1

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

Attention viewers, do not try anything you're about to see at home.

2

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

We're what you call experts.

3

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

On this episode of Mythbusters, there's the good,

4

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

the bad, and the downright bizarre.

5

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

That's insane!

6

00:00:21,000 --> 00:00:25,000

First, serves up as Carrie Granton Tory,

7

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

This will become a projectile.

8

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

And at gnarly with some movie mayhem.

9

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

That's what you get for chasing no Gibson.

10

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

As they find out if a surfboard can ever become a lethal weapon.

11

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

That was a perfect shot!

12

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

Meanwhile, Adam and Jamie also cause some car carnage.

13

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

Oh, I like the car better this way.

14

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

As they buckle up for the most bizarre race-off in Mythbusters history.

15

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

This is shocking front-page science news.

16

00:00:55,000 --> 00:01:01,000

Finding out if a retro race car was really more streamlined backwards than forwards.

17

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

Dude, this is so much more...

18

00:01:07,000 --> 00:01:09,000

Who are the Mythbusters?

19

00:01:09,000 --> 00:01:11,000

Adam Savage.

20

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

All for the glory!

21

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

And Jamie Heidemann.

22

00:01:13,000 --> 00:01:15,000

I call it my little pop gun.

23

00:01:15,000 --> 00:01:19,000

Between them more than 30 years of special effects experience.

24

00:01:19,000 --> 00:01:20,000

Success!

25

00:01:20,000 --> 00:01:23,000

Joining them, Grant Imahara.

26

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

Are you okay?

27

00:01:24,000 --> 00:01:25,000

Tory Belachie.

28

00:01:25,000 --> 00:01:27,000

Can we order some exploding pants?

29

00:01:27,000 --> 00:01:28,000

And Carrie Byron.

30

00:01:28,000 --> 00:01:31,000

Now we're moving on to the big guns.

31

00:01:31,000 --> 00:01:33,000

They don't just tell the myths.

32

00:01:33,000 --> 00:01:36,000

They put them to the test.

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00:01:42,000 --> 00:01:46,000

First up, a myth that's back to the drawing board.

34

00:01:46,000 --> 00:01:48,000

I've got one for you.

35

00:01:48,000 --> 00:01:52,000

Shoot, a friend of mine used to say about a specific making model of sports car.

36

00:01:52,000 --> 00:01:58,000

In fact, so poorly designed, it was more aerodynamically efficient going backwards than forwards.

37

00:01:58,000 --> 00:01:59,000

That's good.

38

00:01:59,000 --> 00:02:01,000

I thought you'd like that one.

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

Car development today is a multi-million dollar industry with aerodynamics at the forefront.

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00:02:08,000 --> 00:02:11,000

But that's not always been the case.

41

00:02:11,000 --> 00:02:18,000

Because, according to this myth, in the 1970s, some car designers put fashion before function.

42

00:02:18,000 --> 00:02:27,000

Crafting cars that sure look sleek, but may have actually been more aerodynamically efficient if the body was switched 180 degrees.

43

00:02:29,000 --> 00:02:31,000

So what kind of car are we talking about?

44

00:02:31,000 --> 00:02:39,000

That's an interesting question, actually, because this claim turns out to have been made by a whole host of automobiles from Europe, Asia, America over the last 40 years.

45

00:02:39,000 --> 00:02:48,000

But after extensively crunching the references we found on the internet, we have honed in on this as the most commonly cited culprit of this myth.

46

00:02:48,000 --> 00:02:53,000

Well, since this myth is all about aerodynamics, let's test it out in the wind tunnel first.

47

00:02:53,000 --> 00:02:55,000

That's exactly what I was thinking.

48

00:02:56,000 --> 00:03:01,000

Ultimately, this full speed fable will come down to the most random race-off in history.

49

00:03:01,000 --> 00:03:06,000

But before that checkered flag, it's time for some small-scale science.

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00:03:07,000 --> 00:03:11,000

This is a 1.24 scale model of the sports car that this myth is about.

51

00:03:11,000 --> 00:03:17,000

Now we're going to put it in this water channel back here and inject dye into the stream of water as it goes past the car.

52

00:03:17,000 --> 00:03:26,000

We'll put it in and look at it going forward, then we'll reverse the car and look at it going that way to see whether we can tell any difference.

53

00:03:27,000 --> 00:03:30,000

Expert engineer Kurt Long's the guy with the dye.

54

00:03:31,000 --> 00:03:32,000

Red dye coming in.

55

00:03:33,000 --> 00:03:36,000

But other than looking cool, what does it all mean?

56

00:03:36,000 --> 00:03:44,000

Well, while this car's shape may announce to the world that it slips through the wind and that it's aerodynamic, the water tunnel here tells a different story.

57

00:03:44,000 --> 00:03:50,000

See this big batch of red behind the car? That is a low pressure zone creating a lot of drag on this car.

58

00:03:50,000 --> 00:03:56,000

It's not as aerodynamic as it looks. Will that change when we flip it around? Well, let's flip it around.

59

00:03:57,000 --> 00:04:02,000

Flip 180 degrees and the result is not exactly crystal clear.

60

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

What do you think?

61

00:04:05,000 --> 00:04:09,000

I don't know. It doesn't look that much different really.

62

00:04:09,000 --> 00:04:18,000

In fact, side by side the dye pattern looks near identical. So it's time for Plan B. Q. NASA twine number two.

63

00:04:19,000 --> 00:04:27,000

This device right here is an in draft wind tunnel. Now we're going to attach the car to a device in the middle and it's going to register the amount of drag in pounds.

64

00:04:27,000 --> 00:04:30,000

The higher that number, the more drag.

65

00:04:31,000 --> 00:04:32,000

It's ready.

66

00:04:33,000 --> 00:04:37,000

In other words, this machine should be able to yield some hard data.

67

00:04:38,000 --> 00:04:41,000

Okay, firing up the wind tunnel, car facing forward.

68

00:04:42,000 --> 00:04:43,000

Okay, we're spinning up.

69

00:04:44,000 --> 00:04:51,000

518, 584, 756 RPM, 889 RPM, 915, pretty much there.

70

00:04:51,000 --> 00:04:57,000

Although it doesn't look like it, their toy car is sitting pretty in a 100 mile an hour gale.

71

00:04:57,000 --> 00:05:00,000

But what's the all important drag force?

72

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

Now with the car in this position, the wind pushed this car with a force of 0.34 pounds, a shade over a third of a pound.

73

00:05:07,000 --> 00:05:16,000

We're about to flip it around and run this test again. And if this myth has any merit to it, we should expect to see the wind push on this car with less force.

74

00:05:16,000 --> 00:05:19,000

We should expect to see a number lower than 0.34.

75

00:05:19,000 --> 00:05:24,000

A flip of the car, then a flip of a switch and drum roll please.

76

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

The drag force for the backward car is 0.37 of a pound.

77

00:05:30,000 --> 00:05:34,000

That's a number and it's higher than the previous number.

78

00:05:34,000 --> 00:05:35,000

That's more drag.

79

00:05:35,000 --> 00:05:39,000

More drag facing reverse. It's not looking very good.

80

00:05:39,000 --> 00:05:40,000

No.

