Upcoming Events

TECHCHASE	BAJA-2018	SAE Aero West	Manovegam– SAE Aero
Annual Techno Fest of VIVA Institute of Technology.	SAE Collegiate series BAJA 2018 Event to be held at IIT Ropar.	Aeromodelling International Event to be held at Van Nyus , California.	SAE India Chapter aeromodelling event to happen soon.

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TESLA ON MARS?

As you're probably aware, Elon Musk sent his personal first-generation Tesla Roadster into space on a SpaceX Falcon Heavy rocket last month. This led *Engineering Explained's* Jason Fenske to ask an important question: How quickly would a new Tesla Roadster accelerate on Mars?

Fenske uses his trusty whiteboard to show precisely how to calculate 0-60 mph acceleration on Mars based on Earth-bound figures. That helps him arrive at a simple equation—gravity on Earth (32.2 feet/second²) divided by gravity on Mars (12.18 feet/second²), multiplied by the Roadster's claimed 0-60 mph time (1.9 seconds). Given this, Fenske estimates the Roadster would hit 60 mph in five seconds flat on the red planet, slowed down significantly by the reduced friction (and thus, reduced traction) of Mars's lower gravity.

This Issue

Why it Takes Less Torque to Loosen a Bolt Than to Tighten It

As Charlie Chaplin figured out during his brief assembly-line career depicted in the 1936 film *Modern Times*, tightening bolts all day can be a real pain. Lucky for Charlie, and for any one of us working on a mechanical project, there's good news at the other end of the wrench: Loosening a bolt takes less torque than you originally put into tightening it. If that seems counterintuitive to you, you're not alone. Mechanical objects, like nuts and bolts, aren't magic.

It would seem, then, that if you torqued a nut or bolt to exactly 100 lb-ft, removing it would require exactly 100 lb-ft of torque applied in the opposite direction. But that's not the case. And YouTuber AvE has an in-depth explanation of why that's the case, complete with demonstrations and data. AvE's full video is nearly 13 minutes long. Most of that is dedicated to him describing how he rigged up the torque-measuring device that he uses to illustrate his hands-on example. And viewer be warned, there's some foul language and Canadian humor contained in the video (a word that AvE pronounces to rhyme with "Ave0)

In short, it takes less torque to loosen a threaded fastener than it does to tighten it, because the pitched threads act like an inclined plane. Tightening the fastener is like pushing "uphill;" loosening it is like pulling "downhill." In AvE's test, it takes around 10 percent less torque to loosen a bolt than what was put into tightening it.

Of course, this doesn't account for what might happen in the period between installation and removal of a nut or bolt: Rust, corrosion, threads seizing, and the like. Anyone who has strained against a badly rusted fastener knows that they're sometimes impossible to remove without the persuasion of a cheater bar or blowtorch. And as AvE demonstrates, oil on the threads has the opposite effect, reducing the breakaway torque even further.

PRINCIPLES FOR PROJECT MANAGEMENT SUCCESS

Project managers must focus on three dimensions of project success. Simply put, project success means completing all project deliverables on time, within budget, and to a level of quality that is acceptable to sponsors and stakeholders. The project manager must keep the team's attention focused on achieving these broad goals.

Planning is everything — and ongoing. On one thing all PM texts and authorities agree: The single most important activity that project managers engage in is planning — detailed, systematic, team-involved plans are the only foundation for project success. And when real-world events conspire to change the plan, project managers must make a new one to reflect the changes. So planning and replanning must be a way of life for project managers

The da Vinci Robot

A sneak peek into the groundbreaking work done by one robot which soon may replace surgeons!

The human body is a rather untidy place where organs, bones, flesh, muscles, arteries and connective tissue all compete for space and about 30 percent of world's 232 million tissue surgeries result in complications. This is because surgeons vary greatly in training, dexterity, experience and decision making and sometimes because of fine tremors of hands and uneconomical movements.Complex surgical procedures like circular anastomosis involve stitching together two severed ends of the intestine and require the skill of an experienced surgeon: Stitch them too far apart or too loose and they will bleed. Tie them too tight, they will strangle and kill the tissue. By embedding the knowledge of the best surgeons in digital systems, autonomous and semi-autonomous robots could deliver universal access to the best surgical techniques and could potentially be a solution to the problems in conventional surgical procedures.Robots in the surgical suite are nothing new. The best known of them, the *da Vinci robot, is more than 15 years old and has performed over 2 million operations wide.*

"THE ROBOTS OF THE FUTURE WILL HAVE SKILLS UNIMAGINED BEFORE OF"

The future of surgery is full of promise as it reduces pain, cost, healing times, scarification, disability, and morbidity. Robot-assisted surgery(RAS) enables surgeons to perform minimally invasive yet complicated procedures that are more precise and more controlled than conventional, 'manual' surgeries, even if performed by the most skilled surgeon with the steadiest of hands.

The *da Vinci* robot is a state of the art technology which enables remote surgery and teleoperation. There are two components of this system: The robot itself (which operates on the patient) and the separate control console (which is controlled by a surgeon). The robot has three small, nimble robotic arms that attach to various instruments such as a scalpel, scissors or electrocautery instruments. Each instrument can easily be swapped out for different functions. The last arm holds an endoscopic camera that gives the surgeon 3-D vision from the control console.

