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Combustion Devices Engineer

1
00:00:00,000 --> 00:00:11,082
When you're building the most powerful

2
00:00:11,117 --> 00:00:13,042
rocket ever it takes a lot of folks

3
00:00:13,077 --> 00:00:15,466
developing a lot of technology and a lot of

4
00:00:15,501 --> 00:00:17,314
hardware. So we are taking advantage of

5
00:00:17,349 --> 00:00:19,731
the SLS program to support it but to also

6
00:00:19,766 --> 00:00:21,409
develop some new technology.

7
00:00:21,444 --> 00:00:23,563
This current SLS test program is basically

8
00:00:23,598 --> 00:00:26,890
focused on getting some acoustic data for

9
00:00:26,925 --> 00:00:29,330
the vehicle that will help us to design the

10
00:00:29,365 --> 00:00:31,563
water suppression system on the launch pad.

11
00:00:31,598 --> 00:00:34,722
For this program we actually made a mockup

12
00:00:34,757 --> 00:00:37,883
of entire vehicle including models of the

13
00:00:37,918 --> 00:00:39,826

liquid engines and the solid rocket boosters.

14
00:00:39,861 --> 00:00:42,290
The SLS program actually uses the same

15
00:00:42,325 --> 00:00:45,594
engines as the Space Shuttle. So in order to

16
00:00:45,629 --> 00:00:48,226
do this testing for the acoustic part of the

17
00:00:48,261 --> 00:00:51,283
SLS vehicle we actually used the exact same

18
00:00:51,318 --> 00:00:53,315
engine models that we used on the Space

19
00:00:53,350 --> 00:00:54,755
Shuttle when they were going through acoustic

20
00:00:54,790 --> 00:00:58,227
testing. The actual engine models are just

21
00:00:58,262 --> 00:01:00,322
some really simple thrusters that's a simple

22
00:01:00,357 --> 00:01:02,266
injector, thrust chamber and nozzle design.

23
00:01:02,301 --> 00:01:04,186
And even through it's simple and old

24
00:01:04,221 --> 00:01:05,755
hardware we bring it out from time to time

25
00:01:05,790 --> 00:01:07,675
to support some different programs.

26
00:01:07,710 --> 00:01:09,947
For this acoustic model testing we didn't

27
00:01:09,982 --> 00:01:12,018
have enough injectors in our inventory so

28
00:01:12,053 --> 00:01:13,866
we actually had to make some new ones.

29
00:01:13,901 --> 00:01:16,201
The traditional technique actually uses a

30
00:01:16,236 --> 00:01:18,298
lot of intensive machining...there's a lot

31
00:01:18,333 --> 00:01:20,402
of different parts to machine. For our new

32
00:01:20,437 --> 00:01:22,898
injectors we actually bypassed all the

33
00:01:22,933 --> 00:01:25,482
machining and welding and braising and

34
00:01:25,517 --> 00:01:27,563
actually made these new pieces in one

35
00:01:27,598 --> 00:01:29,466
piece with selective laser melting which

36
00:01:29,501 --> 00:01:32,130
is a 3D printing process. And with this

37
00:01:32,165 --> 00:01:34,258
process we actually fabricated them

38
00:01:34,293 --> 00:01:36,866

in-house in one piece so we got rid of all

39
00:01:36,901 --> 00:01:38,818
the 32 braised joints and all of the five

40
00:01:38,853 --> 00:01:41,243
welds. We've actually got over twenty hot

41
00:01:41,278 --> 00:01:43,738
fire tests done on the acoustic models so

42
00:01:43,773 --> 00:01:46,178
far and as far as performance goes they

43
00:01:46,213 --> 00:01:48,210
have the same performance, or even better

44
00:01:48,245 --> 00:01:49,738
performance than the traditional injectors.

45
00:01:49,773 --> 00:01:52,130
They have held up really well. After twenty