Brakes

Drum brakes

Requires less force to apply brakes.

They are cost effective.

Transmitting time is less.

No fluid is used.

It is self-locking.

They have poor anti-fade characteristics.

These brakes have 20 to 30 percent more weight than disk brake.

Low ventilation property.

Disk Brakes

Less effort and produces greater braking force

Good heat dissipation

Easy installation

fluid is used

is more efficient and when we stop it stops fast as compared to the drum brake. is never self-locking

Better ventilation property.

*We will use disc brakes in our rover on all front and rear wheels.*

1. Hydraulic Disc Brakes

Uses both the pads to create more effective frictional force.

Less everyday wear and tear.

Better modulation & stopping power.

1. Mechanical Disc Brakes

Prone to wear & tear

Cheaper

Comparatively less modulation and stopping power.

Overall, hydraulic disc brakes are superior in terms of performance and efficiency because of the reduced friction by not having a mechanical cable and reducing wear and tear of cables.

Reasons to use Hydraulic disc brakes at front and rear wheels.

The stopping of vehicles results in more weight at front tires and axles. Now since the disc brakes are more efficient and can bear more weight, they are used at front wheels. While climbing the slopes, we will also need to stop the vehicle from moving backwards, so at rear wheels we will also use disk brakes. We discard the other options of breaking because either they are heavier or very complex to implement into a rover.

As the design of our rover needs brakes for both the drivers sitting at the back and the front, we will be using the brakes in all the four tires according to the dual braking system.

In split or dual braking system, pressure to the brakes is applied to the wheels on separate lines carrying a special Hydraulic fluid.

There are two basic types of split braking systems, viz. a front and rear split system and the second is known as diagonal split braking system.

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| **Front and rear split braking system** |
| Brake lines apply pressure to braking  cylinders in the wheel |
| comprises of an anti-lock system working  on the recirculation principle. |
| Less material will be needed |
| No requirement of symmetrical design |

Diagram

Description automatically generated

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| **Diagonal split braking system** |
| connects the front and the diagonally opposed rear brake assembly to each  hydraulic circuit. |
| No such system will be there using diagonal  split |
| Comparatively more material will be  needed |
| Can be only used in symmetrical design |

Diagram

Description automatically generated