

EBS

Integration With Other Braking Components

Richard Brain

PACCAR Trucks Australia

EBS

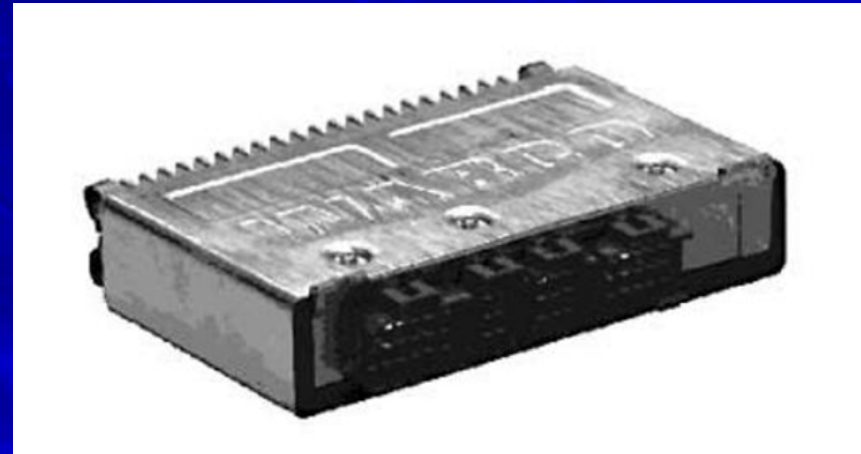
Integration With Other Braking Components

