

1

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

Do not try any of the experiments you are about to see at home.

2

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

You heard him. Don't do it.

3

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

On this high velocity episode of Mythbusters...

4

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

I'm all oiled up and ready to go.

5

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

Adam and Janey wreak highway havoc in Spycar Escape.

6

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

You're not gonna catch me.

7

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

Just how difficult is it to give your pursuer the slip?

8

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

I gotta say that's pretty effective.

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

With in-car weapons that always seem to work so well in the movies.

10

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

There it goes. It's deployed!

11

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

Then Tori, Grant and Carrie play hardball with a myth of momentum.

12

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

We're gonna see that ball drop.

13

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

As they aim to find out if an object shot backwards while traveling forwards...

14

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

I feel like a gladiator ready to be slaughtered.

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00:00:47,000 --> 00:00:50,000

...would really drop straight to the ground.

16

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

That was a pretty good shot.

17

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

Who are the Mythbusters?

18

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

Adam Savage.

19

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

We would need to bring some more power.

20

00:01:00,000 --> 00:01:01,000

And Jamie Heinemann.

21

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

Relax. This one hurt a bit.

22

00:01:04,000 --> 00:01:08,000

Between them more than 30 years of special effects experience...

23

00:01:08,000 --> 00:01:10,000

We've got to keep the reflux!

24

00:01:10,000 --> 00:01:11,000

Joining them...

25

00:01:11,000 --> 00:01:13,000

Tori Belleggi.

26

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

Hello, fire!

27

00:01:14,000 --> 00:01:15,000

Grant Imahara.

28

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

Hey!

29

00:01:16,000 --> 00:01:17,000

And Carrie Byra.

30

00:01:17,000 --> 00:01:19,000

What's the matter here? See?

31

00:01:19,000 --> 00:01:21,000

They don't just tell the Myths.

32

00:01:21,000 --> 00:01:24,000

They put them to the test.

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

Check it out.

34

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

You know we love our movie myths.

35

00:01:38,000 --> 00:01:41,000

And specifically we love our Super Spy movie myths.

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00:01:41,000 --> 00:01:45,000

This next one involves devices that a spy puts into their car...

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00:01:45,000 --> 00:01:49,000

to instantly stop someone from following them in a car chase scenario.

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00:01:49,000 --> 00:01:51,000

Ah, like a smoke screen.

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00:01:51,000 --> 00:01:52,000

Exactly.

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

And I'm thinking we test all the classics.

41

00:01:54,000 --> 00:01:56,000

Smoke screen, I'm thinking releasing a bunch of tax.

42

00:01:56,000 --> 00:01:58,000

And oil slick.

43

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

Fast cars, dangerous gadgets.

44

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

I'm up for it.

45

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

I thought you would pay.

46

00:02:04,000 --> 00:02:07,000

The concept is almost as old as the automobile itself.

47

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

Arming a car with the right kind of gadgets to ensure a slick getaway.

48

00:02:12,000 --> 00:02:14,000

Right on the arm!

49

00:02:14,000 --> 00:02:18,000

The boys are revved up to test three of the all-time classics...

50

00:02:18,000 --> 00:02:22,000

in a series of equally classic car chases.

51

00:02:24,000 --> 00:02:26,000

This is Adam. Can someone get me a car?

52

00:02:27,000 --> 00:02:29,000

This is Jamie. Make it sporty.

53

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

Isn't that nice?

54

00:02:37,000 --> 00:02:39,000

That's cute. Drive it on in.

55

00:02:39,000 --> 00:02:40,000

Okay.

56

00:02:41,000 --> 00:02:43,000

This is SpyCar One.

57

00:02:43,000 --> 00:02:46,000

Right now it's a normal car, but when we're finished with it...

58

00:02:46,000 --> 00:02:51,000

it's going to have all the little tricks and gadgets that any self-respecting spy car would have.

59

00:02:51,000 --> 00:02:53,000

Just ought to do.

60

00:02:54,000 --> 00:02:56,000

So it's straight down to business.

61

00:02:56,000 --> 00:02:59,000

And the key word right now is deployment.

62

00:02:59,000 --> 00:03:02,000

Welcome to Jamie's Chop Shop.

63

00:03:02,000 --> 00:03:06,000

All movie fans know that most weapons are launched from the trunk...

64

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

and a hole in the floor with a sliding trapdoor should fit the bill.

65

00:03:11,000 --> 00:03:15,000

Jamie's simple release can be sprung from a cord to the cockpit.

66

00:03:15,000 --> 00:03:17,000

It's not fancy.

67

00:03:17,000 --> 00:03:19,000

I ought to do it.

68

00:03:19,000 --> 00:03:20,000

But it works.

69

00:03:23,000 --> 00:03:27,000

With the car customized, it's off to the test track to load it with weapons.

70

00:03:29,000 --> 00:03:32,000

We're at the Alameda County Emergency Vehicle Operations Center...

71

00:03:32,000 --> 00:03:36,000

which is where the police practice chasing bad guys.

72

00:03:36,000 --> 00:03:38,000

Which means it's perfect for us.

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00:03:38,000 --> 00:03:41,000

Of course there's no chase without a chase car...

74

00:03:41,000 --> 00:03:44,000

and an experienced daredevil to drive it.

75

00:03:44,000 --> 00:03:45,000

Morning, sir.

76

00:03:45,000 --> 00:03:46,000

Morning.

77

00:03:46,000 --> 00:03:47,000

How are you?

78

00:03:47,000 --> 00:03:48,000

I'm good. How are you?

79

00:03:48,000 --> 00:03:50,000

Good. Good day for a car chase?

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

Everyday is a good day for a car chase.

81

00:03:55,000 --> 00:03:59,000

What is it that makes Brian uniquely qualified to perform this test with us?

82

00:03:59,000 --> 00:04:02,000

I ask you to cast your line back to driving in the rain.

83

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

We'll Brian hydroplane it over 100 miles per hour...

84

00:04:05,000 --> 00:04:07,000

and get a 720 degree turn.

85

00:04:07,000 --> 00:04:09,000

Look at the internal camera.

86

00:04:09,000 --> 00:04:12,000

That impassive face on him is the face of confidence...

87

00:04:12,000 --> 00:04:14,000

and it is the face that will lead this test for us.

88

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

If we can evade him, we can evade anybody.

89

00:04:18,000 --> 00:04:22,000

Escaping a driver who's more skilled than you means disabling his car.

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00:04:22,000 --> 00:04:25,000

So, what's the first trick in Adam's trunk?

91

00:04:25,000 --> 00:04:30,000

They may look friendly, but these are quarter-inch pieces of hot roll steel...

92

00:04:30,000 --> 00:04:33,000

bent at right angles and welded into a tetrahedral arrangement...

93

00:04:33,000 --> 00:04:35,000

and then sharpened.

94

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

These are road spikes.

95

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

Always have one point facing up.

96

00:04:39,000 --> 00:04:43,000

I think they're going to be highly effective when I drop them from the back of the evading...

97

00:04:43,000 --> 00:04:44,000

Spy car.

98

00:04:44,000 --> 00:04:48,000

With over a hundred of these lethal little tire shredders, he might be right.

99

00:04:48,000 --> 00:04:51,000

But Jamie also has a point.

100

00:04:51,000 --> 00:04:55,000

Now, I have no doubt that these tacks are going to stick in the tires...

101

00:04:55,000 --> 00:05:00,000

but will they deflate the tires quickly enough to keep our spy happy?

102

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

I'm not so sure.

103

00:05:02,000 --> 00:05:06,000

Well, first, a quick check on the rules of the chase.

104

00:05:06,000 --> 00:05:09,000

So, Brian, what are the criteria for escaping?

105

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

If Adam's able to get far enough ahead of us that he actually loops and gets behind us...

106

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

then he's gotten away.

107

00:05:15,000 --> 00:05:18,000

Also, if he makes a turn on the course someplace that I don't catch...