81

00:05:40,000 --> 00:05:44,000

No, for car conspiracy theorists, it's not looking good at all.

82

00:05:44,000 --> 00:05:49,000

When the numbers are in, facing forward, this car produced 0.34 pounds of drag.

83

00:05:49,000 --> 00:05:53,000

Facing backwards, 0.37 pounds of drag.

84

00:05:53,000 --> 00:06:00,000

The numbers don't lie. Facing forward, this car was more aerodynamically efficient than backwards, which is the opposite of what the myth says.

85

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

Now, that's in scale. Will that translate to full size?

86

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

We know there's only one way to find out.

87

00:06:10,000 --> 00:06:13,000

Next up, a surfboard shocker.

88

00:06:13,000 --> 00:06:19,000

Okay, so the myth we get to work on is from a classic action movie, Lead the Weapon 2.

89

00:06:19,000 --> 00:06:21,000

I love that movie. What's the myth?

90

00:06:21,000 --> 00:06:28,000

Do you remember the chase scene where there was a big pile up in the middle of the road and one car had a surfboard on top of it and it crashes?

91

00:06:28,000 --> 00:06:31,000

Oh yeah, and the car stops but the surfboard keeps going.

92

00:06:31,000 --> 00:06:36,000

Exactly. The surfboard goes through a windshield and, well, it messes our bad guy up pretty bad.

93

00:06:36,000 --> 00:06:37,000

How bad?

94

00:06:37,000 --> 00:06:40,000

Well, it definitely kills him, possibly decapitates him.

95

00:06:40,000 --> 00:06:41,000

That's pretty bad.

96

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

It's a classic car crash from a classic movie.

97

00:06:48,000 --> 00:06:54,000

A stomp on the brakes sets off a rude Goldberg chain reaction that culminates...

98

00:06:55,000 --> 00:07:01,000

...eventually with it being surfs up for the bad guy.

99

00:07:03,000 --> 00:07:08,000

But can a surfboard really fly that far and be fatal?

100

00:07:09,000 --> 00:07:12,000

Okay, guys, I got a plan and I have some props.

101

00:07:12,000 --> 00:07:13,000

Go ahead.

102

00:07:13,000 --> 00:07:16,000

Alright, we've got our car here with the surfboard on top with a cable on it.

103

00:07:16,000 --> 00:07:18,000

The cable is attached to our pickup truck.

104

00:07:18,000 --> 00:07:22,000

We've got our crash car here and our target car about a truck length away.

105

00:07:22,000 --> 00:07:24,000

We tow the whole thing and...

106

00:07:25,000 --> 00:07:27,000

...the crash car crashes in and...

107

00:07:28,000 --> 00:07:30,000

...the surfboard hits the target car.

108

00:07:30,000 --> 00:07:34,000

Alright, we'll find out if the surfboard has enough power to penetrate the windshield and kill the guy.

109

00:07:34,000 --> 00:07:36,000

Sounds like a plan.

110

00:07:38,000 --> 00:07:42,000

It's a plan that's got full scale written all over it.

111

00:07:42,000 --> 00:07:48,000

The surfboard car will be towed into a parked crash car at the movie's 40 miles an hour.

112

00:07:48,000 --> 00:07:56,000

40 feet away is the bad guy's car that the surfboard, thanks to its momentum, must then hit and penetrate.

113

00:07:57,000 --> 00:08:00,000

But will it all be tow good to be true?

114

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

Groud of the Alameda runway to recreate a crash where a surfboard flies through windshield and kills a guy.

115

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

Time for setup, cue the heavy equipment and rain clouds.

116

00:08:11,000 --> 00:08:13,000

Please move aside.

117

00:08:15,000 --> 00:08:16,000

Good.

118

00:08:16,000 --> 00:08:18,000

And with the cables...

119

00:08:18,000 --> 00:08:23,000

600 pounds, 1,000 feet of 3 eighth inch branded steel cable.

120

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

Pulleys.

121

00:08:25,000 --> 00:08:30,000

This will ensure that our crash vehicle goes exactly where we want it and not where it wants to go.

122

00:08:30,000 --> 00:08:31,000

Cars.

123

00:08:31,000 --> 00:08:33,000

Bill, forget the gym.

124

00:08:35,000 --> 00:08:38,000

And crash barriers in position.

125

00:08:38,000 --> 00:08:40,000

Safety first.

126

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

The sun comes out to kickstart this myth.

127

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

So this is our towed vehicle, an SUV just like the one in the movie that carries the surfboard.

128

00:08:49,000 --> 00:08:58,000

We've attached our tow cable here onto the steering bar and this is going to allow us to tow this vehicle straight towards the crash vehicle at 40 miles an hour.

129

00:08:58,000 --> 00:09:01,000

And on top of our moving vehicle we have our shortboard.

130

00:09:01,000 --> 00:09:04,000

Like the surfboard in the film, this will become a projectile.

131

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

Add 400 yards downstream.

132

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

This is the crash zone.

133

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

This cable will be pulling our car with the surfboard at 40 miles an hour straight into this parked vehicle.

134

00:09:16,000 --> 00:09:19,000

Once it hits there it's going to come to a complete stop.

135

00:09:19,000 --> 00:09:25,000

However the surfboard will be continuing at 40 miles an hour because of the momentum of the moving vehicle.

136

00:09:25,000 --> 00:09:30,000

This is our target vehicle located 40 feet away from the crash site just like in the movie.

137

00:09:30,000 --> 00:09:38,000

The real question here is whether the surfboard will come off the crash, fly straight through the air all this distance and still have enough power

138

00:09:38,000 --> 00:09:41,000

to pierce the windshield and kill the bad guy inside.

139

00:09:41,000 --> 00:09:45,000

Busters set to take another for the team and here's how.

140

00:09:45,000 --> 00:09:51,000

So there are three possibilities for lethality if the surfboard actually hits the guy's head.

141

00:09:51,000 --> 00:09:54,000

One, decapitation which is obviously certain death.

142

00:09:54,000 --> 00:10:01,000

Two, coup which is an impact of a moving object to a stationary object namely the head.

143

00:10:01,000 --> 00:10:07,000

And contra coup which is the brain hitting the back of the skull resulting in a lethal brain injury.

144

00:10:07,000 --> 00:10:11,000

Well it's time to get the flock out of here and find out.

145

00:10:11,000 --> 00:10:16,000

Alright this is surf and turf in three, two, one.

146

00:10:16,000 --> 00:10:18,000

Here we go.

147

00:10:20,000 --> 00:10:22,000

20 miles an hour.

148

00:10:22,000 --> 00:10:23,000

Looking good.

149

00:10:23,000 --> 00:10:25,000

30 miles an hour.

150

00:10:25,000 --> 00:10:26,000

Getting close.

151

00:10:26,000 --> 00:10:28,000

First and holding.

152

00:10:29,000 --> 00:10:31,000

Wow!

153

00:10:32,000 --> 00:10:35,000

Wow! I didn't see that one coming.

154

00:10:35,000 --> 00:10:38,000

No, but you know what the surfboard did fly through the air.

155

00:10:38,000 --> 00:10:41,000

Yeah but it didn't smash through the windshield.

156

00:10:46,000 --> 00:10:51,000

It was a wipeout alright but to really clarify the chaos, cue the high speed.