- Why EBS
- Basics
- Set up of the combination
- Issues and actions

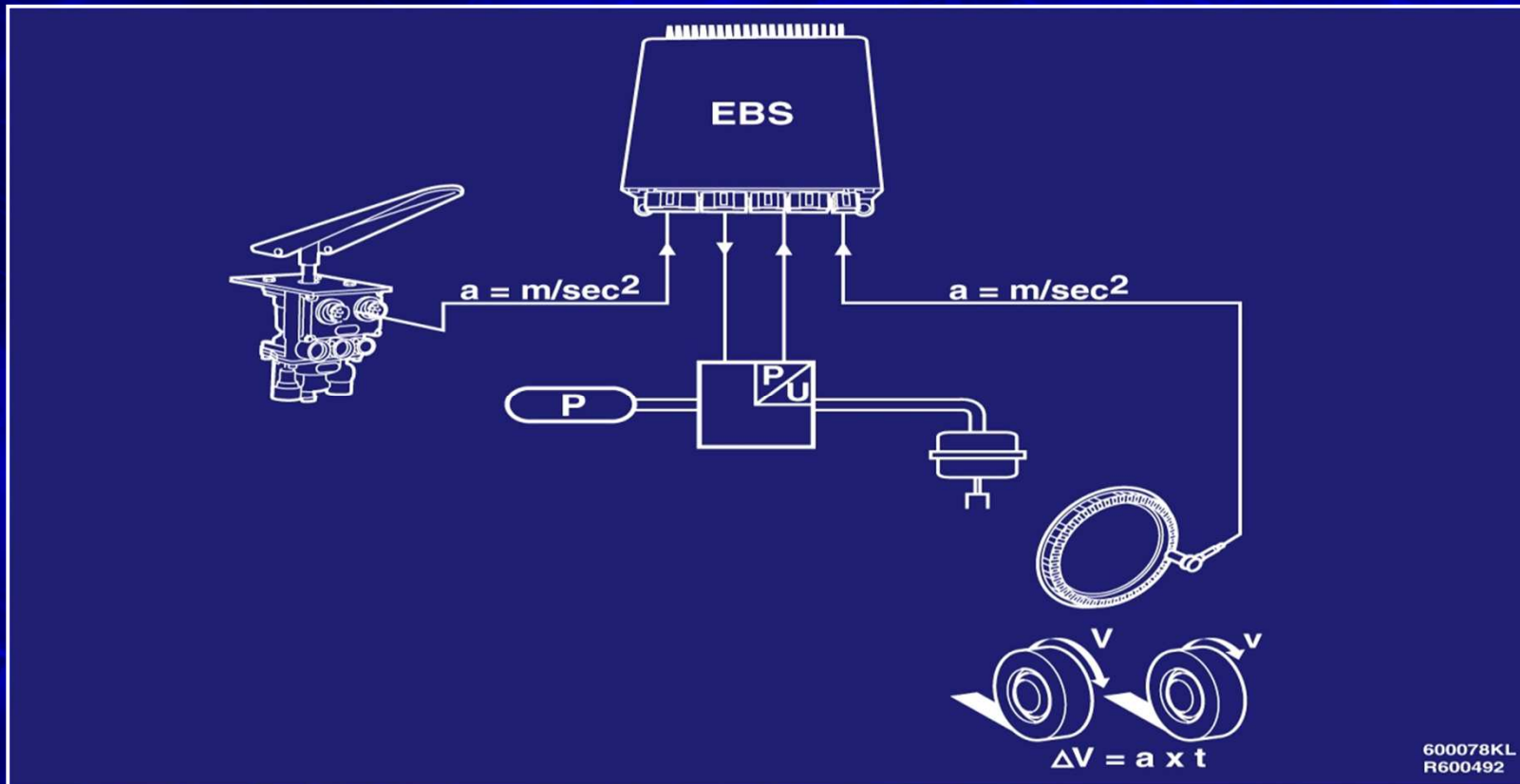


EBS Basics

