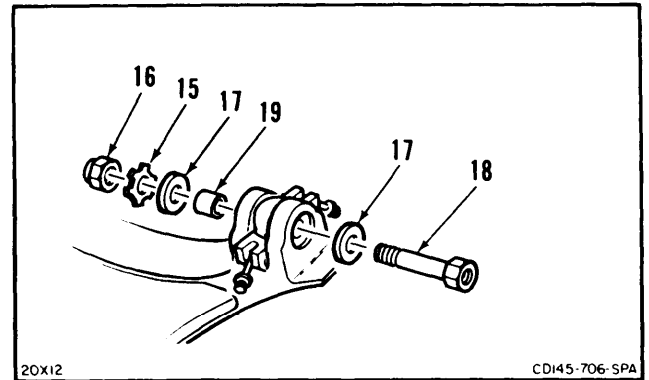
11. Install spare nut (14) on bolt (11) to keep washers (12) in place.



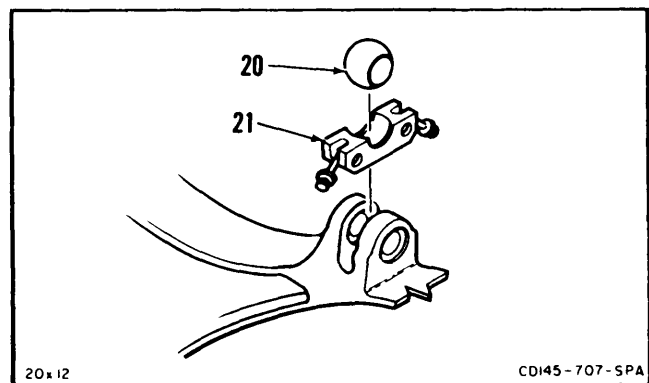
GO TO NEXT PAGE

**4-27 REMOVE FORWARD ENGINE MOUNT CAP ASSEMBLY
(Continued)****4-27**

12. Bend tabs on lockwasher (15). Remove nut (16), lockwasher, and washer (17).
13. **Remove bolt (18)**, washer (17), and slip-fit bushing (19). Use puller.



14. **Remove bearing (20) and cap (21).**

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

4-28 INSPECT FORWARD ENGINE MOUNT PARTS

INITIAL SETUP

Applicable Configurations:

All

Tools:

Micrometer Caliper, Outside, 0 To 1-Inch
 Vernier Caliper, 0 To 24 Inches

Materials:

Cloths (E135)
 Dry Cleaning Solvent (EI 62)
 Gloves (EI 86)

Personnel Required:

67U10 Medium Helicopter Repairer
 67U30 Inspector

References:

TM 55-1520-240-23P

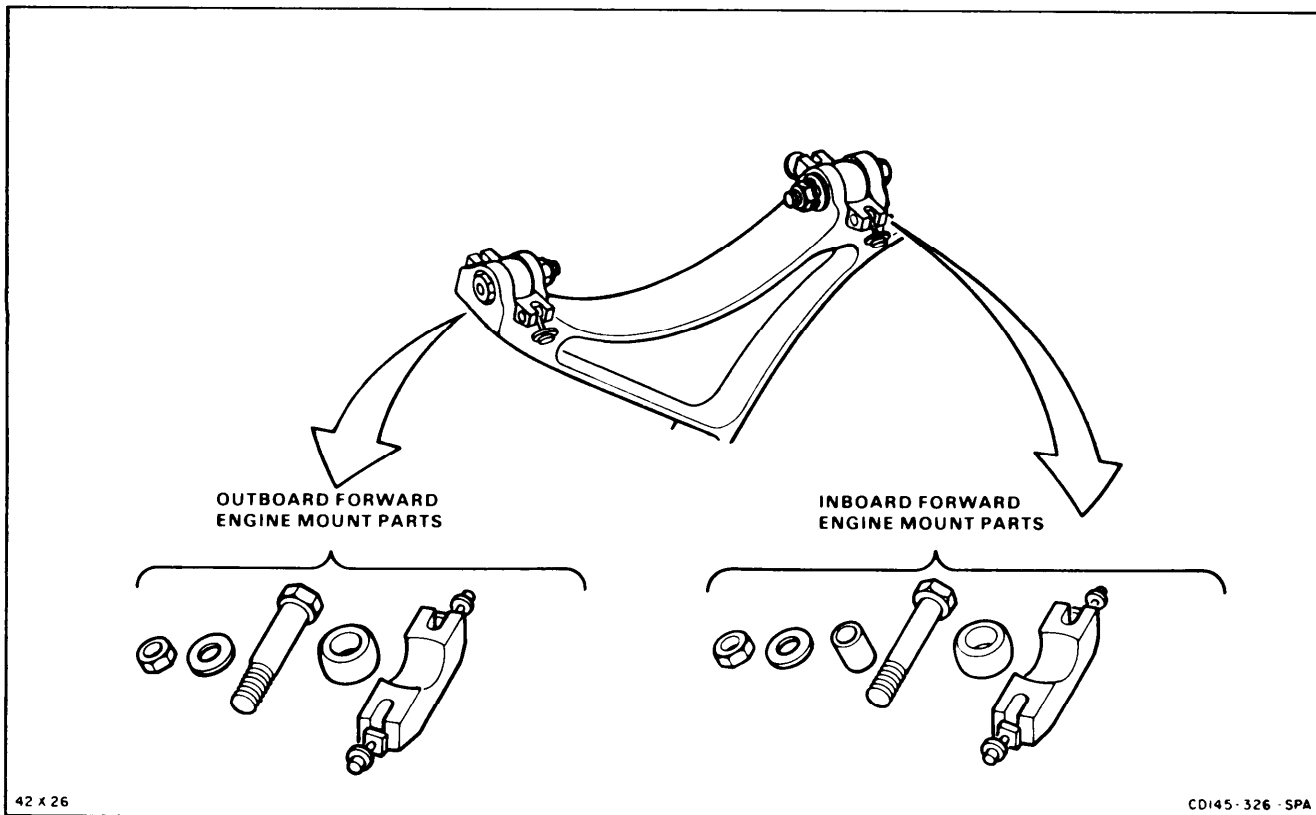
Equipment Condition:

Forward Engine Mount Cap Assembly Removed
 (Task 4-27)
 Off Helicopter Task

General Safety Instructions:

WARNING

Dry cleaning solvent (E162) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.



42 x 26

CDI45-326-SPA

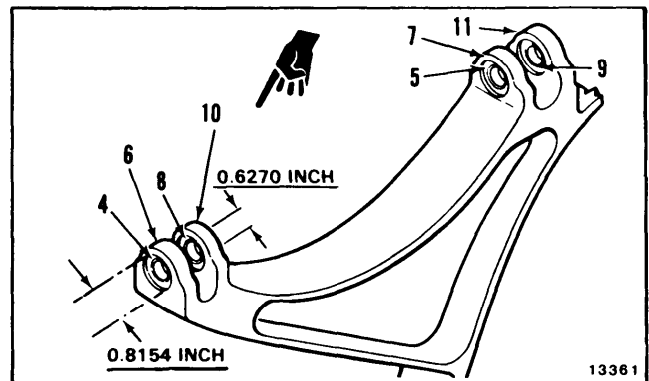
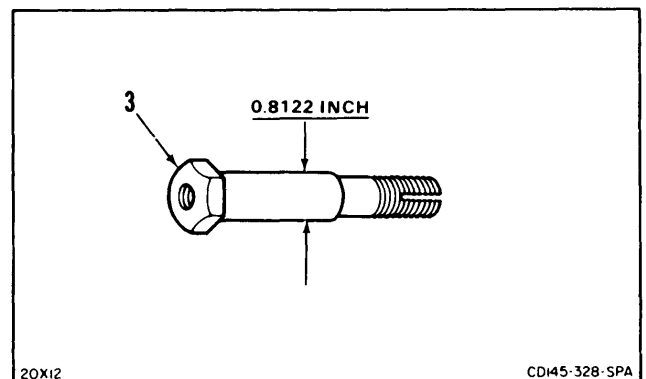
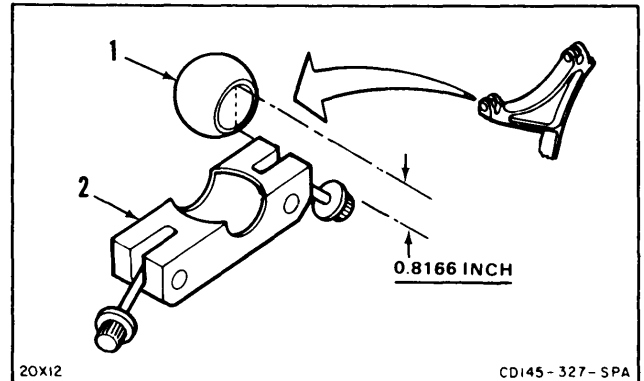
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NOTE

Procedure can be used to inspect parts from No. 1 or No. 2 engine mounts.

INSPECT OUTBOARD MOUNT PARTS

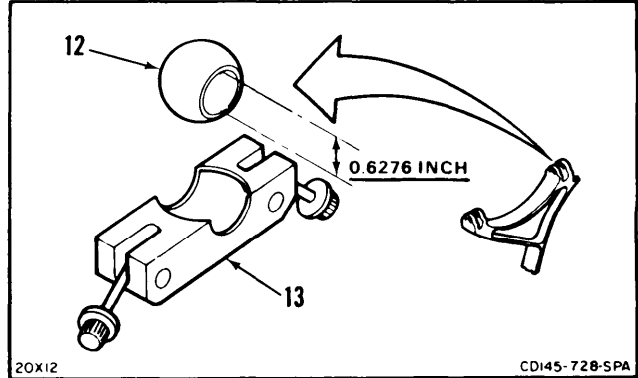
1. Clean bearing (1) and cap (2) with solvent (E 162) and cloths (E 135). Wear gloves (E 186).
2. **Measure inside diameter of bearing (1).** Diameter of bearing shall not be more than 0.8166 inch.
3. **Measure outside diameter** Diameter shall not be less than 0.8122 inch.
4. **Measure inside diameters of bushings (4 and 5) in two lugs (6 and 7).** Diameter shall not be more than 0.8154 inch.
5. **Measure inside diameter of bushings (8 and 9) in two lugs (10 and 11).** Diameter shall not be more than 0.6270 inch.



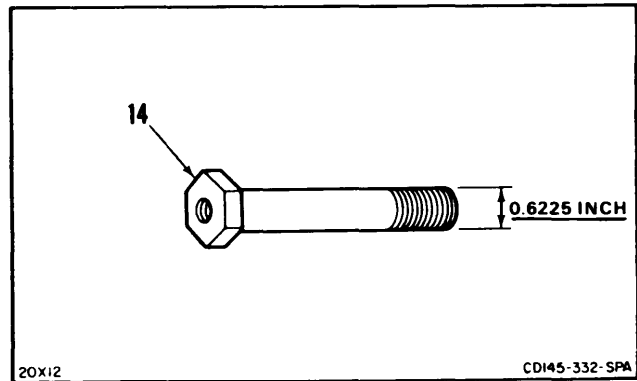
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INSPECT INBOARD MOUNT PARTS

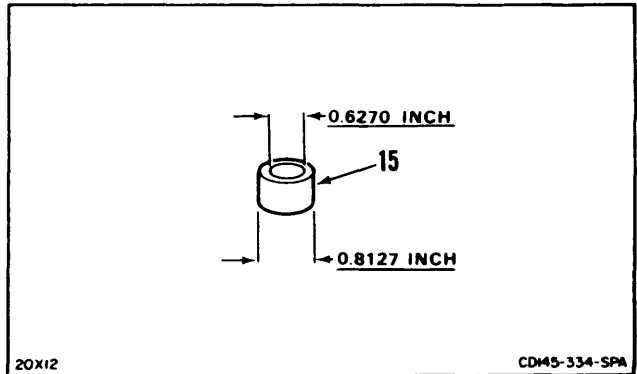
6. Clean bearing (12) and cap (13) with dry cleaning solvent (E162) and cloths (E135). Wear gloves (E186).
7. **Measure inside diameter of bearing (12).** Diameter shall not be more than 0.6276 - inch.



8. **Measure diameter of bolt (14).** Diameter shall not be less than 0.6225-inch.



9. **Measure outside diameter of bushing (15).** Diameter shall not be less than 0.8127 inch
10. **Measure inside diameter of bushing (15).** Diameter shall not exceed 0.6270 inch.



FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-29 REMOVE FORWARD ENGINE MOUNT ADAPTER 4-29

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

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

Sling (T134)

Hoist

Materials:

Tape (E388)

Paper Tags (E264)

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Hydraulic Power Off

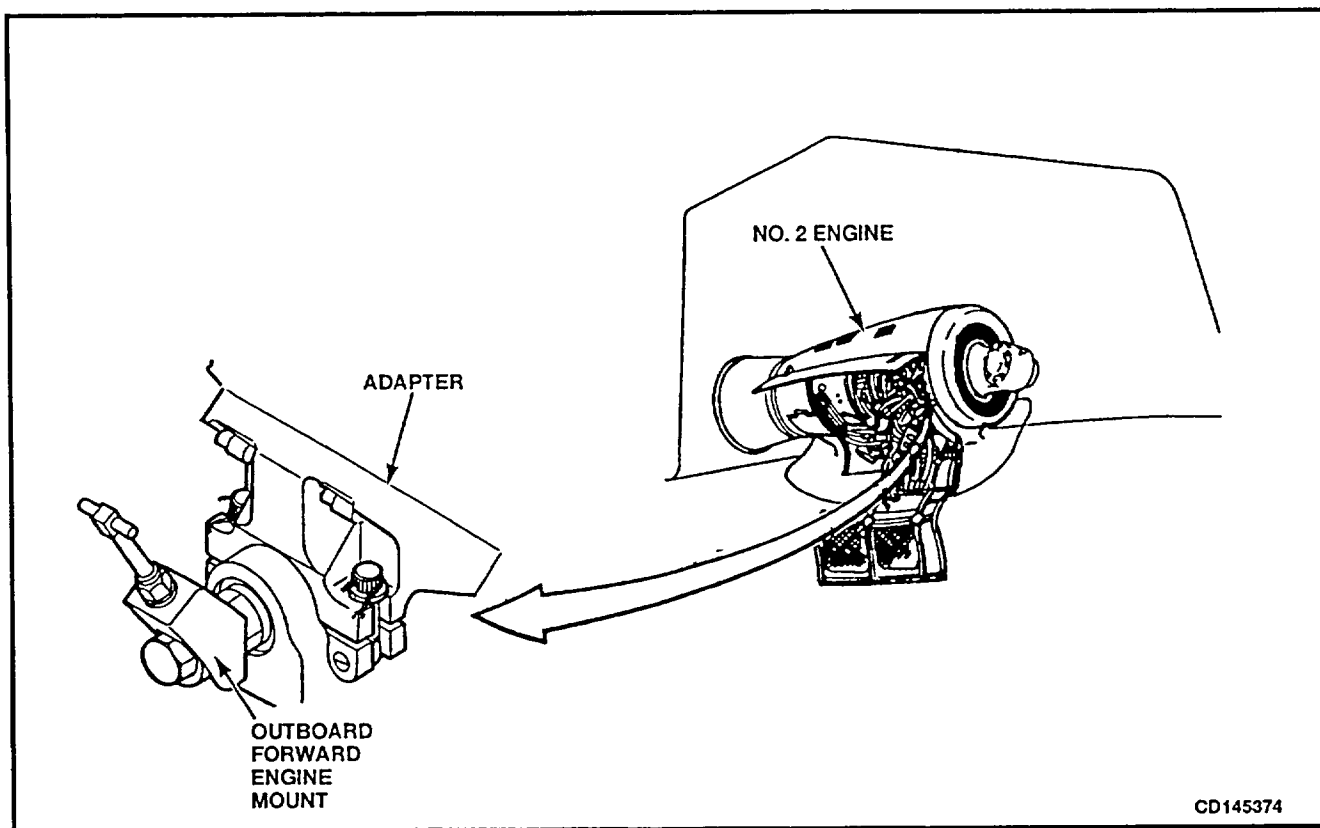
Engine Work Platform Open (Task 2-2)

Engine Air Inlet Screens Removed (Task 4-65)

Engine Side and Lower Access Covers Open
(Task 4-49)

Engine Transmission Fairing Removed (Task 4-70)

Engine Drive Shaft Removed (Task 6-30)



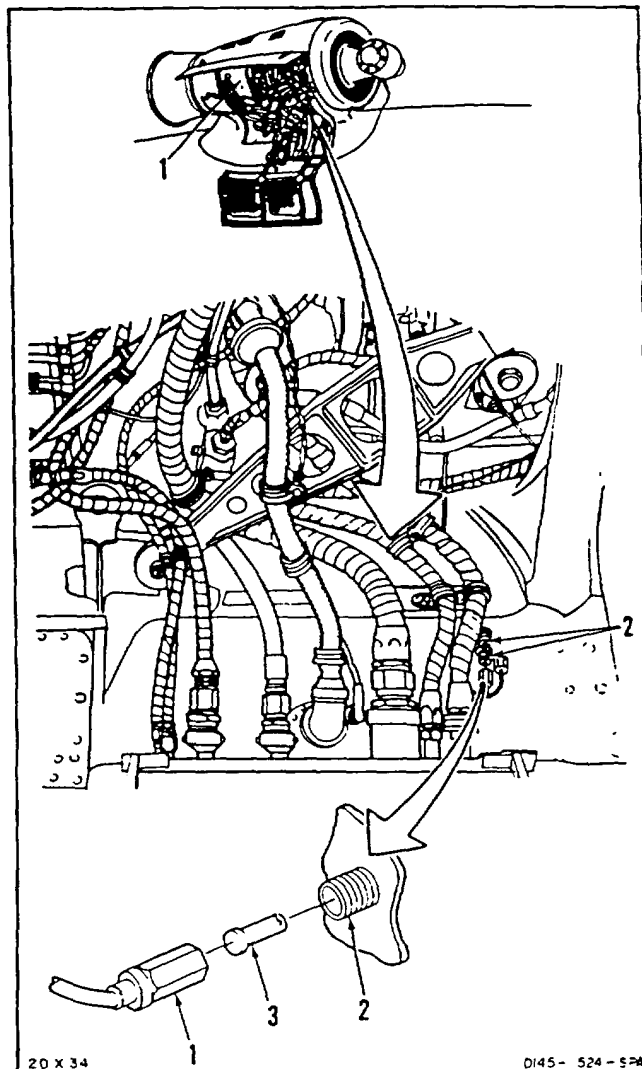
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NOTE

Procedure can be used to remove inboard or outboard forward engine mount adapters on either engine. Outboard adapter on No. 2 engine is shown here.

HOIST ENGINE

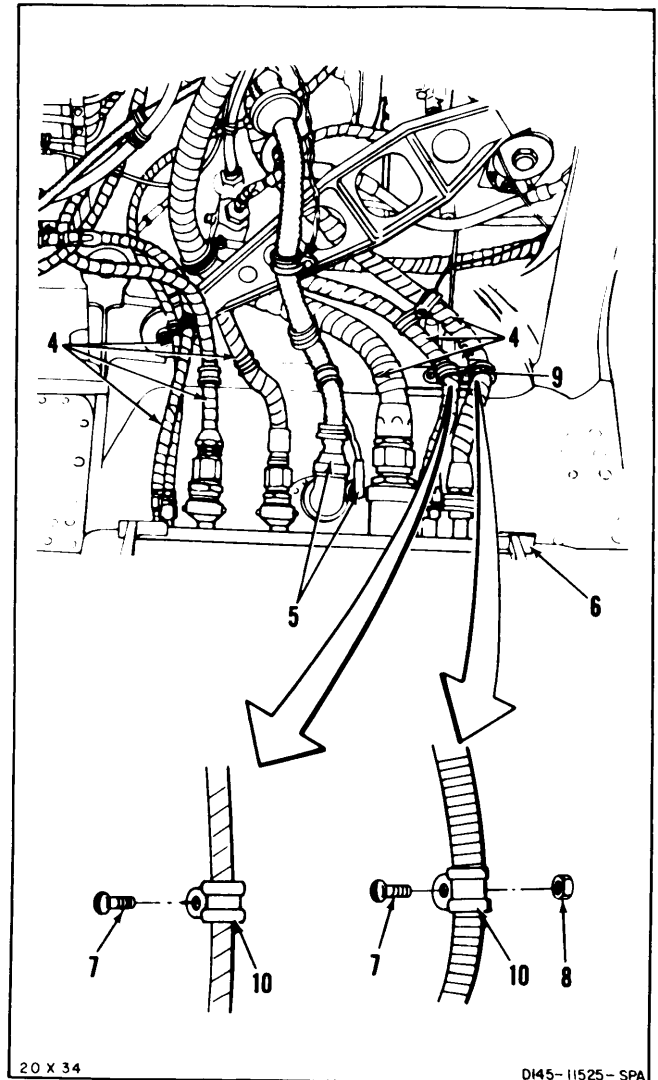
1. Disconnect two fire detection cables (1) from receptacles (2) on fuselage. Make sure insert (3) stays in receptacles. Cap connectors.

**GO TO NEXT PAGE**

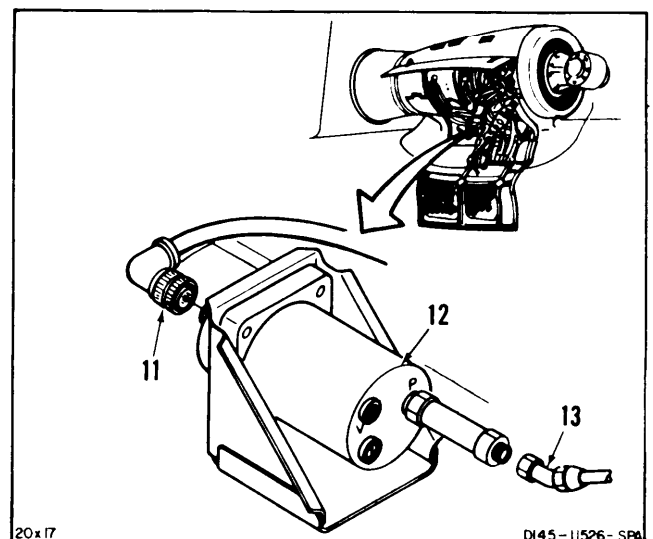
4-29 REMOVE FORWARD ENGINE MOUNT ADAPTER (Continued)

4-29

2. Tag and **disconnect seven hoses (4) and two cable connectors (5) from shelf (6).**
3. Remove two screws (7) and nut (8) from bracket (9). **Remove two clamps (10).** Mark clamp locations. Use tape E388).



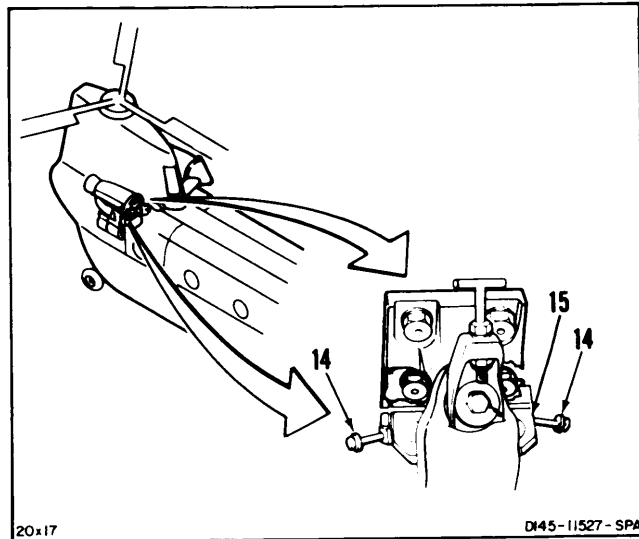
4. Remove lockwire and **disconnect cable plug (11) from oil pressure transmitter (12).** **Disconnect oil hose (13).**



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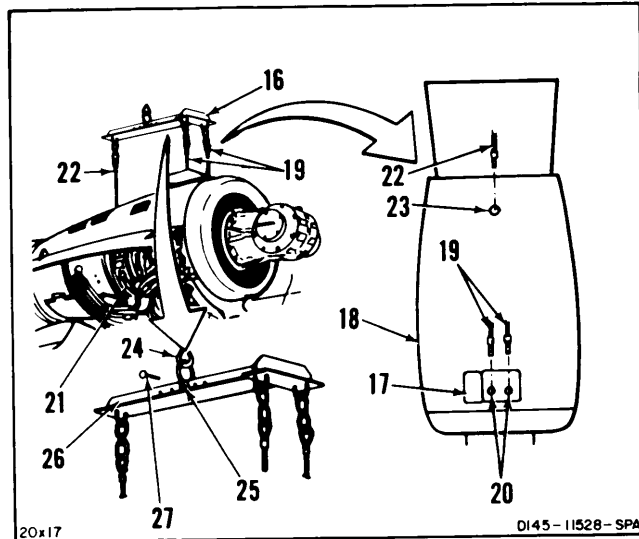
4-29 REMOVE FORWARD ENGINE MOUNT ADAPTER
(Continued)

5. Remove lockwire from two bolts (14) on two forward engine mount caps (15). **Loosen bolts and push down to side.**

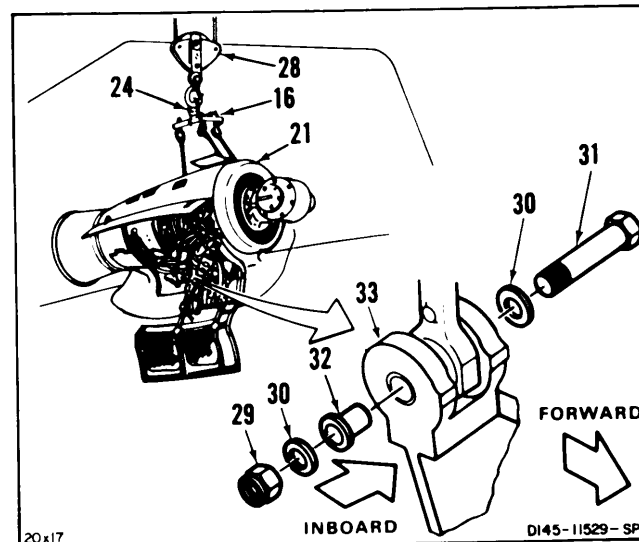


6. **Install sling (16)** as follows:

- a. Open access door (17) in engine access cover (18).
- b. Connect two cables (19) to forward fittings (20) on engine (21).
- c. Connect cable (22) into aft fitting (23) through cover (18).
- d. Adjust sling (16) until eye (24) is over center hole (25) in sling bar (26).
- e. Install pin (27) through bar (26).



7. **Connect hoist (28) to eye (24) of sling (16). Absorb weight of engine (21) with hoist.**
8. **Remove nut (29), two washers (30), bolt (31) and bushing (32) from aft engine mount (33).**



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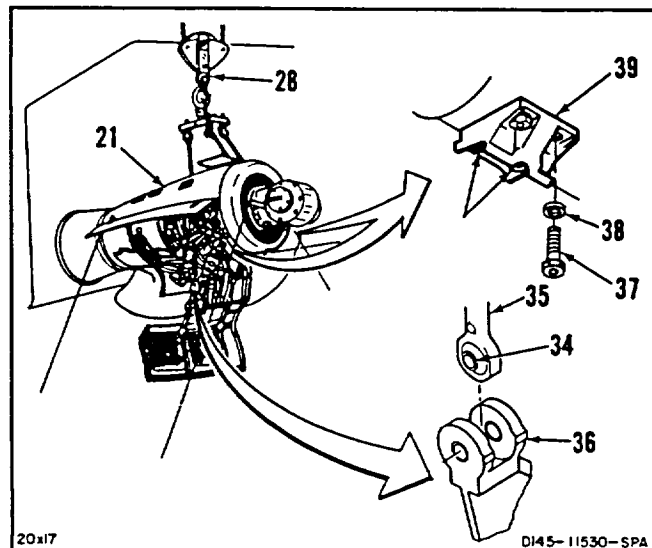
CAUTION

During raising and lowering of powerplant to adapter, make sure bearing in aft engine mount link does not tilt in clevis. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

9. Raise hoist (28) slowly to lift engine (21) 2 to 3 inches above installed position. Make sure bearing (34) in aft link (35) does not tilt in aft engine mount clevis (36).

REMOVE ADAPTER

10. Remove lockwire from 4 bolts (37). Remove four bolts and washers (38).
11. Remove adapter (39).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

4-29.1 REMOVE FORWARD ENGINE MOUNT ADAPTER

4-29.1

INITIAL SETUP

Applicable Configurations:

With 74

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Engine Sling (T134)
Hoist
Container, 2-Quart

Materials:

Tape (E388)
Paper Tags (E264)
Wiping Rags (E121)
Gloves (E184.1)

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Engine Work Platform Open (Task 2-2)
Engine Air Inlet Screens Removed (Task 4-65)
Engine Side and Lower Access Doors Open (Task 4-49)

Engine Transmission Fairing Removed (Task 4-70)

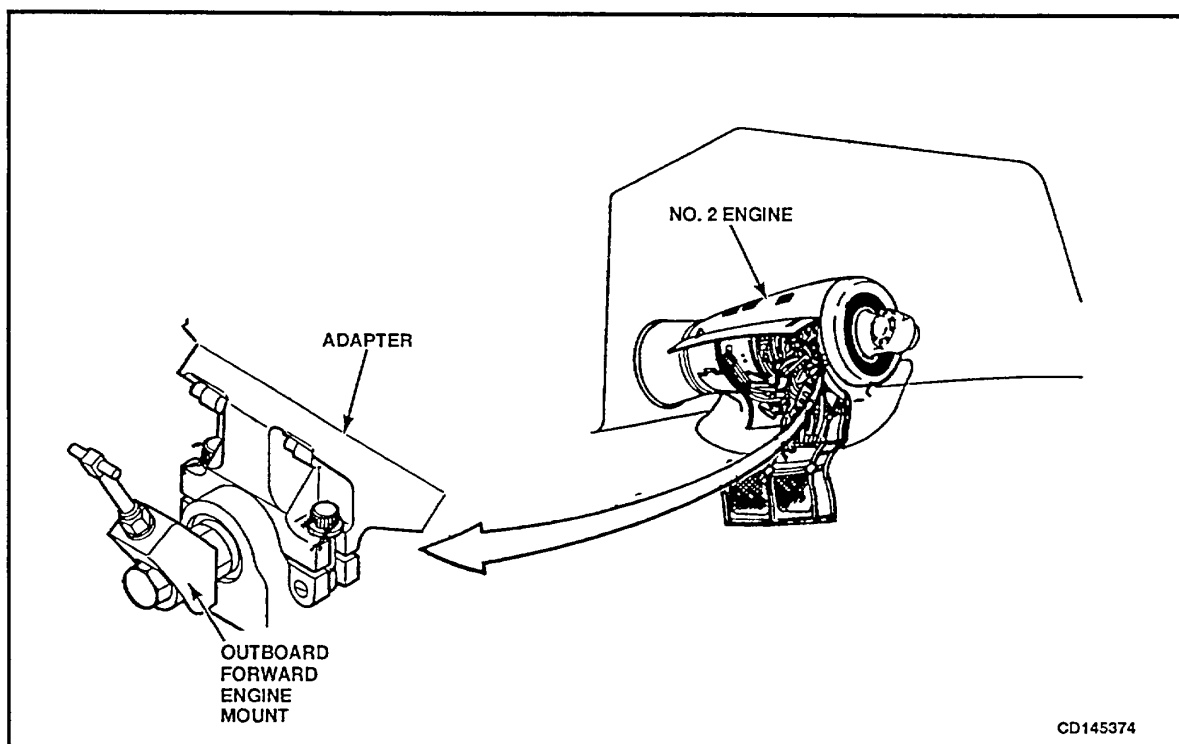
Engine Drive Shaft Removed (Task 6-30)

General Safety Instructions:**WARNING**

Fuels (JP4-JP5) (E182) are combustible 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.

WARNING

Oil (E254) is toxic and 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.



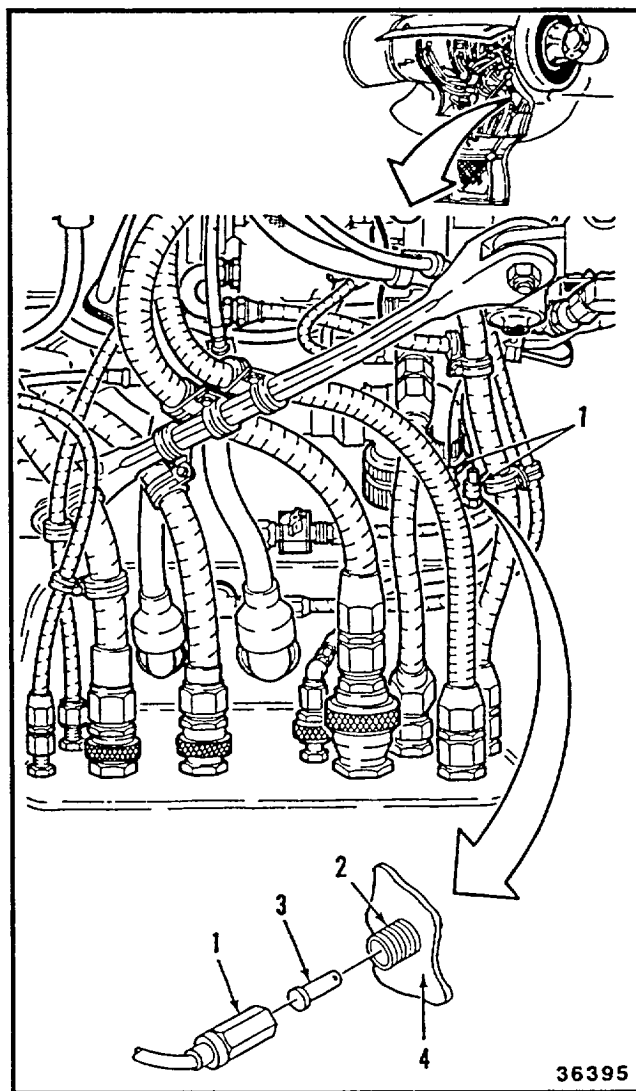
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HOIST ENGINE

NOTE

Procedure can be used to remove inboard or outboard forward engine mount adapters on either engine (powerplant) except as noted. Outboard adapter on No. 2 engine is shown here.

1. Disconnect two fire detection cables (1) from receptacles (2) on fuselage (4). Make sure insert (3) stays in receptacles (2). Cap cables (1) and receptacles (2).



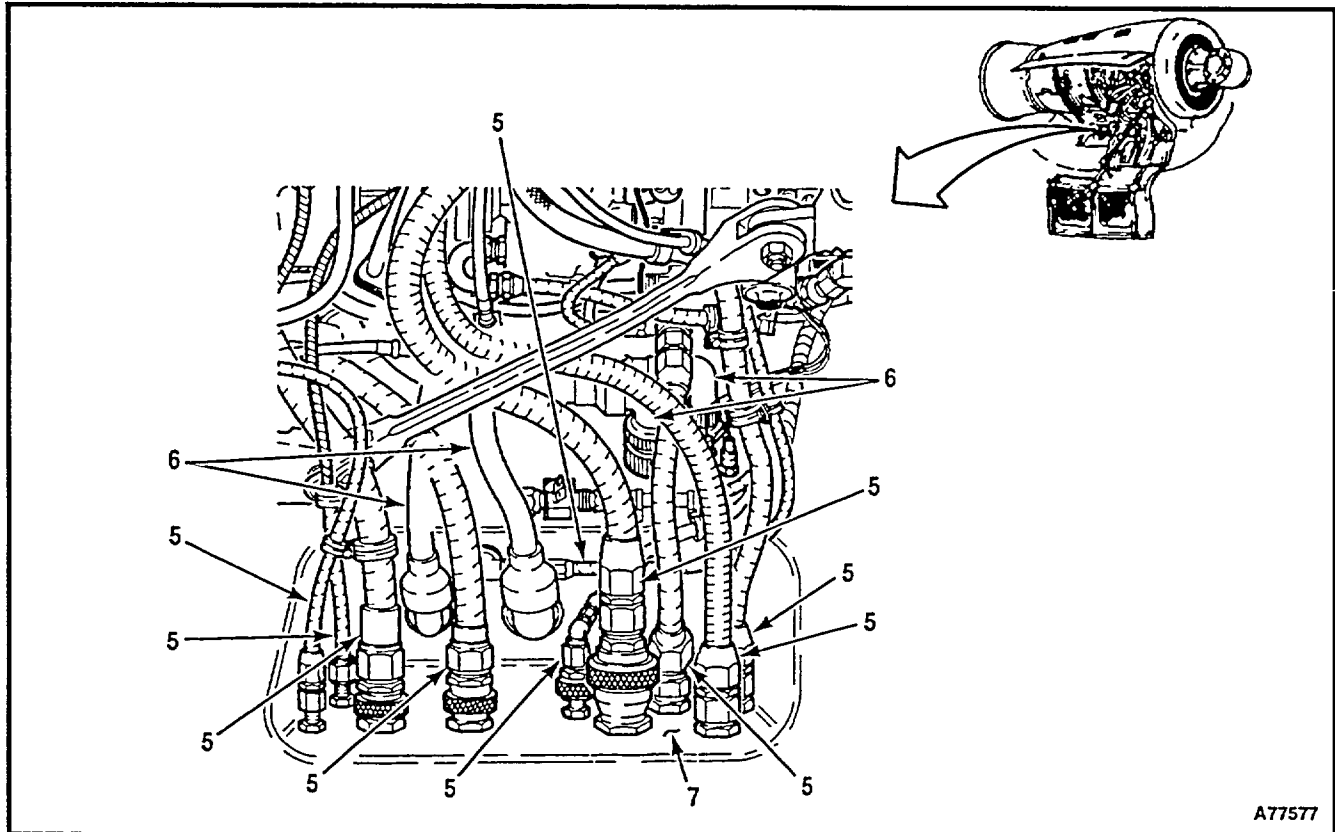
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Change 19 4-94.1

4-29.1 REMOVE FORWARD ENGINE MOUNT ADAPTER (Continued)

4-29.1

2. Tag and disconnect ten hoses (5) and four cable connectors (6) from shelf (7). Wear gloves (E184.1). Use container to catch fluids. Use rags (E121) to wipe up any spilled fluids.



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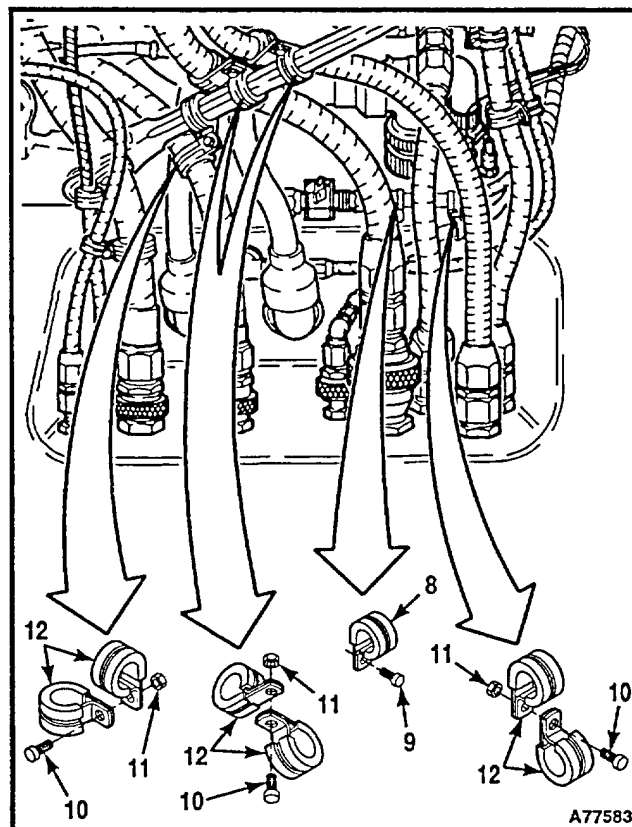
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4-94.2 Change 19

4-29.1 REMOVE FORWARD ENGINE MOUNT ADAPTER (Continued)

4-29.1

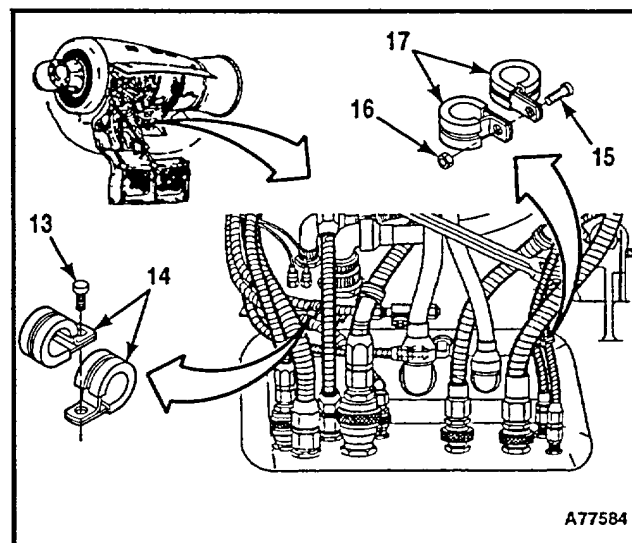
3. On No. 2 engine only:

- a. Remove clamp (8) and screw (9).
- b. Remove four screws (10) and nuts (11). Remove eight clamps (12). Use tape (E388) to mark clamp locations.



4. On No. 1 engine only:

- a. Remove screw (13) and two clamps (14). Remove screw (15), nut (16), and two clamps (17). Use tape (E388) to mark clamp locations.



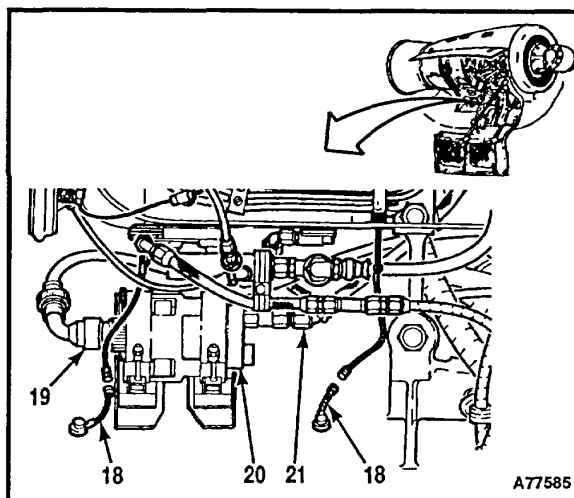
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Change 19 4-94.3

4-29.1 REMOVE FORWARD ENGINE MOUNT ADAPTER (Continued)

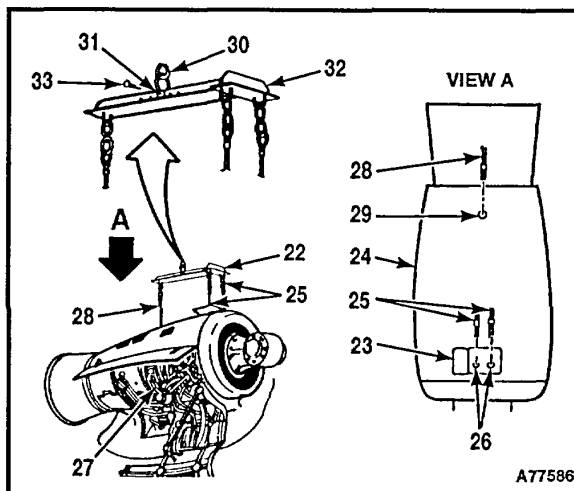
4-29.1

5. Disconnect two bonding Jumpers (18).
6. Disconnect cable plug (19) from oil pressure transmitter (20). Disconnect oil hose (21). Drain oil into container. Wipe up any spilled oil using rags (E121). Wear gloves (E184.1).

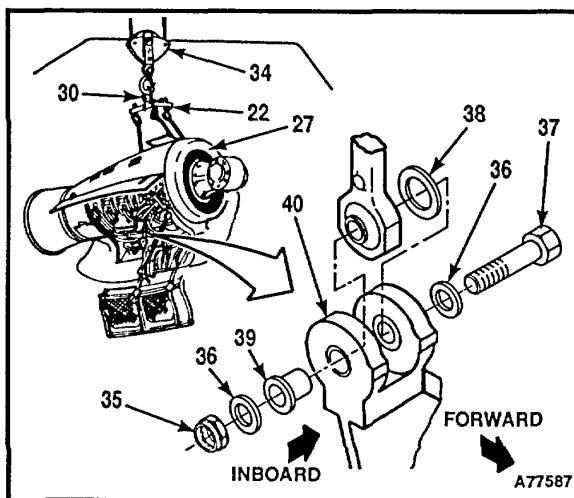


7. Install sling (22) as follows:

- a. Open access door (23) in engine access cover (24).
- b. Connect two cables (25) to forward fittings (26) on powerplant (27).
- c. Connect cable (28) into aft fitting (29) through cover (24).
- d. Move eye (30) over center hole (31) in sling bar (32).
- e. Install pin (33) through center hole in bar.



8. Connect hoist (34) to eye (30) of sling (22). Absorb weight of powerplant (27) with hoist.
9. Remove nut (35), two washers (36), bolt (37), spacer (38), and bushing (39) from aft engine mount (40).



4-29.1 REMOVE FORWARD ENGINE MOUNT ADAPTER (Continued)

4-29.1

10. Remove lockwire from two bolts (41) on two forward engine mount caps (42). Loosen bolts (41) and push down.

CAUTION

All engine hose and cable clamps attached to the airframe must be disconnected and hose and cable routing must be clear before lifting engine. Damage to equipment will occur if hoses or cable clamps are left attached or engine hoses and cables become entangled.

INSPECT**CAUTION**

During raising and lowering of powerplant to adapter, make sure bearing in aft engine mount link does not tilt in clevis. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

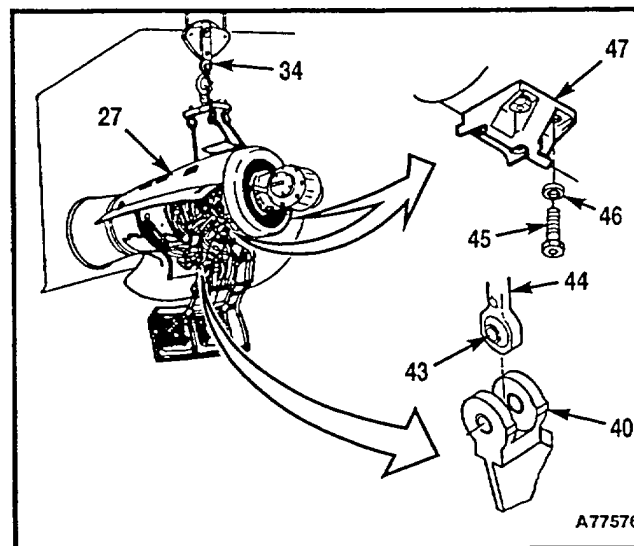
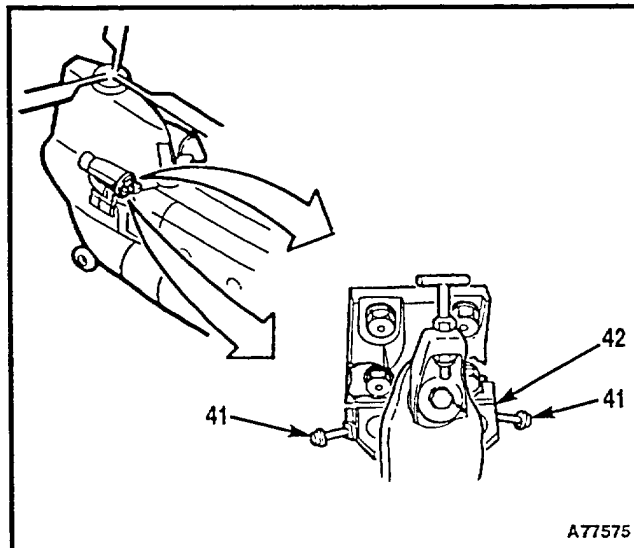
11. Raise hoist (34) slowly to lift powerplant (27) 2 to 3 inches above installed position. Make sure bearing (43) in aft link (44) does not tilt in aft engine mount clevis (40).

REMOVE ADAPTER

12. Remove lockwire from 4 bolts (45). Remove four bolts and washers (46).
13. Remove adapter (47).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

Change 19 4-94.5

4-30 REPAIR FORWARD ENGINE MOUNT STRUCTURE

4-30

INITIAL SETUP

Applicable Configurations:

All

Tools:

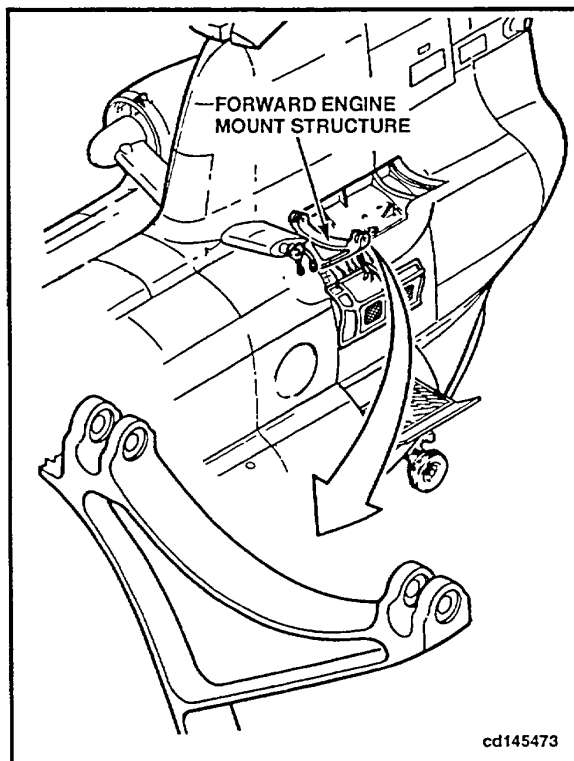
Micrometer Caliper, 0 to 1 Inch

Materials:

Abrasive Cloth (E1)

Personnel Required:

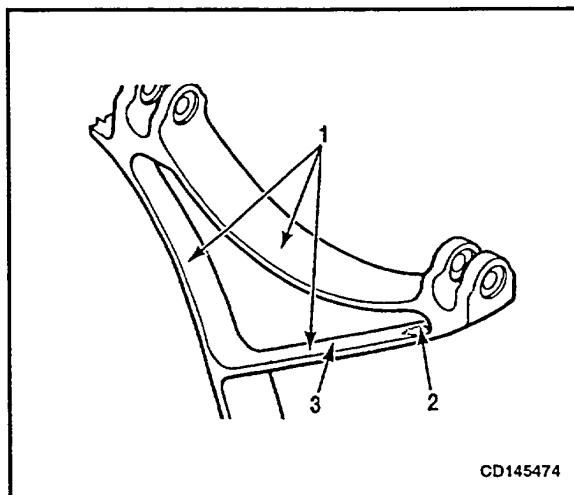
Medium Helicopter Repairer (2)

Equipment Condition:Forward Engine Mount Cap Assembly Removed
(Task 4-27)**CAUTION**

Do not burnish deeper than 10 percent into structure thickness.

NOTE

- Any burnished area must be large enough to blend smoothly into area around it.
 - Procedure can be used to repair mount structure for No. 1 and No. 2 engine. Mount structure for No. 1 engine is shown.
1. Burnish cracks, nicks, or gouges on engine mount structure (1).
 2. **Measure thickness of burnished area (2)** on structure. Record measurement.
 3. **Measure thickness of unburnished area (3)** on structure. Record measurement.
 4. **Subtract measurement in step 2. from measurement in step 3.** Difference shall not be more than 10 percent of structure thickness.



FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-94.6 Change 19

4-31 REPAIR FORWARD ENGINE MOUNT LUGS (AVIM)

4-31

INITIAL SETUP

Applicable Configurations:

All

Tools:

Micrometer Caliper, 0 to 1 Inch

Materials:

Abrasive Cloth (E1)

Personnel Required:

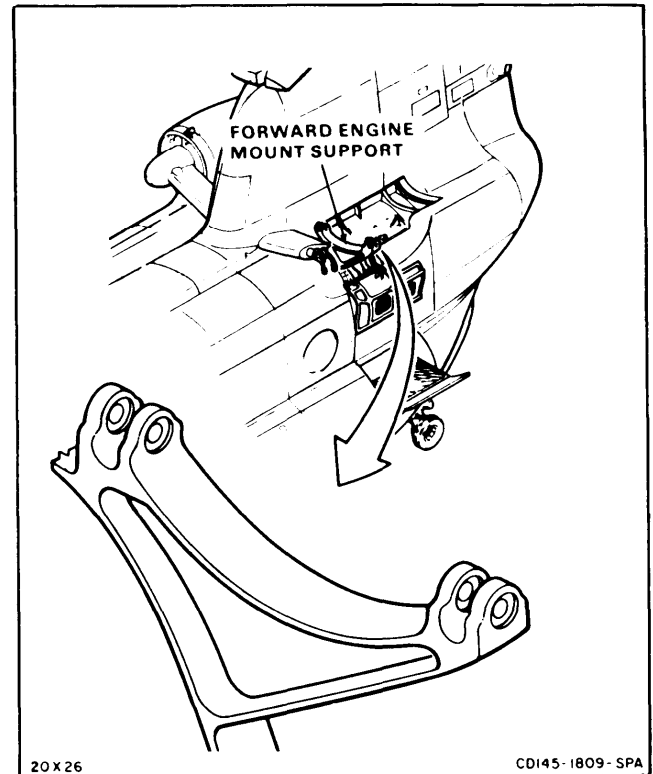
67U20 Medium Helicopter Repairer

67U30 Inspector

Equipment Condition:

Engine Work Platform Open (Task 2-2)

Powerplant Removed (Task 4-10)

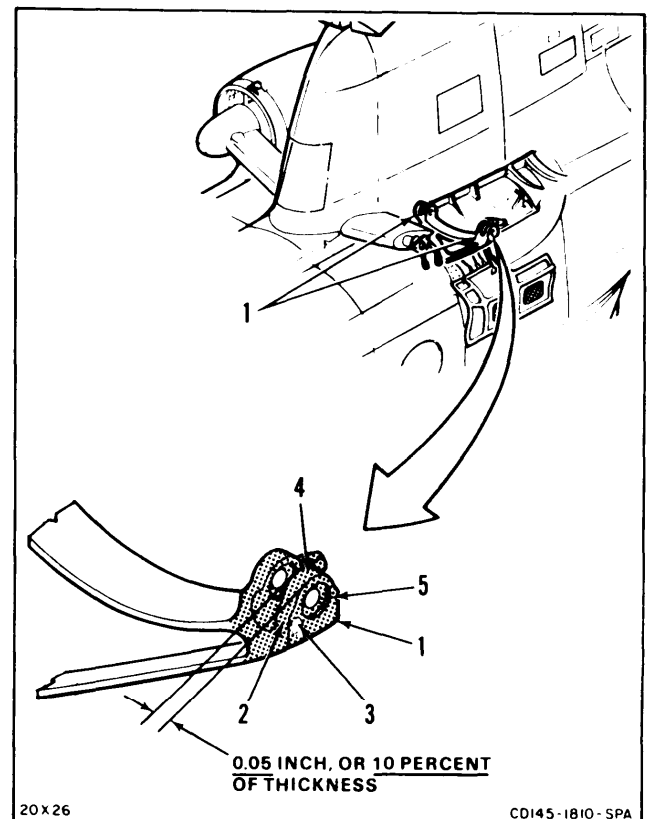
Forward Engine Mount Cap Assembly Removed
(Task 4-27)**NOTE**

- Any burnished area must be large enough to blend smoothly into area around it.
- This task can be used to repair mount lugs for No. 1 and No. 2 engine. Mount lugs for No. 1 engine are shown.

1. **Burnish scratches, nicks, or gouges** on engine mount lugs (1). **Do not burnish deeper than 10 percent into lug thickness, or 0.050-inch, whichever is less.**
2. Measure thickness (2) of burnished area (3) on lug (1). Record measurement.
3. **Measure thickness (4) of unfurnished area (5) on lug (1).** Record measurement.
4. **Subtract measurement in step 2. from measurement in step 3.** Difference shall not be more than 0.050-inch, or 10 percent of material thickness.

FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-32 REPAIR FORWARD ENGINE MOUNT ADAPTER AND CAP

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Torque Wrench, 30 to 150 Inch-Pounds

Materials:

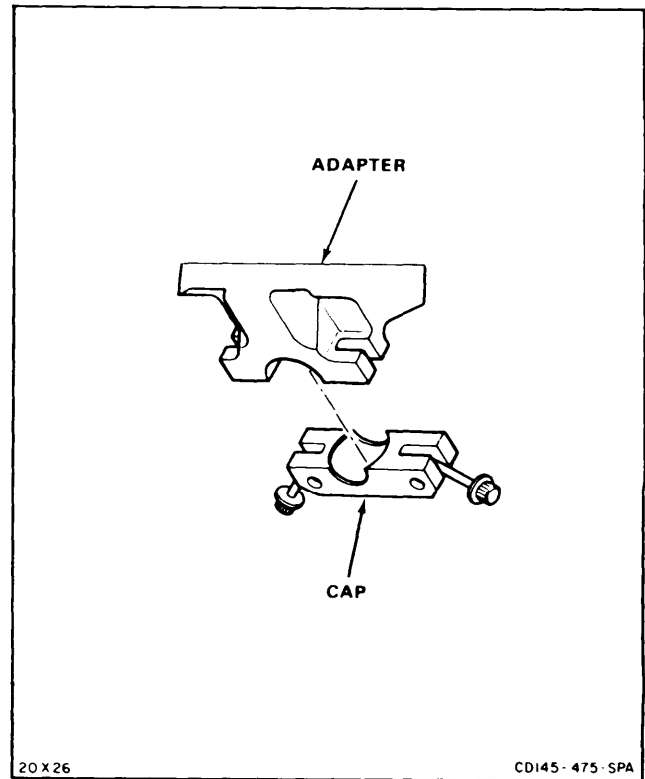
Abrasive Cloth (E1)

Personnel Required:

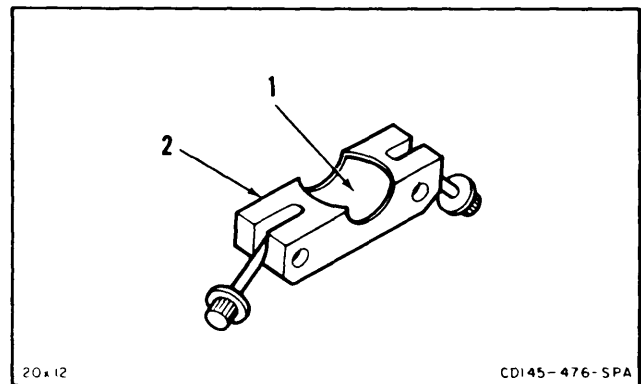
67U20 Medium Helicopter Repairer

Equipment Condition:

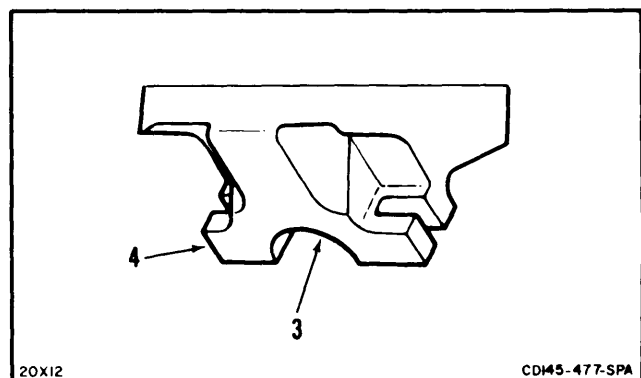
Off Helicopter Task



1. **Burnish inside curve (1) of cap (2)** to remove scratches, scoring, or gouges. Use abrasive cloth (E1).



2. **Burnish inside curve (3) of adapter (4)** to remove scratches, scoring, or gouges. Use abrasive cloth (E1).

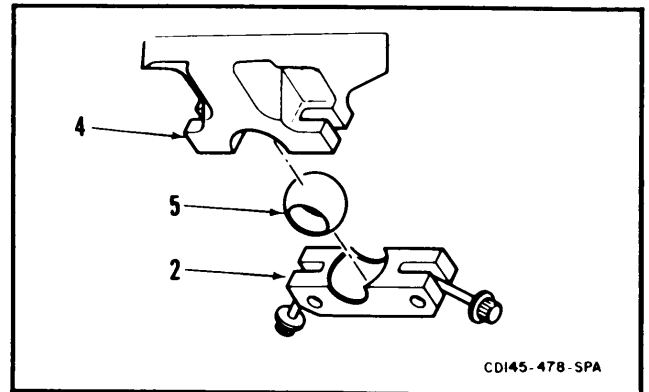


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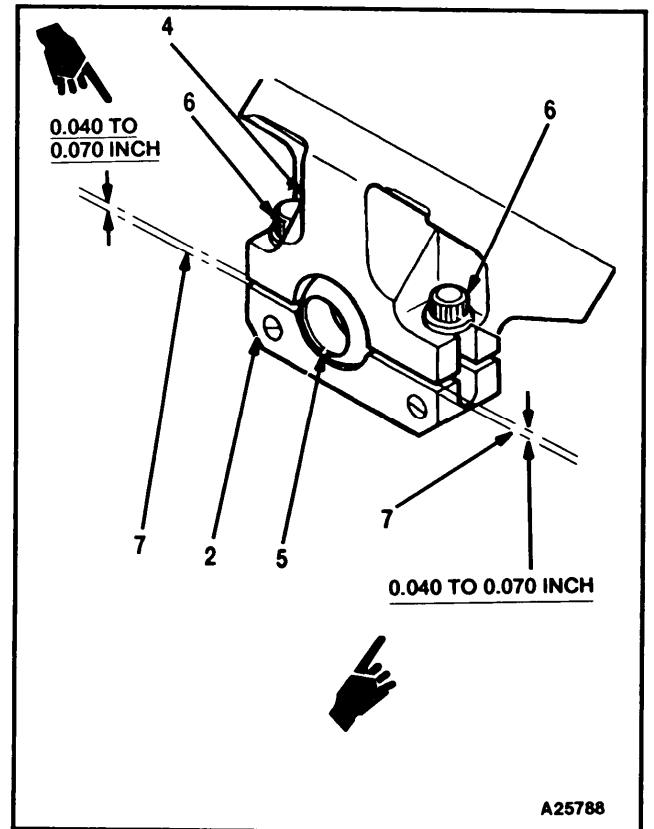
4-32 REPAIR FORWARD ENGINE MOUNT ADAPTER AND CAP (Continued)

4-32

3. Place bearing (5) in cap (2).
4. Hold cap (2) and bearing (5) against adapter (4).



5. Secure cap (2) and bearing (5) to adapter (4) with bolts (6).
6. Torque bolts (6) to 105 inch-pounds.
7. Measure gap (7).
 - a. If gap measures 0.040 to 0.070 inch at each end of cap (2), no repair required.
 - b. If gap is less than 0.040 inch, continue with step 8.
 - c. If gap is more than 0.070 replace cap and adapter (4).
8. Loosen bolts (6).

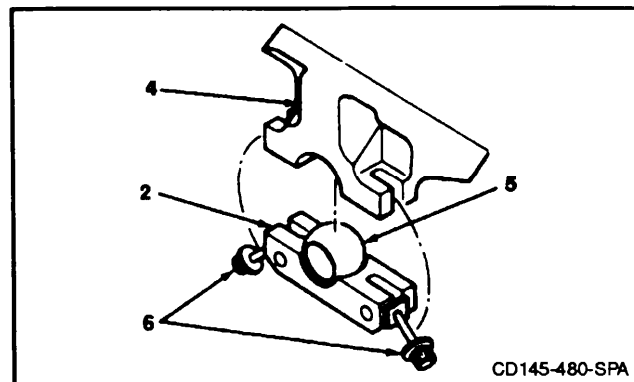


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4-32 REPAIR FORWARD ENGINE MOUNT ADAPTER AND CAP (Continued)

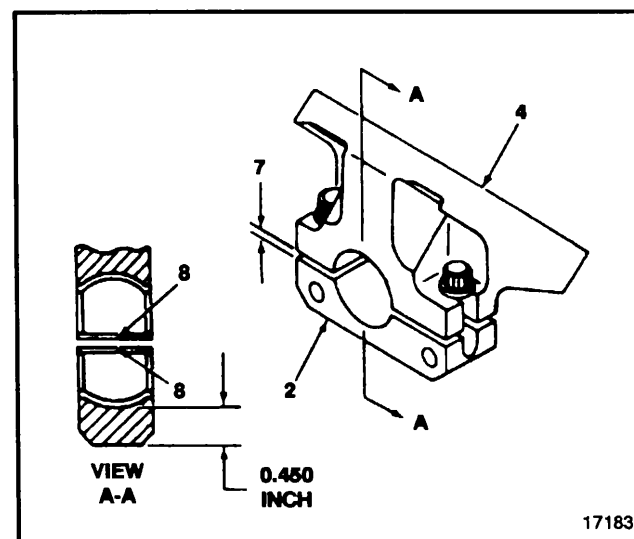
4-32

9. Push bolts (6) out and down.
10. Remove cap (2) and bearing (5) from adapter (4).



11. If gap (7) measured in step 7, is less than **0.040 inch**, dress facing surfaces (8) in equal amounts, with fine aluminum oxide abrasive cloth (E1), supported on a flat surface. Continue until a gap of **0.040 to 0.070 inch** exists. **Do not paint surfaces.**

12. If gap (7) is greater than **0.060 inch**. Replace cap (2) and adapter (4).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aviation Intermediate Machine Shop Set, NSN 4920-00-405-9279
- Mechanical Puller
- Telescoping Gage, 3/4 To 1 1/4-inch
- Outside Micrometer Caliper, 0 To 1-inch
- Inside Caliper

Materials:

- Carbon Dioxide (Dry Ice) (E92)
- Cloths (E135)
- Gloves (E184.1)
- Epoxy Primer (E292)
- Steel, Bar, CRES, 0.040-Inch Thick (E367)

Personnel Required:

Machinist

Equipment Condition:

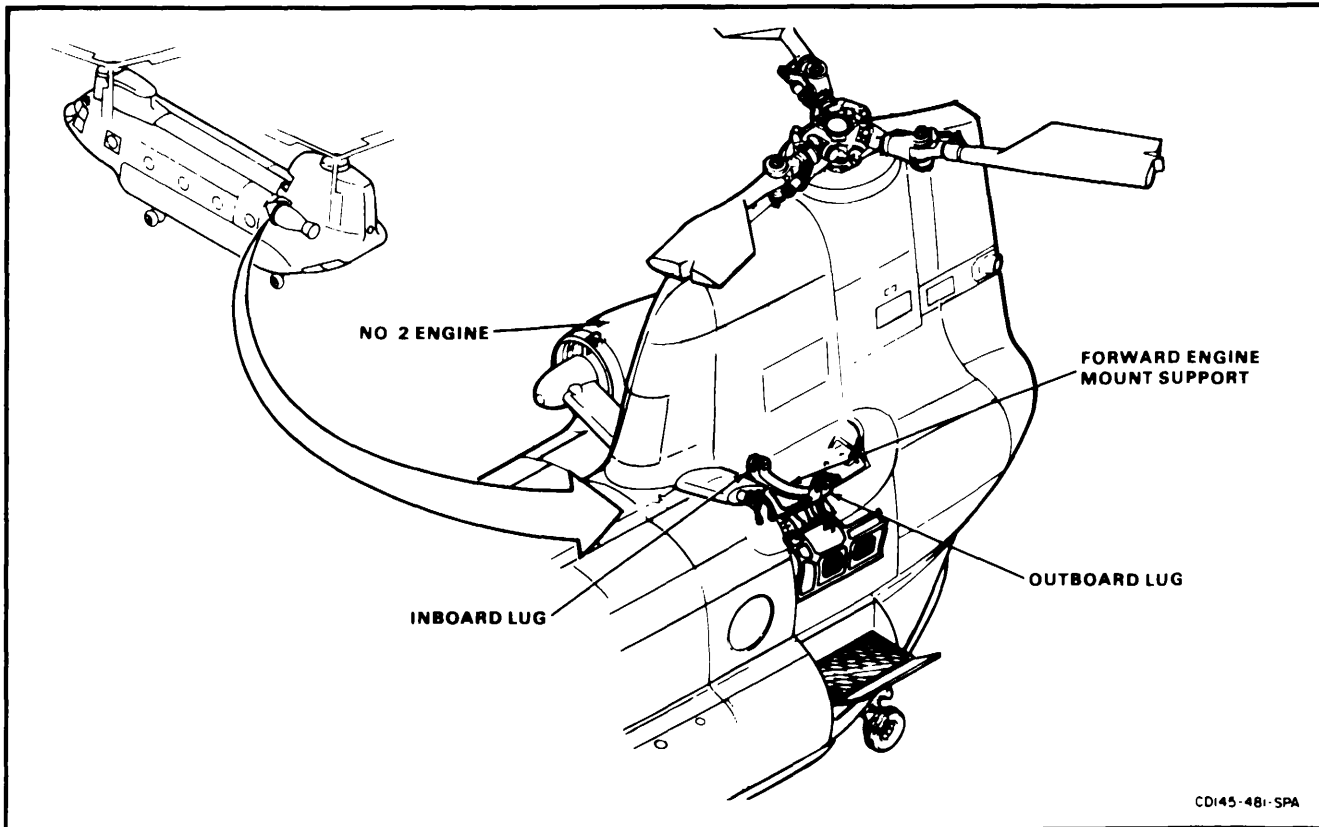
Forward Engine Mount Cap Assembly Removed (Task 4-27)

General Safety Instructions:

WARNING

Carbon dioxide (dry ice) (E92) causes severe burns and may be toxic. Use only in well-ventilated area. Do not get in eyes, on skin or clothing. In case of contact immediately flush skin with water for at least 15 minutes. Get medical attention for eyes.

Epoxy primer (E292) 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.



CD145-481-SPA

4-33 REPLACE BUSHINGS IN FORWARD ENGINE MOUNT LUGS (AVIM) (Continued)

4-33

NOTE

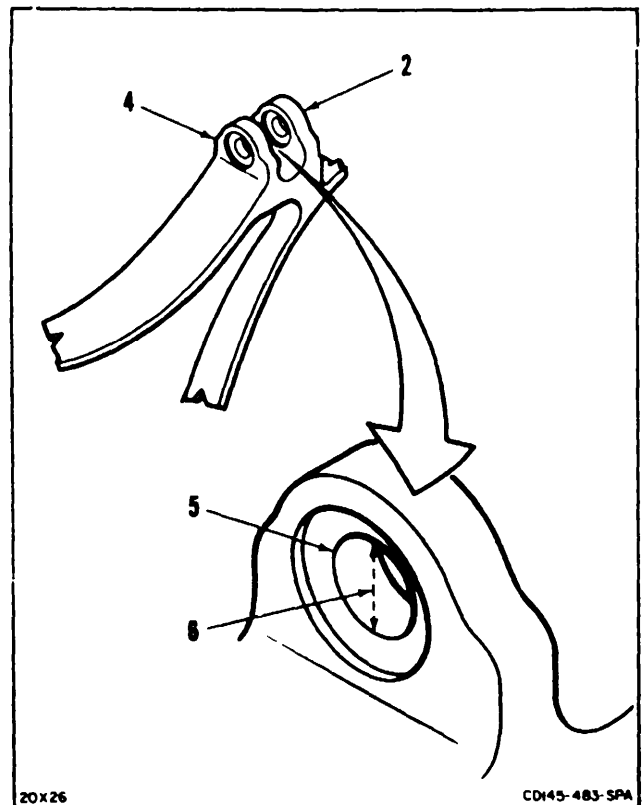
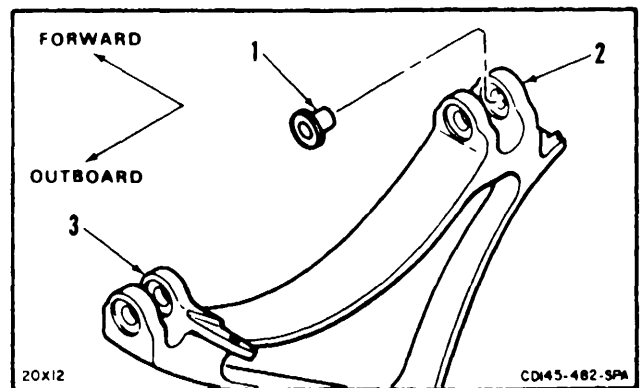
This task can be used to replace bushings in lugs on No 1 or No. 2 engine mount support. Only bushings in lugs on No. 1 engine mount support are shown here.

REPLACE SHOULDER BUSHING

NOTE

It may be necessary to apply carbon dioxide (E92) to bushing area for easier removal of bushing.

1. Remove shoulder bushing (1) from engine mount lugs (2) and (3).
2. Ream lug (2) in line with other lug (4). Make a round hole (5) with an inside diameter (6) no larger than 0.9844-inch.



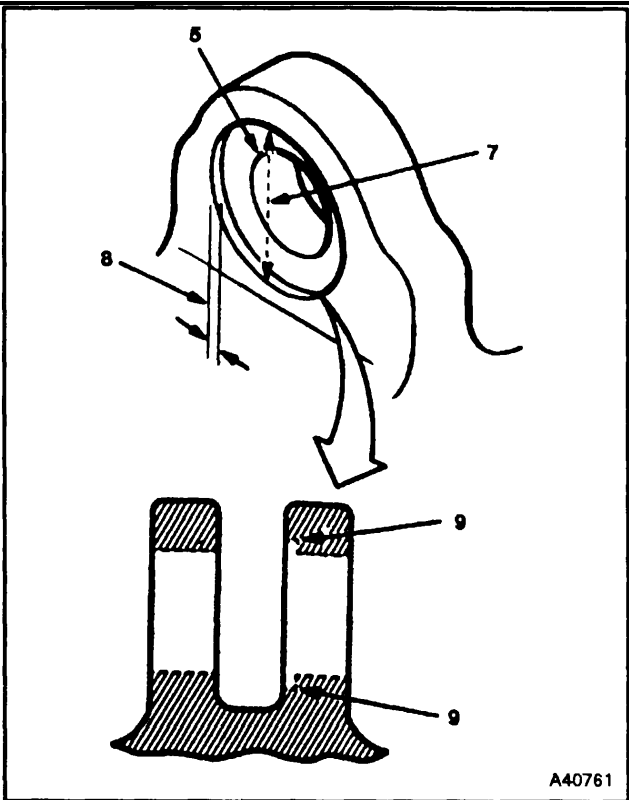
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4-33 REPLACE BUSHINGS IN FORWARD ENGINE MOUNT LUGS (AVIM)
(Continued)

NOTE

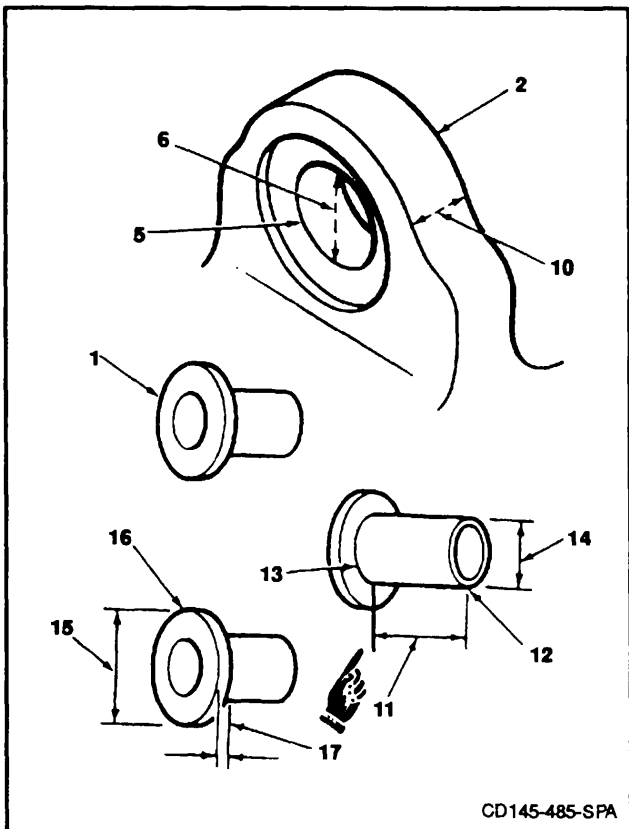
On some helicopters, the original spotface diameter (7) is 1.38 inches. Do not increase this diameter.

3. **Respotface hole (5) to increase spotface diameter (7) to 1.38 inch. Do not increase spotface depth (8).**
4. **Spotface radius (9) to 0.030 inch.**



5. Measure inside diameter (6) of hole (5). Record measurement.
6. Measure width (10) of lug (2). Record measurement.
7. **Make new shoulder bushing (1) from steel (E367) as follows:**

- a. Make bushing length (11) from flat end (12) to counterbore (13) equal to lug width (10). (See measurement recorded in step 6.)
- b. Make outside diameter (14) of bushing (1) 0.0008 to 0.0023 inch more than inside diameter (6) of hole (5). (See measurement recorded in step 5.)
- c. Make outside diameter (15) of shoulder (16) 1.125 inches.
- d. Make width (17) of shoulder (16) 0.060 inch.



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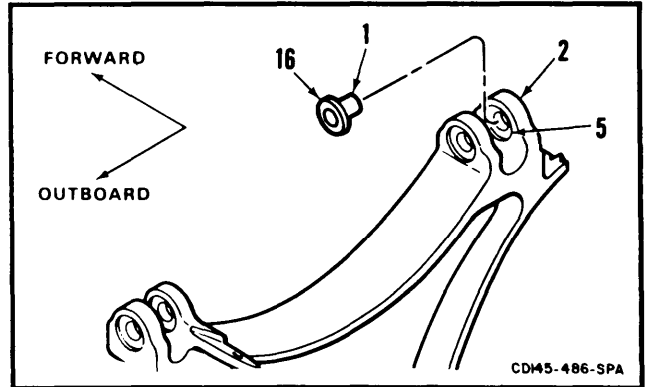
4-33 REPLACE BUSHINGS IN FORWARD ENGINE MOUNT LUGS (AVIM) 4-33 (Continued)

- Coat inside of hole (5) in lug (2) with epoxy primer (E292). Wear gloves (E184.1).

NOTE

Bushing must be installed while epoxy primer (E292) is still wet.

- Install new bushing (1) in lug (2) so shoulder (16) of bushing is facing outboard.
- Wipe off excess primer from lug (2). Use cloths (E135).

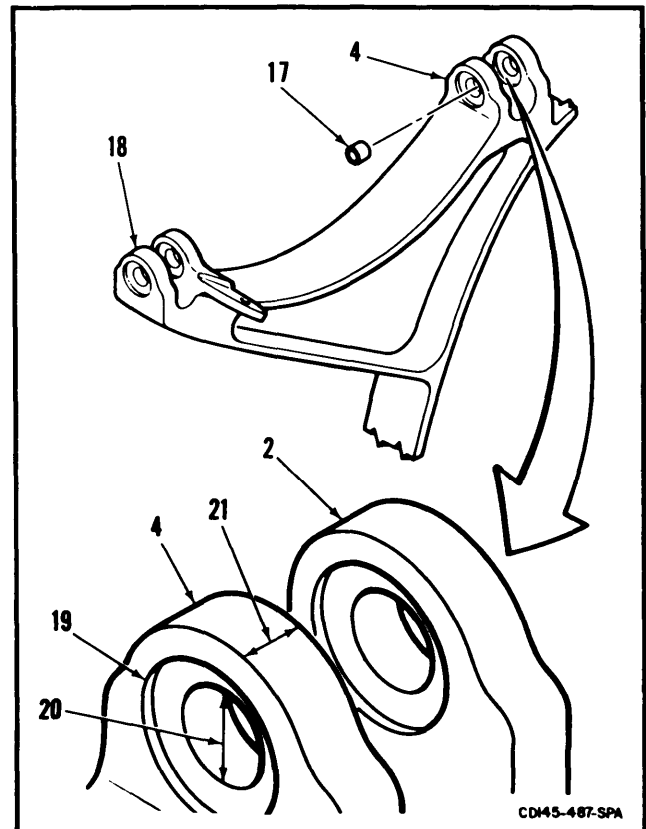


REPLACE SHOULDERLESS BUSHING

NOTE

It may be necessary to apply carbon dioxide (E92) to bushing area for easier removal of bushing.

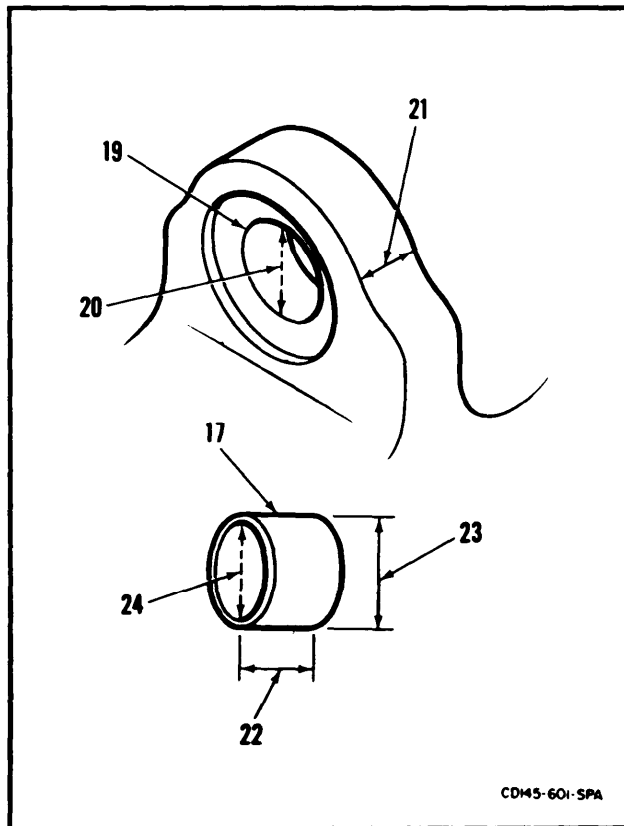
- Remove bushing (17) from engine mount lugs (4) and (18).
- Ream lug (4) in line with other lug (2). Make a round hole (19) with an inside diameter (20) no larger than 0.9844-inch.



GO TO NEXT PAGE

4-33 REPLACE BUSHINGS IN FORWARD ENGINE MOUNT LUGS (AVIM) 4-33
(Continued)

13. **Measure inside diameter (20) of hole (19).** Record measurement.
14. **Measure lug width (21).** Record measurement.
15. **Make new shoulderless bushing (17) from steel (E367) as follows:**
 - a. Make bushing length (22) equal to lug width (21). (See measurement recorded in step 14.)
 - b. Make outside diameter (23) of bushing (17) 0.0008 to 0.0023-inch more than inside diameter (20) of hole (19). (See measurement recorded in step 13.)
 - c. Make inside diameter (24) of bushing (17) equal to 0.8144-inch.

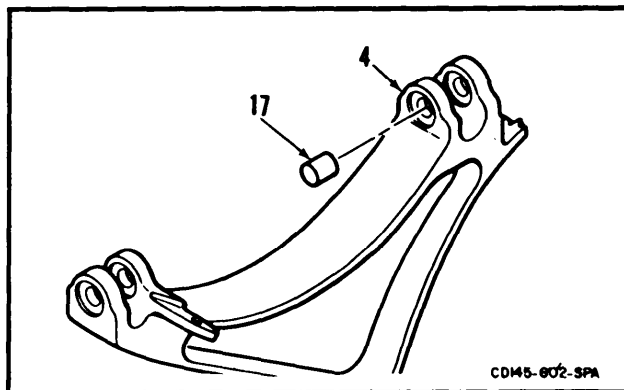


16. **Coat inside of lug (4) with epoxy primer (E292).** Wear gloves (E184.1).

NOTE

Bushing must be installed in lug while epoxy primer (E292) is still wet.

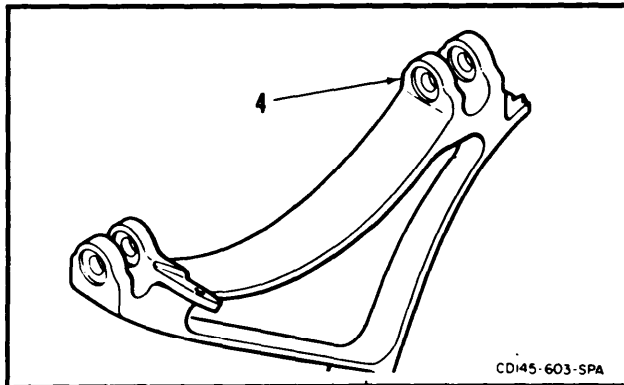
17. **Install new shoulderless bushing (17) in lug (4).**



18. Wipe off any excess epoxy primer (E292) from lug (4). Use cloths (E135).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-34 INSTALL FORWARD ENGINE MOUNT CAP ASSEMBLY**4-34****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit
NSN 5180-00-323-4692
Torque Wrench, 100 To 750 Inch-Pounds

Materials:

Lockwire (E231)

Parts:

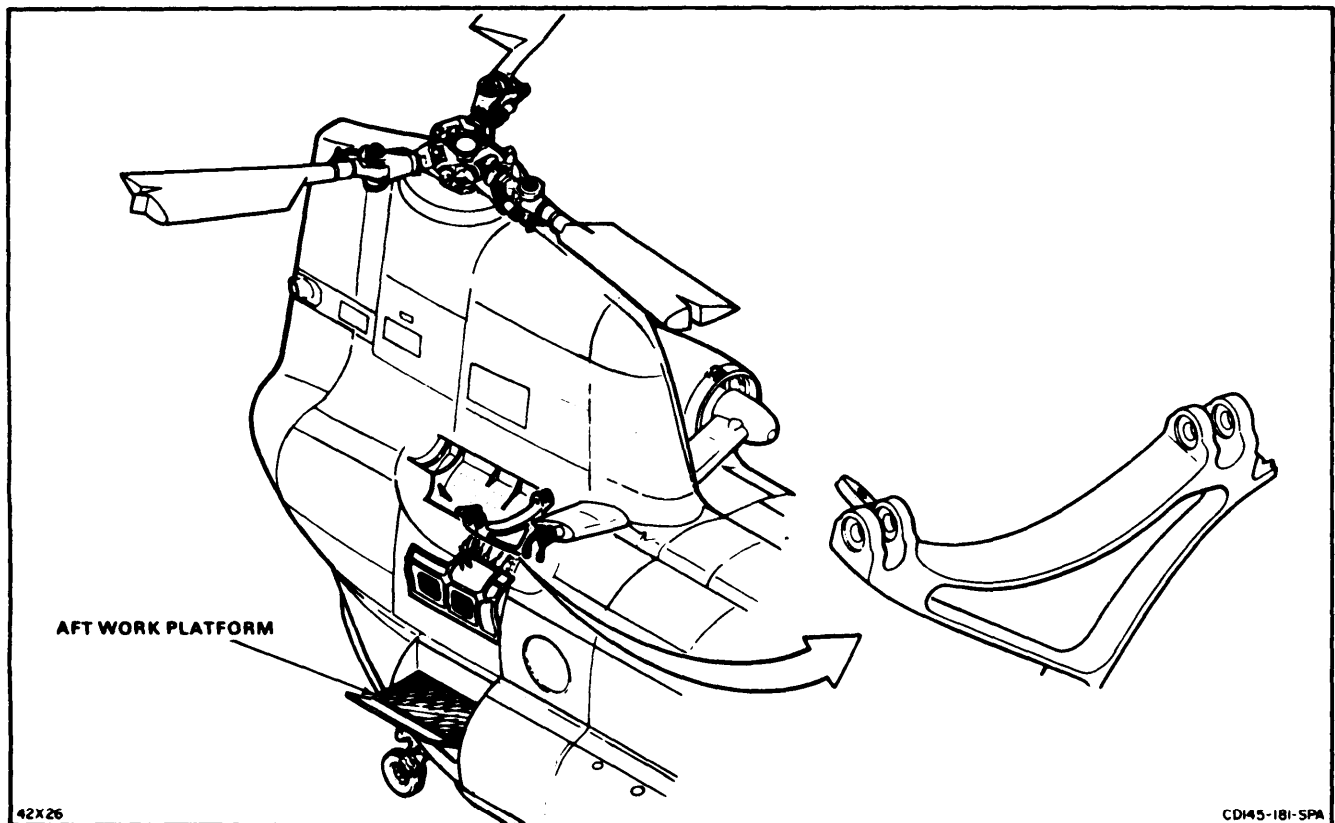
Lockwashers

Personnel Required:

67U20 Medium Helicopter Repairer
67U30 Inspector

References:

TM 55-1520-240-23P

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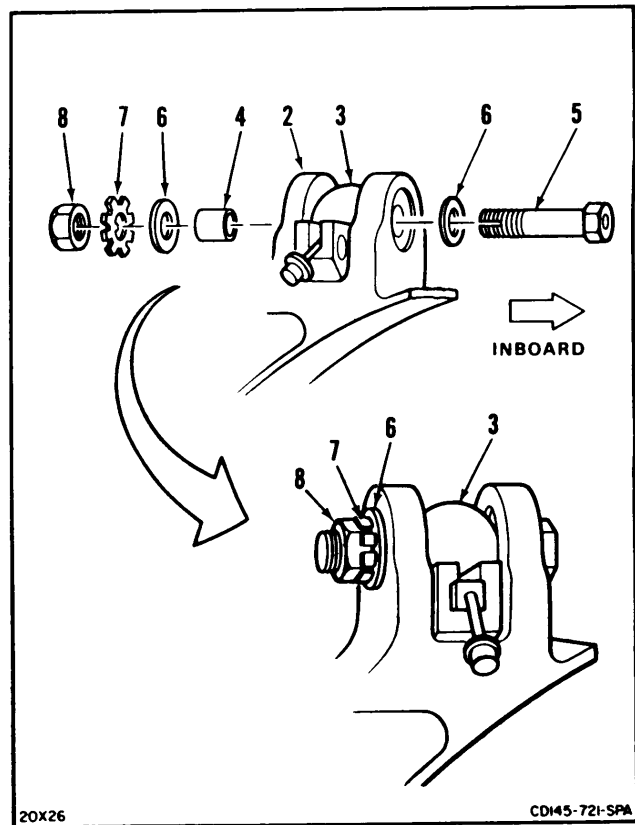
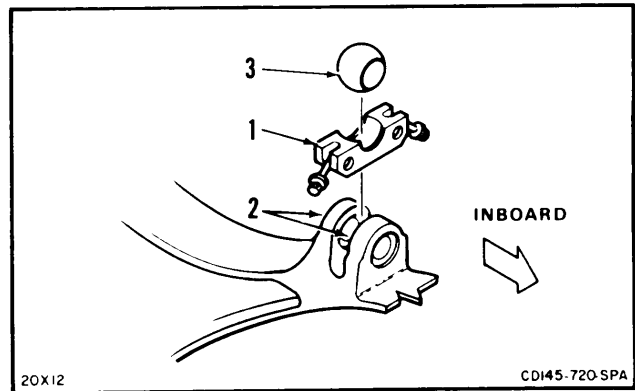
4-34 INSTALL FORWARD ENGINE MOUNT CAP ASSEMBLY
(Continued)

NOTE

This procedure can be used to install forward engine mounts on No. 1 or No. 2 engine. Forward engine mounts on the No. 2 engine are shown here.

INSTALL INBOARD MOUNT

1. Position cap (1) between lugs (2).
2. Install bearing (3) in cap (1) so shoulder of bearing is facing inboard.
3. Install slip-fit bushing (4) in hole in lug (2).
4. Install bolt (5) and washer (6), bolt head inboard.
5. Install washer (6), lockwasher (7), and nut (8) on bolt (5).
6. **Torque nut (8) on inboard mount to 350 inch-pounds.** Make sure bearing (3) is tight.
7. Bend tab on lockwasher (7) flat over nut (8).



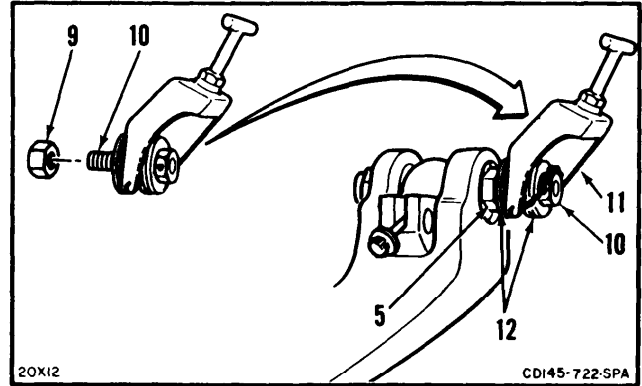
4-34 INSTALL FORWARD ENGINE MOUNT CAP ASSEMBLY
(Continued)

8. Remove spare nut (9) from bolt (10).

NOTE

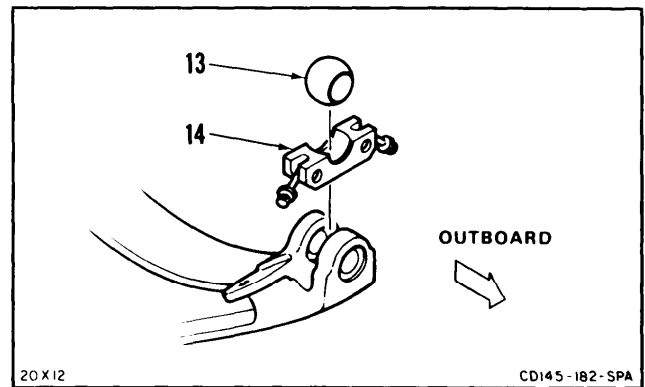
When installing latch bracket, make sure washers are kept in order. Placement of washers affects adjustment of engine covering.

9. Position latch bracket (11), bolt (10), and six washers (12) together as one piece against bolt (5). Install bolt (10), washers (12), and latch bracket (11) into head of bolt (5).
10. Lockwire bolt (10). Use lockwire (E231).

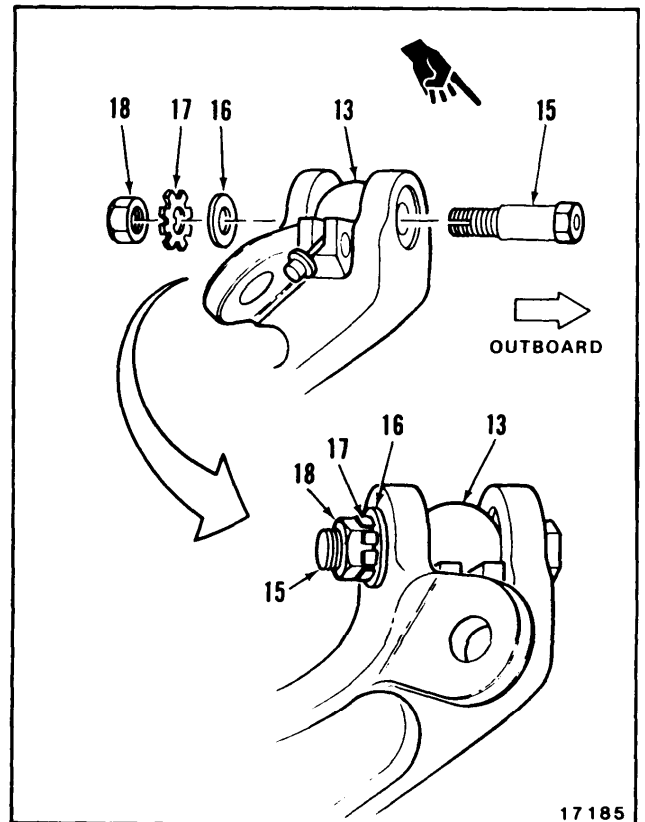


INSTALL OI/TBOARD MOUNT

11. Install bearing (13) and cap (14).



12. Install bolt (15), bolt head outboard.
13. Install washer (16), lockwasher (17), and nut (18) on bolt (15).
14. Torque nut (18) on outboard mount to **350 inch-pounds**. Make sure bearing (13) turns freely.
15. Bend tab on lockwasher (17) flat over nut (18).



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4-34 INSTALL FORWARD ENGINE MOUNT CAP ASSEMBLY
(Continued)

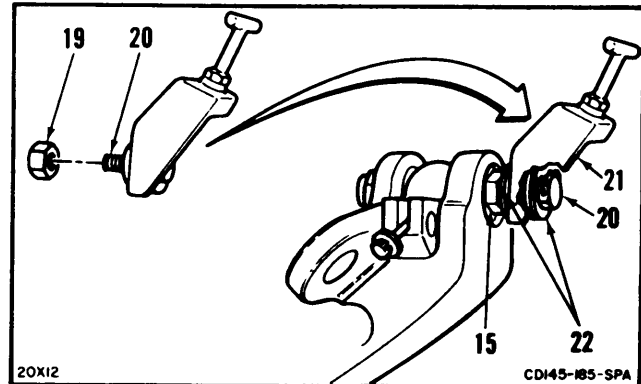
4-34

16. Remove spare nut (19) from bolt (20).

NOTE

When installing latch bracket, make sure washers are kept in order. Placement of washers affects adjustment of engine covering.

17. Hold latch bracket (21), bolt (20), and six washers (22) together as one piece against bolt (15).
18. **Install bolt (20)**, washers (22), and latch bracket (21) into head of bolt (15).
19. Lockwire bolt (20). Use lockwire (E231).

**INSPECT****FOLLOW-ON MAINTENANCE:**

Close aft work platform (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Torque Wrench, 30 to 710 Inch-Pounds
- Torque Wrench, 100 to 750 Inch-Pounds
- Crowfoot Attachment, 3/8-Inch

Materials:

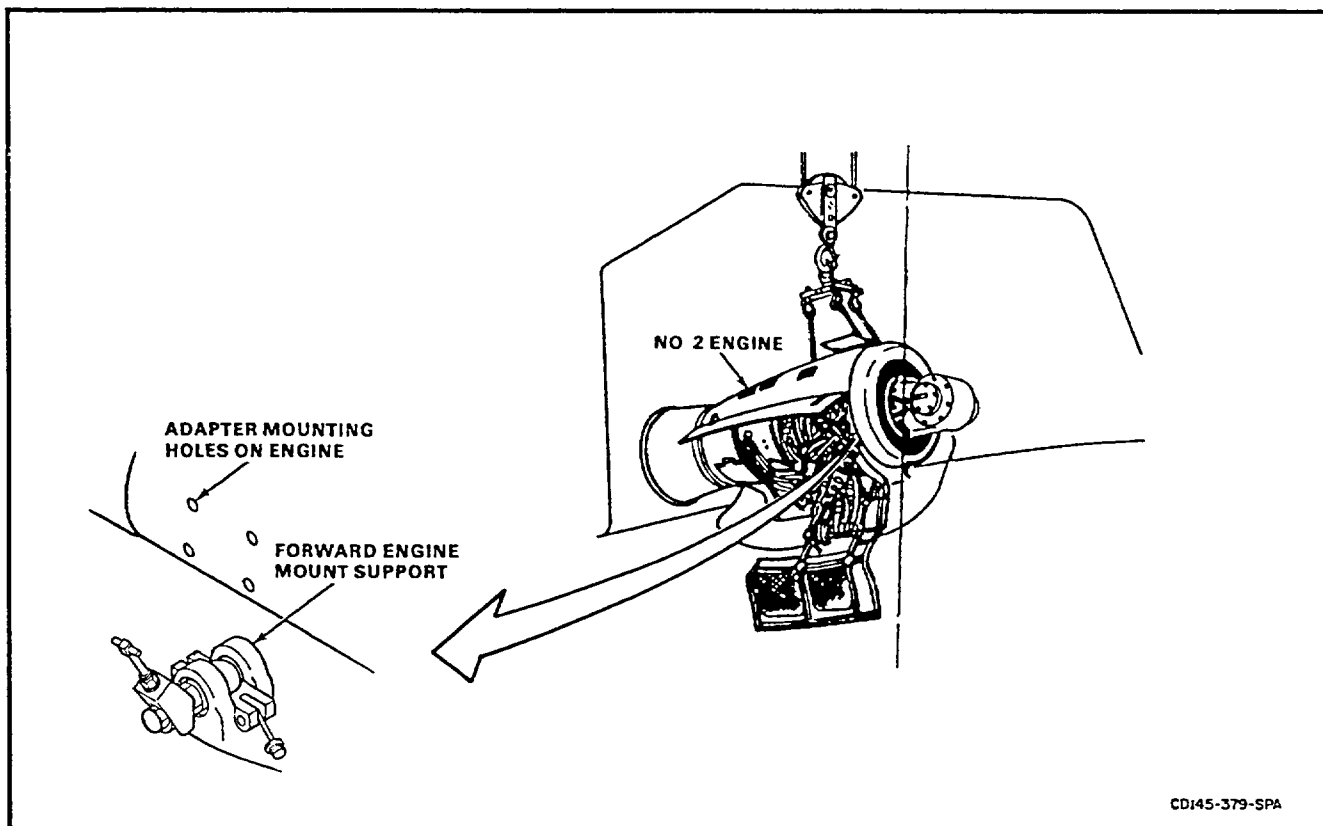
- Lockwire (E229)
- Lockwire (E231)
- Petrolatum (E274)

Personnel Required:

- Medium Helicopter Repairer (2)
- Inspector

References:

- TM 55-1520-240-23P
- Task 4-44



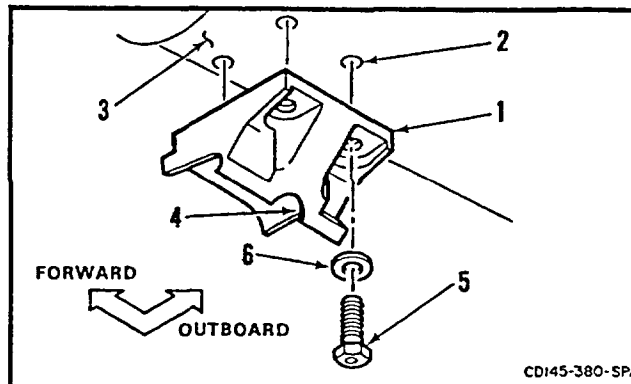
CDI45-379-SPA

NOTE

Procedure can be used to install inboard or outboard forward engine mount adapters on either engine. Outboard adapter on No. 2 engine is shown here.

INSTALL ADAPTER

1. Position adapter (1) so holes in adapter align with holes (2) on engine (3) as shown. Make sure curved surface (4) of adapter is down.
2. Install four bolts (5) and washers (6).
3. Torque four bolts (5) to 300 to 450 inch-pounds.
4. Lockwire bolts (5). Use lockwire (E231).

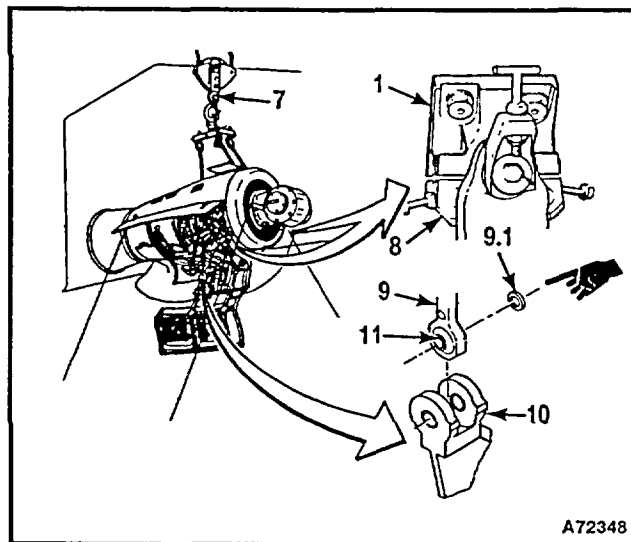
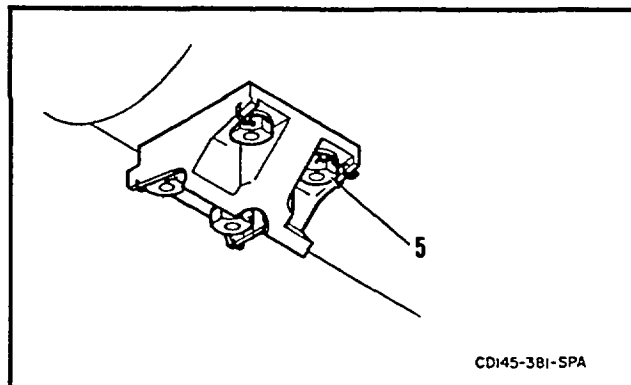


INSTALL ENGINE

CAUTION

Make sure bearing in lower end of aft support link does not tilt in engine mount clevis, before and while lowering engine. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

5. Slowly lower hoist (7) until forward adapters (1) rest on caps (8).
- 5.1. Align holes in aft link (9) with spacer (9.1) with holes in aft engine mount (10). Lower hoist (7) until aft link (9) fits in aft engine mount (10). Make sure bearing (11) does not tilt in aft engine mount (10).



CAUTION

Make sure engine weight is on aft support link and not on firewall former. Damage to engine and former can occur if weight is not on support link.

6. Install slip-fit bushing (12), shoulder outboard, in clevis (10).
7. Install bolt (13), two washers (14) and nut (15). Raise or lower engine (3) as needed for clearance.
8. Adjust firewall former (16) (Task 4-44).
9. Relax tension on hoist (7).
10. Torque nut (15) to 375 inch-pounds to seat bushing. Loosen nut and retorque to 20 inch-pounds above run-on torque. Not to be less than 70 inch-pounds.

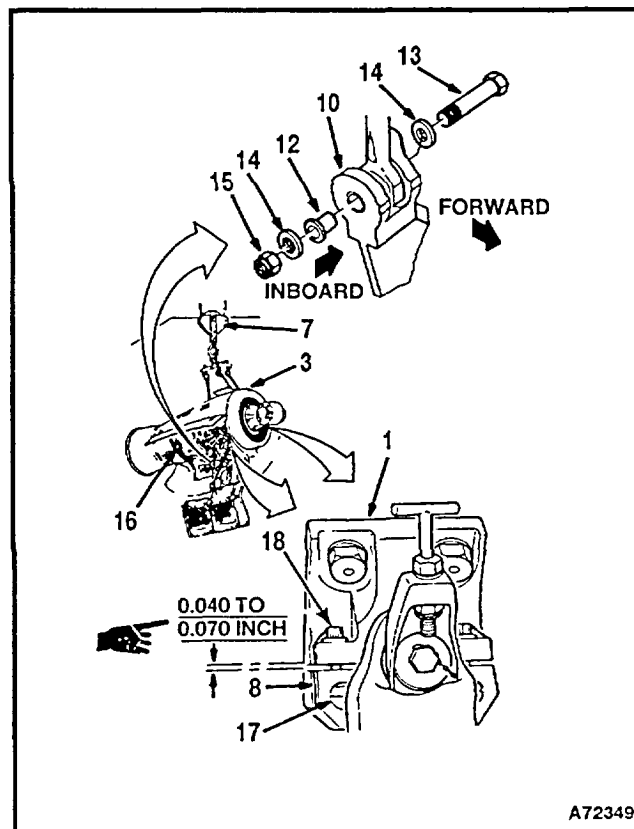
INSPECT

11. Check barrel nuts (17). Breakaway torque shall not be less than 7 inch-pounds.
12. Push four bolts (18) up and over adapter (1).
13. Torque bolts (18) to 20 inch-pounds above friction torque.

NOTE

It is acceptable for clearances to vary inboard to outboard and/or forward to aft providing the clearance at any point is within the defined limits.

14. Measure gap between adapters (1) and caps (8). Gap shall measure 0.040 to 0.070 inch.
15. Torque bolts (18) to 105 inch-pounds.
16. Measure gap between adapters (1) and caps (8). Gap shall measure 0.040 to 0.070 inch.

**NOTE**

It is acceptable for clearances to vary inboard to outboard and/or forward to aft providing the clearance at any point is within the defined limits.

17. Check bolts (18). Bolt threads shall protrude a minimum of two threads through barrel nuts (17), but shall not bottom out. Add washers under bolt head if bolt is bottoming out. Lockwire bolts. Use lockwire (E231).

INSPECT

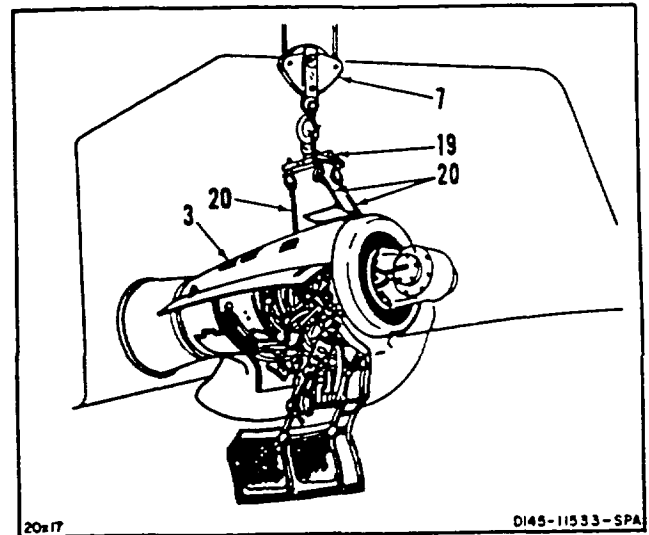
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Change 19 4-109

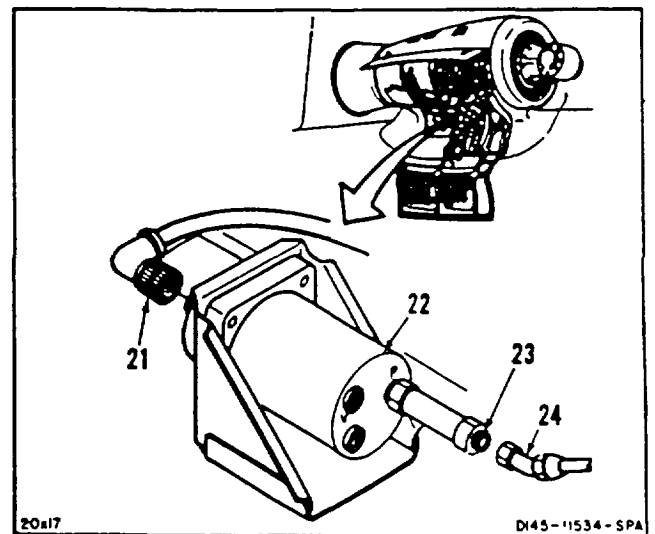
4-35 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

4-35

18. **Disconnect hoist (7) from sling (19).**
19. Disconnect three cables (20) from engine (3).
Remove sling (19).



- 20 **Connect cable plug (21) to oil pressure transmitter (22).** Lockwire plug. Use lockwire (E229).
- 21 Lubricate thread of fitting (23). Use petrolatum (E274). **Connect hose (24).**

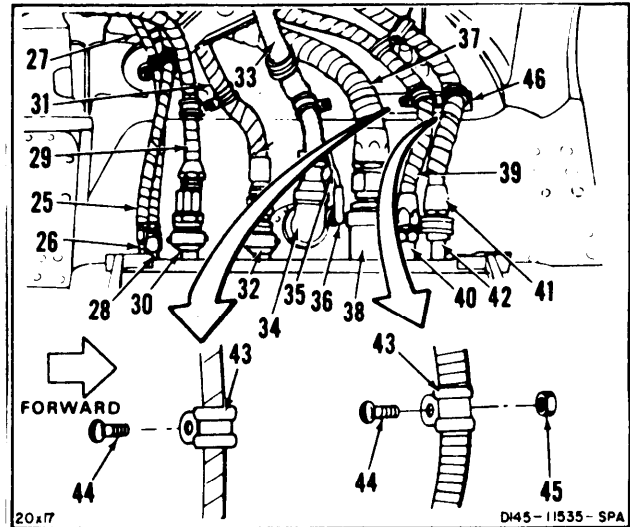


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4-110

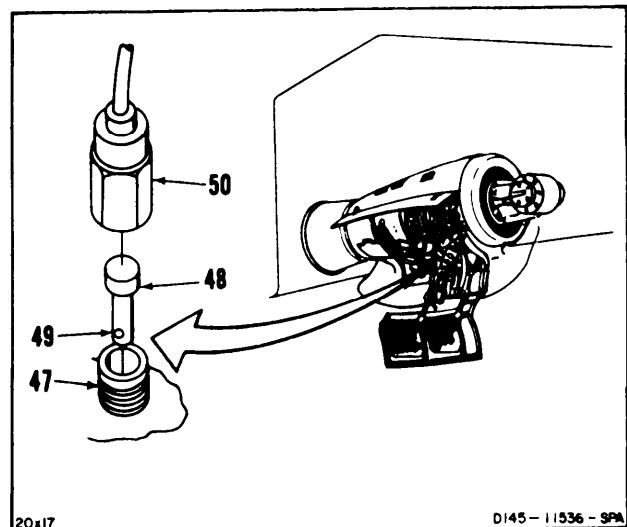
4-35 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

4-35

- 22. Connect hose (25) to port (26). Remove tag.
- 23. Connect hose (27) to port (28). Remove tag.
- 24. Connect hose (29) to port (30). Remove tag.
- 25. Connect hose (31) to port (32). Remove tag.
- 26. Connect cable connector (33) to receptacle (34). Remove tag. Lockwire connector. Use lockwire (E231).
- 27. Connect cable connector (35) to receptacle (36). Remove tag.
- 28. Connect hose (37) to port (38). Remove tag.
- 29. Connect hose (39) to port (40). Remove tag.
- 30. Connect hose (41) to port (42). Remove tag.
- 31. Connect two clamps (43). Install two screws (44) and nut (45) in bracket (46). Remove tape.



- 32. Remove caps from receptacles (47). Make sure inserts (48) are in receptacles white dot (49) first.
- 33. Connect two cables (50) to receptacles (47) at fuselage.



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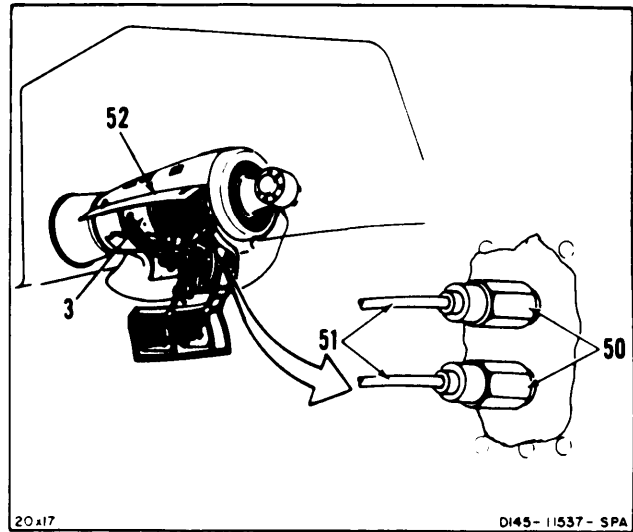
- 34 Torque connectors (50) to 65 inch-pounds.

CAUTION

Make sure fire detection sensing element cannot chafe on powerplant or cover. Chafing can result in a false fire indication or an inoperative fire detection system.

- 35 Make sure fire detection sensing element (51) cannot chafe on engine (3) or Cover (52).

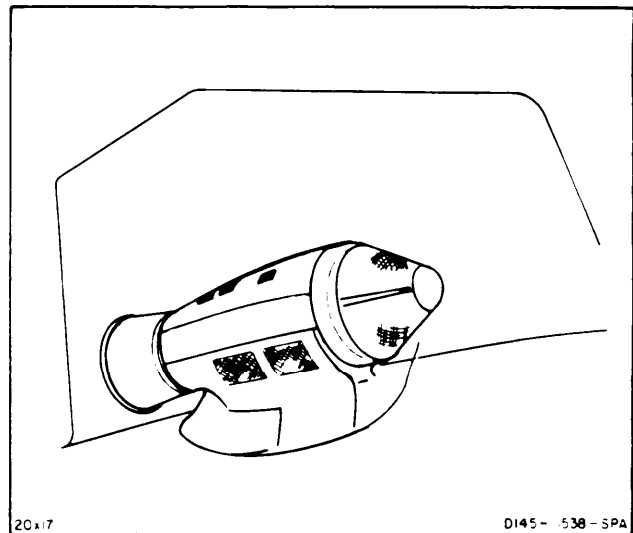
INSPECT



FOLLOW-ON MAINTENANCE

- Install engine drive shaft (Task 6-32)
- Install engine transmission fairing (Task 4-73)
- Install engine air Inlet screens (Task 4-76).
- Perform operational check of gas producer control system (TM 55-1520-240-T)
- Perform operational check of power turbine control system (TM 55-1520-240-T)
- Close engine side and cover access covers (Task 4-50)
- Close engine work platform (Task 2-2)
- Perform initial run-up (Task 4-4)
- Check powerplant plumbing for leaks

- Perform operational check of engine 011 low level warning system (TM 55-1520-240-T)
- Retorque exhaust cone coupling nuts after Initial ground run



END OF TASK

4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER

4-35.1

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench 30 to 150 Inch-Pounds
Torque Wrench 100 to 750 Inch-Pounds
Crowfoot Attachment, 3/8 Inch

Materials:

Lockwire (E229)
Lockwire (E231)
Petrolatum (E274)

Parts:

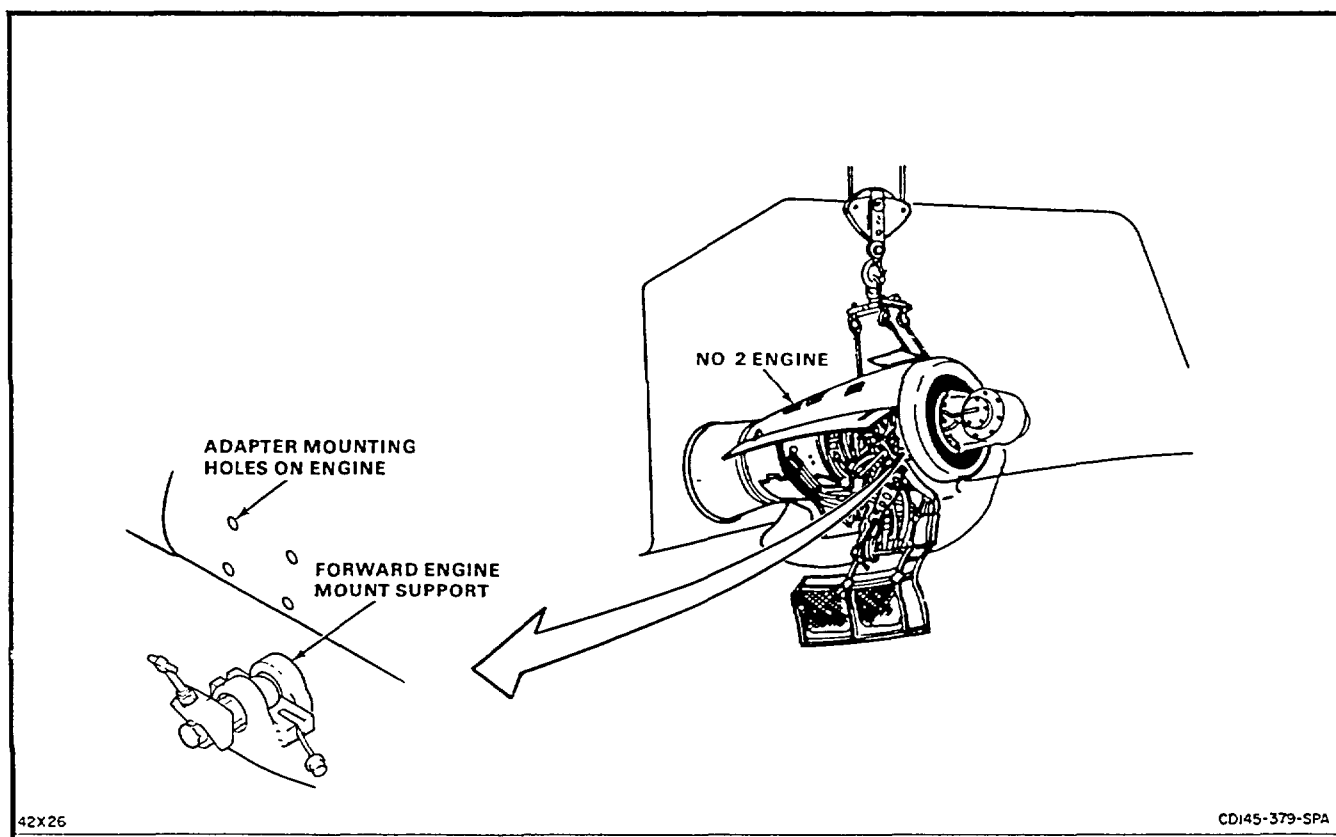
Conical Seal

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

Task 2-313
TM 55-1520-240-T



42X26

CDI45-379-SPA

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Change 19 4-112.1

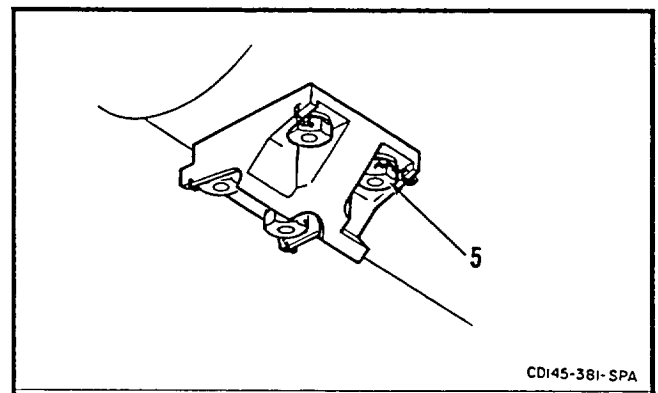
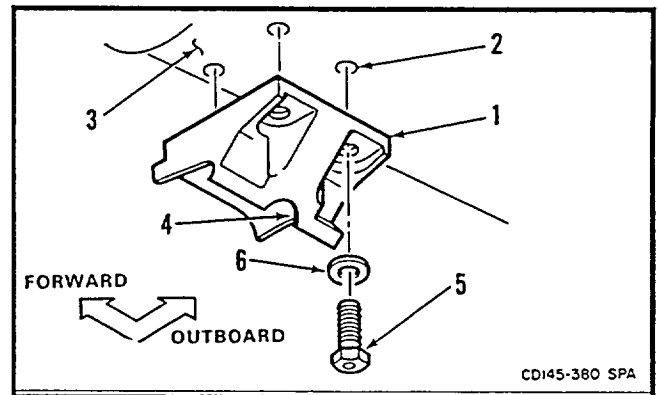
4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

4-35.1

INSTALL ADAPTER**NOTE**

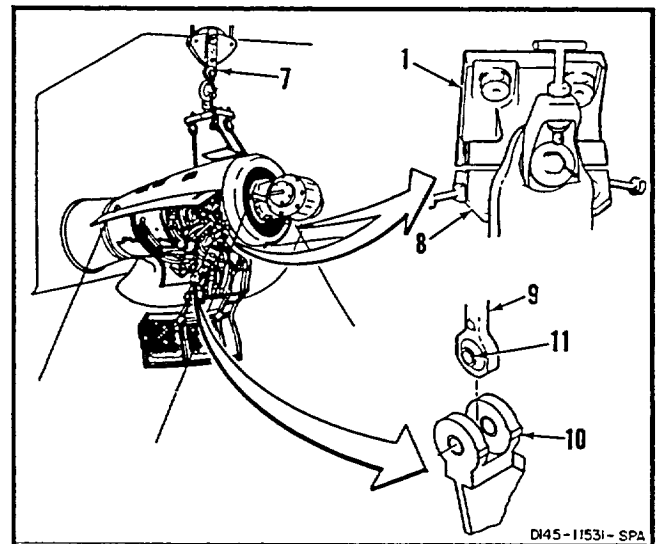
Procedure can be used to install inboard or outboard forward engine mount adapters on either engine. Outboard adapter installation on No. 2 engine is shown here, except as noted.

1. Position adapter (1) so holes in adapter align with holes (2) on engine (3) as shown. Make sure curved surface (4) of adapter is down.
2. Install four bolts (5) and washers (6).
3. Torque four bolts (5) to 300 to 450 inch-pounds.
4. Lockwire bolts (5). Use lockwire (E231).

**INSTALL ENGINE****CAUTION**

Make sure bearing in lower end of aft support link does not tilt in engine mount clevis, before and while lowering engine. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

5. Slowly lower hoist (7) until forward adapters (1) rest on caps (8) and aft link (9) fits in clevis (10). Make sure bearing (11) does not tilt in clevis.



4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

4-35.1

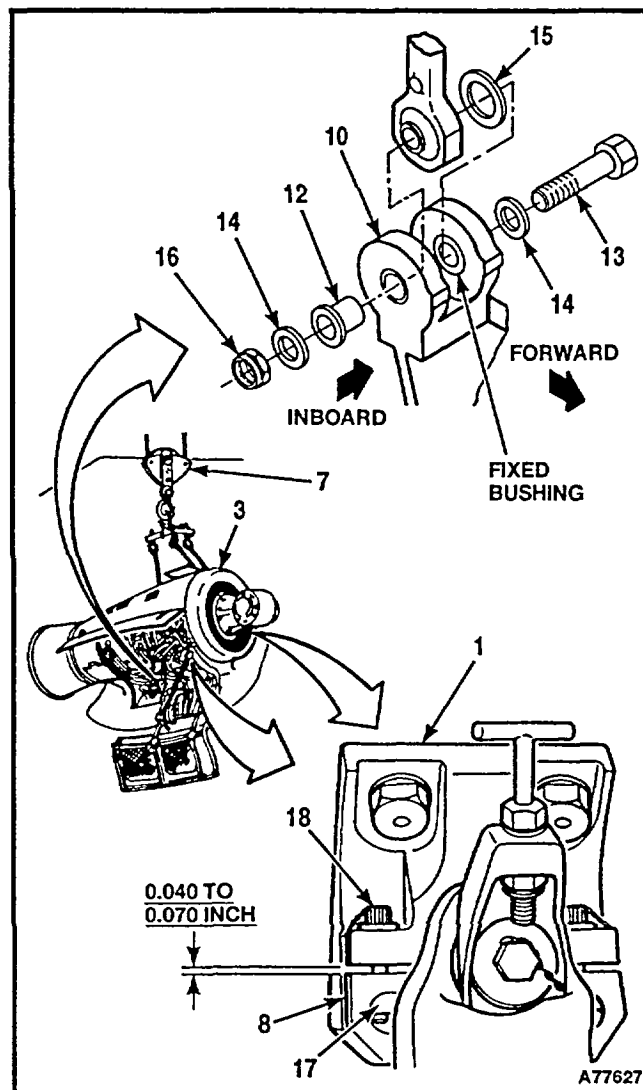
CAUTION

- Make sure engine weight is on aft support link and not on firewall former. Damage to engine and former can occur if weight is not on support link.
 - Spacer must be located on the same side of the link assembly as the fixed bushing.
6. Install slip-fit bushing (12), shoulder outboard, in clevis (10).
 7. Install bolt (13), two washers (14), spacer (15) and nut (16). Raise or lower engine (3) as needed for clearance.
 8. Torque nut (16) to 350 to 400 inch-pounds to seat bushing. Loosen nut and retorque to 20 inch-pounds above run on torque and not less than 70 inch-pounds.

INSPECT

9. Check barrel nuts (17). Rotational torque shall not be less than 7 inch-pounds.
10. Push four bolts (18) up and over adapter (1) and tighten evenly.
11. Torque bolts (18) to 20 inch-pounds above friction torque.
12. Relax tension on hoist (7).
13. Re-torque bolts (18) to 95 to 110 inch-pounds.
14. Measure gap between adapters (1) and caps (8). Gap shall measure 0.040 to 0.070 inch.
15. Check bolts (18). Bolts shall extend a minimum of two threads through barrel nuts (17) but shall not bottom out. If bolts bottom out, add washers under bolt head and repeat steps 13 and 14. Lockwire bolts (18). Use lockwire (E231).

INSPECT



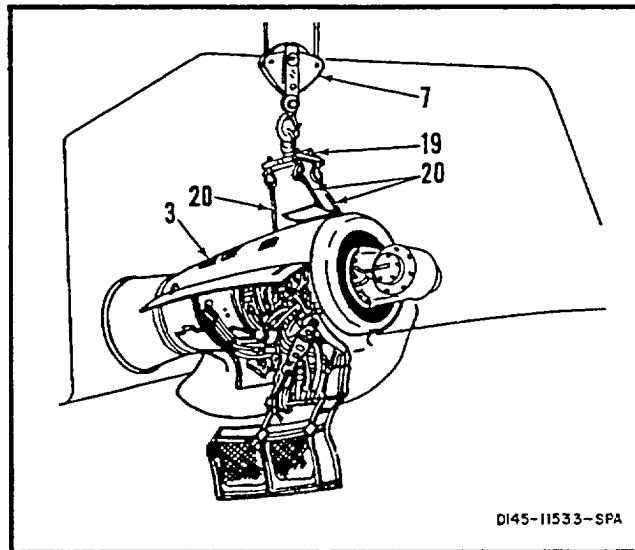
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Change 19 4-112.3

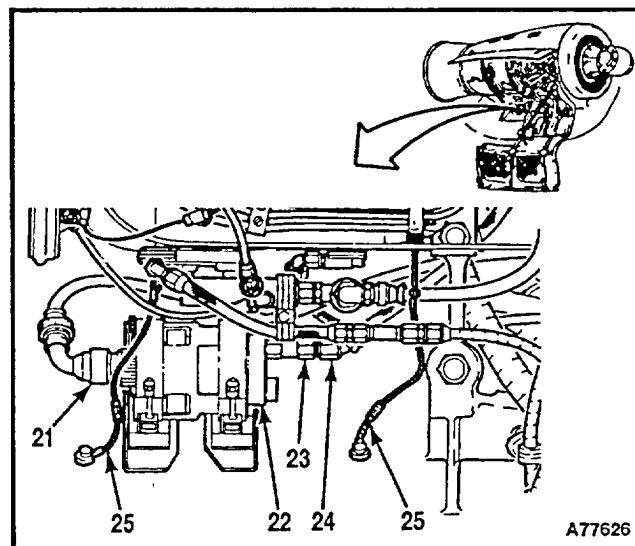
4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

4-35.1

16. **Disconnect hoist (7)** from sling (19).
17. **Disconnect three cables (20)** from engine (3).
Remove sling (19).



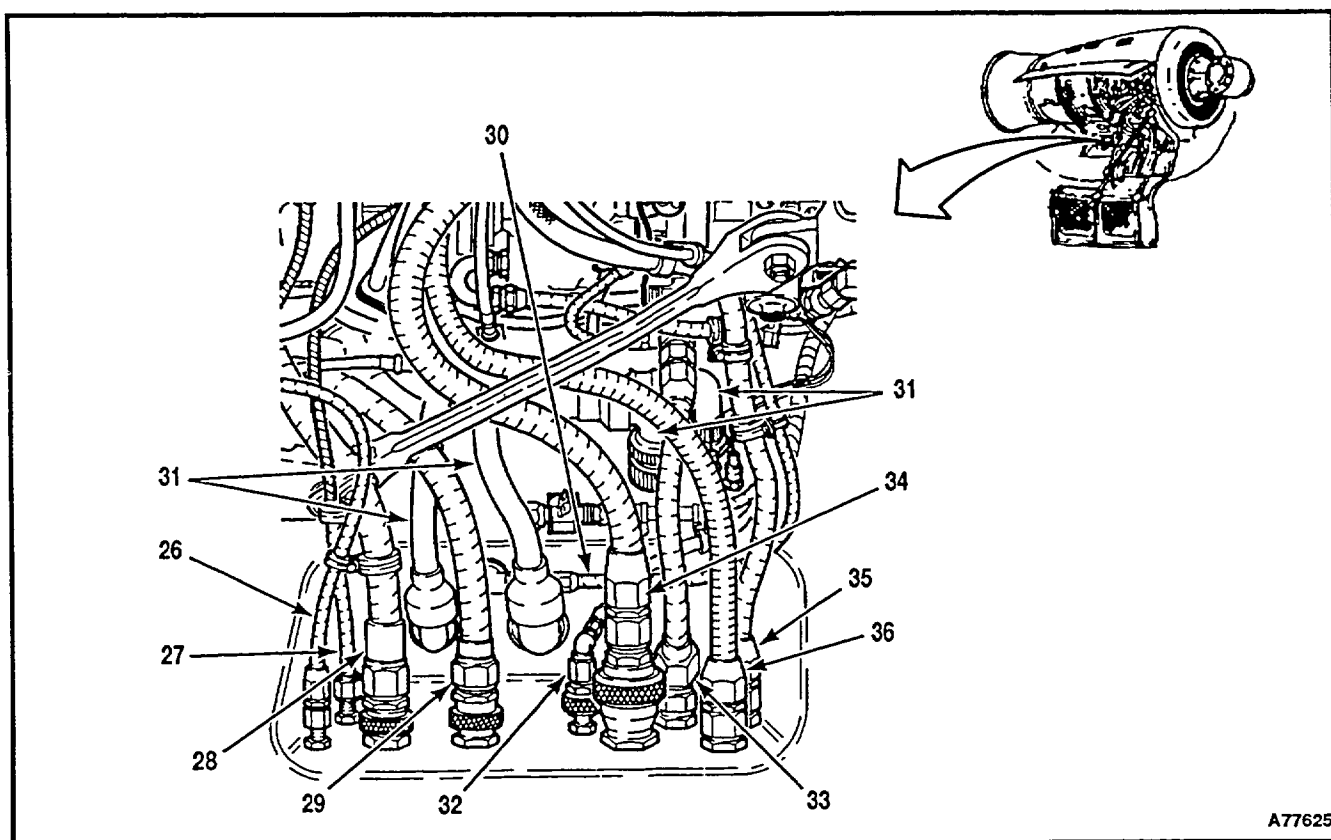
18. **Connect cable plug (21)** to oil pressure transmitter (22). Lockwire plug. Use lockwire (E229).
19. Lubricate thread of fitting (23). Use petrolatum E274. **Connect hose (24).**
20. **Connect bonding jumpers (25).**



4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

4-35.1

21. Connect hoses (26 and 27). Remove tags.
22. Connect hoses (28, 29 and 30). Remove tags.
23. Connect four cable connectors (31). Remove tags.
24. Connect hoses (32 and 33). Remove tags.
25. Connect hose (34). Remove tag.
26. Connect hoses (35 and 36). Remove tags.
27. Perform bonding preparation (Task 2-313).



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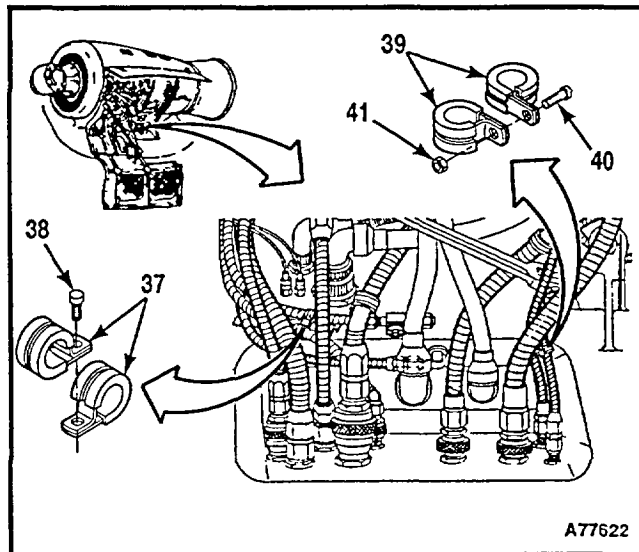
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Change 19 4-112.5

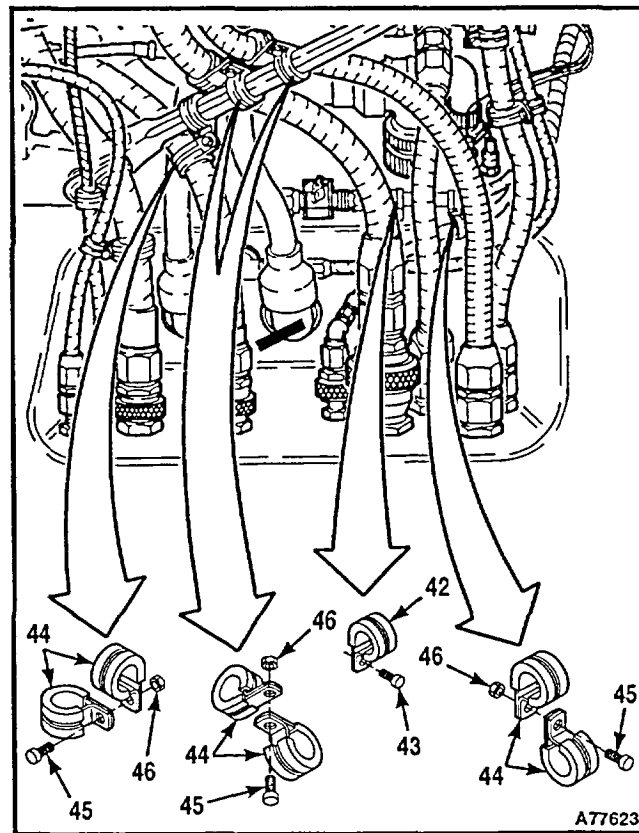
4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

4-35.1

- 28. On No. 1 powerplant only:
 - a. Install two clamps (37) with screw (38). Remove tape from hoses.
 - b. Install two clamps (39) with screw (40) and nut (41). Remove tape from hoses.



- 29. On No. 2 powerplant only:
 - a. Install clamp (42) with screw (43).
 - b. Install eight clamps (44) with screws (45) and nuts (46).



4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

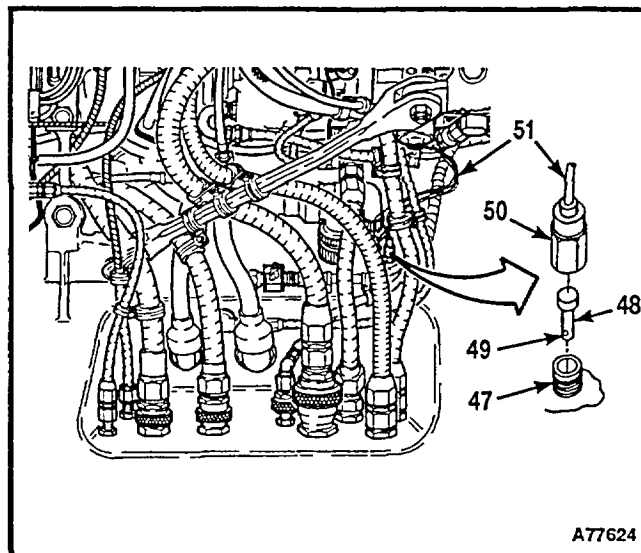
4-35.1

30. Remove caps from two receptacles (47). Make sure inserts (48) are in receptacles, white dot (49) first.
31. **Connect two connectors (50) to receptacles (47) at fuselage.**
32. **Torque connectors (50) to 50 to 75 inch-pounds.**

CAUTION

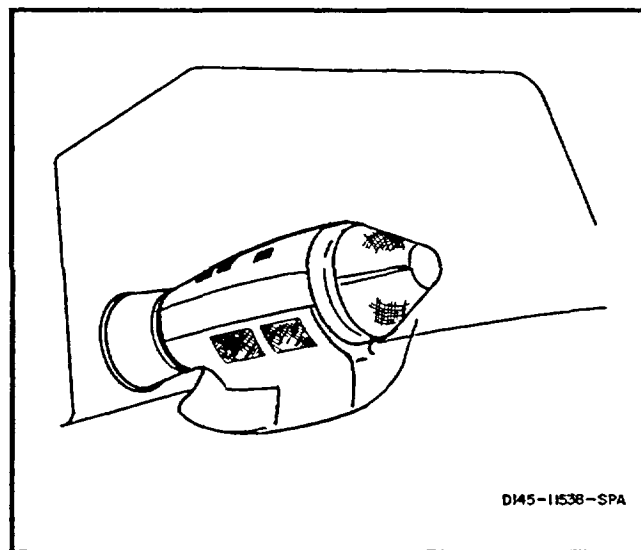
Make sure fire detection sensing element cannot chafe on powerplant or cover. Chafing can result in a false fire indication or an inoperative fire detection system.

33. Make sure fire detection sensing element (51) does not chafe.



FOLLOW-ON MAINTENANCE:

- Install engine drive shaft (Task 6-32).
- Install engine transmission fairing (Task 4-73).
- Install engine air inlet screens (Task 4-76).
- Perform operational check of gas producer control system (TM 55-1520-240-T).
- Perform operational check of power turbine control system (TM 55-1520-240-T).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).
- Perform initial run-up (Task 4-4).
- Check powerplant plumbing for leaks.
- Re-torque bolts (18) and check forward engine mounts for proper clearance after four hours of flight.
- Perform operational check of engine oil low level warning system (TM 55-1520-240-T).



END OF TASK

Change 19 4-112.7/(4-112.8 blank)

4-36 REMOVE AFT ENGINE MOUNT LINK AND ADAPTER**4-36**

INITIAL SETUP

Applicable Configurations:

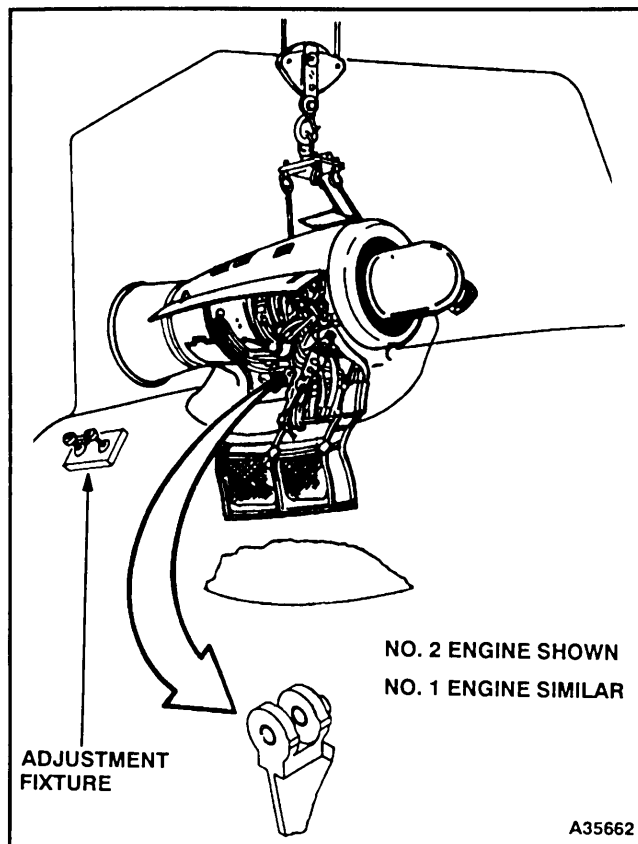
All

Tools:Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692Hoist
Sling**Materials:**

Paper Tags (E264)

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Side Access Doors Open (Task 4-49)
Engine Lower Access Door Opened (Task 4-49)**CAUTION**

- For helicopters without **57** make sure bearing in lower end of link does not tilt within clevis while weight of engine is supported. If bearing tilts it will wedge in clevis and damage bearing and clevis.
- Do not stretch or stress hoses and electrical harnesses attached to helicopter, when supporting engine weight. Stress or stretching can damage hoses and harnesses.

NOTE

- For helicopters with **57** adjustable link 145PS700-1 is adjusted to set engine cross shaft alignment at the time of

aircraft manufacture or incorporation of MWO 1-1520-240-50-60. The adjustment fixtures are unique and are not interchangeable. This preserves the proper link length measurement for each engine should the link need to be replaced or adjusted.

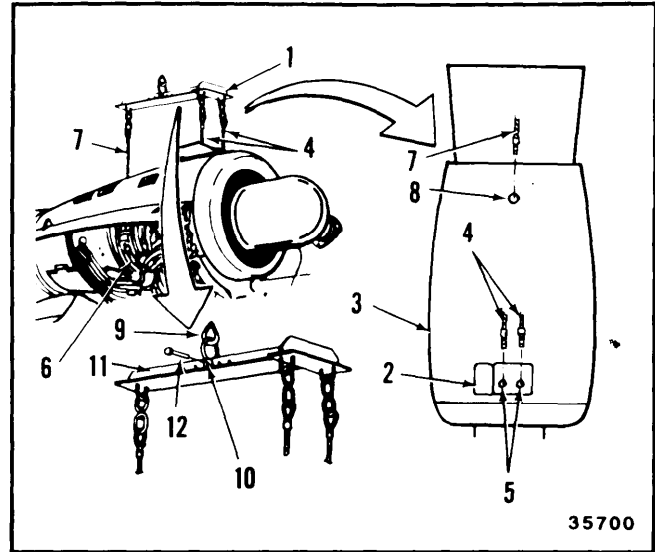
- Aft engine mount links that have been modified by **57** with adjustable link 145PS700-1 must not be replaced with fixed link 114PS223-1.
- This procedure can be used to remove aft engine mount link and adapter on either engine. Link and adapter on No. 2 engine are shown here.

GO TO NEXT PAGE

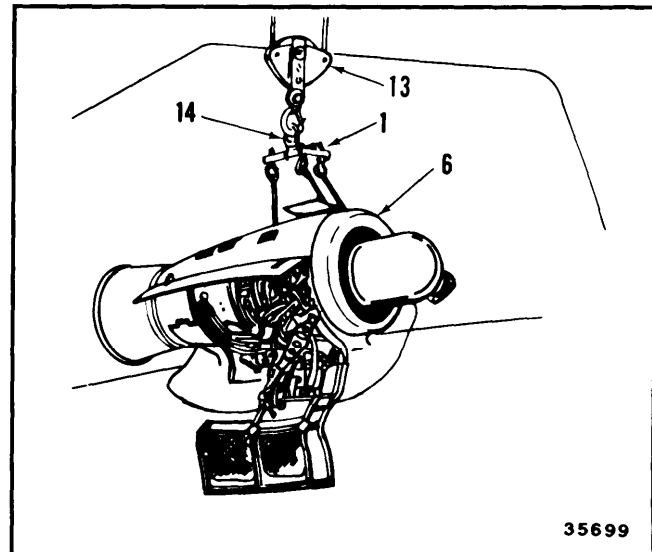
As a result of applying **57** MWO 1-1520-240-50-60, new adjustable link 145PS700-1 becomes part of the air-frame and should not be removed to support engine on trailer adapter (T16). MWO 1-1520-240-50-60 provides instructions to permanently mount old one piece link 114PS223-1 to trailer adapter (T16) to provide support for the engine.

1. Install sling (1) as follows:

- a. **Open access door (2)** in engine access cover (3).
- b. **Connect two cables (4)** to forward fittings (5) on powerplant (6),
- c. **Connect cable (7)** into aft fitting (8) through cover (3).
- d. **Adjust sling (1)** until eye (9) is over center hole (10) in sling bar (11).
- e. **Install pin (12)** through bar (11).



Connect hoist (13) to eye (14) of sling (1). Raise hoist slowly to support weight of powerplant (6). Do not lift engine from installed position.



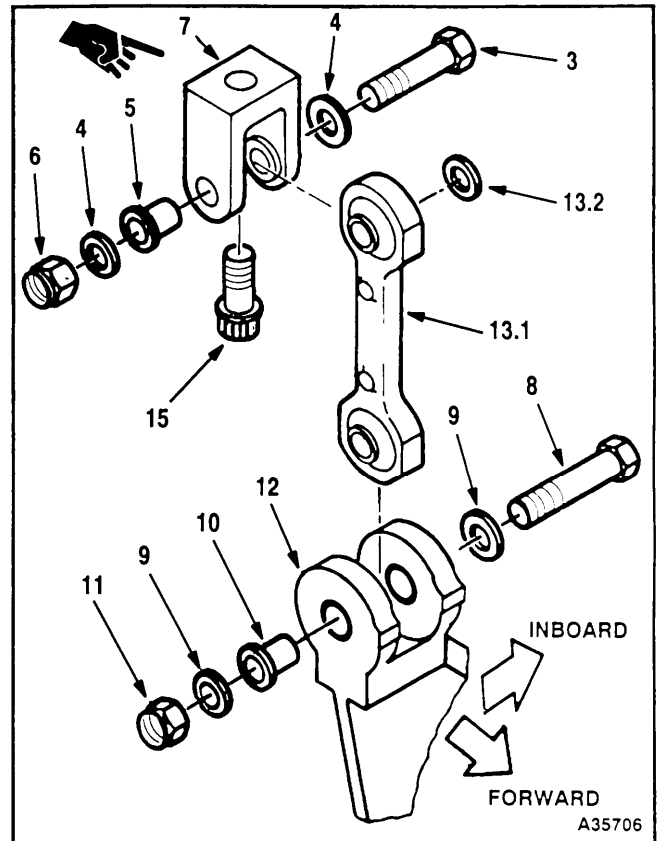
GO TO NEXT PAGE

4-36 REMOVE AFT ENGINE MOUNT LINK AND ADAPTER (Continued)**4-36****NOTE**

Link assembly (13.1), bolts (3 and 8), and spacer (13.2) must be tagged with aircraft serial number and side of aircraft from which they were removed. For spacers and bolts, note whether they were upper or lower.

