Brakes — SPECIFICATIONS

Model		320 i	320 i A
Brakes	Front	ATE caliper-type disc brakes with automatic adjustment for pad wear	
	Rear	Inside shoe brakes with simplex shoes	
Parking brake		Mechanical with action on rear wheels	
Test pressure according to ATE Standards		$100^{}_{-20}$ bar ($1400^{}_{-280}$ psi), may drop by max. 10 % after 1 minute	
Brake fluid tank		on tandem brake master cylinder with clutch connection[2] and brake fluid level indicator switch	
Brake fluid[1]		ATE "SL"	
Brake booster		T 52/200	
Tandem master cylinder			
Piston diameter	mm (in.)	20.64 (0.812)	
Stroke for disc brakes	mm (in.)	20 ± 1 (0.787 ± 0.040)	
Stroke for drum brakes	mm (in.)	$14 \pm .3$ (0.551 ± 0.012)	
Play betw. master cylinder piston and pressure rod	mm (in.)	0.05 (0.0020)	
Front Disc Brakes			
Front caliper		S 48 e / 22/12	
Piston diameter	mm (in.)	48 (1.890)	
Piston turn		20^{0}	
Front brake disc diameter	mm (in.)	255 ± 0.2 (10.040 ± 0.008) - inboard venting	
Brake disc thickness	mm (in.)	$22^{}_{-0.2}$ ($0.866^{}_{-0.008}$)	
Min. brake disc thickness	mm (in.)	21[3] (0.827)	

1) Must be replaced once each year. 2) Clutch connection not applicable to cars with automatic transmission.

3) Max. machining of each braking surface is 0.5 mm (0.020") / min. disc thickness must be 21 mm (0.827").

Model		320 i	320 i A
Continuation of Front Disc Brakes			
Max. brake disc unbalance (after balancing)	gcm		30
Max. brake disc thickness tolerance within braking surface	mm (in.)		0.02 (0.0008)
Max. lateral runout of removed brake disc (checked at 255 - 20 mm/10.040 - 0.787" brake disc diameter)	mm (in.)		0.05 (0.0020)
Max. lateral runout of installed brake disc (checked at 255 - 20 mm/10.040 - 0.787" brake disc diameter)	mm (in.)		0.2 (0.008)
Front brake pad		Textar T 260 FF (color code: yellow-green-yellow	1 rain water groove)
Min. brake pad thickness	mm (in.)		7.65 (0.301)
Min. pad material thickness	mm (in.)		3.00 (0.118)
Rear Drum Brakes			
Rear wheel brake cylinder piston diameter	mm (in.)		19.05 (0.750)
Rear brake drum diameter	mm (in.)		250 (9.842)
1st oversize grind	mm (in.)		$250^{+0.5}$ ($9.842^{+0.020}$)
2nd oversize grind	mm (in.)		$250^{+1.0}$ ($9.842^{+0.040}$)
Max. ovality	mm (in.)		0.05 (0.0020)
Max. brake drum unbalance	gcm		150
Rear brake liner			Energit 336
Test symbol			Energit 336 GH
Brake liner width	mm (in.)		40 ± 0.5 (1.575 ± 0.020)
Brake liner thickness	mm (in.)		$5_{-0.3}$ ($0.197_{-0.012}$)
Min. brake liner thickness	mm (in.)		3.0 (0.118)

Brakes

SPECIFICATIONS

Model		320 i	320 i A
Brake Pressure Regulator			
Make/type			Teves ATE BRMS 18
Code			25
Piston diameter	mm (in.)		18 (0.709)
Switching pressure	bar (psi)		25 (355)
Pressure Differential Indicator Switch			
Make			Teves
Continuous contact at differential pressure	bar (psi)		12.5 $\pm$ 2.5 (178 $\pm$ 35)
Pressure Differential Control Switch			see Group 61

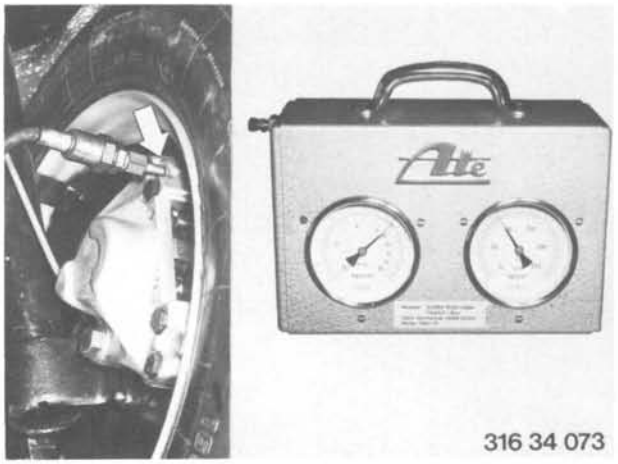
Torque Specifications in Nm / kpm (ft. lbs.)

Caliper to steering knuckle	80 ... 95 / 8.0 ... 9.5 (58 ... 69)	Rear wheel cylinder bleeder valve	2.5 ... 4.0 / 0.25 ... 0.40 (2 ... 3)
Brake disc to wheel hub (M 6 bolt)	4 ... 5 / 0.4 ... 0.5 (3 ... 3.5)	Front caliper bleeder valve	3.5 ... 5.0 / 0.35 ... 0.50 (2.5 ... 3.5)
Brake hose	13 ... 16 / 1.3 ... 1.6 (10 ... 11)	Master cylinder to brake booster	16 ... 20 / 1.6 ... 2.0 (12 ... 14)
Brake line couplings	13 ... 16 / 1.3 ... 1.6 (10 ... 11)	Brake booster to pedal base	22 ... 24 / 2.2 ... 2.4 (16 ... 17)
Lines to brake pressure regulator (M 10)	12 ... 16 / 1.2 ... 1.6 (9 ... 11)	Brake anchor plate to trailing arm (M 10) (with Loctite AVV)	60 ... 67 / 6.0 ... 6.7 (44 ... 48)
Clutch and brake pedal pivot bolt	25 ... 28 / 2.5 ... 2.8 (18 ... 20)	Parking brake cable counternut (M 6)	8 ... 9 / 0.8 ... 0.9 (6 ... 6.5)
Brake booster piston rod counternut	25 ... 27 / 2.5 ... 2.7 (18 ... 19)	Pressure differential indicator control switch	2 ... 2.5 / 0.2 ... 0.25 (1.5 ... 2)
Stop light switch counternut	3 ... 4 / 0.3 ... 0.4 (2 ... 3)	Pressure differential indicator switch to wheelhouse	12 ... 14 / 1.2 ... 1.4 (9 ... 10)

34 00 019 CHECKING SERVICE BRAKE WITH HIGH, LOW AND INITIAL PRESSURE TESTS

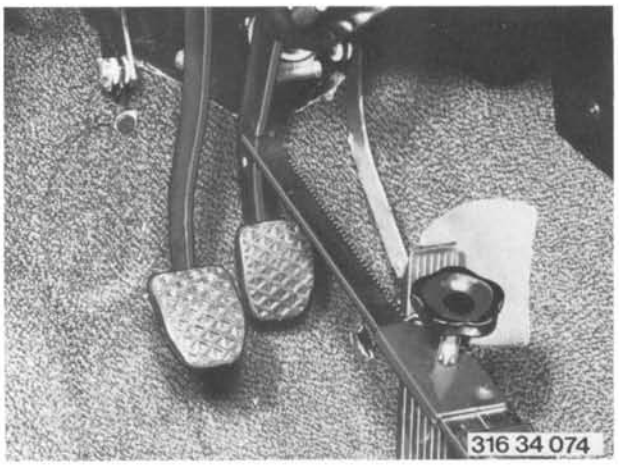
High Pressure Test for Leaks

Unscrew caliper bleeder screw.
Install adapter for connection of tester and connect tester.
Bleed pressure tester.



Build up pressure[1] in brake system by pumping brake pedal and hold brake pedal down with pedal prop.
Max. pressure drop after 1 minute is 10 %.

Caution! High pressure testing for leaks is performed once each with and without a running engine.

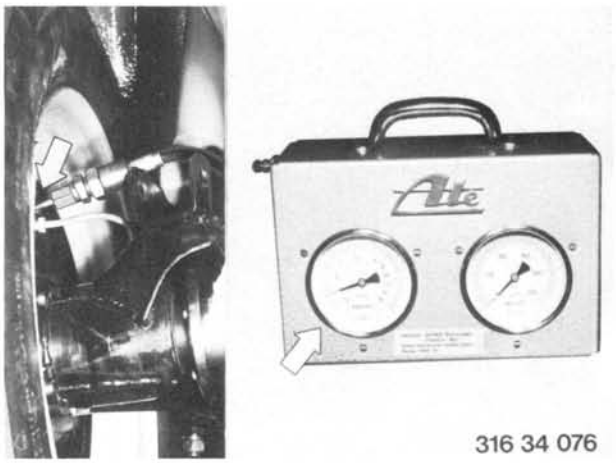


Low Pressure Test

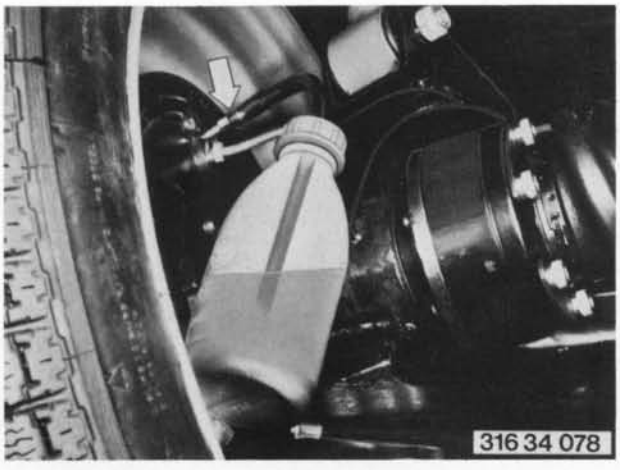
Shorten pedal prop so that test pressure in brake system is 2 ... 5 bar (28 ... 71 psi). Car and tester must remain still, since movement would cause incorrect readings.
Pressure must remain constant during test of 5 min..
Check all rubber parts, if pressure drops considerably.

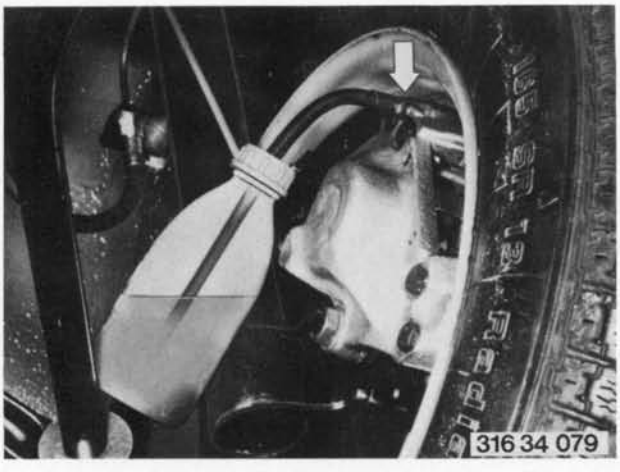
Initial Pressure Test

Remove and install spring strut bolt at trailing arm. Support trailing arm.
Unscrew wheel brake cylinder bleeder screw.
Install adapter for connection of tester and connect pressure tester. Bleed pressure tester.
Pump brake pedal several times, and then release pedal. Pressure must drop to 1.2 ... 0.5 bar (17 ... 7 psi).
Initial pressure must not drop below 0.5 bar (7 psi) during test of 5 minutes.
Installation Note! Torque[1]



1) See Specifications





34 00 046 BLEEDING BRAKES

Brake fluid[1)] must be replaced every year.
Brake fluid is hygroscopic and consequently will absorb moisture from the atmosphere through vent hole in brake fluid tank. This reduces boiling point of brake fluid to 160 ... 180° C (320 ... 355° F).

Caution! Be careful not to spill brake fluid on any painted surface. Brake fluid will destroy paint.
Connect bleeder to brake fluid tank.

Caution! Keep filling pressure below 2 bar (28 psi).

Rear Wheel Brakes

Connect bleeder hose with container to bleeder screw.
Unscrew bleeder screw.
Tighten bleeder screw as soon as there are no air bubbles escaping.

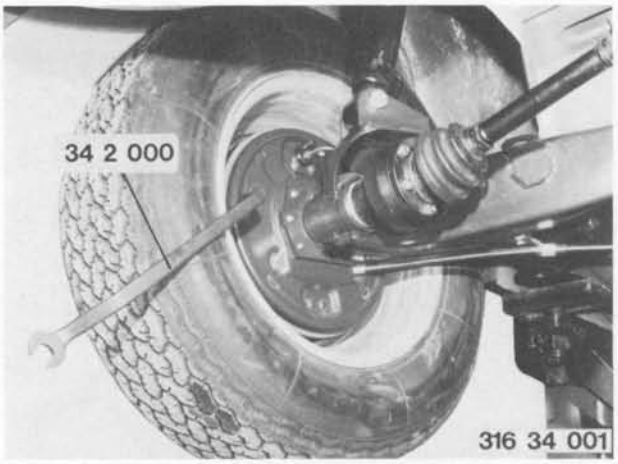
Front Wheel Brakes

Connect bleeder hose with container to bleeder screw.
Unscrew bleeder screw.
Tighten bleeder screw as soon as there are no air bubbles escaping.

