1
00:00:16,029 --> 00:00:10,190
Dragon doesn't count down

2
00:00:16,039 --> 00:00:26,640
Dragon SpaceX go for launch

3
00:00:43,690 --> 00:00:35,320
[Music]

4
00:00:46,970 --> 00:00:43,700
you are looking live at launch complex

5
00:00:49,069 --> 00:00:46,980
39a at Kennedy Space Center in just over

6
00:00:51,770 --> 00:00:49,079
20 minutes this Falcon 9 rocket will

7
00:00:54,350 --> 00:00:51,780
lift off carrying the 28th Commercial

8
00:00:56,270 --> 00:00:54,360
resupply Services Mission from both NASA

9
00:00:57,590 --> 00:00:56,280
and SpaceX to the International Space

10
00:00:59,330 --> 00:00:57,600
Station

11
00:01:02,689 --> 00:00:59,340
good morning and welcome to live

12
00:01:05,149 --> 00:01:02,699
coverage of the crs-28 launch I'm NASA's

13
00:01:07,429 --> 00:01:05,159

Jasmine Hopkins fueling of the Falcon 9

14
00:01:09,530 --> 00:01:07,439
began about 15 minutes ago and we're

15
00:01:13,670 --> 00:01:09,540
counting down to an instantaneous launch

16
00:01:16,130 --> 00:01:13,680
at 11 47 a.m eastern time this Mission

17
00:01:18,649 --> 00:01:16,140
will deliver about 7 000 pounds of

18
00:01:20,630 --> 00:01:18,659
science supplies and equipment to the

19
00:01:22,730 --> 00:01:20,640
space station and these missions help

20
00:01:24,590 --> 00:01:22,740
NASA and our partners continue research

21
00:01:27,770 --> 00:01:24,600
to better our life right here on Earth

22
00:01:29,749 --> 00:01:27,780
and help us as we explore deep space

23
00:01:31,550 --> 00:01:29,759
let's go now to SpaceX headquarters in

24
00:01:33,170 --> 00:01:31,560
Hawthorne California where Zachary

25
00:01:34,969 --> 00:01:33,180
Lupine is standing by to tell us more

26
00:01:38,690 --> 00:01:34,979
about the vehicle supporting today's

27
00:01:42,830 --> 00:01:41,030
thanks Jasmine hello everyone my name is

28
00:01:45,350 --> 00:01:42,840
Zachary Lupine and I'm an avionics

29
00:01:46,370 --> 00:01:45,360
reliability engineer here at SpaceX and

30
00:01:49,370 --> 00:01:46,380
it's great to be covering today's

31
00:01:51,649 --> 00:01:49,380
mission in partnership with NASA

32
00:01:54,050 --> 00:01:51,659
on your screen right now is a live view

33
00:01:56,210 --> 00:01:54,060
of spacex's two-stage Falcon 9 rocket

34
00:01:58,969 --> 00:01:56,220
with our Dragon spacecraft at the very

35
00:02:00,710 --> 00:01:58,979
top dragon is one of the few vehicles

36
00:02:02,569 --> 00:02:00,720
that can deliver significant cargo to

37
00:02:04,910 --> 00:02:02,579
the space station and the only vehicle

38
00:02:07,550 --> 00:02:04,920

that can deliver cargo from it and today

39
00:02:10,370 --> 00:02:07,560
dragon has visited the station 37 times

40
00:02:12,229 --> 00:02:10,380
and transported 280 thousand pounds of

41
00:02:13,430 --> 00:02:12,239
cargo back and forth from the orbiting

42
00:02:15,890 --> 00:02:13,440
Laboratory

43
00:02:18,410 --> 00:02:15,900
below dragon is our Falcon 9 vehicle

44
00:02:20,570 --> 00:02:18,420
which is actually two rockets in one the

45
00:02:22,850 --> 00:02:20,580
lower part also the largest part of the

46
00:02:25,010 --> 00:02:22,860
rocket is called the first stage it has

47
00:02:26,030 --> 00:02:25,020
nine Merlin 1D engines which accelerate

48
00:02:28,010 --> 00:02:26,040
the vehicle through the Earth's

49
00:02:29,089 --> 00:02:28,020
atmosphere and into various orbits in

50
00:02:30,710 --> 00:02:29,099
space

51
00:02:32,869 --> 00:02:30,720
the top of the first stage is the black

52
00:02:35,390 --> 00:02:32,879
interstage and above that is the Falcon

53
00:02:36,830 --> 00:02:35,400
9 second stage now the two stages will

54
00:02:38,570 --> 00:02:36,840
separate about two and a half minutes

55
00:02:40,250 --> 00:02:38,580
into flight and then the second stage

56
00:02:42,229 --> 00:02:40,260
will ignite its single Merlin vacuum

57
00:02:44,150 --> 00:02:42,239
engine or m-back engine which is the

58
00:02:46,610 --> 00:02:44,160
10th engine on the rocket to carry

59
00:02:48,290 --> 00:02:46,620
Dragon to its desired orbit

60
00:02:51,170 --> 00:02:48,300
now during today's Mission you will

61
00:02:52,970 --> 00:02:51,180
notice a shorter nozzle attached to our

62
00:02:54,410 --> 00:02:52,980
second stage we are flying a shorter

63
00:02:55,850 --> 00:02:54,420

nozzle when we don't need as much

64
00:02:57,710 --> 00:02:55,860
performance to get payloads to their

65
00:02:59,150 --> 00:02:57,720
final destination

66
00:03:01,610 --> 00:02:59,160
now for those of you following along

67
00:03:04,690 --> 00:03:01,620
today Mark spacex's 38th launch this

68
00:03:07,250 --> 00:03:04,700
year Fourth Dragon flight in 2023 and

69
00:03:09,470 --> 00:03:07,260
237th Mission overall

70
00:03:11,330 --> 00:03:09,480
Falcon 9 and dragon were both designed

71
00:03:13,070 --> 00:03:11,340
with reflight in mind and the vehicle

72
00:03:15,350 --> 00:03:13,080
Hardware is built to support multiple

73
00:03:17,509 --> 00:03:15,360
missions with minimal refurbishment

74
00:03:20,089 --> 00:03:17,519
today's dragon is flying for its fourth

75
00:03:21,470 --> 00:03:20,099
time and also Mark spacex's 20th reuse

76
00:03:23,750 --> 00:03:21,480
of the vehicle

77
00:03:25,550 --> 00:03:23,760
and the Falcon 9 first stage is flying

78
00:03:27,410 --> 00:03:25,560
for its fifth time and we plan to

79
00:03:29,570 --> 00:03:27,420
recover and fly both the vehicle and the

80
00:03:32,690 --> 00:03:29,580
spacecraft again in the future

81
00:03:34,790 --> 00:03:32,700
so far we've reflowned 170 first stages

82
00:03:36,290 --> 00:03:34,800
including both Falcon 9 and Falcon heavy

83
00:03:38,030 --> 00:03:36,300
and we're planning to recover this

84
00:03:39,949 --> 00:03:38,040
booster on our drone ship a shortfall of

85
00:03:41,750 --> 00:03:39,959
Gravitas which is currently stationed

86
00:03:43,910 --> 00:03:41,760
off the coast of Florida in the Atlantic

87
00:03:46,850 --> 00:03:43,920
Ocean and if successful this will Mark

88
00:03:47,869 --> 00:03:46,860

the 198th recovery of an orbital class

89
00:03:49,910 --> 00:03:47,879
rocket

90
00:03:52,190 --> 00:03:49,920
now as the clock ticks closer to t0

91
00:03:53,390 --> 00:03:52,200
Let's head over to NASA's Megan Cruz at

92
00:03:55,850 --> 00:03:53,400
Cape Canaveral to talk about today's

93
00:03:58,369 --> 00:03:55,860
weather Megan thank you Zach and good

94
00:04:00,229 --> 00:03:58,379
morning everyone welcome into Hangar AE

95
00:04:02,030 --> 00:04:00,239
at nearby Cape Canaveral space force

96
00:04:03,470 --> 00:04:02,040
station this is where I can monitor the

97
00:04:05,990 --> 00:04:03,480
launch team as they take us through

98
00:04:07,789 --> 00:04:06,000
today's countdown so so far hearing a

99
00:04:09,530 --> 00:04:07,799
lot of good things over the Nets the

100
00:04:11,690 --> 00:04:09,540
vehicle is healthy the team working no

101
00:04:13,070 --> 00:04:11,700
issues the range is green meaning our

102
00:04:16,069 --> 00:04:13,080
path from here to the International

103
00:04:17,689 --> 00:04:16,079
Space Station is clear and safe and the

104
00:04:19,550 --> 00:04:17,699
weather which has been the issue all

105
00:04:22,790 --> 00:04:19,560
weekend forcing the team to stand down

106
00:04:25,969 --> 00:04:22,800
Saturday and Sunday attempts today we

107
00:04:27,890 --> 00:04:25,979
are 80 percent go you can see those

108
00:04:29,930 --> 00:04:27,900