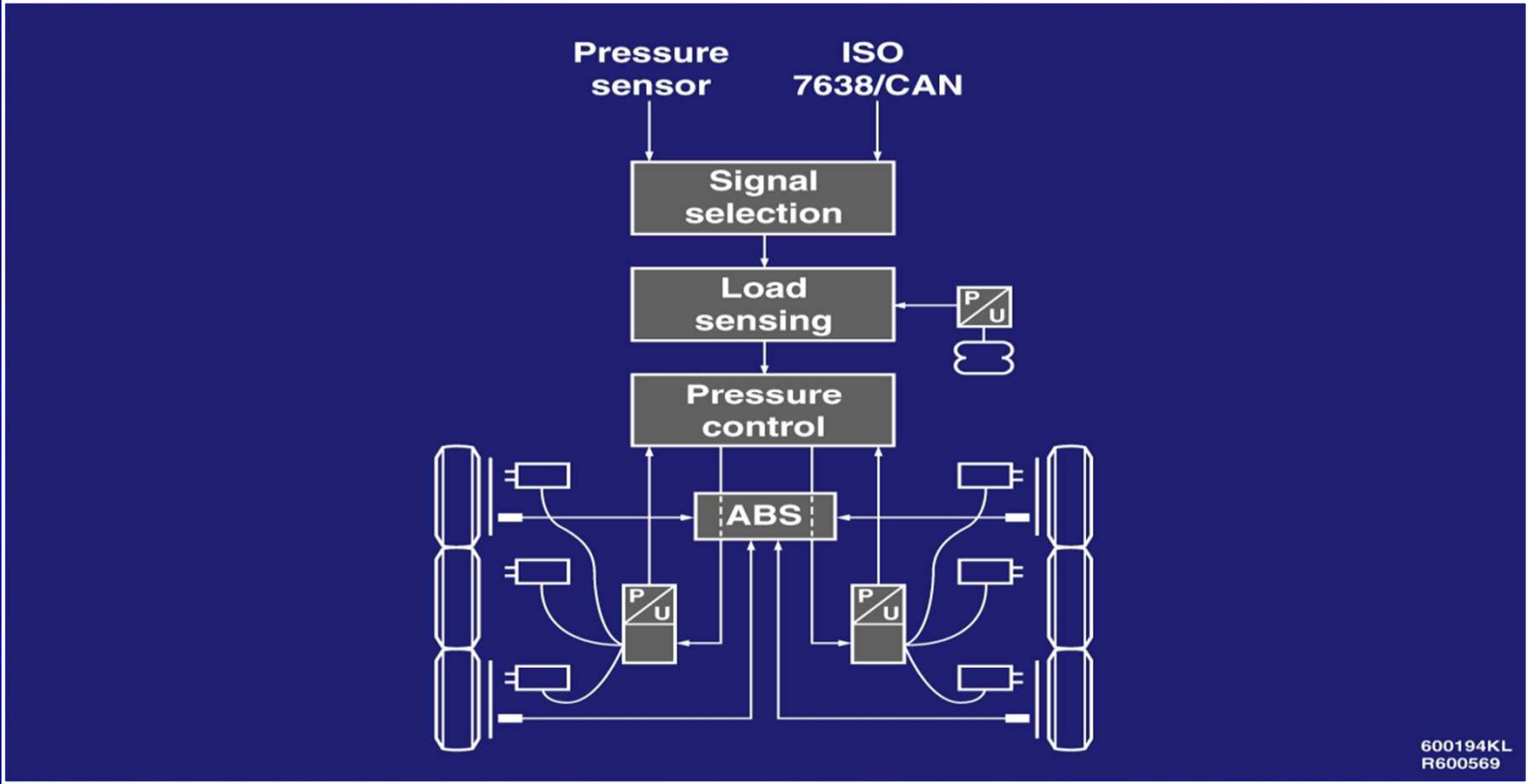
- The EBS is controlling electronically the brake cylinder pressure in relation with the desired deceleration