REMOVE AFT ENGINE MOUNT LINK AND ADAPTER WITHOUT 57

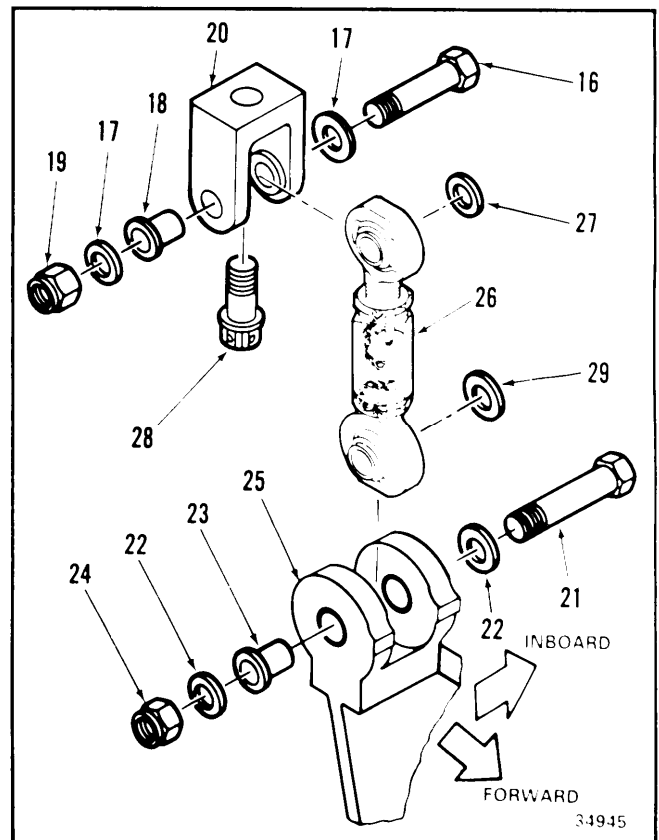
3. Remove bolt (3), two washers (4), bushing (5), and nut (6) from adapter (7).
4. Remove bolt (8), two washers (9), bushing (10), and nut (11) from mount (12),
5. **Tag and remove link (13.1) and spacer (13.2).**
6. Remove lockwire and bolt (15).
7. **Remove adapter (7).**

**NOTE**

Adjustable link assembly (26), bolts (16 and 21), and spacers (27 and 29) must be tagged with aircraft serial number and side of aircraft from which they were removed. For spacers and bolts, note whether they were upper or lower.

REMOVE AFT ENGINE MOUNT LINK AND ADAPTER WITH 57

8. Remove bolt (16), two washers (17), bushing (18), and nut (19) from adapter (20),
9. Remove bolt (21), two washers (22), bushing (23), and nut (24) from mount (25).
10. **Tag and remove link (26) and spacers (27 and 29).**
11. Remove lockwire and bolt (28),
12. **Remove adapter (20).**



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Technical Inspection Tool Kit

NSN 5180-00-323-5114

Dial Indicating Scale, 0 to 50 Pounds

Outside Micrometer, 0 to 1 Inch

Vernier Caliper, 0 to 1 Inch

Vise

Materials:

Cloth (E135)

Dry Cleaning Solvent (E162)

Gloves (E186.1)

Personnel Required:

Medium Helicopter Repairer

Inspector

References:

TM 55-1500-322-24

TM 55-1520-240-23P

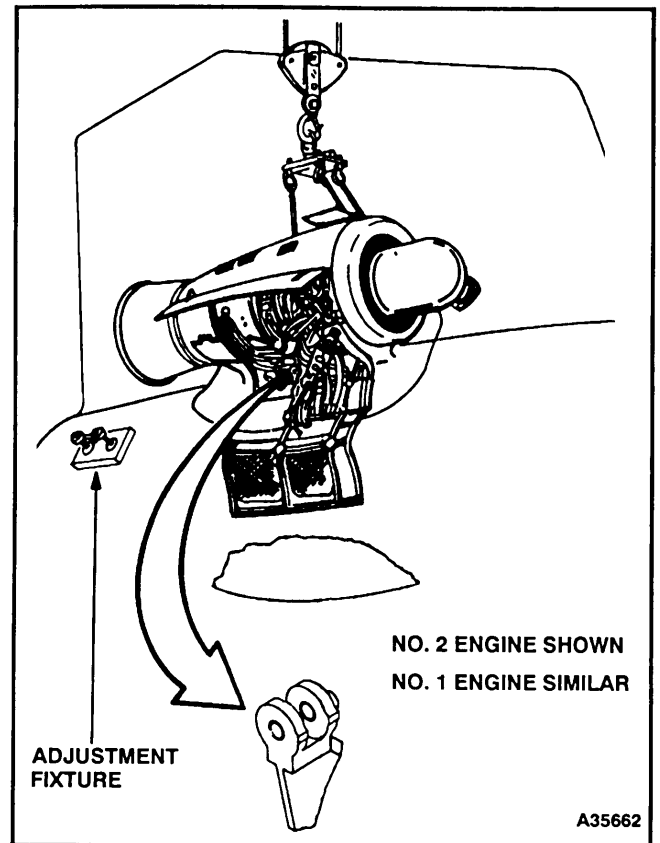
Equipment Condition:

Aft Engine Mount Link and Adapter Removed

(Task 4-36)

General Safety Instructions:**WARNING**

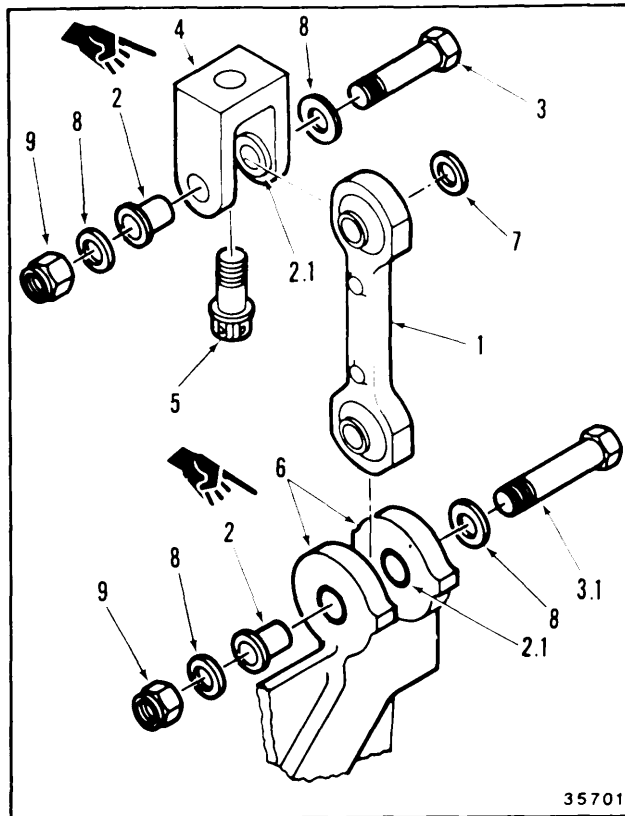
Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.



GO TO NEXT PAGE

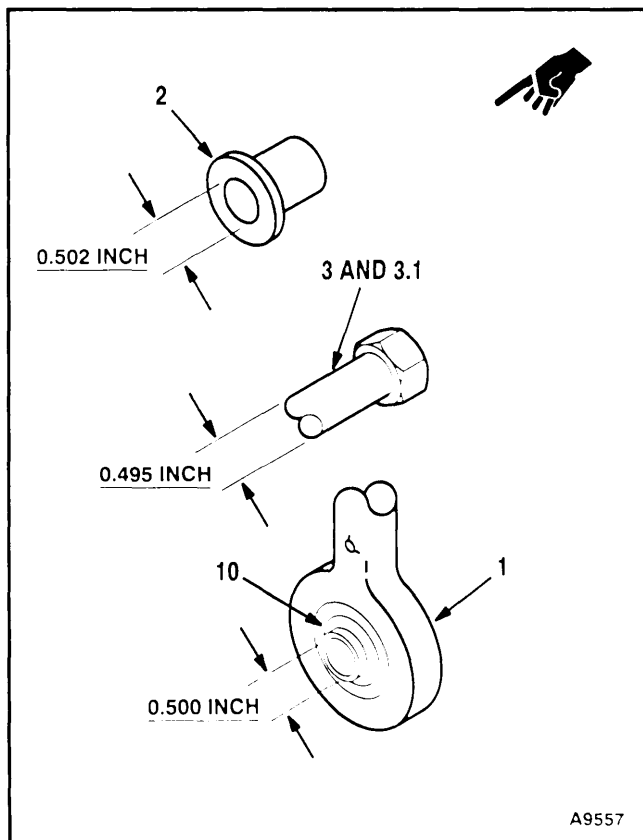
INSPECT AFT ENGINE MOUNT LINK AND ADAPTER WITHOUT 57

1. Clean link (1), four bushings (2 and 2.1), two bolts (3 and 3.1), adapter (4), adapter bolt (5), and aft engine mount lugs (6) on structure. Use solvent (E162) and cloth (E135). Wear gloves (E186.1).
2. **Inspect link (1), four bushings (2 and 2.1), two bolts (3 and 3.1), bolt (5), and adapter (4).** There shall be no cracks, gouges, scratches, or dents, which exceed 10 percent of material thickness or 0.040 inch, whichever is less.
3. **Inspect spacer (7), four washers (8), and two nuts (9)** for obvious damage.
4. **Inspect lugs (6) on structure.** There shall be no cracks, gouges, scratches, or dents deeper than 0.040 inch.



35701

5. **Measure inside diameter of four bushings (2).** Diameter shall not be more than 0.502 inch.
6. **Measure inside diameter of two bearings (10).** Bearing diameter shall not be more than 0.500 inch.
7. **Measure shank diameter of two bolts (3 and 3.1).** Diameter shall not be less than 0.495 inch.
8. **Use a dial indicating scale to apply a 25 to 50 pound load to bearing (10) in axial direction. Apply a 25 to 50 pound load to bearing (10) in opposite direction. Measure axial play.** Play shall not be more than 0.030 inch.
9. **Apply a 25 to 50 pound load to bearing (10) in radial direction. Apply a 25 to 50 pound load to bearing (10) in opposite direction. Measure radial play.** Play shall not be more than 0.006 inch.
10. **Repeat steps 8. and 9. four times for each bearing (10).** Rotate bearing 90 degrees each time.



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4-37 INSPECT AFT ENGINE MOUNT LINK AND ADAPTER PARTS (Continued)

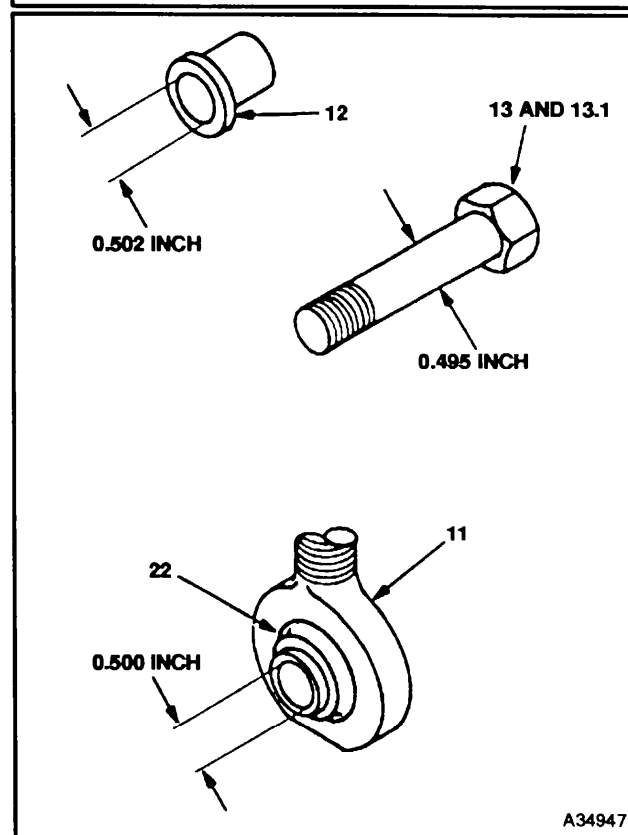
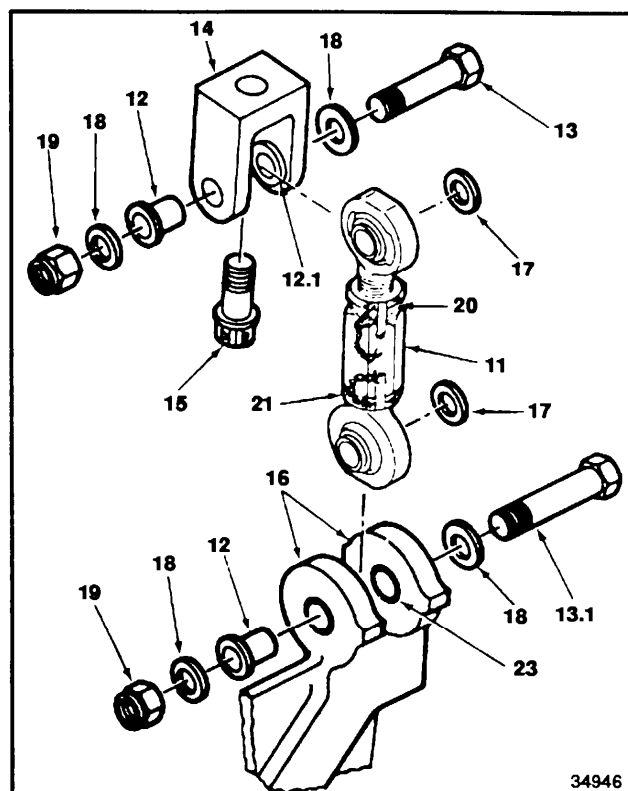
4-37

INSPECT AFT ENGINE MOUNT LINK AND ADAPTER WITH 57

11. Clean link (11), four bushings (12, 12.1, and 23), two bolts (13 and 13.1), adapter (14), adapter bolt (15), and aft engine mount lugs (16) on structure. Use solvent (E162) and cloth (E135). Wear gloves (E186.1).
12. **Inspect link (11), four bushings (12, 12.1, and 23), two bolts (13 and 13.1), bolt (15), and adapter (14).** There shall be no cracks, gouges, scratches, or dents, which exceed 10 percent of material thickness or 0.040 inch, whichever is less.
13. **Inspect lockwire on engine mount link** for breaks.
14. **Inspect torque stripe of link body and jam-nuts (21) for breaks.**
15. **Inspect lugs (16) on structure.** There shall be no cracks, gouges, scratches, or dents deeper than 0.040 inch.
16. **Measure inside diameter of four bushings (12).** Diameter shall not be more than 0.502 inch.
17. **Measure Inside diameter of two bearings (22).** Bearing diameter shall not be more than 0.500 inch.
18. **Measure shank diameter of two bolts (13 and 13.1).** Diameter shall not be less than 0.495 inch.
19. **Use a dial indicating scale to apply a 25 to 50 pound load to bearing (22) in axial direction. Apply a 25 to 50 pound load to bearing (22) in opposite direction. Measure axial play.** Play shall not be more than 0.030 inch.
20. **Apply a 25 to 50 pound load to bearing (22) in radial direction. Apply a 25 to 50 pound load to bearing (22) in opposite direction. Measure radial play.** Play shall not be more than 0.006 inch.
21. **Repeat steps 19. and 20. four times for each bearing (22).** Rotate bearing 90 degrees each time.

FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-38 REPAIR AFT ENGINE MOUNT, LINK, AND ADAPTER

INITIAL SETUP

Applicable Configurations:

All

Tools:

Technical Inspection Tool Kit
NSN 5180-00-323-5114

Materials:

Abrasive Cloth (EI)
Lacquer, Glossy White (E223), Torque Stripe
Antiseize Compound (E76)
Lockwire (E231)

Personnel Required:

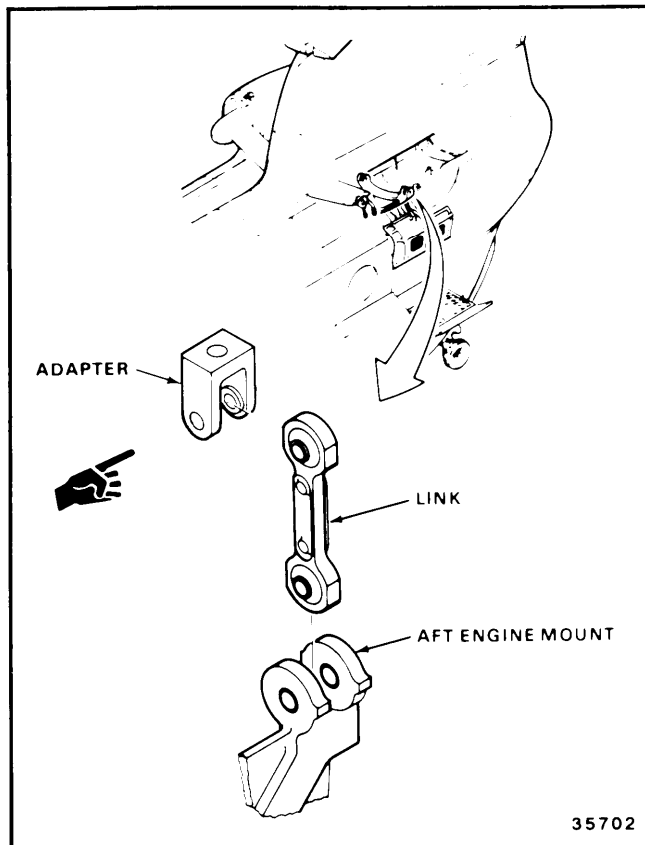
Medium Helicopter Repairer
Inspector

References:

Task 4-37
Task 4-38.1

Equipment Condition:

Aft Engine Mount Link and Adapter Removed
(Task 4-36)

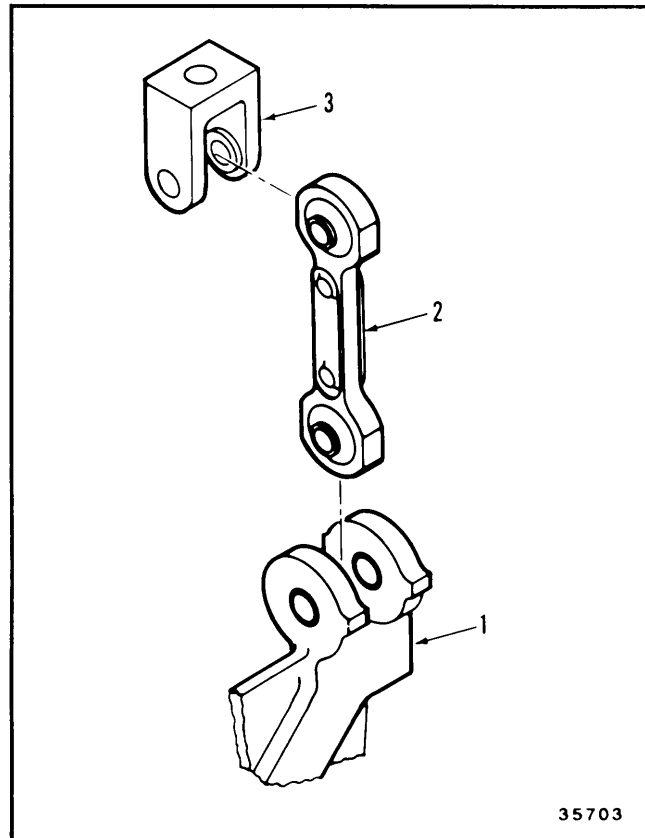


CAUTION

Do not burnish deeper than 0.040 inch on aft engine mount lugs. Do not burnish other areas deeper than 0.040 inch or 10 percent of material thickness, whichever is less.

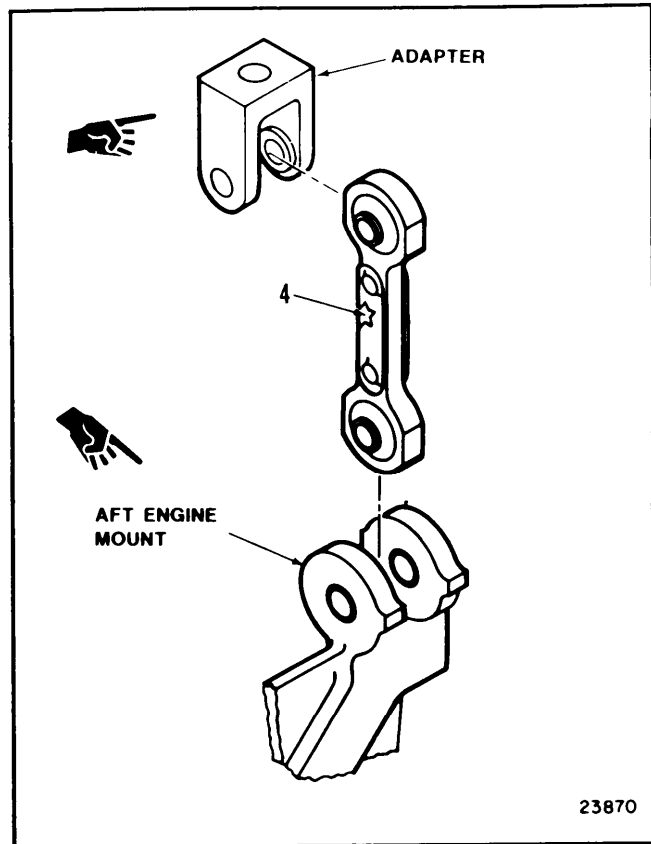
NOTE

- Procedure is same to repair No. 1 or No. 2 aft engine mount, link and adapter. No. 1 aft engine mount, link and adapter are shown here,
 - Any burnished area must blend smoothly into area around it.
 - Repair procedure is similar for aft engine mount link and adapter parts with **57** and without **57**. Differences are noted.
1. **Burnish scratches, dents, or gouges** on engine mount (1), link (2), and adapter (3),



GO TO NEXT PAGE

2. **Measure Depth of Damage (4)** following Blending/Burnishing.
3. **Depth of Blend/Burnish** shall not be deeper than 0.040 inch or 10 percent of material thickness, whichever is less.

INSPECT

NOTE

The following procedures are only for aft engine mount link with **57**.

NOTE

If evidence indicates that adjustment of the aft engine mount link assembly has been tampered with, readjust link assembly (Task 4-38.1).

4. Replace broken lockwire (6). Use lockwire (E231).

NOTE

Before replacing broken torque stripe, check torque on two jamnuts in accordance with Task 4-38.1.

5. Replace broken torque stripe (7) on two jamnuts (8). Use lacquer (E223).

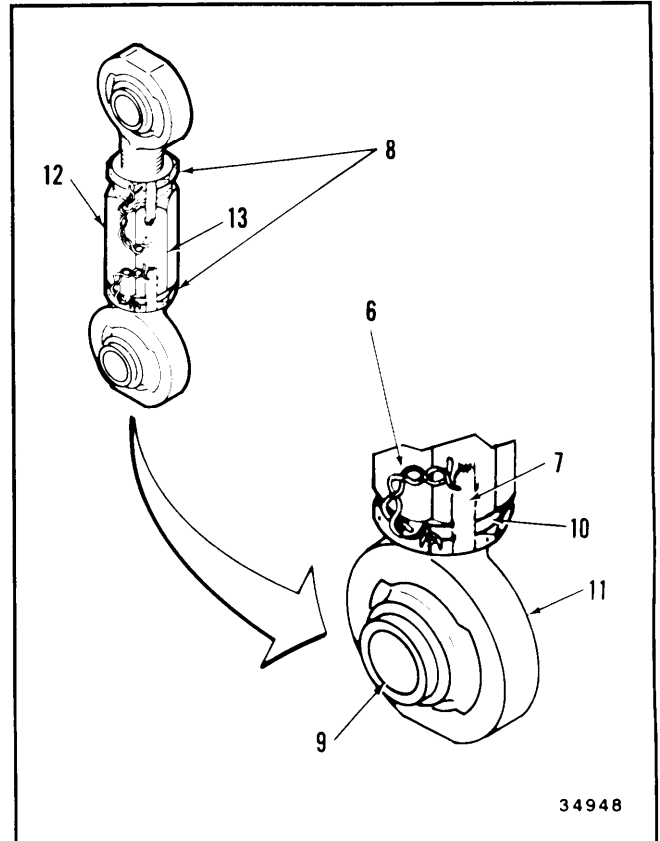
INSPECT

6. If either bearing assembly of the link assembly is worn beyond the axial and radial play limits of Task 4-37, replace the bearings (9) as follows:
 - a. Rotate bearing (9) and align with removal slots in rod end (11). Remove bearing from rod end and discard.
 - b. Clean and inspect bearing surface in rod end. Fretting marks in the bearing race areas may be polished out if the 0.010 inch maximum axial wear tolerance is not exceeded after polishing.
 - c. Install new bearing (9).
 - d. Check bearing play in accordance with Task 4-37.

NOTE

If bearings are replaced and adjustment has not been tampered with, readjustment of link is not necessary.

- e. If other parts of the link assembly are damaged and require replacement, completely disassemble, clean, inspect, and replace parts as necessary.



- f. Reassemble link as follows:

WARNING

Antiseize compound (E76) can irritate skin and cause burns. 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.

NOTE

Coat threads of rod ends with antiseize compound (E76).

- (1) Screw rod end (11) with jamnut (7) and locking device (10) into center body (12) until end of rod end is in the center of the sight hole (13).
 - (2) Repeat above procedure for other end.
- g. Readjust link assembly in accordance with Task 4-38.1,

FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:With **57****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Vernier Caliper 6 to 7 inch
5210-00-234-8017
Torque Wrench, 150 to 750 Inch-Pounds
Drill Bit, 0,063 Inch

Materials:

Lockwire (E231)
Lacquer, Glossy White (E223), Torque Stripe

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

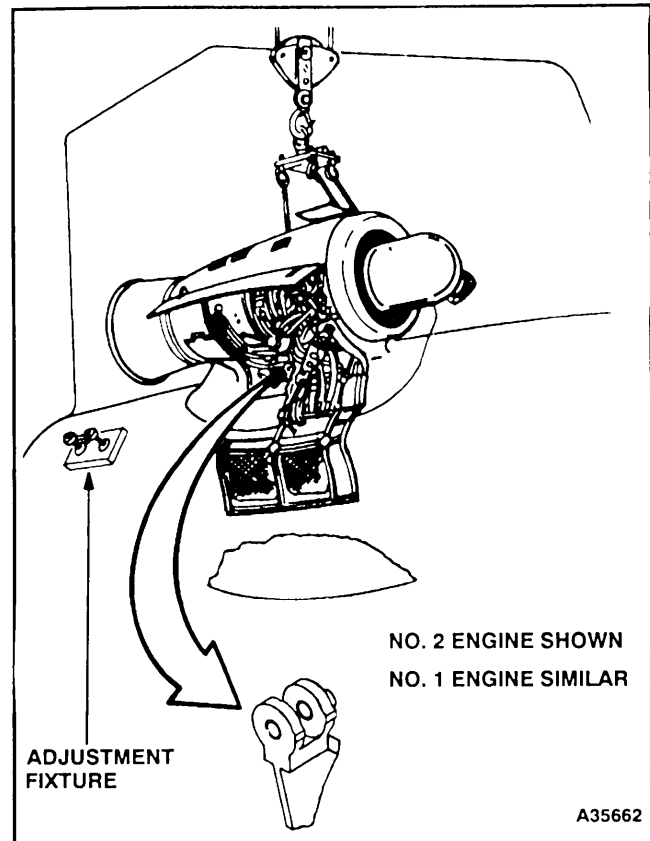
TM 55-1520-240-23P

Equipment Condition:

Aft Engine Mount Link and Adapter Removed
(Task 4-36)

NOTE

- Adjustable link 145PS700-1 is adjusted to set engine cross shaft alignment at the time of aircraft manufacture or incorporation of MWO 1-1520-240-50-60. The adjustment fixtures are unique and are not interchangeable. This preserves the proper link length measurement for each engine should the link need to be replaced or adjusted.
- Aft engine mount links that have been modified by **57** with adjustable link 145PS700-1 must not be replaced with fixed link 114PS223-1.

**GO TO NEXT PAGE**

4-38.1 ADJUSTABLE AFT ENGINE MOUNT LINK ADJUSTMENT (Continued)

4-38.1

NOTE

Adjustment procedure is the same for the left and the right adjustable engine mount link. The right mount link is shown here.

1. Use the two 0.50 inch bolts (1) from the applicable engine mount adjustable link (2) to locate engine mount link (2) between fixture adapters (3). Back off jamnuts (6) to allow rotation of link center body (5). Ensure that as correct length adjustment is reached, bearings on each end of link are in contact with their respective fixture adapters (3). Ensure that bearings do not ride up the shanks of the bolts (1),

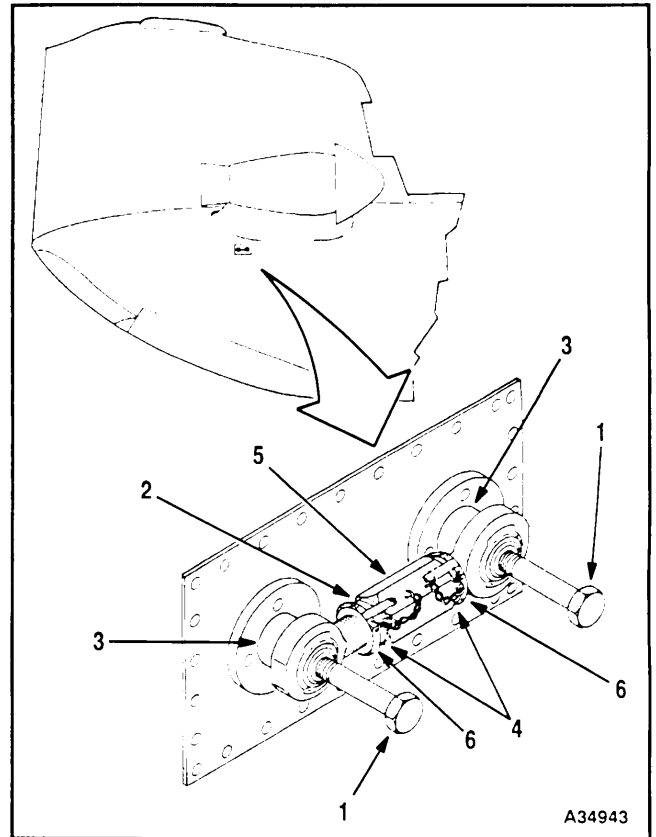
CAUTION

If a 0.063 inch drill bit enters the turn buckle cavity when inserted in the inspection holes, the maximum allowable link length will have been exceeded. Do not adjust link past this point. Damage to helicopter can occur.

NOTE

Ensure that engine mount link center-body does not turn during tightening,

2. **Align keys in two lockwashers (4)** with slots in engine mount link center body (5). Tighten two jamnuts (6).
3. Remove engine mount adjustable link from helicopter.



GO TO NEXT PAGE

4-38.1 ADJUSTABLE AFT ENGINE MOUNT LINK ADJUSTMENT (Continued)

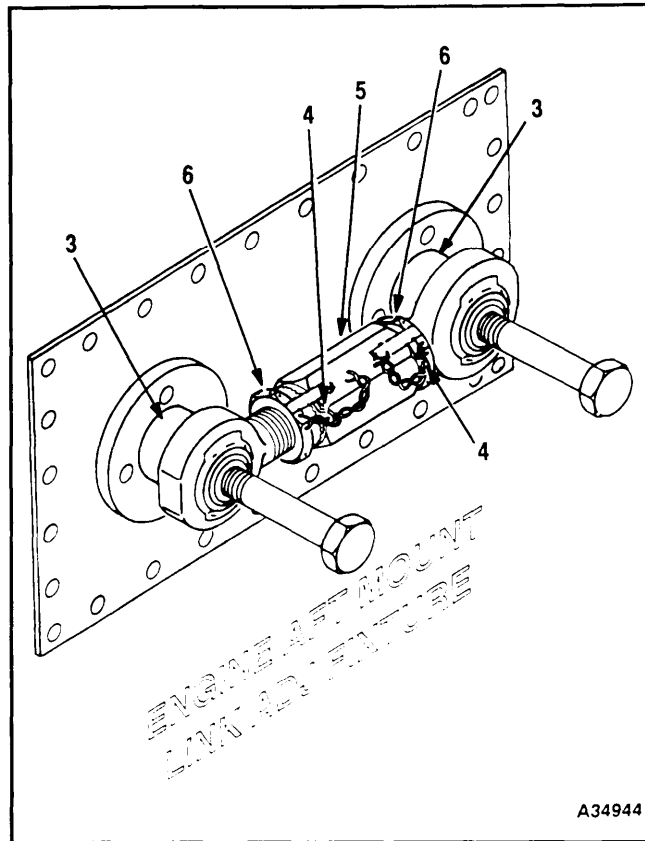
4-38.1

4. Torque two jamnuts (6) to 200 to 300 inch-pounds.
5. Reinstall engine mount adjustable link (5) on adapters (3) of adjustment fixture to ensure proper adjustment.

NOTE

Bottom end of link assembly has left hand thread and must be lockwired accordingly.

6. Lockwire two jamnuts (6) to two lock-washer tabs (4), Use lockwire (E231).
7. Paint torque stripe on two jamnuts (6) and engine mount link (5) center body. Use lacquer (E223).
8. Remove engine mount adjustable link (5) from adjustment fixture.
9. Measure engine mount adjustable link (5) from end to end to three decimal places with a vernier caliper and record dimension in log book.
10. Vibroetch on link (5) center body helicopter tail number, link's length in inches and which engine (No. 11 or No.2) link will be installed on.



FOLLOW-ON MAINTENANCE:

- Install aft engine mount link (Task 4-39).

END OF TASK

4-118.4 Change 14

4-39 INSTALL AFT ENGINE MOUNT LINK AND ADAPTER

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
- NSN 5180-00-323-4692
- Torque Wrench, 100 to 750 Inch-Pounds
- Hoist
- Sling

Materials:

Lockwire (E231)

Personnel Required:

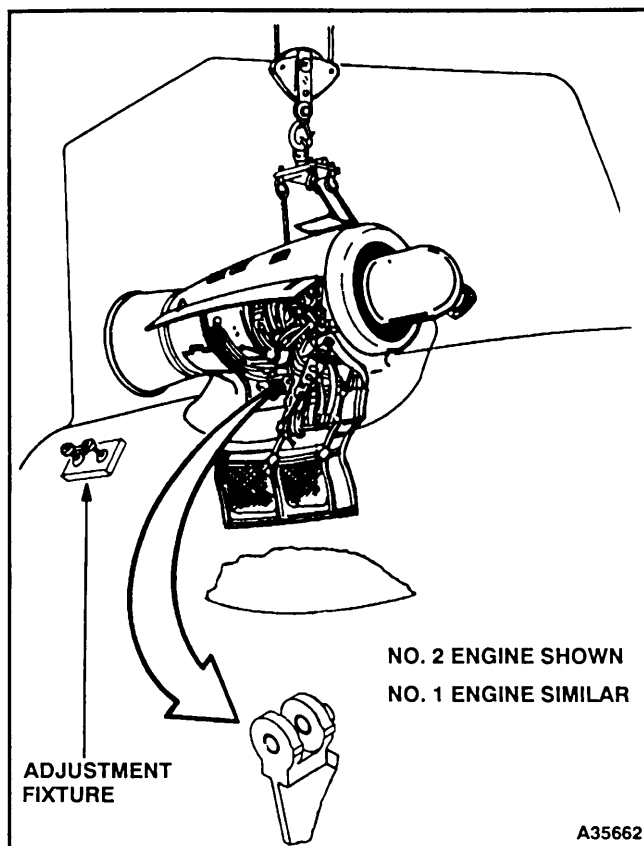
- Medium Helicopter Repairer (2)
- Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Aft Engine Mount Link and Adapter Removed
(Task 4-36)

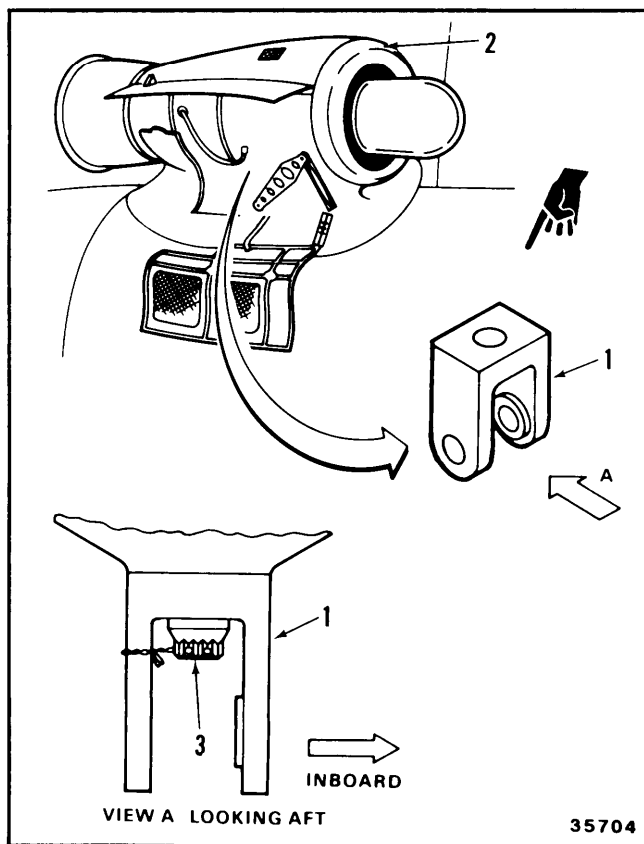


NOTE

- As a result of applying q MWO 1-1520-240-50-60 provides instructions to permanently mount old one piece link 114PS223-1 to trailer adapter (T16) to provide support for engine. Do not remove one piece link from trailer adapter (T16).

- This procedure can be used to install aft engine mount link and adapter on either engine. Link and adapter on No. 2 engine are shown here.

1. Position adapter (1) on engine (2).
2. Install bolt (3).
3. Torque bolt (3) to 300 to 450 inch-pounds.
4. Lockwire bolt (3). Use lockwire (E231).



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INSTALL AFT ENGINE MOUNT LINK AND ADAPTER WITHOUT 57

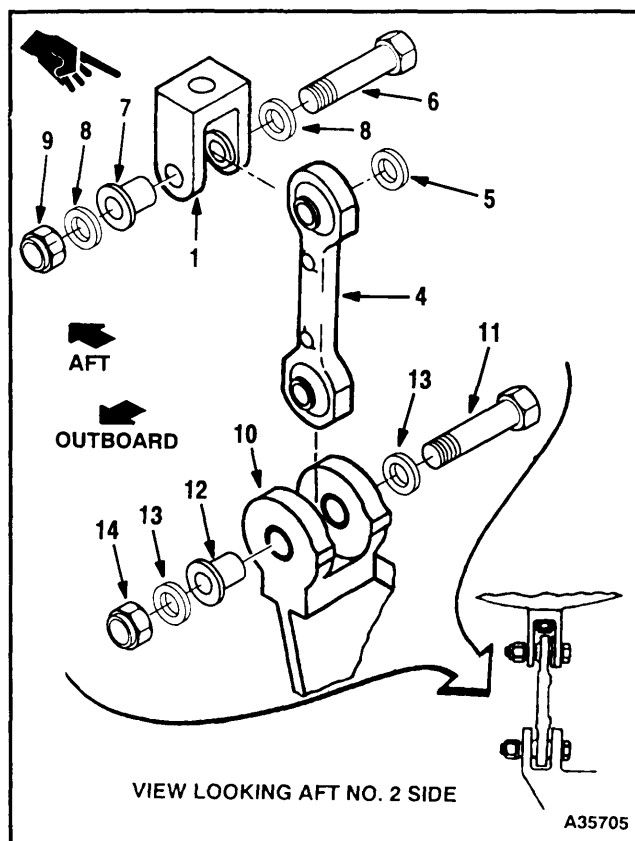
5. Install link (4) as follows:

- Remove tags from link (4), bolts (6 and 11) and spacer (5).
- Align holes in link (4) and spacer (5) with holes in adapter (1). Ensure spacer is on same side as fixed bushing.
- Install bolt (6), bushing (7), two washers (8), and nut (9).
- Align holes in link (4) with holes in aft engine mount (10).
- Install bolt (11), bushing (12), two washers (13), and nut (14).

6. Torque nut (9) to 350 to 400 inch-pounds to seat bushing (7). Loosen nut and re-torque nut to 20 inch-pounds above run-on torque value, but in no case should the torque be less than 70 inch-pounds.

7. Torque nut (14) to 350 to 400 inch-pounds to seat bushing (12). Loosen nut and re-torque nut to 20 inch-pounds above run-on torque value, but in no case should the torque be less than 70 inch-pounds.

8. Go to step 12.

INSPECT

GO TO NEXT PAGE

INSTALL AFT ENGINE MOUNT LINK AND ADAPTER WITH **57**

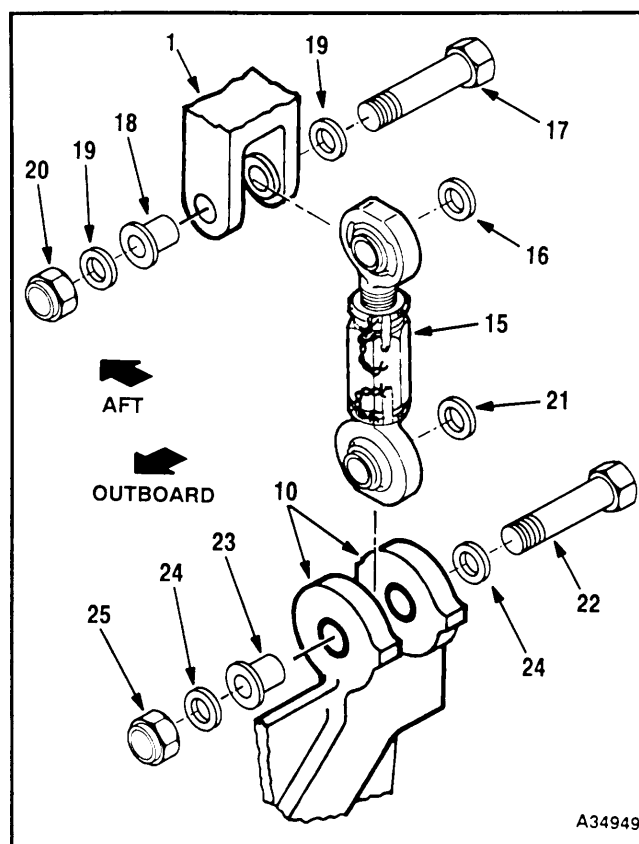
CAUTION

Adjustable link assembly is adjusted to set engine cross shaft alignment at the time of aircraft manufacture or incorporation of MWO 1-1520-240-50-60. The adjustment fixture are unique and are not interchangeable. This preserves the proper link length measurement for each engine should the link need to be replaced or adjusted.

Aft engine mount links that have been modified by **57** adjustable link 145PS700-1 must not be replaced with fixed link 114PS223-1.

NOTE

When installing adjustable link ensure that 'up arrow' located on the link center body is pointing towards the underside of the engine.



9. Install link (15) as follows:

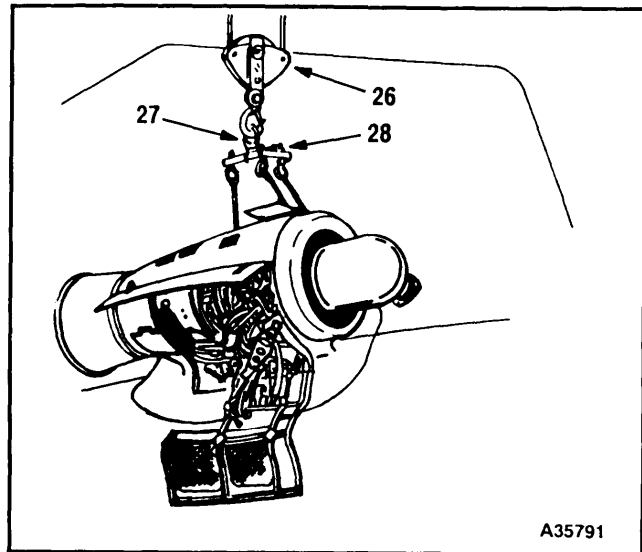
- a. Remove tags from link (15), bolts (17 and 22) and spacers (16 and 21),
- b. Align holes in link (15) and spacer (16) with holes in adapter (1).
- c. Install bolt (17), bushing (18), two washers (19), and nut (20).
- d. Align holes in link (15) and spacer (21) with holes in aft engine mount (10),
- e. Install bolt (22), bushing (23), two washers (24), and nut (25),

10. Torque nut (20) to **350 to 400 inch-pounds** to seat bushing (18). Loosen nut and retorque nut to **20 inch-pounds above run-on torque** value, but in no case should the torque be less than **70 inch-pounds**.
11. Torque nut (25) to **350 to 400 inch-pounds** to seat bushing (23). Loosen nut and retorque nut to **20 inch-pounds above run-on torque** value, but in no case should the torque be less than **70 inch-pounds**.

INSPECT

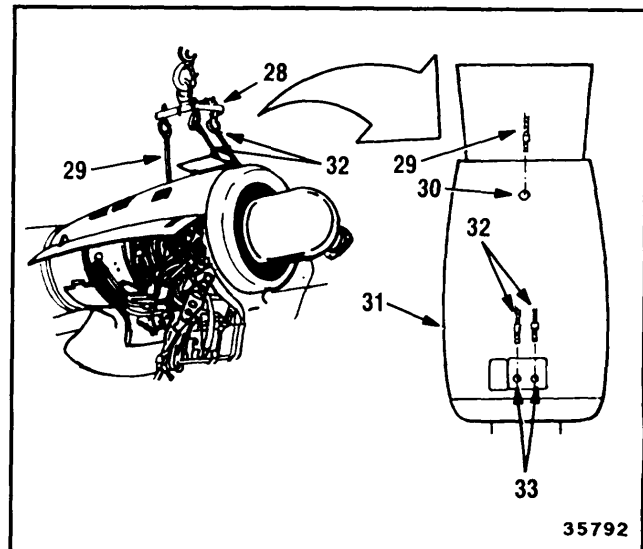
GO TO NEXT PAGE

12. **Lower hoist (26).** Disconnect hoist (26) from eye (27) of sling (28).



13. **Remove sling (28)** as follows:

- a. **Disconnect cable (29)** from aft fitting (30) through cover (31).
- b. **Disconnect two cables (32)** from forward fittings (33) on powerplant,



FOLLOW-ON MAINTENANCE:

Close engine side access doors and lower access door (Task 4-49).

- Close engine work platform (Task 2-2).

END OF TASK

4-40 REMOVE CONNECTING LINK (DRAG STRUT)

4-40

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Drift Pin (Brass)

Materials:

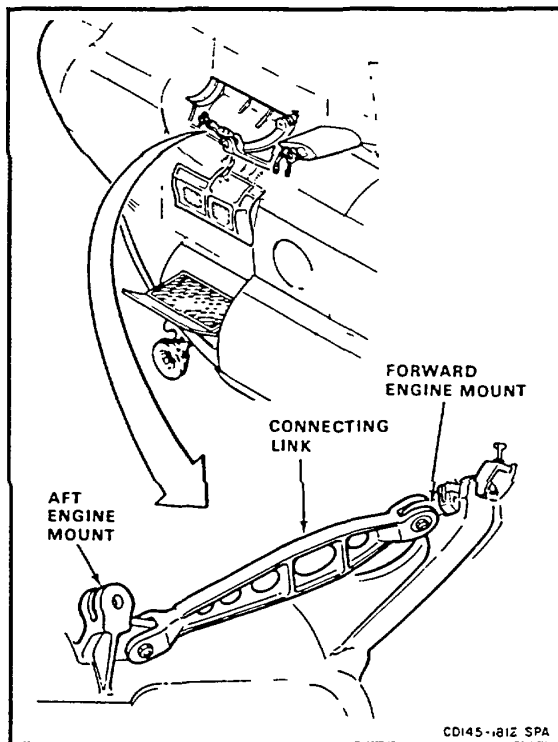
None

Personnel Required:

Medium Helicopter Repairer

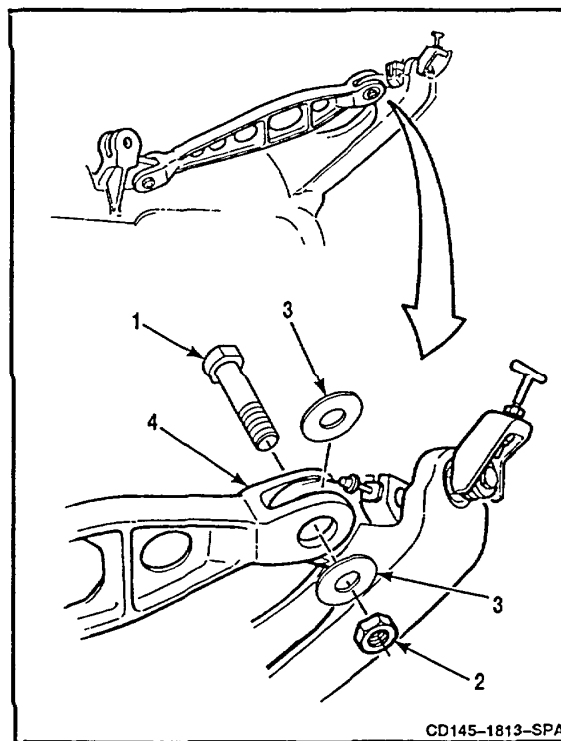
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Powerplant Removed (Task 4-10)



NOTE

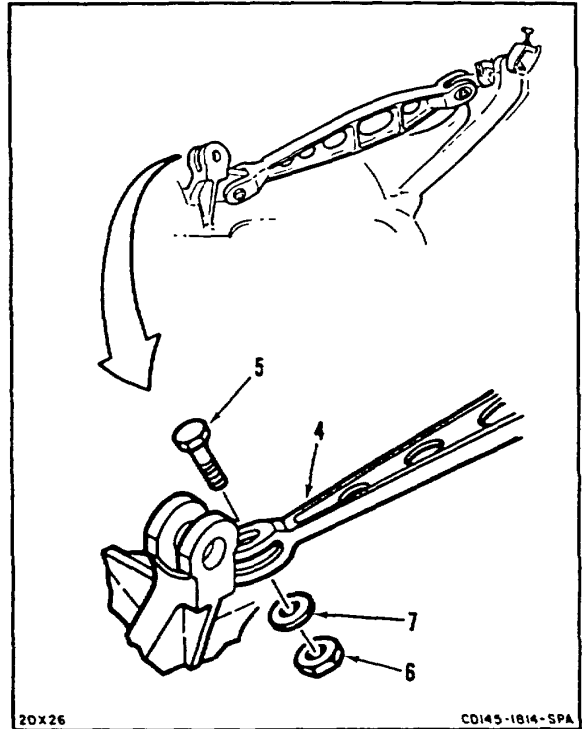
- Procedure can be used to remove connecting link (drag strut) on No. 1 or No. 2 engine. Link on No. 2 engine is shown here.
 - A drift pin and hammer may be used to remove bolt, if necessary.
1. Remove bolt (1), nut (2), and washers (3) from link (4).



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Change 19 4-121

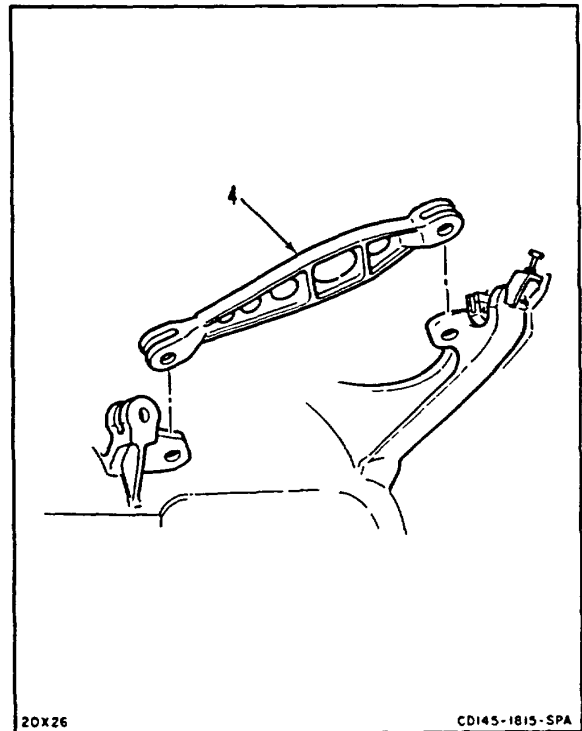
2. Remove bolt (5), nut (6), and washer (7) from link (4).



3. Remove link (4).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-40.1 REMOVE CONNECTING LINK (DRAG STRUT)

4-40.1

INITIAL SETUP

Applicable Configurations:

With 74

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Drift Pin (Brass)

Materials:

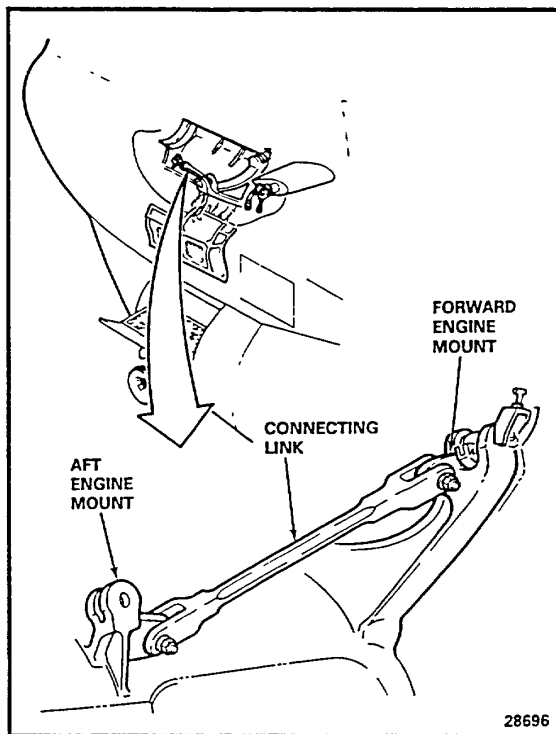
None

Personnel Required:

Medium Helicopter Repairer

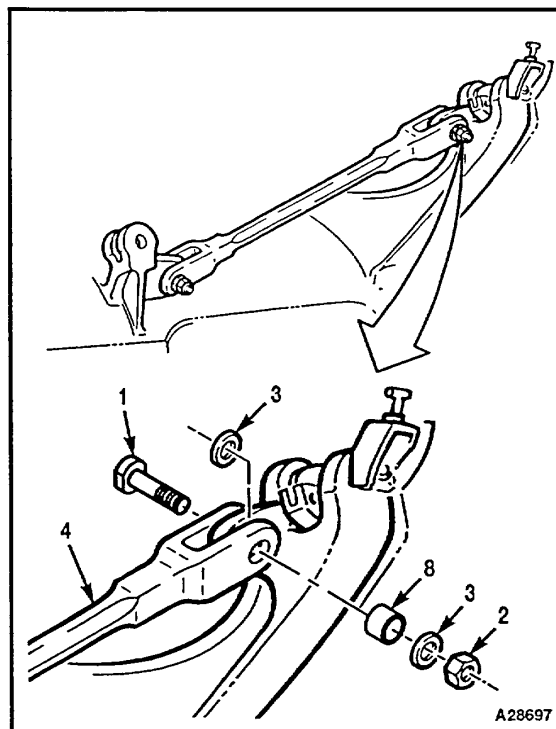
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Powerplant Removed (Task 4-10.1)



NOTE

- Procedure can be used to remove connecting link (drag strut) on No. 1 or No. 2 engine. Link on No. 2 engine is shown here.
 - A drift pin and hammer may be used to remove bolt, if necessary.
1. Remove bolt (1), nut (2), washers (3), and bushing (8) from link (4).



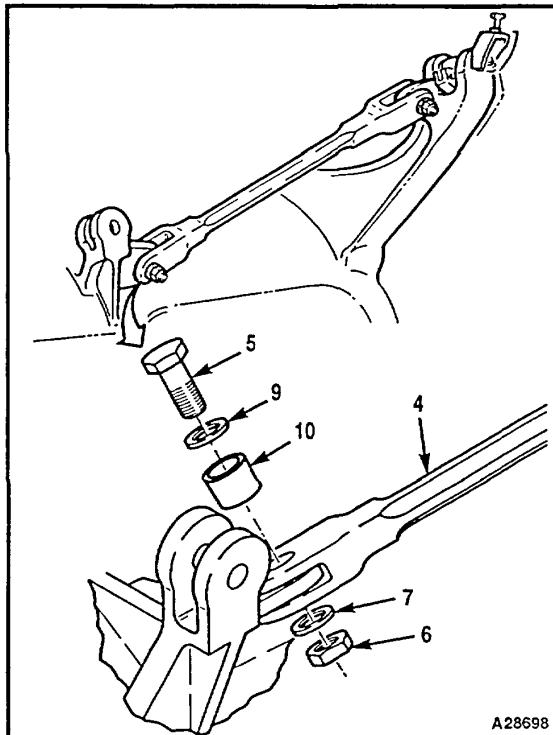
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Change 19 4-122.1

4-40.1 REMOVE CONNECTING LINK (DRAG STRUT) (Continued)

4-40.1

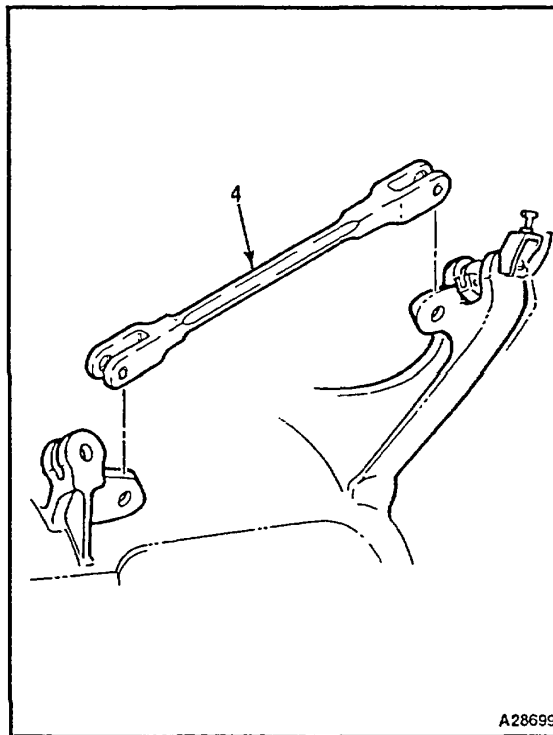
2. Remove bolt (5), washer (9), nut (6), washer (7), and bushing (10) from link (4).



3. Remove link (4).

FOLLOW-ON MAINTENANCE:

None



4-41 INSPECT CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS

4-41

INITIAL SETUP

Equipment Condition:

Connecting Link Removed (Task 4-40)

Applicable Configurations:

Without **74**

General Safety Instructions:

Tools:

- Technical Inspection Tool Kit,
NSN 5180-00-323-5114
- Dial Indicating Scale, 0 to 50 Pounds
- Vernier Caliper
- Micrometer

WARNING

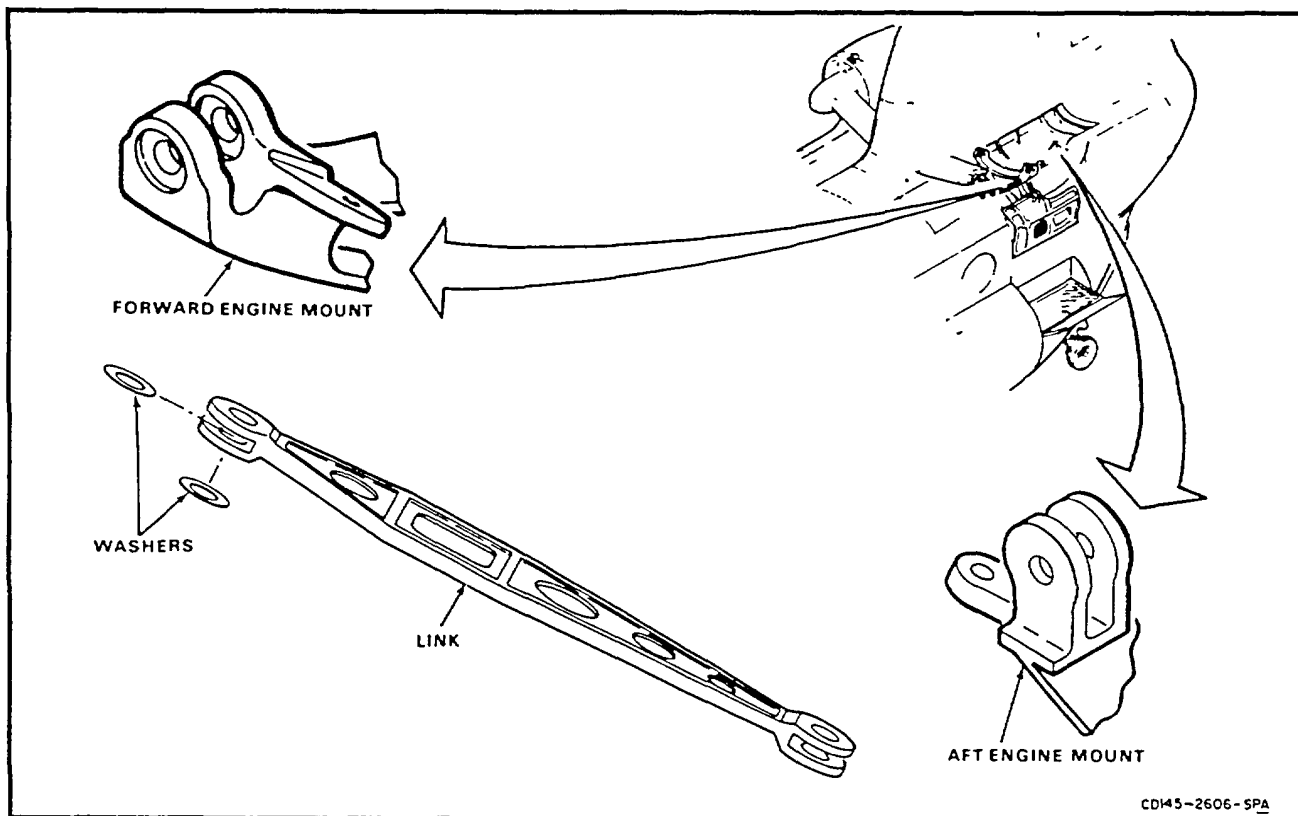
Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

Materials:

- Dry Cleaning Solvent (E162)
- Cloths (E135)
- Gloves (E186)

Personnel Required:

- Medium Helicopter Repairer
- Inspector



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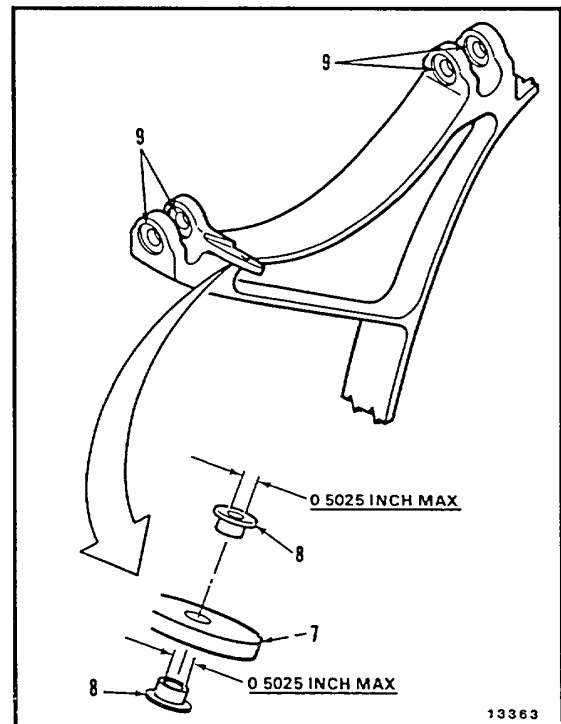
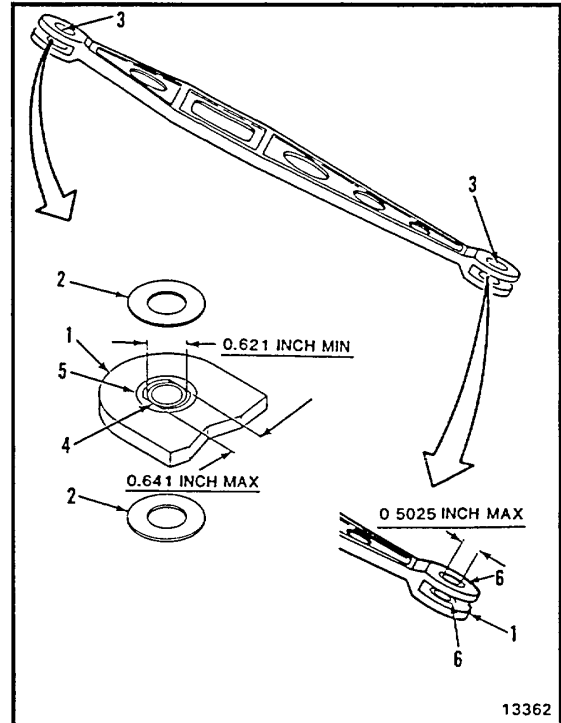
Change 19 122.3

4-41 INSPECT CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (Continued)

NOTE

Procedure can be used for No. 1 or No. 2 engine connecting link and fittings. Link and fittings for No. 1 engine are shown.

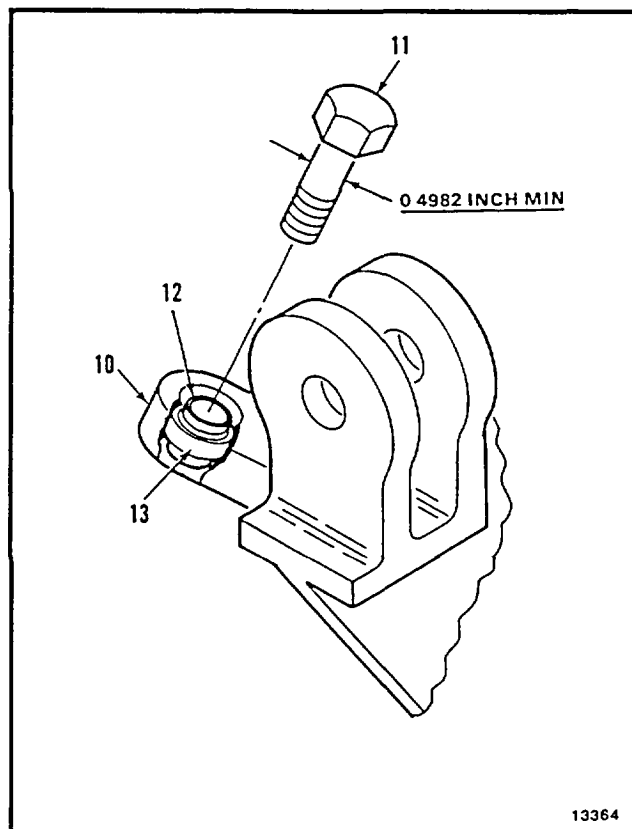
1. Clean link (1) and two washers (2). Use solvent (E162) and cloth (E135). Wear gloves (E186).
2. **Check surface of link (1)** for nicks, scratches, and gouges. Damage in areas other than bores (3) is acceptable if it does not exceed 0.040 inch or 10 percent of material thickness, whichever is less.
3. **Inspect bushing (4)** for wear. Outside diameter shall not be less than 0.621 inch.
4. **Measure inside diameter of insert (5) across flats.** Inside diameter shall not exceed 0.641 inch.
5. **Measure two washers (2).** Washers shall be 0.022 inch to 0.028 inch thick. Maximum allowable reduction of thickness at wear spots is 0.002 inch.
6. **Inspect bushings (6)** on lower end of link (1). Inside diameter shall not exceed 0.5025 inch.
7. Clean fitting (7) and two bushings (8). Use solvent (E162) and cloth (E135). Wear gloves (E186).
8. **Check surface of fitting (7)** for nicks, scratches, and gouges. Damage in areas other than bores (9) is acceptable if it does not exceed 0.040 inch or 10 percent of material thickness, whichever is less.
9. **Inspect two bushings (8)** in fitting (7). Inside diameter shall not exceed 0.5025 inch.



4-41 INSPECT CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (Continued)

4-41

10. **Clean fitting (10) and bolt (11).** Use solvent (E162) and cloth (E135). Wear gloves (E186).
11. **Check surface of fitting (10)** for nicks, scratches, and gouges. Damage in areas other than bore (13) is acceptable if it does not exceed 0.040 inch or 10 percent of material thickness, whichever is less.
12. **Measure shank of bolt (11).** Diameter shall not be less than 0.4982 inch. Record measurement.
13. **Measure inside diameter of bearing (12) in aft mount fitting (10).** Record measurement.
14. **Subtract measurement made in step 12 from measurement made in step 13.** Difference shall not be more than 0.002 inch.
15. **Apply 25 to 50 pound load to bearing (12)** in an axial direction. Apply 25 to 50 pound load in opposite direction. **Measure axial play between bearing and race (13).** Play shall not exceed 0.025-inch.
16. **Apply 25 to 50 pound load to bearing (12)** in a radial direction. Apply 25 to 50 pound load in opposite direction. **Measure radial play between bearing and race (13).** Play shall not exceed 0.006 inch.
17. **Measure radial play between race (13) and fitting (10).** Play shall not exceed 0.002 inch.


FOLLOW-ON MAINTENANCE:

None

END OF TASK

Change 19 4-122.5/(4-122.6 blank)

4-41.1 INSPECT CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS

4-41.1

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

- Technical Inspection Tool Kit,
NSN 5180-00-323-5114
- Dial Indicating Scale, 0 to 50 Pounds
- Vernier Caliper
- Micrometer

Materials:

- Dry Cleaning Solvent (E162)
- Cloths (E135)
- Gloves (E184.1)

Personnel Required:

- Medium Helicopter Repairer
- Inspector

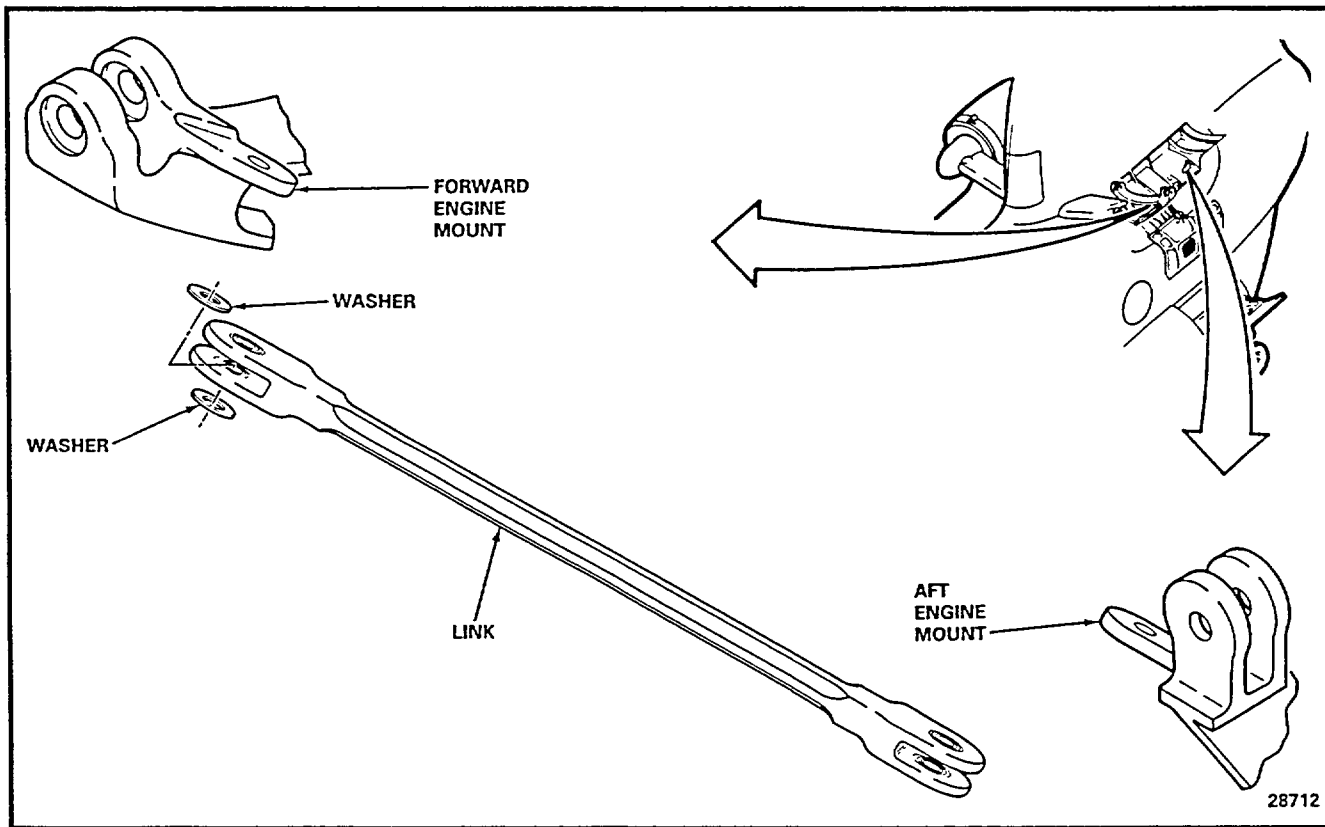
Equipment Condition:

Connecting Link Removed (Task 4-40.1)

General Safety Instructions:

WARNING

Dry cleaning solvent (E162) is flammable and toxic. It 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 water for at least 15 minutes. Get medical attention for eyes.



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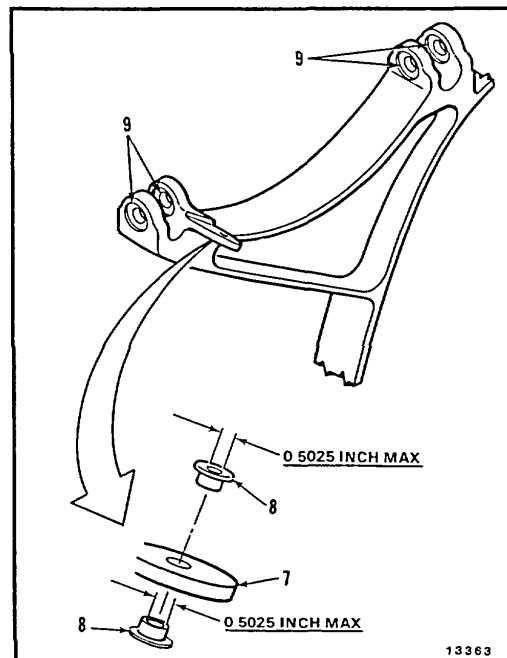
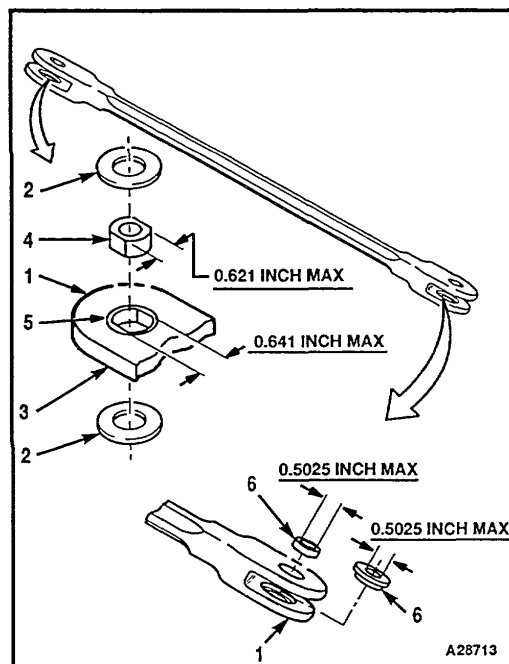
4-41.1 INSPECT CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (Continued)

4-41.1

NOTE

Procedure can be used for No. 1 or No. 2 engine connecting link and fittings. Link and fittings for No. 1 engine are shown.

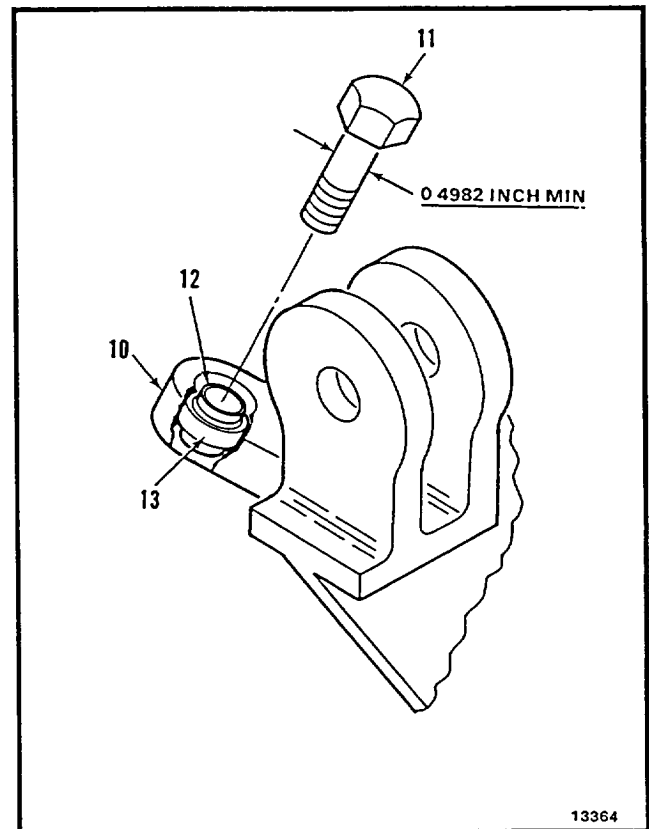
1. Clean link (1) and two washers (2). Use solvent (E162) and cloth (E135). Wear gloves (E184.1).
2. **Check surface of link (1)** for nicks, scratches, and gouges. Damage in areas other than bores (3) is acceptable if it does not exceed 0.040 inch or 10 percent of material thickness, whichever is less.
3. **Inspect bushing (4)** for wear. Outside diameter shall not be less than 0.621 inch across flats.
4. **Measure inside diameter of insert (5) across flats.** Inside diameter shall not exceed 0.641 inch.
5. **Measure two washers (2).** Washers shall be 0.022 inch to 0.028 inch thick. Maximum allowable reduction of thickness at wear spots is 0.002 inch.
6. **Inspect bushings (6)** on lower end of link (1). Inside diameter shall not exceed 0.5025 inch.
7. Clean fitting (7) and two bushings (8). Use solvent (E162) and cloth (E135). Wear gloves (E184.1).
8. **Check surface of fitting (7)** for nicks, scratches, and gouges. Damage in areas other than bores (9) is acceptable if it does not exceed 0.040 inch or 10 percent of material thickness, whichever is less.
9. **Inspect two bushings (8) in fitting (7).** Inside diameter shall not exceed 0.5025 inch.



4-41.1 INSPECT CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (Continued)

4-41.1

10. **Clean fitting (10) and bolt (11).** Use solvent (E162) and cloth (E135). Wear gloves (E184.1).
11. **Check surface of fitting (10)** for nicks, scratches, and gouges. Damage in areas other than bore (13) is acceptable if it does not exceed 0.040 inch or 10 percent of material thickness, whichever is less.
12. **Measure shank of bolt (11).** Diameter shall not be less than 0.4982 inch. Record measurement.
13. **Measure inside diameter of bearing (12) in aft mount fitting (10).** Record measurement.
14. **Subtract measurement made in step 12 from measurement made in step 13.** Difference shall not be more than 0.002 inch.
15. **Apply 25 to 50 pound load to bearing (12)** in an axial direction. Apply 25 to 50 pound load in opposite direction. **Measure axial play between bearing and race (13).** Play shall not exceed 0.025-inch.
16. **Apply 25 to 50 pound load to bearing (12)** in a radial direction. Apply 25 to 50 pound load in opposite direction. **Measure radial play between bearing and race (13).** Play shall not exceed 0.006 inch.
17. **Measure radial play between race (13) and fitting (10).** Play shall not exceed 0.002 inch.



FOLLOW-ON MAINTENANCE:
None

END OF TASK

Change 19 4-125

4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM)

4-42

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Mechanical Puller
- Micrometer Depth Gage
- Outside Micrometer Caliper, 0 to 1-inch
- Staking Tool (T109)
- Vernier Caliper
- Arbor Press
- Installation Bar (Appx E-123)

Materials:

- Brush (E85)
- Gloves (E184.1)
- Cloths (E135)
- Sealant (E328)
- Chalk (E110)
- Steel, Bar (E367)
- Kevlar Gloves (E187)
- Epoxy Primer (E292)
- Carbon Dioxide (Dry Ice) (E92)

Parts:

- Bushings
- Bearing

Personnel Required:

- Machinist, Inspector

References:

- TM 55-1520-240-23P
- TM 55-1500-204-23
- TM 55-1500-322-24

Equipment Condition:

Connecting Link Removed Task 4-40 Without **74**, Task 4-40.1 With **74**)

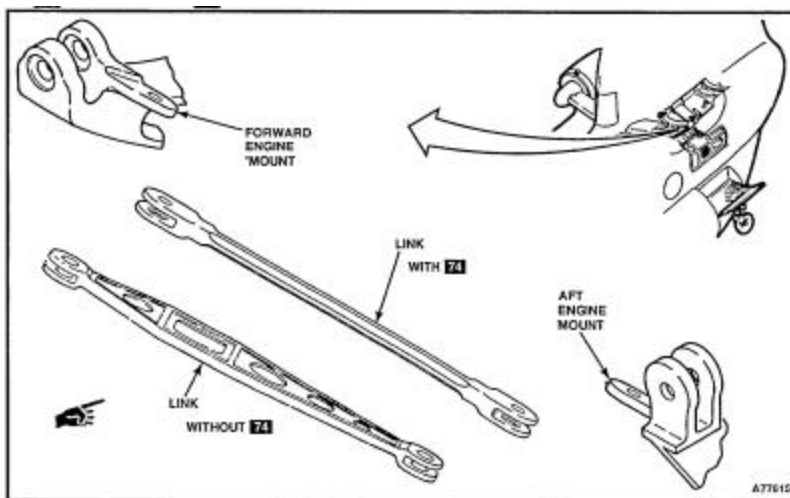
General Safety Instructions:

WARNING

Epoxy primer (E292) is flammable and very toxic. It can irritate skin and cause burns. Protective clothing or body suit with respirator and eye protection is required if material is to be applied by spraying. Use only in well-ventilated area away from open flame and excessive heat. In case of contact, immediately flush skin or eyes with plenty of water for at least **15 minutes**. Get medical attention for eyes.

WARNING

Carbon dioxide (dry ice) (E92) causes severe burns and may be toxic. Use only in well-ventilated area. Do not get in eyes, on skin or clothing. In case of contact, immediately flush skin with plenty of water for at least **15 minutes**. Get medical attention for eyes.



4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

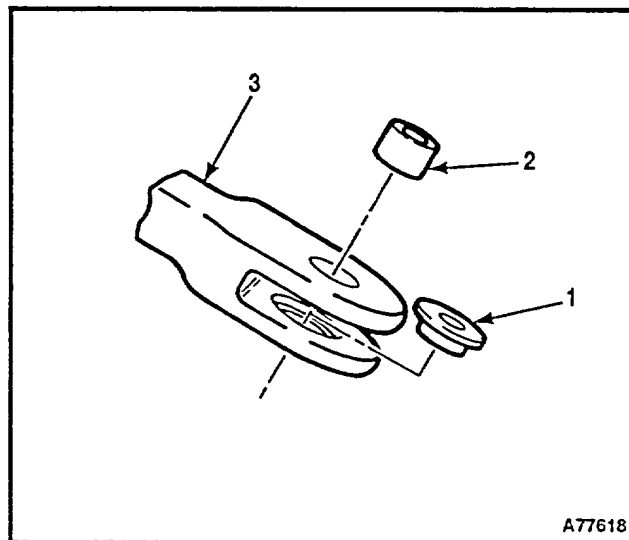
4-42

WARNING

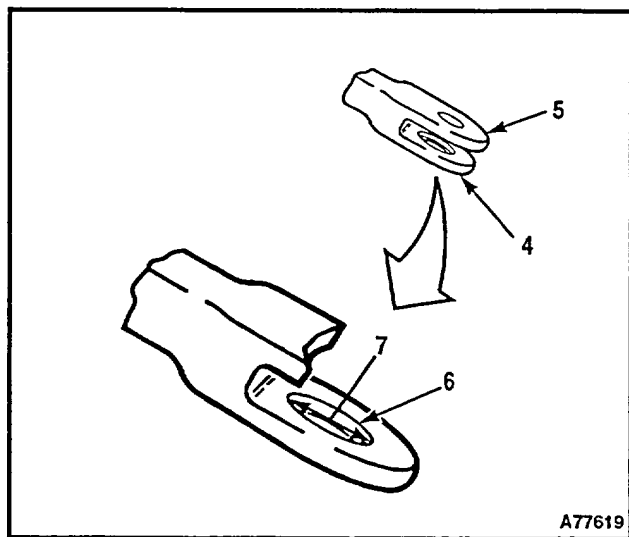
Wear Kevlar gloves (E187) when handling heated or chilled parts. Injury to personnel can result.

NOTE

- Procedure can be used for No. 1 or No. 2 engine connecting link and fittings. Link and fittings for No. 1 engine are shown.
- It may be necessary to freeze bushing areas with carbon dioxide (E92) for easier removal of bushings.


REPLACE BUSHINGS IN LINK AND FORWARD ENGINE MOUNT FITTING

1. Replace shoulder bushing (1) and shoulder-less bushing (2) as follows
 - a. Remove shoulder bushing (1) and shoulder-less bushing (2) from link (3).
 - b. Ream lug (4) in line with other lug (5). Make a round hole (6) with an inside diameter (7) no larger than 0.6562 inch.



GO TO NEXT PAGE

Change 19 4-126.1

**4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT
FITTINGS (AVIM) (Continued)**

4-42

- c. Measure inside diameter (7) of hole (6 and 11). Record measurement.
- d. Measure width (12) of lug (13). Record measurement.
- e. Measure width (14) of lug (15). Record measurement.
- f. **Make new shoulder bushing (1)** from steel (E367) as follows:

- (1) Make bushing length (16) from flat end (17) to counterbore (18) equal to lug width (12). (See measurement recorded in step d.)

- (2) Make outside diameter (19) of bushing (1) 0.0008 to 0.0020 inch more than inside diameter (7) of hole (6). (See measurement recorded in step c.)

- (3) Make inside diameter (20) of bushing (1) 0.500 inch.

- (4) Make outside diameter (21) of shoulder (22) 0.7500 inch.

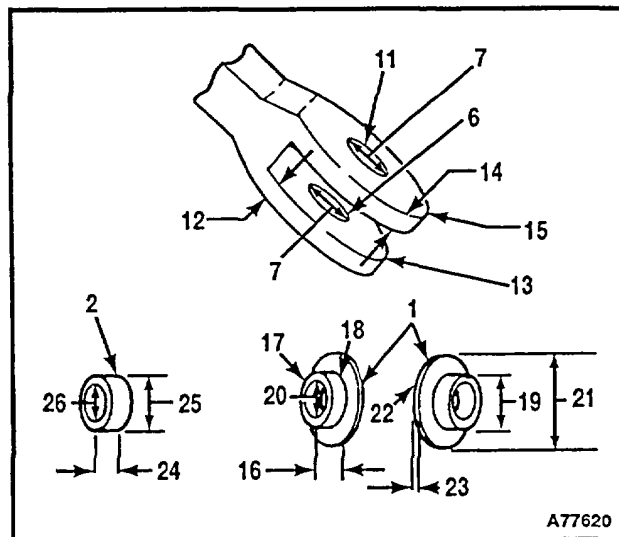
- (5) Make width (23) of shoulder (22) 0.062 inch.

- g. **Make new shoulderless bushing (2)** from steel (E367) as follows:

- (1) Make bushing length (24) 0.4012 to 0.4062 inch.

- (2) Make outside diameter (25) 0.0008 to 0.0023 inch more than inside diameter of hole (7). (See measurement recorded in step c.)

- (3) Make inside diameter (26) of bushing (2) 0.500 inch.



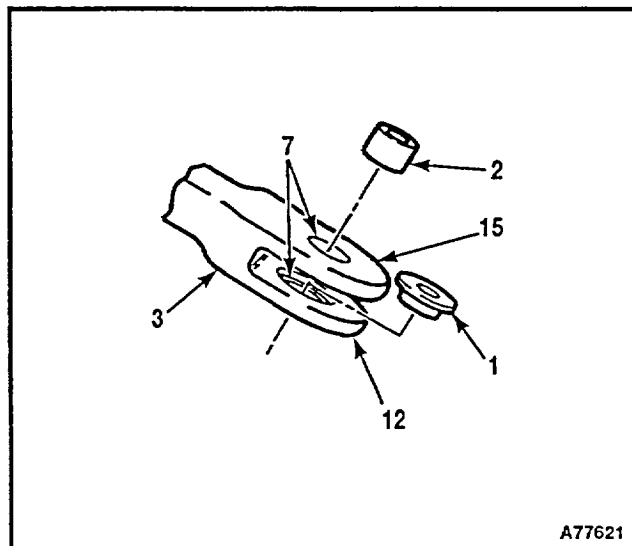
4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

- h. Coat inside of holes (7) in lugs (12 and 15) with epoxy primer (E292). Wear gloves (E184.1).

NOTE

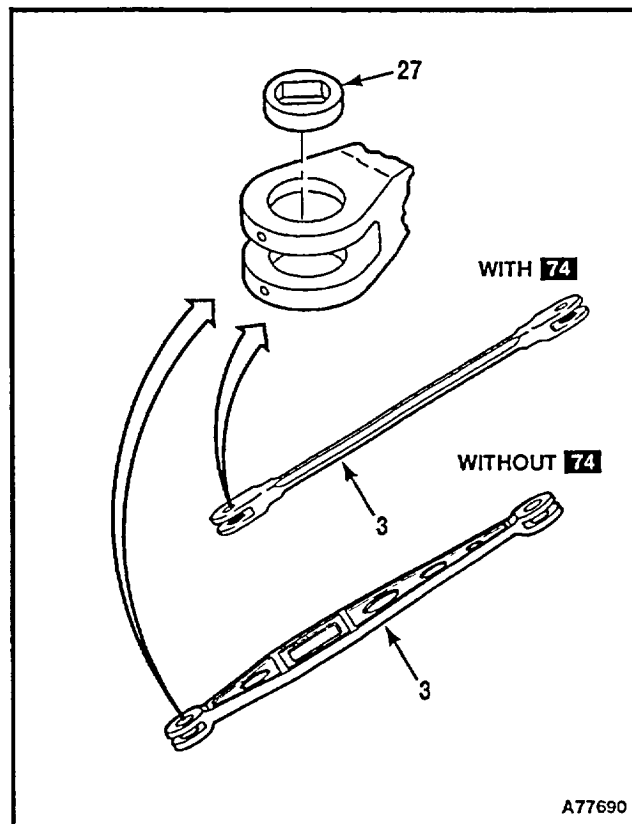
Bushings must be installed while epoxy primer (E292) is still wet.

- i. Install new shoulder and shoulderless bushings (1 and 2) in lugs (12 and 15) of link (3).
- j. Wipe off any excess primer (E292) from lugs (12 and 15). Use cloths (E135).



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- 2. Replace slotted bushing (27) in link (3) as follows:



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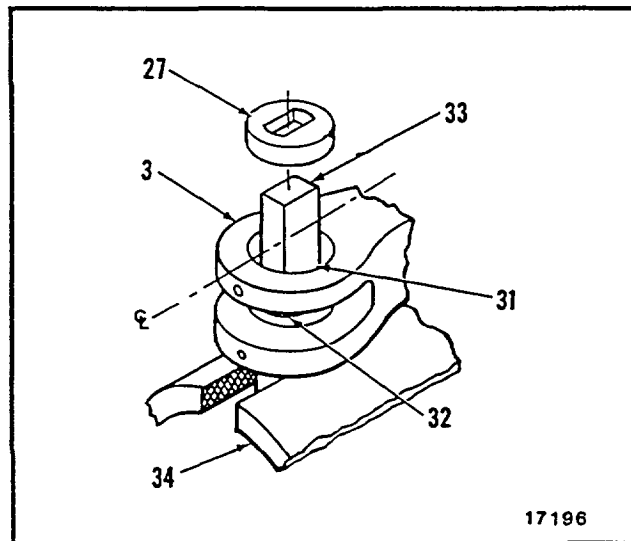
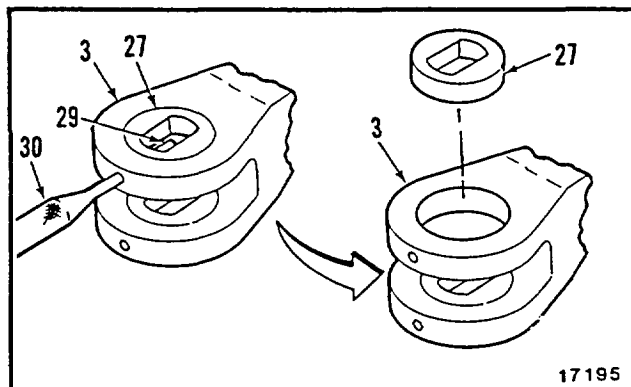
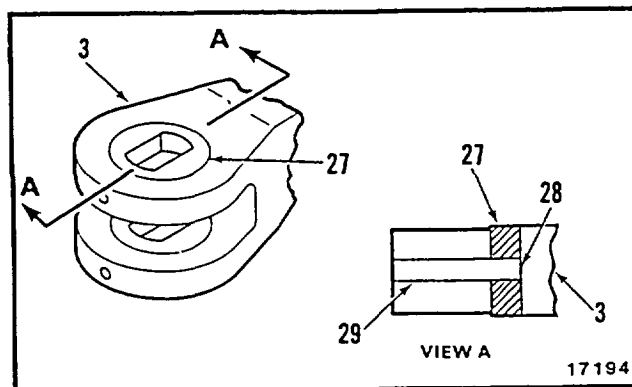
4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

- a. If necessary, grind inside surface (28) of bushing (27) in link (3) to expose end of lockpin (29).
- b. Remove lockpin (29) by driving lockpin through link (3) into slot of bushing (27). Use drift (30). Cut off lockpin about halfway into slot and continue driving until lockpin is removed.
- c. Remove bushing (27) from link (3).

NOTE

Slot in bushing (27) must be parallel to centerline of hole (31) and slot of other bushing (32) within 1/4 degree.

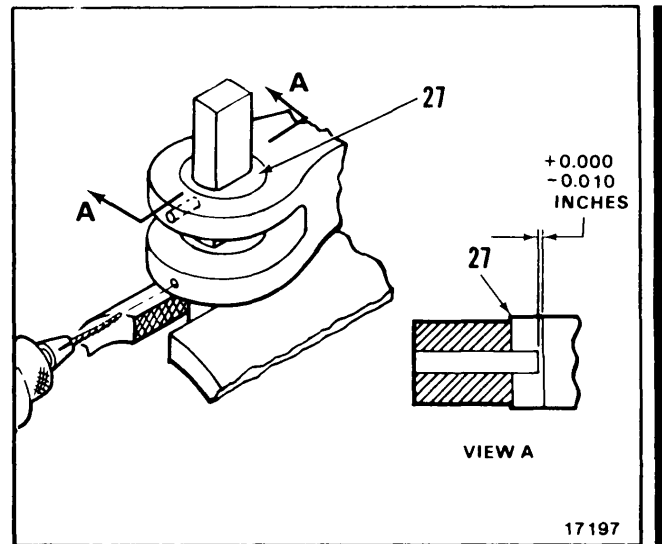
- d. Install new bushing (27) in link (3). Use bar (Appx E-123) (33) and vise (34).



4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

4-42

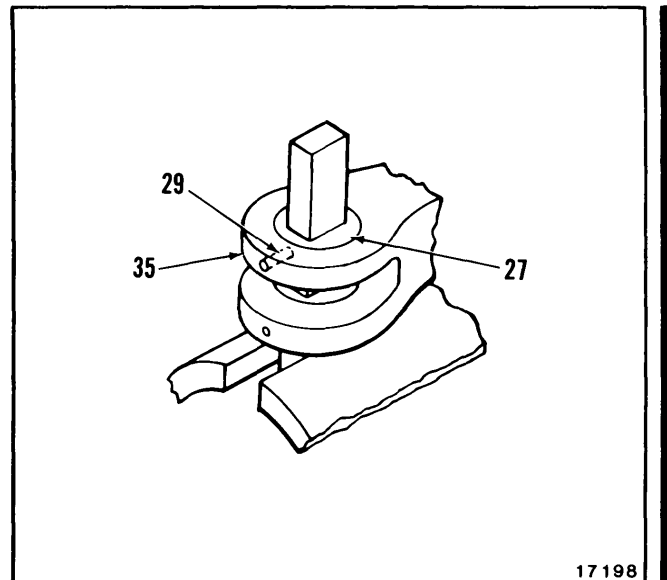
- e. Drill 0.0927 to 0.0937 inch round hole into new bushing (27) to within approximately 0.010 inch of inside edge of bushing.



NOTE

Do not allow lockpin (29) to protrude into slot of bushing (27) after peening.

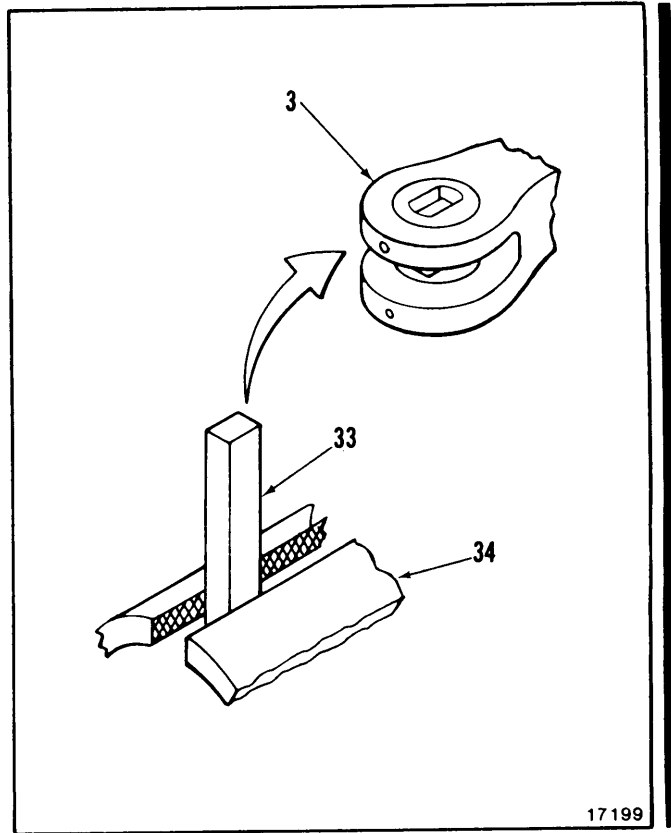
- f. insert new lockpin (29) and peen lug (35) over lockpin at 90 degrees to original peen.



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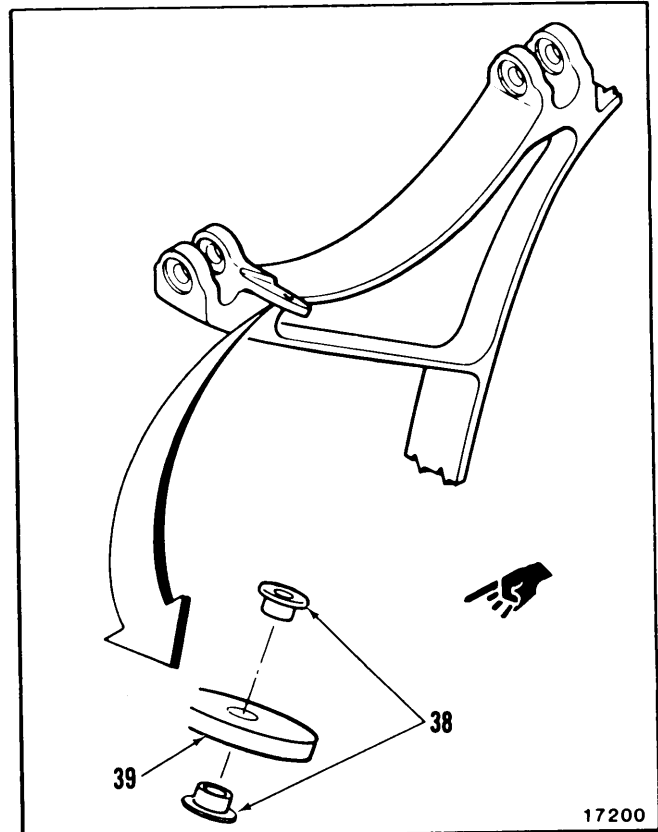
4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

- g. Remove link (3) from bar (33) and vise (34).



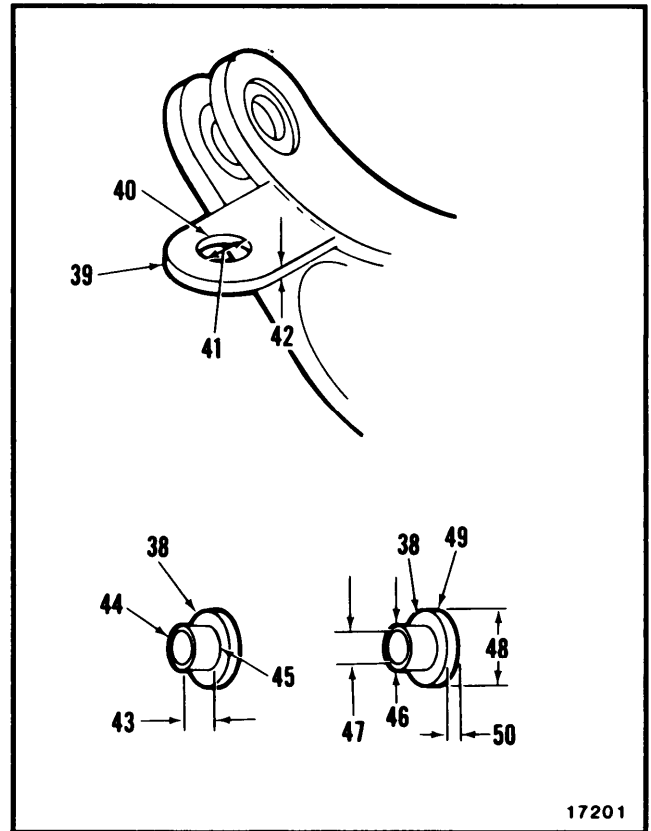
- 3. Replace shoulder bushings (38) in forward engine mount fitting (39) as follows:

- a. Remove shoulder bushings (38) from engine mount fitting lug (39).



4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued) 4-42

- b. Ream lug (39). Make a round hole (40) with an inside diameter (41) no larger than 0.6562 inch.
- c. Measure inside diameter (41) of hole (40). Record measurement.
- d. Measure width (42) of lug (39). Record measurement.
- e. Make new shoulder bushings (38) from steel (E367) as follows:
 - (1) Make length (43) from flat end (44) to counterbore (45) equal to one half of lug width (42). (See measurement recorded in step d.)
 - (2) Make outside diameter (46) of bushing (38) 0.0008 to 0.0020 inch more than inside diameter (40) of hole (41). (See measurement recorded in step c.)
 - (3) Make inside diameter (47) of bushing (38) 0.500 inch.
 - (4) Make outside diameter (48) of shoulder (49) 0.7500 inch.
 - (5) Make width (50) of shoulder (49) 0.062 inch.
- f. Coat inside of hole (40) in lug (39) with epoxy primer (E292). Wear gloves (E184.1).



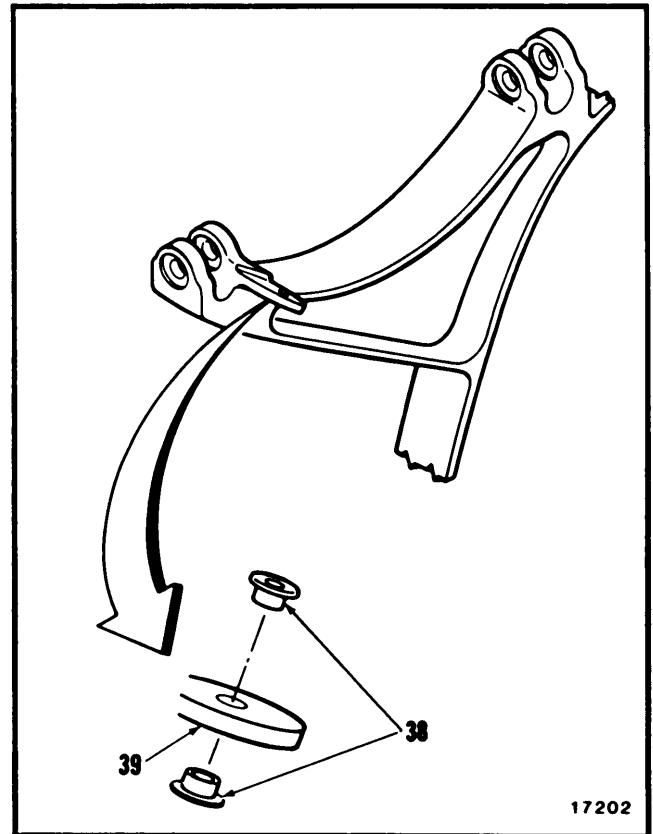
17201

4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued) 4-42**NOTE**

Bushings must be installed while epoxy primer (E292) is still wet.

g. install new shoulder bushings (38) in engine mount fitting lug (39).

h. Wipe off any excess epoxy primer (E292) from lug (39). Use cloths (E135).



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4-42 REPAIR CONNECTING LINK (DRAGS STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

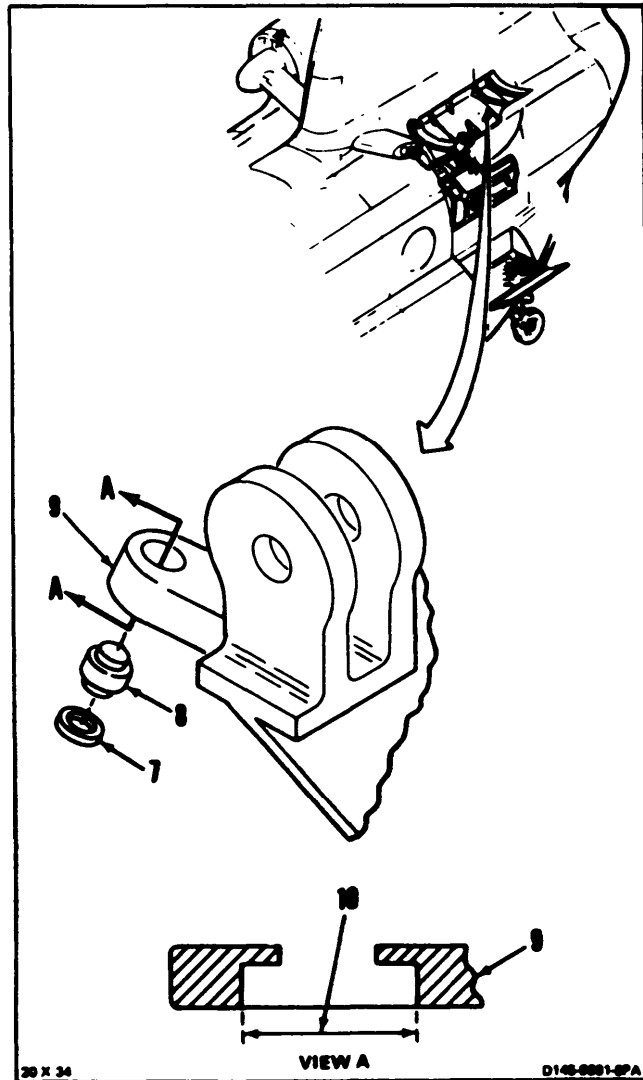
INSTALL BEARING AND OVERSIZE BUSHING IN AFT MOUNT FITTING

4. Remove retainer and bearing (8) from aft engine mount fitting.
5. Measure diameter of hole (10) in fitting (9). If dimension is 1.125-inch or less, go to step 16. If dimension is greater than 1.125-inch, go to step 6.

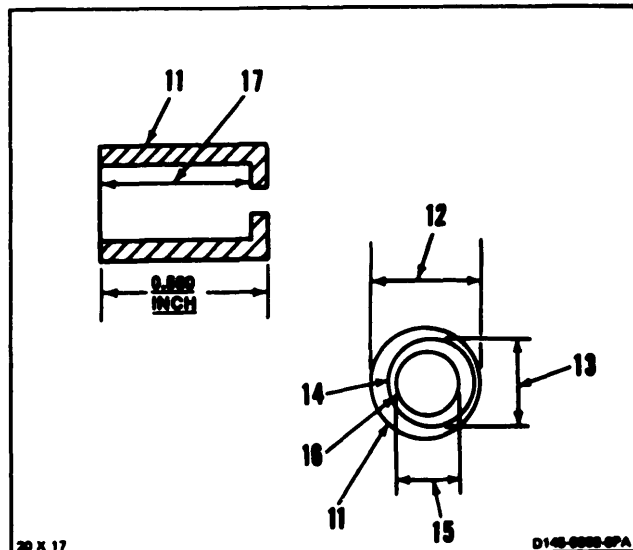
CAUTION

DO not increase hole depth When roaming lug.

6. Ream hole (10) in fitting (9) to 1.3120-inch. Do not increase hole depth.



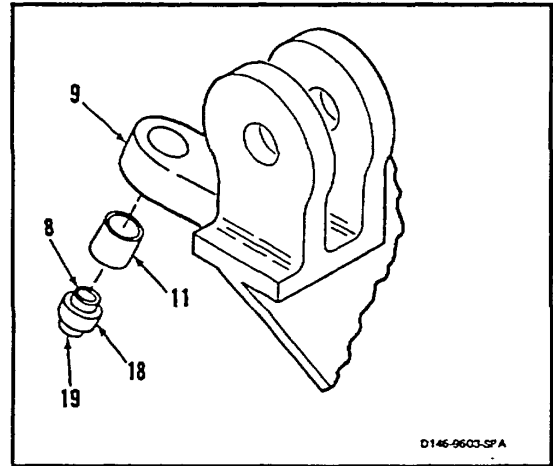
7. Make eccentric bushing (11) from steel (E387) as follows:
 - a. Make bushing (11) 0.560-inch in length.
 - b. Make outside diameter (12) of bushing (11) 1.3125-inch.
 - c. Make inside diameter (13) of hole (14) in bushing (11) 1.000-inch and 0.010-inch off center.
 - d. Make inside diameter (15) of hole (16) in bushing (11) 1.245-inch and 0.010-inch off center.
 - e. Make depth (17) of hole Bin bushing (11) 0.381-inch.



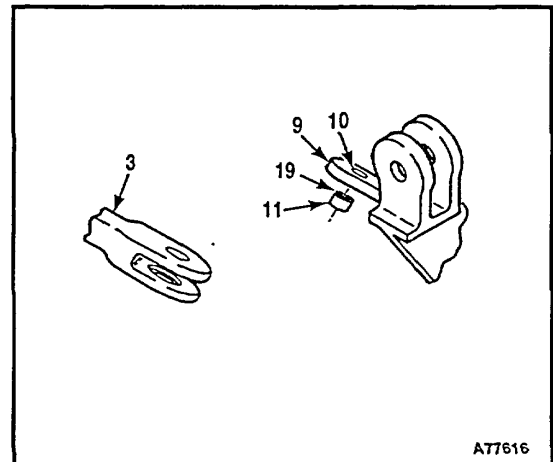
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4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

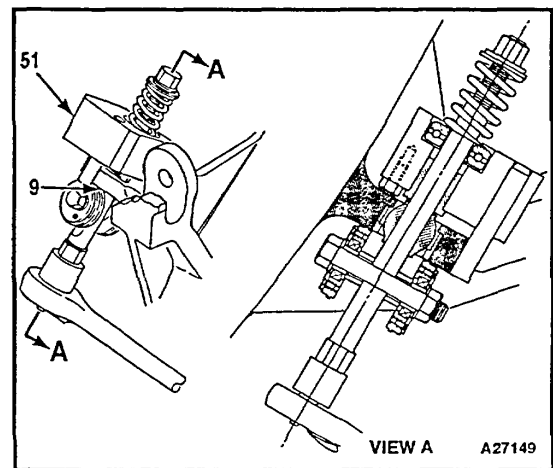
8. Apply epoxy primer (E292) to outside of race (18), inside of bushing (11), and hole in fitting (9). Allow primer to dry. Wear gloves (E184.1).
9. Brush outside of race (18) and inside of bushing (11) with sealant (E328). Wear gloves (E184.1).
10. Install bearing (8) in bushing (11).



11. Position link (3) on aft engine mount fitting (9). Align holes in lower end of link (3), bearing (19), and fitting. Mark position of bushing (11) with chalk (E110).
12. Brush outside of bushing (11) and hole (10) in fitting (9) with sealant (E328).
13. Align bushing (11) with mark on fitting (9) found in step 11. Install bushing in fitting.



14. Stake fitting (9). Use staking tool (51) (T109).
- INSPECT**
15. Go to step 20.



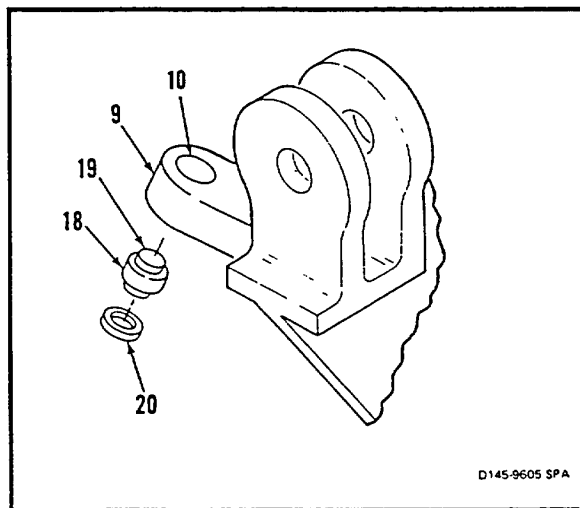
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4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

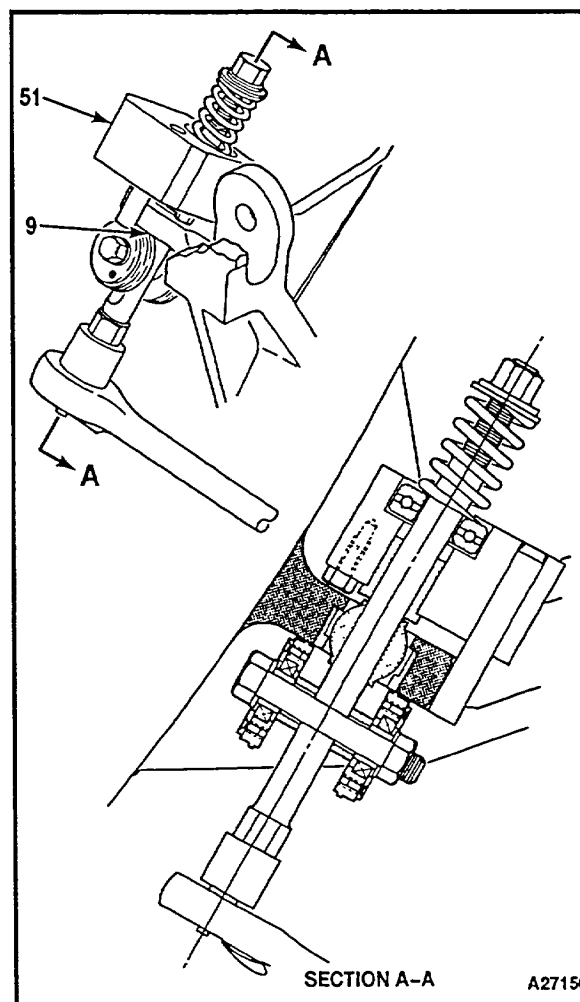
4-42

REPLACE BEARING IN A FT ENGINE MOUNT FITTING

16. Apply epoxy primer (E292) to outside of race (18), retainer (20) and hole (10) in fitting (9). Allow primer to dry. Wear gloves (E184.1).
17. Brush outside of race (18), retainer (20), in hole (10), in fitting (9), with sealant (E328).
18. Install bearing (19), and retainer (20), in hole in fitting (9) (TM 55-1500-322-24).



19. Stake fitting (9). Use staking tool (51) (T109).

INSPECT

GO TO NEXT PAGE
Change 19 4-129

4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

REPLACE BUSHING IN INBOARD LUG

20. Remove bushing (21) from lug (22).
21. Ream lug (22) in line with other lug (23). Make a round hole with an inside diameter (24), no larger than 0.8120 inch.
22. Respotface hole in lug (22) to make flat spotface surface. Do not decrease lug thickness to less than 0.354 inch.
23. Measure inside diameter (24) of hole in lug (22). Record measurement.
24. Measure width (25) of lug (22) to spotface (26). Record measurement.
25. Measure depth (27) of spotface (26). Record measurement.
26. Make new bushing (21) from steel (E367) as follows:
 - a. Make outside diameter (28) of bushing (21) 0.0010 to 0.0020 inch more than dimension found in step 22.
 - b. Make bushing length (29) equal to dimension found in step 24.
 - c. Make outside diameter (30) of shoulder (31) 1.00 inch.
 - d. Make shoulder thickness (32) equal to measurement found in step 25.
27. Apply epoxy primer (E292) to inside of hole in lug (22). Wear gloves (E184.1).

NOTE

Bushing must be installed while epoxy primer (E292) is wet.

28. Install bushing (21) in lug (22) with shoulder (31) of bushing outboard.
29. Wipe off excess primer (E292) from lug (22) with cloths (E135).

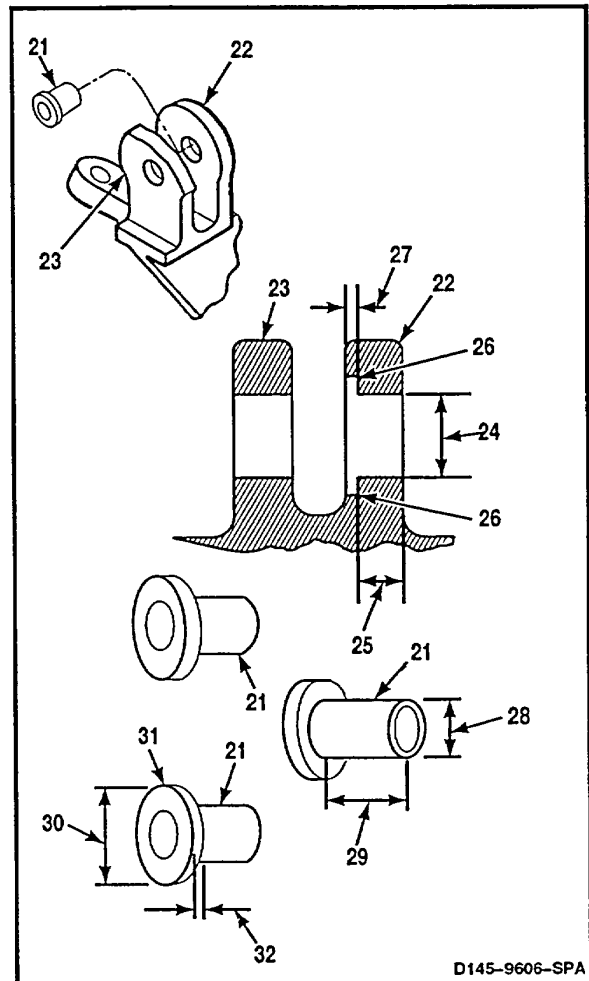
INSPECT

FOLLOW-ON MAINTENANCE:

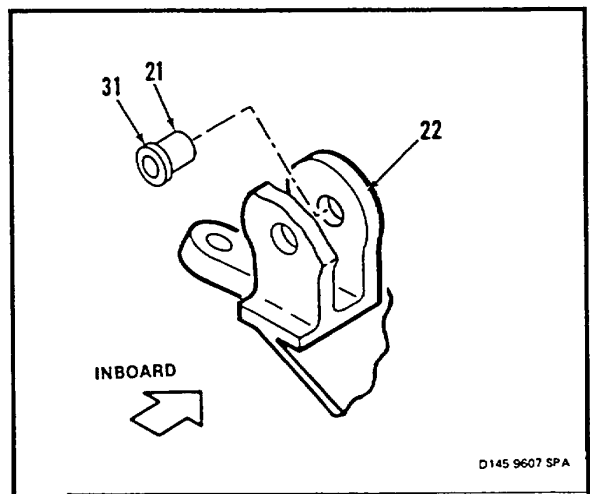
None

END OF TASK

4-130 Change 19



D145-9606-SPA



D145 9607 SPA

4-43 INSTALL CONNECTING LINK (DRAG STRUT)

4-43

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
- Torque Wrench, 30 to 150 Inch-Pounds
- Torque Wrench, 100 to 750 Inch-Pounds

Materials:

None

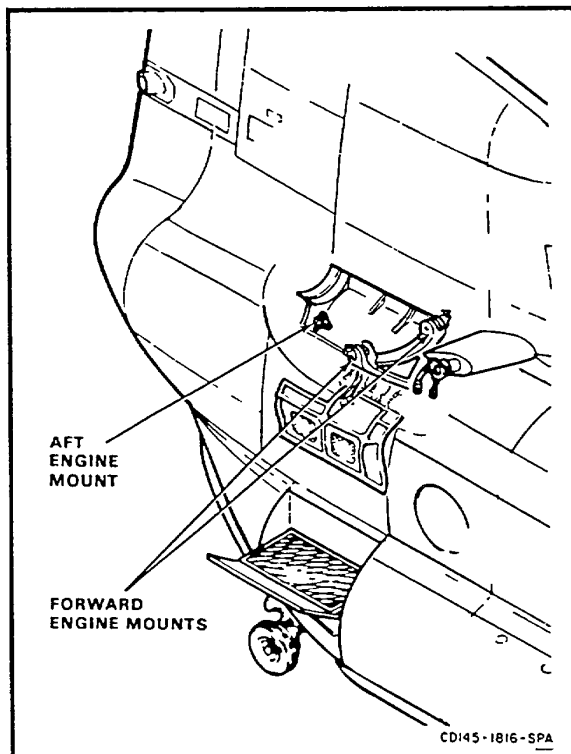
Personnel Required:

- Medium Helicopter Repairer
- Inspector

References:

TM 55-1520-240-23P

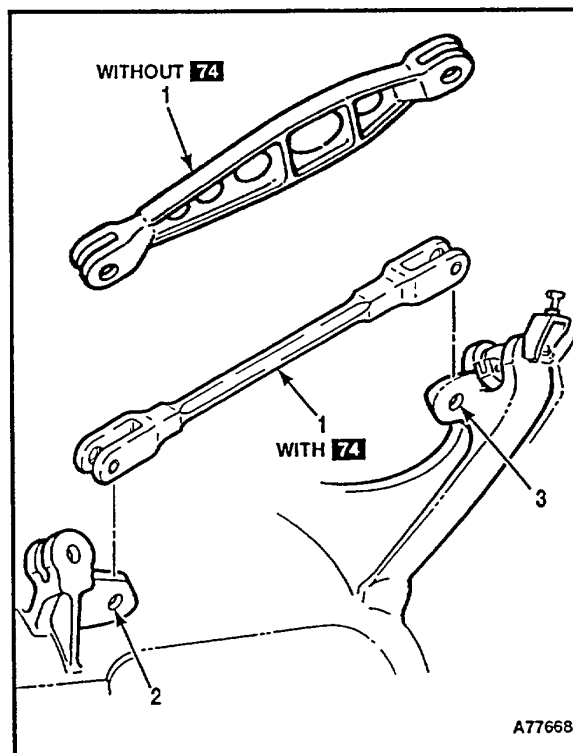
]



NOTE

Procedure can be used to install link (drag strut) on No. 1 engine or No. 2 engine. Link on No. 2 engine is shown here.

1. Position link (1) with the slotted bushing forward between aft engine mount fitting (2) and forward engine mount fitting (3) as shown.
2. Align holes in fitting (2 and 3) with link (1).

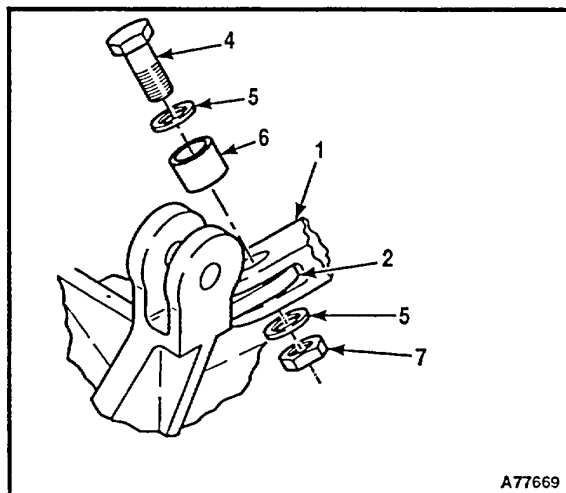


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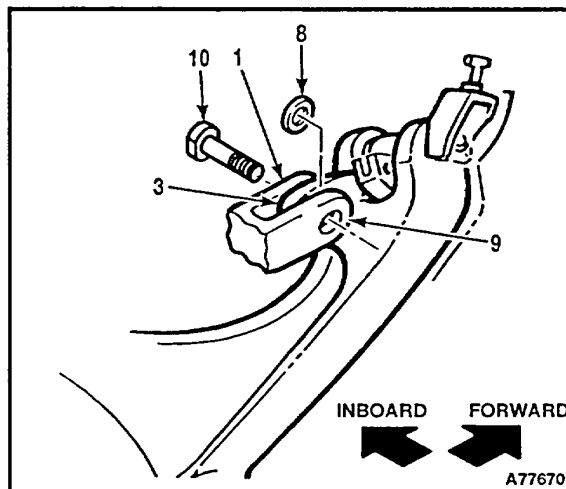
Change 19 4-131

4-43 INSTALL CONNECTING LINK (DRAG STRUT) (Continued)

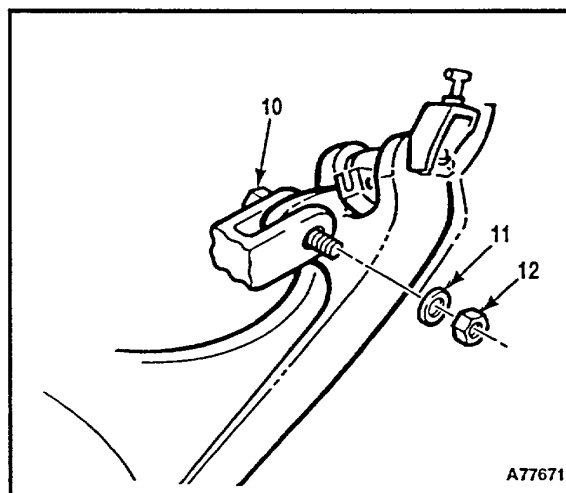
3. Install bolt (4) through washer (5) and bushing (6), through link (1) and fitting (2).
4. Install washer (5) and nut (7) on bolt (4).



5. Position washer (8) between forward engine mount fitting (3) and outboard lug (9) of link (1) as shown.
6. Align holes in fitting (3), washer (8), and link (1).
7. Install bolt (10) through link (1), fitting (3), and washer (8). Align flats on bolt (10) head with flats on link (1).



8. Install washer (11) and nut (12) on bolt (10).



4-43 INSTALL CONNECTING LINK (DRAG STRUT) (Continued)

4-43

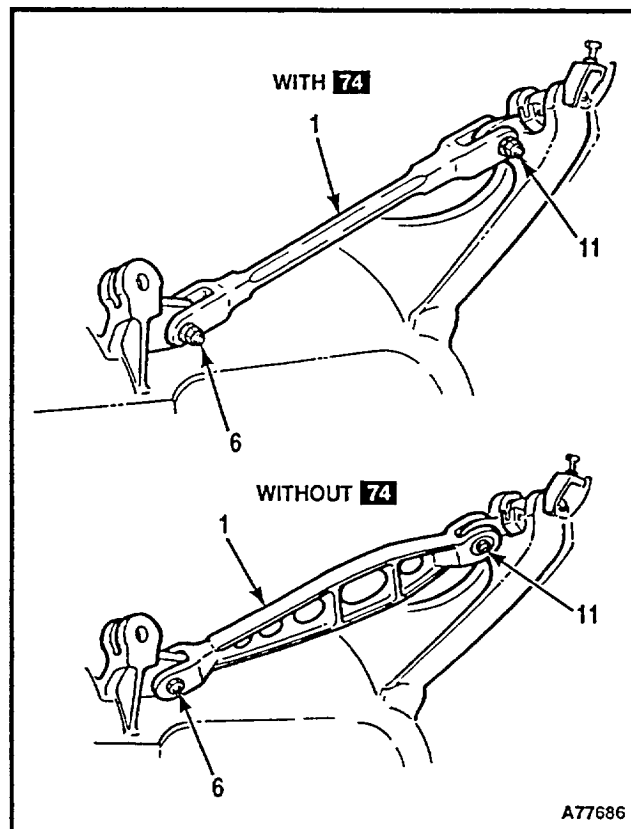
9. Torque nut (6) on aft end of link (1) to 350 inch-pounds.

NOTE

Ensure flats on bolt (10) head remain aligned with flats on link (1) while torquing nut (11).

10. Torque nut (11) on forward end of link (1) to 105 inch-pounds.

INSPECT



A77686

FOLLOW-ON MAINTENANCE:

Install powerplant (Task 4-13).

END OF TASK

Change 19 4-133

4-44 ADJUST ENGINE FIREWALL AND ENGINE COVER FORMER

4-44

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

None

Personnel Required:

Medium Helicopter Repairer
Inspector

Equipment Condition:

Battery Disconnected
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)
Exhaust Cone Removed (Task 4-88)

NOTE

Procedure is same to adjust engine firewall and engine cover former on No. 1 or No. 2 engine. Adjustment of No. 1 engine firewall and cover former is shown here.

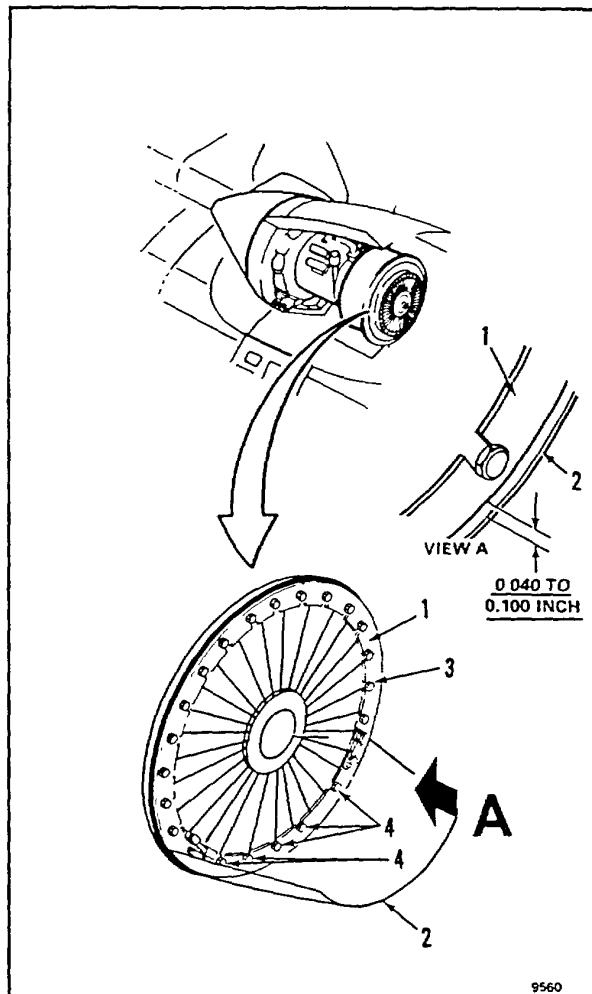
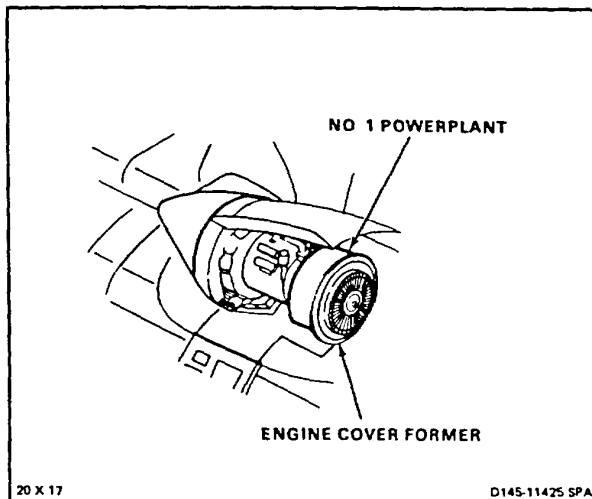
1. Measure seal compression between airframe former (1) and engine former seal (2) If seal appears to be compressed 0.040 to 0.100 inch, go to FOLLOW-ON MAINTENANCE If not, go to step 2.
2. Loosen 20 bolts (3) and five screws (4).
3. Adjust airframe former (1) to compress the seal (2) 0.040 to 0.100 inch.
4. Tighten 20 bolts (3) and five screws (4).

INSPECT

FOLLOW-ON MAINTENANCE:

Install exhaust cone (Task 4-90).
Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).

END OF TASK
4-134 Change 12



4-45 REMOVE ENGINE COVER FORMER**4-45**

INITIAL SETUP

Applicable Configurations:

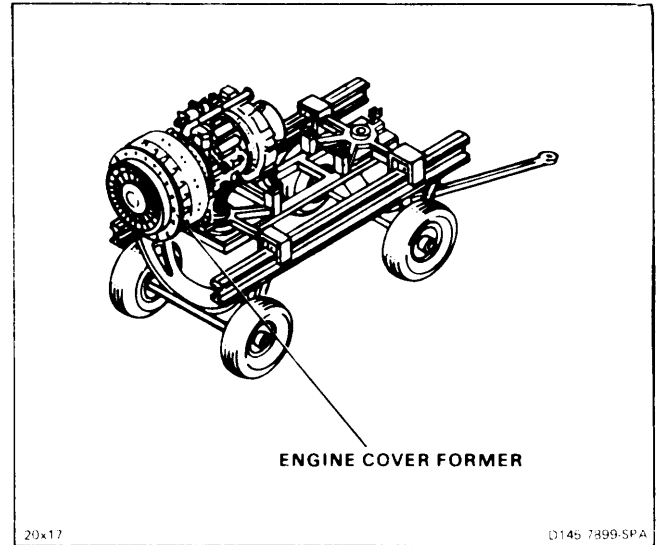
All

Tools:Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944**Materials:**

None

Personnel Required:

■ Aircraft Powerplant Repairer

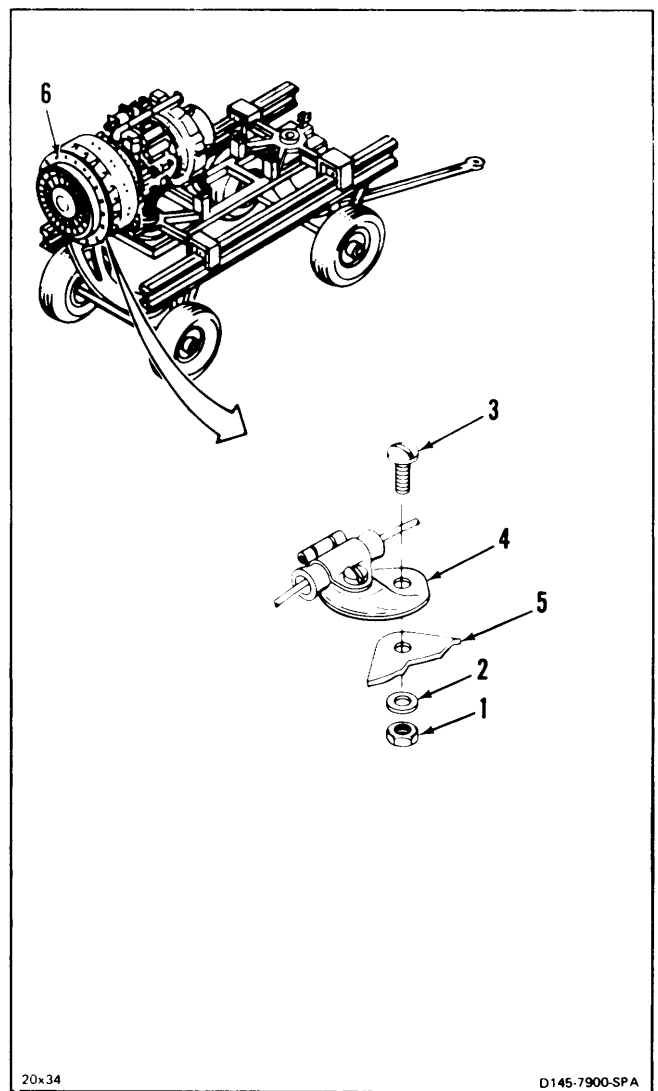
Equipment Condition:Off Helicopter Task
Engine Access Cover Open (Task 4-49)
Engine Exhaust Cone Removed (Task 4-88)**CAUTION**

Do not pinch, crush, kink, or make sharp bends in element. Element can be damaged.

NOTE

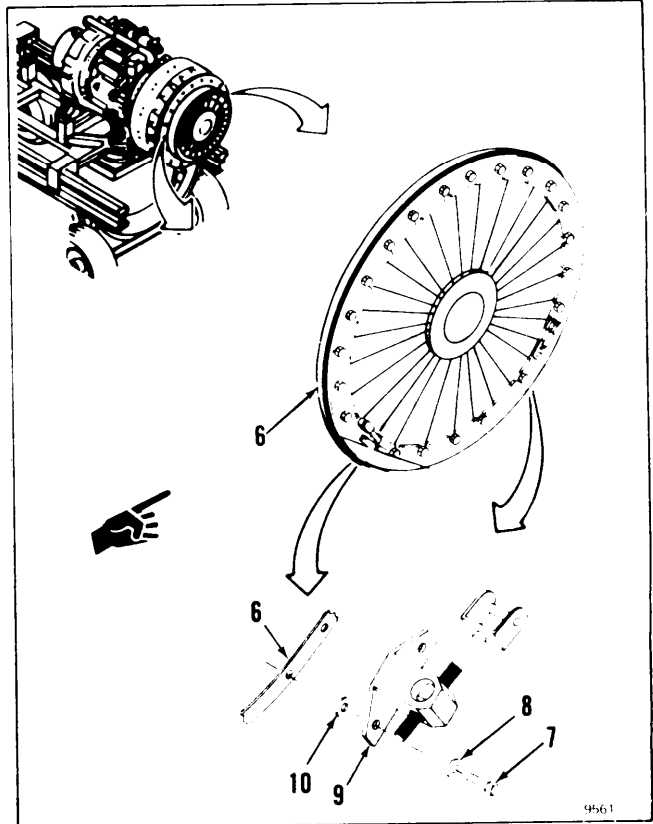
- Procedure is same to remove engine cover former on No. 1 or No. 2 powerplant. Removal of No. 1 former is shown here.
- Engine access cover omitted for clarity,

1. Remove nut (1), washer (2), and screw (3) at 10 locations. Release 10 fire detection element clamps (4) from 10 clips (5). **Move element away from former (6).**

**GO TO NEXT PAGE**

4-45 REMOVE ENGINE COVER FORMER (Continued)

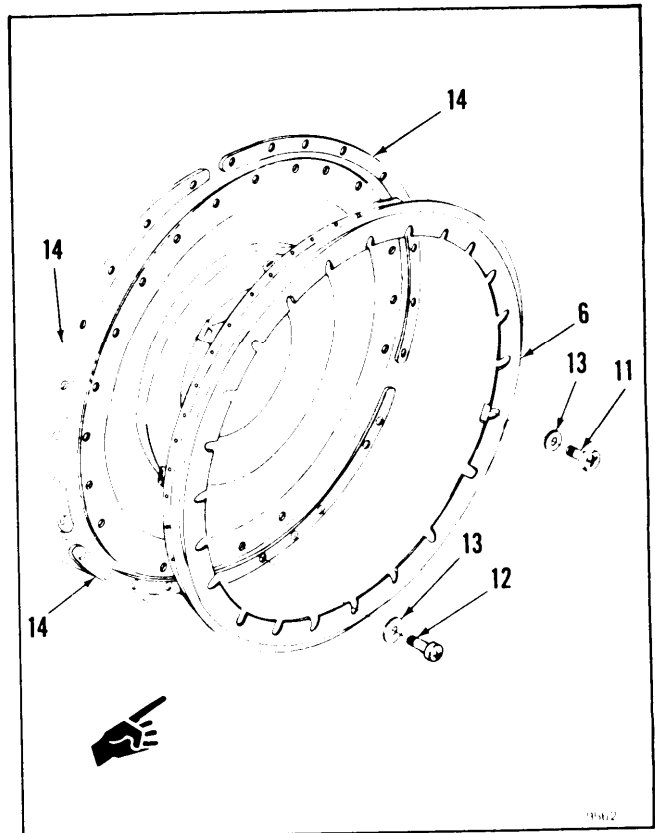
2. Remove four bolts (7) and washers (8) from bracket (9) and former (6). **Remove bracket and two washers (10).**



3. Remove 16 bolts (11), 5 screws (12) and 21 washers (13) from former (6).
4. Remove former (6) and retaining rings (14).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-46 INSTALL ENGINE COVER FORMER

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

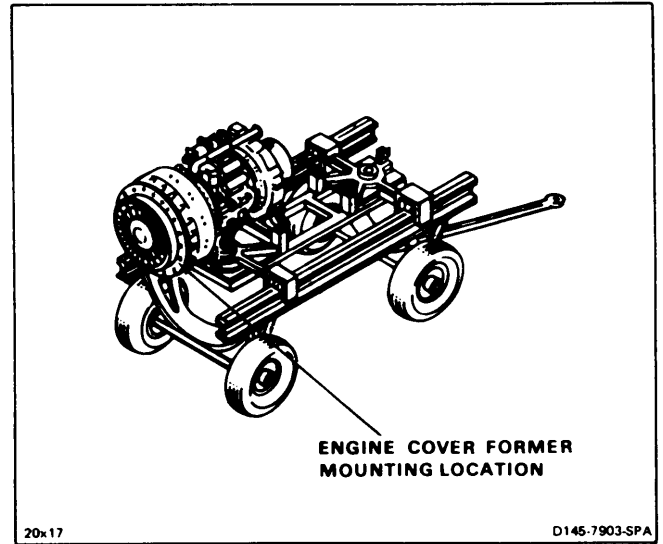
None

Personnel Required:

Aircraft Powerplant Repairer
Inspector

References:

TM 55-1520-240-23P



CAUTION

Do not pinch, crush, kink, or make sharp bends in element. Element can be damaged.

NOTE

Procedure is same to Install engine cover former on No. 1 or No. 2 powerplant. Installation of No. 1 former is shown here.

1. Position former (1) and retaining rings (2 and 3) on powerplant (4) so that bolt holes in former, rings and powerplant align. Install 16 bolts (5), 2 washers (6), and 14 washers (7) in top of former (1).

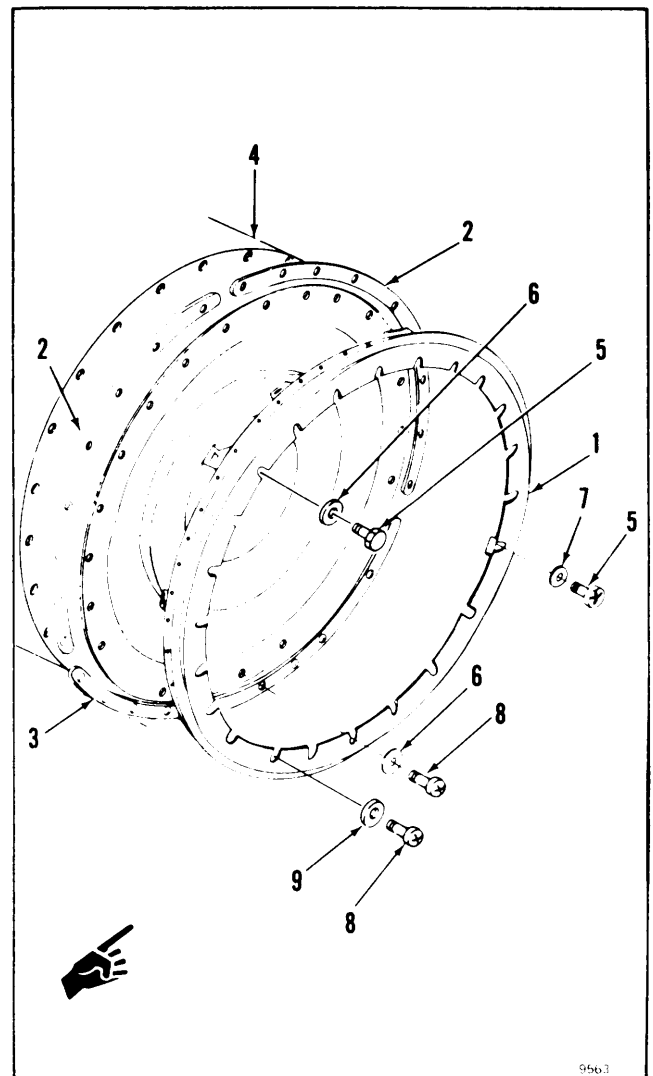
NOTE

Do not tighten bolts at this time

2. Install 5 screws (8), washer (6) and 4 washers (9) in bottom of former (1).

NOTE

Do not tighten bolts at this time

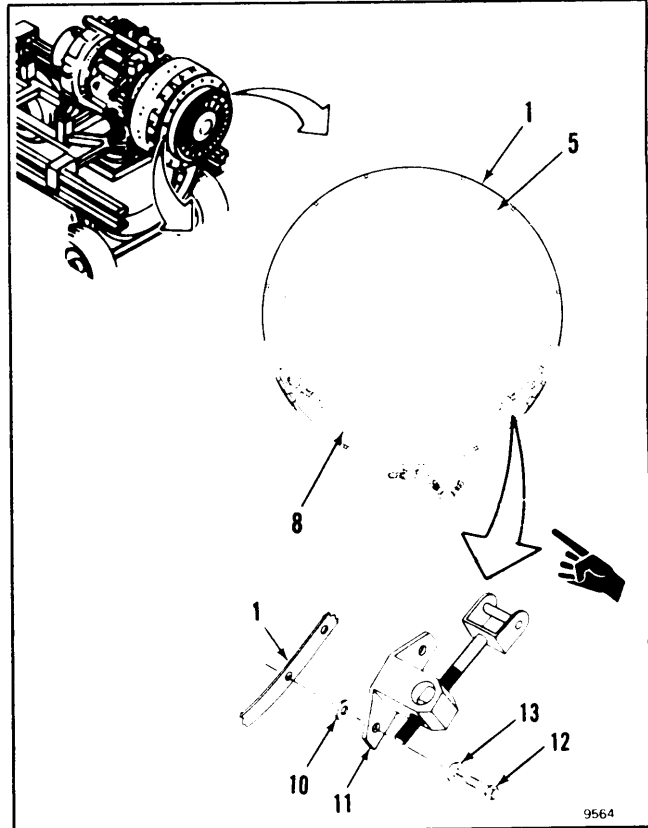


GO TO NEXT PAGE

NOTE

R/H bracket shown, L/H bracket opposite.

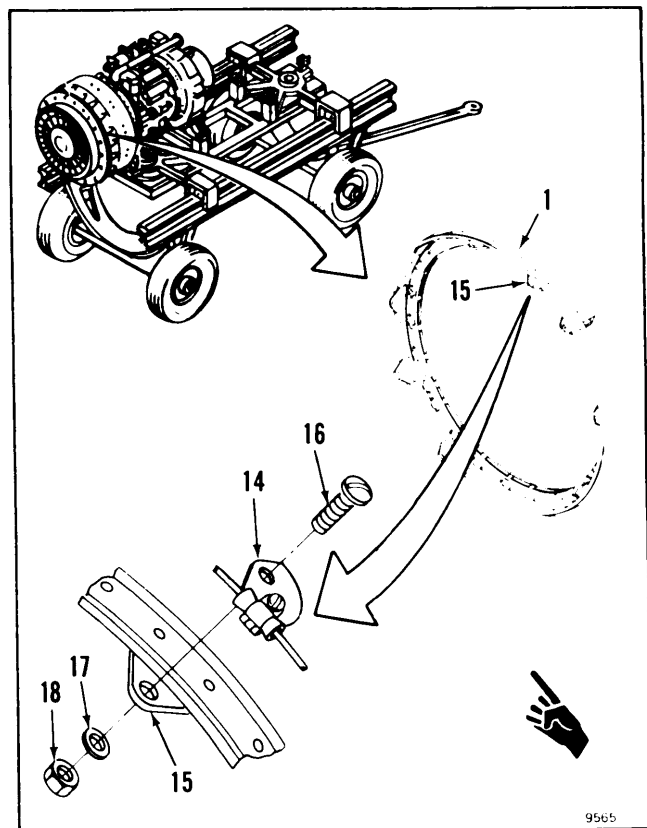
- 3 Position four washers (10) and two brackets (11) on former (1). Install four bolts (12) and washers (13).
- 4 Tighten 16 bolts (5) and five screws (8).



5. Position 10 fire detection element clamps (14) on 10 clips (15) on former (1). Install 10 screws (16), washers (17), and nuts (18).

