



1
00:00:27,830 --> 00:00:04,470
hi i'm mark kelly commander of sts-134

2
00:00:27,840 --> 00:01:34,630
foreign

3
00:01:39,670 --> 00:01:36,469
good morning endeavor and a special good

4
00:01:42,550 --> 00:01:40,390
good roberto

5
00:01:44,469 --> 00:01:42,560
shannon thank you very much for playing

6
00:01:46,789 --> 00:01:44,479
that song and thanks for being

7
00:01:47,910 --> 00:01:46,799
passionate with me for finally and get

8
00:01:53,590 --> 00:01:47,920
it

9
00:01:55,990 --> 00:01:53,600
i was talking about

10
00:01:59,830 --> 00:01:56,000
a guy that is missing

11
00:02:00,630 --> 00:01:59,840
his wife and in this case

12
00:02:05,429 --> 00:02:00,640
i

13
00:02:06,950 --> 00:02:05,439

and

14

00:02:09,830 --> 00:02:06,960

obviously

15

00:02:11,830 --> 00:02:09,840

my thoughts in this case are for my wife

16

00:02:14,710 --> 00:02:11,840

valeria that is in houston and i will

17

00:02:16,550 --> 00:02:14,720

look forward to ever the private

18

00:02:18,470 --> 00:02:16,560

conference tomorrow morning thank you

19

00:02:20,830 --> 00:02:18,480

again

20

00:02:23,430 --> 00:02:20,840

and you're very

21

00:02:25,589 --> 00:02:23,440

welcome as you've heard now the endeavor

22

00:02:27,910 --> 00:02:25,599

crew now awake that special song played

23

00:02:29,990 --> 00:02:27,920

for mission specialist and italian space

24

00:02:34,790 --> 00:02:30,000

agency astronaut roberto vittori the

25

00:02:36,229 --> 00:02:34,800

song el mio pencero was performed

26

00:02:38,309 --> 00:02:36,239

in his honor at the request of his

27

00:02:40,710 --> 00:02:38,319

family the crew now they prepare for the

28

00:02:42,150 --> 00:02:40,720

day and as you heard uh vittori

29

00:02:44,470 --> 00:02:42,160

mentioned they are going to turn their

30

00:02:47,110 --> 00:02:44,480

focus to the spacewalk preparations

31

00:02:49,910 --> 00:02:47,120

today andrew feustel mike fink will be

32

00:02:51,430 --> 00:02:49,920

performing that eba activity they have

33

00:02:54,229 --> 00:02:51,440

spent the night in the quest airlock in

34

00:02:56,070 --> 00:02:54,239

preparation for that spacewalk

35

00:02:57,589 --> 00:02:56,080

they likewise will have some

36

00:02:58,869 --> 00:02:57,599

time for personal hygiene before they

37

00:03:00,869 --> 00:02:58,879

start suiting up

38

00:03:03,190 --> 00:03:00,879

but all the activities remain on track

39

00:03:05,990 --> 00:03:03,200

for that spacewalk today no changes to

40

00:03:09,750 --> 00:03:06,000

the eva task as they were

41

00:03:15,110 --> 00:03:12,149

the crew members inside the quest

42

00:03:18,309 --> 00:03:15,120

airlock preparing for the

43

00:03:20,309 --> 00:03:18,319

second eva extra vehicular activity the

44

00:03:23,110 --> 00:03:20,319

two crew members heading out the door

45

00:03:25,270 --> 00:03:23,120

are being assisted by greg chamitoff you

46

00:03:27,750 --> 00:03:25,280

see in the black shirt there and shuttle

47

00:03:30,229 --> 00:03:27,760

commander mark kelly

48

00:03:32,470 --> 00:03:30,239

with uh all of their preparatory

49

00:03:34,710 --> 00:03:32,480

activities ahead of the

50

00:03:36,869 --> 00:03:34,720

spacewalk which is scheduled to begin

51
00:03:38,470 --> 00:03:36,879
shortly after one o'clock in the morning

52
00:04:21,030 --> 00:03:38,480
sunday

53
00:04:25,430 --> 00:04:23,830
and as mike fink opens the hatch the

54
00:04:29,430 --> 00:04:25,440
outer

55
00:04:32,230 --> 00:04:29,440
protective thermal cover

56
00:04:35,510 --> 00:04:32,240
let's try to get out of your way

57
00:04:36,710 --> 00:04:35,520
which is basically velcroed to provide a

58
00:04:39,030 --> 00:04:36,720
thermal

59
00:04:43,270 --> 00:04:39,040
barrier between the

60
00:04:46,590 --> 00:04:43,280
that small space in the hatch

61
00:04:49,110 --> 00:04:46,600
the space walk marks the

62
00:04:51,670 --> 00:04:49,120
157th in support of space station

63
00:04:52,790 --> 00:04:51,680

assembly and maintenance

64

00:04:55,110 --> 00:04:52,800

this is the

65

00:05:00,310 --> 00:04:55,120

fifth space walk for drew feustel and

66

00:05:04,870 --> 00:05:02,790

the two astronauts are heading out to

67

00:05:07,029 --> 00:05:04,880

the work site they're heading out to the

68

00:05:08,150 --> 00:05:07,039

port side of the station's truss

69

00:05:11,189 --> 00:05:08,160

structure

70

00:05:12,310 --> 00:05:11,199

to complete a task begun on eva one two

71

00:05:14,870 --> 00:05:12,320

days ago

72

00:05:17,909 --> 00:05:14,880

essentially to

73

00:05:20,070 --> 00:05:17,919

