



1
00:00:05,110 --> 00:00:03,590
the pressure down to a vacuum matching

2
00:00:06,789 --> 00:00:05,120
exactly what is outside before the

3
00:01:18,070 --> 00:00:06,799
astronauts open the hatch and begin

4
00:01:22,870 --> 00:01:20,469
and nasa astronaut chris cassidy has now

5
00:02:14,949 --> 00:01:22,880
been moved into the crew lock portion of

6
00:02:19,510 --> 00:02:16,869
some other spacesuit facts while the

7
00:02:22,070 --> 00:02:19,520
crew gets into place at nominal pressure

8
00:02:24,229 --> 00:02:22,080
the suit is about 4.3 pounds per square

9
00:02:25,990 --> 00:02:24,239
inch to put that into context the

10
00:02:28,790 --> 00:02:26,000
atmospheric pressure pressure we are

11
00:02:31,430 --> 00:02:28,800
used to on earth's surface is about 14.7

12
00:02:32,949 --> 00:02:31,440
psi that is also the pressure of the

13
00:02:35,589 --> 00:02:32,959

inside of the international space

14

00:02:40,390 --> 00:02:35,599

station with a mixed oxygen nitrogen

15

00:02:44,869 --> 00:02:43,030

the 4.3 psi inside the spacesuit is

16

00:02:45,830 --> 00:02:44,879

about similar what to what you would

17

00:02:48,630 --> 00:02:45,840

experience

18

00:02:50,710 --> 00:02:48,640

at about 30 000 feet elevation

19

00:02:52,790 --> 00:02:50,720

that low pressure allows for much more

20

00:02:55,110 --> 00:02:52,800

flexibility which is crucial when

21

00:05:53,909 --> 00:02:55,120

flexing those rigid gloves for this

22

00:06:00,230 --> 00:05:56,469

and we saw a wave from nasa astronaut

23

00:06:02,790 --> 00:06:00,240

chris cassidy as now bob benkin or doug

24

00:06:05,430 --> 00:06:02,800

hurley and yvonne wagner have closed the

25

00:06:07,270 --> 00:06:05,440

hatch separating the crew lock portion

26
00:07:26,710 --> 00:06:07,280
from the equipment lock of the quest

27
00:07:31,110 --> 00:07:28,950
you can see nasa astronaut doug hurley

28
00:07:34,150 --> 00:07:31,120
checking his procedures as the crew

29
00:07:37,110 --> 00:07:34,160
continues to prepare for depress

30
00:07:37,120 --> 00:07:43,990
72 and 73 are complete

31
00:07:44,000 --> 00:07:53,430
eastern copies 72 and 73 complete

32
00:07:56,950 --> 00:07:55,990
looks like you guys have some steps 74

33
00:08:05,029 --> 00:07:56,960
through

34
00:08:05,039 --> 00:08:24,629
steps are in work

35
00:08:24,639 --> 00:08:57,829
hmm

36
00:08:57,839 --> 00:09:29,829
um

37
00:09:33,590 --> 00:09:31,670
the battery changeout we'll see today

38
00:09:35,350 --> 00:09:33,600

are quite different than any batteries

39

00:09:37,990 --> 00:09:35,360

you'll find on earth

40

00:09:40,150 --> 00:09:38,000

these batteries collect power that is

41

00:09:42,070 --> 00:09:40,160

gathered by the station's solar arrays

42

00:09:44,949 --> 00:09:42,080

which we hope to get a good look at

43

00:09:46,790 --> 00:09:44,959

today it then stores the power inside

44

00:09:48,230 --> 00:09:46,800

the batteries and then with the help of

45

00:09:50,230 --> 00:09:48,240

something called the battery charge

46

00:09:52,550 --> 00:09:50,240

discharge unit disperses it throughout

47

00:10:22,710 --> 00:09:52,560

the station whenever the station is in

48

00:10:22,720 --> 00:10:38,110

well

49

00:10:44,310 --> 00:10:40,389

[Music]

50

00:10:46,630 --> 00:10:44,320

houston steps 74 75 and 76 are complete

51

00:10:48,470 --> 00:10:46,640

you're going to continue in 77

52

00:10:58,210 --> 00:10:48,480

evie crew you are hot miked on space

53

00:10:58,220 --> 00:11:03,670

[Music]

54

00:11:07,670 --> 00:11:05,509

hey chris comp check can you hear me

55

00:11:10,790 --> 00:11:07,680

climb clear

56

00:11:13,829 --> 00:11:10,800

okay on the uia check the depress pump

57

00:11:16,069 --> 00:11:13,839

power switch is off depressed pump power

58

00:11:19,350 --> 00:11:16,079

switch is off

59

00:11:27,110 --> 00:11:19,360

check that the depress pump enable led

60

00:11:33,509 --> 00:11:31,430

been uh in step 80 year ago i've got uh

61

00:11:58,949 --> 00:11:33,519

about seven minutes for the end of the

62

00:12:03,990 --> 00:12:00,870

doing something about that gopro

63

00:12:15,750 --> 00:12:04,000

i'm just yeah it's flopping look it just

64

00:12:19,269 --> 00:12:17,430

good morning i'm with you now for the

65

00:12:24,230 --> 00:12:19,279

rest of the day and we agree with your

66

00:12:27,590 --> 00:12:25,269

okay

67

00:12:29,670 --> 00:12:27,600

good morning anne uh good to talk to you

68

00:12:33,110 --> 00:12:29,680

we're gonna hold in step 80 for another

69

00:12:33,120 --> 00:12:39,030

good plan thanks

70

00:12:43,110 --> 00:12:40,870

that was the voice of nasa astronaut

71

00:12:44,710 --> 00:12:43,120

anne mclean she's here on the ground

72

00:12:46,949 --> 00:12:44,720

-serving as the capcom while the

73

00:12:48,790 --> 00:12:46,959

astronauts are still in the hatch

74

00:12:51,190 --> 00:12:48,800

once the astronauts make it outside of

75

00:12:53,269 --> 00:12:51,200

the quest airlock this morning she'll

76

00:12:55,509 --> 00:12:53,279

pass over the communication duties to

77

00:12:57,750 --> 00:12:55,519

joshua kootrich a canadian space agency

78

00:12:59,430 --> 00:12:57,760

astronaut who is serving as the ground

79

00:13:01,030 --> 00:12:59,440

iv

80

00:13:03,190 --> 00:13:01,040

if you'd like to do step 81 you're

81

00:13:09,269 --> 00:13:03,200

welcome to while the clock goes down or

82

00:13:39,829 --> 00:13:11,350

uh we were just gonna ask we'll go ahead

83

00:13:39,839 --> 00:13:53,990

hmm

84

00:13:54,000 --> 00:14:11,030

huh

85

00:14:11,040 --> 00:14:25,829

uh

86

00:14:25,839 --> 00:14:32,069

18-22 is expected or removed

87

00:14:32,079 --> 00:15:10,069

good numbers chunky thanks

88

00:15:21,350 --> 00:15:11,750

it might be easier to put the gopro on

89

00:15:25,189 --> 00:15:23,030

this work is just a little i think

90

00:15:45,189 --> 00:15:25,199

convenient to get the

91

00:15:49,590 --> 00:15:47,670

for chris houston when you do get a

92

00:15:50,629 --> 00:15:49,600

final config on how you like that gopro

93

00:16:02,150 --> 00:15:50,639

if you wouldn't mind letting us know

94

00:16:08,150 --> 00:16:04,949

off of my brt

95

00:16:10,389 --> 00:16:08,160

and it's going uh

96

00:16:11,829 --> 00:16:10,399

from one

97

00:16:14,870 --> 00:16:11,839

other loop on the

98

00:16:16,389 --> 00:16:14,880

gopro around

99

00:16:17,990 --> 00:16:16,399

the

100

00:16:19,350 --> 00:16:18,000

camera handrail

101
00:16:22,310 --> 00:16:19,360
back to

102
00:16:24,020 --> 00:16:22,320
an opposite tether loop on the gopro

103
00:16:25,749 --> 00:16:24,030
nice cinched up but adjustable

104
00:16:28,470 --> 00:16:25,759
[Applause]

105
00:16:29,910 --> 00:16:28,480
the reason was it it was a lift flopping

106
00:16:35,990 --> 00:16:29,920
around i don't think i could keep it

107
00:16:36,000 --> 00:17:07,510
okay chris thanks for that

108
00:17:07,520 --> 00:17:43,110
yes

109
00:17:48,549 --> 00:17:45,590
we'll be looking for depressurization of

110
00:17:49,510 --> 00:17:48,559
the quest airlock crew portion to begin

111
00:17:51,750 --> 00:17:49,520
shortly

112
00:17:53,190 --> 00:17:51,760
the spacewalk itself won't begin until

113
00:19:05,990 --> 00:17:53,200

the astronauts have placed their

114

00:19:11,190 --> 00:19:08,150

and houston airlock our previous clock

115

00:19:15,350 --> 00:19:11,200

has expired just let us know we can

116

00:19:24,070 --> 00:19:17,350

and the airlock and crew you are go for

117

00:19:24,080 --> 00:19:31,510

go for the crewlock press thank you

118

00:19:37,270 --> 00:19:34,950

all right gents uh on the uia chris

119

00:19:38,789 --> 00:19:37,280

take the depressed pump power switch to

120

00:19:40,470 --> 00:19:38,799

on

121

00:19:54,870 --> 00:19:40,480

pump power switch

122

00:19:58,070 --> 00:19:55,750

okay

123

00:20:00,950 --> 00:19:58,080

now take the depress pump manual

124

00:20:03,110 --> 00:20:00,960

isolation valve to open expect an alert

125

00:20:07,029 --> 00:20:03,120

tone and monitor your suit pressure

126

00:20:09,990 --> 00:20:07,039

gauges for less than 5.5 psi

127

00:20:22,470 --> 00:20:10,000

copper's pump manual isolation valve is

128

00:20:27,669 --> 00:20:24,710

and depressurization has begun of the

129

00:20:32,830 --> 00:20:27,679

crew lock portion of the quest airlock

130

00:21:08,070 --> 00:20:35,669

tone and chris you're gonna close the

131

00:21:30,310 --> 00:21:20,230

uh

132

00:21:30,320 --> 00:22:29,029

ah

133

00:22:32,870 --> 00:22:30,789

in airlock houston we see a good

134

00:22:34,630 --> 00:22:32,880

depressed rate just as a heads up it

135

00:22:41,029 --> 00:22:34,640

should take us about seven minutes to

136

00:22:41,039 --> 00:23:23,190

happy seven minutes thank you

137

00:23:23,200 --> 00:23:32,280

1.05

138

00:23:32,290 --> 00:23:45,029

[Music]

139

00:23:49,269 --> 00:23:46,549

depressurization of the airlock

140

00:24:32,710 --> 00:23:49,279

continues to move smoothly for our space

141

00:24:36,789 --> 00:24:34,950

we're in a short handover period as the

142

00:24:38,870 --> 00:24:36,799

international space station orbits earth

143

00:24:41,830 --> 00:24:38,880

it changes satellites as part of the

144

00:24:42,789 --> 00:24:41,840

tdrs or tracking data relay satellite

145

00:24:44,549 --> 00:24:42,799

system

146

00:24:56,270 --> 00:24:44,559

we will regain communication with the

147

00:25:36,470 --> 00:25:06,360

[Laughter]

148

00:25:36,480 --> 00:25:57,029

ah

149

00:25:57,039 --> 00:26:10,390

huh

150

00:26:10,400 --> 00:26:39,510

yes

151
00:26:39,520 --> 00:27:20,900
uh

152
00:27:20,910 --> 00:28:09,020
[Laughter]

153
00:28:09,030 --> 00:28:40,710
[Music]

154
00:28:45,669 --> 00:28:42,789
depressurization of the quest airlock

155
00:28:47,669 --> 00:28:45,679
continuing smoothly for our astronauts

156
00:28:49,510 --> 00:28:47,679
nasa's chris cassidy commander of the

157
00:28:51,990 --> 00:28:49,520
international space station and bob

158
00:28:55,590 --> 00:28:52,000
banken both on their ninth spacewalk

159
00:29:00,149 --> 00:28:58,070
currently in the equipment lock portion

160
00:29:02,389 --> 00:29:00,159
of the crew airlock you can see doug

161
00:29:06,789 --> 00:29:02,399
hurley and yvonne wagner who helped the

162
00:29:10,230 --> 00:29:08,710
hurley will also be commanding the

163
00:29:12,230 --> 00:29:10,240

canadarm2

164

00:29:14,630 --> 00:29:12,240

attached to the external pallet moving

165

00:29:33,390 --> 00:29:14,640

it into place for the astronauts

166

00:29:33,400 --> 00:29:48,630

[Music]

167

00:29:53,110 --> 00:29:51,269

that's when it gets to five feet dry

168

00:29:54,830 --> 00:29:53,120

take the deep response manual isolation

169

00:29:56,549 --> 00:29:54,840

valve to close

170

00:30:17,430 --> 00:29:56,559

[Music]

171

00:30:35,190 --> 00:30:19,669

then five inside you can go ahead and

172

00:30:39,990 --> 00:30:36,950

lead check so go ahead and get meat

173

00:30:40,950 --> 00:30:40,000

check question mark displayed

174

00:30:46,230 --> 00:30:40,960

and then

175

00:31:48,389 --> 00:30:47,350

in work

176
00:31:53,830 --> 00:31:49,830
picture complete

177
00:31:58,710 --> 00:31:55,909
if you get leak checks

178
00:32:03,430 --> 00:31:58,720
check your o2 actuator and make sure

179
00:32:08,710 --> 00:32:05,590
dva

180
00:32:11,430 --> 00:32:08,720
dv1 is eva

181
00:32:13,269 --> 00:32:11,440
hey chris you can take this new prompt

182
00:32:17,830 --> 00:32:13,279
we press the content manual isolation

183
00:32:21,669 --> 00:32:19,750
both bob bankin and chris cassidy

184
00:32:23,350 --> 00:32:21,679
reporting that they have good leak

185
00:32:24,870 --> 00:32:23,360
checks on their suit

186
00:32:30,470 --> 00:32:24,880
as the

187
00:32:33,950 --> 00:32:32,950
let's monitor your pressure gauge for

188
00:32:36,630 --> 00:32:33,960

less than

189

00:32:51,029 --> 00:32:36,640

5.5 and this is a good time to do your

190

00:32:53,990 --> 00:32:52,549

i'm okay

191

00:32:57,269 --> 00:32:54,000

the boom is okay i'll start with

192

00:32:59,669 --> 00:32:57,279

structure that sounds good

193

00:33:01,750 --> 00:32:59,679

i'm a closed and locked to the airlock

194

00:33:03,269 --> 00:33:01,760

d-ring with my waist center on my left

195

00:33:05,029 --> 00:33:03,279

side

196

00:33:10,710 --> 00:33:05,039

that waste header is closed and locked

197

00:33:10,720 --> 00:33:20,230

on my right side

198

00:33:22,389 --> 00:33:20,880

i've got a

199

00:33:23,990 --> 00:33:22,399

[Music]

200

00:33:26,389 --> 00:33:24,000

little alleviating strap from the red

201
00:33:29,830 --> 00:33:26,399
wheel closed and locked to my ding ring

202
00:33:32,630 --> 00:33:31,590
i've got a waste feather closed and

203
00:33:33,509 --> 00:33:32,640
locked

204
00:33:35,750 --> 00:33:33,519
to

205
00:33:38,070 --> 00:33:35,760
reel number 27

206
00:33:40,389 --> 00:33:38,080
the reel is unboxed

207
00:33:41,830 --> 00:33:40,399
and i have an anchor hook

208
00:33:49,029 --> 00:33:41,840
on my

209
00:33:49,039 --> 00:33:55,110
that completes my configuration i think

210
00:33:55,120 --> 00:33:59,350
don't speak to me

211
00:34:06,950 --> 00:34:03,750
i'll start with uh structure as well

212
00:34:08,710 --> 00:34:06,960
let's do the same narellan earring

213
00:34:11,190 --> 00:34:08,720

extender

214

00:34:13,349 --> 00:34:11,200

as bob's on my head at which other

215

00:34:16,470 --> 00:34:13,359

microgrid

216

00:34:18,550 --> 00:34:16,480

is closed and locked

217

00:34:19,669 --> 00:34:18,560

going to leave hands dropped in good

218

00:34:21,909 --> 00:34:19,679

shape

219

00:34:24,869 --> 00:34:21,919

it's screwed outside

220

00:34:28,149 --> 00:34:24,879

there's foils along with my right

221

00:34:32,829 --> 00:34:30,550

on my left

222

00:34:34,710 --> 00:34:32,839

d-ring i have a d-ring

223

00:34:36,550 --> 00:34:34,720

extender

224

00:34:37,750 --> 00:34:36,560

with a loader leave it in

225

00:34:42,869 --> 00:34:37,760

hook

226
00:34:49,109 --> 00:34:45,349
the little leaving strap is in good

227
00:34:54,950 --> 00:34:49,909
the

228
00:34:56,230 --> 00:34:54,960
position

229
00:34:57,589 --> 00:34:56,240
and the

230
00:34:59,670 --> 00:34:57,599
anchor hook

231
00:35:11,589 --> 00:34:59,680
the yellow end

232
00:35:17,510 --> 00:35:14,230
copy two good setter configurations for

233
00:35:19,109 --> 00:35:17,520
you chris when you get the 2.0

234
00:35:22,150 --> 00:35:19,119
you'll take the default

235
00:35:36,069 --> 00:35:22,160
pump manual isolation valve to close

236
00:35:36,079 --> 00:35:47,910
ah

237
00:35:51,750 --> 00:35:49,349
gentlemen thank you for that tether

238
00:35:55,349 --> 00:35:51,760

config we like it the only thing that we

239

00:35:56,870 --> 00:35:55,359

didn't catch if bob on your right side

240

00:36:01,109 --> 00:35:56,880

waist tether you could check the

241

00:36:06,230 --> 00:36:03,829

yeah and uh that's a good reminder we'll

242

00:36:08,470 --> 00:36:06,240

do that when we're outside it's uh

243

00:36:14,150 --> 00:36:08,480

that way chris can get eyes on the lock

244

00:36:14,160 --> 00:36:19,030

okay we like that plan thanks

245

00:36:37,910 --> 00:36:21,430

i'm sean 2.1

246

00:36:49,750 --> 00:36:41,430

power switch to off

247

00:36:55,750 --> 00:36:52,230

guys when the crewlocky pdp gets about

248

00:36:59,030 --> 00:36:55,760

to zero expect an alert zone and uh

249

00:37:01,270 --> 00:36:59,040

bob for you when the ev hatch delta p is

250

00:37:11,670 --> 00:37:01,280

0.5 you can go ahead and open the ev

251

00:37:15,829 --> 00:37:12,630

well

252

00:37:20,950 --> 00:37:15,839

that's about as much room as i can

253

00:37:24,310 --> 00:37:22,950

going to be a few minutes uh obviously

254

00:37:29,910 --> 00:37:24,320

but it looks like you guys have some

255

00:37:38,150 --> 00:37:31,430

airlock houston we estimate this is

256

00:37:38,160 --> 00:38:22,550

recapping 14 minutes

257

00:38:22,560 --> 00:38:42,790

huh

258

00:38:42,800 --> 00:39:57,589

uh

259

00:40:08,710 --> 00:39:59,670

depressurization continues in the crew

260

00:40:12,470 --> 00:40:10,550

once the astronauts switch their suits

261

00:40:21,430 --> 00:40:12,480

onto internal battery power that's when

262

00:40:25,910 --> 00:40:23,510

nasa astronaut bob bankin will be the

263

00:43:23,910 --> 00:40:25,920

astronaut today who opens the hatch

264

00:43:27,750 --> 00:43:25,430

here in the international space station

265

00:43:30,630 --> 00:43:27,760

flight control room in mission control

266

00:43:32,150 --> 00:43:30,640

houston you've got a view of the team

267

00:43:33,510 --> 00:43:32,160

you're appearing on the loops this

268

00:43:35,349 --> 00:43:33,520

morning

269

00:43:37,190 --> 00:43:35,359

there in the red jacket in the center of

270

00:43:39,109 --> 00:43:37,200

your screen is allison bollinger she's

271

00:43:40,550 --> 00:43:39,119

the flight director today

272

00:43:43,270 --> 00:43:40,560

to her right

273

00:43:45,030 --> 00:43:43,280

is ann mclean nasa astronaut who you've

274

00:43:46,790 --> 00:43:45,040

been hearing speak with the crew aboard

275

00:43:50,150 --> 00:43:46,800

the international space station as they

276

00:43:52,550 --> 00:43:50,160

prepare for today's spacewalk

277

00:43:54,710 --> 00:43:52,560

and behind them at the eva which means

278

00:43:56,950 --> 00:43:54,720

spacewalk console

279

00:44:01,589 --> 00:43:56,960

that is lead spacewalk officer sandra

280

00:44:06,069 --> 00:44:04,230

depressurization continues inside the

281

00:44:15,270 --> 00:44:06,079

quest airlock aboard the international

282

00:44:18,710 --> 00:44:16,790

in the blue shirt there that you just

283

00:44:21,349 --> 00:44:18,720

saw enter the picture that's joshua

284

00:44:23,109 --> 00:44:21,359

kootrich canadian space agency astronaut

285

00:46:25,270 --> 00:44:23,119

who you can expect to hear once the

286

00:46:32,400 --> 00:46:27,349

this is still showing up around point

287

00:46:32,410 --> 00:47:06,790

[Music]

288

00:47:10,069 --> 00:47:08,550

and doug hurley currently in the

289

00:47:11,990 --> 00:47:10,079

equipment lock portion of the crew

290

00:47:14,390 --> 00:47:12,000

airlock you just got a glimpse at the

291

00:47:17,349 --> 00:47:14,400

bottom of his socks with a special

292

00:47:19,990 --> 00:47:17,359

message it said karen plus jack a shout

293

00:47:37,670 --> 00:47:20,000

out to his wife and son back here on

294

00:50:31,109 --> 00:47:39,670

look at showing about 0.6 on the gauge

295

00:50:38,710 --> 00:50:34,549

bob i'm showing less than 5 psi inside

296

00:50:43,349 --> 00:50:40,549

still showing about 0.6 on the gauge

297

00:50:48,549 --> 00:50:43,359

here so i'll go ahead and open the hatch

298

00:50:48,559 --> 00:51:01,030

no problem we like the plan

299

00:51:30,950 --> 00:51:03,829

now working to open the hatch out into

300

00:51:41,270 --> 00:51:33,510

see the hatches open

301
00:51:45,910 --> 00:51:43,430
y'all and with that i'll hand you guys

302
00:51:48,470 --> 00:51:45,920
over to josh uh good job this morning

303
00:52:03,510 --> 00:51:48,480
and have fun out there

304
00:52:08,230 --> 00:52:05,589
all right chris and bob it's josh good

305
00:52:08,240 --> 00:52:11,510
good morning josh

306
00:52:15,030 --> 00:52:13,109
we're ready to get going with the post

307
00:52:16,710 --> 00:52:15,040
depressed just want to confirm and doug

308
00:52:22,549 --> 00:52:16,720
if you're hearing this that's step 14

309
00:52:27,109 --> 00:52:24,390
complete

310
00:52:28,950 --> 00:52:27,119
gappy in that case bob and chris we're

311
00:52:31,270 --> 00:52:28,960
ready to switch your power switches to

312
00:52:34,790 --> 00:52:31,280
bat please stagger the switch throws

313
00:52:34,800 --> 00:52:44,790

dvd-1 coming to that

314

00:52:44,800 --> 00:52:47,109

keep

315

00:52:50,790 --> 00:52:49,109

copy two suits in that

316

00:52:55,030 --> 00:52:50,800

both of you can just check that your

317

00:53:01,190 --> 00:52:57,190

display switch is functional for uv-1

318

00:53:03,670 --> 00:53:01,200

display switch function will lead me to

319

00:53:06,630 --> 00:53:03,680

copy two times functional chris on the

320

00:53:09,430 --> 00:53:06,640

uia will take the power switch for evs

321

00:53:15,109 --> 00:53:09,440

one and two to off off

322

00:53:20,390 --> 00:53:17,990

our ev1 off

323

00:53:23,270 --> 00:53:20,400

our ev2 off

324

00:53:25,430 --> 00:53:23,280

4 led 0

325

00:53:27,589 --> 00:53:25,440

i copy all four lights off

326

00:53:30,630 --> 00:53:27,599

for both you chris and bob we can

327

00:53:32,630 --> 00:53:30,640

disconnect the scu from your dcms

328

00:53:34,309 --> 00:53:32,640

install the dcm cover and we'll stow the

329

00:53:43,109 --> 00:53:34,319

scu in the pouch let me know when that's

330

00:53:47,910 --> 00:53:45,109

and with the spacesuits switched to

331

00:53:51,030 --> 00:53:47,920

battery power the spacewalk has begun

332

00:53:53,589 --> 00:53:51,040

officially at 6 10 a.m central time 7 10

333

00:54:00,950 --> 00:53:53,599

a.m eastern time as the space station

334

00:54:05,349 --> 00:54:02,549

the new voice you hear talking to the

335

00:54:07,430 --> 00:54:05,359

astronauts is ground iv joshua kootrich

336

00:54:09,910 --> 00:54:07,440

of the canadian space agency he'll be

337

00:54:13,270 --> 00:54:09,920

relaying those tasks to the crew members

338

00:54:17,510 --> 00:54:15,670

evy scu is in the pouch

339

00:54:22,069 --> 00:54:17,520

pcm cover is

340

00:54:22,079 --> 00:54:25,430

copy everyone

341

00:54:31,270 --> 00:54:28,309

an 82 scu

342

00:54:35,030 --> 00:54:31,280

the pouching stove

343

00:54:37,109 --> 00:54:35,040

tap e2 has to use the pouches and stowed

344

00:54:39,030 --> 00:54:37,119

chris you can take the deep breast pump

345

00:54:42,630 --> 00:54:39,040

manual isolation valve check that it's

346

00:54:47,589 --> 00:54:44,950

manual isolation valve is confirmed

347

00:55:15,670 --> 00:54:49,829

guppy for both suits temperature control

348

00:55:20,230 --> 00:55:18,309

copy two times max hots

349

00:55:22,309 --> 00:55:20,240

we're ready for water so if you want n2

350

00:55:26,309 --> 00:55:22,319

you can take your water switches to on

351

00:55:30,950 --> 00:55:28,230

water is on

352

00:55:33,270 --> 00:55:30,960

you do water on

353

00:55:37,829 --> 00:55:33,280

if we wanted to let's check the dcm is

354

00:55:45,030 --> 00:55:42,710

eb1 blank bytes off right now by ev2

355

00:56:11,990 --> 00:55:45,040

3v1n2 temperature control valves as

356

00:56:17,829 --> 00:56:14,069

e1 set to 5

357

00:56:26,549 --> 00:56:20,309

guppy five and four thanks for that up

358

00:56:32,710 --> 00:56:28,829

4.2 for ev1

359

00:56:38,069 --> 00:56:36,150

4.2 and 4.3 advisors you can set as

360

00:56:53,510 --> 00:56:38,079

required we're expecting mostly sun all

361

00:56:53,520 --> 00:56:59,510

josh

362

00:57:03,270 --> 00:57:01,829

okay hi copy visors that completes the

363

00:57:05,510 --> 00:57:03,280

cute card for us we're going to step

364

00:57:07,430 --> 00:57:05,520

into the procedures um just a couple

365

00:57:09,910 --> 00:57:07,440

preliminaries before we head out and

366

00:57:12,150 --> 00:57:09,920

we'll take a baseline half check for ev1

367

00:57:14,230 --> 00:57:12,160

and 2 and then bob whenever we're able

368

00:57:17,910 --> 00:57:14,240

to see it we'll check the status of that

369

00:57:32,069 --> 00:57:21,190

okay so baseline hat3v1

370

00:57:35,030 --> 00:57:33,829

you'll hear a few more hap checks

371

00:57:40,549 --> 00:57:35,040

throughout the day that stands for

372

00:57:46,870 --> 00:57:42,549

and we are go now so bob you can open

373

00:57:51,270 --> 00:57:49,510

the thermal cover is open

374

00:57:55,349 --> 00:57:51,280

might be dressing

375

00:58:02,549 --> 00:57:56,950

bobby i want to inspect your safety

376

00:58:07,510 --> 00:58:04,150

it might face each other wheel on the

377

00:58:07,520 --> 00:58:12,390

to be in that good shape

378

00:58:19,030 --> 00:58:14,390

copy that chris uh you'll be able to

379

00:58:19,040 --> 00:58:23,910

we copy unlocked

380

00:58:27,510 --> 00:58:25,430

and chris over to you how you want to do

381

00:58:29,750 --> 00:58:27,520

this but you want to get ready to the s3

382

00:58:31,109 --> 00:58:29,760

boom with your brt rep and then we're

383

00:58:32,630 --> 00:58:31,119

going to do some checks to make sure the

384

00:58:38,309 --> 00:58:32,640

camera is fully installed before you

385

00:58:38,319 --> 00:59:13,430

great coffee

386

00:59:20,309 --> 00:59:19,270

[Music]

387

00:59:21,829 --> 00:59:20,319

and the

388

00:59:24,870 --> 00:59:21,839

cover

389

00:59:26,150 --> 00:59:24,880

where you bag is removed

390

00:59:28,309 --> 00:59:26,160

copy chris

391

00:59:30,069 --> 00:59:28,319

if now's a good time we wanted to do a

392

00:59:32,069 --> 00:59:30,079

pull test on the camera and just check

393

00:59:37,430 --> 00:59:32,079

that that camera bracket is between the

394

00:59:37,440 --> 00:59:41,990

firm between the alignment marks

395

00:59:46,630 --> 00:59:43,430

and the lever

396

00:59:48,950 --> 00:59:46,640

is forced

397

00:59:50,630 --> 00:59:48,960

copy now we can take a pull test and

398

00:59:53,670 --> 00:59:50,640

then we're ready to send the ru bag

399

01:00:02,230 --> 00:59:55,750

i'll have you are you back

400

01:00:09,349 --> 01:00:04,630

and it's installed on my brt

401
01:00:12,470 --> 01:00:11,349
give chris's go to egress and chris

402
01:00:14,230 --> 01:00:12,480
you'll be doing the same thing

403
01:00:18,309 --> 01:00:14,240
inspecting your load alleviating strap

404
01:00:21,829 --> 01:00:19,589
okay trophy

405
01:00:23,910 --> 01:00:21,839
let's go to e-crash coast thank you

406
01:00:38,549 --> 01:00:23,920
my weight

407
01:00:43,510 --> 01:00:42,230
and josh david go to move my green hook

408
01:00:46,789 --> 01:00:43,520
to the red

409
01:00:52,870 --> 01:00:49,349
bob just confirmed for us you moved to

410
01:00:57,510 --> 01:00:55,430
the other one is closed and locked

411
01:00:58,210 --> 01:00:57,520
onto the

412
01:00:59,430 --> 01:00:58,220
green reel

413
01:01:01,510 --> 01:00:59,440

[Music]

414

01:01:06,150 --> 01:01:01,520

and the reel is unlocked

415

01:01:08,549 --> 01:01:06,160

and i do have that reel restrained

416

01:01:10,470 --> 01:01:08,559

copy bob in that case you're go using a

417

01:01:33,349 --> 01:01:10,480

tether to take your green hook to your

418

01:01:36,829 --> 01:01:35,589

okay my green hook is closed and locked

419

01:01:39,990 --> 01:01:36,839

onto the red

420

01:01:40,710 --> 01:01:40,000

wheel guppy bob when chris is the camera

421

01:01:53,109 --> 01:01:40,720

is

422

01:02:02,789 --> 01:01:55,910

okay the camera's on my

423

01:02:06,549 --> 01:02:04,789

both astronauts have egressed the hatch

424

01:02:10,230 --> 01:02:06,559

and are preparing for their first task

425

01:02:10,240 --> 01:02:14,390

from the airlock d-ring extender

426

01:02:14,400 --> 01:02:23,270

hey affirmative bob here on that

427

01:02:27,589 --> 01:02:25,190

for chris cassidy the first task will be

428

01:02:30,470 --> 01:02:27,599

to go to the s3 external wireless

429

01:02:37,349 --> 01:02:30,480

communications work site and install a

430

01:02:40,549 --> 01:02:39,109

the boom will have a camera attached

431

01:02:46,470 --> 01:02:40,559

which will also have an external

432

01:02:53,910 --> 01:02:49,430

it might be more convenient if you can

433

01:02:53,920 --> 01:03:08,470

that was a good time

434

01:03:08,480 --> 01:03:14,150

we copied chris's yellow hook and work

435

01:03:19,430 --> 01:03:14,829

all

436

01:03:24,710 --> 01:03:21,190

rail 30

437

01:03:27,109 --> 01:03:24,720

which is my green irkum body the reel is

438

01:03:29,430 --> 01:03:27,119

unlocked

439

01:03:30,390 --> 01:03:29,440

and uh getting ready for the green of my

440

01:03:32,470 --> 01:03:30,400

yellow

441

01:03:35,029 --> 01:03:32,480

anchor hook is closed and locked press

442

01:03:37,910 --> 01:03:35,039

the bob on

443

01:03:39,109 --> 01:03:37,920

on that green arkham body

444

01:03:41,589 --> 01:03:39,119

and

445

01:03:47,349 --> 01:03:41,599

that i'm ready to

446

01:03:47,359 --> 01:03:53,230

copy all standing by for the green hook

447

01:03:53,240 --> 01:04:00,309

[Music]

448

01:04:03,990 --> 01:04:02,309

you know it is uh closed and locked on

449

01:04:05,910 --> 01:04:04,000

the redder from reel double checking

450

01:04:07,829 --> 01:04:05,920

again the uh

451
01:04:09,349 --> 01:04:07,839
left side

452
01:04:10,390 --> 01:04:09,359
total leaving strap on my gearing

453
01:04:14,549 --> 01:04:10,400
extender

454
01:04:18,710 --> 01:04:17,029
and we can carry chris good config bob

455
01:04:31,270 --> 01:04:18,720
we can close the hatch thermal cover and

456
01:04:35,510 --> 01:04:33,430
thermal cover is closed

457
01:04:41,270 --> 01:04:35,520
i could verify chris both of your mini

458
01:04:45,109 --> 01:04:43,910
we need workstation and brt tabs for you

459
01:04:46,549 --> 01:04:45,119
are up

460
01:04:51,589 --> 01:04:46,559
i see

461
01:04:58,549 --> 01:04:54,789
then your left handle is down as one

462
01:04:59,990 --> 01:04:58,559
both both safers good to go you see mine

463
01:05:01,750 --> 01:05:00,000

yep

464

01:05:06,470 --> 01:05:01,760

i see your green light i see your green

465

01:05:10,789 --> 01:05:08,789

last thing i think was my the waste

466

01:05:16,150 --> 01:05:10,799

tether that goes to my suit verifying

467

01:05:20,829 --> 01:05:18,069

you can see that chris

468

01:05:22,549 --> 01:05:20,839

please better go into your suit

469

01:05:23,750 --> 01:05:22,559

yes

470

01:05:25,910 --> 01:05:23,760

locked

471

01:05:28,390 --> 01:05:25,920

and closed okay

472

01:05:30,710 --> 01:05:28,400

looking good

473

01:05:33,029 --> 01:05:30,720

and using copies and we copy the lock on

474

01:05:46,069 --> 01:05:33,039

uh bob your last right waist tether

475

01:05:46,079 --> 01:05:55,750

are you clear to go

476

01:05:59,270 --> 01:05:57,589

and chris we you might have said it we

477

01:06:01,349 --> 01:05:59,280

have a couple things we just want to

478

01:06:03,029 --> 01:06:01,359

confirm here so you're the load

479

01:06:05,109 --> 01:06:03,039

alleviating strap that was left outside

480

01:06:06,710 --> 01:06:05,119

on the d-ring can you just run that bias

481

01:06:09,990 --> 01:06:06,720

again and make sure it's in a good

482

01:06:10,000 --> 01:06:15,510

affirmative yes

483

01:06:15,520 --> 01:06:22,309

or mod

484

01:06:27,750 --> 01:06:24,870

guppy and then the other two that we're

485

01:06:30,150 --> 01:06:27,760

still missing is the on chris your brt

486

01:06:33,350 --> 01:06:30,160

tab up and chris is right safer handle

487

01:06:33,360 --> 01:06:45,349

[Music]

488

01:06:49,190 --> 01:06:46,870

and with that we are ready to start

489

01:06:50,710 --> 01:06:49,200

translating bob you have the lead and a

490

01:06:52,710 --> 01:06:50,720

heads up to both of you to avoid the

491

01:06:57,190 --> 01:06:52,720

deployed dust cable all days and at the

492

01:06:57,200 --> 01:07:11,589

coffee

493

01:07:15,829 --> 01:07:13,510

you can now see our astronauts have

494

01:07:18,230 --> 01:07:15,839

egressed or exited the hatch

495

01:07:19,829 --> 01:07:18,240

your adjustables out your fair leads out

496

01:07:23,270 --> 01:07:19,839

leave the adjustables in place on the

497

01:07:23,280 --> 01:07:37,349

you want coffee

498

01:07:55,349 --> 01:07:39,430

the astronauts are now moving to their

499

01:07:55,359 --> 01:07:59,750

will make his way out to the s6 truss

500

01:08:07,910 --> 01:08:01,349

he'll begin setting up the work site for

501

01:08:13,990 --> 01:08:10,789

chris cassidy will stop at s3 for that

502

01:08:16,390 --> 01:08:14,000

boom install at the external wireless

503

01:08:18,229 --> 01:08:16,400

communications worksite before moving on

504

01:08:20,950 --> 01:08:18,239

to the s6 truss

505

01:08:47,960 --> 01:08:20,960

later on to assist with battery

506

01:08:47,970 --> 01:09:11,189

[Applause]

507

01:09:17,269 --> 01:09:13,749

josh both of our adjustables

508

01:09:22,789 --> 01:09:17,279

are revealing on the fever spur

509

01:09:24,950 --> 01:09:22,799

and i'm headed on up with a forward face

510

01:09:26,390 --> 01:09:24,960

copy bob we concur show you heading out

511

01:09:32,070 --> 01:09:26,400

just give me a call with your gauntlets

512

01:09:35,269 --> 01:09:33,990

and chris as you follow your next pause

513

01:09:41,269 --> 01:09:35,279

i'll be at the anchor hooks for an

514

01:09:45,349 --> 01:09:43,030

getting the first view from a helmet

515

01:09:47,590 --> 01:09:45,359

camera today this is the helmet camera

516

01:09:48,709 --> 01:09:47,600

of nasa astronaut chris cassidy

517

01:09:50,789 --> 01:09:48,719

currently the commander of the

518

01:09:53,189 --> 01:09:50,799

international space station

519

01:09:55,110 --> 01:09:53,199

it has the number 18 in the bottom right

520

01:09:57,110 --> 01:09:55,120

hand corner and that's how you'll be

521

01:09:59,430 --> 01:09:57,120

able to designate his view

522

01:10:15,110 --> 01:09:59,440

from nasa astronaut bob benkin whose

523

01:10:15,120 --> 01:10:27,430

this one for ev-2

524

01:10:31,669 --> 01:10:29,189

can't also have to pause to clear my

525

01:10:33,350 --> 01:10:31,679

safety tether it was hung up on some mli

526

01:10:35,430 --> 01:10:33,360

i'll report my gauntlets are down at

527

01:10:36,470 --> 01:10:35,440

this point our comments are up at this

528

01:10:38,950 --> 01:10:36,480

point

529

01:10:38,960 --> 01:11:09,430

copy on the gauntlets

530

01:11:13,510 --> 01:11:11,669

this view from the helmet camera of bob

531

01:11:16,310 --> 01:11:13,520

benkin you can see that number 20 in the

532

01:11:18,149 --> 01:11:16,320

right hand corner he is ev1 today or

533

01:11:20,310 --> 01:11:18,159

spacewalker one

534

01:11:22,149 --> 01:11:20,320

and the view below him is

535

01:11:23,750 --> 01:11:22,159

of course earth you're looking at the

536

01:11:26,790 --> 01:11:23,760

south atlantic ocean as the

537

01:11:30,310 --> 01:11:26,800

international space station flies 271

538

01:11:30,320 --> 01:11:55,830

copy that

539

01:11:55,840 --> 01:12:00,470

nothing under the mt

540

01:12:00,480 --> 01:12:08,550

copycat

541

01:12:11,990 --> 01:12:09,830

cedar cart

542

01:12:59,830 --> 01:12:12,000

for ev2

543

01:13:03,910 --> 01:13:01,990

bob we see you crossing over and the

544

01:13:06,790 --> 01:13:03,920

brakes are on so when you do get to the

545

01:13:08,390 --> 01:13:06,800

ep you'll go ego to proceed onto it i

546

01:13:10,310 --> 01:13:08,400

just want to remind you of the no touch

547

01:13:14,790 --> 01:13:10,320

points of the wheels grapple shafts and

548

01:13:19,750 --> 01:13:17,110

copy that thank you

549

01:13:23,750 --> 01:13:19,760

georgia

550

01:13:27,750 --> 01:13:25,590

hey affirmative we'll be still in the

551
01:13:29,510 --> 01:13:27,760
bag and we want to keep the movement

552
01:13:31,910 --> 01:13:29,520
nice and slow out there less than half a

553
01:13:36,790 --> 01:13:31,920
feet per second let any motion dampen

554
01:13:42,229 --> 01:13:40,470
okay josh i am at the uh

555
01:13:44,830 --> 01:13:42,239
anchor points

556
01:13:47,669 --> 01:13:44,840
i enter playing on three zero six

557
01:13:52,950 --> 01:13:47,679
one is closed and a lot double checking

558
01:13:59,510 --> 01:13:54,470
photo

559
01:13:59,520 --> 01:14:16,950
we copy chris won't take

560
01:14:20,149 --> 01:14:19,270
three zero six zero for bob's anchor

561
01:14:22,709 --> 01:14:20,159
hook

562
01:14:25,270 --> 01:14:22,719
he has a closed and locked

563
01:14:28,790 --> 01:14:25,280

anchor hook that's looking good

564

01:14:32,390 --> 01:14:28,800

i'm tucking under

565

01:14:40,070 --> 01:14:34,310

you can proceed to continue nader and

566

01:14:44,950 --> 01:14:43,189

happy josh

567

01:14:47,189 --> 01:14:44,960

and chris as you do approach your whip

568

01:14:48,950 --> 01:14:47,199

36 there we want to remind you to uh be

569

01:14:50,950 --> 01:14:48,960

careful with the handrail

570

01:14:57,270 --> 01:14:50,960

on that boom we want to avoid imparting

571

01:14:57,280 --> 01:15:06,310

okay

572

01:15:06,320 --> 01:15:17,110

36 here we go

573

01:15:21,350 --> 01:15:19,510

okay so let you get uh sorted there but

574

01:15:23,430 --> 01:15:21,360

once you're ready we're ready for that

575

01:15:27,910 --> 01:15:23,440

install into width 36 aligning the

576

01:15:48,070 --> 01:15:30,070

all right josh it'll be a minute like

577

01:15:48,080 --> 01:15:54,310

i've arrived at the ap josh

578

01:15:59,910 --> 01:15:56,910

what we see about your handrail will be

579

01:16:03,110 --> 01:15:59,920

7328 for that bag storage beside battery

580

01:16:03,120 --> 01:16:06,790

happy 7328

581

01:16:06,800 --> 01:16:25,030

good words

582

01:16:29,830 --> 01:16:28,390

and bob before you do so that bag

583

01:16:38,630 --> 01:16:29,840

your call if you want to remove the

584

01:16:38,640 --> 01:16:43,189

i've arrived at 73-28

585

01:16:43,199 --> 01:16:56,470

roger

586

01:17:00,790 --> 01:16:58,870

also taking off the

587

01:17:04,550 --> 01:17:00,800

pro before i

588

01:17:04,560 --> 01:17:34,790

copy chris

589

01:17:39,510 --> 01:17:36,790

here i have the gopro

590

01:17:43,510 --> 01:17:39,520

just right here at the base and

591

01:17:43,520 --> 01:18:10,390

gabby work

592

01:18:14,630 --> 01:18:12,550

nasa astronaut chris cassidy now at his

593

01:18:16,870 --> 01:18:14,640

first work site today

594

01:18:17,910 --> 01:18:16,880

working to install a

595

01:18:27,750 --> 01:18:17,920

camera

596

01:18:41,669 --> 01:18:30,950

okay black lines are lying

597

01:18:41,679 --> 01:18:45,110

wiggle good protest

598

01:18:50,550 --> 01:18:47,430

the uh

599

01:18:54,630 --> 01:18:50,560

mocking black lines are lined up

600

01:18:59,830 --> 01:18:57,590

we concur chris copy on the full test

601
01:19:00,630 --> 01:18:59,840
we're going after the power cable next

602
01:19:04,950 --> 01:19:00,640
that's

603
01:19:10,709 --> 01:19:06,830
you're okay josh i'll release

604
01:19:10,719 --> 01:19:27,350
affirmative

605
01:19:31,830 --> 01:19:29,430
with the camera securely installed chris

606
01:19:33,510 --> 01:19:31,840
cassidy will now work to mate power

607
01:19:45,830 --> 01:19:33,520
cables

608
01:19:51,990 --> 01:19:47,750
okay josh uh one more time for the

609
01:19:57,110 --> 01:19:53,910
and for chris we're looking for power

610
01:20:00,070 --> 01:19:57,120
cable w4193

611
01:20:02,070 --> 01:20:00,080
that's the p1 end and we can retrieve it

612
01:20:04,390 --> 01:20:02,080
from the handrail where it's stowed on

613
01:20:06,070 --> 01:20:04,400

3049.

