

Annual SAE Report **(2018-2019)**

Redshift Racing India:

Name of the organization/chapter/project: Redshift Racing India
List of Members/Details of Committee- 2018-2019

Sr. No.	Name	Email Id	Position	Department	Year
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Photo of members/committee – 2018-2019



Redshift Racing India Team - 2018-19

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Details of events/activities held during academic year 2018-2019

Sr. No. of Event / Activity	Day/Date	Year	Month	Time	Venue	Description of Activity
1.	23-27 January	2019	January	--	Indore	Competition: BAJA SAE 2019 Participation in BAJA SAE 2018. The competition was held at Indore. National level competition with over 150 teams from INDIA .
2.	6 th June to 10th June	2019	June	--	Rochester, New York	Competition: BAJA SAE Rochester 2019. International competition with best 100 global teams competing at Rochester , New York, USA

Reports of event/activity

Sr. No. of Event / Activity	Day/Date	Year	Month	Time	Venue	Description of Activity
1.	25-28 January	2019	January	--	Indore	Competition: BAJA SAE 2019 Participation in BAJA SAE 2019. The competition was held at Indore.National level competition with over 150 teams from INDIA .

Details of participation in the event/activity

No of students / faculty	COMP	ETRX	EXTC	IT	MECH	Total no of participants
FY						30
SY						
TY						
LY						

Report of event/activity

Competition: BAJA SAE INDORE 2019

Overview

Redshift Racing India participated in the recently concluded BAJA SAE Indore 2018. The competition was held in Indore from 23-27th of January 2019. A total of thirty plus students contributed to the preparations for the competition, while twenty-five students went for the competition. The competition concluded with Racing India being the first team in Mumbai and several rankings up the chart .

The team participated in BAJA SAE INDIA held from 23rd January to 27th January 2019. It took place in NATRIP Ground, Indore.

Day1: Team cleared the technical inspection on its first attempt. along with the safety check and driver ergonomic clearance .

Day 2: Successful completion of Brake test and Acceleration Event (5.9sec) Two attempts of Rock Crawl were also made which were successful. In Statics event, Sales and Cost was presented

Day 3: Dynamic Events such as Maneuverability was completed first, later in the day Suspension and Traction Event was attempted but due to 3 roll-overs we did not finish the event. Simultaneously Design presentation was appreciably presented.

Day 4: It began with the Endurance Race and lining up of the car in its grid position. The first two hours of endurance marked with the completion of 9 laps of 5km each. Due to bearing failure the car was towed to the Pit Area wherein the entire hub and wheel assembly was changed and refuelling was done. This took us around 45mins. Later in the next 40 mins more 4 laps were completed. Due to collision of another ATV with our vehicle, the rear hitch plate pipe was damaged and since a damaged pipe is not

allowed the marshal instructed to bring the ATV to the pit to weld it again. This took us last remaining 35mins of endurance.

Conclusion

The competition was a very good learning experience. It allowed the team members to interact with industrial experts and members of the other teams. We got several design suggestions and the team I s now confident and prepared to present at the next competition –BAJA SAE Rochester .

Details of prizes/accolades

Sr. No.	Name of the student	Department	Details of prize won	Remarks
1	RedshiftRacing India Team - 2018-19	MECH	1. 28th place over all 2. 9th place engineering design report – combustion vehicle 3. 4th place Virtualpresentation . 4. 1st in Mumbai among 8 teams	

Sample Photographs of the Event/Activity



Sr. No. of Event / Activity	Day/Date	Year	Month	Time	Venue	Description of Activity
2	6 th June to 10 June	2019	June	--	Rochester ,New york	Competition: BAJA SAE Rochester 2019. International competition with best 100global teams competing at Rochester , New York, USA

Details of participation in the event/activity

No of students / faculty	COMP	ETRX	EXTC	IT	MECH	Total no of participants
FY						30
SY						
TY						
LY						
No of Faculty						

Report of event/activity

Competition: BAJA SAE Rochester 2019.

Overview

Redshift Racing India participated in the recently concluded **BAJA SAE Rochester 2019**. The competition was held at **Rochester ,New York ,USA**. Total of thirty plus students contributed to the preparations for the competition, while eleven students went for the competition. The competition concluded with Redshift Racing India being the best designed Indian cars in the event .