157

00:10:51,000 --> 00:10:53,000

Here we go.

158

00:10:53,000 --> 00:10:57,000

Pretty good so far and...

159

00:10:57,000 --> 00:10:59,000

impact.

160

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

I look at that. The surfboard is released but it's nosing down.

161

00:11:03,000 --> 00:11:05,000

It's got a downward trajectory.

162

00:11:07,000 --> 00:11:13,000

It's true that the surfboard did drop like a stone but the crash was not like the movie.

163

00:11:13,000 --> 00:11:21,000

The surfer car failed to come to an immediate stop and consequently the board did not fly off cleanly.

164

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

Now if you watch the high speed there's a lot going on.

165

00:11:25,000 --> 00:11:27,000

Glass flying everywhere.

166

00:11:27,000 --> 00:11:34,000

We didn't manage to stop our SUV like in the movie but the surfboard flew out fairly straight.

167

00:11:34,000 --> 00:11:36,000

A fairly straight flight path.

168

00:11:36,000 --> 00:11:40,000

The only thing is that as it was going it started to dive down.

169

00:11:40,000 --> 00:11:45,000

So we're going to reinforce our barrier and this time we're going to try and stop the towed vehicle

170

00:11:45,000 --> 00:11:49,000

and then we'll compare what actually happens to the surfboard.

171

00:11:49,000 --> 00:11:52,000

In other words, reset.

172

00:11:53,000 --> 00:11:59,000

Next up, time to buckle up as Adam and Jamie unleash the big boys toys.

173

00:12:07,000 --> 00:12:15,000

Adam and Jamie are testing the myth that certain older model sports cars were more aerodynamic backwards than forwards.

174

00:12:15,000 --> 00:12:19,000

In scale, forwards was better but not by much.

175

00:12:19,000 --> 00:12:21,000

That's more drag.

176

00:12:23,000 --> 00:12:32,000

So now it's time to test this back to front fable for real with the ultimate symbol of 1970's Jet Set Eagle.

177

00:12:34,000 --> 00:12:36,000

The red sports car.

178

00:12:36,000 --> 00:12:37,000

And here's how.

179

00:12:37,000 --> 00:12:42,000

This myth is all about aerodynamic efficiency, specifically this car slipping through the air.

180

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

The rule of thumb is that the easier it is for this car to slip through the air, the less energy it expends pushing against that air and the more fuel efficient it is.

181

00:12:49,000 --> 00:12:52,000

So we're going to run our forward facing car through three test metrics.

182

00:12:52,000 --> 00:12:57,000

A quarter mile time trial, a zero to sixty acceleration test and a fuel efficiency test.

183

00:12:57,000 --> 00:13:06,000

When we've gathered all that data we're going to cut the body off, flip it around, drive that car through the same test and see if there really is any advantage to it going backwards as opposed to forwards.

184

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

And by the way, I'll be driving.

185

00:13:08,000 --> 00:13:10,000

What do you want to do first?

186

00:13:10,000 --> 00:13:12,000

Let's time me to the quarter mile.

187

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

Okay.

188

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

I'm standing right at the quarter mile from where Adam's at at this moment.

189

00:13:17,000 --> 00:13:20,000

All I'm going to do is time how long it takes Adam to get here.

190

00:13:21,000 --> 00:13:29,000

Okay Adam, quarter mile starting in three, two, one, go.

191

00:13:30,000 --> 00:13:34,000

Our red road warrior slips through the air with the greatest of ease.

192

00:13:38,000 --> 00:13:39,000

Fourteen seconds.

193

00:13:40,000 --> 00:13:44,000

Fourteen seconds on the nose, but one run ain't enough.

194

00:13:44,000 --> 00:13:46,000

So Adam races through again.

195

00:13:47,000 --> 00:13:48,000

Fourteen seconds again.

196

00:13:49,000 --> 00:13:53,000

Like any good myth buster, Adam's happy to go the extra quarter mile.

197

00:13:53,000 --> 00:13:57,000

I could do this all day long.

198

00:13:59,000 --> 00:14:00,000

Fourteen seconds.

199

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

In the forward position the sports car was able to do the quarter mile in fourteen seconds.

200

00:14:05,000 --> 00:14:06,000

Very consistent.

201

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

Thanks Jamie, we'll flag that information later.

202

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

With the quarter mile testing ticked off, it's on to baseline test two.

203

00:14:18,000 --> 00:14:20,000

Here's how this test is going to go.

204

00:14:20,000 --> 00:14:22,000

I'm going to start right here on the starting line.

205

00:14:23,000 --> 00:14:25,000

Jamie will be down there with the timer.

206

00:14:25,000 --> 00:14:29,000

He's going to go three, two, one and start that timer.

207

00:14:29,000 --> 00:14:33,000

At the very moment he says one and starts that timer, I'm going to take off from the starting line,

208

00:14:33,000 --> 00:14:37,000

fang it out, hell bent for leather, towards Jamie like this.

209

00:14:41,000 --> 00:14:45,000

Now about this far down the track, about 800 feet, Jamie will be standing here with a radar gun

210

00:14:45,000 --> 00:14:51,000

and remember is trustee stopwatch and he's going to be watching that radar gun until my speed is 60

miles an hour

211

00:14:51,000 --> 00:14:57,000

and then he will click that stopwatch a second time and we'll get the metric of how long it takes me to get from zero to 60 miles per hour.

212

00:14:57,000 --> 00:14:58,000

Let's get started.

213

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

Alright Jamie, I'm back in position on one.

214

00:15:02,000 --> 00:15:04,000

Okay, stand by for my mark.

215

00:15:04,000 --> 00:15:05,000

Copy that.

216

00:15:05,000 --> 00:15:07,000

Start moving the car.

217

00:15:07,000 --> 00:15:08,000

Here we go.

218

00:15:08,000 --> 00:15:11,000

In three, two, one.

219

00:15:16,000 --> 00:15:18,000

I don't get tired of that.

220

00:15:24,000 --> 00:15:28,000

Pretty quick, looks to me like eight seconds.

221

00:15:28,000 --> 00:15:30,000

And back we go to one.

222

00:15:31,000 --> 00:15:33,000

I'm heading back to one.

223

00:15:33,000 --> 00:15:38,000

Like the quarter mile run, Adam's going to do the acceleration test three times.

224

00:15:39,000 --> 00:15:40,000

Go.

225

00:15:41,000 --> 00:15:48,000

And just like the quarter mile run, the car is amazingly consistent.

226

00:15:51,000 --> 00:15:52,000

So what are the results?

227

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

All three runs, eight seconds.

228

00:15:54,000 --> 00:15:55,000

Excellent.

229

00:15:57,000 --> 00:16:03,000

With an eight second average in the acceleration test, that just leaves fuel efficiency.

230

00:16:04,000 --> 00:16:07,000

The essence of this story is wind resistance.

231

00:16:07,000 --> 00:16:14,000

Now how we're going to measure that during this next run is by determining how much fuel was used over a one mile course.

232

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

How we're going to do that is really simple.

233

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

We fitted the car with a removable fuel tank and we're going to weigh the tank before and after the run.

234

00:16:23,000 --> 00:16:24,000

That's all there is to it.