reconnect a jumper and a and then flow

74

00:05:23,189 --> 00:05:20,080

about five pounds or so of ammonia

75

00:05:25,749 --> 00:05:23,199

basically to recharge the ammonia system

76
00:05:28,070 --> 00:05:25,759
on the port solar alpha rotary joint

77
00:05:30,310 --> 00:05:28,080
side ammonia flows through

78
00:05:32,870 --> 00:05:30,320
a myriad of

79
00:05:34,390 --> 00:05:32,880
intricate systems on the port

80
00:05:36,629 --> 00:05:34,400
side of the station and on the right

81
00:05:40,230 --> 00:05:36,639
side the starboard side to

82
00:05:41,029 --> 00:05:40,240
cool all of the equipment and avionics

83
00:05:42,950 --> 00:05:41,039
that

84
00:05:45,510 --> 00:05:42,960
is operating on the international space

85
00:05:49,909 --> 00:05:47,830
the jumper has now been disconnected

86
00:05:51,270 --> 00:05:49,919
from its temporary stowage position and

87
00:05:55,430 --> 00:05:51,280
now it's

88
00:05:58,070 --> 00:05:55,440

ready to be mated to the p4 side

89

00:06:01,670 --> 00:05:58,080

the solar alpha rotary joint obviously

90

00:06:07,270 --> 00:06:04,870

turned off so that that array is not

91

00:06:13,830 --> 00:06:07,280

turning while the

92

00:06:17,990 --> 00:06:15,749

okay so now we're going to open it

93

00:06:26,230 --> 00:06:18,000

check side loads depress the button move

94

00:06:32,150 --> 00:06:29,830

okay valve is open button pops up

95

00:06:33,909 --> 00:06:32,160

at white band visible

96

00:06:37,029 --> 00:06:33,919

okay you said button up that's good so

97

00:06:38,870 --> 00:06:37,039

then you can close the booty on this

98

00:06:41,270 --> 00:06:38,880

okay it worked

99

00:06:44,550 --> 00:06:41,280

they now have completed the jumper

100

00:06:46,469 --> 00:06:44,560

rerouting the next step will be to go

101
00:06:51,749 --> 00:06:46,479
through the procedures for

102
00:06:57,350 --> 00:06:53,749
and we have confirmation that ammonia is

103
00:06:59,909 --> 00:06:57,360
flowing uh through the line now

104
00:07:03,029 --> 00:06:59,919
this recharge of the ammonia system on

105
00:07:06,469 --> 00:07:03,039
the port side of the truss segment of

106
00:07:09,510 --> 00:07:06,479
the international space station

107
00:07:12,710 --> 00:07:09,520
is expected to

108
00:07:15,189 --> 00:07:12,720
take only a few minutes and recharge the

109
00:07:17,589 --> 00:07:15,199
system by about five pounds

110
00:07:19,990 --> 00:07:17,599
over the course of uh

111
00:07:21,510 --> 00:07:20,000
quite a bit of time there's been a very

112
00:07:25,510 --> 00:07:21,520
very small

113
00:07:28,309 --> 00:07:25,520

leak rate seen of the ammonia and

114

00:07:31,350 --> 00:07:28,319

this is basically flowing

115

00:07:32,790 --> 00:07:31,360

refilling or recharging the ammonia tank

116

00:07:35,029 --> 00:07:32,800

with

117

00:07:36,550 --> 00:07:35,039

ammonia that's in a spare

118

00:07:38,309 --> 00:07:36,560

ammonia

119

00:07:40,710 --> 00:07:38,319

tank assembly

120

00:07:46,550 --> 00:07:40,720

near the center of the station's truss

121

00:07:52,950 --> 00:07:49,909

hey uh greg uh for charge covers

122

00:07:55,189 --> 00:07:52,960

yeah uh some bolts are not uh

123

00:07:57,029 --> 00:07:55,199

able to be unturned they're highly

124

00:07:59,350 --> 00:07:57,039

torqued at alpha six

125

00:08:02,710 --> 00:07:59,360

uh looking for to be able to do one turn

126
00:08:02,720 --> 00:08:06,869
okay

127
00:08:06,879 --> 00:08:13,189
we sure did check in

128
00:08:13,199 --> 00:08:16,550
and every houston preview

129
00:08:21,670 --> 00:08:18,070
hi

130
00:08:24,629 --> 00:08:21,680
yeah to us we are on sheet 16-14

131
00:08:34,630 --> 00:08:24,639
black alpha it does say you can do pgt

132
00:08:34,640 --> 00:08:48,630
happy breville 7 one turn ev2 copies

133
00:08:54,630 --> 00:08:51,430
yeah would you like the explanation tony

134
00:08:56,150 --> 00:08:54,640
yes please thanks

135
00:08:59,110 --> 00:08:56,160
i think you just wanted to use these

136
00:09:00,790 --> 00:08:59,120
things yeah i'm uh loosening three bolts

137
00:09:02,790 --> 00:09:00,800
on cover 17

138
00:09:04,710 --> 00:09:02,800

uh before i put a red on it and since

139

00:09:07,350 --> 00:09:04,720

i'm very close in the worksite i'm

140

00:09:09,829 --> 00:09:07,360

loosening two bolts from cover 16

141

00:09:12,310 --> 00:09:09,839

and i'd say three out of

142

00:09:15,509 --> 00:09:12,320

six volts needed the extra torque i'll

143

00:09:27,509 --> 00:09:17,110

that's good thanks for lunch appreciate

144

00:09:32,070 --> 00:09:30,949

and houston and tabs for cover 17.