Competition (6th June to 10th June 2019)

Team RedShift Racing India participated in BAJA SAE ROCHESTER competition held in Rochester, New York from June 6-9 2019. The team was prepared to take on some of the best teams from across the world and prove its mettle at the highest level . On the first day of the competition, 6th June 2019, the team successfully completed the engine check. The governor setting, idle RPM and the maximum RPM of the Briggs & Stratton (B &S) 10 HP engine were checked & measured by the officials of the B & S. On the same day, Sales presentation was given by 3 members of the team wherein the wehad to convince the “executives” of a hypothetical manufacturing company to purchase the team’s vehicle design & put it in production at the rate of 4000 units per year. For the purpose of presentation, the team had to assume the judges of the event as a mixed group of corporate executives who may have experience in the field of marketing, production, finance as well as engineering. For this event, our team did a thorough market research and gained good knowledge about the production techniques and other aspects carried out in the industries. The following day was a hectic & crucial day for us. Cost event was scheduled at the start of the day. The cost event provided the team an opportunity to showcase the cost/benefit decisions used in the vehicle. Costing of manufacturing all the components used in the vehicle was calculated by carefully reviewing the whole process and considering factors like labour cost, tooling cost and machining cost. In the second half of that day, we got a chance to present our efforts that went into the design of the vehicle. Here we were evaluated on the creation of design specifications & the ability to meet those specifications. Computational Fluid Dynamics (CFD) of the Continuous Variable Transmission(CVT) was presented which helped us to score well in the event.Also, the vehicle was being prepared to go through the Technical Inspection(TI). Here the vehicle was going to be inspected to determine if it complies with the requirements & restrictions of BAJA SAE rules. But due to a clash of the timing of the Design event & the Technical inspection, we could not go through the inspection on the same day. Team faced certain difficulties in the self made brake calipers while conducting practice runs . Adding to our agony team’s brake members were not present as their visa was rejected . On the third day, our team was ready to go through the inspection but as there were more number of vehicles already ahead in the line, the inspection took place at the end of the first half of the day. The inspectors suggested us few

changes such as replacing of damaged fuel tank & covering up the gaps between rotating components for safety reasons. So, our team started to make changes as soon as possible. But as per the rules, all the teams had to get the vehicles inspected before the end of the day to take part in all dynamic events as well as the endurance race. But due to lack of power tools and other machinery, the execution of the changes took a longer time than expected. Hence our team could not pass the inspection as the day had ended. During this event the hosting team ie. team of Rochester Institute of technology along with other teams helped us in the best possible ways. The team of New Jersey Institute of Technology(NJIT) invited us to visit their workshop. So on our return journey to India, we halted in New Jersey and visited NJIT, where we discussed trends in automobiles and design improvisations for next vehicle. Also, we got a chance to visit a place called “Maker’s Space” in their campus. Here, all the advanced manufacturing machines such as Metal 3D printer, wire EDM etc. were kept.

Conclusion

The competition was a very good learning experience. It allowed the team members to interact with industrial experts and members of the other international teams. We got several design suggestions for our car and learnt a lot of things regarding the sustainability and efficiency of the vehicle. The Event definitely traced an upward curve on our learning graph as we interacted with some top performing teams such as Aztec Baja and Michigan Baja Racing on our shortcomings. This will surely help us in our future endeavours .

Sample Photographs of the Event/Activity



Team Onyx India:

Name of the organization/chapter/project: Team Onyx India

List of Members/Details of Committee- 2018-2019

Sr. No.	Name of the Faculty advisor/ in-charge	Department	Portfolio
1	Professor Prashant Jain	Mechanical	Adviser

Sr No.	Name	Branch	Portfolio
1	ParthGabani	Mechanical	Captain and Aerodynamics Head
2	Vishal Thakkar	Mechanical	Marketing Head
3	AdhirajPimpalkar	Mechanical	Manufacturing Head
4	BurhannudinBhavnagarwala	Mechanical	Structural Head
5	MayurNandu	EXTC	Propulsion Head
6	AkshayBhanushali	EXTC	Propulsion
7	Raj Mandal	Mechanical	Joint Marketing Head
8	Arpit Shah	Mechanical	Joint Aerodynamics Head
9	Nadeem Noor Mohammed	Mechanical	Inventory Manager
10	SaurabhShetake	Mechanical	Structural
11	NiravDangi	Mechanical	Structural
12	MohitKawa	Mechanical	Manufacturing
13	Rishi Savla	Mechanical	Manufacturing
14	Aryan Gandhi	Mechanical	Manufacturing
15	ArnabLahiri	Mechanical	PR
16	AryaBafna	ETRX	Propulsion
17	Harmanjeet Singh Bilkhu	ETRX	Propulsion
18	PoonamChawda	ETRX	Propulsion
19	VidyaMakwana	Computer	Web Development

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Photo of members/committee – 2018-2019