108

00:05:18,000 --> 00:05:21,000

and then we end up taking a different turn or a different route, then I've lost him.

109

00:05:21,000 --> 00:05:22,000

Okay, then.

110

00:05:22,000 --> 00:05:27,000

The cones are lined up to mark out a long and winding road.

111

00:05:27,000 --> 00:05:29,000

And they're ready to rumble.

112

00:05:29,000 --> 00:05:32,000

Okay, this is Spy Car in Evasion Techniques.

113

00:05:32,000 --> 00:05:33,000

The tacks.

114

00:05:33,000 --> 00:05:36,000

Eat my dust.

115

00:05:41,000 --> 00:05:42,000

Make no mistake.

116

00:05:42,000 --> 00:05:45,000

Both drivers are hell-bent on surviving the chase.

117

00:05:45,000 --> 00:05:49,000

Brian keeps a respectful distance of five or six car lengths.

118

00:05:49,000 --> 00:05:52,000

He's picking up a little speed.

119

00:05:52,000 --> 00:05:58,000

Eventually, right before a curve, Adam decides to drop his load.

120

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

There we go.

121

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

Despite his considerable skill, Brian's going too fast to avoid all the tacks.

122

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

They stuck in. I can hear them.

123

00:06:09,000 --> 00:06:14,000

But at least for the moment, the chase car shows no signs of losing momentum.

124

00:06:17,000 --> 00:06:20,000

We must have had about a half a dozen at least in there.

125

00:06:20,000 --> 00:06:23,000

We're holding on just fine.

126

00:06:23,000 --> 00:06:26,000

I wouldn't take corners too fast in it, but...

127

00:06:26,000 --> 00:06:30,000

Okay, we got ya. Bang, bang, bang, bang, bang.

128

00:06:32,000 --> 00:06:36,000

So what happens? Didn't... Oh! I got you!

129

00:06:36,000 --> 00:06:39,000

Well, you did, but then you didn't.

130

00:06:39,000 --> 00:06:43,000

The tacks went into the tires, but we were on your tail for several minutes afterwards.

131

00:06:43,000 --> 00:06:44,000

It didn't slow us down.

132

00:06:44,000 --> 00:06:48,000

I thought that as soon as you hit the tacks, you'd be skidding off the road immediately.

133

00:06:48,000 --> 00:06:51,000

I've got flat tires, but you still didn't get away.

134

00:06:51,000 --> 00:06:54,000

No, I didn't get away. Shoot, I wouldn't have called that.

135

00:06:54,000 --> 00:06:58,000

The tacks eventually worked, but they took their sweet time.

136

00:06:58,000 --> 00:07:02,000

I'll say one thing else. While I'm fagging it out on this course, help and for leather,

137

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

it's really disconcerting to look into my rear view mirror and see Brian passively driving after me.

138

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

It's like a lion playing with his food.

139

00:07:10,000 --> 00:07:15,000

Jamie thinks he knows why the spikes kind of worked and kind of didn't.

140

00:07:15,000 --> 00:07:18,000

The problem with tacks is that they plug the hole that they create,

141

00:07:18,000 --> 00:07:20,000

and they don't let the air out quick enough.

142

00:07:20,000 --> 00:07:23,000

Now, eventually, sure, your tire is going to deflate,

143

00:07:23,000 --> 00:07:27,000

but as far as a pursuit goes, you could hang on for quite a while.

144

00:07:27,000 --> 00:07:31,000

As a quick escape option, the tacks didn't cut it.

145

00:07:31,000 --> 00:07:37,000

So it's onto phase two of the myth, blinding the pursuer in a cloud of smoke.

146

00:07:37,000 --> 00:07:43,000

Today, the role of smoke in our little Spy Car episode is going to be played by a military smoke grenade.

147

00:07:43,000 --> 00:07:49,000

Now we were offered the chance to use a minimum smoke grenade, but we said, hell no, give us maximum smoke.

148

00:07:49,000 --> 00:07:54,000

Military style. What does that look like? I don't know. Let's check it out.

149

00:07:55,000 --> 00:08:02,000

Providing the wind doesn't pick up, that should work nicely.

150

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

This rig is about as simple as it gets. All you do is pull the pin, you've got smoke.

151

00:08:08,000 --> 00:08:12,000

All I've done is strap them to the back of the inside of the car.

152

00:08:12,000 --> 00:08:17,000

I've hooked them up to cables that go into the cockpit of the car. I pull on the cables.

153

00:08:17,000 --> 00:08:19,000

I'm gone in a puff of smoke.

154

00:08:19,000 --> 00:08:21,000

Well, that's the theory.

155

00:08:21,000 --> 00:08:23,000

Okay, smoke evasion. You guys ready?

156

00:08:23,000 --> 00:08:26,000

That's affirmative law breaker. Do your worst.

157

00:08:33,000 --> 00:08:40,000

Right from the get go, Janey sets a cracking pace through the traffic cones.

158

00:08:40,000 --> 00:08:46,000

Brian has no idea when to expect the smoke, but he doesn't have long to wait.

159

00:08:47,000 --> 00:08:53,000

For the first few seconds, the deployment looks picture perfect.

160

00:08:53,000 --> 00:09:00,000

It's right about now that it all goes horribly wrong as Janey's convertible starts filling with smoke.

161

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

He misses the wall by a whisker and the chase is called off before Janey swallows more than his pride.

162

00:09:08,000 --> 00:09:10,000

I think he has to get out.

163

00:09:10,000 --> 00:09:17,000

You okay? Can we get some water over here for Janey right away?

164

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

This smoke has gone literally everywhere. It's coming out of every nook and cranny of this car.

165

00:09:23,000 --> 00:09:28,000

Well, that right there was a real pink panther moment.

166

00:09:28,000 --> 00:09:33,000

I mean, we build these things and we're going to be able to get out of here.

167

00:09:33,000 --> 00:09:39,000

With the rushing air pushed over and around the windscreen, the car's interior became a low pressure zone,

168

00:09:39,000 --> 00:09:43,000

sucking much of the smoke back up over the trunk.

169

00:09:43,000 --> 00:09:45,000

That's a rig failure.

170

00:09:45,000 --> 00:09:49,000

I think it's a good idea to get out of here.

171

00:09:49,000 --> 00:09:52,000

I think it's a good idea to get out of here.

172

00:09:52,000 --> 00:09:55,000

I think it's a good idea to get out of here.

173

00:09:55,000 --> 00:09:58,000

I think it's a good idea to get out of here.

174

00:09:58,000 --> 00:10:03,000

We're going to have to get out of here and get much of the smoke back up over the trunk.

175

00:10:03,000 --> 00:10:08,000

That's a rig failure, not a technique failure. We're going to have to reset and try it again.

176

00:10:08,000 --> 00:10:12,000

Adam's right. It's unfair to condemn a myth due to faulty method.

177

00:10:12,000 --> 00:10:20,000

We'll reassess and reload to hopefully make the convertible cockpit a smoke-free zone.

178

00:10:20,000 --> 00:10:26,000

After the break, Carrie Grant and Tori take a treadmill walk on the wild side.

179

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

I'm never going to be...

180

00:10:41,000 --> 00:10:43,000

So what are you so excited about?

181

00:10:43,000 --> 00:10:48,000

Well, it's our turn to try a new type of myth, the physics thought experiment.

182

00:10:48,000 --> 00:10:51,000

Great! So I'm going to get the old gray matter working.

183

00:10:51,000 --> 00:10:55,000

So here's how this one goes. Let's say you're driving along in a car at X miles an hour.

184

00:10:55,000 --> 00:10:59,000

You throw something out the back in the opposite direction at the same speed.

185

00:10:59,000 --> 00:11:01,000

Does it just fall straight down?

186

00:11:01,000 --> 00:11:04,000

Basically what you're saying is the forward momentum and the backward momentum

187

00:11:04,000 --> 00:11:06,000

cancel each other out completely.

