IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)
e-ISSN: 2278-1684,p-ISSN: 2320-334X, Volume 12, Issue 6 Ver. V (Nov. - Dec. 2015), PP 01-14
www.iosrjournals.org

Design and Fabrication of Kids Bike

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Abstract**:** *Today, motorized bi-cycles are being developed in complete shape and also as add-on motor kits for use along with standard bi-cycles, either by part- time hobbyists or by commercial manufacturers. With the development of new, lighter, and more powerful batteries and electric motors it becomes more easy for using hub motors to facilitate after market conversions. Electrically powered bi- cycles use batteries, which have a limited capacity. The usage of these battery based bi-cycles is limited particularly when large amounts of powers are to be utilized and because of this limitation of electrically powered bi- cycles, the use of an internal combustion engine for additional power propulsion is to be more emphasized. As a part of research work an attempt is made to Design and fabricate a low cost KIDS BIKE.The main objective of this project titled "DESIGN AND FABRICATION OF KIDS BIKE" is to avoid human effort in cycle ride under some difficult conditions, and also to make the ride effortless. Since this project is not involved with complex mechanisms, hence reduces time and cost of fabrication.*
Keywords**:** *Kids bike, CAD model, Static strength evaluation, Fabrication of kids bike, comfort and economy.*

I. Introduction

The most popular bicycle model and most popular vehicle of any kind in the world is the Chinese Flying Pigeon, with some 500 million in service. A bicycle, often called a bike, is a human-powered, pedal-driven, single-track vehicle, having two wheels attached to a frame, one behind the other. A bicycle rider is called a cyclist, or bicyclist.

Bicycles were introduced in the 19th century in Europe and, as of 2003, number more than a billion worldwide, twice as many as automobiles. They are the principal means of transportation in many regions. They also provide a popular form of recreation, and have been adapted for use as children's toys, general fitness, military and police applications, courier services, and bicycle racing.

The basic shape and configuration of a typical upright, or safety bicycle, has changed little since the first chain-driven model was developed around 1885. But many details have been improved, especially since the advent of modern materials and computer-aided design. These have allowed for a proliferation of specialized designs for many types of cycling.The bicycle's invention has had an enormous effect on society, both in terms of culture and of advancing modern industrial methods. Several components that eventually played a key role in the development of the automobile were initially invented for use in the bicycle, including ball bearings, pneumatic tires, chain-driven sprockets, and tension-spoked wheels.
Bicycles have been and are employed for many uses:

- Utility: transportation, bicycle commuting, and utility cycling
- Work: mail delivery, paramedics, police, couriering, and general delivery.
- Recreation: bicycle touring, mountain biking, BMX, physical fitness, and play.
- Racing: track racing, criterium, roller racing and time trial to multi-stage events like the Tour of California, Giro d'Italia, the Tour de France, the Vuelta a España, the Volta a Portugal, among others.
- Military: scouting, troop movement, supply of provisions, and patrol. See bicycle infantry.
- Entertainment and performance: Artistic cycling, Freestyle BMX

II. Experimental Setup

- **Procedure For Construction Of Kids Bike**

Fitting Instructions For Raw 50cc And 80cc Bicycle Engines

Some mechanical ability is very desirable to properly install your engine. Some buyers can complete the job in 2 hours whilst others may take 2 days. It is not important how long it takes - you will gain great pleasure and satisfaction from doing the job right. Have fun. The easiest installation is performed on the standard v frame 26" bike with 25mm round tube frame. It can be mounted to some other bikes but it best to stick with the standard bike. Some motors come with a frame adapter plate for fitting to non standard oval or larger tube configurations. If time and care is taken with the initial installation and ongoing maintenance, you should have many thousands on kilometers of trouble free operation Vibration is a factor with all single cylinder bicycle engines so it is a good idea use a spot of 'Holdtite' or 'Locktite' on all screws and nuts when installing the engine. If the head nuts vibrate loose they will cause the head gasket to blow and if the side cover plates come loose it will let water into the magneto and cause damage to your electrical system. Engine mounts can also vibrate loose.