614

01:20:08,229 --> 01:20:06,080

four nine okay

615

01:20:10,229 --> 01:20:08,239

by hand

616

01:20:12,149 --> 01:20:10,239

roger that next we're going to want a

617

01:20:18,070 --> 01:20:12,159

red to the power cable adjustable that

618

01:20:23,030 --> 01:20:20,709

it's complete

619

01:20:25,110 --> 01:20:23,040

copy in that case you can use that new

620

01:20:26,950 --> 01:20:25,120

config the mini workstation rhett and

621

01:20:43,350 --> 01:20:26,960

adjustable on the end of that rep to

622

01:20:46,390 --> 01:20:44,870

okay josh the

623

01:20:48,310 --> 01:20:46,400

who oru bag

624

01:20:49,350 --> 01:20:48,320

is installed on the

625

01:20:50,629 --> 01:20:49,360

ep

626

01:20:54,470 --> 01:20:50,639

between him

627

01:21:00,229 --> 01:20:54,480

truly between can rail 70 328

628

01:21:07,750 --> 01:21:02,550

okay good config bob thanks let us know

629

01:21:12,870 --> 01:21:10,709

i'll be taking the camera here

630

01:21:15,930 --> 01:21:12,880

working on that now

631

01:21:19,430 --> 01:21:17,590

[Music]

632

01:21:21,270 --> 01:21:19,440

yeah we got cut off on the handover but

633

01:21:23,910 --> 01:21:21,280

we want to take the cap off and put it

634

01:21:25,030 --> 01:21:23,920

onto that adjustable and the adjustable

635

01:21:31,590 --> 01:21:25,040

that's connected to your mini

636

01:21:31,600 --> 01:22:08,550

okay

637

01:22:08,560 --> 01:22:12,149

that's removed

638

01:22:15,910 --> 01:22:13,669

copy chris

639

01:22:18,229 --> 01:22:15,920

next we'll be relocating the lens cover

640

01:22:28,470 --> 01:22:18,239

rat hook from the small boom handrail to

641

01:22:32,709 --> 01:22:30,709

it's complete

642

01:22:34,470 --> 01:22:32,719

copy in that case we're ready to release

643

01:22:36,709 --> 01:22:34,480

the two quarter turn fasteners on the

644

01:22:39,110 --> 01:22:36,719

lens cover assembly we're going to take

645

01:22:40,070 --> 01:22:39,120

it off stow it with the gaps behind your

646

01:22:42,310 --> 01:22:40,080

t-bar

647

01:22:44,629 --> 01:22:42,320

and just a heads up here that we want to

648

01:22:46,550 --> 01:22:44,639

avoid contact with the high depth camera

649

01:23:02,790 --> 01:22:46,560

quartz antenna apertures window and

650

01:23:02,800 --> 01:23:11,430

ready for the next step josh

651
01:23:15,669 --> 01:23:13,669
and josh i've retrieved the camera i'll

652
01:23:17,990 --> 01:23:15,679
be making my way

653
01:23:20,070 --> 01:23:18,000
out board on the truss

654
01:23:22,310 --> 01:23:20,080
got the uh bob you can return to

655
01:23:25,990 --> 01:23:22,320
structure i'll have you verify the s6

656
01:23:27,830 --> 01:23:26,000
with uh apfr settings before you pass it

657
01:23:30,070 --> 01:23:27,840
and then chris we're ready for you to

658
01:23:31,590 --> 01:23:30,080
mate the power cable

659
01:23:33,270 --> 01:23:31,600
we are talking a little bit about met

660
01:23:35,110 --> 01:23:33,280
rates here and we might have a rest

661
01:23:37,110 --> 01:23:35,120
coming up but we'd like to finish this

662
01:23:40,709 --> 01:23:37,120
task first so chris

663
01:23:53,990 --> 01:23:40,719

you're going to mate power cable 4193 to

664

01:24:00,709 --> 01:23:56,950

power cable 4 1

665

01:24:03,030 --> 01:24:00,719

9 3 to the j one fourth on the camera

666

01:24:05,030 --> 01:24:03,040

good words chris with a reminder to not

667

01:24:10,149 --> 01:24:05,040

check so check the safety tether not

668

01:24:52,149 --> 01:24:12,629

no safety feather truck

669

01:24:59,030 --> 01:24:55,590

okay josh go with the apfr settings

670

01:25:05,990 --> 01:24:59,040

so bob we'd like to see six india india

671

01:25:06,000 --> 01:25:22,310

okay six india india

672

01:25:22,320 --> 01:25:26,070

no worries

673

01:25:26,080 --> 01:25:32,390

a good apfr bob

674

01:25:37,030 --> 01:25:34,310

nasa astronaut bob binkin is currently

675

01:25:46,709 --> 01:25:37,040

setting up the apfr or articulating

676

01:25:50,550 --> 01:25:48,709

as i said bob you can continue to

677

01:25:58,470 --> 01:25:50,560

translate nice and slowly up to your

678

01:26:02,149 --> 01:26:00,229

and chris with that mate we'll move on

679

01:26:03,990 --> 01:26:02,159

to the ethernet connections you're going

680

01:26:07,110 --> 01:26:04,000

to be looking to grab the pigtail it's

681

01:26:09,350 --> 01:26:07,120

labeled whiskey4290

682

01:26:26,870 --> 01:26:09,360

pigtail bundle from the wire tie on the

683

01:26:26,880 --> 01:26:56,390

uh

684

01:26:56,400 --> 01:26:59,430

it's released

685

01:27:03,510 --> 01:27:01,510

copy chris you'll be taking it in board

686

01:27:10,709 --> 01:27:03,520

uh towards the ethernet cable that's

687

01:27:15,189 --> 01:27:13,030

caps coming off of that

688

01:27:17,189 --> 01:27:15,199

affirmative that cap can go on to the

689

01:27:24,390 --> 01:27:17,199

other end of the adjustable roger cap

690

01:27:26,390 --> 01:27:24,760

and

691

01:27:28,470 --> 01:27:26,400

[Music]

692

01:27:32,950 --> 01:27:28,480

plus i've arrived

693

01:27:38,390 --> 01:27:34,870

copy bob green hook and go there two

694

01:27:41,669 --> 01:27:40,149

and with that uh as soon as you have the

695

01:27:43,430 --> 01:27:41,679

green hook down bob we're just gonna

696

01:27:49,189 --> 01:27:43,440

pause for timeline for a few minutes

697

01:27:51,350 --> 01:27:49,520

okay

698

01:27:54,550 --> 01:27:51,360

[Music]

699

01:27:55,910 --> 01:27:54,560

chris fart bmi bear in fact fins are

700

01:27:58,149 --> 01:27:55,920

straight

701

01:28:00,709 --> 01:27:58,159

ready to mate on your go

702

01:28:01,550 --> 01:28:00,719

copy we are go for that mate it should

703

01:28:18,070 --> 01:28:01,560

be

704

01:28:18,080 --> 01:28:40,550

good words

705

01:28:44,149 --> 01:28:42,390

a couple wire ties that are

706

01:28:46,310 --> 01:28:44,159

pre-installed you'll be using those

707

01:28:48,390 --> 01:28:46,320

pre-integrated wire tie at the top of

708

01:29:04,310 --> 01:28:48,400

the boom one at the base and then you

709

01:29:07,669 --> 01:29:05,830

and chris just for your awareness we're

710

01:29:13,030 --> 01:29:07,679

putting power onto the boom now so we'll

711

01:29:26,149 --> 01:29:14,149

thank you for

712

01:29:31,110 --> 01:29:29,110

the uh josh with the um

713

01:29:33,270 --> 01:29:31,120

structure to keep the

714

01:29:38,550 --> 01:29:33,280

lines on opposite side of the boom for

715

01:29:39,590 --> 01:29:38,560

emi for purposes i'm going to need to

716

01:29:43,189 --> 01:29:39,600

use

717

01:29:50,629 --> 01:29:45,830

pre-installed short one doesn't reach

718

01:29:55,669 --> 01:29:53,430

and uh recopy you're using an additional

719

01:29:57,510 --> 01:29:55,679

long wire tie further words from here if

720

01:29:59,110 --> 01:29:57,520

it helps is that we just need the

721

01:30:01,510 --> 01:29:59,120

separation width equivalent to the

722

01:30:03,189 --> 01:30:01,520

handrail so opposite sides of the boom

723

01:30:09,189 --> 01:30:03,199

would do but opposite sides of the

724

01:30:15,510 --> 01:30:10,629

okay so that's different than the

725

01:30:20,470 --> 01:30:18,629

copy it's uh i mean the detail here that

726

01:30:22,470 --> 01:30:20,480

i'm hearing is that if we have an inch

727

01:30:28,790 --> 01:30:22,480

between the two cables we'll be good on

728

01:30:28,800 --> 01:31:11,669

all right

729

01:31:16,470 --> 01:31:14,310

nasa's chris cassidy is now securing

730

01:31:20,629 --> 01:31:16,480

those cables with wire ties to the

731

01:31:27,430 --> 01:31:23,189

he has just installed an hd camera

732

01:31:31,030 --> 01:31:28,830

okay josh i've

733

01:31:33,110 --> 01:31:31,040

arrived at the crew rock bag and can

734

01:31:36,229 --> 01:31:33,120

pause here if that's what you all are

735

01:31:40,229 --> 01:31:38,709

copy that bob continue to pause there at

736

01:31:45,540 --> 01:31:40,239

the crewlock bag and we'll come back to

737

01:31:45,550 --> 01:33:02,550

[Music]

738

01:33:10,490 --> 01:33:05,189

about the overu bags up on the

739

01:33:15,110 --> 01:33:13,510

[Music]

740

01:33:17,510 --> 01:33:15,120

i have the camera

741

01:33:19,750 --> 01:33:17,520

and i am pausing at the cool lock bag

742

01:33:20,790 --> 01:33:19,760

all right i'm uh

743

01:33:23,189 --> 01:33:20,800

putting up cables everything

744

01:33:26,629 --> 01:33:23,199

everything's connected just

745

01:33:28,709 --> 01:33:26,639

doing wire ties and stuff copy

746

01:33:29,669 --> 01:33:28,719

we copy and just with a bit of a big

747

01:33:31,990 --> 01:33:29,679

picture

748

01:33:34,550 --> 01:33:32,000

chris after these cables are tidied up

749

01:33:36,709 --> 01:33:34,560

and down we anticipate taking a little

750

01:33:38,310 --> 01:33:36,719

bit of a break here for you as well

751

01:33:40,229 --> 01:33:38,320

and then bob will probably get you

752

01:33:47,189 --> 01:33:40,239

moving momentarily once we show good

753

01:33:51,910 --> 01:33:48,830

i'll be

754

01:33:54,629 --> 01:33:51,920

working hey firm but no worries we're

755

01:35:35,430 --> 01:33:54,639

just over 40 minutes in so doing well on

756

01:35:40,629 --> 01:35:39,109

and bob an update on the pause just

757

01:35:42,790 --> 01:35:40,639

as you know have been shown a little bit

758

01:35:44,470 --> 01:35:42,800

higher than normal on you so we're

759

01:37:38,790 --> 01:35:44,480

indicating potentially another five

760

01:37:43,510 --> 01:37:41,030

i'm going to use

761

01:37:45,669 --> 01:37:43,520

one short wire tie from my main

762

01:38:11,990 --> 01:37:45,679

workstation

763

01:38:12,000 --> 01:38:23,510

hey

764

01:38:27,430 --> 01:38:26,390

nasa astronaut chris cassidy continues

765

01:38:28,870 --> 01:38:27,440

to

766

01:38:31,189 --> 01:38:28,880

route and

767

01:38:33,990 --> 01:38:31,199

wire tie these cables for the newly

768

01:38:41,270 --> 01:38:34,000

installed hd camera on the outside of

769

01:38:46,390 --> 01:38:43,430

meanwhile nasa astronaut bob benkin is

770

01:38:48,470 --> 01:38:46,400

pausing taking a brief rest to conserve

771

01:39:51,350 --> 01:38:48,480

some of the consumables like oxygen in

772

01:39:55,750 --> 01:39:53,510

all right chris as you finish up those

773

01:39:57,669 --> 01:39:55,760

wire ties the data here is showing about

774

01:40:07,510 --> 01:39:57,679

a three minute wait three minute pause

775

01:40:10,950 --> 01:40:09,109

and as you pause that that might be a

776

01:40:13,430 --> 01:40:10,960

good time to kind of just move your head

777

01:40:23,510 --> 01:40:13,440

around as able and give us a wvs scan of

778

01:40:27,910 --> 01:40:25,830

and uh bob we're back with you and we're

779

01:40:29,350 --> 01:40:27,920

ready to pick up again we are on

780

01:40:31,109 --> 01:40:29,360

timeline

781

01:40:36,550 --> 01:40:31,119

so if you're ready we can get going with

782

01:40:36,560 --> 01:40:39,910

okay copy that

783

01:40:44,950 --> 01:40:41,990

i know you're already up by the radiator

784

01:40:47,189 --> 01:40:44,960

side there the caution was uh

785

01:40:48,629 --> 01:40:47,199

to avoid the radiator all day and then

786

01:40:54,070 --> 01:40:48,639

we're going to be looking to reconfigure

787

01:40:54,080 --> 01:40:57,030

okay copy that

788

01:41:05,590 --> 01:40:58,709

and you want to cool off pipe between

789

01:41:10,310 --> 01:41:07,590

that's a good config

790

01:41:12,390 --> 01:41:10,320

now we can get out of it the

791

01:41:22,470 --> 01:41:12,400

pip pin with the hex driver and we'll

792

01:41:43,510 --> 01:41:24,390

bob benkin is back to work as chris

793

01:41:49,030 --> 01:41:44,830

josh i've used

794

01:41:54,070 --> 01:41:49,040

two small wire drives

795

01:41:54,080 --> 01:42:23,189

copy chris

796

01:42:26,709 --> 01:42:25,030

from bob binkin's helmet camera you can

797

01:42:35,750 --> 01:42:26,719

see some of the tools that they'll be

798

01:42:39,510 --> 01:42:37,510

and for chris during the pause if it's

799

01:42:43,590 --> 01:42:39,520

convenient when the text driver is

800

01:42:43,600 --> 01:42:49,590

copy bob take a full test

801

01:42:53,590 --> 01:42:51,990

full test

802

01:42:55,350 --> 01:42:53,600

roger that so bob we're going to be

803

01:42:58,470 --> 01:42:55,360

stealing the pgt

804

01:43:05,510 --> 01:42:58,480

on battery 4's h2 scoop using that

805

01:43:05,520 --> 01:43:11,830

the other end with the red red series

806

01:43:15,030 --> 01:43:13,590

and it's going to go on the red red

807

01:43:20,310 --> 01:43:15,040

series back to the crew lock bag if

808

01:43:28,310 --> 01:43:22,149

i'm sorry nothing else out of crew lock

809

01:43:32,310 --> 01:43:29,990

the first of those tools that we'll see

810

01:43:34,229 --> 01:43:32,320

used today which you've just watched bob

811

01:43:35,910 --> 01:43:34,239

banking configure

812

01:43:38,870 --> 01:43:35,920

and gauntlet check here during your

813

01:43:40,790 --> 01:43:38,880

pause

814

01:43:44,629 --> 01:43:40,800

that'll be the hex driver attached to

815

01:43:47,830 --> 01:43:44,639

the pgt or the pistol grip tool

816

01:43:50,950 --> 01:43:47,840

i have the small piece of rtv

817

01:43:53,669 --> 01:43:50,960

the base of my left index finger

818

01:43:56,470 --> 01:43:53,679

and that's the missing and that's

819

01:43:58,550 --> 01:43:56,480

was uh baseline glove check g so it's

820

01:44:06,709 --> 01:43:58,560

the same as equal

821

01:44:06,719 --> 01:44:11,430

gopro survey complete

822

01:44:11,440 --> 01:44:56,950

roger

823

01:44:56,960 --> 01:45:06,629

bob i'm in my three minute rest here

824

01:45:14,709 --> 01:45:08,629

nasa astronaut chris cassidy finishing

825

01:45:19,270 --> 01:45:16,629

also preparing to get back to work and

826
01:45:53,510 --> 01:45:19,280
head out to the same workstation as bob

827
01:45:58,470 --> 01:45:56,870
pgt config for chris and we just lost

828
01:46:00,470 --> 01:45:58,480
you there on the handover but your rest

829
01:46:02,870 --> 01:46:00,480
is complete or go for you to translate

830
01:46:05,030 --> 01:46:02,880
out towards your green hook location

831
01:46:08,470 --> 01:46:05,040
two reminders pick up the gopro and

832
01:46:15,109 --> 01:46:11,830
gauntlets are in place

833
01:46:18,629 --> 01:46:16,550
roger chris

834
01:46:20,550 --> 01:46:18,639
for bob uh next up we'll be headed down

835
01:46:46,390 --> 01:46:20,560
to your apfr and we want to check the

836
01:46:51,669 --> 01:46:49,030
and guys big picture on the day we're 55

837
01:46:55,350 --> 01:46:51,679
minutes in right on timeline

838
01:46:56,950 --> 01:46:55,360

at the 6 45 working towards a 6 45 pt

839

01:47:06,070 --> 01:46:56,960

right now with medics the limiting

840

01:47:11,189 --> 01:47:09,669

please also arrive at the uh apfr

841

01:47:16,149 --> 01:47:11,199

12

842

01:47:24,470 --> 01:47:19,030

copy bob that's a good apfr config and

843

01:47:30,229 --> 01:47:27,910

my tap is dry baseline

844

01:47:32,229 --> 01:47:30,239

my gauntlets are still

845

01:47:37,430 --> 01:47:32,239

cut

846

01:47:37,440 --> 01:47:52,629

on my left hand

847

01:47:52,639 --> 01:48:12,870

thank you

848

01:48:16,870 --> 01:48:14,870

chris as you head out towards uh closer

849

01:48:19,109 --> 01:48:16,880

to the pallet if you wanted to this is

850

01:48:25,669 --> 01:48:19,119

where we'd show you dropping off those

851

01:48:29,430 --> 01:48:27,990

very burdensome but

852

01:48:32,870 --> 01:48:29,440

it would be better but i just want to

853

01:48:34,070 --> 01:48:32,880

check with bob all the timing

854

01:48:36,390 --> 01:48:34,080

about ready to get in there if you're

855

01:48:38,390 --> 01:48:36,400

far above yeah i think

856

01:48:40,310 --> 01:48:38,400

carrying the uh covers and stuff with

857

01:48:42,550 --> 01:48:40,320

the batteries i don't know we're gonna i

858

01:48:44,229 --> 01:48:42,560

want to get rid of them at some point so

859

01:48:46,149 --> 01:48:44,239

you don't mind wait in a second i'll do

860

01:48:58,310 --> 01:48:46,159

that

861

01:49:02,709 --> 01:49:01,030

small lesson learned from the last dba

862

01:49:04,229 --> 01:49:02,719

was i think it's slightly better to have

863

01:49:06,390 --> 01:49:04,239

my green hook

864

01:49:09,510 --> 01:49:06,400

or inboard

865

01:49:12,550 --> 01:49:09,520

if you guys are okay i'm gonna do

866

01:49:12,560 --> 01:49:15,990

my green hook

867

01:49:16,000 --> 01:49:22,390

copy chris we have no worries of that

868

01:49:26,470 --> 01:49:24,629

on his way out to meet bob banking chris

869

01:49:28,709 --> 01:49:26,480

cassidy is stowing the lens cover and

870

01:49:30,470 --> 01:49:28,719

some other caps for chris as you do work

871

01:49:32,229 --> 01:49:30,480

with the tethers we want them both

872

01:49:39,270 --> 01:49:32,239

safety tethers wrote at zenith of the

873

01:49:39,280 --> 01:50:04,310

okay

874

01:50:07,669 --> 01:50:06,550

once chris cassidy meets up with bob

875

01:50:09,990 --> 01:50:07,679

benkin

876

01:50:12,310 --> 01:50:10,000

they will remove battery one a nickel

877

01:50:15,109 --> 01:50:12,320

hydrogen battery from the integrated

878

01:50:17,350 --> 01:50:15,119

electronics assembly and move it to the

879

01:50:21,030 --> 01:50:17,360

external pallet in slot z

880

01:50:21,040 --> 01:50:50,310

copy 2015.

881

01:50:50,320 --> 01:51:06,310

near go chris

882

01:51:06,320 --> 01:51:55,189

ugh

883

01:51:55,199 --> 01:51:58,310

i just

884

01:52:04,709 --> 01:52:00,470

appear

885

01:52:07,510 --> 01:52:04,719

in the back area and i'll be working on

886

01:52:22,070 --> 01:52:07,520

that stuff in the back

887

01:52:22,080 --> 01:53:21,270

uh

888

01:53:24,709 --> 01:53:23,910

if you're watching online you can use

889

01:53:26,950 --> 01:53:24,719

the

890

01:53:28,629 --> 01:53:26,960

ask nasa on twitter to submit your

891

01:53:30,149 --> 01:53:28,639

questions today and they might just be

892

01:53:32,709 --> 01:53:30,159

answered on air

893

01:53:35,510 --> 01:53:32,719

we have one coming from angelo palino

894

01:53:37,189 --> 01:53:35,520

asking where the old batteries will go

895

01:53:39,830 --> 01:53:37,199

that's a good question and there are a

896

01:53:41,990 --> 01:53:39,840

few answers some will be put on the

897

01:53:44,390 --> 01:53:42,000

external pallet which will eventually be

898

01:53:45,830 --> 01:53:44,400

sent back to earth to burn up in the

899

01:53:47,510 --> 01:53:45,840

atmosphere

900

01:53:49,830 --> 01:53:47,520

other nickel hydrogen batteries those

901
01:53:52,390 --> 01:53:49,840
aging batteries will be placed on top of

902
01:53:54,550 --> 01:53:52,400
adapter plates for permanent storage

903
01:54:32,790 --> 01:53:54,560
however they will not be in use at that

904
01:54:32,800 --> 01:54:36,629
copy that

905
01:54:36,639 --> 01:54:47,910
recheck

906
01:54:58,550 --> 01:54:50,790
closing up the bag

907
01:55:13,990 --> 01:55:00,229
it'll slide a little bit too it looks

908
01:55:17,990 --> 01:55:14,950
all right

909
01:55:20,149 --> 01:55:18,000
backups complete

910
01:55:23,669 --> 01:55:20,159
down to a nominal mini workstation setup

911
01:55:23,679 --> 01:55:32,229
and heading back on copy chris

912
01:55:36,790 --> 01:55:34,390
so bob as chris makes his way over and

913
01:55:38,629 --> 01:55:36,800

we can check that the tethers are clear

914

01:55:44,950 --> 01:55:38,639

your ingress aids stowed and i can take

915

01:55:50,870 --> 01:55:48,310

yeah tethers are clear

916

01:55:52,870 --> 01:55:50,880

the ingress is stowed

917

01:55:55,570 --> 01:55:52,880

and the battery

918

01:55:56,629 --> 01:55:55,580

looks like zero zero eight six

919

01:55:58,790 --> 01:55:56,639

[Music]

920

01:56:20,550 --> 01:55:58,800

copy zero zero eight six that's a good

921

01:56:24,550 --> 01:56:22,790

you'll also hear the term rhett quite

922

01:56:31,270 --> 01:56:24,560

frequently today that stands for

923

01:56:35,430 --> 01:56:33,510

our astronauts are always tethered to a

924

01:56:37,109 --> 01:56:35,440

point on the space station

925

01:56:38,709 --> 01:56:37,119

additionally any of the tools you see

926
01:56:57,669 --> 01:56:38,719
floating around are tethered to the

927
01:57:01,589 --> 01:57:00,310
fashion bob one more thing to just drop

928
01:57:03,030 --> 01:57:01,599
down to

929
01:57:09,560 --> 01:57:03,040
make train

930
01:57:09,570 --> 01:57:16,229
[Music]

931
01:57:16,239 --> 01:58:10,629
and cross-eyed copy on the gopro

932
01:58:10,639 --> 01:58:46,629
no worries

933
01:58:46,639 --> 01:58:57,910
okay

934
01:59:02,070 --> 01:58:59,589
before our astronauts get started on

935
01:59:04,550 --> 01:59:02,080
that battery work just a reminder of the

936
01:59:06,229 --> 01:59:04,560
initial configuration

937
01:59:08,149 --> 01:59:06,239
there are currently six nickel hydrogen

938
01:59:11,030 --> 01:59:08,159

batteries on the integrated electronics

939

01:59:13,030 --> 01:59:11,040

assembly and on the ep or the external

940

01:59:15,270 --> 01:59:13,040

pallet there are six lithium ion

941

01:59:17,350 --> 01:59:15,280

batteries

942

01:59:19,750 --> 01:59:17,360

there are also six adapter plates under

943

01:59:21,990 --> 01:59:19,760

those batteries to keep them warm

944

01:59:23,910 --> 01:59:22,000

and three empty slots

945

01:59:25,910 --> 01:59:23,920

by the end of today's spacewalk we will

946

01:59:28,470 --> 01:59:25,920

see five nickel hydrogen batteries

947

01:59:31,109 --> 01:59:28,480

removed and replaced with three lithium

948

01:59:32,790 --> 01:59:31,119

ion batteries and two adapter plates a

949

01:59:35,109 --> 01:59:32,800

long blockage there but we're back with

950

01:59:37,589 --> 01:59:35,119

you now i see the pgt and we're ready

951
01:59:40,149 --> 01:59:37,599
your settings are alpha seven counter

952
01:59:43,669 --> 01:59:41,589
alpha seven

953
01:59:45,830 --> 01:59:43,679
bouncer two is six

954
01:59:48,550 --> 01:59:45,840
copy we want to confirm socket tape line

955
01:59:50,470 --> 01:59:48,560
flush on the h1 scoop and then here we

956
01:59:55,270 --> 01:59:50,480
go to turn to release we expect eight

957
01:59:55,280 --> 02:00:16,470
the pocket tape line is flush

958
02:00:21,750 --> 02:00:18,950
it has eight turns the indicator

959
02:00:23,669 --> 02:00:21,760
indicates unlocks

960
02:00:26,470 --> 02:00:23,679
copy eight turns with an unlocked

961
02:00:35,830 --> 02:00:26,480
indicator we'll move over to h2 looking

962
02:00:41,530 --> 02:00:37,750
in houston

963
02:00:41,540 --> 02:00:50,149

[Music]

964

02:00:59,030 --> 02:00:51,510

we did hear you though we checked

965

02:01:03,109 --> 02:01:00,790

roger so on eight

966

02:01:05,750 --> 02:01:03,119

affirmative

967

02:01:11,109 --> 02:01:05,760

bob we can go to h2 tape line flash we

968

02:01:11,119 --> 02:01:14,310

19 turns

969

02:01:17,990 --> 02:01:16,310

indicators moving the batteries moving

970

02:01:20,070 --> 02:01:18,000

out

971

02:01:22,550 --> 02:01:20,080

copy

972

02:01:26,149 --> 02:01:22,560

bob bengan is currently using the pgt or

973

02:01:29,270 --> 02:01:26,159

the pistol grip tool essentially a drill

974

02:01:32,550 --> 02:01:29,280

to remove two bolts from battery one on

975

02:01:34,709 --> 02:01:32,560

the integrated electronics assembly

976
02:01:36,470 --> 02:01:34,719
looks nice and smooth yeah i think it's

977
02:01:40,709 --> 02:01:36,480
all the way out but uh

978
02:01:44,390 --> 02:01:42,820
there we go

979
02:01:56,629 --> 02:01:44,400
[Music]

980
02:02:00,790 --> 02:01:59,270
battery is uh

981
02:02:03,189 --> 02:02:00,800
disconnected here i'll wait for you to

982
02:02:05,430 --> 02:02:03,199
get into a good position

983
02:02:06,950 --> 02:02:05,440
expect i'm giving you h1s and some type

984
02:02:14,310 --> 02:02:06,960
of h2

985
02:02:18,470 --> 02:02:16,550
and the first battery is released benkin

986
02:02:20,149 --> 02:02:18,480
will pass it to cassidy and they'll work

987
02:02:47,910 --> 02:02:20,159
together to move it to the external

988
02:02:52,709 --> 02:02:50,950

you have control okay you have control

989

02:02:59,350 --> 02:02:52,719

uh i don't need to do a rest probably

990

02:02:59,360 --> 02:03:01,910

control

991

02:03:06,470 --> 02:03:04,390

and verify that josh was gonna do a

992

02:03:08,149 --> 02:03:06,480

feather swap so that chris has the

993

02:03:19,150 --> 02:03:08,159

tether

994

02:03:38,550 --> 02:03:20,550

[Music]

995

02:03:41,830 --> 02:03:40,070

you'll hear a lot of communication

996

02:03:43,589 --> 02:03:41,840

between the astronauts as they move

997

02:03:45,430 --> 02:03:43,599

these batteries from one platform to

998

02:03:47,109 --> 02:03:45,440

another today

999

02:03:49,589 --> 02:03:47,119

this is called shepherding or inch

1000

02:03:51,669 --> 02:03:49,599

warming meaning they'll move slowly down

1001
02:03:53,189 --> 02:03:51,679
the truss segment they'll each call out

1002
02:03:56,390 --> 02:03:53,199
i have the battery or you have the

1003
02:03:58,629 --> 02:03:56,400
battery ensuring that one or the other

1004
02:04:02,640 --> 02:03:58,639
is always in contact with that nickel

1005
02:04:12,550 --> 02:04:04,069
[Music]

1006
02:04:34,310 --> 02:04:14,470
i'm going to move one handrail

1007
02:04:38,470 --> 02:04:35,990
helmet camera you could see nasa

1008
02:04:40,229 --> 02:04:38,480
astronaut chris cassidy ev2 with no

1009
02:04:42,709 --> 02:04:40,239
stripes on his spacesuit

1010
02:04:44,470 --> 02:04:42,719
moving one handrail at a time to bring

1011
02:05:03,430 --> 02:04:44,480
that battery to its permanent home on

1012
02:05:03,440 --> 02:05:17,480
control the battery

1013
02:05:38,470 --> 02:05:18,629

[Music]

1014

02:05:38,480 --> 02:05:47,990

i have control of our field controls

1015

02:05:52,470 --> 02:05:50,470

here's that spot

1016

02:05:55,270 --> 02:05:52,480

can't reach all the way to the

1017

02:05:57,430 --> 02:05:55,280

neck across the tee okay i have control

1018

02:06:02,149 --> 02:05:57,440

so be a short hop get your control i

1019

02:06:07,350 --> 02:06:04,229

and the battery work today is obviously

1020

02:06:12,870 --> 02:06:07,360

now underway that first battery nickel

1021

02:06:19,830 --> 02:06:15,430

just prior to that chris cassidy

1022

02:06:22,950 --> 02:06:19,840

installed a new boom and hd camera

1023

02:06:24,629 --> 02:06:22,960

to the international space station

1024

02:06:26,709 --> 02:06:24,639

he then moved over to work with bob

1025

02:06:28,550 --> 02:06:26,719

benkin in releasing this first battery

1026

02:06:30,550 --> 02:06:28,560

as we mentioned a nickel hydrogen

1027

02:06:32,870 --> 02:06:30,560

battery originally on the integrated

1028

02:06:35,270 --> 02:06:32,880

electronics assembly and they are now

1029

02:06:42,629 --> 02:06:35,280

shepherding or slowly moving that

1030

02:06:47,270 --> 02:06:44,470

in this view from chris cassidy's helmet

1031

02:06:49,270 --> 02:06:47,280

camera you can see bob bankin ev1 or

1032

02:06:51,589 --> 02:06:49,280

spacewalker one with those red stripes

1033

02:07:05,589 --> 02:06:51,599

around the legs of his spacesuit as they

1034

02:07:05,599 --> 02:07:18,629

um

1035

02:07:45,030 --> 02:07:20,550

and control there you have control the

1036

02:07:50,550 --> 02:07:47,030

i'll control the battery yeah picture

1037

02:07:54,790 --> 02:07:52,550

it's not in my head yet where your happy

1038

02:07:56,550 --> 02:07:54,800

zone is

1039

02:07:58,629 --> 02:07:56,560

this is right in here yeah it's right in

1040

02:08:02,709 --> 02:07:58,639

there maybe the at least local to that

1041

02:08:34,229 --> 02:08:04,390

i have control of that you have control

1042

02:08:39,030 --> 02:08:36,629

control the battery your control of the

1043

02:08:41,830 --> 02:08:39,040

battery

1044

02:08:44,470 --> 02:08:41,840

and i'll just take your input on when

1045

02:08:45,750 --> 02:08:44,480

you're ready for me to

1046

02:08:47,589 --> 02:08:45,760

get up in there

1047

02:08:49,430 --> 02:08:47,599

okay

1048

02:08:51,589 --> 02:08:49,440

as i'm concerned it's now but i just

1049

02:08:53,510 --> 02:08:51,599

want to get you in a good spot okay i'll

1050

02:08:57,430 --> 02:08:53,520

let you take the uh battery i have the

1051
02:08:59,669 --> 02:08:57,440
battery okay do what you got to do okay

1052
02:09:04,069 --> 02:08:59,679
and chris you are go unable to end your

1053
02:09:04,079 --> 02:09:44,790
thank you

1054
02:09:50,229 --> 02:09:48,470
i have the battery uh and you want a red

1055
02:09:52,069 --> 02:09:50,239
yeah good idea you still have the

1056
02:10:07,270 --> 02:09:52,079
battery i stopped the battery i control

1057
02:10:07,280 --> 02:10:15,589
ah

1058
02:10:19,109 --> 02:10:18,149
here i have the battery and the rest in

1059
02:10:23,910 --> 02:10:19,119
the wrap

1060
02:10:23,920 --> 02:10:35,830
okay so here's

1061
02:10:35,840 --> 02:10:53,430
unclear how many

1062
02:10:53,440 --> 02:10:57,510
bye

1063
02:11:03,589 --> 02:10:59,189

it's probably surprising how close the

1064

02:11:07,669 --> 02:11:05,910

you still have a waste tether down onto

1065

02:11:11,350 --> 02:11:07,679

the structure

1066

02:11:45,270 --> 02:11:11,360

it wouldn't be an mdl run or pva

1067

02:11:49,990 --> 02:11:47,990

each other okay

1068

02:11:51,910 --> 02:11:50,000

it's taking an interesting route around

1069

02:11:53,990 --> 02:11:51,920

that frgf but

1070

02:11:55,669 --> 02:11:54,000

i think if you

1071

02:12:17,030 --> 02:11:55,679

keep it in front of you right there

1072

02:12:20,629 --> 02:12:17,990

okay

1073

02:12:25,669 --> 02:12:20,639

i'm in preparing

1074

02:12:30,610 --> 02:12:27,830

we copy and concur you'll want h1 in

1075

02:12:46,830 --> 02:12:32,470

[Music]

1076

02:12:51,669 --> 02:12:49,510

battery chris a reminder as you soft

1077

02:12:52,709 --> 02:12:51,679

dock here to stay less than 20 pounds

1078

02:12:55,910 --> 02:12:52,719

for us

1079

02:12:55,920 --> 02:12:59,750

okay coffee

1080

02:12:59,760 --> 02:13:04,629

okay build i'm gonna need

1081

02:13:23,270 --> 02:13:05,910

standby

1082

02:13:27,109 --> 02:13:25,270

and from bob bankins helmet camera a

1083

02:13:29,830 --> 02:13:27,119

great view of nasa astronaut chris

1084

02:13:31,669 --> 02:13:29,840

cassidy as he begins to place

1085

02:13:34,390 --> 02:13:31,679

that battery that nickel hydrogen

1086

02:13:41,270 --> 02:13:34,400

battery into the external pallet

1087

02:13:51,270 --> 02:13:43,430

cabinet

1088

02:14:08,709 --> 02:13:53,910

okay i'm ready

1089

02:14:15,669 --> 02:14:11,589

turning on h2 confirm socket tape line

1090

02:14:15,679 --> 02:14:18,629

h2

1091

02:14:18,639 --> 02:14:22,390

roger

1092

02:14:29,750 --> 02:14:25,669

guppy here go to turn we're driving two

1093

02:14:33,750 --> 02:14:29,760

torque expect 16 or 17 turns

1094

02:14:35,990 --> 02:14:33,760

16 or 17 turns here we go

1095

02:14:38,470 --> 02:14:36,000

cassidy is using the pistol grip tool to

1096

02:14:41,589 --> 02:14:38,480

drive one bolt and secure that nickel

1097

02:14:50,069 --> 02:14:41,599

hydrogen battery to the external pallet

1098

02:14:54,470 --> 02:14:52,550

it's going in

1099

02:15:10,669 --> 02:14:54,480

it's moving in smoothly both sides

1100

02:15:15,589 --> 02:15:12,629

16.9

1101
02:15:16,629 --> 02:15:15,599
turns 9.3 foot pounds green light with

1102
02:15:19,510 --> 02:15:16,639
locking

1103
02:15:20,830 --> 02:15:19,520
indicators all the way on

1104
02:15:22,390 --> 02:15:20,840
i copy

1105
02:15:25,030 --> 02:15:22,400
16.9

1106
02:15:28,229 --> 02:15:25,040
9.3 green light and lock that's a good

1107
02:15:30,229 --> 02:15:28,239
install you can stow the pgt and next we

1108
02:15:34,229 --> 02:15:30,239
need a glove hop and gauntlet check from

1109
02:15:34,239 --> 02:15:40,950
have a look down here chris

1110
02:15:40,960 --> 02:15:45,189
okay

1111
02:15:51,030 --> 02:15:49,189
my hat is still baseline dry

1112
02:15:54,229 --> 02:15:51,040
my gauntlets are still

1113
02:15:59,030 --> 02:15:56,390

my

1114

02:16:00,790 --> 02:15:59,040

left glove is uh in good shape there's a

1115

02:16:03,189 --> 02:16:00,800

visual patch of uh

1116

02:16:05,270 --> 02:16:03,199

rgb only that is uh got a little bit of

1117

02:16:06,229 --> 02:16:05,280

a feel to it

1118

02:16:14,390 --> 02:16:06,239

on the

1119

02:16:14,400 --> 02:16:19,420

just like it was we cannot

1120

02:16:33,509 --> 02:16:27,210

[Music]

