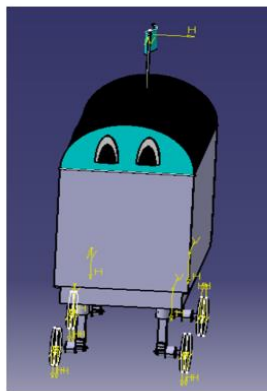


장애물을 피하는 배달로봇



Team 로봇 배달부 딜리
2012012071 김민식
2016031767 이승현

목차

- 1. 주제선정이유, 팀 명 선정 이유
- 2. 역할 분담
- 3. 프로젝트 참고 자료
- 4. Part Design & Assembly Design
- 5. DMU Kinematics
- 6. 어려웠던 점 & 한계
- 7. 시뮬레이션 영상

1. 주제 선정 이유, 팀 명 선정 이유

• 주제 선정 이유

- 코로나로 인해 1인 배달이 증가하여 많은 오토바이가 다니는 것을 보고 보행자의 안전을 위해 배달 로봇이 배달을 하면 더욱 안전한 보행 환경을 만들 수 있을 것이라 생각해 제작하게 되었다.

• 팀 명 선정 이유

- '배달부' 라는 단어가 집배원이 우편물을 배달해준다는 친근한 느낌을 주어서 음식을 배달 받을 때에도 그런 느낌을 주고 싶은 마음을 담아 짓게 되었습니다.

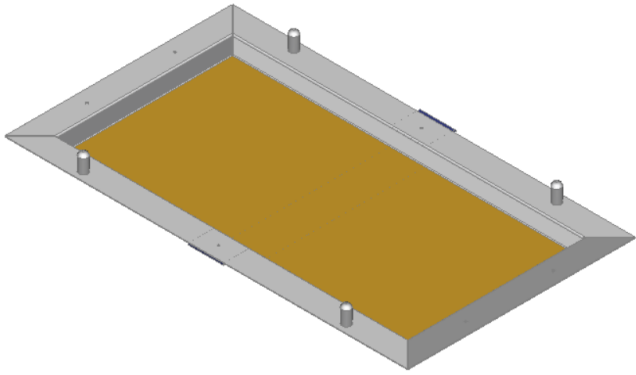
2. 역할 분담

- 2012012071 김민식
 - 배달 로봇의 상부에 들어가는 Lift 부품을 제작하여 Lift Assembly Design 제작
- 2016031767 이승현
 - Part Design : 로봇의 하부에 들어가는 바퀴, 유압 실린더, 모터, 제작하여 Assembly Design 제작
- 나머지 프레임(몸통, 위에 달려 있는 문) 같이 제작하여 총 Assembly Design 마무리



3. 프로젝트 참고 자료

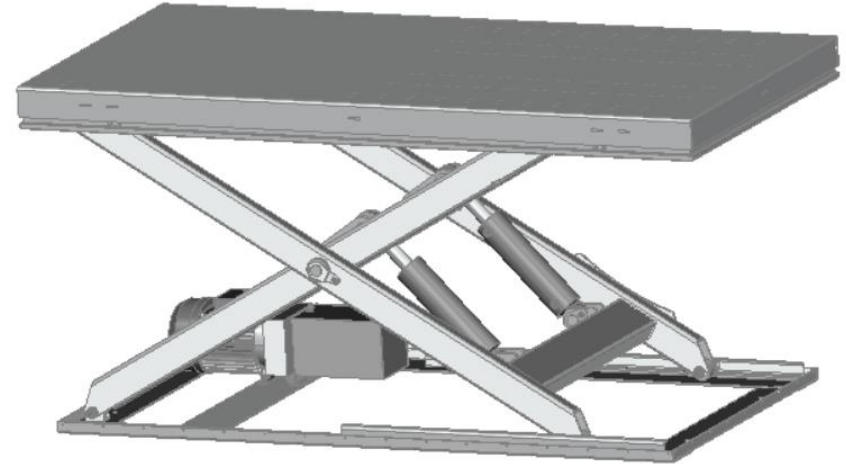
- Grab Cad 등의 3D 모델링 참고사이트에서 도면을 참고



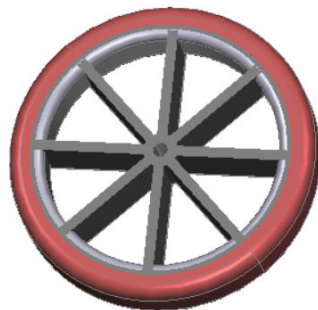
밑 판



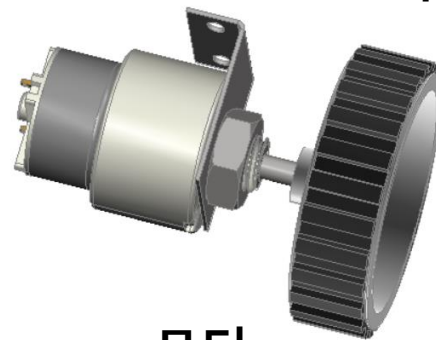
유압 실린더



리프트



바퀴



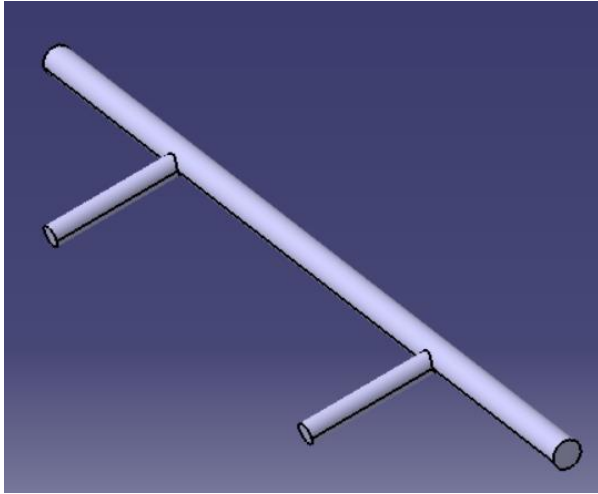
모터

3. 프로젝트 참고 자료

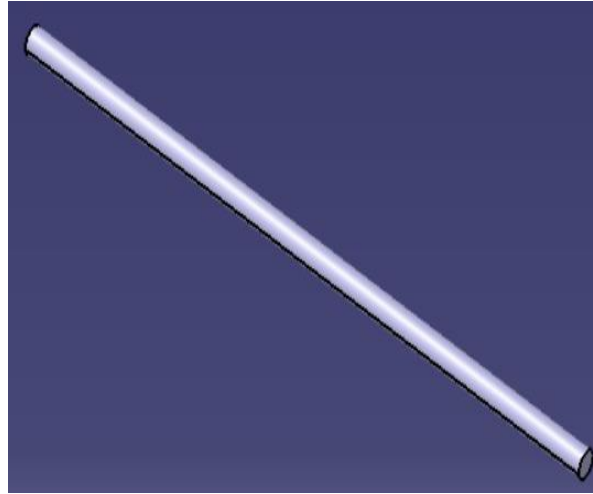
- 배달 로봇 'Dilly'의 도안이 나와있는 것이 없어 외관을 최대한 참고하여 제작



