1
00:00:07,110 --> 00:00:04,470
first jeff williams will be exiting the

2
00:00:08,950 --> 00:00:07,120
quest airlock on his fifth spacewalk and

3
00:00:12,150 --> 00:00:08,960
followed by kate rubins

4
00:00:14,390 --> 00:00:12,160
jeff will lead from the airlock up onto

5
00:00:16,390 --> 00:00:14,400
the main truss segment

6
00:00:17,830 --> 00:00:16,400
because of the distance of the radiator

7
00:00:19,990 --> 00:00:17,840
from the airlock it's actually on the

8
00:00:21,429 --> 00:00:20,000
end of the truss out p6

9
00:00:23,189 --> 00:00:21,439
jeff will be

10
00:00:24,550 --> 00:00:23,199
taking the safe tethers of both crew

11
00:00:26,950 --> 00:00:24,560
members out

12
00:00:28,870 --> 00:00:26,960
and setting them up on p1

13
00:00:30,310 --> 00:00:28,880

to allow enough reach

14
00:00:31,910 --> 00:00:30,320
for them from the airlock all the way

15
00:00:33,750 --> 00:00:31,920
out to p6

16
00:00:35,190 --> 00:00:33,760
and while he's taking care of that kate

17
00:00:37,670 --> 00:00:35,200
will wait

18
00:00:39,110 --> 00:00:37,680
at the airlock for him to set that up

19
00:00:40,869 --> 00:00:39,120
and then he'll head out towards the

20
00:00:42,630 --> 00:00:40,879
solar off-roader joint the sarge and

21
00:00:46,389 --> 00:00:42,640
then followed by kate who will come

22
00:00:48,549 --> 00:00:46,399
after she will follow that same path and

23
00:00:50,150 --> 00:00:48,559
follow her tether to meet jeff out there

24
00:00:52,869 --> 00:00:50,160
before they both head out to the prime

25
00:00:58,229 --> 00:00:52,879
task on the eva which is retracting the

26
00:01:03,670 --> 00:01:00,150
as we've mentioned this uh previously

27
00:01:05,270 --> 00:01:03,680
tried to retract this on usc va 33

28
00:01:06,469 --> 00:01:05,280
and

29
00:01:08,070 --> 00:01:06,479
they had a lot of other tasks that they

30
00:01:09,030 --> 00:01:08,080
had to do and

31
00:01:11,190 --> 00:01:09,040
were unable to get to this one

32
00:01:13,350 --> 00:01:11,200
successfully but we were taking this as

33
00:01:15,910 --> 00:01:13,360
our prime task and we'll go ahead and

34
00:01:18,630 --> 00:01:15,920
knock it out first on the eva

35
00:01:20,870 --> 00:01:18,640
so once both crew get outboard of the

36
00:01:23,190 --> 00:01:20,880
sarge there they'll inspect

37
00:01:24,390 --> 00:01:23,200
the radiator and the various mechanisms

38
00:01:26,710 --> 00:01:24,400

around it to make sure none of them will

39
00:01:29,270 --> 00:01:26,720
be in the way as we retract it both the

40
00:01:30,630 --> 00:01:29,280
shroud and there are six inches rotated

41
00:01:31,749 --> 00:01:30,640
are located around it that they'll

42
00:01:33,990 --> 00:01:31,759
inspect

43
00:01:35,910 --> 00:01:34,000
kate will translate around the zenith

44
00:01:37,670 --> 00:01:35,920
side of that truss and

45
00:01:39,830 --> 00:01:37,680
jeff on the nader looking at the

46
00:01:43,190 --> 00:01:39,840
radiator to make sure it's prepared for

47
00:01:46,789 --> 00:01:44,870
once they've completed their inspections

48
00:01:49,670 --> 00:01:46,799
jeff will move into place

49
00:01:51,830 --> 00:01:49,680
to take his pistol grip tool or pgt

50
00:01:54,389 --> 00:01:51,840
power tool to retract the radiator

51
00:01:56,149 --> 00:01:54,399
manually while kate gets in position to

52
00:01:57,990 --> 00:01:56,159
view the radiator's retraction to make

53
00:02:00,310 --> 00:01:58,000
sure it goes smoothly

54
00:02:01,590 --> 00:02:00,320
now with its location uh facing forward

55
00:02:03,030 --> 00:02:01,600
on the iss we'll have good views from

56
00:02:05,510 --> 00:02:03,040
the ground as well to help the crew

57
00:02:07,510 --> 00:02:05,520
monitor its retraction

58
00:02:10,710 --> 00:02:07,520
you see here kate will slide out board