EBS Basics



EBS Basics



Footbrake Valve

- To inform the electronic unit EBS about the desired deceleration
- To admit and bleed air to/from the pneumatic circuit in the event of a fault in the electrical circuit



Front Axle Modulator

- To send a specific braking pressure to the front axle controlled by the EBS unit
- To inform the EBS unit about the braking pressure via a pressure sensor



Rear Axle Modulator

- Processes information from the CAN data bus of the EBS electronic unit regarding the braking pressure required
- Transmits the wheel slip registered by the wheel speed sensors to the EBS electronic unit via the CAN data bus



Rear Axle Modulator

- Controls the braking pressure to the rear axle by comparing the output pressure to the rear axle with the information received from the EBS electronic unit
- Controls the ABS and ASR functions of the rear axle



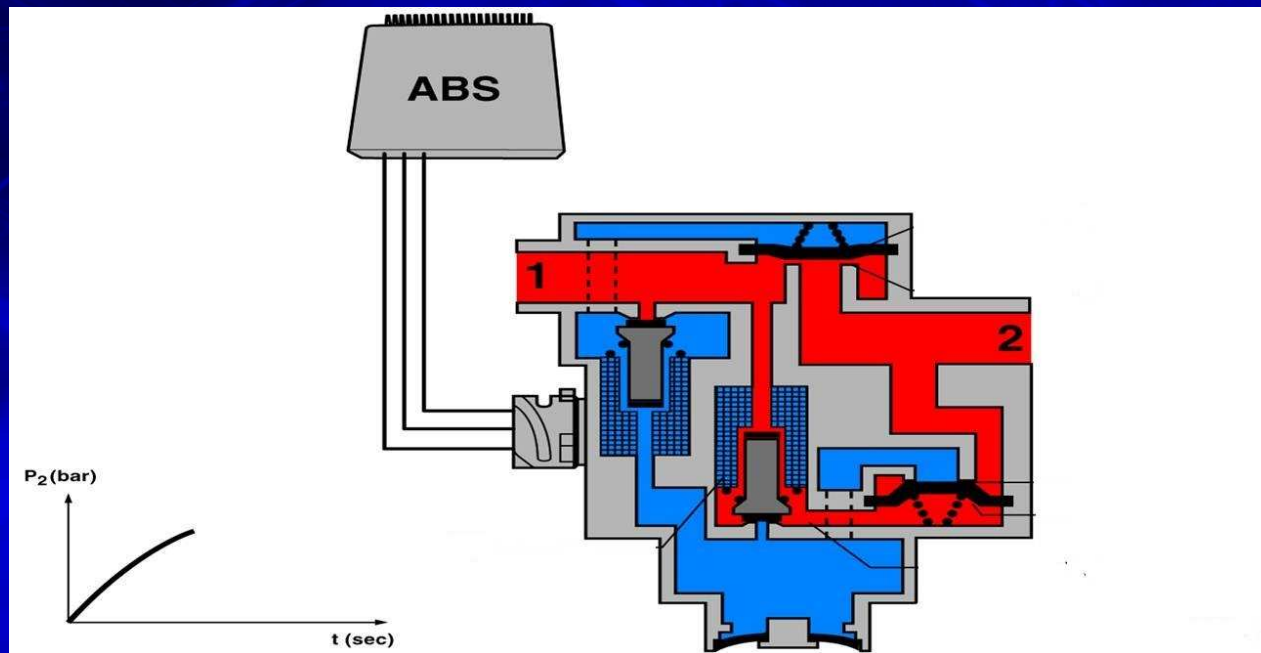
ABS Valve



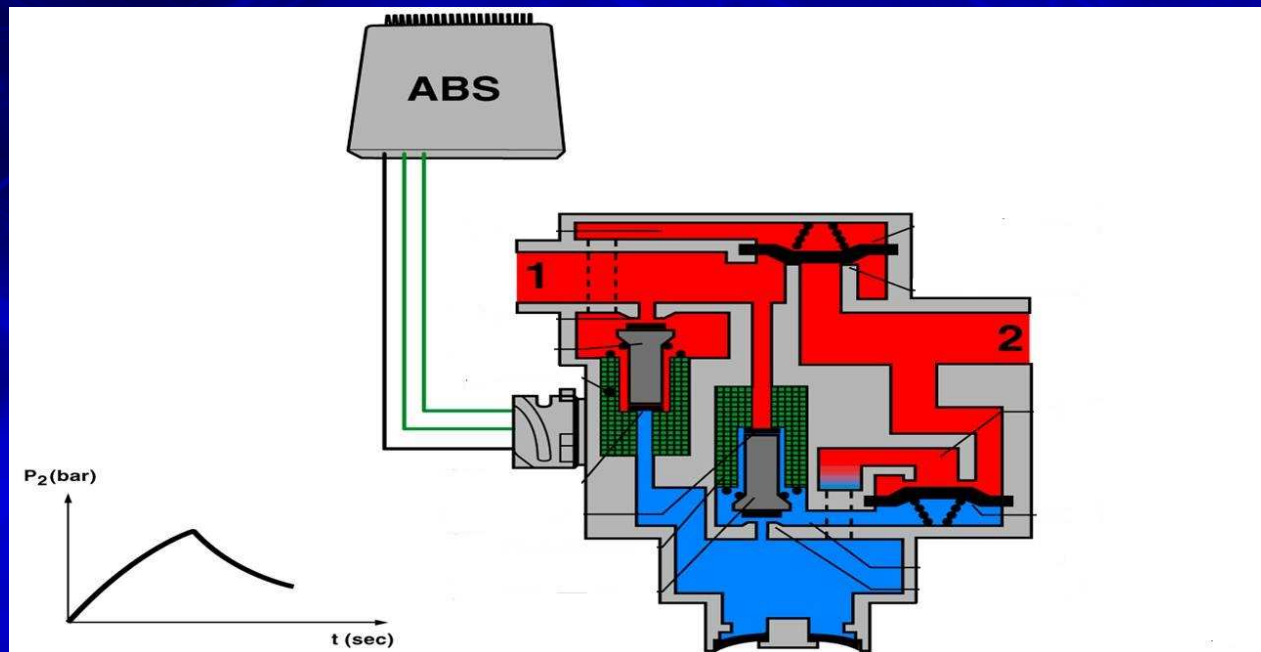
- Sends a specific braking pressure to the brake booster controlled by the EBS unit or rear axle modulator during ABS control