Fitted Engine Installing Rear Sprocket

Step 1

There are two rear sprocket rubber packers. Cut only one of them. Cut between the drilled holes.

Step 2

Place the cut one inside of the spokes.

Step 3

Place the other packer on the outside of the spokes.

Step 4

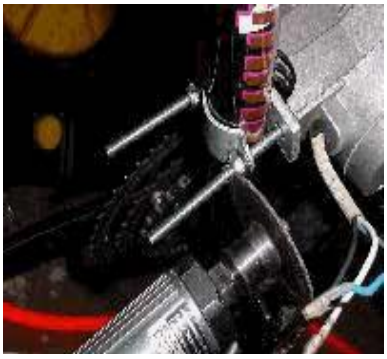
Thread the nine bolts through the sprocket and use the half moon backing plates on the inside. Tighten all nine bolts moving across in a star fashion and a little at a time to allow for an even pull down. Once the sprocket is tight, spin the wheel and check that the sprocket runs true. Deviation can be no more than 1.5mm both ways. Any side-to-side excess deviation can be corrected by spinning the wheel and then tightening the sprocket where needed in order to get correct alignment. Make sure bolts are tight. Notice that concavity or indentation of teeth of the rear sprocket is inward towards spokes. This helps keep the chain closer to the inside of the wheel and spokes and allows for better clearance of the rear stays of the bicycle frame.

Here is how it looks when completed. Nice, tight and true.

Mounting Engine To Frame

Step 5

Mount the engine into the frame. This is the front motor mount. Some bikes have a large diameter lower bar and some need clearance for the air box intake so you need to use the parts provided in the kit. Use spacer provided with the kit. This spacer normally would require the drilling of a hole in the frame to bolt the centre of the spacer through (shown below). I prefer the method shown, which is to pull the studs and replace them with longer ones (threaded rod) that you can get at the local hardware store. Then you can use the steel motor mount clamp that came with the kit and not have to drill a hole in your frame. Then cut the excess off. My bike had an ovoid shaped lower bar about 50mm across. I used this method.



Here is how the front motor mount looks if you have to use the 3 hole adaptor. Yes, you drill and as you can see it works perfectly and you may have to get a longer bolt and bend the exhaust pipe some too. To bend the pipe, simply get a vice and use some wood to block the pipe and then bend it. RAW motors has made special galvanised U-bolt adaptor assemblies.if you don't want to drill a hole through your fronttube.

RAW U-clamp large frame adaptor

Here is step 5 complete with studs nipped and looking good!! Notice how well the intake inlets clear. Always mount air intake with inlets down! Always! If you need to, you can put the air box on a grinder and cut down on the inlet tubes a little to make sure they clear the frame. If you use the spacer on the front engine mount, usually this is enough to clear. Also, you may need to file down any water bottle screw mounts if they protrude and are in the way of a engine mount.

Step 6

The new style throttle is fitted to the r/h side of the handle bars - before you slip the throttle onto bars you will need to drill a 5mm hole in the handle bar 125mm from the end to locate the plastic throttle location tit. Put a drop of machine oil into the cable sheath whilst you have it apart. Care should be taken with the cable location grove - if you are too rough with it, you will break it. Be gentle when installing the throttle. The throttle has a kill switch incorporated into it. Earth the kill switch anywhere on bike frame using the wire with the lug on its end. Attach the remaining kill switch wire to the white wire from the engine. Pressing kill switch will cut power to the spark plug and stop engine running. If your bike has twist action gear shifter it may cause problems when fitting your throttle. The twist action gear shifter can be replaced with a thumb action gear shifter available from any bike shop or from the RAW.

Step 7

Mount the clutch lever.

Here is what the clutch cable connection should look like at the motor.

The larger spring is a heat shield for the clutch cable:

Standard mounting to 28mm tube.

Step 8

Screw in the fuel valve filter combo into the tank and then mount the tank. Tip. Wrap top frame tube with bar wrap where tank clamps are. Also, if you have cable runs on the top bar that are open cables, you may need to run them through cable sheath the length of the tank in order for them to work once tank is clamped over them. Apply plumber's tape to thread if leaking.