Details of SAE events/activities held during academic year 2018-2019

Sr. No. of Event / Activity	Day/Date	Year	Month	Time	Venue	Description of Activity
1	8 th - 10 th March	2019	March	--	Fort Worth, Dallas	SAE Aero Design East: Participation at SAE Aero-Design East held at Fort Worth, Dallas, Texas

Details of participation in the event/activity
(Fill wherever is applicable or information is available. At least total need to fill)

Report of event/activity

Competition: SAE Aero-Design East

Overview

Team Onyx India participated in the recently concluded SAE Aero Design East 2019. This exercise allows students to apply knowledge gained in the classroom in a real work environment. To help develop the students' written and oral communication skills, a sizable percentage of each team's score is devoted to the design report and oral presentation required in the competition. A total of eighteen students contributed to the preparations for the competition, while five students went for the competition. We also took our Team Pilot and Alumni Mr. SohrabMistri (Faculty at IIT Bombay) at the competition along with two other participating teams from Mumbai i.e., DJSCE & MPSTME,

Preparations

We had started preparing for the competition in the month of September working upon the design flaws and scope for further improvements. We had faced an issue with the landing gears mechanisms, structural aspects of wing and effective mechanisms for the control surfaces of the aircraft. Hence these systems needed to be made more reliable. We took a major decision of updating the design of the fuselage to accommodate new payload volume of tennis balls and payload plates for the international competition. We also focused on reducing the empty weight of the aircraft to increase the payload weight to achieve maximum during the flight rounds. This was done exploring new materials that had high strength to weight ratios.

We also did a major focus on the aerodynamic sizing of control surfaces for the pilot to sustain and handle the aircraft in extreme windy conditions. This was ensured by designing large control surface areas for ailerons and rudder to withstand heavy crosswinds at the competition site and also taking maximum test flights here with the pilot.

Two prototype aircrafts were fabricated to test certain aerodynamic and structural changes and the first test flight of the prototype was performed in the first week of December. During the test

flights, the nose steering landing gear tend to bend at extreme dynamic conditions and hence the design was changed. The second prototype was built with further scope of reduction in empty weight and was tested in the last week of December. The aircraft was tested at with incremental increase in payload weight and crashed at maximum takeoff weight of 21 kg, i.e. at the maximum design point. Hence, the team finalized to lift 20 kg for avoiding any risks at the competition.

Hence, the design was finalized, and two aircrafts were built for the competition with all necessary documents and packing. We departed for the competition on 5th of March with the aircraft boxes and necessary tools & equipment with us.

Competition

Day 1: Technical Inspection and Technical Presentation

Day 1 of the competition began with the lineup for the Technical Inspection. The team reached on time and we were among the first teams to be ready for the inspection. We faced a rule issue attempt but managed to clear the inspection in the first attempt and later moved forward for the Technical Presentation Round. We finished the presentation well within the allotted time and the judges responded with a positive feedback. We were also commended as the best 'Project Management Plan' by the judges and officials. We stood 13th Overall in the Technical Presentation round.

Day 2: Flight Rounds

The following day was hit by a thunderstorm followed by heavy rains, this caused severe delay in the flight rounds. They were supposed to start at 8am but because of heavy cross winds they started at 9am. All the flight tests of the teams had resulted in crashes in round 1 because of the gusty cross winds. Many teams decided to pass round 1. We decided to attempt the flight round with the lesser weight but unfortunately the aircraft could not handle the gusty winds and ended up as a failed flight. We were prepared for a failed flight as we had carried a spare aircraft which gave us a liberty of taking high risk. Very few teams had fabricated a spare aircraft and they ended up not taking flights hence receiving a heavy penalty.

Day 3: Flight Rounds and Award Presentation

At Day 3 flight rounds continued and this time with good weather conditions. We were able to perform a flight with moderate weight, hence having successful flight rounds. As the day went on, other universities from around world took test flights and we started to talk to with students from other universities to gain further insight and gain knowledge in many sectors which will enable us to perform even better the next time around. In the evening, the award ceremony underwent and awards pertaining to different categories in different classes were presented to the winning teams. The competition was hence concluded as the ceremony ended with the organization of SAE thanking everyone for participating.

Conclusion

The competition was a very good learning experience. It allowed the team members to interact with industrial experts and members of the other teams. We got great positive design feed-backs from the judges and the team is now confident and prepared to present at the next competition – SAE Aero Design West 2020, Lakeland, Florida US where we will be targeting to compete with the best universities in the world.

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Details of prizes (wherever applicable fill all the entries)

Sr. No.	Name of the student	Department	Details of prize won	Remarks
1	Team Onyx India 2018-2019	MECH	--	

Sample Photographs of the Event/Activity