145

00:09:32,949 --> 00:09:32,080

go ahead

146

00:09:35,269 --> 00:09:32,959

because

147

00:09:37,030 --> 00:09:35,279

of the extra torque and everything i've

148

00:09:38,230 --> 00:09:37,040

been doing a really good job counting

149

00:09:42,389 --> 00:09:38,240

turns

150

00:09:45,269 --> 00:09:42,399

two

151
00:09:46,070 --> 00:09:45,279
uh did not pop up so i gave it one more

152
00:09:47,350 --> 00:09:46,080
turn

153
00:09:49,910 --> 00:09:47,360
and uh

154
00:09:52,310 --> 00:09:49,920
on the 10th turn i pulled it up and it

155
00:09:54,070 --> 00:09:52,320
popped up and popped out the good news

156
00:09:56,470 --> 00:09:54,080
is i caught it i'm putting it in my

157
00:10:01,350 --> 00:09:56,480
trash bag

158
00:10:01,360 --> 00:10:05,430
it was a little bit of a surprise

159
00:10:09,030 --> 00:10:07,670
yep using copies yeah i'll say good

160
00:10:12,630 --> 00:10:09,040
catch wow

161
00:10:16,550 --> 00:10:14,069
hold 16

162
00:10:20,710 --> 00:10:16,560
volts three or excuse me cover 16

163
00:10:25,110 --> 00:10:22,470

alright we're loosened

164

00:10:27,509 --> 00:10:25,120

one turn higher torque three turns lower

165

00:10:27,519 --> 00:10:32,230

up

166

00:10:35,590 --> 00:10:34,150

and denver houston we're back with you

167

00:10:41,590 --> 00:10:35,600

thanks for we cut that last bit from

168

00:10:41,600 --> 00:10:45,509

yeah but wait to hear about jessica

169

00:10:50,870 --> 00:10:47,110

okay yeah you got a report for him go

170

00:10:54,069 --> 00:10:50,880

ahead okay uh swanee are you uh copying

171

00:10:58,310 --> 00:10:54,949

okay

172

00:11:01,430 --> 00:10:58,320

uh volt 17 or excuse me cover 17.

