1

00:00:00,000 --> 00:00:05,000

On MythBusters...

2

00:00:05,000 --> 00:00:07,000

Am I missing an eyebrow?

3

00:00:07,000 --> 00:00:09,000

Danger at the gas pump.

4

00:00:09,000 --> 00:00:12,000

Our cell phones triggering deadly explosions.

5

00:00:12,000 --> 00:00:17,000

Can high altitudes cause big problems for silicon implants?

6

00:00:17,000 --> 00:00:21,000

If I were in there with the breast implants, I'd probably be dead about now.

7

00:00:21,000 --> 00:00:23,000

And computer drives.

8

00:00:23,000 --> 00:00:26,000

Have they reached dangerous warp speeds?

9

00:00:27,000 --> 00:00:31,000

Oh my God! It's a horror show!

10

00:00:32,000 --> 00:00:34,000

Who are the MythBusters?

11

00:00:35,000 --> 00:00:36,000

Adam Savage

12

00:00:36,000 --> 00:00:38,000

That's right, you've got some kind of bogus minister thing.

13

00:00:38,000 --> 00:00:41,000

It's not a bogus ministry. I've performed a dozen weddings already.

14

00:00:41,000 --> 00:00:43,000

And Jamie Heinemann

15

00:00:43,000 --> 00:00:45,000

Farewell, cruel world.

16

00:00:45,000 --> 00:00:50,000

Between them, more than 30 years special effects experience.

17

00:00:50,000 --> 00:00:51,000

You're kind of sexy.

18

00:00:51,000 --> 00:00:53,000

They don't just tell the myths.

19

00:00:54,000 --> 00:00:57,000

They put them to the test.

20

00:01:10,000 --> 00:01:13,000

Hey, wake up, farboy.

21

00:01:13,000 --> 00:01:14,000

What?

22

00:01:14,000 --> 00:01:18,000

You helped me with directions to Antiong and lost.

23

00:01:18,000 --> 00:01:26,000

What are we doing at the Stoke Gas and Oil Memorabilia Town in Santa Rosa, California?

24

00:01:26,000 --> 00:01:31,000

We're here to see if you can accidentally blow up a gas station with a cell phone.

25

00:01:31,000 --> 00:01:34,000

And even if we fail, do we still get to blow something up?

26

00:01:34,000 --> 00:01:35,000

Oh yeah.

27

00:01:35,000 --> 00:01:36,000

Excellent.

28

00:01:36,000 --> 00:01:38,000

So what exactly is this myth?

29

00:01:38,000 --> 00:01:45,000

It's an email myth that says that the use of a cell phone near a gas station could cause an accidental explosion.

30

00:01:45,000 --> 00:01:50,000

And in fact, people have bought into this and on some gas stations near the gas pumps, you can see a sign saying,

31

00:01:50,000 --> 00:01:52,000

please don't use your cell phone here.

32

00:01:52,000 --> 00:01:54,000

But also it's a very good story.

33

00:01:54,000 --> 00:01:58,000

And a very good story is very powerful and promotes belief.

34

00:01:58,000 --> 00:02:04,000

Heather Joseph Withle, resident folklorist, has another dramatic cell phone explosion story.

35

00:02:04,000 --> 00:02:09,000

Well, the story goes that there's an executive speeding along on the freeway in Los Angeles.

36

00:02:09,000 --> 00:02:15,000

And all of a sudden he hears the ding, ding, ding and looks down and he sees that his car is just about out of gas.

37

00:02:15,000 --> 00:02:22,000

So cursing and frustrated, he gets off the freeway, he drives up to a gas station, gets out, starts pumping the gas,

38

00:02:22,000 --> 00:02:26,000

takes out his cell phone and calls the office.

39

00:02:26,000 --> 00:02:33,000

At which point there's a tremendous fireball that engulfs the executive and then the entire gas station explodes.

40

00:02:34,000 --> 00:02:41,000

There have been more than 150 gas station fires across the United States since the early 90s.

41

00:02:41,000 --> 00:02:44,000

Could cell phones be the culprit?

42

00:02:48,000 --> 00:02:55,000

The Stoke Gas and Oil memorabilia town is an ideal location for road testing the cell phone myth.

43

00:02:55,000 --> 00:02:56,000

What are you doing?

44

00:02:56,000 --> 00:02:58,000

It's kind of a low rider.

45

00:02:58,000 --> 00:03:03,000

Fred Stoke used to collect tractor parts until oil cans proved to be more rewarding.

46

00:03:03,000 --> 00:03:04,000

Wow!

47

00:03:04,000 --> 00:03:06,000

Oh, that's amazing!

48

00:03:06,000 --> 00:03:13,000

This is the largest one quart oil can collection in the world. There's over 10,000 different cans here.

49

00:03:13,000 --> 00:03:16,000

I'm going to do my house like this.

50

00:03:16,000 --> 00:03:23,000

We're going to need a big blast chamber. It's something large enough to contain a large explosion and protect us.

51

00:03:23,000 --> 00:03:30,000

And also to control environmental conditions like humidity and temperature and that kind of thing.

52

00:03:30,000 --> 00:03:34,000

We're going to need gas and a way to get it in there in a vapor form.

53

00:03:34,000 --> 00:03:39,000

And we're going to put a cell phone in there and call it and see what happens.

54

00:03:42,000 --> 00:03:50,000

The chamber will be constructed from Lexan, a polycarbonate product favored by race car drivers and jet pilots.

55

00:03:50,000 --> 00:03:52,000

I find this very appealing.

56

00:03:54,000 --> 00:04:00,000

Polycarbonate is a plastic that is extremely tough. You can about fold it in half and it won't break.

57

00:04:00,000 --> 00:04:06,000

It'll stop a bullet, it'll stop all sorts of shrapnel and I just love this stuff.

58

00:04:06,000 --> 00:04:08,000

I love it!

59

00:04:09,000 --> 00:04:14,000

Anticipating a big bang, the guys are constructing the chamber with a failure point.

60

00:04:14,000 --> 00:04:17,000

The center of the two halves of the box.

61

00:04:17,000 --> 00:04:25,000

So that if the blast is too big instead of the Lexan failing or the aluminum welds failing, the box itself will just poof separate into two halves.

62

00:04:25,000 --> 00:04:26,000

Like a clamp.

63

00:04:26,000 --> 00:04:29,000

Yeah. The blast we might deal with might be a lot larger than we think.

64

00:04:29,000 --> 00:04:35,000

And so building in a failure point for this that it can fail safe seems like a good idea.

65

00:04:35,000 --> 00:04:37,000

Plus it'll look really cool.

66

00:04:37,000 --> 00:04:39,000

Oh yeah, it'll definitely look really cool.

67

00:04:40,000 --> 00:04:47,000

Considering Americans pump gas around 12 billion times a year, there are plenty of opportunities for disaster.

68

00:04:47,000 --> 00:04:55,000

Electrical sparks and gasoline vapors are a potent mix and it seems there is much more to this story.

69

00:04:55,000 --> 00:04:59,000

You know, I think it's highly unlikely that a cell phone is going to do this.

70

00:04:59,000 --> 00:05:02,000

You know, it seems like a dumb idea to me.

71

00:05:02,000 --> 00:05:05,000

Well actually it turns out that there's another part to this myth.

72

00:05:05,000 --> 00:05:09,000

It seems that women are largely responsible for the gas station explosions.

73

00:05:09,000 --> 00:05:13,000

Specifically because they get in and out of their cars while filling up.

74

00:05:13,000 --> 00:05:15,000

And so they'll build up a static charge on their body.

75

00:05:15,000 --> 00:05:22,000

And when they touch either the gas tank lip or the filler nozzle, that will ignite the gas and cause an explosion.

76

00:05:22,000 --> 00:05:23,000

That seems more likely.

77

00:05:23,000 --> 00:05:25,000

I think so.

78

00:05:25,000 --> 00:05:30,000

Over 50% of the accidents occur when a person re-enters her car while refueling.

79

00:05:31,000 --> 00:05:36,000

Bob Rankis of the Petroleum Equipment Institute has studied the hard data.

80

00:05:36,000 --> 00:05:40,000

10 years of statistics place women in the most danger.

81

00:05:40,000 --> 00:05:43,000

We've had 152 cases now that we've confirmed.

82

00:05:43,000 --> 00:05:47,000

78% are women, 22% are men.

83

00:05:47,000 --> 00:05:51,000

The problem comes from getting back into the car while refueling.

84

00:05:51,000 --> 00:05:55,000

Electrostatic charges are generated on the seat and clothing due to movement.