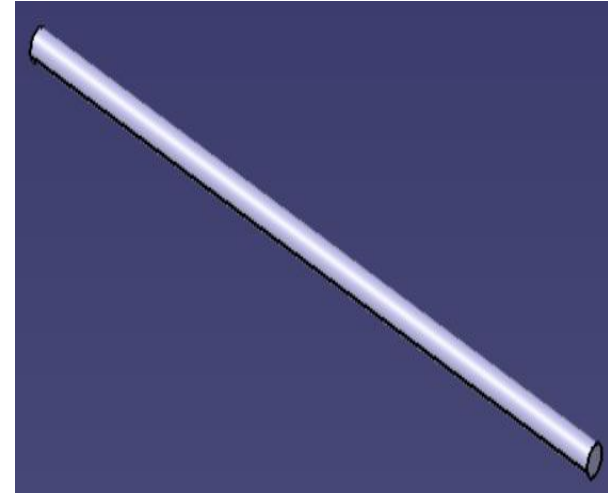
4. Part Design -> Lift



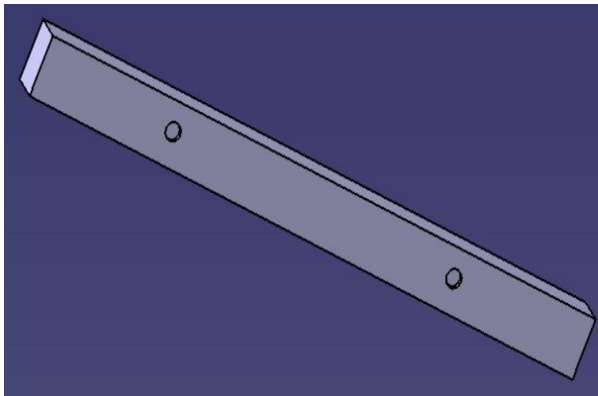
앞쪽 축



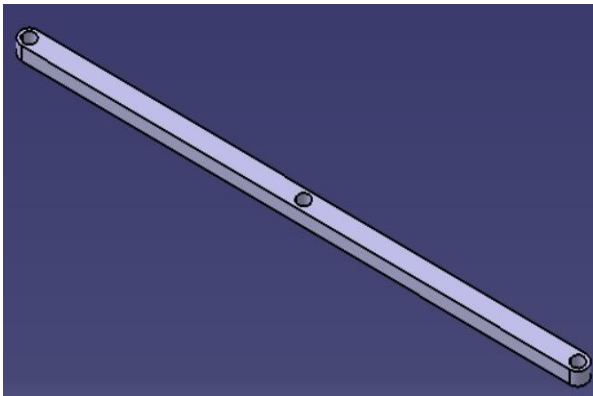
중간 축



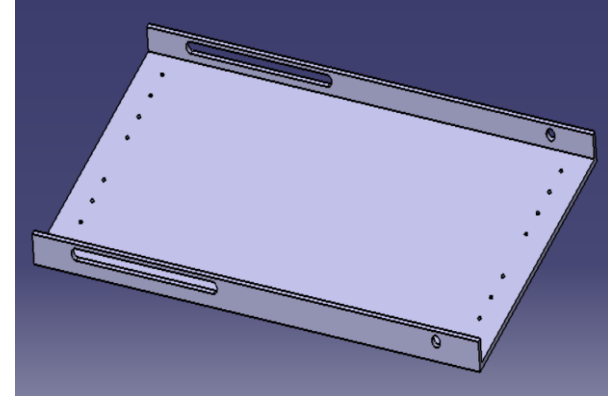
뒤쪽 축



앞쪽 축 연결 부

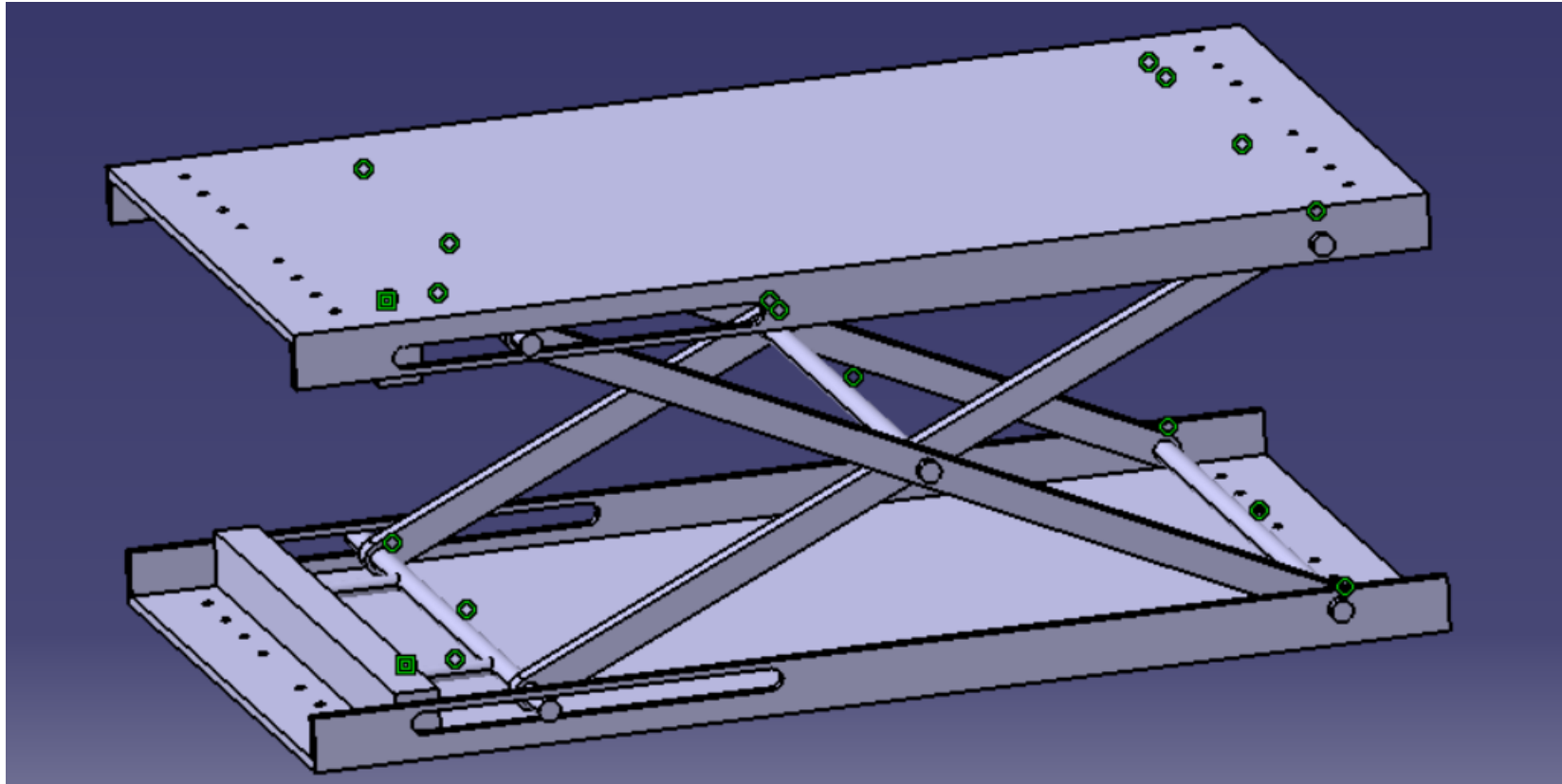


X 자 부분 링크



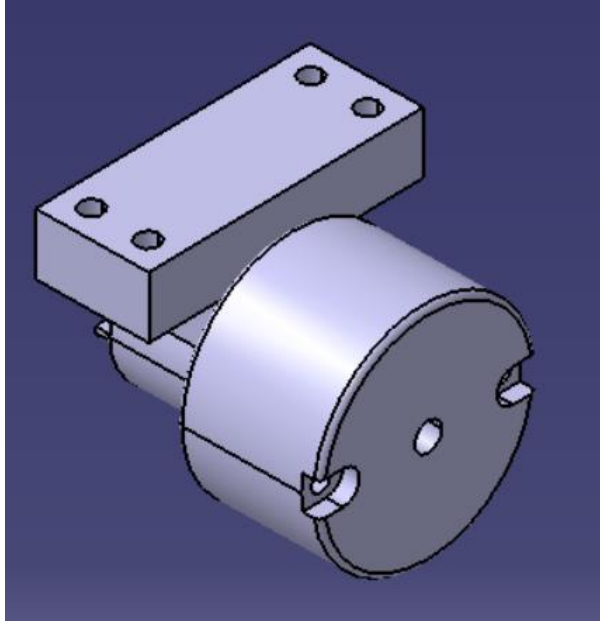
위, 아래 판

5. Assembly Design -> Lift

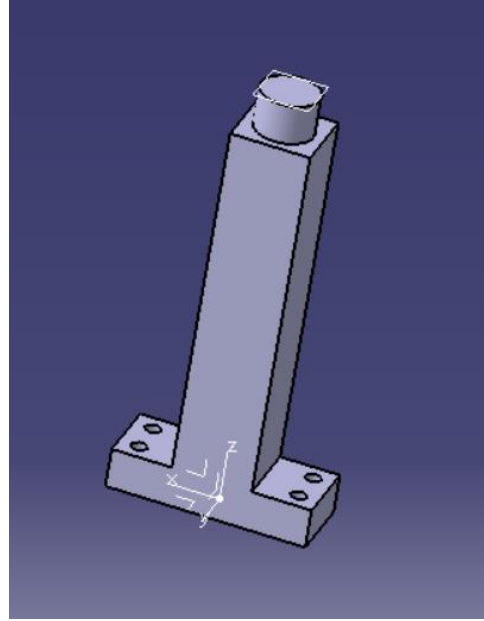


Lift Assembly Design

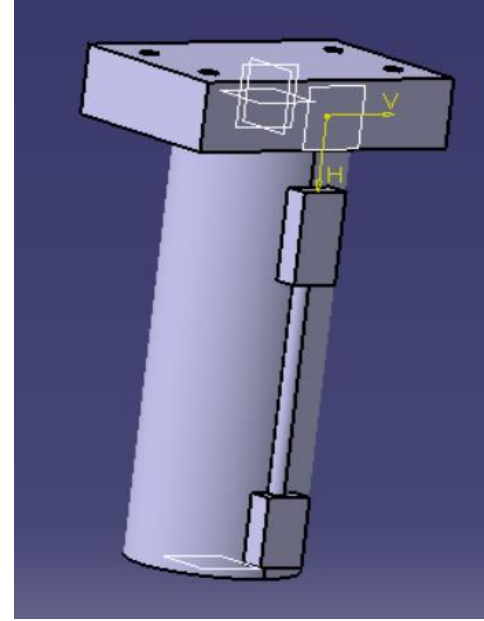
4. Part Design -> Motor, Hydraulic cylinder, Wheel



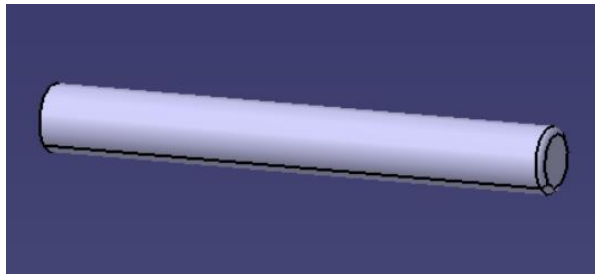
모터



유압 실린더 아랫부분과 윗부분



타이어와 타이어 휠



모터 축



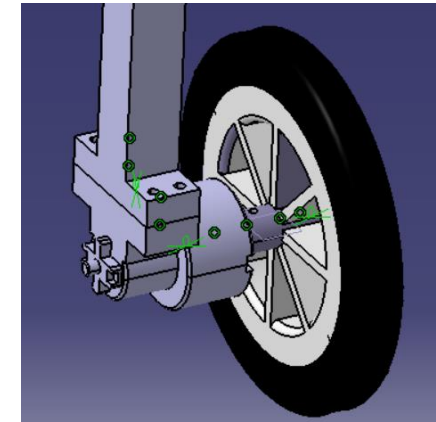
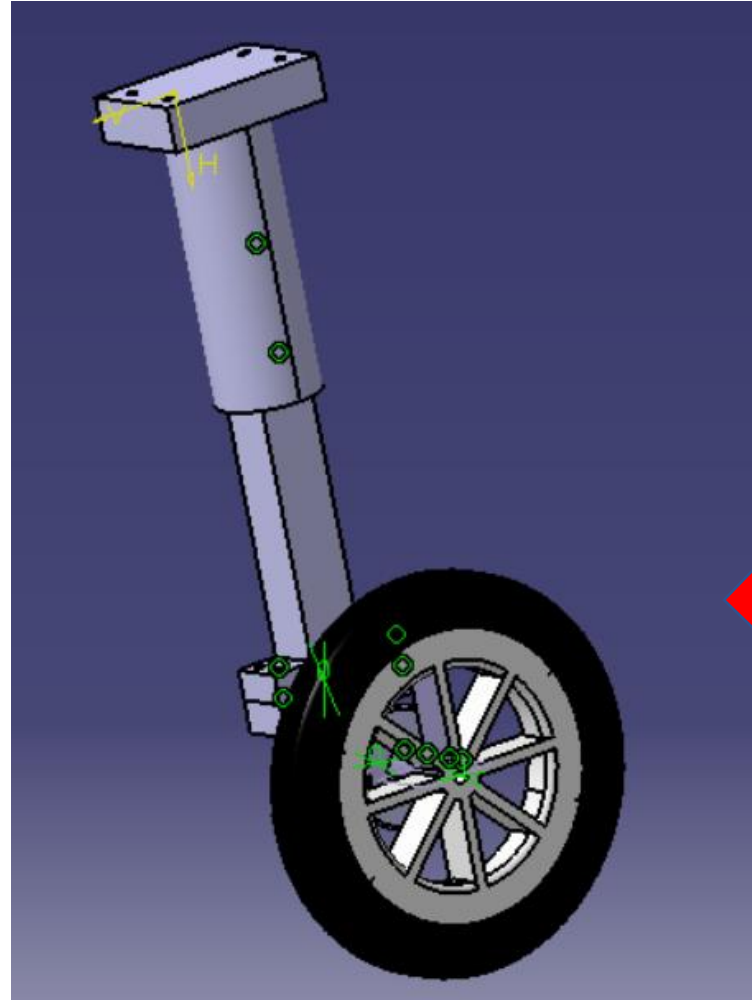
3mm 너트



