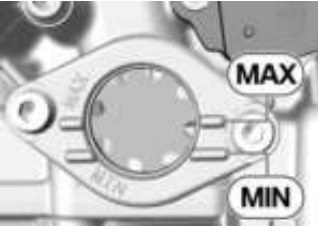
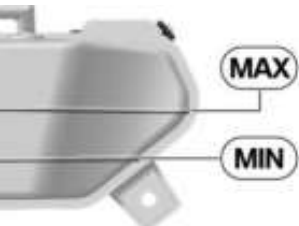


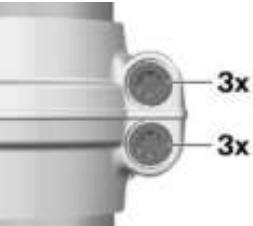
Service data 0G02 - G 310 GS

Designation	Precondition	Value	Valid
11 - Engine			
Running-in speed	Odometer reading 0...300 km	<6000 min ⁻¹	
	Odometer reading 0...1000 km	No full load	
Engine oil, capacity	with filter change	approx. 1.65 l	
	Fluids and lubricants		
	Viscosity class		
Engine oil, specified level 	Engine at operating temperature, vehicle is in vertical position	between MIN and MAX mark	
Engine oil, quantity for topping up	Difference between MIN and MAX	max 185 ml	
1134 - Valves with springs			
Exhaust valve clearance	Engine cold max 35 °C	0.26...0.35 mm	
Inlet valve clearance	Engine cold max 35 °C	0.11...0.20 mm	
1212 - Ignition lead, spark plugs			
Spark plugs, manufacturer and designation		NGK LMAR9D-J	
13 - Fuel preparation and control			
Recommended fuel grade		Regular, unleaded max. 10 % ethanol, E10 91 ROZ/RON 87 AKI	
16 - Fuel supply			
Usable fuel capacity		approx. 11 l	
Fuel reserve		approx. 1 l	
17 - Cooling			
Cooling system test pressure	Test pressure must remain unchanged: min 5 min	1.5 bar	
Coolant, specified level 	Engine is cold, motorcycle is upright	between MIN and MAX marks on the expansion tank	
31 - Front axle, front-wheel steering			

Fork oil, capacity of left fork leg		approx. 480 ml
	Telescopic fork oil (Telescope fork oil type 3)	
Fork oil, capacity of right fork leg		approx. 395 ml
	Telescopic fork oil (Telescope fork oil type 3)	
Fork oil level, right (air cushion)	Forks and piston rod fully compressed, compression spring and sleeve removed, measured on slider tube	110 mm
	Telescopic fork oil (Telescope fork oil type 3)	
Level of fork oil in left fork leg (air chamber)	Forks fully compressed, compression spring and sleeve removed	120 mm
	Telescopic fork oil (Telescope fork oil type 3)	
3142 - Telescopic forks		
Projection of fork tube in fork bridge, top with cap		9 mm
3273 - Bowden cables		
Setting of throttle-cable play	Engine is cold on the outer diameter of the rubber grip max 35 °C	1...2 mm
Clutch-lever play	on the manual controls, handlebars in straight-ahead position, with cold engine	1...2 mm
3383 - Traction drive, chain, belt		
Chain deflection	Motorcycle with no weight applied, supported on its side stand	40...50 mm
34 - Brakes		
Brake fluid level, front	Brake-fluid reservoir horizontal	You should never allow the brake fluid level to drop below the MIN mark.
	Hydraulic fluid (Brake fluid, DOT4)	
Brake fluid level, rear	Brake-fluid reservoir horizontal	You should never allow the brake fluid level to drop below the MIN mark.
	Hydraulic fluid (Brake fluid, DOT4)	
3411 - Front wheel brakes		
Brake-pad wear limit, front	Friction lining without carrier plate	min 1.0 mm
Brake disc thickness, front	when new	5.0 mm
	Wear limit	min 4.5 mm
3421 - Rear wheel brakes		

Brake-pad wear limit, rear	Friction lining without carrier plate	min 1.0 mm	
Brake disc thickness, rear	when new	4.5 mm	
	Wear limit	min 4 mm	
3630 - Motorcycle wheels			
Balance weight for the rear wheel		max 80 g	
One half of the weights must be attached to the left and the other half to the right of the wheel rim			
Permissible rear-wheel imbalance		max 45 g	
Balance weight for front wheel		max 80 g	
One half of the weights must be attached to the left and the other half to the right of the wheel rim			
Permissible front-wheel imbalance		max 5 g	
3632 - Tyres			
Wheel valve test pressure		4 bar	
Tyre pressure, rear	with cold tyre; one-up and two-up	1.9 bar	
Tyre pressure, front	with cold tyre; one-up and two-up	1.7 bar	
Tyre tread depth, front and rear	Wear limit, for Germany only	min 1.6 mm	
	Wear limit, outside Germany	Country-specific legal requirements	
6312 - Headlight			
Distance between light/dark cut-off and mark at height of centre of headlight	Suspension set to basic setting and vehicle loaded with 85 kg	5 cm	
Distance between headlight and vertical surface		5 m	
For headlight adjustment			
11 12 - Cylinder head with cover			
Cylinder head cover to cylinder head			
M6 x 15,5	tighten in diagonally opposite sequence		
	10 Nm		
Camshaft bearing cap to cylinder head			
M7 x 38 - 10.9, Threads and contact surface of screw head are oiled	Tightening sequence: See repair manual		
	Screw in all screws hand-tight		
	Tightening torque, 15 Nm		
11 13 - Oil sump			
Vibration damper to oil sump			
M8, Long thread in oil sump		12 Nm	
Oil drain plug to engine housing			

M16 x 1.5	20 Nm	
11 14 - Housing cover		
Screw plug in engine cover, left		
M26 x 1.5	10 Nm	
Screw plug for bore for locating pin		
M10 x 1	15 Nm	
11 31 - Camshaft		
Chain guide to cylinder head		
M8 x 1 Thread-locking compound (Loctite 243, Medium strength)	12 Nm	
Timing chain tensioner in cylinder head		
M24 x 1.5	30 Nm	
11 42 - Oil filter and lines		
Oil filter to engine		
M20, Lubricate seal with engine oil	11 Nm	
12 12 - Ignition lead, spark plugs		
Spark plug to cylinder head		
M10 x 1 Lubricant (Copper paste)	12 Nm	
13 61 - Control unit electronic		
Engine control unit holder to main frame		
M5 x 20, 9 mm collar	2 Nm	
16 11 - Fuel tank with filler neck		
Fuel tank to frame		
M8 x 45	19 Nm	
23 00 - Gearbox		
Pinion to gearbox output shaft		
M8 x 28 Thread-locking compound (Loctite 243, Medium strength)	28 Nm	
31 42 - Telescopic forks		
Damper unit to fork base		
M10 x 25 - 10.9 Thread-locking compound (Loctite 243, Medium strength)	23 Nm	
Cover to fixed fork tube	20 Nm	
Adjustment specification for steering-head bearing		
M20	Tightening torque (forks turned fully to right), 25 Nm	

		Swing the forks 3x to left/right through full arc of travel	
		back off (forks turned fully to the left), 60°	
		Tightening torque (forks turned fully to right), 15 Nm	
Fork bridge, top, to steering tube			
M8 x 30		19 Nm	
Clamping screws in axle holder			
			
M8 x 30		Tightening sequence: Tighten screws six times in alternate sequence	
		19 Nm	
Fork bridge, bottom, to fork fixed tube			
			
M8 x 30		Tightening sequence: Tighten screws six times in alternate sequence	
		19 Nm	
Fork bridge, top, to fork fixed tube			
M8 x 30		19 Nm	
Locknut to cover			
M10		17 Nm	
Threaded plug in fixed fork tube			
Thread-locking compound (Loctite 243, Medium strength)		17 Nm	
Adjusting screw to fixed fork tube			
M20		38 Nm	
33 35 - Rear wheel swinging arm with pivot mount, link			
Locknut of the final-drive chain tensioning screw			
M8		19 Nm	
33 84 - Traction drive, chainwheel, belt wheel			
Chain sprocket to chain-sprocket carrier			

M8 x 30 - 10.9, Renew nuts. Tighten nuts, counter-hold on screws. Thread-locking compound (mechanical)	Tightening sequence: tighten in diagonally opposite sequence	
	1st tightening torque, 10 Nm	
	1st tightening torque, 30 Nm	
33 85 - Mounted parts, traction drivetrain		
Chain roller to frame		
M8 x 1	19 Nm	
Chain slide rail to rear wheel swinging arm		
M5 x 12	5 Nm	
Pinion cover to engine housing		
M6 x 20	8 Nm	
34 11 - Front wheel brakes		
Radial brake calliper to axle mounting		
M8 x 50 - 10.9	28 Nm	
Brake disc to front wheel		
M8 x 20,5 Thread-locking compound (Loctite 243, Medium strength)	Tightening sequence: tighten in diagonally opposite sequence	
	32 Nm	
34 21 - Rear wheel brakes		
Brake disc to rear wheel		
M8 x 20,5 Thread-locking compound (Loctite 243, Medium strength)	Tightening sequence: tighten in diagonally opposite sequence	
	32 Nm	
36 23 - Electronic components		
Wheel-speed sensor to brake calliper mount, rear		
M6 x 20	8 Nm	
Wheel-speed sensor, front, to bracket		
M6 x 20	8 Nm	
Bracket for wheel-speed sensor to fork leg		
M5 x 12	4.5 Nm	
36 31 - Wheels with bearings		
Rear quick-release axle in swinging arm		
M18 x 1.5	100 Nm	
Screw in front-wheel quick-release axle		
M12 x 20	50 Nm	
46 63 - Motorcycle fairing, windscreen		
Engine spoiler to vibration damper		
M8	10 Nm	
51 16 - Mirrors, covers, ashtrays, stowage compartments		

Left mirror (lock nut) to adapter		
M10 x 1.25	22 Nm	
Right mirror (lock nut) to adapter		
M10 x 1.25	Left-hand thread, 22 Nm	

Tightening torques 0G02 - G 310 GS		
11 - Engine	Value	Valid
11 11 - Engine block		
Wiring harness to crankcase		
M6 x 16	10 Nm	
Assembly of top side of crankcase		
M6 x 70, Threads and contact surface of screw head are oiled	Tightening sequence: See repair manual	
	1st tightening torque, 5 Nm	
M6 x 40, Threads and contact surface of screw head are oiled	1st tightening torque, 5 Nm	
M6 x 70	2nd tightening torque, 10 Nm	
M6 x 40	2nd tightening torque, 10 Nm	
Assembly of lower side of crankcase		
M9 x 95, Threads and contact surface of screw head are oiled	Tightening sequence: See repair manual	
	1st tightening torque, 10 Nm	
M6 x 70, Threads and contact surface of screw head are oiled	1st tightening torque, 5 Nm	
M9 x 95	2nd tightening torque, 10 Nm	
	Additional angle of rotation, 90°	
M6 x 70	2nd tightening torque, 10 Nm	
Seal plug (oil duct) to engine housing		
M10 x 1	11 Nm	
11 12 - Cylinder head with cover		
Threaded bolt for exhaust manifold in cylinder head		
M7 x 30 Thread-locking compound (Loctite 243, Medium strength)	Protrusion, 17 ^{+1.5} _{-0.5} mm	
Cylinder head cover to cylinder head		
M6 x 15,5	tighten in diagonally opposite sequence	
	10 Nm	
Camshaft bearing cap to cylinder head		
M7 x 38 - 10.9, Threads and contact surface of screw head are oiled	Tightening sequence: See repair manual	
	Screw in all screws hand-tight	
	Tightening torque, 15 Nm	
SLS lid to cylinder head		
M5 x 12	6 Nm	
Seal plug (rocker arm axle) to cylinder head		
M10 x 1	15 Nm	
Seal plug to cylinder head		

M8 x 1 Thread-locking compound (Loctite 243, Medium strength)	10 Nm	
Wiring harness to cylinder head		
M5 x 12	6 Nm	
Air intake to cylinder head		
M6 x 16	10 Nm	
Cylinder head to engine block		
M9 x 1.25, Threads and contact surface of screw head are oiled	Tightening sequence: See repair manual	
	Screw in all screws hand-tight	
	1st tightening torque, 5 Nm	
M6 x 35, Threads and contact surface of screw head are oiled	1st tightening torque, 5 Nm	
M9 x 1.25	2nd tightening torque, 20 Nm	
	Additional angle of rotation, 90°	
M6 x 35	2nd tightening torque, 10 Nm	
11 13 - Oil sump		
Vibration damper to oil sump		
M8, Long thread in oil sump	12 Nm	
Oil drain plug to engine housing		
M16 x 1.5	20 Nm	
Oil pan to crankcase		
M6 x 30	10 Nm	
11 14 - Housing cover		
Engine-block cover, left, to engine block		
M6 x 30	10 Nm	
Engine housing cover, right, to crankcase		
M6 x 30	Tightening sequence: tighten in diagonally opposite sequence	
	10 Nm	
Pinion cover TO crankcase		
M6 x 25	8 Nm	
Screw plug in engine cover, left		
M26 x 1.5	10 Nm	
Screw plug for bore for locating pin		
M10 x 1	15 Nm	
11 24 - Conrod with bearings		
Conrod bolt		
M8 x 31, Replace screw Threads and contact surface of screw head are oiled	1st tightening torque, 10 Nm	
	2nd tightening torque, 25 Nm	
	Additional angle of rotation, 90°	

11 26 - Starter freewheel, layshaft		
Guide for starter motor freewheel on crankcase		
M5 x 16 Thread-locking compound (Loctite 243, Medium strength)	6 Nm	
11 31 - Camshaft		
Top chain guide with camshaft bearing cap to cylinder head		
M7 x 38 - 10.9, Threads and contact surface of screw head are oiled	15 Nm	
Chain guide to cylinder head		
M8 x 1 Thread-locking compound (Loctite 243, Medium strength)	12 Nm	
Chain slide rail to cylinder head		
M8 x 1 Thread-locking compound (Loctite 243, Medium strength)	12 Nm	
Ventilation nozzle for timing chain tensioner in cylinder head		
M5 Thread-locking compound (Loctite 243, Medium strength)	5 Nm	
Timing chain tensioner in cylinder head		
M24 x 1.5	30 Nm	
11 41 - Oil pump with strainer and drive		
Oil intake pipe to crankcase		
M6 x 25	10 Nm	
11 42 - Oil filter and lines		
Oil filter to engine		
M20, Lubricate seal with engine oil	11 Nm	
Oil filter adapter to crankcase		
M20 Thread-locking compound (Loctite 243, Medium strength)	25 Nm	
Oil intake pipe to crankcase		
M6 x 25	10 Nm	
Oil spray nozzle to crankcase		
M10 x 1	20 Nm	
11 43 - Oil filling, dipstick		
Oil filler plug to filler neck		
M27 x 2	approx. 5 Nm	
Flange for engine oil level indicator to crankcase		
M6 x 25	10 Nm	
11 51 - Coolant pump with drive		

Lid of coolant pump to clutch cover		
M6 x 45	10 Nm	
M6 x 25	10 Nm	
Drain plug to coolant pump		
M6 x 25	10 Nm	
Impeller to shaft		
M5 x 12	6 Nm	
Thread-locking compound (Loctite 243, Medium strength)		
11 53 - Thermostat and on-engine coolant lines		
Lid for thermostat to cylinder head		
M5 x 12	6 Nm	

 11 12 116 Removing/installing cylinder head or replacing cylinder-head gasket

+ 11 12 814

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Drain engine oil and remove oil filter

Removing right frame cover

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Loosen main wiring harness from frame

Draining coolant

Removing right radiator cowl

Removing idle actuator

Removing left radiator cowl

Remove the intake air silencer

Remove throttle valve with intake manifold

Removing direct ignition coil

Removing spark plug

Disconnect connector for the oxygen sensor

Remove valve for secondary air system and loosen ground cable from cylinder head

Removing secondary air system changeover valve

Removing exhaust system

Releasing coolant hose from engine to radiator

Loosen coolant hose from cylinder head and disconnect connector for coolant temperature sensor

Removing crankshaft cover

Removing screw for bore for locating pin

Lock the crankshaft in TDC position

Removing cylinder head cover

Removing timing-chain tensioner

Removing camshaft bearing cap

Remove the camshafts

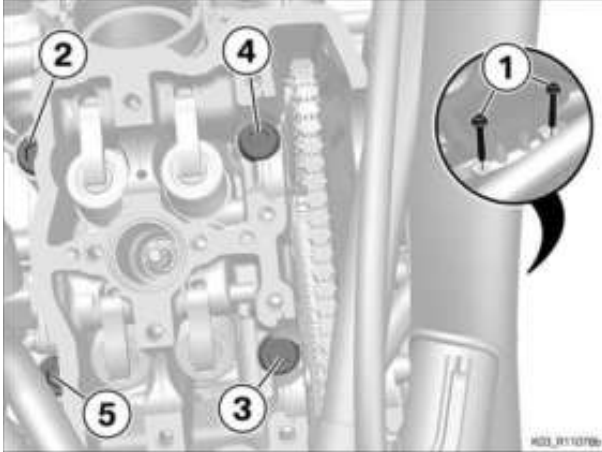
Loosen timing chain slide rail

Core activity

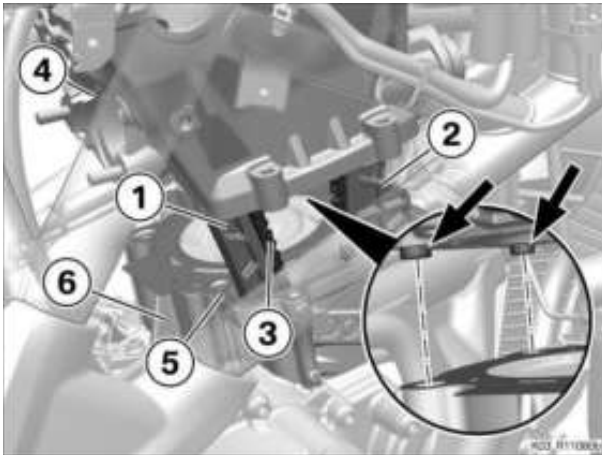
(-) Removing cylinder head

► Loosen and remove cylinder head bolts

- Loosen screws (1) up to (5) gradually and then remove.

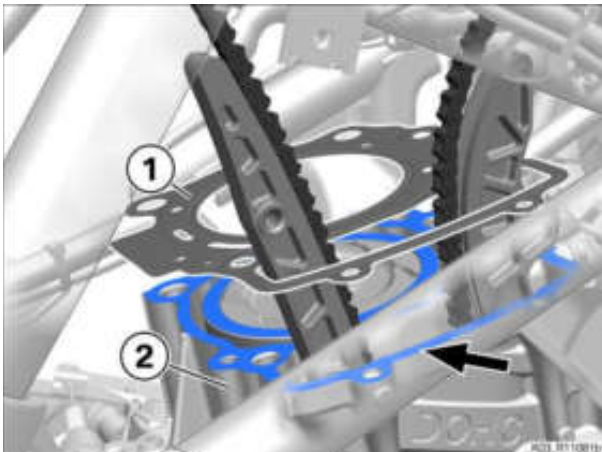


- Press slide rail (1) and tensioning rail (2) together paying attention to the timing chain (3) while doing so.
- Remove cylinder head (4) from cylinder head gasket (5) and crankcase (6), paying attention to the fitting sleeves (arrows).

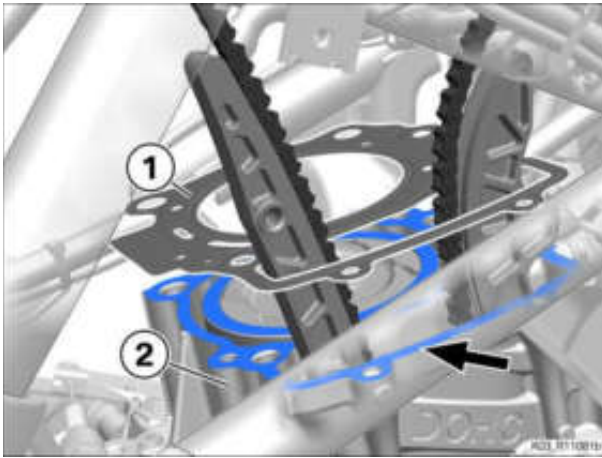
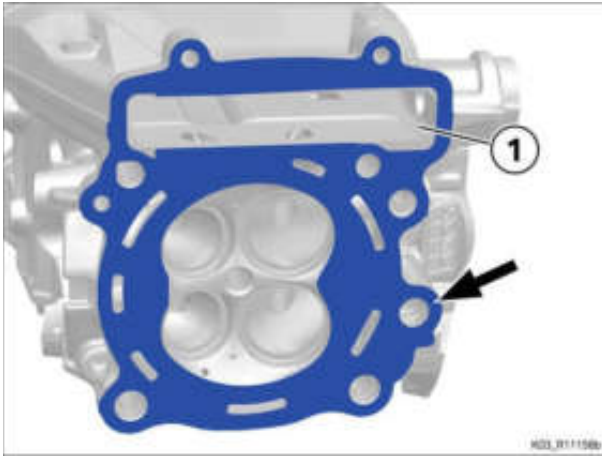


(-) Replace cylinder head gasket

- Remove cylinder head gasket (1) from engine housing (2).
- Clean sealing surface (arrow) of engine housing (2).

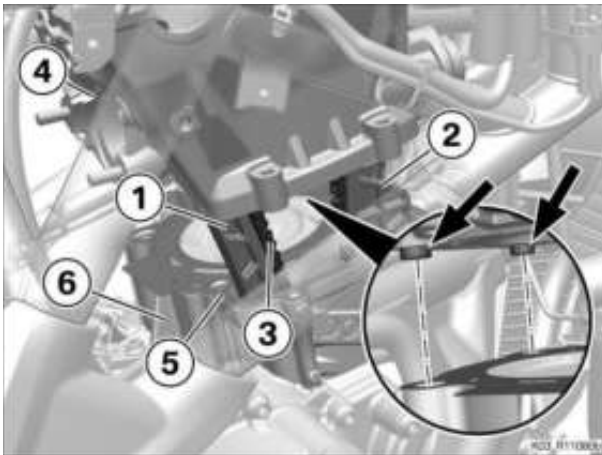


- Clean sealing surface (arrow) of cylinder head (1).



- Lay cylinder head gasket (1) on sealing surface (arrow) of the engine housing (2)

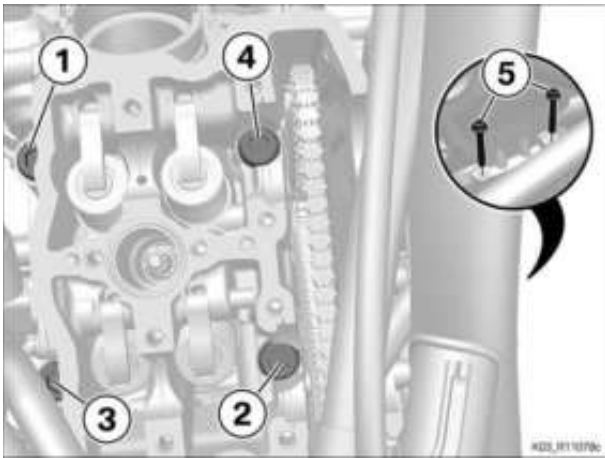
(-) Installing cylinder head



- Press slide rail (1) and tensioning rail (2) together and insert timing chain (3) in timing chain shaft from cylinder head (4).
- Secure timing chain (3) against falling down.
- Lower cylinder head (4) to cylinder head gasket (5), paying attention to correct fit of the fitting sleeves (arrows) in the crankcase (6).

► Install and tighten cylinder head bolts

- Lubricate thread and contact surfaces of the screw (1) up to (5) with engine oil.
- Screw in screws (1) up to (5) hand-tight.
- Tighten screws (1) up to (5) with **1. tightening torque**.
- Tighten screws (1) up to (4) with **additional angle of rotation**.
- Tighten screws (5) with **2. tightening torque**.



Tightening torques		
Cylinder head to engine block		
M9 x 1.25, Threads and contact surface of screw head are oiled	Tightening sequence: See repair manual	
	Screw in all screws hand-tight	
	1st tightening torque, 5 Nm	
M6 x 35, Threads and contact surface of screw head are oiled	1st tightening torque, 5 Nm	
M9 x 1.25	2nd tightening torque, 20 Nm	
	Additional angle of rotation, 90°	
M6 x 35	2nd tightening torque, 10 Nm	



Follow-up work

- Secure timing chain slide rail
- Installing camshafts
- Installing camshaft bearing cap
- Installing timing chain tensioner
- Removing locating pin
- Turning engine through several revolutions and making sure that all components move freely
- Recheck the valve clearance
- Installing cylinder head cover
- Installing screw in bore for locating pin
- Installing crankshaft cover
- Connect connector for coolant temperature sensor and secure coolant hose to cylinder head
- Securing coolant hose from engine to radiator
- Installing exhaust system
- Installing secondary air system changeover valve
- Install valve for secondary air system and secure ground cable to cylinder head
- Connect connector for oxygen sensor
- Installing spark plug
- Installing direct ignition coil
- Install throttle valve with intake stubs

Install the intake air silencer
Installing left radiator cowl
Installing idle actuator
Securing wiring harness to frame
Installing fuel tank
Pouring in engine oil
Installing right radiator cowl
Filling cooling system
Installing cover for fuel tank
Installing cover for right intake snorkel
Installing cover for left intake snorkel
Installing seat
Installing right frame cover
Installing engine spoiler
Final check of work performed

11 12 256 Removing/installing and sealing or replacing cylinder-head cover

+ 11 12 821

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

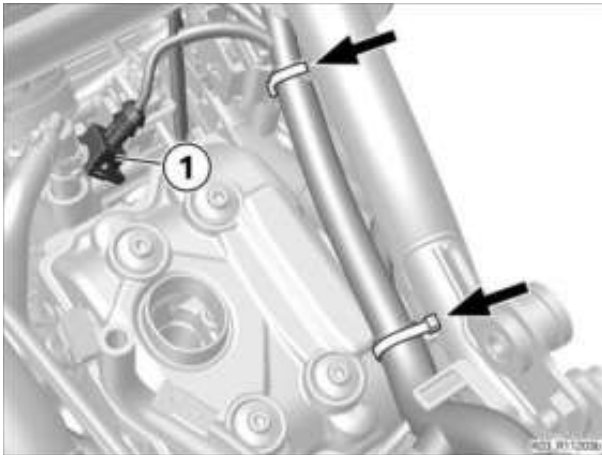
Removing cover for fuel tank

Removing fuel tank

Removing direct ignition coil

Core activity

(-) Removing cylinder head cover

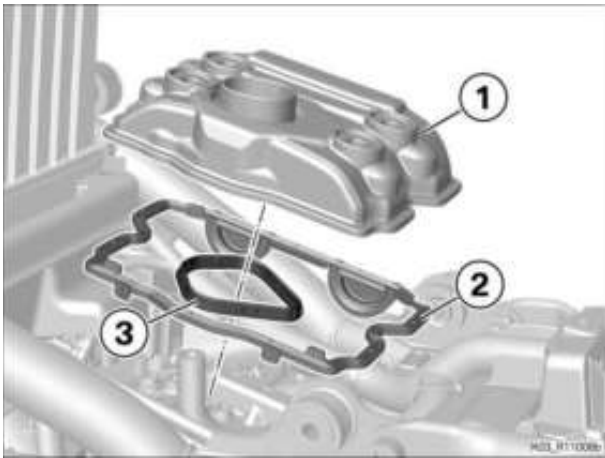


- Disconnect plug (1) for the injection valve.
- Remove the cable straps (arrows).



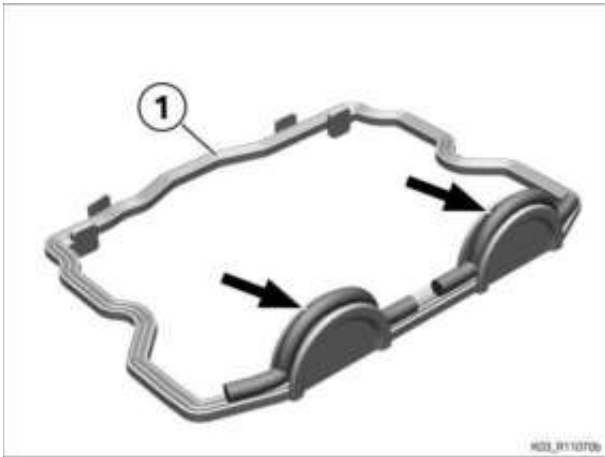
- Remove screws (1) with seals (2).

- Remove cylinder-head cover (1).
- Remove gaskets (2) and (3).

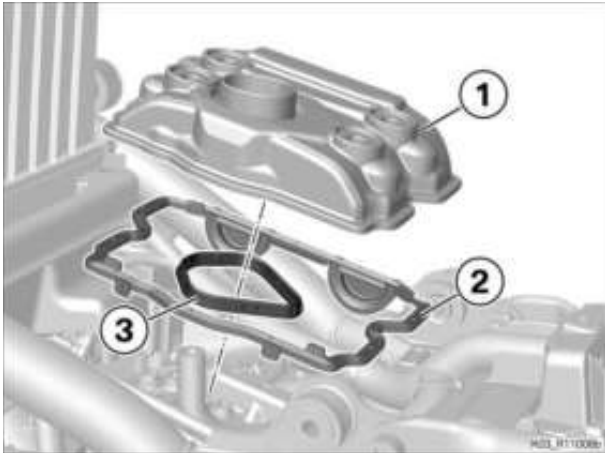


(-) Installing cylinder head cover

- Seal the **new** gasket (1) in the whole area (Arrows).



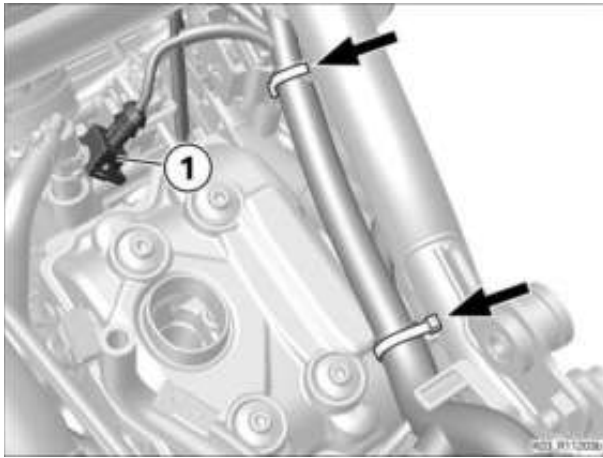
 Sealant		
3 - Bond 1209		07 58 9 062 376



- Clean the sealing faces.
- Place **new** gasket (2).
- Install **new** gasket (3) in cylinder head cover (1).
- Install cylinder-head cover (1), making sure that none of the seals (2) and (3) slip out of position.

- Install screws (1) with **new** gaskets (2).

 Tightening torques		
Cylinder head cover to cylinder head		
M6 x 15,5	tighten in diagonally opposite sequence	
	10 Nm	



- Connect plug (1) for the injection valve.
- Close the cable strap (arrows).

Follow-up work

Installing direct ignition coil

Installing fuel tank

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

 11 13 000 Removing/installing or sealing oil pan

+ 11 13 531

Preparatory work

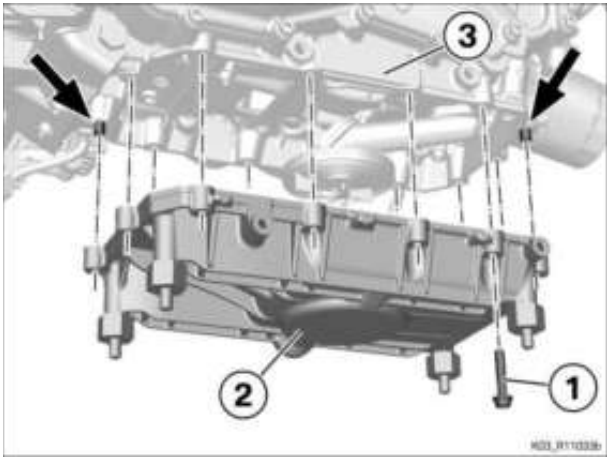
=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Removing engine spoiler

Draining engine oil from engine

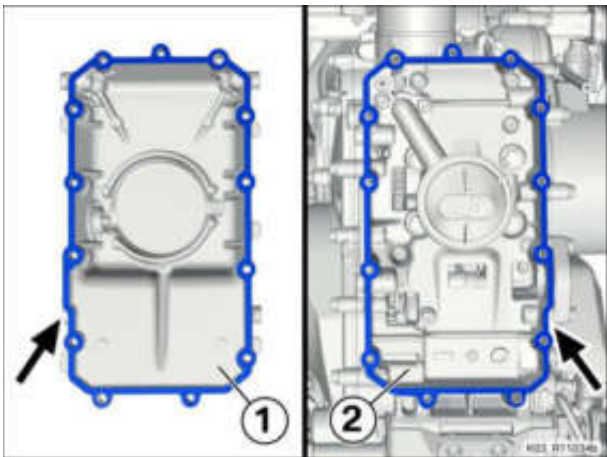
Core activity

(-) Removing oil pan



- Remove screws (1).
- Remove oil sump (2) from crankcase (3) and while doing so, pay attention to the dowel pins (Arrow).

(-) Clean sealing surfaces of the oil sump and the engine housing

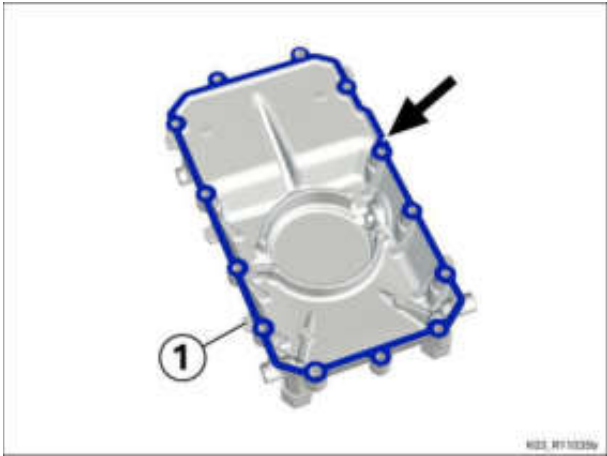


- Free sealing surfaces (arrows) of the oil sump (1) and the engine housing (2) from gasket remains and engine oil.
- Clean the sealing faces.

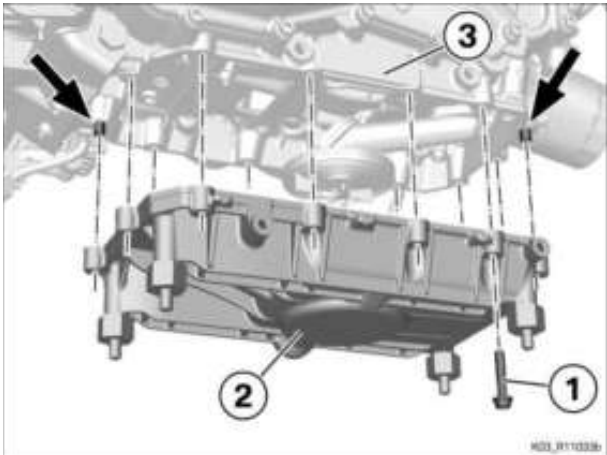
 Cleaner	
Brake cleaner	83 19 2 154 780

(-) Seal oil sump

- Apply sealing compound to sealing surface (Arrow) of the oil sump (1).



 Sealant	
Dow Corning	07 58 0 397 777



(-) Installing oil pan

- Place oil sump (2) on crankcase (3) and while doing so, pay attention to the dowel pins (Arrow).
- Install screws (1) **diagonally** hand-tight.
- » The oil sump (2) is not tensioned.
- Tighten screws (1).

 Tightening torques		
Oil pan to crankcase		
M6 x 30	10 Nm	

Follow-up work

- Pouring in engine oil
- Installing engine spoiler
- Final check of work performed

11 14 075 Replacing engine-block cover, left

+ 11 14 858

Preparatory work

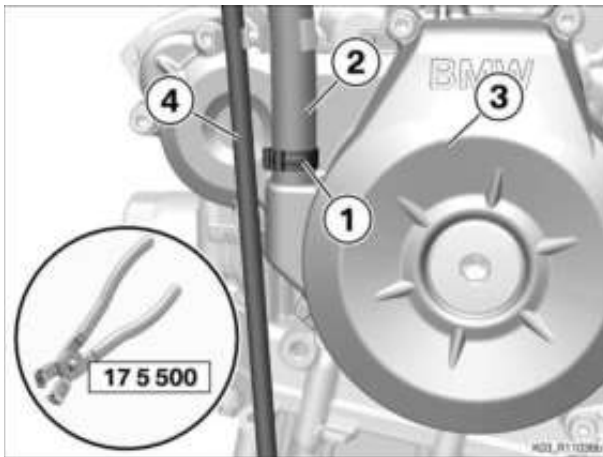
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

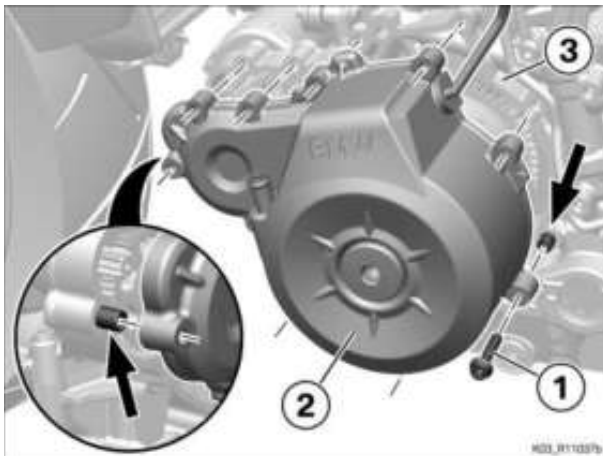
Removing pinion cover

Core activity

(-) Removing left crankcase cover



- Loosen clamp (1) with pliers (No. 17 5 500) and pull off hose (2) for crankcase ventilation from engine housing cover (3).
- Hang hose (4) for active carbon filter ventilation and hose (2) for crankcase ventilation apart.



- Remove screws (1).
- Loosen engine housing cover (2) from engine housing (3) and while doing so, pay attention to the dowel pins (arrows).

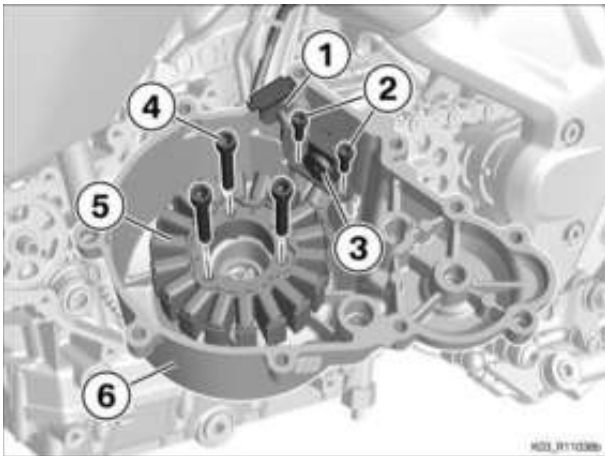
ATTENTION

Component damage, paint damage

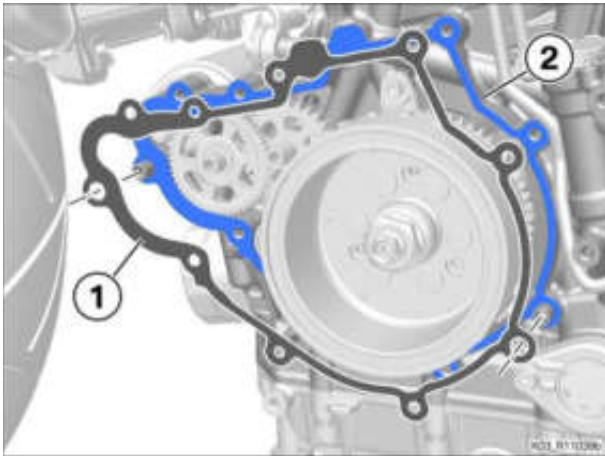
Damage through contaminated, hard surfaces.

- Lay component on clean, white surface.

- Disengage rubber grommet (1).
- Remove screws (2) and loosen hall effect sensor (3).

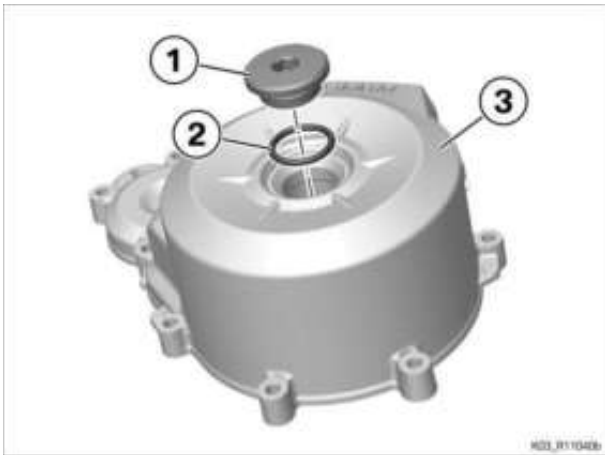


- Remove screws (4).
- Loosen alternator (5) from engine housing cover (6) and allow it to dangle to one side.



- Remove seal (1) from engine housing (2).

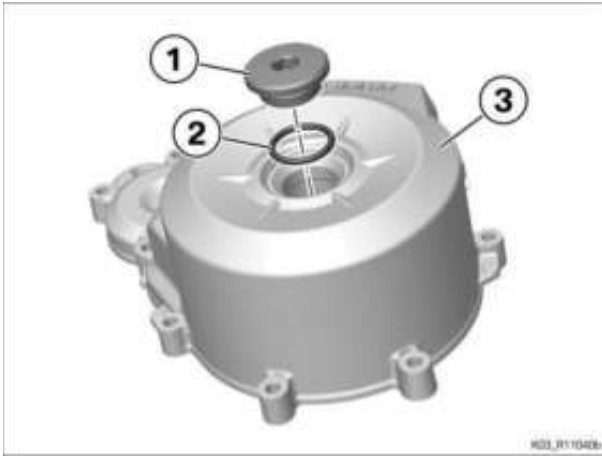
(-) Replace engine housing lid



- Remove camshaft lid (1) with O-ring (2) from engine housing lid (3).

- Check O-ring (2); replace if necessary.
- Install camshaft lid (1) with O-ring (2) in new part (3).

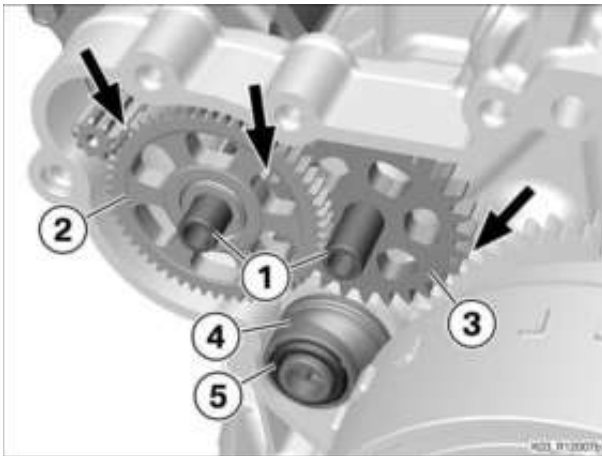
 Tightening torques		
Screw plug in engine cover, left		
M26 x 1.5	10 Nm	



(-) Installing left crankcase cover

► Check installation position of the starter motor pinion

- Check installation position of the components, if necessary, this is to be adjusted.



Check

Result:

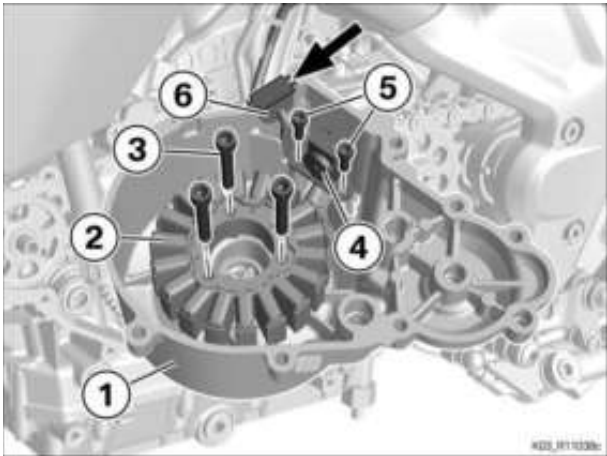
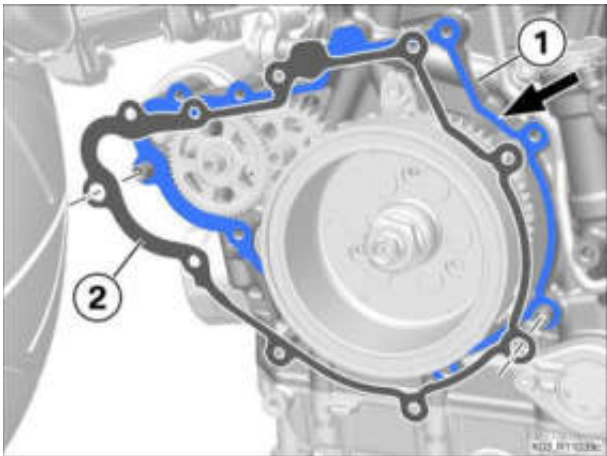
- Installation position of the components is not OK.

Measure:

- Install shafts (1) correctly.
- Check installation position of the starter motor pinions (2) and (3). Gearings (arrow) must engage with each other correctly.
- Check installation position of the adapter (4), if required install correctly.
- Check O-ring (5) for damage; replace if necessary.



- Clean sealing surface (arrow) of engine housing (1).
- Place new gasket (2).



- If necessary, clean the sealing surface of the engine housing cover (1).
- Insert alternator (2) in engine housing lid (1) and install screws (3).

 Tightening torques		
Stator to housing cover		
M6 x 40 Thread-locking compound (Loctite 243, Medium strength)	10 Nm	

- Hold hall effect sensor (4) in position and install screws (5).
- Install rubber grommet (6) and apply sealing compound (arrow).

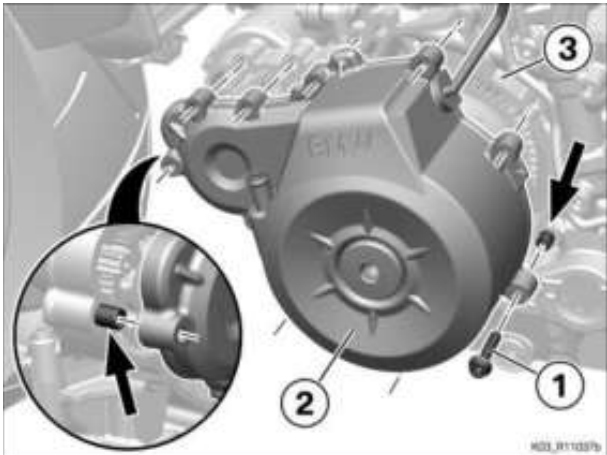
 Sealant	
Dow Corning	07 58 0 397 777

 CAUTION

Crimping danger

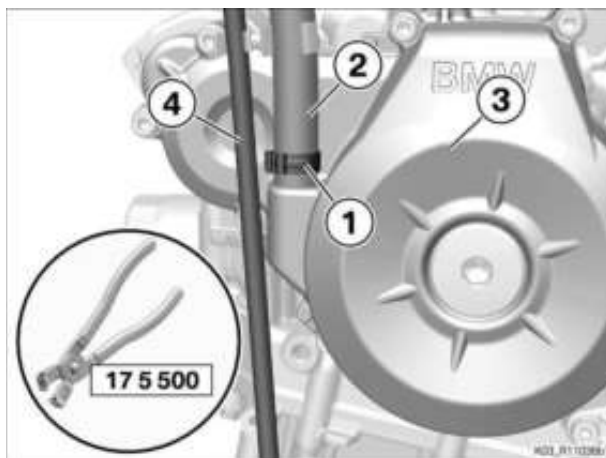
Strong magnetic attraction force between magnet wheel and stator of the alternator.

- When assembling the components, do not reach at or in the sealing surface edges.
- Do not jam any lines or cables.



- Place engine housing lid (2) on engine housing (3) and while doing so, pay attention to the dowel pins (arrows).
- Install screws (1).

 Tightening torques		
Engine-block cover, left, to engine block		
M6 x 30	10 Nm	



Lay hose (4) for active carbon filter ventilation and hose (2) for crankcase ventilation.

- Connect hose (2) for crankcase ventilation on engine housing lid (3) and secure clamp (1) with pliers (No. 17 5 500).

Follow-up work

Installing pinion cover

Installing engine spoiler

Final check of work performed

11 14 085 Replacing right engine-block cover

+ 11 14 859

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Draining coolant

Removing cover for coolant pump

Removing impeller

Removing the cable duct for the brake light switch

Releasing footbrake cylinder

Core activity

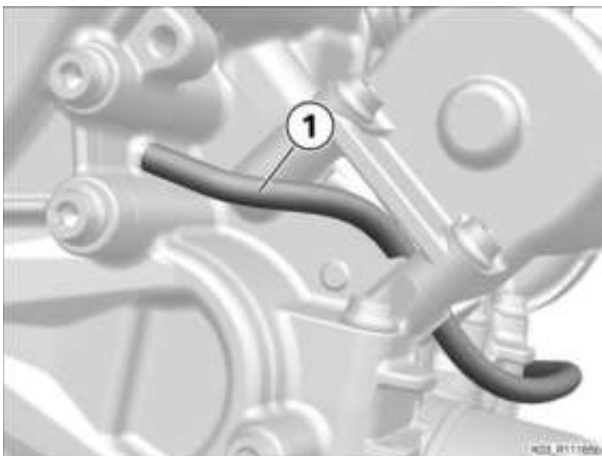
(-) Removing right crankcase cover

ATTENTION

Reduced lubricity namely cool reaction by dirty coolants containing oil

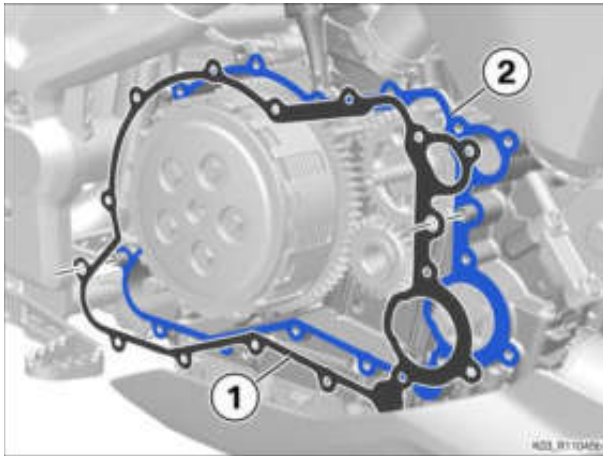
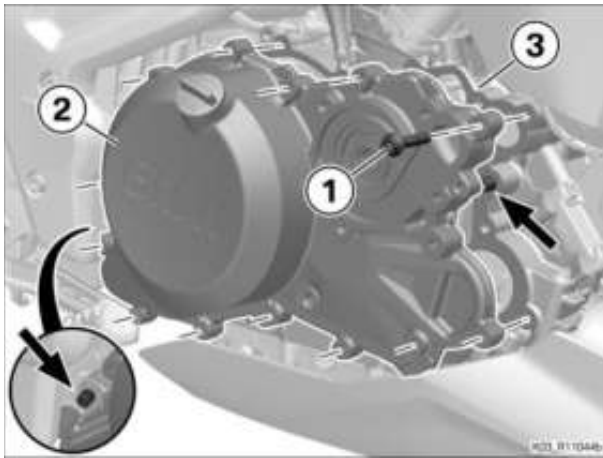
Component damage

- Ensure that coolant and oil do not mix.
-



- Pull off drainage hose (1).

- Remove screws (1).
- Loosen engine housing cover (2) from crankcase (3) and while doing so, pay attention to the dowel pins (arrow).



- Remove seal (1) from crankcase (2).

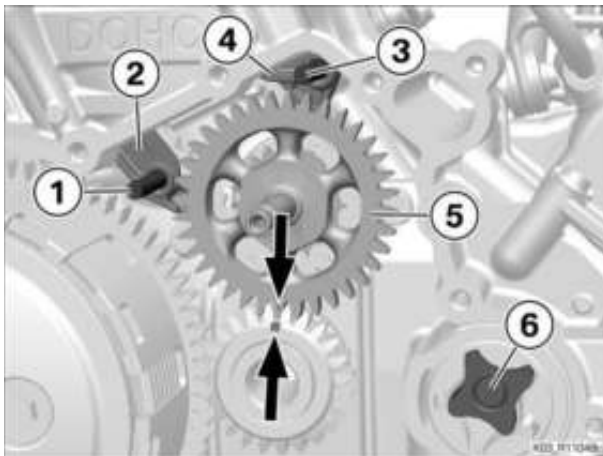
(-) Installing right crankcase cover

- Check installation position of the tensioning rail and slide rail of the water pump drive pulley and oil pump rotor.

- Check installation position of the components (1) to (6) and adjust, if necessary.

NOTICE

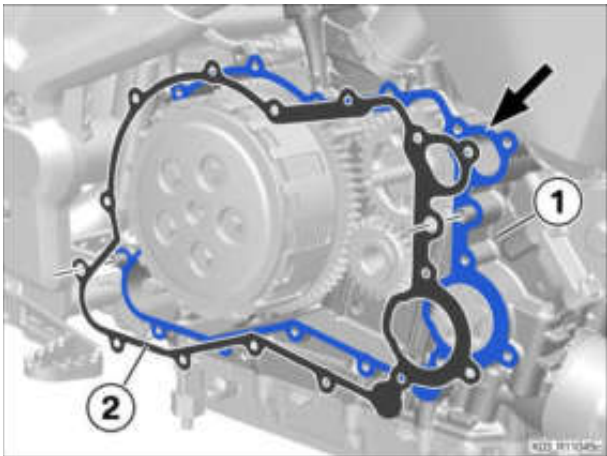
If the timing chain tensioning rail with axle cannot be installed correctly, then the timing chain has to be slackened by removing the timing chain tensioner.



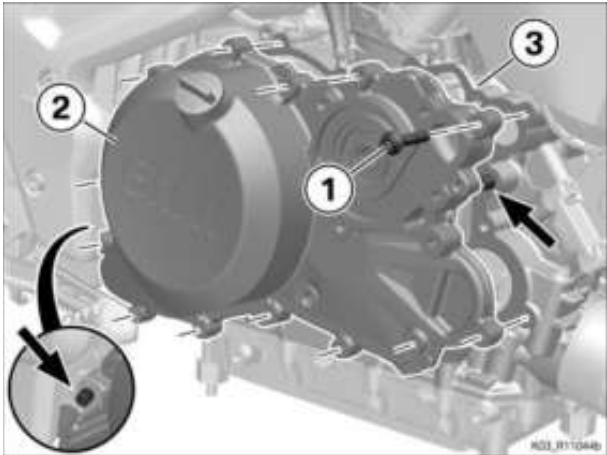
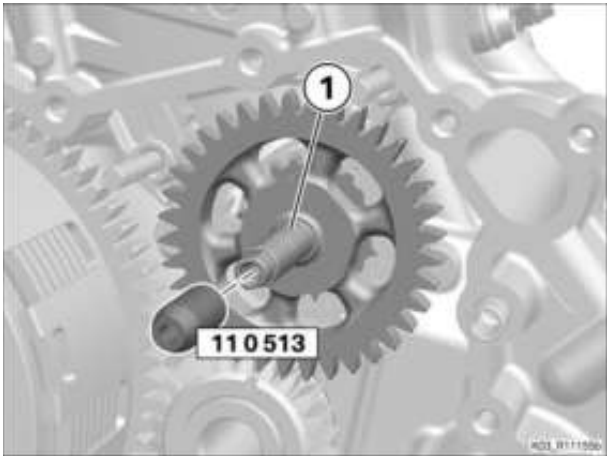
- » Axles and rails (1) to (4) are installed correctly, axles (1) and (3) are installed up to **the limit position**.
- » The point (arrow) on countershaft (5) is on the slot (arrow) if the **crankshaft is at top dead centre**.
- » Oil pump rotor (6) is installed up to the limit position (marking points in the direction of the engine cover).



- Clean sealing surface (arrow) of engine housing (1).
- Place **new** gasket (2).



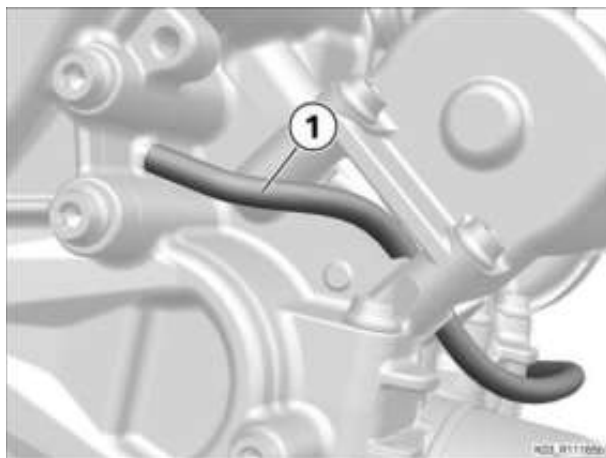
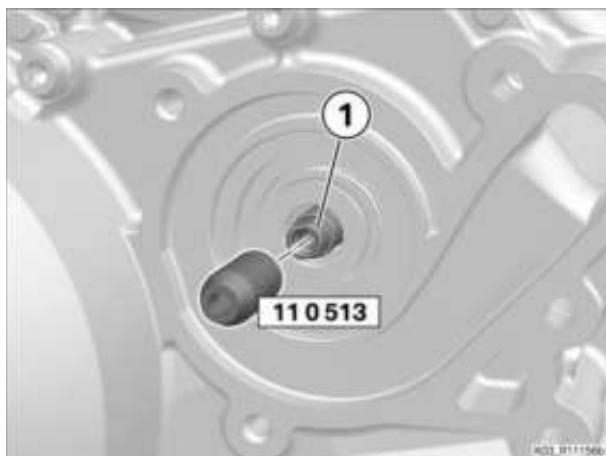
- Position sliding sleeve (No. 11 0 513) on shaft (1).



- If necessary, clean the sealing surface of the engine housing cover (2).
- Place engine housing cover (2) on engine housing (3) and while doing so pay attention to the dowel pins (arrows).
- Install screws (1).

Tightening torques		
Engine housing cover, right, to crankcase		
M6 x 30	Tightening sequence: tighten in diagonally opposite sequence	
	10 Nm	

- Pull off sliding sleeve (No. 11 0 513) of shaft (1).



- Connect drainage hose (1).

Follow-up work

- Securing footbrake cylinder
- Installing the cable duct for the brake light switch
- Installing impeller
- Installing cover for coolant pump
- Filling cooling system
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Installing engine spoiler
- Final check of work performed

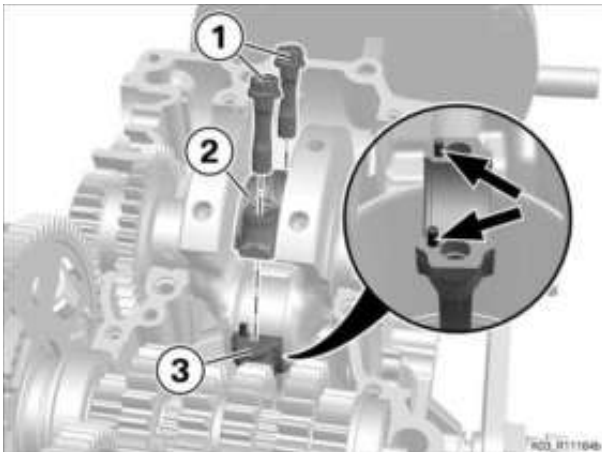
11 21 511 Renewing crankshaft (engine removed)

Preparatory work

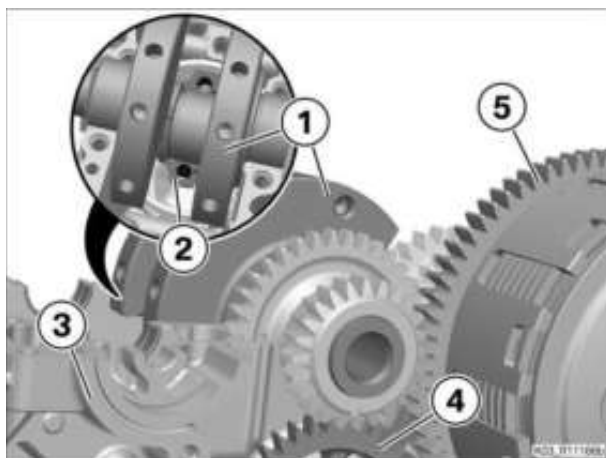
- Removing starter
- Securing engine to assembly stand
- Removing cover for coolant pump
- Removing impeller
- Removing right crankcase cover
- Removing oil suction pump
- Removing left crankcase cover
- Removing layshaft for starter
- Remove adapter
- Removing direct ignition coil
- Removing cylinder head cover
- Adjust engine to firing TDC
- Install alignment pin
- Removing rotor
- Removing locating pin
- Remove engine screws
- Removing oil pan
- Remove intake pipe
- Remove bottom engine housing
- Removing shaft sealing ring of output shaft
- Removing balancing shaft

Core activity

(-) Removing crankshaft

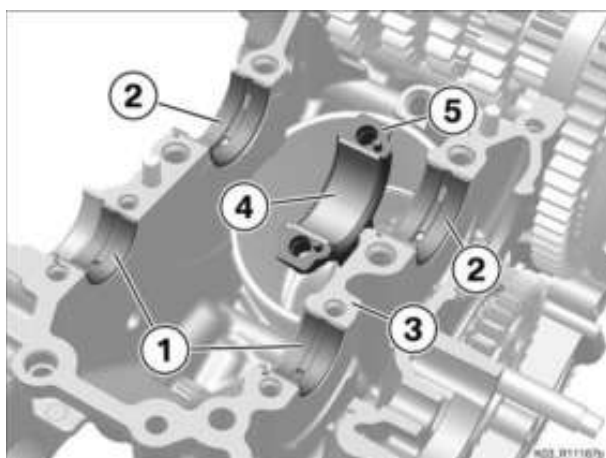


- Remove screws (1).
- Remove connecting rod bearing cap (2) from connecting rod (3) and while doing so, pay attention to the dowel pins (arrows).

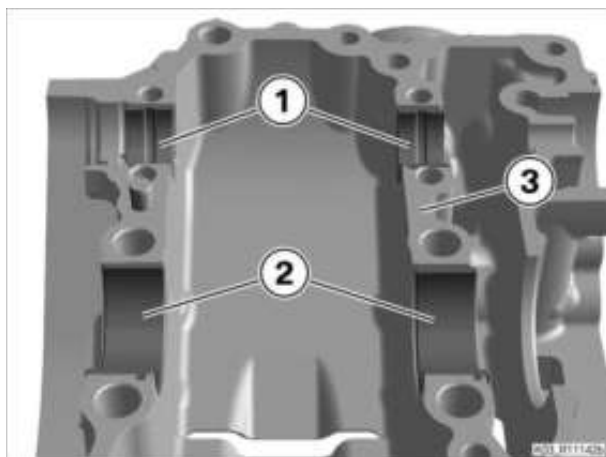


Remove crankshaft (1) from connecting rod (2) and top engine housing (3), paying attention to the intermediate shaft (4) and clutch basket (5) while doing so.

(-) Remove crankshaft and connecting rod bearing

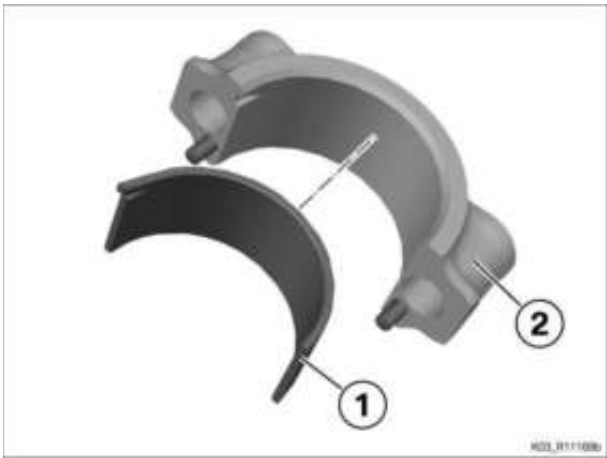


- Check counterbalance shaft bearing (1) for damage; replace if necessary.
- Remove crankshaft bearing shells (2) from top engine housing (3).
- Remove connecting rod bearing shell (4) from connecting rod (5).



- Check counterbalance shaft bearing (1) for damage; replace if necessary.
- Remove crankshaft bearing shells (2) from bottom engine housing (3).

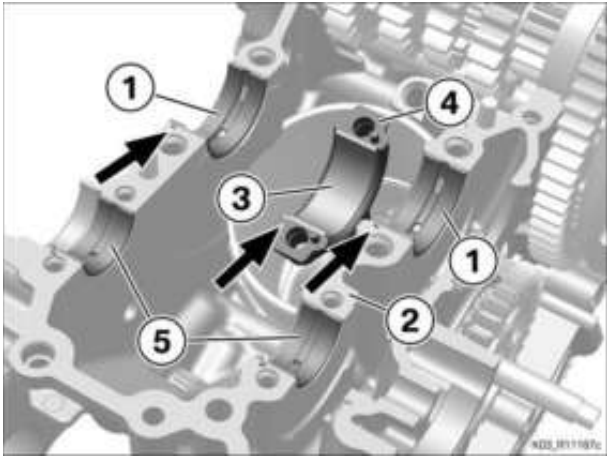
- Remove connecting rod bearing shell (1) from connecting rod bearing cap (2).



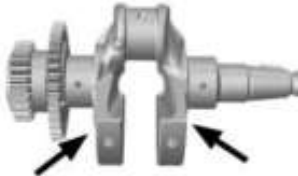
(-) Install crankshaft and connecting rod bearing

 NOTICE

Replace the crankshaft bearing shells if the crankshaft is replaced.



- Lubricate **new** crankshaft bearings (1) with engine oil.

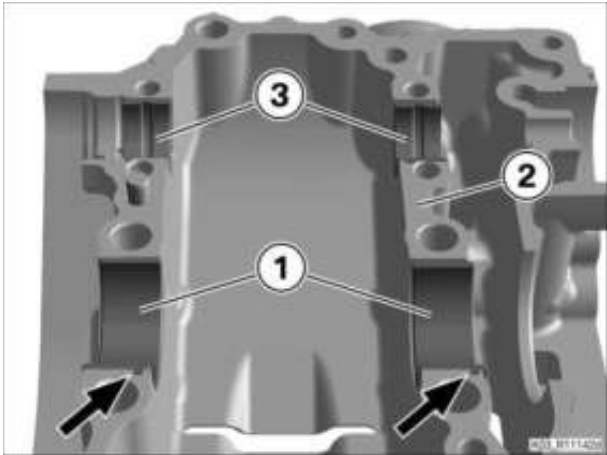
 Technical data			
Colour codes of crankshaft bearing shells	Mark on the crankshaft R/red	Bearing shell brown	
	Mark on the crankshaft B/blue	Bearing shell yellow	
Mark for classification of the crankshaft bearings for identifying the bearing shells	Mark on the crankshaft	R/B	
			

- Install crankshaft bearings (1) in top crankcase half (2), making sure that the lugs (arrows) are correctly seated.
- Lubricate **new** connecting rod bearing shell (3) with engine oil.

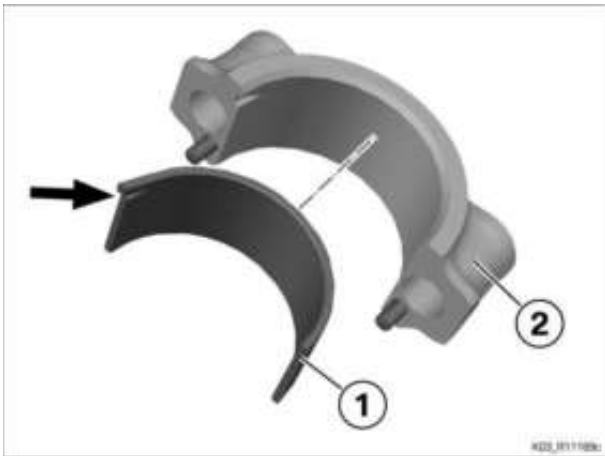
 Technical data			
Conrod bearing, bore diameter	Identification/colour coding on the connecting rod	red or blue	

			
Mark for classification of the conrod bearings 	Mark on the crankshaft	O/orange or G/green	
Colour codes, conrod bearings Assignment, conrod/conrod cap	Connecting rod red / crankshaft journal O/orange	Bearing shell yellow	
	Connecting rod blue / crankshaft journal O/orange	Bearing shell brown	
	Connecting rod red / crankshaft journal G/green	Bearing shell brown	
	Connecting rod blue / crankshaft journal G/green	Bearing shell blue	

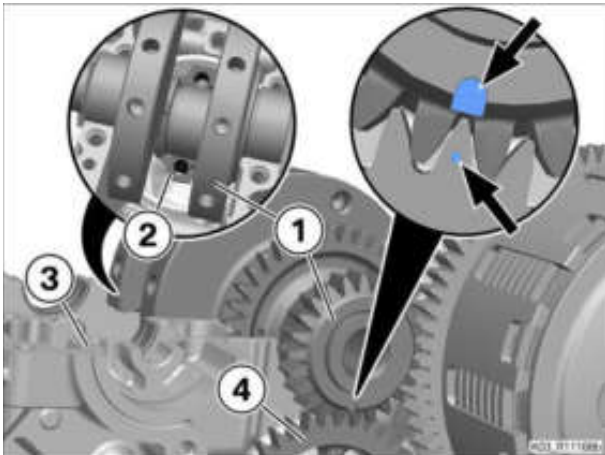
- Install connecting rod bearing shell (3) in connecting rod (4), ensuring correct fit of the lug (arrow) while doing so.
- Lubricate counterbalance shaft bearing (5) with engine oil.
- Lubricate **new** crankshaft bearings (1) with engine oil.
- Install crankshaft bearings (1) in top crankcase half (2), making sure that the lugs (arrows) are correctly seated.
- Lubricate counterbalance shaft bearing (3) with engine oil.



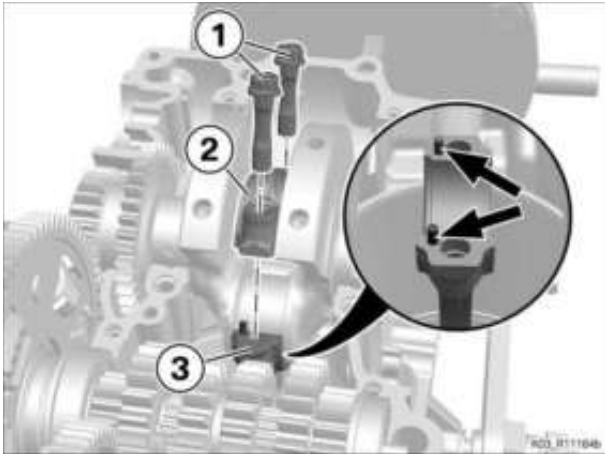
- Lubricate **new** connecting rod bearing shell (1) with engine oil.
- Install connecting rod bearing shell (1) in connecting rod bearing cap (2), ensuring correct fit of the lug (arrow) while doing so.



(-) Installing crankshaft



- Insert crankshaft (1) in connecting rod (2) and top engine housing (3) ensuring that mark (arrow) on intermediate shaft (4) aligns with mark (arrow) of the crankshaft (1).



- Place connecting rod bearing cap (1) on connecting rod (2) and while doing so, pay attention to dowel pins (arrows).
- Lubricate **new** connecting rod bolts (3) with engine oil and install.

Tightening torques		
Conrod bolt		
M8 x 31, Replace screw Threads and contact surface of screw head are oiled	1st tightening torque, 10 Nm	
	2nd tightening torque, 25 Nm	
	Additional angle of rotation, 90°	

Follow-up work

- Installing balancing shaft
- Install engine housing, bottom
- Install intake pipe
- Installing oil pan
- Installing shaft sealing ring of output shaft

Check OT marks

Turning engine through several revolutions and making sure that all components move freely

Installing cylinder head cover

Installing direct ignition coil

Install alignment pin

Installing rotor

Removing locating pin

Install adapter

Installing layshaft for starter

Installing left crankcase cover

Installing oil suction pump

Installing right crankcase cover

Installing impeller

Installing cover for coolant pump

Removing engine from assembly stand

Installing starter

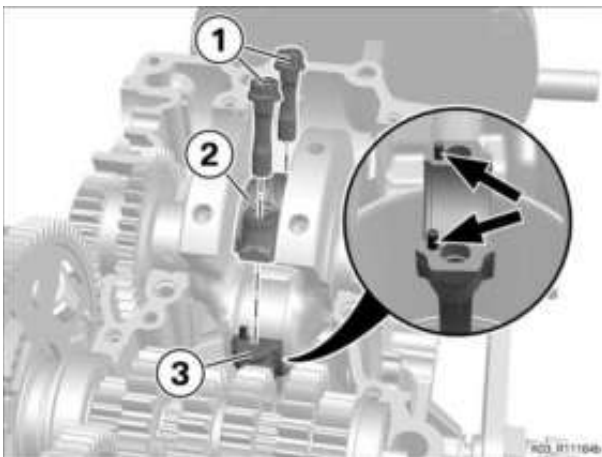
11 24 549 Replacing all conrod bearings (engine removed)

Preparatory work

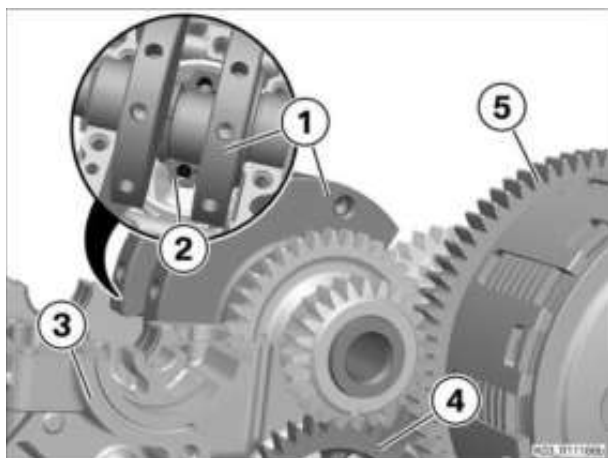
- Removing starter
- Securing engine to assembly stand
- Removing cover for coolant pump
- Removing impeller
- Removing right crankcase cover
- Removing oil suction pump
- Removing left crankcase cover
- Removing layshaft for starter
- Remove adapter
- Removing direct ignition coil
- Removing cylinder head cover
- Adjust engine to firing TDC
- Remove engine screws
- Removing oil pan
- Remove intake pipe
- Remove bottom engine housing
- Removing shaft sealing ring of output shaft
- Removing balancing shaft

Core activity

(-) Removing crankshaft

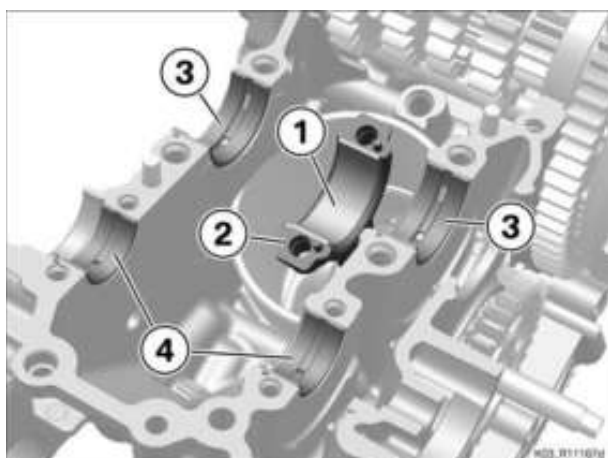


- Remove screws (1).
- Remove connecting rod bearing cap (2) from connecting rod (3) and while doing so, pay attention to the dowel pins (arrows).
- Remove crankshaft (1) from connecting rod (2) and top engine housing (3), paying attention to the intermediate shaft (4) and clutch basket (5) while doing so.

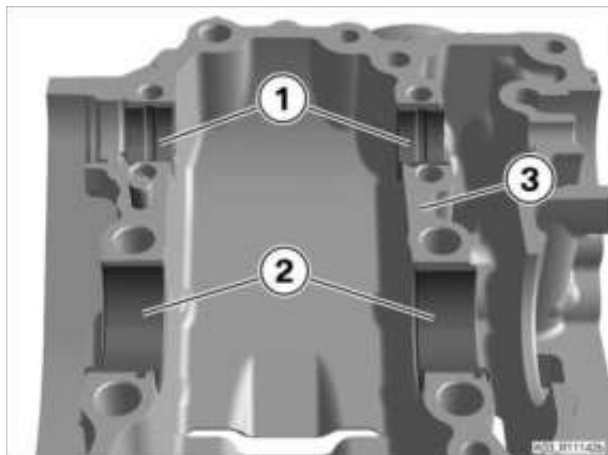


(-) Replace connecting rod bearing

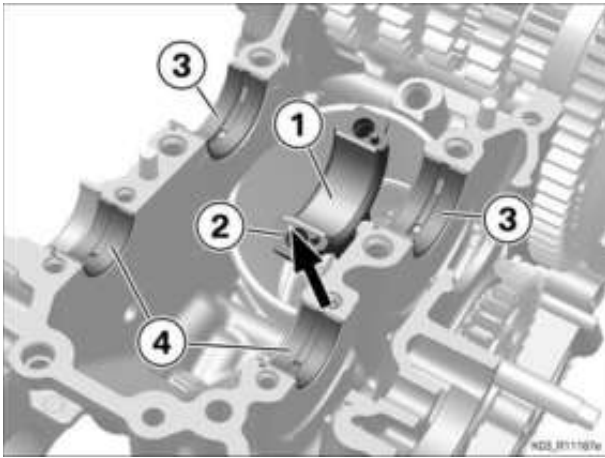
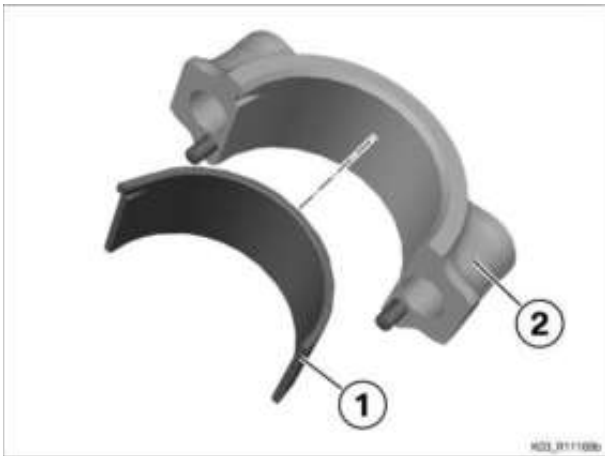
- Remove connecting rod bearing shell (1) from connecting rod (2).
- Check counterbalance shaft bearing (3) and crankshaft bearing shell (4) for damage, replace if required.



- Check counterbalance shaft bearing (3) and crankshaft bearing shell (4) in the bottom engine housing (3) for damage, replace if required.



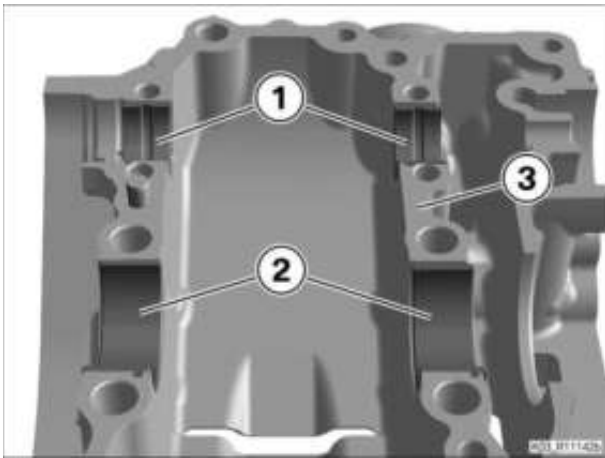
- Remove connecting rod bearing shell (1) from connecting rod bearing cap (2).



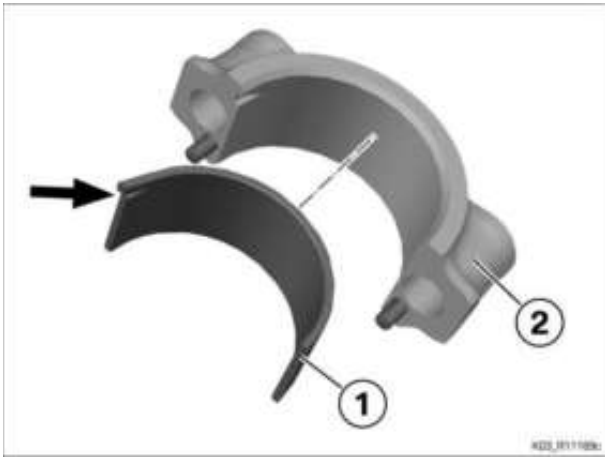
• Lubricate **new** connecting rod bearing shell (1) with engine oil.

 Technical data			
Conrod bearing, bore diameter	Identification/colour coding on the connecting rod	red or blue	
			
Mark for classification of the conrod bearings	Mark on the crankshaft	O/orange or G/green	
			
Colour codes, conrod bearings Assignment, conrod/conrod cap	Connecting rod red / crankshaft journal O/orange	Bearing shell yellow	
	Connecting rod blue / crankshaft journal O/orange	Bearing shell brown	
	Connecting rod red / crankshaft journal G/green	Bearing shell brown	
	Connecting rod blue / crankshaft journal G/green	Bearing shell blue	

- Install connecting rod bearing shell (1) in connecting rod (2), ensuring correct fit of the lug (arrow) while doing so.
- Lubricate counterbalance shaft bearing (3) and crankshaft bearing shells (4) with engine oil.

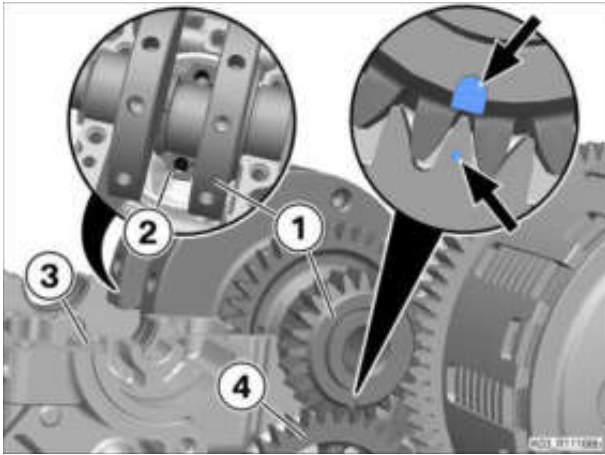


- Lubricate counterbalance shaft bearing (1) and crankshaft bearing shells (2) in the bottom engine housing (3) with engine oil.



- Lubricate **new** connecting rod bearing shell (1) with engine oil.
- Install connecting rod bearing shell (1) in connecting rod bearing cap (2), ensuring correct fit of the lug (arrow) while doing so.

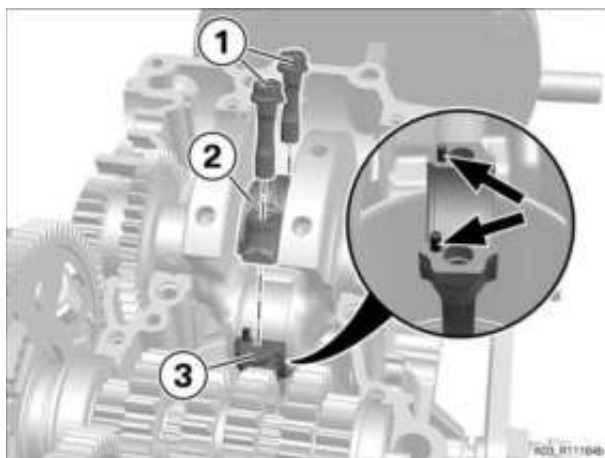
(-) Installing crankshaft



- Insert crankshaft (1) in connecting rod (2) and top engine housing (3) ensuring that mark (arrow) on intermediate shaft (4) aligns with mark (arrow) of the crankshaft (1).

- Place connecting rod bearing cap (1) on connecting rod (2) and while doing so, pay attention to dowel pins (arrows).
- Lubricate **new** connecting rod bolts (3) with engine oil and install.

 Tightening torques		
Conrod bolt		
M8 x 31, Replace screw	1st tightening torque, 10 Nm	



Threads and contact surface of screw head are oiled

2nd tightening torque, 25 Nm

Additional angle of rotation, 90°

Follow-up work

Installing balancing shaft

Install engine housing, bottom

Install intake pipe

Installing oil pan

Installing shaft sealing ring of output shaft

Check OT marks

Turning engine through several revolutions and making sure that all components move freely

Installing cylinder head cover

Installing direct ignition coil

Install adapter

Installing layshaft for starter

Installing left crankcase cover

Installing oil suction pump

Installing right crankcase cover

Installing impeller

Installing cover for coolant pump

Removing engine from assembly stand

Installing starter

11 26 001 Replace reduction gear for starter motor

+ 11 26 608

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing pinion cover

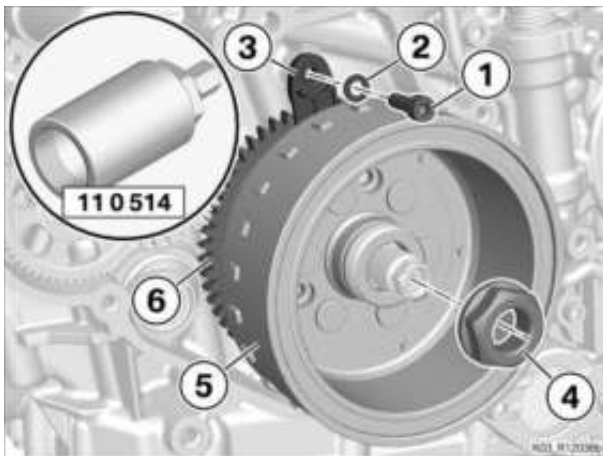
Disengage the left crankcase cover

Removing screw for bore for locating pin

Lock the crankshaft in TDC position

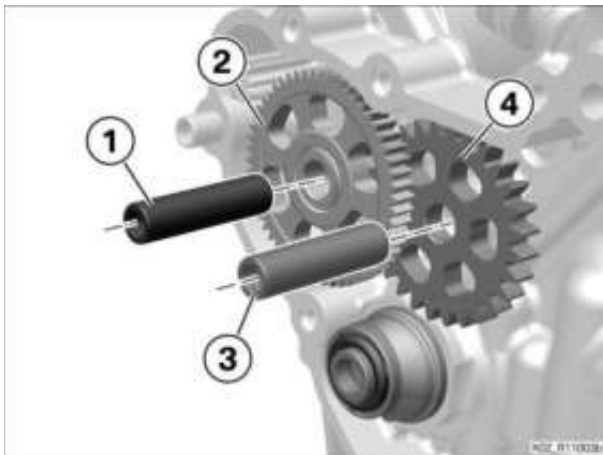
Core activity

(-) Removing rotor



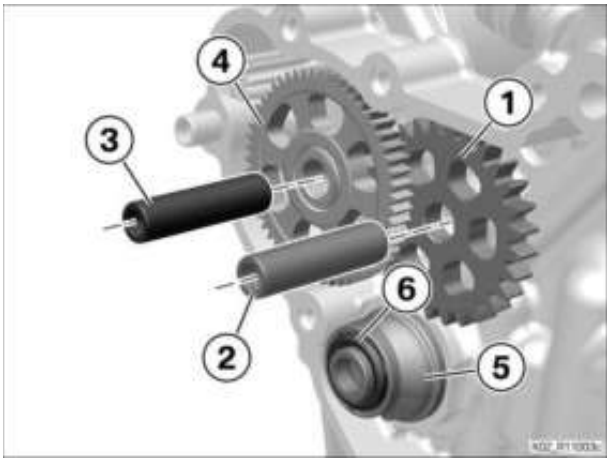
- Remove bolt (1), washer (2) and guide (3).
- Remove nut (4).
- Pull off rotor (5) with extractor (No. 11 0 514) and remove along with gear (6).

(-) Removing reduction gear for starter



- Remove shaft (1) and remove starter motor pinion (2).
- Remove shaft (3) and remove pinion (4).

(-) Installing reduction gear for starter

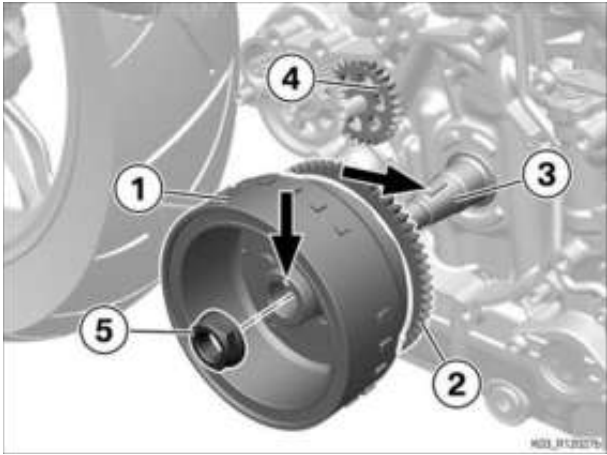


- Lubricate shaft (1) and starter motor pinion (2) with engine oil and install.
- Lubricate shaft (3) and pinion (4) with engine oil and install.
- Check installation position of the adapter (5), if required install correctly.
- Check the O-ring (6) for damage, replace if necessary.

(-) Installing rotor



- Insert gear (1) in magnet wheel (2) and turn the gear in the anti-clockwise direction while doing so.
- Check free wheel function and install gear (1) correctly if required.

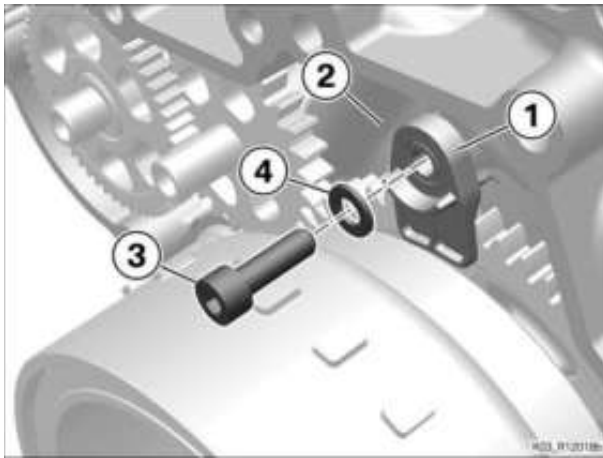


- Clean the threads.
- Push rotor (1) with gear (2) on crankcase butt (3); while doing so, pay attention the anti-twist lock (arrows) and correct gearing of the gear (2) with the pinion (4).
- Install nut (5).

Tightening torques		
Rotor to crankshaft		
M16 x 1.5	120 Nm	
Thread-locking compound (Loctite 243, Medium strength)		

- Clean the threads.
- Fit guide (1) on engine housing (2).
- Install bolt (3) and washer (4).

Tightening torques		
Guide for starter motor freewheel on crankcase		
M5 x 16	6 Nm	



Thread-locking compound (Loctite 243, Medium strength)		
--	--	--

Follow-up work

Removing locating pin

Installing screw in bore for locating pin

Securing left crankcase cover

Installing pinion cover

Installing engine spoiler

Final check of work performed

11 26 002 Replacing freewheel for starter motor

+ 11 26 609

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing pinion cover

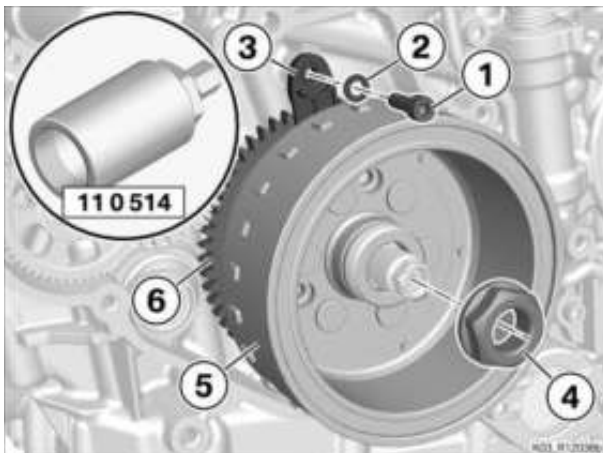
Disengage the left crankcase cover

Removing screw for bore for locating pin

Lock the crankshaft in TDC position

Core activity

(-) Removing rotor



- Remove bolt (1), washer (2) and guide (3).
- Remove nut (4).
- Pull off rotor (5) with extractor (No. 11 0 514) and remove along with gear (6).

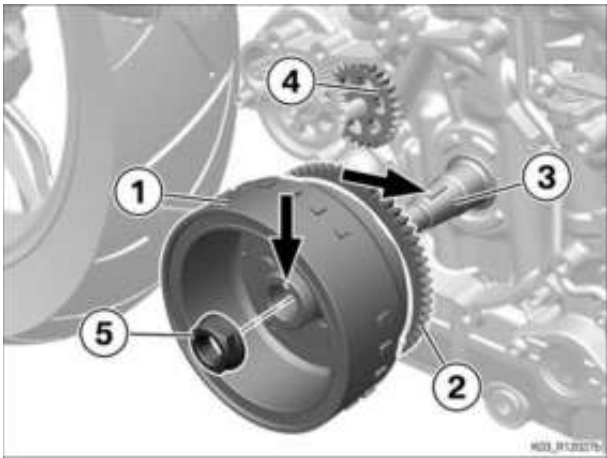
(-) Installing rotor



- Insert gear (1) in magnet wheel (2) and turn the gear in the anti-clockwise direction while doing so.
- Check free wheel function and install gear (1) correctly if required.

- Clean the threads.

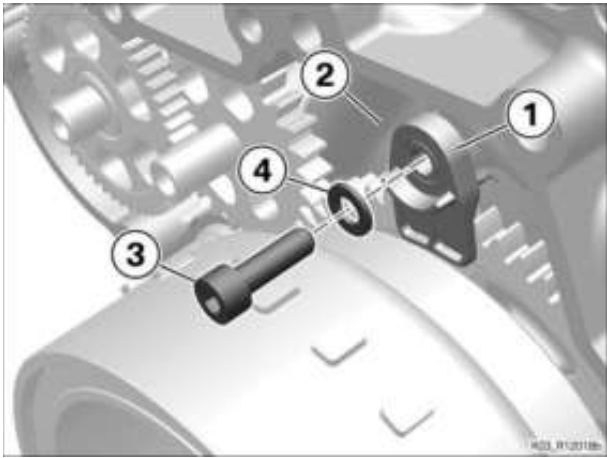
•



Push rotor (1) with gear (2) on crankcase butt (3); while doing so, pay attention the anti-twist lock (arrows) and correct gearing of the gear (2) with the pinion (4).

- Install nut (5).

 Tightening torques		
Rotor to crankshaft		
M16 x 1.5 Thread-locking compound (Loctite 243, Medium strength)	120 Nm	



- Clean the threads.
- Fit guide (1) on engine housing (2).
- Install bolt (3) and washer (4).

 Tightening torques		
Guide for starter motor freewheel on crankcase		
M5 x 16 Thread-locking compound (Loctite 243, Medium strength)	6 Nm	

Follow-up work

- Removing locating pin
- Installing screw in bore for locating pin
- Securing left crankcase cover
- Installing pinion cover
- Installing engine spoiler
- Final check of work performed

11 27 506 Removing/installing balancing shaft (engine removed)

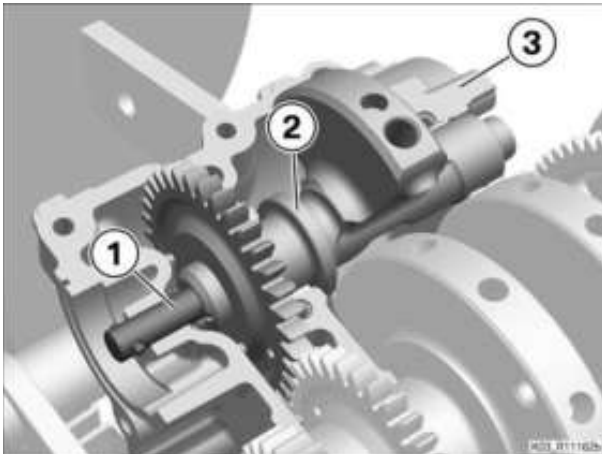
Preparatory work

- Removing starter
- Securing engine to assembly stand
- Removing left crankcase cover
- Removing layshaft for starter
- Remove adapter
- Removing cover for coolant pump
- Removing impeller
- Removing right crankcase cover
- Removing oil suction pump
- Removing direct ignition coil
- Removing cylinder head cover
- Adjust engine to firing TDC
- Remove engine screws
- Removing oil pan
- Remove intake pipe
- Remove bottom engine housing
- Removing shaft sealing ring of output shaft

Core activity

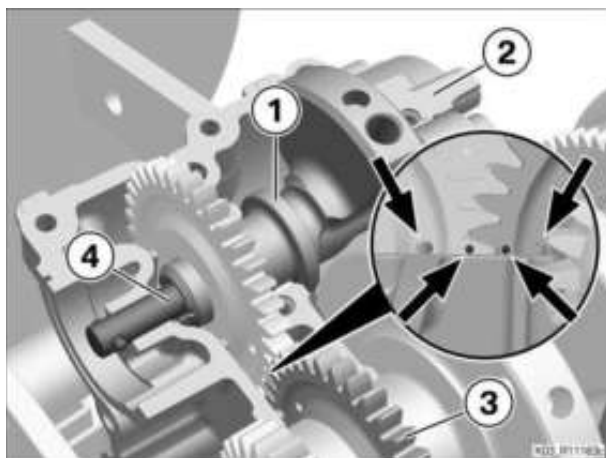
(-) Removing balancing shaft

- Remove pump shaft (1) and counterbalance shaft (2) from top engine housing (3).



(-) Installing balancing shaft

- Insert counterbalance shaft (1) in top engine housing (2) and crankshaft (3), ensuring that both marks (Arrows) point to each other and align with sealing surface.
- Install pump shaft (4) in counterbalance shaft (1).



Follow-up work

Install engine housing, bottom

Install intake pipe

Installing oil pan

Check OT marks

Turning engine through several revolutions and making sure that all components move freely

Installing cylinder head cover

Installing direct ignition coil

Installing oil suction pump

Installing right crankcase cover

Installing impeller

Installing cover for coolant pump

Install adapter

Installing layshaft for starter

Installing left crankcase cover

Installing shaft sealing ring of output shaft

Removing engine from assembly stand

Installing starter

 11 31 080 Removing/installing or replacing timing-chain tensioner
+ 11 31 780

Preparatory work

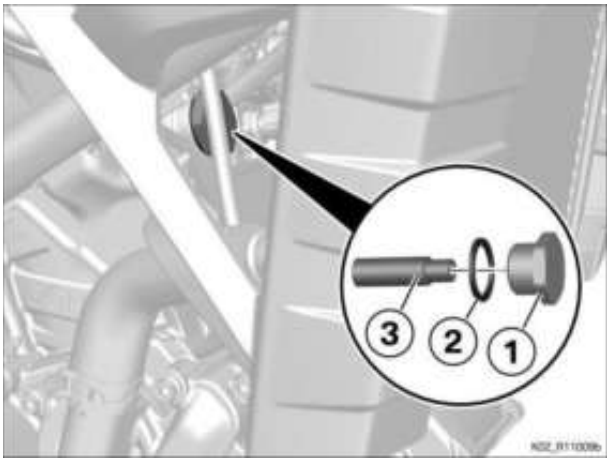
=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Removing air guide

Core activity

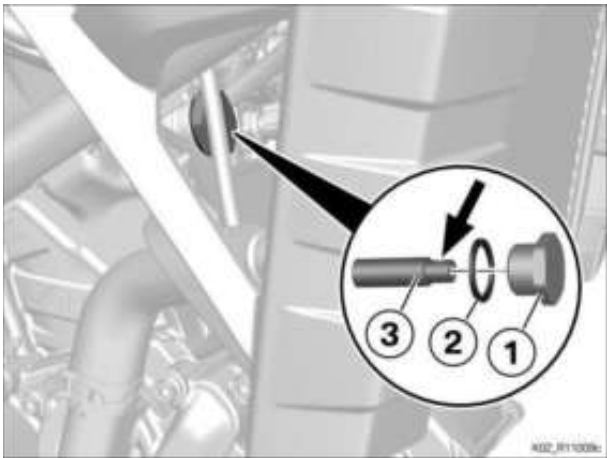
(-) Removing timing-chain tensioner

- Remove threaded plug (1) with sealing ring (2).
- Remove timing-chain tensioner (3).



(-) Installing timing chain tensioner

- Install timing chain tensioner (3) with the smaller diameter (arrow) toward the outside.
- Install screw plug (1) with **new** sealing ring (2).



 Tightening torques		
Timing chain tensioner in cylinder head		
M24 x 1.5	30 Nm	

Follow-up work

Installing air guide

Final check of work performed

11 31 125 Replacing chain guide

+ 11 31 786

NOTICE

The chain guide is available exceptionally as repair kit with Chain wrench and chain slide rail.

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Draining coolant

Removing right radiator cowl

Removing cover for coolant pump

Removing impeller

Removing the cable duct for the brake light switch

Releasing footbrake cylinder

Removing right crankcase cover

Removing crankshaft cover

Lock the crankshaft in TDC position

Removing direct ignition coil

Removing cylinder head cover

Removing timing-chain tensioner

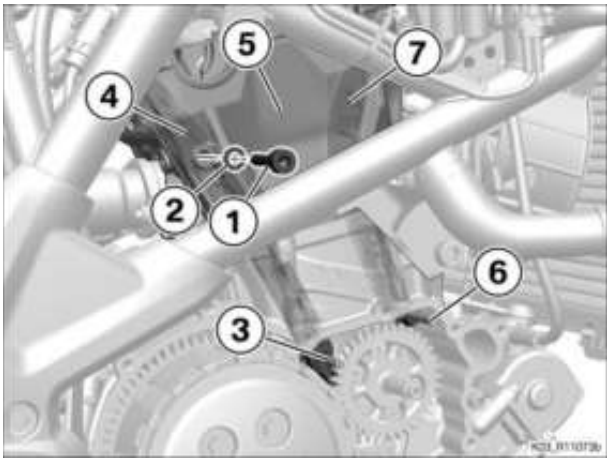
Removing camshaft bearing cap

Remove the camshafts

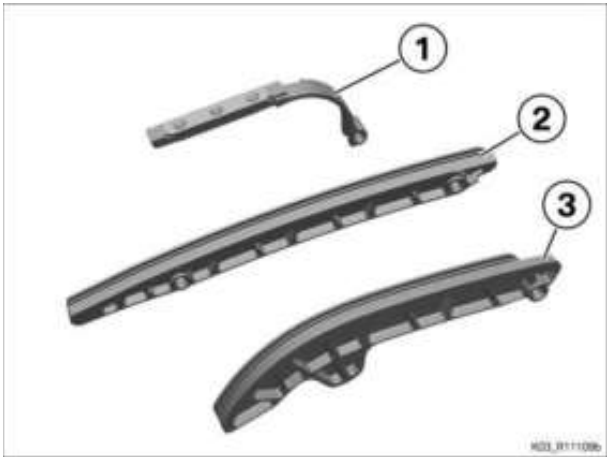
Core activity

(-) Removing slide rail and tensioning rail

- Remove screw (1) with sealing ring (2).
- Remove axle (3) and pull out slide rail (4) from cylinder head (5).
- Remove axle (6) and pull out tensioning rail (7) from cylinder head (5).

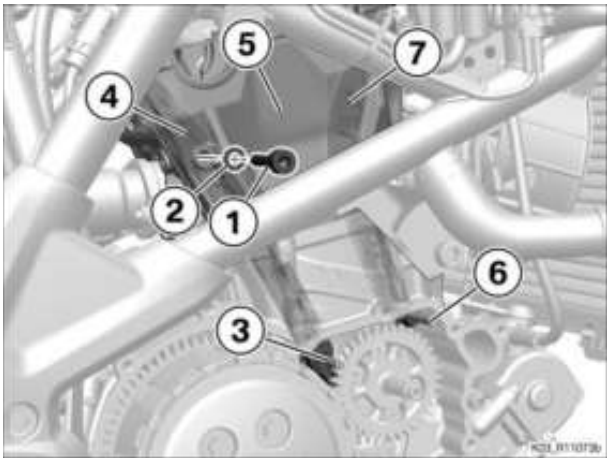


(-) Replace chain guide



- Replace following components with new parts:
- Chain guide, top (1)
- Slide rail (2)
- Tensioning rail (3)
- Axles
- Bearing cap screws

(-) Installing slide rail and tensioning rail



- Clean the threads.
- Insert tensioning rail (7) in cylinder head (5) and install axle (6).
- Insert slide rail (4) in cylinder head (5) and install axle (3).
- Install screw (1) with sealing ring (2).

 Tightening torques		
Chain guide to cylinder head		
M8 x 1 Thread-locking compound (Loctite 243, Medium strength)	12 Nm	

Follow-up work

- Installing camshafts
- Installing camshaft bearing cap
- Installing timing chain tensioner
- Removing locating pin

Turning engine through several revolutions and making sure that all components move freely

Installing cylinder head cover

Installing direct ignition coil

Installing right crankcase cover

Securing footbrake cylinder

Installing the cable duct for the brake light switch

Installing impeller

Installing cover for coolant pump

Installing crankshaft cover

Installing right radiator cowl

Installing fuel tank

Filling cooling system

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Installing engine spoiler

Checking engine oil level

Final check of work performed

11 31 539 Replacing all camshafts (cylinder-head cover removed)

Preparatory work

Removing right radiator cowl

Removing crankshaft cover

Removing screw for bore for locating pin

Adjusting the crankshaft to firing TDC

Lock the crankshaft in TDC position

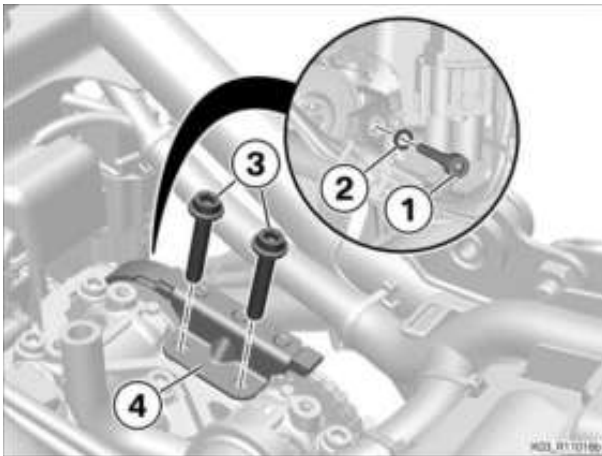
Removing timing-chain tensioner

Core activity

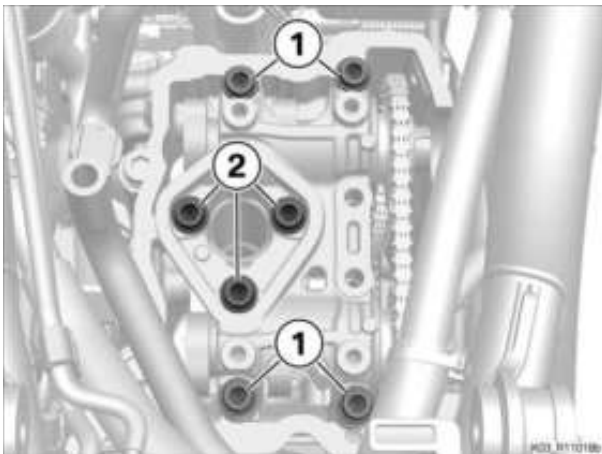
(-) Removing camshaft bearing cap

► Removing chain guide

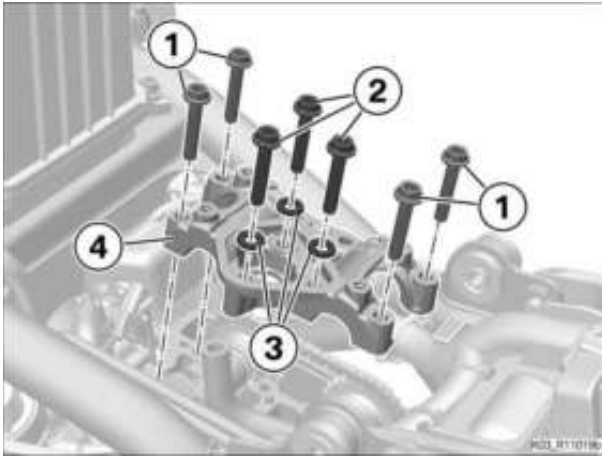
- Remove screw (1) with sealing ring (2).
- Remove screws (3).
- Remove chain guide (4).



- Slacken screws (1) and (2) from the outside to the inside.

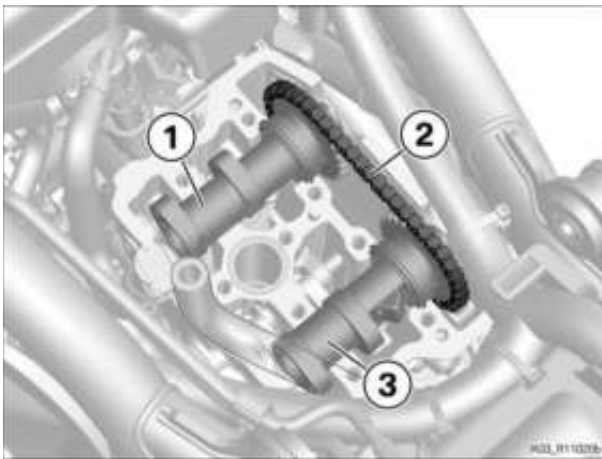


- Remove screws (1).
- Remove screws (2) with washers (3).
- Remove bearing cap (4).



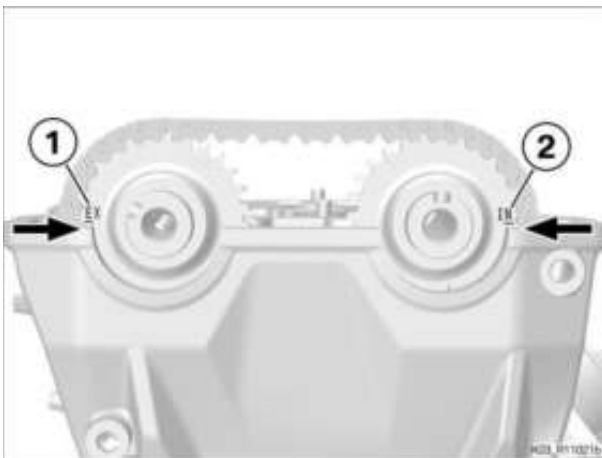
(-) Remove the camshafts

- Feed out inlet camshaft (1) from timing chain (2) and remove.
- Feed out exhaust camshaft (3) from timing chain (2) and remove.
- Secure timing chain (2) against falling down.

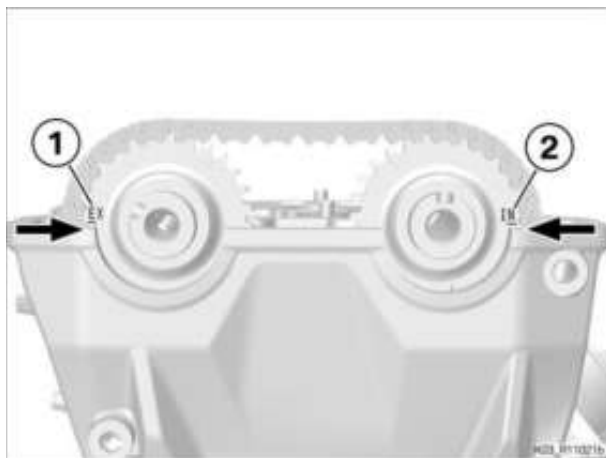
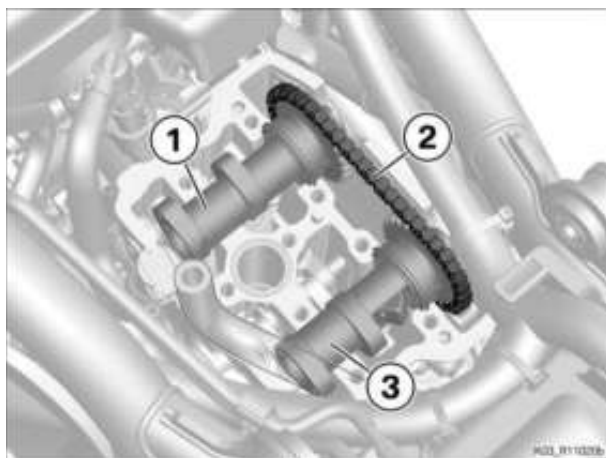


(-) Installing camshafts

- Adjust the timing when installing the camshafts according to the figure.
- Marks (1) and (2) on the camshaft sprockets must align with edge of housing (Arrow).

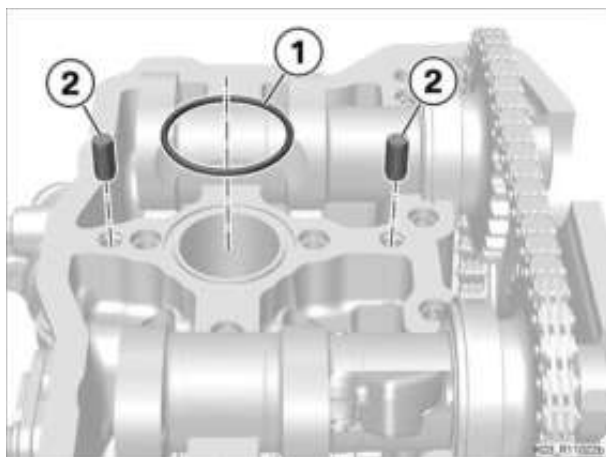


- Lubricate all bearing seats with engine oil.
- Pull timing chain (2) tight at exhaust side and feed in exhaust camshaft (3) and install.
- Pull timing chain (2) downstream of exhaust camshaft (3) tight and feed in intake camshaft (1) and install.



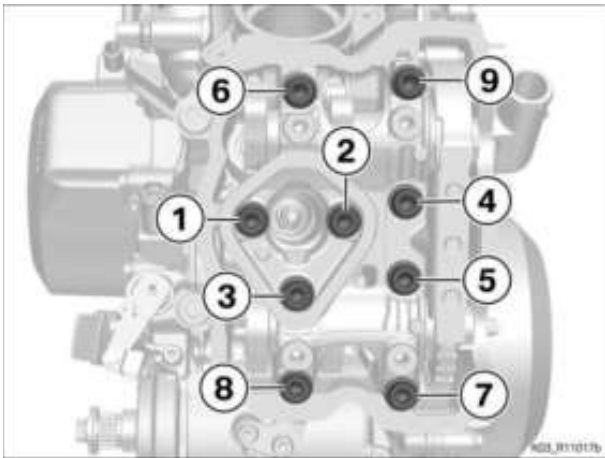
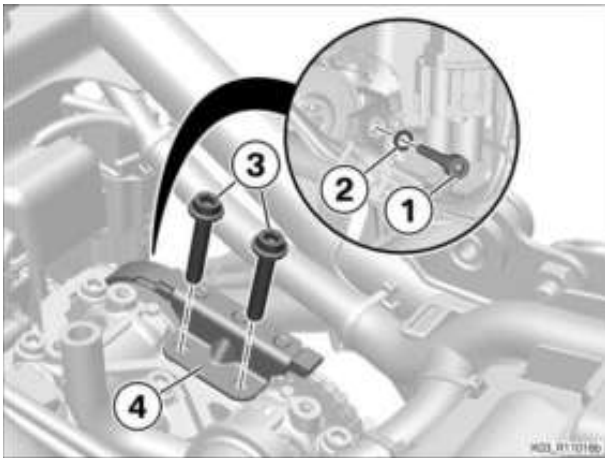
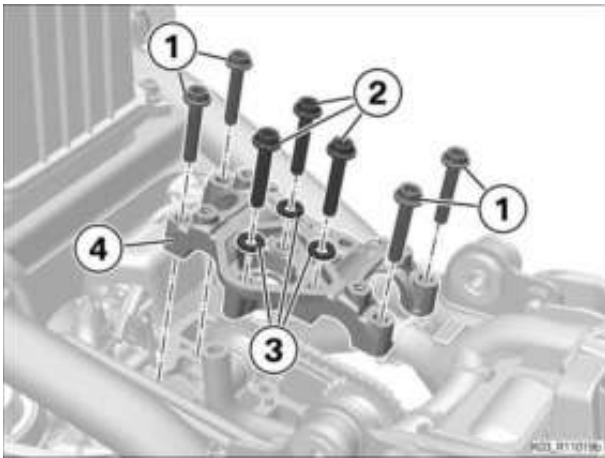
- Check timing and adjust, if necessary.
- Marks (1) and (2) on camshaft sprockets must align with edge of housing (Arrows).

(-) Installing camshaft bearing cap



- Replace O-ring (1).
- Ensure that the fitting bushes (2) are installed.

- Install camshaft bearing cap (4).
- Install screws (2) with washers (3) and tighten until hand-tight.
- Install screws (1) and tighten until hand-tight.



► **Installing chain guide**

- Clean the threads.
- Install chain guide (4).
- Install screws (3) and tighten until hand-tight.
- Install screw (1) with sealing ring (2).

 Tightening torques		
Chain guide to cylinder head		
M8 x 1 Thread-locking compound (Loctite 243, Medium strength)	12 Nm	



- Tighten the screws in the sequence given (1) to (9).

 Tightening torques		
Camshaft bearing cap to cylinder head		
M7 x 38 - 10.9, Threads and contact surface of screw head are oiled	Tightening sequence: See repair manual	
	Screw in all screws hand-tight	
	Tightening torque, 15 Nm	

Follow-up work

Installing timing chain tensioner

Removing locating pin

Turning engine through several revolutions and making sure that all components move freely

Checking timing

Checking valve clearance

Installing screw in bore for locating pin

Installing crankshaft cover

Installing right radiator cowl

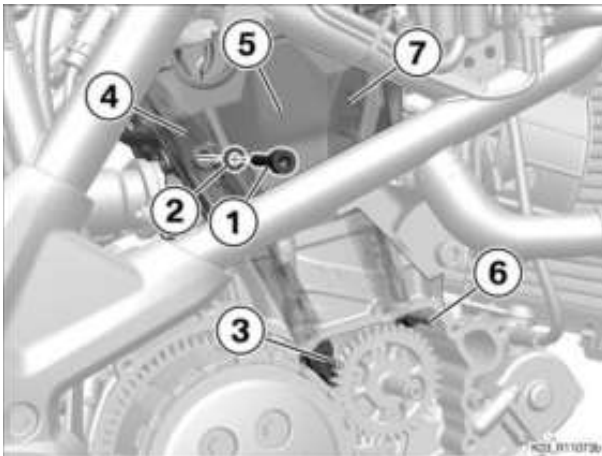
11 31 555 Replacing timing chain(cylinder head cover removed)

Preparatory work

- Removing engine spoiler
- Draining coolant
- Removing right radiator cowl
- Removing cover for coolant pump
- Removing impeller
- Removing the cable duct for the brake light switch
- Releasing footbrake cylinder
- Removing right crankcase cover
- Removing crankshaft cover
- Lock the crankshaft in TDC position
- Removing timing-chain tensioner
- Removing camshaft bearing cap
- Remove the camshafts

Core activity

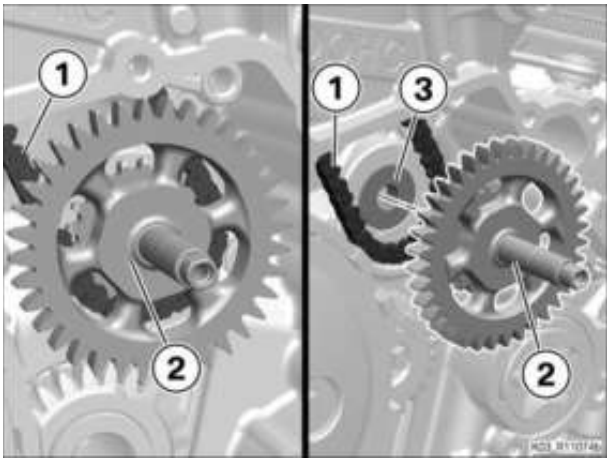
(-) Removing slide rail and tensioning rail



- Remove screw (1) with sealing ring (2).
- Remove axle (3) and pull out slide rail (4) from cylinder head (5).
- Remove axle (6) and pull out tensioning rail (7) from cylinder head (5).

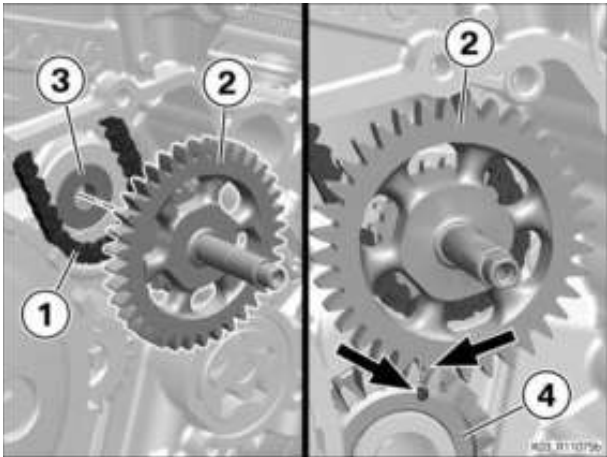
(-) Removing timing chain

- Loosen timing chain (1) from countershaft (2).
- Remove countershaft (2) from camshaft bearing (3).
- Remove timing chain (1).



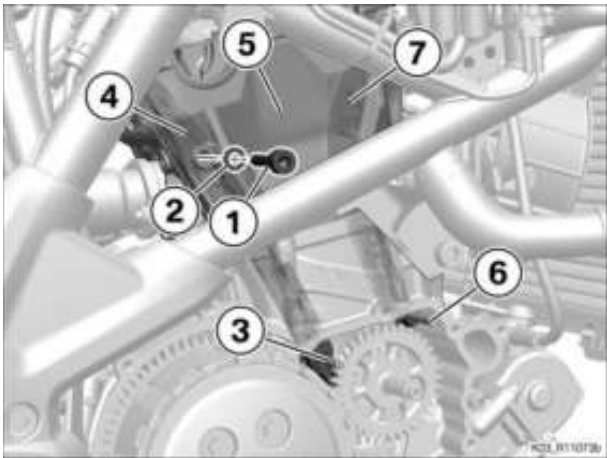
(-) Installing timing chain

- Insert timing chain (1) and secure it from falling out.
 - Insert countershaft (2) in bearing (3) and timing chain (1).
 - Ensure correct installation position of the countershaft (2) and crankshaft (4) (arrows).
- » The point/slot marks **stand by each other** if the crankshaft lies on top dead centre.



(-) Installing slide rail and tensioning rail

- Clean the threads.
- Insert tensioning rail (7) in cylinder head (5) and install axle (6).
- Insert slide rail (4) in cylinder head (5) and install axle (3).
- Install screw (1) with sealing ring (2).



 Tightening torques		
Chain guide to cylinder head		
M8 x 1 Thread-locking compound (Loctite 243, Medium strength)	12 Nm	

Follow-up work

- Installing camshafts
- Installing camshaft bearing cap
- Installing timing chain tensioner
- Removing locating pin

Turning engine through several revolutions and making sure that all components move freely

Installing right crankcase cover

Securing footbrake cylinder

Installing the cable duct for the brake light switch

Installing impeller

Installing cover for coolant pump

Installing crankshaft cover

Installing right radiator cowl

Filling cooling system

Installing engine spoiler

11 33 295 Removing/installing or replacing all cam followers

+ 11 33 694

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Removing right radiator cowl

Removing left radiator cowl

Removing direct ignition coil

Removing spark plug

Removing cylinder head cover

Removing secondary air system changeover valve

Removing crankshaft cover

Removing screw for bore for locating pin

Lock the crankshaft in TDC position

Removing timing-chain tensioner

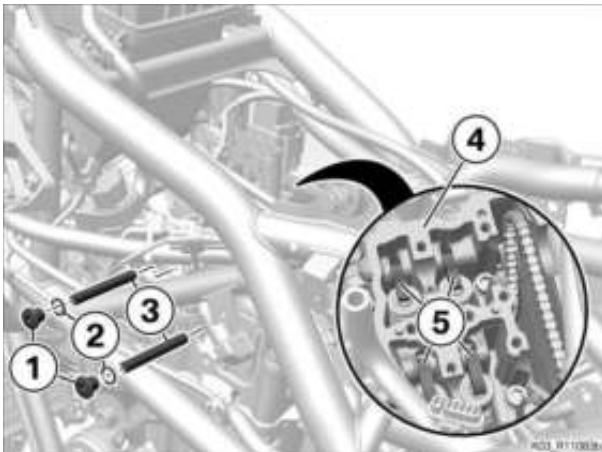
Removing camshaft bearing cap

Remove the camshafts

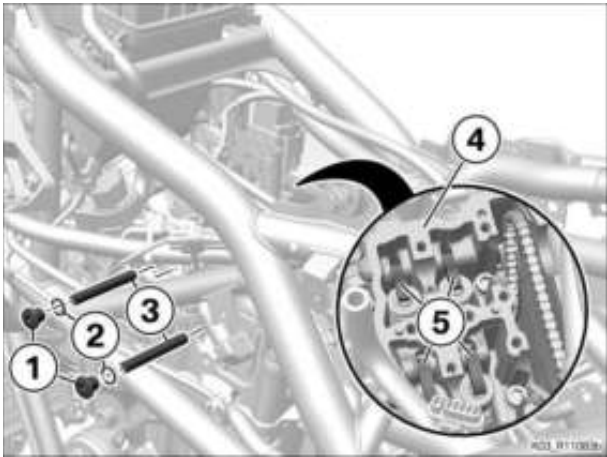
Core activity

(-) Removing all cam followers

- Remove screws (1) and sealing ring (2).
- Remove rocker arm axles (3) with appropriate tool, for example with a magnetic bar, from cylinder head (4).
- Remove rocker arm (5).



(-) Installing all cam followers



- Lubricate **new** rocker arm (5) and **new** rocker arm axles (3) with engine oil before the installation.
- Install rocker arm axles (3) in cylinder head (4) and rocker arm (5).
- Install screws (1) and sealing rings (2).

 Tightening torques		
Seal plug (rocker arm axle) to cylinder head		
M10 x 1	15 Nm	

Follow-up work

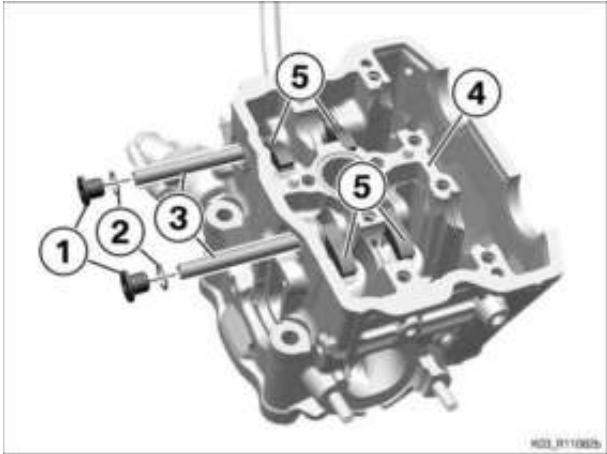
- Installing camshafts
- Installing camshaft bearing cap
- Installing timing chain tensioner
- Removing locating pin
- Turning engine through several revolutions and making sure that all components move freely
- Checking timing
- Checking valve clearance
- Installing screw in bore for locating pin
- Installing crankshaft cover
- Installing secondary air system changeover valve
- Installing cylinder head cover
- Installing spark plug
- Installing direct ignition coil
- Installing left radiator cowl
- Installing right radiator cowl
- Installing fuel tank
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Final check of work performed

 11 33 552 Replacing all cam followers (cylinder head removed)

Core activity

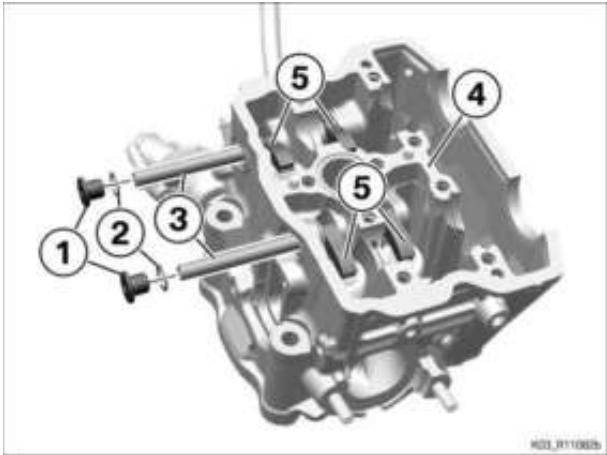
(-) Removing all cam followers

- Remove screws (1) and sealing ring (2).
- Remove rocker arm axles (3) with appropriate tool, for example with a magnetic bar, from cylinder head (4).
- Remove rocker arm (5).