85

00:05:55,000 --> 00:05:58,000

Getting out takes the charge with you.

86

00:05:58,000 --> 00:06:05,000

So if your first touch is near the open fuel tank, the resulting discharge spark could be deadly.

87

00:06:06,000 --> 00:06:09,000

So, silver car, not getting in, he's done.

88

00:06:09,000 --> 00:06:17,000

A misbusters stakeout showed very clearly that women were more likely to get back into the car while the gas was pumping.

89

00:06:17,000 --> 00:06:23,000

When you broke it down to percentages, women were actually six times more likely to get back in their cars than men were.

90

00:06:24,000 --> 00:06:28,000

To investigate this second theory, static electricity,

91

00:06:28,000 --> 00:06:35,000

they'll also need to build a device that generates body to clothing friction and hopefully create a big spark.

92

00:06:35,000 --> 00:06:40,000

So the misbusters are shopping for something shocking.

93

00:06:40,000 --> 00:06:43,000

So do you ever have customers come in and say, could you sell me something different?

94

00:06:43,000 --> 00:06:46,000

This one causes too much static shock when I wear it.

95

00:06:46,000 --> 00:06:49,000

No, but they say this causes too much shock.

96

00:06:49,000 --> 00:06:54,000

Yeah, we have to define our terms here, I guess.

97

00:06:54,000 --> 00:06:57,000

Should we get two? Two of each?

98

00:06:57,000 --> 00:06:58,000

Why do we need two?

99

00:06:58,000 --> 00:07:00,000

Well, one for each of us to wear.

100

00:07:00,000 --> 00:07:03,000

Well, if we're going to get two of them, we might as well get two.

101

00:07:03,000 --> 00:07:05,000

Yeah, why don't we get one of those and one of the regular ones?

102

00:07:05,000 --> 00:07:06,000

Sure.

103

00:07:09,000 --> 00:07:14,000

The experiment is now focused on creating and storing a strong spark.

104

00:07:14,000 --> 00:07:20,000

No one will be allowed inside the blast chamber, so the spark has to be discharged remotely.

105

00:07:20,000 --> 00:07:28,000

So this is called a lighting jar and it's actually just tupperware with foil on the inside and foil on the outside.

106

00:07:28,000 --> 00:07:33,000

And it's an early capacitor, which is basically an energy storage device.

107

00:07:34,000 --> 00:07:44,000

Around 1750 in the Dutch city of Leiden, scientists discovered that two conductors separated by an insulator could store an electrical charge.

108

00:07:44,000 --> 00:07:53,000

Benjamin Franklin used it to shock his party guests, who stood in a circle while the current surged

through them, not a stunt for people with weak hearts.

109

00:07:53,000 --> 00:07:59,000

So the electrons are leaping off the PVC and being stored in the lighting jar.

110

00:08:00,000 --> 00:08:02,000

Ooh, alright, good.

111

00:08:02,000 --> 00:08:07,000

Oh, wow, I got like three shocks from there.

112

00:08:09,000 --> 00:08:15,000

With the shocking garments in hand, they're off to the auto yard to find a suitable car seat.

113

00:08:20,000 --> 00:08:23,000

You think we could build some panty friction in the bed here?

114

00:08:23,000 --> 00:08:25,000

Well, that's what it's for, isn't it?

115

00:08:25,000 --> 00:08:27,000

Well, we won't be the first.

116

00:08:27,000 --> 00:08:31,000

These panties had no idea what they were in for.

117

00:08:31,000 --> 00:08:36,000

This is like where panties go and they've been very, very bad.

118

00:08:41,000 --> 00:08:44,000

I mean, I don't know which one to actually go with anymore.

119

00:08:44,000 --> 00:08:49,000

At this point, it's just like a sea of rubbing and vinyl and wet car seats.

120

00:08:49,000 --> 00:08:51,000

It's like high school.

121

00:08:52,000 --> 00:08:54,000

That's actually good.

122

00:08:54,000 --> 00:08:58,000

I got more of a charge off of this than anything yet.

123

00:08:58,000 --> 00:09:03,000

They have the seat of choice, but will it provide the necessary charge?

124

00:09:03,000 --> 00:09:06,000

I don't see any sparks.

125

00:09:06,000 --> 00:09:08,000

Watch this.

126

00:09:11,000 --> 00:09:17,000

Back at Fred Stokes Gas Museum, the fire department has arrived to supervise the experiment.

127

00:09:17,000 --> 00:09:23,000

So is it cell phones or static sparks that cause gas station fires?

128

00:09:23,000 --> 00:09:27,000

Well, let me see. We've got a crash test dummy with his legs removed.

129

00:09:27,000 --> 00:09:36,000

We've got a panty static generator with leopard fur and panties wrapped around it.

130

00:09:36,000 --> 00:09:38,000

It's not exactly hard science.

131

00:09:38,000 --> 00:09:45,000

Nonetheless, the firemen want a much smaller bank, too much gasoline vapor inside the chamber,

132

00:09:45,000 --> 00:09:48,000

and it becomes a very large bomb.

133

00:09:48,000 --> 00:09:50,000

What's the potential? What could go wrong?

134

00:09:50,000 --> 00:09:55,000

Break all the windows around here. That might be the worst case.

135

00:09:55,000 --> 00:09:57,000

I don't want to see that happen.

136

00:09:57,000 --> 00:09:59,000

Jamie wants big bombs.

137

00:10:00,000 --> 00:10:02,000

Down boy, down boy!

138

00:10:02,000 --> 00:10:06,000

He's being a little conservative, which is his job, and I appreciate that.

139

00:10:06,000 --> 00:10:09,000

We will still try to get the biggest explosion we can.

140

00:10:11,000 --> 00:10:13,000

Time for the fire protection suit.

141

00:10:13,000 --> 00:10:17,000

Delivering the gasoline to the chamber is Jamie's responsibility.

142

00:10:17,000 --> 00:10:22,000

He will use an aerosol device to spray high concentrations of flammable fuel vapor

143

00:10:22,000 --> 00:10:25,000

directly inside the blast chamber.

144

00:10:26,000 --> 00:10:29,000

So I rigged up the cell phone in there.

145

00:10:29,000 --> 00:10:30,000

Okay.

146

00:10:30,000 --> 00:10:33,000

When I call it, it says, detonate.

147

00:10:33,000 --> 00:10:36,000

Very cute.

148

00:10:36,000 --> 00:10:40,000

Okay, we're going to start the fuel. You guys ready?

149

00:10:41,000 --> 00:10:46,000

For gas to explode, you need the right mix of fuel and air.

150

00:10:46,000 --> 00:10:52,000

As the concentration edges towards the flammable level, their gas meter emits a warning.

151

00:10:52,000 --> 00:10:53,000

Okay.

152

00:10:53,000 --> 00:10:58,000

The chamber is primed and ready for the cell phone blast test.

153

00:10:58,000 --> 00:10:59,000

Calling now.

154

00:11:03,000 --> 00:11:06,000

Hello, explosion? Hello? Hello?

155

00:11:11,000 --> 00:11:13,000

He never answers his phone.

156

00:11:13,000 --> 00:11:18,000

Both Jamie and Adam are confident the cell phone won't cause an explosion.

157

00:11:18,000 --> 00:11:22,000

It creates heat, but not enough to cause ignition.

158

00:11:22,000 --> 00:11:25,000

Time to test the second theory.

159

00:11:25,000 --> 00:11:30,000

Okay, guys, we're done with the cell phone and we're going to the panty-static generator.

160

00:11:31,000 --> 00:11:33,000

Keep as many unnecessary people back.

161

00:11:33,000 --> 00:11:35,000

I really have some concerns about that thing. I really do.

162

00:11:35,000 --> 00:11:38,000

Okay. All right, I will tell everybody. Thank you.

163

00:11:38,000 --> 00:11:43,000

You'll notice the firemen are all kind of standing a lot further back than we are.

164

00:11:43,000 --> 00:11:44,000

Yeah.

165

00:11:44,000 --> 00:11:47,000

So this is not to be toyed around with. It is a bomb.

166

00:11:47,000 --> 00:11:48,000

Okay.

167

00:11:48,000 --> 00:11:49,000

Okay.

168

00:11:49,000 --> 00:11:56,000

With the chamber saturated in gasoline, it's time now for Adam's panty-static generator to spark an explosion.

169

00:11:56,000 --> 00:12:02,000

All right, we're going in five, four, three, two, one.

170

00:12:02,000 --> 00:12:07,000

We should have had a spark right about then.

171

00:12:07,000 --> 00:12:10,000

Come on. Come on, baby.