173

00:11:02,949 --> 00:11:01,440

three bolts came undone i have all three

174

00:11:04,550 --> 00:11:02,959

bolts with me

175

00:11:06,150 --> 00:11:04,560

when they came undone

176

00:11:09,509 --> 00:11:06,160

i did not see

177

00:11:11,350 --> 00:11:09,519

uh the locking washer on the

178

00:11:14,150 --> 00:11:11,360

back of them or when they came under the

179

00:11:16,550 --> 00:11:14,160

locking washer that makes them captive

180

00:11:19,110 --> 00:11:16,560

uh did not uh float out with the rest of

181

00:11:21,509 --> 00:11:19,120

them i looked uh very carefully during

182

00:11:24,310 --> 00:11:21,519

the process you'll see it in the wbs

183

00:11:26,710 --> 00:11:24,320

i'll copy so far copy three of the four

184

00:11:30,870 --> 00:11:26,720

are off the cover and you didn't see the

185

00:11:35,910 --> 00:11:34,069

all right the one one uh and

186

00:11:38,630 --> 00:11:35,920

let me explain a little bit further to

187

00:11:41,350 --> 00:11:38,640

help with with the process

188

00:11:44,069 --> 00:11:41,360

i had last we left the program

189

00:11:46,069 --> 00:11:44,079

you knew we were missing two bolts

190

00:11:47,190 --> 00:11:46,079

and i turned over the cover for an

191

00:11:48,870 --> 00:11:47,200

inspection

192

00:11:51,030 --> 00:11:48,880

and the

193

00:11:53,509 --> 00:11:51,040

third bolt popped off when i

194

00:11:55,590 --> 00:11:53,519

pushed it in to check the spring when i

195

00:11:57,190 --> 00:11:55,600

had it over upside down i did not see

196

00:11:58,949 --> 00:11:57,200

its locking washer

197

00:12:00,949 --> 00:11:58,959

so i i think i have a visual

198

00:12:04,069 --> 00:12:00,959

confirmation that we were missing at

199

00:12:05,590 --> 00:12:04,079

least one locking washer

200

00:12:07,590 --> 00:12:05,600

okay

201
00:12:09,269 --> 00:12:07,600
houston copies that and you could verify

202
00:12:13,190 --> 00:12:09,279
that on the one bolt left there is a

203
00:12:17,590 --> 00:12:15,910
yes that is verified

204
00:12:20,150 --> 00:12:17,600
and i think that's the reason why i have

205
00:12:28,069 --> 00:12:20,160
one bolt left

206
00:12:34,470 --> 00:12:30,949
i have more swanny if you have time

207
00:12:39,750 --> 00:12:37,190
okay uh i've had some good questions

208
00:12:42,230 --> 00:12:39,760
during the loss one of the questions was

209
00:12:45,110 --> 00:12:42,240
were all of those ones they all need the

210
00:12:47,430 --> 00:12:45,120
higher torque the answer is no i need a

211
00:12:49,110 --> 00:12:47,440
higher torque on volts number

212
00:12:52,870 --> 00:12:49,120
uh one

213
00:12:56,629 --> 00:12:52,880

three excuse me volts number two

214

00:13:00,389 --> 00:12:58,550

but uh volt number three is still with

215

00:13:04,470 --> 00:13:00,399

us

216

00:13:08,790 --> 00:13:06,389

okay and then you've got the part about

217

00:13:10,710 --> 00:13:08,800

cover 16. we have two bolts with four

218

00:13:12,629 --> 00:13:10,720

turns on them i've been counting really

219

00:13:14,629 --> 00:13:12,639

carefully i'm going to put a red on

220

00:13:16,629 --> 00:13:14,639

cover 16 and

221

00:13:18,870 --> 00:13:16,639

try to make this one work we'll do a

222

00:13:21,190 --> 00:13:18,880

very careful inspection to see if there

223

00:13:23,990 --> 00:13:21,200

are locking washers on those bolts

224

00:13:26,310 --> 00:13:24,000

i understand and there's a from past

225

00:13:28,230 --> 00:13:26,320

experience working on those bolts if you

226

00:13:32,870 --> 00:13:28,240

want to stop even a hair short and do

227

00:13:37,430 --> 00:13:35,110

in fact i did that on the

228

00:13:39,430 --> 00:13:37,440

the second vote that popped out 20. i

229

00:13:42,629 --> 00:13:39,440

have eight turns i stopped

230

00:13:43,910 --> 00:13:42,639

and uh it didn't pop up so i did the

231

00:13:46,150 --> 00:13:43,920

quarter turns

232

00:13:48,069 --> 00:13:46,160

and uh it popped out and the rest of it

233

00:13:49,990 --> 00:13:48,079

came with it

234

00:13:53,670 --> 00:13:50,000

so that popped out at my turn got it

235

00:13:56,629 --> 00:13:54,710

but uh

236

00:14:02,550 --> 00:13:56,639

understood to be very careful with these

237

00:14:02,560 --> 00:14:07,509

endeavor houston freebay

238

00:14:12,150 --> 00:14:10,629

we're wondering if spanky can use

239

00:14:15,030 --> 00:14:12,160

this is a quote now

240

00:14:17,670 --> 00:14:15,040

gentle backhand sweeping motions

241

00:14:18,550 --> 00:14:17,680

to get that washer away

242

00:14:26,870 --> 00:14:18,560

from

243

00:14:36,069 --> 00:14:28,629

thank you you'll be a hubble

244

00:14:40,710 --> 00:14:38,069

and uh

245

00:14:42,870 --> 00:14:40,720

i will try to use a tip pin and coax it

246

00:14:46,230 --> 00:14:42,880

out i do want to be very careful to keep

247

00:14:49,030 --> 00:14:46,240

it away from the serge mechanism

248

00:14:51,030 --> 00:14:49,040

and heating occurs with that thanks