watch items on the bottom left of your

109
00:04:31,850 --> 00:04:29,940
screen launch weather officer arlena

110
00:04:33,950 --> 00:04:31,860
Moses will be monitoring a few showers

111
00:04:35,810 --> 00:04:33,960
she expects to move into the area during

112
00:04:37,370 --> 00:04:35,820
launch and I know some of you out there

113
00:04:40,010 --> 00:04:37,380

you might be thinking it seems a little

114
00:04:42,890 --> 00:04:40,020
windy out here but those winds are well

115
00:04:44,689 --> 00:04:42,900
below any concerns for launch and as for

116
00:04:46,550 --> 00:04:44,699
the weather around the booster recovery

117
00:04:48,950 --> 00:04:46,560
area yesterday uh yesterday yesterday

118
00:04:50,950 --> 00:04:48,960
high seas kept us from launching but

119
00:04:53,270 --> 00:04:50,960
today check out this live look from

120
00:04:55,430 --> 00:04:53,280
spacex's drone ship out in the Atlantic

121
00:04:57,290 --> 00:04:55,440
conditions are still a little rough out

122
00:04:59,689 --> 00:04:57,300
there but better than yesterday hence

123
00:05:01,730 --> 00:04:59,699
again that 80 percent go for a launch in

124
00:05:04,189 --> 00:05:01,740
just about 17 minutes

125
00:05:06,830 --> 00:05:04,199
so right now SpaceX is fueling Falcon 9

126
00:05:09,170 --> 00:05:06,840
rp1 or rocket grade kerosene load is

127
00:05:11,150 --> 00:05:09,180
complete super chilled liquid oxygen is

128
00:05:13,070 --> 00:05:11,160
being loaded into the first and second

129
00:05:15,170 --> 00:05:13,080
stage you see those white clouds

130
00:05:17,689 --> 00:05:15,180
completely normal that's some of the

131
00:05:19,730 --> 00:05:17,699
liquid oxygen venting off SpaceX vents

132
00:05:21,890 --> 00:05:19,740
off some of that locks to maintain the

133
00:05:23,930 --> 00:05:21,900
right pressure in the tanks and those

134
00:05:26,810 --> 00:05:23,940
clouds form when the liquid oxygen makes

135
00:05:28,730 --> 00:05:26,820
contact with Florida's humid air

136
00:05:32,390 --> 00:05:28,740
our instantaneous launch opportunity

137
00:05:33,890 --> 00:05:32,400
today 11 47 and zero seconds eastern

138
00:05:37,070 --> 00:05:33,900

time if we want to dock with the

139
00:05:39,409 --> 00:05:37,080
International Space Station on Tuesday

140
00:05:41,629 --> 00:05:39,419
June 6th for more on that let's head

141
00:05:44,830 --> 00:05:41,639
over to Shaniqua vraine inside NASA's

142
00:05:48,650 --> 00:05:47,450
thanks Megan and welcome to the

143
00:05:51,110 --> 00:05:48,660
International Space Station flight

144
00:05:52,969 --> 00:05:51,120
control room I am Shaniqua Marine live

145
00:05:54,830 --> 00:05:52,979
at the Johnson Space Center here in

146
00:05:56,150 --> 00:05:54,840
Houston Texas the team of flight

147
00:05:58,189 --> 00:05:56,160
controllers at Mission Control Houston

148
00:06:00,290 --> 00:05:58,199
today is being led by flight director

149
00:06:02,150 --> 00:06:00,300
Scott Stover teams here in Mission

150
00:06:03,770 --> 00:06:02,160
Control will really jump into action

151
00:06:06,170 --> 00:06:03,780
tomorrow night into early Tuesday

152
00:06:08,210 --> 00:06:06,180
morning as cargo Dragon approaches the

153
00:06:09,950 --> 00:06:08,220
International Space Station there are

154
00:06:12,950 --> 00:06:09,960
currently seven crew members living and

155
00:06:15,670 --> 00:06:12,960
working aboard the station Expedition 69

156
00:06:18,830 --> 00:06:15,680
consists of NASA astronaut Frank Rubio

157
00:06:20,810 --> 00:06:18,840
Dimitri Patel of Ross Cosmos sotan

158
00:06:23,150 --> 00:06:20,820
anayadi from the United Arab Emirates

159
00:06:25,730 --> 00:06:23,160
Woody hoberg and Stephen Bowen of NASA

160
00:06:27,890 --> 00:06:25,740
Andre fed yayev and Commander Sergey

161
00:06:30,170 --> 00:06:27,900
prokopiev of Ross Cosmos

162
00:06:31,430 --> 00:06:30,180
as cargo Dragon approaches the

163
00:06:33,650 --> 00:06:31,440

International Space Station and the

164
00:06:35,629 --> 00:06:33,660
morning hours of June 6. NASA astronauts

165
00:06:37,070 --> 00:06:35,639
Frank Rubio and Woody hober will be

166
00:06:38,330 --> 00:06:37,080
monitoring the arrival from the

167
00:06:40,370 --> 00:06:38,340
station's cupola

168
00:06:41,930 --> 00:06:40,380
cargo Dragon will remain attached to

169
00:06:44,210 --> 00:06:41,940
their actual Space Station

170
00:06:46,850 --> 00:06:44,220
it's Zenith Port of the harmony module

171
00:06:48,710 --> 00:06:46,860
for about one month being one of two

172
00:06:50,749 --> 00:06:48,720
dragons joining crew Dragon Endeavor

173
00:06:53,270 --> 00:06:50,759
people are being packed up with critical

174
00:06:55,249 --> 00:06:53,280
science and supplies that will Splash

175
00:06:57,110 --> 00:06:55,259
down off the coast of Florida

176
00:06:59,629 --> 00:06:57,120
for that science to be analyzed back

177
00:07:01,189 --> 00:06:59,639
here on Earth everything is still a go

178
00:07:02,689 --> 00:07:01,199
from the mission control center here in

179
00:07:04,550 --> 00:07:02,699
Houston and we're looking forward to

180
00:07:06,770 --> 00:07:04,560
welcoming another dragon to the National

181
00:07:09,230 --> 00:07:06,780
Space Station so for now we'll head back

182
00:07:12,170 --> 00:07:09,240
out to Kennedy Jasmine

183
00:07:13,790 --> 00:07:12,180
thank you Shaniqua now we are about T

184
00:07:16,370 --> 00:07:13,800
minus 14 minutes and Counting from

185
00:07:18,590 --> 00:07:16,380
liftoff of crs-28 so let's talk about

186
00:07:20,689 --> 00:07:18,600
the science new experiments will soon

187
00:07:22,370 --> 00:07:20,699
arrive on the space station thunderstorm

188
00:07:24,650 --> 00:07:22,380

observation equipment could improve

189
00:07:27,050 --> 00:07:24,660
research on Earth's climate and weather

190
00:07:29,450 --> 00:07:27,060
and astronauts will be growing a second

191
00:07:31,850 --> 00:07:29,460
generation of plant seeds in space to

192
00:07:34,249 --> 00:07:31,860
see if Gene changes transfer to Future

193
00:07:36,110 --> 00:07:34,259
generations and those are just some of

194
00:07:38,390 --> 00:07:36,120
the experiments joining the hundreds of

195
00:07:40,909 --> 00:07:38,400
ongoing investigations already aboard

196
00:07:42,710 --> 00:07:40,919
the orbiting lab this Mission will also

197
00:07:44,990 --> 00:07:42,720
increase power supply on the station

198
00:07:48,469 --> 00:07:45,000
delivering the third set of roll out

199
00:07:50,330 --> 00:07:48,479
solar arrays also known as irosas after

200
00:07:52,249 --> 00:07:50,340
being installed on upcoming spacewalks

201
00:07:54,770 --> 00:07:52,259
the arrays will roll out into position

202
00:07:56,689 --> 00:07:54,780
boosting power on the station by up to

203
00:07:59,210 --> 00:07:56,699
30 percent

204
00:08:01,490 --> 00:07:59,220
now across the country NASA and our

205
00:08:03,290 --> 00:08:01,500
partners are making small steps and

206
00:08:05,510 --> 00:08:03,300
giant leaps in preparation for the

207
00:08:07,850 --> 00:08:05,520
Artemis II crude Mission around the moon

208
00:08:11,770 --> 00:08:07,860
so let's take a look at our Artemis Moon

209
00:08:17,270 --> 00:08:14,809
all five major structures of the space

210
00:08:19,490 --> 00:08:17,280
launch system Rockets core stage have

211
00:08:22,129 --> 00:08:19,500
now been fully integrated at the michoud

212
00:08:24,589 --> 00:08:22,139
assembly facility in Louisiana

213