188

00:11:06,000 --> 00:11:10,000

Exactly. Or is there some other factor like air resistance that makes it impossible?

189

00:11:10,000 --> 00:11:14,000

And I wonder if it works at six miles an hour. Will it also work at 60?

190

00:11:14,000 --> 00:11:16,000

That is what we're going to find out.

191

00:11:16,000 --> 00:11:21,000

It makes sense that an object subjected to equal and opposite forces,

192

00:11:21,000 --> 00:11:24,000

forwards and backwards, would drop like a stone.

193

00:11:24,000 --> 00:11:31,000

But unless we can prove it in real life, this simple equation's no more than an untested myth.

194

00:11:31,000 --> 00:11:32,000

So how are we going to test this one?

195

00:11:32,000 --> 00:11:35,000

How about a pickup truck with a treadmill on the back?

196

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

A pickup truck drives forward at 10 miles an hour, a treadmill goes back at 10 miles an hour,

197

00:11:38,000 --> 00:11:40,000

and then one of us jumps on it.

198

00:11:40,000 --> 00:11:42,000

By one of us you mean Tori?

199

00:11:42,000 --> 00:11:45,000

What? So this is to see if I just fall straight down or get flung off the back.

200

00:11:45,000 --> 00:11:46,000

That's the idea.

201

00:11:46,000 --> 00:11:48,000

Yeah, great idea.

202

00:11:48,000 --> 00:11:53,000

Best if they bust out the gym equipment before Tori changes his mind.

203

00:11:53,000 --> 00:11:55,000

That seems safe enough.

204

00:11:55,000 --> 00:11:57,000

Normally treadmills are pretty straightforward.

205

00:11:57,000 --> 00:11:59,000

You set the speed and go.

206

00:11:59,000 --> 00:12:01,000

That is, of course, if you haven't been drinking.

207

00:12:01,000 --> 00:12:06,000

As Adam bravely proved, the treadmill is not to be trifled with.

208

00:12:06,000 --> 00:12:09,000

And now it's Tori's turn.

209

00:12:09,000 --> 00:12:13,000

My question is if he jumps onto a moving treadmill,

210

00:12:13,000 --> 00:12:17,000

will it slow down and actually throw him off at a slower speed?

211

00:12:17,000 --> 00:12:21,000

To test this, we're going to put a 180 pound load onto the treadmill,

212

00:12:21,000 --> 00:12:23,000

see if it slows down.

213

00:12:23,000 --> 00:12:27,000

If it does, then we'll turn it up until it throws it off at the target speed.

214

00:12:27,000 --> 00:12:32,000

According to the manual, the maximum speed of the treadmill is 10 miles per hour.

215

00:12:32,000 --> 00:12:35,000

That's fast enough to get the stripes strobing.

216

00:12:35,000 --> 00:12:37,000

That looks a little crazy to me.

217

00:12:37,000 --> 00:12:39,000

It looks a lot crazy.

218

00:12:39,000 --> 00:12:41,000

That looks so dangerous.

219

00:12:41,000 --> 00:12:43,000

I would not want to try to jump on that.

220

00:12:43,000 --> 00:12:45,000

And at least for the moment, he doesn't.

221

00:12:45,000 --> 00:12:50,000

That was kind of a problem.

222

00:12:50,000 --> 00:12:52,000

In fact, it was just what Grant predicted.

223

00:12:52,000 --> 00:12:56,000

The bag slowed the belt down to a relative crawl.

224

00:12:56,000 --> 00:12:58,000

It actually covers fairly quickly.

225

00:12:58,000 --> 00:13:03,000

And it gets back up to 5.45 miles per hour.

226

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

All right, now the tricky part is doing it without falling.

227

00:13:06,000 --> 00:13:08,000

I suggest you tuck and roll.

228

00:13:08,000 --> 00:13:14,000

So to balance the myth, the truck should also move forwards at 5.5 miles per hour.

229

00:13:14,000 --> 00:13:18,000

All that remains is to attach one to the other.

230

00:13:18,000 --> 00:13:20,000

Are you really going to run on this thing, huh?

231

00:13:20,000 --> 00:13:22,000

Not so much run.

232

00:13:22,000 --> 00:13:24,000

More just fly off the back.

233

00:13:24,000 --> 00:13:30,000

Four bolts later, this traveling treadmill is primed for a field trip.

234

00:13:30,000 --> 00:13:36,000

They're bound for the Concord Naval Weapon Station, where the roads are long and level.

235

00:13:36,000 --> 00:13:38,000

That's not going anywhere.

236

00:13:38,000 --> 00:13:40,000

No, that's good.

237

00:13:40,000 --> 00:13:42,000

Should be real safe. Real safe.

238

00:13:42,000 --> 00:13:46,000

That would be the least of our safety concerns, I think.

239

00:13:46,000 --> 00:13:48,000

Straps on the famous red suit.

240

00:13:48,000 --> 00:13:52,000

Carrie still can't understand why his knee pads are traveling.

241

00:13:52,000 --> 00:13:56,000

You got dragged by a horse and it didn't seem like a bad idea.

242

00:13:56,000 --> 00:13:58,000

Got buried alive, didn't seem like a bad idea.

243

00:13:58,000 --> 00:14:00,000

Whoa, whoa, stop, stop!

244

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

You got in a ring with a bullet, didn't seem like a bad idea.

245

00:14:04,000 --> 00:14:06,000

He's looking right at us.

246

00:14:06,000 --> 00:14:08,000

This is a bad idea.

247

00:14:08,000 --> 00:14:10,000

I feel like a gladiator ready to be slaughtered.

248

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

We'll chalk that one up as a yes.

249

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

So here's the setup. For our control test, our truck is going to be stationary.

250

00:14:18,000 --> 00:14:22,000

Troy's going to drop under the treadmill and then project off the end of the truck in a gentle arc.

251

00:14:22,000 --> 00:14:26,000

Okay, so this is our control test. You ready?

252

00:14:26,000 --> 00:14:28,000

I'm ready. I'm never going to be.

253

00:14:28,000 --> 00:14:34,000

Famous last words as a telephone call disrupts the filming.

254

00:14:34,000 --> 00:14:36,000

Hello?

255

00:14:36,000 --> 00:14:38,000

Who is it?

256

00:14:38,000 --> 00:14:40,000

Yeah, we've got the insurance company shipped.

257

00:14:40,000 --> 00:14:42,000

This is Brian. He's our director.

258

00:14:42,000 --> 00:14:44,000

You should know better.

259

00:14:44,000 --> 00:14:46,000

What's going on?

260

00:14:46,000 --> 00:14:54,000

With uncanny timing, the office has called up to tell them that Tori cannot take the fall.

261

00:14:54,000 --> 00:15:01,000

Okay, so this is unusual. We're just about to go for it and our producer gets a phone call from the insurers.

262

00:15:01,000 --> 00:15:07,000

Apparently, this is way too dangerous for Tori to attempt, this uncontrollable fall.

263

00:15:07,000 --> 00:15:13,000

So I think we're going to have to go for the next best thing, which is sandbags or something.

264

00:15:13,000 --> 00:15:19,000

So while Tori stands down, the supply truck is ransacked for raw materials.

265

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

Okay, what do we got?

266

00:15:21,000 --> 00:15:27,000

They're looking to build a substitute fall guide, so coveralls and a blow-up doll fit the bill.

267

00:15:27,000 --> 00:15:30,000

How's that? Has it gotten into the legs?

268

00:15:30,000 --> 00:15:32,000

Oh, it is. It's getting heavy.

269

00:15:32,000 --> 00:15:36,000

And there's a real bonus to having a sand-filled stand-in.

270

00:15:36,000 --> 00:15:44,000

They can fill it to just a fraction of Tori's weight, so they can run their tests at 10 miles per hour, not the planned five.