172

00:12:10,000 --> 00:12:14,000

Okay, I've gone through what should have been like at least three sparks so far.

173

00:12:14,000 --> 00:12:15,000

Okay.

174

00:12:15,000 --> 00:12:22,000

Even with sparks and the heavy fuel load, the gas will only blow if conditions are absolutely optimal.

175

00:12:22,000 --> 00:12:24,000

So far, nothing is happening.

176

00:12:24,000 --> 00:12:29,000

How hard can it be to blow up a room full of gasoline?

177

00:12:29,000 --> 00:12:35,000

My guess is just a wrong mixture. Just that simple. Wrong mixture.

178

00:12:35,000 --> 00:12:38,000

That's it. We're packing up and we're going to go home.

179

00:12:38,000 --> 00:12:42,000

Without tail between our legs.

180

00:12:42,000 --> 00:12:49,000

So it's back to the drawing board to see if cell phones or static sparks can cause gas pump fires.

181

00:12:49,000 --> 00:12:54,000

Ignition is still proving to be difficult, but the personal flash point is rising.

182

00:12:54,000 --> 00:12:59,000

Wait, wait. Hold on, Adam, before you break up all the way up. All afternoon's work.

183

00:12:59,000 --> 00:13:01,000

Give me just a static.

184

00:13:01,000 --> 00:13:05,000

I thought all four sides were taped.

185

00:13:05,000 --> 00:13:10,000

You're a nice guy in all, but sometimes you're a bull in a china shop.

186

00:13:10,000 --> 00:13:14,000

I'm not going to respond to that.

187

00:13:15,000 --> 00:13:21,000

Working with a smaller blast box should help them figure out the right fuel-air mix to achieve ignition.

188

00:13:21,000 --> 00:13:27,000

You know, all of that spray presents a lot of surface area, and I think it's probably sinking down and collecting right at the ground.

189

00:13:27,000 --> 00:13:34,000

My guess is that one of our mistakes with the big chamber was that we had the ignition source too far above the ground.

190

00:13:34,000 --> 00:13:39,000

So let's just see whether this works.

191

00:13:39,000 --> 00:13:44,000

To get a bigger spark, Jamie connects a device called a Jacob's Ladder.

192

00:13:44,000 --> 00:13:50,000

You'll be familiar with its climbing arc from those old science fiction movies, but this is no toy.

193

00:13:50,000 --> 00:13:55,000

It's high voltage and potentially lethal.

194

00:13:55,000 --> 00:14:00,000

Now be careful on this metal, you know, we've got some pretty heavy duty currents here, so.

195

00:14:00,000 --> 00:14:05,000

All right, shall we lose the spark and get some gasoline going and blow some stuff up in miniature?

196

00:14:05,000 --> 00:14:10,000

Is gasoline flammable? You'll find out after this!

197

00:14:10,000 --> 00:14:14,000

3, 2, 1.

198

00:14:14,000 --> 00:14:18,000

Hey, we made something close up!

199

00:14:18,000 --> 00:14:21,000

We made something close up!

200

00:14:21,000 --> 00:14:23,000

Oh, my God!

201

00:14:23,000 --> 00:14:26,000

I'm so sorry.

202

00:14:26,000 --> 00:14:29,000

I'm so sorry.

203

00:14:29,000 --> 00:14:32,000

I'm so sorry.

204

00:14:32,000 --> 00:14:36,000

I made something close up!

205

00:14:40,000 --> 00:14:46,000

Adam has improved his lighting jar. The heavy duty version will provide a potent spark.

206

00:14:46,000 --> 00:14:52,000

And finally, they are getting an ideal blend of fuel and air.

207

00:14:55,000 --> 00:15:00,000

Well, I lost a lot of hair on my arm. How about that?

208

00:15:00,000 --> 00:15:03,000

It definitely works.

209

00:15:03,000 --> 00:15:05,000

Okay, now I'm afraid.

210

00:15:05,000 --> 00:15:08,000

Adding more gasoline won't guarantee a bigger blast.

211

00:15:08,000 --> 00:15:10,000

You watch yourself there, Ombre.

212

00:15:10,000 --> 00:15:12,000

The critical mix needs more air.

213

00:15:12,000 --> 00:15:16,000

That's probably it. That's probably all that it takes.

214

00:15:16,000 --> 00:15:19,000

Do you think there's anything left of a fume in there?

215

00:15:19,000 --> 00:15:21,000

Go, go, go!

216

00:15:21,000 --> 00:15:23,000

Okay, here I go.

217

00:15:23,000 --> 00:15:25,000

Let's talk more sparks.

218

00:15:25,000 --> 00:15:29,000

Stop your grinning and grab your linen. Here we go!

219

00:15:29,000 --> 00:15:31,000

Oh!

220

00:15:31,000 --> 00:15:34,000

The Heinemann was right!

221

00:15:34,000 --> 00:15:39,000

We now know exactly what kind of concentration of fuel that we have to have for ignition.

222

00:15:39,000 --> 00:15:44,000

We know that we can create a spark from static electricity off of fabric.

223

00:15:44,000 --> 00:15:47,000

And we know that it is something that we have to be very careful with.

224

00:15:52,000 --> 00:15:54,000

I'm fine, I'm fine, I'm fine.

225

00:15:54,000 --> 00:15:57,000

Am I missing an eyebrow?

226

00:15:57,000 --> 00:15:59,000

I am missing an eyebrow, aren't I?

227

00:15:59,000 --> 00:16:01,000

You lost a lot of hair up there too.

228

00:16:01,000 --> 00:16:02,000

You're kidding me.

229

00:16:02,000 --> 00:16:06,000

You're alright, it's not going to look weird after a day or two.

230

00:16:09,000 --> 00:16:14,000

I think it took him about five seconds to worry about whether he's going to look funny for his date.

231

00:16:14,000 --> 00:16:16,000

I have a date tomorrow.

232

00:16:16,000 --> 00:16:19,000

Is it survival more important or sex?

233

00:16:19,000 --> 00:16:23,000

All of the names are science.

234

00:16:23,000 --> 00:16:26,000

Oh, okay, that was probably one of the stupidest things I've ever done.

235

00:16:27,000 --> 00:16:30,000

No problem now with the static spark.

236

00:16:30,000 --> 00:16:33,000

The mix is right and ignition comes easily.

237

00:16:33,000 --> 00:16:35,000

But what about the cell phone?

238

00:16:35,000 --> 00:16:38,000

Will it prove to be the cause of gas station fires?

239

00:16:38,000 --> 00:16:41,000

Nada. Miente.

240

00:16:41,000 --> 00:16:43,000

Second call.

241

00:16:43,000 --> 00:16:45,000

No explosion.

242

00:16:45,000 --> 00:16:51,000

So Bob, have you heard of this myth regarding exploding a gas station by using a cell phone?

243

00:16:51,000 --> 00:16:57,000

Not only did I hear of it, I'm quoted in the myth that says Mr. Rinkus says don't use cell phones.

244

00:16:57,000 --> 00:17:00,000

They can cause fire at the pump.

245

00:17:00,000 --> 00:17:07,000

That email's gone around and people take that literally because they are believing everything they see in emails unfortunately.

246

00:17:07,000 --> 00:17:16,000

After researching hundreds of gas station fires, Bob Rinkus of the Petroleum Equipment Institute says cell phones are in the clear.

247

00:17:16,000 --> 00:17:23,000

Here in Semple, we don't have any accidents involving a cell phone at a service station. It just doesn't happen.

248

00:17:24,000 --> 00:17:31,000

But a dramatic fire department demonstration clearly shows what can happen when static is involved.

249

00:17:31,000 --> 00:17:36,000

People who re-enter the car during refueling face the biggest risk.

250

00:17:36,000 --> 00:17:43,000

They're typically younger people because older people will go like this to get out of their car and when they do that they discharge.

251

00:17:43,000 --> 00:17:50,000

So they just simply pop out of the car, not touch anything, not shut the door, not ground themselves, not touch this.

252

00:17:50,000 --> 00:17:57,000

They'll take one, two steps. They're wearing neoprene shoes so they're not discharging, they're not dissipating on the concrete.

253

00:17:57,000 --> 00:18:01,000

They touch a piece of metal here. The vapors are coming out of the tank.

254

00:18:01,000 --> 00:18:09,000

The air is coming in from outside so that's two parts of the fire triangle and the third part is the source of ignition which is the spark.

255

00:18:09,000 --> 00:18:20,000

The problem comes is when they overreact they go, oh my goodness, and they leave a stream of

gasoline, they already have a fire, it gets underneath the car, or they could get it on themselves.