1121

02:16:36,230 --> 02:16:35,270

a quarter of an inch

1122

02:16:38,309 --> 02:16:36,240

or

1123

02:16:44,629 --> 02:16:38,319

rgb flap

1124

02:16:50,070 --> 02:16:45,830

and

1125

02:16:51,830 --> 02:16:50,080

outer outer layer of the rtv only

1126
02:16:54,070 --> 02:16:51,840
copy chris we see it and have no

1127
02:16:56,790 --> 02:16:54,080
concerns at this time you can proceed

1128
02:16:58,549 --> 02:16:56,800
with retrieving the h1 and h2 scoop and

1129
02:17:07,509 --> 02:16:58,559
for awareness on both of you the met

1130
02:17:14,549 --> 02:17:09,270
sitting in the apf

1131
02:17:17,270 --> 02:17:15,789
it's retrieved

1132
02:17:19,830 --> 02:17:17,280
[Music]

1133
02:17:22,070 --> 02:17:19,840
and my

1134
02:17:25,830 --> 02:17:22,080
fingers are tucked in

1135
02:17:25,840 --> 02:17:29,750
that's clear

1136
02:17:33,669 --> 02:17:32,070
we copy chris and with that when you're

1137
02:17:35,910 --> 02:17:33,679
ready you can give

1138
02:17:39,990 --> 02:17:35,920

ssrms a go for gca we're going to

1139

02:17:40,000 --> 02:17:44,549

ready for you to move to published

1140

02:18:04,150 --> 02:17:46,629

hi gappy brakes are coming off and

1141

02:18:08,230 --> 02:18:05,990

and with that the first nickel hydrogen

1142

02:18:10,549 --> 02:18:08,240

battery of the day has been removed from

1143

02:18:12,629 --> 02:18:10,559

its place on the integrated electronics

1144

02:18:16,870 --> 02:18:12,639

assembly into its new home on the

1145

02:18:21,910 --> 02:18:19,110

and here comes motion chris the

1146

02:18:25,509 --> 02:18:21,920

pilot will be traveling uh left drop me

1147

02:18:29,429 --> 02:18:27,429

you're also hearing the voice of nasa

1148

02:18:31,910 --> 02:18:29,439

astronaut doug hurley who's currently

1149

02:18:33,910 --> 02:18:31,920

inside the space station

1150

02:18:36,549 --> 02:18:33,920

he is maneuvering the robotic arm the

1151
02:18:40,150 --> 02:18:36,559
cannon arm to today you can see some

1152
02:18:41,830 --> 02:18:40,160
slight motion there

1153
02:18:43,750 --> 02:18:41,840
he's moving into place that external

1154
02:18:45,990 --> 02:18:43,760
pallet which is attached to the end of

1155
02:18:47,750 --> 02:18:46,000
the canon arm too

1156
02:18:50,709 --> 02:18:47,760
this will put it in a good position for

1157
02:18:52,950 --> 02:18:50,719
chris cassidy to release the

1158
02:18:53,990 --> 02:18:52,960
next battery which will be a lithium-ion

1159
02:18:56,150 --> 02:18:54,000
battery

1160
02:18:58,950 --> 02:18:56,160
he will then work with bob benkin to

1161
02:19:41,270 --> 02:18:58,960
transfer it down to the iea the

1162
02:19:53,270 --> 02:19:49,510
uh

1163
02:19:54,469 --> 02:19:53,280

worksite

1164

02:19:56,469 --> 02:19:54,479

foxtrot

1165

02:20:01,110 --> 02:19:56,479

okay let me know if you need any other

1166

02:20:01,120 --> 02:20:07,590

okay uh complete

1167

02:20:10,309 --> 02:20:09,510

once the brakes are on your go for ep

1168

02:20:13,429 --> 02:20:10,319

ops

1169

02:20:18,309 --> 02:20:15,510

all right josh

1170

02:20:22,870 --> 02:20:20,710

hey chris recopy brakes are on you can

1171

02:20:24,870 --> 02:20:22,880

install those scoops both at a clocking

1172

02:20:29,990 --> 02:20:24,880

of nine and one should still be rated to

1173

02:20:41,190 --> 02:20:34,630

which is straight down in my local world

1174

02:20:50,309 --> 02:20:44,630

it looks like h1 is probably the one

1175

02:20:55,190 --> 02:20:53,270

by procedure we had it on h2 but as long

1176

02:21:02,309 --> 02:20:55,200

as it's reddit whatever works best for

1177

02:21:02,319 --> 02:21:13,910

um

1178

02:21:17,990 --> 02:21:15,190

and chris when you're ready we'll take

1179

02:21:21,990 --> 02:21:18,000

the serial number

1180

02:21:28,469 --> 02:21:26,230

copy 27 good number

1181

02:21:30,389 --> 02:21:28,479

i think i'm going to hold on to this one

1182

02:21:32,790 --> 02:21:30,399

bob and then

1183

02:21:35,910 --> 02:21:32,800

swing it under and you'll get okay

1184

02:21:49,349 --> 02:21:37,830

now we're good with that plan pgt

1185

02:21:49,359 --> 02:22:00,710

alpha seven counterclockwise two

1186

02:22:05,030 --> 02:22:03,030

copy confirm socket tape line flush to

1187

02:22:15,830 --> 02:22:05,040

the h2 scoop

1188

02:22:21,349 --> 02:22:17,830

pick line flush

1189

02:22:24,790 --> 02:22:23,750

indicator moving

1190

02:22:27,110 --> 02:22:24,800

copy

1191

02:22:30,389 --> 02:22:27,120

three for 19. okay looks like it's

1192

02:22:32,070 --> 02:22:30,399

coming out evenly copy that

1193

02:22:34,710 --> 02:22:32,080

this view from chris cassidy's helmet

1194

02:22:37,510 --> 02:22:34,720

camera as he removes battery f a new

1195

02:22:46,950 --> 02:22:37,520

lithium-ion battery from the external

1196

02:22:51,030 --> 02:22:48,710

and this view from bob benkin's helmet

1197

02:22:53,670 --> 02:22:51,040

camera waiting nearby to receive that

1198

02:22:56,230 --> 02:22:53,680

battery to help shepherd it down to the

1199

02:23:04,230 --> 02:22:56,240

iea the integrated electronics assembly

1200

02:23:08,309 --> 02:23:07,510

indicators and unlocked it it pops up on

1201
02:23:09,750 --> 02:23:08,319
the

1202
02:23:11,990 --> 02:23:09,760
bolt shoulder

1203
02:23:13,990 --> 02:23:12,000
two times

1204
02:23:17,990 --> 02:23:14,000
and i'm ready to take it out

1205
02:23:23,270 --> 02:23:21,030
got you got a bad sun this time yeah

1206
02:23:35,990 --> 02:23:23,280
worst time you can have huh yeah direct

1207
02:23:40,630 --> 02:23:38,150
and i'm going to wrap to it correct

1208
02:23:46,790 --> 02:23:40,640
affirmative we show a red swap here bob

1209
02:23:51,190 --> 02:23:49,030
okay i am wretched

1210
02:23:53,110 --> 02:23:51,200
richardson

1211
02:23:57,429 --> 02:23:53,120
and i have control of the battery in

1212
02:23:57,439 --> 02:24:09,190
thank you

1213
02:24:13,110 --> 02:24:10,630

i think there was a

1214

02:24:14,710 --> 02:24:13,120

dva questionnaire a few

1215

02:24:17,590 --> 02:24:14,720

a couple years ago about do you really

1216

02:24:20,150 --> 02:24:17,600

need this hard visor

1217

02:24:22,070 --> 02:24:20,160

and uh his example

1218

02:24:25,110 --> 02:24:22,080

i think the answer is yes just like in

1219

02:24:34,230 --> 02:24:25,120

baseball yep

1220

02:24:38,309 --> 02:24:36,630

chris cassidy egressing or exiting that

1221

02:24:40,830 --> 02:24:38,319

apfr

1222

02:24:43,830 --> 02:24:40,840

articulating portable foot

1223

02:24:45,990 --> 02:24:43,840

restraint moving to meet bob benkin and

1224

02:24:47,990 --> 02:24:46,000

help to shepherd that battery to its

1225

02:24:56,389 --> 02:24:48,000

permanent home on the integrated

1226

02:25:54,469 --> 02:24:58,550

i have control okay

1227

02:25:58,469 --> 02:25:56,389

as the astronauts work to move this

1228

02:26:00,870 --> 02:25:58,479

battery to its new home a recap of

1229

02:26:02,790 --> 02:26:00,880

everything that's happened so far today

1230

02:26:05,190 --> 02:26:02,800

the spacewalk began officially this

1231

02:26:07,110 --> 02:26:05,200

morning at 6 10 a.m central time when

1232

02:26:10,150 --> 02:26:07,120

the astronauts converted their

1233

02:26:12,870 --> 02:26:10,160

spacesuits to battery power

1234

02:26:14,630 --> 02:26:12,880

chris cassidy moved to the s3 to install

1235

02:26:16,790 --> 02:26:14,640

an hd camera

1236

02:26:19,590 --> 02:26:16,800

and then joined nasa astronaut bob

1237

02:26:21,670 --> 02:26:19,600

bankin on the s6 truss for the first

1238

02:26:23,190 --> 02:26:21,680

battery removal that was battery one a

1239

02:26:25,590 --> 02:26:23,200

nickel hydrogen battery from the

1240

02:26:28,550 --> 02:26:25,600

integrated electronics assembly

1241

02:26:30,710 --> 02:26:28,560

then moved the battery to ep or external

1242

02:26:32,630 --> 02:26:30,720

pallet slot z

1243

02:26:35,110 --> 02:26:32,640

and just recently we saw chris cassidy

1244

02:26:37,830 --> 02:26:35,120

remove battery f a lithium-ion battery

1245

02:26:39,510 --> 02:26:37,840

from the external pallet he and bob

1246

02:26:41,750 --> 02:26:39,520

benkin are now moving that towards the

1247

02:26:45,670 --> 02:26:41,760

integrated electronics assembly for its

1248

02:26:51,830 --> 02:26:47,190

except for here all the treads are

1249

02:27:02,710 --> 02:26:53,110

obviously

1250

02:27:13,750 --> 02:27:04,550

more control of the battery you have

1251

02:27:13,760 --> 02:27:28,870

let's control the battery yield control

1252

02:27:40,550 --> 02:27:30,870

i have control of the battery we have

1253

02:27:44,070 --> 02:27:42,710

keep my hands here

1254

02:27:56,790 --> 02:27:44,080

i have controlled the battery you have

1255

02:28:38,870 --> 02:27:58,870

i have control of the battery you have

1256

02:28:46,070 --> 02:28:40,710

control of the batteries share control

1257

02:28:50,469 --> 02:28:48,150

we've got another ask nasa question

1258

02:28:53,030 --> 02:28:50,479

coming up don't forget to submit yours

1259

02:28:55,190 --> 02:28:53,040

on twitter with the hashtag asknasa this

1260

02:28:56,790 --> 02:28:55,200

one coming from mel who wants to know

1261

02:28:59,110 --> 02:28:56,800

what the astronauts do if they get

1262

02:29:01,190 --> 02:28:59,120

thirsty on a spacewalk the astronauts

1263

02:29:03,190 --> 02:29:01,200

are out of the hatch for sometimes six

1264

02:29:06,070 --> 02:29:03,200

seven hours so we definitely expect them

1265

02:29:08,150 --> 02:29:06,080

to need a sip of water they do have a

1266

02:29:10,550 --> 02:29:08,160

water filled pouch attached to the

1267

02:29:12,710 --> 02:29:10,560

inside of the hard upper torso

1268

02:29:15,030 --> 02:29:12,720

they have a plastic tube with a valve

1269

02:29:17,750 --> 02:29:15,040

and that is adjusted to be near the

1270

02:29:46,550 --> 02:29:17,760

astronauts mouth so the astronauts have

1271

02:29:46,560 --> 02:29:55,190

copy

1272

02:29:59,990 --> 02:29:57,270

the red is released i will ingress the

1273

02:30:02,150 --> 02:30:00,000

apfr copy that

1274

02:30:05,830 --> 02:30:02,160

we copy your go bob just check the gap

1275

02:30:05,840 --> 02:30:09,349

the gap spanner is clear

1276

02:30:09,359 --> 02:30:48,469

roger

1277

02:30:48,479 --> 02:31:03,910

uh

1278

02:31:14,960 --> 02:31:05,590

bob once you're in a reminder to check

1279

02:31:44,070 --> 02:31:16,389

[Music]

1280

02:31:44,080 --> 02:31:48,950

okay i am ingress to the api

1281

02:31:48,960 --> 02:31:53,190

copy

1282

02:31:57,270 --> 02:31:55,190

do i have the battery

1283

02:31:58,630 --> 02:31:57,280

all right you can read if you want okay

1284

02:32:09,990 --> 02:31:58,640

i will put it right on it you've got the

1285

02:32:13,429 --> 02:32:11,670

next step will be an it's the battery

1286

02:32:15,110 --> 02:32:13,439

and i'm ready

1287

02:32:19,590 --> 02:32:15,120

get the battery in the rent here comes

1288

02:32:19,600 --> 02:32:24,790

removed it's yours

1289

02:32:31,830 --> 02:32:27,030

looking for an inspection bob of the ie8

1290

02:32:31,840 --> 02:32:35,750

on the iea side

1291

02:32:41,030 --> 02:32:38,870

yeah both interfaces so clear no fod

1292

02:32:43,110 --> 02:32:41,040

and the electrical connectors

1293

02:32:46,389 --> 02:32:43,120

look clear notepad

1294

02:32:49,510 --> 02:32:46,399

good emi band

1295

02:32:50,870 --> 02:32:49,520

on the battery side

1296

02:32:52,710 --> 02:32:50,880

so far

1297

02:32:55,030 --> 02:32:52,720

nice pins

1298

02:32:56,710 --> 02:32:55,040

mr is

1299

02:32:59,910 --> 02:32:56,720

intact look good

1300

02:33:01,429 --> 02:32:59,920

things look nice and clean

1301

02:33:04,469 --> 02:33:01,439

oh

1302

02:33:10,309 --> 02:33:04,479

serious markings

1303

02:33:10,319 --> 02:33:13,670

that's better i've got it

1304

02:33:18,389 --> 02:33:16,070

we go for the installs off

1305

02:33:19,910 --> 02:33:18,399

you are go for the install as a heads-up

1306

02:33:22,150 --> 02:33:19,920

reminder this is the slot with the

1307

02:33:23,910 --> 02:33:22,160

interference and so after we do install

1308

02:33:26,710 --> 02:33:23,920

this battery we want to avoid putting

1309

02:33:44,230 --> 02:33:26,720

any loads onto the h2 side of it h2

1310

02:33:44,240 --> 02:33:48,630

there's the soft dock

1311

02:33:53,110 --> 02:33:50,710

copy soft dock i have pgt settings when

1312

02:33:57,270 --> 02:33:54,870

bob bengan now

1313

02:33:59,190 --> 02:33:57,280

soft docking that lithium-ion battery

1314

02:34:02,550 --> 02:33:59,200

into its new home on the integrated

1315

02:34:04,870 --> 02:34:02,560

electronics assembly

1316

02:34:07,270 --> 02:34:04,880

good settings we'll confirm socket tape

1317

02:34:09,349 --> 02:34:07,280

line flush to h2

1318

02:34:13,510 --> 02:34:09,359

h2 side and then drive to torque we

1319

02:34:19,429 --> 02:34:16,389

we find this plus sixteen to 17 turns

1320

02:34:23,270 --> 02:34:21,830

indicator is moving i see the battery

1321

02:34:24,630 --> 02:34:23,280

going in

1322

02:34:26,710 --> 02:34:24,640

good

1323

02:34:27,990 --> 02:34:26,720

banking will tighten two bolts to secure

1324

02:34:51,349 --> 02:34:28,000

this battery to the integrated

1325

02:34:57,670 --> 02:34:53,670

there's 16 turns

1326

02:35:02,630 --> 02:34:57,680

indicator is just shy of a lock

1327

02:35:06,870 --> 02:35:05,270

the copy is 16 turns 9.0 on the torque

1328

02:35:14,950 --> 02:35:06,880

green light and the indicator where

1329

02:35:35,910 --> 02:35:17,910

same settings for h1 bob alpha seven

1330

02:35:35,920 --> 02:35:48,870

expect 4 to 5.5 turns

1331

02:35:48,880 --> 02:35:54,590

four and a half times

1332

02:36:00,550 --> 02:35:57,670

[Music]

1333

02:36:02,309 --> 02:36:00,560

uh clockwise on it so we'll have to

1334

02:36:09,030 --> 02:36:02,319

re-attempt a four-and-a-half turns but

1335

02:36:12,389 --> 02:36:10,710

that we copy bob we'll just uh

1336

02:36:17,270 --> 02:36:12,399

re-attempt so that we do get the torque

1337

02:36:21,349 --> 02:36:18,830

there's a green light

1338

02:36:24,710 --> 02:36:21,359

9.4 on the torque

1339

02:36:27,030 --> 02:36:24,720
to the zero turns that time so

1340

02:36:31,270 --> 02:36:27,040
copy and concur with 9.4 in a green

1341

02:36:31,280 --> 02:36:36,309
indicator is just shy of locked

1342

02:36:36,319 --> 02:36:40,469
that's a good install

1343

02:36:40,479 --> 02:36:43,830
we can release the wrap

1344

02:36:47,910 --> 02:36:46,230
okay so the scoops

1345

02:36:52,389 --> 02:36:47,920
look at them

1346

02:36:56,230 --> 02:36:54,309
all good words chris you're relocating

1347

02:37:07,030 --> 02:36:56,240
uh scoops and bob you're relocating the

1348

02:37:11,670 --> 02:37:09,590
battery f the lithium-ion battery has

1349

02:37:21,830 --> 02:37:11,680
now been installed on the integrated

1350

02:37:26,550 --> 02:37:23,830
so far today nasa astronaut chris

1351
02:37:28,230 --> 02:37:26,560
cassidy installed a new hd camera and

1352
02:37:29,830 --> 02:37:28,240
then the two worked together to remove a

1353
02:37:31,750 --> 02:37:29,840
nickel hydrogen battery from the

1354
02:37:35,670 --> 02:37:31,760
integrated electronics assembly and move

1355
02:37:35,680 --> 02:37:42,070
h1

1356
02:37:46,389 --> 02:37:44,550
affirmative and we don't have the video

1357
02:37:54,870 --> 02:37:46,399
right now but ptt settings when you're

1358
02:38:00,469 --> 02:37:57,590
i do have a green light

1359
02:38:04,389 --> 02:38:00,479
but i've got the alpha 7 sets

1360
02:38:08,070 --> 02:38:06,469
alpha seven and counter two are good

1361
02:38:13,110 --> 02:38:08,080
settings just confirm you're showing a

1362
02:38:21,830 --> 02:38:15,590
yeah i'm showing a green light i have a

1363
02:38:44,790 --> 02:38:24,070

okay we're just pause for one we're

1364

02:38:48,710 --> 02:38:46,630

and bob we think that's okay but we're

1365

02:38:57,830 --> 02:38:48,720

asking you to just click in and back

1366

02:39:03,670 --> 02:39:01,110

as i've power cycled the uh

1367

02:39:05,270 --> 02:39:03,680

the wds

1368

02:39:08,389 --> 02:39:05,280

and alpha

1369

02:39:08,399 --> 02:39:13,750

counter 2. for h1 if you're ready

1370

02:39:17,910 --> 02:39:16,469

we're back with you and uh

1371

02:39:20,230 --> 02:39:17,920

fully aware of the green light you were

1372

02:39:22,389 --> 02:39:20,240

talking about so we're ready h1 tape

1373

02:39:24,270 --> 02:39:22,399

line flash turn to release expect eight

1374

02:39:31,910 --> 02:39:24,280

turns

1375

02:39:35,590 --> 02:39:33,510

this view from nasa astronaut chris

1376

02:39:38,070 --> 02:39:35,600

cassidy's helmet camera looking at bob

1377

02:39:40,630 --> 02:39:38,080

benkin ev1 with those red stripes on his

1378

02:39:43,750 --> 02:39:40,640

spacesuit now using the pistol grip tool

1379

02:39:45,910 --> 02:39:43,760

to release the next battery battery 2

1380

02:39:47,590 --> 02:39:45,920

which is nickel hydrogen he will then

1381

02:39:49,349 --> 02:39:47,600

pass it over to chris cassidy and

1382

02:40:04,550 --> 02:39:49,359

they'll work together to move it back to

1383

02:40:19,269 --> 02:40:07,030

head over to h2 looking for a socket

1384

02:40:23,349 --> 02:40:21,590

uh i have

1385

02:40:28,630 --> 02:40:23,359

ordered that do you have my rent locked

1386

02:40:28,640 --> 02:40:36,309

copy that we're expecting 19 turns here

1387

02:40:40,389 --> 02:40:38,550

this is the second of two bolts required

1388

02:41:06,150 --> 02:40:40,399

to release that nickel hydrogen battery

1389

02:41:12,150 --> 02:41:07,990

i think that's all the way out

1390

02:41:49,510 --> 02:41:13,429

[Music]

1391

02:41:49,520 --> 02:42:03,429

h2 scoop going to christ

1392

02:42:08,550 --> 02:42:05,269

really tell how much different these

1393

02:42:23,349 --> 02:42:08,560

batteries are than the yeah the new ones

1394

02:42:27,269 --> 02:42:25,510

and battery to a nickel hydrogen battery

1395

02:42:29,110 --> 02:42:27,279

has been removed from the integrated

1396

02:42:32,710 --> 02:42:29,120

electronics assembly

1397

02:42:38,070 --> 02:42:34,870

pixel okay you have control and you have

1398

02:42:45,590 --> 02:42:38,080

the rat i have control on the red okay

1399

02:42:49,750 --> 02:42:48,150

and you see bob benkin egress or exit

1400

02:42:51,750 --> 02:42:49,760

that articulating portable foot

1401

02:42:53,429 --> 02:42:51,760

restraint he will join chris cassidy and

1402

02:43:01,910 --> 02:42:53,439

the two will work together to move the

1403

02:43:06,710 --> 02:43:03,830

once the battery arrives at the external

1404

02:43:10,150 --> 02:43:06,720

pallet chris cassidy will work to

1405

02:43:13,910 --> 02:43:11,030

okay

1406

02:43:20,469 --> 02:43:13,920

that helps you yeah

1407

02:43:24,790 --> 02:43:22,230

the battery that was just removed will

1408

02:43:27,750 --> 02:43:24,800

go into the slot of the adapter plate

1409

02:43:29,590 --> 02:43:27,760

which will be removed next

1410

02:43:36,710 --> 02:43:29,600

and that adapter plate will be moved to

1411

02:43:36,720 --> 02:43:45,670

ready

1412

02:44:02,070 --> 02:43:47,269

[Music]

1413

02:44:02,080 --> 02:44:13,429

you are clear

1414

02:44:13,439 --> 02:44:16,230

wow

1415

02:44:19,670 --> 02:44:18,150

one battery bait over makes a big

1416

02:44:21,670 --> 02:44:19,680

difference

1417

02:44:42,870 --> 02:44:21,680

not quite yet

1418

02:44:49,269 --> 02:44:45,429

i have the battery control you have the

1419

02:44:54,070 --> 02:44:51,910

there's the two hour mark guys two hours

1420

02:44:56,150 --> 02:44:54,080

we have seven minutes of consuming seven

1421

02:44:58,550 --> 02:44:56,160

hours of consumables medox is the

1422

02:45:07,590 --> 02:44:58,560

limiting factor and we're 15 ahead of

1423

02:45:12,630 --> 02:45:09,429

as you heard from ground iv joshua

1424

02:45:14,070 --> 02:45:12,640

kutrik a canadian space agency astronaut

1425

02:45:16,389 --> 02:45:14,080

the astronauts are slightly ahead of the

1426
02:45:17,349 --> 02:45:16,399
timeline today as we reach the two-hour

1427
02:45:19,510 --> 02:45:17,359
mark

1428
02:45:27,110 --> 02:45:19,520
you have control of the sun yeah that'd

1429
02:45:31,349 --> 02:45:28,870
no nice to pay for

1430
02:45:35,030 --> 02:45:31,359
it not going away i guess yeah

1431
02:45:47,750 --> 02:45:36,870
it's nice to

1432
02:46:40,710 --> 02:45:49,269
control the battery

1433
02:46:40,720 --> 02:46:53,110
um

1434
02:46:53,120 --> 02:47:11,590
control the battery shield control

1435
02:47:15,510 --> 02:47:13,910
okay i have control play you have

1436
02:47:17,510 --> 02:47:15,520
control

1437
02:47:19,830 --> 02:47:17,520
next up for our two crew members once

1438
02:47:21,750 --> 02:47:19,840

they arrive at the external pallet bob

1439

02:47:24,230 --> 02:47:21,760

benkin will hold on to that battery

1440

02:47:26,230 --> 02:47:24,240

battery number two while chris cassidy

1441

02:47:28,790 --> 02:47:26,240

uses the pistol grip tool to release two

1442

02:47:31,110 --> 02:47:28,800

bolts from the adapter plate they will

1443

02:48:08,230 --> 02:47:31,120

then remove the adapter plate and

1444

02:48:12,309 --> 02:48:09,750

and then uh

1445

02:48:14,830 --> 02:48:12,319

red for you okay

1446

02:48:19,820 --> 02:48:14,840

i just need to get it down here so all

1447

02:48:23,190 --> 02:48:21,990

[Music]

1448

02:48:25,110 --> 02:48:23,200

and ready

1449

02:48:27,110 --> 02:48:25,120

i have a battery you're ready then you

1450

02:48:34,230 --> 02:48:27,120

have the battery

1451

02:48:42,070 --> 02:48:35,990

chris the brakes are on you are go for

1452

02:48:46,070 --> 02:48:44,389

i'll be there thank you

1453

02:48:53,269 --> 02:48:46,080

there's a reminder we want to check the

1454

02:48:53,279 --> 02:49:23,190

box 12 confirmed i see it

1455

02:49:26,550 --> 02:49:25,030

we see almost and we'll check the

1456

02:49:28,230 --> 02:49:26,560

tethers check the ingress aid and make

1457

02:49:34,870 --> 02:49:28,240

sure you have access to the tools you'll

1458

02:49:40,550 --> 02:49:38,469

the tools are in perfect spot

1459

02:49:53,030 --> 02:49:40,560

and uh

1460

02:50:01,750 --> 02:49:56,309

okay i'm rated i have control tf control

1461

02:50:01,760 --> 02:50:09,110

h2 onto your brt

1462

02:50:09,120 --> 02:50:14,030

h2 under my brt

1463

02:50:17,269 --> 02:50:15,269

[Music]

1464

02:50:18,790 --> 02:50:17,279

good words and at this point we'll after

1465

02:50:26,309 --> 02:50:18,800

it's stowed we'll need another glove

1466

02:50:32,070 --> 02:50:28,950

my gauntlets are both still up

1467

02:50:33,510 --> 02:50:32,080

my hat is still dry

1468

02:50:34,830 --> 02:50:33,520

and

1469

02:50:38,230 --> 02:50:34,840

i write

1470

02:50:40,389 --> 02:50:38,240

gloves still fresh bean

1471

02:50:43,190 --> 02:50:40,399

and my left glove

1472

02:50:43,200 --> 02:51:02,150

choppy bob

1473

02:51:02,160 --> 02:51:05,830

okay brg

1474

02:51:05,840 --> 02:51:23,429

it is

1475

02:51:23,439 --> 02:51:32,150

hey

1476

02:51:32,160 --> 02:51:35,750

for the adapter plate

1477

02:51:35,760 --> 02:51:40,710

copy good config

1478

02:51:58,389 --> 02:51:42,870

going for the ratchet next and the glove

1479

02:51:58,399 --> 02:52:04,790

glove no

1480

02:52:04,800 --> 02:52:08,870

no change to the reported rtv

1481

02:52:13,510 --> 02:52:10,870

copy chris so for the torque brakes

1482

02:52:14,630 --> 02:52:13,520

we'll start with h1 confirming one line

1483

02:52:16,389 --> 02:52:14,640

flush

1484

02:52:22,790 --> 02:52:16,399

and max of one turn i want to remind you

1485

02:52:22,800 --> 02:52:26,870

okay one line flush

1486

02:52:31,269 --> 02:52:29,269

chris cassidy now breaking torque on two

1487

02:52:34,309 --> 02:52:31,279

bolts of the adapter plate

1488

02:52:42,389 --> 02:52:34,319

same thing on h2 one line flush max one

1489

02:52:46,790 --> 02:52:44,389

he'll then use the pistol grip tool to

1490

02:52:49,269 --> 02:52:46,800

release those two bolts

1491

02:52:53,670 --> 02:52:49,279

and remove the adapter plate from the

1492

02:52:53,680 --> 02:53:00,469

copy that we can store the ratchet

1493

02:53:18,790 --> 02:53:02,070

and it'll be the same settings on the

1494

02:53:18,800 --> 02:53:23,030

[Applause]

1495

02:53:30,630 --> 02:53:25,269

h1 confirm one line flash turn to

1496

02:53:35,429 --> 02:53:33,349

online flush here we go

1497

02:53:37,510 --> 02:53:35,439

chris cassidy now removing those two

1498

02:53:39,990 --> 02:53:37,520

bolts once this adapter plate is

1499

02:53:42,469 --> 02:53:40,000

released the battery battery number two

1500

02:53:44,230 --> 02:53:42,479

and nickel hydrogen battery will go into

1501
02:53:48,550 --> 02:53:44,240
its place and this will be its permanent

1502
02:53:55,910 --> 02:53:50,830
two lines visible it started

1503
02:53:55,920 --> 02:53:58,870
copy six

1504
02:54:06,790 --> 02:54:01,349
moving over to h2 same settings alpha

1505
02:54:10,070 --> 02:54:09,030
alpha seven counter clockwise two here

1506
02:54:15,990 --> 02:54:10,080
we go

1507
02:54:27,429 --> 02:54:17,910
a little bit high running torque at the

1508
02:54:30,309 --> 02:54:29,030
we're saying keep going at this time

1509
02:54:45,510 --> 02:54:30,319
chris

1510
02:54:45,520 --> 02:54:49,750
19 turns

1511
02:54:53,830 --> 02:54:51,110
definitely out

1512
02:55:03,590 --> 02:54:53,840
copy 19 let's turn the pgd off and then

1513
02:55:09,110 --> 02:55:06,710

h2 on this guy yeah i was listening a

1514

02:55:11,510 --> 02:55:09,120

little yeah it was it was nothing big

1515

02:55:13,190 --> 02:55:11,520

but it was definitely noticeable

1516

02:55:26,309 --> 02:55:13,200

that'll be towards the end of your

1517

02:55:28,710 --> 02:55:27,370

all right

1518

02:55:37,030 --> 02:55:28,720

[Music]

1519

02:55:40,389 --> 02:55:38,630

bob you'll get to the handrail tether

1520

02:55:51,030 --> 02:55:40,399

point

1521

02:55:55,110 --> 02:55:53,110

okay mine's coming off if you're ready i

1522

02:55:58,630 --> 02:55:55,120

am ready

1523

02:55:58,640 --> 02:56:11,290

i have

1524

02:56:15,510 --> 02:56:13,190

[Music]

1525

02:56:17,510 --> 02:56:15,520

we see the uh the wave chris you can

1526
02:56:19,429 --> 02:56:17,520
check the ingress that is test and then

1527
02:56:25,990 --> 02:56:19,439
the battery can come out h2 into your

1528
02:56:31,830 --> 02:56:28,630
wave from chris cassidy

1529
02:56:40,790 --> 02:56:31,840
who has just released adapter plate f

1530
02:56:45,030 --> 02:56:42,950
coming up next he'll install battery to

1531
02:56:47,429 --> 02:56:45,040
that nickel hydrogen battery onto the

1532
02:57:05,830 --> 02:56:47,439
external pallet right where you see his

1533
02:57:08,950 --> 02:57:07,510
yeah i'm about to put a little bit of

1534
02:57:11,030 --> 02:57:08,960
force into the

1535
02:57:38,230 --> 02:57:11,040
ballast

1536
02:57:42,710 --> 02:57:39,750
okay

1537
02:57:45,590 --> 02:57:42,720
leave it soft up josh

1538
02:57:59,030 --> 02:57:45,600

copy that chris pgt settings alpha seven

1539

02:58:02,950 --> 02:58:00,469

good settings

1540

02:58:11,670 --> 02:58:02,960

confirmed socket tape line flush to h2

1541

02:58:17,190 --> 02:58:13,830

batteries going in

1542

02:58:19,269 --> 02:58:17,200

indicator and approaching locks

1543

02:58:20,510 --> 02:58:19,279

routine

1544

02:58:23,590 --> 02:58:20,520

15

1545

02:58:26,309 --> 02:58:23,600

[Music]

1546

02:58:29,190 --> 02:58:26,319

16 and a half turns

1547

02:58:32,469 --> 02:58:29,200

9.1 with a green torque light lock

1548

02:58:36,070 --> 02:58:32,479

indicator is all the way at long

1549

02:58:41,190 --> 02:58:36,080

copy 16.5 9.1 green light and locked

1550

02:58:45,110 --> 02:58:43,349

so chris that's a good install and we're

1551
02:58:50,870 --> 02:58:45,120
going to be taking the scoops with us

1552
02:58:50,880 --> 02:58:58,230
all right

1553
02:59:01,510 --> 02:58:59,910
bob i see you looking at it we'll be

1554
02:59:06,550 --> 02:59:01,520
ready for the inspection when you are

1555
02:59:06,560 --> 02:59:10,150
besides

1556
02:59:14,550 --> 02:59:12,950
on the battery side

1557
02:59:17,030 --> 02:59:14,560
now the

1558
02:59:30,820 --> 02:59:17,040
bolts look clear no fod

1559
02:59:34,870 --> 02:59:32,309
[Music]

1560
02:59:37,190 --> 02:59:34,880
on the other side of the adapter plate

1561
02:59:43,190 --> 02:59:37,200
the bolts look clear

1562
02:59:45,910 --> 02:59:44,760
and then on the iea

1563
02:59:47,590 --> 02:59:45,920

[Music]

1564

02:59:49,910 --> 02:59:47,600

the bulk

1565

02:59:51,910 --> 02:59:49,920

areas look at clear no fod and the

1566

02:59:54,830 --> 02:59:51,920

electrical connectors look at clear

1567

02:59:54,840 --> 03:00:00,469

the emi band looks intact

1568

03:00:04,389 --> 03:00:02,550

copy bob good inspection you can soft

1569

03:00:09,560 --> 03:00:04,399

dock the blind mate connector should be

1570

03:00:14,230 --> 03:00:12,389

[Music]

1571

03:00:16,550 --> 03:00:14,240

copy josh you need anything done with

1572

03:00:18,389 --> 03:00:16,560

this bag

1573

03:00:19,830 --> 03:00:18,399

i've got the two scoops on me and i

1574

03:00:22,870 --> 03:00:19,840

think i'm just going to head to bob and

1575

03:00:26,950 --> 03:00:25,190

yeah as long as the bag is uh tacked

1576

03:00:28,870 --> 03:00:26,960

down it's not going to rotate but it is

1577

03:00:31,590 --> 03:00:28,880

going to translate so if you got the two

1578

03:00:33,830 --> 03:00:31,600

scoops you can come off the ep and to

1579

03:00:35,830 --> 03:00:33,840

the apfr just check the ingress eight is

1580

03:00:44,790 --> 03:00:35,840

stowed and then when you're five feet

1581

03:00:49,030 --> 03:00:46,790

this view from nasa astronaut bob

1582

03:00:51,990 --> 03:00:49,040

bankins helmet camera as he works to

1583

03:00:54,230 --> 03:00:52,000

soft dock that adapter plate first he

1584

03:00:56,309 --> 03:00:54,240

had to check it out for fraud or foreign

1585

03:01:03,429 --> 03:00:56,319

object debris to make sure it was clear

1586

03:01:07,990 --> 03:01:06,389

hey i gave you three inspections sorry

1587

03:01:10,710 --> 03:01:08,000

about that the

1588

03:01:13,030 --> 03:01:10,720

the battery side of the adapter plates

1589

03:01:14,790 --> 03:01:13,040

the underside of the adapter plate and

1590

03:01:17,269 --> 03:01:14,800

then the iea

1591

03:01:18,630 --> 03:01:17,279

all three of those emi bands no thought

1592

03:01:20,710 --> 03:01:18,640

on the bolts

1593

03:01:24,070 --> 03:01:20,720

and the electrical connector area looks

1594

03:01:28,230 --> 03:01:26,389

guppy thanks for the uh confirmation and

1595

03:01:32,309 --> 03:01:28,240

we'll go for soft dock

1596

03:01:32,319 --> 03:01:38,150

the adapter plate is soft

1597

03:01:43,190 --> 03:01:40,389

pgt settings when you're ready to go

1598

03:01:45,750 --> 03:01:43,200

this is chris

1599

03:01:47,910 --> 03:01:45,760

look i am 5 feet away

1600

03:01:50,150 --> 03:01:47,920

my ingress 8 is tucked out of the way

1601
03:01:52,389 --> 03:01:50,160
tethers are all clear you have a go

1602
03:01:54,870 --> 03:01:52,399
for your motion

1603
03:01:56,790 --> 03:01:54,880
happy chris clear the worksite uh ready

1604
03:01:58,550 --> 03:01:56,800
for the maneuver to

1605
03:02:12,469 --> 03:01:58,560
worksite echo

1606
03:02:16,950 --> 03:02:14,230
joshua

1607
03:02:18,710 --> 03:02:16,960
where would you like these two scoops

1608
03:02:24,560 --> 03:02:18,720
back out to the iea chris they'll be

1609
03:02:24,570 --> 03:02:28,150
[Music]

1610
03:02:37,670 --> 03:02:30,150
and bob we're with you on the pgt alpha

1611
03:02:52,230 --> 03:02:40,150
alpha seven

1612
03:03:04,469 --> 03:02:55,510
good settings h2 confirm one line flush

1613
03:03:11,190 --> 03:03:06,550

one line is flush

1614

03:03:12,950 --> 03:03:11,200

16 to 17 turns on h2

1615

03:03:14,389 --> 03:03:12,960

good reback and this is the one where we

1616

03:03:16,309 --> 03:03:14,399

might see some

1617

03:03:23,990 --> 03:03:16,319

of the higher torque as we get near 12

1618

03:03:28,230 --> 03:03:25,750

bob banking working to secure the

1619

03:03:30,150 --> 03:03:28,240

adapter plate by turning two bolts

1620

03:03:32,550 --> 03:03:30,160

meanwhile you heard chris cassidy call

1621

03:03:33,590 --> 03:03:32,560

out to doug hurley that he is now ready

1622

03:03:35,990 --> 03:03:33,600

for the

1623

03:03:38,070 --> 03:03:36,000

canadarm2 to move the external pallet to

1624

03:03:42,700 --> 03:03:38,080

its next position three o'clock on

1625

03:03:46,230 --> 03:03:44,070

[Music]