00:08:26,869 --> 00:08:24,599

the engine section is the most complex

214
00:08:29,390 --> 00:08:26,879
and intricate part of the core stage

215
00:08:30,430 --> 00:08:29,400
that powers the Artemis missions to the

216
00:08:33,529 --> 00:08:30,440
Moon

217
00:08:35,630 --> 00:08:33,539
rs-25 engine testing is underway at

218
00:08:36,949 --> 00:08:35,640
stennis Space Center near Bay St Louis

219
00:08:39,409 --> 00:08:36,959
Mississippi

220
00:08:41,990 --> 00:08:39,419
this test is part of a 12 test series

221
00:08:43,969 --> 00:08:42,000
that will certify the new design for

222
00:08:47,269 --> 00:08:43,979
crude Artemis missions

223
00:08:50,570 --> 00:08:47,279
the engine ran for its full planned 720

224
00:08:52,509 --> 00:08:50,580
seconds the longest duration to date

225
00:08:54,829 --> 00:08:52,519
at Kennedy Space Center in Florida

226
00:08:56,870 --> 00:08:54,839
technicians have been testing the solar

227
00:08:59,810 --> 00:08:56,880
array wings for the Artemis 2 service

228
00:09:02,810 --> 00:08:59,820
module Orion will have four solar Wings

229
00:09:04,550 --> 00:09:02,820
drawing in 11 kilowatts of power from

230
00:09:07,190 --> 00:09:04,560
the Sun

231
00:09:09,470 --> 00:09:07,200
some of the avionics for Artemis 2 have

232
00:09:11,329 --> 00:09:09,480
already been to space technicians

233
00:09:13,730 --> 00:09:11,339
finished cleaning and removing avionics

234
00:09:15,829 --> 00:09:13,740
on the Artemis 1 Crew module which will

235
00:09:24,050 --> 00:09:15,839
be used on the Orion capsule for Artemis

236
00:09:29,090 --> 00:09:26,509
now we are at T minus 12 minutes and

237
00:09:30,650 --> 00:09:29,100
Counting from the liftoff of the 28th

238
00:09:32,810 --> 00:09:30,660

Commercial resupply Services Mission

239
00:09:34,850 --> 00:09:32,820
from both NASA and SpaceX to the

240
00:09:36,410 --> 00:09:34,860
International Space Station let's bring

241
00:09:41,150 --> 00:09:36,420
back Zach now to tell us more about

242
00:09:44,269 --> 00:09:42,889
thanks Jasmine for those of you

243
00:09:46,250 --> 00:09:44,279
following along you'll know that it's

244
00:09:48,350 --> 00:09:46,260
already been a very busy year and couple

245
00:09:50,990 --> 00:09:48,360
of weeks for Dragon vehicles at the

246
00:09:53,509 --> 00:09:51,000
International Space Station crs-28 Mark

247
00:09:56,630 --> 00:09:53,519
spacex's fourth dragon mission of 2023

248
00:09:58,550 --> 00:09:56,640
following the launches of crew 6 crs-27

249
00:10:00,290 --> 00:09:58,560
and ax2

250
00:10:02,090 --> 00:10:00,300
the dragon spacecraft supporting today's

251
00:10:03,470 --> 00:10:02,100
Mission will be joining crew 6 and

252
00:10:05,930 --> 00:10:03,480
dragon Endeavor which have been on

253
00:10:08,690 --> 00:10:05,940
station since March so in order to make

254
00:10:11,329 --> 00:10:08,700
room for ax2 and crs-28 at the harmony

255
00:10:13,490 --> 00:10:11,339
Zenith port on the ISS the four members

256
00:10:16,670 --> 00:10:13,500
of cruise 6 underwent a port relocation

257
00:10:18,710 --> 00:10:16,680
on May 6th and put another way a dragon

258
00:10:20,750 --> 00:10:18,720
move parking spots to make room for the

259
00:10:23,090 --> 00:10:20,760
incoming dragons

260
00:10:25,490 --> 00:10:23,100
a few weeks later on Sunday May 21st

261
00:10:27,889 --> 00:10:25,500
dragon and the crew of ax2 lifted off

262
00:10:30,110 --> 00:10:27,899
from historic launch complex 39a at

263
00:10:32,210 --> 00:10:30,120

NASA's Kennedy Space Center and arrived

264
00:10:34,730 --> 00:10:32,220
at station about 15 and a half hours

265
00:10:36,889 --> 00:10:34,740
later and this is dragon's fastest

266
00:10:38,930 --> 00:10:36,899
launch to docking time for a human space

267
00:10:40,850 --> 00:10:38,940
flight mission

268
00:10:42,230 --> 00:10:40,860
after eight days of living and

269
00:10:44,269 --> 00:10:42,240
conducting research on the space station

270
00:10:46,670 --> 00:10:44,279
Dragon freedom undocked from the

271
00:10:48,710 --> 00:10:46,680
orbiting laboratory and returned the ax2

272
00:10:51,170 --> 00:10:48,720
crew back to planet Earth off the coast

273
00:10:53,990 --> 00:10:51,180
of Florida at 11 04 PM Eastern on

274
00:10:55,490 --> 00:10:54,000
Tuesday May 30th and this made room for

275
00:10:57,050 --> 00:10:55,500
the dragon vehicle supporting today's

276
00:10:58,850 --> 00:10:57,060
mission

277
00:11:01,190 --> 00:10:58,860
from the beginning Dragon was designed

278
00:11:03,769 --> 00:11:01,200
to fly cargo and humans to and from

279
00:11:06,170 --> 00:11:03,779
space and since dragons first visit to

280
00:11:08,449 --> 00:11:06,180
the space station in May 2012 we've come

281
00:11:10,910 --> 00:11:08,459
a long way in that time as I mentioned

282
00:11:13,009 --> 00:11:10,920
earlier dragon has visited the ISS 37

283
00:11:15,829 --> 00:11:13,019
times and nine of those missions carried

284
00:11:17,630 --> 00:11:15,839
crew in fact the first time Dragon flew

285
00:11:20,150 --> 00:11:17,640
people was just about three years ago

286
00:11:21,829 --> 00:11:20,160
with SpaceX and NASA's demo 2 mission to

287
00:11:24,230 --> 00:11:21,839
the space station

288
00:11:25,910 --> 00:11:24,240

NASA astronauts Bob benken and Doug

289
00:11:28,730 --> 00:11:25,920
Hurley took the first flight on Dragon

290
00:11:30,410 --> 00:11:28,740
on May 30th 2020 returning human space

291
00:11:32,090 --> 00:11:30,420
flight capabilities to the United States

292
00:11:34,730 --> 00:11:32,100
for the first time since the space

293
00:11:36,710 --> 00:11:34,740
shuttle retired in 2011.

294
00:11:38,269 --> 00:11:36,720
the launch of demo 2 also marked the

295
00:11:40,490 --> 00:11:38,279
first time in history that a commercial

296
00:11:41,750 --> 00:11:40,500
company successfully took astronauts to

297
00:11:43,730 --> 00:11:41,760
orbit

298
00:11:45,710 --> 00:11:43,740
and since then SpaceX has launched a

299
00:11:47,870 --> 00:11:45,720
total of 10 human spaceflight missions

300
00:11:49,550 --> 00:11:47,880
to space and to help enable greater

301
00:11:51,710 --> 00:11:49,560
flexibility for future Dragon missions

302
00:11:53,810 --> 00:11:51,720
SpaceX is preparing our neighboring pad

303
00:11:55,370 --> 00:11:53,820
space launch complex 40 at Cape

304
00:11:58,850 --> 00:11:55,380
Canaveral space force station in Florida

305
00:12:00,889 --> 00:11:58,860
to support both cargo and crew missions

306
00:12:02,690 --> 00:12:00,899
as we fly more and more people to and

307
00:12:04,310 --> 00:12:02,700
from space human space flight becomes

308
00:12:06,769 --> 00:12:04,320
more accessible and creates more

309
00:12:08,630 --> 00:12:06,779
opportunities for Humanity to become a

310
00:12:10,850 --> 00:12:08,640
space-bearing civilization

311
00:12:12,230 --> 00:12:10,860
and now I'll turn it back to Jasmine at

312
00:12:13,670 --> 00:12:12,240
KSC to take a look at one of the

313
00:12:17,150 --> 00:12:13,680

payloads flying on today's Mission

314
00:12:19,550 --> 00:12:17,160
Jasmine thank you Zach one experiment on

315
00:12:22,610 --> 00:12:19,560
crs-28 could be used to predict your

316
00:12:24,889 --> 00:12:22,620
risk for certain diseases aging and how

317
00:12:26,329 --> 00:12:24,899
our bodies heal earlier this week I got

318
00:12:29,990 --> 00:12:26,339
the chance to speak with the brains

319
00:12:32,269 --> 00:12:30,000
behind genes in space 10.