271

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

Not bad for a stand-in, Tori.

272

00:15:47,000 --> 00:15:52,000

It's only fitting that the man who missed out gets to discharge his stunt double.

273

00:15:52,000 --> 00:15:56,000

Alright, here we go. 10 miles an hour.

274

00:15:56,000 --> 00:16:00,000

In three, two, one.

275

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

I am so glad that that wasn't you, man.

276

00:16:03,000 --> 00:16:06,000

That was an arc. I wouldn't say a gentle arc.

277

00:16:06,000 --> 00:16:11,000

Nor would we, and it's probably time to admit that the safety team had a fair point.

278

00:16:11,000 --> 00:16:17,000

So in our control test, stand-in Tori was thrown six feet away from the treadmill from a height of three and a half feet.

279

00:16:17,000 --> 00:16:21,000

What this means is he didn't fall straight down, but that's not a surprise.

280

00:16:21,000 --> 00:16:24,000

Now it's time to move on.

281

00:16:25,000 --> 00:16:34,000

Okay, this is the main test. I'm going to drive the pickup at 10 miles an hour while Tori throws his sand-in onto the treadmill right in front of the high-speed cameras.

282

00:16:34,000 --> 00:16:42,000

If the sack of sand comes even close to falling straight to the ground, we'll finally know that this myth is on track.

283

00:16:42,000 --> 00:16:48,000

It's a rare case where the team gets excited by a lack of spectacle.

284

00:16:48,000 --> 00:16:52,000

Still, best check the high speed.

285

00:16:52,000 --> 00:16:55,000

So watch that point right there.

286

00:16:55,000 --> 00:16:57,000

Oh, nice timing on the drop.

287

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

It pretty much dropped straight down.

288

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

I mean, compared to our control test, it would have been out there.

289

00:17:04,000 --> 00:17:06,000

Yeah. Here, straight down.

290

00:17:06,000 --> 00:17:08,000

That is really cool.

291

00:17:08,000 --> 00:17:10,000

So there might be some merit to this myth.

292

00:17:10,000 --> 00:17:12,000

Absolutely.

293

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

The morning's testing was a total success, and they'd learned something along the way.

294

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

First of all, we learned that Tori is more important than we thought.

295

00:17:20,000 --> 00:17:22,000

We can't just chuck him off the back of a truck.

296

00:17:22,000 --> 00:17:25,000

Secondly, we learned something from our 10-mile-an-hour test.

297

00:17:25,000 --> 00:17:28,000

We had the treadmill going at 10 miles an hour on a stationary truck.

298

00:17:28,000 --> 00:17:32,000

We dropped our sand-in Tori, and he fell in a little arc.

299

00:17:32,000 --> 00:17:40,000

Then we drove exactly 10 miles an hour, dropped our sand-in Tori in the same position, and he went straight down.

300

00:17:40,000 --> 00:17:44,000

But this is Mythbusters, and we just can't stop there.

301

00:17:47,000 --> 00:17:52,000

Coming up, Adam and Jamie look for satisfaction in traction.

302

00:17:52,000 --> 00:17:55,000

I gotta say, that's pretty effective.

303

00:18:00,000 --> 00:18:08,000

So far, the spikes are a bust, and the smoke is a maybe in our spy car evasion myth.

304

00:18:08,000 --> 00:18:14,000

Given that Jamie almost gassed himself first time around, he's made some modifications.

305

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

I didn't like inhaling all that smoke, so I've done a couple of things.

306

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

The first is that I've put the smoke bombs out away from the car.

307

00:18:22,000 --> 00:18:25,000

And the second is, Adam's gonna drive.

308

00:18:27,000 --> 00:18:32,000

So the scene is set for a smarter and healthier smoke screen.

309

00:18:32,000 --> 00:18:34,000

All right Jamie, are you ready?

310

00:18:34,000 --> 00:18:35,000

We're ready.

311

00:18:35,000 --> 00:18:39,000

Okay, eat my smoke.

312

00:18:40,000 --> 00:18:44,000

Adam leads Brian on a merry chase.

313

00:18:44,000 --> 00:18:46,000

You know this is pretty fun.

314

00:18:46,000 --> 00:18:50,000

Till the time comes to pull the pin on those twin grenades.

315

00:18:50,000 --> 00:18:52,000

Oh, there we go.

316

00:18:55,000 --> 00:18:58,000

I gotta say, that's pretty effective.

317

00:18:59,000 --> 00:19:04,000

The smoke comes thick and fast as the chase car slows to a crawl.

318

00:19:04,000 --> 00:19:05,000

Oh.

319

00:19:05,000 --> 00:19:09,000

And Adam actually starts to catch up.

320

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

With the red car now in Brian's rear view mirror, Adam's officially shaken his tail.

321

00:19:28,000 --> 00:19:30,000

I think that's a win.

322

00:19:30,000 --> 00:19:31,000

Good job.

323

00:19:31,000 --> 00:19:33,000

That was awesome.

324

00:19:34,000 --> 00:19:39,000

At one point I looked over and Jamie and Brian were like all the way across the course.

325

00:19:39,000 --> 00:19:41,000

At that point I figured I had it.

326

00:19:41,000 --> 00:19:46,000

With one crucial adjustment, the smoke screen worked big time.

327

00:19:46,000 --> 00:19:51,000

Now to move on to a test that should push Brian's skills to the limit.

328

00:19:51,000 --> 00:19:54,000

Well, you know this is good for the taste buds and bad for the waistline.

329

00:19:54,000 --> 00:19:58,000

The question is, is it good for the escapee and bad for the pursuer?

330

00:19:58,000 --> 00:20:00,000

I think it will be.

331

00:20:00,000 --> 00:20:04,000

As Adam implied, we are doing our best to save the planet.

332

00:20:04,000 --> 00:20:08,000

The lubricant of choice is vegetable oil.

333

00:20:08,000 --> 00:20:11,000

Okay guys, I'm all oiled up and ready to go.

334

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

Are you ready?

335

00:20:12,000 --> 00:20:14,000

We're ready, yes.

336

00:20:14,000 --> 00:20:16,000

This should be slick.

337

00:20:18,000 --> 00:20:22,000

Knowing what's coming won't help Brian avoid a potential disaster.

338

00:20:22,000 --> 00:20:25,000

The course is too narrow to skirt around the slick.

339

00:20:25,000 --> 00:20:30,000

And he doesn't know where or when Jamie plans to give him the slip.

340

00:20:32,000 --> 00:20:34,000

And then we see oil pour out of his back.

341

00:20:34,000 --> 00:20:38,000

And Brian tries to avoid it, but actually because Jamie does it on the turn,

342

00:20:38,000 --> 00:20:41,000

it sort of crosses the whole road and we can't avoid it.

343

00:20:41,000 --> 00:20:44,000

The chase car has clearly lost traction.

344

00:20:44,000 --> 00:20:50,000

It slips and it slides as Brian struggles to point the nose forward and stay on the track.

345

00:20:50,000 --> 00:20:51,000

Definitely made a slick.

346

00:20:51,000 --> 00:20:53,000

Yes, definitely.

347

00:20:53,000 --> 00:21:00,000

He's lost valuable time as the car careens sideways and Jamie decides to quit while he's ahead.

348

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

At speed, the rig worked perfectly.

349

00:21:03,000 --> 00:21:08,000

Unfortunately, it didn't cause us to totally spin out and lose control of our car.

350

00:21:08,000 --> 00:21:12,000

Jamie did get far ahead, but Brian was able to stay on the road.

351

00:21:12,000 --> 00:21:14,000

So where does that leave us overall?

352

00:21:14,000 --> 00:21:16,000

Well, it's tally them up.

353

00:21:16,000 --> 00:21:17,000

Tax.

354

00:21:17,000 --> 00:21:18,000

Busted.

355

00:21:18,000 --> 00:21:19,000

Smoke screen.

