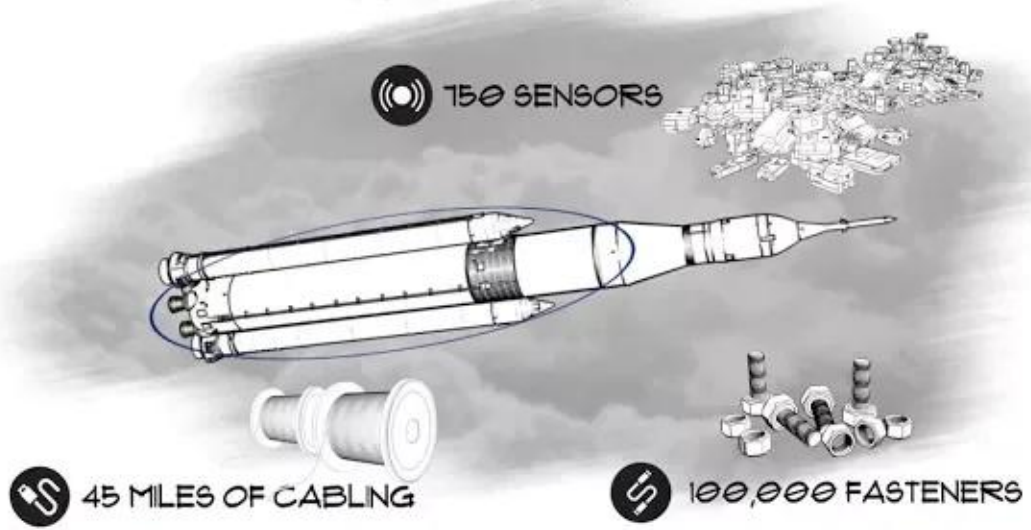
CORE STAGE 5 SECTIONS



1
00:00:00,000 --> 00:00:01,053
[Music]

2
00:00:01,253 --> 00:00:02,373
The Space Launch System’s Core

3
00:00:02,573 --> 00:00:04,325
Stage is the framework of the

4
00:00:04,525 --> 00:00:05,957
world’s most powerful rocket.

5
00:00:06,157 --> 00:00:07,932
But before it’s assembled and

6
00:00:08,132 --> 00:00:10,012
integrated into SLS, the Core

7
00:00:10,212 --> 00:00:12,012
Stages five sections will need a

8
00:00:12,212 --> 00:00:13,660
combination of more than 750

9
00:00:13,860 --> 00:00:17,229
censors, 45 miles of cabling and

10
00:00:17,429 --> 00:00:19,941
100,000 fasteners. All that work

11
00:00:20,141 --> 00:00:22,165
is being done as we speak! Let’s

12
00:00:22,365 --> 00:00:23,405
take a closer look.

13
00:00:23,605 --> 00:00:24,437

[Music]

14
00:00:24,637 --> 00:00:25,596
At the base of the Core Stage

15
00:00:25,796 --> 00:00:27,628
sits the Engine Section, home to

16
00:00:27,828 --> 00:00:29,205
the four RS-25 engines, the

17
00:00:29,405 --> 00:00:31,061
thrust structure they push

18
00:00:31,261 --> 00:00:32,925
against, as well as more than 18

19
00:00:33,125 --> 00:00:35,093
miles of cables. Because of this

20
00:00:35,293 --> 00:00:36,837
section’s complexity and the

21
00:00:37,037 --> 00:00:37,885
extreme temperatures and

22
00:00:38,085 --> 00:00:39,077
vibrations it will experience,

23
00:00:39,277 --> 00:00:40,845
nearly 500 sensors are being

24
00:00:41,045 --> 00:00:43,301
installed in the engine section

25
00:00:43,501 --> 00:00:44,645
to monitor conditions.