1626

03:03:47,990 --> 03:03:46,240

that's complete

1627

03:03:54,790 --> 03:03:48,000

copy for your awareness the hd camera

1628

03:03:54,800 --> 03:03:57,269

it is

1629

03:04:00,630 --> 03:03:59,110

yeah running torque started at about

1630

03:04:03,269 --> 03:04:00,640

eight turns

1631

03:04:07,590 --> 03:04:03,279

i got 17 turns

1632

03:04:11,190 --> 03:04:07,600

the green light 9.2 on the torque

1633

03:04:14,070 --> 03:04:11,200

okay good news 17 9.2 in a green light

1634

03:04:21,510 --> 03:04:14,080

move to h1 confirming two lines visible

1635

03:04:21,520 --> 03:04:27,190

okay two lines visible one flush on h1

1636

03:04:31,429 --> 03:04:29,429

good words turning two torque expecting

1637

03:04:43,110 --> 03:04:31,439

four decimal five or five decimal five

1638

03:04:46,710 --> 03:04:44,790

as you can see from his helmet camera

1639

03:04:49,990 --> 03:04:46,720

chris cassidy has made his way back to

1640

03:04:51,830 --> 03:04:50,000

the integrated electronics assembly

1641

03:04:56,150 --> 03:04:51,840

five turns

1642

03:04:56,160 --> 03:05:01,030

i copy 5 9.0 green light

1643

03:05:04,469 --> 03:05:03,110

it's a good adapter plate the pgt can go

1644

03:05:24,790 --> 03:05:04,479

back to the crew lock bag and we'll

1645

03:05:34,730 --> 03:05:27,750

i should move in the uh

1646

03:05:38,710 --> 03:05:37,030

[Music]

1647

03:05:41,030 --> 03:05:38,720

and chris i missed that but if it was a

1648

03:05:49,269 --> 03:05:41,040

move on the gopro sounds good just let

1649

03:05:53,349 --> 03:05:51,670

still cameras behaving funny

1650

03:05:57,030 --> 03:05:53,359

yeah it was uh

1651
03:05:58,469 --> 03:05:57,040
not washing the green light

1652
03:06:01,000 --> 03:05:58,479
but maybe it was the lighting we'll just

1653
03:06:03,030 --> 03:06:01,010
keep trying it yeah

1654
03:06:05,429 --> 03:06:03,040
[Music]

1655
03:06:07,830 --> 03:06:05,439
the ta comps are released i'm going to

1656
03:06:11,110 --> 03:06:07,840
e-crest the apfr

1657
03:06:14,150 --> 03:06:11,120
and they'll remove the cap

1658
03:06:17,110 --> 03:06:14,160
on that j4 i'm very in

1659
03:06:17,120 --> 03:06:26,389
copy and concur

1660
03:06:35,349 --> 03:06:28,790
with that adapter plate now secured the

1661
03:06:59,990 --> 03:06:37,510
they will mate the adapter plate cable

1662
03:07:39,110 --> 03:07:11,830
uh

1663
03:07:47,190 --> 03:07:41,910

gopro is at the top of the inboard gap

1664

03:07:53,110 --> 03:07:50,820

copy chris two zero four four

1665

03:07:54,790 --> 03:07:53,120

[Music]

1666

03:07:56,550 --> 03:07:54,800

and chris as bob finishes with the

1667

03:08:16,230 --> 03:07:56,560

cables this might be a good time for

1668

03:08:23,269 --> 03:08:18,790

right glove no change

1669

03:08:26,710 --> 03:08:24,230

about

1670

03:08:29,910 --> 03:08:26,720

an inch of flat

1671

03:08:32,230 --> 03:08:29,920

rgb flop in the same

1672

03:08:35,349 --> 03:08:32,240

left index finger where the index finger

1673

03:08:59,030 --> 03:08:35,359

meets the fall

1674

03:09:04,469 --> 03:09:02,230

anything i can be doing to help

1675

03:09:09,190 --> 03:09:04,479

i think i just have this uh

1676
03:09:09,200 --> 03:09:13,830
go to j4

1677
03:09:17,830 --> 03:09:15,269
and we want to kind of out of the way of

1678
03:09:19,590 --> 03:09:17,840
the battery

1679
03:09:21,269 --> 03:09:19,600
is your apfr

1680
03:09:24,630 --> 03:09:21,279
protein

1681
03:09:26,630 --> 03:09:24,640
what's the box drop maybe

1682
03:09:27,590 --> 03:09:26,640
possibly

1683
03:09:30,870 --> 03:09:27,600
and uh

1684
03:09:32,790 --> 03:09:30,880
you can take this pgt back to the

1685
03:09:34,630 --> 03:09:32,800
locate down

1686
03:09:36,469 --> 03:09:34,640
okay

1687
03:09:41,750 --> 03:09:36,479
and we concur with all it will be

1688
03:09:52,870 --> 03:09:44,710

that's complete and i'll take

1689

03:09:57,030 --> 03:09:55,910

the k4 both the pin side and the jack

1690

03:09:58,710 --> 03:09:57,040

side

1691

03:10:04,550 --> 03:09:58,720

look clear

1692

03:10:08,950 --> 03:10:06,950

copy bob on the pins fought in emi a

1693

03:10:23,269 --> 03:10:08,960

reminder to check the gap spanner stays

1694

03:10:26,950 --> 03:10:25,670

after completion of the mating of these

1695

03:10:29,429 --> 03:10:26,960

cables

1696

03:10:31,030 --> 03:10:29,439

chris cassidy and bob benkin will remain

1697

03:10:33,590 --> 03:10:31,040

here at the integrated electronics

1698

03:10:35,590 --> 03:10:33,600

assembly for the next battery move

1699

03:10:37,349 --> 03:10:35,600

that'll be battery 2 which is here at

1700

03:10:39,510 --> 03:10:37,359

this site and rather than taking it to

1701

03:10:41,830 --> 03:10:39,520

the external pallet they will actually

1702

03:10:43,990 --> 03:10:41,840

move it on top of the

1703

03:10:50,150 --> 03:10:44,000

adapter plate that you see bob banking

1704

03:10:53,110 --> 03:10:52,070

can't be a good mate with an inboard gap

1705

03:11:02,950 --> 03:10:53,120

spanner

1706

03:11:06,070 --> 03:11:04,710

gauntlets are still

1707

03:11:10,389 --> 03:11:06,080

up

1708

03:11:10,399 --> 03:11:14,550

my right hand still looks uh

1709

03:11:19,510 --> 03:11:17,200

same condition it was when i eat rest

1710

03:11:21,269 --> 03:11:19,520

[Music]

1711

03:11:23,510 --> 03:11:21,279

on my left hand

1712

03:11:26,790 --> 03:11:23,520

if you have a little bit of the tiny

1713

03:11:28,950 --> 03:11:26,800

outer layer of rtv on my thumb now

1714

03:11:47,460 --> 03:11:28,960

so other than that

1715

03:11:47,470 --> 03:11:48,950

[Music]

1716

03:11:48,960 --> 03:11:51,190

all next

1717

03:11:55,190 --> 03:11:52,630

yeah so we're ready to move on to the

1718

03:11:57,670 --> 03:11:55,200

battery 3 uh move taking it out and

1719

03:11:59,590 --> 03:11:57,680

taking it over to slot 2. i understand

1720

03:12:02,150 --> 03:11:59,600

chris already rolled the apfr so we'll

1721

03:12:04,309 --> 03:12:02,160

just verify here that the pgt and hex

1722

03:12:06,150 --> 03:12:04,319

driver is clear of slot three and that

1723

03:12:07,990 --> 03:12:06,160

the adapter plate connector cable is

1724

03:12:14,469 --> 03:12:08,000

clear of slot two basically nothing in

1725

03:12:19,269 --> 03:12:16,550

three could use some tidy some clean up

1726

03:12:23,750 --> 03:12:19,279

but when spawn gets in i'll take this

1727

03:12:27,110 --> 03:12:25,670

gt

1728

03:12:30,469 --> 03:12:27,120

yep

1729

03:12:32,150 --> 03:12:30,479

very heavy is not a good spot

1730

03:12:33,590 --> 03:12:32,160

a little bit early i guess for a ticket

1731

03:12:35,990 --> 03:12:33,600

to the

1732

03:12:37,190 --> 03:12:36,000

street from the crew up right

1733

03:12:52,070 --> 03:12:37,200

i guess

1734

03:12:52,080 --> 03:13:01,750

is

1735

03:13:05,590 --> 03:13:03,750

at the integrated electronics assembly

1736

03:13:07,830 --> 03:13:05,600

on the international space station bob

1737

03:13:10,950 --> 03:13:07,840

banken is now working to remove battery

1738

03:13:14,070 --> 03:13:10,960

3 a nickel hydrogen battery and place it

1739

03:13:16,229 --> 03:13:14,080

on top of the adapter plate f in slot 2

1740

03:13:18,309 --> 03:13:16,239

which was just installed that'll be its

1741

03:13:21,990 --> 03:13:18,319

final place and it won't be providing

1742

03:13:41,349 --> 03:13:22,000

power but it will just serve as a final

1743

03:13:45,349 --> 03:13:42,870

yep

1744

03:13:48,070 --> 03:13:45,359

each one

1745

03:13:49,750 --> 03:13:48,080

a affirmative alpha seven counter two h1

1746

03:13:51,110 --> 03:13:49,760

and we dropped either of that enough i

1747

03:13:54,550 --> 03:13:51,120

just want to make sure chris you have a

1748

03:13:54,560 --> 03:14:00,389

hey firm

1749

03:14:14,150 --> 03:14:02,870

to turn on h1 we're expecting eight

1750

03:14:18,229 --> 03:14:16,070

thinking we'll be releasing two of these

1751
03:14:25,750 --> 03:14:18,239
bolts to remove the nickel hydrogen

1752
03:14:33,110 --> 03:14:28,150
each one is released the indicator

1753
03:14:41,970 --> 03:14:35,429
copy that we'll move to h2 confirming

1754
03:14:41,980 --> 03:14:48,550
[Music]

1755
03:14:59,030 --> 03:14:50,710
good settings turn to release expecting

1756
03:14:59,040 --> 03:15:29,890
checking out smoothly

1757
03:15:29,900 --> 03:15:34,630
[Music]

1758
03:15:37,670 --> 03:15:35,830
it's all the way

1759
03:15:39,590 --> 03:15:37,680
to unlocked with the

1760
03:15:42,950 --> 03:15:39,600
on the indicator with two additional

1761
03:15:42,960 --> 03:15:46,180
copy

1762
03:15:46,190 --> 03:15:51,269
[Music]

1763
03:15:51,279 --> 03:15:59,110

and it is free

1764

03:16:04,150 --> 03:16:02,950

so i'm gonna hand it off to you

1765

03:16:05,830 --> 03:16:04,160

and i will

1766

03:16:09,670 --> 03:16:05,840

use the

1767

03:16:16,469 --> 03:16:11,750

we concur suggested role setting of

1768

03:16:22,010 --> 03:16:18,870

there was only a delta in my head

1769

03:16:22,020 --> 03:16:25,190

[Music]

1770

03:16:32,630 --> 03:16:29,190

okay i have control and i have a red if

1771

03:16:34,870 --> 03:16:32,640

keep it move it up just a little bit yep

1772

03:17:46,220 --> 03:16:34,880

towards your head get up towards me

1773

03:17:46,230 --> 03:17:50,790

[Applause]

1774

03:17:56,150 --> 03:17:53,590

i'm in i'm ready to

1775

03:17:57,190 --> 03:17:56,160

shoot the battery i won't read this

1776

03:17:59,910 --> 03:17:57,200

or

1777

03:18:02,389 --> 03:17:59,920

can you continue to translate i i think

1778

03:18:04,469 --> 03:18:02,399

i can translate okay you pull me a

1779

03:18:06,309 --> 03:18:04,479

little

1780

03:18:08,150 --> 03:18:06,319

and a final final reminder to make sure

1781

03:18:13,429 --> 03:18:08,160

the gap spanner and cables are clear of

1782

03:18:17,990 --> 03:18:15,269

table is clear

1783

03:18:24,229 --> 03:18:18,000

yeah i get up spanner that's being got

1784

03:18:42,630 --> 03:18:26,389

yeah a little bit

1785

03:18:42,640 --> 03:18:49,990

let's find out

1786

03:18:50,000 --> 03:18:56,710

it's always seen so high

1787

03:18:56,720 --> 03:19:05,590

you need a pgt i guess

1788

03:19:10,950 --> 03:19:07,750

i think it's the gap down there it's

1789

03:19:14,150 --> 03:19:10,960

like five inches

1790

03:19:16,469 --> 03:19:14,160

we'll see my five inches so

1791

03:19:20,790 --> 03:19:16,479

i guess it's because it has those uh

1792

03:19:20,800 --> 03:19:25,910

okay i've got the pgt

1793

03:19:29,910 --> 03:19:28,150

it's down past the

1794

03:19:33,590 --> 03:19:29,920

that comes

1795

03:19:35,510 --> 03:19:33,600

this has got to be a soft dock there so

1796

03:19:38,389 --> 03:19:35,520

hey alpha seven

1797

03:19:41,670 --> 03:19:38,399

clockwise two

1798

03:19:46,550 --> 03:19:44,150

h2

1799

03:19:52,070 --> 03:19:46,560

affirmative socket tape line flush we

1800

03:19:52,080 --> 03:19:57,190

here we go

1801

03:20:03,990 --> 03:20:00,870

bob ben can now installing that aging

1802

03:20:06,070 --> 03:20:04,000

nickel hydrogen battery battery 3 to the

1803

03:20:09,269 --> 03:20:06,080

adapter plate that was just installed

1804

03:20:13,750 --> 03:20:09,279

from the iea the integrated electronics

1805

03:20:17,590 --> 03:20:15,590

on top of the adapter plate the nickel

1806

03:20:19,990 --> 03:20:17,600

hydrogen battery will not be powered on

1807

03:20:24,070 --> 03:20:20,000

it just serves as a permanent storing

1808

03:20:28,389 --> 03:20:25,670

this is the third nickel hydrogen

1809

03:20:30,630 --> 03:20:28,399

battery to be removed today

1810

03:20:35,190 --> 03:20:30,640

and one lithium-ion battery has been

1811

03:20:35,200 --> 03:20:42,309

copy 16 green light 9.2

1812

03:20:42,319 --> 03:20:46,150

and confirm the status indicator

1813

03:20:50,950 --> 03:20:48,229

the assembly fader is locked

1814

03:20:53,190 --> 03:20:50,960

all the way locked

1815

03:21:20,229 --> 03:20:53,200

roger lot same settings for h1 alpha

1816

03:21:25,750 --> 03:21:23,349

four and a half turns green light 9.1 on

1817

03:21:31,910 --> 03:21:25,760

the torque

1818

03:21:39,590 --> 03:21:34,150

this indicates lock

1819

03:21:43,269 --> 03:21:41,349

and with that battery 3 has found its

1820

03:21:44,950 --> 03:21:43,279

permanent home on the integrated

1821

03:21:50,830 --> 03:21:44,960

electronics assembly on top of an

1822

03:21:50,840 --> 03:21:54,550

yeah awesome

1823

03:21:59,269 --> 03:21:55,750

awesome thanks

1824

03:22:03,110 --> 03:22:00,950

so next step here uh bob we're going to

1825

03:22:05,269 --> 03:22:03,120

want to roll the apfr the f

1826
03:22:25,510 --> 03:22:05,279
and then those scoops one is going to

1827
03:22:32,870 --> 03:22:26,950
yeah h4

1828
03:22:32,880 --> 03:22:37,990
complete

1829
03:23:01,190 --> 03:22:40,710
looks good and then pfcs will be h4 at

1830
03:23:25,910 --> 03:23:04,950
okay if you're first back to foxtrot

1831
03:23:31,110 --> 03:23:28,830
and chris that looks like a good scoop

1832
03:23:44,229 --> 03:23:31,120
clock you guys are both headed out to

1833
03:23:48,389 --> 03:23:46,309
as our astronauts make their way to the

1834
03:23:50,309 --> 03:23:48,399
external palate a recap of everything

1835
03:23:52,790 --> 03:23:50,319
that's happened so far today

1836
03:23:55,110 --> 03:23:52,800
we are now two hours and 40 minutes into

1837
03:24:04,469 --> 03:23:55,120
today's spacewalk which started at 6 10

1838
03:24:08,389 --> 03:24:06,309

the first task of the day was completed

1839

03:24:11,510 --> 03:24:08,399

by chris cassidy when he installed a

1840

03:24:13,510 --> 03:24:11,520

brand new hd camera since then we've

1841

03:24:17,269 --> 03:24:13,520

heard confirmation that the camera is

1842

03:24:19,830 --> 03:24:17,279

relaying good data to the ground

1843

03:24:22,630 --> 03:24:19,840

he then moved to help bob benkin on the

1844

03:24:24,309 --> 03:24:22,640

s6 truss as they removed battery one a

1845

03:24:26,309 --> 03:24:24,319

nickel hydrogen battery from the

1846

03:24:28,469 --> 03:24:26,319

integrated electronics assembly 40

1847

03:24:30,229 --> 03:24:28,479

minutes ahead of time

1848

03:24:35,830 --> 03:24:30,239

and they moved it to the external pallet

1849

03:24:40,710 --> 03:24:37,990

from there the crew removed battery f a

1850

03:24:41,830 --> 03:24:40,720

lithium ion battery one of the newer

1851
03:24:44,389 --> 03:24:41,840
batteries

1852
03:24:46,790 --> 03:24:44,399
to slot one so they moved it back to the

1853
03:24:48,870 --> 03:24:46,800
integrated electronics assembly

1854
03:24:50,469 --> 03:24:48,880
they then removed battery two a nickel

1855
03:24:52,790 --> 03:24:50,479
hydrogen battery

1856
03:24:55,910 --> 03:24:52,800
and placed it on the external pallet in

1857
03:24:58,070 --> 03:24:55,920
slot f while at the external pallet they

1858
03:25:00,469 --> 03:24:58,080
removed an adapter plate that was in

1859
03:25:04,070 --> 03:25:00,479
slot f and moved it to the integrated

1860
03:25:08,469 --> 03:25:06,150
we just saw the installation of that

1861
03:25:10,550 --> 03:25:08,479
adapter plate in slot 2 on the

1862
03:25:13,110 --> 03:25:10,560
integrated electronics assembly and

1863
03:25:15,349 --> 03:25:13,120

battery 3 a nickel hydrogen battery was

1864

03:25:21,990 --> 03:25:15,359

removed and placed on top of that

1865

03:25:26,150 --> 03:25:23,670

makes the removal of three nickel

1866

03:25:27,910 --> 03:25:26,160

hydrogen batteries so far the movement

1867

03:25:30,710 --> 03:25:27,920

of one adapter plate and the

1868

03:25:33,349 --> 03:25:30,720

installation of one lithium-ion battery

1869

03:25:35,349 --> 03:25:33,359

coming up next battery e a lithium-ion

1870

03:25:37,990 --> 03:25:35,359

battery will be moved from the external

1871

03:25:40,630 --> 03:25:38,000

pallet to its new home on the integrated

1872

03:25:42,070 --> 03:25:40,640

electronics assembly in slot 3. copy

1873

03:25:44,710 --> 03:25:42,080

that we'll take a serial number when you

1874

03:25:48,229 --> 03:25:46,229

the astronauts are running about 40

1875

03:25:50,309 --> 03:25:48,239

minutes ahead of their timeline today

1876
03:25:52,070 --> 03:25:50,319
things progressing smoothly it's a good

1877
03:25:55,110 --> 03:25:52,080
serial number pgt settings when you're

1878
03:25:55,990 --> 03:25:55,120
ready no change alpha seven counter two

1879
03:25:57,750 --> 03:25:56,000
seven

1880
03:26:00,790 --> 03:25:57,760
two

1881
03:26:03,670 --> 03:26:00,800
alpha seven

1882
03:26:14,550 --> 03:26:06,950
hey firm tape line plus h2 scoop

1883
03:26:14,560 --> 03:26:19,429
flush here we go

1884
03:26:19,439 --> 03:26:49,590
super 19 indicator moving

1885
03:26:49,600 --> 03:26:53,830
first topic 17

1886
03:26:58,830 --> 03:26:56,630
19 turns couple hops on the bolt

1887
03:27:04,469 --> 03:26:58,840
unlock

1888
03:27:07,110 --> 03:27:04,479

can store the pgt

1889

03:27:09,030 --> 03:27:07,120

and battery e that lithium ion battery

1890

03:27:11,190 --> 03:27:09,040

has now been removed from the external

1891

03:27:12,630 --> 03:27:11,200

pallet

1892

03:27:25,269 --> 03:27:12,640

for the handoff box going to want to

1893

03:27:28,389 --> 03:27:27,030

and bob just curious is that camera

1894

03:27:32,710 --> 03:27:28,399

working for you normally now with the

1895

03:27:35,510 --> 03:27:34,309

i'm not getting a green light indicating

1896

03:27:37,190 --> 03:27:35,520

there's a

1897

03:27:40,469 --> 03:27:37,200

should be unsaved

1898

03:27:42,950 --> 03:27:40,479

if you see the red focus

1899

03:27:45,670 --> 03:27:42,960

come on when it uh

1900

03:27:47,429 --> 03:27:45,680

i pushed me did i push the button

1901
03:27:51,190 --> 03:27:47,439
but it does look like it remains out of

1902
03:27:56,229 --> 03:27:53,380
copy thanks

1903
03:27:58,309 --> 03:27:56,239
[Music]

1904
03:28:00,330 --> 03:27:58,319
and no green light like i said today's

1905
03:28:03,349 --> 03:28:00,340
out of focus

1906
03:28:05,429 --> 03:28:03,359
[Music]

1907
03:28:07,429 --> 03:28:05,439
okay if we check if it helps you you can

1908
03:28:17,670 --> 03:28:07,439
still use the original button is what

1909
03:28:46,870 --> 03:28:20,309
coming out bob happy

1910
03:28:53,349 --> 03:28:50,229
okay i have a hand on it

1911
03:28:55,510 --> 03:28:53,359
can i uh can you eat i'll take control

1912
03:28:57,190 --> 03:28:55,520
of the battery you have to maybe turn it

1913
03:28:59,030 --> 03:28:57,200

to get away from the ep and then i'll

1914

03:29:00,950 --> 03:28:59,040

work on getting my

1915

03:29:01,990 --> 03:29:00,960

tray right on it you have control i have

1916

03:29:09,100 --> 03:29:02,000

control

1917

03:29:09,110 --> 03:29:13,910

[Music]

1918

03:29:27,190 --> 03:29:15,990

i'm on it and can take control anytime

1919

03:29:31,269 --> 03:29:29,670

okay i've got control in a wrap let's

1920

03:29:36,229 --> 03:29:31,279

see copy that

1921

03:29:40,229 --> 03:29:38,630

now that battery e a lithium-ion battery

1922

03:29:42,469 --> 03:29:40,239

has been removed from the external

1923

03:29:45,190 --> 03:29:42,479

pallet chris cassidy and bob benkin will

1924

03:29:59,670 --> 03:29:45,200

work to shepherd it back to its new home

1925

03:30:24,790 --> 03:30:01,590

and we copy and concur on all inch

1926
03:30:29,590 --> 03:30:26,389
trying to try to squeeze through here

1927
03:30:29,600 --> 03:30:35,590
give you some more space

1928
03:30:39,750 --> 03:30:37,190
get about a foot

1929
03:30:42,070 --> 03:30:39,760
be stuck on something

1930
03:30:43,349 --> 03:30:42,080
as our astronauts move this battery to

1931
03:30:45,670 --> 03:30:43,359
its new home on the integrated

1932
03:30:47,990 --> 03:30:45,680
electronics assembly we have another ask

1933
03:30:49,830 --> 03:30:48,000
an asset question this one from isaac

1934
03:30:51,910 --> 03:30:49,840
who wants to know if time is allotted

1935
03:30:55,030 --> 03:30:51,920
for astronauts to appreciate the views

1936
03:30:56,790 --> 03:30:55,040
during a spacewalk or take any breaks

1937
03:30:58,550 --> 03:30:56,800
as we've seen earlier today from their

1938
03:31:00,309 --> 03:30:58,560

helmet camera the astronauts do get

1939

03:31:02,229 --> 03:31:00,319

glimpses of earth

1940

03:31:04,229 --> 03:31:02,239

they don't have any specific time

1941

03:31:06,469 --> 03:31:04,239

scheduled to appreciate the views but

1942

03:31:08,469 --> 03:31:06,479

they often get a chance whenever they

1943

03:31:09,910 --> 03:31:08,479

are in between tasks

1944

03:31:12,309 --> 03:31:09,920

they also took a couple of breaks

1945

03:31:14,550 --> 03:31:12,319

earlier to help conserve some of their

1946

03:31:18,760 --> 03:31:14,560

consumables like oxygen and water inside

1947

03:31:22,550 --> 03:31:20,070

[Music]

1948

03:31:24,469 --> 03:31:22,560

okay

1949

03:31:26,710 --> 03:31:24,479

all right

1950

03:31:50,270 --> 03:31:26,720

looking for the handle i have control

1951

03:31:55,670 --> 03:31:52,950

[Music]

1952

03:31:57,510 --> 03:31:55,680

funny the way the hook spins around

1953

03:31:59,269 --> 03:31:57,520

yeah

1954

03:32:01,349 --> 03:31:59,279

i think it's just a dumb piece of metal

1955

03:32:11,990 --> 03:32:01,359

but it knows how to make it harder to

1956

03:32:24,309 --> 03:32:13,910

and control the batteries here control

1957

03:32:45,950 --> 03:32:25,990

and control the battery you have control

1958

03:32:45,960 --> 03:33:00,309

[Music]

1959

03:33:05,110 --> 03:33:02,870

and cassidy continue to move battery e

1960

03:33:07,590 --> 03:33:05,120

that lithium-ion battery down toward the

1961

03:33:12,950 --> 03:33:07,600

integrated electronics assembly where it

1962

03:33:35,349 --> 03:33:14,870

okay i have control of the battery you

1963

03:33:39,990 --> 03:33:37,910

now at two hours and 50 minutes into

1964

03:33:41,990 --> 03:33:40,000

today's spacewalk

1965

03:33:43,750 --> 03:33:42,000

this view of the international space

1966

03:33:45,190 --> 03:33:43,760

station flight control room here in

1967

03:33:46,710 --> 03:33:45,200

houston texas

1968

03:33:47,670 --> 03:33:46,720

where teams are walking the space

1969

03:33:49,750 --> 03:33:47,680

walkers

1970

03:33:52,150 --> 03:33:49,760

through today's tasks and monitoring

1971

03:33:53,830 --> 03:33:52,160

their suits and all the procedures and

1972

03:34:12,229 --> 03:33:53,840

the systems aboard the international

1973

03:34:12,239 --> 03:34:30,970

control of the battery

1974

03:34:30,980 --> 03:34:34,710

[Music]

1975

03:34:39,190 --> 03:34:36,550

i have control of the battery we have

1976

03:34:41,910 --> 03:34:39,200

control of the battery

1977

03:34:45,269 --> 03:34:41,920

let me try to view the inspection before

1978

03:35:01,030 --> 03:34:45,279

you get into the apfr okay

1979

03:35:04,070 --> 03:35:02,710

as you can see the crew members have now

1980

03:35:06,150 --> 03:35:04,080

made it back to the integrated

1981

03:35:08,469 --> 03:35:06,160

electronics assembly where they're

1982

03:35:11,110 --> 03:35:08,479

preparing to install that

1983

03:35:13,510 --> 03:35:11,120

lithium-ion battery battery e

1984

03:35:15,349 --> 03:35:13,520

emi

1985

03:35:19,349 --> 03:35:15,359

and either

1986

03:35:19,359 --> 03:35:24,150

copy pop copy

1987

03:35:28,150 --> 03:35:26,550

um so yeah let me take control of it and

1988

03:35:29,750 --> 03:35:28,160

i think i should probably

1989

03:35:36,070 --> 03:35:29,760

do a tether swap

1990

03:35:47,429 --> 03:35:37,830

i've got control of the battery you've

1991

03:36:07,190 --> 03:35:51,349

i have already i have control coverage

1992

03:36:07,200 --> 03:36:12,710

i will ingress the apfr right here

1993

03:36:19,110 --> 03:36:14,469

we copy bob a reminder check gap

1994

03:36:19,120 --> 03:36:48,710

thank you joshua spanner is clear

1995

03:36:48,720 --> 03:36:54,229

okay i have ingress the apfr

1996

03:36:58,710 --> 03:36:56,150

i have control of the battery if you

1997

03:37:07,110 --> 03:36:58,720

have control you can

1998

03:37:11,670 --> 03:37:09,830

has now ingressed or entered the apfr

1999

03:37:13,830 --> 03:37:11,680

that's the articulating portable foot

2000

03:37:16,389 --> 03:37:13,840

restraint it gives the astronauts a

2001
03:37:19,590 --> 03:37:16,399
place to secure themselves when working

2002
03:37:21,990 --> 03:37:19,600
outside the international space station

2003
03:37:24,550 --> 03:37:22,000
you can see he is now going to place

2004
03:37:29,030 --> 03:37:24,560
battery e a lithium ion battery into

2005
03:37:29,040 --> 03:37:31,190
iea assembly

2006
03:37:34,630 --> 03:37:31,990
the

2007
03:37:36,229 --> 03:37:34,640
electrical connectors are clear

2008
03:37:39,990 --> 03:37:36,239
it's like a good

2009
03:37:43,349 --> 03:37:41,349
and the

2010
03:37:44,389 --> 03:37:43,359
mechanical connectors are clear

2011
03:37:46,630 --> 03:37:44,399
stems are

2012
03:38:06,870 --> 03:37:46,640
good and straight

2013
03:38:06,880 --> 03:38:12,309

there you go perfect

2014

03:38:34,389 --> 03:38:14,469

ben can now soft docking that battery

2015

03:38:52,830 --> 03:38:36,150

grab a little bit on each one do they

2016

03:38:57,510 --> 03:38:55,590

clockwise two

2017

03:38:59,830 --> 03:38:57,520

for h2

2018

03:39:02,950 --> 03:38:59,840

affirmative good settings h2 confirmed

2019

03:39:05,349 --> 03:39:02,960

tape line flush drive to torque 16 to 17

2020

03:39:09,429 --> 03:39:05,359

turns 16 to 17

2021

03:39:11,429 --> 03:39:09,439

the tape line is flush copy 16 to 17

2022

03:39:13,910 --> 03:39:11,439

seconds

2023

03:39:16,790 --> 03:39:13,920

benkin is now going to tighten two bolts

2024

03:39:18,550 --> 03:39:16,800

to securely fasten the new lithium-ion

2025

03:39:47,590 --> 03:39:18,560

battery to the integrated electronics

2026
03:39:57,189 --> 03:39:53,510
16 turns green light 9.1 on the torque

2027
03:39:59,670 --> 03:39:57,199
copy 16 9.1 and green confirmed status

2028
03:40:05,830 --> 03:39:59,680
indicator

2029
03:40:09,750 --> 03:40:05,840
copy we'll move to h1 same settings

2030
03:40:17,429 --> 03:40:13,269
alpha seven clockwise two on h1

2031
03:40:17,439 --> 03:40:22,780
expecting four to five point five

2032
03:40:22,790 --> 03:40:27,030
[Music]

2033
03:40:32,469 --> 03:40:30,150
five point five turns on each one

2034
03:40:37,030 --> 03:40:32,479
this indicator indicates locked

2035
03:40:44,170 --> 03:40:40,229
copy 9.2 5.5 green we can install the

2036
03:40:48,630 --> 03:40:46,630
[Music]

2037
03:40:51,349 --> 03:40:48,640
so that's a good battery and once we

2038
03:40:59,349 --> 03:40:51,359

have the pgt stowed we'll take a glove

2039

03:41:02,710 --> 03:41:00,870

my gauntlets are

2040

03:41:06,070 --> 03:41:02,720

up

2041

03:41:08,309 --> 03:41:06,080

my hat still feels dry

2042

03:41:12,150 --> 03:41:08,319

and uh

2043

03:41:25,670 --> 03:41:12,160

no changes to my gloves

2044

03:41:32,870 --> 03:41:28,389

it's still about an inch of

2045

03:41:34,790 --> 03:41:32,880

outer layer rtv frame location

2046

03:41:37,110 --> 03:41:34,800

copy chris so we're moving on to the

2047

03:41:39,030 --> 03:41:37,120

battery 4 to

2048

03:41:41,030 --> 03:41:39,040

ep echo move

2049

03:41:43,349 --> 03:41:41,040

in terms of the big picture we have

2050

03:41:45,110 --> 03:41:43,359

seminar seven hours on the consumables

2051
03:41:47,189 --> 03:41:45,120
limited by matt docks

2052
03:41:49,830 --> 03:41:47,199
and we're still about four zero minutes

2053
03:41:54,550 --> 03:41:49,840
ahead of timeline

2054
03:42:00,309 --> 03:41:56,950
property so expect josh that i'm going

2055
03:42:02,309 --> 03:42:00,319
to relocate an apfr next

2056
03:42:10,710 --> 03:42:02,319
affirmative bob it's going inboard one

2057
03:42:14,870 --> 03:42:12,790
and that was the second lithium-ion

2058
03:42:17,349 --> 03:42:14,880
battery of the day to be installed to

2059
03:42:19,110 --> 03:42:17,359
the integrated electronics assembly so

2060
03:42:21,189 --> 03:42:19,120
far we've had three nickel hydrogen

2061
03:42:23,189 --> 03:42:21,199
batteries removed and two lithium-ion

2062
03:42:28,389 --> 03:42:23,199
batteries installed

2063
03:42:32,229 --> 03:42:30,229

okay so where did these two scoops go

2064

03:42:34,790 --> 03:42:32,239

that just came off of

2065

03:42:36,389 --> 03:42:34,800

battery a3

2066

03:42:38,150 --> 03:42:36,399

they're going to stay there for now the

2067

03:42:40,070 --> 03:42:38,160

move comes up later in the procedure but

2068

03:42:42,309 --> 03:42:40,080

i can get that for you if you think it

2069

03:42:43,830 --> 03:42:42,319

would help

2070

03:42:45,910 --> 03:42:43,840

yeah please

2071

03:42:51,990 --> 03:42:45,920

so they end up over on

2072

03:42:56,469 --> 03:42:54,150

coming up on three hours into today's

2073

03:42:59,349 --> 03:42:56,479

spacewalk which began at 6 10 a.m

2074

03:43:01,189 --> 03:42:59,359

central time 7 10 a.m eastern time the

2075

03:43:03,750 --> 03:43:01,199

astronauts are preparing for their next

2076

03:43:05,429 --> 03:43:03,760

task to remove battery for a nickel

2077

03:43:08,790 --> 03:43:05,439

hydrogen battery from the integrated

2078

03:43:12,550 --> 03:43:10,550

they will then move to the external

2079

03:43:15,429 --> 03:43:12,560

pallet where they will remove

2080

03:43:18,070 --> 03:43:15,439

an adapter plate before placing battery

2081

03:43:38,710 --> 03:43:18,080

4 in its slot

2082

03:43:49,269 --> 03:43:41,510

the twist test and a good pull test

2083

03:43:53,910 --> 03:43:50,710

rob is out

2084

03:43:55,590 --> 03:43:53,920

copy all three checks bob thanks you can

2085

03:44:04,070 --> 03:43:55,600

ingress just checking that the gap

2086

03:44:08,309 --> 03:44:05,910

and bob i should have reminded you too

2087

03:44:14,229 --> 03:44:08,319

on the settings we want 12 quebec quebec

2088

03:44:14,239 --> 03:44:19,110

every six oops installed

2089

03:44:25,349 --> 03:44:22,070

copy chris thanks to

2090

03:44:27,189 --> 03:44:25,359

three collapse on h2 two o'clock on

2091

03:45:18,229 --> 03:44:27,199

each one

2092

03:45:22,389 --> 03:45:20,630

this view from bob bankins helmet camera

2093

03:45:25,030 --> 03:45:22,399

you can see the number 20 in the bottom

2094

03:45:27,269 --> 03:45:25,040

right hand corner which designates it as

2095

03:45:30,070 --> 03:45:27,279

his view

2096

03:45:33,110 --> 03:45:30,080

he is ev1 or spacewalker 1 today out on

2097

03:45:35,510 --> 03:45:33,120

his 9th spacewalk and is now in place to

2098

03:45:37,269 --> 03:45:35,520

remove the next nickel hydrogen battery

2099

03:45:48,640 --> 03:45:37,279

battery 4 from the integrated

2100

03:45:53,269 --> 03:45:50,630

[Music]

2101

03:45:56,469 --> 03:45:53,279

we're going to tether to this

2102

03:45:59,030 --> 03:45:56,479

battery where will we feather

2103

03:46:03,510 --> 03:45:59,040

it's probably me i think uh bob you're

2104

03:46:06,150 --> 03:46:04,630

okay so

2105

03:46:08,389 --> 03:46:06,160

h2

2106

03:46:10,950 --> 03:46:08,399

i get the pgt for yourself if you need

2107

03:46:12,389 --> 03:46:10,960

it i'm good okay

2108

03:46:16,630 --> 03:46:12,399

and we'll take the serial number when

2109

03:46:16,640 --> 03:46:20,870

number zero zero eight five

2110

03:46:20,880 --> 03:46:26,550

zero zero eight five is a good number

2111

03:46:36,070 --> 03:46:29,429

no change to the settings alpha seven

2112

03:47:00,229 --> 03:46:38,790

h1

2113

03:47:06,630 --> 03:47:04,630

it was complete at five turns

2114

03:47:12,870 --> 03:47:06,640

chopping size indicator indicates

2115

03:47:12,880 --> 03:47:19,510

same settings for h2 expecting 19 turns

2116

03:47:25,269 --> 03:47:23,189

19 turns for h2

2117

03:47:26,469 --> 03:47:25,279

keep it flush

2118

03:47:28,469 --> 03:47:26,479

roger

2119

03:47:30,630 --> 03:47:28,479

ben can working to remove the second of

2120

03:47:53,349 --> 03:47:30,640

two bolts that will release this nickel

2121

03:47:53,359 --> 03:47:59,990

uh

2122

03:48:04,870 --> 03:48:02,389

[Music]

2123

03:48:09,750 --> 03:48:04,880

it's released

2124

03:48:22,440 --> 03:48:12,550

copy unlocked

2125

03:48:26,950 --> 03:48:25,030

[Music]

2126

03:48:30,950 --> 03:48:26,960

so we'll remove this battery and i'm

2127

03:48:37,110 --> 03:48:30,960

going to pass it to you for translation

2128

03:48:55,189 --> 03:48:38,870

happy where you're at

2129

03:48:55,199 --> 03:49:04,150

that scoop is a lot lower yeah

2130

03:49:07,910 --> 03:49:05,830

bank and now passing this battery to

2131

03:49:10,070 --> 03:49:07,920

nasa astronaut chris cassidy they'll

2132

03:49:17,910 --> 03:49:10,080

work together to shepherd it down to the

2133

03:49:21,670 --> 03:49:19,670

before installing it in the external

2134

03:49:23,590 --> 03:49:21,680

palette however they will remove an

2135

03:50:11,910 --> 03:49:23,600

adapter plate before putting the battery

2136

03:50:11,920 --> 03:50:20,630

so

2137

03:50:26,070 --> 03:50:22,469

nice that these inchworms get closer and

2138

03:50:27,590 --> 03:50:26,080

closer every time yeah that part's nice

2139

03:50:31,700 --> 03:50:27,600

i think we're trying to set a record for

2140

03:50:36,550 --> 03:50:31,710

the number of apfr ingresses though

2141

03:50:39,349 --> 03:50:36,560

[Music]

2142

03:50:41,269 --> 03:50:39,359

that bump the y'all played on the

2143

03:50:42,309 --> 03:50:41,279

pfr here just trying to get it back so

2144

03:50:44,870 --> 03:50:42,319

that

2145

03:51:06,300 --> 03:50:44,880

nothing could be big for

2146

03:51:06,310 --> 03:51:10,150

[Applause]

2147

03:51:18,229 --> 03:51:12,150

i have control of the battery here

2148

03:51:18,239 --> 03:51:39,189

um

2149

03:51:39,199 --> 03:51:58,550

uh

2150

03:52:04,309 --> 03:52:00,710

see i have control you'll control the

2151
03:52:08,710 --> 03:52:06,309
as the astronauts are moving it to their

2152
03:52:15,030 --> 03:52:08,720
next position a rundown of everything

2153
03:52:19,510 --> 03:52:17,670
first chris cassidy installed a new hd

2154
03:52:20,790 --> 03:52:19,520
camera which is relaying good data to

2155
03:52:22,710 --> 03:52:20,800
the ground

2156
03:52:28,229 --> 03:52:22,720
then moved to help bob benkin with the

2157
03:52:31,670 --> 03:52:29,990
that was battery one on the integrated

2158
03:52:34,309 --> 03:52:31,680
electronics assembly and the two

2159
03:52:37,269 --> 03:52:34,319
installed it on external pallet and slot

2160
03:52:39,429 --> 03:52:37,279
z it then moved battery f a lithium ion

2161
03:52:42,309 --> 03:52:39,439
battery from the external pallet to slot

2162
03:52:44,070 --> 03:52:42,319
1 on the integrated electronics assembly

2163
03:52:46,870 --> 03:52:44,080

the second nickel hydrogen battery

2164

03:52:50,070 --> 03:52:46,880

battery 2 was removed and placed on the

2165

03:52:51,750 --> 03:52:50,080

electronics the

2166

03:53:03,429 --> 03:52:51,760

external

2167

03:53:07,830 --> 03:53:05,990

battery to the nickel hydrogen battery

2168

03:53:11,030 --> 03:53:07,840

was placed on the external pallet in

2169

03:53:15,269 --> 03:53:13,349

and apf that was on the external pallet

2170

03:53:18,710 --> 03:53:15,279

was moved to slot 2 on the integrated

2171

03:53:24,710 --> 03:53:20,429

and i guess this is your

2172

03:53:26,710 --> 03:53:24,720

yeah right there yep okay

2173

03:53:29,910 --> 03:53:26,720

nickel hydrogen battery number three was

2174

03:53:31,990 --> 03:53:29,920

moved to the apf the adapter plate f

2175

03:53:34,790 --> 03:53:32,000

that had been moved to slot 2 on the

2176
03:53:35,590 --> 03:53:34,800
integrated electronics assembly it stays

2177
03:53:37,750 --> 03:53:35,600
on the

2178
03:53:42,710 --> 03:53:37,760
integrated electronics assembly but will

2179
03:53:49,750 --> 03:53:46,870
and we just saw the removal of battery e

2180
03:53:51,670 --> 03:53:49,760
a lithium ion battery it's now placed in

2181
03:53:53,990 --> 03:53:51,680
the integrated electronics assembly in

2182
03:53:56,630 --> 03:53:54,000
slot 3.