356

00:21:19,000 --> 00:21:20,000

Confirmed.

357

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

Oil slick.

358

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

Somewhere in the middle.

359

00:21:22,000 --> 00:21:23,000

I agree.

360

00:21:23,000 --> 00:21:24,000

Somewhere in the middle.

361

00:21:24,000 --> 00:21:27,000

All right, let's get out of here and slowly please.

362

00:21:29,000 --> 00:21:33,000

That's three classic evasion techniques done in Dustin.

363

00:21:33,000 --> 00:21:37,000

But they're having way too much fun to stop here.

364

00:21:43,000 --> 00:21:48,000

Carrie, Grant and Tori are trying to confirm the myth that a dead weight drops straight to the ground

365

00:21:48,000 --> 00:21:53,000

if its forward momentum is exactly the same as its backwards propulsion.

366

00:21:53,000 --> 00:21:58,000

So far, a mobile treadmill seems to have proved the point.

367

00:21:58,000 --> 00:22:01,000

True, but you know the fans are never going to be happy if we stop right there.

368

00:22:01,000 --> 00:22:03,000

We have to test this at higher speeds.

369

00:22:03,000 --> 00:22:04,000

All right, why don't we ramp it up?

370

00:22:04,000 --> 00:22:07,000

We'll build an air cannon, fire a soccer ball at 60 miles an hour.

371

00:22:07,000 --> 00:22:10,000

We'll do it again inside of a moving vehicle going 60 miles an hour.

372

00:22:10,000 --> 00:22:13,000

See if the energies cancel each other out and we get a vertical drop.

373

00:22:13,000 --> 00:22:14,000

Love it.

374

00:22:14,000 --> 00:22:15,000

Let's do it.

375

00:22:15,000 --> 00:22:20,000

Grant gets the task of building the cannon and he's not one for half measures.

376

00:22:20,000 --> 00:22:23,000

This is our next step in testing this myth.

377

00:22:23,000 --> 00:22:27,000

It's the barrel of the largest air cannon I have ever built.

378

00:22:28,000 --> 00:22:29,000

Okay, here we go.

379

00:22:29,000 --> 00:22:32,000

9 psi in three, two, one.

380

00:22:34,000 --> 00:22:37,000

Yep, that looked like 60 miles an hour to me.

381

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

At a check of the high speed confirms the call.

382

00:22:42,000 --> 00:22:44,000

The good news is that we have our number.

383

00:22:44,000 --> 00:22:49,000

We now know that 9 psi equals 60 miles an hour out of the barrel.

384

00:22:50,000 --> 00:22:51,000

Perfect.

385

00:22:51,000 --> 00:22:52,000

Great.

386

00:22:52,000 --> 00:22:53,000

That's our target speed.

387

00:22:53,000 --> 00:22:54,000

All right, we're there.

388

00:22:54,000 --> 00:22:55,000

Well, almost.

389

00:22:55,000 --> 00:22:59,000

It's now back to Concord to see if they've got the balance just right.

390

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

All right, time to give this experiment a shot of steroids.

391

00:23:04,000 --> 00:23:07,000

Logistically, this is going to be a very difficult experiment.

392

00:23:07,000 --> 00:23:11,000

Everything has to come together for it to actually yield the results we want.

393

00:23:11,000 --> 00:23:13,000

I mean, the small scale was brilliant.

394

00:23:13,000 --> 00:23:16,000

If we can get anywhere close to that, I will be happy.

395

00:23:17,000 --> 00:23:20,000

But Tori's already anticipating trouble down the road.

396

00:23:21,000 --> 00:23:24,000

My feeling is, Grant's going to prematurely hit that button

397

00:23:24,000 --> 00:23:28,000

and the soccer ball is not actually going to make it in the high speed shot.

398

00:23:28,000 --> 00:23:29,000

We'll see what happens.

399

00:23:29,000 --> 00:23:30,000

All right, you guys ready?

400

00:23:31,000 --> 00:23:33,000

Cannon is armed and truck is in place.

401

00:23:33,000 --> 00:23:34,000

We're ready on your go, Tori.

402

00:23:35,000 --> 00:23:36,000

Hit it.

403

00:23:38,000 --> 00:23:42,000

20, 30, 40, 50.

404

00:23:44,000 --> 00:23:45,000

I'm going to get to 60.

405

00:23:46,000 --> 00:23:47,000

Come on.

406

00:23:47,000 --> 00:23:48,000

Okay.

407

00:23:49,000 --> 00:23:51,000

And fire.

408

00:23:52,000 --> 00:23:53,000

Hey!

409

00:23:53,000 --> 00:23:55,000

That was a pretty good shot.

410

00:23:56,000 --> 00:23:57,000

It's in the high speed.

411

00:23:57,000 --> 00:24:01,000

Given how hard this is to get right, it's a mighty first effort,

412

00:24:01,000 --> 00:24:03,000

but the ball did bounce backwards.

413

00:24:07,000 --> 00:24:08,000

It's not perfect.

414

00:24:08,000 --> 00:24:10,000

It's not the same results as the other one.

415

00:24:10,000 --> 00:24:11,000

That's what I'm saying.

416

00:24:11,000 --> 00:24:14,000

This should drop straight down, not fly backwards.

417

00:24:14,000 --> 00:24:19,000

It's agreed that either the car was too slow or the cannon too fast.

418

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

The afternoon rolls on as a series of runs.

419

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

The ball did not drop straight down.

420

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

Never quite seemed to hit the mark.

421

00:24:28,000 --> 00:24:29,000

Looking good.

422

00:24:31,000 --> 00:24:33,000

And he fired it too soon.

423

00:24:33,000 --> 00:24:35,000

But the ball still bounced backwards.

424

00:24:36,000 --> 00:24:42,000

25 attempts later, they haven't come close to seeing the soccer ball drop like a stone.

425

00:24:42,000 --> 00:24:49,000

Some even bounced forwards, and it could be the cannon, the car, or the myth that's at fault.

426

00:24:49,000 --> 00:24:53,000

We could be out here all day and not get a result.

427

00:24:53,000 --> 00:24:56,000

This might be the time to rethink their approach.

428

00:24:56,000 --> 00:24:59,000

After all, no one said science was meant to be easy.

429

00:24:59,000 --> 00:25:08,000

Up next, Jamie and Adam take on each other in an empty head spy car challenge.

430

00:25:08,000 --> 00:25:09,000

Not hard to do it.

431

00:25:13,000 --> 00:25:15,000

Please do not try what we do on the show at home.

432

00:25:15,000 --> 00:25:17,000

We're what you call experts.

433

00:25:17,000 --> 00:25:18,000

It's safer that way.

434

00:25:22,000 --> 00:25:27,000

Adam and Jamie have already tested three classic spy car evasion techniques.

435

00:25:27,000 --> 00:25:31,000

Tax, smoke, and a 10 gallon oil slip.

436

00:25:34,000 --> 00:25:42,000

And the best way to keep the thrills coming is getting our two spies to take on each other with weapons they'll both build from scratch.

437

00:25:42,000 --> 00:25:45,000

Pop quiz, what do you see here on the table?

438

00:25:45,000 --> 00:25:48,000

You may see a random clutch in the plumbing parts.

439

00:25:48,000 --> 00:25:53,000

I see the next evolution in spy evasion technology.

440

00:25:54,000 --> 00:25:55,000

Ow!

441

00:25:55,000 --> 00:25:59,000

If you think Adam's being deliberately obscure, give a load of Jamie.

442

00:25:59,000 --> 00:26:02,000

You know what they say, the best defense is a good offense.

443

00:26:02,000 --> 00:26:10,000

Well, I figure I'm going to make something that I can take right to the pursuer's car, deliver it point blank, and take him out.

444

00:26:10,000 --> 00:26:21,000

Ensuring their secrets remain just that, a huge curtain divides the workshop, while Adam assembles what looks and sounds like a prototype space shuttle toilet.