1) See Specifications

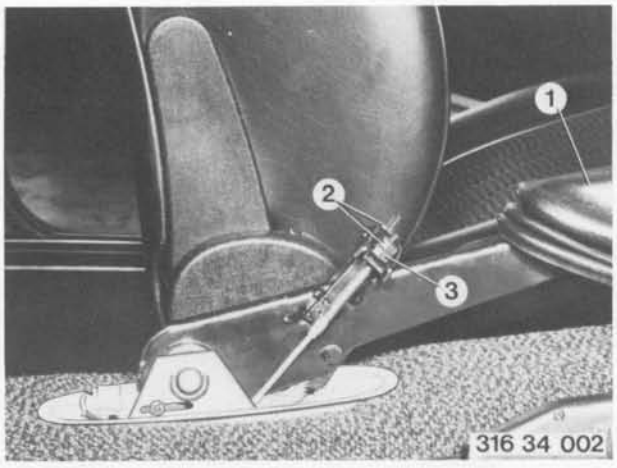
34 10 014 ADJUSTING PARKING BRAKE

Parking brake must be adjusted when parking brake lever can be pulled by more than 5 teeth without any braking effect.
Jack up rear of car and insert supports.
Release parking brake lever fully.
Use Special Tool 34 2 000 to tighten brake shoes until wheel is held tight by turning the adjusting cam, left cam counterclockwise and right cam clockwise, while turning the wheel continuously. Then loosen cam bolts by 1/8 turn until the wheel can just barely turn.



Slide rubber cap (1) up on parking brake lever.
Loosen counternut (2).
Pull on parking brake lever by 5 teeth from completely released position.
Tighten adjusting nut (3) until wheel is held tight.
Tighten counternut (2) again.

Installation Note! Tighten to specified torque[1].



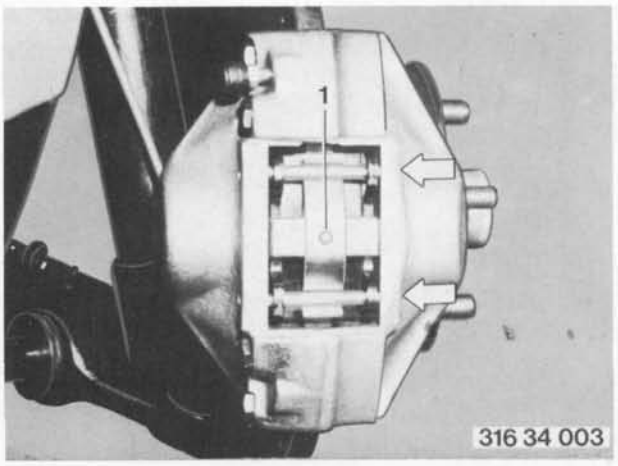
Now check whether rear wheels turn freely when parking brake lever is released. Both cables can be checked for uniform adjustment by turning the rear wheels by hand with parking brake lever pulled slightly.

1) See Specifications

34 11 000 REMOVING AND INSTALLING BRAKE PADS

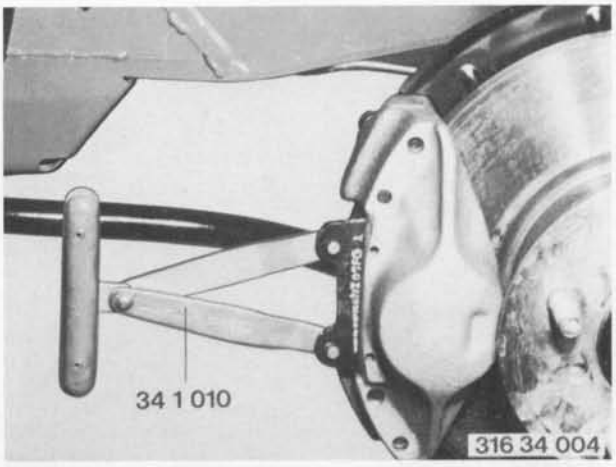
Remove and install front wheel - 36 10 300.
Drive out retaining pin.
Remove cross spring (1).

Installation Note! Check cross spring (1), and replace if necessary.



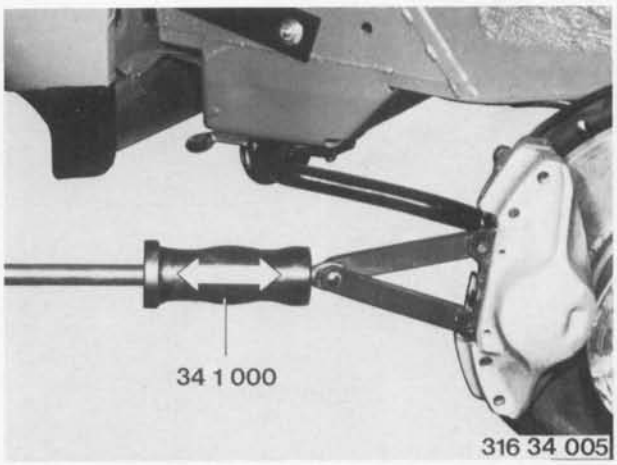
Pull out brake pad with Special Tool 34 1 010.

Caution! Mark position of used brake pads.
Never mix pads which are worn on only one side.

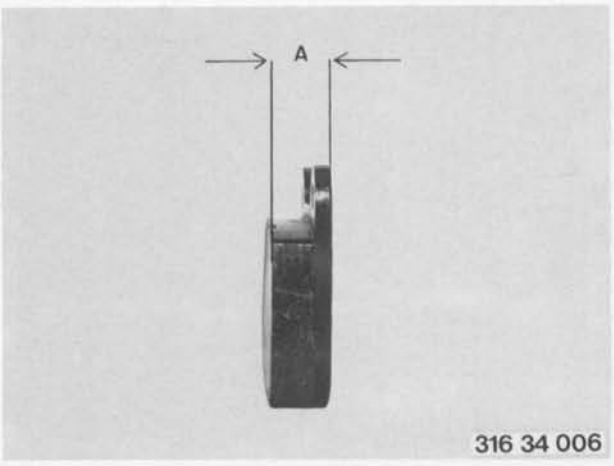


Knock out stuck brake pads with Special Tool 34 1 000.

Caution! Mark position of used brake pads.
Never mix pads which are worn on only one side.



Installation Note! Note minimum thickness A[1].
Brake pads mose move freely in calipers.



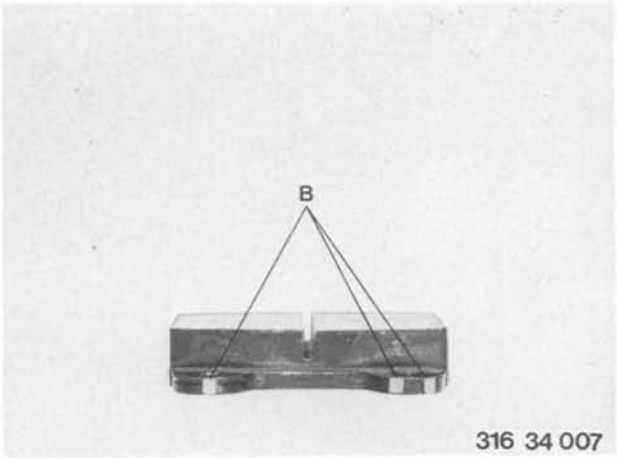
1) See Specifications

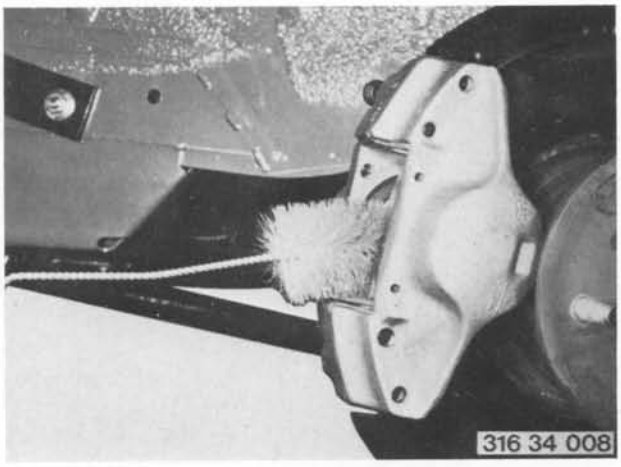
34 11 001 REPLACING BRAKE PADS

Remove and install brake pads - 34 11 000.

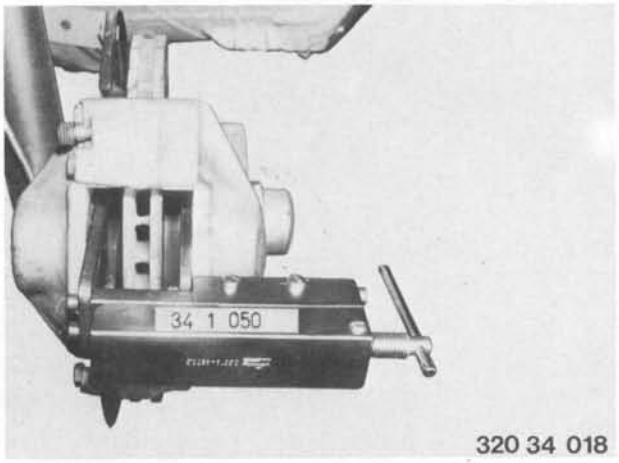
Caution! Brake pads must always be replaced on both calipers of one axle at the same time.

Note color code (B)[1] and make[1].



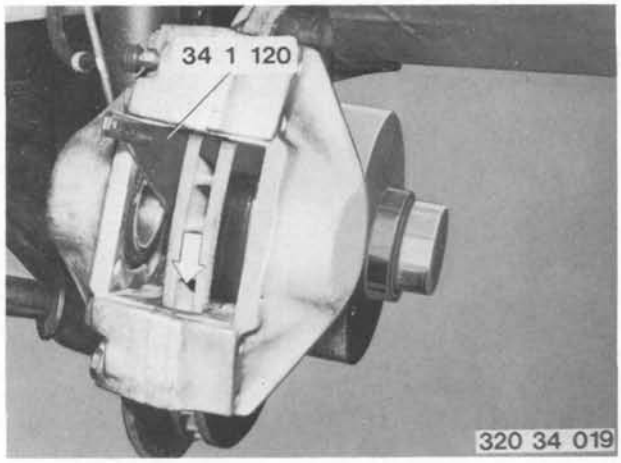


Clean guide surface and seat in housing recess with a cylindrical brush.
Never apply a mineral oil solvent.
New brake pads must move freely in calipers.



Press piston against stop in caliper with Special Tool 34 1 050.

Caution! Watch brake fluid level in tank.



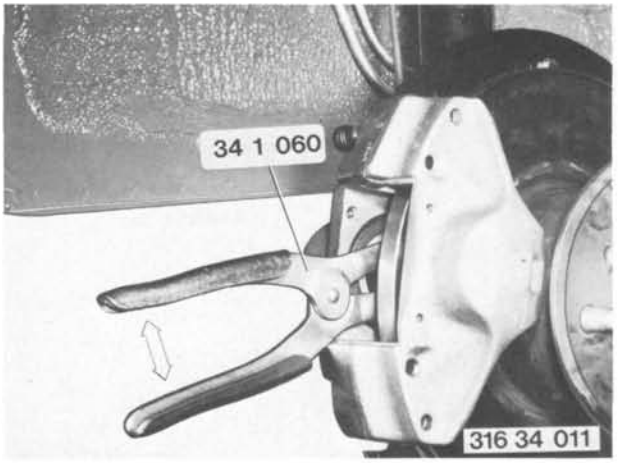
Check 20° position of piston with Special Tool 34 1 120.
20° shoulder of piston faces brake disc lead.
See "Troubleshooting Brakes" for results of incorrect positioning.

1) See Specifications

Correct position of piston to its 20° point with Special Tool 34 1 060.

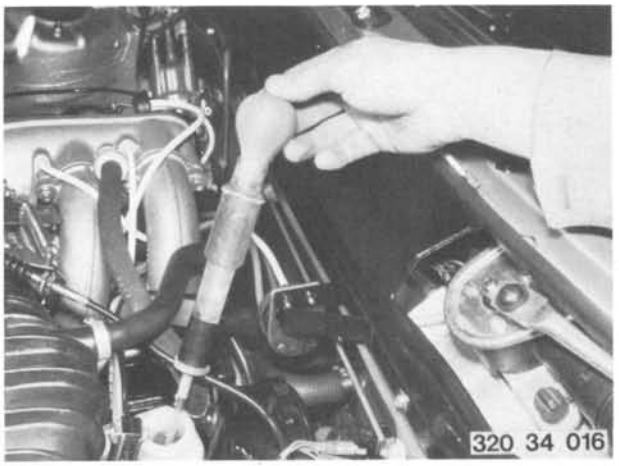
Installation Note! Install brake pads. Pump brake pedal several times to press brake pads against brake disc. Correct brake fluid level in tank.

Caution! Break in new brake pads during first 600 km (300 miles). Avoid violent stops from top speeds. Non-conformance will prevent brake pads from reaching their most favorable wear and friction values.



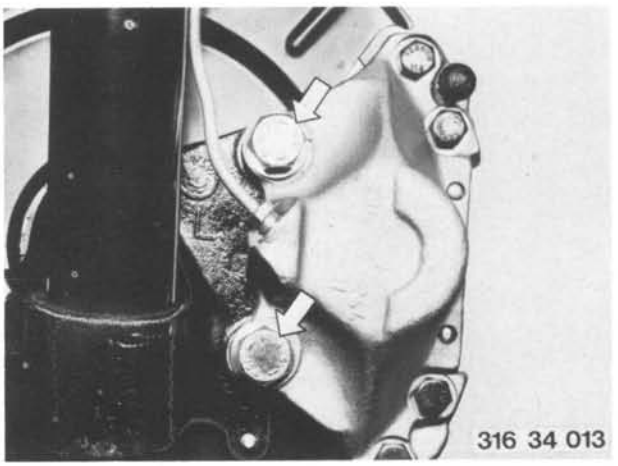
34 11 020 REMOVING AND INSTALLING CALIPER

Remove and install front wheel - 36 10 300.
Draw brake fluid out of tank with a siphoning device reserved exclusively for this purpose.



