The background of the slide features a faded, grayscale image of bicycle gears. The gears are arranged in a cluster, with some overlapping, and are positioned behind the text. The overall aesthetic is technical and mechanical.

**Bicycle Mechanics and Repair Decal**  
**Mechanical Engineering 98/198**  
**Spring 11**

**Lecture 5**

Aleksey Shepelev

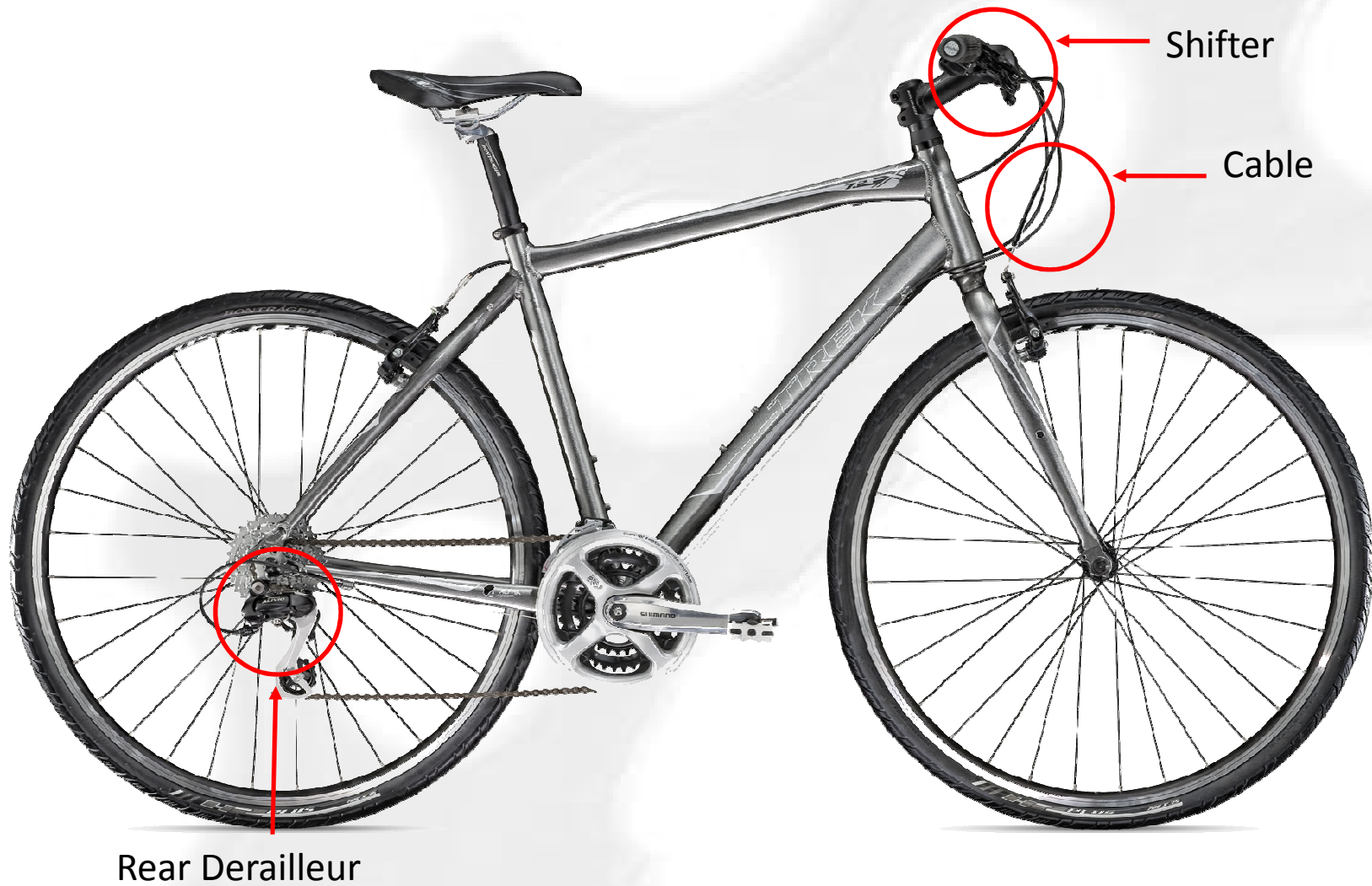
Jim Gao

Nick Koo

Henry Yi

Allen Gurdus

# Components



# Many different choices...



Shimano RD-TX31 Tourney  
- \$12



Campagnolo Record 11 -  
\$255

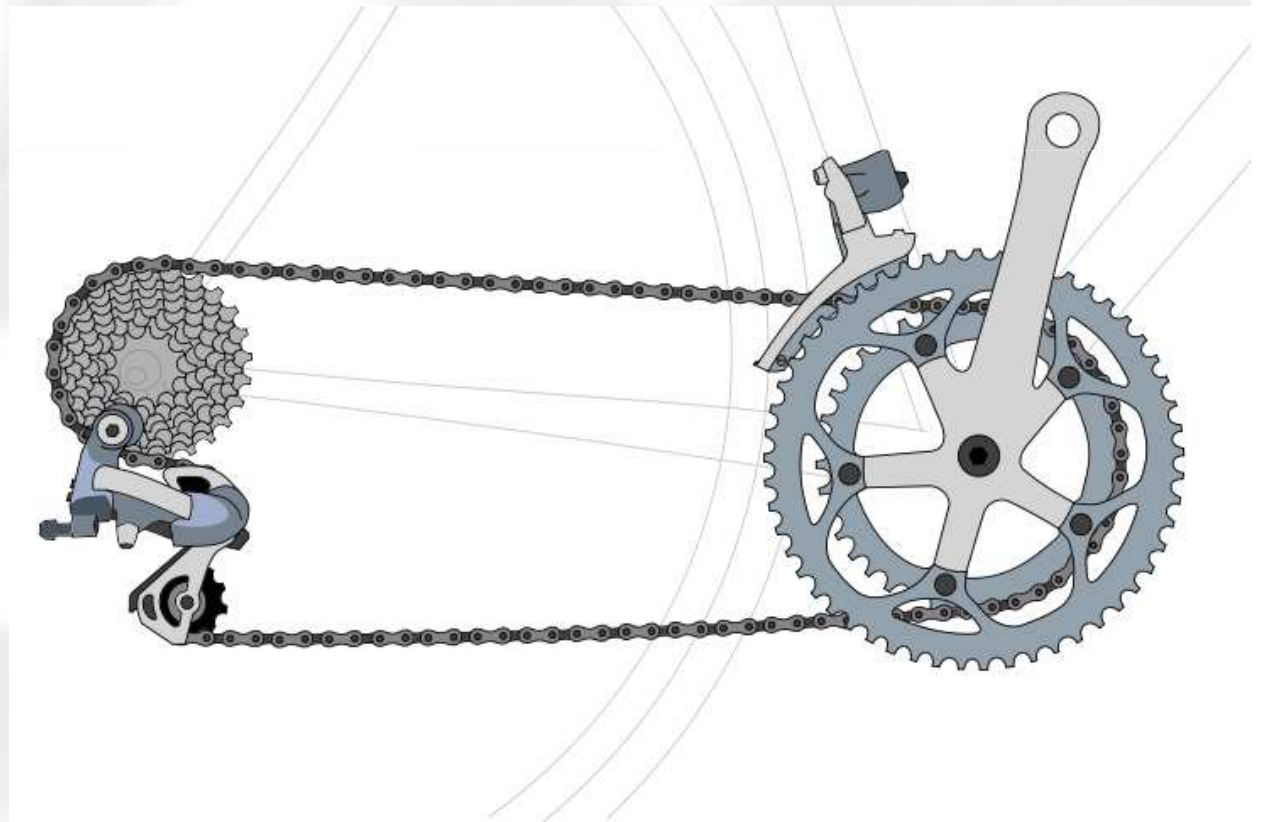


Shimano RD-M980 XTR - \$179