These robots have enabled surgeons the mobility and nimbleness to perform abdominal surgery within the limited space of the human body. Combine this nimbleness with 3D imaging technology and augmented reality and surgeons will be able to 'see right through you' by superimposing 3D information from CAT scans and MRIs onto the view of the actual tissue. This 3D virtual environment will enable the surgeon to 'see the invisible' as certain areas in the body can be 'illuminated' in order to track the movement of, for instance, cancer as it spreads through the lymphatic system, enabling the surgeon to intervene where possible. Apart from their primary focus, the abdomen, the bots are now also correcting vision problems, reshaping joints and even drilling into brains.

Drawbacks:

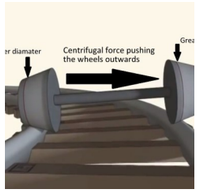
One of the biggest drawbacks of the *da Vinci* robot is that they work exclusively with solid objects like bones or eyes which remain stationary during surgery. In contrast, soft tissues vary in shape and size from patient to patient, and they are, by definition, pliant. This is especially problematic when we want to stitch soft tissues together. Stitch them all together and each stitch will alter their shape. Sometime a stitch may even cover the previous stitch or hide the location of the next switch. Sometimes leaking blood obscures the tissue. Moreover, there is no fixed value of spacing and tension as such.

Turning Mechanism in Trains

Have you ever wondered what keeps the train on the track? How does a train follow the track during a circular path? After all, there is no steering nor a differential in a train. As a matter of fact, the wheels on either side are connected through an axle which makes them rotate with the same angular velocity . Many of us would think that the flanges on the wheels would do the job. But that is not the answer. The flanges are just a safety device. If the flanges rub against the track, it gives a horrible noise and it is a huge waste of energy. Moreover, there will be wear of tracks and wheels.

The flanges are a secondary mechanism just in case the real mechanism fails There is something fundamentally different in the design of wheels of a train and an automobile.

So, why is it different on a train? Unlike a normal locomotive, trains have a huge body. Trains don't make sharp turns like an automobile Hence adding a differential would be a potential waste of resources. So, how does it go around a corner? The solution is simple and elegant and it lies in the geometry of the wheels and tracks The wheels are tapered, conical in shape. That means they have a varying diameter at different points of contact.



This makes the point of contact of the right wheel is at a larger diameter of the cone. While the diameter at the point of contact on the left wheel is much smaller.
As both the wheels are connected by a solid shaft both the wheels must the same angular velocity, making them rotate at different speeds. This system essential replaces the need for the differential in trains.

This also solves another major problem: Whenever there is a bump on tracks, the wheels suddenly slide even when travelling on a straight track & there is a great danger of being derailed, so the same design helps to stabilize the train & to run smoother

The whole beauty of this system is that the amount of shift of the wheelset happens automatically, makes the train move on turns smoothly and keeps the train on track.

Hence the conical geometry along with the flanges ensures the train stays on the track

THIS VOLUMES Q & A

Q: Which are some of the best Mechanical Engineering Movies to see.

A: I dont Think There is some movie Especially Made for Mechanical Engineer. There are Movies Based Upon the life of Engineering Students.like 3 Idiots- One Best Movie Which no one can make.
If You are passionate about cars and automobiles watch Whether it's pure science fiction fantasy or a grounding in high-tech fact that floats your boat, there's a fine canon of films out there to draw on for inspiration in all things STEM. With summer blockbusters now hitting screens, we decided to look back at seven of our favourite examples of 'engineering on film' And the number one spot goes to fact-filled, hyper-real film, The Martian. Short of actually going to Mars to film it, the science and engineering it depicts couldn't feel more real-life. But, putting excitement and delusion aside for one moment, the film is firmly rooted in the real stuff.In short, it tells the story of American astronaut Mark Watney, played by Matt Damon, who becomes stranded on Mars in the year 2035 after his team assume him dead, and must rely on his engineering ingenuity and space know-how to find a way to survive and signal to Earth.

EYE ON IT

Current Industry Trends

Mechanical engineers over the next two decades will be called upon to develop technologies that foster a cleaner, healthier, safer and sustainable global environment. According to the ASME report, 2028 Vision for Mechanical Engineering, mechanical engineers will need to collaborate with partners worldwide in order to apply innovative solutions and best practices to improve quality of life for all people
Mechanical engineers can be at the forefront of developing new technology for environmental remediation, farming and food production, housing, transportation, safety, security, healthcare and water resources," says the report, which is based on the proceedings of The Global Summit on the Future of Mechanical Engineering, held April 16-18, 2008, Washington, D.C. The summit, hosted by ASME at the U.S. National Academy of Engineering, convened more than 120 engineering and science leaders from 19 countries for the purpose of defining the elements of a shared vision that will keep the profession at the forefront of grand challenges and great contributions over the next 20 years. The report said "As mechanical engineering looks to 2028, leaders will value people with diverse expertise and experience. They will bring this global profession together to keep the promise of technology serving people. They will inspire men and women everywhere to believe that grand challenges are a rally cry for a profession that is ready for the adventure of making the difficult doable."
The full report, 2028 Vision for Mechanical Engineering, is available online at http://www.asmeconferences.org/