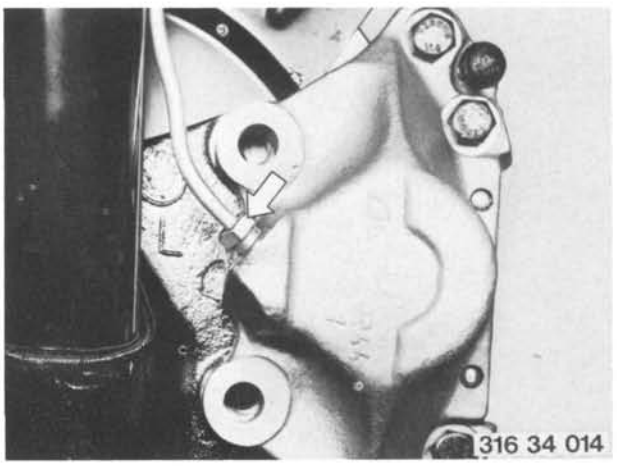
Unscrew mounting bolts.

Installation Note! Tighten to specified torque[1].



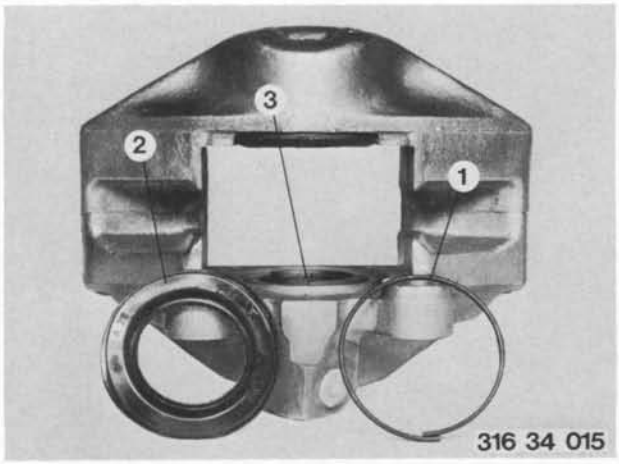
Detach brake line.

Installation Note! Tighten to specified torque[1].
Bleed brakes - 34 00 046.



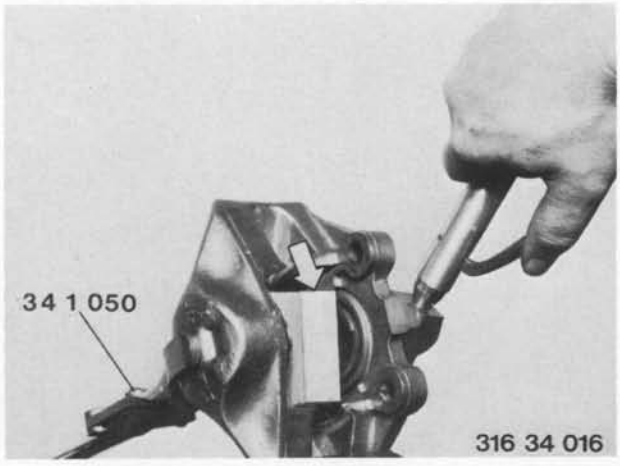
1) See Specifications

34 11 072 OVERHAULING FRONT BRAKE CALIPER
- Repair Kit Applied -



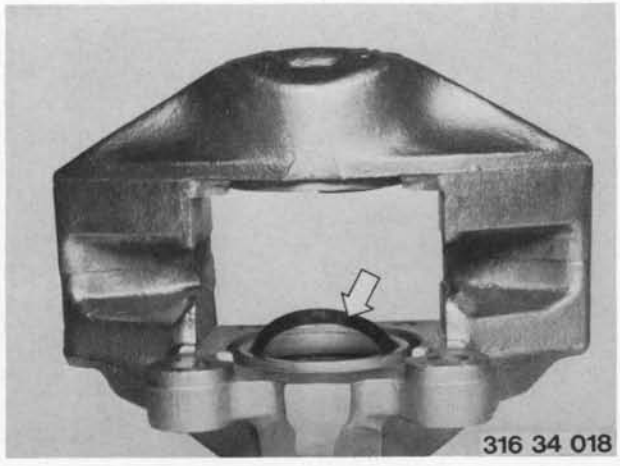
Remove and install front brake pads - 34 11 000.
Remove and install front brake caliper - 34 11 020.
Take clamping ring (1) and rubber cap (2) off of piston (3).

Installation Note! Coat inside of rubber cap (2) with ATE cylinder paste.



Tighten one piston with Special Tool 34 1 050.
Place an about 8 mm (0.315") thick plate (hard wood, hard felt or other) in caliper recess to protect piston.
Remove piston by applying compressed air through connection bore.
Plug open cylinder bore with a sealing plate and remove second piston from caliper.
Place plate in caliper recess to protect piston.
Perhaps use locally manufactured tools (sealing plate with clamping ring) from ATE.

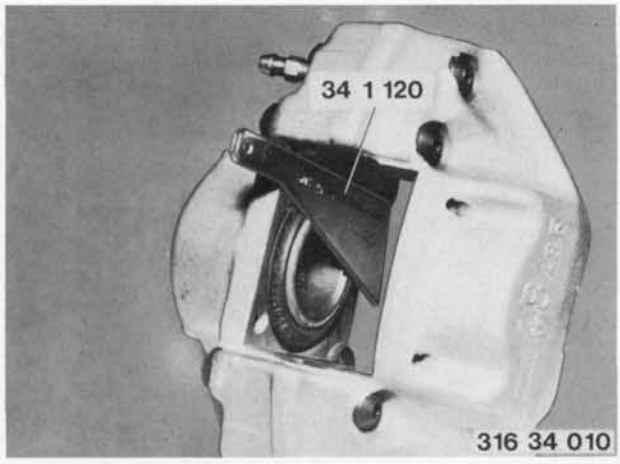
Caution! Danger! 10 bar (140 psi) pressure is equal to a force of about 125 kp (275 lbs.).



Carefully remove seal with a plastic needle.
Clean cylinder bores and parts with methylated spirits and dry with compressed air.
Check cylinder bores and pistons for damage thoroughly.
Never machine cylinders or pistons.

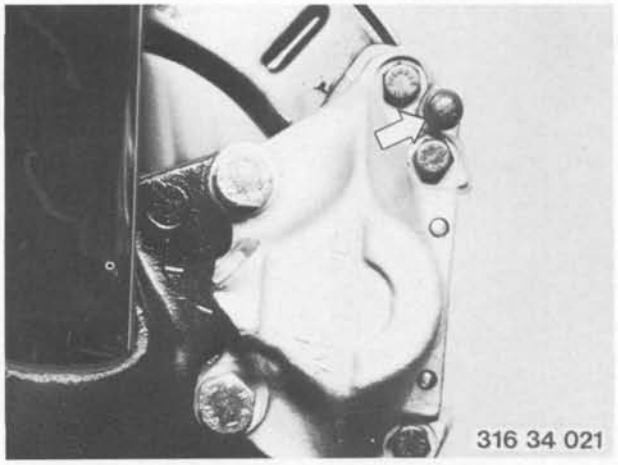
Installation Note! Apply a light coat of ATE brake cylinder paste to all parts before installing.

Caution! Don't cant pistons.



Before installing caliper check 20^{0} position of piston with Special Tool 34 1 120.
20^{0} shoulder of piston faces brake disc lead.
Correct position of piston to 20^{0} point with Special Tool 34 1 060.

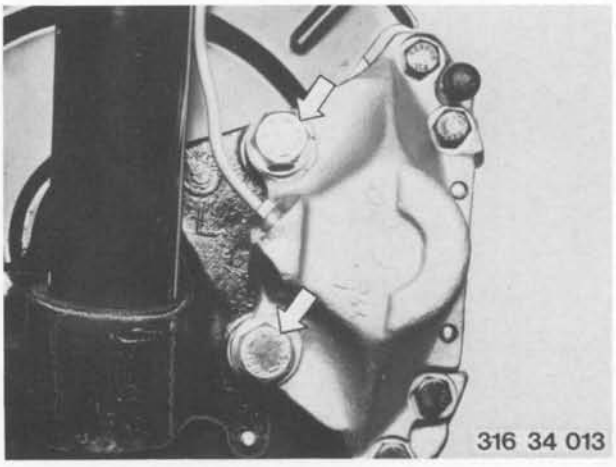
Installation Note! When installing calipers make sure that left and right calipers are not mixed up. Bleeder valves must face up.


316 34 021

34 11 200 REMOVING AND INSTALLING BRAKE DISC

Remove and install front wheel - 36 10 300.
Detach bracket at spring strut shock absorber.
Detach caliper and tie up.
Brake line remains connected.

Installation Note! Tighten to specified torque[1].


316 34 013

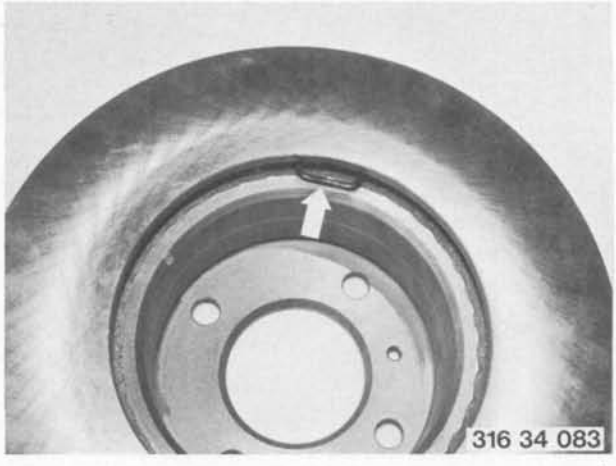
Unscrew bolt and remove brake disc.

Installation Note! Tighten to specified torque[1].

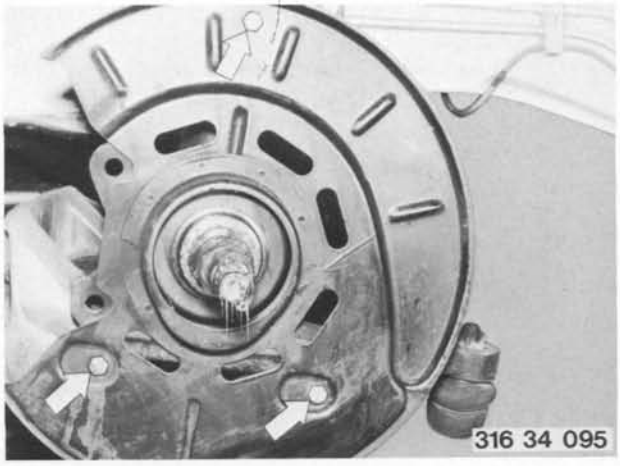
Caution! If a brake disc has to be replaced, always replace both brake discs of one axle.

316 34 094

Caution! Inboard vented brake discs have balance weight clips.
Never remove or displace them.


316 34 083

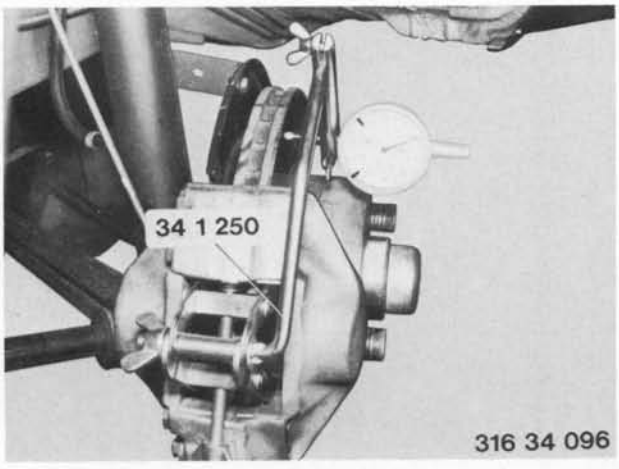
1) See Specifications



34 11 250 REMOVING AND INSTALLING GUARD

Remove and install wheel hub - 31 21 100.
Unscrew bolts and remove guard.

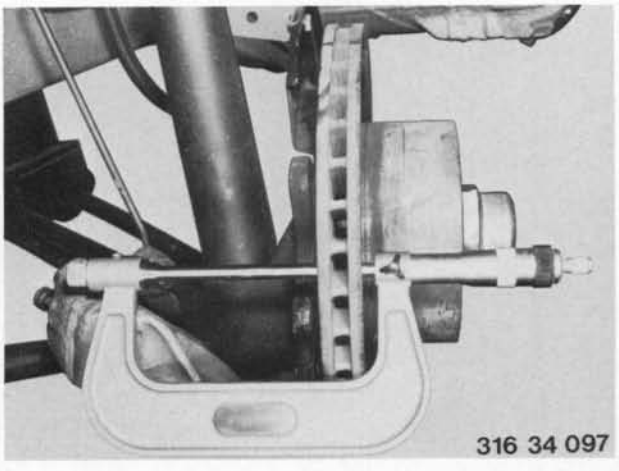
Installation Note! Tighten to specified torque[1].
Make sure that only guards with vent slots are used for replacements.



34 11 589 CHECKING BRAKE DISC RUNOUT AND DIFFERENCE IN THICKNESS

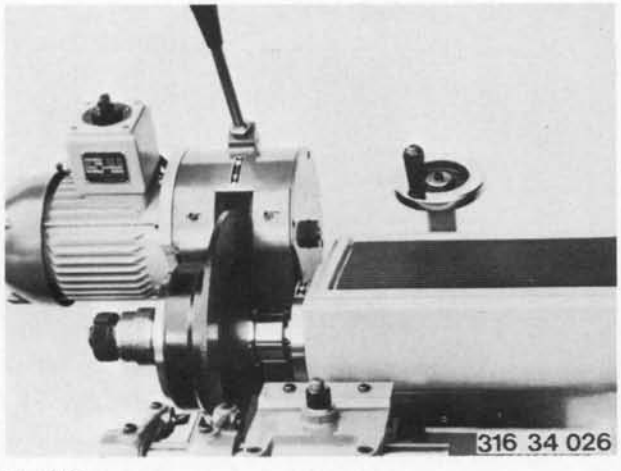
- Front Wheel Removed -

This requires specified wheel bearing play.
Remove and install front brake pads - 34 11 500.
Mount brake disc with two M 12 x 1.5 bolts.
Install holder 34 1 250 and check lateral runout[1] of brake disc with dial gage.



