Frame

Freshmen Seminar 102
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Brakes and Wheels

Before
(rear wheel)

After
Exploded diagram for Rear Wheel and Hub

Fig. 5.2 Rear wheel and hub
- component parts

1. Rear wheel assembly - complete
2. Rim, spokes and hub assembly
3. Wheel rim
4. Spoke - 20 off
5. Spoke - 10 off
6. Spoke - 10 off
7. Nipple - 40 off
8. Hub and brake drum
9. Sprocket
10. Spring washer - 8 off
11. Bolt - 8 off
12. Splined
13. Backing ring
14. Bearing - 2 off
15. Retaining ring
16. Spacers - 2 off
17. Speedometer gear box
18. Brake anchor plate
20. Liner - 2 off
21. Brass rivet - 12 off
22. Return spring - 2 off
23. Brake cam
24. Cam lever
25. Washer
26. Nut
27. Return spring - T2055
28. Chain adjuster - 2 off
29. End plate - 2 off
30. Spring washer - 2 off
31. Nut - 2 off
32. Nut - 2 off
33. Security bolt (competition models only)
34. Bolt
35. Washer
36. Nut

Note: Full-width hub similar
Rear Wheel Sprocket

Original Sprocket

New Sprocket
We are currently waiting for the speedometer to arrive, which will attach to the rear axle.
Drum Brakes

- Drum brakes get their name due to the components being housed in a round drum which rotate with the wheel.

- Inside of the drum are a set of shoes, so when the brakes are applied the shoes becomes forced against the drum and slow the wheel.

- The shoes are made of a heat-resistant friction material similar to what is used on the clutch.
Drum Brake

- Brake Cylinder
- Pistons
- Drum
- Cable
- To Emergency Brake Lever
- Adjuster Mechanism
- Emergency Brake Mechanism
- Brake Shoes
Drum Brakes for our 1963 Tiger Cub

Front Wheel Drum Brake

Heat Resistance Break Pads

Shoes

Return Spring

Brake Cam

Rear Wheel Drum Brake
Disk Brakes

- Disk brakes use a slim rotor and small caliper to stop and slow the wheels

- The caliper contains two brake pads, one on each side of the rotor that squeeze together when the breaks are activated.

- Disk brakes are more reliable and last longer because the rotor is on the outside of the bike and fully exposed to air, helping the disk brakes to cool down and not cause fading.
How a Disc Brake Works

- Caliper
- Piston
- Brake Pads
- Rotor
- Hub
- Wheel attaches here
General Frame
Fig. 4.3 Frame and rear suspension — component parts

1 Front frame section
2 Rear frame section
3 Stud
4 Spring washer
5 Nut
6 Swinging fork
7 Bolt
8 Spring washer
9 Suspension unit
10 Pillion footrest support — LH
11 Pillion footrest support — RH
12 Stud
13 Spring washer
14 Nut
15 Bolt
16 Washer
17 Nut
18 Bolt
19 Nut
20 Spacers
21 Centre stand
22 Spring
23 Pivot bolt — 2 off
24 Nut — 2 off
25 Prop stand
26 Bolt
27 Lockwasher
28 Spring
29 Steering race cup — 2 off
30 Bolt
31 Nut
32 Bolt
33 Nut
34 Brake pedal spindle
35 Spring washer
36 Nut

Fig. 4.4 Frame — component parts (Bantam Cub and Super Cub models)

1 Front frame assembly
2 Cup — 2 off
3 Washer
4 Hollow dowel
5 Pillion footrest spacer — 2 off
6 Rear frame assembly
7 Bolt
8 Spring washer — 5 off
9 Nut
10 Swinging fork
11 Bush — 2 off
12 Spindle
13 Washer
14 Left footrest bracket
15 Right footrest bracket
16 Hollow bolt — 2 off
17 Spring washer — 2 off
18 Spring washer — 2 off
19 Bolt — 2 off
20 Suspension unit — 2 off
21 Bush — 2 off
22 Nut — 2 off
23 Bolt — 2 off
24 Washer — 2 off
25 Nut — 4 off
26 Engine rear plate — 2 off
27 Nut — 4 off
28 Centre stand
29 Plain washer — 3 off
30 Return spring
31 Bolt — 2 off
32 Nut — 2 off
33 Bolt
34 Bolt — 2 off
35 Nut — 2 off
36 Self-locking nut — 3 off
37 Spring washer — 3 off
38 Bolt — 2 off
39 Grease nipple — 3 off
40 Shims — as required
Progress

- We spent the first two weeks degreasing and cleaning off various parts of the motorcycle.
- We then sent various parts of the motorcycle off to be powder coated: including the rear and front frame assembly, and the swinging fork.
- It took approximately six weeks for all of the parts to be powder coated and then returned to us. Upon return, we discovered a crack in the frame which Glen then welded together.
- We added two new kickstands to the frame to help support the bike better.
• In the past few weeks our group, in addition to the clutch group has been painting various parts of the motorcycle including the gas tank, license plate brace, and the oil tank cover.

• The painting process involves removing previous rust/paint from the part, applying a primer coat, and then applying additional layers of paint until smooth.
Suspension: Front Forks and Rear Cushions
Forks:

- Connects a motorcycles front wheel and axle to its frame
- Allows the bike to be steered via the handlebars
- Incorporates front suspension for best ride / handling
- Maintains best possible contact between road surface & wheel

Telescopic forks:
- Simple design
  - Fork Tubes contain all suspension components (coil springs, dampers, oil, air)
Front Suspension

- Plays a major role in bike handling

- Brake Dive:
  - Load transfer: excess weight on front wheel absorbed by suspension
  - Bike dives towards the ground with braking
  - If suspension bottoms out, suspension needs to be fixed or replaced
Handling

• A bike’s stability and handling depend on:
  • Wheel alignment
  • Wheelbase
  • Weight distribution
  • Center of gravity position
  • Type / performance of suspension
  • Size / performance of tires
  • Riding position

• Most important of all though: caster (rake) and trail
Caster and Trail

- Caster angle (rake): angle formed by the intersection of a line following the forks and a vertical line passing the center of the front wheel axle.

- Trail: Distance between the intersection of these two lines and the ground.
When trail is large:
- Better high speed stability, poor low speed stability

Must decide on purpose of bike before setting trail
Swing Arm

- Pivots vertically to allow rear cushions to better absorb bumps in road.

- Pair of parallel pipes connected to the main frame
Rear Cushions

- Connected to rear swing arm and frame just under the seat
- Motorcycles nearly all use a shock absorber and a coil-over spring to smooth vibrations and offer a softer ride