1
00:00:00,000 --> 00:00:06,930
Hey everyone! I'm

2
00:00:06,965 --> 00:00:07,884
Logan. And I'm Josh.

3
00:00:07,919 --> 00:00:09,343
We work at Marshall

4
00:00:09,378 --> 00:00:10,380
Space Flight Center.

5
00:00:10,415 --> 00:00:11,534
And we're working on a

6
00:00:11,569 --> 00:00:13,180
robotic lander prototype.

7
00:00:13,215 --> 00:00:14,639
Some of you may not know

8
00:00:14,674 --> 00:00:15,582
everything that's going

9
00:00:15,617 --> 00:00:16,652
on at NASA right now, so

10
00:00:16,687 --> 00:00:17,870
we wanted to make a video

11
00:00:17,905 --> 00:00:18,910
of our project, cause it's

12
00:00:18,945 --> 00:00:19,935
pretty cool!

13
00:00:19,970 --> 00:00:21,596

This test bed will fly

14
00:00:21,631 --> 00:00:22,798
here on Earth, but an

15
00:00:22,833 --> 00:00:24,348
actual space-worthy vehicle

16
00:00:24,383 --> 00:00:26,686
could fly missions to our

17
00:00:26,721 --> 00:00:27,901
Moon, the moons of mars, or

18
00:00:27,936 --> 00:00:29,502
any other airless body!

19
00:00:29,537 --> 00:00:32,078
Like an asteroid.

20
00:00:32,113 --> 00:00:33,708
Our prototype uses 90%

21
00:00:33,743 --> 00:00:34,925
hydrogen peroxide which is

22
00:00:34,960 --> 00:00:36,795
30 times more concentrated

23
00:00:36,830 --> 00:00:38,204
than what you get at the

24
00:00:38,239 --> 00:00:39,486
drug store. People like

25
00:00:39,521 --> 00:00:41,325
to call it a green propellant

26
00:00:41,360 --> 00:00:42,383
(green propellant), that’s

27
00:00:42,418 --> 00:00:43,582
right. And we spray this

28
00:00:43,617 --> 00:00:44,876
peroxide over a catalyst bed

29
00:00:44,911 --> 00:00:46,716
of silver screens to cause a

30
00:00:46,751 --> 00:00:47,917
chemical reaction, just like

31
00:00:47,952 --> 00:00:49,931
diet coke and mentos, and we

32
00:00:49,966 --> 00:00:51,631
get thrust!

33
00:00:51,666 --> 00:00:54,204
Before every test, Wayne uses

34
00:00:54,239 --> 00:00:57,758
a rubber glove as a visual

35
00:00:57,793 --> 00:00:59,007
indicator to make sure all of

36
00:00:59,042 --> 00:01:00,556
our thrusters are actually

37
00:01:00,591 --> 00:01:02,287
working correctly. Make’s sure

38
00:01:02,322 --> 00:01:04,141

all the valves work.

39
00:01:04,176 --> 00:01:05,455
Before every flight, we have

40
00:01:05,490 --> 00:01:07,133
to warm the catalyst beds.

41
00:01:07,168 --> 00:01:08,350
You'll see some liquid peroxide

42
00:01:08,385 --> 00:01:10,157
come out, because before the

43
00:01:10,192 --> 00:01:11,614
catalyst beds are fully warmed

44
00:01:11,649 --> 00:01:13,211
up, the peroxide doesn't

45
00:01:13,246 --> 00:01:15,100
decompose all the way, but once

46
00:01:15,135 --> 00:01:16,574
they're warmed up, you'll get

47
00:01:16,609 --> 00:01:17,741
nothing but super-heated steam

48
00:01:17,776 --> 00:01:19,213
out the end.

49
00:01:19,248 --> 00:01:22,461
Ok, the test is about to start.

50
00:01:22,496 --> 00:01:24,141
Control room, take it away.

51
00:01:24,176 --> 00:01:25,935
We will confirm Go/No Go for test.

52
00:01:25,970 --> 00:01:28,061
Operations Engineer? Go. Flight

53
00:01:28,096 --> 00:01:30,124
Software is go. AE? Go. Data?

54
00:01:30,159 --> 00:01:32,110
Data is go. Command? Command's go.

55
00:01:32,145 --> 00:01:34,109
Systems Engineering is go. RCL?

56
00:01:34,144 --> 00:01:35,901
Go. System safety? Go. Test

57
00:01:35,936 --> 00:01:37,262
director? Test director is go.

58
00:01:37,297 --> 00:01:38,590
Test conductor is go.

59
00:01:38,625 --> 00:01:52,734
ED02, ED03, EA04, EA05, EA06, 7,

60
00:01:52,769 --> 00:02:05,662
EA08, EA09, EA11, EA12, ED01, ED02,

61
00:02:05,697 --> 00:02:14,255
ED03, Opening the thrust…EGC.

62
00:02:14,290 --> 00:02:21,228
Nice.

63
00:02:21,263 --> 00:02:25,630

Strapdown test 4 is a simulation

64
00:02:25,665 --> 00:02:27,916
of a full length flight. If you

65
00:02:27,951 --> 00:02:29,535
look at the infrared video, you

66
00:02:29,570 --> 00:02:30,925
can see the thrusters pulsing

67
00:02:30,960 --> 00:02:32,048
just like it would if it was

68
00:02:32,083 --> 00:02:33,918
actually flying. The lander

69
00:02:33,953 --> 00:02:35,165
thinks that it’s flying around

70
00:02:35,200 --> 00:02:36,621
right now, so the occasional

71
00:02:36,656 --> 00:02:37,934
burst of steam that you see

72
00:02:37,969 --> 00:02:38,990
are the thrusters trying to

73
00:02:39,025 --> 00:02:41,167
keep it on course.

74
00:02:41,202 --> 00:02:42,767
These first few tests have the

75
00:02:42,802 --> 00:02:44,766
lander bolted to the ground.

76
00:02:44,801 --> 00:02:46,381
This way we can fire all of

77
00:02:46,416 --> 00:02:48,206
our thrusters and even if

78
00:02:48,241 --> 00:02:49,644
something were to go wrong,

79
00:02:49,679 --> 00:02:51,502
it’s not going to go anywhere.

80
00:02:51,537 --> 00:02:59,632
Strapdown test 5 proves our

81
00:02:59,667 --> 00:03:01,373
ability to abort any test in

82
00:03:01,408 --> 00:03:03,197
case an emergency arises.

83
00:03:03,232 --> 00:03:15,467
Countdown, nominal, emergency.

84
00:03:15,502 --> 00:03:19,068
And we have landed.

85
00:03:19,103 --> 00:03:20,174
Thanks for watching! And tune

86
00:03:20,209 --> 00:03:21,519
in next time when we’ll take