Detach bracket at spring strut shock absorber.
Remove and install caliper.

Caution! Brake line remains connected.
Use a micrometer to check difference in thickness[1] at about 8 points inside of braking surface.



34 11 667 GRINDING FRONT BRAKE DISCS

- Brake Discs Removed -

Caution! Always grind both brake discs of one axle on both sides.
Note minimum thickness[1].

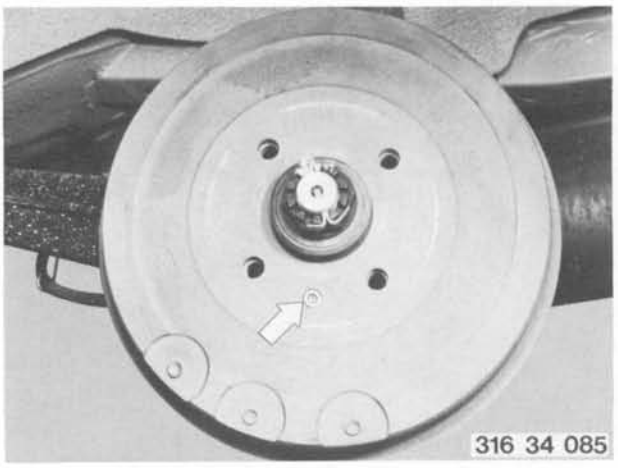
Installation Note! If a brake disc has to be replaced, always replace both brake discs of one axle.

1) See Specifications

34 21 000 REMOVING AND INSTALLING BRAKE DRUM

Remove and install rear wheel - 36 10 320.
If brake drums are seriously worn, turn back cam and loosen parking brake cables.
Unscrew bolt and remove brake drum.

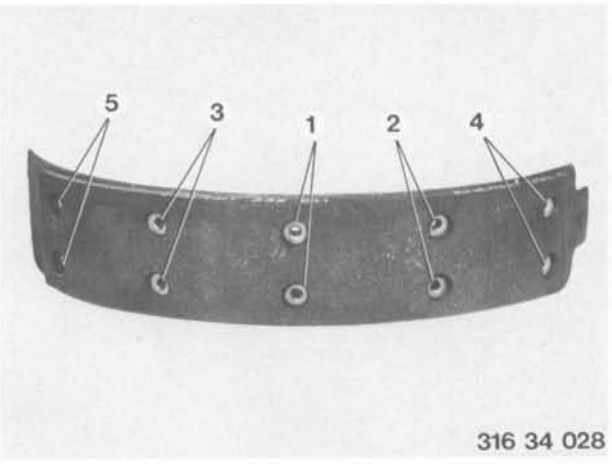
Installation Note! Check brake drum for ovality[1], scoring and cracks (sound test).
Machining is allowed, but always machine both brake drums.
Note grinding sizes[1] and maximum ovality[1].
Adjust parking brake - 34 10 014.



34 21 039 RELINING REAR WHEEL BRAKE

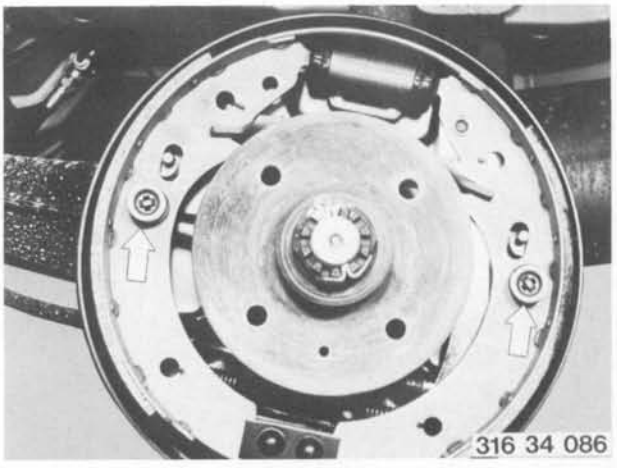
Remove and install brake shoes - 34 21 040.
Unrivet brake liners.

Installation Note! Liner must fit on brake shoe perfectly and may not protrude on sides.
Insert rivets in sequence (1 ... 5).
Always replace all four brake liners and use liners of same make. 1)
Adjust parking brake - 34 10 014.



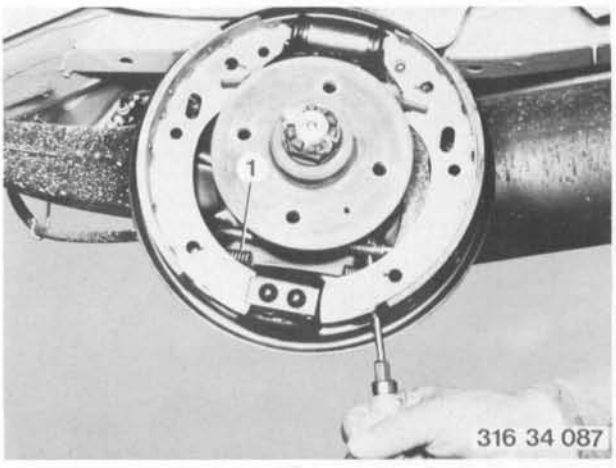
34 21 040 REMOVING AND INSTALLING BRAKE SHOES

Remove and install brake drum - 34 21 000.
Detach retaining springs.

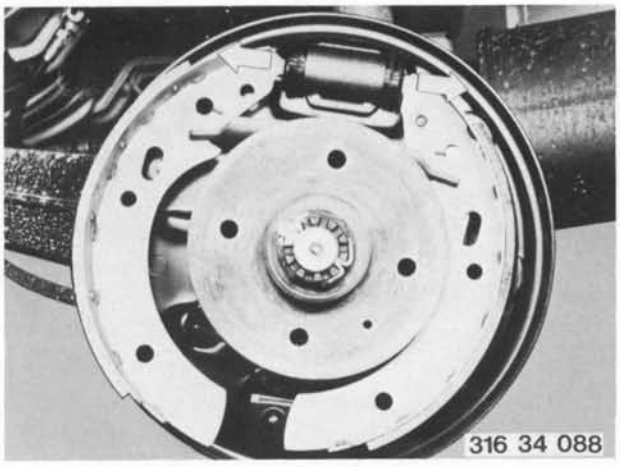


Disconnect brake shoes and return spring (1) at bottom.

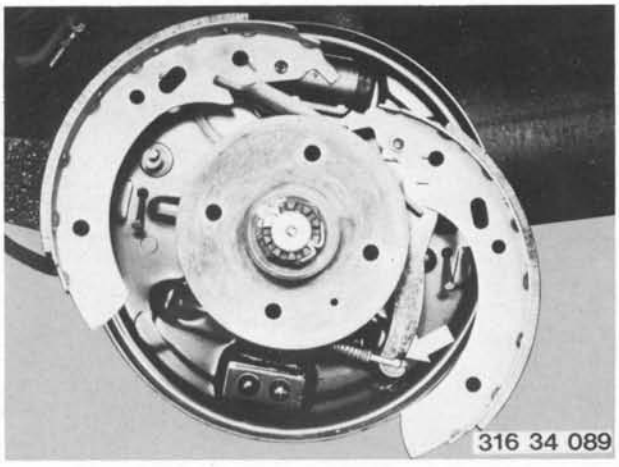
Installation Note! Note position of return springs.
Check return springs, and replace if necessary.



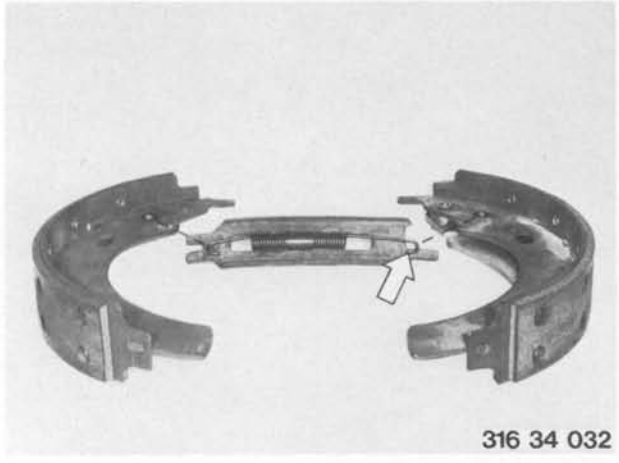
1) See Specifications



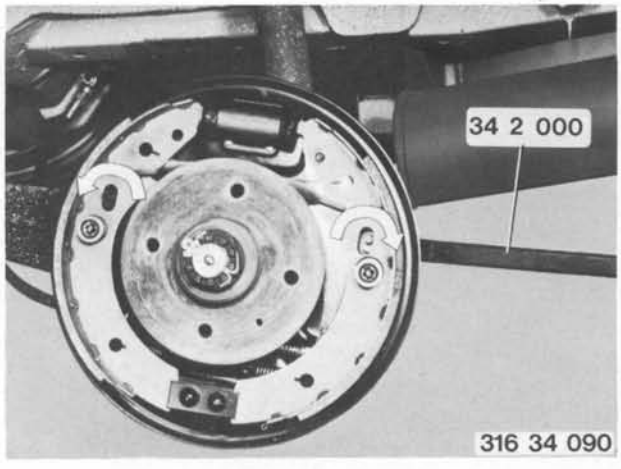
Pull brake shoes out of wheel brake cylinder.



Disconnect parking brake cable.
Remove brake shoes.



Installation Note! Connect long end of spring between parking brake lever and brake shoe.
Note minimum brake liner thickness. 1)
Check return spring, and replace if necessary.



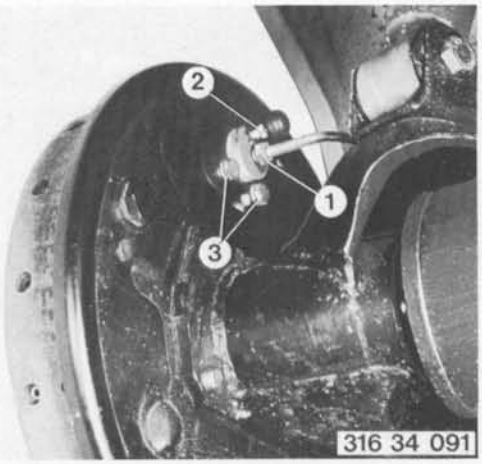
34 21 070 REMOVING AND INSTALLING WHEEL BRAKE CYLINDER

Remove and install brake drum - 34 21 000.
Turn brake shoes all the way out with Special Tool 34 2 000.

1) See Specifications

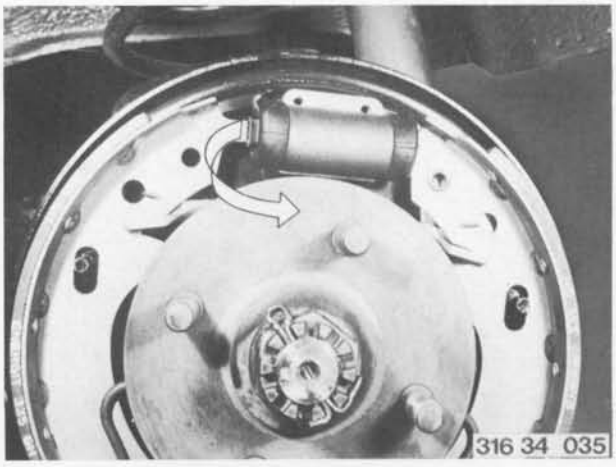
Take brake line (1), bleeder valve (2) and screws (3) off of wheel brake cylinder.

Installation Note! Tighten to specified torque[1].



Press wheel brake cylinder to the right and then pull out forward.

Installation Note! Bleed brakes - 34 00 046.
If replacing, make sure that wheel brake cylinder diameter 1) is correct.



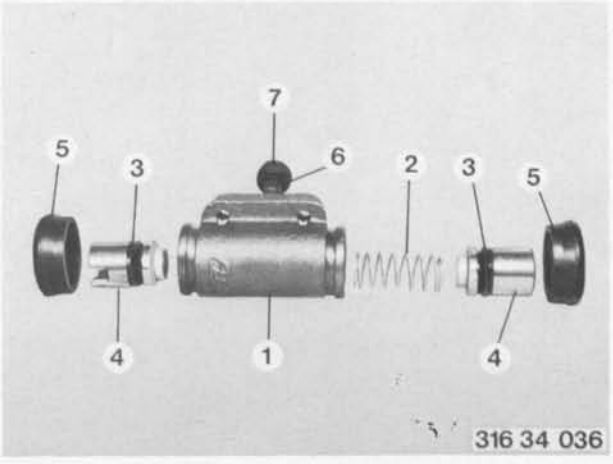
34 21 102 OVERHAULING WHEEL BRAKE CYLINDER

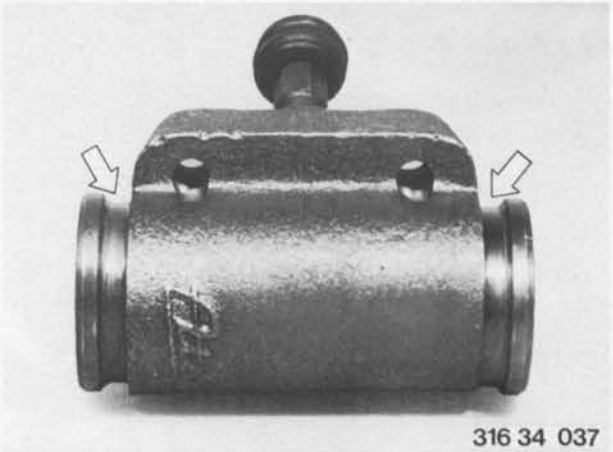
Remove and install wheel brake cylinder - 34 21 070.