256

00:18:22,000 --> 00:18:28,000

With the cell phone myth well and truly busted, they still want to make their own big static back.

257

00:18:28,000 --> 00:18:34,000

So they're back at Fred Stokes Gasoline Museum with the fire department there to monitor safety.

258

00:18:34,000 --> 00:18:36,000

Here it comes, the whole thing in there.

259

00:18:36,000 --> 00:18:44,000

It's maker break time so today the guys are using a much higher concentration of gas in a much finer spray.

260

00:18:46,000 --> 00:18:48,000

OK, that's it.

261

00:18:48,000 --> 00:18:51,000

Alright, here we go. Watching for spark.

262

00:18:57,000 --> 00:19:02,000

Despite a heavy saturation of gasoline vapors, still no blast.

263

00:19:02,000 --> 00:19:10,000

This is a pain in the butt, you know, we've got the darn thing so it's foggy with gas fumes in there and no boom. What are you going to do?

264

00:19:11,000 --> 00:19:13,000

Lighten jar, I am finished with you.

265

00:19:14,000 --> 00:19:19,000

Desperate to get their big bang, the boys decide to use extra juice.

266

00:19:19,000 --> 00:19:20,000

Good spark.

267

00:19:21,000 --> 00:19:22,000

Is that good?

268

00:19:22,000 --> 00:19:23,000

Yeah.

269

00:19:23,000 --> 00:19:28,000

We're using a spark that's actually a smaller spark in terms of the kilovolts, but it's longer.

270

00:19:28,000 --> 00:19:37,000

We're using neon transformer to generate it, but lasts as long as we want so I feel totally confident we're going to get the concussive boom that we want right now.

271

00:19:38,000 --> 00:19:39,000

OK Adam, let's get ready.

272

00:19:39,000 --> 00:19:42,000

Come on, OK, here we go. Stand by.

273

00:19:42,000 --> 00:19:44,000

I feel like something's going to happen this time.

274

00:19:44,000 --> 00:19:47,000

In three, two, one.

275

00:19:59,000 --> 00:20:02,000

Wow, I forgot to watch. That was really cool.

276

00:20:05,000 --> 00:20:06,000

Right on.

277

00:20:07,000 --> 00:20:08,000

Hey, we got it.

278

00:20:09,000 --> 00:20:10,000

Yeah.

279

00:20:10,000 --> 00:20:11,000

That was a lot of force.

280

00:20:11,000 --> 00:20:12,000

Yes it was.

281

00:20:12,000 --> 00:20:16,000

Let's burst apart this 24 foot seam of metal tape.

282

00:20:16,000 --> 00:20:17,000

Well, it's about time, huh?

283

00:20:17,000 --> 00:20:20,000

It's about time. Absolutely right.

284

00:20:21,000 --> 00:20:29,000

Don't be fooled. Gasoline vapors and a strong spark under the right conditions spell danger at the fuel pump.

285

00:20:29,000 --> 00:20:34,000

Bob, what is your recommendation if there is a spark, if there is ignition? What should you do?

286

00:20:34,000 --> 00:20:39,000

If you discharge here and you get a spark, don't be a hero. Don't take your nozzle out.

287

00:20:39,000 --> 00:20:46,000

Your gas tank will contain the gasoline. We don't want any gasoline spilling on the forecorder, on the pavement.

288

00:20:46,000 --> 00:20:49,000

Stand away and notify the station immediately.

289

00:20:51,000 --> 00:20:54,000

Adam, what do you reckon? Myth busted?

290

00:20:54,000 --> 00:21:02,000

Absolutely. This myth is definitely busted. No cell phone will ever cause a gas station to ignite. Just not going to happen.

291

00:21:02,000 --> 00:21:03,000

I agree.

292

00:21:08,000 --> 00:21:09,000

Jamie.

293

00:21:10,000 --> 00:21:11,000

Yo.

294

00:21:11,000 --> 00:21:14,000

I got breasts. Check this out.

295

00:21:20,000 --> 00:21:27,000

There's a myth that when you go up on an airplane, the reduction in pressure will explode your implants.

296

00:21:27,000 --> 00:21:37,000

The basic story is that there's a woman with silicone implants on an airplane and there's a depressurized cabin because it's a local flight perhaps from LA to San Francisco.

297

00:21:37,000 --> 00:21:51,000

And as the plane goes higher, the implants get bigger and bigger and bigger and bigger until finally they explode as she's walking down the aisle to the lavatory to see what's going on with her implants.

298

00:21:53,000 --> 00:21:57,000

There we go. Oh, sample not for implant.

299

00:21:57,000 --> 00:22:01,000

One size fits all. There's not like a bigger or smaller one.

300

00:22:01,000 --> 00:22:05,000

So we've got the implants, right? What else are we going to need for this, Jamie?

301

00:22:05,000 --> 00:22:10,000

We've got to have a chamber that will handle both pressure and, you know, vacuum.

302

00:22:10,000 --> 00:22:12,000

Positive and negative pressure.

303

00:22:12,000 --> 00:22:19,000

Yeah. And we've got to have a vacuum pump, a pressure pump, and to make it look good, you know, put the implants in a body of some sort, maybe a...

304

00:22:19,000 --> 00:22:24,000

The ballistics gel would be perfect for that. We could make up a torso out of ballistics gel and put the implants in.

305

00:22:24,000 --> 00:22:28,000

It would be very close to skin so we could probably see, you know, if there was any real movement.

306

00:22:28,000 --> 00:22:30,000

And the gel is clear so we can see what's going on.

307

00:22:30,000 --> 00:22:32,000

Yeah. Okay, that's weird.

308

00:22:33,000 --> 00:22:38,000

You know what? Since I've never owned a pair, I don't know what they're supposed to feel like, but these feel pretty good.

309

00:22:38,000 --> 00:22:41,000

You know, it just makes me feel more like a woman.

310

00:22:43,000 --> 00:22:44,000

Come on, let's give me the creeps.

311

00:22:44,000 --> 00:22:45,000

Come on, give me them.

312

00:22:45,000 --> 00:22:46,000

Take those off.

313

00:22:51,000 --> 00:22:55,000

You do it for cosmetic purposes. Probably over 100,000 patients a year have breast augmentation.

314

00:22:55,000 --> 00:22:56,000

For that group...

315

00:22:56,000 --> 00:23:00,000

Plastic surgeon Dr. Gregory Giorgi knows his implants.

316

00:23:00,000 --> 00:23:04,000

He's performed thousands of procedures over 25 years.

317

00:23:04,000 --> 00:23:09,000

I have heard the myths. And you'd be not infrequently asked by patients, you know, who had active lifestyles,

318

00:23:09,000 --> 00:23:15,000

if they were going to skin dive what would happen in their implants or what would happen in decompression and airplane.

319

00:23:15,000 --> 00:23:16,000

That was a common question.

320

00:23:16,000 --> 00:23:19,000

Have you ever heard any fantastic stories about this actually occurring?

321

00:23:19,000 --> 00:23:22,000

No, I never really have heard any fantastic stories.

322

00:23:22,000 --> 00:23:28,000

I had no first-hand experience with a patient that had a quote, blowout at altitude along the way.

323

00:23:28,000 --> 00:23:31,000

But lots of people were worried about it, shall we say.

324

00:23:34,000 --> 00:23:41,000

Adam and Jamie are back in familiar territory surrounded by scrap metal and high-tech surplus.

325

00:23:41,000 --> 00:23:47,000

I love this place. I spend every Saturday that I get a chance down here. They have coffee and donuts.

326

00:23:47,000 --> 00:23:53,000

Cryo containers, beer kegs, what else we got?

327

00:23:53,000 --> 00:23:56,000

They're looking for a tank to convert to a chamber.

328

00:23:56,000 --> 00:24:02,000

They want to reproduce the altitude pressures that may cause an implant to expand or explode.

329

00:24:02,000 --> 00:24:05,000

Looks like the world's most expensive garbage can.

330

00:24:05,000 --> 00:24:06,000

Yeah.

331

00:24:06,000 --> 00:24:12,000

Now there's a tank. Unfortunately, it feels like it's maybe 2,000 pounds or so.

332

00:24:12,000 --> 00:24:16,000

I see one back here that's starting to look like...

333

00:24:16,000 --> 00:24:20,000

Oh my lord! You have to come here and look at this.

334

00:24:20,000 --> 00:24:26,000

By the looks of this, this is not ultra-high pressure, but it's pretty good.

335

00:24:26,000 --> 00:24:28,000

Look at the thickness on this.