볼트

5. Assembly Design -> Motor, Hydraulic cylinder

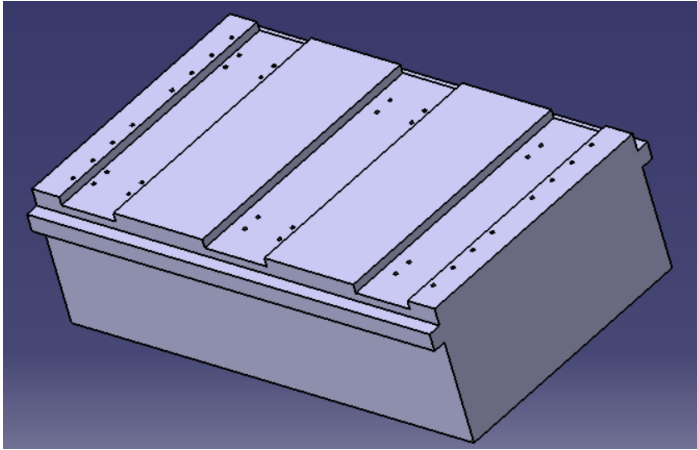
Hydraulic Cylinder



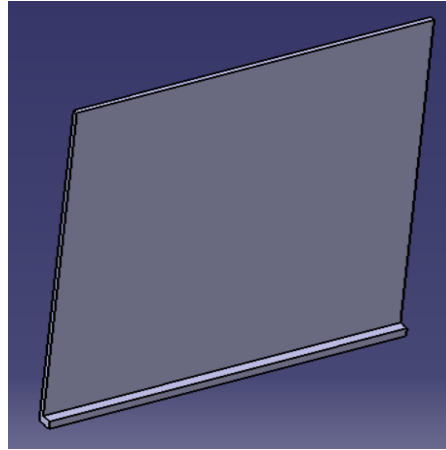
뒷면

Tire and Motor

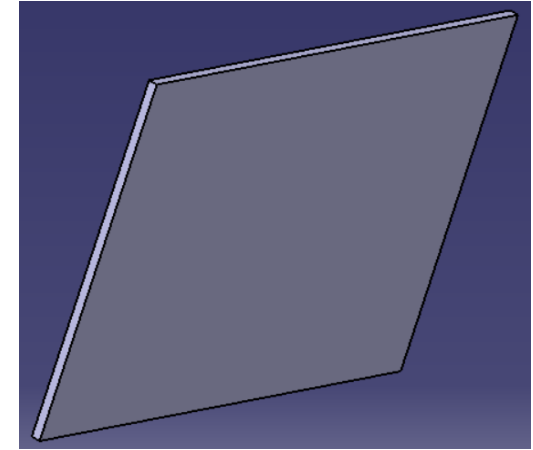
4. Part Design -> Body, Upper Door



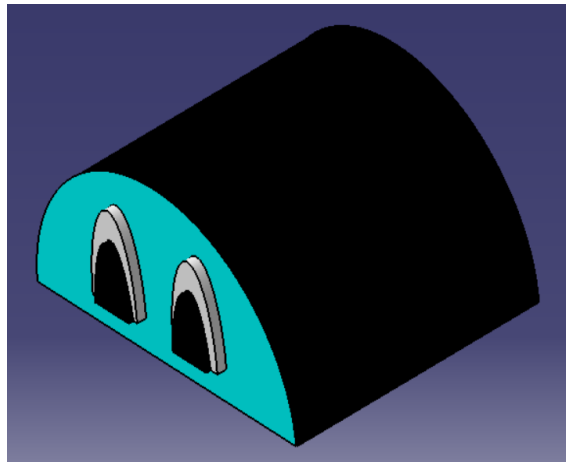
밀 판



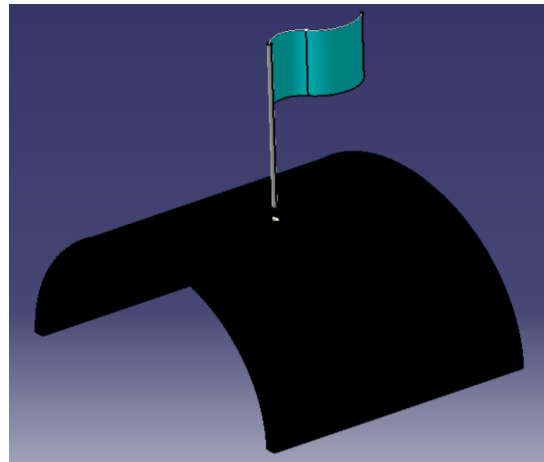
몸체의 앞, 뒤 판



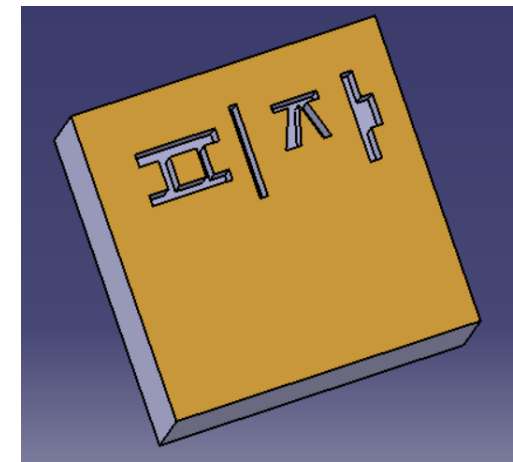
몸체의 좌, 우 판



왼쪽 문



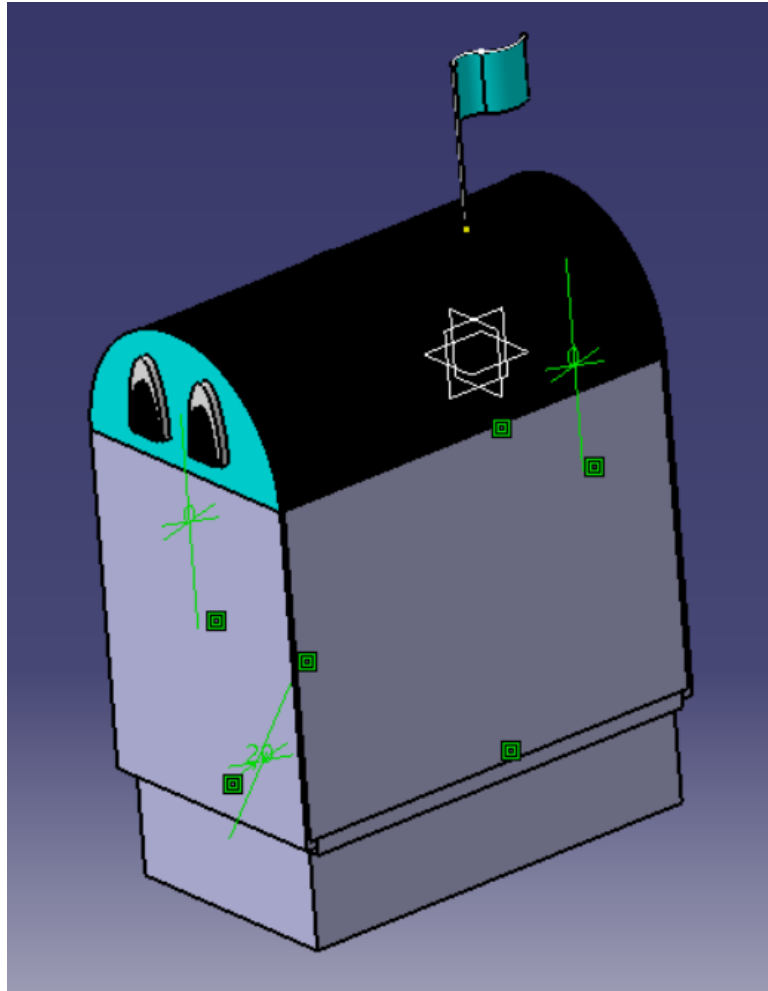
오른쪽 문



배달 품

5. Assembly Design -> Body, Upper Door

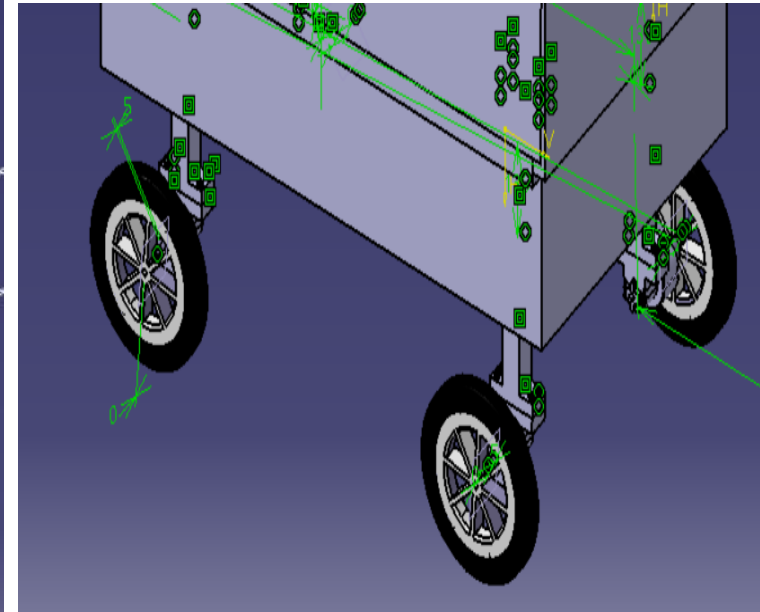
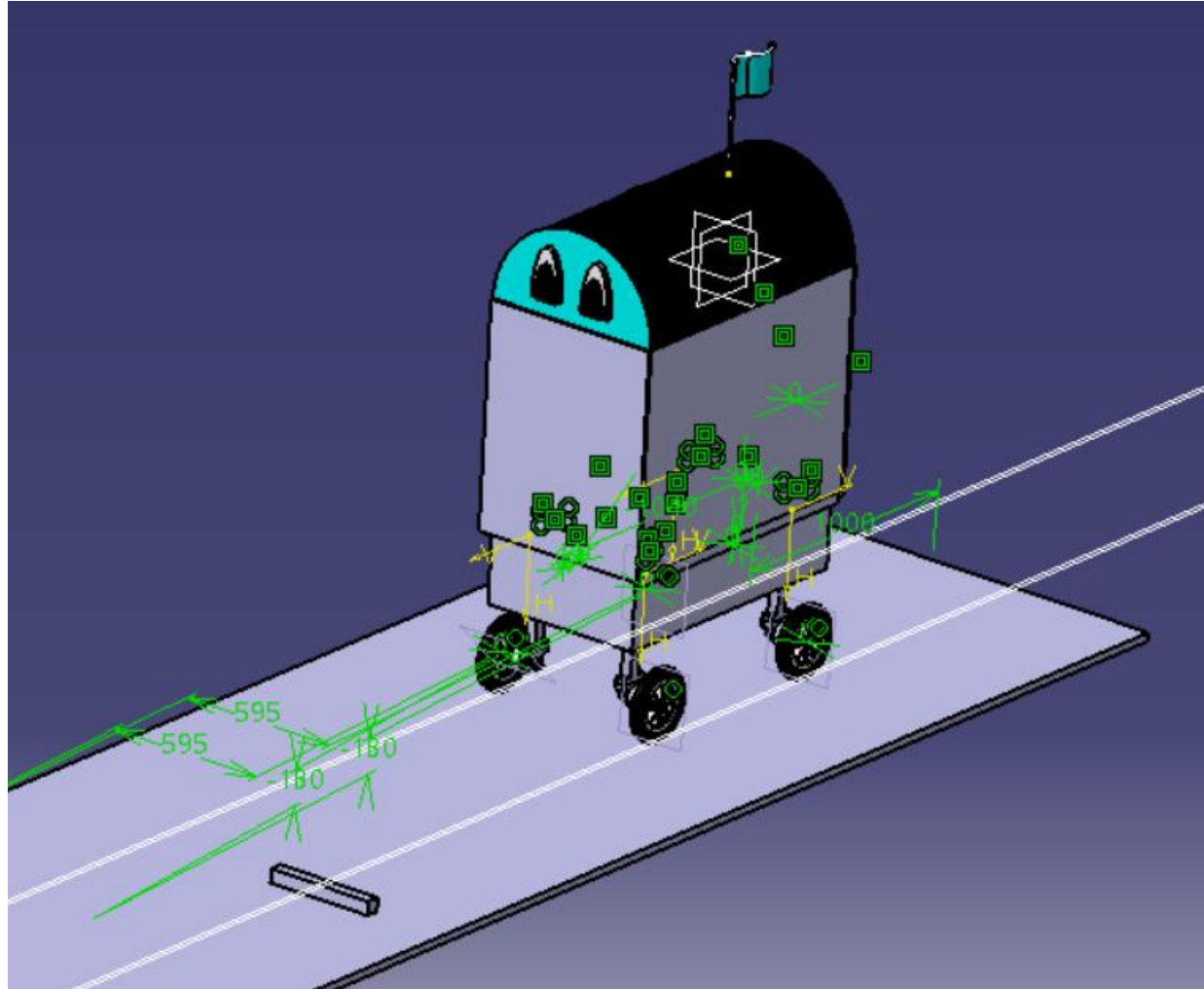
Upper Door