(-) Installing all cam followers

- Lubricate **new** rocker arm (5) and **new** rocker arm axles (3) with engine oil before the installation.
- Install rocker arm axles (3) in cylinder head (4) and rocker arm (5).
- Install screws (1) and sealing rings (2).



 Tightening torques		
Seal plug (rocker arm axle) to cylinder head		
M10 x 1	15 Nm	

11 34 001 Checking valve clearance

+ 11 34 501

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Removing direct ignition coil

Removing spark plug

Removing cylinder head cover

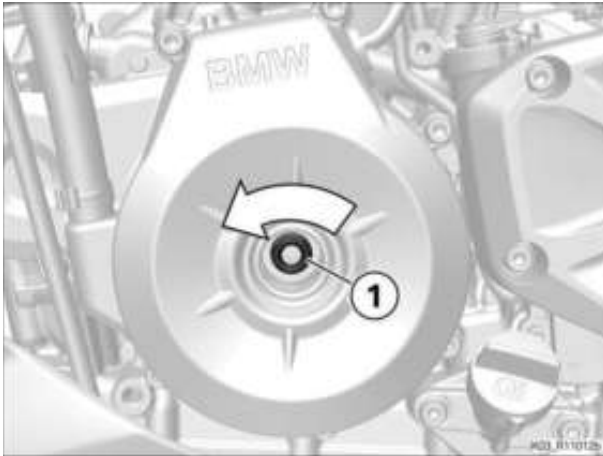
Removing right radiator cowl

Removing crankshaft cover

Core activity

(-) Adjusting the crankshaft to firing TDC

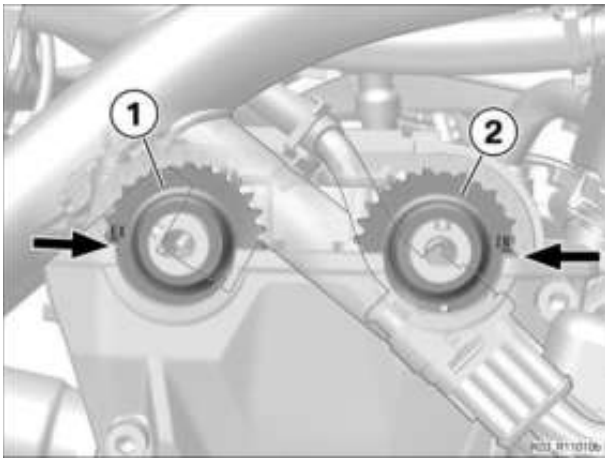
- To adjust the crankshaft to firing TDC, turn nut (1) counter-clockwise.



- Turn crankshaft until marks **EX** on exhaust side (1) and **IN** on intake side (2) align with edge of housing (arrows).

NOTICE

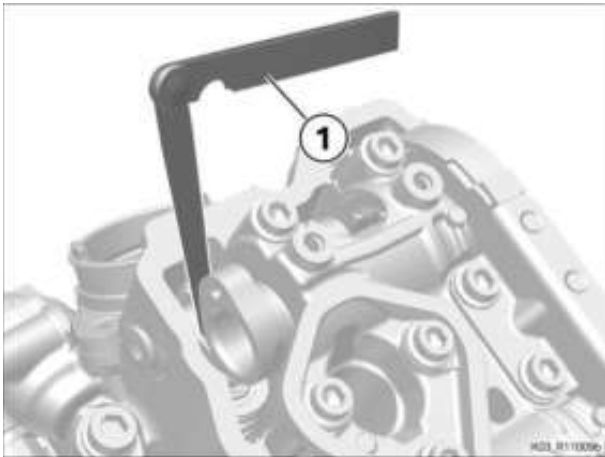
The chain tensioner works with oil pressure. When the chain tensioner is removed or without oil pressure, the camshafts are twisted slightly in the anticlockwise direction.



(-) Checking valve clearance

Check

- Determine valve clearance using feeler gauge (1) by checking between cams and rocker arms.



 Technical data			
Inlet valve clearance	Engine cold max 35 °C	0.11...0.20 mm	
Exhaust valve clearance	Engine cold max 35 °C	0.26...0.35 mm	

- Check intake and exhaust valves.
- **Noting measured results**
- Note down the measured results on a record sheet.

Messblatt Ventilspiel
BMW Motorrad

Fahrtrichtung  

Typ	Typ-Nr.	Werkstoff	Zeichen	Name
Einlassventil Einlassventil Einlassventil Einlassventil Einlassventil Einlassventil Einlassventil Einlassventil Einlassventil Einlassventil Einlassventil				



Result:

- Valve clearance is outside specified range.

Measure:

=> 11 34 504, Adjusting valve clearance (cylinder-head cover removed)
(Billed as a separate item)

Follow-up work

Installing crankshaft cover

Installing cylinder head cover

Installing spark plug

Installing direct ignition coil

Installing fuel tank

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

11 34 502 Checking valve clearance (for maintenance)

Preparatory work

Removing fuel tank

Removing direct ignition coil

Removing spark plug

Removing cylinder head cover

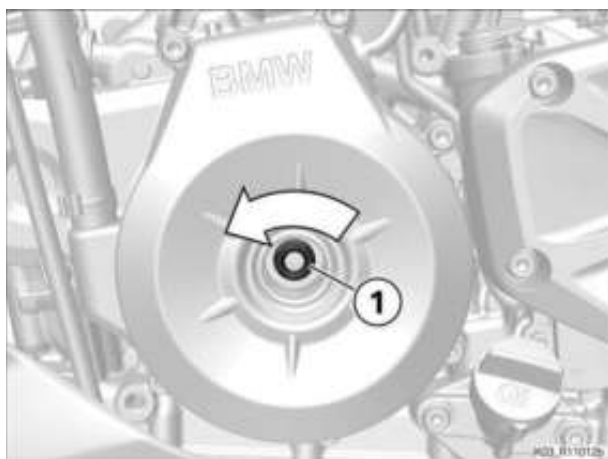
Removing right radiator cowl

Removing crankshaft cover

Core activity

(-) Adjusting the crankshaft to firing TDC

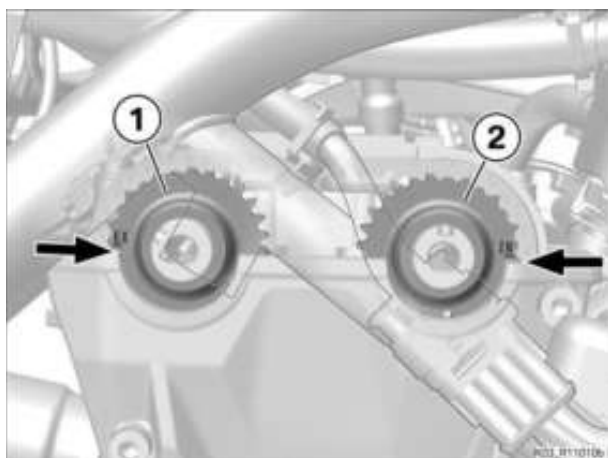
- To adjust the crankshaft to firing TDC, turn nut (1) counter-clockwise.



- Turn crankshaft until marks **EX** on exhaust side (1) and **IN** on intake side (2) align with edge of housing (arrows).

NOTICE

The chain tensioner works with oil pressure. When the chain tensioner is removed or without oil pressure, the camshafts are twisted slightly in the anticlockwise direction.



(-) Checking valve clearance

Check

- Determine valve clearance using feeler gauge (1) by checking between cams and rocker arms.

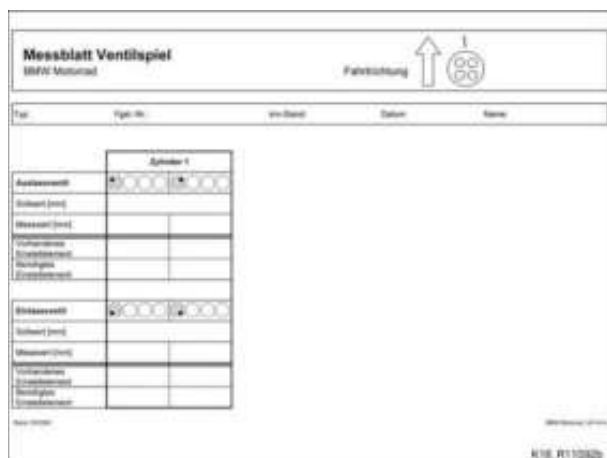


Technical data



Inlet valve clearance	Engine cold max 35 ° C	0.11...0.20 mm	
Exhaust valve clearance	Engine cold max 35 ° C	0.26...0.35 mm	

- Check intake and exhaust valves.



► **Noting measured results**

- Note down the measured results on a record sheet.



Result:

- Valve clearance is outside specified range.

Measure:

=> 11 34 504, Adjusting valve clearance (cylinder-head cover removed)
(Billed as a separate item)

Follow-up work

Installing crankshaft cover

Installing right radiator cowl

Installing cylinder head cover

Installing spark plug

Installing direct ignition coil

Installing fuel tank

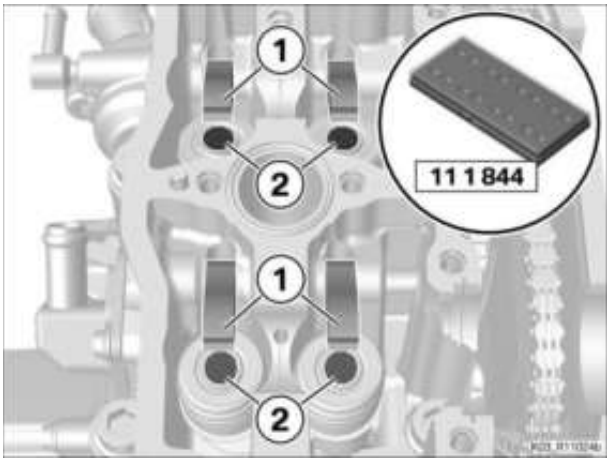
 11 34 504 Adjusting valve clearance (cylinder-head cover removed)

Preparatory work

- Removing screw for bore for locating pin
- Lock the crankshaft in TDC position
- Removing timing-chain tensioner
- Removing camshaft bearing cap
- Remove the camshafts

Core activity

(-) Adjusting valve clearance



- Slightly raise cam follower (1).
- Remove adjustment plates (2) and place them, correctly sorted, in tray (No. 11 1 844).
- Measure thickness of removed adjustment plate (2) with a caliper gauge.
- Calculate the thickness of the new shim from the difference between the specified value and the valve clearance noted down beforehand.

 Technical data			
Inlet valve clearance	Engine cold max 35 ° C	0.11...0.20 mm	
Exhaust valve clearance	Engine cold max 35 ° C	0.26...0.35 mm	

- Check thickness of the **new** adjustment plate before installation.
- Install new shim (2).

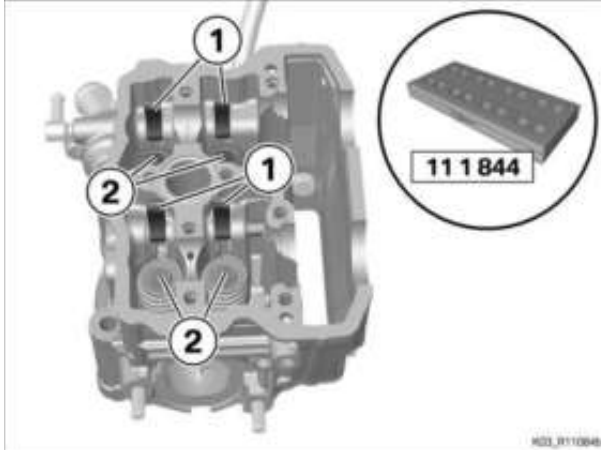
Follow-up work

- Installing camshafts
- Installing camshaft bearing cap
- Installing timing chain tensioner
- Removing locating pin
- Turning engine through several revolutions and making sure that all components move freely
- Checking timing
- Recheck the valve clearance
- Installing screw in bore for locating pin

11 34 600 Removing/installing or replacing all valves (cylinder head removed)

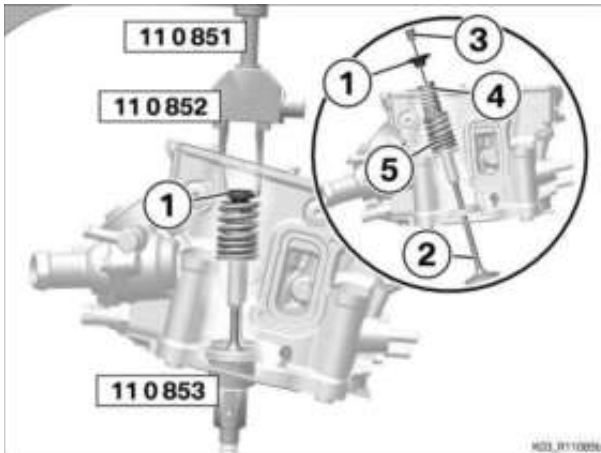
Core activity

(-) Remove adjustment plate



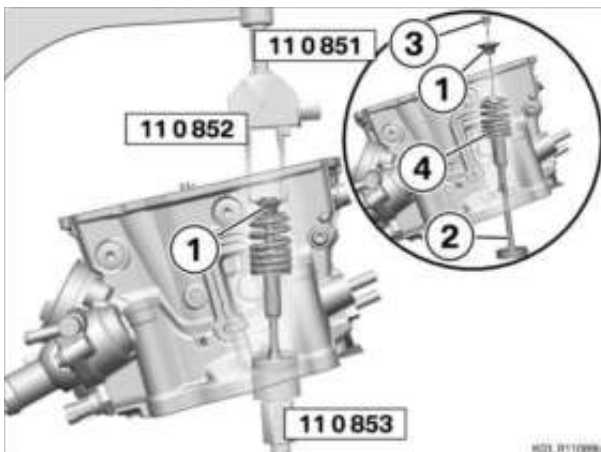
- Slightly raise cam follower (1).
- Remove adjustment plates (2) and place them, correctly sorted, in tray (No. 11 1844).

(-) Removing inlet valves

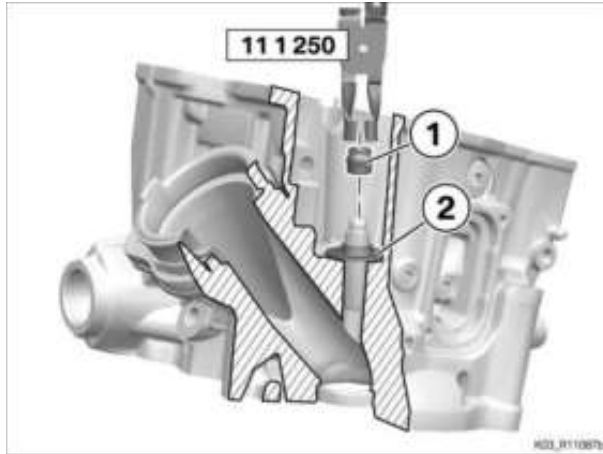


- Position valve spring compressor equipment (No. 11 0851) and fit compression fixture (No. 11 0852) on spring cup (1) and mounting (No. 11 0853) on intake valve (2) and adjust.
- Press down spring cup (1) with compression fixture (No. 11 0852).
- Remove valve collets (3) and remove valve-spring compressor (No. 11 0851).
- Remove intake valve (2), spring cup (1), **inner** valve spring (4) and **outer** valve spring (5).
- Remove the other intake valve in the same way.

(-) Removing exhaust valves

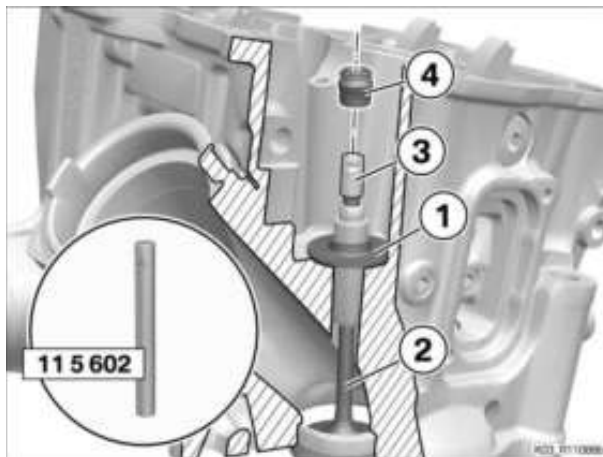


- Position valve spring compressor equipment (No. 11 0851) and fit compression fixture (No. 11 0852) on spring cup (1) and mounting (No. 11 0853) on exhaust valve (2) and adjust.
- Press down spring cup (1) with compression fixture (No. 11 0852).
- Remove valve collets (3) and remove valve-spring compressor (No. 11 0851).
- Remove exhaust valve (2), spring cup (1) and valve spring (4).
- Remove the other exhaust valve in the same way.



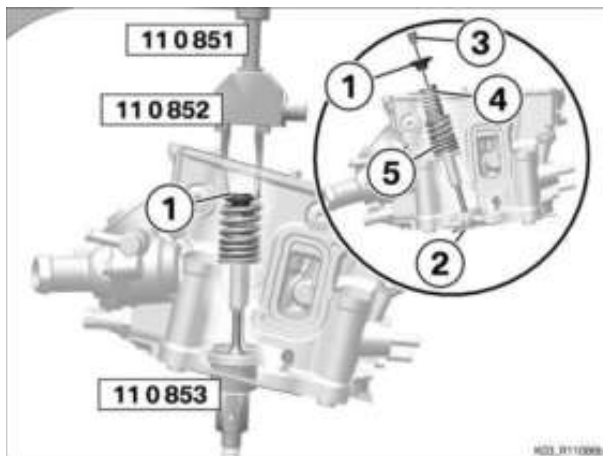
(-) Removing valve stem seals and spring retainers

- Remove valve stem seal (1) with pliers (No. 11 1 250).
- Remove spring retainer (2).
- Remove other valve stem seals and spring cup in the same way.



(-) Installing valve stem seals and spring retainers

- Install spring retainer (1)
- Install valve (2).
- Slip assembly sleeve (3) on to valve (2).
- Drive in valve stem seal (4) until seated, using drift (No. 11 5 602).
- Remove assembly sleeve (3).
- Install the other spring cup and valve stem seal in the same way.



(-) Installing inlet valves

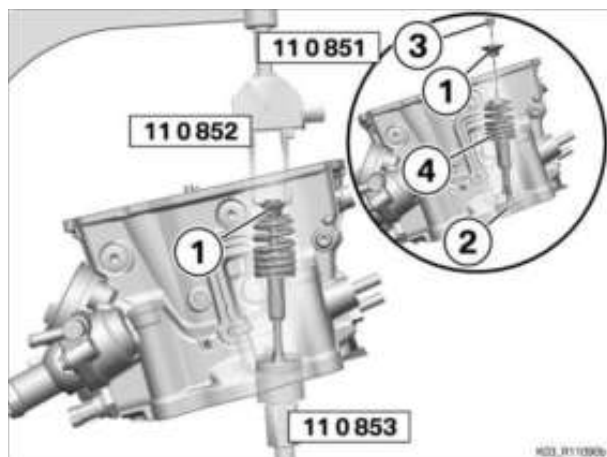
- Lubricate the components with engine oil.
- Insert **inner** valve spring (4), outer valve spring (5) and valve head (1).
- Position valve spring compressor equipment (No. 11 0 851) and fit compression fixture (No. 11 0 852) on spring cup (1) and mounting (No. 11 0 853) on intake valve (2) and adjust.
- Press down spring cup (1) with compression fixture (No. 11 0 852).
- Fit valve shim (3) on intake valve (2).

NOTICE

The valve shim is easier to install if it is coated with **acid free grease** .

» Valve shims (3) stick to valve stem.

- Relieve spring cup (1) slowly, paying attention to correct fit of the valve shim (3).
- Remove valve-spring compressor (No. 11 0 851).
- Install the other intake valve in the same way.



(-) Installing exhaust valves

- Insert valve spring (4) and valve head (1).
- Position valve spring compressor equipment (No. 11 0 851) and fit compression fixture (No. 11 0 852) on spring cup (1) and mounting (No. 11 0 853) on exhaust valve (2) and adjust.
- Press down spring cup (1) with compression fixture (No. 11 0 852).
- Fit valve shim (3) on exhaust valve (2).

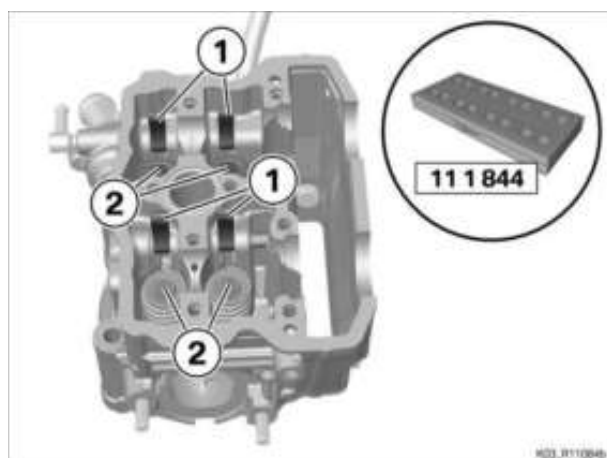
NOTICE

The valve shim is easier to install if it is coated with **acid free grease**.

» Valve shims (3) stick to valve stem.

- Relieve spring cup (1) slowly, paying attention to correct fit of the valve shim (3).
- Remove valve-spring compressor (No. 11 0 851).
- Install the other exhaust valve in the same way.

(-) Install adjustment plate



- Take adjustment plate (2) from oddments tray (No. 11 1 844) and lubricate with engine oil.
- Install adjustment plate (2) and lower rocker arm (1) on adjustment plate (2).

11 41 000 Removing/installing or replacing oil pump

+ 11 41 651

Preparatory work

Removing engine spoiler

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Draining coolant

Removing cover for coolant pump

Removing impeller

Removing the cable duct for the brake light switch

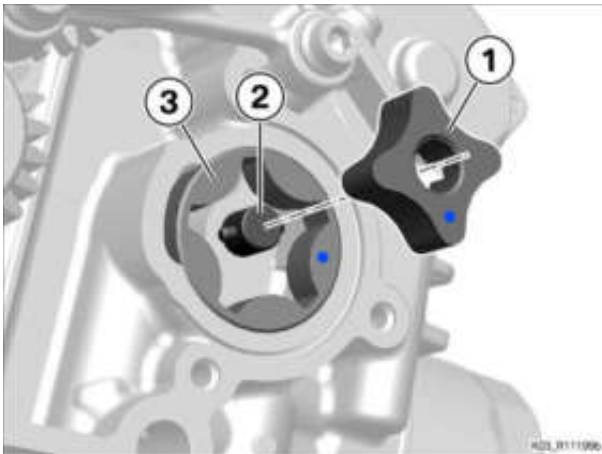
Releasing footbrake cylinder

Removing right crankcase cover

Core activity

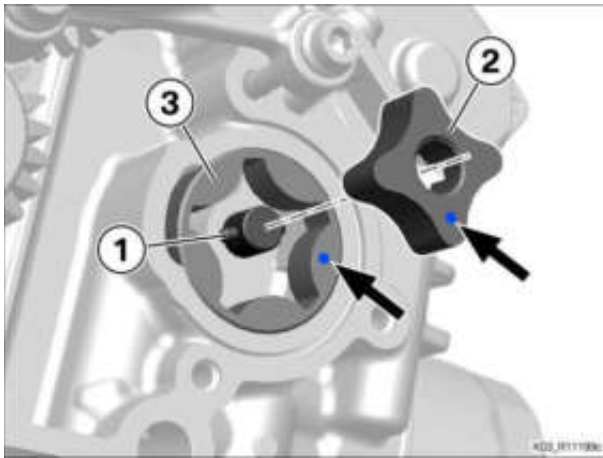
(-) Removing oil suction pump

- Pull off inner rotor (1) **with magnetic bar** from shaft (2).
- Remove outer rotor (3).



(-) Installing oil suction pump

- Clean all components and lubricate with engine oil prior to installation.
- Pay attention to the centre position of pin (1).
- Install inner rotor (2) and outer rotor (3) with marks (arrows) **facing out**.



Follow-up work

Installing right crankcase cover

Securing footbrake cylinder

Installing impeller

Installing cover for coolant pump

Installing the cable duct for the brake light switch

Filling cooling system

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Installing engine spoiler

Checking engine oil level

Final check of work performed

 11 41 004 Measuring engine oil pressure

+ 11 41 817

Preparatory work

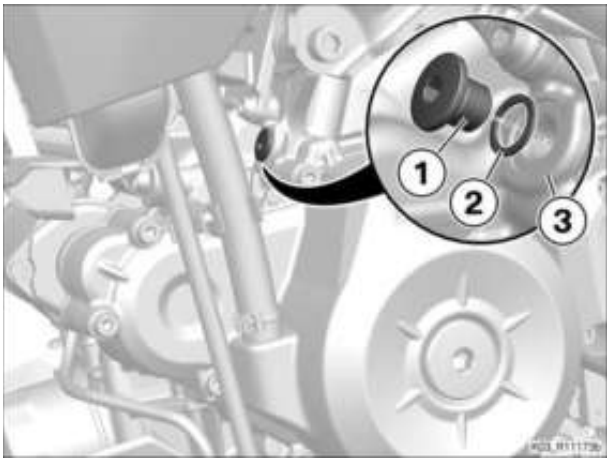
=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Removing air guide

Core activity

(-) Removing threaded plug for oil system

- Remove threaded plug (1) with sealing ring (2).



(-) Checking oil pressure in engine circuit

Requirement

- Make sure that engine and engine oil are at operating temperature.



 CAUTION

Working with hot components

Risk of burn injury

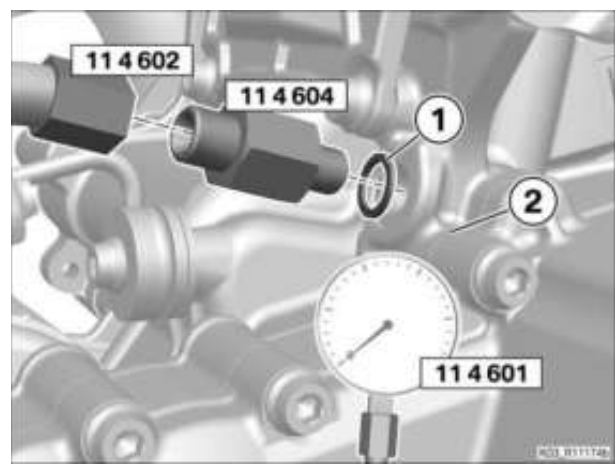
- Wear protective gloves.

- Install adapter (No. 11 4 604) with sealing ring (1) in engine housing (2).
- Install pressure gauge (No. 11 4 601) with hose (No. 11 4 602).

Check

- Start the engine.
- Check oil pressure across the entire engine rpm range.

	Technical data



Oil pressure Engine oil is at regular operating temperature	with idling mixture	0.5...3 bar	
	at engine rpm 4000 min -1	2.5...5 bar	

Result:

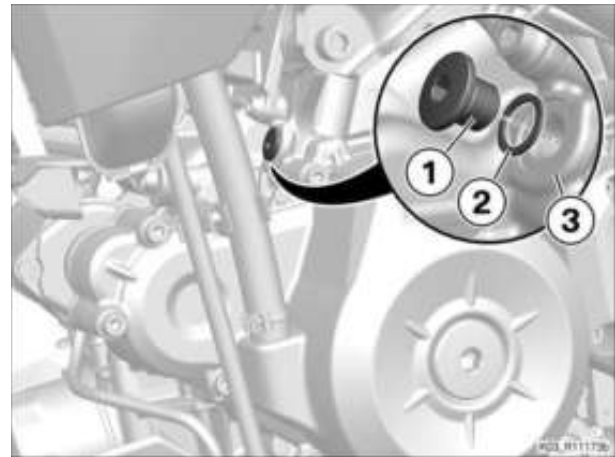
- Oil pressure is lower than specified.

Measure:

- Identify and rectify the cause of the fault.

(-) Installing threaded plug for oil system

- Install screw plug (1) with **new** sealing ring (2) in crankcase (3).



 Tightening torques		
Seal plug (oil duct) to engine housing		
M10 x 1	11 Nm	

Follow-up work

- Installing air guide
- Checking engine oil level
- Final check of work performed

11 41 310 Replacing oil-pressure control valve

+ 11 41 810

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Draining engine oil from engine

Removing oil pan

Core activity

(-) Removing oil pressure control valve

CAUTION

Components spring-loaded

Risk of injury caused by flying parts

- Wear safety goggles.
 - Carefully relieve and, as applicable, apply spring tension.
-
- Insert snap ring pliers in snap ring (1).
 - Press shouldered bushing (2) against spring (3) using a suitable tool and remove snap ring (2).
 - Reduce spring pressure slowly.
 - Remove shouldered bushing (2), spring (3) and control piston (4) from crankcase (5).

(-) Installing oil pressure control valve

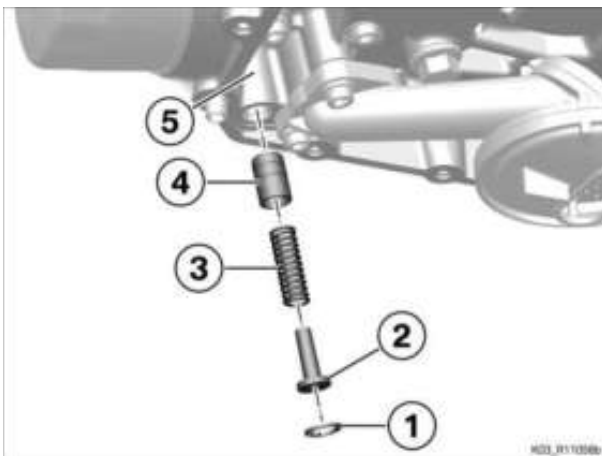
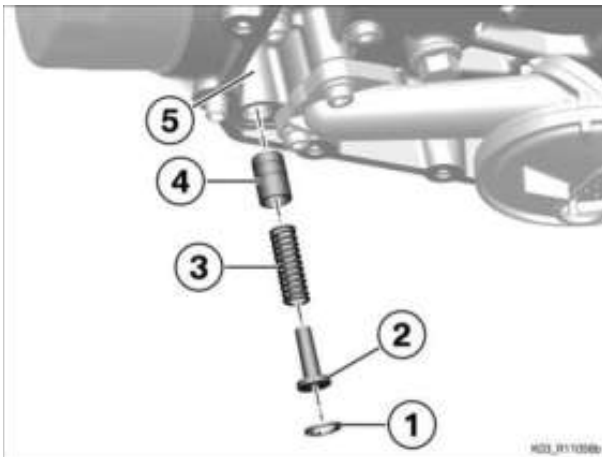
- Lubricate the components with engine oil.
- Position components carefully and build up spring pressure slowly.

CAUTION

Components spring-loaded

Risk of injury caused by flying parts

- Wear safety goggles.
 - Carefully relieve and, as applicable, apply spring tension.
-
- Insert control piston (4), spring (3) and shouldered bushing (2) in crankcase (5).
 - Push shouldered bushing (2) in crankcase (5) using a suitable tool.
 - » Spring pressure is built up.
 - Install snap ring (1) in crankcase (5).



- Relieve shouldered bushing (2).
- » Spring pressure is reduced and shouldered bushing (2) lies on snap ring (1).

Follow-up work

Clean sealing surfaces of the oil sump and the engine housing

Seal oil sump

Installing oil pan

Pouring in engine oil

Installing engine spoiler

Final check of work performed

 11 43 010 Replacing oil level indicator

+ 11 43 510

Preparatory work

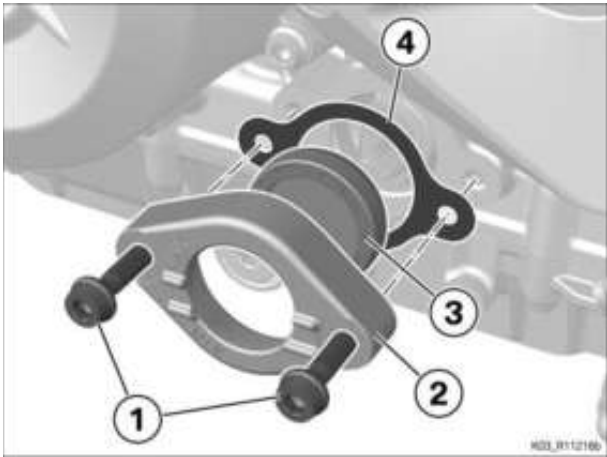
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Draining engine oil

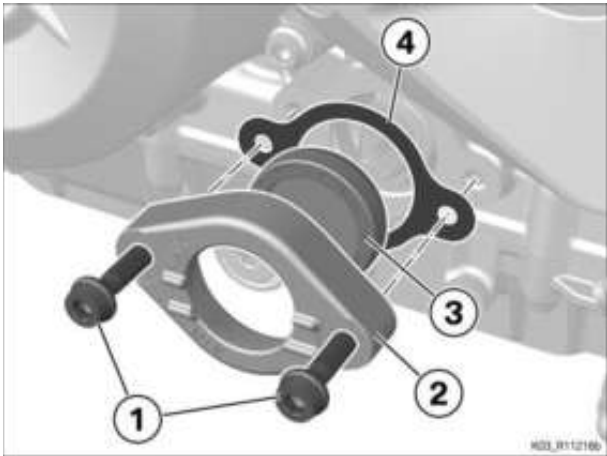
Core activity

(-) Removing engine-oil level indicator



- Remove screws (1).
- Remove flange (2) and engine oil level indicator (3).
- Remove gasket (4).

(-) Installing engine-oil level indicator



- Clean the sealing faces.
- Replace seal (4).
- Secure seal (4), flange (2) and engine oil level indicator (3) with screws (1).

 Tightening torques		
Flange for engine oil level indicator to crankcase		
M6 x 25	10 Nm	

Follow-up work

Pouring in engine oil

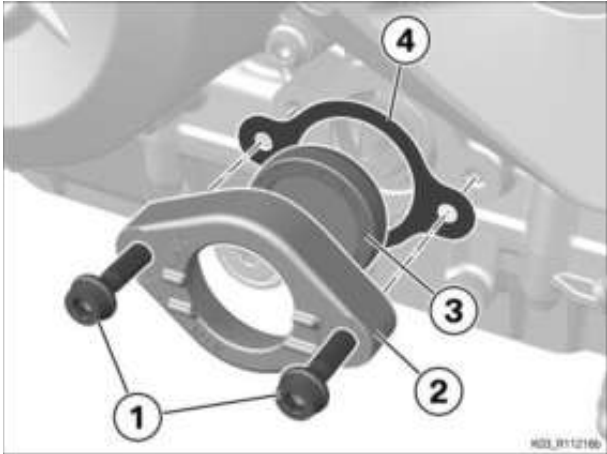
Installing engine spoiler

Final check of work performed

 11 43 511 Replacing oil level indicator (for maintenance/draining oil)

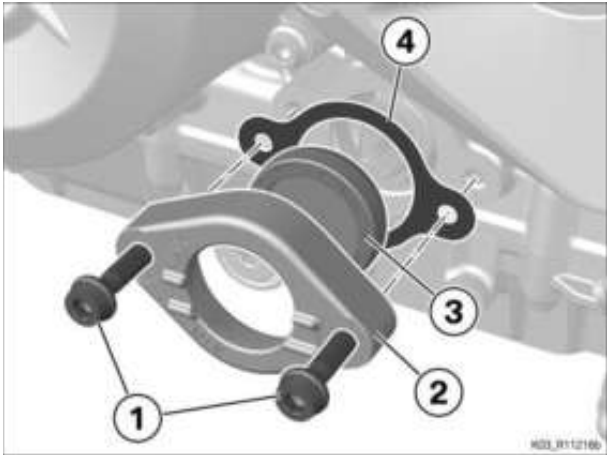
Core activity

(-) Removing engine-oil level indicator



- Remove screws (1).
- Remove flange (2) and engine oil level indicator (3).
- Remove gasket (4).

(-) Installing engine-oil level indicator



- Clean the sealing faces.
- Replace seal (4).
- Secure seal (4), flange (2) and engine oil level indicator (3) with screws (1).

 Tightening torques		
Flange for engine oil level indicator to crankcase		
M6 x 25	10 Nm	

11 51 005 Replacing or sealing cap for coolant pump

+ 11 51 566

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

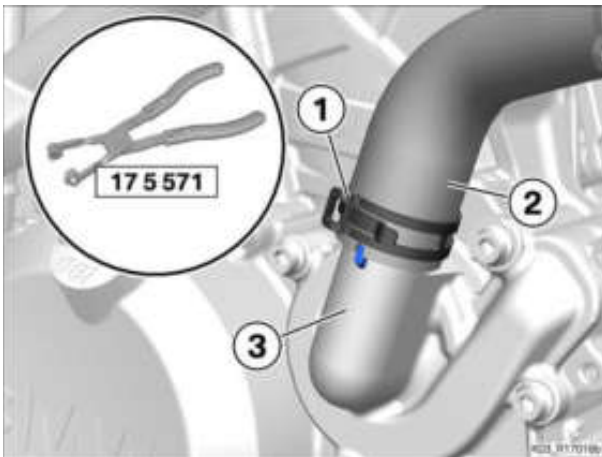
Draining coolant

Core activity

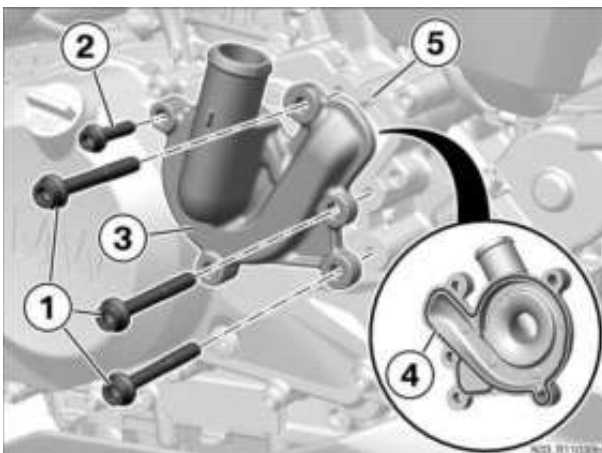
(-) Removing cover for coolant pump

► Loosen coolant hose from lid of the coolant pump

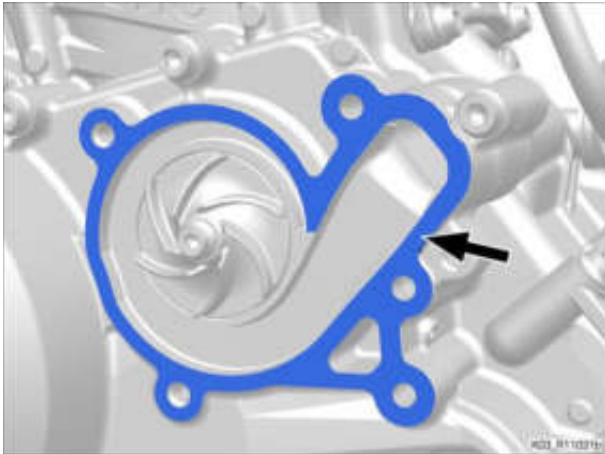
- Open clip (1) with pliers (No. 17 5 571).
- Loosen coolant hose (2) from lid for (3) coolant pump.



- Remove screws (1) and screw (2).
- Remove cover (3) for coolant pump with seal (4) from clutch cover (5).

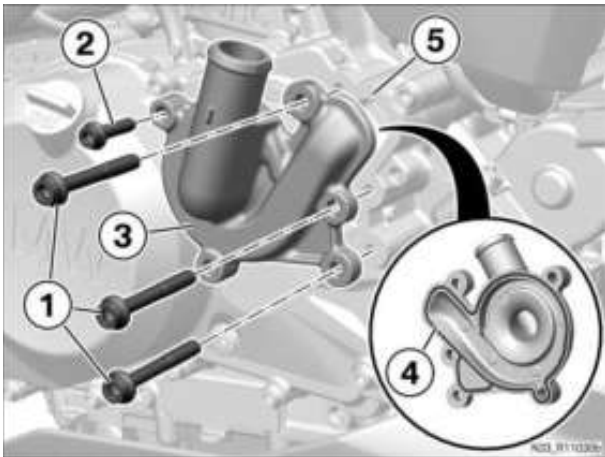


(-) Clean the sealing surface



- Clean the sealing face (arrow).

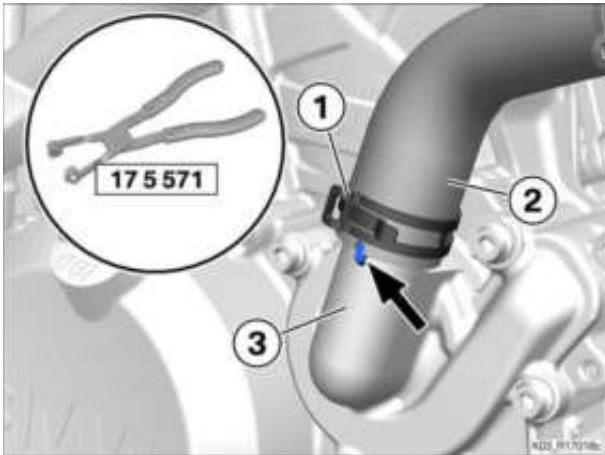
(-) Installing cover for coolant pump



- Place cover (3) for coolant pump with gasket (4) on clutch cover (5).
- Install screws (1) and screw (2).

Tightening torques		
Lid of coolant pump to clutch cover		
M6 x 45	10 Nm	
M6 x 25	10 Nm	

► Secure coolant hose at the coolant pump lid



- Secure coolant hose (2) to the lid for (3) coolant pump, paying attention to alignment (arrow).
- Secure clip (1) with pliers (No. 17 5 571).

Follow-up work

Filling cooling system

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Installing engine spoiler

Final check of work performed

11 51 507 Replacing shaft sealing ring for coolant pump in engine block (engine-block cover removed)

Core activity

(-) Removing radial shaft seal of coolant pump

► Remove sliding shaft sealing ring

- Tighten puller (No. 11 0 871) in sliding shaft sealing ring (1).
- Tighten pull rod (No. 00 8 581) and impact weight (No. 00 8 582) with adapter M6 (No. 00 8 585) in puller (No. 11 0 871).
- Heat sealing ring seat.

 Technical data			
Release/mating temperature		80 °C	

- Pull sliding shaft sealing ring (1) with puller (No. 11 0 871).



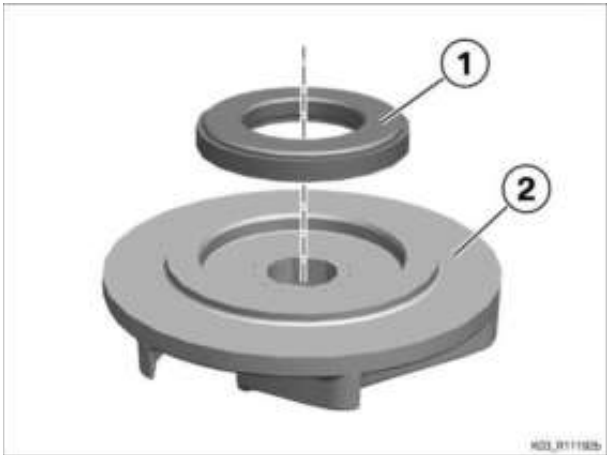
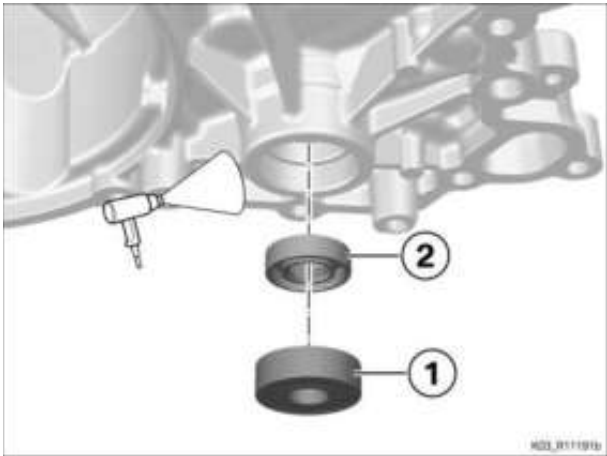
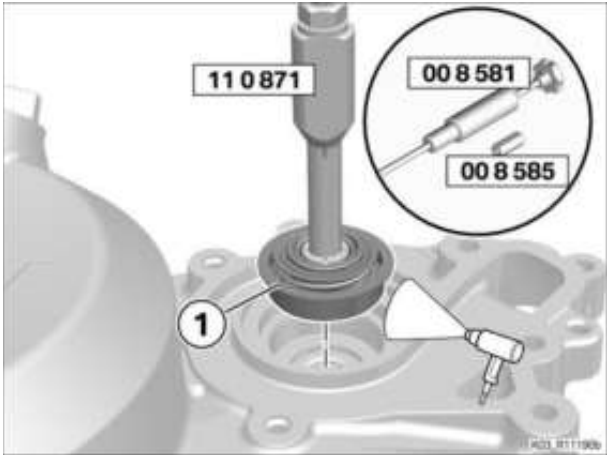
- Heat the bearing seat.

 Technical data			
Release/mating temperature		80 °C	

- Remove ball bearing (1) and radial shaft seal (2) from engine housing cover (3) using a suitable tool.

(-) Replace gasket in coolant pump rotor

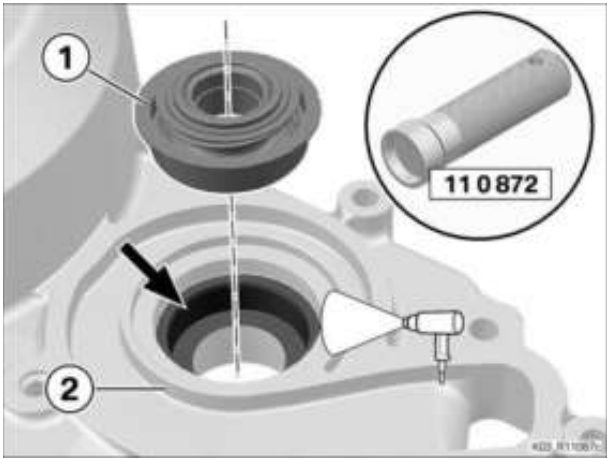
- Replace gasket (1) in coolant pump rotor (2) observing the direction of installation: Rubber side is in the coolant pump rotor.



(-) Mount cam shaft seal of coolant pump

► Install sliding shaft

- Clean gasket seating (arrow).
- Heat gasket seating (arrow).

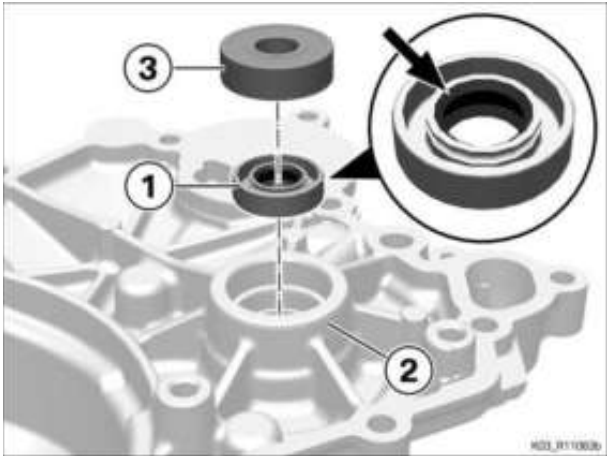


 Technical data			
Release/mating temperature		80 °C	

- Press sliding shaft sealing ring (1) with drift (No. 11 0 872) in engine housing hood (2) **on limit position**.



- Lubricate radial shaft seal on run surfaces (arrow) .



 Lubricant	
Acid-free friction-bearing grease	81 22 9 407 174

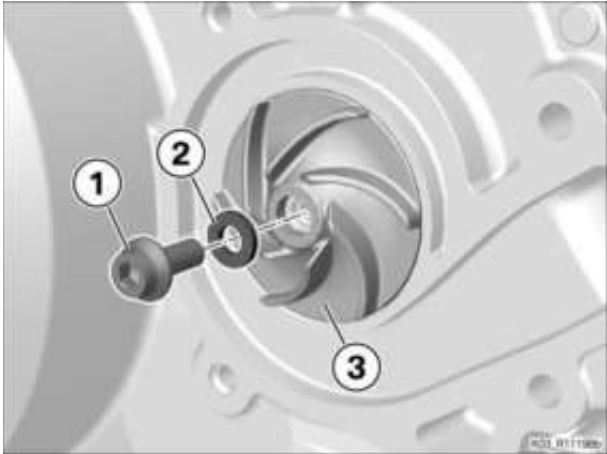
- Mount radial shaft seal (1) in engine housing cover (2), paying attention to the **direction of installation**.
- » The open side of radial shaft seal (1) indicates towards bearing.
- Install ball bearing (3) in engine housing cover (2) with suitable tool, subjecting the ball bearing to load only **on the outer ring**.

 11 51 510 Removing/installing coolant-pump impeller (coolant-pump housing removed)

Core activity

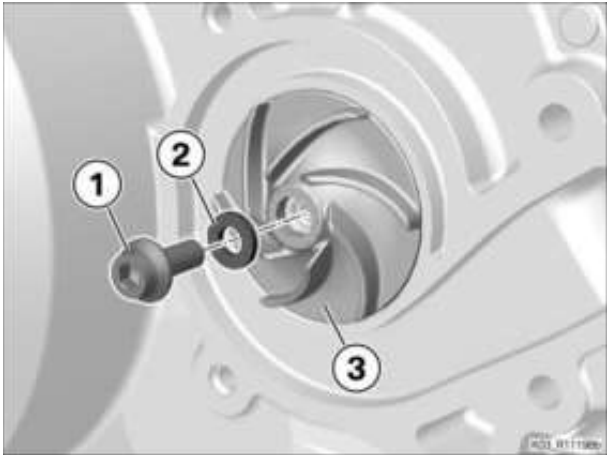
(-) Removing impeller

- Remove screw (1) and washer (2) and pull off impeller (3).



(-) Installing impeller

- Clean the threads.
- Slide on impeller (3).
- Install bolt (1) with **new** washer (2).



 Tightening torques		
Impeller to shaft		
M5 x 12	6 Nm	
Thread-locking compound (Loctite 243, Medium strength)		

11 61 176 Removing/installing/sealing or replacing one intake stub

+ 11 61 578

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Removing right radiator cowl

Removing expansion tank

Removing idle actuator

Removing left radiator cowl

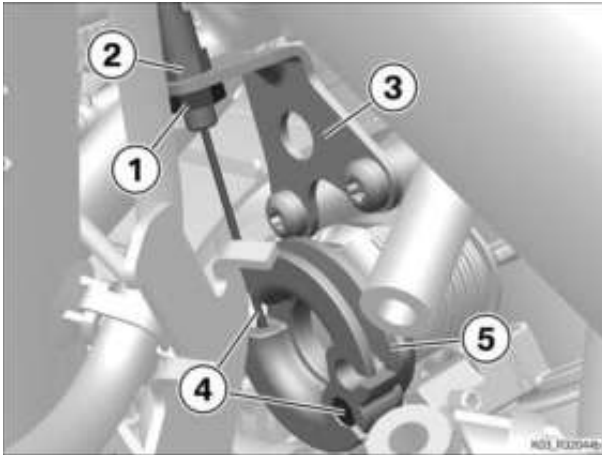
Remove the intake air silencer

Core activity

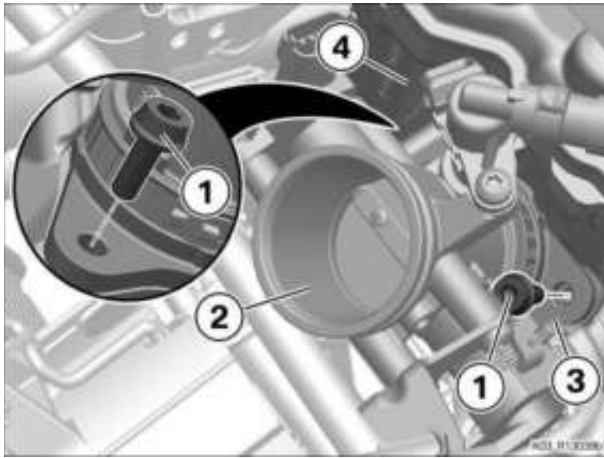
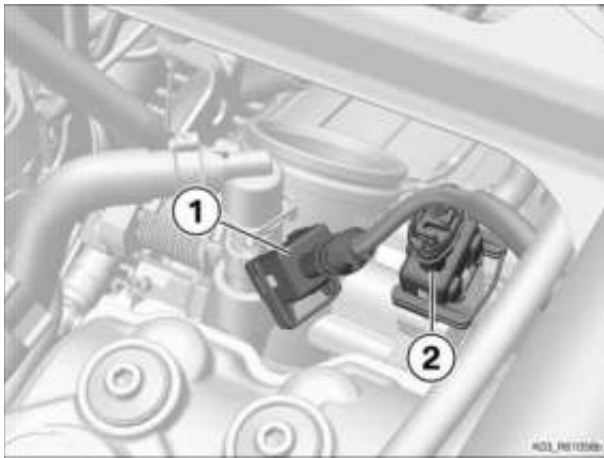
(-) Remove throttle valve with intake manifold

► Loosening throttle cable from pulley

- Loosen nut (1), counter-holding on **hexagon head** of throttle cable (2).
- Disengage throttle cable (2) from holder (3).
- Remove cable (4) from pulley (5).

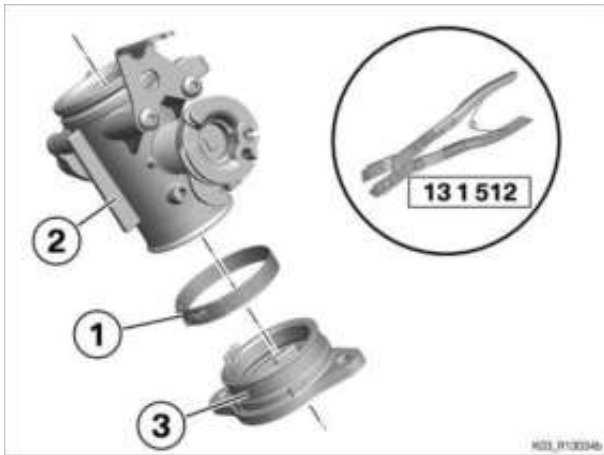


- Disconnect connector (1) for fuel injector and connector (2) for the throttle valve.



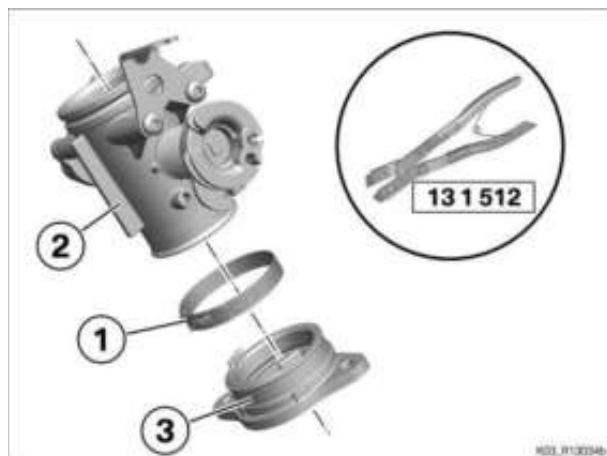
- Remove screws (1).
- Remove throttle valve (2) with intake manifold (2) from cylinder head (4).

(-) Replace intake stubs



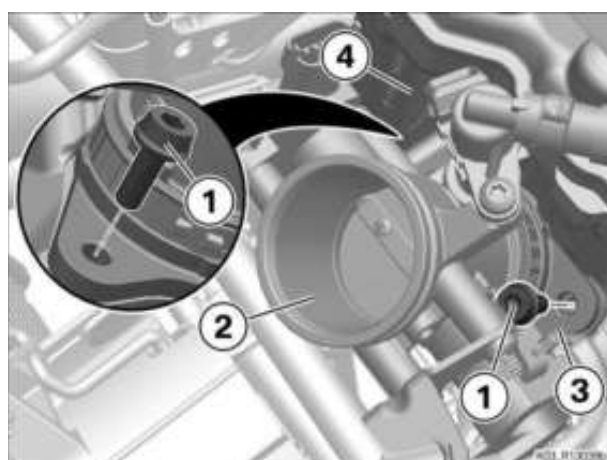
- Open clip (1) with pliers (No. 13 1 512).
- Remove throttle valve (2) from intake stubs (3).

- Install throttle valve (2) in **new** intake stubs (3).
- Install clip (1) and close it with pliers (No. 13 1 512).



(-) Install throttle valve with intake stubs

- Position intake manifold (3) with throttle valve (2) on cylinder head (4).
- Install screws (1).



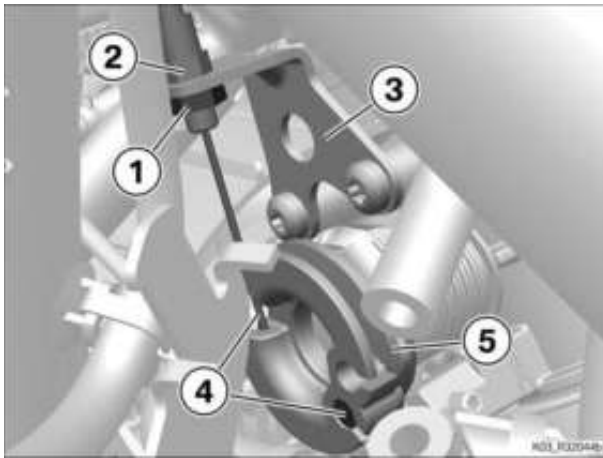
 Tightening torques		
Air intake to cylinder head		
M6 x 16	10 Nm	

- Connect connector (1) for fuel injector and connector (2) for the throttle valve.



► Securing throttle cable in pulley

- Install throttle cable (4) in pulley (5).
- Insert throttle cable (2) in holder (3).
- Install nut (1), counter-holding on **hexagon head** of throttle cable (2).



Follow-up work

Install the intake air silencer

Installing fuel tank

Installing left radiator cowl

Installing idle actuator

Installing expansion tank

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

11 72 210 Removing/installing or replacing changeover valve for secondary air system

+ 11 72 670

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

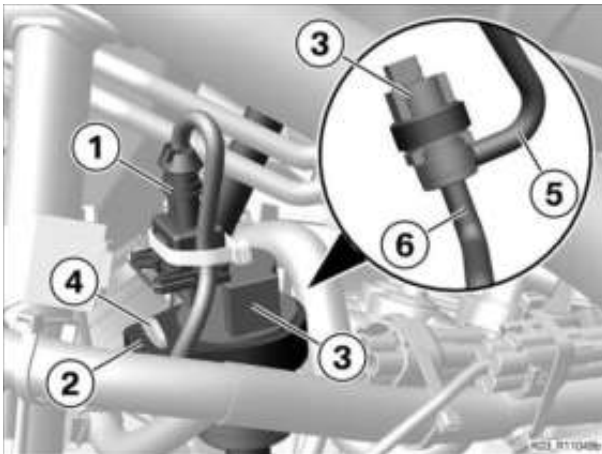
Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing left radiator cowl

Core activity

(-) Removing secondary air system changeover valve

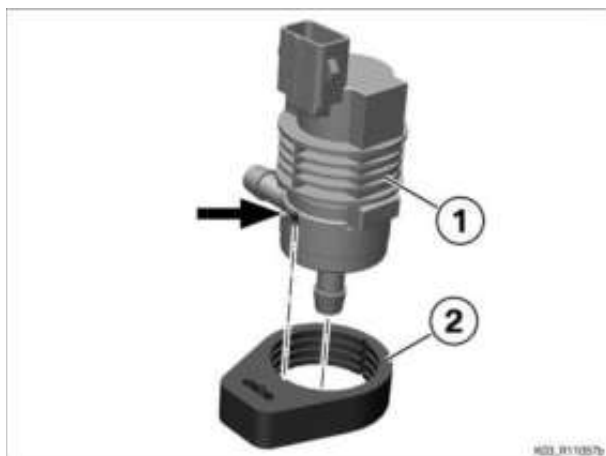


- Disconnect connector (1) for the secondary air system shift valve.
- Loosen holder (2) with secondary air system shift valve (3) from frame tab (4).
- Pull off hose (5) and hose (6) from secondary air system shift valve (3).

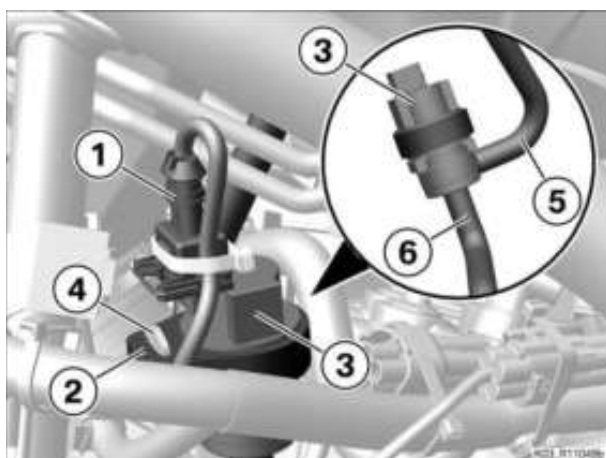
(-) Replace secondary air system of shift valve



- Remove secondary air system of shift valve (1) from holder (2), paying attention to the lug (arrow).
- Install secondary air system of shift valve (1) in holder (2), paying attention to the lug (arrow).



(-) Installing secondary air system changeover valve



- Connect hose (5) and hose (6) to secondary air system shift valve (3).
- Fasten holder (2) with secondary air system shift valve (3) on frame tab (4).
- Connect connector (1) for secondary air system shift valve.

Follow-up work

Installing left radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

11 72 300 Removing/installing or replacing valve for secondary air system

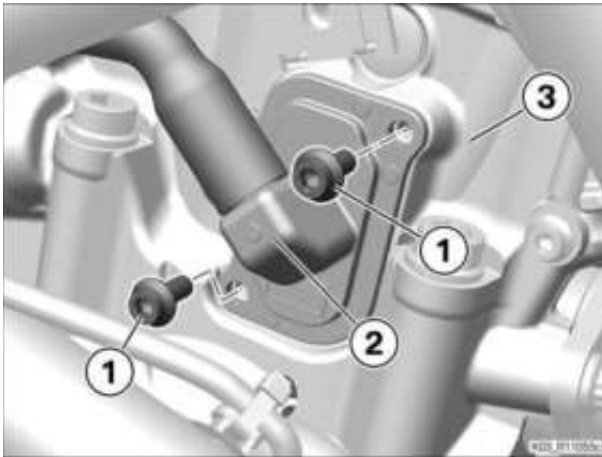
+ 11 72 654

Preparatory work

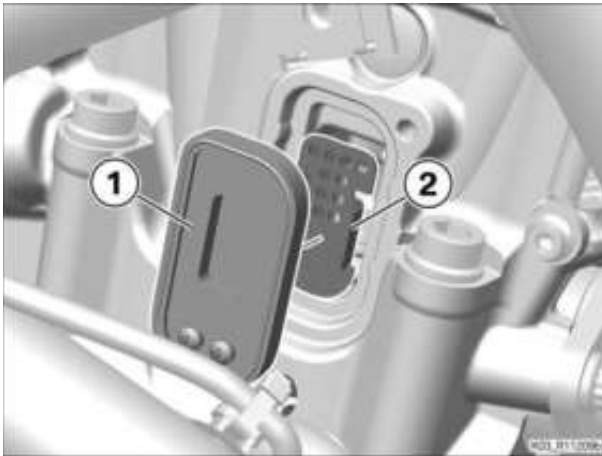
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

(-) Removing valve for secondary air system



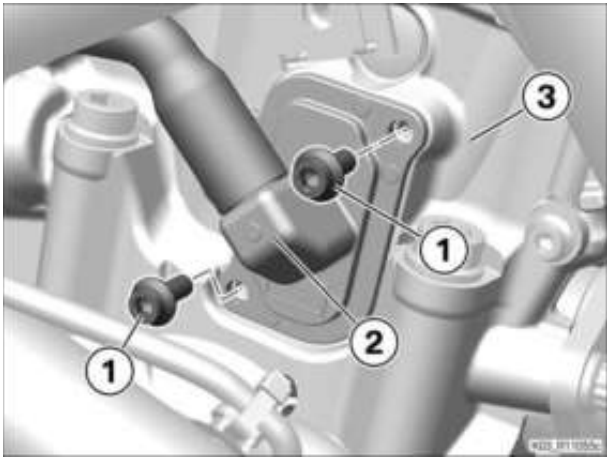
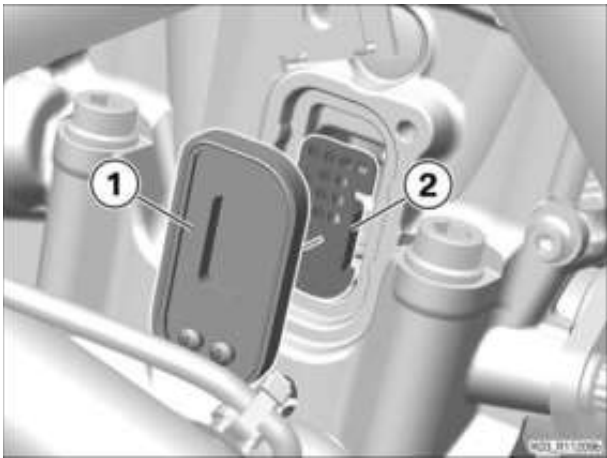
- Remove screws (1).
- Loosen cover (2) with hose from cylinder head (3).



- Remove the secondary air valve (1) and heat shield (2).

(-) Installing valve for secondary air system

- Install heat shield (2) as shown in the figure.
- Install secondary air valve (1).



- Install cover (2) with hose on cylinder head (3) and install screws (1).

 Tightening torques		
SLS lid to cylinder head		
M5 x 12	6 Nm	

Follow-up work

Final check of work performed

 11 78 000 Replacing oxygen sensor
+ 11 78 500

Preparatory work

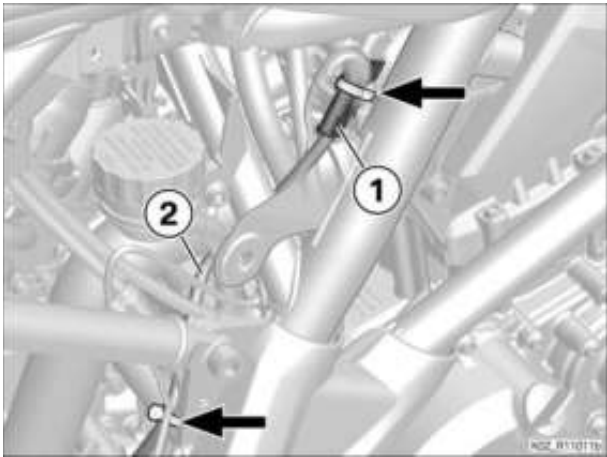
=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Removing seat

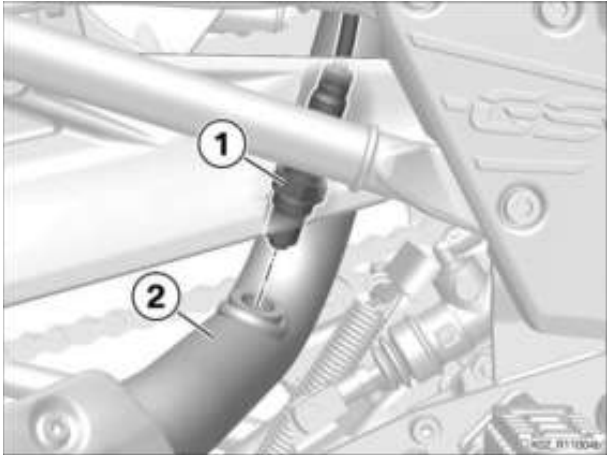
Removing right frame cover

Core activity

(-) Removing oxygen sensor



- Remove the cable straps (arrows).
- Disconnect connector (1) for oxygen sensor.
- Thread out cable (2).

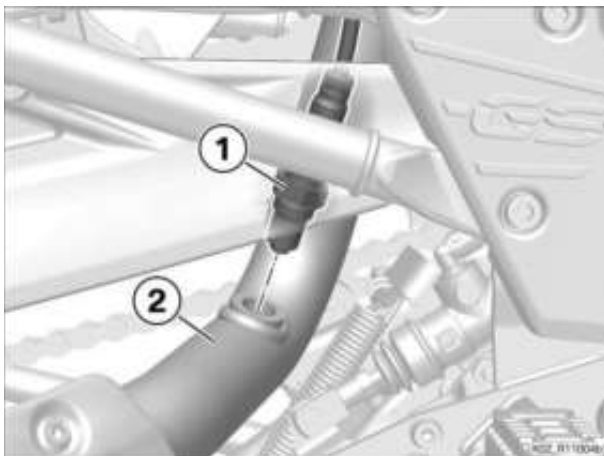


- Remove oxygen sensor (1) from exhaust manifold (2).

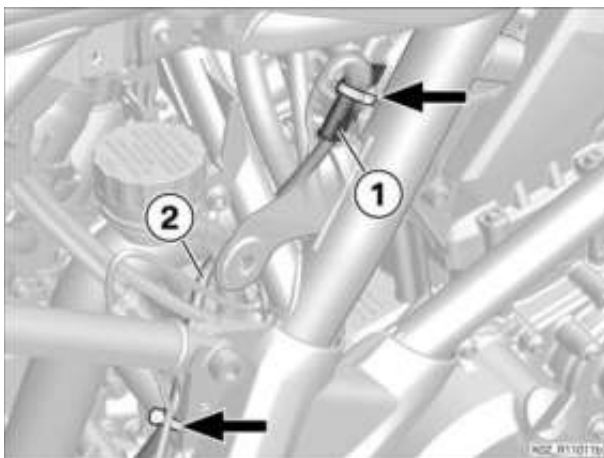
(-) Installing oxygen sensor

- Install oxygen sensor (1) in exhaust manifold (2).

 Tightening torques		
Oxygen sensor to exhaust system		
M18 x 1.5	50 Nm	



Thinly lubricate thread, Lubricant (Optimoly TA)		
--	--	--



- Route the cable (2).
- Connect connector (1) for oxygen sensor
- Close the cable strap (arrows).

Follow-up work

Installing right frame cover

Connecting **BMW Motorrad** diagnostic system to vehicle

Perform the vehicle test with **BMW Motorrad** diagnostic system, read out fault memory and reset adaptation values

Disconnecting **BMW Motorrad** diagnostic system from vehicle

Installing seat

Final check of work performed

 12 12 011 Renewing all spark plugs
+ 12 12 513

Preparatory work

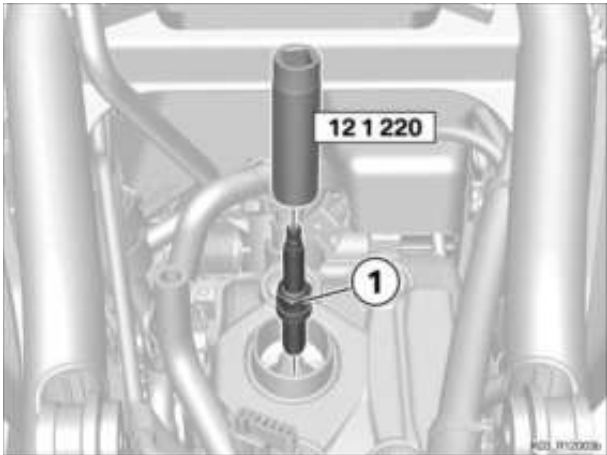
=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

- Removing seat
- Removing cover for left intake snorkel
- Removing the cover for right intake snorkel
- Removing cover for fuel tank
- Removing fuel tank
- Removing direct ignition coil

Core activity

(-) Removing spark plug

- Clean the spark-plug shaft with compressed air.
- Remove spark plug (1) with spark-plug wrench (No. 12 1 220).



(-) Replacing spark plugs

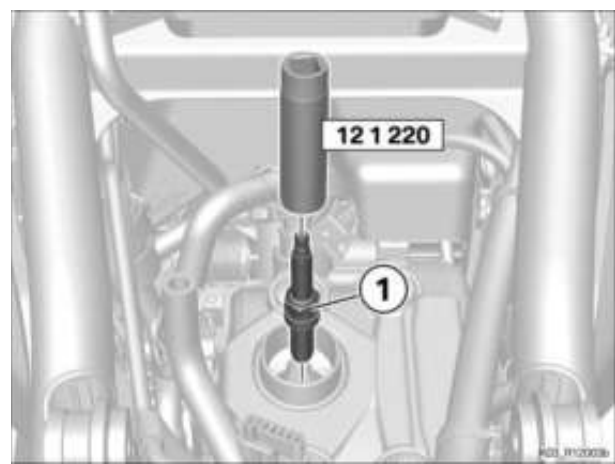
- Install new spark plugs.

 Technical data			
Spark plugs, manufacturer and designation		NGK LMAR9D-J	

(-) Installing spark plug

- Install spark plug (1) with spark-plug wrench (No. 12 1 220).

 Tightening torques



Spark plug to cylinder head		
M10 x 1	12 Nm	
Lubricant (Copper paste)		

Follow-up work

- Installing direct ignition coil
- Installing fuel tank
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Final check of work performed

 12 12 509 Replace all spark plugs (for maintenance)

Core activity

(-) Replacing spark plugs

- Install new spark plugs.

 Technical data			
Spark plugs, manufacturer and designation		NGK LMAR9D-J	

12 13 155 Replacing direct ignition coil

+ 12 13 655

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Core activity

(-) Removing direct ignition coil

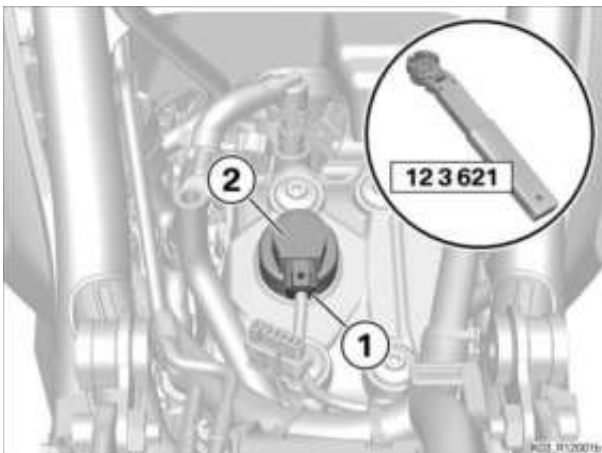
- Clean the cylinder-head cover with compressed air prior to removal.

ATTENTION

Disconnection of the connector not in compliance with correct procedure

Damage to locking tab

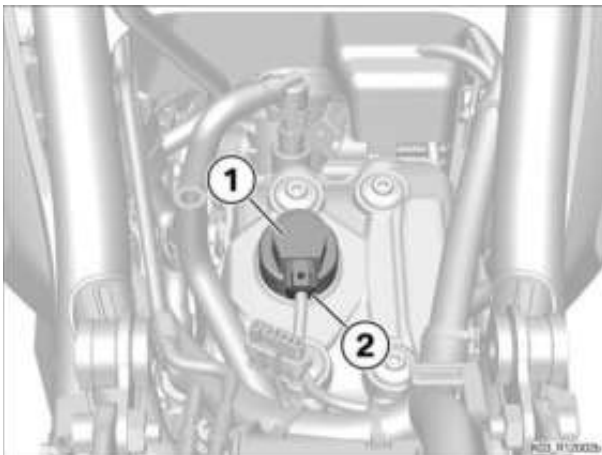
- Push the connector away from the locking tab, do not lift or bend the locking tab.



- Disconnect connector (1) for the direct ignition coil.
- Remove direct ignition coil (2) with puller (No. 12 3 621).

(-) Installing direct ignition coil

- Introduce direct ignition coil (1) into the spark-plug recess, seat it on the spark plug and make sure it engages.
- Connect connector (2) for the direct ignition coil.



Follow-up work

Installing fuel tank

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Connecting **BMW Motorrad** diagnostic system to vehicle

Perform the vehicle test with **BMW Motorrad** diagnostic system, read out fault memory and reset adaptation values

Disconnecting **BMW Motorrad** diagnostic system from vehicle

Installing seat

Final check of work performed

12 31 022 Replace generator

+ 12 31 673

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

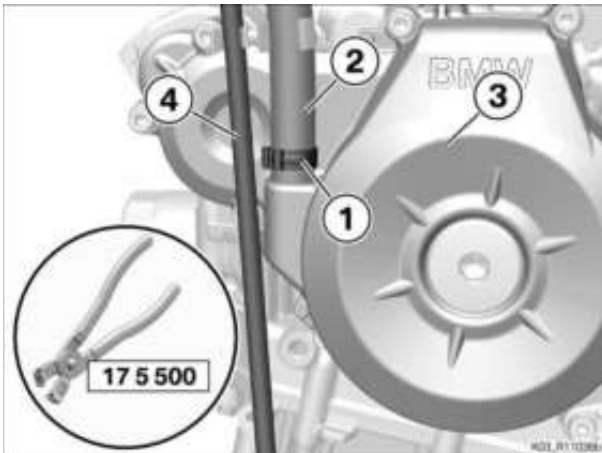
Removing left radiator cowl

Disengage the engine control unit

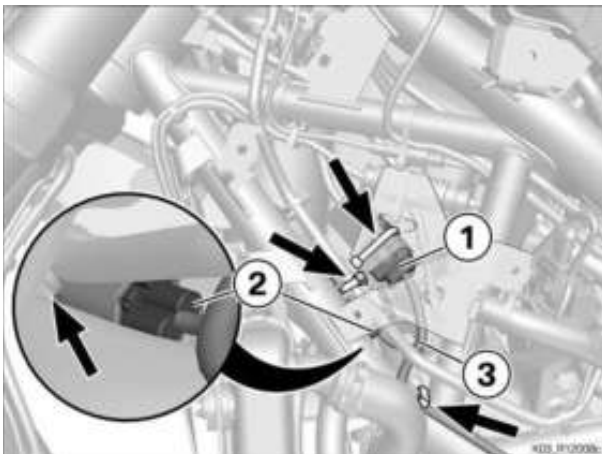
Removing pinion cover

Core activity

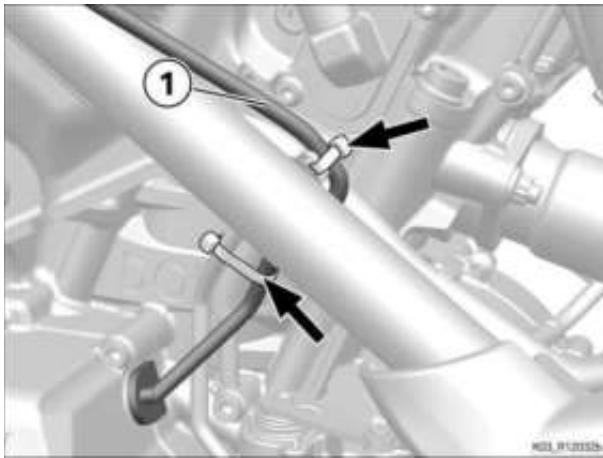
(-) Removing alternator



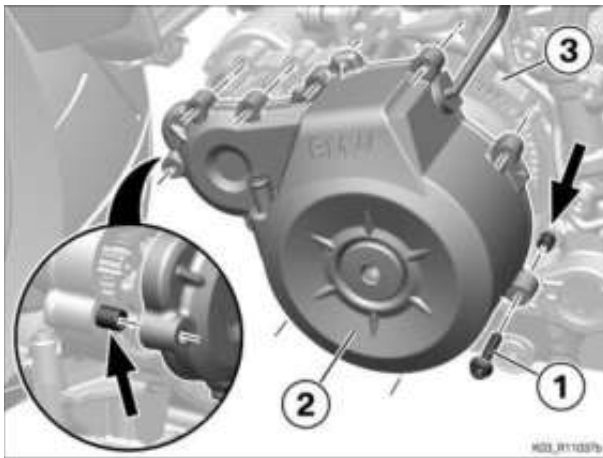
- Loosen clamp (1) with pliers (No. 17 5 500) and pull off hose (2) for crankcase ventilation from engine housing cover (3).
- Hang hose (4) for active carbon filter ventilation and hose (2) for crankcase ventilation apart.



- Remove the cable straps (arrows).
- Disconnect plug connections (1) and (2).
- Work cable (3) clear of the motorcycle.



- Remove cable straps (arrows) and feed out cable (1).



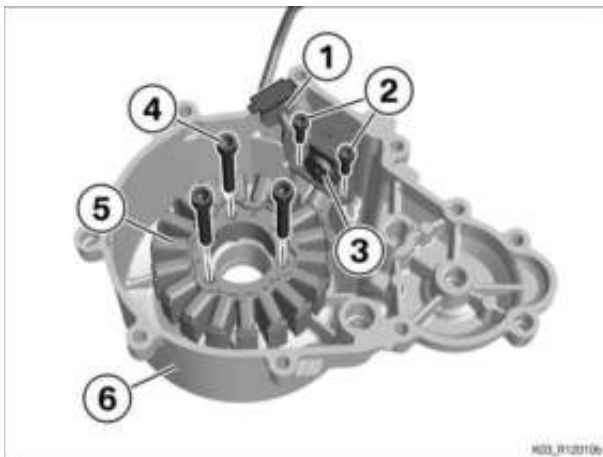
- Remove screws (1).

ATTENTION

Component damage, paint damage

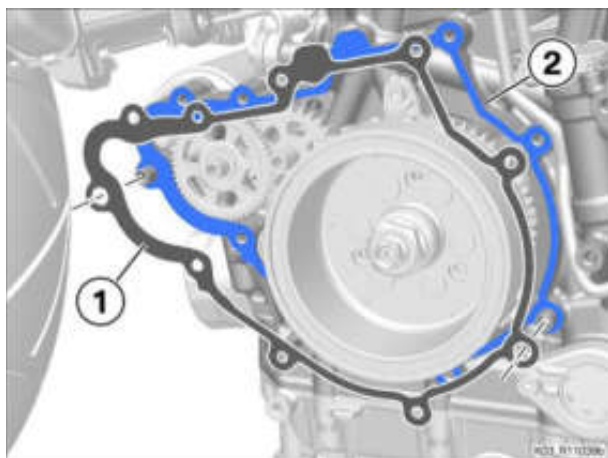
Damage through contaminated, hard surfaces.

- Lay component on clean, white surface.
- Loosen engine housing cover (2) from engine housing (3) and while doing so, pay attention to the dowel pins (arrows).



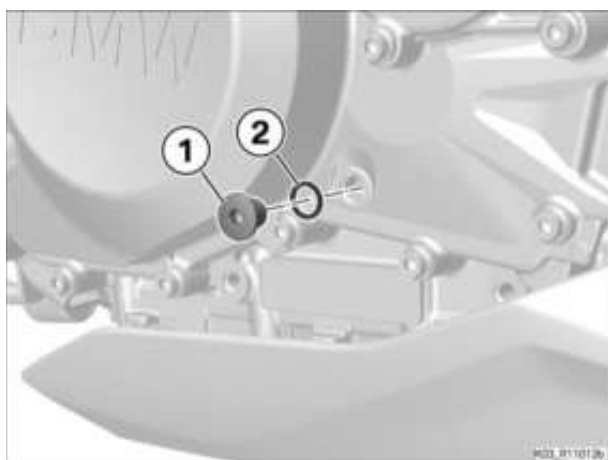
- Disengage rubber grommet (1).
- Remove screws (2) and loosen hall effect sensor (3).
- Remove screws (4).
- Loosen alternator (5) from engine housing cover (6) and allow it to dangle to one side.

- Remove seal (1) from engine housing (2).



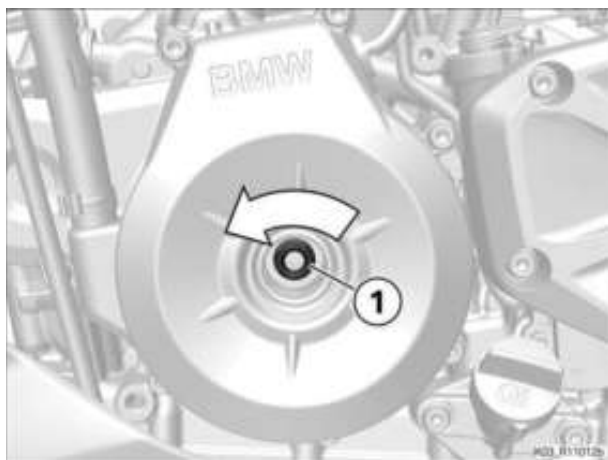
(-) Removing screw for bore for locating pin

- Remove screw (1) with sealing washer (2).

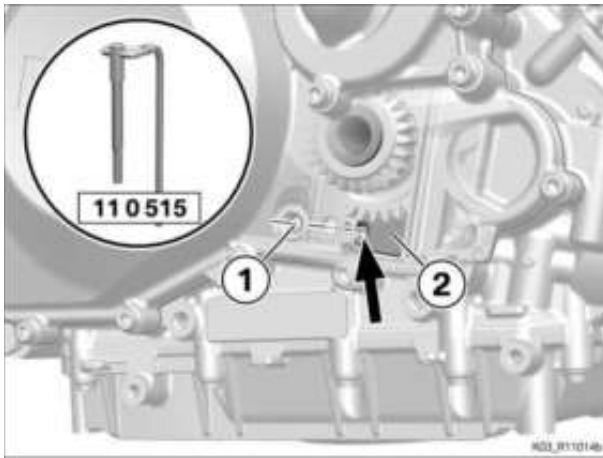


(-) Lock the crankshaft in TDC position

- If required, turn crankshaft at nut (1) in the anti-clockwise direction.

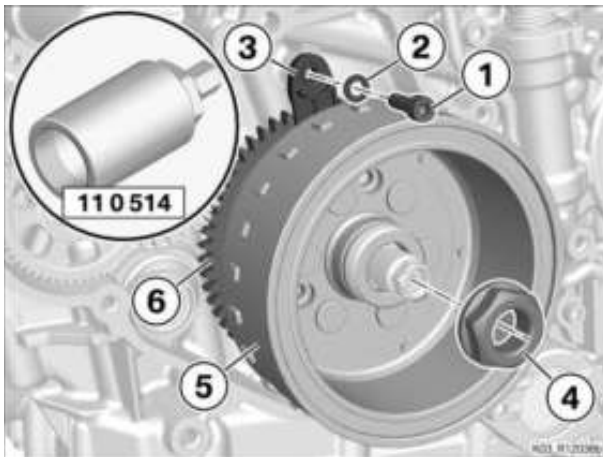


- Retract alignment pin (No. 11 0 515) in bore hole (1) and let it engage in bore hole (arrow) of crank arm (2).



(-) Removing rotor

- Remove bolt (1), washer (2) and guide (3).
- Remove nut (4).
- Pull off rotor (5) with extractor (No. 11 0 514) and remove along with gear (6).

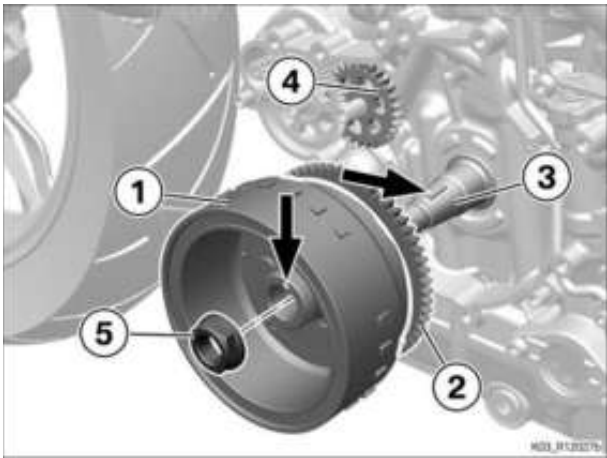


(-) Installing rotor

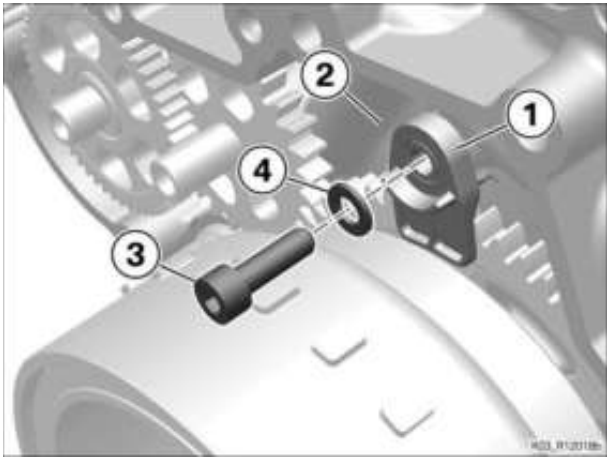
- Insert gear (1) in magnet wheel (2) and turn the gear in the anti-clockwise direction while doing so.
- Check free wheel function and install gear (1) correctly if required.



- Clean the threads.
- Push rotor (1) with gear (2) on crankcase butt (3); while doing so, pay attention the anti-twist lock (arrows) and correct gearing of the gear (2) with the pinion (4).
- Install nut (5).



 Tightening torques		
Rotor to crankshaft		
M16 x 1.5 Thread-locking compound (Loctite 243, Medium strength)	120 Nm	

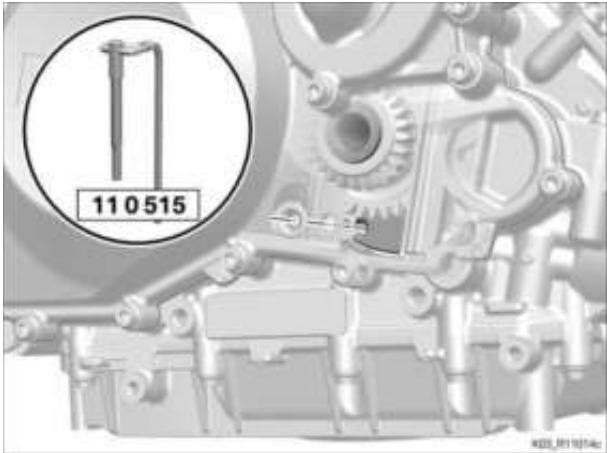


- Clean the threads.
- Fit guide (1) on engine housing (2).
- Install bolt (3) and washer (4).

 Tightening torques		
Guide for starter motor freewheel on crankcase		
M5 x 16 Thread-locking compound (Loctite 243, Medium strength)	6 Nm	

(-) Removing locating pin

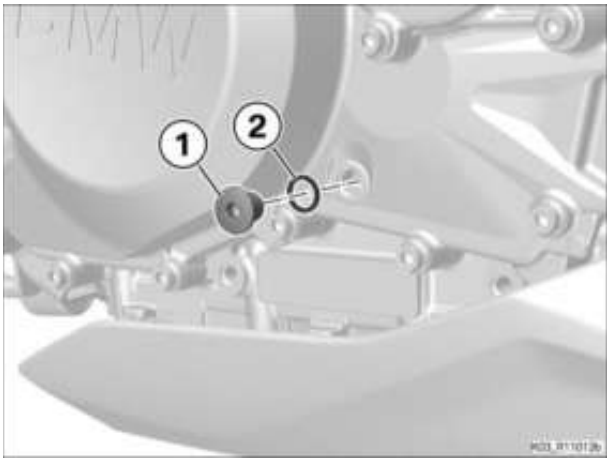
- Remove locating pin (No. 11 0 515).



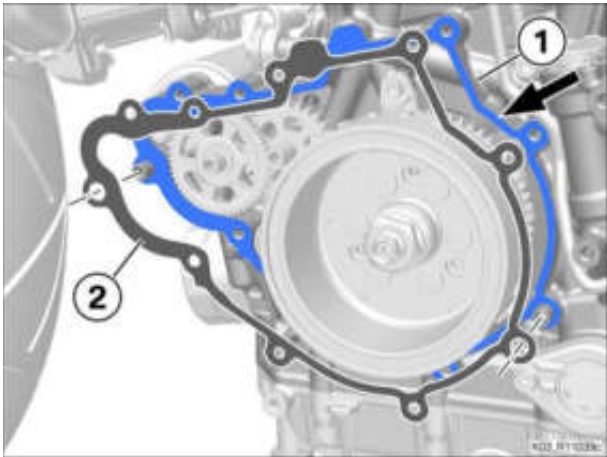
(-) Installing screw in bore for locating pin

- Install screw (1) with new sealing washer (2).

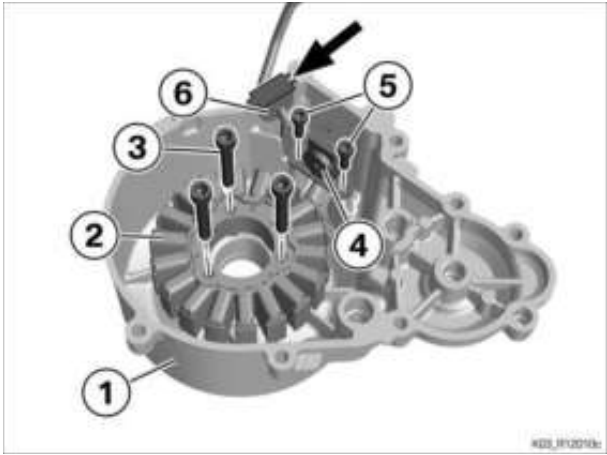
 Tightening torques		
Screw plug for bore for locating pin		
M10 x 1	15 Nm	



(-) Installing alternator



- Clean sealing surface (arrow) of engine housing (1).
- Place **new** gasket (2).



- If necessary, clean the sealing surface of the engine housing cover (1).
- Insert alternator (2) in engine housing lid (1) and install screws (3).

 Tightening torques		
Stator to housing cover		
M6 x 40 Thread-locking compound (Loctite 243, Medium strength)	10 Nm	

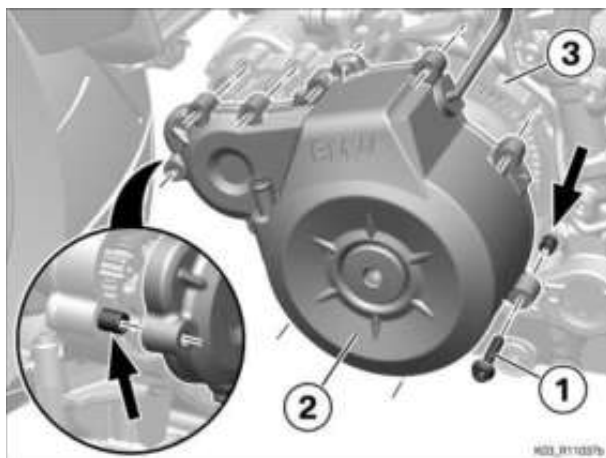
- Hold hall effect sensor (4) in position and install screws (5).
- Install rubber grommet (6) and apply sealing compound **Pfeil**.

 Sealant	
Dow Corning	07 58 0 397 777

 CAUTION

Crimping danger

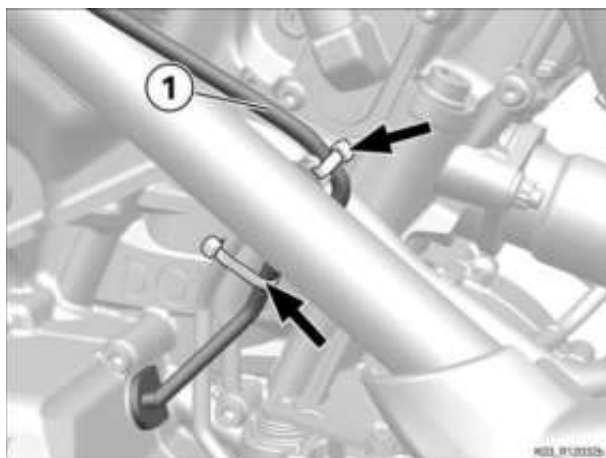
Strong magnetic attraction force between magnet wheel and stator of the alternator.



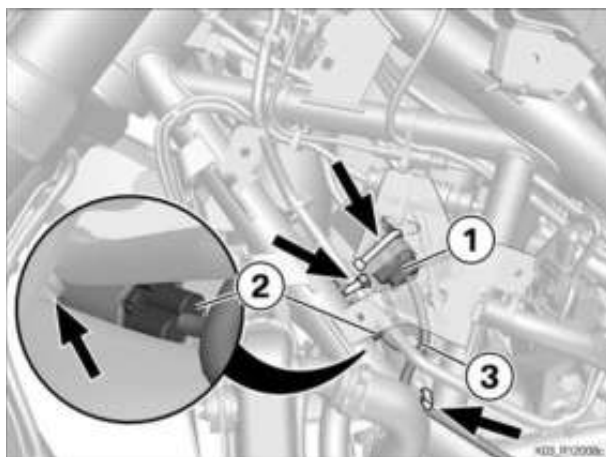
- When assembling the components, do not reach at or in the sealing surface edges.
- Do not jam any lines or cables.

- Place engine housing cover (2) on engine housing (3) and while doing so pay attention to the dowel pins (arrows).
- Install screws (1).

 Tightening torques		
Engine-block cover, left, to engine block		
M6 x 30	10 Nm	

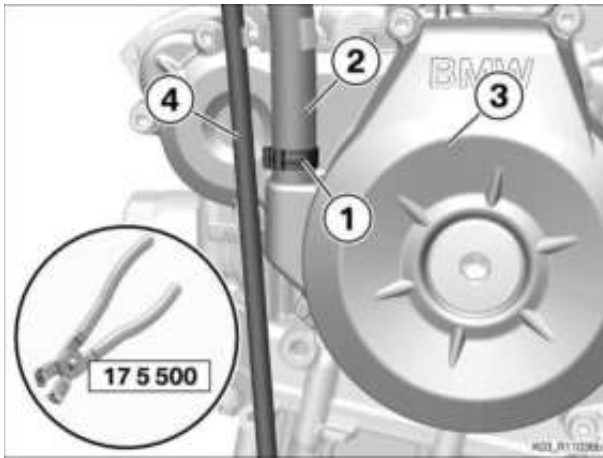


- Route cable (1) and secure the cable ties (arrows).



- Route cable (3) into position.
- Connect plug connections (1) and (2).
- Close the cable strap (arrows).

- Lay hose (4) for active carbon filter ventilation and hose (2) for crankcase ventilation.
- Connect hose (2) for crankcase ventilation on engine housing lid (3) and secure clamp (1) with pliers (No. 17 5 500).



Follow-up work

- Installing pinion cover
- Securing engine control unit
- Installing left radiator cowl
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Installing engine spoiler
- Final check of work performed

 12 32 000 Removing/installing voltage regulator

+ 12 32 500

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

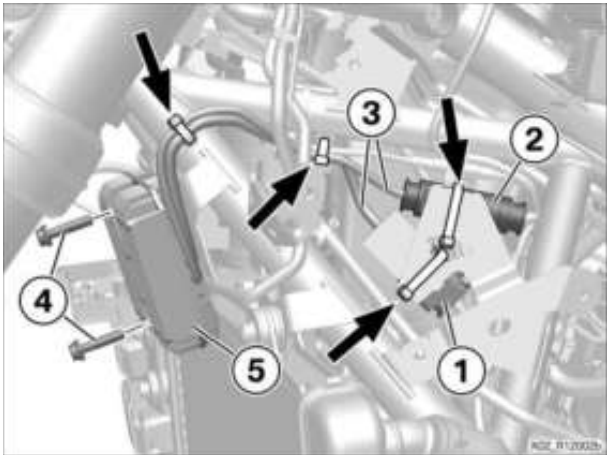
Removing cover for fuel tank

Removing left radiator cowl

Disengage the engine control unit

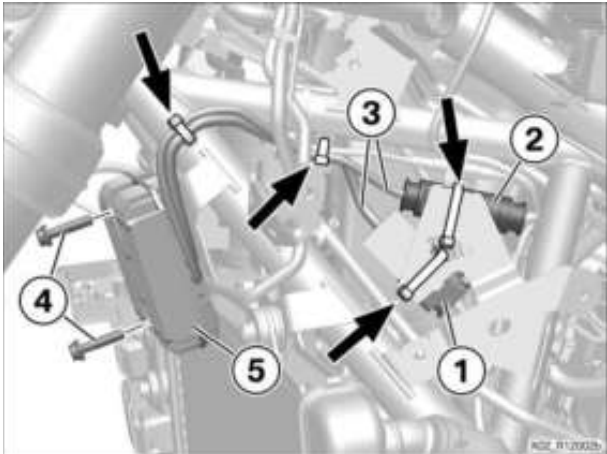
Core activity

(-) Removing voltage regulator



- Remove the cable straps (arrows).
- Disconnect plug connections (1) and (2) and work cable (3) clear.
- Remove screws (4) and remove voltage regulator (5).

(-) Installing voltage regulator



- Positioning the voltage regulator (5) and routing cable (3)
- Secure voltage regulator (5) with screws (4).

 Tightening torques		
Voltage regulator to frame		
M6 x 25	11 Nm	

- Connect plug connections (2) and (1).
- Close the cable strap (arrows).

Follow-up work

Securing engine control unit

Installing left radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

12 41 025 Replacing starter

+ 12 41 528

Preparatory work

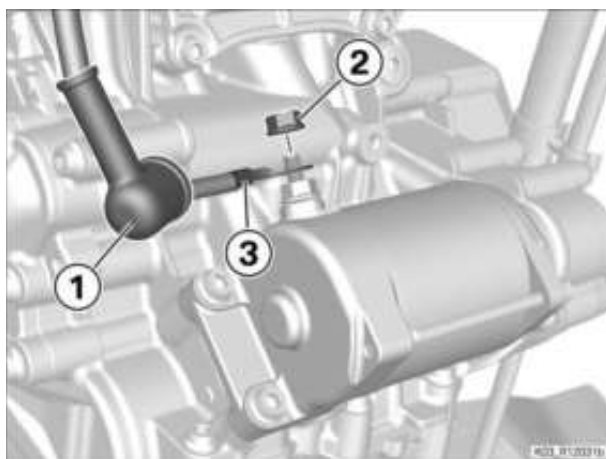
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

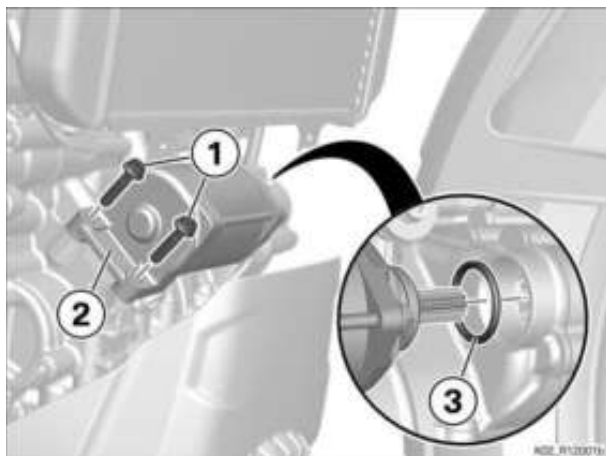
Disconnect battery from vehicle

Core activity

(-) Removing starter



- Push back cap (1).
- Remove nut (2) and disconnect positive lead (3).



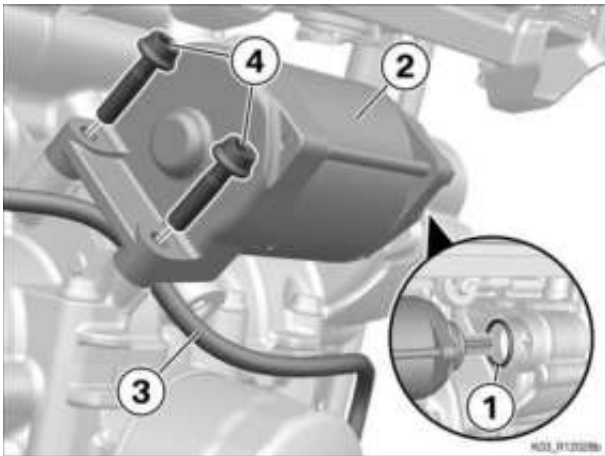
- Remove screws (1).
- Remove starter motor (2) with O-ring (3).

(-) Installing starter

- Check O-ring (1) for damage; replace if necessary.
- Lubricate O-ring (1).



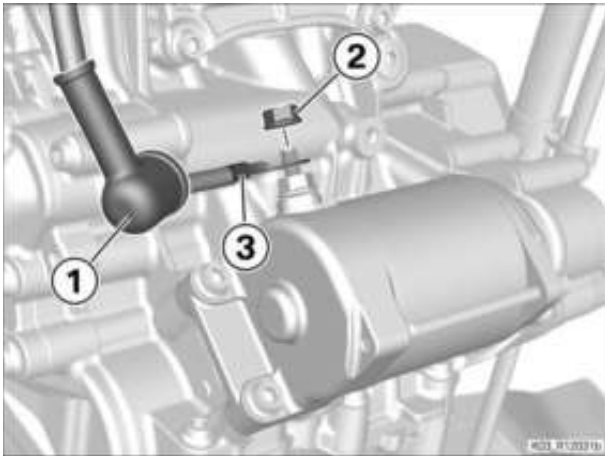
Lubricant



Molykote D paste

- Install starter motor (2), paying attention to the position of drainage hose (3) while doing so (do not clamp drainage hose).
- Install screws (4).

Tightening torques		
Starter to crankcase		
M6 x 25	10 Nm	



ATTENTION

Nut tightened too strongly

- Assembly components, ripping off of the starter motor positive contacts
- Tighten the nuts only to their specified tightening torque.

Tightening torques		
Wiring harness (positive wire) to starter motor		
M6	4.5 Nm	

- Slip cap (1) over nut (2) and positive lead (3).

Follow-up work

Connect battery with vehicle

Installing seat

Checking, if necessary correcting date

Setting calendar date

Final check of work performed

 12 62 010 Replacing coolant-temperature sensor

+ 12 62 510

Preparatory work

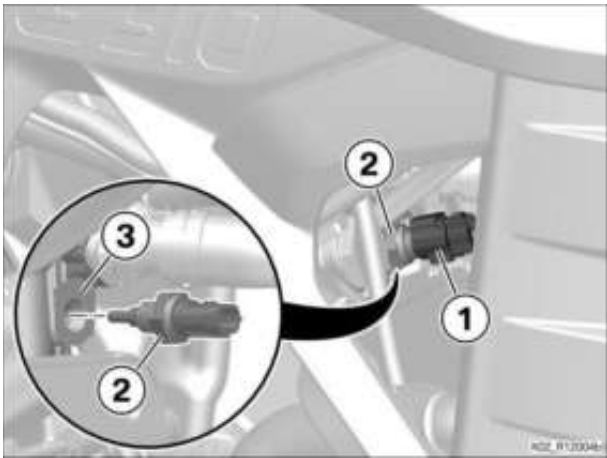
=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Removing air guide

Core activity

(-) Removing coolant-temperature sensor

- Disconnect connector (1) for coolant temperature sensor (2).
- Remove coolant temperature sensor (2) from cylinder head (3).

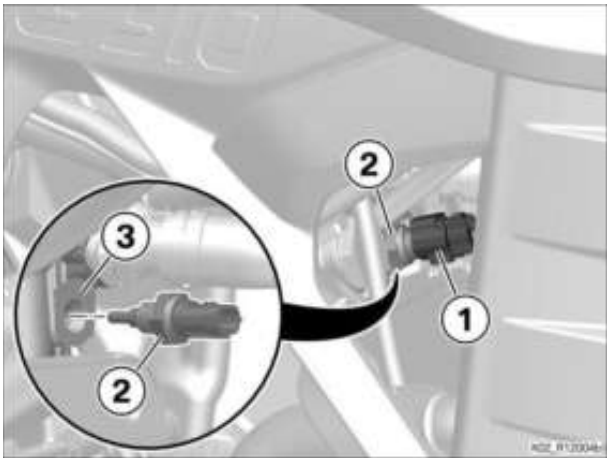


(-) Installing coolant-temperature sensor

- Install coolant temperature sensor (2) in cylinder head (3).

 Tightening torques		
Coolant-temperature sensor to cylinder head		
M12 x 1.5	13 Nm	

- Connect connector (1) to coolant temperature sensor (2).



Follow-up work

Installing air guide

Checking coolant level

Final check of work performed

 13 51 002 Measuring fuel pressure
+ 13 51 502

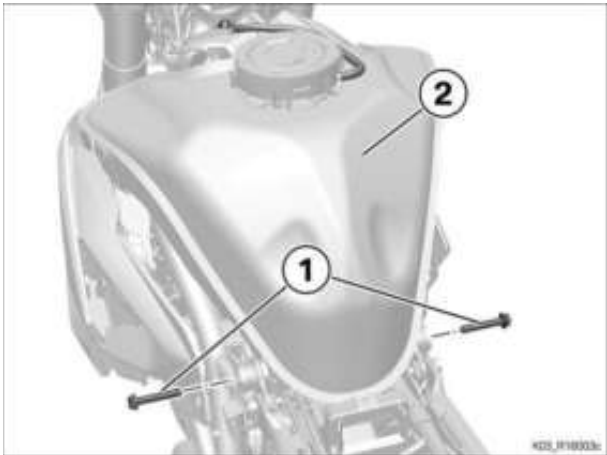
Preparatory work

=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

- Removing seat
- Removing cover for left intake snorkel
- Removing the cover for right intake snorkel
- Removing cover for fuel tank

Core activity

(-) Removing fuel tank



- Remove screws (1).
- Raise fuel tank (2) and support it with suitable auxiliary materials.

(-) Measuring fuel pressure

 ATTENTION

Escape of fuel when pressurised fuel lines are opened

Damage to surfaces

- Employ suitable means to catch escaping fuel.

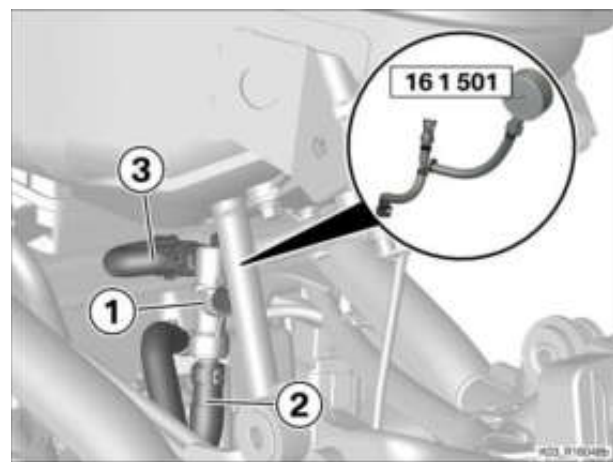
- Cut suitable fuel hose (1) to length (A) and connect to tester for fuel pressure (No. 16 1 500).

 Technical data			
Dimension (A) Length of fuel hose for tester		approx. 15 cm	

- Push hose clips (2) on to hoses (1) and (3).
-



- Install coupling receptacle (part number 7 659 120) (4) and connector (part number 7 700 800) (5).
- Tighten clamping screws (2).



- Disconnect quick-action coupling (1).

ATTENTION

Application of force to close locked quick-action couplings

Leak due to damaged O-rings

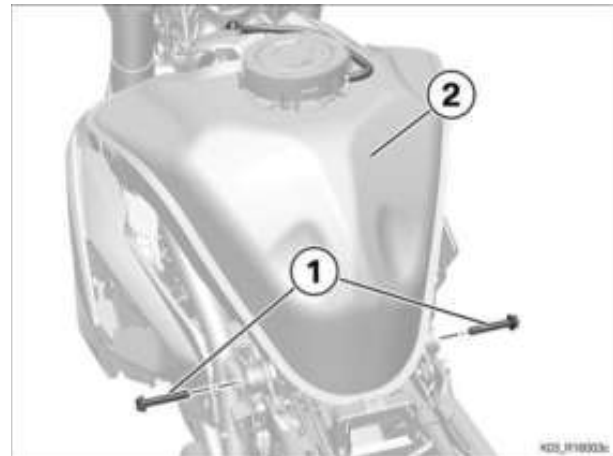
- Close the quick-action coupling of the fuel line only with the latch open/pressed.
-
- Connect tester (No. 16 1 500) with fuel hoses (2) and (3).
 - Start the engine and read the pressure from pressure gauge (No. 16 1 501).

 Technical data			
Fuel pressure of the injection system		3.5 ^{+0.25} _{-0.25} bar	

- Stop the engine and switch off the ignition.
- Remove tester (No. 16 1 500).
- Connect quick-action coupling (1).

(-) Securing fuel tank

- Remove support and position fuel tank (2).
- Install screws (1).



 Tightening torques		
Fuel tank to frame		
M8 x 45	19 Nm	

Follow-up work

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

13 54 017 Replacing complete throttle-valve assembly

+ 13 54 521

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Removing right radiator cowl

Removing expansion tank

Removing idle actuator

Removing left radiator cowl

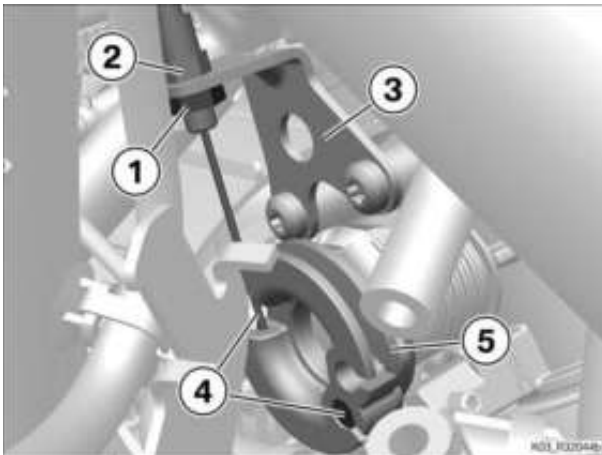
Remove the intake air silencer

Core activity

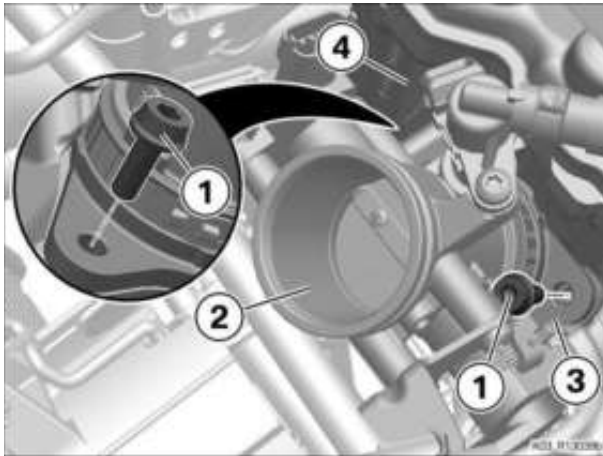
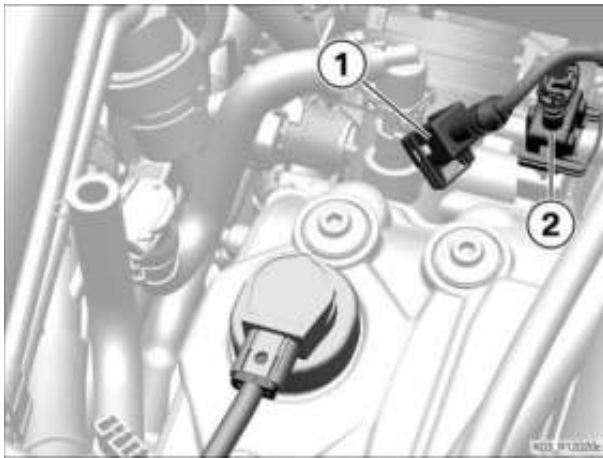
(-) Remove throttle valve with intake manifold

► Loosening throttle cable from pulley

- Loosen nut (1), counter-holding on **hexagon head** of throttle cable (2).
- Disengage throttle cable (2) from holder (3).
- Remove cable (4) from pulley (5).

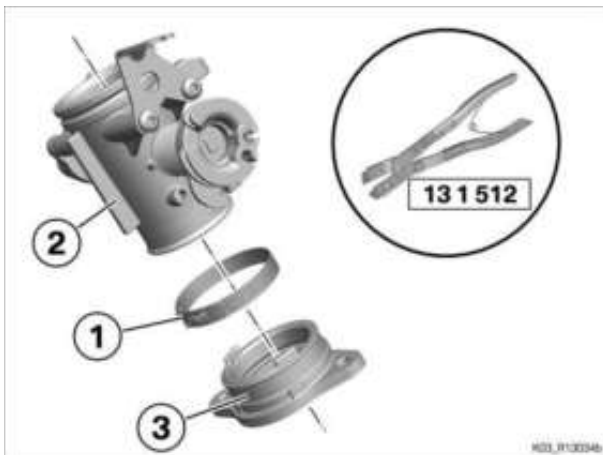


- Disconnect plug (1) for the injection valve.
- Disconnect connector (2) for throttle valve.



- Remove screws (1).
- Remove throttle valve (3) with intake manifold (2) from cylinder head (4).

(-) Replace throttle valve



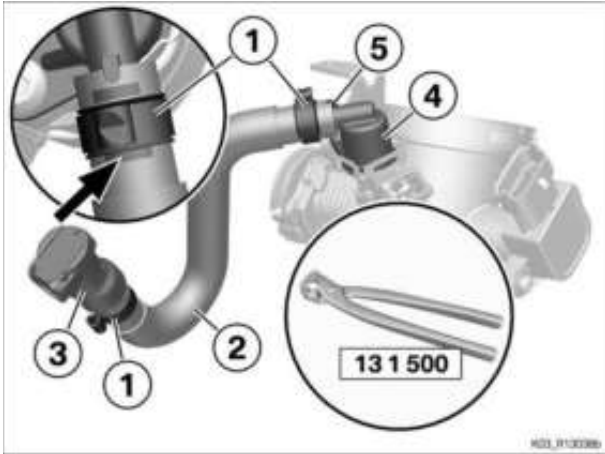
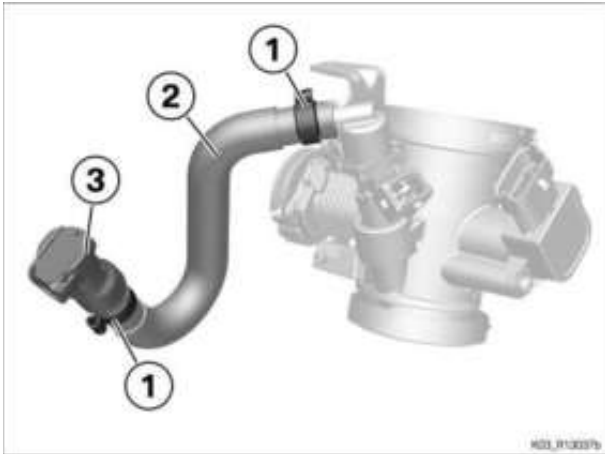
- Open clip (1) with pliers (No. 13 1 512).
- Remove throttle valve (2) from intake stubs (3).

ATTENTION

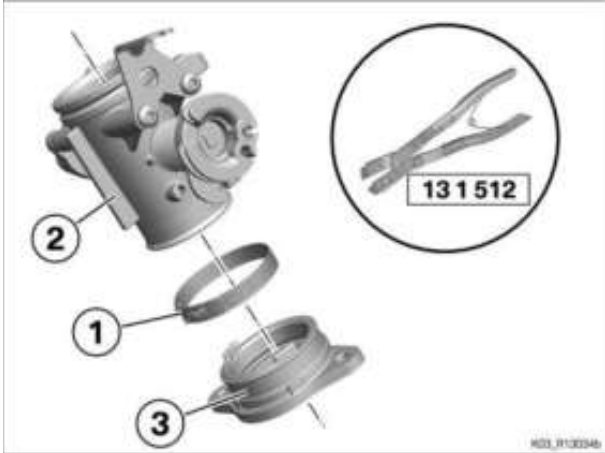
Refitting hoses with non-reusable clamps at the same place leaks

- Always replace clamps fitted with non-reusable clamps.

- Open clips (1).
- Remove hose (2) and snap fastener (3).



- Connect clamps (1) on to **new** hose (2).
- Connect hose (2) to quick-release coupling (3) and fuel injector (4) noting locator (5).
- Align clamps (1) with marks (arrows and) secure them with pliers (No. 13 1 500).

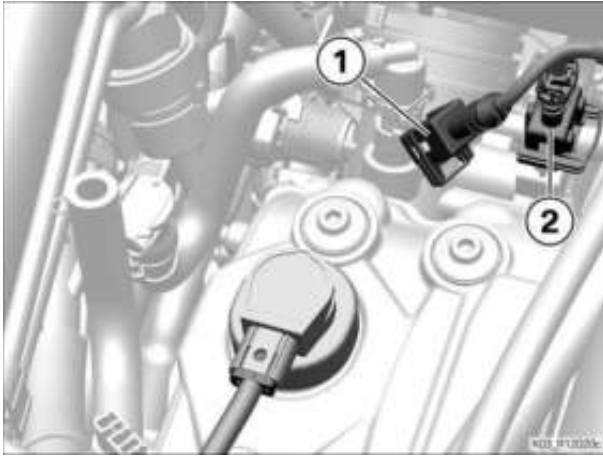
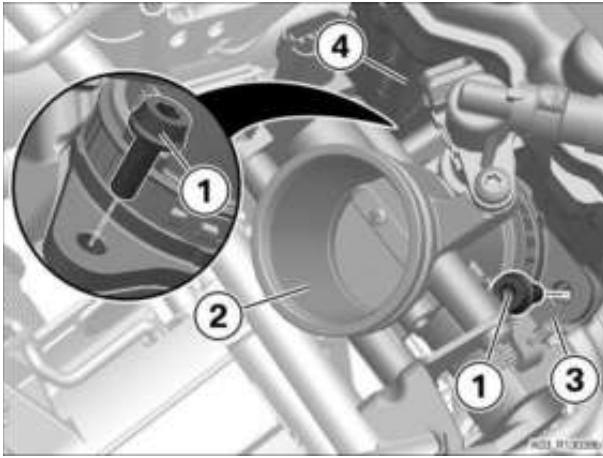


- Check intake stubs (3) for damage; replace if necessary.
- Install **new** throttle valve (2) in intake stubs (3).
- Install clip (1) and close it with pliers (No. 13 1 512).

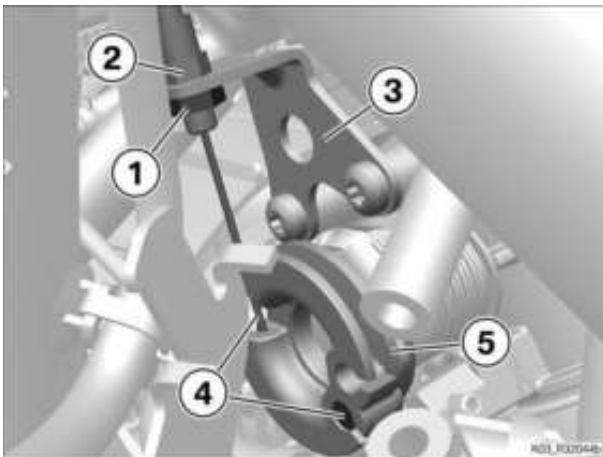
(-) Install throttle valve with intake stubs

- Position intake manifold (3) with throttle valve (2) on cylinder head (4).
- Install screws (1).

 Tightening torques		
Air intake to cylinder head		
M6 x 16	10 Nm	



- Connect plug (1) for the injection valve.
- Connect connector (2) for throttle valve.



► Securing throttle cable in pulley

- Install throttle cable (4) in pulley (5).
- Insert throttle cable (2) in holder (3).
- Install nut (1), counter-holding on **hexagon head** of throttle cable (2).



Follow-up work

Adjusting throttle cable

Install the intake air silencer

Installing fuel tank

Installing left radiator cowl

Installing idle actuator

Installing expansion tank

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Connecting **BMW Motorrad** diagnostic system to vehicle

Perform the vehicle test with **BMW Motorrad** diagnostic system,
read out fault memory and reset adaptation values

Disconnecting **BMW Motorrad** diagnostic system from vehicle

Installing seat

Final check of work performed

 13 61 510 Replacing engine management control unit (not including checking/programming software)

 NOTICE

Before removal, test the control unit with the **BMW Motorrad** diagnostic system and make a backup copy of the data.

Preparatory work

=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Removing seat

Removing cover for left intake snorkel

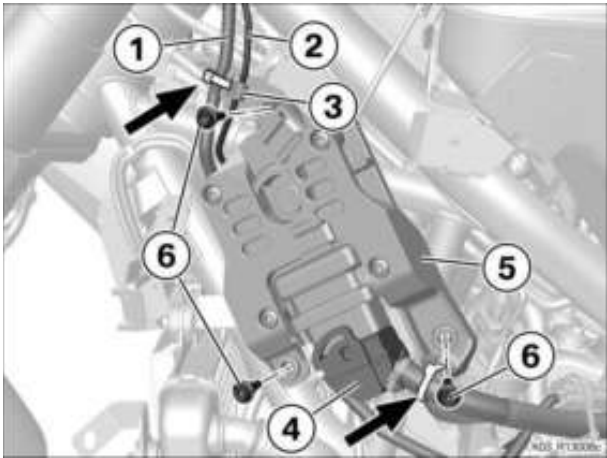
Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing left radiator cowl

Core activity

(-) Removing engine control unit

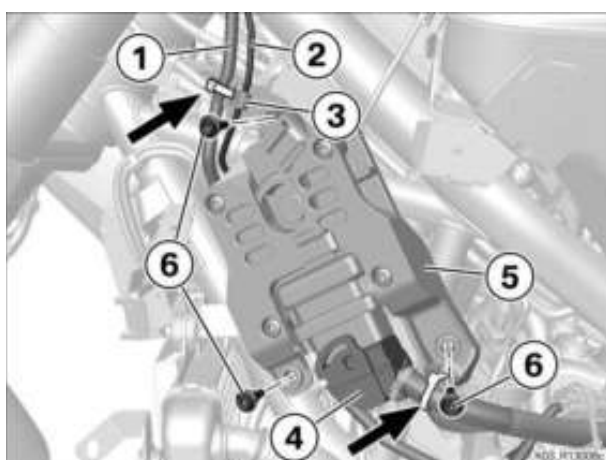
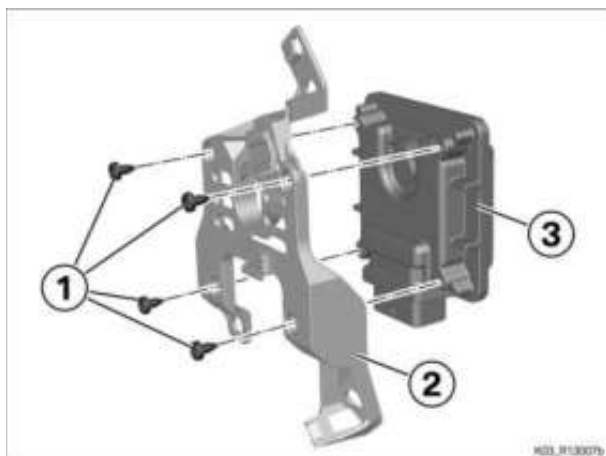


- Remove the cable ties (arrows) and disengage cable (1).
- Disengage cable (2) from cable holder (3).
- Disconnect connector (4) from engine control unit (5).
- Remove screws (6).
- Remove engine control unit (5) together with the holder.

(-) Replacing engine control unit

- Remove screws (1).
- Transfer holder (2) to new engine control unit (3).
- Install screws (1).

 Tightening torques		
Engine control unit to holder		
5 x 10	6 Nm	



(-) Installing engine control unit

- Position engine control unit (5) to holder.
- Install screws (6).

 Tightening torques		
Engine control unit holder to main frame		
M5 x 20, 9 mm collar	2 Nm	

- Connect connector (4) from engine control unit (5).
- Secure cable (2) in cable clip (3).
- Hold cable (1) in position and secure the cable ties (arrows).

Follow-up work

Installing left radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

=> Testing software (Description in item: 61 00 502, Billed as a separate item)

Installing seat

 13 61 522 Programming control unit of engine management system (along with testing software)

Core activity

(-) Programming engine-management control unit

- Start the programming routine and follow the instructions issued by the **BMW Motorrad** diagnostic system.