Caution! Use repair kit.
Disassemble wheel brake cylinder.
Clean all parts with methylated spirits.
Wheel brake cylinder (1), spring (2), cups (3), pistons (4), caps (5), bleeder valve (6) and dust cap (7).

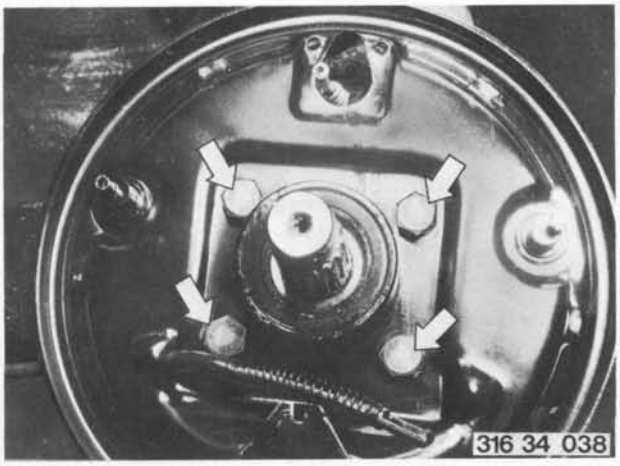
Installation Note! Always replace cups.
To facilitate installation apply a very thin coat of ATE cylinder paste to cylinder bores, piston bearing surfaces and cups. This will also help to inhibit corrosion.

Caution! Grooves must be cleaned of rust and not be damaged.





1) See Specifications



34 21 171 REPLACING REAR BRAKE ANCHOR PLATE

Remove and install brake shoes - 34 21 040.
Remove and install wheel brake cylinder - 34 21 600.
Remove and install drive flange - 33 41 000.
Unscrew bolts and remove brake anchor plate.
Pull parking brake cable out of brake anchor plate.

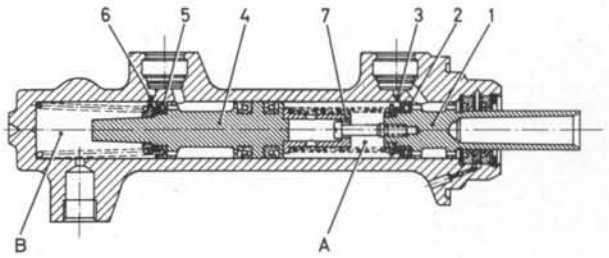
Installation Note! Tighten to specified torque[1].
Adjust parking brake - 34 00 014.
Bleed brakes - 34 00 046.

1) See Specifications

34 31 000 REMOVING AND INSTALLING TANDEM BRAKE MASTER CYLINDER

Description of Function

Depressing brake pedal moves pistons (1) and (4) forward. Primary cups (2) and (5) pass over compensation bores (3) and (6). There is now equal pressure in chambers A and B.
Chamber A acts on rear wheel brakes.
Chamber B acts on front wheel brakes.
Brake pedal travel increases considerably when a brake circuit fails. If second brake circuit fails, piston (4) in chamber B without pressure is pressed against tandem master cylinder housing by piston (1) via pressure built up in chamber A and in this manner the first brake circuit functions.
If first brake circuit fails, piston (1) in chamber A without pressure is pressed against spring cap (7) and the second brake circuit has full effect by way of chamber B.



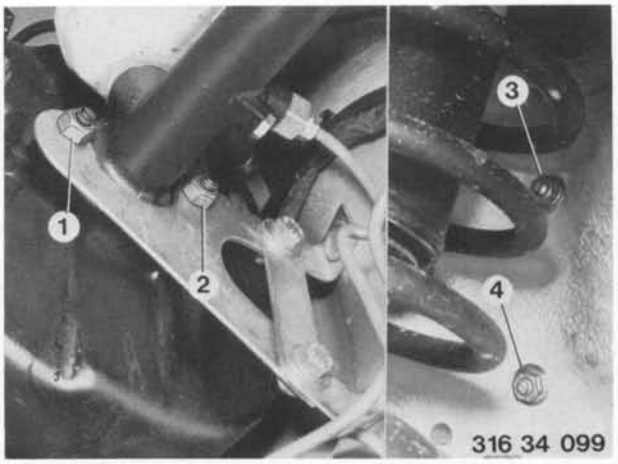
316 34 039

Remove and install mixture control unit - 13 51 010.
Draw brake fluid off of tank with a siphoning device.
Detach hose at clutch connection.

320 34 016

Loosen tandem brake master cylinder nuts (1 and 2) at brake booster. Unscrew nuts (3 and 4) at support in wheelhouse. Remove support.

Installation Note! Tighten to specified torque[1].



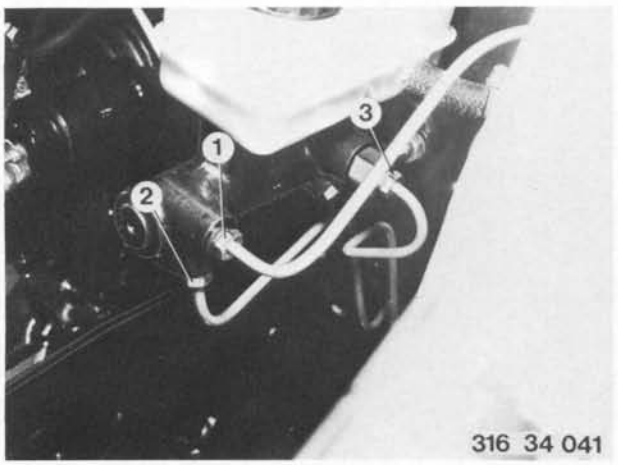
316 34 099

Detach brake lines.

1 Front right } = 2nd brake circuit
2 Front left }

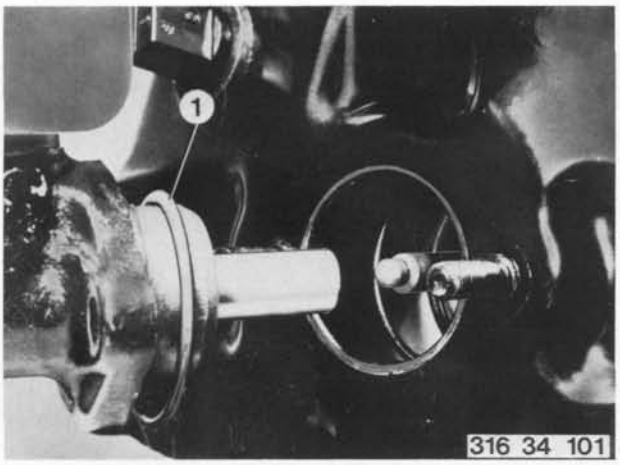
3 Rear wheel brakes) = 1st brake circuit

Installation Note! Tighten to specified torque[1].
Bleed brakes - 34 00 046.

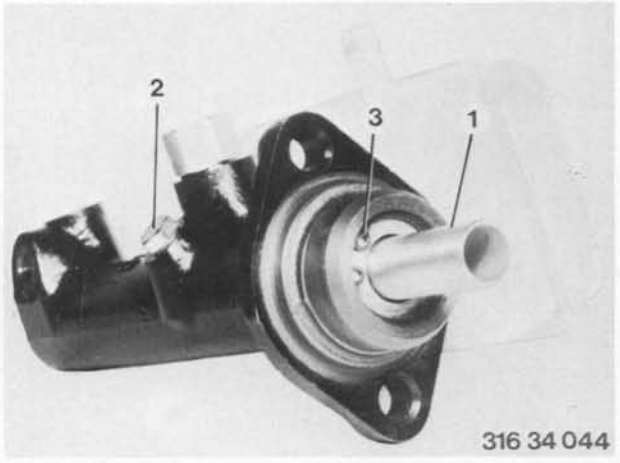


316 34 041

1) See Specifications



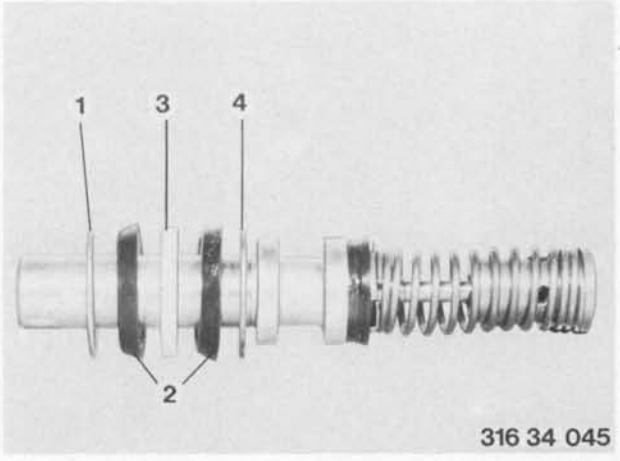
Installation Note! Check rubber ring (1).
If rubber ring does not provide a perfect seal, it prevents building up vacuum.



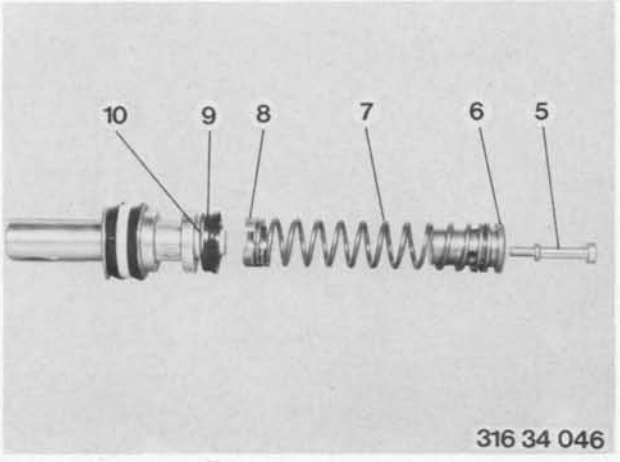
34 31 012 OVERHAULING TANDEM BRAKE MASTER CYLINDER

Caution! Use repair kit.
Remove and install tandem brake master cylinder - 34 31 000.
Apply slight pressure to piston (1) and unscrew stop screw (2).
Remove circlip (3) and pull out piston (1).

Installation Note! When installing stop screw (2) place piston (1) under slight pressure and replace copper seal underneath stop screw.
Coat piston skirt with silicone grease.



Sequence of Installation: Bearing ring (1), secondary cups (2), intermediate ring (3) and bearing ring (4).
Install secondary cups (2) to point in one direction.
Coat space between secondary cups (2) and intermediate ring (3) with silicone grease.

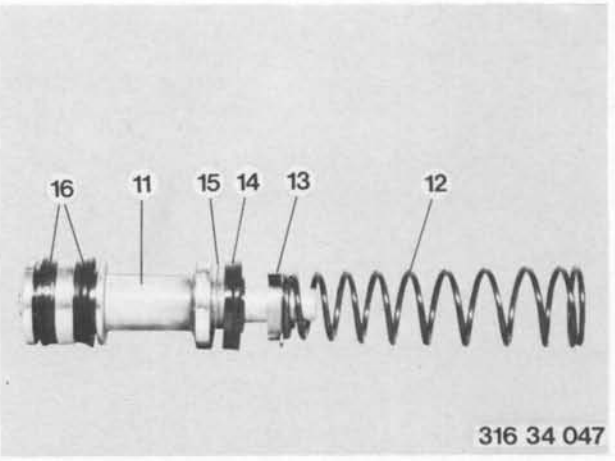


Loosen connecting bolt (5) to replace primary cup (9).
Pull off spring retainer (6), spring (7), support ring (8), primary cup (9) and filler disc (10).

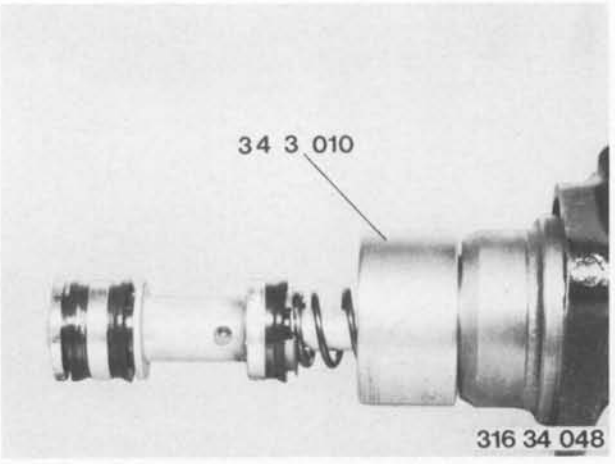
Installation Note! Make sure that support ring (8) is positioned properly on primary cup (9).

Remove intermediate piston (11) by knocking housing against wood lightly.
Pull off spring (12), support ring (13), primary cup (14) and filler disc (15).
Remove separating cups (16).

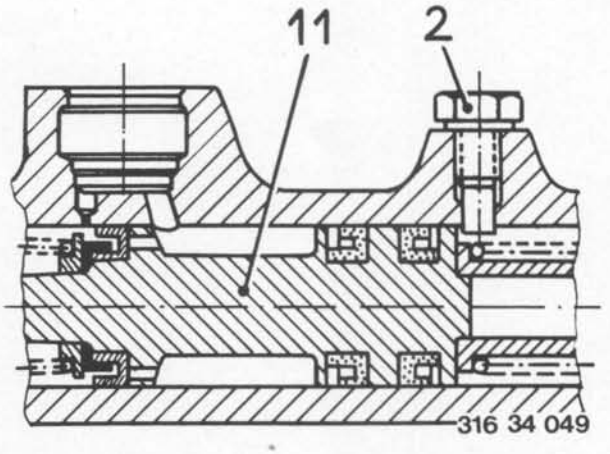
Installation Note! Separating cups (16) in repair kit are marked with a ring of paint.
Install separating cups (16) that lips are positioned opposite each other.
Make sure that support ring (13) is positioned on primary cup (14) properly.