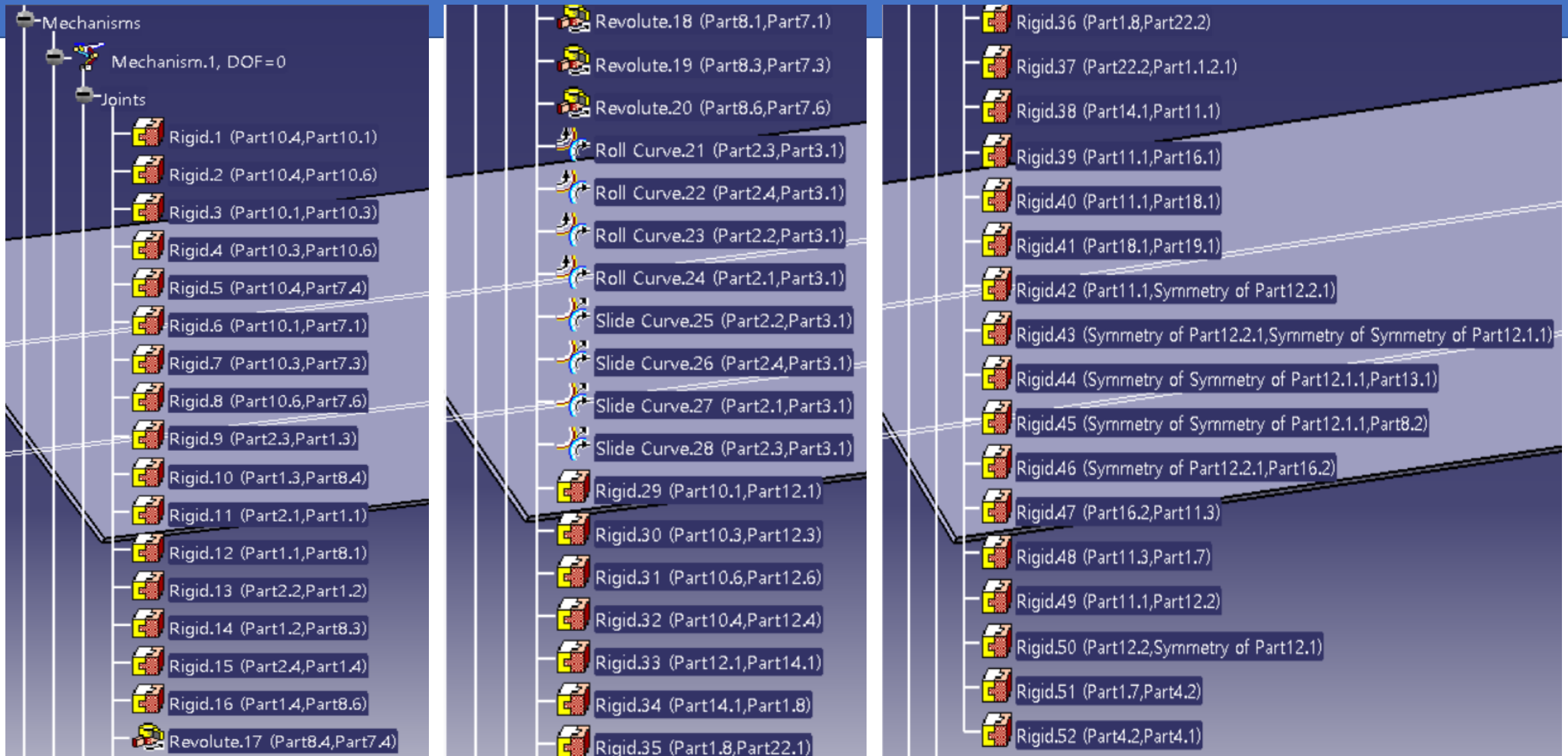
Body Assembly

5. Total Assembly Design

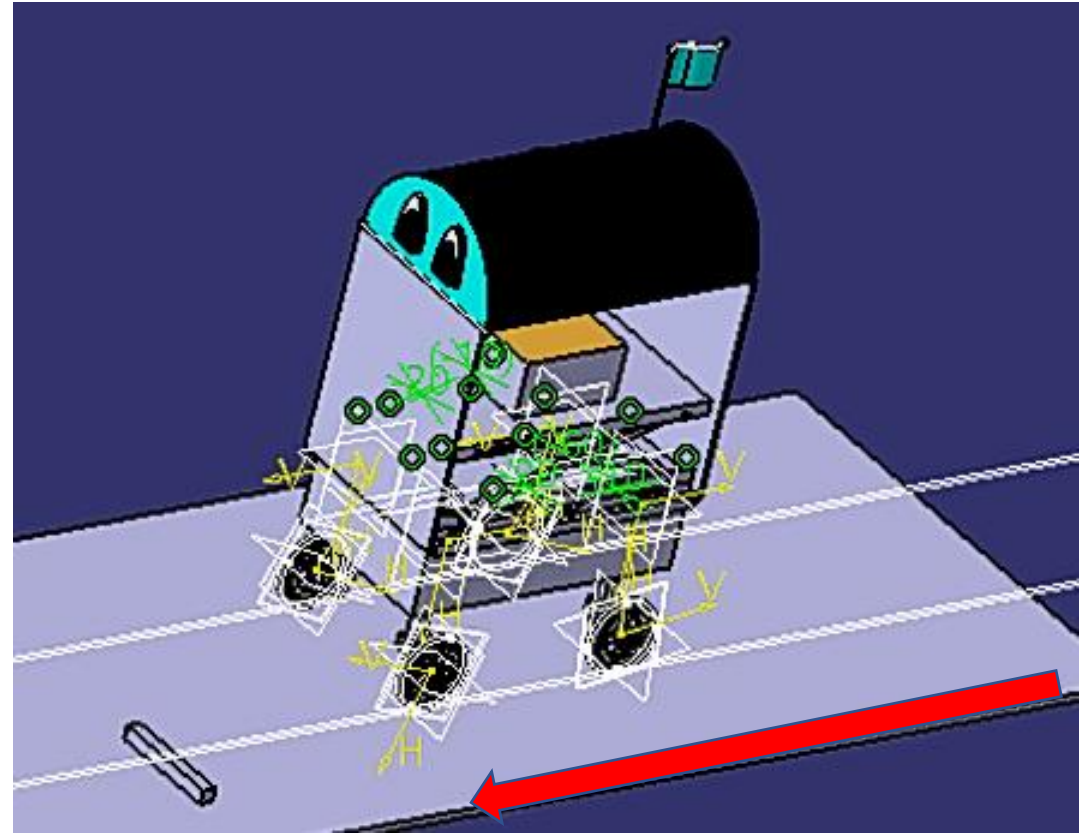
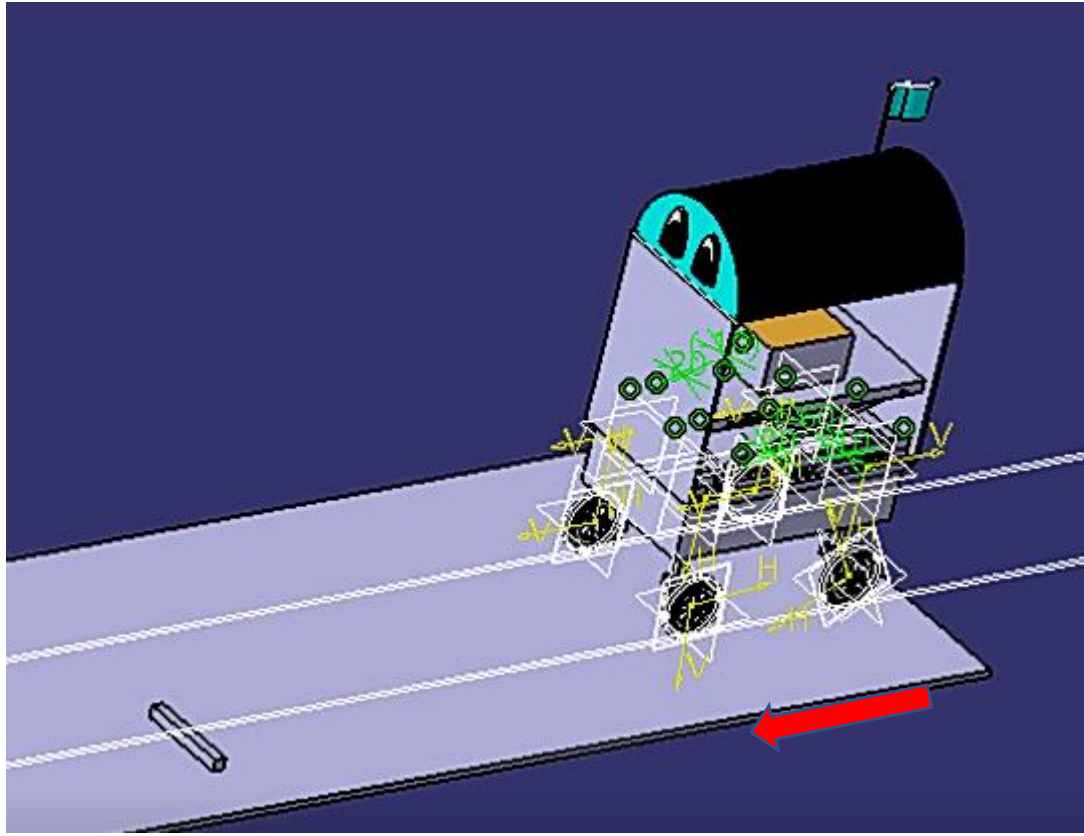
Road with obstacle



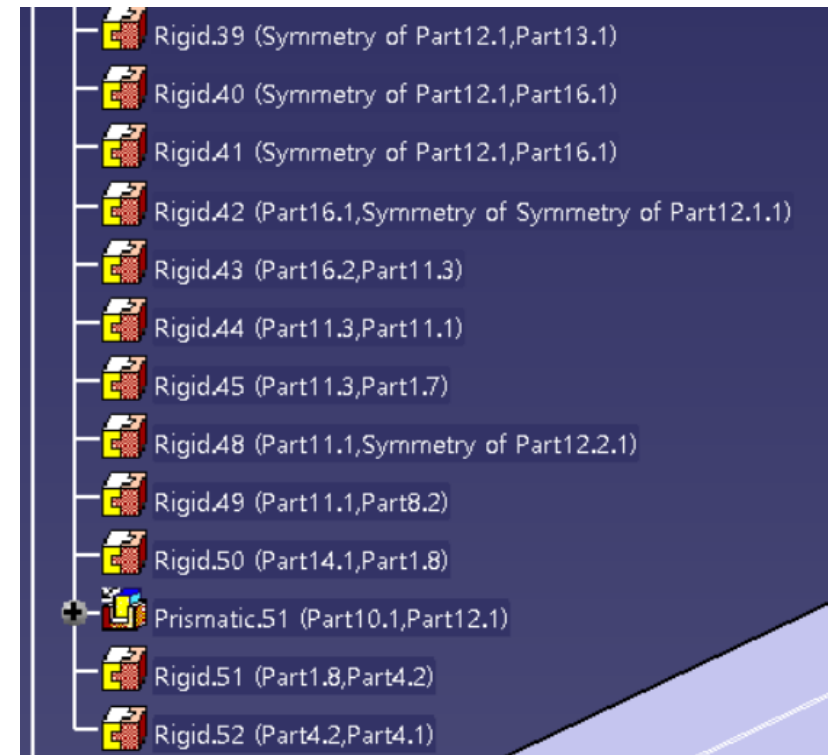
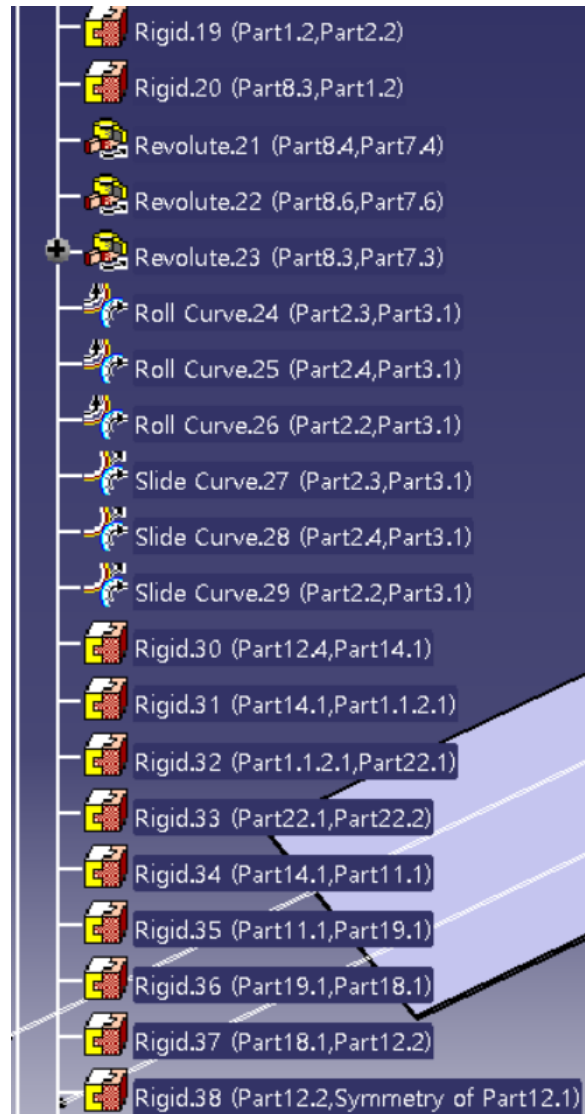
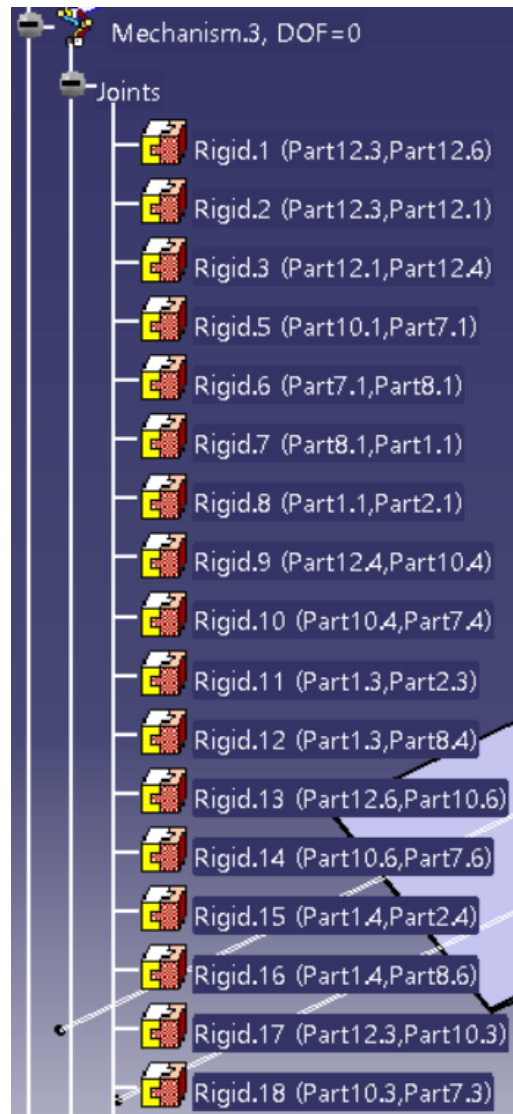
6. DMU Kinematics -> 직진