13 63 020 Replace idle actuator

+ 13 63 520

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

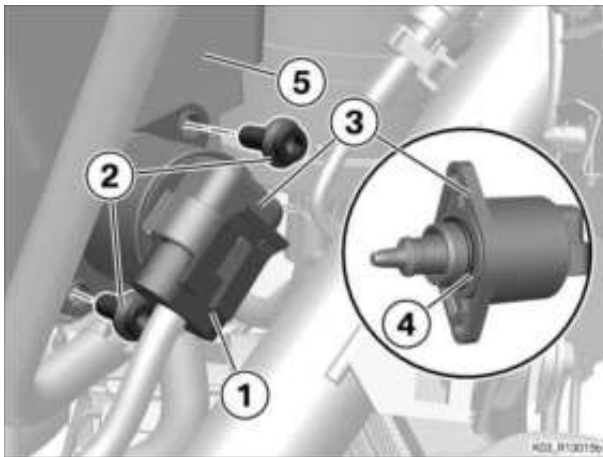
Removing cover for fuel tank

Removing right radiator cowl

Removing expansion tank

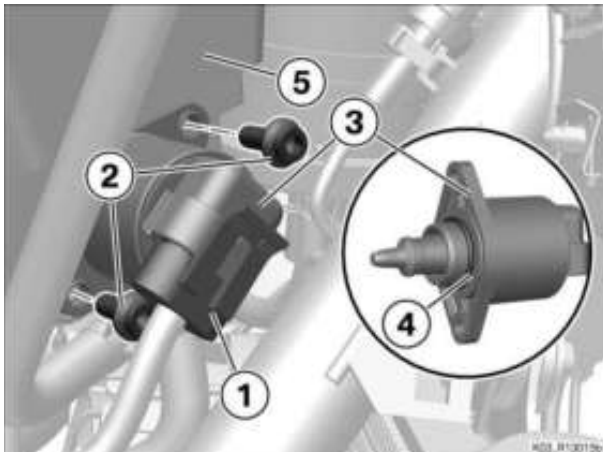
Core activity

(-) Removing idle actuator



- Disconnect connector (1) for the idle controller.
- Remove screws (2).
- Remove idle controller (3) with O-ring (4) from intake air silencer (5).

(-) Installing idle actuator



- Check O-ring (4) for damage, replace if necessary.
- Install idle controller (3) with O-ring (4) in intake air silencer (5).
- Install screws (2).
- Connect connector (1) for the idle controller.

Follow-up work

Installing expansion tank

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

13 64 165 Renewing one injector

+ 13 64 501

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

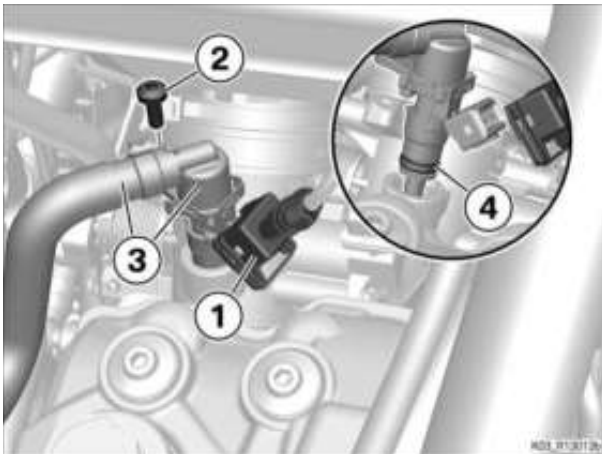
Removing cover for fuel tank

Removing fuel tank

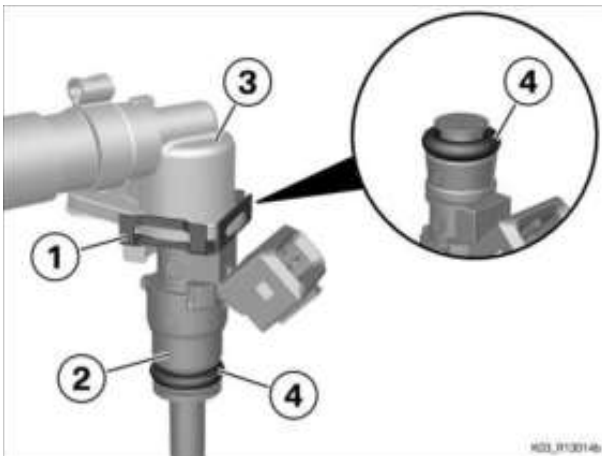
Core activity

(-) Removing injection valve

- Disconnect plug (1) for the injection valve.
- Remove screw (2).
- Remove fuel injector (3) with fuel injection line and O-ring (4).

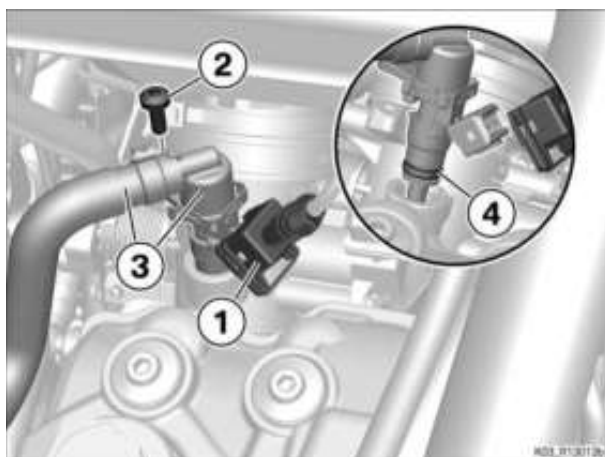
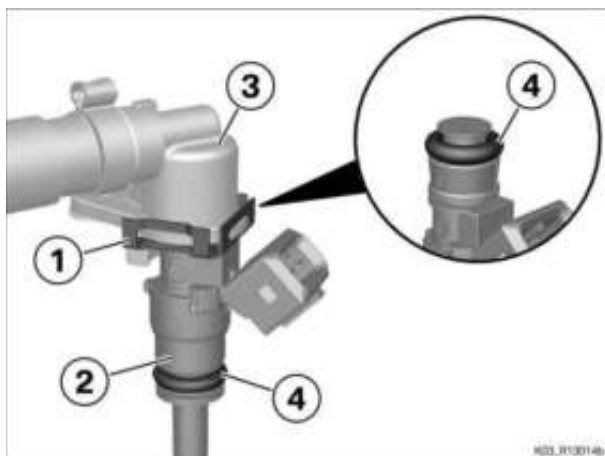


- Remove clip clamp (1).
- Remove fuel injector (2) from fuel injection line (3).
- Remove O-rings (4).



(-) Installing injection valve

- Lubricate **new** O-rings (4) and install.



Installation tool

Silicone spray

83 19 2 208 609

- Install fuel injector (2) in fuel injection line (3).
- Install clip clamp (1).
- Install fuel injector (3) with fuel injection line while noting the O-ring (4).
- Install screw (2).
- Connect plug (1) for the injection valve.

Follow-up work

Installing fuel tank

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Connecting **BMW Motorrad** diagnostic system to vehicle

Perform the vehicle test with **BMW Motorrad** diagnostic system, read out fault memory and reset adaptation values

Disconnecting **BMW Motorrad** diagnostic system from vehicle

Installing seat

Final check of work performed

13 71 010 Replace intake-air silencer

+ 13 71 510

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Removing right radiator cowl

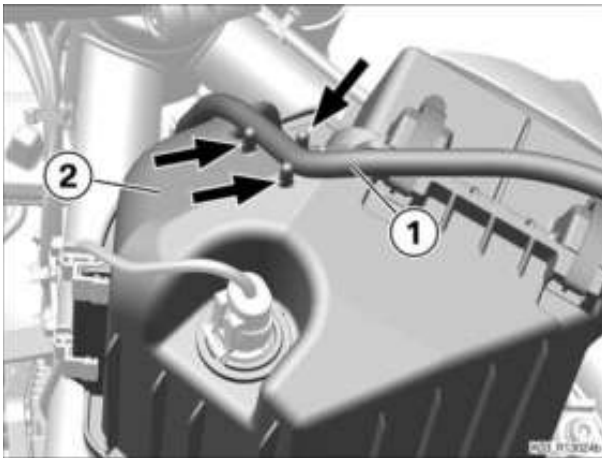
Removing expansion tank

Removing idle actuator

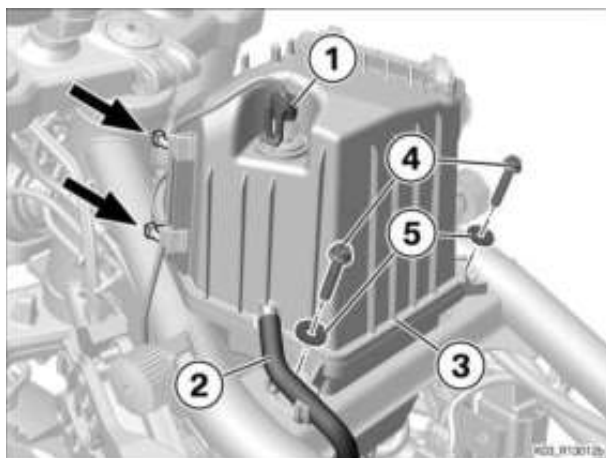
Removing the left radiator cowl with the air duct

Core activity

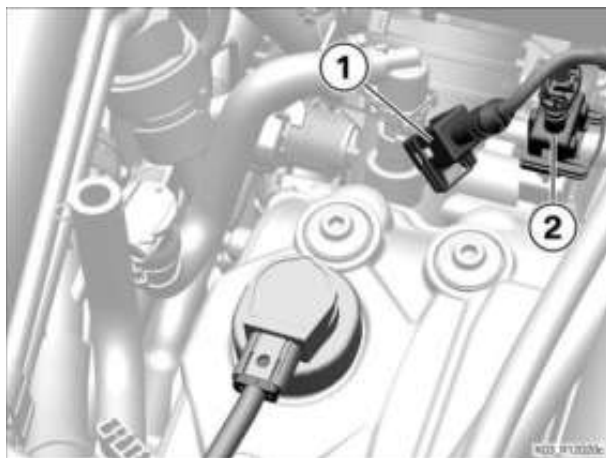
(-) Remove the intake air silencer



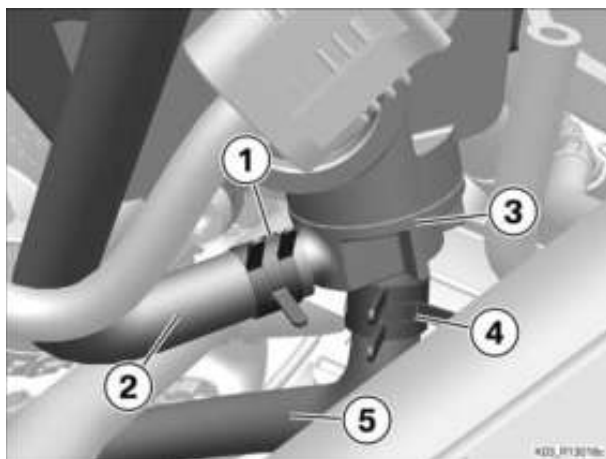
- Loosen hose (1) from guides (arrows) of the intake silencer (2) and hang to one side.
- Remove the cable straps (arrows).
- Disconnect connector (1) for intake air temperature sensor and hang to one side.
- Pull off hose (2) for secondary air system from intake silencer (3).
- Remove screws (4) and washers (5).



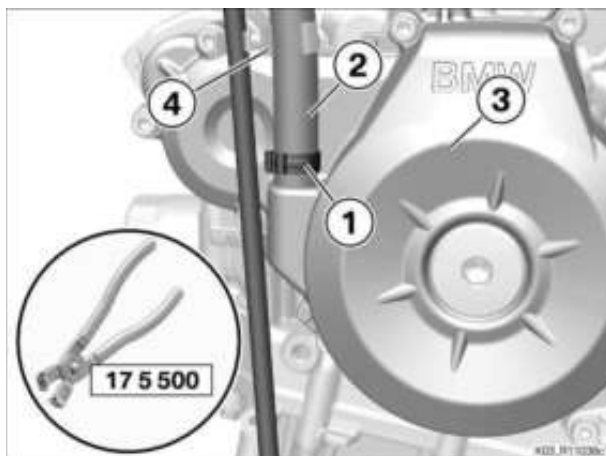
- Disconnect plug (1) for the injection valve.
- Disconnect connector (2) for throttle valve.



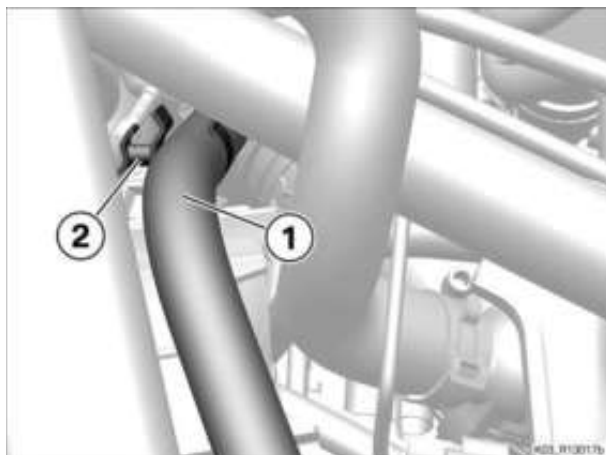
- Open clamp (1) and pull off hose (2) from intake silencer (3).
- Open clamp (4) and pull off hose (5) from intake silencer (3).



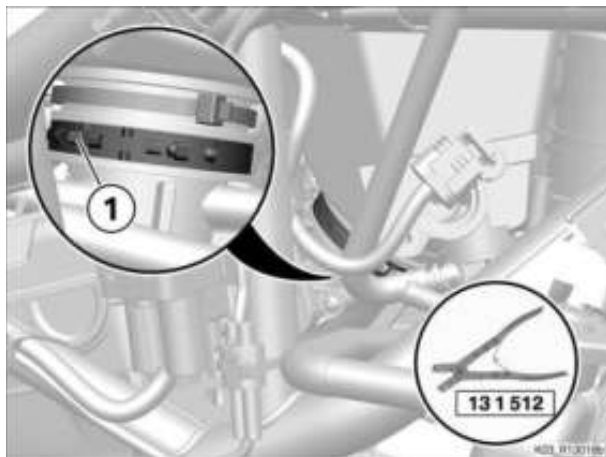
- Loosen clamp (1) with pliers (No. 17 5 500) and pull off hose (2) for crankcase ventilation from engine housing cover (3).
- Loosen hose (2) for crankcase ventilation from holder (4).



- Loosen hose (1) for crankcase ventilation from holder (2).



- Open clip (1) with pliers (No. 13 1 512).



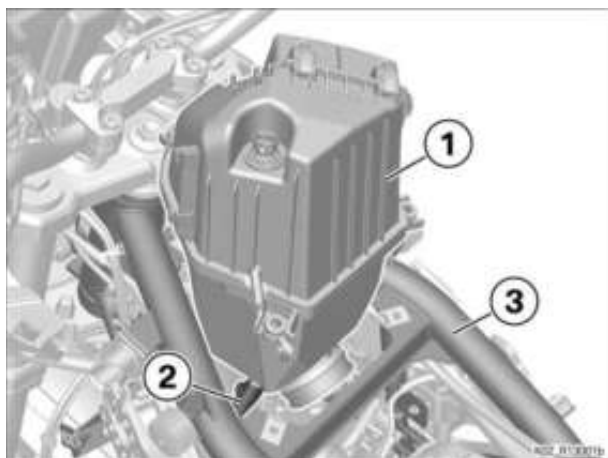
ATTENTION

Unnoticed cases of small part in the engine

Engine damage

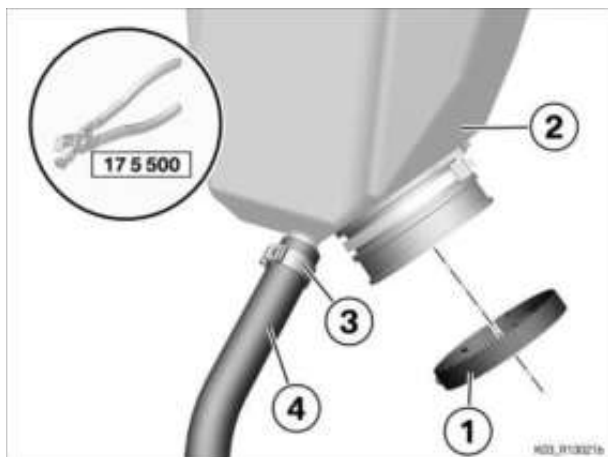
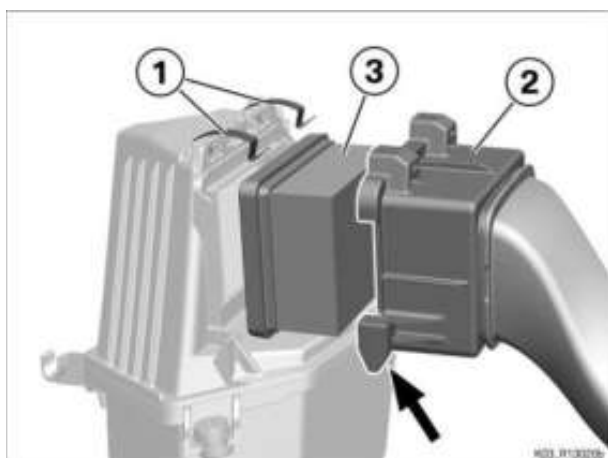
- Cover or close openings with suitable auxiliary materials. Remove again the auxiliary materials with assembly.

- Remove intake silencer (1) with hose (2) for crankcase ventilation from frame (3).

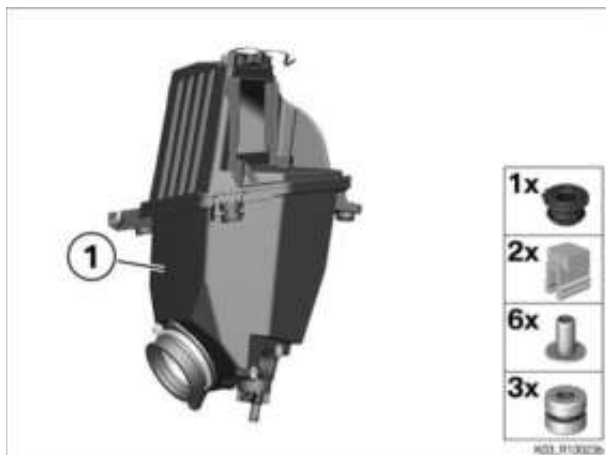
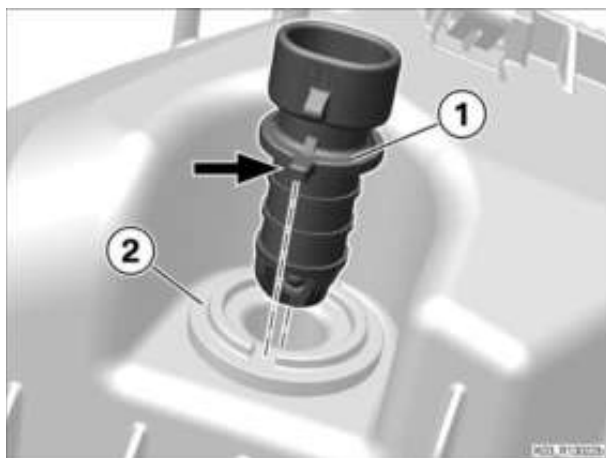


(-) Replacing intake air silencer

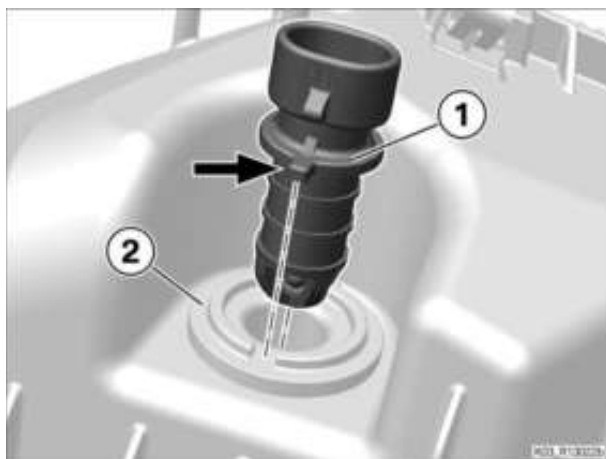
- Open clamps (1).
- Remove intake snorkel (2), paying attention to the lug (arrow).
- Remove air filter element (3) from intake snorkel (2).



- Remove clamp (1) from intake air silencer (2).
 - Remove clip (3) with pliers (No. 17 5 500).
 - Pull off hose (3) from intake air silencer (2).
-
- Remove intake air temperature sensor (1) from rubber grommets (2), paying attention to the lug (arrow).

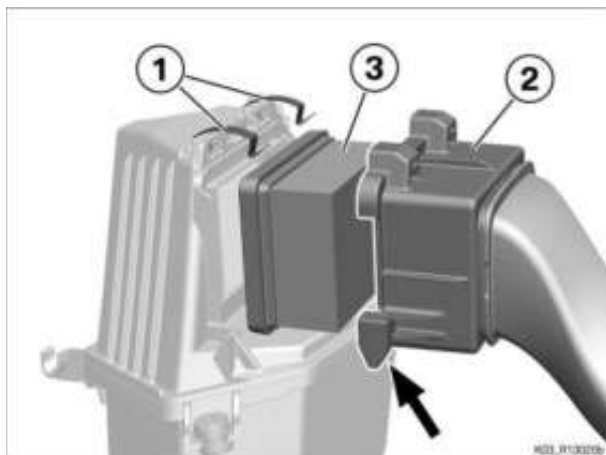
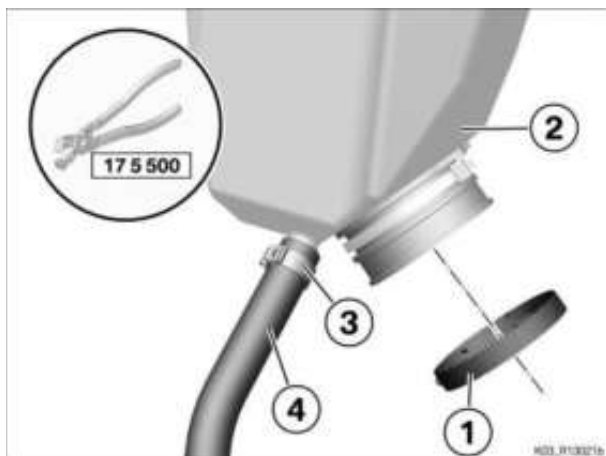


- Transfer reusable small items to new part (1) or replace the small items as necessary.
- 1 x rubber grommet
- 2 x cable-tie holder
- 6 x shouldered bushing
- 3 x rubber grommet



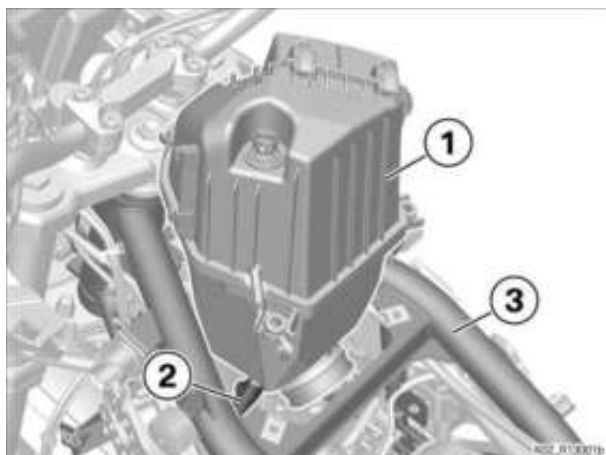
- Install intake air temperature sensor (1) in rubber grommet (2), paying attention to the lug (arrow).

- Connect clamp (1) to intake air silencer (2).
- Connect hose (3) to intake air silencer (2).
- Close clip (3) with pliers (No. 17 5 500).

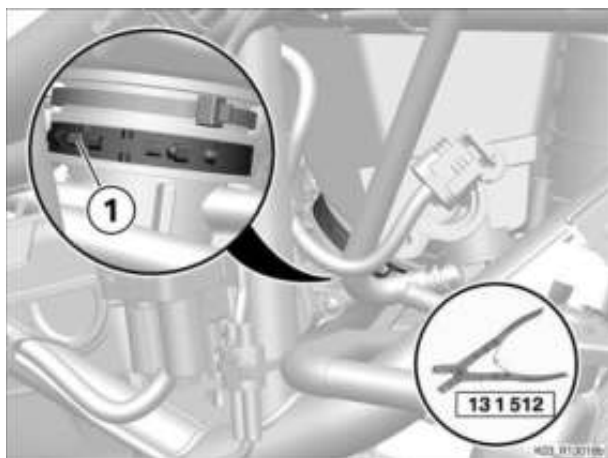


- Install air filter element (3) in intake snorkel (2).
- Install intake snorkel (2), paying attention to the lug (arrow).
- Close clips (1).

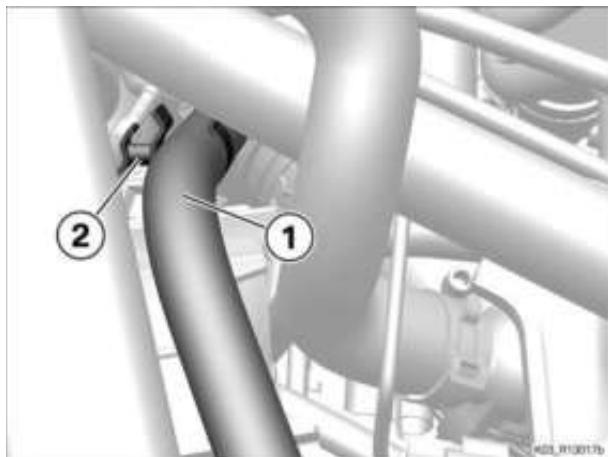
(-) Install the intake air silencer



- Install intake silencer (1) with hose (2) for crankcase ventilation in frame (3)
- Close clip (1) with pliers (No. 13 1 512).

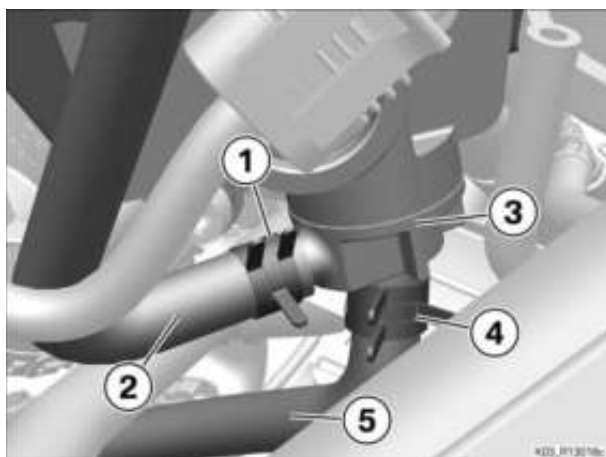
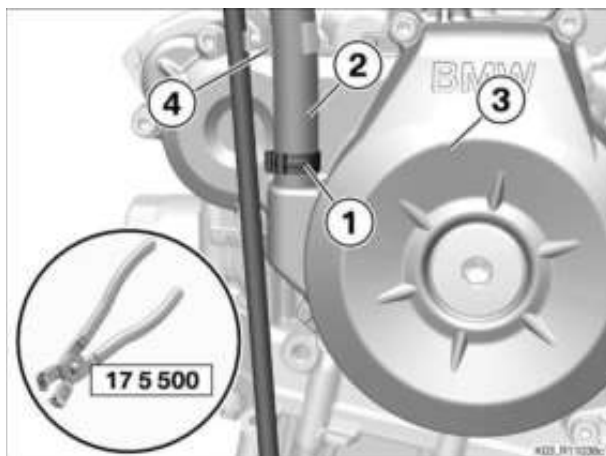


- Connect connector (1) for fuel injector and connector (2) for the throttle valve.

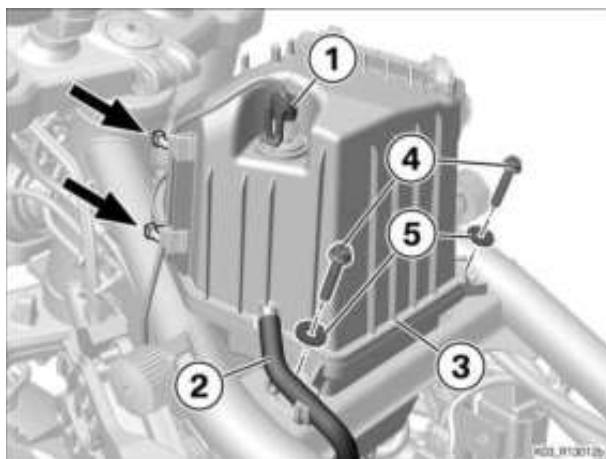


- Secure hose (1) for crankcase ventilation in holder (2).

- Connect hose (2) for crankcase ventilation on engine housing lid (3) and secure clamp (1) with pliers (No. 17 5 500).
- Secure hose (2) for crankcase ventilation in holder (4).

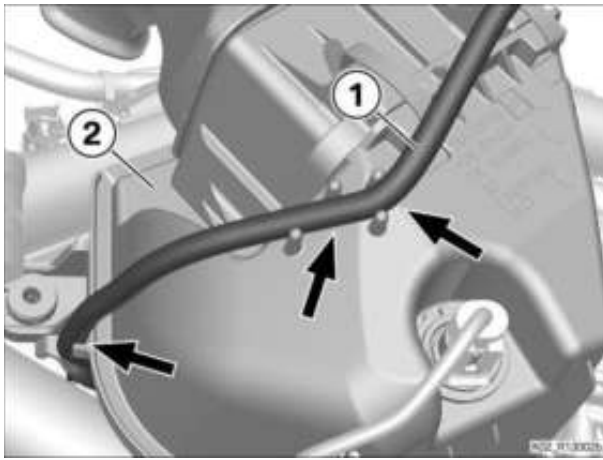


- Connect hose (5) to intake silencer (3) and secure clamp (4).
- Connect hose (2) to intake silencer (3) and secure with clamp (1).



- Install screws (4) and washers (5).
- Connect hose (2) for secondary air system to intake silencer (3).
- Connect connector (1) for the intake-air temperature sensor.
- Close the cable strap (arrows).

- Secure hose (1) in guides (arrows) of the intake silencer (2).



- Ensure correct laying of hose (see image).



- Ensure correct laying of hose (see image).

Follow-up work

Installing fuel tank

Installing the left radiator cowl with the air duct

Installing idle actuator

Installing expansion tank

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

13 71 020 Replacing air intake duct

+ 13 71 520

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

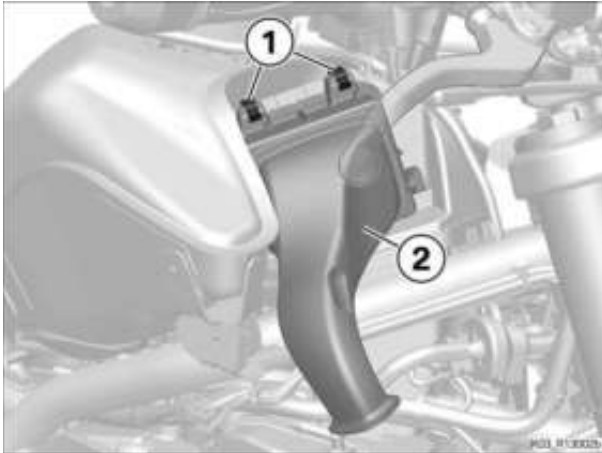
Removing cover for left intake snorkel

Removing the cover for right intake snorkel

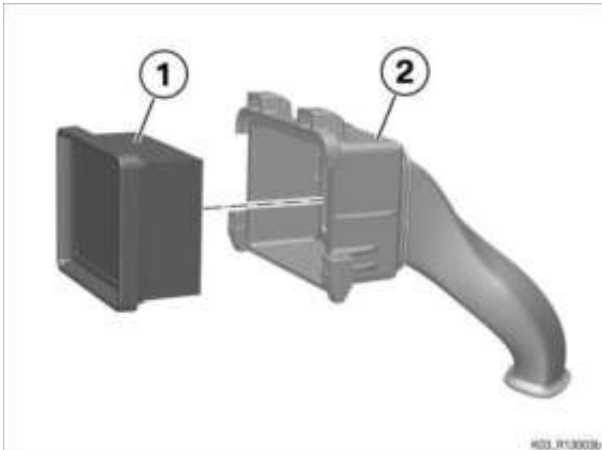
Removing cover for fuel tank

Core activity

(-) Replacing intake air pipe

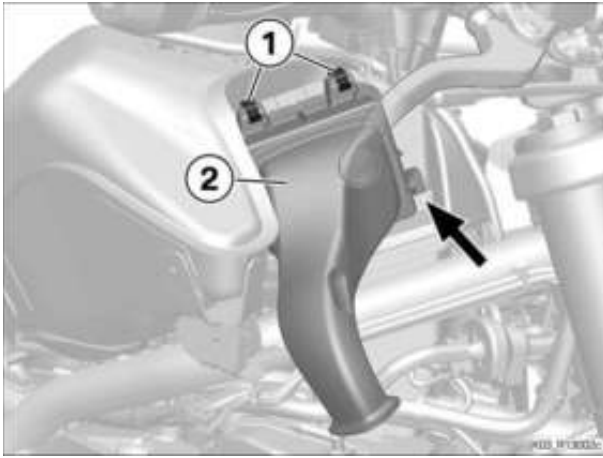


- Open clamps (1).
- Remove intake air pipe (2).



- Remove air filter element (1) from intake air pipe (2).
- Install air filter element (1) in new intake air pipe (2).

- Position intake air pipe (2) in the bottom holder (arrow) and swing it up into place.
- Close clips (1).



Follow-up work

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

 13 71 539 Replace hoses from intake silencer to cylinder head and tank vent valve (at maintenance)

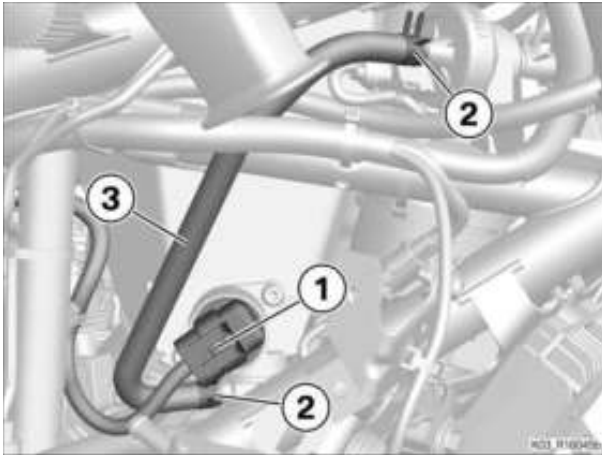
Preparatory work

Releasing expansion tank

Core activity

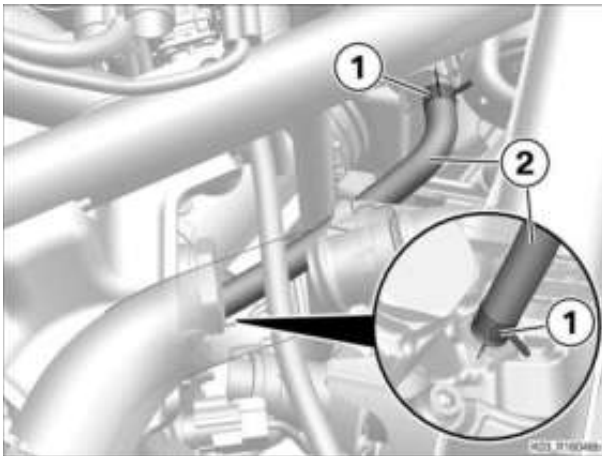
(-) Remove hose, intake silencer tank vent valve

- Disconnect connector (1) for the idle controller.
- Loosen clamps (2) and remove hose (3).



(-) Remove hose, intake silencer cylinder head

- Open clips (1) and remove hose (2).

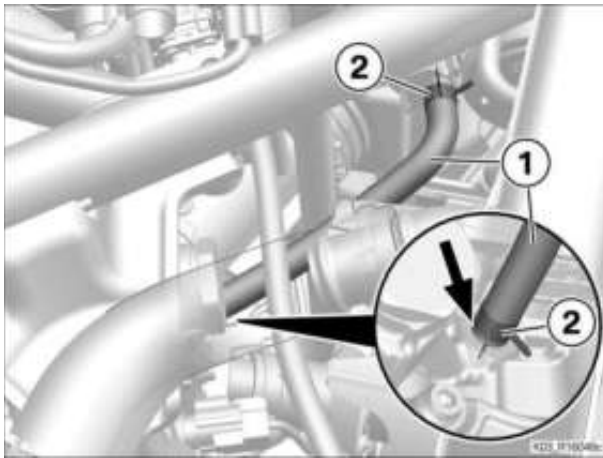


(-) Install hose, intake silencer cylinder head

 NOTICE

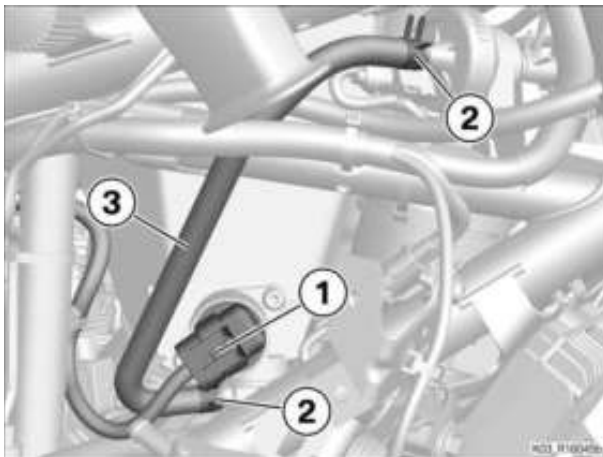
In case of repair a suitable screw clamp must also be used on the hose (cylinder head side).

- Install hose (1) with clamps (2), making sure that hose (1) is **completely inserted** (arrow).
- Secure clamps (2) and secure screw clamp if required.



(-) Install hose, intake silencer tank vent valve

- Install hose (3) with clamps (2).
- Secure clips (2).
- Connect connector (1) for the idle controller.



Follow-up work

Securing expansion tank

13 72 001 Renewing air cleaner insert

+ 13 72 532

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

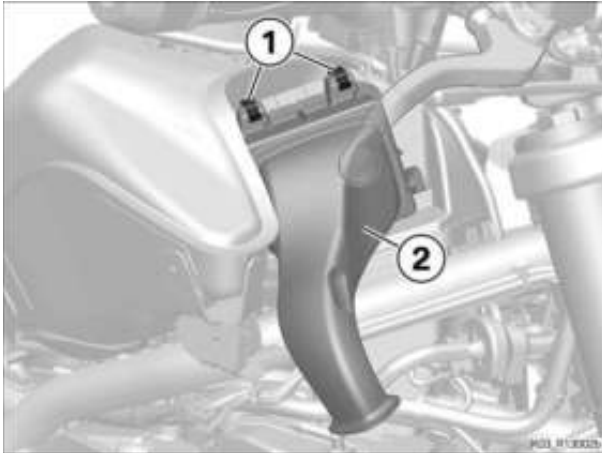
Removing cover for left intake snorkel

Removing the cover for right intake snorkel

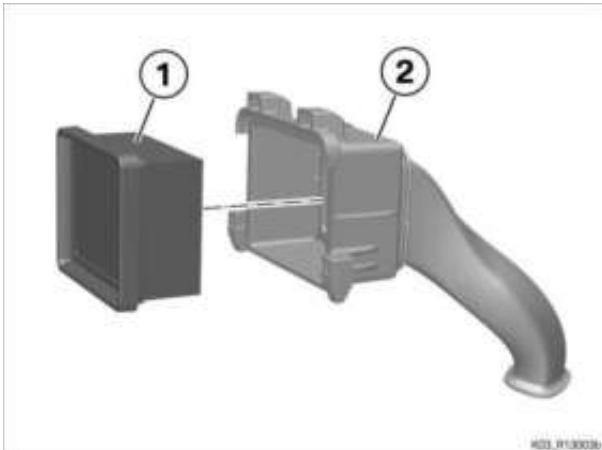
Removing cover for fuel tank

Core activity

(-) Replacing air filter element

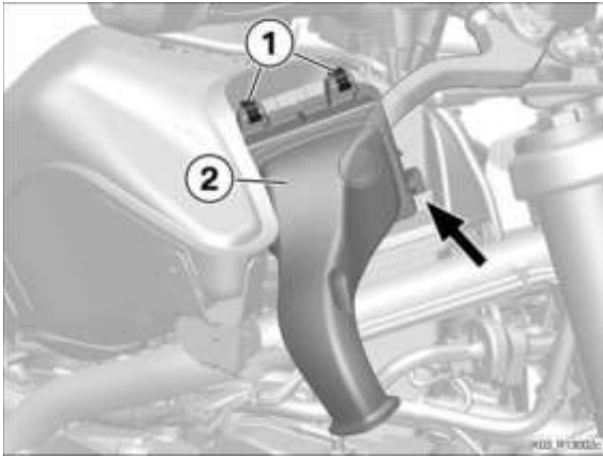


- Open clamps (1).
- Remove intake air pipe (2).



- Remove air filter element (1) from intake air pipe (2) and dispose of correctly.
- Install new air filter element (1) in intake air pipe (2).

- Position intake air pipe (2) in the bottom holder (arrow) and swing it up into place.
- Close clips (1).



Follow-up work

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

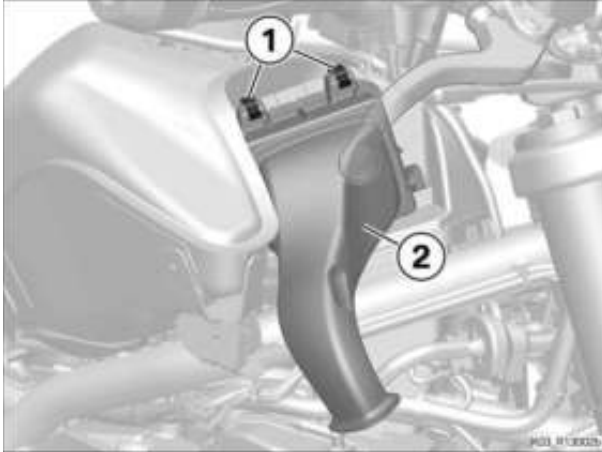
Installing seat

Final check of work performed

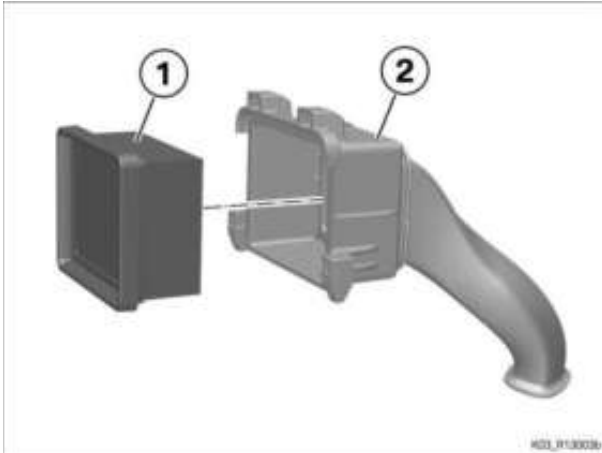
13 72 505 Replace air filter cartridge (for maintenance)

Core activity

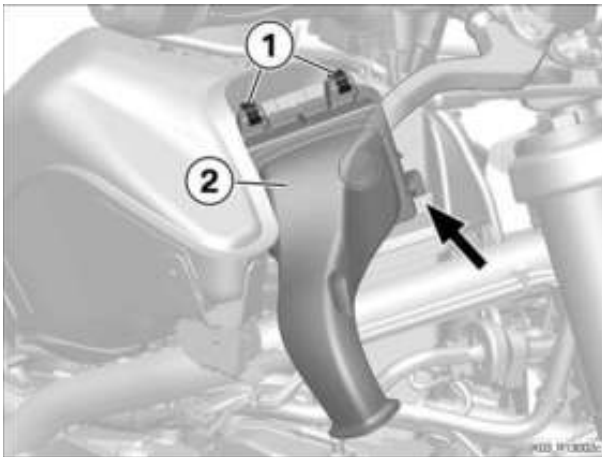
(-) Replacing air filter element



- Open clamps (1).
- Remove intake air pipe (2).



- Remove air filter element (1) from intake air pipe (2) and dispose of correctly.
- Install new air filter element (1) in intake air pipe (2).



- Position intake air pipe (2) in the bottom holder (arrow) and swing it up into place.
- Close clips (1).

 16 11 008 Removing/installing fuel filler neck

+ 16 11 745

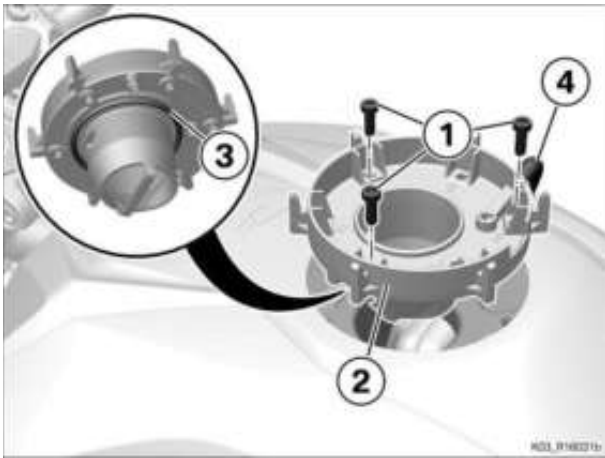
Preparatory work

=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Removing cap for fuel tank

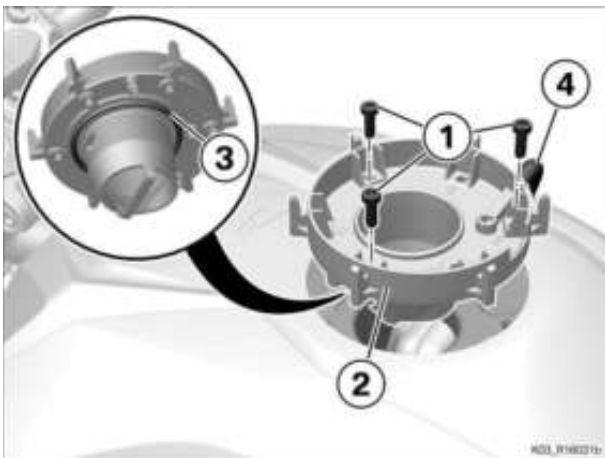
Core activity

(-) Removing fuel filler neck



- Remove screws (1).
- Loosen fuel filler neck (2) with seal (3) and dirty-water hose (4).
- Pull off dirty-water hose (4) and remove fuel filler neck (2).

(-) Installing fuel filler neck



- Secure dirty water hose (4) to fuel filler neck (2).
- Install fuel filler neck (2) with gasket (3) and dirty-water hose (4).
- Install screws (1).

 Tightening torques		
Fuel filler neck to fuel tank		
M5 x 14	5 Nm	

Follow-up work

Installing cap for fuel tank

Final check of work performed

16 11 030 Removing/installing fuel tank

+ 16 11 533

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Core activity

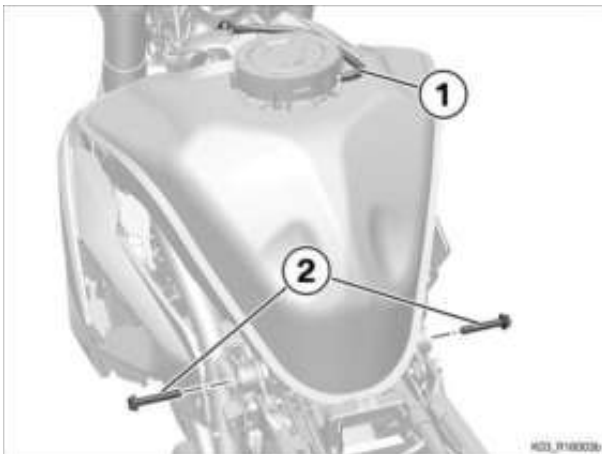
(-) Removing fuel tank

WARNING

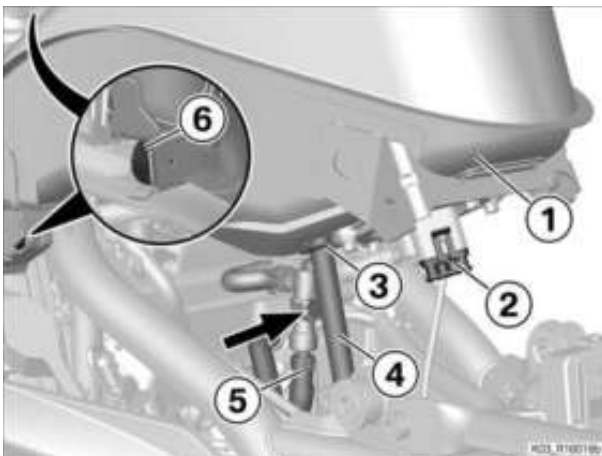
Fuel is highly flammable and hazardous to health

Risk of fire, risk of damage to health

* Comply with the safety regulations.



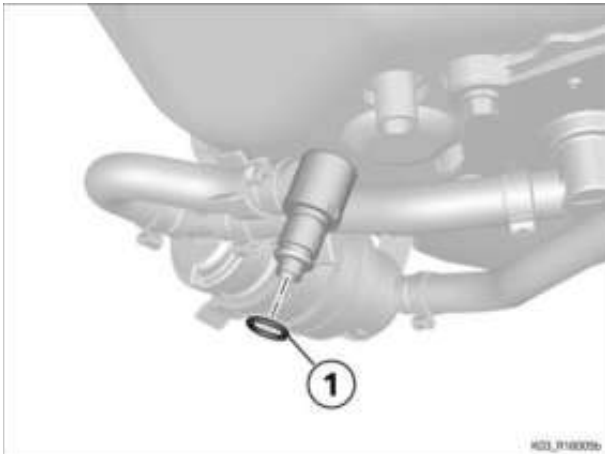
- Disconnect hose (1).
- Remove screws (2).



- Lift fuel tank (1).
- Disconnect connector (2) for the electric fuel pump.
- Open hose clip (3) and disconnect dirty-water hose (4).
- Press open the lock of the fuel deliver line (Arrow) and disconnect the snap fastener of the fuel delivery line (5).
- Pull fuel tank (1) from rubber damper (6) and remove.

(-) Installing fuel tank

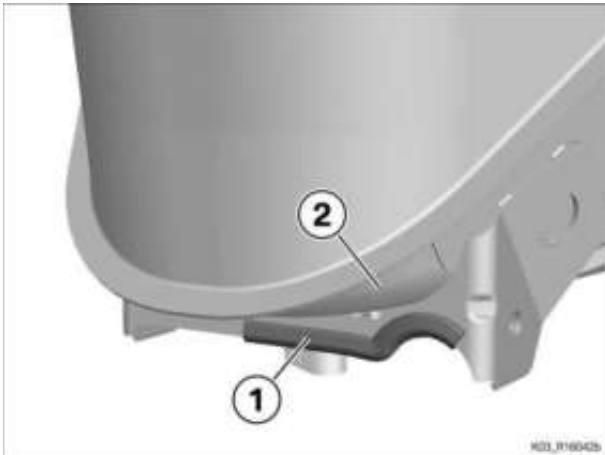
- Check O-ring of fuel delivery line (1) for damage; replace if necessary.



- Check edge protection (1) for damage; replace if necessary.

NOTICE

Prior to the installation of the fuel tank, the correct fit of the edge protection must be checked. If the edge protection is missing or damaged, then this must be replaced.



- Check for fit of the edge protection (1) on the fuel tank (2) and install edge protection correctly if required.

» The wiring harness running underneath is not damaged.

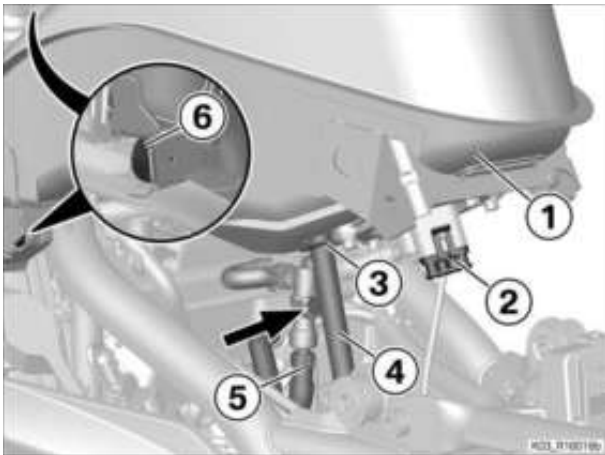
- Push fuel tank (1) on to rubber dampers (6).

ATTENTION

Application of force to close locked quick-action couplings

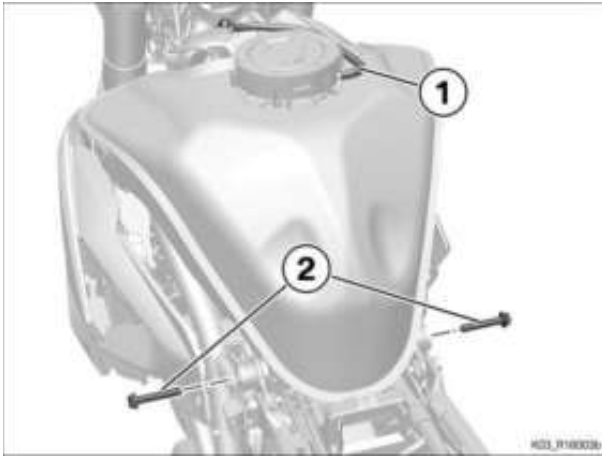
Leak due to damaged O-rings

- Close the quick-action coupling of the fuel line only with the latch open/pressed.



- Push open the lock for fuel delivery line (Arrow) and press the snap fastener of fuel delivery line (5) using little effort into the bush. Release the lock and check that the snap fastener is tightly fit.
- Connect dirty-water hose (4) and position hose clip (3).
- Connect connector (2) for the electric fuel pump.
- Lower fuel tank (1).
- Install screws (2).

 Tightening torques		
Fuel tank to frame		
M8 x 45	19 Nm	



- Connect hose (1).

Follow-up work

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

 16 11 204 Replacing seal for fuel filler neck

+ 16 11 704

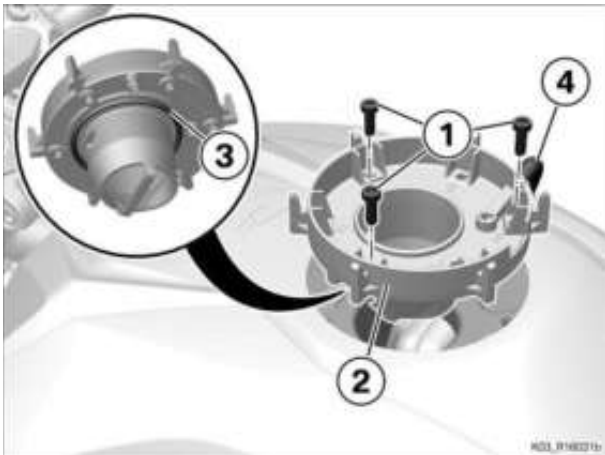
Preparatory work

=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

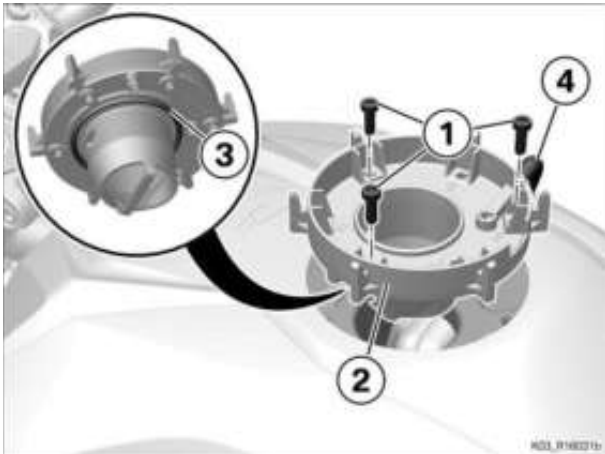
Removing cap for fuel tank

Core activity

(-) Replace gasket for fuel filler neck



- Remove screws (1).
- Loosen fuel filler neck (2) with gasket (3) and dirty water hose (4) from fuel tank (5).
- Loosen dirty water hose (3).
- Remove gasket (3) from fuel filler neck (2).



- Lubricate **new** gasket (3) and install in fuel filler neck (2).

 Care products	
Rubber care product	83 12 0 397 018

- Secure dirty water hose (3) to fuel filler neck (2).
- Fit fuel filler neck (2) with gasket (3) and dirty water hose (4) to fuel tank (5).
- Install screws (1).

 Tightening torques		
Fuel filler neck to fuel tank		
M5 x 14	5 Nm	

Follow-up work

Installing cap for fuel tank

Final check of work performed

 16 11 213 Renewing fuel tank cover flap

+ 16 11 543

 NOTICE

Ignition steering lock, fuel filler cap and seat lock are available solely with preassembled lock barrels.

Lock barrels cannot be exchanged or encoded individually.

When individual components are replaced, there is no single key locking system.

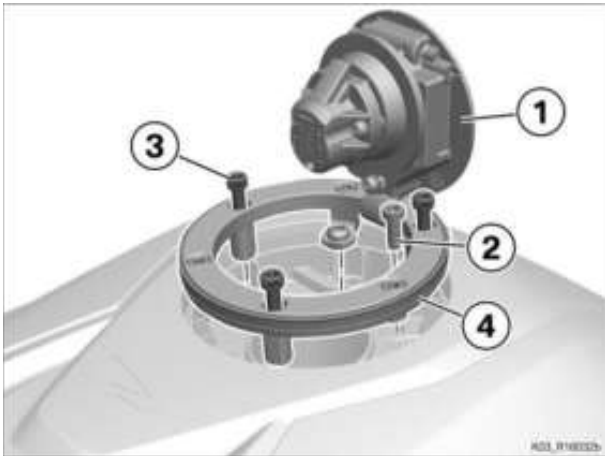
A single key locking system set is available.

Preparatory work

=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

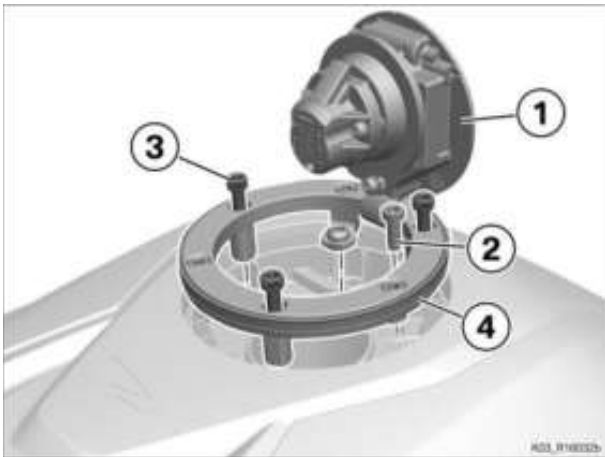
Core activity

(-) Removing cap for fuel tank



- Open lid for fuel tank (1).
- Remove screw (2) and screws (3).
- Remove lid for fuel tank (1) completely with gasket (4).

(-) Installing cap for fuel tank



- Fit lid for fuel tank (1) with gasket (4).
- Install screws (3) and bolt (2).

 Tightening torques		
Lid for fuel tank to fuel tank		
M5 x 14	4.5 Nm	
M5 x 30	4.5 Nm	

- Close lid for fuel tank (1).

Follow-up work

Final check of work performed

16 11 531 Replacing fuel tank (fuel tank removed)

Core activity

(-) Draining fuel tank



WARNING

Fuel is highly flammable and hazardous to health

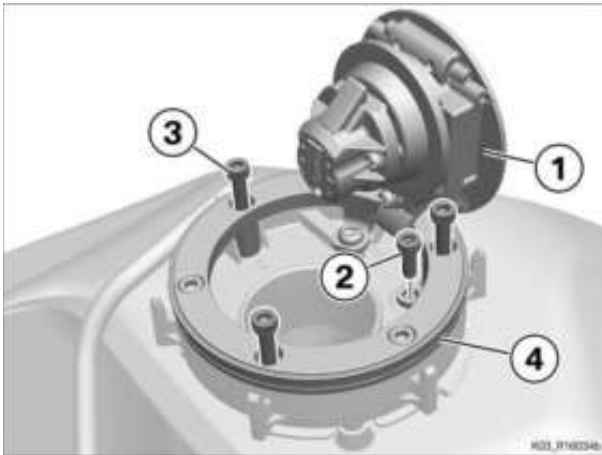
Risk of fire, risk of damage to health

- Comply with the safety regulations.
-

- Drain the fuel tank, using the commercially available special tool.

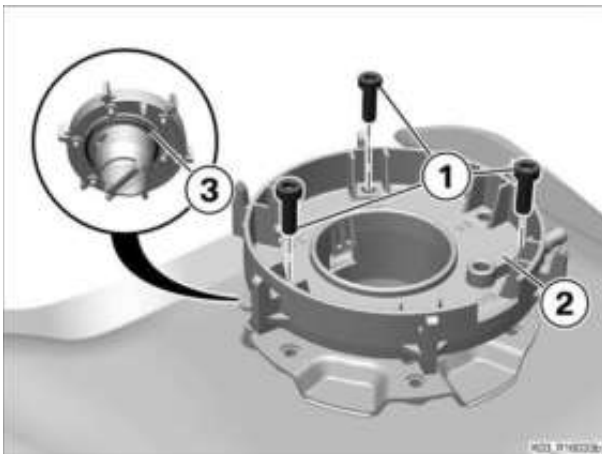
(-) Removing cap for fuel tank

- Open lid for fuel tank (1).
- Remove screw (2) and screws (3).
- Remove lid for fuel tank (1) with gasket (4).



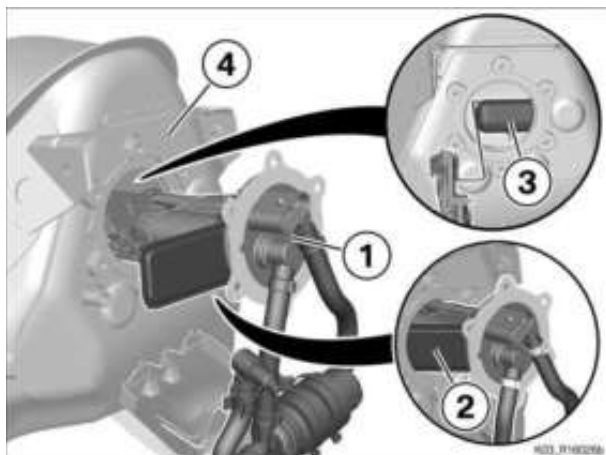
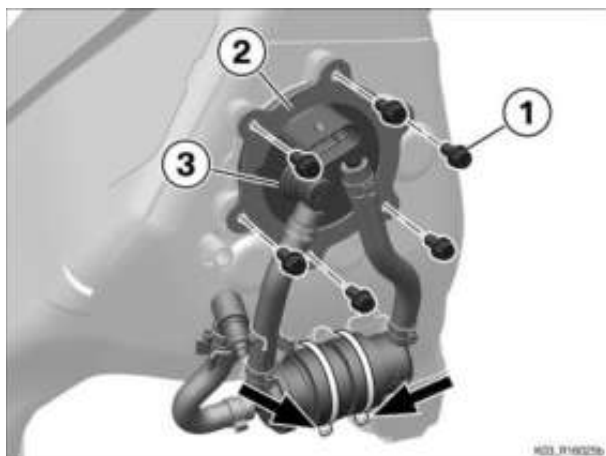
(-) Removing fuel filler neck

- Remove screws (1).
- Remove fuel filler cap (2) with gasket (3).

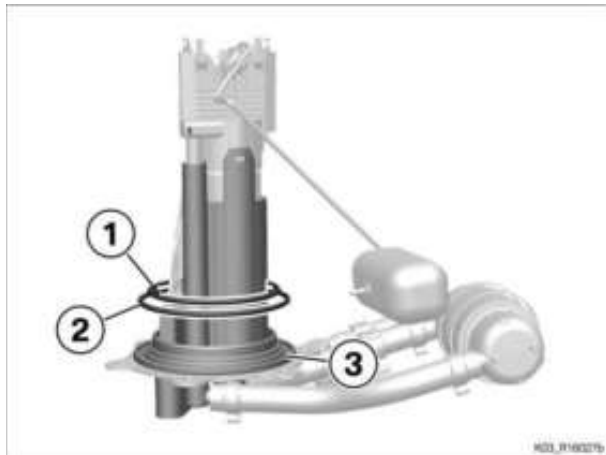


(-) Removing fuel-pump unit

- Remove the cable ties (arrows).
- Remove screws (1).
- Loosen pressure plate (2) from electric fuel pump (3).



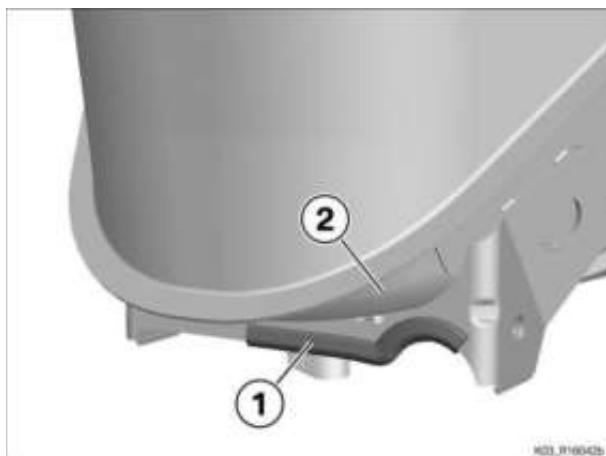
- Disengage fuel-pump unit (1).
- Fold fuel strainer (2) inward and remove from fuel-pump unit (1).
- Carefully manoeuvre lever-type sensor (3) out of fuel tank (4) and remove fuel-pump unit (1).



- Remove O-rings (1) and (2) from fuel-pump unit (3).

(-) Replacing fuel tank

- Check edge protection (1) for damage; replace if necessary.
- Convert edge protection (1) to **new** fuel tank (2).



(-) Install the fuel pump

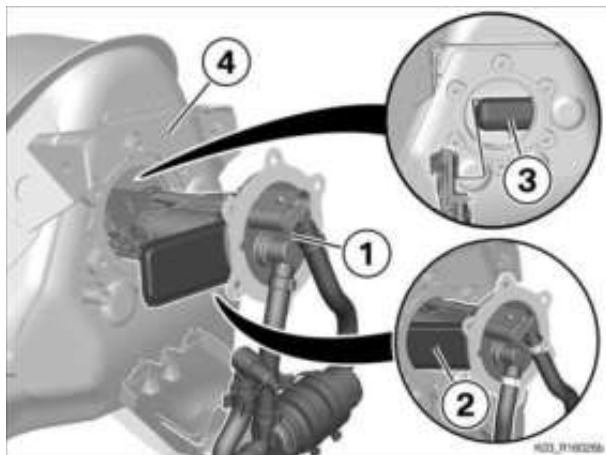
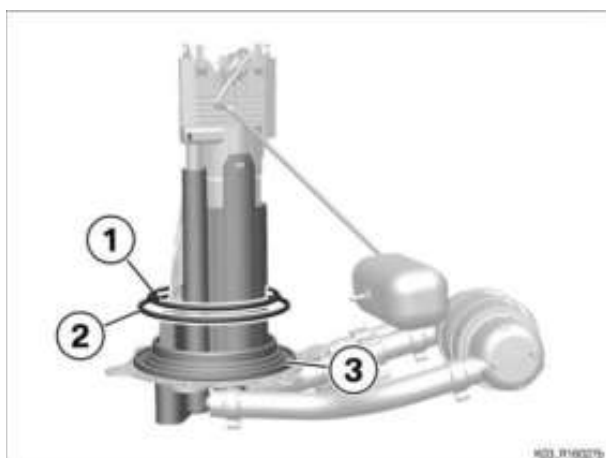
- Lubricate new O-rings (1) and (2) and install in fuel-pump unit (3).



Installation tool

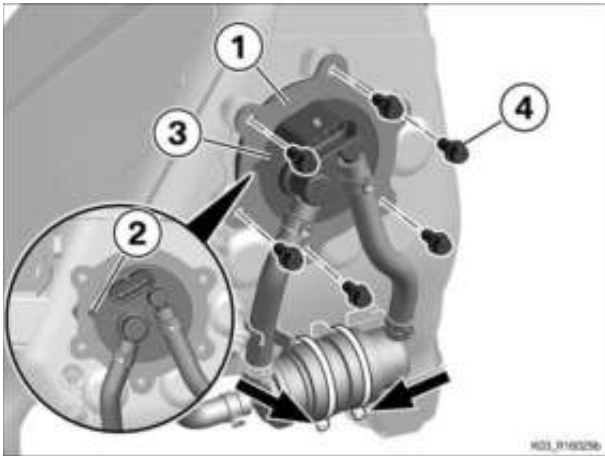
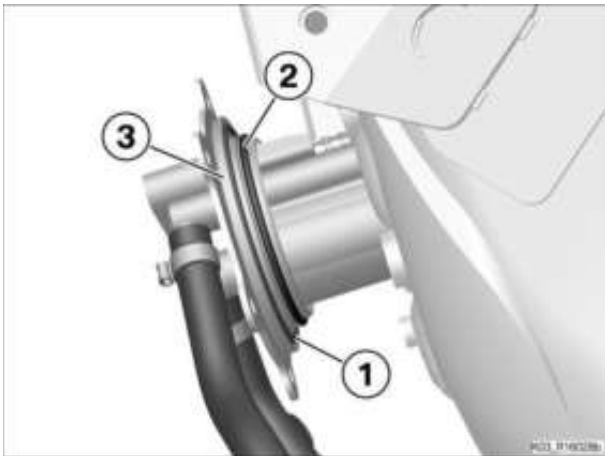
Silicone spray

83 19 2 208 609



- Carefully work lever-type sensor (3) into fuel tank (4).
- Fold fuel strainer (2) inward and insert into fuel-pump unit (1).

- Check the position of O-rings (1) and (2); correct if necessary.
- Install fuel-pump unit (3) until it is correctly seated.

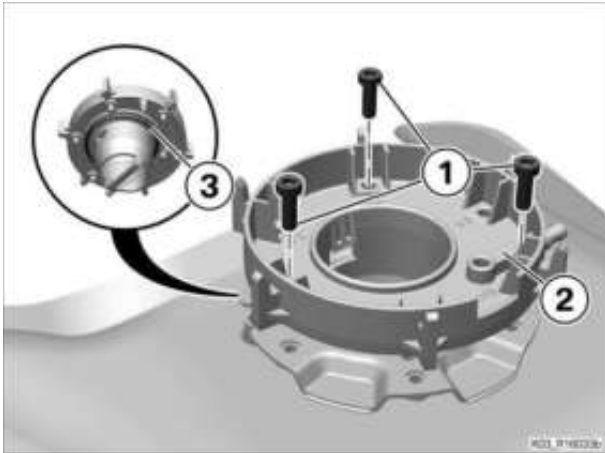


- Place pressure plate (1) in position.
- Align lug (2) of electric fuel pump (3) with recess of pressure plate (1).
- Install screws (4).

 Tightening torques		
Fuel pump to fuel tank		
M6 x 10	8 Nm	

- Close the cable ties (arrows).

(-) Install fuel filler neck



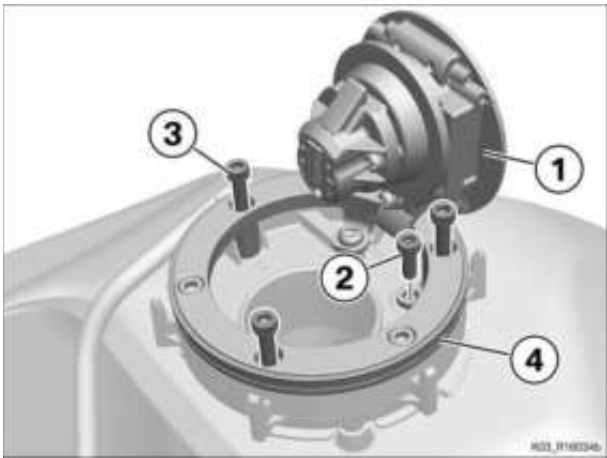
- Install fuel filler cap (2) with gasket (3).
- Install screws (1).

 Tightening torques		
Fuel filler neck to fuel tank		
M5 x 14	5 Nm	

(-) Installing cap for fuel tank

- Install lid for fuel tank (1) with gasket (4).
- Install screws (3) and screw (2).

 Tightening torques		
Lid for fuel tank to fuel tank		
M5 x 14	4.5 Nm	



M5 x 30	4.5 Nm	
---------	--------	--

- Close lid for fuel tank (1).

(-) Filling fuel tank

 WARNING

Fuel is highly flammable and hazardous to health

Risk of fire, risk of damage to health

- Comply with the safety regulations.

- Fill the fuel tank with fuel

 Technical data			
Recommended fuel grade		Regular, unleaded max. 10 % ethanol, E10 91 ROZ/RON 87 AKI	
Usable fuel capacity		approx. 11 l	
Fuel reserve		approx. 1 l	

16 12 002 Replacing quick-action coupling of the fuel flow line

+ 16 12 520

WARNING

Fuel is highly flammable and hazardous to health

Risk of fire, risk of damage to health

- Comply with the safety regulations.

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

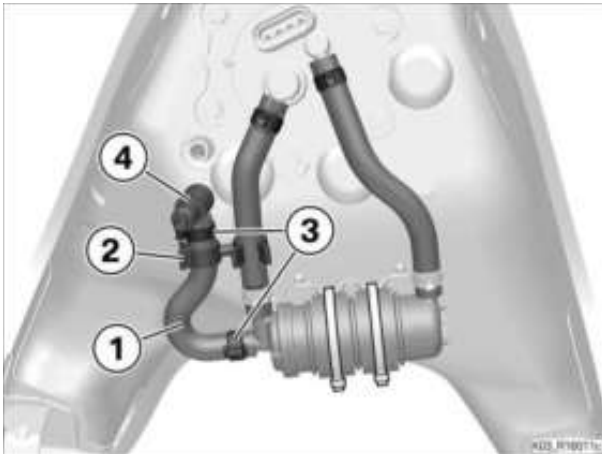
Core activity

(-) Removing quick-action coupling

ATTENTION

Refitting hoses with non-reusable clamps at the same place leaks

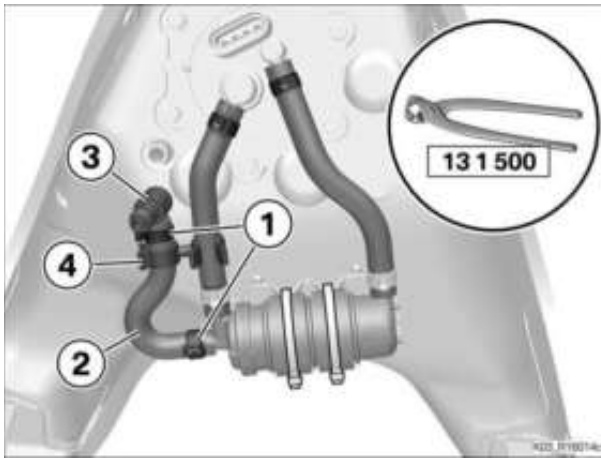
- Always replace clamps fitted with non-reusable clamps.



- Disengage hose (1) from hose holder (2).
- Open clips (3).
- Remove quick-action coupling (4) and hose (1).

(-) Installing quick-action coupling

- Slip clips (1) on to new hose (2).
- Install quick-action coupling (3) and hose (2).
- Align clips (1) with the marks and secure them with pliers (No. 13 1 500).
- Secure hose (2) in hose holder (4).



Follow-up work

Installing fuel tank

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

16 12 008 Replacing fuel filter

+ 16 12 506

WARNING

Fuel is highly flammable and hazardous to health

Risk of fire, risk of damage to health

- Comply with the safety regulations.

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Core activity

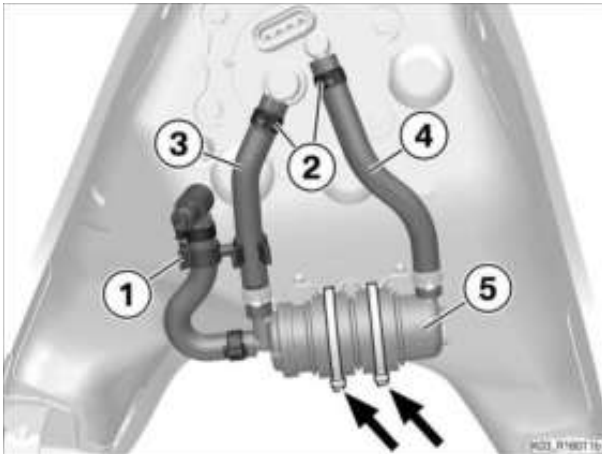
(-) Removing fuel filter

ATTENTION

Escape of fuel when pressurised fuel lines are opened

Damage to surfaces

- Employ suitable means to catch escaping fuel.



- Remove hose holder (1).

- Open clips (2).

- Disconnect hoses (3) and (4).

- Remove the cable ties (arrows) and remove fuel filter (5) with the hoses.

(-) Renewing fuel filter

ATTENTION

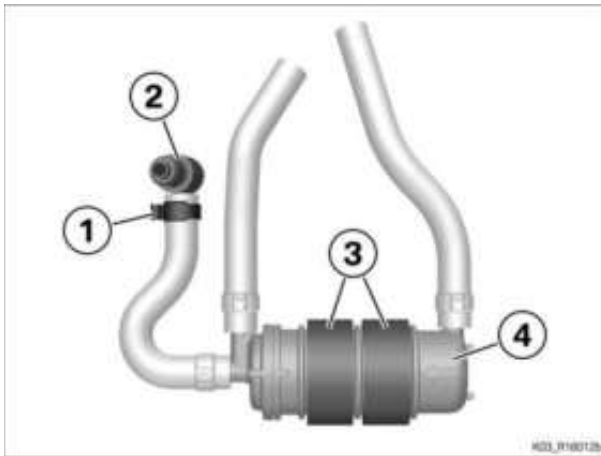
Refitting hoses with non-reusable clamps at the same place

leaks

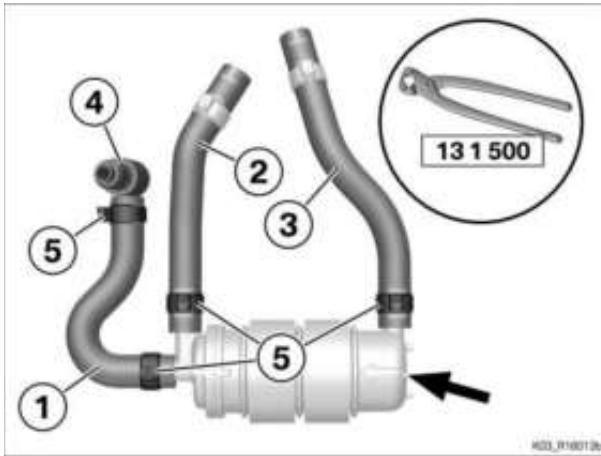
- Always replace clamps fitted with non-reusable clamps.

- Open clip (1) and remove quick-action coupling (2).

- Remove hoses (3) and transfer them to new fuel filter (4).



- Dispose of fuel filter (4) in an environmentally friendly manner.

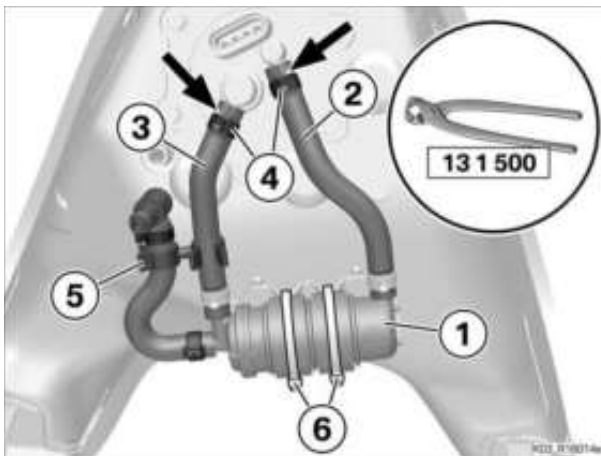


ATTENTION

Fuel filter mistakenly installed around Malfunction

- Observe the direction of fuel flow on filter.
- Slip all clips on to the new hoses.
- Install new hoses (1), (2) and (3), noting the direction of fuel flow (arrow).
- Install quick-action coupling (4).
- Align clips (5) with the marks and secure them with pliers (No. 13 1 500).

(-) Installing fuel filter



- Fit fuel filter (1) with hoses (2) and (3) and insert hoses.
- Align clamps (4) with the marks (arrows and) secure them with pliers (No. 13 1 500).
- Install cable holder (5).
- Secure cable tie (6).

Follow-up work

Installing fuel tank

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

16 12 526 Replacing fuel filters and fuel hoses (at maintenance)

WARNING

Fuel is highly flammable and hazardous to health

Risk of fire, risk of damage to health

- Comply with the safety regulations.

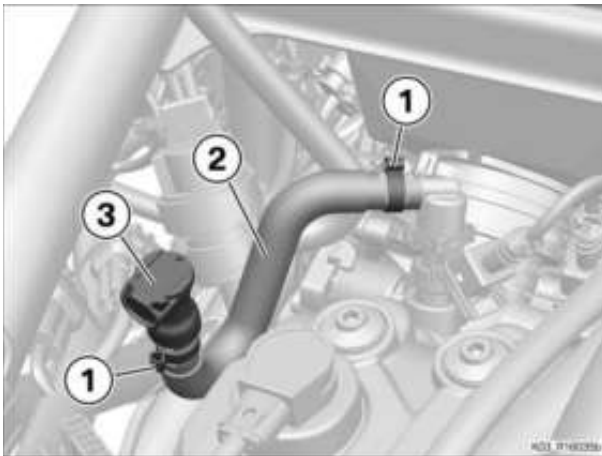
Core activity

(-) Remove fuel hose to the fuel injector

ATTENTION

Refitting hoses with non-reusable clamps at the same place leaks

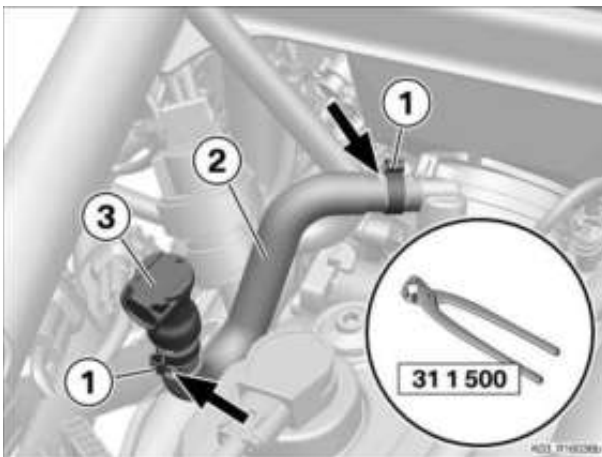
- Always replace clamps fitted with non-reusable clamps.



- Open clips (1).
- Remove fuel hose (2).
- Remove snap fastener (3) from fuel hose (2).

(-) Install fuel hose to the fuel injector

- Connect clamps (1) on to **new** hose (2).
- Install snap fastener (3) in hose (2).
- Install hose (2).
- Align clamps (1) with marks (arrows and) secure them with pliers (No. 31 1 500).



(-) Removing fuel filter

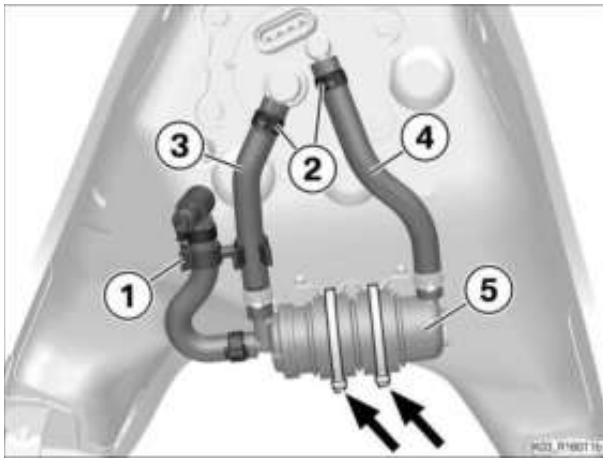
ATTENTION

Escape of fuel when pressurised fuel lines are opened

Damage to surfaces

- Employ suitable means to catch escaping fuel.

- Remove hose holder (1).



- Open clips (2).
- Disconnect hoses (3) and (4).
- Remove the cable ties (arrows) and remove fuel filter (5) with the hoses.

(-) Renew fuel filter and fuel hose

ATTENTION

Refitting hoses with non-reusable clamps at the same place leaks

- Always replace clamps fitted with non-reusable clamps.

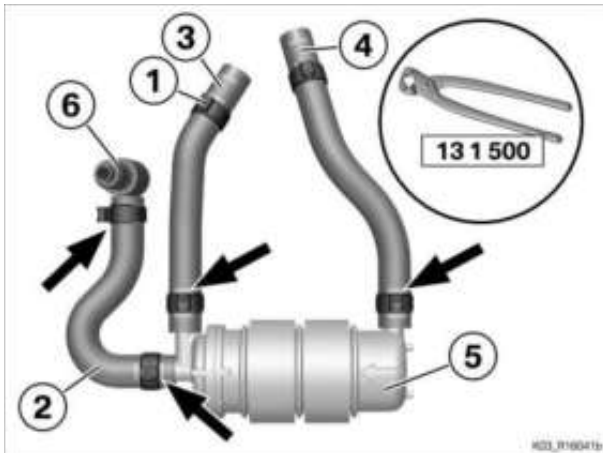


- Open clip (1) and remove quick-action coupling (2).
- Remove hoses (3).
- Dispose of fuel filter (4) in an environmentally friendly manner.
- Remount hoses (3) to new fuel filter (4).

ATTENTION

Fuel filter mistakenly installed around Malfunction

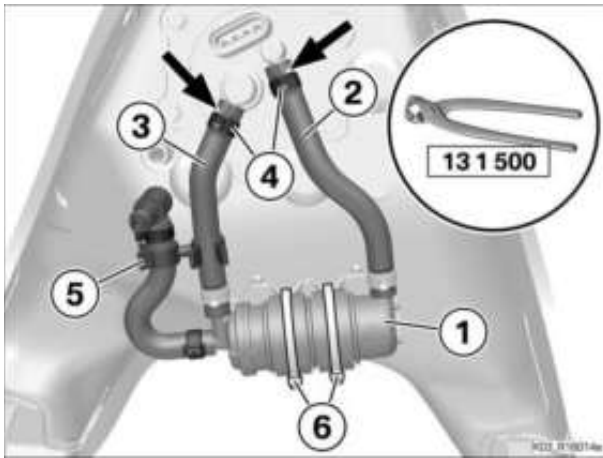
- Observe the direction of fuel flow on filter.



- Connect all clamps (1) to **new** hoses (2), (3) and (4).
- Connect hoses (2), (3) and (4) **as shown in the image** to fuel filter (5).
- Install quick-action coupling (6).
- Align clamps (1) with marks (arrows) and secure with pliers (No. 13 1 500) to fuel filter (5) and snap fastener (6).

(-) Installing fuel filter

- Fit fuel filter (1) with hoses (2) and (3) and insert hoses.
- Align clamps (4) with the marks (arrows and) secure them with pliers (No. 13 1 500).
- Install cable holder (5).
- Secure cable tie (6).



16 13 001 Replacing carbon canister

+ 16 13 500

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Removing right radiator cowl

Removing expansion tank

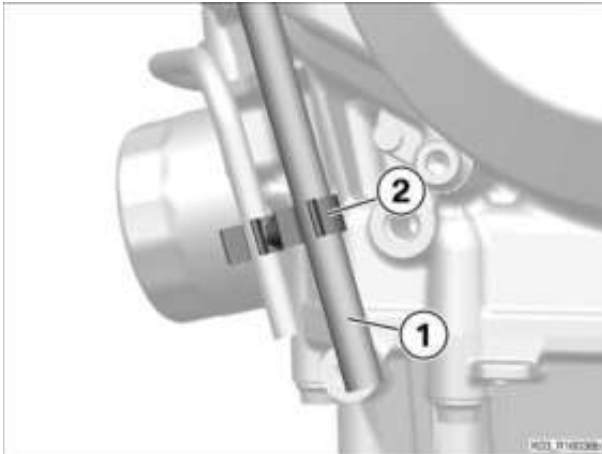
Removing idle actuator

Removing left radiator cowl

Remove the intake air silencer

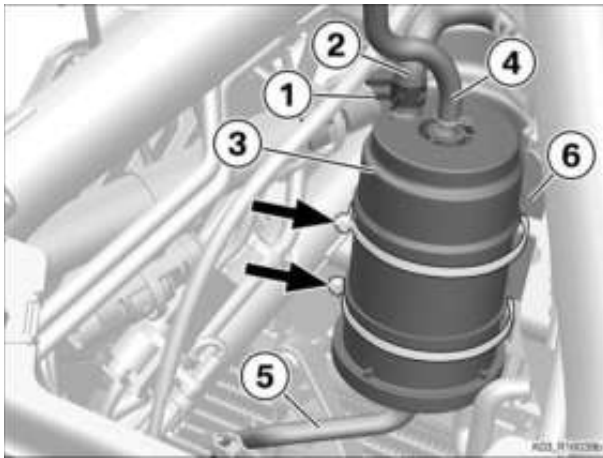
Core activity

(-) Removing carbon canister

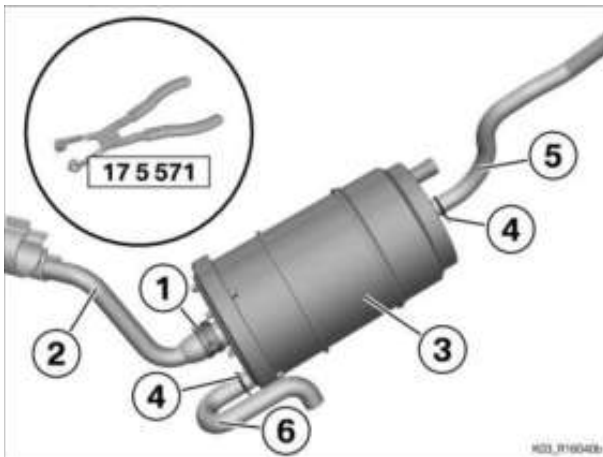


- Loosen drainage hose (1) from holder (2).

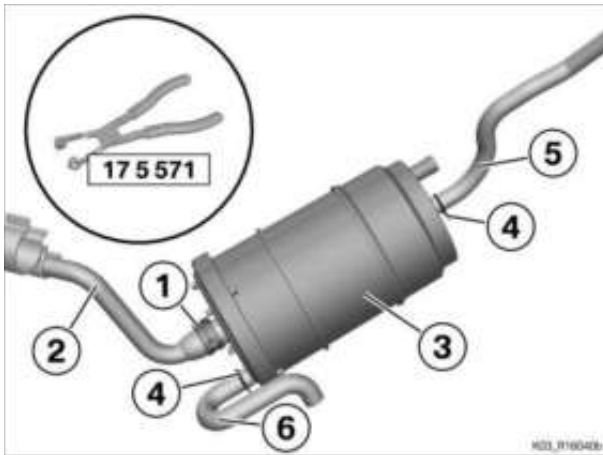
- Open clamp (1) and pull off hose (2) from carbon canister (3).
- Remove the cable ties (arrows).
- Disengage carbon canister (3) with hoses (4) and (5) from holder (6) and remove.



(-) Replacing carbon canister



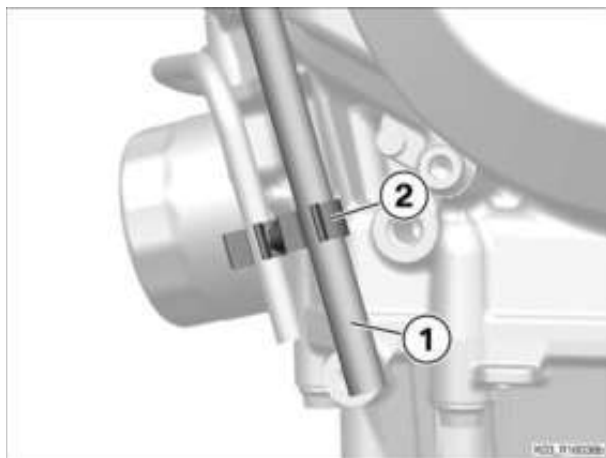
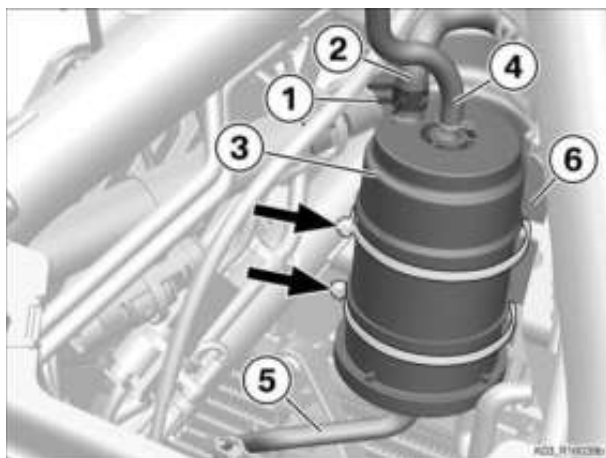
- Open clamp (1) with pliers (No. 17 5 571) and pull off drainage hose (2) from carbon canister (3).
- Open hose clips (4) and pull off hoses (5) and (6) from carbon canister (3).



- Connect hoses (5) and (6) to **new** carbon canister (3) and secure with hose clips (4).
- Open clamp (1) with pliers (No. 17 5 571) and connect drainage hose (2) from carbon canister (3).

(-) Installing carbon canister

- Fix carbon canister (3) with hoses (4) and (5) to holder (6) and secure with cable strap (arrows).
- Connect hose (2) to carbon canister (3) and secure with clamp (1).



- Secure drainage hose (1) in holder (2).

Follow-up work

Install the intake air silencer

Installing fuel tank

Installing left radiator cowl

Installing idle actuator

Installing expansion tank

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

16 13 002 Replacing fuel-evaporation control valve, activated charcoal filter

+ 16 13 510

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

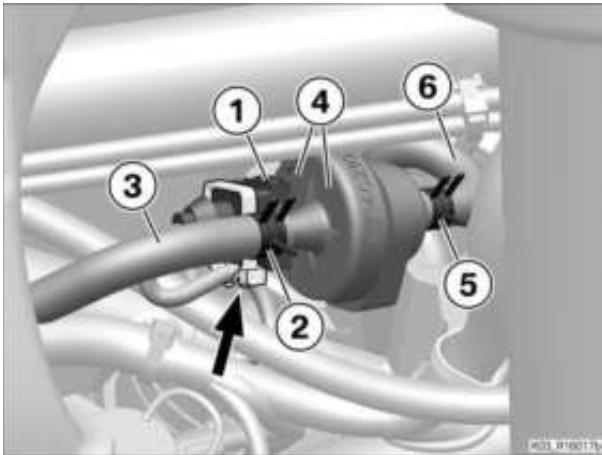
Removing cover for left intake snorkel

Removing the cover for right intake snorkel

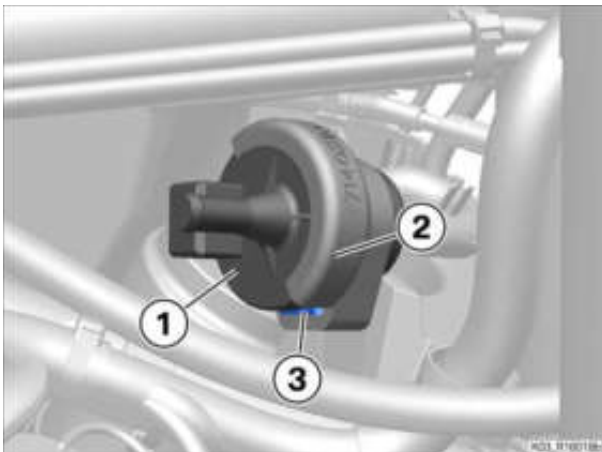
Removing cover for fuel tank

Core activity

(-) Removing tank vent valve



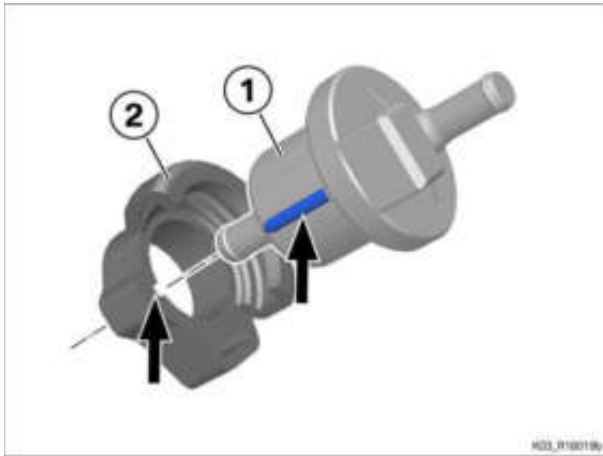
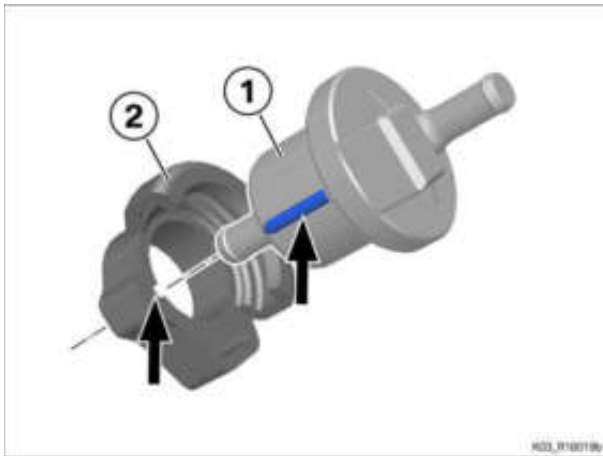
- Remove cable tie (arrow).
- Disconnect connector (1) for the tank vent valve.
- Loosen clamp (2) and pull off hose (3) from tank vent valve (4).
- Loosen clamp (5) and pull off hose (6) from tank vent valve (4).



- Pull off tank vent valve (1) with holder (2) for tank vent valve from holder (3).

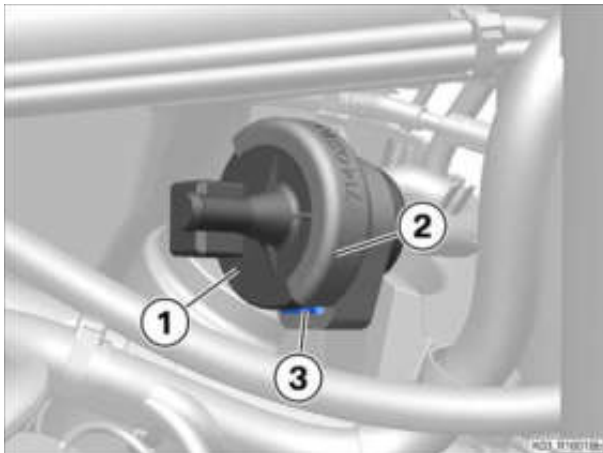
(-) Replacing tank vent valve

- Remove tank vent valve (1) from holder (2) for tank vent valve, paying attention to the guide (arrows).



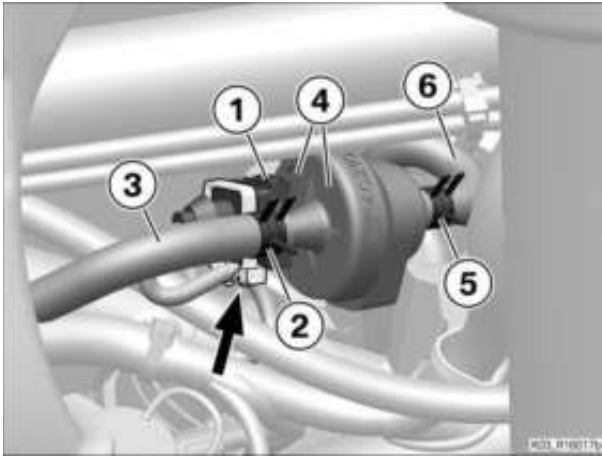
- Install **new** tank vent valve (1) in holder (2) for tank vent valve, paying attention to the guide (arrows).

(-) Installing tank vent valve



- Connect tank vent valve (1) with holder (2) for tank vent valve on holder (3).

- Connect hose (6) to tank vent valve (4) and secure clamp (5).
- Connect connector (1) for the tank vent valve.
- Secure the cable tie (arrow).
- Connect hose (3) to tank vent valve (4) and secure clamp (2).



Follow-up work

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

16 14 011 Replacing fuel pump unit

+ 16 14 503

WARNING

Fuel is highly flammable and hazardous to health

Risk of fire, risk of damage to health

- Comply with the safety regulations.

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

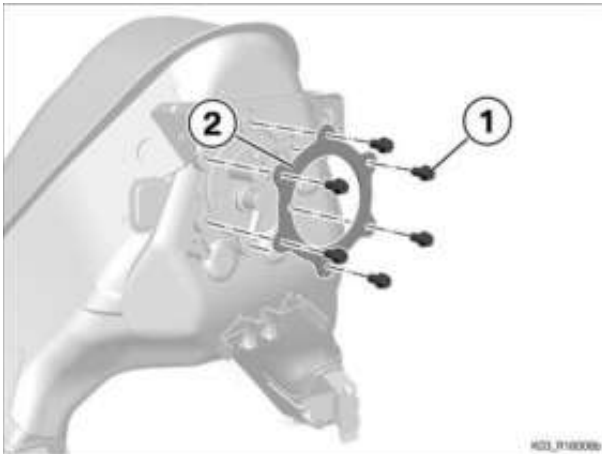
Draining fuel tank

Removing fuel filter

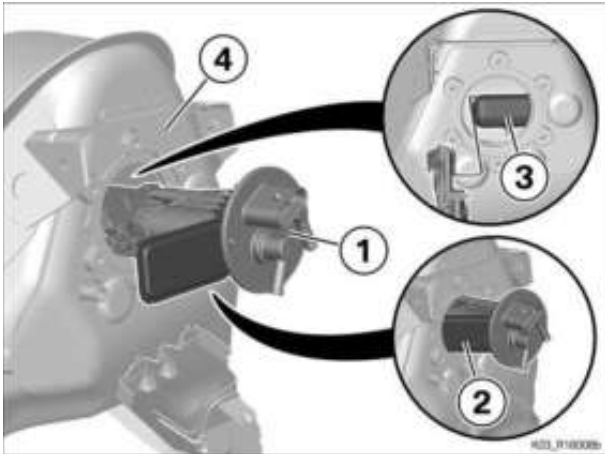
Core activity

(-) Removing fuel-pump unit

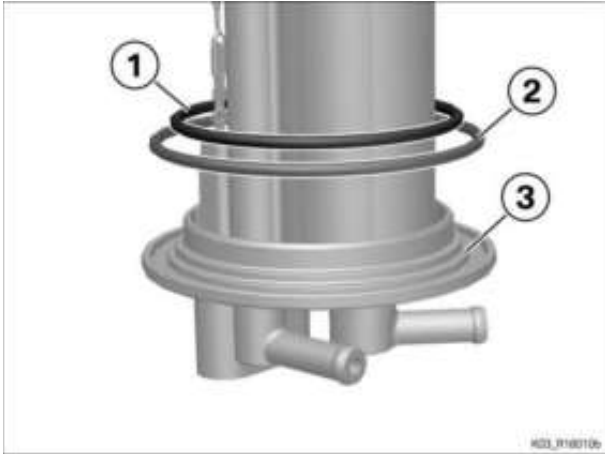
- Remove screws (1).
- Remove pressure plate (2).



- Disengage fuel-pump unit (1).
- Fold fuel strainer (2) inward and remove from fuel-pump unit (1).
- Carefully manoeuvre lever-type sensor (3) out of fuel tank (4) and remove fuel-pump unit (1).

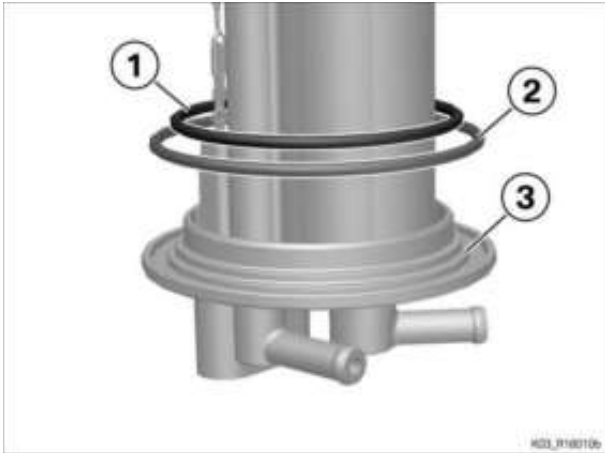


- Remove O-rings (1) and (2) from fuel-pump unit (3).



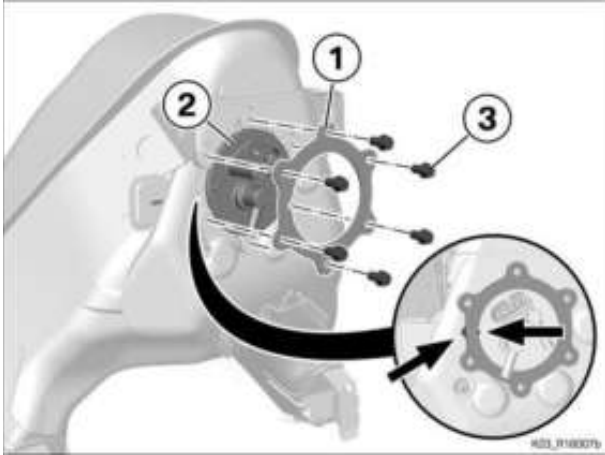
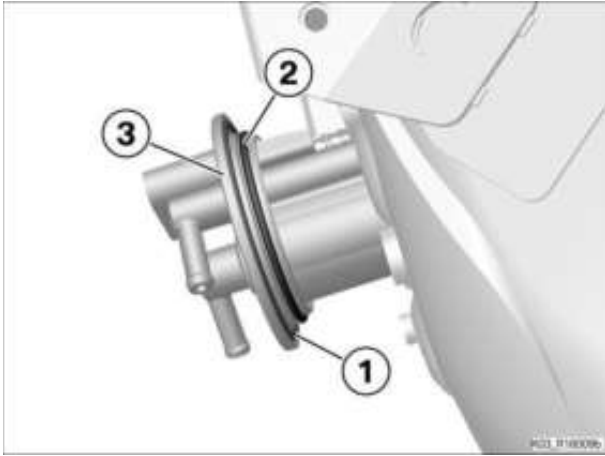
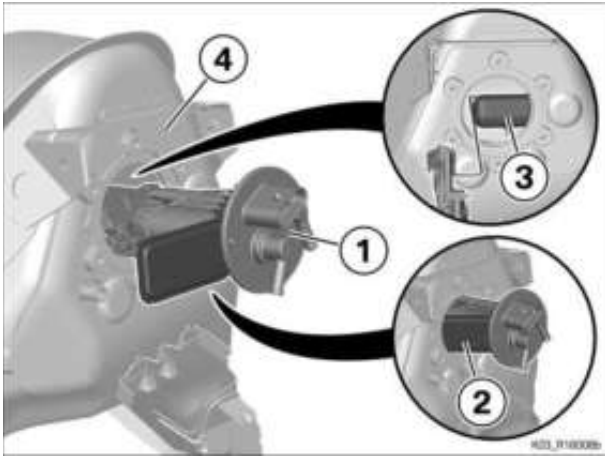
(-) Install the fuel pump

- Lubricate new O-rings (1) and (2) and install in fuel-pump unit (3).



 Installation tool	
Silicone spray	83 19 2 208 609

- Carefully work lever-type sensor (3) into fuel tank (4).
- Fold fuel strainer (2) inward and insert into fuel-pump unit (1).



- Check the position of O-rings (1) and (2); correct if necessary.
- Install fuel-pump unit (3) until it is correctly seated.

- Place pressure plate (1) in position.
- Align lug of electric fuel pump (2) and recess of pressure plate with the mark (arrows).
- Install screws (3).

Tightening torques		
Fuel pump to fuel tank		
M6 x 10	8 Nm	

Follow-up work

- Installing fuel filter
- Installing fuel tank
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Filling fuel tank

Final check of work performed

17 11 008 Removing/installing radiator (without draining/refilling coolant system)

+ 17 11 508

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining coolant, refilling/bleeding system (Description in item: 17 00 504, Billed as a separate item)

Removing right radiator cowl

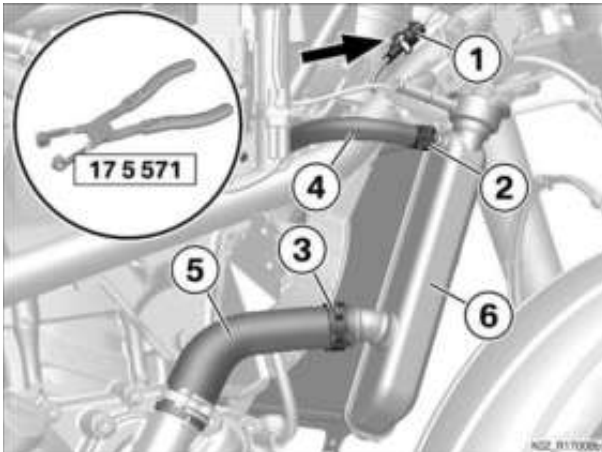
Removing expansion tank

Removing left radiator cowl

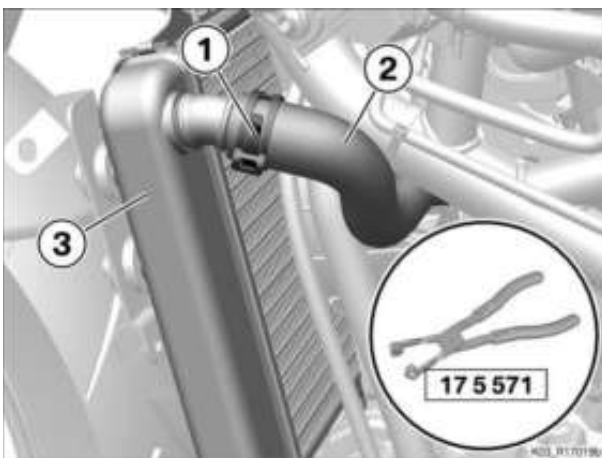
Loosen controller from main frame

Core activity

(-) Removing radiator



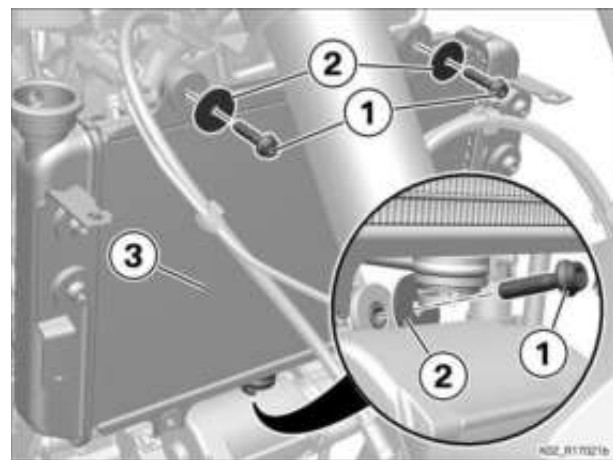
- Remove cable strap (Arrow) and disconnect connector (1) for the radiator fan.
- Release clamps (2) and (3) with pliers (No. 17 5 571) and move.
- Pull off hoses (4) and (5) from radiator (6).



- Loosen clamp (1) with pliers (No. 17 5 571) and move.
- Disconnect hose (2) from radiator (3).

ATTENTION

Component damage



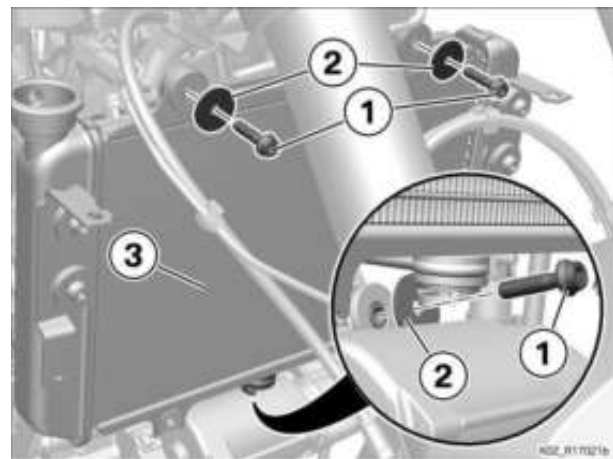
Paint damage on the start motor

- Mask the starter motor thickly or cover it with cardboard.

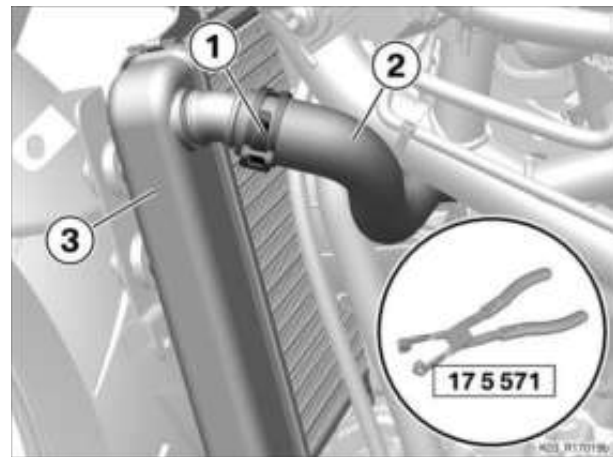
- Remove screws (1) and washers (2).
- Remove radiator (3).

(-) Installing radiator

- Hold radiator (3) in position.
- Install screws (1) and washers (2).

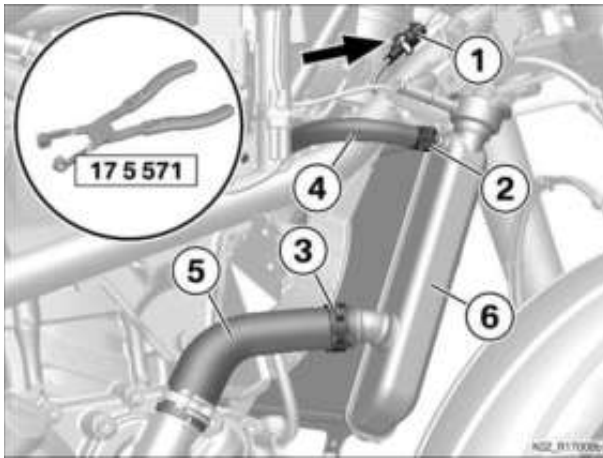


 Tightening torques		
Radiator to frame		
M6 x 25	8 Nm	
Radiator bracket to engine housing		
M6 x 25	8 Nm	



- Push hose (2) on radiator (3).
- Secure clip (1) with pliers (No. 17 5 571).

- Push hoses (4) and (5) on radiator (6).
- Secure clips (2) and (3) with pliers (No. 17 5 571).
- Connect connector (1) for radiator fan and fasten cable strap (Arrow).



Follow-up work

Secure controller at main frame

Installing left radiator cowl

Installing expansion tank

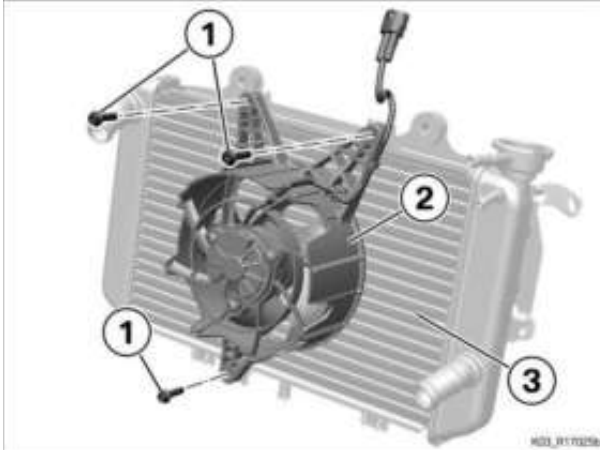
Installing right radiator cowl

Final check of work performed

17 11 510 Replacing radiator (radiator removed)

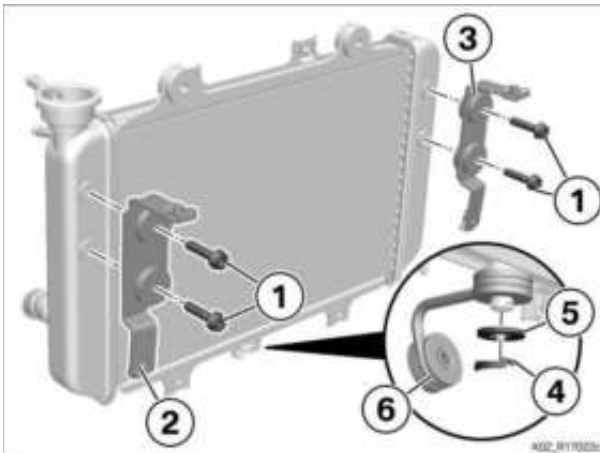
Core activity

(-) Removing fan

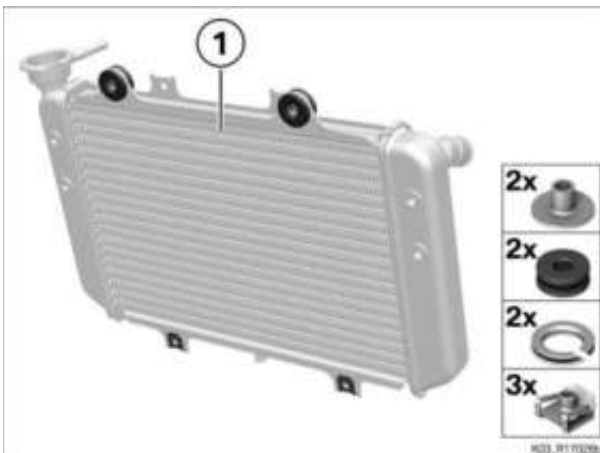


- Remove screws (1).
- Remove fan (2) from radiator (3).

(-) Replace the radiator

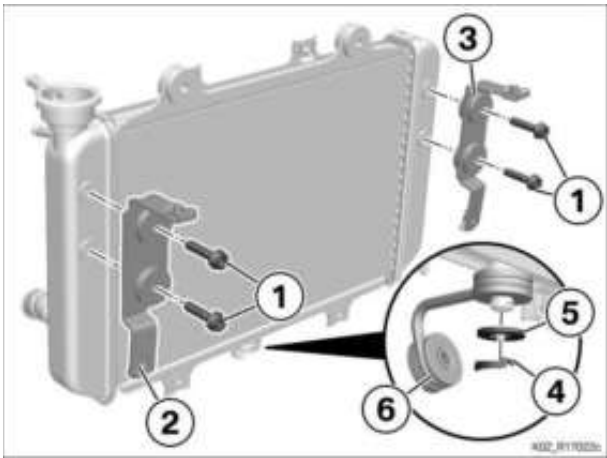


- Remove screws (1).
- Remove holders (2) and (3).
- Remove retainer (4), contact disc (5) and strut (6).



- Convert small parts to new part (1) or replace with new parts.
 - 2 x shouldered bushing
 - 2 x rubber grommet
 - 2 x insert
 - 3 x flat nut, M5

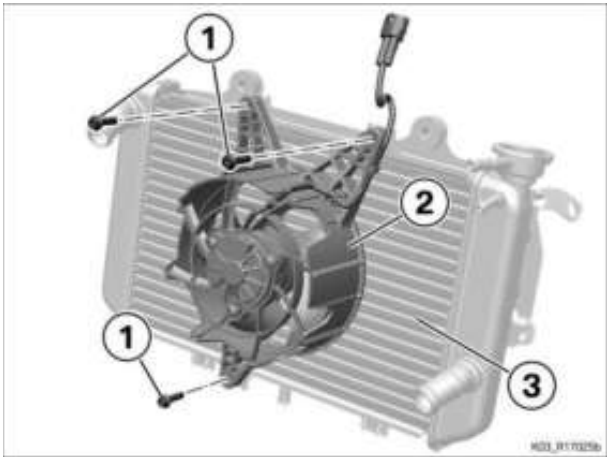
- Secure holders (2) and (3) with screws (1) to the new part.



 Tightening torques		
Holder for radiator cowl to radiator on left and right		
M6 x 25	8 Nm	

- Secure strut (6), contact disc (5) and retainer (4) to the new part.

(-) Installing fan



- Position fan (2) on radiator (3).
- Install screws (1).

 Tightening torques		
Radiator cowl to radiator		
M5 x 20	5 Nm	

 17 12 098 Replacing coolant hose from cylinder head (without draining/ refilling coolant system)

+ 17 12 758

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining coolant, refilling/bleeding system (Description in item: 17 00 504, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

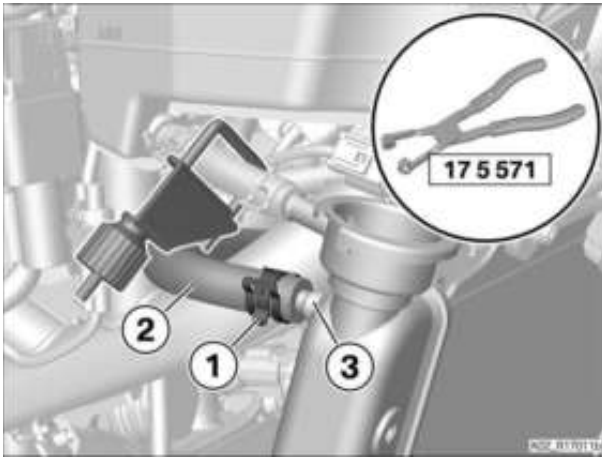
Removing cover for fuel tank

Removing right radiator cowl

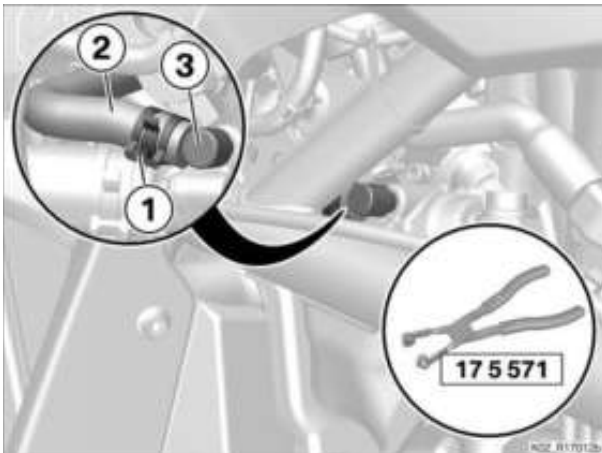
Core activity

(-) Removing coolant hose from cylinder head

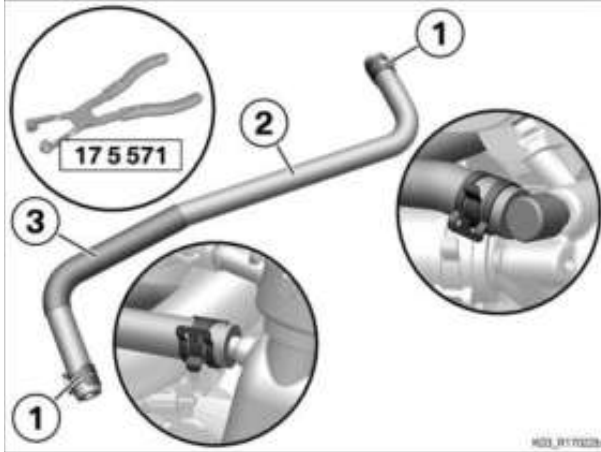
- Loosen clamp (1) with pliers (No. 17 5 571) and move.
- Pull coolant hose (2) off radiator (3).



- Loosen clamp (1) with pliers (No. 17 5 571) and move.
- Pull coolant hose (2) off connection (3) and remove.

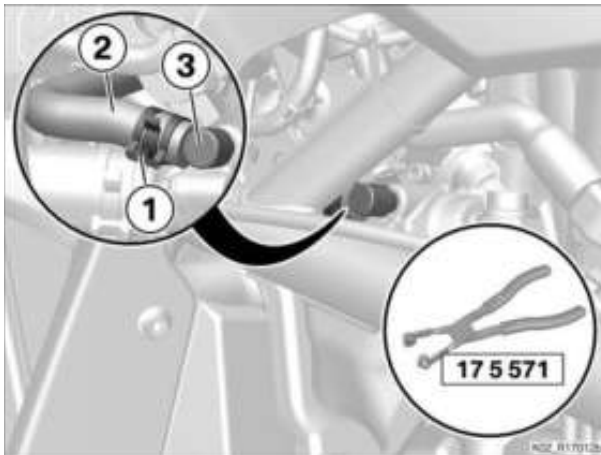


(-) Replacing coolant hose from cylinder head

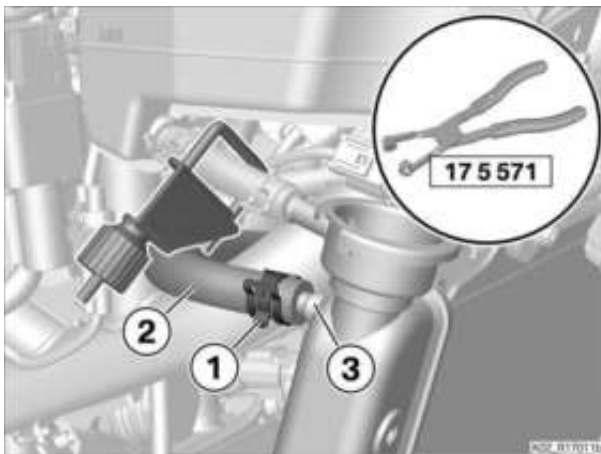


- Remove clamps (1) with pliers (No. 17 5 571) and remount on **new** coolant hose (2).
- Ensure correct installation position during installation of the coolant hose (2).
- » Abrasion protection (3) is on the **radiator-side**.

(-) Installing coolant hose from cylinder head



- Route coolant hose (2) and connect to connection (3).
- Move clamp (1) with pliers (No. 17 5 571) and secure.



- Connect coolant hose (2) to radiator (3).
- Move clamp (1) with pliers (No. 17 5 571) and secure.

Follow-up work

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

17 12 100 Replacing coolant hose from radiator (without draining/ refilling coolant system)

+ 17 12 600

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining coolant, refilling/bleeding system (Description in item: 17 00 504, Billed as a separate item)

Removing seat

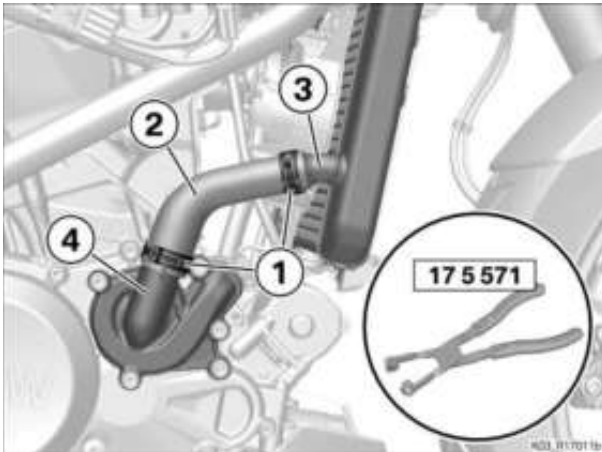
Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

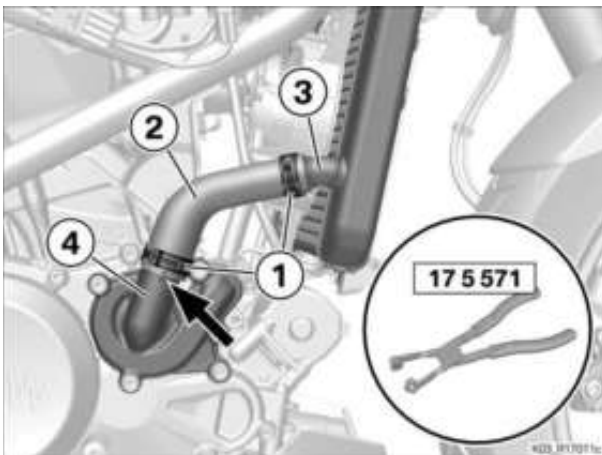
Core activity

(-) Remove the coolant hose from radiator



- Loosen clamps (1) with pliers (No. 17 5 571) and move.
- Disconnect coolant hose (2) from radiator (3) and coolant pump (4) and remove.

(-) Installing coolant hose from radiator



- Preinstall clips (1) with pliers (No. 17 5 571) on coolant hose (2).
- Connect coolant hose (2) to radiator (3) and coolant pump (4) and while doing so, align groove and lug (Arrow) to each other.
- Move clamps (1) with pliers (No. 17 5 571) and secure.