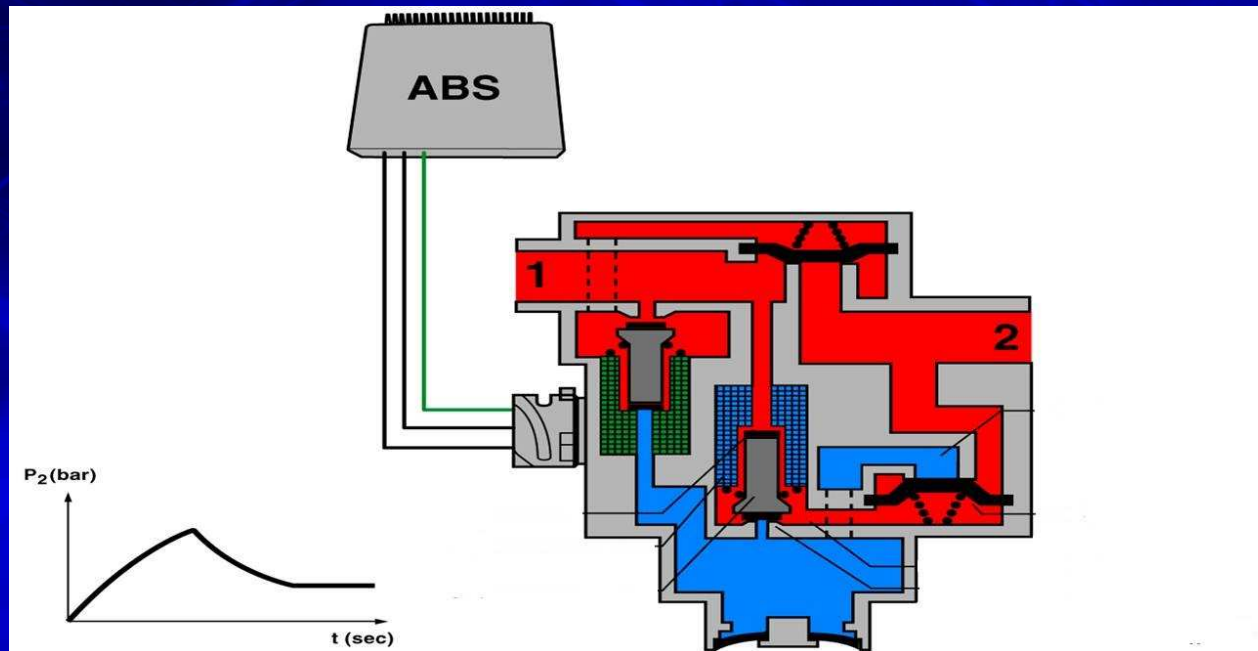
ABS Valve Increasing Pressure



ABS Valve Decreasing Pressure



ABS Valve Hold Pressure



Trailer Control Valve

- Sends a specific pressure to the trailer controlled by the EBS unit via the blue line
- Informs the EBS unit of the coupling pressure in the blue line.



Trailer Control Valve

- Controls the coupling pressure to the trailer in the event of an electrical failure



Wheel Speed Sensor

- Registers;
 - Deceleration in wheel speed
 - Acceleration in wheel speed
 - Wheel slip



Set Up Of The Combination

ECO Tronic EBS




~~EBS
ABS
LSV (ALB)~~



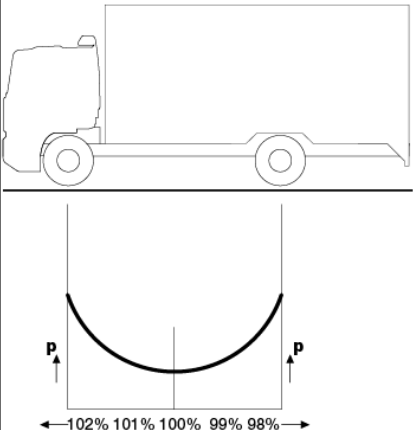
EBS
ABS
LSV (ALB)