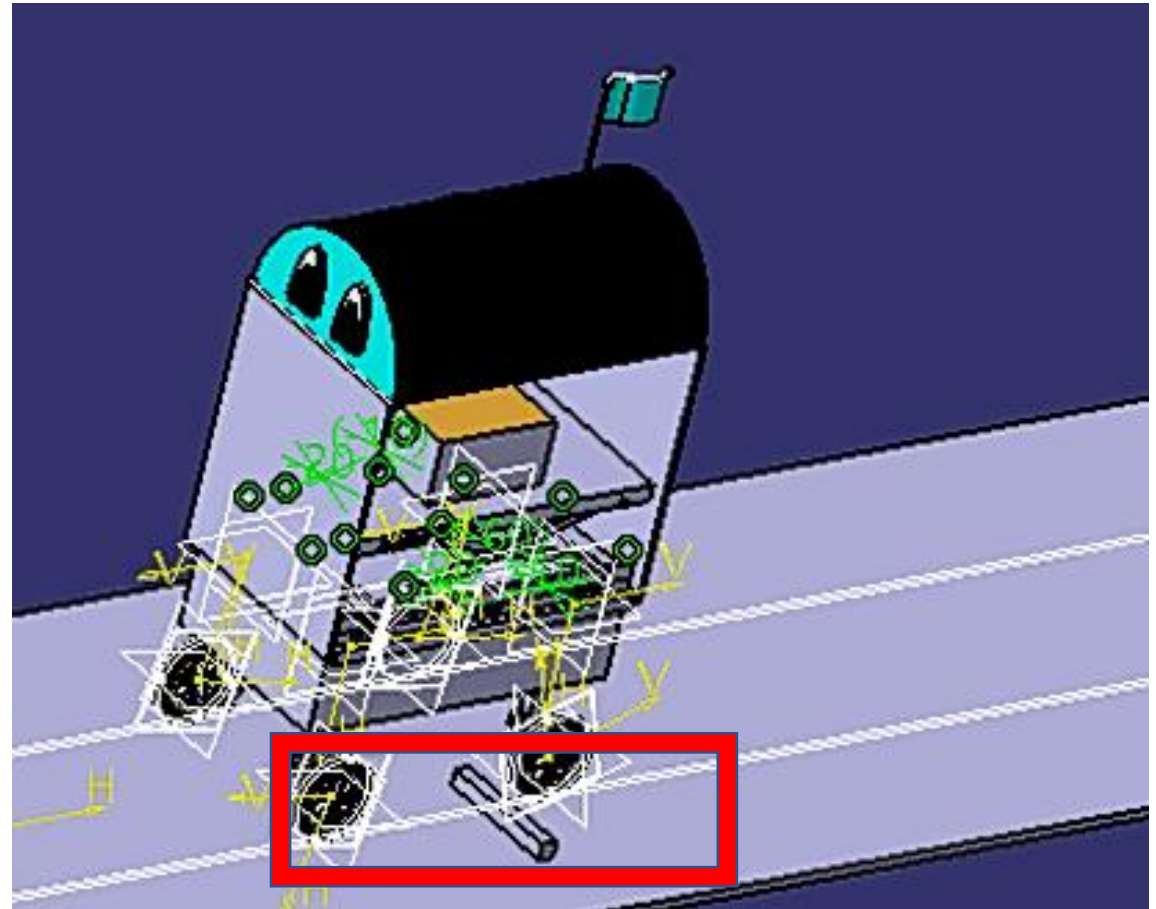
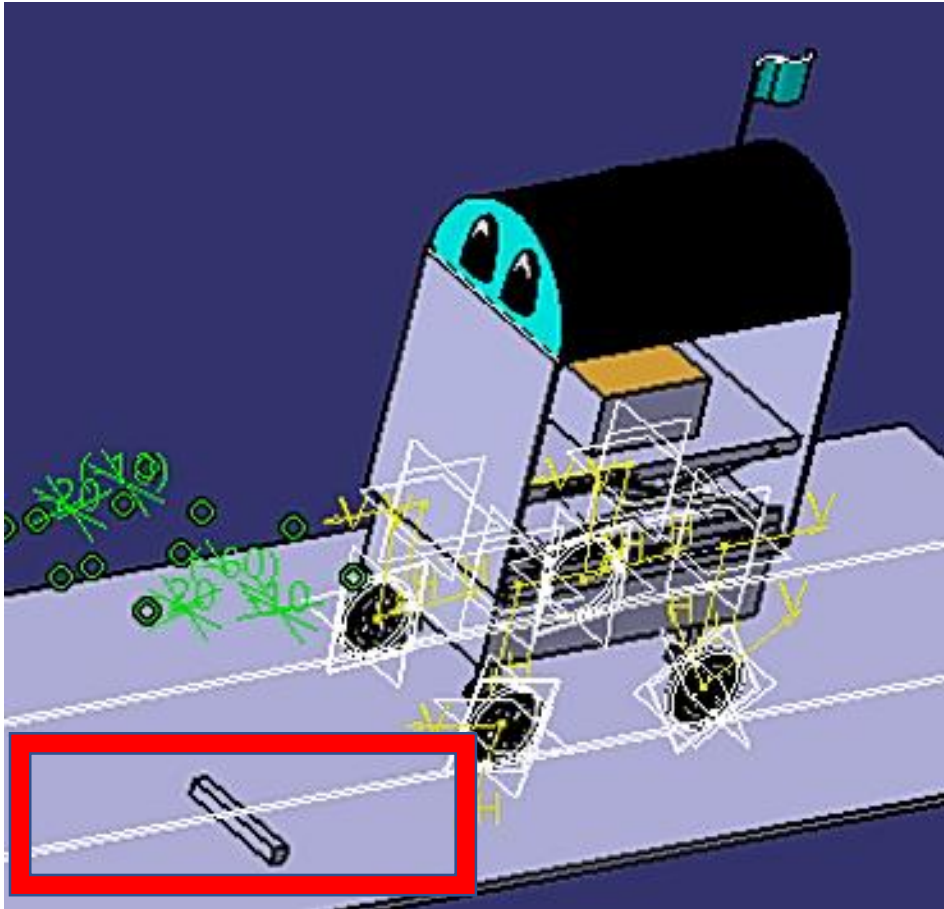
6. DMU Kinematics -> 직진