# ...but all the same functionality!

## What does it do?

- Allows you to change rear gears
- Provides chain tension



# Mountain vs Road RDs

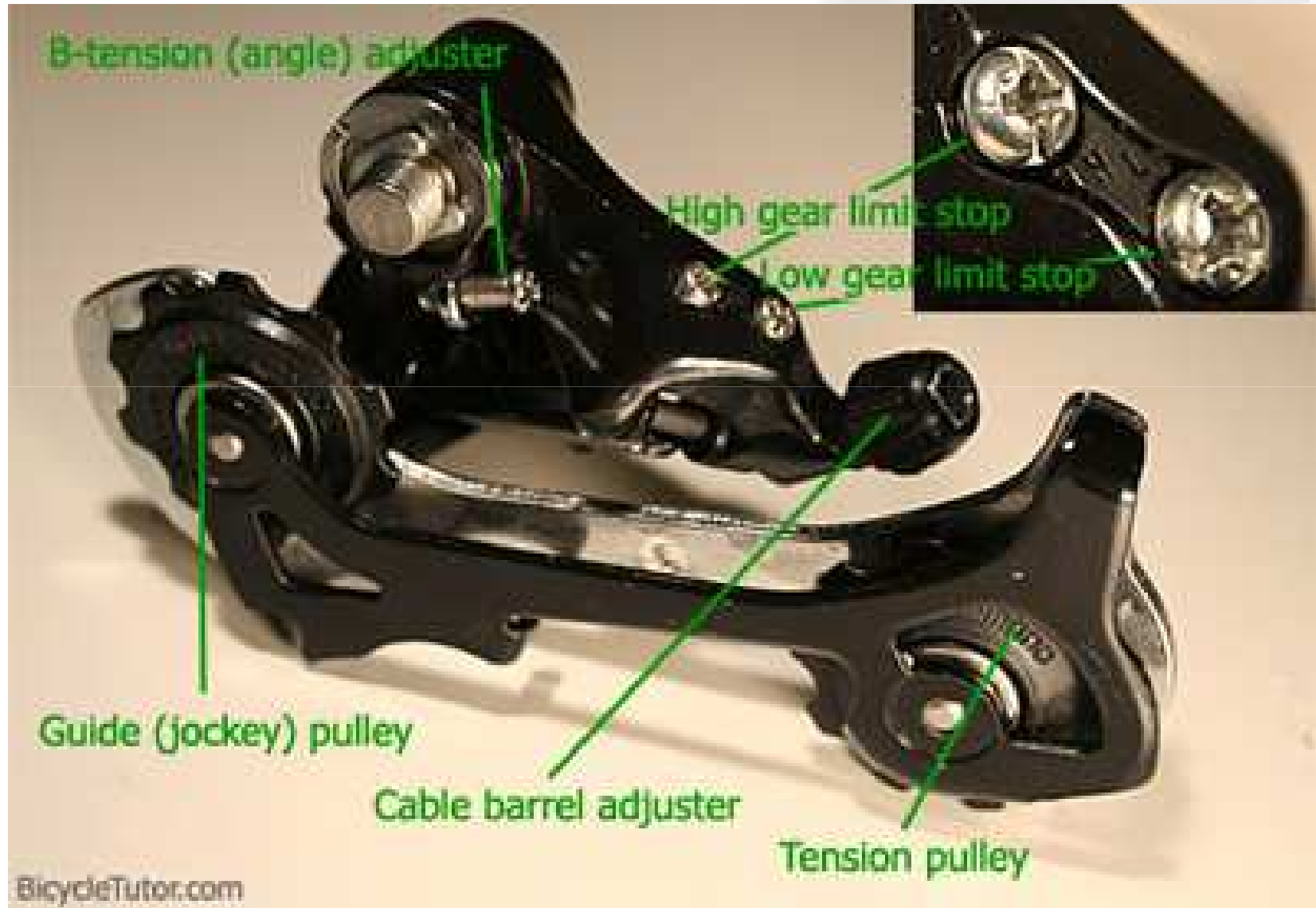


- Low normal
- Longer cage length



- High normal
- Shorter cage length
  - Less flex and danger of catching in spokes