235

00:16:24,000 --> 00:16:26,000

Where are we at?

236

00:16:26,000 --> 00:16:29,000

Okay, the start weight of the tank is 20.12 pounds.

237

00:16:29,000 --> 00:16:32,000

Fuel efficiency over one mile, here we go.

238

00:16:32,000 --> 00:16:36,000

With the fuel cell in place, Adam does the first of three runs.

239

00:16:36,000 --> 00:16:40,000

Each run is a mile long at 50 MPH.

240

00:16:40,000 --> 00:16:41,000

The results?

241

00:16:42,000 --> 00:16:46,000

On that last run, Adam used 0.87 pounds of gasoline.

242

00:16:46,000 --> 00:16:49,000

All right, well, I'll go back to the start and let's do it again.

243

00:16:49,000 --> 00:16:50,000

Yeah.

244

00:16:50,000 --> 00:16:51,000

Way we go.

245

00:16:54,000 --> 00:16:58,000

The average fuel used over the three runs is 0.87 pounds.

246

00:16:58,000 --> 00:17:00,000

So what's next?

247

00:17:01,000 --> 00:17:03,000

Well, we got the data we came for.

248

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

Let's go back to the shop and flip the car.

249

00:17:06,000 --> 00:17:07,000

Hop in.

250

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

By the time we come back to this location, we will have done something very, very unnatural in this car.

251

00:17:21,000 --> 00:17:22,000

On the other side of the break.

252

00:17:22,000 --> 00:17:23,000

Never get tired of this.

253

00:17:23,000 --> 00:17:26,000

There's more lethal weapon wreckage.

254

00:17:31,000 --> 00:17:38,000

Just to recap, we are testing the movie myth from lethal weapon two, where a car carrying a surfboard crashes into another car.

255

00:17:38,000 --> 00:17:44,000

The surfboard flies off the top of that car into another car through the windshield, killing the driver.

256

00:17:44,000 --> 00:17:46,000

Now we had a little problem with our last test.

257

00:17:46,000 --> 00:17:49,000

The car carrying a surfboard didn't come to a complete stop.

258

00:17:49,000 --> 00:17:53,000

It means we may have lost some energy that could have been transferred to the surfboard.

259

00:17:53,000 --> 00:17:55,000

So we have added more mass to our barrier.

260

00:17:55,000 --> 00:17:58,000

We have a new car and we have four more K-rails.

261

00:17:58,000 --> 00:18:00,000

This will ensure that our barrier does not move.

262

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

So when our car carrying the surfboard hits it, it will come to a complete stop.

263

00:18:04,000 --> 00:18:08,000

And all that momentum from the car will be transferred to the surfboard.

264

00:18:08,000 --> 00:18:09,000

Alright, Kerry, you ready?

265

00:18:10,000 --> 00:18:12,000

Alright, here we go. This is surf and turf.

266

00:18:12,000 --> 00:18:15,000

In three, two, one, take it away.

267

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

Looks straight.

268

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

Yeah, it looks like it really hits so far.

269

00:18:21,000 --> 00:18:23,000

It's going right for the barrier.

270

00:18:23,000 --> 00:18:26,000

It didn't even go anywhere.

271

00:18:26,000 --> 00:18:29,000

It ran right into the crash vehicle.

272

00:18:30,000 --> 00:18:37,000

There's a wealth of wreckage, but having flown just three feet, the surfboard was not a lethal weapon.

273

00:18:37,000 --> 00:18:39,000

So what went wrong?

274

00:18:39,000 --> 00:18:46,000

In the movie, a car carrying a surfboard crashes into another car, stops cold and spits the surfboard out.

275

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

And that's exactly what we did here.

276

00:18:48,000 --> 00:18:52,000

This car carrying the surfboard stopped completely, right on target.

277

00:18:52,000 --> 00:18:58,000

The only thing is, the car we crashed into crumpled up like this and blocked the surfboard's path.

278

00:18:58,000 --> 00:19:01,000

You can see a green line right where the surfboard hit.

279

00:19:01,000 --> 00:19:09,000

And if I look from the holder all the way out past the green line, I can see it's heading right towards the windshield.

280

00:19:09,000 --> 00:19:12,000

I think definitely this merits another shot.

281

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

The team resets again.

282

00:19:15,000 --> 00:19:22,000

All right, this is lethal weapon surfboard decapitation myth. Here we go in three, two, one, hit it.

283

00:19:22,000 --> 00:19:30,000

Once again, carry accelerates to 40, towing the surfer car 400 yards behind her until...

284

00:19:34,000 --> 00:19:36,000

That was a perfect shot.

285

00:19:37,000 --> 00:19:40,000

That was a perfect shot.

286

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

Hit the ground and bounce up and hit the windshield.

287

00:19:48,000 --> 00:19:54,000

Tori's right. The board did hit the target windscreen, but not quite as the movie portrayed.

288

00:19:55,000 --> 00:20:00,000

Like Take One, the surfboard very soon starts taking a nose dive. But that's not all.

289

00:20:01,000 --> 00:20:08,000

That is incredible. Look at that. It's kind of flying okay, but now look at it starting to twist.

290

00:20:08,000 --> 00:20:12,000

I mean, there's like no aerodynamics there whatsoever.

291

00:20:12,000 --> 00:20:18,000

So after three proof of concept full scale tests, what have the guys learned?

292

00:20:18,000 --> 00:20:25,000

So we are 0 for 3 today. None of our surfboards have pierced the windshield and the bad guy lives on to fight another day.

293

00:20:26,000 --> 00:20:30,000

However, you might think that I'm sad about this, but actually I'm quite excited.

294

00:20:30,000 --> 00:20:38,000

The reason is that we've noticed a trend. All of the surfboards have come off the racks with a significant amount of forward momentum.

295

00:20:38,000 --> 00:20:44,000

But they've also pitched forward and rolled slightly, which indicates there's something going on.

296

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

Maybe something about the shape of the surfboard that's preventing it from getting to the windshield and killing the bad guy.

297

00:20:50,000 --> 00:20:55,000

So what we need to do is break this down to its elements and really figure out what's going on.

298

00:20:55,000 --> 00:20:59,000

Meaning it's time to scrutinize the science of the surfboard.

299

00:21:01,000 --> 00:21:02,000

Later.

300

00:21:02,000 --> 00:21:04,000

Oh, this is going to be fun.

301

00:21:04,000 --> 00:21:07,000

A bungee cord board goes ballistic.

302

00:21:08,000 --> 00:21:11,000

Wow.

303

00:21:17,000 --> 00:21:22,000

Adam and Jamie have put their 70s sports car through its forward paces.

304

00:21:22,000 --> 00:21:25,000

I could do this all day long.

305

00:21:25,000 --> 00:21:29,000

Meaning now it's time to do a 180.

306

00:21:29,000 --> 00:21:31,000

Bring her in.

307

00:21:31,000 --> 00:21:33,000

All right.

308

00:21:33,000 --> 00:21:43,000

The next step in testing this story is to separate the body of the car from its chassis, flip it around and reattach it so that the back end of the car is facing forward.

309

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

Now this is a pretty complicated task, so we've decided to bring out the big guns.

310

00:21:48,000 --> 00:21:55,000

Mike Allen is the senior automotive editor for Popular Mechanics Magazine. He's going to make sure it gets done right.