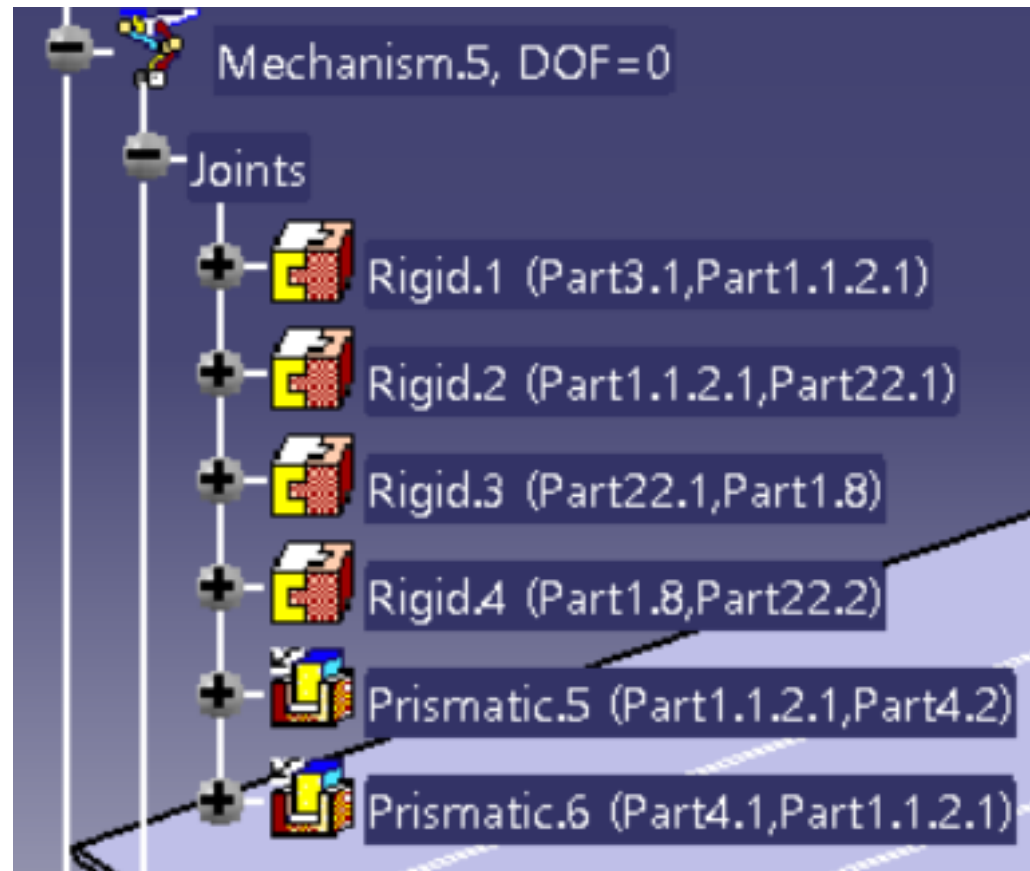
6. DMU Kinematics -> 장애물 피하기



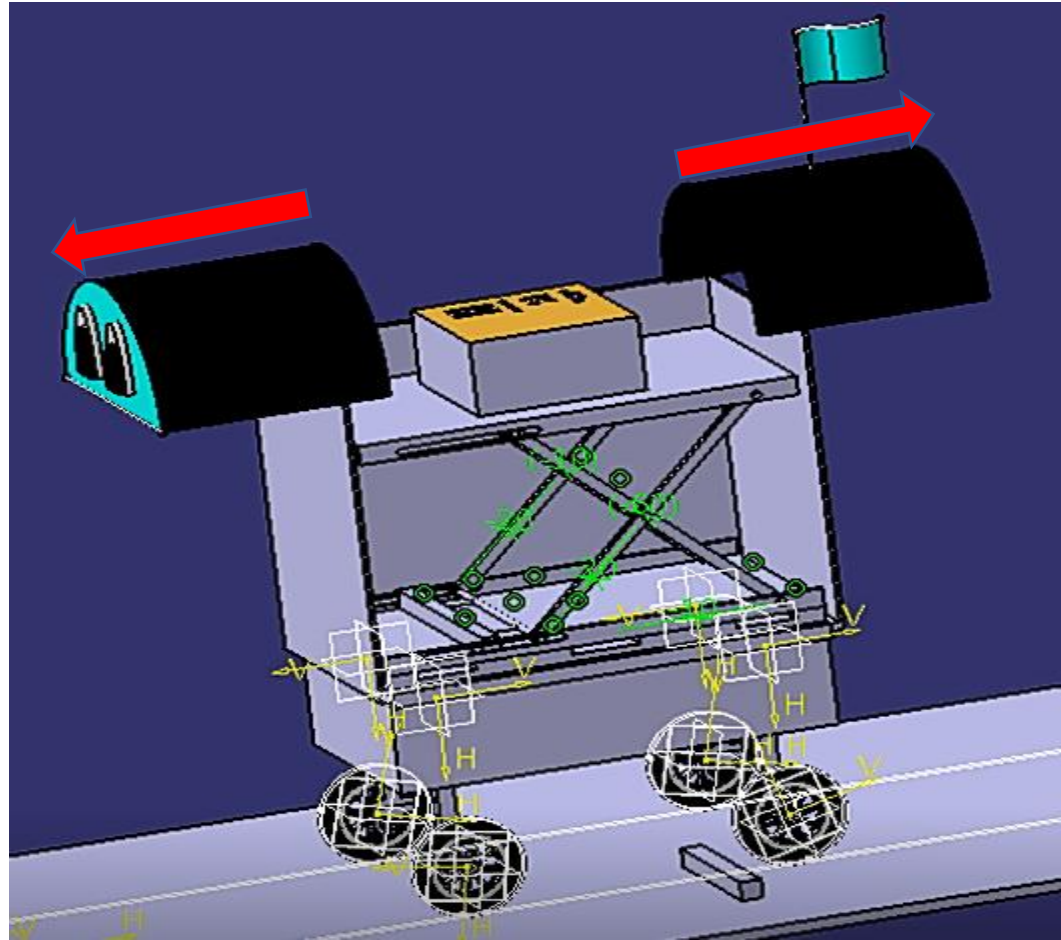
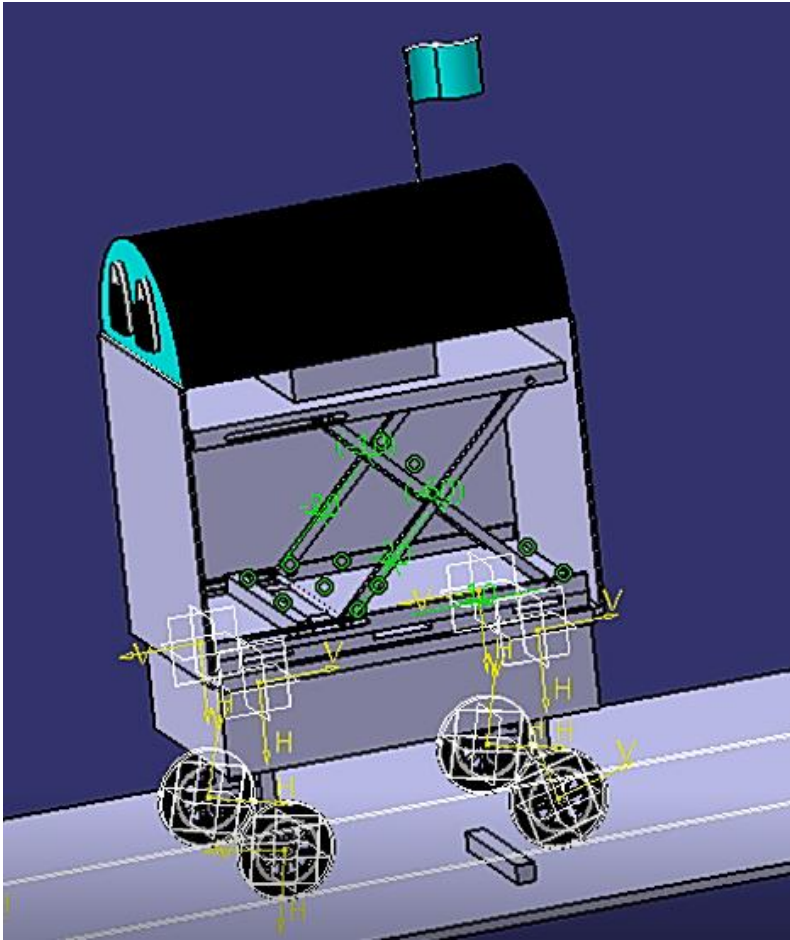
6. DMU Kinematics -> 장애물 피하기