FOLLOW-ON MAINTENANCE:

- Install exhaust cone (Task 4-90).
- Install powerplant (Task 4-13).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

4-47 REMOVE ENGINE MAIN ELECTRICAL CABLE ASSEMBLY

4-47

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

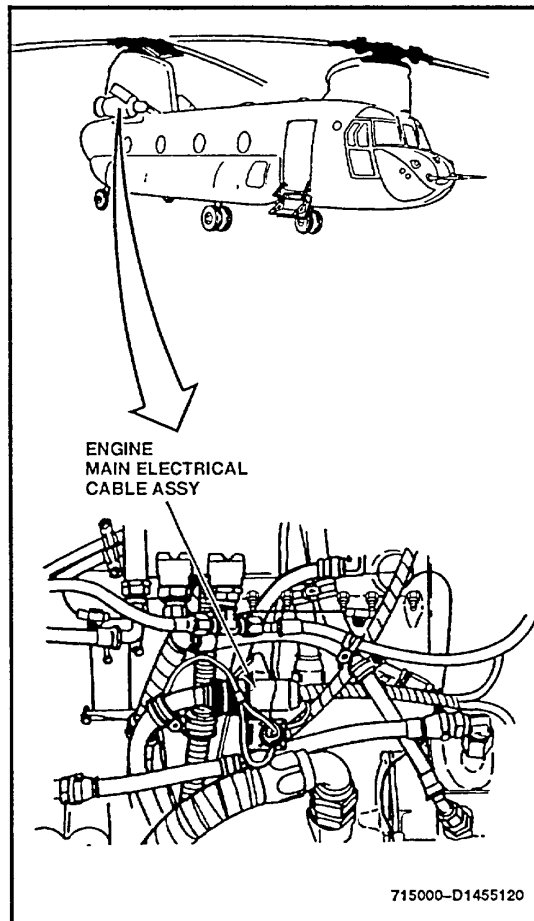
Aircraft Powerplant Repairer (2)

References:

TM 55-2840-254-23 (Without **74**)
TM 1-2840-265-23 (With **74**)

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)



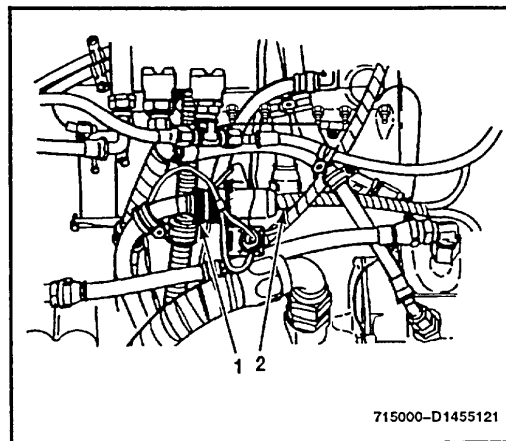
NOTE

Procedure is same to remove main electrical cable assembly on No. 1 or No. 2 engine. No. 2 engine is shown here.

1. **Disconnect connector (1)** from cable assembly (2)
2. **Remove cable assembly (2)** (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**)

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-48 INSTALL ENGINE MAIN ELECTRICAL CABLE ASSEMBLY

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

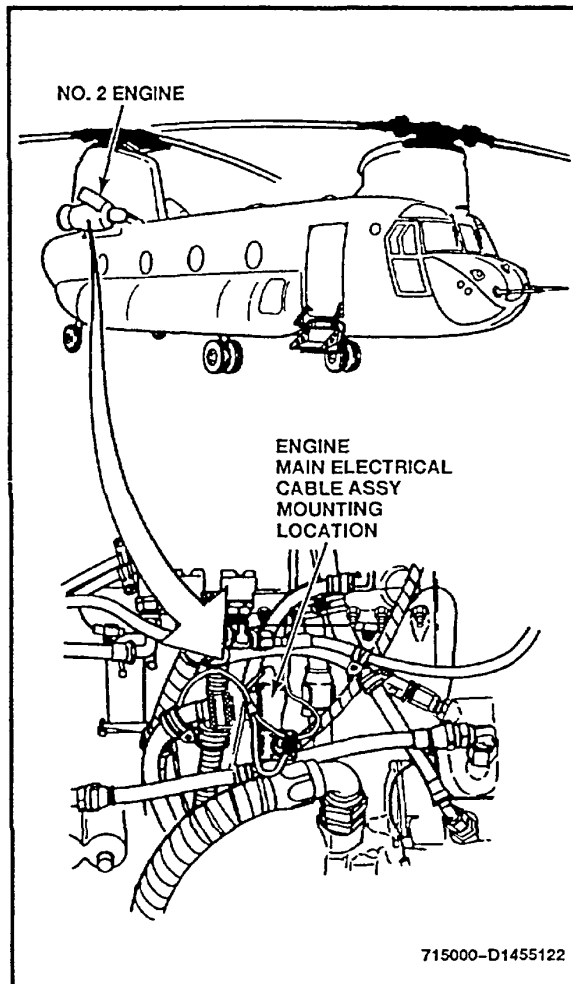
None

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

- TM 55-2840-254-23 (Without **74**)
- TM 55-2840-254-23P (Without **74**)
- TM 1-2840-265-23 (With **74**)
- TM 1-2840-265-23P (With **74**)



NOTE

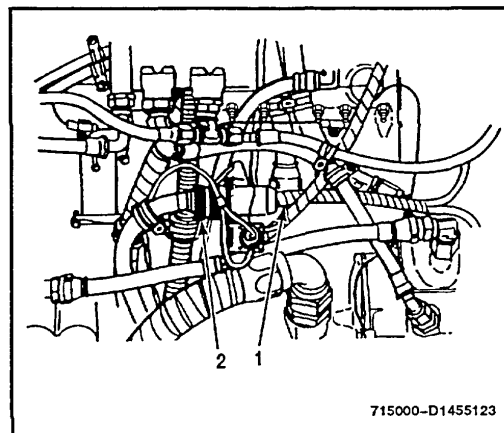
Procedure is same to install main electrical cable assembly on No. 1 or No. 2 engine. No. 2 engine is shown here.

1. **Install cable assembly (1)** (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
2. **Connect connector (2)** to cable assembly (1).

INSPECT

FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

4-140 Change 19

SECTION III
COOLING SYSTEM

4-49 OPEN ENGINE ACCESS COVER

4-49

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

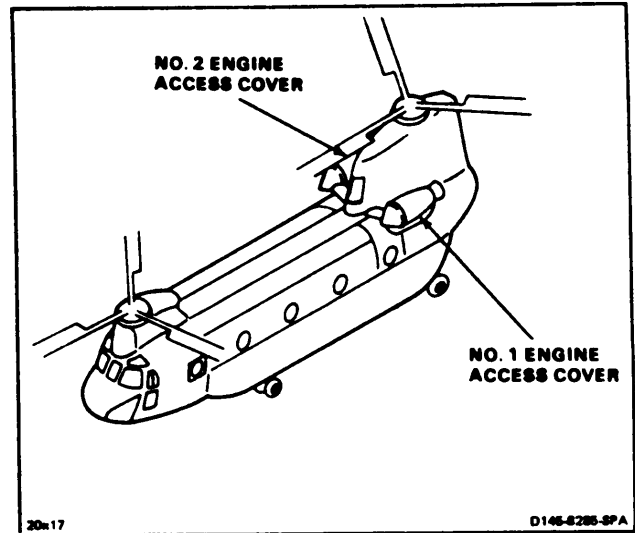
None

Personnel Required:

67U10 Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)

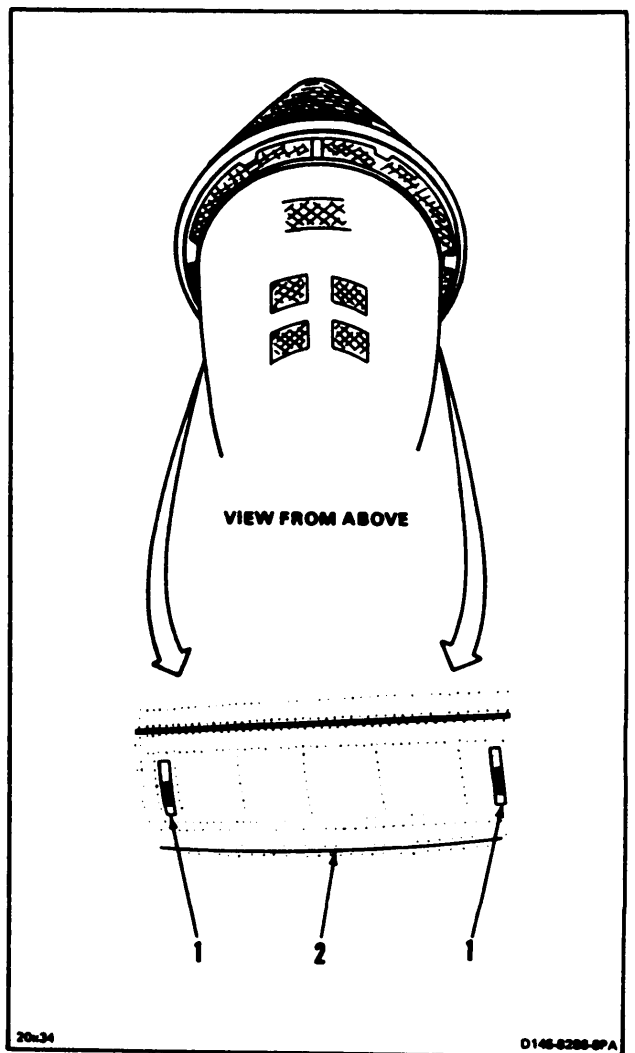


NOTE

Procedure is same to open engine access cover on No. 1 and No. 2 engine. Opening of No. 1 engine cover is shown.

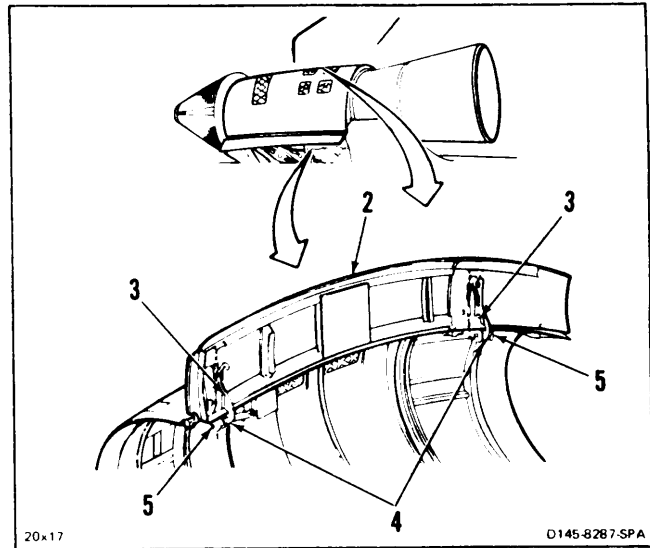
OPEN SIDE ACCESS DOORS

1. Disengage four latches (1) on two side access doors (2).



GO TO NEXT PAGE

2. Raise side access doors (2). Align holes in hinges (3) and fittings (4) and install pins (5).

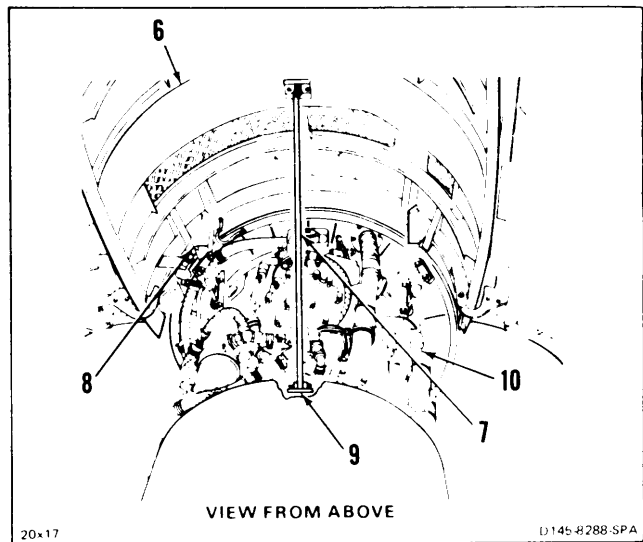


CAUTION

Make sure side access doors are pinned open before raising upper access cover. Raising upper cover with side doors down can damage engine components.

OPEN UPPER ACCESS COVER

3. Raise upper cover (6). Disengage support strut (7) from fitting (8).
4. Position strut (7) over fitting (9) in power-plant (10). Lower cover (6) enough to install strut in fitting.

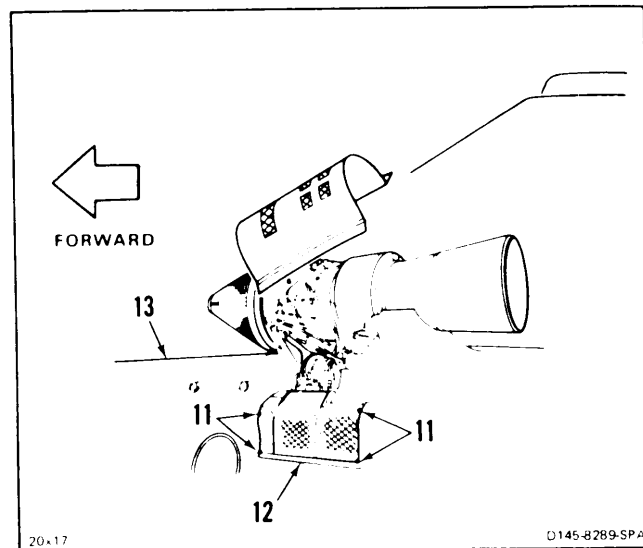


OPEN LOWER ACCESS DOOR

5. Release four fasteners (11) on lower access door (12). Lower door to fuselage (13).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-49.1 REMOVE ENGINE COVER SUPPORT STRUT**4-49.1****INITIAL SETUP****Applicable Configurations:**

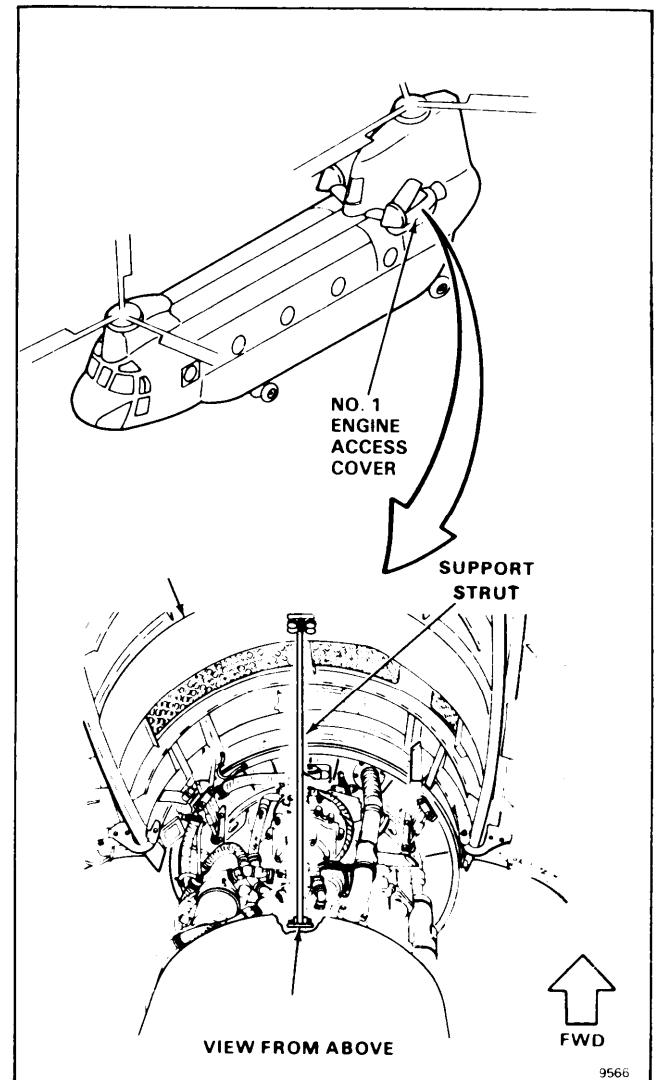
All

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

None

Personnel Required:

Medium Helicopter Repairer (2)

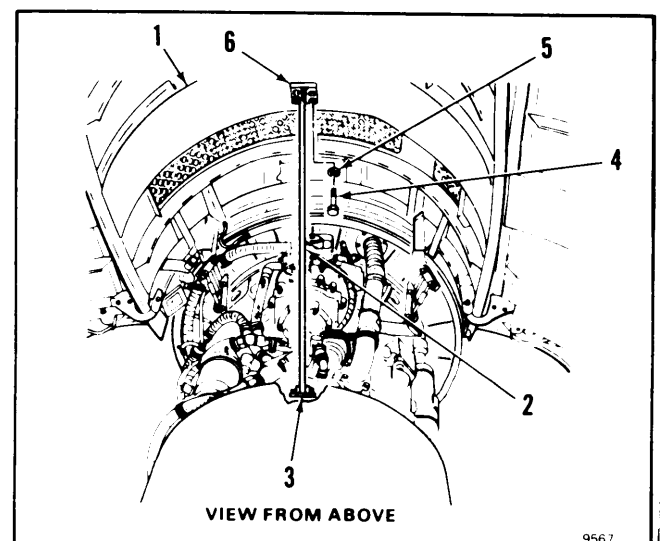
Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)**NOTE**

Procedure is same to remove support strut on No. 1 and No. 2 engine. Removal of No. 1 support strut is shown here.

1. Have helper **support upper cover (1)**.
2. **Disengage support strut (2)** from power-plant fitting (3).
3. **Remove four screws (4) and washers (5)** from bracket (6). **Remove strut (2)**.

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

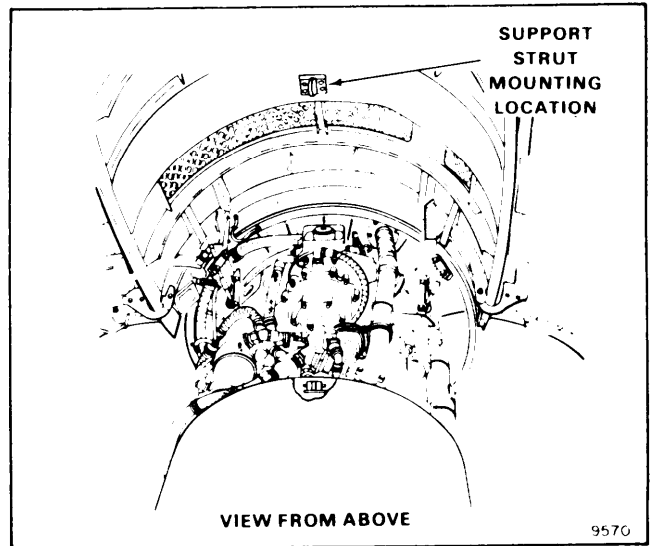
All:

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

None

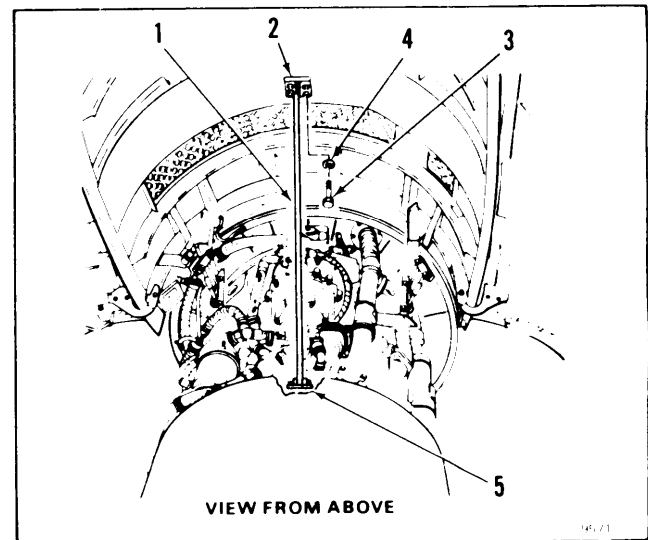
Personnel Required:Medium Helicopter Repairer (2)
Inspector**References:**

TM 55-1520-240-23P

**NOTE**

Procedure is same to install support strut on No. 1 and No. 2 engine. installation of No. 1 support strut is shown here.

1. Position strut (1) on bracket (2). **Install four screws (3) and washers (4)** in bracket.
2. **Engage strut (1)** In powerplant fitting (5).

**FOLLOW-ON MAINTENANCE:**

Close engine cover (Task 4-50).

END OF TASK

4-50 CLOSE ENGINE ACCESS COVER

INITIAL SETUP

Applicable Configurations:

All

Tools:

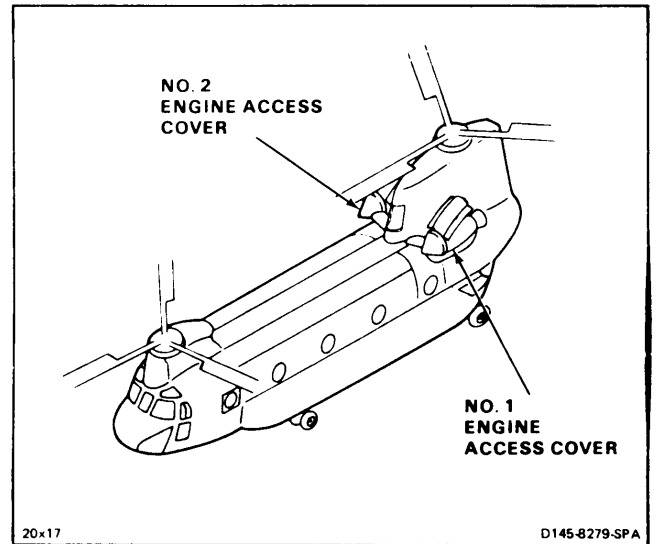
Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692

Materials:

None

Personnel Required:

Medium Helicopter Repairer

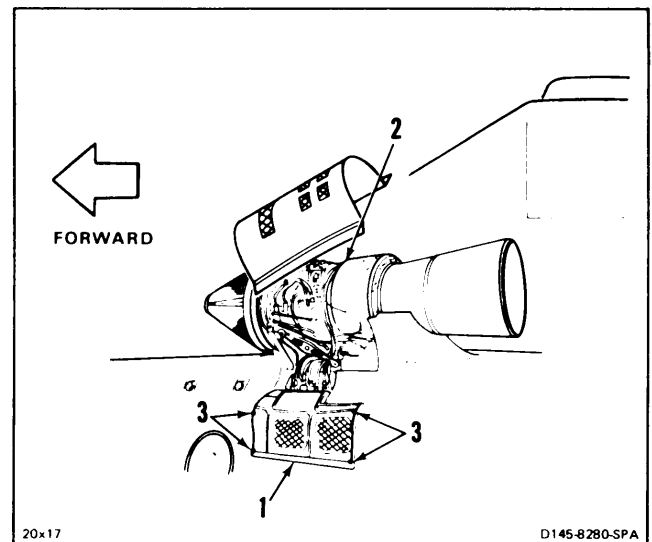


NOTE

Procedure is same to close engine access cover on No. 1 and No. 2 engine. Closing of No. 1 engine cover is shown.

CLOSE LOWER ACCESS DOOR

1. Raise lower access door (1) to powerplant (2) and secure in position with four fasteners (3).

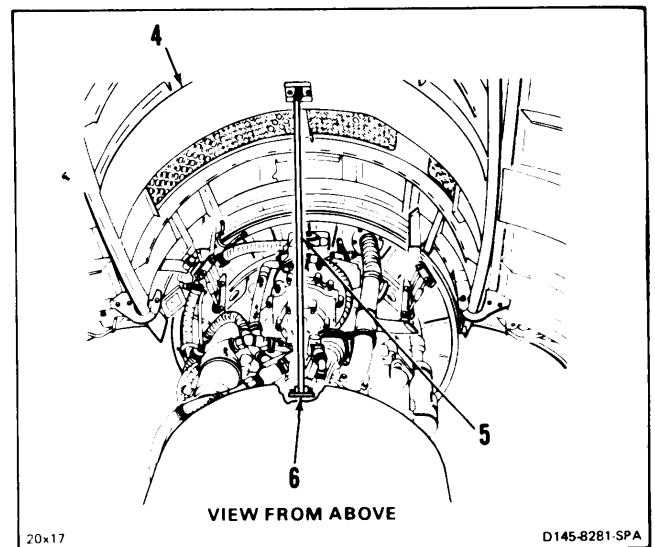


CLOSE UPPER ACCESS COVER

CAUTION

Make sure side access doors are pinned open before lowering upper access cover. Lowering upper cover with side doors down can damage engine components.

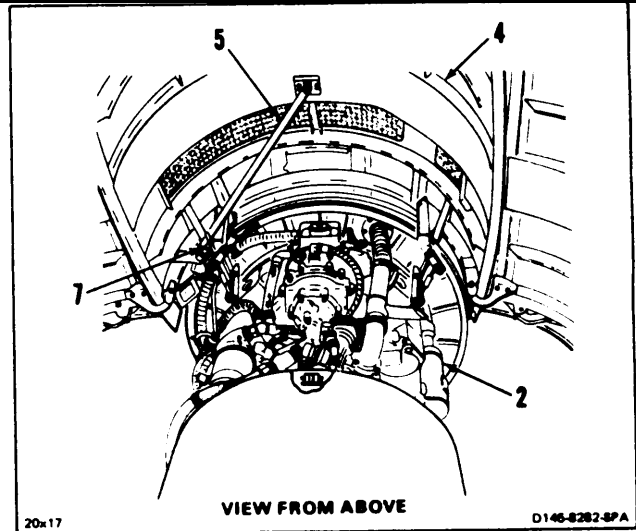
2. Support upper access cover (4) and disengage support strut (5) from powerplant fitting (6).



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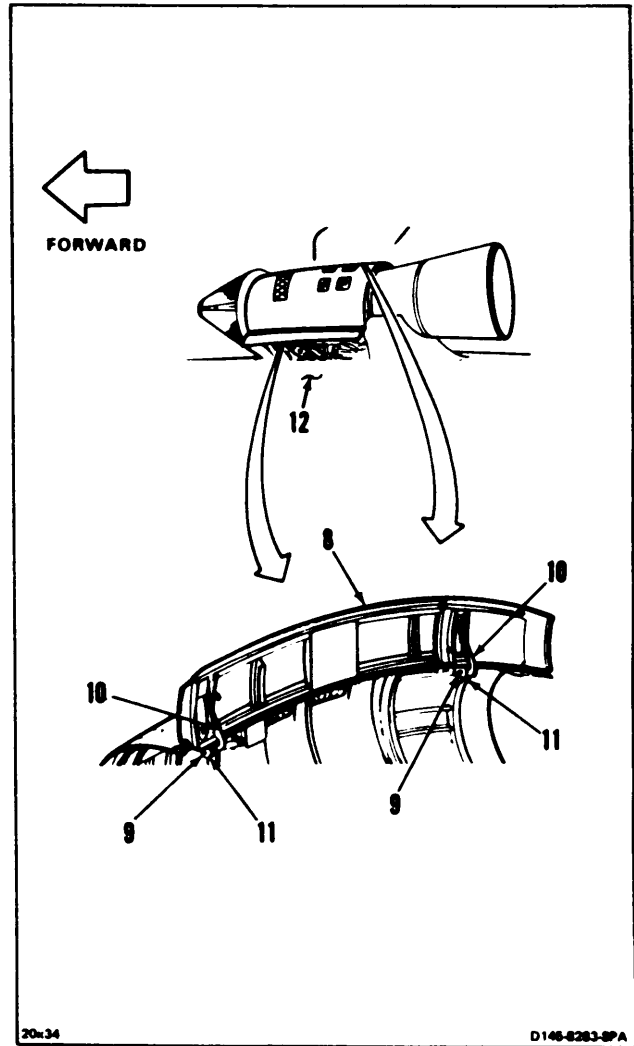
4-50 CLOSE ENGINE ACCESS COVER (Continued)

3. Install strut (5) in fitting (7) on cover (4).
Lower cover to powerplant (2).



CLOSE SIDE ACCESS DOORS

4. Support two side access doors (8) and remove pins (9) from hinges (10) and fittings (11). Lower door to fuselage (12).



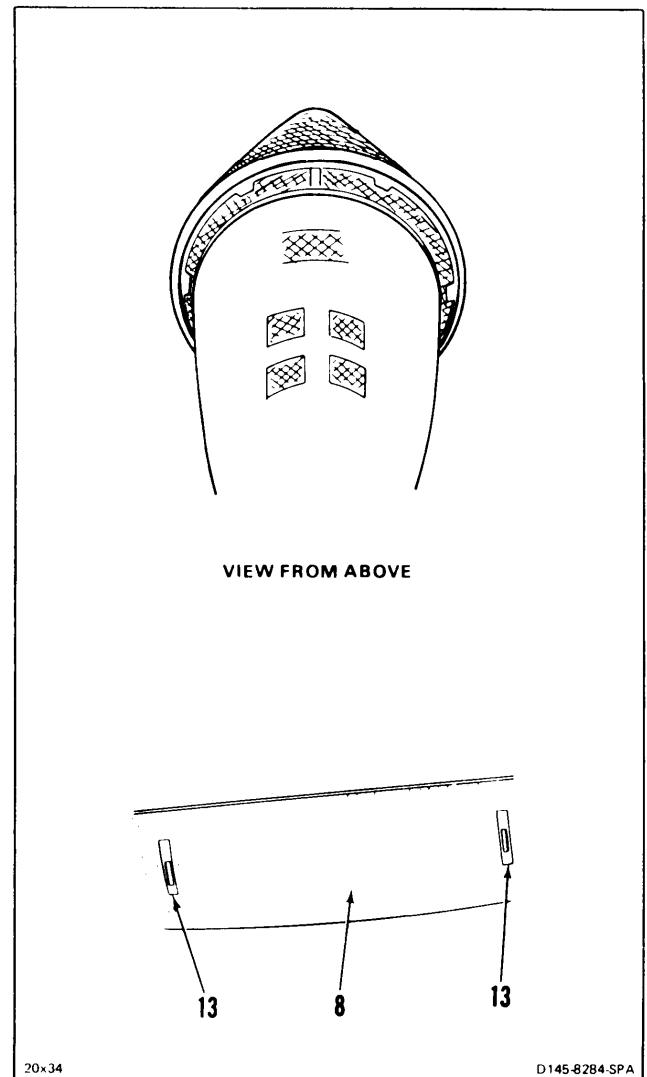
GO TO NEXT PAGE

4-50 CLOSE ENGINE ACCESS COVER (Continued)**4-50**

5. **Secure four latches (13)** on two side access doors (8).

FOLLOW-ON MAINTENANCE:

Close engine work platform (Task 2-2).

**END OF TASK**

4-51 ADJUST ENGINE ACCESS COVER

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

None

Personnel Required:

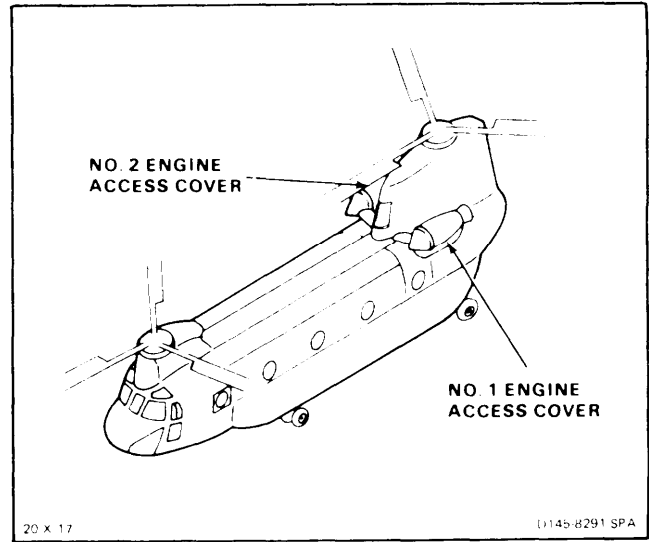
67U10 Medium Helicopter Repairer

References:

Task 4-49

Equipment Condition:

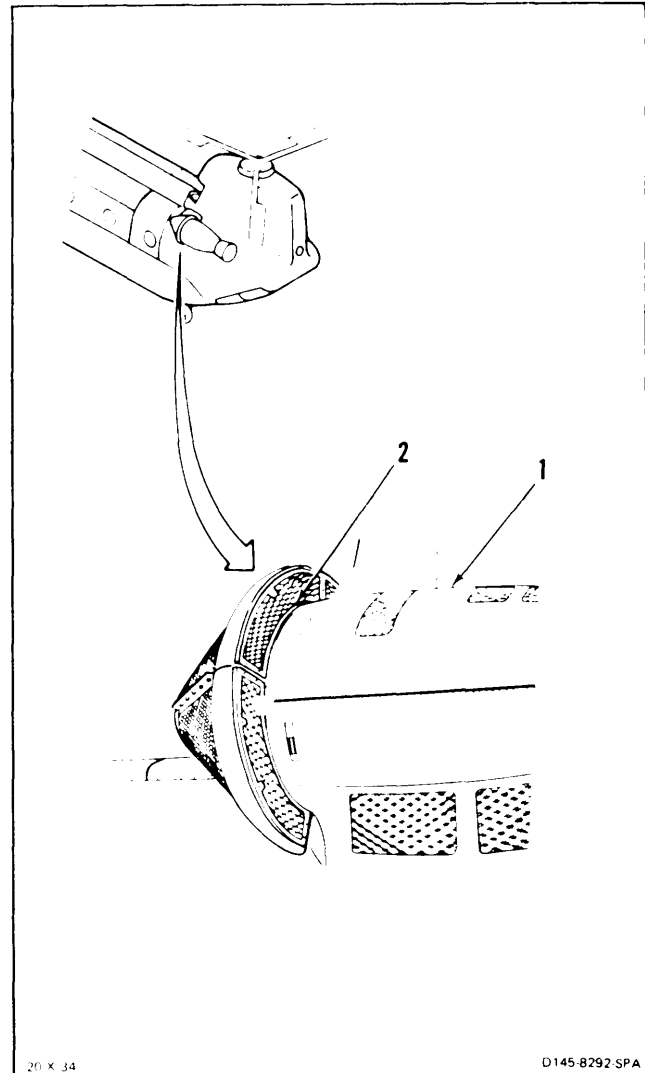
Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)



NOTE

Procedure is same to adjust No. 1 or No. 2 engine access cover. Adjustment on No. 1 engine cover is shown.

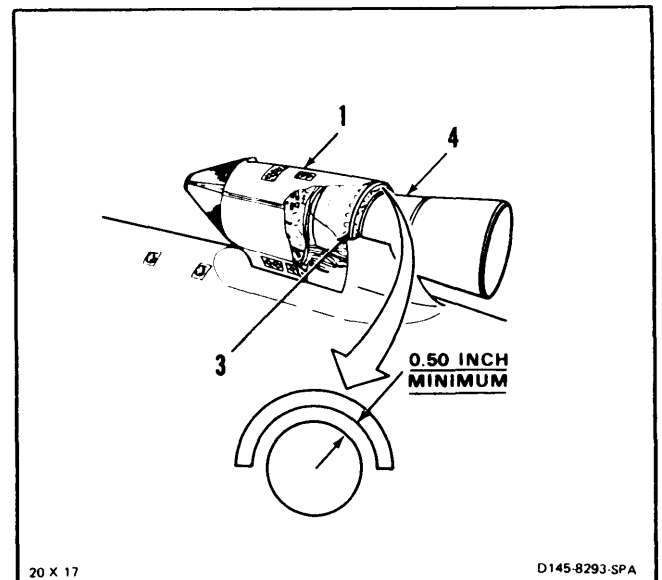
- 1 Check fit of engine access cover (1) and engine air inlet fairing (2). Make sure cover fits flush on fairing.



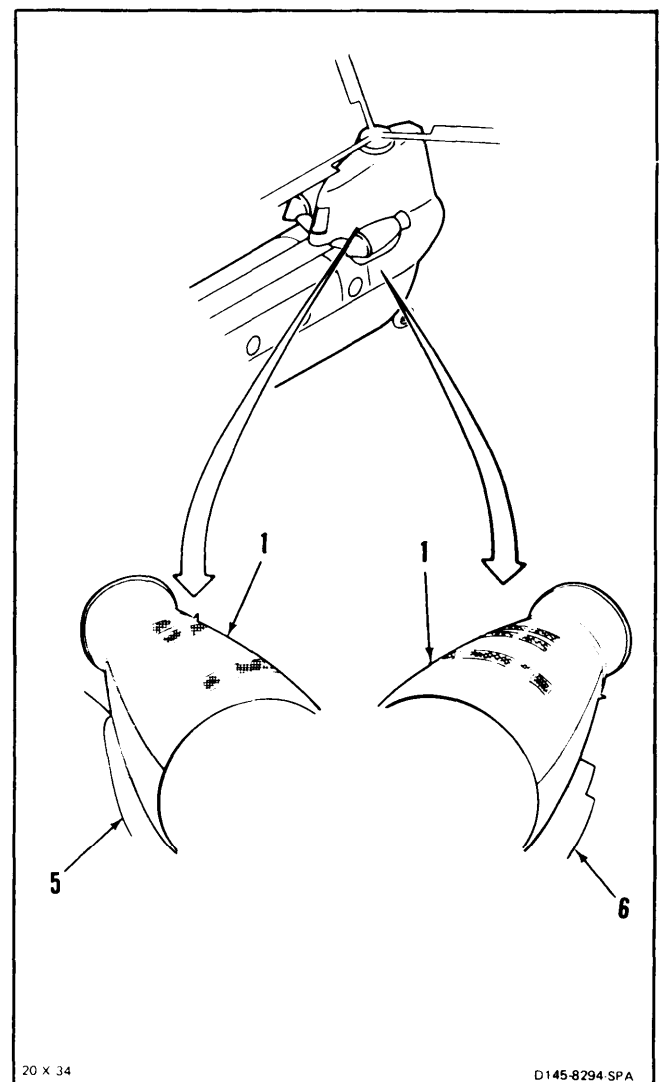
GO TO NEXT PAGE

4-51 ADJUST ENGINE ACCESS COVER (Continued)**4-51**

2. Make sure cover (1) sits firmly on engine cover former (3).
3. Check gap between aft end of cover (1) and exhaust cone (4). An uneven gap is allowed. Minimum gap shall be 0.50 inch.



4. Make sure gap between cover (1) and fairing (5) is equal to gap between cover and lower access door (6). If gaps are not equal, perform step 5. If gaps are equal, go to follow-on maintenance.

**GO TO NEXT PAGE**

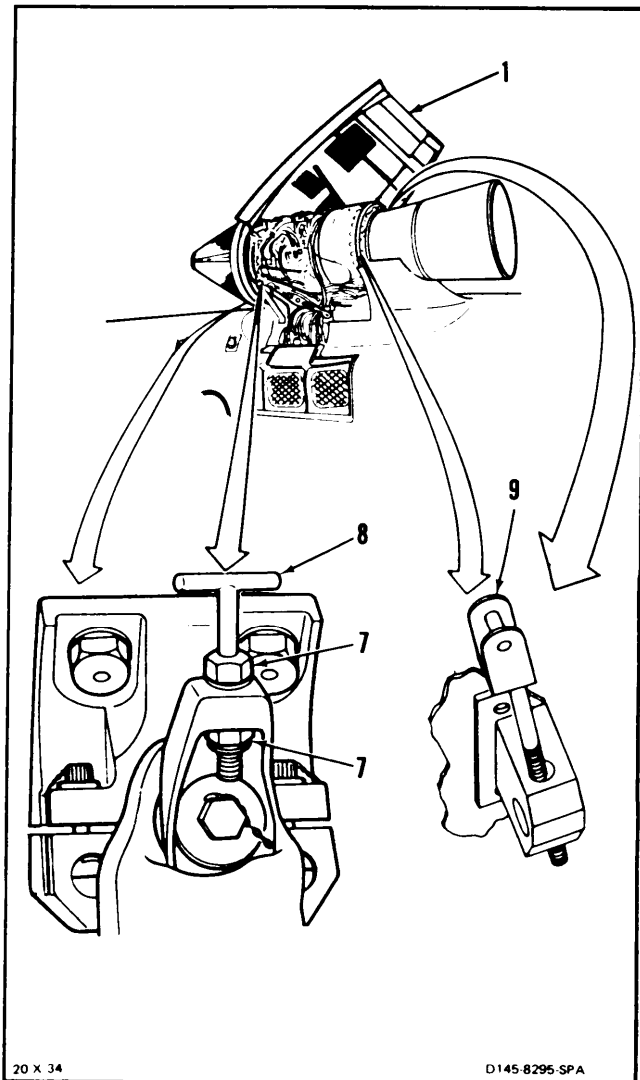
4-51 ADJUST ENGINE ACCESS COVER (Continued)**4-51****CAUTION**

When adjusting cover, do not overtighten latches. Damage to cover can result.

5. **Adjust engine cover (1)** as follows:
 - a. Open engine cover (1) (Task 4-49).
 - b. Loosen two nuts (7) on forward latch brackets (8).
 - c. Turn brackets (8 and 9) counterclockwise to loosen cover (1). Turn brackets clockwise to tighten cover.
 - d. Tighten two nuts (7) on forward latch brackets (8).

FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

**END OF TASK**

4-52 REMOVE ENGINE ACCESS COVER**4-52**

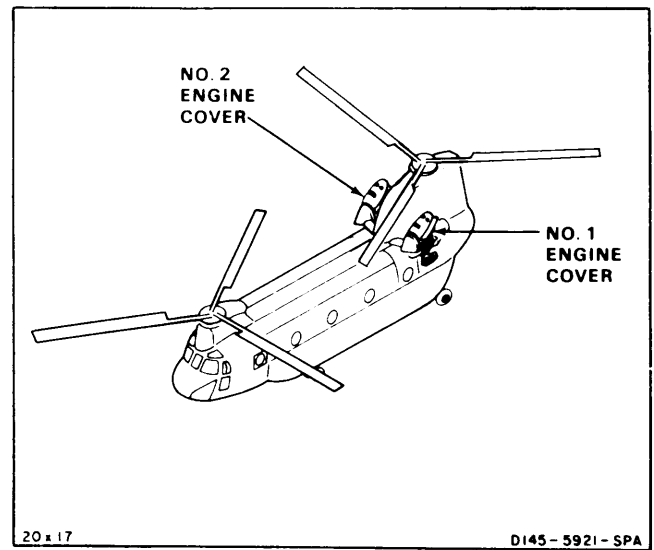
INITIAL SETUP

Applicable Configurations:

All

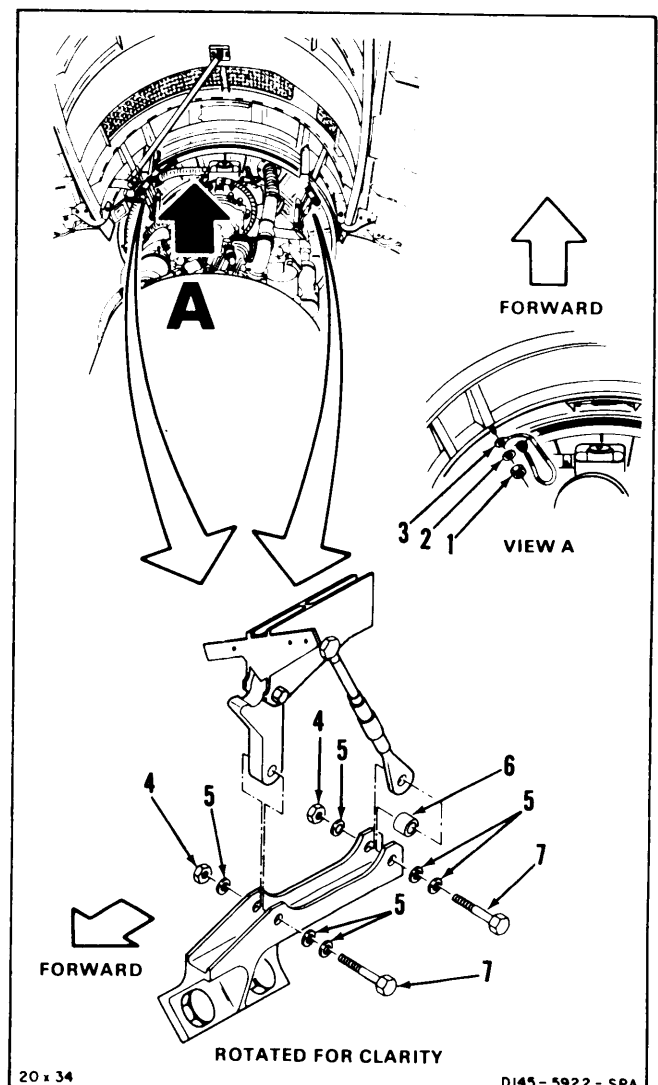
Tools:Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692**Materials:**

None

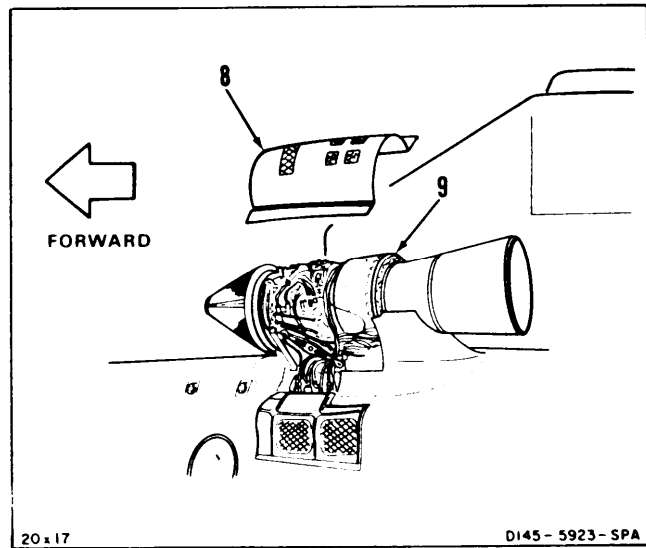
Personnel Required:67U10 Medium Helicopter Repairer
67U20 Medium Helicopter Repairer**Equipment Condition:**Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)**NOTE**

Procedure is same to remove engine access cover from No. 1 or No. 2 engine.

1. Remove nut (1), and washer (2). **Disconnect bonding jumper (3).**
2. **Remove** four nuts (4), twelve washers (5), two spacers (6), and four **bolts (7).**

**GO TO NEXT PAGE**

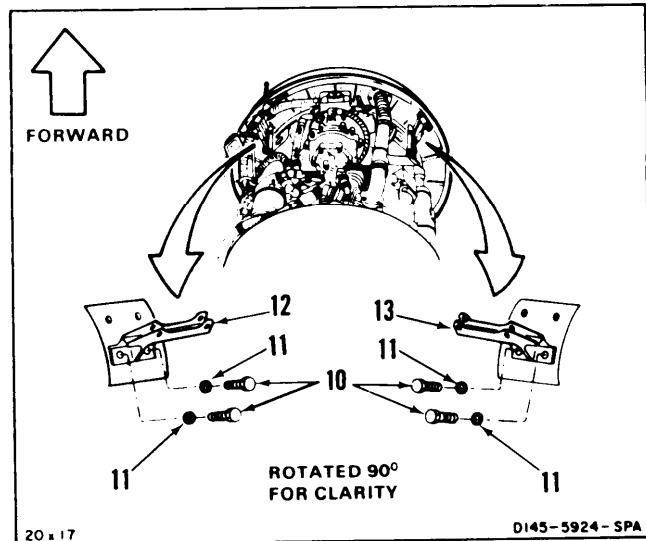
3. Lift and remove cover (8) from engine (9)



4. Remove lockwire from four bolts (10).
 Remove four bolts and washers (11).
 Remove two hinge fittings (12 and 13).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-53 DISASSEMBLE ENGINE ACCESS COVER

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

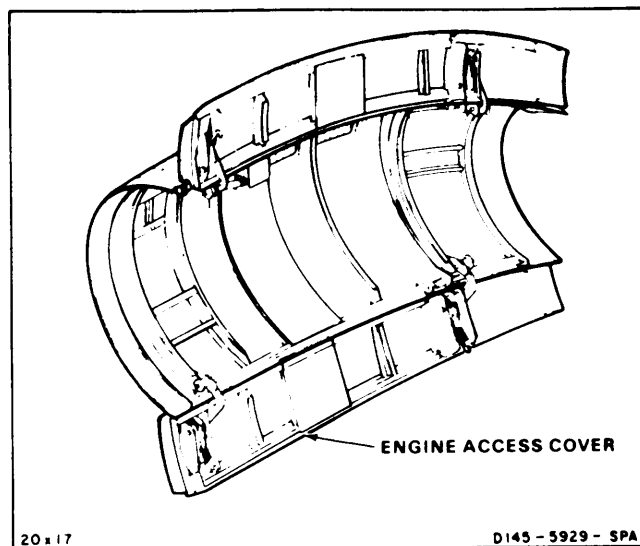
None

Personnel Required:

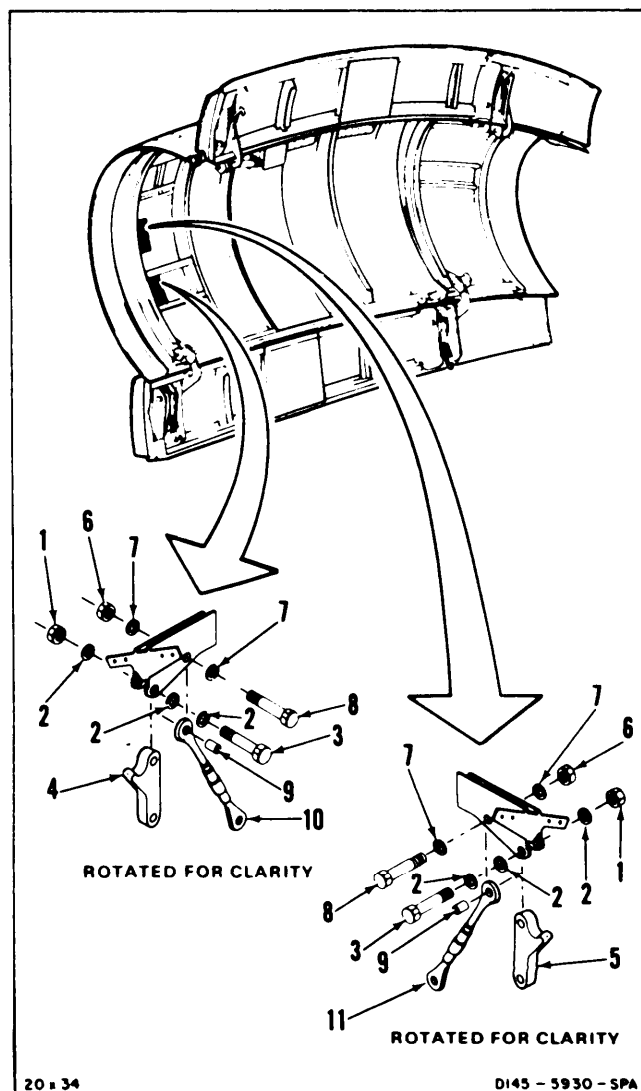
67U10 Medium Helicopter Repairer

Equipment Condition:

Off Helicopter Task



1. Remove two nuts (1), six washers (2), and two bolts (3). Remove two hinge links (4 and 5).
2. Remove two nuts (6), four washers (7), two bolts (8), and two spacers (9). Remove two turnbuckles (10 and 11).

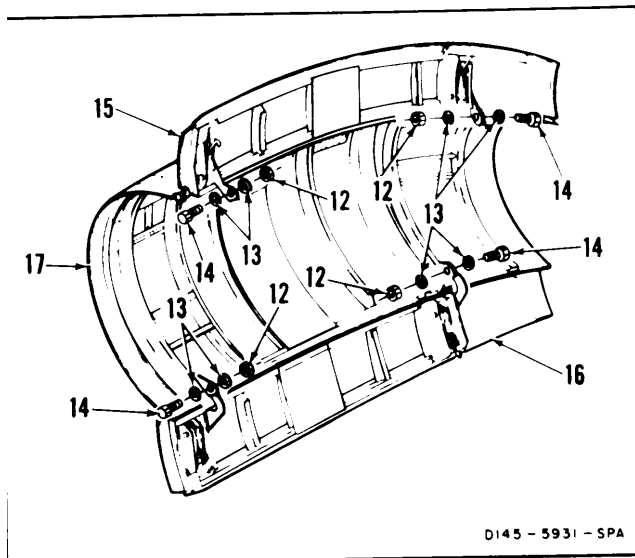


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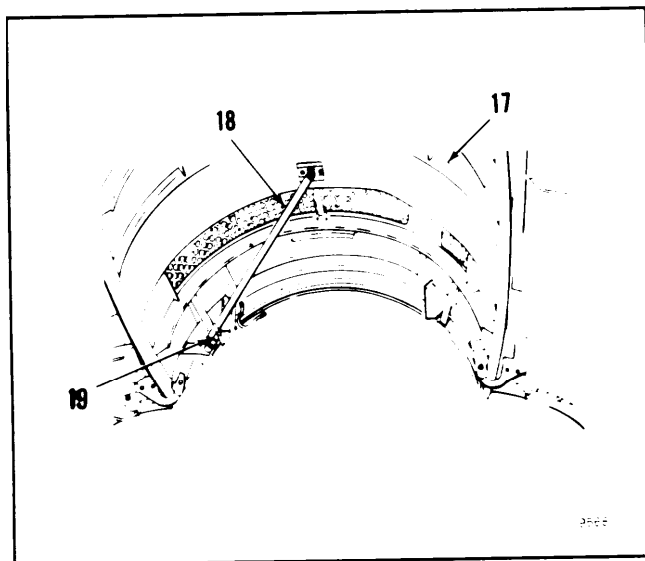
NOTE

Make sure bushing remains in each access door hinge.

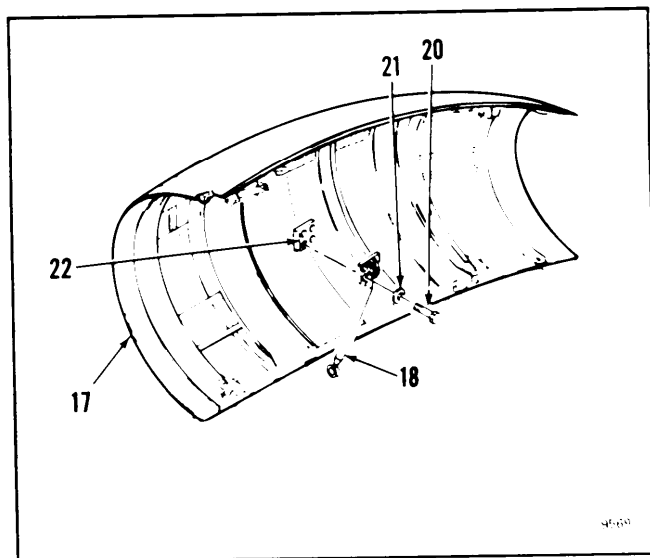
3. Remove four nuts (12), eight washers (13), and four bolts (14). **Remove side access doors (15 and 16) from cover (17).**



4. Disengage strut (18) from fitting (19) on cover (17).



5. **Remove four screws (20) and washers (21) from bracket (22) in upper cover (17). ~~Remove~~ strut (18).**



FOLLOW-ON MAINTENANCE:
None

END OF TASK

4-54 REPAIR ENGINE COVER — GENERAL INFORMATION**4-54****INITIAL SETUP****Applicable Configurations:**

All

Tools:

As Required

Materials:

As Required

Personnel Required:68G20 Aircraft Structural Repairer
67U30 Inspector**References:**Task 4-55
Task 4-56
Task 4-57**Equipment Condition:**

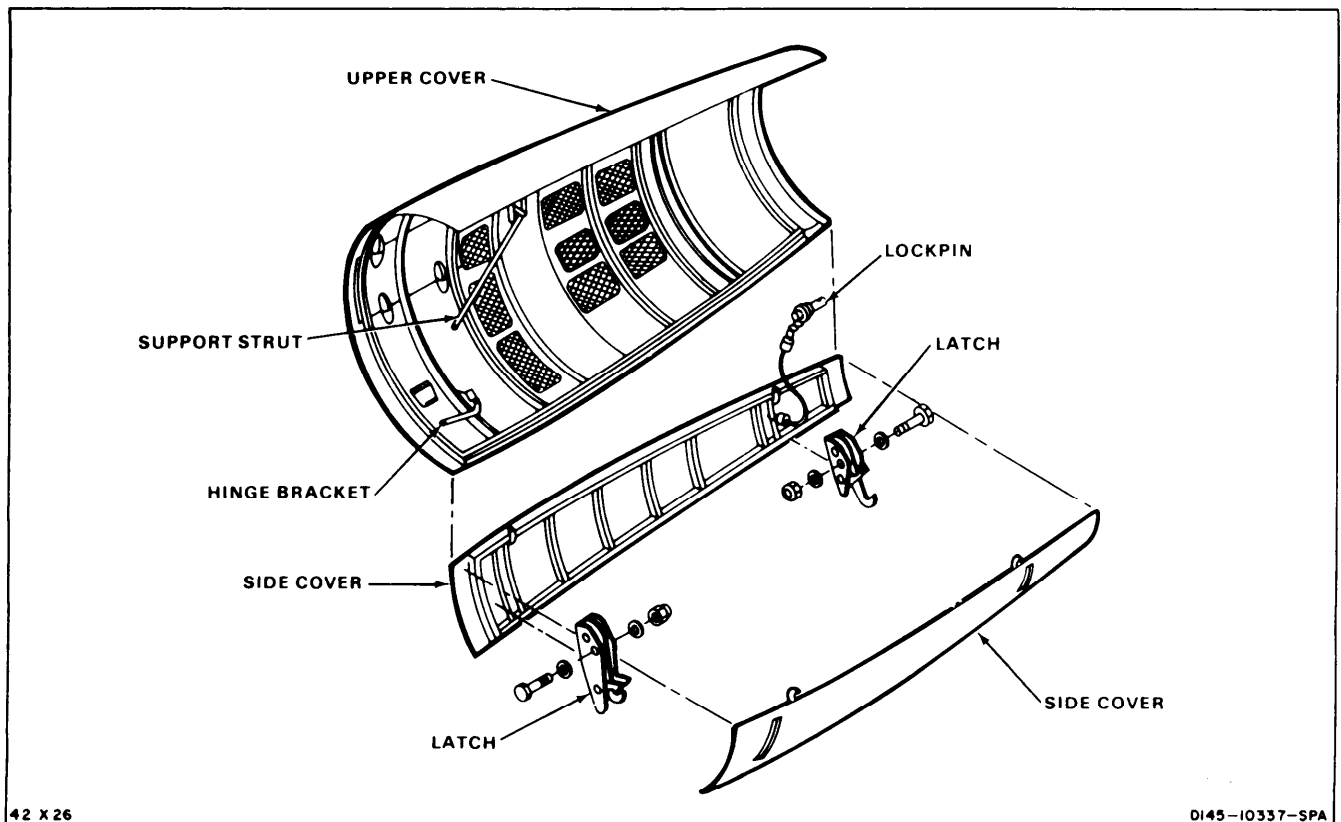
As Required

General Safety Instructions:

As Required

1. Each engine covering consists of an upper cover assembly and two side cover assemblies.

2. Repairs to engine covering are classified as minor repairs (Task 4-55), major repairs (Task 4-56), and repairs requiring replacement (Task 4-57).

INSPECT**FOLLOW-ON MAINTENANCE.**

As required.

END OF TASK

4-55 REPAIR ENGINE COVER — MINOR DAMAGE

4-55

INITIAL SETUP

Applicable Configurations:
All

Tools:
As Required

Materials:
As Required

Personnel Required:
68G20 Aircraft Structural Repairer
67U30 Inspector

References:
Task 2-6

Equipment Condition:
As Required

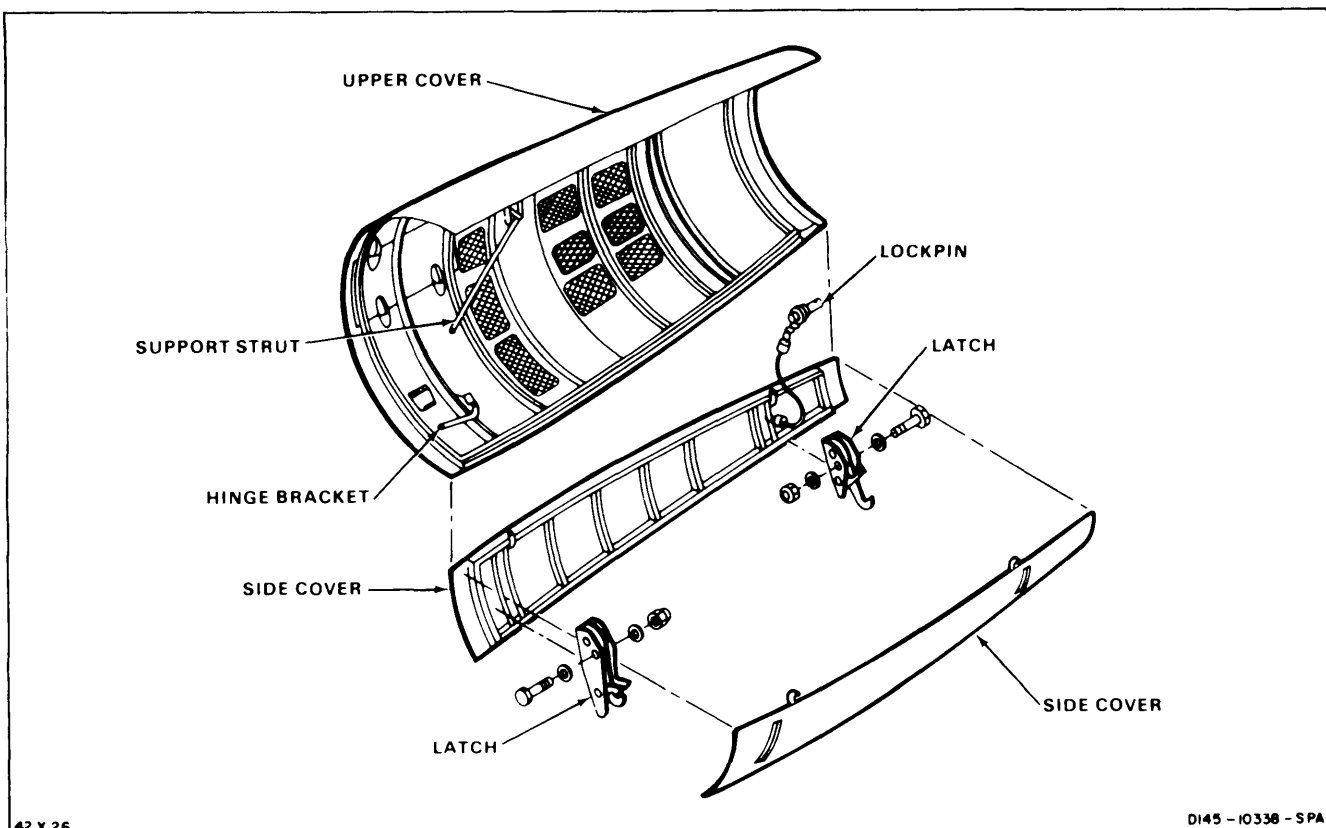
General Safety Instructions:
As Required

1. Repair small nicks, dents, or scratches by burnishing.
2. Stop drill cracks less than 1-inch long. Cracks shall not exceed 1-inch.
3. Check holes. Trimmed diameter of round or oval holes shall not exceed 1-inch.

FOLLOW-ON MAINTENANCE:

Refinish as required (Task 2-6).

INSPECT



END OF TASK

**4-56 REPAIR ENGINE COVER — MAJOR DAMAGE
(AVIM)**

4-56

INITIAL SETUP

Applicable Configurations:
All

Tools:
As Required

Materials:
As Required

Personnel Required:
68G20 Aircraft Structural Repairer
67U30 Inspector

References:
TM 55-1 500-209-25/1
Task 4-55

Equipment Condition:
As Required

General Safety Instructions:
As Required

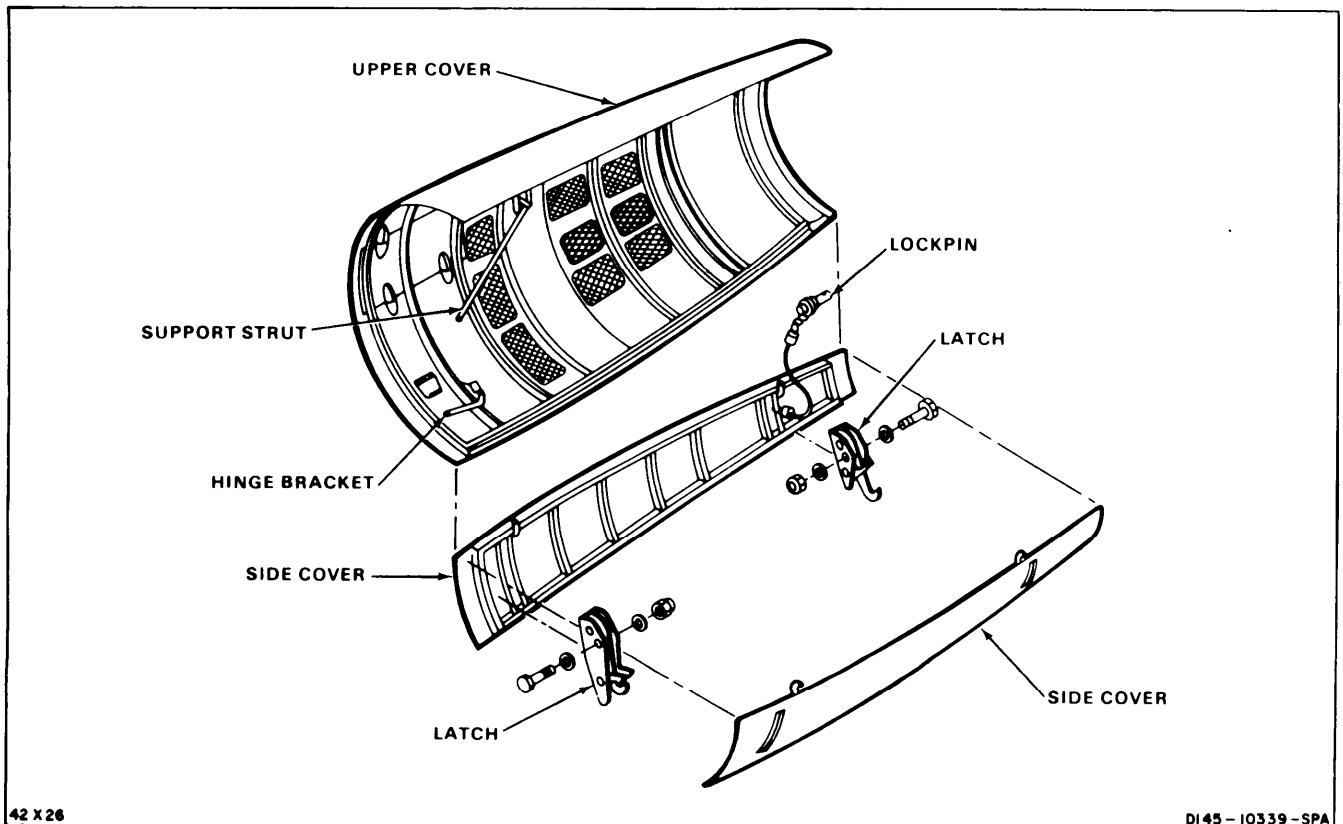
1. Repair damage to skin greater than minor damage (Task 4-55) as follows:
 - a. Patch skin damage that affects less than 25 percent of skin panel.
 - b. Repair skin damage that affects more than 25 percent of skin panel, or boundary member, by insertion.

2. Patch damage to formed parts that does not affect a bend radius.

INSPECT

FOLLOW-ON MAINTENANCE:

As required.



42 X 26

DI 45 - 10339 - SPA

END OF TASK

4-57 REPAIR ENGINE COVER — REPAIRS REQUIRING REPLACEMENT (AVIM)

4-57

INITIAL SETUP

Applicable Configurations:
All

Tools:
As Required

Materials:
As Required

Personnel Required:
Aircraft Structural Repairer
Inspector

References:
Task 4-53
Task 4-58

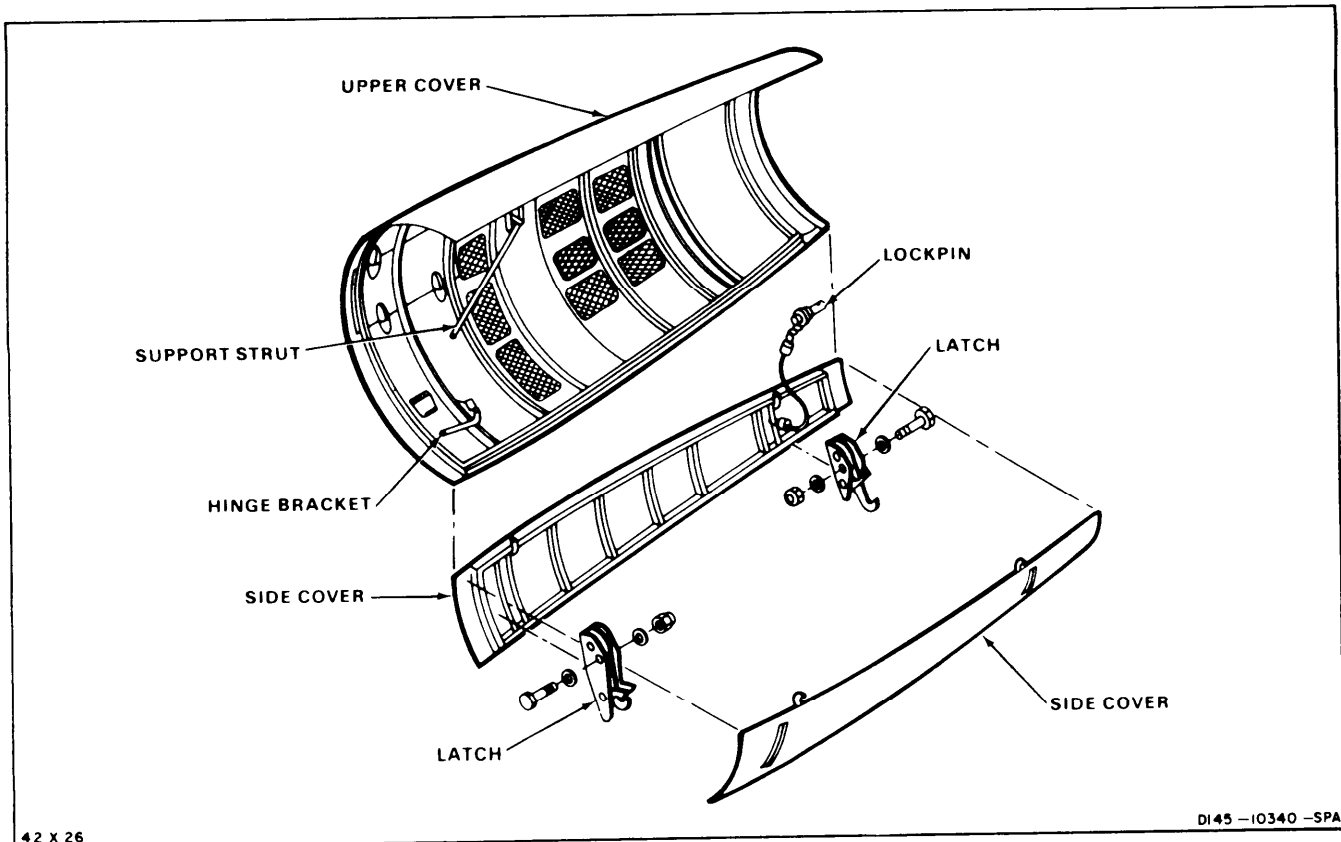
Equipment Condition:
As Required

General Safety Instructions:
As Required

1. Replace upper cover or side cover if damage affects bend radius of formed parts (Task 4-53 and Task 4-58).

FOLLOW-ON MAINTENANCE:
As required.

INSPECT



END OF TASK

4-58 ASSEMBLE ENGINE ACCESS COVER**4-58**

INITIAL SETUP

Applicable Configurations:

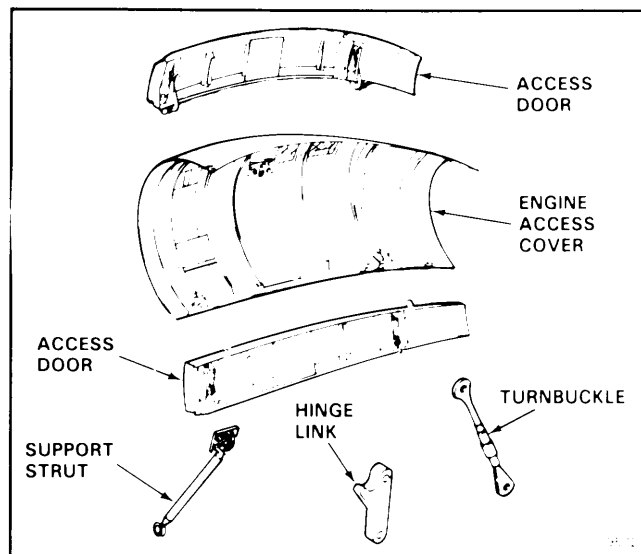
All

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

None

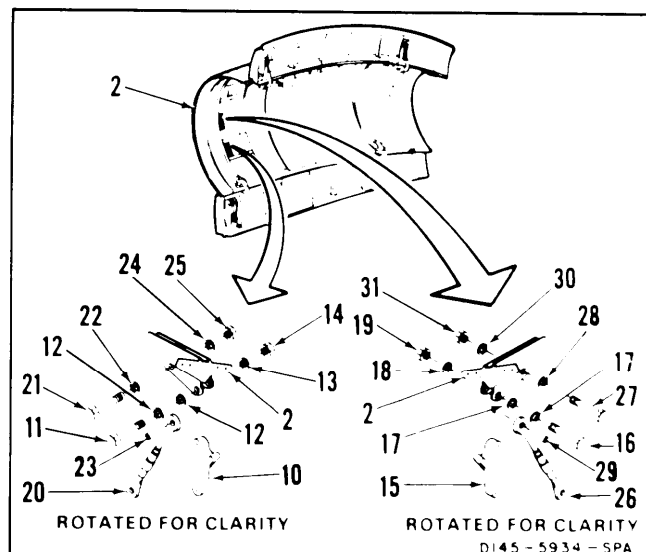
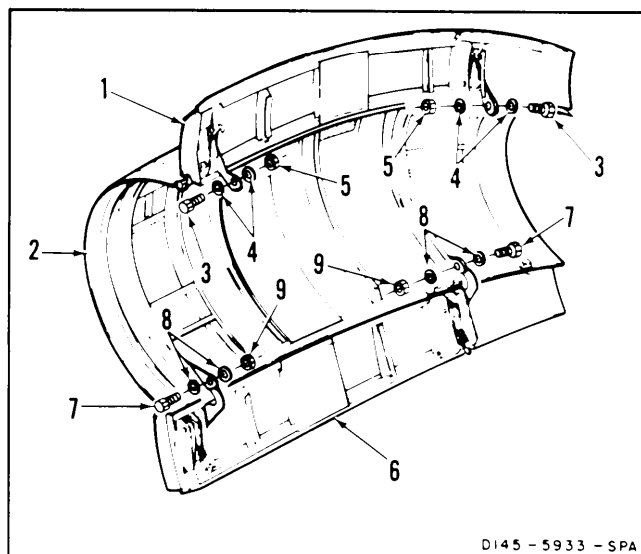
Personnel Required:Medium Helicopter Repairer
Inspector**References:**

TM 55-1520-240-23P

**NOTE**

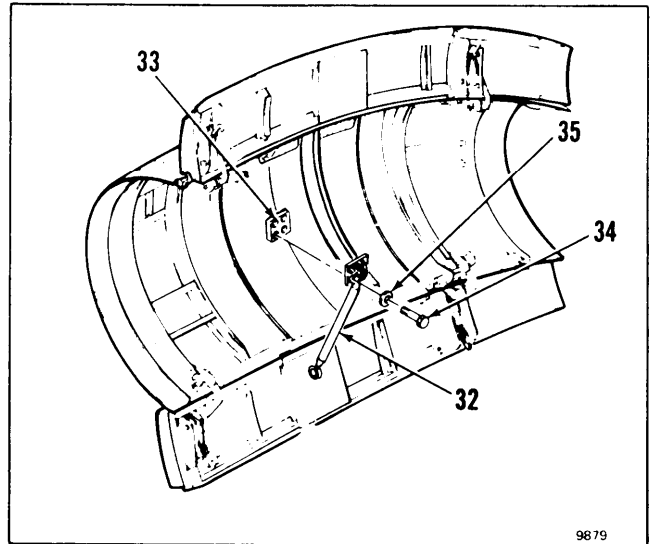
Make sure each access door hinge has bushing installed.

1. Position side access door (1) on engine access cover (2), Install two bolts (3), four washers (4), and two nuts (5),
2. Position side access door (6) on engine access cover (2). Install two bolts (7), four washers (8), and two nuts (9),
3. Position hinge link (10) on cover (2). Install bolt (11), two washers (12), washer (13), and nut (14).
4. Position hinge link (15) on cover (2), Install bolt (16), two washers (17), washer (18), and nut (19).
5. Position turnbuckle (20) on cover (2). Install bolt (21), washer (22), spacer (23), washer (24), and nut (25),
6. Position turnbuckle (26) on cover (2). Install bolt (27), washer (28), spacer (29), washer (30), and nut (31),

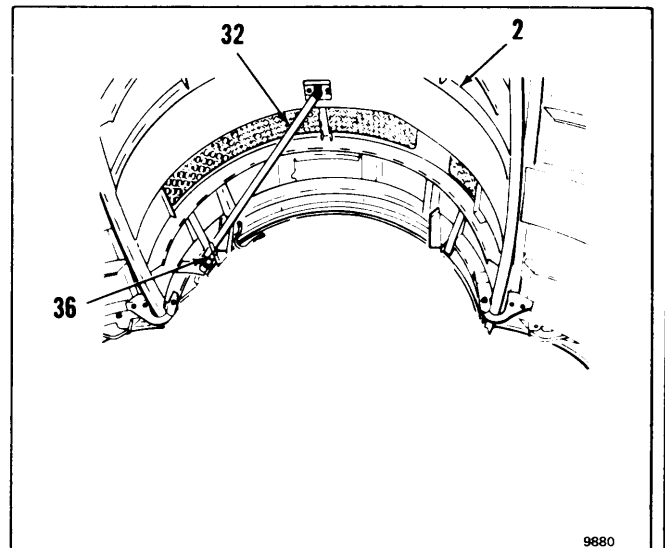
INSPECT**GO TO NEXT PAGE**

4-58 ASSEMBLE ENGINE ACCESS COVER (Continued)**4-58**

7. Position strut (32) on bracket (33). Install four screws (34) and washers (35).



8. Install strut (32) in fitting (36) on upper cover (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:

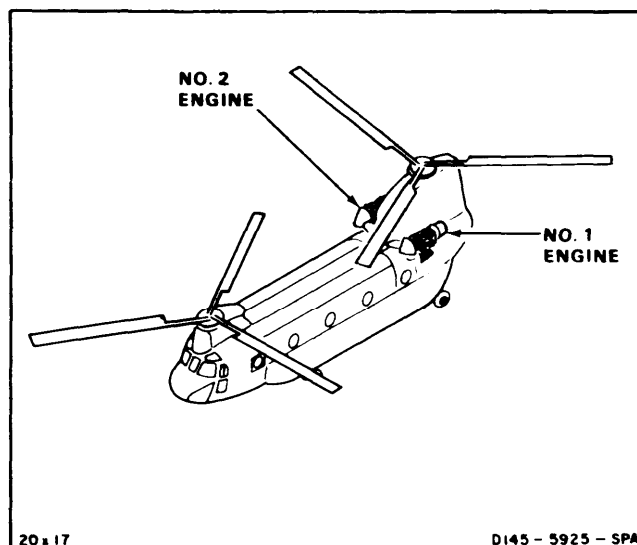
Lockwire (E231)

Personnel Required:

67U10 Medium Helicopter Repairer
67U20 Medium Helicopter Repairer
67U30 Inspector

References:

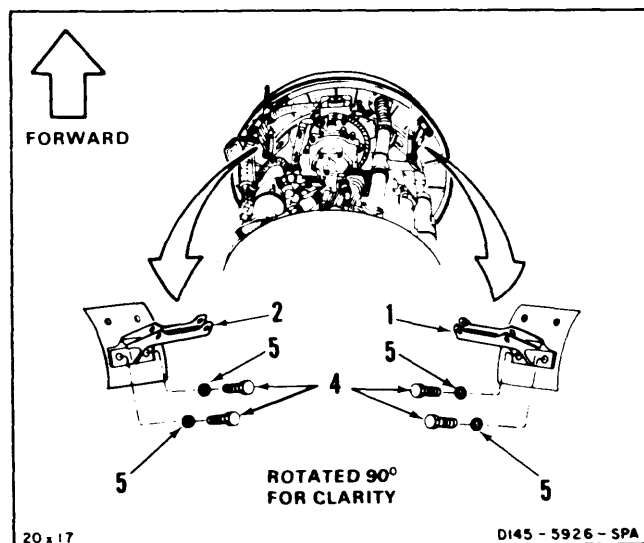
TM 55-1520-240-23P



NOTE

Procedure is same to install engine access cover on No. 1 or No. 2 engine.

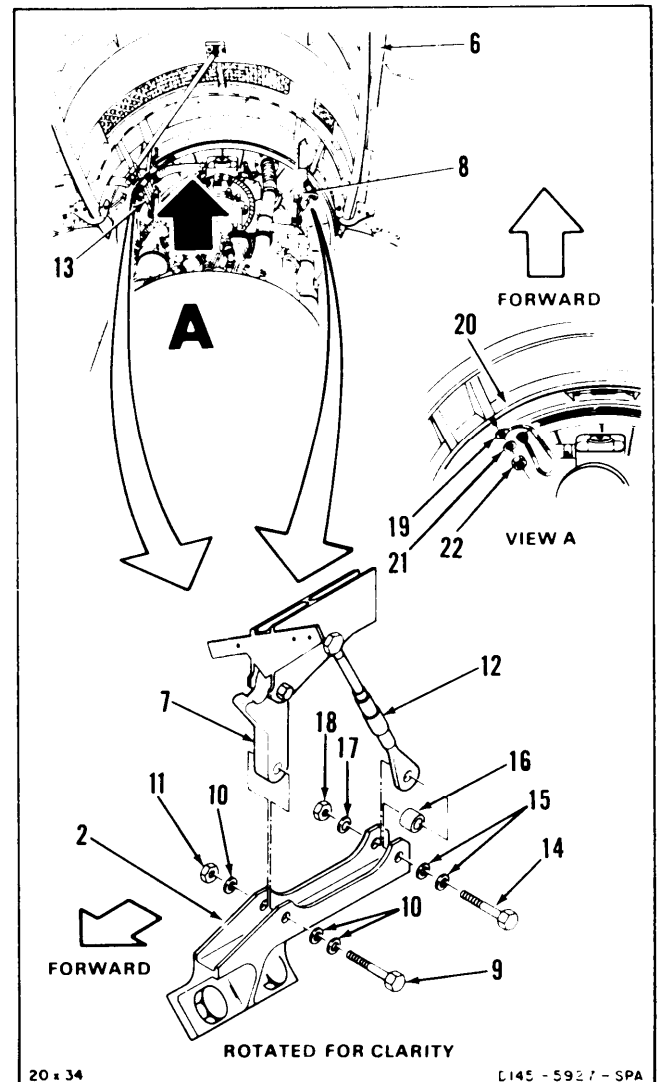
1. **Position two hinge link fittings (1 and 2)** on engine (3). **Install two bolts (4)** and washers (5). Lockwire bolts. Use lockwire (E231).



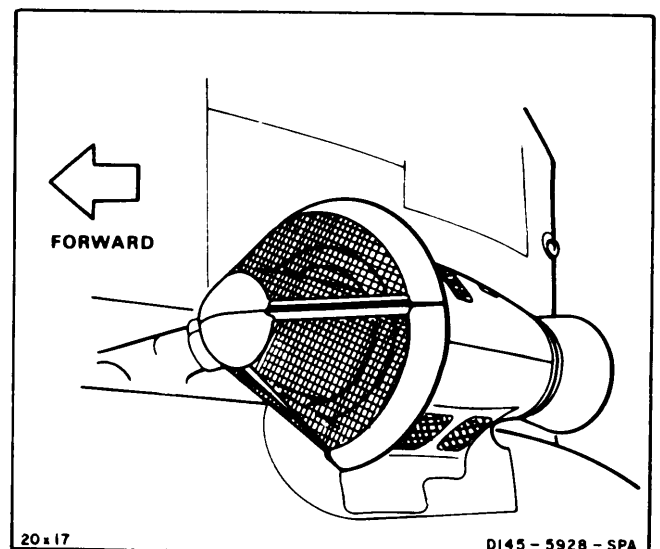
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4-59 INSTALL ENGINE ACCESS COVER (Continued)**4-59**

2. **Position cover (6)** on engine (3). **Position hinge links (7 and 8)** in fittings (1 and 2). **Install two bolts (9)**, six washers (10), and two nuts (11).
3. **Position turnbuckles (12 and 13)** in fittings (1 and 2). **Install two bolts (14)**, four washers (15), two spacers (16), two washers (17), and two nuts (18).
4. **Connect bonding jumper (19)** to fairing (20). **Install washer (21)** and **nut (22)**.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Adjust engine access cover (Task 4-51).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

**4-60 REPAIR LOWER ACCESS DOOR —GENERAL
INFORMATION**

4-60

INITIAL SETUP**Applicable Configurations:**

All

Tools:

As Required

Materials:

As Required

Personnel Required:

68G20 Aircraft Structural Repairer

67U30 Inspector

References:

Task 4-61

Task 4-62

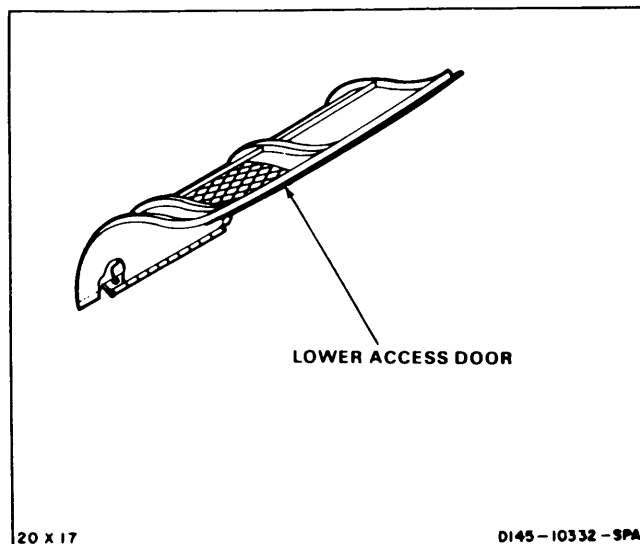
Equipment Condition:

As Required

General Safety Instructions:

As Required

-
1. Lower access door is a hinged single piece of skin whose contour is supported by pressed frames. The skin is cut out in one place, and a screen is installed.
 2. Repairs to lower access door are classified as minor repairs (Task 4-61), major repairs and repairs requiring replacement (Task 4-62).

**INSPECT****FOLLOW-ON MAINTENANCE:**

As required.

END OF TASK

4-60.1 REPLACE ENGINE LOWER ACCESS COVER

4-60.1

INITIAL SETUP

Applicable Configurations:

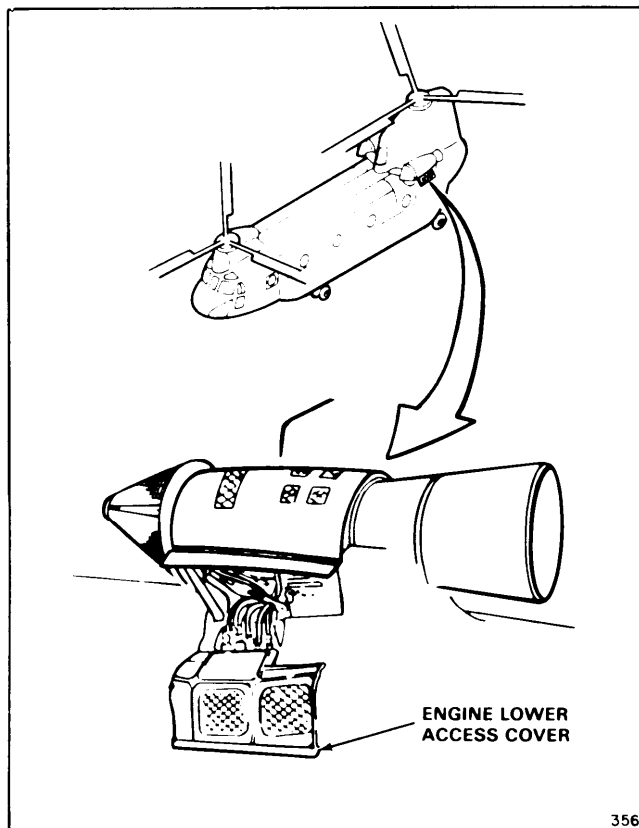
All

Tools:Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692**Materials:**Dry Cleaning Solvent (E 162)
Sealant (E339)
Cloths (E 120)
Gloves (E 186)**Personnel Required:**

Medium Helicopter Repairer (2)

Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Lower Access Cover Open (Task 4-49)**References:**

TM 55-1520-240-23P



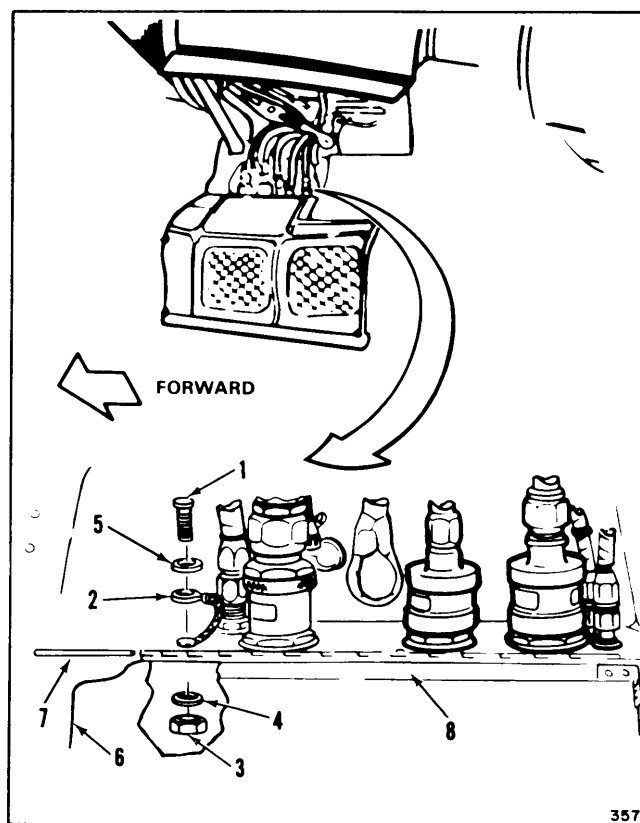
356

NOTE

Procedure is same to replace right or left engine lower access cover. Replacement of left cover is shown here.

REMOVE

1. Remove sealant from bolt (1) head holding bonding jumper (2).
2. Have helper hold bolt (1). Working inside aircraft, remove nut (3) and washer (4) from bolt.
3. Remove bolt (1) and washer (5). Disconnect jumper (2) from bolt.
4. Have helper support cover (6). **Push hinge pin (7) forward out of hinge (8) until pin can be gripped and pulled forward out of hinge. Remove cover.**

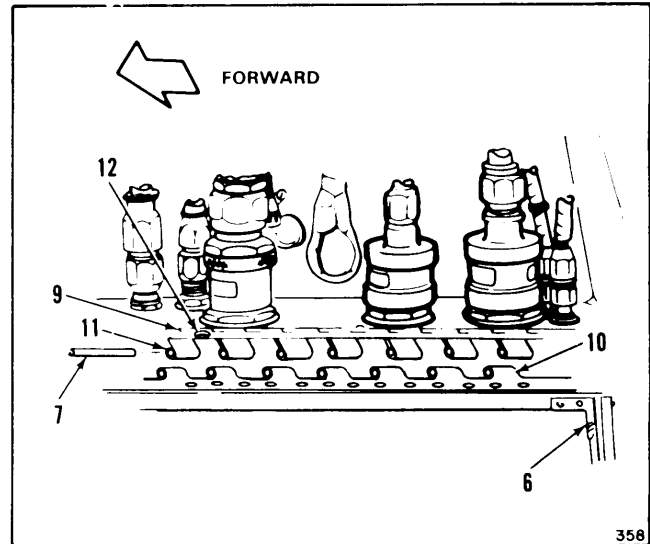


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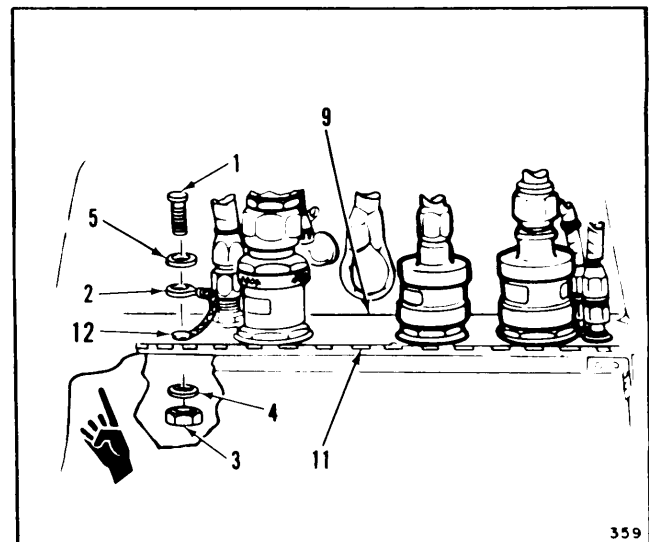
INSTALL

5. Position cover (6) on pylon structure (9). **Align hinge fitting (10) on cover (6) and hinge fitting (11) on structure.** Have helper support cover.
6. **Install hinge pin (7) from forward end of cover (6) in hinge fittings (10 and 11).** Pin must be about .2 inches inside hinge (10) when fully installed.
7. **Squash end of hinge leave (10) to stop pin (7) sliding out.**

**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.

8. **Clean bolt (1) head and surface around bolt hole (12).** Use cloths (E120) and solvent (E162). Wear gloves (E186).
9. Position washer (5) and jumper (2) on bolt (1). **Install bolt** in hinge (11) and structure (9).
10. Have helper hold bolt (1). Install washer (4) and nut (3) on bolt.

**WARNING**

Sealant (E339) can irritate skin and cause burns. 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.

11. **Apply sealant (E339) to bolt (1) head and surface around bolt.** Wear gloves (E 186).

FOLLOW-ON MAINTENANCE:

Close engine lower access cover (Task 4-49).

END OF TASK

4-61 REPAIR LOWER ACCESS DOOR — MINOR REPAIRS

4-61

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

Rubber (E319)

Cement (E101)

Tape (E381)

Gloves (E186)

Personnel Required:

68G20 Aircraft Structural Repairer

67U30 Inspector

References:

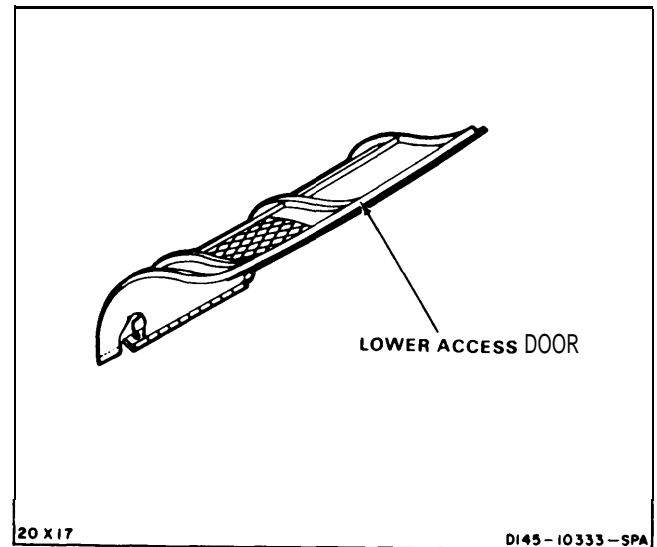
As Required

Equipment Condition:

As Required

General Safety Instructions:**WARNING**

Cement (E101) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. 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.



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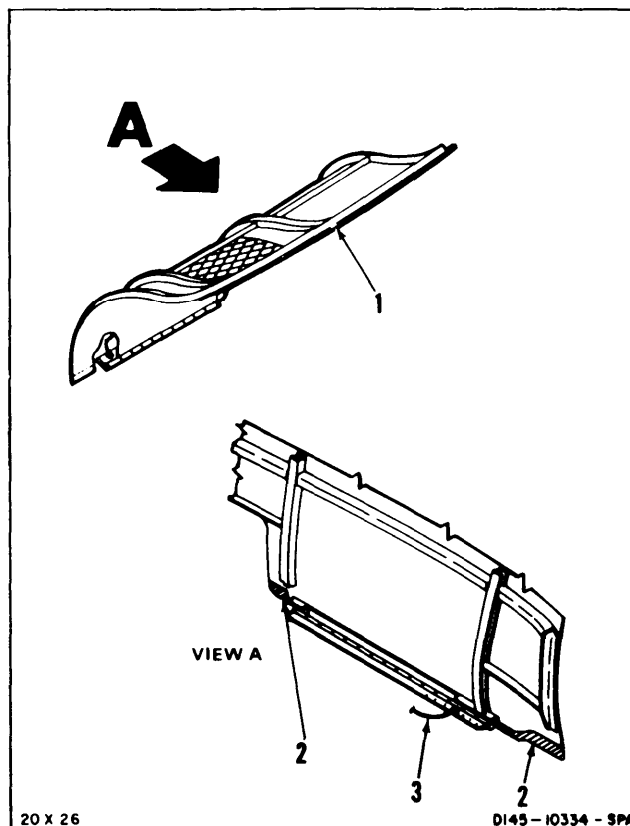
4-61 REPAIR LOWER ACCESS DOOR — MINOR REPAIRS (Continued)

4-61

1. **Check door seal (1)** for wear or damage. **Replace seal if needed.** Use rubber (E319) and cement (E101). Wear gloves (E186).
2. **Check anti-chafe tape (2)** for wear or damage. **Replace tape if needed.** Use tape (E381) and cement (E101).
3. **Replace bonding jumper (3) if damaged.**
4. Repair small nicks, dents, or scratches by burnishing.
5. **Stop drill cracks less than 1-inch long.** Cracks shall not exceed 1-inch.
6. **Check holes.** Trimmed diameter of round or oval holes shall not exceed 1-inch.

INSPECT**FOLLOW-ON MAINTENANCE:**

Refinish as required (Task 2-6).

**END OF TASK**

4-62 REPAIR LOWER ACCESS DOOR — MAJOR DAMAGE (AVIM)

4-62

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

As Required

Personnel Required:

68G20 Aircraft Structural Repairer

67U30 Inspector

References:

TM 55-1500-204-25/1

Task 4-61

Equipment Condition:

As Required

General Safety Instructions:

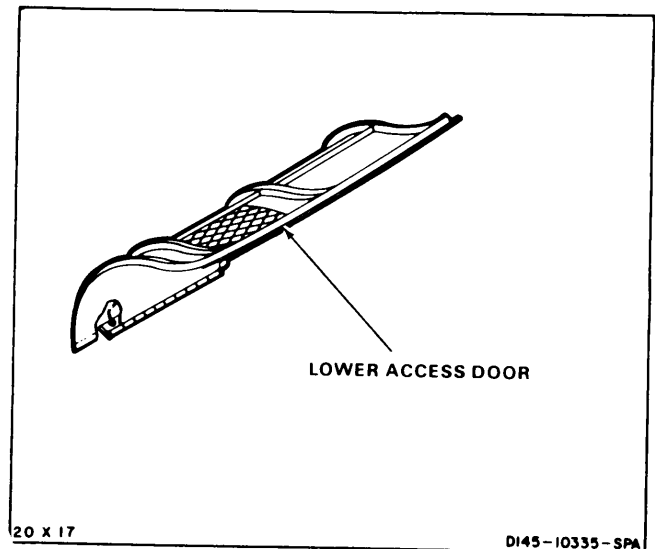
As Required

1. Repair damage to skin greater than minor damage (Task 4-61) as follows:
 - a. Patch skin damage that affects less than 25 percent of skin panel.
 - b. Repair skin damage that affects more than 25 percent of skin panel, or boundary members, by insertion.
2. Patch damage to formed parts that does not affect a bend radius.
3. Replace lower access door when damage affects bend radius of formed parts.

INSPECT

FOLLOW-ON MAINTENANCE:

As required.

**END OF TASK**

SECTION IV
AIR INDUCTION SYSTEM

4-63 ADJUST NEW ENGINE AIR INLET SCREENS**4-63**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Airframe Repairer's Tool Kit,
NSN 5180-00-323-4876
Thickness Gage

Materials:

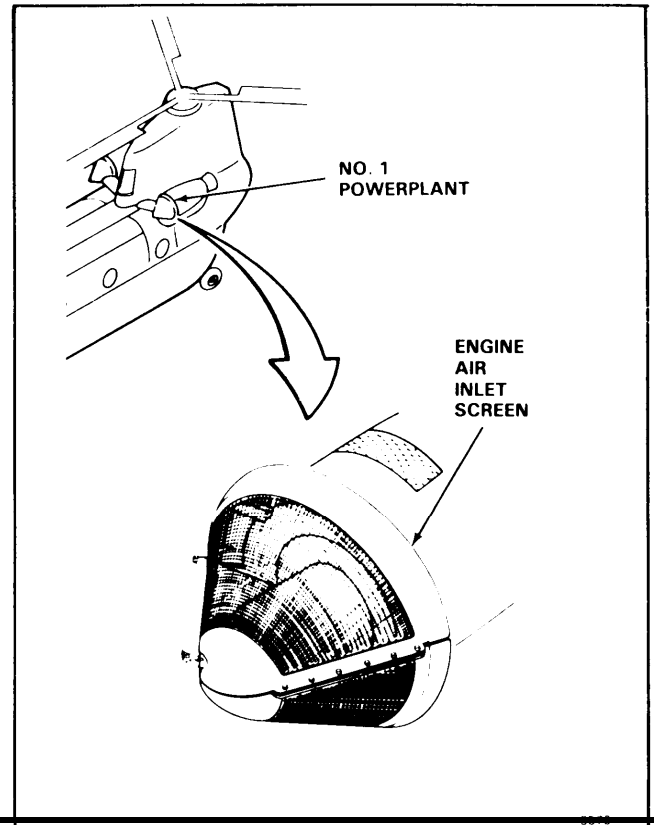
None

Personnel Required:

Aircraft Structural Repairer (2)
Inspector

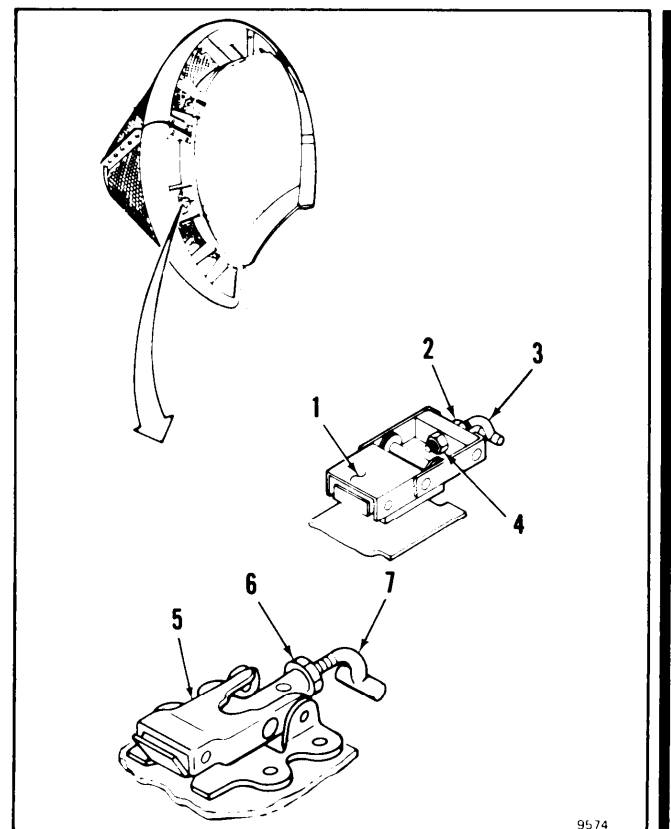
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)

**NOTE**

- Procedure is same to adjust new engine air inlet screens for No. 1 or No. 2 engine. Adjustment of screens for No. 1 engine is shown here.
- Two types of latches are used on engine screens. Screen adjustment is shown using both latches.

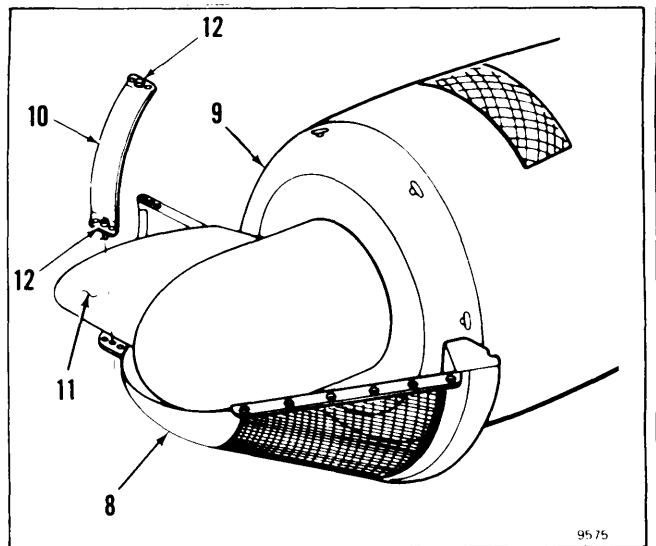
1. On five Hartwell latches (1):
 - a. Tighten nuts (2) against upper ends of tee bolts (3).
 - b. Tighten nuts (4) against lower ends of tee bolts (3).
2. On five Avibank latches (5):
 - a. Tighten nuts (6) against upper ends of tee bolts (7).
 - b. Turn tee bolts (7) five turns counterclockwise.

**GO TO NEXT PAGE**

ADJUST LOWER SCREEN**CAUTION**

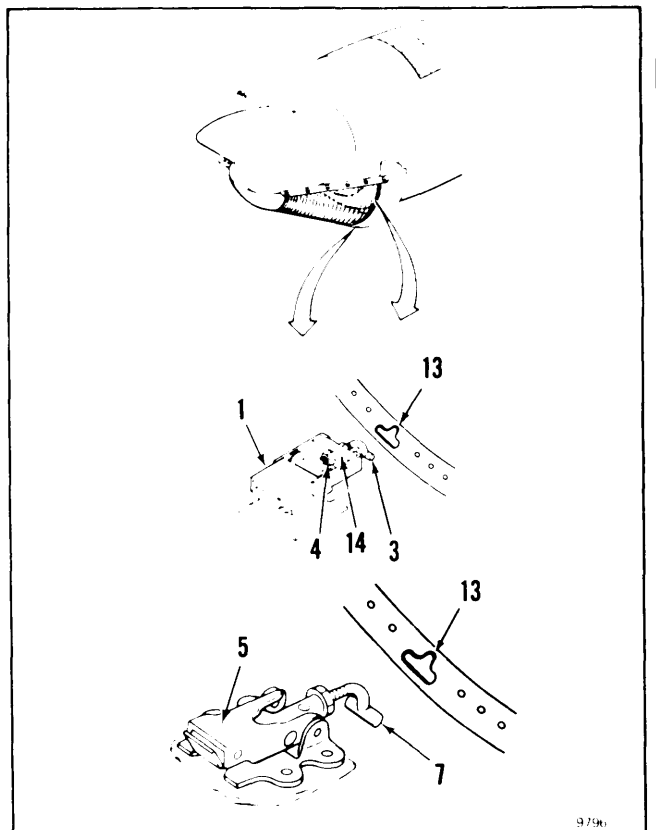
When installing lower screen, do not cover air holes on air inlet fairing. Air pressure build up will damage fairing.

3. Have helper position lower screen (8) on engine air inlet fairing (9). Make sure air holes on fairing are not covered.
4. Position strap (10) over engine drive shaft fairing (11). Secure two fasteners (12).
5. Trim cushions and flange on screen (8) as required to fit around air inlet firing (9) and drive shaft fairing (11). A maximum gap of 0.25 inch is allowed.

**INSPECT****CAUTION**

Do not overtighten nuts on latches. Overtightening can cause damage to screens, latches, and fairings.

6. On two Hartwell latches (1):
 - a. Insert tee bolts (3) in fairing holes (13) and close latches (1).
 - b. Tighten nuts (4) until they contact trunnions (14).
7. On two Avibank latches (5):
 - a. Insert tee bolts (7) in fairing holes (13) and close latches (5). If latch closes with moderate force, go to step 8. If not, go to step 7b
 - b. Release latches (5) and remove tee bolts (7) from holes (13)
 - c. Tighten tee bolts (7) one turn.
 - d. Insert tee bolts (7) in holes (13) and close latches (5).
 - e. Repeat steps b, c, and d until only a moderate force is required to close latches (5).

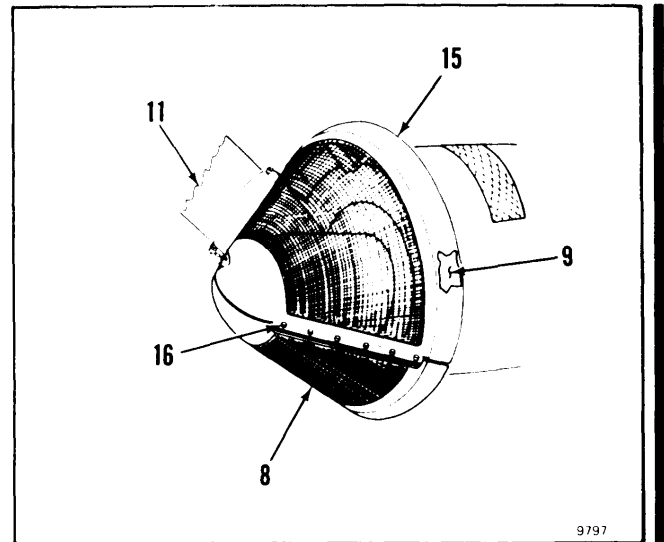
**GO TO NEXT PAGE**

ADJUST UPPER SCREEN**CAUTION**

Make sure there is no foreign matter in air inlet. If foreign matter is left in inlet, damage to powerplant will occur.

CAUTION

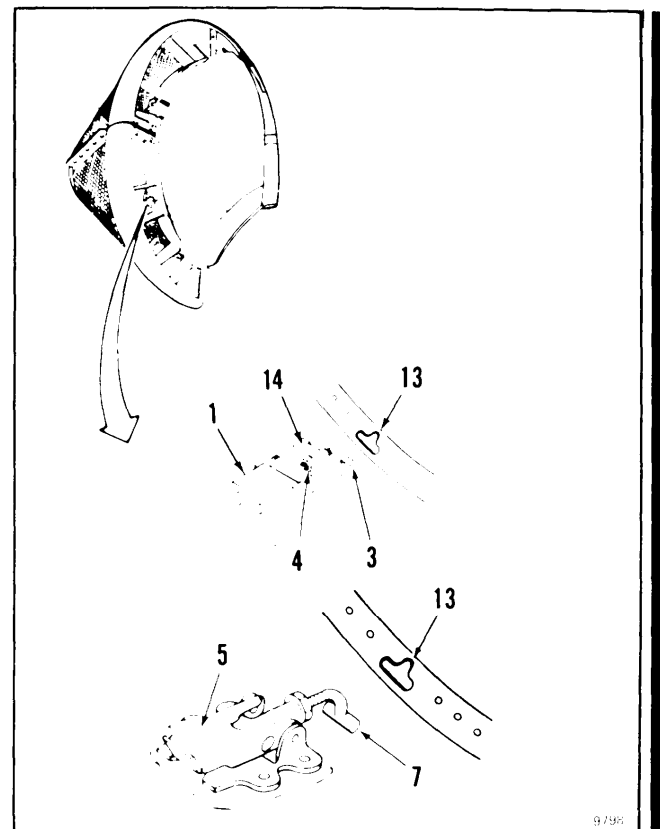
When installing upper screen, do not cover air holes on air inlet fairing. Air pressure build up will damage fairing.



- 8 Position upper screen (15) on lower screen (8) and fairing (11). Make sure holes on fairing are not covered
- 9 Trim cushions and flange on screen (15) as required to obtain proper fit around air inlet fairing (9) and drive shaft fairing (11). A maximum gap of 0.25 inch is allowed.

INSPECT

10. Secure six fasteners (16).
11. On three Hartwell latches (1):
 - a. Insert tee bolts (3) in holes (13).
 - b. Tighten nuts (4) against trunnions (14) until light force is required to close latches (1).
12. On three Avibank latches (5):
 - a. Insert tee bolts (7) in fairing holes (13) and close latches (5). If latch closes with moderate force, go to step 13. If not, go to step 12b.
 - b. Release latches (5) and remove tee bolts (7) from holes (13).
 - c. Tighten tee bolts (7) one turn.
 - d. Insert tee bolts (7) in holes (13) and close latches (5).
 - e. Repeat steps b, c, and d until moderate force is required to close latches (5) in step d.

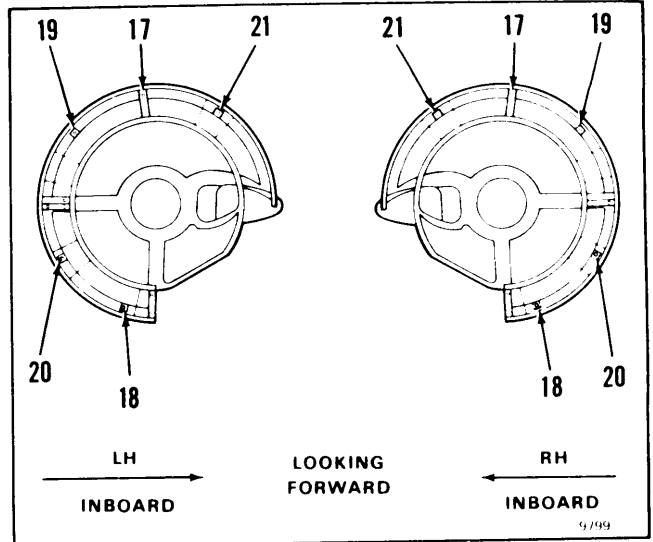


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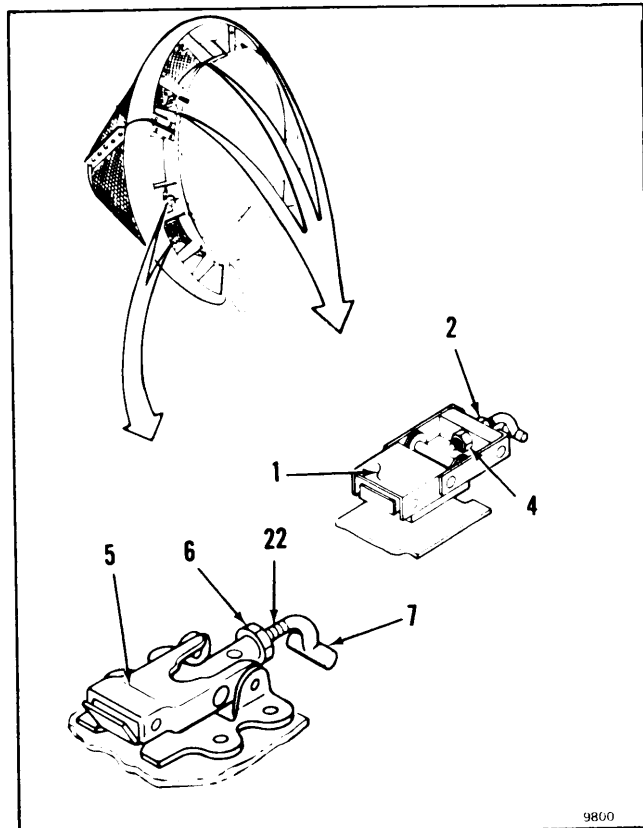
ADJUST LATCHES

13. **Adjust all latches** as in steps 6, 7, 11 and 12 in the following sequence:

- a. Upper screen center latch (17).
- b. Lower inboard latch (18).
- c. Upper outboard latch (19).
- d. Lower outboard latch (20).
- e. Upper inboard latch (21).



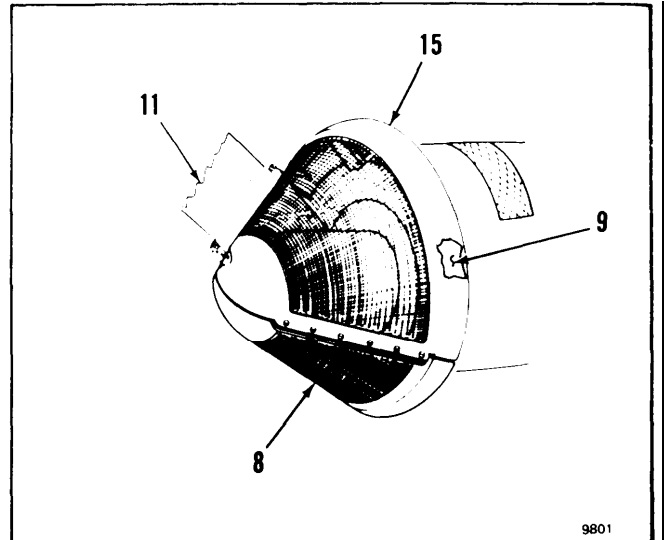
14. Do step 13 until a moderate force is required to close latches (1 or 5).
15. Repeat step 13 until a firm force is required to close latches (1 or 5).
16. Tighten nuts (2 and 4 or 6) on tee bolts (3 or 7).
17. If too few tee bolt threads (22) are available to accomplish a firm force on latches, add another nose cushion (Task 4-68.3). If firm closing force is obtained, go to step 19. If not, do step 18.
18. Repeat steps 14, 15, and 16.



GO TO NEXT PAGE

4-63 ADJUST NEW ENGINE AIR INLET SCREENS (Continued)**4-63**

19. Check gap between screens (8 and 5), air inlet fairing (9), and drive shaft fairing (11). A maximum gap of 0.25 inch is allowed.

INSPECT**FOLLOW-ON MAINTENANCE:**

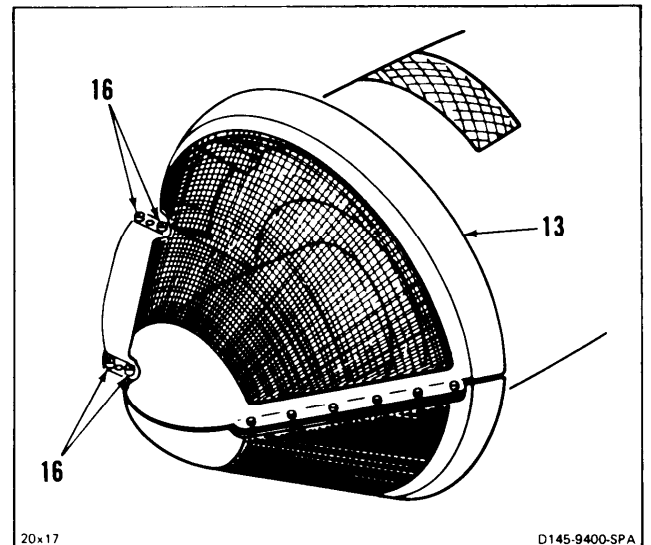
- Remove engine air inlet screens (Task 4-65).
- Paint last 3 numbers of aircraft serial number on upper and lower screens (TB746-93-2).
- Install engine air inlet screens (Task 4-76).
- Close engine work platform (Task 2-2).

END OF TASK

4-63 ADJUST NEW ENGINE AIR INLET SCREENS (Continued)

4-63

23. Release four fasteners (16).
24. Remove upper screen (13).



25. Sand edges of upper screen (13) and three teflon cushions (18) in small amounts. Alternately sand and fit upper screen on lower screen (5), engine transmission fairing (8), and air inlet fairing (6) until gap is 1/8 inch or less,
26. Repeat steps 15, 16, and 19 thru 21.

INSPECT

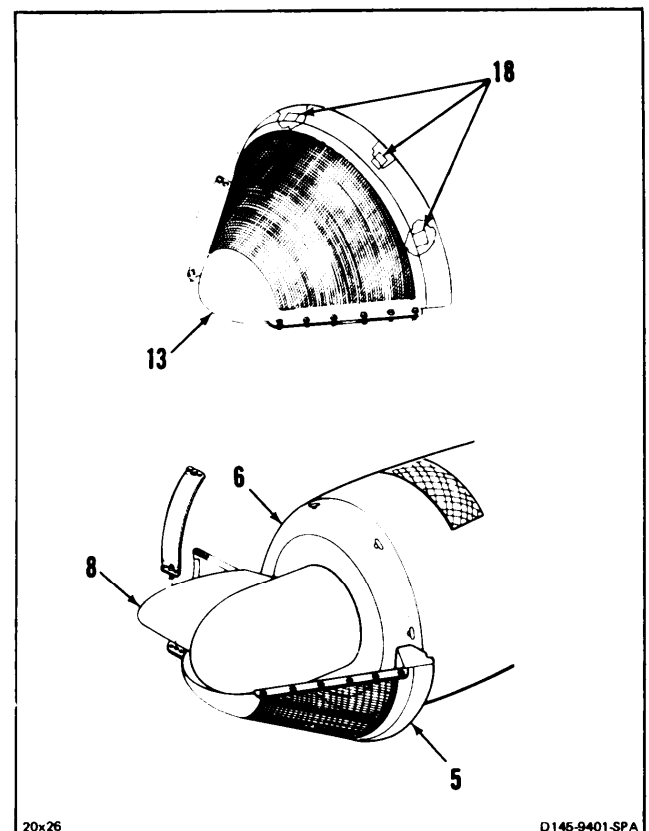
FOLLOW-ON MAINTENANCE:

Remove engine air inlet screens (Task 4-65).

Paint last 3 numbers of aircraft serial number on upper and lower screens (TB 746-93-2).

Install engine air inlet screens (Task 4-76).

Close engine work platform (Task 2-2).



END OF TASK

4-64 REMOVE ENGINE AIR INLET BYPASS PANELS

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

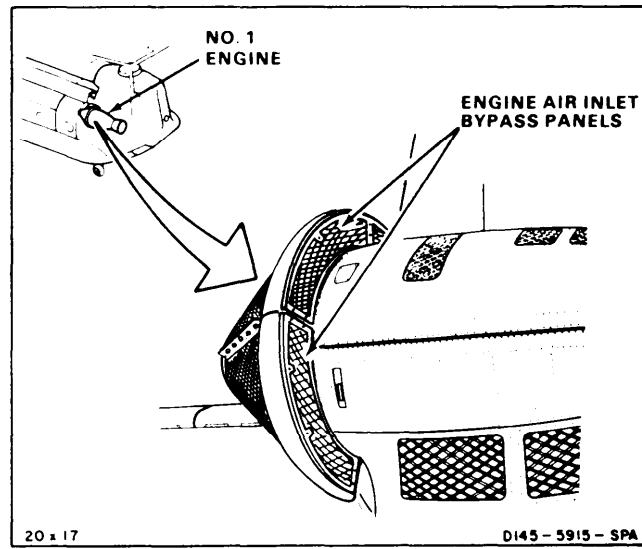
None

Personnel Required:

67U10 Medium Helicopter Repairer

Equipment Condition:

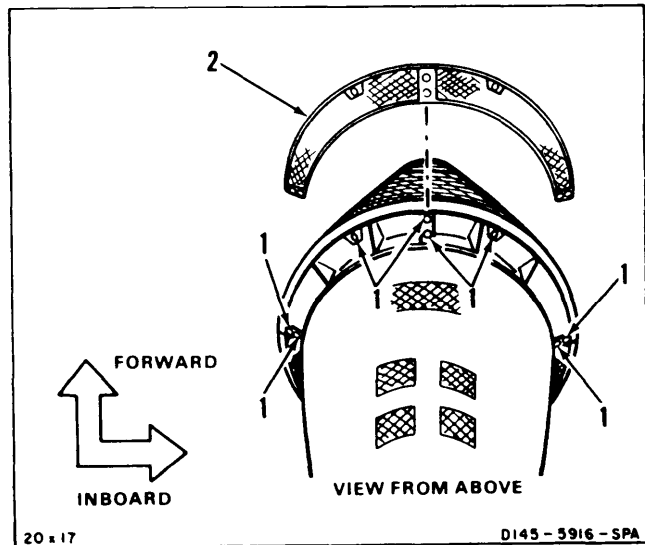
Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)



NOTE

Procedure is same to remove bypass panels on No. 1 or No. 2 engine. Removal of No. 1 bypass panels is shown here.

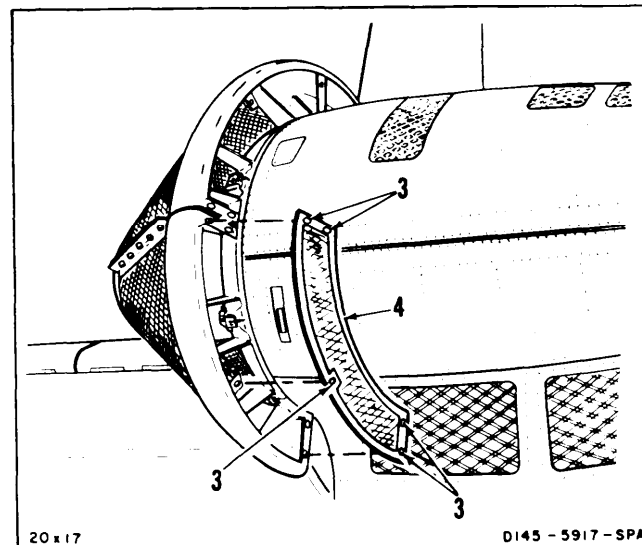
1. Release eight fasteners (1)
2. Remove upper panel (2).



3. Release five fasteners (3).
4. Remove lower panel (4).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-65 REMOVE ENGINE AIR INLET SCREENS**4-65****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:

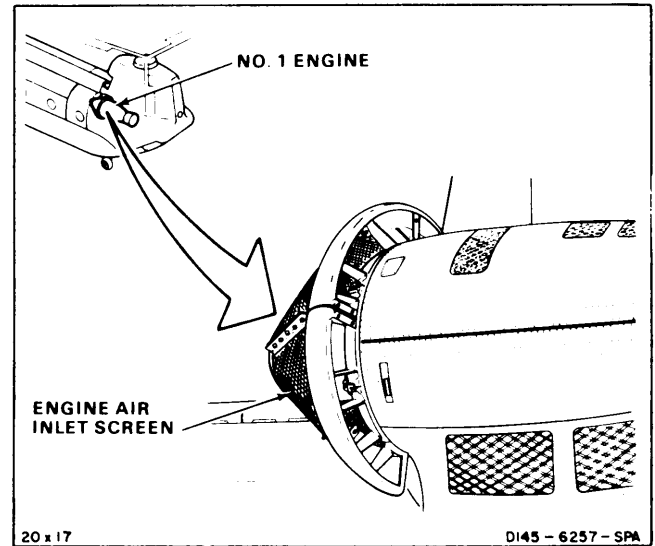
Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Work Platform Open (Task 2-2)

Engine Air Inlet Screen Bypass Panels

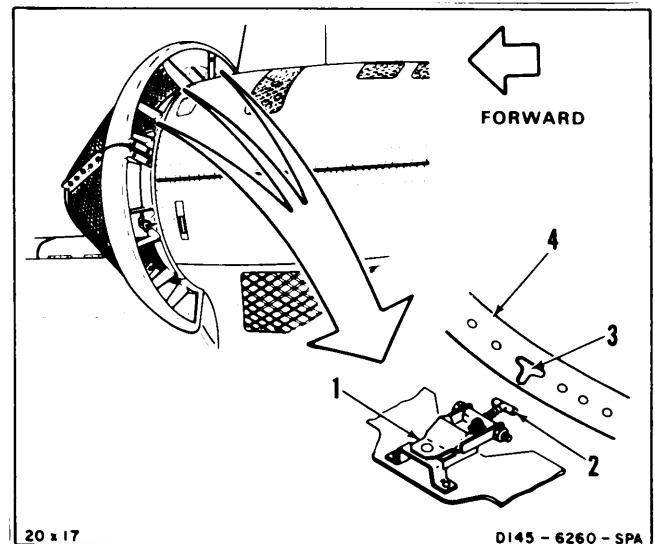
Removed (Task 4-64)

**NOTE**

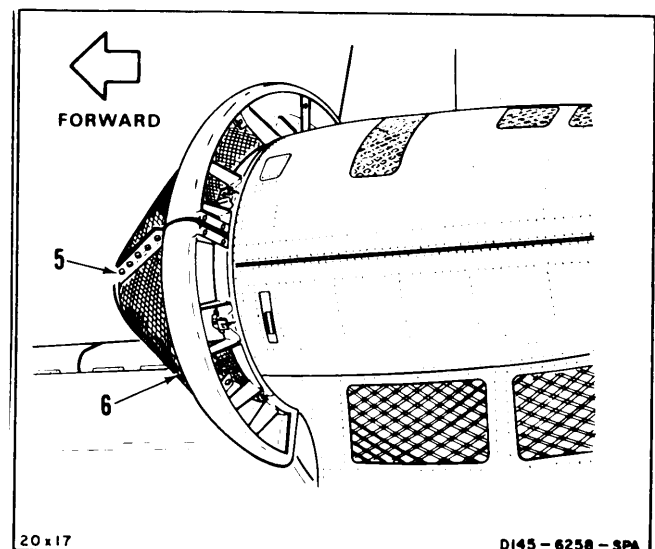
Procedure is same to remove engine air inlet screens on No. 1 or No. 2 engine. Removal of No. 1 air inlet screens is shown here.

REMOVE LIPPER SCREEN

1. Release three latches (1). Disengage three tee bolts (2) from holes (3) in inlet fairing (4).

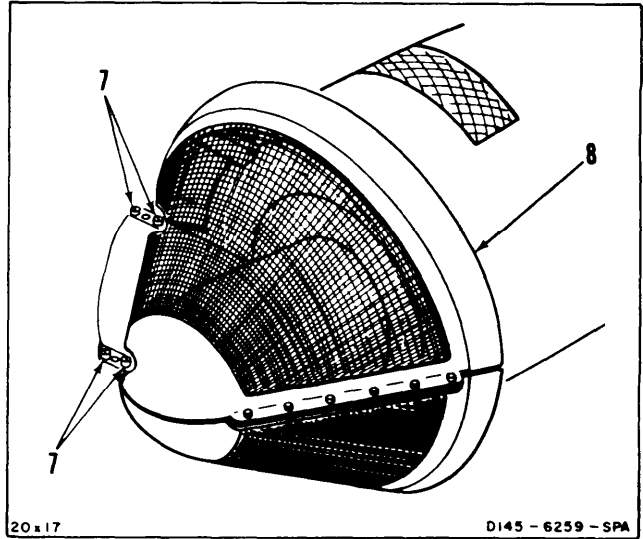


2. Release six fasteners (5) on lower screen (6).

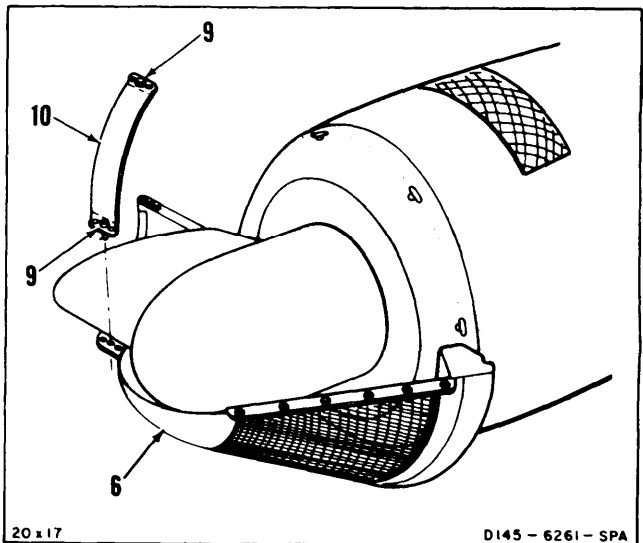
**GO TO NEXT PAGE**

**4-65 REMOVE ENGINE AIR INLET SCREENS
(Continued)**

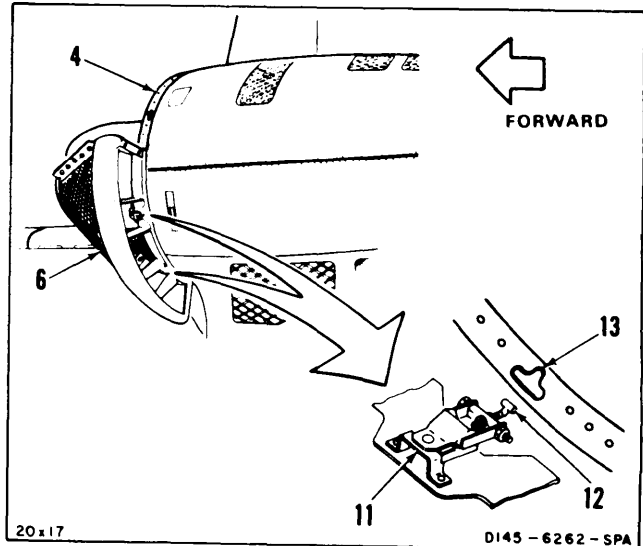
- 3 Release four fasteners (7).
- 4 Remove upper screen (8).



- 5. Release two fasteners (9). Remove strap (10). Support lower screen (6).



- 6. Release two latches (11). Disengage two tee bolts (12) from holes (13) in inlet fairing (4).
- 7. Remove lower screen (6).

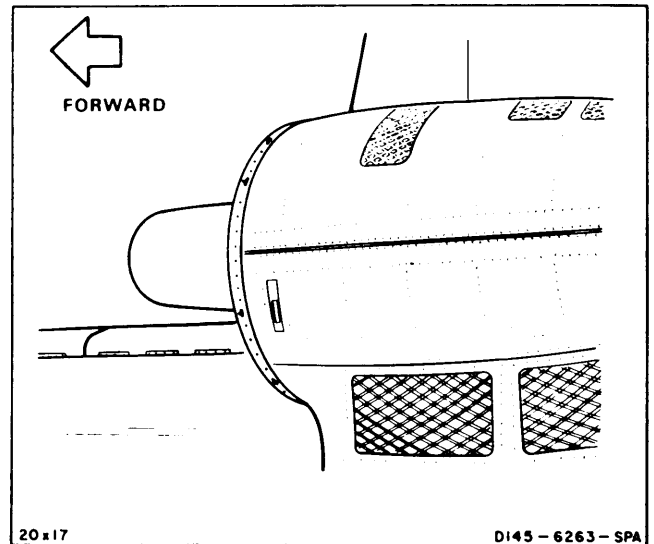


GO TO NEXT PAGE

4-65 REMOVE ENGINE AIR INLET SCREENS
(Continued)**4-65****FOLLOW-ON MAINTENANCE:**

Inspect engine inlet for FOD.

Install engine inlet protective covers (Task 1-32).

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Source of Compressed Air
Goggles

Materials:

Brush (E85)

Personnel Required:

■ Medium Helicopter Repairer

Equipment Condition:

Off Helicopter Task

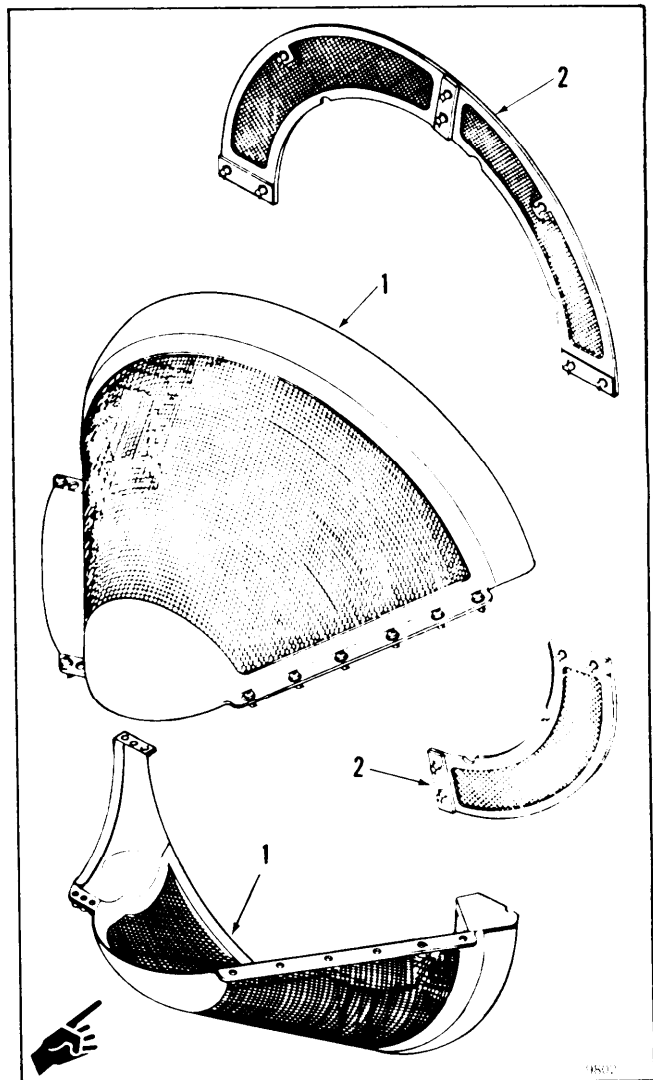
WARNING

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.

- 1 Clean engine air Inlet screens (1) and bypass panels (2). Use compressed air and brush (E85). Wear goggles.

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

4-67 REPAIR ENGINE AIR INLET SCREEN AND BYPASS PANELS — 4-67

GENERAL INFORMATION

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

As Required

Personnel Required:

Aircraft Structural Repairer
Inspector

References:

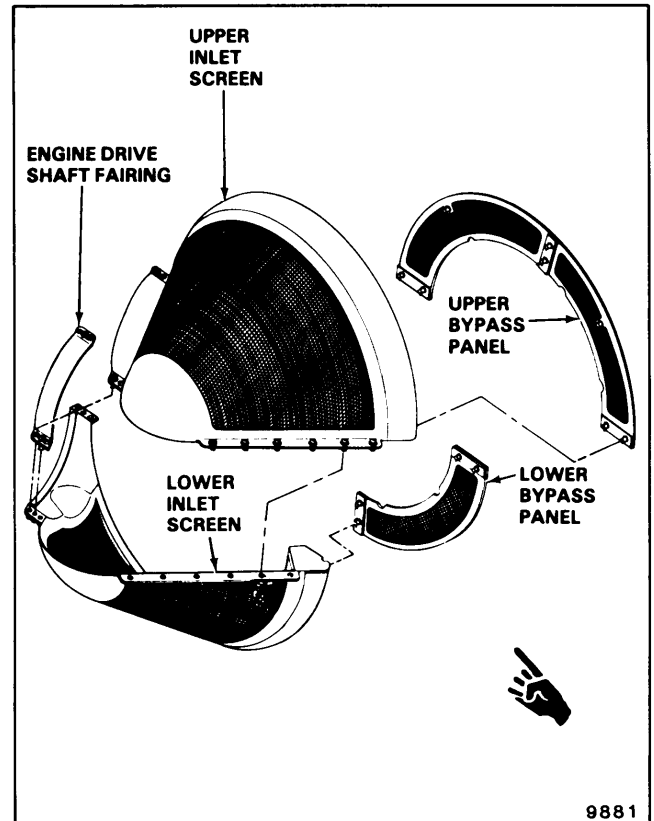
Task 4-68
Task 4-69

Equipment Condition:

As Required

General Safety Instructions:

As Required



1. On aircraft equipped with **40**, 0.020 fine mesh screen is installed over 0.063 coarse mesh screen of the upper and lower engine inlet screens only.
2. Engine air inlet screens consist of upper and lower screen assemblies attached with quick-release fasteners at each mating flange. Upper and lower bypass panels are attached with quick-release fasteners to upper and lower screen assemblies.
3. Repairs to engine air inlet screen and bypass panels are classified as minor repairs (Task 4-68), major repairs, and repairs requiring replacement (Task 4-69).

END OF TASK

4-68 REPAIR ENGINE AIR INLET SCREEN AND BYPASS PANELS — MINOR DAMAGE

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

As Required

Personnel Required:

Aircraft Structural Repairer

Inspector

References:

Task 4-69

Task 2-6

TM 55-1500-204-25/1

Equipment Condition:

As Required

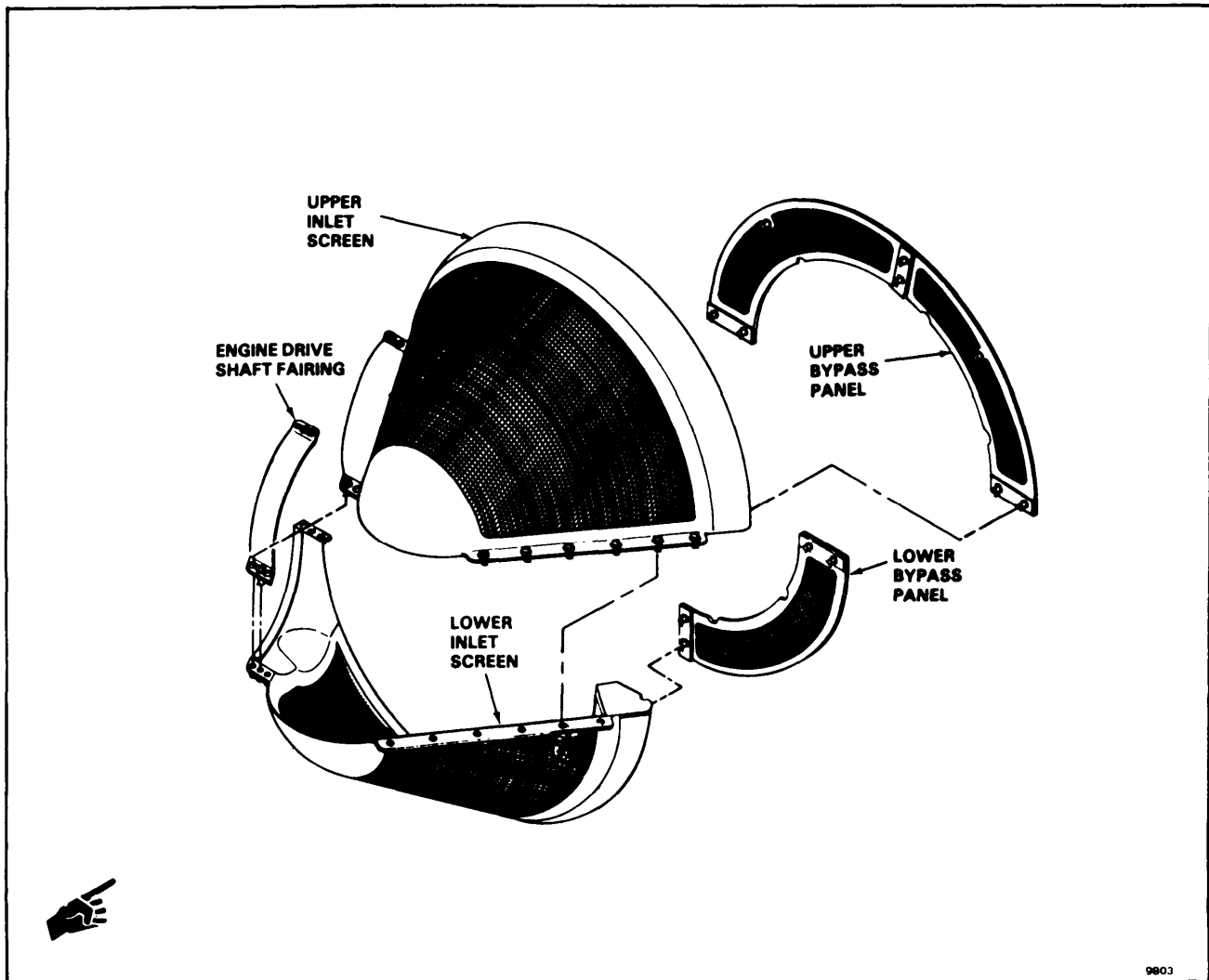
General Safety Instructions:

As Required

1. Burnish minor nicks, dents, or scratches on engine air inlet screen and bypass panels (Task 4-69).
2. Refinish repaired area (Task 2-6).
3. Replace Camloc fastener (TM 55-1500-204-25/1).

FOLLOW-ON MAINTENANCE:

As required.



4-68.1 REPLACE ENGINE SCREEN LATCH ASSEMBLIES

4-68.1

INITIAL SETUP

Applicable Configurations:

Tools:

Airframe Repairer's Tool Kit,
NSN 5180-00-323-4876

Materials:

Pencil (E271)
Adhesive (E27)
Gloves (E 186)

Parts:

Washers
Rivets

Personnel Required:

Aircraft Structural Repairer
Inspector

References:

TM 55-1520-240-23P
Task 2-317

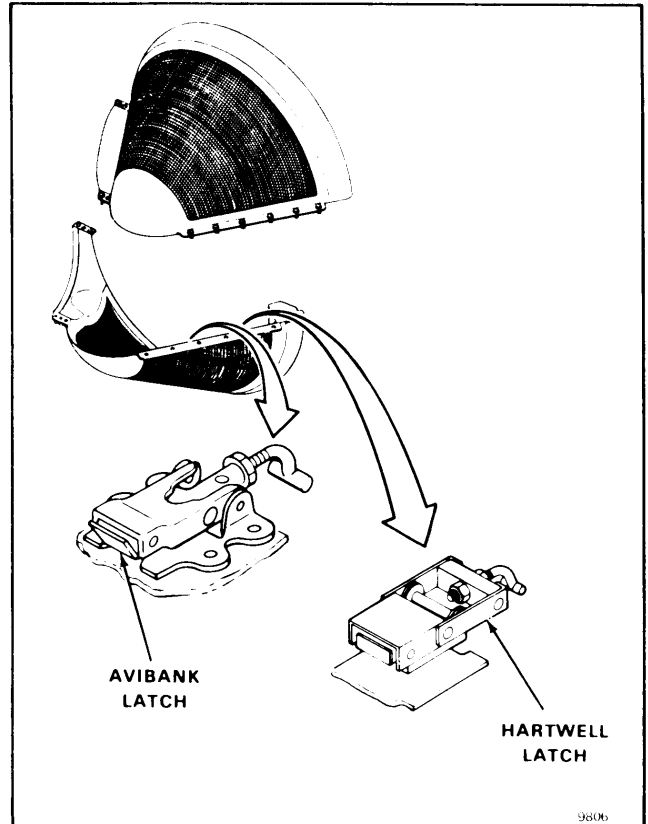
Equipment Condition:

Off Helicopter Task

General Safety Instructions:

WARNING

Adhesive (E27) 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.

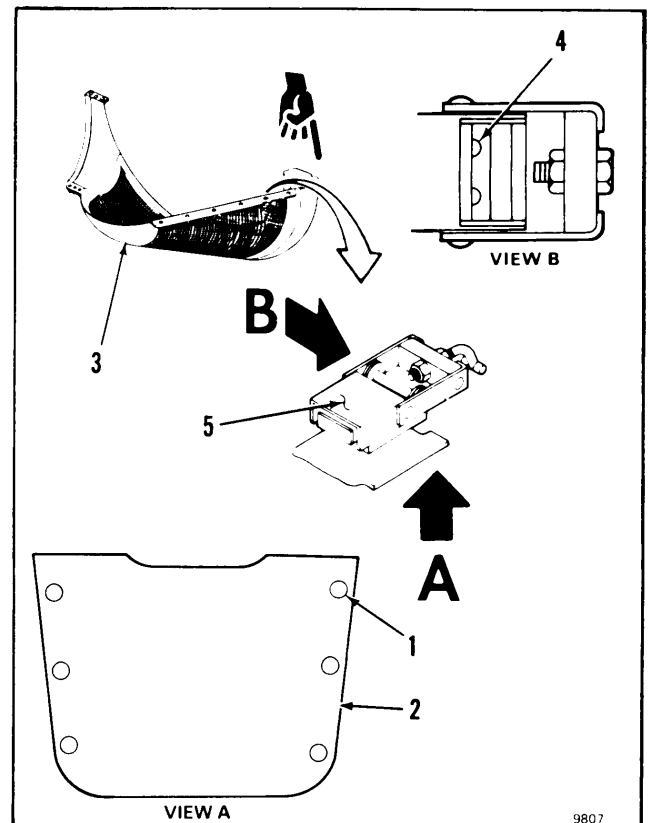


NOTE

Two types of latches (Avibank 9170 and Hartwell H976-7) are used on engine screens. When replacing latch assemblies, use only Avibank 9170 latches.

The engine screen assembly has five latches. Replacement is same for all.

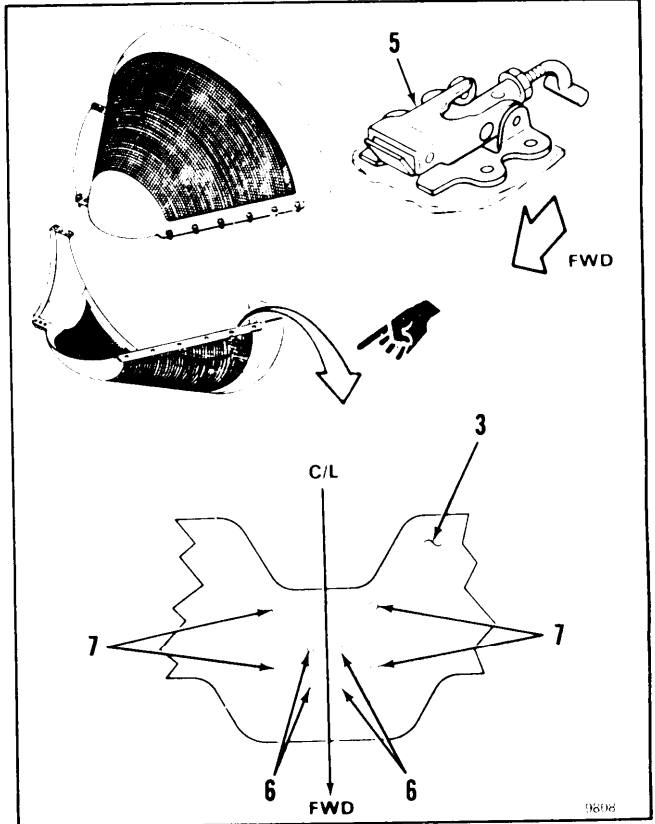
- 1 If Hartwell latch (5) is installed, drill out six rivets (1) which attach pad (2). Remove pad from screen (3). If Avibank latch is installed, go to step 7.
- 2 Drill out four rivets (4) securing latch (5). Remove latch.