311

00:21:55,000 --> 00:22:01,000

Time to rip it and strip it. And Jamie thinks it might just work.

312

00:22:01,000 --> 00:22:02,000

What do I think about it?

313

00:22:02,000 --> 00:22:08,000

Well, water naturally forms a perfectly aerodynamic shape when it forms a teardrop like so.

314

00:22:08,000 --> 00:22:15,000

And if you look at this car, it's kind of teardrop shape if you look at it going backwards.

315

00:22:15,000 --> 00:22:19,000

So as far as I'm concerned, this might actually be possible.

316

00:22:19,000 --> 00:22:25,000

But before possible becomes practical, some heavy-handed surgery is required.

317

00:22:26,000 --> 00:22:33,000

But with all these bits ripped out, won't the backwards car be lighter and therefore faster?

318

00:22:33,000 --> 00:22:35,000

I'll let Jamie handle that one.

319

00:22:35,000 --> 00:22:41,000

I know what you're thinking. Wait a second. You can't remove all that stuff because that'll skew the results. The car will be lighter.

320

00:22:41,000 --> 00:22:46,000

Well, yes and no. Yes because it would skew the results if we didn't account for it.

321

00:22:46,000 --> 00:22:53,000

No because we're going to account for it by putting sandbags or barbell weights in the car before we do our testing.

322

00:22:53,000 --> 00:22:58,000

Now to slice, dice and desecrate one formerly cool car.

323

00:22:58,000 --> 00:23:07,000

After dozens of hours and hundreds of carefully made cuts, it is finally time to take this sports car which looks like it's in one piece.

324

00:23:07,000 --> 00:23:13,000

But in fact, it's into pull off the body, turn it around and put it back down and see where we stand.

325

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

How are we going to do that? Well, we need some muscle.

326

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

Muscle? Like an Egyptian.

327

00:23:19,000 --> 00:23:21,000

You guys ready?

328

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

Alright, on my count. Three, two, one, lift.

329

00:23:28,000 --> 00:23:32,000

Look at that. Anybody having problems?

330

00:23:32,000 --> 00:23:38,000

Fans of these classic cars are probably having their first coronary. Right about now.

331

00:23:38,000 --> 00:23:40,000

Is there a wire there, Mike?

332

00:23:45,000 --> 00:23:46,000

Lovely.

333

00:23:48,000 --> 00:23:50,000

I don't know. I like the car better this way.

334

00:23:50,000 --> 00:23:54,000

The ultimate convertible. Yeah, this would be cool.

335

00:23:54,000 --> 00:24:07,000

It's ready to lower. After three days of cutting, piecing, hammering, I think it's finally ready to lower down and stay on.

336

00:24:07,000 --> 00:24:10,000

Well, let's do it. Let's do it. Come on down.

337

00:24:12,000 --> 00:24:15,000

Tilting forward, coming down. It's good.

338

00:24:16,000 --> 00:24:18,000

Whoa! Hey!

339

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

It's on. I'm confused.

340

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

Exactly, it is this.

341

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

Just one more touch and this mechanical misfit is ready.

342

00:24:29,000 --> 00:24:31,000

Next stop, back to the track.

343

00:24:35,000 --> 00:24:37,000

Sweet.

344

00:24:37,000 --> 00:24:44,000

Alright, for this myth to be confirmed, we're going to need the surfboard to fly off the car at 40 miles an hour.

345

00:24:44,000 --> 00:24:51,000

We're going to need it to fly straight as an arrow for 40 feet and we're going to need it to bash through the windshield and take out the bad guy.

346

00:24:51,000 --> 00:24:59,000

And we are getting none of that. In fact, the surfboard immediately takes your nose down and then banks right or left in an unpredictable way.

347

00:24:59,000 --> 00:25:01,000

Yeah, I mean, right now, this myth doesn't look true at all.

348

00:25:01,000 --> 00:25:04,000

But what do you guys want to do? We could try driving the vehicle faster.

349

00:25:04,000 --> 00:25:14,000

Or we could do a small scale experiment. We could make a mini surfboard, take it over to NASA, put it in their water channel and find out if we're ever going to get a stable flight pattern out of a surfboard.

350

00:25:14,000 --> 00:25:17,000

A little aerodynamic analysis. I like it.

351

00:25:18,000 --> 00:25:23,000

And at NASA, Cary will be armed with not one but two baby boards.

352

00:25:23,000 --> 00:25:29,000

So I've been hand shaping my little surfboard here for our small scale experiment over at NASA.

353

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

And I think I have a little too much of a nose lift.

354

00:25:33,000 --> 00:25:38,000

Instead of scrapping this and starting over, I need perfection. So I'm going to go high tech.

355

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

I am going to go to a 3D printer, throw in a CAD drawing and print out an exact replica to our life

size surfboards.

356

00:25:46,000 --> 00:25:51,000

So if the hand carved one doesn't cut it, the 3D one should do the business.

357

00:25:53,000 --> 00:25:56,000

And before you can say, I want one, it's ready.

358

00:26:00,000 --> 00:26:03,000

Little resin and it's done.

359

00:26:09,000 --> 00:26:17,000

Aerodynamically speaking, both water and air are fluids. So what we're going to do is submerge our surfboard under the water and inject dye upstream.

360

00:26:17,000 --> 00:26:25,000

As the dye flows over the surfboard, we should get an idea of whether they'll generate lift or more importantly, maintain stable flight.

361

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

Like Adam and Jamie earlier, they'll also be helped by aero expert Kurt Long.

362

00:26:31,000 --> 00:26:37,000

Who on seeing Cary's hand carved board duck and dive is already unimpressed.

363

00:26:37,000 --> 00:26:42,000

So the board seems to be pivoting. What does that indicate to us?

364

00:26:42,000 --> 00:26:50,000

In this particular case, it means that although momentarily it might try to fly straight, very quickly thereafter it's going to be dramatically upwards or downwards.

365

00:26:50,000 --> 00:26:52,000

Nothing resembling control flight.

366

00:26:52,000 --> 00:26:59,000

So Cary's board's a bust, but will the more accurate 3D printed one get a different result?

367

00:26:59,000 --> 00:27:05,000

Okay, this is our surfboard with a less severe nose lift. Let's see how it sluzzes.

368

00:27:05,000 --> 00:27:14,000

To the untrained eye, this looks much better. The board is certainly stable, but remember Kurt's eye is far from untrained.

369

00:27:14,000 --> 00:27:21,000

The board itself just isn't really doing anything. That's a good thing because it will slice through the air a lot easier.

370

00:27:21,000 --> 00:27:26,000

However, because it's not changing the flow patterns very much, it's not going to get much lift.

371

00:27:26,000 --> 00:27:29,000

I believe this board would not fly stably at this angle.

372

00:27:29,000 --> 00:27:34,000

So I'm gathering from all these tests is that surfboards were not meant to fly through the air like an aero.

373

00:27:34,000 --> 00:27:38,000

Yeah, I think you're exactly right. They make wonderful surfboards, but that's about it.

374

00:27:38,000 --> 00:27:41,000

Alright, guess it's back to the drying board.

375

00:27:42,000 --> 00:27:43,000

Next up...