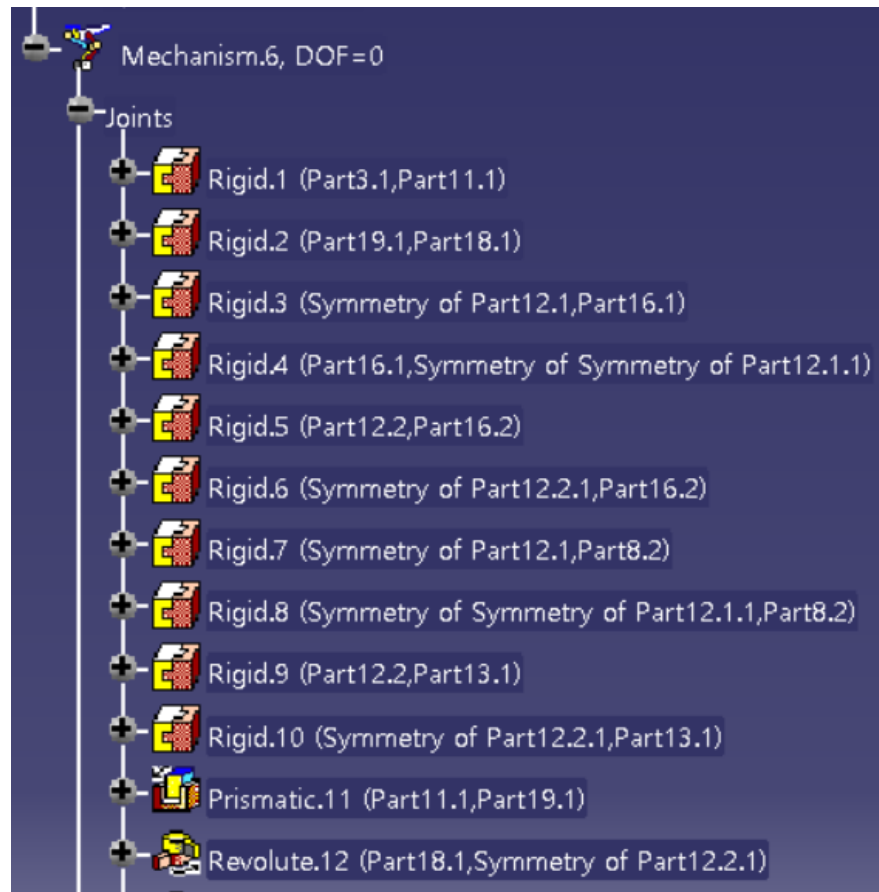
6. DMU Kinematics -> Upper door 작동



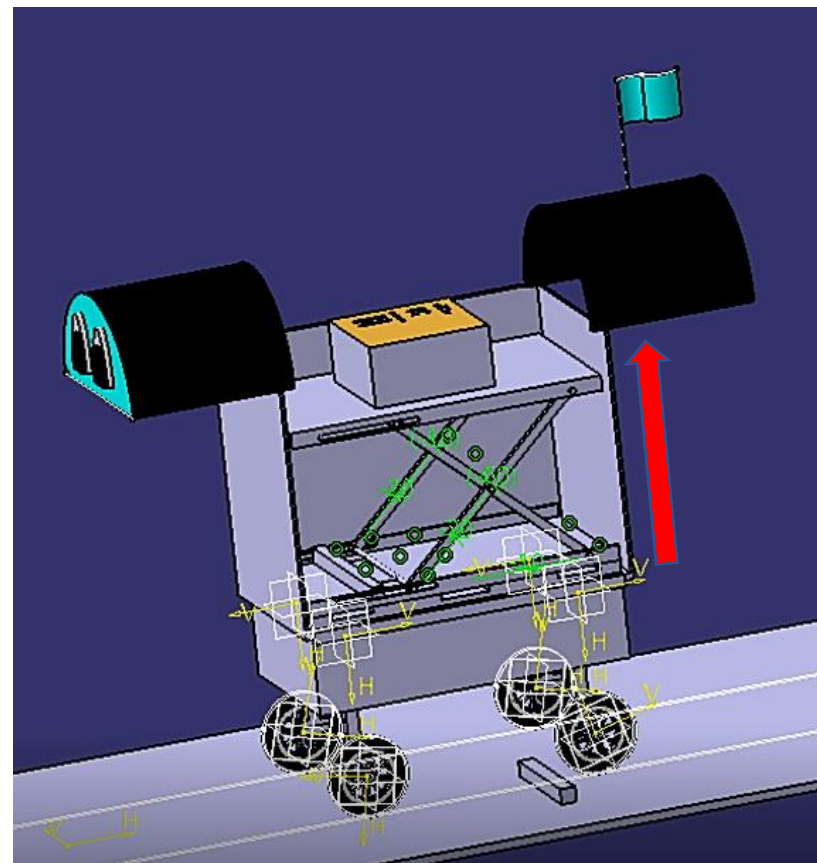
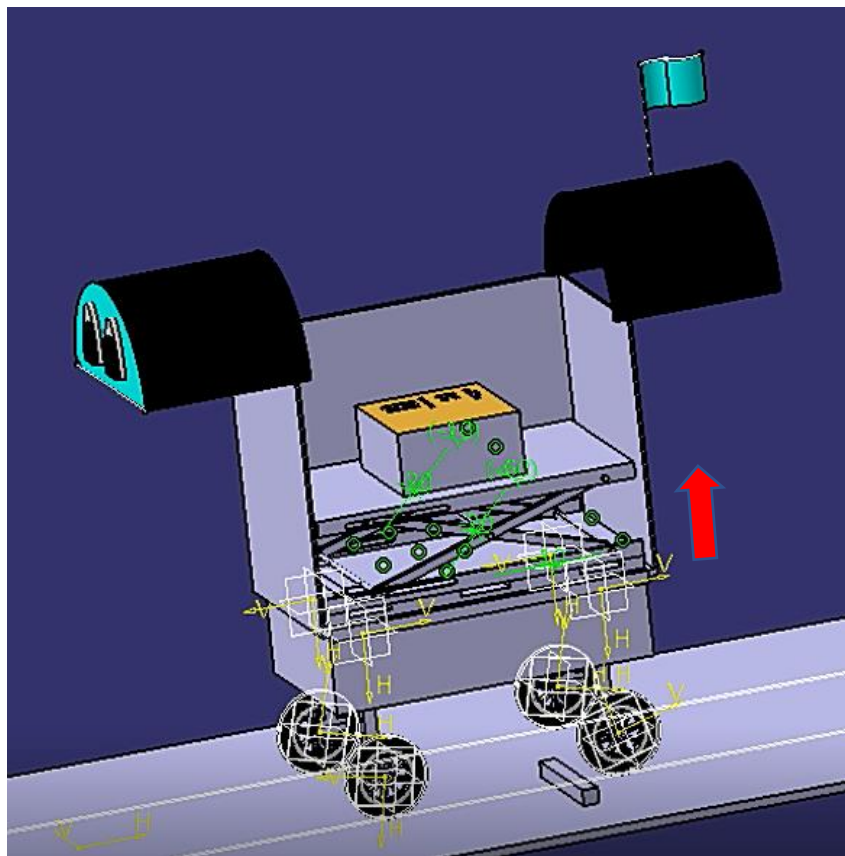
6. DMU Kinematics -> Upper door 작동