Follow-up work

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

 17 12 105 Replacing coolant hose to radiator (without draining/ refilling coolant system)

+ 17 12 605

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining coolant, refilling/bleeding system (Description in item: 17 00 504, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

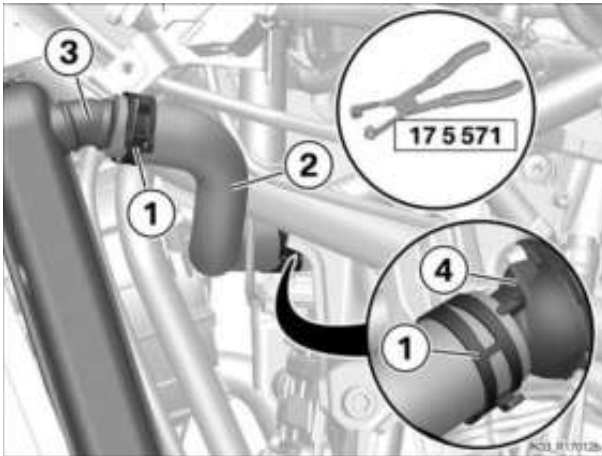
Removing left radiator cowl

Removing air guide

Core activity

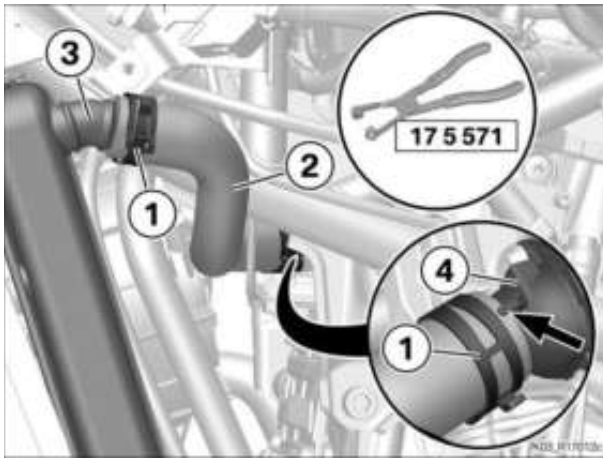
(-) Removing coolant hose from engine to radiator

- Open clips (1) with pliers (No. 17 5 571).
- Disconnect coolant hose (2) from radiator (3) and thermostat housing (4) and remove.



(-) Installing coolant hose from engine to radiator

- Preinstall clips (1) with pliers (No. 17 5 571) on coolant hose (2).
- Connect coolant hose (2) to radiator (3) and thermostat housing (4), aligning the groove and the lug (arrow) with each other.
- Close clips (1) with pliers (No. 17 5 571).



Follow-up work

Installing air guide

Installing left radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

17 13 001 Replace expansion tank

+ 17 13 501

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

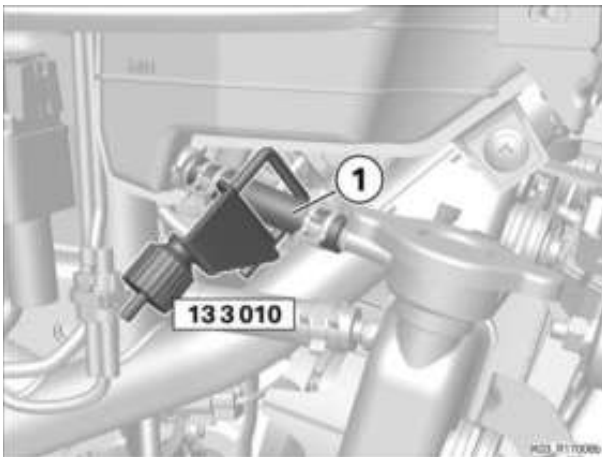
Removing right radiator cowl

Core activity

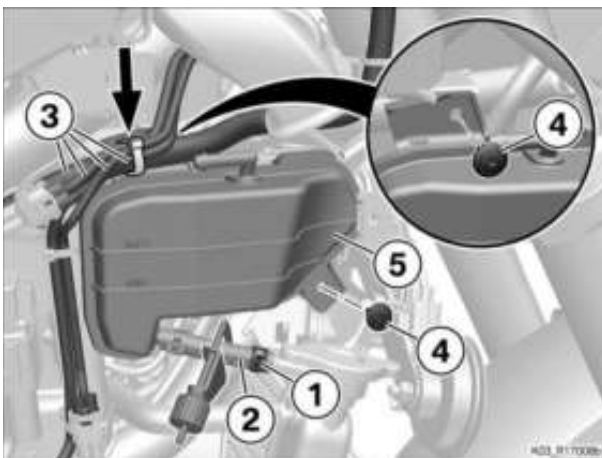
(-) Removing expansion tank

► Sealing off hose from expansion tank

- Seal off hose (1) with hose clamp (No. 13 3 010).

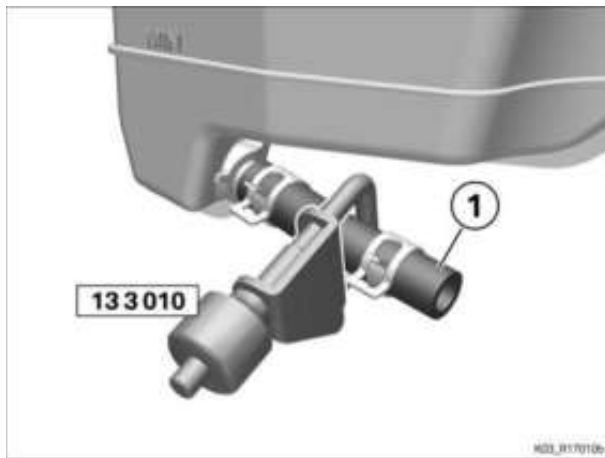


- Remove cable tie (arrow).
- Open clip (1) and disconnect hose (2).
- Push cable legs (3) aside and remove expanding rivet (4).
- Remove expansion tank (5).



► Removing hose clamp from expansion tank

- Remove hose clamp (No. 13 3 010) from hose (1).



- Drain the expansion tank.

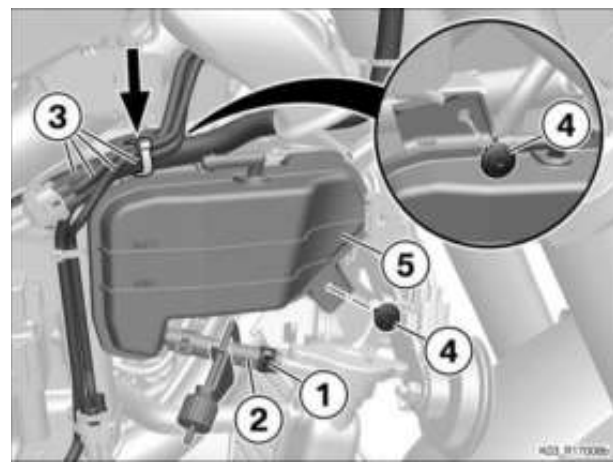
(-) Replacing expansion tank

- Slacken clip (2) and transfer hose (1) to new expansion tank (3).
- Position clamp (1).
- Work the cable tie (arrow) into position.

(-) Installing expansion tank

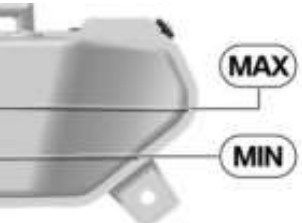
- Feed cable strap (arrow) in expansion tank (1).

- Hold expansion tank (5) in position.
- Push cable legs (3) aside and install expanding rivet (4).
- Connect hose (2) and position clip (1).
-



Tighten the cable tie (arrow).

- Fill expansion tank (5).

 Technical data			
Coolant, specified level	Engine is cold, motorcycle is upright	between MIN and MAX marks on the expansion tank	
			

Follow-up work

- Installing right radiator cowl
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Final check of work performed

 17 21 006 Replacing heat exchanger (without draining/refilling coolant system)

+ 17 21 506

Preparatory work

**=> Draining coolant, refilling/bleeding system
(Description in item: 17 00 504, Billed as a separate item)**

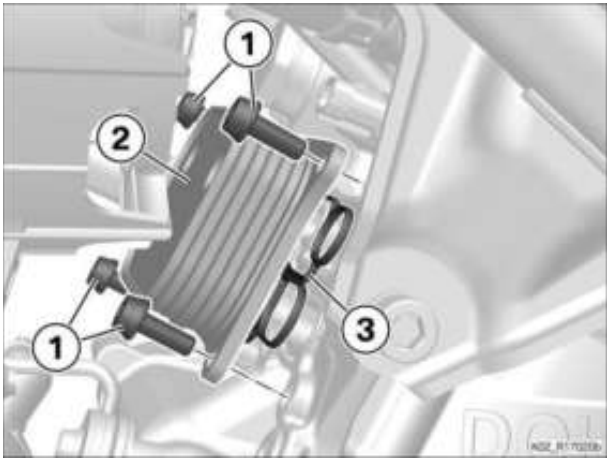
- Disconnect battery from vehicle
- Removing starter
- Removing left radiator cowl
- Removing right radiator cowl
- Removing air guide
- Loosen coolant hose from lid of the coolant pump
- Disengaging radiator

Core activity

(-) Remove the heat exchanger

 NOTICE

Ensure that coolant and oil do not mix.

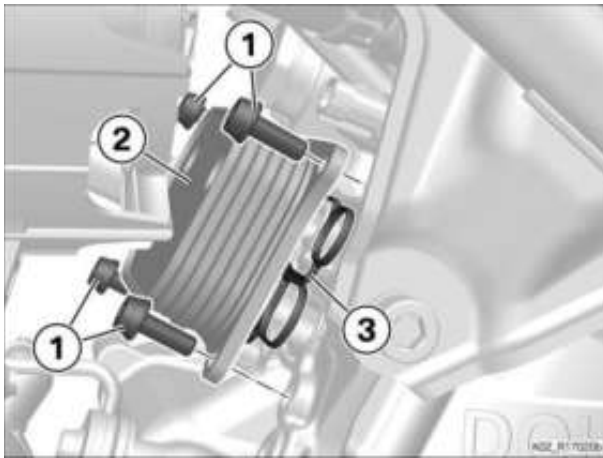


- Remove screws (1).
- Remove heat exchanger (2) and catch escaping fluid in a suitable container.
- Remove seal (3).

(-) Installing heat exchanger

- Install **new** gasket (3).
- Hold heat exchanger (2) in position.
- Install screws (1).

 Tightening torques		
Heat exchanger to crankcase		
M6 x 16	10 Nm	



Follow-up work

Securing radiator

Secure coolant hose at the coolant pump lid

Installing air guide

Installing left radiator cowl

Installing right radiator cowl

Installing starter

Connect battery with vehicle

Checking engine oil level

Final check of work performed

17 40 000 Removing/installing or replacing fan

+ 17 40 500

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Disconnect battery from vehicle

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing right radiator cowl

Removing the left radiator cowl with the air duct

Loosen controller from main frame

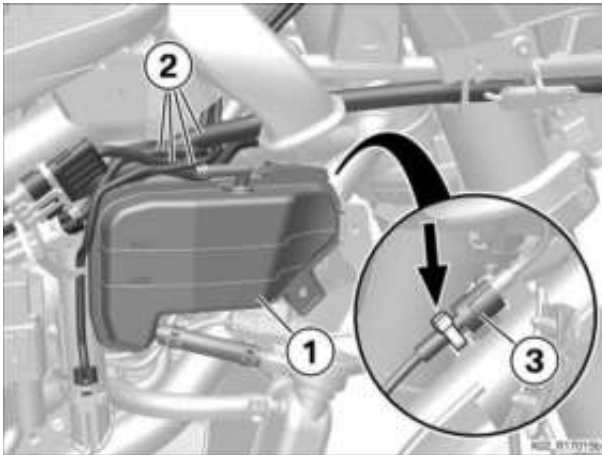
Removing starter

Releasing expansion tank

Disengaging radiator

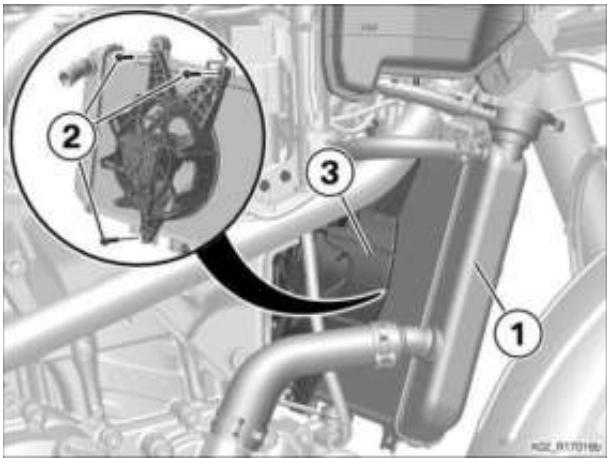
Core activity

(-) Removing fan



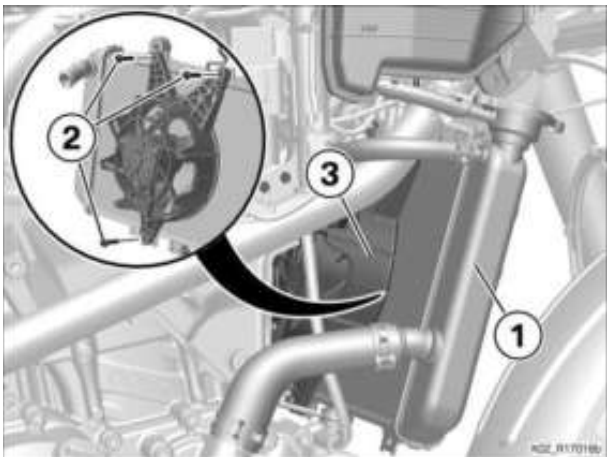
- Bend aside expansion tank (1), paying attention to the wiring harness (2) while doing so.
- Remove cable strap (arrow).
- Disconnect connector (3) for fan and feed it out.

- Push radiator (1) to the front.
- Remove screws (2).
- Remove fan (3) from radiator (1).

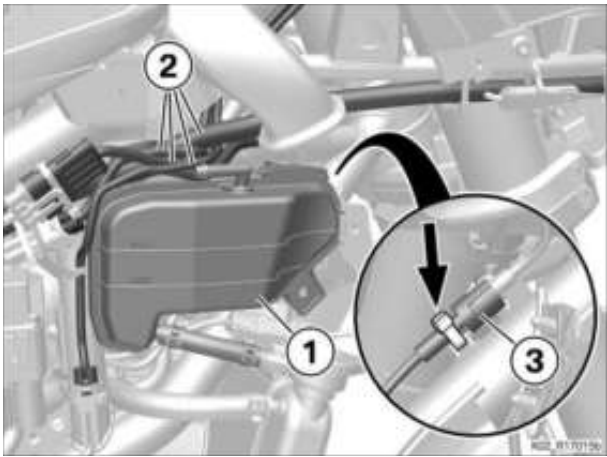


(-) Installing fan

- Push radiator (1) to the front.
- Position fan (3) on radiator (1).
- Install screws (2).



 Tightening torques		
Radiator cowl to radiator		
M5 x 20	5 Nm	



- Bend aside expansion tank (1), paying attention to the wiring harness (2) while doing so.
- Route and connect connector (3) for fan.
- Secure the cable strap (arrow).

Follow-up work

- Securing radiator
- Securing expansion tank
- Installing starter
- Secure controller at main frame
- Installing the left radiator cowl with the air duct
- Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Connect battery with vehicle

Installing seat

Setting calendar date

Final check of work performed

 17 65 000 Replacing thermostat for coolant (without draining/ refilling coolant system)
+ 17 65 500

Preparatory work

=> **Draining coolant, refilling/bleeding system**
(Description in item: 17 00 504, Billed as a separate item)

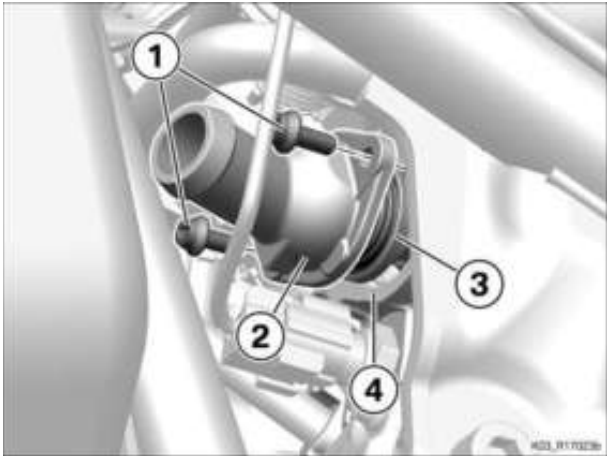
Removing left radiator cowl

Removing air guide

Removing coolant hose from engine to radiator

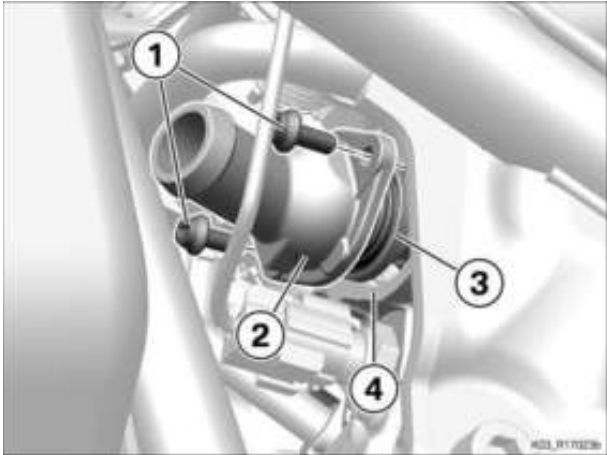
Core activity

(-) Removing thermostat



- Remove screws (1).
- Remove thermostat housing (2).
- Remove thermostat (3) from cylinder head (4).

(-) Installing thermostat



- Install thermostat (3) in cylinder head (4).
- Position thermostat housing (2) and install screws (1).

 Tightening torques		
Lid for thermostat to cylinder head		
M5 x 12	6 Nm	

Follow-up work

Installing coolant hose from engine to radiator

Installing air guide

Installing left radiator cowl

18 51 014 Replacing rubber mount for silencer

+ 18 51 517

CAUTION

Hot exhaust system

Risk of burn injury

- Do not touch a hot exhaust system.
-

Preparatory work

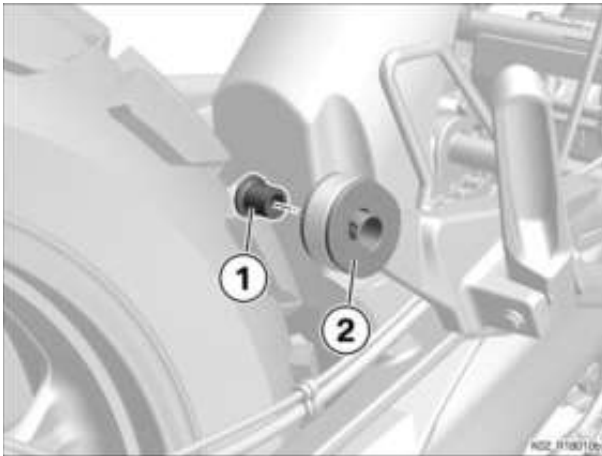
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing silencer

Core activity

(-) Replacing rubber mount for silencer

- Remove bushing (1).
- Remove rubber mount (2) and install new rubber mount (2).
- Install bushing (1).



Follow-up work

Securing the exhaust system

Final check of work performed

18 51 015 Replacing heat shield for silencer

+ 18 51 518

CAUTION

Hot exhaust system

Risk of burn injury

- Do not touch a hot exhaust system.

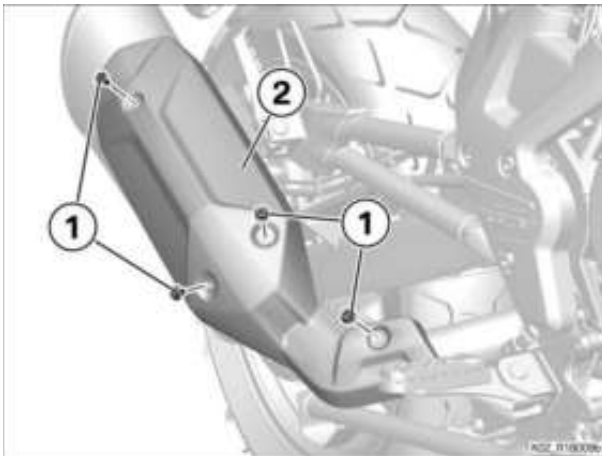
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

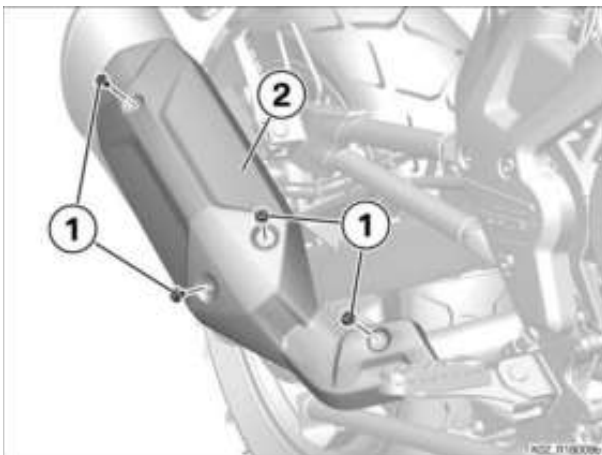
(-) Removing heat shield for silencer

- Remove screws (1) and remove cover (2).



(-) Installing heat shield for silencer

- Hold heat shield (2) in position and install screws (1).



Follow-up work

Final check of work performed

 18 51 019 Replace holder for exhaust manifold

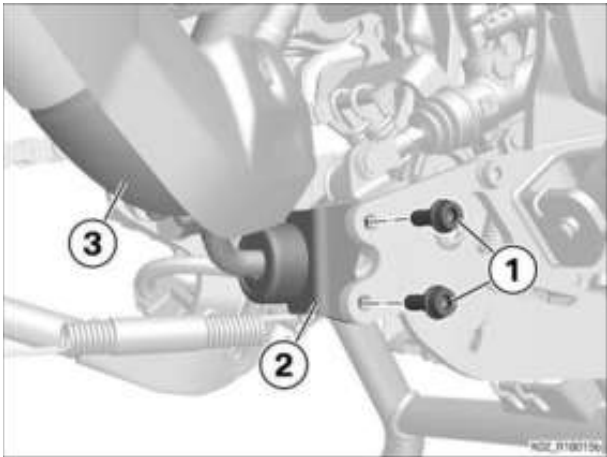
+ 18 51 619

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

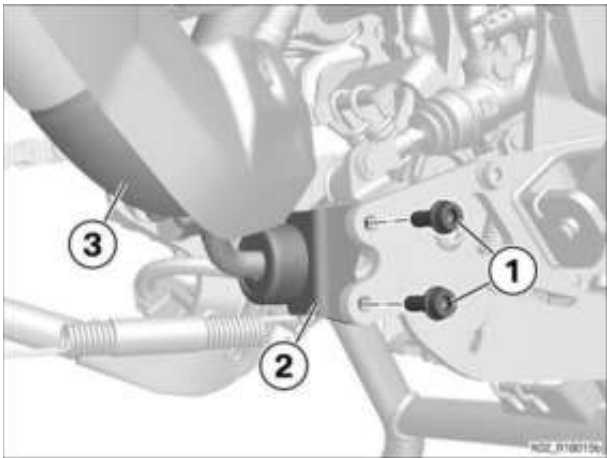
Core activity

(-) Removing the holder for the exhaust system



- Remove screws (1).
- Remove holder (2) from exhaust system (3).

(-) Installing the holder for the exhaust system



- Push holder (2) on exhaust system (3).
- Install screws (1).

 Tightening torques		
Exhaust system to footrest plate		
M8 x 35	19 Nm	

Follow-up work

Final check of work performed

18 51 020 Replace exhaust system completely

+ 18 51 620

Preparatory work

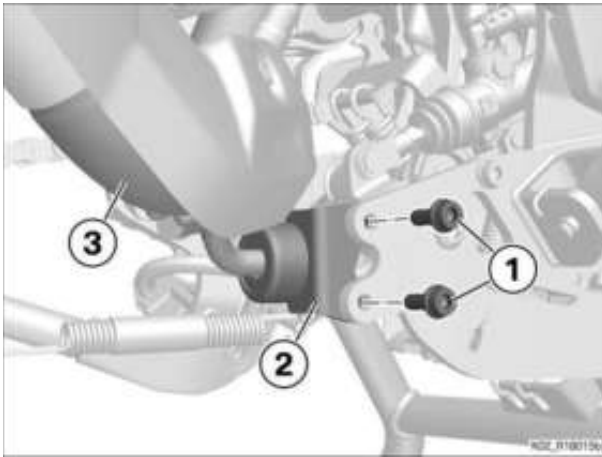
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing right frame cover

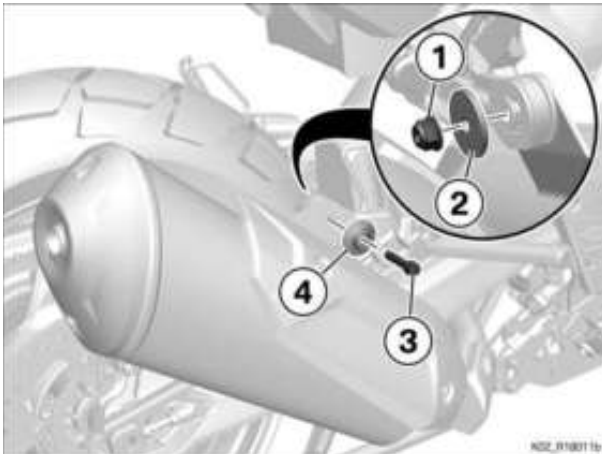
Disconnect connector for the oxygen sensor

Core activity

(-) Removing exhaust system

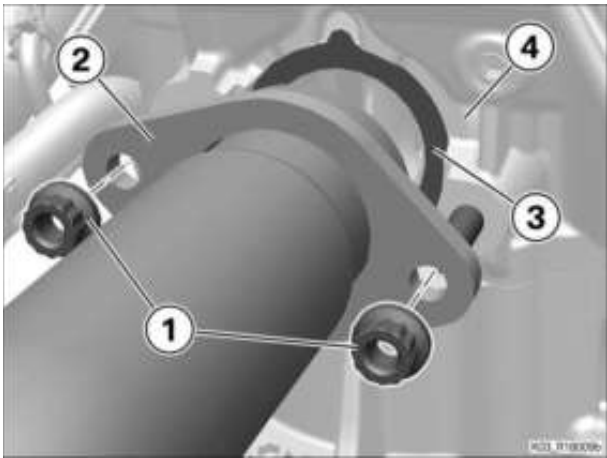


- Remove screws (1).
- Remove holder (2) from exhaust system (3).



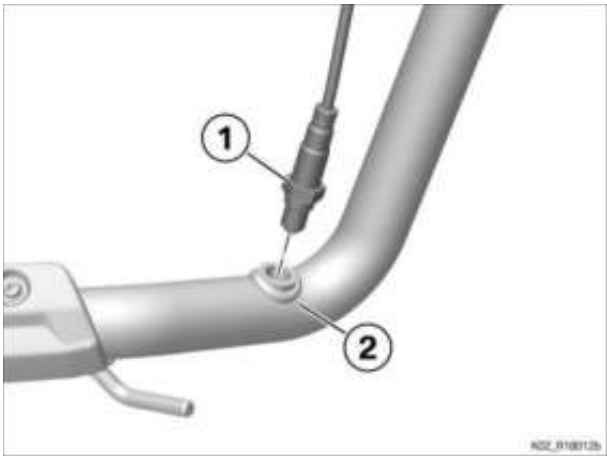
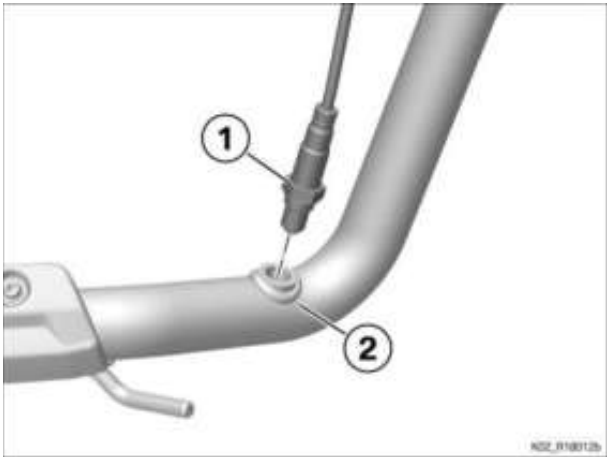
- Remove nut (1) with washer (2), counter-holding screw (3).
- Remove screw (3) with thrust piece (4).

- Remove nuts (1).
- Remove exhaust system (2).
- Remove exhaust manifold gasket (3) from cylinder head (4).



(-) Replace exhaust system

- Remove oxygen sensor (1) from exhaust system (2).



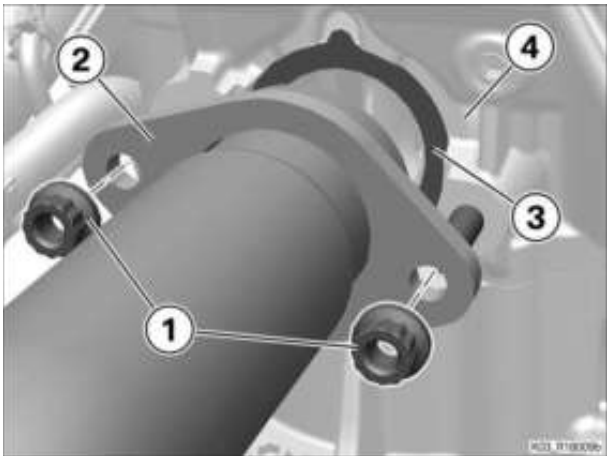
- Install oxygen sensor (1) in new part (2).

 Tightening torques		
Oxygen sensor to exhaust system		
M18 x 1.5 Thinly lubricate thread, Lubricant (Optimoly TA)	50 Nm	

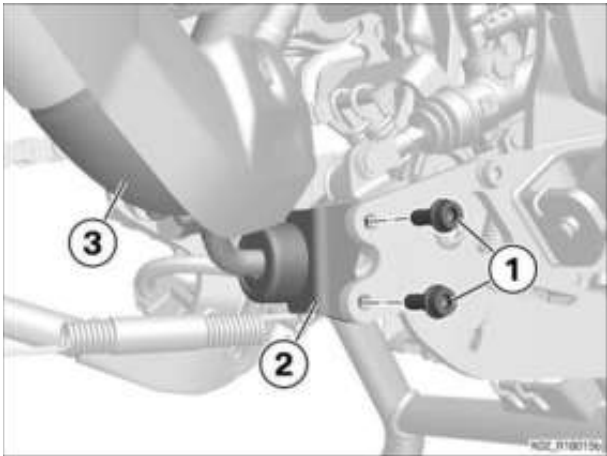
(-) Installing exhaust system

- Install **new** exhaust manifold gasket (3) in cylinder head (4).
- Install exhaust system (2).
- Install nuts (1).

 Tightening torques	
Exhaust system to cylinder head	

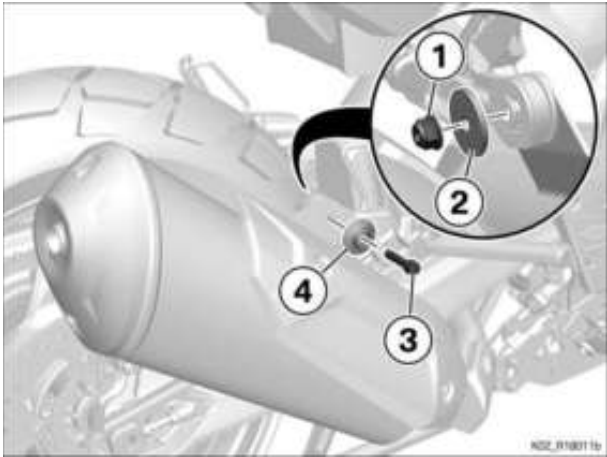


M7x1	14 Nm	
------	-------	--



- Push holder (2) on exhaust system (3).
- Install screws (1).

 Tightening torques		
Exhaust system to footrest plate		
M8 x 35	19 Nm	



- Install screw (3) with thrust piece (4).
- Install nut (1) with washer (2).

 Tightening torques		
Exhaust system to footrest plate		
M8 x 35	19 Nm	

Follow-up work

- Connect connector for oxygen sensor
- Installing right frame cover
- Final check of work performed

21 21 000 Removing and installing or replacing clutch

+ 21 21 606

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Draining coolant

Removing cover for coolant pump

Removing impeller

Removing the cable duct for the brake light switch

Releasing footbrake cylinder

Removing right crankcase cover

Remove the pressure plate

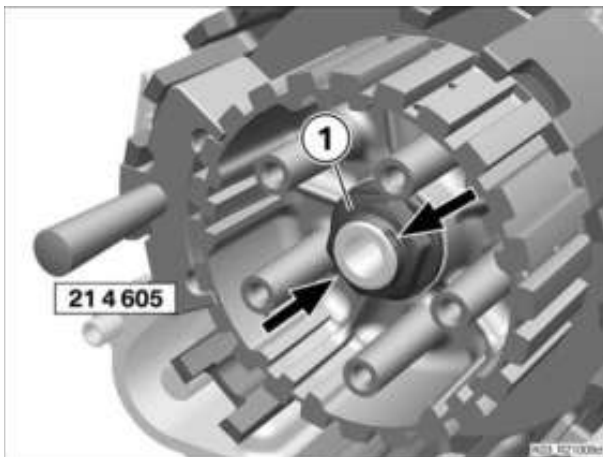
Removing thrust piece and pushrod

Removing plate cluster

Lock the crankshaft in TDC position

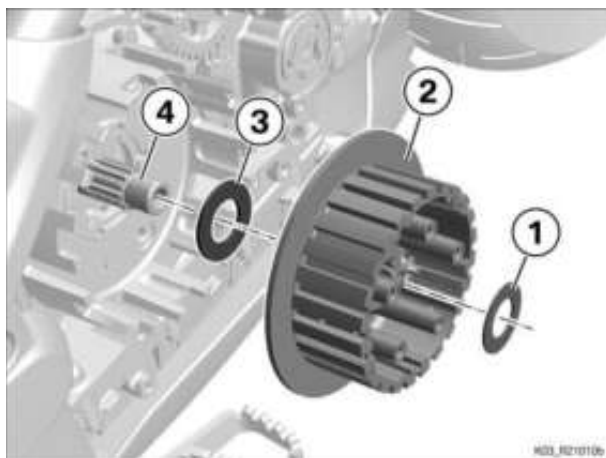
Core activity

(-) Removing driver



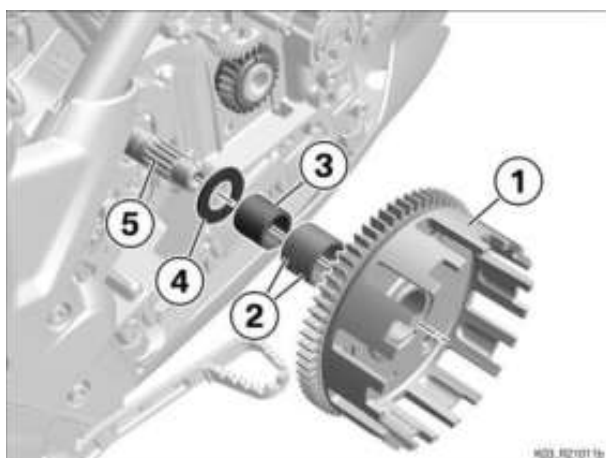
- Release crimp-lock (arrows).
- Remove nut (1).
- Remove driver lock (No. 21 4 605).

- Remove thrust washer (1), driver (2) and thrust washer (3) from transmission input shaft (4).



(-) Removing clutch basket

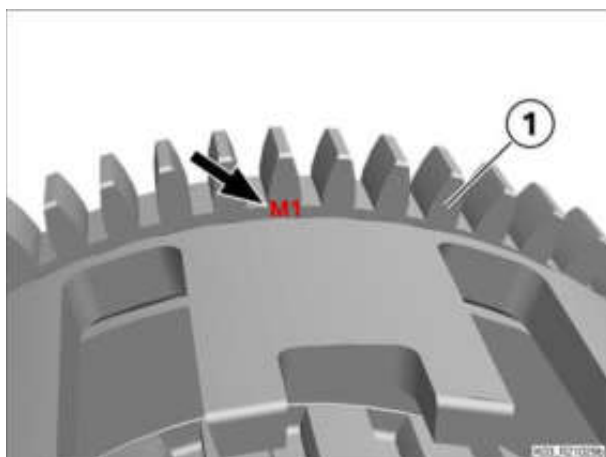
- Remove clutch basket (1).
- Remove needle bearing (2), bearing bush (3) and thrust washer (4) from transmission input shaft (5).



(-) Installing clutch cage

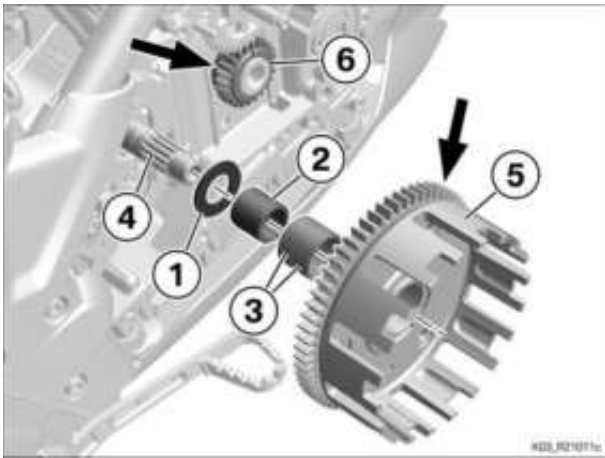
NOTICE

If the clutch cage is replaced it is essential to install a replacement clutch cage of the same classification.



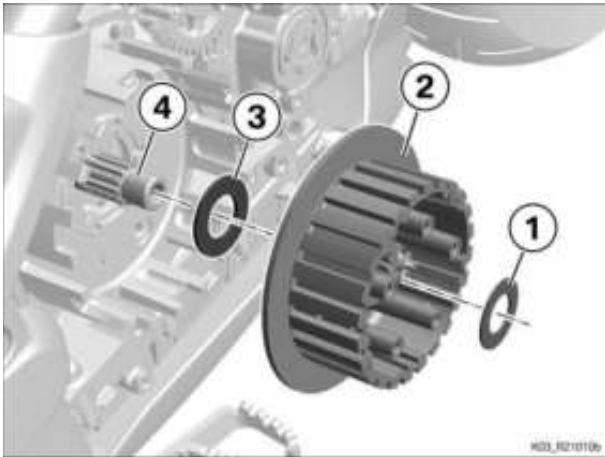
- Check classification on **front side** of primary wheel (1), obstruct clutch basket in the same classification.
- M1/M2/M3

- Lubricate the components with engine oil.
-

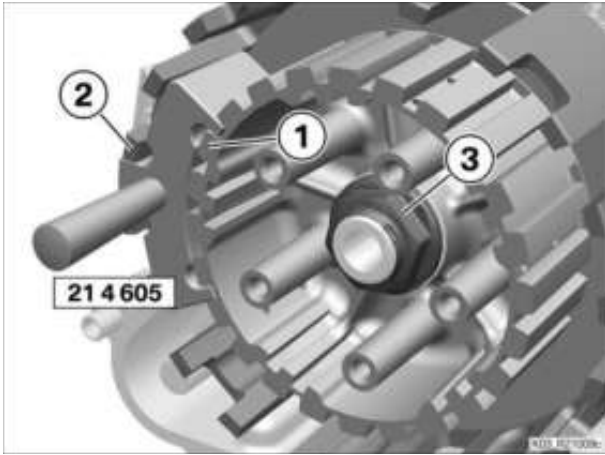


- Install thrust washer (1), bearing bush (2) and needle bearing (3) on transmission input shaft (4).
- Install clutch basket (5) and while doing so, see that the gearing (arrows) of clutch basket (5) and of the primary pinion (6) engage with each other.

(-) Installing driver



- Lubricate the components with engine oil.
- Install thrust washer (3), driver (2) and thrust washer (2) on transmission input shaft (4).



- Insert driver stop (No. 21 4 605) into driver (1) and clutch basket (2).
- Install nut (3) and tighten.

 Tightening torques		
Clutch to transmission input shaft		
M18 x 1, Replace nut	80 Nm	
Thread-locking compound (mechanical)	Caulk nut to transmission shaft	

- Caulk nut (1) on both sides with the drift (arrows).

 Technical data			
Diameter of drift		4 mm	

- Remove driver lock (No. 21 4 605).



Follow-up work

Lubricating new plate cluster
Installing plate cluster
Install thrust piece
Installing pressure plate
Removing locating pin
Installing right crankcase cover
Securing footbrake cylinder
Installing the cable duct for the brake light switch
Installing impeller
Installing cover for coolant pump
Filling cooling system
Installing cover for fuel tank
Installing cover for right intake snorkel
Installing cover for left intake snorkel
Installing seat
Installing engine spoiler
Checking engine oil level
Final check of work performed

21 21 140 Removing and installing or replacing lined plates

+ 21 21 609

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Draining coolant

Removing cover for coolant pump

Removing impeller

Removing the cable duct for the brake light switch

Releasing footbrake cylinder

Removing right crankcase cover

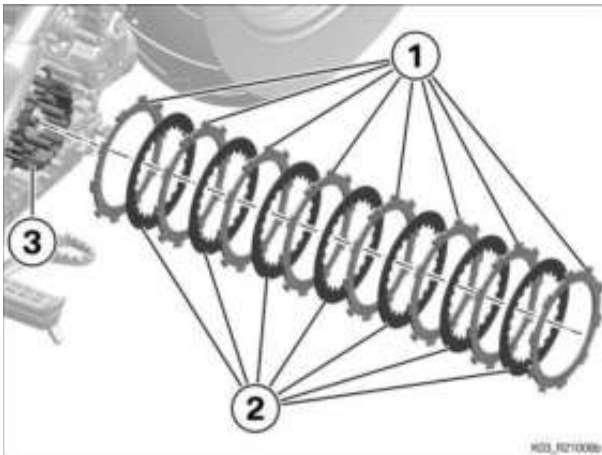
Remove the pressure plate

Removing thrust piece and pushrod

Core activity

(-) Removing plate cluster

- Remove friction washers (1) and steel discs (2) from clutch basket (3).



(-) Lubricating new plate cluster

ATTENTION

Installation of the clutch plates dry

Burning of the clutch plates

- Immerse new clutch disc package in clean engine oil.

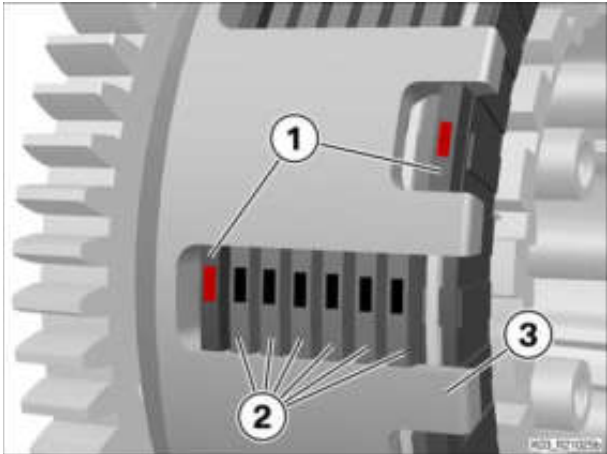
- Immerse new lined plates in engine oil.
- » The friction faces of the lined plates are wetted by oil.

(-) Installing plate cluster

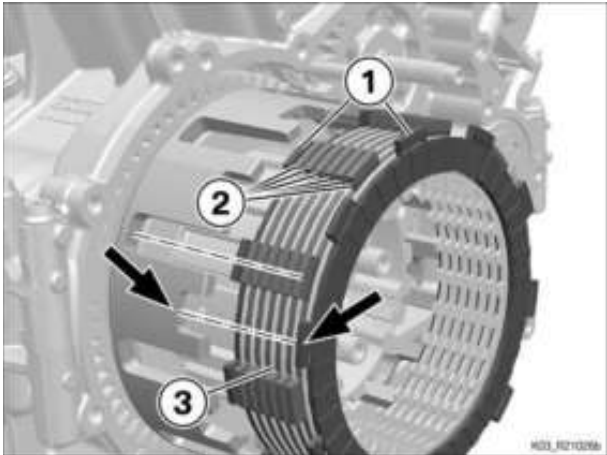
- When installing the mounting orientation of the friction plate (1) and (2) in the clutch basket (3).

 NOTICE

The outer (first and last) friction plates are marked red.
The inner friction plates are marked black.



- different colour coding of friction plates
- offset installation of the last friction plate



- Beginning with a friction plate (1), install friction plates (2) and steel discs (3) alternately.

 Technical data			
Number of friction plates and steel discs	Outer friction plates	2 pieces, marked red	
	Inner friction plates	6 pieces, marked black	
	Steel discs	7 of	

- The **last** friction plate (1) must be installed offset (Arrow).

Follow-up work

- Install thrust piece
- Installing pressure plate
- Installing right crankcase cover
- Securing footbrake cylinder
- Installing the cable duct for the brake light switch
- Installing impeller
- Installing cover for coolant pump
- Filling cooling system
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat

Installing engine spoiler

Checking engine oil level

Final check of work performed

21 51 002 Replacing thrust piece

+ 21 51 729

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Draining coolant

Removing cover for coolant pump

Removing impeller

Removing the cable duct for the brake light switch

Releasing footbrake cylinder

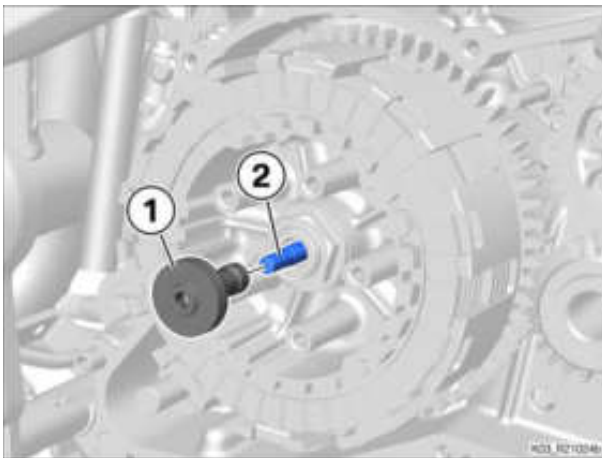
Removing right crankcase cover

Remove the pressure plate

Core activity

(-) Removing thrust piece and pushrod

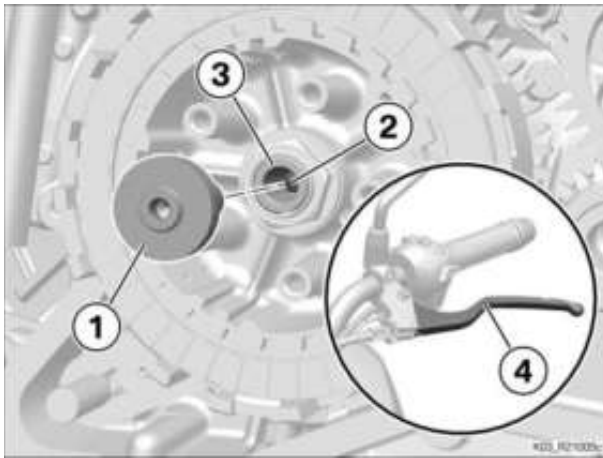
- Remove thrust piece (1).
- Remove pushrod (2) **with magnetic bar**.



(-) Install thrust piece

- Lubricate thrust piece (1) and pushrod (2) with engine oil.
- Install pushrod (2) (**shoulder in direction of clutch**).
- Insert thrust piece (1) into transmission input shaft (3).

 NOTICE



The thrust piece can be easier to install if the clutch lever is activated several times when inserting the thrust piece.

- Place thrust piece (1) on pushrod (2), operate the clutch lever (4) simultaneously several times while doing so.

Follow-up work

Installing pressure plate
Installing right crankcase cover
Securing footbrake cylinder
Installing the cable duct for the brake light switch
Installing impeller
Installing cover for coolant pump
Filling cooling system
Installing cover for fuel tank
Installing cover for right intake snorkel
Installing cover for left intake snorkel
Installing seat
Installing engine spoiler
Checking engine oil level
Final check of work performed

23 12 078 Replace shaft sealing ring of output shaft

+ 23 12 620

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Relieving chain tension

Removing pinion cover

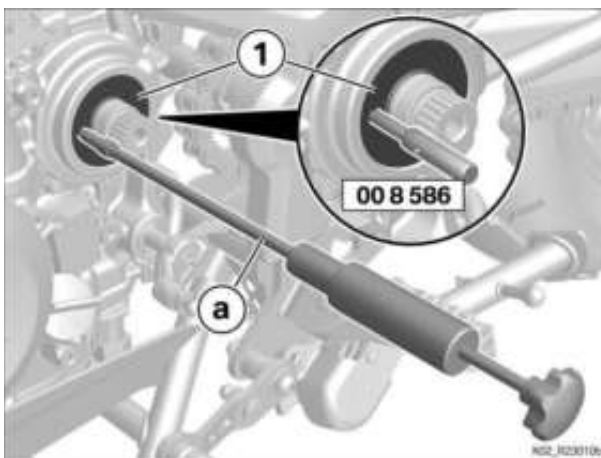
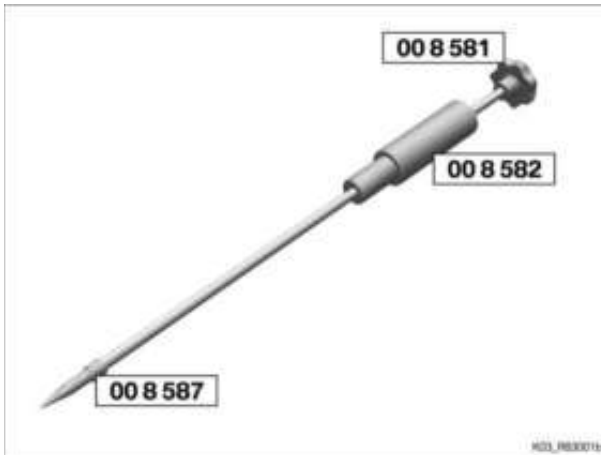
Removing pinion

Core activity

(-) Removing shaft sealing ring of output shaft

► Reassemble drive-out tool

- Slide impact weight (No. 00 8 582) on pull rod (No. 00 8 581).
- Screw adapter of cone head self-tapping screw (No. 00 8 587) on pull rod (No. 00 8 581).



ATTENTION

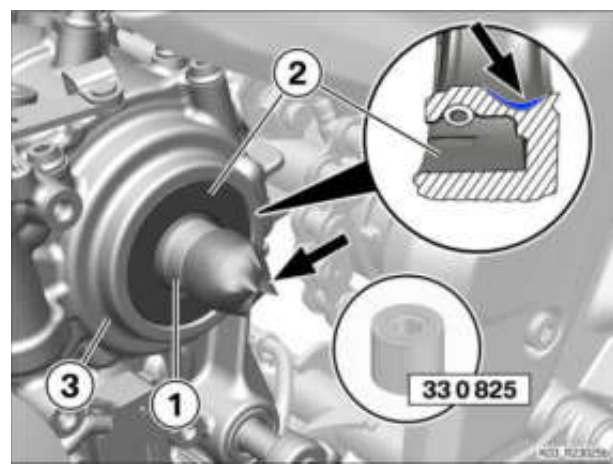
Drilling of pilot hole in radial shaft seal not in compliance with correct procedure

Housing damage

- Do not use too large a twist drill.
 - Centre the hole.
-
- Using a drill bit (< 3 mm) and drill stop (No. 00 8 586), carefully drill a centred hole into, but not through, the shaft sealing ring (1).
 - Screw drive-out tool (a) into the bored radial shaft seal (1).
 - Remove radial shaft seal (1).
 - Remove boring residues fully.

(-) Installing shaft sealing ring of output shaft

- Clean the housing.



- Wind adhesive tape (arrow) around the gearing of output shaft (1).
- » The sealing lip of radial shaft seal (2) are not damaged when pushed on output shaft (1).
- Pack the space between the inner sealing lips of shaft sealing ring (2) with lubricant.

 Lubricant	
Acid-free friction-bearing grease	81 22 9 407 174

- Remove sufficient lubricant to leave a **fillet** (arrow).
- Install radial shaft seal (2) with drift (No. 33 0 825) **until flush** in engine housing (3).
- Remove the adhesive tape (arrow).

Follow-up work

Installing pinion

Installing pinion cover

Adjust chain sag

Final check of work performed

 23 12 111 Replacing shaft sealing ring of selector shaft

+ 23 12 621

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Disengaging shift lever

Core activity

(-) Remove radial shaft seal of the gearshift shaft



- Turn back press-off bolt (A) in puller (No. 24 5 410).
- Position puller (No. 24 5 410) on gearshift shaft (1) and screw into radial shaft seal (2) **hand-tight**.
- Screw in press-off bolt (A) and remove radial shaft seal (2).

(-) Install radial shaft seal of the gearshift shaft



- Clean seating of radial shaft seal (1).
- Lubricate gap between the sealing lips (arrow) of radial shaft seal (1).

 Lubricant	
Acid-free friction-bearing grease	81 22 9 407 174

- Cover/mask gearing on gearshift shaft (2).
- Install radial shaft seal (1) using suitable tool in engine housing (2) **evenly with engine housing** (open side facing the engine housing).
- Remove auxiliary materials from gearshift shaft (2).

Follow-up work

Securing selector lever

Checking engine oil level

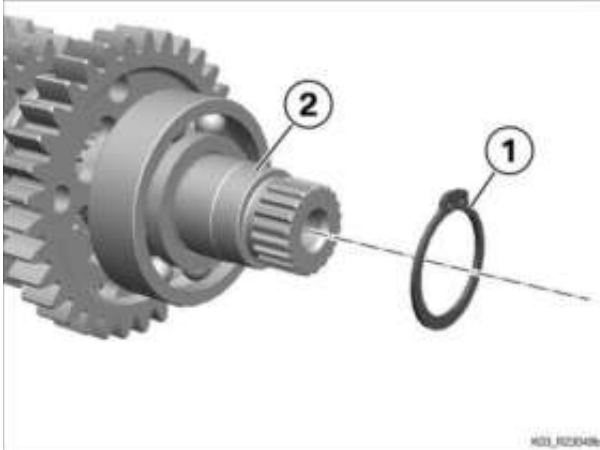
Final check of work performed

23 12 506 Replacing bearings of all gearbox shafts (shafts removed)

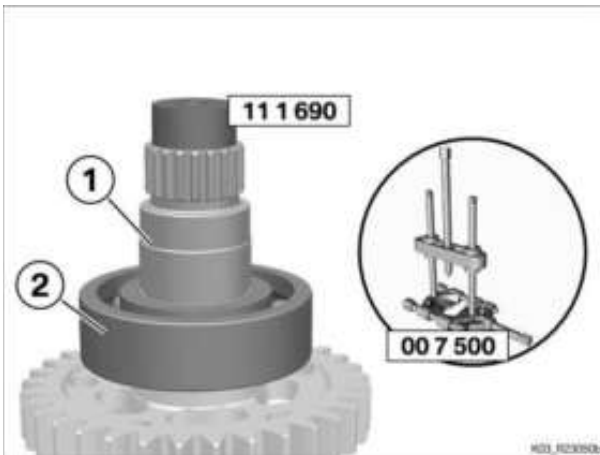
Core activity

(-) Removing bearing for gearbox output shaft

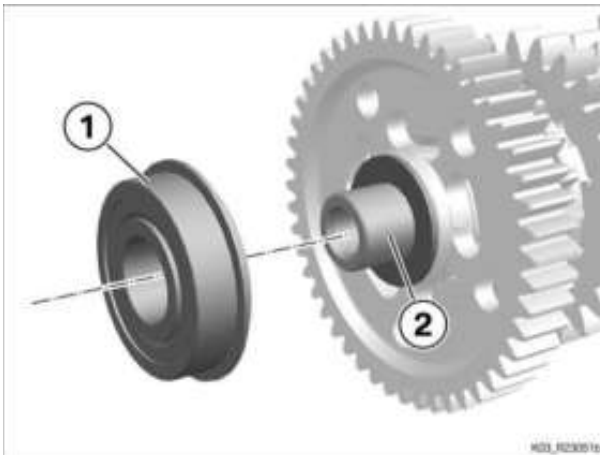
- Remove circlips (1) from transmission output shaft (2).



- Insert thrust piece (No. 11 1 690) into the transmission output shaft (1).
- Remove ball bearing (2) with puller/separator (No. 00 7 500).
- Remove the tools.

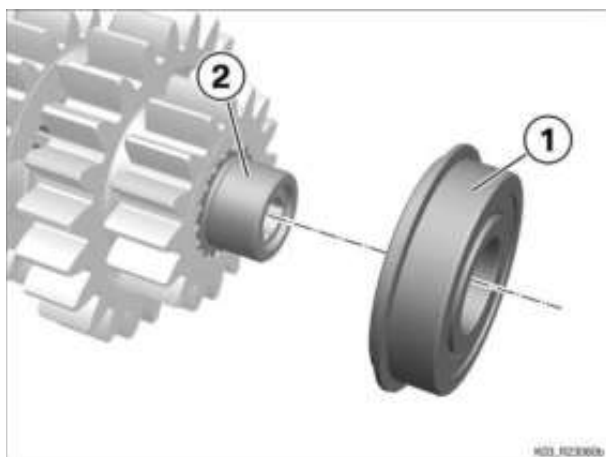
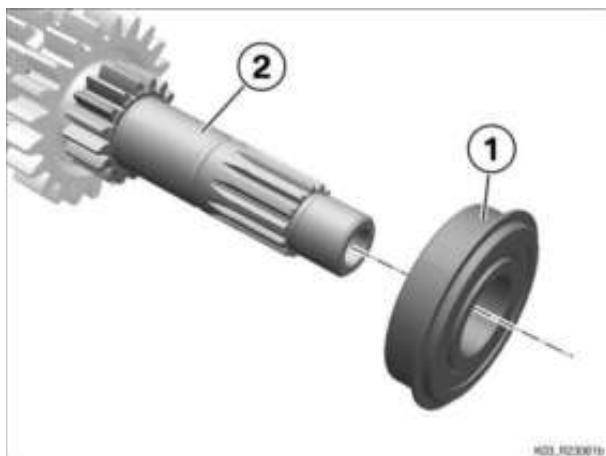


- Remove ball bearing (1) from transmission output shaft (2).



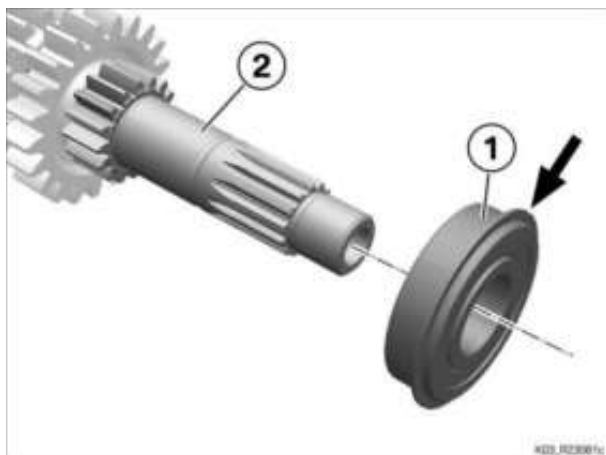
(-) Remove the bearing of gearbox input shaft

- Pull ball bearing (1) off transmission input shaft (2).



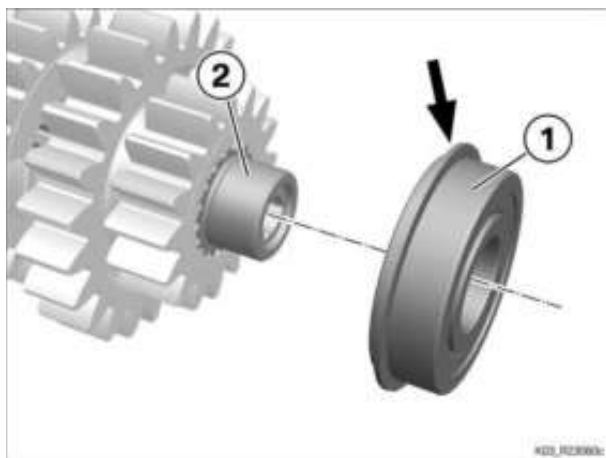
- Pull ball bearing (1) off transmission input shaft (2).

(-) Installing transmission input shaft bearing

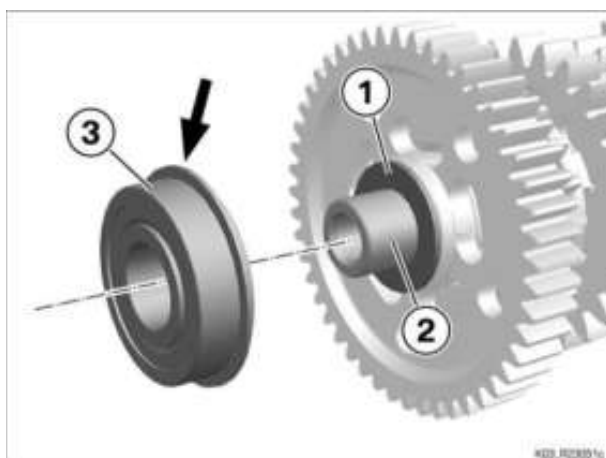


- Slide **new** ball bearing (1) onto transmission input shaft (2) and while doing so, pay attention to the alignment of the bearing fixing (Arrow).

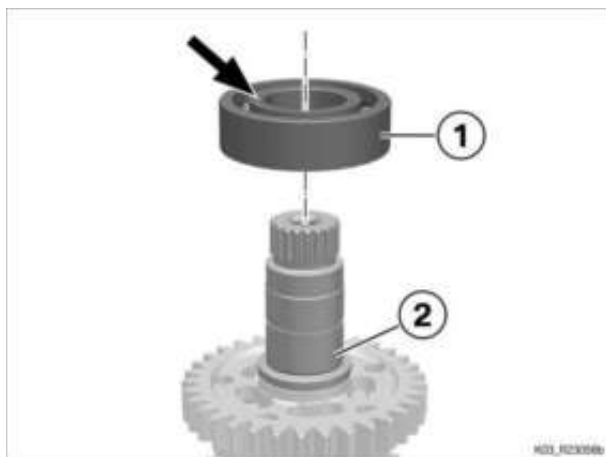
- Slide **new** ball bearing (1) onto transmission input shaft (2) and while doing so, pay attention to the alignment of the bearing fixing (Arrow).



(-) Installing bearings of gearbox output shaft

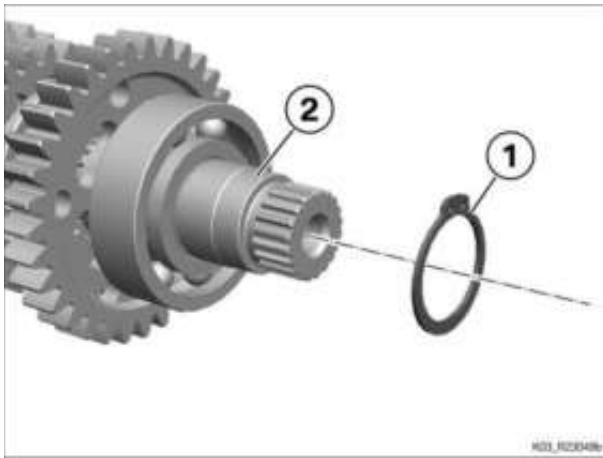


- Ensure that the thrust washer (1) is installed.
- Slide **new** ball bearing (3) onto transmission output shaft (2) and while doing so, pay attention to the alignment of the bearing fixing (arrow).



- Press **new** ball bearing (1) on transmission output shaft (2) and while doing so, subject inner ring (arrow) to load.

- Install **new** circlip (1) in transmission output shaft (2).



 23 14 051 Replacing potentiometer for gear indicator

+ 23 14 507

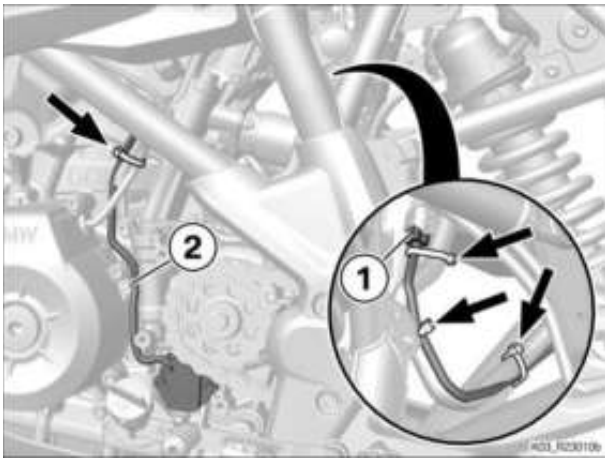
Preparatory work

=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

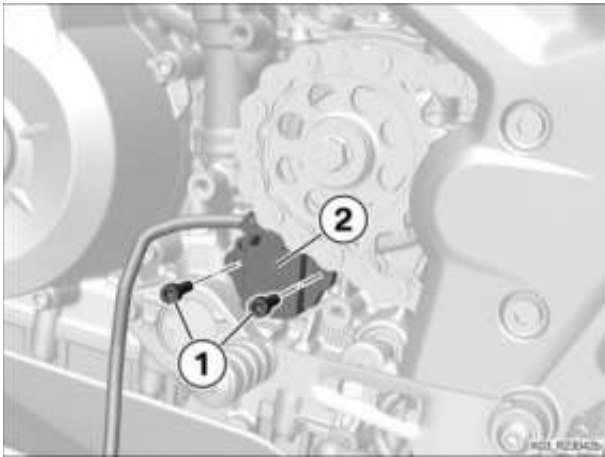
Removing pinion cover

Core activity

(-) Removing potentiometer for gear indicator



- Remove the cable ties (arrows).
- Disconnect connector (1) and work cable (2) for the potentiometer clear of the vehicle.

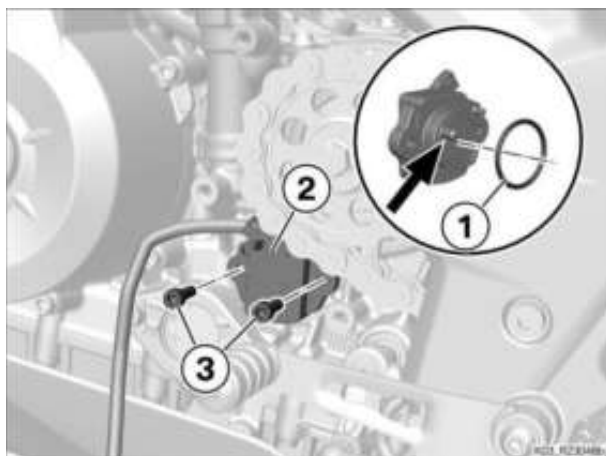


- Remove screws (1).
- Remove potentiometer (2).

(-) Install the potentiometer for gear indicator

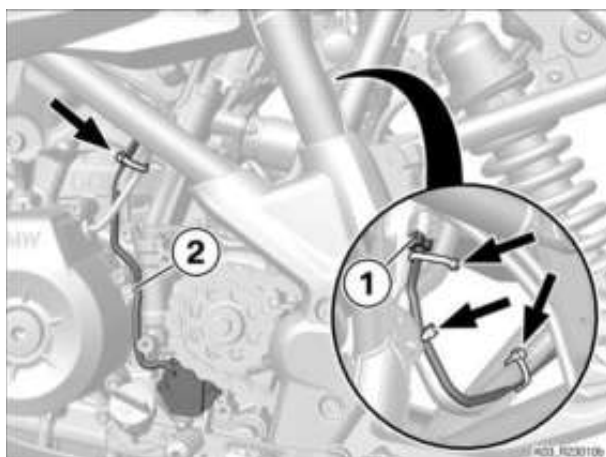
- Check O-ring (1) for damage; replace if necessary.
- Lubricate O-ring (1) and install on potentiometer (2).

 Installation tool	
Silicone spray	83 19 2 208 609



- Install potentiometer (2), engaging the lug (arrow) in the hole in the selector drum.
- Install screws (3).

 Tightening torques		
Potentiometer for gear indicator to crankcase		
M5 x 16	6 Nm	



- Work cable (2) for the potentiometer into place and route it correctly.
- Connect plug connection (1).
- Close the cable ties (arrows).

Follow-up work

Installing pinion cover

Removing seat

Connecting **BMW Motorrad** diagnostic system to vehicle

Perform the vehicle test with **BMW Motorrad** diagnostic system, read out fault memory and reset adaptation values

Disconnecting **BMW Motorrad** diagnostic system from vehicle

Installing seat

Final check of work performed

23 21 503 Removing/installing transmission shafts (engine removed)

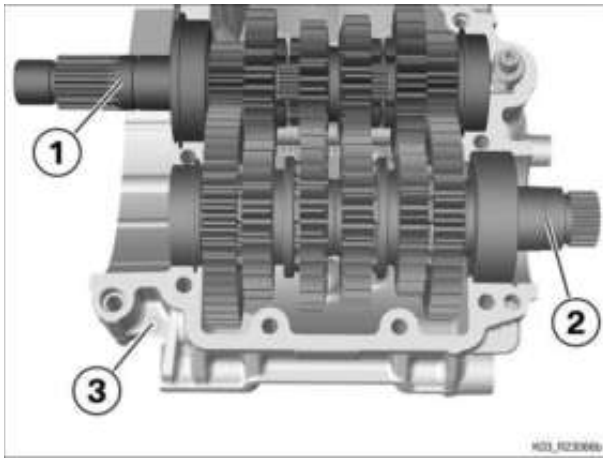
Preparatory work

Removing starter
Securing engine to assembly stand
Removing left crankcase cover
Removing layshaft for starter
Remove adapter
Removing cover for coolant pump
Removing impeller
Removing right crankcase cover
Removing oil suction pump
Removing direct ignition coil
Removing cylinder head cover
Adjust engine to firing TDC
Install alignment pin
Remove the pressure plate
Removing thrust piece
Removing plate cluster
Removing driver
Removing clutch basket
Removing locating pin
Remove engine screws
Removing oil pan
Remove intake pipe
Remove bottom engine housing
Removing shaft sealing ring of output shaft

Core activity

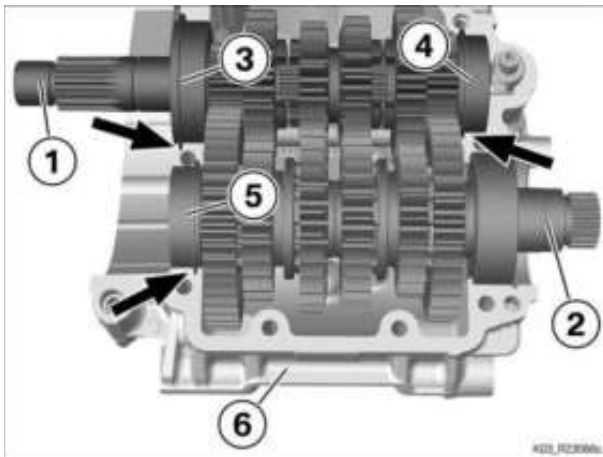
(-) Removing gearbox shafts

- Remove transmission input shaft (1) and transmission output shaft (2) from engine housing (3).



(-) Installing gearbox shafts

- Install transmission input shaft (1) and transmission output shaft (2) and while doing so, ensure that circlips (3), (4) and (5) fit correctly in the grooves (arrows) of engine housing (6).



Follow-up work

Install engine housing, bottom

Install intake pipe

Installing oil pan

Check OT marks

Turning engine through several revolutions and making sure that all components move freely

Install alignment pin

Installing clutch cage

Installing driver

Installing plate cluster

Install thrust piece

Installing pressure plate

Removing locating pin

Installing cylinder head cover

Installing direct ignition coil

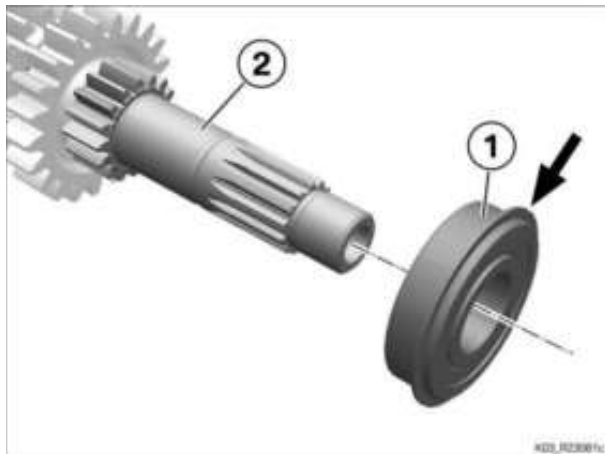
Installing oil suction pump

- Installing right crankcase cover
- Installing impeller
- Installing cover for coolant pump
- Install adapter
- Installing layshaft for starter
- Installing left crankcase cover
- Installing shaft sealing ring of output shaft
- Removing engine from assembly stand
- Installing starter

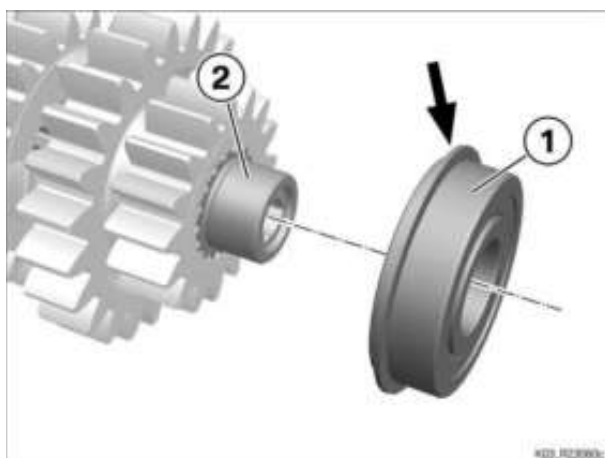
23 21 510 Replace input shaft (gearbox removed)

Core activity

(-) Installing transmission input shaft bearing



- Slide **new** ball bearing (1) onto transmission input shaft (2) and while doing so, pay attention to the alignment of the bearing fixing (Arrow).

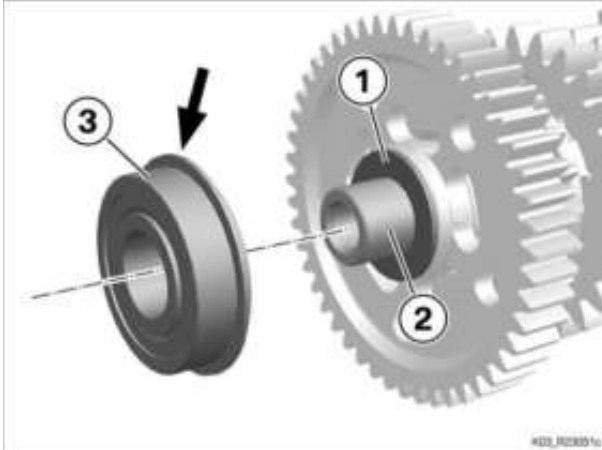


- Slide **new** ball bearing (1) onto transmission input shaft (2) and while doing so, pay attention to the alignment of the bearing fixing (Arrow).

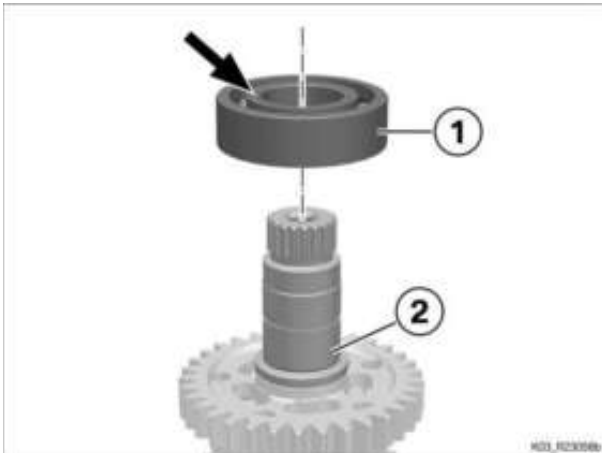
23 21 540 Replacing output shaft (gearbox removed)

Core activity

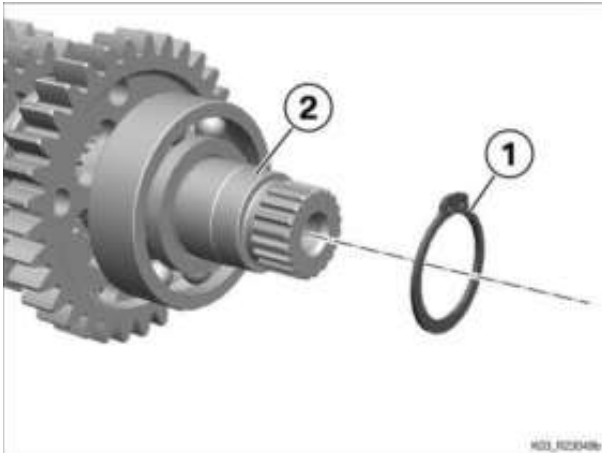
(-) Installing bearings of gearbox output shaft



- Ensure that the thrust washer (1) is installed.
- Slide **new** ball bearing (3) onto transmission output shaft (2) and while doing so, pay attention to the alignment of the bearing fixing (arrow).



- Press **new** ball bearing (1) on transmission output shaft (2) and while doing so, subject inner ring (arrow) to load.



- Install **new** circlip (1) in transmission output shaft (2).

23 31 120 Replacing locking lever

+ 23 31 620

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Draining coolant

Removing cover for coolant pump

Removing impeller

Removing the cable duct for the brake light switch

Releasing footbrake cylinder

Removing right crankcase cover

Remove the pressure plate

Removing thrust piece and pushrod

Removing plate cluster

Removing crankshaft cover

Lock the crankshaft in TDC position

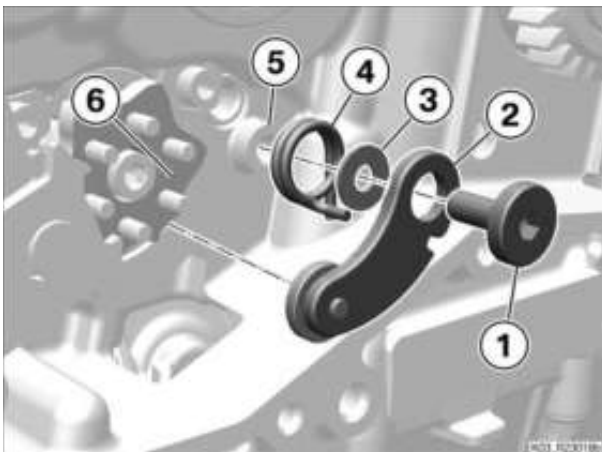
Removing driver

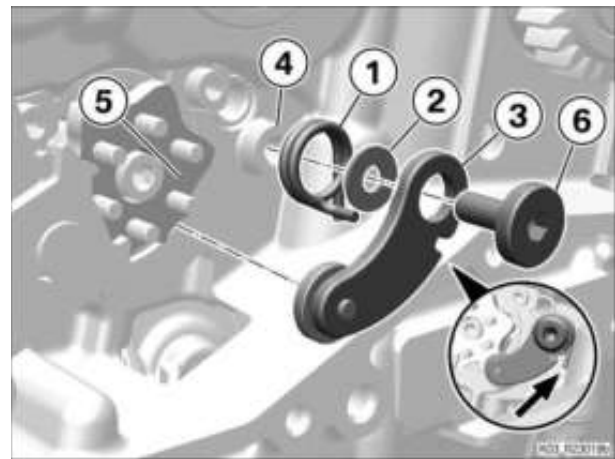
Removing clutch basket

Core activity

(-) Removing locking lever

- Remove bolt (1), stop lever (2), thrust washer (3) and spring (4) from engine housing (5) and stop star (6).





(-) Installing locking lever

- Lubricate the components with engine oil.
- Fit spring (1) and thrust washer (2) on stop lever (3), paying attention to correct position while doing so.
- Fit stop lever (3), thrust washer (2) and spring (1) on engine housing (4) and stop star (5).
- Fit spring (1) correctly on engine housing (arrow).
- Install screw (6).

 Tightening torques		
Locking lever to crankcase		
M6 x 16	10 Nm	

Follow-up work

- Installing clutch cage
- Installing driver
- Installing plate cluster
- Install thrust piece
- Installing pressure plate
- Removing locating pin
- Installing right crankcase cover
- Securing footbrake cylinder
- Installing the cable duct for the brake light switch
- Installing impeller
- Installing cover for coolant pump
- Installing crankshaft cover
- Filling cooling system
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Installing engine spoiler
- Checking engine oil level
- Final check of work performed

23 31 130 Replacing selector shaft

+ 23 31 904

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Draining coolant

Removing cover for coolant pump

Removing impeller

Removing the cable duct for the brake light switch

Releasing footbrake cylinder

Removing right crankcase cover

Remove the pressure plate

Removing thrust piece and pushrod

Removing plate cluster

Removing crankshaft cover

Lock the crankshaft in TDC position

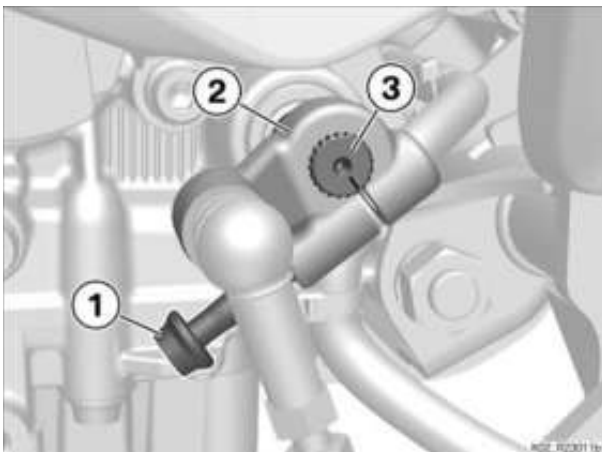
Removing driver

Removing clutch basket

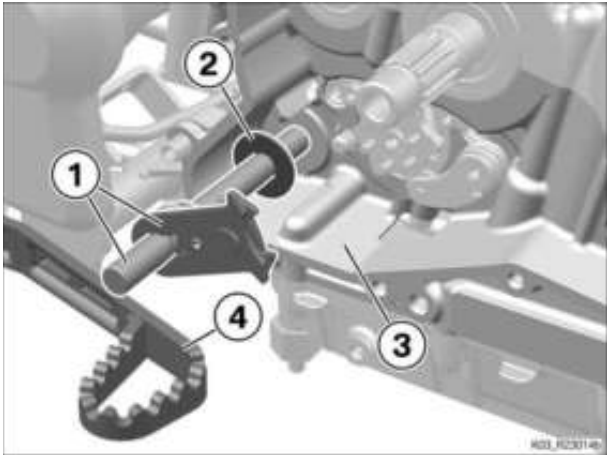
Core activity

(-) Disengaging shift lever

- Slacken screw (1).
- Disengage shift lever (2) from selector shaft (3) and remove.

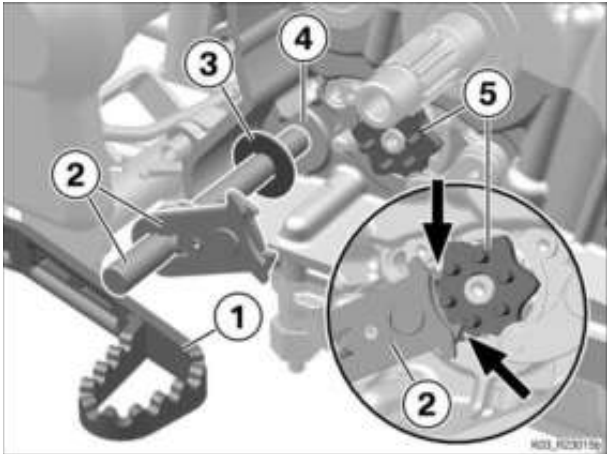


(-) Remove the selector shaft



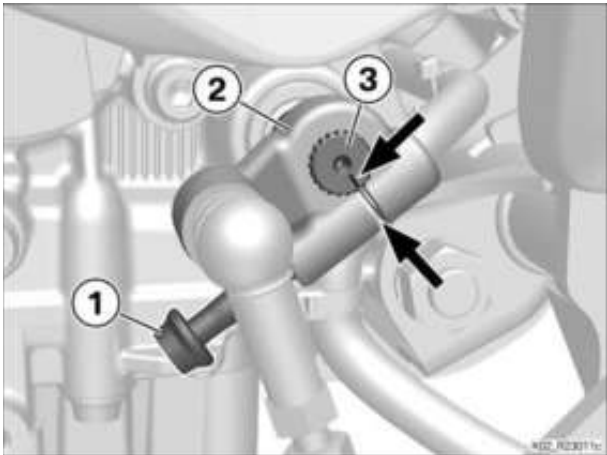
- Remove gearshift shaft (1) and thrust washer (2) from engine housing (3), operating the footbrake lever (4) at the same time if required, in order to facilitate removal.

(-) Installing selector shaft



- Operate footbrake lever (1) if required in order to facilitate installation of the gearshift shaft (2).
- Insert gearshift shaft (2) with thrust washer (3) in engine housing (4). While doing so, ensure that the shift star (5) is located in the intervention (arrows) of the gearshift shaft (2).

(-) Securing selector lever



- Clean the threads.
- Push shift lever (1) on to selector shaft (2).
- » Mark on selector shaft is aligned with the gap (arrows) of shift lever (1).
- Tighten screw (3).

 Tightening torques		
Selector lever to selector shaft		
M6 x 30 Thread-locking compound (Loctite 243, Medium strength)	8 Nm	

Follow-up work

Installing clutch cage

Installing driver

Installing plate cluster

- Install thrust piece
- Installing pressure plate
- Removing locating pin
- Installing right crankcase cover
- Securing footbrake cylinder
- Installing the cable duct for the brake light switch
- Installing impeller
- Installing cover for coolant pump
- Installing crankshaft cover
- Filling cooling system
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Installing engine spoiler
- Checking engine oil level
- Final check of work performed

23 31 502 Replacing shift forks (engine removed)

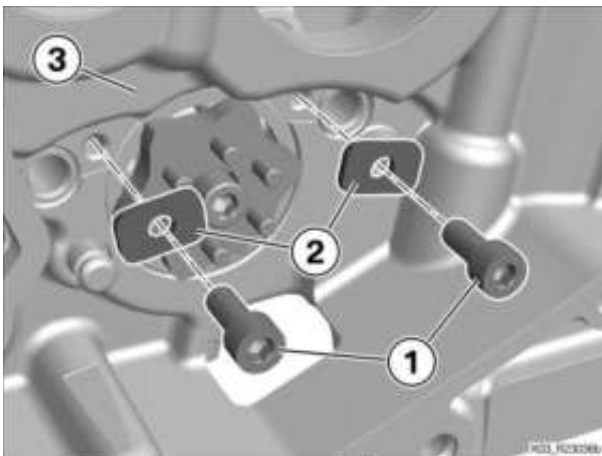
Preparatory work

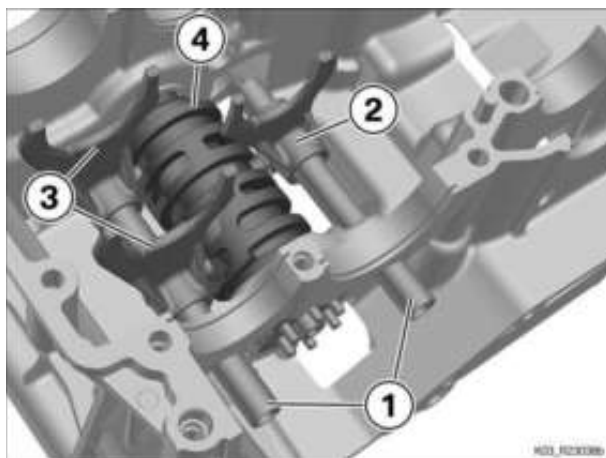
- Removing starter
- Securing engine to assembly stand
- Removing cover for coolant pump
- Removing impeller
- Removing right crankcase cover
- Removing oil suction pump
- Removing left crankcase cover
- Removing layshaft for starter
- Remove adapter
- Removing direct ignition coil
- Removing cylinder head cover
- Adjust engine to firing TDC
- Install alignment pin
- Removing rotor
- Removing locating pin
- Remove engine screws
- Removing oil pan
- Remove intake pipe
- Remove bottom engine housing
- Removing shaft sealing ring of output shaft
- Remove the selector shaft
- Removing locking lever

Core activity

(-) Remove the shift forks

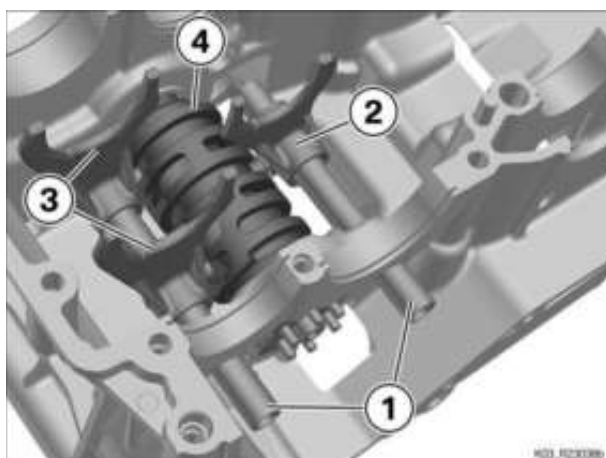
- Remove screws (1) and remove retaining plate (2) from engine housing (3).



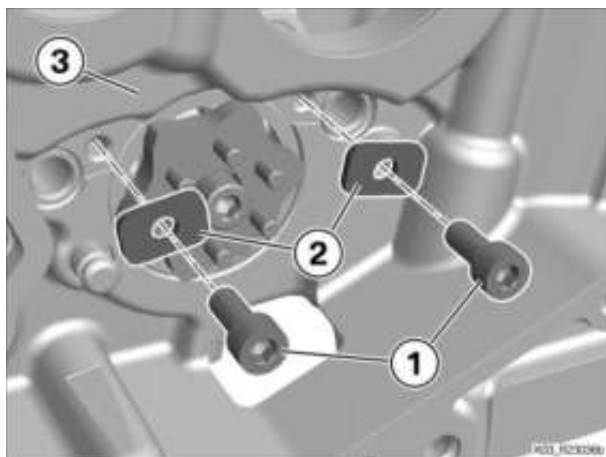


- Pull out axles (1) and remove gearshift forks (2) and (3) from selector drum (4).

(-) Installing shift forks



- Lubricate axles (1) and gearshift forks (2) and (3) with engine oil.
- Insert gearshift forks (2) and (3) in selector drum (4) and install axles (1).



- Position retaining plate (2) on engine housing (3) and install screws (1).

 Tightening torques		
Retaining plate for selector drum/shift-fork axles to crankcase		
M5 x 12	6 Nm	

Follow-up work

Installing locking lever
 Installing selector shaft
 Install engine housing, bottom
 Install intake pipe
 Installing oil pan
 Install engine screws

Installing shaft sealing ring of output shaft

Check OT marks

Turning engine through several revolutions and making sure that all components move freely

Installing cylinder head cover

Installing direct ignition coil

Install alignment pin

Installing rotor

Removing locating pin

Install adapter

Installing layshaft for starter

Installing left crankcase cover

Installing oil suction pump

Installing right crankcase cover

Installing impeller

Installing cover for coolant pump

Removing engine from assembly stand

Installing starter

23 31 626 Replacing shift drum (engine removed)

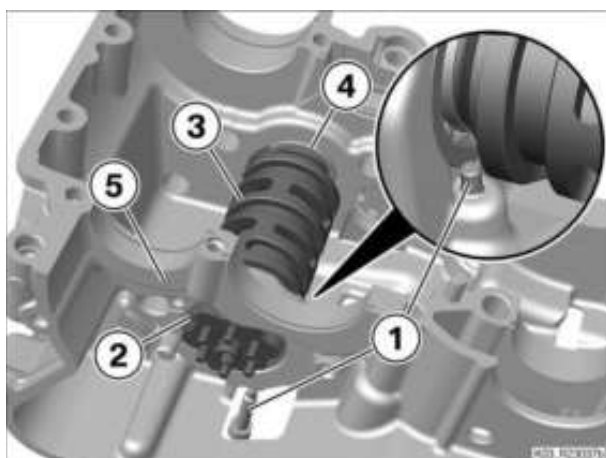
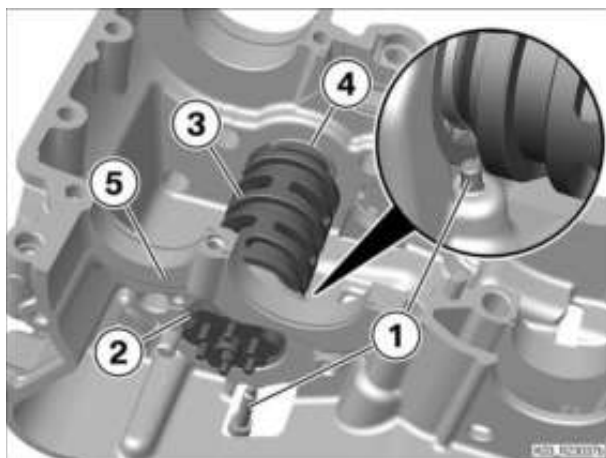
Preparatory work

Removing starter
Securing engine to assembly stand
Removing cover for coolant pump
Removing impeller
Removing right crankcase cover
Removing oil suction pump
Removing left crankcase cover
Removing layshaft for starter
Remove adapter
Removing direct ignition coil
Removing cylinder head cover
Adjust engine to firing TDC
Install alignment pin
Removing rotor
Removing locating pin
Remove engine screws
Removing oil pan
Remove intake pipe
Remove bottom engine housing
Removing shaft sealing ring of output shaft
Remove the selector shaft
Removing locking lever
Remove the shift forks

Core activity

(-) Removing selector drum with star-shaped locking element

- Remove locating screw (1).
- Remove ball bearing (2) with selector drum (3) from needle bearing (4) and engine housing (5).



(-) Installing selector drum with star-shaped locking element

- Lubricate needle bearing (4), selector drum (3) and ball bearing (2) with engine oil.
- Install selector drum (2) with ball bearing (3) in engine housing (5) and install in needle bearing (4).
- Install retaining screw (1) and while doing so, ensure that it lies correctly on ball bearing (2).



Tightening torques

Retaining screw (selector drum) to crankcase

M6 x 28,5

10 Nm

Follow-up work

Installing shift forks

Installing locking lever

Installing selector shaft

Install engine housing, bottom

Install intake pipe

Installing oil pan

Install engine screws

Installing shaft sealing ring of output shaft

Check OT marks

Turning engine through several revolutions and making sure that all components move freely

Installing cylinder head cover

Installing direct ignition coil

Install alignment pin

Installing rotor

Removing locating pin

Install adapter

Installing layshaft for starter

Installing left crankcase cover

Installing oil suction pump

Installing right crankcase cover

Installing impeller

Installing cover for coolant pump

Removing engine from assembly stand

Installing starter

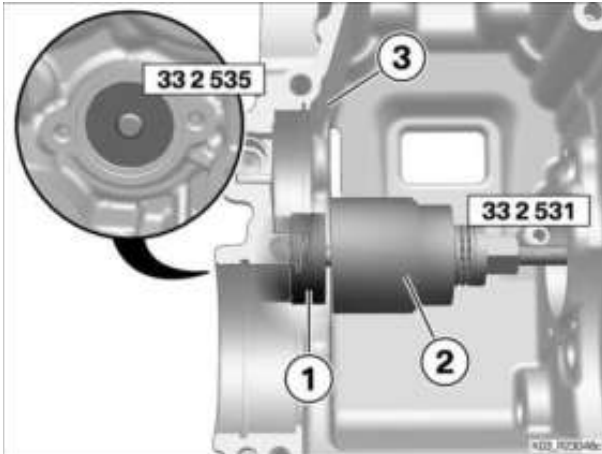
23 31 627 Replacing bearing for shift drum (shift drum removed)

Preparatory work

Removing potentiometer for gear indicator

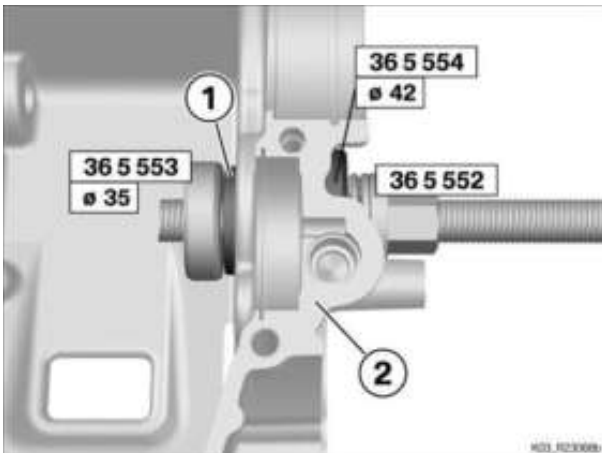
Core activity

(-) Removing bearing for selector drum



- Position washer (No. 33 2 535) on bearing (1).
- Insert the spindle with thrust nut (No. 33 2 531) and matching socket (2) in washer (No. 33 2 535) position on lower engine housing (3) and pretension.
- Remove bearing (1) from bottom engine housing (3).
- Remove the tools.

(-) Install bearing for selector drum



- Lubricate **new** bearing (1) with engine oil.
- Insert bearing (1) into engine block (2).
- Position the short spindle with thrust nut (No. 36 5 552), thrust piece without thread 42 mm (No. 36 5 554) and thrust piece with thread 35 mm (No. 36 5 553).
- Insert bearing (1) into engine block to the limit position (2).
- Remove the tools.

Follow-up work

Install the potentiometer for gear indicator

 23 41 300 Removing/installing or replacing gearshift lever

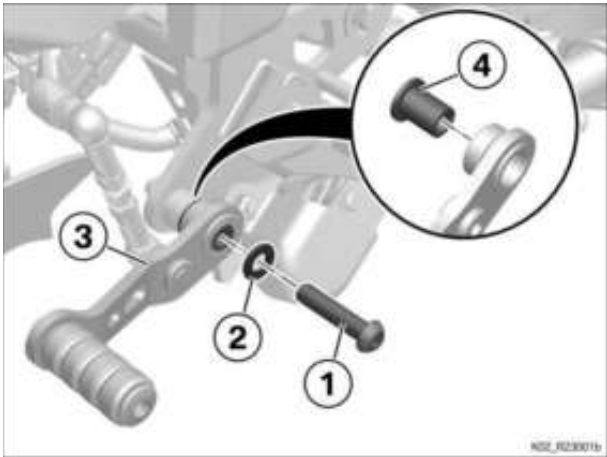
+ 23 41 551

Preparatory work

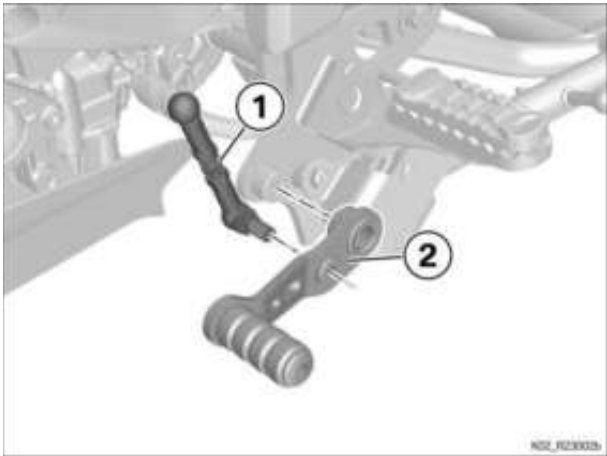
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

(-) Removing shift lever



- Remove bolt (1) with washer (2).
- Release gearshift lever (3).
- Remove bush (4).

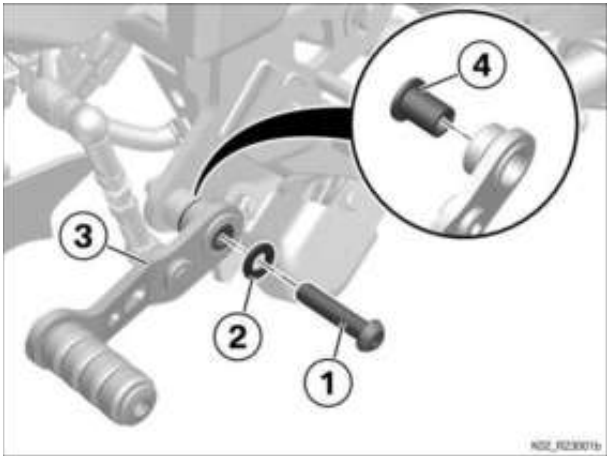
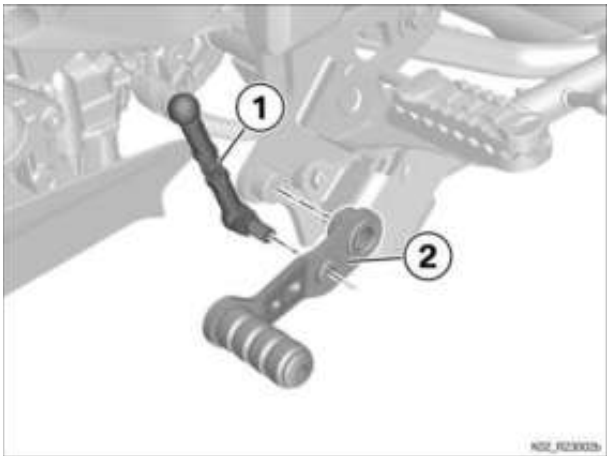


- Release ball head (1) with gearshift rod from gearshift lever (2).
- Remove gearshift lever (2).

(-) Installing shift lever

- Install ball head with gearshift rod (1) in gearshift lever (2).

 Tightening torques		
Selector rod to gearbox/gearshift lever		
M6 x 20	8 Nm	



- Clean and lubricate bush (4).

 Lubricant	
Staburags NBU 30 PTM	07 55 9 056 992

- Install bush (4) **on the inside** in gearshift lever (3).
- Position gearshift lever (3) and install bolt (1) with washer (2).

 Tightening torques		
Gearshift lever to main frame		
M8 x 35	19 Nm	

Follow-up work

Final check of work performed

 23 41 310 Adjusting gearshift lever

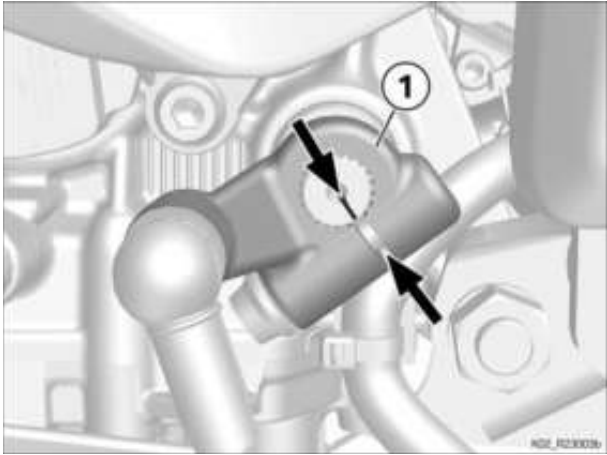
+ 23 41 510

Core activity

(-) Checking and, if necessary, adjusting position of gearshift lever

Check

- Check position of the gearshift lever (1). Mark on selector shaft and gap (arrows) must be aligned with **gearbox is in neutral position**.



Result:

- Shift lever is incorrectly installed.

Measure:

- Reposition gearshift lever (1).

 Tightening torques		
Selector lever to selector shaft		
M6 x 30 Thread-locking compound (Loctite 243, Medium strength)	8 Nm	

- Check the ease of movement of the components of the gearshift linkage; remove, clean and lubricate if necessary.

 Lubricant	
Staburags NBU 30 PTM	07 55 9 056 992

- Ensure that customer-specific settings are correct, for example the setting for seat height.
- Have the customer don suitable footwear and assume the usual riding position on the motorcycle.



Check

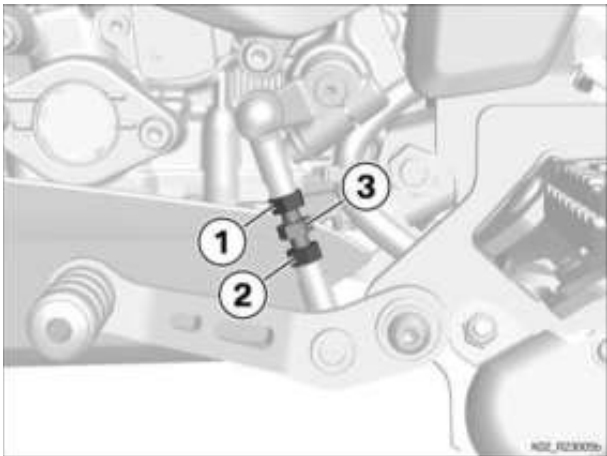
Result:

- When not touched, the gearshift lever is not on a level with the rider's toe joint.

Measure:

► Adjusting shift lever

- Slacken nut (1) (left-hand thread) and nut (2).
- Adjust the position of the shift lever by turning shift rod (3), noting the depth of thread engagement of shift rod (3).



 Technical data			
Screw-in depth, selector rod in ball head		min. 3 full threads	

- Tighten nut (1) (left-hand thread) and nut (2).



- Have the customer take the motorcycle for a test ride to check the setting; readjust if necessary.

 NOTICE

A poorly adjusted shift lever has a negative effect on the shiftability of the gearbox.

Follow-up work

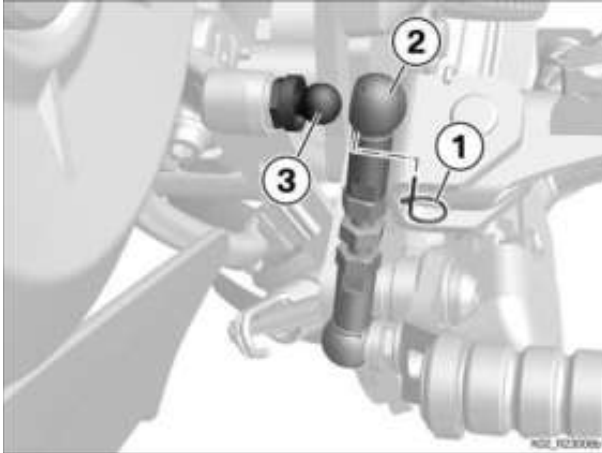
Final check of work performed

23 41 325 Replacing selector rod on pedals

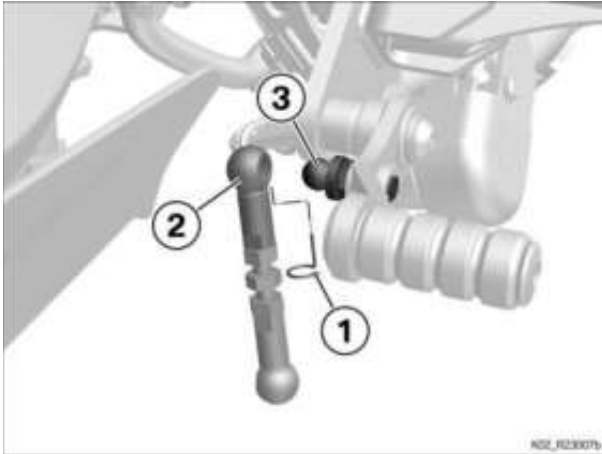
+ 23 41 555

Core activity

(-) Removing shift rod

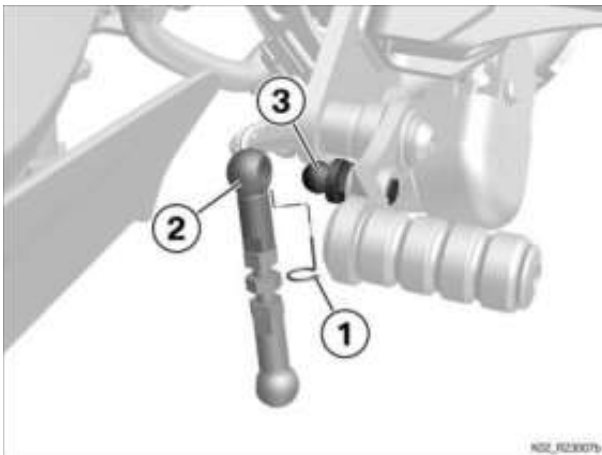


- Remove retaining clip (1).
- Release gearshift rod (2) from ball head (3).



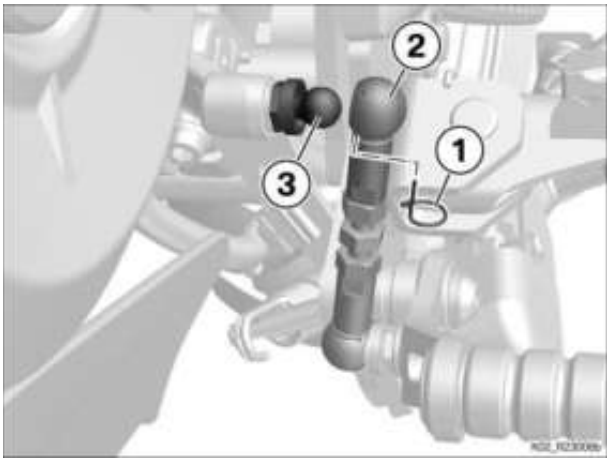
- Remove retaining clip (1).
- Release gearshift rod (2) from ball head (3) and remove.

(-) Installing shift rod



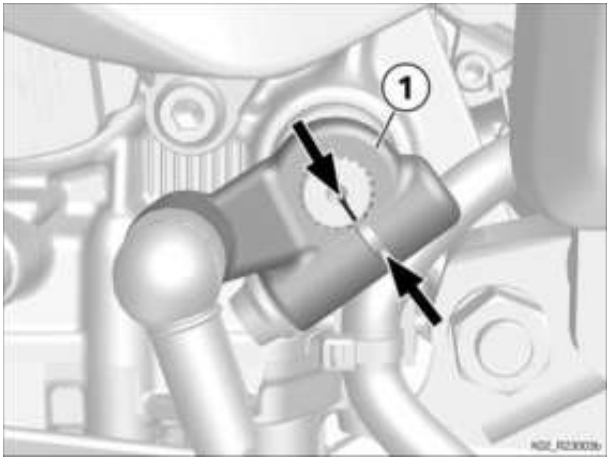
- Push gearshift rod (2) on ball head (3).
- Install retaining clip (1).

- Push gearshift rod (2) on ball head (3).



- Install retaining clip (1).

(-) Checking and, if necessary, adjusting position of gearshift lever



Check

- Check position of the gearshift lever (1). Mark on selector shaft and gap (arrows) must be aligned with **gearbox is in neutral position**.

Result:

- Shift lever is incorrectly installed.

Measure:

- Reposition gearshift lever (1).

 Tightening torques		
Selector lever to selector shaft		
M6 x 30 Thread-locking compound (Loctite 243, Medium strength)	8 Nm	

- Check the ease of movement of the components of the gearshift linkage; remove, clean and lubricate if necessary.

 Lubricant	
Staburags NBU 30 PTM	07 55 9 056 992



- Ensure that customer-specific settings are correct, for example the setting for seat height.
- Have the customer don suitable footwear and assume the usual riding position on the motorcycle.



Check

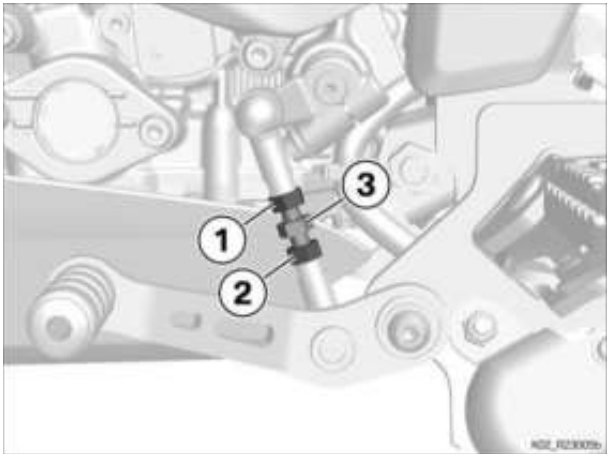
Result:

- When not touched, the gearshift lever is not on a level with the rider's toe joint.

Measure:

► Adjusting shift lever

- Slacken nut (1) (left-hand thread) and nut (2).
- Adjust the position of the shift lever by turning shift rod (3), noting the depth of thread engagement of shift rod (3).



 Technical data			
Screw-in depth, selector rod in ball head		min. 3 full threads	

- Tighten nut (1) (left-hand thread) and nut (2).

Have the customer take the motorcycle for a test ride to check the setting; readjust if necessary.

 NOTICE

A poorly adjusted shift lever has a negative effect on the shiftability of the gearbox.

Follow-up work

Final check of work performed

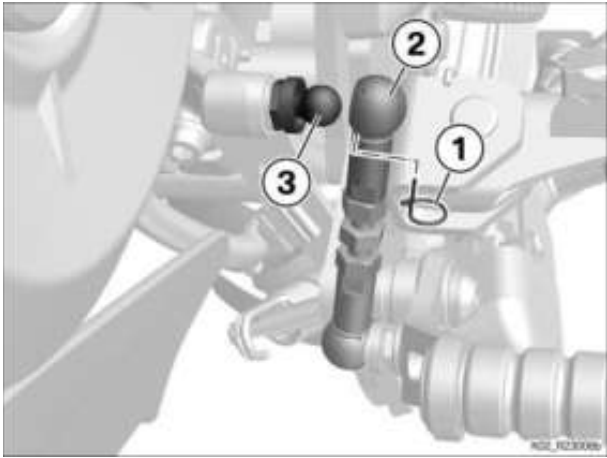
 23 41 329 Replacing shift lever on selector shaft

+ 23 41 556

Core activity

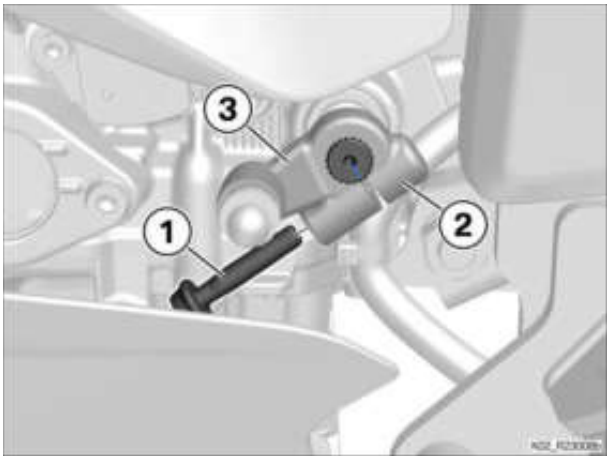
(-) Disengaging shift rod

- Remove retaining clip (1).
- Release gearshift rod (2) from ball head (3).



(-) Removing shift lever

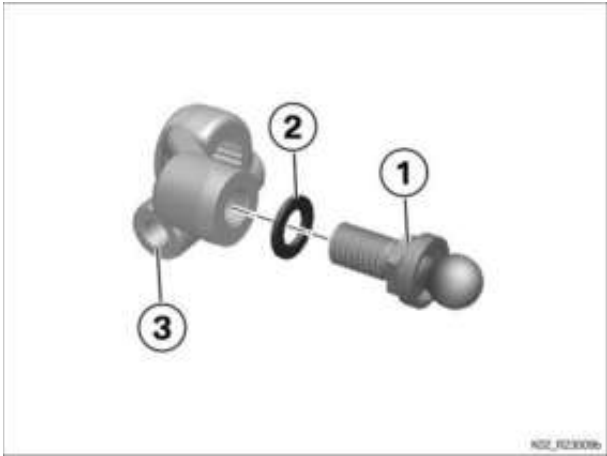
- Remove bolt (1).
- Release gearshift lever (2) from gearshift shaft (3) and remove.



(-) Replacing gear lever

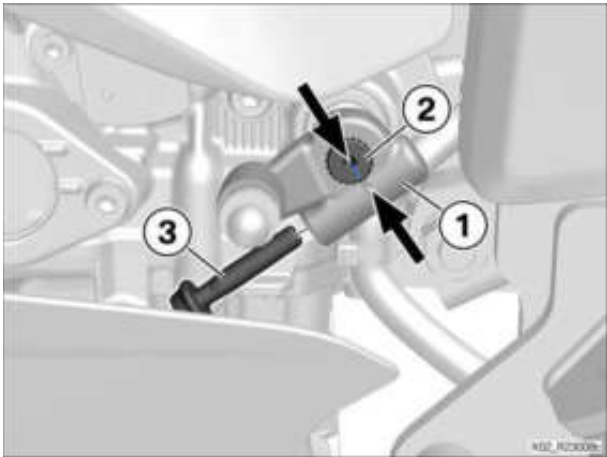
- Remove ball stud (1) and washer (2) from the gearshift lever (3).
- Install ball stud (1) and washer (2) on the new gearshift lever (3).

 Tightening torques		
Selector rod to gearbox/gearshift lever		
M6 x 20	8 Nm	



(-) Installing shift lever

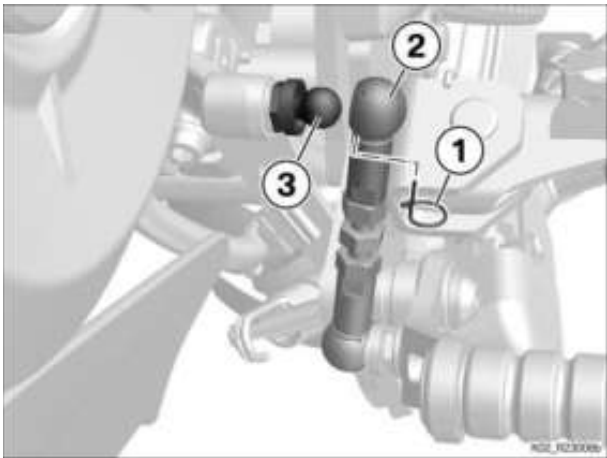
- Push gearshift lever (1) on gearshift shaft (2).
- » Mark on gearshift shaft is aligned with the gap (arrows) of gearshift lever (1).
- Install bolt (3).



 Tightening torques		
Selector lever to selector shaft		
M6 x 30 Thread-locking compound (Loctite 243, Medium strength)	8 Nm	

(-) Securing selector rod

- Push gearshift rod (2) on ball head (3).
- Install retaining clip (1).



Follow-up work

Final check of work performed

31 42 005 Oil change in telescopic front forks

+ 31 42 899

NOTICE

To guarantee optimum functioning, renew following parts during oil change:

Sliding bush, sealing, circlip , dust boot.

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Installing engine lifter

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing front-wheel cover

Loosening the front brake caliper and brake line

Removing front wheel

Disengaging front wheel-speed sensor

Loosen lid for fork leg

Removing both fork legs

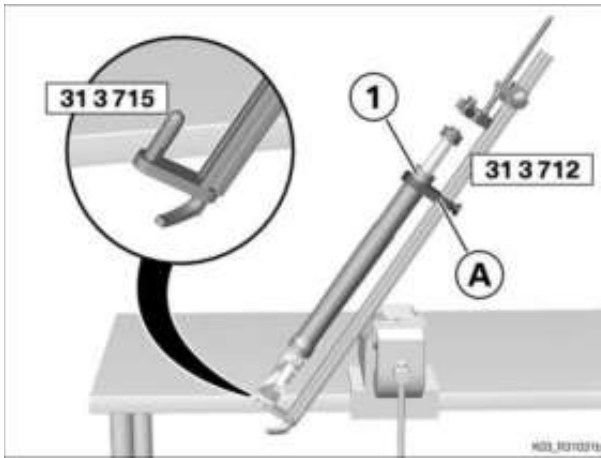
Core activity

(-) Draining oil from right fork legs

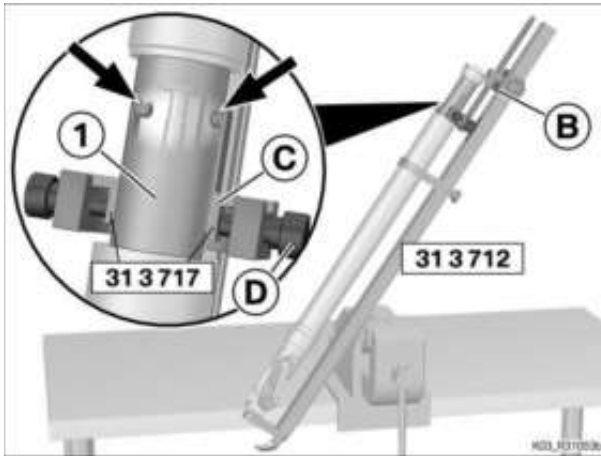
- Firmly and repeatedly compress the fork leg to free any dirt that may be inside.
- Screw out lid (1) fully with special wrench **SW17** (No. 31 1 521) and special wrench mounting (No. 31 1 529) and carefully lower fixed fork tube (2).
- Drain the oil from the fork leg into a suitable container.



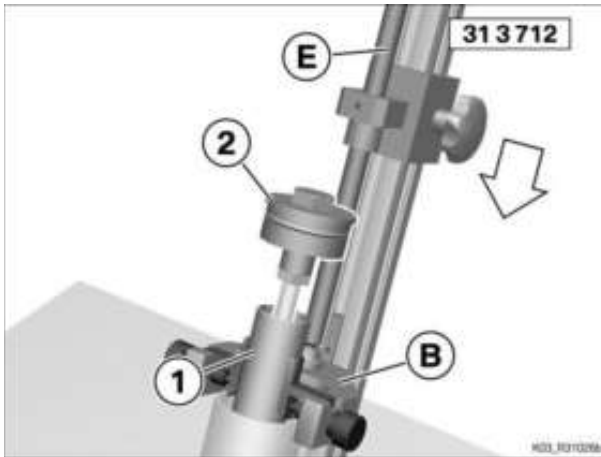
- Install fixture (No. 31 3 715) into pre-tensioning tool (No. 31 3 712).
- Insert fork leg (1) in pre-tensioning tool (No. 31 3 712).



- Secure fork leg (1) with rubber retainer (A).

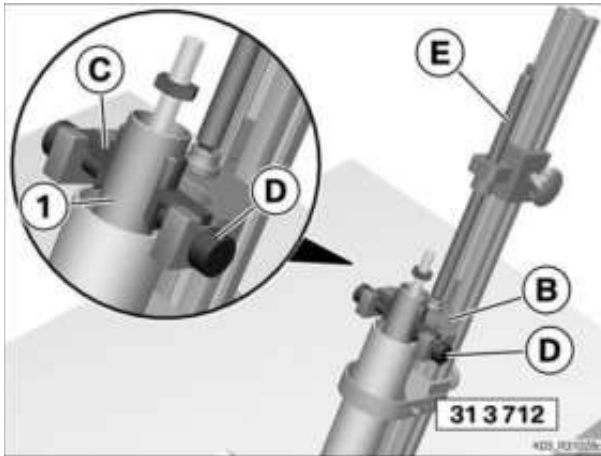
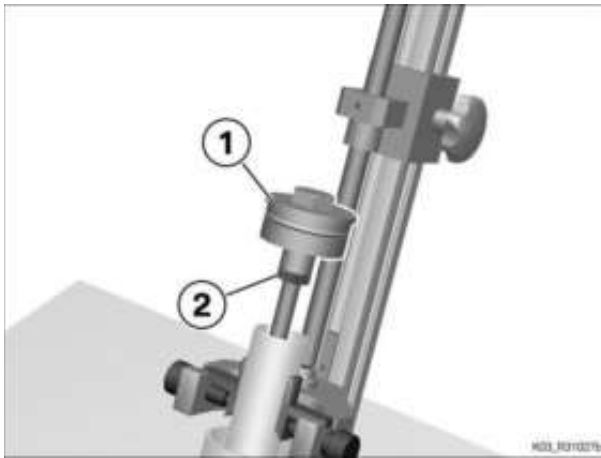


- **Rotate** hold-down tool (B) out of pre-tensioning tool (No. 31 3 712) and position it.
- Position **long mountings** (C) (No. 31 3 717) with knurled screws (D) in bore holes (Arrows) of the bush (1).

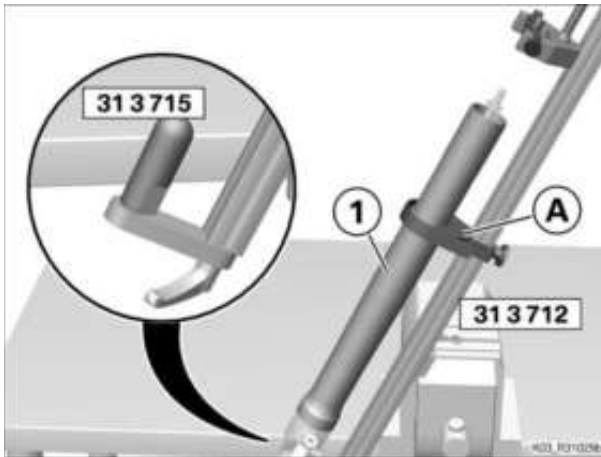


- Press bush (1) down with press-down tool (B) and spindle (E) out of pre-tensioning tool (No. 31 3 712).
- Pull lid (2) **up**.

- Counter-hold lid (1) with special wrench **SW17** (No. 31 1 521) and special wrench mounting (No. 31 1 529) and loosen lock nut (2).
- Remove lid (1) and lock nut (2).

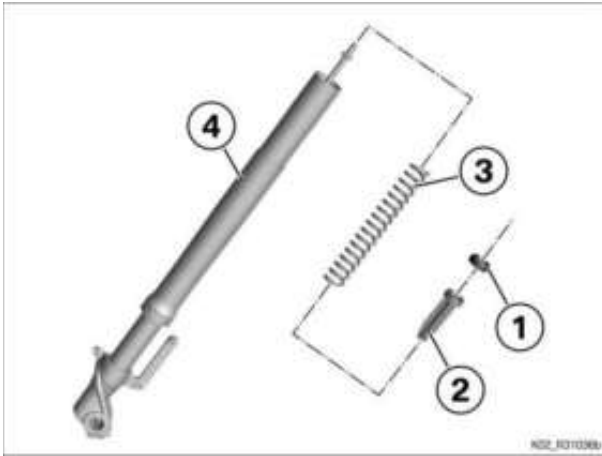


- Rotate hold-down tool (B) with spindle (E) out of pre-tensioning tool (No. 31 3 712) in the reverse direction.
- Loosen mountings (C) with knurled screws (D) out of bush (1).
- Remove bush (1).



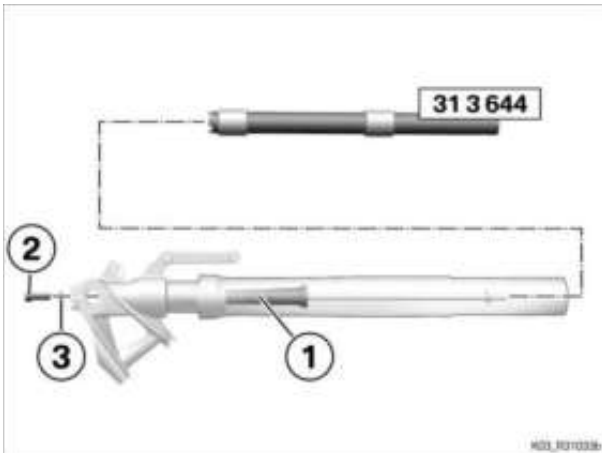
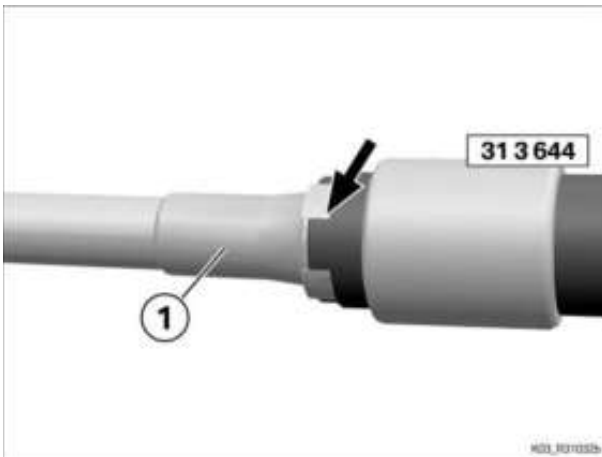
- Disengage pre-tensioning tool (No. 31 3 712) and relieve tension.
- Loosen rubber retainer (A) and remove fork leg (1) from mounting (No. 31 3 715).