Clean all parts with methylated spirits.
A tandem brake master cylinder with surface damage in cylinder bore cannot be installed again.
Apply a very thin coat of ATE cylinder paste to new parts.
Install piston with Special Tool 34 3 010 to prevent damage to cups.



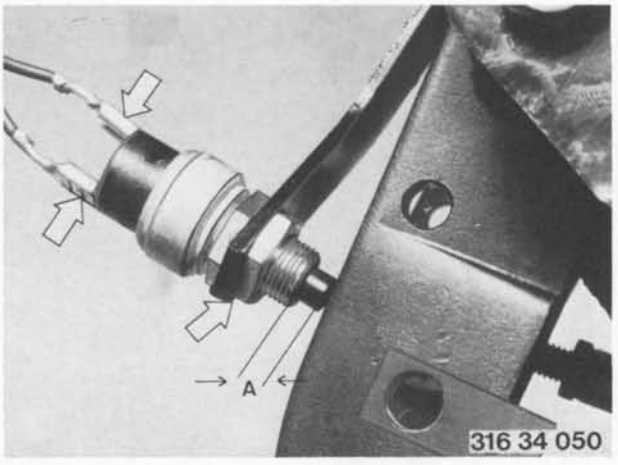
Caution! Note position of intermediate piston (11) and stop screw (2).



34 31 111 REPLACING STOP LIGHT SWITCH

Remove and install instrument panel trim - 51 45 190.
Disconnect wires.
Unscrew nut and remove stop light switch.

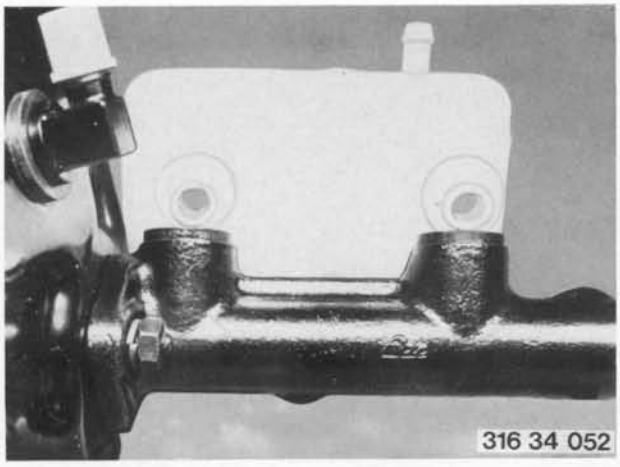
Installation Note! Tighten to specified torque[1].
Install stop light switch that contact button is visible by 5 ... 6 mm (0.197 ... 0.236") (A).



1) See Specifications

34 31 181 REPLACING BRAKE FLUID TANK

Disconnect brake fluid level indicator wire.
Draw brake fluid out of tank.
Detach hose at clutch connection.



Remove tank by tilting to one side.

Installation Note! Press in tank up to stop.
Make sure that it fits properly.
Add brake fluid. 1)

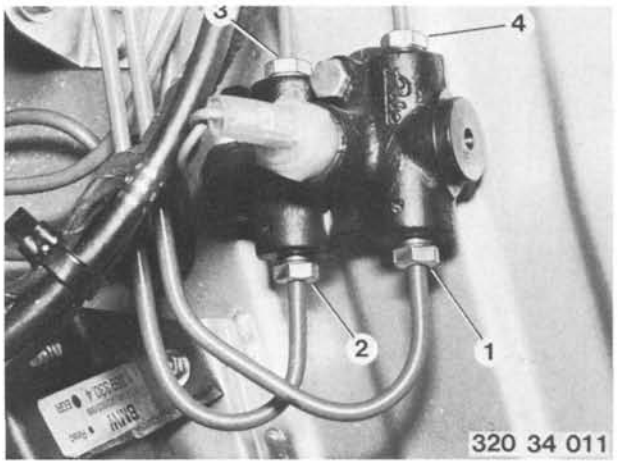
Caution! Don't depress brake pedal to prevent drawing air into brake system.

1) . See Specifications

34 32 010 REMOVING AND INSTALLING PRESSURE DIFFERENTIAL INDICATOR SWITCH

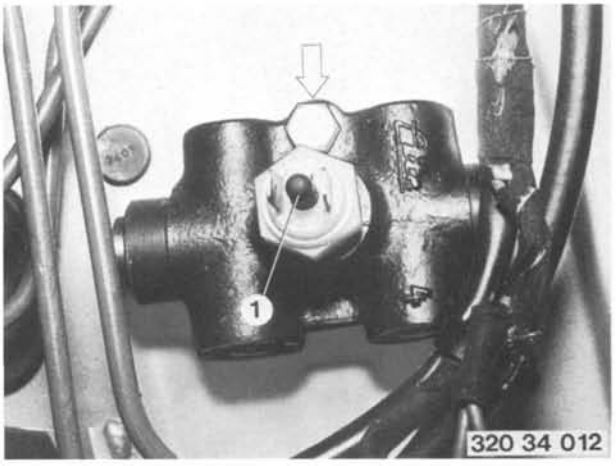
Remove and install mixture control unit - 13 51 010.
Draw brake fluid out of tank.
Detach lines.
1 = Inlet for left front wheel brake
2 = Inlet for rear wheel brakes
3 = Outlet for rear wheel brakes
4 = Outlet for left front wheel brake

Installation Note! Tighten to specified torque[1].
Bleed brakes - 34 00 046.



Disconnect control switch wire.
Unscrew bolt and remove pressure differential indicator switch.

Note! "BRAKE" indicator lamp in instrument panel comes on immediately, if a brake circuit fails. Reset switch after repairing a defective brake circuit by pressing button (1).



34 32 381 REPLACING FRONT BRAKE HOSE

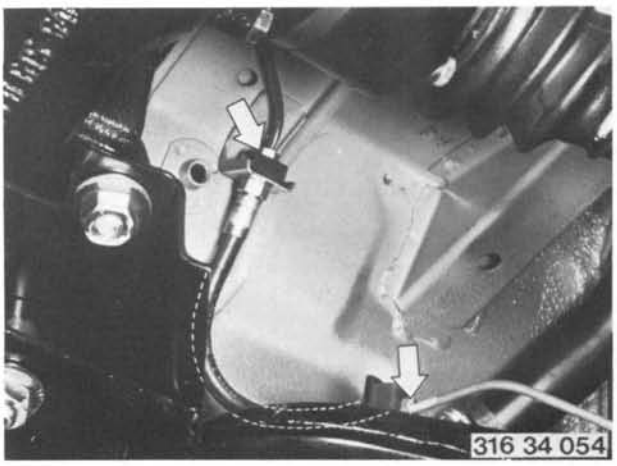
Draw brake fluid out of tank.
Detach brake hose.

Installation Note! Tighten to specified torque[1].
Don't twist brake hose when installing.
Bleed brakes - 34 00 046.

34 32 451 REPLACING REAR BRAKE HOSE

Draw brake fluid out of tank.
Detach brake hose.

Installation Note! Tighten to specified torque[1].
Don't twist brake hose when installing.
Bleed brakes - 34 00 046.



1) See Specifications

34 33 000 REMOVING AND INSTALLING BRAKE BOOSTER WITH TANDEM BRAKE MASTER CYLINDER

Description of Function

Depress brake pedal 10 times with engine off. Hold down brake pedal and start engine. If brake pedal gives, system is good. If brake pedal does not give, check valve, vacuum hose, rubber ring between master cylinder and brake booster could be defective. Engine vacuum insufficient or brake booster filter cartridge completely contaminated.

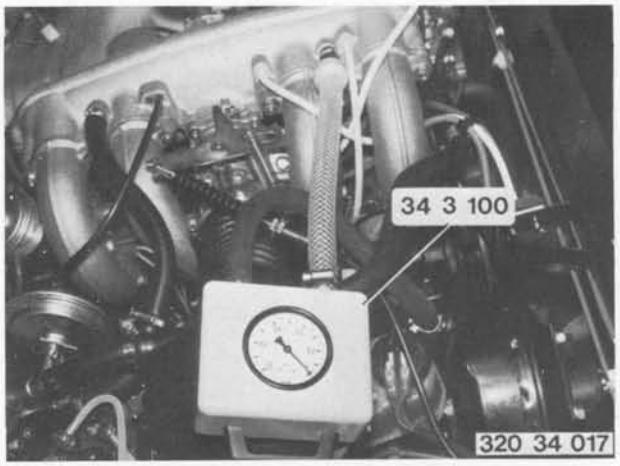
Testing Engine Vacuum for Brake Booster:

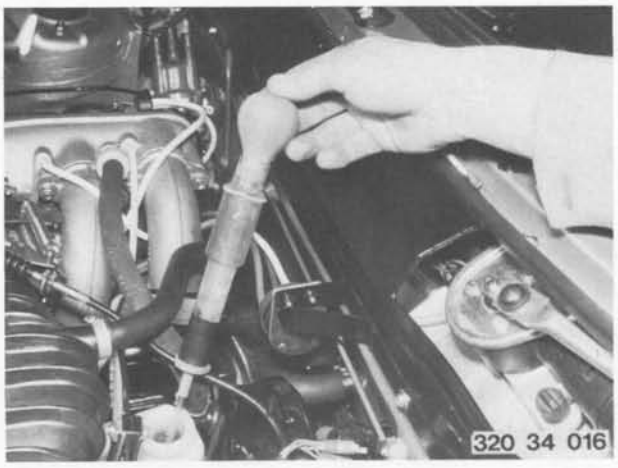
Detach vacuum hose at check valve. Install tester 34 3 100 between brake booster and check valve. Check vacuum available when releasing accelerator pedal from an engine speed of 3000 rpm (engine at operating temperature).

Min. value: - 0.65 bar (9 psi).

Repeat test several times.

Minimum value at specified engine idle speed and engine at operating temperature is - 0.50 bar(7 psi).



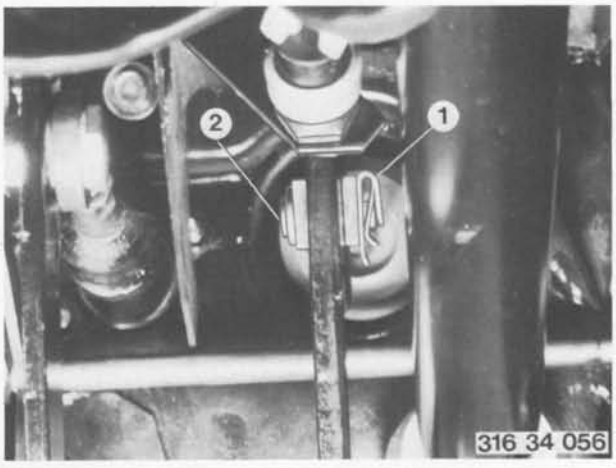


Remove and install mixture control unit - 13 51 010.

Draw brake fluid out of tank with a siphoning device.

Remove clip (1) and take off pin (2) at piston rod.

Installation Note! Contact button of stop light switch must be visible by 5 ... 6 mm (0.197 ... 0.236"). 2)



Detach brake lines.

1 = Front right

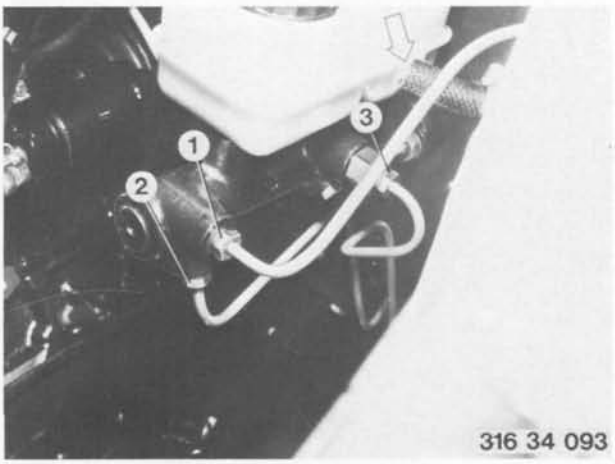
2 = Front left

3 = Rear wheel brakes

Detach hose for clutch.

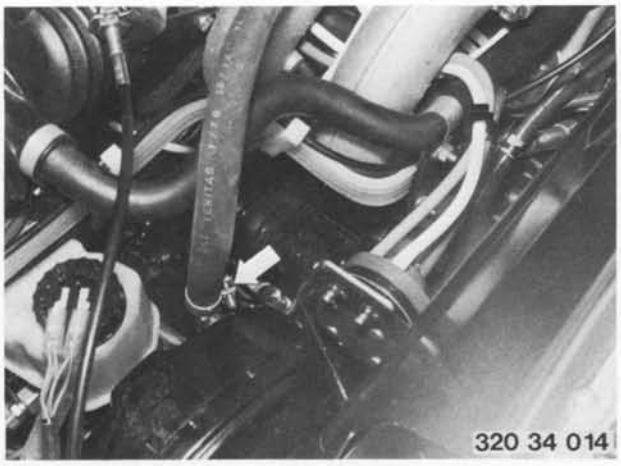
Installation Note! Tighten to specified torque[1].

Bleed brakes - 34 00 046.