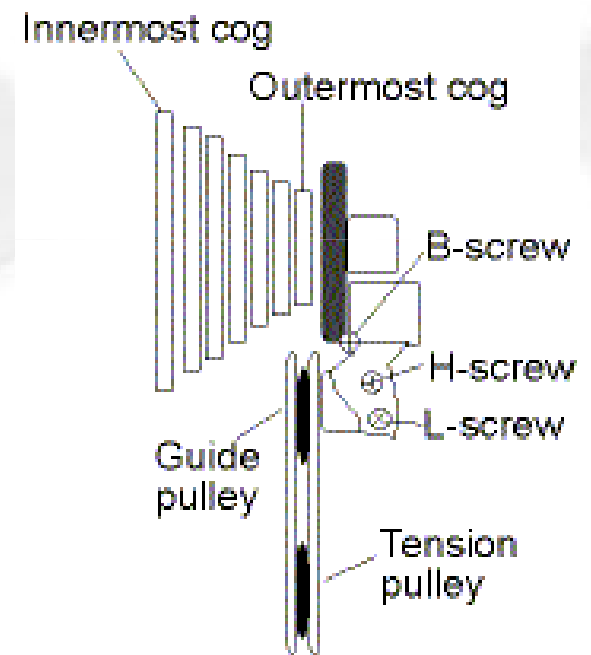
# Three Limit Screws





# Adjustment Methods

- Adjust in quarter turns.
- Turning B-screw clockwise increases tension, pushing the guide pulley further from the sprocket.
- Adjust the H-screw (high limit) when the derailleur is at the smallest (outermost) sprocket.
- Adjust the L-screw when the derailleur is at the largest (innermost) sprocket.







Guide is too far. Need to turn B-Screw Counter-Clockwise



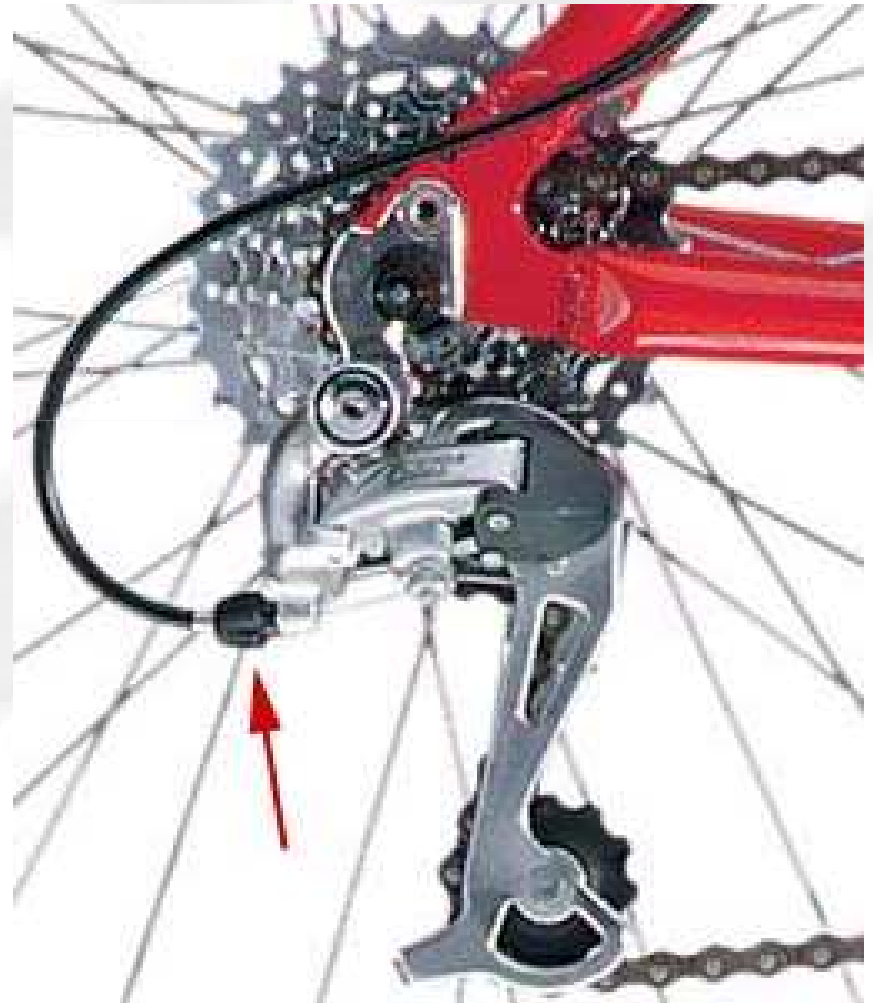
Guide is too close. Need to turn B-Screw Clockwise