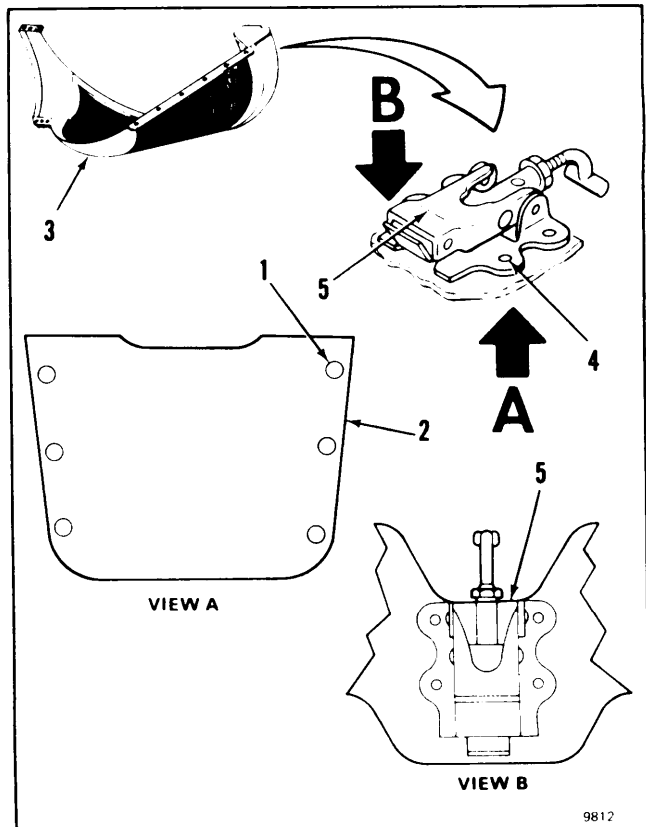
GO TO NEXT PAGE

4-68.1 REPLACE ENGINE SCREEN LATCH ASSEMBLIES (Continued) 4-68.1

3. To prepare holes for Avibank installation, mark centerline between Hartwell holes (6) to rear edge of screen (3). Use pencil (E271).
4. Position new Avibank latch (5) centered on mark drawn in step 3 and flush with rear edge of screen (3).
5. Mark new latch (5) hole positions. Use pencil (E271). Remove latch.
6. Drill four holes (7) through marks drawn in step 5. Countersink holes on underside of screen (3).



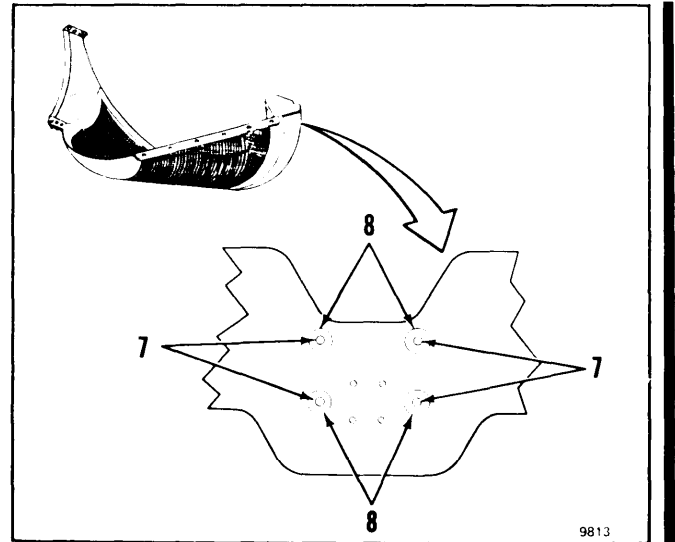
7. If replacing an Avibank latch, drill out six rivets (1) from pad (2) on screen (3). Remove pad.
- 8 Drill out four rivets (4) which attach latch (5). Remove latch.



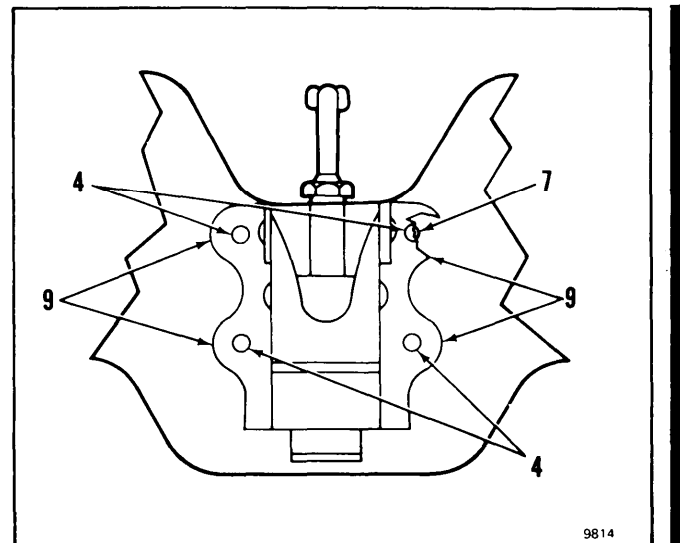
GO TO NEXT PAGE

4-68.1 REPLACE ENGINE SCREEN LATCH ASSEMBLIES (Continued) 4-68.1

9. Prepare adhesive (E27) (Task 2-317).
- 10 If any washers (8) are loose or missing, do step 11. If not, go to step 12.
11. Apply adhesive (E27) to one side of four washers (8). Install washers over holes (7).



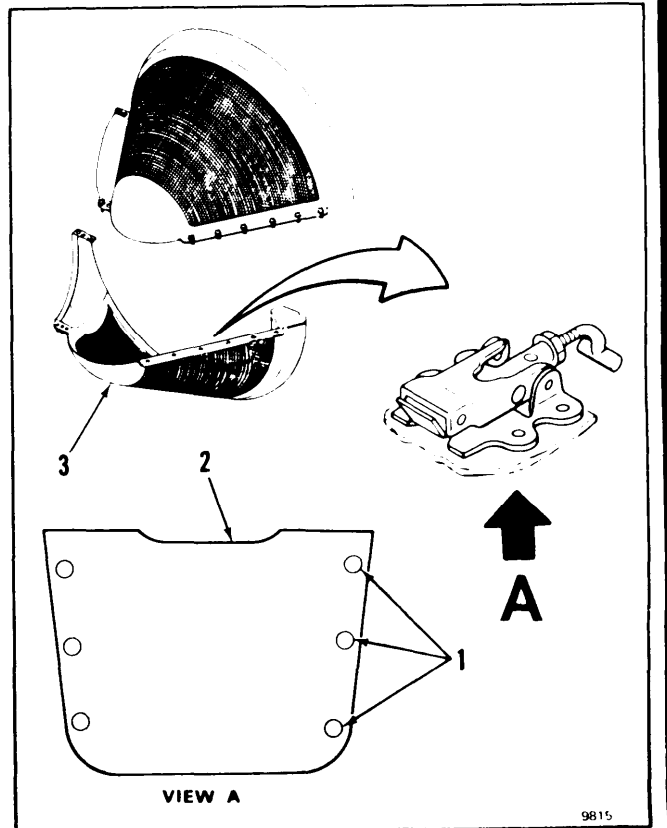
- 12 Apply adhesive (E27) to bottom of latch mounting flanges (9).
- 13 Position latch flanges (9) over holes (7) and install four rivets (4). Apply adhesive to heads of rivets.
14. Remove excess adhesive (E27), Leave a fillet around flanges (9).



GO TO NEXT PAGE

4-68.1 REPLACE ENGINE SCREEN LATCH ASSEMBLIES (Continued) 4-68.1

15. Position serviceable pad (2) on screen (3) and install with six rivets (1). Apply adhesive to heads of rivets (Task 2-3 17). Allow adhesive to cure.



FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-170.4 Change 5

4-68.2 REPLACE ENGINE SCREEN ACCESS DOOR LATCHES

4-68.2

INITIAL SETUP

Applicable Configurations:

All

Tools:

Airframe Repairer's Tool Kit,
NSN 5180-00-323-4876

Materials:

Adhesive (E27)

Parts:

Rivets
Cable
Ferrule (2)
Eyelet (Appendix E-46)
Latch (Appendix E-47)
Clip (Appendix E-48)

Personnel Required:

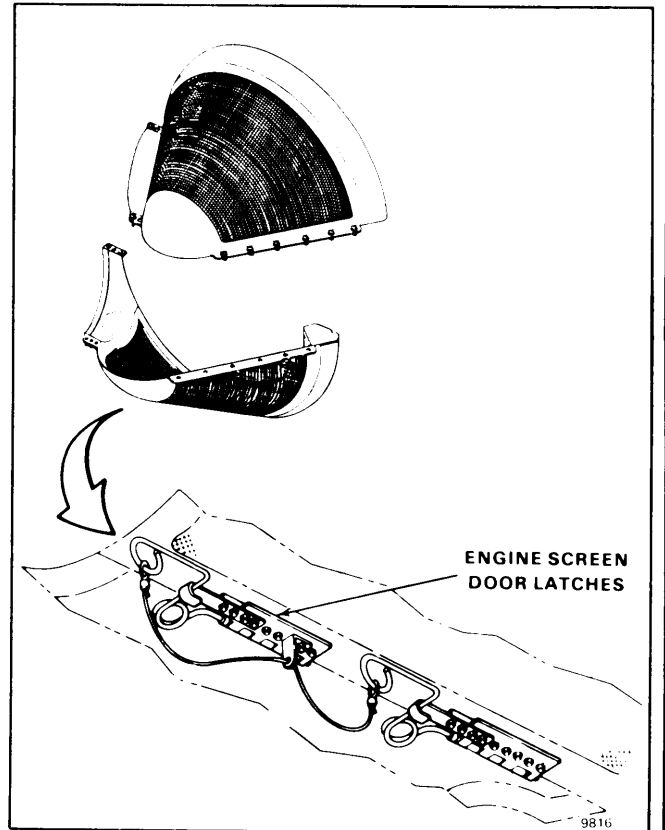
Aircraft Structural Repairer
Inspector

References:

Appendix E
TM 55-1520-240-23P
Task 2-317

Equipment Condition:

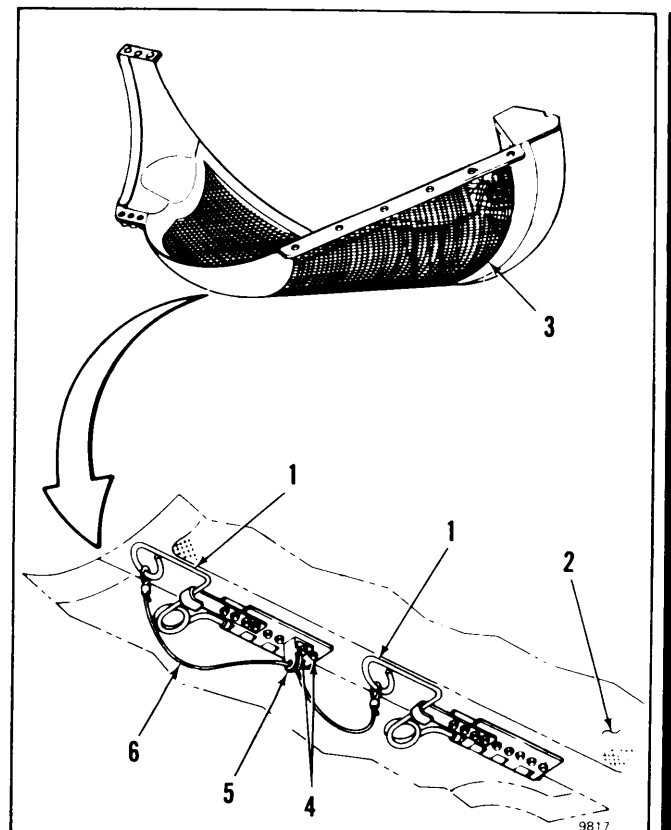
Off Helicopter Task

**NOTE**

Procedure is same to repair latches in RH or LH screens. Repair of LH screen is shown.

REPLACE EYELET

1. Disengage latch pins (1) and open access panel (2) on screen (3).
2. Drill out two rivets (4) from eyelet (5). Remove eyelet.
3. Cut and remove latch cable (6).
4. Position new eyelet (5) on screen (3). Install two rivets (4).
5. Go to step 17.



GO TO NEXT PAGE

4-68.2 REPLACE ENGINE SCREEN ACCESS DOOR LATCHES (Continued)

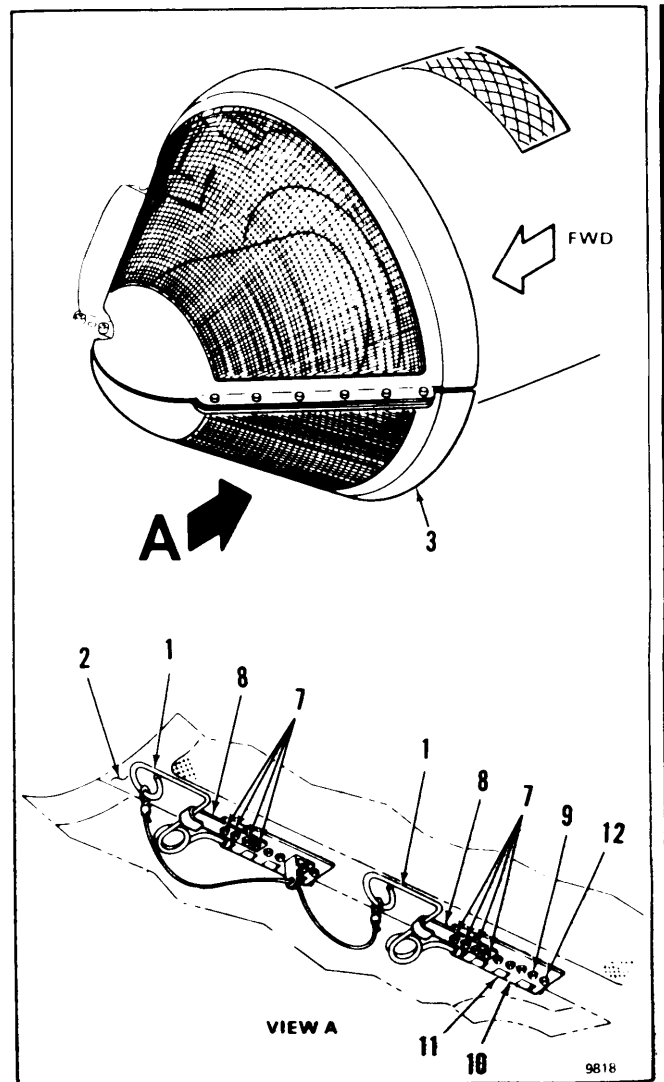
4-68.2

REPLACE CLIP

6. Disengage latch pins (1) and **open access door (2) on screen (3).**
7. **Drill out four rivets (7) and remove clip (8).**
8. **Position new clip (8) on screen (3) and install four rivets (7).**
9. **Go to Follow-on Maintenance.**

REPLACE LATCH

10. **Do steps 1 thru 3 and 7.**
11. Drill out remaining rivets (9) and remove latch (10).
12. **Position new latch (10) on screen (3)** so it aligns and engages mating latch (11).
13. **Install new latch (10) with rivets (9).** Place washer (12) under rivet heads.
14. Repeat steps 4 and 8.
15. Go to step 7.



GO TO NEXT PAGE

4-178.6 Change 5

4-68.2 REPLACE ENGINE SCREEN ACCESS DOOR LATCHES (Continued)

4-68.2

REPLACE LATCH CABLES AND PINS

- 16 Cut cable (6) and remove from latch pins (1) and eyelet (5)
- 17 Replace pins (1), as required
- 18 Cut new cable (6) to 13.31 inches
- 19 Thread new cable (6) thru eyelet (5) and pass each end (13) through new ferrule (14).
- 20 Thread cable ends (13) thru pin loops (15) and back thru ferrules (14).
- 21 Crimp ferrules (14)

INSPECT

WARNING

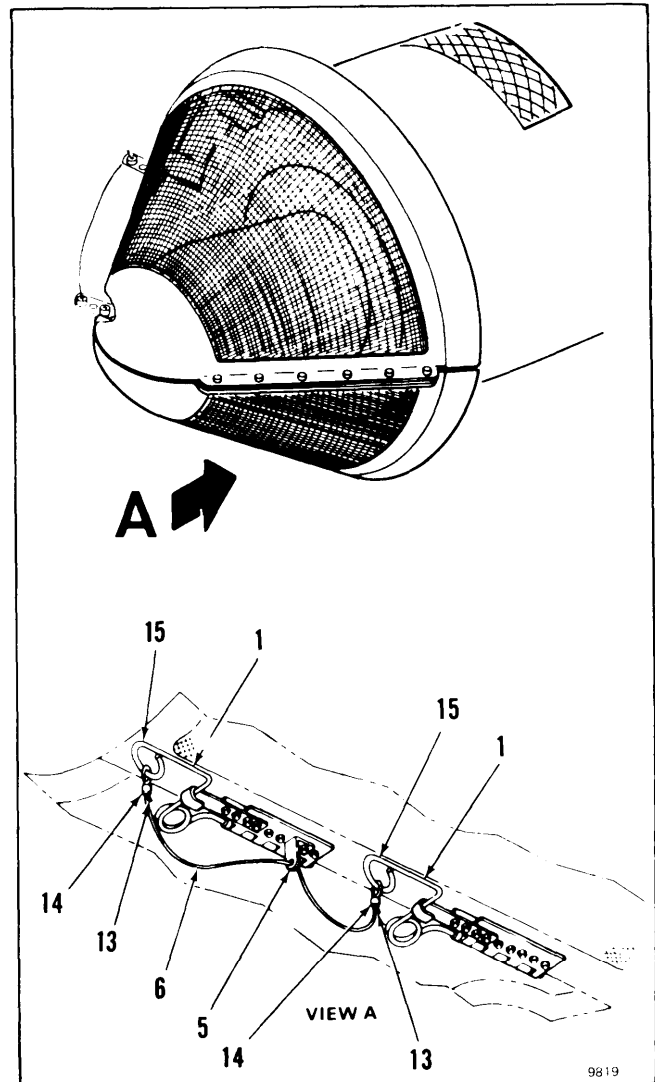
Adhesive (E27) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

- 22 Prepare adhesive (E27) (Task 2-317). Coat all rivet heads with adhesive. Allow adhesive to cure.

INSPECT

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

Adhesive (E58)

Solvent (E244)

Cloths (E 120)

Gloves (E 186)

Rubber, Sheet (E319)

personnel Required:

Aircraft Structural Repairer

Inspector

References:

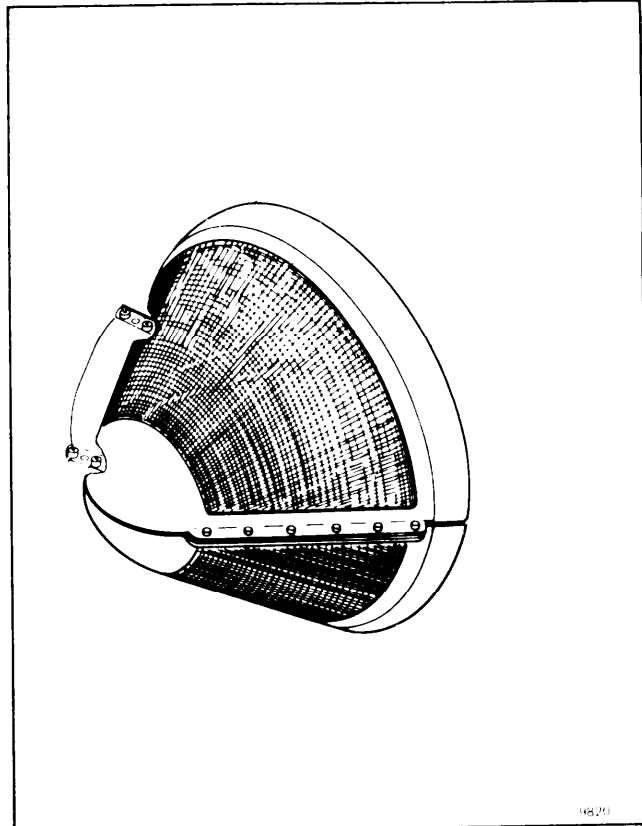
TM 55-1520-240-23P

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

Methyl-ethyl-ketone (E244) 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.



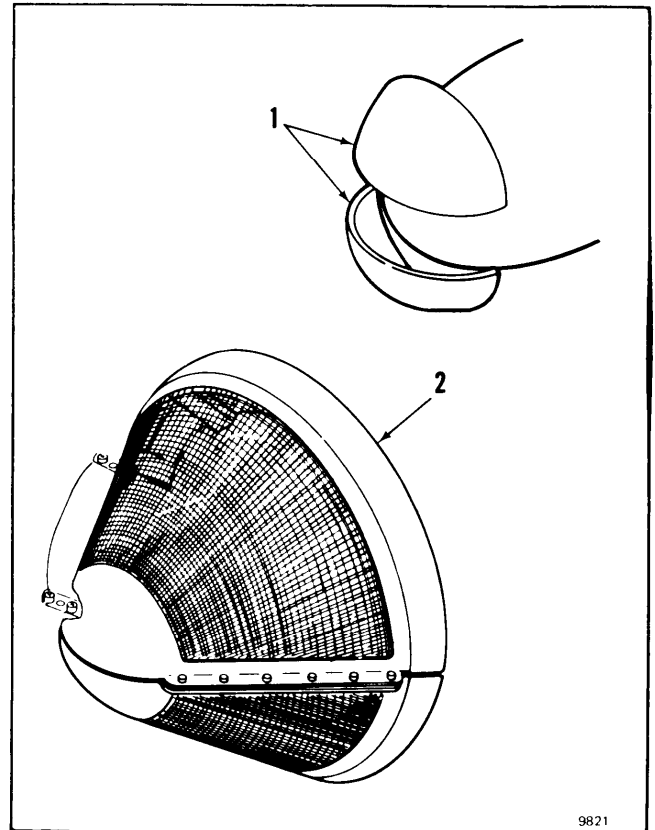
4-68.3 REPLACE ENGINE SCREEN CUSHIONS (Continued)

4-68.3

NOTE

Procedure is same for replacement of all engine screen rubber cushions. Replacement of nose cushion is shown here.

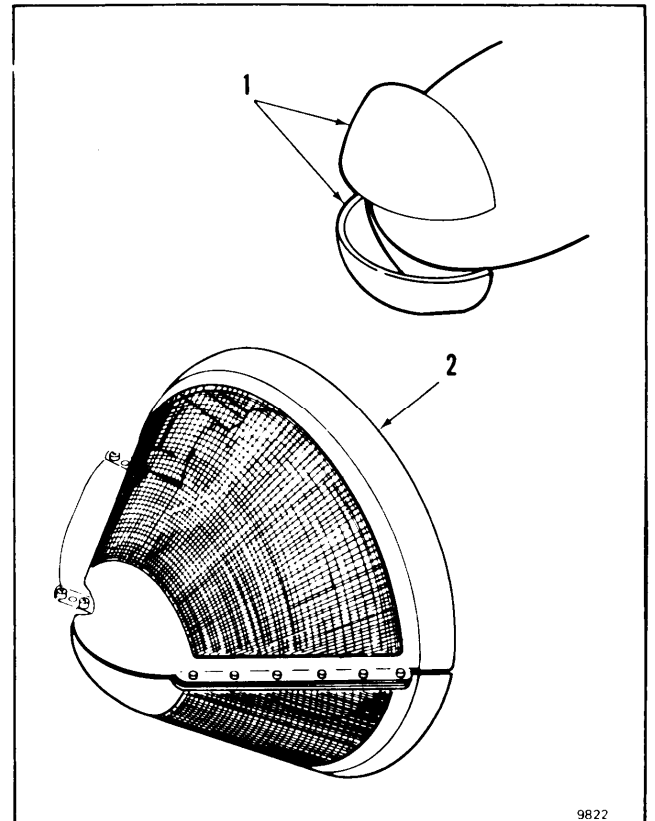
1. **Pull cushion (1) from screen (2).**
2. **Clean** surface of **screen (2)**. Use solvent (E244) and cloths (E 120). Wear gloves (E186).



3. Make new cushion (1) from rubber (E319).
4. Fit new cushion (1) to screen (2) and trim, as required.
5. Apply adhesive to cushion (1) and screen (2).
6. Immediately **install cushion (1)** on screen (2), with firm hand pressure.
7. Remove excess adhesive from cushion (1) and screen (2). Use solvent (E244) and cloths (E 120). Wear gloves (E186).

INSPECT**FOLLOW-ON MAINTENANCE:**

None

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

All

Tools:Airframe Repairer's Tool Kit,
NSN 5180-00-323-4876

AVIM Tool Set #2

Heat Lamp

Materials:

Adhesive (E43)

Dry Cleaning Solvent (E161)

Cloths (E 120)

Epoxy Topcoat (E 166)

Epoxy Primer (E292)

Abrasive Pad (E2)

Acetone (E20)

Temperature Indicating Strips (E413)

Personnel Required:

Aircraft Structural Repairer

Inspector

References:

TM 55-1520-240-23P

Task 2-317

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

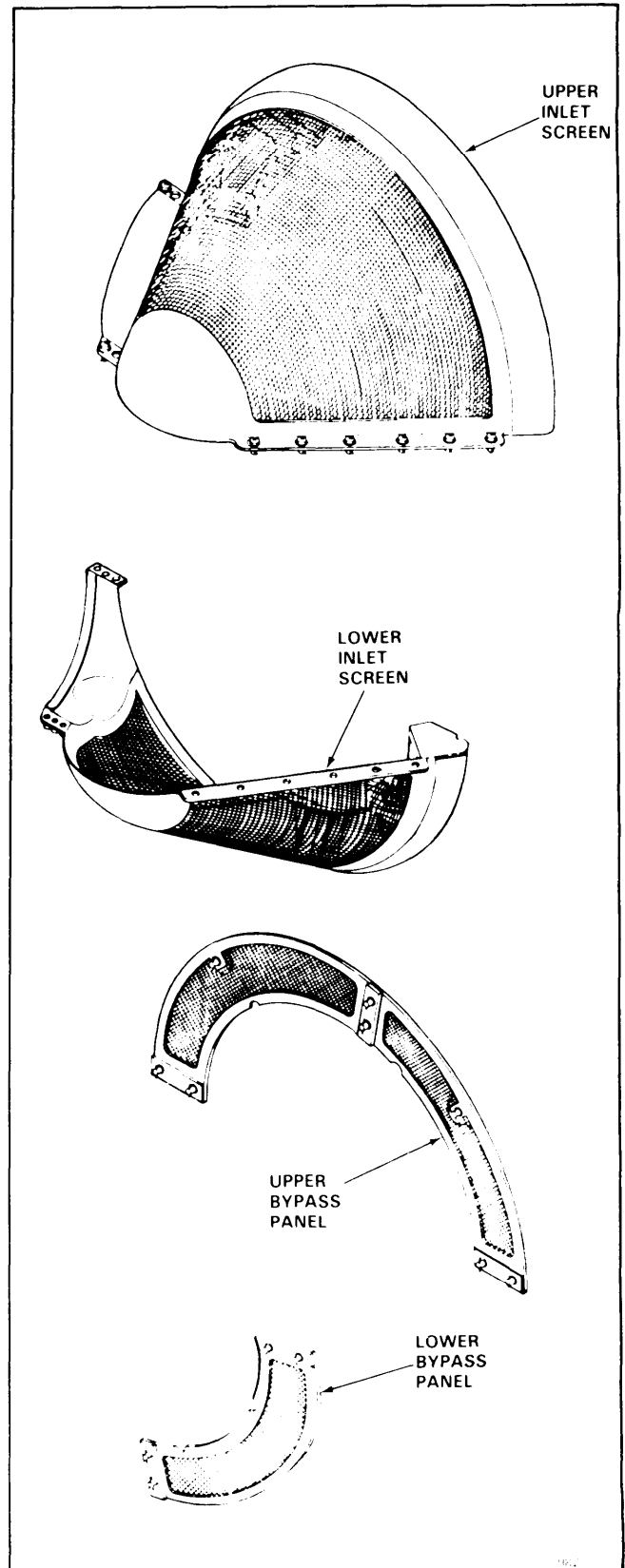
Methyl-ethyl-ketone (E244) is flammable. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

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

Epoxy primer (E292) 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

4-178.10 Change 5

4-68.4 REPLACE ENGINE SCREEN BYPASS PANEL FASTENERS (Continued)

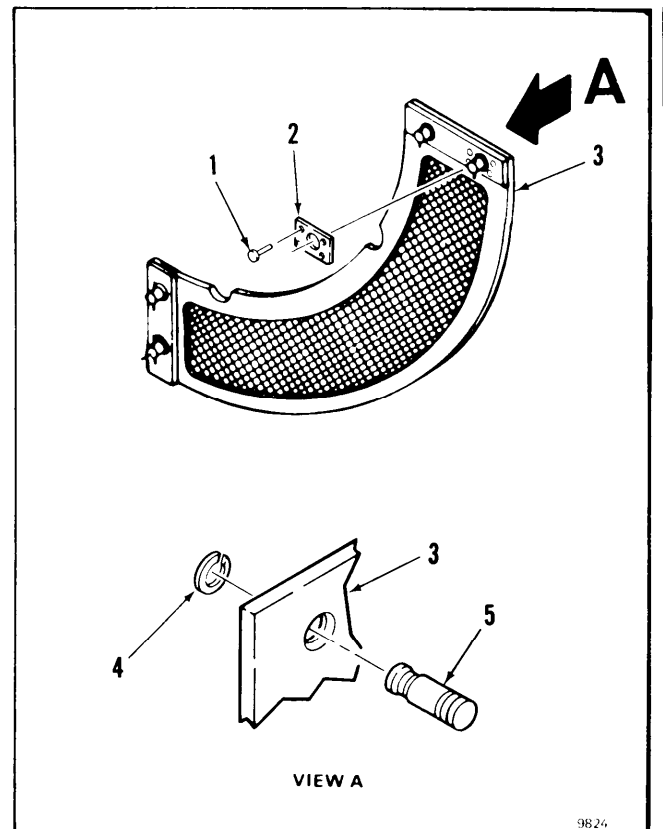
4-68.4

NOTE

Procedure is similar to remove Deutsch fastener from any screen. Removal from lower bypass panel and screen is shown.

REPLACE STUD

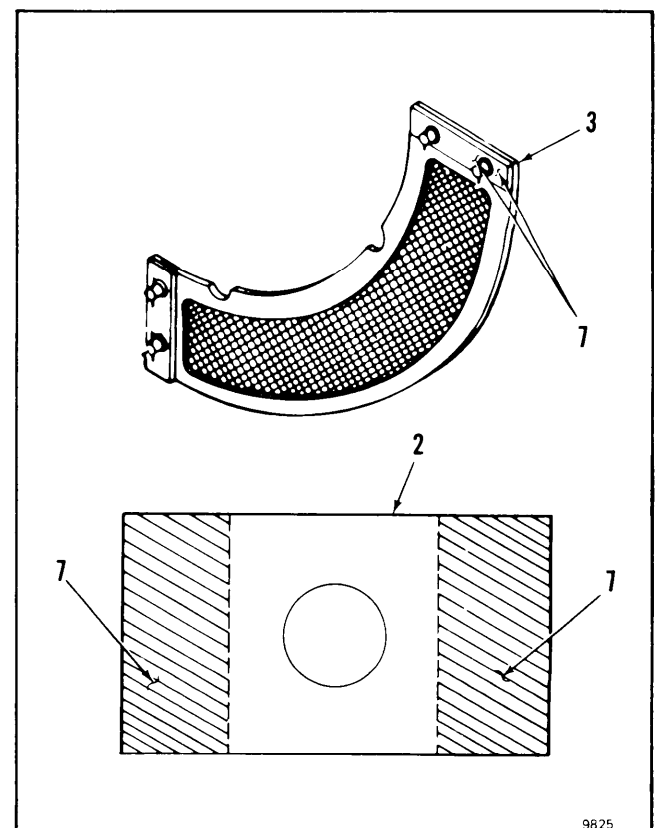
1. If installed, drill rivets (1) from retainer (2) and panel (3).
2. Heat retainer (2) to 140°F to 160°F (60°C to 71°C) and remove from panel (3). Use heat lamp. Monitor temperature with temperature indicating strips (E413).
3. Remove retaining ring (4) and stud (5) from panel (3).



WARNING

Acetone (E20) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. 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.

- 4 Remove epoxy finish from bonding surface (7) of retainer (2) and panel (3). Use acetone (E20) and abrasive pads (E2)
- 5 Clean bonding surfaces (7) on new retainer (2) and panel (3). Use cloths (E120) and solvent (E161).



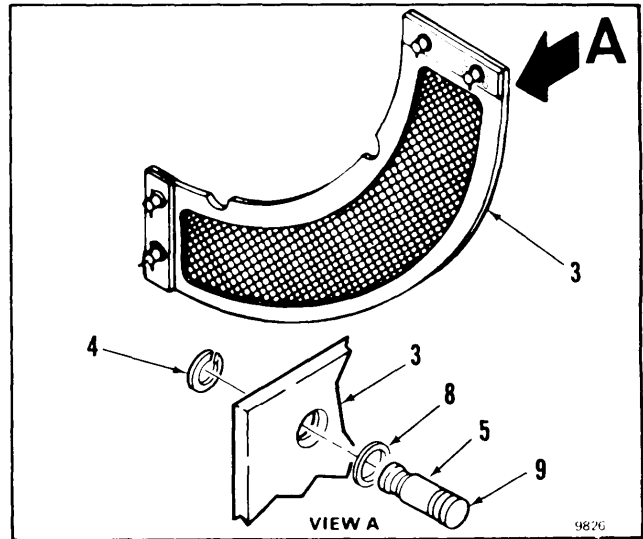
GO TO NEXT PAGE

**4-68.4 REPLACE ENGINE SCREEN BYPASS PANEL FASTENERS
(Continued)**

4-68.4

6. Insert new stud (5) in panel (3) with washer (8) under stud head (9).
7. Install retainer ring (4) on stud (5) on back side of panel (3).

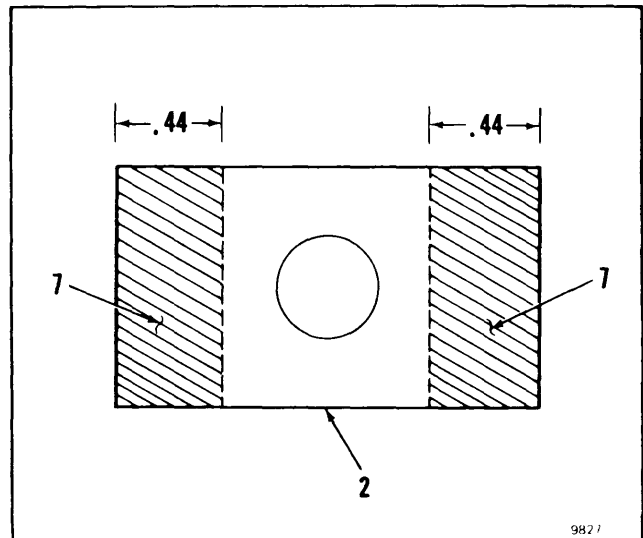
INSPECT



NOTE

Do not apply adhesive to panel.

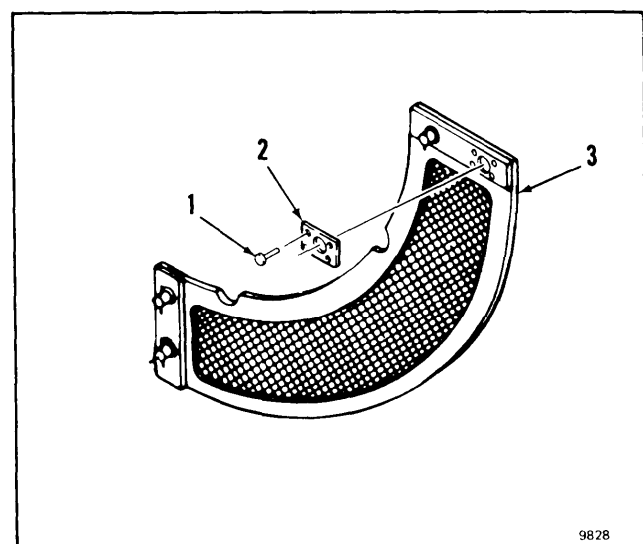
8. Prepare adhesive (Task 2-317). Apply light coat of adhesive to bonding surface (7) of retainer (2).



9. Position retainer (2) on panel (3). Align holes in retainer with holes in panel. Install four rivets (1). Allow adhesive to cure.

INSPECT

10. Apply primer (E292) and two coats of epoxy topcoat (E166).



GO TO NEXT PAGE

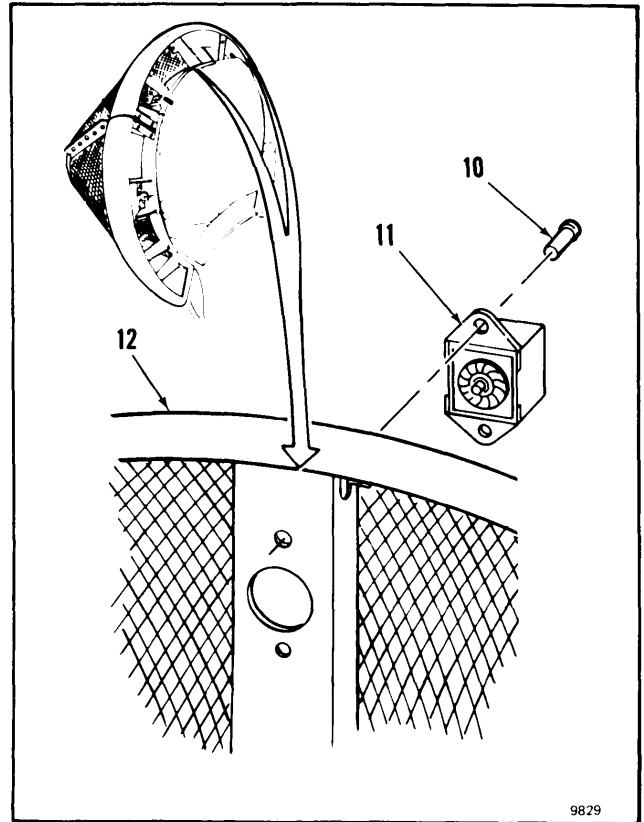
4-68.4 REPLACE ENGINE SCREEN BYPASS PANEL FASTENERS (Continued)

4-68.4

REPLACE RECEPTACLE

11. Drill out two rivets (10) securing receptacle (11) to screen (12). **Remove receptacle.**
12. **Remove adhesive residue and debris** from screen (12). Use solvent (E161) and cloths (E 120).
13. Position new receptacle (11) on screen (12). **Install receptacle on screen with two rivets (10).**
14. Mix adhesive (E43) (Task 2-317) and **apply adhesive to rivet heads (10).**
15. Allow adhesive to cure. **Apply** one coat of epoxy primer (E292) and two coats of epoxy topcoat (E166).

INSPECT



9829

FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

As Required

Personnel Required:

Aircraft Structural Repairer
Inspector

References:

AMS 5680
MIL-W-8611A
Task 2-349
Task 2-352
Task 2-367

Task 4-64
Task 4-65
Task 4-67
Task 4-68.1
Task 4-68.2
Task 4-68.3
Task 4-68.4
Task 4-76
TB 746-93-2
TM 55-1 500-204-25/

Equipment Condition:

Off Helicopter Task

General Safety Instructions:

As Required



Anytime a screen is damaged in different areas, and same strand of wire is impacted by those areas, care must be taken to make sure repairs secure the wire along its entire length across the screen.

NOTE

Aircraft with **40** have 0.020 fine mesh screen installed over 0.063 coarse mesh screen of the upper and lower engine inlet only.

1. Repair screen material as follows;
 - a. Remove screen assembly from engine. Refer to Tasks 4-64 and 4-65.
 - b. Before repairing screen material, make sure screen is cleaned (Task 4-66) and existing finish removed from affected area.
 - c. If fine mesh material on inlet screen is not badly abraded or opened, repair as follows:
 - (1) If abrasion of screen does not exceed half the thickness of the wire, sand the surfaces smooth and refinish the screen (Tasks 2-349 and 2-352).
 - (2) If only a few strands of screen are badly abraded or separated, tac weld (MIL-W-8611A) across the defect with 0.020, AMS 5680 wire.

- d. Proceed as follows if fine mesh screen is badly abraded, opened, or separated:

NOTE

- If screen was previously patched in area recently damaged, or repair requires overlapping an older repair with a new one, the new repair should encompass new and old areas with removal of the old patch.
- If numerous repairs have already been made to the screen, the screen assembly should be replaced.
 - (1) Cut out damaged area to form a square or rectangular hole, cutting each side of the hole along and on the damaged side of good strands of wire.
 - (2) Bend back strands from cut wires to first good cross strand along each side of the hole.
 - (3) Weld (MIL-W-8611A) the cut and bent back strands to the cross strands with 0.020, AMS 5680 wire.
 - (4) Prepare a patch of the same screen material slightly larger and same shape as hole.
 - (5) Remove strand(s) running along each side of the patch so as to free strands along those sides.

GO TO NEXT PAGE

4-69 REPAIR ENGINE AIR INLET SCREEN AND BYPASS PANELS—MAJOR REPAIRS (AVIM) (Continued)

4-69

- (6) Bend free strands down and place patch over hole with strands going through screen being repaired.
- (7) From other side of screen assembly, bend wires extending from patch around good wires of screen assembly.
- (8) Weld (MIL-W-8611A) bent strands from patch, to strands of screen assembly with 0.020, AMS 5680 wire.
- (9) After welding is completed, sand or grind away any rough surfaces.
- (10) Refinish screen (Tasks 2-349 and 2-352).
3. Repair impregnated glass cloth parts. (Refer to TM 55-1 500-204-25/1, TB 746-93-2 and Task 4-67.)
4. Repair rubber seals. (Refer to Task 2-367.)
5. Replace mounting latch assembly, including rubber pad. (Refer to Task 4-68.1.)
6. Replace access door latches. (Refer to Task 4-68.2).
7. Replace engine screen cushions. (Refer to Task 4-68.3.)
8. Replace engine screen bypass panel fasteners. (Refer to Task 4-68.4)

Replace air inlet screen or bypass panel when enough of the heavy mesh screen is broken away to allow objects to pass. (Refer to Tasks 4-67, 4-65 and 4-76.)

FOLLOW-ON MAINTENANCE:

As required.

END OF TASK

4-70 REMOVE ENGINE TRANSMISSION FAIRING

4-70

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

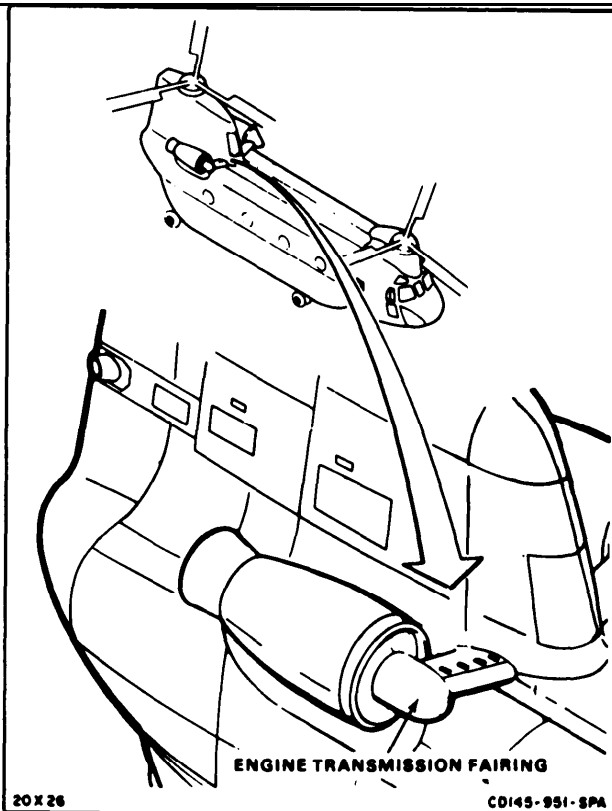
None

Personnel Required:

67U10 Medium Helicopter Repairer
67U30 Inspector

Equipment Condition:

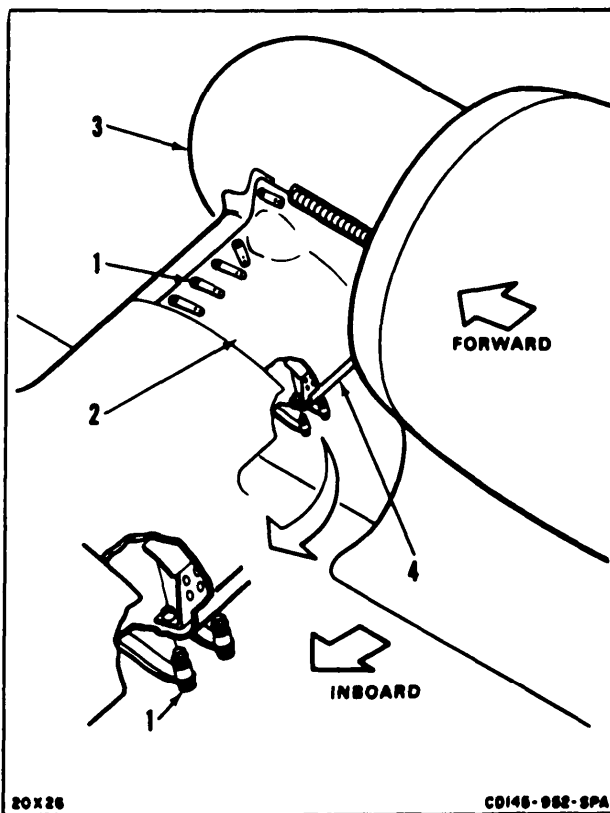
Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Air Bypass Panels Removed (Task 4-64)
Engine Air Inlet Screens Removed (Task 4-65)



NOTE

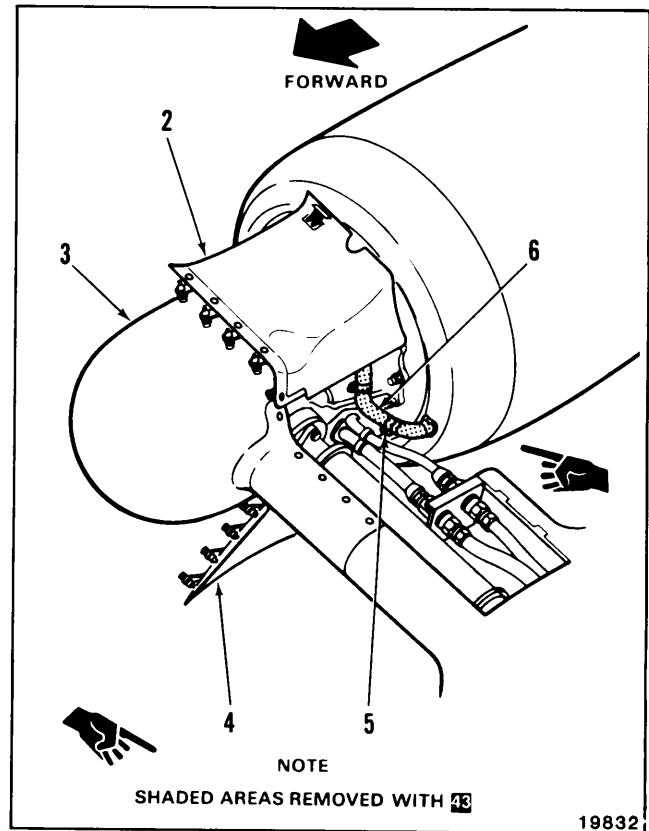
Procedure can be used to remove transmission fairing on No. 1 or No. 2 engine. Fairing on No. 2 engine is shown here.

1. Release five turnlock fasteners(1) on upper panel (2) of transmission fairing (3).
2. Release seven fasteners (1) on lower panel (4) of fairing (3).

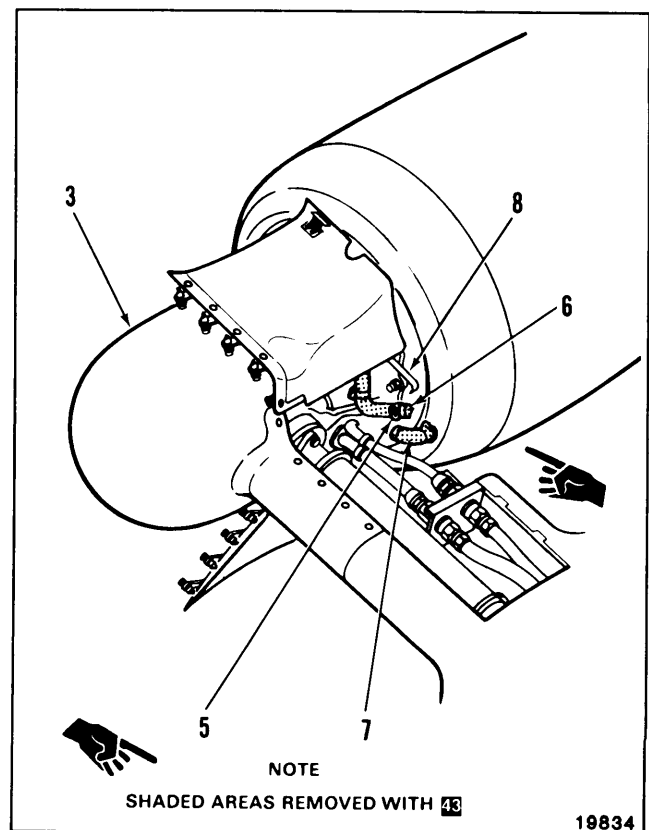


GO TO NEXT PAGE

3. Open upper panel (2) and lower panel (4) of fairing (3).
4. Loosen clamp (5) on anti-icing hose (6).



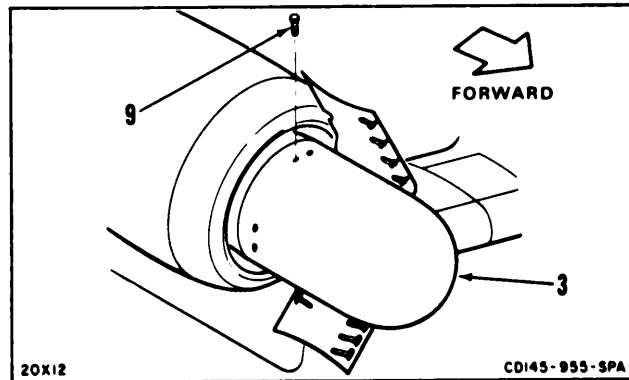
5. Disconnect hose (6) and clamp (5) from hot air outlet (7).
6. Remove retainer band (8) from fairing (3).



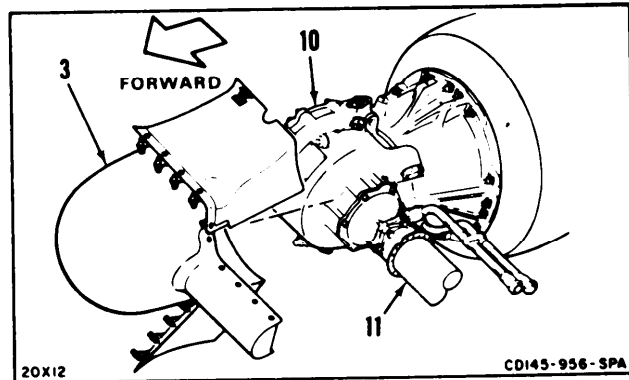
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4-70 REMOVE ENGINE TRANSMISSION FAIRING
(Continued)

7. Remove six bolts (9) from top, Side, and bottom of fairing (3)



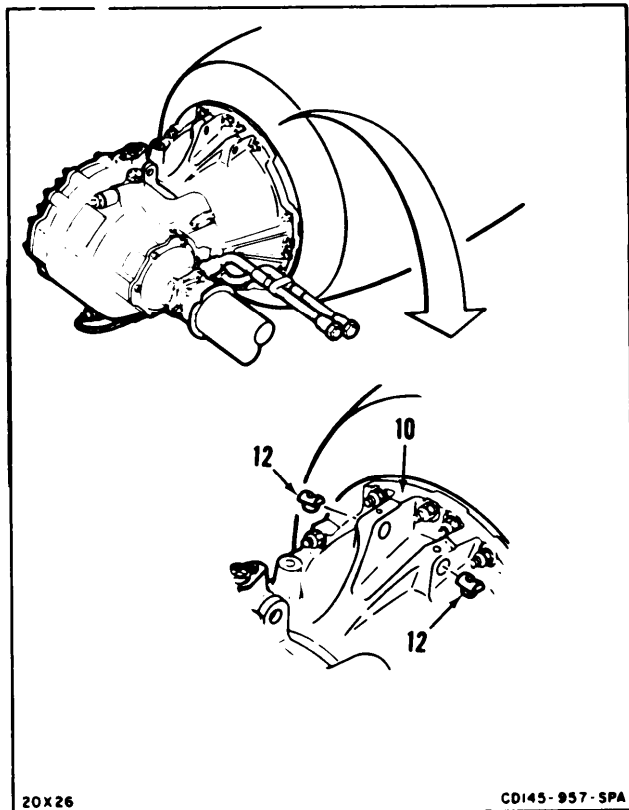
8. Move fairing (3) forward off transmission (10). Turn fairing as needed to clear engine shaft (11).



CAUTION

Do not operate engine with transmission fairing removed unless barrel nuts are removed from transmission. If engine is operated with barrel nuts installed, barrel nuts can loosen and lodge in engine.

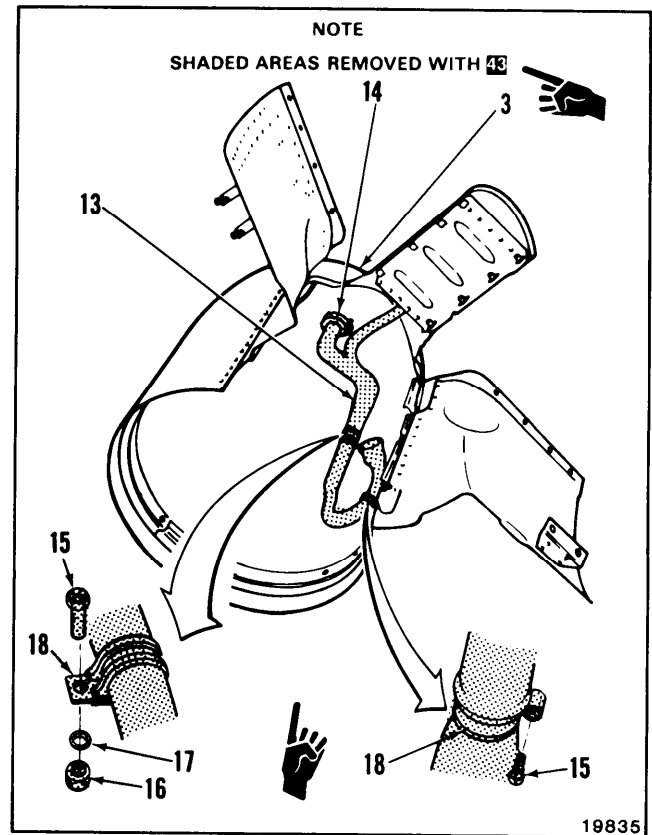
9. If engine is to be operated, remove six barrel nuts (12) from top, side, and bottom of transmission (10).



GO TO NEXT PAGE

4-70 REMOVE ENGINE TRANSMISSION FAIRING (Continued)**4-70**

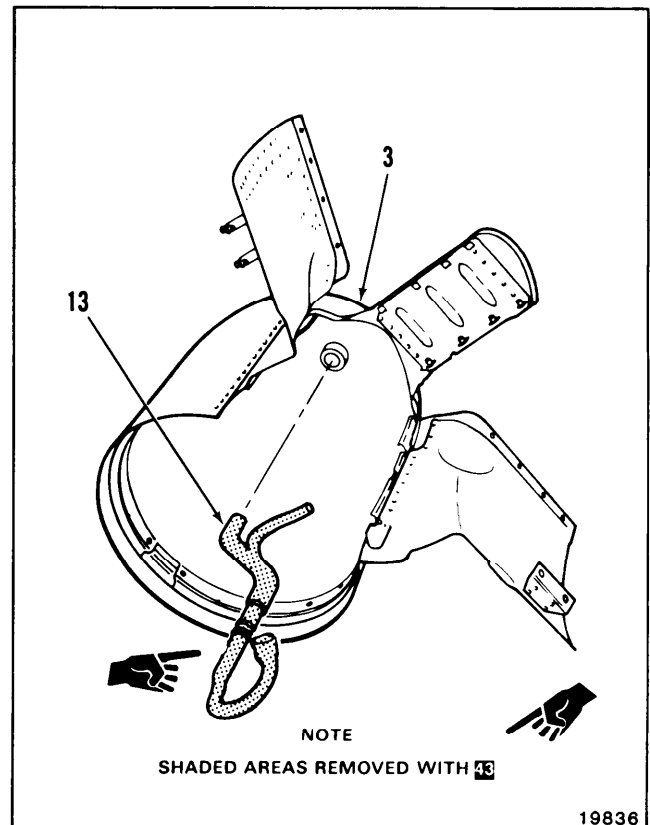
10. If a new fairing is to be installed, remove anti-icing duct (13) from fairing (3) as follows:
- Loosen clamp coupling (14).
 - Remove two screws (15), nut (16), washer (17) and two clamps (18).



- Remove anti-icing duct (13) from fairing (3).

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

INITIAL SETUP

Applicable Configurations:
All

Tools:
Airframe Repairer's Tool Kit
NSN 5180-00-323-4876

Materials:
As Required

Personnel Required:
Aircraft Structural Repairer
Inspector

Reference:
TM 55-1500-204-25/1
TM 43-0105

Equipment Condition:
As Required

General Safety Instructions:
As Required

1. Engine transmission fairing consists of bullet shaped shell and airfoil-shaped structures. Shell covers engine transmission. Airfoil shaped structure covers part of engine shaft between engine and combining transmissions. Both fairing sections contain anti-icing air ducts.
2. Check that damage such as cracks, dents, and scratches is no closer than 3/4 inch from any fastener.
3. Stop drill small cracks (TM 55-1500-204-25/1).
4. Remove dents and scratches by burnishing (TM 55-1500-204-25/1).

NOTE

Once as engine transmission fairing has been drilled, the fairing will be limited to installation on the side of the aircraft where the holes will be on the bottom of the fairing.

5. if evidence of corrosion or fluids pooling in the lower part of the engine transmission fairing, drill one 1/8 inch hole directly forward of the engine transmission fairing stiffening ring and one 1/8 inch hole directly AFT of the engine transmission fairing stiffening ring.

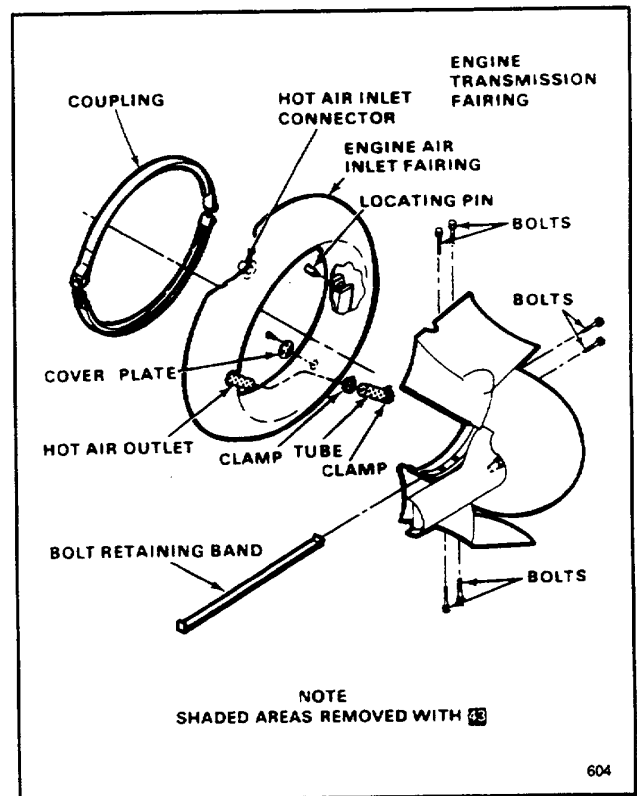
6. Refinish as required (TM 43-0105).

INSPECT

FOLLOW-ON MAINTENANCE:
As Required

END OF TASK

4-184 Change 17



4-72 REPAIR ENGINE TRANSMISSION FAIRING - MAJOR DAMAGE (AVIM)

4-72

INITIAL SETUP**Applicable Configurations:**

All

Tools:Airframe Repairer's Tool Kit
NSN 5180-00-323-4876**Materials:**

As Required

Personnel Required:Aircraft Structural Repairer
Inspector**References:**

TM 55-1500-204-25/1

TM 43-0105

Task 4-71

Task 2-6

Equipment Condition:

Off Helicopter Task

General Safety Instructions:As Required

1. Repair damage to engine transmission fairing that exceeds minor damage limits (Task 4-71). Damage may not exceed 50 percent of cross-section of part. (Task 4-71 and TM 55-1 500-204-25/1).
2. Refinish as required (Task 2-6 and TM 43-0105).
3. Replace engine transmission fairing parts if damage is more than 50 percent of cross section.

INSPECT**FOLLOW-ON MAINTENANCE:**

See Task 4-71 for modification of fairing for corrosion.

END OF TASK

Change 17 4-185

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

None

Personnel Required:

Medium Helicopter Repairer
Inspector

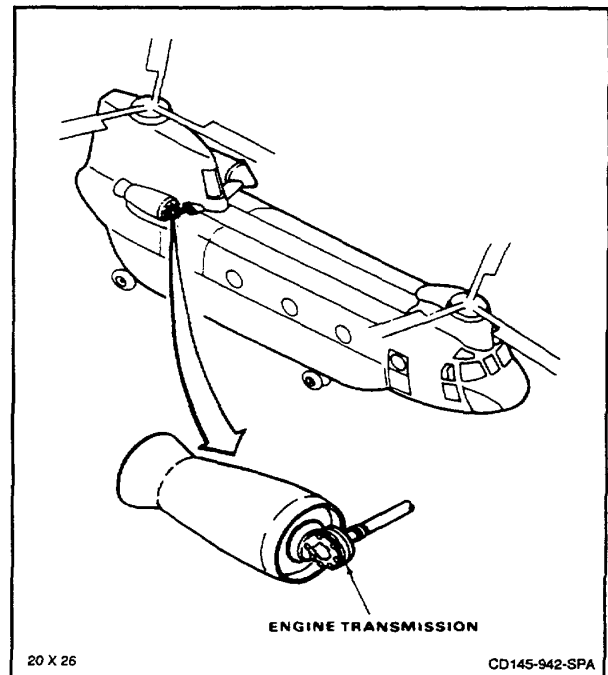
References:

TM 55-1520-240-23P

NOTE

Procedure can be used to install transmission fairing on No. 1 or No. 2 engine. Fairing on No. 2 engine is shown here.

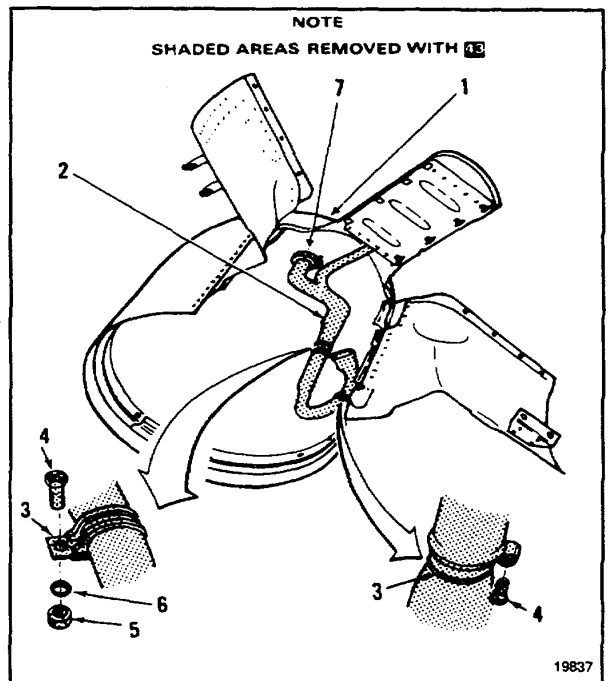
If fairing has been modified to add drain holes per Task 4-71, the fairing is limited to installation on the side of the aircraft where the holes will be on the bottom of the fairing.



1. If fairing (1) is being replaced, install antiicing duct (2) as follows:
 - a. Position duct (2) in fairing (1). Install clamps (3) with two screws (4), nut (5), and washer (6).
 - b. Tighten clamp coupling (7).
2. **Check fairing (1) and anti-icing duct (2).** There shall be no cracks, holes, or fraying. Make sure clamp (3) is tight.

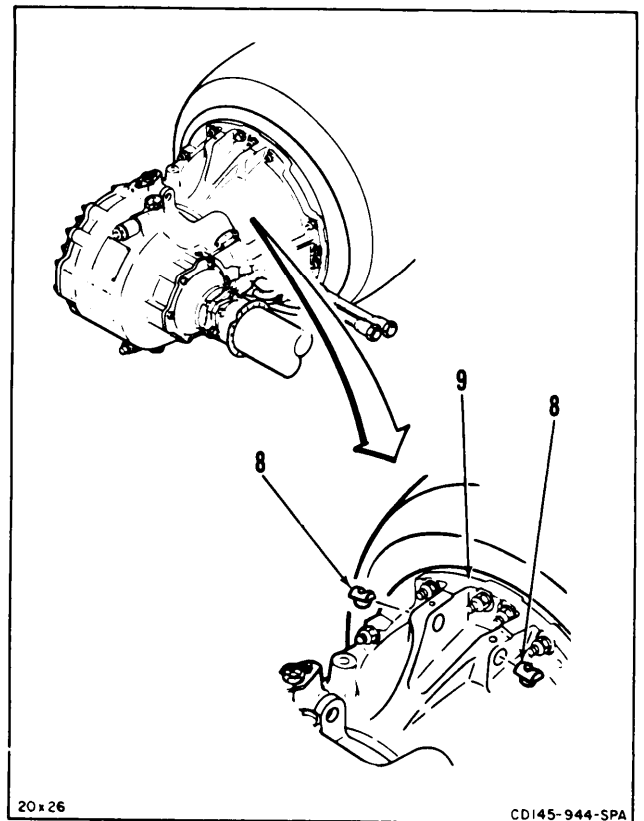
INSPECT

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3. If barrel nuts (8) were removed, install six barrel nuts in top, side, and bottom of transmission (9).

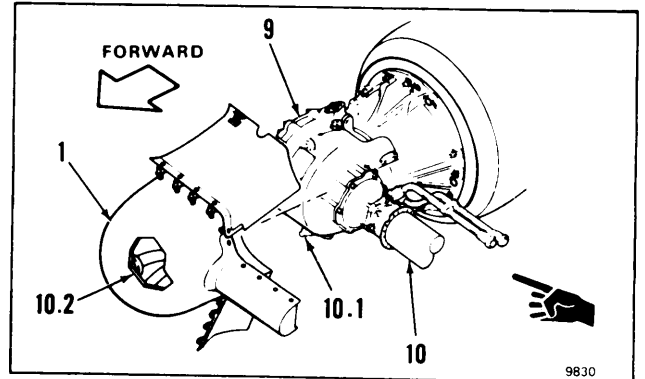
INSPECT



CAUTION

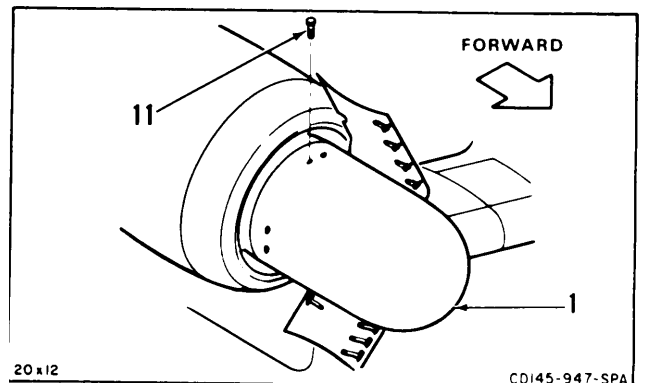
Handle fairing carefully to avoid damage to anti-icing duct.

4. Carefully position fairing (1) on transmission (9) so electrical connector (10.1) does not damage anti-icing duct (10.2) inside fairing. Turn fairing as needed to clear engine shaft (10).



5. Install six bolts (11) in top, side, and bottom of fairing (1).

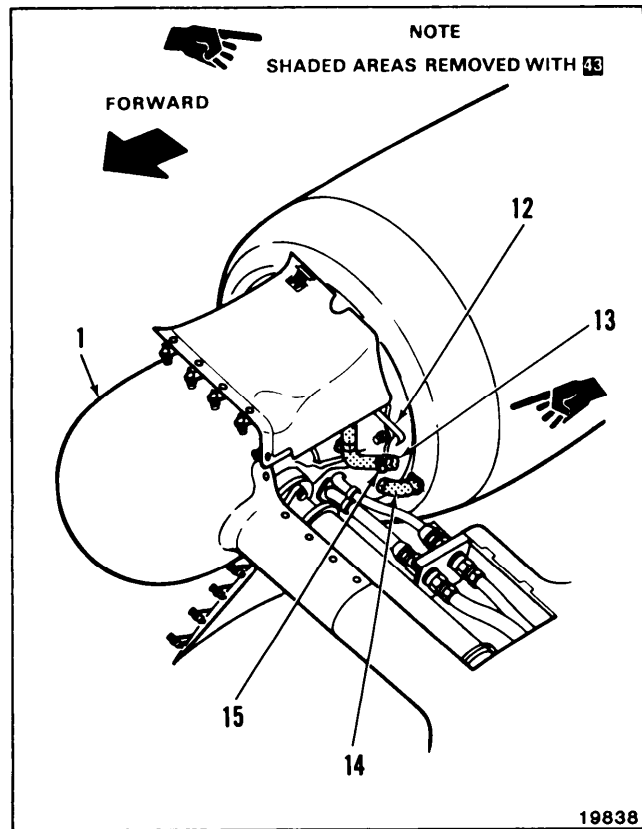
INSPECT



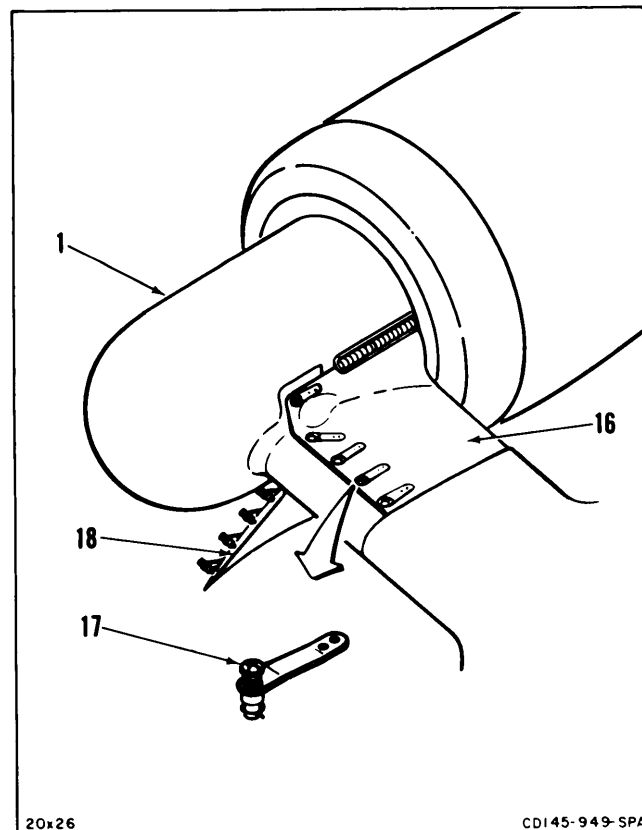
GO TO NEXT PAGE

- 6. Install retainer band (12) in fairing (1)
- 7. Connect anti-icing hose (13) to hot air outlet (14) with clamp (15).

INSPECT



- 8. Secure upper panel (16) to fairing (1) with five turnlock fasteners (17). There shall be no broken or loose fasteners.
- 9. Close lower panel (18).



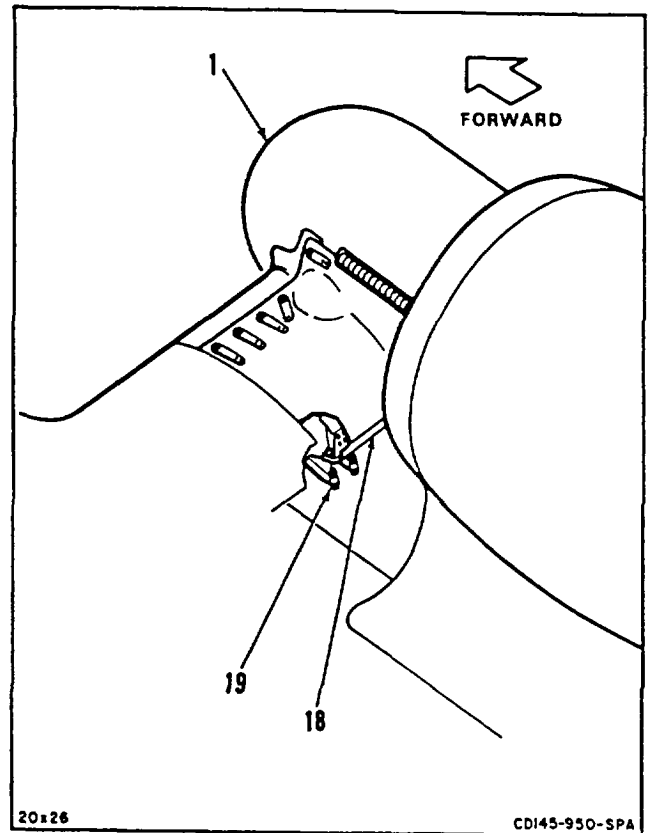
**4-73 INSTALL ENGINE TRANSMISSION FAIRING
(Continued)**

4-73

10. **Secure lower panel (18) to fairing (1)** with seven fasteners (19). There shall be no broken or loose fasteners.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Install air inlet screen assembly (Task 4-76).
- Install air bypass panels (Task 4-77).

**END OF TASK**

4-189

4-74 REMOVE ENGINE AIR INLET FAIRING

4-74

INITIAL SETUP**Applicable Configurations:**Without **74****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Sling (T134)
Hoist

Materials:

Paper Tags (E264)
Masking Tape (E388)

Personnel Required:

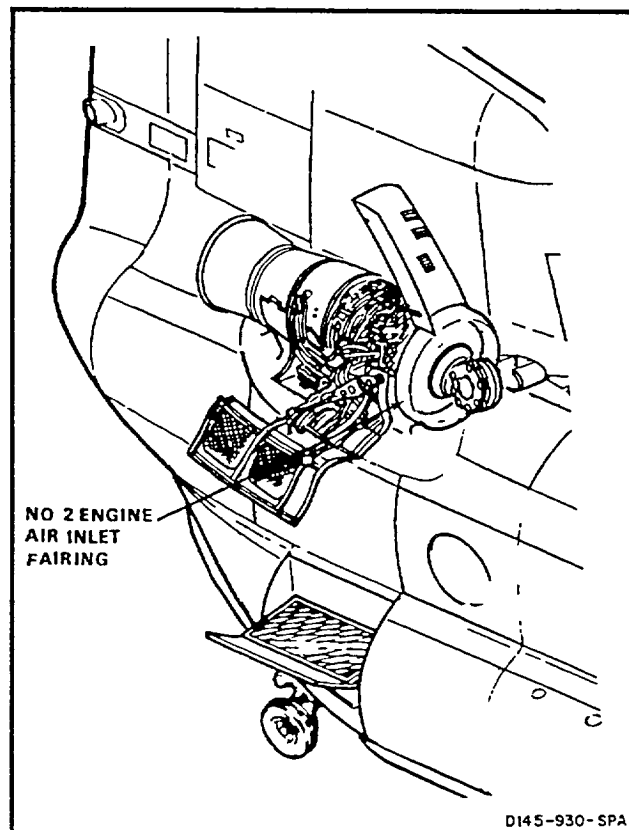
Medium Helicopter Repairer (2)

References:

Task 4-50

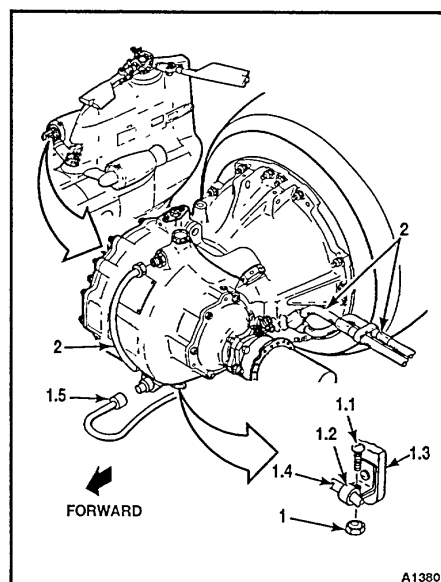
Equipment Condition:

Engine Work Platform Open (Task 2-2)
Engine Mount Adapter Removed (Task 4-29)
Engine Access Cover Open (Task 4-49)
Engine Air Inlet Screens Removed (Task 4-65)
Engine Transmission Fairing Removed (Task 4-70)
Engine Drive Shaft Removed (Task 6-30)

**NOTE**

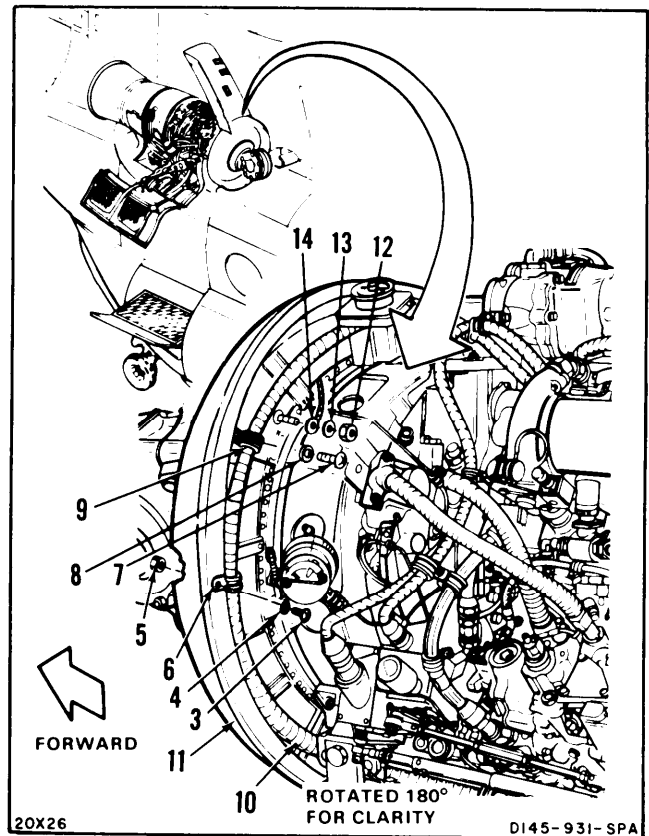
Procedure is same to remove No. 1 or No. 2 engine air inlet fairing. No. 2 fairing is shown here.

1. Remove nut (1) and screw (1.1) from clamp (1.2) at lower lifting lug (1.3). Release temperature and chip detector wire (1.4).
- 1.1. **Disconnect cable plug (1.5).**
2. Tag and **disconnect three hoses (2).** Use paper tags (E264).

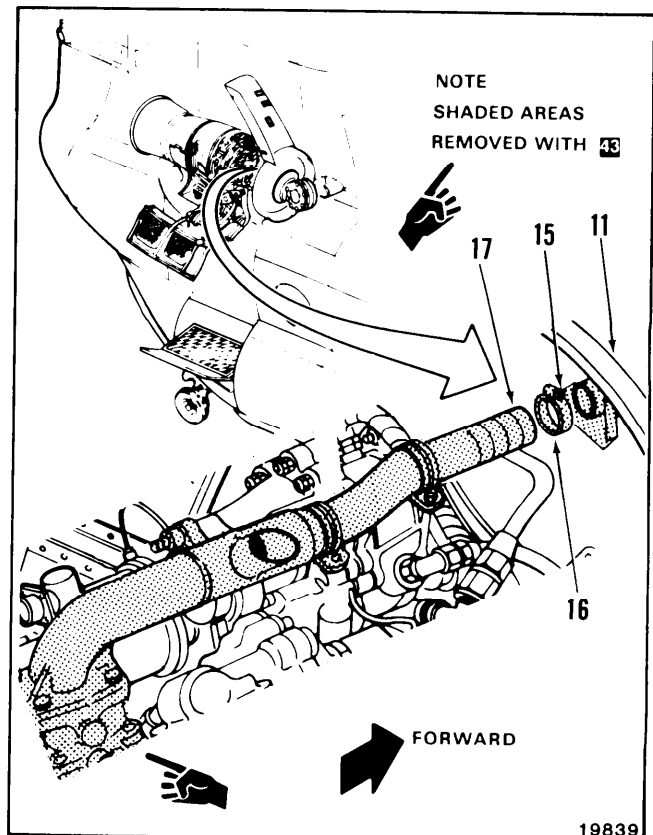


GO TO NEXT PAGE
4-190 Change 19

3. Remove screw (3), washer (4), and nut (5) from clamp (6). Remove screw (7) and washer (8) from clamp (9). **Move hose (10) away from fairing (11).**
4. **Remove nut (12) and washer (13).** Disconnect electrical lead (14) from fairing (11).

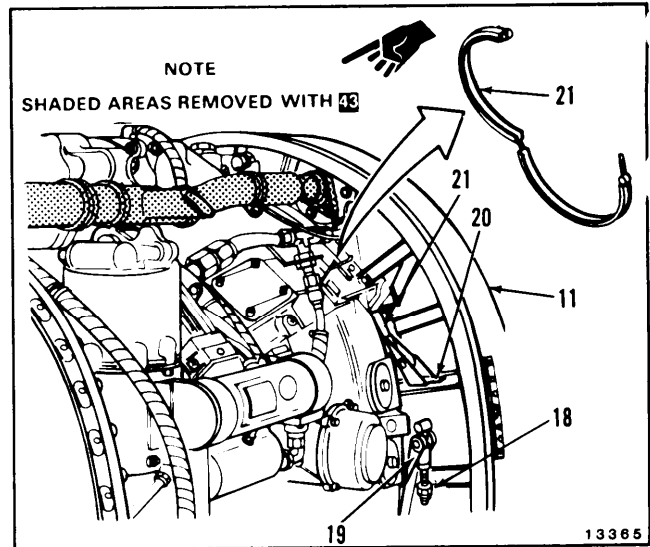


5. Loosen screw (15) on clamp (16). **Move hose (17) and clamp away from fairing (11).**

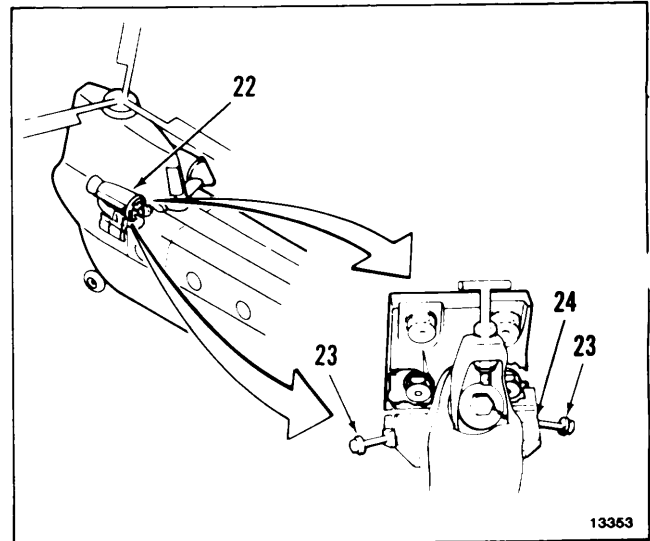


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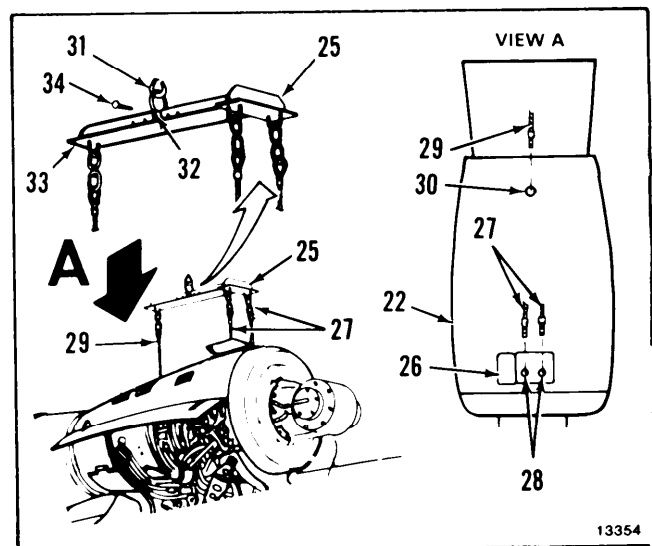
6. Loosen nut (18) on clamp (19) until lever (20) can be lifted to release coupling (21).
7. **Remove coupling (21) from fairing (11).**



8. Close engine upper access cover (22) (Task 4-50).
9. Remove lockwire from two bolts (23) on two forward engine mount caps (24). **Loosen bolts and push down to side.**



10. **Install sling (25) as follows:**
 - a. Open access door (26) in engine access cover (22).
 - b. Connect two cables (27) to forward fittings (28).
 - c. Connect cable (29) into aft fitting (30) through cover (22).
 - d. Adjust sling (25) until eye (31) is over center hole (32) in sling bar (33).
 - e. Install pin (34) through bar (33).



4-74 REMOVE ENGINE AIR INLET FAIRING (Continued)

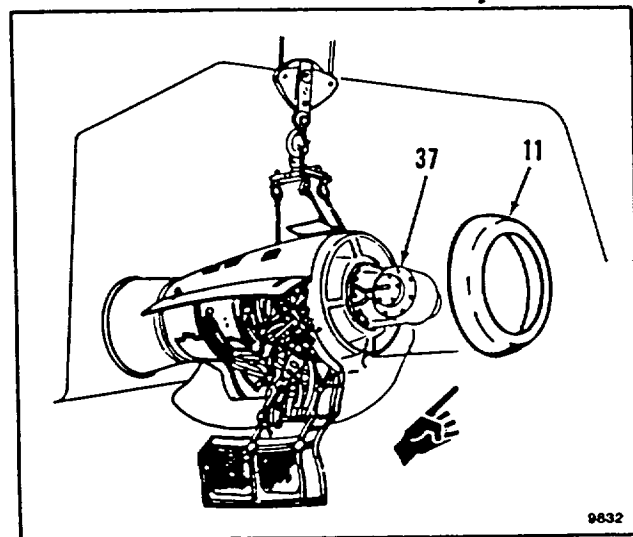
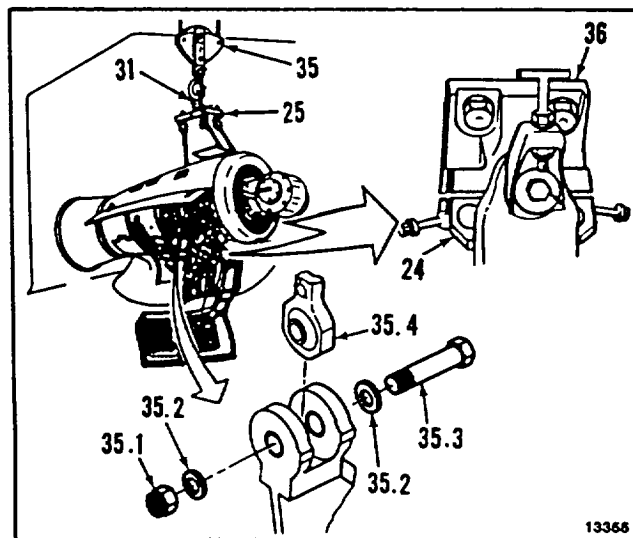
4-74

11. Connect hoist (35) to eye (31) of sling (25).
12. Raise hoist (35) slowly to remove slack from sling (25).
13. Remove nut (35.1), washers (35.2), and bolt (35.3) from lower end of aft engine mount link (35.4).

CAUTION

Do not lift powerplant more than **1 inch**. Connecting hoses and wires might be damaged.

14. Continue to raise hoist (35) slowly until forward adapters (36) are lifted about 1 inch above caps (24).
15. Move fairing (11) forward and off engine transmission (37).



FOLLOW-ON MAINTENANCE:
None

END OF TASK

Change 8 4-193

4-74.1 REMOVE ENGINE AIR INLET FAIRING

4-74.1

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Sling (T134)
Hoist

Materials:

Paper Tags (E264)
Masking Tape (E388)

Personnel Required:

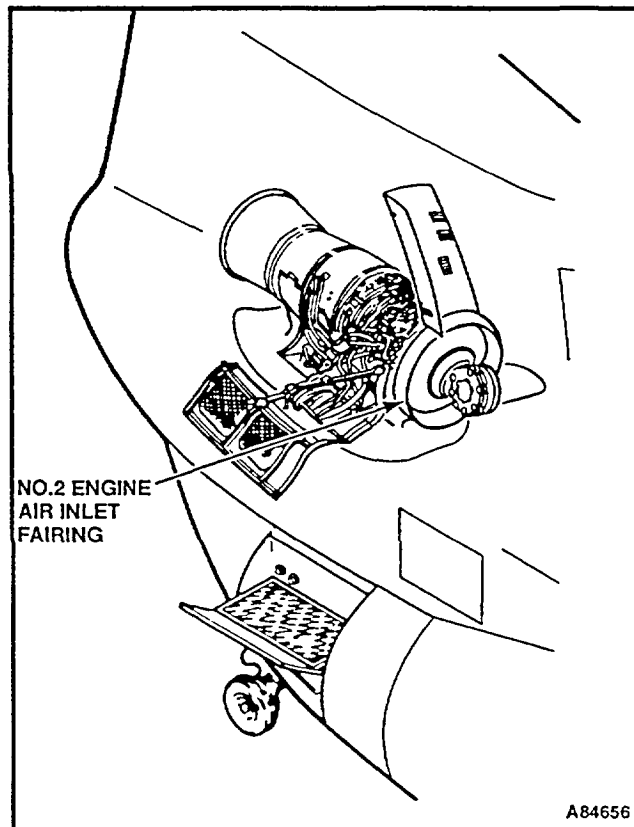
Medium Helicopter Repairer (3)

References:

Task 4-50

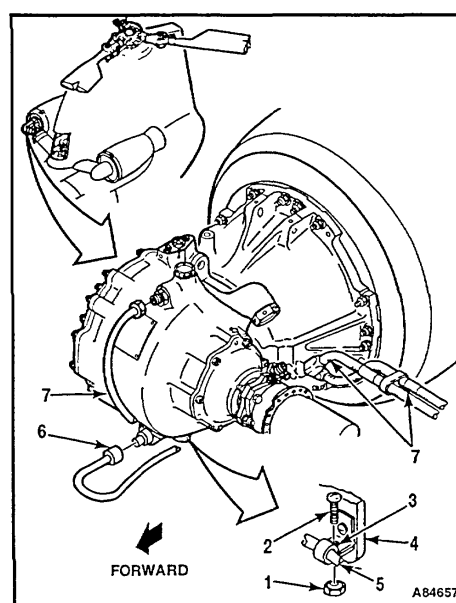
Equipment Condition:

Engine Work Platform Open (Task 2-2)
Engine Drive Shaft Removed (Task 6-30)
Remove Engine Mount Adapter (Task 4-29.1)
Engine Access Cover Open (Task 4-49)
Engine Air Inlet Screens Removed (Task 4-65)
Engine Transmission Fairing Removed
(Task 4-70)

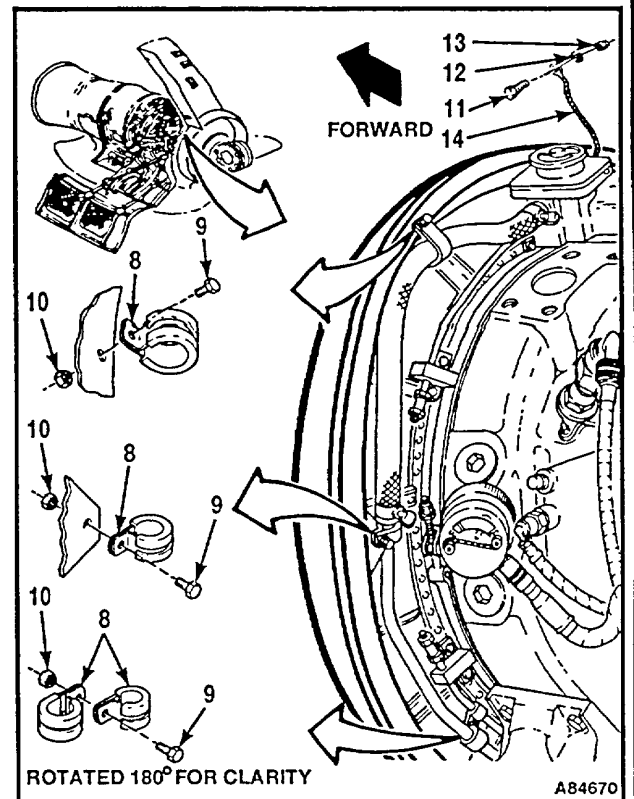
**NOTE**

Procedure is same to remove No. 1 or No. 2 engine air inlet fairing. No. 2 fairing is shown here.

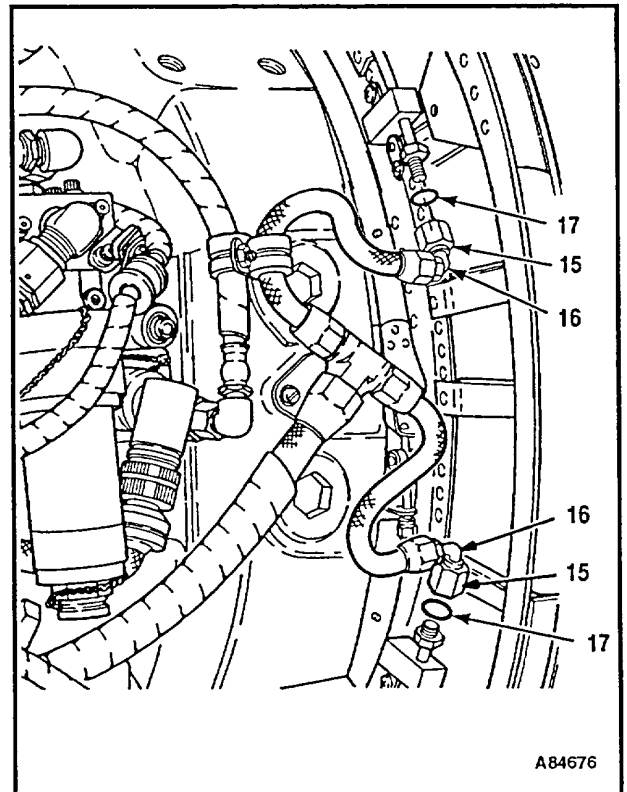
1. Remove nut (1) and screw (2) from clamp (3) at lower lifting lug (4). Release temperature and chip detector wire (5).
2. **Disconnect cable plug (6).**
3. Tag and **disconnect three hoses (7).** Use paper tags (E264).



4. Remove four clamps (8), secured by three screws (9) and nuts (10). Use masking tape (E388) to make clamp locations.
5. Remove screw (11), washer (12), and nut (13) from bonding wire (14).

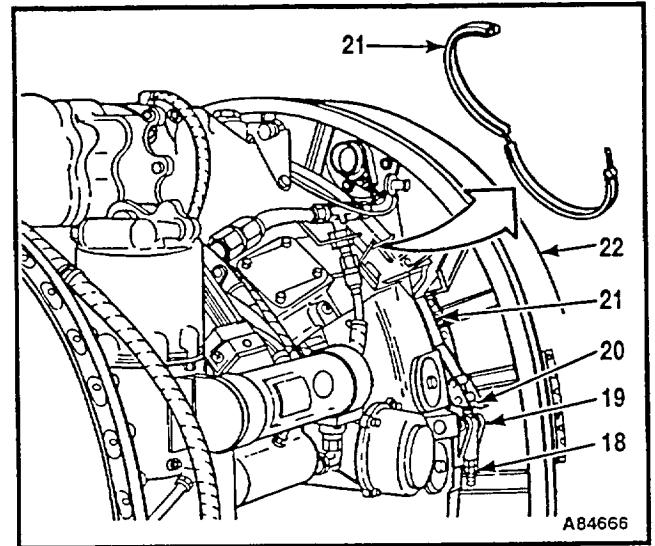


6. Disconnect two fittings (15) from water wash tubing (16).
7. Remove two packings (17) from two fittings (15). Discard packings (17).

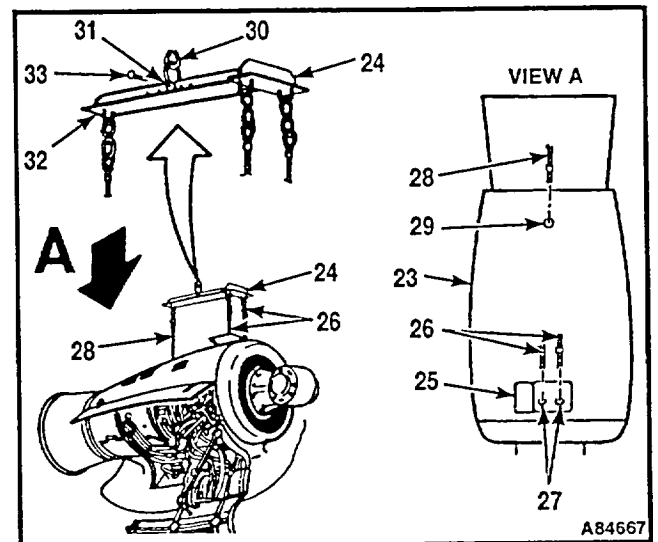


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7. Loosen nut (18) on clamp (19) until lever (20) can be lifted to release coupling (21).
8. **Remove coupling (21)** from fairing (22).



9. Close engine upper access cover (23) (Task 4-62).
10. **Install sling (24)** as follows:
 - a. Open access door (25) in engine access cover (23).
 - b. Connect two cables (26) to forward fittings (27)
 - c. Connect cable (28) into aft fitting (29) through cover (23).
 - d. Adjust sling (24) until eye (30) is over center hole (31) in sling bar (32).
 - e. Install pin (33) through bar (32).



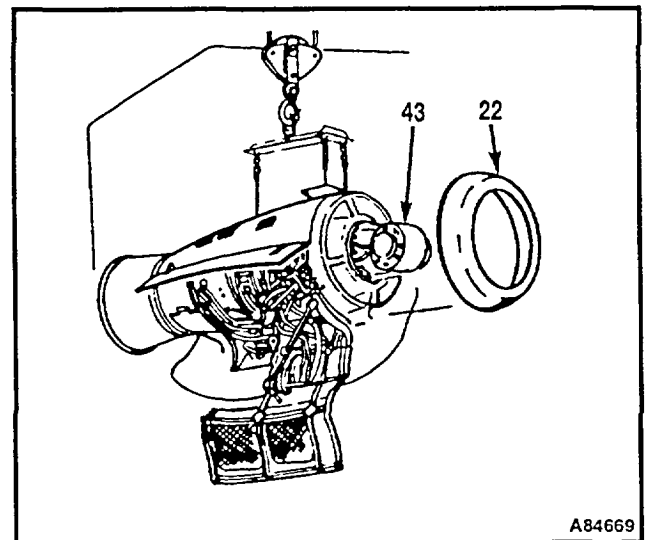
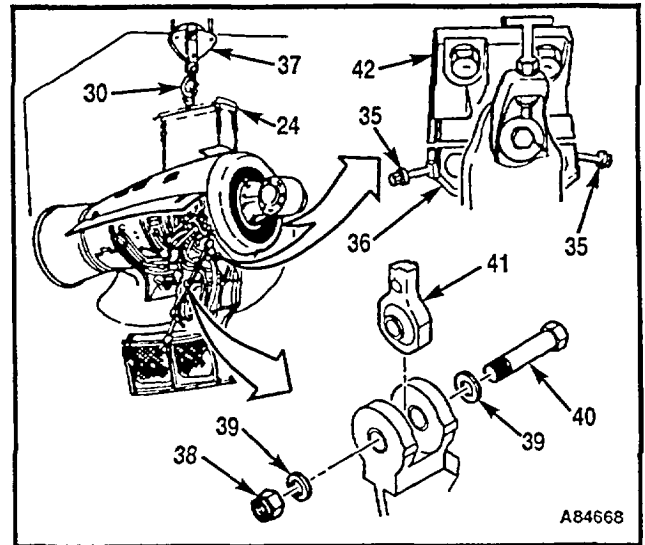
11. Connect hoist (34) to eye (30) of sling (24).
12. Remove lockwire from two bolts (35) on two forward engine mount caps (36). **Loosen bolts and push down to side.**
13. Have helpers hold engine to prevent unnecessary movement.
14. Raise hoist (37) slowly to remove slack from sling (24).
15. Remove nut (38), washers (39), and bolt (40) from lower end of aft engine mount link (41).

CAUTION

Do not lift powerplant more than **1 inch**. Connecting hoses and wires might be damaged.

16. Continue to **raise hoist (37)** slowly until forward adapters (42) are lifted about **1 inch** above caps (36).
17. **Move fairing (22) forward and over engine transmission (43).**

FOLLOW-ON MAINTENANCE:
None



END OF TASK

4-75 INSTALL ENGINE AIR INLET FAIRING

4-75

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 0 to 150 Inch-Pounds

Materials:

Lockwire (E231)

Personnel Required:

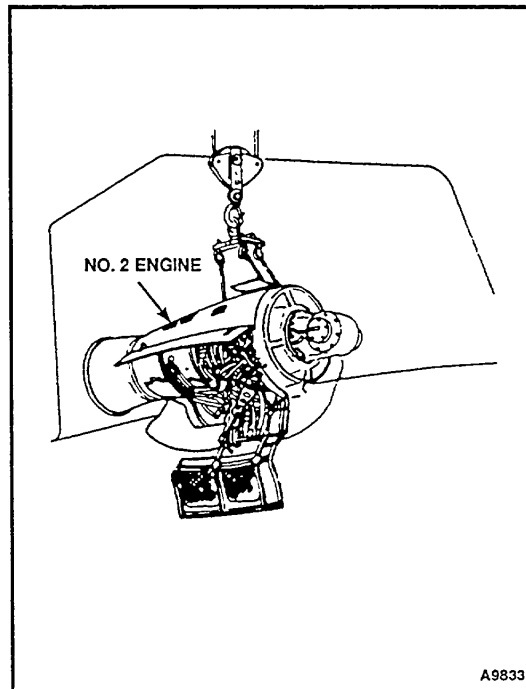
Medium Helicopter Repairer (2)
Inspector

References:

TM 55-1520-240-23P
Task 4-49
Task 4-32

Equipment Condition:

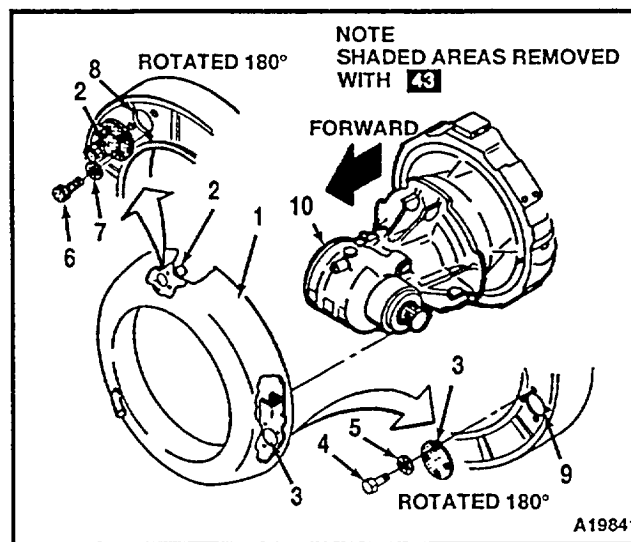
Engine Raised With Hoist (Task 4-74)



NOTE

- Procedure is same to install engine air inlet fairing on No. 1 or No. 2 engine. No. 2 engine is shown here.
- Fairing can be used on either engine.

1. On helicopters with **43**, if fairing (1) is replacement for No. 1 engine, go to step 2. If fairing (1) is replacement for No. 2 engine, reverse tube (2) and cover (3) as follows:
 - a. Remove four screws (4) and washers (5). Remove cover (3).
 - b. Remove four screws (6) and washers (7). Remove tube (2).
 - c. Position cover (3) on opposite hole (8). Install four screws (4) and washers (5).
 - d. Position tube (2) on hole (9). Install four screws (6) and washers (7).
2. Slide fairing (1) over transmission (10).

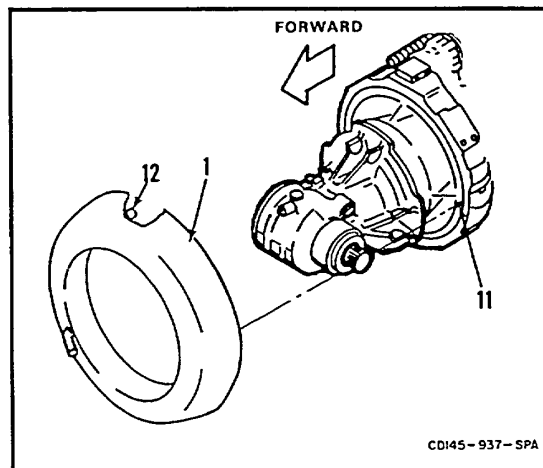


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4-194.4 Change 19

NOTE

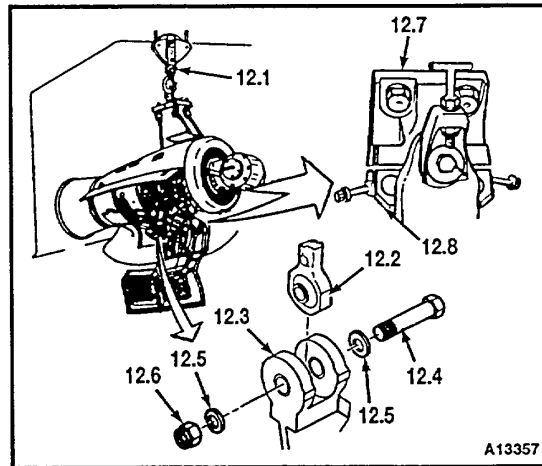
Engine access cover is not shown for clarity.

3. Position fairing (1) on engine (11) so locating pin (12) aligns with engine.



- 3.1 Slowly lower hoist (12.1) until lower end of aft engine mount link (12.2) aligns with mount (12.3). Install bolt (12.4), washers (12.5), and nut (12.6). Torque nut to 590 inch-pounds.

4. Continue to lower hoist (12.1) slowly until forward adapters (12.7) rest on caps (12.8).



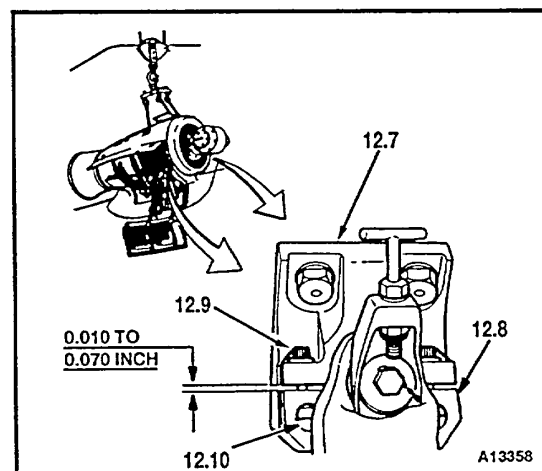
5. Check that friction torque of bolts (12.9) in barrel nuts (12.10) is not less than 7 inch pounds.

- 5.1. Push four bolts (12.9) up and over adapter (12.7).

- 5.2. Torque bolts (12.9) to 105 inch-pounds. Check that gap between adapters (12.7) and caps (12.8) is 0.010 to 0.070 inch.

- 5.3. If gap measurement exceeds 0.010 to 0.070 inch, repair mount (Task 4-32), and repeat step 5.2.

- 5.4. Check bolts (12.9). Bolt threads shall protrude a minimum of two threads through barrel nuts (12.10), but shall not bottom out. Add washers under bolthead if bolt is bottoming out. Lockwire bolts. Use lockwire (E231).



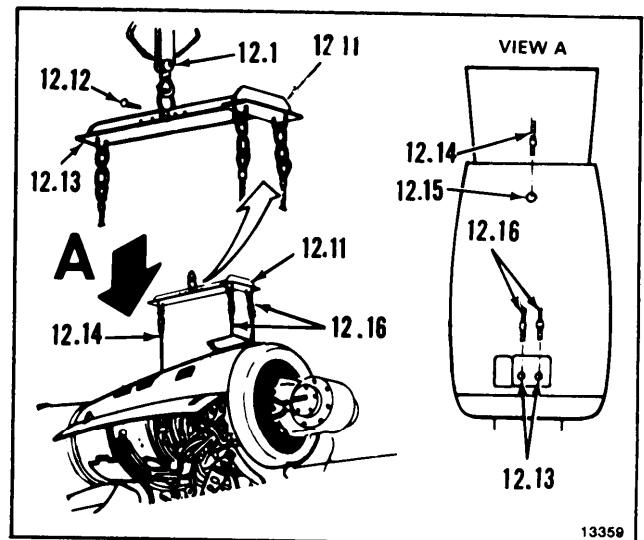
INSPECT
GO TO NEXT PAGE

4-75 INSTALL ENGINE AIR INLET FAIRING (Continued)

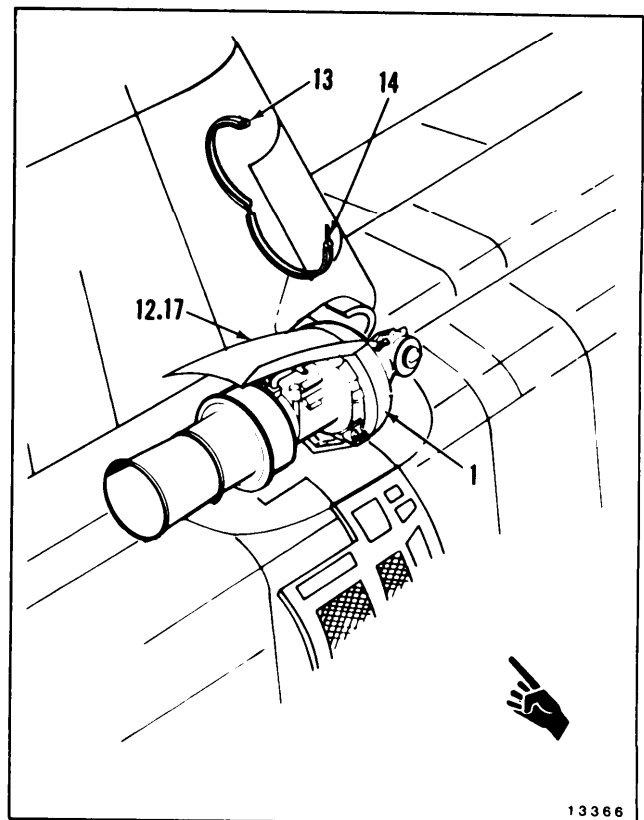
4-75

5.5. Remove sling (12.11) as follows:

- a. Remove pin (12.12) from bar (12.13)
- b. Remove cable (12.14) from aft fitting (12.15).
- c. Remove two cables (12.16) from forward fittings (12.13).
- d. Remove sling (12.11) from hoist (12.1),



- 5.6. Open access cover (12.17) Task 4-49).
- 5.7. Position coupling (13) around fairing (1) with clamp (14) outboard, mid-position.
- 5.8. Push clamp (14) down to secure coupling (13). Lockwire clamp. Use lockwire (E231).

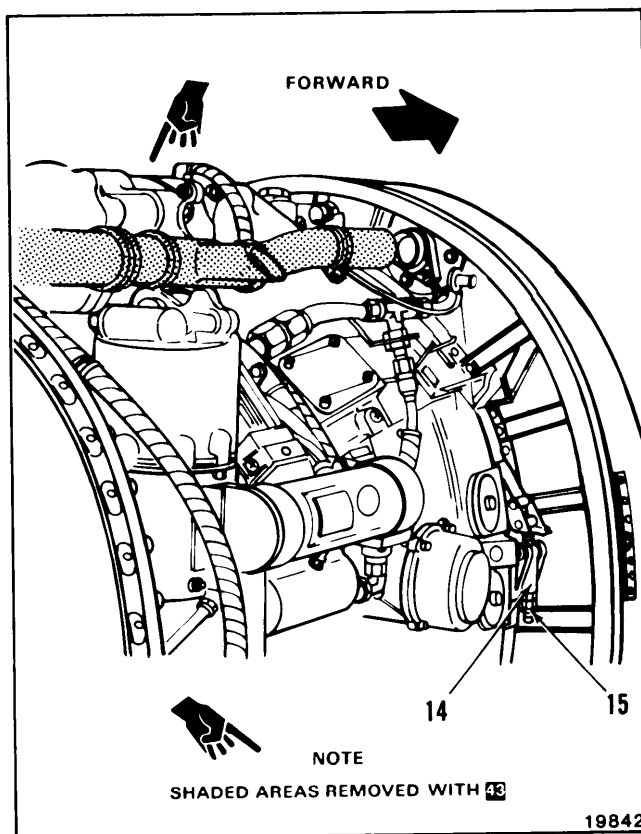


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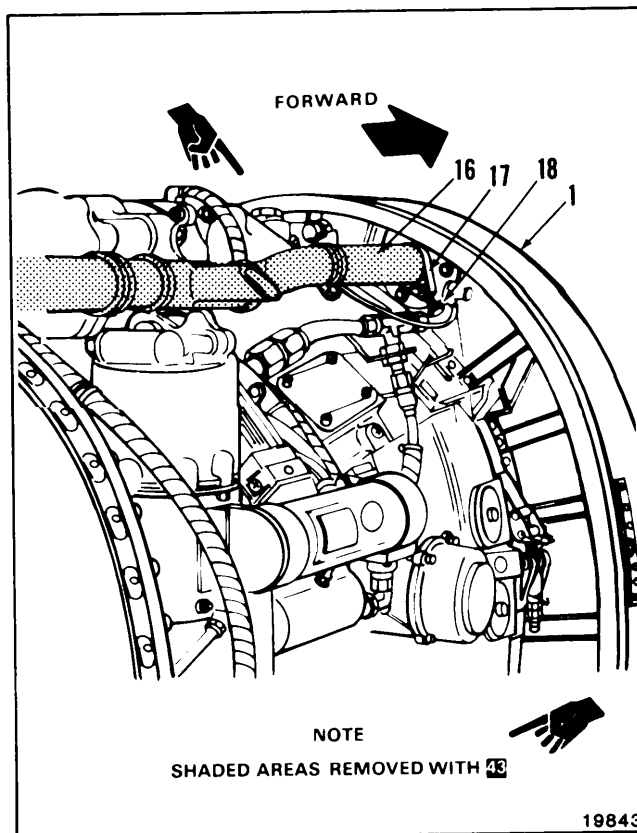
NOTE

Engine must be cool to touch before torquing nut.

6. Torque nut (15) on clamp (14) to 50 inch-pounds.

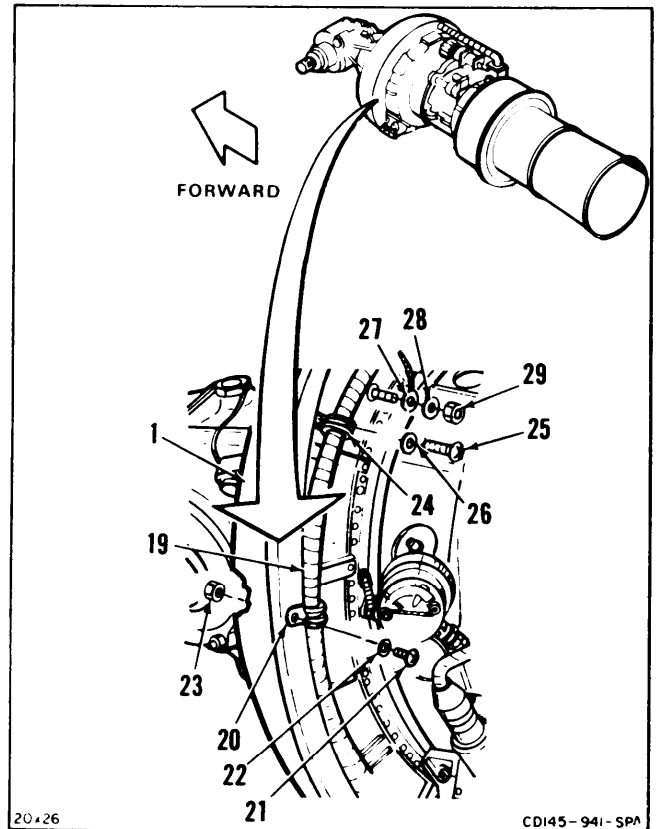


7. Connect hose (16) to fairing (1).
8. Install clamp (17) on hose (16). Tighten screw (18) on clamp.



4-75 INSTALL ENGINE AIR INLET FAIRING (Continued)**4-75**

9. **Secure hose (19) to fairing (1) with clamp (20), screw (21), washer (22), and nut (23). Install clamp (24) with screw (25) and washer (26).**
10. **Connect electrical lead (27) to fairing (1) and install washer (28) and nut (29).**

**GO TO NEXT PAGE**

4-75 INSTALL ENGINE AIR INLET FAIRING (Continued)

4-75

11. **Connect hose (30)** to port (31) on transmission (10). Remove tag.
12. **Connect hose (32)** to port (33). Remove tag.
13. **Connect hose (34)** to port (35). Remove tag.
14. **Connect cable plug (36)**.
15. Position clamp (37) with temperature and chip detector wiring (38) against clip (39) on lower lifting lug (40). Install screw (41) and nut (42).

FOLLOW-ON MAINTENANCE:

Install engine drive shaft (Task 6-32).

Install engine transmission fairing (Task 4-73).

Install engine air inlet screens (Task 4-76).

Perform operational check of gas producer control system (TM 55-1520-240-T).

Perform operational check of power turbine control system (TM 55-1520-240-T).

Close engine side and cover access covers (Task 4-50).

(Close engine work platform (Task 2-2).

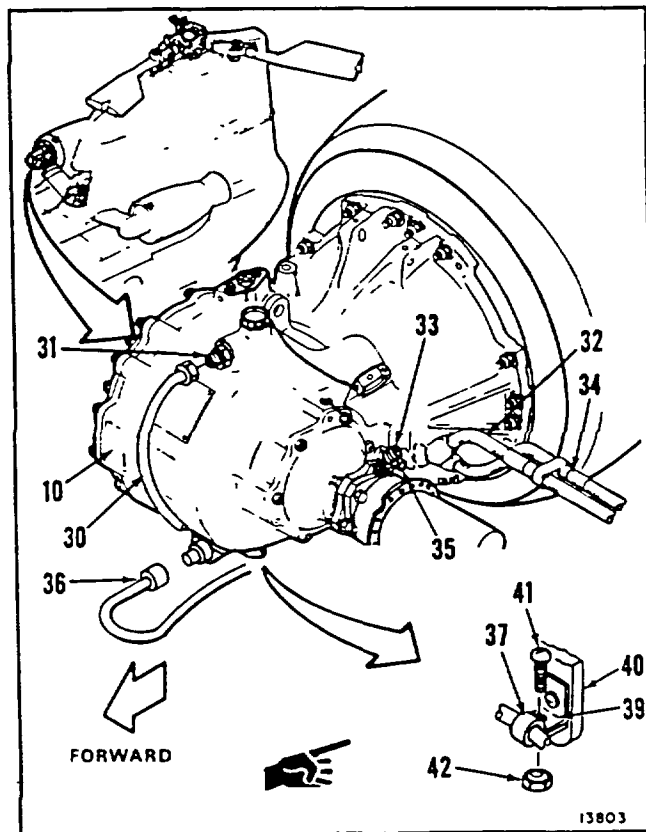
Perform initial run-up (Task 4-4).

Check powerplant plumbing for leaks.

Check forward engine mounts for proper clearance after four hours of flight.

Perform operational check of engine oil low level warning system (TM 55-1520-240-T).

Retorque exhaust cone coupling nuts after initial ground run.

**END OF TASK****Change 8 4-197**

4-75.1 INSTALL ENGINE AIR INLET FAIRING

4-75.1

INITIAL SETUP

Applicable Configurations:

With 74

Tools:

Aircraft Mechanic's Tool Kit,
 NSN 5180-00-323-4692
 Torque Wrench, 100 to 750 Inch-Pounds
 Torque Wrench, 30 to 150 Inch-Pounds

Materials:

Lockwire (E231)

Personnel Required:

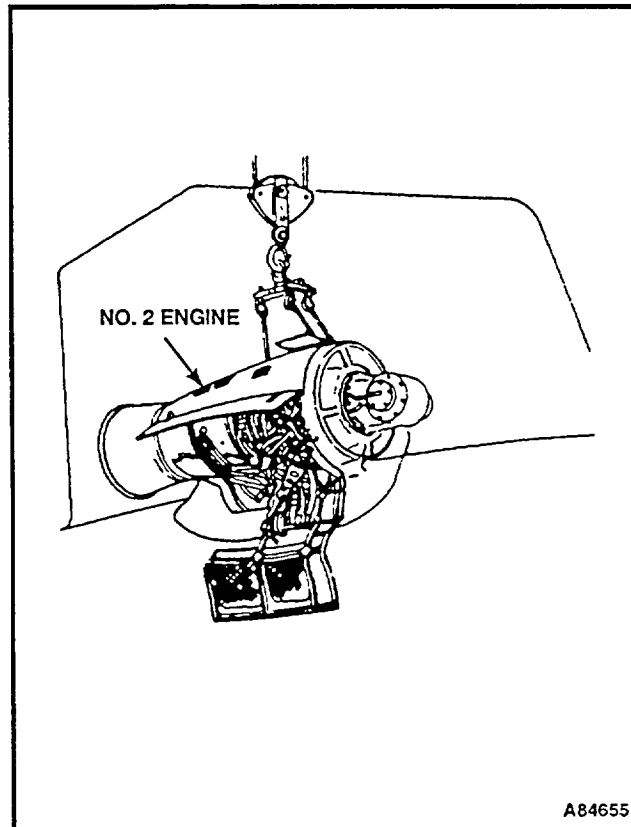
Medium Helicopter Repairer (3)
 Inspector

References:

Task 4-35.1
 Task 4-49
 TM 55-1520-240-23P

Equipment Condition:

Engine Raised with Hoist (Task 4-74)

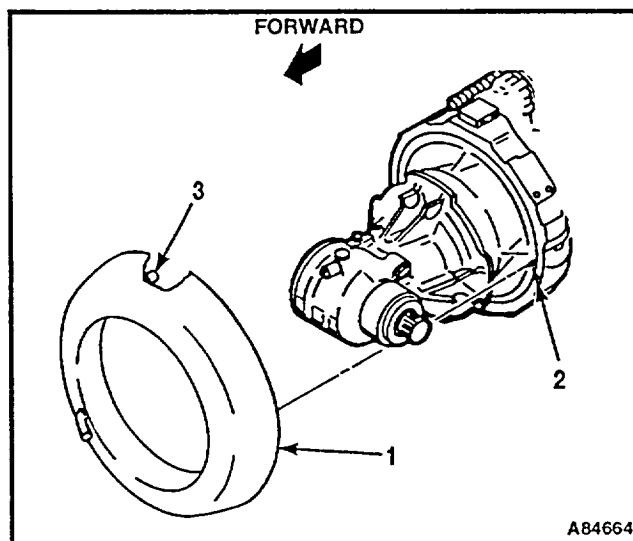


A84655

NOTE

- Procedure is same to install engine air inlet fairing on No. 1 or No. 2 engine. No. 2 engine is shown here.
- Fairing can be used on either engine.
- Engine access cover not shown for clarity.

1. Using two helpers, steady engine and position fairing (1) on engine (2) so locating pin (3) aligns with engine.



A84664

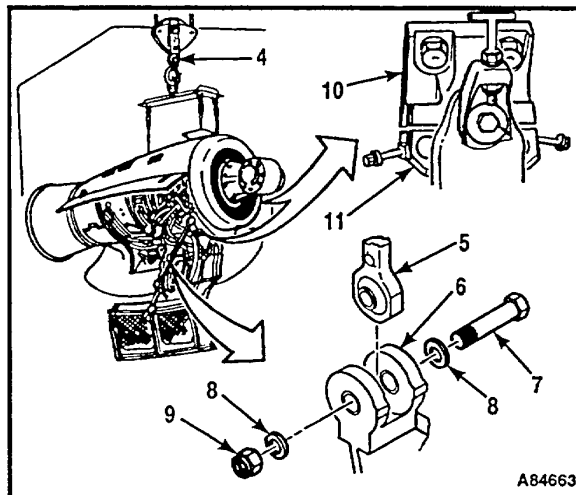
GO TO NEXT PAGE

4-198 Change 19

4-75.1 INSTALL ENGINE AIR INLET FAIRING (Continued)

4-75.1

2. Slowly lower hoist (4) until lower end of aft engine mount link (5) aligns with mount (6).
3. Install bolt (7) with head facing inboard, washers (8), and nut (9). Torque nut to 375 inch-pounds to seat bushing. Loosen nut and retorque to 20 inch-pounds above run-on torque. Not to be less than 70 inch-pounds.
4. Continue to lower hoist (4) slowly until forward adapters (10) rest on caps (11).

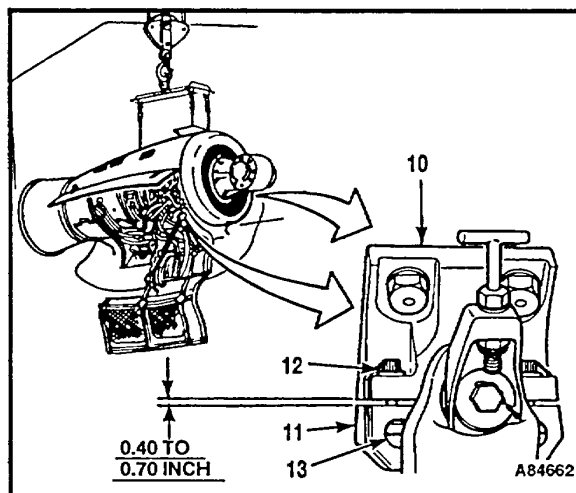


5. Check that friction torque of bolts (12) in barrel nuts (13) is not less than 7 inch-pounds.
6. Push four bolts (12) up and over adapter (10).
7. Torque bolts (12) to 105 inch-pounds. Check that gap between adapters (10) and caps (11) is 0.40 to 0.70 inch.
8. If the gap measurement exceeds 0.40 to 0.70 inch, go to Task 4-35.1, step 15.

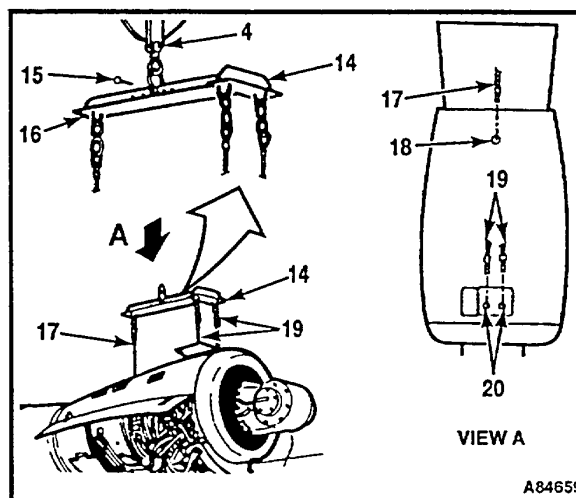
NOTE

If bolts bottom out, washer may be added under bolt head.

9. Check that bolts (12) protrude through barrel nuts (13) a minimum of two threads, but shall not bottom out. Lockwire bolts. Use lockwire (E278).

**INSPECT**

10. Remove sling (14) as follows:
 - a. Remove pin (15) from bar (16).
 - b. Remove cable (17) from aft fitting (18).
 - c. Remove two cables (19) from forward fittings (20).
 - d. Remove sling (14) from hoist (4).



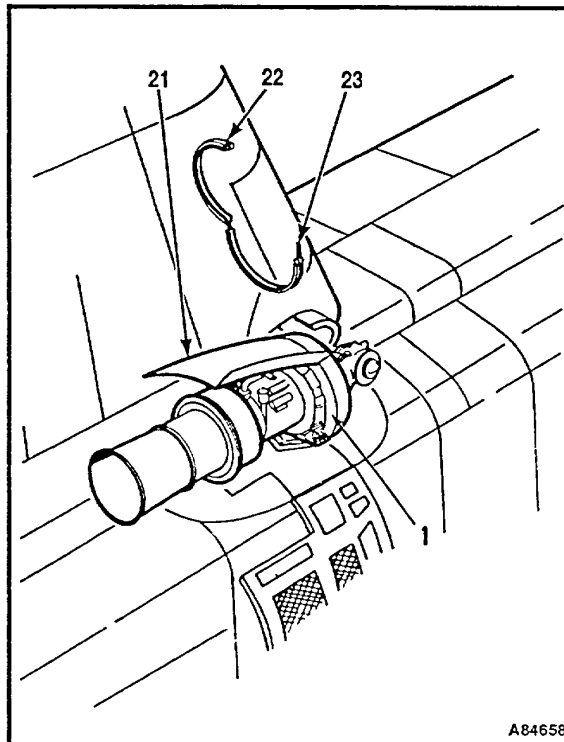
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Change 19 4-198.1

4-75.1 INSTALL ENGINE AIR INLET FAIRING (Continued)

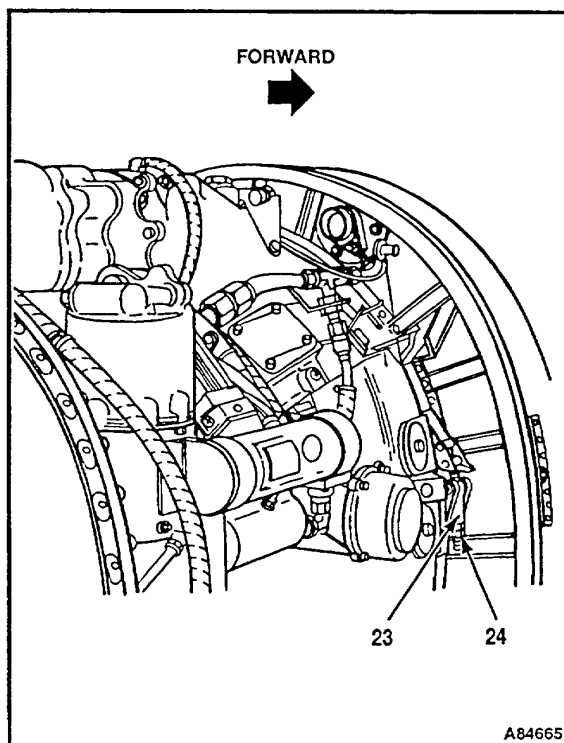
4-75.1

11. **Open access cover (21)** (Task 4-49).
12. **Position coupling (22)** around fairing (1) with clamp (23) outboard, mid-position.
13. Push clamp (23) down to **secure coupling (22)**.



NOTE
Engine must be cool to touch before torquing nut.

14. Torque nuts (24) on both sides of clamp (23) to 50 inch-pounds.
15. Lockwire clamp (23). Use lockwire (E231).



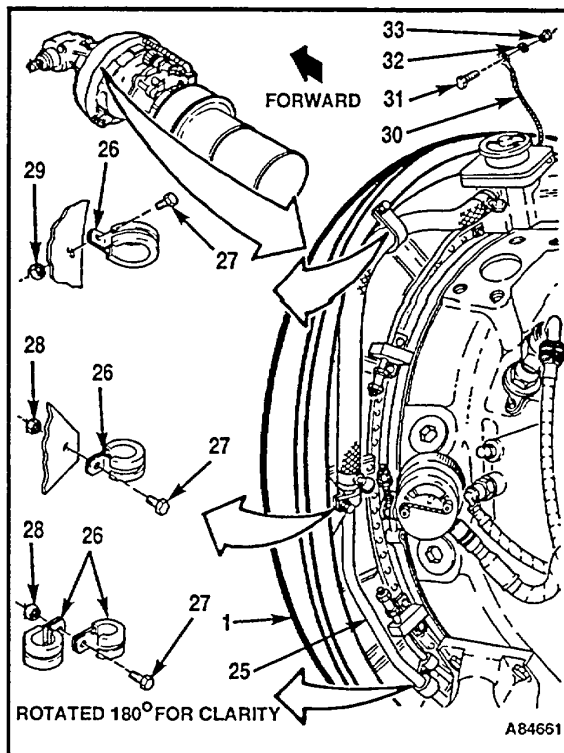
GO TO NEXT PAGE

4-198.2 Change 19

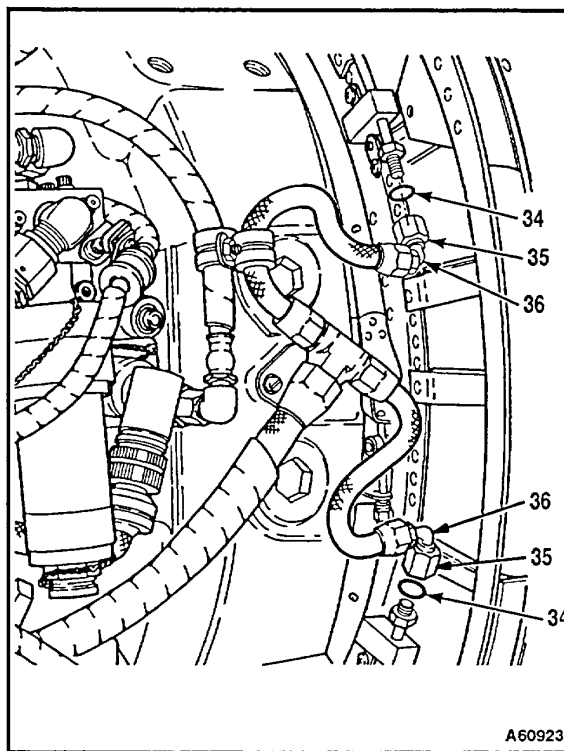
4-75.1 INSTALL ENGINE AIR INLET FAIRING (Continued)

4-75.1

- 16. Secure tube (25) to fairing (1) with four clamps (26), three screws (27), and nuts (28 and 29).
- 17. Install bonding wire (30), with screw (31), washer (32), and nut (33).



- 18. Install two new packings (34) on fittings (35).
- 19. Connect two fittings (35) to water wash tubing (36).

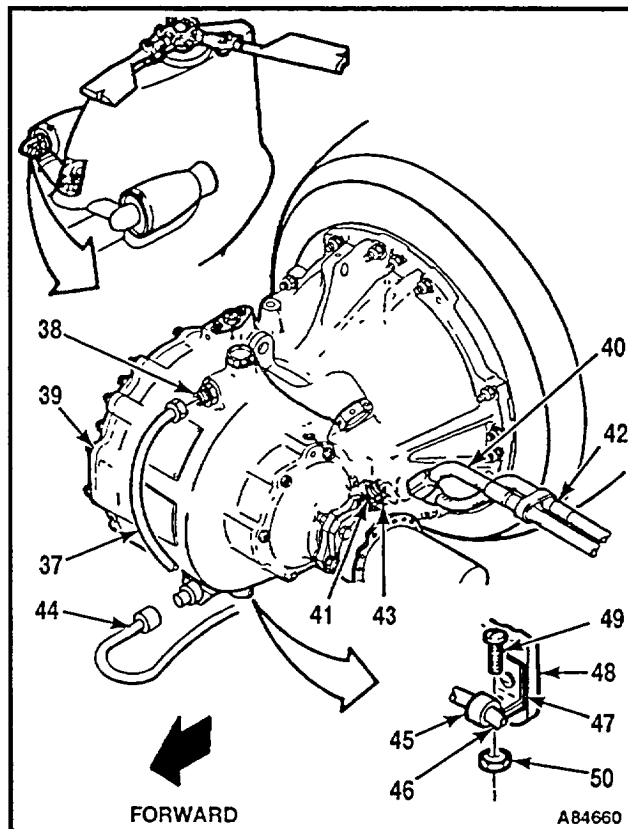


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4-75.1 INSTALL ENGINE AIR INLET FAIRING (Continued)

4-75.1

20. **Connect hose (37)** to port (38) on transmission (39). Remove tag.
21. **Connect hose (40)** to port (41). Remove tag.
22. **Connect hose (42)** to port (43). Remove tag.
23. **Connect cable plug (44)**.
24. **Position clamp (45)** with temperature and chip detector wiring (46) against clip (47) on lower lifting lug (48). Install screw (49) and nut (50).

**FOLLOW-ON MAINTENANCE:**

- Install engine drive shaft (Task 6-32).
- Install engine transmission fairing (Task 4-73).
- Install engine air inlet screens (Task 4-76).
- Close engine access covers (Task 4-50).
- Close engine work platform (Task 2-2).
- Perform initial run-up (Task 4-2).
- Check powerplant plumbing for leaks.
- Check forward engine mounts for proper clearance after four hours of flight.
- Perform operational check of engine oil low level warning system (TM 55-1520-240-T).

END OF TASK

4-198.4 Change 19

4-76 INSTALL ENGINE AIR INLET SCREENS

4-76

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

None

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Air Inlet Screen Adjusted (Task 4-63)
Engine Inlet Protective Covers Removed (Task
1-32)

NOTE

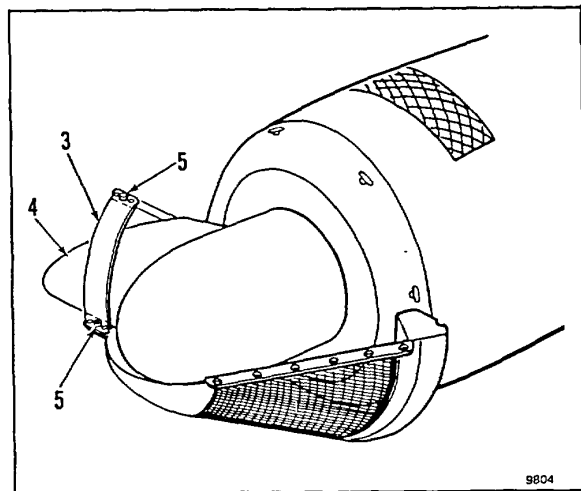
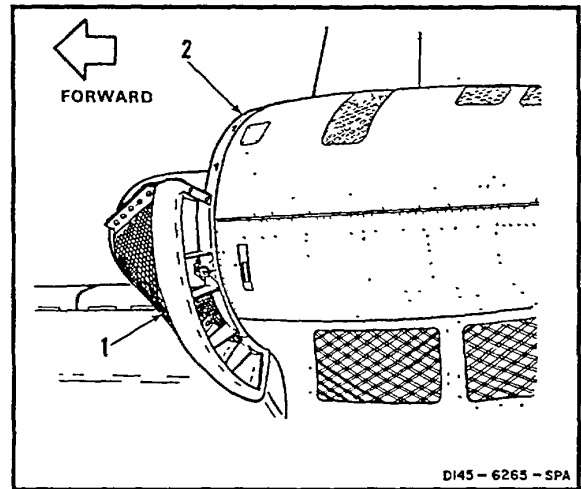
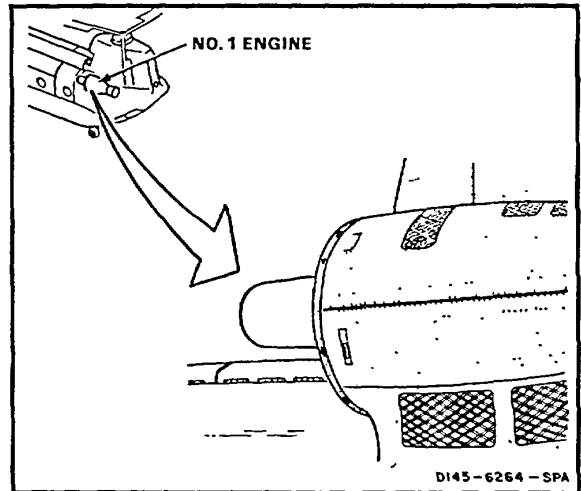
Procedure is same to install No. 1 or
No. 2 engine air inlet screens.
Installation of No. 1 air inlet screens
is shown here.

INSTALL LOWER SCREEN

CAUTION

When installing lower screen, do not
cover air holes on air inlet fairing. Air
pressure build up will damage fairing.

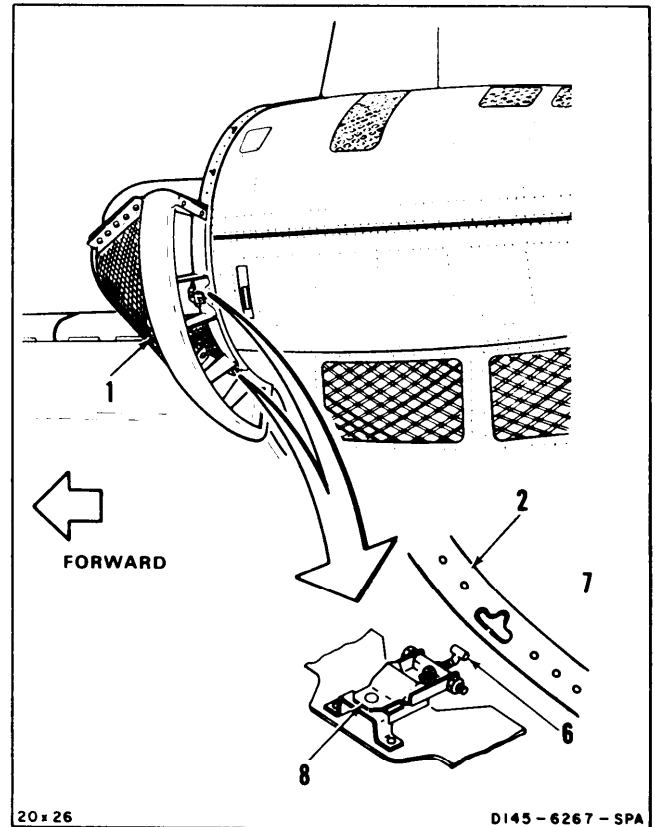
1. Have helper **position lower screen (1)** on air inlet fairing (2). Make sure air holes on fairing are not covered.
2. **Position strap (3)** over engine transmission fairing (4). **Secure two fasteners (5)**.



GO TO NEXT PAGE

4-76 INSTALL ENGINE AIR INLET SCREENS
(Continued)

- Engage two tee bolts (6) in holes (7). Hold lower screen (1) firmly against inlet fairing (2). **Secure two latches (8) on screen.**



INSPECT

INSTALL UPPER SCREEN

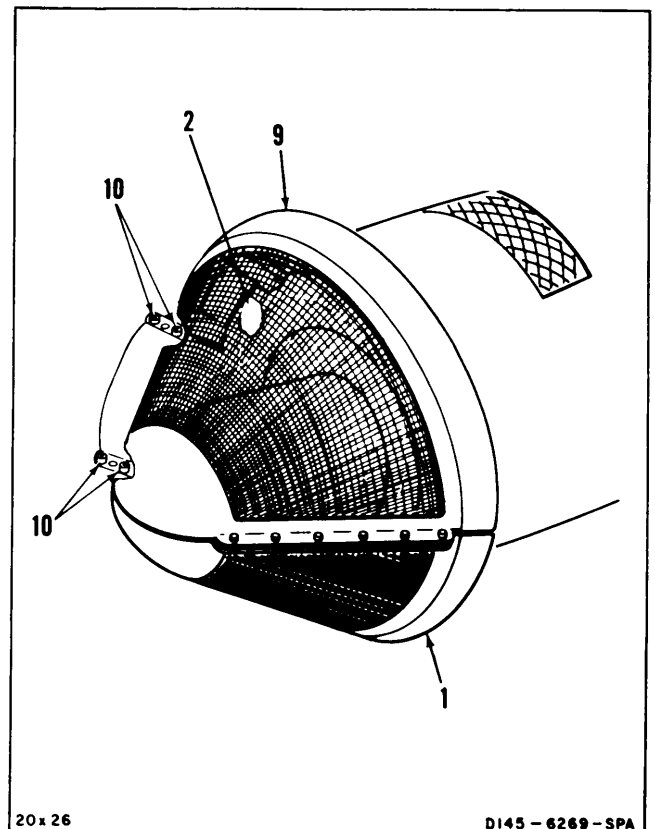
CAUTION

Make sure there is no foreign matter in air inlet. If foreign matter is left in inlet, damage to powerplant will occur.

CAUTION

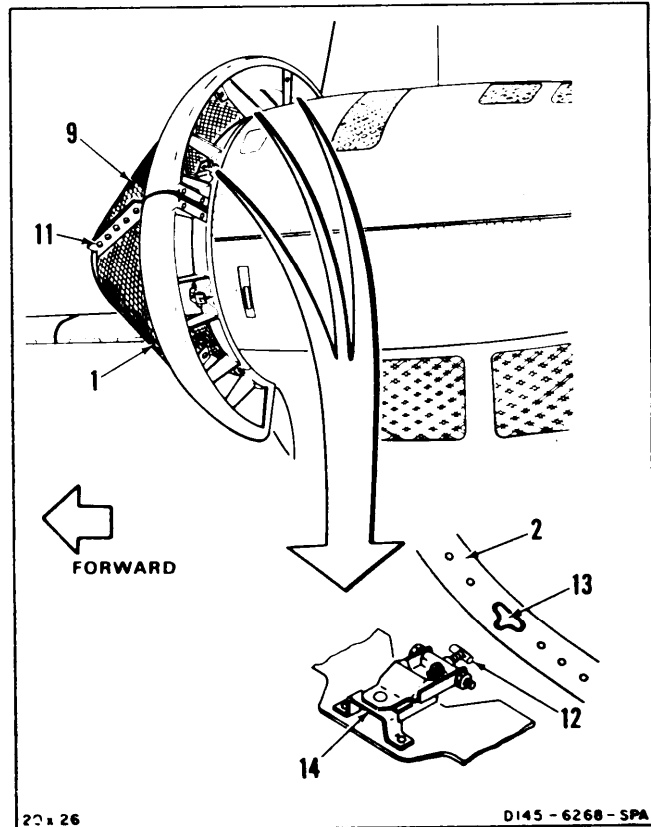
When installing upper screen, do not cover air holes on air inlet fairing. Air pressure build up will damage fairing.

- Position upper screen (9) on lower screen (1) and fairing (2). Make sure air holes on fairing are not covered.
- Secure four fasteners (10).

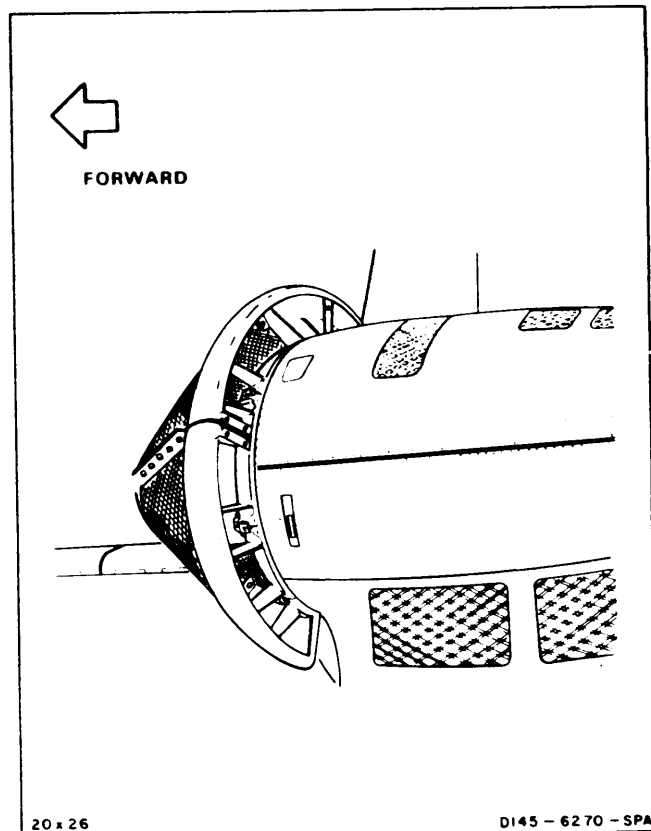


GO TO NEXT PAGE

6. Secure six fasteners (11) on lower screen (1).
7. Engage three tee bolts (12) in holes (13) in fairing (2). Hold upper screen (9) firmly against fairing (2). Secure three latches (14) on screen.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Install engine air inlet bypass screens (Task 4-77).
- Close engine work platform (Task 2-2).
- Adjust engine screen latches (Task 4-63).