376

00:27:43,000 --> 00:27:45,000

That's insane!

377

00:27:45,000 --> 00:27:48,000

The guys get in touch with their inner road warrior.

378

00:27:52,000 --> 00:28:01,000

In reverse engineering, it's time for the most surreal time trial in Mythbusters history.

379

00:28:01,000 --> 00:28:08,000

Well, I know for all intents and purposes it looks like I'm sitting on the hood, but check this out. That's the exhaust.

380

00:28:08,000 --> 00:28:15,000

There's three tests today. 0 to 60, quarter mile drag, and fuel efficiency.

381

00:28:15,000 --> 00:28:21,000

At each test, we'll put the Frankenstein cars aerodynamics to the ultimate test.

382

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

Adam, let's start testing.

383

00:28:23,000 --> 00:28:25,000

I'm ready. Let's do it.

384

00:28:25,000 --> 00:28:27,000

Here we go.

385

00:28:27,000 --> 00:28:30,000

First up, 0 to 60.

386

00:28:31,000 --> 00:28:35,000

The forward-facing car did 0 to 60 in...

387

00:28:35,000 --> 00:28:36,000

Eight seconds.

388

00:28:37,000 --> 00:28:42,000

For the myth to be true, the backwards mobile should hit 60 in less time.

389

00:28:43,000 --> 00:28:46,000

Okay, Adam. 0 to 60 in...

390

00:28:46,000 --> 00:28:50,000

Three, two, one, go!

391

00:28:56,000 --> 00:28:58,000

Nine seconds.

392

00:28:58,000 --> 00:29:01,000

That right there is the rush.

393

00:29:01,000 --> 00:29:06,000

To get the hard data, Jamie and Adam run the tests three times.

394

00:29:06,000 --> 00:29:08,000

Not that Adam's complaining.

395

00:29:09,000 --> 00:29:13,000

Dude, this is so much fun!

396

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

Nine seconds again.

397

00:29:21,000 --> 00:29:22,000

Eight seconds.

398

00:29:22,000 --> 00:29:24,000

How did I do on that?

399

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

The runs with the car facing backwards were an average of 8.66 seconds.

400

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

How does that compare to the forward-facing test?

401

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

The average on the forward-facing car was eight seconds.

402

00:29:34,000 --> 00:29:36,000

So the backwards was a little slower?

403

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

It is.

404

00:29:37,000 --> 00:29:40,000

Test one, and the myths got adept.

405

00:29:40,000 --> 00:29:46,000

Rather than being quicker than the forward's time, the backwards car took longer to hit 60.

406

00:29:46,000 --> 00:29:55,000

When we do the math, we find that our backwards-facing car was accelerating 7.5% more slowly than the normal car.

407

00:29:55,000 --> 00:29:57,000

Still too close to call.

408

00:29:57,000 --> 00:29:59,000

So bring on test number two.

409

00:29:59,000 --> 00:30:01,000

Shall we go on to the quarter mile?

410

00:30:01,000 --> 00:30:03,000

Let's go on to the quarter mile.

411

00:30:03,000 --> 00:30:06,000

Front first, it did the quarter mile in 14 seconds.

412

00:30:06,000 --> 00:30:08,000

That's the time to trough.

413

00:30:09,000 --> 00:30:12,000

Alright Jamie, I am in position and ready to go.

414

00:30:12,000 --> 00:30:17,000

Okay Adam, quarter mile in three, two, one.

415

00:30:19,000 --> 00:30:25,000

Crabbed up against the rear windscreen is not what you'd call an ideal driving position.

416

00:30:25,000 --> 00:30:27,000

But it is very myth musters.

417

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

17 seconds.

418

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

Here we go.

419

00:30:37,000 --> 00:30:39,000

17 seconds.

420

00:30:39,000 --> 00:30:44,000

The same on run two, and one more time.

421

00:30:49,000 --> 00:30:51,000

Let's go.

422

00:30:55,000 --> 00:30:57,000

16 seconds.

423

00:30:58,000 --> 00:31:00,000

How did I do on the quarter mile?

424

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

You're doing the quarter mile in an average of 16.6 seconds.

425

00:31:03,000 --> 00:31:05,000

And how does that compare to the forward run?

426

00:31:05,000 --> 00:31:07,000

Forward test was 14 seconds.

427

00:31:07,000 --> 00:31:08,000

A little bit slower.

428

00:31:08,000 --> 00:31:09,000

Yep.

429

00:31:09,000 --> 00:31:10,000

Nice.

430

00:31:10,000 --> 00:31:15,000

Time to gas up for the backwards-facing fuel efficiency test.

431

00:31:15,000 --> 00:31:26,000

In the forwards-facing test, the retro racer used an average of 0.87 pounds of fuel over three runs on a one mile track at 50 MPH.

432

00:31:26,000 --> 00:31:30,000

Now they're at it again, filling her up and weighing the tank.

433

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

There we go.

434

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

29.32 pounds.

435

00:31:33,000 --> 00:31:36,000

Running the mile, go.

436

00:31:41,000 --> 00:31:45,000

That is the most uncomfortable car ever.

437

00:31:45,000 --> 00:31:49,000

Then weighing the tank to see how much fuel was used.

438

00:31:49,000 --> 00:31:51,000

28.6 pounds.

439

00:31:51,000 --> 00:31:55,000

But after three runs, the car was out of the way.

440

00:31:55,000 --> 00:32:01,000

But after three runs over the same distance, at the same speed, the results are puzzling.

441

00:32:01,000 --> 00:32:03,000

Okay.

442

00:32:03,000 --> 00:32:08,000

The difference between forwards and backwards is much larger than in the other tests.

443

00:32:08,000 --> 00:32:11,000

And that's got Jamie concerned.

444

00:32:11,000 --> 00:32:17,000

Our runs with the body on reverse are showing an increase in fuel consumption of 44%.

445

00:32:17,000 --> 00:32:21,000

That's an awful lot, and it makes me suspicious.

446

00:32:21,000 --> 00:32:25,000

Suspicious that the data may not be correct.

447

00:32:27,000 --> 00:32:29,000

No idea what that means.

448

00:32:29,000 --> 00:32:34,000

Jamie and Adam are stumped. They're going to need a plan B.

449

00:32:42,000 --> 00:32:49,000

All right, this myth is on thin ice. I mean, because of the surfboard's shape and its fins, it's not going to have a predictable flight path.

450

00:32:49,000 --> 00:32:54,000

Meaning a surfboard flying off the roof of a car crashing into another windshield just probably never going to happen.

451

00:32:54,000 --> 00:32:57,000

True, but there's still one part of this myth we haven't dealt with.

452

00:32:57,000 --> 00:33:01,000

What would happen if a surfboard hit a windshield at 40 miles an hour?

453

00:33:01,000 --> 00:33:08,000

I mean, yes, in the movie, it looks a little suspect, but fact remains, would it take out a guy?

454

00:33:08,000 --> 00:33:10,000

All right, what if we build some kind of surfboard slingshot?

455

00:33:10,000 --> 00:33:18,000

Put it on some rails, hook it a bungee cord, pull it back, let it rip, and fire it into a windshield at point blank going 40 miles an hour.

456

00:33:18,000 --> 00:33:19,000

Do you see if it busts through?