Correct distance between guide and sprockets.

# Cable Barrel Adjuster

- Look at derailleur and sprockets from the back.
- The chain should be aligned with each sprocket as you shift through the gears.
- If the derailleur is pushing too hard towards the wheel, turn the barrel adjuster clockwise until the chain is aligned.





Aligned Derailleur (Smallest Sprocket).

# Deraillieur Hanger

The hanger allows the deraillieur to be attached to the frame



## Replaceable Hanger

Will sacrifice itself in an accident to keep the frame unharmed.



## Non-Replaceable Hanger

Requires special attention and care. A broken hanger is often beyond repair.

# Repairing a Bent Hanger

- If your hanger can be replaced, replace it.
- Bend the hanger back with a wrench for leverage. Be aware, it may still break.



Bent Hanger

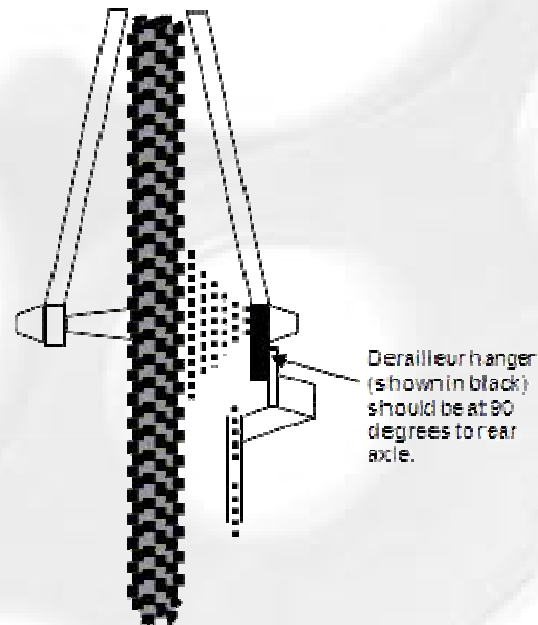


Repair Option 1



Repair Option 2

# Aligning the Derailleur Hanger



- The hanger must be parallel to the rear wheel
- If the hanger is straight, but the derailleur looks bent, replace the derailleur.

Resources:

<http://www.utahmountainbiking.com/fix/rhanger.htm>

<http://www.parktool.com/blog/repair-help/rear-derailleur-hanger-alignment>



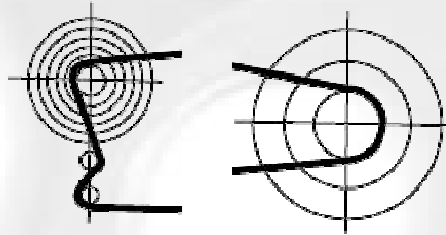
# Pointers on Replacing Cable/Housing

- Shift to gear with lowest cable tension.

Usually:

Smallest  
sprocket

Smallest  
chainring



- Take note of how the cable is mounted before removing it

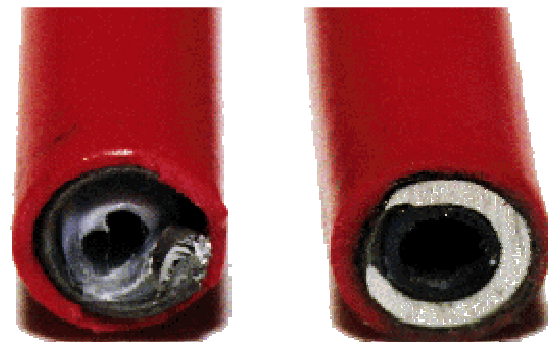


# Pointers on Replacing Cable/Housing

- Use the old housing to determine the length of the new one. Cut to just the right length.