2183
03:53:58,309 --> 03:53:56,640
confirmed i can see it right now

2184
03:53:59,910 --> 03:53:58,319
copy thanks

2185
03:54:02,309 --> 03:53:59,920
currently the astronauts are moving

2186
03:54:04,710 --> 03:54:02,319
battery 4 and nickel hydrogen battery to

2187
03:54:08,950 --> 03:54:04,720
its new home on the external pallet in

2188
03:54:13,110 --> 03:54:11,110

before the astronauts are able to

2189

03:54:15,910 --> 03:54:13,120

install that battery into slot e they'll

2190

03:54:18,630 --> 03:54:15,920

need to remove an adapter plate

2191

03:54:20,229 --> 03:54:18,640

you have control i have control

2192

03:54:23,590 --> 03:54:20,239

which will eventually be moved to the

2193

03:54:25,349 --> 03:54:23,600

integrated electronics assembly

2194

03:54:29,830 --> 03:54:25,359

i am ready

2195

03:54:29,840 --> 03:54:32,720

what's off

2196

03:54:32,730 --> 03:54:37,189

[Music]

2197

03:54:40,630 --> 03:54:39,269

copy chris you go and a reminder check

2198

03:54:44,170 --> 03:54:40,640

that you have access to all the tools

2199

03:54:44,180 --> 03:54:45,429

[Applause]

2200

03:54:45,439 --> 03:54:47,349

oh need

2201
03:54:56,550 --> 03:54:48,870
waste center's a little bit under the

2202
03:54:56,560 --> 03:55:24,870
copy josh

2203
03:55:28,870 --> 03:55:26,710
in this view from bob benkin's helmet

2204
03:55:31,910 --> 03:55:28,880
camera you can see nasa astronaut chris

2205
03:55:34,550 --> 03:55:31,920
cassidy ingressing or getting into that

2206
03:55:36,309 --> 03:55:34,560
articulating portable foot restraint

2207
03:55:38,630 --> 03:55:36,319
and in the background

2208
03:55:40,229 --> 03:55:38,640
the blue marble of the earth the space

2209
03:55:43,990 --> 03:55:40,239
station currently flying over the south

2210
03:55:45,770 --> 03:55:44,000
pacific ocean 264 statute miles above us

2211
03:55:51,030 --> 03:55:45,780
all on the ground

2212
03:55:56,870 --> 03:55:53,030
and we want h1 scoop to end up on

2213
03:56:03,510 --> 03:55:59,269

bob i'm ready and i have control okay

2214

03:56:03,520 --> 03:56:08,160

you have the battery i have the battery

2215

03:56:28,790 --> 03:56:13,110

[Music]

2216

03:56:52,630 --> 03:56:30,630

bob while chris maneuvers the battery we

2217

03:56:58,389 --> 03:56:55,429

chris cassidy is now stowing that

2218

03:57:00,870 --> 03:56:58,399

battery on his brt or body restraint

2219

03:57:05,189 --> 03:57:02,630

it'll be right there when he needs it

2220

03:57:06,870 --> 03:57:05,199

after releasing the adapter plate from

2221

03:57:10,469 --> 03:57:06,880

the slot where this battery will call

2222

03:57:13,590 --> 03:57:12,710

the road flash in the slush and the

2223

03:57:16,469 --> 03:57:13,600

square

2224

03:57:18,710 --> 03:57:16,479

no green lights

2225

03:57:20,550 --> 03:57:18,720

focus

2226
03:57:26,420 --> 03:57:20,560
copy bob and we're we're seeing that in

2227
03:57:26,430 --> 03:57:29,670
[Music]

2228
03:57:29,680 --> 03:57:33,990
okay

2229
03:57:34,000 --> 03:57:38,150
both sides the top is still dry

2230
03:57:42,389 --> 03:57:40,229
and light gloves

2231
03:57:43,590 --> 03:57:42,399
and let gloves

2232
03:57:46,309 --> 03:57:43,600
have no

2233
03:57:46,319 --> 03:58:41,110
copy bob 10 seconds to hand over

2234
03:58:47,349 --> 03:58:42,950
and chris i think we're back with you

2235
03:58:49,269 --> 03:58:48,150
okay

2236
03:58:50,469 --> 03:58:49,279
dry hat

2237
03:58:53,590 --> 03:58:50,479
heartless

2238
03:58:55,670 --> 03:58:53,600

no change gloves no change

2239

03:58:58,389 --> 03:58:55,680

copy chris you can read to the adapter

2240

03:59:00,870 --> 03:58:58,399

plate heater map

2241

03:59:03,830 --> 03:59:00,880

it's complete

2242

03:59:08,469 --> 03:59:03,840

copy we are ready to break torque h1

2243

03:59:13,189 --> 03:59:10,070

do that

2244

03:59:15,830 --> 03:59:13,199

think of a turn on each one

2245

03:59:20,710 --> 03:59:15,840

copy eighth of a turn same thing on h2

2246

03:59:24,469 --> 03:59:22,790

cassidy will now break torque on two of

2247

03:59:26,950 --> 03:59:24,479

the bolts that need to be removed to

2248

03:59:28,870 --> 03:59:26,960

release this adapter plate copy we can

2249

03:59:52,229 --> 03:59:28,880

swap the wrench for the pgt i have your

2250

03:59:55,590 --> 03:59:54,389

alpha seven counter clockwise two will

2251
03:59:58,229 --> 03:59:55,600
sit

2252
04:00:01,100 --> 03:59:58,239
good settings h1 first confirm one line

2253
04:00:02,710 --> 04:00:01,110
flush we expect eight turns

2254
04:00:04,790 --> 04:00:02,720
[Applause]

2255
04:00:18,229 --> 04:00:04,800
h1 in my left hand

2256
04:00:22,550 --> 04:00:20,150
once this adapter plate is released

2257
04:00:24,550 --> 04:00:22,560
battery 4 which was just removed from

2258
04:00:26,790 --> 04:00:24,560
the inter integrated electronics

2259
04:00:29,429 --> 04:00:26,800
assembly a nickel hydrogen battery will

2260
04:00:35,510 --> 04:00:29,439
be placed in its spot one line flush

2261
04:00:35,520 --> 04:00:46,710
name turns

2262
04:00:46,720 --> 04:00:55,830
line is flush

2263
04:01:05,750 --> 04:00:58,710

copy 19 reminder to turn

2264

04:01:05,760 --> 04:01:19,700

happy

2265

04:01:19,710 --> 04:01:24,550

[Music]

2266

04:01:28,229 --> 04:01:26,309

16

2267

04:01:29,910 --> 04:01:28,239

17

2268

04:01:40,389 --> 04:01:29,920

18

2269

04:01:40,399 --> 04:01:43,510

gt is off

2270

04:01:43,520 --> 04:01:49,670

i'm all set

2271

04:02:18,950 --> 04:01:51,510

bob will be writing to the handrail

2272

04:02:18,960 --> 04:02:34,070

the i'll switch

2273

04:02:37,990 --> 04:02:35,990

with this adapter plate removed chris

2274

04:02:39,510 --> 04:02:38,000

cassidy will pass it off to bob benkin

2275

04:02:41,670 --> 04:02:39,520

who will move to the integrated

2276
04:02:48,880 --> 04:02:41,680
electronics assembly where this adapter

2277
04:02:48,890 --> 04:02:52,550
[Music]

2278
04:02:58,229 --> 04:02:55,110
i am ready to the adapter plate you can

2279
04:02:58,239 --> 04:03:16,950
released please

2280
04:03:20,630 --> 04:03:18,710
and we see the wave chris we want to

2281
04:03:22,630 --> 04:03:20,640
check in go say tucked and then we'll be

2282
04:03:26,950 --> 04:03:22,640
grabbing the battery from your brt h1 in

2283
04:03:31,990 --> 04:03:29,510
each one of my left hand

2284
04:03:39,670 --> 04:03:32,000
congress

2285
04:03:45,349 --> 04:03:43,429
cassidy is now preparing to soft dock

2286
04:03:47,189 --> 04:03:45,359
the battery for a nickel hydrogen

2287
04:03:48,870 --> 04:03:47,199
battery just removed from the integrated

2288
04:03:52,229 --> 04:03:48,880

electronics assembly

2289

04:03:57,030 --> 04:03:52,239

onto the external pallet where he just

2290

04:04:17,750 --> 04:03:58,229

copy

2291

04:04:21,670 --> 04:04:19,590

i'm headed back to the

2292

04:04:35,189 --> 04:04:21,680

iea

2293

04:04:39,349 --> 04:04:38,150

alpha 7 clockwise 2

2294

04:04:44,150 --> 04:04:39,359

set

2295

04:04:50,070 --> 04:04:44,160

looking for the h2 scoop confirming tape

2296

04:04:50,080 --> 04:04:53,269

flush

2297

04:04:53,279 --> 04:05:21,269

driving indicator moving

2298

04:05:24,710 --> 04:05:23,030

of our two space walkers you can see

2299

04:05:28,710 --> 04:05:24,720

right now chris cassidy on the left and

2300

04:05:35,870 --> 04:05:30,870

copy bob you can ingress keep an eye on

2301
04:05:41,110 --> 04:05:39,269
16.5 turns green torque white at 9.1

2302
04:05:44,309 --> 04:05:41,120
foot pounds

2303
04:05:45,830 --> 04:05:44,319
and the indicator is locked and the

2304
04:05:47,349 --> 04:05:45,840
batteries flush with

2305
04:05:55,990 --> 04:05:47,359
its neighbor

2306
04:06:01,030 --> 04:05:58,150
just confirmed for me was that 18 or 19

2307
04:06:15,830 --> 04:06:04,150
16.5

2308
04:06:20,070 --> 04:06:18,550
chris uh you can still the ptt those two

2309
04:06:23,990 --> 04:06:20,080
scoops are going to be going to battery

2310
04:06:24,000 --> 04:06:35,490
where do we see charlie

2311
04:06:35,500 --> 04:06:39,269
[Music]

2312
04:06:44,150 --> 04:06:42,469
and chris with regards to the oru bag we

2313
04:06:45,910 --> 04:06:44,160

do have a bit of an evolving plan here

2314

04:06:47,429 --> 04:06:45,920

on the ground and i'll i'll bring that

2315

04:06:49,990 --> 04:06:47,439

to you in the next few minutes but for

2316

04:06:52,150 --> 04:06:50,000

the bag itself we'd like it bundled up

2317

04:06:55,830 --> 04:06:52,160

packed close and just left in place

2318

04:06:55,840 --> 04:07:04,469

okay

2319

04:07:19,130 --> 04:07:09,349

lock back is the greatest idea all week

2320

04:07:19,140 --> 04:07:24,550

[Music]

2321

04:07:24,560 --> 04:07:34,070

inventory now or later

2322

04:07:41,030 --> 04:07:35,910

working on an evolving plan i'll just

2323

04:07:44,630 --> 04:07:42,950

and chris i'm sorry but if that was

2324

04:07:47,030 --> 04:07:44,640

about the inventory firm we're not going

2325

04:07:50,870 --> 04:07:47,040

to inventory right now

2326

04:07:54,950 --> 04:07:53,110

just starting off josh the

2327

04:07:57,510 --> 04:07:54,960

iea side

2328

04:07:59,269 --> 04:07:57,520

is a good emi band no fault in the

2329

04:08:00,870 --> 04:07:59,279

electrical connectors

2330

04:08:03,269 --> 04:08:00,880

both

2331

04:08:05,030 --> 04:08:03,279

mechanical interfaces with clear thought

2332

04:08:07,269 --> 04:08:05,040

and the fins look straight

2333

04:08:08,950 --> 04:08:07,279

on the cold plate i'll give you a

2334

04:08:10,790 --> 04:08:08,960

inspection of the adapter plate here in

2335

04:08:30,309 --> 04:08:10,800

a minute

2336

04:08:30,319 --> 04:08:47,429

uh

2337

04:08:54,469 --> 04:08:49,590

for the adapter plates

2338

04:08:56,630 --> 04:08:54,479

good emi band on the battery side

2339

04:08:59,670 --> 04:08:56,640

mechanical interface looks clear on the

2340

04:08:59,680 --> 04:09:03,110

on the cold plate side

2341

04:09:09,510 --> 04:09:04,469

the mechanical

2342

04:09:09,520 --> 04:09:15,410

copy bob good inspection on the ap side

2343

04:09:15,420 --> 04:09:18,550

[Music]

2344

04:09:23,110 --> 04:09:21,269

bob you can soft dock that into slot 4

2345

04:09:29,670 --> 04:09:23,120

should have the connectors oriented

2346

04:09:35,269 --> 04:09:32,389

bob benkin now soft docking this adapter

2347

04:09:39,670 --> 04:09:35,279

plate e into slot 4 on the integrated

2348

04:09:44,630 --> 04:09:41,830

so far today we've had four nickel

2349

04:09:47,189 --> 04:09:44,640

hydrogen batteries removed two lithium

2350

04:09:48,870 --> 04:09:47,199

ion batteries installed and this will be

2351
04:09:52,870 --> 04:09:48,880
the second adapter plate installed as

2352
04:09:57,750 --> 04:09:55,830
number

2353
04:10:01,030 --> 04:09:57,760
i believe them that's correct but just

2354
04:10:03,590 --> 04:10:01,040
want to double check that's the

2355
04:10:23,429 --> 04:10:03,600
battery you're looking at

2356
04:10:27,269 --> 04:10:25,269
and chris uh i found it that's the

2357
04:10:29,670 --> 04:10:27,279
correct serial number we want to take

2358
04:10:58,790 --> 04:10:29,680
the h1 scoop to one o'clock each two to

2359
04:11:01,990 --> 04:11:00,950
hey josh i'm ready with the adapter

2360
04:11:03,910 --> 04:11:02,000
plate

2361
04:11:09,429 --> 04:11:03,920
is soft docked

2362
04:11:13,990 --> 04:11:12,070
clockwise q

2363
04:11:16,309 --> 04:11:14,000

is set

2364

04:11:19,110 --> 04:11:16,319

copy bob good settings confirm one line

2365

04:11:21,470 --> 04:11:19,120

flush on h2 side or drive to torque

2366

04:11:24,070 --> 04:11:21,480

expecting sixteen to seventeen

2367

04:11:26,790 --> 04:11:24,080

[Music]

2368

04:11:31,910 --> 04:11:26,800

one line flush from the h2 side that'll

2369

04:11:38,149 --> 04:11:35,110

it's a twerked out immediately and uh

2370

04:11:45,269 --> 04:11:38,159

popped out of the softback

2371

04:11:56,870 --> 04:11:46,950

and paul will just let you work that to

2372

04:12:00,870 --> 04:11:59,269

like the pgc says it has

2373

04:12:08,240 --> 04:12:00,880

half a turn

2374

04:12:08,250 --> 04:12:15,110

[Music]

2375

04:12:18,950 --> 04:12:17,590

and bob to uh to our view it looks like

2376

04:12:21,110 --> 04:12:18,960

it was still free float so there would

2377

04:12:22,710 --> 04:12:21,120

be no requirement to back that off we'd

2378

04:12:24,469 --> 04:12:22,720

just ask that you you pull the battery

2379

04:12:44,630 --> 04:12:24,479

back an inch put it back into the soft

2380

04:12:49,030 --> 04:12:46,149

all right i am off

2381

04:12:50,550 --> 04:12:49,040

yeah the ru bag is cinched up and

2382

04:12:53,910 --> 04:12:50,560

everything's in it

2383

04:12:56,070 --> 04:12:53,920

two scoops are on battery c

2384

04:12:59,990 --> 04:12:56,080

three o'clock in

2385

04:13:04,870 --> 04:13:01,750

and uh

2386

04:13:07,030 --> 04:13:04,880

look at my way to call

2387

04:13:32,790 --> 04:13:07,040

copy chris we concur 10 seconds to hand

2388

04:13:37,429 --> 04:13:35,110

at three hours and 30 minutes into

2389

04:13:39,510 --> 04:13:37,439

today's spacewalk we have seen our

2390

04:13:40,389 --> 04:13:39,520

astronauts remove four nickel hydrogen

2391

04:13:43,429 --> 04:13:40,399

batteries

2392

04:13:45,990 --> 04:13:43,439

to be replaced with two new lithium ion

2393

04:13:47,990 --> 04:13:46,000

batteries they've also installed an

2394

04:13:49,590 --> 04:13:48,000

adapter plate and are working on

2395

04:13:55,189 --> 04:13:49,600

installing the next to the integrated

2396

04:14:02,309 --> 04:13:57,269

i guess

2397

04:14:15,189 --> 04:14:04,229

and guys we're back with you now bob i

2398

04:14:21,590 --> 04:14:17,750

that's correct josh you got the

2399

04:14:25,189 --> 04:14:21,600

15 and a half turns green light 9.9 on

2400

04:14:34,870 --> 04:14:29,510

i copy 16.5 green light 9.9 now same

2401

04:14:38,790 --> 04:14:36,469

copy

2402

04:14:47,910 --> 04:14:38,800

don't uh action anything on h1 yet we're

2403

04:14:59,030 --> 04:14:48,710

bob

2404

04:14:59,040 --> 04:15:04,630

and chris with each one

2405

04:15:07,590 --> 04:15:05,990

go ahead bob

2406

04:15:12,389 --> 04:15:07,600

i've got

2407

04:15:16,389 --> 04:15:14,229

those are good words we're driving two

2408

04:15:22,389 --> 04:15:16,399

torque expecting four and a half to five

2409

04:15:22,399 --> 04:15:29,990

okay

2410

04:15:33,429 --> 04:15:31,510

and chris we might have missed it in the

2411

04:15:35,349 --> 04:15:33,439

handover but when you are clear you can

2412

04:15:37,030 --> 04:15:35,359

give the ssrms to go to the back off

2413

04:15:42,469 --> 04:15:37,040

position provided all the tethers and

2414

04:15:59,110 --> 04:15:46,420

thank you for that reminder uh i am

2415

04:16:20,070 --> 04:16:00,550

green light

2416

04:16:23,750 --> 04:16:21,269

h1

2417

04:16:29,269 --> 04:16:23,760

green light 9.2 on the torque just over

2418

04:16:36,630 --> 04:16:31,030

drop you on the green light for h1 can

2419

04:16:43,830 --> 04:16:41,830

just over five turns 9.2 on the torque

2420

04:16:45,990 --> 04:16:43,840

nine point two thank you are you doing

2421

04:16:54,149 --> 04:16:46,000

nick clearly chris i hear you loud and

2422

04:16:58,790 --> 04:16:56,149

and chris uh we're just looking at the

2423

04:17:00,550 --> 04:16:58,800

palette movement and we have the ingress

2424

04:17:02,070 --> 04:17:00,560

eight slightly extended we're hoping

2425

04:17:06,309 --> 04:17:02,080

that you could go back out and tuck it

2426

04:17:10,469 --> 04:17:08,469

yeah sure no problem

2427

04:17:33,189 --> 04:17:10,479

i didn't push it in

2428

04:17:39,030 --> 04:17:35,670

josh i've got the ta clamps uh

2429

04:17:43,429 --> 04:17:41,110

copy pop so we can demate the adapter

2430

04:17:48,710 --> 04:17:43,439

plate connector p4

2431

04:17:53,110 --> 04:17:51,030

you can see the canon rm2 is now moving

2432

04:17:54,870 --> 04:17:53,120

into its next position carrying that

2433

04:17:56,790 --> 04:17:54,880

external pallet

2434

04:17:58,790 --> 04:17:56,800

proceed is all the way

2435

04:18:03,110 --> 04:17:58,800

back

2436

04:18:07,510 --> 04:18:04,870

benkin has recently completed the

2437

04:18:10,070 --> 04:18:07,520

installation of the adapter plate e into

2438

04:18:15,429 --> 04:18:10,080

slot 4 on the integrated electronics

2439

04:18:19,590 --> 04:18:17,269

you'll need to mate some cables to the

2440

04:18:32,790 --> 04:18:19,600

adjacent lithium ion battery to complete

2441

04:18:36,469 --> 04:18:34,860

see what's the next big chunk

2442

04:18:38,469 --> 04:18:36,479

[Music]

2443

04:18:40,229 --> 04:18:38,479

so chris you're just coming back out to

2444

04:18:42,229 --> 04:18:40,239

the iea and then we'll be helping bob to

2445

04:18:46,830 --> 04:18:42,239

move from battery

2446

04:18:49,830 --> 04:18:46,840

six over to slot four it's an iea

2447

04:19:02,229 --> 04:18:49,840

swap the fourth

2448

04:19:05,590 --> 04:19:03,990

and bob i see you working with the cable

2449

04:19:09,110 --> 04:19:05,600

it looks good just a reminder to make

2450

04:19:14,830 --> 04:19:09,120

sure the gap spanner stays inboard

2451

04:19:19,349 --> 04:19:16,469

um i think

2452

04:19:20,950 --> 04:19:19,359

i want is the job spanner to not be

2453

04:19:23,110 --> 04:19:20,960

okay by inboard it's just two different

2454

04:19:24,630 --> 04:19:23,120

ways to say an inboard so you mean don't

2455

04:19:26,469 --> 04:19:24,640

put the cable over the top of the gap

2456

04:19:30,210 --> 04:19:26,479

spanner

2457

04:19:31,830 --> 04:19:30,220

okay affirmative yeah

2458

04:19:34,550 --> 04:19:31,840

[Music]

2459

04:19:42,550 --> 04:19:34,560

josh i can release h1 and 6.

2460

04:19:42,560 --> 04:19:49,110

and chris we're go for that

2461

04:19:56,469 --> 04:19:53,429

output seven counterclockwise two

2462

04:19:57,910 --> 04:19:56,479

each one and h1 only hey perimeter we

2463

04:20:01,349 --> 04:19:57,920

just want to make sure you have a rat to

2464

04:20:08,469 --> 04:20:03,990

although if it's h1 only then i i concur

2465

04:20:08,479 --> 04:20:13,510

okay

2466

04:20:19,750 --> 04:20:15,510

the connector is mated

2467

04:20:31,349 --> 04:20:19,760

d4 to j4 with the bailover center

2468

04:20:36,710 --> 04:20:32,790

eight turns

2469

04:20:40,229 --> 04:20:36,720

if it was released at six

2470

04:20:43,189 --> 04:20:40,239

indicators lost

2471

04:20:46,550 --> 04:20:43,199

okay we copy uh six for the release

2472

04:20:50,630 --> 04:20:47,990

we're just going to pause here for a

2473

04:20:52,229 --> 04:20:50,640

minute we need uh glovehop and gauntlets

2474

04:20:53,830 --> 04:20:52,239

from both of you so we can go with that

2475

04:20:59,030 --> 04:20:53,840

and then i'll pass you some words on

2476
04:21:02,630 --> 04:21:00,550
i'm going to go ahead and make this a

2477
04:21:05,830 --> 04:21:02,640
connected test first and then i'll give

2478
04:21:05,840 --> 04:21:31,910
sounds good

2479
04:21:31,920 --> 04:21:49,030
uh

2480
04:21:54,550 --> 04:21:51,429
both of my gauntlets are up

2481
04:21:56,790 --> 04:21:54,560
my half is dry

2482
04:21:59,590 --> 04:21:56,800
and for my gloves

2483
04:22:01,590 --> 04:21:59,600
my glove is in great shape

2484
04:22:03,830 --> 04:22:01,600
no change

2485
04:22:08,469 --> 04:22:03,840
and the left

2486
04:22:08,479 --> 04:22:13,510
coffee bob

2487
04:22:30,149 --> 04:22:16,630
3b2 dry hat

2488
04:22:30,159 --> 04:22:38,149

it has not grown

2489

04:22:41,910 --> 04:22:40,389

one inch is uh

2490

04:22:43,910 --> 04:22:41,920

i'm trying to say the lower part of the

2491

04:22:46,469 --> 04:22:43,920

rtg is only one inch

2492

04:22:53,269 --> 04:22:46,479

hose

2493

04:22:55,510 --> 04:22:54,630

and we're standing by for the big

2494

04:22:58,550 --> 04:22:55,520

picture

2495

04:23:00,070 --> 04:22:58,560

copy so uh chris we just took a little

2496

04:23:01,910 --> 04:23:00,080

bit of a closer look at your cause to

2497

04:23:15,189 --> 04:23:01,920

the wbs and we're good with that as

2498

04:23:15,199 --> 04:23:49,990

okay guys

2499

04:23:55,840 --> 04:23:51,590

guessing we're moving that battery over

2500

04:23:59,269 --> 04:23:55,850

to this place i think so

2501
04:24:03,590 --> 04:24:01,750
okay uh guys back with you search with a

2502
04:24:06,070 --> 04:24:03,600
little bit of a pause we are talking

2503
04:24:08,070 --> 04:24:06,080
about how to end the day we still have

2504
04:24:10,389 --> 04:24:08,080
seven hours of consumables all the rates

2505
04:24:12,469 --> 04:24:10,399
look really good your progress has been

2506
04:24:15,349 --> 04:24:12,479
really good so we are

2507
04:24:17,429 --> 04:24:15,359
an hour 10 up on timeline and continuing

2508
04:24:19,429 --> 04:24:17,439
to to eat into that with each of our

2509
04:24:21,590 --> 04:24:19,439
swaps and of course we only have the one

2510
04:24:23,750 --> 04:24:21,600
battery move left on the nominal

2511
04:24:25,670 --> 04:24:23,760
timeline that said there is a plan

2512
04:24:27,830 --> 04:24:25,680
coming together down here

2513
04:24:31,030 --> 04:24:27,840

to consider trying to do the final

2514

04:24:33,349 --> 04:24:31,040

battery that's the battery 5 to ep

2515

04:24:36,070 --> 04:24:33,359

charlie slot swap

2516

04:24:37,750 --> 04:24:36,080

as we've drawn it out on paper and

2517

04:24:39,189 --> 04:24:37,760

looking at all the met rates and

2518

04:24:41,750 --> 04:24:39,199

consumables

2519

04:24:45,429 --> 04:24:41,760

we're quite confident we could do that

2520

04:24:47,349 --> 04:24:45,439

while staying inside of a 630 eva

2521

04:24:49,110 --> 04:24:47,359

again you're working to a seven hour

2522

04:24:51,189 --> 04:24:49,120

limit right now

2523

04:24:53,750 --> 04:24:51,199

so that's where where our headspace is

2524

04:24:56,149 --> 04:24:53,760

at on it right now we could do

2525

04:24:57,830 --> 04:24:56,159

everything inside of 630

2526
04:24:59,670 --> 04:24:57,840
but of course we wanted to offer that up

2527
04:25:06,630 --> 04:24:59,680
and just see what your your thoughts or

2528
04:25:11,110 --> 04:25:08,790
i think uh josh where we are right now

2529
04:25:13,830 --> 04:25:11,120
is that it's probably good that that is

2530
04:25:15,590 --> 04:25:13,840
our plan going forward here but let's

2531
04:25:19,349 --> 04:25:15,600
keep seeing how we're tracking to see if

2532
04:25:23,110 --> 04:25:21,189
okay everyone's nodding their heads to

2533
04:25:24,950 --> 04:25:23,120
that here so uh that's what we'll do

2534
04:25:27,349 --> 04:25:24,960
we'll get going with the battery 6 move

2535
04:25:34,550 --> 04:25:27,359
and i'll come back to you with more rate

2536
04:25:39,590 --> 04:25:37,269
and so uh good with that chris yes

2537
04:25:43,590 --> 04:25:42,469
okay copy with that um bob

2538
04:25:45,670 --> 04:25:43,600

we're going to want to check that the

2539

04:25:48,070 --> 04:25:45,680

gap spanner is clear and then you're

2540

04:25:50,200 --> 04:25:48,080

getting back in the apfr to roll it

2541

04:25:54,550 --> 04:25:50,210

around to h hotel

2542

04:26:00,830 --> 04:25:58,469

yeah gaps matter is clear

2543

04:26:04,070 --> 04:26:00,840

and i'll roll it over to

2544

04:26:07,429 --> 04:26:04,080

hotel a couple of gap scanners who are

2545

04:26:13,349 --> 04:26:09,990

three hours and 42 minutes into today's

2546

04:26:14,469 --> 04:26:13,359

spacewalk and the crew has been

2547

04:26:15,750 --> 04:26:14,479

outside

2548

04:26:18,309 --> 04:26:15,760

they're actually their battery power

2549

04:26:19,269 --> 04:26:18,319

turning on at 6 10 am central time this

2550

04:26:21,429 --> 04:26:19,279

morning

2551
04:26:23,590 --> 04:26:21,439
since then chris cassidy has installed a

2552
04:26:25,110 --> 04:26:23,600
new hd camera that is communicating well

2553
04:26:27,429 --> 04:26:25,120
with the ground

2554
04:26:30,229 --> 04:26:27,439
the team has also

2555
04:26:32,309 --> 04:26:30,239
removed four nickel hydrogen batteries

2556
04:26:34,710 --> 04:26:32,319
from the integrated electronics assembly

2557
04:26:37,189 --> 04:26:34,720
and replaced those with two lithium ion

2558
04:26:38,870 --> 04:26:37,199
batteries they've also installed two

2559
04:26:43,590 --> 04:26:38,880
adapter plates to the integrated

2560
04:26:47,030 --> 04:26:45,110
the teams here on the ground in mission

2561
04:26:49,110 --> 04:26:47,040
control houston have been talking about

2562
04:26:51,349 --> 04:26:49,120
the cruise timeline they are now an hour

2563
04:26:53,830 --> 04:26:51,359

and ten minutes ahead of schedule which

2564

04:26:55,830 --> 04:26:53,840

provides them the potential to continue

2565

04:26:58,229 --> 04:26:55,840

with a get ahead today that would be

2566

04:27:00,070 --> 04:26:58,239

removal of the final nickel hydrogen

2567

04:27:01,269 --> 04:27:00,080

battery in this series of battery

2568

04:27:03,990 --> 04:27:01,279

upgrades

2569

04:27:05,990 --> 04:27:04,000

and it's and moving it to the external

2570

04:27:08,309 --> 04:27:06,000

pallet the crew agrees that they will

2571

04:27:09,830 --> 04:27:08,319

continue to work toward that

2572

04:27:11,590 --> 04:27:09,840

and the teams here will continue

2573

04:27:13,189 --> 04:27:11,600

monitoring the timeline as they move

2574

04:27:14,950 --> 04:27:13,199

through the tasks

2575

04:27:17,110 --> 04:27:14,960

to walk you through the removal of

2576

04:27:18,790 --> 04:27:17,120

battery 6 and its movement to the

2577

04:27:21,110 --> 04:27:18,800

adapter plate

2578

04:27:23,830 --> 04:27:21,120

is my colleague sandra jones take it

2579

04:27:25,590 --> 04:27:23,840

away sandra

2580

04:27:28,149 --> 04:27:25,600

good morning and thanks for joining us

2581

04:27:30,149 --> 04:27:28,159

for today's spacewalk i'm nasa's sandra

2582

04:27:32,389 --> 04:27:30,159

jones coming up the crew members will

2583

04:27:34,710 --> 04:27:32,399

remove battery 6 which is an older

2584

04:27:36,950 --> 04:27:34,720

nickel hydrogen battery and install it

2585

04:27:41,990 --> 04:27:36,960

into its new home in slot e on the

2586

04:27:47,189 --> 04:27:44,550

we are three hours and 44 minutes into

2587

04:27:48,870 --> 04:27:47,199

the 230th spacewalk in the history of

2588

04:27:50,710 --> 04:27:48,880

the space station's assembly and

2589

04:27:52,710 --> 04:27:50,720

maintenance

2590

04:27:54,469 --> 04:27:52,720

nasa astronauts bob bankin and chris

2591

04:27:56,710 --> 04:27:54,479

cassidy have been busy swapping out

2592

04:27:59,349 --> 04:27:56,720

older nickel hydrogen batteries with

2593

04:28:01,510 --> 04:27:59,359

newer lithium ion batteries

2594

04:28:03,189 --> 04:28:01,520

this series of spacewalks will round out

2595

04:28:05,830 --> 04:28:03,199

the final phase of a three and a half

2596

04:28:07,429 --> 04:28:05,840

year power upgrade to the station

2597

04:28:09,510 --> 04:28:07,439

this battery swap will ensure the

2598

04:28:22,550 --> 04:28:09,520

station's solar arrays can store power

2599

04:28:27,830 --> 04:28:24,550

cassidy has just set the stage for the

2600

04:28:30,149 --> 04:28:27,840

next task by installing adapter plate e

2601
04:28:39,010 --> 04:28:30,159
battery 6 now has a spot open and

2602
04:28:39,020 --> 04:28:42,790
[Music]

2603
04:28:53,990 --> 04:28:45,030
bob we see you almost in a reminder to

2604
04:28:57,750 --> 04:28:55,830
hey my uh

2605
04:28:59,110 --> 04:28:57,760
others look good i think

2606
04:29:02,790 --> 04:28:59,120
christian is tethered to it we're going

2607
04:29:04,550 --> 04:29:02,800
to be you did h1 already right yep

2608
04:29:07,790 --> 04:29:04,560
affirmative we're ready for h2 and we

2609
04:29:12,070 --> 04:29:07,800
just need the serial number when you can

2610
04:29:12,080 --> 04:29:15,990
0094

2611
04:29:23,830 --> 04:29:18,610
94 is a good serial number

2612
04:29:30,149 --> 04:29:27,429
okay the tape line is flush

2613
04:29:35,349 --> 04:29:30,159

copy tape line flush to h2 we're turning

2614

04:29:41,030 --> 04:29:38,309

banking will now use the pgt or pistol

2615

04:29:43,030 --> 04:29:41,040

grip tool essentially a space drill to

2616

04:29:46,070 --> 04:29:43,040

remove two bolts in order to release

2617

04:29:47,910 --> 04:29:46,080

battery 6 from its current location this

2618

04:29:49,030 --> 04:29:47,920

battery is an older nickel hydrogen

2619

04:29:50,950 --> 04:29:49,040

battery

2620

04:29:52,870 --> 04:29:50,960

following release banking will then pass

2621

04:30:28,710 --> 04:29:52,880

the battery to cassidy in preparation

2622

04:30:32,870 --> 04:30:31,510

yeah screwed up and around a little bit

2623

04:30:34,630 --> 04:30:32,880

okay

2624

04:30:55,510 --> 04:30:34,640

interesting that these were the best

2625

04:31:00,309 --> 04:30:57,990

a good view of battery 6 from bob

2626
04:31:05,030 --> 04:31:00,319
bankins helmet cam as the crew works to

2627
04:31:10,149 --> 04:31:07,510
far over should i go

2628
04:31:11,910 --> 04:31:10,159
to the crew maybe maybe right to that

2629
04:31:15,510 --> 04:31:11,920
yeah cool off bag or right to that gap

2630
04:31:20,550 --> 04:31:17,349
need to get enough space between the two

2631
04:31:22,149 --> 04:31:20,560
of us to pass the battery so

2632
04:31:23,990 --> 04:31:22,159
that's the radiator size i don't know if

2633
04:31:26,630 --> 04:31:24,000
you want to yeah i think i need to get

2634
04:31:28,630 --> 04:31:26,640
up here a little bit okay i'm gonna get

2635
04:31:33,269 --> 04:31:28,640
small

2636
04:31:33,279 --> 04:31:37,590
little brg down

2637
04:31:40,850 --> 04:31:39,750
right because of the radiator

2638
04:31:41,910 --> 04:31:40,860

yeah

2639

04:31:44,630 --> 04:31:41,920

[Music]

2640

04:31:46,229 --> 04:31:44,640

and then uh you might consider

2641

04:31:48,389 --> 04:31:46,239

each other with a little bit of a fairly

2642

04:31:57,670 --> 04:31:48,399

you know

2643

04:32:01,990 --> 04:31:59,269

it makes you backtrack it looks like

2644

04:32:06,630 --> 04:32:05,500

a little farther back oh do you think

2645

04:32:08,630 --> 04:32:06,640

[Music]

2646

04:32:10,550 --> 04:32:08,640

yeah

2647

04:32:12,790 --> 04:32:10,560

i'm just wondering if i can get

2648

04:32:15,110 --> 04:32:12,800

away with this wire tie or a bit yeah

2649

04:32:16,790 --> 04:32:15,120

that might work with that wire so yeah

2650

04:32:18,630 --> 04:32:16,800

that'll be good

2651
04:32:22,790 --> 04:32:18,640
just need about six inches of clearance

2652
04:32:22,800 --> 04:32:25,429
okay

2653
04:32:31,670 --> 04:32:26,710
you know when you

2654
04:32:31,680 --> 04:32:55,830
i'm ready

2655
04:32:59,910 --> 04:32:57,990
nasa astronauts chris cassidy and bob

2656
04:33:02,469 --> 04:32:59,920
bankin are continuing to work together

2657
04:33:04,709 --> 04:33:02,479
to remove battery six following its

2658
04:33:06,869 --> 04:33:04,719
removal they'll work together to place

2659
04:33:09,109 --> 04:33:06,879
it into slot e which will be its new

2660
04:33:10,869 --> 04:33:09,119
permanent home

2661
04:33:12,470 --> 04:33:10,879
i'm not sure about rolling across you

2662
04:33:39,510 --> 04:33:12,480
right now i'm just going to erase it

2663
04:33:43,670 --> 04:33:42,230

and battery 6 has been removed the crew

2664

04:33:45,590 --> 04:33:43,680

will now work together to move the

2665

04:34:08,390 --> 04:33:45,600

battery over to the adapter plate and

2666

04:34:08,400 --> 04:34:37,349

uh

2667

04:34:40,709 --> 04:34:39,109

we're in a brief handover between

2668

04:34:49,109 --> 04:34:40,719

satellites right now but we'll be

2669

04:34:52,470 --> 04:34:50,789

i have control of the body if you want

2670

04:35:14,179 --> 04:34:52,480

to change hand positions you have

2671

04:35:14,189 --> 04:35:19,429

[Music]

2672

04:35:27,109 --> 04:35:23,189

we uh get on this side with the cable

2673

04:35:27,119 --> 04:35:39,510

looks clear actually

2674

04:35:39,520 --> 04:35:45,109

i think that's soft up

2675

04:35:50,869 --> 04:35:47,670

banking has just soft docked battery 6

2676
04:35:52,709 --> 04:35:50,879
on the adapter plate in slot e this will

2677
04:35:54,551 --> 04:35:52,719
this required tightening two bolts to

2678
04:35:56,230 --> 04:35:54,561
secure the battery

2679
04:35:58,390 --> 04:35:56,240
following this soft dock banking will

2680
04:36:00,789 --> 04:35:58,400
now complete installation of battery 6

2681
04:36:03,429 --> 04:36:00,799
on the adapter plate in slot e by using

2682
04:36:07,429 --> 04:36:03,439
the pistol grip tool or pgt to fully

2683
04:36:13,990 --> 04:36:08,949
on h2

2684
04:36:22,629 --> 04:36:15,429
copy that buff

2685
04:36:28,390 --> 04:36:26,310
did you see any emotion yeah

2686
04:36:30,869 --> 04:36:28,400
same thing with the uh

2687
04:36:33,590 --> 04:36:30,879
worked out a little bit there early josh

2688
04:36:37,990 --> 04:36:33,600

a little over it says he got to almost

2689

04:36:38,000 --> 04:36:42,629

okay we copy bob drive it backwards

2690

04:36:46,659 --> 04:36:44,070

i just want to confirm is it off the

2691

04:36:50,070 --> 04:36:46,669

soft docker still on it

2692

04:36:56,390 --> 04:36:52,070

as far as we can tell it's kind of still

2693

04:36:59,670 --> 04:36:58,551

okay if it's still on i'm going to ask

2694

04:37:11,750 --> 04:36:59,680

we're just going to look here whether or

2695

04:37:17,109 --> 04:37:13,349

looks like it doesn't hurt anything to

2696

04:37:17,119 --> 04:37:25,429

you walk out this red

2697

04:37:25,439 --> 04:37:33,910

i get the right one yeah

2698

04:37:38,709 --> 04:37:35,750

and so bob we're back with you actually

2699

04:37:40,310 --> 04:37:38,719

in the crib sheet we just want to verify

2700

04:37:42,629 --> 04:37:40,320

that the battery isn't soft dock it

2701
04:37:44,310 --> 04:37:42,639
sounds like it is check your alignment

2702
04:37:46,150 --> 04:37:44,320
make sure the side loads are gone and

2703
04:37:53,429 --> 04:37:46,160
then we will re-attempt to drive on the

2704
04:37:57,510 --> 04:37:55,429
okay

2705
04:37:59,590 --> 04:37:57,520
yeah the uh i think we're soft off as

2706
04:38:01,590 --> 04:37:59,600
much as we can tell josh

2707
04:38:03,269 --> 04:38:01,600
um

2708
04:38:04,709 --> 04:38:03,279
and we'll re-attempt this at these

2709
04:38:20,230 --> 04:38:04,719
settings

2710
04:38:20,240 --> 04:38:28,070
same thing josh look out

2711
04:38:33,189 --> 04:38:30,629
copy bob so in that case we are going to

2712
04:38:35,269 --> 04:38:33,199
back the bolt off a little bit your pgt

2713
04:38:44,150 --> 04:38:35,279

settings alpha 7 counter

2714

04:38:48,470 --> 04:38:45,910

so with the counterclockwise bob we'll

2715

04:39:03,269 --> 04:38:48,480

take out that turn

2716

04:39:09,830 --> 04:39:05,409

tape

2717

04:39:12,709 --> 04:39:11,590

if i could hand you the pgt i could try

2718

04:39:31,990 --> 04:39:12,719

to

2719

04:39:34,709 --> 04:39:32,830

he

2720

04:39:36,551 --> 04:39:34,719

stopped

2721

04:39:39,190 --> 04:39:36,561

copy soft docked again we're gonna

2722

04:39:44,628 --> 04:39:39,200

re-attempt same settings alpha seven

2723

04:39:44,638 --> 04:39:49,830

alpha seven clockwise two

2724

04:39:56,708 --> 04:39:51,430

good settings we'll try to turn to

2725

04:39:56,718 --> 04:40:00,470

is what we expect

2726

04:40:00,480 --> 04:40:08,948

i think it's driving in this time

2727

04:40:19,270 --> 04:40:10,708

if

2728

04:40:33,910 --> 04:40:21,270

banken and cassidy are continuing to

2729

04:40:39,030 --> 04:40:37,430

okay there's a 16 turns green light and

2730

04:40:42,230 --> 04:40:39,040

9.3

2731

04:40:45,510 --> 04:40:42,240

the indicator indicates locked

2732

04:40:49,510 --> 04:40:45,520

i copy 16 turn screen light 9.3 with a

2733

04:40:56,040 --> 04:40:52,470

sliding over to h1 same settings alpha 7

2734

04:41:01,270 --> 04:40:56,050

clockwise 2.

