



# HANS Cycle – Reciprocating Lever Transmission

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## Overview

### Problem Statement:

Conventional bicycles crank rotations can cause harm to the users legs and does not produce enough torque.

- Exploit existing RLT patent
- Ensure easier bicycling
- Produce a working prototype

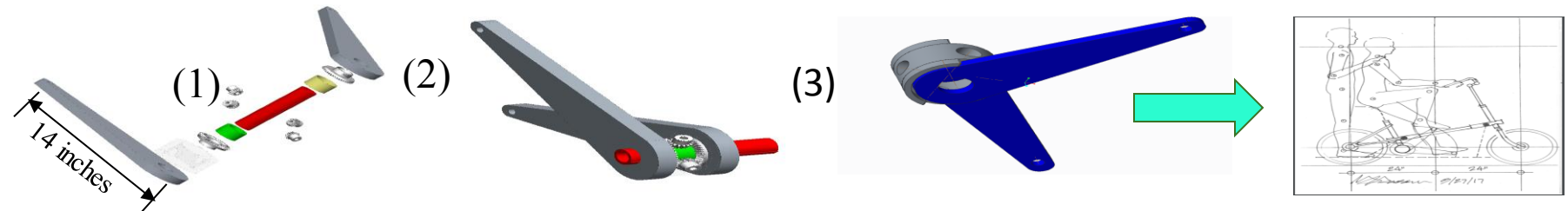
## Design

- 14 inch (355.6 mm) tapered profile, splined crank arms
- Dependent crank arm motion
- Recessed gear housing
- SUS303 stainless steel bevel gears
- Sprag clutches to transmit power in one direction
- Hollow driveshaft allows for bicycle reverse implementation (4140 steel alloy)

## Objectives and Constraints

- Addition of Sprag Clutches (1)
- Longer splined 14 inch crank arms (2)
- Recessed housing to limit range of motion (3)
- Generate 10% more power over conventional
- Improvement of gear meshing
- Partnership with team 20 and their human powered vehicle
- Build prototype with a budget of 2,000\$

## Prototype Reciprocating Lever Transmission (RLT) Bicycle



## Testing

### Requirements:

- Minimum 10% efficiency increase
- Ergonomic motion



Sprag Clutch

### Results:

- Proper testing is needed on new model
- RLT needs refinement



Testing Rig

## Conclusion

Success as proof of concept

### Design needs to be refined:

- Improve bicycle attachment points
- Sprag clutch positioning

### Component Implementation

- Sprag clutch
- Bearing selection