249

00:14:54,949 --> 00:14:51,040

and the conversation that you're hearing

250

00:14:57,269 --> 00:14:54,959

is related to a washer that is

251
00:14:59,590 --> 00:14:57,279
supposed to be captive on one of the

252
00:15:02,389 --> 00:14:59,600
covers that

253
00:15:04,470 --> 00:15:02,399
mike fink has released from the port

254
00:15:07,030 --> 00:15:04,480
solar alpha rotary joint so the

255
00:15:09,910 --> 00:15:07,040
discussion is to uh for him to try to

256
00:15:12,550 --> 00:15:09,920
gently capture that washer mike fink

257
00:15:15,509 --> 00:15:12,560
went off to begin the efforts to remove

258
00:15:18,790 --> 00:15:15,519
covers to support the lubrication

259
00:15:20,949 --> 00:15:18,800
using some brake coat grease on the port

260
00:15:22,949 --> 00:15:20,959
solar alpha rotary joint and in the

261
00:15:24,710 --> 00:15:22,959
process of that effort removing those

262
00:15:27,590 --> 00:15:24,720
covers some of the

263
00:15:30,069 --> 00:15:27,600

bolts that support uh to secure those

264

00:15:32,230 --> 00:15:30,079

covers came free

265

00:15:34,389 --> 00:15:32,240

and that's what the teams on the ground

266

00:15:37,670 --> 00:15:34,399

and the mission evaluation room are

267

00:15:39,910 --> 00:15:37,680

discussing uh at this point

268

00:15:41,030 --> 00:15:39,920

those washers on those

269

00:15:44,069 --> 00:15:41,040

covers

270

00:15:45,910 --> 00:15:44,079

may become flimsy or

271

00:15:48,310 --> 00:15:45,920

lose some of their integrity due to the

272

00:15:50,230 --> 00:15:48,320

cycles of removing and replacing those

273

00:15:52,629 --> 00:15:50,240

covers

274

00:15:55,590 --> 00:15:52,639

so the discussion is ongoing as to just

275

00:15:58,069 --> 00:15:55,600

how much of the lubrication effort

276

00:16:00,150 --> 00:15:58,079

will be performed uh during this

277

00:16:02,389 --> 00:16:00,160

spacewalk

278

00:16:03,990 --> 00:16:02,399

through the helmet uh cam of drew

279

00:16:06,790 --> 00:16:04,000

feustel uh

280

00:16:08,470 --> 00:16:06,800

two hours 17 minutes into the spacewalk

281

00:16:12,710 --> 00:16:08,480

he has just

282

00:16:14,949 --> 00:16:13,910

jumper

283

00:16:18,069 --> 00:16:14,959

and the

284

00:16:19,990 --> 00:16:18,079

thermal team here in the flight control

285

00:16:21,430 --> 00:16:20,000

room for space station reporting that

286

00:16:26,150 --> 00:16:21,440

the

287

00:16:27,829 --> 00:16:26,160

holding uh pressure just fine

288

00:16:29,430 --> 00:16:27,839

this is only venting that little short

289

00:16:30,550 --> 00:16:29,440

line so

290

00:16:33,030 --> 00:16:30,560

looking for

291

00:16:35,350 --> 00:16:34,470

you saw it

292

00:16:37,430 --> 00:16:35,360

yeah

293

00:16:40,470 --> 00:16:37,440

did you see my gentle sleeping motion

294

00:16:43,189 --> 00:16:40,480

yeah okay that was for the

295

00:16:45,829 --> 00:16:43,199

block washer

296

00:16:48,310 --> 00:16:45,839

i did get the pull

297

00:17:02,150 --> 00:16:48,320

and you saw how gentle i was until it

298

00:17:05,669 --> 00:17:03,910

yeah we're watching very closely and

299

00:17:07,590 --> 00:17:05,679

snakey was doing a great job on being

300

00:17:09,590 --> 00:17:07,600

gentle and again he gets the golden

301
00:17:10,870 --> 00:17:09,600
glove award for another catch that was

302
00:17:12,309 --> 00:17:10,880
fantastic

303
00:17:14,150 --> 00:17:12,319
we really don't have a good answer now

304
00:17:19,429 --> 00:17:14,160
why that's happening uh we have to talk

305
00:17:22,789 --> 00:17:21,350
and mike uh which bowl was that which

306
00:17:33,190 --> 00:17:22,799
one yes

307
00:17:36,710 --> 00:17:35,270
and it looks like the

308
00:17:39,750 --> 00:17:36,720
uh

309
00:17:41,350 --> 00:17:39,760
washers that are holding them are in an

310
00:17:43,430 --> 00:17:41,360
oval shape i don't know if that's their

311
00:17:47,830 --> 00:17:43,440
normal shape one appears to be more

312
00:17:52,150 --> 00:17:49,990
did you see that in wdf yeah hold it

313
00:17:54,150 --> 00:17:52,160

there where uh actually we

314

00:17:55,909 --> 00:17:54,160

lost your video it's going in and out so

315

00:17:57,590 --> 00:17:55,919

hold it there for a second actually

316

00:17:59,669 --> 00:17:57,600

houston got to has it pretty good and

317

00:18:00,549 --> 00:17:59,679

that's good and and we're checking on

318

00:18:02,070 --> 00:18:00,559

that

319

00:18:07,270 --> 00:18:02,080

i think it's supposed to be circular so

320

00:18:10,789 --> 00:18:09,590

and i'll give you a look at the

321

00:18:13,430 --> 00:18:10,799

other one that

322

00:18:19,110 --> 00:18:13,440

seems to be sticking in there the best

323

00:18:25,830 --> 00:18:21,430

that's bolt number one is oval shape

324

00:18:30,390 --> 00:18:27,270

and i'll confirm that when i turn it

325

00:18:35,190 --> 00:18:32,070

so all right we're going to go with

326

00:18:37,190 --> 00:18:35,200

cover 9 and cover 13.