336

00:24:28,000 --> 00:24:33,000

I love it when I find this kind of stuff. I mean, this is so cool. This is like sci-fi right here.

337

00:24:33,000 --> 00:24:37,000

Probably cost somebody maybe 30 or 50 grand new, I don't know.

338

00:24:37,000 --> 00:24:42,000

But it's just a beautiful piece of hardware. I get such a kick out of this stuff.

339

00:24:42,000 --> 00:24:44,000

How much does he want for it?

340

00:24:44,000 --> 00:24:47,000

It's going to be by the weight of the aluminum, I'm sure.

341

00:24:47,000 --> 00:24:48,000

God bless them.

342

00:24:48,000 --> 00:24:52,000

I don't care what it was, just tell me how much it weighs.

343

00:25:04,000 --> 00:25:08,000

So, I'm going to try and implant these in a fake woman.

344

00:25:09,000 --> 00:25:18,000

The first step towards exploding the implant myth is to modify a store dummy.

345

00:25:22,000 --> 00:25:28,000

A heat vacuum appliance is used to make a plastic mold of the torso that will hold the implants.

346

00:25:29,000 --> 00:25:36,000

Always looking to match reality, Adam will suspend the implants in the ballistics gel.

347

00:25:38,000 --> 00:25:46,000

So, if we let this sit for 20 or 30 minutes, the ice against the skin should make that layer of ballistics gel harden,

348

00:25:46,000 --> 00:25:53,000

but not the rest. We should end up with a nice, fleshy barrier. About that thick maybe?

349

00:25:54,000 --> 00:25:58,000

The skin layer takes about 10 minutes to form.

350

00:25:58,000 --> 00:26:05,000

It's perfect actually, yeah, I've got a layer of skin here that's actually like 3-sixteenths of an inch thick. It's not bad.

351

00:26:05,000 --> 00:26:09,000

Now it's just a matter of putting the implants into place.

352

00:26:09,000 --> 00:26:18,000

The silicone is actually a little bit lighter in density than the water, but I push them down in and hopefully suction will keep them at the bottom.

353

00:26:18,000 --> 00:26:22,000

They're looking pretty good right now. I'm going to wash my hands and check in in 20 minutes.

354

00:26:24,000 --> 00:26:29,000

The important job is to make the chamber as airtight as possible.

355

00:26:32,000 --> 00:26:36,000

Some portholes are welded shut while others are replaced.

356

00:26:38,000 --> 00:26:41,000

And finally, an air pressure gauge is fitted.

357

00:26:45,000 --> 00:26:49,000

Adam's gelatin torso has set. The implants are holding.

358

00:26:49,000 --> 00:26:53,000

Look at that, it's a thing of beauty.

359

00:26:53,000 --> 00:26:56,000

My God, I've done it!

360

00:26:59,000 --> 00:27:07,000

As a parallel experiment, Jamie places an implant in a jug of water. Any changes should be easy to see.

361

00:27:07,000 --> 00:27:13,000

If we find that the implant is actually expanding, the water level will raise and we can measure that.

362

00:27:14,000 --> 00:27:18,000

Adam calibrates an easy to read altitude guide for the gauge.

363

00:27:21,000 --> 00:27:23,000

The chingar is sealed.

364

00:27:23,000 --> 00:27:25,000

Are we ready to go?

365

00:27:25,000 --> 00:27:35,000

For the first test, the implants are subjected to typical in-flight cabin pressure, which for passenger comfort is equivalent to around 8,000 feet above sea level.

366

00:27:35,000 --> 00:27:36,000

Okay.

367

00:27:37,000 --> 00:27:48,000

What I see is the bubbles that were on the surface of the implant have gotten larger and it's maybe raised the water level of minuscule amount as a result of that.

368

00:27:48,000 --> 00:27:52,000

But I don't see any expansion of the breast itself.

369

00:27:52,000 --> 00:27:57,000

Alright, shall we take it up to, let's say, 30,000 feet?

370

00:27:58,000 --> 00:28:10,000

The big test comes as the chamber matches an altitude of around 30,000 feet, an impossible height for humans unless flying in a pressurized cabin.

371

00:28:10,000 --> 00:28:16,000

I mean, it doesn't look like much, but if I were in there with the breast implants, I'd probably be dead about now.

372

00:28:16,000 --> 00:28:20,000

Your lungs would fill with fluid, your head would, you know, compress.

373

00:28:20,000 --> 00:28:23,000

There's a whole bunch of conditions, none of them are pretty.

374

00:28:23,000 --> 00:28:27,000

You probably pass away in about 10 minutes at that height.

375

00:28:27,000 --> 00:28:33,000

Despite the negative pressure of high flying, the implants appear unchanged.

376

00:28:33,000 --> 00:28:40,000

We've seen the implants at about 8,000 feet, then we bumped it up to around 35,000 feet or so.

377

00:28:40,000 --> 00:28:51,000

And in both cases, we've seen expansion of little air bubbles around the things to some degree, but the implants themselves have shown no significant increase in volume.

378

00:28:54,000 --> 00:28:59,000

Adam had a theory that injecting the implants with air might force a failure.

379

00:28:59,000 --> 00:29:02,000

I added some air to each of the implants.

380

00:29:02,000 --> 00:29:07,000

To the right one, I added three cc's of air, to the left one, I added ten cc's of air.

381

00:29:07,000 --> 00:29:09,000

There we go.

382

00:29:09,000 --> 00:29:12,000

Yeah, we're at about 35,000 feet now.

383

00:29:12,000 --> 00:29:17,000

I'm not really noticing any significant change in the air pockets.

384

00:29:18,000 --> 00:29:20,000

We definitely know that air can expand really well.

385

00:29:20,000 --> 00:29:27,000

We've got a balloon in there and the balloon's been blowing up to twice its volume, but the air inside the implants is not.

386

00:29:27,000 --> 00:29:30,000

I didn't really notice any difference at all.

387

00:29:30,000 --> 00:29:31,000

Me neither.

388

00:29:31,000 --> 00:29:34,000

Yeah, I mean, effectively nothing.

389

00:29:35,000 --> 00:29:44,000

Nothing much happening at altitude, so Jamie hooks up a small chamber to emulate the high pressures of deep sea diving.

390

00:29:44,000 --> 00:29:47,000

But he didn't figure on explosive results.

391

00:29:50,000 --> 00:29:52,000

We had a seal blow.

392

00:29:52,000 --> 00:29:54,000

Are you guys alright?

393

00:29:54,000 --> 00:29:56,000

It sounded like you shot an elephant.

394

00:29:56,000 --> 00:29:59,000

Yeah, it kind of hurt my ears too.

395

00:30:00,000 --> 00:30:04,000

No one heard, but Jamie had a close call.

396

00:30:04,000 --> 00:30:08,000

Rapid changes in pressure can cause serious hearing damage.

397

00:30:09,000 --> 00:30:17,000

No changes to the implanted high pressure, so it's back to the large chamber for another low pressure altitude test.

398

00:30:17,000 --> 00:30:24,000

Within a few minutes, it's taken the equivalent of a rapid trip from the ocean's floor to the summit of Everest.

399

00:30:24,000 --> 00:30:26,000

So we go up to 30,000 feet.

400

00:30:33,000 --> 00:30:35,000

I don't see nothing.

401

00:30:35,000 --> 00:30:39,000

I don't see any air bubbles. I don't see any noticeable difference.

402

00:30:39,000 --> 00:30:43,000

So this replicated someone diving in water and then immediately getting into a plane?

403

00:30:43,000 --> 00:30:44,000

Yes.

404

00:30:44,000 --> 00:30:47,000

So effectively no difference.

405

00:30:48,000 --> 00:30:55,000

Scientists at Duke University have been studying the rigors of pressure on the human body for many years.

406

00:30:55,000 --> 00:30:59,000

This is the main clinical chamber here. Watch your heads again.

407

00:30:59,000 --> 00:31:03,000

And the actual chamber is compressed with air.

408

00:31:03,000 --> 00:31:12,000

Dr. Richard Van from Duke University's Center for Hyperbaric Medicine knows all about pressure and the concerns of people with implants.

409

00:31:12,000 --> 00:31:20,000

We had several questions that came in with regard to breast implants as to whether there were any hazards with regard to diving.

410

00:31:20,000 --> 00:31:28,000

And as a result, we decided we might do a study and so we approached some of the plastic surgeons who we've been working with.

411

00:31:28,000 --> 00:31:34,000

Well, we found that basically in anything that the patient could survive, it wasn't going to be an issue.