**END OF TASK**

4-77 INSTALL ENGINE AIR INLET SCREEN BYPASS PANELS

4-77

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

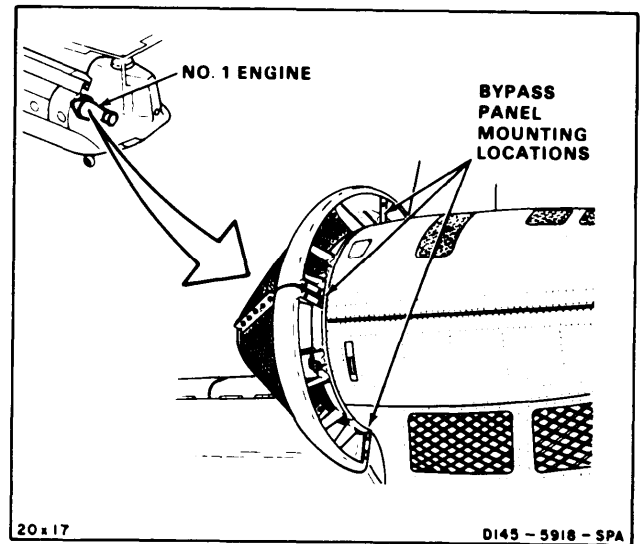
None

Personnel Required:

67U10 Medium Helicopter Repairer

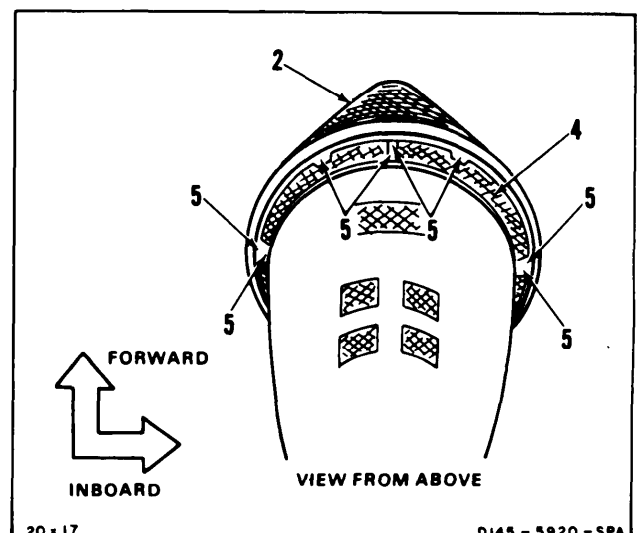
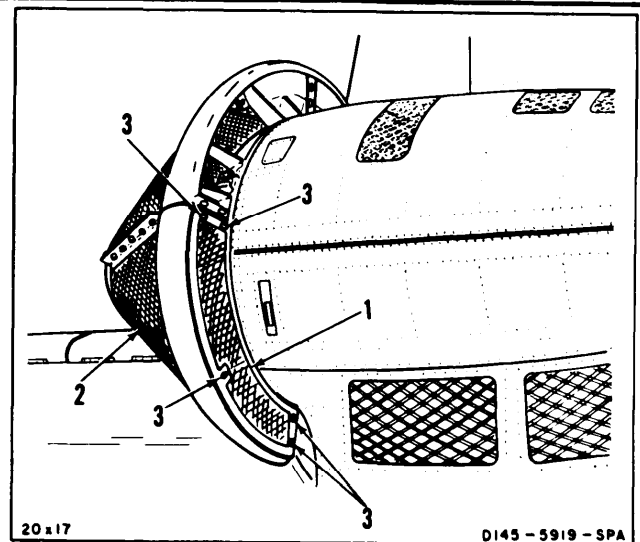
References:

TM 55-1520-240-23P



NOTE

- Procedure is same to install bypass panels on No. 1 or No. 2 engine. Installation of No. 1 bypass panels is shown here.
 - Do not install bypass panels when inflight temperatures of 40°F (4.4°C) or below and visible moisture are expected.
1. Position lower bypass panel (1) on air inlet screen (2).
 2. Secure five fasteners (3) on lower panel (1).
 3. Position upper bypass panel (4) on air inlet screen (2).
 4. Secure eight fasteners (5) on upper panel (4).



FOLLOW-ON MAINTENANCE:

Close engine work platform (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

Without 43

Tools:

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

Materials:

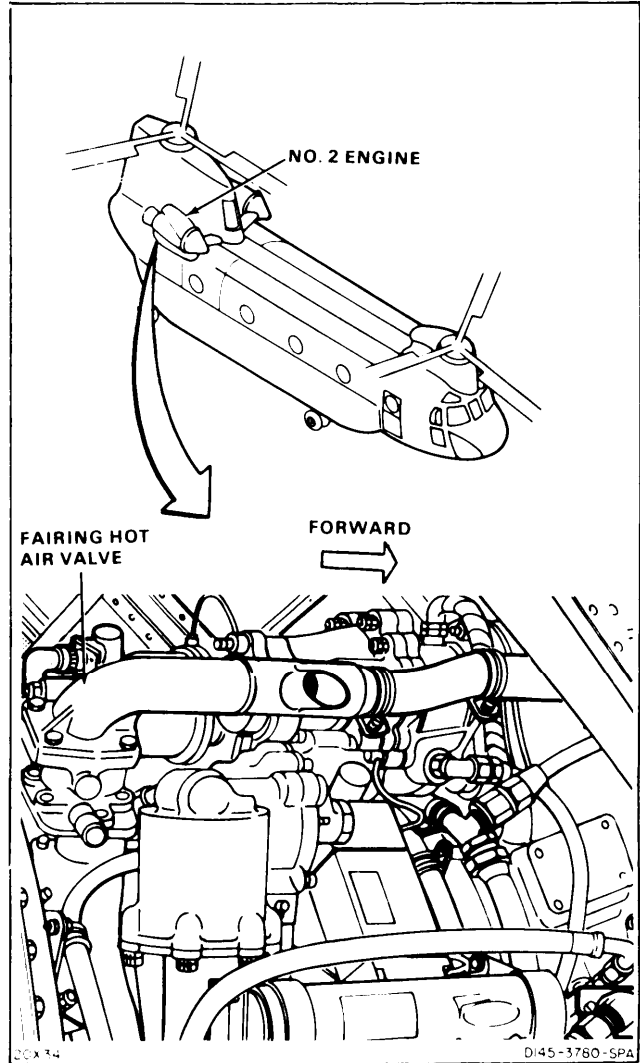
Tape (E388)
Barrier Material (E81)

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

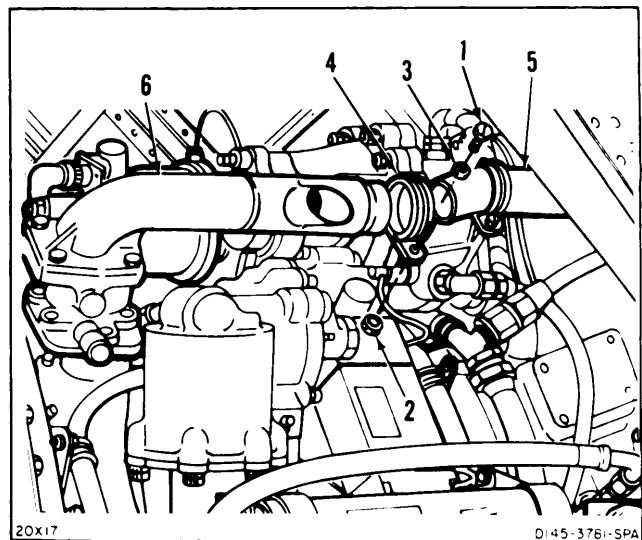
Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)



NOTE

Procedure is same to remove fairing hot air valve on No. 1 or No. 2 engine. No. 2 engine is shown here.

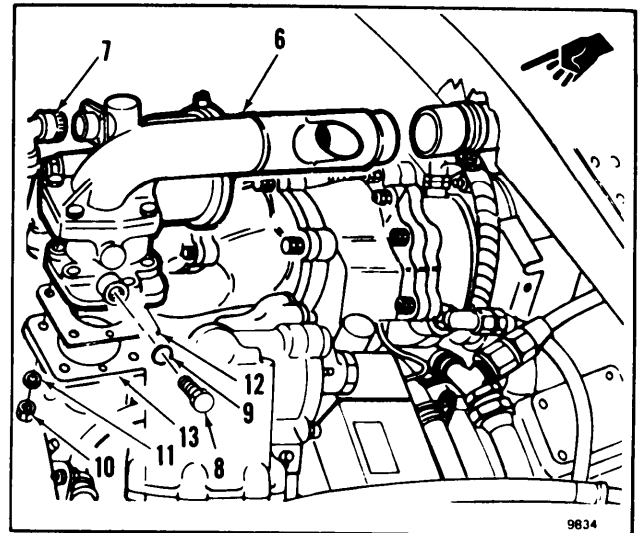
- 1 Remove screw (1), nut (2), and washer (3) from clamp (4). Remove clamp.
- 2 Disconnect hose (5) from valve (6).



GO TO NEXT PAGE

4-78 REMOVE FAIRING HOT AIR VALVE (Continued)**4-78**

3. **Disconnect electrical connector (7).**
4. **Remove plug (8) and packing (9).** Retain plug. Discard packing.
5. Remove six nuts (10) and washers (11).
6. **Remove valve (6) and gasket (12).** Cover hole in gallery (13). Use tape (E388) and barrier material (E81).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:Without **43****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Airframe Repairer's Tool Kit,
NSN 5180-00-323-4876

Materials:

Cloths (E135)

Parts:

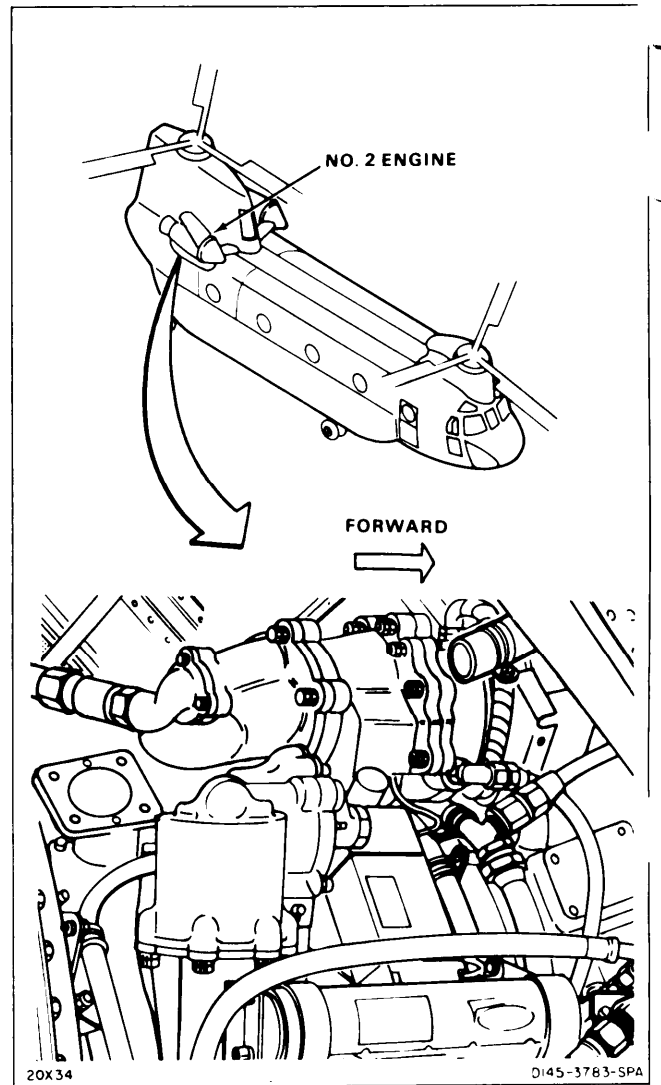
Gasket
Packing

Personnel Required:

Aircraft Powerplant Repairer
Aircraft Structural Repairer

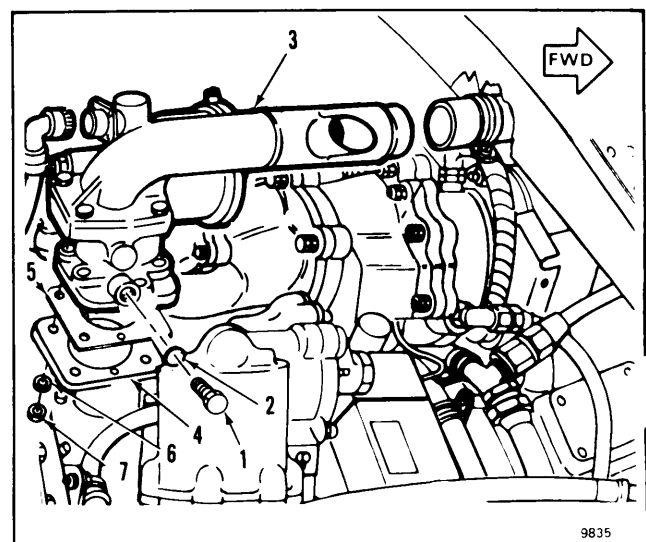
References:

TM 55-1520-240-23P
Task 4-50
Task 4-49

**NOTE**

Procedure is same to install fairing hot air valve on No. 1 or No. 2 engine. No. 2 engine is shown here.

1. Install plug (1) and packing (2) in valve (3).
2. Remove tape and barrier material from hole in gallery (4).
3. **Position gasket (5) on hole in gallery (4). Position valve (3) on gasket (5).**
4. **Install six washers (6) and nuts (7).**

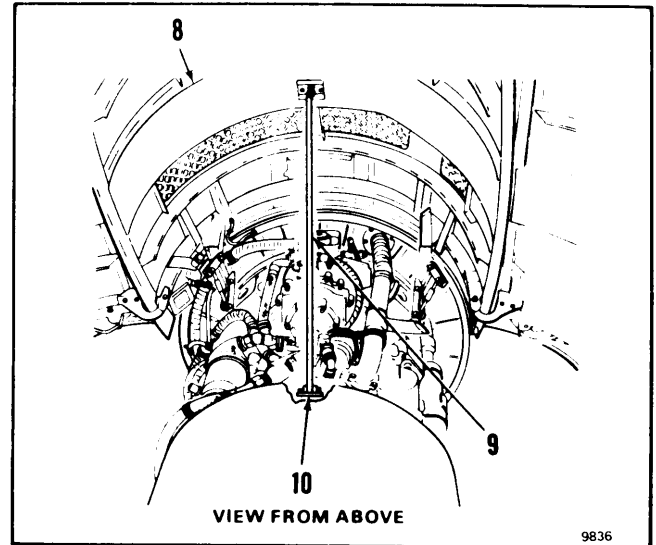
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4-204

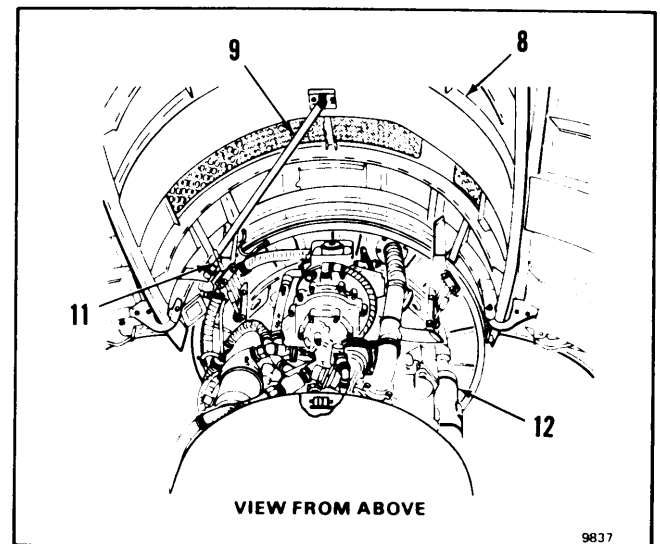
Change 12

4-79 INSTALL FAIRING HOT AIR VALVE (Continued)**4-79**

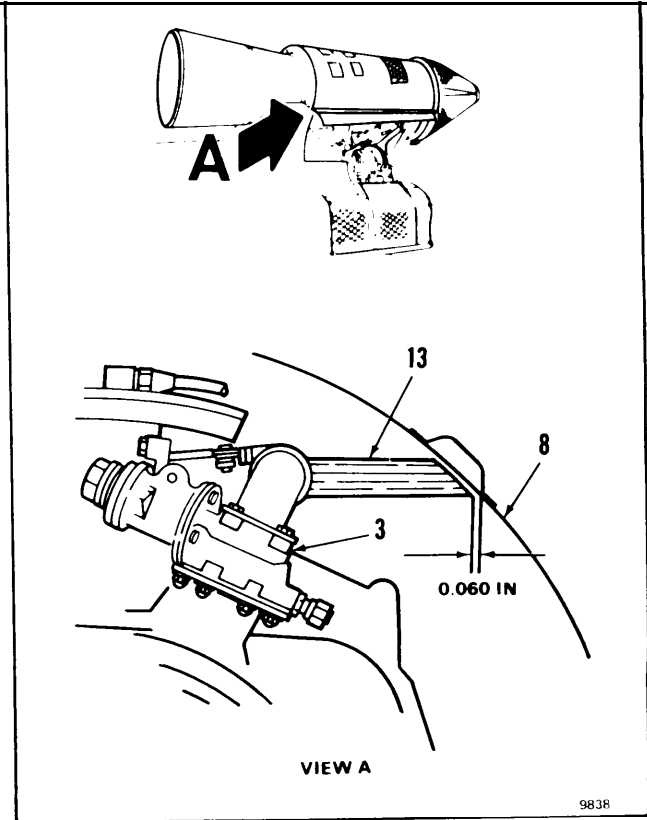
5. Support upper access cover (8) and disengage support strut (9) from powerplant fitting (10).



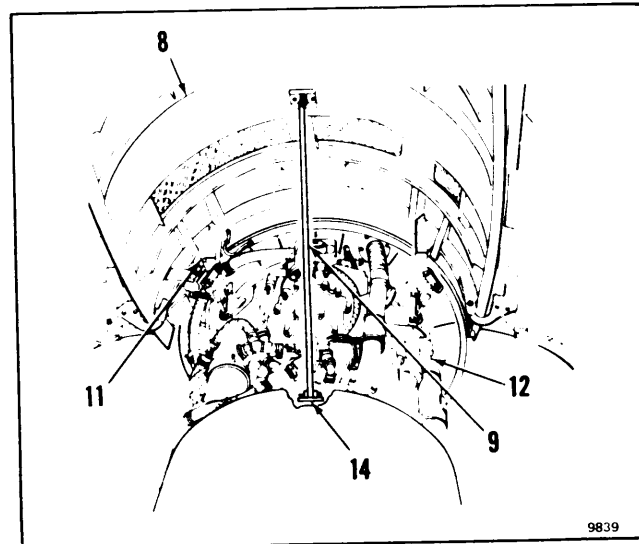
6. Install strut (9) in fitting (11) on cover (8). Lower cover to powerplant (12).

**GO TO NEXT PAGE**

7. Check clearance between cover (8) and duct (13) on valve (3). If clearance is 0.060 inch or more, go to step 12. If not, go to step 8.



8. Raise upper cover (8). Disengage support strut (9) from fitting (11). Position strut (9) over hole (14) in powerplant (12). Lower cover (8) enough to install strut.



GO TO NEXT PAGE

4-79 INSTALL FAIRING HOT AIR VALVE (Continued)**4-79****CAUTION**

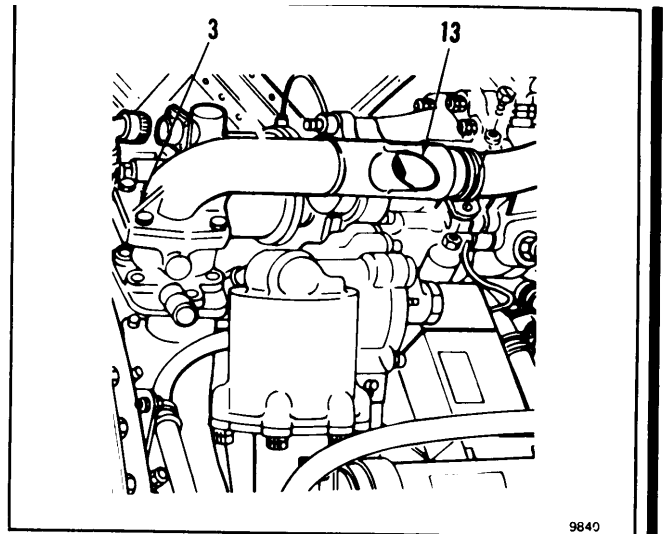
Do not allow debris to enter valve duct when trimming.

9. Use cloths (E135) in duct (13) when trimming to prevent debris from entering valve (3).

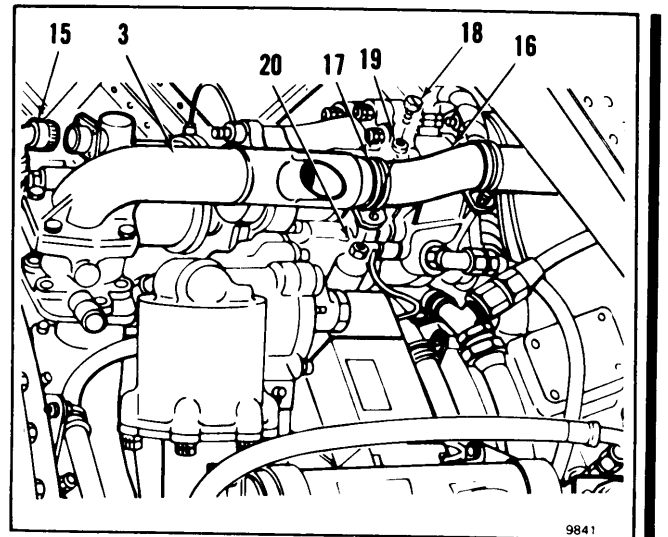
CAUTION

Ensure duct is clear of all materials after trimming.

10. Trim duct (13) on valve (3) to obtain clearance of 0.60 inch.
11. Repeat steps 5, 6, and 7.



12. Connect electrical connector (15).
13. Connect hose (16) to valve (3).
14. Install clamp (17), screw (14), washer (19), and nut (20).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Perform firing hot air valve operational check (TM 55-1520-240-T).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2),

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

Tape (E388)
Cloths (E135)

Personnel Required:

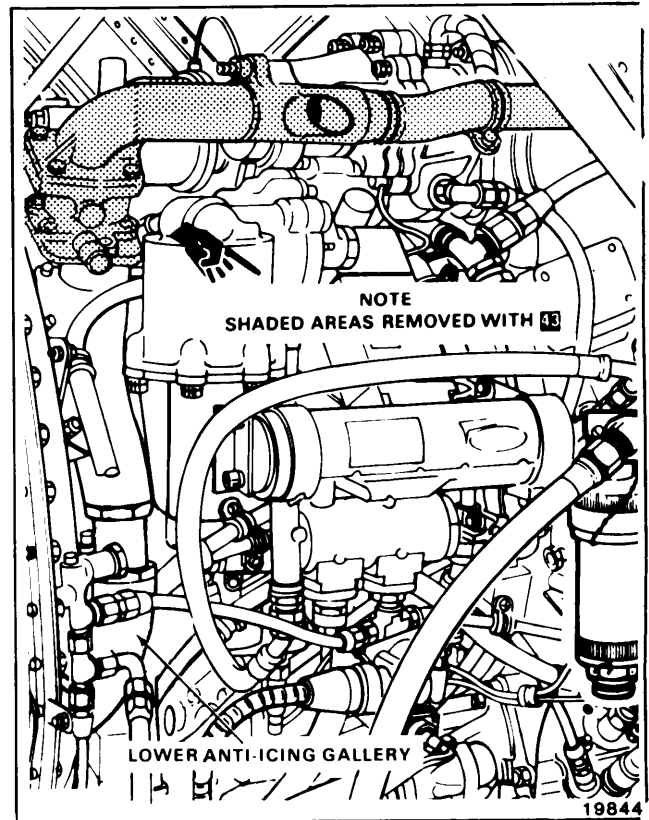
Aircraft Powerplant Repairer

References:

TM 55-2840-254-23

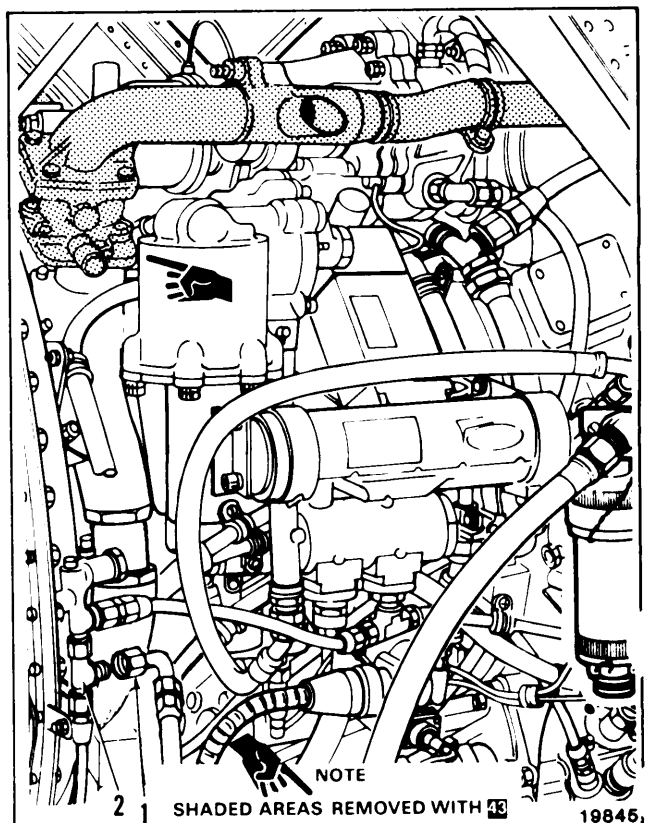
Equipment Condition:

Powerplant Removed (Task 4-10)
Engine Access Cover Open (Task 4-49)

**NOTE**

Procedure is same to remove lower anti-icing gallery on No. 1 or No. 2 engine.

1. Disconnect and **remove hose** (1) at tee (2). Wipe up oil with cloths (E 135).

**GO TO NEXT PAGE**

4-206

Change 12

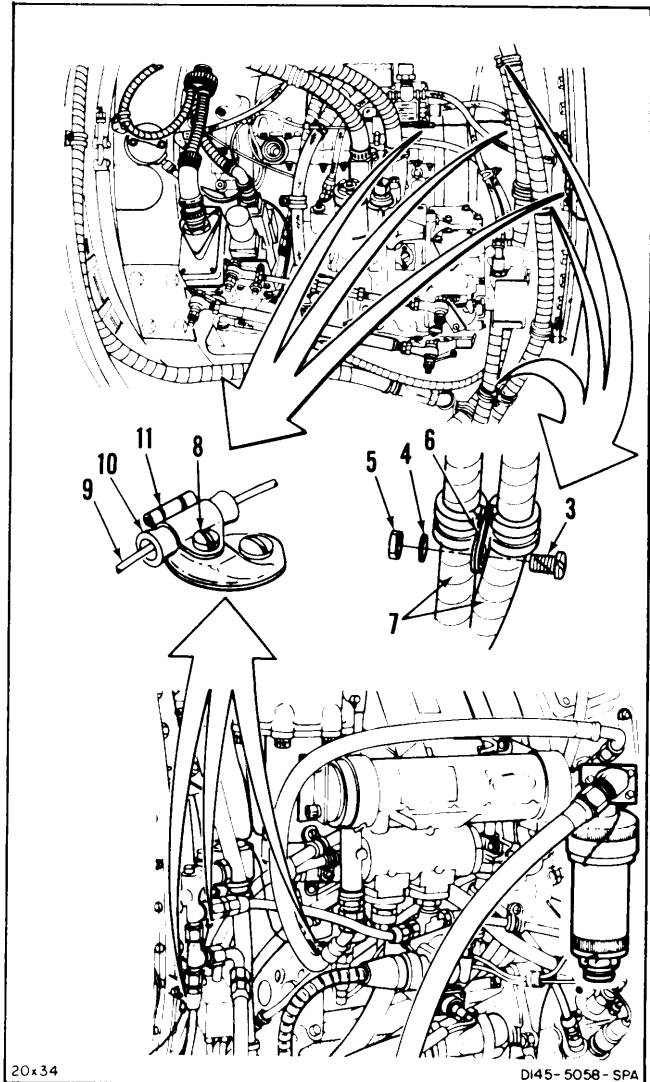
4-80 REMOVE LOWER ANTI-ICING GALLERY (Continued)**4-80**

- 2 Remove three screws (3), washers (4), and nuts (5). **Disconnect three clamps (6).** **Remove two hoses (7).** Mark clamp locations. Use tape (E388).

CAUTION

Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

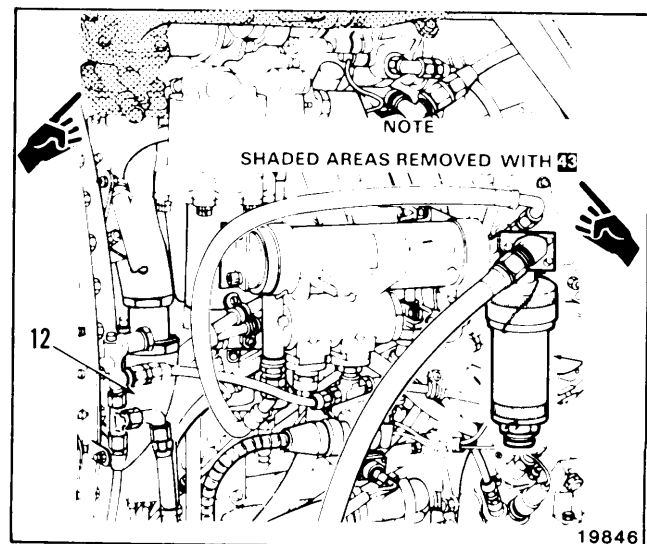
3. Turn fastener (8) counterclockwise and **release element (9)** and bushing (10) from six clamps (11). **Move element away from gallery (12).**



4. **Remove lower gallery (12)** (TM 55-2840-254-23).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

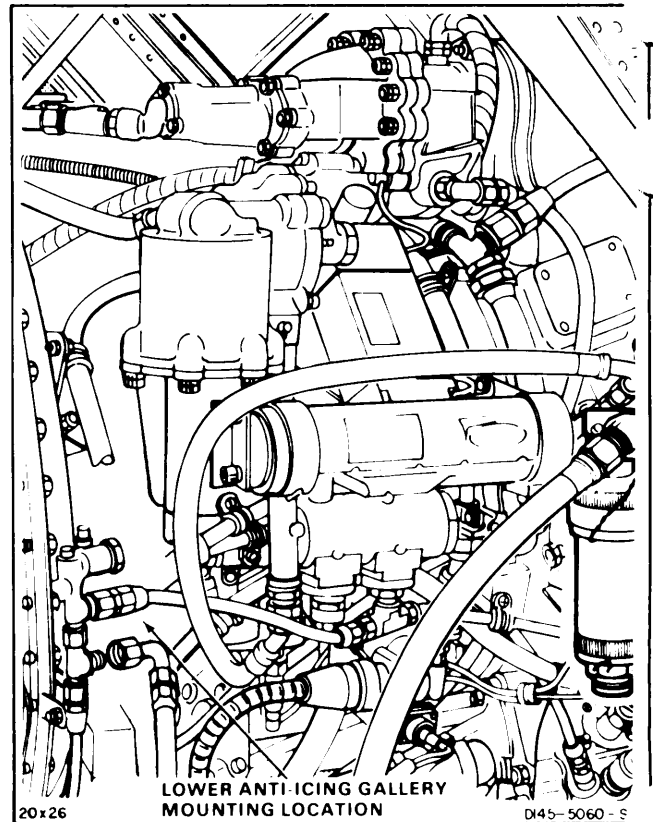
None

Personnel Required:

Aircraft Powerplant Repairer
Inspector

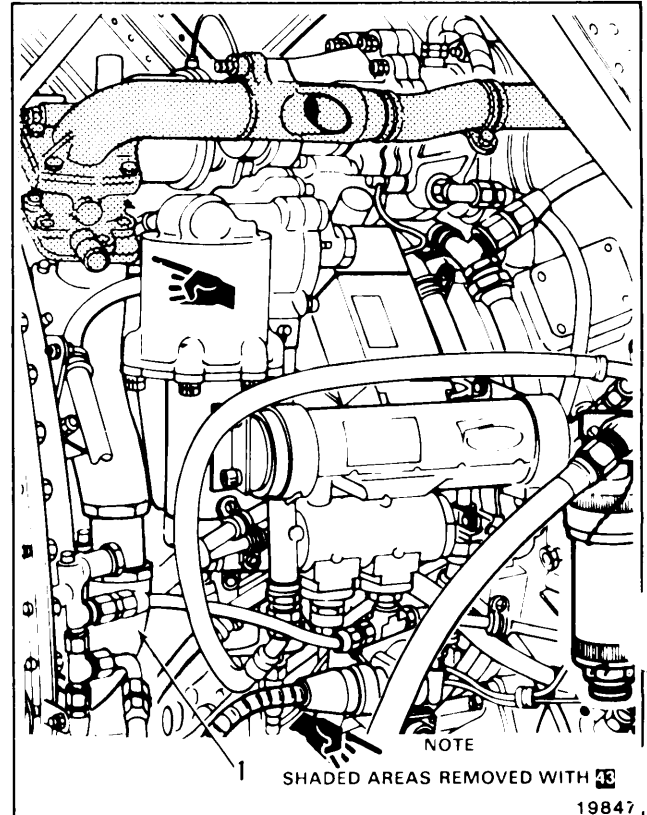
References:

TM 55-2840-254-23
TM 55-2840-254-23P
TM 55-1520-240-23P

**NOTE**

Procedure is same to install lower anti-icing gallery on No. 1 or No. 2 engine.

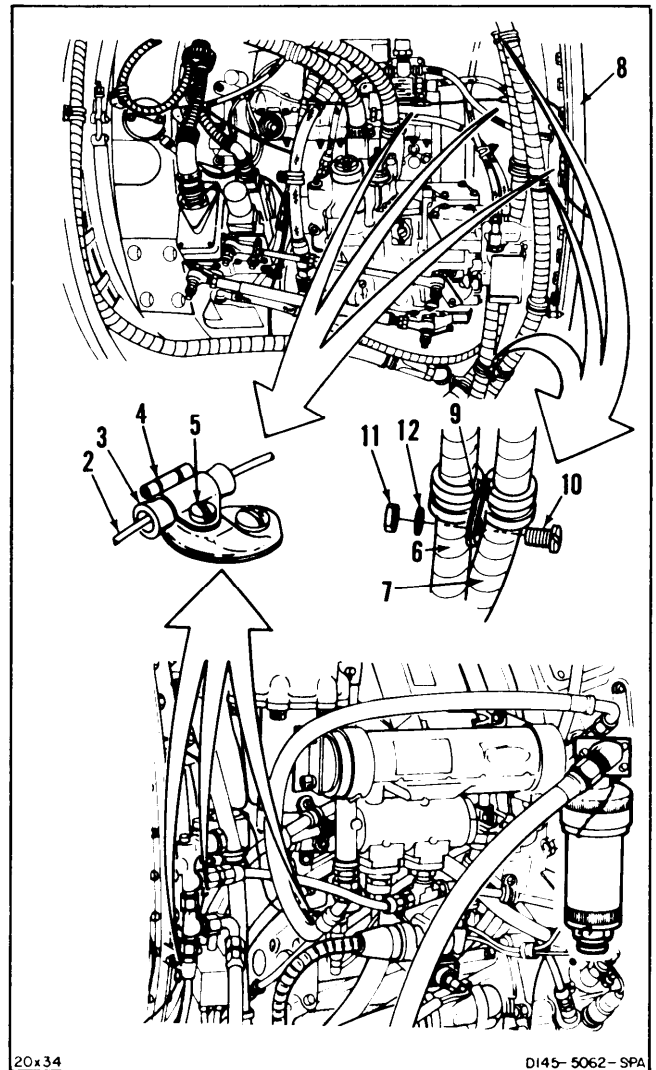
1. Install lower gallery (1) (TM 55-2840-254-23).



4-81 INSTALL LOWER ANTI-ICING GALLERY (Continued)**4-81**

Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

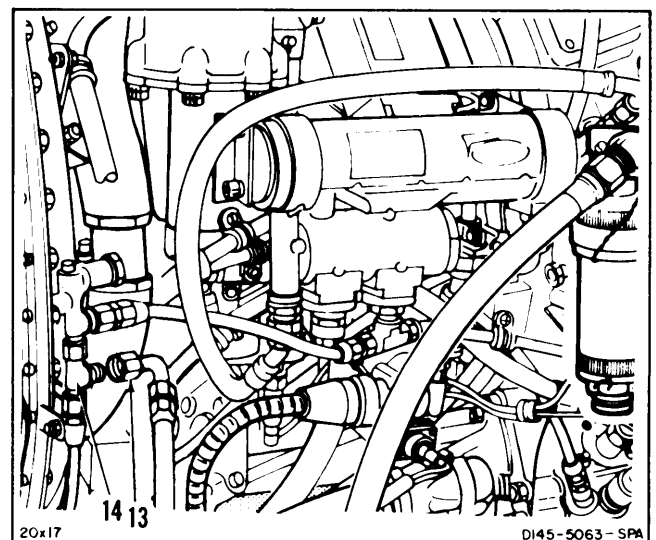
2. Press element (2) and bushing (3) into clamps (4) at six locations. Bushings shall be centered in clamps.
3. Lock each clamp (4) with fastener (5).
4. Position two hoses (6 and 7) on powerplant (8). Connect three clamps (9) and install three screws (10), nuts (11), and washers (12). Remove tape marking clamp locations.



5. Connect hose (13) to tee (14).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Install powerplant (Task 4-13).
- Close engine access cover (Task 4-50),

END OF TASK

4-82 REMOVE UPPER ANTI-ICING GALLERY

4-82

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

Tape (E388)
Cloths (E135)

Personnel Required:

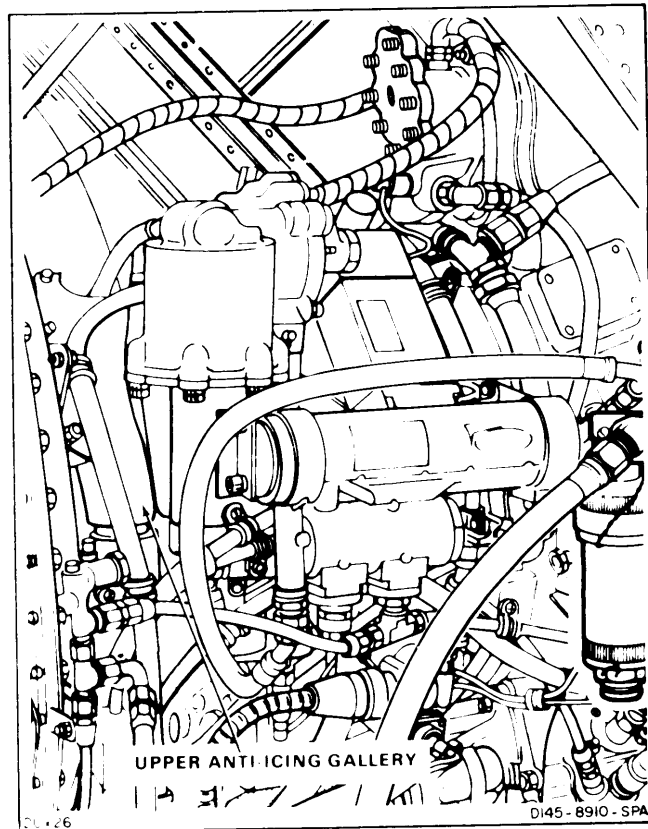
Aircraft Powerplant Repairer

References:

TM 55-2840-254-23

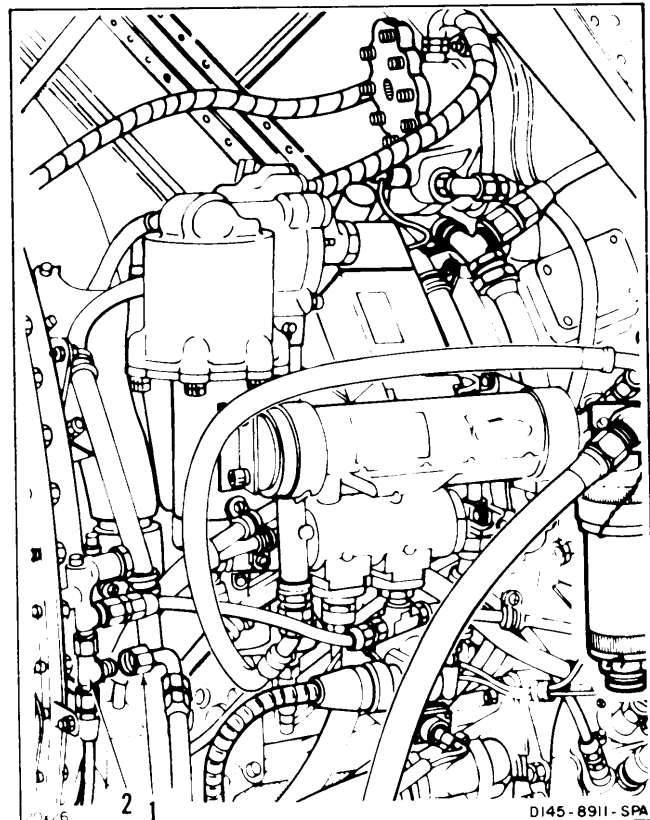
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Open (Task 2-2)
Engine Access Cover Open (Task 4-49)
Fairing Hot Air Valve Removed (Task 4-78)
Starter Removed (Task 7-141)

**NOTE**

Procedure is same to remove upper anti-icing gallery on No. 1 or No. 2 engine.

- 1, Disconnect and **remove hose (1)** at tee (2).
Wipe up 011 with cloths (E135).

**GO TO NEXT PAGE**

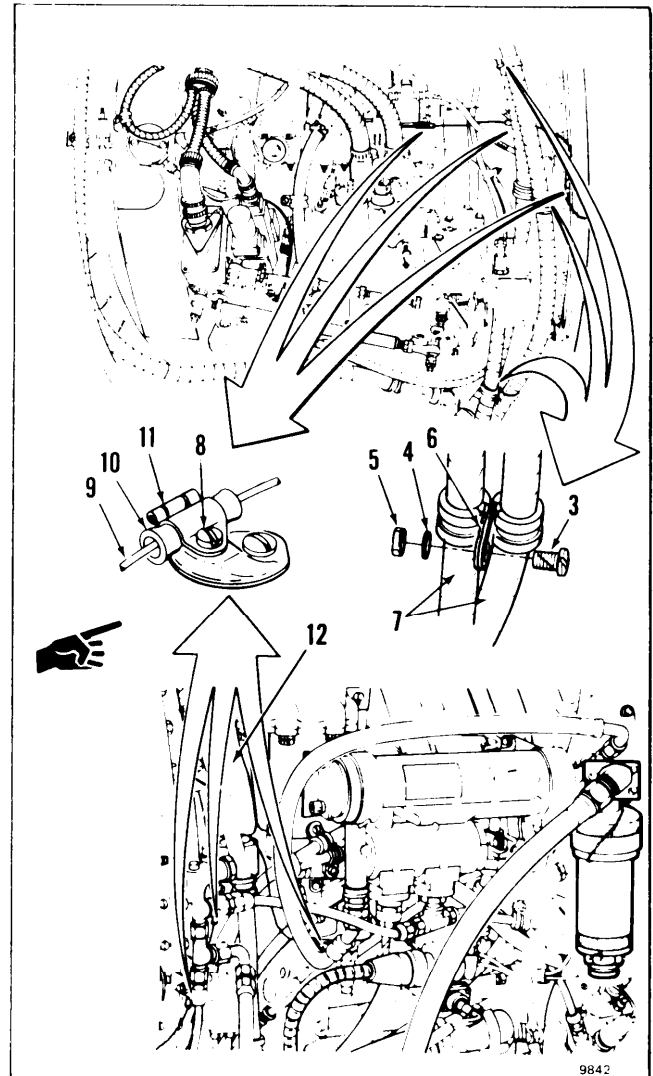
4-82 REMOVE UPPER ANTI-ICING GALLERY (Continued)**4-82**

- Remove three screws (3), washers (4), and nuts (5). **Disconnect three clamps (6).** Remove two hoses (7). Mark clamp locations. Use tape (E388).

CAUTION

Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

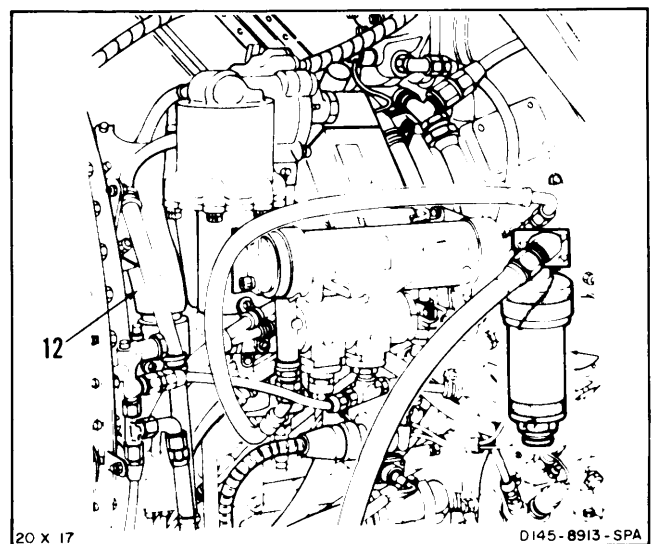
- Turn fastener (8) counterclockwise and release element (9) and bushing (10) from six clamps (11). **Move element away from gallery (12).**



- Remove upper gallery (12) (TM 55-2840-254-23).

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

INITIAL SETUP

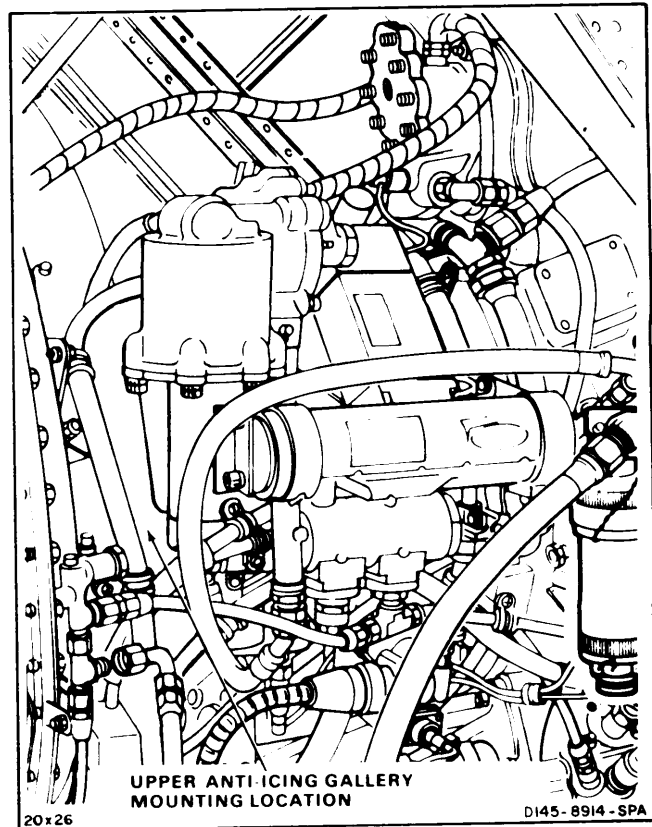
Applicable Configurations:
All

Tools:
Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:
None

Personnel Required:
68B10 Aircraft Powerplant Repairer
67U30 Inspector

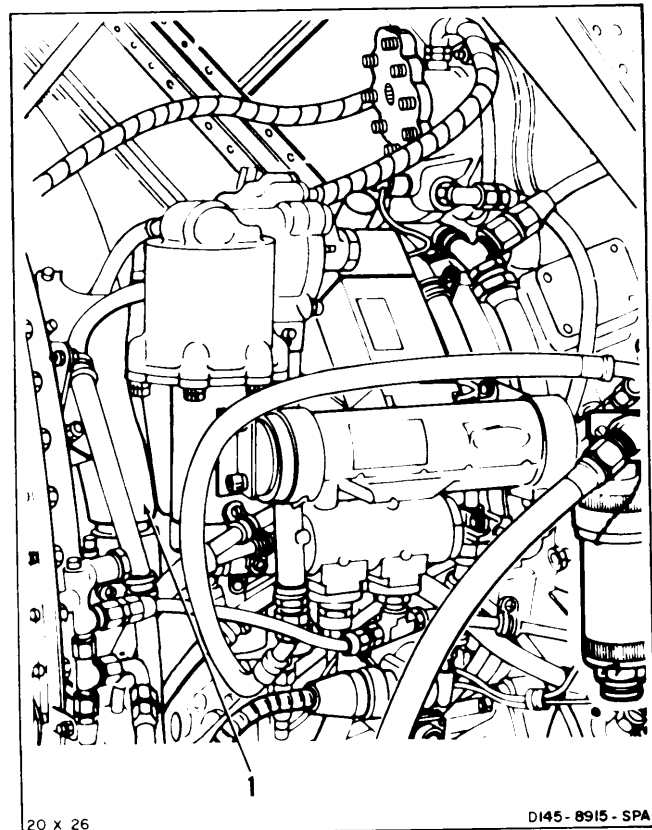
References:
TM 55-2840-254-23
TM 55-2840-254-23P
TM 55-1520-240-23P



NOTE

Procedure is same to install upper anti-icing gallery on No. 1 or No. 2 engine.

1. Install upper gallery (1) (TM 55-2840-254-23).



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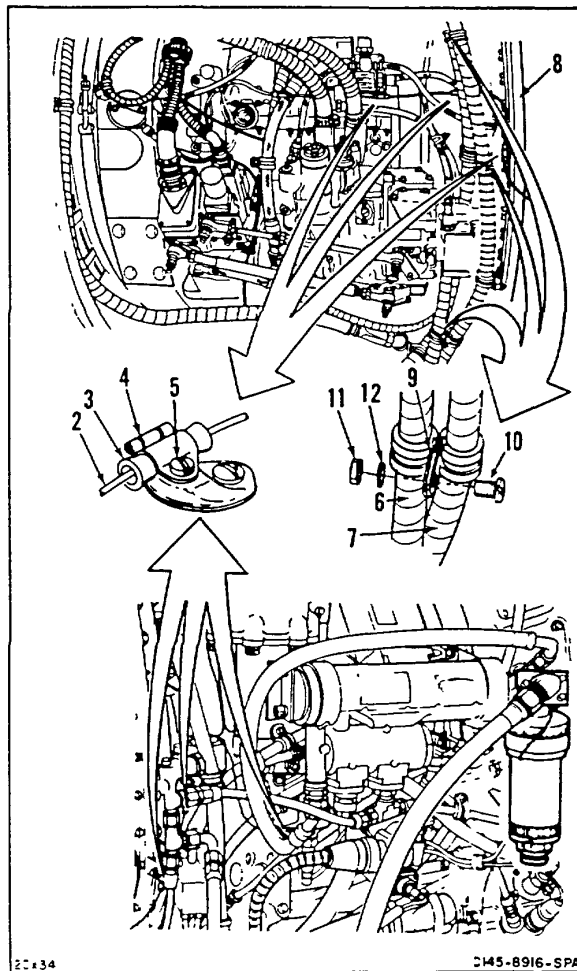
**4-83 INSTALL UPPER ANTI-ICING GALLERY
(Continued)**

4-83

CAUTION

Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

2. Press element (2) and bushing (3) into clamps (4) at six locations. Bushings shall be centered in clamps.
3. Lock each clamp (4) with fastener (5).
4. Position two hoses (6 and 7) on powerplant (8). Connect three clamps (9) and install three screws (10), nuts (11), and washers (12). Remove tape marking clamp locations

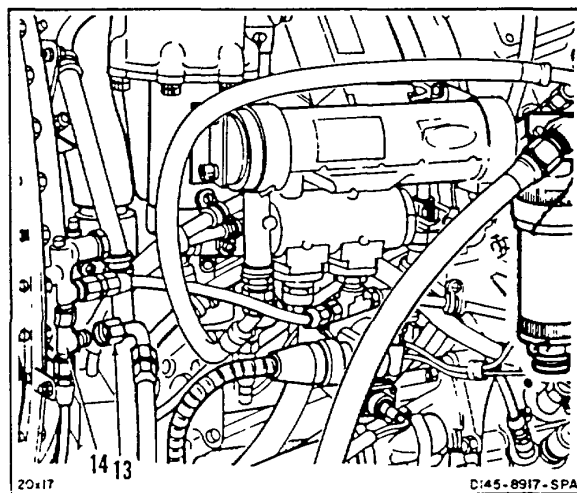


5. Connect hose (13) to tee (14).

INSPECT

FOLLOW-ON MAINTENANCE:

- Install starter (Task 7-142).
- Install hot air valve (Task 4-79).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

4-84 REMOVE INTERSTAGE AIR BLEED BAND

4-84

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer

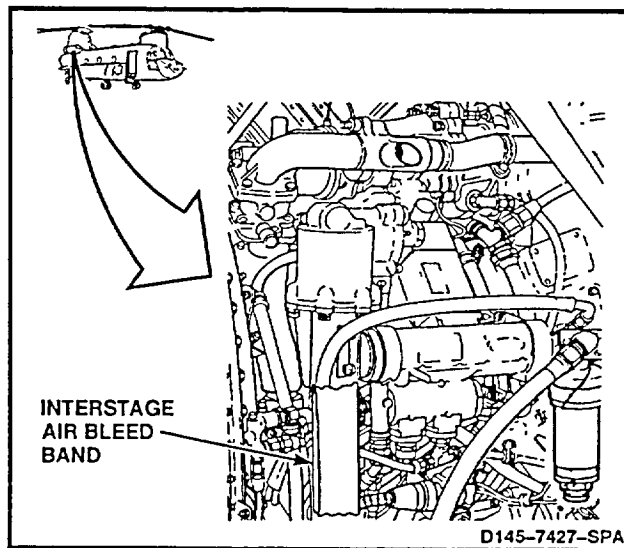
References:

TM 55-2840-254-23 (Without **74**)

TM 1-2840-265-23 (With **74**)

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



CAUTION

Do not pinch, crush, kink or make sharp bends in fire detection element. Element can be damaged.

NOTE

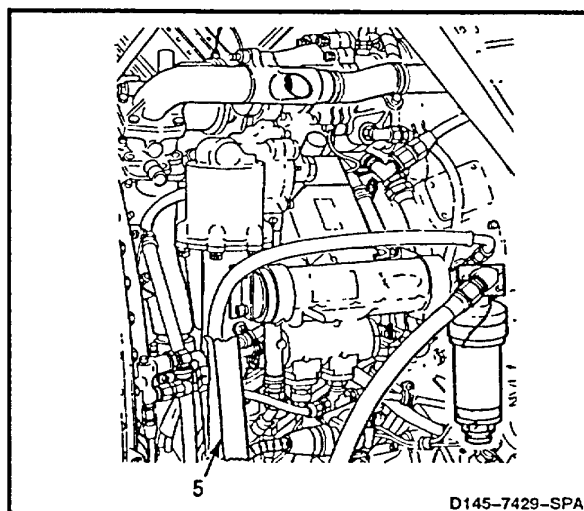
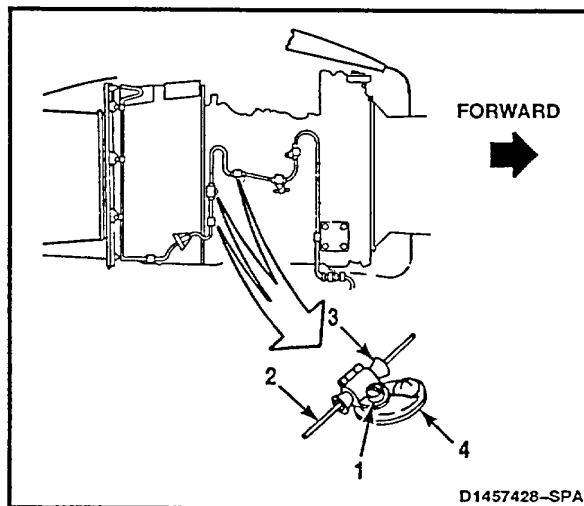
Procedure is same to remove interstage air bleed band from No. 1 or No. 2 powerplant. Removal of No. 2 bleed band is shown here.

1. Turn three fasteners (1) counterclockwise and release elements (2) and bushing (3) from three clamps (4). Move element to side.

2. Remove interstage air bleed band (5) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-214 Change 19

4-85 INSTALL INTERSTAGE AIR BLEED BAND

4-85

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

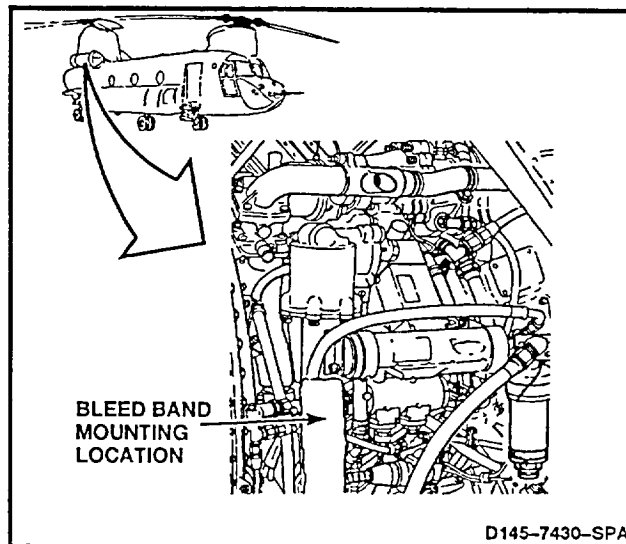
None

Personnel Required:

Aircraft Powerplant Repairer
Inspector

References:

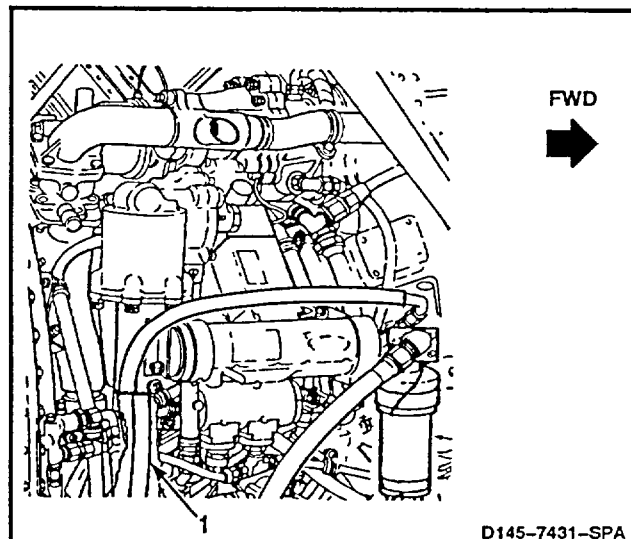
- TM 55-1520-240-23P
- TM 55-2840-254-23 (Without **74**)
- TM 1-2840-265-23 (With **74**)



NOTE

Procedure is same to install interstage bleed band on No. 1 or No. 2 powerplant. Installation of No. 2 bleed band is shown here.

1. Install interstage air bleed band (1) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



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**4-85 INSTALL INTERSTAGE AIR BLEED BAND
(Continued)**

4-85

CAUTION

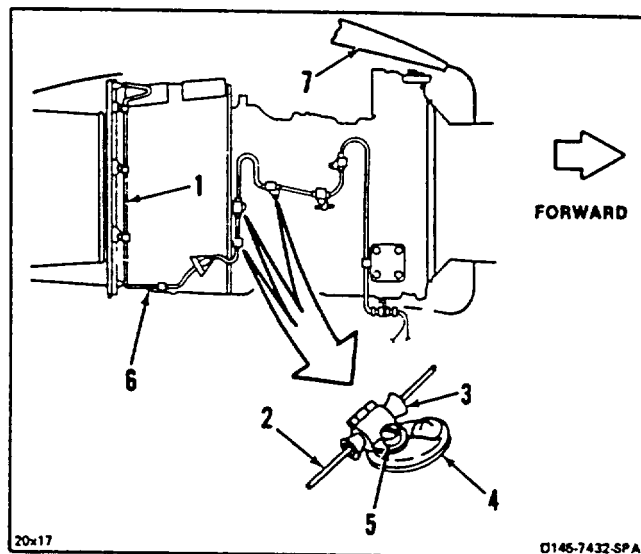
Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

- Position element (2) and bushing (3) in three clamps (4). Turn three fasteners (5) clockwise to secure element.

CAUTION

Make sure fire detection sensing element cannot chafe on powerplant or cover. Chafing can result in a false fire indication or an inoperative fire detection system.

- Make sure element (2) cannot chafe on powerplant (6) or cover (7).

**INSPECT****FOLLOW-ON MAINTENANCE:**

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

4-216

4-86 REMOVE BLEED BAND ACTUATOR

4-86

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer

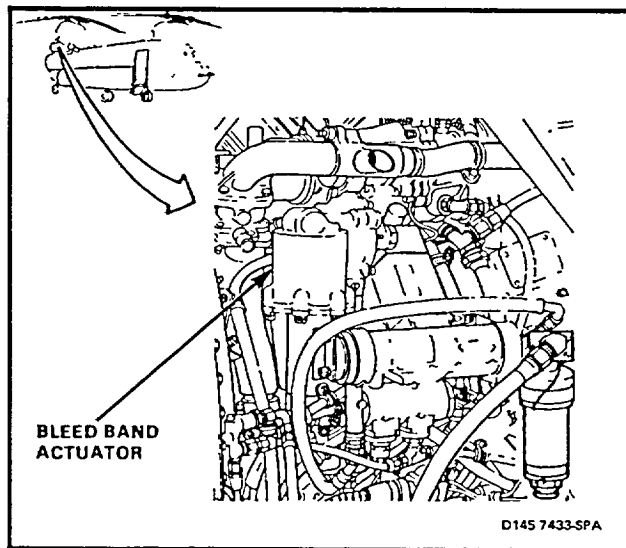
References:

TM 55-2840-254-23 (Without **74**)

TM 1-2840-265-23 (With **74**)

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



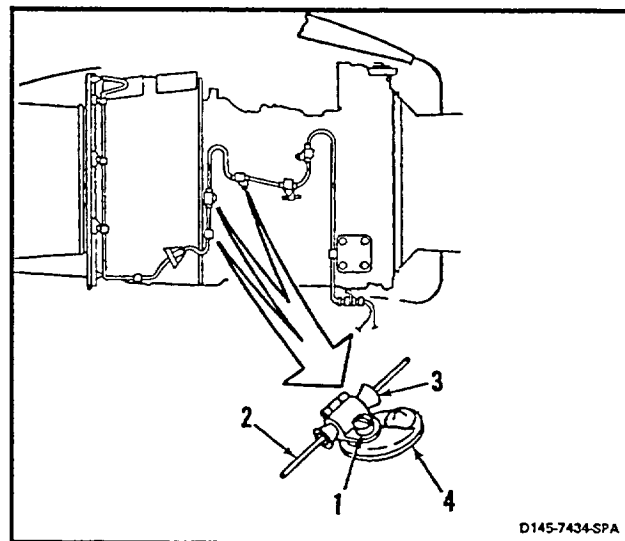
NOTE

Procedure is same to remove bleed band actuator from No. 1 or No. 2 powerplant. Removal of No. 2 bleed band is shown here.

CAUTION

Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

1. Turn three fasteners (1) counterclockwise and release element (2) and bushing (3) from three clamps (4). Move element to side.



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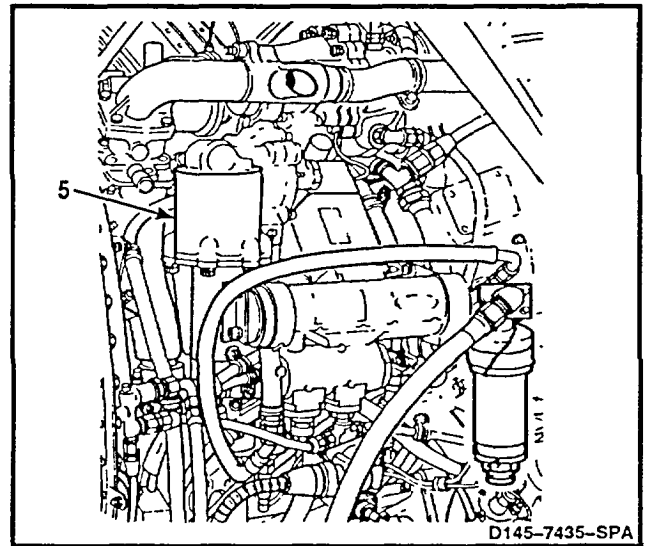
4-86 REMOVE BLEED BAND ACTUATOR (Continued)

4-86

2. Remove bleed band actuator (5) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-218 Change 19

4-87 INSTALL BLEED BAND ACTUATOR

4-87

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

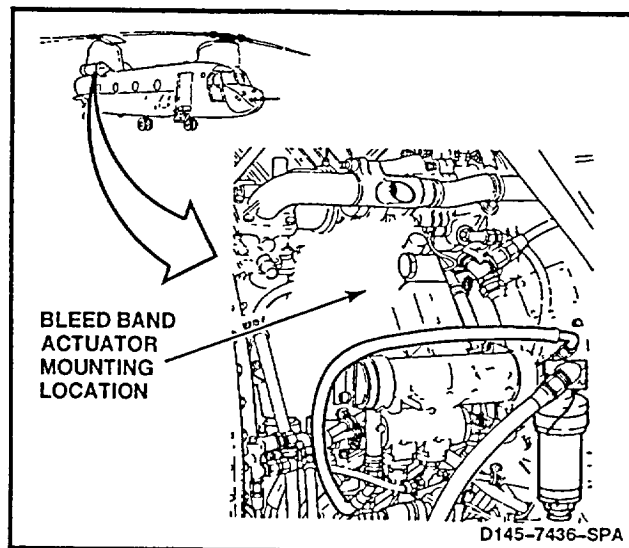
None

Personnel Required:

Aircraft Powerplant Repairer
Inspector

References:

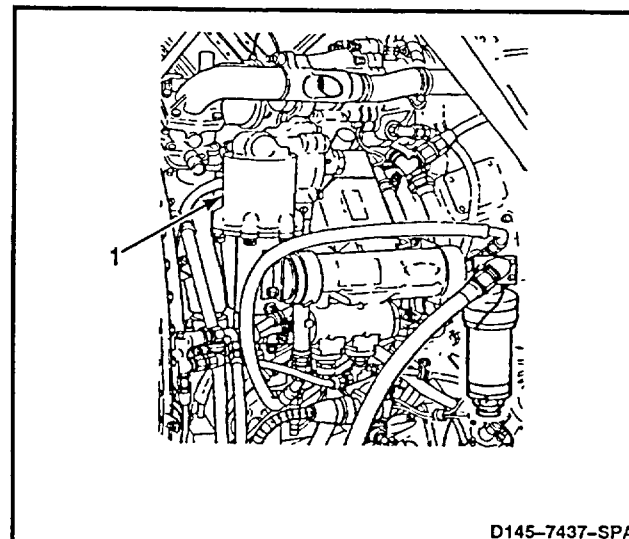
- TM 55-1520-240-23P
- TM 55-2840-254-23 (Without **74**)
- TM 1-2840-265-23 (With **74**)



NOTE

Procedure is same to install bleed band actuator on No. 1 or No. 2 powerplant. Installation of No. 2 bleed band actuator is shown here.

1. Install bleed band actuator (1) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



GO TO NEXT PAGE

CAUTION

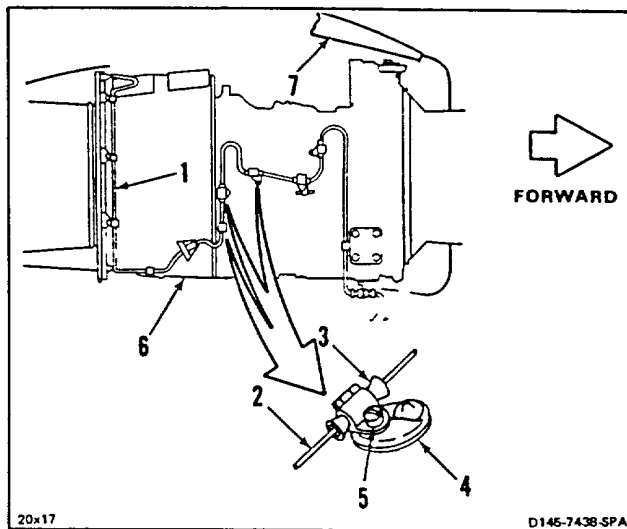
Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

- Position element (2) and bushing (3) in three clamps (4). Turn three fasteners (5) clockwise to secure element.

CAUTION

Make sure fire detection sensing element cannot chafe on powerplant or cover. Chafing can result in a false fire indication or an inoperative fire detection system.

- Make sure element (2) cannot chafe on powerplant (6) or cover (7).

**INSPECT****FOLLOW-ON MAINTENANCE:**

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2)

END OF TASK

SECTION V
EXHAUST SYSTEM

4-88 REMOVE EXHAUST CONE

4-88

INITIAL SETUP

Applicable Configurations:

All

Tools:

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

Materials:

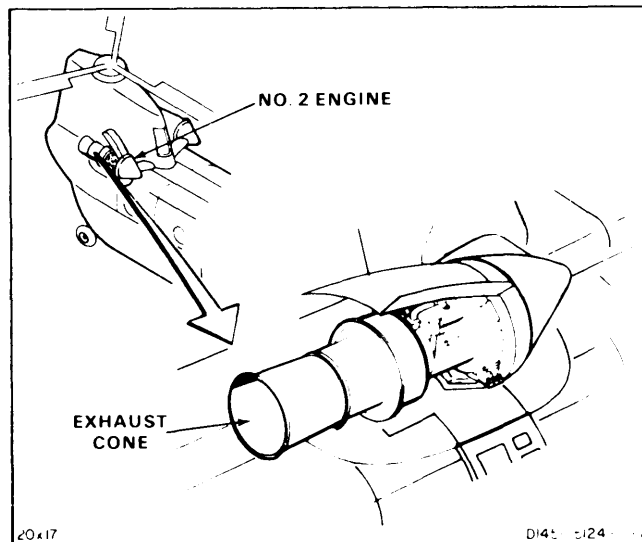
None

Personnel Required:

- Medium Helicopter Repairer (2)

Equipment Condition:

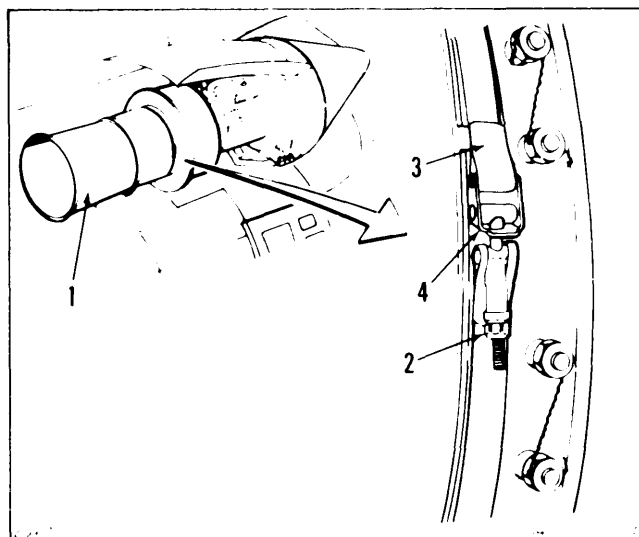
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



NOTE

Procedure is same to remove exhaust cone from No. 1 or No. 2 engine. No. 2 engine is shown here.

1. Have helper support cone (1). Loosen nut (2) on coupling (3). Disengage latch (4).



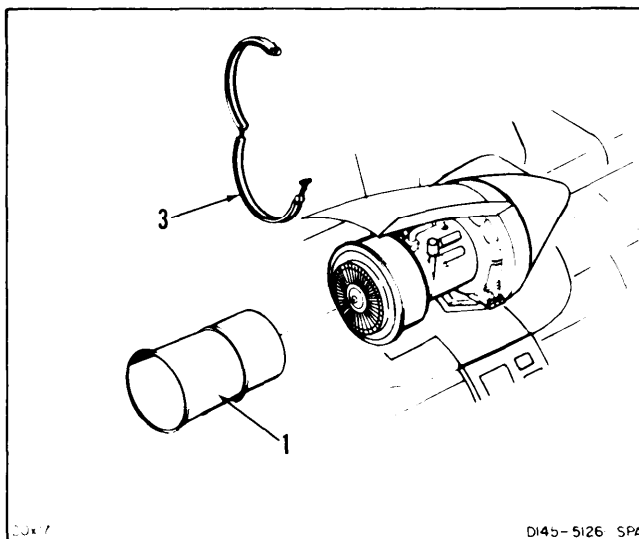
CAUTION

Do not let cone contact engine blades. Damage to blades can result.

2. Remove cone (1) and coupling (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-89 REPAIR EXHAUST CONE (AVIM)**4-89****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Inert Gas Welding Set
 NSN 3431-00-079-0498
 Airframe Repairer's Tool Kit,
 NSN 5180-00-323-4876

Materials:

Alloy Sheet (Inconel), 0.025 Inch Thick (E202)
 Welding Rods AMS5679 (E444)

Personnel Required:

Welder
 Inspector

References:

MIL-W-8611
 TM 55-1500-204-25/1

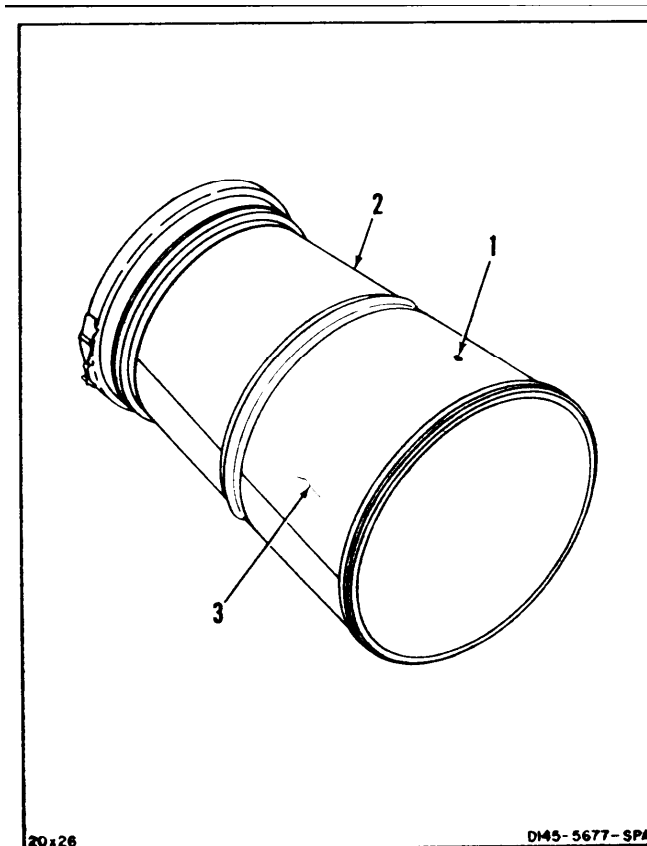
Equipment Condition:

Off Helicopter Task

1. **Repair holes (1)** in cone (2) by welding patches of alloy sheet (E202) (MIL-W-8611). Use welding rods (E444). Repair limits are as follows:
 - a. Limit of 2-inch hole diameter.
 - b. Limit of three holes per cone.
 - c. Limit of 9 square inches of patching per cone.
 - d. Minimum of 6 inches between holes.

INSPECT

2. Repair cracks (3) in cone (2) by welding. Use welding rod (E444). Repair limits are as follows:
 - a. Limit of 8 inches crack length.
 - b. Limit of 1/8-inch crack width.
 - c. Limit of 16-inches of crack repair.

INSPECT

20-26

DM5-5677-SPA

GO TO NEXT PAGE

4-222 Change 5

4-89 REPAIR EXHAUST CONE (AVIM) (Continued)

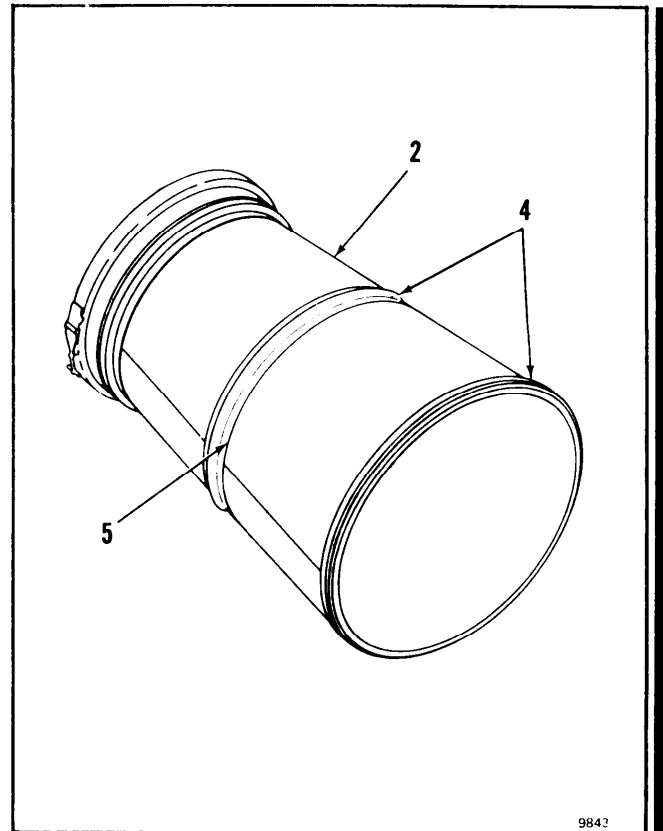
REPLACE STIFFENER BY WELDING

NOTE

Replace either of two stiffeners in the same way.

3. **Cut stiffener (4) away from cone (2).** Grind flange edge (5) smooth.
4. **Install new stiffener (4) on flange edges (5) by seam welding** (TM 55-1500-204-25/1).
5. **Butt weld ends** of new stiffener (4) (TM 55-1500-204-25/1). **Drill two equally spaced 0.125 inch holes** in new stiffener (4).

INSPECT



9842

REPLACE STIFFENER WITH RIVETS

6. Cut stiffener (4) away from cone (2). Grind flange edges (5) smooth.
7. **Install new stiffener (4) on flange edges (5) with rivets (6)** (TM 55-1500-204-25/1). Rivets are to be spaced 0.50 inch apart and 0.18 inch from flange edge.

INSPECT

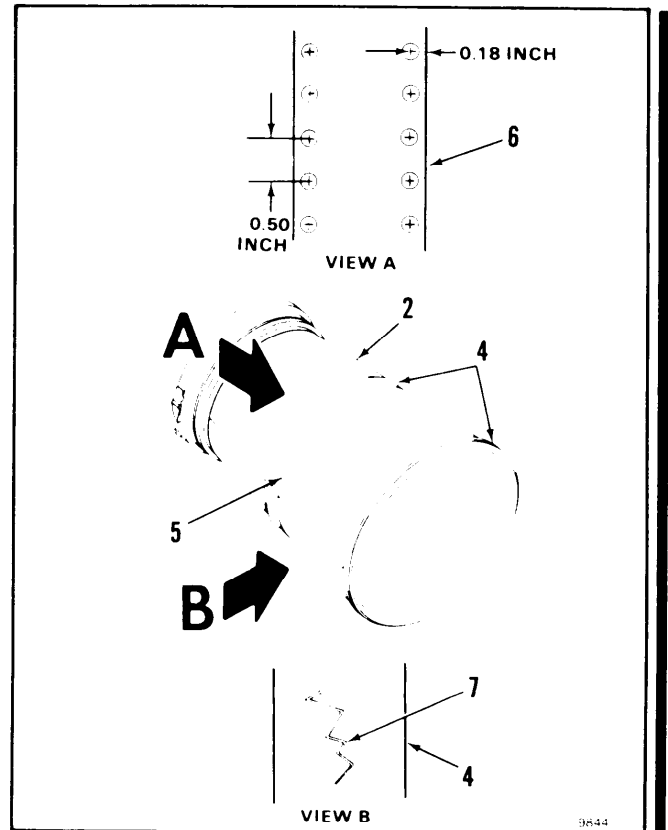
REPAIR STIFFENER CRACKS

8. Drill 0.062 inch hole at each end of crack (7) in stiffener (4). Deburr holes.
9. Repair crack (7) by butt welding (TM 55-1500-204-25/1). Use welding rod (E444).

INSPECT

FOLLOW-ON MAINTENANCE,

None



9844

END OF TASK

4-90 INSTALL EXHAUST CONE**4-90****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Torque Wrench, 5 to 50 Inch-Pounds
Rawhide Mallet

Materials:

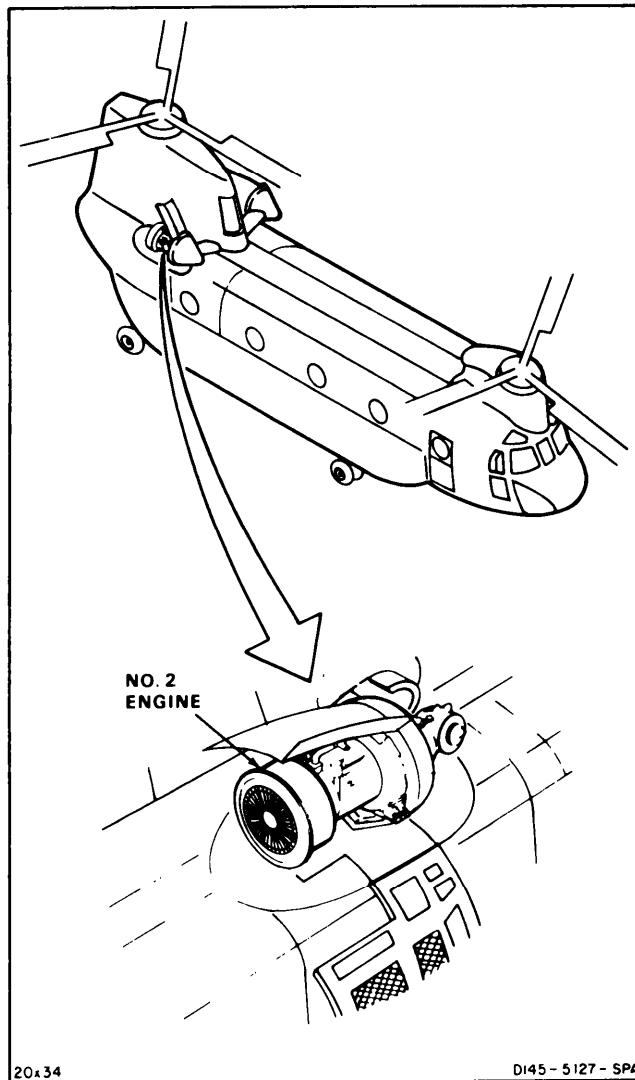
None

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

TM 55-1520-240-23P
TM 55-1500-204-25/1

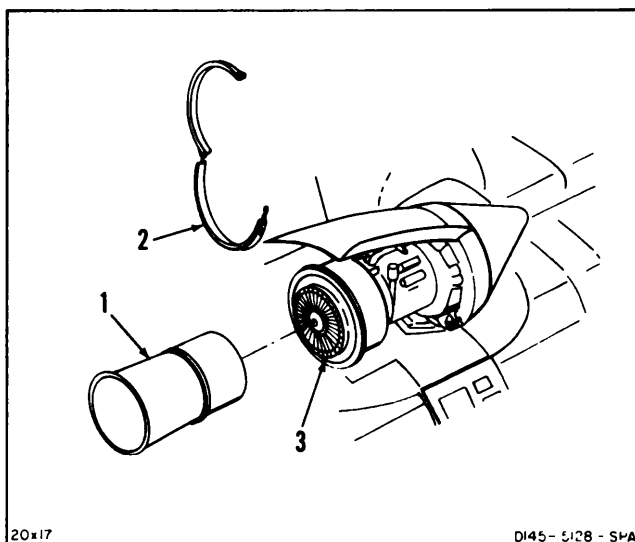
**CAUTION**

Do not let cone contact engine blades. Damage to blades can result.

NOTE

Procedure is same to install exhaust cone on No. 1 or No. 2 engine. No. 2 engine is shown here.

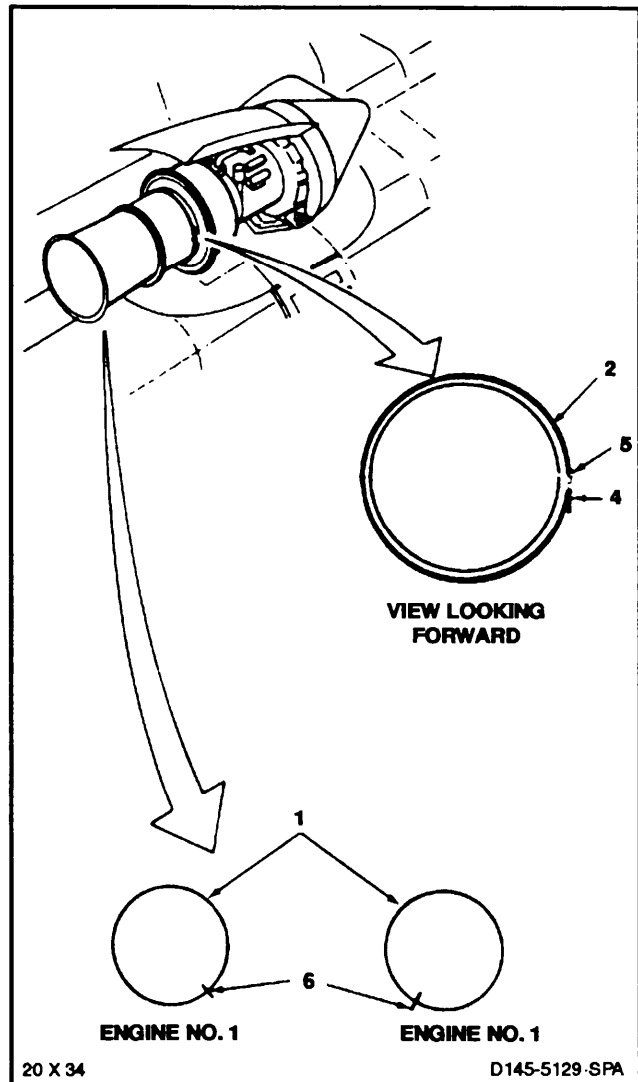
1. Position cone (1) and coupling (2) on engine (3). Have helper support cone.

**GO TO NEXT PAGE**

4-90 INSTALL EXHAUST CONE (Continued)

4-90

2. **Align nut (4) on coupling (2). Engage latch (5).** Tighten nut until cone (1) is secure. Have helper tap around coupling with rawhide mallet while nut is tightened to **make sure coupling seats properly.** For the No. 1 and No. 2 engine, align coupling nut at the 3 and 9 o'clock positions.
3. **Align seam (6) on cone (1) as follows:**
 - a. On No. 1 engine, rotate cone until seam is at 4 o'clock position.
 - b. On No. 2 engine, rotate cone until seam is at 8 o'clock position.



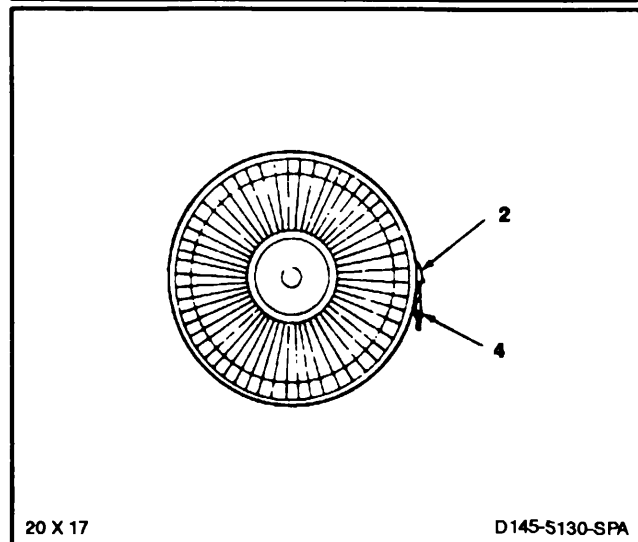
4. **Torque nut (4) to 30 inch-pounds above friction-torque.** Tap completely around coupling (2) with rawhide mallet. **Make sure coupling is properly seated.**

INSPECT

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).
Torque nut to 30 inch-pounds above friction torque after initial ground run.

END OF TASK



4-91 CHANGE ENGINE OIL FROM MIL-L-23699 OR MIL-L-7808

4-91

INITIAL SETUP**Applicable Configurations:**

All

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

Oil (E253)

Oil (E254)

Personnel Required:

Medium Helicopter Repairer

Inspector

Army Rotary-Wing Aviator (2)

References:TM 55-2840-254-23 (Without **74**)TM 1-2840-265-23 (With **74**)

TM 55-1520-240-10

Task 1-52

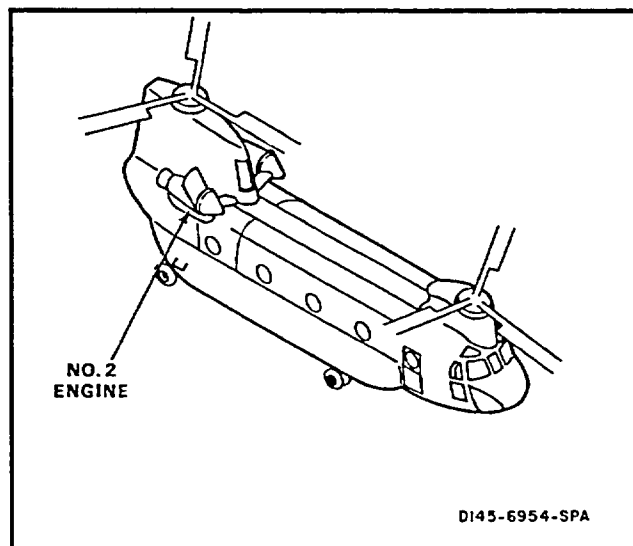
Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Work Platform Open (Task 2-2)

Engine Access Cover Open (Task 4-49)

**NOTE**

Procedure is same to change engine oil on No. 1 or No. 2 powerplant.

1. Drain engine oil (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
2. Change engine oil (TM 55-2840-254-23, without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).

END OF TASK

4-92 REMOVE OIL PUMP FROM NO. 1 POWERPLANT

4-92

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
- Open End Wrench, 1-1/2 Inch
- Container, 2-Quart

Materials:

- Cloths (E135)
- Paper Tags (E264)

Personnel Required:

Aircraft Powerplant Repairer (2)

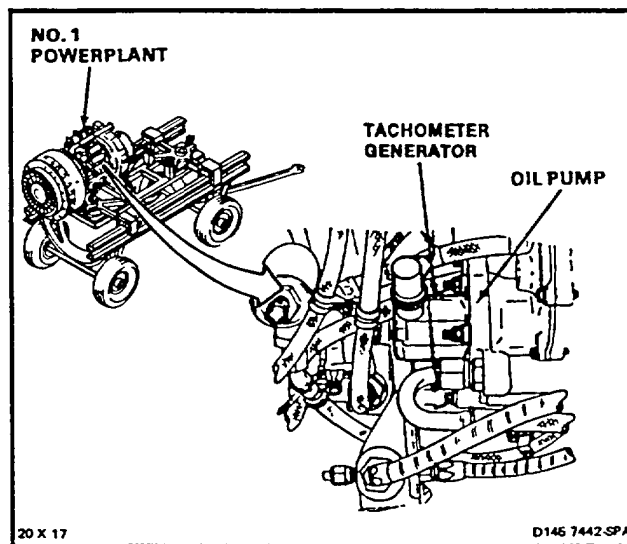
References:

- TM 55-2840-254-23 (Without **74**)
- TM 1-2840-265-23 (With **74**)

Equipment Condition:

Off Helicopter Task

General Safety Instructions:



WARNING

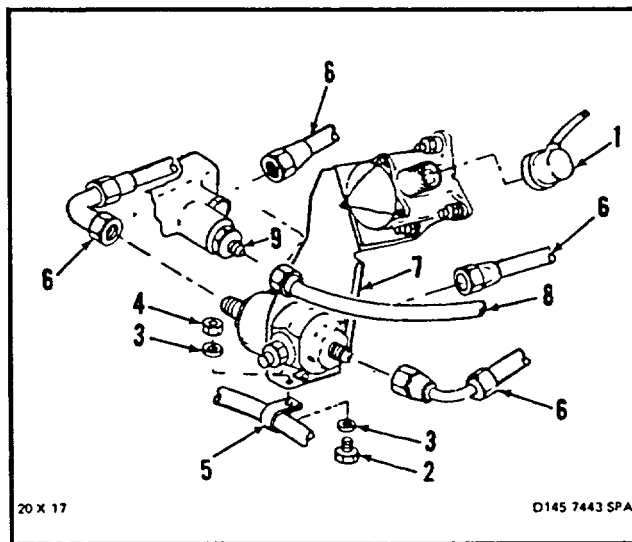
All regulations for handling fuels shall be strictly observed.

1. Remove oil pump (TM 1-2840-265-23 with **74**).

NOTE

Steps 2 thru 11 are for engines without **74**.

2. Remove lockwire and disconnect cable connector (1).
3. Remove screw (2), two washers (3), and nut (4). Disconnect clamp (5) from bracket (7).
4. Tag and disconnect four drain hoses (6) from bracket (7). Use cloths (E135) for spilled fluid.
5. Disconnect fuel hose (8) and cap hose and fuel control fitting (9). Clean up spilled fluid. Use cloths (E135).



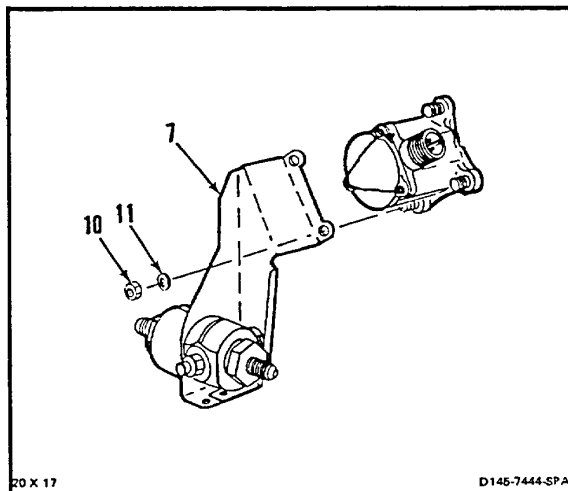
GO TO NEXT PAGE

4-226 Change 19

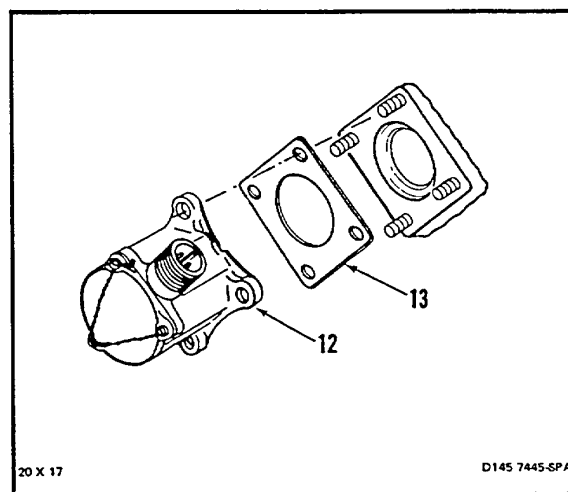
4-92 REMOVE OIL PUMP FROM NO. 1 POWERPLANT (Continued)

4-92

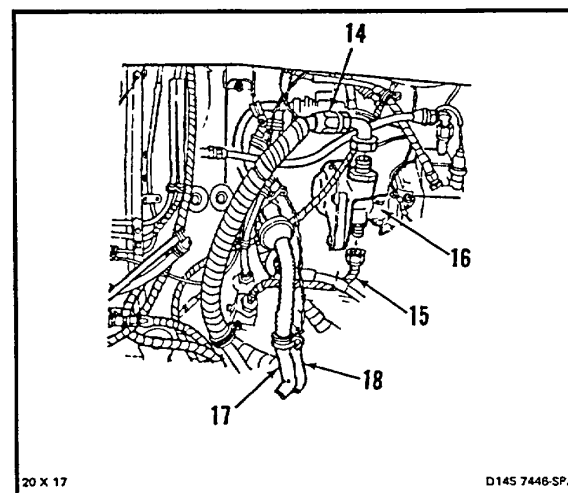
6. Remove four nuts (10) and washers (11).
7. Remove bracket (7).



8. Remove tachometer generator (12) and gasket (13).



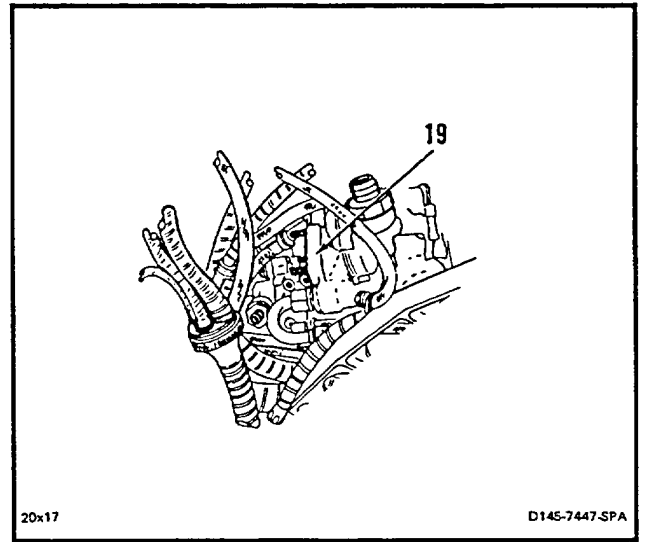
9. Disconnect two hoses (14 and 15) from fuel pump (16). Use container to catch spilled fuel. Clean up any spilled fuel. Use cloths (E135). Remove two hoses.
10. Move electrical harnesses (17 and 18) to side.



GO TO NEXT PAGE

Change 19 4-227

11. Remove oil pump (19) (TM 55-2840-254-23).



FOLLOW-ON MAINTENANCE:
None

END OF TASK

4-228 Change 19

4-93 INSTALL OIL PUMP ON NO. 1 POWERPLANT

4-93

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
- Open End Wrench, 1-1/2 Inch
- Container, 2-Quart

Materials:

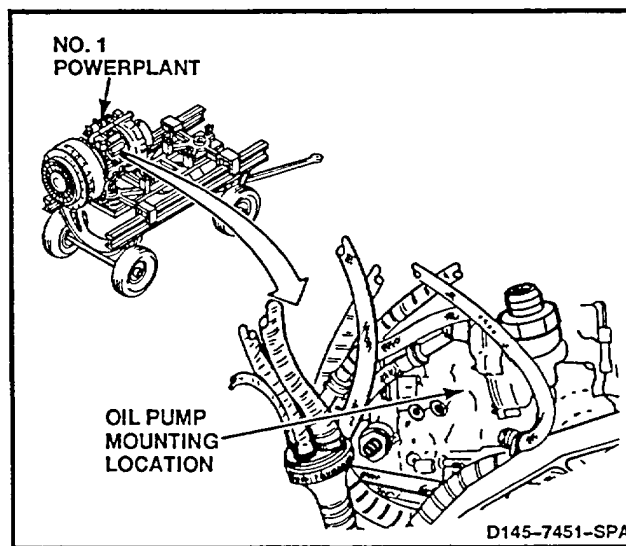
- Plastilube (E280)
- Lockwire (E231)

Personnel Required:

- Aircraft Powerplant Repairer (2)
- Inspector

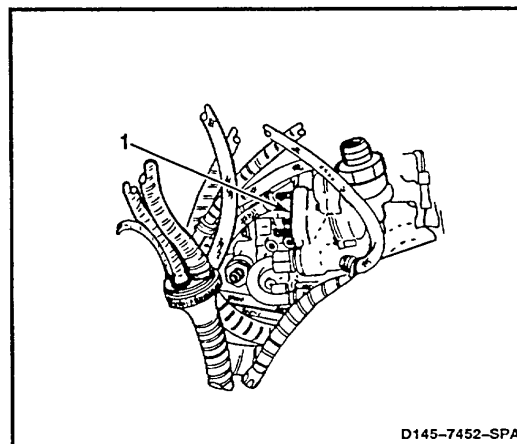
References:

- TM 55-2840-254-23 (Without **74**)
- TM 1-2840-265-23 (With **74**)
- TM 55-1520-240-23



D145-7451-SPA

1. **Install oil pump (1)** (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

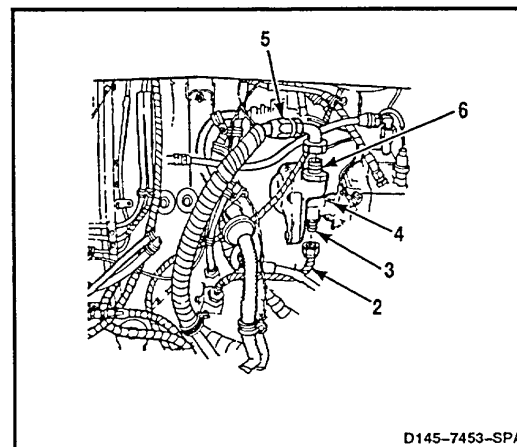


D145-7452-SPA

NOTE

Remainder of steps are for engines without **74**.

2. **Connect hose (2)** to port (3) on fuel pump (4).
3. **Connect hose (5)** to port (6) on fuel pump (4).



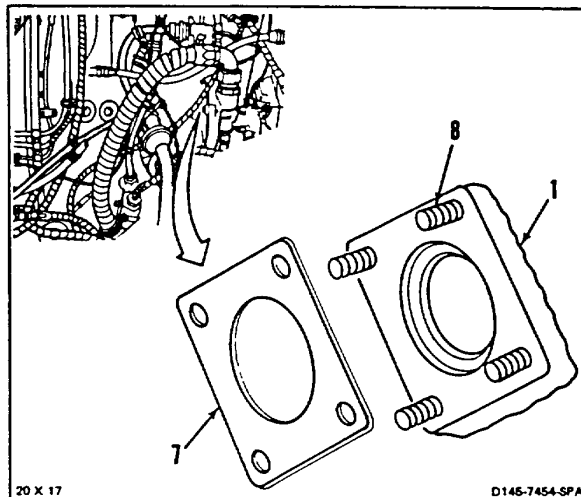
D145-7453-SPA

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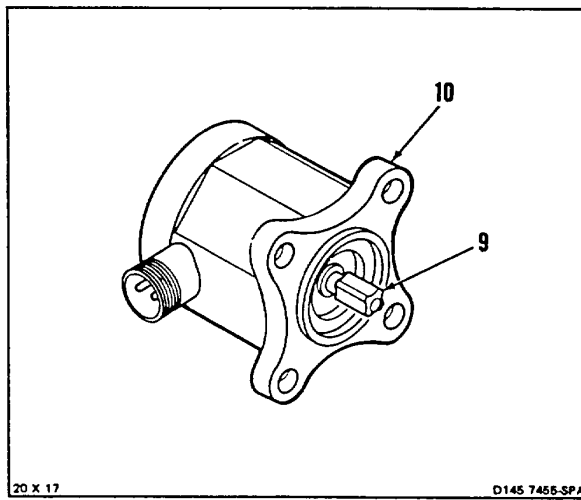
4-93 INSTALL OIL PUMP ON NO. 1 POWERPLANT
(Continued)

4-93

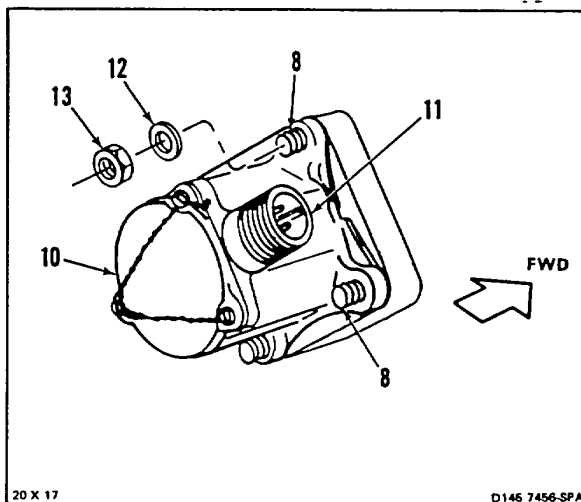
4. Install **gasket (7)** over mounting studs (8) on oil pump (1).



5. Lubricate shaft (9) on tachometer generator (10). Use plastilube (E280).



6. **Position tachometer generator (10)** on mount pad studs (8) with receptacle (11) positioned at 2 o'clock.
7. Install two washers (12) and **nuts (13)** on two outboard studs (8). Do not tighten nuts at this time.

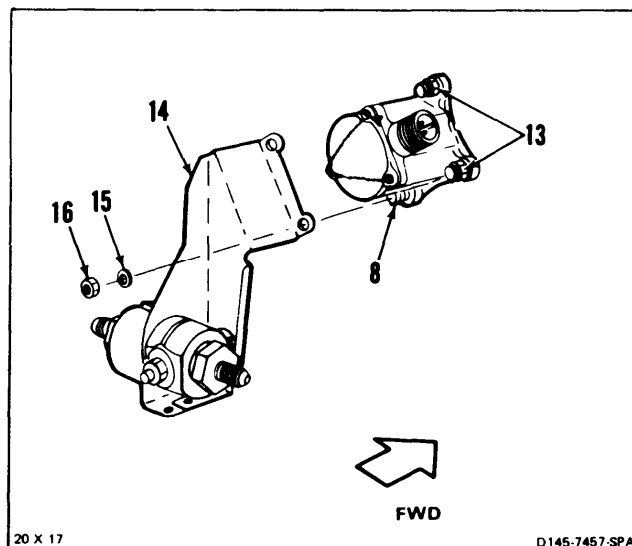


GO TO NEXT PAGE

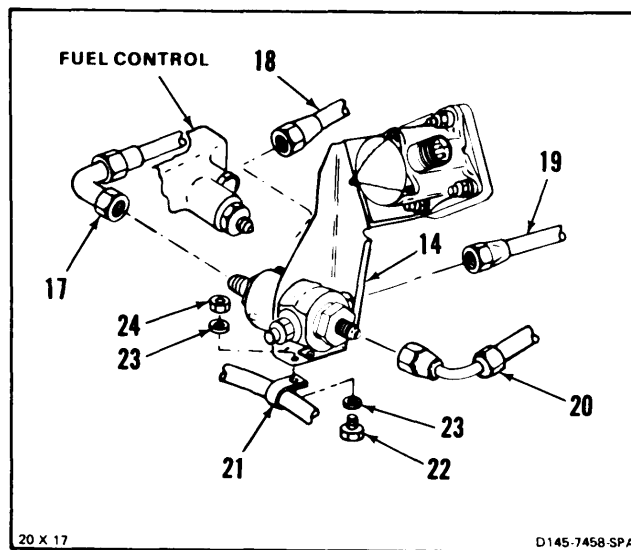
4-93 INSTALL OIL PUMP ON NO. 1 POWERPLANT (Continued)

4-93

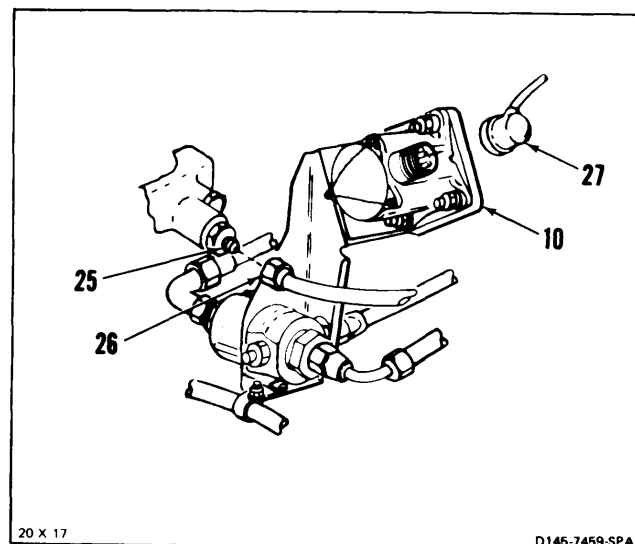
8. **Position bracket (14)** over two inboard studs (8).
9. **Install two washers (15) and nuts (16)** on two inboard studs (8). Tighten all four nuts (13 and 16).



10. **Connect drain hose (17)**. Remove tag.
11. **Connect drain hose (18)**. Remove tag.
12. **Connect drain hose (19)**. Remove tag.
13. **Connect drain hose (20)**. Remove tag.
14. **Connect clamp (21)** to bracket 14. Install screw (22), two washers (23), and nut (24).



15. Remove cap from fitting (25) and **connect fuel hose (26)**.
16. **Connect cable connector (27)** to tachometer generator (10). Lockwire connector with lockwire (E231).

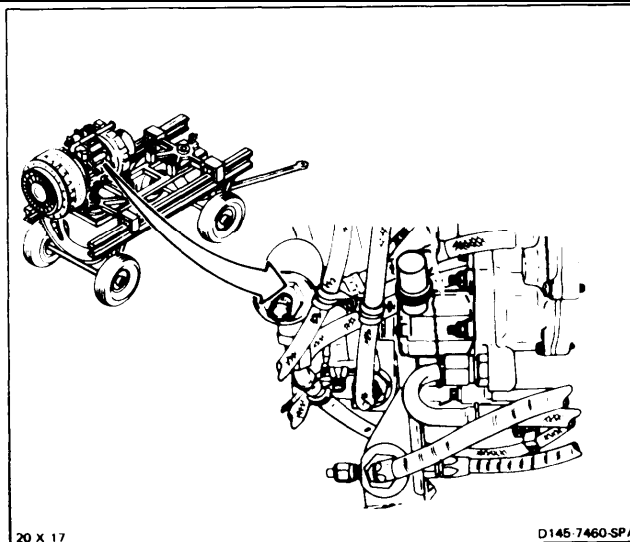


GO TO NEXT PAGE

**4-93 INSTALL OIL PUMP ON NO. 1 POWERPLANT
(Continued)**

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-94 REMOVE OIL PUMP FROM NO. 2 POWERPLANT

4-94

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
Open End Wrench, 1-1/2 Inch
Container, 2-Quart

Materials:

Cloths (E135)

Personnel Required:

Aircraft Powerplant Repairer (2)

References:TM 55-2840-254-23 (Without **74**)TM 1-2840-265-23 (With **74**)**Equipment Condition:**

Battery Disconnected (Task 1-39)

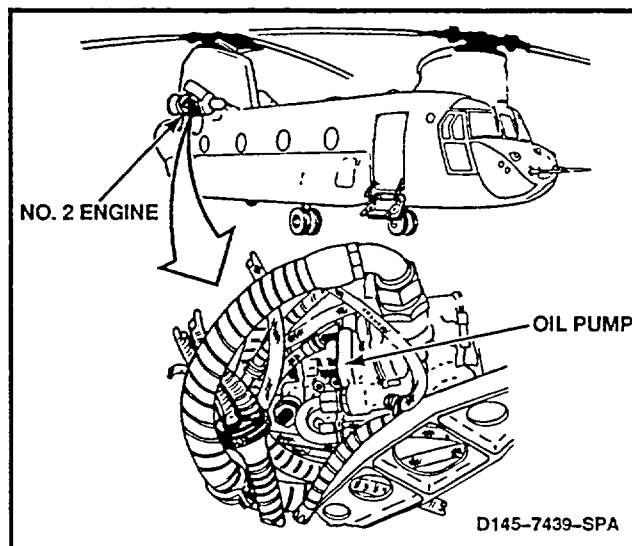
Electrical Power Off

Engine Work Platform Open (2-2)

Engine Access Cover Open (4-49)

No. 2 Gas Producer Tachometer Generator
Removed (Task 8-10)**General Safety Instructions:****WARNING**

All regulations for handling fuels
shall be strictly observed.

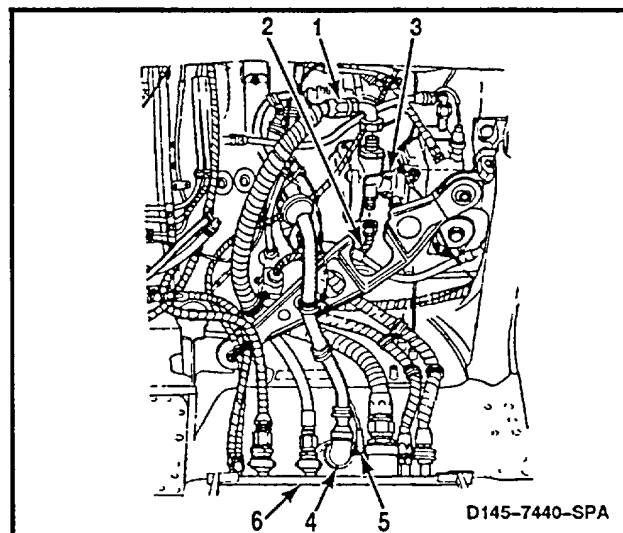


1. Remove oil pump from No. 2 powerplant (TM 1-2840-265-23 with **74**).

NOTE

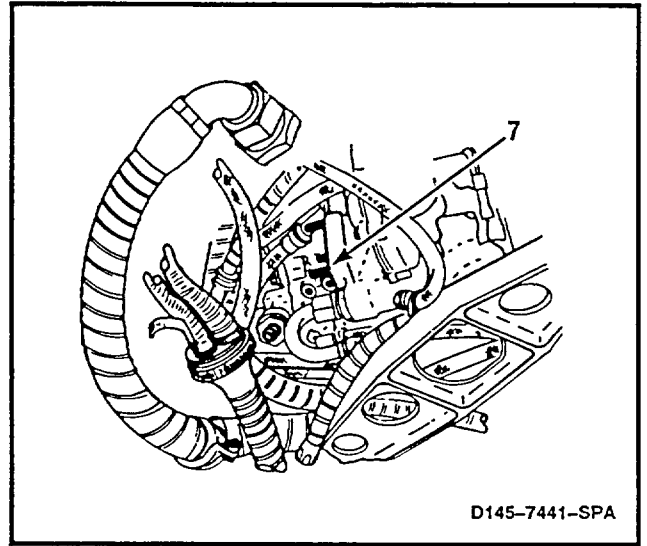
Steps 2 and 5 are for engines without **74**.

2. **Disconnect two hoses (1 and 2)** from fuel pump (3). Use container to catch spilled fuel. Plug hoses. Clean up any spilled fuel. Use cloths (E135). Move hoses to side.
3. Remove lockwire from electrical harness (4).
4. **Disconnect electrical harnesses (4 and 5)**. Move harnesses to side.



GO TO NEXT PAGE

5. Remove oil pump (7) (TM 55-2840-254-23 without 74).



FOLLOW-ON MAINTENANCE:
None

END OF TASK

4-234 Change 19

4-95 INSTALL OIL PUMP ON NO. 2 POWERPLANT

4-95

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
Open End Wrench, 1-1/2 Inch

Materials:

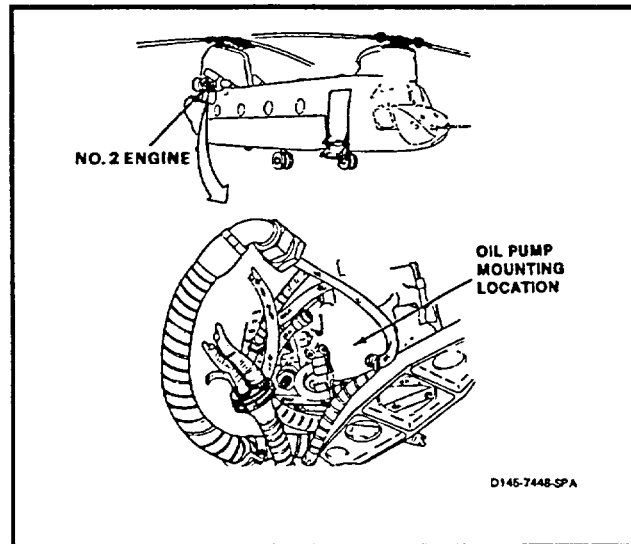
Lockwire (E231)

Personnel Required:

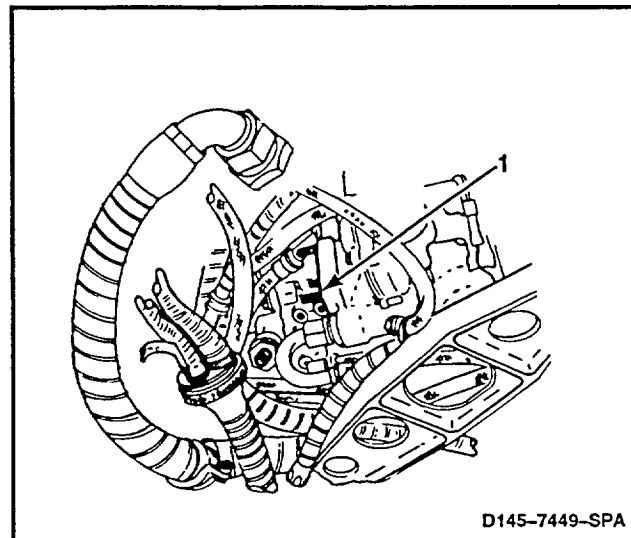
Aircraft Powerplant Repairer (2)
Inspector

References:

TM 55-2840-254-23 (Without **74**)
TM 1-2840-265-23 (With **74**)
TM 55-1520-240-23P



1. Install oil pump (1) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



GO TO NEXT PAGE

4-95 INSTALL OIL PUMP ON NO. 2 POWERPLANT (Continued)

4-95

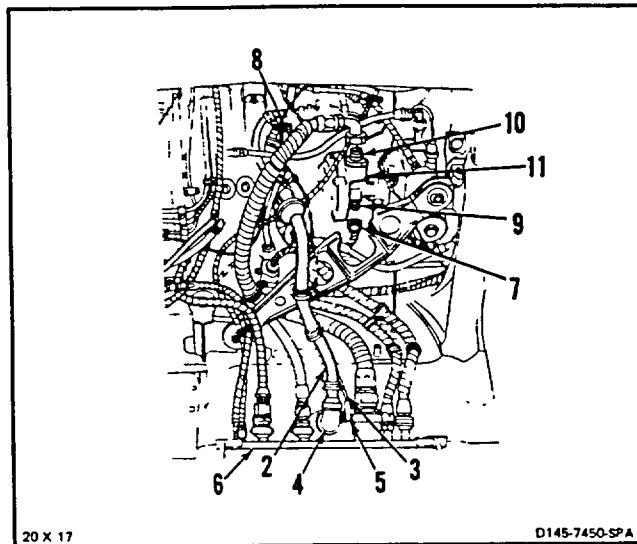
2. **Connect electrical harnesses (2 and 3)** to connector (4 and 5) on shelf (6). Lockwire connector (2). Use lockwire (E231).
3. Remove plugs from hoses (7 and 8). **Connect hoses** to ports (9 and 10) on fuel pump (11).

CAUTION

Make sure hoses and harnesses cannot chafe against each other. Chafing can cause damage to hoses and harnesses.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Install No 2 gas producer tachometer generator (Task 8-13).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

**END OF TASK**

4-236 Change 1

4-96 REPLACE OIL COOLER

4-96

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit,
NSN 5100-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer

References:

- TM 55-2840-254-23 (Without 74)
- TM 55-2840-234-23P (Without 74)
- TM 1-2840-265-23 (With 74)
- TM 1-2840-265-23P (With 74)

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)

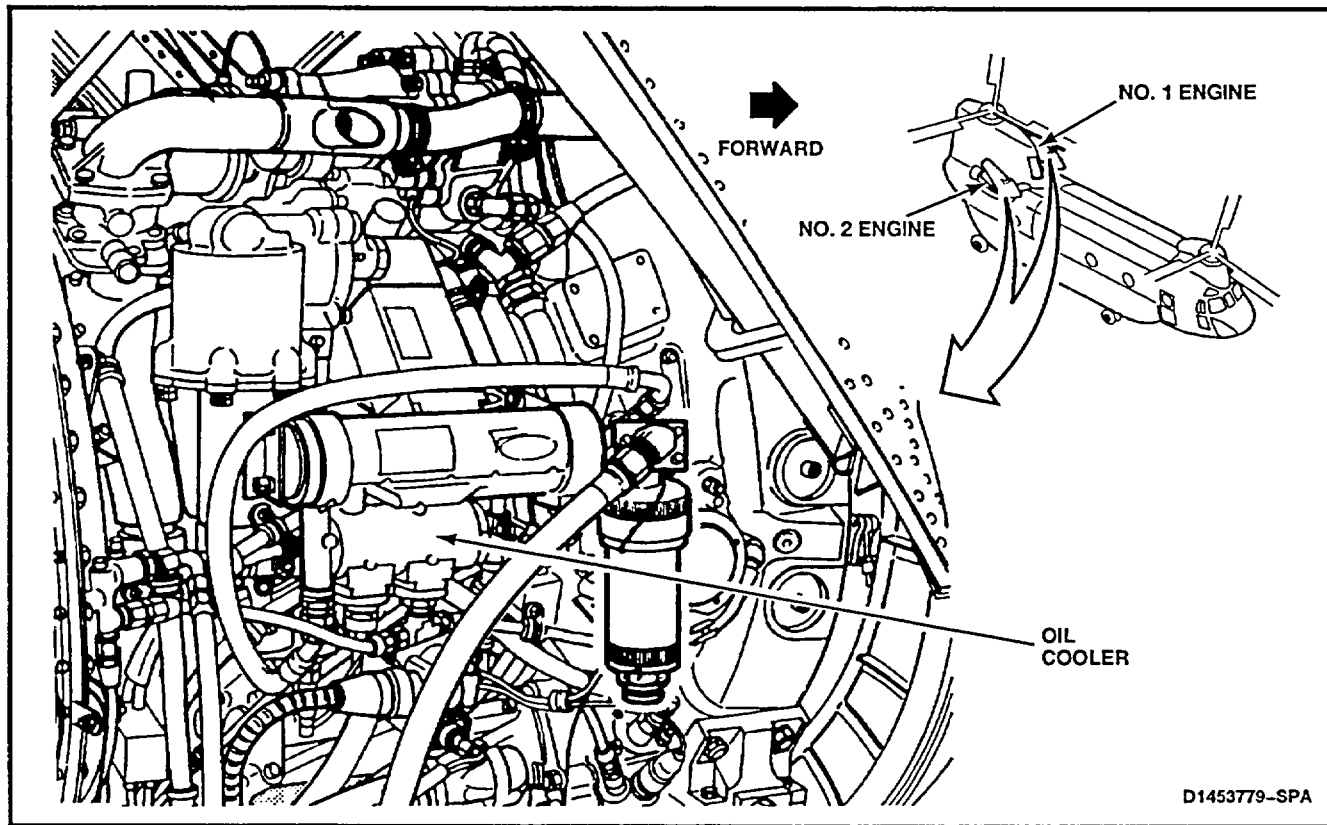
NOTE

Procedure is same to replace oil cooler on No. 1 or No. 2 engine.

1. Replace oil cooler (TM 55-2840-254-23 without 74, TM 1-2840-265-23 with 74).

FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

4-97 REPLACE OIL FILLER STRAINER ELEMENT

4-97

INITIAL SETUP

Applicable Configurations:

All

Tools:Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944**Materials:**

None

Personnel Required:

Aircraft Powerplant Repairer

References:

TM 55-2840-254-23 (Without **74**)
 TM 55-2840-254-23P (Without **74**)
 TM 1-2840-265-23 (With **74**)
 TM 1-2840-265-23P (With **74**)

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Access Cover Open (Task 4-49)
 Oil Filler Removed (Task 4-98)

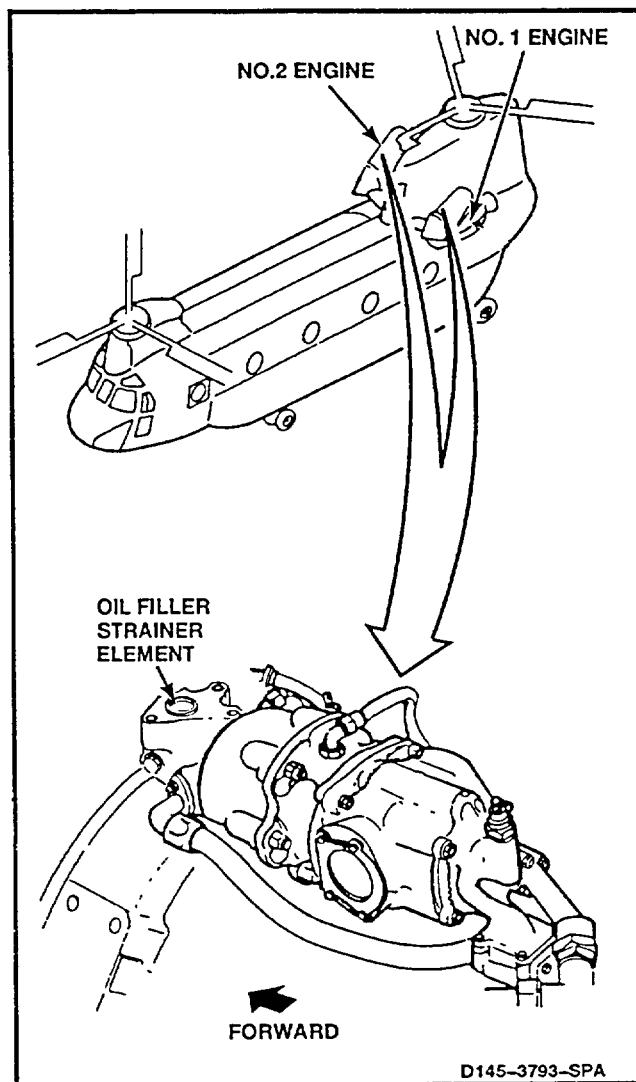
NOTE

Procedure is same to replace oil filler strainer element on No. 1 or No. 2 engine.

1. Replace oil filler strainer element (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Install oil filler (Task 4-99).
 Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).

**END OF TASK**

4-238 Change 19

4-98 REMOVE OIL FILLER

4-98

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit
NSN 5180-00-323-4944

Materials:

Cloths (E135)

Personnel Required:

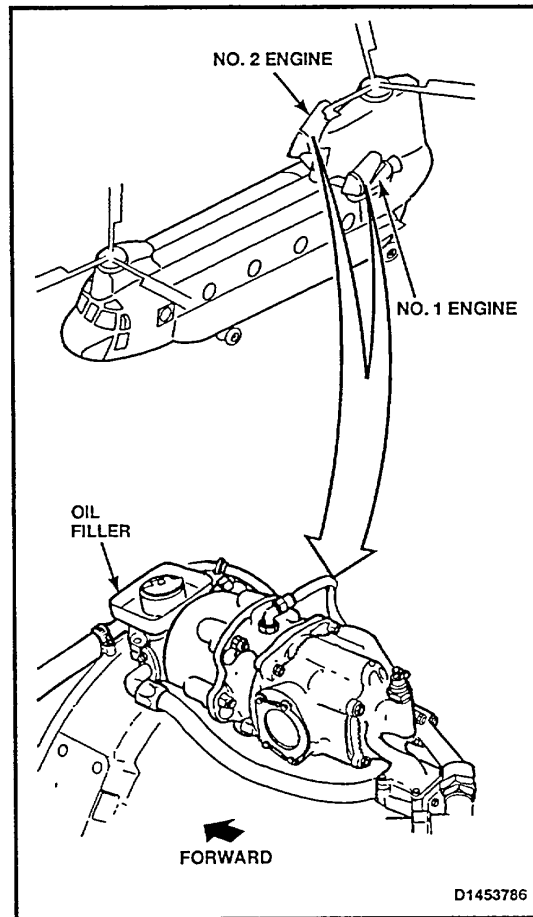
Aircraft Powerplant Repairer

References:

TM 55-2840-254-23 (Without **74**)
TM 1-2840-265-23 (With **74**)

Equipment Condition:

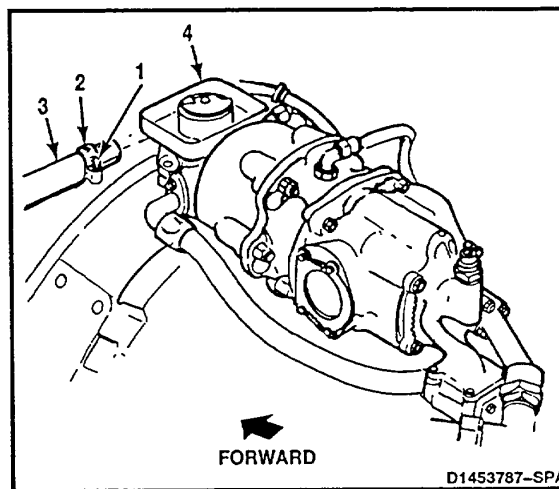
Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)



NOTE

Procedure is same to remove oil filler on No. 1 or No. 2 engine.

1. Loosen screw (1) on clamp (2). **Disconnect hose (3) from oil filler (4).** Use cloths (E135) to clean spilled oil.

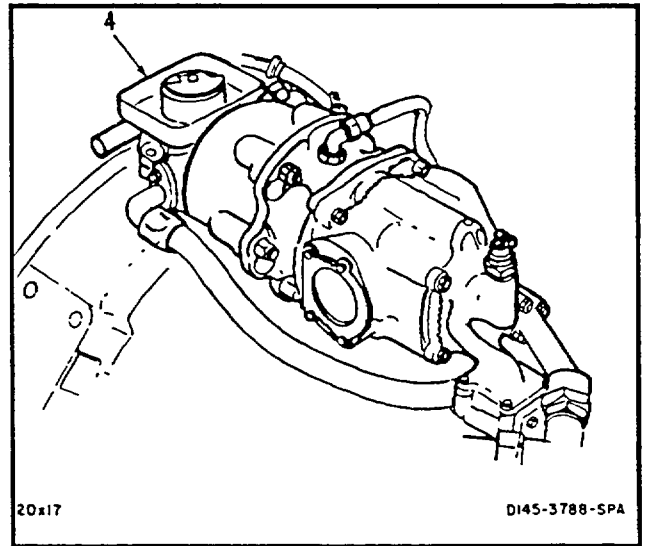


GO TO NEXT PAGE

4-98 REMOVE OIL FILLER (Continued)

4-98

2. Remove oil filler (4) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



FOLLOW-ON MAINTENANCE:
None

END OF TASK

4-240 Change 19

4-99 INSTALL OIL FILLER

4-99

INITIAL SETUP

Applicable Configurations:

All

Tools:Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944**Materials:**

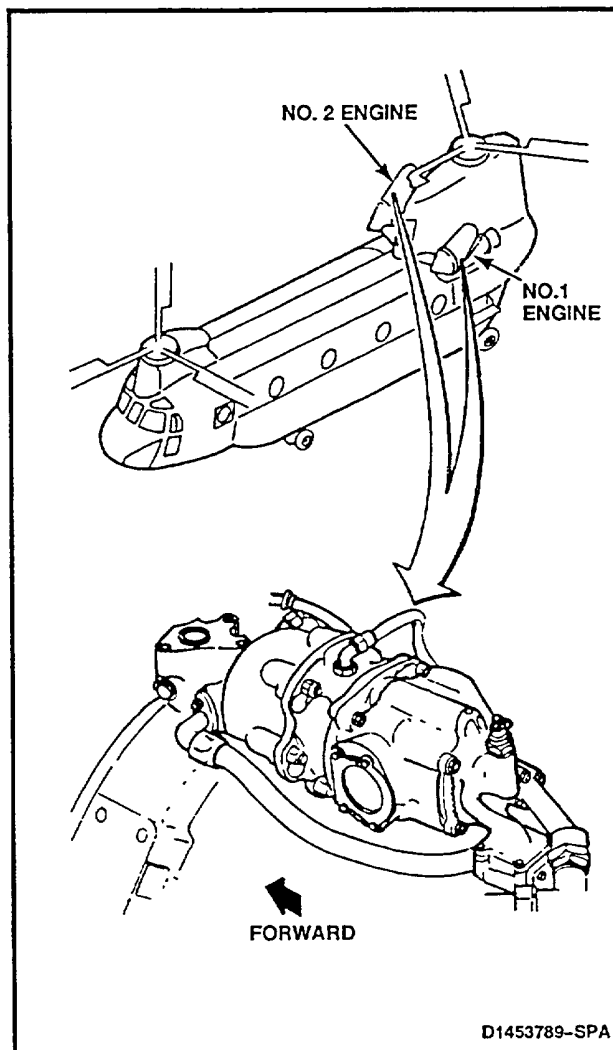
None

Personnel Required:

Aircraft Powerplant Repairer

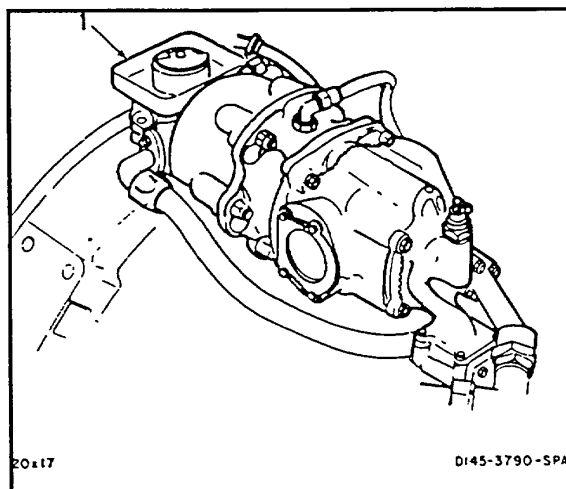
References:

- TM 55-2840-254-23 (Without **74**)
- TM 55-2840-254-23P (Without **74**)
- TM 1-2840-265-23 (With **74**)
- TM 1-2840-265-23P (With **74**)

**NOTE**

Procedure is same to install oil filler on No. 1 or No. 2 engine.

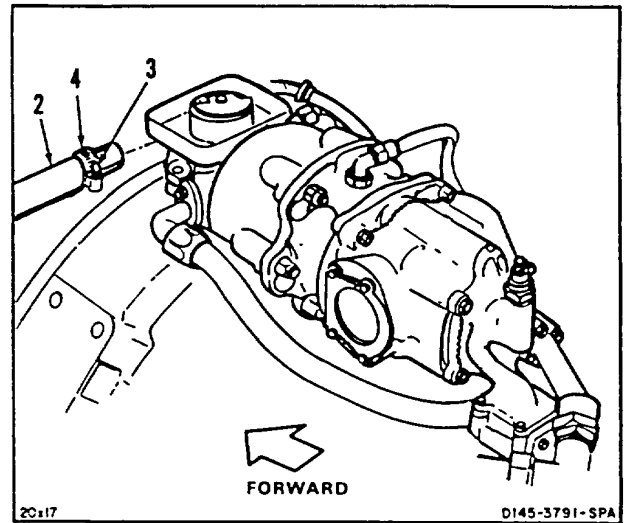
1. Install oil filler (1) (TM 55-2840-254-23 without **74** TM 1-2840-265-23 with **74**).



GO TO NEXT PAGE

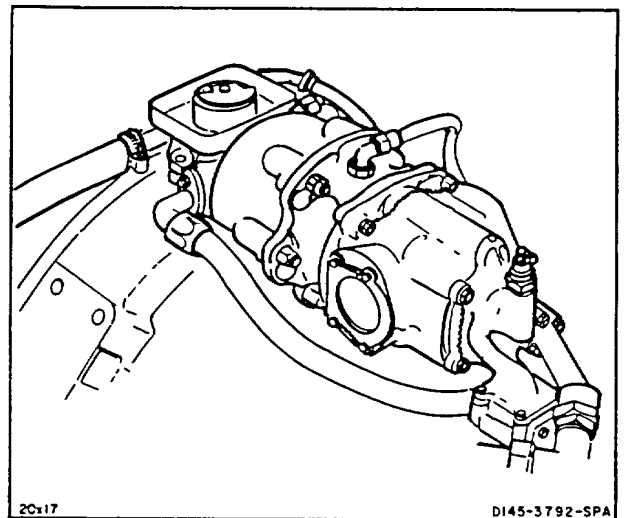
Change 19 4-241

2. **Connect hose (2).** Tighten screw (3) on clamp (4).

**FOLLOW-ON MAINTENANCE:**

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).



END OF TASK

4-242

SECTION VII
IGNITION SYSTEM

4-100 REMOVE IGNITION SWITCH**4-100**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Soldering Gun

Materials:

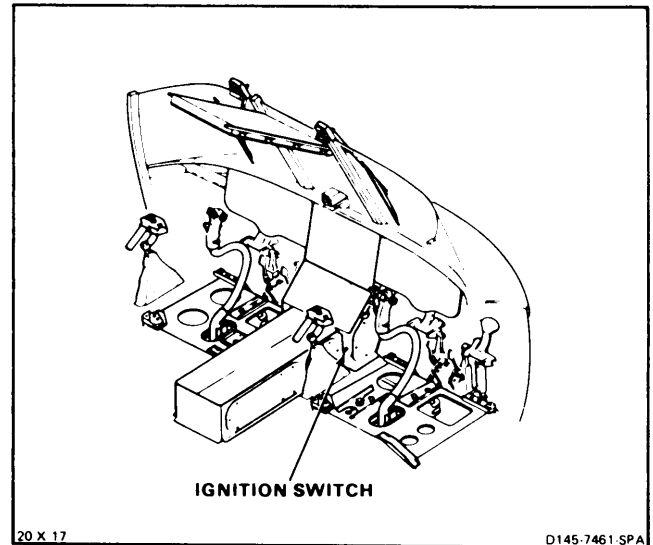
Paper Tags (E264)
Tape (E385)

Personnel Required:

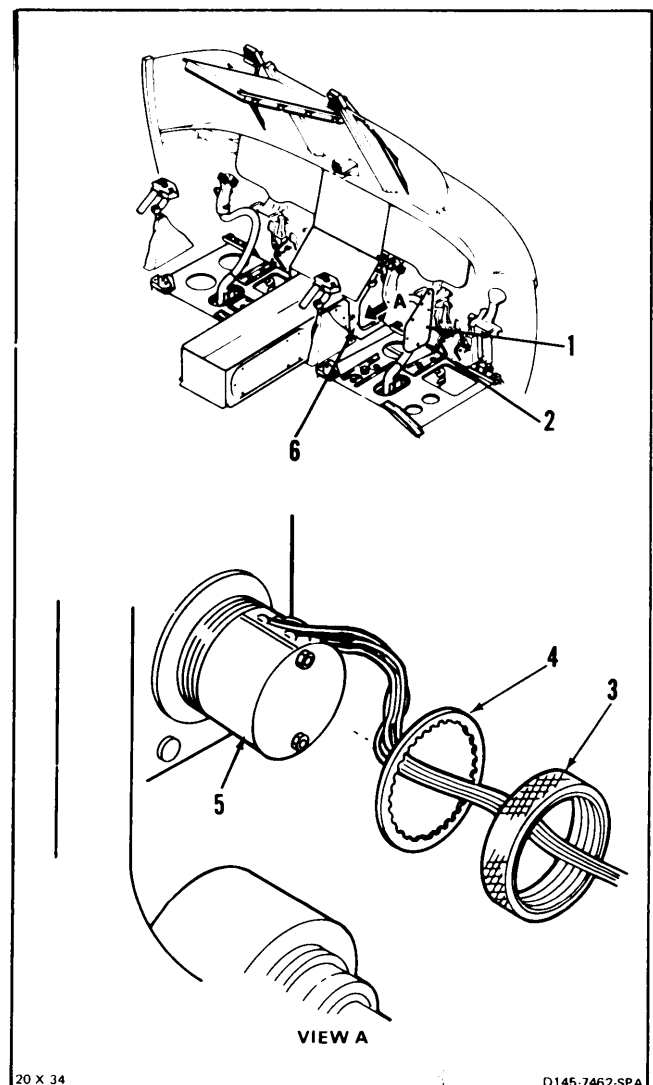
68F10 Aircraft Electrician

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

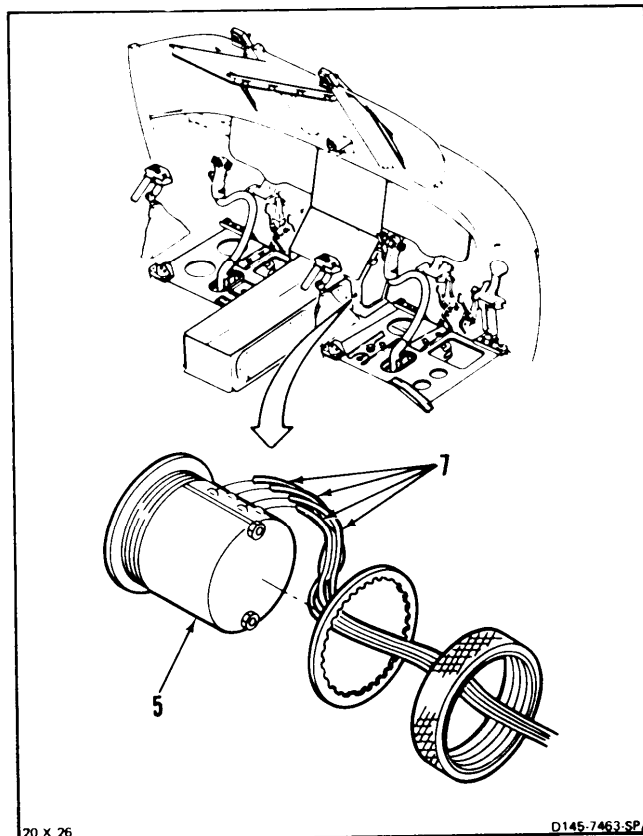


1. Release seven fasteners (1). **Remove panel (2).**
2. Remove nut (3) and washer (4) from sw (5).
3. **Remove switch (5)** from console (6).

**GO TO NEXT PAGE**

4-100 REMOVE IGNITION SWITCH (Continued)**4-100**

4. **Unsolder four wires (7) from switch (5).**
Tag wires. Use paper tags (E264). Tape exposed ends of wires. Use tape (E385).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

4-101 INSTALL IGNITION SWITCH**4-101**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Soldering Gun

Materials:

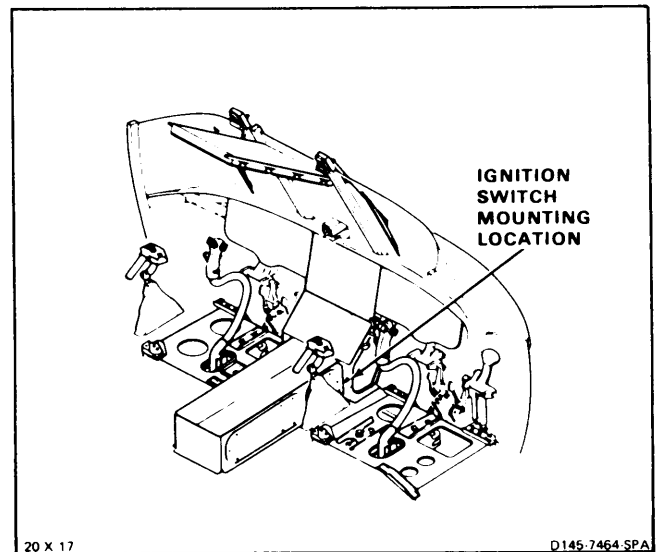
Solder (E360)

Personnel Required:

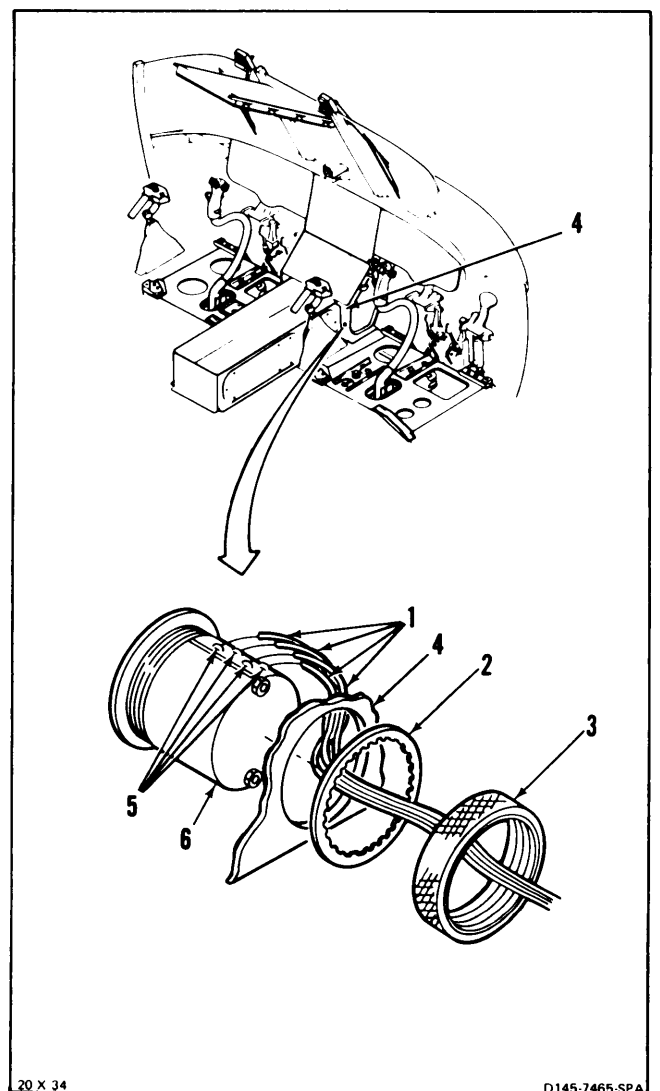
68F10 Aircraft Electrician
67U30 Inspector

References:

TM 55-1520-240-23P



1. Insert four wires (1) through washer (2), nut (3), and console (4).
2. Remove tape from ends of four wires (1).
Solder four wires to four terminals (5) on switch (6). Use solder (E360). Remove tape from wires.

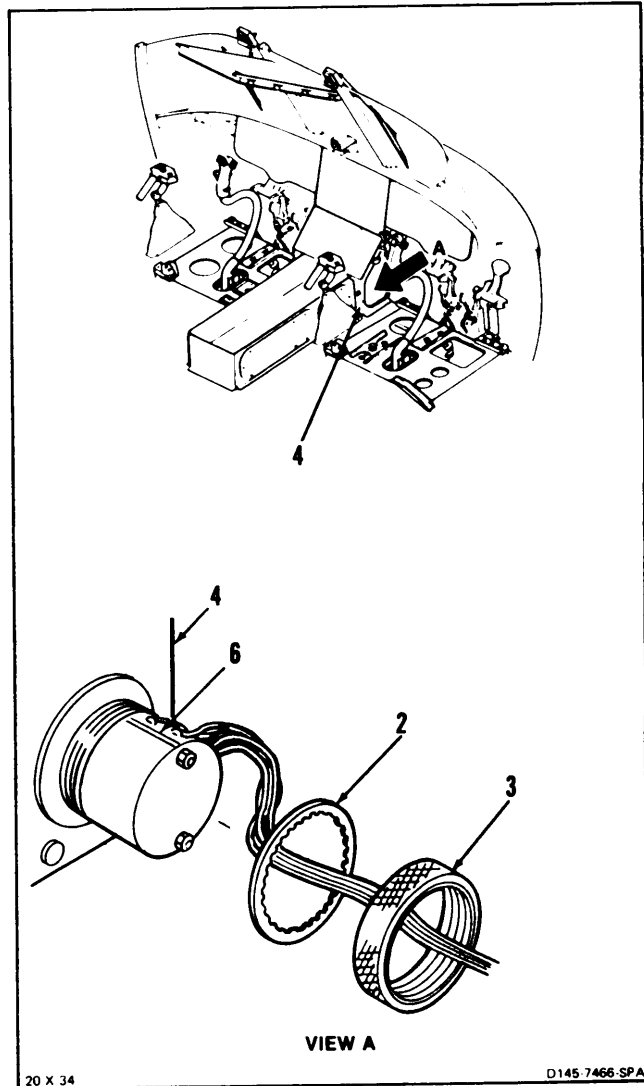
**GO TO NEXT PAGE**

4-101 INSTALL IGNITION SWITCH (Continued)

4-101

- 3. Position switch (6) in console (4) Install washer (2) and nut (3).

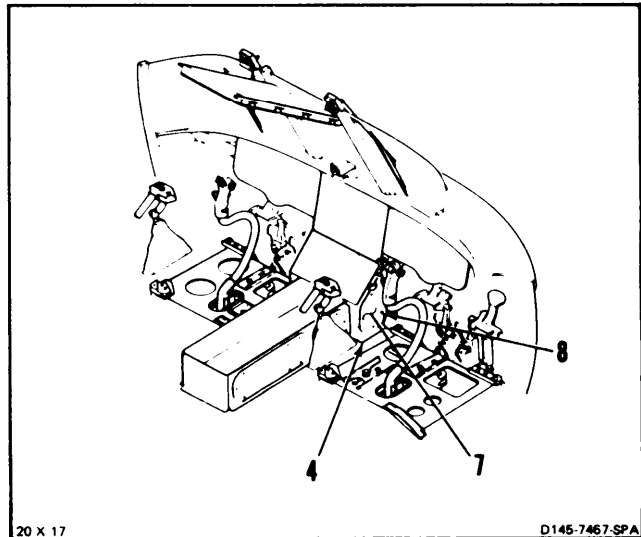
INSPECT



- 4. Position panel (7) on console (4). Tighten 7 fasteners (8).

FOLLOW-ON MAINTENANCE:

Perform operational check of ignition system (TM 55-1520-240-T).