	BPW ADR Tü.EGG.094-04	4S/2M Stability	11A 11B	110mm 100t	11A 11B	110mm 100t			
TRAILER MANUFACTURER FAHRZEUGHERSTELLER PRODUCTEUR DE VEHICULE	Byford Equipment	BRAKE CALCULATION NO. BREMSBERECHNUNGSNUMMER CALCUL DE FREINAGE NO.	AU512KAK2300						
CHASSIS NUMBER FAHRGESTELLENUMMER NUMERO DE CHASSIS	6B9BP3F23C1DR6595	TYPE TYP TYPE	Tri L 32329						
THRESHOLD PRESSURE ANSPRECHDRUCK PRESSION D'APPROCHE [bar]	0.20	PRESSURE LIMIT DRUCKGRENZUNG LIMITE DE PRESSION [bar]	6.50						
UNLADEN / LEER / A VIDE			LADEN / BELADEN / EN CHARGE						
INPUT PRESSURE EINGANGSDRUCK PRESSION D'ENTREE [bar]	6.50	INPUT PRESSURE EINGANGSDRUCK PRESSION D'ENTREE [bar]	0.50	1.60	-	6.50			
AXLE LOAD ACHSLAST CHARGE ESSEIU [kg]	SUSPENSION PRESSURE BAGDRUCK PRESSION DE SUSPENSION [bar]	OUTPUT PRESSURE AUSGANGSDRUCK PRESSION DE SORTIE [bar]	AXLE LOAD ACHSLAST CHARGE ESSEIU [kg]	SUSPENSION PRESSURE BAGDRUCK PRESSION DE SUSPENSION [bar]	OUTPUT PRESSURE AUSGANGSDRUCK PRESSION DE SORTIE [bar]	6.50			
1 AXLE 1 ACHSE 1 ESSEIU	2206	0.90	4.20	7500	4.25	0.40	1.40	-	6.50
2 AXLE 2 ACHSE 2 ESSEIU	2206	0.90	4.20	7500	4.25	0.40	1.40	-	6.50
3 AXLE 3 ACHSE 3 ESSEIU	2206	0.90	4.20	7500	4.25	0.40	1.40	-	6.50

Set Up Of The Combination “P” Shot

3-01	This is a comfort parameter setting which determines the pulsing 'P-inshot' to the semi-trailer.	0 bar	3.5 bar	<p>The pressure pulse activation 'P inshot' is only available on FT vehicles and is only active if a semi-trailer without EBS system is coupled.</p> <p>This setting can be changed if:</p> <ul style="list-style-type: none">there is a complaint relating to the towing of the semi-trailer when braking is started. <p> Within DAVIE a value between 0 and 200 is programmed. Where 0 = 0 bar and 200 = 3.5 bar.</p>
------	--	-------	---------	--

Set Up Of The Combination Lining Wear Balance

<p>3-02</p>	<p>This setting allows you to determine the brake pressure ratio (in the brake lining wear control) between the front axle and the rear axle.</p> <p>The value of this setting is related to:</p> $\text{Front axle braking pressure} / \text{rear axle braking pressure} \times 100\%$	<p>70%</p>	<p>170%</p>	<p>If the value of this customer parameter is increased, pressure (p) to the front axle increases proportionally and pressure (p) to the rear axle decreases proportionally. In the brake lining wear control this causes the brake lining wear load to the front axle to increase and the brake lining wear load to the rear axle to decrease.</p>  <p style="text-align: right;">R601251</p>
-------------	---	------------	-------------	--

Set Up Of The Combination Pre-dominance

3-04	This setting allows you to adjust the pre-dominance of a (semi-)trailer that is executed with a conventional brake system or EBS.	-0.35 bar	0.50 bar	<p>If the value of this customer parameter is increased, the pre-dominance of the (semi-)trailer is increased. The brake lining wear load to the truck decreases and the brake lining wear load to the (semi-)trailer increases as a result.</p> 
------	---	-----------	----------	---

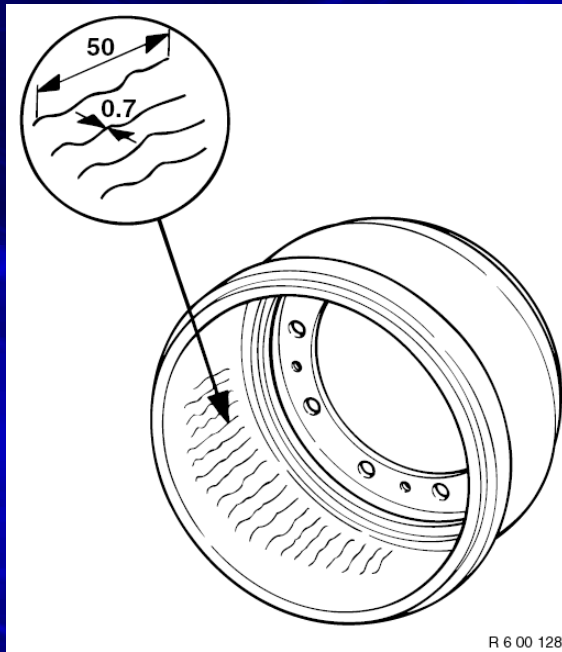
Set Up Of The Combination Brake Roller test