327

00:18:39,190 --> 00:18:37,200

we're going to lube of course do the

328

00:18:41,750 --> 00:18:39,200

best we can on that

329

00:18:43,510 --> 00:18:41,760

and of course as spanky's working on

330

00:18:45,750 --> 00:18:43,520

that dude's gonna be doing the other

331

00:18:47,750 --> 00:18:45,760

event the 17-minute event

332

00:18:49,430 --> 00:18:47,760

and uh after that of course you can come

333

00:18:52,470 --> 00:18:49,440

or during that you can eventually you

334

00:18:55,029 --> 00:18:52,480

can come help and know when we can get

335

00:18:56,549 --> 00:18:55,039

the jumper over the p3v4 we can then

336

00:18:58,070 --> 00:18:56,559

rotate the sarge and at that point we'll

337

00:18:59,750 --> 00:18:58,080

figure out where we are again and do

338

00:19:03,909 --> 00:18:59,760

another assessment and how much more we

339

00:19:09,350 --> 00:19:06,549

okay copy off

340

00:19:12,710 --> 00:19:09,360

okay the cap is off of the

341

00:19:16,230 --> 00:19:14,310

so those big picture words from

342

00:19:18,789 --> 00:19:16,240

astronaut steve swanson in the station

343

00:19:20,630 --> 00:19:18,799

flight control room after the team on

344

00:19:22,549 --> 00:19:20,640

the ground caucus

345

00:19:23,750 --> 00:19:22,559

so the plan would be to

346

00:19:25,190 --> 00:19:23,760

remove

347

00:19:27,270 --> 00:19:25,200

and as you see

348

00:19:29,830 --> 00:19:27,280

mike fink

349

00:19:32,230 --> 00:19:29,840

through his helmet cam remove two more

350

00:19:34,470 --> 00:19:32,240

covers covers nine and thirteen

351
00:19:37,029 --> 00:19:34,480
lubricate underneath those and then

352
00:19:39,350 --> 00:19:37,039
assess after the

353
00:19:40,950 --> 00:19:39,360
rotary joints been

354
00:19:42,710 --> 00:19:40,960
repositioned

355
00:19:44,789 --> 00:19:42,720
any further work

356
00:19:50,789 --> 00:19:44,799
associated with the overall lubricating

357
00:19:54,789 --> 00:19:52,470
if you hear from

358
00:19:57,029 --> 00:19:54,799
mike fink's helmet camera as he works on

359
00:19:59,590 --> 00:19:57,039
lubricating the top

360
00:20:01,110 --> 00:19:59,600
surface of the race ring to do the

361
00:20:03,990 --> 00:20:01,120
bottom surface they'll have to use a

362
00:20:05,190 --> 00:20:04,000
special grease gun with a j shaped

363
00:20:07,990 --> 00:20:05,200

nozzle

364

00:20:09,830 --> 00:20:08,000

to get under the race ring

365

00:20:11,510 --> 00:20:09,840

it's currently under cover nine one of

366

00:20:15,430 --> 00:20:11,520

four covers that they removed so they

367

00:20:19,029 --> 00:20:16,789

and the team here on the ground is

368

00:20:21,110 --> 00:20:19,039

reporting that the space the solar alpha

369

00:20:22,789 --> 00:20:21,120

rotary joint on the port side of the

370

00:20:24,310 --> 00:20:22,799

station that the crew members have been

371

00:20:26,870 --> 00:20:24,320

lubricating

372

00:20:29,350 --> 00:20:26,880

is now in motion this uh will take about

373

00:20:31,669 --> 00:20:29,360

20 minutes and the plan is to rotate at

374

00:20:34,789 --> 00:20:31,679

200 excuse me 45 minutes and the plane

375

00:20:37,510 --> 00:20:34,799

is to rotate it 200 degrees

376

00:20:39,510 --> 00:20:37,520

it rotates at full 360 um in normal

377

00:20:41,270 --> 00:20:39,520

operations for every orbit that the

378

00:20:43,350 --> 00:20:41,280

space station makes of the air

379

00:20:44,950 --> 00:20:43,360

25 minutes before it's there

380

00:20:47,190 --> 00:20:44,960

this will spread the lubrication that

381

00:20:49,430 --> 00:20:47,200

they have been adding to its race rings

382

00:20:51,270 --> 00:20:49,440

around okay very good

383

00:20:53,350 --> 00:20:51,280

and then once that's done the plan is

384

00:20:55,029 --> 00:20:53,360

for them to go back and do one more

385

00:20:57,190 --> 00:20:55,039

layer of lubrication before they close

386

00:21:00,630 --> 00:20:57,200

the covers that they removed earlier in

387

00:21:04,470 --> 00:21:02,230

meanwhile the team here on the ground

388

00:21:06,710 --> 00:21:04,480

also reports that the space station's

389

00:21:09,669 --> 00:21:06,720

robotic arm is in motion getting ready

390

00:21:12,789 --> 00:21:11,270

mission specialist drew feustel's next

391

00:21:14,470 --> 00:21:12,799

task which is going to be doing some

392

00:21:17,590 --> 00:21:14,480

work on the special purpose dexterous

393

00:21:21,190 --> 00:21:17,600

manipulator or dexter as it's known

394

00:21:23,990 --> 00:21:21,200

a member of the robotic

395

00:21:26,390 --> 00:21:24,000

suite at the station that

396

00:21:28,230 --> 00:21:26,400

could be used to

397

00:21:29,270 --> 00:21:28,240

install spare parts on the outside of

398

00:21:42,390 --> 00:21:29,280

the station without requiring a

399

00:21:45,350 --> 00:21:44,070

fox i think what i'm gonna need is

400

00:21:46,310 --> 00:21:45,360

actually

401

00:21:49,830 --> 00:21:46,320

uh

402

00:21:51,669 --> 00:21:49,840

about 30 centimeters nader

403

00:21:53,350 --> 00:21:51,679

give me some clearance i am in the boot

404

00:21:55,510 --> 00:21:53,360

plate

405

00:21:57,350 --> 00:21:55,520

but i need about 30 centimeters major

406

00:22:00,149 --> 00:21:57,360

away from my body

407

00:22:02,549 --> 00:22:00,159

okay 30 centimeters nader

408

00:22:04,950 --> 00:22:02,559

and uh give me a couple seconds and are

409

00:22:06,710 --> 00:22:04,960

you touching my arm now negative

410

00:22:09,510 --> 00:22:06,720

30 centimeters later call you when i'm

411

00:22:12,950 --> 00:22:11,029

a few from admission specialist drew