END OF TASK

SECTION VIII
POWER CONTROLS

INITIAL SETUP

Applicable Configurations:

Without **18** and **74**

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

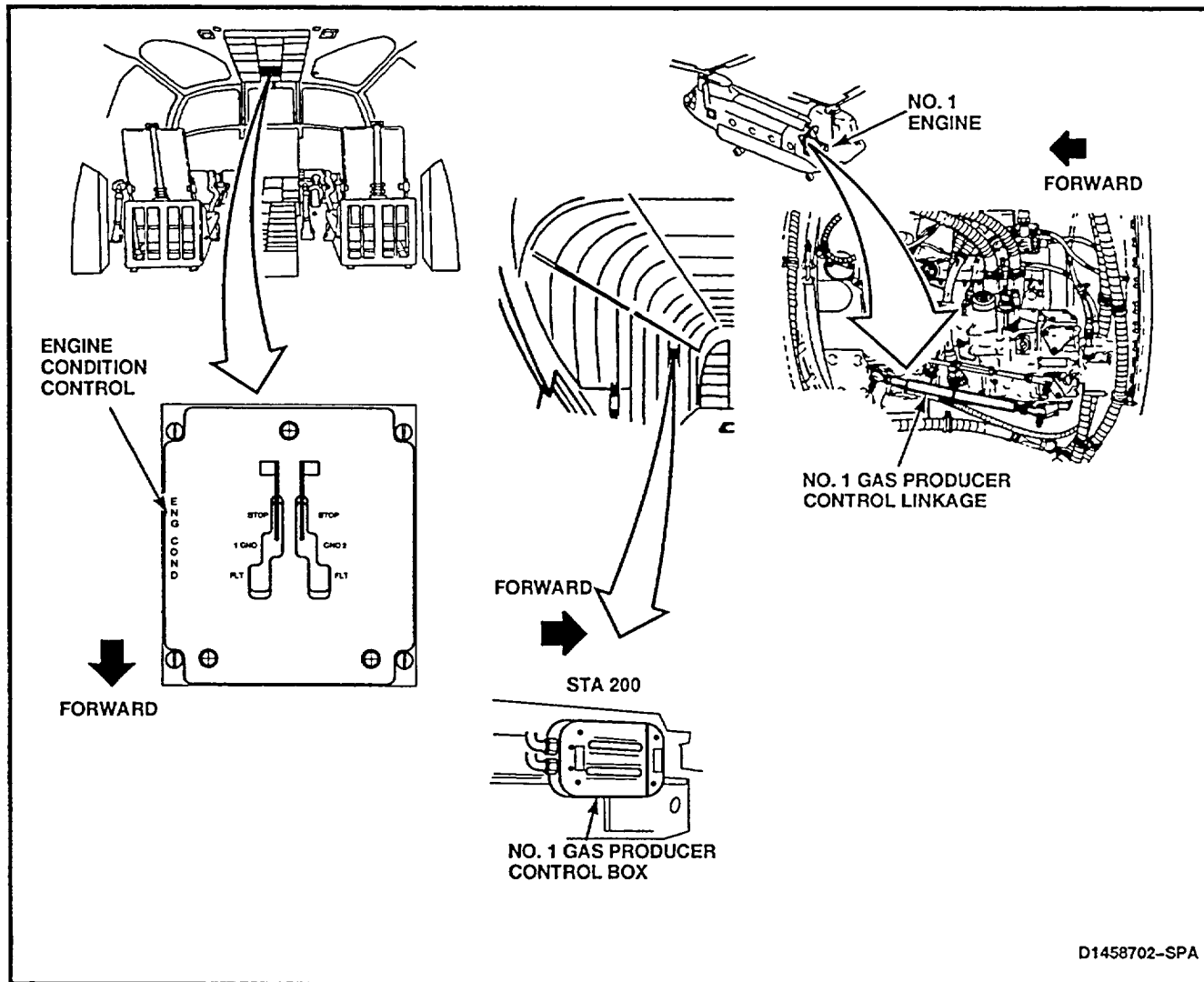
None

Personnel Required:

Aircraft Powerplant Repairer (2)

Equipment Condition:

- Battery Connected (Task 1-39)
- Electrical Power On
- Hydraulic Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)

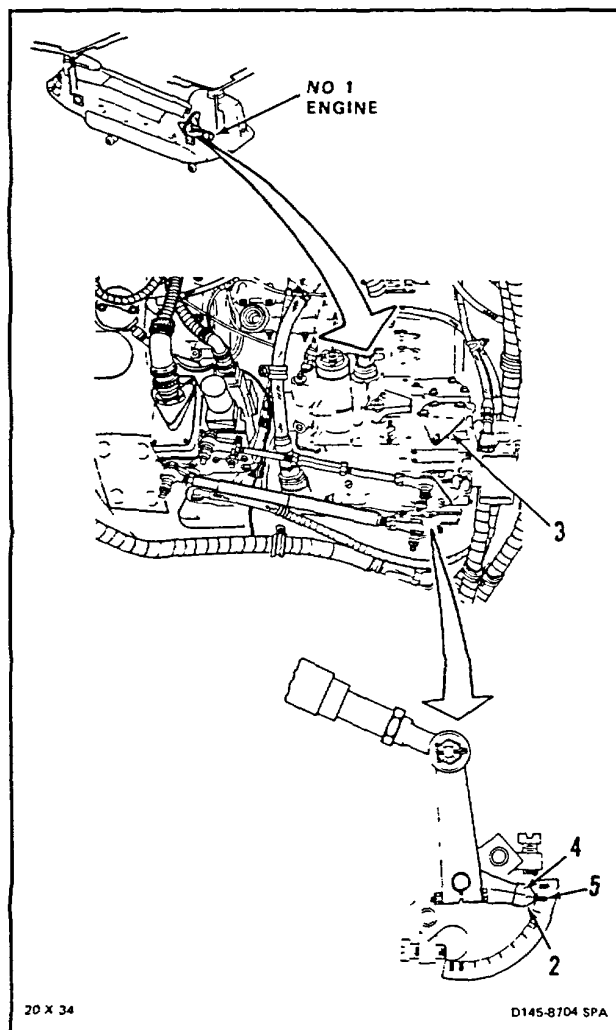
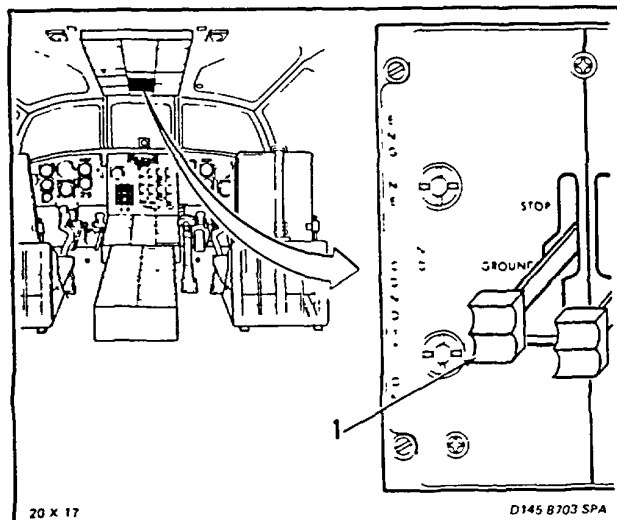


D1458702-SPA

NOTE

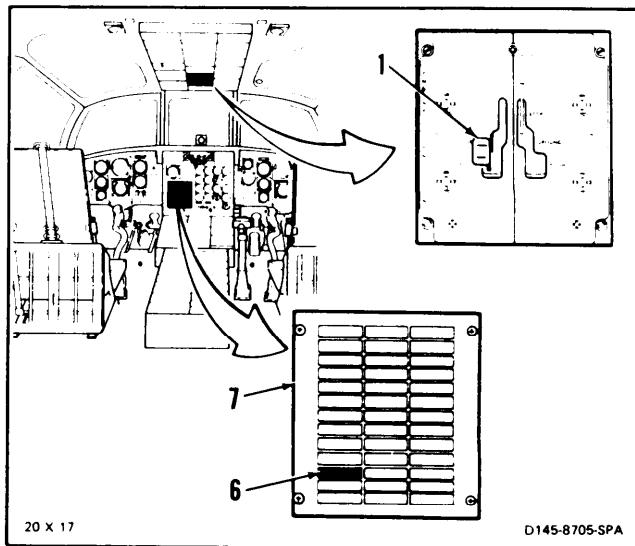
- This procedure is for systems using control box P/N 114ES2831. For adjustment of systems using control box 234ES283-1, go to Task 4-102.1.
- Procedure is same to adjust gas producer control system for No. 1 or No. 2 engine. Adjustment of No. 1 engine is shown here.

1. Set No. 1 engine condition control lever (1) to GROUND detent.
2. Have helper check gas producer pointer (2) on fuel control (3). If index mark (4) on pointer is centered on G1 band (5), go to step 3. If not, go to step 7.

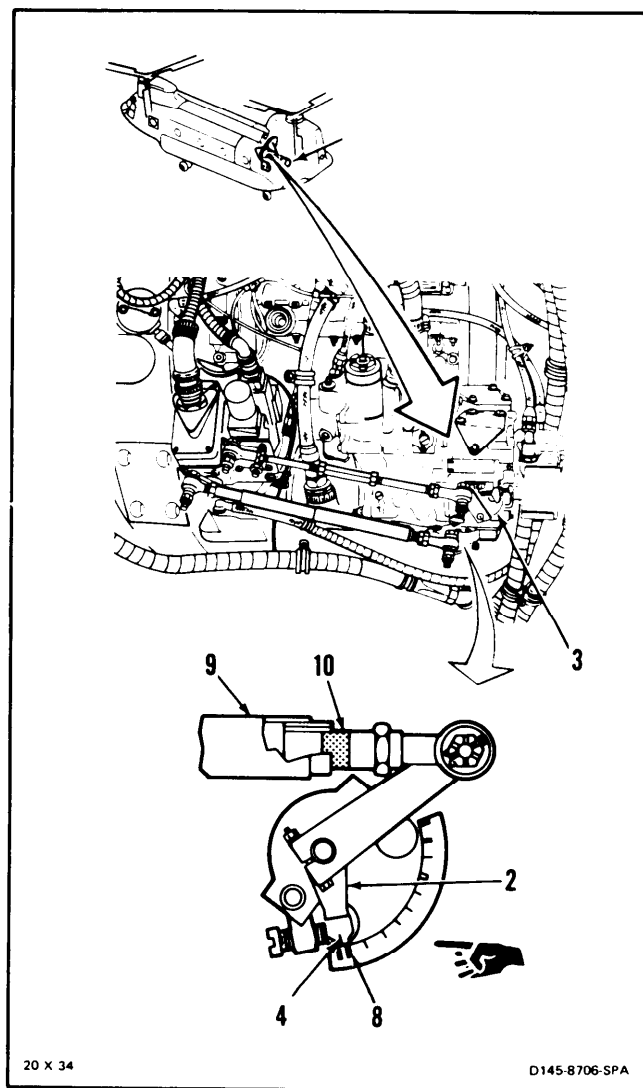


4-102 ADJUST GAS PRODUCER CONTROL SYSTEM (Continued)

3. Set lever (1) to FLIGHT detent.
4. Wait for No. 1 ENG N 1 COND light capsule (6) on master caution panel (7) to go out.



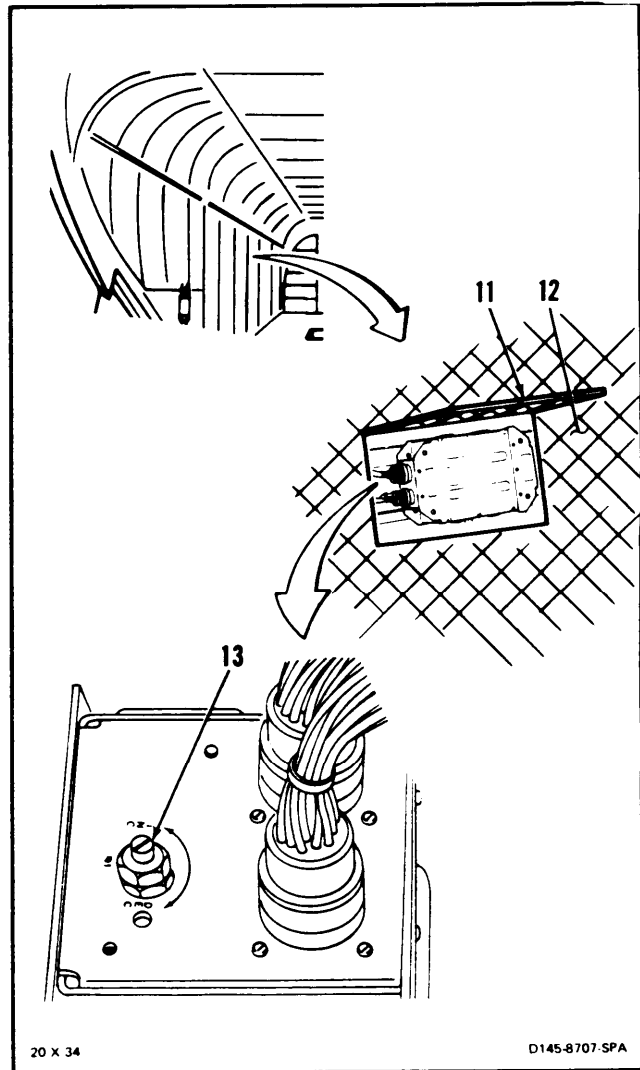
5. Have helper check pointer (2) on fuel control (3). If index mark (4) on pointer is centered on MAX band (8), go to next step. If not, go to step 7.
6. Have helper check rod (9). If band (10) on rod is partially covered, to go step 15. If band is completely covered, go to step 7.



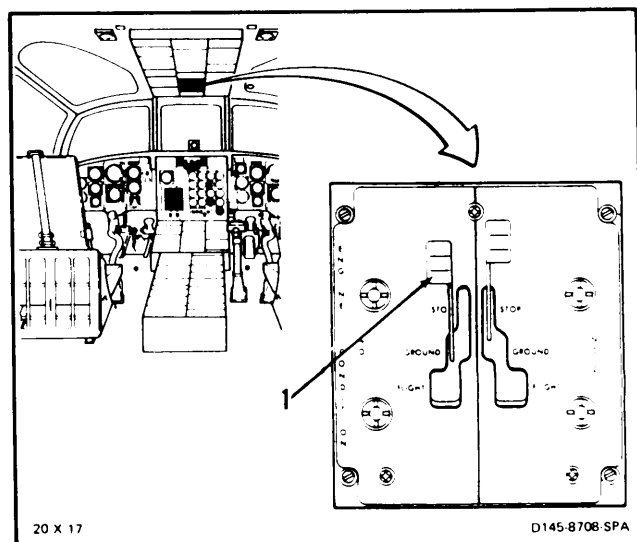
GO TO NEXT PAGE

4-102 ADJUST GAS PRODUCER CONTROL SYSTEM
(Continued)

- 7. **Open access flap (11) in acoustic blanket (12).**
- 8. **Loosen locknut (13).**



- 9. **Set lever (1) to GROUND detent.**



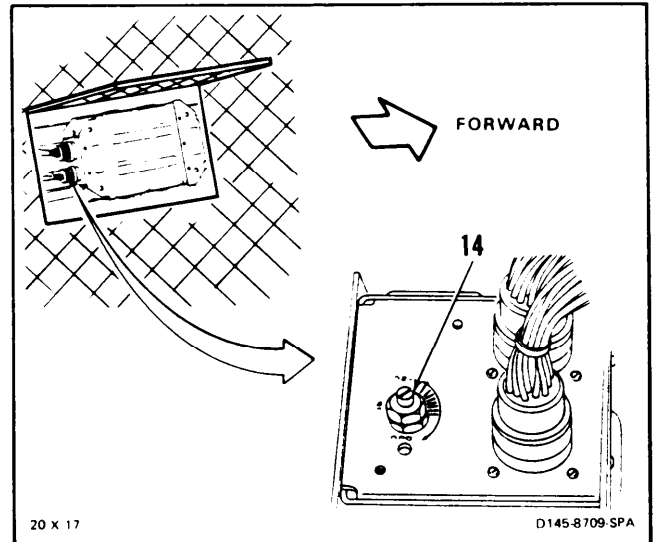
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4-102 ADJUST GAS PRODUCER CONTROL SYSTEM (Continued)

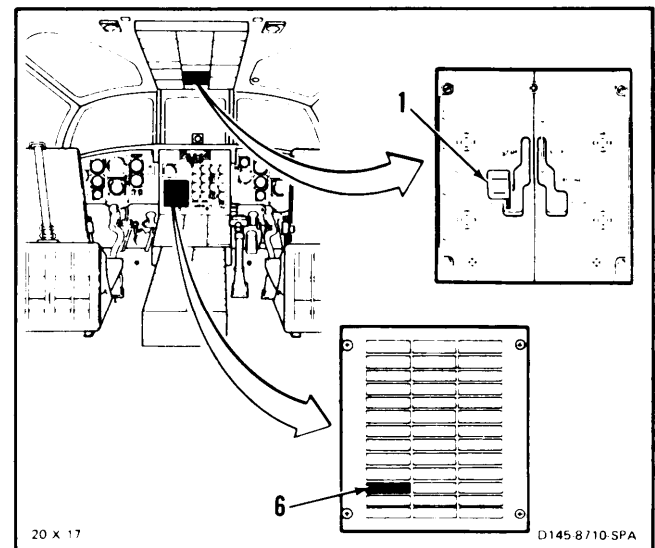
10. **Adjust resistor shaft (14)** one index mark at a time.

NOTE

Turning resistor shaft clockwise will cause pointer to move to the right. Counterclockwise adjustment will cause pointer to move left.

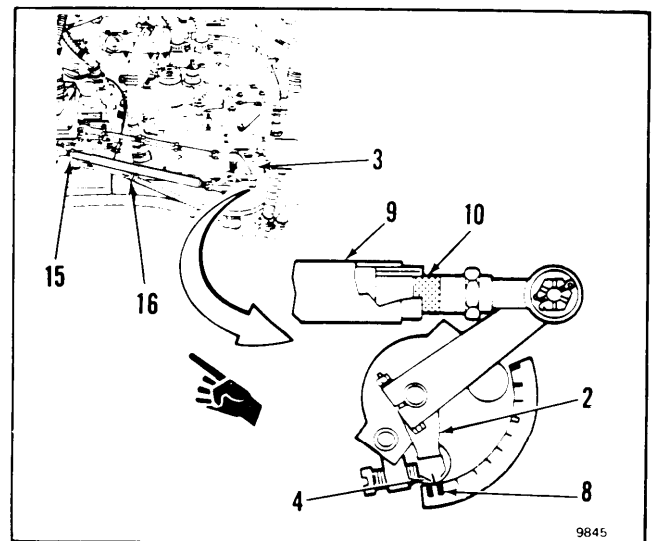


11. **Set lever (1) to FLIGHT.** Wait for NO. 1 ENG COND light capsule (6) to go out.



12. Have helper check pointer (2) on fuel control (3). **Make sure index mark (4) on pointer is centered on MAX band (8).** If not, repeat steps 9. thru 11.

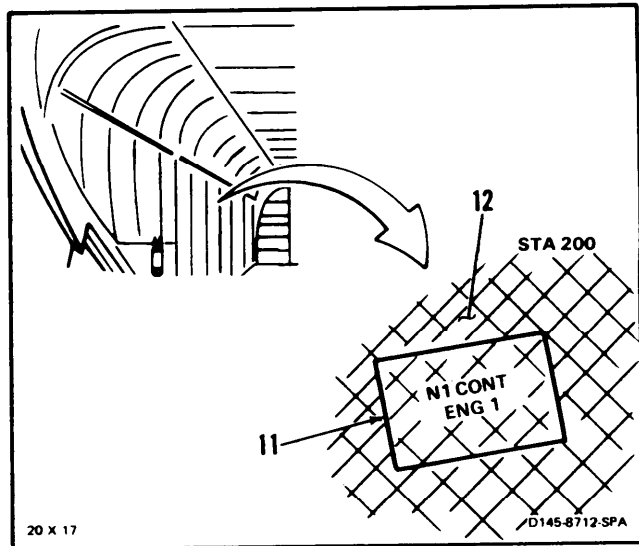
13. **Make sure band (130) on rod (9) is partially covered.** If not, do the following:
- a. Cut lockwire and loosen nut (15).
 - b. Rotate cylinder (16) until index mark (4) on pointer (2) is centered on MAX band (8).
 - c. Tighten and lockwire nut (1 5).



GO TO NEXT PAGE

**4-102 ADJUST GAS PRODUCER CONTROL SYSTEM
(Continued)**

14. Close access flap (11) on blanket (12).



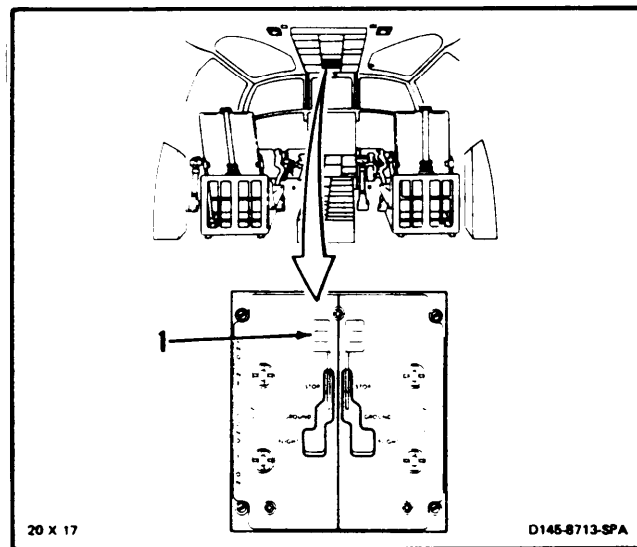
15. Set lever (1) to STOP.

FOLLOW-ON MAINTENANCE:

Electrical power off.

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).



END OF TASK

4-102.1 ADJUST GAS PRODUCER CONTROL SYSTEM

4-102.1

INITIAL SETUP

Applicable Configurations:

With **18** and Without **74**

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer (2)

Equipment Condition:

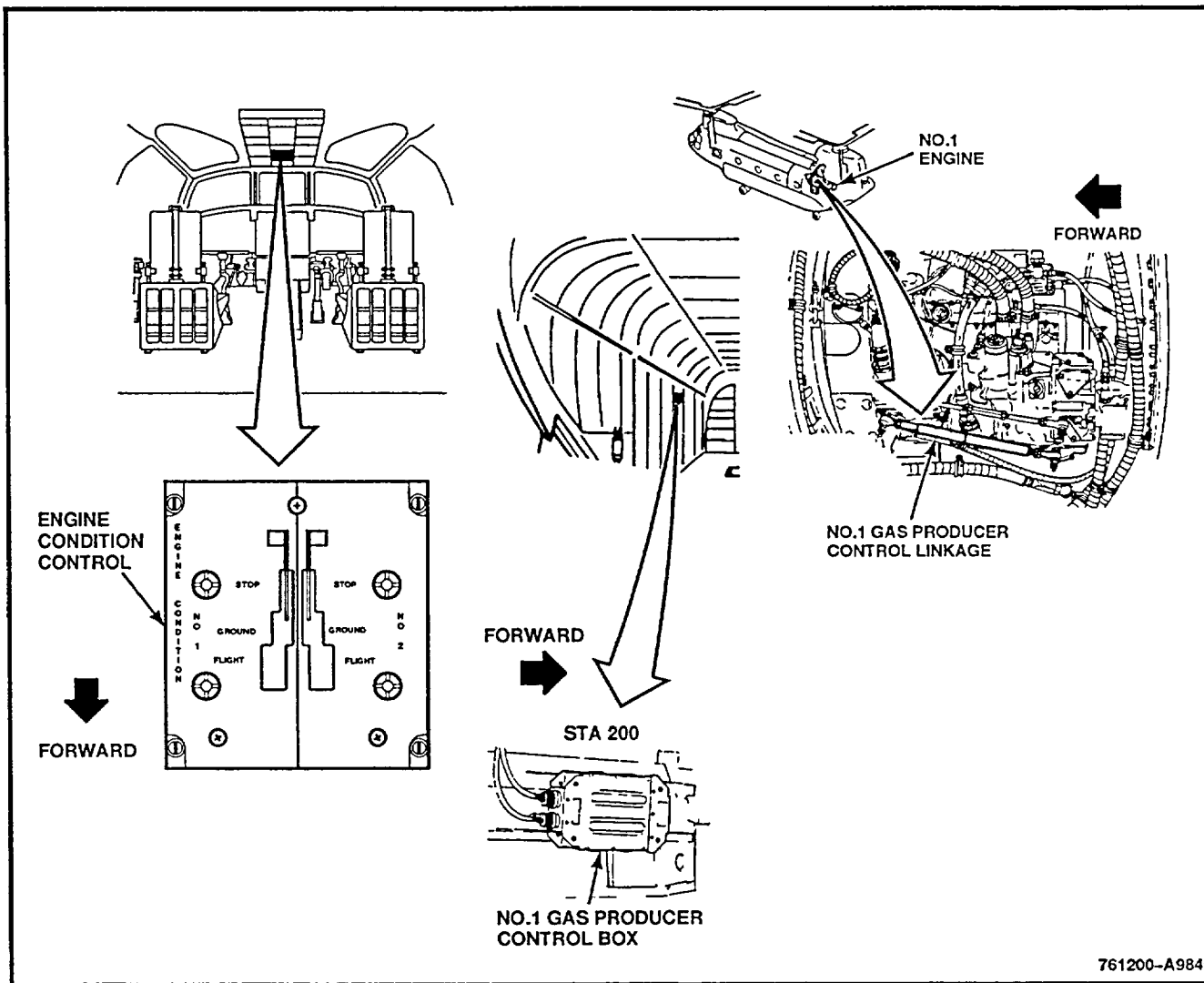
Battery Connected (Task 1-39)

Electrical Power On

Hydraulic Power Off

Engine Work Platform Open (Task 2-2)

Engine Access Cover Open (Task 4-49)



761200-A9846

GO TO NEXT PAGE

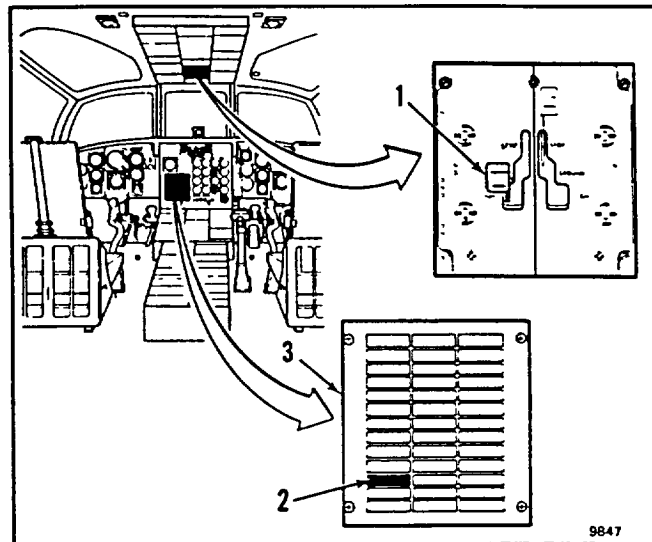
Change 19 4-252.1

CAUTION

Do not adjust mechanical stops on fuel control. Engine performance will be altered.

NOTE

- Procedure is same to adjust gas producer control system for No. 1 or No. 2 engine. Adjustment of No. 1 engine is shown here.
- This procedure is for systems using control box 234ES283-1. For adjustment of systems using control box 114ES283-1, go to Task 4-102.

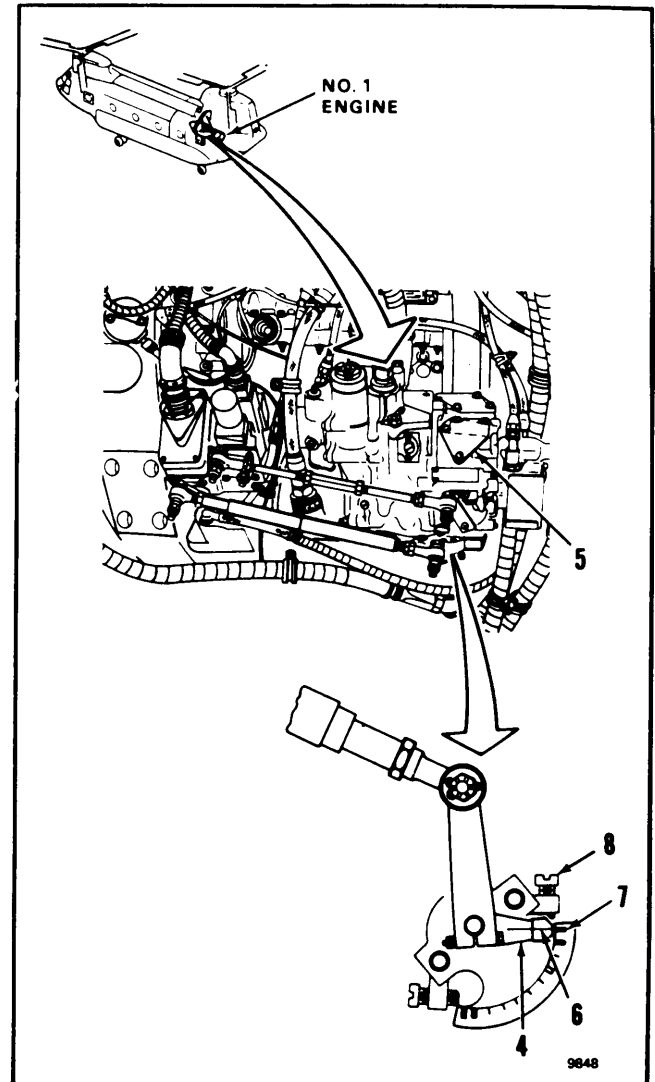


1. Set No. 1 engine condition lever (1) to **FLIGHT** detent. Wait for No. 1 ENG N1 COND light capsule (2) on master caution panel (3) to go out.
2. Set lever (1) to **STOP** detent. Wait for No. 1 ENG N1 COND light capsule on master caution panel (3) to go out.

GO TO NEXT PAGE

4-102.1 ADJUST GAS PRODUCER CONTROL SYSTEM (Continued) 4-102.1

3. Have helper check gas producer pointer (4) on fuel control (5). If index mark (6) on pointer is approximately centered on OFF band (7) and in contact with mechanical stop (8), go to step 4. If not, go to step 8.



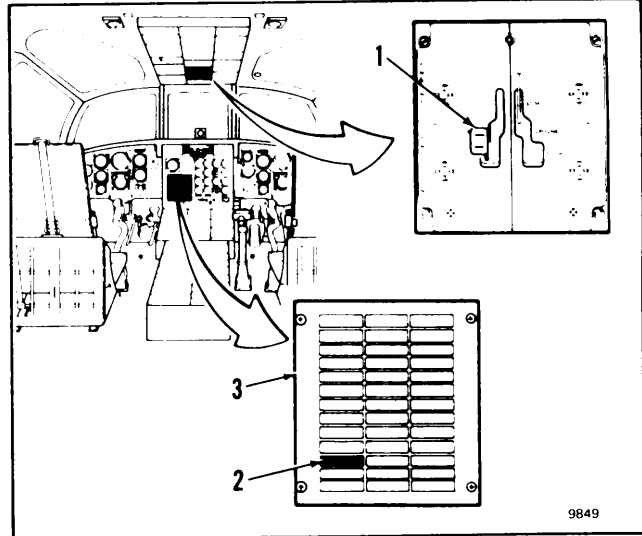
GO TO NEXT PAGE

4-102.1 ADJUST GAS PRODUCER CONTROL SYSTEM (Continued) 4-102.1

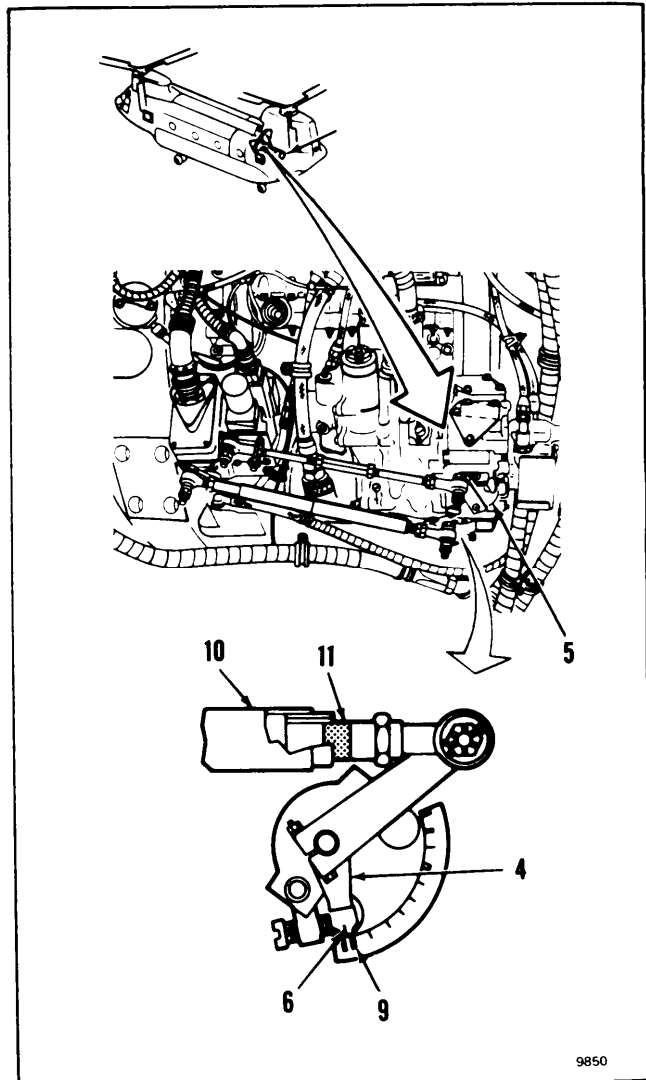
NOTE

Do not change FLIGHT adjustment until STOP adjustment is correct.

4. Set lever (1) to FLIGHT detent.
5. Wait for No. 1 ENG N1 COND light capsule (2) on master caution panel (3) to go out.



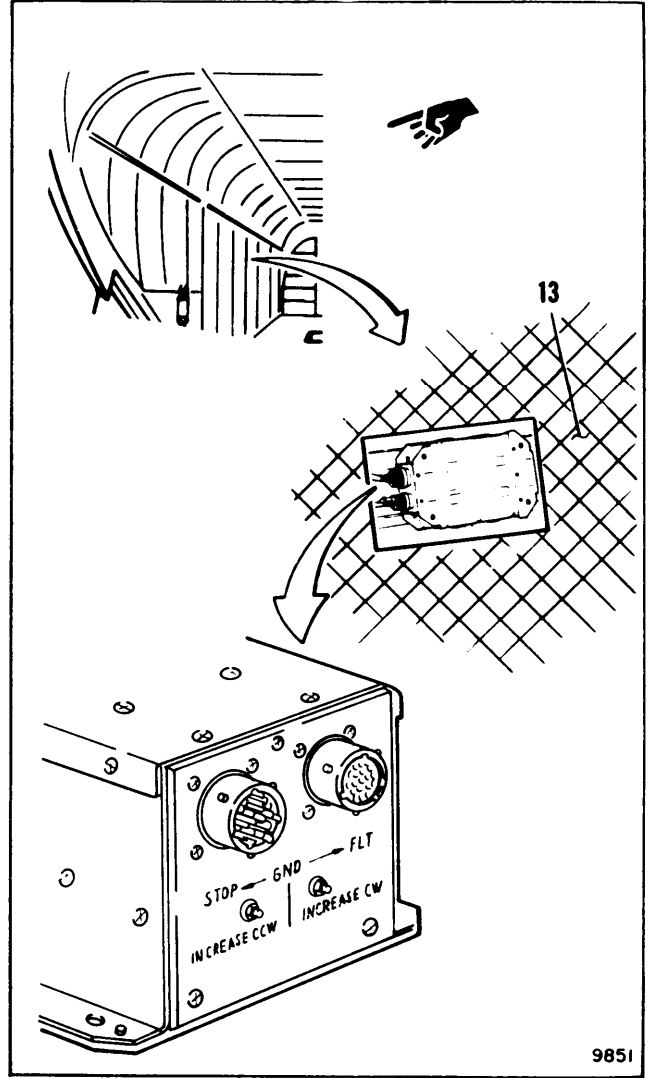
6. Have helper check pointer (4) on fuel control (5). If index mark (6) on pointer is approximately centered on EMER band (9) and the pointer is in contact with the mechanical stop, go to step 7. If not, go to step 11.
7. Have helper check rod (10). If band (11) on rod is partially covered, go to step 16. If band is completely uncovered or covered, go to step 11.



GO TO NEXT PAGE

4-102.1 ADJUST GAS PRODUCER CONTROL SYSTEM (Continued) 4-102.1

- 8. Open acoustic blanket (13),



GO TO NEXT PAGE

4-102.1 ADJUST GAS PRODUCER CONTROL SYSTEM (Continued) 4-102.1

CAUTION

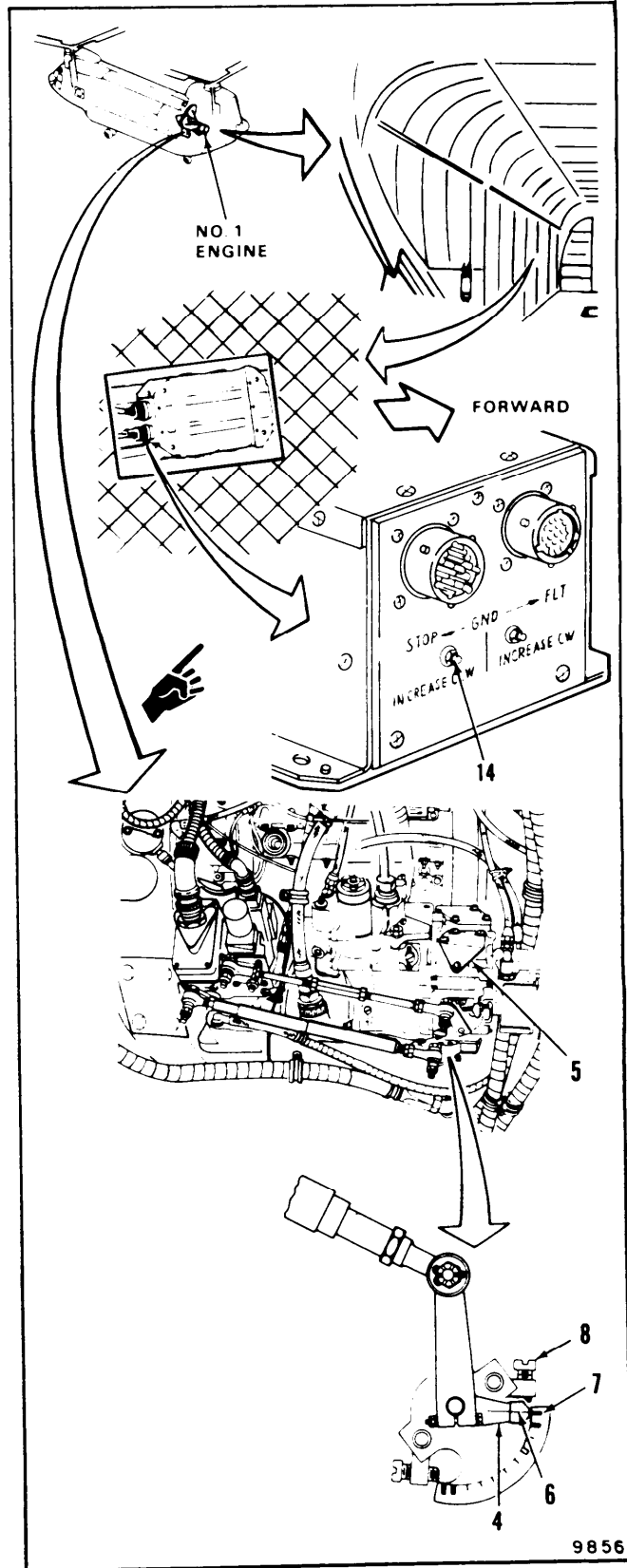
Do not adjust locknut on N1 control box.

9. Adjust resistor shaft (14) until index mark (6) on pointer (4) is approximately centered on OFF band (7) and pointer is in contact with mechanical stop (8).

NOTE

Turning resistor shaft clockwise will cause pointer to move away from the stop. Counterclockwise adjustment will cause pointer to move toward stop.

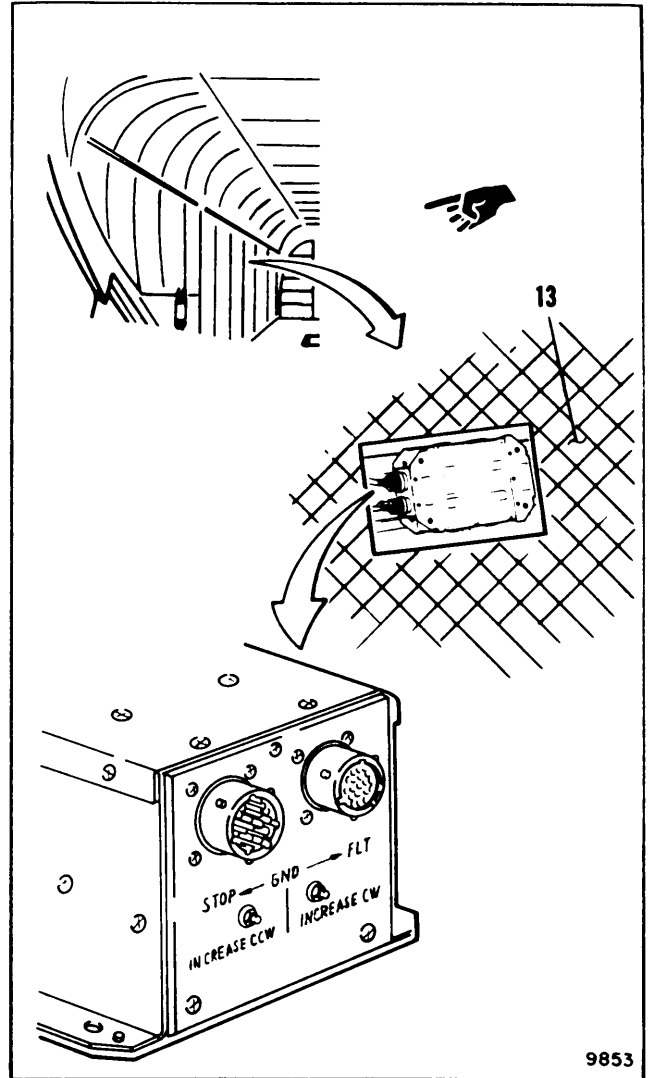
10. Have helper check pointer (4) on fuel control (5). Make sure index mark (6) on pointer is approximately centered on OFF band (7) and pointer is in contact with mechanical stop (8). If so, go to step 15. If not, repeat steps (9) and (10).



GO TO NEXT PAGE

4-102.1 ADJUST GAS PRODUCER CONTROL SYSTEM (Continued) 4-102.1

- 11. Open acoustic blanket (13).



GO TO NEXT PAGE

4-102.1 ADJUST GAS PRODUCER CONTROL SYSTEM (Continued) 4-102.1

CAUTION

Do not adjust locknut on N1 control box.

12. If the index mark (6) on pointer (4) is not approximately centered on EMER band (9) and pointer is not in contact with mechanical stop (8), **adjust resistor shaft (15)** until index mark (6) on pointer (4) is approximately centered on EMER band (9) and pointer is in contact with mechanical stop (8).

NOTE

Turning resistor shaft clockwise will cause pointer to move toward mechanical stop. Counterclockwise adjustment will cause pointer to move away from mechanical stop.

13. If dark band (11) on rod (10) is not partially covered (as illustrated), adjust resistor shaft (15) until dark band (11) is partially covered.

NOTE

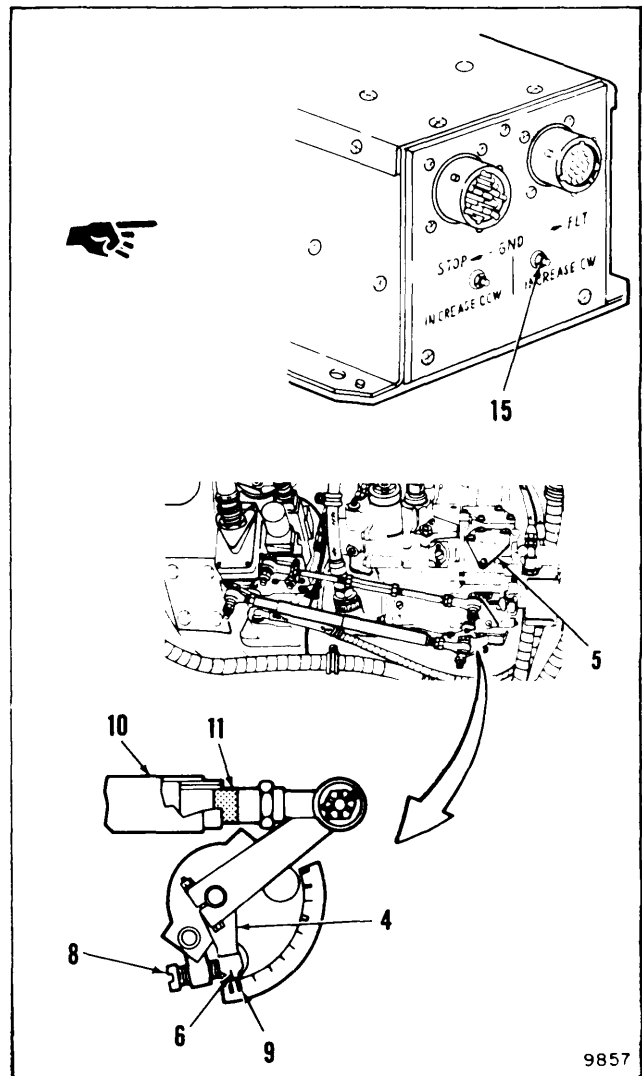
Turning resistor shaft clockwise will tend to cover band (11). Counterclockwise adjustment will tend to uncover band (11).

14. Have helper check pointer (4) on fuel control (5). **Make sure index mark (6) on pointer is centered on EMEG band (9)**. If so, go to step 15. If not, repeat steps 12, 13 and 14.

NOTE

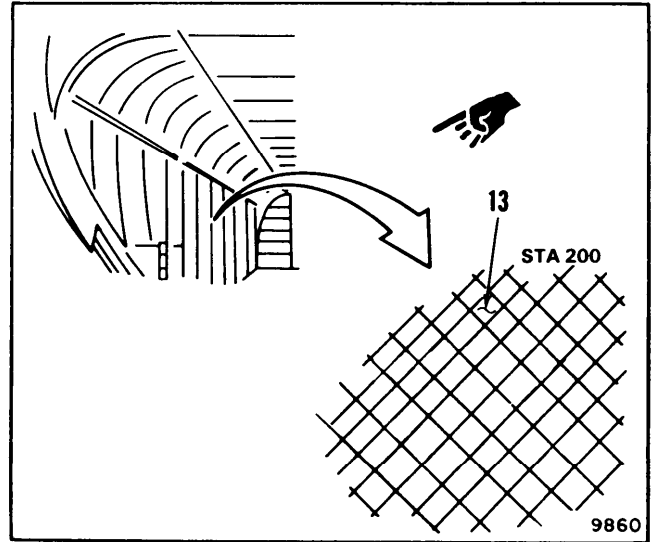
If proper adjustment cannot be obtained and gas producer control box has been changed, refer to TM 55-2840-254-23.

15. Make sure band (11) on rod (10) is partially covered. If so, go to step 16. If not, repeat steps 12, 13 and 14.

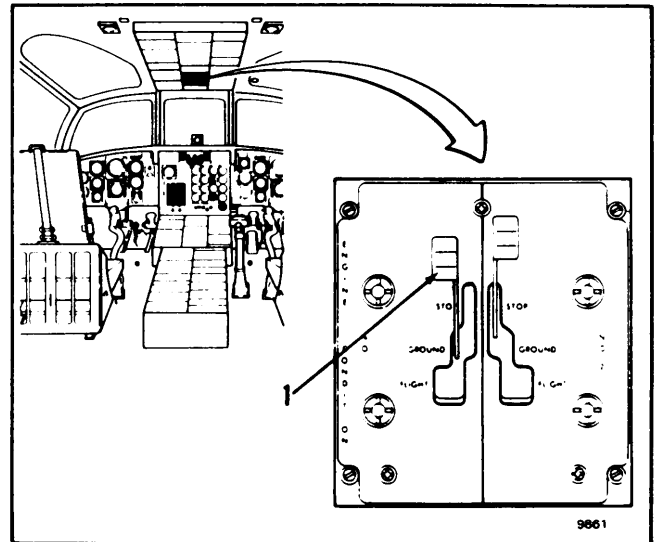
**GO TO NEXT PAGE**

4-102.1 ADJUST GAS PRODUCER CONTROL SYSTEM (Continued) 4-102.1

16. Close acoustic blanket (13).



17. Set lever (1) to STOP.



FOLLOW-ON MAINTENANCE:

- Electrical power off.
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

4-103 INSPECT ENGINE CONDITION CONTROL**4-103**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Dial Indicating Scale, 0 to 10 Pounds

Materials:

None

Personnel Required

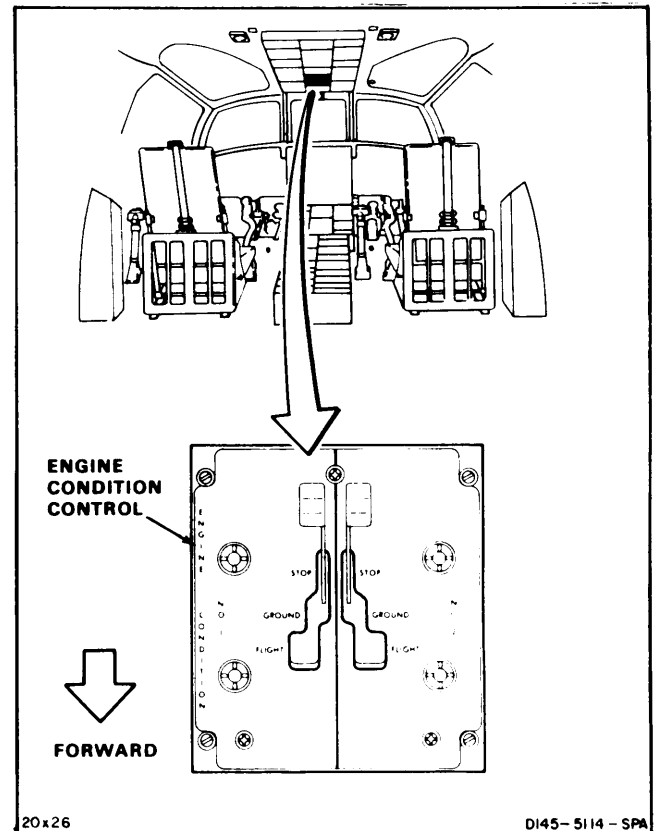
67U30 Inspector

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Hydraulic Power Off



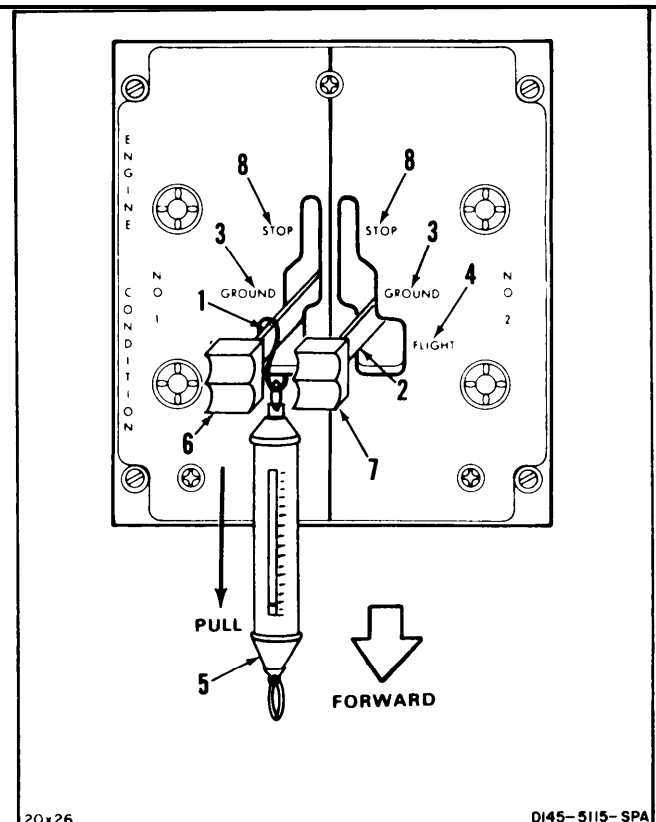
20x26

DI45-5114-SPA

1. Set No. 1 lever (1) and No. 2 lever (2) between GROUND (3) and FLIGHT (4).
2. Hook dial indicating scale (5) to No. 1 lever (1) behind knob (6).
3. Pull scale (5) forward until lever (1) moves. Force to move lever shall be 4 to 5 pounds. Unhook scale from lever.
4. Hook scale (5) to No. 2 lever (2) behind knob (7).
5. Pull scale (5) forward until lever (2) moves. Force to move lever shall be 4 to 5 pounds. Unhook scale from lever.
6. Set levers (1 and 2) to STOP (8).

FOLLOW-ON MAINTENANCE:

None



20x26

DI45-5115-SPA

END OF TASK

4-104 REMOVE ENGINE CONDITION CONTROL

4-104

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

Paper Tags (E264)

Personnel Required:

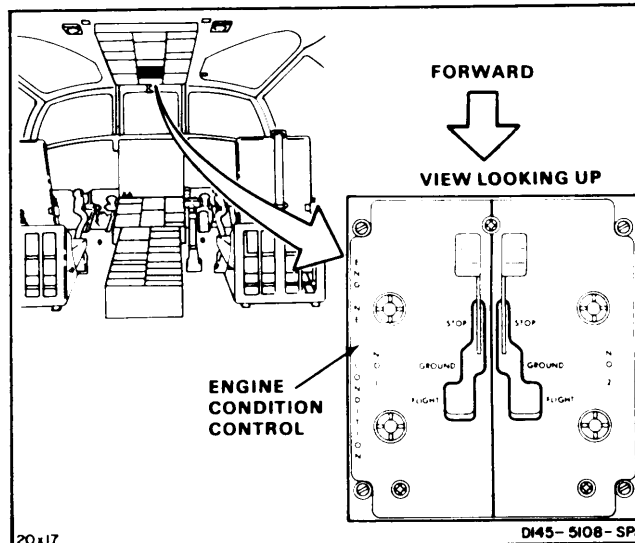
68F10 Aircraft Electrician

Equipment Condition:

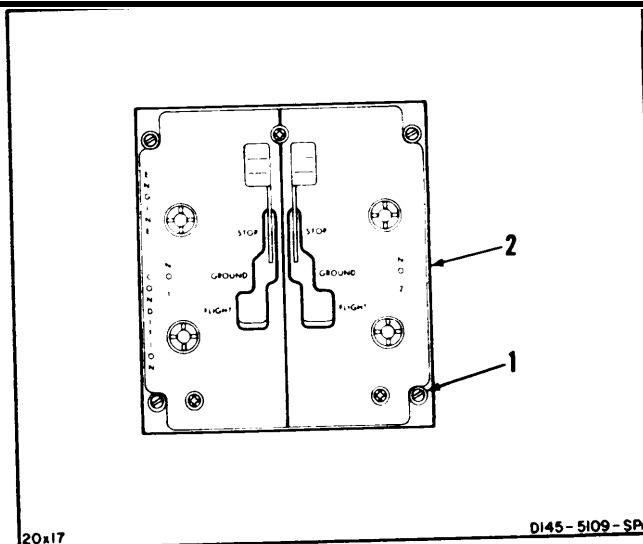
Battery Disconnected (Task 1-39)

Electrical Power Off

Hydraulic Power Off



1. Release four fasteners (1) on control (2).

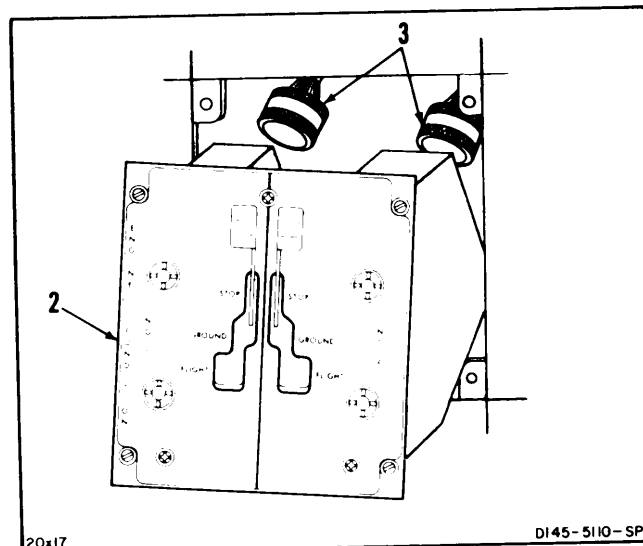


2. Lower control (2) enough to reach electrical connectors (3). Tag and **disconnect two electrical connectors.**

3. **Remove control (2).**

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-105 INSTALL ENGINE CONDITION CONTROL **4-105**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit.
NSN 5180-00-323-4915

Materials:

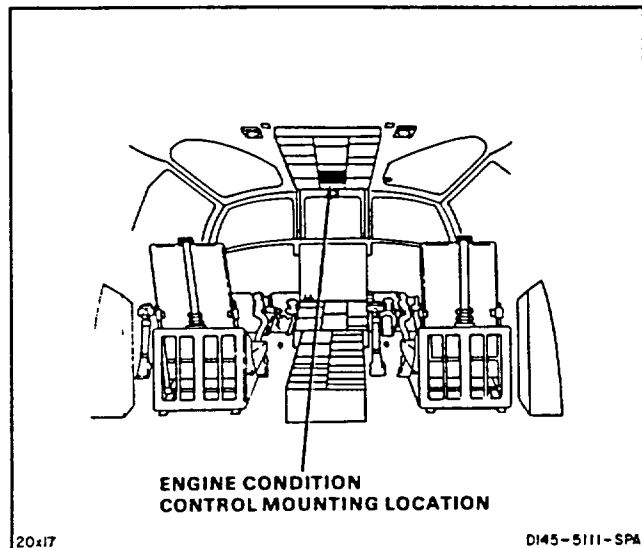
None

Personnel Required:

68F10 Aircraft Electrician
68U30 Inspector

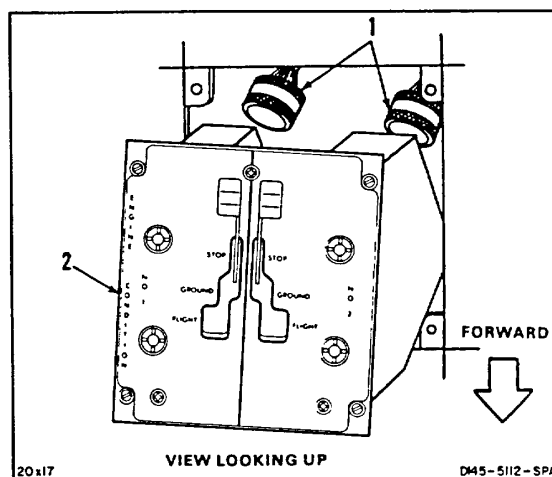
References:

TM 55-1520-240-23P



1. Connect two electrical connectors (1) to control (2). Remove tags.

INSPECT

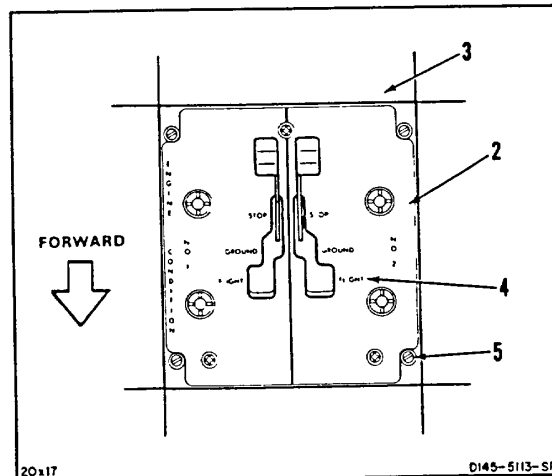


2. Position control (2) on panel (3). Make sure FLIGHT marking (4) is forward.
3. Secure four fasteners (5).

INSPECT

FOLLOW-ON MAINTENANCE:

Perform operational check of gas producer system (TM 55-1520-240-T).



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Electrical Mechanic's Tool Kit,
NSN 5180-00-323-4915

Materials:

Paper Tags (E264)

Personnel Required:

Aircraft Electrician

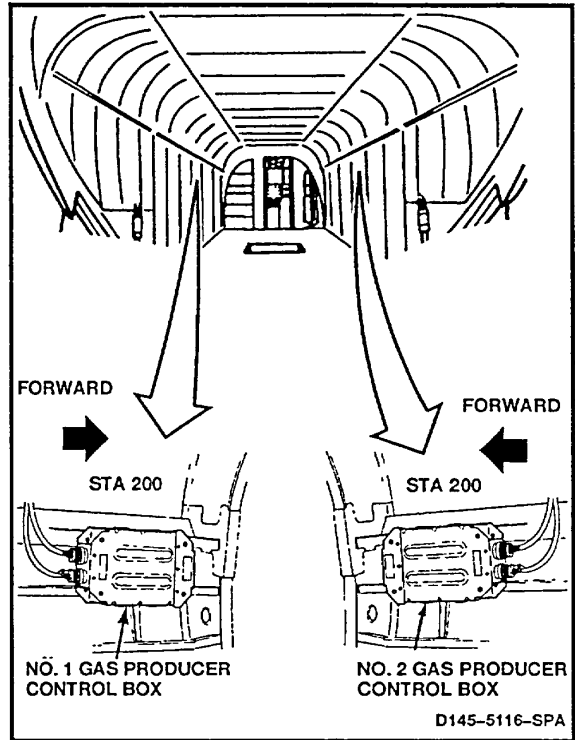
Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

No. 1 Gas Producer Control Box Access Panel

Open (Task 2-2) or No. 2 Gas Producer Control
Box Access Panel (Task 2-2)



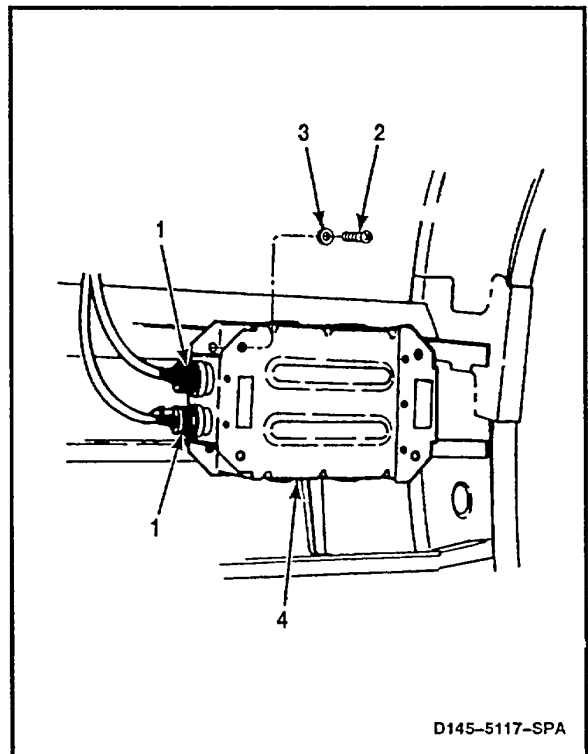
NOTE

Procedure is same to remove No. 1 or No. 2 gas producer control box. Removal of No. 1 box is shown here.

1. Tag and disconnect two electrical connectors (1).
2. Remove four screws (2) and washers (3).
3. Remove box (4).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-107 INSTALL NO. 1 OR NO. 2. GAS PRODUCER CONTROL BOX

4-107

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

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

Materials:

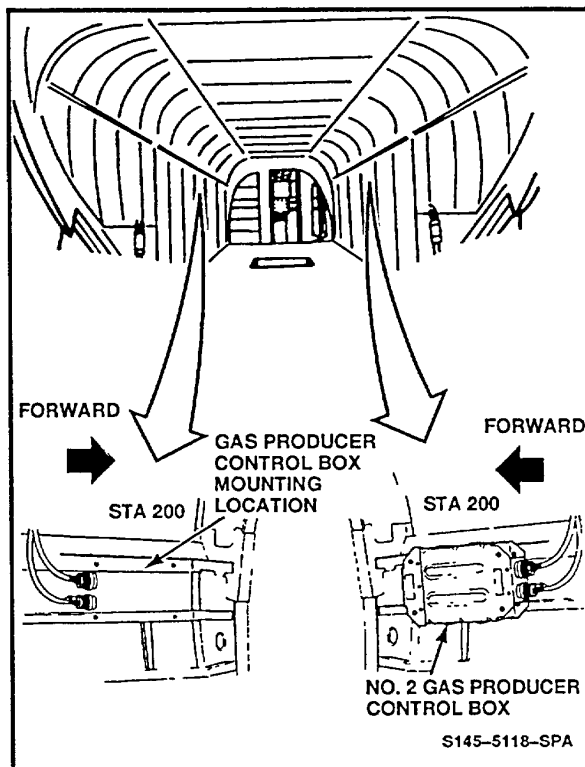
None

Personnel Required:

Aircraft Electrician

References:

TM 55-1520-240-23P



NOTE

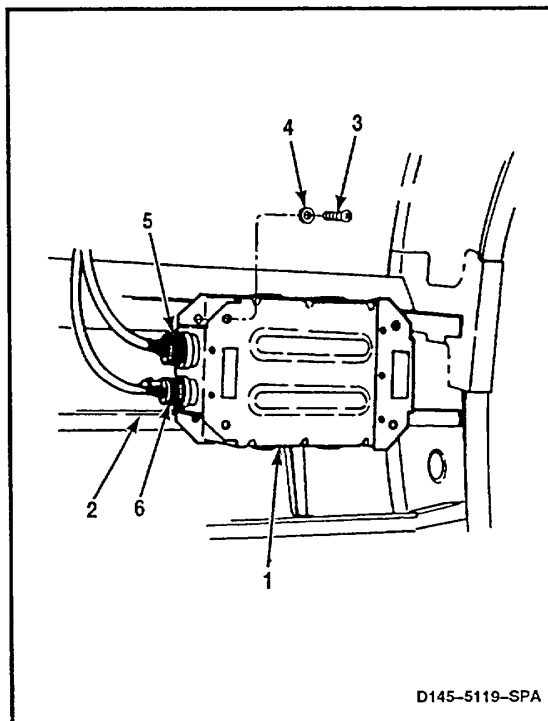
Procedure is same to install No. 1 or No. 2 gas producer control box. Installation of No. 1 control box is shown here.

1. Position box (1) on fuselage (2).
2. Install four screws (3) and washers (4).
3. Connect two electrical connectors (5 and 6). Remove tags.

FOLLOW-ON MAINTENANCE:

Perform operational check of gas producer system (TM 55-1520-240-T).

Close No. 1 gas producer control box access panel (Task 2-2) or No. 2 gas producer control box access panel (Task 2-2).



END OF TASK

4-108 REMOVE GAS PRODUCER CONTROL ACTUATOR

4-108

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

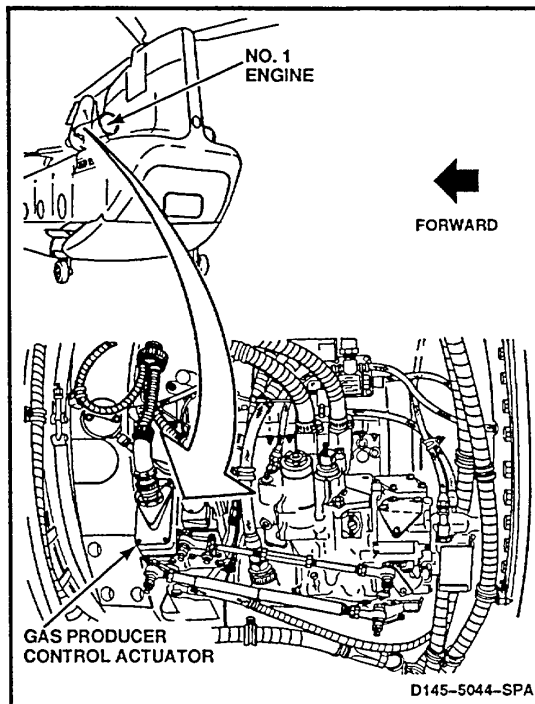
None

Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:

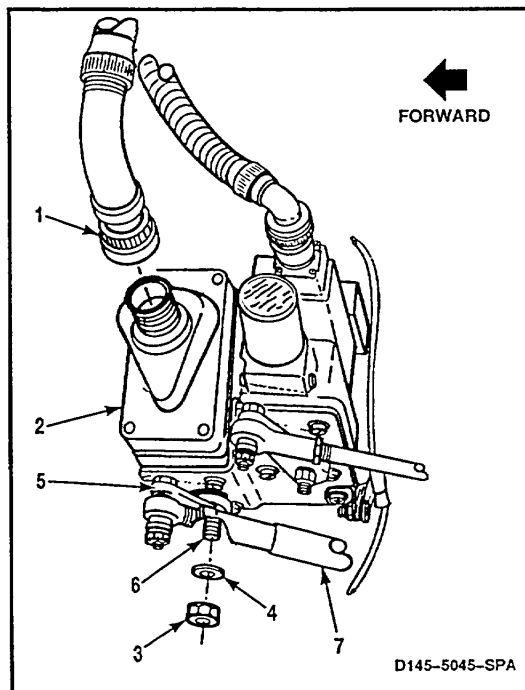
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



NOTE

Procedure is same to remove gas producer control actuator from No. 1 or No. 2 engine. No. 1 engine is shown here.

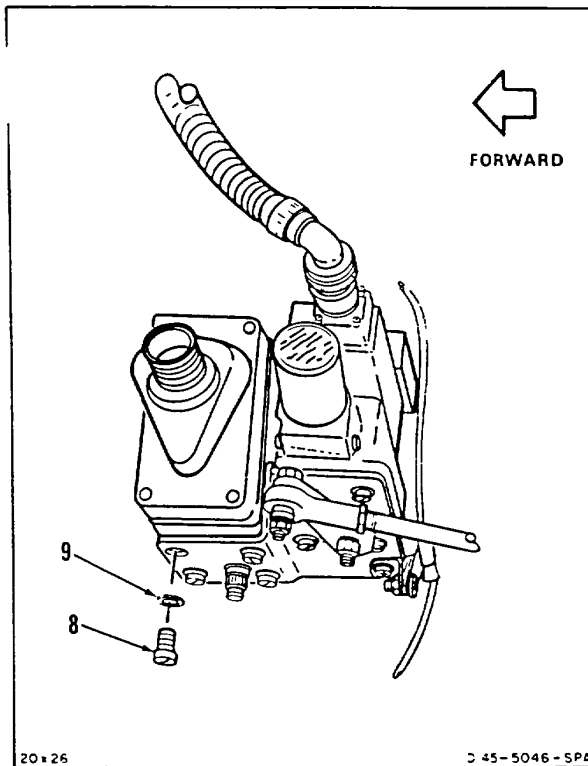
1. Disconnect cable connector (1) from actuator (2).
2. Remove nut (3) and washer (4). Slide lever (5) off shaft (6). Move rod (7) up and aft.



4-108 REMOVE GAS PRODUCER CONTROL ACTUATOR
(Continued)

4-108

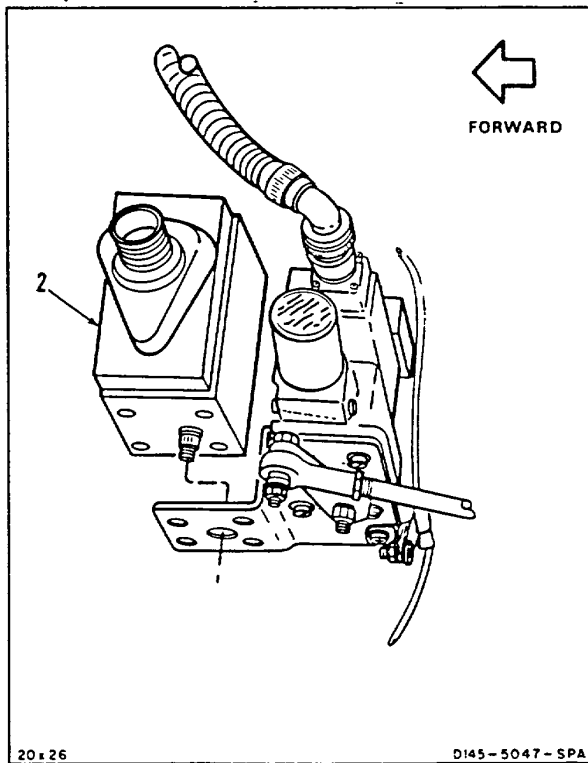
3. Remove lockwire from four screws (8). **Remove four screws** and washers (9).



4. **Remove actuator (2).**

FOLLOW-ON MAINTENANCE.
 None

END OF TASK



4-109 INSTALL GAS PRODUCER CONTROL ACTUATOR

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

- Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
- Torque Wrench, 5 to 50 Inch-Pounds

Materials:

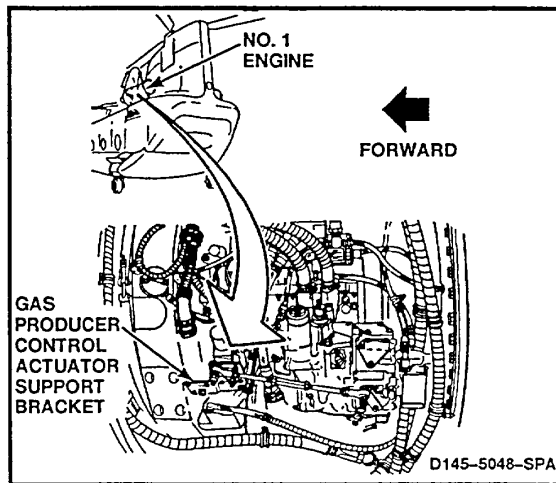
Lockwire (E231)

Personnel Required:

- Aircraft Powerplant Repairer
- Inspector

References:

TM 55-1520-240-23P



NOTE

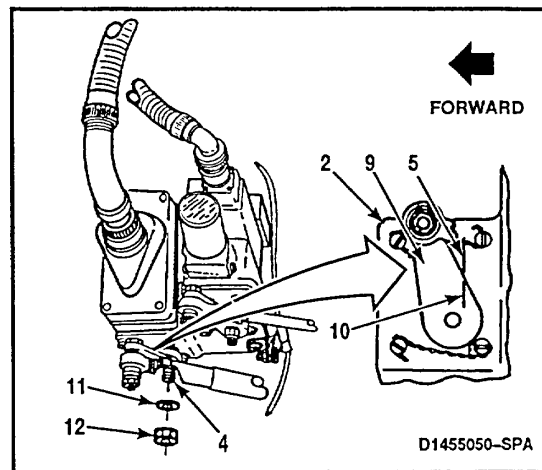
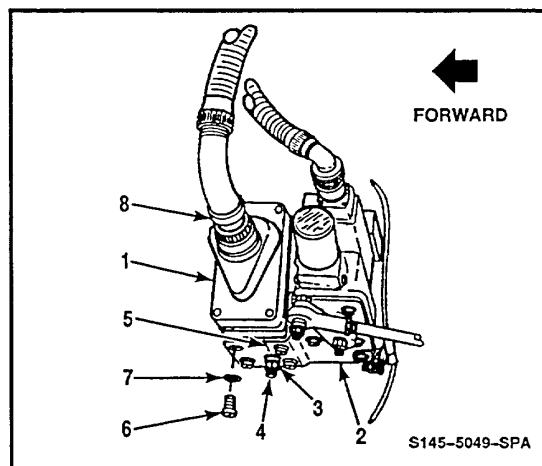
Procedure is same to install gas producer control actuator on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Position actuator (1) on bracket (2). Check index mark (3) on actuator shaft (4). Index mark shall align with index mark (5) on bracket.

CAUTION

Screws must be lockwired left to right. Interference or damage to control rod could result if screws are lockwired up and down.

2. Install four screws (6) and washers (7). Lockwire screws left to right. Use lockwire (E231).
3. Connect cable connector (8).
4. Position lever (9) on shaft (4). Index mark (10) on lever shall align with index mark (5) on bracket. Install washer (11) and nut (12) on shaft. Torque nut to 35 inch-pounds.



INSPECT

FOLLOW-ON MAINTENANCE:

- Perform operational check of gas producer control system (TM 55-1520-240-T).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

4-110 REMOVE ACTUATOR SUPPORT BRACKET

4-110

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

- Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
- Container, 2-Quart

Materials:

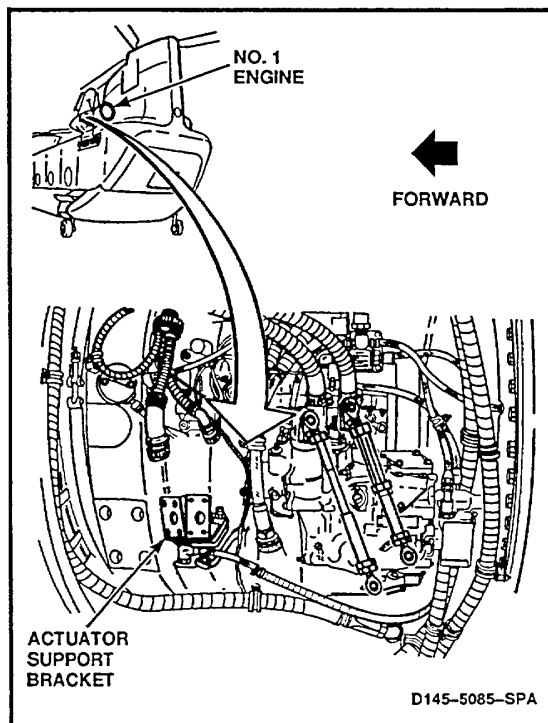
Cloths (E135)

Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)
- Gas Producer Control Actuator Removed (Task 4-108)
- Power Turbine Control Actuator Removed (Task 4-138)



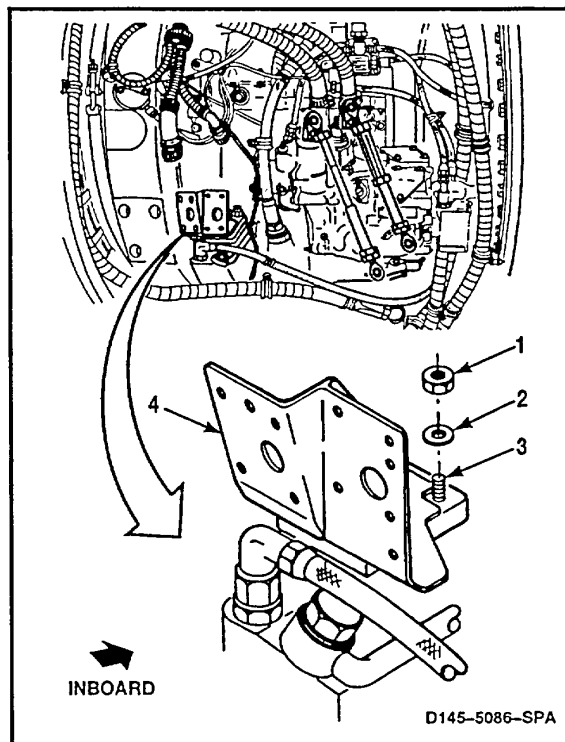
NOTE

Procedure is same to remove actuator support on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Remove four nuts (1) and washers (2) from studs (3).
2. Remove bracket (4). Use container to catch any oil spill. Clean up spilled oil. Use cloths (E135).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-111 INSTALL ACTUATOR SUPPORT BRACKET

4-111

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

- Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
- Torque Wrench, 5 to 50 Inch-Pounds

Materials:

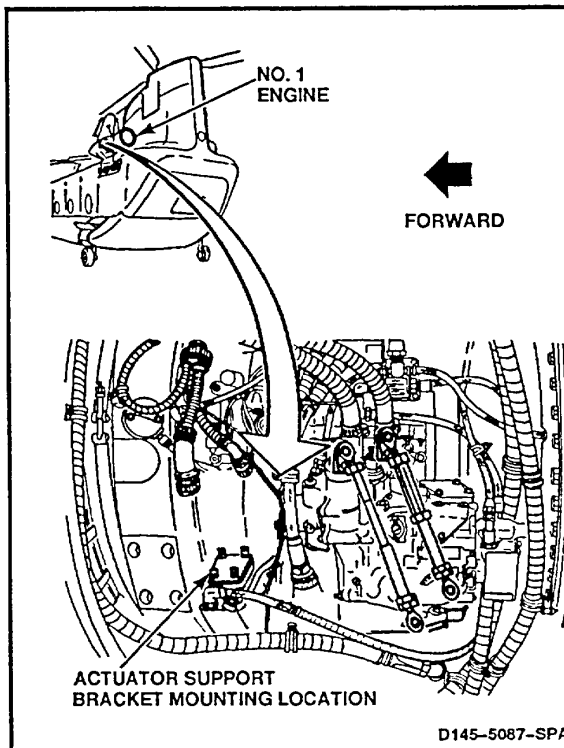
None

Personnel Required:

- Aircraft Powerplant Repairer
- Inspector

References:

TM 55-1520-240-23P



NOTE

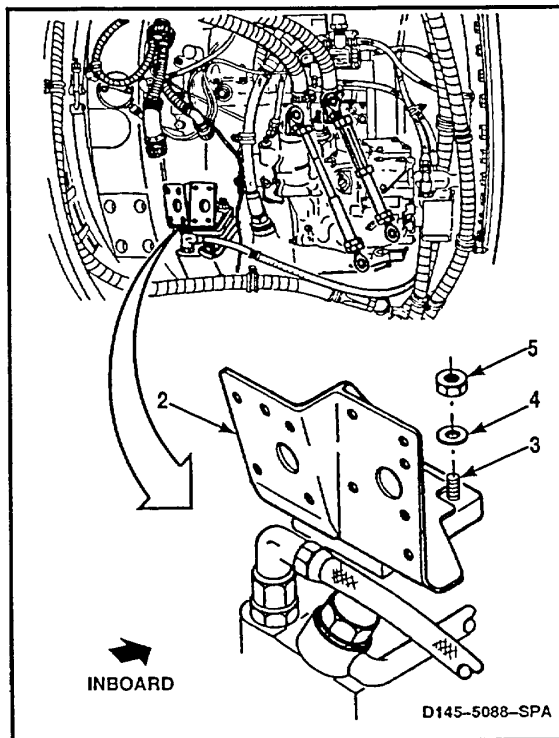
Procedure is same to install actuator support bracket on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Make sure gasket (1) is in serviceable condition.
2. **Position bracket (2)** on studs (3). **Install four washers (4) and nuts (5)** on studs.
3. **Torque four nuts (5) to 35 inch-pounds.**

INSPECT

FOLLOW-ON MAINTENANCE:

- Install gas producer control actuator (Task 4-109).
- Install power turbine control actuator (Task 4-139).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



4-112 REMOVE GAS PRODUCER CONTROL LINKAGE

4-112

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

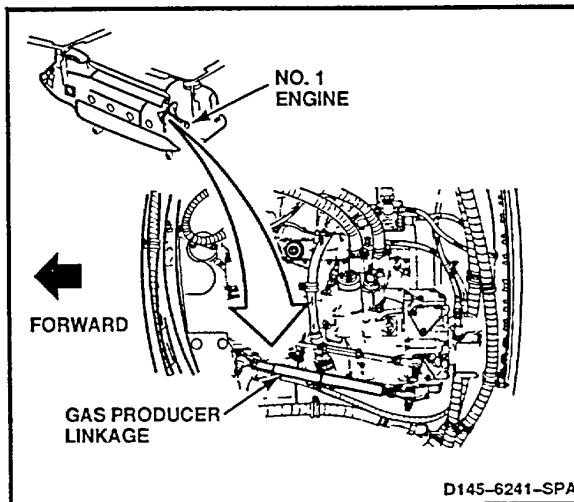
Twine (E433)

Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:

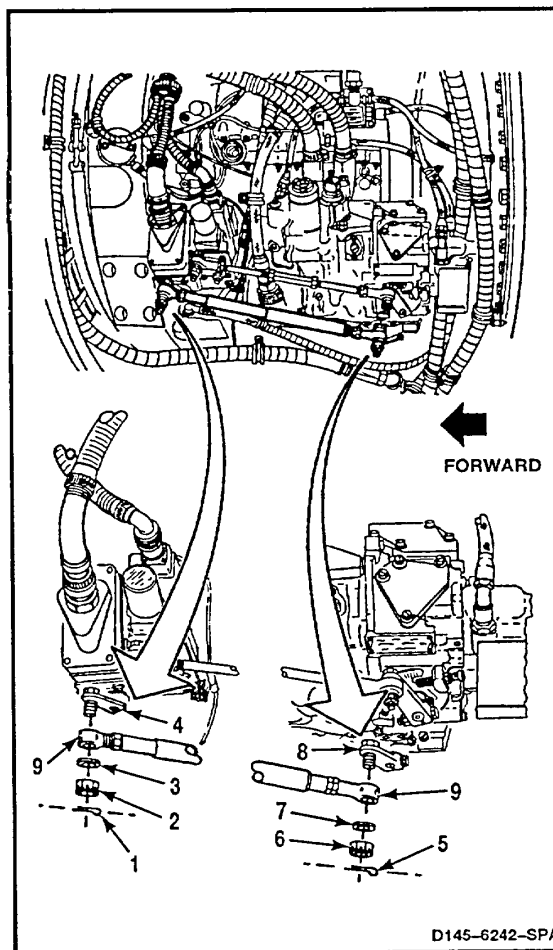
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



NOTE

Procedure is same to remove gas producer linkage from No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Remove cotter pin (1), nut (2), and washer (3), from lever (4).
2. Remove cotter pin (5), nut (6), and washer (7) from lever (8).
3. Remove rod (9).

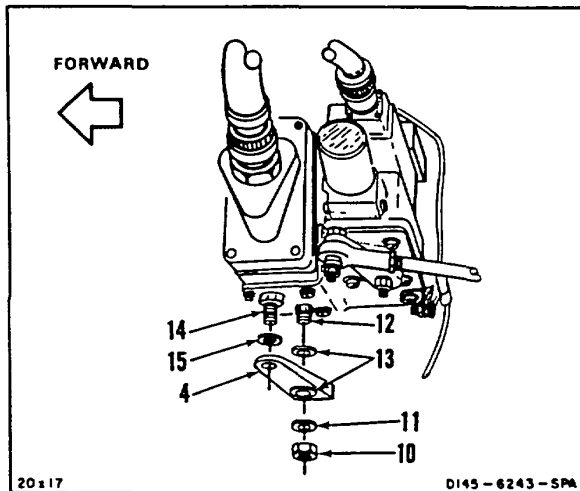


GO TO NEXT PAGE

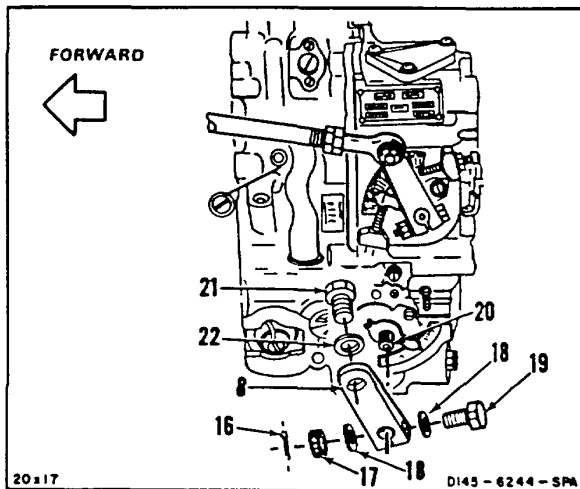
NOTE

If special washers are not bonded to lever at removal, secure them to lever with twine.

4. Remove nut (10) and washer (11) from actuator shaft (12). Slide and **remove lever (4)** from shafts. Secure any loose washers (13) to lever. Use twine (E433). Remove bolt (14) and washer (15) from lever.



5. Remove cotter pin (16), nut (17), two washers (18), and bolt (19). Slide and **remove lever (8)** from shaft (20). Remove bolt (21) and washer (22) from lever.



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

Lockwire (E230)

Parts:

Cotter Pins

Personnel Required:

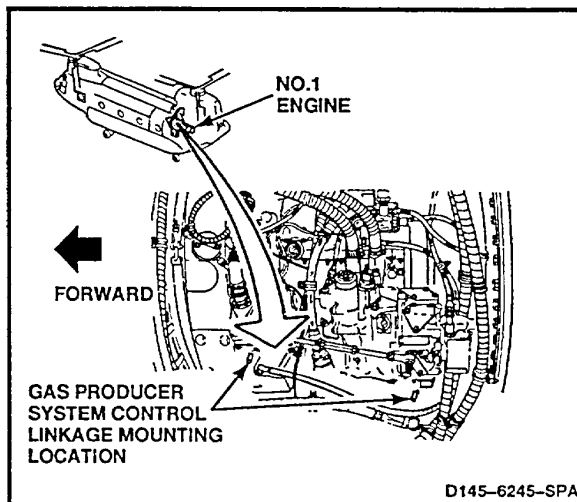
Aircraft Powerplant Repairer (2)
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

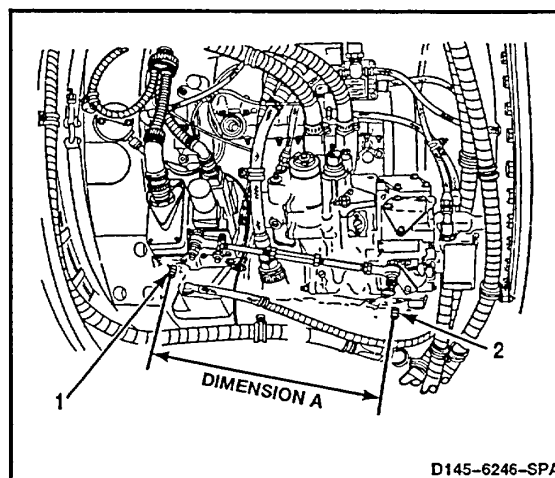
DC Power On (Task 1-37)



NOTE

- Procedure is same to install and rig gas producer system control linkage on No. 1 or No. 2 engine. Installation and rigging on No. 1 engine is shown here.
- Check that control link 114P2035-19 is used. Otherwise, the fault indicator light on the master caution panel may give a false indication during operation.

1. Measure dimension A between actuator shaft (1) and fuel control shaft (2).



GO TO NEXT PAGE

4-113 INSTALL AND RIG GAS PRODUCER CONTROL LINKAGE
(Continued)

4-113

2. Measure distance between centers of holes (3) in rod end bearings (4 and 5). **If length is same as dimension A found in step 1, go to step 3. If not, do the following:**

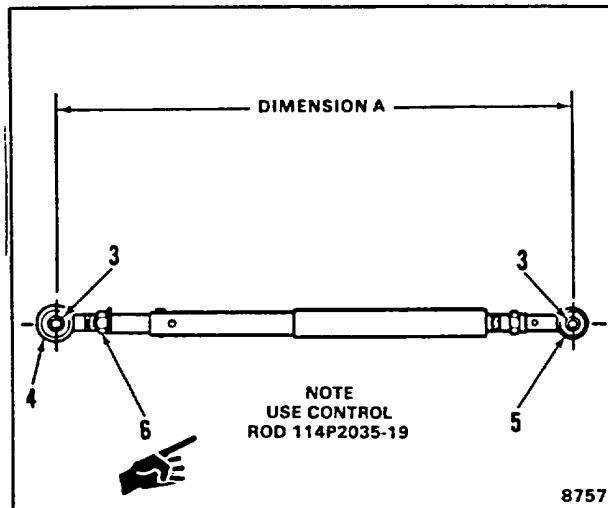
- a. Remove lockwire and loosen nut (6).
- b. Rotate rod end bearing (4) until distance between centers of holes (3) is same as dimension A.
- c. Make sure rod ends (4 and 5) are aligned.
- d. Tighten nut (6).

NOTE

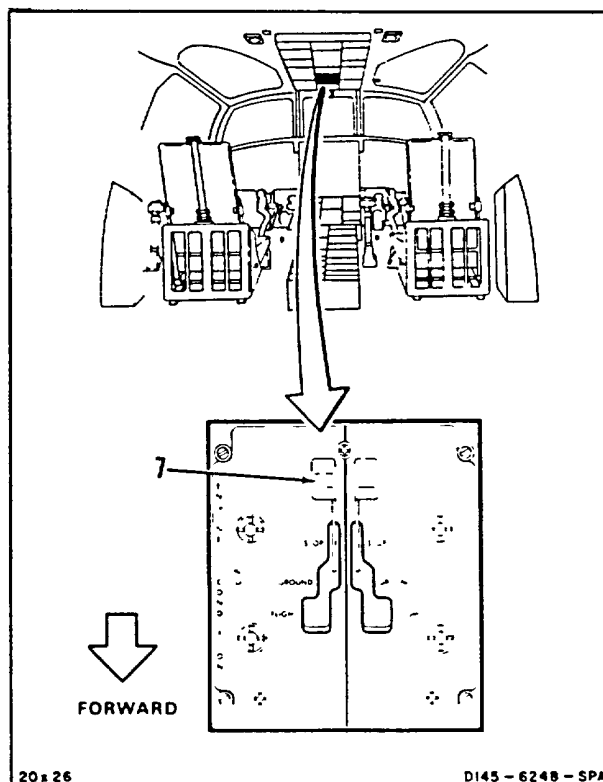
· **Nominal distance between centers of holes in rod ends is 13.16 to 13.28 inches**

· **Do not lockwire nut at this time.**

3. Make sure **No. 1 ENG COND lever (7) is at STOP.**



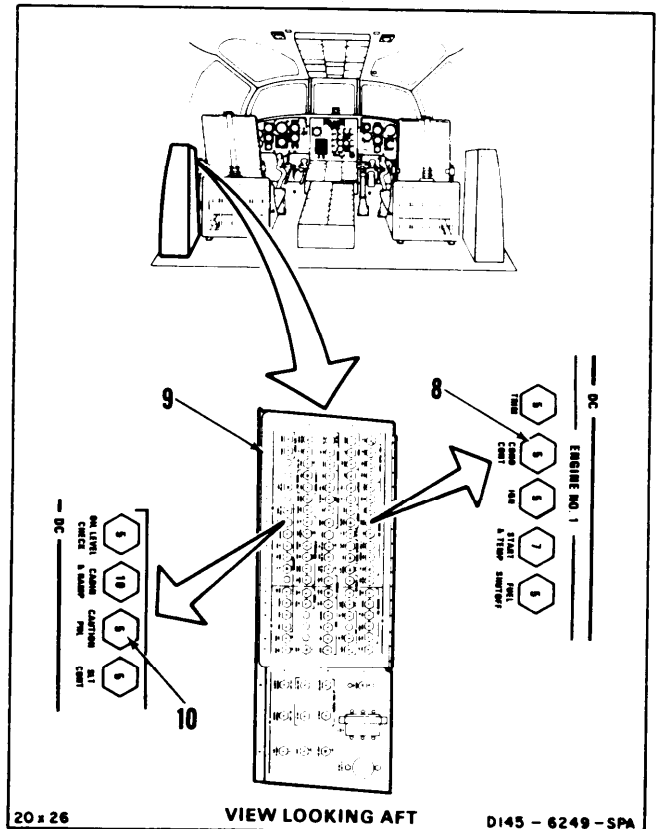
8757



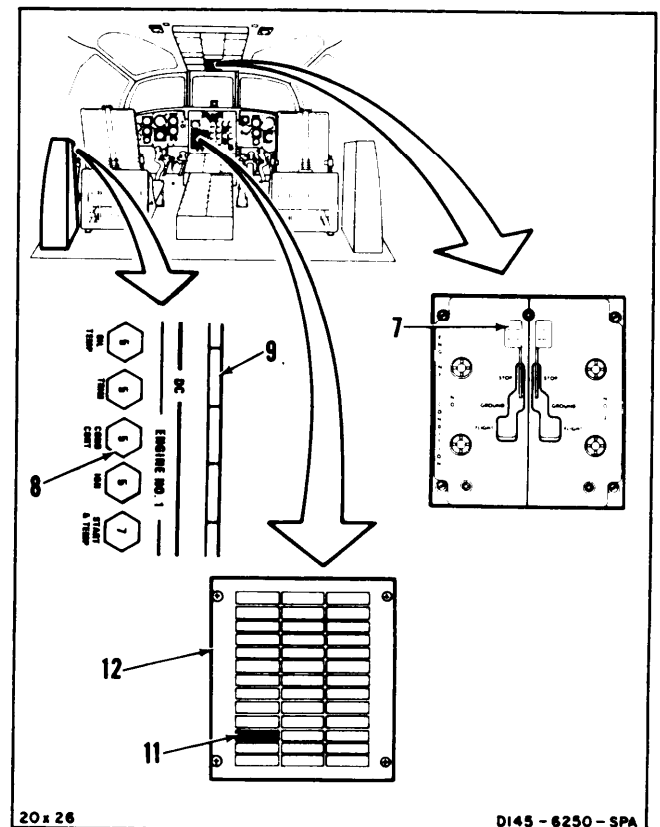
4-113 INSTALL AND RIG GAS PRODUCER CONTROL LINKAGE (Continued)

4-113

4. **Make sure No. 1 ENG COND CONT circuit breaker (8) on No. 1 power distribution panel (9) is closed.**
5. **Make sure CAUTION PNL circuit breaker (10) on No. 1 power distribution panel (9) is closed.**



6. **Set lever (7) to GROUND.**
7. **Set lever (7) to FLIGHT.**
8. **Set lever (7) to GROUND.**
9. **Wait for ENG N1 COND light capsule (11) on master caution panel (12) to go out.**
10. **Open No. 1 ENG COND CONT circuit breaker (8) on No. 1 power distribution panel (9).**

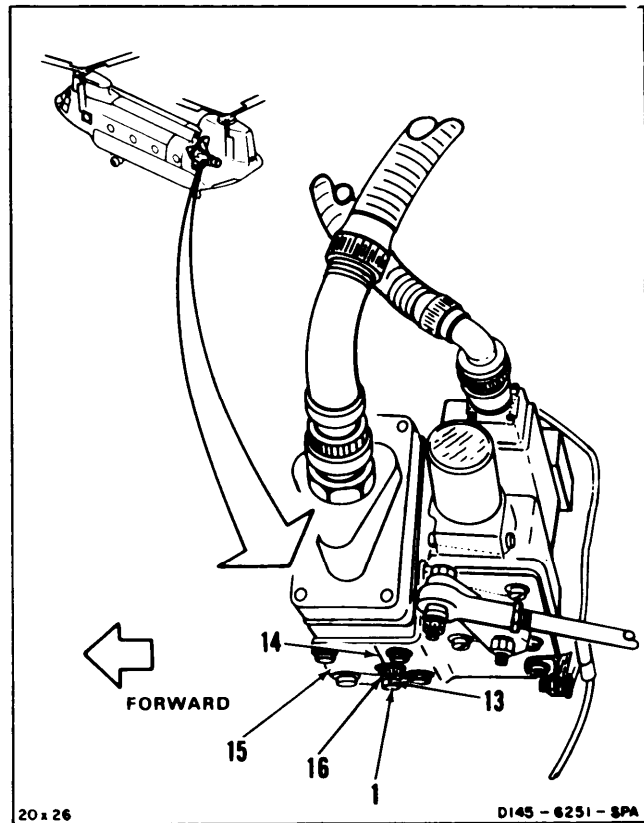


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4-113 INSTALL AND RIG GAS PRODUCER CONTROL LINKAGE (Continued)

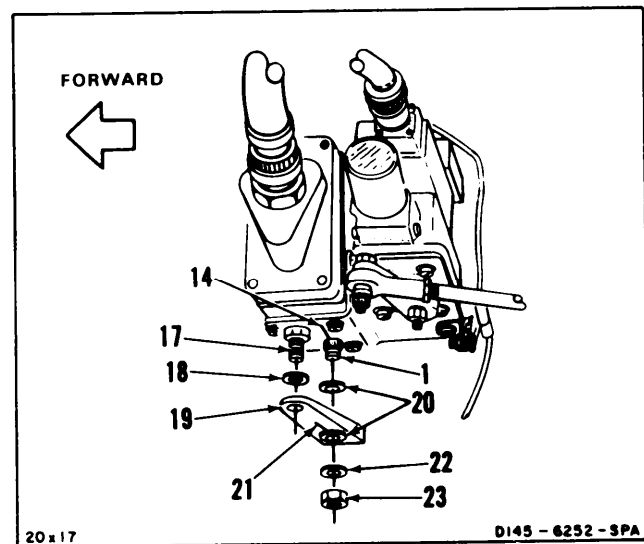
11. **Check index mark (13) on actuator shaft (1).** Index mark shall align with index mark (14) on bracket (15) within one tooth on spline (16).

INSPECT



12. Install bolt (17) and washer (18) in lever (19)
13. **Slide lever (19) on shaft (1).** If special washers (20) are loose, position them on shaft. Index mark (21) on lever shall align with index mark (14).
14. Install washer (22) and **nut (23)** on shaft (1). **Torque nut to 35 inch-pounds.**

INSPECT



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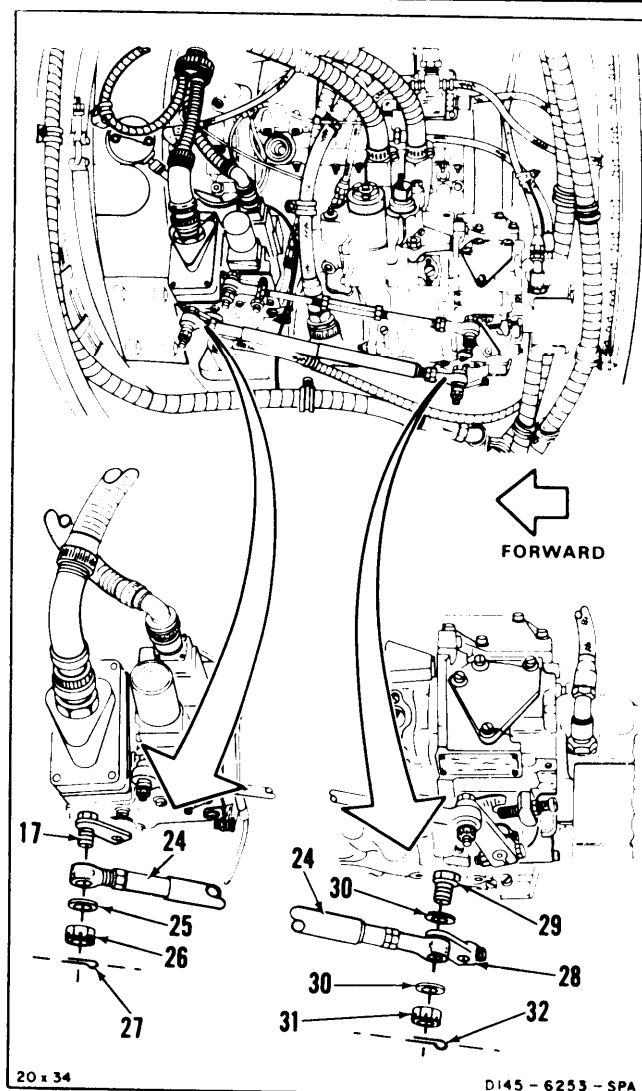
4-113 INSTALL AND RIG GAS PRODUCER CONTROL LINKAGE
(Continued)

15. Position rod (24) on bolt (17). Install washer (25) and nut (26). Torque nut to 30 to 60 inch-pounds. Install cotter pin (27).

INSPECT

16. Position lever (28) behind rod (24). install bolt (29), two washers (30) and nut (31). Torque nut to 30 to 60 inch-pounds. Install cotter pin (32).

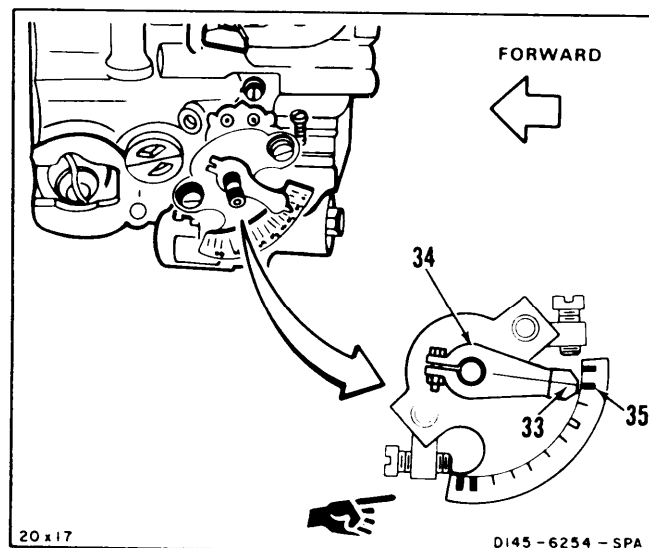
INSPECT



NOTE

Control linkage is omitted for clarity.

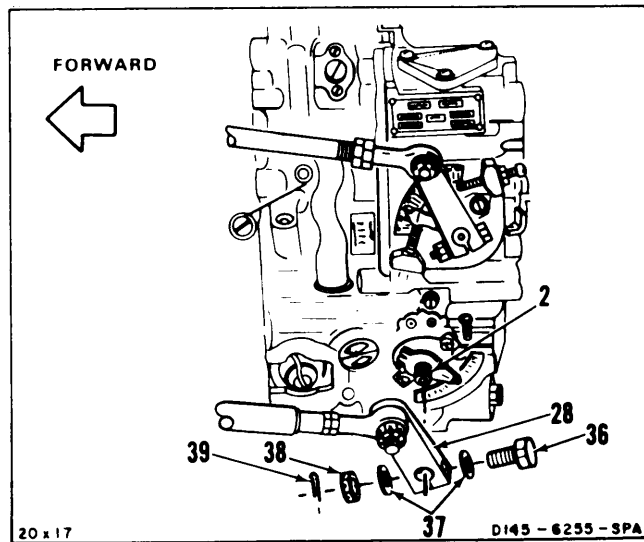
17. Align index mark (33) on fuel control pointer (34) with center of GI band (35).



GO TO NEXT PAGE

4-113 INSTALL AND RIG GAS PRODUCER CONTROL LINKAGE
(Continued)

18. Slide lever (28) on shaft (2). Install bolt (36), two washers (37), nut (38), and cotter pin (39).



19. Make sure index mark (33) on pointer (34) is centered on GI band (35). If it is not, do the following:

- a. Loosen nut (6).
- b. Rotate cylinder (40) until index mark (33) on pointer (34) is centered on GI band (35).
- c. Tighten nut (6).

20. Lockwire nut (6).

INSPECT

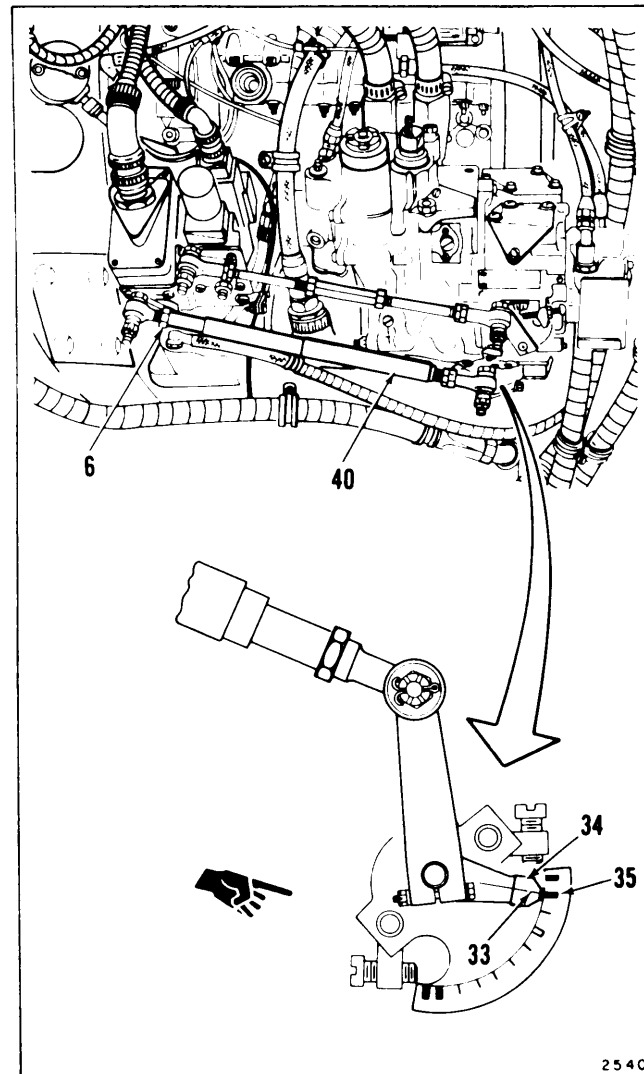
FOLLOW-ON MAINTENANCE:

Perform operational check of gas producer system (TM 55-1520-240-T).

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).

Dc power off (Task 1-37).



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

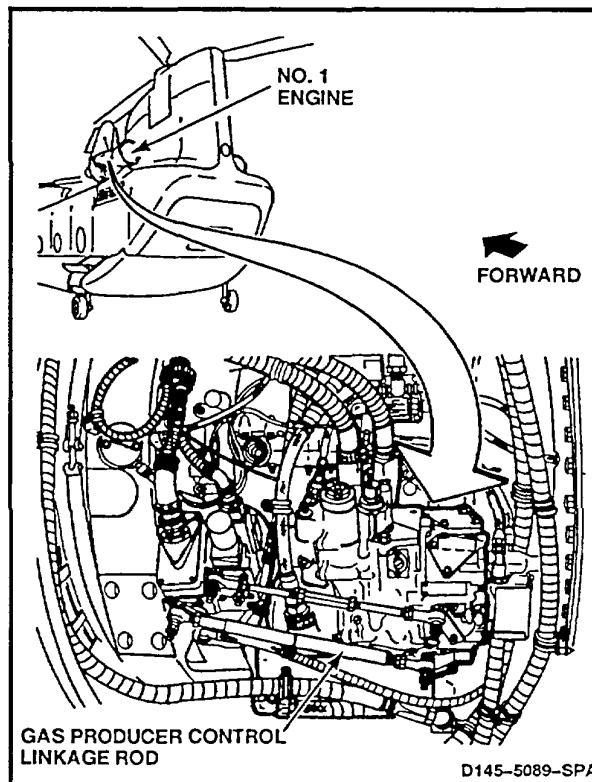
None

Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:

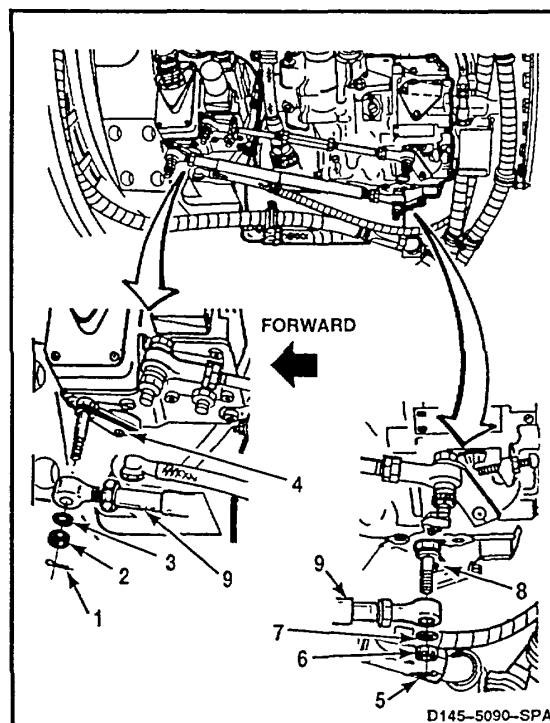
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



NOTE

Procedure is same to remove gas producer control linkage rod from No. 1 or No. 2 engine. Removal of No. 1 rod is shown here.

1. Remove cotter pin (1), nut (2), and washer (3) from lever (4).
2. Remove cotter pin (5), nut (6), and washer (7) from lever (8).
3. Remove rod (9).



GO TO NEXT PAGE

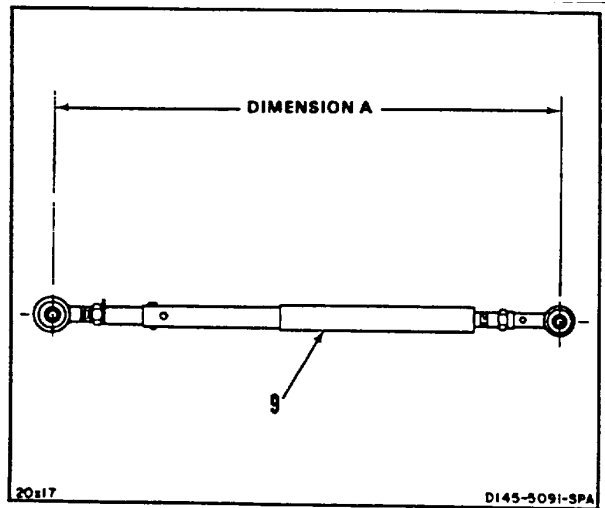
**4-114 REMOVE GAS PRODUCER CONTROL LINKAGE ROD
(Continued)**

4-114

4. **Measure and record dimension A** on rod (9).

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

4-272

4-115 INSPECT GAS PRODUCER CONTROL LINKAGE ROD

4-115

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Dial Indicator

Dial Indicating Scale, 0 to 50 Pounds

Vise

Materials:

None

Personnel Required:

Inspector

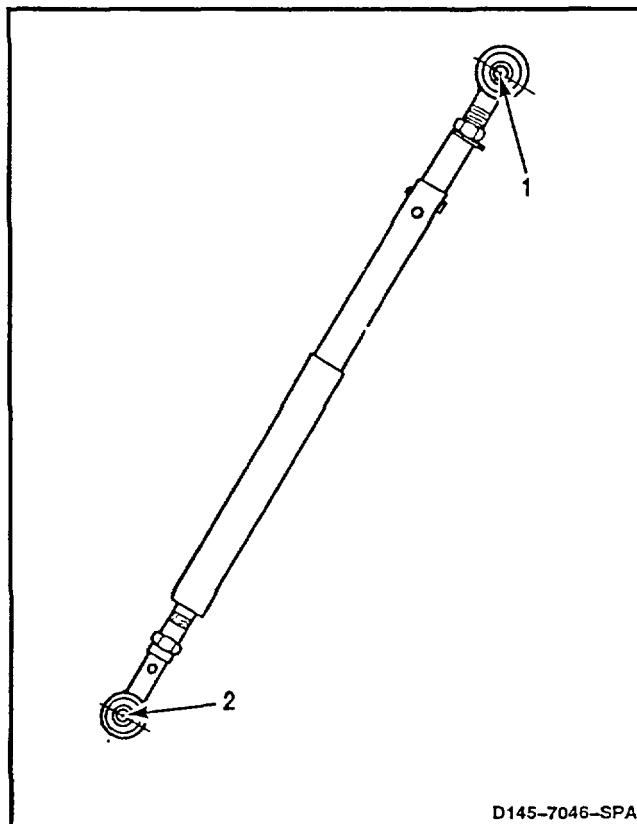
Equipment Condition:

Off Helicopter Task

1. Apply 5 to 15 pound load to bearing (1) in radial direction.
2. Apply 5 to 15 pound load to bearing (1) in opposite direction.
3. Measure radial play of bearing (1). Radial play shall not be more than 0.005 inch.
4. Repeat steps 1 thru 3 three times. Rotate bearing (1) to a different position each time.
5. Repeat steps 1 thru 4 on bearing (2).
6. Apply 5 to 15 pound load to bearing (1) in axial direction.
7. Apply 5 to 15 pound load to bearing (1) in opposite direction.
8. Measure axial play of bearing (1). Axial play shall not be more than 0.025 inch.
9. Repeat steps 6 thru 8 to bearing (2).

FOLLOW-ON MAINTENANCE:

None



D145-7046-SPA

END OF TASK

Change 19 4-273

4-116 REPAIR GAS PRODUCER CONTROL LINKAGE ROD

4-116

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
Measuring Tape

Materials:

Antiseize Compound (E75)

Parts:

Rod Ends (2)

Personnel Required:

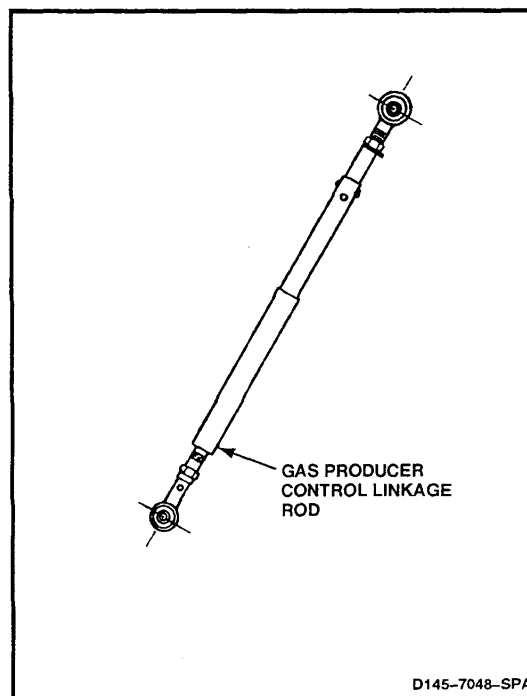
Aircraft Powerplant Repairer

References:

TM 55-1520-240-23P

Equipment Condition:

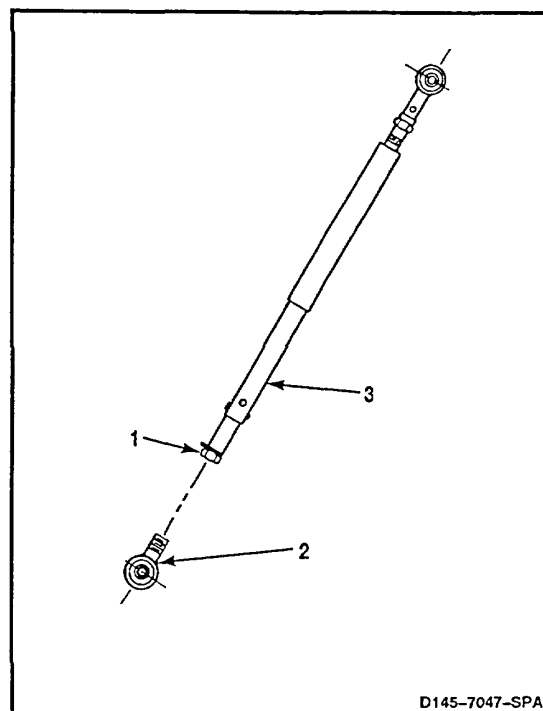
Off Helicopter Task



1. Remove lockwire from nut (1).
2. **Loosen nut (1).**
3. **Remove rod end (2)** from rod (3).
4. Coat thread of replacement rod end (2) with antiseize compound (E75).
5. **Install rod end (2)** in rod (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-274 Change 19

4-117 INSTALL GAS PRODUCER CONTROL LINKAGE ROD

4-117

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

- Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
- Torque Wrench, 30 to 150 Inch-Pounds
- Measuring Tape

Materials:

Lockwire (E229)

Parts:

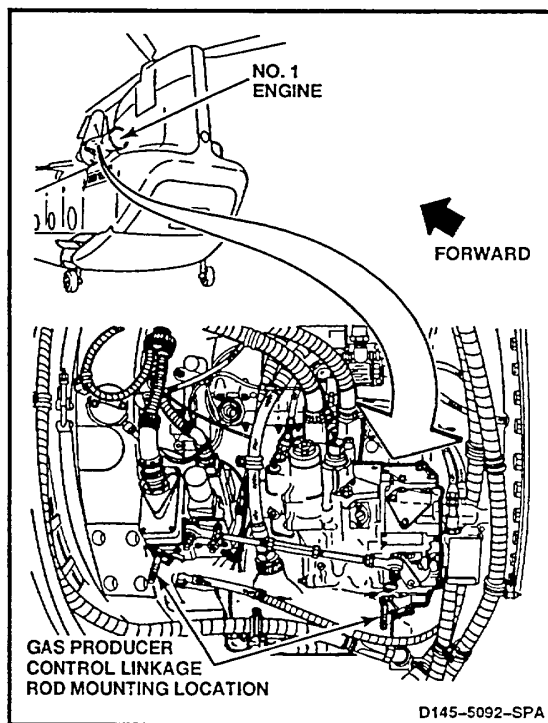
Cotter Pins

Personnel Required:

- Aircraft Powerplant Repairer (2)
- Inspector

References:

TM 55-1520-240-23P



NOTE

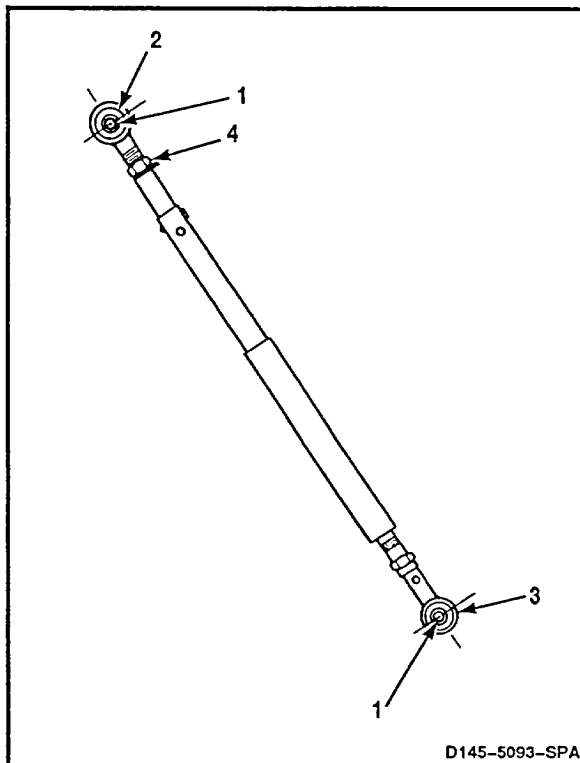
Procedure is same to install gas producer control linkage rod on No. 1 or No. 2 engine. Installation of No. 1 rod is shown here.

1. Measure distance between centers of holes (1) in rod ends (2 and 3). If length is same as dimension A found in removal, go to step 2. If length is not same, do the following:
 - a. Loosen nut (4).
 - b. Rotate rod end (2) until distance between centers of holes (1) in rod ends (2 and 3) is same as dimension A.
 - c. Make sure rod ends (2 and 3) are aligned.
 - d. Tighten nut (4).

NOTE

Nominal distance between centers of holes in rod ends is 13.16 to 13.28 inches

Do not lockwire nut at this time.



GO TO NEXT PAGE

4-117 INSTALL GAS PRODUCER CONTROL LINKAGE ROD (Continued)

4-117

2. **Position rod (5)** on bolt (6). Make sure end with nut (4) on rod is forward. **Install washer (7) and nut (8). Torque nut to 30 to 60 inch-pounds.** Install cotter pin (9).

INSPECT

3. **Position rod (5)** on bolt (10). **Install washer (11) and nut (12). Torque nut to 30 to 60 inch-pounds.** Install cotter pin (13).

INSPECT

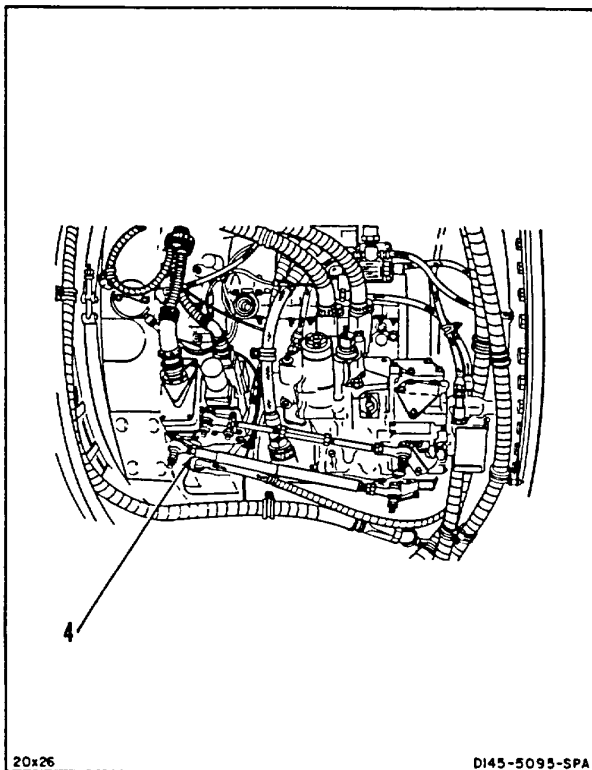
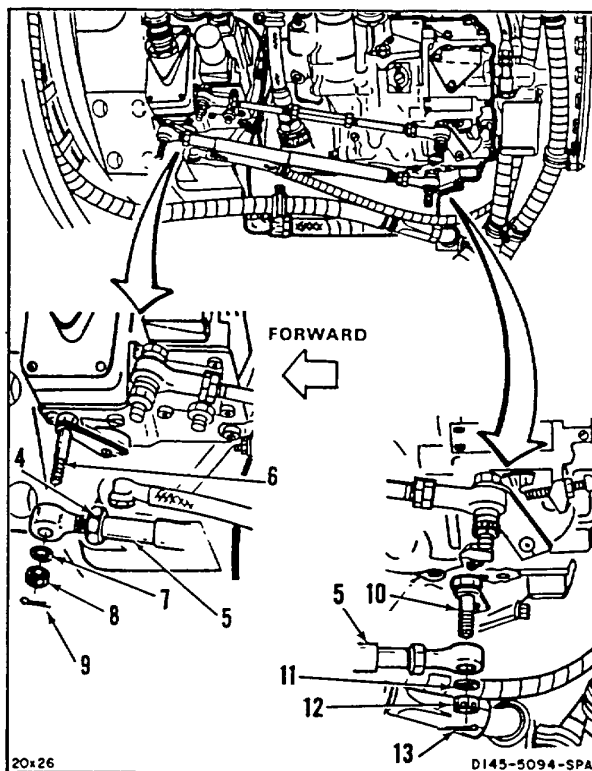
4. Lockwire nut (4). Use lockwire (E229).

INSPECT**FOLLOW-ON MAINTENANCE.**

Perform operational check of gas producer system (TM 55-1520-240-T)

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).

**END OF TASK**

4-276

4-118 ADJUST ENGINE DROOP ELIMINATOR VARIABLE RESISTORS

4-118

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Torque Wrench 5 to 50 Inch-Pounds
Thrust Pallet Rigging Pin (T133)
Multimeter

Materials:

None

Personnel Required:

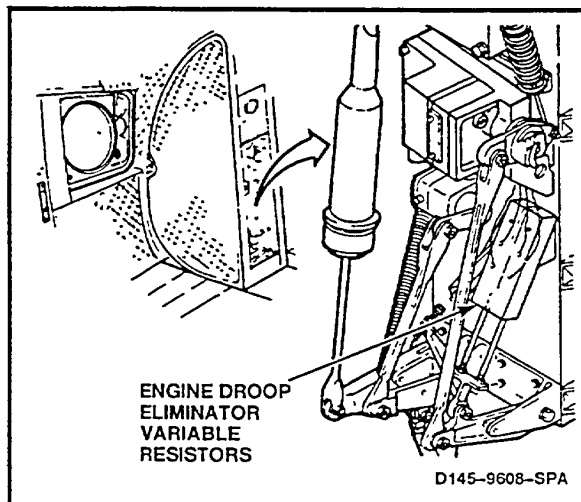
Aircraft Electrician
Army Rotary-Wing Aviator (2)
Inspector

References:

TM 55-1520-240-MTF

Equipment Condition:

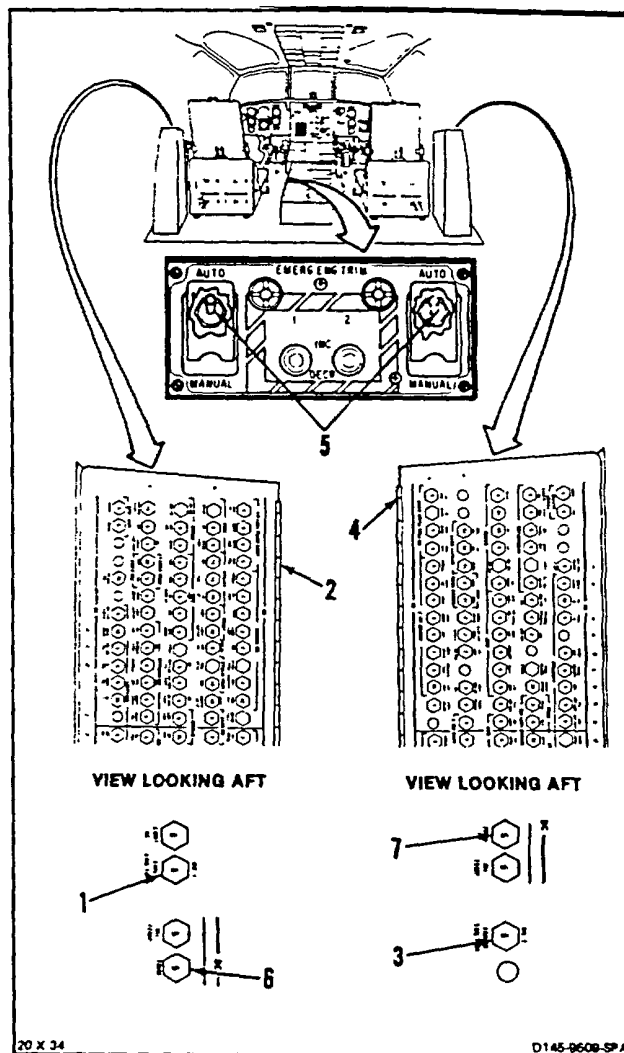
Battery Connected (Task 1-39)
Electrical Power On
Hydraulic Power On
Adjust Engine Condition Control Resistors
(Task 4-129)
Controls Closet Acoustic Blanket Removed
(Task 2-107)
Controls Closet Panel Removed (Task 2-2)
Rig Power Turbine Control Linkage (Task 4-140)



GO TO NEXT PAGE

**4-118 ADJUST ENGINE DROOP ELIMINATOR
VARIABLE RESISTORS (Continued)**

1. **Open No. 1 EMERG ENG TRIM circuit breaker (1)** on No. 1 power distribution panel (2).
2. **Open No. 2 EMERG ENG TRIM circuit breaker (3)** on No. 2 power distribution panel (4).
3. **Set two switches (5) to MANUAL.**
4. **Open DC TRIM circuit breaker (6)** on No. 1 power distribution panel (2).
5. **Open DC TRIM circuit breaker (7)** on No. 2 power distribution panel (4).



**GO TO NEXT PAGE
4-278**

4-118 ADJUST ENGINE DROOP ELIMINATOR VARIABLE RESISTORS (Continued)

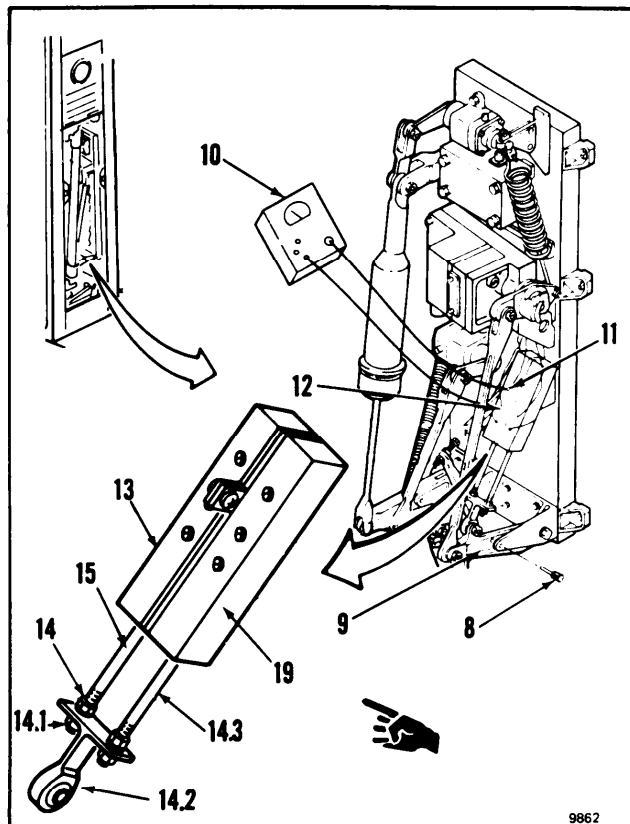
4-118

RIG VARIABLE RESISTORS

NOTE

- Adjustments for the No. 1 and the No. 2 resistors are the same. The No. 1 resistor is described.
- Steps 12.1 thru 12.10 describes the preferred method of rigging the variable resistor because it checks the active portion of the circuit and the wiring from the resistor to the control box. This has been added as an option to steps 6 thru 12 which checks only the inactive portion of the variable resistor.

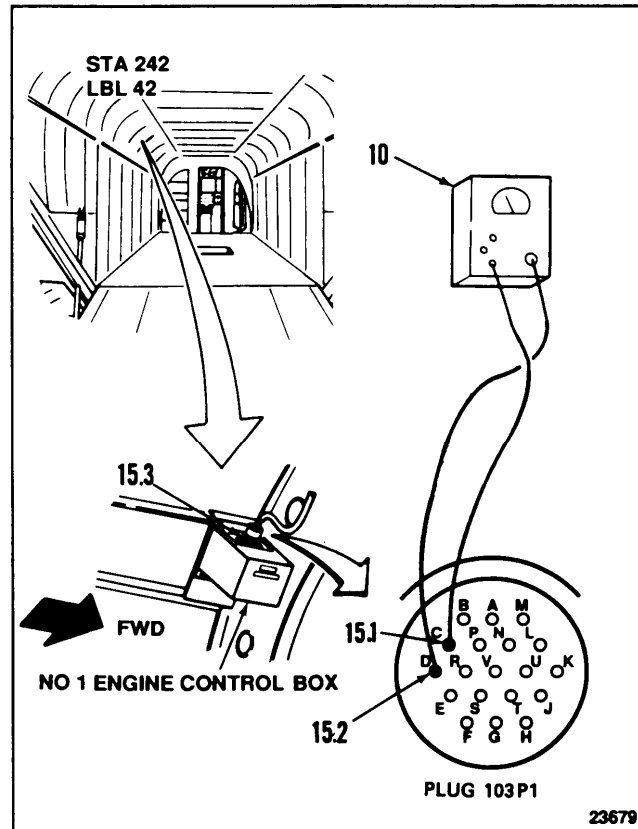
6. Install rig pin (T133) (8) in thrust control idler (9).
7. Connect multimeter (10) to terminals 1 (11) and 2 (12) on No. 1 potentiometer (13). Check multimeter (10). If multimeter reads 31 to 35 ohms, go to step 13. If not, go to step 9.
9. Loosen one nut (14) above and one nut (14.1) below the link assembly on No. 1 potentiometer shaft (15).
10. Adjust shaft until multimeter reads 31 to 35-ohms. If multimeter reads 31 to 35 ohms, go to step 10.2. If not, go to step 10.1.
- 10.1. Check nuts for thread protrusion. If all threads of nuts are not engaged, replace engine droop eliminator potentiometer (13 and 19) (Task 4-119 and 4-122).
- 10.2. Make sure link assembly (14.2) is parallel to resistor shafts (15 and 14.3).
- 10.3. Tighten one nut (14) above and one nut (14.1) below the link assembly (14.2). Apply loctite to one nut (14). Torque nuts to 25 inch-pounds.
Disconnect multimeter (10) from terminals 1 (11) and 2 (12). Go to step 13.
Repeat steps 6 through 11 for the No. 2 potentiometer (19).



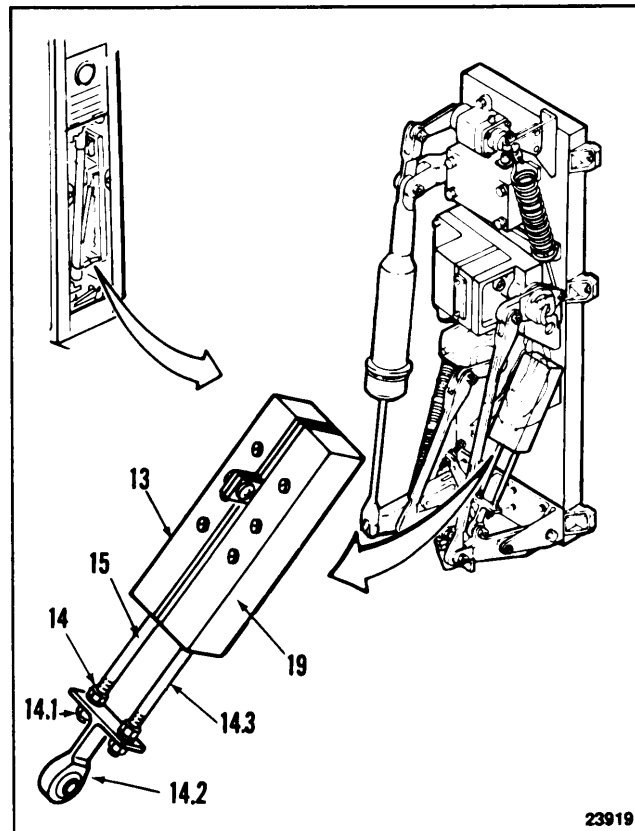
GO TO NEXT PAGE

RIG VARIABLE RESISTORS (OPTIONAL METHOD)

- 12.1. Install rig pin (T133) in thrust control idler (Step 6).
- 12.2. Connect multimeter (10) to pins C (15.1) and D (15.2) on plug 1031P1 (15.3) of the No. 1 engine control box.
- 12.3. Check multimeter (10). If multimeter reads 92 to 96 ohms, go to step 13. If not, go to step 12.4.



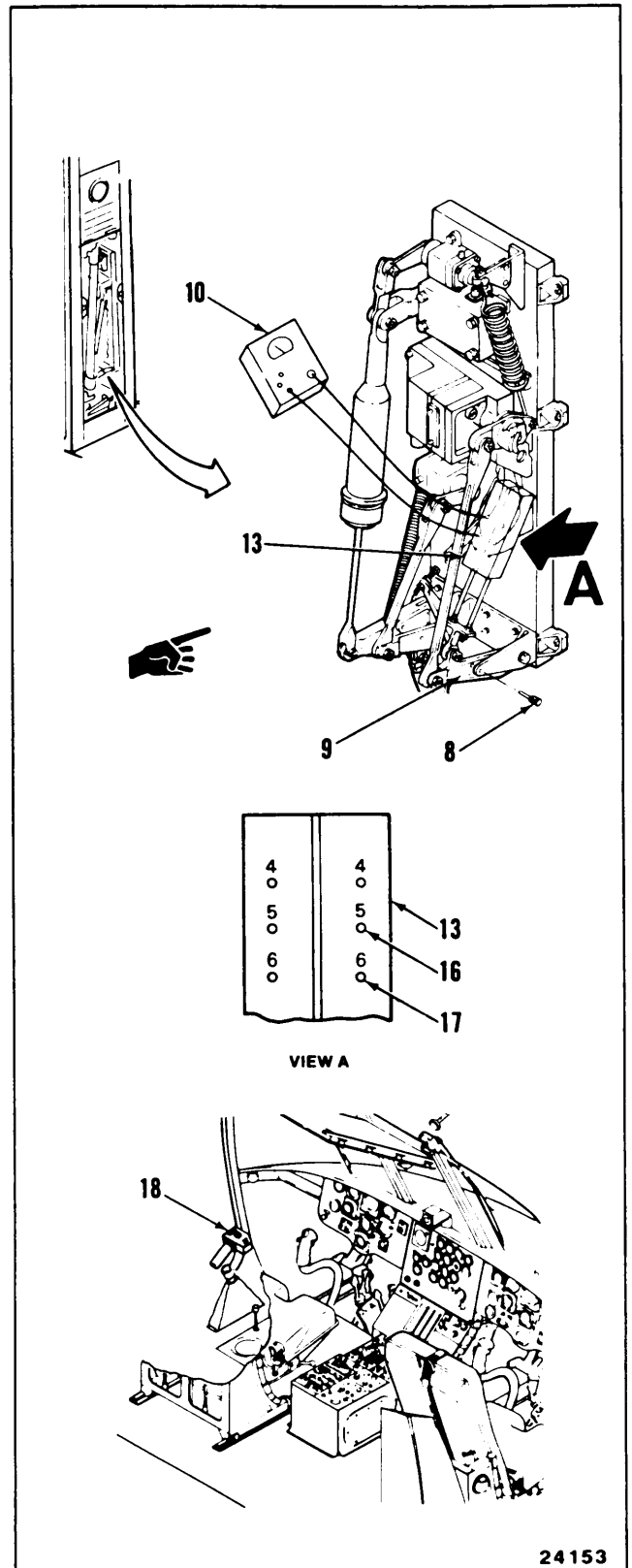
- 12.4. Loosen one nut (14) above and one nut (14.1) below the link assembly on the No. 1 potentiometer shaft (15).
- 12.5. Adjust shaft until multimeter reads 92 to 96 ohms. If multimeter reads 92 to 96 ohms go to step 12.7. If not, go to step 12.6.
- 12.6. Check nuts for thread protrusion. If all threads of nuts are not engaged, replace engine droop eliminator potentiometers (13 and 19) (Task 4-119 and 4-122),
- 12.7. Make sure link (14.2) is parallel to resistor shafts (15 and 14.3).
- 12.8. Tighten one nut (14) above and one nut (14.1) below the link assembly. Torque nuts to 25 inch-pounds. Apply loctite to one nut (14).
- 12.9. Disconnect multimeter from pins C and D. Go to step 13.
- 12.10. Repeat steps 12.1 through 12.9 for the No. 2 engine control box. The No. 2 control box is located in the right electrical equipment compartment then go to step 13.

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4-118 ADJUST ENGINE DROOP ELIMINATOR VARIABLE RESISTORS (Continued)

4-118

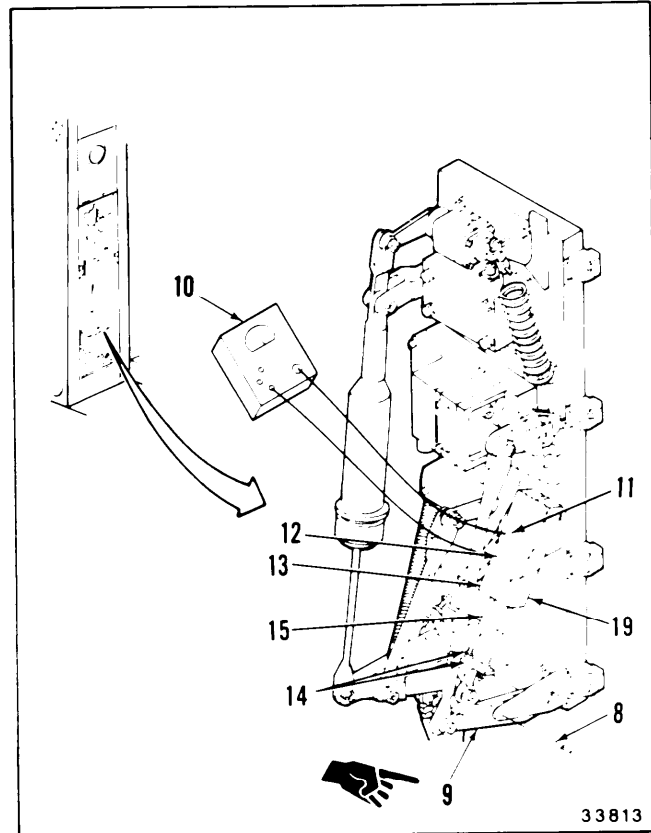
13. Connect multimeter (10) to terminals 5 (16) and 6 (17) on No. 1 resistor (13).
14. Remove rigging pin (8) from thrust control idler (9).
15. Set thrust control (18) to ground detent.
16. Check multimeter (10). **Multimeter shall read 133 to 147 ohms.** Disconnect multimeter. Set thrust control (18) to neutral.



GO TO NEXT PAGE

ADJUST RESISTORS FOR EXCESSIVE ROTOR RPM

17. Have pilot perform Droop Eliminator Flight Check (TM 55-1520-240-MTF). **If rotor rpm is 98 to 100 percent, go to step 29. If not, go to step 18.**
18. Record rotor rpm percent. **Subtract rpm percent from 100 if rpm percent is 97 or less. Subtract 100 from rotor rpm percent if rpm percent is greater than 100. Multiply result by 10.** Record number.
- 18.1. **Install rig pin (T133) (8) in thrust control idler (9).**
19. **Connect multimeter (10), set to RX1, to terminals 1 (11) and 2 (12) on No. 1 resistor (13).** Record reading.
20. **Add number recorded in step 18 to reading recorded in step 19 if rotor rpm is 97 percent or lower. Subtract number found in step 18 from reading found in step 19 if rotor rpm is greater than 100 percent.**
21. **Loosen four nuts (14) on resistor shaft (15).**
22. **Adjust shaft (15) until multimeter (10) reads number of ohms equal to number found in step 20.**
23. **Tighten four nuts (14) on shaft (15).**
Torque nuts to 25 inch-pounds.
24. **Check multimeter (10). If multimeter reads amount recorded in step 20 go to step 25. If not, repeat steps 21 thru 24.**
25. **Disconnect multimeter (10).**
26. **Repeat steps 19 thru 24 on No. 2 resistor (19).**
- 26.1. **Remove rig pin (T133) (8) from thrust control idler (9).**

**GO TO NEXT PAGE**

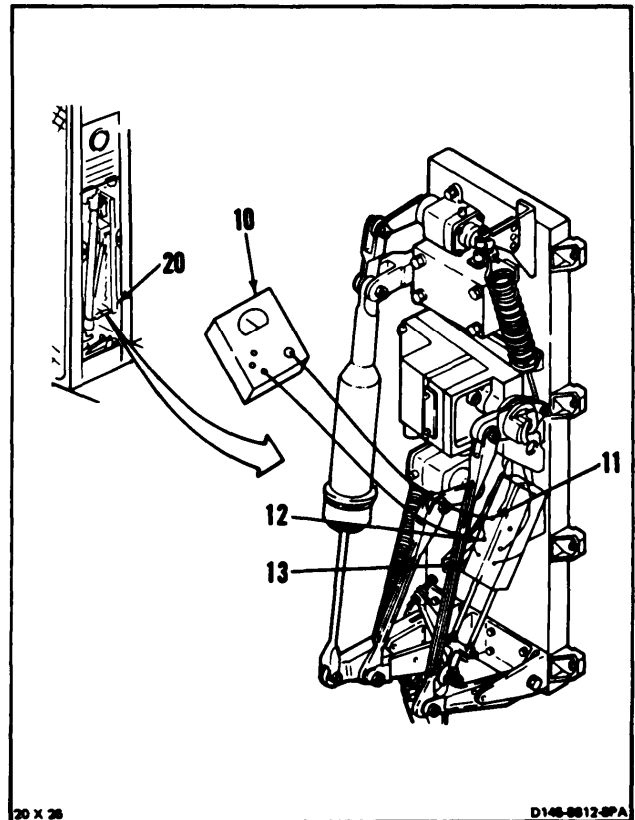
4-118 ADJUST ENGINE DROOP ELIMINATOR VARIABLE RESISTORS (Continued)

4-118

27. Have pilot move thrust control through entire range. **There shall be no interference in resistor installation (20) movement or thrust control movement.**
28. Have pilot perform Droop Eliminator Flight Check (TM 55-1520-240-MTF). **Maximum steady state change in rotor rpm shall be 0 to -1%. If rotor RPM is out of limits repeat step 18 through 28. Maximum torque split between No. 1 and No. 2 engines shall not exceed 6%. If torque split is out of limits go to step 29. If RPM and torque are in limits go to FOLLOW ON MAINTENANCE.**

ADJUST RESISTORS FOR EXCESSIVE ENGINE TORQUE SPLIT

29. Record difference between engine torques percentages and multiply by 0.6. Record number.
30. Connect multimeter (10), set to RX1, to terminals 1 (11) and 2 (12) on No. 1 resistor (13). Record reading.



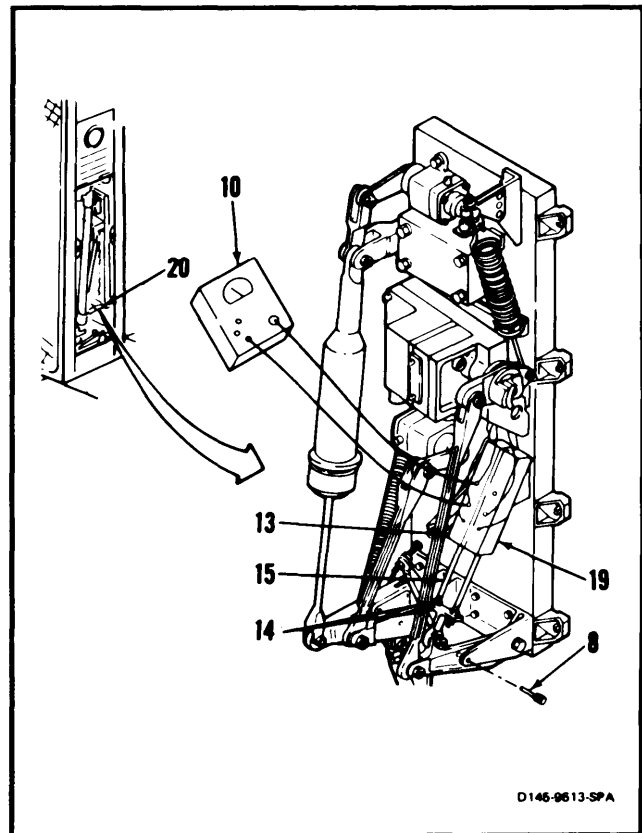
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4-118 ADJUST ENGINE DROOP ELIMINATOR VARIABLE RESISTORS (Continued)

31. If the No. 1 engine had a higher torque reading, subtract the number recorded in step 29 from the result found in step 30. If the No. 1 engine had a lower torque reading, add the result found in step 29 to the result found in step 30.
32. Loosen four nuts (14) on resistor shaft (15).
33. Adjust resistor shaft (15) until multimeter (10) reads amount of ohms equal to number recorded in step 31.
34. Tighten four nuts (14). Torque four nuts to 25 inch-pounds.
35. If multimeter (10) reads amount recorded in steps 33, go to step 37. If not, repeat step 32 through 36.
36. Disconnect multimeter (10) from No. 1 resistor (13).
37. Repeat steps 30 through 36 on No. 2 resistor (19).
38. Close No. 1 EMERG ENG TRIM circuit breaker (1) on No. 1 power distribution panel (Step 1).
39. Close No. 2 EMERG ENG TRIM circuit breaker (3) on No. 2 power distribution panel (Step 2).
40. Close DC TRIM circuit breaker (6) on No. 1 power distribution panel (Step 4).
41. Close DC TRIM circuit breaker (7) on No. 2 power distribution panel (Step 5).
42. Have pilot move thrust control through entire range. **There shall be no interference in resistor installation (20) movement or thrust control movement.**
43. Have pilot perform Droop Eliminator Flight Check (TM 55-1520-240-MTF). **If difference between engine torque readings is 6 percent or more, repeat steps 29 thru 43. If not, go to FOLLOW-ON MAINTENANCE.**

FOLLOW-ON MAINTENANCE:

- Adjust Engine Condition Control Resistor (Task 4-129).
- Electrical power off.
- Disconnect battery (Task 1-39).
- Hydraulic power off.
- Install controls closet panel (Task 2-2),
- Install controls closet acoustic blanket (Task 2-108).