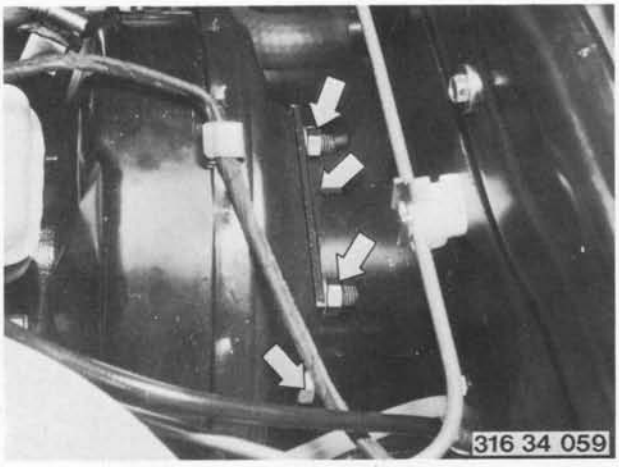
1) See Specifications

2) See replacing stop light switch - 34 31 111.



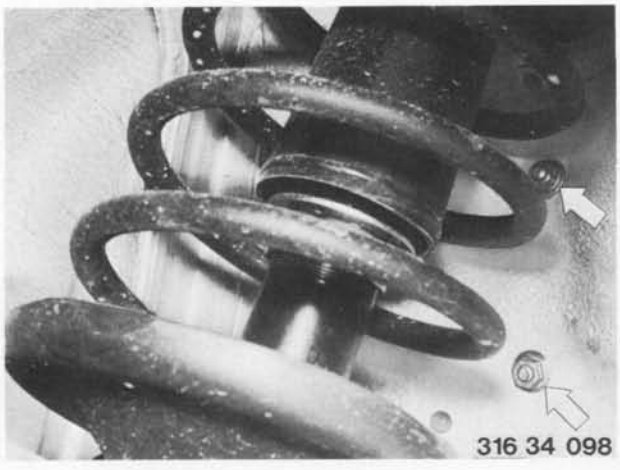
Detach vacuum hose at brake booster.

Installation Note! Replace hose clamp, if necessary.

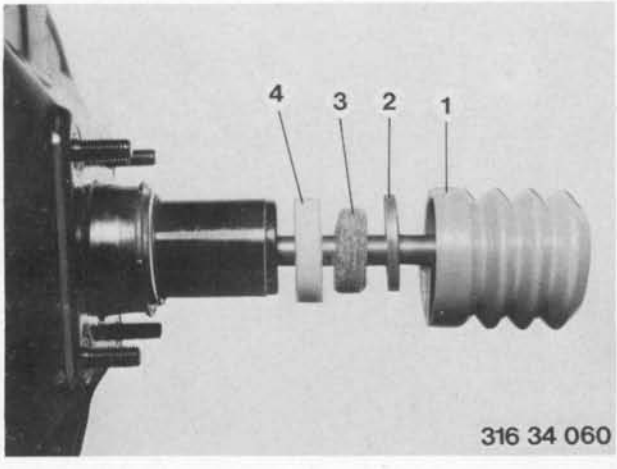


Unscrew brake booster at holder.

Installation Note! Tighten to specified torque[1].



Detach support in wheelhouse.
Remove brake booster with tandem brake master cylinder forward.



If brake booster filter cartridge is plugged, remove cap (1), holder (2), damper (3) and filter (4).

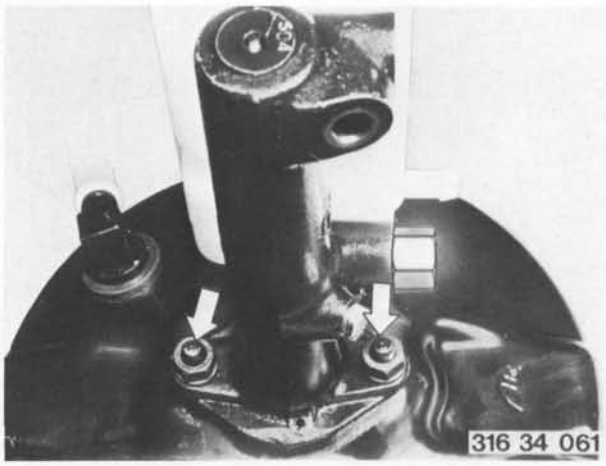
Installation Note! Clean damper (3) and filter (4).

1) See Specifications

34 33 001 REPLACING BRAKE BOOSTER

Remove and install brake booster with tandem brake master cylinder - 34 33 000.
Detach tandem brake master cylinder at brake booster.

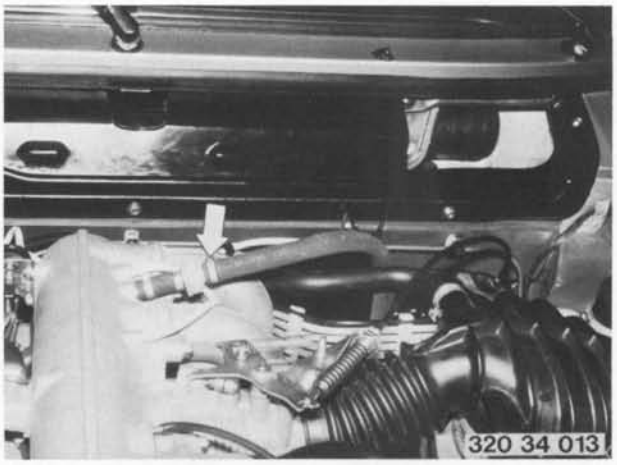
Installation Note! Tighten to specified torque [1].
Check rubber ring between master cylinder and brake booster, replace if necessary.



34 33 051 REPLACING BRAKE BOOSTER CHECK VALVE

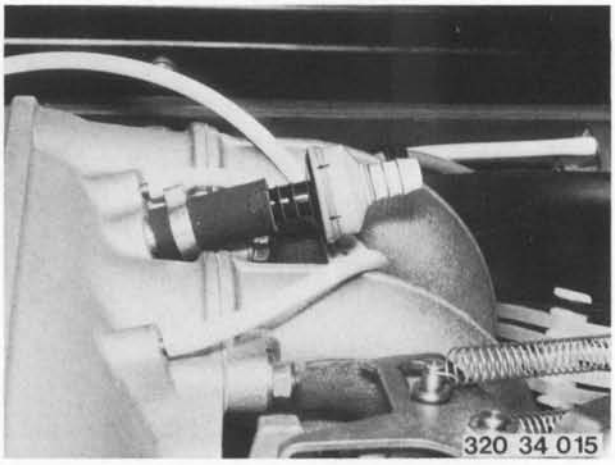
Detach vacuum hose at check valve.

Installation Note! Replace clamp.



Loosen clamp and remove check valve.

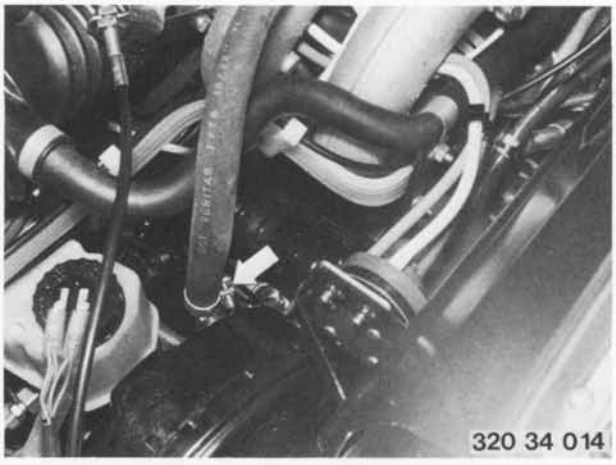
Installed Position: Arrow or black side faces intake manifold.
Replace clamp.



34 33 071 REPLACING BRAKE BOOSTER VACUUM HOSE

Detach vacuum hose at brake booster.

Installation Note! Replace clamp.



1) See Specifications

Detach vacuum hose at check valve.

Installation Note! Replace clamp.

34 34 099 CHECKING FUNCTION OF BRAKE PRESSURE REGULATOR

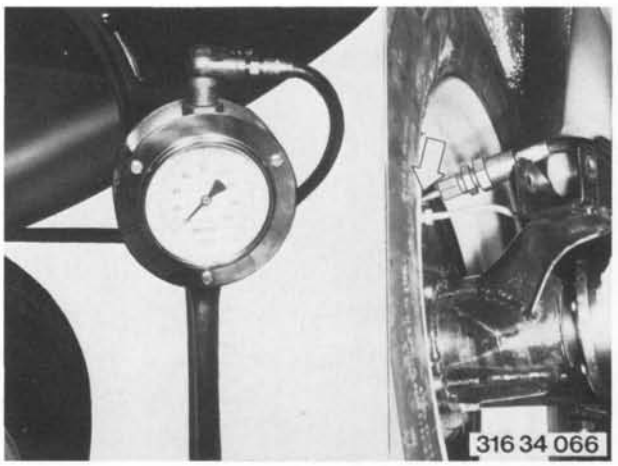
Description of Function

When operating the brakes the entire hydraulic pressure in brake circuit 2 is delivered to the front wheel brakes, but in brake circuit 1 (rear wheels) the hydraulic line pressure is reduced in a predetermined manner by the brake pressure regulator. If brake circuit 2 (front wheels) fails, a checking piston functions and permits the full hydraulic pressure of brake circuit 1 (rear wheels) to be applied. Pressure regulation is then cancelled.

Connect high pressure gage to front wheel brake bleeder. Bleed high pressure gage.

Remove and install spring strut shock absorber bolt at trailing arm.
Connect a second high pressure gage to rear wheel brake bleeder.
Bleed high pressure gage.

Installation Note! Tighten to specified torque[1].



Depress brake pedal firmly at least 5 times. Hold down brake pedal with pedal prop. Both high pressure gages must show same values up to pressure of 25 bar (355 psi). From 25 bar (355 psi) rear wheel brake cylinder pressure must drop according to diagram.

PVA = Front axle pressure
PHA = Rear axle pressure
Ke. = Code
K. = Piston diameter
Pr. = Test

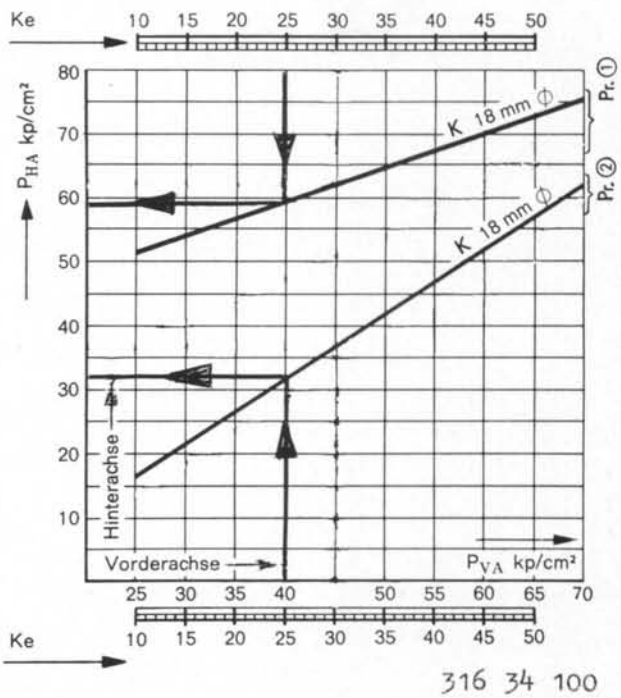
Note code[1] and piston[1].

Example 1
Code 25
Piston dia. 18 mm (0.709")
PVA test pressure 100 bar (1400 psi)
PHA test pressure 59 ± 3 bar (840 ± 40 psi)

Example 2
Code 25
Piston dia. 18 mm (0.709")
PVA test pressure 40 bar (570 psi)
PHA test pressure 32 ± 2 bar (455 ± 28 psi)

If necessary, take mean value of three measurements. Replace brake pressure regulator, if measured values deviate from specifications.

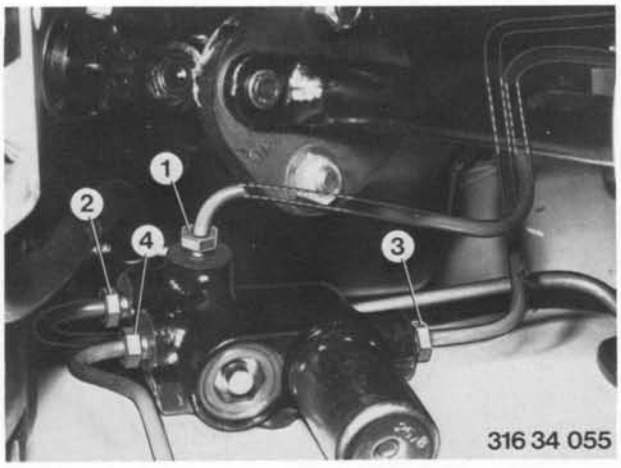
1 PVA Test Pressure 100 bar (1400 psi)



2 PVA Test Pressure Selected to Match Code

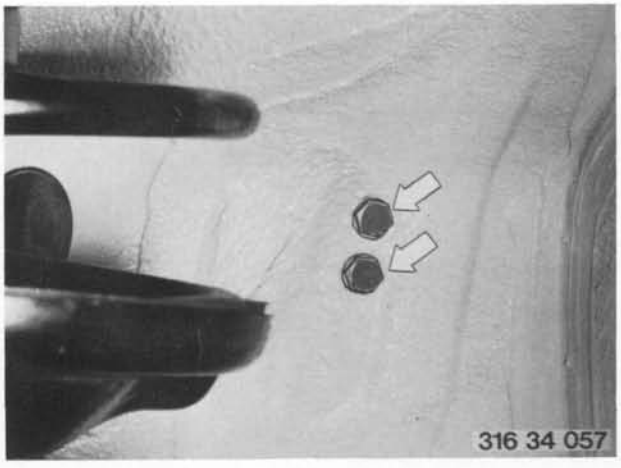
1) See Specifications

34 34 100 REMOVING AND INSTALLING BRAKE PRESSURE REGULATOR



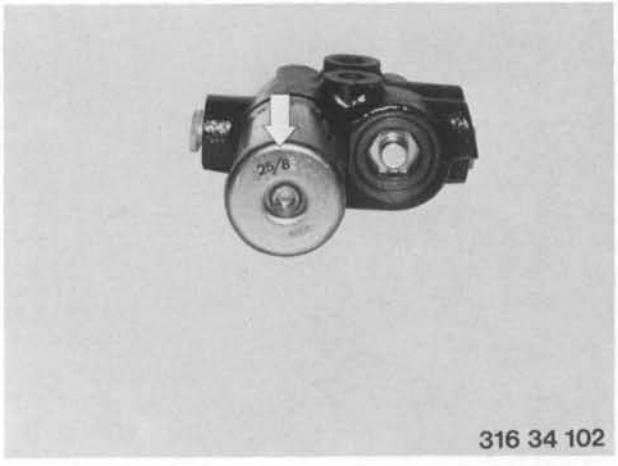
Draw off brake fluid.
Detach lines (1 ... 4).
1 = Front wheel brake inlet
2 = Front wheel brake outlet
3 = Rear wheel brake inlet
4 = Rear wheel brake outlet

Installation Note! Tighten to specified torque[1].
Bleed brakes - 34 00 046.