59
00:02:11,910 --> 00:02:10,720
and get a view of the radiator

60
00:02:13,430 --> 00:02:11,920
while jeff

61
00:02:17,030 --> 00:02:13,440
puts himself in the outboard side in

62
00:02:21,350 --> 00:02:19,350
as i stated we attracted it previously

63
00:02:23,110 --> 00:02:21,360

and we've got the video here of

64
00:02:25,270 --> 00:02:23,120
what we hope to see on this attempt is a

65
00:02:28,390 --> 00:02:25,280
nice smooth retraction of

66
00:02:29,430 --> 00:02:28,400
the radiator as it comes down

67
00:02:31,190 --> 00:02:29,440
and

68
00:02:33,509 --> 00:02:31,200
gets retracted fully to protect it from

69
00:02:34,869 --> 00:02:33,519
the mod and

70
00:02:39,509 --> 00:02:34,879
thermal conditions as i've mentioned

71
00:02:44,229 --> 00:02:42,229
assuming a nice clean retraction there

72
00:02:45,830 --> 00:02:44,239
and they've got it seated fully

73
00:02:47,750 --> 00:02:45,840
the crew will work to install four

74
00:02:48,790 --> 00:02:47,760
cinches much as you would

75
00:02:52,309 --> 00:02:48,800
the

76
00:02:54,949 --> 00:02:52,319
in a cross pattern diagonally from each

77
00:02:56,710 --> 00:02:54,959
other installing two cinches here

78
00:02:58,710 --> 00:02:56,720
and then they will slide and work a

79
00:03:00,270 --> 00:02:58,720
cross pattern two additional cinches and

80
00:03:03,270 --> 00:03:00,280
work back and forth

81
00:03:04,790 --> 00:03:03,280
a couple times at each bolt to get the

82
00:03:09,670 --> 00:03:04,800
radiator fully cinched and compressed

83
00:03:13,190 --> 00:03:11,910
after fully securing all four of the

84
00:03:15,270 --> 00:03:13,200
cinches

85
00:03:17,589 --> 00:03:15,280
the next step is to deploy a thermal

86
00:03:18,550 --> 00:03:17,599
cover in order to fully protect the

87
00:03:21,030 --> 00:03:18,560
radiator

88
00:03:22,630 --> 00:03:21,040

gets uh both thermal protection and

89
00:03:27,110 --> 00:03:22,640
micro media orbital debris protection

90
00:03:31,670 --> 00:03:28,789
and deploying that shroud over the

91
00:03:33,350 --> 00:03:31,680
radiator will complete the

92
00:03:42,149 --> 00:03:33,360
retraction of the radiator and the the

93
00:03:45,910 --> 00:03:43,750
so here you see the crew they'll move

94
00:03:47,830 --> 00:03:45,920
the shroud which was stowed by a

95
00:03:50,309 --> 00:03:47,840
previous crew that deployed the radiator

96
00:03:51,910 --> 00:03:50,319
sunny williams on aki hushidi and

97
00:03:53,990 --> 00:03:51,920
they'll deploy that and cinch it tight

98
00:03:56,070 --> 00:03:54,000
to protect that radiator

99
00:03:57,589 --> 00:03:56,080
moving on for the second set of tasks on

100
00:03:59,190 --> 00:03:57,599
the eva jeff will pick up a foot

101
00:04:01,750 --> 00:03:59,200
restraint here and make his way back

102
00:04:04,149 --> 00:04:01,760
inboard to the ssr mess or the canon arm

103
00:04:05,589 --> 00:04:04,159
2 for the high definition camera task

104
00:04:07,750 --> 00:04:05,599
that zeb mentioned

105
00:04:09,190 --> 00:04:07,760
while kate is translating back all the

106
00:04:10,470 --> 00:04:09,200
way the airlock to retrieve those

107
00:04:19,670 --> 00:04:10,480
cameras

108
00:04:23,030 --> 00:04:21,030
so she'll pick up a both a high

109
00:04:24,950 --> 00:04:23,040
definition camera and a light from the

110
00:04:26,950 --> 00:04:24,960
airlock uh to put on the camera port

111
00:04:28,790 --> 00:04:26,960
nine worksite that's on the nadir side

112
00:04:30,310 --> 00:04:28,800
of the port one truss

113
00:04:33,189 --> 00:04:30,320

while jeff will meet

114
00:04:34,790 --> 00:04:33,199
the ssrms that's being driven by

115
00:04:36,870 --> 00:04:34,800
jackson crew member

116
00:04:38,310 --> 00:04:36,880
takuya anishi

117
00:04:40,469 --> 00:04:38,320
who will then