Step 9

Mount your coil. Use 2 high quality cable zip ties. Go up and over and around the coil and zip tie it to the frame. Loop one zip tie up and over and also through the holes that would normally have the screws going through them. This is a better method than using the screws that come with the kit. You will have a more solid mount and not break the coil. It is not hard the break the coil ears off using the screws. Wire Connections: Blue to Blue and Black To Black.

Engine vibration can often cause the HT lead between the black box and plug cap to come loose. If this happens you will have no spark so twist the HT leads in a clockwise direction at both ends to close connection.

It is very important to ensure the cover plate on the magneto remains tightly sealed (use 'Holdtite' or 'Locktite' on screws). If water is allowed to get into the magneto chamber, it will cause the magneto to fuse out. Also seal the wire outlet with silicon or similar sealant to ensure water is not carried into the magneto via the wires. Silicon sealant and 'Holdtite' is available on the RAW spare parts page.

If your spark plug has its crown screwed on. Unscrew it and remove it so that you can put your spark plug cap on. Failure to remove this crown can damage or ruin the spark plug cap.

Here is what the idler pulley looks like installed. Notice the wheel is at the most down position so as the chain gets slack, you simply move the wheel upwards to take out the slack.

Step 10

Remove the 3 screws from Counter shaft side cover and also remove spark plug. Remove clip from master link of chain and then thread chain up and over counter shaft sprocket by rotating the sprocket using tool. Having the spark plug removed allows engine to be turned easily to thread chain.Since you have this cover off, hold clutch arm and rotate cover and pull clutch arm out of cover and then grease it and rotate it back in. RAW engines are fitted with an extra heavy duty 415 chain so it is a good idea to remove the sharp tips from the small drive sprocket with a file or grinder to ensure smoother travel of the chain over the teeth.

Step 11

Put some molly grease on the shaft and in the hole.

Step 12

Cut chain to length and using master link put chain back together. Do not cut chain too short! Install idler pulley. Do not over tighten chain. Install chain guard. Use some tin snips to cut cover at the rear if needed. Use a good zip tie at the rear and the extra long bolt for the counter shaft cover will hold the front.

If you ever need a new chain and can't buy the 415 chain locally, you can buy BMX stunt chain (probably even better than 415 heavy) from any good bicycle shop - save the waiting time and save on the freight costs from Bellingen to you.

Step 13

Install exhaust pipe. If you need to bend the pipe so it will not hit the frame or bolts, clamp the pipe into wood blocks and bend. Don't bend it too much because you don't want to break it. Don't bend the exhaust whilst mounted to engine. If you do, you will not bend the exhaust, you will break the motor! Exhaust pipe is very strong - much stronger than the 2 mounting studs on the motor.

Step 14

Mount the carburetor. Check the other screws including the brass fuel inlet screw for tightness. Typically they need some slight turning. Once the carburetor is on and tight, you are ready to connect the tank line to the carburetor. Even though the fuel petcock has a screen filter, it is porous and allows sediment through. A high quality RAW inline fuel filter with paper element is the way to go to keep fine particulate out of the carburetor and the engine.The installation is now completed. Mix your oil with the petrol before adding to tank. Fuel up the bike and fire it up. It is recommended to pedal the bike up to about walking pace before releasing the clutch lever. This is a new motor and you need to take it easy for the first 500 kilometers in accordance with the run-in procedure.

During run in, keep drive chain snug. During run in keep the mix ratio at 16:1 for 500 kilometers and keep your speed down to a maximum of 20kph and do not run your motor for longer than 30 minute periods.

III. Maintenance Routine

1. Clutch

a) Remove right side cover from engine.
b) Place a small dab of grease at gear mesh area.
c) Replace cover.

2. Carburetor

Depending on riding conditions, clean air filter every 5 to 20 hours of operation by removing the filter cover to access the screen and element. Wash element with a degreasing agent. Be sure element is completely dry before re-assembly.

3. Spark Plug

Remove spark plug and inspect for excess carbon build up. Clean, re-gap to .6mm - .7mm if necessary. Check plug after every 20 hours of operation. A suitable replacement plug an NGK B6HS; NGK B5HS or BOSCH WR 7AC or Champion equivalent is okay to use. The NGK R7-HS is also recommended for better performance and smoother idling.