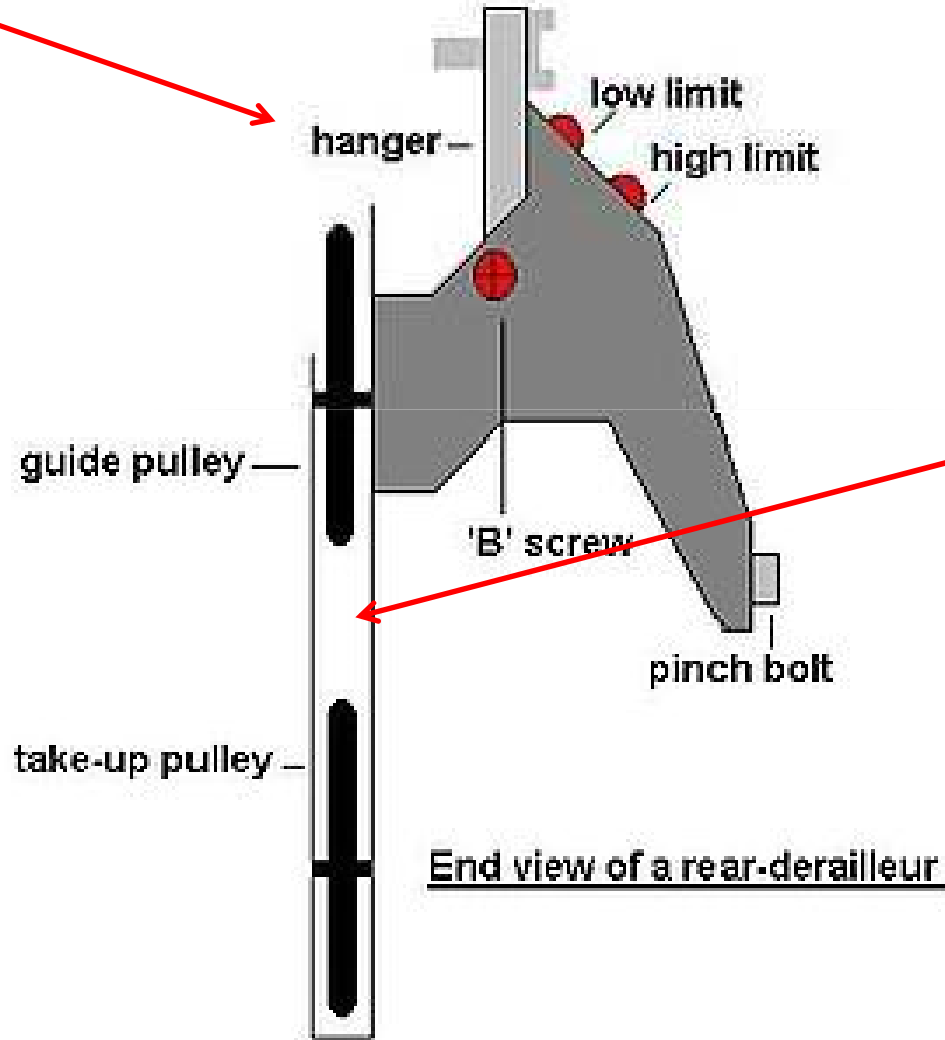


- Cut housing with the correct tool. Make sure the newly-cut edges are not sharp.



# Common Problems and Basic Maintenance

Fix or replace the bent hanger



Parallel running of chain between pulleys is a good sign of a straight derailleur

End view of a rear-derailleur

# Adjustments?

- Chain is falling off the big/small sprocket
  - Set the H/L limit screws
- Shifting is making lots of noise, doesn't shift
  - Barrel adjustment. If it's trying to shift into the large sprocket, there is not enough cable tension and vice versa
- Shifting is only slow onto smallest sprocket
  - Cable is either too tight or too much friction in the housing/cable; lubricate cable, or replace housing/cable