412

00:31:34,000 --> 00:31:41,000

Plastic surgeon Dr. Gregory Georgeade provided subjects for the implant pressure test at Duke's Hyperbaric Lab.

413

00:31:41,000 --> 00:31:43,000

The results were convincing.

414

00:31:43,000 --> 00:31:47,000

Basically what we have here is we have two implants that were initially the same size.

415

00:31:47,000 --> 00:31:55,000

And I expanded it by about 50%, which is the maximum volume expansion we could find in the studies we did to show you what the implant would look like.

416

00:31:55,000 --> 00:32:02,000

And you can see it's 50% bigger. The implant could double or triple its total volume before the shell is ever going to break.

417

00:32:02,000 --> 00:32:04,000

So it isn't going to be an issue.

418

00:32:04,000 --> 00:32:11,000

And a patient that had this happen would have been dead because of the nitrogen bubbles that ended up in their brain with the bends long before the implant got to this size.

419

00:32:11,000 --> 00:32:15,000

So why do you think people were worried about this to begin with?

420

00:32:15,000 --> 00:32:21,000

Well, I think they were worried about it because the supermarket tabloids had got their attention.

421

00:32:21,000 --> 00:32:26,000

And that it's another good story along with Bigfoot and the Loch Ness Monster.

422

00:32:26,000 --> 00:32:32,000

The myth of the exploding implant appears to be well and truly busted.

423

00:32:32,000 --> 00:32:34,000

I've got to do it really hard, right?

424

00:32:34,000 --> 00:32:35,000

No, you can't!

425

00:32:35,000 --> 00:32:38,000

Oh, God!

426

00:32:38,000 --> 00:32:41,000

But the story has one more chapter.

427

00:32:41,000 --> 00:32:44,000

Adam now tries an inflatable brassiere.

428

00:32:44,000 --> 00:32:46,000

Jamie, you want to tie me up?

429

00:32:46,000 --> 00:32:59,000

An earlier version of this narrative that took place in the 1950s dealt with a national sales manager for the inflatable bra was on, again, a flight in a depressurized plane.

430

00:32:59,000 --> 00:33:02,000

She was wearing her product as any good salesperson would.

431

00:33:02,000 --> 00:33:07,000

And as the plane got higher, her bra got bigger and bigger and bigger.

432

00:33:07,000 --> 00:33:10,000

And the other passengers were kind of starting to freak out.

433

00:33:10,000 --> 00:33:16,000

So she had to go spend the rest of the flight in the cabin with the pilots, which you couldn't do these days.

434

00:33:18,000 --> 00:33:22,000

Okay, wow, that sucks. That sound? That's really bad.

435

00:33:22,000 --> 00:33:28,000

Adam volunteers to give the inflatable bra a personal test at 8,000 feet.

436

00:33:28,000 --> 00:33:32,000

Go for tank depressurization, slowly, and increments.

437

00:33:36,000 --> 00:33:38,000

Adam, how are they doing? Are they getting bigger?

438

00:33:38,000 --> 00:33:43,000

Roger that, Mr. Control. My breasts are expanding. Repeat, breasts are expanding.

439

00:33:46,000 --> 00:33:50,000

They're definitely getting firmer, but nothing exploded, unfortunately.

440

00:33:51,000 --> 00:33:58,000

Well, these don't really change that much. I mean, they've got vinyl enclosures. They're going to be pretty resilient, too. Pressure.

441

00:33:58,000 --> 00:34:02,000

But, you know, they were definitely firmer at 8,000 feet, but not by much.

442

00:34:02,000 --> 00:34:04,000

Well, do you want to go all the way?

443

00:34:08,000 --> 00:34:10,000

Hello, camera.

444

00:34:12,000 --> 00:34:14,000

Shall we take it up to 40,000?

445

00:34:14,000 --> 00:34:16,000

Let's do that, but not with me and them.

446

00:34:16,000 --> 00:34:17,000

Okay.

447

00:34:18,000 --> 00:34:25,000

Jamie is keen to push the inflatable inserts to the limit. There should be obvious changes at 40,000 feet.

448

00:34:26,000 --> 00:34:32,000

Those puppies are looking pretty taut. Looks like they're about twice the volume that they started out with or so.

449

00:34:32,000 --> 00:34:37,000

These things are quite resilient. I'm not sure they're going to blow.

450

00:34:38,000 --> 00:34:45,000

Even at an intolerable 40,000 feet, these inflatable inserts are in no danger of exploding.

451

00:34:45,000 --> 00:34:46,000

What do you think?

452

00:34:46,000 --> 00:34:49,000

We can see them all expanding individually.

453

00:34:50,000 --> 00:34:57,000

Always looking for a novel twist. The Mythbusters loaded food items into the tank for some frivolous science.

454

00:34:57,000 --> 00:35:01,000

Hey, the marshmallows are definitely expanding. They're lethal.

455

00:35:02,000 --> 00:35:08,000

Oh, hey, we have a rupture in one of our cream-filled cakes. Look at that.

456

00:35:08,000 --> 00:35:10,000

Oh, my Lord.

457

00:35:10,000 --> 00:35:15,000

I'd say the snowballs are much larger now. They're coming off the plate.

458

00:35:16,000 --> 00:35:25,000

I think this just goes to show that if you're a paratrooper and you've got one of these cream-filled confections in your pocket or your uniform, you better be careful.

459

00:35:25,000 --> 00:35:33,000

So, Pinemon, exploding implants. What do we get?

460

00:35:33,000 --> 00:35:37,000

No results. No expansion whatsoever on these things.

461

00:35:37,000 --> 00:35:42,000

You're more in danger of your cannoli rupturing than your implants actually exploding.

462

00:35:42,000 --> 00:35:43,000

Your cannoli?

463

00:35:43,000 --> 00:35:46,000

Cannoli. It's Italian pastry that's cream-filled.

464

00:35:46,000 --> 00:35:47,000

Oh, okay.

465

00:35:47,000 --> 00:35:48,000

Study euphemism.

466

00:35:48,000 --> 00:35:52,000

Okay. So, as far as I'm concerned, Mythbusted.

467

00:35:52,000 --> 00:35:54,000

Oh, definitively busted. Absolutely.

468

00:35:55,000 --> 00:36:06,000

Oh, must test CD-ROM.

469

00:36:06,000 --> 00:36:16,000

Oh, must test CD-ROM.

470

00:36:16,000 --> 00:36:28,000

It turns out that with the brand new extremely high-speed drives, they may actually be exceeding the structural capabilities of the CDs themselves and shattering them into tons of pieces, sometimes even leaving the computer.

471

00:36:28,000 --> 00:36:29,000

Wow.

472

00:36:29,000 --> 00:36:38,000

Yeah, so we're actually going to try and do this. We're going to try and speed up a bunch of CDs and or a bunch of conditions and get them to explode in all sorts of spectacular ways.

473

00:36:38,000 --> 00:36:39,000

I like that.

474

00:36:39,000 --> 00:36:40,000

Yeah.

475

00:36:40,000 --> 00:36:48,000

Along with the computer drive, they will adapt some high-speed tools to spin the CDs beyond 30,000 RPM.

476

00:36:48,000 --> 00:36:52,000

At that point, they expect to see critical failure.

477

00:36:52,000 --> 00:36:54,000

You know, this could be dangerous.

478

00:36:54,000 --> 00:37:02,000

Absolutely. In fact, sharp fragments of polycarbonate are going to be traveling in excess of like 700 miles per hour.

479

00:37:02,000 --> 00:37:06,000

I think to test to see if it can penetrate skin will put our ballistic dummy in there.

480

00:37:06,000 --> 00:37:07,000

I think so.

481

00:37:07,000 --> 00:37:11,000

I think he's perfectly suited to sit in front of this computer and be abused.

482

00:37:11,000 --> 00:37:26,000

We are driving through Silicon Valley on our way to one of the largest computer recyclers in the Bay Area.

483

00:37:26,000 --> 00:37:33,000

And if anyone's going to have a high-speed, like 52-speed CD-ROM drive for us to test, it's going to be them.

484

00:37:37,000 --> 00:37:42,000

If there's something better than a computer store and a shopping cart, I'm not sure what it is.

485

00:37:45,000 --> 00:37:47,000

This is Adam's Life 3.0.

486

00:37:50,000 --> 00:37:53,000

I need to get a couple of towers to put these in.

487

00:37:53,000 --> 00:38:01,000

What I'm trying to test is the idea that, you know, these ultra-fast drives have actually exceeded the physical limitations of the CDs and shattered them inside the case.

488

00:38:01,000 --> 00:38:03,000

Have you guys ever had that happen?