- Remove spacer (1) spring guide (2) and compression spring (3) from fork leg (4).
- Carefully turn fork leg (4) over and drain the rest of the oil.



(-) Removing damper unit from right fork leg

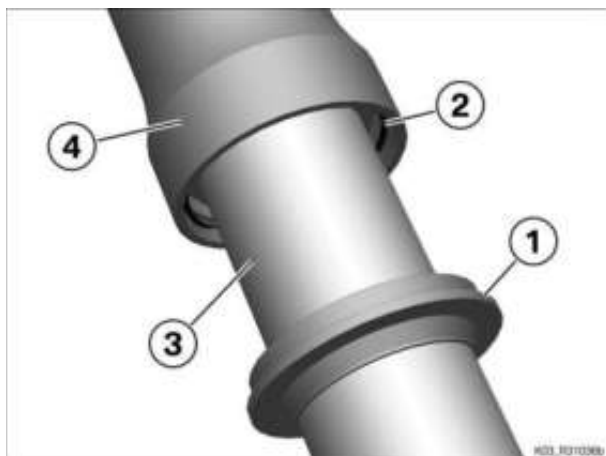
- When inserting the counter support (No. 31 3 644), make sure that the gearing (arrow) of counter support (No. 31 3 644) and damper unit (1) engage in each other.



- Insert counter support (No. 31 3 644) into the fork leg and counter-hold damper unit (1).
- Remove screw (2) with sealing ring (3).
- Remove damper unit (1).
- Pump damper unit (1) to drain it fully.

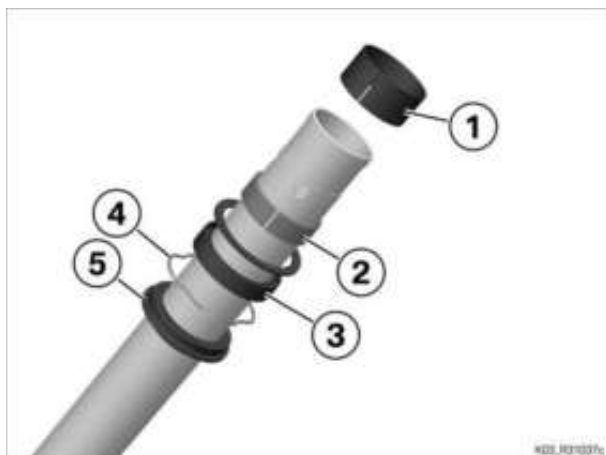
(-) Remove slider tube, right

- Loosen dust boot (1) with a suitable tool.
- Disengage circlip (2).
- Remove slider tube (3) with a strong jerk from fixed fork tube (4).



- Spread top slide bush (1) and bottom slide bush (2) slightly using a suitable tool and remove.
- Remove support disc (3), fork sealing ring (4), circlip (5) and dust boot (6).
- Check support disc (3) for deformations and damage; replace if necessary.

(-) Renew sealing and bearing



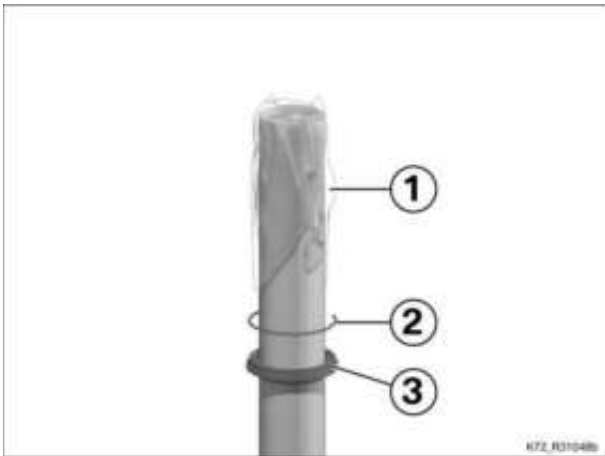
- Renew the following parts:
- Sliding bushes at top (1) and bottom (2)
- Fork sealing ring (3) and circlip (4)
- sealing boot (5)

(-) Install slider tube, right

- Slip a bag (1) over the **new** slider tube so as not to damage the new sealing ring on the sharp edges.
- Lubricate the **new** dust boot (3) lightly on the inside.



Lubricant



Molykote 111	11 00 7 660 832
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- Push a **new** dust boot (3) and circlip (2) on the slider tube.

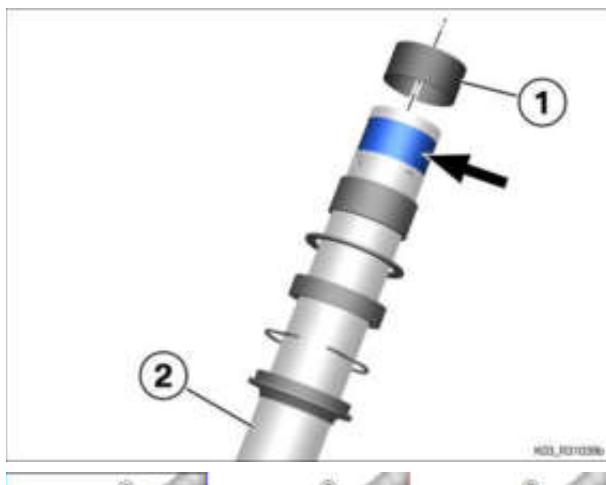
- Lubricate the **inner** sealing lips of the sealing ring (1) lightly.

 Lubricant	
Molykote 111	11 00 7 660 832

- Note the installation position: the protruding sealing lip (arrow) points in the direction of the dust boot.

- Lubricate components with fork oil.
- Push support disc (1) and bottom sliding bush (2) on slider tube (3).
- Remove bag (4).

- Lubricate upper sliding bush (1) with fork oil.
- Spread upper sliding bush (1) slightly and install in the bead (Arrow) of the slider tube (2).



- Carefully slide the fixed fork tube (1) onto the slider tube (2).
- Lubricate bottom sliding bush (3).

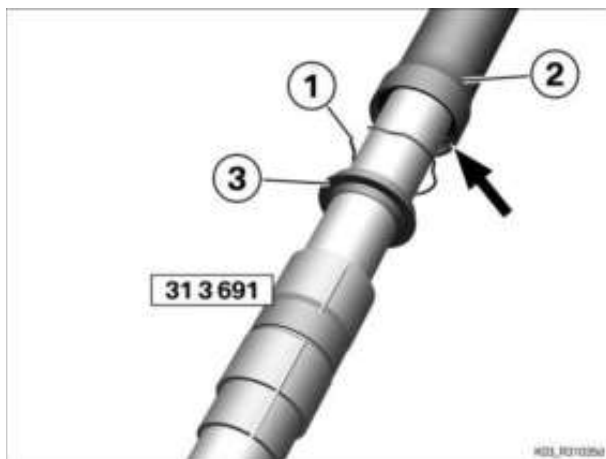


Lubricant

Molykote 111

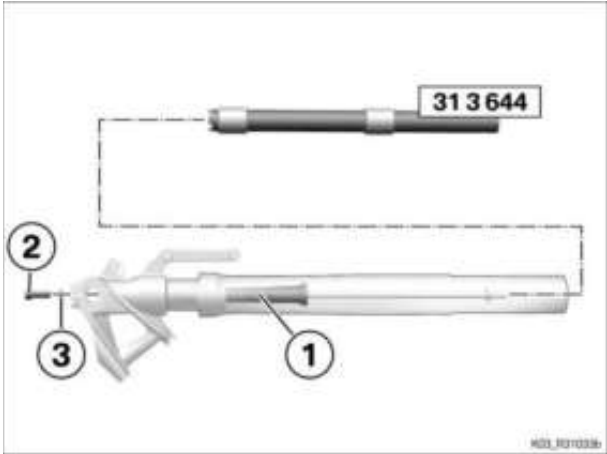
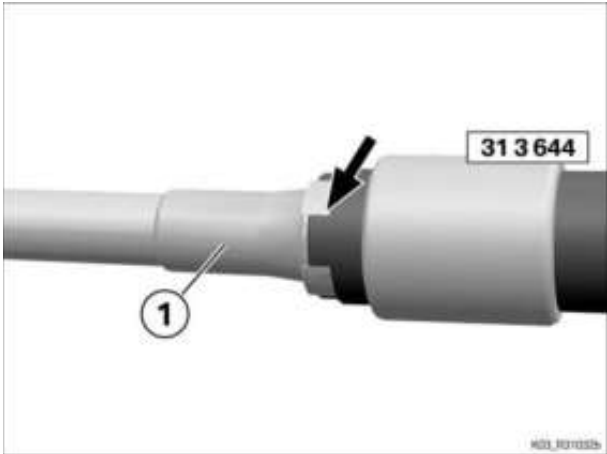
11 00 7 660 832

- Position lower sliding bush (3) in fixed fork tube (1).
- Install lower sliding bush (3) and support disc (4) with impact bush (No. 31 3 691).
- Install sealing ring (5) with impact bush (No. 31 3 691)(No. 31 3 692).
- Install a **new** circlip (1) and while doing so, pay attention to its correct seating in the groove (Arrow) of fixed fork tube (2).
- Turn impact bush (No. 31 3 691) over and install a **new** dust boot (3) into the fixed fork tube (2).



(-) Installing the damper unit in the right fork leg

- When inserting the counter support (No. 31 3 644), make sure that the gearing (arrow) of counter support (No. 31 3 644) and damper unit (1) **engage in each other**.

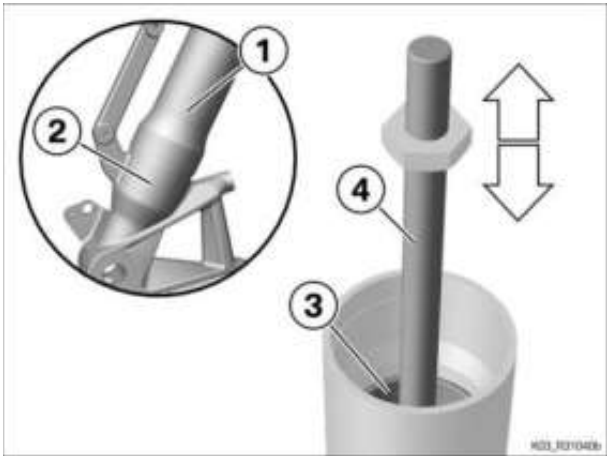


- Clean the threads.
- Install damper unit (1).
- Insert counter support (No. 31 3 644) into the fork leg and counter-hold damper unit (1).
- Install screw (2) with new sealing ring (3).

 Tightening torques		
Damper unit to fork base		
M10 x 25 - 10.9	23 Nm	
Thread-locking compound (Loctite 243, Medium strength)		

(-) Pouring oil into right fork leg

- Carefully lower the fixed fork tube (1) all the way onto the forkleg (2).
- Fill oil into the slider tube (3).



 Technical data		
Fork oil, capacity of right fork leg	approx. 395 ml	
Telescopic fork oil (Telescope fork oil type 3)		

- Move the piston rod (4) of the damper unit up and down several times.
- » The damper unit is filled with oil and is bled.
- Allow the oil to settle for a few minutes.
- Repeat the procedure until the oil is free of bubbles and the oil level no longer changes.

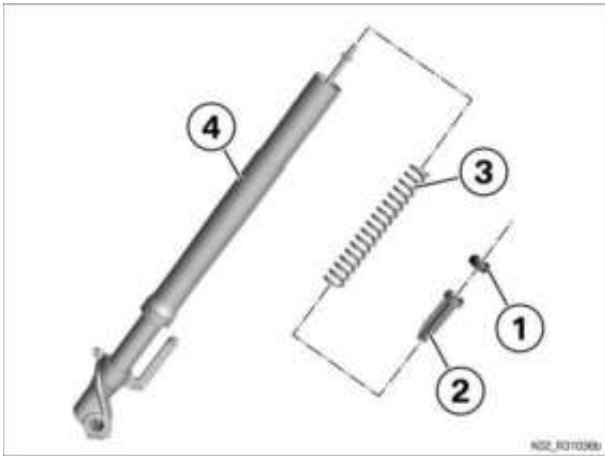
► Adjusting the right-side oil level

- Place the fork leg vertical.
- Adjust the correct oil level according to the filler dipstick (No. 31 6 551), place the filler dipstick **on the fixed fork tube (inner tube)** and draw off excess oil.

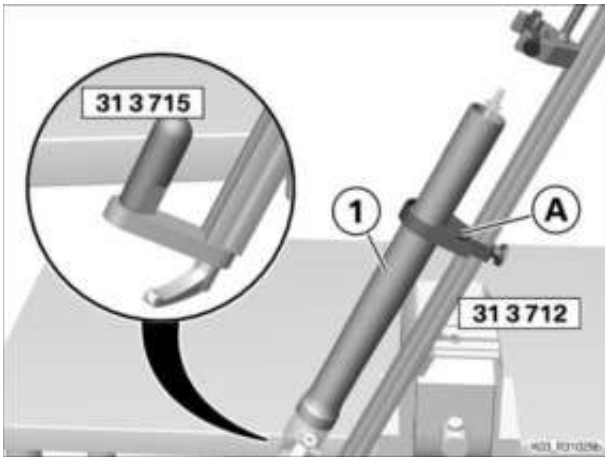


Technical data

Fork oil level, right (air cushion)	Forks and piston rod fully compressed, compression spring and sleeve removed, measured on slider tube	110 mm	
Telescopic fork oil (Telescope fork oil type 3)			

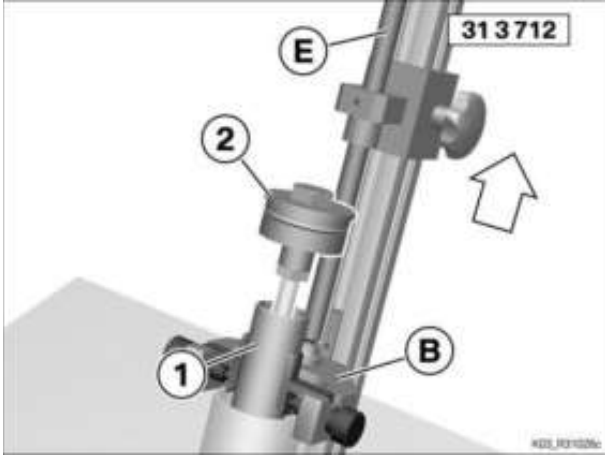
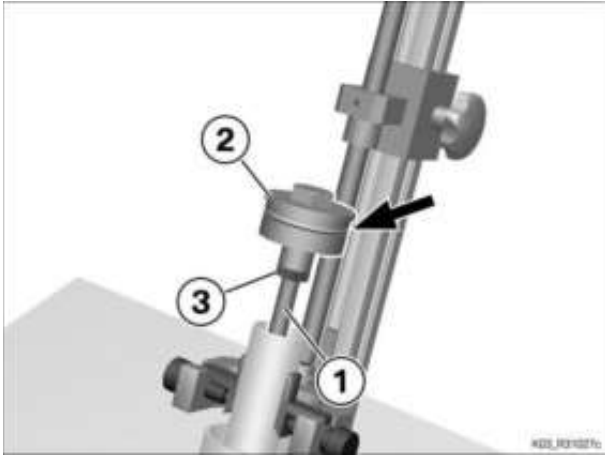
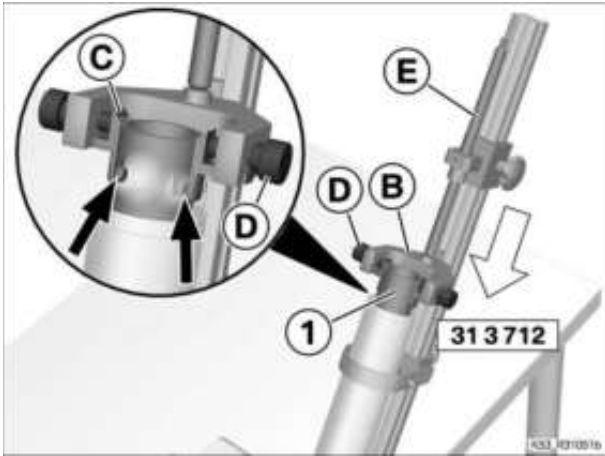


- Install compression spring (3) and spring guide (2) in forkleg (4).
- » The tapered winding of the compression spring (3) points downwards, spring guide(2) lies **inside** the compression spring.
- Install support disc (1) (inner edge in spring guide (2)).



- Position fork leg (1) on mounting (No. 31 3 715) and insert in pre-tensioning tool(No. 31 3 712).
- Secure fork leg (1) with rubber retainer (A).

- Install bush (1).
- Position hold-down tool (B) out of pre-tensioning tool (No. 31 3 712).
- Position mountings (C) in bore holes (Arrows) of bush (1) using knurled screws (D).
- Press bush (1) down with press-down tool (B) and spindle (E) out of pre-tensioning tool (No. 31 3 712).

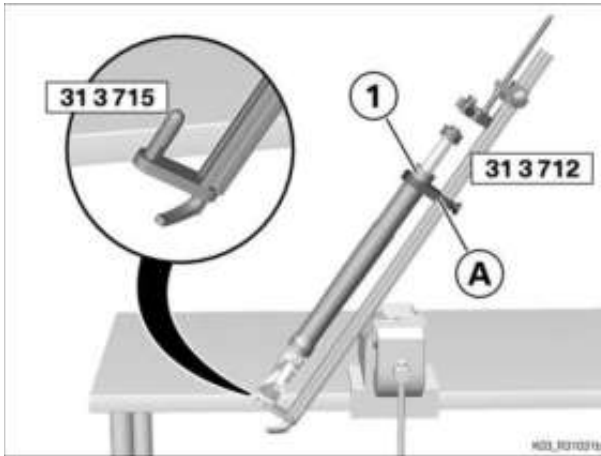
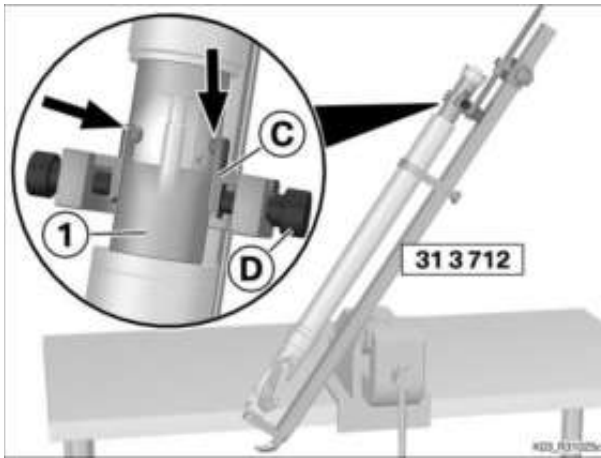


- Install **new** O-ring (Arrow) and lubricate with fork oil.
- Pull piston rod (1) up.
- Screw lid (2) by hand **onto the block**.
- Tighten lock nut (3) while counter-holding lid (2) of special wrench **SW17** (No. 31 1 521) and mounting of special wrench (No. 31 1 529).

Tightening torques		
Locknut to cover		
M10	17 Nm	

- Slowly relieve pressure on bush (1) with hold-down tool (B) and spindle (E) from pretensioning tool (No. 31 3 712).
- Make sure that bush (1) is correctly seated in lid (2).

- Loosen knurled screws (D) and loosen mountings (C) from bore holes (Arrows) of bush (1).



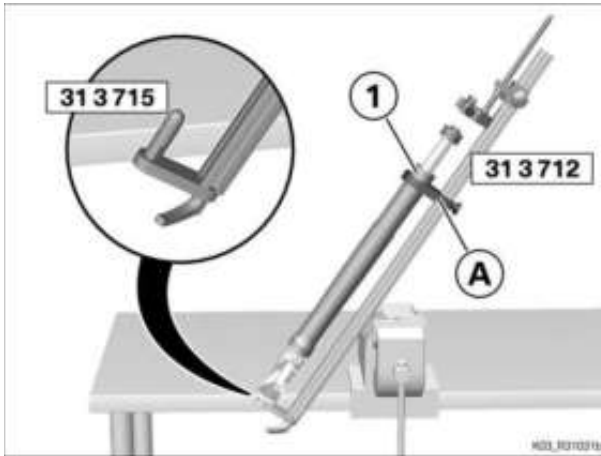
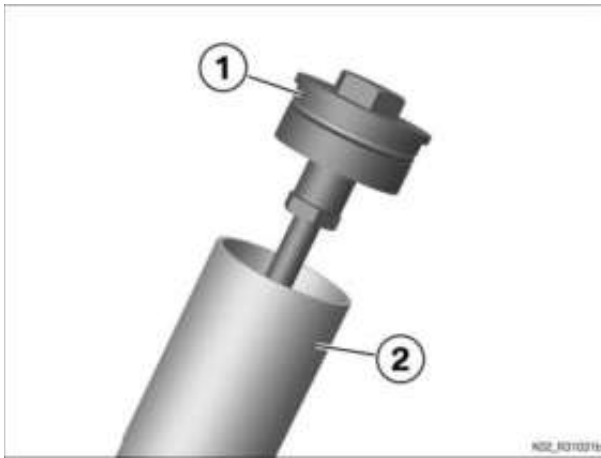
- Loosen rubber retainer (A).
- Remove fork leg (1) from pre-tensioning tool (No. 31 3 712), noting mounting (No. 31 3 715).



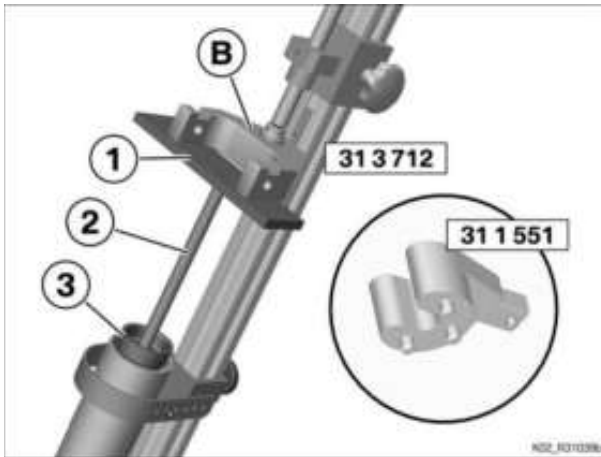
- Push fixed fork tube (2) up and install lid (1) with special wrench **SW17**.

(-) Draining oil from left fork leg

- Firmly and repeatedly compress the fork leg to free any dirt that may be inside.
- Screw out lid (1) fully with special wrench **SW17** (No. 31 1 521) and special wrench mounting (No. 31 1 529) and carefully lower fixed fork tube (2).
- Drain the oil from the fork leg (2) into a suitable container.

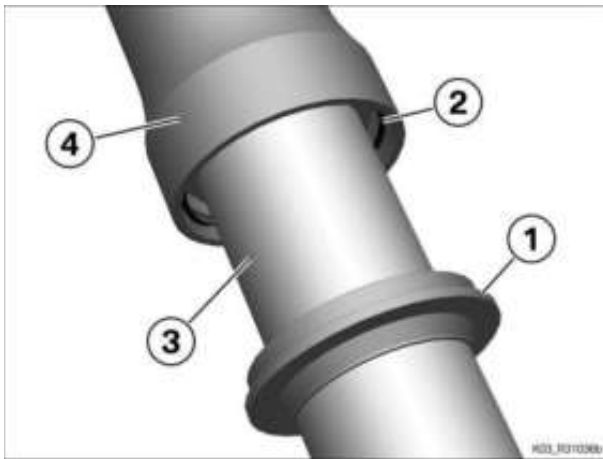


- Install fixture (No. 31 3 715) into pre-tensioning tool (No. 31 3 712).
- Insert fork leg (1) in pre-tensioning tool (No. 31 3 712).
- Secure fork leg (1) with rubber retainer (A).



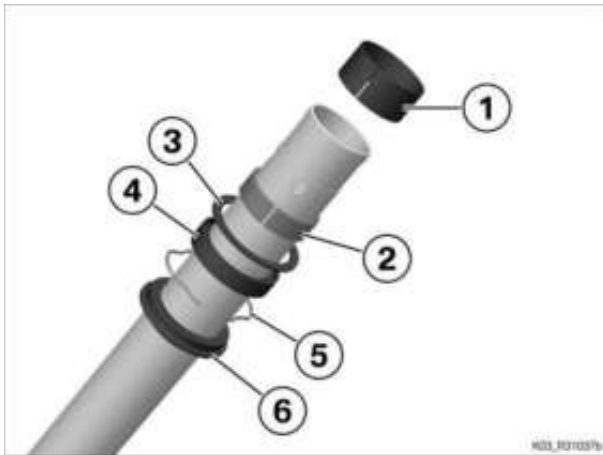
- Position a suitable tool (1) between piston rod (2) and hold-down tool (B).
- Press piston rod (2) with pre-tensioning tool (No. 31 3 712) slightly downwards.
- Loosen screw cap (3) using special wrench (No. 31 1 551) while counter-holding the forkleg.
- Relieve tension on pre-tensioning tool (No. 31 3 712) slowly.
- Loosen rubber retainer (A) and remove forkleg (3) from pre-tensioning tool (No. 31 3 712).

- Remove the screw cap with threaded rod (1).
- Remove compression spring (2) and allow to be drip-free.
- » Compression spring is free of oil.
- Remove screw (3) and bush (4).
- Carefully turn fork leg (5) over and drain the rest of the oil.



(-) Remove left slider tube

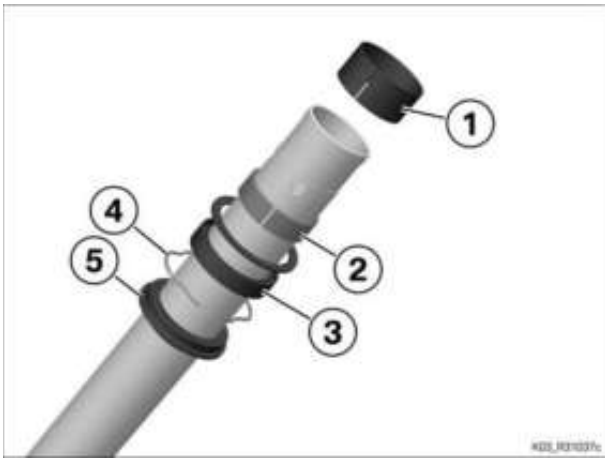
- Loosen dust boot (1) with a suitable tool.
- Disengage circlip (2).
- Remove slider tube (3) with a strong jerk from fixed fork tube (4).



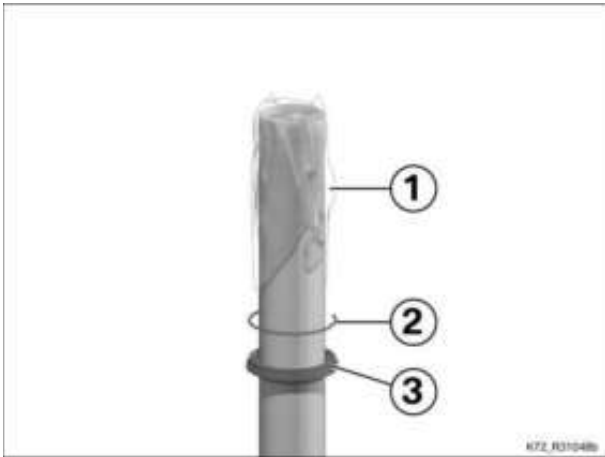
- Spread top slide bush (1) and bottom slide bush (2) slightly using a suitable tool and remove.
- Remove support disc (3), fork sealing ring (4), circlip (5) and dust boot (6).
- Check support disc (3) for deformations and damage; replace if necessary.

(-) Renew sealing and bearing

- Renew the following parts:
- Sliding bushes at top (1) and bottom (2)
- Fork sealing ring (3) and circlip (4)
- sealing boot (5)



(-) Install slider tube, left



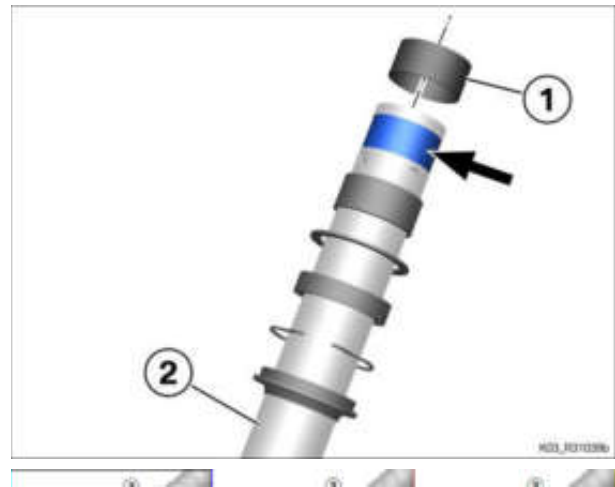
- Slip a bag (1) over the **new** slider tube so as not to damage the new sealing ring on the sharp edges.
- Push a **new** dust boot (3) and circlip (2) on the slider tube.

- Lubricate the **inner** sealing lips of the sealing ring (1) lightly.

 Lubricant	
Molykote 111	11 00 7 660 832

- Note the mounting orientation: the protruding sealing lip (arrow) points in the direction of the dust boot.

- Lubricate components with fork oil.
- Push support disc (1) and bottom sliding bush (2) on slider tube (3).
- Remove bag (4).

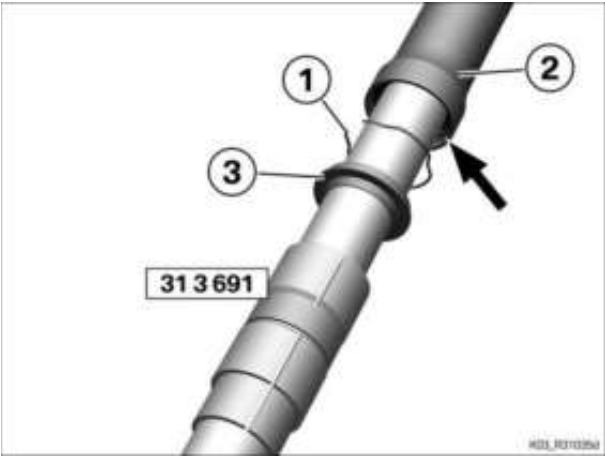


- Lubricate upper sliding bush (1) with fork oil.
- Spread upper sliding bush (1) slightly and install in the bead (Arrow) of the slider tube (2).

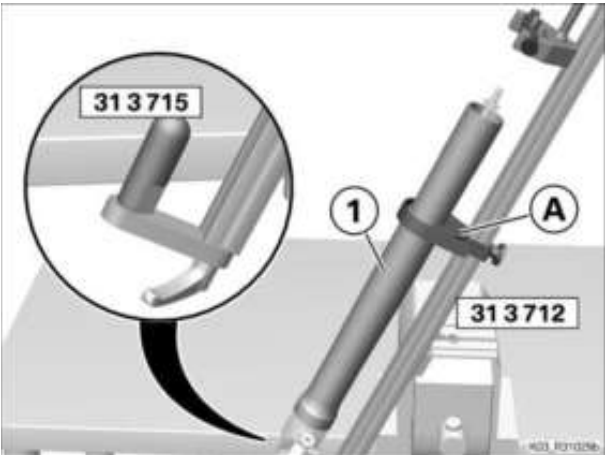
- Carefully slide the fixed fork tube (1) onto the slider tube (2).
- Lubricate bottom sliding bush (3).

 Lubricant	
Molykote 111	11 00 7 660 832

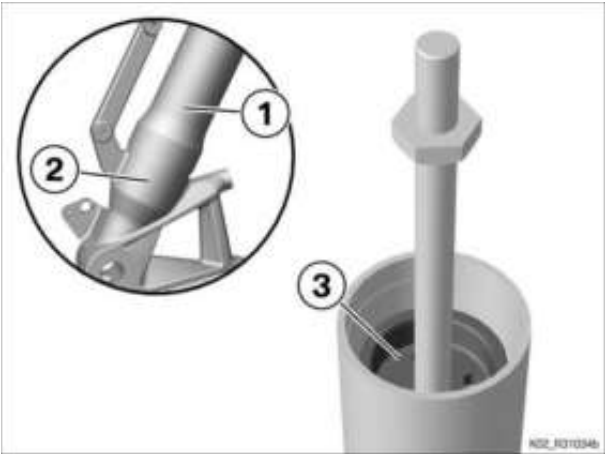
- Position lower sliding bush (3) in fixed fork tube (1).
- Install lower sliding bush (3) and support disc (4) with impact bush (No. 31 3 691).
- Install sealing ring (5) with impact bush (No. 31 3 691)(No. 31 3 692).
- Install a **new** circlip (1) and while doing so, pay attention to its correct seating in the groove (Arrow) of fixed fork tube (2).
- Turn impact bush (No. 31 3 691) over and install a **new** dust boot (3) into the fixed fork tube (2).



(-) Pouring oil into left fork leg



- Insert fork leg (1) in pretensioning tool (No. 31 3 712) and secure with rubber retainer (A).



- Carefully lower the fixed fork tube (1) all the way onto the forkleg (2).
- Fill oil in slider tube (3) **slowly**.

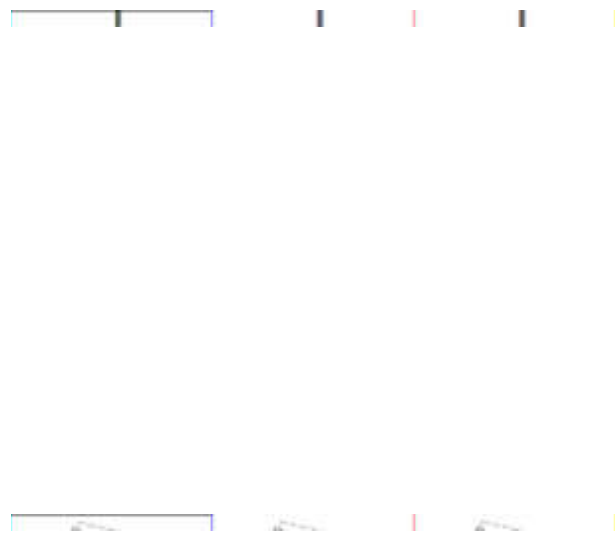
 Technical data			
Fork oil, capacity of left fork leg			approx. 480 ml
	Telescopic fork oil (Telescope fork oil type 3)		

- Allow the oil to settle for a few minutes.

► Adjusting the left-side oil level

- Place the fork leg vertical.
- On the filler dipstick (No. 31 6 551) set the correct oil level, then insert the filler dipstick in the telescopic forks and draw off excess fork oil.

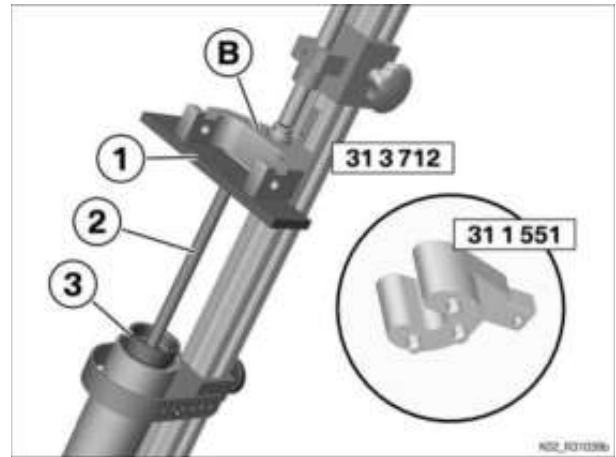
 Technical data			
	Forks fully compressed,	120 mm	



Level of fork oil in left fork leg (air chamber)	compression spring and sleeve removed		
Telescopic fork oil (Telescope fork oil type 3)			



- Clean threads of screw cap (1) and mating thread in fixed fork tube.
- Install bush (4) and contact disc (3) in fork leg (5).
- Install compression spring (2) and screw cap with threaded rod (1) in the fork leg (5).



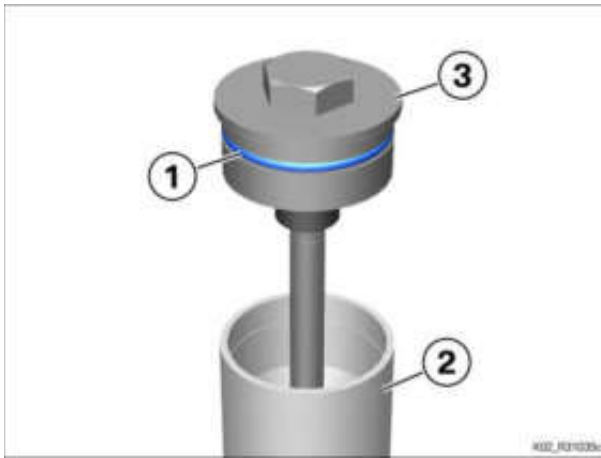
- Position a suitable tool (1) between piston rod (2) and hold-down tool (B).
- Apply screw locking agent to screw cap (3).

 Thread-locking compound	
Loctite 243, Medium strength	83 19 2 210 339

- Pretension piston rod (2) until screw cap (3) can be turned without spring force.
- Tighten screw cap (3) using special wrench (No. 31 1 551) while counter-holding the forkleg.

 Tightening torques	
Threaded plug in fixed fork tube	
Thread-locking compound (Loctite 243, Medium strength)	17 Nm

- Slowly relieve tension on spindle (E) from pretensioning tool (No. 31 3 712).
- Loosen rubber retainer (A) and remove forkleg (3) from pre-tensioning tool (No. 31 3 712).



- Renew O-ring (1) and lubricate with fork oil.
- Push fixed fork tube (2) up and install lid (3) with special wrench **SW17**.

Follow-up work

Installing both fork legs

Tighten lid for fork legs

Securing front wheel-speed sensor

Install the front wheel

Securing the front brake caliper and brake line

Installing front-wheel cover

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Removing engine lifter

Installing engine spoiler

Final check of work performed

31 42 011 Checking steering-head bearing

+ 31 42 511

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

(-) Checking the steering-head bearing



- Release the front wheel.
- Move the handlebars left and right as far as they will go, push the fork on the **fixed fork tube** backwards and forwards.

NOTICE

The steering must move smoothly from lock to lock. There should be no perceptible catching and no notching at the straight-ahead position.

The steering-head bearing must be free of play.

Check

Result:

- The bearing has got stuck and the setting is therefore not free of play.

Measure:

=> 31 42 514, Adjusting steering-head bearing (with checking steering-head bearing) (Billed as a separate item)

Check

Result:

- The steering angle is stiff or the centre position can be felt.

Measure:

=> 31 42 879, Replacing both steering-head bearings (Billed as a separate item)

Follow-up work

Final check of work performed

31 42 028 Replace upper fork bridge

+ 31 42 528

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

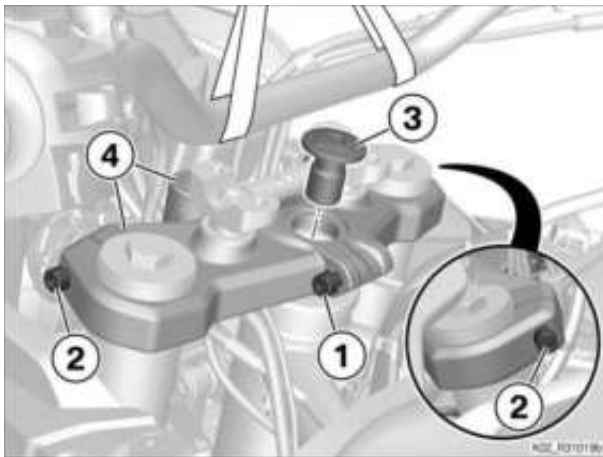
Removing cover for fuel tank

Loosen cable for ignition steering lock

Removing handlebars

Core activity

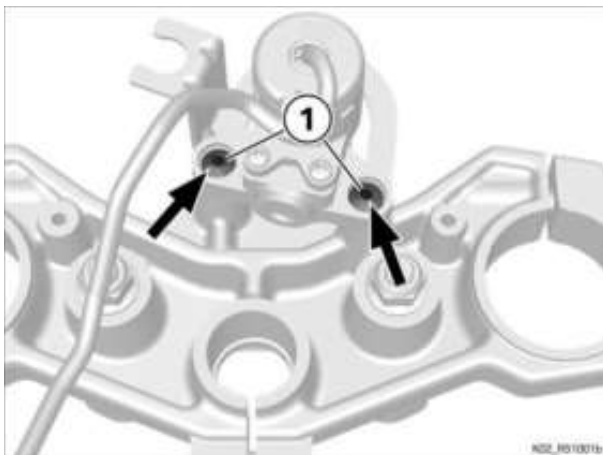
(-) Removing top fork bridge



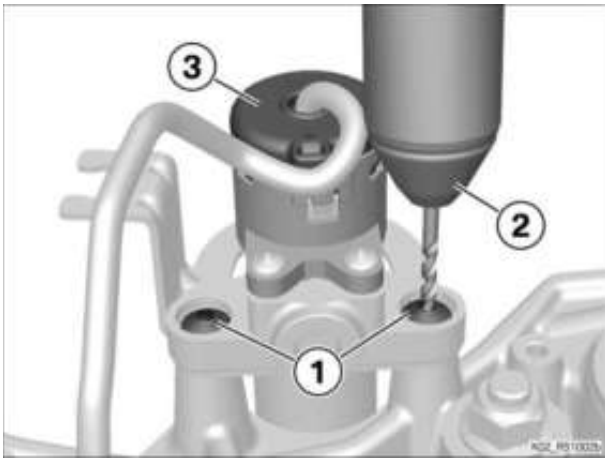
- Remove clamping bolts (1) and (2).
- Remove adjusting screw (3).
- Remove fork bridge (4) with ignition steering lock.

(-) Replace top fork bridge

► Removing ignition switch/steering lock

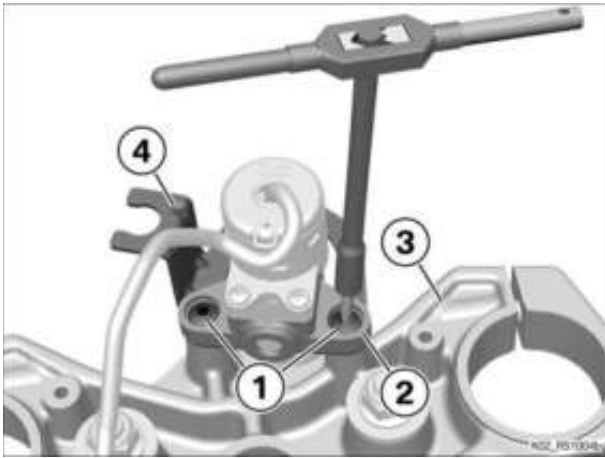


- Punch-mark shear screws (1) in centre (arrows).

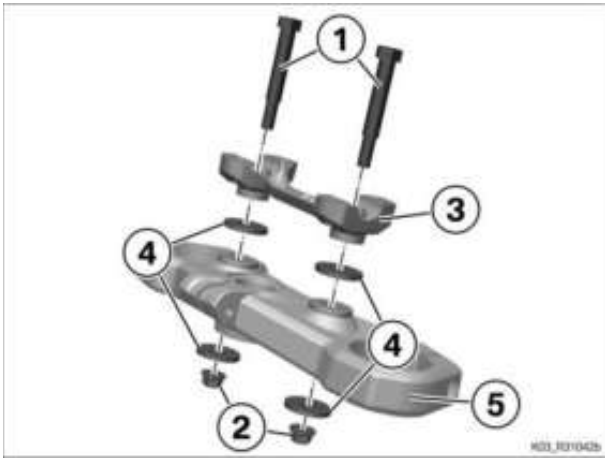


- Remove shear screws (1) by first **pre-drilling bore holes with a 2 mm drill** and then **drilling out to 6 mm**, making sure there is ample clearance between drill chuck (2) and ignition steering lock (3).

 Technical data			
Ignition switch/steering lock - drilling depth for drilling out tamper-proof shear screws	(Pilot) hole diameter 2 mm	min 5 mm	
	Hole diameter 6 mm	5 mm	



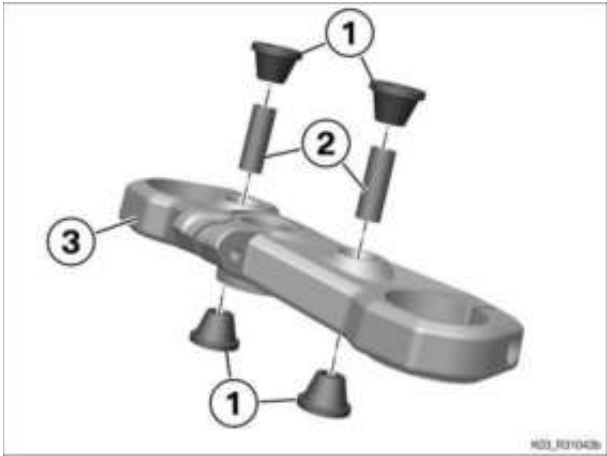
- Remove shear screws (1) with a suitable screw extractor.
- Remove ignition steering lock (2) with holder (4) from top fork bridge (3).



▶ **Disassemble top fork bridge**

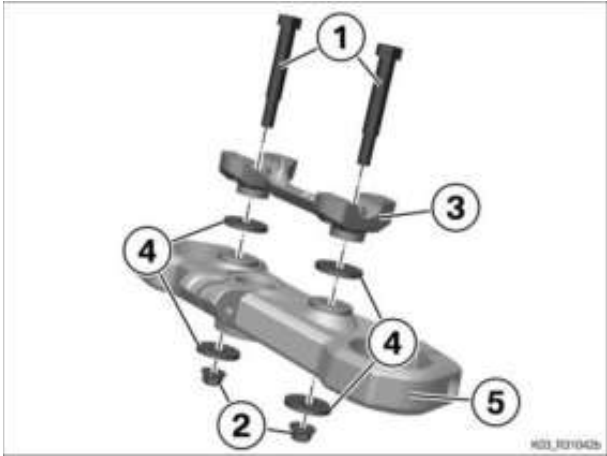
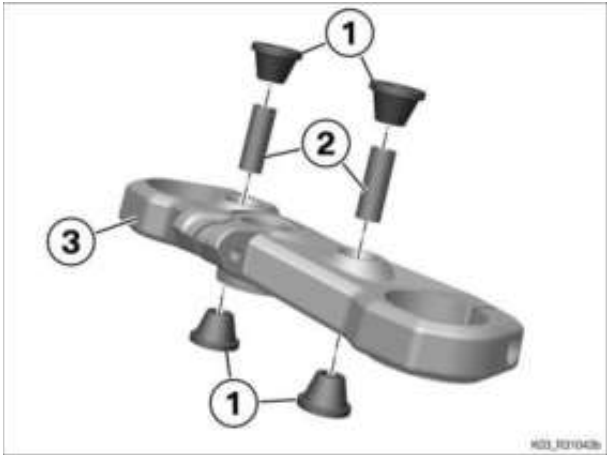
- Remove nuts (1) and bolts (2).
- Remove clamping block (3).
- Remove washers (4) from top fork bridge (5).

- Remove rubber mount (1) and sleeves (2) from top fork bridge (3).



► Reassemble top fork bridge

- Install sleeves (2) and rubber mount (1) in top fork bridge (3).



- Seat washers (4) on top fork bridge (5).
- Lay clamping block (3).
- Install nuts (1) and bolts (2).

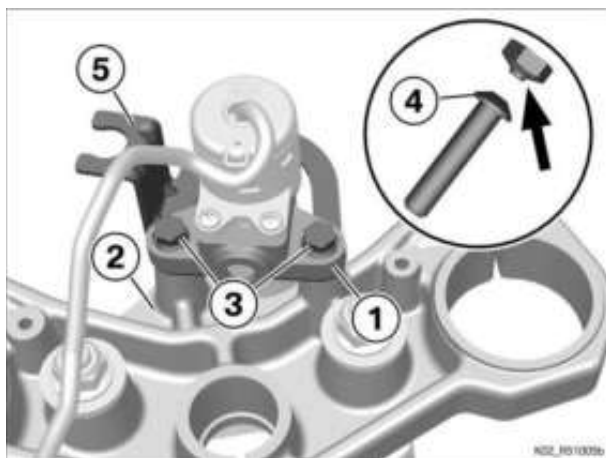
 Tightening torques		
Clamping block to fork bridge		
M10 x 65, Tighten the nut, counter-holding the bolt	19 Nm	



► Installing ignition switch/steering lock

- Position ignition steering lock (1) with holder (5) on top fork bridge (2).
- Install shear screws (3) and tighten until the tool engagement (arrow) shears off head (4).

 Tightening torques		



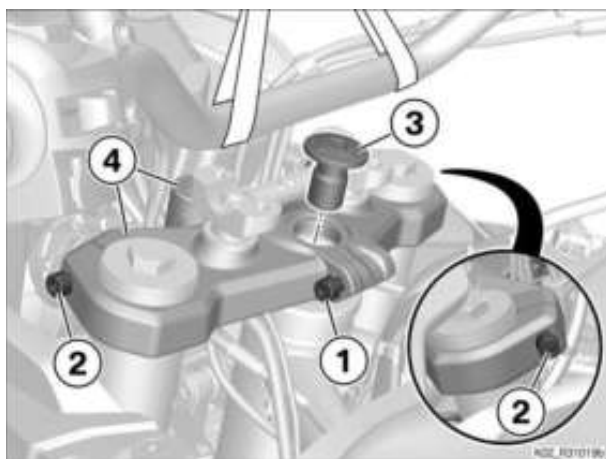
Ignition/steering lock to fork bridge

Shear screw, M6 x 20, Replace screw

Tighten screw until screw-head shears off.



(-) Install the top fork bridge



- Install fork bridge (4) with ignition steering lock.
- Install clamping bolts (1) and (2), but do not tighten.
- Screw in adjusting screw (3) hand-tight.
- Do not tighten clamping bolts (1), (2) and adjusting screw (3), this will be done when adjusting the steering-head bearing play.

Follow-up work

Securing handlebars

Adjusting steering-head bearing play

Secure cable for ignition steering lock

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

31 42 029 Replace lower fork bridge

+ 31 42 527

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Installing engine lifter

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing front-wheel cover

Loosening the front brake caliper and brake line

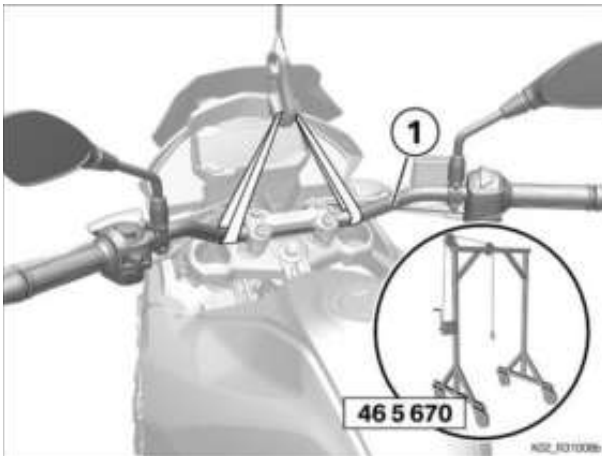
Removing front wheel

Disengaging front wheel-speed sensor

Removing both fork legs

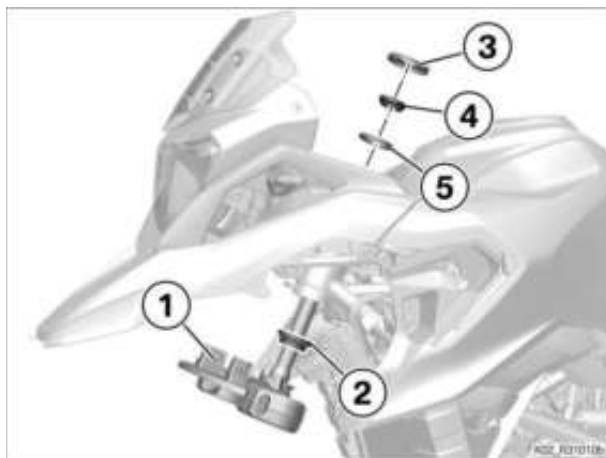
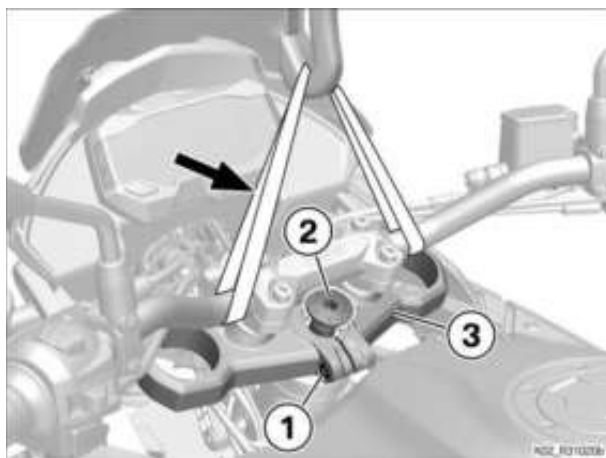
Core activity

(-) Removing fork bridges



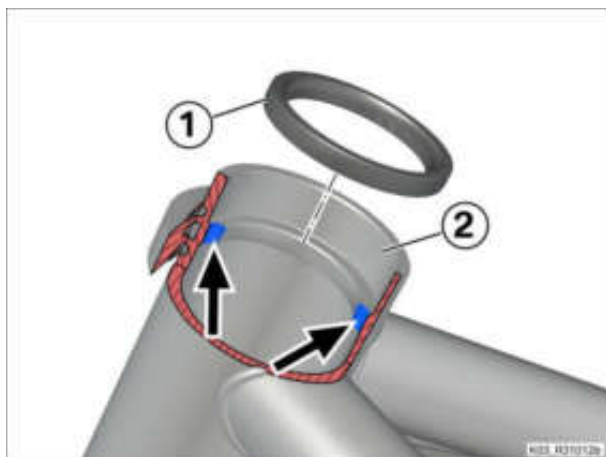
- Secure handlebars (1) with tensioning straps to assembly crane (No. 46 5 670).

- Slacken clamping screw (1).
- Secure lower fork bridge against falling and loosen adjusting screw (2).
- Remove top fork bridge (3) together with adjusting screw (2) and allow to hang from tensioning strap (Arrow).



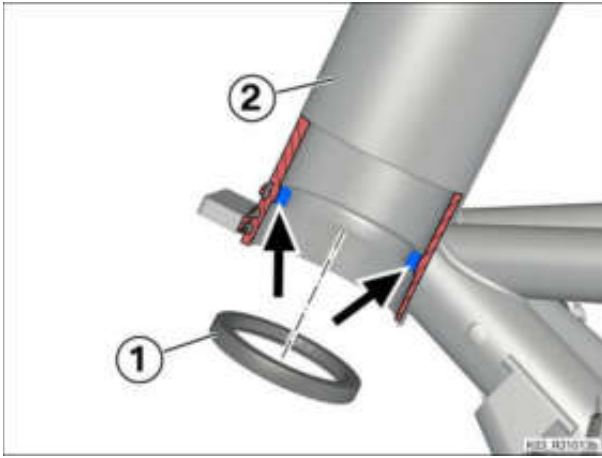
- Remove bottom fork bridge (1) and ball cage (2) downwards.
- Remove ball cage (2) from bottom fork bridge (1).
- Remove protective cap (3), inner ring (4) and ball cage (5).

(-) Removing outer rings for steering-head bearing



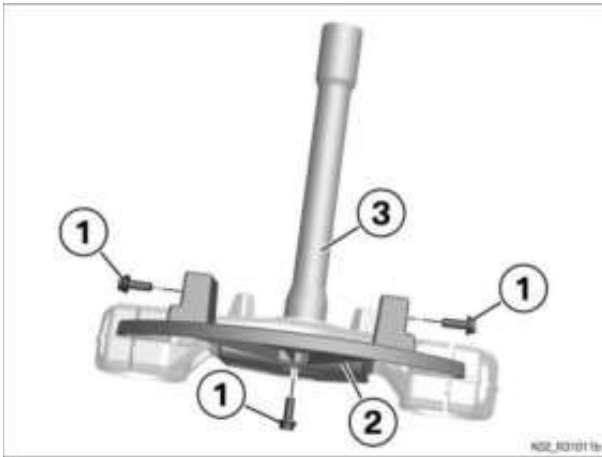
- Using a suitable tool, drive top outer ring (1) uniformly out of frame (2), using the removal aids (arrows) provided.

- Using a suitable tool, drive bottom outer ring (1) uniformly out of frame (2), using the removal aids (arrows) provided.



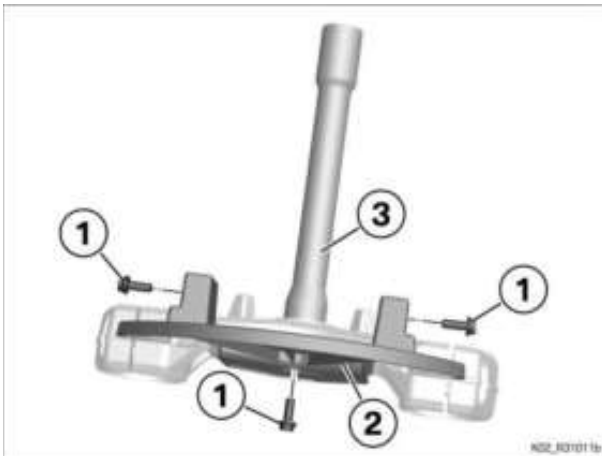
(-) Removing the cover of the fork bridge

- Remove screws (1).
- Remove cover (2) from bottom fork bridge (3).



(-) Installing the fork bridge cover

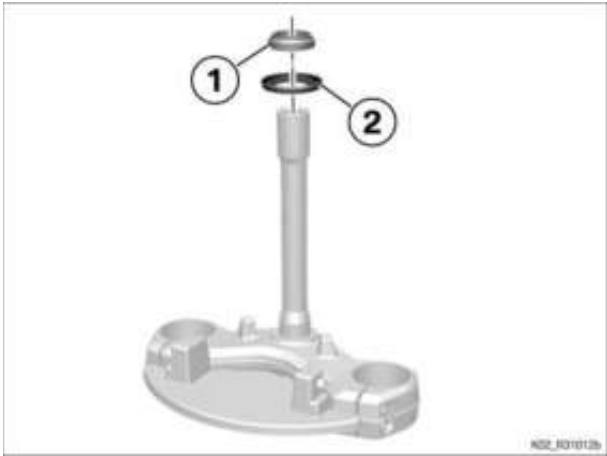
- Position cover (2) on bottom fork bridge (3).
- Install screws (1).



(-) Replace bottom fork bridge

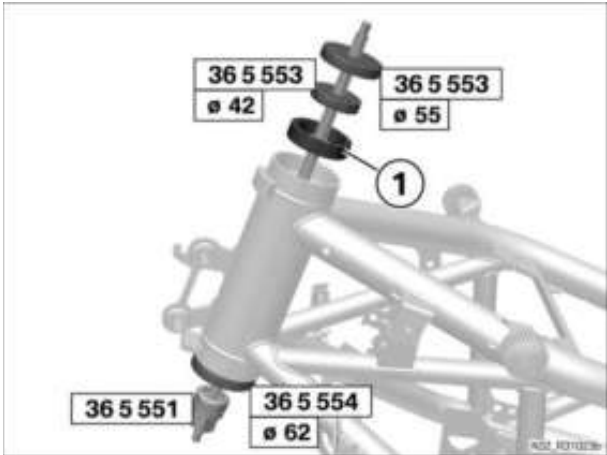
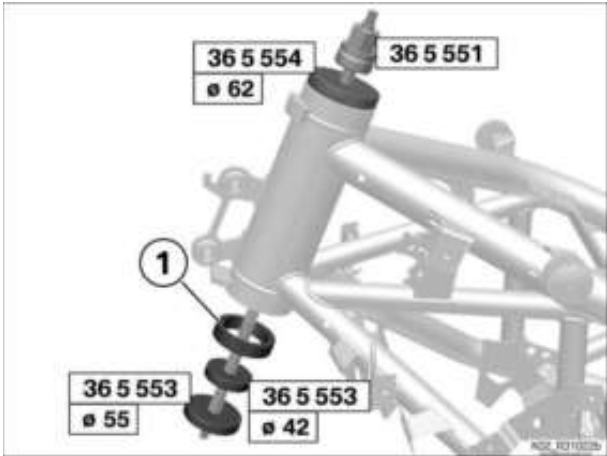
► Installing inner ring for steering-head bearing on fork bridge

- Clean seat of inner ring (1).
- Install new dust cap (2).
- Install inner ring (1) with suitable pipe to the limit position.



(-) Installing outer races of steering-head bearing

- Clean bearing seats in frame.
- Install bottom bearing shell (1) with long spindle (No. 36 5 551), contact discs 55 mm and 42 mm with thread (No. 36 5 553) and contact disc 62 mm without thread (No. 36 5 554) up to the limit position.

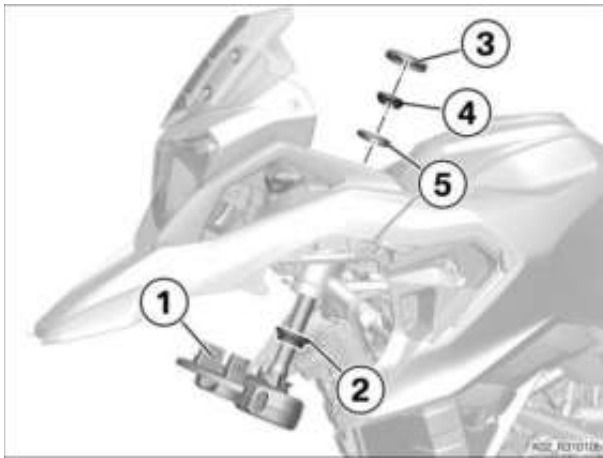


- Install top bearing shell (1) with long spindle (No. 36 5 551), contact discs 55 mm and 42 mm with thread (No. 36 5 553) and 62 mm contact disc (No. 36 5 554) up to the limit position.

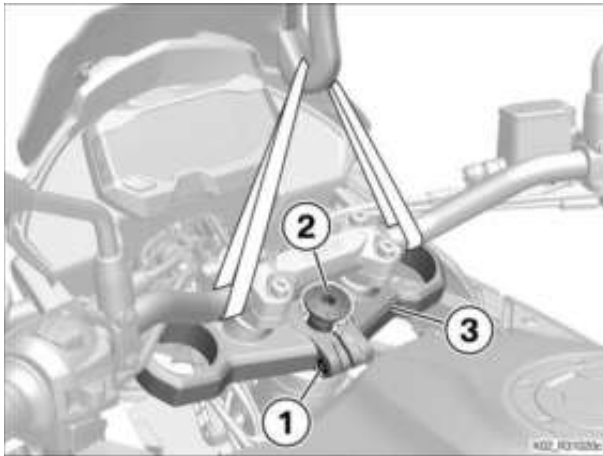
(-) Installing the fork bridges

- Lubricate ball cages (2) and (5).

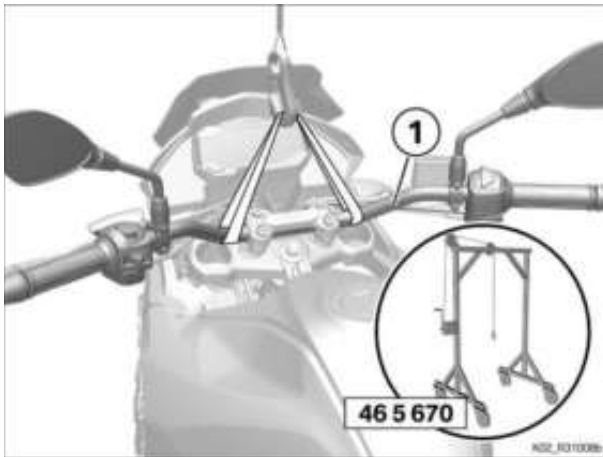
		
Lubricant		
Acid-free friction-bearing grease	81 22 9 407 174	



- Install ball cage (2) on bottom fork bridge (1).
- Install bottom fork bridge (2) with ball cage (1).
- Install ball cage (5), inner ring (4) and protective cap (3).



- Position top fork bridge (3) together with adjusting screw (2).
- Screw in adjusting screw (2) hand-tight.
- Do not tighten clamping bolt (1) and adjusting screw (2), this will be done when adjusting the steering-head bearing play.



- Remove assembly crane (No. 46 5 670) and tensioning straps from handlebars (1).

Follow-up work

Installing both fork legs

Securing front wheel-speed sensor

Install the front wheel

Securing the front brake caliper and brake line

Installing front-wheel cover

Removing engine lifter

Installing engine spoiler

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Adjusting steering-head bearing play

Checking headlight beam throw

Final check of work performed

31 42 321 Replacing both steering-head bearings

+ 31 42 879

ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Installing engine lifter

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing front-wheel cover

Loosening the front brake caliper and brake line

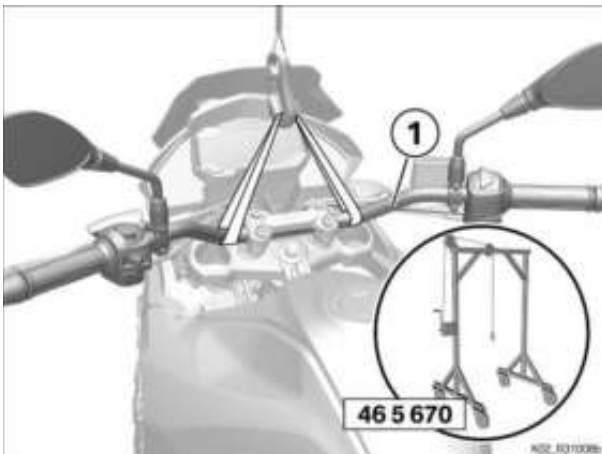
Removing front wheel

Disengaging front wheel-speed sensor

Removing both fork legs

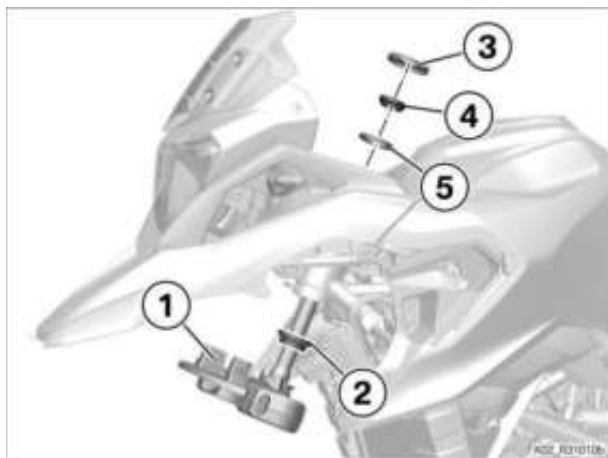
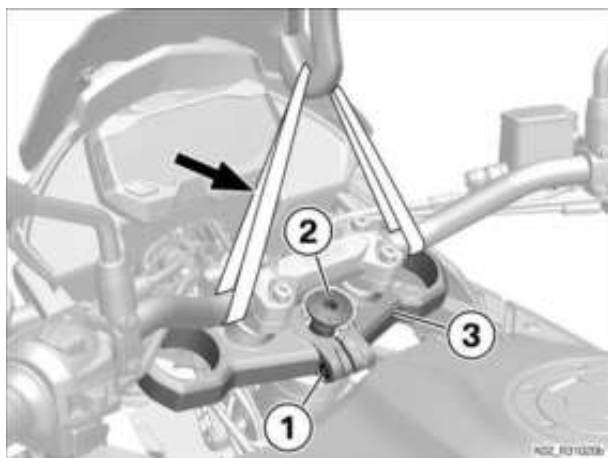
Core activity

(-) Removing fork bridges



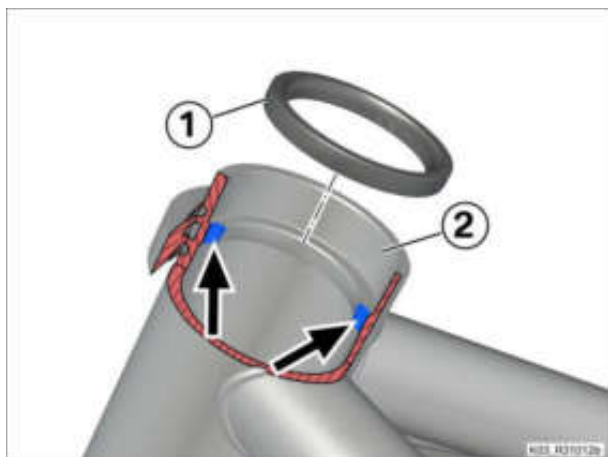
- Secure handlebars (1) with tensioning straps to assembly crane (No. 46 5 670).

- Slacken clamping screw (1).
- Secure lower fork bridge against falling and loosen adjusting screw (2).
- Remove top fork bridge (3) together with adjusting screw (2) and allow to hang from tensioning strap (Arrow).



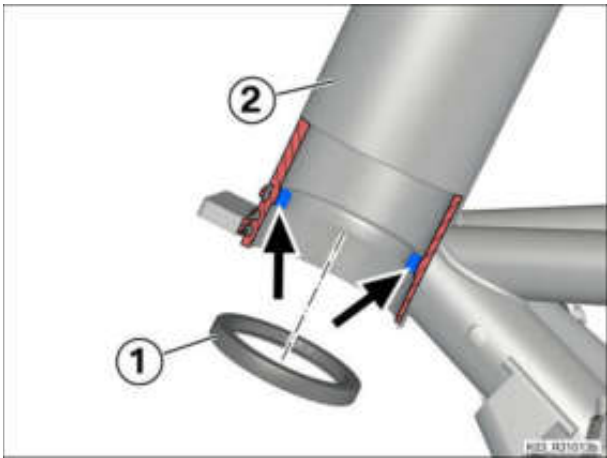
- Remove bottom fork bridge (1) and ball cage (2) downwards.
- Remove ball cage (2) from bottom fork bridge (1).
- Remove protective cap (3), inner ring (4) and ball cage (5).

(-) Removing outer rings for steering-head bearing



- Using a suitable tool, drive top outer ring (1) uniformly out of frame (2), using the removal aids (arrows) provided.

- Using a suitable tool, drive bottom outer ring (1) uniformly out of frame (2), using the removal aids (arrows) provided.



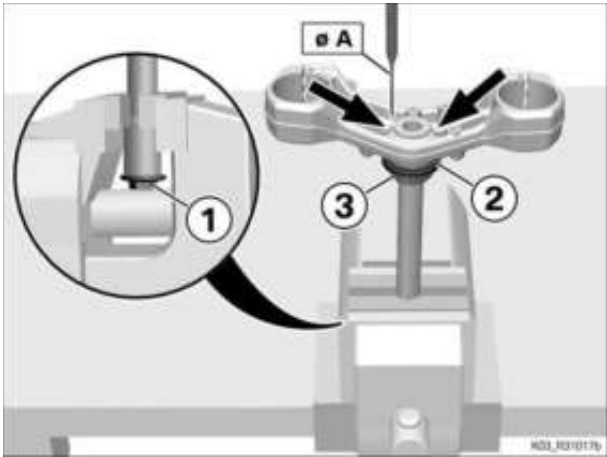
(-) Removing inner ring for steering-head bearing from fork bridge

- Fully tighten adjusting screw (1) in the steering tube.
- Clamp the handlebar tube in a vice, while doing so, place a block of wood as protection between the adjusting screw and the face.

 ATTENTION

Driving out steering-head bearing with a punch that is too small
Damage to fork bridge

- Use a punch that is a snug fit the hole.
-
- Use a punch to remove dust cap (2) and inner ring (3), taking care to prevent the inner ring from tilting by alternating from one bore hole to the other.

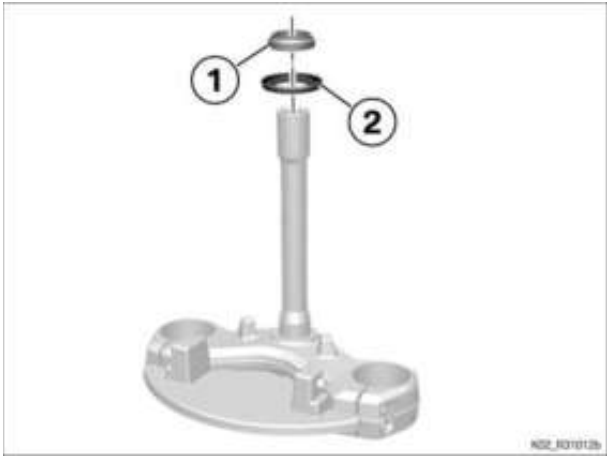


 Technical data			
Diameter (A) of punch		5 mm	

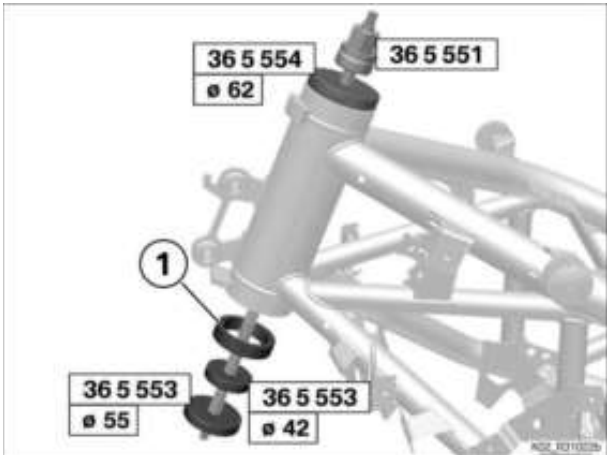
- Remove adjusting screw (1).

(-) Installing inner ring for steering-head bearing on fork bridge

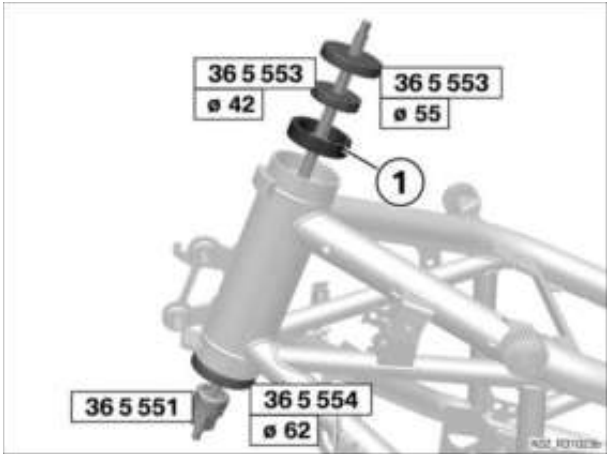
- Clean seat of inner ring (1).
- Install new dust cap (2).
- Install inner ring (1) with suitable pipe to the limit position.



(-) Installing outer races of steering-head bearing



- Clean bearing seats in frame.
- Install bottom bearing shell (1) with long spindle (No. 36 5 551), contact discs 55 mm and 42 mm with thread (No. 36 5 553) and contact disc 62 mm without thread (No. 36 5 554) up to the limit position.



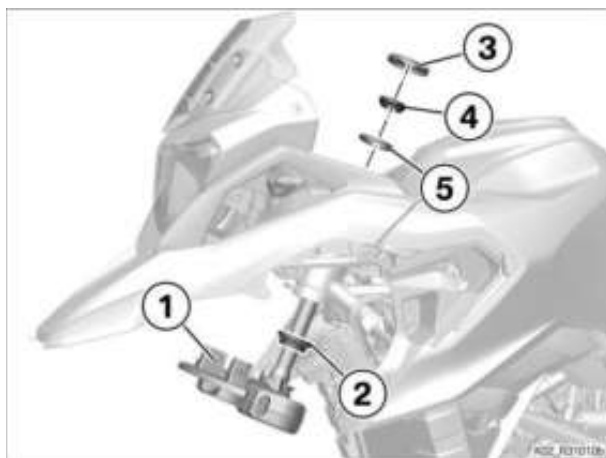
- Install top bearing shell (1) with long spindle (No. 36 5 551), contact discs 55 mm and 42 mm with thread (No. 36 5 553) and 62 mm contact disc (No. 36 5 554) up to the limit position.

(-) Installing the fork bridges

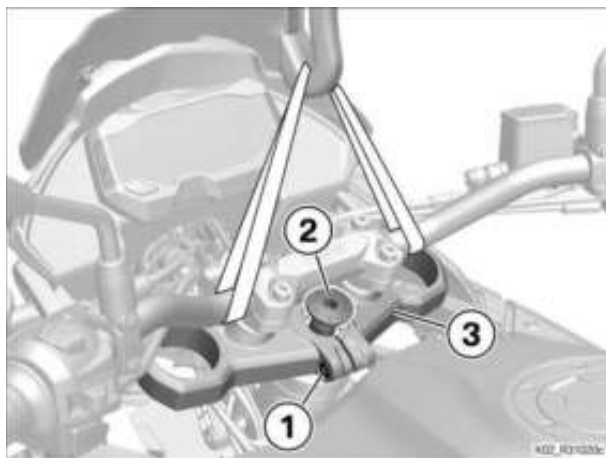
- Lubricate ball cages (2) and (5).

		
Lubricant		
Acid-free friction-bearing grease	81 22 9 407 174	

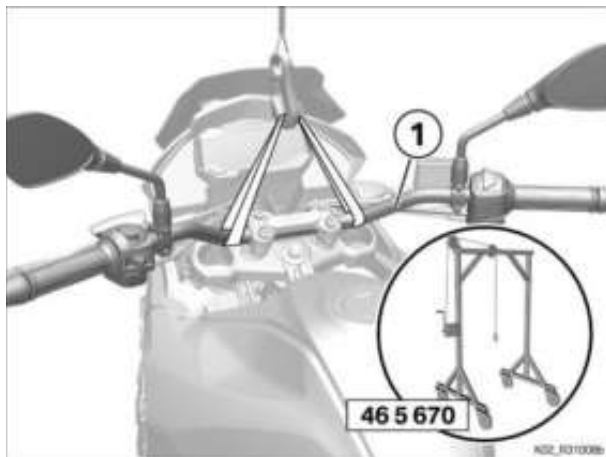
- Install ball cage (2) on bottom fork bridge (1).



- Install bottom fork bridge (2) with ball cage (1).
- Install ball cage (5), inner ring (4) and protective cap (3).



- Position top fork bridge (3) together with adjusting screw (2).
- Screw in adjusting screw (2) hand-tight.
- Do not tighten clamping bolt (1) and adjusting screw (2), this will be done when adjusting the steering-head bearing play.



- Remove assembly crane (No. 46 5 670) and tensioning straps from handlebars (1).

Follow-up work

Installing both fork legs

Securing front wheel-speed sensor

Install the front wheel

Securing the front brake caliper and brake line

Installing front-wheel cover

Removing engine lifter

Installing engine spoiler

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Adjusting steering-head bearing play

Final check of work performed

 31 42 341 Removing/installing left fork leg

+ 31 42 841

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

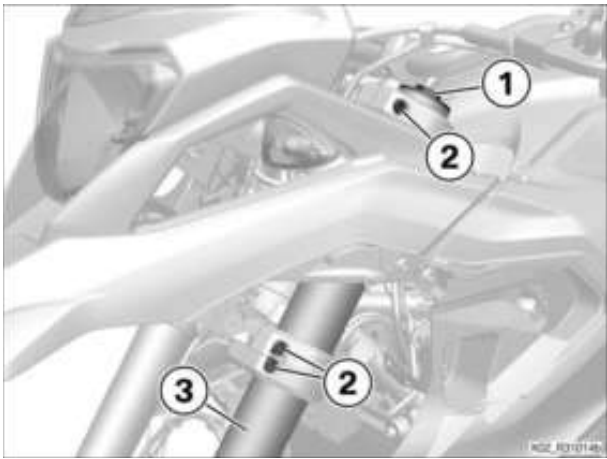
- Removing engine spoiler
- Installing engine lifter
- Removing front-wheel cover
- Loosening the front brake caliper and brake line
- Removing front wheel
- Disengaging front wheel-speed sensor

Core activity

(-) Removing left fork leg

 NOTICE

If the forks are to be disassembled, the caps should be slackened and also tightened to specified torque with the forks installed.



- If required, loosen cover (1) for left fork leg.
- Slacken screws (2).
- Work fork leg (3) down to remove.

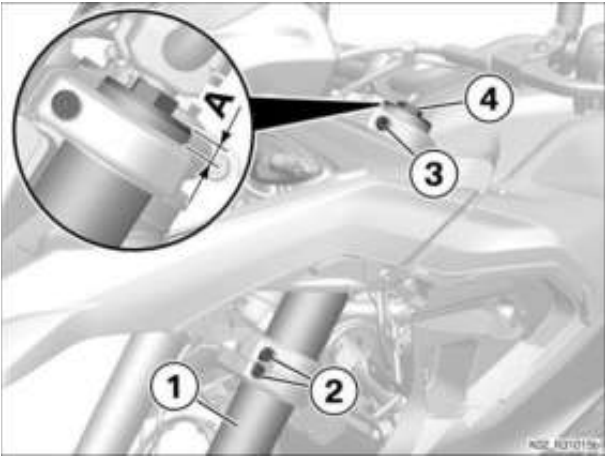
(-) Installing left fork leg

 NOTICE

If the forks are to be disassembled, the caps should be slackened and also tightened to specified torque with the forks installed.

- Install fork leg (1) from the bottom and adjust fork-tube projection (dimension A).

	Technical data			
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Projection of fork tube in fork bridge, top with cap		9 mm	
--	--	------	--

- Tighten the screw (2).

Tightening torques		
Fork bridge, bottom, to fork fixed tube		
M8 x 30	Tightening sequence: Tighten screws six times in alternate sequence	
		19 Nm

- If required, tighten cover (4) for left fork leg.

NOTICE

If the fork has been dismantled, the fork caps are tightened in the installed state with torque.

If required, the clamping bolts of the upper fork bridge are tightened after the fork caps.

Tightening torques		
Cover to fixed fork tube		
	20 Nm	

- Tighten the screw (3).

Tightening torques		
Fork bridge, top, to fork fixed tube		
M8 x 30	19 Nm	

Follow-up work

- Securing front wheel-speed sensor
- Install the front wheel
- Securing the front brake caliper and brake line
- Installing front-wheel cover
- Removing engine lifter
- Installing engine spoiler
- Final check of work performed

 31 42 342 Removing/installing right fork leg

+ 31 42 842

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Installing engine lifter

Removing front-wheel cover

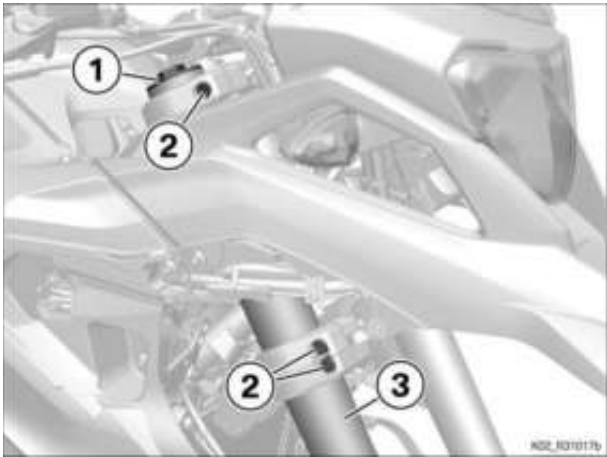
Removing front wheel

Core activity

(-) Removing right fork leg

 NOTICE

If the forks are to be disassembled, the caps should be slackened and also tightened to specified torque with the forks installed.



- If required, loosen cover (1) for right fork leg.
- Slacken screws (2).
- Work fork leg (3) down to remove.

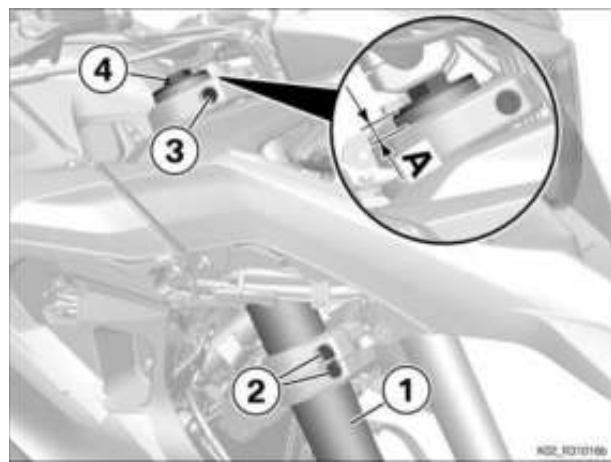
(-) Install the right fork leg

 NOTICE

If the forks are to be disassembled, the caps should be slackened and also tightened to specified torque with the forks installed.

- Install fork leg (1) from the bottom and adjust fork-tube projection (dimension A).

 Technical data			
Projection of fork tube in fork bridge, top		9 mm	



with cap			
----------	--	--	--

- Tighten the screws (2).

 Tightening torques		
Fork bridge, bottom, to fork fixed tube		
M8 x 30		Tightening sequence: Tighten screws six times in alternate sequence
		19 Nm

- If required, tighten cover (4) for right fork leg.

 NOTICE

If the fork has been dismantled, the fork caps are tightened in the installed state with torque.

If required, the clamping bolts of the upper fork bridge are tightened after the fork caps.

 Tightening torques		
Cover to fixed fork tube		
	20 Nm	

- Tighten the screw (3).

 Tightening torques		
Fork bridge, top, to fork fixed tube		
M8 x 30	19 Nm	

Follow-up work

- Install the front wheel
- Bedding in brake pads
- Installing front-wheel cover
- Removing engine lifter
- Installing engine spoiler
- Final check of work performed

 31 42 514 Adjusting steering-head bearing (with checking steering-head bearing)

Core activity

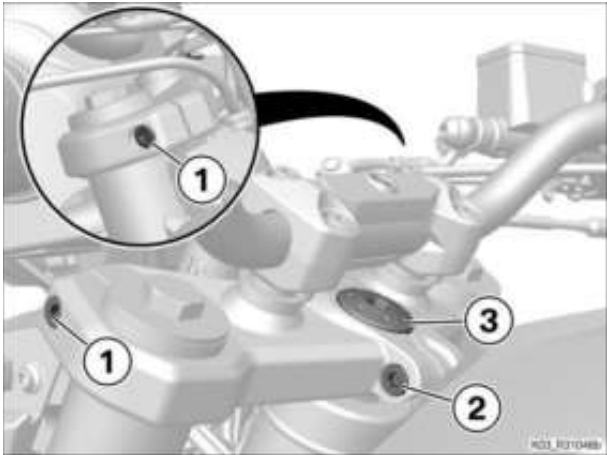
(-) Adjusting steering-head bearing play

Requirement

- Front wheel on the ground.



- Slacken clamping screws (1) at top fork bridge.
- Slacken clamping screw (2) for the steering tube.
- Slacken adjusting screw (3), then tighten it to specification.



 Tightening torques		
Adjustment specification for steering-head bearing		
M20	Tightening torque (forks turned fully to right), 25 Nm	
	Swing the forks 3x to left/right through full arc of travel	
	back off (forks turned fully to the left), 60°	
	Tightening torque (forks turned fully to right), 15 Nm	

- Tighten clamping screws (1) and (2).

 Tightening torques		
Fork bridge, top, to fork fixed tube		
M8 x 30	19 Nm	
Fork bridge, top, to steering tube		
M8 x 30	19 Nm	

- Tighten adjusting screw (3).

 Tightening torques		
Adjusting screw to fixed fork tube		
M20	38 Nm	

31 42 515 Checking steering head bearing (for maintenance)

Core activity

(-) Checking the steering-head bearing



- Release the front wheel.
- Move the handlebars left and right as far as they will go, push the fork on the **fixed fork tube** backwards and forwards.

NOTICE

The steering must move smoothly from lock to lock. There should be no perceptible catching and no notching at the straight-ahead position.

The steering-head bearing must be free of play.

Check

Result:

- The bearing has got stuck and the setting is therefore not free of play.

Measure:

=> 31 42 514, Adjusting steering-head bearing (with checking steering-head bearing) (Billed as a separate item)

Check

Result:

- The steering angle is stiff or the centre position can be felt.

Measure:

=> 31 42 879, Replacing both steering-head bearings (Billed as a separate item)

31 42 524 Replacing seal for right fork leg (fork leg removed)

Preparatory work

Drain the oil from right fork leg

Removing damper unit from right fork leg

Removing fixed fork tube

Core activity

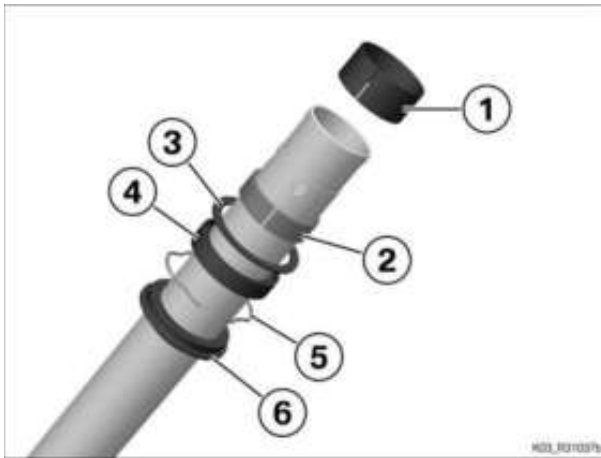
(-) Removing seal of fork leg

ATTENTION

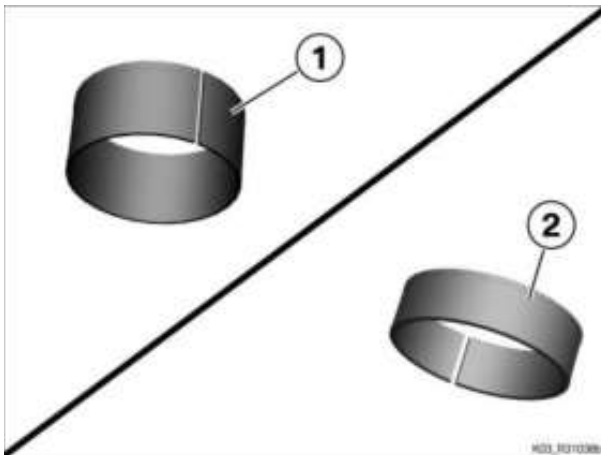
Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.



- Spread out the top sliding bush (1) the bottom sliding bush (2) a little using a suitable tool and remove.
- Remove support disc (3), fork sealing ring (4), circlip (5) and dust boot (6).



- Replace top sliding bush (1) and bottom sliding bush (2).

(-) Installing seal of fork leg

- Lubricate the **inner** sealing lip of the sealing ring (1) lightly.



Lubricant



Molykote 111

11 00 7 660 832

- Note the installation position: the protruding sealing lip (arrow) points in the direction of the dust boot.

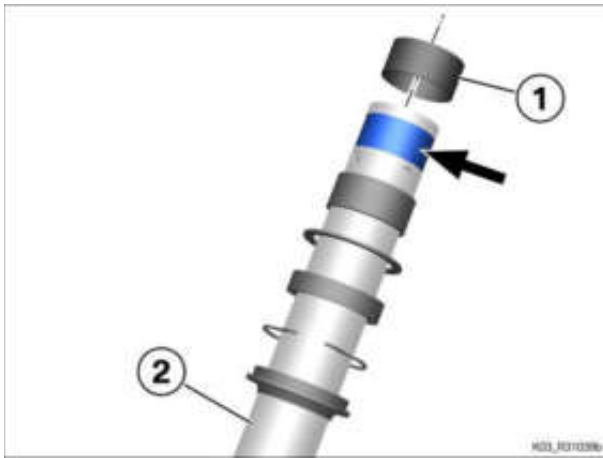


- Clean the slider tube.
- Slip a bag (1) over the slider tube so that the new sealing ring cannot be damaged by sharp edges.
- Push on the dust boot (2) and circlip (3).
- Push on sealing ring (4).



- Slip support disc (1) and bottom slide bush (2) on to slider tube (3).
- Remove bag (4).

- Spread top slide bush (1) slightly open and install it in the bead (arrow) of slider tube (2).



Follow-up work

Install the fixed tube

Installing the damper unit in the right fork leg

Pouring oil into right fork leg

31 42 525 Replacing seal for left fork leg (fork leg removed)

Preparatory work

Draining oil from left fork leg

Removing fixed fork tube

Core activity

(-) Removing seal of fork leg

ATTENTION

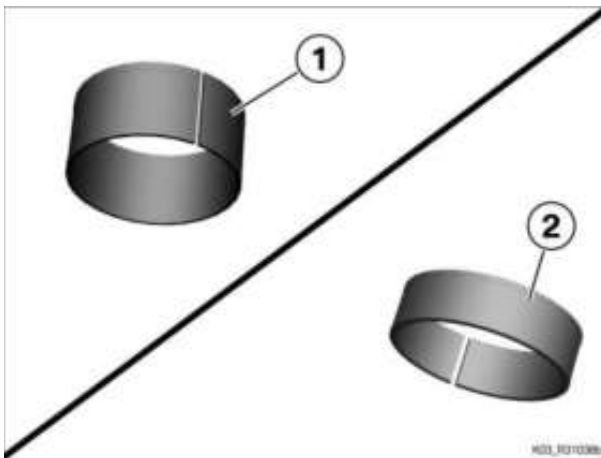
Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.



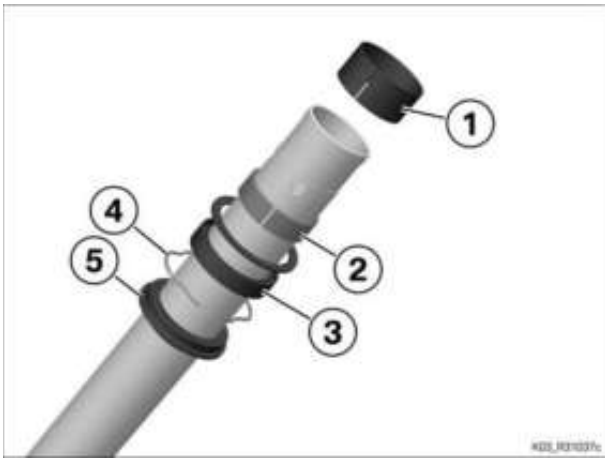
- Spread out the top sliding bush (1) the bottom sliding bush (2) a little using a suitable tool and remove.
- Remove support disc (3), fork sealing ring (4), circlip (5) and dust boot (6).



- Replace top sliding bush (1) and bottom sliding bush (2).

(-) Renew sealing and bearing

- Renew the following parts:
- Sliding bushes at top (1) and bottom (2)
- Fork sealing ring (3) and circlip (4)
- sealing boot (5)



(-) Installing seal of fork leg

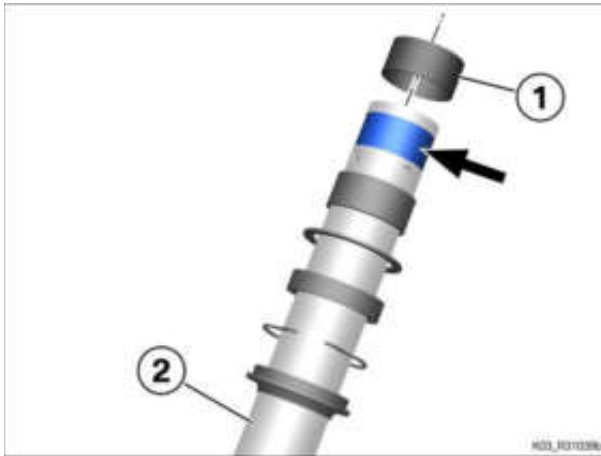
- Lubricate the **inner** sealing lip of the sealing ring (1) lightly.

 Lubricant	
Molykote 111	11 00 7 660 832

- Note the installation position: the protruding sealing lip (arrow) points in the direction of the dust boot.

- Clean the slider tube.
- Slip a bag (1) over the slider tube so that the new sealing ring cannot be damaged by sharp edges.
- Push on the dust boot (2) and circlip (3).
- Push on sealing ring (4).

- Slip support disc (1) and bottom slide bush (2) on to slider tube (3).
- Remove bag (4).



- Spread top slide bush (1) slightly open and install it in the bead (arrow) of slider tube (2).

Follow-up work

Install the fixed tube

Pouring oil into left fork leg

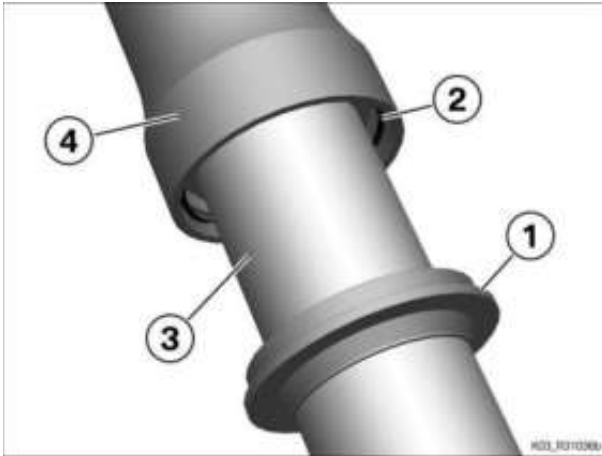
31 42 534 Replacing left slider tube (fork leg removed)

Preparatory work

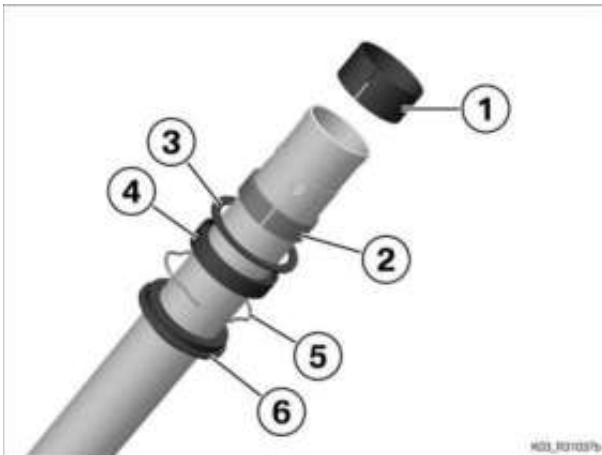
Draining oil from left fork leg

Core activity

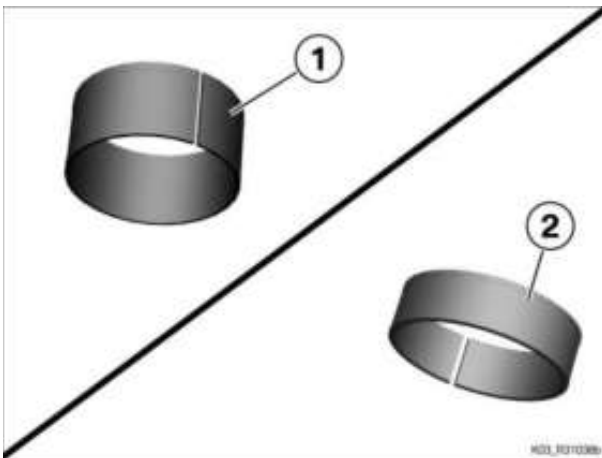
(-) Remove left slider tube



- Loosen dust boot (1) with a suitable tool.
- Disengage circlip (2).
- Remove slider tube (3) with a strong jerk from fixed fork tube (4).



- Spread top slide bush (1) and bottom slide bush (2) slightly using a suitable tool and remove.
- Remove support disc (3), fork sealing ring (4), circlip (5) and dust boot (6).
- Check support disc (3) for deformations and damage; replace if necessary.



- Check top slide bush (1) and bottom slide bush (2) for damage.

Check

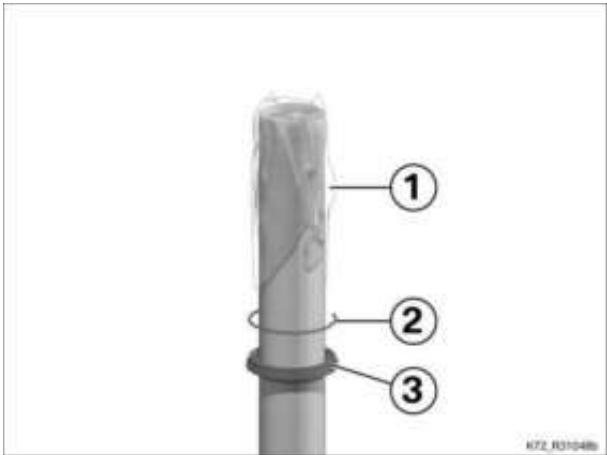
Result:

- Slide bushes reveal scoring or signs of wear in the coating.

Measure:

- Replace slide bushes.

(-) Install slider tube, left



- Slip a bag (1) over the **new** slider tube so as not to damage the new sealing ring on the sharp edges.
- Push a **new** dust boot (3) and circlip (2) on the slider tube.

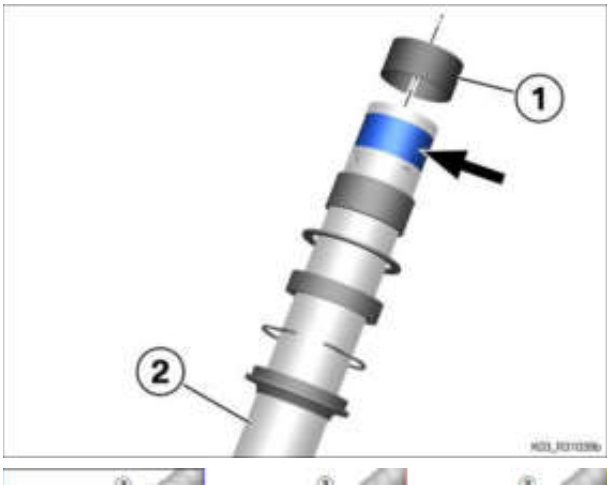
- Lubricate the **inner** sealing lips of the sealing ring (1) lightly.

 Lubricant	
Molykote 111	11 00 7 660 832

- Note the mounting orientation: the protruding sealing lip (arrow) points in the direction of the dust boot.

- Lubricate components with fork oil.
- Push support disc (1) and bottom sliding bush (2) on slider tube (3).
- Remove bag (4).

- Lubricate upper sliding bush (1) with fork oil.
- Spread upper sliding bush (1) slightly and install in the bead (Arrow) of the slider tube (2).



- Carefully slide the fixed fork tube (1) onto the slider tube (2).
- Lubricate bottom sliding bush (3).

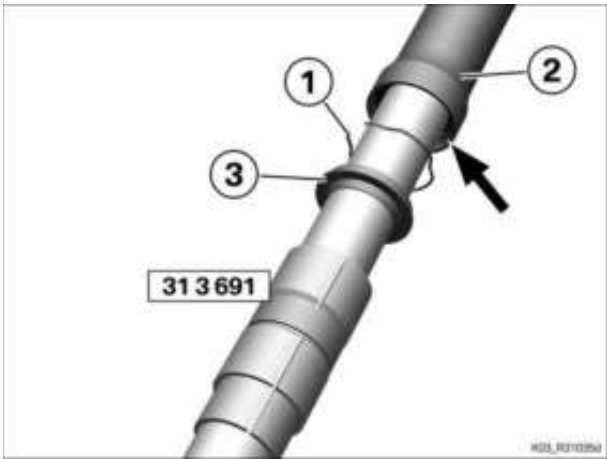


Lubricant

Molykote 111

11 00 7 660 832

- Position lower sliding bush (3) in fixed fork tube (1).
- Install lower sliding bush (3) and support disc (4) with impact bush (No. 31 3 691).
- Install sealing ring (5) with impact bush (No. 31 3 691)(No. 31 3 692).
- Install a **new** circlip (1) and while doing so, pay attention to its correct seating in the groove (Arrow) of fixed fork tube (2).
- Turn impact bush (No. 31 3 691) over and install a **new** dust boot (3) into the fixed fork tube (2).



Follow-up work

Install the fixed tube

Pouring oil into left fork leg

31 42 535 Replacing right slider tube (fork leg removed)

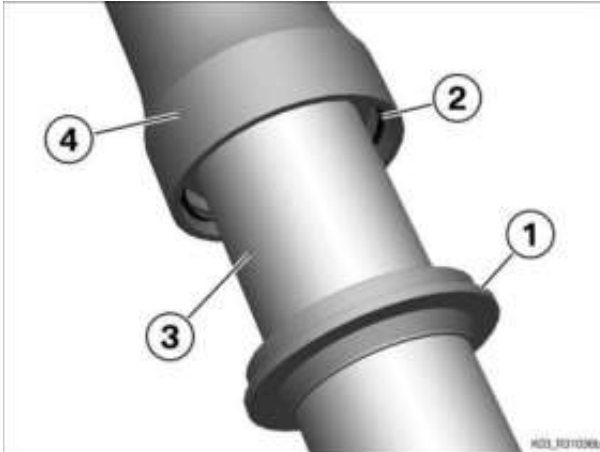
Preparatory work

Drain the oil from right fork leg

Removing damper unit from right fork leg

Core activity

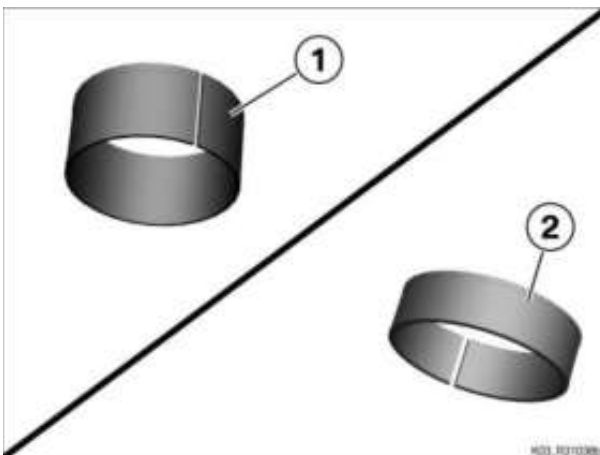
(-) Remove slider tube, right



- Loosen dust boot (1) with a suitable tool.
- Disengage circlip (2).
- Remove slider tube (3) with a strong jerk from fixed fork tube (4).



- Spread top slide bush (1) and bottom slide bush (2) slightly using a suitable tool and remove.
- Remove support disc (3), fork sealing ring (4), circlip (5) and dust boot (6).
- Check support disc (3) for deformations and damage; replace if necessary.



- Check top slide bush (1) and bottom slide bush (2) for damage.

Check

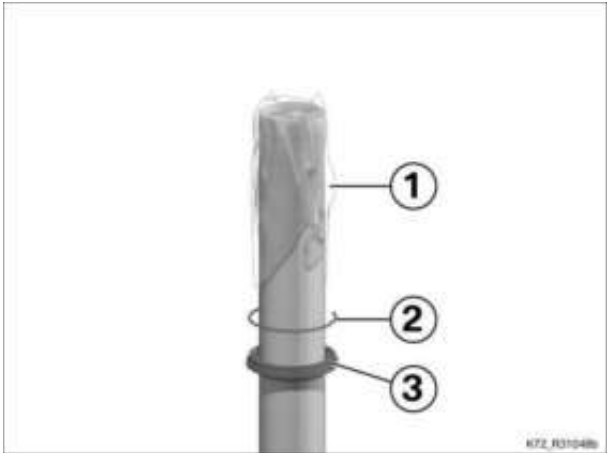
Result:

- Slide bushes reveal scoring or signs of wear in the coating.

Measure:

- Replace slide bushes.

(-) Install slider tube, right



- Slip a bag (1) over the **new** slider tube so as not to damage the new sealing ring on the sharp edges.
- Lubricate the **new** dust boot (3) lightly on the inside.

 Lubricant	
Molykote 111	11 00 7 660 832

- Push a **new** dust boot (3) and circlip (2) on the slider tube.

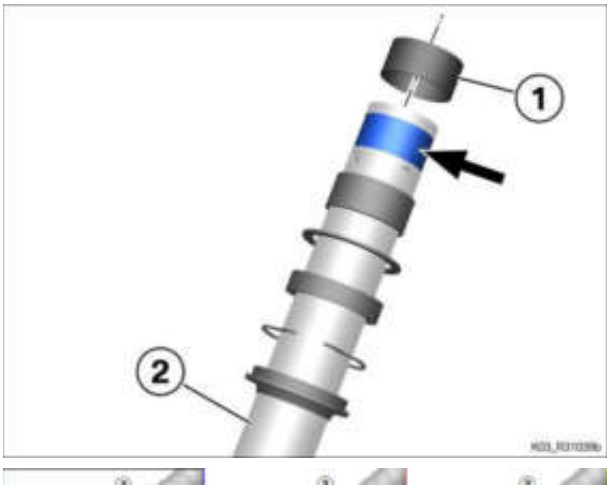
- Lubricate the **inner** sealing lips of the sealing ring (1) lightly.

 Lubricant	
Molykote 111	11 00 7 660 832

- Note the installation position: the protruding sealing lip (arrow) points in the direction of the dust boot.

- Lubricate components with fork oil.
- Push support disc (1) and bottom sliding bush (2) on slider tube (3).
- Remove bag (4).

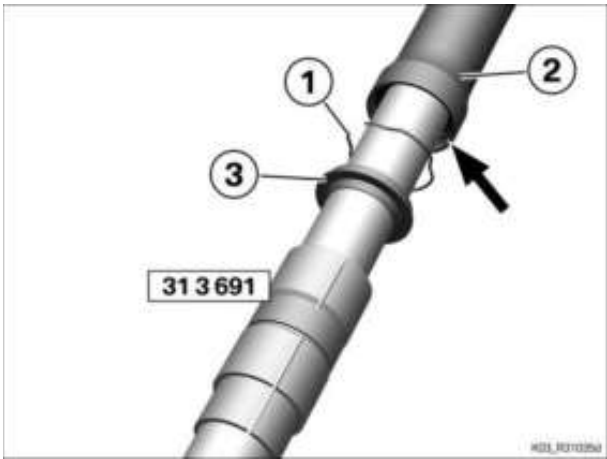
- Lubricate upper sliding bush (1) with fork oil.
- Spread upper sliding bush (1) slightly and install in the bead (Arrow) of the slider tube (2).



- Carefully slide the fixed fork tube (1) onto the slider tube (2).
- Lubricate bottom sliding bush (3).

 Lubricant	
Molykote 111	11 00 7 660 832

- Position lower sliding bush (3) in fixed fork tube (1).
- Install lower sliding bush (3) and support disc (4) with impact bush (No. 31 3 691).
- Install sealing ring (5) with impact bush (No. 31 3 691)(No. 31 3 692).
- Install a **new** circlip (1) and while doing so, pay attention to its correct seating in the groove (Arrow) of fixed fork tube (2).
- Turn impact bush (No. 31 3 691) over and install a **new** dust boot (3) into the fixed fork tube (2).



Follow-up work

Installing the damper unit in the right fork leg

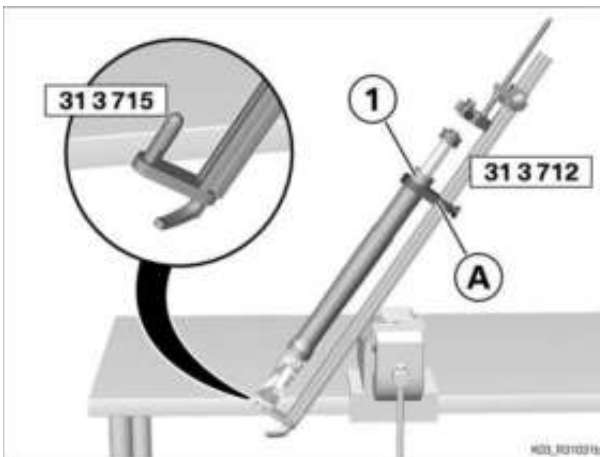
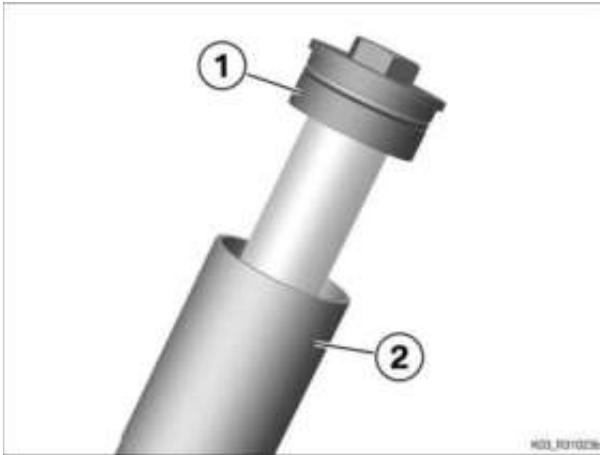
Pouring oil into right fork leg

31 42 656 Replacing damper unit, right (slider tube removed)

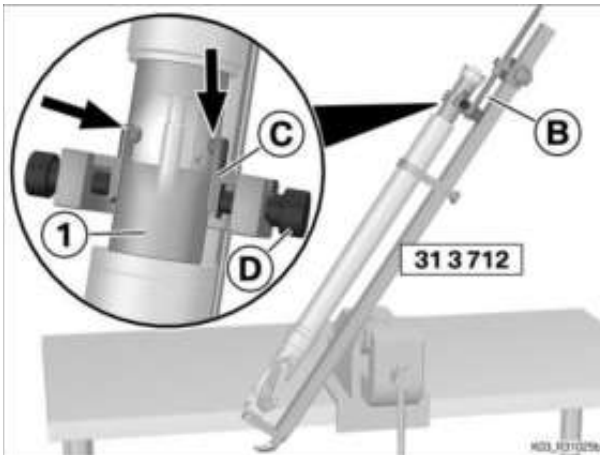
Core activity

(-) Drain the oil from right fork leg

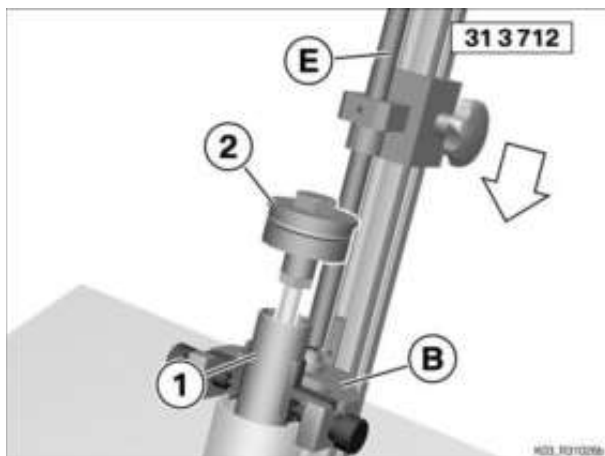
- Firmly and repeatedly compress the fork leg to free any dirt that may be inside.
- Screw out lid (1) fully with special wrench **SW17** (No. 31 1 521) and special wrench mounting (No. 31 1 529) and carefully lower fixed fork tube (2).
- Drain the oil from the fork leg into a suitable container.



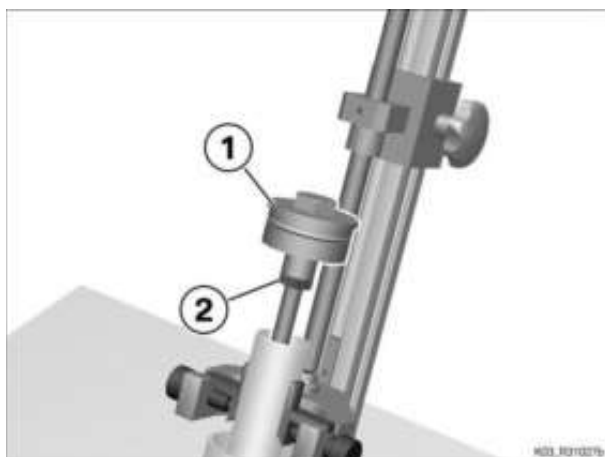
- Install fixture (No. 31 3 715) into pre-tensioning tool (No. 31 3 712).
- Insert fork leg (1) in pre-tensioning tool (No. 31 3 712).
- Secure fork leg (1) with rubber retainer (A).



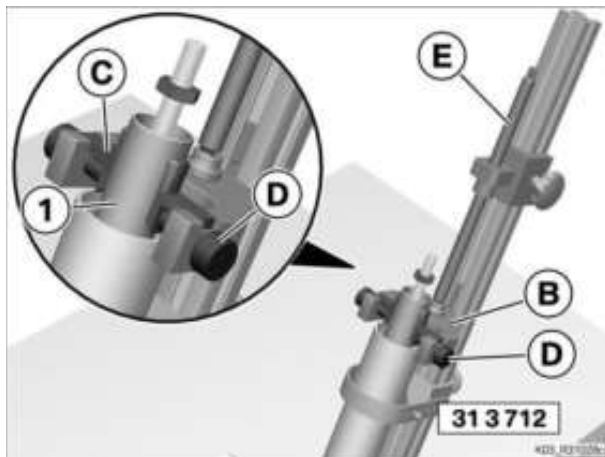
- Position hold-down tool (B) out of pre-tensioning tool (No. 31 3 712).
- Position mountings (C) in bore holes (Arrows) of bush (1) using knurled screws (D).
- Press bush (1) down with press-down tool (B) and spindle (E) out of pre-tensioning tool (No. 31 3 712).



- Pull lid (2) up.

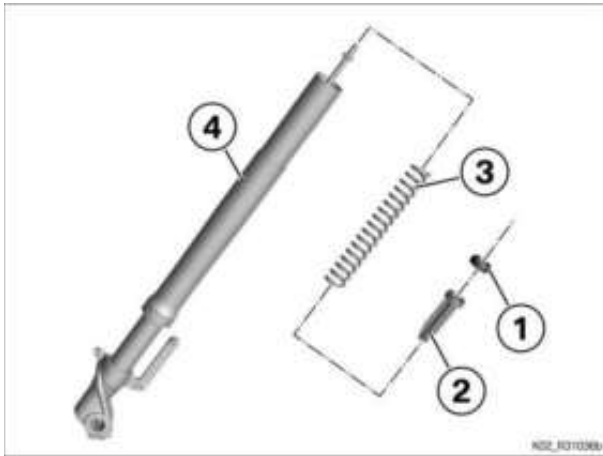
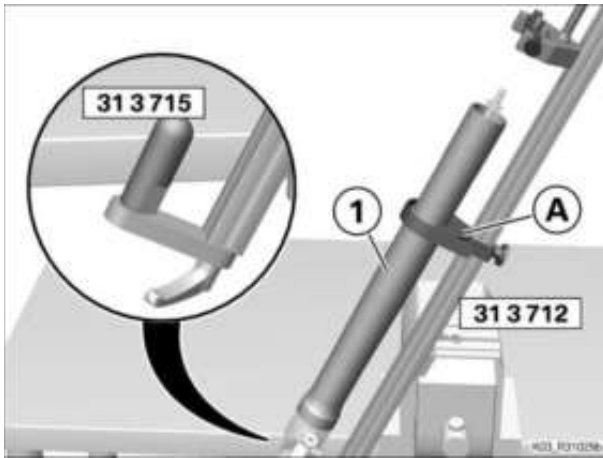


- Counter-hold lid (1) with special wrench **SW17** (No. 31 1 521) and special wrench mounting (No. 31 1 529) and loosen lock nut (2).
- Remove lid (1) and lock nut (2).



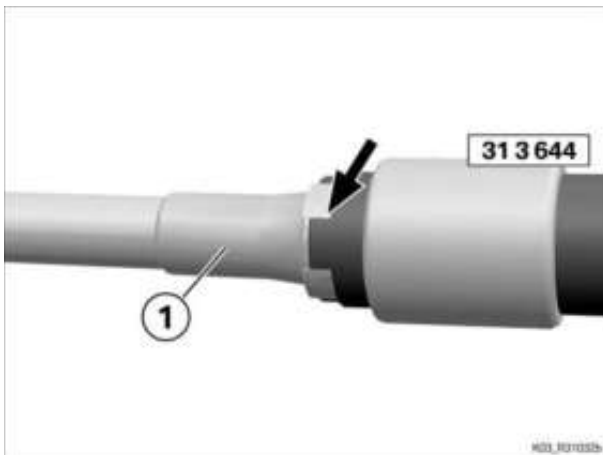
- Rotate hold-down tool (B) with spindle (E) out of pre-tensioning tool (No. 31 3 712) in the reverse direction.
- Loosen mountings (C) with knurled screws (D) out of bush (1).
- Remove bush (1).

- Disengage pre-tensioning tool (No. 31 3 712) and relieve tension.
- Loosen rubber retainer (A) and remove fork leg (1) from mounting (No. 31 3 715).



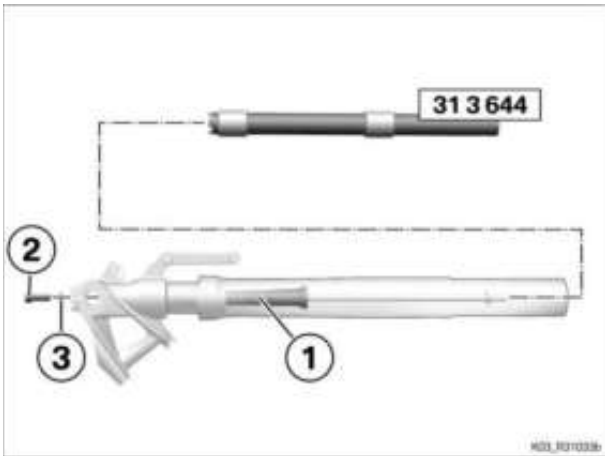
- Remove spacer (1) spring guide (2) and compression spring (3) from fork leg (4).
- Carefully turn fork leg (4) over and drain the rest of the oil.

(-) Removing damper unit from right fork leg



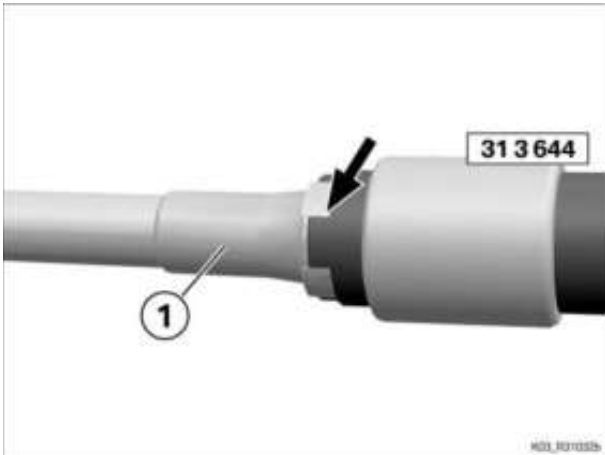
- When inserting the counter support (No. 31 3 644), make sure that the gearing (arrow) of counter support (No. 31 3 644) and damper unit (1) are engaged.

- Insert counter support (No. 31 3 644) into the fork leg and counter-hold damper unit (1).
- Remove screw (2) with sealing ring (3).
- Remove damper unit (1).
- Pump damper unit (1) to drain it fully.



(-) Installing the damper unit in the right fork leg

- When inserting the counter support (No. 31 3 644), make sure that the gearing (arrow) of counter support (No. 31 3 644) and damper unit (1) engage in each other.



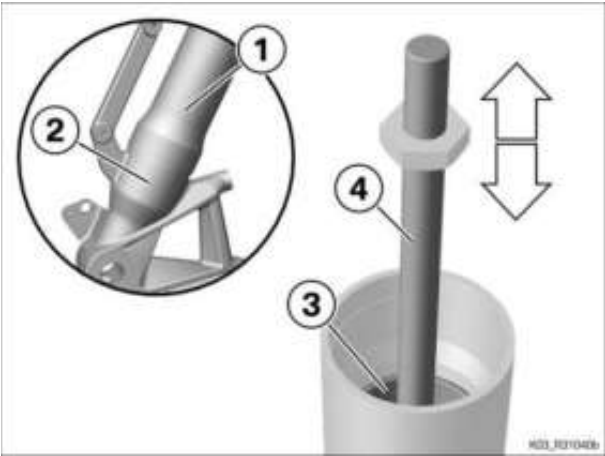
- Clean the threads.
- Install damper unit (1).
- Insert counter support (No. 31 3 644) into the fork leg and counter-hold damper unit (1).
- Install screw (2) with new sealing ring (3).

 Tightening torques		
Damper unit to fork base		
M10 x 25 - 10.9	23 Nm	
Thread-locking compound (Loctite 243, Medium strength)		

(-) Pouring oil into right fork leg

- Carefully lower the fixed fork tube (1) all the way onto the forkleg (2).
- Fill oil in the slider tube (3).

 Technical data		
	approx. 395 ml	



Fork oil, capacity of right fork leg

Telescopic fork oil (Telescope fork oil type 3)

- Move the piston rod (4) of the damper unit up and down several times.
- » The damper unit is filled with oil and is bled.
- Allow the oil to settle for a few minutes.
- Repeat the procedure until the oil is free of bubbles and the oil level no longer changes.

► Adjusting the right-side oil level

- Place the fork leg vertical.
- Adjust the correct oil level according to the filler dipstick (No. 31 6 551), place the filler dipstick **on the fixed fork tube (inner tube)** and draw off excess oil.



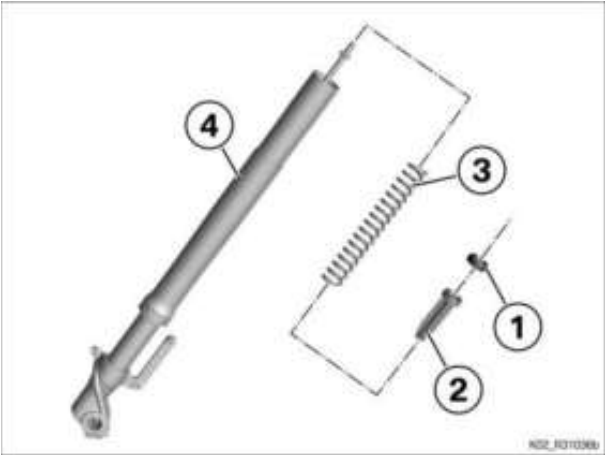
Technical data

Fork oil level, right (air cushion)

Forks and piston rod fully compressed, compression spring and sleeve removed, measured on slider tube

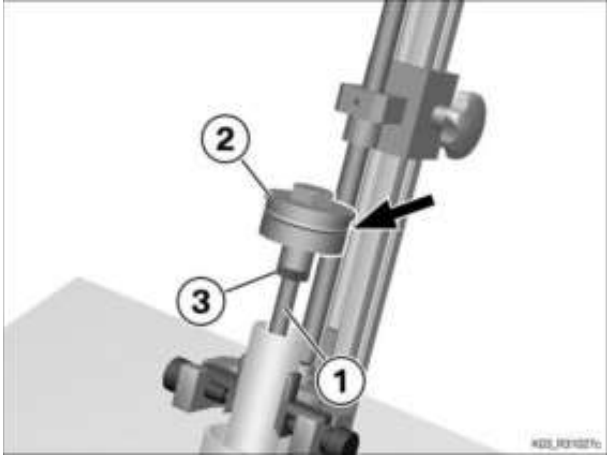
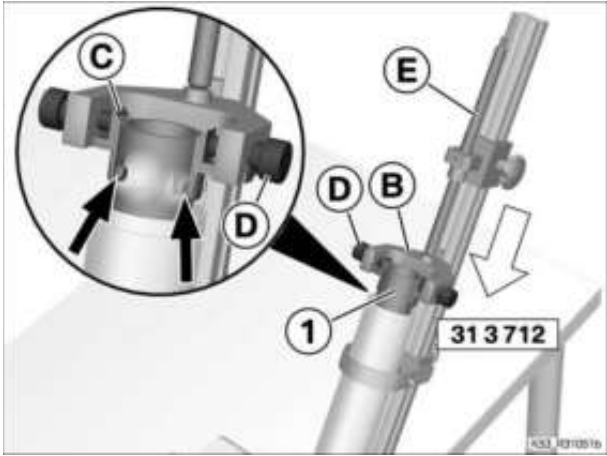
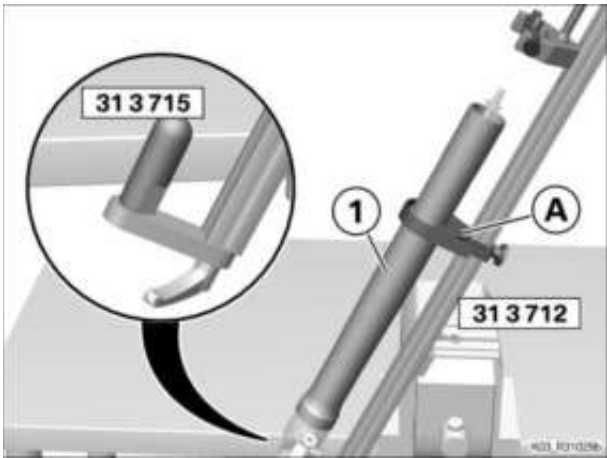
110 mm

Telescopic fork oil (Telescope fork oil type 3)



- Install compression spring (3) and spring guide (2) in forkleg (4).
- » The tapered winding of the compression spring (3) points downwards, spring guide(2) lies **inside** the compression spring.
- Install support disc (1) (inner edge in spring guide (2)).