445

00:26:22,000 --> 00:26:25,000

Jamie gets low down, nasty.

446

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

Yeah, baby.

447

00:26:28,000 --> 00:26:30,000

That thing starts to dig in.

448

00:26:30,000 --> 00:26:32,000

We've got some trouble on our hands.

449

00:26:34,000 --> 00:26:43,000

It's clear from the outset this mystery rig will be heavy duty, as gear teeth are cut into crommely steel with a plasma torch.

450

00:26:43,000 --> 00:26:49,000

Whatever he's building, it's a safe bet this would get you suspended from metal shop.

451

00:26:51,000 --> 00:26:53,000

That ought to do it.

452

00:26:53,000 --> 00:26:59,000

After hours of diligent, diabolical labor, Jamie's finally up for some show and tell.

453

00:26:59,000 --> 00:27:10,000

I've made this relatively simple looking little thing out of crommely steel, and it's flat enough to mount underneath my car out of sight and out of mind.

454

00:27:10,000 --> 00:27:19,000

But it's going to be mounted in a gun, and I'm going to drive up to the pursuer's car, fire this from under my car right over the ground to under their car.

455

00:27:19,000 --> 00:27:23,000

At which point it changes, and it goes like that.

456

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

If it works on the day, that's a bona fide car crippler.

457

00:27:31,000 --> 00:27:32,000

Yeah.

458

00:27:32,000 --> 00:27:36,000

Adam, meantime, has taken his show on the road.

459

00:27:36,000 --> 00:27:41,000

In a radical twist, it looks like he's trying to slow himself down.

460

00:27:41,000 --> 00:27:43,000

That's promising right there.

461

00:27:43,000 --> 00:27:51,000

The idea is to shut down the chase car with a parachute blindfold, launched from that strange plumbing project.

462

00:27:51,000 --> 00:27:59,000

He'll cut the rig loose when it's caught enough air, the main chute deployed by a much smaller one called a drogue.

463

00:27:59,000 --> 00:28:06,000

I'm going to try throwing this out as I drive and see if that launches this parachute for me.

464

00:28:07,000 --> 00:28:13,000

Adam takes off, and short of cutting loose the big chute, the test seems to work.

465

00:28:19,000 --> 00:28:20,000

Ow!

466

00:28:21,000 --> 00:28:23,000

Okay, ow!

467

00:28:23,000 --> 00:28:30,000

The parachute launched and immediately ripped this off the trunk and sent it into my head.

468

00:28:31,000 --> 00:28:36,000

But I like the drogue chute. It seems like a nice quick deploy.

469

00:28:36,000 --> 00:28:43,000

While Adam untangles, Jamie just adds to his arsenal how this one fits in is anyone's guess.

470

00:28:43,000 --> 00:28:45,000

It's still smoking.

471

00:28:45,000 --> 00:28:53,000

But his real party piece is the Auto Stub 3000, installed in a tube welded under the chassis.

472

00:28:53,000 --> 00:29:01,000

When I pull this trigger, the pressurized air that's in this tank goes through the valve, out the bottom of the car and out the barrel.

473

00:29:03,000 --> 00:29:12,000

And so the air from the car has shot this whole assembly out the bottom of this car aimed for the bottom of the neighboring car.

474

00:29:12,000 --> 00:29:14,000

That would be a successful test.

475

00:29:14,000 --> 00:29:19,000

Adam's also been busy customizing his rear end.

476

00:29:19,000 --> 00:29:21,000

Then, just to rattle Jamie's cage.

477

00:29:21,000 --> 00:29:24,000

Yeah, yeah, bring in all the puppies and all the lead.

478

00:29:25,000 --> 00:29:33,000

On that disturbing note, it's time to return to a favorite Mythbusters test track, this abandoned suburb at Fort Orr.

479

00:29:36,000 --> 00:29:37,000

Are you ready for this?

480

00:29:37,000 --> 00:29:38,000

I'm ready.

481

00:29:38,000 --> 00:29:42,000

I want to go first, because I don't think you can handle my technique.

482

00:29:42,000 --> 00:29:43,000

Knock yourself out.

483

00:29:45,000 --> 00:29:47,000

Okay, here's my plan.

484

00:29:47,000 --> 00:29:52,000

Right about here, I'm going to push the launch switch, activating the cannon, setting the drope shoot out behind my car.

485

00:29:52,000 --> 00:29:57,000

At this point, Brian and Jamie are likely to wonder what the hell's going on, and they're likely to back off a little bit.

486

00:29:57,000 --> 00:30:00,000

It'll take the drope shoot a little while to fully inflate the parachute.

487

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

Right about here, in fact, at that point, Brian and Jamie are likely to be wondering,

488

00:30:04,000 --> 00:30:07,000

what the hell am I doing slowing myself down with a parachute?

489

00:30:07,000 --> 00:30:13,000

And this is where I activate the final part of my plan, which is to cut the cord that holds the parachute to my car.

490

00:30:13,000 --> 00:30:20,000

They will either A, get entangled in the parachute, or B, figure that because the parachute stopped, I've stopped, and they will stop.

491

00:30:20,000 --> 00:30:29,000

Meanwhile, I will have pulled into my secret hiding place, out of sight of the road, sending them down the wrong road, looking for me in the wrong place.

492

00:30:29,000 --> 00:30:33,000

I think it's a pretty sound plan. I think it'll work.

493

00:30:34,000 --> 00:30:39,000

Let's remember that Jamie hasn't a clue that the plan is to blind him with billows of nylon.

494

00:30:40,000 --> 00:30:42,000

Nothing to see here, folks.

495

00:30:43,000 --> 00:30:45,000

Are you guys ready?

496

00:30:45,000 --> 00:30:46,000

We're all set.

497

00:30:46,000 --> 00:30:49,000

Okay, eat my dust.

498

00:30:50,000 --> 00:30:53,000

Adam takes off like a shell from a shotgun.

499

00:30:53,000 --> 00:30:56,000

Once again, Brian's steering the chase car.

500

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

These streets have never seen speeds like these.

501

00:31:05,000 --> 00:31:10,000

You're not going to catch me. I got a secret weapon right here on the desk.

502

00:31:10,000 --> 00:31:13,000

And the shoot is let loose right on the mark.

503

00:31:13,000 --> 00:31:15,000

Here it goes. It's deployed.

504

00:31:15,000 --> 00:31:17,000

Parachutes out.

505

00:31:17,000 --> 00:31:18,000

Oh, and it's away.

506

00:31:18,000 --> 00:31:20,000

Nice try.

507

00:31:20,000 --> 00:31:22,000

But no cigar.

508

00:31:22,000 --> 00:31:24,000

I hope that wasn't all he had.

509

00:31:24,000 --> 00:31:26,000

Well, it was all he had.

510

00:31:26,000 --> 00:31:29,000

The parachute worked, but not well enough.

511

00:31:32,000 --> 00:31:34,000

Ah, it caught me.

512

00:31:35,000 --> 00:31:38,000

Adam's been totally tailed to his secret lair.

513

00:31:38,000 --> 00:31:40,000

Well, shoot.

514

00:31:40,000 --> 00:31:43,000

Well, your device deployed fine.

515

00:31:43,000 --> 00:31:44,000

It deployed beautifully.

516

00:31:44,000 --> 00:31:48,000

I was hoping it would either make you stay too far back or you'd get entangled in it.

517

00:31:48,000 --> 00:31:50,000

I thought it would contest just right.

518

00:31:50,000 --> 00:31:52,000

It might have worked, but it didn't.

519

00:31:53,000 --> 00:31:56,000

Adam admits that it could have gone better.

520

00:31:56,000 --> 00:32:02,000

It might work under certain circumstances, but to be a viable spy-caravasion technique, it really has to work every time.

521

00:32:02,000 --> 00:32:08,000

So I think we've got to relegate the parachute to the dustbin of failed ideas.