457

00:33:19,000 --> 00:33:20,000

Okay, that could work.

458

00:33:20,000 --> 00:33:21,000

Yeah.

459

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

Both the NASA data and the full-scale proof of concept tests prove that the movie scenes a sham.

460

00:33:29,000 --> 00:33:32,000

Yeah, but it didn't smash through the windshield.

461

00:33:32,000 --> 00:33:41,000

But what if the crash had been a regular head-on by eliminating the 40-foot flight with the surfboard then become a lethal weapon?

462

00:33:42,000 --> 00:33:49,000

To find out, Tori's got a plan for a surfboard surprise that should be way more reliable than the towing system.

463

00:33:49,000 --> 00:33:51,000

This is going to be a serious slingshot.

464

00:33:51,000 --> 00:33:54,000

It's a seriously beefy build.

465

00:33:54,000 --> 00:33:56,000

Yeah, do the good way to start.

466

00:33:56,000 --> 00:34:00,000

That expert builder Tori is relishing.

467

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

All right, so I have my rails set up that the surfboard can run along.

468

00:34:04,000 --> 00:34:16,000

I also have a track down the center so I can attach the surfboard to this little trolley and this trolley will fit into the track and we will know the surfboard is going to go exactly where we point this thing.

469

00:34:16,000 --> 00:34:22,000

And with some serious science about to get sprung, let's step outside.

470

00:34:22,000 --> 00:34:32,000

Okay, so now that Tori has finished the surfboard firing rig, we need a way to accelerate our surfboard up to our target speed of 40 miles an hour.

471

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

And we're going to do that using this industrial grade bungee.

472

00:34:35,000 --> 00:34:43,000

What we need to do is calibrate how far back to pull the bungee in order to get the surfboard up to 40 miles an hour.

473

00:34:44,000 --> 00:34:52,000

And with a high-speed gauge, a target, and a mattress come crash pad in place, that looks good.

474

00:34:52,000 --> 00:34:55,000

It's time to commence the calibration.

475

00:34:55,000 --> 00:34:57,000

Shall we start at 10 feet?

476

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

Yeah, we pull back to 10 feet and see how fast the surfboard flies.

477

00:35:01,000 --> 00:35:03,000

Alright, let me know when to stop.

478

00:35:03,000 --> 00:35:08,000

Grant triggers the winch and when the board hits the 10-foot marker, it's over to Tori.

479

00:35:09,000 --> 00:35:13,000

Surfboard calibration in 3, 2, 1.

480

00:35:14,000 --> 00:35:17,000

Wow! That was amazing!

481

00:35:17,000 --> 00:35:18,000

Oh my gosh!

482

00:35:18,000 --> 00:35:20,000

That might be going fast.

483

00:35:21,000 --> 00:35:23,000

Carries spot on.

484

00:35:23,000 --> 00:35:27,000

The 10-foot pullback resulted in a speed of over 70 miles an hour.

485

00:35:27,000 --> 00:35:32,000

So for test two, they dial it back to 6 feet of tension.

486

00:35:33,000 --> 00:35:36,000

Alright, this is launching from 6 feet away.

487

00:35:36,000 --> 00:35:39,000

In 3, 2, 1.

488

00:35:40,000 --> 00:35:42,000

Once again, the shot was on the money.

489

00:35:42,000 --> 00:35:47,000

And once again, at 52 miles per hour, it was too fast.

490

00:35:47,000 --> 00:35:50,000

So Tori dials it down for test three.

491

00:35:50,000 --> 00:35:57,000

Here we go. Surfboard sleek shot calibration test at 5 feet in 3, 2, 1.

492

00:36:01,000 --> 00:36:05,000

Okay, it looks like it's going 17 frames over a foot.

493

00:36:05,000 --> 00:36:08,000

So that's about 58 feet.

494

00:36:08,000 --> 00:36:10,000

58.8 feet per second.

495

00:36:10,000 --> 00:36:11,000

Okay.

496

00:36:11,000 --> 00:36:12,000

That's 40 miles an hour.

497

00:36:12,000 --> 00:36:13,000

We hit our target speed.

498

00:36:13,000 --> 00:36:14,000

That's crazy.

499

00:36:14,000 --> 00:36:16,000

We actually got the exact speed.

500

00:36:16,000 --> 00:36:18,000

That never happens.

501

00:36:18,000 --> 00:36:21,000

With the rig calibrated, what's next?

502

00:36:21,000 --> 00:36:24,000

Now, it's time to set up the car, put the man inside,

503

00:36:24,000 --> 00:36:28,000

and see if this surfboard will punch through the window and kill that guy.

504

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

Coming right out, the heat is on for Adam and Jamie.

505

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

Adam here.

506

00:36:37,000 --> 00:36:40,000

Then, Buster's staring down the barrel.

507

00:36:40,000 --> 00:36:42,000

Good luck.

508

00:36:45,000 --> 00:36:52,000

Since humans first conquered the waves, the surfboard has been the tool of choice.

509

00:36:52,000 --> 00:36:56,000

But in the wrong hands, can it really kill you?

510

00:36:56,000 --> 00:36:57,000

Help!

511

00:36:57,000 --> 00:36:58,000

Help!

512

00:36:59,000 --> 00:37:00,000

So we are set.

513

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

We have our vehicle in place.

514

00:37:02,000 --> 00:37:05,000

Inside, we have our man with the human analog neck.

515

00:37:05,000 --> 00:37:06,000

Careful.

516

00:37:06,000 --> 00:37:09,000

Stretch across the door opening, we have our bungee cord,

517

00:37:09,000 --> 00:37:12,000

which is hooked into our surfboard.

518

00:37:12,000 --> 00:37:17,000

The surfboard is hooked up to a quick release, which is also connected to this cable.

519

00:37:17,000 --> 00:37:20,000

Now, all we need to do is pull the surfboard back with the winch

520

00:37:20,000 --> 00:37:23,000

until we get to the right position on our surfboard's sleeve shot.

521

00:37:23,000 --> 00:37:28,000

Then, we're going to release it and let it crash into the windshield going 40 miles an hour.

522

00:37:28,000 --> 00:37:32,000

And find out if this myth is a facture or not.

523

00:37:32,000 --> 00:37:33,000

Alright, here we go.

524

00:37:33,000 --> 00:37:36,000

In three, two, one.

525

00:37:43,000 --> 00:37:48,000

The surfboard came in, hit the windshield, the windshield absorbed the impact,

526

00:37:48,000 --> 00:37:50,000

and the surfboard glanced off the top.

527

00:37:50,000 --> 00:37:54,000

That's because this safety glass, which is standard on modern American automobiles,

528

00:37:54,000 --> 00:37:58,000

has many layers, and those are designed to absorb that impact energy

529

00:37:58,000 --> 00:38:02,000

and keep the driver safe, which is exactly what it did here.

530

00:38:02,000 --> 00:38:04,000

Or to put it another way,

531

00:38:04,000 --> 00:38:07,000

the windshield's busted and sows the myth that 40 miles an hour,

532

00:38:07,000 --> 00:38:11,000

surfboard is not going to penetrate the windshield and kill our target.

533

00:38:11,000 --> 00:38:17,000

Yep, even point-playing a 40-mile-an-hour surfboard will not be fatal.