118
00:04:42,070 --> 00:04:40,479
drive the arm in on under jeff's

119
00:04:43,430 --> 00:04:42,080
guidance such so that they can get the

120
00:04:44,310 --> 00:04:43,440
foot restraint installed and the safe

121
00:04:49,110 --> 00:04:44,320
tether

122
00:04:55,030 --> 00:04:51,030
while jeff is installing that kate will

123
00:04:57,030 --> 00:04:55,040
come out to meet him with his bag of

124
00:04:58,550 --> 00:04:57,040
oru so that he can install them on the

125
00:05:03,670 --> 00:04:58,560
the nader side of the trust there that

126
00:05:06,390 --> 00:05:05,110
after picking up his bag they'll

127
00:05:07,990 --> 00:05:06,400
maneuver the

128
00:05:19,350 --> 00:05:08,000
the arm down to the nader side of the

129
00:05:22,870 --> 00:05:21,029
so following retrieving that bag for

130
00:05:24,550 --> 00:05:22,880
jeff kate will have some secondary tasks

131
00:05:25,749 --> 00:05:24,560
that she'll go off to

132
00:05:28,070 --> 00:05:25,759
at the

133
00:05:29,749 --> 00:05:28,080
solar alpha rotary joint the sarge

134
00:05:32,710 --> 00:05:29,759
cinching those bolts as i've mentioned

135
00:05:34,629 --> 00:05:32,720
and also doing a sarge inspection

136
00:05:36,550 --> 00:05:34,639
so still translate outboard grab some

137
00:05:38,550 --> 00:05:36,560
tools that you'll need for those tasks

138
00:05:40,950 --> 00:05:38,560

and then head back around to tighten the

139
00:05:43,270 --> 00:05:40,960
three remaining bolts of

140
00:05:45,270 --> 00:05:43,280
the sarge there were a fourth one that

141
00:05:47,590 --> 00:05:45,280
was previously tightened on usb 33 and

142
00:05:49,350 --> 00:05:47,600
they saw improvement in the data

143
00:05:50,629 --> 00:05:49,360
so they decided that the remaining three

144
00:05:53,189 --> 00:05:50,639
bolts would

145
00:05:55,110 --> 00:05:53,199
hopefully finish the job there

146
00:05:56,469 --> 00:05:55,120
so kate will translate around three

147
00:05:58,870 --> 00:05:56,479
corners and

148
00:06:01,270 --> 00:05:58,880
give us good photos and

149
00:06:02,870 --> 00:06:01,280
video close out as she goes ahead and

150
00:06:04,790 --> 00:06:02,880
tightens those bolts and secures the

151
00:06:07,110 --> 00:06:04,800
thermal booties around them

152
00:06:09,189 --> 00:06:07,120
previously on usb 33 they saw one of the

153
00:06:10,469 --> 00:06:09,199
booties was dislodged and in order to

154
00:06:11,990 --> 00:06:10,479
make sure that

155
00:06:13,430 --> 00:06:12,000
if the if need be if the velcro is

156
00:06:16,469 --> 00:06:13,440
degraded on those booties that they can

157
00:06:18,830 --> 00:06:16,479
put a wire tie to secure them in place

158
00:06:20,629 --> 00:06:18,840
so it'll translate around to

159
00:06:24,150 --> 00:06:20,639
multiple

160
00:06:24,160 --> 00:06:27,749
second one and then a third one

161
00:06:30,950 --> 00:06:29,510
and depending on timing here and

162
00:06:32,950 --> 00:06:30,960
lighting conditions of how the uva is

163
00:06:35,990 --> 00:06:32,960

going she will complete a sarge

164
00:06:38,790 --> 00:06:36,000
inspection previously on sts-134 the

165
00:06:40,150 --> 00:06:38,800
crew did lube the port sarge and the

166
00:06:42,390 --> 00:06:40,160
ground has done some testing to see how

167
00:06:44,629 --> 00:06:42,400
that lube will hold up over time and

168
00:06:46,790 --> 00:06:44,639
we'll get kate's on-site inspection to

169
00:06:48,870 --> 00:06:46,800
verify that the ground testing is

170
00:06:50,790 --> 00:06:48,880
matching up with what happens on orbit

171
00:06:52,070 --> 00:06:50,800
and we'll catch that during uh sometime

172
00:06:54,469 --> 00:06:52,080
during when the day passes and she'll

173
00:06:56,870 --> 00:06:54,479
come swing by here give us her report

174
00:07:03,909 --> 00:06:56,880