4. Exhaust System

After 20 hours of operation check exhaust pipe for excessive oil and carbon build-up. Be sure to use supplied support strap to secure exhaust muffler to a solid anchor point on bike frame or engine.

a) Remove exhaust pipe cap by loosening the retaining screw.
b) Spray degreaser into baffle rinse and dry.
c) Re-assemble

Excessive periods of low speed operation, idling or leaving fuel petcock in the "on" position during shut down periods may cause the pipe to become clogged with unburned fuel.

5. Chain

Every time bike is ridden check the tension of the drive chain by:

a) Rolling to bicycle forward to remove slack from the bottom of the chain.
b) Find the center and push downward on the top of chain while measuring the deflection.
c) Tighten chain if deflection is more than 15mm.
d) Low speed "chain rattle" can be eliminated with the application of graphite grease to chain.

6. Head Bolts

Tighten all fasteners after each five hours of operation. It's most important to check cylinder head bolts: tighten in a X pattern to 12 ft/lb. using a torque wrench. A two piece cylinder and head design engine requires head bolts be kept tight. Check head bolts before each and every ride, vibration can cause them to loosen and blow a head gasket. Caution: Do not over torque or head bolts may break off. Use of a little 'Holdtite' or 'Locktite' is recommended to keep head nuts secured against vibration.

7. Right Side Gears

Remove cover plate and apply a small amount of heavy grease on gear train. Do not over grease as leaks will occur and also may adversely affect clutch operation.

8. Sealing The Magneto Coil From Water

The magneto coil will fuse if it gets wet. Unfortunately with the design of the engine, the wire outlet hole faces forward into the weather and water can get into the magneto if the outlet hole is not properly sealed. RAW engines will come fitted with a rubber grummet that will partially exclude water but you are strongly advised to completely seal the hole with silicone jelly or a similar product. Regularly check cover plates screws are tight. See image below:

Obey all traffic regulations. Always wear an approved helmet whilst riding. Remember that you are riding a motorized bicycle and other traffic may not be able to see you. Never operate your motorized bicycle on a pedestrian thoroughfare or pathway whilst the engine is operating. Never operate your motorized bicycle in an unsafe manner. Check local and state laws before riding on streets.

9. Motorized Bicycle Starting And Operating Instructions
Petrol And Oil Mixture Ratio

The engine is a 2 stroke design, therefore a petrol/oil mixture is necessary. During the first 500km run-in period, the ratio for engine is 16 parts petrol to 1 part high-grade 2 stroke motorcycle oil (65ml Penrite 2 stroke motor oil to 1 litre of 91 octane unleaded petrol). After the run-in period, the ratio is increased to 20 parts petrol to 1 part oil (50ml Penrite 2 stroke motor oil to 1 litre of 91 octane unleadedpetrol). Be sure to mix fuel and oil before adding to tank - don't add separately.
Do not exceed 20km/h during run-in period. Speed may be increased to 35km/h after the first 500km.

Use only high grade 2 stroke motorcycle oil to ensure proper engine lubrication.

1. Open the fuel valve. Small lever pointed down with fuel line is in the open position.
2. Depress the small round cap plunger (tickle button), to prime carburetor. One or two times is enough.
3. Lift choke lever to the upward position. This is the small lever on the right side of the carburetor. All the way up the choke is on. All the way down the choke is off. Move progressively downward to off position during engine warm up period.
4. Pull the handlebar clutch lever inward, to disengage the engine from the rear wheel.
5. Pedal up to pedestrian walking speed (down hill if possible for first start).
6. Let out the clutch lever all the way out while continuing to pedal. The result is a direct engine hook up with the rear wheel via chain and sprocket and the engine will now start spinning. Pedal until motor starts. Accelerate slowly at first.
7. Twist throttle to increase speed, reverse twist throttle to decrease speed. To stop, disengage clutch and apply brakes. To accelerate, pedal and release clutch whilst opening throttle.
8. Adjust choke to the smoothest engine running position.
9. After warm up push choke lever all the way down. If engine races too fast, or too slow, pull clutch lever and lock in the button, stop and adjust engine rpm.
10. If the rpm needs adjusting, turn the idle adjust screw (top of carburetor) in or out slowly to obtain the proper idle speed of about 1400 rpm +/- 100 rpm To correctly run the engine in, do not exceed 20kph or 30 minutes of continual running for the first 500klms during engine run in. Engine will develop more power after run in.
11. To stop the engine, push kill switch and turn off fuel valve at tank. Turning off the fuel will prevent fuel from being drained from tank. Never leave the tank gas valve in “open” position when engine is not running or the bike is in storage.
12. After or before each ride check all mounting fasteners, including head bolts, axle and brakes. Using 'Holdtite' or 'Locktite' during initial installation will stop screws and nuts vibrating loose during running.