- Position fork leg (1) on mounting (No. 31 3 715) and insert in pre-tensioning tool(No. 31 3 712).
- Secure fork leg (1) with rubber retainer (A).

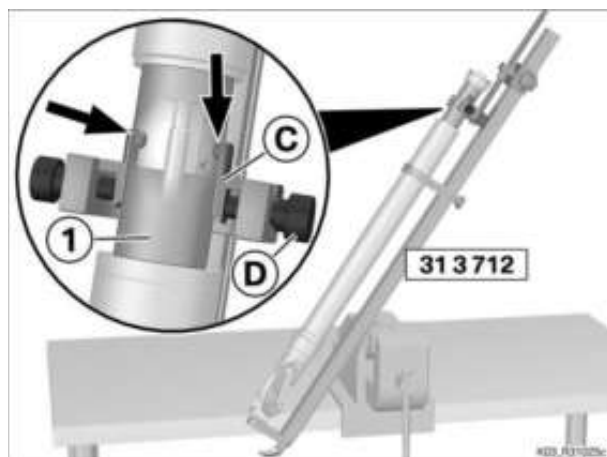
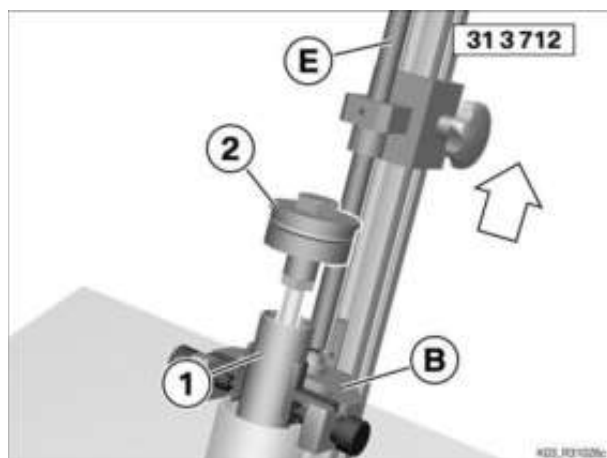


- Install bush (1).
- Position hold-down tool (B) out of pre-tensioning tool (No. 31 3 712).
- Position mountings (C) in bore holes (Arrows) of bush (1) using knurled screws (D).
- Press bush (1) down with press-down tool (B) and spindle (E) out of pre-tensioning tool (No. 31 3 712).

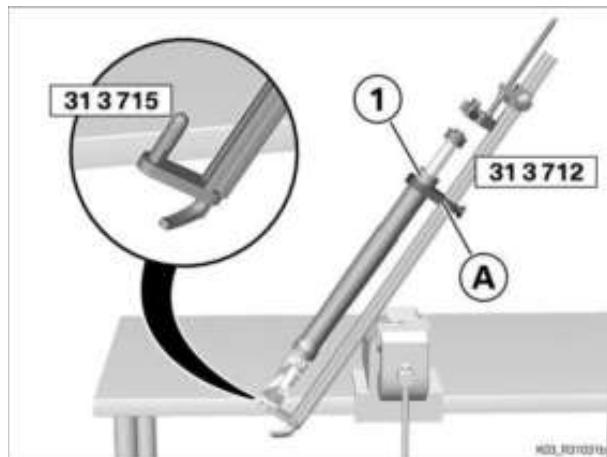
- Check the O-ring (arrow) for damage; replace if necessary.
- Pull piston rod (1) up.
- Screw lid (2) by hand **onto the block**.
- Tighten lock nut (3) while counter-holding lid (2) of special wrench **SW17** (No. 31 1 521) and mounting of special wrench (No. 31 1 529).

Tightening torques		
Locknut to cover		
M10	17 Nm	

- Slowly relieve pressure on bush (1) with hold-down tool (B) and spindle (E) from pretensioning tool (No. 31 3 712).
- Make sure that bush (1) is correctly seated in lid (2).



- Loosen knurled screw (D) and loosen mountings (C) from bore holes (Arrows) of bush (1).



- Loosen rubber retainer (A).
- Remove fork leg (1) from pre-tensioning tool (No. 31 3 712), noting mounting (No. 31 3 715).

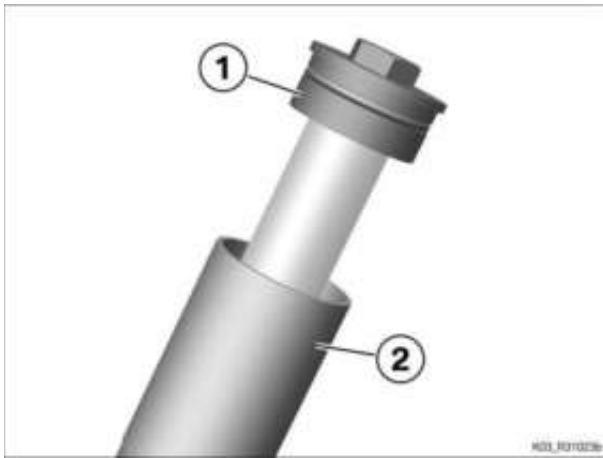
ATTENTION

Use of unsuitable tool

Damage to fork cover

- Use a tool with a hexagon.
- Also use adhesive tape as padding for the tool.

- Push fixed fork tube (2) up and install lid (1) with special wrench **SW17**.



31 42 689 Replacing right compression spring (fork leg removed)

Core activity

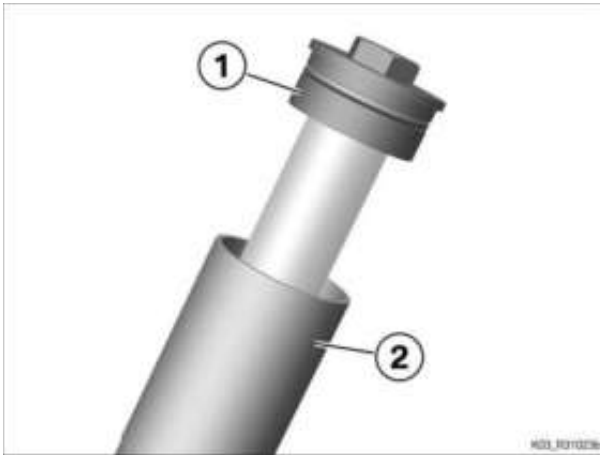
(-) Removing the right compression spring

ATTENTION

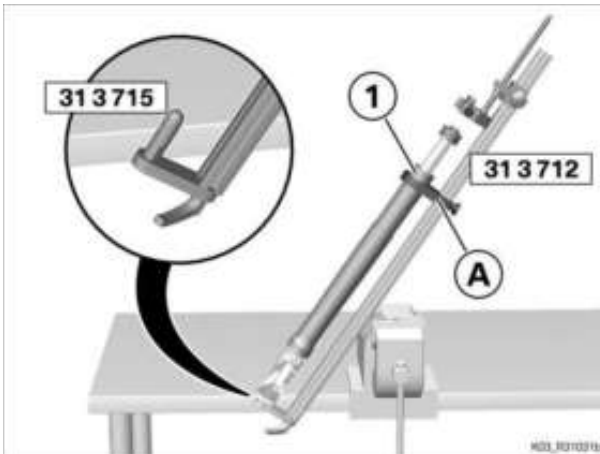
Sharp-edged vent hole in the slider tube

Damage to the radial shaft seal in the fixed fork tube

- Do not pull the slider tube out of the fixed fork tube past the as-installed position.



- Screw out lid (1) fully with special wrench **SW17** (No. 31 1 521) and special wrench mounting (No. 31 1 529) and carefully lower fixed fork tube (2).



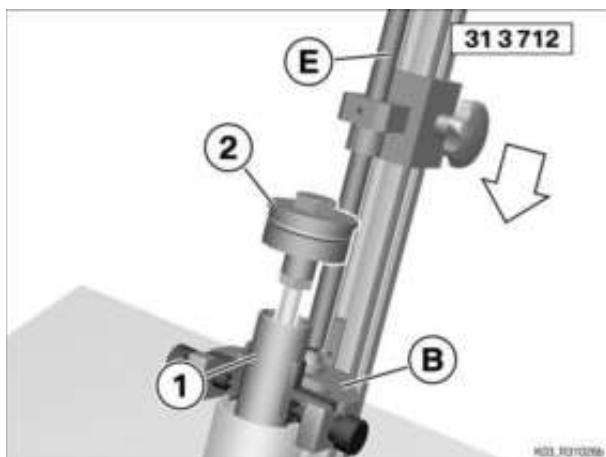
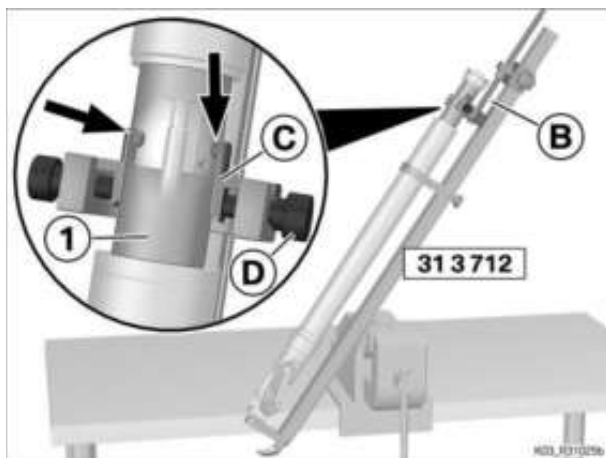
- Install fixture (No. 31 3 715) into pre-tensioning tool (No. 31 3 712).

- Insert fork leg (1) in pre-tensioning tool (No. 31 3 712).

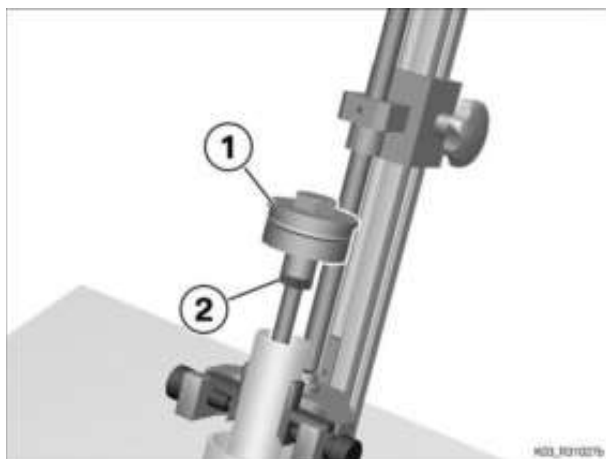
- Secure fork leg (1) with rubber retainer (A).

- Position hold-down tool (B) of the pre-tensioning tool (No. 31 3 712).

- Position mountings (C) in bore holes (Arrows) of bush (1) using knurled screws (D).

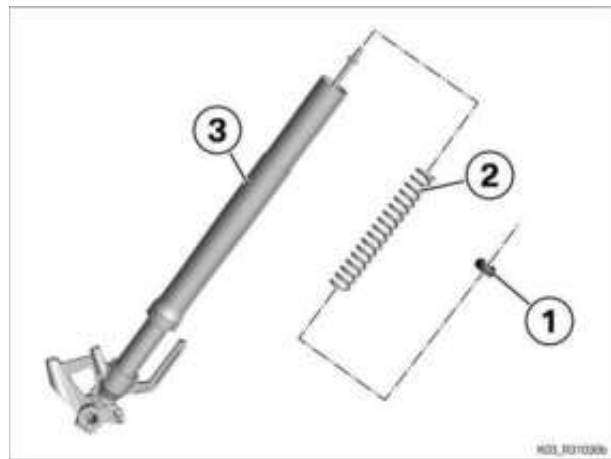
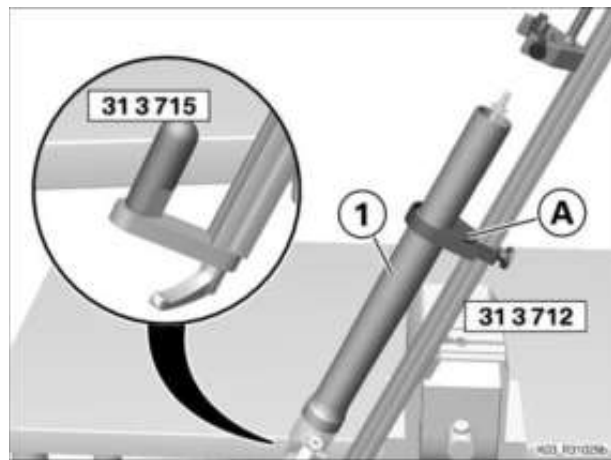
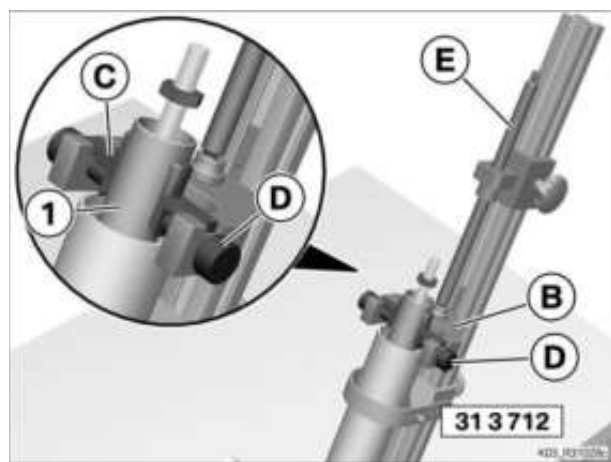


- Press bush (1) down with press-down tool (B) and spindle (E) out of pre-tensioning tool (No. 31 3 712).
- Pull lid (2) up.



- Counter-hold lid (1) with special wrench **SW17** (No. 31 1 521) and loosen lock nut (2).
- Remove the lid (1).

- Rotate hold-down tool (B) with spindle (E) out of pre-tensioning tool (No. 31 3 712) in the reverse direction.
- Loosen mountings (C) with knurled screws (D) out of bushes (1).
- Remove bush (1).



- Disengage pre-tensioning tool (No. 31 3 712) and relieve tension.
- Loosen rubber retainer (A) and remove fork leg (1) from mounting (No. 31 3 715).
- Remove spacer (1) and compression spring (2) from fork leg (3).

(-) Adjusting oil level

- Carefully lower fixed fork tube (1) all the way down on to the fork tube (2).
- Top up oil in the slider tube (3).

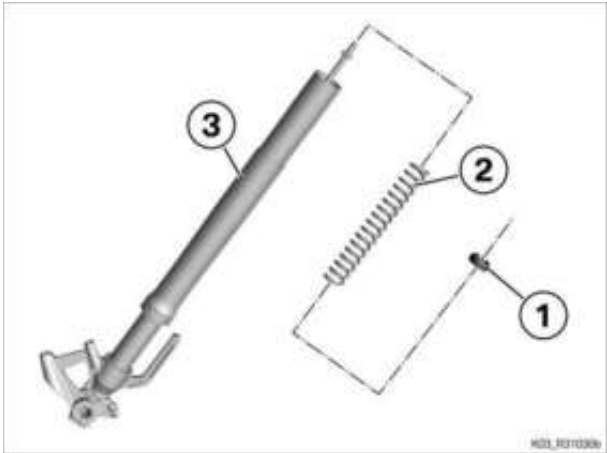
 Telescopic fork oil	
Telescope fork oil type 2	83 19 2 408 581



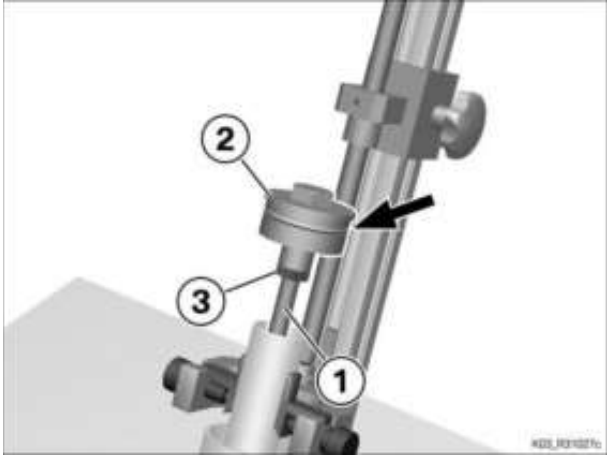
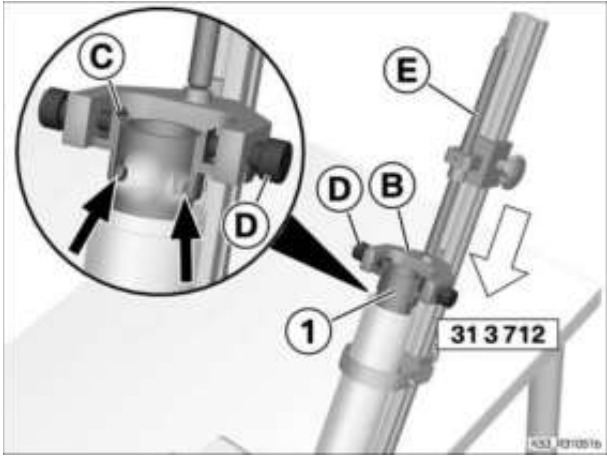
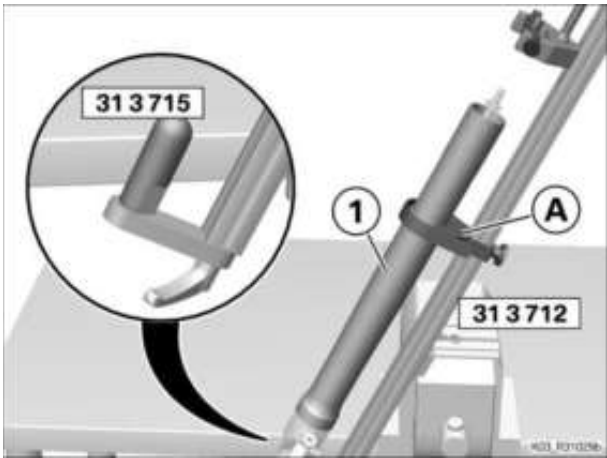
- Set the correct oil level on dipstick (No. 31 6 551), insert the dipstick into the telescopic fork and draw off the excess fork oil.

 Technical data			
Fork oil level, right (air cushion)	Forks and piston rod fully compressed, compression spring and sleeve removed, measured on slider tube	110 mm	
Telescopic fork oil (Telescope fork oil type 3)			

(-) Installing right compression spring



- Install compression spring (2) and spacer (1) in fork leg (3).
- Position fork leg (1) on mounting (No. 31 3 715) and insert in pre-tensioning tool(No. 31 3 712).
- Secure fork leg (1) with rubber retainer (A).

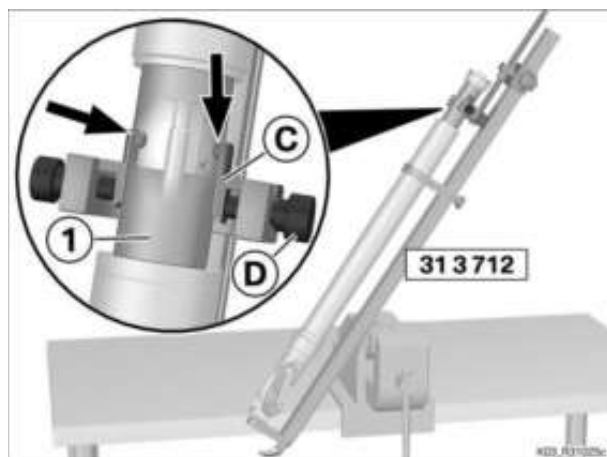
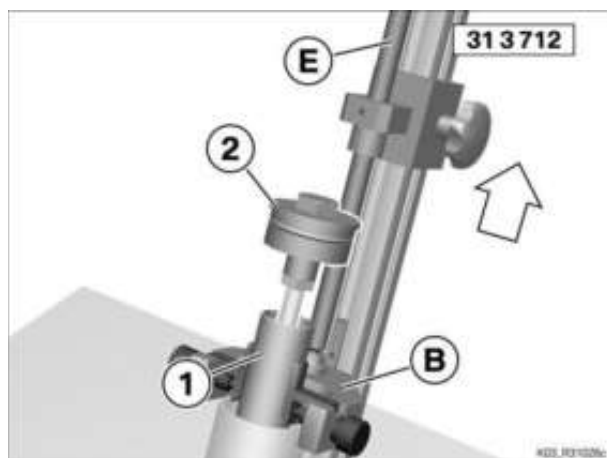


- Install bush (1).
- Position hold-down tool (B) out of pre-tensioning tool (No. 31 3 712).
- Position mountings (C) in bore holes (Arrows) of bush (1) using knurled screws (D).
- Press bush (1) down with press-down tool (B) and spindle (E) out of pre-tensioning tool (No. 31 3 712).

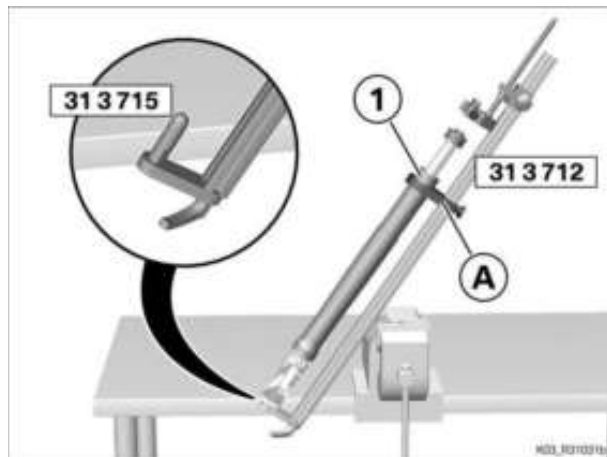
- Check the O-ring (arrow) for damage; replace if necessary.
- Pull piston rod (1) up.
- Slowly screw on lid (2) until it sits lightly on the block.
- Secure lid (2) with lock nut (3).

Tightening torques		
Locknut to cover		
M10	17 Nm	

- Slowly relieve pressure on bush (1) with hold-down tool (B) and spindle (E) from pretensioning tool (No. 31 3 712).
- Make sure that bush (1) is correctly seated in lid (2).



- Loosen knurled screws (D) and loosen mountings (C) from bore holes (Arrows) of bush (1).



- Loosen rubber retainer (A).
- Remove fork leg (1) from pre-tensioning tool (No. 31 3 712), noting mounting (No. 31 3 715).

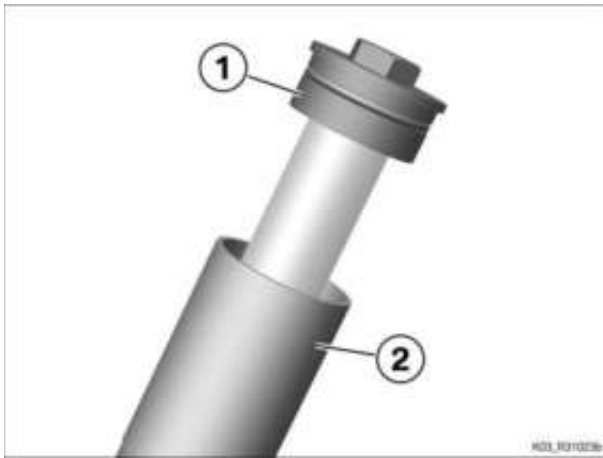
ATTENTION

Use of unsuitable tool

Damage to fork cover

- Use a tool with a hexagon.
- Also use adhesive tape as padding for the tool.

- Push fixed fork tube (2) up and install lid (1).



- Install screws (1) on left and right, but do not tighten.

31 42 690 Replacing left compression spring (fork leg removed)

Core activity

(-) Removing left compression spring

ATTENTION

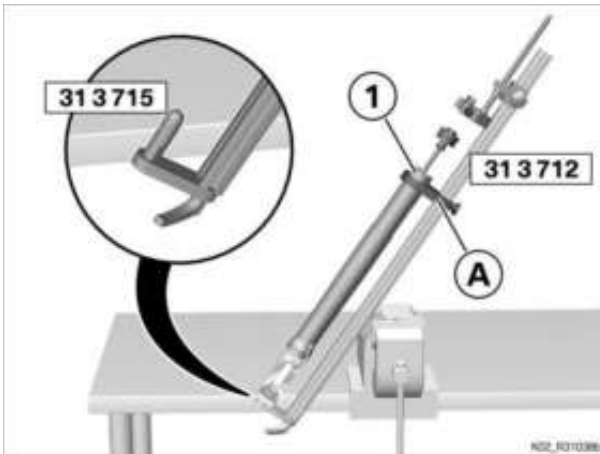
Sharp-edged vent hole in the slider tube

Damage to the radial shaft seal in the fixed fork tube

- Do not pull the slider tube out of the fixed fork tube past the as-installed position.

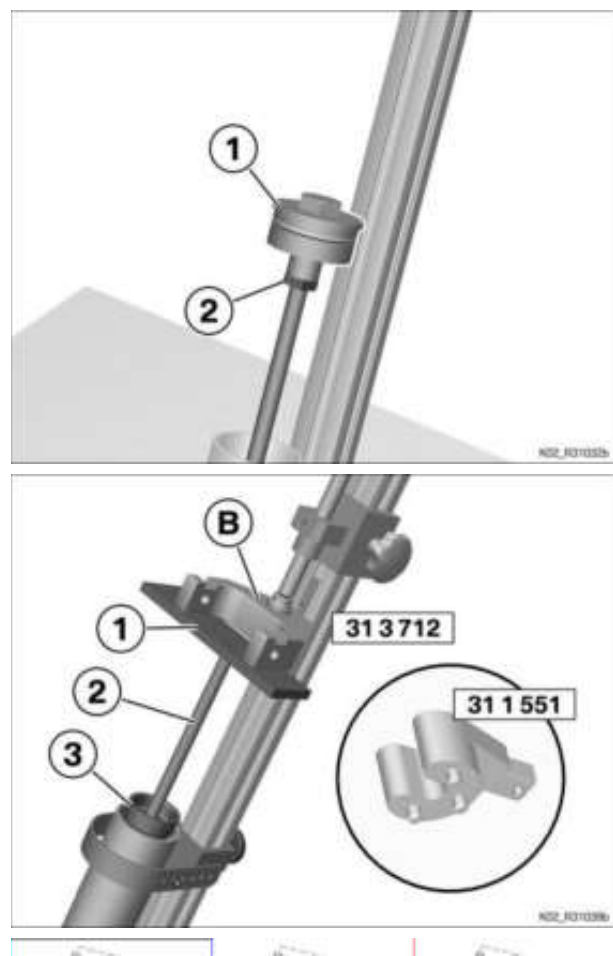


- Screw out lid (1) fully with special wrench **SW17** (No. 31 1 521) and special wrench mounting (No. 31 1 529) and carefully lower fixed fork tube (2).



- Install fixture (No. 31 3 715) into pre-tensioning tool (No. 31 3 712).
- Insert fork leg (1) in pre-tensioning tool (No. 31 3 712).
- Secure fork leg (1) with rubber retainer (A).

- Counter-hold lid (1) with special wrench **SW17** (No. 31 1 521) and loosen lock nut (2).
- Remove the lid (1).



- Position a suitable tool (1) between piston rod (2) and hold-down tool (B).
 - Press piston rod (2) with pre-tensioning too (No. 31 3 712) slightly downwards.
 - Loosen screw cap (3) using special wrench (No. 31 1 551) while counter-holding the forkleg.
 - Relieve tension on pre-tensioning tool (No. 31 3 712) slowly.
 - Loosen rubber retainer (A) and remove forkleg (3) from pre-tensioning tool (No. 31 3 712).
-
- Remove the screw cap with threaded rod (1).
 - Remove compression spring (2) and allow to be drip-free.

(-) Adjusting the left-side oil level

- Place the fork leg vertical.
- On the filler dipstick (No. 31 6 551) set the correct oil level, then insert the filler dipstick in the telescopic forks and draw off excess fork oil.

 Technical data			
Level of fork oil in left fork leg (air chamber)	Forks fully compressed, compression spring and	120 mm	

	sleeve removed	
	Telescopic fork oil (Telescope fork oil type 3)	

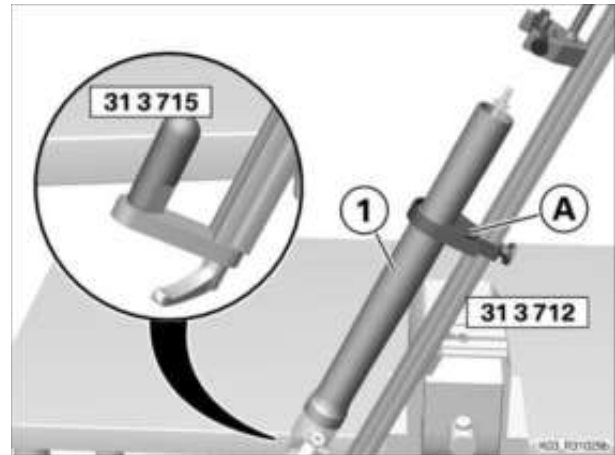


(-) Installing left compression spring

- Clean threads of screw cap (1) and mating thread in fixed fork tube.
- Apply screw locking agent to screw cap (1).

 Thread-locking compound	
Loctite 243, Medium strength	83 19 2 210 339

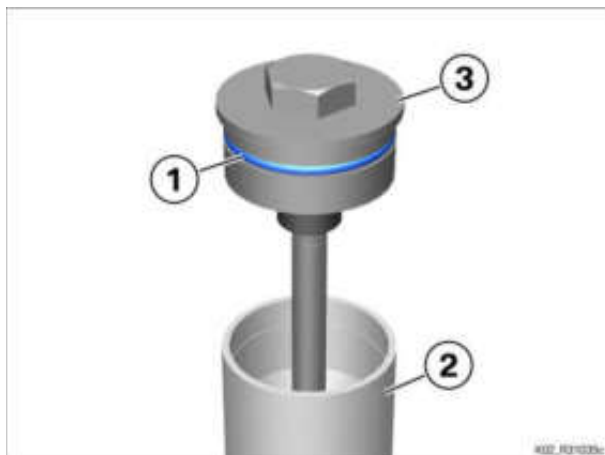
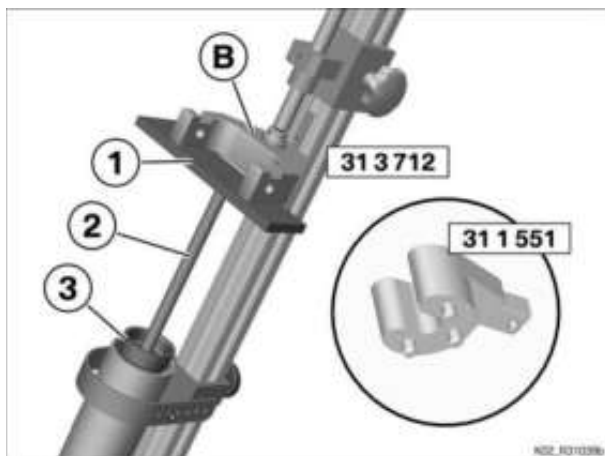
- Install compression spring (2) (the tapered wound end pointing upwards to the screw cap).
- Install the screw cap with threaded rod (1).



- Position fork leg (1) on mounting (No. 31 3 715) and insert in pre-tensioning tool(No. 31 3 712).
- Secure fork leg (1) with rubber retainer (A).

- Position a suitable tool (1) between piston rod (2) and hold-down tool (B).
- Pretension piston rod (2) until screw cap (3) can be turned without spring force.
- Tighten screw cap (3) using special wrench (No. 31 1 551) while counter-holding the forkleg.

 Tightening torques



Threaded plug in fixed fork tube

Thread-locking compound (Loctite 243, Medium strength)

17 Nm

- Slowly relieve tension on spindle (E) from pretensioning tool (No. 31 3 712).
- Loosen rubber retainer (A) and remove forkleg (3) from pre-tensioning tool (No. 31 3 712).
- Renew O-ring (1) and lubricate with fork oil.
- Push fixed fork tube (2) up and install lid (3) with special wrench **SW17**.

31 42 902 Changing fluid in telescopic forks (for maintenance)

NOTICE

To guarantee optimum functioning, renew following parts during oil change:

Sliding bush, sealing, circlip , dust boot.

Preparatory work

Installing engine lifter

Removing front-wheel cover

Loosening the front brake caliper and brake line

Removing front wheel

Disengaging front wheel-speed sensor

Loosen lid for fork leg

Removing both fork legs

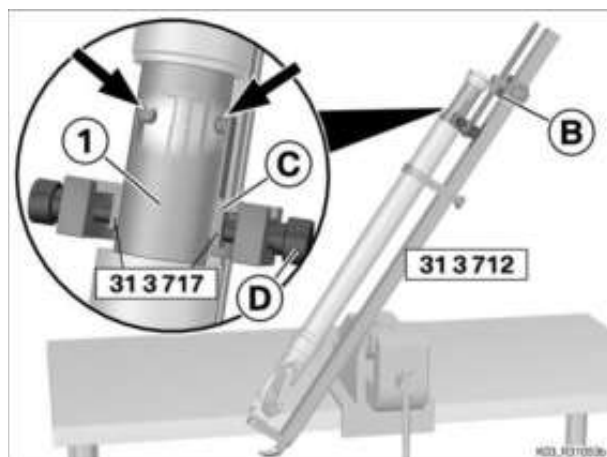
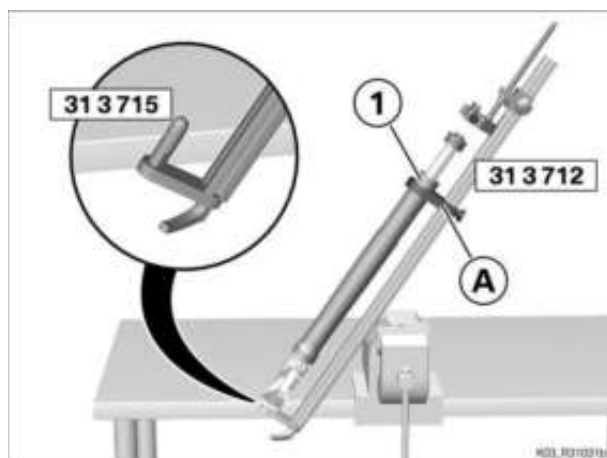
Core activity

(-) Draining oil from right fork legs

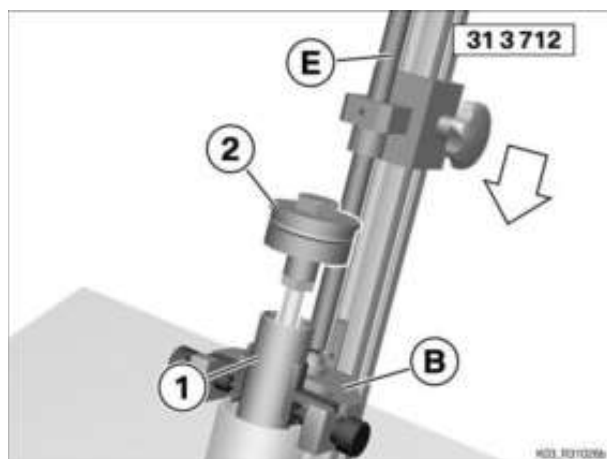
- Firmly and repeatedly compress the fork leg to free any dirt that may be inside.
- Screw out lid (1) fully with special wrench **SW17** (No. 31 1 521) and special wrench mounting (No. 31 1 529) and carefully lower fixed fork tube (2).
- Drain the oil from the fork leg into a suitable container.



- Install fixture (No. 31 3 715) into pre-tensioning tool (No. 31 3 712).
- Insert fork leg (1) in pre-tensioning tool (No. 31 3 712).
- Secure fork leg (1) with rubber retainer (A).

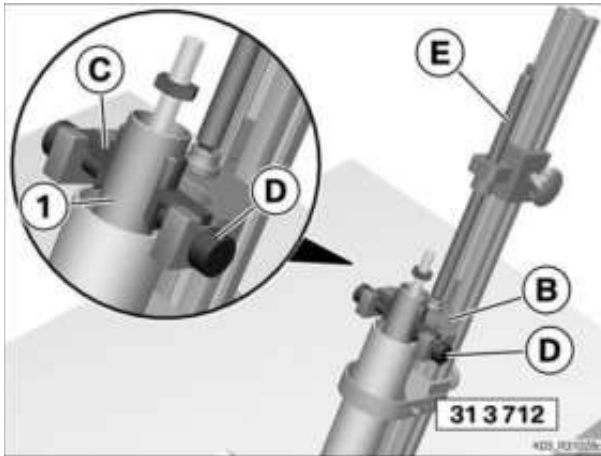
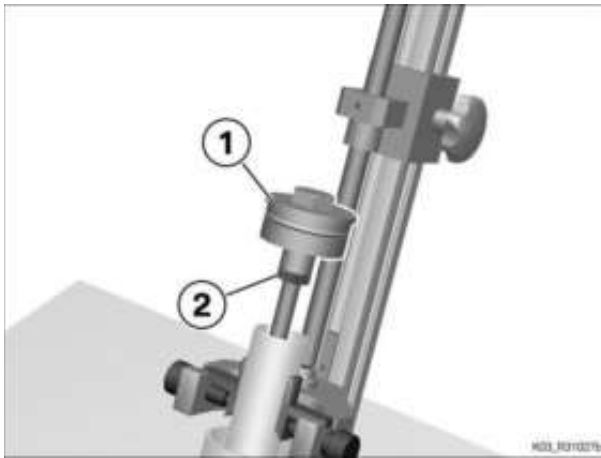


- **Rotate** hold-down tool (B) out of pre-tensioning tool (No. 31 3 712) and position it.
- Position **long mountings** (C) (No. 31 3 717) with knurled screws (D) in bore holes (Arrows) of the bush (1).

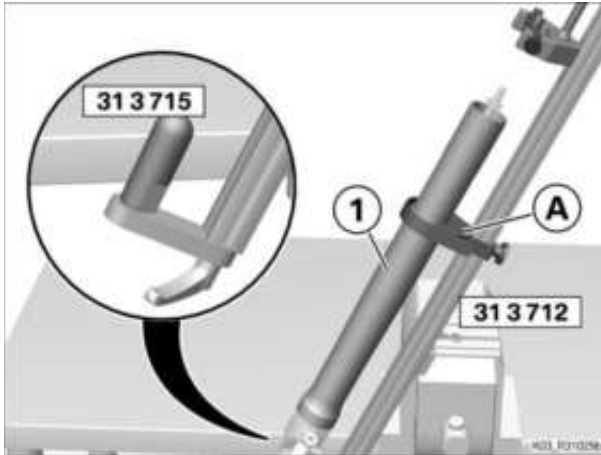


- Press bush (1) down with press-down tool (B) and spindle (E) out of pre-tensioning tool (No. 31 3 712).
- Pull lid (2) **up**.

- Counter-hold lid (1) with special wrench **SW17** (No. 31 1 521) and special wrench mounting (No. 31 1 529) and loosen lock nut (2).
- Remove lid (1) and lock nut (2).

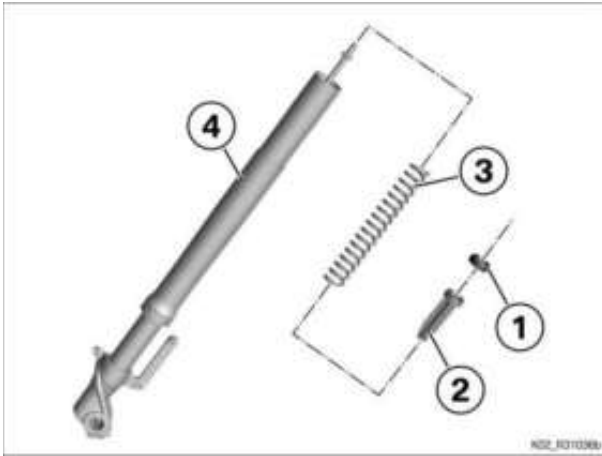


- Rotate hold-down tool (B) with spindle (E) out of pre-tensioning tool (No. 31 3 712) in the reverse direction.
- Loosen mountings (C) with knurled screws (D) out of bush (1).
- Remove bush (1).



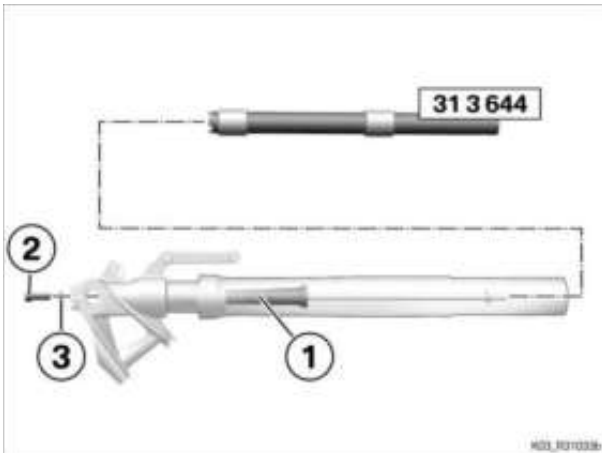
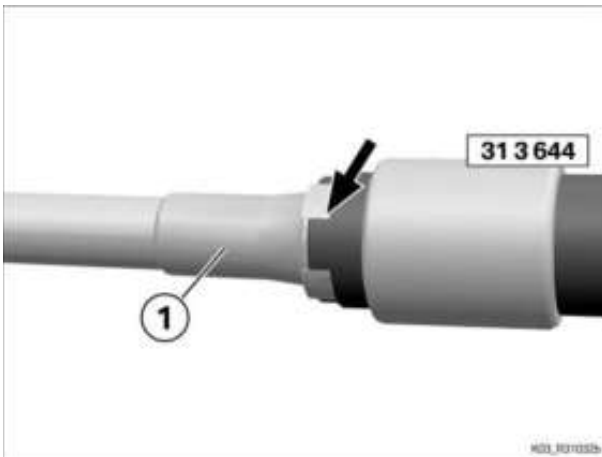
- Disengage pre-tensioning tool (No. 31 3 712) and relieve tension.
- Loosen rubber retainer (A) and remove fork leg (1) from mounting (No. 31 3 715).

- Remove spacer (1) spring guide (2) and compression spring (3) from fork leg (4).
- Carefully turn fork leg (4) over and drain the rest of the oil.



(-) Removing damper unit from right fork leg

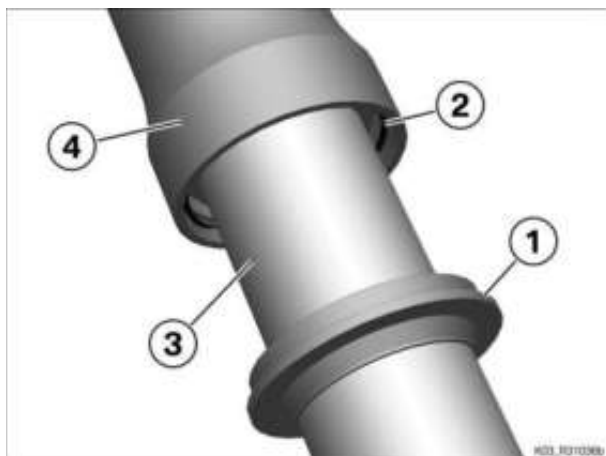
- When inserting the counter support (No. 31 3 644), make sure that the gearing (arrow) of counter support (No. 31 3 644) and damper unit (1) engage in each other.



- Insert counter support (No. 31 3 644) into the fork leg and counter-hold damper unit (1).
- Remove screw (2) with sealing ring (3).
- Remove damper unit (1).
- Pump damper unit (1) to drain it fully.

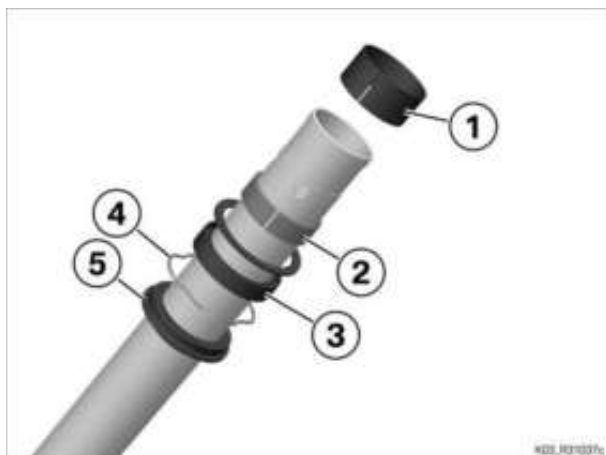
(-) Remove slider tube, right

- Loosen dust boot (1) with a suitable tool.
- Disengage circlip (2).
- Remove slider tube (3) with a strong jerk from fixed fork tube (4).



- Spread top slide bush (1) and bottom slide bush (2) slightly using a suitable tool and remove.
- Remove support disc (3), fork sealing ring (4), circlip (5) and dust boot (6).
- Check support disc (3) for deformations and damage; replace if necessary.

(-) Renew sealing and bearing



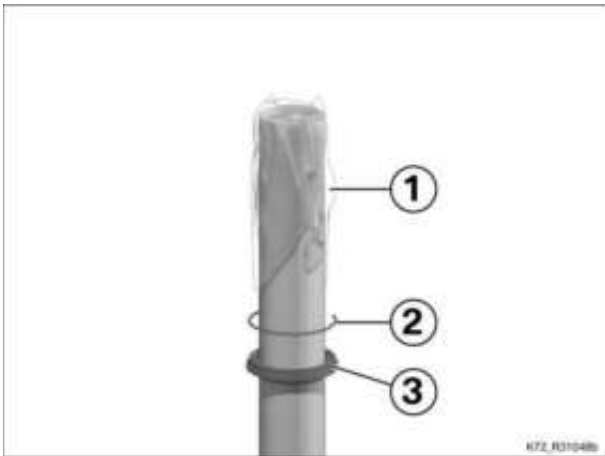
- Renew the following parts:
- Sliding bushes at top (1) and bottom (2)
- Fork sealing ring (3) and circlip (4)
- sealing boot (5)

(-) Install slider tube, right

- Slip a bag (1) over the **new** slider tube so as not to damage the new sealing ring on the sharp edges.
- Lubricate the **new** dust boot (3) lightly on the inside.



Lubricant



Molykote 111	11 00 7 660 832
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- Push a **new** dust boot (3) and circlip (2) on the slider tube.

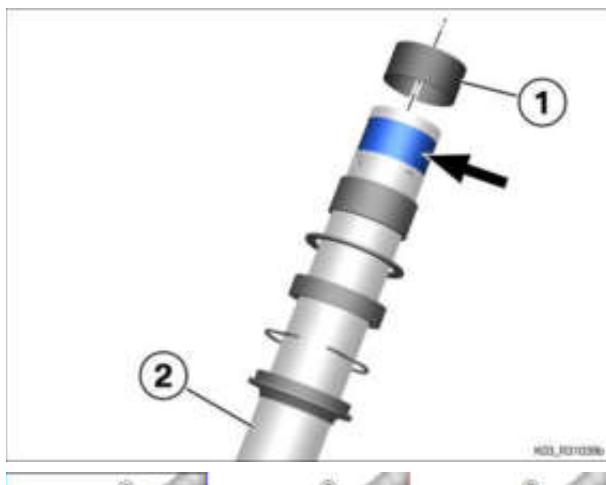
- Lubricate the **inner** sealing lips of the sealing ring (1) lightly.

 Lubricant	
Molykote 111	11 00 7 660 832

- Note the installation position: the protruding sealing lip (arrow) points in the direction of the dust boot.

- Lubricate components with fork oil.
- Push support disc (1) and bottom sliding bush (2) on slider tube (3).
- Remove bag (4).

- Lubricate upper sliding bush (1) with fork oil.
- Spread upper sliding bush (1) slightly and install in the bead (Arrow) of the slider tube (2).



- Carefully slide the fixed fork tube (1) onto the slider tube (2).
- Lubricate bottom sliding bush (3).

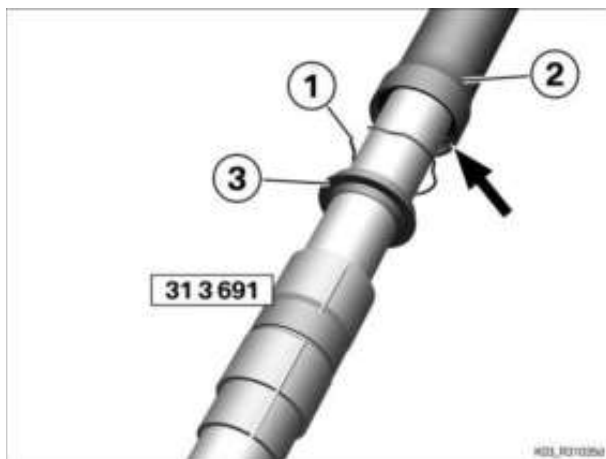


Lubricant

Molykote 111

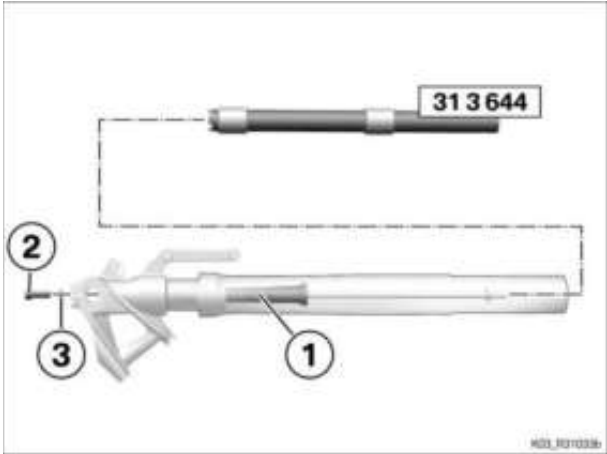
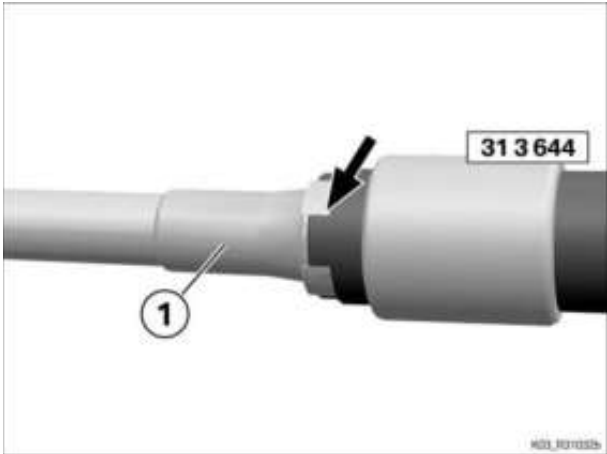
11 00 7 660 832

- Position lower sliding bush (3) in fixed fork tube (1).
- Install lower sliding bush (3) and support disc (4) with impact bush (No. 31 3 691).
- Install sealing ring (5) with impact bush (No. 31 3 691)(No. 31 3 692).
- Install a **new** circlip (1) and while doing so, pay attention to its correct seating in the groove (Arrow) of fixed fork tube (2).
- Turn impact bush (No. 31 3 691) over and install a **new** dust boot (3) into the fixed fork tube (2).



(-) Installing the damper unit in the right fork leg

- When inserting the counter support (No. 31 3 644), make sure that the gearing (arrow) of counter support (No. 31 3 644) and damper unit (1) **engage in each other**.

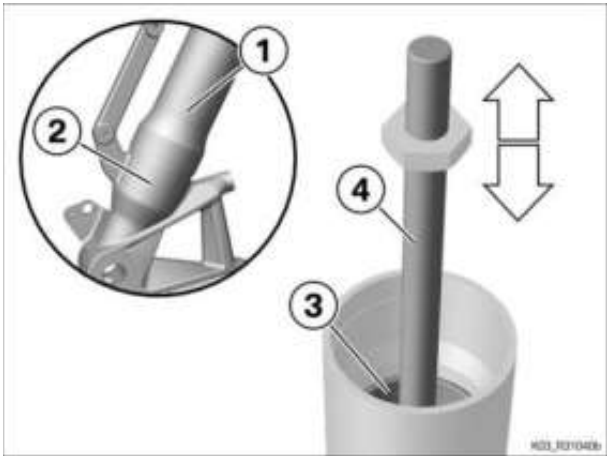


- Clean the threads.
- Install damper unit (1).
- Insert counter support (No. 31 3 644) into the fork leg and counter-hold damper unit (1).
- Install screw (2) with new sealing ring (3).

 Tightening torques		
Damper unit to fork base		
M10 x 25 - 10.9	23 Nm	
Thread-locking compound (Loctite 243, Medium strength)		

(-) Pouring oil into right fork leg

- Carefully lower the fixed fork tube (1) all the way onto the forkleg (2).
- Fill oil into the slider tube (3).



 Technical data		
Fork oil, capacity of right fork leg	approx. 395 ml	
Telescopic fork oil (Telescope fork oil type 3)		

- Move the piston rod (4) of the damper unit up and down several times.
- » The damper unit is filled with oil and is bled.
- Allow the oil to settle for a few minutes.
- Repeat the procedure until the oil is free of bubbles and the oil level no longer changes.

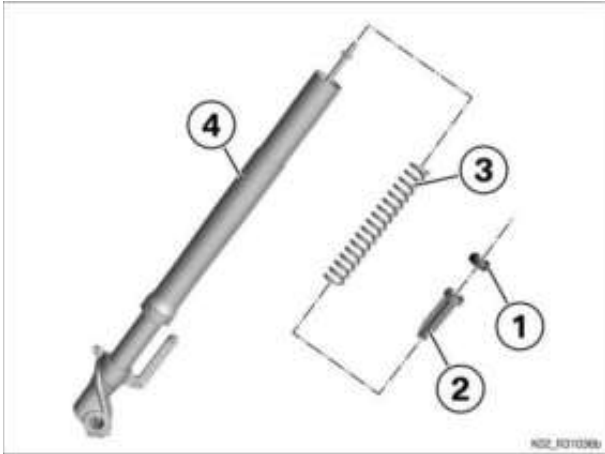
► Adjusting the right-side oil level

- Place the fork leg vertical.
- Adjust the correct oil level according to the filler dipstick (No. 31 6 551), place the filler dipstick **on the fixed fork tube (inner tube)** and draw off excess oil.

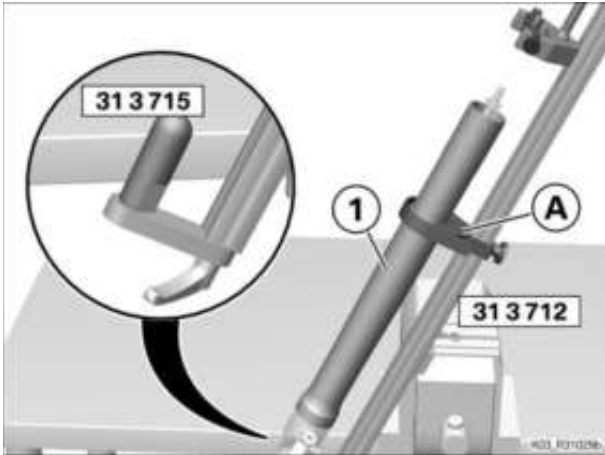


Technical data

Fork oil level, right (air cushion)	Forks and piston rod fully compressed, compression spring and sleeve removed, measured on slider tube	110 mm	
Telescopic fork oil (Telescope fork oil type 3)			

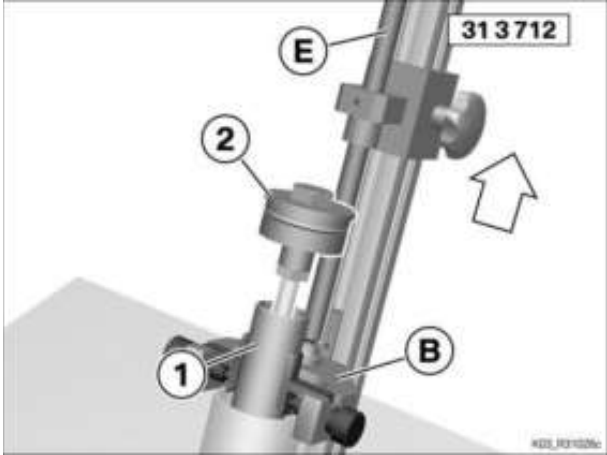
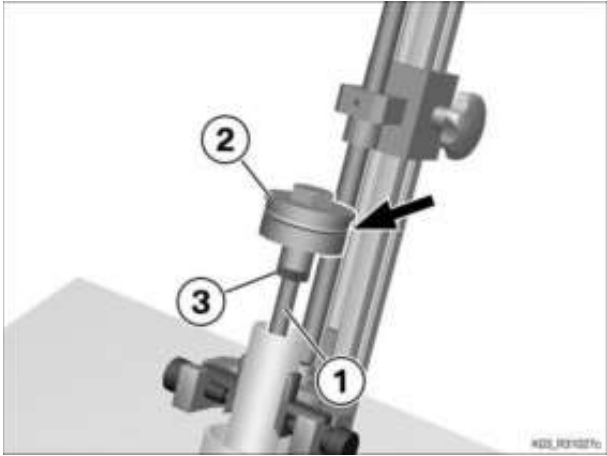
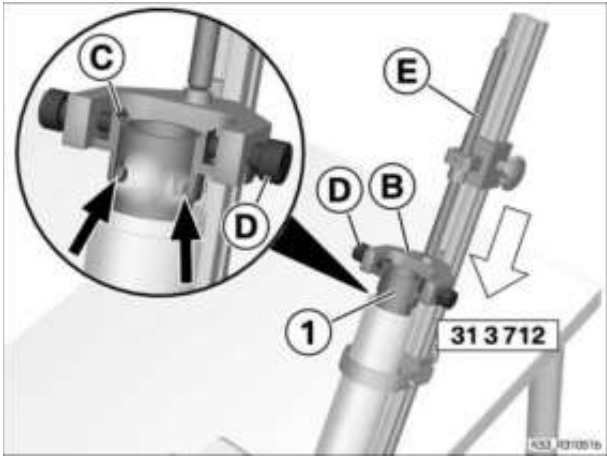


- Install compression spring (3) and spring guide (2) in forkleg (4).
- » The tapered winding of the compression spring (3) points downwards, spring guide(2) lies **inside** the compression spring.
- Install support disc (1) (inner edge in spring guide (2)).



- Position fork leg (1) on mounting (No. 31 3 715) and insert in pre-tensioning tool(No. 31 3 712).
- Secure fork leg (1) with rubber retainer (A).

- Install bush (1).
- Position hold-down tool (B) out of pre-tensioning tool (No. 31 3 712).
- Position mountings (C) in bore holes (Arrows) of bush (1) using knurled screws (D).
- Press bush (1) down with press-down tool (B) and spindle (E) out of pre-tensioning tool (No. 31 3 712).

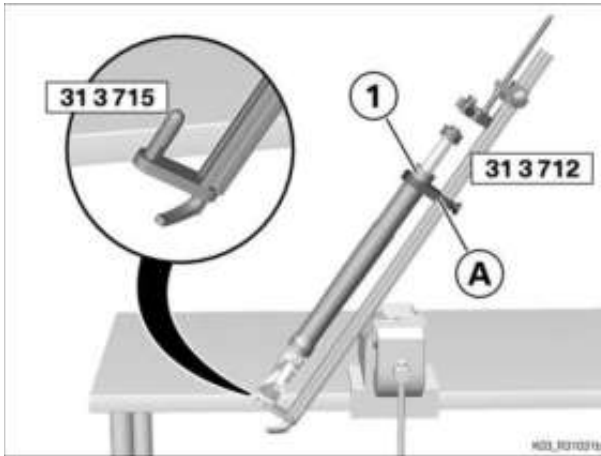
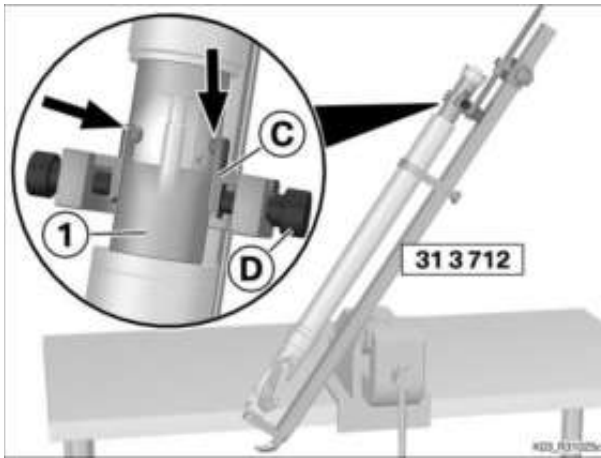


- Install **new** O-ring (Arrow) and lubricate with fork oil.
- Pull piston rod (1) up.
- Screw lid (2) by hand **onto the block**.
- Tighten lock nut (3) while counter-holding lid (2) of special wrench **SW17** (No. 31 1 521) and mounting of special wrench (No. 31 1 529).

Tightening torques		
Locknut to cover		
M10	17 Nm	

- Slowly relieve pressure on bush (1) with hold-down tool (B) and spindle (E) from pretensioning tool (No. 31 3 712).
- Make sure that bush (1) is correctly seated in lid (2).

- Loosen knurled screws (D) and loosen mountings (C) from bore holes (Arrows) of bush (1).



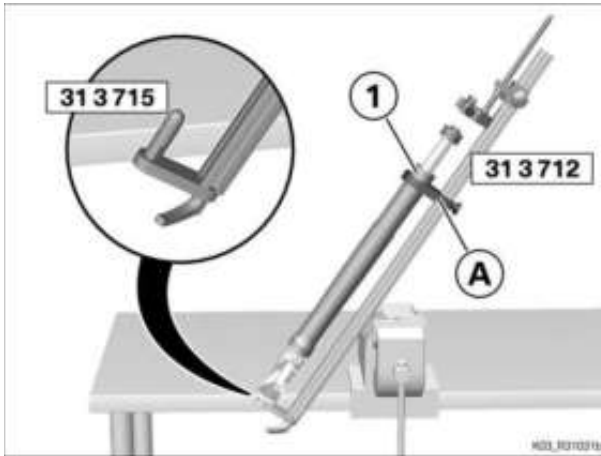
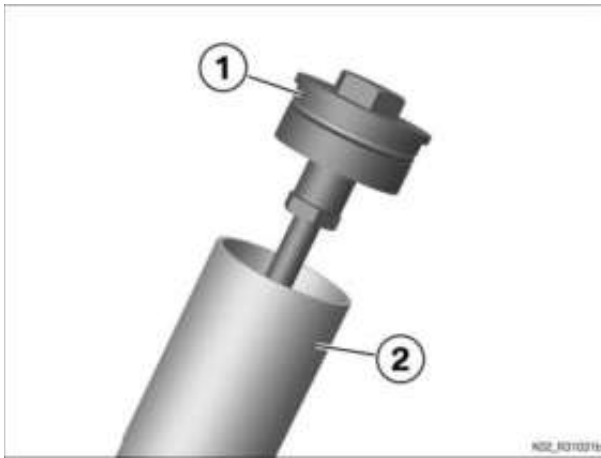
- Loosen rubber retainer (A).
- Remove fork leg (1) from pre-tensioning tool (No. 31 3 712), noting mounting (No. 31 3 715).



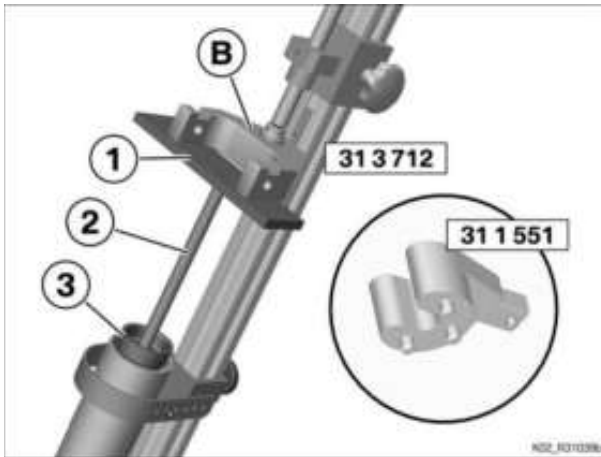
- Push fixed fork tube (2) up and install lid (1) with special wrench **SW17**.

(-) Draining oil from left fork leg

- Firmly and repeatedly compress the fork leg to free any dirt that may be inside.
- Screw out lid (1) fully with special wrench **SW17** (No. 31 1 521) and special wrench mounting (No. 31 1 529) and carefully lower fixed fork tube (2).
- Drain the oil from the fork leg (2) into a suitable container.

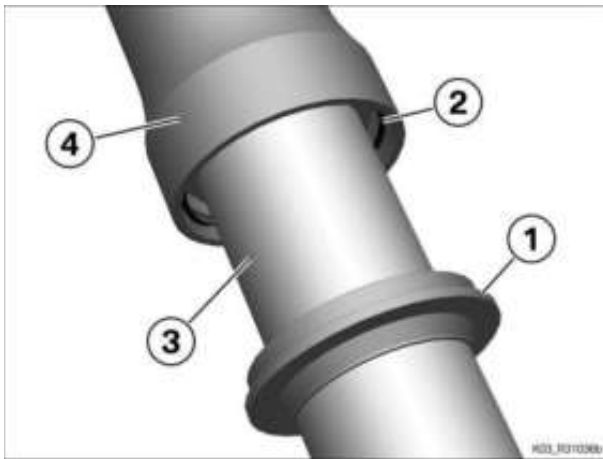


- Install fixture (No. 31 3 715) into pre-tensioning tool (No. 31 3 712).
- Insert fork leg (1) in pre-tensioning tool (No. 31 3 712).
- Secure fork leg (1) with rubber retainer (A).



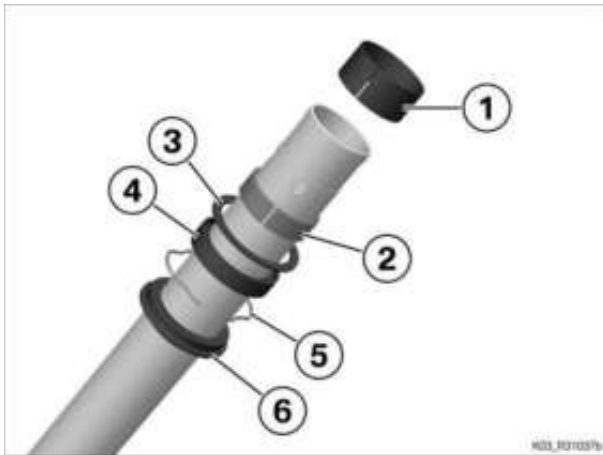
- Position a suitable tool (1) between piston rod (2) and hold-down tool (B).
- Press piston rod (2) with pre-tensioning tool (No. 31 3 712) slightly downwards.
- Loosen screw cap (3) using special wrench (No. 31 1 551) while counter-holding the forkleg.
- Relieve tension on pre-tensioning tool (No. 31 3 712) slowly.
- Loosen rubber retainer (A) and remove forkleg (3) from pre-tensioning tool (No. 31 3 712).

- Remove the screw cap with threaded rod (1).
- Remove compression spring (2) and allow to be drip-free.
- » Compression spring is free of oil.
- Remove screw (3) and bush (4).
- Carefully turn fork leg (5) over and drain the rest of the oil.



(-) Remove left slider tube

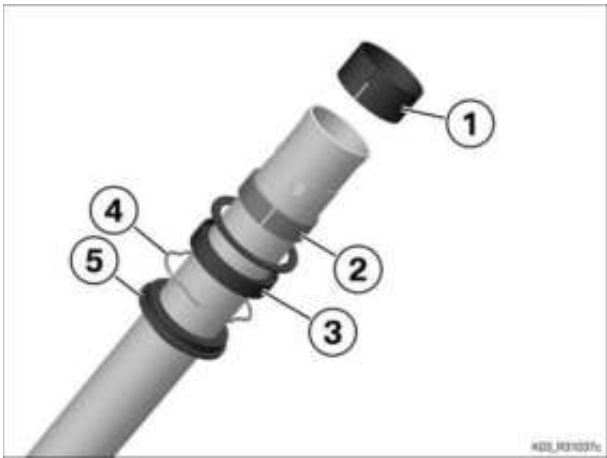
- Loosen dust boot (1) with a suitable tool.
- Disengage circlip (2).
- Remove slider tube (3) with a strong jerk from fixed fork tube (4).



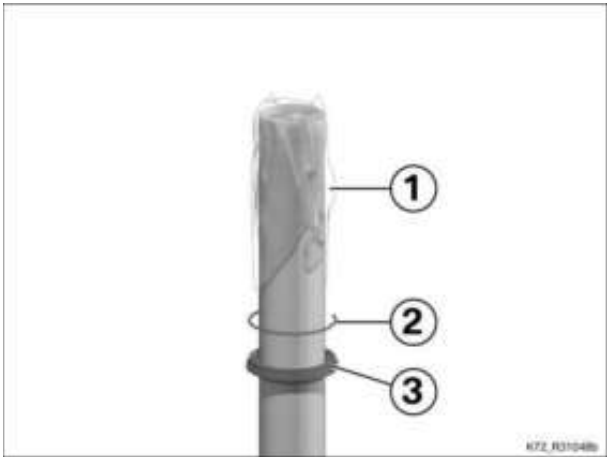
- Spread top slide bush (1) and bottom slide bush (2) slightly using a suitable tool and remove.
- Remove support disc (3), fork sealing ring (4), circlip (5) and dust boot (6).
- Check support disc (3) for deformations and damage; replace if necessary.

(-) Renew sealing and bearing

- Renew the following parts:
- Sliding bushes at top (1) and bottom (2)
- Fork sealing ring (3) and circlip (4)
- sealing boot (5)



(-) Install slider tube, left



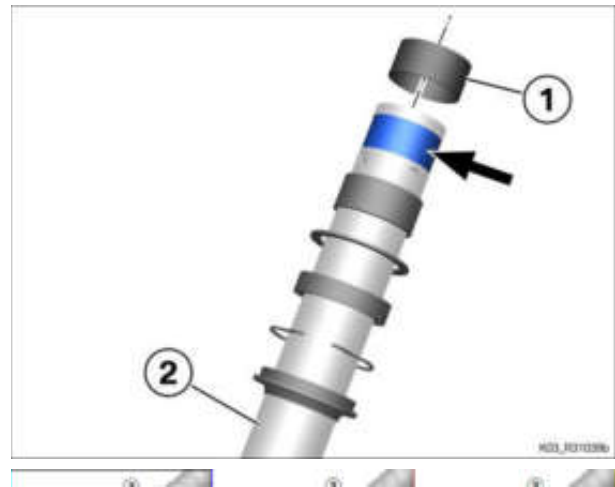
- Slip a bag (1) over the **new** slider tube so as not to damage the new sealing ring on the sharp edges.
- Push a **new** dust boot (3) and circlip (2) on the slider tube.

- Lubricate the **inner** sealing lips of the sealing ring (1) lightly.

 Lubricant	
Molykote 111	11 00 7 660 832

- Note the mounting orientation: the protruding sealing lip (arrow) points in the direction of the dust boot.

- Lubricate components with fork oil.
- Push support disc (1) and bottom sliding bush (2) on slider tube (3).
- Remove bag (4).

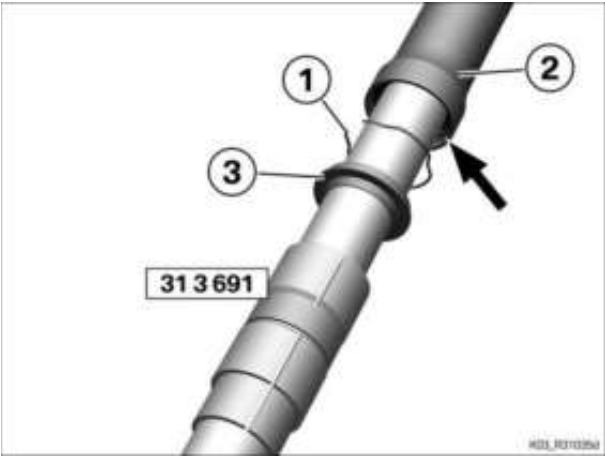


- Lubricate upper sliding bush (1) with fork oil.
- Spread upper sliding bush (1) slightly and install in the bead (Arrow) of the slider tube (2).

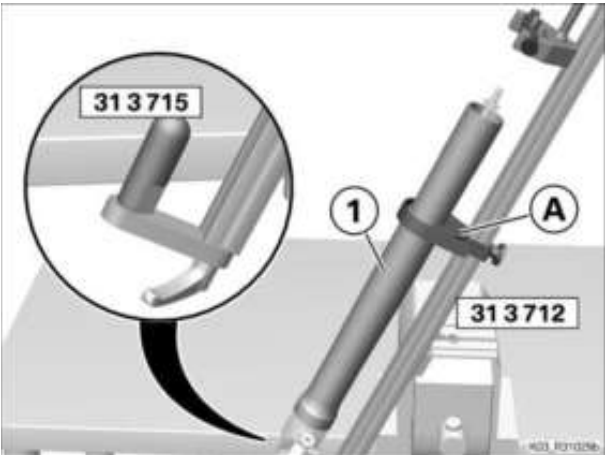
- Carefully slide the fixed fork tube (1) onto the slider tube (2).
- Lubricate bottom sliding bush (3).

 Lubricant	
Molykote 111	11 00 7 660 832

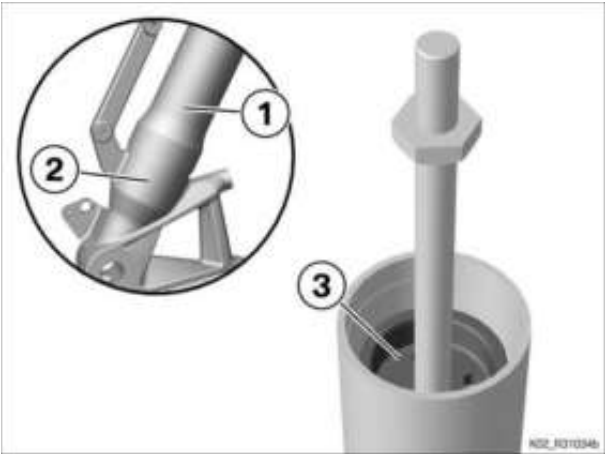
- Position lower sliding bush (3) in fixed fork tube (1).
- Install lower sliding bush (3) and support disc (4) with impact bush (No. 31 3 691).
- Install sealing ring (5) with impact bush (No. 31 3 691)(No. 31 3 692).
- Install a **new** circlip (1) and while doing so, pay attention to its correct seating in the groove (Arrow) of fixed fork tube (2).
- Turn impact bush (No. 31 3 691) over and install a **new** dust boot (3) into the fixed fork tube (2).



(-) Pouring oil into left fork leg



- Insert fork leg (1) in pretensioning tool (No. 31 3 712) and secure with rubber retainer (A).



- Carefully lower the fixed fork tube (1) all the way onto the forkleg (2).
- Fill oil in slider tube (3) **slowly**.

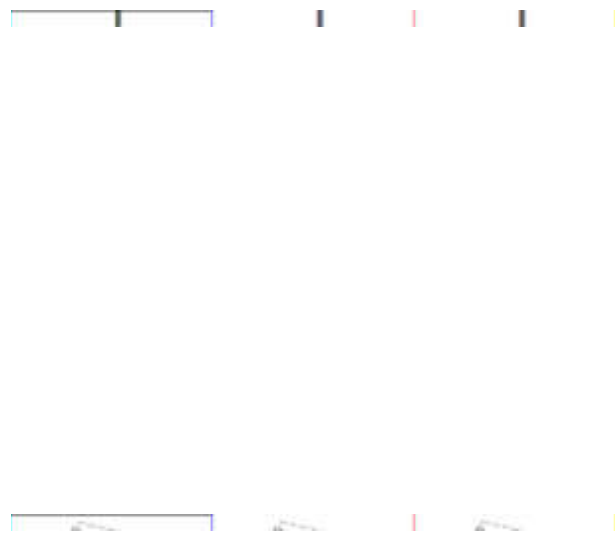
 Technical data			
Fork oil, capacity of left fork leg		approx. 480 ml	
	Telescopic fork oil (Telescope fork oil type 3)		

- Allow the oil to settle for a few minutes.

► Adjusting the left-side oil level

- Place the fork leg vertical.
- On the filler dipstick (No. 31 6 551) set the correct oil level, then insert the filler dipstick in the telescopic forks and draw off excess fork oil.

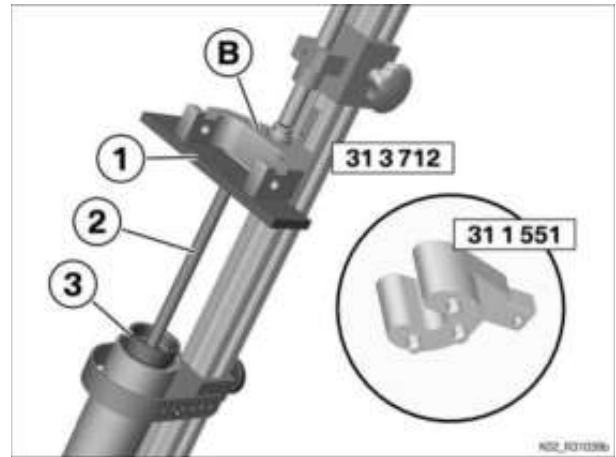
 Technical data			
	Forks fully compressed,	120 mm	



Level of fork oil in left fork leg (air chamber)	compression spring and sleeve removed		
Telescopic fork oil (Telescope fork oil type 3)			



- Clean threads of screw cap (1) and mating thread in fixed fork tube.
- Install bush (4) and contact disc (3) in fork leg (5).
- Install compression spring (2) and screw cap with threaded rod (1) in the fork leg (5).



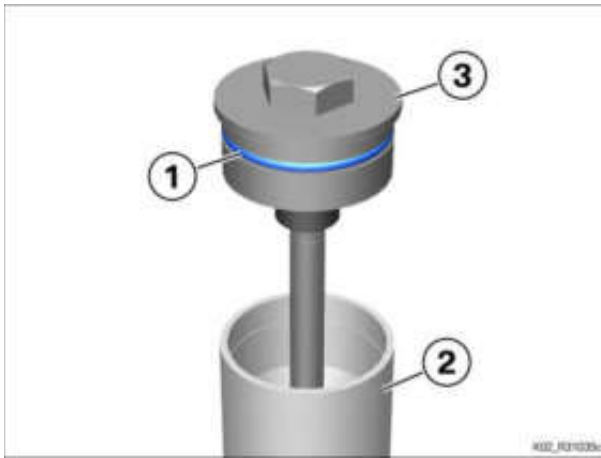
- Position a suitable tool (1) between piston rod (2) and hold-down tool (B).
- Apply screw locking agent to screw cap (3).

 Thread-locking compound	
Loctite 243, Medium strength	83 19 2 210 339

- Pretension piston rod (2) until screw cap (3) can be turned without spring force.
- Tighten screw cap (3) using special wrench (No. 31 1 551) while counter-holding the forkleg.

 Tightening torques	
Threaded plug in fixed fork tube	
Thread-locking compound (Loctite 243, Medium strength)	17 Nm

- Slowly relieve tension on spindle (E) from pretensioning tool (No. 31 3 712).
- Loosen rubber retainer (A) and remove forkleg (3) from pre-tensioning tool (No. 31 3 712).



- Renew O-ring (1) and lubricate with fork oil.
- Push fixed fork tube (2) up and install lid (3) with special wrench **SW17**.

Follow-up work

Installing both fork legs

Tighten lid for fork legs

Securing front wheel-speed sensor

Install the front wheel

Securing the front brake caliper and brake line

Installing front-wheel cover

Removing engine lifter

 32 71 040 Renewing handlebar
+ 32 71 514

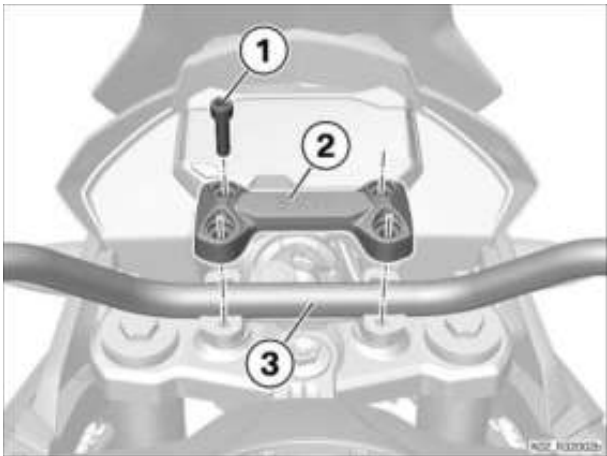
Preparatory work

=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

- Remove the left handlebar weight
- Removing left handlebar grip
- Removing left multifunction switch
- Releasing clutch lever fitting
- Remove the right handlebar weight
- Removing right multifunction switch
- Disengaging brake fitting for front wheel

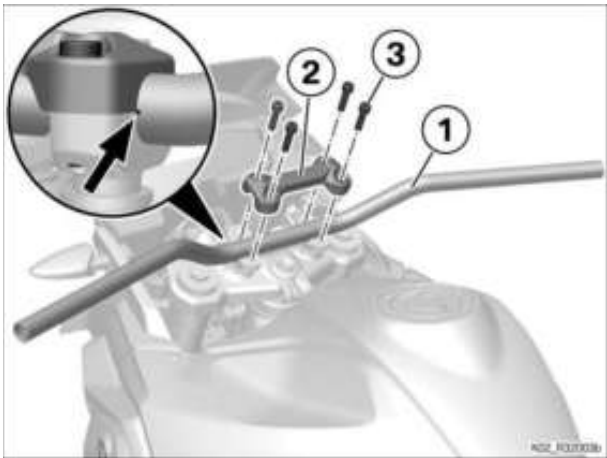
Core activity

(-) Removing handlebars



- Remove screws (1).
- Remove clamping block (2) and handlebars (3).

(-) Installing handlebars



- Place handlebars (1) and clamping block (2) and while doing so, align mark (Arrow) to the edge of clamping block (2).
- Install screws (3).

 Tightening torques		
Handlebar to handlebar clamp		
M8 x 30	Tightening sequence: in the forward direction of travel, tighten until seated	
	19 Nm	

Follow-up work

Securing brake fitting for front wheel

Securing right multifunction switch

Installing right handlebar weight

Secure the clutch lever fitting

Secure multifunction switch, left

Installing left handlebar grip

Installing left handlebar weight

Final check of work performed

32 72 001 Replacing throttle twistgrip

+ 32 72 620

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Increasing the play at the accelerator Bowden cable

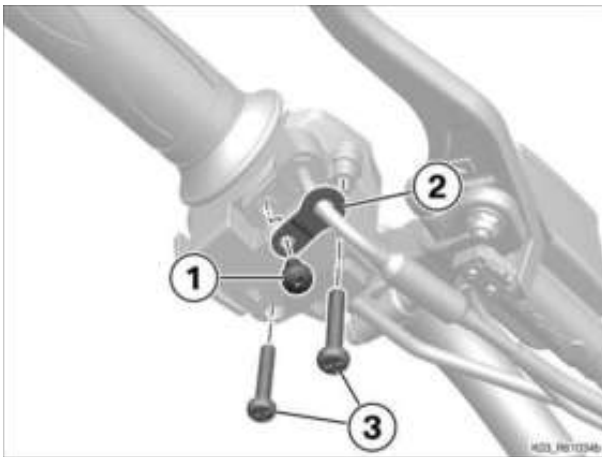
Remove the right handlebar weight

Core activity

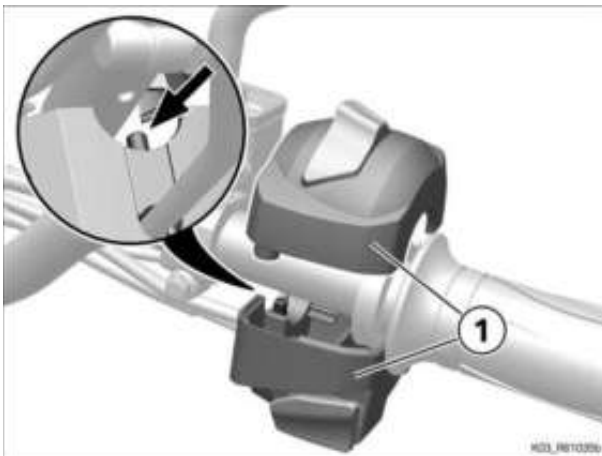
(-) Replacing throttle twistgrip

► Removing right multifunction switch

- Remove screw (1) and disengage retaining plate (2).
- Remove screws (3).

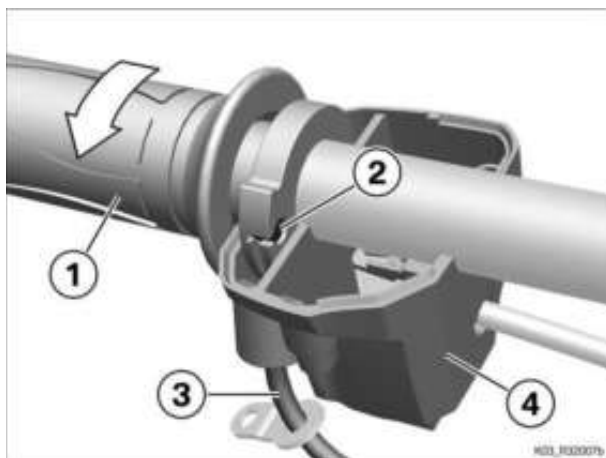


- Separate housing halves of multifunction switch (1), noting the lug (arrow).

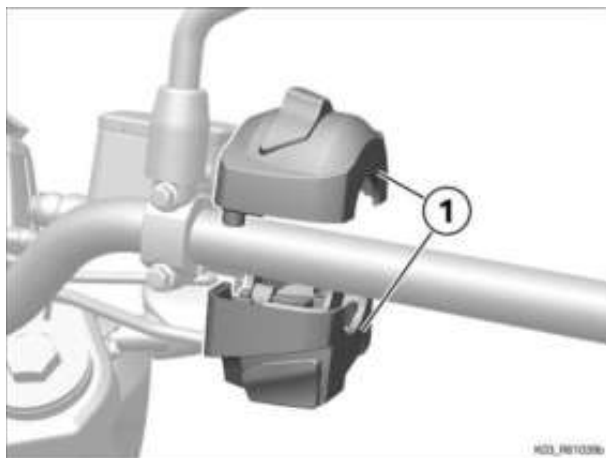


► Removing throttle twistgrip

- Twist throttle grip (1) to the front.
- Detach nipple (2) and feed throttle cable (3) out of multifunction switch (4).
- Remove throttle twistgrip (1).

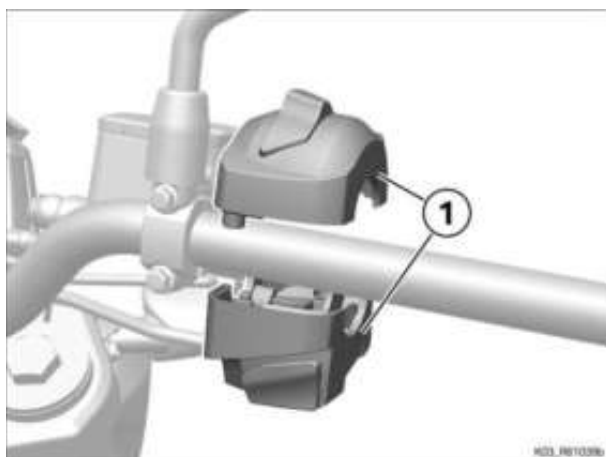


- Loosen multifunction switch (1) and let it hang from the cable.



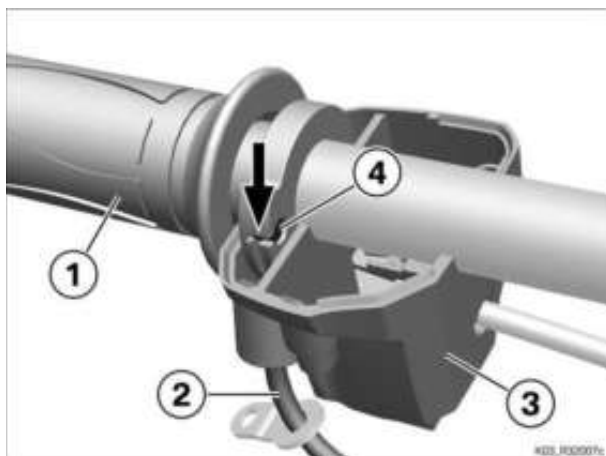
► Securing right multifunction switch

- Hold multifunction switch (1) in position.

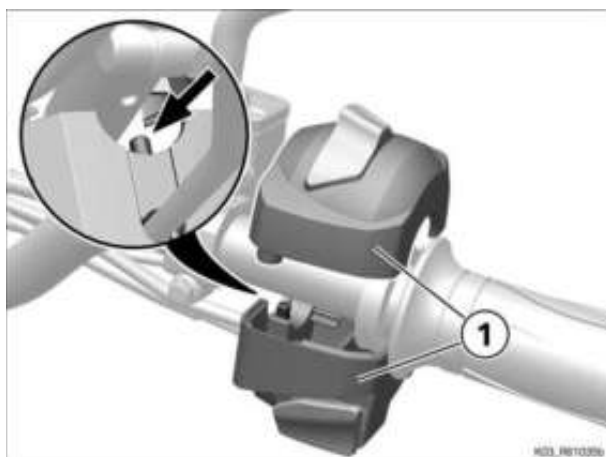


► Installing throttle twistgrip

- Install throttle twistgrip (1).
- Position throttle grip (1) such that the mounting for throttle cable (Arrow) points to the bottom.
- Feed throttle cable (2) into multifunction switch (3) and attach nipple (4).



- Join housing halves of multifunction switch (1), making sure that the lug (arrow) engages the hole in the handlebar.



- Install screws (3).
- Hold retaining plate (2) in position and install screw (1).



Follow-up work

Installing right handlebar weight

Adjusting throttle cable

Final check of work performed

 32 72 065 Replacing handlebar fitting for clutch actuation

+ 32 72 626

Preparatory work

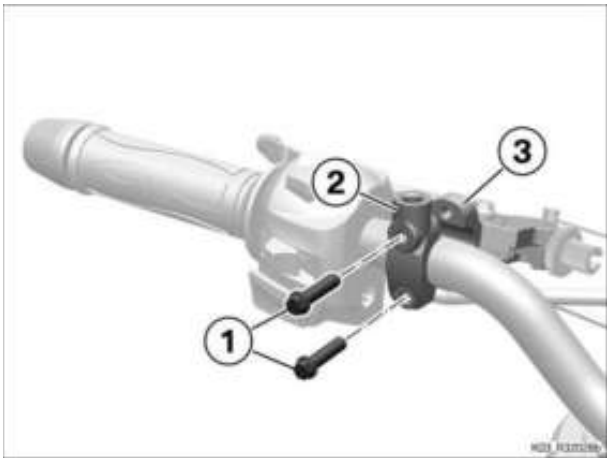
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

- Removing seat
- Removing cover for left intake snorkel
- Removing the cover for right intake snorkel
- Removing cover for fuel tank
- Removing left radiator cowl
- Disengage the engine control unit
- Disconnect plug connection for the clutch switch
- Loosen clutch cable from manual controls for clutch control
- Removing left mirror

Core activity

(-) Removing clutch lever fitting

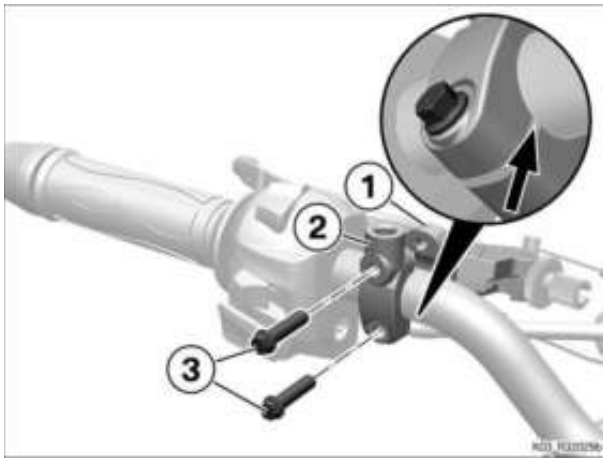
- Remove screws (1).
- Remove clamping block (2) and clutch lever fitting (3).



(-) Installing clutch lever fitting

- Hold clutch lever fitting (1) and clamping block (2) in position.
- Install screws (3), but do not tighten yet.
- Align edge of clamping block (2) to mark (Arrow) and tighten screws (3).

 Tightening torques		
Clutch lever fitting to handlebar		
M6 x 25		



Tightening sequence: tighten upper bolt to block
8 Nm

Follow-up work

Installing left mirror

Secure clutch cable in manual controls for clutch control

Checking/adjusting clutch play

Connect plug connection for the clutch switch

Securing engine control unit

Installing left radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

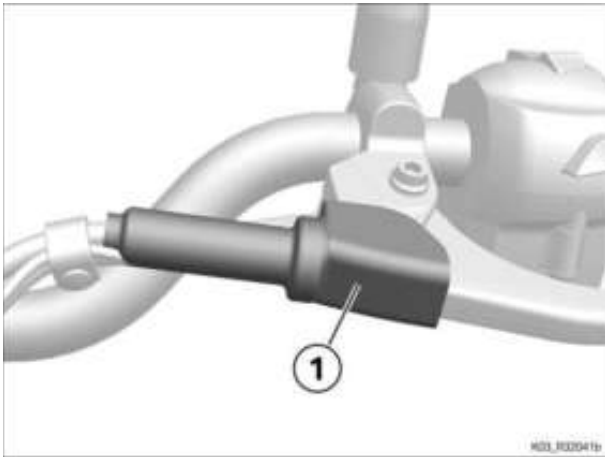
 32 72 070 Replace clutch lever
+ 32 72 627

Preparatory work

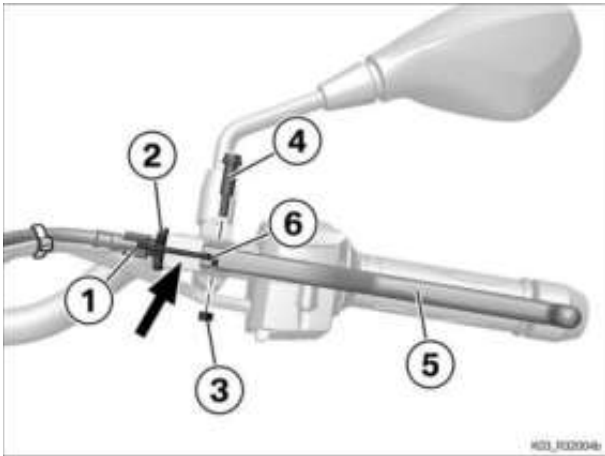
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

(-) Removing clutch lever



- Fold down rubber cap (1).



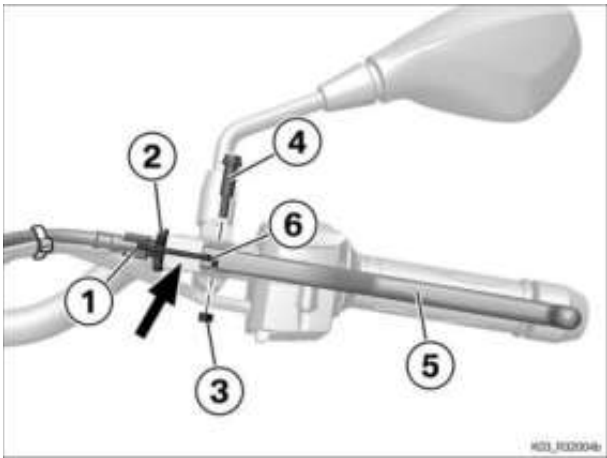
- Tighten adjusting screw (1) and locknut (2) as far as possible and align such that all recesses are aligned with the clutch lever fitting (arrow).
- Remove nut (3) and screw (4).
- Remove clutch lever (5) and disengage clutch cable (6).

(-) Installing clutch lever

- Lubricate clutch lever (5) and screw (4).

 Lubricant	
Klüberplex BE 11-462	83 22 0 397 761

- Engage clutch cable (6) and install clutch lever (5).
- Make sure that clutch cable (6) is routed in the recess (arrow) of adjusting screw (1).



- Install bolt (4) and **new** nut (3).

 Tightening torques		
Handlebar lever to clutch lever fitting		
Screw, M5	1 Nm	
Nut, M5, Replace nut	1 Nm	
Thread-locking compound (mechanical)		

- Back off locknut (2) and adjusting screw (1).

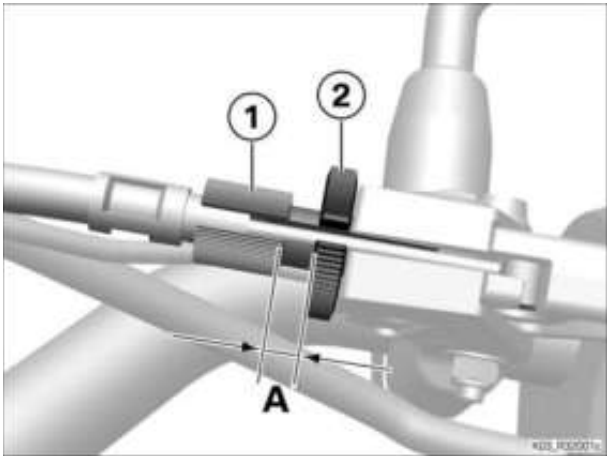
(-) Checking/adjusting clutch play

 NOTICE

Before the adjustment of the clutch cable, it must be ensured that a correct adjustment range is available on the coupling hand armature.

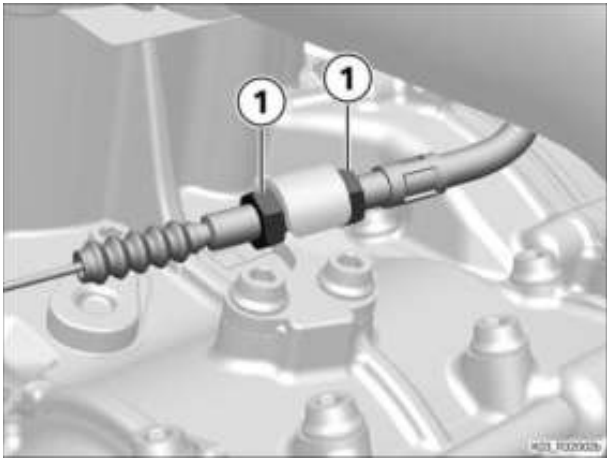
► Adjusting the adjustment range (clutch cable) on clutch handlebar fitting

- Loosen lock nut (2) and adjust distance (A) using adjusting screw (1).



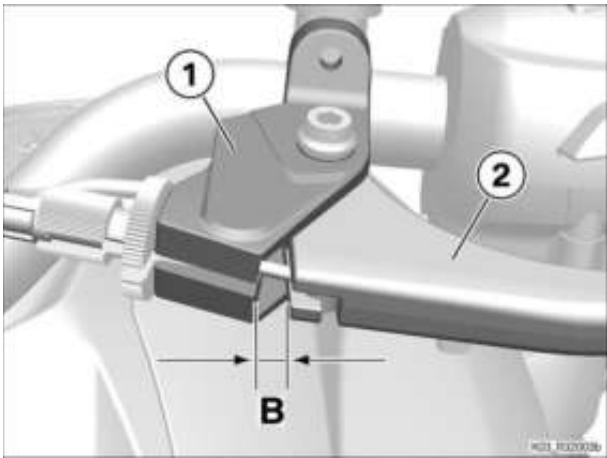
 Technical data			
Distance between adjusting screw and locknut		6 ⁺¹ mm	

- If necessary, re-adjust clutch cable on engine.



- If necessary, loosen nuts (1) and adjust clutch play until the adjustment range on the clutch handlebar fitting is correct.
- Tighten nuts (1) hand-tight.

◀
Check



- Measure distance (B) between manual controls (1) and clutch lever (2).

 Technical data			
Clutch-lever play	on the manual controls, handlebars in straight-ahead position, with cold engine	1...2 mm	

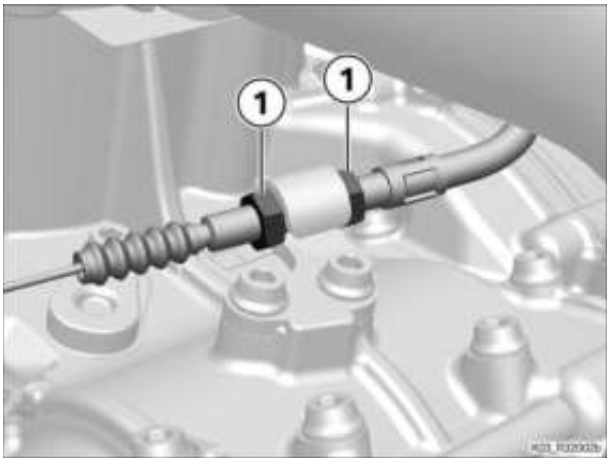
Result:

- Clearance is out of tolerance.

Measure:

► **Adjusting clutch cable at engine housing**

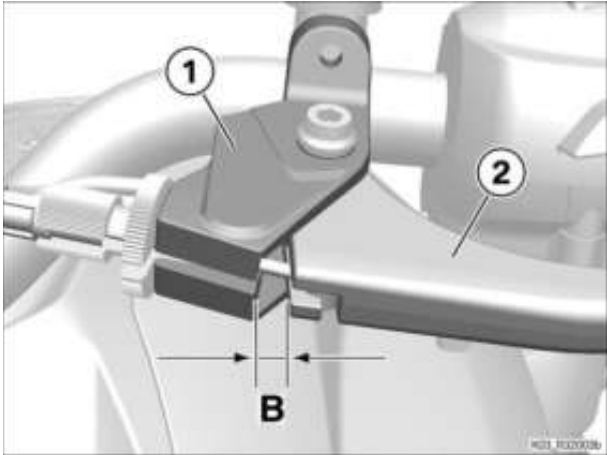
- Loosen nuts (1) and adjust clutch play.



 Technical data			
Clutch-lever play	on the manual controls, handlebars in straight-ahead position, with cold engine	1...2 mm	

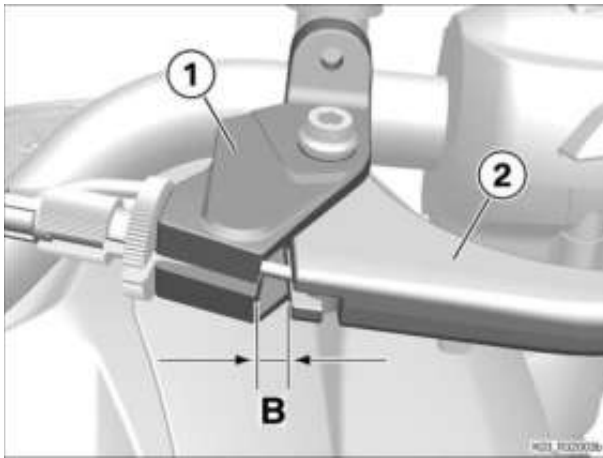
- Tighten nuts (1).

- Then, measure the distance (B) between manual controls (1) and clutch lever (2) again and if necessary, adjust **on engine housing**.

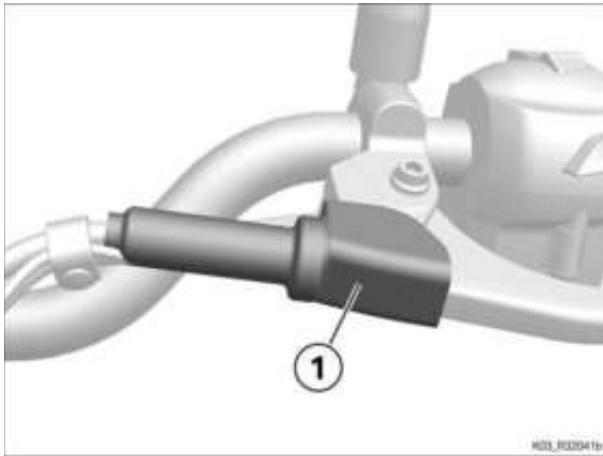


 Technical data			
Clutch-lever play	on the manual controls, handlebars in straight-ahead position, with cold engine	1...2 mm	





- Fold back rubber cap (1).



Follow-up work

Final check of work performed

 32 72 076 Replacing lever for front-wheel brake

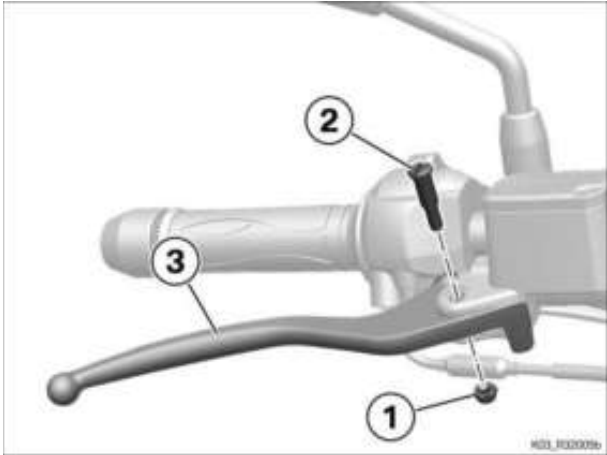
+ 32 72 576

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

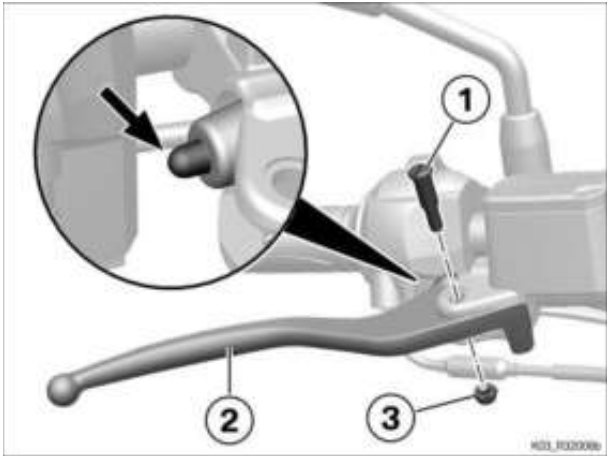
(-) Removing lever for front brake



- Remove nut (1) and screw (2).
- Remove lever (3).

(-) Installing lever for front brake

- Lubricate screw (1) and the thrust rod (arrow).



 Lubricant	
Teflon spray	83 23 0 154 884

- Install lever (2).
- Install bolt (1) with **new** nut (3).

 Tightening torques		
Handlebar lever to handbrake lever fitting		
M6, counter-holding on bolt, renew nut	6 Nm	
Thread-locking compound (mechanical)		

Follow-up work

Final check of work performed

 32 72 078 Replacing brake handlebar fitting for front wheel

+ 32 72 578

Preparatory work

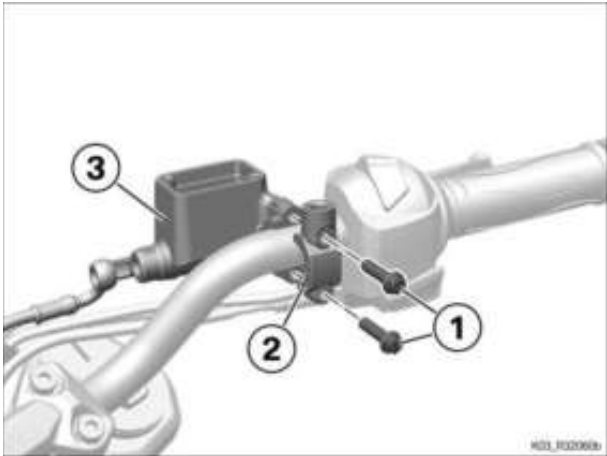
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

- Removing seat
- Removing cover for left intake snorkel
- Removing the cover for right intake snorkel
- Removing cover for fuel tank
- Removing right radiator cowl
- Releasing expansion tank
- Disconnecting connector for the brake light switch
- Emptying brake-fluid reservoir
- Loosen brake line from brake fitting for front wheel
- Removing right mirror

Core activity

(-) Removing brake fitting for front wheel

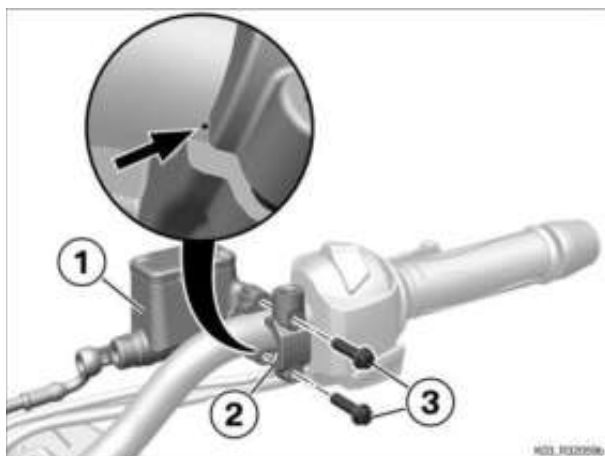
- Remove screws (1).
- Remove clamping block (2) and brake fitting (3).



(-) Installing brake fitting for front wheel

- Position brake fitting (1) and clamping block (2).
- Install screws (3), but do not tighten yet.
- Align edge of clamping block (2) to mark (Arrow) and tighten screws (3).

 Tightening torques		
Handlebar fitting to handlebar		
M6 x 25		



**Tightening
sequence: tighten
upper bolt on
block**

8 Nm

Follow-up work

Installing right mirror

Secure brake line to brake fitting for front wheel

Removing reservoir cap

Top up brake fluid tank

Connecting the connector for the brake light switch

Securing expansion tank

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

 32 72 097 Replacing left handlebar grip

+ 32 72 632

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Remove the left handlebar weight

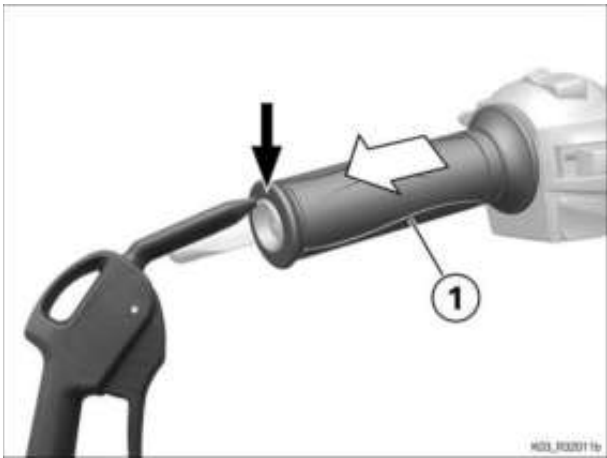
Core activity

(-) Removing left handlebar grip

- Lift the edge of handlebar grip (1) (Arrow), spray brake cleaner and spread it under handlebar grip (1) with compressed air.

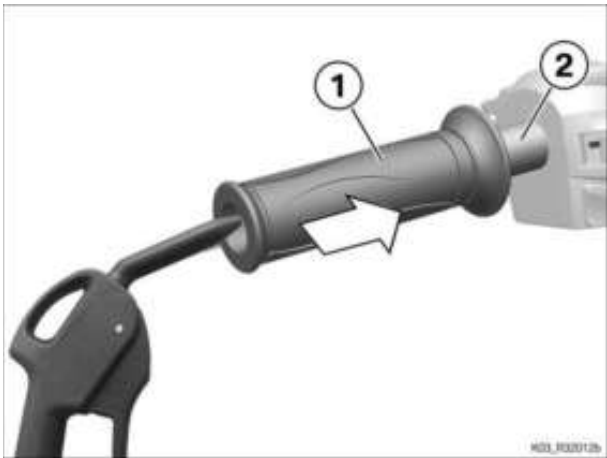
 Cleaner	
Brake cleaner	83 19 2 154 780

- Pull off handlebar grip (1).



(-) Installing left handlebar grip

- Push handlebar grip (1) onto handlebars (2) up to the limit position using compressed air.



Follow-up work

Installing left handlebar weight

Final check of work performed

32 73 000 Removing/installing or replacing clutch cable

+ 32 73 500

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

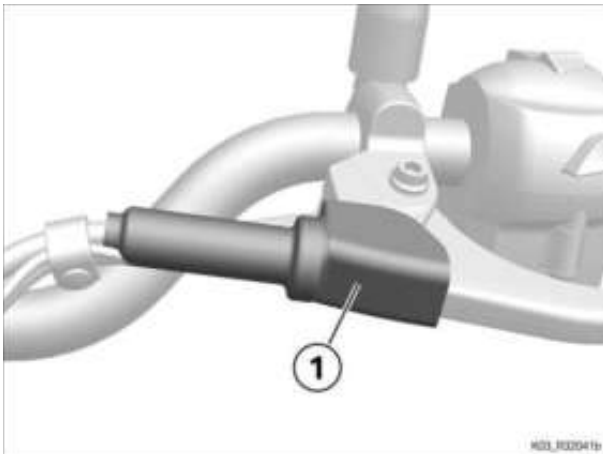
Removing cover for fuel tank

Removing fuel tank

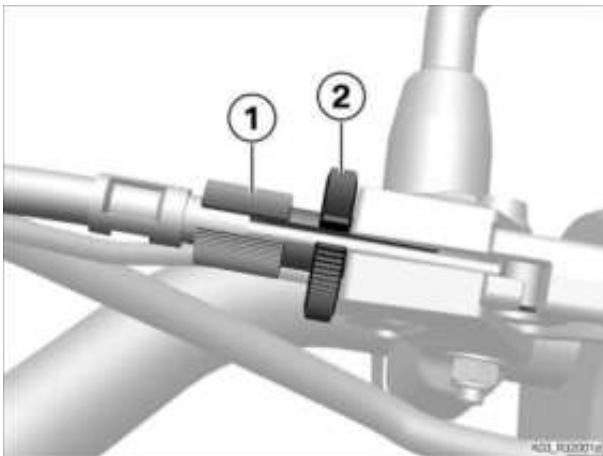
Core activity

(-) Removing clutch cable

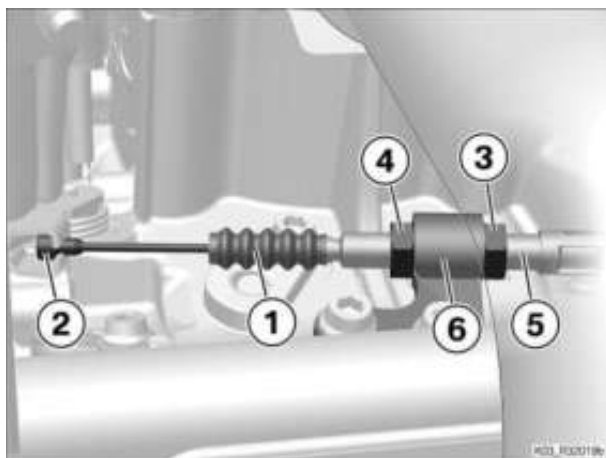
- Fold down rubber cap (1).



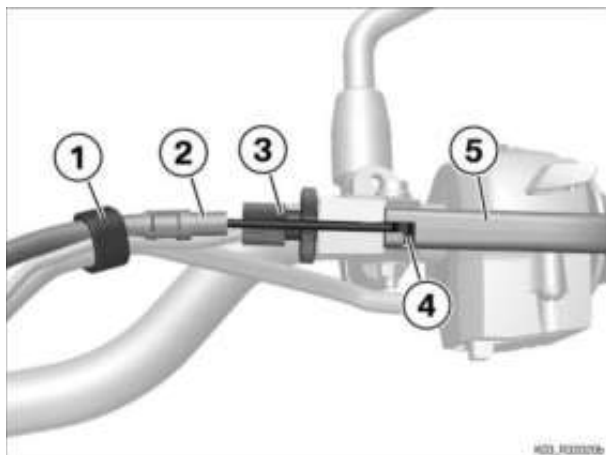
- Screw in adjusting screw (1) and lock nut (2) as far as possible and align such that all recesses are aligned with each other.



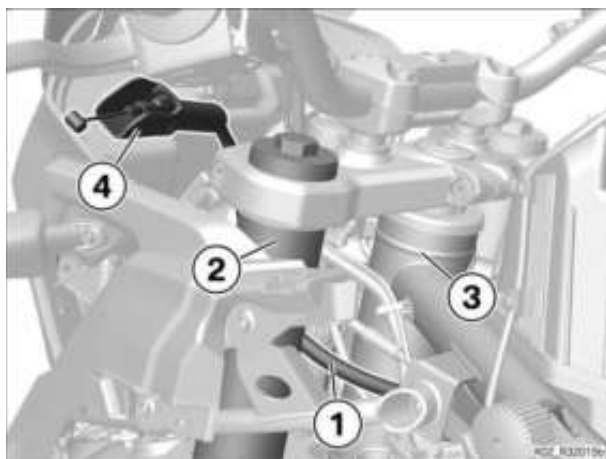
- Slide rubber grommet (1) in the direction of nipple (2).
- Slacken nuts (3) and (4) and turn each outwards, till nut (4) hangs on cable.
- Disengage nipple (2).



- Detach adjuster (5) from holder (6).

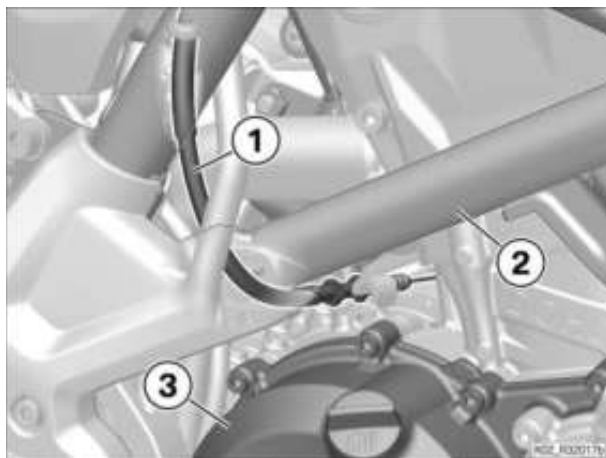
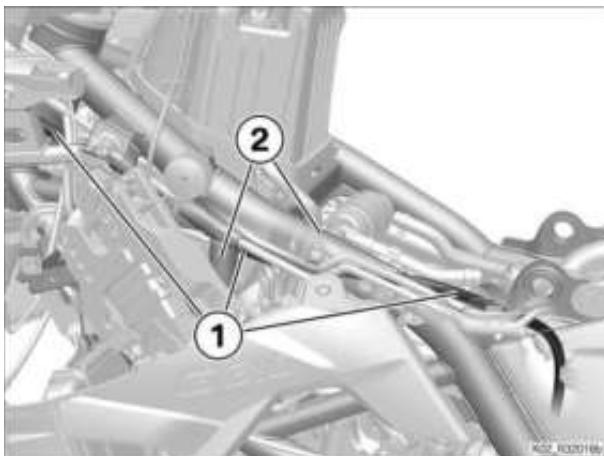


- Remove bracket (1).
- Pull out Bowden cable sleeve (2) from adjusting screw (3) and detach cable (4) from clutch lever (5).



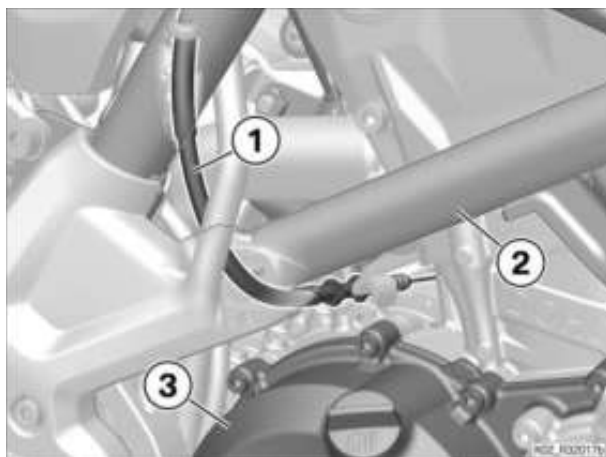
- Remove rubber grommet (4).
- Feed clutch cable (1) out from between the left fork leg (2) and steering head (3).

- Feed clutch cable (1) out from the top behind the main frame (2) to the bottom.



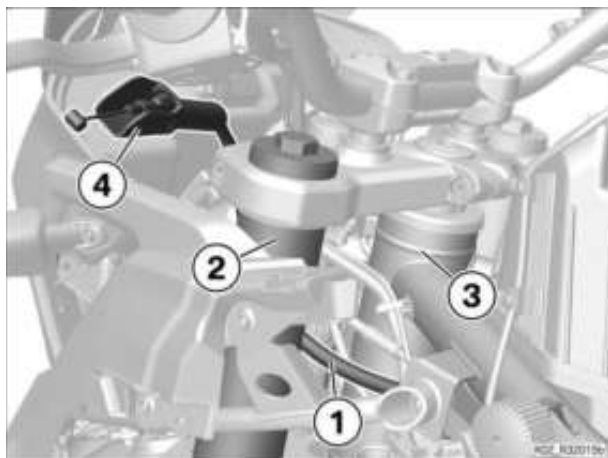
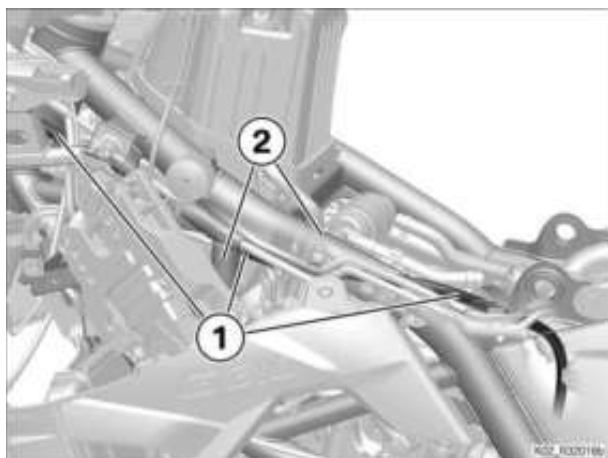
- Remove clutch cable (1) from between main frame (2) and clutch cover (3).

(-) Installing clutch cable

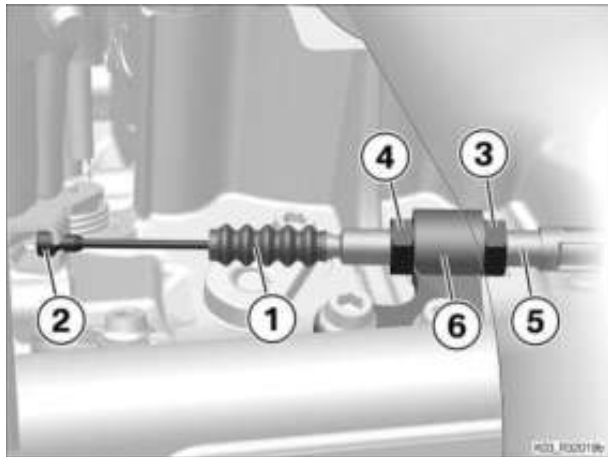


- Install clutch cable (1) between main frame (2) and clutch cover (3).

- Feed clutch cable (1) from the bottom behind the main frame (2) to the top and secure.

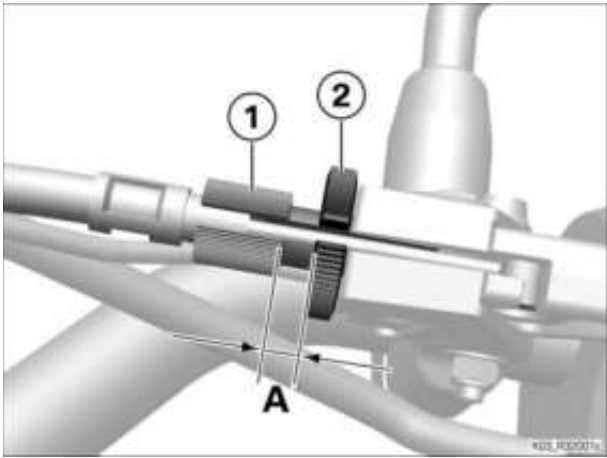
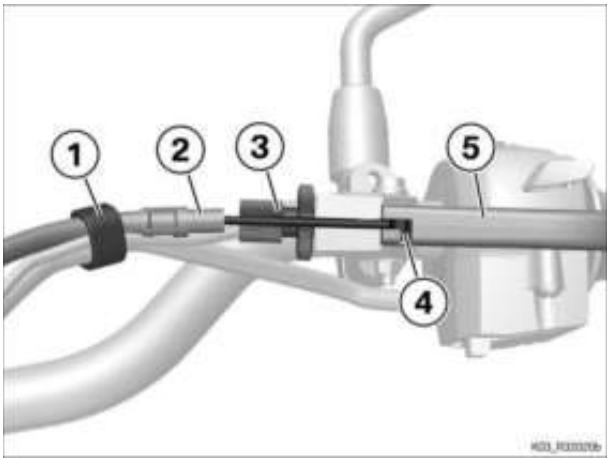


- Install rubber grommet (4).
- Feed clutch cable (1) between left fork leg (2) and steering head (3).



- Attach adjuster (5) in holder (6).
- Engage nipple (2).
- Turn nuts (3) and (4) inwards and do not tighten.
- Position rubber grommet (1) on adjuster (5).

- Attach cable (4) in clutch lever (5) and insert Bowden cable sleeve (2) in adjusting screw (3).
- Install bracket (1).



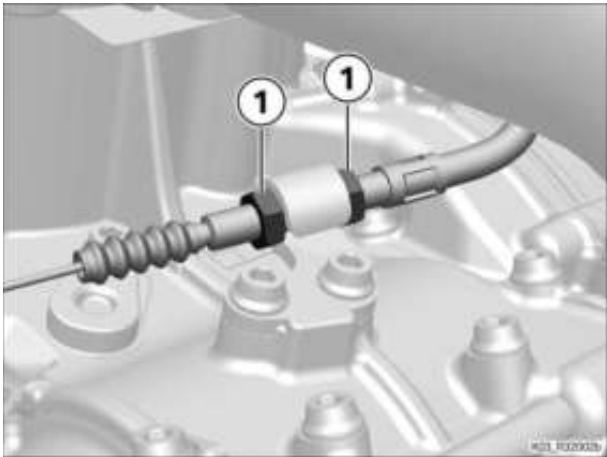
- Adjust gap (A) by turning adjusting screw (1).

 Technical data			
Distance between adjusting screw and locknut		6 ⁺¹ mm	

- Tighten lock nut (2).

► **Adjusting clutch cable at engine housing**

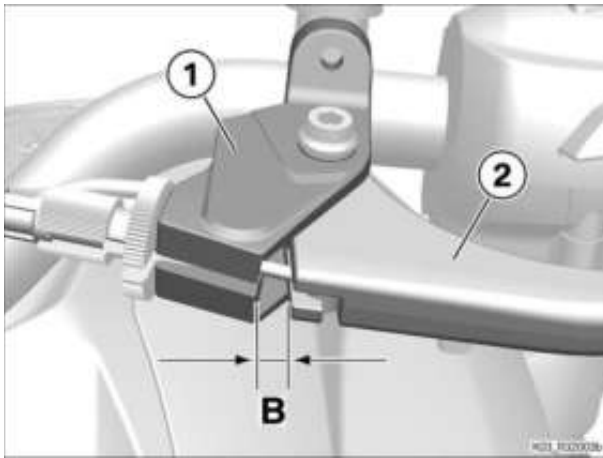
- Loosen nuts (1) and adjust clutch play.



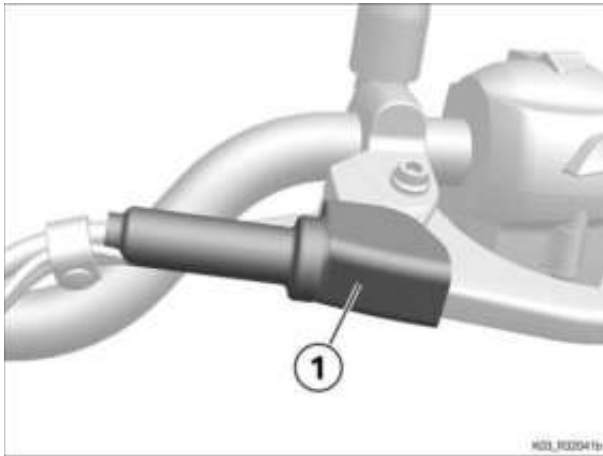
 Technical data			
Clutch-lever play	on the manual controls, handlebars in straight-ahead position, with cold engine	1...2 mm	

- Tighten nuts (1).
- Then, measure the distance (B) between manual controls (1) and clutch lever (2) again and if necessary, adjust **on engine housing**.

 Technical data			
Clutch-lever play	on the manual controls, handlebars in straight-ahead	1...2 mm	



position, with cold engine		
-------------------------------	--	--



- ◀
- Fold back rubber cap (1).