2735

04:41:01,280 --> 04:41:05,190

here we go

2736

04:41:05,200 --> 04:41:15,590

so on this one expecting 4 to 5.5

2737

04:41:21,590 --> 04:41:17,830

five and a quarter turns

2738

04:41:31,910 --> 04:41:24,390

five and a quarter green light 9.1

2739

04:41:39,990 --> 04:41:35,190

the indicator shows locked

2740

04:41:45,510 --> 04:41:41,590

that's a good install so we can install

2741

04:41:49,670 --> 04:41:47,590

and with that banking and cassidy have

2742

04:41:51,590 --> 04:41:49,680

successfully completed the removal of

2743

04:41:53,510 --> 04:41:51,600

battery 6 and installed it to the

2744

04:41:55,190 --> 04:41:53,520

adapter plate e

2745

04:41:57,350 --> 04:41:55,200

i'm going to hand it back over to Leah

2746

04:42:02,550 --> 04:41:57,360

cheshire to discuss battery c release

2747

04:42:06,788 --> 04:42:04,550

thanks Sandra and things are moving

2748

04:42:09,190 --> 04:42:06,798

smoothly this morning as the astronauts

2749

04:42:11,270 --> 04:42:09,200

continue to remove and replace those

2750

04:42:17,990 --> 04:42:11,280

aging nickel hydrogen batteries with the

2751
04:42:22,868 --> 04:42:20,070
we're coming up on four hours into

2752
04:42:25,510 --> 04:42:22,878
today's spacewalk as the international

2753
04:42:31,070 --> 04:42:25,520
space station is flying 260 statute

2754
04:42:31,080 --> 04:42:34,788
[Music]

2755
04:42:41,030 --> 04:42:36,310
when you say straight across you mean

2756
04:42:46,708 --> 04:42:42,628
yeah i meant uh straight across from

2757
04:42:46,718 --> 04:42:51,910
so it is a diagonal across the iu

2758
04:42:51,920 --> 04:42:58,948
slot six correct

2759
04:43:03,430 --> 04:43:00,788
so far today the astronauts have

2760
04:43:05,430 --> 04:43:03,440
installed a new hd camera they've also

2761
04:43:07,270 --> 04:43:05,440
removed five of those aging nickel

2762
04:43:09,670 --> 04:43:07,280
hydrogen batteries from the integrated

2763
04:43:12,470 --> 04:43:09,680

electronics assembly and they have

2764

04:43:15,270 --> 04:43:12,480

installed two lithium ion batteries to

2765

04:43:17,110 --> 04:43:15,280

the integrated electronics assembly

2766

04:43:19,510 --> 04:43:17,120

they've also installed two adapter

2767

04:43:21,590 --> 04:43:19,520

plates

2768

04:43:23,590 --> 04:43:21,600

coming up next both astronauts will head

2769

04:43:27,030 --> 04:43:23,600

to the external pallet where they will

2770

04:43:29,270 --> 04:43:27,040

remove battery c a lithium ion battery

2771

04:43:48,708 --> 04:43:29,280

and move it to slot six on the

2772

04:43:53,110 --> 04:43:51,350

all right i'm making my way to the

2773

04:43:55,350 --> 04:43:53,120

tower

2774

04:44:11,350 --> 04:43:55,360

hey firm chris

2775

04:44:11,360 --> 04:44:17,590

uh

2776

04:44:33,910 --> 04:44:19,830

feels weird going this way without a

2777

04:44:33,920 --> 04:44:49,270

uh

2778

04:44:49,280 --> 04:45:02,948

oh that's already let's get around

2779

04:45:02,958 --> 04:45:21,990

uh

2780

04:45:25,750 --> 04:45:23,990

and chris we see you in and i believe

2781

04:45:30,628 --> 04:45:25,760

you already confirmed that serial number

2782

04:45:30,638 --> 04:46:15,750

20 29.

2783

04:46:21,430 --> 04:46:17,430

and chris i can't quite see it but you

2784

04:46:24,550 --> 04:46:21,440

should have other it is right to the h1

2785

04:46:26,390 --> 04:46:24,560

h2 keep it on h2

2786

04:46:29,350 --> 04:46:26,400

your choice

2787

04:46:36,230 --> 04:46:29,360

yeah l2 h2 if you don't mind

2788

04:46:40,150 --> 04:46:38,550

we're ready to drive h1

2789

04:46:44,150 --> 04:46:40,160

that's already done

2790

04:46:48,310 --> 04:46:45,270

yeah we're with you you're going

2791

04:46:57,110 --> 04:46:48,320

straight to h2 alpha 7 counterclockwise

2792

04:47:03,030 --> 04:47:00,150

alpha 7 counter 2

2793

04:47:17,830 --> 04:47:03,040

good settings we expect 19 turns in a

2794

04:47:17,840 --> 04:47:23,030

okay i've got the scoops installed

2795

04:47:26,310 --> 04:47:24,310

copy bob

2796

04:47:51,910 --> 04:47:26,320

you can head on over to the pallet and

2797

04:48:07,110 --> 04:48:03,830

uh

2798

04:48:09,030 --> 04:48:07,120

no

2799

04:48:10,948 --> 04:48:09,040

fancy stuff with the brt or anything or

2800

04:48:12,550 --> 04:48:10,958

this one right it just comes out and we

2801
04:48:14,628 --> 04:48:12,560
shepherd

2802
04:48:16,788 --> 04:48:14,638
yeah those are good words out and back

2803
04:48:19,940 --> 04:48:16,798
to the palette back to the iea with both

2804
04:48:19,950 --> 04:48:24,788
[Music]

2805
04:48:27,990 --> 04:48:26,550
the iea is right here

2806
04:48:37,430 --> 04:48:28,000
yeah sorry the

2807
04:48:54,310 --> 04:48:39,750
this is the darkest has been i noticed

2808
04:48:59,350 --> 04:48:56,390
damn ready

2809
04:49:03,510 --> 04:49:01,830
alpha seven

2810
04:49:08,510 --> 04:49:03,520
counter two

2811
04:49:08,520 --> 04:49:15,590
[Music]

2812
04:49:15,600 --> 04:49:45,110
see the indicator moving

2813
04:49:45,120 --> 04:49:48,390

here's 19

2814

04:49:53,910 --> 04:49:50,230

indicators unlock

2815

04:49:58,788 --> 04:49:56,310

copy 19 that's a good release we can

2816

04:50:03,510 --> 04:49:58,798

transfer the battery h2 should go to bob

2817

04:50:08,070 --> 04:50:05,750

[Applause]

2818

04:50:21,950 --> 04:50:08,080

uh we're going to flip that in vh1 but

2819

04:50:21,960 --> 04:50:26,150

[Music]

2820

04:50:30,550 --> 04:50:28,470

10 seconds to a handover but when you do

2821

04:50:32,150 --> 04:50:30,560

get out chris a reminder to stow the

2822

04:50:49,270 --> 04:50:32,160

grass aid and make sure the tethers are

2823

04:50:54,628 --> 04:50:52,310

and battery c the lithium-ion battery on

2824

04:50:56,788 --> 04:50:54,638

the external pallet the final

2825

04:51:01,590 --> 04:50:56,798

lithium-ion battery to complete these

2826
04:51:06,708 --> 04:51:03,750
bob behn and chris cassidy will now inch

2827
04:51:12,830 --> 04:51:06,718
worm or shepherd the battery to its

2828
04:51:12,840 --> 04:51:20,628
assembly tell me about it

2829
04:51:27,670 --> 04:51:22,390
this will mark the installation of the

2830
04:51:32,230 --> 04:51:29,590
so far we've also seen five nickel

2831
04:51:35,510 --> 04:51:32,240
hydrogen batteries removed and two

2832
04:51:37,590 --> 04:51:35,520
adapter plates installed

2833
04:51:42,948 --> 04:51:37,600
chris cassidy started out the day by

2834
04:51:46,390 --> 04:51:44,470
we're now at four hours and eight

2835
04:51:48,910 --> 04:51:46,400
minutes into today's spacewalk and the

2836
04:51:55,430 --> 04:51:48,920
international space station is flying

2837
04:51:55,440 --> 04:52:08,400
oh mongolia is straight

2838
04:52:08,410 --> 04:52:13,750

[Music]

2839

04:52:17,830 --> 04:52:16,230

and we're back with yesterday new

2840

04:52:20,230 --> 04:52:17,840

shepherding the battery back towards the

2841

04:52:22,788 --> 04:52:20,240

ia there's no need here chris to give

2842

04:52:26,230 --> 04:52:22,798

the ssrms we go to maneuver how it's

2843

04:52:29,190 --> 04:52:26,240

going to stay for now right where it is

2844

04:53:01,990 --> 04:52:29,200

i have control of the battery

2845

04:53:06,150 --> 04:53:03,510

you've done a lot of

2846

04:53:09,110 --> 04:53:06,160

runs in the nba illness i would know

2847

04:53:11,750 --> 04:53:09,120

which right to decide to put the red on

2848

04:53:14,310 --> 04:53:11,760

my network station here

2849

04:53:20,390 --> 04:53:14,320

i have control of the battery to control

2850

04:53:24,868 --> 04:53:22,628

once this lithium-ion is battery is

2851
04:53:27,110 --> 04:53:24,878
installed on the integrated electronics

2852
04:53:28,948 --> 04:53:27,120
assembly the astronauts will be done

2853
04:53:31,190 --> 04:53:28,958
with their scheduled tasks for today

2854
04:53:33,350 --> 04:53:31,200
however they are quite ahead of their

2855
04:53:36,230 --> 04:53:33,360
timeline and so the decision has been

2856
04:53:38,550 --> 04:53:36,240
made to aim to proceed by removing the

2857
04:53:41,350 --> 04:53:38,560
final nickel hydrogen battery powering

2858
04:53:49,270 --> 04:53:41,360
the space station battery 5 and placing

2859
04:53:56,070 --> 04:53:51,140
good work

2860
04:53:56,080 --> 04:54:07,030
stay there again

2861
04:54:27,910 --> 04:54:09,350
control the battery you have control of

2862
04:54:27,920 --> 04:55:00,628
the battery

2863
04:55:05,270 --> 04:55:03,110

i have control of the batteries

2864

04:55:08,310 --> 04:55:05,280

maybe i go

2865

04:55:13,110 --> 04:55:10,470

this one i think you should go towards

2866

04:55:35,350 --> 04:55:13,120

the top

2867

04:55:43,270 --> 04:55:36,788

i don't need a rock

2868

04:55:43,280 --> 04:55:58,868

huh

2869

04:56:16,868 --> 04:56:01,990

i have control maybe you have control

2870

04:56:37,990 --> 04:56:18,948

bob reminder to check dab spanner clear

2871

04:56:38,000 --> 04:56:56,470

uh

2872

04:57:04,470 --> 04:56:59,910

and hotel was the setting

2873

04:57:33,750 --> 04:57:08,150

and for bob that's affirmative

2874

04:57:33,760 --> 04:57:38,948

or far enough away from your head

2875

04:57:43,270 --> 04:57:40,788

i think so yeah

2876

04:57:52,390 --> 04:57:43,280

i think there's plenty of room

2877

04:57:56,550 --> 04:57:53,990

benken and hurley have made it back to

2878

04:57:59,110 --> 04:57:56,560

the integrated electronics assembly in

2879

04:58:01,430 --> 04:57:59,120

preparation of installing battery c the

2880

04:58:07,830 --> 04:58:01,440

final lithium-ion battery

2881

04:58:12,830 --> 04:58:10,070

this view from benkin's helmet camera he

2882

04:58:15,750 --> 04:58:12,840

is spacewalker one today on his ninth

2883

04:58:18,150 --> 04:58:15,760

spacewalk as he ingresses or enters the

2884

04:58:20,470 --> 04:58:18,160

apfr the articulating portable foot

2885

04:58:22,150 --> 04:58:20,480

restraint giving him a

2886

04:58:24,310 --> 04:58:22,160

solid place to

2887

04:58:27,030 --> 04:58:24,320

put his feet as he works with his hands

2888

04:58:28,550 --> 04:58:27,040

to install this

2889

04:58:29,830 --> 04:58:28,560

good you can just battery it there at

2890

04:58:35,960 --> 04:58:29,840

all

2891

04:58:41,270 --> 04:58:38,390

[Music]

2892

04:58:42,550 --> 04:58:41,280

electrical connectors look good

2893

04:58:44,788 --> 04:58:42,560

and on the

2894

04:58:47,110 --> 04:58:44,798

iea side

2895

04:58:48,310 --> 04:58:47,120

see the emr van looks good on the on the

2896

04:58:54,948 --> 04:58:48,320

battery

2897

04:59:00,310 --> 04:58:57,110

and on the yep side

2898

04:59:02,390 --> 04:59:00,320

the migrant looks good

2899

04:59:05,910 --> 04:59:02,400

the pins are good

2900

04:59:10,788 --> 04:59:05,920

mechanical interfaces are clear

2901

04:59:14,788 --> 04:59:13,670

i'm going to need the h2 side

2902

04:59:15,910 --> 04:59:14,798

here

2903

04:59:18,070 --> 04:59:15,920

oh yeah you want to hand me that and

2904

04:59:21,910 --> 04:59:18,080

i'll spin it if you can spin it down a

2905

04:59:21,920 --> 05:00:35,270

okay you have it i have the batteries

2906

05:00:39,510 --> 05:00:37,430

that looks pretty good i'm gonna

2907

05:00:41,990 --> 05:00:39,520

draw the

2908

05:00:44,070 --> 05:00:42,000

roll the boot plate one click yeah and

2909

05:00:47,350 --> 05:00:44,080

you'll have to probably do h1 after that

2910

05:00:47,360 --> 05:01:13,430

we copy

2911

05:01:17,830 --> 05:01:14,948

you got it all set up alpha seven

2912

05:01:19,830 --> 05:01:17,840

clockwise two

2913

05:01:22,230 --> 05:01:19,840

those are good settings confirmed tape

2914

05:01:28,310 --> 05:01:22,240

line flush to the h2 scoop we're going

2915

05:01:36,310 --> 05:01:31,050

the tape line is flush

2916

05:01:36,320 --> 05:01:38,948

here we go

2917

05:01:43,590 --> 05:01:41,190

with that battery soft docked this view

2918

05:01:45,670 --> 05:01:43,600

from chris cassidy's helmet camera shows

2919

05:01:47,750 --> 05:01:45,680

bob bankin as he uses the pistol grip

2920

05:01:50,868 --> 05:01:47,760

tool to drive two bolts

2921

05:01:52,550 --> 05:01:50,878

into the battery the lithium-ion battery

2922

05:02:30,628 --> 05:01:52,560

and firmly secure it to the integrated

2923

05:02:37,750 --> 05:02:33,030

okay 17 turns

2924

05:02:37,760 --> 05:02:47,430

copy 17 green 9.1 status

2925

05:02:52,868 --> 05:02:50,788

seven clockwise two confirmed

2926

05:02:55,830 --> 05:02:52,878

one on each one

2927

05:02:57,590 --> 05:02:55,840

hey from chris tape line flush to h1

2928

05:03:00,708 --> 05:02:57,600

we're expecting four to five point five

2929

05:03:00,718 --> 05:03:04,708

flush help you

2930

05:03:10,070 --> 05:03:06,628

my next is to move the apfr is that

2931

05:03:17,830 --> 05:03:12,070

and that is correct

2932

05:03:26,070 --> 05:03:19,350

5.4

2933

05:03:30,868 --> 05:03:29,430

i copy 5492 green light and chris i'll

2934

05:03:32,910 --> 05:03:30,878

have you both check both status

2935

05:03:36,070 --> 05:03:32,920

indicators

2936

05:03:39,110 --> 05:03:38,150

each one

2937

05:03:41,430 --> 05:03:39,120

is

2938

05:03:42,390 --> 05:03:41,440

locked

2939

05:03:43,750 --> 05:03:42,400

two

2940

05:03:56,708 --> 05:03:43,760

is locked

2941

05:03:56,718 --> 05:04:05,270

hmm

2942

05:04:09,590 --> 05:04:06,868

and with the

2943

05:04:11,990 --> 05:04:09,600

secure installation of that second bolt

2944

05:04:13,750 --> 05:04:12,000

the final lithium ion battery in three

2945

05:04:15,430 --> 05:04:13,760

and a half years of upgrades to the

2946

05:04:17,990 --> 05:04:15,440

international space station has been

2947

05:04:22,788 --> 05:04:18,000

installed to the integrated electronics

2948

05:04:26,310 --> 05:04:24,230

brake glove

2949

05:04:28,390 --> 05:04:26,320

stain less glove

2950

05:04:29,990 --> 05:04:28,400

a little bit

2951
05:04:31,670 --> 05:04:30,000
more

2952
05:04:33,350 --> 05:04:31,680
outer layer rtv

2953
05:04:35,190 --> 05:04:33,360
ring back

2954
05:04:38,868 --> 05:04:35,200
the same

2955
05:04:47,590 --> 05:04:40,788
uh caviar chris and bob will get your

2956
05:04:47,600 --> 05:04:53,350
i josh anything with these scoops or

2957
05:04:57,910 --> 05:04:55,590
and uh chris let's just hold on to the

2958
05:05:00,230 --> 05:04:57,920
scoops for now but the pgt with the hex

2959
05:05:05,270 --> 05:05:00,240
driver we can move that to battery

2960
05:05:10,070 --> 05:05:07,190
gt hex driver

2961
05:05:12,310 --> 05:05:10,080
battery charlie swap six

2962
05:05:14,788 --> 05:05:12,320
just as temp still using the adjustable

2963
05:05:17,430 --> 05:05:14,798

that's on the pgt so it's positioned

2964

05:05:39,350 --> 05:05:17,440

near that side of the ieee

2965

05:05:39,360 --> 05:05:44,550

i'm going to with 17.

2966

05:05:49,430 --> 05:05:46,948

good words pop

2967

05:05:52,070 --> 05:05:49,440

four hours and 22 minutes into today's

2968

05:05:54,070 --> 05:05:52,080

spacewalk our spacewalkers switch their

2969

05:05:57,110 --> 05:05:54,080

spacesuits onto internal battery power

2970

05:05:59,110 --> 05:05:57,120

at 6 10 am central time this morning 7

2971

05:06:00,628 --> 05:05:59,120

10 a.m eastern

2972

05:06:02,708 --> 05:06:00,638

they have completed all of their

2973

05:06:04,948 --> 05:06:02,718

scheduled tasks for today's spacewalk

2974

05:06:07,350 --> 05:06:04,958

and they're moving into the final

2975

05:06:09,110 --> 05:06:07,360

battery swap for the entire power

2976

05:06:11,190 --> 05:06:09,120

upgrades on the international space

2977

05:06:13,590 --> 05:06:11,200

station this will be the removal of

2978

05:06:15,910 --> 05:06:13,600

battery five a nickel hydrogen battery

2979

05:06:17,510 --> 05:06:15,920

from the integrated electronics assembly

2980

05:06:20,708 --> 05:06:17,520

and they will move it to the external

2981

05:06:25,990 --> 05:06:22,070

epsilon

2982

05:06:27,910 --> 05:06:26,000

lock on black get the twist test

2983

05:06:30,788 --> 05:06:27,920

and get full tests

2984

05:06:32,150 --> 05:06:30,798

and the knob is that popped out

2985

05:06:33,430 --> 05:06:32,160

i think we need that

2986

05:06:34,628 --> 05:06:33,440

quebec

2987

05:06:37,830 --> 05:06:34,638

and uh

2988

05:06:39,670 --> 05:06:37,840

abstract 12 which is

2989

05:06:41,430 --> 05:06:39,680

all good words bob we copy the checks

2990

05:06:42,800 --> 05:06:41,440

copy the settings those are the correct

2991

05:06:44,550 --> 05:06:42,810

ones thank you

2992

05:06:46,230 --> 05:06:44,560

[Music]

2993

05:06:49,190 --> 05:06:46,240

and then guys uh maybe it's a good time

2994

05:06:51,670 --> 05:06:49,200

for a a big picture update so we are an

2995

05:06:54,150 --> 05:06:51,680

hour 20 up on timeline 120 up on

2996

05:06:56,550 --> 05:06:54,160

timeline leaning strongly towards

2997

05:06:58,310 --> 05:06:56,560

the final battery adapter plate swap

2998

05:06:59,830 --> 05:06:58,320

which will complete this channel of

2999

05:07:01,350 --> 05:06:59,840

course give you a chance to weigh in on

3000

05:07:02,788 --> 05:07:01,360

that if you have any different

3001

05:07:05,030 --> 05:07:02,798

perspectives there

3002

05:07:07,110 --> 05:07:05,040

but in short we think we can get it done

3003

05:07:13,030 --> 05:07:07,120

and and be in the door with margin ahead

3004

05:07:16,628 --> 05:07:15,350

what time josh just kind of playing it

3005

05:07:17,910 --> 05:07:16,638

out what time are you guys looking at

3006

05:07:23,350 --> 05:07:17,920

for us to

3007

05:07:27,510 --> 05:07:25,190

so bob i'll get you that number from the

3008

05:07:31,030 --> 05:07:27,520

team and we're at 4 24 on the clock

3009

05:07:31,040 --> 05:07:35,110

copy

3010

05:07:43,190 --> 05:07:37,430

okay so i'll uh ingress the

3011

05:07:47,670 --> 05:07:45,590

and uh bob affirmative you can ingress

3012

05:07:50,470 --> 05:07:47,680

the apfr just checking as usual that the

3013

05:07:51,830 --> 05:07:50,480

gap spanners are clear as you do that

3014

05:07:55,030 --> 05:07:51,840

the answer to your question we'd be

3015

05:07:57,270 --> 05:07:55,040

looking to start cleanup at about 5 20

3016

05:08:00,830 --> 05:07:57,280

and again we're at 424 on the clock

3017

05:08:05,510 --> 05:08:03,590

okay just of course let us know if you

3018

05:08:07,190 --> 05:08:05,520

have any any concerns or inputs to that

3019

05:08:10,150 --> 05:08:07,200

plan but that's how we're leaning right

3020

05:08:14,470 --> 05:08:12,948

is there any breakouts along this way or

3021

05:08:19,270 --> 05:08:14,480

you need to do all all of it is what

3022

05:08:21,830 --> 05:08:20,788

and we

3023

05:08:23,430 --> 05:08:21,840

pretty much

3024

05:08:35,510 --> 05:08:23,440

would like to do all of it if we jump

3025

05:08:39,430 --> 05:08:37,190

okay if you guys are good uh we're

3026
05:08:41,910 --> 05:08:39,440
definitely good so we'll we'll continue

3027
05:08:50,790 --> 05:08:41,920
that way for your info we've planned

3028
05:08:50,800 --> 05:08:55,430
[Music]

3029
05:09:00,708 --> 05:08:57,830
okay so we're ready to jump into this

3030
05:09:02,550 --> 05:09:00,718
plan uh as an admin item bob where we'll

3031
05:09:10,788 --> 05:09:02,560
need a glove hop and gauntlet before we

3032
05:09:13,430 --> 05:09:12,230
that's while he's doing that i can

3033
05:09:16,310 --> 05:09:13,440
release each

3034
05:09:25,190 --> 05:09:18,070
we're going with that chris

3035
05:09:35,830 --> 05:09:26,948
make sure it's flush we expect eight

3036
05:09:39,110 --> 05:09:37,580
josh my gauntlets are up

3037
05:09:42,070 --> 05:09:39,120
[Music]

3038
05:09:45,990 --> 05:09:42,080

the half are still dry

3039

05:09:51,510 --> 05:09:48,470

additional areas of uh

3040

05:09:53,270 --> 05:09:51,520

rgb to report just the same areas

3041

05:09:56,150 --> 05:09:53,280

index finger and

3042

05:09:58,948 --> 05:09:56,160

left thumb they continue to deteriorate

3043

05:10:02,788 --> 05:09:58,958

they can still looks good

3044

05:10:07,110 --> 05:10:02,798

okay copy bob get tethered yeah

3045

05:10:13,110 --> 05:10:10,230

each one is released at eight turns

3046

05:10:14,868 --> 05:10:13,120

the indicator is unlocked

3047

05:10:16,310 --> 05:10:14,878

and it was uh

3048

05:10:18,550 --> 05:10:16,320

yeah eight turns

3049

05:10:20,550 --> 05:10:18,560

i'm digging for my right right now

3050

05:10:23,030 --> 05:10:20,560

copy eight turns chris say firm we need

3051
05:10:27,830 --> 05:10:23,040
to rep to it and for whoever is easiest

3052
05:10:45,030 --> 05:10:31,910
the serial number is zero zero nine five

3053
05:10:51,110 --> 05:10:46,948
you can go left

3054
05:10:52,868 --> 05:10:51,120
i think we can go up i'll

3055
05:10:54,948 --> 05:10:52,878
press if you have a past a hand draw

3056
05:10:56,788 --> 05:10:54,958
pass down

3057
05:10:57,750 --> 05:10:56,798
i pretty much have to go all the way

3058
05:10:59,350 --> 05:10:57,760
down

3059
05:11:01,910 --> 05:10:59,360
but that's the same relative this thing

3060
05:11:04,948 --> 05:11:01,920
says yeah i think i can pass it to you

3061
05:11:06,230 --> 05:11:04,958
on the left side okay and uh so i think

3062
05:11:07,990 --> 05:11:06,240
uh

3063
05:11:09,750 --> 05:11:08,000

i'm just curious as to if that's going

3064

05:11:11,670 --> 05:11:09,760

to be long enough right for

3065

05:11:14,150 --> 05:11:11,680

to get there from here

3066

05:11:15,910 --> 05:11:14,160

yeah i'm not so sure about that i don't

3067

05:11:18,310 --> 05:11:15,920

i think we need you to write nothing but

3068

05:11:25,910 --> 05:11:18,320

that's what he was saying to that okay

3069

05:11:29,990 --> 05:11:27,670

and which uh

3070

05:11:33,110 --> 05:11:30,000

scoop should chris get

3071

05:11:36,470 --> 05:11:34,230

so um

3072

05:11:38,628 --> 05:11:36,480

the question on the rack bob to h1 and

3073

05:11:45,590 --> 05:11:38,638

then this question on the scoop

3074

05:11:49,430 --> 05:11:47,190

okay without i think we're in a good

3075

05:11:50,550 --> 05:11:49,440

config we're ready i am bob is ready to

3076
05:11:55,750 --> 05:11:50,560
h1

3077
05:11:57,190 --> 05:11:55,760
we're ready to drive on h2

3078
05:11:59,990 --> 05:11:57,200
alpha 7

3079
05:12:02,628 --> 05:12:00,000
counter two

3080
05:12:05,670 --> 05:12:02,638
good settings confirm flush we expect 19

3081
05:12:05,680 --> 05:12:21,270
tape tape one is flush

3082
05:12:26,948 --> 05:12:23,350
nasa astronaut bob benkin using the

3083
05:12:49,590 --> 05:12:26,958
pistol grip tool to remove these two

3084
05:12:53,910 --> 05:12:51,830
there's 18 turns the indicator indicates

3085
05:13:25,190 --> 05:12:53,920
unlocked

3086
05:14:03,910 --> 05:13:26,628
okay i'll

3087
05:14:03,920 --> 05:14:10,628
huh

3088
05:14:10,638 --> 05:14:15,670

a little bit bunched up on the apfroz

3089

05:14:20,948 --> 05:14:18,230

next up benkin and cassidy will move

3090

05:14:28,788 --> 05:14:20,958

this battery to its final place

3091

05:14:32,948 --> 05:14:31,110

we're now 4 hours and 32 minutes into

3092

05:14:35,590 --> 05:14:32,958

today's spacewalk and this was actually

3093

05:14:36,550 --> 05:14:35,600

a task scheduled for the spacewalk next

3094

05:14:38,150 --> 05:14:36,560

week

3095

05:14:40,788 --> 05:14:38,160

the astronauts completed all of their

3096

05:14:46,690 --> 05:14:40,798

tasks early today and were able to move

3097

05:14:46,700 --> 05:14:52,788

[Music]

3098

05:14:57,030 --> 05:14:54,628

see here i'm going to go ahead and just

3099

05:14:59,110 --> 05:14:57,040

get stable and then uh

3100

05:15:06,470 --> 05:14:59,120

we'll do a little bit of inchworm here

3101

05:15:11,110 --> 05:15:08,868

yes okay we could just do a little one

3102

05:15:12,948 --> 05:15:11,120

to get on the other side yeah i have

3103

05:15:34,150 --> 05:15:12,958

control of the battery here control the

3104

05:16:14,390 --> 05:15:35,990

let's control the battery top of your

3105

05:16:14,400 --> 05:16:48,310

control the battery you have control

3106

05:17:13,750 --> 05:16:49,910

i have control of the battery do you

3107

05:17:17,510 --> 05:17:15,670

as a reminder if you are watching with

3108

05:17:19,270 --> 05:17:17,520

us today and you have a twitter account

3109

05:17:21,990 --> 05:17:19,280

feel free to send in your questions with

3110

05:17:24,470 --> 05:17:22,000

the hashtag asknasa and we'll work to

3111

05:17:26,628 --> 05:17:24,480

get some of those answered on air this

3112

05:17:28,470 --> 05:17:26,638

next one comes from patrick who wants to

3113

05:17:30,788 --> 05:17:28,480

know how much the batteries would weigh

3114

05:17:33,590 --> 05:17:30,798

on earth good question because of course

3115

05:17:36,788 --> 05:17:33,600

when in microgravity the weight of these

3116

05:17:38,628 --> 05:17:36,798

batteries are reduced to nearly nothing

3117

05:17:41,150 --> 05:17:38,638

but on earth they do have a difference

3118

05:17:43,910 --> 05:17:41,160

the nickel hydrogen batteries weigh

3119

05:17:45,990 --> 05:17:43,920

364 pounds on earth while the new

3120

05:17:47,830 --> 05:17:46,000

lithium-ion batteries being installed

3121

05:17:56,470 --> 05:17:47,840

into the state space station's power

3122

05:17:59,430 --> 05:17:58,310

chris the brakes are on and as a

3123

05:18:07,030 --> 05:17:59,440

reminder we just want to check the

3124

05:18:19,510 --> 05:18:10,070

in the opposite of 6 12 copy that's

3125

05:18:22,470 --> 05:18:20,788

and chris

3126

05:18:24,310 --> 05:18:22,480

looking at your wvs we want you to

3127

05:18:32,070 --> 05:18:24,320

secure the wire tie at the base of the

3128

05:18:32,080 --> 05:18:51,110

yeah that one

3129

05:18:54,550 --> 05:18:53,030

like i'm going to pull up on them say to

3130

05:18:56,628 --> 05:18:54,560

each other

3131

05:19:09,030 --> 05:18:56,638

get stuck on that kind of lift yeah it

3132

05:19:13,190 --> 05:19:10,868

this view from

3133

05:19:15,190 --> 05:19:13,200

bob benkin's helmet camera of astronaut

3134

05:19:17,270 --> 05:19:15,200

chris cassidy as he works to get into

3135

05:19:18,470 --> 05:19:17,280

position in that articulating portable

3136

05:19:20,310 --> 05:19:18,480

foot restraint

3137

05:19:22,708 --> 05:19:20,320

you can see those solar arrays stretched

3138

05:19:25,670 --> 05:19:22,718

out behind him and even further beyond

3139

05:19:28,628 --> 05:19:25,680

that earth as the astronauts are now

3140

05:19:33,750 --> 05:19:28,638

orbiting 260 statute miles over the

3141

05:19:35,990 --> 05:19:34,600

on the left

3142

05:19:39,750 --> 05:19:36,000

[Music]

3143

05:19:39,760 --> 05:19:48,470

see you're interested

3144

05:19:58,628 --> 05:19:50,470

copy so chris you're going to want h2 on

3145

05:19:58,638 --> 05:20:02,390

two on my brt

3146

05:20:09,990 --> 05:20:04,948

affirmative with the brt running to the

3147

05:20:10,000 --> 05:20:17,110

okay

3148

05:20:21,350 --> 05:20:18,948

an interesting fact about those solar

3149

05:20:23,190 --> 05:20:21,360

panels that you see if you were to add

3150

05:20:25,270 --> 05:20:23,200

together all of the solar panels on the

3151

05:20:26,948 --> 05:20:25,280

space station it would take up the total

3152

05:20:33,030 --> 05:20:26,958

space of an

3153

05:20:37,110 --> 05:20:35,190

since it is essentially an acre of solar

3154

05:20:39,990 --> 05:20:37,120

panels in the sky it means you can

3155

05:20:44,390 --> 05:20:40,000

sometimes look up at dawn or dusk and

3156

05:20:47,910 --> 05:20:44,400

see the spacecraft flying over your area

3157

05:20:50,390 --> 05:20:47,920

if you go to spot the station.nasa.gov

3158

05:21:15,270 --> 05:20:50,400

you can check out when and where to look

3159

05:21:15,280 --> 05:21:34,250

uh

3160

05:21:34,260 --> 05:21:39,030

[Music]

3161

05:21:44,310 --> 05:21:42,390

okay this time i'll go to the

3162

05:21:47,190 --> 05:21:44,320

another point on the

3163

05:21:49,590 --> 05:21:47,200

adapter plate and not the hand

3164

05:21:56,310 --> 05:21:49,600

thank you hey firm heater matt tether

3165

05:21:56,320 --> 05:22:04,470

my tools go

3166

05:22:09,750 --> 05:22:07,270

that was part of the uh

3167

05:22:12,070 --> 05:22:09,760

plan to move the oru bag we're in a

3168

05:22:14,230 --> 05:22:12,080

little bit of a

3169

05:22:16,470 --> 05:22:14,240

thoughtful here for a buffalo i think

3170

05:22:17,990 --> 05:22:16,480

with this vrt situation bob maybe he's

3171

05:22:22,470 --> 05:22:18,000

found it yeah i'm going to have to go

3172

05:22:34,150 --> 05:22:24,470

and we're we're good with how we concur

3173

05:22:37,350 --> 05:22:36,470

where is it relative to you now

3174

05:22:42,310 --> 05:22:37,360

right

3175

05:22:45,190 --> 05:22:42,320

it's a complete like opposite side of

3176
05:22:47,110 --> 05:22:45,200
the ballot from where you are

3177
05:22:48,390 --> 05:22:47,120
but more towards

3178
05:22:49,510 --> 05:22:48,400
the

3179
05:22:51,670 --> 05:22:49,520
outboard

3180
05:22:54,070 --> 05:22:51,680
or inboard

3181
05:22:55,990 --> 05:22:54,080
you have a go to

3182
05:23:39,820 --> 05:22:56,000
i'm entrepreneur

3183
05:23:39,830 --> 05:23:44,948
[Music]

3184
05:23:44,958 --> 05:23:57,750
i've arrived at the bag

3185
05:24:03,190 --> 05:23:59,910
this view from chris cassidy's helmet

3186
05:24:05,990 --> 05:24:03,200
camera as he is capturing footage of bob

3187
05:24:17,350 --> 05:24:06,000
benkin ev1 with the red stripes around

3188
05:24:20,470 --> 05:24:19,190

banking is retrieving some of the tools

3189

05:24:23,430 --> 05:24:20,480

necessary

3190

05:25:13,250 --> 05:24:23,440

to install this final battery to the

3191

05:25:13,260 --> 05:25:17,110

[Music]

3192

05:25:21,510 --> 05:25:19,110

that handrail right there where your

3193

05:25:24,628 --> 05:25:21,520

right hand is go straight up it this one

3194

05:25:33,750 --> 05:25:27,350

your target is just around the corner

3195

05:25:33,760 --> 05:25:42,708

this is one they suggested

3196

05:25:48,070 --> 05:25:46,070

and and curse affirmative 7312 but we'll

3197

05:25:49,190 --> 05:25:48,080

defer to you of course if you think it

3198

05:25:50,470 --> 05:25:49,200

we just want to make sure you don't

3199

05:25:52,390 --> 05:25:50,480

think that's going to get in the way of

3200

05:25:56,868 --> 05:25:52,400

the adapter plate removal or the battery

3201

05:26:02,788 --> 05:25:58,868

i'd kind of rather have it be

3202

05:26:08,948 --> 05:26:04,230

yeah

3203

05:26:08,958 --> 05:26:19,670

you give me the one of the hooks i can

3204

05:26:19,680 --> 05:26:22,760

confirmed

3205

05:26:22,770 --> 05:26:28,150

[Music]

3206

05:26:35,190 --> 05:26:32,788

30 seconds to handle 73 19.

3207

05:26:38,788 --> 05:26:37,830

which it'll do hey don't need to get it

3208

05:27:01,430 --> 05:26:38,798

you got it

3209

05:27:06,548 --> 05:27:04,230

a quick satellite handover as the tools

3210

05:27:07,990 --> 05:27:06,558

needed for this final battery install

3211

05:27:09,270 --> 05:27:08,000

are in place

3212

05:27:11,350 --> 05:27:09,280

this is the

3213

05:27:12,628 --> 05:27:11,360

battery 5 a nickel hydrogen battery

3214

05:27:15,030 --> 05:27:12,638

which has been removed from the

3215

05:27:17,990 --> 05:27:15,040

integrated electronics assembly and will

3216

05:27:19,510 --> 05:27:18,000

be placed on the external pallet

3217

05:27:22,310 --> 05:27:19,520

all of the batteries on the external

3218

05:27:24,230 --> 05:27:22,320

pallet will eventually be disposed

3219

05:27:26,150 --> 05:27:24,240

they will be projected toward earth and

3220

05:27:43,110 --> 05:27:26,160

disintegrate upon re-entry into the

3221

05:27:48,310 --> 05:27:46,150

we're now four hours and 45 minutes into

3222

05:27:50,470 --> 05:27:48,320

today's spacewalk and we've seen the

3223

05:27:52,868 --> 05:27:50,480

removal of all six

3224

05:27:54,628 --> 05:27:52,878

nickel hydrogen batteries the pallet

3225

05:27:58,070 --> 05:27:54,638

chris will be proceeding with breaking

3226

05:27:58,080 --> 05:28:04,390

i'm off the collet

3227

05:28:10,230 --> 05:28:06,470

i am tethered

3228

05:28:10,240 --> 05:28:13,910

line visible

3229

05:28:18,948 --> 05:28:15,990

all good words will break to a max one

3230

05:28:23,830 --> 05:28:21,360

turn here comes hq

3231

05:28:25,270 --> 05:28:23,840

[Music]

3232

05:28:27,910 --> 05:28:25,280

copy

3233

05:28:30,230 --> 05:28:27,920

just to confirm your tether to the hand

3234

05:28:31,350 --> 05:28:30,240

to knot to the to the yeah to the black

3235

05:28:33,990 --> 05:28:31,360

face

3236

05:28:37,670 --> 05:28:34,000

good and you you got the handrail part

3237

05:28:39,430 --> 05:28:37,680

perfect we see it looks good

3238

05:28:41,190 --> 05:28:39,440

that's chris cassidy in the center of

3239

05:28:43,510 --> 05:28:41,200

your screen working to install that

3240

05:28:45,590 --> 05:28:43,520

battery on the external pallet you will

3241

05:28:48,548 --> 05:28:45,600

see that external pallet is in the grip

3242

05:28:50,708 --> 05:28:48,558

of the canada arm 2. today the canadarm2

3243

05:28:52,548 --> 05:28:50,718

was controlled by doug hurley an

3244

05:29:06,868 --> 05:28:52,558

astronaut also aboard the international

3245

05:29:08,868 --> 05:29:07,830

alpha

3246

05:29:10,948 --> 05:29:08,878

7

3247

05:29:13,430 --> 05:29:10,958

counter 2

3248

05:29:15,910 --> 05:29:13,440

h1 here we go

3249

05:29:40,070 --> 05:29:15,920

affirmative check flush and we expect

3250

05:29:51,670 --> 05:29:42,708

copy eight same settings for h2 we

3251
05:29:56,868 --> 05:29:53,910
alpha 7

3252
05:29:56,878 --> 05:30:01,350
2

3253
05:30:01,360 --> 05:30:05,270
roger

3254
05:30:09,670 --> 05:30:07,190
definitely high running higher running

3255
05:30:12,788 --> 05:30:09,680
torque than normal

3256
05:30:14,150 --> 05:30:12,798
higher than the last time yeah

3257
05:30:16,628 --> 05:30:14,160
and for about

3258
05:30:17,910 --> 05:30:16,638
i meant seven turns and it's

3259
05:30:20,150 --> 05:30:17,920
still there

3260
05:30:21,510 --> 05:30:20,160
there we go loosened up at eight turns

3261
05:30:23,190 --> 05:30:21,520
yeah the last one that i when i

3262
05:30:25,270 --> 05:30:23,200
installed it it had the higher running

3263
05:30:28,868 --> 05:30:25,280

torque about halfway through

3264

05:30:31,030 --> 05:30:28,878

eight turns it started yeah

3265

05:30:38,390 --> 05:30:31,040

i put it in so this one might stay even

3266

05:30:38,400 --> 05:30:41,910

there's night

3267

05:30:45,110 --> 05:30:43,430

that's really out

3268

05:30:49,670 --> 05:30:45,120

copy 19.

