Progress Report for SAE BAJA 2013
The team structure

**Drive Train**
- Pushkar
- Kartik
- Anish
- Prasad
- Sourabh
- Monali

**Professor Incharge:**
- Prof. K S Sangwan

**Team Captain:**
- Kartik N Sunku

**Suspension**
- Aman
- Shashank
- Darshan
- Achyuth
- Ronak
- Ankit

**Design**
- Mohit
- Alok
- Tarun

**Electronics**
- Anish
- Ronak

**Braking**
- Akhil
- Anantim
- Rohan

**Steering**
- Siddhartha
- Saket
- Rohit
- Sujit
Virtual BAJA

• Virtual BAJA is the design validation phase which also serves as an elimination criterion as the BAJA over the years has become fiercely competitive with the number of participants crossing the 200 mark.

• It was held in the Bangalore Institute of Technology on August 24th and with efficient theoretical knowledge and usage of analytical tools, our team made it through this stage and were one amongst 110 teams to do so.
Manufacturing process

• The process was multi fold. For efficient management of both time and resources, we divided the process into different stages.

1. Procuring all possible equipment
2. Roll cage manufacturing
3. Individual sub system work
4. Sub system assembly
Phase 1

• This involved 4 Delhi trips, 1 hissar trip and ordering chassis rods from a certified dealer in Mumbai.

• The Delhi and hissar trips were mostly for various sub system components and we managed to procure all the required components barring a few which we had to order from abroad.
Phase 2

• After the rods were successfully shipped from Rajshree Enterprises in Mumbai, we immediately started the roll cage manufacturing process. This meant, the workshop attendance peaked and work was cut out for each team member for cutting rods, profiling them and the welders had long days as well.

• The enthusiasm was heartening and we were also successful in teaching a couple of junior team members how to weld and that meant the knowledge transfer process was spot on as well.

• With all the design constraints and after carefully studying the revised rule book, we managed to complete the chassis by mid November after taking a 10 day break thanks to our mid semester examinations.
The final roll cage
Final Exam Break

• We took a break from 23rd of November as our exams began from 30th November. It wasn’t a complete sabbatical of sorts. Our knuckles were being manufactured in the BITS workshop as we wrote our exams.

• Also, we made use of this time to get the mold for our chassis done so as to successfully make our body panels later in the BITS museum workshop out of fiber glass.

• BAJA India will see its first team use fiber glass body panels and that too, custom made according to the shape requirements of the chassis.
Phase 3

• This phase is all about making the separate sub assemblies and this phase started right after our final exams got over.
• We have finished so far:
  a. Transmission mounts
  b. Pedal assembly
  c. 4 Wheel Steering Assembly – Sona Koyo sponsored this and since this was the first time we were going to use the 4 wheel steering assembly, it was manufactured in their workshop in Delhi while the design was made by our own steering team. Two professionals even came on campus to give us the final 4 wheel steering assembly and help with the installation. A massive thanks to Sona Koyo for all their support.
The 4-Wheel Steering System
Sona Koyo’s Visit to campus

They came on campus on 16th December, 2012 and helped us with the installation of the newly manufactured 4 wheel steering system.
d. Chain and Sprockets for coupling the engine and transmission: This again, was the first time we were going to be using a chain and sprocket drive and we got the sprockets manufactured by a materials engineer in Chandigarh after having a close look at all the available materials and the design was made by our powertrain team.

e. The tires have been bought and are wheel balanced as well. Two of them were bought newly from Polaris and two of them are being reused from the previous car. There is also one spare tire in good condition.

f. The suspension clamps are welded, FOX springs are on their way from America and the A-Arms will be manufactured by the 7th of January. FOX also gave us a discount of 150 dollars helping us out with our finances.
Sprockets and Tires
The wheel assembly is being done at a professional workshop at Hissar as of now. The knuckles/uprights were manufactured in our BITS workshop itself on conventional lathe and milling machines in order to save cost and time. Only the MIG welding and spline cutting has been outsourced to Hissar due to lack of expertise and equipment at the BITS workshop. The wheel assembly will be ready by 2\textsuperscript{nd} of January. According to the schedule, the car should be on wheels by mid January which gives us 25 days of testing time which is a remarkable improvement of timeline from the previous edition of BAJA.
Acknowledgements

1. A big thank you to the BITS83 group for helping us with this venture and we have been able to improvise on a lot of aspects thanks to the support you have extended and we are extremely grateful for that.

2. Thank you to Sona Koyo for providing their workshop facility to manufacture the 4 wheel steering for the first time ever.

3. Thank you to Kundan Lal and Sons for manufacturing our sprockets for no cost at all in an effort to help with student activity.

The car is shaping up well and the team extends a heartfelt thank you to everyone who have supported us so far.