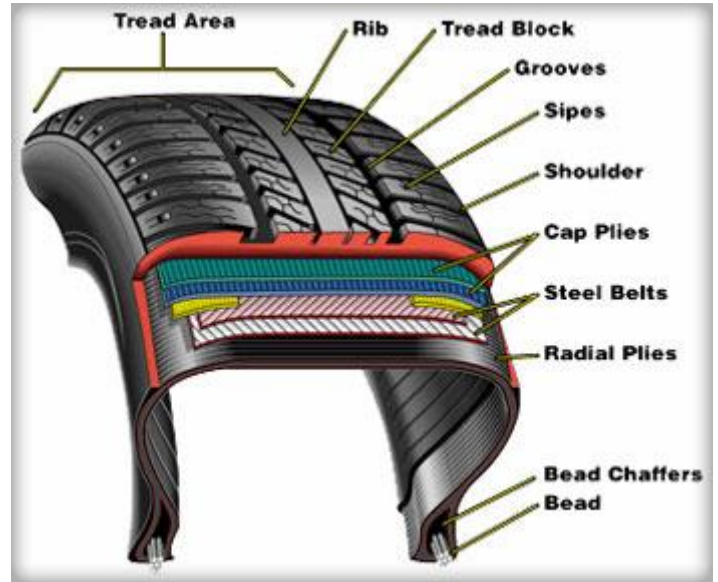
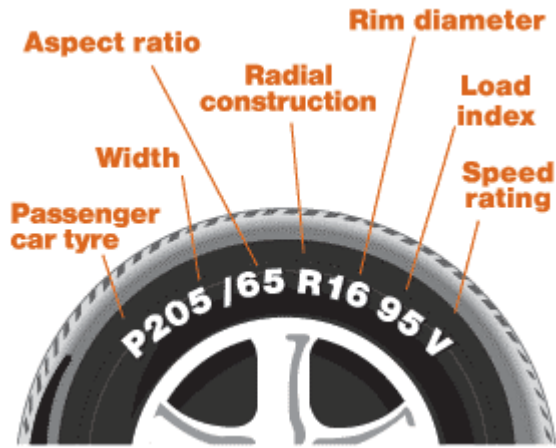


Motor Vehicle Design & Technology (Wheels, Tyres & Brakes) – Knowledge Organiser



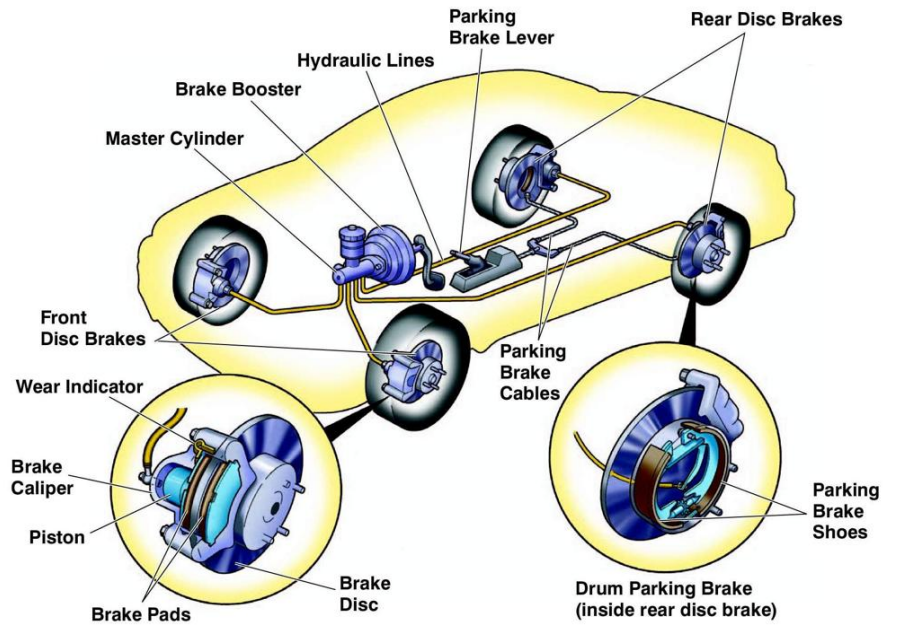
Key words and definitions


Aquaplane	when water lifts the tyre away from the road surface and grip is lost	Deflate	let the air out of something	Efficiency	how well something works
Pneumatic	using air pressure to work	Leading shoe	the brake shoe mounted after the wheel cylinder in the direction of drum rotation	Self-servo	this is a type of braking assistance, created by the rotation of the brake drum
Deform	to become badly out of shape	Trailing shoe	the brake shoe mounted before the wheel cylinder in the direction of drum rotation	Hydraulic	using liquids to operate
Radial-ply	a tyre construction method where the casing plies are wrapped at an angle of 90° to the bead	Brake fade	a condition that occurs when brake friction material can no longer absorb any more heat	Alloy	a mixture of metals combined to form a single metallic construction
Tubeless construction	a tyre construction method that uses a soft inner liner to seal air against the wheel rim	Shimmy	an abnormal wobble of a car's wheels	Aspect ratio	the height of the tyre sidewall, measured as a percentage of the tyre tread width
Bead	a number of steel wire hoops. the casing plies are wrapped around them.	Tyre shoulders	the outer edges of the tyre tread	Dissipation	the removal of heat into the air from braking components
Plies	flat strips of material that are wrapped around bead wires to form the tyre casing	Understeer	where a vehicle tries to continue in a straight line when it is turned into a corner	Hygroscopic	a term that describes the moisture absorbing properties of brake fluid
Balance	the balance of a tyre ensures that it has no heavy spots that will create vibrations	Oversteer	when a car tries to turn further than it should when it is turned into a corner. This leads to the back end of the car spinning	Retract	to take or move back

Conventional Brake System (non-ABS)

Anti-lock braking systems (ABS)

- An ABS system uses electronics to detect the rotating speed of individual wheels.
- If one wheel is turning considerably slower than the others, a computer decides that it is about to skid.
- This computer then operates a series of valves to reduce or remove hydraulic pressure from that particular brake assembly.
- When the wheel is once again turning speed similar to the others, normal braking is returned.



Component	Description
Brake pedal	The brake pedal is a mechanical lever operated by the driver's foot. It acts upon pistons in the brake master cylinder.
Master cylinder	A brake master cylinder contains one or more pistons. When moved by the brake pedal, the piston/s forces fluid under pressure through pipes and hoses down to the wheel assemblies.
Slave cylinder	A slave cylinder is a general term used to describe the hydraulic pistons at the wheel brake assemblies, i.e. wheel cylinders and calipers.
Brake booster/servo	A vacuum operated mechanism that assists the driver in the application of the brakes. This is a form of power assistance.
Brake pipes and hoses	 <p>When a hydraulic leaves the brake master cylinder, it travels to the wheel assemblies using pipes and hoses. Metal brake pipes are routed around the car body/chassis and are usually clipped securely to prevent vibration and damage. At the wheel assemblies, reinforced rubber hoses are used to direct the fluid to wheel cylinders or brake calipers. Flexible rubber hoses are needed so that they can allow for steering and suspension movement.</p>