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

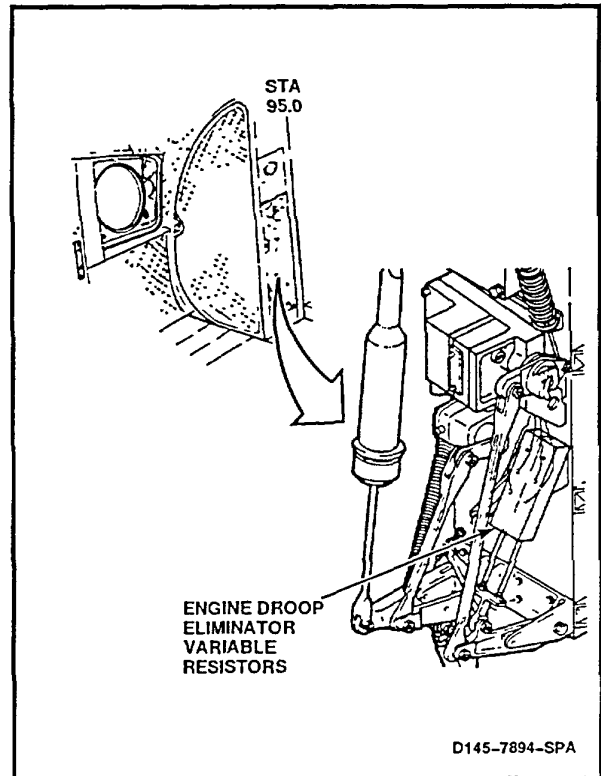
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

Tape (E385)
Paper Tags (E264)

Personnel Required:

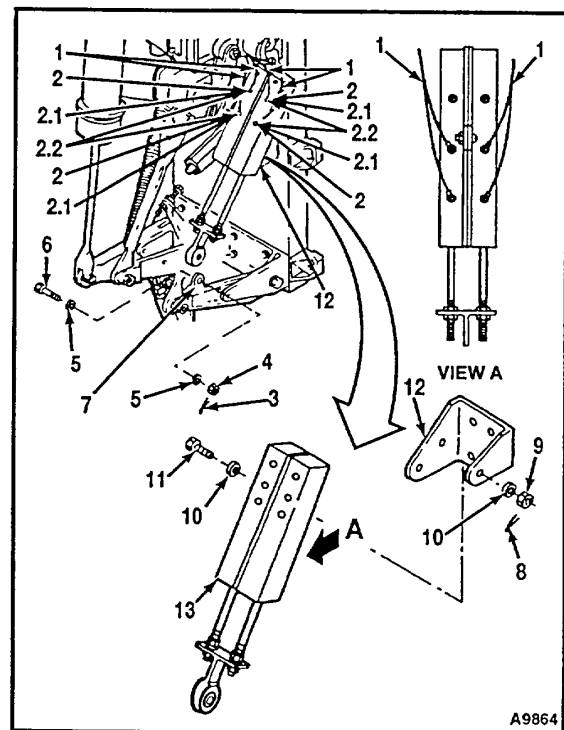
Aircraft Electrician
Equipment Condition:
Battery Disconnected (Task 1-39)
Electrical Power Off
Controls Closet Acoustic Blanket Removed (Task 2-101)
Controls Closet Panel Removed (Task 2-2)



1. Tag eight wires (1). Use paper tags (E264).
2. **Disconnect eight wires (1) by removing eight screws (2).** Remove eight washers (2.1) and eight lockwashers (2.2), if installed. Remove twine from resistors, if installed.
3. **Remove cotter pin (3), nut (4), two washers (5), and bolt (6) from idler (7).**
4. **Remove cotter pin (8), nut (9), two washers (10), and bolt (11) from support bracket (12).**
5. **Remove resistors (13).**

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

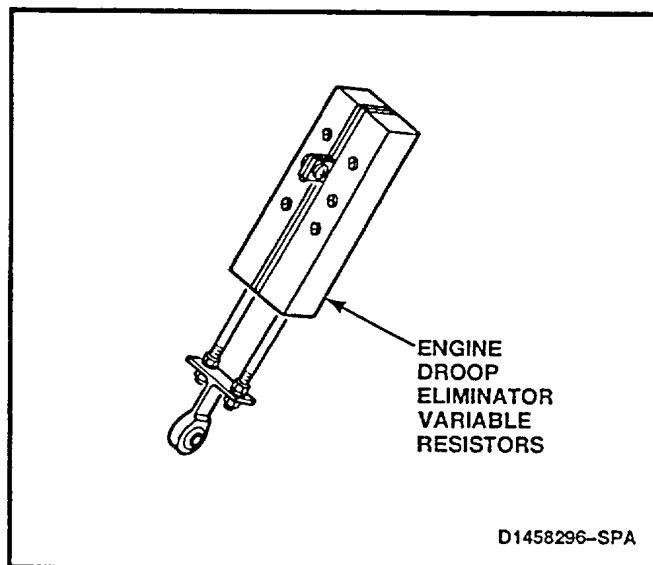
None

Personnel Required:

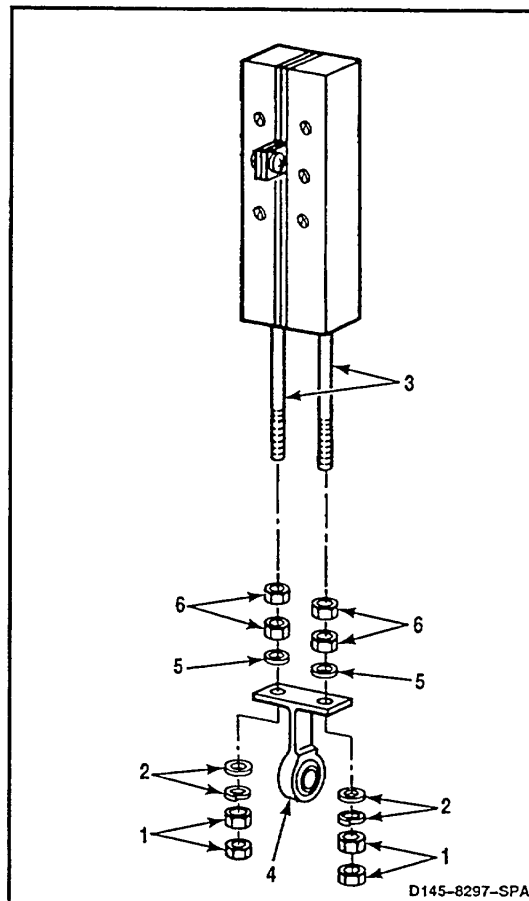
Aircraft Electrician

Equipment Condition:

Off Helicopter Task



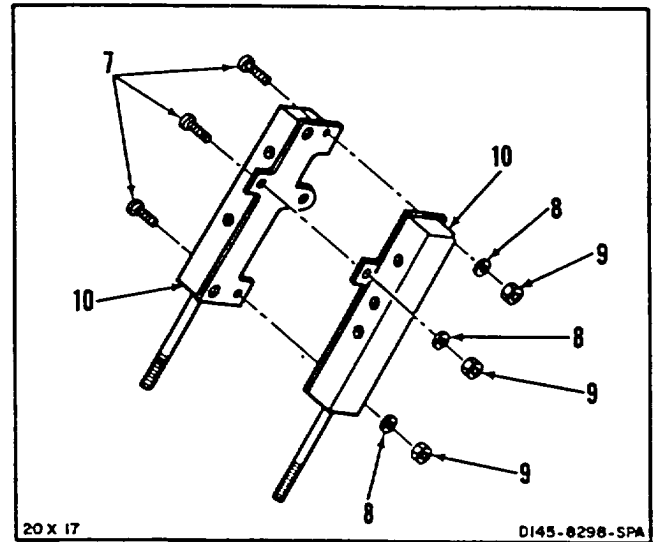
1. Remove two nuts (1) and four washers (2) from resistor shafts (3). Remove link (4).
2. Remove two washers (5) and two nuts (6) from shafts (3).



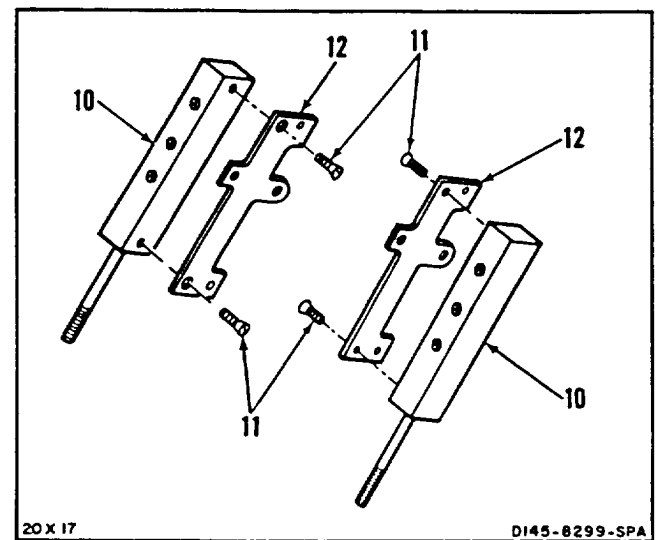
**4-120 DISASSEMBLE ENGINE DROOP ELIMINATOR
VARIABLE RESISTORS (Continued)**

4-120

3. Remove three screws (7), washers (8), and nuts (9). Separate resistors (10).



4. Remove four screws (11). Separate resistors (10) and plates (12).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-285

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Multimeter

Materials:

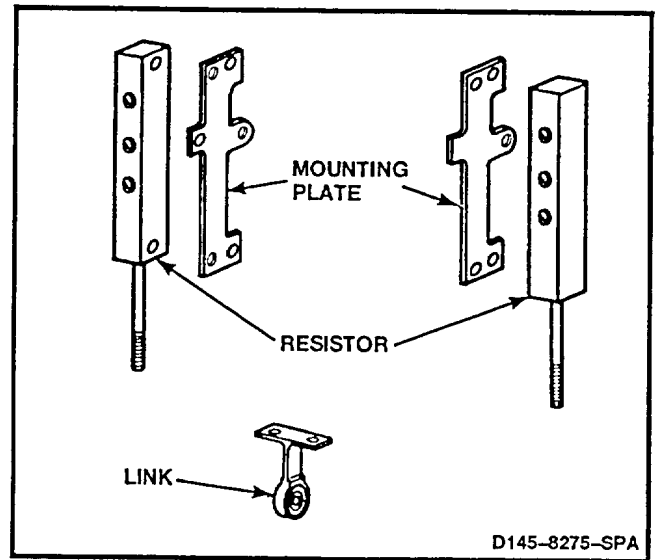
None

Personnel Required:

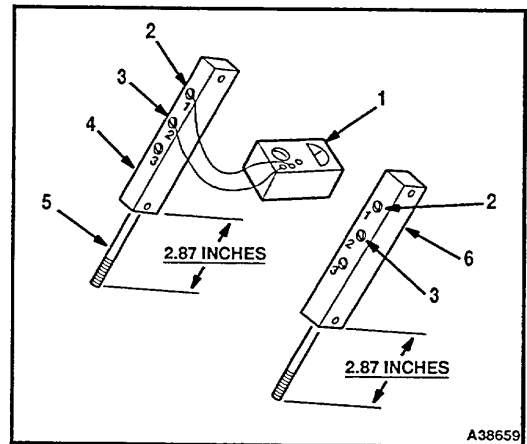
Aircraft Electrician
Inspector

References:

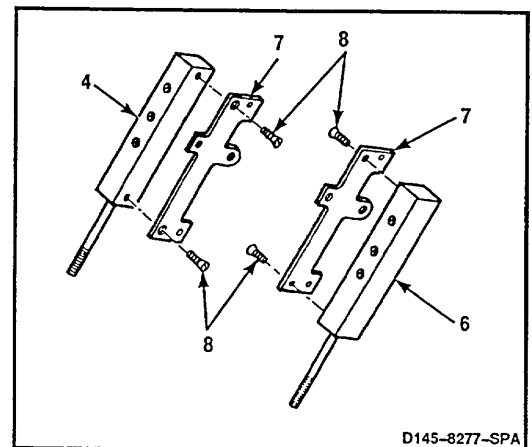
TM 55-1520-240-23P



1. Connect multimeter (1) to terminals 1 (2) and 2 (3) on resistor (4). Set multimeter to RX1. Extend shaft (5) to 2.87 inches. Multimeter shall indicate 58 to 62 ohms.
2. Repeat step 1 on resistor (6).

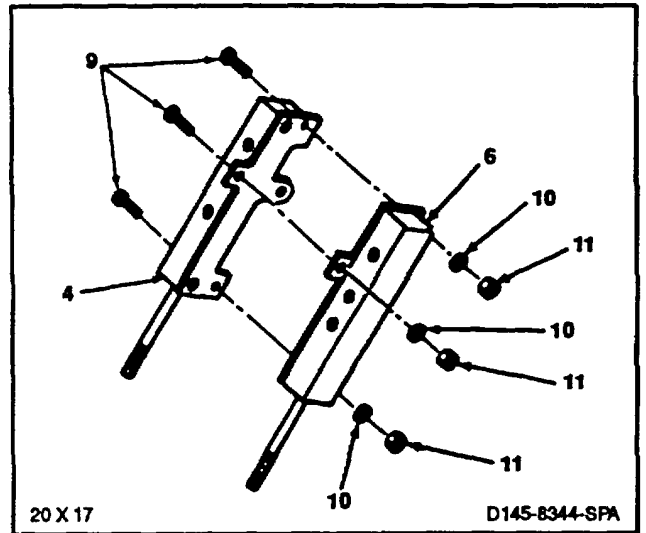


3. Position two resistors (4 and 6) on two plates (7). Secure two resistors to two plates with four screws (8).



4-121 ASSEMBLE ENGINE DROOP ELIMINATOR VARIABLE RESISTORS
(Continued)

4. Position two resistors (4 and 6) together. Install three screws (9), washers (10), and nut (11).



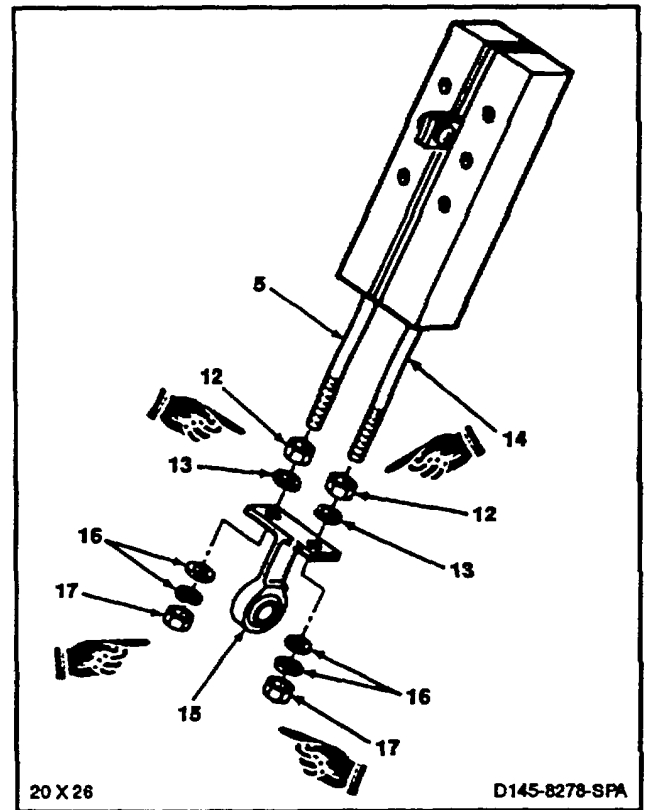
5. Install two nuts (12) and two washers (13) on resistor shafts (5 and 14).
6. Position link (15) on shafts (5 and 14). Install four washers (16) and two nuts (17) on resistor shafts (5 and 14).

NOTE

Do not tighten nuts at this time.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-122 INSTALL AND RIG ENGINE DROOP ELIMINATOR VARIABLE RESISTORS

4-122

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:

Twine (E433)

Parts:

Cotter Pins

Personnel Required:

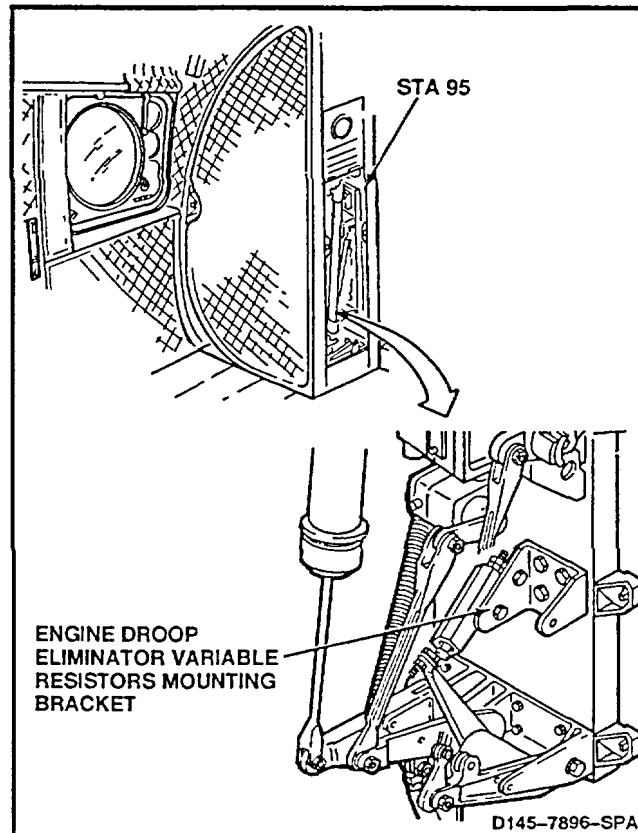
Aircraft Electrician
Inspector

References:

TM 55-1520-240-23P
Task 4-119

Equipment Condition:

Flight Controls Rigged in Neutral Position (Task
11-33)

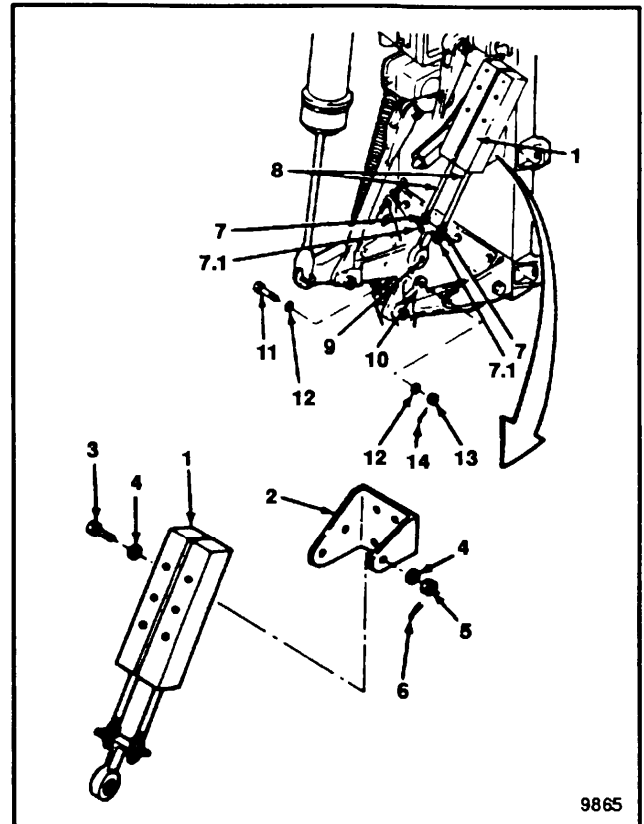


4-122 INSTALL AND RIG ENGINE DROOP ELIMINATOR VARIABLE RESISTORS (Continued)

4-122

INSTALL VARIABLE RESISTORS

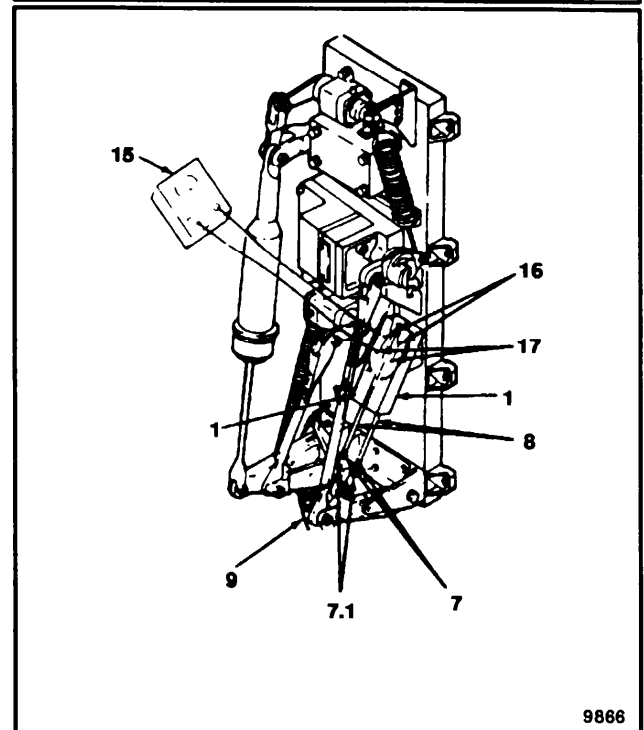
1. Position resistors (1) on bracket (2). Install bolt (3), two washers (4), and nut (5). Install cotter pin (6).
2. Loosen four nuts (7 and 7.1) on resistor shafts (8).
3. Align hole in link (9) with lug of idler (10). Install bolt (11), two washers (12), nut (13), and cotter pin (14).



9865

RIG VARIABLE RESISTORS

4. Set multimeter (15) to RX1. Connect multimeter to terminals 1 (16) and 2 (17) on resistors (1). Move resistor shafts (8) until multimeter indicates 30 to 35 ohms. Tighten four nuts (7 and 7.1) Make sure link (9) is parallel with resistor shafts.
5. Check multimeter (15). If multimeter indicates 30 to 35 ohms, go to step 9. If not, go to step 6.



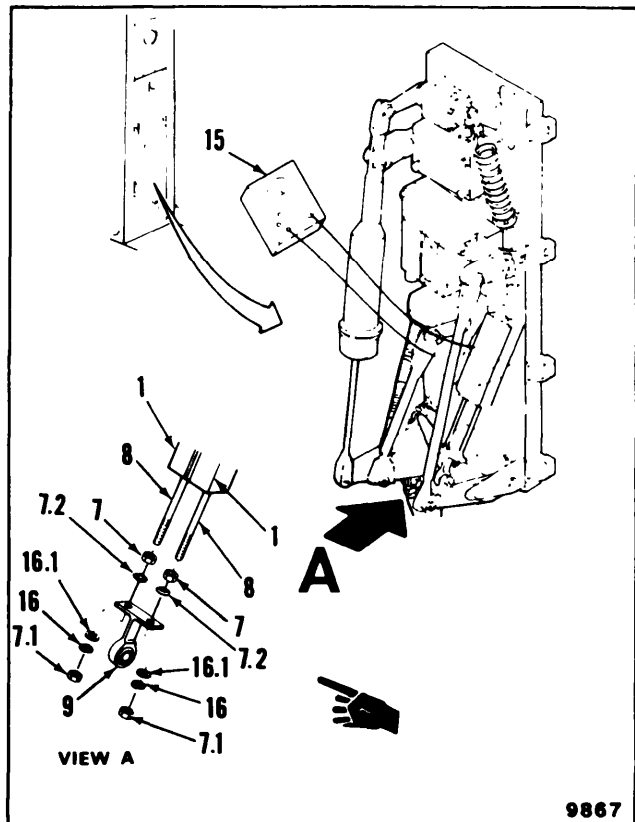
9866

GO TO NEXT PAGE

6. Remove two nuts (7.1) and two washers (16).
7. Adjust shaft (8) until multimeter (15) reads 30 to 35 ohms.
8. Install two washers (16), two lockwashers (16.1) and two nuts (7.1). Torque nuts to 25 inch-pounds. Check nuts for thread protrusion. If all threads on nut are not engaged, replace engine droop eliminator variable resistors (1) (Task 4-119 and 4-122).
9. Tighten two nuts (7) against link (9). Torque nuts to 25 inch-pounds. Make sure link (9) is parallel to resistor shafts (8).

NOTE

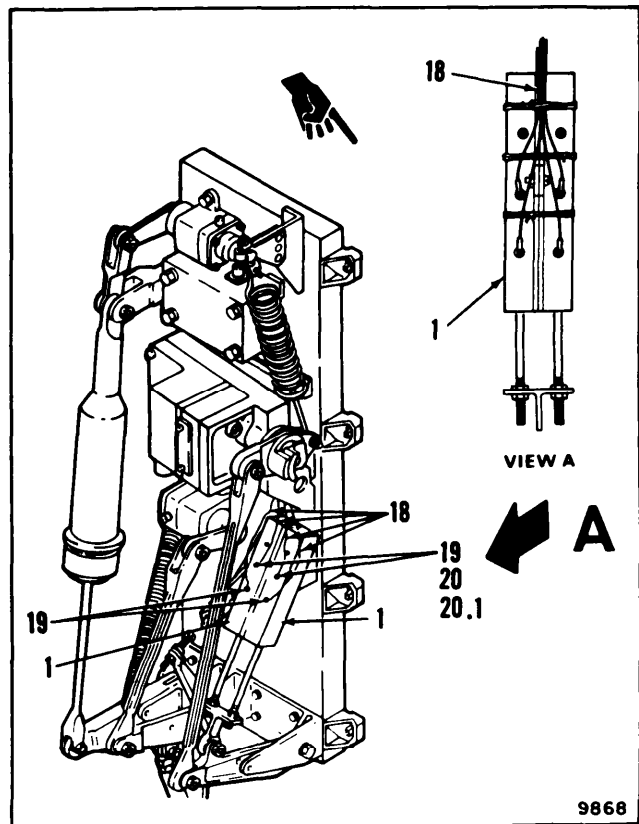
Use the following hardware to connect wiring to resistors: screws MS35275-202, washers AN960C3L, and lockwashers MS35340-39 or equivalent.



10. Remove tape from ends of eight wires (18). Connect eight wires to resistors (1) by installing eight screws (19), eight lock washers (20), and eight washers (20.1). Remove tags from wires.
11. Secure wires (18) to resistors (1). Use twine (E433).

FOLLOW-ON MAINTENANCE:

- Adjust engine droop eliminator variable resistors (4-118).
- Install controls closet panel (2-2).
- Install controls closet acoustic blanket (2-108).



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

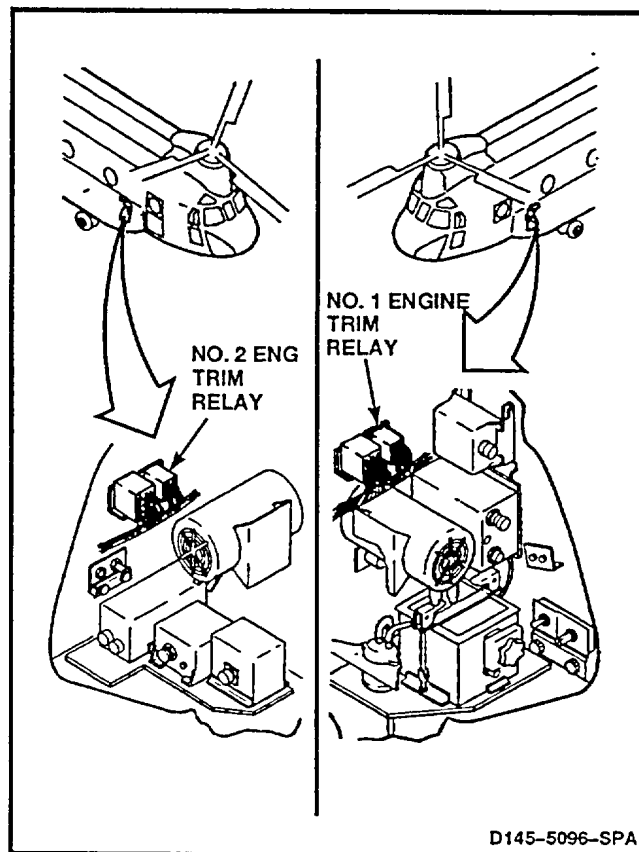
Paper Tags (E264)
Tape (E385)

Personnel Required:

Aircraft Electrician Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Left or Right Electrical Compartment Access Door
Open (Task 2-2)

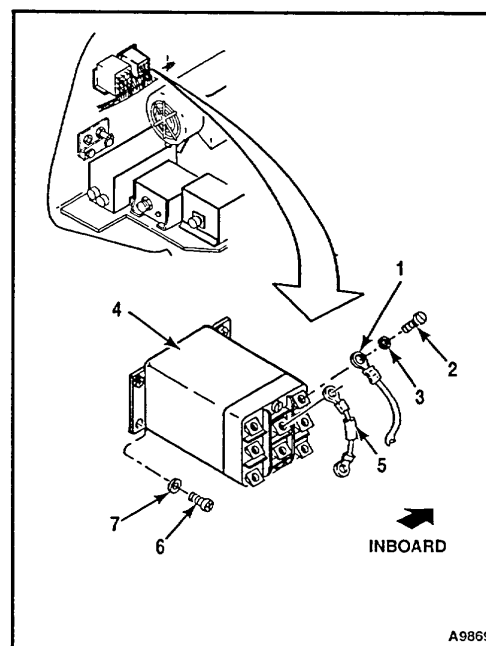


D145-5096-SPA

NOTE

Procedure is similar to remove No. 1 or No. 2 engine trim relay. Removal of No. 2 (right) relay is shown here.

1. Tag eight wires (1). Remove eight screws (2) and washers (3) from relay (4). **Disconnect eight wires** and one diode (5). Tape exposed ends of wires. Use tape (E385).
2. Remove four screws (6) and washers (7).
3. Remove relay (4).



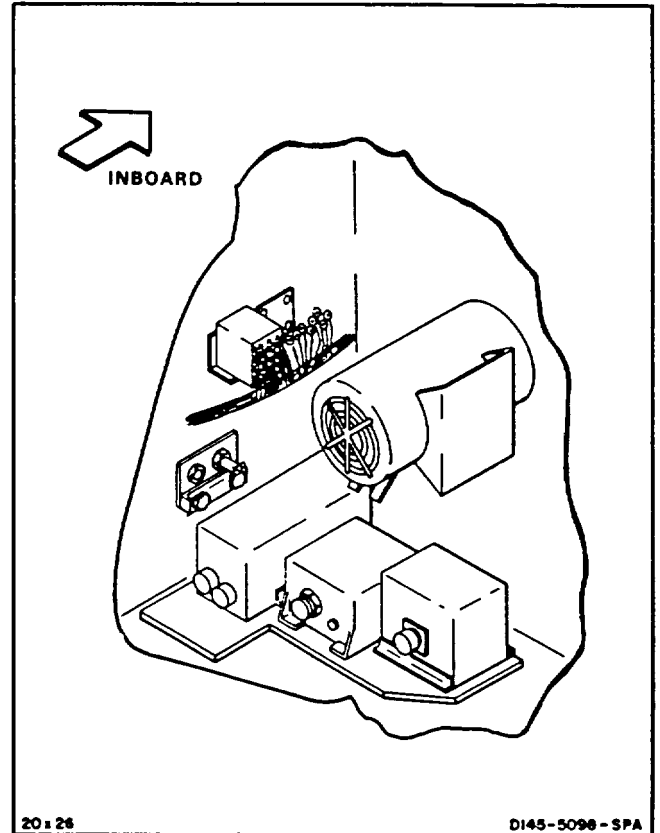
A9869

GO TO NEXT PAGE

**4-123 REMOVE ENGINE TRIM RELAY
(Continued)**

4-123

FOLLOW-ON MAINTENANCE:
None



END OF TASK
4-292

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

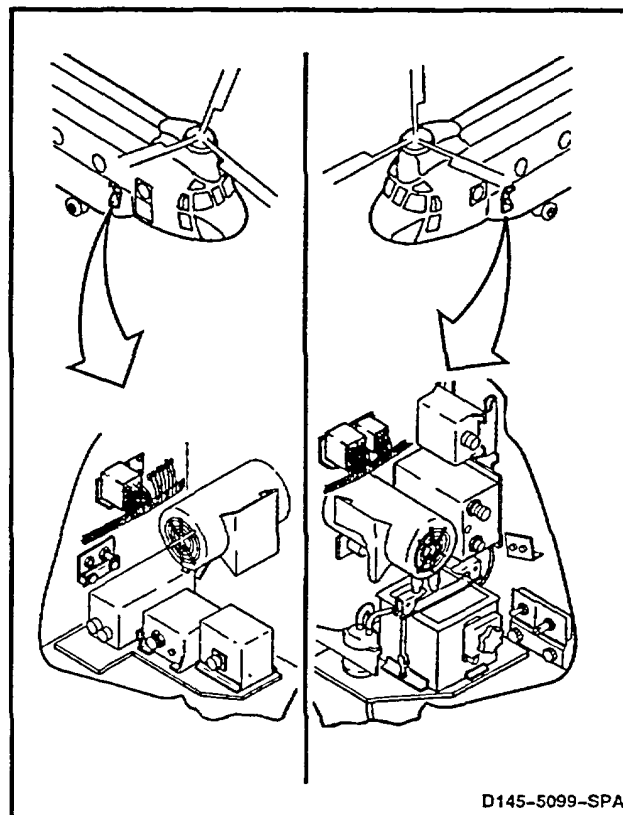
None

Personnel Required:

Aircraft Electrician
Inspector

References:

TM 55-1520-240-23P
TM 55-1520-240-T



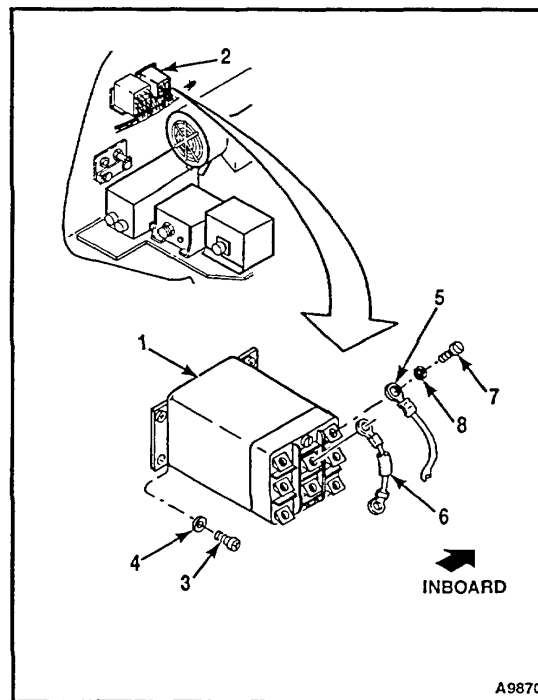
D145-5099-SPA

NOTE

Procedure is same to install No. 1 or No. 2 engine trim relays. Installation of No. 2 (right) relay is shown here.

1. Position relay (1) on fuselage (2). Install four screws (3) and washers (4).
2. Remove tape from eight wires (5). Connect eight wires and one diode (6) to relay (1) by installing eight screws (7) and washers (8) (TM 55-1520-240-T). Remove tags.

INSPECT

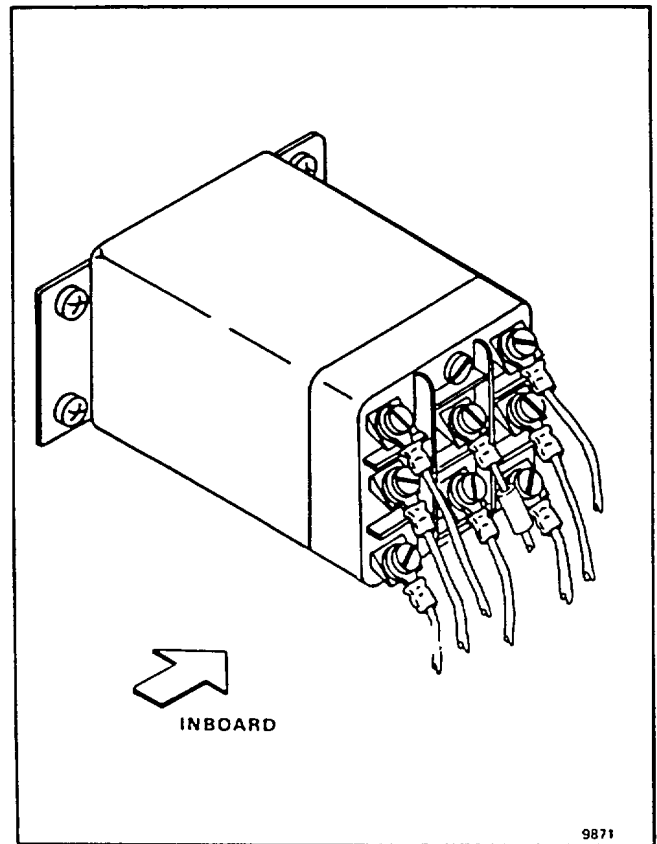


GO TO NEXT PAGE

FOLLOW-ON MAINTENANCE:

Close left or right electrical compartment access door (Task 2-2).

Perform operational check of power turbine system (TM 55-1520-240-T).



END OF TASK
4-294 Change 5

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

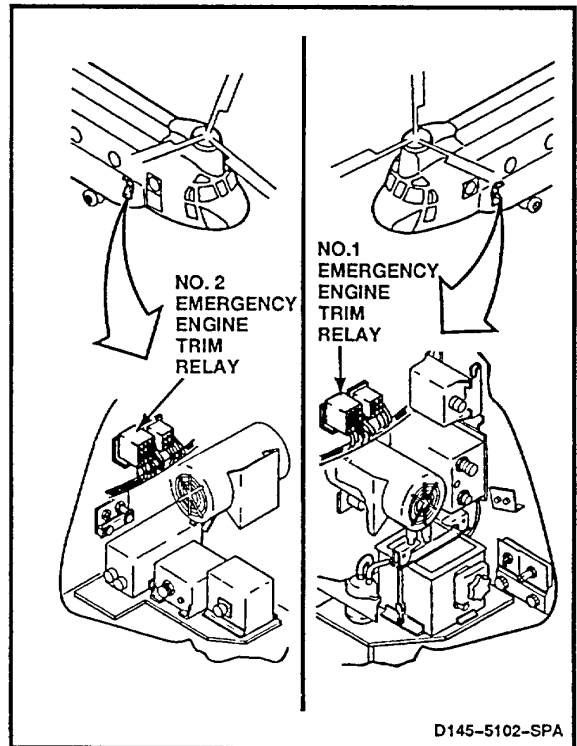
Paper Tags (E264)
Tape (E385)

Personnel Required:

Aircraft Electrician

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Left Or Right Side Electrical Compartment Access
Door Open (Task 2-2)

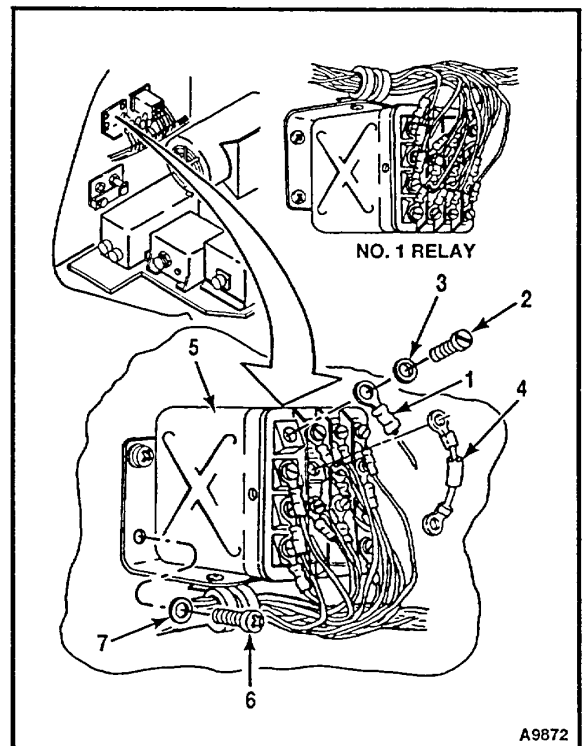


D145-5102-SPA

NOTE

Positioning of No. 1 emergency engine trim relay is **180 degrees** from No. 2 installation. Removal is same for both. Removal of No. 2 (right) relay is shown here.

1. Tag 14 wires (1). Remove 14 screws (2) and washers (3). **Disconnect 14 wires and one diode (4) from relay (5).** Tape exposed ends of wires. Use tape (E385).
2. **Remove four screws (6) and washers (7).**
3. **Remove relay (5).**



A9872

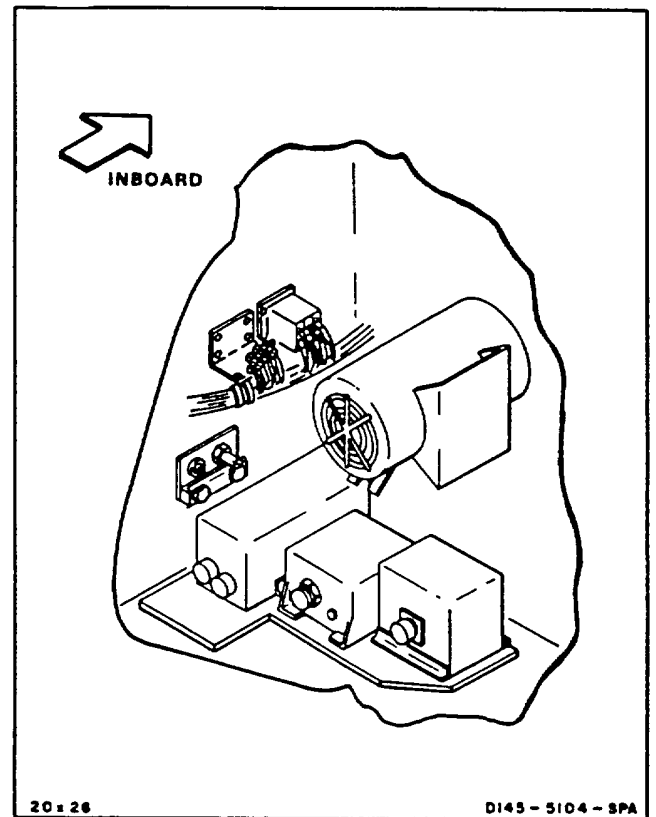
GO TO NEXT PAGE

**4-125 REMOVE EMERGENCY ENGINE TRIM RELAY
(Continued)**

4-125

FOLLOW-ON MAINTENANCE:

None

**END OF TASK
4-296**

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

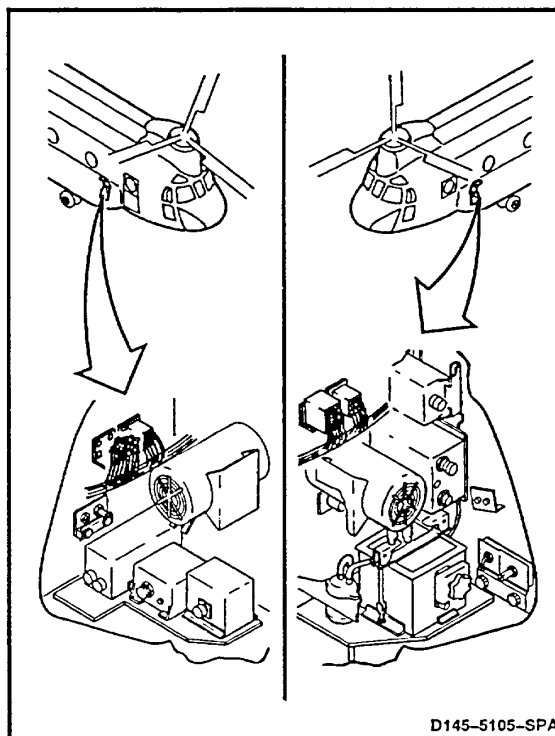
None

Personnel Required:

Aircraft Electrician
Inspector

References:

TM 55-1520-240-23P
TM 55-1520-240-T

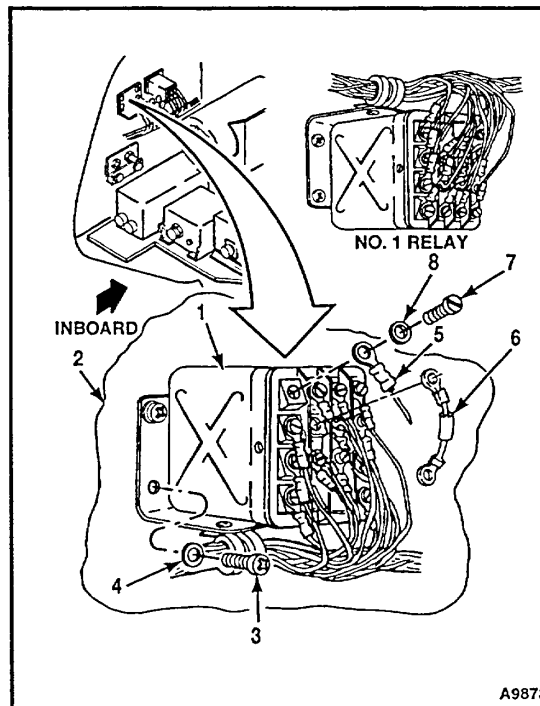


NOTE

Positioning of No. 1 emergency engine trim relay is **180 degrees** from No. 2 installation. Installation procedure is same for both. Installation of No. 2 (right) relay is shown here.

1. Position relay (1) on fuselage (2). Install four screws (3) and washers (4).
2. Remove tape from 14 wires (5). Connect 14 wires and one diode (6) to relay (1) by installing 14 screws (7) and washers (8) (TM 55-1520240-T). Remove tags.

INSPECT

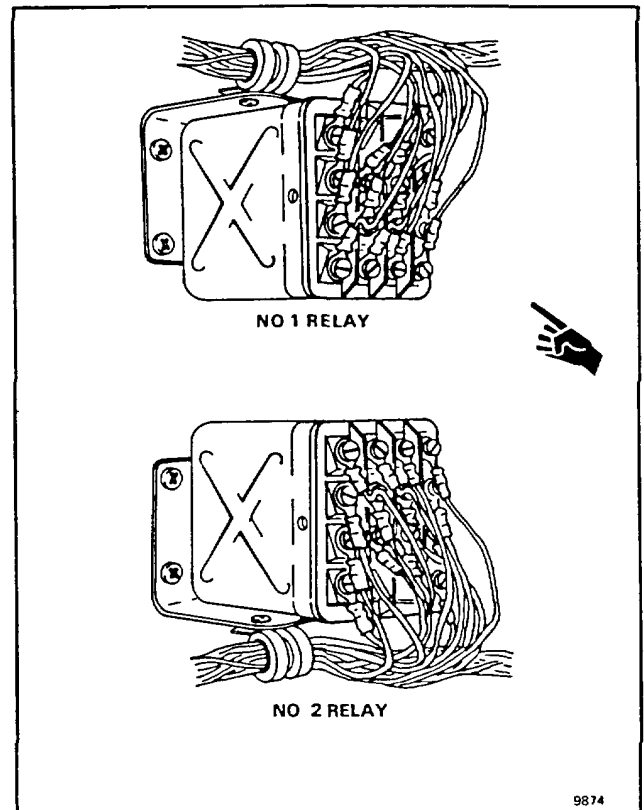


GO TO NEXT PAGE

FOLLOW-ON MAINTENANCE:

Close left or right electrical compartment access door
(Task 2-2).

Perform operational check of power turbine system
(TM 55-1520-240-T).



INITIAL SETUP

Applicable Configurations:

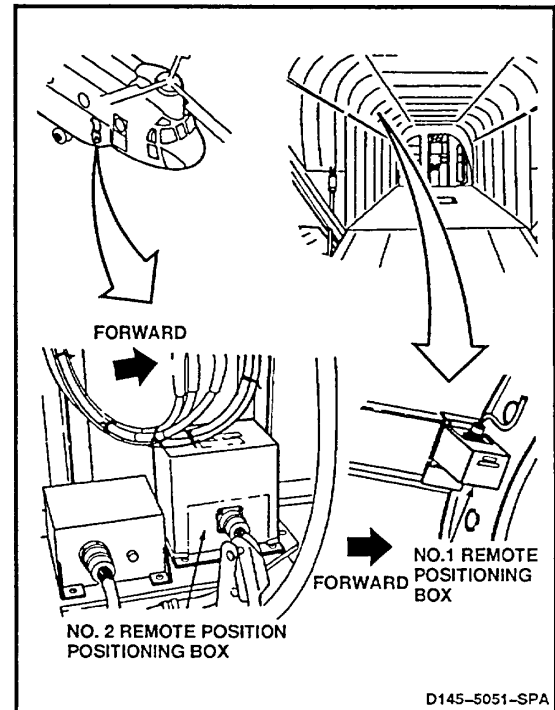
Without 74

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

None

Personnel Required:

Medium Helicopter Repairer

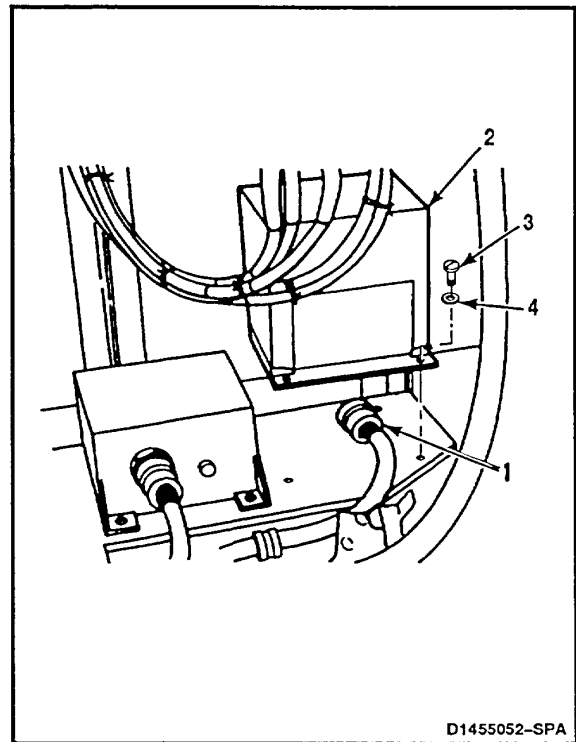
Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Right Electrical Compartment Access Door Open
(Task 2-2), Or No. 1 Remote Positioning Box
Access Cover Removed (Task 2-2)**NOTE**

- Procedure is same to remove No. 1 or No. 2 remote positioning control box. Removal of No. 2 box is shown here.
- Two types of boxes are used (SYLZ7561-3 and SYLZ7561-4). Procedure is same for both.

1. Disconnect electrical connector (1) from box (2).
2. Remove four screws (3) and washers (4).
3. Remove box (2).

FOLLOW-ON MAINTENANCE:

None

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

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

Materials:

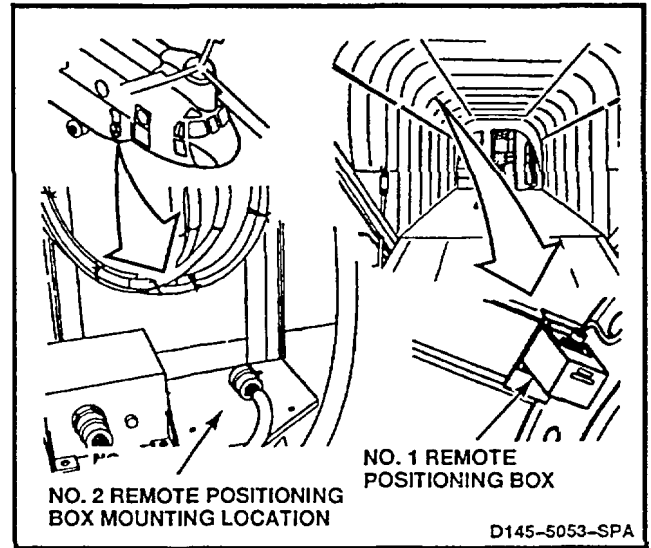
None

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

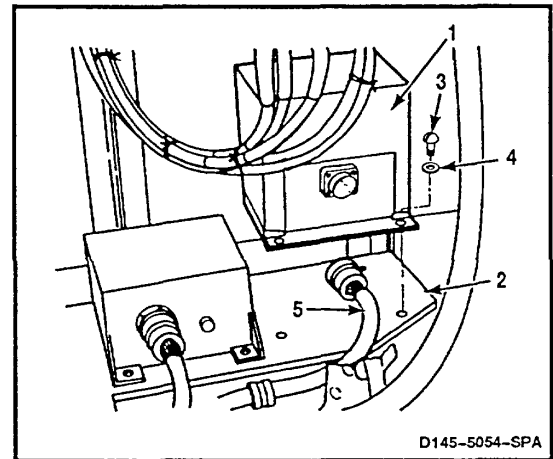
TM 55-1520-240-23P



NOTE

- Procedure is same to install No. 1 or No. 2 remote positioning control. No. 2 box is shown here.
- Two types of boxes are used (SYLZ7561-3 and SYLZ7561-4). Procedure is same for both.

1. Position box (1) on shelf (2).
2. Install four screws (3) and washers (4).
3. Connect electrical connector (5).

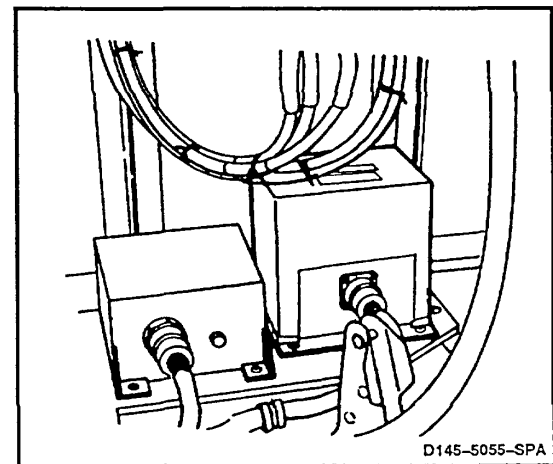


INSPECT

FOLLOW-ON MAINTENANCE:

Install No. 1 remote positioning control box access cover (Task 2-2) or close right electrical compartment access door (Task 2-2).

Perform operational check of power turbine system (TM 55-1520-240-T).



END OF TASK

4-300 Change 19

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Stop Watch

Materials:

None

Personnel Required:Aircraft Powerplant Repairer
Army Rotary-Wing Aviator (2)**References:**

TM 55-1520-240-MTF

TM 55-2840-254-23

Equipment Condition:

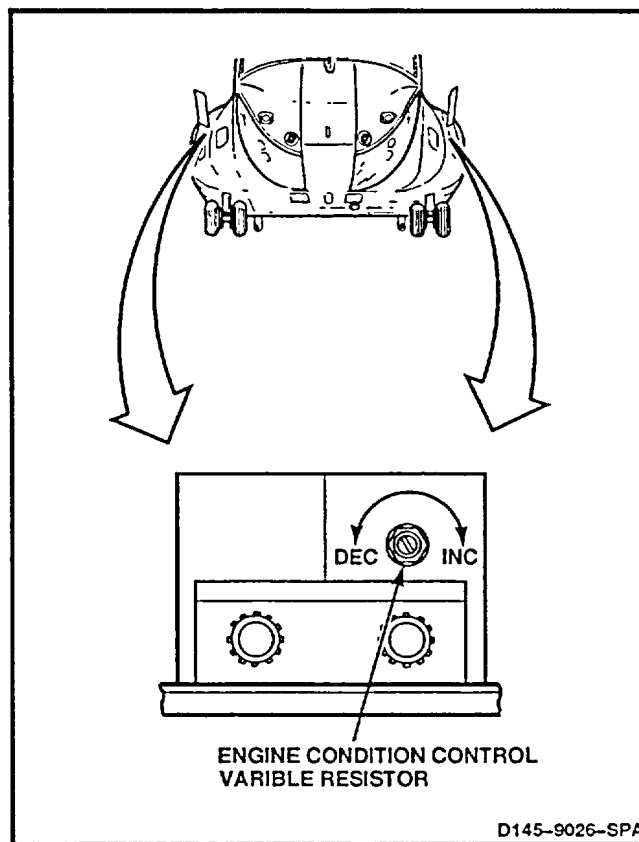
Battery Connected (Task 1-39)

Adjust Fuel Control (TM 55-2840-254-23)

Adjust Engine Droop Eliminator Variable Resistors
(Task 4-118)

Rig Power Turbine Control Linkage (Task 4-140)

Electrical Power On

Right and Left Electrical Compartment Open
(Task 2-2)

GO TO NEXT PAGE

Change 19 4-301

NOTE

See TM 55-1520-240-10 for operational procedures performed by pilot.

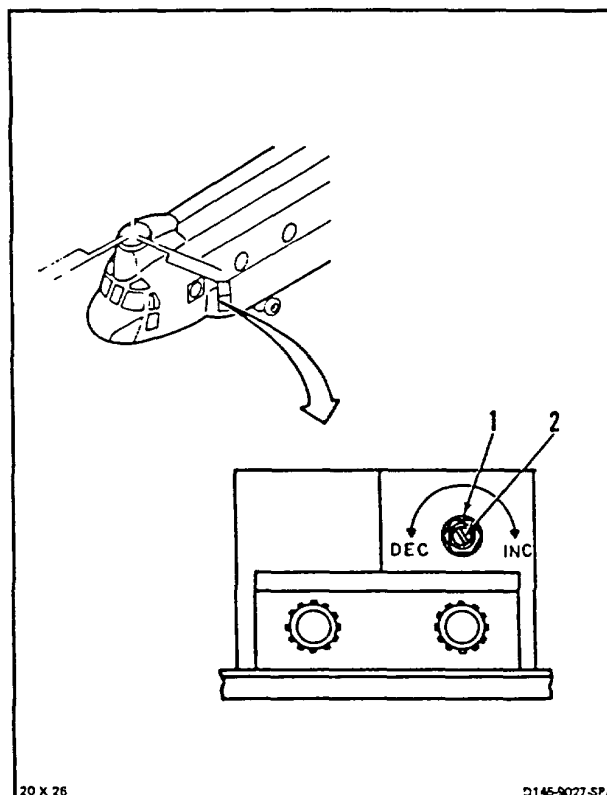
1. Have pilot set thrust control to ground detent.
2. Have pilot set NO. 1 & NO. 2 ENGINE BEEP trim switch to RPM DECREASE for 8 seconds.
3. Have pilot operate No. 1 engine in FLIGHT.
4. if minimum rotor rpm is 91 to 94 percent go to step 6. If not, go to step 5.

CAUTION

Do not force resistor at either limit of its range. Internal damage to resistor can result.

NOTE

- Variable resistor for No. 1 engine is in left electrical compartment. Variable resistor for No. 2 engine is in right electrical compartment.
 - Turning shaft clockwise will increase rotor rpm. Counterclockwise adjustment will decrease rotor rpm.
5. Loosen nut (1) on variable resistor shaft (2). Adjust resistor shaft slowly until rotor rpm is 92.5 percent. Tighten nut. Make sure rotor rpm is 92.5 percent.
 6. Have pilot shut down No. 1 engine.

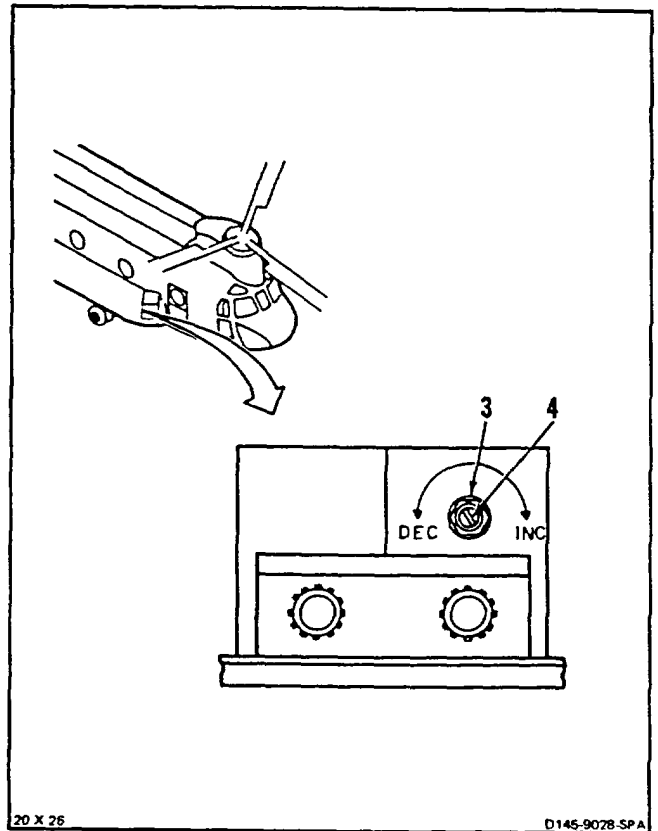


7. Have pilot operate No. 2 engine in FLIGHT.
8. If rotor rpm is 91 to 94 percent, go to step 10. If not, go to step 9.
9. Loosen nut (3) on variable resistor shaft (4). Adjust resistor shaft slowly until rotor rpm is 92.5 percent. Tighten nut. Make sure rotor rpm is 92.5 percent.
10. Have pilot shut down No. 2 engine.

FOLLOW-ON MAINTENANCE:

Electrical power off.

Close right and left electrical compartment (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Soldering Iron

Materials:

Paper Tags (E264)

Tape (E385)

Personnel Required:

Aircraft Electrician

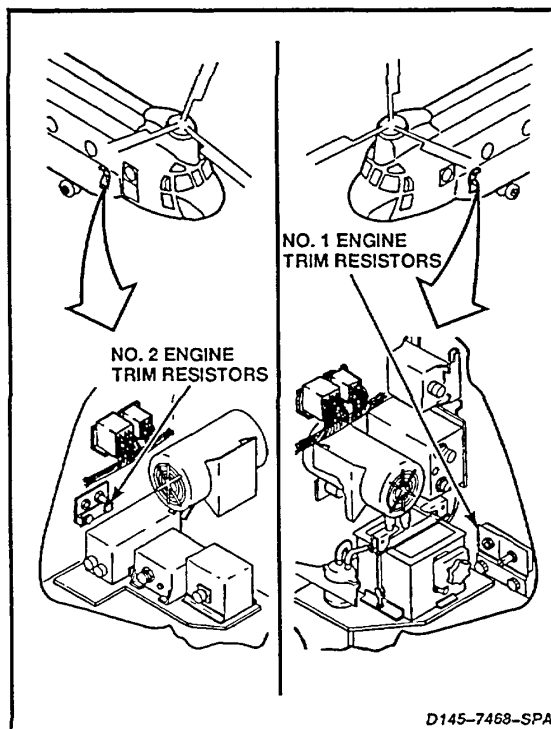
Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Left or Right Electrical Compartment Access Door

Open (Task 2-2)



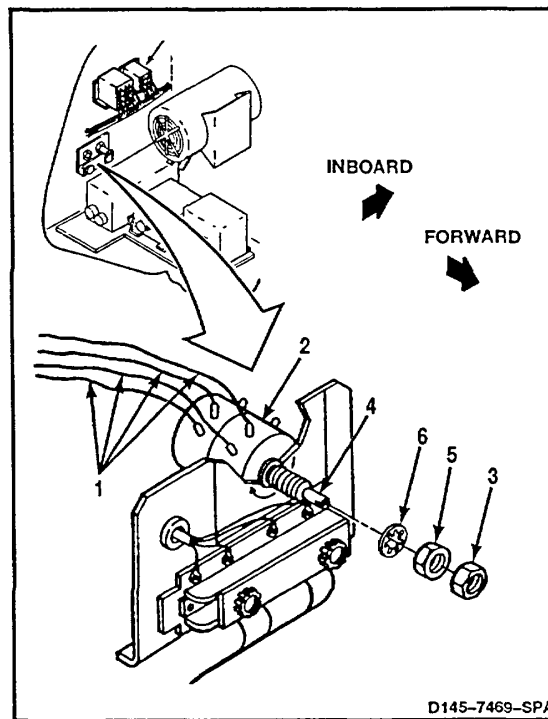
D145-7468-SPA

NOTE

Procedure is same to remove No. 1 or No. 2 engine trim resistors. Removal of No. 2 (right) resistors is shown here.

REMOVE ADJUSTABLE RESISTOR

1. Tag and **unsolder four wires (1) from resistor (2)**. Tape exposed ends of wires. Use tape (E385).
2. Remove locknut (3) from shaft (4).
3. Remove nut (5) and washer (6) from shaft (4).

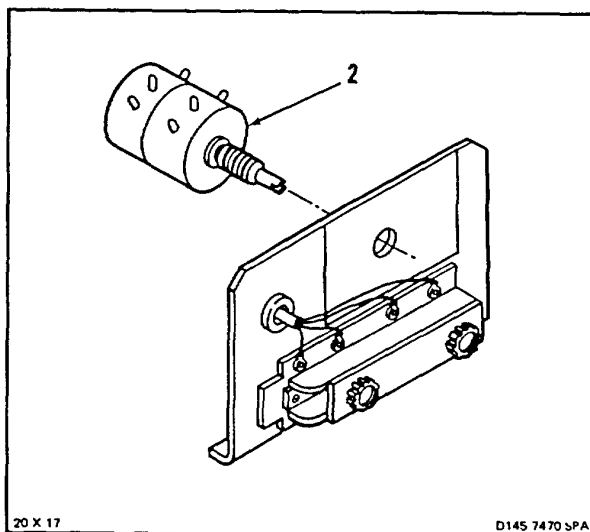


D145-7469-SPA

GO TO NEXT PAGE

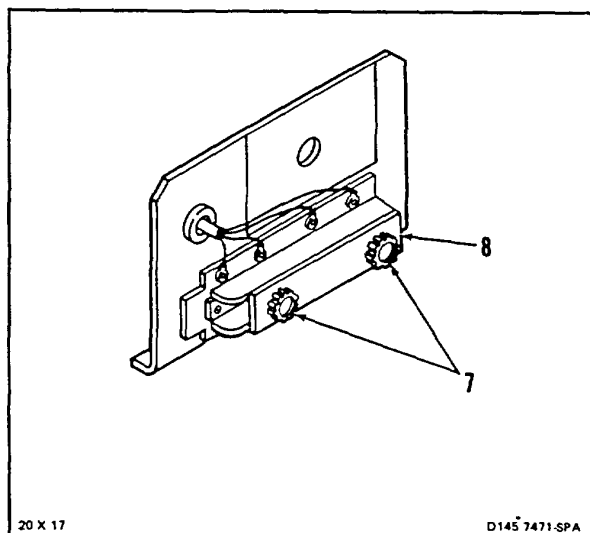
4-304 Change 19

4. Remove resistor (2).



REMOVE FIXED RESISTOR

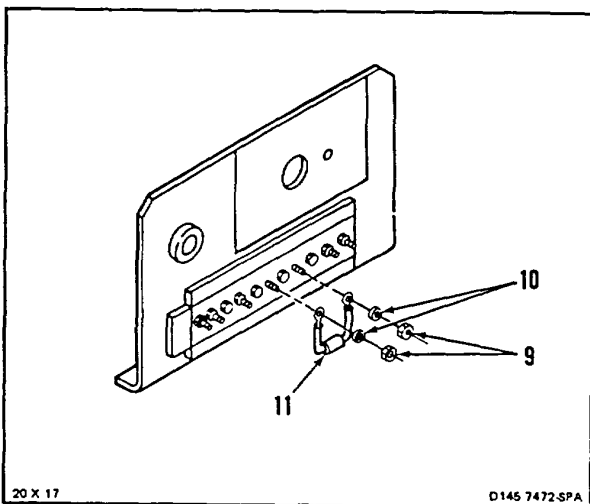
5. Loosen two screws (7). Remove cover (8).



6. Remove two nuts (9) and washers (10). Disconnect and remove resistor (11).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Multimeter

Materials:

Solder (E360)

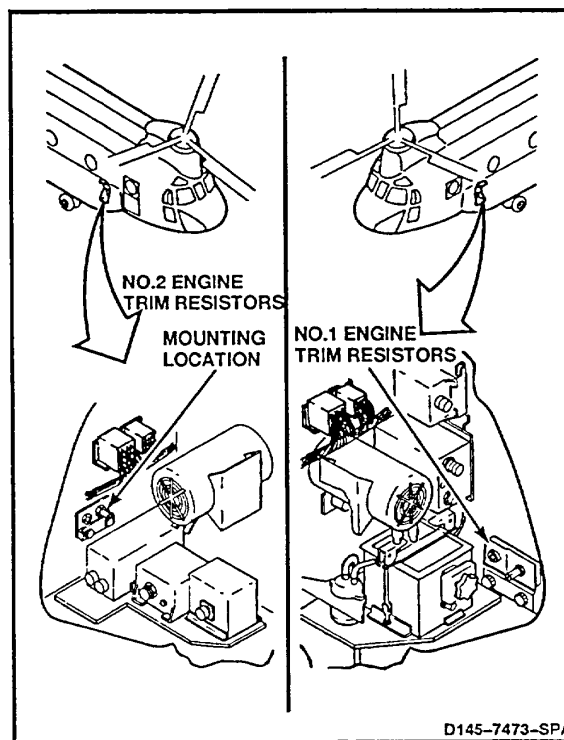
Personnel Required:

Aircraft Electrician

Inspector

References:

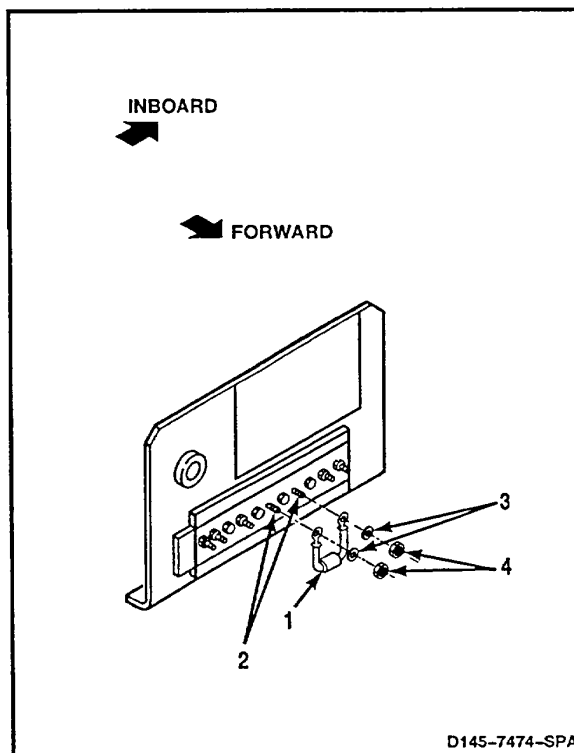
TM 55-1520-240-23P

**NOTE**

Procedure is same to install No. 1 or No. 2 engine trim resistors. Installation of No. 2 (right) resistors is shown here.

INSTALL FIXED RESISTOR

1. Connect resistor (1) to two terminals (2).
2. Install two washers (3) and nuts (4).

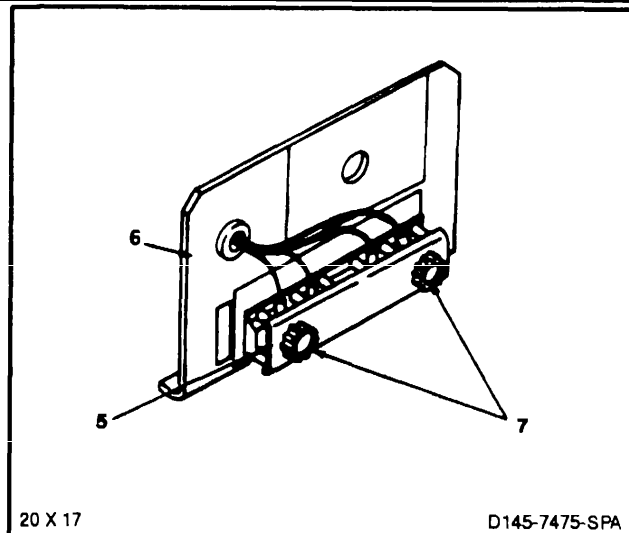


4-131 INSTALL ENGINE TRIM RESISTORS (Continued)

4-131

3. Position cover (5) on bracket (6). Tighten two screws (7).

INSPECT

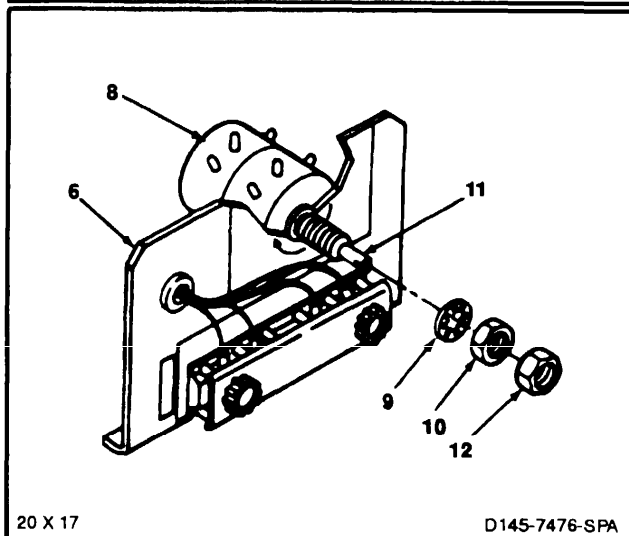


INSTALL ADJUSTABLE RESISTOR

4. Position resistor (8) through hole in bracket (6). Install washer (9) and nut (10) on shaft (11). Install locknut (12) on shaft.

NOTE

Do not tighten locknut at this time.



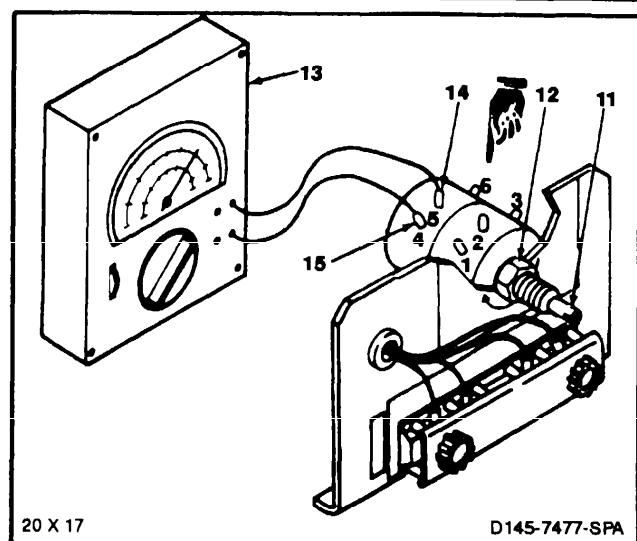
5. Set multimeter (13) to R x 1. Connect multimeter between terminals (5) and (6).

CAUTION

Do not force resistor at either limit of its range. Internal damage to resistor can result.

6. Adjust resistor shaft (11) until multimeter (13) indicates 60 ohms.
7. Tighten shaft locknut (12).
8. Check multimeter (13). Resistance shall read 60 ohms.
9. Disconnect multimeter (13).

GO TO NEXT PAGE



4-131 INSTALL ENGINE TRIM RESISTORS (Continued)

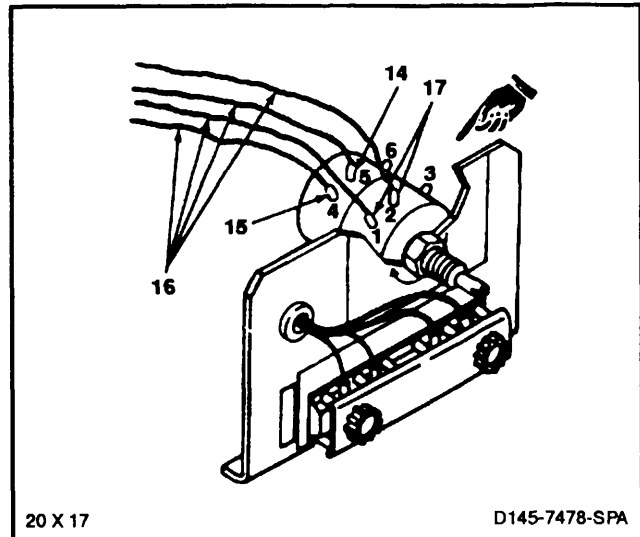
4-131

10. Remove tape from ends of four wires (16). **Solder four wires to four terminals (2, 3, 5, and 6).** Use solder (E360). Remove tags from wire.

INSPECT

FOLLOW-ON MAINTENANCE:

- Adjust minimum rotor rpm (Task 4-129).
- Perform operational check of power turbine control system (TM 55-1520-240-T).
- Close left or right electrical compartment access door (Task 2-2).

**END OF TASK**

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Measuring Tape

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer

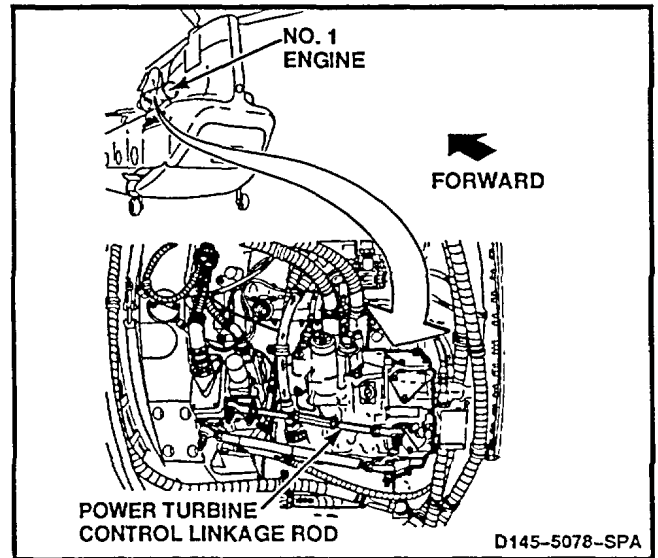
Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Work Platform Open (Task 2-2)

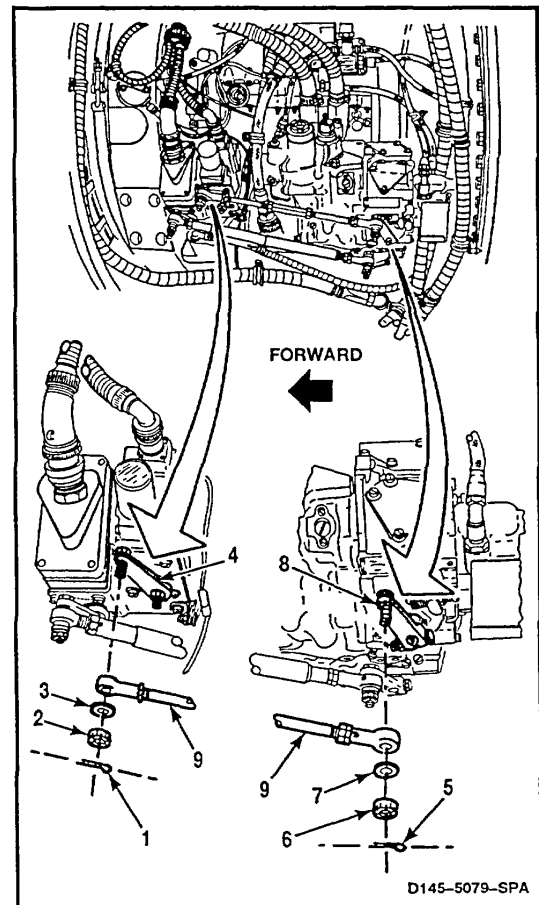
Engine Access Cover Open (Task 4-49)



NOTE

Procedure is same to remove power turbine control linkage rod from No. 1 or No. 2 engine. Removal of No. 1 rod is shown here.

1. Remove cotter pin (1), nut (2) and washer (3) from lever (4).
2. Remove cotter pin (5), nut (6) and washer (7) from lever (8).
3. Remove rod (9).

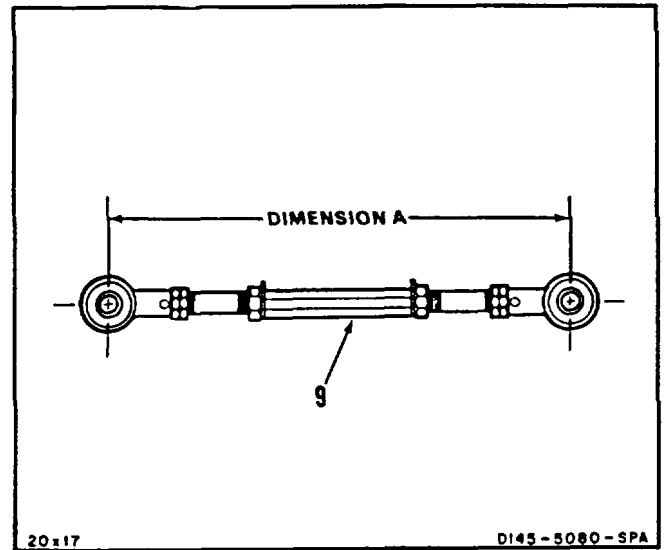


GO TO NEXT PAGE

**4-132 REMOVE POWER TURBINE CONTROL LINKAGE ROD
(Continued)**

4-132

4. Measure and record dimension A on rod (9).



FOLLOW-ON MAINTENANCE:

None

END OF TASK
4-310

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Dial Indicator

Dial Indicating Scale, 0 to 50 Pounds

Vise

Materials:

None

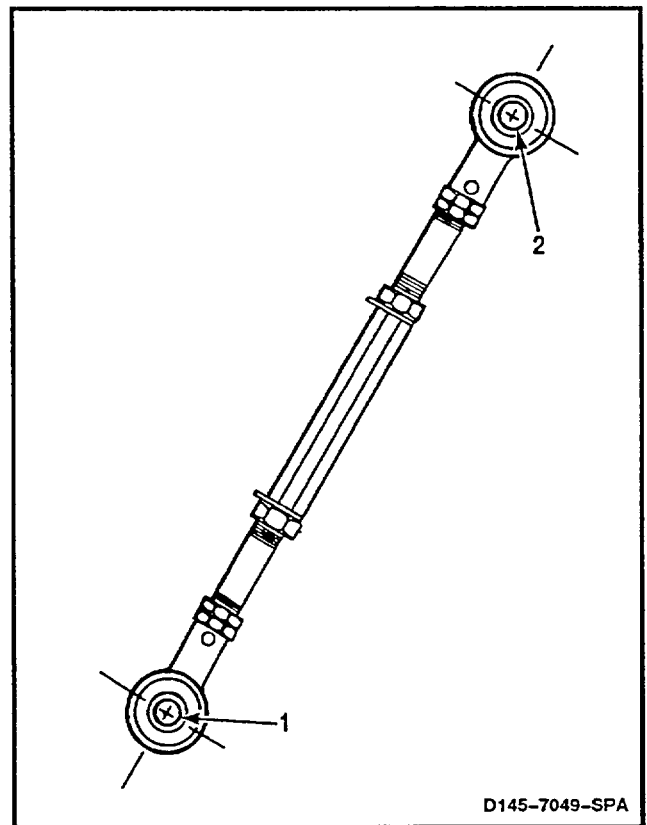
Personnel Required:

Inspector

Equipment Condition:

Off Helicopter Task

1. **Apply 5 to 15 pound load to bearing (1) in radial direction.**
2. **Apply 5 to 15 pound load to bearing (1) in opposite direction.**
3. **Measure radial play of bearing (1).** Radial play shall not be more than 0.005 inch.
4. **Repeat steps 1 thru 3 three times.** Rotate bearing (1) to a different position each time.
5. **Repeat steps 1 thru 4 on bearing (2).**
6. **Apply 5 to 15 pound load to bearing (1) in an axial direction.**
7. **Apply 5 to 15 pound load to bearing (1) in opposite direction.**
8. **Measure axial play of bearing (1).** Axial play shall not be more than 0.025 inch.
9. **Repeat steps 6 thru 8 on bearing (2).**



D145-7049-SPA

FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:Airframe Repairer's Tool Kit,
NSN 5180-00-323-4944**Materials:**Antiseize Compound (E75)
Epoxy Primer (E292)
Gloves (E1 84.1)**Parts:**Rod Ends (2)
Rivets**Personnel Required:**

Aircraft Structural Repairer

References:

TM 55-1520-240-23P

Equipment Condition:

Off Helicopter Task

1. Remove lockwire from two nuts (1 and 2).
2. **Loosen nuts (1 and 2).**
3. **Remove rods (3 and 4)** from turnbuckle (5).
4. **Drill out two rivets (6).** Remove bearings (7) from rods (3 and 4).

WARNING

Epoxy primer (E292) 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, and Clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

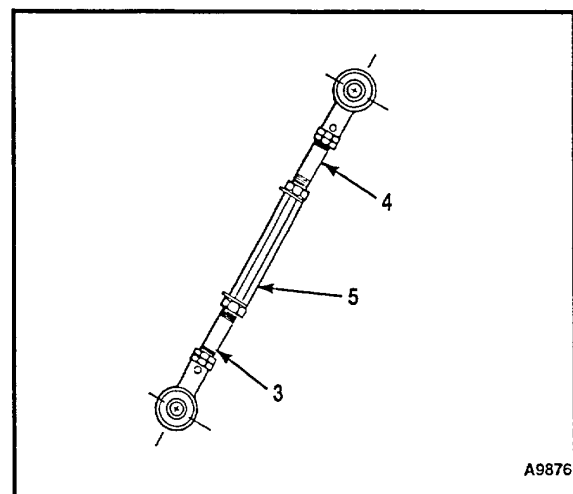
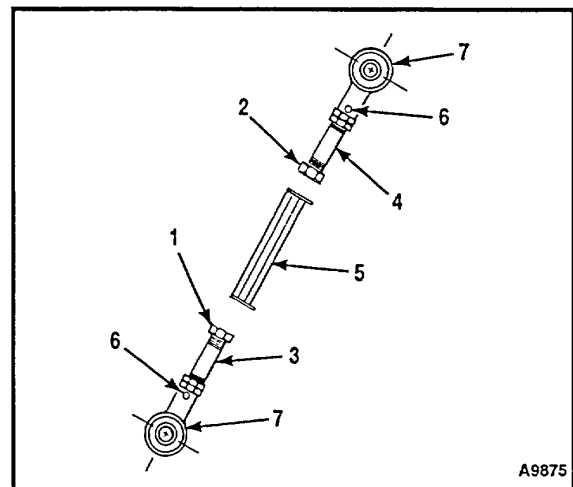
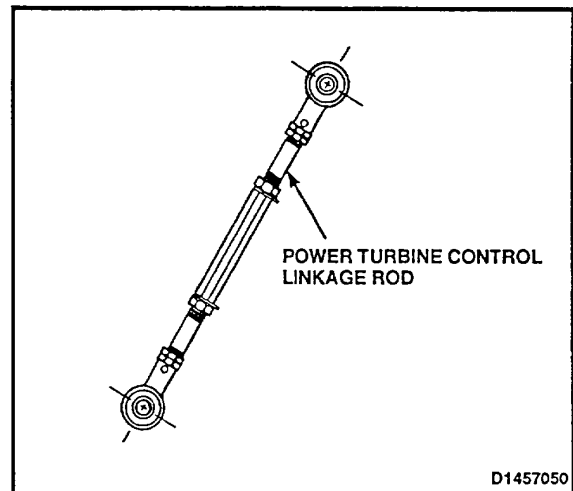
5. **Install new bearings (7)** on rods (3 and 4). **Install rivets wet.** Use epoxy primer (E292). Wear gloves (E184.1).
6. Coat thread of replacement rods (3 and 4) with antiseize compound (E75).
7. **Install rods (3 and 4)** in turnbuckle (5).

FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-312 Change 19



INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
Torque Wrench, 30 to 150 Inch-Pounds
Measuring Tape

Materials:

Lockwire (E229)

Parts:

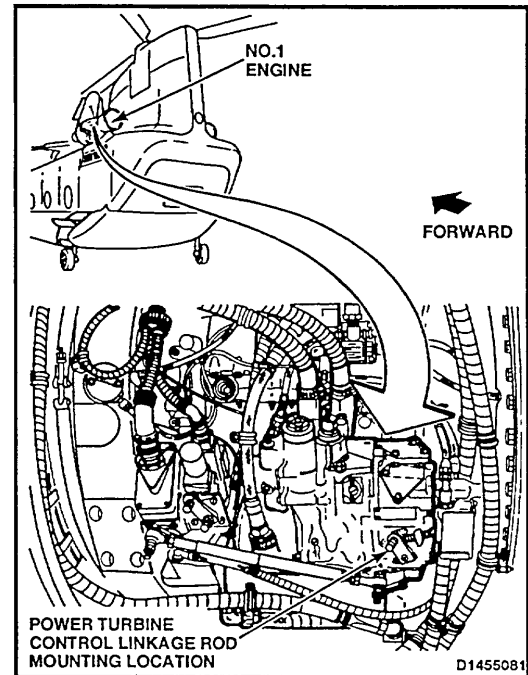
Cotter Pins

Personnel Required:

Aircraft Powerplant Repairer
Inspector

References:

TM 55-1520-240-23P

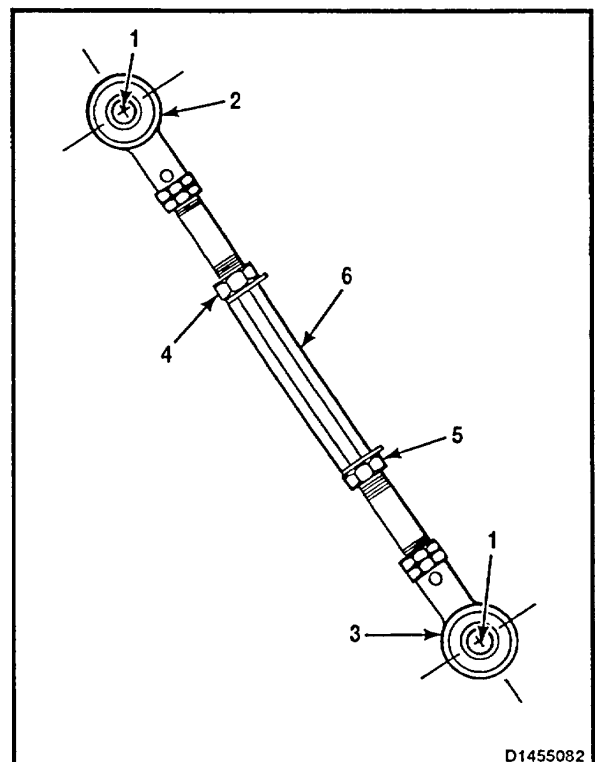
**NOTE**

Procedure is same to install power turbine control linkage rod on No. 1 or No. 2 engine. Installation of No. 1 rod is shown here.

1. Measure distance between centers of holes (1) in rod ends (2 and 3). If length is same as dimension A found in removal, go to step 2. If length is not same, do the following:
 - a. Loosen nuts (4 and 5).
 - b. Rotate turnbuckle (6) until distance between holes (1) in rod ends (2 and 3) is same as dimension A found in removal.
 - c. Make sure rod ends (2 and 3) are aligned.
 - d. Tighten nuts (4 and 5).

NOTE

- Nominal distance between centers of holes in rod ends is 10-17/32 to 10-9/16 inches.
- Do not lockwire nuts at this time.



GO TO NEXT PAGE

Change 19 4-313

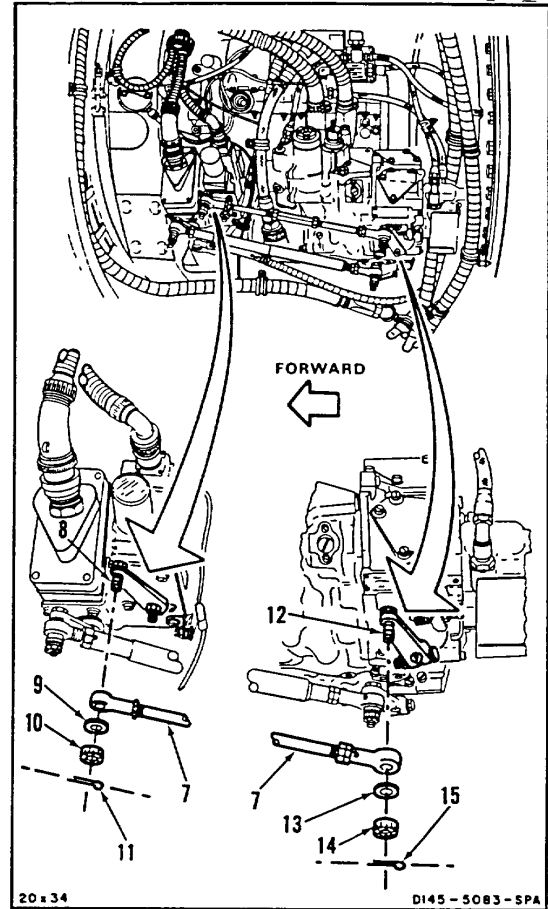
**4-135 INSTALL POWER TURBINE CONTROL LINKAGE
ROD (Continued)**

4-135

2. Position rod (7) on bolt (8). Install washer (9) and nut (10). Torque nut to 30 to 60 inch-pounds. Install cotter pin (11).

INSPECT

3. Position rod (7) on bolt (12). Install washer (13) and nut (14). Torque nut to 30 to 60 inch-pounds. Install cotter pin (15).

INSPECT

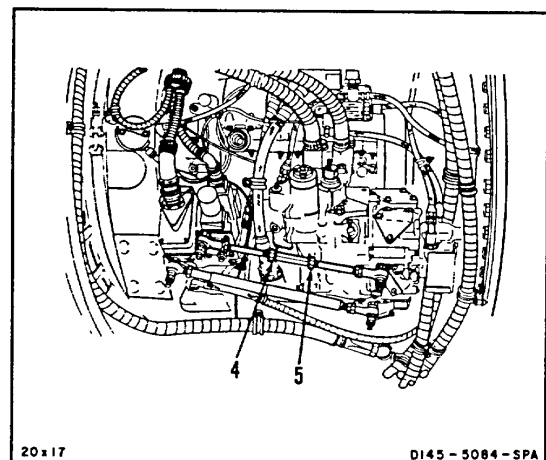
4. Lockwire nuts (4 and 5) Use lockwire (E229)

INSPECT**FOLLOW-ON MAINTENANCE.**

Perform operational check of power turbine system (TM 55-1520-240-T).

Close engine access cover (Task 4-50)

Close engine work platform (Task 2-2).



END OF TASK
4-314

INITIAL SETUP

Applicable Configurations:

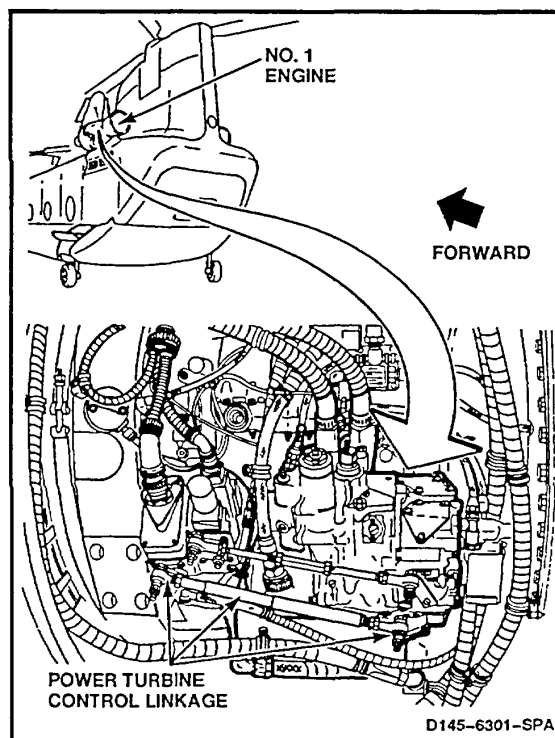
Without 74

Tools:Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944**Materials:**

None

Personnel Required:

Aircraft Powerplant Repairer

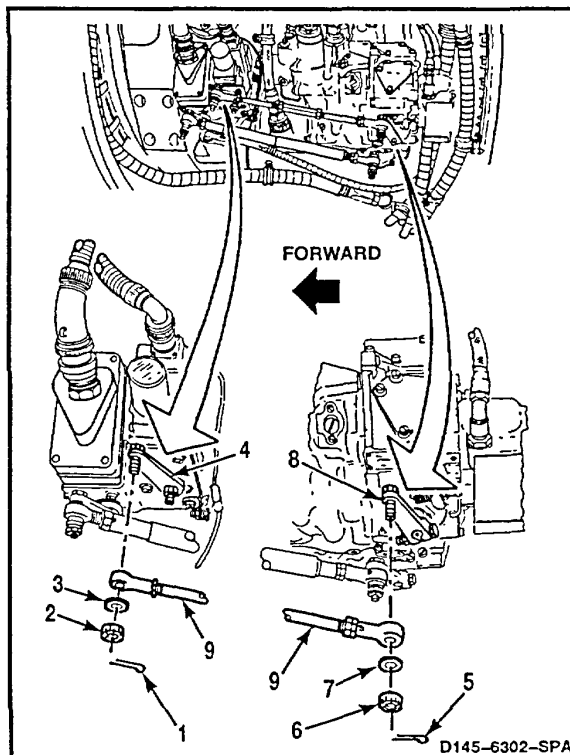
Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-50)

D145-6301-SPA

NOTE

Procedure is same to remove power turbine control linkage from No. 1 or No. 2 engine. Removal of linkage from No. 1 engine is shown here.

1. Remove cotter pin (1), nut (2), and washer (3) from lever (4).
2. Remove cotter pin (5), nut (6), and washer (7) from lever (8).
3. Remove rod (9).



D145-6302-SPA

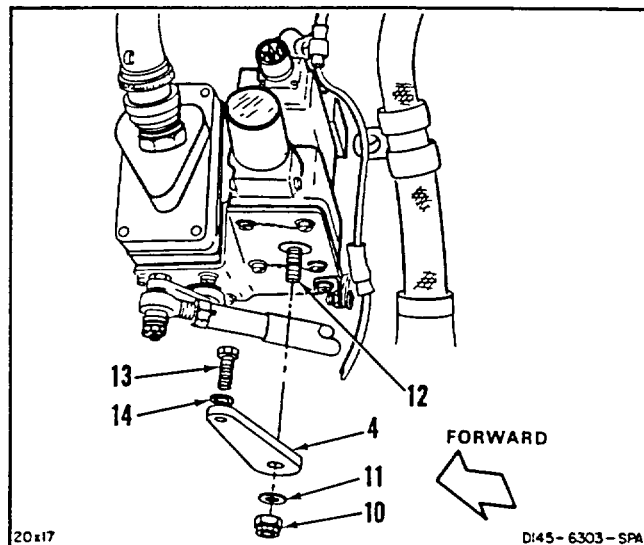
GO TO NEXT PAGE

Change 19 4-315

4-136 REMOVE POWER TURBINE CONTROL LINKAGE (Continued)

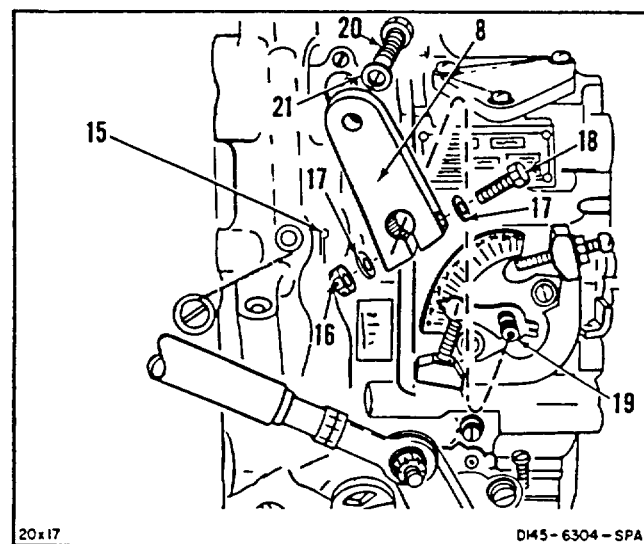
4-136

4. Remove nut (10) and washer (11). Slide **lever (4) from shaft (12)**. Remove bolt (13) and washer (14) from lever.



5. Remove cotter pin (15), nut (16), two washers (17), and bolt (18), from lever (8). **Slide lever from shaft (19)**. Remove bolt (20) and washer (21) from lever.

FOLLOW-ON MAINTENANCE:
None



END OF TASK

4-316

4-137 REPLACE POWER TURBINE RPM LIMITING STOP

4-137

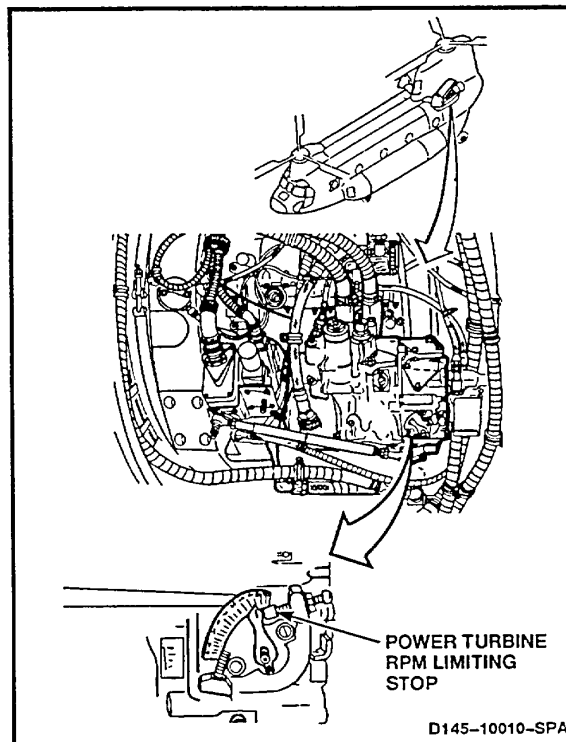
INITIAL SETUP

Applicable Configurations:Without **74****Tools:**Powerplant Repairer's Tool Kit,
NSN 5180-00-3234944**Materials:**

Lockwire (E229)

Personnel Required:Aircraft Powerplant Repairer
Inspector**References:**

TM 55-1520-240-23P

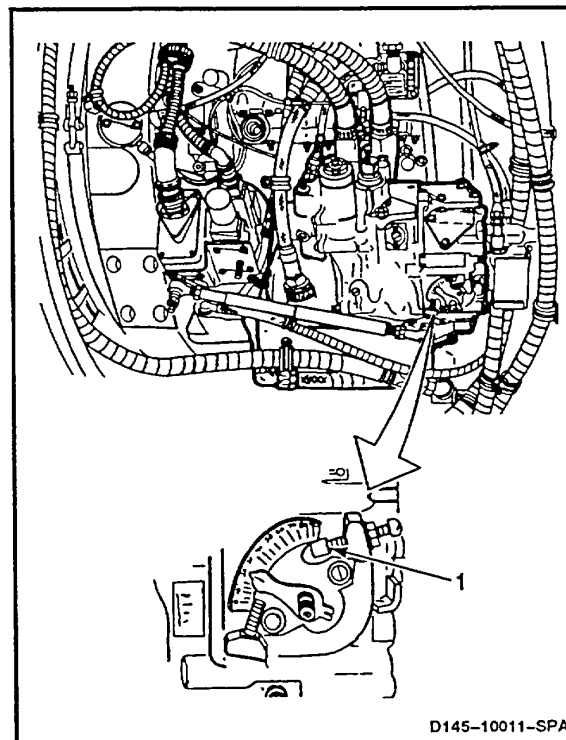
Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)**NOTE**

- Procedure is same to replace power RPM Limiting Stop on No. 1 or No. 2 engine. No. 1 engine is shown.
- Power Turbine control linkage omitted for clarity.

1. Cut lockwire and **remove stop (1)**.
2. **Install new stop (1)** and lockwire. Use lockwire (E229).

INSPECT

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

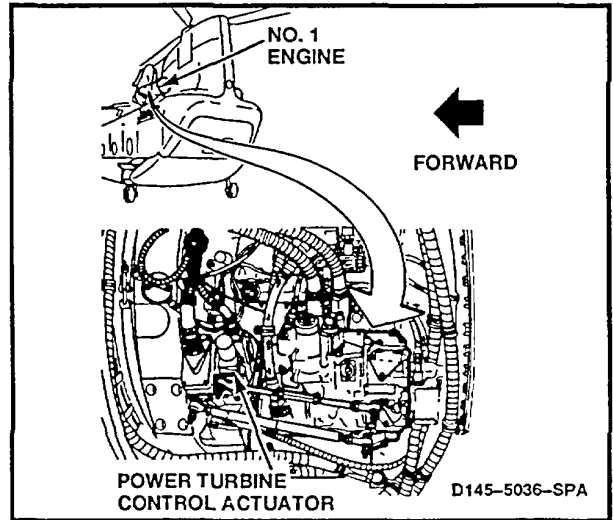
None

Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:

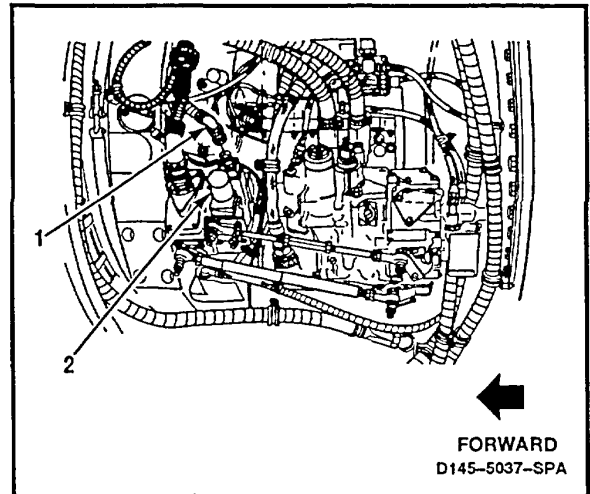
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



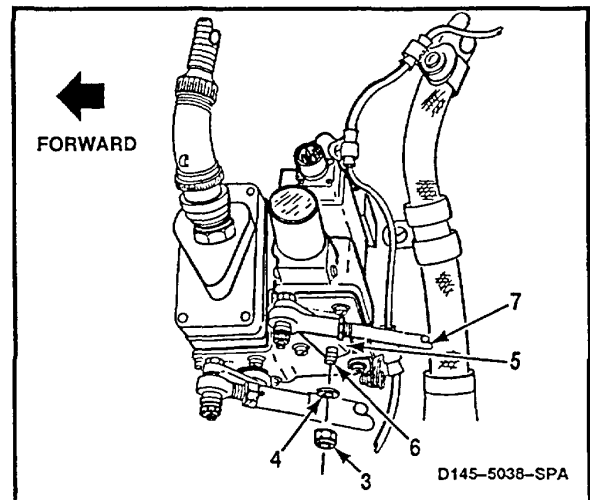
NOTE

Procedure is same to remove power turbine control actuator on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Disconnect cable connector (1) from actuator (2).



2. Remove nut (3) and washer (4). Slide lever (5) from shaft (6). Move rod (7) up and aft.



**4-138 REMOVE POWER TURBINE CONTROL ACTUATOR
(Continued)**

4-138

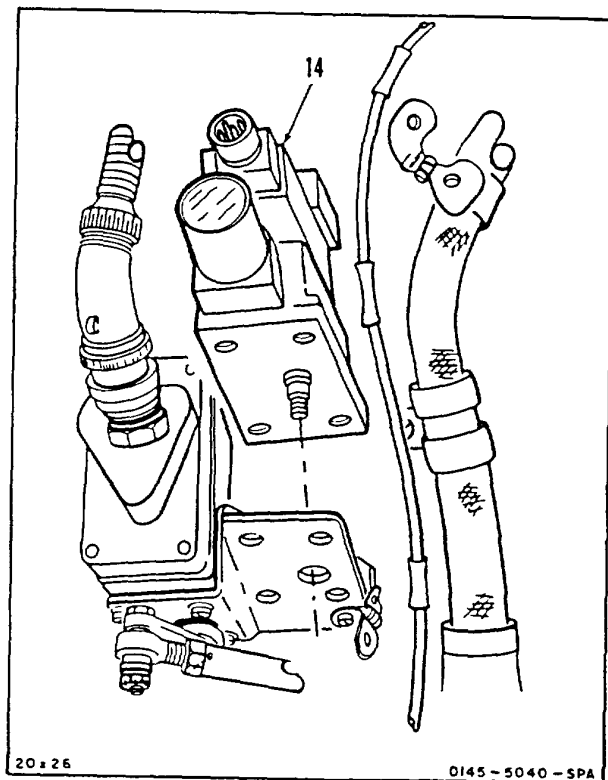
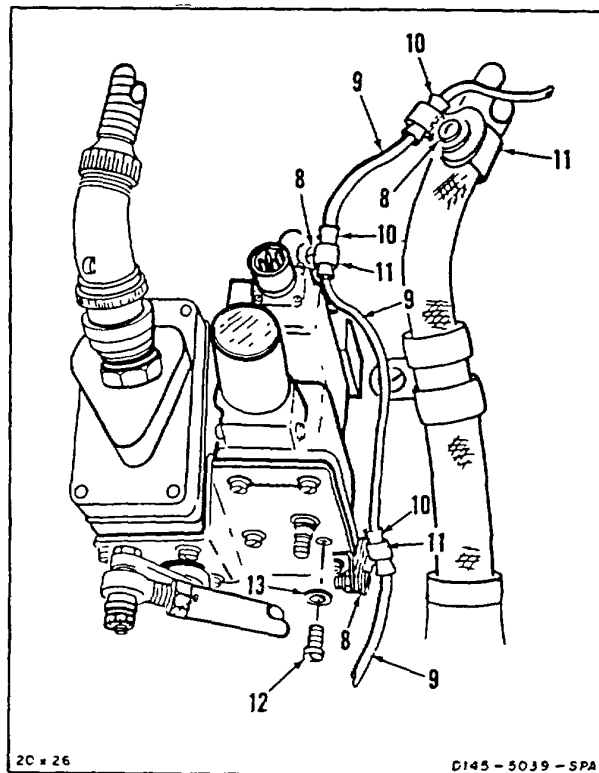
CAUTION

Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

3. Turn fastener (8) counterclockwise and release element (9) and bushing (10) from three clamps (11). Move element to side.
4. Remove lockwire from four screws (12). Remove four screws and washers (13).

5. Remove actuator (14).

FOLLOW-ON MAINTENANCE.
None



END OF TASK

4-319

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

- Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
- Torque Wrench, 5 To 50 Inch-Pounds

Materials:

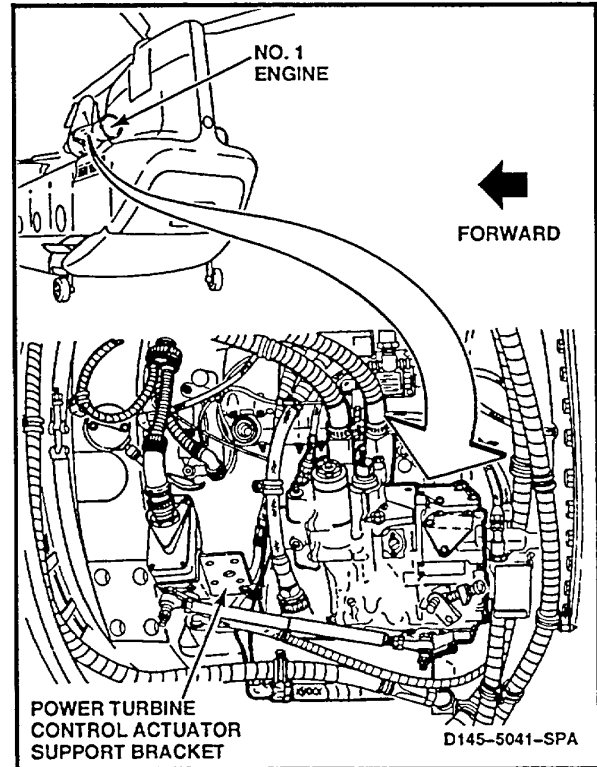
Lockwire (E231)

Personnel Required:

- Medium Helicopter Repairer
- Inspector

References:

TM 55-1520-240-23P



NOTE

Procedure is same to install power turbine control actuator on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Position actuator (1) on bracket (2).

CAUTION

Screws must be lockwired left to right. Interference or damage to control rod could result if screws are lockwired up and down.

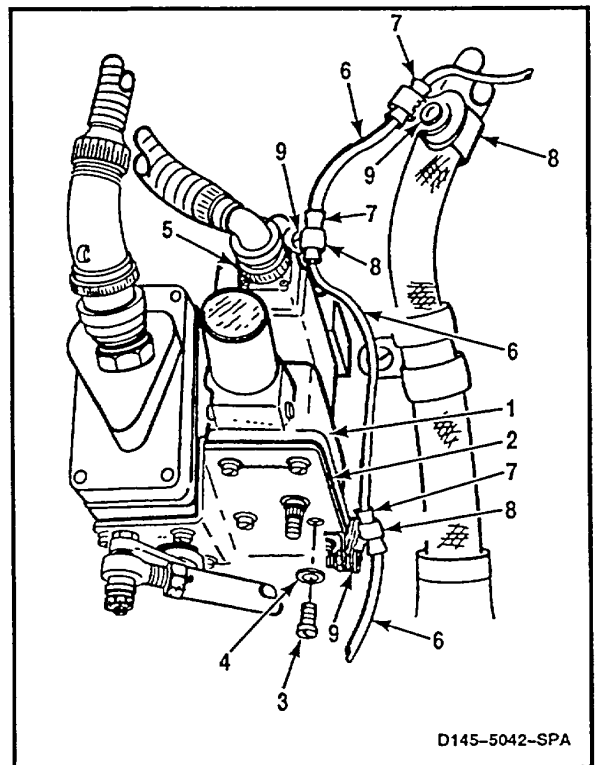
2. Install four screws (3) and washers (4). Lockwire screws left to right. Use lockwire (E231).

3. Connect cable connector (5).

CAUTION

Do not pinch, crush, kink or make sharp bends in fire detection element. Element can be damaged.

4. Press element (6) and bushing (7) into clamps (8) at three locations. Bushings shall be centered in clamps.
5. Lock each clamp (8) with fasteners (9).



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4-139 INSTALL POWER TURBINE CONTROL ACTUATOR
(Continued)

4-139

6. Move rod (10) forward and down. Position lever (11) on shaft (12). Install washer (13) and nut (14). Torque nut to 35 inch-pounds.

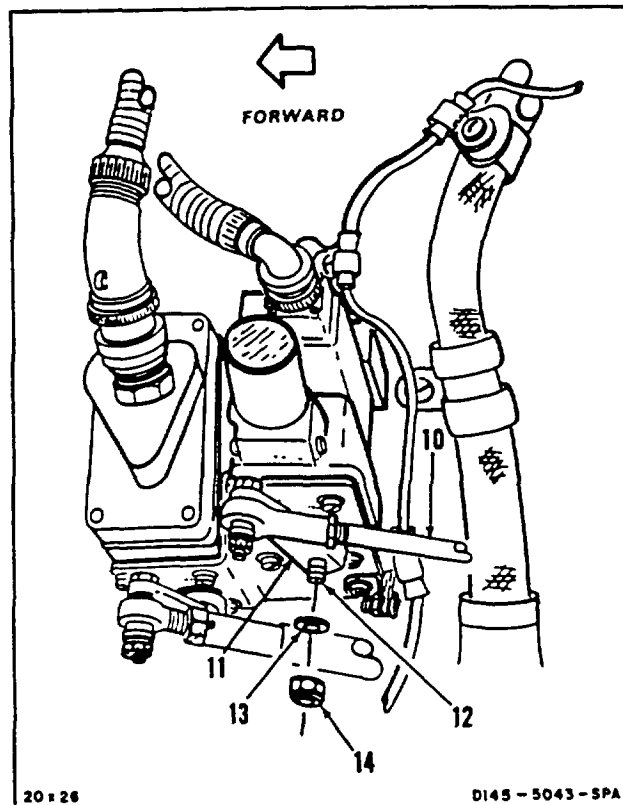
FOLLOW-ON MAINTENANCE:

Install and rig power turbine control linkage (Task 4-140).

Perform operational check of power turbine control system (TM 55-1520-240-T).

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).

**END OF TASK**

Change 7 4-321

4-140 INSTALL AND RIG POWER TURBINE CONTROL LINKAGE

4-140

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944
Torque Wrench, 30 to 150 Inch-Pounds
Thrust Control Rigging Pin (T122)
Stopwatch

Materials:

Lockwire (E229)

Parts:

Cotter Pins

Personnel Required:

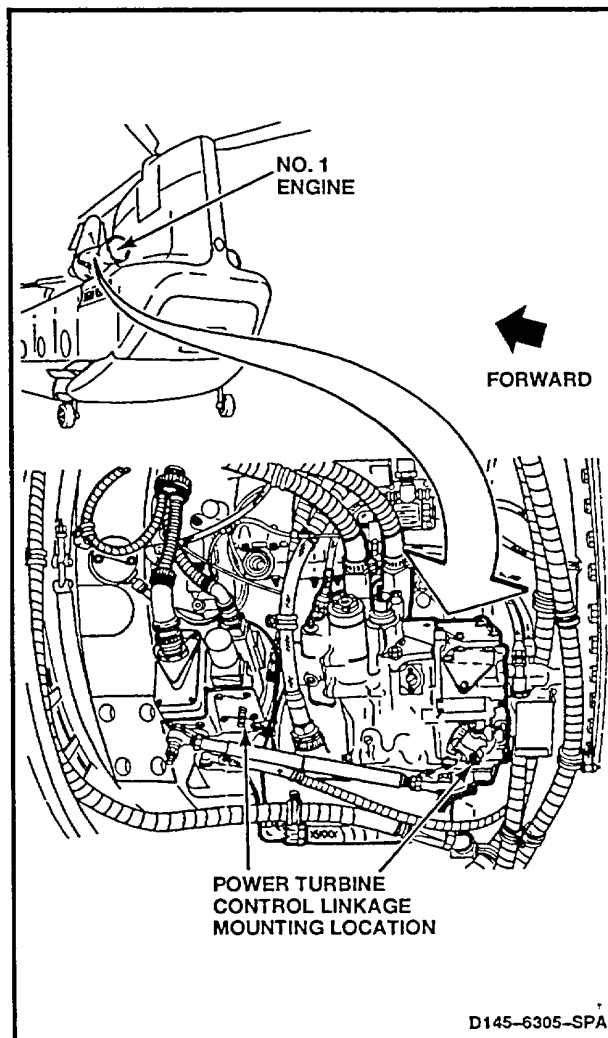
Aircraft Powerplant Repairer (2)
Inspector

References:

TM 55-1520-240-23P

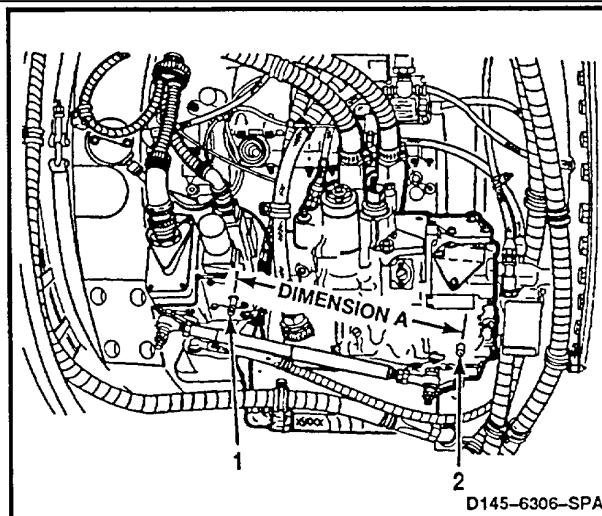
Equipment Condition:

Battery Disconnected (Task 1-39)
Hydraulic Power Off
Electrical Power Off
Forward Floor Panels Removed (Task 2-81)
Electrical Compartment Access Door Open (Task 2-2)
Adjust Engine Droop Eliminator Variable Resistors (Task 4-118)

**NOTE**

Procedure is same to install and rig power turbine control linkage on No. 1 or No. 2 engine. Installation and rigging for No. 1 engine is shown here.

1. Measure dimension A from actuator shaft (1) to fuel control shaft (2).



4-140 INSTALL AND RIG POWER TURBINE CONTROL LINKAGE (Continued)

4-140

2. Measure distance between centers of holes (3) in rod end bearings (4 and 5). If length is same as dimension A found in step 1, go to step 3. If not, do the following:
 - a. Remove lockwire and loosen two nuts (6 and 7).
 - b. Rotate two bearings (4 and 5) alternately until distance between centers of holes (3) is same as dimension A.
 - c. Make sure bearings (4 and 5) are aligned.
 - d. Tighten nuts (6 and 7). Do not lockwire nuts at this time.

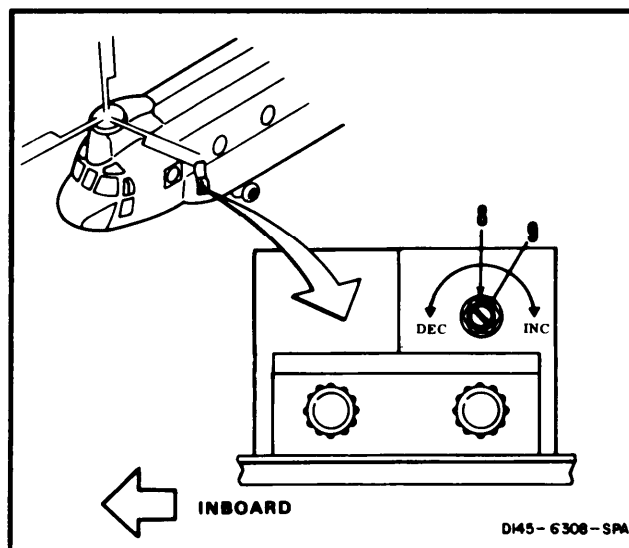
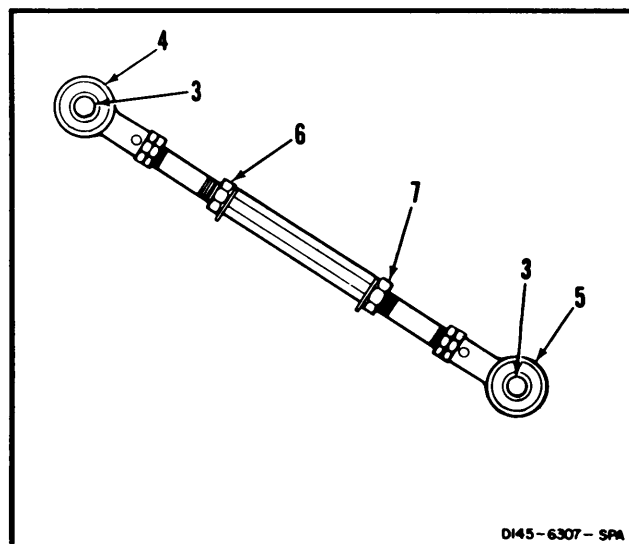
NOTE

Nominal distance between centers of holes in rod end bearings is 10.55 inches.

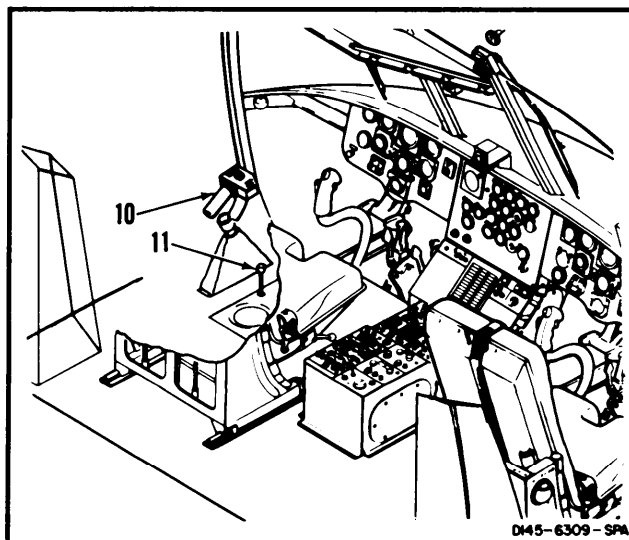
CAUTION

Do not force resistor at either limit of its range. Internal damage to resistor can result.

3. Loosen nut (8). Set variable resistor shaft (9) to halfway between full clockwise and counter-clockwise positions.
- 3.1. Connect the battery (Task 1-39), turn on the electrical power, and the hydraulic power.



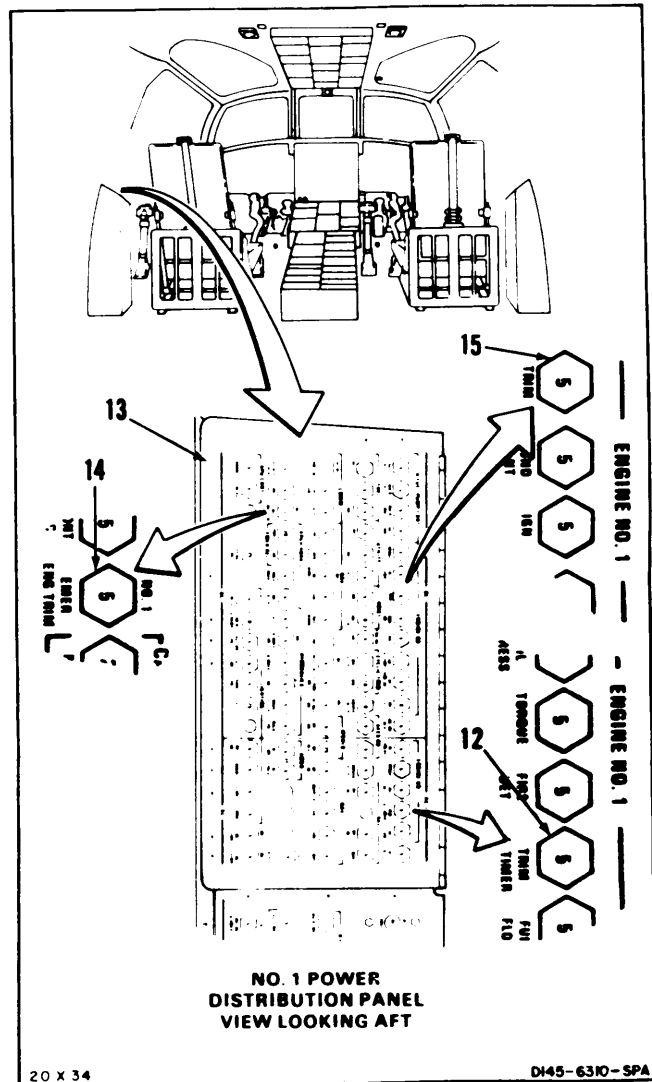
4. Set thrust control (10) to neutral. Install rigging pin (T122) (11).



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4-140 INSTALL AND RIG POWER TURBINE CONTROL LINKAGE
(Continued)

5. Check that TRIM & TIMER circuit breaker (12) on No. 1 power distribution panel (13) is closed. Check that No. 1 EM ERG ENG TRIM circuit breaker (14) and TRIM circuit breaker (15) are closed.



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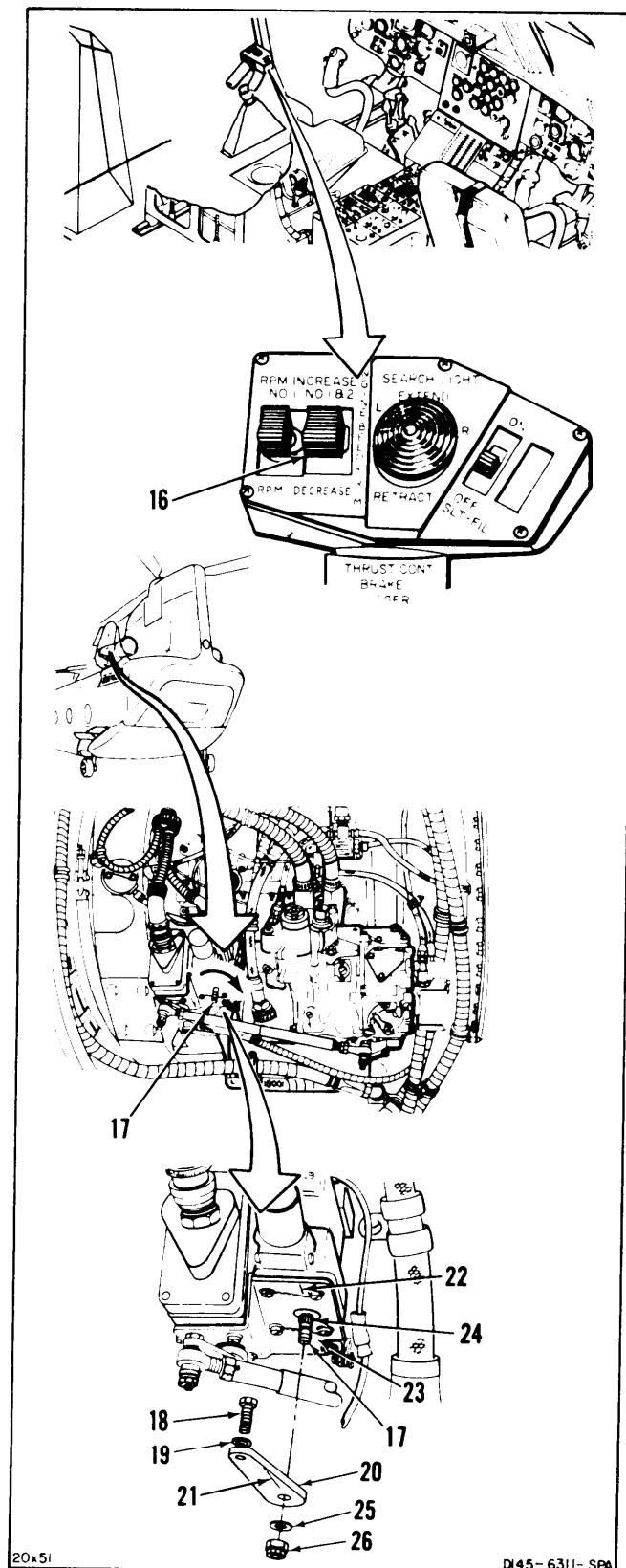
4-140 INSTALL AND RIG POWER TURBINE CONTROL LINKAGE

(Continued)

4-140

6. Have helper set **ENGINE BEEP TRIM NO. 1 & 2 switch (16)** to **RPM INCREASE** for **3 to 5 seconds**. Check that **N2 actuator shaft (17)** moves clockwise.
7. Have helper set **switch (16)** to **RPM DECREASE** until shaft (17) stops turning.

8. Install bolt (18) and washer (19) in lever (20). **Slide lever (20) into position on shaft (17)**. Make Sure index mark (21) on lever aligns with index mark (22) on bracket (23), within one tooth on spline (24).
9. Install washer (25) and nut (26). **Torque nut to 35 inch-pounds.**



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4-140 INSTALL AND RIG POWER TURBINE CONTROL LINKAGE (Continued)

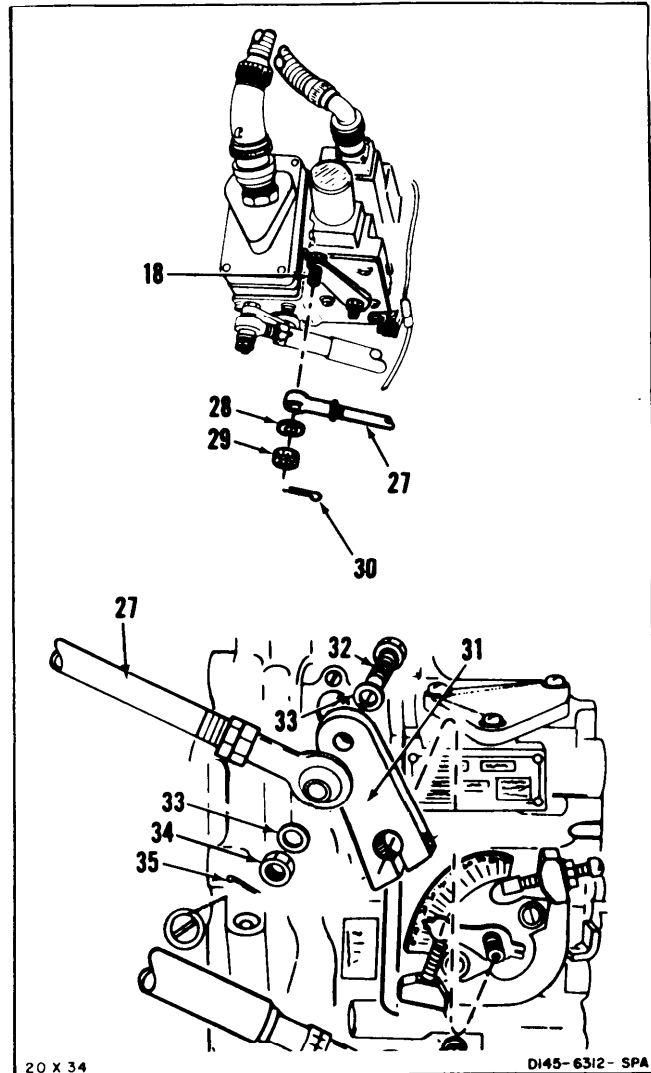
4-140

10. **Position rod (27)** on bolt (18) **Install** washer (28) and **nut (29)** on bolt. Torque nut to **30 to 60 inch-pounds**. Install cotter pin (30).

INSPECT

11. **Position lever (31)** behind rod (27). **Install bolt (32)**, two washers (33), and nut (34) Torque nut to **30 to 60 inch-pounds**. install cotter pin (35).

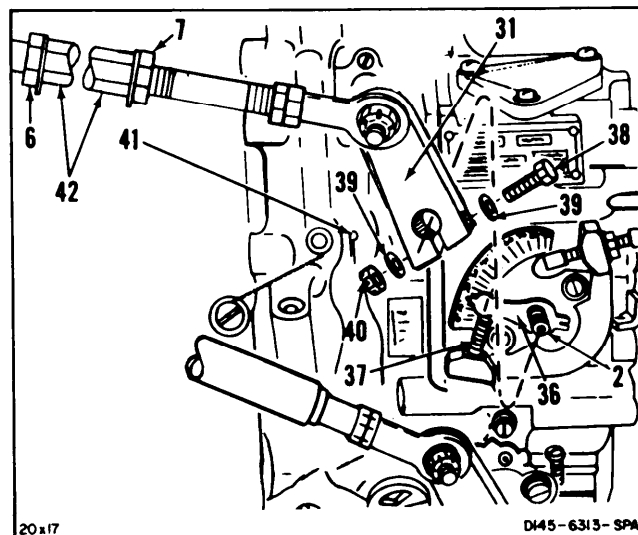
INSPECT



12. **Rotate pointer (36)** on fuel control shaft (2) **to MIN stop (37)**.
13. **Slide lever (31) onto shaft (2)**. install bolt (38) two washers (39), nut (40), and cotter pin (41).
14. **Make sure pointer (36) contacts MIN stop (37)**. If pointer (36) does not contact MIN stop (37), do the following:
- Remove lockwire and loosen two nuts (6 and 7).
 - Rotate turnbuckle (42) until pointer (36) contacts stop (37).
15. **Tighten and lockwire nuts (6 and 7)**. Use lockwire (E229).

INSPECT

GO TO NEXT PAGE

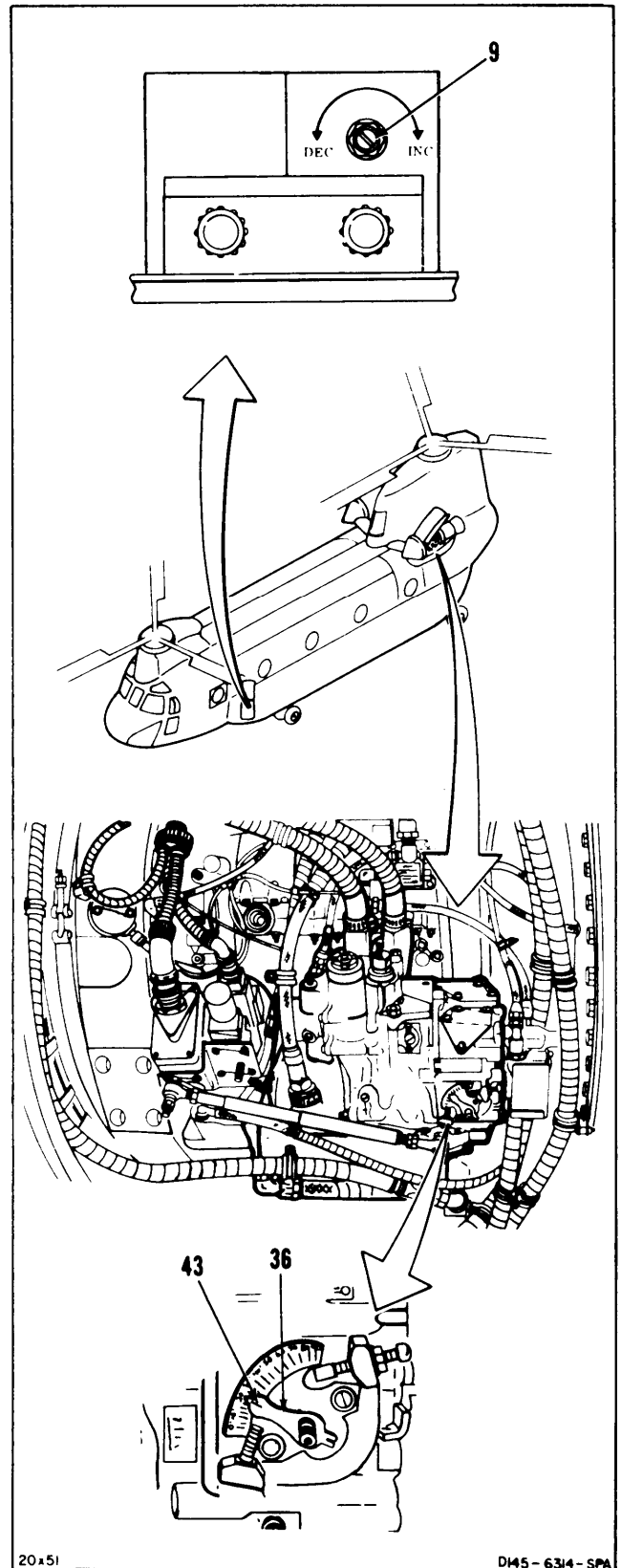


4-140 INSTALL AND RIG POWER TURBINE CONTROL LINKAGE
(Continued)**4-140**

16. Have helper rotate resistor shaft (9) until index mark (43) on pointer (36) is at 20 degrees.

NOTE

Control linkage not shown for clarity.

**GO TO NEXT PAGE**

4-140 INSTALL AND RIG POWER TURBINE CONTROL LINKAGE
(Continued)

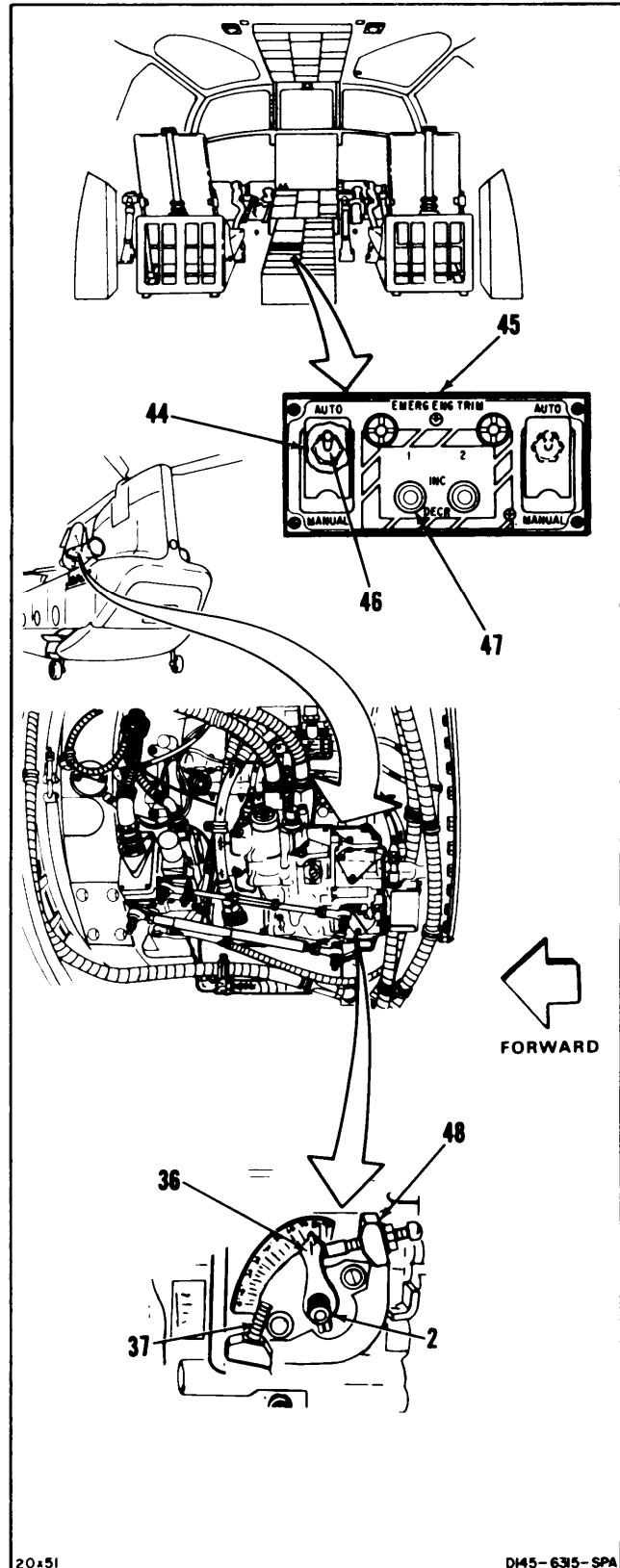
17. Lift switch guard (44) on panel (45). Set left switch (46) to **MANUAL**. Set EM ERG ENG TRIM No. 1 switch (47) to **INCR** for 8 to 10 seconds.

18. Check pointer (36) on fuel control shaft (2). pointer shall contact N2 RPM limiting stop (48).

19. Have helper set switch (47) to **DECR** for 8 to 10 seconds.

20. check pointer (36). Pointer shall contact MIN stop (37).

21. Lower switchguard (44).



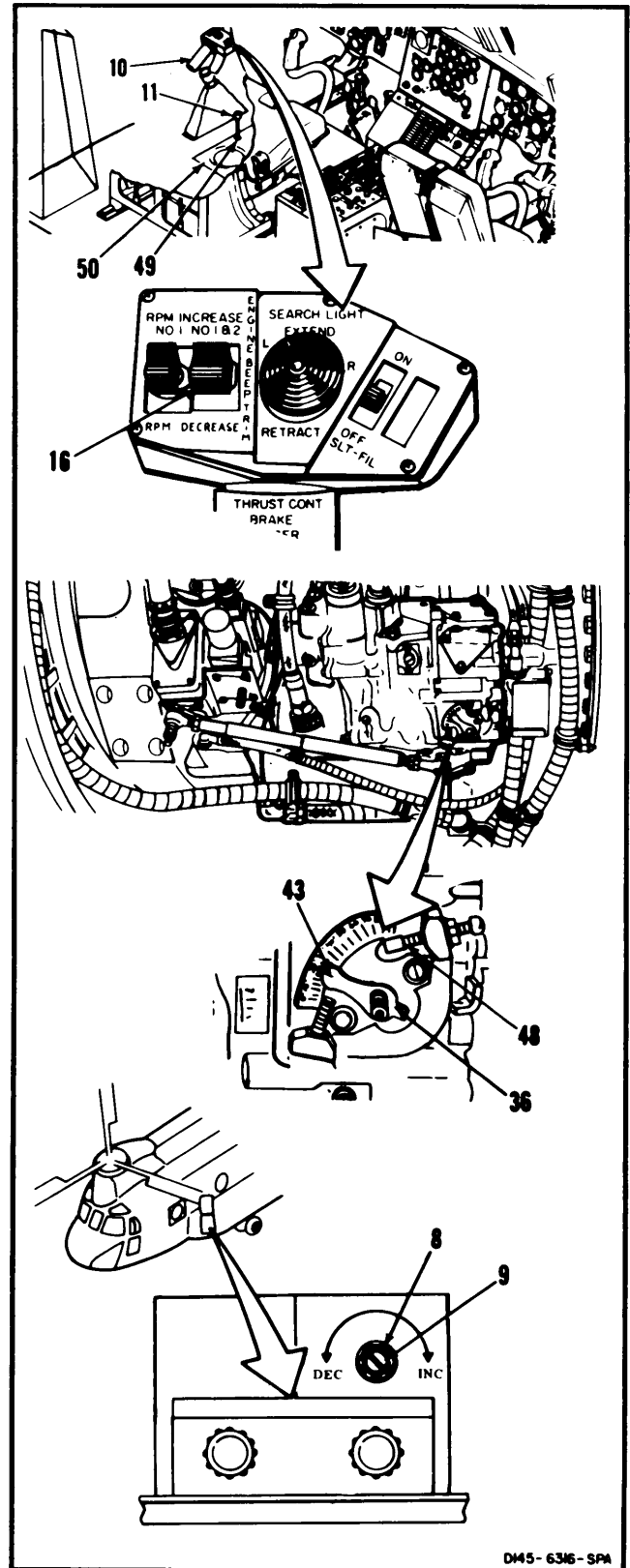
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4-140 INSTALL AND RIG POWER TURBINE CONTROL LINKAGE
(Continued)

22. **Remove rigging pin (11)** from hole (49) in floor (50). **Set thrust control (10) to detent position.**
23. Have helper hold No. 1 & 2 switch (16) to RPM INCREASE for 8 to 10 seconds.
24. **Check pointer (36).** Pointer shall contact N2 RPM limiting stop (48).
25. Have helper hold switch (16) to RPM DECREASE for 8 to 10 seconds. Index mark (43) on pointer (36) shall be between 19 and 21 degrees. If pointer is not between 19 and 21 degrees, rotate resistor shaft (9) until pointer is at 20 degrees.
26. **Tighten locknut (8).**

FOLLOW-ON MAINTENANCE:

- Install forward floor panels (Task 2-82).
- Close left electrical compartment access door (Task 2-2).
- Perform operational check of power turbine system (TM 55-1520-240-T).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).
- Electrical power off.
- Hydraulic power off.
- Disconnect battery (Task 1-39).