Unscrew front left bolts in wheelhouse.

Installation Note! Tighten to specified torque[1].



When replacing brake pressure regulator, note code[1] and piston diameter. 1)

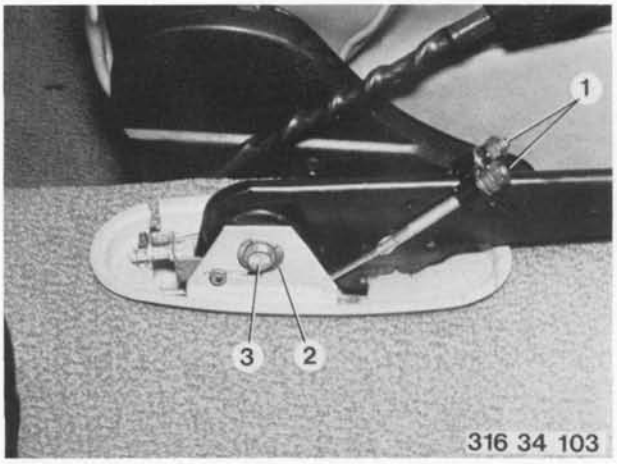
25 = Code
8 = Piston dia. 18 mm (0.709").

1) See Specifications

34 41 000 REMOVING AND INSTALLING PARKING BRAKE LEVER

Scrape off rubber cap.
Detach parking brake cables (1).
Remove circlip (2) and pull out pin (3).

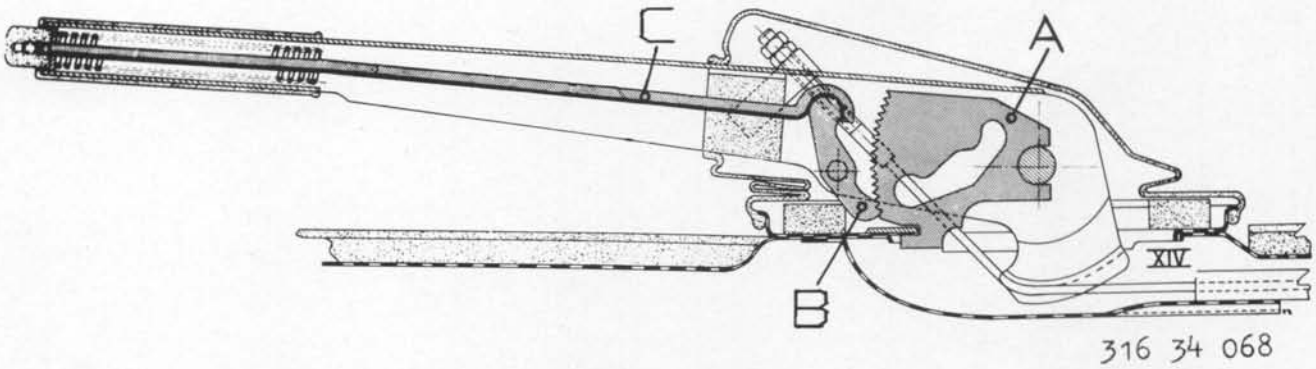
Installation Note! Adjust parking brake - 34 10 014.



34 41 011 REPLACING RATCHET

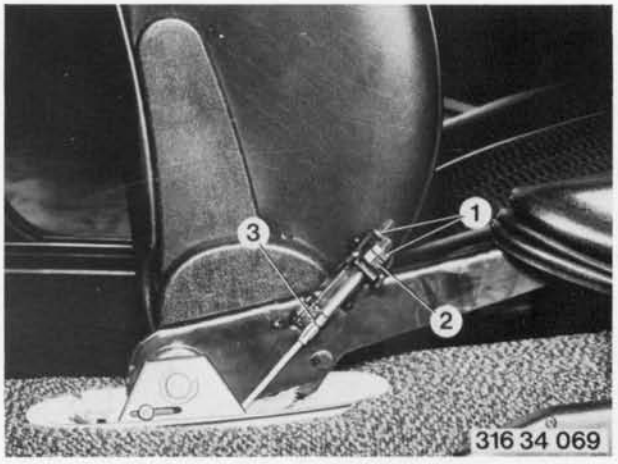
Remove and install parking brake lever - 34 41 000.

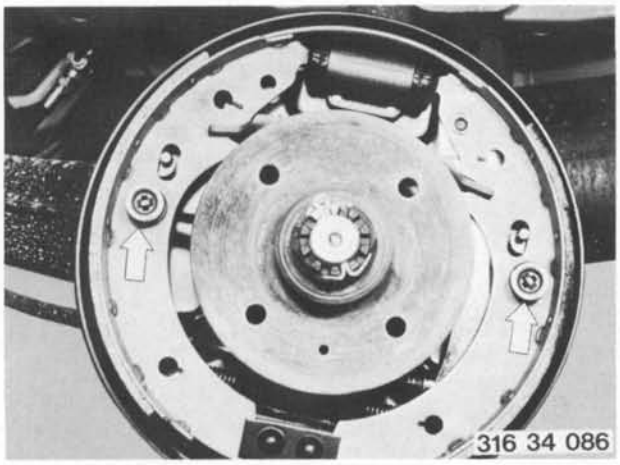
Caution! Note location of ratchet (A), pawl (B) and pressure rod (C).



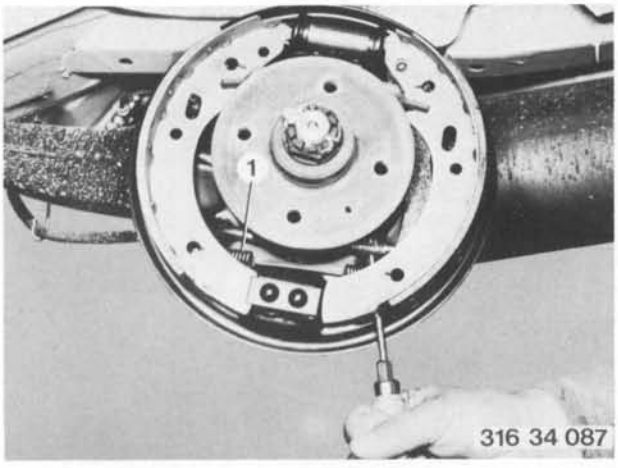
34 41 100 REMOVING AND INSTALLING PARKING BRAKE CABLE

Remove and install brake drum - 34 21 000.
Scrape rubber cap off of parking brake lever.
Unscrew counternut (1) and nut (2) from parking brake cable (3).



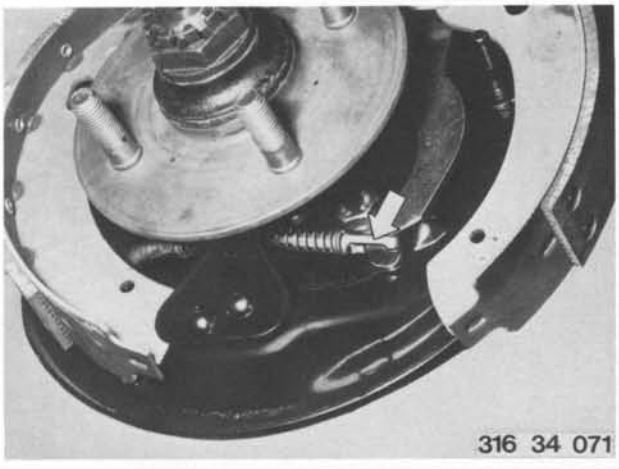


Detach hold-down springs.

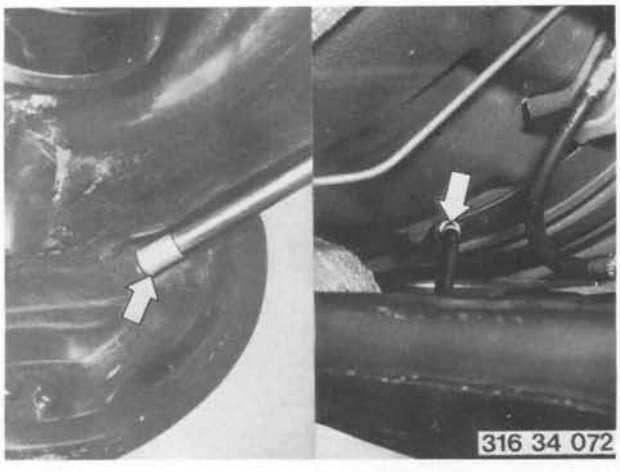


Detach brake shoes and spring (1).

Installation Note! Check brake shoe spring, replace if necessary.



Disconnect parking brake cable.



Pull parking brake cable out of holder.

Installation Note! Make sure that both parking brake cable holders are located in protective tube and brake anchor plate.
Adjust parking brake - 34 10 014.

Condition	Cause
Brakes pull to one side	a) Incorrect tire pressures b) Unevenly worn tire treads c) Oil splattered pads d) Incorrect type of pad or liner e) Dirty caliper recesses f) Misaligned rear axle g) Corroded caliper or wheel cylinders h) Insufficient shock absorber effect i) Brake liner outer edge scraping on brake drum radius k) Poor contact pattern of brake liner due to distorted brake shoes l) Worn brake drums m) Brake shoes not resting against brake anchor plate n) Worn pad of one caliper o) Glazed pads p) Incorrect 20^{0} position of piston shoulder
Brakes overheat seriously while driving	a) Plugged compensating bore in master cylinder b) Missing play between pressure rod and master cyl. piston c) Swollen rubber parts due to use of incorrect brake fluid d) Plugged vent bore in tank e) Incorrect wheel bearing play f) Corroded caliper g) Broken cross spring h) Parking brake not fully released
Poor braking effect despite high pedal pressure Brake pedal travel normal short long	a) Oil splattered or burnt brake pads and liners, incorrect type of pads or liners b) Malfunctioning brake booster, insufficient engine vacuum c) Failed brake circuit due to leakage or damage
Brake pedal soft and spongy when depressed	a) Air in brake system b) Brake fluid level in tank too low - as a) c) Overheated brake fluid - vapor lock due to excessive water content in brake fluid or excessive brake loads d) Malfunctioning automatic wear adjustment
Brakes bled and adjusted, but brake pedal travel is still too long	a) Damaged primary cup in master cylinder b) Leaking separating cups on floating piston in tandem master cylinder c) Leak in brake system
Uneven brake pad wear	a) Incorrect type of pads b) Dirty caliper recesses, damaged caps c) Corrosion in caliper or wheel cylinders d) Swollen rubber ring for piston adjustment e) Incorrect 20^{0} position of piston shoulder
Brake pads worn at an angle	a) Insufficient cross spring pressure b) Excessive wheel bearing play c) Brake disc not aligned with caliper d) Corrosion in caliper or wheel cylinders e) Brake disc worn at an angle f) Pads worn below minimum thickness g) 20^{0} position of piston shoulder incorrect

Condition	Cause
Brake pads sticking, pad will not move off of brake disc	a) Dirty caliper recesses, damaged caps b) Insufficient cross spring pressure c) Corrosion in caliper or wheel cylinders d) Plugged compensating bore in master cylinder
Brakes squeak or rattle	a) Incorrect type of pads b) Dirty caliper recesses c) Insufficient cross spring pressure d) Brake disc not aligned with caliper e) Brake disc runout f) Excessive difference in thickness within braking surface g) Brake drum runout h) Worn brake drums i) Dirt and dust in brake drums k) Insufficiently chamfered liner ends l) Loose liner rivets m) Loose liner n) Rust border on brake discs o) 20^{0} position of piston shoulder incorrect
Brakes tend to lock or grab	a) Brake liners not chamfered b) Protruding liner rivets c) Worn brake drums d) Brake shoe return spring too weak
Excessive brake pedal free travel	a) Excessive wheel bearing play b) Brake disc not aligned with caliper c) Brake disc runout d) Excessive difference in thickness within braking surface e) Leak in brake system f) Air in brake system g) Brake shoes not adjusted
Piston seized in brake caliper	a) Dirty caliper recesses, damaged caps b) Brake disc not aligned with caliper c) Corroded piston in caliper or wheel cylinders d) Swollen rubber ring for piston compensator
Brake pedal pulsates	a) Excessive wheel bearing play b) Brake disc not aligned with caliper c) Brake disc runout d) Excessive difference in thickness within braking surface e) Brake drums out of round
Parking brake effect insufficient	a) Oil splattered brake shoes b) Excessive clearance between brake shoes and brake drum c) Excessive slack in cables d) Cables adjustments incorrect e) Corroded linkage