412

00:22:14,950 --> 00:22:12,960

feustel's helmet camera looking inside

413

00:22:16,549 --> 00:22:14,960

the latching end defector of the special

414

00:22:20,390 --> 00:22:16,559

purpose dexterous manipulator the

415

00:22:25,029 --> 00:22:22,310

operating the space station's robotic

416

00:22:26,390 --> 00:22:25,039

arm which is uh

417

00:22:28,630 --> 00:22:26,400

which is a holding

418

00:22:31,190 --> 00:22:28,640

dexter and uh

419

00:22:33,029 --> 00:22:31,200

within um feustel's reach is

420

00:22:34,549 --> 00:22:33,039

pilot greg johnson and flight engineer

421

00:22:36,630 --> 00:22:34,559

katie coleman

422

00:22:40,230 --> 00:22:36,640

and

423

00:22:44,149 --> 00:22:40,240

okay i've got a rhett on the cla cover

424

00:22:46,310 --> 00:22:44,159

the moi will remain in the bag

425

00:22:49,190 --> 00:22:46,320

you hear of joy drew feustel and the

426
00:22:56,630 --> 00:22:49,200
special purpose dexter's manipulator arm

427
00:23:03,830 --> 00:22:59,190
i see good motion towards my feet

428
00:23:08,470 --> 00:23:05,590
i see some of the pitch coming guys i

429
00:23:10,470 --> 00:23:08,480
need to do the apple first again purple

430
00:23:13,590 --> 00:23:10,480
forward both i'm sorry first four revolt

431
00:23:15,830 --> 00:23:13,600
first same as before crappy

432
00:23:18,070 --> 00:23:15,840
one turn

433
00:23:23,029 --> 00:23:18,080
required uh turn to required

434
00:23:28,950 --> 00:23:25,909
18.3 torque down maybe a quarter of a

435
00:23:32,870 --> 00:23:30,230
happy

436
00:23:35,990 --> 00:23:32,880
beam is very very secure

437
00:23:37,510 --> 00:23:36,000
okay yeah look how tough

438
00:23:41,110 --> 00:23:37,520

reporting that he has got the second

439

00:23:42,470 --> 00:23:41,120

bolt uh driven on the first of two i'll

440

00:23:44,870 --> 00:23:42,480

set that up

441

00:23:45,830 --> 00:23:44,880

radiator grapple bar stowage beams that

442

00:23:47,110 --> 00:23:45,840

he's

443

00:23:48,630 --> 00:23:47,120

setting up

444

00:23:50,710 --> 00:23:48,640

each of this has two bolts that hold it

445

00:23:51,830 --> 00:23:50,720

in place and he's got now got the second

446

00:23:53,029 --> 00:23:51,840

of two

447

00:23:57,430 --> 00:23:53,039

on the first

448

00:24:01,269 --> 00:23:59,590

close up look at the work that

449

00:24:03,510 --> 00:24:01,279

mission specialist drew foster is doing

450

00:24:05,350 --> 00:24:03,520

with dexter's hand

451
00:24:07,750 --> 00:24:05,360
adding some

452
00:24:11,510 --> 00:24:07,760
grease to the stairs of the hand which

453
00:24:12,549 --> 00:24:11,520
are which constrict to

454
00:24:15,750 --> 00:24:12,559
three different pieces of wires that

455
00:24:18,390 --> 00:24:15,760
constrict into a very small

456
00:24:32,789 --> 00:24:18,400
circle to grab onto items that the hands

457
00:24:36,630 --> 00:24:34,870
good view here of how the snares look

458
00:24:39,110 --> 00:24:36,640
when they are fully constricted you can

459
00:24:41,190 --> 00:24:39,120
see the small uh triangle they make in

460
00:24:43,190 --> 00:24:41,200
the center which will

461
00:24:45,029 --> 00:24:43,200
close around um items they're trying to

462
00:24:47,269 --> 00:24:45,039
pick up

463
00:24:49,909 --> 00:24:47,279

already the wiggle test shows this

464

00:24:51,430 --> 00:24:49,919

uh this beam is firmly attached ready to

465

00:24:53,590 --> 00:24:51,440

move to the next setting

466

00:25:00,390 --> 00:24:53,600

okay bravo three clockwise one is your

467

00:25:03,430 --> 00:25:02,390

about exactly how much

468

00:25:04,630 --> 00:25:03,440

of the

469

00:25:06,710 --> 00:25:04,640

tasks are going to be able to get to

470

00:25:08,310 --> 00:25:06,720

today again we're about six hours and

471

00:25:09,590 --> 00:25:08,320

eight minutes into today's spacewalk and

472

00:25:12,789 --> 00:25:09,600

the crew

473

00:25:14,789 --> 00:25:12,799

thinks they'll be able to go to the 7 15

474

00:25:21,430 --> 00:25:14,799

7 hours fifteen minutes or seven hours

475

00:25:25,830 --> 00:25:22,710

so the team on the ground is discussing

476

00:25:28,230 --> 00:25:25,840

whether or not that gives them time to

477

00:25:29,990 --> 00:25:28,240

finish uh re-installing the covers the

478

00:25:34,070 --> 00:25:30,000

four of

479

00:25:39,990 --> 00:25:34,080

rotary joint before they need to come

480

00:25:44,230 --> 00:25:42,310

up after we get out there and start the

481

00:25:46,390 --> 00:25:44,240

lube and see how we're doing and how we

482

00:25:48,549 --> 00:25:46,400

expect the covers to go and make a

483

00:25:51,590 --> 00:25:48,559

determination at that time yeah let's do

484

00:25:55,430 --> 00:25:53,350

okay

485

00:25:57,909 --> 00:25:55,440

it sounds like they've decided to

486

00:25:59,350 --> 00:25:57,919

leave that tvd while they go ahead and

487

00:26:03,190 --> 00:25:59,360

finish the lubrication of the solar

488

00:26:04,630 --> 00:26:03,200

alpha rotary joint and i just see if

489

00:26:05,830 --> 00:26:04,640

see once they once they get to that

490

00:26:08,070 --> 00:26:05,840

point if they feel like there's still

491

00:26:09,669 --> 00:26:08,080

enough time to to relent reinstall the

492

00:26:10,549 --> 00:26:09,679

covers or if they need to be temporarily

493

00:26:13,590 --> 00:26:10,559

stored

494

00:26:15,990 --> 00:26:13,600

and reinstalled another time

495

00:26:19,110 --> 00:26:16,000

okay drew are you on your way out to

496

00:26:20,310 --> 00:26:19,120

your green hook

497

00:26:21,830 --> 00:26:20,320

affirmative

498

00:26:23,590 --> 00:26:21,840

