

Raytheon Sarcos Exoskeleton Shotlist & Interview Clips April 2008

- 3:09:17 – Raytheon Sarcos building exterior
- 3:09:33 – Close up of Raytheon sign
- 3:09:50 – Pull back from sign
- 3:10:02 – Pull back to building exterior
- 3:10:22 – Close up of Raytheon sign
- 3:10:34 – Raytheon Sarcos building exterior
- 3:11:11 – Close up of Raytheon sign (different angle)

- 3:11:31 – Close up and moving shot of “enemy” soldier
- 3:11:36 – Moving shot stops
- 3:16:36 – Interesting mechanical shot
- 3:16:40 – Pulls out to reveal more of interesting mechanical shot/box
- 3:18:47 – Working on the Exoskeleton
- 3:19:20 – Working on the Exoskeleton (wide)
- 3:20:02 – Close up of suit power pack...360 to show front of suit
- 3:20:21 – Joint shot of Exoskeleton suit close up (pulls up to show arm)
- 3:21:36 – Low up tilt shot of suit
- 3:23:01 – Natural sound...pressurizing the suit...suit starts moving as pressure increases
- 3:23:33 – Natural sound... “Starting cycle...”
- 3:23:37 – Exoskeleton starts moving on its own
- 3:23:56 – Wide shot of Exoskeleton moving with chaperone
- 3:24:30 – Moves into a tighter shot of the suit’s chest area...arms moving
- 3:25:17 – Shadow of suit’s feet on the cement
- 3:25:45 – Good shot of the Exoskeleton’s rear gears and wires
- 3:26:02 – Arms moving close up
- 3:27:01 – Good shot of the wrists with branding
- 3:28:06 – Wide of the test area
- 3:29:00 – Rex Jamieson practices on the bag before getting suited up (soldier foreground)
- 3:29:19 – Suit moving wide shot

3:29:33 – Jamieson “It responds to your motions, so you basically act naturally and it follows you around.” 3:29:40

3:29:57 – Jamieson “I can lift 72 pounds out in front of me without any problem, but I don’t feel it 3:30:01, so I don’t naturally lean back.” 3:30:05

3:31:15 – Jamieson “It’s the suit that’s the big deal. The engineering that went into it is fantastic.”

3:31:54 – Jamieson “The possibilities are endless. There are issues yet to overcome, but if you look at the Wright brothers’ plane, you wouldn’t have come up with commercial aviation.” 3:32:06

3:32:27 – Jamieson “I like the quick movements like the speed bag, playing soccer with it...and some of the power stuff. It can carry 150 pound payload while walking up ramps and walking up stairs...things I couldn’t do myself, so that’s kind of fun.” 3:32:40

3:32:50 – Jamieson checks out the suit.

3:33:41 – Jamieson begins suiting up. (Need to cover nat sound here)

3:34:11 – Jamieson suits up from a different angle. Knee and ankle pads applied.

3:34:54 – Jamieson puts on helmet

3:35:16 – Jamieson enters suit after slightly swinging it

3:35:36 – Straps in feet works way up

3:36:25 – Straps in chest

3:37:06 – Wide shot of Jamieson in the suit

3:37:21 – Handlers adjust suit

3:38:26 – Adjusting suit pressure...Jamieson moves in the suit

3:39:00 – Jamieson jogs in place in the suit and shadow boxes

3:39:43 – Hooks are installed on his hands

3:40:21 – Drops shield over his eyes

3:41:04 – Unknown guy at computer “Mostly it’s just fault checking and maintenance...it’s watching for errors. If there are faults, it’s getting it back up as fast as I can.” 3:41:11

3:41:47 – Weight pull down...200 pounds sign clearly visible...multiple repetitions (Jamieson, the weight of my arms pretty much does the work).

3:43:27 – Pans down from visor to hooks on hands.