Follow-up work

Installing fuel tank

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

32 73 101 Replacing throttle cable to handlebar

+ 32 73 509

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing left radiator cowl

Increasing the play at the accelerator Bowden cable

Removing right multifunction switch

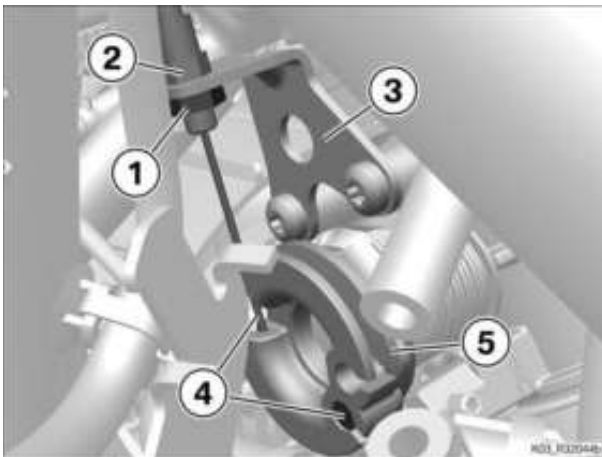
Disengage the engine control unit

Removing secondary air system changeover valve

Releasing wiring harness

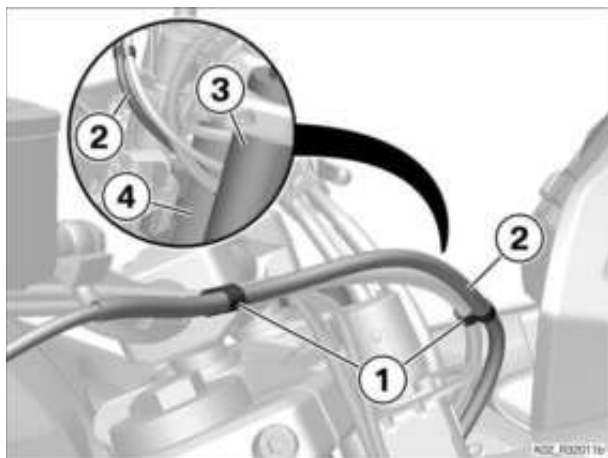
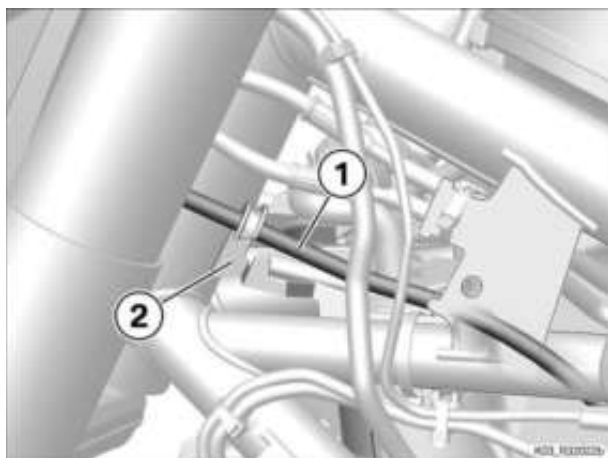
Core activity

(-) Removing throttle cable



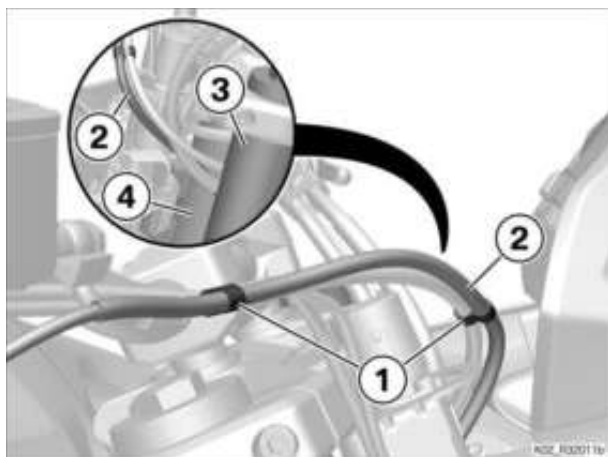
- Loosen nut (1), counter-holding on **hexagon head** of throttle cable (2).
- Disengage throttle cable (2) from holder (3).
- Remove cable (4) from pulley (5).

- Feed throttle cable (1) out of holder (2).



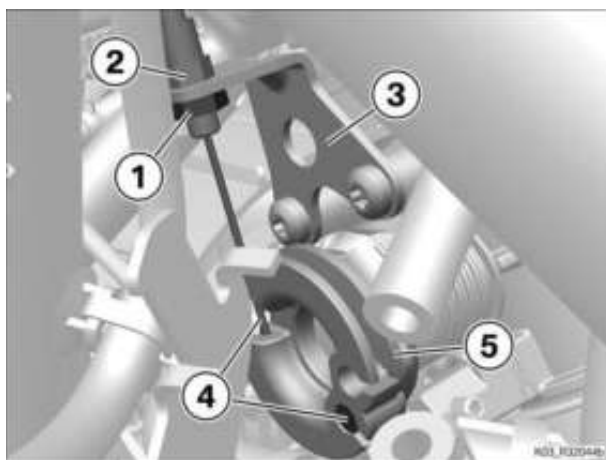
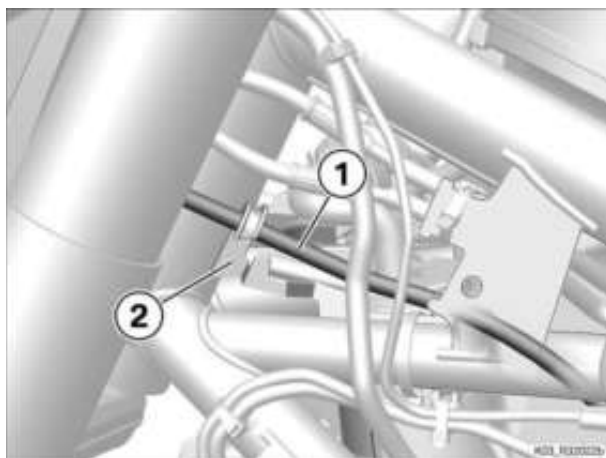
- Release holder (1) from throttle cable (2).
- Feed throttle cable (2) out from between fork leg (3) and steering head (4) and remove.

(-) Installing throttle cable



- Install throttle cable (2) between fork leg (3) and steering head (4).
- Secure stop (1) on throttle cable (2).

- Insert throttle cable (1) in holder (2) and route.



- Install cable (4) in pulley (5).
- Insert throttle cable (2) in holder (3).
- Install nut (1), counter-holding on **hexagon head** of throttle cable (2).

Follow-up work

Securing wiring harness

Installing secondary air system changeover valve

Securing engine control unit

Securing right multifunction switch

Adjusting throttle cable

Installing left radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

33 35 000 Replacing rear wheel swinging arm

+ 33 35 501

Preparatory work

Removing engine spoiler

Installing engine lifter

Remove the rear wheel

Removing the left passenger seat catch support

Removing chain guard

Removing silencer

Removing the right passenger seat catch support

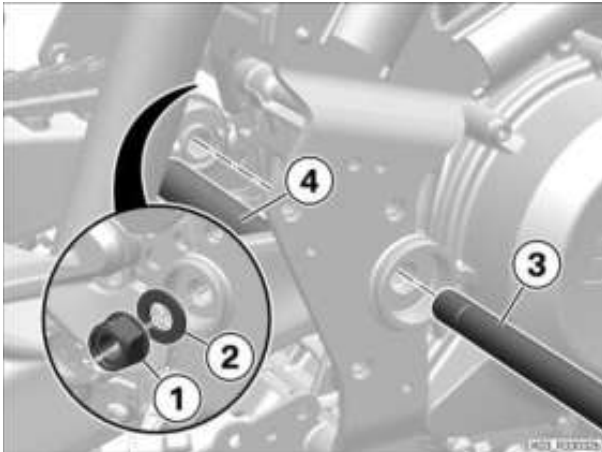
Removing rear-wheel cover

Disengaging spring strut from swinging arm

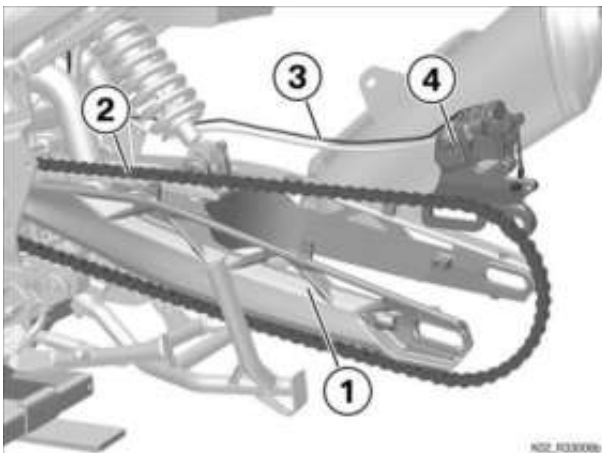
Core activity

(-) Remove the swinging arm

- Remove nut (1) and washer (2).
- Remove swinging arm axle (3) and spacer pipe (4).

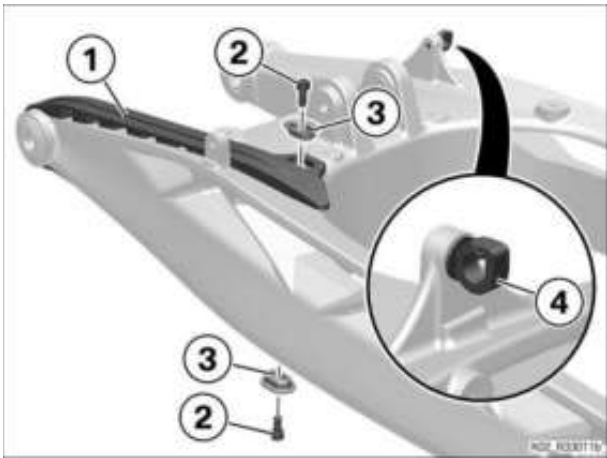


- Remove swinging arm (1), paying attention to the chain (2), cable (3) and rear wheel brake (4) while doing so.



(-) Replacing rear wheel swinging arm

- Check chain slide rail (1) for damage, replace if necessary.



- Remount chain slide rails (1), screws (2) and retaining plate (3) on new part.

 Tightening torques		
Chain slide rail to rear wheel swinging arm		
M5 x 12	5 Nm	

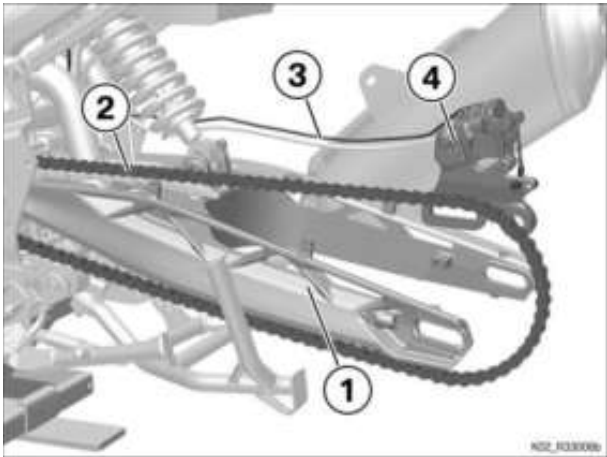
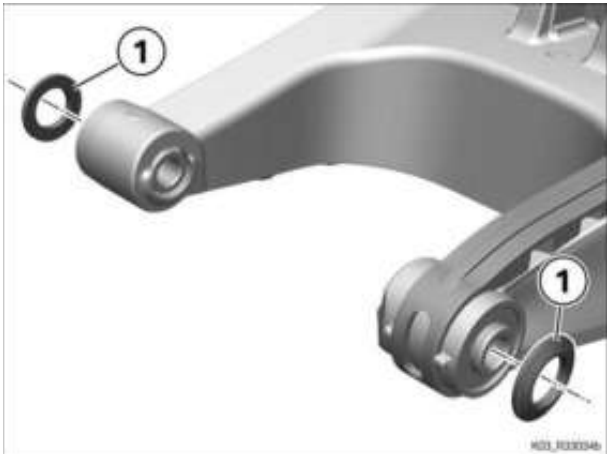
- Remount holder (4) on new part or renew.

(-) Installing swinging arm

- Clean and lubricate the swinging-arm shaft.

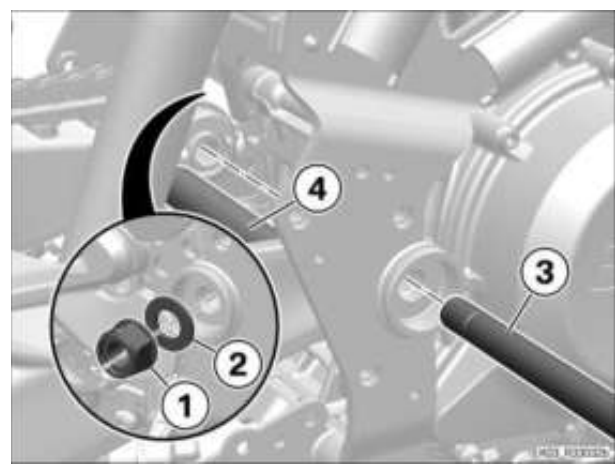
 Lubricant		
Acid-free friction-bearing grease	81 22 9 407 174	

- Make sure that thrust washers (1) are installed.



- Insert swinging arm (1), paying attention to the chain (2), cable (3) and rear wheel brake (4).

- Insert swinging arm axle (3) and spacer pipe (4).
- Install washer (2) and nut (1).



Tightening torques		
Rear wheel swinging arm to frame		
M14 x 1.5	135 Nm	
Replace nut, Thread-locking compound (mechanical)		

Follow-up work

- Securing spring strut to swinging arm
- Installing rear-wheel cover
- Installing the right passenger seat catch support
- Securing the exhaust system
- Installing the left passenger seat catch support
- Install the rear wheel
- Installing chain guard
- Removing engine lifter
- Installing engine spoiler
- Adjust chain sag
- Final check of work performed

33 35 001 Replacing swinging-arm bearing

+ 33 35 502

Preparatory work

Removing engine spoiler

Installing engine lifter

Remove the rear wheel

Removing the left passenger seat catch support

Removing chain guard

Removing silencer

Removing the right passenger seat catch support

Removing rear-wheel cover

Disengaging spring strut from swinging arm

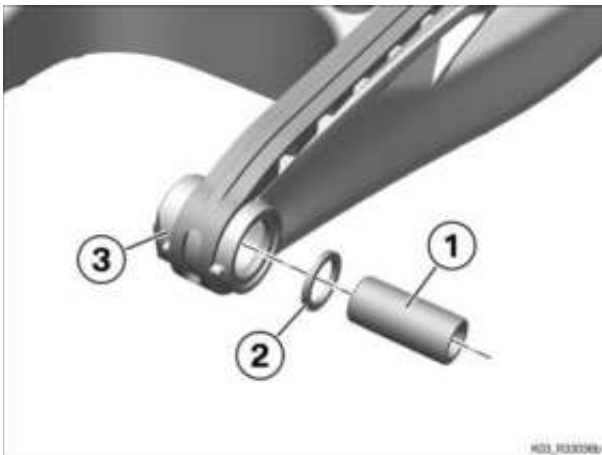
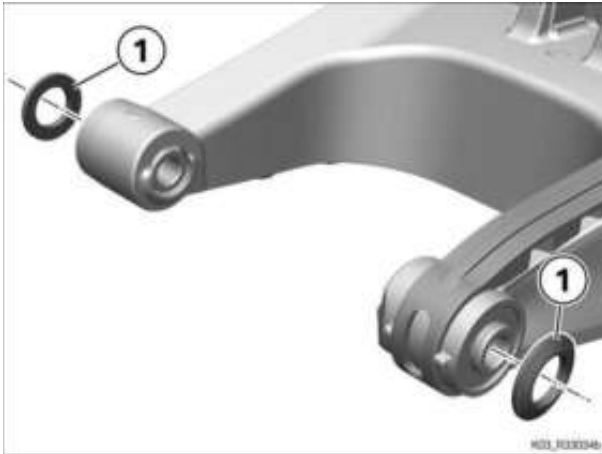
Remove the swinging arm

Core activity

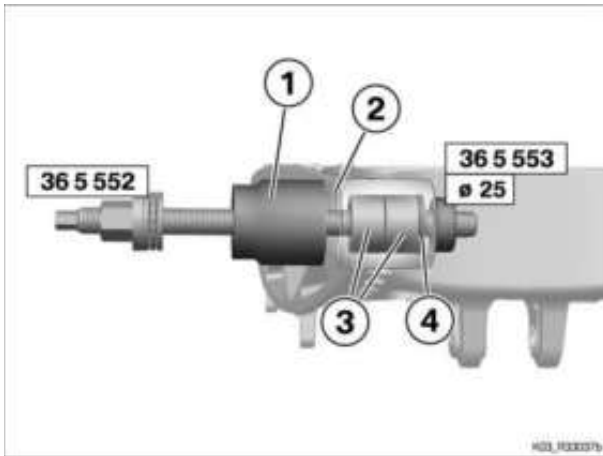
(-) Remove the swinging-arm bearing

► Removing left swinging-arm bearing

- Remove thrust washers (1).



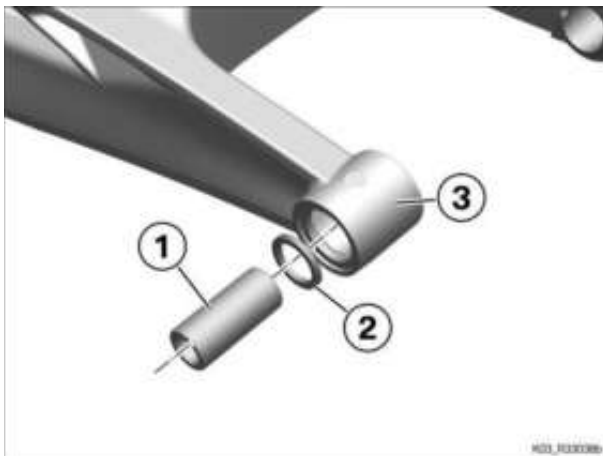
- Remove bearing bush (1) and square sealing ring (2) from swinging arm (3).



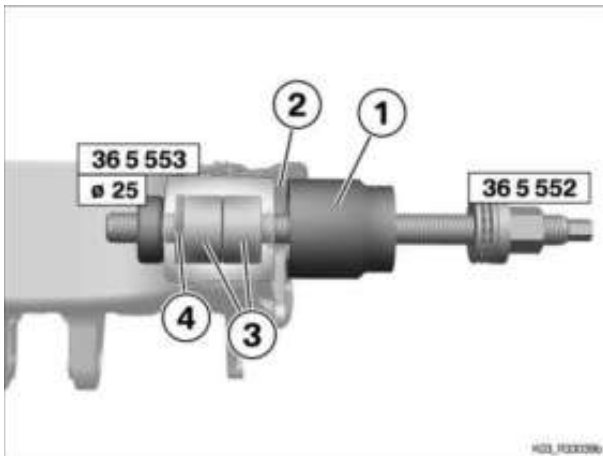
- Position short spindle (No. 36 5 552) with matching socket (1) on swinging arm (2).
- Attach contact disc with 25 mm thread (No. 36 5 553) to short spindle (No. 36 5 552).
- Remove needle bearing (3) and square sealing ring (4) from swinging arm (2).



▶ Removing right swinging-arm bearing



- Remove bearing bush (1) and square sealing ring (2) from swinging arm (3).



- Position short spindle (No. 36 5 552) with matching socket (1) on swinging arm (2).
- Attach contact disc with 25 mm thread (No. 36 5 553) to short spindle (No. 36 5 552).
- Remove needle bearing (3) and square sealing ring (4) from swinging arm (2).



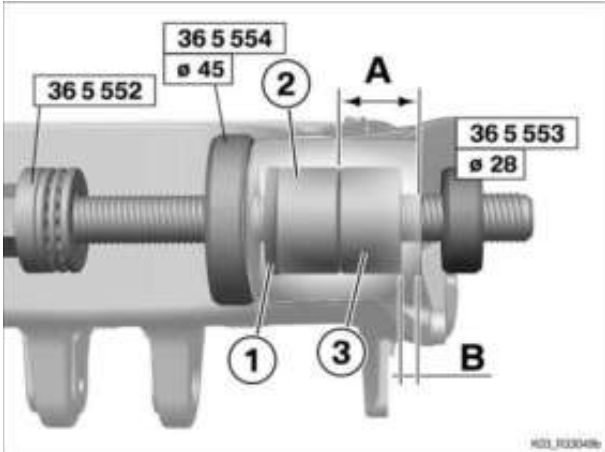
(-) Installing swinging-arm bearings

ATTENTION

Four edged sealing ring can be crimped by needle bearing.

Component damage

- Observe the installation depth of the needle bearing, e.g. make a mark on the installation tool.



► Install the right swinging-arm bearing

- Lubricate **new** square sealing ring (1) and **new** needle bearing (2) and (3).

 Lubricant	
Acid-free friction-bearing grease	81 22 9 407 174

- Install square sealing ring (1).
- Position short spindle (No. 36 5 552) with contact disc without thread 45 mm (No. 36 5 553) and needle bearing (2).

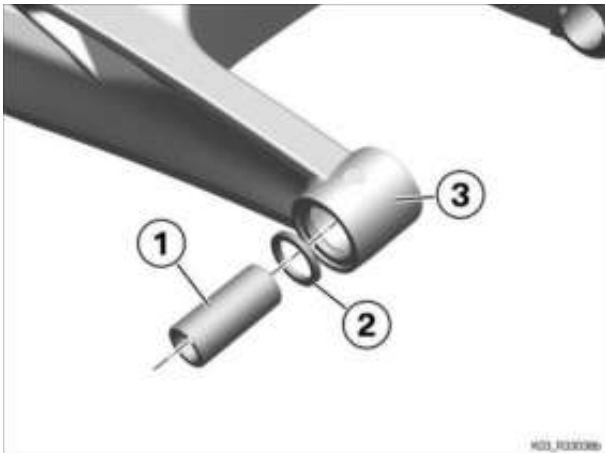
 NOTICE

Install the needle bearings individually in the swinging arm.

- Attach disc with 28 mm thread (No. 36 5 553) to short spindle (No. 36 5 552).
- Install needle bearing (2), noting the installation depth A.

 Technical data			
Installation depth (measured from swinging arm outer edge)	A: inner swinging-arm pivot mount	21 mm	
	B: outer swinging-arm pivot mount	5 mm	

- Install second needle bearing (3) in the same way, paying attention to installation depth B.
- Lubricate **new** bearing bush (1) and **new** square sealing ring (2) and install in swinging arm (3).

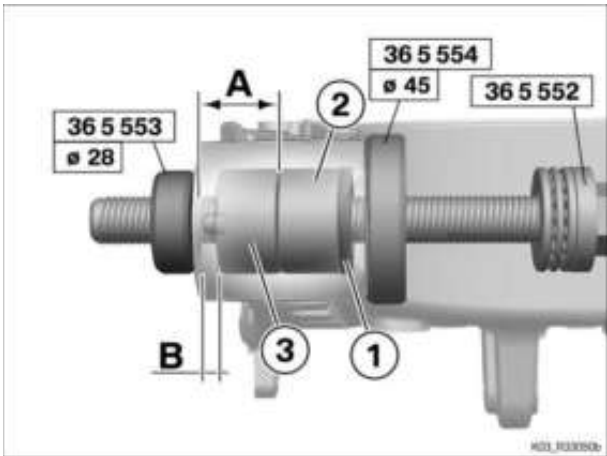


 Lubricant	
Acid-free friction-bearing grease	81 22 9 407 174



► Install the left swinging-arm bearing

- Lubricate **new** square sealing ring (1) and **new** needle bearing (2) and (3).



Lubricant

Acid-free friction-bearing grease	81 22 9 407 174
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- Install square sealing ring (1).
- Position short spindle (No. 36 5 552) with contact disc without thread 45 mm (No. 36 5 553) and needle bearing (2).

NOTICE

Install the needle bearings individually in the swinging arm.

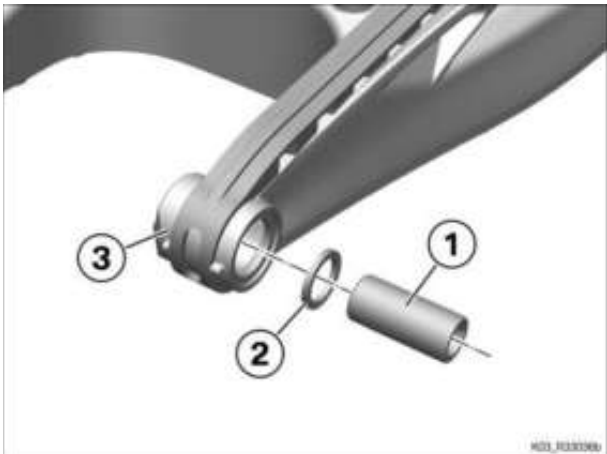
- Attach disc with 28 mm thread (No. 36 5 553) to short spindle (No. 36 5 552).
- Install needle bearing (2), noting the installation depth A.



Technical data

Installation depth (measured from swinging arm outer edge)	A: inner swinging-arm pivot mount	21 mm	
	B: outer swinging-arm pivot mount	5 mm	

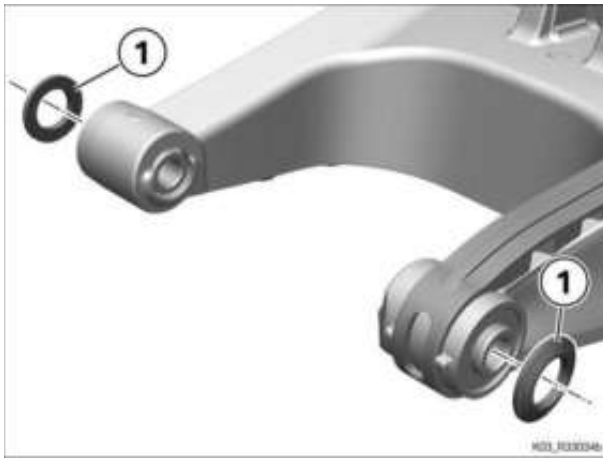
- Install second needle bearing (3) in the same way, paying attention to installation depth B.
- Lubricate **new** bearing bush (1) and **new** square sealing ring (2) and install in swinging arm (3).



Lubricant

Acid-free friction-bearing grease	81 22 9 407 174
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- Install thrust washers (1).



Follow-up work

- Installing swinging arm
- Securing spring strut to swinging arm
- Installing rear-wheel cover
- Installing the right passenger seat catch support
- Securing the exhaust system
- Installing the left passenger seat catch support
- Install the rear wheel
- Installing chain guard
- Removing engine lifter
- Installing engine spoiler
- Adjust chain sag
- Final check of work performed

33 54 000 Replacing rear spring strut

+ 33 54 500

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing right frame cover

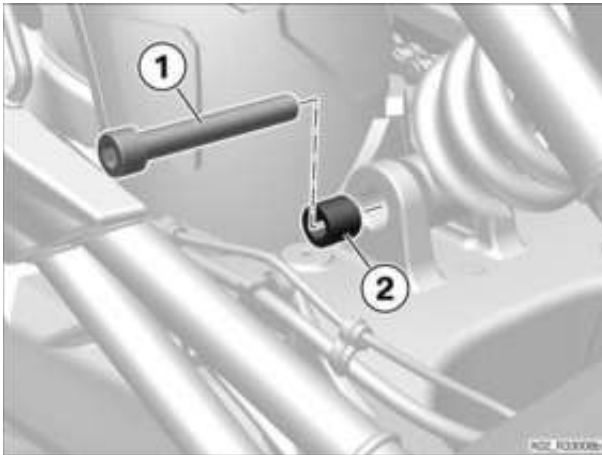
Removing engine spoiler

Installing engine lifter

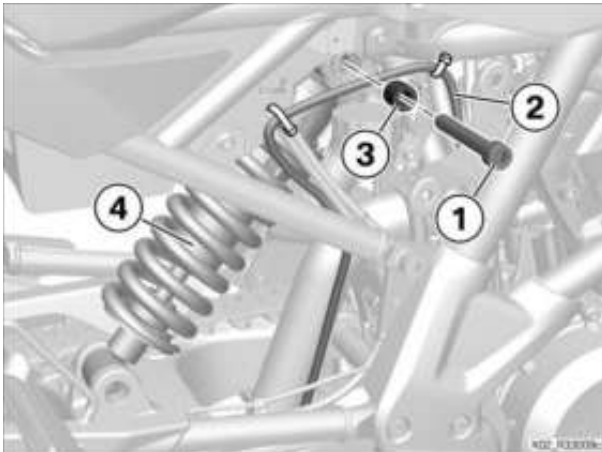
Removing rear-wheel cover

Core activity

(-) Removing spring strut



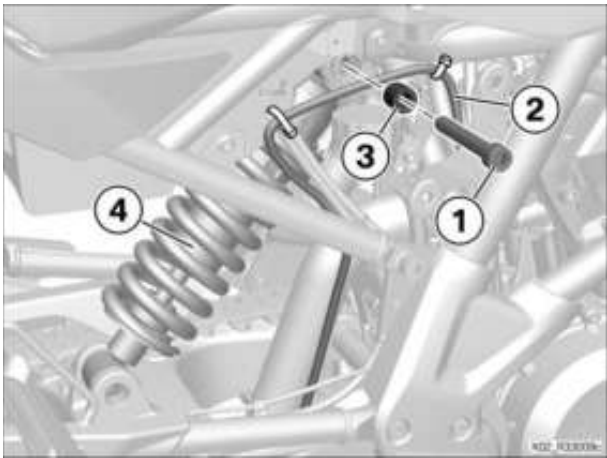
- Remove screw (1) and bushing (2).



- Remove bolt (1) and while doing so, note the cable (2) for the oxygen sensor.
- Remove bushing (3).
- Loosen spring strut (4), feed out and remove.

(-) Installing spring strut

- Clean the threads.
- Place screw locking on screw (1) lightly.



Thread-locking compound

Loctite 243, Medium strength	83 19 2 210 339
------------------------------	-----------------

- Clean bush (3) and lubricate **on the outside thinly**.



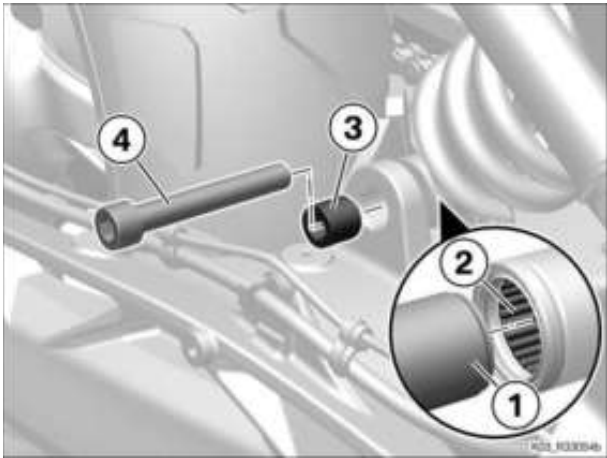
Lubricant

Acid-free friction-bearing grease	81 22 9 407 174
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- Feed in spring strut (4) into place and hold it in position.
- Install bolt (1) with bush (3) and while doing so, note the cable (2) for the oxygen sensor.

NOTICE

Tighten the screw connection only until the rear wheel/swinging arm is loaded.



- If the bearing inner bush (1) has been removed, check the position of the bearing rollers (2) and lubricate.



Lubricant

Acid-free friction-bearing grease	81 22 9 407 174
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- Lubricate bush (3) **on the outside thinly**.



Lubricant

Acid-free friction-bearing grease	81 22 9 407 174
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- Place screw locking on screw (4) **lightly**.



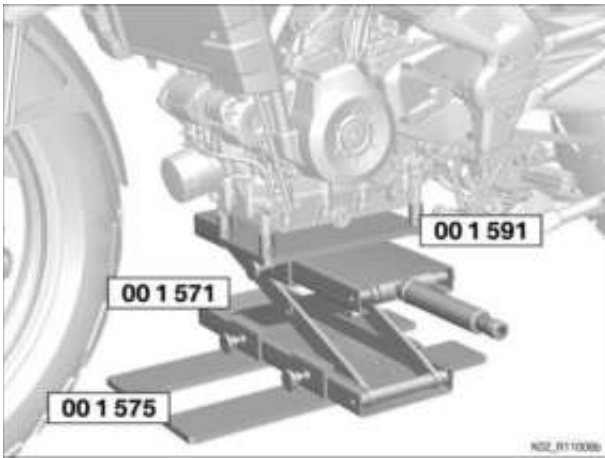
Thread-locking compound

Loctite 243, Medium strength	83 19 2 210 339
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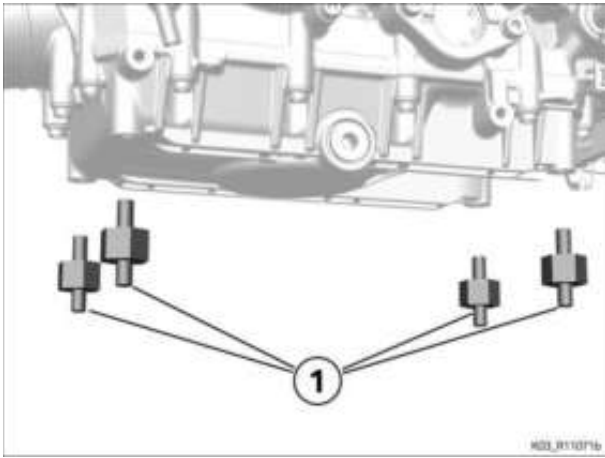
- Install bolt (4) with bush (3), but do not tighten.
- Align swinging arm if required by raising or lowering the scissor-type lifter.

(-) Removing engine lifter

- Lower engine lifter until it is free of load. While doing so, ensure that the vehicle is secure and cannot tip over.
- Remove scissor-type lifter (No. 00 1 571) from engine adapter (No. 00 1 591).
- Disengage engine fixture (No. 00 1 591) from engine.



- Lower scissor-type lifter (No. 00 1 571).
- Disengage extensions (No. 00 1 575) from scissor-type lifter (No. 00 1 591) and remove.



ATTENTION

Damage of the vibration damper due to incorrect tools

Component damage

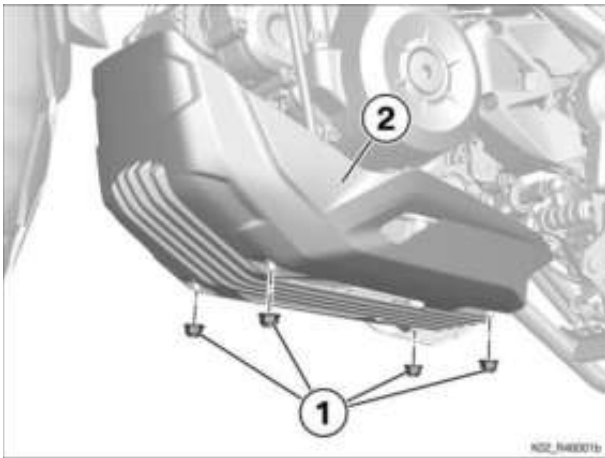
- Use especially six edged tools.
- Set tools on the top metal space (oil sump side).

- Install vibration damper (1) (long thread in oil sump).

Tightening torques		
Vibration damper to oil sump		
M8, Long thread in oil sump	12 Nm	

(-) Installing engine spoiler

- Hold engine spoiler (2) in position.
- Install nuts (1).

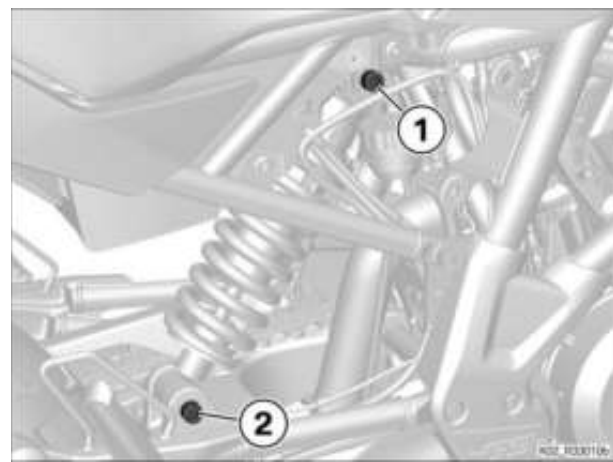


Tightening torques		
Engine spoiler to vibration damper		
M8	10 Nm	

(-) Tightening the spring strut

- Tighten screws (1) and (2).

Tightening torques		
Spring strut to frame		
M10 x 70 - 10.9	56 Nm	



Thread-locking compound (Loctite 243, Medium strength)		
Spring strut to swinging arm		
M10 x 70 - 10.9	56 Nm	
Thread-locking compound (Loctite 243, Medium strength)		

Follow-up work

- Installing rear-wheel cover
- Installing right frame cover
- Final check of work performed

33 81 000 Replacing chainset

+ 33 81 500

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing pinion cover

Releasing pinion

Core activity

(-) Splitting drive chain

Requirement

- Drive-chain splitting/joining tool (No. 27 1 560) in combination with set, drive-chain splitting/joining tool (No. 27 1 570).



► Preparing drive-chain splitting/joining tool for splitting chain with press-out pin

- Insert rivet die (No. 27 1 577) into basic tool (No. 27 1 561).
- Insert screw (No. 27 1 562) with press-out pin (No. 27 1 572) into basic tool (No. 27 1 561).

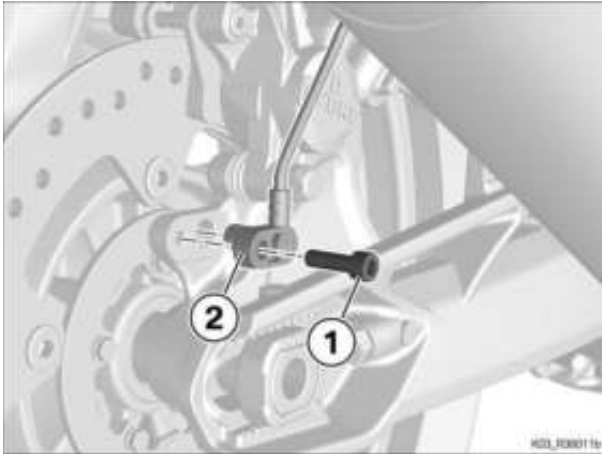


- Secure locator for press-out pin (No. 27 1 583) with hole over chain rivet (1).
- Press out chain rivet (1) with press-out pin (No. 27 1 572).
- Remove the tool and separate chain link plates (2).
- Take removed chain rivet (1) out of the tool.

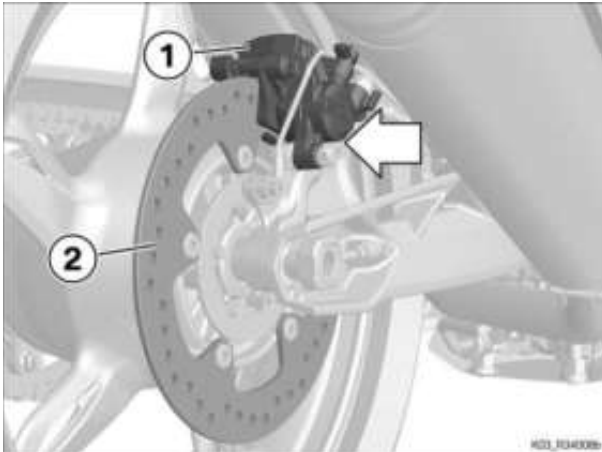
(-) Remove the rear wheel

► Releasing rear wheel-speed sensor

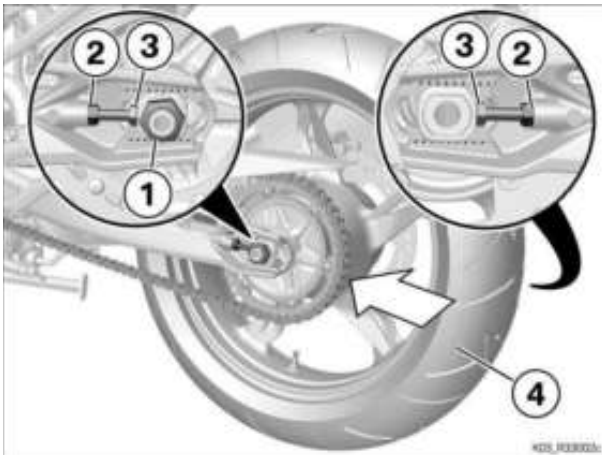
- Remove screw (1).
- Disengage wheel-speed sensor (2) and push it aside.



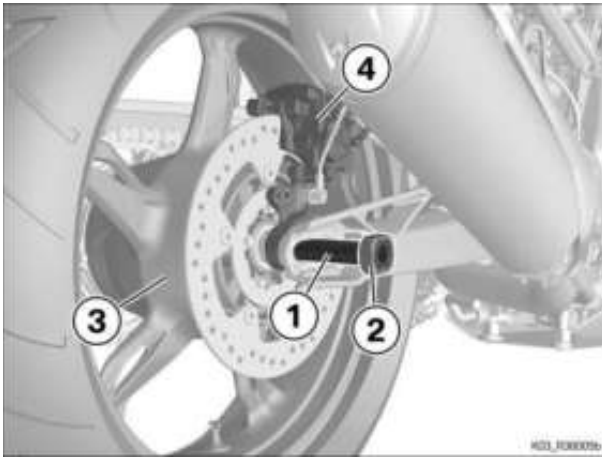
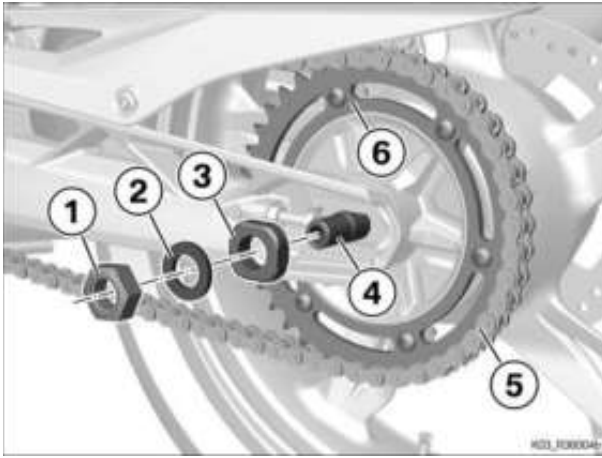
- Press brake caliper (1) against brake disc (2) to force the brake piston back.



- Slacken nut (1).
- Slacken locknuts (2) on left and right.
- Screw in tensioning screws (3).
- Push rear wheel (4) forward.
- » Chain is slackened.



- Remove nut (1), washer (2) and thruster (3).
- Push quick-release axle (4) forward.
- Remove chain (5) from camshaft sprocket (6) and move it aside, making sure that the swinging arm is not scratched.



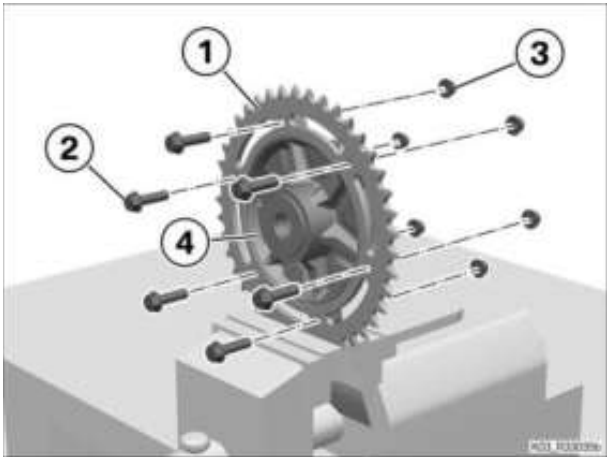
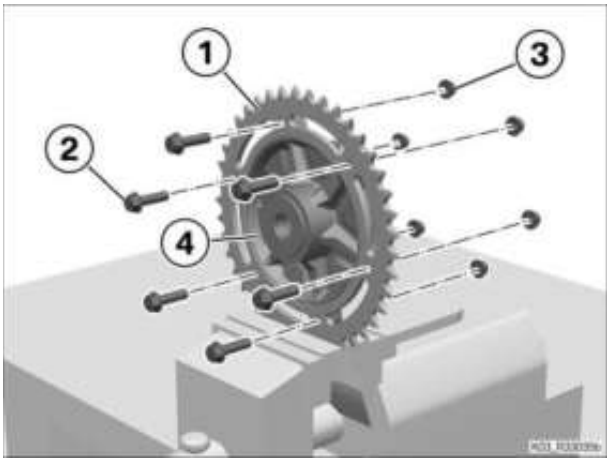
- Remove quick-release axle (1) with thruster (2).
- Remove wheel (3) and at the same time disengage complete brake caliper (4) and leave it hanging to the side.



- Remove complete chain sprocket support (1) with spacing bushing (2).
- Remove judder damper elements (3).

(-) Removing sprocket

- Clamp sprocket (1) in a vice fitted with **protective jaws**.
- Remove screws (2) and nuts (3).
- Separate sprocket (3) and chain sprocket support (4).
- Remove sprocket (1) from the bench vice.



(-) Installing sprocket

- Clamp new chain sprocket (1) in a vice fitted with **vice jaw protectors**.
- Position wheel carrier (4) on chain sprocket (1).
- Install screws (2) and new nuts (3).

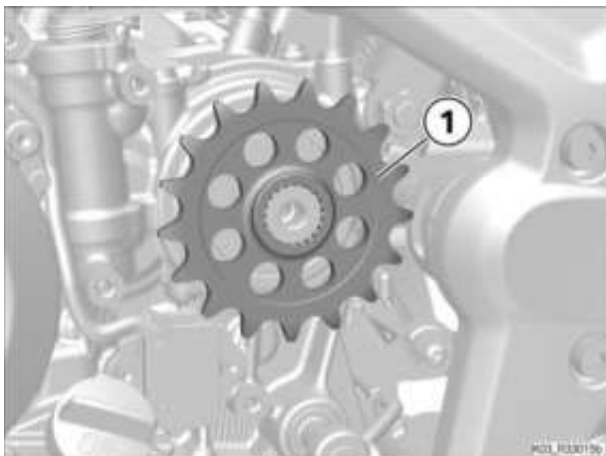
 Tightening torques		
Chain sprocket to chain-sprocket carrier		
M8 x 30 - 10.9, Renew nuts. Tighten nuts, counter-hold on screws. Thread-locking compound (mechanical)	Tightening sequence: tighten in diagonally opposite sequence	
	1st tightening torque, 10 Nm	
	1st tightening torque, 30 Nm	

(-) Removing drive chain

- Remove drive chain (1) from the motorcycle.

(-) Removing pinion

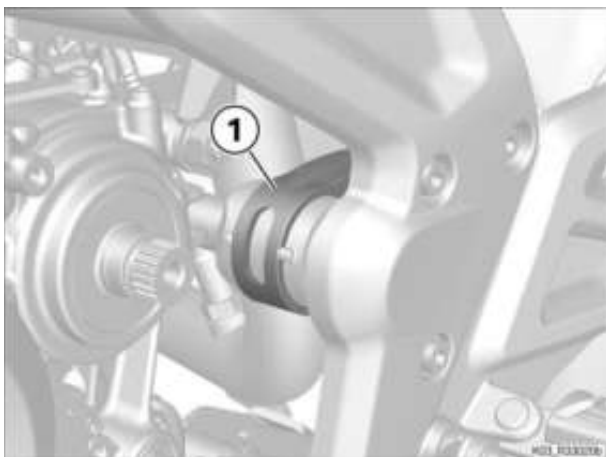
- Remove pinion (1).



(-) Checking chain slide rail

Check

- Check chain slide rail (1) for deep scoring and chipping.



Result:

- Chain slide rail (1) is damaged.

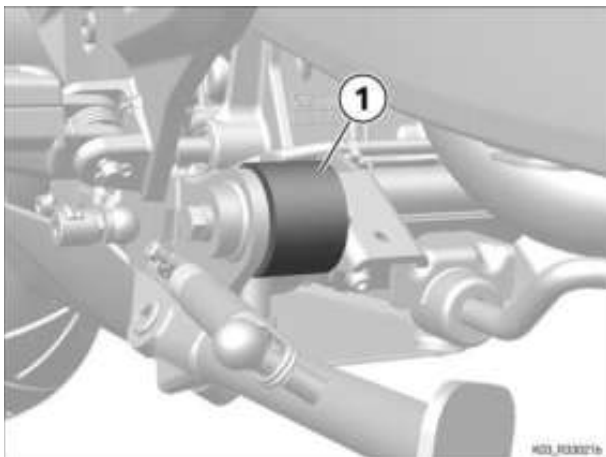
Measure:

=> 33 85 501, Replacing chain slide rail (Billed as a separate item)

(-) Checking chain roller

Check

- Check chain roller (1) for damage and wear.



Result:

-

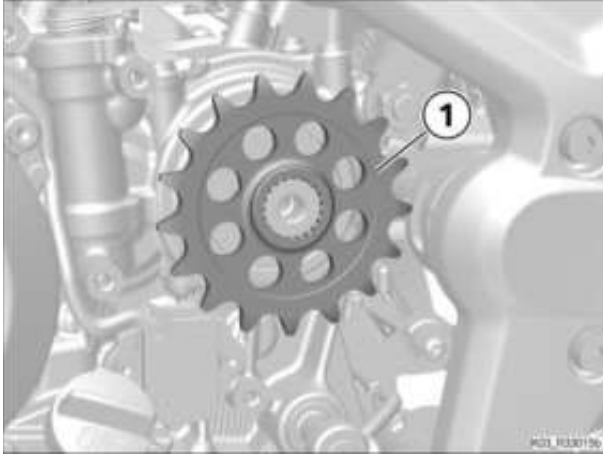
Chain roller is damaged or worn.

Measure:

=> 33 85 518, Replacing bottom chain take-up roller (Billed as a separate item)

(-) Installing pinion

- Install chain pinion (1).



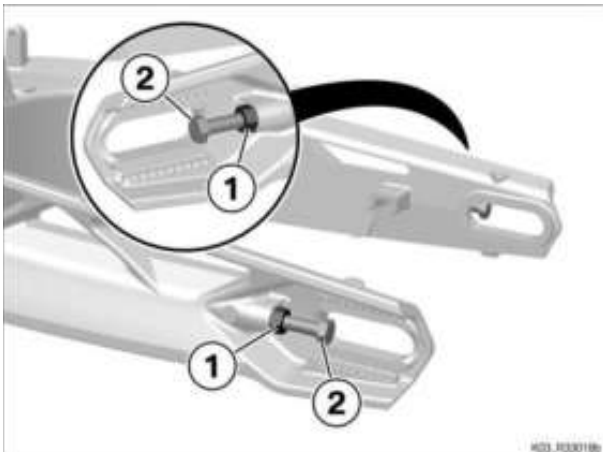
(-) Installing drive chain

- Feed in drive chain (1) and lay on pinion (2).
- Pull drive chain (1) with pinion (2) through and pull to the rear.



(-) Backing off tensioning screws

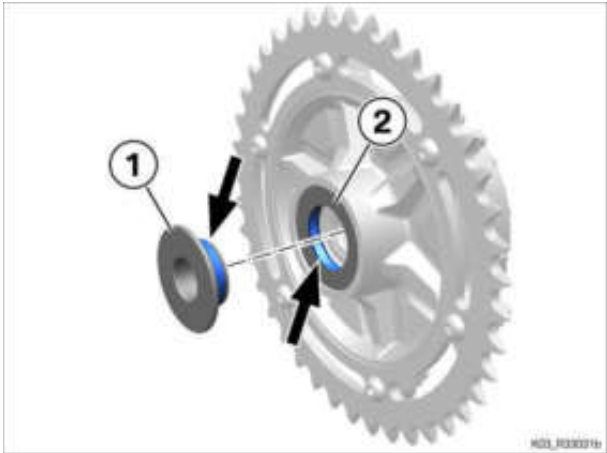
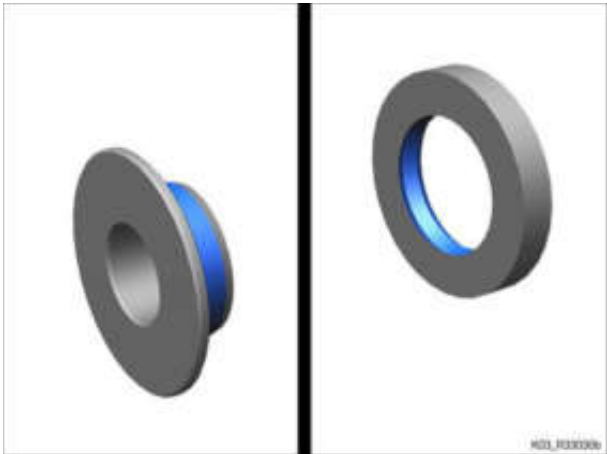
- Slacken locknuts (1) and tighten tensioning screws (2) by about five turns.



(-) Install the rear wheel

► Lubricate the bearing bushing and radial shaft sealing ring of sprocket carrier

- Surfaces to be cleaned and lubricated.



- Remove all dirt and old lubricant from spacing bushing (1) and radial shaft seal (2).
- Lubricate spacing bushing (1) and radial shaft seal (2) at the **marked surfaces** (arrows).

 Lubricant	
Unirex N3	83 19 2 160 349

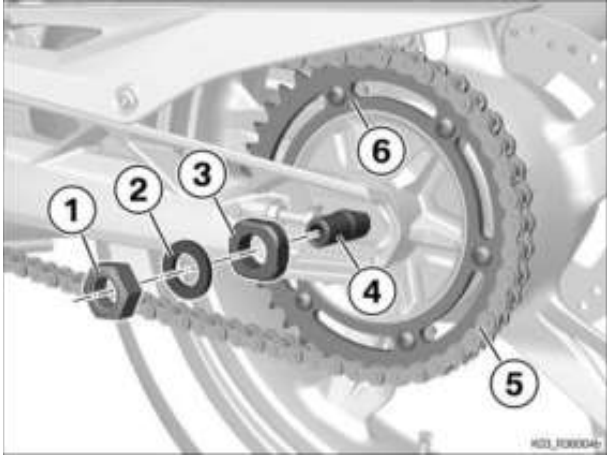
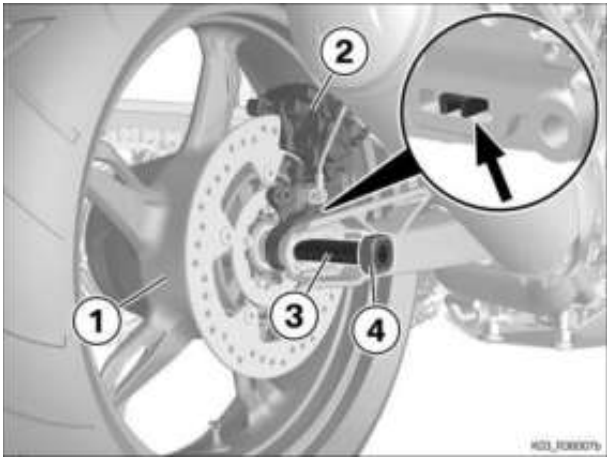


- Check judder damper elements (1) for damage, deformation and wear; replace if necessary.
- Lubricate judder damper elements (1) and install.



 Installation tool	
Silicone spray	83 19 2 208 609

- Install complete chain sprocket support (1) in judder damper elements (3).
- Make sure that spacing bushing (2) is installed.



- Install rear wheel (1) and at the same time work complete brake caliper (2) into position, making sure that it is seated in the guide (arrow).
- Lubricate quick-release axle (3) and install with slider (4).

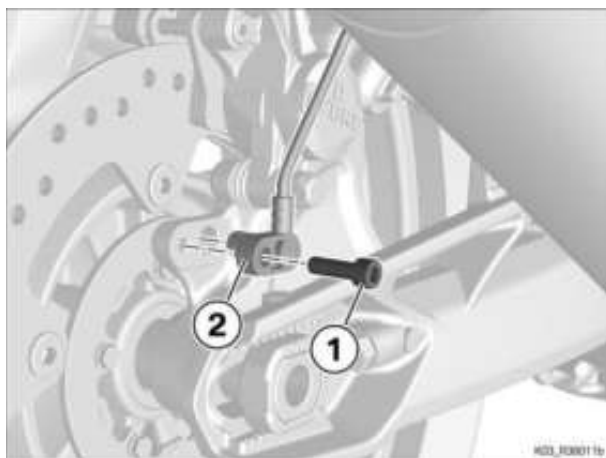
 Lubricant	
Optimoly TA	18 21 9 062 599

- Loop chain (5) over sprocket (6).
- Push quick-release axle (4) to the rear.
- Install slider (3) and washer (2).
- Engage nut (1), do not tighten.

► **Securing rear wheel-speed sensor**

- Insert wheel-speed sensor (2) and install screw (1).

 Tightening torques		
Wheel-speed sensor to brake calliper mount, rear		
M6 x 20	8 Nm	



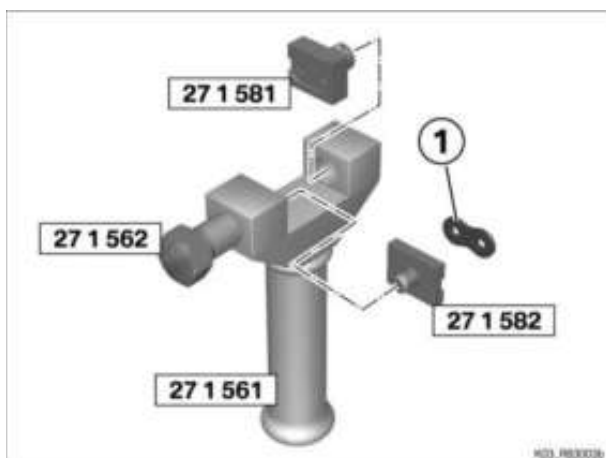
(-) Joining drive chain

Requirement

- Drive-chain splitting/joining tool (No. 27 1 560) in combination with set, drive-chain splitting/joining tool (No. 27 1 570).



- Position sealing rings (1) on chain joining link (2).
- Lubricate and insert chain joining link (2).
- Place sealing rings (3) in position.



- Position counter-support (No. 27 1 581) in chain splitting and joining tool (No. 27 1 561).
- Position outside link plate of chain joining link (1) in insert (No. 27 1 582).
- Position insert (No. 27 1 582) in thrust screw (No. 27 1 562).

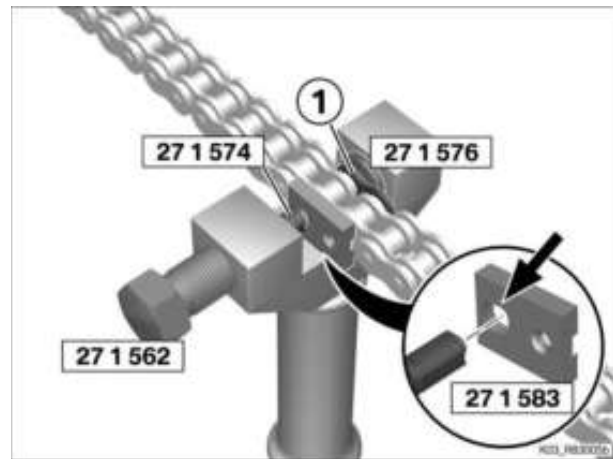
- Seat chain joining link (1) with insert (No. 27 1 582) and counter-support (No. 27 1 581).
- Tighten thrust screw (No. 27 1 562) until fully tightened.



- Back off the thrust screw and remove insert (No. 27 1 582) and counter-support (No. 27 1 581).



- Insert rivet die (No. 27 1 574) in thrust screw (No. 27 1 562).
- Position insert **without bore** (No. 27 1 576) in the chain splitting and joining tool.



- Position locating and press-out pin (No. 27 1 583) **with the square head (arrow)** on chain joining link (1).
- Press-fit chain joining link (1) with rivet die (No. 27 1 574).

 Technical data			
Tightening torque for installing rivets in chain joining link		50 Nm	

- Back off thrust screw (No. 27 1 562), turn rivet die (No. 27 1 574) **through 90°** and **again** press-fit the rivet.
- Back off thrust screw (No. 27 1 562).
- Reposition the tool and press-fit the second rivet in the same way.
- Remove the tools.

► **Checking security of drive-chain link**



Check

Result:

- Pin head not adequately secured.

Measure:

- Repeat the process step and seat the pin head more securely.

Check

Result:

- Pin head cracked, irregularly flattened or rounded.

Measure:

- Remove the chain link and re-join the chain, using a **new chain joining link**.



Follow-up work

Securing pinion

Installing pinion cover

Adjust chain sag

Bedding in brake pads

Final check of work performed

33 81 501 Replacing chainset (for maintenance)

Preparatory work

Removing pinion cover

Releasing pinion

Core activity

(-) Splitting drive chain

Requirement

- Drive-chain splitting/joining tool (No. 27 1 560) in combination with set, drive-chain splitting/joining tool (No. 27 1 570).



► Preparing drive-chain splitting/joining tool for splitting chain with press-out pin

- Insert rivet die (No. 27 1 577) into basic tool (No. 27 1 561).
- Insert screw (No. 27 1 562) with press-out pin (No. 27 1 572) into basic tool (No. 27 1 561).

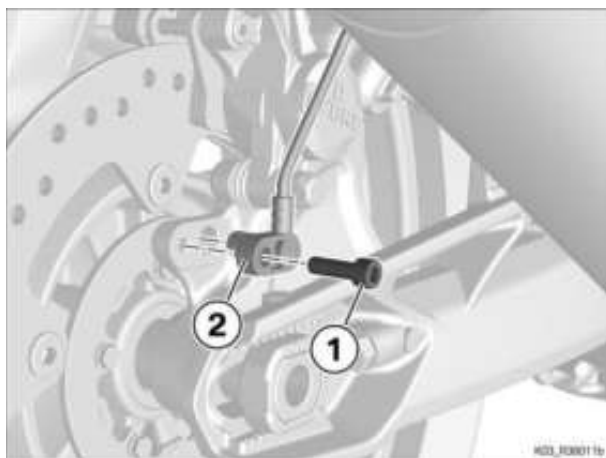


- Secure locator for press-out pin (No. 27 1 583) with hole over chain rivet (1).
- Press out chain rivet (1) with press-out pin (No. 27 1 572).
- Remove the tool and separate chain link plates (2).
- Take removed chain rivet (1) out of the tool.

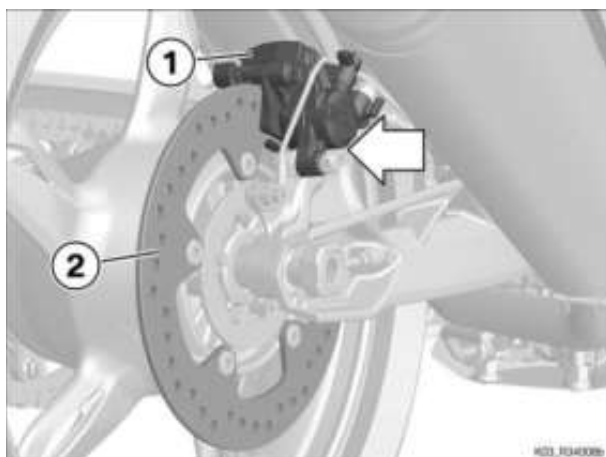
(-) Remove the rear wheel

► Releasing rear wheel-speed sensor

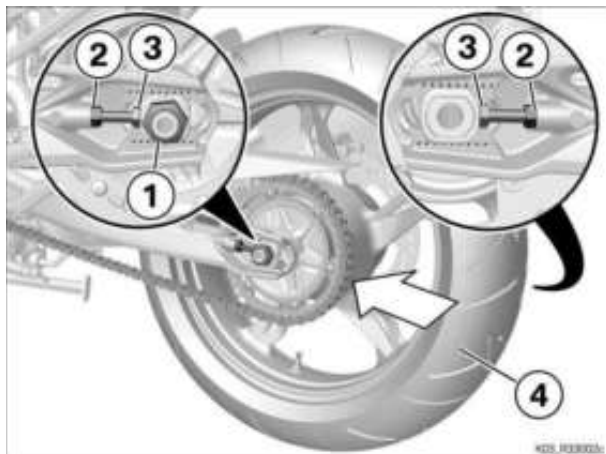
- Remove screw (1).
-



Disengage wheel-speed sensor (2) and push it aside.

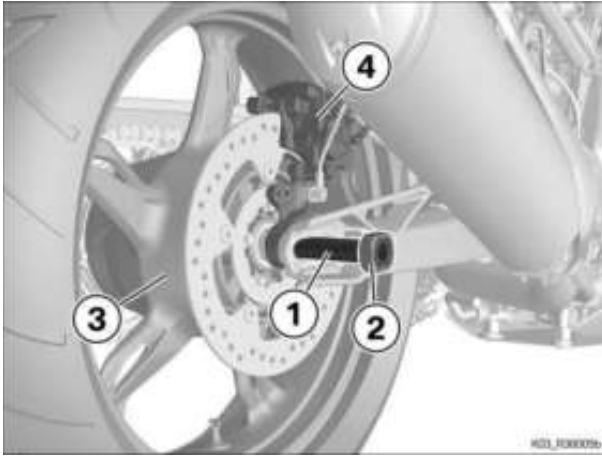
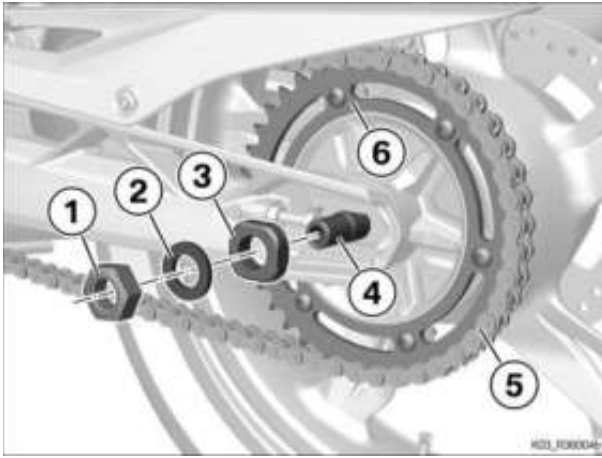


- Press brake caliper (1) against brake disc (2) to force the brake piston back.



- Slacken nut (1).
 - Slacken locknuts (2) on left and right.
 - Screw in tensioning screws (3).
 - Push rear wheel (4) forward.
- » Chain is slackened.

- Remove nut (1), washer (2) and thruster (3).
- Push quick-release axle (4) forward.
- Remove chain (5) from camshaft sprocket (6) and move it aside, making sure that the swinging arm is not scratched.



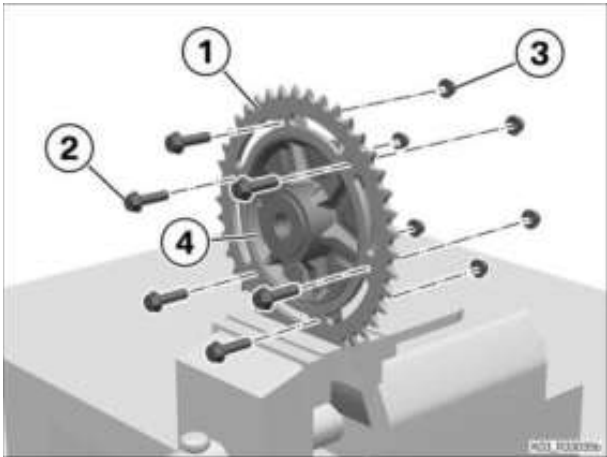
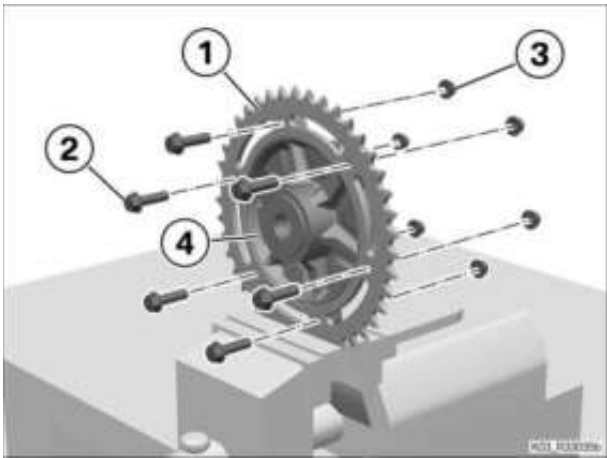
- Remove quick-release axle (1) with thruster (2).
- Remove wheel (3) and at the same time disengage complete brake caliper (4) and leave it hanging to the side.



- Remove complete chain sprocket support (1) with spacing bushing (2).
- Remove judder damper elements (3).

(-) Removing sprocket

- Clamp sprocket (1) in a vice fitted with **protective jaws**.
- Remove screws (2) and nuts (3).
- Separate sprocket (3) and chain sprocket support (4).
- Remove sprocket (1) from the bench vice.



(-) Installing sprocket

- Clamp new chain sprocket (1) in a vice fitted with **vice jaw protectors**.
- Position wheel carrier (4) on chain sprocket (1).
- Install screws (2) and new nuts (3).

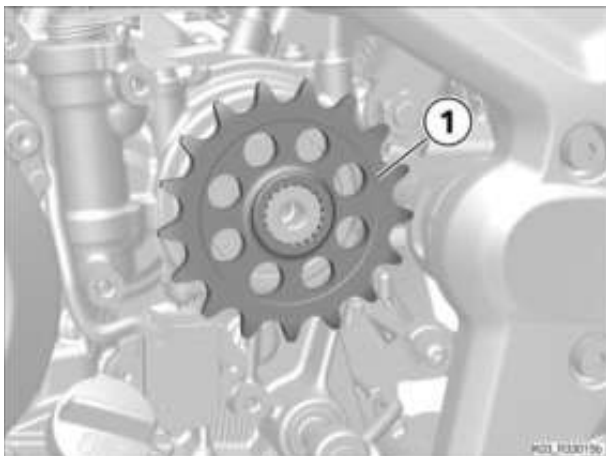
 Tightening torques		
Chain sprocket to chain-sprocket carrier		
M8 x 30 - 10.9, Renew nuts. Tighten nuts, counter-hold on screws. Thread-locking compound (mechanical)	Tightening sequence: tighten in diagonally opposite sequence	
	1st tightening torque, 10 Nm	
	1st tightening torque, 30 Nm	

(-) Removing drive chain

- Remove drive chain (1) from the motorcycle.

(-) Removing pinion

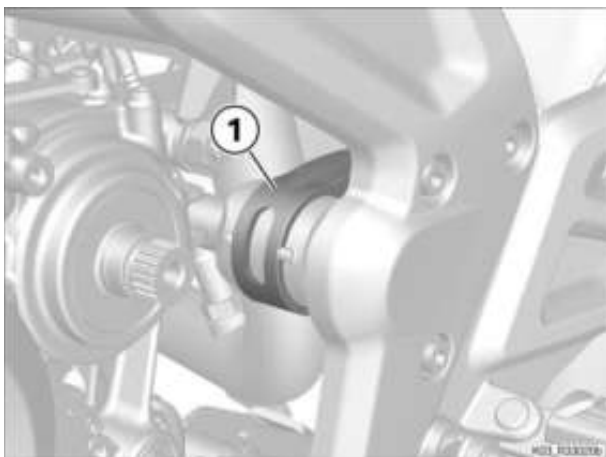
- Remove pinion (1).



(-) Checking chain slide rail

Check

- Check chain slide rail (1) for deep scoring and chipping.



Result:

- Chain slide rail (1) is damaged.

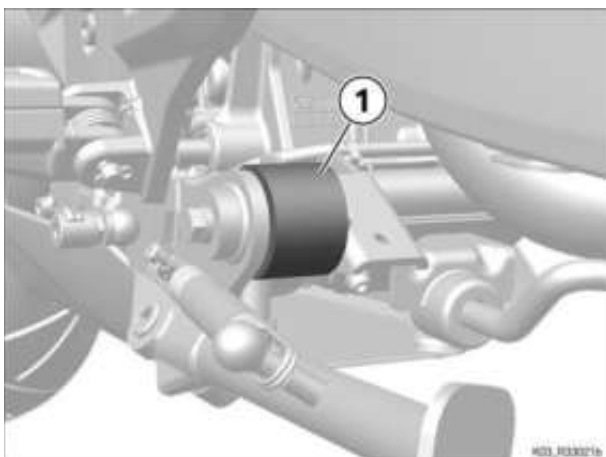
Measure:

=> 33 85 501, Replacing chain slide rail (Billed as a separate item)

(-) Checking chain roller

Check

- Check chain roller (1) for damage and wear.



Result:

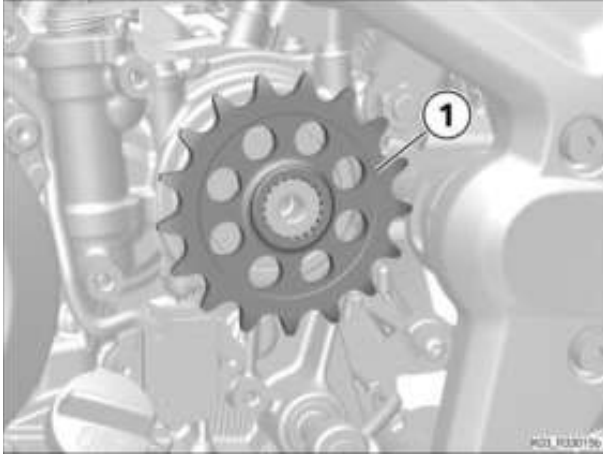
-

Chain roller is damaged or worn.

Measure:

=> 33 85 518, Replacing bottom chain take-up roller (Billed as a separate item)

(-) Installing pinion



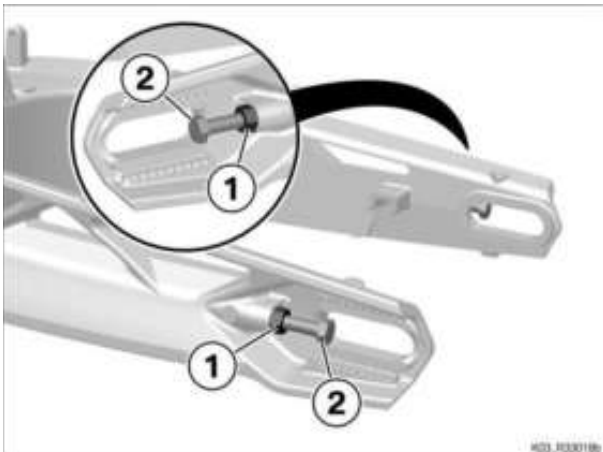
- Install chain pinion (1).

(-) Installing drive chain



- Feed in drive chain (1) and lay on pinion (2).
- Pull drive chain (1) with pinion (2) through and pull to the rear.

(-) Backing off tensioning screws

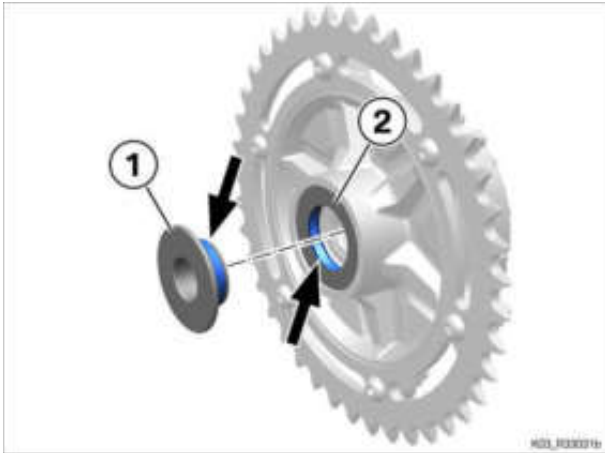
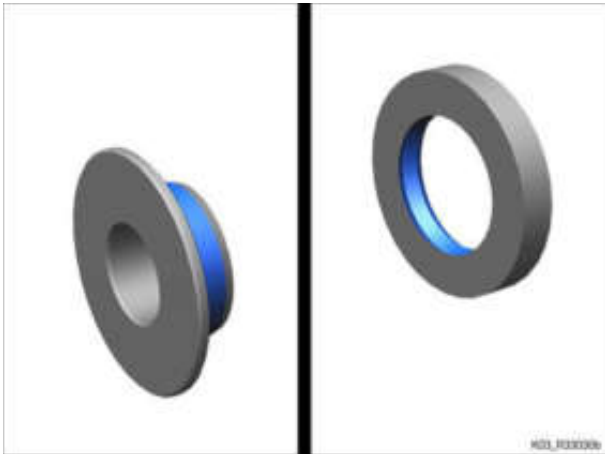


- Slacken locknuts (1) and tighten tensioning screws (2) by about five turns.

(-) Install the rear wheel

► Lubricate the bearing bushing and radial shaft sealing ring of sprocket carrier

- Surfaces to be cleaned and lubricated.



- Remove all dirt and old lubricant from spacing bushing (1) and radial shaft seal (2).
- Lubricate spacing bushing (1) and radial shaft seal (2) at the **marked surfaces** (arrows).

 Lubricant	
Unirex N3	83 19 2 160 349

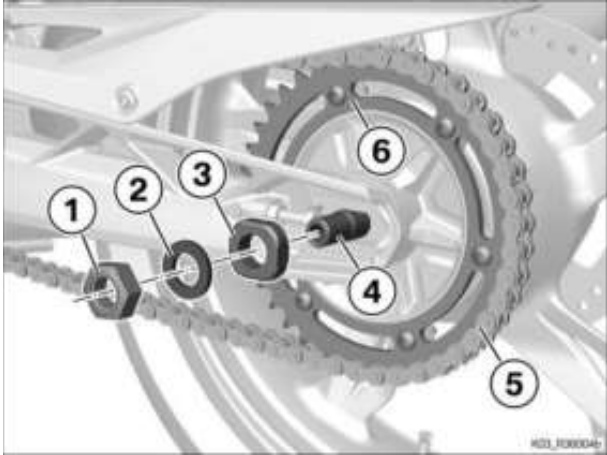
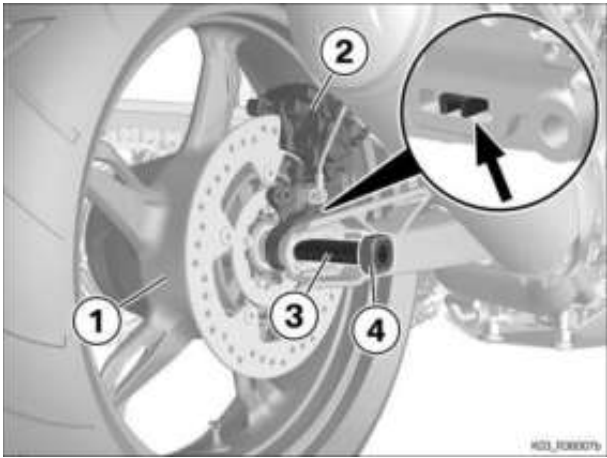


- Check judder damper elements (1) for damage, deformation and wear; replace if necessary.
- Lubricate judder damper elements (1) and install.



 Installation tool	
Silicone spray	83 19 2 208 609

- Install complete chain sprocket support (1) in judder damper elements (3).
- Make sure that spacing bushing (2) is installed.



- Install rear wheel (1) and at the same time work complete brake caliper (2) into position, making sure that it is seated in the guide (arrow).
- Lubricate quick-release axle (3) and install with slider (4).

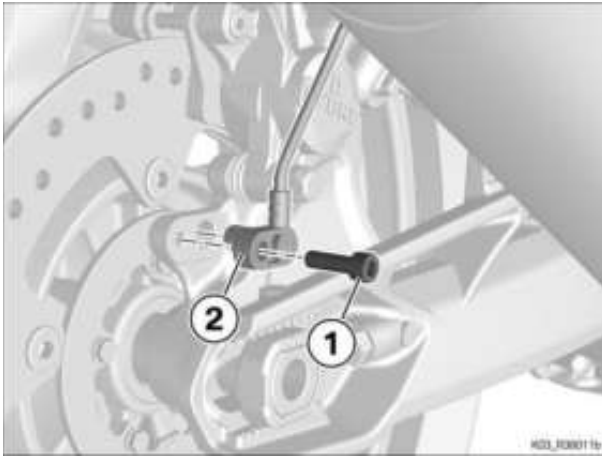
 Lubricant	
Optimoly TA	18 21 9 062 599

- Loop chain (5) over sprocket (6).
- Push quick-release axle (4) to the rear.
- Install slider (3) and washer (2).
- Engage nut (1), do not tighten.

► **Securing rear wheel-speed sensor**

- Insert wheel-speed sensor (2) and install screw (1).

 Tightening torques		
Wheel-speed sensor to brake calliper mount, rear		
M6 x 20	8 Nm	



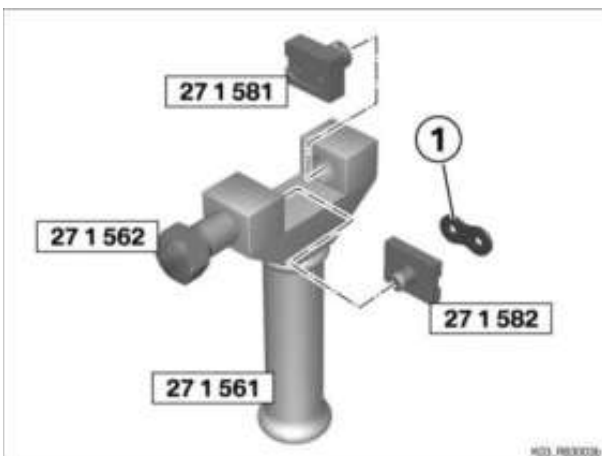
(-) Joining drive chain

Requirement

- Drive-chain splitting/joining tool (No. 27 1 560) in combination with set, drive-chain splitting/joining tool (No. 27 1 570).



- Position sealing rings (1) on chain joining link (2).
- Lubricate and insert chain joining link (2).
- Place sealing rings (3) in position.



- Position counter-support (No. 27 1 581) in chain splitting and joining tool (No. 27 1 561).
- Position outside link plate of chain joining link (1) in insert (No. 27 1 582).
- Position insert (No. 27 1 582) in thrust screw (No. 27 1 562).

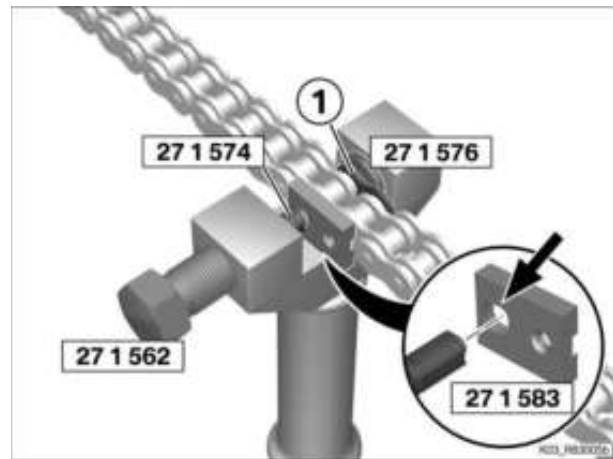
- Seat chain joining link (1) with insert (No. 27 1 582) and counter-support (No. 27 1 581).
- Tighten thrust screw (No. 27 1 562) until fully tightened.



- Back off the thrust screw and remove insert (No. 27 1 582) and counter-support (No. 27 1 581).



- Insert rivet die (No. 27 1 574) in thrust screw (No. 27 1 562).
- Position insert **without bore** (No. 27 1 576) in the chain splitting and joining tool.



- Position locating and press-out pin (No. 27 1 583) **with the square head (arrow)** on chain joining link (1).
- Press-fit chain joining link (1) with rivet die (No. 27 1 574).

 Technical data			
Tightening torque for installing rivets in chain joining link		50 Nm	

- Back off thrust screw (No. 27 1 562), turn rivet die (No. 27 1 574) **through 90°** and **again** press-fit the rivet.
- Back off thrust screw (No. 27 1 562).
- Reposition the tool and press-fit the second rivet in the same way.
- Remove the tools.

► **Checking security of drive-chain link**



Check

Result:

- Pin head not adequately secured.

Measure:

- Repeat the process step and seat the pin head more securely.

Check

Result:

- Pin head cracked, irregularly flattened or rounded.

Measure:

- Remove the chain link and re-join the chain, using a **new chain joining link**.



Follow-up work

Securing pinion

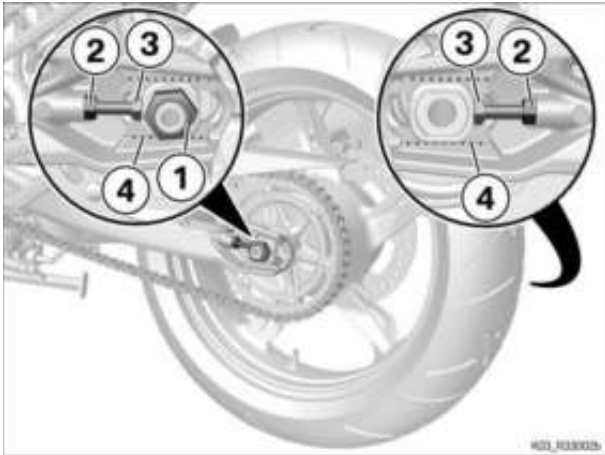
Installing pinion cover

Adjust chain sag

Bedding in brake pads

 33 83 000 Adjusting chain tension

+ 33 83 500



Core activity

(-) Adjust chain sag

- Slacken nut (1).
- Slacken locknuts (2) on left and right.

 ATTENTION

Rear wheel at an angle because tensioning screws not adjusted to same setting

Accelerated wear at rear wheel and chain drive

- Make sure that the rear wheel is aligned to track correctly (same scale reading on both sides of the rear wheel swinging arm).
-
- Use tensioning screws (3) to adjust chain sag, making sure that the rear wheel is aligned to track correctly (same scale readings (4) on both sides of the rear wheel swinging arm).

 Technical data			
Chain deflection	Motorcycle with no weight applied, supported on its side stand	40...50 mm	

- Tighten quick-release axle nut (1) and while doing so, see that the chain tension does not change.

 Tightening torques		
Rear quick-release axle in swinging arm		
M18 x 1.5	100 Nm	

- Tighten locknuts (2) on left and right.

 Tightening torques		
Locknut of the final-drive chain tensioning screw		
M8	19 Nm	

Follow-up work

Lubricating drive chain

Final check of work performed

 33 85 001 Replacing chain slide rail
+ 33 85 501

Preparatory work

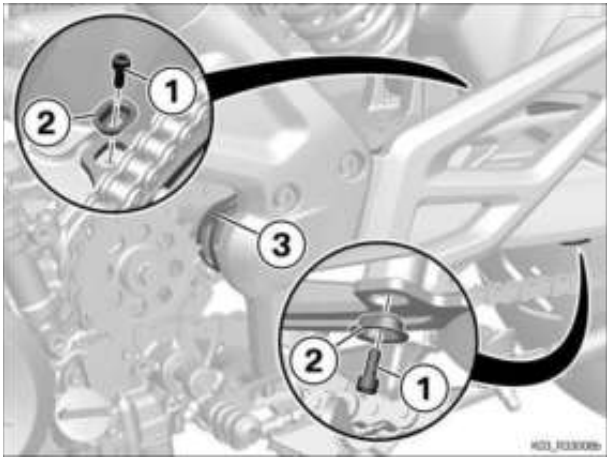
=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Removing pinion cover

Removing chain guard

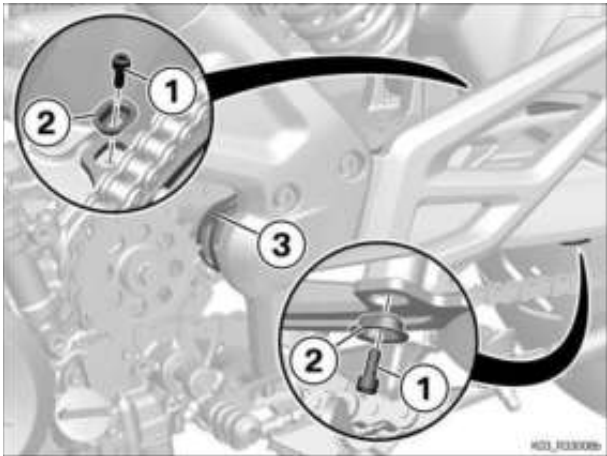
Core activity

(-) Remove the chain slide rail



- Remove screws (1) and retaining plate (2).
- Work chain slide rail (3) forward and remove.

(-) Installing chain slide rail



- Work chain slide rail (3) into position and install.
- Install screws (1) and retaining plate (2).

 Tightening torques		
Chain slide rail to rear wheel swinging arm		
M5 x 12	5 Nm	

Follow-up work

Installing chain guard

Installing pinion cover

Final check of work performed

33 85 002 Replacing bearing for sprocket carrier

+ 33 85 502

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

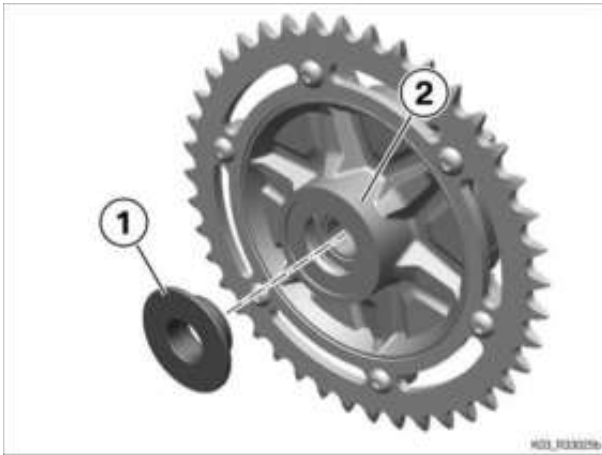
Remove the rear wheel

Core activity

(-) Replace camshaft bearing for chain sprocket support

► Remove camshaft bearing from chain sprocket support

- Remove spacer bush (1) from chain sprocket support (2).



- Remove radial shaft seal (1) and snap ring (2) from chain sprocket support (3).

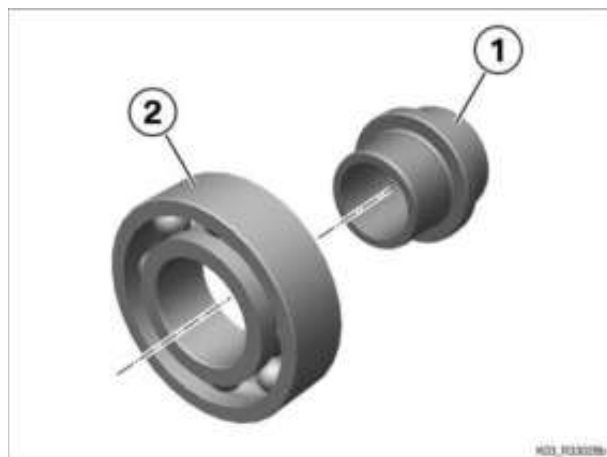


► Reassemble internal puller and reaction support

- Install internal puller (No. 00 8 573) in reaction support (No. 00 8 562).

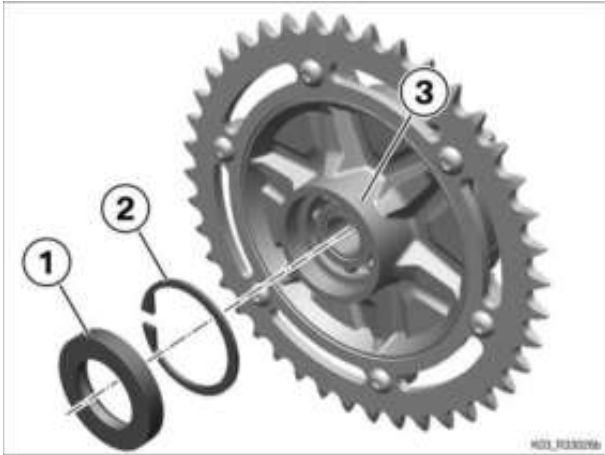
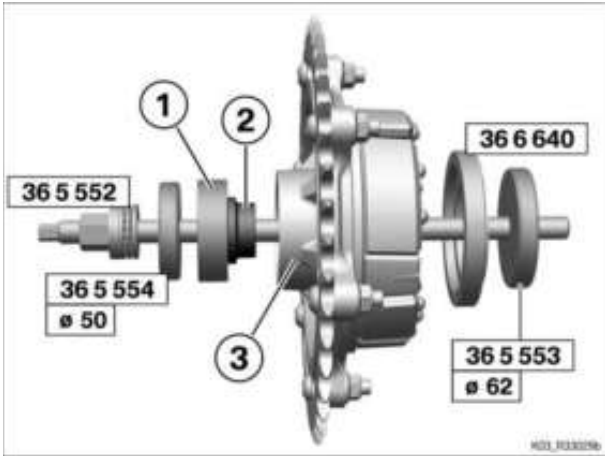
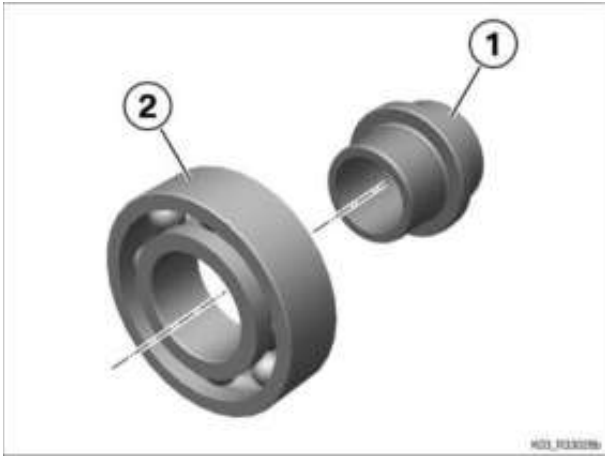


- Lay support ring (No. 36 6 640) on the chain sprocket support (1).
- Insert puller (a) into camshaft bearing (2) and place it on the support ring (No. 36 6 640)
- Remove camshaft bearing (2) with puller (a) from chain sprocket support (1).



- Remove spacer sleeve (1) from camshaft bearing (2).

- Install spacer sleeve (1) in connecting rod bearing (2) until flush.



► **Installing bearings in sprocket carrier**

- Insert **new** camshaft bearing (1) with spacer bush (2) in chain sprocket support (3).
- Position short spindle with locking nuts (No. 36 5 552), contact disc without 50 mm thread (No. 36 5 554), support ring (No. 36 6 640) and contact disc with 62 mm thread (No. 36 5 553) and feed camshaft bearing (1) on limit position into chain sprocket support (3).

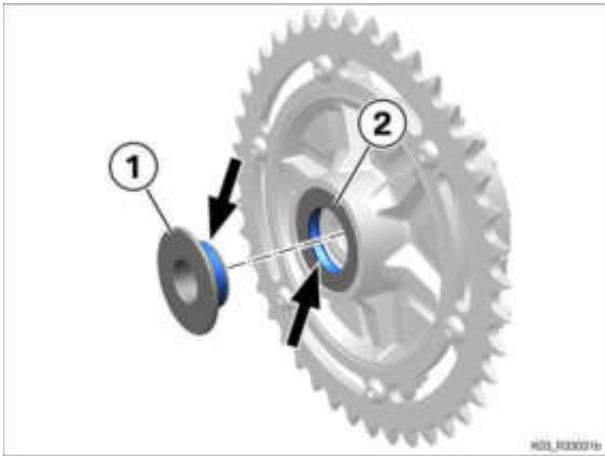
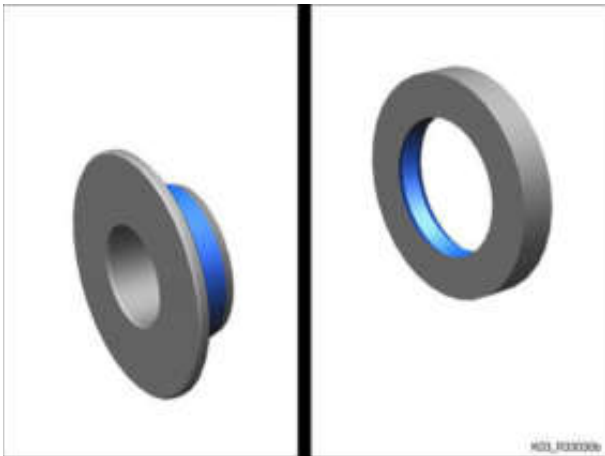
- Check snap ring (2) for damage; replace if necessary.
- Lubricate snap ring (2).

 Lubricant	
Acid-free friction-bearing grease	81 22 9 407 174

- Install snap ring (2) and **new** radial shaft seal (1) in chain sprocket support (3).

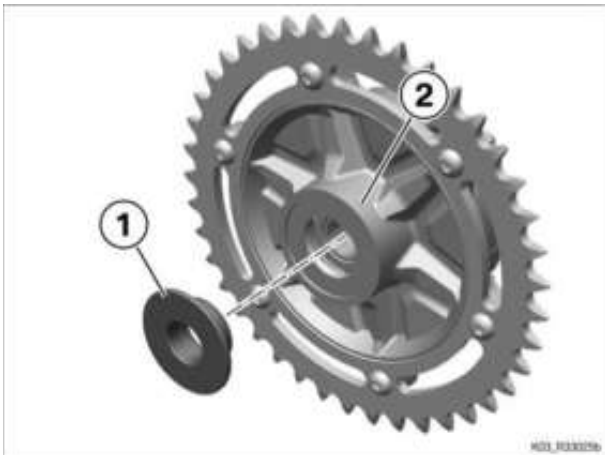
► **Lubricate the bearing bushing and radial shaft sealing ring of sprocket carrier**

- Surfaces to be cleaned and lubricated.



- Clean spacer bush (1) of dirt and old lubricant.
- Lubricate spacing bushing (1) and radial shaft seal (2) at the **marked surfaces** (arrows).

 Lubricant	
Unirex N3	83 19 2 160 349



- Install spacer bush (1) in chain sprocket support (2).

Follow-up work

- Install the rear wheel
- Adjust chain sag
- Bedding in brake pads
- Final check of work performed

 33 85 004 Replacing judder damper

+ 33 85 509

Preparatory work

=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Remove the rear wheel

Core activity

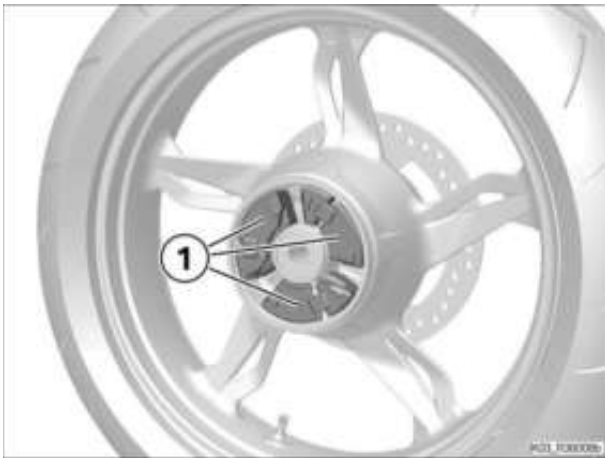
(-) Removing judder damper



- Remove complete chain sprocket support (1) with spacing bushing (2).
- Remove judder damper elements (3).

(-) Installing judder damper

- Lubricate new judder damper elements (1) and install.



 Installation tool	
Silicone spray	83 19 2 208 609

Follow-up work

Install the rear wheel

Adjust chain sag

Bedding in brake pads

Final check of work performed

 33 85 015 Replacing bottom chain take-up roller

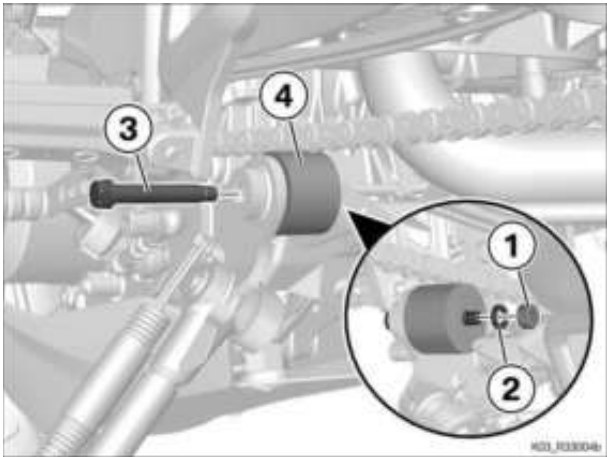
+ 33 85 518

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

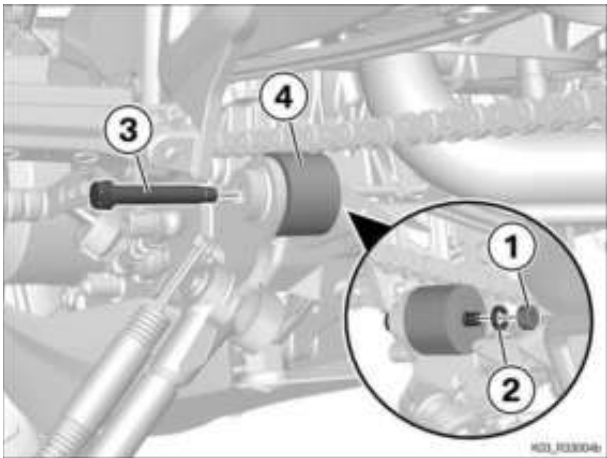
Core activity

(-) Removing chain roller



- Remove nut (1) with washer (2), counter-holding screw (3).
- Remove screw (3) and chain roller (4).

(-) Installing chain roller



- Hold chain roller (4) in position and install screw (3).
- Install nut (1) with washer (2), counter-holding screw (3).

 Tightening torques		
Chain roller to frame		
M8 x 1	19 Nm	

Follow-up work

Final check of work performed

 34 11 001 Measuring front brake-disc run-out

+ 34 11 844

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Installing front-wheel stand

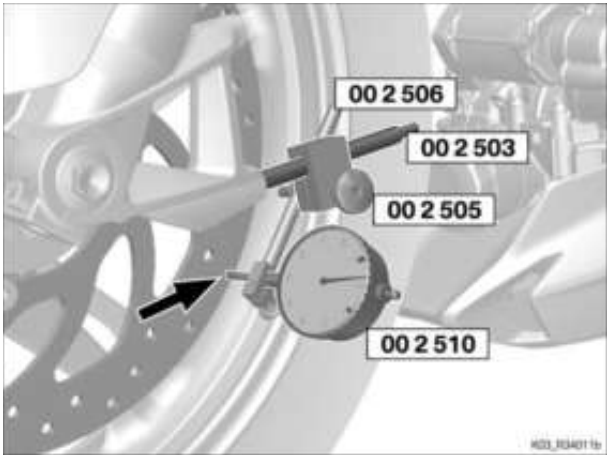
Releasing brake caliper, front

Core activity

(-) Check front brake disc for runout

Requirement

- No burrs or scoring on brake disc, brake disc thickness above minimum.
- Positioning of the brake disc/wheel rim has been checked.
- Wheel rim has been checked for damage.



- Raise the front wheel clear of the ground so that it can turn freely.
- Install extension (No. 00 2 503) with clamping pieces (No. 00 2 505) and (No. 00 2 506).
- Seat dial gauge (No. 00 2 510) in clamping piece (No. 00 2 506).
- Align dial gauge in such a way that the tip is in contact with the brake disc close to the outer edge (arrow) and the dial gauge is slightly preloaded.

Check

- Set the dial gauge to "0".
- **Slowly turn the wheel through at least one complete revolution** and observe the dial gauge reading.
- » The sum of the positive and negative dial-gauge readings is the total run-out.
- Repeat this check on the other brake disc.

 Technical data			
		max 0.1 mm	

Brake disc lateral runout, front	Wheel removed, on the outer diameter		
----------------------------------	--------------------------------------	--	--

Result:

- Lateral run-out is excessive.

Measure:

- Check positioning of the brake disc/wheel rim.
- Check the wheel rim for damage.
- If necessary, check the brake disc.
- See the "Diagnosis tree, braking torque fluctuations" overview for further information.

=> 34 11 839, Removing/installing front brake disc (Billed as a separate item)

Follow-up work

Securing front brake caliper

Removing front-wheel stand

Final check of work performed

34 11 008 Replacing front brake pads

+ 34 11 832

NOTICE

The brake fluid level in the brake fluid reservoir rises when new brake pads are installed. If necessary, lower the brake fluid level before removing the brake pads, in order to prevent brake fluid from overflowing from the brake-fluid reservoir. On completion of the work, correct the brake fluid level.

Preparatory work

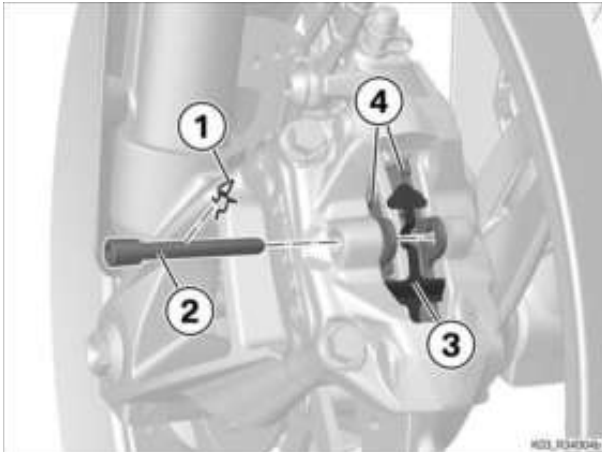
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

(-) Replacing front brake pads

► Removing front brake pads

- Remove split pin (1).
- Remove threaded pin (2).
- Remove spring (3).
- Remove brake pads (4).

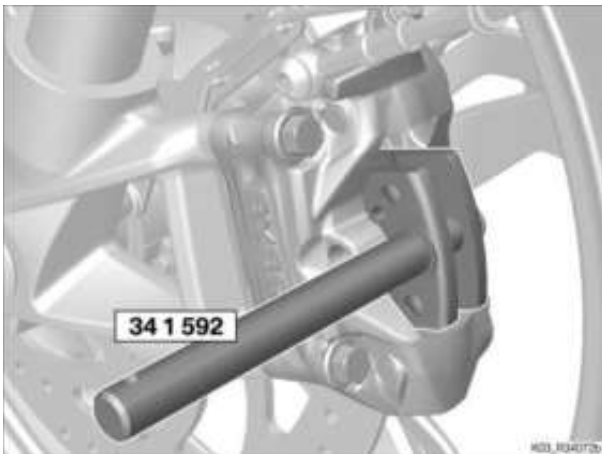


ATTENTION

Round off the brake piston in brake caliper

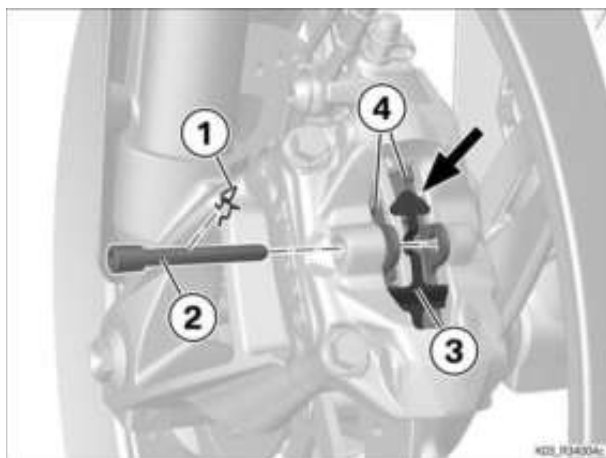
Component damage

- Press again the brake pad **exceptionally** with piston resetting device.
- Carefully centre piston resetting device (No. 34 1 592) so as to avoid scratching the brake caliper.
- Use piston resetting device (No. 34 1 592) to force the pistons back just far enough to allow the new pads to be slipped into position.



► Installing front brake pads

•



Install brake pads (4).

- Install spring (3) with the arrow (arrow) pointing in the direction of rotation.
- Install threaded pin (2).
- Install split pin (1).



► Bedding in brake pads



WARNING

Brake pads not lying against the brake disc

Risk of accident due to delayed braking effect.

- Before driving, check that the brakes respond without delay.

-
- After completing work, operate the brake several times until the brake pads are bedded.



Follow-up work

Final check of work performed

34 11 060 Replacing front brake caliper (without bleeding brakes)

+ 34 11 560

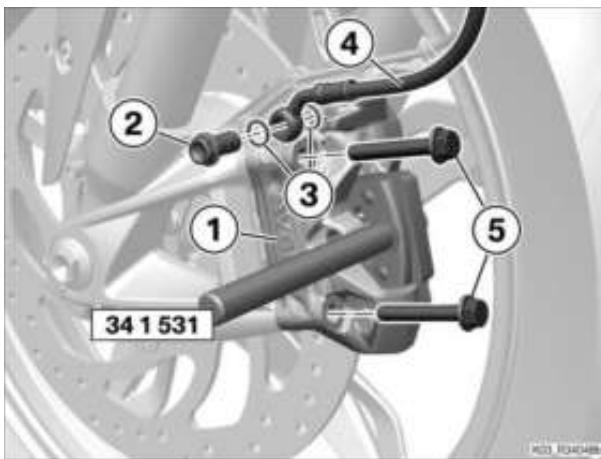
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining/filling/bleeding front brake system (Description in item: 34 00 583, Billed as a separate item)

Core activity

(-) Removing front brake caliper



ATTENTION

Brake fluid on painted surfaces, plastic and rubber components

Material damage

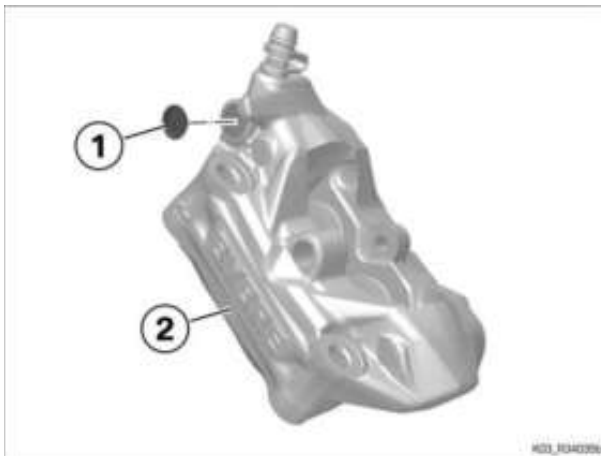
- Do not allow brake fluid to come into contact with painted surfaces, plastic or rubber components.

- Wash components immediately with clear water if required.

-
- Remove piton resetting device (No. 34 1 531) from brake caliper (1).
 - Remove banjo bolt (2) with sealing rings (3) and wipe off escaping brake fluid, if any.
 - Disengage brake hose (4).
 - Remove screws (5) and remove brake caliper (1).

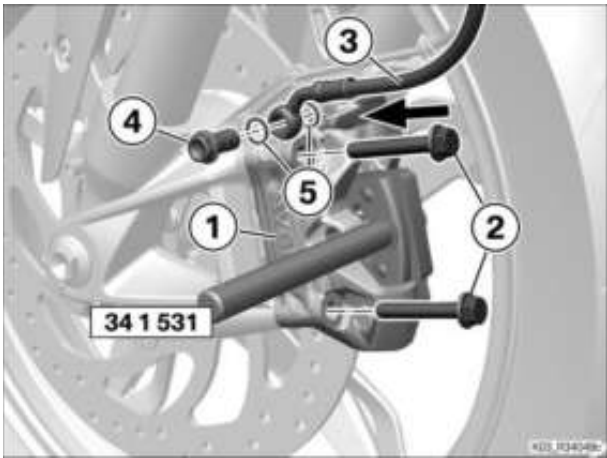
(-) Replace brake caliper, front

- Remove sealing cap (1) from new brake caliper (2).



(-) Installing front brake calliper

- Hold brake calliper (1) in position and install screws (2) **hand-tight**.
» Screws are tightened **later with built-in brake pads**.



- Hold brake line (3) in position with banjo bolt (4) and **new** sealing rings (5).
- Position brake line (3) at the anti-twist stop (arrow).
- Tighten banjo bolt (4).

Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	

- Install piston resetting device (No. 34 1 631) in brake calliper (1) and if necessary, force back the brake pistons.

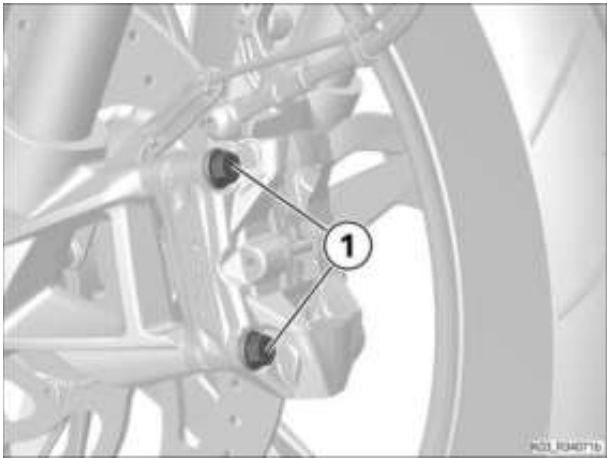
(-) Secure front brake caliper (after installing the brake pads and bleeding the brake system)

ATTENTION

non-uniform wear of the brake pad, slant wear

component damage, noise generation

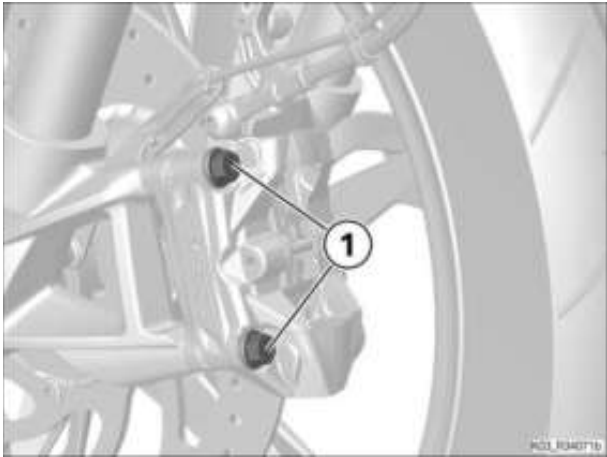
- On tightening of the brake saddle screws on the front wheel brake, stop operation and brake pressure.



- Operate the brake several times until the brake pads are bedded, **fix brake lever with elastic band**.
- Tighten screws (1).

Tightening torques		
Radial brake calliper to axle mounting		
M8 x 50 - 10.9	28 Nm	

- Release the brake lever.



- Tighten screws (1) **again**.

Tightening torques		
Radial brake calliper to axle mounting		
M8 x 50 - 10.9	28 Nm	

Follow-up work

Final check of work performed

34 11 200 Removing/installing front brake disc

+ 34 11 839

Preparatory work

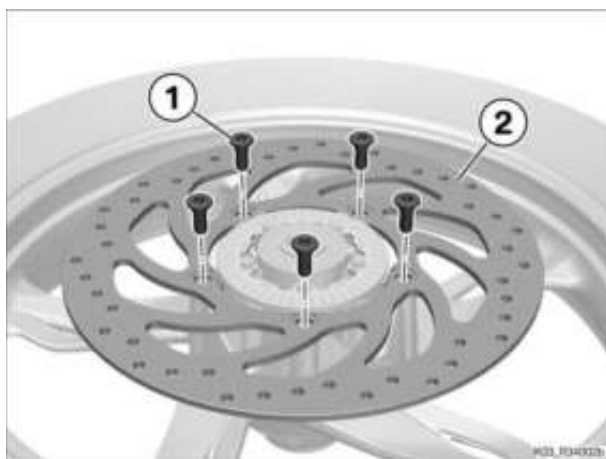
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Installing front-wheel stand

Removing front wheel

Core activity

(-) Remove the front brake disc



- Remove screws (1).
- Remove brake disc (2).

(-) Installing front brake disc



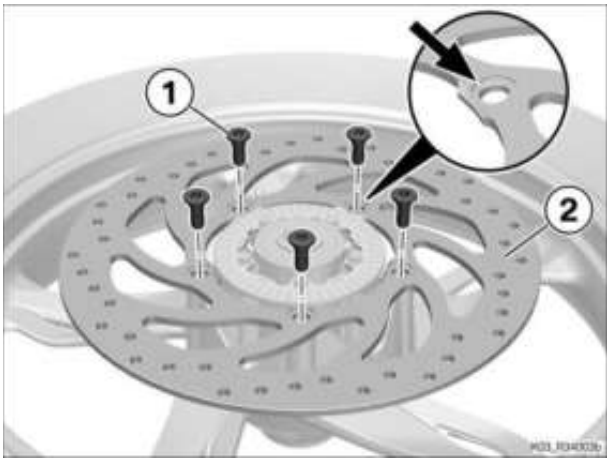
- Clean contact surfaces (arrow) for brake discs and thread.

- Lay brake disc (2) on the wheel rim with recess for screw head (arrow) to the outside.

- Install screws (1).



Tightening torques



Brake disc to front wheel		
M8 x 20,5 Thread-locking compound (Loctite 243, Medium strength)	Tightening sequence: tighten in diagonally opposite sequence	
	32 Nm	

Follow-up work

- Install the front wheel
- Bedding in brake pads
- Removing front-wheel stand
- Final check of work performed

Technical data 0G02 - G 310 GS

34 - Brakes

Designation	Precondition	Value	Valid
Brake fluid level, front 	Brake-fluid reservoir horizontal	You should never allow the brake fluid level to drop below the MIN mark.	
Hydraulic fluid (Brake fluid, DOT4)			
Brake fluid level, rear 	Brake-fluid reservoir horizontal	You should never allow the brake fluid level to drop below the MIN mark.	
Hydraulic fluid (Brake fluid, DOT4)			

34 11 - Front wheel brakes

Type of front brake		4-piston fixed caliper	
Brake-pad material, front		Sintered metal	
Brake-pad wear limit, front	Friction lining without carrier plate	min 1.0 mm	
Brake disc lateral runout, front	Wheel removed, on the outer diameter	max 0.1 mm	
Brake disc thickness, front	when new	5.0 mm	
	Wear limit	min 4.5 mm	
Brake disc thickness, front	When new	5 mm	

34 21 - Rear wheel brakes

Type of rear brake		1-piston floating caliper	
Brake-pad material, rear		Organic material	
Brake-pad wear limit, rear	Friction lining without carrier plate	min 1.0 mm	
Brake disc lateral runout, rear	Wheel installed, at outer diameter, components cooled	max 0.15 mm	
	Wheel removed, at outer diameter, components cooled	max 0.1 mm	
Brake disc thickness, rear	when new	4.5 mm	
	Wear limit	min 4 mm	

 34 21 031 Measuring rear brake-disc run-out

+ 34 21 774

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Releasing rear wheel-speed sensor

Core activity

(-) Checking rear brake disc for run-out

Requirement

- No burrs or scoring on brake disc, brake disc thickness above minimum.
- No play in wheel bearing.



- Install dial gauge (No. 00 2 510) in dial-gauge holder (No. 34 2 524) and install measuring adapter (No. 34 2 510).
- Use bolt (1) of the wheel speed sensor to secure the dial gauge holder.
- Align dial gauge in such a way that the measuring shoe is in contact with the brake disc close to the outer circumference and the dial gauge is slightly preloaded.

Check

- Set the dial gauge to "0".
 - Slowly turn the wheel through at least one complete revolution and observe the dial gauge reading.
- » The sum of the positive and negative dial-gauge readings is the total run-out.

 Technical data			
Brake disc lateral runout, rear	Wheel installed, at outer diameter, components cooled	max 0.15 mm	
	Wheel removed, at	max 0.1 mm	

	outer diameter, components cooled		
--	--	--	--

Result:

- Lateral runout excessive.

Measure:

=> 34 21 772, Removing/installing rear brake disc (Billed as a separate item)

Follow-up work

Securing rear wheel-speed sensor

Final check of work performed

34 21 060 Replacing rear brake caliper (without bleeding brakes)

+ 34 21 560

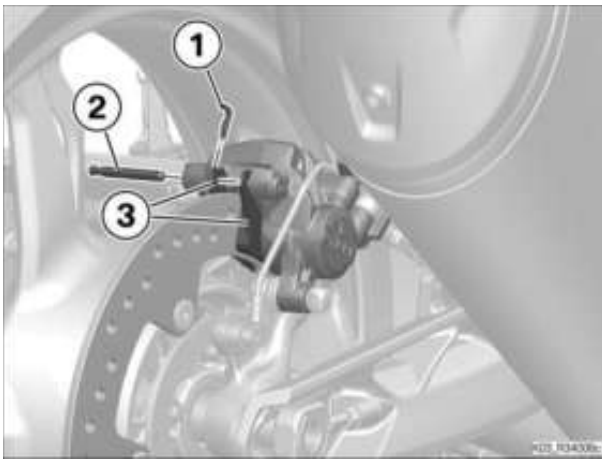
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining/filling/bleeding rear brake system (Description in item: 34 00 584, Billed as a separate item)

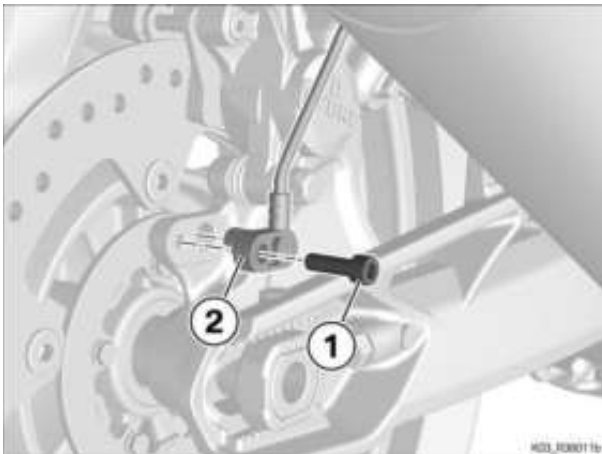
Core activity

(-) Removing rear brake pads



- Remove retaining clip (1).
- Using a suitable tool, drive out retaining pin (2) toward the wheel side.
- Remove brake pads (3).

(-) Releasing rear wheel-speed sensor

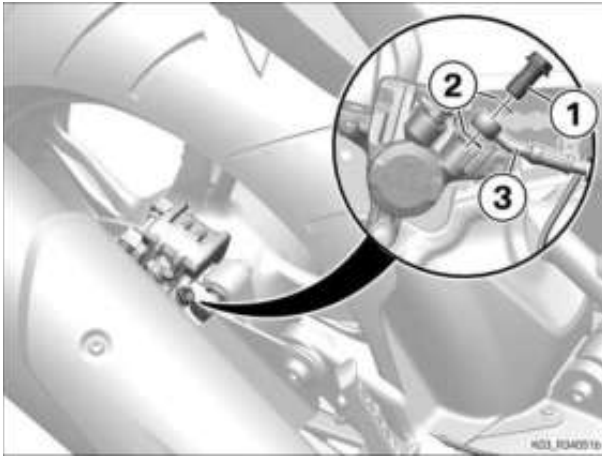


- Remove screw (1).
- Disengage wheel-speed sensor (2) and push it aside.

(-) Disengaging rear brake line from brake caliper

ATTENTION

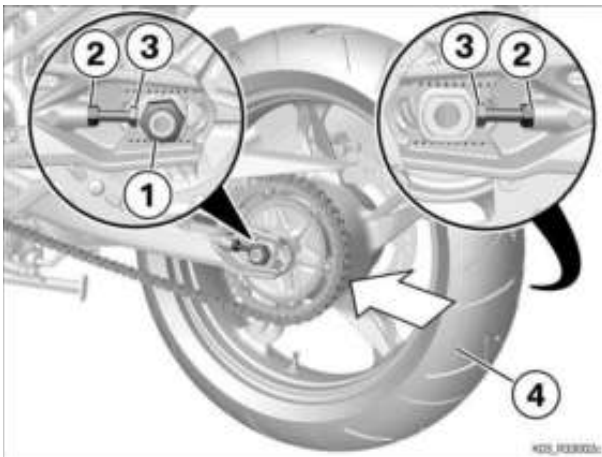
Brake fluid on painted surfaces, plastic and rubber components
Material damage



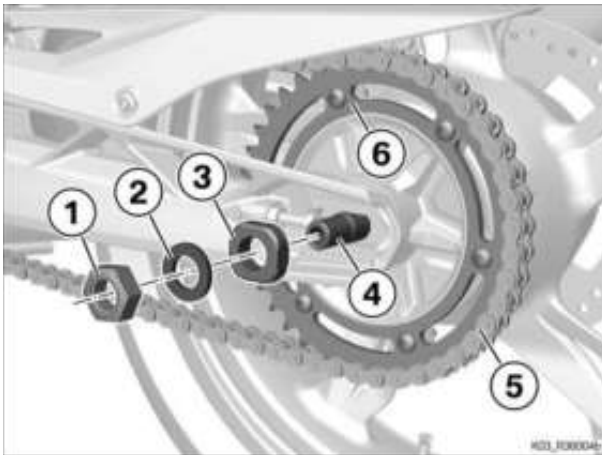
- Do not allow brake fluid to come into contact with painted surfaces, plastic or rubber components.
- Wash components immediately with clear water if required.

- Remove banjo bolt (1) with sealing rings (2).
- Remove brake line (3).

(-) Remove the rear wheel

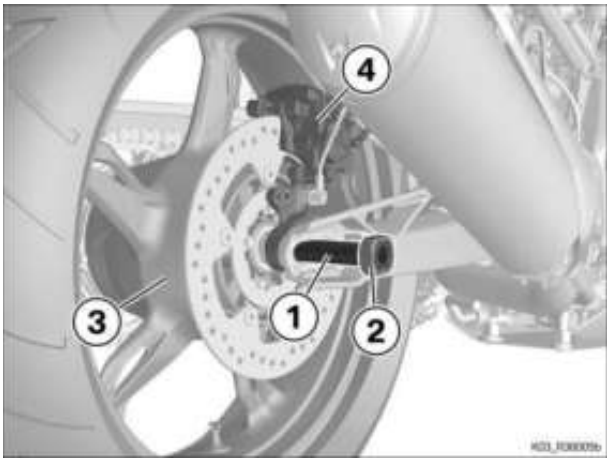


- Slacken nut (1).
 - Slacken locknuts (2) on left and right.
 - Screw in tensioning screws (3).
 - Push rear wheel (4) forward.
- » Chain is slackened.



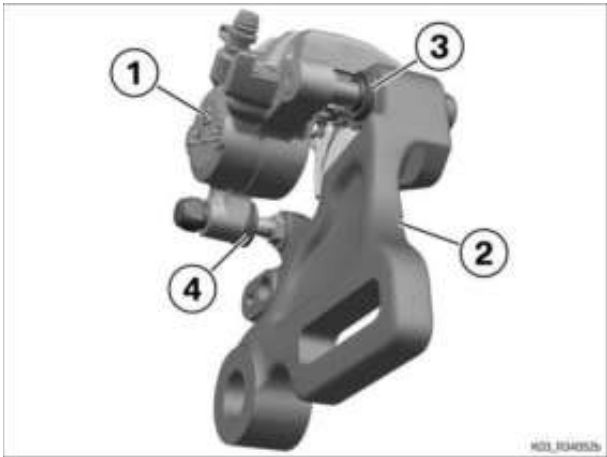
- Remove nut (1), washer (2) and thruster (3).
- Push quick-release axle (4) forward.
- Remove chain (5) from camshaft sprocket (6) and move it aside, making sure that the swinging arm is not scratched.

- Remove quick-release axle (1) with thruster (2).
- Remove rear wheel (3) while doing so, disengage brake caliper (4) with support and remove.



(-) Removing rear brake caliper

- Pull off brake caliper (1) a little from support (2).
- Loosen dust guard (3) on the brake caliper (1) and loosen insulation (4) on the support (2).
- Remove brake caliper (1).



(-) Installing rear brake caliper

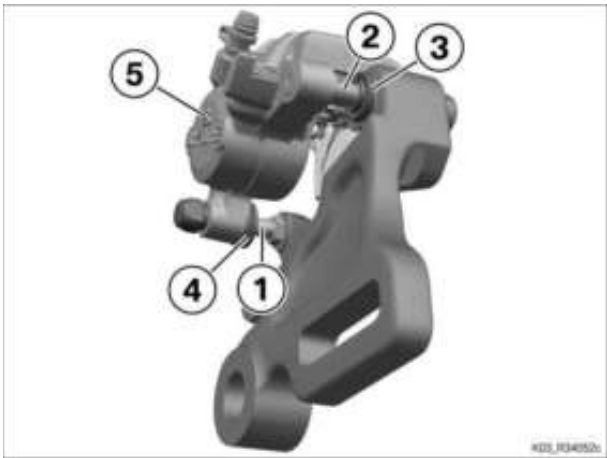
- Clean and lubricate bolts (1) and (2).