522

00:32:08,000 --> 00:32:14,000

Now it's all up to Jamie to press his advantage and take out this head-to-head challenge.

523

00:32:14,000 --> 00:32:18,000

And if his plan comes off, Adam's in for the ride of his life.

524

00:32:18,000 --> 00:32:24,000

Straight ahead, a surprise result in a high-tech three-way machine shootout.

525

00:32:24,000 --> 00:32:26,000

Hurry!

526

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

Can an object shot backwards while traveling forwards ever drop straight to the ground?

527

00:32:38,000 --> 00:32:44,000

It's a fascinating thought, but trying to prove it is bringing our physics team unravel.

528

00:32:46,000 --> 00:32:49,000

Okay, either this myth is busted or a methodology's flawed.

529

00:32:49,000 --> 00:32:51,000

I'm pretty sure it's the latter.

530

00:32:51,000 --> 00:32:53,000

Okay, well, there's more than one way to fling a ball.

531

00:32:53,000 --> 00:32:56,000

Let's look into some other propulsion systems and figure out which one's the most reliable.

532

00:32:56,000 --> 00:32:58,000

All right, we could get a ball pitching machine.

533

00:32:58,000 --> 00:33:00,000

They actually make it for soccer balls.

534

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

They're pretty accurate.

535

00:33:02,000 --> 00:33:05,000

I've got an idea for another machine where it actually punches the ball without imparting any spin.

536

00:33:05,000 --> 00:33:07,000

That might help.

537

00:33:07,000 --> 00:33:09,000

Okay, let's get started and have a showdown.

538

00:33:09,000 --> 00:33:12,000

It sounds like a plan.

539

00:33:12,000 --> 00:33:18,000

Three machines, including the air cannon, competing to see which is the most consistent shooter.

540

00:33:18,000 --> 00:33:24,000

The soccer ball launcher is designed to reliably fire ball after ball at the same speed,

541

00:33:24,000 --> 00:33:26,000

and it's working just fine.

542

00:33:26,000 --> 00:33:28,000

Oh!

543

00:33:28,000 --> 00:33:30,000

I think you got your aim.

544

00:33:30,000 --> 00:33:32,000

And there's work to be done on the factory floor.

545

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

For machine number two, Grant needs to modify a mythbusters favorite.

546

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

Now, the last time you saw it, it had a play to fix to the end, and it was smashing frozen heads.

547

00:33:43,000 --> 00:33:46,000

I must say it was a smashing success.

548

00:33:49,000 --> 00:33:53,000

But now it's going to become a soccer ball kicking robot.

549

00:33:53,000 --> 00:33:55,000

Just you wait.

550

00:33:55,000 --> 00:34:00,000

It's a 10 out of 10 for lateral thinking, and you know that when Grant gets his hands on a robot,

551

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

it will kick balls.

552

00:34:03,000 --> 00:34:05,000

Okay.

553

00:34:05,000 --> 00:34:10,000

Okay, all of our kicking contraptions should be complete, which is perfect because it's time for the mythbusters World Cup,

554

00:34:10,000 --> 00:34:12,000

also known as calibration tests.

555

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

We have our official goal right here.

556

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

Back here we have the contenders.

557

00:34:16,000 --> 00:34:18,000

First off, we have the ball checker.

558

00:34:18,000 --> 00:34:21,000

You're already familiar with the air cannon, and finally, we have our robot kicker.

559

00:34:21,000 --> 00:34:24,000

Consistency was a huge problem when we did our last test.

560

00:34:24,000 --> 00:34:26,000

So, that's what we're testing now.

561

00:34:26,000 --> 00:34:30,000

Which one of these contraptions will be the most consistent at 60 miles an hour?

562

00:34:30,000 --> 00:34:33,000

In three, two, one.

563

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

Wow.

564

00:34:35,000 --> 00:34:37,000

That was a good kick.

565

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

How fast did it go?

566

00:34:38,000 --> 00:34:40,000

58 miles an hour.

567

00:34:40,000 --> 00:34:41,000

Nice.

568

00:34:41,000 --> 00:34:42,000

We're in the ballpark.

569

00:34:43,000 --> 00:34:44,000

The kicking robot was great.

570

00:34:44,000 --> 00:34:46,000

It was consistent within three miles per hour.

571

00:34:46,000 --> 00:34:53,000

Now, moving on to the ball checker, which was actually made to chuck balls, so hopefully this will be consistent.

572

00:34:53,000 --> 00:34:55,000

All right, we're ready to go.

573

00:34:55,000 --> 00:34:58,000

Tori's already fine tuned the speed of the tires,

574

00:34:58,000 --> 00:35:02,000

and from the very first ball, it looks like he's right in the zone.

575

00:35:02,000 --> 00:35:03,000

God!

576

00:35:03,000 --> 00:35:04,000

59.

577

00:35:04,000 --> 00:35:08,000

It's an impressive display from the favor, but there's still one to go.

578

00:35:08,000 --> 00:35:09,000

Nerves.

579

00:35:09,000 --> 00:35:10,000

All right, why don't we do this?

580

00:35:10,000 --> 00:35:12,000

Let's test the air cannon one more time.

581

00:35:12,000 --> 00:35:13,000

Who knows?

582

00:35:13,000 --> 00:35:15,000

Maybe it's more consistent than the other machines.

583

00:35:15,000 --> 00:35:16,000

All right.

584

00:35:17,000 --> 00:35:19,000

Going up to 9 psi.

585

00:35:19,000 --> 00:35:23,000

So it comes down to these last five shots.

586

00:35:23,000 --> 00:35:24,000

Fire away!

587

00:35:31,000 --> 00:35:34,000

The shootout is finished, and the result is a shock to everyone.

588

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

You know what?

589

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

Out of all the machines, this one looks like it's the most consistent.

590

00:35:39,000 --> 00:35:44,000

Yeah, I think we all know who the winner was, but just for fun, I calculated the standard deviation.

591

00:35:44,000 --> 00:35:46,000

You and I have really different ideas on foot.

592

00:35:46,000 --> 00:35:48,000

He said, um...

593

00:35:48,000 --> 00:35:49,000

Go ahead.

594

00:35:49,000 --> 00:35:52,000

Okay, this one's 1.22.

595

00:35:52,000 --> 00:36:02,000

This one is 2.3, and the winner and still champion, Air Cannon, with 0.84.

596

00:36:02,000 --> 00:36:03,000

Oh, my gosh.

597

00:36:03,000 --> 00:36:06,000

After all that, we have to go back to the air cannon.

598

00:36:06,000 --> 00:36:07,000

Yes.

599

00:36:07,000 --> 00:36:13,000

The ball speeds as close as we're going to get, but let's not forget that's just half the equation.

600

00:36:13,000 --> 00:36:21,000

If the speed going forward is also in doubt, we'd be fools not to fix it, and Carrie's no fool.

601

00:36:21,000 --> 00:36:25,000

So the solution to our speedometer problem is this.

602

00:36:25,000 --> 00:36:26,000

It's a tachometer.

603

00:36:26,000 --> 00:36:31,000

Now what we're going to do is we're going to brace it with all sorts of clamps that I've scavenged from the camera department.

604

00:36:31,000 --> 00:36:34,000

So it's right here against the wheel.

605

00:36:34,000 --> 00:36:39,000

We have some reflective tape that's going to make the laser able to pick up every revolution,

606

00:36:39,000 --> 00:36:43,000

and from there we can do the math, find out exactly how fast our car is going.

607

00:36:43,000 --> 00:36:50,000

Now they've done all they can do to fine tune the hardware, but with cannon reloaded, reverse the results.

608

00:36:50,000 --> 00:36:53,000

Only time mixed with patience...

609

00:36:53,000 --> 00:36:54,000

Nerds!

610

00:36:54,000 --> 00:36:55,000

...will tell.

611

00:36:55,000 --> 00:37:00,000

And still to come, Jamie unleashes his arsenal of car killers.