Kids Bike Specifications

Particulars	Dimensions in Cms
Front tyre Diameter	60.96
Rear tyre Diameter	66.04
Over all Length	172.72
Over all Height	78.74
Ground Clearence	30.48
Seat Height	91.84

Engine Specifications

Particulars	Specification
Engine type	2 Stroke air cooled
Displacement	50cc
Number Of cylinders	1
Power	4.578Kw
Maximum Speed	55kmph
Mileage	50km

Costing

S.NO	COMPONENTS	QUANTITY	COST IN Rs.
1	Cycle	1	6500
2	Engine	1	15000
3	Carburettor	1	1000
4	Clutch Assembly	1	1500
5	Air Filter	1	150
6	Accelerator Assembly	1	1500
7	Accelerator Wire	1	450
8	Fuel Tank	1	1000
9	Sprocket and Heavy Duty Chain	4 & 1	2000
10	Tensioner	2	500
11	Welding Work		1500
12	Painting	1 to 2 litrs	1200
13	Labour cost		2000
14	Miscellanies		2000
	Total	Rs.	36300

IV. Basic Motion Calculations

1. General Assumptions Made To Move The Vehicle

1. Weight of the vehicle 2. Maximum weight that can carry 3. Gear ratio

2. Forces Consider To Design Vehicle

2.1. Linear Inertia

Inertia is the resistance of any physical object to any change in its state of motion, including changes to its speed and direction. In other words, it is the tendency of objects to keep moving in a straight line at constant linear velocity. **F=ma**

Where,F= force acting on the body, m = mass, a = acceleration

a = v/t, v = 30 km/hr, t = 60 seconds required to reach the velocity 30 km/hr

v = 30*5/18=8.33 m/sec, m = 100 kg

f = ma

= 80*9.81*8.33/60

=108.954 N

2.2. Rotational Inertia

Another form of inertia is rotational inertia which refers to the fact that a rotating rigid body maintains its state of uniform rotational motion. Its angular momentum is unchanged, unless an external torque is applied; this is also called conservation of angular momentum. Rotational inertia depends on the object remaining structurally intact as a rigid body, and also has practical consequences; For example, a gyroscope uses the property that it resists any change in the axis of rotation.

Fr = 5 to 20 % of the linear inertia

We considered 10%

Fr = 108.954 *0.10

= 10.8954 N

2.3. Aerodynamic Drag

In aerodynamics, aerodynamic drag is the fluid drag force that acts on any moving solid body in the direction of the fluid freestream flow. From the body's perspective (near-field approach), the drag comes from forces due to pressure distributions over the body surface, symbolized D_{pr}, and forces due to skin friction, which is a result of viscosity, denoted D_f. Alternatively, calculated from the flowfield perspective (far-field approach), the drag force comes from three natural phenomena: shock waves, vortex sheet, and viscosity.