3269

05:30:49,680 --> 05:31:03,110

get it off in a second

3270

05:31:16,150 --> 05:31:04,708

bob you'll be writing to the handrail

3271

05:31:24,868 --> 05:31:18,650

tight spot

3272

05:31:24,878 --> 05:31:31,030

okay i'm tethered to it

3273

05:31:31,040 --> 05:31:40,070

okay i'm released

3274

05:31:43,510 --> 05:31:42,070

copy so bob we have you headed back to

3275

05:31:45,670 --> 05:31:43,520

the iea

3276

05:31:54,948 --> 05:31:45,680

chris we'll finish up with the pgt still

3277

05:31:54,958 --> 05:31:58,788

headed to the ia

3278

05:31:58,798 --> 05:32:09,270

copy

3279

05:32:14,868 --> 05:32:11,350

chris you'll be wanting h2 in your left

3280

05:32:43,190 --> 05:32:18,548

each two go left

3281

05:32:56,310 --> 05:32:47,110

i'm about to put code on the palette

3282

05:33:00,708 --> 05:32:58,150

in the top left hand corner of your

3283

05:33:03,510 --> 05:33:00,718

screen you see bob bankins helmet camera

3284

05:33:05,350 --> 05:33:03,520

as he soft docks the battery 5 the

3285

05:33:23,030 --> 05:33:05,360

nickel hydrogen battery

3286

05:33:27,750 --> 05:33:25,190

this marks the final nickel hydrogen

3287

05:33:34,070 --> 05:33:27,760

battery removal on the space station in

3288

05:33:37,830 --> 05:33:36,070

bob we see you back reminder to check

3289

05:33:42,070 --> 05:33:37,840

gap spanner's clear in your reach to the

3290

05:33:46,470 --> 05:33:44,628

gas spanner is clear and i

3291

05:33:50,470 --> 05:33:46,480

it does look like i have

3292

05:33:58,708 --> 05:33:52,470

copy go to ingress remember to tuck the

3293

05:34:03,430 --> 05:34:00,470

alpha seven

3294

05:34:06,310 --> 05:34:03,440

clockwise two

3295

05:34:14,948 --> 05:34:06,320

affirmative flush to h2 scoop chris and

3296

05:34:19,030 --> 05:34:16,390

okay flush

3297

05:34:19,040 --> 05:34:24,548

indicator moving

3298

05:34:24,558 --> 05:34:32,548

ben can we'll tighten this one bolt to

3299

05:34:36,708 --> 05:34:34,230

cassidy will tighten this one bolt to

3300

05:34:39,190 --> 05:34:36,718

complete installation of that nickel

3301
05:34:41,110 --> 05:34:39,200
hydrogen battery to the external pallet

3302
05:34:43,670 --> 05:34:41,120
we're seeing a few questions come in on

3303
05:34:45,750 --> 05:34:43,680
ask nasa on social media asking what

3304
05:34:47,430 --> 05:34:45,760
will happen to these old batteries

3305
05:34:49,350 --> 05:34:47,440
some of them as you see here on the

3306
05:34:51,910 --> 05:34:49,360
external pallet will eventually be

3307
05:34:54,230 --> 05:34:51,920
disposed of by sending that external

3308
05:34:58,230 --> 05:34:54,240
pallet back into earth's atmosphere

3309
05:35:02,628 --> 05:34:59,910
green torque light and the lock

3310
05:35:10,310 --> 05:35:02,638
indicator is locked

3311
05:35:15,830 --> 05:35:14,070
and that battery is fully installed

3312
05:35:18,150 --> 05:35:15,840
the other no longer needed nickel

3313
05:35:20,150 --> 05:35:18,160

hydrogen batteries are stored on top of

3314

05:35:22,708 --> 05:35:20,160

adapter plates on the integrated

3315

05:35:24,230 --> 05:35:22,718

electronics assembly we saw that happen

3316

05:35:31,030 --> 05:35:24,240

with two

3317

05:35:34,868 --> 05:35:32,548

affirmative so we're going to do a bit

3318

05:35:36,628 --> 05:35:34,878

of cleanup on the ep getting stuff back

3319

05:35:39,350 --> 05:35:36,638

into the bag and then we'll head back

3320

05:35:40,628 --> 05:35:39,360

over to bob to do a few cleanup steps

3321

05:35:45,270 --> 05:35:40,638

there

3322

05:35:45,280 --> 05:35:49,670

in terms of the immediate next action

3323

05:35:53,670 --> 05:35:51,590

the only remaining thing bob's adapter

3324

05:35:58,708 --> 05:35:53,680

plate that's a permanent battery

3325

05:35:58,718 --> 05:36:03,750

okay that sounds good there okay

3326

05:36:09,830 --> 05:36:06,868

i'll give you four more batteries yeah

3327

05:36:09,840 --> 05:36:13,110

there's got to be another one

3328

05:36:13,120 --> 05:36:16,460

there's gotta be man

3329

05:36:21,190 --> 05:36:18,548

[Music]

3330

05:36:23,670 --> 05:36:21,200

uh cautiously share your optimism so

3331

05:36:24,708 --> 05:36:23,680

chris you can uh grab both those scoops

3332

05:36:26,840 --> 05:36:24,718

and we're going to be storing them in

3333

05:36:29,270 --> 05:36:26,850

the medium or u-bag

3334

05:36:32,868 --> 05:36:29,280

[Music]

3335

05:36:36,708 --> 05:36:34,708

hey josh i want to start giving you some

3336

05:36:39,990 --> 05:36:36,718

inspections here

3337

05:36:41,990 --> 05:36:40,000

i'll start with the iea

3338

05:36:43,990 --> 05:36:42,000

and the electrical connectors are look

3339

05:36:45,670 --> 05:36:44,000

clear no thought the mechanical

3340

05:36:47,670 --> 05:36:45,680

connectors look clear

3341

05:36:52,390 --> 05:36:47,680

no thought i don't think the fins are

3342

05:36:58,230 --> 05:36:54,000

coffee bob

3343

05:37:15,270 --> 05:37:00,150

get the adapter plate off my brt i'll

3344

05:37:20,548 --> 05:37:17,350

inventory josh

3345

05:37:25,350 --> 05:37:20,558

and chris we're going to pass the uh

3346

05:37:30,150 --> 05:37:27,990

maybe ask it and then open it again okay

3347

05:37:32,230 --> 05:37:30,160

sorry yeah we can curse it we'll take

3348

05:37:34,708 --> 05:37:32,240

the inventory now uh we only need the

3349

05:37:36,390 --> 05:37:34,718

the oru bag itself no need to to go

3350

05:37:41,190 --> 05:37:36,400

after the inventory of the crewlock bag

3351

05:37:45,510 --> 05:37:43,350

okay so the crew lock bag is really i

3352

05:37:47,430 --> 05:37:45,520

get these uh here because if that's your

3353

05:37:50,310 --> 05:37:47,440

hand then i can start working absolutely

3354

05:37:52,390 --> 05:37:50,320

doing it okay so the adapter plate uh

3355

05:37:54,470 --> 05:37:52,400

wash the emi pan

3356

05:37:55,750 --> 05:37:54,480

if there was another battery

3357

05:37:57,510 --> 05:37:55,760

that would be

3358

05:37:59,670 --> 05:37:57,520

good for it

3359

05:38:01,430 --> 05:37:59,680

and the mechanical interfaces for that

3360

05:38:04,070 --> 05:38:01,440

battery would be good

3361

05:38:07,190 --> 05:38:04,080

then on the

3362

05:38:09,030 --> 05:38:07,200

iea side of the adapter plate

3363

05:38:11,270 --> 05:38:09,040

both of those

3364

05:38:14,868 --> 05:38:11,280

phone interfaces look clear with no

3365

05:38:20,230 --> 05:38:16,548

i think i'm ready to go for soft dock

3366

05:38:27,510 --> 05:38:22,868

and we can bob uh we're ready for you to

3367

05:38:34,510 --> 05:38:29,190

thanks chris

3368

05:38:34,520 --> 05:38:39,430

[Music]

3369

05:38:43,030 --> 05:38:41,190

and bob uh it sounds like we're okay

3370

05:38:44,548 --> 05:38:43,040

here to divide and conquer so if you're

3371

05:38:46,230 --> 05:38:44,558

you're good with getting going on the

3372

05:38:48,868 --> 05:38:46,240

bolts now we'll just confirm the

3373

05:38:50,390 --> 05:38:48,878

settings alpha seven as always and then

3374

05:38:53,670 --> 05:38:50,400

we'll take the calm with chris for the

3375

05:39:11,510 --> 05:38:56,708

sounds good i'll get you office 7 as

3376

05:39:11,520 --> 05:39:23,110

thank you

3377

05:39:27,350 --> 05:39:24,868

and chris it sounds like we want to

3378

05:39:34,080 --> 05:39:27,360

double check that that ptt is off before

3379

05:39:34,090 --> 05:39:41,030

[Music]

3380

05:39:49,430 --> 05:39:44,390

if josh is okay with my uh

3381

05:39:54,310 --> 05:39:51,350

those are good settings bob we're good

3382

05:39:56,548 --> 05:39:54,320

with the plan you expect 16 to 17 turns

3383

05:40:03,590 --> 05:39:56,558

on h2 and four and a half to five and a

3384

05:40:08,868 --> 05:40:05,590

okay josh you ready

3385

05:40:13,510 --> 05:40:11,510

drew lock bag is in there it's attached

3386

05:40:15,750 --> 05:40:13,520

with its integral wrap

3387

05:40:17,990 --> 05:40:15,760

has not been opened

3388

05:40:25,350 --> 05:40:18,000

there's a rhett with a pit pin

3389

05:40:27,350 --> 05:40:26,230

there's

3390

05:40:30,230 --> 05:40:27,360

a red

3391

05:40:33,110 --> 05:40:30,240

the pit bin that has the extra

3392

05:40:37,190 --> 05:40:35,270

and i attached that

3393

05:40:39,030 --> 05:40:37,200

that hook

3394

05:40:40,868 --> 05:40:39,040

to the adjustable that came off of the

3395

05:40:46,470 --> 05:40:40,878

pgt

3396

05:40:51,430 --> 05:40:49,270

there is a camera lens cover for the

3397

05:40:54,230 --> 05:40:51,440

wrap

3398

05:40:58,230 --> 05:40:54,240

there is a red one adjustable with two

3399

05:41:01,110 --> 05:40:59,350

there is

3400

05:41:03,030 --> 05:41:01,120

number eight pgt

3401
05:41:05,110 --> 05:41:03,040
two reds in series

3402
05:41:07,430 --> 05:41:05,120
power switching off

3403
05:41:13,430 --> 05:41:07,440
in a um

3404
05:41:17,510 --> 05:41:15,510
two reds in series with a ratchet wrench

3405
05:41:19,350 --> 05:41:17,520
a palm wheel

3406
05:41:21,670 --> 05:41:19,360
and a seven sixteenths nine inch long

3407
05:41:25,750 --> 05:41:21,680
hex head

3408
05:41:30,150 --> 05:41:27,670
small small adjustable

3409
05:41:32,708 --> 05:41:30,160
and a large small adjustable

3410
05:41:48,700 --> 05:41:32,718
eventually complete

3411
05:41:53,190 --> 05:41:50,948
[Music]

3412
05:41:55,430 --> 05:41:53,200
and this is the five hour mark guys

3413
05:42:01,350 --> 05:41:55,440

still limited to seven hours on

3414

05:42:07,060 --> 05:42:03,110

so we're uh we're we're doing well on

3415

05:42:07,070 --> 05:42:27,510

[Music]

3416

05:42:31,510 --> 05:42:29,910

now five hours into today's spacewalk

3417

05:42:33,670 --> 05:42:31,520

since the astronauts switched their

3418

05:42:36,150 --> 05:42:33,680

suits to battery power at 6 10 a.m

3419

05:42:38,150 --> 05:42:36,160

central time this morning 7 10 a.m

3420

05:42:40,310 --> 05:42:38,160

central eastern time

3421

05:42:43,430 --> 05:42:40,320

chris cassidy has just taken inventory

3422

05:43:12,548 --> 05:42:43,440

of all of the tools in his bag while bob

3423

05:43:17,590 --> 05:43:15,430

as a recap today we saw six nickel

3424

05:43:20,948 --> 05:43:17,600

hydrogen batteries removed from the

3425

05:43:23,030 --> 05:43:20,958

integrated electronics assembly

3426
05:43:29,110 --> 05:43:23,040
and copy four and three quarters green

3427
05:43:34,868 --> 05:43:30,708
those nickel hydrogen batteries were

3428
05:43:36,470 --> 05:43:34,878
replaced by three lithium ion batteries

3429
05:43:41,670 --> 05:43:36,480
so we're uh we're all finished up with

3430
05:43:47,270 --> 05:43:43,190
for the cable

3431
05:43:51,190 --> 05:43:49,110
we can however is easiest for you if you

3432
05:44:03,910 --> 05:43:51,200
want to get out of the apfr turn the pgt

3433
05:44:08,868 --> 05:44:04,868
uh

3434
05:44:13,670 --> 05:44:08,878
just have the outer lid closed

3435
05:44:21,350 --> 05:44:15,670
copy chris it'll be going on your brt

3436
05:44:21,360 --> 05:44:31,450
okay

3437
05:44:31,460 --> 05:44:37,110
[Music]

3438
05:44:45,030 --> 05:44:39,910

mr one shows that the ta clamps have to

3439

05:44:52,310 --> 05:44:46,868

and uh bob i believe it is because we're

3440

05:44:52,320 --> 05:45:04,390

i'm going to check for you

3441

05:45:27,510 --> 05:45:06,470

and you're correct bob they we require

3442

05:45:31,190 --> 05:45:29,830

with the completion of today's battery

3443

05:45:33,510 --> 05:45:31,200

tasks

3444

05:45:35,270 --> 05:45:33,520

the astronauts have completed all of the

3445

05:45:37,910 --> 05:45:35,280

power channel upgrades on the

3446

05:45:40,310 --> 05:45:37,920

international space station it took 11

3447

05:45:42,948 --> 05:45:40,320

spacewalks to complete those upgrades

3448

05:45:45,750 --> 05:45:42,958

removing 48 aging nickel hydrogen

3449

05:45:49,510 --> 05:45:45,760

batteries and replacing them with 24 new

3450

05:45:51,350 --> 05:45:49,520

lithium ion batteries and adapter plates

3451

05:45:54,628 --> 05:45:51,360

the first batch of those batteries were

3452

05:45:57,830 --> 05:45:54,638

launched on jaxa's htv-6 vehicle in

3453

05:46:00,390 --> 05:45:57,840

december 2016 and the first spacewalk to

3454

05:46:03,270 --> 05:46:00,400

install them was on the s4 truss in

3455

05:46:05,590 --> 05:46:03,280

january 2017 when astronauts shane

3456

05:46:09,270 --> 05:46:05,600

kimbrough and peggy whitson conducted

3457

05:46:11,030 --> 05:46:09,280

the first battery swap spacewalk

3458

05:46:14,470 --> 05:46:11,040

there's

3459

05:46:19,270 --> 05:46:17,830

i'm going to get out and head over to

3460

05:46:21,510 --> 05:46:19,280

degree

3461

05:46:23,190 --> 05:46:21,520

we agree chris with the reminders that

3462

05:46:25,750 --> 05:46:23,200

we want to stow the ingress eight to the

3463

05:46:27,270 --> 05:46:25,760

boot plate and make sure the tethers are

3464

05:46:40,310 --> 05:46:27,280

all clear which i guess they would be at

3465

05:46:45,990 --> 05:46:42,548

after completion of battery swaps on the

3466

05:46:48,548 --> 05:46:46,000

s4 truss the p4 truss was next and the

3467

05:46:51,990 --> 05:46:48,558

batteries delivered on htv 7 in

3468

05:47:00,470 --> 05:46:52,000

september 2018 were installed beginning

3469

05:47:04,390 --> 05:47:03,350

next up the p6 truss received its new

3470

05:47:07,270 --> 05:47:04,400

batteries

3471

05:47:09,270 --> 05:47:07,280

thanks to jax's htv-8 vehicle in

3472

05:47:11,430 --> 05:47:09,280

september 2019.

3473

05:47:14,788 --> 05:47:11,440

the spacewalks to replace those

3474

05:47:17,830 --> 05:47:14,798

batteries were conducted in october 2019

3475

05:47:21,830 --> 05:47:17,840

and january of this year 2020 to finish

3476

05:47:25,190 --> 05:47:23,510

chris next you'll be

3477

05:47:27,110 --> 05:47:25,200

making sure you are five feet clear and

3478

05:47:28,948 --> 05:47:27,120

when you're five feet clear with tethers

3479

05:47:35,030 --> 05:47:28,958

verified clear you can get the go to

3480

05:47:35,040 --> 05:47:39,910

okay

3481

05:47:44,868 --> 05:47:42,390

finally the last set of new batteries

3482

05:47:46,628 --> 05:47:44,878

for the s6 truss where our astronauts

3483

05:47:49,830 --> 05:47:46,638

have been working today

3484

05:47:51,030 --> 05:47:49,840

were launched on jax's htv-9 in may of

3485

05:47:53,430 --> 05:47:51,040

this year

3486

05:47:57,210 --> 05:47:53,440

and they were installed in june and july

3487

05:48:16,628 --> 05:47:57,220

by chris cassidy and bob banken

3488

05:48:16,638 --> 05:48:25,780

uh

3489

05:48:25,790 --> 05:48:33,430

[Music]

3490

05:48:36,310 --> 05:48:34,770

as well

3491

05:48:41,670 --> 05:48:36,320

[Music]

3492

05:48:46,190 --> 05:48:43,590

go to mate with the standard reminder to

3493

05:48:46,200 --> 05:48:50,830

[Music]

3494

05:48:57,510 --> 05:48:53,750

spanner spanner is not

3495

05:48:57,520 --> 05:49:00,230

data

3496

05:49:05,270 --> 05:49:02,788

we copy

3497

05:49:06,948 --> 05:49:05,280

e4 is made into j4 the bale is over

3498

05:49:11,190 --> 05:49:06,958

summer

3499

05:49:11,200 --> 05:49:14,150

okay doug

3500

05:49:18,708 --> 05:49:16,230

i am clear

3501

05:49:21,030 --> 05:49:18,718

the ingress 8 is all the way against the

3502

05:49:22,948 --> 05:49:21,040

boot plate

3503

05:49:24,628 --> 05:49:22,958

there are no tethers anyway you have a

3504

05:49:41,270 --> 05:49:24,638

go

3505

05:49:47,030 --> 05:49:44,628

if i have something weird with my

3506

05:49:49,270 --> 05:49:47,040

each other on my food

3507

05:49:57,430 --> 05:49:49,280

okay can you well yeah that's just all

3508

05:49:57,440 --> 05:50:02,628

i would say can you reach it for yeah

3509

05:50:06,470 --> 05:50:04,470

you can

3510

05:50:08,788 --> 05:50:06,480

can you bring your legs back towards me

3511

05:50:13,030 --> 05:50:10,868

and it's in front of that one

3512

05:50:17,030 --> 05:50:13,040

i don't know about that

3513

05:50:19,670 --> 05:50:17,040

oh perfect thank you

3514

05:50:21,030 --> 05:50:19,680

okay so uh chris we we check you you're

3515

05:50:23,750 --> 05:50:21,040

back there with the tether cleared we

3516

05:50:25,670 --> 05:50:23,760

want you to just pause for a few minutes

3517

05:50:27,510 --> 05:50:25,680

that's a result of looking at some of

3518

05:50:29,590 --> 05:50:27,520

the data coming down to us

3519

05:50:33,030 --> 05:50:29,600

um and as you pause we'll take the club

3520

05:50:33,040 --> 05:50:37,590

dry gauntlets in place left glove

3521

05:50:41,830 --> 05:50:38,470

it's

3522

05:50:43,190 --> 05:50:41,840

that rtv is like slowly creeping with a

3523

05:50:45,270 --> 05:50:43,200

um

3524

05:50:46,628 --> 05:50:45,280

or feel bad

3525

05:50:54,708 --> 05:50:46,638

it's

3526
05:50:54,718 --> 05:51:04,160
copy chris

3527
05:51:04,170 --> 05:51:09,670
[Music]

3528
05:51:15,590 --> 05:51:12,310
guys what can i do to help what's the

3529
05:51:20,150 --> 05:51:17,510
and chris sorry if you missed it but we

3530
05:51:21,670 --> 05:51:20,160
wanted just to pause for a few minutes

3531
05:51:23,510 --> 05:51:21,680
and then we'll come back to you with a

3532
05:51:26,390 --> 05:51:23,520
plan on in terms of how much of cleanup

3533
05:51:28,230 --> 05:51:26,400
we're going to do today

3534
05:51:37,030 --> 05:51:28,240
pausing for mint rate or pausing because

3535
05:51:46,230 --> 05:51:39,190
and uh chris the reason for the pause is

3536
05:51:46,240 --> 05:51:49,990
the cap is on j4

3537
05:51:50,000 --> 05:51:53,510
copy bob

3538
05:51:56,948 --> 05:51:55,350

and what's my next

3539

05:51:58,548 --> 05:51:56,958

just want to make sure that ta clamps

3540

05:52:00,150 --> 05:51:58,558

are all done up you might have done that

3541

05:52:03,270 --> 05:52:00,160

when we were talking about it previously

3542

05:52:08,868 --> 05:52:06,230

all three ta files are taken care of

3543

05:52:10,868 --> 05:52:08,878

copy in that case we'll go for

3544

05:52:21,530 --> 05:52:10,878

gloved hop and gauntlet from you as well

3545

05:52:21,540 --> 05:52:24,770

[Music]

3546

05:52:24,780 --> 05:52:34,628

[Applause]

3547

05:52:34,638 --> 05:52:37,830

standby

3548

05:52:41,270 --> 05:52:39,430

are we uh

3549

05:52:42,948 --> 05:52:41,280

leaving still

3550

05:52:45,110 --> 05:52:42,958

yeah i'm asking for you chris but the

3551

05:52:47,190 --> 05:52:45,120

word is still just uh to stay where you

3552

05:52:53,830 --> 05:52:47,200

are if if you want you could take some

3553

05:52:57,110 --> 05:52:55,350

are you clear on what we're doing big

3554

05:52:58,948 --> 05:52:57,120

picture right now are we working our way

3555

05:53:01,110 --> 05:52:58,958

towards going in i think we're working

3556

05:53:03,430 --> 05:53:01,120

on our way towards going in and i think

3557

05:53:05,430 --> 05:53:03,440

they're managing year or that rate for

3558

05:53:08,548 --> 05:53:05,440

the co2 elevation and they're trying to

3559

05:53:11,590 --> 05:53:08,558

decide how much cleanup to do you know

3560

05:53:13,830 --> 05:53:11,600

i think uh my next will be to start

3561

05:53:15,990 --> 05:53:13,840

doing things with this uh crew lock bag

3562

05:53:17,590 --> 05:53:16,000

i think after i report my gauntlets are

3563

05:53:20,788 --> 05:53:17,600

both up

3564

05:53:21,750 --> 05:53:20,798

and that my half is still dry

3565

05:53:23,670 --> 05:53:21,760

and

3566

05:53:26,390 --> 05:53:23,680

no

3567

05:53:31,030 --> 05:53:26,400

additional areas of rtp feeling on my

3568

05:53:34,948 --> 05:53:33,190

uh thanks for the check spot and we

3569

05:53:37,270 --> 05:53:34,958

concur with all your other words yeah

3570

05:53:38,628 --> 05:53:37,280

we're we are going back in the work is

3571

05:53:40,230 --> 05:53:38,638

all complete

3572

05:53:42,470 --> 05:53:40,240

um we'll be cleaning up the crew lock

3573

05:53:44,948 --> 05:53:42,480

bag and we're just pausing still now

3574

05:53:46,800 --> 05:53:44,958

with chris to see the co2 indication go

3575

05:53:49,670 --> 05:53:46,810

down on that canister

3576

05:53:53,350 --> 05:53:49,680

[Music]

3577

05:53:54,948 --> 05:53:53,360

so i have a go to stow the nine inch in

3578

05:53:58,788 --> 05:53:54,958

the uh

3579

05:54:00,868 --> 05:53:58,798

lock bag and recover the pgt correct

3580

05:54:02,868 --> 05:54:00,878

affirmative bob you can store the hex

3581

05:54:05,110 --> 05:54:02,878

driver on the rat in the crew lock bag

3582

05:54:09,110 --> 05:54:05,120

and then pgt back to yourself with all

3583

05:54:09,120 --> 05:54:12,640

okay

3584

05:54:16,708 --> 05:54:15,510

[Music]

3585

05:54:18,948 --> 05:54:16,718

we'll talk about how much of an

3586

05:54:23,910 --> 05:54:18,958

inventory of the kulas bag

3587

05:54:23,920 --> 05:54:31,830

for one x driver

3588

05:54:31,840 --> 05:54:39,120

we're asking bob

3589

05:54:39,130 --> 05:54:43,510

[Music]

3590

05:54:48,390 --> 05:54:46,390

all right bob uh no inventory required

3591

05:54:50,390 --> 05:54:48,400

all we'll do is put the hex driver back

3592

05:54:52,150 --> 05:54:50,400

in and uh at that point we're going to

3593

05:54:54,070 --> 05:54:52,160

start making our way back in

3594

05:54:59,030 --> 05:54:54,080

just for everyone's essay we're at 512

3595

05:55:07,270 --> 05:55:01,830

the hex driver is back into the crew

3596

05:55:07,280 --> 05:55:11,750

had a good pull test on the pip end

3597

05:55:14,548 --> 05:55:12,868

and i will

3598

05:55:23,990 --> 05:55:14,558

am i going to bring the trulock bag with

3599

05:55:27,430 --> 05:55:25,910

and chris we are leaving the crew lock

3600

05:55:29,030 --> 05:55:27,440

bag out

3601
05:55:49,670 --> 05:55:29,040
and so we're going to configure it as

3602
05:56:15,670 --> 05:55:52,310
right behind you

3603
05:56:20,708 --> 05:56:17,750
and bob i think the storage of that bag

3604
05:56:21,830 --> 05:56:20,718
is however you deem fittest i have here

3605
05:56:23,910 --> 05:56:21,840
handrail

3606
05:56:25,910 --> 05:56:23,920
2050 if you wanted to disconnect that

3607
05:56:28,788 --> 05:56:25,920
one from 2050

3608
05:56:32,830 --> 05:56:28,798
and run it down to the battery 4 or the

3609
05:56:39,030 --> 05:56:35,510
suffice okay did you just start trying

3610
05:56:55,910 --> 05:56:40,628
large

3611
05:57:00,948 --> 05:56:59,110
okay i've collected the pgt

3612
05:57:03,030 --> 05:57:00,958
it's got a red red series and an

3613
05:57:29,110 --> 05:57:03,040

adjustable tether

3614

05:57:33,910 --> 05:57:31,110

and the only other thing you want

3615

05:57:36,390 --> 05:57:33,920

flashes for uh

3616

05:57:38,070 --> 05:57:36,400

to be configured correct

3617

05:57:40,868 --> 05:57:38,080

that's correct bob the only other thing

3618

05:57:43,510 --> 05:57:40,878

would be to take that tether from 2050

3619

05:58:00,948 --> 05:57:43,520

and run it down to a dcsu or battery

3620

05:58:04,708 --> 05:58:03,430

we don't have any scoops on uh battery

3621

05:58:06,310 --> 05:58:04,718

four

3622

05:58:10,070 --> 05:58:06,320

and we'll just go to the teller points

3623

05:58:10,080 --> 05:58:28,708

we copy though

3624

05:58:33,350 --> 05:58:30,788

okay and chris uh good news on your

3625

05:58:35,350 --> 05:58:33,360

friend you're free to move again um

3626
05:58:37,270 --> 05:58:35,360
we've cleaned up as far as we're going

3627
05:58:40,150 --> 05:58:37,280
to today we're content to leave the rest

3628
05:58:41,590 --> 05:58:40,160
to follow on eba and so the big picture

3629
05:58:43,430 --> 05:58:41,600
here is that as soon as bob has the

3630
05:58:59,030 --> 05:58:43,440
crewlock bank configured we're going to

3631
05:58:59,040 --> 05:59:05,900
before kenny finds a battery

3632
05:59:05,910 --> 05:59:10,708
[Music]

3633
05:59:54,070 --> 05:59:11,910
obviously

3634
05:59:57,370 --> 05:59:56,628
gopro still working

3635
05:59:59,110 --> 05:59:57,380
see

3636
06:00:01,430 --> 05:59:59,120
[Music]

3637
06:00:03,430 --> 06:00:01,440
probably do some

3638
06:00:11,430 --> 06:00:03,440

footage and

3639

06:00:11,440 --> 06:00:27,590

put

3640

06:00:32,070 --> 06:00:29,350

actually i got a little bit out of the

3641

06:00:33,750 --> 06:00:32,080

battery and it turned itself off and i

3642

06:00:35,590 --> 06:00:33,760

turned it back on it's going to work for

3643

06:00:39,190 --> 06:00:35,600

maybe

3644

06:00:39,200 --> 06:00:43,190

a little bit of those out

3645

06:00:46,788 --> 06:00:44,868

okay i've got the crew lock bag

3646

06:00:48,948 --> 06:00:46,798

configured with the doors

3647

06:00:50,708 --> 06:00:48,958

facing inwards

3648

06:00:52,390 --> 06:00:50,718

it's using the combination of the

3649

06:00:55,030 --> 06:00:52,400

integral strap

3650

06:00:57,910 --> 06:00:55,040

adjustable small small

3651

06:01:00,708 --> 06:00:57,920

and adjustable large small

3652

06:01:04,150 --> 06:01:00,718

the small smalls going to handrail 2055

3653

06:01:05,990 --> 06:01:04,160

the intervals go into handrail 2050

3654

06:01:10,948 --> 06:01:06,000

and the large small is going to the

3655

06:01:17,110 --> 06:01:12,628

copy bob we see it and that's a good

3656

06:01:21,030 --> 06:01:19,190

i think i'm headed towards my green hook

3657

06:01:22,310 --> 06:01:21,040

is that right

3658

06:01:23,910 --> 06:01:22,320

affirmative

3659

06:01:25,910 --> 06:01:23,920

now we just want to make sure before we

3660

06:01:27,510 --> 06:01:25,920

start handing in that you do have both

3661

06:01:29,670 --> 06:01:27,520

cameras we brought out between the two

3662

06:01:32,230 --> 06:01:29,680

of you

3663

06:01:34,310 --> 06:01:32,240

i have the still camera i have the gopro

3664

06:01:36,230 --> 06:01:34,320

and the tether and the

3665

06:01:39,190 --> 06:01:36,240

butt

3666

06:01:42,788 --> 06:01:40,708

welcome back we did

3667

06:01:44,310 --> 06:01:42,798

ask and got some troubleshooting steps

3668

06:01:46,070 --> 06:01:44,320

for that camera if you're interested in

3669

06:01:47,830 --> 06:01:46,080

pursuing them

3670

06:01:52,150 --> 06:01:47,840

there's no rush to get back in we're at

3671

06:01:59,430 --> 06:01:54,788

okay i want to get to a stable

3672

06:02:05,350 --> 06:02:01,350

what do you think our consumables give

3673

06:02:21,670 --> 06:02:06,948

we're taking a closer look right now

3674

06:02:49,030 --> 06:02:45,350

uh

3675

06:02:51,830 --> 06:02:49,040

we're seeing consumables out to anywhere

3676
06:02:54,310 --> 06:02:51,840
between 6 30 and 7. we're on time to be

3677
06:02:58,070 --> 06:02:54,320
in on schedule to be in the airlock at 5

3678
06:03:00,708 --> 06:02:59,190
copy

3679
06:03:02,470 --> 06:03:00,718
okay let me uh

3680
06:03:03,750 --> 06:03:02,480
pick your troubleshooting steps if you

3681
06:03:11,910 --> 06:03:03,760
want to

3682
06:03:11,920 --> 06:03:18,548
[Applause]

3683
06:03:22,628 --> 06:03:20,230
no problem we checked green hook up

3684
06:03:24,788 --> 06:03:22,638
thanks chris and for bob i'm looking at

3685
06:03:27,190 --> 06:03:24,798
a picture here from imaging they're

3686
06:03:29,270 --> 06:03:27,200
suggesting that if you look just past

3687
06:03:31,190 --> 06:03:29,280
the button there's a slide lock

3688
06:03:32,868 --> 06:03:31,200

and the thought is that that slide lock

3689

06:03:34,948 --> 06:03:32,878

could have been locked to the slid to

3690

06:03:36,868 --> 06:03:34,958

the locked position it would take your

3691

06:03:38,708 --> 06:03:36,878

thumb movement to kind of slide it back

3692

06:03:39,480 --> 06:03:38,718

to the unlocked position before you make

3693

06:03:45,670 --> 06:03:39,490

the camera work

3694

06:03:49,430 --> 06:03:45,680

[Music]

3695

06:03:53,350 --> 06:03:49,440

yeah i did check that lock earlier just

3696

06:03:56,948 --> 06:03:55,910

looking at something like an r68 or

3697

06:03:58,948 --> 06:03:56,958

something

3698

06:04:02,948 --> 06:03:58,958

thrown up in the bottom right instead of

3699

06:04:02,958 --> 06:04:10,250

okay our 68 we're checking thanks

3700

06:04:15,590 --> 06:04:11,670

[Music]

3701

06:04:20,548 --> 06:04:18,390

roger the r68 is not there anymore

3702

06:04:23,590 --> 06:04:20,558

copy did you cycle the lock unlock or

3703

06:04:24,948 --> 06:04:23,600

did it just start working

3704

06:04:26,470 --> 06:04:24,958

well it was in the

3705

06:04:28,470 --> 06:04:26,480

unlocked position i got about two

3706

06:04:30,708 --> 06:04:28,480

pictures out of it and then it

3707

06:04:31,960 --> 06:04:30,718

stopped again

3708

06:04:38,868 --> 06:04:31,970

468.