and take photos of that for

175
00:07:08,629 --> 00:07:05,909
and while she's working on that jeff

176
00:07:09,749 --> 00:07:08,639
will work in here he'll first change out

177
00:07:12,230 --> 00:07:09,759
this light

178
00:07:14,150 --> 00:07:12,240
this is the a light that has

179
00:07:16,230 --> 00:07:14,160
burnt out its bulbs and once we get

180
00:07:18,150 --> 00:07:16,240
complete chin up the rpcm rnr that zeb

181
00:07:20,230 --> 00:07:18,160
mentioned they'll have a good heater

182
00:07:22,390 --> 00:07:20,240
circuit there for the light new light to

183
00:07:24,150 --> 00:07:22,400
be put in its place and make this camera

184
00:07:25,350 --> 00:07:24,160
fully functional

185
00:07:26,710 --> 00:07:25,360
and on the side of the standard

186
00:07:27,990 --> 00:07:26,720
definition camera that's already there

187
00:07:29,670 --> 00:07:28,000
we'll install an additional high

188
00:07:31,430 --> 00:07:29,680

definition camera so they'll be

189
00:07:37,430 --> 00:07:31,440
co-located to get both standard def and

190
00:07:45,749 --> 00:07:40,710
and jeff will clean up his work site and

191
00:07:49,510 --> 00:07:47,589
following uh kate's sarge inspection

192
00:07:51,350 --> 00:07:49,520
test she will move back outboard towards

193
00:07:55,110 --> 00:07:51,360
the radiator worksite that we previously

194
00:07:56,869 --> 00:07:55,120
were at we have some overu's that are

195
00:07:59,510 --> 00:07:56,879
pump flow control subassemblies that are

196
00:08:01,990 --> 00:07:59,520
ammonia pumps for the outboard elements

197
00:08:04,230 --> 00:08:02,000
and those pumps had previously failed

198
00:08:06,550 --> 00:08:04,240
and they are under an mli blanket and to

199
00:08:10,150 --> 00:08:06,560
enable future change out of these boxes

200
00:08:12,629 --> 00:08:10,160
by the spdm dexter the kate will fold

201
00:08:14,629 --> 00:08:12,639
back that mli and tie it back and so a

202
00:08:18,710 --> 00:08:14,639
future spacex mission can bring up

203
00:08:21,510 --> 00:08:20,230
and so the since the

204
00:08:22,950 --> 00:08:21,520
mli was never designed for robotic

205
00:08:26,309 --> 00:08:22,960
compatibility she'll just tuck that out

206
00:08:27,749 --> 00:08:26,319
of the way and wire tied in place

207
00:08:29,749 --> 00:08:27,759
that'll complete the main task

208
00:08:31,589 --> 00:08:29,759
objectives on the eva for the day so

209
00:08:33,509 --> 00:08:31,599
jeff will uh

210
00:08:35,190 --> 00:08:33,519
guide talking the arm back to

211
00:08:37,990 --> 00:08:35,200
same position he got in

212
00:08:39,670 --> 00:08:38,000
and he'll egress the arm and stow both

213
00:08:40,389 --> 00:08:39,680

his foot restraint and remove his tether

214
00:08:41,670 --> 00:08:40,399
from

215
00:08:48,230 --> 00:08:41,680
the arm and get back on the structure

216
00:08:52,470 --> 00:08:50,710
once he's cleaned up the arm and allowed

217
00:08:54,710 --> 00:08:52,480
talk to move to the overnight park

218
00:08:57,590 --> 00:08:54,720
position he they will take the foot

219
00:09:02,070 --> 00:08:57,600
restraint installed on the cedar cart

220
00:09:05,590 --> 00:09:04,470
and then the crew will repeat uh a

221
00:09:07,670 --> 00:09:05,600
reverse

222
00:09:09,350 --> 00:09:07,680
direction of their egress and jeff will

223
00:09:11,350 --> 00:09:09,360
meet up at the tether anchor point while

224
00:09:12,710 --> 00:09:11,360
kate heads back to the airlock and they

225
00:09:14,389 --> 00:09:12,720
will

226
00:09:17,670 --> 00:09:14,399
use their tethers to move their way back

227
00:09:21,190 --> 00:09:17,680
to the airlock and ingress for a

228
00:09:22,470 --> 00:09:21,200
hopefully successful u.s eva 37

229
00:09:24,070 --> 00:09:22,480
and then we'll get jeff back inside for