Fa = Cd*ℓ*a*v/2*v2

Cd= Coefficient of aerodynamic drag

= 0.32

A = frontal area m^2

Normal person area = 0.6*0.2

=0.12 m^2

Tyre area =0.05*0.6

=0.03 m^2

Handle area =0.025*0.2

=0.005 m^2

Total area = 0.12+0.03+0.005 = 0.155 m2

ℓ= density of the body kg/m^3

= 1.15 kg/m^3

V = velocity m/s

=8.33m/s

Fa = 0.32*1.18*0.155*8.33/2*(8.33)2

= 16.926 N

2.4. WIND Or AIR DRAG

Fluid dynamics, drag (sometimes called air resistance, a type of friction, or fluid resistance, another type of friction) refers to forces acting opposite to the relative motion of any object moving with respect to a surrounding fluid. This can exist between two fluid layers (or surfaces) or a fluid and a solid surface. Unlike

other resistive forces, such as dry friction, which are nearly independent of velocity, drag forces depend on velocity.
Wind drag = 20% of the aerodynamic drag
= 16.926*0.20
=3.385 N

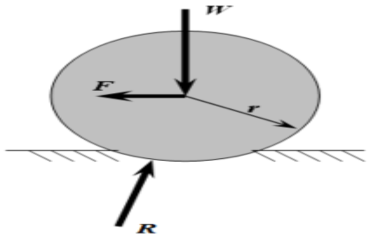
2.5. Force On Inclination

F= W Sinø

Ø = inclination between vehicle and ground
= 0 to 40°
W = weight of the body
F = 80*9.81*Sin20
=268.41 N

2.6. Rolling Drag

Rolling resistance, sometimes called rolling friction or rolling drag, is the force resisting the motion when a body (such as a ball, tire, or wheel) rolls on a surface. It is mainly caused by non-elastic effects; that is, not all the energy needed for deformation (or movement) of the wheel, roadbed, etc. is recovered when the pressure is removed.

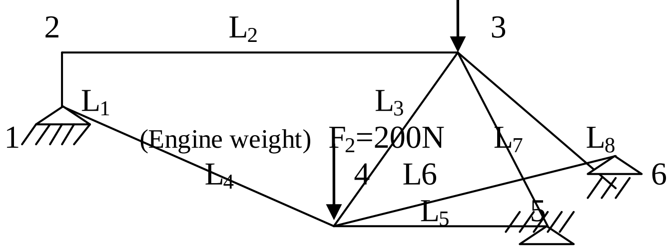


Two forms of this are hysteresis losses, see below, and permanent (plastic) deformation of the object or the surface (e.g. soil). Another cause of rolling resistance lies in the slippage between the wheel and the surface, which dissipates energy. Note that only the last of these effects involves friction, therefore the name "rolling friction" is to an extent a misnomer.
Rolling drag = Cr*w*Cosø , Cr = rolling resistance = 0.02
Ø = inclination between vehicle and ground = 0 to 40°
W = weight of the body

Rolling drag = 0.02*80*9.81*Cos20 =14.749 N
TOTAL FORCE =linear inertia + rotational inertia + aerodynamic drag + wind drag +force on inclination+ rolling drag
=11.106+1.1106+16.91+3.382+268.41+14.749 =316 N

V. Static Strength Evaluation Of Kids Bike

F_1=600N(persons weight)