320
00:12:33,829 --> 00:12:32,279
joining us now is pristine on waha a

321
00:12:35,750 --> 00:12:33,839
high school student from East Chapel

322
00:12:37,730 --> 00:12:35,760
Hill North Carolina Welcome Christine

323
00:12:39,590 --> 00:12:37,740
thanks for having me of course happy to

324
00:12:40,970 --> 00:12:39,600
have you here so can you tell us a

325
00:12:42,769 --> 00:12:40,980
little bit about how you're feeling a

326
00:12:44,389 --> 00:12:42,779
high school student with your experiment

327
00:12:46,430 --> 00:12:44,399
heading to the International Space

328
00:12:48,710 --> 00:12:46,440
Station it's honestly a dream come true

329
00:12:50,449 --> 00:12:48,720
this idea started off originally in my

330
00:12:52,430 --> 00:12:50,459
head and now it's going to be a reality

331
00:12:54,110 --> 00:12:52,440
pretty soon so I'm really excited of

332
00:12:55,430 --> 00:12:54,120
course we love that excitement pristine

333
00:12:57,710 --> 00:12:55,440
and we cannot wait to see your dreams

334
00:12:59,990 --> 00:12:57,720
realized can you break down what is the

335
00:13:01,910 --> 00:13:00,000
genes in space 10 experiment the

336
00:13:03,470 --> 00:13:01,920
experiment involved telomeres and these

337
00:13:05,389 --> 00:13:03,480
are the repetitive sequences that cap

338
00:13:07,009 --> 00:13:05,399

the ends of our chromosomes on the earth

339
00:13:09,170 --> 00:13:07,019
tone your is normally shortened as we

340
00:13:10,910 --> 00:13:09,180
age but for astronauts in space they

341
00:13:13,009 --> 00:13:10,920
actually appear to get longer and so

342
00:13:14,449 --> 00:13:13,019
with that I developed an experiment to

343
00:13:16,910 --> 00:13:14,459
see if that process could be linked to

344
00:13:18,650 --> 00:13:16,920
the activity of stem cells now in the

345
00:13:20,930 --> 00:13:18,660
development of that experiment something

346
00:13:23,090 --> 00:13:20,940
really important was measuring telling

347
00:13:25,250 --> 00:13:23,100
your length but it turns out that isn't

348
00:13:27,710 --> 00:13:25,260
something that can really be done on the

349
00:13:29,629 --> 00:13:27,720
ISS instead experiments involving DNA

350
00:13:31,790 --> 00:13:29,639
link measurement need to be sent down to

351
00:13:33,590 --> 00:13:31,800
earth and that costs time and resources

352
00:13:35,150 --> 00:13:33,600
so with that the genes in space team

353
00:13:36,949 --> 00:13:35,160
that I got thinking what if we developed

354
00:13:39,170 --> 00:13:36,959
an experiment that could help address

355
00:13:40,730 --> 00:13:39,180
that and so we developed an experiment

356
00:13:43,009 --> 00:13:40,740
that will allow astronauts and the Isis

357
00:13:44,569 --> 00:13:43,019
to detect the fourfold difference in DNA

358
00:13:46,250 --> 00:13:44,579
length and so with that it opens the

359
00:13:49,069 --> 00:13:46,260
door up for more kinds of research to be

360
00:13:51,050 --> 00:13:49,079
done on the ISS such as into genetic

361
00:13:52,670 --> 00:13:51,060
monitoring because being in space makes

362
00:13:53,810 --> 00:13:52,680
you more prone to genetic mutation so

363
00:13:56,030 --> 00:13:53,820

that's something that can help with that

364
00:13:58,129 --> 00:13:56,040
also opens the door up for more research

365
00:13:59,210 --> 00:13:58,139
into tone years to be done and even

366
00:14:01,129 --> 00:13:59,220
broader

367
00:14:03,410 --> 00:14:01,139
Christine that is so exciting and your

368
00:14:05,449 --> 00:14:03,420
experiment was chosen out of over 600

369
00:14:06,889 --> 00:14:05,459
applications so what advice do you have

370
00:14:08,509 --> 00:14:06,899
for students who are also interested in

371
00:14:10,250 --> 00:14:08,519
this opportunity yeah I would just

372
00:14:12,230 --> 00:14:10,260
encourage other students to just explore

373
00:14:14,629 --> 00:14:12,240
their passions in space biology and

374
00:14:16,370 --> 00:14:14,639
pursue it as best as you can that's what

375
00:14:18,410 --> 00:14:16,380
I did and it led me to where I am here

376
00:14:20,389 --> 00:14:18,420
exactly very excited to have you here

377
00:14:21,710 --> 00:14:20,399
and tell me what are your plans after

378
00:14:23,750 --> 00:14:21,720
high school I mean we've got some great

379
00:14:25,430 --> 00:14:23,760
things on the horizon right yeah so in

380
00:14:28,009 --> 00:14:25,440
the fall I'll be headed off to UNC

381
00:14:30,170 --> 00:14:28,019
Chapel Hill um I'm planning on studying

382
00:14:32,090 --> 00:14:30,180
either biology or biochemistry and I'm

383
00:14:33,470 --> 00:14:32,100
really excited to get more involved with

384
00:14:36,050 --> 00:14:33,480
biological research in the future

385
00:14:36,949 --> 00:14:36,060
especially space biology of course thank

386
00:14:40,370 --> 00:14:36,959
you so much for joining us today

387
00:14:42,410 --> 00:14:40,380
Christine thanks for having me

388
00:14:44,449 --> 00:14:42,420

thanks again to pristine for speaking

389
00:14:47,210 --> 00:14:44,459
with us and she is not the only student

390
00:14:48,769 --> 00:14:47,220
experiment going up on CRS 28 stem

391
00:14:50,569 --> 00:14:48,779
engagement is very important to us here

392
00:14:51,590 --> 00:14:50,579
at Nasa for the future of the Artemis

393
00:14:54,290 --> 00:14:51,600
generation

394
00:14:56,769 --> 00:14:54,300
all right now we are just about seven

395
00:14:59,569 --> 00:14:56,779
minutes and Counting and to liftoff of

396
00:15:01,550 --> 00:14:59,579
crs28 so let's bring back Megan here on

397
00:15:03,050 --> 00:15:01,560
Florida Space Coast and Zach live at

398
00:15:04,910 --> 00:15:03,060
SpaceX headquarters in Hawthorne

399
00:15:09,710 --> 00:15:04,920
California to walk us through the final

400
00:15:14,030 --> 00:15:11,870
thanks Jasmine it's T-minus six minutes

401
00:15:15,710 --> 00:15:14,040
and 50 seconds and the SpaceX team is

402
00:15:18,290 --> 00:15:15,720
currently working no significant issues

403
00:15:20,509 --> 00:15:18,300
and the vehicle is healthy weather is

404
00:15:23,090 --> 00:15:20,519
currently 80 percent go and the range is

405
00:15:26,150 --> 00:15:23,100
ready to support today's mission

406
00:15:28,009 --> 00:15:26,160
at this point rocket propellant 1 or rp1

407
00:15:29,810 --> 00:15:28,019
fuel is completely loaded on the second

408
00:15:32,689 --> 00:15:29,820
stage and nearly complete on the first

409
00:15:34,610 --> 00:15:32,699
stage liquid oxygen or locks loading is

410
00:15:36,470 --> 00:15:34,620
currently underway on both stages and

411
00:15:38,269 --> 00:15:36,480
will complete at the T minus two minutes

412
00:15:40,430 --> 00:15:38,279
uh Mark to Launch

413
00:15:43,310 --> 00:15:40,440

we're also loading helium gas into both

414
00:15:44,930 --> 00:15:43,320
stages Falcon 9 uses helium as a

415
00:15:47,389 --> 00:15:44,940
pressure to backfill the propellant

416
00:15:49,790 --> 00:15:47,399
tanks as locks and rp1 are consumed by

417
00:15:51,650 --> 00:15:49,800
the Merlin engines during ascent helium

418
00:15:53,689 --> 00:15:51,660
load began before the broadcast went

419
00:15:56,810 --> 00:15:53,699
live and will continue to top off until

420
00:15:58,910 --> 00:15:56,820
about a minute and a half before launch

421
00:16:01,189 --> 00:15:58,920
and about 40 seconds ago SpaceX

422
00:16:03,110 --> 00:16:01,199
performed the engine chill that's when

423
00:16:05,329 --> 00:16:03,120
the team flowed a small amount of the

424
00:16:07,430 --> 00:16:05,339
super chilled liquid oxygen into the

425
00:16:09,230 --> 00:16:07,440
Merlin engines turbo pumps they're

426
00:16:11,810 --> 00:16:09,240
basically prepping the propulsion system

427
00:16:14,090 --> 00:16:11,820
for the full flow of liquid oxygen by

428
00:16:16,189 --> 00:16:14,100
doing this they avoid avoid a thermal

429
00:16:18,530 --> 00:16:16,199
shock to the system ensuring engine

430
00:16:19,910 --> 00:16:18,540
started let's go load is complete and

431
00:16:23,030 --> 00:16:19,920
you heard that call out for stage one

432
00:16:25,129 --> 00:16:23,040
fuel RP fuel load complete now Dragon

433
00:16:27,110 --> 00:16:25,139
also began its startup sequence at T

434
00:16:29,689 --> 00:16:27,120
minus 35 minutes when it coordinated

435
00:16:31,189 --> 00:16:29,699
timing with Falcon 9. the spacecraft is

436
00:16:33,710 --> 00:16:31,199
currently undergoing vehicle health

437
00:16:35,509 --> 00:16:33,720
checks it will enter terminal count at T

438
00:16:37,730 --> 00:16:35,519

minus five minutes with the next big

439
00:16:45,050 --> 00:16:37,740
step just a minute before a liftoff when

440
00:16:48,530 --> 00:16:46,670
now you may have noticed those white

441
00:16:50,569 --> 00:16:48,540
clouds around the vehicle those are

442
00:16:53,509 --> 00:16:50,579
completely normal they are chilled gas

443
00:16:55,129 --> 00:16:53,519
above the Lox tank with lox tank liquid

444
00:16:56,990 --> 00:16:55,139
surface that we bent overboard to

445
00:16:58,550 --> 00:16:57,000
maintain pressure in the tank as needed

446
00:17:00,590 --> 00:16:58,560
and when that gas comes out into contact

447
00:17:04,610 --> 00:17:00,600
with the warm humid Florida Air the air

448
00:17:04,620 --> 00:17:08,390
now

449
00:17:08,400 --> 00:17:15,450
horsepower

450
00:17:19,189 --> 00:17:16,909
[Music]

451
00:17:20,750 --> 00:17:19,199
the transporter erector or te is used

452
00:17:22,490 --> 00:17:20,760
for vehicle rollout and a route

453
00:17:24,409 --> 00:17:22,500
propellants and electrical power to the

454
00:17:26,030 --> 00:17:24,419
vehicle in preparation for launch and

455
00:17:27,949 --> 00:17:26,040
once those clamp arms have fully opened

456
00:17:31,190 --> 00:17:27,959
the te will then retract away from the

457
00:17:32,990 --> 00:17:31,200
rocket in preparation for liftoff

458
00:17:37,010 --> 00:17:33,000
we have a hot mic on the countdown that

459
00:17:40,850 --> 00:17:37,020
all parties check your key panels

460
00:17:49,430 --> 00:17:42,650
we should see those clamp arms opening

461
00:17:53,029 --> 00:17:51,470
those clamp arms are located just below

462
00:18:01,070 --> 00:17:53,039
the trunk of the vehicle which is

463
00:18:05,029 --> 00:18:02,690

and there you can see those clamp arms

464
00:18:06,950 --> 00:18:05,039
beginning to open around the booster

465
00:18:08,930 --> 00:18:06,960
now in these last few minutes before t0

466
00:18:11,150 --> 00:18:08,940
Falcon 9 is performing final hell checks

467
00:18:12,890 --> 00:18:11,160
on its primary Communications avionics

468
00:18:14,990 --> 00:18:12,900
and propulsion systems in preparation

469
00:18:17,090 --> 00:18:15,000
for flight and we may hear callouts the

470
00:18:22,010 --> 00:18:17,100
engines are sufficiently chilled as we

471
00:18:26,270 --> 00:18:24,409
clamp arm should be fully open and the

472
00:18:33,529 --> 00:18:26,280
transporter erector that strong back is

473
00:18:37,070 --> 00:18:35,390
now you may have noticed in some of

474
00:18:39,289 --> 00:18:37,080
these shots the Falcon 9 booster

475
00:18:40,850 --> 00:18:39,299
supporting today's mission is covered in

476
00:18:43,029 --> 00:18:40,860
quite a bit of soot and that is because

477
00:18:47,390 --> 00:18:43,039
the previously supported NASA crew 5

478
00:18:55,190 --> 00:18:47,400
gps3 space vehicle 6 in marsat 6f2 and

479
00:18:59,450 --> 00:18:57,049
and you can see that strong back slowly

480
00:19:04,310 --> 00:18:59,460
reclining away from the vehicle stage

481
00:19:08,870 --> 00:19:06,409
will bring about seven thousand pounds

482
00:19:10,850 --> 00:19:08,880
of Hardware crew supplies and science to

483
00:19:13,190 --> 00:19:10,860
the space station one research project

484
00:19:15,710 --> 00:19:13,200
will study the effects of space on human

485
00:19:18,110 --> 00:19:15,720
DNA another will study the effects on

486
00:19:20,270 --> 00:19:18,120
plant DNA findings from both could help

487
00:19:22,490 --> 00:19:20,280
us Advance things here on Earth but also

488
00:19:24,529 --> 00:19:22,500

prepare us for future farther missions

489
00:19:26,210 --> 00:19:24,539
into space

490
00:19:27,830 --> 00:19:26,220
and dragon will be docked to the space

491
00:19:33,049 --> 00:19:27,840
station for about a month before

492
00:19:37,730 --> 00:19:35,630
now checkouts of the second stage thrust

493
00:19:40,669 --> 00:19:37,740
vector control actuators are now

494
00:19:43,250 --> 00:19:40,679
underway this is often referred to as an

495
00:19:46,010 --> 00:19:43,260
engine wiggle test this is when SpaceX

496
00:19:48,049 --> 00:19:46,020
moves the thrust nozzle slightly to make

497
00:19:51,110 --> 00:19:48,059
sure the guidance Hardware is ready for

498
00:19:55,310 --> 00:19:53,390
SpaceX will do the exact same test on

499
00:20:12,289 --> 00:19:55,320
the first stage engines but that happens

500
00:20:16,010 --> 00:20:14,510
now dragon is also performing its final

501
00:20:23,990 --> 00:20:16,020
health checks to make sure all of the

502
00:20:27,529 --> 00:20:25,789
call out that stage two locks loading is

503
00:20:30,710 --> 00:20:27,539
complete that wraps up pellet loading

504
00:20:32,330 --> 00:20:30,720
for both stages of the falcon 9.