3709

06:04:42,628 --> 06:04:41,510

okay bob uh copy thanks for trying and

3710

06:05:00,788 --> 06:04:42,638

we're ready for you to retrieve your

3711

06:05:05,910 --> 06:05:03,030

mr ready for me to

3712

06:05:07,670 --> 06:05:05,920

head towards the airlock and we just got

3713

06:05:09,590 --> 06:05:07,680

that go chris you can start heading

3714

06:05:11,270 --> 06:05:09,600

towards the airlock reminder we'll be

3715

06:05:12,948 --> 06:05:11,280

putting back your fair lead on three

3716

06:05:15,350 --> 06:05:12,958

four zero nine when you get to the cedar

3717

06:05:19,670 --> 06:05:16,230

okay

3718

06:05:28,868 --> 06:05:19,680

welcome i'm gonna make my way slowly

3719

06:05:28,878 --> 06:05:46,390

uh

3720

06:05:53,350 --> 06:05:49,110

the h fixture

3721

06:05:53,360 --> 06:05:59,670

see you next week fixture

3722

06:06:03,990 --> 06:06:01,830

it's five hours and 23 minutes into

3723

06:06:06,230 --> 06:06:04,000

today's spacewalk where the astronauts

3724

06:06:08,948 --> 06:06:06,240

completed the removal of six nickel

3725

06:06:11,030 --> 06:06:08,958

hydrogen hydrogen batteries and the

3726

06:06:13,350 --> 06:06:11,040

installation of three lithium ion

3727

06:06:15,350 --> 06:06:13,360

batteries earlier we mentioned that this

3728

06:06:18,390 --> 06:06:15,360

was the completion of those battery

3729

06:06:21,590 --> 06:06:18,400

upgrades however there was a

3730

06:06:26,150 --> 06:06:21,600

lost uh lithium-ion battery that shorted

3731

06:06:29,430 --> 06:06:26,160

in april 2019 so there is still one more

3732

06:06:31,110 --> 06:06:29,440

battery to be replaced 23 of 24 new

3733

06:06:36,788 --> 06:06:31,120

lithium ion batteries have been

3734

06:06:42,310 --> 06:06:38,470

that will be conducted on a future

3735

06:06:45,750 --> 06:06:44,150

i wonder if the button underneath the

3736

06:06:51,110 --> 06:06:45,760

blanket is

3737

06:06:51,120 --> 06:07:05,910

it could be

3738

06:07:10,390 --> 06:07:08,470

zero six zero bob roger hook closed him

3739

06:07:12,230 --> 06:07:10,400

up

3740

06:07:18,230 --> 06:07:12,240

thank you chris

3741

06:07:18,240 --> 06:07:21,990

three zero six one my

3742

06:07:29,750 --> 06:07:25,430

if your hope is closed and locked

3743

06:07:33,590 --> 06:07:31,830

bob is a reminder when you do get to the

3744

06:07:35,430 --> 06:07:33,600

both data carts you're going to be

3745

06:07:56,548 --> 06:07:35,440

pressing the inboard brake releases

3746

06:08:00,628 --> 06:07:58,628

and chris just uh just to let you know

3747

06:08:01,350 --> 06:08:00,638

we are still watching your co2 there's

3748

06:08:02,868 --> 06:08:01,360

uh

3749

06:08:05,190 --> 06:08:02,878

no change to our plan right now we're

3750

06:08:07,590 --> 06:08:05,200

heading in it has taken us uh in terms

3751

06:08:10,150 --> 06:08:07,600

of a limiting number from seven down to

3752

06:08:11,830 --> 06:08:10,160

six thirty so that's been the effect um

3753

06:08:37,750 --> 06:08:11,840

everyone here is content with the plan

3754

06:09:14,470 --> 06:08:55,110

uh

3755

06:09:14,480 --> 06:09:18,788

it was a long way out there

3756

06:09:18,798 --> 06:09:25,830

more like it's a long way back

3757

06:09:29,670 --> 06:09:27,670

that was a short view of bob benkin's

3758

06:09:30,948 --> 06:09:29,680

helmet camera he was the lead space

3759

06:09:35,670 --> 06:09:30,958

walker today

3760

06:09:40,150 --> 06:09:37,750

our coverage for today's spacewalk won't

3761

06:09:45,350 --> 06:09:40,160

end until repressurization of the

3762

06:09:45,360 --> 06:09:48,548

get my way to my

3763

06:09:48,558 --> 06:09:53,030

early location

3764

06:09:57,030 --> 06:09:55,270

cabbie bob and uh just looking forward

3765

06:09:58,548 --> 06:09:57,040

for you after you put that fair lead in

3766

06:10:00,470 --> 06:09:58,558

we're probably going to take you to the

3767

06:10:32,708 --> 06:10:00,480

toolbox to grab the hammer before

3768

06:10:32,718 --> 06:10:40,470

copy chris

3769

06:10:40,480 --> 06:10:43,750

what are the asks correct

3770

06:10:49,590 --> 06:10:45,670

affirmative chris you're using the

3771

06:10:53,590 --> 06:10:51,430

this view inside the international space

3772

06:10:55,670 --> 06:10:53,600

station flight control room

3773

06:10:58,310 --> 06:10:55,680

as teams here have been monitoring and

3774

06:10:59,910 --> 06:10:58,320

directing the space walk today

3775

06:11:01,510 --> 06:10:59,920

you can see in the red jacket there

3776

06:11:03,350 --> 06:11:01,520

that's allison bolinger she is the

3777

06:11:05,590 --> 06:11:03,360

flight director for today

3778

06:11:08,150 --> 06:11:05,600

to her right is joshua kootrick canadian

3779

06:11:09,750 --> 06:11:08,160

space agency astronaut

3780

06:11:13,510 --> 06:11:09,760

blanket

3781

06:11:13,520 --> 06:11:27,590

extremely different

3782

06:11:31,830 --> 06:11:29,750

slider

3783

06:11:35,030 --> 06:11:31,840

on the aft

3784

06:11:36,150 --> 06:11:35,040

external d-ring

3785

06:11:37,590 --> 06:11:36,160

the reel

3786

06:11:39,910 --> 06:11:37,600

is unlocked

3787

06:11:42,390 --> 06:11:39,920

copy chris that's a good config with you

3788

06:11:56,070 --> 06:11:42,400

now on the airlock d-ring extender from

3789

06:12:07,110 --> 06:11:58,070

okay i'll make my way down to the uh

3790

06:12:12,070 --> 06:12:08,390

realize

3791

06:12:14,150 --> 06:12:12,080

i've got you all i'm clear as well

3792

06:12:14,868 --> 06:12:14,160

and bob we were blocked but we can curve

3793

06:12:31,110 --> 06:12:14,878

off

3794

06:12:35,750 --> 06:12:33,430

joshua kootrick there in the

3795

06:12:37,430 --> 06:12:35,760

light blue shirt he is the voice you've

3796

06:12:38,788 --> 06:12:37,440

hear heard talking with the astronauts

3797

06:12:47,190 --> 06:12:38,798

when they've been outside the hatch

3798

06:12:50,948 --> 06:12:49,670

and to his right is nasa astronaut and

3799

06:12:52,708 --> 06:12:50,958

mclean

3800

06:12:54,628 --> 06:12:52,718

she is the capcom and will be

3801
06:12:56,708 --> 06:12:54,638
communicating with the astronauts once

3802
06:13:01,830 --> 06:12:56,718
they make it back into the hatch and

3803
06:13:08,390 --> 06:13:05,590
behind allison bolinger is the eva lead

3804
06:13:10,788 --> 06:13:08,400
spacewalk officer today that is sandra

3805
06:13:13,110 --> 06:13:10,798
moore she's been keeping tabs on the

3806
06:13:14,868 --> 06:13:13,120
crew's spacesuits as they move

3807
06:13:16,708 --> 06:13:14,878
throughout their tasks

3808
06:13:18,310 --> 06:13:16,718
and also walking through the procedures

3809
06:13:21,990 --> 06:13:18,320
and feeding that information to the

3810
06:13:24,788 --> 06:13:23,670
and by chris and i are having a good

3811
06:13:27,590 --> 06:13:24,798
time so

3812
06:13:29,830 --> 06:13:27,600
just checking in with you bring with me

3813
06:13:32,230 --> 06:13:29,840

yeah we we did not have you we just got

3814

06:13:34,150 --> 06:13:32,240

you back guys we copy you have good calm

3815

06:13:35,910 --> 06:13:34,160

bob you're going to the starboard nader

3816

06:13:46,310 --> 06:13:35,920

toolbox we expect the hammer to be on

3817

06:14:15,750 --> 06:13:48,310

range right this second i've got four

3818

06:14:15,760 --> 06:14:19,670

um

3819

06:14:25,430 --> 06:14:21,110

actually it looks like it'll be a couple

3820

06:14:29,750 --> 06:14:26,310

just

3821

06:14:32,868 --> 06:14:29,760

randomly start opening doors

3822

06:14:34,788 --> 06:14:32,878

yeah i'm not gonna do that

3823

06:14:38,548 --> 06:14:34,798

what i might do

3824

06:14:43,620 --> 06:14:38,558

is i give you the camera yep

3825

06:14:43,630 --> 06:14:47,510

[Music]

3826

06:14:53,990 --> 06:14:49,110

and bob it looks like we're back with

3827

06:15:24,470 --> 06:14:55,750

in case it didn't get through starboard

3828

06:15:33,190 --> 06:15:26,310

i've arrived at uh

3829

06:15:33,200 --> 06:15:44,868

copy that

3830

06:15:50,850 --> 06:15:46,230

a couple weeks since i opened one of

3831

06:15:58,310 --> 06:15:52,230

[Music]

3832

06:16:03,350 --> 06:16:00,470

i see the

3833

06:16:07,110 --> 06:16:05,190

a little tethered to

3834

06:16:11,350 --> 06:16:07,120

the plates because i don't

3835

06:16:20,868 --> 06:16:14,150

copy and concur

3836

06:16:28,708 --> 06:16:22,470

good call on each other into the fight

3837

06:16:28,718 --> 06:16:53,110

it comes all the way out

3838

06:16:57,510 --> 06:16:54,708

we see you grabbing the hammer bob we're

3839

06:16:59,030 --> 06:16:57,520

30 seconds from a 15 second handover

3840

06:17:02,390 --> 06:16:59,040

in the top right hand corner of your

3841

06:17:07,270 --> 06:17:02,400

screen you can see chris cassidy

3842

06:17:11,590 --> 06:17:09,270

our nasa astronauts coming up on the end

3843

06:17:13,430 --> 06:17:11,600

of their spacewalk today now at 5 hours

3844

06:17:24,150 --> 06:17:13,440

and 40 minutes since they switched to

3845

06:17:28,310 --> 06:17:26,470

today the astronauts installed a new hd

3846

06:17:31,910 --> 06:17:28,320

camera outside the international space

3847

06:17:34,310 --> 06:17:31,920

station that is working well

3848

06:17:35,750 --> 06:17:34,320

they also removed six nickel hydrogen

3849

06:17:38,310 --> 06:17:35,760

batteries from the integrated

3850

06:17:46,390 --> 06:17:38,320

electronics assembly and they installed

3851

06:17:51,750 --> 06:17:49,750

this marks 23 of 24 of the new

3852

06:17:52,628 --> 06:17:51,760

lithium-ion batteries that need to be in

3853

06:17:54,470 --> 06:17:52,638

place

3854

06:17:56,470 --> 06:17:54,480

very close to completing all of the

3855

06:18:00,150 --> 06:17:56,480

station's battery upgrades but not there

3856

06:18:04,390 --> 06:18:01,830

one of the batteries that was installed

3857

06:18:07,030 --> 06:18:04,400

last year on the 4a channel

3858

06:18:09,270 --> 06:18:07,040

tripped the bcdu or the battery charge

3859

06:18:13,030 --> 06:18:09,280

discharge unit that helps disseminate

3860

06:18:17,830 --> 06:18:15,270

that battery was disposed

3861

06:18:20,708 --> 06:18:17,840

and a new one was launched on spacex 19

3862

06:18:22,628 --> 06:18:20,718

in january 2020 so the battery needed is

3863

06:18:25,350 --> 06:18:22,638

stowed outside the international space

3864

06:18:29,990 --> 06:18:25,360

station and that will occur on a future

3865

06:18:30,000 --> 06:18:35,190

are locked

3866

06:18:41,220 --> 06:18:37,350

copy bob just back with you we heard

3867

06:18:41,230 --> 06:18:43,350

[Music]

3868

06:18:43,360 --> 06:18:46,948

that's locked

3869

06:18:50,150 --> 06:18:48,788

copy so uh you're cleared down the

3870

06:19:16,150 --> 06:18:50,160

airlock and we'll attach the waste

3871

06:19:16,160 --> 06:19:20,868

[Music]

3872

06:19:24,628 --> 06:19:23,030

you've got the thumbnail cover open and

3873

06:19:27,110 --> 06:19:24,638

you're in dressing

3874

06:19:57,270 --> 06:19:27,120

chris morning

3875

06:20:01,030 --> 06:19:59,270

and closed and locked

3876
06:20:03,780 --> 06:20:01,040
onto the

3877
06:20:05,030 --> 06:20:03,790
airlock earring extender

3878
06:20:08,070 --> 06:20:05,040
[Music]

3879
06:20:11,990 --> 06:20:09,990
we check with that you can use a tether

3880
06:20:39,990 --> 06:20:12,000
to take your green ring to the forward

3881
06:20:44,070 --> 06:20:42,150
from bob benkin's helmet camera you can

3882
06:20:46,548 --> 06:20:44,080
see the feet of nasa astronaut chris

3883
06:20:48,948 --> 06:20:46,558
cassidy who reported he could see their

3884
06:20:51,190 --> 06:20:48,958
crewmates awaiting them inside the

3885
06:20:53,510 --> 06:20:51,200
international space station

3886
06:20:55,110 --> 06:20:53,520
copy pop good config you can release

3887
06:21:08,070 --> 06:20:55,120
your yellow hook and store it on your

3888
06:21:13,670 --> 06:21:10,310

i've retrieved my

3889

06:21:17,430 --> 06:21:15,510

copy with that you're going to ingress

3890

06:21:22,150 --> 06:21:17,440

the airlock or close the thermal cover

3891

06:21:25,430 --> 06:21:24,310

so take a look at that pitch and see

3892

06:21:27,510 --> 06:21:25,440

what you think

3893

06:21:30,070 --> 06:21:27,520

it looks like it could slide in see it

3894

06:21:31,510 --> 06:21:30,080

right there yeah let me i go over and

3895

06:21:45,720 --> 06:21:31,520

you know i see it looks like it needs to

3896

06:21:45,730 --> 06:21:57,830

[Music]

3897

06:22:02,628 --> 06:22:01,430

there are pins on that mechanism for the

3898

06:22:05,830 --> 06:22:02,638

hatch

3899

06:22:08,548 --> 06:22:05,840

and one of them was uh out about an inch

3900

06:22:10,788 --> 06:22:08,558

let's push back in now

3901

06:22:12,708 --> 06:22:10,798

okay copy uh bob we're we've been

3902

06:22:26,230 --> 06:22:12,718

looking at that through your wbs so

3903

06:22:26,240 --> 06:22:33,750

hey for you

3904

06:22:47,590 --> 06:22:35,350

that area with the pit bin once more

3905

06:22:51,750 --> 06:22:49,830

on both sides

3906

06:22:52,868 --> 06:22:51,760

and they all look to both be fully

3907

06:23:00,548 --> 06:22:52,878

seated

3908

06:23:03,510 --> 06:23:01,830

i think we're just looking to make sure

3909

06:23:11,510 --> 06:23:03,520

that there's nothing abnormal there and

3910

06:23:11,520 --> 06:23:16,628

yeah it seems like maybe it just got uh

3911

06:23:20,468 --> 06:23:18,310

hold a little bit it's in as far as it

3912

06:23:22,390 --> 06:23:20,478

goes it doesn't seem like there's a ball

3913

06:23:29,590 --> 06:23:22,400

detent that holds it

3914

06:23:33,190 --> 06:23:31,750

copying the confirm first does it look

3915

06:23:38,150 --> 06:23:33,200

symmetrical with the other side the

3916

06:23:40,390 --> 06:23:38,540

thanks

3917

06:23:45,430 --> 06:23:40,400

[Music]

3918

06:23:50,150 --> 06:23:47,510

i guess uh

3919

06:23:53,910 --> 06:23:50,160

one additional word the one on

3920

06:23:57,030 --> 06:23:53,920

the forward side doesn't seem to plunger

3921

06:23:59,910 --> 06:23:57,040

the same way it goes all the way in

3922

06:24:01,270 --> 06:23:59,920

on the wvs as you can see the handle for

3923

06:24:03,910 --> 06:24:01,280

the pin

3924

06:24:06,628 --> 06:24:03,920

is only about an eighth on the other

3925

06:24:09,110 --> 06:24:06,638

side it's closer to a quarter of an inch

3926

06:24:10,948 --> 06:24:09,120

and there's a clear spring

3927

06:24:13,830 --> 06:24:10,958

picture that's there the

3928

06:24:15,030 --> 06:24:13,840

features the spring feature doesn't seem

3929

06:24:26,150 --> 06:24:15,040

like it's

3930

06:24:30,628 --> 06:24:28,548

and it looks like there are pins on the

3931

06:24:33,670 --> 06:24:30,638

other

3932

06:24:36,390 --> 06:24:33,680

lever on the hinge arm as well

3933

06:24:38,468 --> 06:24:36,400

and they appear to be they have the same

3934

06:24:39,990 --> 06:24:38,478

spring feature

3935

06:24:44,788 --> 06:24:40,000

it's a functional

3936

06:24:48,948 --> 06:24:47,190

copy that's very helpful understanding

3937

06:24:50,390 --> 06:24:48,958

the problems we've had with the camera

3938

06:24:55,270 --> 06:24:50,400

do you think it's worth trying to take a

3939

06:24:59,510 --> 06:24:57,670

chris has the camera at this point

3940

06:25:04,468 --> 06:24:59,520

if it's easily accessible we could try

3941

06:25:07,350 --> 06:25:06,468

uh the teams here would appreciate it if

3942

06:25:08,868 --> 06:25:07,360

you can

3943

06:25:13,910 --> 06:25:08,878

appreciate it

3944

06:25:13,920 --> 06:25:17,110

the camera

3945

06:25:17,120 --> 06:25:38,230

the red will reach

3946

06:25:44,868 --> 06:25:41,190

the crew investigating the exterior of

3947

06:25:47,030 --> 06:25:44,878

the hatch on the quest airlock now at 5

3948

06:25:50,070 --> 06:25:47,040

hours and 48 minutes into today's

3949

06:25:53,750 --> 06:25:52,150

stable here

3950

06:25:56,390 --> 06:25:53,760

i'll just put a brt down and then i'll

3951
06:25:56,400 --> 06:26:07,990
do it copy

3952
06:26:08,000 --> 06:26:36,370
thank you

3953
06:26:36,380 --> 06:26:42,868
[Music]

3954
06:26:42,878 --> 06:26:47,990
we're getting r68

3955
06:26:48,000 --> 06:26:52,468
copy about

3956
06:26:57,030 --> 06:26:54,868
try turning on the gopro

3957
06:26:58,628 --> 06:26:57,040
and we'll call it good

3958
06:27:00,548 --> 06:26:58,638
all right tried it it

3959
06:27:03,190 --> 06:27:00,558
it's dead it gets a flashing red light

3960
06:27:05,590 --> 06:27:03,200
and then cut and then turns off okay

3961
06:27:07,750 --> 06:27:05,600
so it's completely good

3962
06:27:34,310 --> 06:27:07,760
okay i appreciate the effort and will

3963
06:27:34,320 --> 06:28:11,830

uh

3964

06:28:19,990 --> 06:28:14,020

i love that velcro

3965

06:28:22,868 --> 06:28:21,990

good job we could do next week there's a

3966

06:28:24,150 --> 06:28:22,878

new

3967

06:28:25,350 --> 06:28:24,160

mechanism

3968

06:28:27,190 --> 06:28:25,360

here

3969

06:28:29,020 --> 06:28:27,200

alright go ahead yep the thermal cover

3970

06:28:30,628 --> 06:28:29,030

is closed and i have been dressed

3971

06:28:33,430 --> 06:28:30,638

[Music]

3972

06:28:35,750 --> 06:28:33,440

copy bob thermal cover is closed we'll

3973

06:28:37,910 --> 06:28:35,760

start stepping into the uh

3974

06:28:40,628 --> 06:28:37,920

the reconnect part so you can take the

3975

06:28:50,708 --> 06:28:40,638

scu from the pouch or move your dcm

3976
06:28:55,190 --> 06:28:52,948
five hours and 51 minutes into today's

3977
06:28:56,788 --> 06:28:55,200
spacewalk both astronauts are back

3978
06:28:59,190 --> 06:28:56,798
inside the hatch

3979
06:29:01,110 --> 06:28:59,200
wrapping up their ninth spacewalk each

3980
06:29:21,830 --> 06:29:01,120
and the hatch thermal cover is now

3981
06:29:21,840 --> 06:29:25,990
my scu is installed verified

3982
06:29:26,000 --> 06:29:35,470
copy bob

3983
06:29:35,480 --> 06:29:42,788
[Music]

3984
06:29:46,628 --> 06:29:43,830
you too

3985
06:29:48,948 --> 06:29:46,638
i see you installing

3986
06:29:51,350 --> 06:29:48,958
copy installed and locked on both the

3987
06:29:53,030 --> 06:29:51,360
note here is that a tcp setting of 8

3988
06:29:55,030 --> 06:29:53,040

will maximize

3989

06:29:57,830 --> 06:29:55,040

cooling and minimize time for scu

3990

06:30:01,270 --> 06:29:57,840

cooling with that for both of you we can

3991

06:30:06,708 --> 06:30:01,280

switch water to off and we expect an h2o

3992

06:30:06,718 --> 06:30:11,910

rewind water off pv2 water off

3993

06:30:14,830 --> 06:30:13,510

guppy we're gonna wait for two minutes

3994

06:30:21,628 --> 06:30:14,840

prior to reaching for the

3995

06:30:47,590 --> 06:30:25,190

hatch on that thick and

3996

06:31:15,850 --> 06:30:59,510

uh

3997

06:31:15,860 --> 06:31:20,948

[Music]

3998

06:31:23,750 --> 06:31:22,548

and bob we're looking at the formation

3999

06:31:24,868 --> 06:31:23,760

of the thermal cover there we're

4000

06:31:26,468 --> 06:31:24,878

wondering if you could just give it a

4001
06:31:38,468 --> 06:31:26,478
tap in the center to try to have it

4002
06:31:45,740 --> 06:31:40,150
while holding onto this drop bulb just

4003
06:31:45,750 --> 06:31:48,868
[Music]

4004
06:31:51,910 --> 06:31:50,548
you just don't want to

4005
06:31:53,910 --> 06:31:51,920
kind of hold on to it a little bit

4006
06:31:54,948 --> 06:31:53,920
otherwise it's going to come off of this

4007
06:31:58,230 --> 06:31:54,958
uh

4008
06:31:58,240 --> 06:32:10,548
so we can care that looks better to us

4009
06:32:23,830 --> 06:32:13,750
nasa astronaut bob benkin securing that

4010
06:32:26,788 --> 06:32:25,270
all right bob back with you you can

4011
06:32:30,788 --> 06:32:26,798
verify the outer hatch is clear of

4012
06:32:35,030 --> 06:32:32,788
hardware

4013
06:32:45,230 --> 06:32:35,040

verify the handle position per the hatch

4014

06:32:49,430 --> 06:32:47,670

[Music]

4015

06:32:51,350 --> 06:32:49,440

the handle position is clear to have

4016

06:32:59,350 --> 06:32:51,360

detail

4017

06:32:59,360 --> 06:33:23,430

good work

4018

06:33:38,390 --> 06:33:25,110

we need to move

4019

06:33:48,548 --> 06:33:42,050

that was good wherever you moved okay

4020

06:33:48,558 --> 06:34:11,110

you see this dog

4021

06:34:21,510 --> 06:34:13,990

i believe it's closed watched blocking

4022

06:34:26,948 --> 06:34:24,468

the house is closed and locked

4023

06:34:29,510 --> 06:34:26,958

gabib with that we're picking up in the

4024

06:34:31,510 --> 06:34:29,520

pre-repressed cue card a couple items

4025

06:34:34,628 --> 06:34:31,520

have been done we'll reconfirm so for

4026
06:34:36,420 --> 06:34:34,638
both please confirm check scu connected

4027
06:34:38,868 --> 06:34:36,430
to the dcm

4028
06:34:41,510 --> 06:34:38,878
[Music]

4029
06:34:43,910 --> 06:34:41,520
scu is connected to the dcm you need to

4030
06:34:45,110 --> 06:34:43,920
acu tv

4031
06:34:49,510 --> 06:34:45,120
for both

4032
06:34:53,350 --> 06:34:51,590
water and water is off you get your

4033
06:34:57,670 --> 06:34:53,360
water up

4034
06:35:01,430 --> 06:34:57,680
for bob check evie hatch closed unlocked

4035
06:35:07,510 --> 06:35:04,468
chris on the uia check oxygen emu one

4036
06:35:08,788 --> 06:35:07,520
and two valves both to open

4037
06:35:11,750 --> 06:35:08,798
[Music]

4038
06:35:13,510 --> 06:35:11,760

oxygen emu one and two two valves are

4039

06:35:16,310 --> 06:35:13,520

open

4040

06:35:18,708 --> 06:35:16,320

chris on the uia switch power ev1 and

4041

06:35:25,190 --> 06:35:18,718

two both to on o n

4042

06:35:29,510 --> 06:35:26,628

182

4043

06:35:33,910 --> 06:35:29,520

power switches are on

4044

06:35:36,310 --> 06:35:33,920

and the leds of the emu are eliminated

4045

06:35:41,590 --> 06:35:36,320

copy for chris check the power to ev1

4046

06:35:41,600 --> 06:35:46,788

13.6 on both

4047

06:35:51,030 --> 06:35:48,548

copy

4048

06:35:54,628 --> 06:35:51,040

for both we can switch power to scu and

4049

06:35:54,638 --> 06:36:01,510

upon coming to scu

4050

06:36:01,520 --> 06:36:05,430

v2scu

4051
06:36:09,430 --> 06:36:07,830
copy both in scu that completes the

4052
06:36:12,708 --> 06:36:09,440
pre-request i'll turn you over to doug

4053
06:36:17,750 --> 06:36:15,910
thanks josh thank you josh

4054
06:36:23,190 --> 06:36:17,760
okay gents welcome back

4055
06:36:23,200 --> 06:36:31,010
work

4056
06:36:31,020 --> 06:36:41,270
[Music]

4057
06:36:46,708 --> 06:36:44,628
bob check the ed hatch empath closed the

4058
06:36:49,590 --> 06:36:46,718
easy hatch

4059
06:36:53,350 --> 06:36:51,590
okay i'm going to start throttling the

4060
06:37:29,830 --> 06:36:53,360
equalization valve

4061
06:37:29,840 --> 06:37:32,788
it's in norm

4062
06:37:32,798 --> 06:38:08,030
good right there if you want good road

4063
06:38:08,040 --> 06:38:14,310

[Music]

4064

06:38:25,510 --> 06:38:16,628

that's another alert tone at four to

4065

06:38:25,520 --> 06:38:57,590

[Applause]

4066

06:39:01,510 --> 06:38:59,270

okay we're gonna wait two minutes now

4067

06:39:04,390 --> 06:39:01,520

for stabilization where it should be

4068

06:39:39,750 --> 06:39:04,400

roughly 5.0 on your gauges

4069

06:39:43,510 --> 06:39:41,150

and with the beginning of

4070

06:39:46,230 --> 06:39:43,520

repressurization today we have a six

4071

06:39:49,910 --> 06:39:46,240

hour space walk

4072

06:39:52,310 --> 06:39:49,920

ending at 12 10 p.m central time

4073

06:39:54,030 --> 06:39:52,320

1 10 p.m eastern time as the space

4074

06:39:57,030 --> 06:39:54,040

station was flying

4075

06:40:23,990 --> 06:39:57,040

259 statute miles over the north pacific

4076

06:40:58,070 --> 06:40:43,830

uh

4077

06:42:15,910 --> 06:41:25,830

so

4078

06:42:20,788 --> 06:42:17,590

the pressure is stable

4079

06:42:22,788 --> 06:42:20,798

check uh that your glove heaters are off

4080

06:42:26,708 --> 06:42:22,798

even one glove heaters off

4081

06:42:30,628 --> 06:42:28,868

gloves for contamination and report any

4082

06:42:33,510 --> 06:42:30,638

to houston

4083

06:42:38,548 --> 06:42:33,520

no additional contamination for ev1

4084

06:42:43,270 --> 06:42:39,990

happy both

4085

06:42:45,990 --> 06:42:43,280

okay on your dcm take your o2 actuators

4086

06:42:54,468 --> 06:42:46,000

to iv

4087

06:43:02,868 --> 06:42:58,310

dv1 is iv bb2 iv

4088

06:43:12,190 --> 06:43:04,960

copy

4089

06:43:12,200 --> 06:43:21,350

[Applause]

4090

06:43:25,430 --> 06:43:23,510

and in this side of the

4091

06:43:26,628 --> 06:43:25,440

equipment lock portion of the quest

4092

06:43:29,670 --> 06:43:26,638

airlock

4093

06:43:32,230 --> 06:43:29,680

you can see anatoly ivanishin yvonne

4094

06:43:34,468 --> 06:43:32,240

wagner and nasa's doug hurley awaiting

4095

06:43:36,310 --> 06:43:34,478

their crew members as repressurization

4096

06:43:38,868 --> 06:43:36,320

continues in the crew lock portion of

4097

06:43:40,628 --> 06:43:38,878

the quest airlock

4098

06:43:42,230 --> 06:43:40,638

today's spacewalk began when the

4099

06:43:45,110 --> 06:43:42,240

astronauts switched their suits to

4100

06:43:48,230 --> 06:43:45,120

battery power at 6 10 am central time

4101
06:43:52,468 --> 06:43:48,240
and ended exactly six hours later at 12

4102
06:43:57,030 --> 06:43:54,070
the astronauts completed all of their

4103
06:43:59,750 --> 06:43:57,040
tasks today removing six nickel hydrogen

4104
06:44:04,788 --> 06:43:59,760
batteries and installing three new

4105
06:44:08,548 --> 06:44:07,110
there will be only one more spacewalk

4106
06:44:10,628 --> 06:44:08,558
required

4107
06:44:13,430 --> 06:44:10,638
to be planned for a future date to

4108
06:44:16,788 --> 06:44:13,440
replace a failed lithium-ion battery

4109
06:44:19,110 --> 06:44:16,798
from a spacewalk in 2019

4110
06:44:20,948 --> 06:44:19,120
that battery replacement was flown on

4111
06:44:22,310 --> 06:44:20,958
spacex 19

4112
06:44:23,990 --> 06:44:22,320
and is

4113
06:44:25,430 --> 06:44:24,000

already at the international space

4114

06:44:27,400 --> 06:44:25,440

station awaiting that future

4115

06:44:44,320 --> 06:44:27,410

installation

4116

06:45:09,190 --> 06:44:56,948

[Laughter]

4117

06:45:15,110 --> 06:45:11,430

the end of the space walk today makes

4118

06:45:16,548 --> 06:45:15,120

marks this the 230th space walk of

4119

06:45:24,548 --> 06:45:16,558

assembly and maintenance at the

4120

06:45:28,628 --> 06:45:26,948

this was the sixth spacewalk of this

4121

06:45:31,430 --> 06:45:28,638

year and the third spacewalk for the

4122

06:45:33,430 --> 06:45:31,440

expedition 63 crew

4123

06:45:36,468 --> 06:45:33,440

it's the ninth spacewalk for bob bankin

4124

06:45:37,590 --> 06:45:36,478

who has a total of 55 hours and 41

4125

06:45:39,270 --> 06:45:37,600

minutes

4126
06:45:41,830 --> 06:45:39,280
of eva time

4127
06:45:44,548 --> 06:45:41,840
it was also the ninth spacewalk for nasa

4128
06:45:49,430 --> 06:45:44,558
astronaut chris cassidy who now has 49

4129
06:45:51,830 --> 06:45:49,440
hours and 22 minutes of spacewalk time

4130
06:45:53,830 --> 06:45:51,840
today's spacewalk lasted exactly six

4131
06:45:56,310 --> 06:45:53,840
hours

4132
06:45:57,830 --> 06:45:56,320
and in total that brings the total

4133
06:46:00,468 --> 06:45:57,840
amount of spacewalk time at the

4134
06:46:23,910 --> 06:46:00,478
international space station to 60 days

4135
06:47:10,708 --> 06:46:42,868
uh

4136
06:47:10,718 --> 06:47:33,030
bye

4137
06:47:38,548 --> 06:47:35,830
anybody get an alert town yet

4138
06:47:40,150 --> 06:47:38,558

yeah i had a challenge live suppose

4139

06:47:41,510 --> 06:47:40,160

whenever it gets close to the stable it

4140

06:47:43,670 --> 06:47:41,520

starts beeping

4141

06:47:47,830 --> 06:47:43,680

okay copy that we're going to run into

4142

06:47:52,548 --> 06:47:49,910

a quick view outside the space station

4143

06:47:54,868 --> 06:47:52,558

to show you the new hd camera that was

4144

06:47:57,190 --> 06:47:54,878

installed earlier today by nasa

4145

06:47:59,670 --> 06:47:57,200

astronaut chris cassidy the view you

4146

06:48:02,868 --> 06:47:59,680

have is of the blue earth below the

4147

06:48:13,830 --> 06:48:02,878

space station flying 260 statute miles

4148

06:48:18,070 --> 06:48:15,910

meanwhile inside the space station you

4149

06:48:19,990 --> 06:48:18,080

can see the hatch between the crew and

4150

06:48:22,708 --> 06:48:20,000

equipment lock portions of the quest

4151
06:48:24,628 --> 06:48:22,718
airlock is now being opened and nasa

4152
06:48:26,628 --> 06:48:24,638
astronaut chris cassidy

4153
06:48:31,830 --> 06:48:26,638
is happy to greet his crewmates on the

4154
06:48:42,310 --> 06:48:34,708
eastern airlock your step in

4155
06:48:42,320 --> 06:49:00,788
we have that in work

4156
06:49:04,070 --> 06:49:02,548
and i think you're already tracking but

4157
06:49:08,548 --> 06:49:04,080
you guys are go to continuing the

4158
06:49:12,708 --> 06:49:11,110
we're continuing

4159
06:49:15,110 --> 06:49:12,718
once again you're now hearing the voice

4160
06:49:16,468 --> 06:49:15,120
of nasa astronaut and maclean who will

4161
06:49:19,030 --> 06:49:16,478
walk the crew

4162
06:49:23,030 --> 06:49:19,040
through their procedures to doff or take

4163
06:49:27,110 --> 06:49:24,948

the astronaut and cosmonauts now moving

4164

06:49:29,270 --> 06:49:27,120

chris cassidy into the equipment lock

4165

06:49:35,990 --> 06:49:29,280

portion of the crew or of the quest

4166

06:49:40,868 --> 06:49:38,150

with the six hours of spacewalk time

4167

06:49:43,948 --> 06:49:40,878

today that puts nasa astronaut chris

4168

06:49:46,468 --> 06:49:43,958

cassidy on 12th on the all-time list for

4169

06:49:49,270 --> 06:49:46,478

cumulative spacewalk time

4170

06:50:30,310 --> 06:49:49,280

now with 49 hours and 22 minutes in the

4171

06:50:34,390 --> 06:50:32,868

that's safer backpack being removed from

4172

06:50:40,070 --> 06:50:34,400

nasa astronaut

4173

06:50:45,510 --> 06:50:41,750

we didn't see the safer or the

4174

06:50:47,190 --> 06:50:45,520

simplified aid for eva rescue used today

4175

06:50:49,190 --> 06:50:47,200

that compressed nitrogen-powered

4176

06:50:50,868 --> 06:50:49,200

backpack allows a crew member to

4177

06:50:53,190 --> 06:50:50,878

maneuver independently of the space

4178

06:50:55,990 --> 06:50:53,200

station but it's primarily intended for

4179

06:53:09,670 --> 06:50:56,000

use if a spacewalker became detached and

4180

06:53:14,548 --> 06:53:12,070

nasa astronaut bob benkin is now back

4181

06:53:17,110 --> 06:53:14,558

inside the equipment lock portion of the

4182

06:53:20,788 --> 06:53:17,120

crew lock

4183

06:53:24,468 --> 06:53:22,468

a reminder of all of all that our

4184

06:53:26,390 --> 06:53:24,478

astronauts accomplished today

4185

06:53:29,110 --> 06:53:26,400

earlier this morning nasa astronaut

4186

06:53:32,070 --> 06:53:29,120

chris cassidy installed the hd camera we

4187

06:53:34,070 --> 06:53:32,080

got a glimpse from just moments earlier

4188

06:53:35,830 --> 06:53:34,080

the nasa astronauts also removed six

4189

06:53:38,070 --> 06:53:35,840

nickel hydrogen batteries from the

4190

06:53:39,590 --> 06:53:38,080

integrated electronics assembly on the

4191

06:53:42,310 --> 06:53:39,600

s6 truss

4192

06:53:52,310 --> 06:53:42,320

they then installed three lithium ion

4193

06:53:56,310 --> 06:53:53,990

battery updates for the international

4194

06:53:59,350 --> 06:53:56,320

space station are close to complete but

4195

06:54:02,468 --> 06:53:59,360

not quite there yet this was the 11th of

4196

06:54:08,948 --> 06:54:02,478

what will require 12 spacewalks to fully

4197

06:54:13,750 --> 06:54:11,030

there's one remaining battery that a

4198

06:54:14,868 --> 06:54:13,760

lithium-ion ion battery that tripped

4199

06:54:15,830 --> 06:54:14,878

last year

4200

06:54:18,548 --> 06:54:15,840

and

4201
06:54:21,910 --> 06:54:18,558
it will need replacing on the

4202
06:54:25,510 --> 06:54:23,830
the replacement for that lithium-ion

4203
06:54:26,948 --> 06:54:25,520
battery is already aboard the space

4204
06:54:30,628 --> 06:54:26,958
station having

4205
06:54:32,708 --> 06:54:30,638
flown aboard the spacex 19 vehicle

4206
06:54:47,350 --> 06:54:32,718
it will be scheduled for a future

4207
06:54:51,910 --> 06:54:49,510
prior to any more battery repairs

4208
06:54:53,830 --> 06:54:51,920
battery replacement spacewalks however

4209
06:54:56,150 --> 06:54:53,840
banking and cassidy still have another

4210
06:54:59,270 --> 06:54:56,160
spacewalk to accomplish that'll be next

4211
06:55:01,510 --> 06:54:59,280
tuesday july 21st they will remove two

4212
06:55:03,990 --> 06:55:01,520
lifting fixtures used for ground

4213
06:55:06,868 --> 06:55:04,000

processing of the station's solar arrays

4214

06:55:10,708 --> 06:55:08,310

they will also begin preparing the

4215

06:55:13,350 --> 06:55:10,718

tranquility module of the

4216

06:55:15,910 --> 06:55:13,360

international space station for the

4217

06:55:18,310 --> 06:55:15,920

installation of a commercial airlock

4218

06:55:21,110 --> 06:55:18,320

provided by nano racks that's scheduled

4219

06:56:15,030 --> 06:55:21,120

to arrive on a spacex cargo flight later

4220

06:56:19,990 --> 06:56:17,430

another look at today's space spacewalk

4221

06:56:22,468 --> 06:56:20,000

it was the 230th spacewalk in support of

4222

06:56:25,510 --> 06:56:22,478

space station assembly and maintenance

4223

06:56:27,030 --> 06:56:25,520

and it was the sixth spacewalk this year

4224

06:56:29,830 --> 06:56:27,040

that makes it the third spacewalk for

4225

06:56:31,510 --> 06:56:29,840

expedition 63 the current crew

4226

06:56:33,910 --> 06:56:31,520

it was the ninth spacewalk for bob

4227

06:56:36,628 --> 06:56:33,920

benkin who now has a total of 55 hours

4228

06:56:39,110 --> 06:56:36,638

and 41 minutes outside the hatch that

4229

06:56:41,190 --> 06:56:39,120

makes him eighth on all-time list for

4230

06:56:43,350 --> 06:56:41,200

cumulative spacewalk time

4231

06:56:45,510 --> 06:56:43,360

nasa astronaut chris cassidy also

4232

06:56:48,788 --> 06:56:45,520

finished his ninth spacewalk today

4233

06:56:50,628 --> 06:56:48,798

totaling at 49 hours and 22 minutes

4234

06:56:53,910 --> 06:56:50,638

putting him at 12th on the all-time

4235

06:56:56,310 --> 06:56:53,920

cumulative spacewalk list

4236

06:56:59,270 --> 06:56:56,320

today's spacewalk lasted exactly six

4237

06:57:03,270 --> 06:56:59,280

hours beginning at 6 10 a.m central time

4238

06:57:05,270 --> 06:57:03,280

and ending at 12 10 p.m central time

4239

06:57:07,750 --> 06:57:05,280

that makes all of these spacewalks those

4240

06:57:09,110 --> 06:57:07,760

230 that have been conducted in support

4241

06:57:12,230 --> 06:57:09,120

of space station assembly and

4242

06:58:10,948 --> 06:57:12,240

maintenance totaling at 60 days 6 hours

4243

06:58:14,948 --> 06:58:12,788

one more look outside the international

4244

06:58:18,150 --> 06:58:14,958

space station today thanks to that new

4245

06:58:20,150 --> 06:58:18,160

and newly installed hd camera that chris

4246

06:58:24,788 --> 06:58:20,160

cassidy worked on first thing this

4247

06:58:29,670 --> 06:58:26,230

the international space station is

4248

06:58:31,830 --> 06:58:29,680

currently flying 266 statute miles over

4249

06:58:38,708 --> 06:58:31,840

the south pacific ocean giving you those

4250

06:58:41,830 --> 06:58:40,310

back inside the international space

4251
06:58:44,150 --> 06:58:41,840
station the astronauts are getting some

4252
06:58:47,270 --> 06:58:44,160
help from doug hurley who commanded the

4253
06:58:49,190 --> 06:58:47,280
canada arm 2 today and yvonne wagner

4254
06:58:51,110 --> 06:58:49,200
rose cosmos cosmonaut

4255
07:00:21,510 --> 06:58:51,120
now doffing their gloves which just

4256
07:01:27,910 --> 07:00:23,510
and the helmets for the astronauts now

4257
07:01:33,190 --> 07:01:30,868
and with nasa astronaut chris cassidy

4258
07:01:35,190 --> 07:01:33,200
and bob benkin back in the

4259
07:01:37,990 --> 07:01:35,200
crew lock or the equipment lock portion

4260
07:01:40,948 --> 07:01:38,000
of the quest airlock that wraps up

4261
07:01:43,350 --> 07:01:40,958
today's spacewalk coverage as a look

4262
07:01:45,270 --> 07:01:43,360
back the spacewalk began at 6 10 a.m

4263
07:01:48,070 --> 07:01:45,280

central time this morning and ended at

4264

07:01:51,190 --> 07:01:48,080

12 10 p.m central time making it an

4265

07:01:53,430 --> 07:01:51,200

exactly six hour spacewalk it was the

4266

07:01:56,548 --> 07:01:53,440

ninth spacewalk for each of these

4267

07:02:01,350 --> 07:01:58,788

their tasks today included the

4268

07:02:02,788 --> 07:02:01,360

installation of a new hd camera outside

4269

07:02:04,708 --> 07:02:02,798

the space station

4270

07:02:06,628 --> 07:02:04,718

and then they moved on to remove six

4271

07:02:08,948 --> 07:02:06,638

nickel hydrogen batteries from the

4272

07:02:11,430 --> 07:02:08,958

integrated electronics assembly those

4273

07:02:14,390 --> 07:02:11,440

were replaced by three lithium ion

4274

07:02:17,670 --> 07:02:15,750

that completes

4275

07:02:19,430 --> 07:02:17,680

the battery removal and replacement on

4276

07:02:21,270 --> 07:02:19,440

the s6 truss

4277

07:02:23,990 --> 07:02:21,280

however there will still be one more

4278

07:02:25,270 --> 07:02:24,000

spacewalk required to complete all of

4279

07:02:28,070 --> 07:02:25,280

the

4280

07:02:30,390 --> 07:02:28,080

battery upgrades

4281

07:02:32,868 --> 07:02:30,400

due to a failed lithium-ion battery on

4282

07:02:35,190 --> 07:02:32,878

the 4a channel last year that tripped a

4283

07:02:37,030 --> 07:02:35,200

battery charge discharge unit

4284

07:02:38,628 --> 07:02:37,040

that failed lithium-ion battery needed

4285

07:02:40,628 --> 07:02:38,638

to be discarded

4286

07:02:43,750 --> 07:02:40,638

it will be replaced in a future

4287

07:02:46,150 --> 07:02:43,760

spacewalk and the lithium-ion battery is

4288

07:02:48,788 --> 07:02:46,160

already aboard the space station after

4289

07:02:54,310 --> 07:02:48,798

arriving on spacex's 19th commercial

4290

07:02:58,628 --> 07:02:56,150

bob benkin and chris cassidy have now

4291

07:03:00,548 --> 07:02:58,638

completed three spacewalks together but

4292

07:03:04,468 --> 07:03:00,558

they have one more coming up and you can

4293

07:03:06,708 --> 07:03:04,478

watch that next tuesday july 21st

4294

07:03:16,230 --> 07:03:06,718

we'll be going live on the air at 5 a.m

4295

07:03:20,868 --> 07:03:17,990

with that we thank you for joining us

4296

07:03:23,110 --> 07:03:20,878

today for these battery replacement and

4297

07:03:27,460 --> 07:03:23,120

upgrade spacewalk

4298

07:04:10,948 --> 07:03:34,660

[Music]

4299

07:04:15,910 --> 07:04:13,510

it's all about matters of the heart hi

4300

07:04:18,390 --> 07:04:15,920

i'm nasa astronaut tracy dyson welcome

4301

07:04:20,788 --> 07:04:18,400

to station life the focus of today's