534

00:38:17,000 --> 00:38:20,000

But how about faster still?

535

00:38:20,000 --> 00:38:22,000

With a new windscreen in place...

536

00:38:22,000 --> 00:38:24,000

Oh, yeah, that's nice.

537

00:38:24,000 --> 00:38:26,000

The team's ramping it up.

538

00:38:26,000 --> 00:38:28,000

11 feet.

539

00:38:28,000 --> 00:38:31,000

Looking good. 12 feet.

540

00:38:31,000 --> 00:38:33,000

The wind's just slowing down.

541

00:38:33,000 --> 00:38:35,000

13 feet.

542

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

All right, that's as much as the winch is going to pull.

543

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

We're at 15 feet. You guys ready?

544

00:38:41,000 --> 00:38:46,000

With the winch maxed out under the tension, it's time to unleash the beast.

545

00:38:52,000 --> 00:38:56,000

The 15-foot pull turned into an 85-mile-an-hour hit.

546

00:38:59,000 --> 00:39:01,000

But what happened to Buster?

547

00:39:01,000 --> 00:39:05,000

Even with the surfboard traveling 85 miles an hour,

548

00:39:05,000 --> 00:39:09,000

the windshield still absorbed all the energy of the impact

549

00:39:09,000 --> 00:39:11,000

and stopped it before it hit our driver.

550

00:39:11,000 --> 00:39:15,000

That means that this myth is not just busted, it is double-busted.

551

00:39:15,000 --> 00:39:18,000

So we busted this myth in multiple ways.

552

00:39:18,000 --> 00:39:20,000

Number one, aim.

553

00:39:20,000 --> 00:39:24,000

When you have a real vehicle hitting another vehicle with the surfboard on the top,

554

00:39:24,000 --> 00:39:26,000

hitting your mark is very difficult.

555

00:39:26,000 --> 00:39:29,000

Not to mention transferring the energy to the surfboard.

556

00:39:29,000 --> 00:39:31,000

Number two, aerodynamics.

557

00:39:31,000 --> 00:39:33,000

We've analyzed the aerodynamics of the surfboard

558

00:39:33,000 --> 00:39:37,000

and they make it very difficult for the surfboard to fly straight through the air.

559

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

Number three, force.

560

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

Even at 85 miles per hour, twice the speed that's in the myth,

561

00:39:44,000 --> 00:39:48,000

it just bounces right off the safety glass and doesn't pierce.

562

00:39:48,000 --> 00:39:51,000

No matter how you look at it, this one is busted.

563

00:39:51,000 --> 00:39:53,000

Number three, power.

564

00:39:58,000 --> 00:40:00,000

Back with the driving duo.

565

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

And this reverse rally is gearing up for a grand finale.

566

00:40:05,000 --> 00:40:07,000

I've got two problems with this story right now.

567

00:40:07,000 --> 00:40:08,000

One is our data.

568

00:40:08,000 --> 00:40:11,000

I don't feel like it's definitive and I don't feel like it answers the question yet.

569

00:40:11,000 --> 00:40:12,000

And the second?

570

00:40:12,000 --> 00:40:15,000

The second is I can't shake the feeling that I want to see a race off

571

00:40:15,000 --> 00:40:20,000

between our backwards-facing car and a forwards-facing car racing each other at the same time.

572

00:40:20,000 --> 00:40:22,000

Yeah, me too.

573

00:40:22,000 --> 00:40:24,000

I'm glad you're on the same page. Let's do it.

574

00:40:24,000 --> 00:40:27,000

So roll on up for one last run.

575

00:40:27,000 --> 00:40:29,000

So this is what we've come up with.

576

00:40:29,000 --> 00:40:31,000

Two cars, identical make and model.

577

00:40:31,000 --> 00:40:36,000

One of them as the manufacturer intended, the other one with its body on in reverse.

578

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

We're going to see which one's more aerodynamically efficient.

579

00:40:39,000 --> 00:40:41,000

So how are we going to make this race a fair fight

580

00:40:41,000 --> 00:40:44,000

when these two cars' engines might be tuned differently?

581

00:40:44,000 --> 00:40:45,000

Here's how.

582

00:40:45,000 --> 00:40:48,000

Starting from this starting line, when we hear the ghost signal,

583

00:40:48,000 --> 00:40:52,000

Jamie and Al will both put our foot to the floor, pedal to the metal,

584

00:40:52,000 --> 00:40:56,000

and bang it out of here as fast as we can to this green flag.

585

00:40:56,000 --> 00:41:00,000

By the time Jamie and I get here, we want to be going neck and neck and about 100 miles an hour.

586

00:41:00,000 --> 00:41:06,000

At that point in time, Mike will give us a signal and we will throw both cars into neutral at the exact same second

587

00:41:06,000 --> 00:41:10,000

and drift the next quarter mile solely under the power of our own momentum,

588

00:41:10,000 --> 00:41:15,000

the only force acting against that momentum being the air around us.

589

00:41:15,000 --> 00:41:22,000

The first car then across this very finish line is by definition the more aerodynamically efficient of the two.

590

00:41:22,000 --> 00:41:24,000

That's how we'll get our answer.

591

00:41:24,000 --> 00:41:31,000

So the two matching cars, which weigh exactly the same, are going to run nice and steady at 100 miles per hour.

592

00:41:31,000 --> 00:41:37,000

Then at the green flag, they'll put the cars into neutral and let them drift on through to the finish.

593

00:41:37,000 --> 00:41:42,000

In the red car, the Baron of Backwards, Adam Savage.

594

00:41:42,000 --> 00:41:43,000

Hot in here.

595

00:41:43,000 --> 00:41:52,000

And racing nose first in silver, Jamie Highspeed Heinemann with guest gear head, Mike Allen, the man in command.

596

00:41:52,000 --> 00:41:55,000

I'm in position and ready to go. How do I think this is going to work?

597

00:41:55,000 --> 00:42:01,000

Well, we've done everything we can to level the playing field with these cars. It's all about wind resistance.

598

00:42:01,000 --> 00:42:06,000

Reverse engineering, drift off. Gentlemen, start your engine.

599

00:42:06,000 --> 00:42:10,000

Three, two, one, go!

600

00:42:11,000 --> 00:42:19,000

40, 60, the guys are now toe to toe at 100 miles per hour.

601

00:42:22,000 --> 00:42:24,000

Green flag approaching.

602

00:42:25,000 --> 00:42:27,000

And drift.

603

00:42:27,000 --> 00:42:29,000

Gear sticks in neutral.

604

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

The pictures tell the story.

605

00:42:37,000 --> 00:42:39,000

Front first was first.

606

00:42:46,000 --> 00:42:48,000

That is a result.

607

00:42:48,000 --> 00:42:50,000

That was awesome.

608

00:42:50,000 --> 00:42:57,000

This is shocking front-page science news. Apparently, the car designers knew what they were doing to begin with.

609

00:42:57,000 --> 00:42:59,000

Yep. And that means myth is busted.

610

00:42:59,000 --> 00:43:00,000

Totally busted.

611

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

And with that said, it's time to ride off into the sunset.

612

00:43:04,000 --> 00:43:08,000

Okay, Adam, let's try that again.