505
00:20:33,770 --> 00:20:32,340
and as I mentioned earlier you may have

506
00:20:36,049 --> 00:20:33,780
seen those white clouds around the

507
00:20:37,370 --> 00:20:36,059
vehicle ground gas close up what you see

508
00:20:39,409 --> 00:20:37,380
are the chilled gas

509
00:20:41,029 --> 00:20:39,419
above the Lox tank liquid surface that

510
00:20:42,529 --> 00:20:41,039
we vent overboard and when that gas

511
00:20:44,210 --> 00:20:42,539
comes out in contact with the warm

512
00:20:47,750 --> 00:20:44,220
Florida Air the air condenses into

513
00:20:53,270 --> 00:20:49,789

now dragon is about to transition into

514
00:20:55,370 --> 00:20:53,280
internal power also Falcon 9 computers

515
00:20:58,130 --> 00:20:55,380
will then enter startup mode which is

516
00:21:00,350 --> 00:20:58,140
when the Falcon 9 flight computers take

517
00:21:02,090 --> 00:21:00,360
control of the countdown guiding the

518
00:21:03,710 --> 00:21:02,100
rocket through the last seconds before

519
00:21:05,270 --> 00:21:03,720
liftoff you should hear a call out about

520
00:21:07,430 --> 00:21:05,280
startup shortly

521
00:21:09,409 --> 00:21:07,440
Falcon 9 is in startup

522
00:21:11,390 --> 00:21:09,419
dragon is in countdown

523
00:21:14,270 --> 00:21:11,400
both stages are now pressurizing for

524
00:21:16,730 --> 00:21:14,280
launch at T-minus 45 seconds we'll hear

525
00:21:19,250 --> 00:21:16,740
the SpaceX launch director verify go for

526
00:21:22,490 --> 00:21:20,750
for lunch

527
00:21:23,930 --> 00:21:22,500
there you go and at launched the

528
00:21:27,529 --> 00:21:23,940
International Space Station will be

529
00:21:33,890 --> 00:21:27,539
flying 260 miles over the North Atlantic

530
00:21:33,900 --> 00:21:48,590
T-minus 30 seconds

531
00:21:48,600 --> 00:21:54,970
15 seconds

532
00:22:06,890 --> 00:22:02,169
nine eight seven six five four three

533
00:22:10,850 --> 00:22:06,900
two one ignition engine full power and

534
00:22:14,090 --> 00:22:10,860
liftoff of crs-28 go falcon go dragon

535
00:22:16,190 --> 00:22:14,100
liftoff of about 7 000 pounds of science

536
00:22:45,470 --> 00:22:16,200
at the cargo

537
00:22:49,970 --> 00:22:48,169
at t plus 40 seconds Falcon 9 has

538
00:22:53,210 --> 00:22:49,980

successfully lifted off from historic

539
00:22:55,970 --> 00:22:53,220
launch complex 39a in Florida

540
00:22:57,649 --> 00:22:55,980
and we're now coming up on Max Q in

541
00:22:59,570 --> 00:22:57,659
about 20 seconds from now and this is

542
00:23:00,890 --> 00:22:59,580
the point of Maximum aerodynamic

543
00:23:07,149 --> 00:23:00,900
pressure that the vehicle will go

544
00:23:07,159 --> 00:23:14,930
traveling faster than the speed of sound

545
00:23:14,940 --> 00:23:19,070
that's cute

546
00:23:23,690 --> 00:23:20,810
and there you've heard the call out for

547
00:23:25,730 --> 00:23:23,700
Max Q coming up next are three events

548
00:23:27,890 --> 00:23:25,740
back to back the first of which is main

549
00:23:29,990 --> 00:23:27,900
engine cutoff or Mikko and this is when

550
00:23:31,370 --> 00:23:30,000
all nine Merlin 1D engines on first

551
00:23:33,350 --> 00:23:31,380
stage shutdown

552
00:23:35,210 --> 00:23:33,360
after those nine engine shutdown the

553
00:23:36,950 --> 00:23:35,220
first and second stages will separate

554
00:23:39,110 --> 00:23:36,960
and this is also called out over the

555
00:23:40,970 --> 00:23:39,120
Nets as stage separation

556
00:23:43,010 --> 00:23:40,980
from there the second stage will ignite

557
00:23:45,289 --> 00:23:43,020
its Merlin vacuum engine to boost Dragon

558
00:23:47,690 --> 00:23:45,299
to low earth orbit during SES or second

559
00:23:55,970 --> 00:23:47,700
engine start one and this whole sequence

560
00:23:59,630 --> 00:23:57,830
should be expecting that call out for

561
00:24:08,210 --> 00:23:59,640
main engine cut off in about 40 seconds

562
00:24:11,870 --> 00:24:10,190
some amazing views of our Falcon 9

563
00:24:26,029 --> 00:24:11,880

vehicle as it takes our Dragon

564
00:24:39,830 --> 00:24:27,890
and in just about 10 seconds we should

565
00:24:49,070 --> 00:24:41,810
Nico

566
00:24:49,080 --> 00:24:53,690
in recognition

567
00:24:57,409 --> 00:24:55,310
and there you heard those call-outs and

568
00:24:59,810 --> 00:24:57,419
probably saw on your screen main engine

569
00:25:03,470 --> 00:24:59,820
cutoff followed by stage separation and

570
00:25:08,750 --> 00:25:05,510
as I mentioned earlier we are flying an

571
00:25:12,890 --> 00:25:08,760
mvac nozzle a shortened m-back nozzle on

572
00:25:16,850 --> 00:25:14,630
if you're just tuning in you're watching

573
00:25:18,409 --> 00:25:16,860
a live webcast for the 28th commercial

574
00:25:21,529 --> 00:25:18,419
resupply mission to the International

575
00:25:24,470 --> 00:25:21,539
Space Station for NASA this is spacex's

576
00:25:26,090 --> 00:25:24,480
38th mission for 2023 and the Fourth

577
00:25:28,549 --> 00:25:26,100
Dragon flight to the International Space

578
00:25:30,529 --> 00:25:28,559
Station this year we lifted off from

579
00:25:32,990 --> 00:25:30,539
Kennedy Space Center's historic launch

580
00:25:36,230 --> 00:25:33,000
complex 39a just about three and a half

581
00:25:40,370 --> 00:25:38,570
now on your screen on the left side you

582
00:25:41,529 --> 00:25:40,380
can see our Falcon 9 first stage which

583
00:25:44,269 --> 00:25:41,539
is going to

584
00:25:45,649 --> 00:25:44,279
descend back towards Earth and the

585
00:25:47,149 --> 00:25:45,659
second stage on the right side of your

586
00:25:49,070 --> 00:25:47,159
screen which is carrying the dragon

587
00:25:51,950 --> 00:25:49,080
spacecraft

588
00:25:54,289 --> 00:25:51,960

now as a reminder today's Michigan fight

589
00:25:55,970 --> 00:25:54,299
for this Falcon 9 booster Falcon 9

590
00:25:59,630 --> 00:25:55,980
booster which previously supported the

591
00:26:04,490 --> 00:25:59,640
crew 5 gps3 space vehicle 6 in marsat

592
00:26:07,970 --> 00:26:05,990
in order to make its way back to our

593
00:26:10,190 --> 00:26:07,980
drone ship a shortfall of Gravitas the

594
00:26:12,529 --> 00:26:10,200
Falcon 9 first stage has two more Burns

595
00:26:14,570 --> 00:26:12,539
to execute the first is the entry burn

596
00:26:15,590 --> 00:26:14,580
where three of the Merlin engines will

597
00:26:17,630 --> 00:26:15,600
reignite

598
00:26:19,190 --> 00:26:17,640
this helps slow the stage down as it

599
00:26:21,950 --> 00:26:19,200
re-enters the upper part of the Earth's

600
00:26:25,970 --> 00:26:23,930
the entry burn is followed by The

601
00:26:27,710 --> 00:26:25,980
Landing burn and this is a single engine

602
00:26:29,570 --> 00:26:27,720
burn that brings the vehicle speed down

603
00:26:34,190 --> 00:26:29,580
rapidly in order to land on the Drone

604
00:26:37,430 --> 00:26:36,110
now occasionally with the Falcon 9 first

605
00:26:40,250 --> 00:26:37,440
stage on the left side of your screen

606
00:26:42,649 --> 00:26:40,260
you may see some small white Puffs and

607
00:26:45,470 --> 00:26:42,659
those are nitrogen gas bursts that are

608
00:26:47,690 --> 00:26:45,480
used for attitude control

609
00:26:49,730 --> 00:26:47,700
you can also see there on your screen a

610
00:26:51,169 --> 00:26:49,740
pair of the Hypersonic grid fins

611
00:26:52,610 --> 00:26:51,179
falconized is equipped with four of

612
00:26:54,409 --> 00:26:52,620
these grid fins which are comprised of

613
00:26:56,690 --> 00:26:54,419

