



1
00:00:04,160 --> 00:00:07,909
t minus 30 seconds

2
00:00:14,230 --> 00:00:08,950
long

3
00:00:14,240 --> 00:00:19,189
20.

4
00:00:24,230 --> 00:00:21,750
15. d minus 15 seconds standing by for

5
00:00:25,750 --> 00:00:24,240
terminal count

6
00:00:26,710 --> 00:00:25,760
t minus 10

7
00:00:27,509 --> 00:00:26,720
9

8
00:00:28,550 --> 00:00:27,519
8

9
00:00:29,509 --> 00:00:28,560
7

10
00:00:31,269 --> 00:00:29,519
6

11
00:00:32,310 --> 00:00:31,279
five four

12
00:00:33,270 --> 00:00:32,320
three

13
00:00:34,310 --> 00:00:33,280

two

14

00:00:37,750 --> 00:00:34,320

one

15

00:00:40,790 --> 00:00:37,760

main engine ignition and liftoff of the

16

00:00:43,510 --> 00:00:40,800

atlas v rocket with lro l cross

17

00:00:53,910 --> 00:00:43,520

america's first step of a lasting return

18

00:01:00,709 --> 00:00:55,590

and we have the pitch program here

19

00:01:04,549 --> 00:01:02,630

rd180 is operating more

20

00:01:09,830 --> 00:01:04,559

speeds are stable

21

00:01:14,070 --> 00:01:11,750

plus battery voltages are stable tank

22

00:01:37,190 --> 00:01:14,080

pressures look good rd180 is continuing

23

00:01:37,200 --> 00:02:06,870

all systems are stable at this point

24

00:02:17,910 --> 00:02:08,630

as we pass through maximum dynamic

25

00:02:21,030 --> 00:02:19,350

and the boosters throttle down right

26
00:02:23,589 --> 00:02:21,040
down schedule engine response looks

27
00:02:26,309 --> 00:02:23,599
typical pump speeds are stable injector

28
00:02:29,270 --> 00:02:26,319
pressures look good

29
00:02:32,710 --> 00:02:29,280
current altitude is 11.3 nautical miles

30
00:02:34,630 --> 00:02:32,720
downrange position is 9.9 miles

31
00:02:43,270 --> 00:02:34,640
velocity is

32
00:02:47,030 --> 00:02:45,030
and we've begun flying the alpha by

33
00:02:49,430 --> 00:02:47,040
stirring phase of flight vehicle body

34
00:02:50,949 --> 00:02:49,440
rates continue to look good

35
00:02:55,910 --> 00:02:50,959
battery voltages are stable tank

36
00:03:05,270 --> 00:02:58,710
booster has enabled closed loop steering

37
00:03:09,509 --> 00:03:06,949
booster engine operation continues to

38
00:03:18,149 --> 00:03:09,519

look very good as we

39

00:03:22,949 --> 00:03:20,309

we've already the rcs pyro valve and

40

00:03:25,270 --> 00:03:22,959

that system has pressurized

41

00:03:33,270 --> 00:03:25,280

according to its normal

42

00:03:41,910 --> 00:03:35,990

and the booster has begun its 180 degree

43

00:03:41,920 --> 00:04:06,789

booster engine continues to operate well

44

00:04:13,110 --> 00:04:08,630

vehicle is still operating well as we

45

00:04:24,629 --> 00:04:14,869

blue space cooldown is underway pump

46

00:04:32,710 --> 00:04:27,430

coming up on our 4.6 g throttle segment

47

00:04:32,720 --> 00:04:39,430

and boost phase cooldown is complete

48

00:04:44,469 --> 00:04:41,749

and we have pico entrance shutdown looks

49

00:04:48,310 --> 00:04:46,790

we have retros and stage separation

50

00:04:50,150 --> 00:04:48,320

looks clean

51
00:04:56,390 --> 00:04:50,160
box and fuel pre-start chain two purge

52
00:05:03,749 --> 00:04:58,550
we have ignition and full thrust on the

53
00:05:07,830 --> 00:05:05,909
we have payload fairing jettison

54
00:05:13,670 --> 00:05:07,840
two good brake wires and good visual

55
00:05:18,310 --> 00:05:15,990
centaur has begun uh closed loop

56
00:05:20,230 --> 00:05:18,320
steering the vehicle baggage look good

57
00:05:22,070 --> 00:05:20,240
centaur pu is being commanded to fixed

58
00:05:31,990 --> 00:05:22,080
angles for the early portion of this

59
00:05:36,629 --> 00:05:34,710
centaur has begun eu limiting

60
00:05:38,230 --> 00:05:36,639
it's operating at the oxidizer rich

61
00:05:46,230 --> 00:05:38,240
condition which is expected for this

62
00:05:49,670 --> 00:05:48,070
rl10 operation looks very good at this

63
00:05:53,830 --> 00:05:49,680

point

64

00:05:55,990 --> 00:05:53,840

continue to run oxidizer rich