1
00:00:00,000 --> 00:00:10,836
Here at Marshall Space Flight Center, we

2
00:00:10,871 --> 00:00:12,859
are building the multi-purpose crew stage

3
00:00:12,894 --> 00:00:15,042
adaptor for the Space Launch System

4
00:00:15,077 --> 00:00:19,171
which will fly in 2017. We are using the

5
00:00:19,206 --> 00:00:21,203
same design and manufacturing techniques

6
00:00:21,238 --> 00:00:24,043
for the test flight of the Orion capsule on

7
00:00:24,078 --> 00:00:26,283
the Delta IV mission in 2014.

8
00:00:26,318 --> 00:00:30,282
We received these three panels from Amro

9
00:00:30,317 --> 00:00:32,202
where they were originally in the plate

10
00:00:32,237 --> 00:00:34,715
condition and we had them bump formed

11
00:00:34,750 --> 00:00:38,691
and machined into the iso grids that gave

12
00:00:38,726 --> 00:00:40,419
us the final parts that we have now.

13
00:00:40,454 --> 00:00:43,387

We begin with the vertical welds and we'll

14
00:00:43,422 --> 00:00:47,066
weld three panels together on the vertical

15
00:00:47,101 --> 00:00:49,546
weld tool and then we'll transition that

16
00:00:49,581 --> 00:00:52,003
over to the robotic weld tool. We will

17
00:00:52,038 --> 00:00:55,451
weld the circumferential welds the cone

18
00:00:55,486 --> 00:00:58,291
to the rings to create the Orion adapter.

19
00:00:58,326 --> 00:01:01,426
In the past we've used fusion welding

20
00:01:01,461 --> 00:01:04,202
which introduces a lot of heat and a lot of

21
00:01:04,237 --> 00:01:06,523
stress into the part itself. And with friction

22
00:01:06,558 --> 00:01:09,411
stir welding, we can maximize the joint's

23
00:01:09,446 --> 00:01:12,859
strength by basically joining the two metals

24
00:01:12,894 --> 00:01:16,130
without introducing all the heat. So it's

25
00:01:16,165 --> 00:01:18,082
basically a way of stirring the two metals

26
00:01:18,117 --> 00:01:20,795
together. On the circumferential welds,

27
00:01:20,830 --> 00:01:23,379
we use the self-reacting process. We

28
00:01:23,414 --> 00:01:27,939
basically take and we pinch the joint

29
00:01:27,974 --> 00:01:31,130
between two shoulders and stir the metals

30
00:01:31,165 --> 00:01:33,978
in-between those two pieces of metal. On

31
00:01:34,013 --> 00:01:36,723
the vertical welds we use a conventional

32
00:01:36,758 --> 00:01:39,035
method where we basically push up

33
00:01:39,070 --> 00:01:41,163
against an anvil – a big large piece of

34
00:01:41,198 --> 00:01:44,994
metal and just stir from one side the

35
00:01:45,029 --> 00:01:48,674
metals together. We really don’t have

36
00:01:48,709 --> 00:01:50,699
these types of tools and these types of

37
00:01:50,734 --> 00:01:52,051
resources in one place anywhere else in

38
00:01:52,086 --> 00:01:53,715

the world. And the team that we work with

39
00:01:53,750 --> 00:01:57,003
is exciting. Every day it’s a lot of fun and

40
00:01:57,038 --> 00:01:59,762
it’s amazing just because I feel like the

41
00:01:59,797 --> 00:02:01,754
limit of our team’s capabilities is just a