titanium and they are positioned near

614
00:26:58,669 --> 00:26:56,700
the top of the first stage once in the

615
00:27:00,769 --> 00:26:58,679
atmosphere stage one is only using the

616
00:27:02,690 --> 00:27:00,779
grid fins for steering as it makes its

617
00:27:04,789 --> 00:27:02,700
return to Earth and these grid fins

618
00:27:15,529 --> 00:27:04,799
Orient the rocket during re-entry and

619
00:27:20,450 --> 00:27:17,870
now the Falcon 9 first stage has nine

620
00:27:24,769 --> 00:27:20,460
Merlin 1D engines and and each engine

621
00:27:27,289 --> 00:27:24,779
generates about 192 000 pounds of thrust

622
00:27:31,610 --> 00:27:27,299
on the second stage is the mbac engine

623
00:27:44,510 --> 00:27:34,070
and that uh and the vacuum engine

624
00:27:48,529 --> 00:27:46,669
next major Milestone is going to be the

625
00:27:58,789 --> 00:27:48,539
first stage entry burn which will take

626
00:28:12,350 --> 00:28:01,010
there you can see an amazing view of our

627
00:28:15,830 --> 00:28:14,269
the Falcon 9 first stage which is not

628
00:28:17,810 --> 00:28:15,840
currently on your screen has reached

629
00:28:19,669 --> 00:28:17,820
apogee and is now beginning its descent

630
00:28:21,830 --> 00:28:19,679
back towards Earth

631
00:28:35,269 --> 00:28:21,840
the second stage is continuing to take

632
00:28:39,769 --> 00:28:37,370
we should see that first stage entry

633
00:29:09,830 --> 00:28:39,779
burn begin in about 15 seconds from now

634
00:29:13,310 --> 00:29:11,630
stage one entry second stage on the

635
00:29:15,230 --> 00:29:13,320
right side of your screen

636
00:29:16,850 --> 00:29:15,240
and there's that call out for stage one

637
00:29:18,529 --> 00:29:16,860
entry burn startup on the left side of

638
00:29:20,149 --> 00:29:18,539

your screen the second stage is

639
00:29:23,510 --> 00:29:20,159
continuing to take our Dragon spacecraft

640
00:29:27,769 --> 00:29:25,909
now again the entry burn is the first of

641
00:29:29,750 --> 00:29:27,779
two Burns that the Falcon 9 booster

642
00:29:30,950 --> 00:29:29,760
performs before landing on our drone

643
00:29:34,669 --> 00:29:30,960
ship

644
00:29:38,330 --> 00:29:36,470
and there's that confirmation of stage

645
00:29:40,190 --> 00:29:38,340
one entry burn shutdown

646
00:29:41,690 --> 00:29:40,200
as we get closer to First Stage Landing

647
00:29:43,130 --> 00:29:41,700
it's good to note that the Falcon 9

648
00:29:44,750 --> 00:29:43,140
first stage is equipped with four

649
00:29:47,630 --> 00:29:44,760
Landing legs made of state-of-the-art

650
00:29:49,010 --> 00:29:47,640
carbon fiber with aluminum honeycomb

651
00:29:50,389 --> 00:29:49,020
these Landing links are placed

652
00:29:52,190 --> 00:29:50,399
symmetrically around the base of the

653
00:29:53,210 --> 00:29:52,200
rocket and deployed just prior to

654
00:29:54,950 --> 00:29:53,220
Landing

655
00:29:57,710 --> 00:29:54,960
and if successful

656
00:29:59,149 --> 00:29:57,720
this Landing will Mark the 198th time

657
00:30:01,130 --> 00:29:59,159
that we've recovered a first stage

658
00:30:09,470 --> 00:30:01,140
booster including both Falcon 9 and

659
00:30:15,169 --> 00:30:11,810
we are about 25 seconds away from that

660
00:30:15,179 --> 00:30:19,490
stage when transonic

661
00:30:22,850 --> 00:30:21,230
now as the rocket descends through the

662
00:30:24,889 --> 00:30:22,860
Earth's atmosphere this really puts

663
00:30:26,210 --> 00:30:24,899

deceleration into perspective in the

664
00:30:27,830 --> 00:30:26,220
span of less than a minute will have

665
00:30:29,930 --> 00:30:27,840
reduced from twice the speed of a jet

666
00:30:31,250 --> 00:30:29,940
all the way down to zero as the rocket

667
00:30:35,630 --> 00:30:31,260
lands

668
00:30:46,130 --> 00:30:35,640
call out that the second engine will

669
00:30:46,140 --> 00:31:02,570
Patron Landing burn

670
00:31:02,580 --> 00:31:10,730
planting like deploy

671
00:31:15,169 --> 00:31:12,310
stage one lightning

672
00:31:16,430 --> 00:31:15,179
and and there you have it the Falcon 9

673
00:31:18,470 --> 00:31:16,440
first stage that supported today's

674
00:31:21,169 --> 00:31:18,480
Mission has landed for its fifth time

675
00:31:24,529 --> 00:31:21,179
having previously supported crew 5 gps3

676
00:31:26,630 --> 00:31:24,539
space vehicle 6 in marsat 6f2 and a

677
00:31:29,090 --> 00:31:26,640
starlink mission today's Landing also

678
00:31:31,190 --> 00:31:29,100
marks the 198th successful Landing for

679
00:31:33,470 --> 00:31:31,200
an orbital class rocket you may have

680
00:31:36,649 --> 00:31:33,480
also heard confirmation of good orbit

681
00:31:38,630 --> 00:31:36,659
acquisition signal to Finland

682
00:31:40,970 --> 00:31:38,640
at t plus nine minutes and 30 seconds

683
00:31:43,549 --> 00:31:40,980
into the mission we are coming up on the

684
00:31:45,470 --> 00:31:43,559
last major task for stage two commanding

685
00:31:48,049 --> 00:31:45,480
separation of dragon a couple minutes

686
00:31:50,149 --> 00:31:48,059
from now and we expect to have video of

687
00:31:55,549 --> 00:31:50,159
Dragon separation from the top of the

688
00:31:59,870 --> 00:31:57,950

crs-28 will be joining the crew 6

689
00:32:01,130 --> 00:31:59,880
vehicle currently on orbit I could also

690
00:32:03,950 --> 00:32:01,140
we'll be back to having two dragon

691
00:32:06,590 --> 00:32:03,960
spacecraft two dragon spacecraft docked

692
00:32:09,110 --> 00:32:06,600
at the International Space Station

693
00:32:11,149 --> 00:32:09,120
as for cargo today we will be delivering

694
00:32:13,490 --> 00:32:11,159
more than 7 000 pounds of science

695
00:32:15,409 --> 00:32:13,500
research crew supplies and vehicle

696
00:32:16,730 --> 00:32:15,419
Hardware to the orbital laboratory and

697
00:32:18,769 --> 00:32:16,740
its crew

698
00:32:22,070 --> 00:32:18,779
to date SpaceX has sent and brought back

699
00:32:36,470 --> 00:32:22,080
over 280 000 pounds of crew and cargo to

700
00:32:39,769 --> 00:32:37,730
and we should be seeing Dragon

701
00:32:43,310 --> 00:32:39,779
separation about a minute and a half

702
00:32:46,909 --> 00:32:45,470
as a reminder this is the fourth flight

703
00:32:50,570 --> 00:32:46,919
for this Dragon capsule having

704
00:32:53,510 --> 00:32:50,580
previously supported crs-21 crs-23 and

705
00:32:56,210 --> 00:32:53,520
CRS 25 to the space station

706
00:33:01,850 --> 00:32:56,220
today's flight also marks the 20th reuse

707
00:33:06,169 --> 00:33:04,370
now dragon has 16 Draco thrusters on

708
00:33:08,630 --> 00:33:06,179
board each with the capability to

709
00:33:10,789 --> 00:33:08,640
deliver 90 pounds of force there are

710
00:33:12,590 --> 00:33:10,799
four pairs of three thrusters spaced

711
00:33:14,210 --> 00:33:12,600
evenly around the capsule as well as

712
00:33:16,130 --> 00:33:14,220
four forward bulkhead thrusters

713
00:33:18,169 --> 00:33:16,140

underneath the nose cone

714
00:33:20,509 --> 00:33:18,179
now notably today's Dragon does not have

715
00:33:22,490 --> 00:33:20,519
super Draco thrusters seats or life

716
00:33:24,710 --> 00:33:22,500
support systems as it's not carrying

717
00:33:26,330 --> 00:33:24,720
crew and this saves on weight and space

718
00:33:34,130 --> 00:33:26,340
and also allows for a faster

719
00:33:38,149 --> 00:33:36,289
while initial designs of dragon carried

720
00:33:40,190 --> 00:33:38,159
solar arrays extended outward from the

721