D45-6346-SPA

END OF TASK

SECTION IX
ENGINE COMPRESSOR CLEANING AND PRESERVATION SYSTEM
(WITH 74)



INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Materials:

Cloths (E120)
Sealant (E336)
Lockwire (E229)
Gloves (E184.1)
Dry Cleaning Solvent (E162)

Personnel Required:

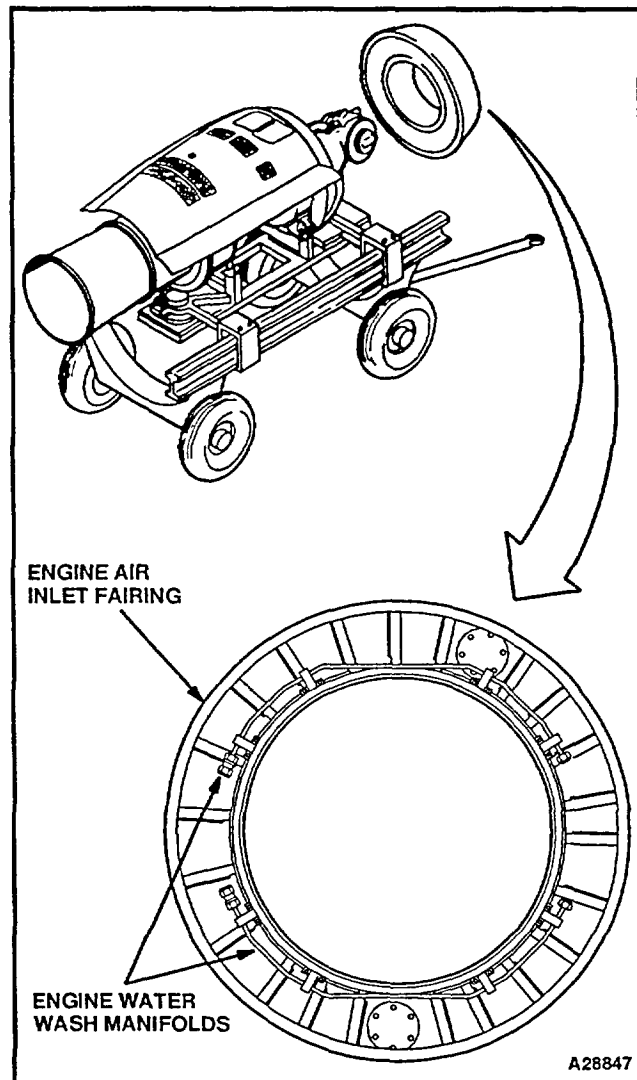
Aircraft Powerplant Repairer
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Engine Transmission Fairing Removed (Task 4-70)
Off Helicopter Task



GO TO NEXT PAGE

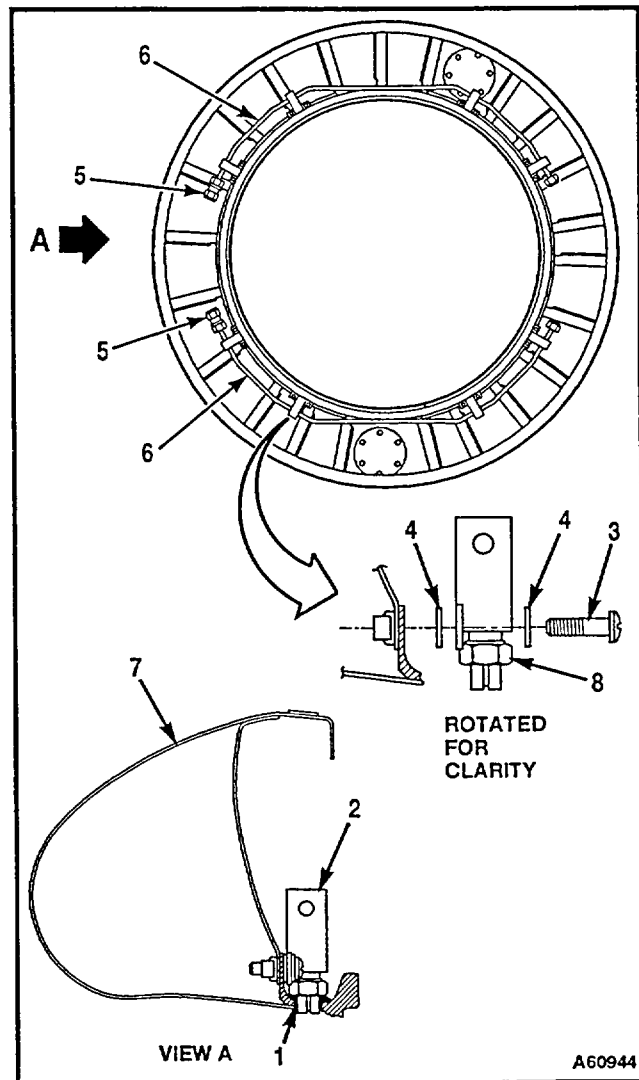
4-141 REPLACE ENGINE WATER WASH NOZZLES AND MANIFOLDS
(Continued)

4-141

NOTE

Procedure is same to replace No. 1 or No. 2 engine water wash manifolds.

1. Remove sealant (1) from eight manifold fittings (2), in engine air inlet fairing (7).
2. Remove sixteen screws (3) and thirty-two washers (4).
3. Remove lockwire and caps (5).
4. Remove manifold assemblies (6).
5. Remove eight vee jet nozzles (8) from manifold fittings (2).



GO TO NEXT PAGE

4-334 Change 19

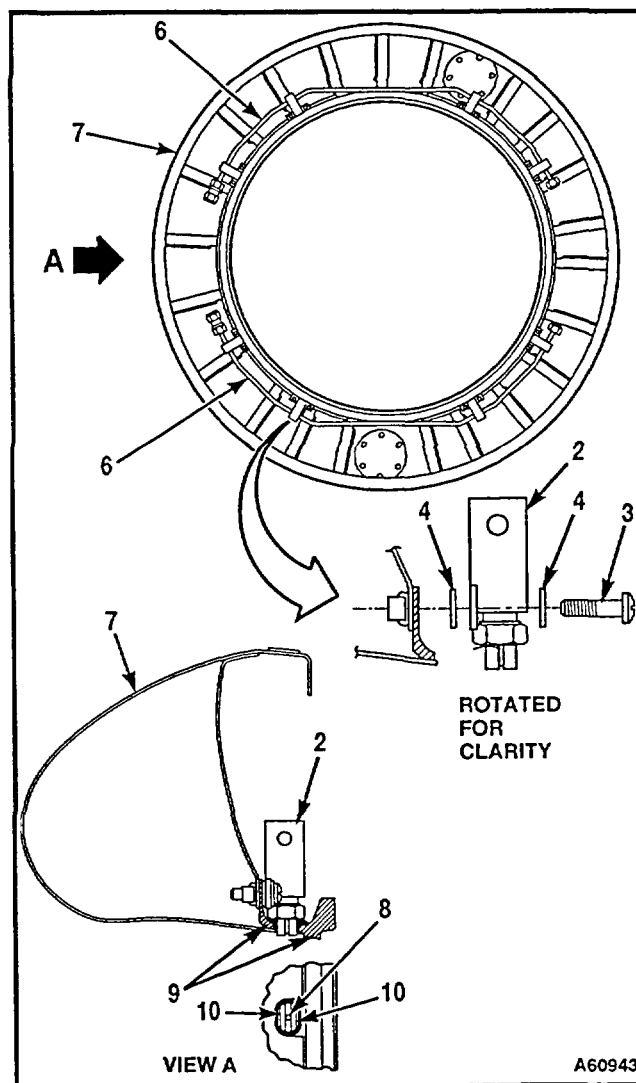
**4-141 REPLACE ENGINE WATER WASH NOZZLES AND MANIFOLDS
(Continued)**

4-141

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.

6. Clean eight vee jet nozzles (8) and fairing slot openings (9) in fairing surface (7). Use solvent (E162) and cloths (E120). Wear gloves (E184.1).
7. Install eight vee jet nozzles (8) in manifold fittings (2).
8. Insure that vee jet nozzle flats (10) are locked in place by slot openings (9) in fairing (7), but **DO NOT** extend into fairing airstream.
9. Align manifold assemblies (6) in fairing slot openings (9).
10. Install sixteen screws (3) and thirty-two washers (4).

INSPECT

GO TO NEXT PAGE

Change 19 4-335

WARNING

Sealant (E336) can irritate skin and cause burns. 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.

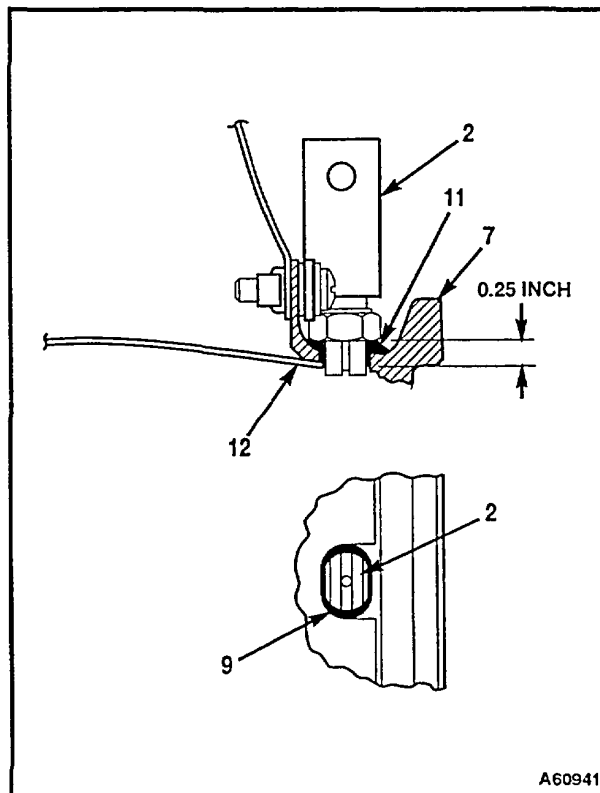
CAUTION

If sealant (E336) is allowed to enter vee jet nozzle slot, water wash system operation will be impaired.

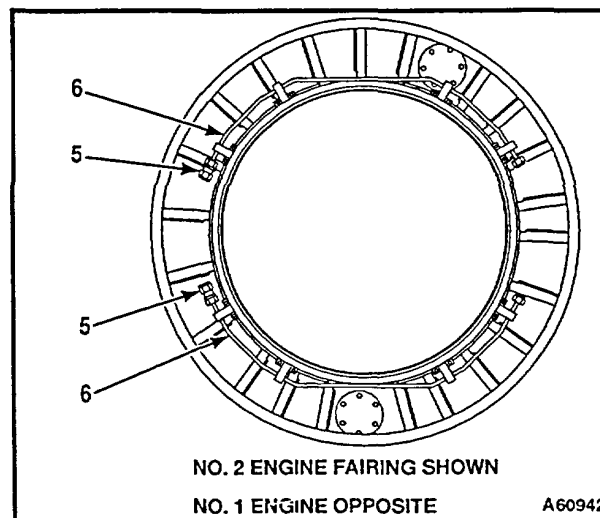
11. Apply sealant (E336) to manifold fittings (2) and fairing surface (7).
12. Fill gaps between manifold fittings (2) and fairing slots (9) with sealant (E336). Wear gloves (E184.1).
13. Apply a minimum bead of 0.025 inch of sealant (E336) around the manifold nozzle base (11) and fairing surface (7).
14. Ensure that sealant (E336) is flush with inlet side of fairing (12).

INSPECT

15. Install two caps (5) on manifold assemblies (6). Lockwire (E229).
16. Allow sealant (E336) to cure for 24 hours after application.



A60941



A60942

FOLLOW-ON MAINTENANCE:
None

END OF TASK
4-336 Change 19

4-142 REMOVE NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE

4-142

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944

Container, 2-Quart

Materials:

Cloths (E120)

Tape (E388)

Personnel Required:

Aircraft Powerplant Repairer

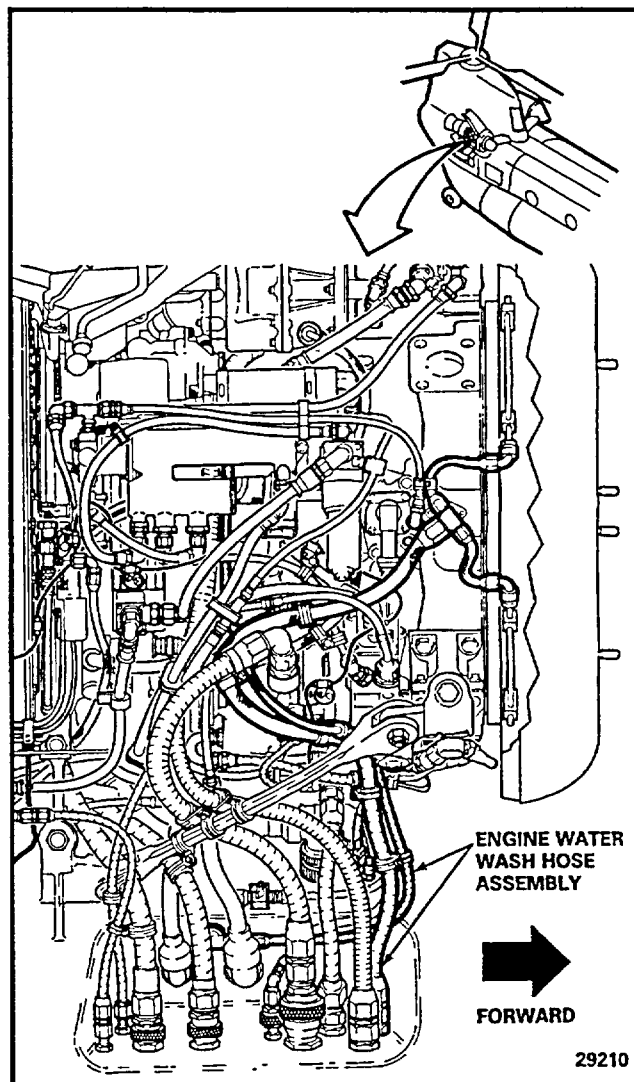
Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Work Platform Open (Task 2-2)

Engine Access Cover Open (Task 4-49)



GO TO NEXT PAGE

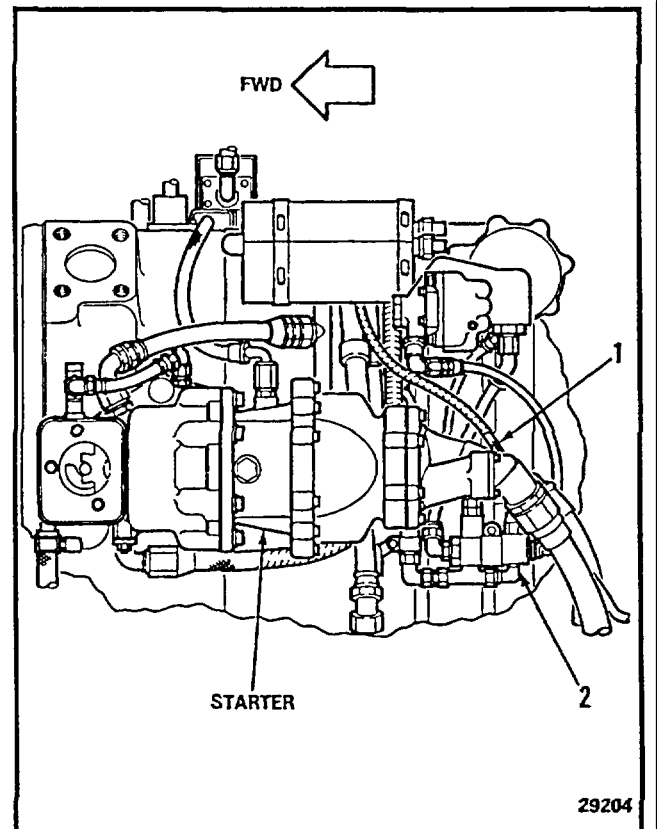
4-142 REMOVE NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE (Continued)

4-142

NOTE

Procedure is same to remove engine water wash hoses from No. 1 or No. 2 engine, except as noted. No. 2 engine is shown here.

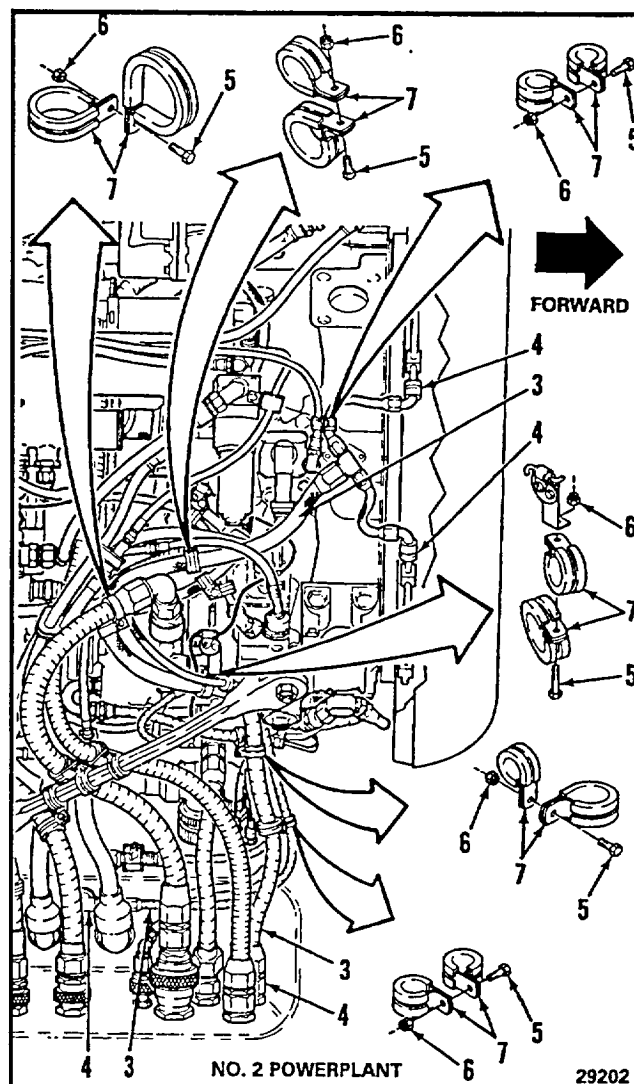
1. Disconnect air pressure hose (1) from fitting (2).



4-142 REMOVE NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE (Continued)

4-142

2. **Disconnect hoses (3)** from fittings (4).
3. **Remove six screws (5)**, and nuts (6), from twelve clamps (7).
4. Use tape (E388) to mark clamp locations.
5. **Remove hoses (3)**. Use cloths (E120) to clean spilled water.



GO TO NEXT PAGE

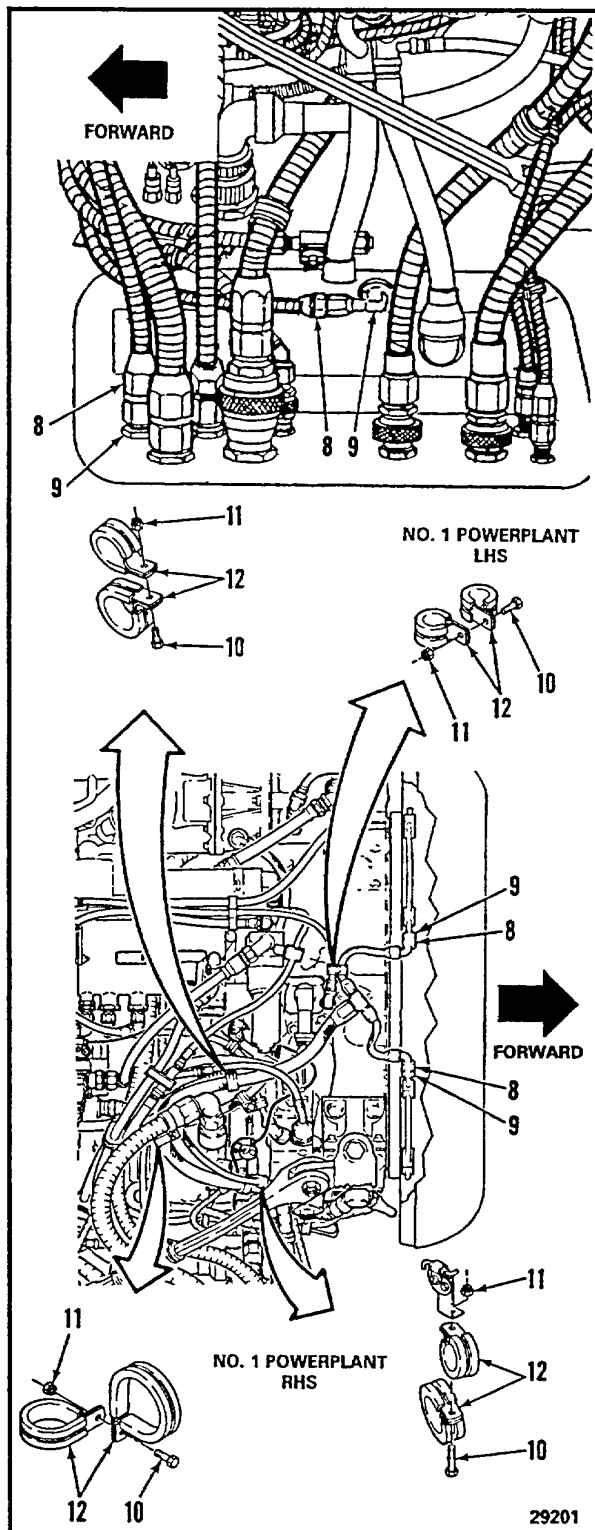
Change 19 4-339

4-142 REMOVE NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE (Continued)

NO. 1 POWERPLANT

6. Disconnect hoses (8) at fittings (9).
7. Remove four screws (10) and nuts (11) from eight clamps (12).
8. Use tape (E388) to mark clamp locations.
9. Remove hoses (8). Use cloths (E120) to clean spilled water.

FOLLOW-ON MAINTENANCE:
None



END OF TASK
4-340 Change 19

4-143 INSTALL NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE

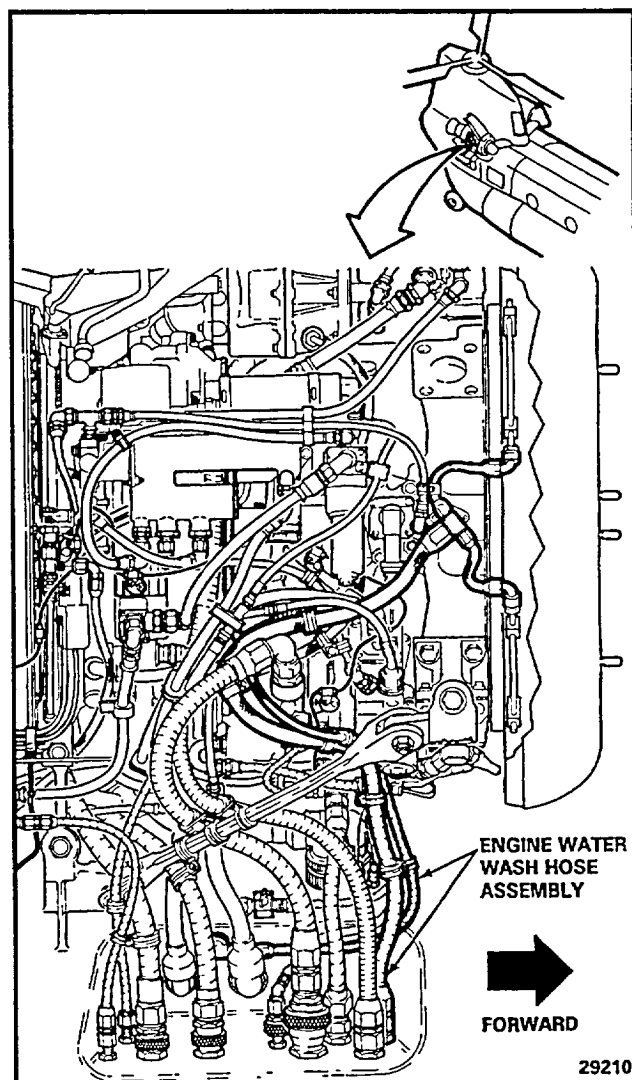
4-143

INITIAL SETUP**Applicable Configurations:**With **74****Tools:**Powerplant Repairer's Tool Kit,
NSN 5180-00-323-4944**Materials:**

None

Personnel Required:Aircraft Powerplant Repairer
Inspector**References:**

TM 55-1520-240-23P



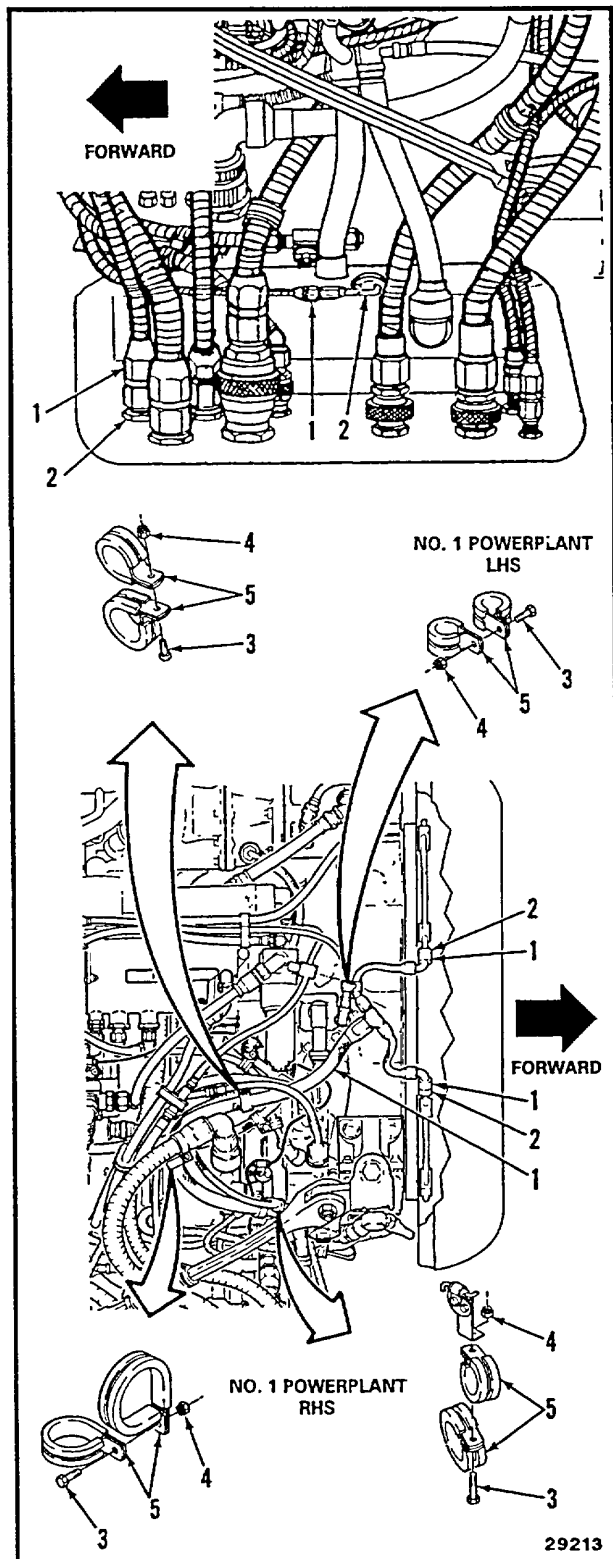
GO TO NEXT PAGE

Change 19 4-341

NOTE

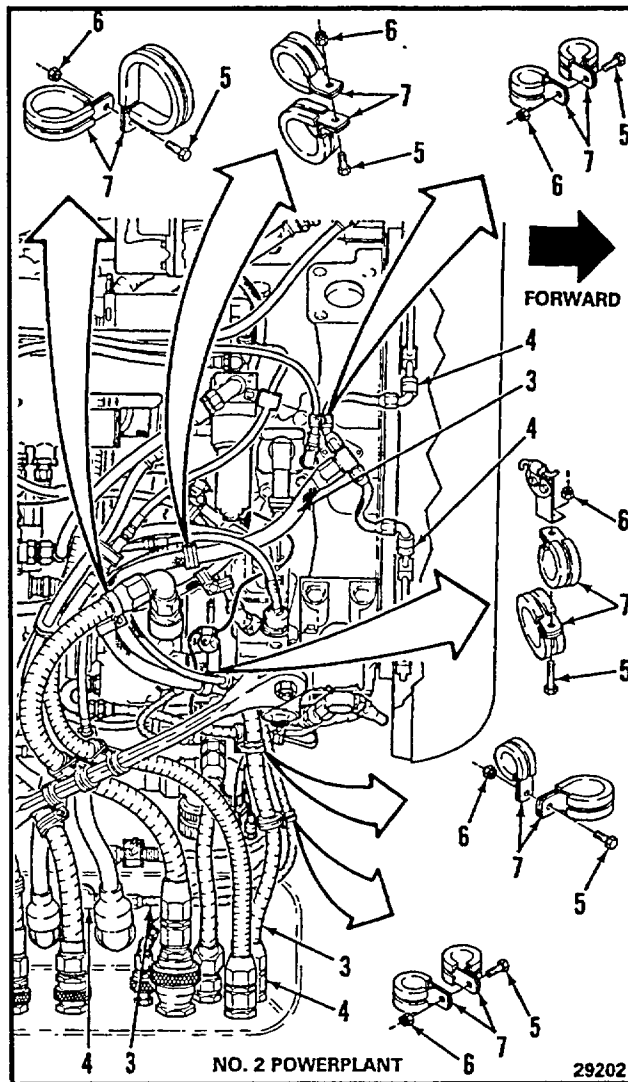
Procedure is same to install engine water wash hoses from No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Install hoses (1) at fittings (2).
2. Install four screws (3), and nuts (4), in eight clamps (5). Remove tape.



NO. 2 POWERPLANT

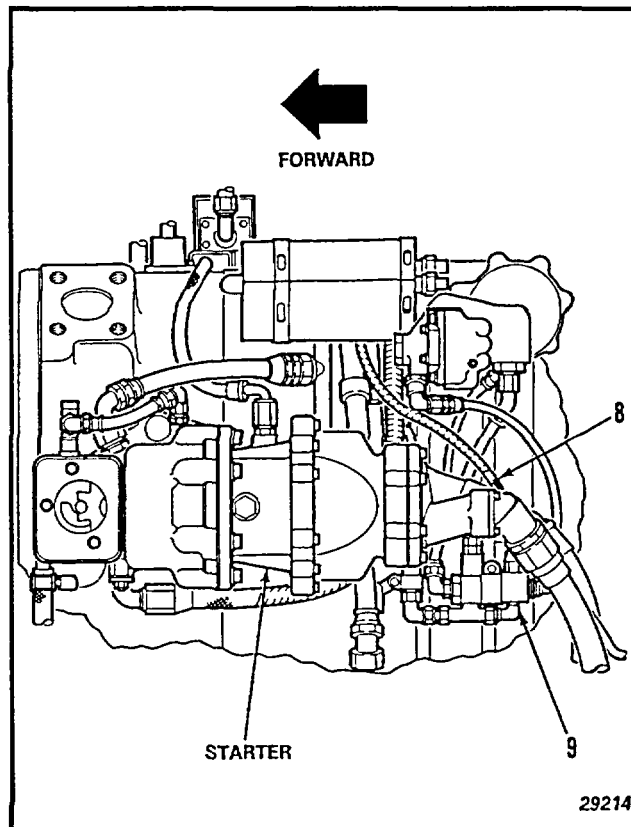
3. Install hoses (3) at fittings (4).
4. Install six screws (5), and nuts (6), in twelve clamps (7). Remove tape.



4-143 INSTALL NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE (Continued)

4-143

5. Connect hose (8) at fitting (9).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK
4-344 Change 19

INITIAL SETUP**Applicable Configurations:**With **74****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Portable Cleaning and Preservation
Unit LTCT 23980-01 (T-26)
Stopwatch

Materials:

Cloths (E135)
Gloves (EI 84.1)
Methanol (E243)
Dry Cleaning Solvent, Type II (E162)
Water Soluble Cleaner (E466 or E467)

Personnel Required:

Rotary-Wing Aviator (2)
Medium Helicopter Repairer

References:

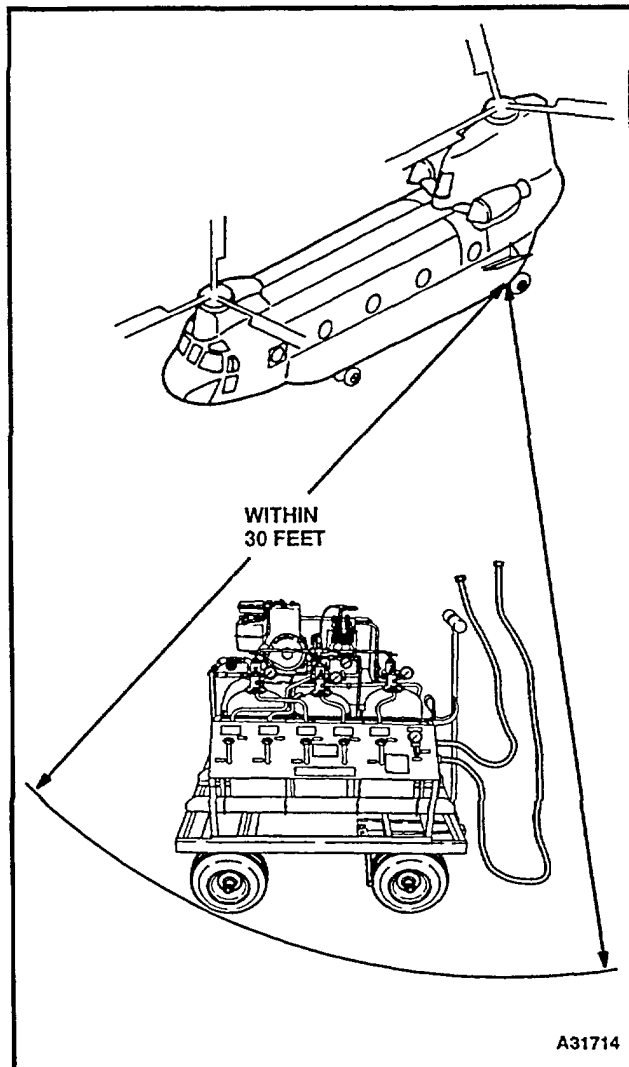
Task 4-145
Task 4-146
TM 55-1520-240-10
Vendor Manual for LTCT 23980-01

Equipment Condition:

Electrical Power On
Hydraulic Power On
Engine Work Platform Open (Task 2-2)

General Safety Instructions:**CAUTION**

Throughout cleaning operation, ensure combustor drain valve is operative and fluids are drained from combustor before starting engine. Puddling of flammable liquids can cause a hot start.



GO TO NEXT PAGE

Change 19 4-345

WARNING

Methanol (E243) is flammable and toxic. Use only with adequate ventilation. Keep away from heat, sparks, or open flame. Do not inhale. Do not contact eyes, skin, 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. Avoid contact eyes, skin, or clothing. Avoid inhaling. Use only with adequate ventilation, away from heat open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

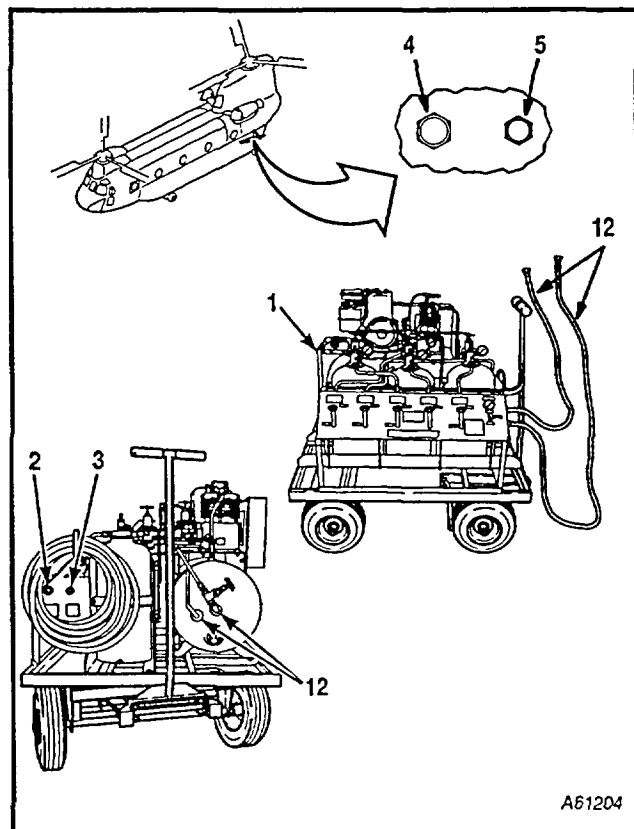
- At an ambient temperature below 35 degrees F (2 degrees C), use a 40 percent methanol (E243), and 60 percent water mixture in lieu of fresh water. This will prevent freezing.
- If water soluble cleaners (E466 or E467) and dry cleaning solvent (E162) are not available, go to Task 4-145.
- Procedure is the same for both No. 1 and No. 2 engine. No. 1 engine shown.

1. Position portable cleaning and preservation unit (1) (T-26) within 30 feet of aircraft.
2. Install portable cleaning unit hoses (12) on fittings (2 and 3) and on aircraft fittings (4 and 5).

CAUTION

Allow engine to cool for a minimum of 45 minutes prior to cleaning engine compressor. Cooling period is mandatory to prevent warpage of internal components.

3. Start portable cleaning and preservation unit (1) (Refer to vendor manual).



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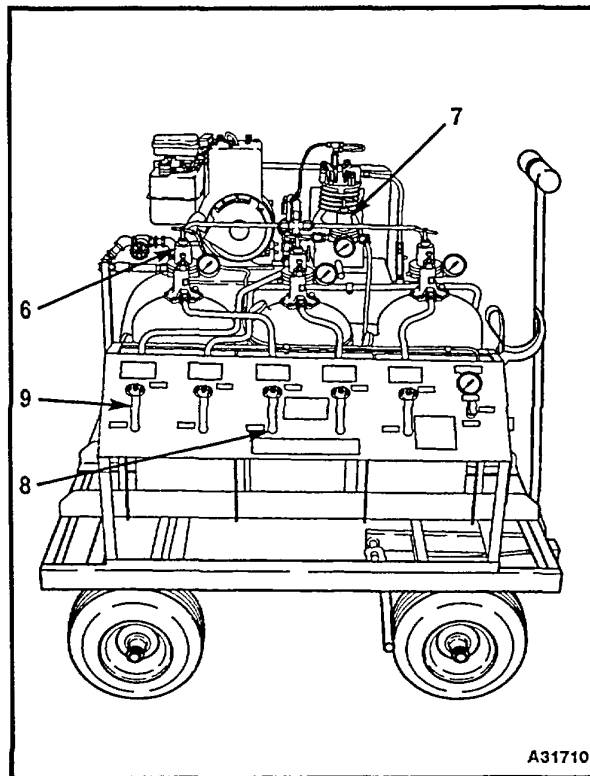
4-144 ENGINE COMPRESSOR CLEANING (Continued)

4-144

4. Adjust cleaner reservoir air regulator (6) to **50 psi** and customer air source regulator (7) to **60 psi** to close bleed band.
5. Motor engine. Position **CLEANER** valve (8) to **OPEN** for **20 seconds**. Position **CLEANER** valve (8) to **CLOSE**.
6. **Stop engine motoring.**
7. During engine coastdown, position **AIR/PURGE** valve (9) to **OPEN**, until lines are purged of solvent. Position **AIR/PURGE** valve (9) to **CLOSE**.

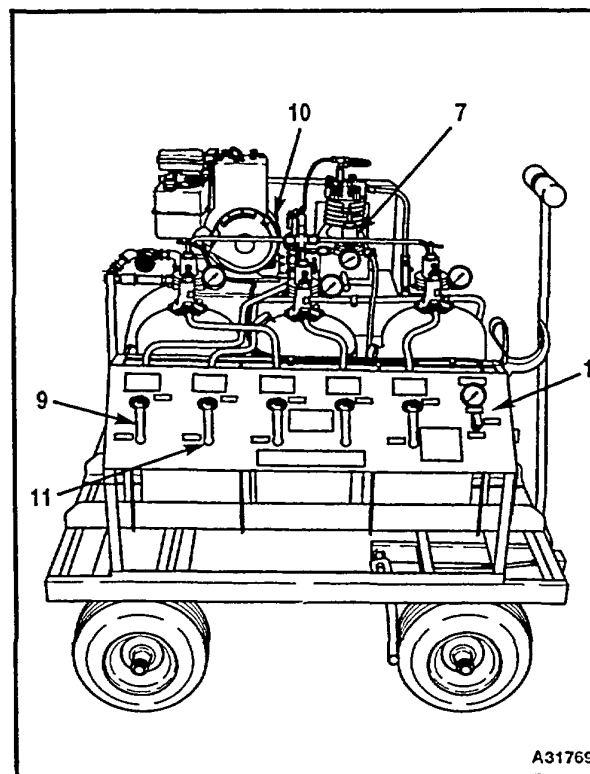
NOTE

Check that outlet pressure gage indicates **35 psi**.



A31710

8. Adjust air regulator (10) to **100 psi**.
9. Motor engine. Position **WATER** valve (11) to **OPEN** for **40 seconds**.
10. **Stop motoring.** Position **WATER** valve (11) to **CLOSE**.
11. During engine coastdown, position **AIR/PURGE** valve (9) to **OPEN**, until lines are purged of water. Position **AIR/PURGE** valve (9) to **CLOSE**.
12. **Decrease compressed customer air source valve (7) to 0 psi** to open bleed band.
13. **Start engine and run at idle for two minutes minimum** to dry out engine.
14. Shut down engine and portable cleaning and preservation unit (1). (Refer to vendor manual).



A31769

GO TO NEXT PAGE

Change 19 4-347

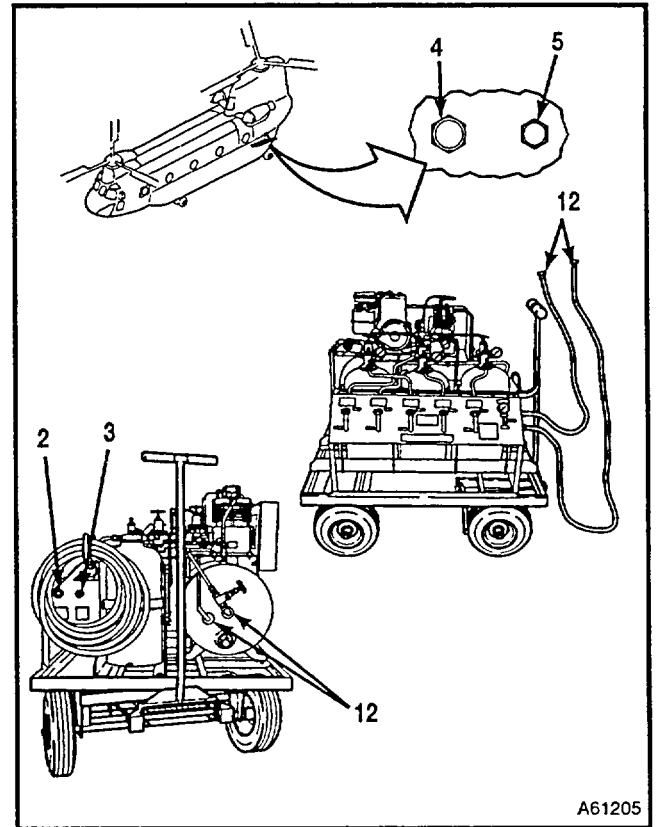
4-144 ENGINE COMPRESSOR CLEANING (Continued)

4-144

15. Remove portable cleaning unit hoses (12) from fittings (2 and 3), and from aircraft fittings (4 and 5).

FOLLOW-ON MAINTENANCE

Perform engine compressor preservation procedure (Task 4-146).



END OF TASK
4-348 Change 19

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Stopwatch
Portable Cleaning and Preservation Unit
LTCT 23980-01 (T-26)

Materials:

Methanol (E243)
Cloths (E135)

Personnel Required:

Medium Helicopter Repairer
Rotary-Wing Aviator (2)
Inspector

References:

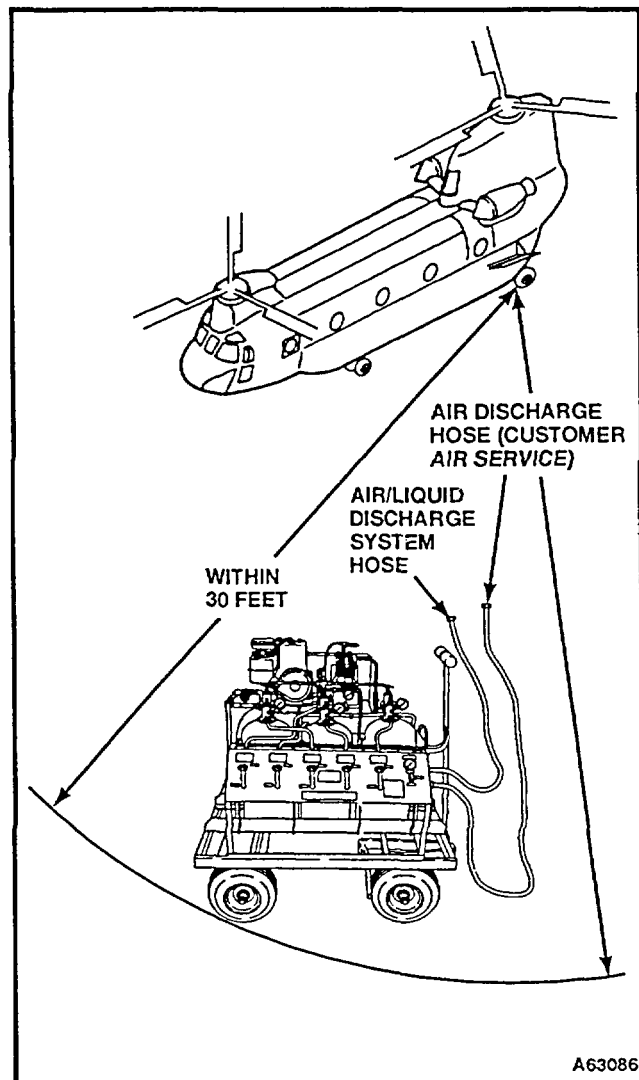
Task 4-146
TM 55-1520-240-10
Vendor Manual for LTCT 23980-01

Equipment Condition:

Hydraulic Power On
Electrical Power On
Engine Work Platform Open (Task 2-2)
LTCT 23980-01 (T-26) Connected

General Safety Instructions:**CAUTION**

Throughout cleaning operation,
ensure combustor drain valve is
operative and fluids are drained from
combustor prior to starting engine.



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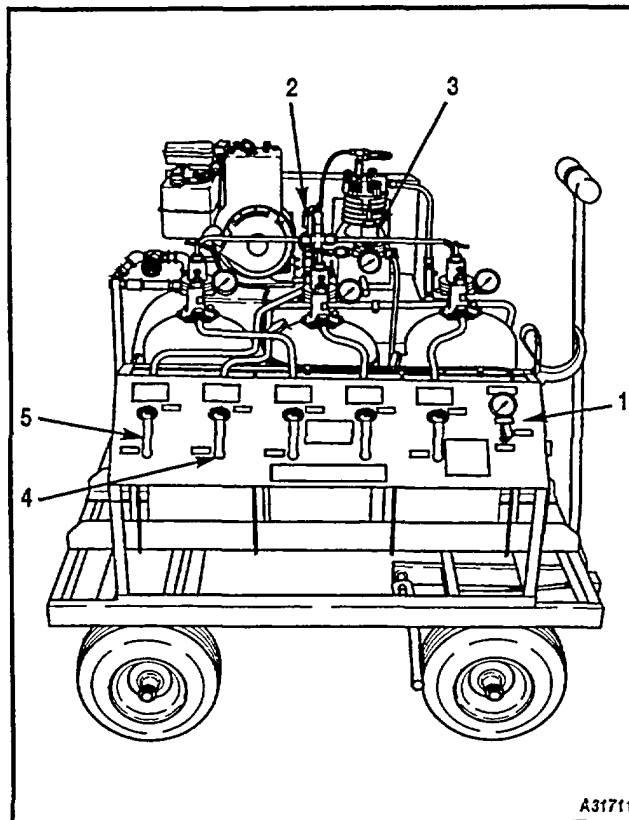
Change 19 4-349

WARNING

Methanol (E243) is flammable and toxic. Use only with adequate ventilation. Keep away from heat, sparks, or open flame. Do not inhale. Do not contact eyes, skin, or clothing. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

NOTE

- This procedure is to be used only for the cleaning of salt deposits, and as an alternate cleaning procedure when water soluble compressor cleaners (E466 or E467) or solvent (E162) are not available.
- At an ambient temperature of below 35 degrees Fahrenheit (2 degrees Celsius), use a 40 percent methanol (E243) and 60 percent water mixture to prevent line freezing.
- Procedure is same for No. 1 or No. 2 engine wash. No. 1 engine shown.



1. Start portable cleaning and preservation unit (1) (T-26). (Refer to vendor manual.)
2. Set main air regulator (2) to 100 psi. Adjust customer air source (3) to 60 psi to close bleed band.
3. Position **WATER** valve (4) to **OPEN**.
4. After 10 seconds, motor engine for 30 seconds.
5. Stop motoring the engine, and position **WATER** valve (4) to **CLOSE**.
6. During engine coastdown, position **AIR/PURGE** valve (5) to **OPEN** until lines are purged of water, then position **AIR/PURGE** valve (5) to **CLOSE**.
7. Inspect compressor for cleanliness, repeat steps 3 through 7 if necessary.

INSPECT

8. Decrease compressed customer air source (3) to **zero** to open bleed band.
9. Start engine and run at idle for two minutes minimum to dry out engine.
10. Shut down engine and portable cleaning and preservation unit (1). (Refer to vendor manual.)

FOLLOW-ON MAINTENANCE:

Perform engine compressor preservation procedure (Task 4-146).

INITIAL SETUP**Applicable Configurations:**With **74****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Portable Cleaning and Preservation Unit
LTCT 23980-01 (T-26)

Materials:

Engine Preservative (E154.1)
Lockwire (E231)
Cloths (E135)

Personnel Required:

Medium Helicopter Repairer
Army Rotary Aviator (2)
Inspector

References:

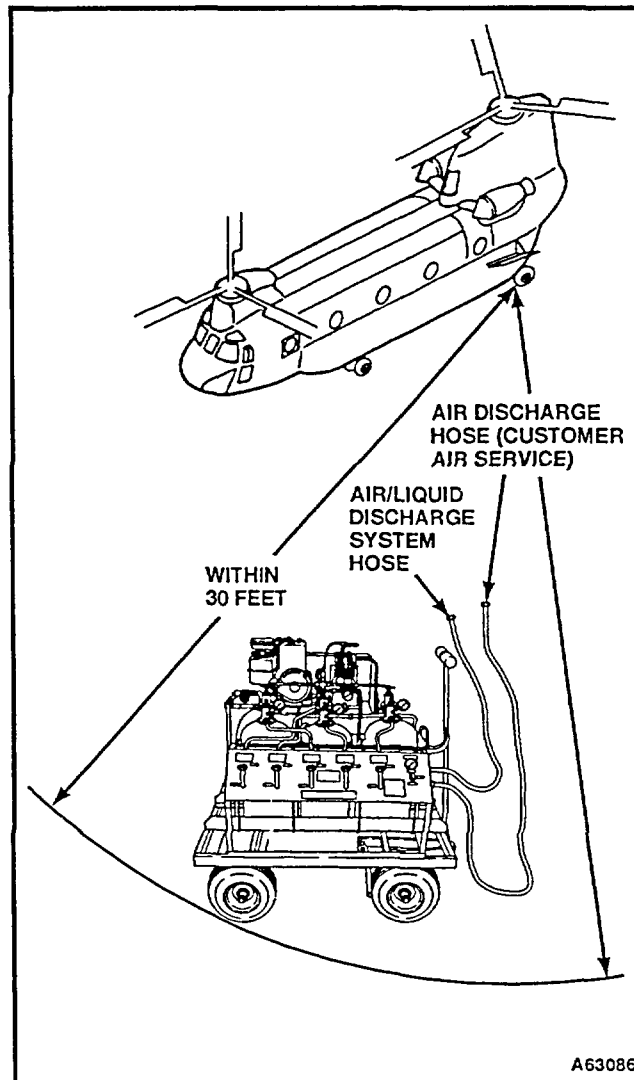
Vendor Manual for LTCT 23980-01

Equipment Condition:

Engine Work Platform Open (Task 2-2)
Portable Cleaning and Preservation Unit
(T-26) Connected
Task 4-144 or Task 4-145 Completed
Hydraulic Power On
Electrical Power On

General Safety Instructions:**CAUTION**

Allow engine to cool for a minimum of 45 minutes prior to preserving the engine compressor. Cooling period is mandatory to prevent warpage of internal components.



GO TO NEXT PAGE

Change 19 4-351

WARNING

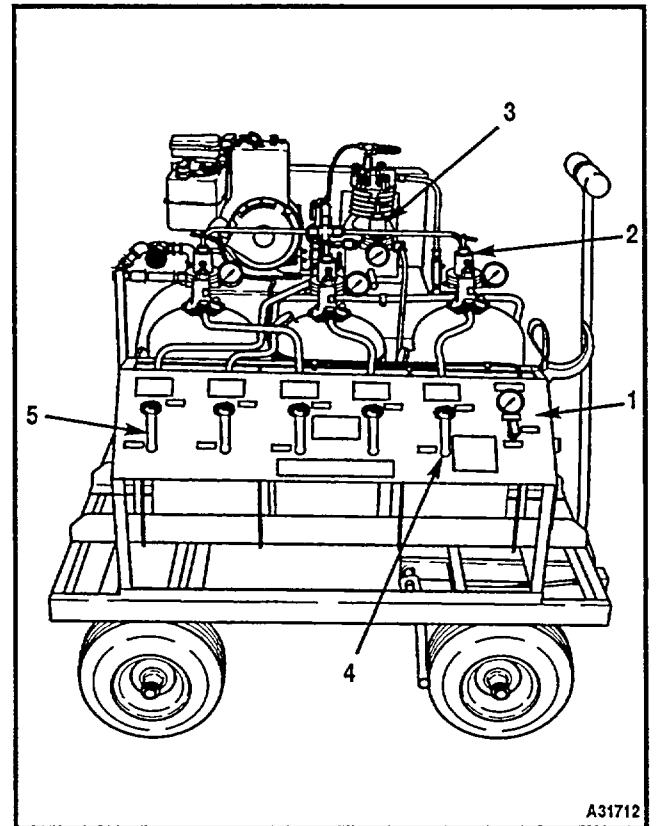
Engine compressor must be cleaned and dry before the compressor can be preserved. Otherwise, damage to compressor may occur.

NOTE

Ensure dirt, oil, and salt deposits are removed (Task 4-144 or Task 4-145) and compressor is dry prior to engine compressor preservation.

Procedure is same to preserve No. 1 or No. 2 engine compressor. No. 1 engine preservation is shown here.

1. Start portable cleaning and preservation unit (1) (T-26). (Refer to vendor manual.)
2. Adjust preservative reservoir air regulator (2) to 20 psi.
3. Adjust customer air source regulator (3) to 60 psi to close bleed band.
4. **Motor engine.**
5. Position **PRESERVATIVE** valve (4) to **OPEN** for one second. Immediately position **PRESERVATIVE** valve (4) to **CLOSE**.
6. **Stop motoring engine.**
7. Position **AIR/PURGE** valve (5) to **OPEN** until lines are purged of preservative, then position **AIR/PURGE** valve (5) to **CLOSE**.



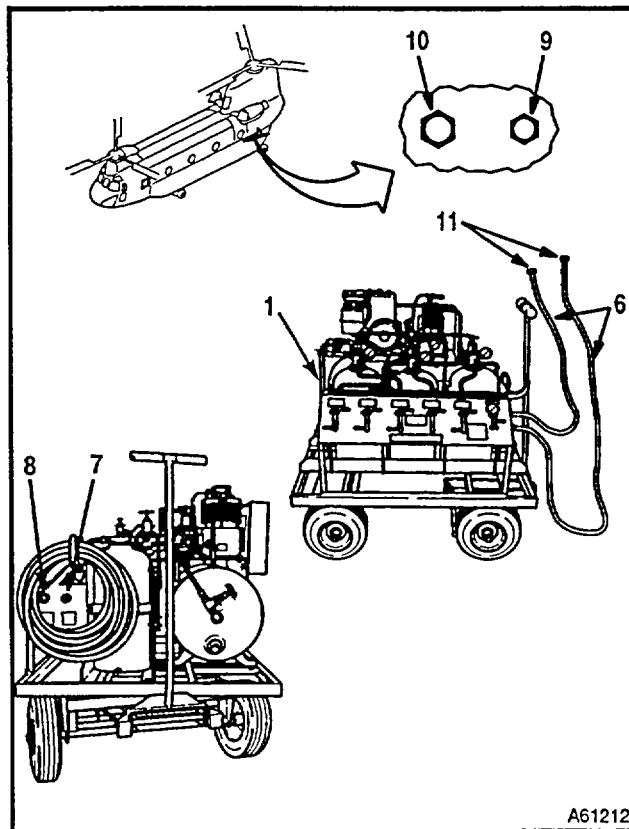
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4-146 ENGINE COMPRESSOR PRESERVATION PROCEDURE (Continued)

4-146

8. Shut down portable cleaning and preservation unit (1). (Refer to vendor manual.)
9. Disconnect hoses (6) from portable cleaning unit fittings (7 and 8) and from aircraft fittings (9 and 10).
10. Install caps on end fittings of hoses (11), and on fittings (9 and 10).
11. Lockwire (E231) fittings (9 and 10).

INSPECT



FOLLOW-ON MAINTENANCE:

- Turn electrical power off.
- Turn hydraulic power off.
- Close engine work platform (Task 2-2).

END OF TASK

Change 19 4-353/(4-354 blank)

SECTION X
FADEC CONTROL SYSTEM
(WITH 74)



INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

- Electrical Mechanic's Tool Kit,
NSN 5180-00-323-4915
- Low Resistance OHM Meter
(Biddle) (T7)

Materials:

- Cloths (E120)
- Gloves (E184.1)
- Paper Tags (E264)
- Aliphatic Naphtha, Type II (E245)

Personnel Required:

- Aircraft Powerplant Repairer (2)
- Inspector

References:

TM 9-6625-975-35

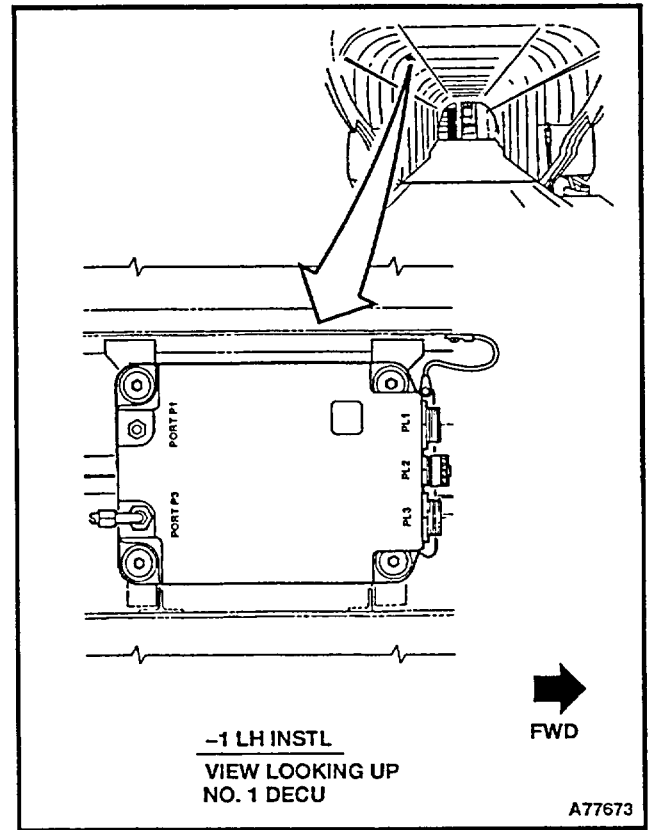
Equipment Condition:

- Digital Electronic Control Unit Historical
Files Downloaded (Task 4-149)
- Electrical Power Off
- Hydraulic Power Off
- Battery Disconnected (Task 1-39)

General Safety Instructions:

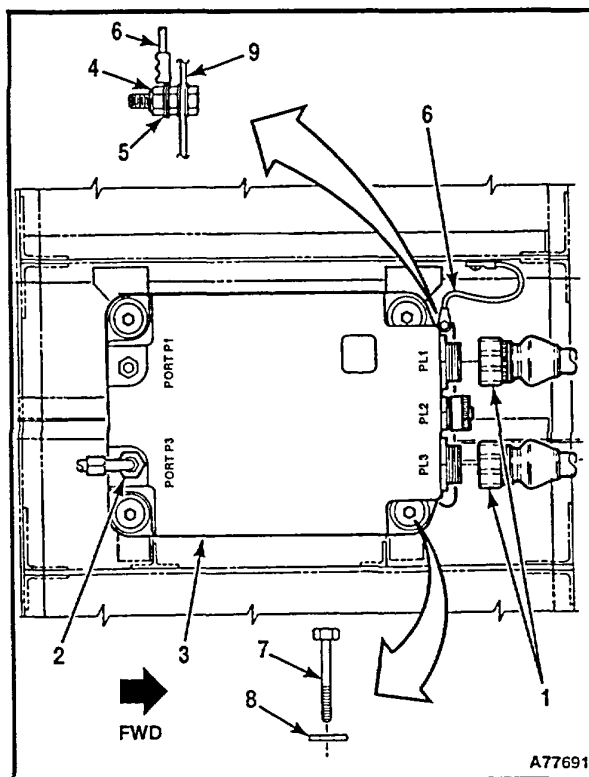
WARNING

Aliphatic 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.



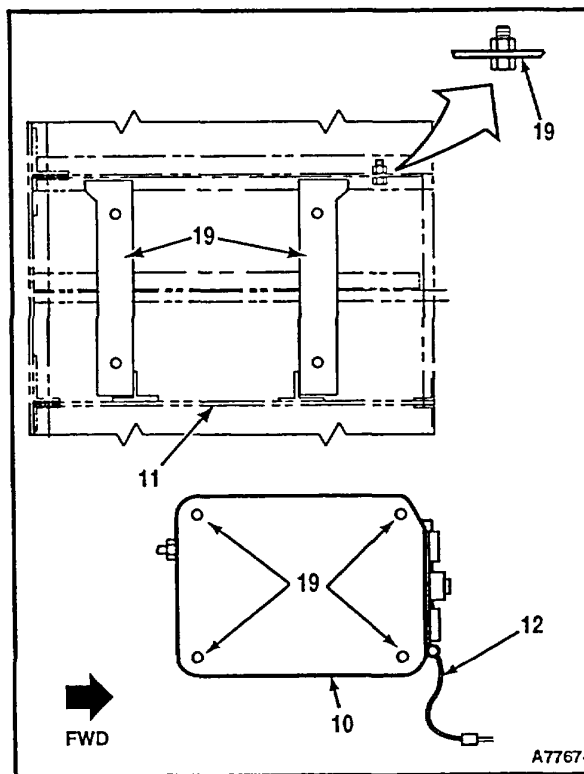
REMOVE

1. Tag and disconnect two electrical connectors (1) and hose (2) from digital electronic control unit (3). Use tags (E264). Cap hose (2).
2. Remove nut (4), washer (5), and bonding jumper (6) from fuselage (9).
3. With helper supporting the digital control unit, remove four bolts (7) and washers (8).
4. Remove digital electronic control unit (3).



INSTALL

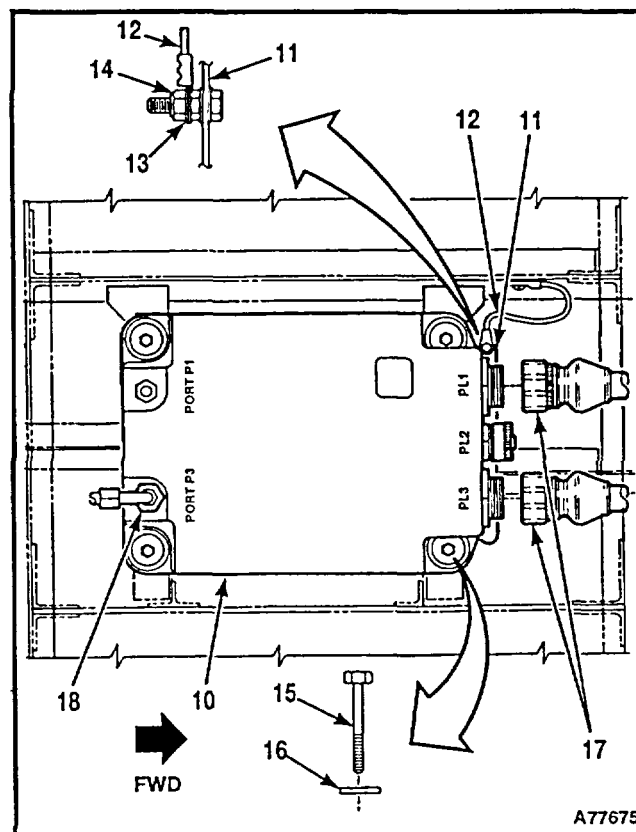
5. Clean bonding and mating surfaces (19) of digital control unit (10), fuselage (11), and bonding jumper (12) with aliphatic naphtha (E245) and cloths (E120). Wear gloves (E184.1).



4-147 REPLACE NO. 1 DIGITAL ELECTRONIC CONTROL UNIT (Continued)

4-147

6. Position digital control unit (10) on fuselage (11).
7. With helper supporting digital electronic control unit (10), install four bolts (15) and washers (16).
8. Install bonding jumper (12) with washer (13) and nut (14).
9. Connect two electrical connectors (17). Remove tags.
10. Remove cap and tag from hose (20). Connect hose (20) to P3 port (18).
11. Using low resistance ohmmeter (T7), perform electrical bonding check (TM 9-6625-975-35) between digital control unit (10) and fuselage (11). Resistance shall be no greater than 0.003 ohms
12. Using low resistance ohmmeter (T7), perform electrical bonding check (TM 9-6625-975-35) between bonding jumper (12) and digital control unit (10). Resistance shall be no greater than 0.0025 ohms

**INSPECT****FOLLOW-ON MAINTENANCE:**

Digital electronic control unit historical files uploaded (Task 4-149).
 Perform operational check of digital electronic control unit (TM 55-1520-240-T).

END OF TASK

Change 19 4-359

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Electrical Mechanic's Tool Kit,
NSN 5180-00-323-4915
Low Resistance OHM Meter (Biddle) (T7)

Materials:

Gloves (E184.1)
Cloths (E120)
Aliphatic Naphtha, Type II (E245)
Paper Tags (E264)

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

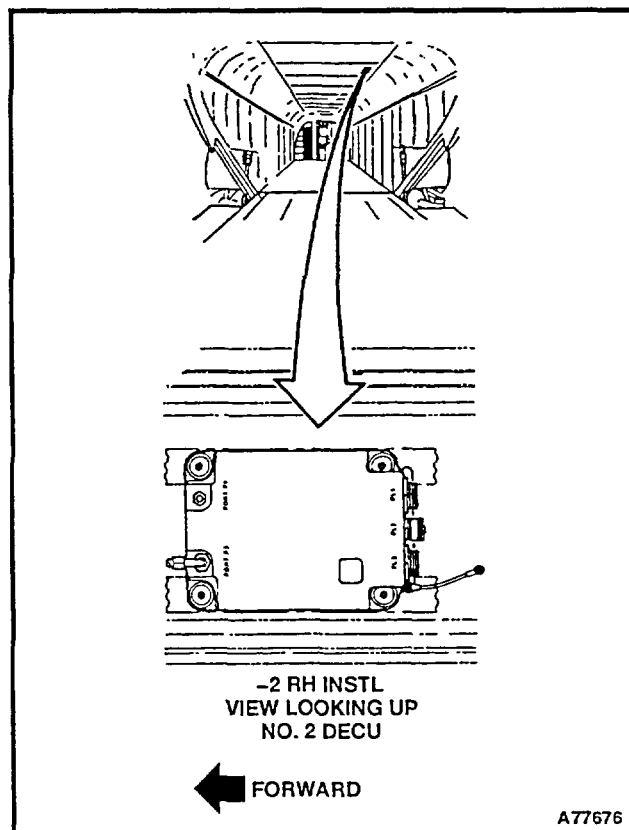
TM 9-6625-975-35

Equipment Condition:

Digital Electronic Control Unit Historical Files
Downloaded (Task 4-149)
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

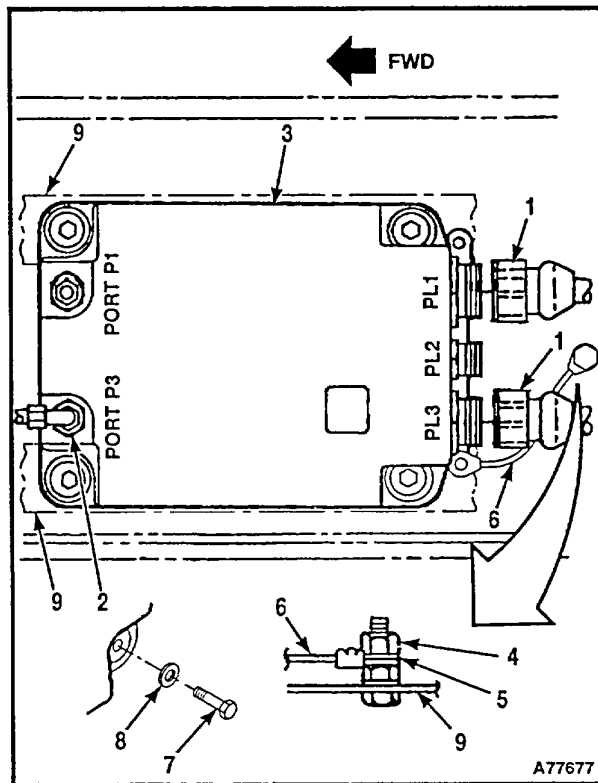
General Safety Instructions:**WARNING**

Aliphatic 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.



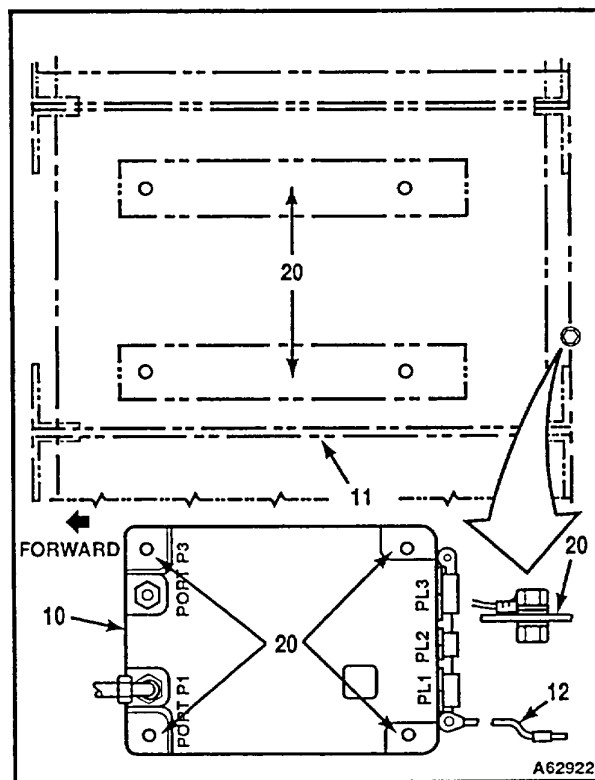
REMOVE

1. Tag and disconnect two electrical connectors (1) and hose (2) from digital electronic control unit (3). Use tags (E264). Cap hose (2).
2. Remove nut (4), washer (5), and bonding jumper (6) from fuselage (9).
3. With helper supporting the digital control unit, remove four bolts (7) and washers (8).
4. Remove digital electronic control unit (3).

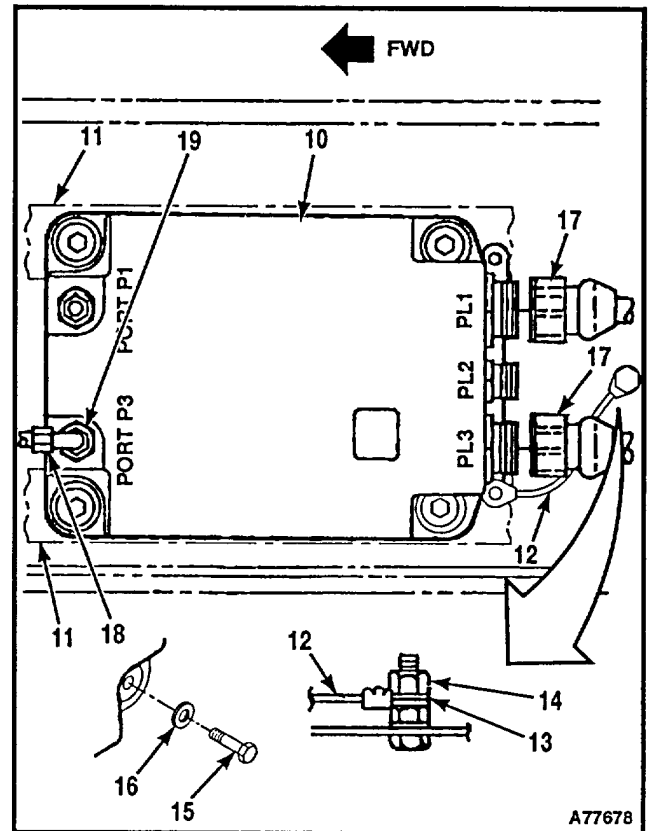


INSTALL

5. Clean bonding surfaces (20) of digital control unit (10), fuselage (11), and bonding jumper (12) with aliphatic naphtha (E245) and cloths (E120). Wear gloves (E184.1).



6. Position digital control unit (10) on fuselage (11).
7. With helper supporting digital electronic control unit (10), install four bolts (15) and washers (16).
8. Install bonding jumper (12) with washer (13) and nut (14).
9. Connect two electrical connectors (17). Remove tags.
10. Remove cap and tag from hose (18). Connect hose (18) to P3 port (19).
11. Using low resistance ohmmeter (T7), perform electrical bonding check (TM 9-6625-975-35) between digital control unit (10) and fuselage (11). Resistance shall be no greater than 0.003 ohms.
12. Using low resistance ohmmeter (T7), perform electrical bonding check (TM 9-6625-975-35) between bonding jumper (12) and digital control unit (10). Resistance shall be no greater than 0.0025 ohms.



FOLLOW-ON MAINTENANCE:

Digital electronic control unit historical files uploaded (Task 4-149).

Perform operational check of digital electronic control unit (TM 55-1520-240-T).

INITIAL SETUP

Applicable Configurations:

With 74

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
EMC-32T-2 (Husky)

Materials:

None

Personnel Required:

Aircraft Electrician

References:

Operators Manual EMC-32T-2, Engine
Historical Record Terminal
TM 1-2840-265-23

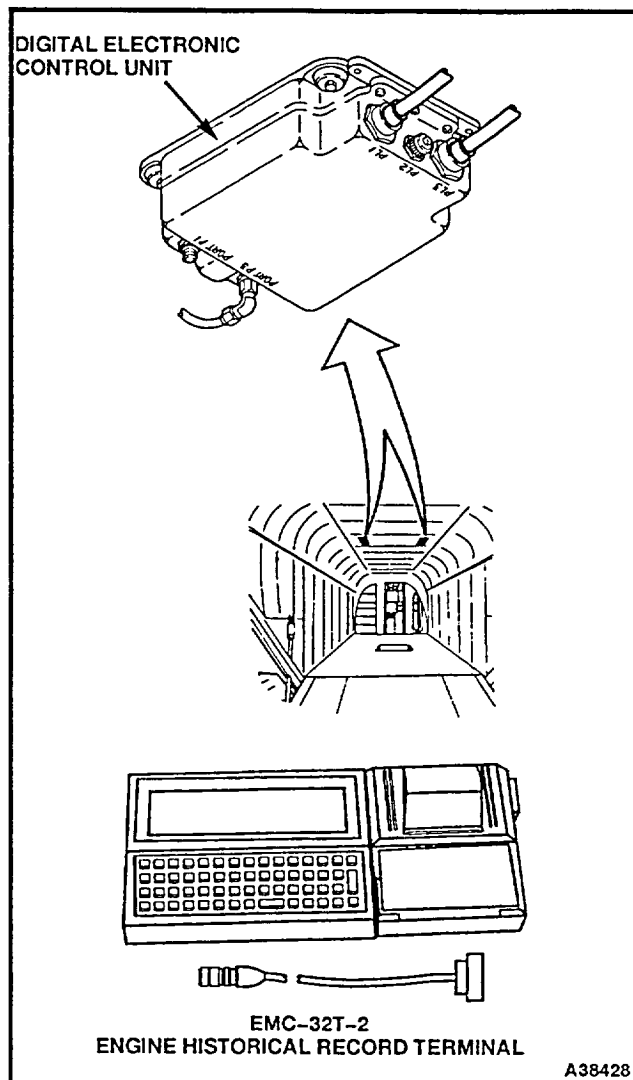
Equipment Condition:

Electrical Power On
ENGINE CONDITION Lever Set to GROUND
PRI/REV Switch on FADEC Panel Set to PRI

General Safety Instructions:

CAUTION

Rough handling of the EMC-32T-2 Engine Historical Record Terminal could cause damage.



1. Upload or download historical files from the digital electronic control unit (decu) (TM 1-2840-265-23).

END OF TASK

INITIAL SETUP

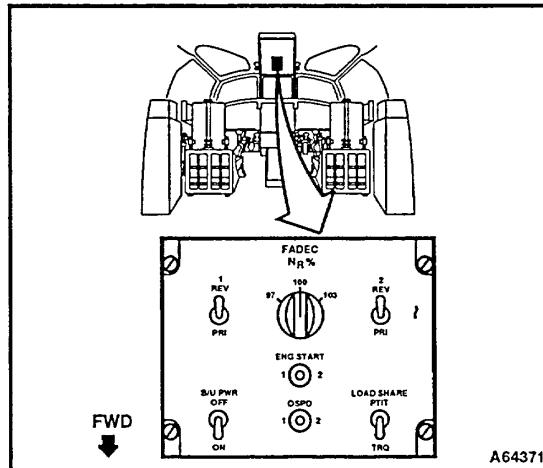
Applicable Configurations:
With **74**

Tools:
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

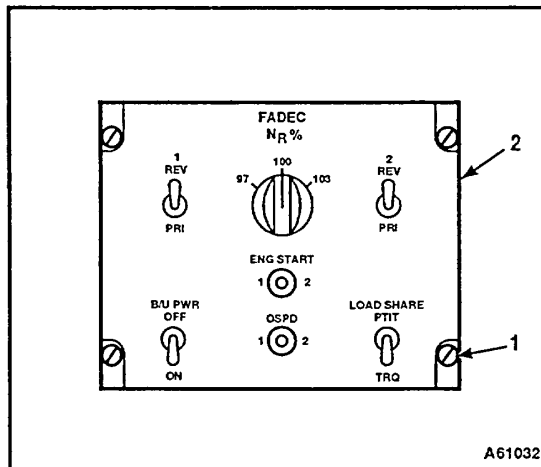
Materials:
Paper Tags (E264)

Personnel Required:
Aircraft Electrician

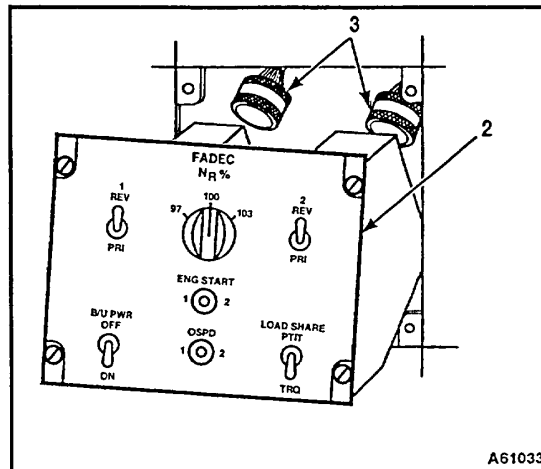
Equipment Condition:
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



1. Release four fasteners (1) on control panel (2).



2. Lower control panel (2) enough to reach electrical connectors (3). Tag and **disconnect two electrical connectors**.
3. Remove control panel (2).



FOLLOW-ON MAINTENANCE:
None

END OF TASK
4-364 Change 19

INITIAL SETUP

Applicable Configurations:

With fl

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

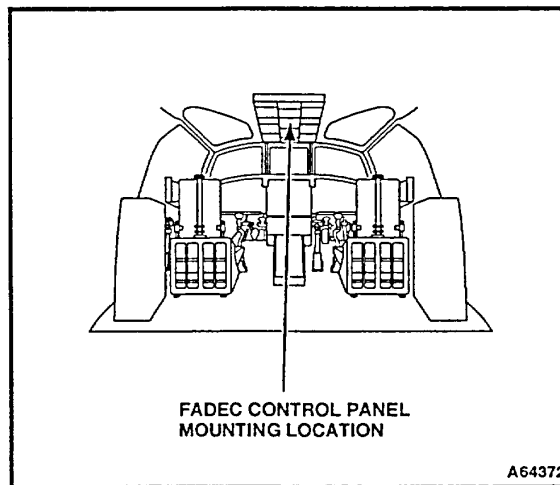
None

Personnel Required:

Aircraft Electrician
Inspector

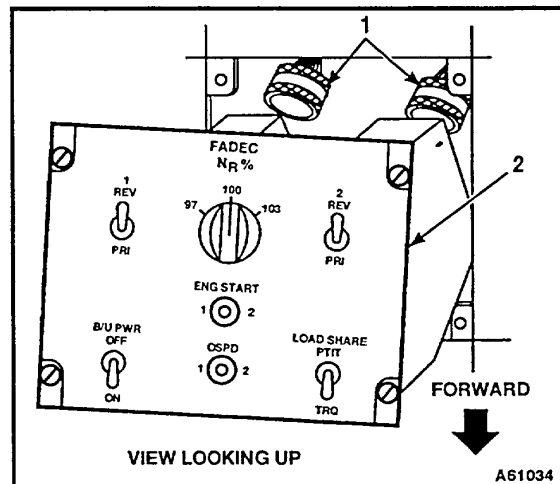
References:

TM 55-1520-240-23P
TM 55-1520-240-T



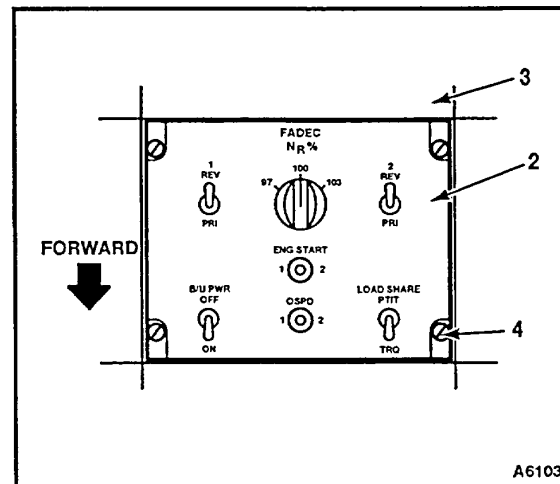
1. Connect two electrical connectors (1) to control panel (2). Remove tags.

INSPECT



2. Position control panel (2) on overhead panel (3).
3. Secure four fasteners (4).

INSPECT



FOLLOW-ON MAINTENANCE:

Perform operational check of gas producer system (TM 55-1520-240-T).

END OF TASK

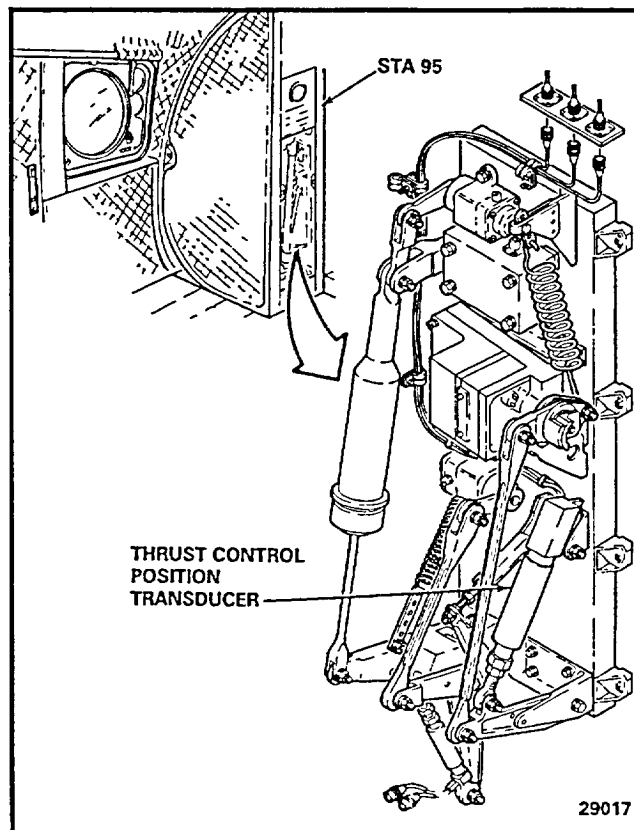
INITIAL SETUP

Applicable Configurations:With **74****Tools:**Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915**Materials:**

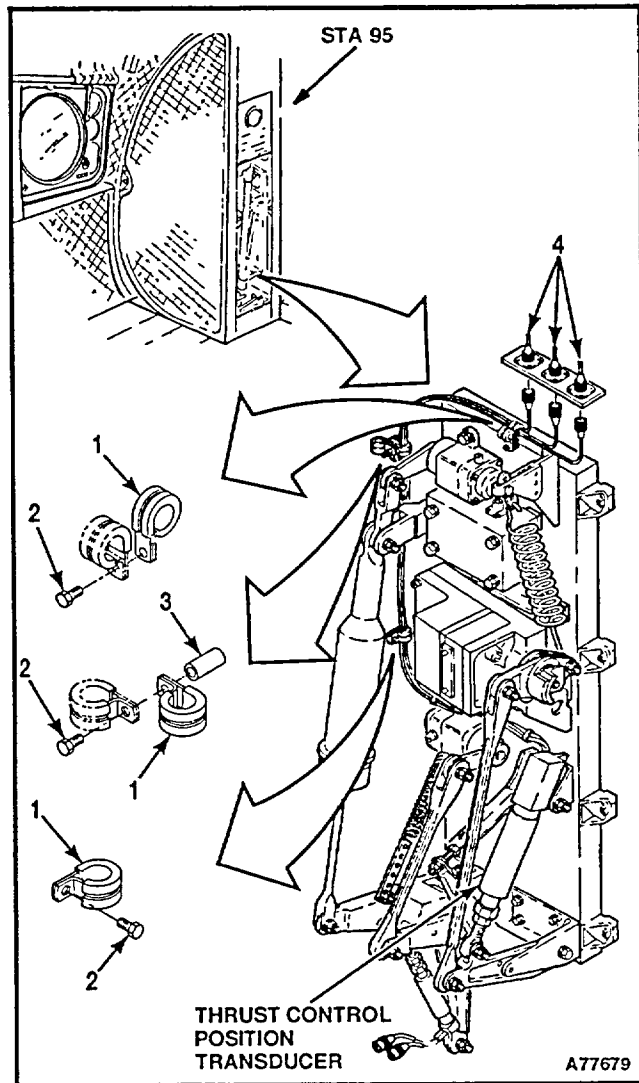
Paper Tags (E264)

Personnel Required:

Aircraft Electrician

Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Controls Closet Acoustic Blanket Removed
(Task 2-208)
Controls Closet Panel Removed (Task 2-2)

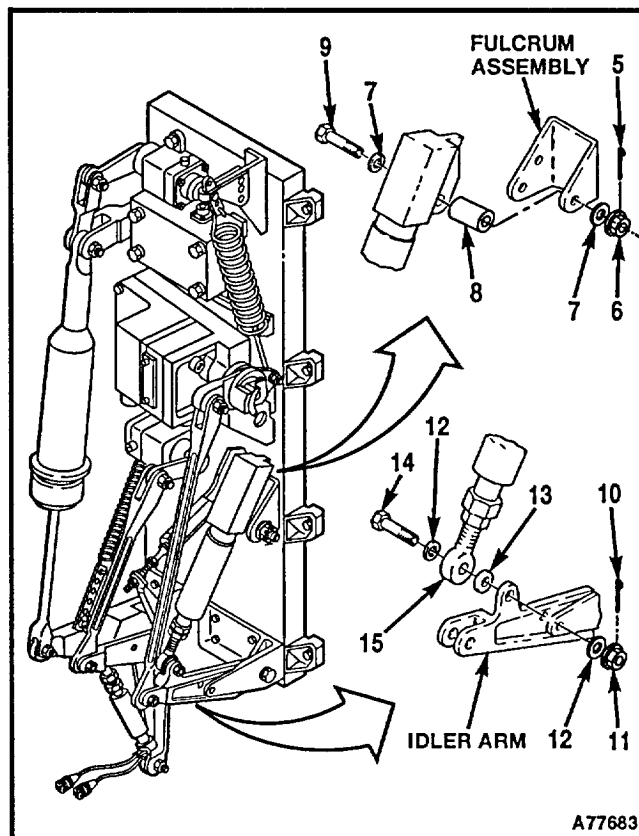
1. Remove five clamps (1), three bolts (2), and one spacer (3).
2. Tag (E264) and disconnect three connectors (4).



4-152 REMOVE THRUST CONTROL POSITION TRANSDUCER ASSEMBLY (Continued)

4-152

3. **Remove** cotter pin (5), nut (6), two washers (7), bushing (8), and **bolt** (9). **Discard washers (7).**
4. **Remove** cotter pin (10), nut (11), washers (12), bushing (13), and **bolt** (14). **Discard washers (12).**
5. **Remove** thrust control position transducer assembly (15).



FOLLOW-ON MAINTENANCE:
None

END OF TASK
4-368 Change 19

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

- Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
- Digital Multimeter (T-27)
- LVDT Test Harness (Appx E-319)

Materials:

Lockwire (E231)

Parts:

Washers

Personnel Required:

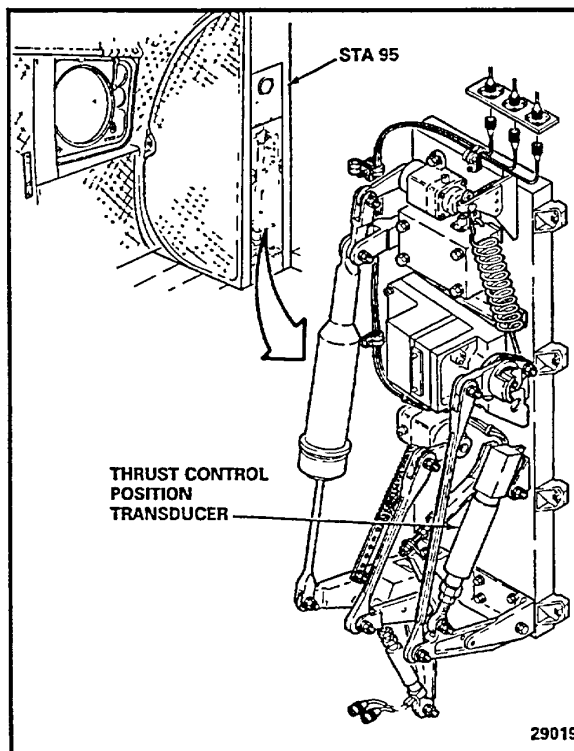
- Aircraft Electrician (2)
- Inspector

References:

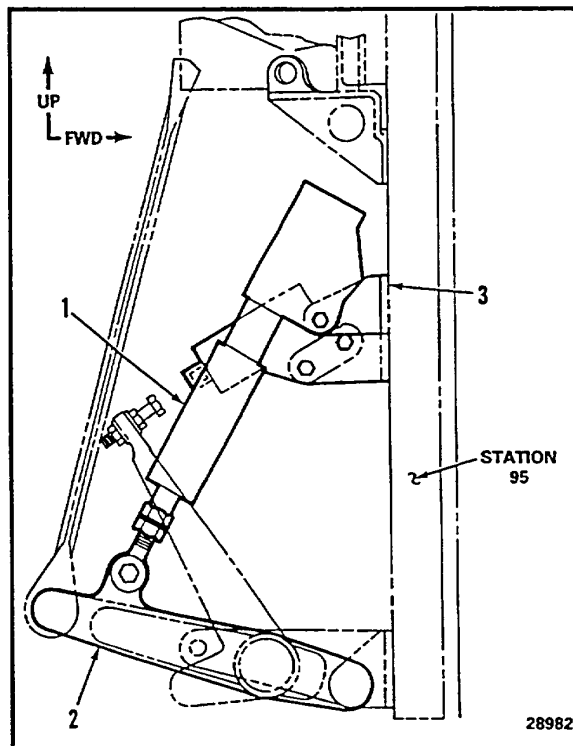
- Task 1-37
- Task 1-38
- TM 55-1520-240-23P
- Appendix E

Equipment Condition:

- Electrical Power On
- Hydraulic Power On
- Flight Controls Rugged in Neutral Position
(Task 11-33)



1. Position thrust control position transducer assembly (1) on idler arm (2) and fulcrum (3).



GO TO NEXT PAGE

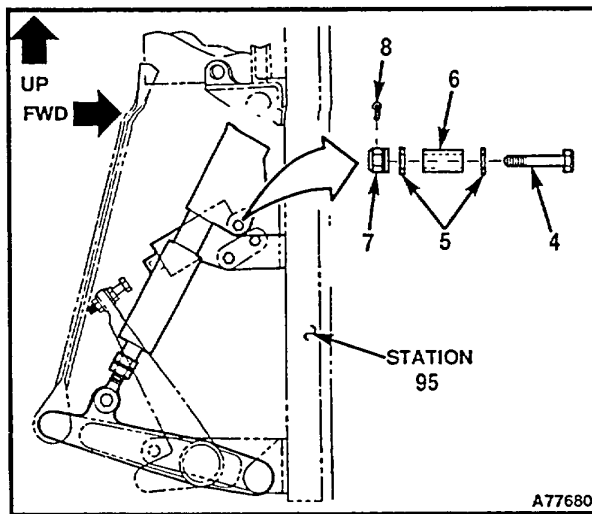
CAUTION

When a light washer is used under the nut prior to applying nut torque, make certain that washer does not hang up in the bolt retaining groove. If this condition is allowed to exist, damage can result to associated hardware and/or prevent proper clamp-up.

NOTE

Bolt and nut installation is not acceptable if, after tightening nut to torque value, the bolt and nut assembly can be rotated with a torque less than 10 inch pounds and/or any axial looseness exists. If either condition is present, add washer under nut and retorquing.

2. Install bolt (4), two new washers (5), bushing (6), nut (7), and cotter pin (8) through fulcrum assembly.

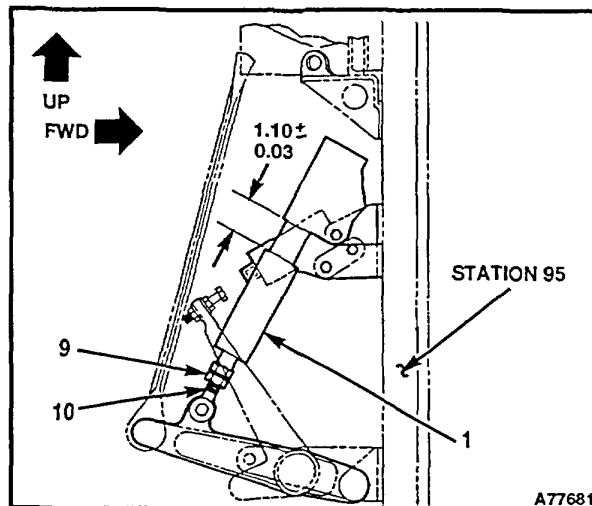


INSPECT

NOTE

Before adjusting thrust control position transducer rod end, ensure that flight controls have been rigged to neutral position (Task 11-33).

3. Loosen jamnut (9). Adjust rod end (10) to achieve clearance dimension of not more than 1.13 inch or less than 1.07 inch on thrust control transducer assembly (1).



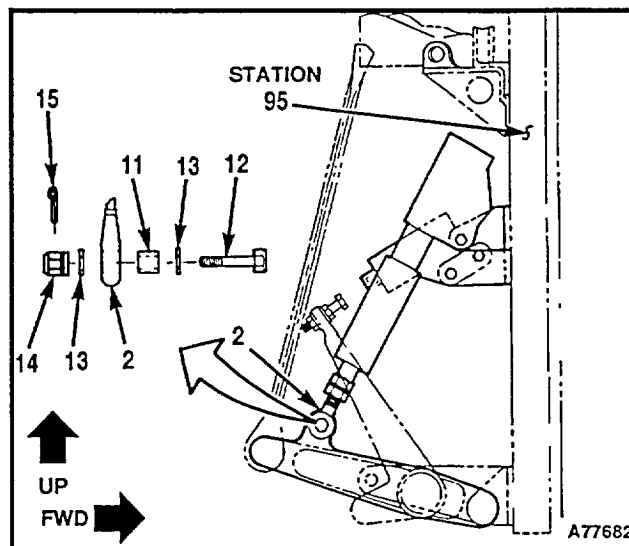
CAUTION

When a light washer is used under the nut prior to applying nut torque, make certain that washer does not hang up in the bolt retaining groove. If this condition is allowed to exist, damage can result to associated hardware and/or prevent proper clamp-up.

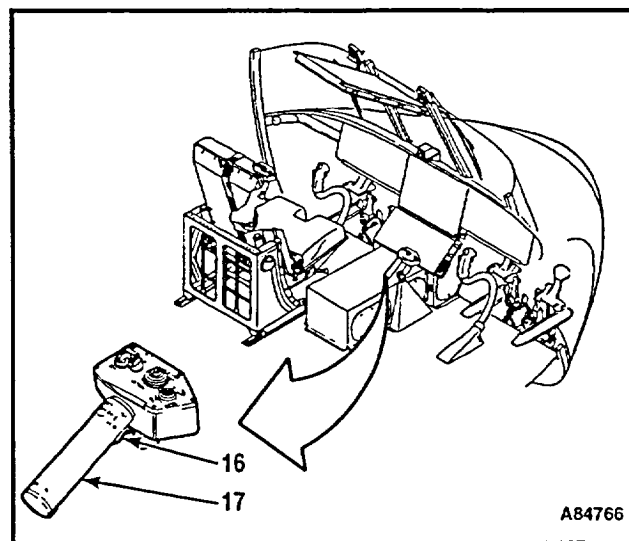
NOTE

Bolt and nut installation is not acceptable if, after tightening nut to torque value, the bolt and nut assembly can be rotated with a torque less than 10 inch pounds and/or any axial looseness exists. If either condition is present, add washer under nut and retorque.

4. Install bushing (11), bolt (12), two new washers (13), nut (14), and cotter pin (15) through idler arm (2).

**INSPECT**

5. With magnetic brake (16) released, **depress the pilot thrust lever (17)** until contact is made at the thrust lever down stop.
6. Using minimum force required, **maintain thrust lever down stop contact.**



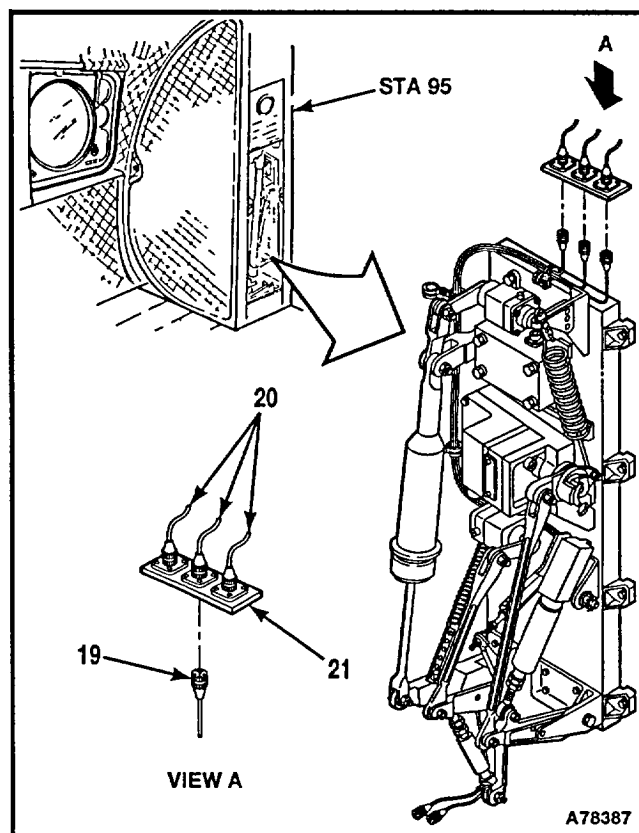
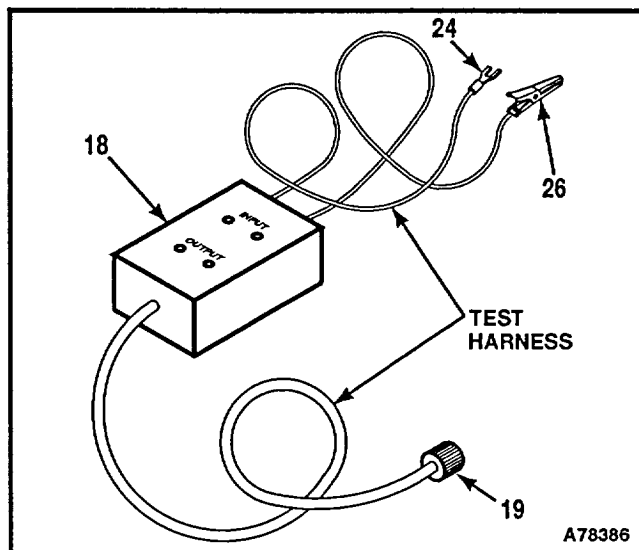
NOTE

Each cable is banded with a color code on pigtail. Channel 1 cable is banded red, Channel 2 is banded blue, Channel 3 is banded yellow.

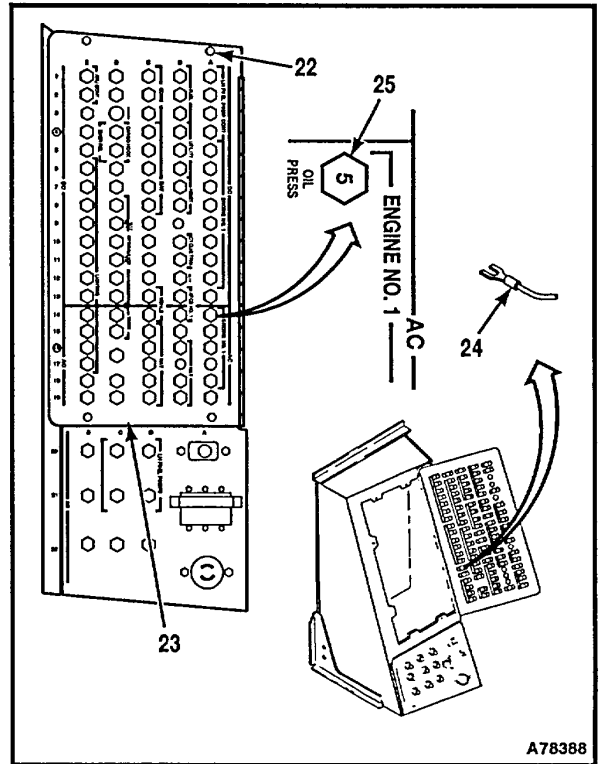
NOTE

Before the collective position sensor rigging can be done, the mechanical flight controls system must be rigged. Refer to Aircraft Rigging Procedure (Task 11-33).

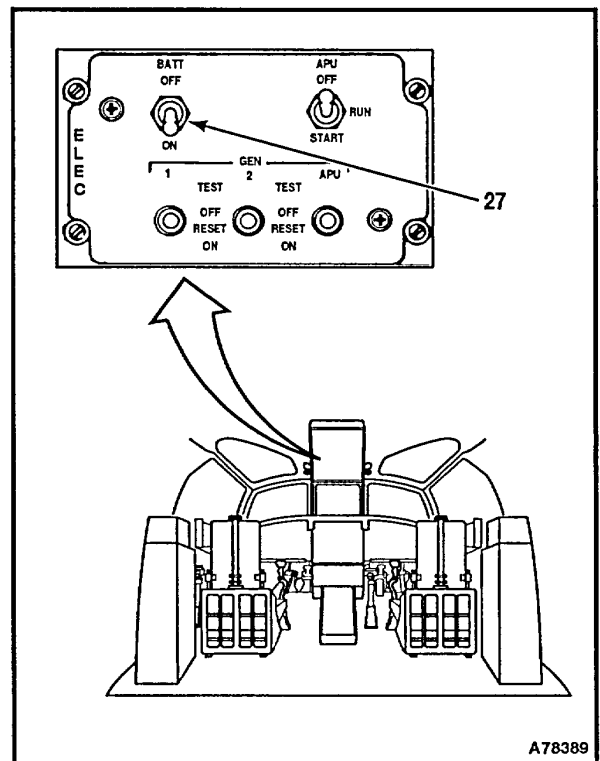
7. **Disconnect electrical power** (Task 1-37) prior to connecting lvdt test harness (Appx E-319).
8. **Lay out the two test wire harnesses** from test box (18) so that they reach from the cockpit to the flight controls closet at sta 95.
9. At sta 95, connect test wire harness plug (19) to either red or blue marked channel (20) of the collective pitch lvdt assembly (21), adjacent to connector 104J7.



10. Loosen six fasteners (22) and open No. 1 PDP (23) to gain access to the rear of circuit breaker panel.
11. Attach Ivdt test harness power lead lug (24) to rear contact of ENGINE NO. 1 OIL PRESS circuit breaker (25).

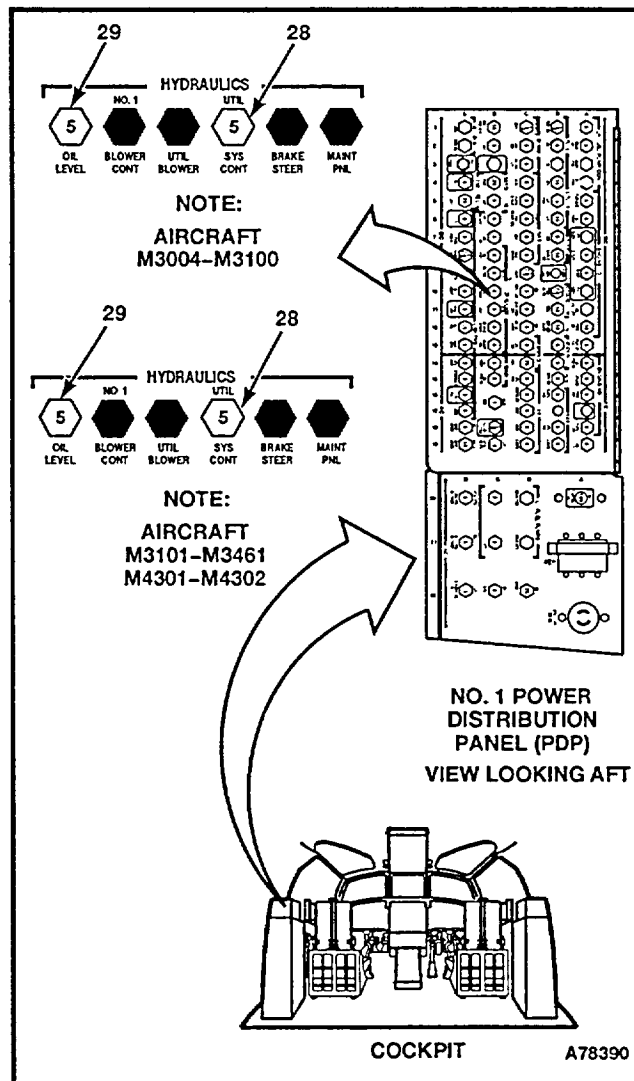


12. Attach Ivdt test wire harness ground lead clip (26) to helicopter ground.
13. On the cockpit overhead panel, set the ELECT-BATT switch (27) to ON.



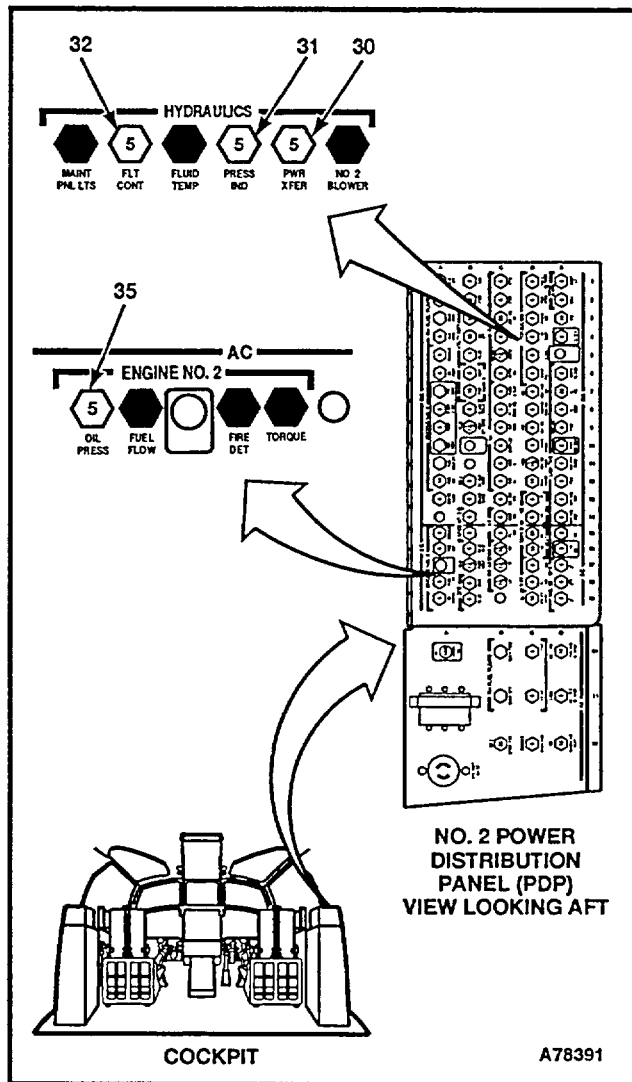
14. Apply electrical power to helicopter (Task 1-37).
15. Apply hydraulic power to helicopter (Task 1-38).
16. Close the following circuit breakers on No. 1 DC PDP:

HYDRAULICS UTIL SYS CONT (28) or
 HYDRAULICS SYS CONT (28)
 HYDRAULICS OIL LEVEL (29)

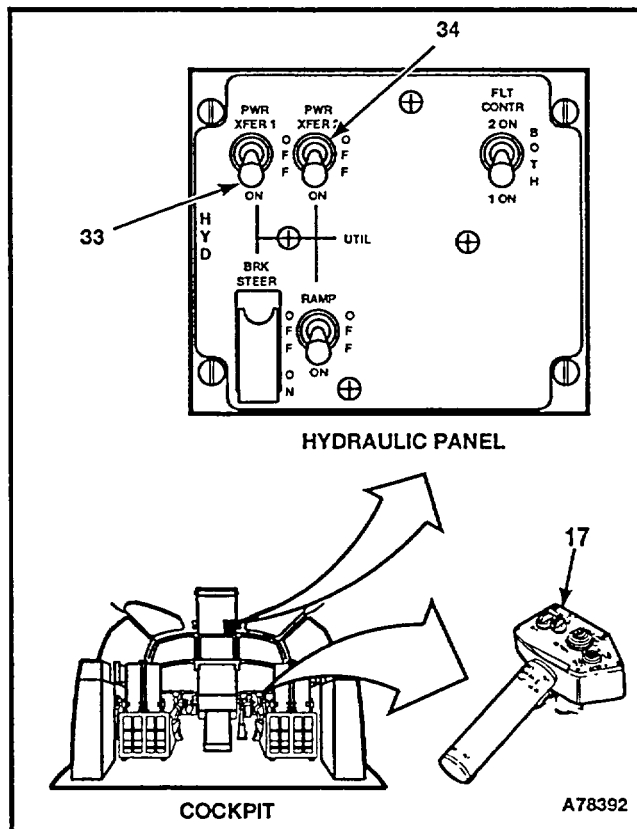


17. Close the following circuit breakers on No. 2 DC PDP:

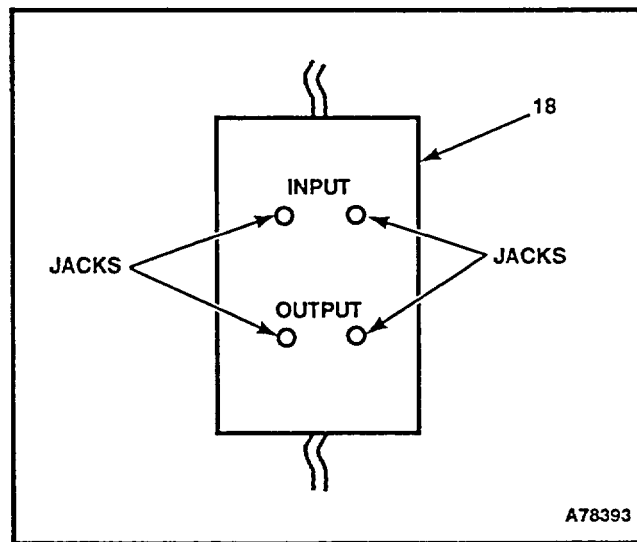
- HYDRAULICS PWR XFER (30)
- HYDRAULICS PRESS IND (31)
- HYDRAULICS FLT CONT (32)



18. On the cockpit overhead panel, set **PWR XFR NO. 1 (33)** and **PWR XFR NO. 2 (34)** switches to ON.
19. Close the **ENGINE NO. 1 OIL PRESS** circuit breaker (35) on the No. 1 AC PDP.
20. Move the pilot or copilot thrust lever (17) to the full down position, hard against the stop.



21. Connect a multimeter to the lvdt test box (18) input jacks. **Measure the input voltages at pins 1 and 2 and pins 6 and 7.** Input voltages shall be 26.000 to 29.000 Vac.
22. Record the readings to three decimal places.
23. Connect a multimeter to the lvdt test box (18) output jacks. **Measure the output voltages at pins 3 and 4 and pins 8 and 9.**
24. The output voltage readings shall be within the **Max and Min range that corresponds to the input voltage shown in the table on the following page.** For example, if the input voltage is 27.70 Vac, the output voltage should be between 1.928 and 1.920 Vac.



4-153 INSTALL AND RIG THRUST CONTROL POSITION TRANSDUCER ASSEMBLY (Continued)

4-153

Input Voltage (Vac)	Output Voltage (Vac)	
	Max	Min
26.00	1.809	1.802
26.05	1.813	1.805
26.10	1.816	1.809
26.15	1.820	1.812
26.20	1.823	1.816
26.25	1.827	1.819
26.30	1.830	1.823
26.35	1.834	1.826
26.40	1.837	1.830
26.45	1.841	1.833
26.50	1.844	1.836
26.55	1.848	1.840
26.60	1.851	1.843
26.65	1.855	1.847
26.70	1.858	1.850
26.75	1.862	1.854
26.80	1.865	1.857
26.85	1.868	1.861
26.90	1.872	1.864
26.95	1.875	1.868
27.00	1.879	1.871
27.05	1.882	1.875
27.10	1.886	1.878
27.15	1.889	1.881
27.20	1.893	1.885
27.25	1.896	1.888
27.30	1.900	1.892
27.35	1.903	1.895
27.40	1.907	1.899
27.45	1.910	1.902
27.50	1.914	1.906

Input Voltage (Vac)	Output Voltage (Vac)	
	Max	Min
27.50	1.914	1.906
27.55	1.917	1.909
27.60	1.921	1.913
27.65	1.924	1.916
27.70	1.928	1.920
27.75	1.931	1.923
27.80	1.935	1.927
27.85	1.938	1.930
27.90	1.942	1.933
27.95	1.945	1.937
28.00	1.949	1.940
28.05	1.952	1.944
28.10	1.955	1.947
28.15	1.959	1.951
28.20	1.962	1.954
28.25	1.966	1.958
28.30	1.969	1.961
28.35	1.973	1.965
28.40	1.976	1.968
28.45	1.980	1.972
28.50	1.983	1.975
28.55	1.987	1.979
28.60	1.990	1.982
28.65	1.994	1.985
28.70	1.997	1.989
28.75	2.001	1.992
28.80	2.004	1.996
28.85	2.008	1.999
28.90	2.011	2.003
28.95	2.015	2.006
29.00	2.018	2.010

25. If the voltages do not fall within those specified in the table, remove the safety wire, and **adjust the lvdt until voltage is within range limits.**

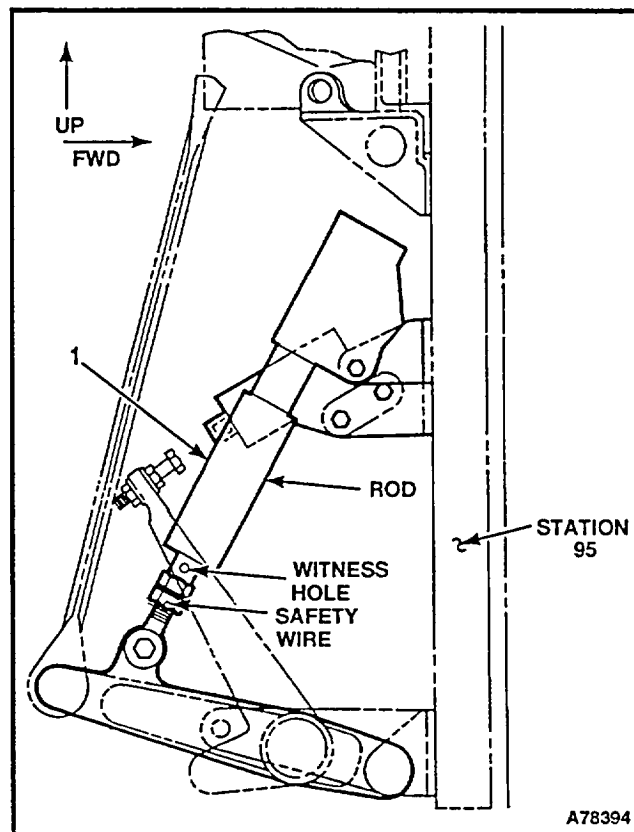
NOTE

Ensure that the threads of the rod end can be seen through the witness hole. If the threads are not visible, a new rod will be required.

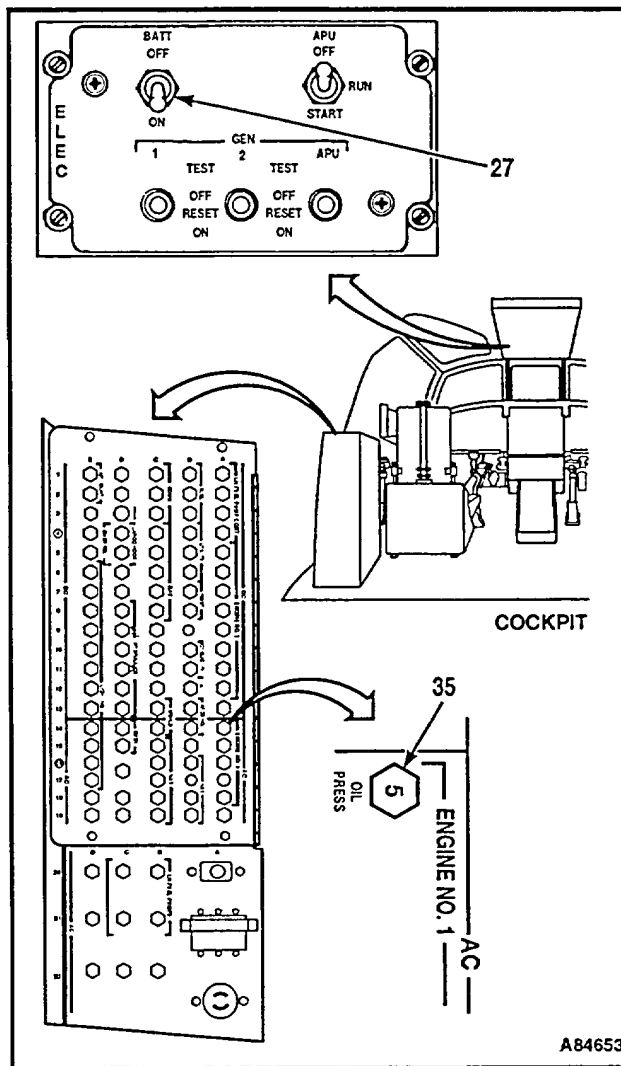
26. **Lockwire the rod end** after adjustment is completed. Use lockwire (E231).

INSPECT

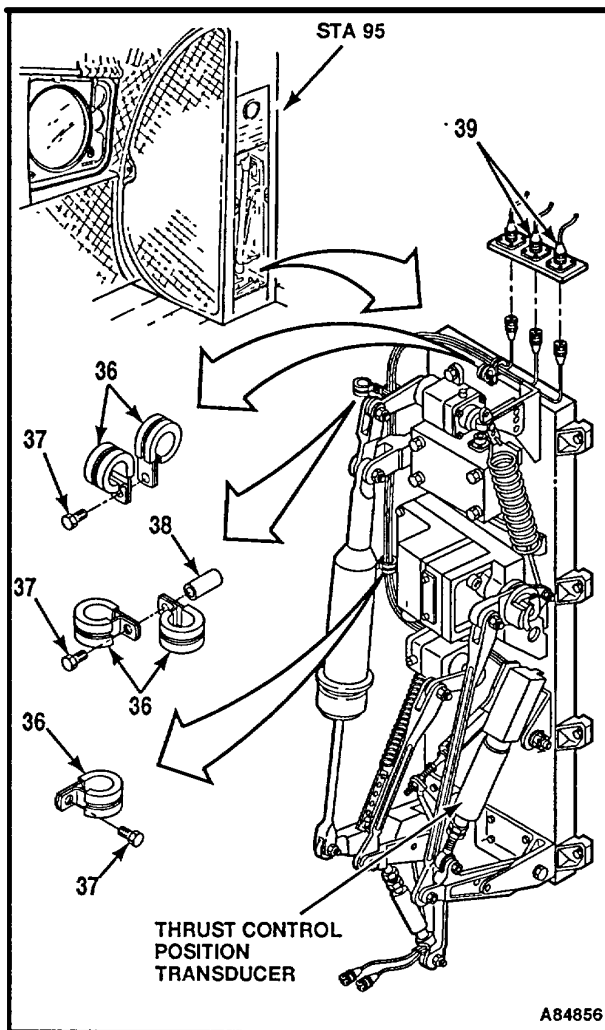
27. Ensure that the voltage ranges are correct. Repeat steps 20 thru 24.



28. Open **ENGINE NO. 1 OIL PRESS** circuit breaker (35) on the No. 1 AC PDP.
29. Remove electrical power from the aircraft (Task 1-37).
30. Set the **BATT** switch (27) to **OFF**.
31. Remove hydraulic power from the aircraft (Task 1-38).
32. Disconnect and remove the lvdt test harness. Close the **No. 1 PDP** and tighten six fasteners.
33. Stow the appropriate channel of the collective pitch lvdt assembly.



- 34. Install five clamps (36). Secure clamps (36) with bolts (37) and spacer (38).
- 35. Connect tagged electrical connectors (39) to their respective receptacles.

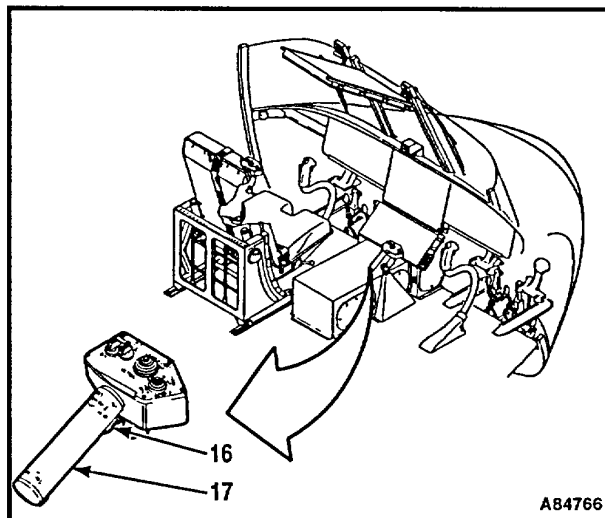


A84856

- 36. Release thrust lever (17) and engage magnetic brake (16).

FOLLOW-ON MAINTENANCE:

- Install controls closet acoustic blanket (Task 2-210).
- Install controls closet panel (Task 2-2).
- Perform operational check of thrust control position transducer (TM 55-1520-240-T).



A84766

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

Paper Tags (E264)

Personnel Required:

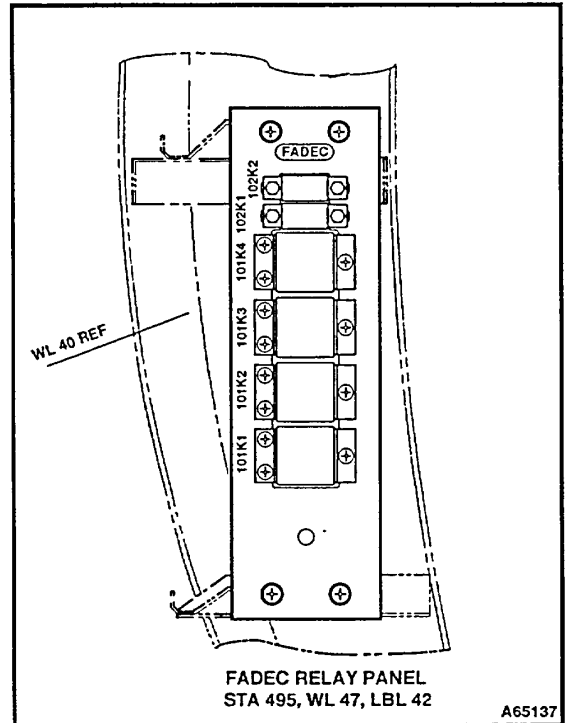
Aircraft Electrician

References:

TM 55-1520-240-23P

Equipment Condition:

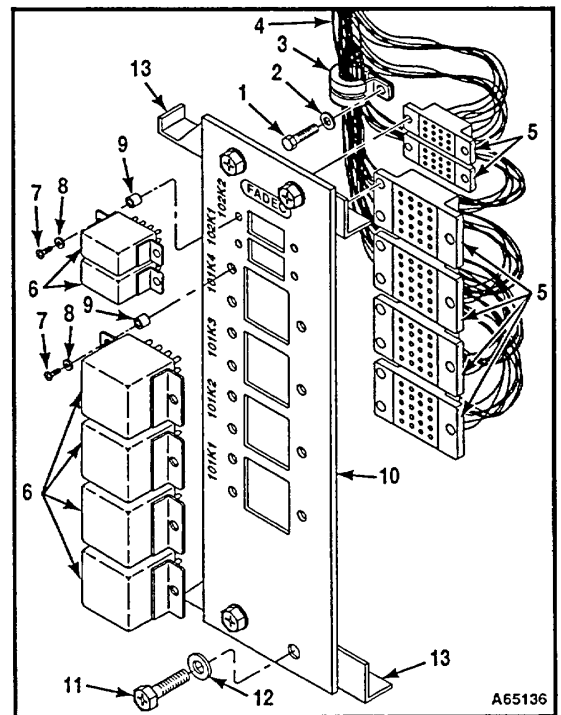
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



1. Remove screw (1) and washer (2) from clamp (3).
2. Remove clamp (3) from wire bundle (4).
3. Tag and disconnect six connectors (5) from relays (6). Use tags (E264).
4. Remove screws (7), washers (8), and spacers (9) from relays (6).
5. Remove relays (6) from FADEC relay panel (10).
6. Remove screws (11) and washers (12) from FADEC relay panel (10).
7. Remove FADEC relay panel (10) from mounting brackets (13).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

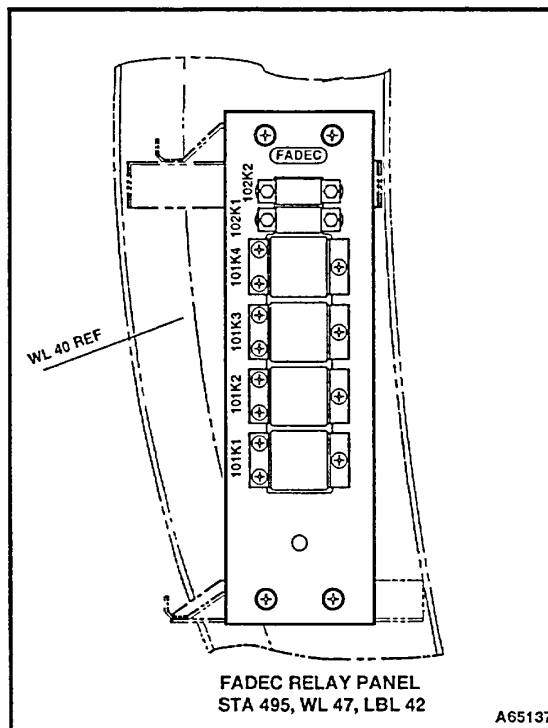
Aircraft Electrician
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

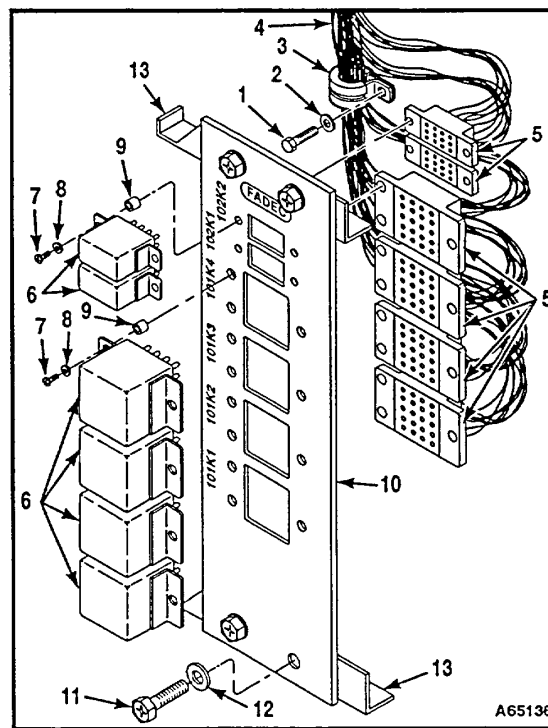
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



1. Position FADEC relay panel (10) on mounting bracket (13).
2. Install screws (11) and washers (12) on FADEC relay panel (10).
3. Position relays (6) on FADEC relay panel (10).
4. Install screws (7), washers (8), and spacers (9) on relays (6).
5. Connect six connectors (5) to relays (6). Remove tags.
6. Position clamp (3) on wire bundle (4).
7. Install screw (1) and washer (2) on clamp (3).

FOLLOW-ON MAINTENANCE:

None



4-156 REMOVE POWER ASSURANCE PANEL AND TEST SWITCH

4-156

INITIAL SETUP

Applicable Configurations:

With 74

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:

Paper Tags (E264)

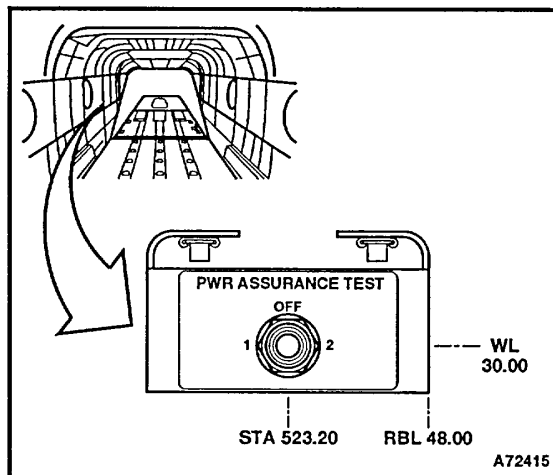
Personnel Required:

Aircraft Electrician

Equipment Condition:

Battery Disconnected (Task 1-39)

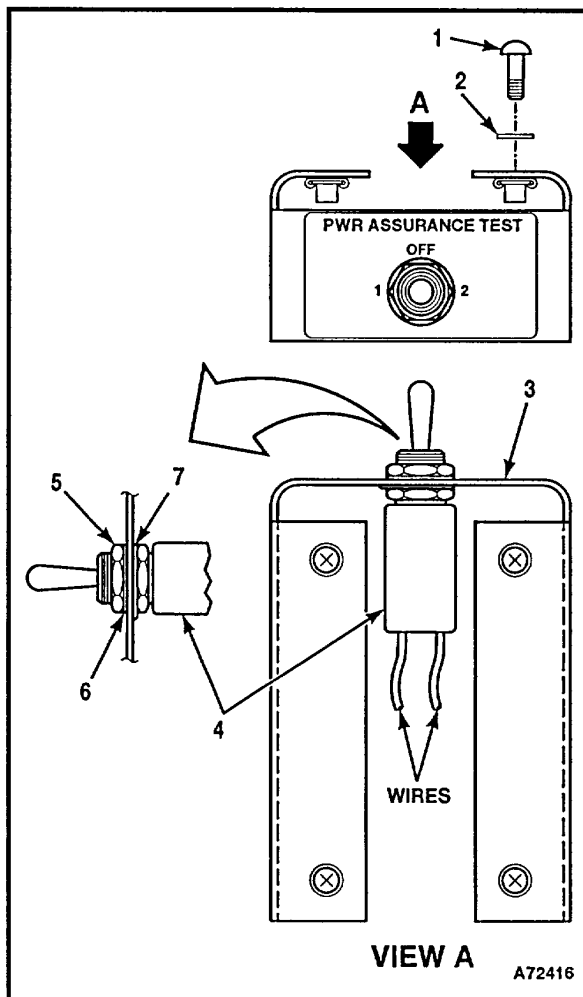
Electrical Power Off



1. Remove screws (1) and washers (2) from panel (3).
2. Tag and disconnect wires from the test switch (4).
3. Remove nut (5) and lockwasher (6).
4. Remove switch (4) and lockring (7) from panel (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-157 INSTALL POWER ASSURANCE PANEL AND TEST SWITCH

4-157

INITIAL SETUP

Applicable Configurations:

With 74

Tools:

Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Ohmmeter

Materials:

Paper Tags (E264)

Personnel Required:

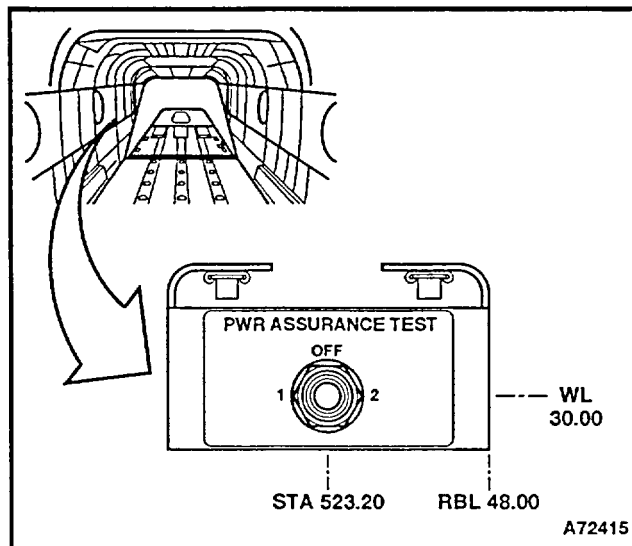
Aircraft Electrician

References:

TM 9-6625-975-35
TM 55-1520-240-T

Equipment Condition:

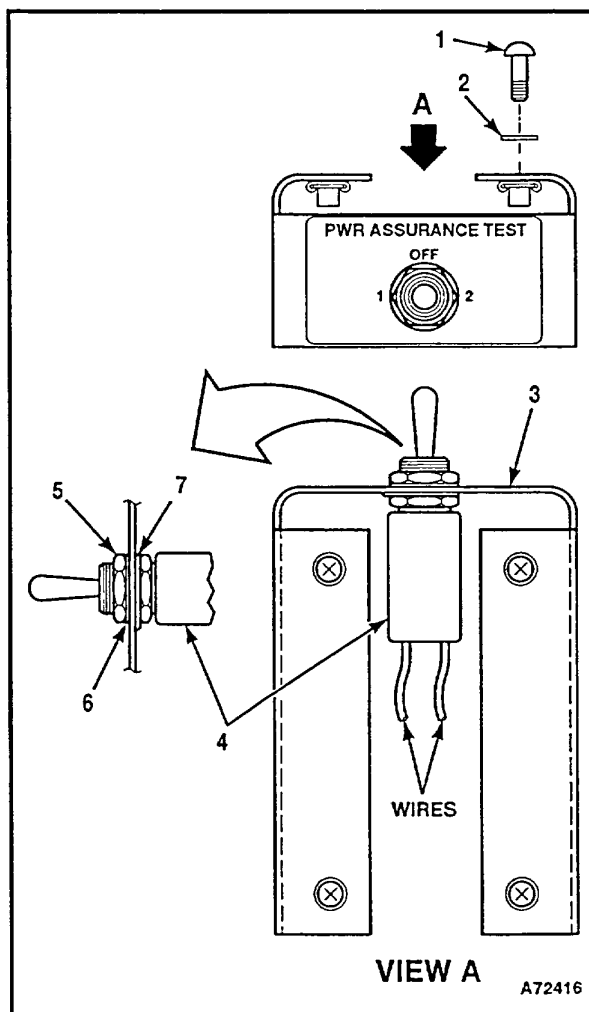
Battery Disconnected (Task 1-39)
Electrical Power Off



1. **Position switch (4)** and locking (7) on panel(3).
2. **Install lockwasher (6)** and nut (7) on the switch (4).
3. **Attach the wires to the switch (4)**. Discard the tags.
4. **Position the panel (3)** and install the washers (2) and screws (1).
5. Perform bonding and grounding check per TM 9-6625-975-35. The maximum resistance between the switch (4) and the panel (3) is 0.0025 ohms.

FOLLOW-ON MAINTENANCE:

Perform the operational check of the power assurance test switch (TM 55-1520-240-T).



INITIAL SETUP**Applicable Configurations:**With **74****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Fuel Resistant Container, 2-Gallon
Hose (Appx E-317)

Materials:

Cloths (E121)
Gloves (E184.1)

Personnel Required:

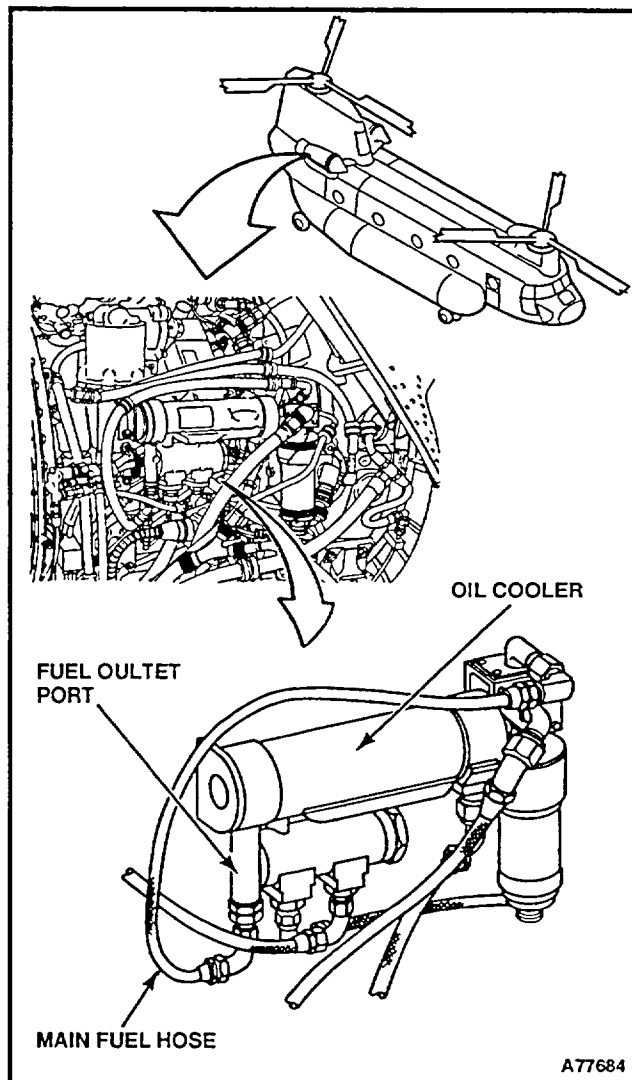
Army Rotary-Wing Aviator (2)
Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-10
TM 1-2840-265-23
Appendix E

Equipment Condition:

Battery Connected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Engine Oil Tank Serviced (Task 1-52)
Helicopter Grounded (Task 1-29)
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)
All Covers and Barrier Material Removed From
Engine
Engine Inlet and Exhaust Inspected for FOD
All Bypass Indicators on Engine Fuel Filters Reset
(TM 1-2840-265-23)



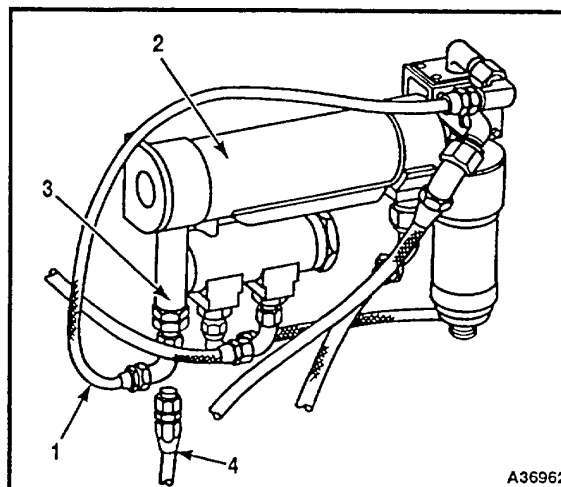
GO TO NEXT PAGE

Change 19 4-385

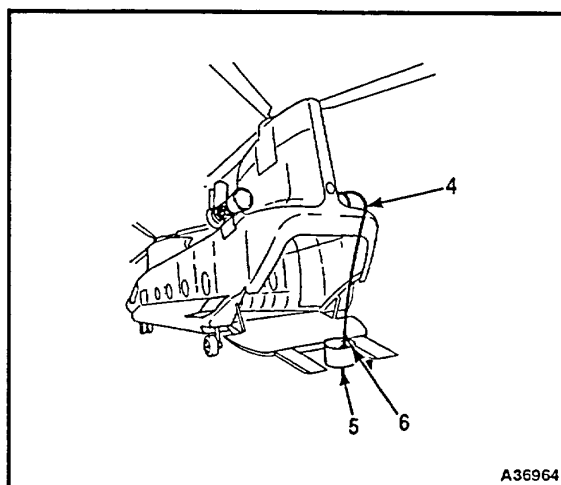
NOTE

This procedure is the same for the No. 1 or the No. 2 engine. The No. 2 engine is shown here.

1. **Disconnect and cap the main fuel hose (1)** from the oil cooler (2) at the fuel outlet port (3).
2. **Attach the drain hose (4) (Appx E-317)** to the fuel outlet port (3).
3. **Place the free end of the drain line (4)** into the grounded fuel resistant container (5).
4. **Attach a grounding wire (6)** from the fuel container (5) to the drain line (4).



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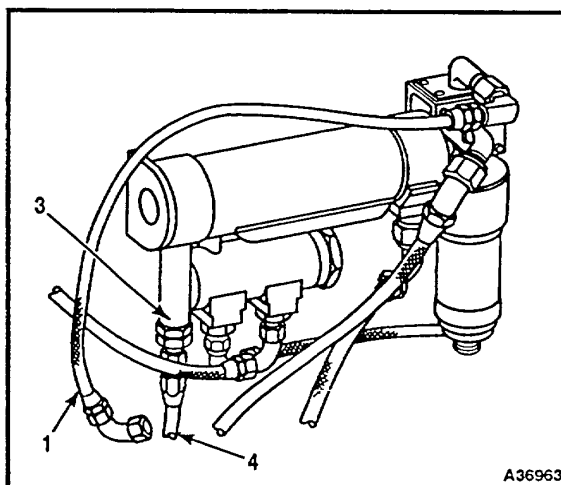


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NOTE

An external AC power and external hydraulic power may be used.

5. **Prepare and start the APU (5)** (TM 55-1520-240-10).
6. Have the rotary-wing aviators motor the engine.
7. Continue motoring the engine until approximately one gallon of fuel has drained into the grounded fuel container (5).
8. Stop motoring the engine.
9. **Remove the drain line (4)** from the fuel outlet port (3).
10. **Remove the cap and connect the main fuel hoses (1)** to the oil cooler outlet port (3).



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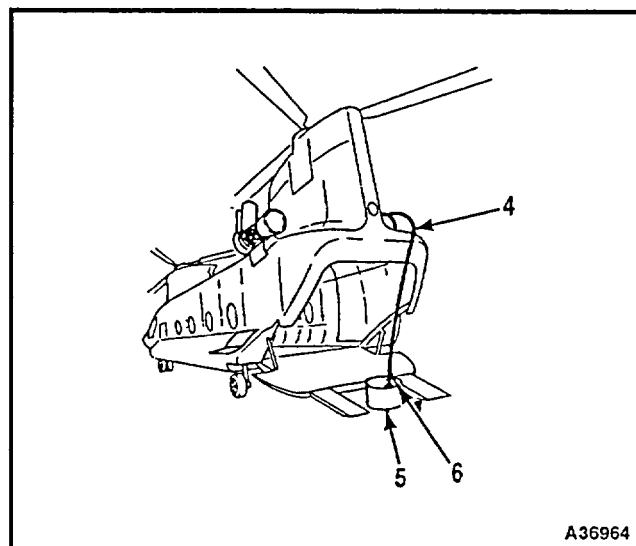
11. Remove the grounding wire (6) from the fuel drain line (4) and the fuel container (5).
12. Clean up any spilled fuel. Use cloths (E121) and wear gloves (E184.1).

NOTE

The Digital Electronic Control Unit (DECU) may show a fault indication. This indication will clear at the next engine start.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Close the engine access cover (Task 4-50).
- Close the work platform (Task 2-2).
- Disconnect the battery (Task 1-39).
- Install all covers and barrier material removed from engine.



A36964

END OF TASK

Change 19 4-387

INITIAL SETUP**Applicable Configurations:**With **74****Tools:**

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Fuel Resistant Container, 1-Gallon Minimum
144 Inch Hose Assembly Compatible with the
Chosen Air Source and Having a 1/4 Inch Male
Flared End Fitting Compatible with the Engine
Hose Connection
Gauge, 0 to 150 PSI
Face Shield

Materials:

Cloths (E121)
Gloves (E184.1)
Soap (E351)
Air Source, Regulated, 0 to 100 PSI
Nitrogen (E248)

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
Cabin Acoustic Blankets Removed As Required
Test Setup Assembled (If Required)
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

General Safety Instructions:**WARNING**

During high pressure operations, care must be taken to ensure that all connections and fittings are properly and tightly secured prior to applying pressure. All system components must be compatible with pressure applied. Personnel must be protected at a distance sufficient to prevent injury. Perform high pressure pneumatic operations in a well-ventilated, protected area

CAUTION

Although nitrogen (E248) is not toxic, exposure to large quantities can cause suffocation. Use only in a well-ventilated area.

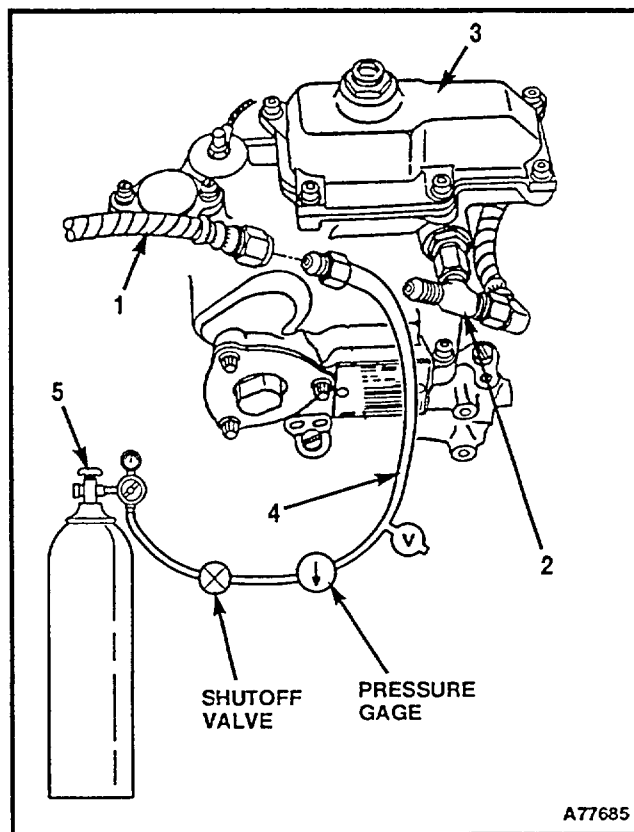
CAUTION

Eye protection will be worn when using air or gas pressurized above 30 psi.

NOTE

This procedure must be accomplished whenever the powerplant, Digital Electronic Control Unit (DECU), Hydromechanical Assembly (HMA), or the drain cartridge are changed; or when the P3 system is breached.

1. Disconnect the P3 hose (1) from P3 tee (2) on the HMA (3).
2. Install compressed air source (or nitrogen (E248)) hose (4) in P3 hose (1).
3. Open the supply valve (5) on the pressure source and slowly increase the pressure to 100 psi.



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Change 19 4-389

4. If there is no significant drop in pressure after one minute:

- a. Working on one connection joint at a time, apply a liberal coating of soap solution to each joint in the P3 system.
- b. Outside of the cabin, apply soap (E351) to the P3 fitting (7) and the coupling (8) on the engine shelf (9).
- c. In the cabin starting from the DECU fitting (10) and working aft, apply a liberal coating of soap (E351) to each connection joint (11, 12, and 13) including around the drain cartridge (14).
- d. If leaks are observed, mark them with a grease pencil.
- e. De-pressurize the system, and repair the leaks as required.
- f. Slowly pressurize the system to 100 psi and inspect for leaks.
- g. Upon successful completion of the leak check, go to step 6.

5. If there is a significant drop in pressure:

- a. Reduce the pressure to 0 psi and inspect all P3 connections and repair as necessary.
- b. Go to step 3.

6. Close the valve (5) on the pressure source.
7. At the drain cartridge (13), push up on the cartridge condensate release mechanism (14) to relieve the pressure in the P3 system.
8. Remove the air source hose (4) from the P3 hose (1).

CAUTION

Before reconnecting the P3 pressure hose to the P3 tee fitting on the HMA, make sure that the 0.060 orifice in the tee fitting is visible and unobstructed. If not visible, the tee fitting is installed backwards and must be rotated. Remove any obstruction from the orifice.

9. Connect the P3 pressure hose (1) to the P3 tee fitting (2).

INSPECT

FOLLOW-ON MAINTENANCE:

Install acoustic blankets as required.
Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).
Disassemble test setup.

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By Order of the Secretary of the Army:

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ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

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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.

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: ls-lp@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, MO 63108

DATE SENT
 22 August 1992

PUBLICATION NUMBER
 TM 1-1520-250-10

PUBLICATION DATE
 15 June 1992

PUBLICATION TITLE
 Operator's manual MH60K 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 to 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*

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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 dekagram = 10 grams = .35 ounce
 1 hectogram = 10 dekagrams = 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 = 38.82 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

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	3.94
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	square 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	1.365	metric tons	short tons	1.102
pound-inches	newton-meters	.11375			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
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