3:44:26 – Lifts barbell

3:45:52 – Lifts green ammunition box and swings it

3:46:30 – Gets in close and uses hooks to pick up ammunition box...drops on pallet

3:47:03 – Holds ammunition box aloft...deposits it on pallet
 3:47:49 – Ammunition box lifting sequence. Two workers try to keep up with Jamieson
 3:48:34 – Picks up two ammunition boxes (72 pounds) and moves them to the other side of the platform and back again 3:48:49
 3:58:17 – Getting the hooks taken off his hands
 3:58:55 – Jabs to camera (good closing shot) 3:59:10
 3:59:17 – Punching bag (remember 3:29 when he practices without the suit) 3:59:34
 4:01:13 – Climbing stairs wide shot
 4:01:40 – Jumping side to side
 4:02:22 – Jamieson runs across the platform 4:02:27
 4:03:08 – Walking up the ramp and back down again 4:03:24
 4:03:35 – Walking up the ramp and back down again (close up of feet) 4:03:47
 4:04:02 – Balancing on one foot...walking on tip toe...walking on his heels
 4:04:48 – Playing with the soccer ball
 4:05:44 – Close up of feet playing with the soccer ball
 4:06:00 – New tape. Jamieson extricates himself from the Exoskeleton robotic suit

Interview with Dr. Stephen Jacobsen

4:13:38 – Jacobsen “People call it different things. Sometimes they call it inventing, sometimes they call it engineering. Sometimes they call it being a mad scientist or whatever...To us, it’s the process of getting together, understanding the problems, goals and then designing something to satisfy the need. 4:13:52

4:15:03 – Jacobsen “How could you do that? How could you make something do an amazing thing that’s never been done before.” 4:15:07 (tight out...picks up usually)

4:15:37 – Jacobsen “If you want to have any kind of speed, you need real time interaction with the people doing it, so there’s a lot of conference rooms here...a lot of meetings and a lot of personalities that fit.” 4:15:45 (tight out...if you’ve got)

4:16:27 – Jacobsen “With us, it’s not just the financial outcome it’s actually doing it that’s fun. And that’s the payoff...is doing it.” 4:16:33

4:18:13 – Jacobsen “Many times when we’re running down a project and we’ve got a pretty good design and we believe in it, somebody will get suspicions that it’s maybe not the best thing we could do, so we’ll run a side project that tries to separately, but in competition and see where it ends up. If it ends up better, we’ll jump over to that track. If it ends up not better, we stay on the old track.” 4:18:30

4:25:40 – Jacobsen “Now, we’re finally to the first step. We’ve proven that the base unit...the thing the person wears can be fast, graceful, strong and can provide endurance,

now the next level is to cut down its expenditure of power and the next level after that is to make a new power unit, and finally, if you're independently powered, you're the right weight with speed, strength and grace, you'll have a system that you can start building into commercial, military and medical applications. 4:26:04

4:29:43 “Oh yeah, sure, I go to see all those movies. We all do. We all like them. They're fun. They stimulate your imagination. 4:29:50

4:29:56 “It makes excitement happen and that always makes creativity happen.” 4:30:00

4:41:07 – Video of Jamieson and Jacobsen...man and his machine (natural sound not good)

4:43:13 – Jamieson “This one works very hard to stay out of your way. It's very fluid. It's very dynamic, it's maybe perceptively slower than you are, so you have to adjust a little bit, but it's basically effortless.

4:44:14 – As far as software engineering goes, this job is about as good as it gets. 4:44:18 “We get to write programs and we see them working on actual robots, that's very exciting. I've had a lot of software jobs before this. This one is definitely the most fun.” 4:44:29

4:44:42 – Jamieson “Initially, it's going to be mostly logistics ...moving heavy things, protecting people...carry lots of armor...carry protective equipment for fires...

4:45:02 -- Jamieson “It can just magnify your strength enormously and even more than strength, it magnifies your endurance. You can do the same task over and over again forever. 4:45:08

4:45:53 – Jamieson “When you're in the suit, it's definitely an empowering feeling, but compared to what I've seen on the trailers, I can't fly...maybe we'll work on that next, so I'd say not so much.” 4:46:06

4:47:29 – Jamieson “What they do now is already pretty heroic and I think, you know, it's the mind more than the equipment for me that's impressive. But, if we can help protect them, in any way, I think that's a win.

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