okay but

499

00:26:25,029 --> 00:26:23,600

when you do the

500

00:26:26,310 --> 00:26:25,039

you drop your green give me a golden

501
00:26:28,630 --> 00:26:26,320
gauntlet check

502
00:26:29,430 --> 00:26:28,640
we'll do

503
00:26:34,549 --> 00:26:29,440
and

504
00:26:39,029 --> 00:26:36,830
i'm at the airlock by the way

505
00:26:40,310 --> 00:26:39,039
okay you can drop the bean bag on the

506
00:26:41,909 --> 00:26:40,320
curved handrail

507
00:26:44,230 --> 00:26:41,919
done

508
00:26:45,669 --> 00:26:44,240
and glove and collar check

509
00:26:47,990 --> 00:26:45,679
labs are good

510
00:26:58,149 --> 00:26:48,000
lifts are down excellent headed after

511
00:27:02,390 --> 00:26:59,510
meanwhile the team here on the ground

512
00:27:04,870 --> 00:27:02,400
reports that uh the robotic

513
00:27:06,390 --> 00:27:04,880

arm controllers are moving in to have a

514

00:27:08,710 --> 00:27:06,400

special special purpose dexter's

515

00:27:13,750 --> 00:27:08,720

manipulator grappled back onto the

516

00:27:18,950 --> 00:27:16,230

this is a second lubrication that the

517

00:27:23,909 --> 00:27:18,960

team has done of these areas on the

518

00:27:27,269 --> 00:27:25,750

well it was actually the second task on

519

00:27:29,110 --> 00:27:27,279

the space walk to

520

00:27:31,590 --> 00:27:29,120

do the first lubrication

521

00:27:33,990 --> 00:27:31,600

then the team on the ground rotated the

522

00:27:35,830 --> 00:27:34,000

solar alpha rotary joint 200 degrees for

523

00:27:38,470 --> 00:27:35,840

about 45 minutes

524

00:27:39,669 --> 00:27:38,480

to spread some of the grease around and

525

00:27:43,669 --> 00:27:39,679

now they're going back to give it a

526

00:27:46,789 --> 00:27:45,430

commander mark kelly here waiting on the

527

00:27:50,149 --> 00:27:46,799

other side of the hatch in the quest

528

00:27:51,590 --> 00:27:50,159

airlock ready to help the space walkers

529

00:27:52,950 --> 00:27:51,600

back inside

530

00:27:53,909 --> 00:27:52,960

once uh the

531

00:27:54,870 --> 00:27:53,919

space

532

00:27:57,190 --> 00:27:54,880

the

533

00:27:58,950 --> 00:27:57,200

been

534

00:28:00,789 --> 00:27:58,960

repressurized

535

00:28:02,149 --> 00:28:00,799

that hasn't started yet but once it does

536

00:28:03,430 --> 00:28:02,159

start that'll mark the end of today's

537

00:28:05,909 --> 00:28:03,440

space walk

538

00:28:11,909 --> 00:28:05,919

currently uh almost seven hours and 45

539

00:28:15,350 --> 00:28:13,350

pilot greg

540

00:28:17,350 --> 00:28:15,360

johnson here taking some photos inside

541

00:28:20,389 --> 00:28:17,360

the quest airlock ready

542

00:28:21,510 --> 00:28:20,399

to meet the space walkers as they

543

00:28:23,190 --> 00:28:21,520

make their

544

00:28:25,269 --> 00:28:23,200

return to the states to the inside of

545

00:28:27,750 --> 00:28:25,279

the space station

546

00:28:29,909 --> 00:28:27,760

johnson of course was at the helm of the

547

00:28:31,590 --> 00:28:29,919

shuttle station's robotic arm during

548

00:28:34,630 --> 00:28:31,600

today's work with special purpose

549

00:28:37,029 --> 00:28:34,640

dexterous manipulator

550

00:28:38,070 --> 00:28:37,039

mission specialist feustel installed a

551
00:28:39,350 --> 00:28:38,080
camera

552
00:28:42,149 --> 00:28:39,360
lens cover

553
00:28:42,950 --> 00:28:42,159
on the dexter arm

554
00:28:45,350 --> 00:28:42,960
and

555
00:29:00,149 --> 00:28:45,360
lubricated the

556
00:29:03,750 --> 00:29:01,830
with repressurization of the quest

557
00:29:06,230 --> 00:29:03,760
airlock now started the

558
00:29:08,310 --> 00:29:06,240
second spacewalk of the sts-134 mission

559
00:29:10,950 --> 00:29:08,320
is now officially complete

560
00:29:12,710 --> 00:29:10,960
lasted a total of eight hours and seven

561
00:29:14,389 --> 00:29:12,720
minutes making it the sixth longest

562
00:29:17,029 --> 00:29:14,399
space walk in history

563
00:29:19,510 --> 00:29:17,039

crew went up the door at 105 am central

564

00:29:21,029 --> 00:29:19,520

time and i just wrapped that up at 9 12

565

00:29:23,750 --> 00:29:21,039

a.m central

566

00:29:26,070 --> 00:29:23,760

it was the 116th

567

00:29:27,190 --> 00:29:26,080

spacewalk conducted from space station

568

00:29:29,950 --> 00:29:27,200

air locks

569

00:29:35,669 --> 00:29:32,710

157th spacewalk for any international

570

00:29:37,350 --> 00:29:35,679

space station assembly and maintenance

571

00:29:40,630 --> 00:29:37,360

the eight hours and seven minutes added

572

00:29:43,909 --> 00:29:40,640

to that total brings them up to 988

573

00:29:46,230 --> 00:29:43,919

hours and 19 minutes spent on

574

00:29:47,990 --> 00:29:46,240

iss assembly and maintenance

575

00:29:53,110 --> 00:29:48,000

and a total of 14 hours and 20 minutes

576
00:29:57,350 --> 00:29:55,190
for mission specialist drew feustel with

577
00:29:58,950 --> 00:29:57,360
his five space walks including two now

578
00:30:02,070 --> 00:29:58,960
at the space station

579
00:30:03,990 --> 00:30:02,080
35 hours and 24 minutes of space walking

580
00:30:05,750 --> 00:30:04,000
time for him that puts him at 30th on

581
00:30:08,389 --> 00:30:05,760
the list of

582
00:30:09,350 --> 00:30:08,399
astronauts time spent space walking

583
00:30:12,070 --> 00:30:09,360
fink

584
00:30:14,630 --> 00:30:12,080
is just behind him at 32nd on the list

585
00:30:17,590 --> 00:30:14,640
with his 34 hours and 19 minutes over

586
00:30:20,470 --> 00:30:17,600
seven space walks first of which uh that

587
00:30:23,750 --> 00:30:20,480
was in a u.s space suit was today of