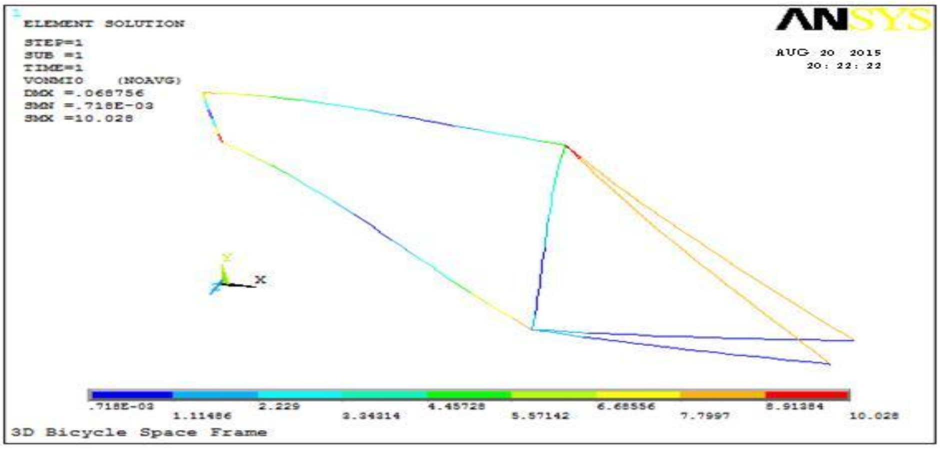
! Command File mode of 3D Bicycle Space Frame
/title, 3D Bicycle Space Frame
/prep7 ! Enter the pre-processor
! Define Keypoints
K , 1 , 0 , 358.609 , 0 ! k,key-point number ,x-coord, y-coord, z-coord

```
K , 2 , 0 , 478.609 , 0
K , 3 , 518 , 478.609 , 0
K , 4 , 460.929 , 0 ,0
K , 5 , 900.929 , 0 ,50
K , 6 , 900.929 , 0 , -50
! Define Lines Linking Keypoints
L , 1 , 2 ! l ,keyoint 1 ,keypoint 2
L , 2 , 3
L , 3 , 4
L , 4 , 1
L , 4 , 6
L , 4 , 5
L , 3 , 5 ! these last two lines are for the rear forks
L , 3 , 6
! Define Element Type
ET, 1 , pipe16
KEYOPT , 1 , 6 , 1
! Define Real Constsnts
! (Note : the inside diameter should be positive)
R , 1 , 37.55 , 2 ! r , real set number ,out diameter , wall thickness
R , 2 , 12 , 1 ! second set of real constants – for rear forks
! Define Material Properties
MP, EX,1,20000 ! mp, Young’s modulus, material number, value
MP, PRXY, 1,0.3 !mp ,Poisson’s ratio ,material number, value
MP, DENS, 1, 7.83e^-9
! Define the number of elements each line is to be divided into
LESIZE, ALL, 20 !lesize,  line number(all lines), size of elements
! Line Meshing
REAL ,1 ! turn on real property set #1
LMESH,7,8 ! mesh the rear forks
! mesh lines 1
REAL ,2 ! turn on real property set#2
LMESH ,7,8 ! mesh the rear forks
FINISH ! Finish pre – processing
/SOLU ! Enter the solution processor
ANTYPE,0 ! Analysis type, static
! Define Displacement Constraints on Keypoints (dk command)

DK, 1, UX, 0, , , UY, UZ ! dk,keypoint, direction, displacement, , ,direction, direction
DK, 5, UY, 0, , , UZ
DK, 6, UY, 0, , , UZ
! Define Forces on Keypoints (fk command)
FK, 3, FY, -600 !fk, keypoint , direction, force
FK, 4, FY, -200
SOLVE ! Solve the problem
FINISH ! Finish the solution processor
SAVE ! Save your work to the database
/post1 ! Enter the general post processor
/GCMD, 1, PLDISP,2 ! Plot the deformed and undeformed edge
/GCMD, 2, PLNSOL, U, SUM, 0,1
! For the VonMises (or equivalent) stresses at angle 0 at both ends of the
! element (node i and node j)
Etable, vonmi0, nmisc, 5
etable, vonmj0, nmisc, 45
! For the Axial stresses at angle 0
Etable, axii0, 1s, 1
etable, axij0,1s, 33
! For the Direct axial stress component due to axial load (no bending)
! Note it is independent of angular location
```

```
etable ,diri , smisc ,13
etable ,dirj , smisc , 15
! ADD OTHERS THAT YOU NEED IN HERE ….
! To plot the data , simply type
! plls , name for node I , name for node j
! for example ,
/GCMD , 3 , PLLS , vonmi 0 ,vonm j 0
/GCMD , 4 , PLLS , axii 0 ,ax I j 0
/CONT , 2 , 9 , 0 , , 0.27
/CONT , 3 , 9 , 0 , ,18
/CONT , 4 , 9 , -18 , ,18
/ FOC , ALL , -0.340000 , , , 1
/replot
PRNSOL , DOF
```

Solution:



VI. Conclusion

The design of kids bike was based on the standard data available. The fabrication was done using locally available materials. Compared to the kids bike existing in the market, our bike is economical. The weight of our kids bike with par with light weight bikes available in the market .The bike has adjustable seat and handle positions enabling children.

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