489

00:38:03,000 --> 00:38:09,000

There has been a couple cases. One customer in particular did bring back a CD-ROM drive.

490

00:38:09,000 --> 00:38:12,000

It had some contents rattling inside.

491

00:38:12,000 --> 00:38:20,000

As we opened it up, we discovered that the CD itself shattered completely into many, many pieces.

492

00:38:20,000 --> 00:38:24,000

That's the one I remember notably that sticks out in my mind.

493

00:38:24,000 --> 00:38:27,000

So, yeah, let's get this one.

494

00:38:27,000 --> 00:38:28,000

140, 145.

495

00:38:28,000 --> 00:38:29,000

Hey, how about that?

496

00:38:29,000 --> 00:38:30,000

Okay.

497

00:38:31,000 --> 00:38:32,000

Good enough?

498

00:38:32,000 --> 00:38:33,000

That's good enough.

499

00:38:33,000 --> 00:38:34,000

Right.

500

00:38:34,000 --> 00:38:37,000

We'll take it back to the lab and destroy it.

501

00:38:40,000 --> 00:38:43,000

CD manufacturers are aware of developments.

502

00:38:43,000 --> 00:38:47,000

David Bunzel from the Optical Storage Association has been tracking the stories.

503

00:38:47,000 --> 00:38:56,000

And it seems that much of it relates back to an article that was generated by a PC journalist based in Sweden.

504

00:38:56,000 --> 00:39:07,000

And he was able to do some testing that he suggested at 30,000 RPM, which would approximate a 52X CD-ROM drive, that they would explode.

505

00:39:07,000 --> 00:39:13,000

Over time, we've talked to various people in the industry, and it seems to be very difficult to

replicate.

506

00:39:14,000 --> 00:39:27,000

To replicate the CD-shattering experience, Adam exposed some computer disks to the kind of treatment imposed on them by users.

507

00:39:27,000 --> 00:39:36,000

CDs that blew apart in computer drives may have been damaged by sunlight, corrosive spills, or normal wear and tear.

508

00:39:36,000 --> 00:39:41,000

To test this myth realistically, a few CDs had to be sacrificed.

509

00:39:43,000 --> 00:39:47,000

Cracked, exposed to sunlight, 24 hours.

510

00:39:47,000 --> 00:39:55,000

Rubbing alcohol, microwave, off-center label, expensive name brand control CD.

511

00:39:55,000 --> 00:39:57,000

See how it does.

512

00:40:03,000 --> 00:40:10,000

I've just installed Windows on this computer so that I can install this drive externally,

513

00:40:10,000 --> 00:40:15,000

and hopefully we'll be able to operate it while being able to view the CD spinning.

514

00:40:15,000 --> 00:40:19,000

And the high-speed camera ought to catch the point of failure if there is one.

515

00:40:19,000 --> 00:40:22,000

If there isn't, we're going to make one.

516

00:40:24,000 --> 00:40:27,000

Speed is the key for busting this myth.

517

00:40:27,000 --> 00:40:35,000

Computer drives rated at 52X will be spinning CDs at around 30,000 RPM.

518

00:40:36,000 --> 00:40:42,000

Some disks may disintegrate at this point. Others may require much higher stresses to induce failure.

519

00:40:44,000 --> 00:40:46,000

What do you think about that?

520

00:40:46,000 --> 00:40:55,000

Jamie's quest for more speed involves adapting electrical hand tools and fitting CDs where they weren't meant to go.

521

00:40:55,000 --> 00:40:56,000

Oh no.

522

00:40:56,000 --> 00:40:57,000

Is that sweet or what?

523

00:40:57,000 --> 00:40:59,000

No, it's pretty special.

524

00:40:59,000 --> 00:41:00,000

Worth a trip to the store?

525

00:41:00,000 --> 00:41:01,000

How fast is it?

526

00:41:01,000 --> 00:41:03,000

This is rated for 10,000 RPM.

527

00:41:03,000 --> 00:41:08,000

So I'm going to run the 30,000 RPM router into this and out the other side.

528

00:41:08,000 --> 00:41:14,000

Are you sure that this is a balance enough mechanism to handle six times its current load?

529

00:41:14,000 --> 00:41:16,000

It says it's heavy duty.

530

00:41:20,000 --> 00:41:27,000

Adam is cooking up a ballistics dummy to be placed in the shatter zone for a dramatic demonstration of possible injury.

531

00:41:27,000 --> 00:41:33,000

It's made from gelatin, a substance which when set, closely matches human skin and flesh.

532

00:41:38,000 --> 00:41:41,000

I wish I could understand why we can't get this to spin up to its full speed.

533

00:41:41,000 --> 00:41:45,000

We've done everything we can to get it to max out.

534

00:41:45,000 --> 00:41:49,000

And it may just be that the computer's not fast enough to read it as fast as 56 speed.

535

00:41:50,000 --> 00:41:56,000

The budget computer failed with the latest 56x drive, achieving only 20,000 RPM.

536

00:41:56,000 --> 00:41:58,000

Nowhere near fast enough.

537

00:41:58,000 --> 00:42:01,000

It should be pushing at least 30,000.

538

00:42:01,000 --> 00:42:03,000

Jamie has another plan.

539

00:42:03,000 --> 00:42:06,000

Frankly, I'm terrified of Jamie's drive.

540

00:42:06,000 --> 00:42:09,000

He's built the equivalent of a 300 speed drive in there.

541

00:42:09,000 --> 00:42:16,000

I don't want to be anywhere near it and I'm really glad we have it contained in the blast chamber because the drive itself may fail catastrophically.

542

00:42:16,000 --> 00:42:19,000

Jamie is adding more power to the equation.

543

00:42:19,000 --> 00:42:24,000

He's adapted a super fast motor and plugged it into a variable speed controller.

544

00:42:24,000 --> 00:42:31,000

This motor is set up to go maybe 90,000 RPM if not for the drag on it.

545

00:42:31,000 --> 00:42:34,000

I'm guessing it might go like 80.

546

00:42:34,000 --> 00:42:37,000

I ought to go faster than it's supposed to though.

547

00:42:38,000 --> 00:42:40,000

Oh, this is cool.

548

00:42:41,000 --> 00:42:42,000

Wow.

549

00:42:43,000 --> 00:42:45,000

Look at me, I'm a god.

550

00:42:47,000 --> 00:42:49,000

Doesn't look much like you, Adam.

551

00:42:49,000 --> 00:42:51,000

Looks exactly like me. Look at that.

552

00:42:52,000 --> 00:42:54,000

You know, I've always wanted a six pack.

553

00:42:57,000 --> 00:42:58,000

Close your eyes.

554

00:42:58,000 --> 00:43:00,000

Okay, there we go.

555

00:43:00,000 --> 00:43:02,000

All right.

556

00:43:02,000 --> 00:43:05,000

Doctor, the patient is ready.

557

00:43:06,000 --> 00:43:10,000

Repping CDs up to demolition speed is the aim.

558

00:43:10,000 --> 00:43:14,000

Jamie's customized drive is about to get its chance.

559

00:43:14,000 --> 00:43:15,000

Contact.

560

00:43:16,000 --> 00:43:17,000

Whoa.

561

00:43:18,000 --> 00:43:19,000

Oh my god.

562

00:43:21,000 --> 00:43:23,000

Faster, faster.

563

00:43:23,000 --> 00:43:24,000

That's all of it?

564

00:43:24,000 --> 00:43:25,000

Yup.

565

00:43:26,000 --> 00:43:28,000

It's all they're reading, 20,000.

566

00:43:31,000 --> 00:43:35,000

That might be as fast as it can spin something like a CD.

567

00:43:35,000 --> 00:43:39,000

The friction with the air makes it have to draw more amps in order to do it.

568

00:43:39,000 --> 00:43:42,000

We do better direct drive right off of the air.

569

00:43:42,000 --> 00:43:44,000

I know it would spin that up.

570

00:43:45,000 --> 00:43:49,000

They're still unable to get to the required 30,000 RPM.

571

00:43:49,000 --> 00:43:52,000

But the workshop has other fast tools.

572

00:43:53,000 --> 00:43:56,000

Blade, 2,000 RPM.

573

00:43:57,000 --> 00:44:00,000

Bench grinder, 3,500 RPM.

574

00:44:02,000 --> 00:44:05,000

Dental drill, 60,000 RPM.

575

00:44:05,000 --> 00:44:08,000

Dental drill, 60,000 RPM.

576

00:44:12,000 --> 00:44:17,000

I don't know how fast it's going, but it's off the set.

577

00:44:23,000 --> 00:44:24,000

I mean, there it is.