612

00:37:00,000 --> 00:37:03,000

We hear this boom, and he takes off.

613

00:37:10,000 --> 00:37:23,000

Tori, Carrie and Grant are struggling to prove the supposedly common sense myth that an object drops straight to the ground when its forward and backward momentum are exactly the same.

614

00:37:23,000 --> 00:37:25,000

So here's where we're at.

615

00:37:25,000 --> 00:37:36,000

Grant's air cannon was precise enough to earn a second shot, but Carrie's replaced a possibly faulty speedometer with an incredibly accurate tachometer.

616

00:37:36,000 --> 00:37:46,000

This is it. We have eliminated all the variables. We have the cannon shooting at 60 miles an hour, the car driving at 60 miles an hour, just to show that this ball will drop straight down.

617

00:37:46,000 --> 00:37:47,000

This is it.

618

00:37:47,000 --> 00:37:48,000

It's go time.

619

00:37:48,000 --> 00:37:49,000

Go!

620

00:37:51,000 --> 00:37:54,000

Look, this is a classic physics thought experiment.

621

00:37:54,000 --> 00:38:02,000

You've got something moving, you fire something off of that moving vehicle at the same speed, and ideally it should cancel out.

622

00:38:02,000 --> 00:38:04,000

But this is the real world.

623

00:38:06,000 --> 00:38:11,000

And the real world remains a frustratingly difficult place to do science.

624

00:38:11,000 --> 00:38:13,000

The cannon was fired a little too soon.

625

00:38:13,000 --> 00:38:17,000

This is all a bit finicky. I think we're going to have to try it a lot until we get it perfect.

626

00:38:17,000 --> 00:38:22,000

More tests only lead to more disappointment.

627

00:38:22,000 --> 00:38:30,000

Once again, Grant's timing is just off the mark, but Carrie at least sees a light at the end of the runway.

628

00:38:30,000 --> 00:38:36,000

I have a feeling that we are very close to a perfect demonstration. We're going to see that ball drop.

629

00:38:36,000 --> 00:38:43,000

With the forward and backward momentum matched as close as they're going to get it, the pressure's on Grant for a perfect release.

630

00:38:45,000 --> 00:38:50,000

I don't know about you guys, but I look pretty good to me. Let's check the high speed.

631

00:38:51,000 --> 00:38:56,000

It really looked good to the naked eye, but the judge in this case is the high speed.

632

00:38:57,000 --> 00:39:02,000

Oh my God, it's like a cartoon. It's just in the air. It stops and it just falls.

633

00:39:02,000 --> 00:39:04,000

Look at that. Fantastic.

634

00:39:04,000 --> 00:39:07,000

I mean, look, it doesn't move at all. It's going straight down.

635

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

Woo! We did it! We did it! Yeah! Vector edition!

636

00:39:13,000 --> 00:39:16,000

We canceled that velocity.

637

00:39:16,000 --> 00:39:22,000

After three days of suffering, that single shot brings the myth to an end.

638

00:39:22,000 --> 00:39:30,000

I can't be happier. We actually got the speed of the car to match the speed of the soccer ball, and we got a perfect straight down drop.

639

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

Ladies and gentlemen, the laws of physics are still hard at work.

640

00:39:43,000 --> 00:39:48,000

Adam's attempt to escape Janie's spy car came sadly adrift.

641

00:39:48,000 --> 00:39:51,000

Parachute's out! Oh, and it's away!

642

00:39:51,000 --> 00:39:57,000

Things might have gone better with a backup device, and Janie will not make the same mistake.

643

00:39:57,000 --> 00:40:03,000

First up are my tailgater terminators, which are going to deploy out of the back of my car like so.

644

00:40:04,000 --> 00:40:12,000

Notice that I've placed them in a narrow area that the chase car pretty much has to go through, and that means that they have to drive over these things.

645

00:40:12,000 --> 00:40:15,000

Frankly, if they do, I think they're done.

646

00:40:15,000 --> 00:40:17,000

But...

647

00:40:18,000 --> 00:40:24,000

If they're still moving, I go to plan B, which is the side shooter.

648

00:40:24,000 --> 00:40:34,000

Now, this puppy will be shooting out from underneath my car to underneath their car where it opens up, and also will prohibit them from moving forward.

649

00:40:34,000 --> 00:40:42,000

Not to mention the fact that I have a smoke bomb that is going to be set off at the same time just for, well, fun.

650

00:40:42,000 --> 00:40:46,000

Probably just as well, Adam doesn't know what's about to hit him.

651

00:40:46,000 --> 00:40:50,000

Hey, guys. Yeah? See if you can keep up, okay?

652

00:40:50,000 --> 00:40:53,000

Roger that! Secret agent code name Walrus.

653

00:40:53,000 --> 00:40:55,000

Go!

654

00:41:00,000 --> 00:41:05,000

Just a few seconds in, Janie launches the first of his deadly barrages.

655

00:41:05,000 --> 00:41:09,000

He's playing the game. I said puppies. He's throwing puppies out.

656

00:41:09,000 --> 00:41:13,000

Brian heedlessly plows through the pelting of puppies.

657

00:41:13,000 --> 00:41:15,000

And regains lost ground.

658

00:41:15,000 --> 00:41:22,000

But to pull off his serious double deployment, Janie needs to slow way, way down.

659

00:41:24,000 --> 00:41:27,000

Brian has no choice but to take on the spikes.

660

00:41:29,000 --> 00:41:33,000

Only to find he's been set up for the sucker punch.

661

00:41:33,000 --> 00:41:37,000

And then Janie's just looking at us. We hear this, boom!

662

00:41:37,000 --> 00:41:39,000

And he takes off.

663

00:41:40,000 --> 00:41:48,000

And incredibly, Adam and Brian lurch off right behind it, calling enough shrapnel to sink a battleship.

664

00:41:48,000 --> 00:41:50,000

We are on him!

665

00:41:51,000 --> 00:41:55,000

The cars leaking gas and the noise is not healthy.

666

00:41:58,000 --> 00:42:03,000

But they ride Janie's tail for a five minute lap of the desolate streets.

667

00:42:04,000 --> 00:42:09,000

Until their prey makes a bolt for his barrel.

668

00:42:14,000 --> 00:42:16,000

We found him!

669

00:42:20,000 --> 00:42:25,000

You guys are leaking a little bit. I don't know, what do you think? Did I get away or didn't I?

670

00:42:25,000 --> 00:42:30,000

Technically you didn't get away because we saw you turn in here from the road. So we caught you.

671

00:42:30,000 --> 00:42:34,000

If you'd have went any farther we wouldn't have. This thing wasn't running much longer.

672

00:42:34,000 --> 00:42:40,000

One of the spikes is still stuck in the car. And Janie can't fathom how this one turned pear-shaped.

673

00:42:40,000 --> 00:42:45,000

I can't believe they were able to keep going. I mean I thought those spikes were a death trap for that car.

674

00:42:45,000 --> 00:42:47,000

So how are we going to wrap this up?

675

00:42:47,000 --> 00:42:56,000

Well, between the five things that we tested, I think we've definitely proved that stopping a car that's chasing you instantly in its tracks is actually really hard.

676

00:42:56,000 --> 00:43:01,000

Well your parachute might have worked under perfect circumstances, but as it was it was pretty much a bust.

677

00:43:01,000 --> 00:43:07,000

And your spikes, while ultimately I think effective in the long haul, were far from instantaneous.

678

00:43:07,000 --> 00:43:10,000

Something tells me you guys are already cooking up other ideas.

679

00:43:10,000 --> 00:43:11,000

Yeah.

680

00:43:11,000 --> 00:43:12,000

I smell a revisit.

681

00:43:12,000 --> 00:43:14,000

So do I.

682

00:43:14,000 --> 00:43:23,000

One more?

683

00:43:23,000 --> 00:43:27,000

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