00:33:42,889 --> 00:33:40,200
trunk the cylindrical structure located

722
00:33:44,570 --> 00:33:42,899
directly behind the Dragon capsule

723
00:33:46,549 --> 00:33:44,580
the current dragon has these arrays

724
00:33:48,169 --> 00:33:46,559
fixed directly to the trunk and you may

725
00:33:49,850 --> 00:33:48,179
see at some point both a light and the

726
00:33:51,470 --> 00:33:49,860
dark side of the trunk and that dark

727
00:33:53,269 --> 00:33:51,480
side is actually those solar panels

728
00:33:59,330 --> 00:33:53,279
while the light side is a radiator to

729
00:34:03,230 --> 00:34:01,490
and speaking of solar panels uh you can

730
00:34:04,970 --> 00:34:03,240
see on your screen right now the solar

731
00:34:08,149 --> 00:34:04,980
panels that we will install on the

732
00:34:12,230 --> 00:34:10,369
once the Dragon capsule reaches the ISS

733
00:34:14,389 --> 00:34:12,240
it will be able to autonomously dock

734
00:34:16,250 --> 00:34:14,399
using its navigation sensors Center Line

735
00:34:17,930 --> 00:34:16,260
camera and light detection and ranging

736
00:34:19,550 --> 00:34:17,940
or lidar equipment

737
00:34:23,329 --> 00:34:19,560
and there you can see on your screen

738
00:34:25,010 --> 00:34:23,339

dragons separating from the second stage

739
00:34:26,990 --> 00:34:25,020
well that's going to do it for me here

740
00:34:30,050 --> 00:34:27,000
in Hawthorne have your next Milestone

741
00:34:31,270 --> 00:34:30,060
coming up is the is the dragon nose cone

742
00:34:34,190 --> 00:34:31,280
opening sequence

743
00:34:36,169 --> 00:34:34,200
and navigational sensors

744
00:34:39,970 --> 00:34:36,179
and I'll toss it over to Shaniqua in

745
00:34:42,530 --> 00:34:39,980
Houston to talk us through it Shaniqua

746
00:34:43,669 --> 00:34:42,540
thanks Zach everything is still going

747
00:34:45,829 --> 00:34:43,679
well back here in Mission Control

748
00:34:47,930 --> 00:34:45,839
Houston right after a dragon separated

749
00:34:49,909 --> 00:34:47,940
it began a series of automatic checkouts

750
00:34:52,190 --> 00:34:49,919
including small firings of the Draco

751
00:34:54,589 --> 00:34:52,200
maneuvering thrusters the next Milestone

752
00:34:56,270 --> 00:34:54,599
is no scone deploy the nose cone

753
00:34:58,550 --> 00:34:56,280
protects that docking hardware and

754
00:35:01,190 --> 00:34:58,560
Rendezvous and tracking elements on top

755
00:35:02,630 --> 00:35:01,200
of dragon during a set the nose cone

756
00:35:05,870 --> 00:35:02,640
deploy uncovers the four forward

757
00:35:08,750 --> 00:35:05,880
bulkhead thrusters which Dragon will use

758
00:35:10,430 --> 00:35:08,760
for its major burn maneuvers

759
00:35:13,790 --> 00:35:10,440
and we do have confirmation that that

760
00:35:17,210 --> 00:35:13,800
nose cone deploy sequence has begun

761
00:35:20,510 --> 00:35:17,220
again major burn Maneuvers will be

762
00:35:22,310 --> 00:35:20,520
dragon nose cone deploy uncovers those

763
00:35:24,770 --> 00:35:22,320

uh major Hardware

764
00:35:26,390 --> 00:35:24,780
it will also uncover Dragon Eyes that

765
00:35:28,730 --> 00:35:26,400
Rendezvous and tracking Hardware that

766
00:35:30,770 --> 00:35:28,740
allows Dragon to know where it is in

767
00:35:32,990 --> 00:35:30,780
space and how to find the space station

768
00:35:34,970 --> 00:35:33,000
once opened the nose cone will stay in

769
00:35:37,190 --> 00:35:34,980
that position until the very end of its

770
00:35:38,390 --> 00:35:37,200
Mission closing prior to re-entry to

771
00:35:41,030 --> 00:35:38,400
provide some of that additional

772
00:35:42,349 --> 00:35:41,040
protection to the same Hardware during

773
00:35:44,569 --> 00:35:42,359
re-entry

774
00:35:47,210 --> 00:35:44,579
it does take about five minutes for a

775
00:35:49,609 --> 00:35:47,220
nose cone to open we are looking for 12

776
00:35:52,370 --> 00:35:49,619
hooks two sets of six that will open

777
00:35:57,109 --> 00:35:52,380
here and once open we will see the nose

778
00:36:02,930 --> 00:36:00,530
again that sequence has begun

779
00:36:04,370 --> 00:36:02,940
and we'll be waiting to hear once all 12

780
00:36:06,530 --> 00:36:04,380
hooks are open

781
00:36:09,589 --> 00:36:06,540
and we will see movement of the nose

782
00:36:12,410 --> 00:36:09,599
cone as all 12 hooks open after nose

783
00:36:14,390 --> 00:36:12,420
cone deploy is Cargo Dragon will be

784
00:36:18,530 --> 00:36:14,400
safely on its way to their actual Space

785
00:36:22,190 --> 00:36:20,329
if you're just joining us NASA and

786
00:36:25,010 --> 00:36:22,200
spacex's 28th commercial resupply

787
00:36:27,890 --> 00:36:25,020
Mission launched from pad 39a at the

788
00:36:30,890 --> 00:36:27,900

Kennedy Space Center in Florida at 10 47

789
00:36:33,650 --> 00:36:30,900
a.m Central Time 11 47 a.m eastern time

790
00:36:37,750 --> 00:36:33,660
and is currently in orbit we're standing

791
00:36:41,569 --> 00:36:39,829
dragon is filled with over seven

792
00:36:43,310 --> 00:36:41,579
thousand pounds of cargo and supplies

793
00:36:45,770 --> 00:36:43,320
including a variety of science

794
00:36:47,630 --> 00:36:45,780
investigations hardware and Fresh Foods

795
00:36:49,370 --> 00:36:47,640
for the crew on station

796
00:36:52,250 --> 00:36:49,380
some of those Fresh Foods that will be

797
00:36:55,609 --> 00:36:52,260
delivered include apples grapefruits

798
00:36:57,470 --> 00:36:55,619
oranges cherry tomatoes and blueberries

799
00:36:59,930 --> 00:36:57,480
Dragon will dock to the Zenith or

800
00:37:02,329 --> 00:36:59,940
space-facing side of the harmony module

801
00:37:05,450 --> 00:37:02,339
just recently freed up by Dragon Freedom

802
00:37:07,790 --> 00:37:05,460
which brought up the Axiom 2 crew

803
00:37:09,829 --> 00:37:07,800
the Axiom 2 crew aboard the SpaceX

804
00:37:12,650 --> 00:37:09,839
Dragon Freedom spacecraft safely slashed

805
00:37:16,250 --> 00:37:12,660
down off the coast of Florida at 1004 PM

806
00:37:17,690 --> 00:37:16,260
Central Time 1104 PM Eastern on May 30th

807
00:37:19,790 --> 00:37:17,700
2023.

808
00:37:21,770 --> 00:37:19,800
the crew's return officially concluded

809
00:37:24,589 --> 00:37:21,780
the second all-private astronaut mission

810
00:37:27,470 --> 00:37:24,599
to the International Space Station

811
00:37:29,630 --> 00:37:27,480
Axiom 2 commander and retired NASA

812
00:37:32,109 --> 00:37:29,640
astronaut Peggy Whitson ended her

813
00:37:35,030 --> 00:37:32,119

eight-day Mission with a new record of

814
00:37:38,150 --> 00:37:35,040
675 days in space

815
00:37:40,730 --> 00:37:38,160
the most of any American or woman

816
00:37:42,829 --> 00:37:40,740
and while we're discussing records NASA

817
00:37:44,569 --> 00:37:42,839
astronaut Frank Rubio will end his

818
00:37:46,970 --> 00:37:44,579
mission this fall breaking a record of

819
00:37:49,430 --> 00:37:46,980
his own Rubio will return to Earth

820
00:37:52,490 --> 00:37:49,440
aboard a Russian soyuz spacecraft no

821
00:37:54,109 --> 00:37:52,500
earlier than September 27th and in his

822
00:37:57,170 --> 00:37:54,119
stay aboard the orbiting laboratory

823
00:37:59,150 --> 00:37:57,180
having logged a total of at least 371

824
00:38:01,069 --> 00:37:59,160
days in orbit

825
00:38:05,329 --> 00:38:01,079
that tour of Duty will beat the previous

826
00:38:08,510 --> 00:38:05,339
record of 355 days set by NASA astronaut

827
00:38:10,730 --> 00:38:08,520
Mark vandehe in 2022.