26
00:00:44,845 --> 00:00:46,821
[Music]

27
00:00:47,021 --> 00:00:48,173
The Core Stage contains two

28
00:00:48,373 --> 00:00:49,869
separate fuel sources: The

29
00:00:50,069 --> 00:00:51,741
Liquid Hydrogen Tank, and the

30
00:00:51,941 --> 00:00:53,460
Liquid Oxygen Tank. Together,

31
00:00:53,660 --> 00:00:55,222
they hold a combination of

32
00:00:55,422 --> 00:00:57,245
733,000 gallons of propellant.

33
00:00:57,445 --> 00:01:00,044
[Music]

34
00:01:00,244 --> 00:01:01,908
This fuel is kept so cold that

35
00:01:02,108 --> 00:01:03,277
it will actually shrink the

36
00:01:03,477 --> 00:01:04,941
tanks up to 6 inches in length

37
00:01:05,141 --> 00:01:07,068
and more than 1 inch in diameter

38
00:01:07,268 --> 00:01:09,109

before they expand again as the

39
00:01:09,309 --> 00:01:12,525
fuel empties. That means that

40
00:01:12,725 --> 00:01:14,357
anything attached to the tanks

41
00:01:14,557 --> 00:01:16,021
must be secured with a variety

42
00:01:16,221 --> 00:01:17,845
of flexible or accordion-like or

43
00:01:18,045 --> 00:01:19,525
telescoping connectors.

44
00:01:19,725 --> 00:01:21,757
[Music]

45
00:01:21,957 --> 00:01:23,453
The Intertank is designed to

46
00:01:23,653 --> 00:01:25,380
connect the two fuel tanks. It

47
00:01:25,580 --> 00:01:27,197
isn’t being welded together like

48
00:01:27,397 --> 00:01:29,581
the rest of SLS. The Intertank

49
00:01:29,781 --> 00:01:31,781
is being put together by 14,500

50
00:01:31,981 --> 00:01:35,549
custom bolts, fasteners, and

51
00:01:35,749 --> 00:01:39,052
fittings. The “brain” of SLS is

52
00:01:39,252 --> 00:01:41,269
in its forward skirt section.

53
00:01:41,469 --> 00:01:43,501
The 45 miles of cables

54
00:01:43,701 --> 00:01:45,637
controlling the SLS eventually

55
00:01:45,837 --> 00:01:47,277
lead to the forward skirt

56
00:01:47,477 --> 00:01:49,165
section, where 3 flight

57
00:01:49,365 --> 00:01:50,821
computers monitor more than

58
00:01:51,021 --> 00:01:52,645
1,100 sensors to ensure a

59
00:01:52,845 --> 00:01:55,332
successful flight. Power for the

60
00:01:55,532 --> 00:01:57,405
computers and other core stage

61
00:01:57,605 --> 00:01:59,604
electronics is provided by four

62
00:01:59,804 --> 00:02:02,268
lithium ion batteries. Each is

63
00:02:02,468 --> 00:02:04,077

about the size of an average car

64
00:02:04,277 --> 00:02:06,429
battery and provides about 1.8

65
00:02:06,629 --> 00:02:08,301
kilowatts of power for the

66
00:02:08,501 --> 00:02:09,653
rocket’s 10-minute mission.

67
00:02:09,853 --> 00:02:12,820
[Music]

68
00:02:13,020 --> 00:02:14,692
NASA Engineers are working hard

69
00:02:14,892 --> 00:02:16,532
as we speak to make sure that

70
00:02:16,732 --> 00:02:18,373
every part of the Core Stage is

71
00:02:18,573 --> 00:02:20,748
outfitted and tested. But that’s

72
00:02:20,948 --> 00:02:22,885
just the beginning. Once the

73
00:02:23,085 --> 00:02:24,909
individual sections are complete,

74
00:02:25,109 --> 00:02:26,269
the whole thing needs to be

75
00:02:26,469 --> 00:02:28,453
assembled… but we’ll save that