578

00:44:24,000 --> 00:44:32,000

None of those tools were suitable, so they purchased a tougher, faster router to direct drive some of the damaged CDs.

579

00:44:32,000 --> 00:44:35,000

We really need to see some explosions now.

580

00:44:36,000 --> 00:44:38,000

We've got the microwave CD.

581

00:44:38,000 --> 00:44:39,000

Okay.

582

00:44:39,000 --> 00:44:41,000

That one's been severely stressed.

583

00:44:42,000 --> 00:44:48,000

Adam is convinced the CD he fried in the microwave will not withstand the forces.

584

00:44:49,000 --> 00:44:51,000

All the way, baby. All the way.

585

00:44:53,000 --> 00:44:54,000

Come on.

586

00:44:55,000 --> 00:44:56,000

Yes.

587

00:44:57,000 --> 00:44:58,000

Goodness, man.

588

00:45:00,000 --> 00:45:01,000

Everything else is coming off of it.

589

00:45:01,000 --> 00:45:04,000

Oh, yes.

590

00:45:08,000 --> 00:45:12,000

It just goes to show that you shouldn't microwave your CD and then put it in your drive.

591

00:45:14,000 --> 00:45:17,000

But what happened to the ballistics dummy?

592

00:45:19,000 --> 00:45:22,000

Oh my God. That's a horror show.

593

00:45:23,000 --> 00:45:28,000

Look at this. It's embedded like two inches into his flesh. That's bad.

594

00:45:29,000 --> 00:45:36,000

To imitate a computer drive, Adam and Jamie set up a high speed run with a CD mounted in its plastic tray.

595

00:45:37,000 --> 00:45:38,000

Ready? Here we go.

596

00:45:42,000 --> 00:45:44,000

That's 25,024.

597

00:45:48,000 --> 00:45:51,000

See, I'd turn my computer off if it was making that noise.

598

00:45:51,000 --> 00:45:53,000

It's making that noise.

599

00:45:56,000 --> 00:45:57,000

Oh.

600

00:45:58,000 --> 00:45:59,000

Well, there you go.

601

00:45:59,000 --> 00:46:01,000

In the tray, we got failure at 25,000 RPM.

602

00:46:02,000 --> 00:46:03,000

In the tray.

603

00:46:03,000 --> 00:46:06,000

Absolutely. And that was a control one. We didn't damage that one at all.

604

00:46:06,000 --> 00:46:08,000

That CD was whole and intact.

605

00:46:08,000 --> 00:46:11,000

And the tray made it fail pretty quickly.

606

00:46:11,000 --> 00:46:14,000

Yeah. You can smell the burning plastic from it.

607

00:46:14,000 --> 00:46:15,000

Yeah, here, look.

608

00:46:15,000 --> 00:46:16,000

Yeah.

609

00:46:16,000 --> 00:46:21,000

Even the computer drive's metal shield is given a solid microwaved CD workout.

610

00:46:29,000 --> 00:46:30,000

That's spectacular.

611

00:46:30,000 --> 00:46:32,000

Look at the damage it did to this case.

612

00:46:33,000 --> 00:46:35,000

I mean, spread the sides out.

613

00:46:35,000 --> 00:46:36,000

Yeah, little depth marks.

614

00:46:36,000 --> 00:46:38,000

Yeah, it dented the steel.

615

00:46:38,000 --> 00:46:39,000

It's like hitting it with a hammer.

616

00:46:39,000 --> 00:46:44,000

If the high speed 52 and 56 times drives are already causing some discs to shatter,

617

00:46:44,000 --> 00:46:46,000

what does the future hold?

618

00:46:47,000 --> 00:46:51,000

So, David, are we going to see 100x drives, 200?

619

00:46:51,000 --> 00:46:52,000

Where's it going to stop?

620

00:46:52,000 --> 00:46:58,000

I wouldn't really expect the optical drives to go much past the 52x range.

621

00:46:58,000 --> 00:47:02,000

I think what you're going to see in terms of increased capacity is going to be done

622

00:47:02,000 --> 00:47:05,000

more with different types of lasers.

623

00:47:05,000 --> 00:47:09,000

Different technology unpacking the bits tighter on the disc.

624

00:47:09,000 --> 00:47:12,000

And their speed is not as critical of an issue.

625

00:47:12,000 --> 00:47:17,000

So you will probably not even need the 52x to be able to accomplish this.

626

00:47:17,000 --> 00:47:19,000

You ready to ramp it up to double speed?

627

00:47:19,000 --> 00:47:20,000

I'm ready.

628

00:47:20,000 --> 00:47:21,000

All right.

629

00:47:21,000 --> 00:47:22,000

Let's go, Spin Man.

630

00:47:22,000 --> 00:47:28,000

So far, most undamaged control CDs have withstood standard spin forces,

631

00:47:28,000 --> 00:47:29,000

only one disintegrated.

632

00:47:29,000 --> 00:47:32,000

Slow speed is the only thing that's going to be able to do that.

633

00:47:32,000 --> 00:47:35,000

Spin forces, only one disintegrated.

634

00:47:35,000 --> 00:47:39,000

Slow motion pictures show them warping, but not shattering.

635

00:47:39,000 --> 00:47:42,000

But Jamie and Adam want mass destruction.

636

00:47:42,000 --> 00:47:46,000

They switch from 110 volts to a potent 220.

637

00:47:46,000 --> 00:47:48,000

It's party time.

638

00:47:48,000 --> 00:47:49,000

You ready, Baldi?

639

00:47:49,000 --> 00:47:50,000

Wait.

640

00:47:51,000 --> 00:47:52,000

Ready?

641

00:47:52,000 --> 00:47:54,000

And unplug it right after you're done.

642

00:47:54,000 --> 00:47:55,000

Yeah.

643

00:47:55,000 --> 00:47:57,000

Three, two, one.

644

00:47:57,000 --> 00:48:02,000

Next one.

645

00:48:02,000 --> 00:48:05,000

Next one.

646

00:48:05,000 --> 00:48:08,000

It's like lightning a match under the thing.

647

00:48:13,000 --> 00:48:14,000

Ah!

648

00:48:17,000 --> 00:48:18,000

Okay, next one.

649

00:48:18,000 --> 00:48:19,000

Next one.

650

00:48:19,000 --> 00:48:20,000

Ah!

651

00:48:20,000 --> 00:48:23,000

Couldn't take it.

652

00:48:23,000 --> 00:48:24,000

Plug it.

653

00:48:24,000 --> 00:48:29,000

I think it actually blew the router, though.

654

00:48:29,000 --> 00:48:30,000

We're done, I guess.

655

00:48:30,000 --> 00:48:32,000

I think we've done a good day's work here.

656

00:48:32,000 --> 00:48:35,000

Any day we create that much shrapnel is a good day.

657

00:48:35,000 --> 00:48:36,000

That's astounding.

658

00:48:36,000 --> 00:48:39,000

I mean, it's like almost like Christmas.

659

00:48:39,000 --> 00:48:44,000

So listen, even if one blew up in your computer, would you be at risk?

660

00:48:44,000 --> 00:48:45,000

No.

661

00:48:45,000 --> 00:48:46,000

Why not?

662

00:48:46,000 --> 00:48:49,000

Well, maybe if you open the thing up and put your eye right in there.

663

00:48:49,000 --> 00:48:51,000

See, that's just the sort of thing I might do.

664

00:48:51,000 --> 00:48:54,000

Well, there are easier ways to poke your eye out, I suppose.

665

00:48:54,000 --> 00:48:58,000

Now, are you worried about CDs exploding in your computers?

666

00:48:58,000 --> 00:48:59,000

No.

667

00:48:59,000 --> 00:49:05,000

I have three computers that sit around me, and I don't sit there with any concern that

668

00:49:05,000 --> 00:49:07,000

I'm going to have fragments flying at me.

669

00:49:07,000 --> 00:49:12,000

Given the millions of years that you've been living in, what's the biggest risk you've

670

00:49:12,000 --> 00:49:13,000

had at me?

671

00:49:13,000 --> 00:49:18,000

Given the millions and millions of CDs that are out there being burned all the time, and

672

00:49:18,000 --> 00:49:23,000

maybe dozen cases that we've heard of this happening, it's pretty much almost a non-event.

673

00:49:23,000 --> 00:49:24,000

I agree.

674

00:49:24,000 --> 00:49:27,000

It's not something the average buyer has to worry about.

675

00:49:27,000 --> 00:49:29,000

Highly, highly unlikely.

676

00:49:42,000 --> 00:49:49,000

Thank you.