828
00:38:12,890 --> 00:38:10,740
joining Rubio on station are six other

829
00:38:15,109 --> 00:38:12,900
crew members living and working aboard

830
00:38:17,990 --> 00:38:15,119
the National Space Station

831
00:38:21,109 --> 00:38:18,000
Expedition 69 also includes Dimitri

832
00:38:23,150 --> 00:38:21,119
patelan from Ross Cosmos sotan arayi

833
00:38:26,569 --> 00:38:23,160
from the United Arab Emirates

834
00:38:29,150 --> 00:38:26,579
Woody hoberg and Stephen Bowen of NASA

835
00:38:33,710 --> 00:38:29,160
Andre fredierev and Commander Sergey

836
00:38:37,970 --> 00:38:35,810
All crew members are awake and after

837
00:38:40,190 --> 00:38:37,980
enjoying a midday meal some are headed

838
00:38:45,290 --> 00:38:40,200

to exercise while others are headed to

839
00:38:50,329 --> 00:38:48,050
NASA astronauts Stephen Bowen and Woody

840
00:38:52,730 --> 00:38:50,339
hoberg are prepping for a June 9th

841
00:38:54,710 --> 00:38:52,740
spacewalk to install one of two new

842
00:38:58,490 --> 00:38:54,720
rollout solar arrays on the space

843
00:39:00,890 --> 00:38:58,500
station starboard side trust structure

844
00:39:03,050 --> 00:39:00,900
this cargo resupply will bring up two

845
00:39:06,050 --> 00:39:03,060
new rollout solar arrays packed inside

846
00:39:11,690 --> 00:39:06,060
its unpressurized trunk

847
00:39:15,710 --> 00:39:14,030
and again if you're just joining us we

848
00:39:22,430 --> 00:39:15,720
are currently waiting on nose cone

849
00:39:26,750 --> 00:39:24,470
that sequence has begun just a few

850
00:39:29,870 --> 00:39:26,760
minutes ago and it does take about five

851
00:39:36,069 --> 00:39:29,880
minutes for the nose cone to fully

852
00:39:41,870 --> 00:39:39,290
after confirmation of nose cone that the

853
00:39:43,609 --> 00:39:41,880
nose cone has been deployed we will have

854
00:39:45,650 --> 00:39:43,619
a special guest to join me for a quick

855
00:39:47,450 --> 00:39:45,660
interview

856
00:39:49,370 --> 00:39:47,460
he will talk a little more on what

857
00:40:00,910 --> 00:39:49,380
dragon is bringing up and its benefits

858
00:40:05,329 --> 00:40:03,050
and back here in the National Space

859
00:40:07,790 --> 00:40:05,339
Station room flight control room while

860
00:40:10,849 --> 00:40:07,800
we are waiting for that nose cone to

861
00:40:13,190 --> 00:40:10,859
officially be fully deployed

862
00:40:14,990 --> 00:40:13,200
we will have flight controllers

863
00:40:17,150 --> 00:40:15,000

that are monitoring the systems on

864
00:40:23,569 --> 00:40:17,160
station itself ahead of dragon's arrival

865
00:40:28,190 --> 00:40:25,849
yeah

866
00:40:30,470 --> 00:40:28,200
again once the nose cone is fully

867
00:40:33,410 --> 00:40:30,480
deployed

868
00:40:34,130 --> 00:40:33,420
we will have dragon cargo dragon on its

869
00:40:38,150 --> 00:40:34,140
way

870
00:40:42,410 --> 00:40:40,069
once Dragon does cross that approach

871
00:40:44,210 --> 00:40:42,420
ellipsoid which is that mythical spear

872
00:40:45,349 --> 00:40:44,220
around the space station flight

873
00:40:47,990 --> 00:40:45,359
controllers here in Mission Control

874
00:40:51,950 --> 00:40:48,000
Houston will begin joint operations with

875
00:40:56,329 --> 00:40:53,990
again we will have NASA astronauts Frank

876
00:40:58,370 --> 00:40:56,339
Rubio in Woody hoberg who will be

877
00:40:59,690 --> 00:40:58,380
monitoring the approach and arrival of

878
00:41:02,450 --> 00:40:59,700
dragon

879
00:41:05,569 --> 00:41:02,460
with a plain docking time on Tuesday

880
00:41:11,210 --> 00:41:05,579
morning at 4 50 a.m Central Time 5 50

881
00:41:15,170 --> 00:41:13,310
once cargo dragon is docked to the

882
00:41:17,270 --> 00:41:15,180
station Rubio and hoberg will begin

883
00:41:18,589 --> 00:41:17,280
hatch operations to open the hatches

884
00:41:29,470 --> 00:41:18,599
between the International Space Station

885
00:41:34,609 --> 00:41:31,670
and again this is live Mission

886
00:41:35,870 --> 00:41:34,619
operations of the crs-28 resupply

887
00:41:38,810 --> 00:41:35,880
mission to the International Space

888
00:41:40,670 --> 00:41:38,820

Station if you are just joining us we

889
00:41:48,349 --> 00:41:40,680
are currently waiting on the nose cone

890
00:42:15,970 --> 00:41:50,450
and we currently see that nose cone

891
00:42:51,670 --> 00:42:19,010
and we have confirmation of nose cone

892
00:42:57,230 --> 00:42:54,410
and there we have it we have nose cone

893
00:42:59,089 --> 00:42:57,240
confirmation of deployment

894
00:43:00,410 --> 00:42:59,099
and now joining me on the phone is

895
00:43:02,150 --> 00:43:00,420
manager of the International Space

896
00:43:05,930 --> 00:43:02,160
Station transportation and integration

897
00:43:08,630 --> 00:43:05,940
office Phil Dempsey hi Phil

898
00:43:11,030 --> 00:43:08,640
hey Shaniqua

899
00:43:13,190 --> 00:43:11,040
thanks for joining me and as we get into

900
00:43:15,890 --> 00:43:13,200
it can you outline the major activities

901
00:43:17,569 --> 00:43:15,900
for the crew with crs-28 I know we

902
00:43:19,309 --> 00:43:17,579
talked some of what's being brought up

903
00:43:21,230 --> 00:43:19,319
but can you go a little more in depth

904
00:43:24,770 --> 00:43:21,240
for us

905
00:43:26,690 --> 00:43:24,780
sure the uh during this Mission there's

906
00:43:29,150 --> 00:43:26,700
uh quite a bit of research that has to

907
00:43:31,849 --> 00:43:29,160
be done so the crew will start you know

908
00:43:34,010 --> 00:43:31,859
unloading the the cargo Dragon they'll

909
00:43:36,470 --> 00:43:34,020
be actually quite a bit of research

910
00:43:38,150 --> 00:43:36,480
that's done in time to complete it and

911
00:43:40,370 --> 00:43:38,160
return those samples to the ground at

912
00:43:43,190 --> 00:43:40,380
the end of this documentation as well as

913
00:43:44,930 --> 00:43:43,200

that we're carrying up some irosis uh

914
00:43:46,910 --> 00:43:44,940
external solar rays that has to be

915
00:43:50,290 --> 00:43:46,920
installed with a couple of Evas during

916
00:43:55,250 --> 00:43:53,510
of course and these resupply missions

917
00:43:57,290 --> 00:43:55,260
just like you mentioned are delivering

918
00:43:59,750 --> 00:43:57,300
science hardware and other cargo to the

919
00:44:02,690 --> 00:43:59,760
station I know one key delivery on

920
00:44:04,730 --> 00:44:02,700
crs-28 includes a pair of ISS rollout

921
00:44:06,530 --> 00:44:04,740
solar rays can you discuss what the plan

922
00:44:09,410 --> 00:44:06,540
is for these arrays and what the

923
00:44:12,290 --> 00:44:09,420
importance is for station

924
00:44:14,990 --> 00:44:12,300
yeah absolutely so as you know the Isis

925
00:44:16,910 --> 00:44:15,000
program is extending operations to 2030.

926
00:44:19,250 --> 00:44:16,920
the robustness of the vehicle has been

927
00:44:21,890 --> 00:44:19,260
one of the key factors in our ability to

928
00:44:23,870 --> 00:44:21,900
do so one thing we've seen is expected

929
00:44:26,510 --> 00:44:23,880
degradation of solar array performance

930
00:44:28,309 --> 00:44:26,520
over time so these are roses will enable

931
00:44:30,950 --> 00:44:28,319
us to get back to beginning of Life

932
00:44:33,410 --> 00:44:30,960
power levels with this pair on the

933
00:44:35,870 --> 00:44:33,420
SpaceX 28 Mission we'll have augmented

934
00:44:37,490 --> 00:44:35,880
six of our eight horror channels further

935
00:44:39,290 --> 00:44:37,500
enabling the ISS program to continue

936
00:44:41,089 --> 00:44:39,300
full research utilization without

937
00:44:43,510 --> 00:44:41,099
interruption that's why we're here in

938
00:44:46,609 --> 00:44:43,520

the first place

939
00:44:48,230 --> 00:44:46,619
thank you and as always I know it's a

940
00:44:49,970 --> 00:44:48,240
busy time aboard the International Space

941
00:44:52,490 --> 00:44:49,980
Station with cargo vehicles coming and

942
00:44:54,710 --> 00:44:52,500
going and multiple planned spacewalks

943
00:44:56,510 --> 00:44:54,720
how complex will the next few months be

944
00:44:58,609 --> 00:44:56,520
for the station program and the global

945
00:45:00,349 --> 00:44:58,619
partnership

946
00:45:01,849 --> 00:45:00,359
sure well there's always there's a lot

947
00:45:03,890 --> 00:45:01,859
going on you know first we have the

948
00:45:05,690 --> 00:45:03,900
spacewalk to install the eye roses which

949
00:45:07,430 --> 00:45:05,700
I just mentioned those are actually some

950
00:45:10,069 --> 00:45:07,440
of the most complex that our crew

951
00:45:12,230 --> 00:45:10,079
performs not long after completing those

952
00:45:14,870 --> 00:45:12,240
we're looking forward to the ng-19 cargo

953
00:45:17,150 --> 00:45:14,880
resupply Mission later this summer I

954
00:45:19,490 --> 00:45:17,160
bring up more critical supplies and and

955
00:45:21,530 --> 00:45:19,500
research and then we're not too far away

956
00:45:23,510 --> 00:45:21,540
from the next crew rotation missions on

957
00:45:25,550 --> 00:45:23,520
both the SpaceX crew dragon and the

958
00:45:27,890 --> 00:45:25,560
soyuz spacecraft so we're definitely

959
00:45:29,510 --> 00:45:27,900
looking at some complex choreography but

960
00:45:32,150 --> 00:45:29,520
we've got an extremely capable teams

961
00:45:34,670 --> 00:45:32,160
across the world making it all happen

962
00:45:37,910 --> 00:45:34,680
thank you so much and we again

963
00:45:39,770 --> 00:45:37,920

appreciate you for joining us today

964
00:45:41,569 --> 00:45:39,780
all right well thank you have a great

965
00:45:44,270 --> 00:45:41,579
day it's good to see a good launch today

966
00:45:47,210 --> 00:45:44,280
perfect thanks Phil joining us join us

967
00:45:48,829 --> 00:45:47,220
again early Tuesday morning at 3 15 a.m

968
00:45:51,950 --> 00:45:48,839
central time for live coverage of

969
00:45:53,390 --> 00:45:51,960
docking for crs-28 again everything is

970
00:45:55,309 --> 00:45:53,400
on track on the International Space

971
00:45:57,290 --> 00:45:55,319
Station side so that'll do it for us

972
00:45:59,690 --> 00:45:57,300
here at Mission Control Houston now back

973
00:46:01,970 --> 00:45:59,700
over to you Kennedy Jasmine

974
00:46:04,010 --> 00:46:01,980
thank you Shaniqua yet another beautiful

975
00:46:05,390 --> 00:46:04,020
launch from Florida Space Coast and

976
00:46:08,089 --> 00:46:05,400
that's going to wrap up our launch

977
00:46:10,430 --> 00:46:08,099
coverage of the 28th Commercial resupply

978
00:46:12,290 --> 00:46:10,440
Services Mission from NASA and SpaceX

979
00:46:13,609 --> 00:46:12,300
thanks again for joining us and we'll

980
00:46:17,150 --> 00:46:13,619
leave you with a replay of today's

981
00:47:16,150 --> 00:46:17,160
launch until next time go NASA go SpaceX

982
00:47:21,230 --> 00:47:19,309
40 seconds Falcon 9 has successfully