6. DMU Kinematics -> Lift 작동

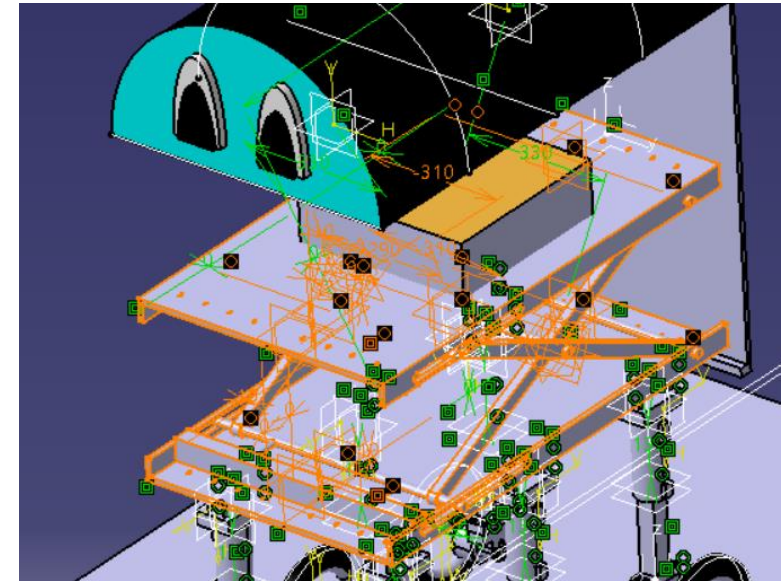
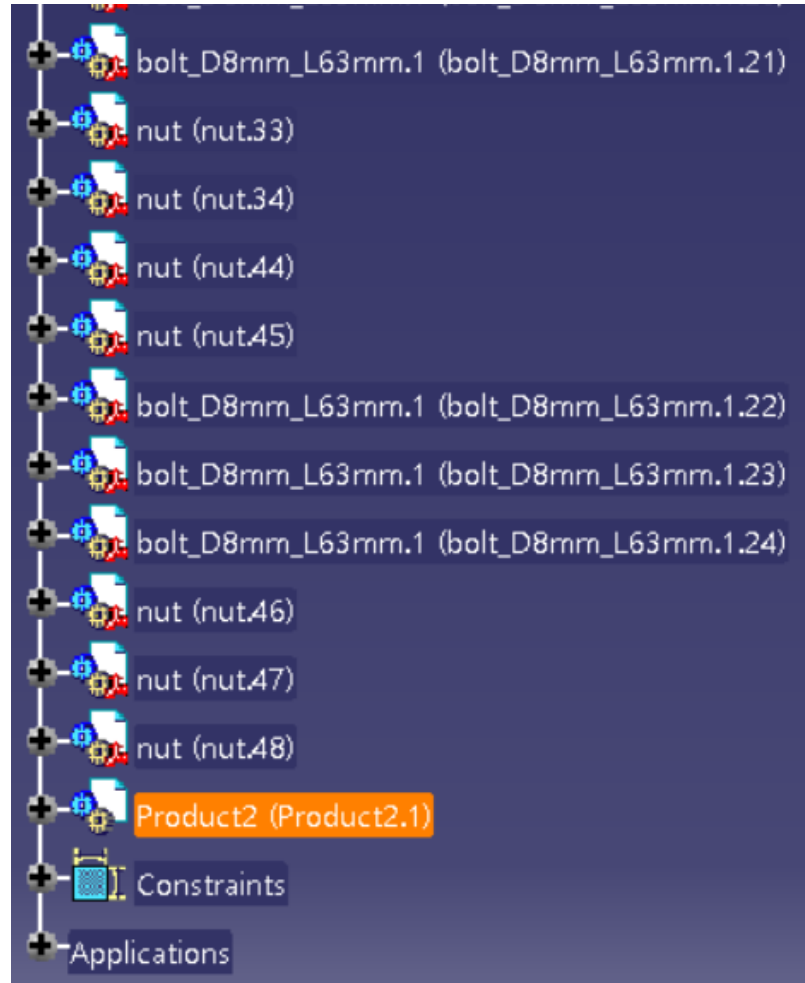


6. DMU Kinematics -> Lift 작동



7. 어려웠던 점 & 한계

- 1) Assembly 파일을 불러올 때, Lift가 따로 움직이지 않아 다시 constraint를 주어야했다.



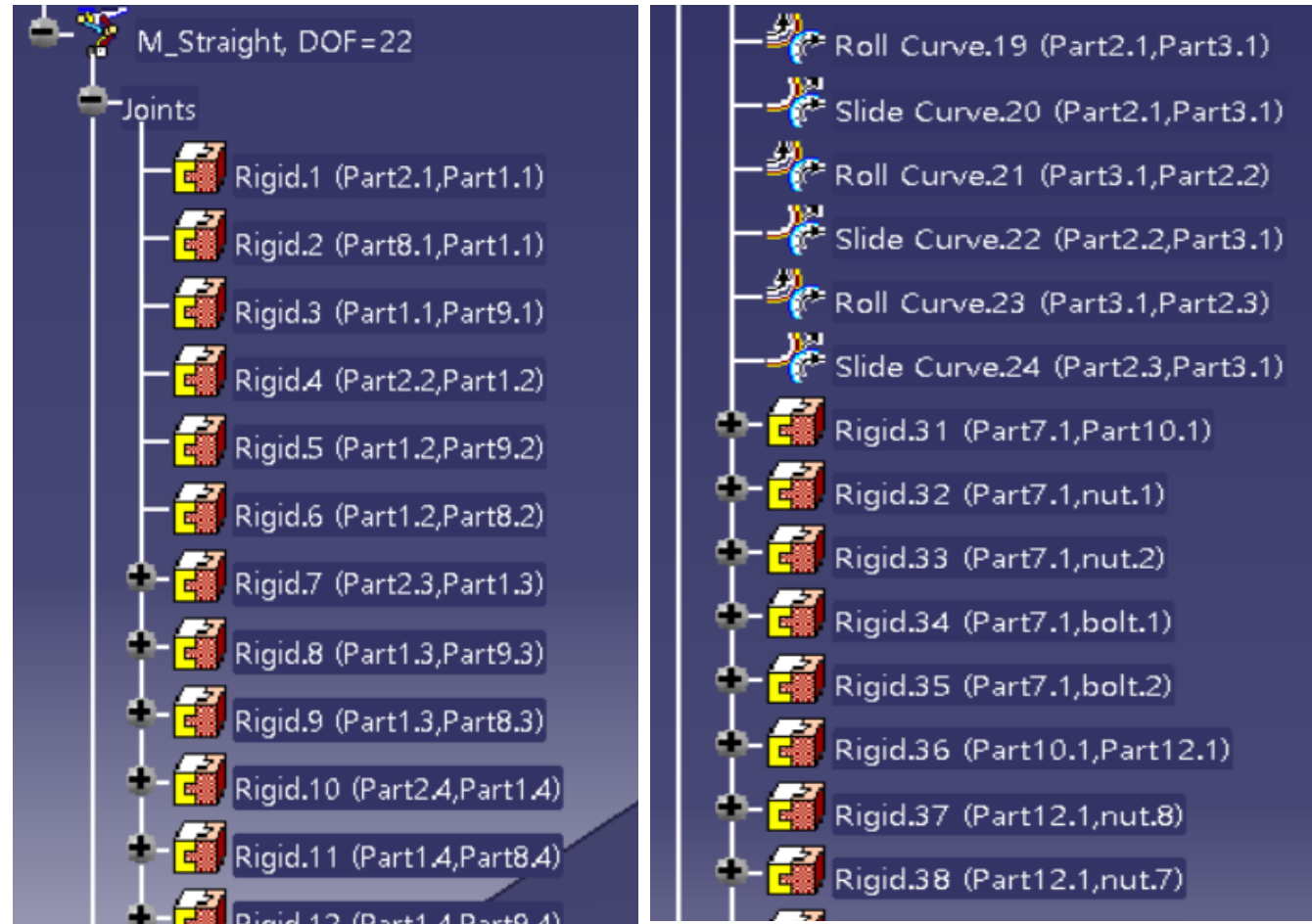
7. 어려웠던 점 & 한계

- 2) '배달 로봇 딜리'의 도면을 찾을 수 없어서 외관을 보고 치수를 고려해서 모델링을 하였다. 이 과정에서 정확한 형상을 그리는 것이 어려웠고 서스펜션 형상을 고려하지 않았다.



7. 어려웠던 점 & 한계

- 3) Joint를 줄 때, 자유도를 0으로 만들어 주는 것이 어려웠다. 이를 통해, 움직임을 주는 Rigid Joint를 먼저 설정하는 것이 더 쉽다는 것을 알았다.



8. 시뮬레이션 영상

- 유튜브 링크

<https://youtu.be/mmlHjIBM0fY>

감사합니다.