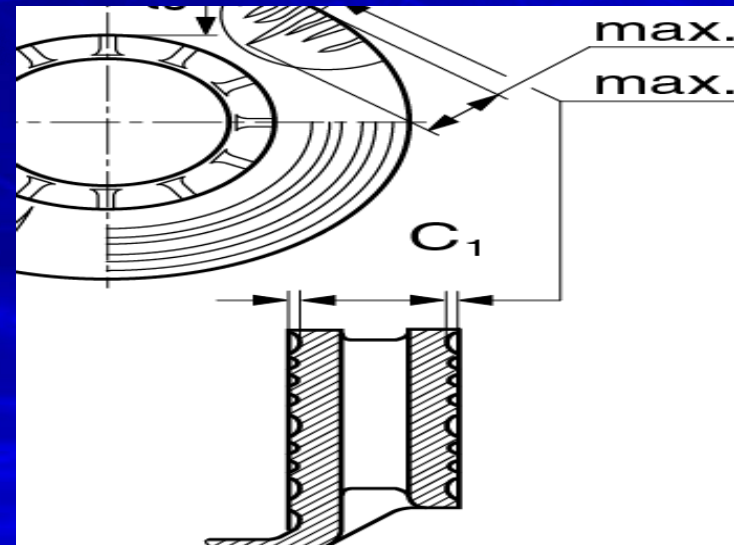
Goal Pre-Dominance

- To compensate the actuating time of the trailer
- To achieve that all wheels are braked at the same time
- To keep a 'straight' vehicle combination
- To have a equal deceleration on all wheels of the combination

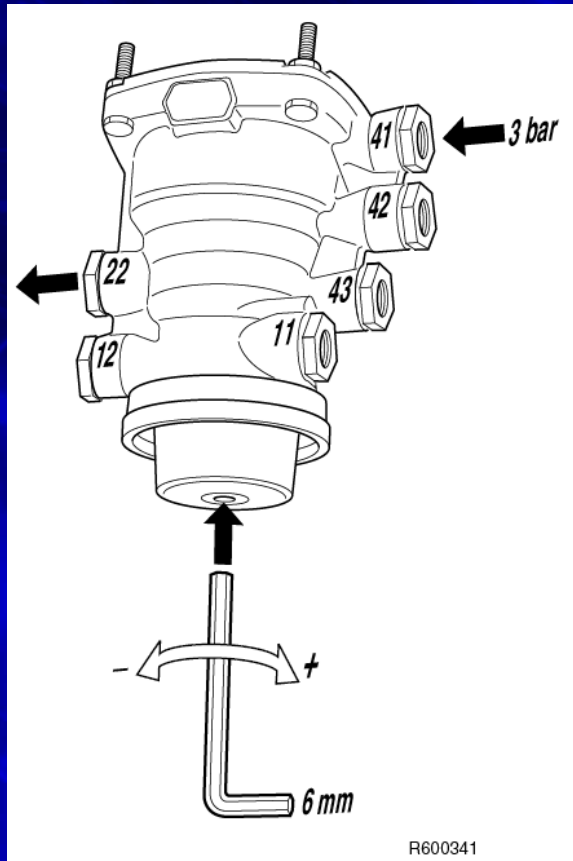
Issues and Actions



- Check the manual



Issues and Actions



- Check the manual
- Understand what you are doing and the consequences of getting it wrong!

Issues and Actions



- Have good records of what has been done
- Talk to the OEM supplier

Issues and Actions



- There is always a solution!
- Working together we can all help to achieve the best possible solution