Lubricant

Acid-free friction-bearing grease	81 22 9 407 174
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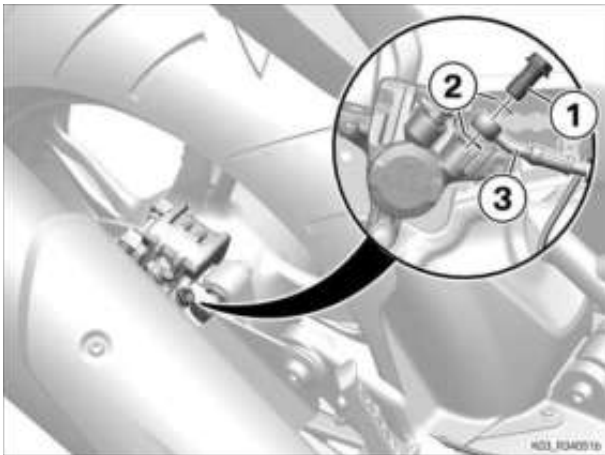
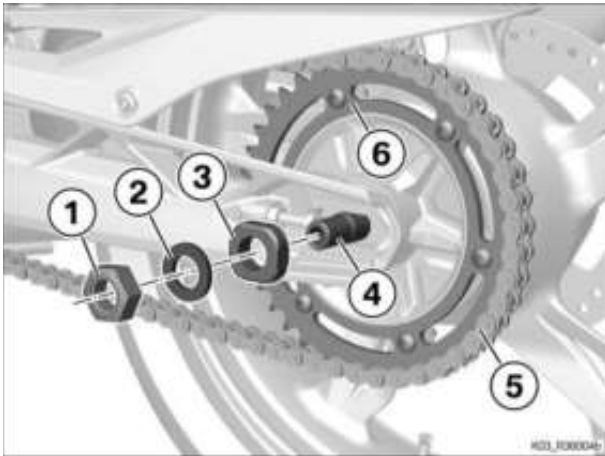
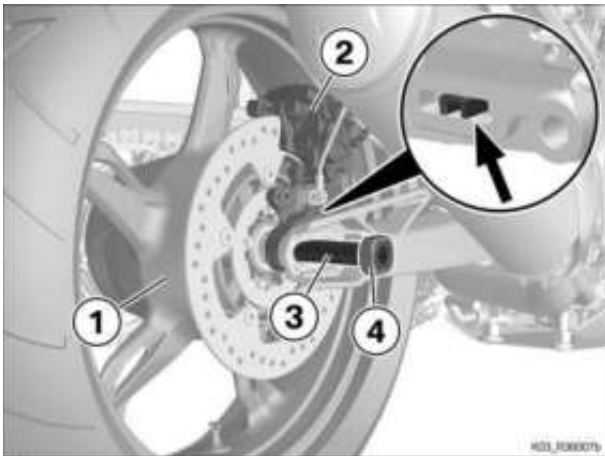
- Check dust guard (3) and insulation (4); renew if necessary.
- Fit brake caliper (5), secure dust guard (3) and insulation (4).
- Install brake caliper (5) to limit position on bolts (1) and (2).



(-) Install the rear wheel

- Install rear wheel (1) and at the same time work complete brake caliper (2) into position, making sure that it is seated in the guide (arrow).
- Lubricate quick-release axle (3) and install with slider (4).





 Lubricant	
Optimoly TA	18 21 9 062 599

- Loop chain (5) over sprocket (6).
- Push quick-release axle (4) to the rear.
- Install slider (3) and washer (2).
- Engage nut (1), do not tighten.

(-) Securing rear brake line to brake caliper

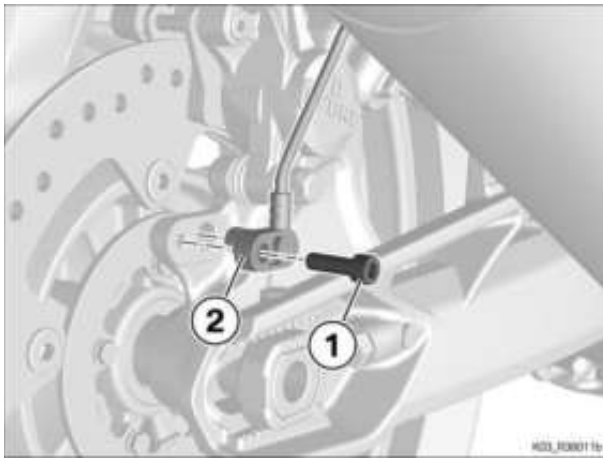
- Hold brake line (3) in position and install banjo bolt (1) with **new** sealing rings (2).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	

(-) Securing rear wheel-speed sensor

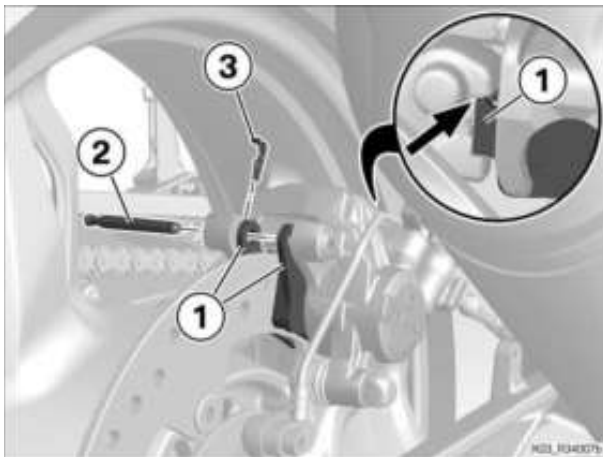
- Insert wheel-speed sensor (2) and install screw (1).

 Tightening torques		
Wheel-speed sensor to brake calliper mount, rear		
M6 x 20	8 Nm	



(-) Installing rear brake pads

- Install brake pads (1), making sure that they are seated in the guides (arrow).
- Using a suitable tool, drive in retaining pin (2) until seated.
- Install retaining clip (3).



Follow-up work

Adjust chain sag

Final check of work performed

34 21 200 Replacing rear brake pads

+ 34 21 769

NOTICE

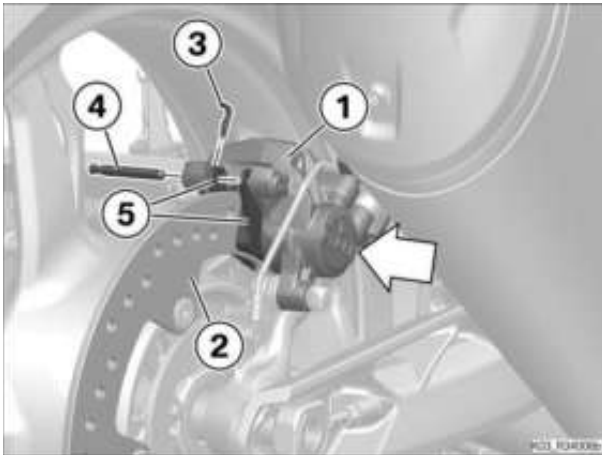
The brake fluid level in the brake fluid reservoir rises when new brake pads are installed. If necessary, lower the brake fluid level before removing the brake pads, in order to prevent brake fluid from overflowing from the brake-fluid reservoir. On completion of the work, correct the brake fluid level.

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

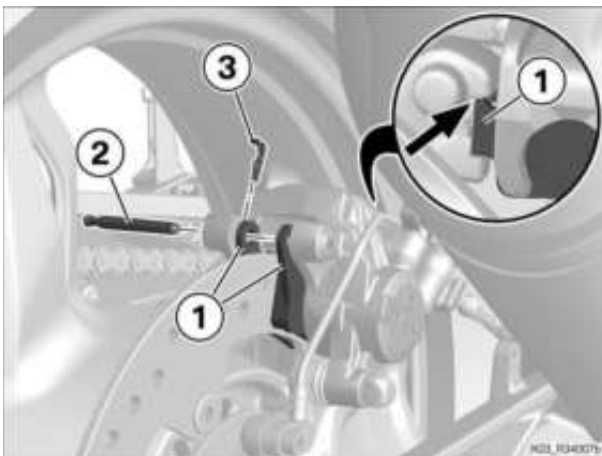
Core activity

(-) Removing rear brake pads



- Press brake caliper (1) against brake disc (2) to force the piston back.
- Remove retaining clip (3).
- Using a suitable tool, drive out retaining pin (4) toward the wheel side.
- Remove brake pads (5).

(-) Installing rear brake pads



- Install brake pads (1), making sure that they are seated in the guides (arrow).
- Using a suitable tool, drive in retaining pin (2) until seated.
- Install retaining clip (3).

Follow-up work

Bedding in brake pads

Final check of work performed

 34 21 301 Removing/installing rear brake disc

+ 34 21 772

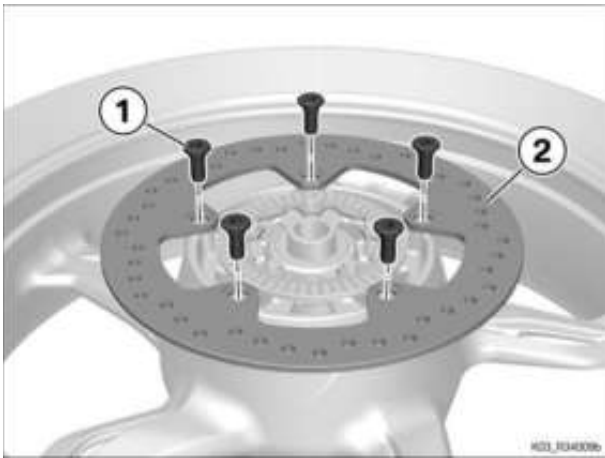
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Remove the rear wheel

Core activity

(-) Removing rear brake disc



- Remove screws (1).
- Remove brake disc (2).

(-) Installing rear brake disc

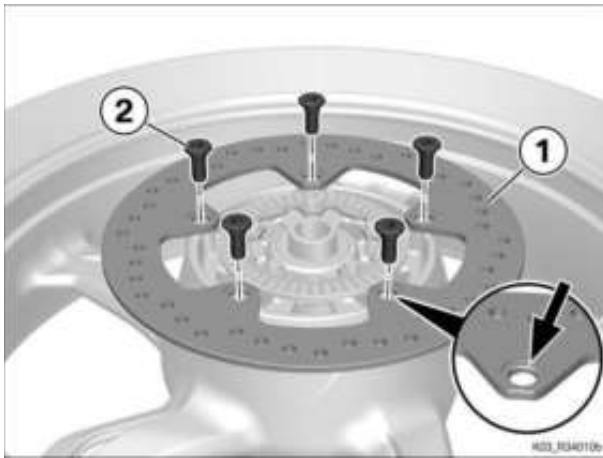


- Clean contact surfaces (arrow) for brake discs and thread.

- Lay brake disc (1) on the wheel rim with recess for screw head (arrow) to the outside.

- Install screws (2).

 Tightening torques	
Brake disc to rear wheel	



M8 x 20,5

Thread-locking compound (Loctite 243, Medium strength)

Tightening sequence: tighten in diagonally opposite sequence

32 Nm

Follow-up work

Install the rear wheel

Adjust chain sag

Bedding in brake pads

Final check of work performed

34 31 002 Replacing footbrake cylinder (without bleeding brakes)

+ 34 31 502

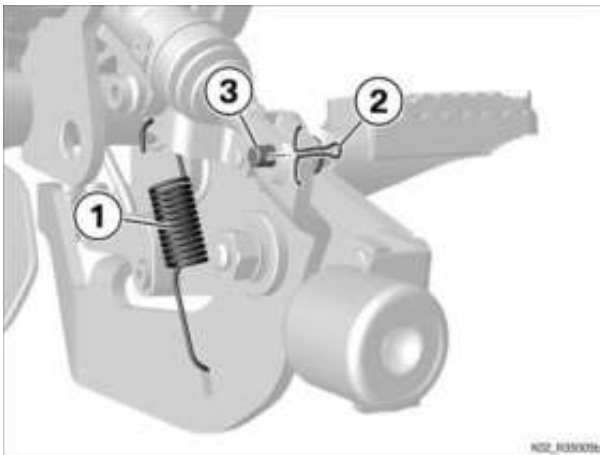
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining/filling/bleeding rear brake system (Description in item: 34 00 584, Billed as a separate item)

Core activity

(-) Removing footbrake cylinder



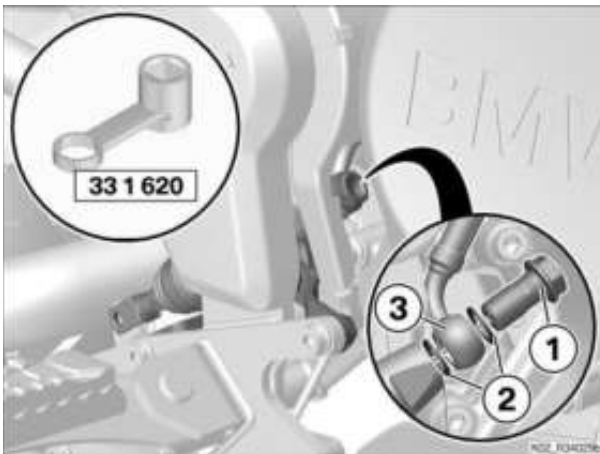
CAUTION

Components spring-loaded

Risk of injury caused by flying parts

- Wear safety goggles.
- Carefully relieve and, as applicable, apply spring tension.

- Remove spring (1).
- Remove cotter pin (2) and bolts (3).



ATTENTION

Brake fluid on painted surfaces, plastic and rubber components

Material damage

- Do not allow brake fluid to come into contact with painted surfaces, plastic or rubber components.
- Wash components immediately with clear water if required.

- Remove banjo bolt (1) and sealing rings (2) using the special ring key (No. 33 1 620) for this purpose. Wipe away any brake fluid that may leak.

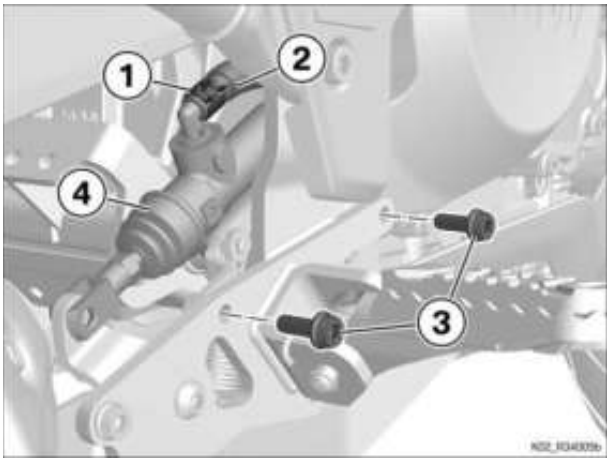
- Release brake hose (3).

ATTENTION

Brake fluid on painted surfaces, plastic and rubber components

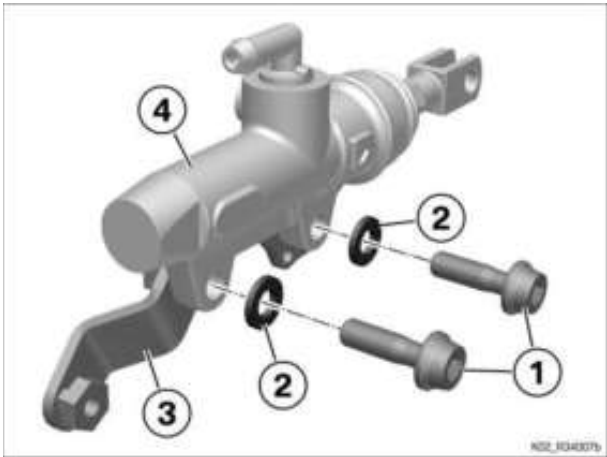
Material damage

- Do not allow brake fluid to come into contact with painted surfaces, plastic or rubber components.
- Wash components immediately with clear water if required.



- Release clamp (1) and pull off hose (2).
- Remove screws (3) and remove footbrake cylinder (4).

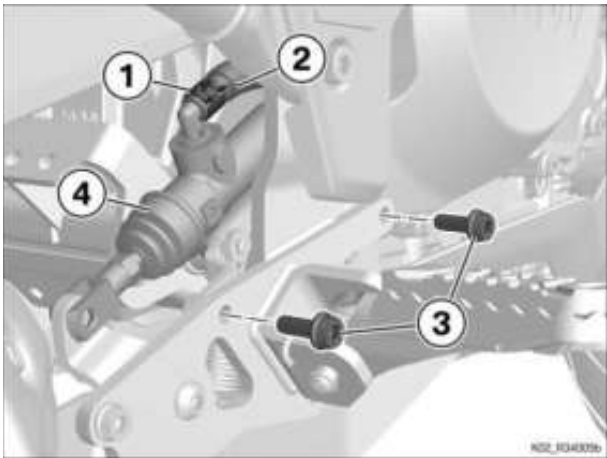
(-) Replacing footbrake cylinder



- Remove screws (1) with washers (2).
- Position holder (3) on new footbrake cylinder (4).
- Install screws (1) with washers (2).

Tightening torques		
Footbrake cylinder to holder		
M6 x 20	8 Nm	

(-) Installing footbrake cylinder



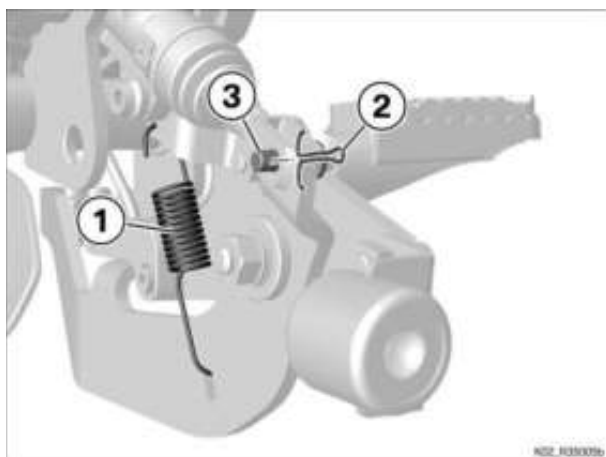
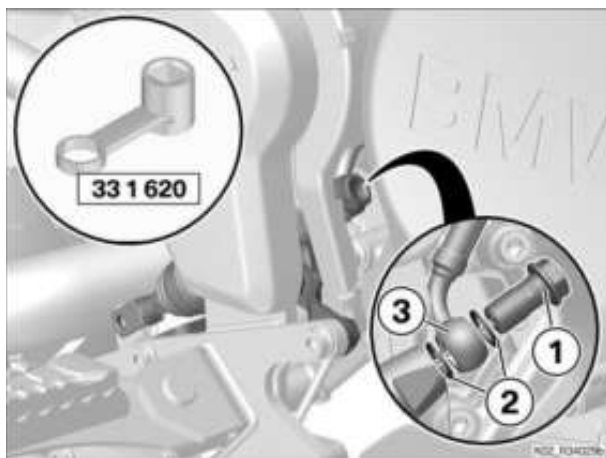
- Position footbrake cylinder (4) and install screws (3).

Tightening torques		
Holder for footbrake cylinder to main frame		
M6 x 16	8 Nm	

- Connect hose (2).
- Position clamp (1) and secure.

- Position brake hose (3) with **new** sealing rings (2).
- Install banjo bolt (1) with special ring key (No. 33 1 620).

Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	



- Install bolt (3) and **new** cotter pin (2).

⚠ CAUTION

Components spring-loaded

Risk of injury caused by flying parts

- Wear safety goggles.
- Carefully relieve and, as applicable, apply spring tension.

- Install spring (1).

Follow-up work

Adjusting play of footbrake lever

Final check of work performed

34 31 212 Replacing brake-fluid reservoir for rear brake

+ 34 31 510

Preparatory work

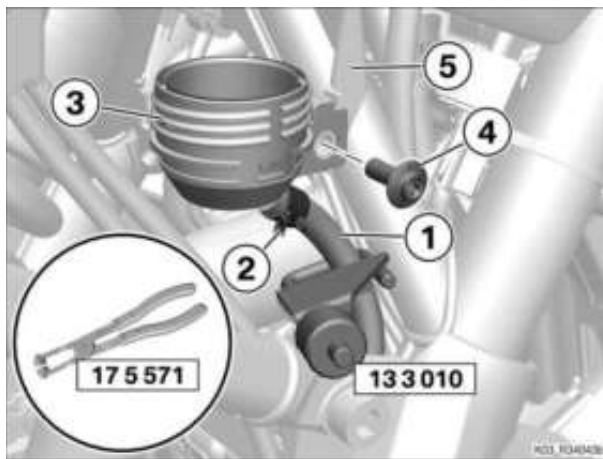
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing right frame cover

Draining brake-fluid reservoir for rear brake

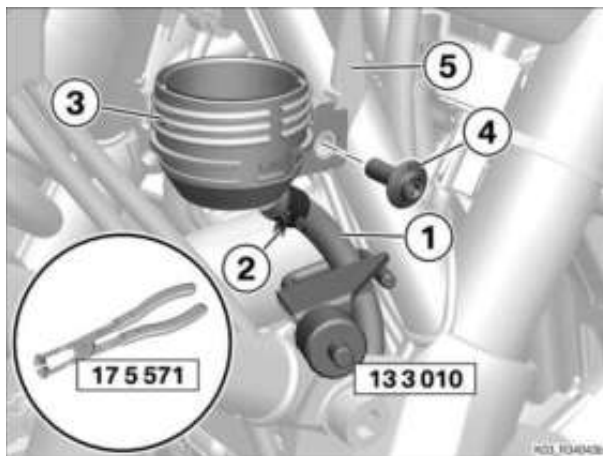
Core activity

(-) Removing brake fluid tank for rear wheel brake



- Seal off hose (1) with hose clamp (No. 13 3 010).
- Loosen clip (2) with pliers (No. 17 5 571) and move.
- Pull hose (1) off brake fluid tank (3).
- Remove bolt (4) and brake fluid tank (3) from holder (5).

(-) Install brake fluid tank for rear wheel brake



- Position brake fluid tank (3) on holder (5) and install bolt (4).
- Secure hose (1) to brake fluid tank (3).
- Install clip (2) with pliers (No. 17 5 571).
- Remove hose clamp (No. 13 3 010).

Follow-up work

Fill brake fluid tank for rear wheel brake

Installing right frame cover

Final check of work performed

34 32 040 Replacing front brake line to pressure modulator (without bleeding brakes)

+ 34 32 640

ATTENTION

Brake fluid on painted surfaces, plastic and rubber components

Material damage

- Do not allow brake fluid to come into contact with painted surfaces, plastic or rubber components.
 - Wash components immediately with clear water if required.
-

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining/filling/bleeding front brake system (Description in item: 34 00 583, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

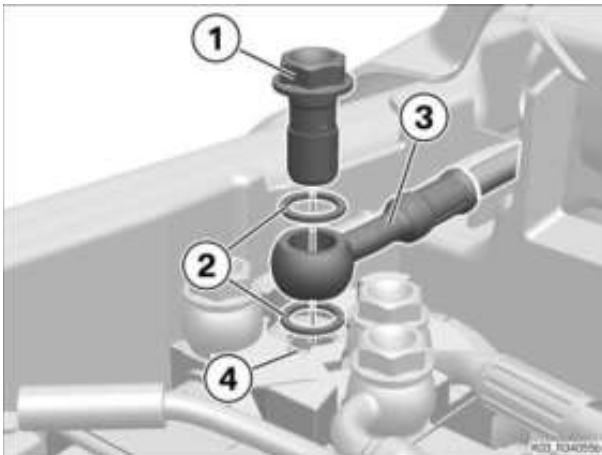
Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

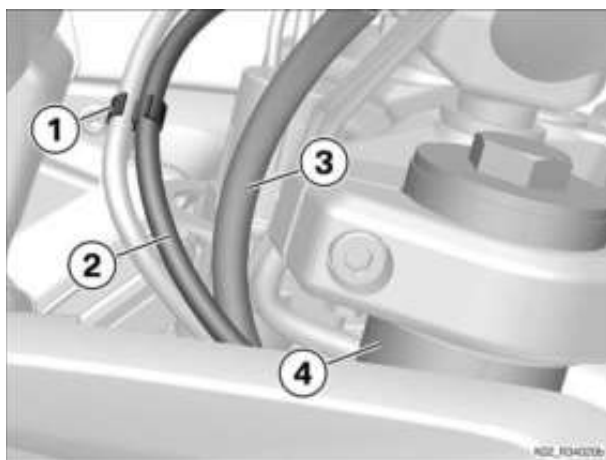
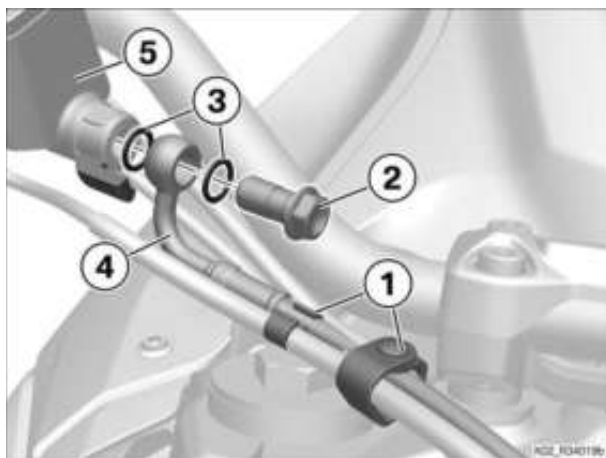
Core activity

(-) Removing front brake line to pressure modulator

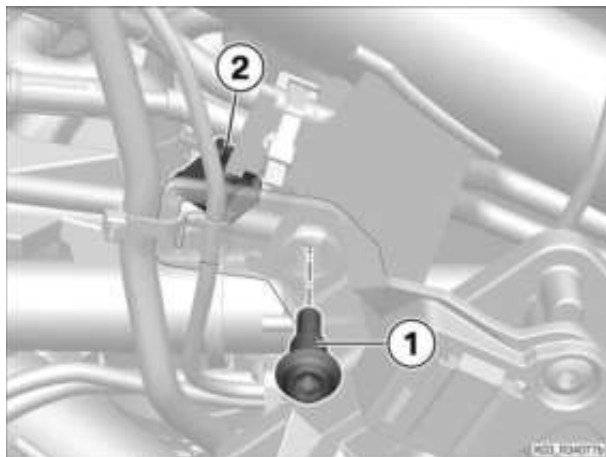


- Remove banjo bolt (1) with sealing rings (2).
- Disengage brake line (3) from pressure modulator (4).

- Remove bracket (1).
- Remove banjo bolt (2) with sealing rings (3).
- Loosen brake line (4) from brake fitting (5).

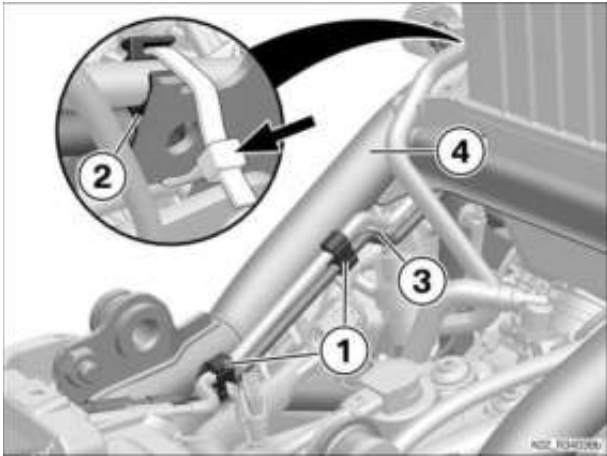


- Loosen holder (1) from brake line (2).
- Feed out brake line (2) between clutch cable (3) and left fork leg.



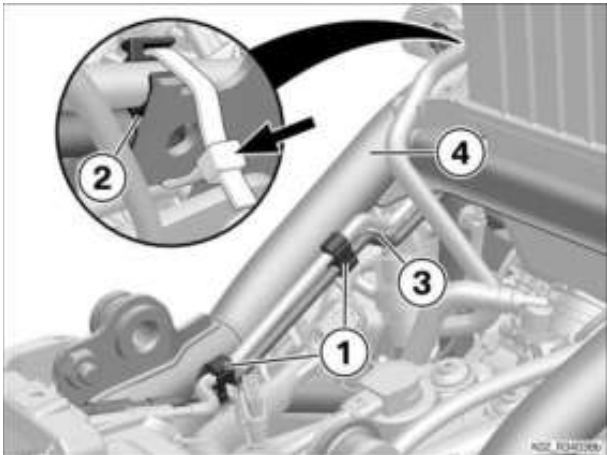
- Remove screw (1) and flat nut (2).
- » Damage through the sharp-edged flat nut (2) is avoided.

- Open holder (1).
- Remove cable strap (arrow).
- Loosen holder (2) from brake line (3).
- Remove brake line (3) from frame (4).

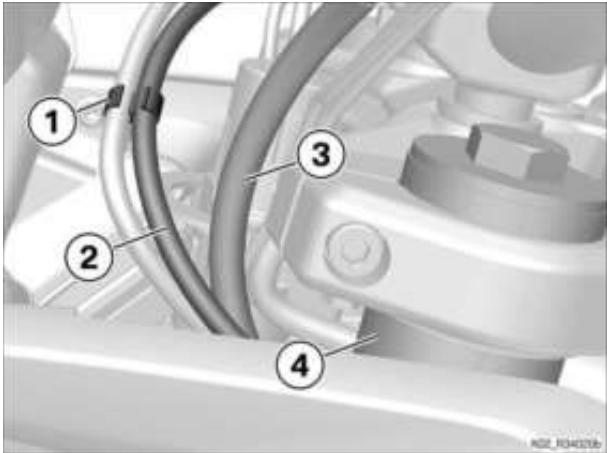


(-) Installing front brake line to pressure modulator

- Insert brake line (3) in frame (4).
- Secure brake line (3) in holder (2).
- Secure the cable strap (arrow).
- Close holder (1).

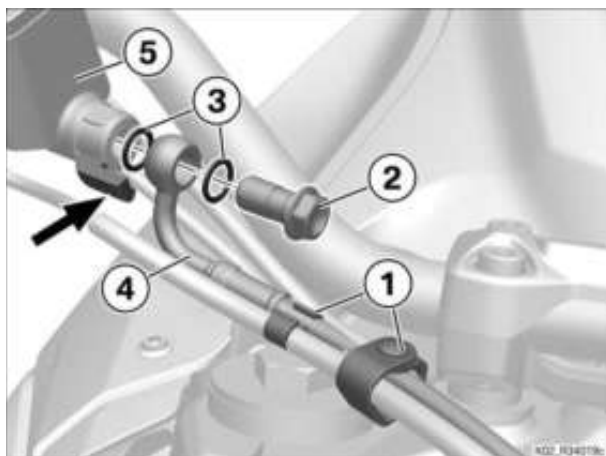


- Ensure that brake line (2) is routed between clutch cable (3) and fork leg (4).
- Secure holder (1) on brake line (2).

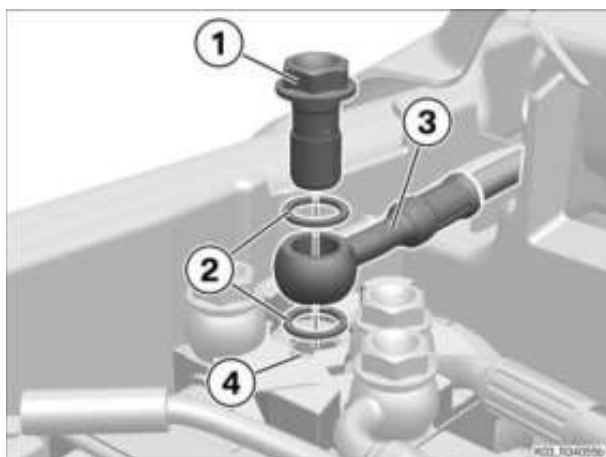


- Hold brake line (4) with **new** sealing rings (3) in position at brake fitting (5), noting the torsional stop (arrow) at the same time.
- Install banjo bolt (2).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	

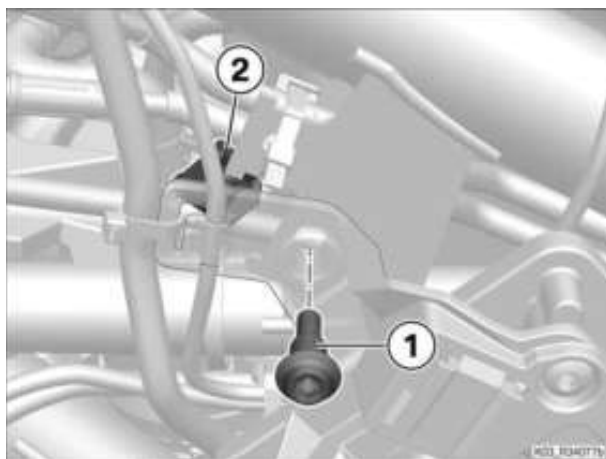


- Install bracket (1).



- Hold brake line (3) in position at pressure modulator (4).
- Install banjo bolt (1) with **new** sealing rings (2).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	



- Install flat nuts (2) and bolt (1).

Follow-up work

Installing fuel tank

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

34 32 044 Replacing front brake line from pressure modulator (without bleeding brakes)

+ 34 32 644

ATTENTION

Brake fluid on painted surfaces, plastic and rubber components

Material damage

- Do not allow brake fluid to come into contact with painted surfaces, plastic or rubber components.
 - Wash components immediately with clear water if required.
-

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining/filling/bleeding front brake system (Description in item: 34 00 583, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing right radiator cowl

Removing the left radiator cowl with the air duct

Disengage the engine control unit

Removing fuel tank

Removing expansion tank

Loosen controller from main frame

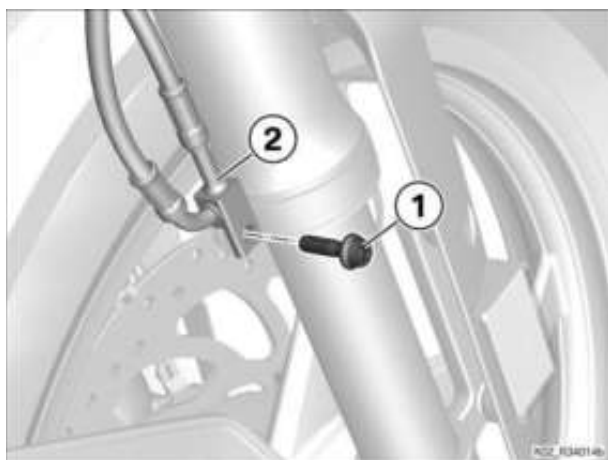
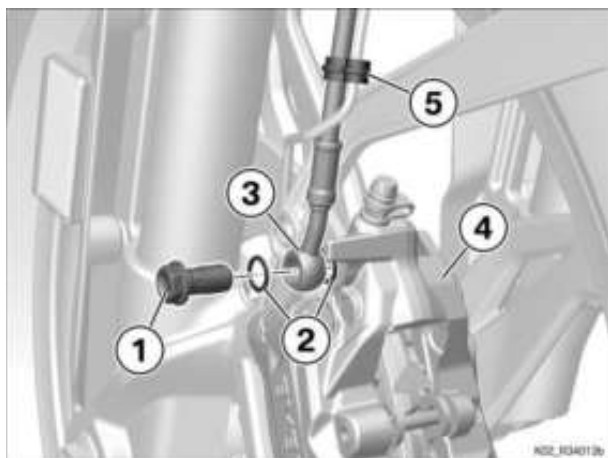
Removing idle actuator

Remove the intake air silencer

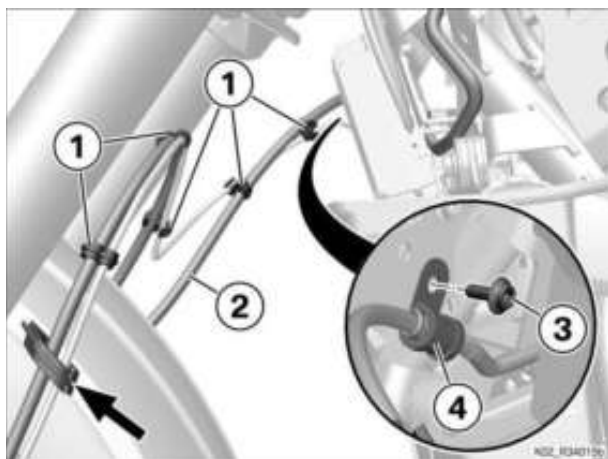
Core activity

(-) Removing front brake line from pressure modulator

- Remove banjo bolt (1) with sealing rings (2).
- Loosen brake line (3) from brake calliper (4).
- Loosen holder (5) from brake line (3).

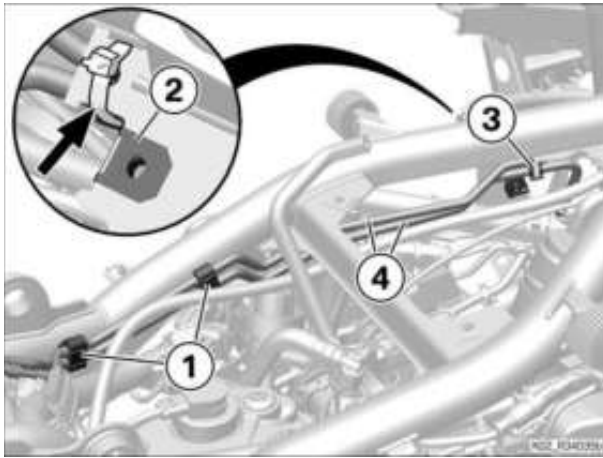
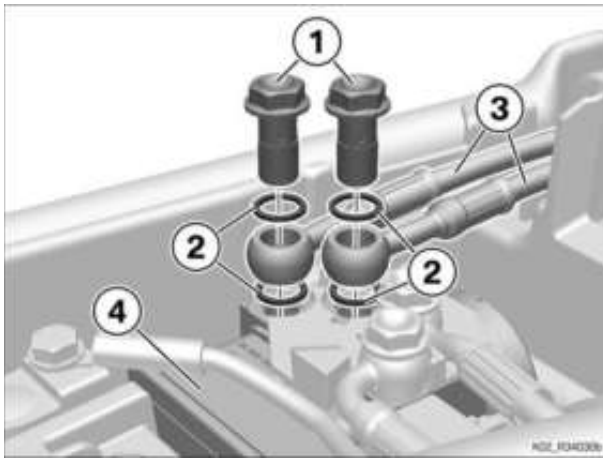


- Remove screw (1).
- Remove brake line (2).

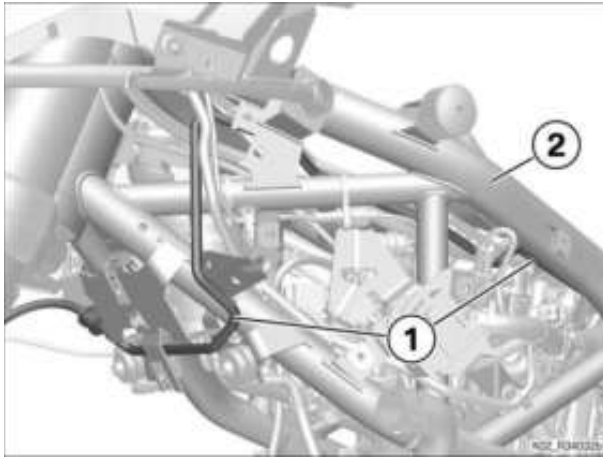


- Loosen holder (1) from brake line (2).
- Detach brake line (2) from guide (arrow).
- Remove screw (3) and remove bracket (4).

- Remove banjo bolts (1) with sealing rings (2).
- Loosen brake lines (3) from pressure modulator (4).



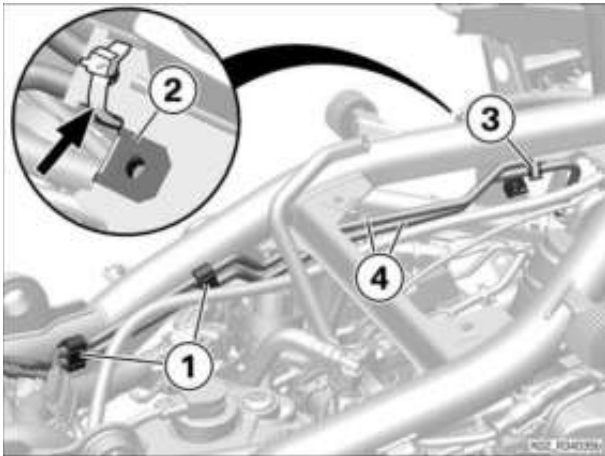
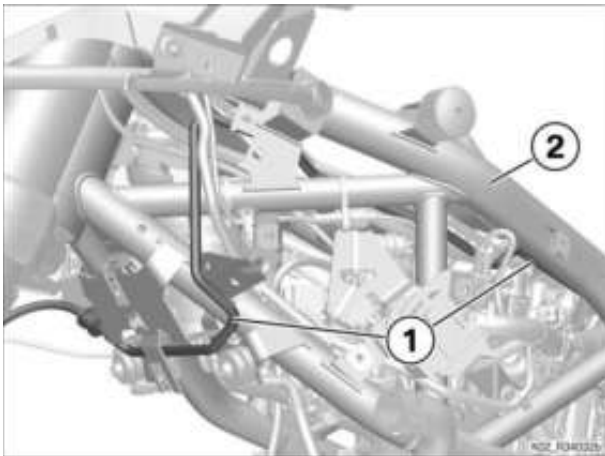
- Open holder (1).
- Remove cable strap (arrow).
- Remove flat nut (2).
- » Damage through the sharp-edged flat nut (2) is avoided.
- Release holder (3) from brake lines (4).



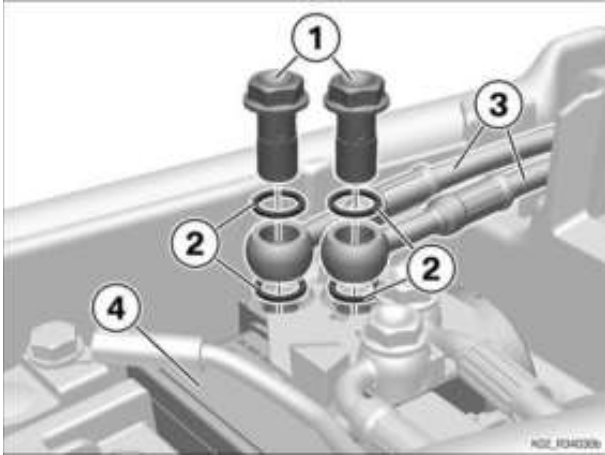
- Turn the handlebars all the way to the right.
- Feed out brake line (1) from frame (2) forward.

(-) Install the front brake line from pressure modulator

- Turn the handlebars all the way to the right.
- Hold brake line (1) in position on frame (2).



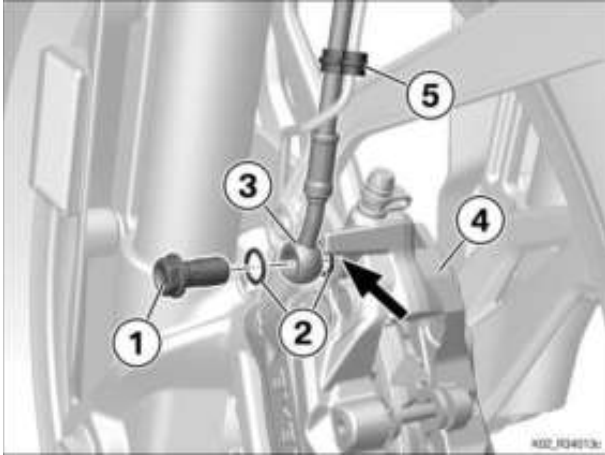
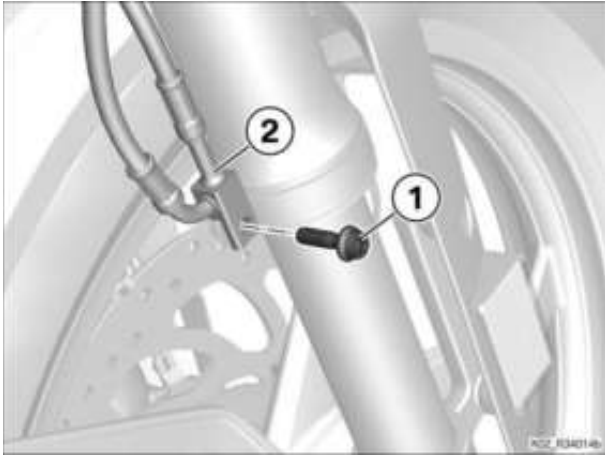
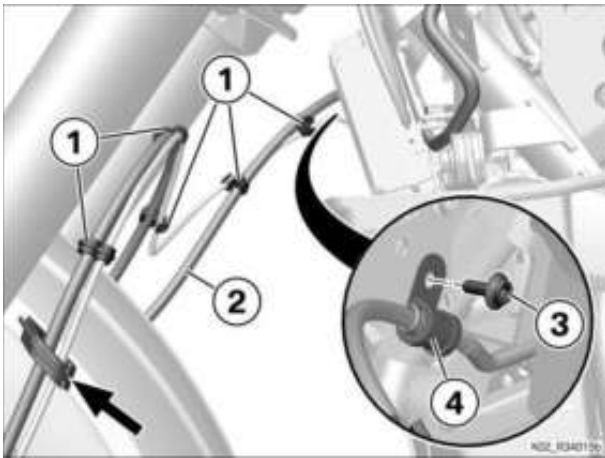
- Secure brake lines (4) in holder (3).
- Secure the cable strap (arrow).
- Install flat nut (2).
- Close holder (1).



- Hold brake lines (3) in position on pressure modulator (4).
- Install banjo bolts (1) with **new** sealing rings (2).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	

- Hold holder (4) in position and install screw (3).
- Secure holder (1) on brake line (2).
- Attach brake line (2) in guide (arrow).



- Position brake line (2) and install screw (1).

- Hold brake line (3) in position at brake caliper (4).
- Install banjo bolt (1) with **new** sealing rings (2), noting the torsional stop (arrow) while doing so.

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	

- Secure holder (5) on brake line (3).

Follow-up work

- Install the intake air silencer
- Installing idle actuator
- Installing expansion tank
- Secure controller at main frame
- Installing fuel tank
- Securing engine control unit
- Installing the left radiator cowl with the air duct

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

34 32 050 Replacing rear brake line to pressure modulator (without bleeding brakes)

+ 34 32 650

ATTENTION

Brake fluid on painted surfaces, plastic and rubber components

Material damage

- Do not allow brake fluid to come into contact with painted surfaces, plastic or rubber components.
 - Wash components immediately with clear water if required.
-

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

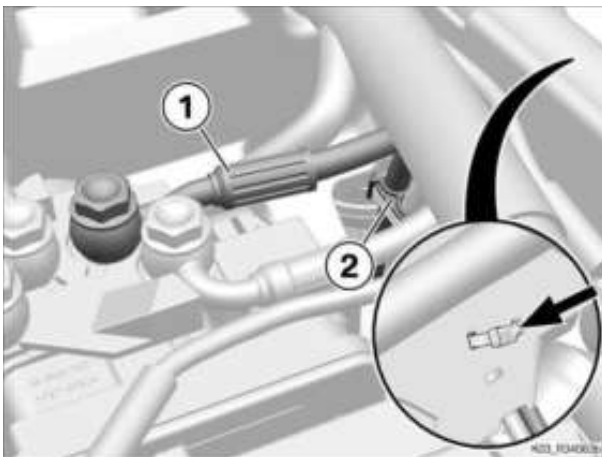
=> Draining/filling/bleeding rear brake system (Description in item: 34 00 584, Billed as a separate item)

Removing seat

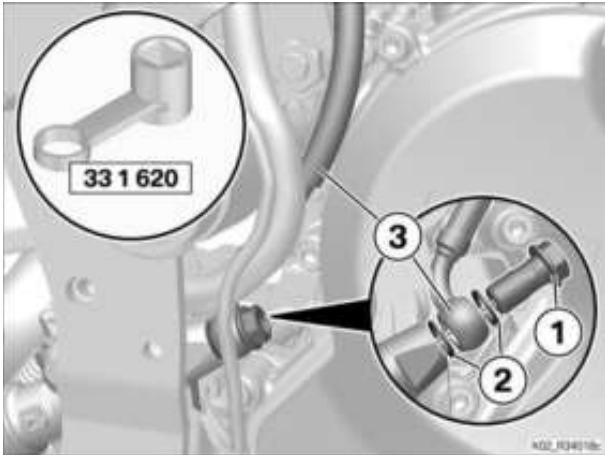
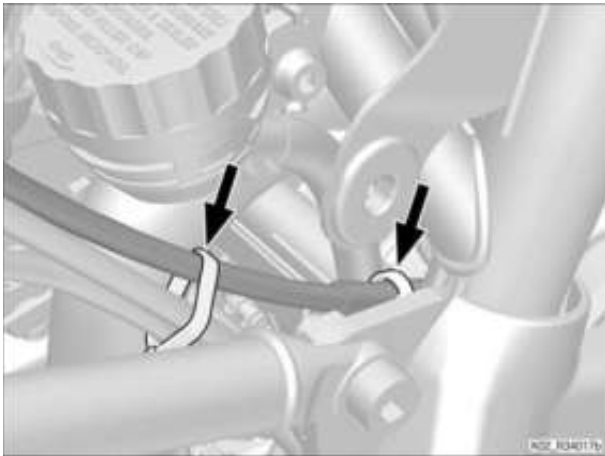
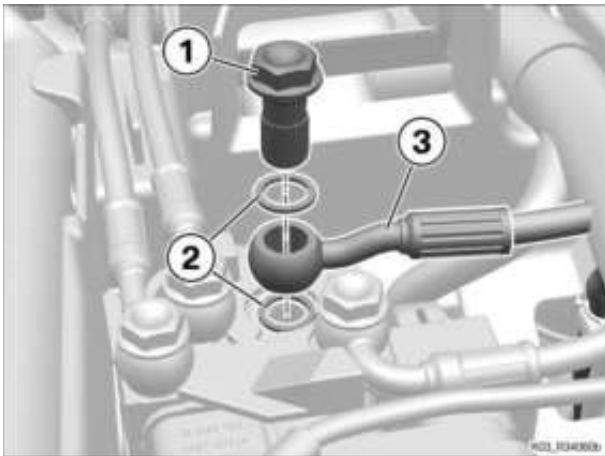
Removing the cable duct for the brake light switch

Core activity

(-) Removing rear brake pipe to pressure modulator



- Remove cable strap (arrow).
 - Disengage brake line (1) from holder (2).
-
- Remove banjo bolt (1) and sealing rings (2).
 - Disengage brake line (3).

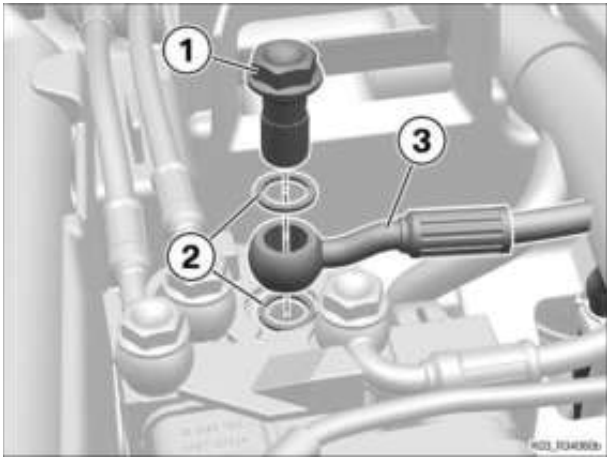
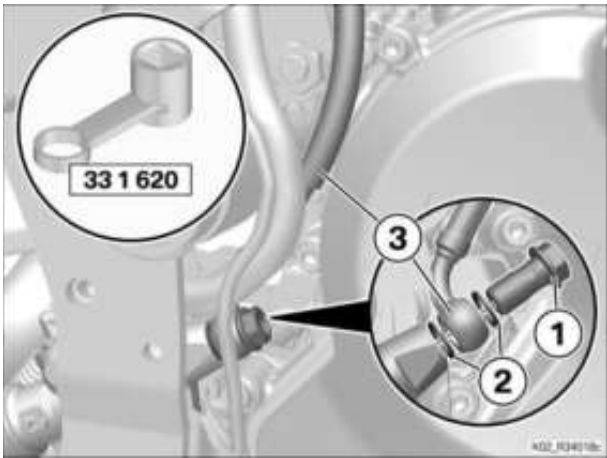


- Remove the cable straps (arrows).
- Remove banjo bolt (1) and sealing rings (2) using the special ring key (No. 33 1 620) for this purpose. Wipe away any brake fluid that may leak.
- Work brake line (3) clear and remove it from the vehicle.

(-) Install the rear brake line to pressure modulator

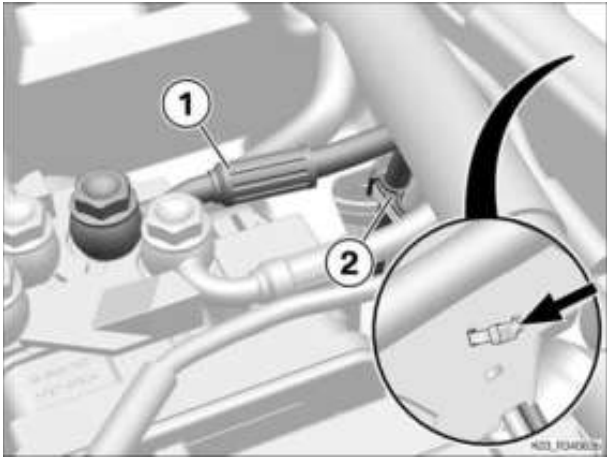
- Feed in brake line (3) and lay it.
- Hold brake line (3) in position with **new** sealing rings (2).
- Install banjo bolt (1) with special ring key (No. 33 1 620).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	



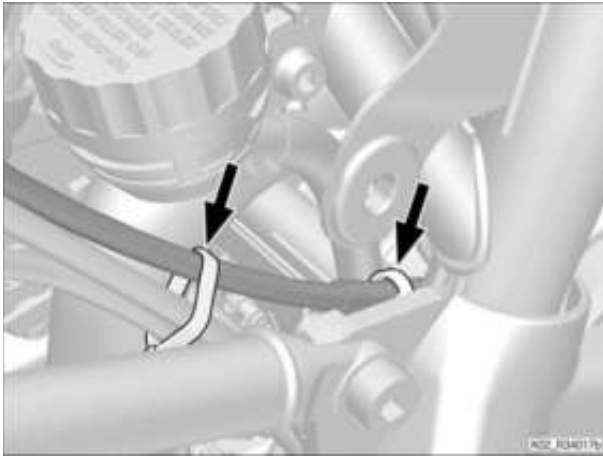
- Hold brake line (3) in position.
- Install banjo bolt (1) with **new** sealing rings (2).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	



- Install brake line (1) in holder (2) and secure cable strap (arrow).

- Secure new cable straps (arrows).



Follow-up work

Installing the cable duct for the brake light switch

Installing seat

Final check of work performed

34 32 051 Replacing rear brake line from pressure modulator (without bleeding brakes)

+ 34 32 651

ATTENTION

Brake fluid on painted surfaces, plastic and rubber components

Material damage

- Do not allow brake fluid to come into contact with painted surfaces, plastic or rubber components.
 - Wash components immediately with clear water if required.
-

Preparatory work

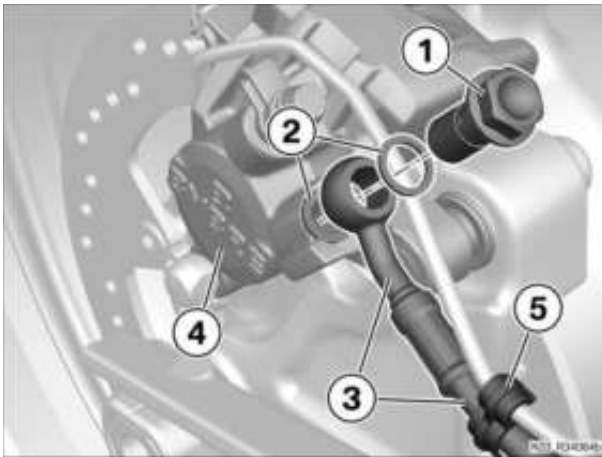
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining/filling/bleeding rear brake system (Description in item: 34 00 584, Billed as a separate item)

Removing seat

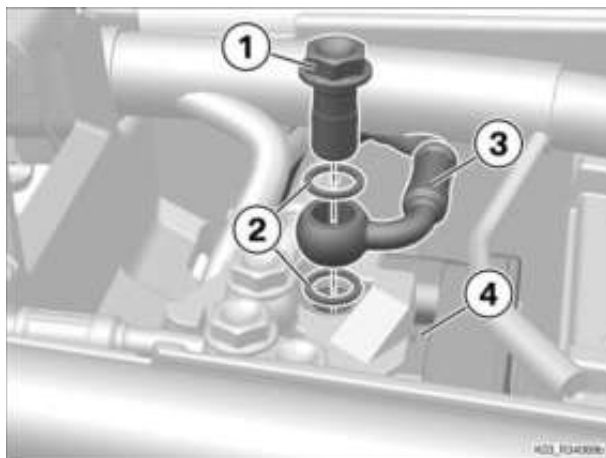
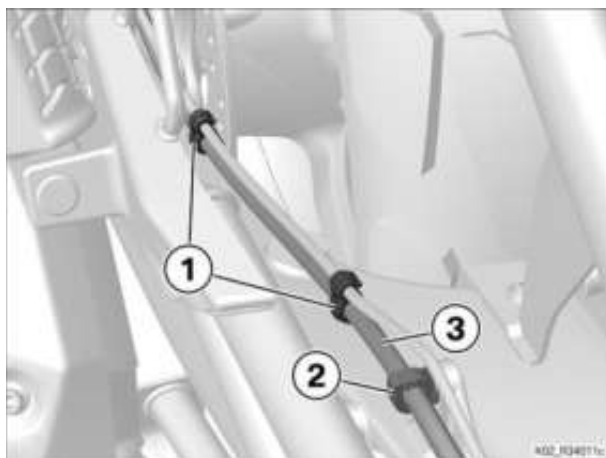
Core activity

(-) Removing rear brake line from pressure modulator

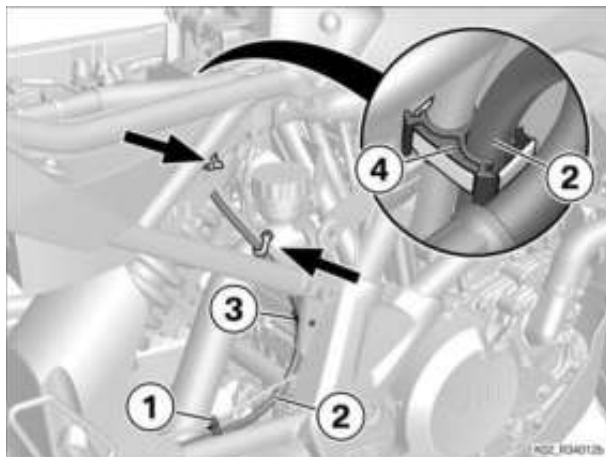


- Remove banjo bolt (1) with sealing rings (2).
- Release brake line (3) from brake caliper (4).
- Release holder (5) from brake line (3).

- Release holder (1) from brake line (3).
- Open holder (2) and release brake line (3).



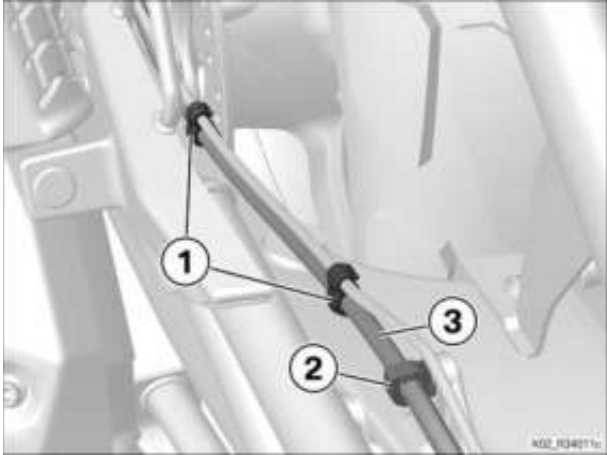
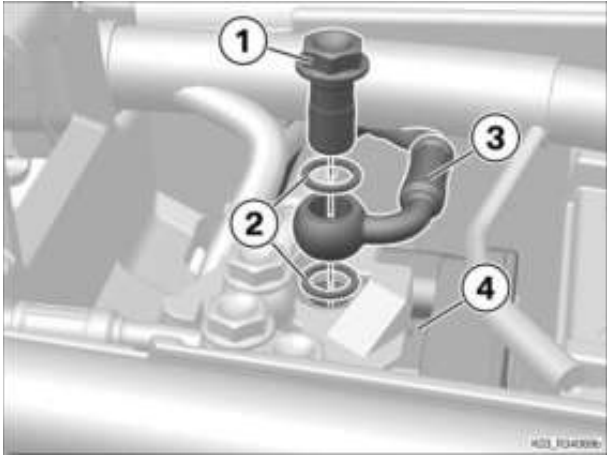
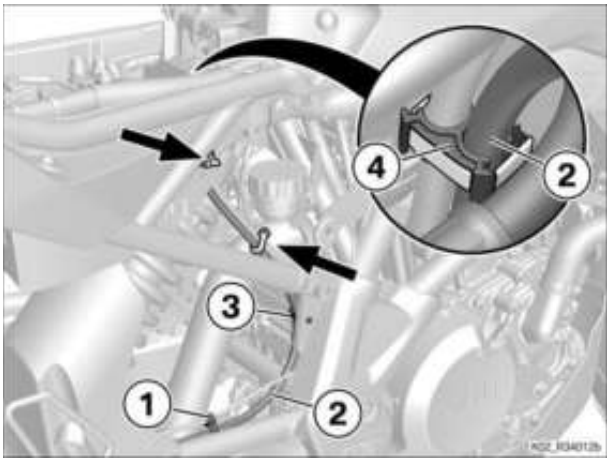
- Remove banjo bolt (1) with sealing rings (2).
- Release brake line (3) from pressure modulator (4).



- Release holder (1) from brake line (2).
- Open holder (3) and release brake line (2).
- Remove cable straps (Arrows) and remove brake line (2) from holder (4).

(-) Installing rear brake line from pressure modulator

- Install brake line (2) in holder (4) and secure cable straps (Arrows).
- Secure brake line (2) in holder (3).
- Secure holder (1) on brake line (2).



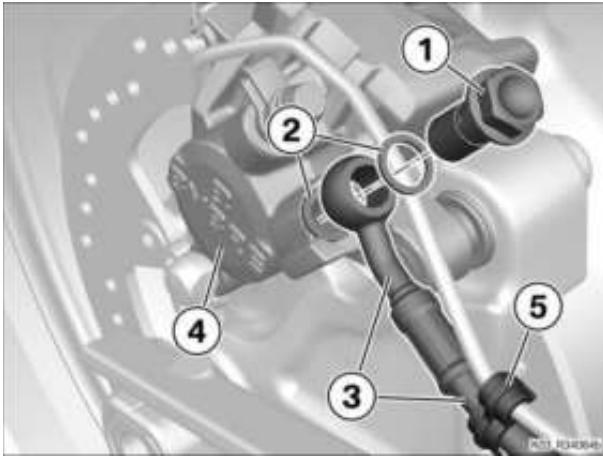
- Position brake line (3) on pressure modulator (4).
- Install banjo bolt (1) with **new** sealing rings (2).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	

- Secure brake line (3) in holder (2).
- Secure holder (1) on brake line (3).

- Secure brake line (3) in holder (5).
- Position brake line (3) on brake caliper (4).
- Install banjo bolt (1) with **new** sealing rings (2).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	



Follow-up work

Installing seat

Final check of work performed

34 32 499 Replacing hose, rear, to reservoir

+ 34 32 525

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing right frame cover

Draining brake-fluid reservoir for rear brake

Core activity

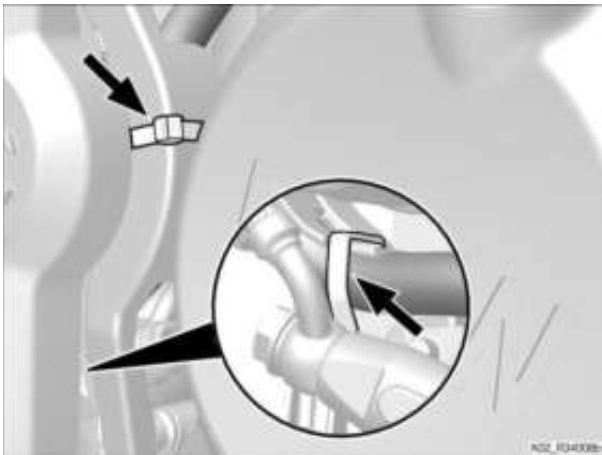
(-) Remove the rear hose to reservoir

ATTENTION

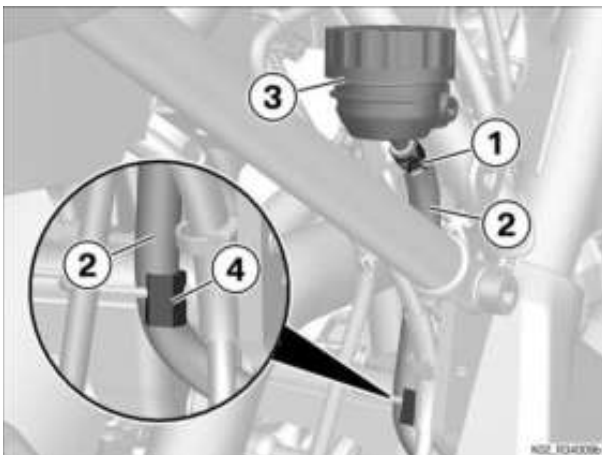
Brake fluid on painted surfaces, plastic and rubber components

Material damage

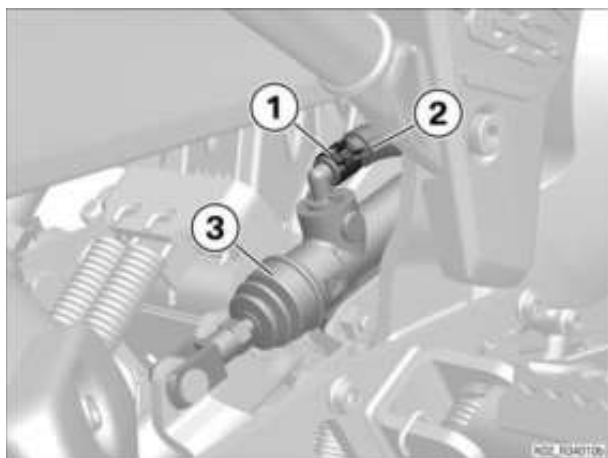
- Do not allow brake fluid to come into contact with painted surfaces, plastic or rubber components.
- Wash components immediately with clear water if required.



- Remove the cable straps (arrows).

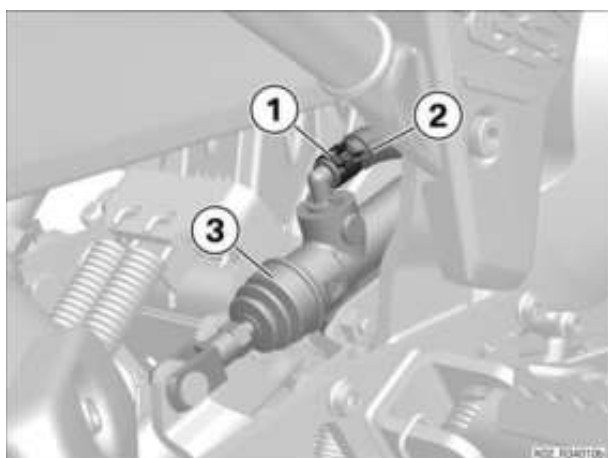


- Loosen clamp (1) and pull hose (2) off expansion tank (3).
- Loosen hose (2) out of holder (4) and feed out.

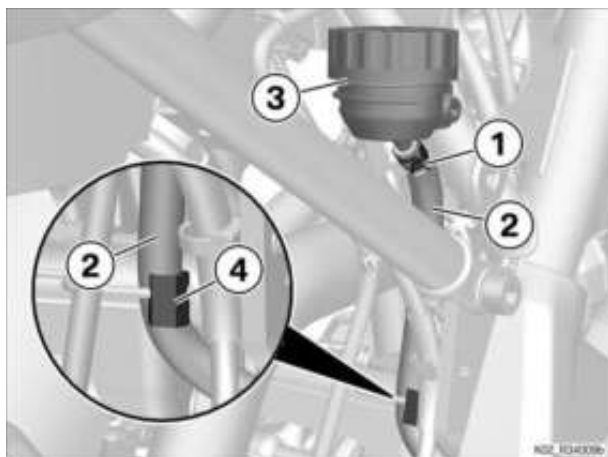


- Loosen clamp (1) and pull off hose (2) from footbrake cylinder (3) and remove.
- Absorb and wipe away any brake fluid that may leak.

(-) Install the rear hose to reservoir

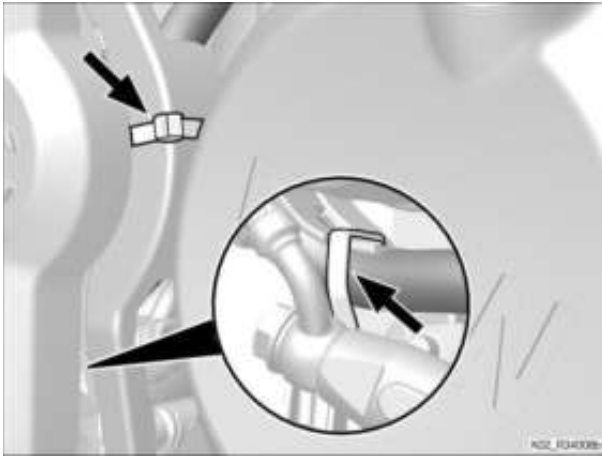


- Connect hose (2) to footbrake cylinder (3) and position clamp (1).



- Feed in hose (2) and secure in holder (4).
- Connect hose (2) to expansion tank (3) and position clamp (1).

- Secure new cable straps (4).



Follow-up work

Fill brake fluid tank for rear wheel brake

Installing right frame cover

Final check of work performed

34 51 011 Replacing pressure modulator (without bleeding/testing software/ programming)

+ 34 51 511

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining/filling/bleeding front brake system (Description in item: 34 00 583, Billed as a separate item)

=> Draining/filling/bleeding rear brake system (Description in item: 34 00 584, Billed as a separate item)

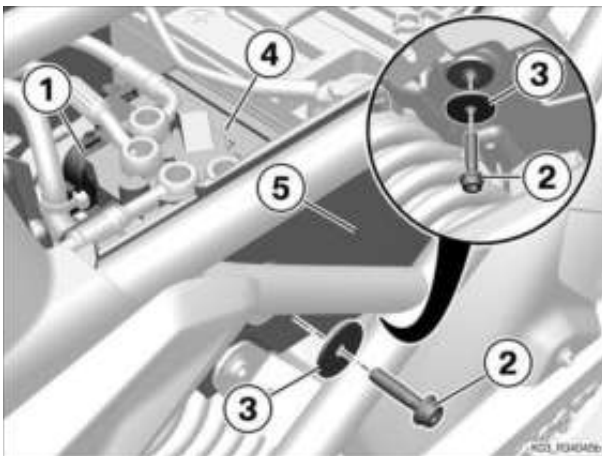
Removing left frame cover

Removing seat

Disconnecting brake lines from pressure modulator

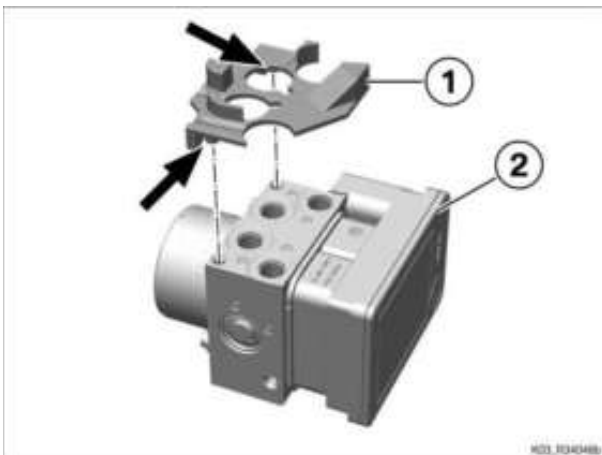
Core activity

(-) Removing pressure modulator

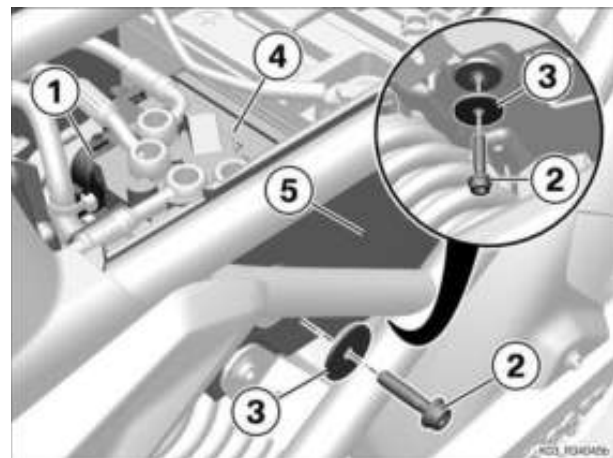


- Disconnect connector (1) for the pressure modulator.
- Remove screws (2) and washers (3).
- Remove pressure modulator (4) from battery tray (5).

(-) Replacing pressure modulator



- Remount anti-twist lock (1) on **new** pressure modulator (2), making sure that the retaining pins (arrows) engage correctly in the pressure modulator (2).



(-) Installing pressure modulator

- Install pressure modulator (4) in battery tray (5).
- Install screws (2) and washers (3).

 Tightening torques		
Pressure modulator to battery tray		
M6 x 25	8 Nm	

- Connect connector (1) for the pressure modulator.

Follow-up work

Securing brake lines to pressure modulator

=> Testing software (Description in item: 61 00 502, Billed as a separate item)

=> Programming control units of vehicle (along with testing software) (Description in item: 61 00 510, Billed as a separate item)

Installing seat

Installing left frame cover

Final check of work performed

35 21 000 Removing/installing or replacing footbrake lever

+ 35 21 531

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

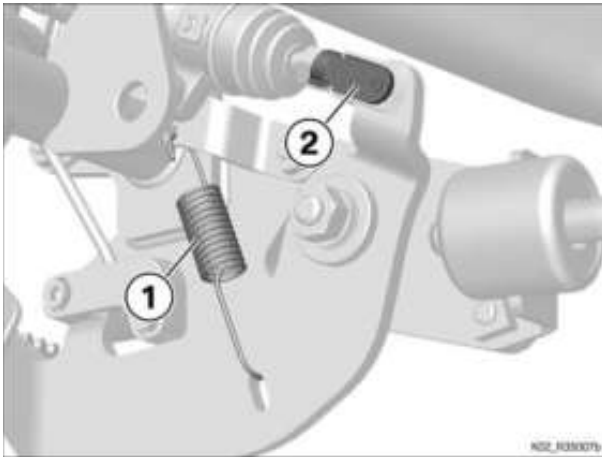
(-) Removing footbrake lever

CAUTION

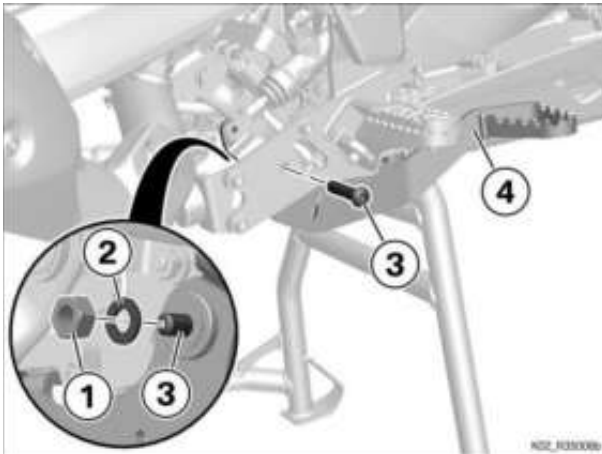
Components spring-loaded

Risk of injury caused by flying parts

- Wear safety goggles.
- Carefully relieve and, as applicable, apply spring tension.

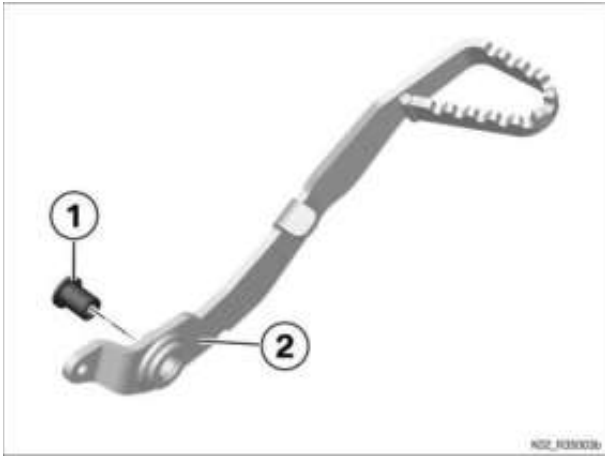


- Remove spring (1).
- Remove pin (2).



- Remove nut (1) with washer (2), counter-holding screw (3).
- Remove bolt (3) and footbrake lever (4).

- Remove bush (1) from footbrake lever (2).



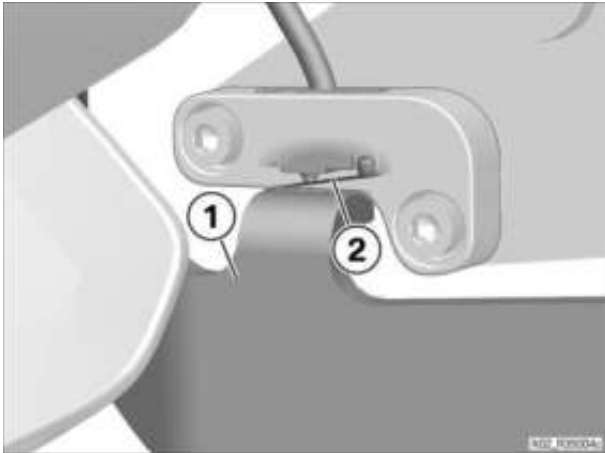
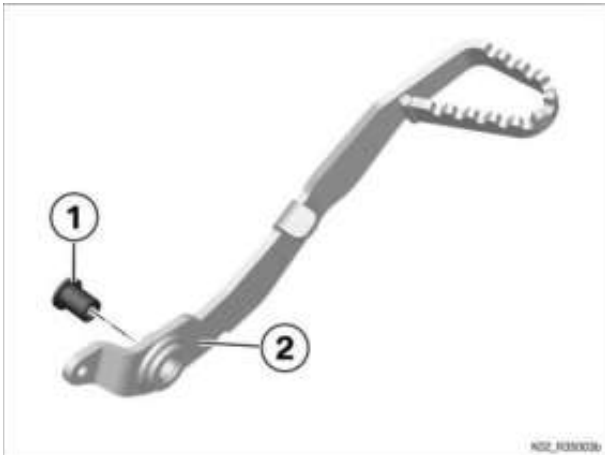
(-) Installing footbrake lever

 ATTENTION

Damage of the bearing due to lubricants.

Component damage, stiff movement

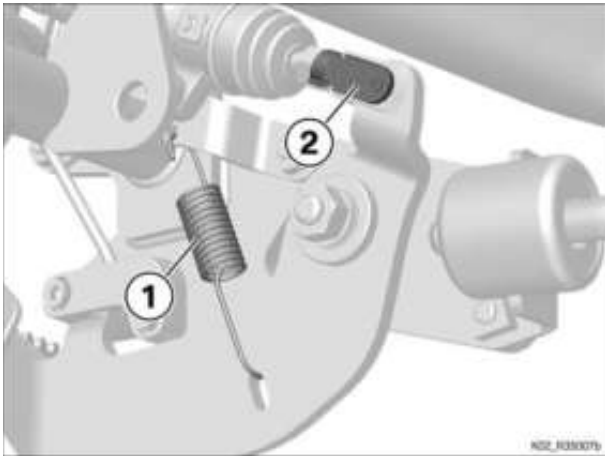
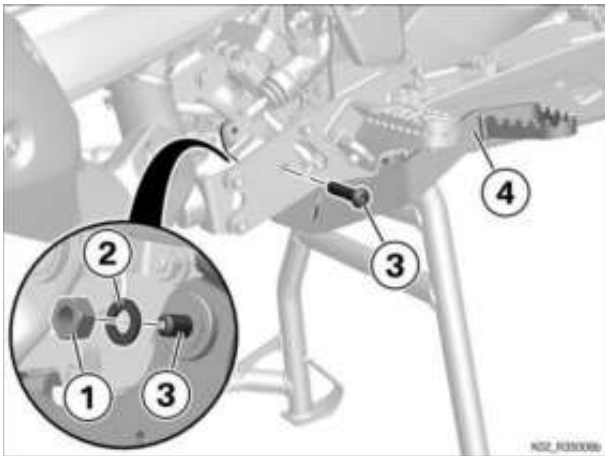
- Lubricants can damage the coating chemically.
- Lubricant bind dirt particles and increase the wear by this.
- A **PTFE**-bearing is maintenance free; do not lubricate the bearing.



- Clean bush (1).
- Install bush (1) in footbrake lever (2).
- When installing brake lever (1), make sure that switch tongue (2) is not bent out of shape.

- Hold footbrake lever (4) in position.
- Install screw (3).
- Install nut (1) with washer (2) and tighten, counter-holding bolt (3).

 Tightening torques		
Footbrake lever to main frame		
M8 x 35	19 Nm	



- Install pin (2).

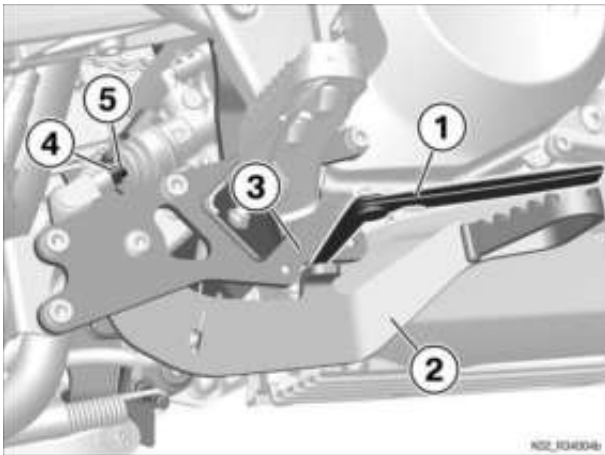
CAUTION

Components spring-loaded

Risk of injury caused by flying parts

- Wear safety goggles.
 - Carefully relieve and, as applicable, apply spring tension.
-
- Install spring (1).

(-) Adjusting play of footbrake lever



- Insert feeler gauge (1) to the thickness of the specified blow-by clearance traverse to the direction of travel between footbrake lever (2) and limit position (3).

 Technical data			
Blow-by clearance of the footbrake lever	between footbrake lever and footrest plate limit position	2.0...2.5 mm	

- Slacken nut (4).
- Turn anti-roll bar link (5) until no more play is present **at the anti-roll bar link**.
- Tighten nut (4).
- Remove feeler gauge (1).

Follow-up work

Final check of work performed

36 23 001 Replacing wheel-speed sensor, front

+ 36 23 601

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

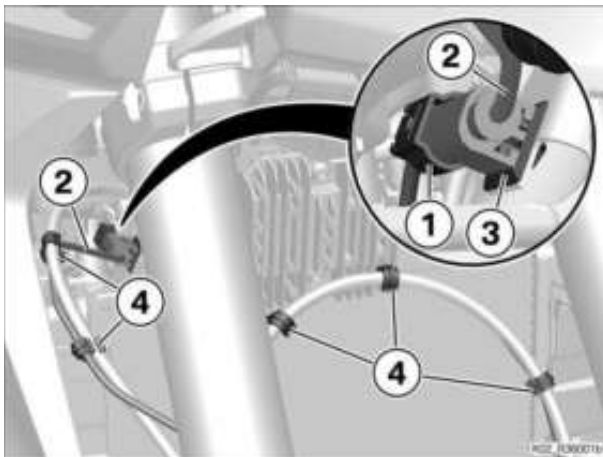
Installing front-wheel stand

Removing front-wheel cover

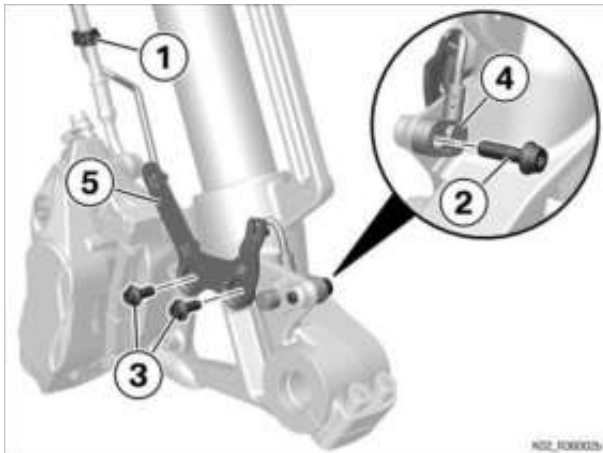
Removing front wheel

Core activity

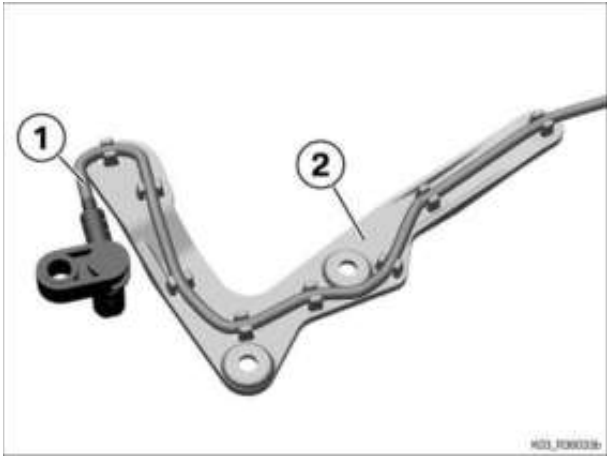
(-) Removing wheel-speed sensor



- Disconnect connector (1) for the wheel-speed sensor.
- Remove cable (2) for wheel speed sensor from holder (3).
- Loosen cable (2) for wheel speed sensor from clamps (4).

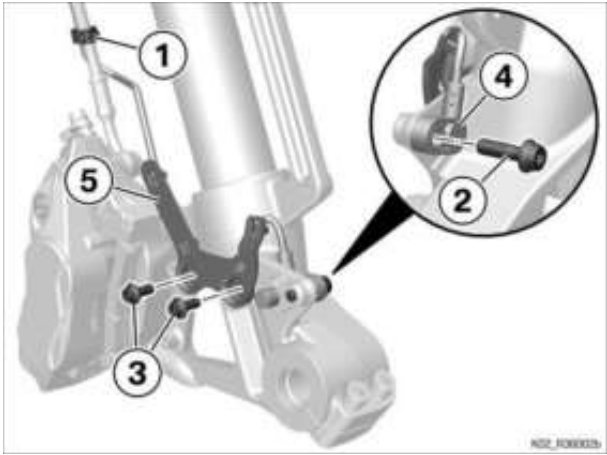
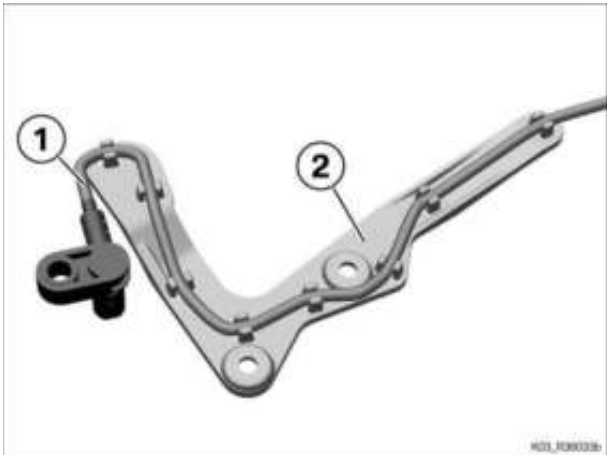


- Loosen clamp (1).
 - Remove screw (2) and screws (3).
 - Remove wheel speed sensor (4) with cable clip (5).
-
- Remove wheel speed sensor (1) from cable clip (2).



(-) Install wheel speed sensor

- Install wheel speed sensor (1) in cable clip (2).



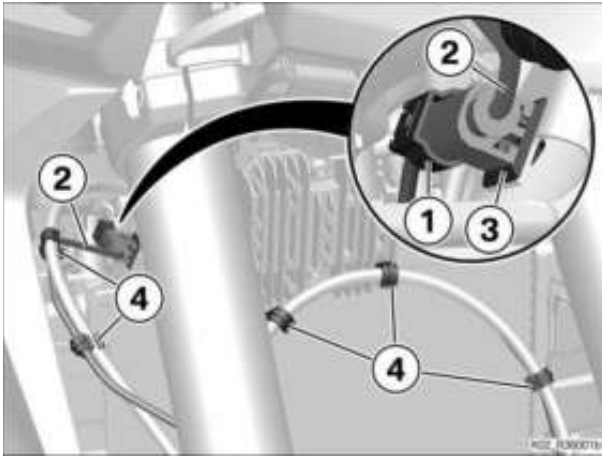
- Hold cable clip (5) in position and install screws (3).

 Tightening torques		
Wheel-speed sensor, front, to bracket		
M6 x 20	8 Nm	

- Hold wheel speed sensor (4) in position and install bolt (2).

 Tightening torques		
Bracket for wheel-speed sensor to fork leg		
M5 x 12	4.5 Nm	

- Secure clip (1).
- Install cable (2) for the wheel speed sensor in holder (3).
- Connect connector (1) for the wheel-speed sensor.
- Secure cable (2) for the wheel speed sensor in clamps (4).



Follow-up work

- Install the front wheel
- Installing front-wheel cover
- Bedding in brake pads
- Removing front-wheel stand
- Final check of work performed

36 23 002 Replacing wheel-speed sensor, rear

+ 36 23 602

Preparatory work

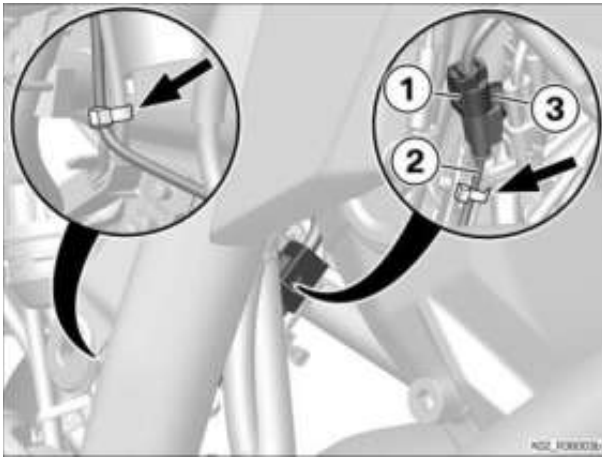
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing left frame cover

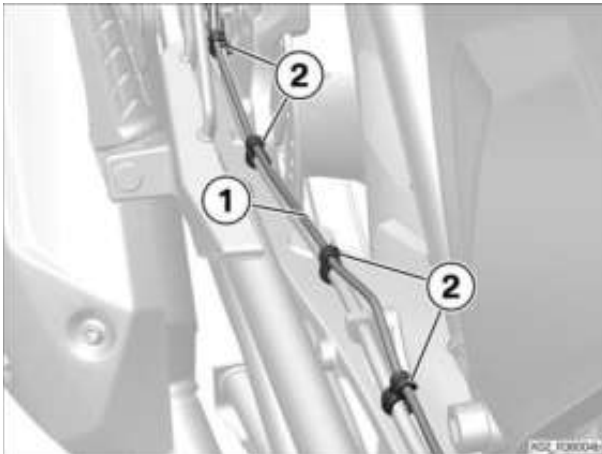
Removing right frame cover

Core activity

(-) Removing rear wheel-speed sensor

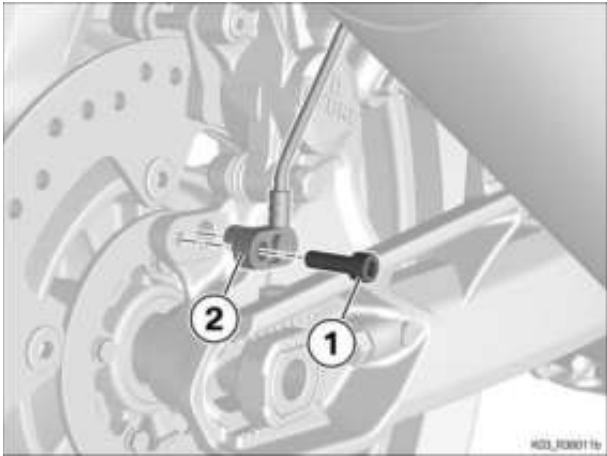


- Remove the cable straps (arrows).
- Disconnect connector (1) for the wheel-speed sensor.
- Remove cable (2) for wheel speed sensor from holder (3).



- Loosen cable (1) for the wheel speed sensor from holders (2).

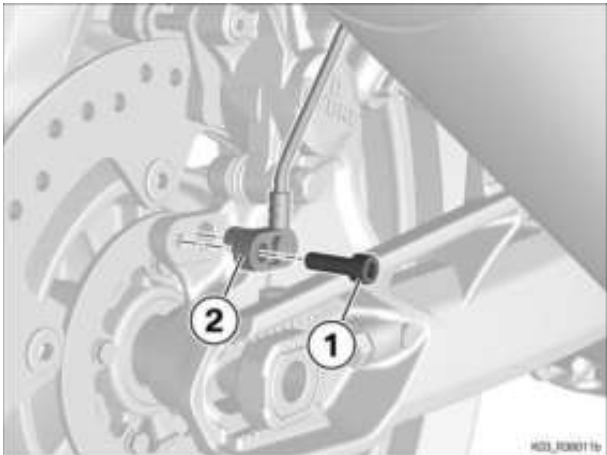
- Remove screw (1).
- Remove wheel-speed sensor (2).



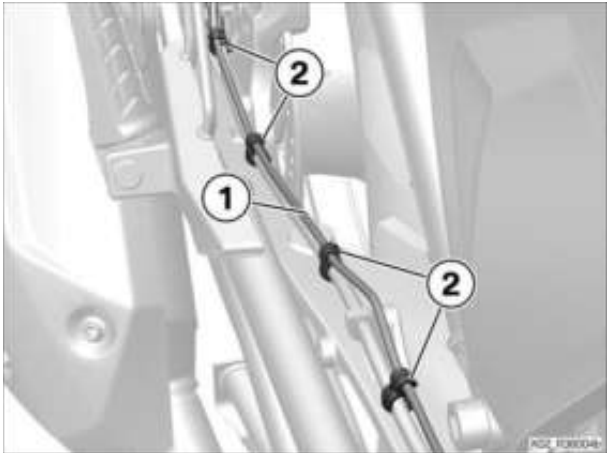
(-) Installing rear wheel-speed sensor

- Insert wheel-speed sensor (2) and install screw (1).

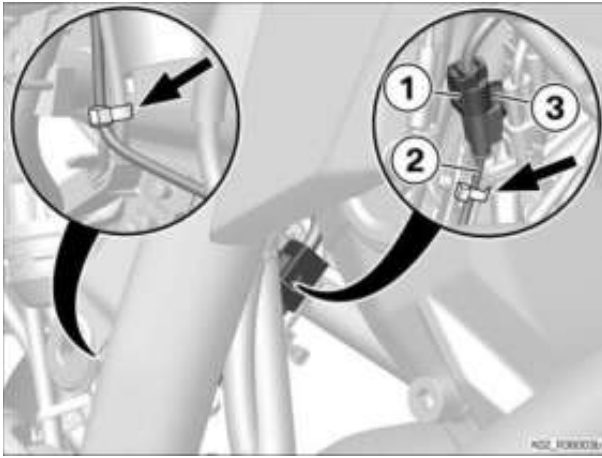
 Tightening torques		
Wheel-speed sensor to brake calliper mount, rear		
M6 x 20	8 Nm	



- Secure cable (1) for wheel speed sensor in holders (2).



- Install cable (2) for the wheel speed sensor in holder (3).
- Connect connector (1) for the wheel-speed sensor.
- Close the cable strap (arrows).



Follow-up work

Installing right frame cover

Installing left frame cover

Final check of work performed

 36 23 003 Replacing sensor ring, front

+ 36 23 603

Preparatory work

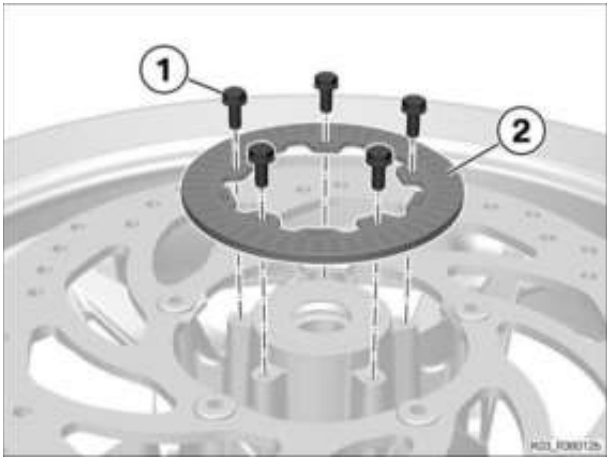
=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Installing front-wheel stand

Removing front wheel

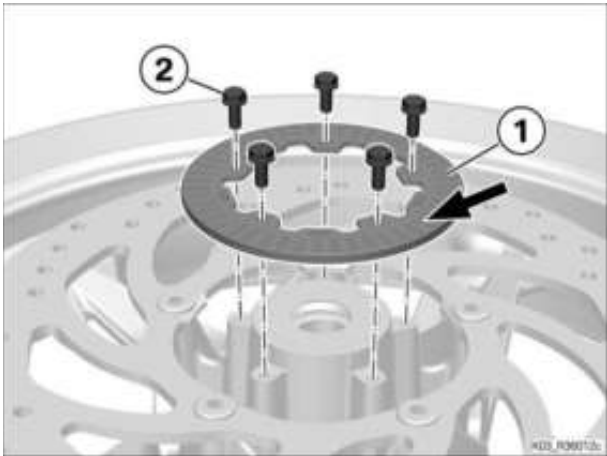
Core activity

(-) Removing front sensor ring



- Remove screws (1).
- Remove sensor ring (2).

(-) Installing front sensor ring



- Hold sensor ring in position (1), making sure that segments (arrow) point outside.
- Install screws (2).

 Tightening torques		
Sensor ring to front wheel		
M5 x 12	4.5 Nm	

Follow-up work

Install the front wheel

Bedding in brake pads

Removing front-wheel stand

Final check of work performed

 36 23 004 Replacing sensor ring, rear

+ 36 23 604

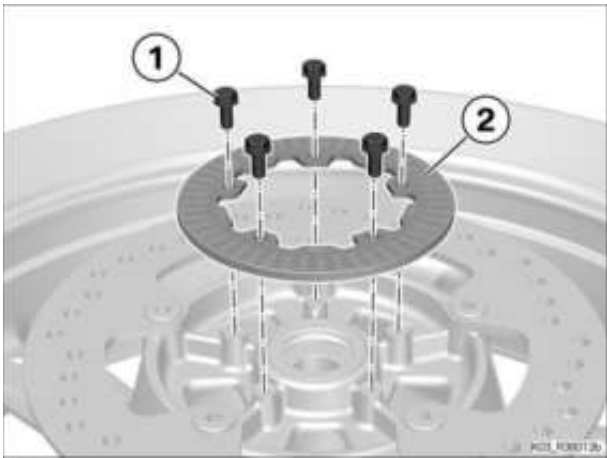
Preparatory work

=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Remove the rear wheel

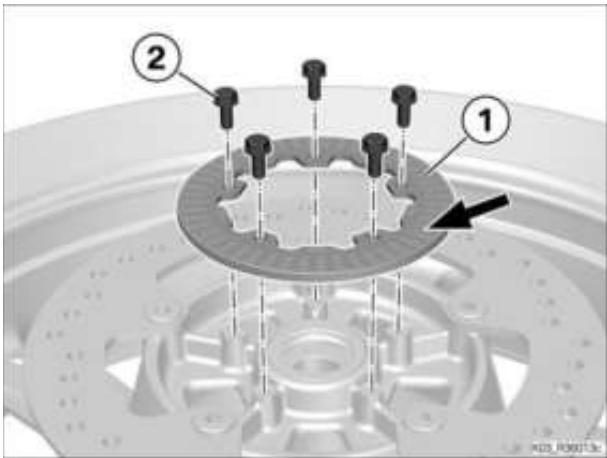
Core activity

(-) Removing rear sensor ring



- Remove screws (1).
- Remove sensor ring (2).

(-) Installing rear sensor ring



- Hold sensor ring in position (1), making sure that segments (arrow) point outside.
- Install screws (2).

 Tightening torques		
Sensor ring to rear wheel		
M5 x 12	4.5 Nm	

Follow-up work

Install the rear wheel

Adjust chain sag

Final check of work performed

36 30 300 Removing/installing front wheel

+ 36 30 628

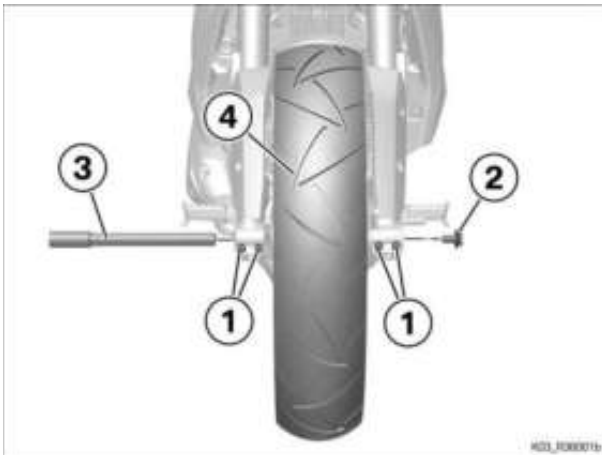
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Installing front-wheel stand

Core activity

(-) Removing front wheel



- Slacken clamping screws (1).
- Remove screw (2), while counter-holding axle (3).
- Remove quick-release axle (3) with a suitable mandrel.
- Roll front wheel (4) forward to remove.

(-) Install the front wheel

► Pushing back brake pistons

ATTENTION

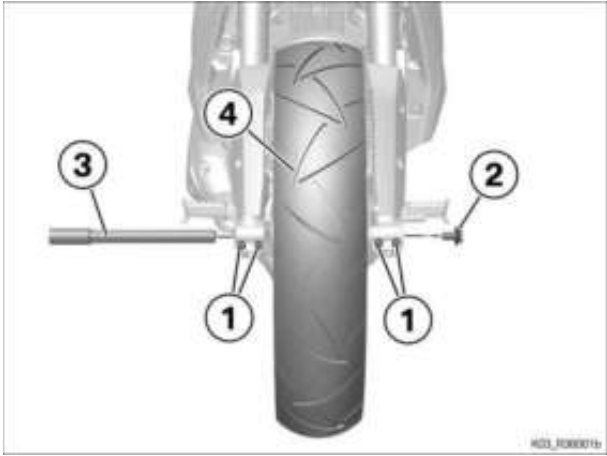
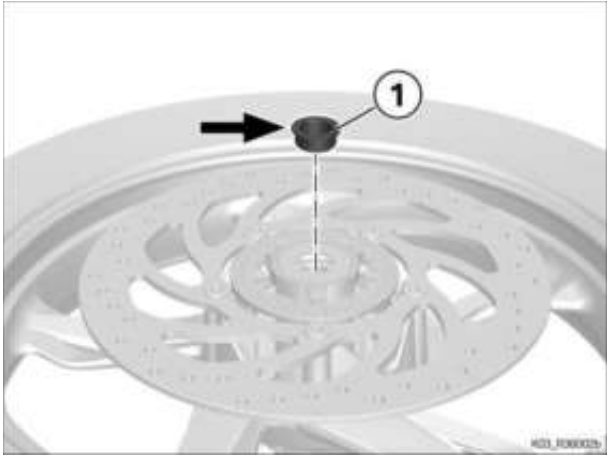
Round off the brake piston in brake caliper

Component damage

- Press again the brake pad **exceptionally** with piston resetting device.



- Push apart brake pads (1) using piston resetting device (No. 34 1 592).
- » The brake pistons are pushed back.



- If necessary, clean spacing bushing (1) and lubricate.
- Make sure that spacing bushing (1) is installed with the collar (arrow) toward the outside.

- Clean and lubricate quick-release axle (3).

 Lubricant	
Optimoly TA	18 21 9 062 599

- Hold front wheel (4) in position.
- Install quick-release axle (3).
- Install screw (2) while counter-holding quick-release axle (3).

 Tightening torques		
Screw in front-wheel quick-release axle		
M12 x 20	50 Nm	

- Tighten clamping screws (1).

 Tightening torques		
Clamping screws in axle holder		
M8 x 30	Tightening sequence: Tighten screws six times in alternate sequence	
		
	19 Nm	

Follow-up work

Bedding in brake pads

Removing front-wheel stand

Final check of work performed

36 30 320 Removing/installing rear wheel

+ 36 30 629

Preparatory work

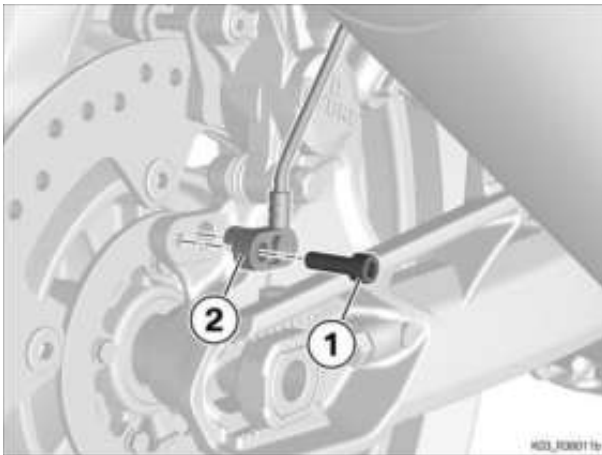
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

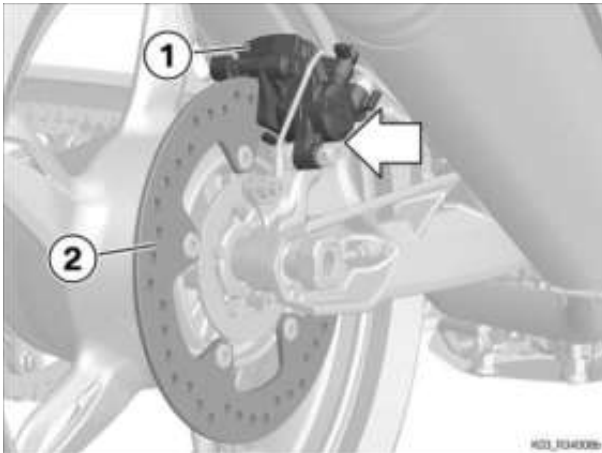
(-) Remove the rear wheel

► Releasing rear wheel-speed sensor

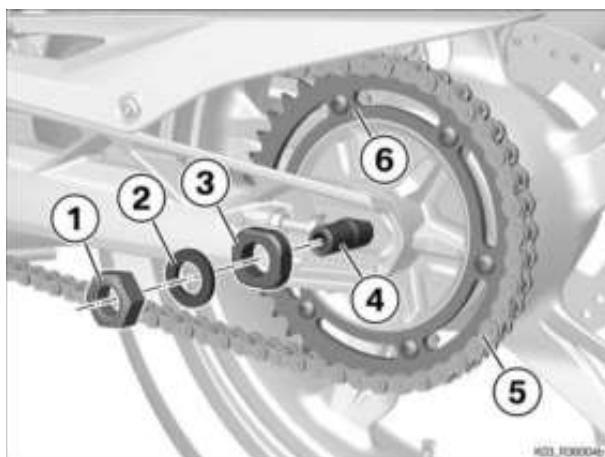
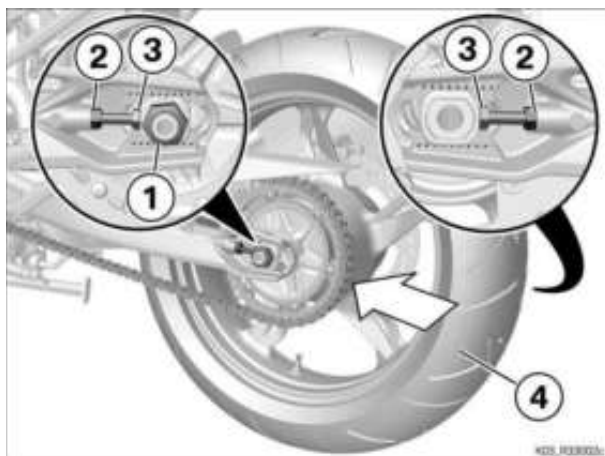
- Remove screw (1).
- Disengage wheel-speed sensor (2) and push it aside.



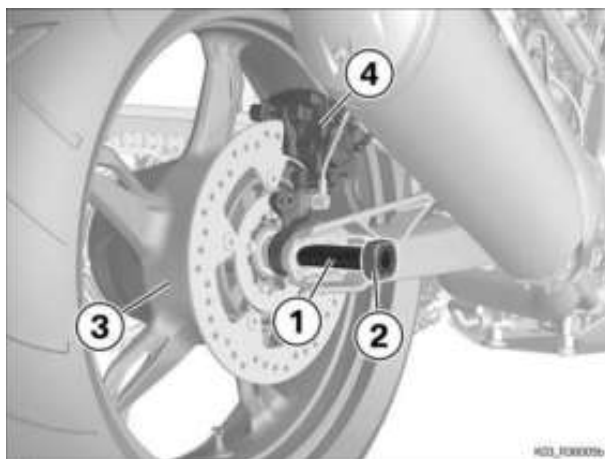
- Press brake caliper (1) against brake disc (2) to force the brake piston back.



- Slacken nut (1).
- Slacken locknuts (2) on left and right.
- Screw in tensioning screws (3).
- Push rear wheel (4) forward.
- » Chain is slackened.



- Remove nut (1), washer (2) and thruster (3).
- Push quick-release axle (4) forward.
- Remove chain (5) from camshaft sprocket (6) and move it aside, making sure that the swinging arm is not scratched.



- Remove quick-release axle (1) with thruster (2).
- Remove wheel (3) and at the same time disengage complete brake caliper (4) and leave it hanging to the side.

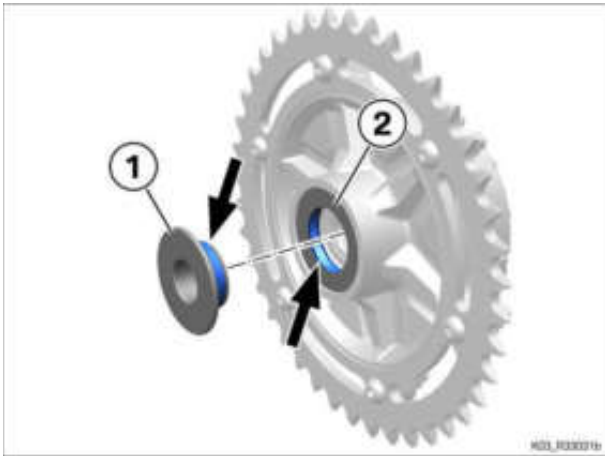
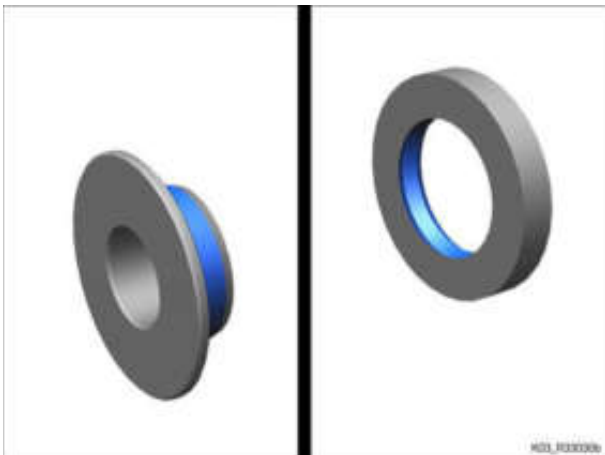
- Remove complete chain sprocket support (1) with spacing bushing (2).
- Remove judder damper elements (3).



(-) Install the rear wheel

► **Lubricate the bearing bushing and radial shaft sealing ring of sprocket carrier**

- Surfaces to be cleaned and lubricated.

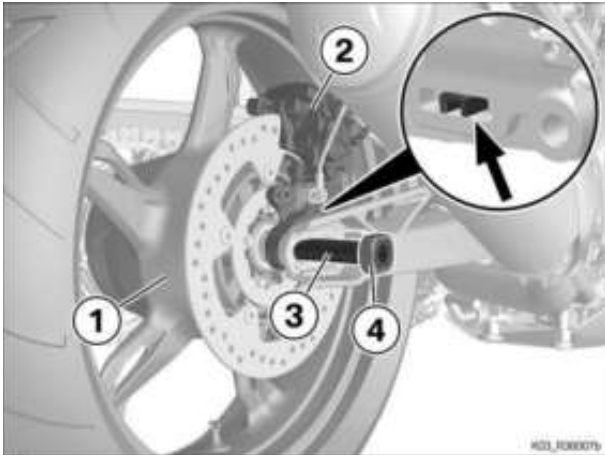


- Remove all dirt and old lubricant from spacing bushing (1) and radial shaft seal (2).
- Lubricate spacing bushing (1) and radial shaft seal (2) at the **marked surfaces** (arrows).

 Lubricant	
Unirex N3	83 19 2 160 349



- Check judder damper elements (1) for damage, deformation and wear; replace if necessary.
- Lubricate judder damper elements (1) and install.



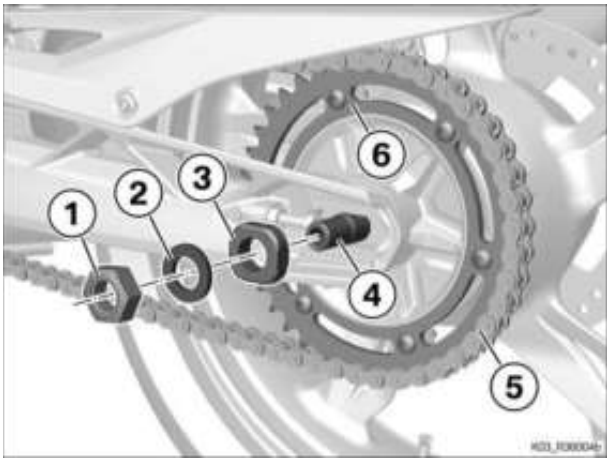
 Installation tool	
Silicone spray	83 19 2 208 609

- Install complete chain sprocket support (1) in judder damper elements (3).
- Make sure that spacing bushing (2) is installed.

- Install rear wheel (1) and at the same time work complete brake caliper (2) into position, making sure that it is seated in the guide (arrow).
- Lubricate quick-release axle (3) and install with slider (4).

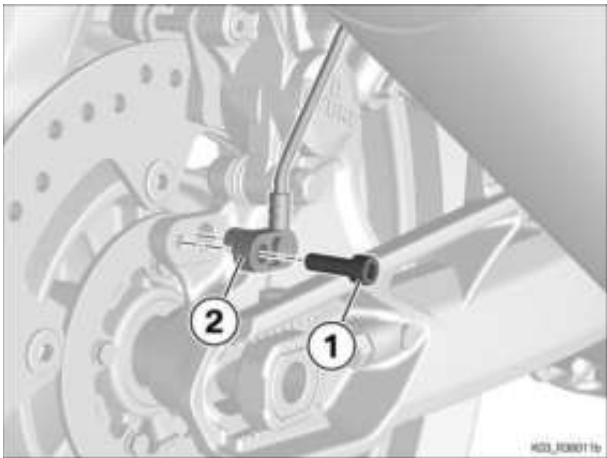
 Lubricant	
Optimoly TA	18 21 9 062 599

- Loop chain (5) over sprocket (6).
- Push quick-release axle (4) to the rear.
- Install slider (3) and washer (2).
- Engage nut (1), do not tighten.



► **Securing rear wheel-speed sensor**

- Insert wheel-speed sensor (2) and install screw (1).



 Tightening torques		
Wheel-speed sensor to brake calliper mount, rear		
M6 x 20	8 Nm	



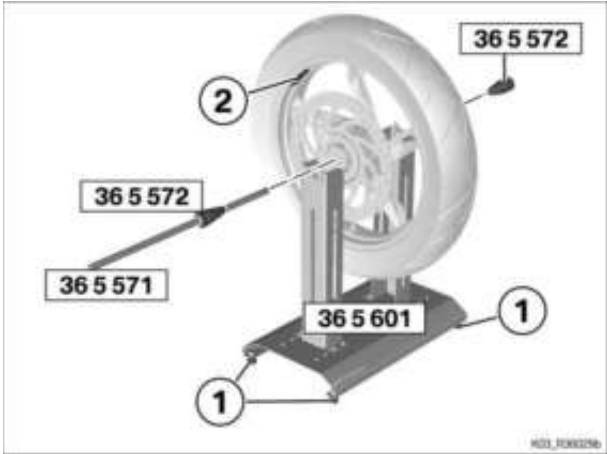
Follow-up work

- Adjust chain sag
- Bedding in brake pads
- Final check of work performed

 36 30 508 Balancing front wheel (statically) (wheel removed)

Core activity

(-) Statically balancing front wheel



- Plumb balancing jig (No. 36 5 601) by adjusting adjustable feet (1).
- Insert balancing shaft (No. 36 5 571) in front-wheel bearing and secure it with tensioners (No. 36 5 572), making sure that front-wheel bearing is **lightly** preloaded.
- Remove old adhesive weights (2).
- Place the front wheel on the balancing jig and allow it to come to rest.
- Clean the attachment points for the adhesive weights.
- Affix **new** adhesive weights (2) uniformly spaced on both sides of the rim opposite the wheel's heaviest point.

 Technical data			
Permissible front-wheel imbalance		max 5 g	
Balance weight for front wheel		max 80 g	
One half of the weights must be attached to the left and the other half to the right of the wheel rim			

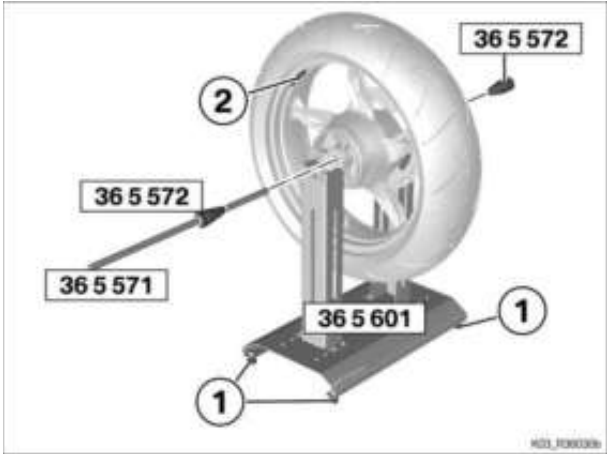
- Repeat the balancing procedure as a check.
- Remove the front wheel from the balancing jig.
- Remove balancing shaft (No. 36 5 571).

 36 30 518 Balancing rear wheel (statically) (wheel removed)

Core activity

(-) Statically balancing rear wheel

- Plumb balancing jig (No. 36 5 601) by adjusting adjustable feet (1).
- Remove old adhesive weights (2).
- Insert balancing shaft (No. 36 5 571) into the rear wheel.
- Place the rear wheel on the balancing jig and allow it to come to rest.
- Clean the attachment points for the adhesive weights.
- Affix **new** adhesive weights (2) opposite the heaviest point of the wheel.



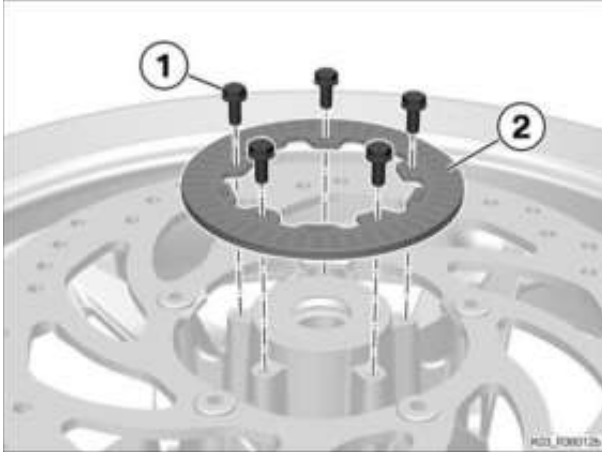
 Technical data			
Permissible rear-wheel imbalance		max 45 g	
Balance weight for the rear wheel One half of the weights must be attached to the left and the other half to the right of the wheel rim		max 80 g	

- Repeat the balancing procedure as a check.
- Remove the rear wheel and the balancing shaft.

36 30 601 Replacing rim for front wheel (wheel removed)

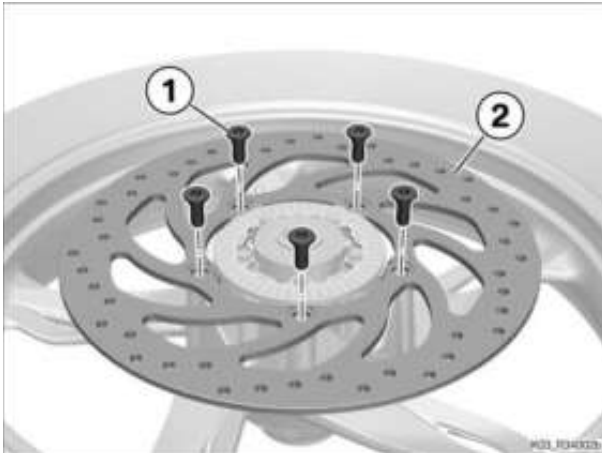
Core activity

(-) Removing front sensor ring



- Remove screws (1).
- Remove sensor ring (2).

(-) Remove the front brake disc



- Remove screws (1).
- Remove brake disc (2).

(-) Removing front tyre

ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.

- Remove the tyre with commercially available tools.

(-) Installing rubber valve

ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage



• Take care not to scratch components; cover or mask as necessary.

• Lubricate **new** rubber valve (1) and install, using a suitable tool.

 Care products	
Rubber care product	83 12 0 397 018

(-) Installing front tyre

 ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

• Take care not to scratch components; cover or mask as necessary.

- Use commercially available tools and work to the manufacturer's specifications to fit the tyres, and make sure that the direction-of-rotation arrows on tyre and rim point in the same direction.
- Manufacturer-specific tyre mark for imbalance must be toward the valve.

Check

• Inflate the tyre to test pressure and check the valve for leaks.

 Technical data			
Wheel valve test pressure		4 bar	

Result:

• Valve leaking

Measure:

• Replace the valve insert.

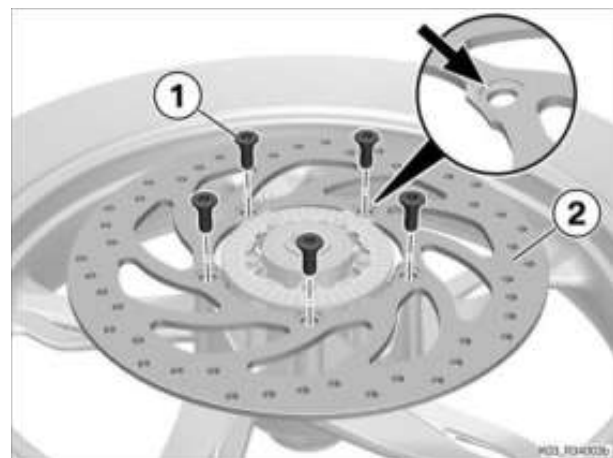
Result:

• Valve leaktight

Measure:

• Correct the tyre pressure.

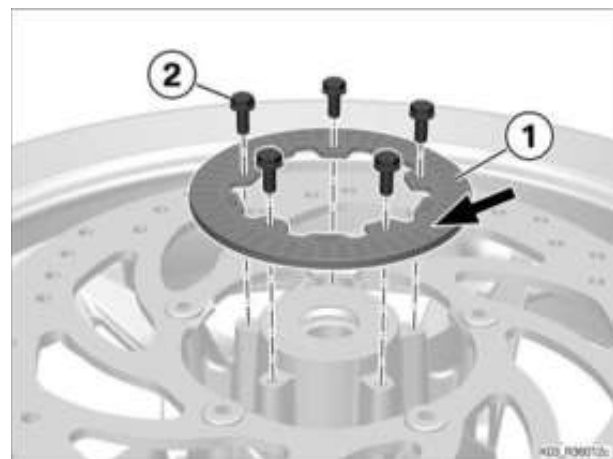
 Technical data			
Tyre pressure, front	with cold tyre; one-up and two-up	1.7 bar	



(-) Installing front brake disc

- Lay brake disc (2) on the wheel rim with recess for screw head (arrow) to the outside.
- Install screws (1).

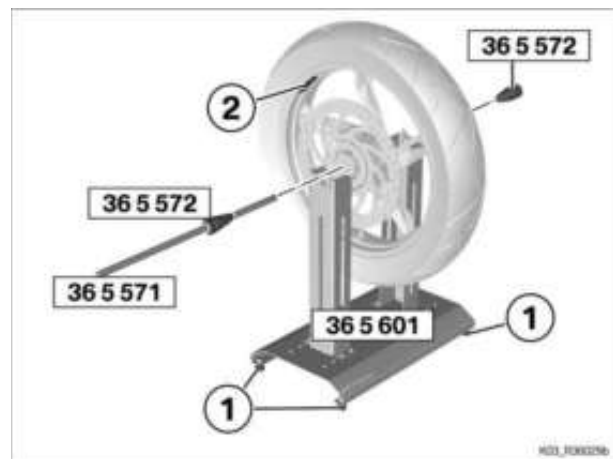
Tightening torques		
Brake disc to front wheel		
M8 x 20,5 Thread-locking compound (Loctite 243, Medium strength)	Tightening sequence: tighten in diagonally opposite sequence	
	32 Nm	



(-) Installing front sensor ring

- Hold sensor ring in position (1), making sure that segments (arrow) point outside.
- Install screws (2).

Tightening torques		
Sensor ring to front wheel		
M5 x 12	4.5 Nm	



(-) Statically balancing front wheel

- Plumb balancing jig (No. 36 5 601) by adjusting adjustable feet (1).
- Insert balancing shaft (No. 36 5 571) in front-wheel bearing and secure it with tensioners (No. 36 5 572), making sure that front-wheel bearing is **lightly** preloaded.
- Remove old adhesive weights (2).
- Place the front wheel on the balancing jig and allow it to come to rest.
- Clean the attachment points for the adhesive weights.
- Affix **new** adhesive weights (2) uniformly spaced on both sides of the rim opposite the wheel's heaviest point.

Technical data			
Permissible front-wheel imbalance		max 5 g	
Balance weight for front wheel		max 80 g	

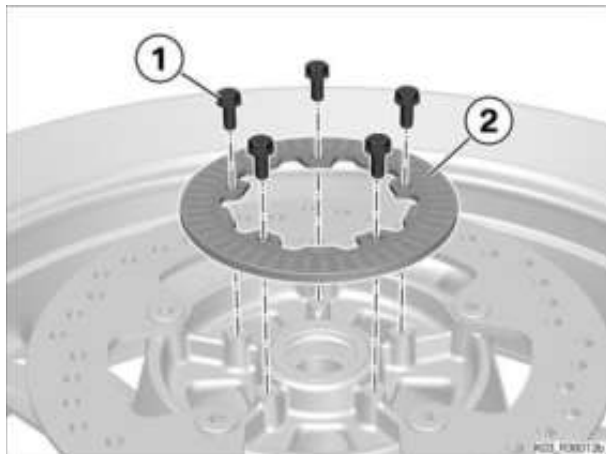
One half of the weights must be attached to the left and the other half to the right of the wheel rim			
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- Repeat the balancing procedure as a check.
- Remove the front wheel from the balancing jig.
- Remove balancing shaft (No. 36 5 571).

36 30 611 Replacing rim for rear wheel (wheel removed)

Core activity

(-) Removing rear sensor ring



- Remove screws (1).
- Remove sensor ring (2).

(-) Removing rear brake disc



- Remove screws (1).
- Remove brake disc (2).

(-) Removing rear tyre

ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.

- Remove the tyre with commercially available tools.

(-) Installing rubber valve

ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage



• Take care not to scratch components; cover or mask as necessary.

• Lubricate **new** rubber valve (1) and install, using a suitable tool.

 Care products	
Rubber care product	83 12 0 397 018

(-) Installing rear tyre

 ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

• Take care not to scratch components; cover or mask as necessary.

- Use commercially available tools and work to the manufacturer's specifications to fit the tyres, and make sure that the direction-of-rotation arrows on tyre and rim point in the same direction.
- Manufacturer-specific tyre mark for imbalance must be toward the valve.

Check

• Inflate the tyre to test pressure and check the valve for leaks.

 Technical data			
Wheel valve test pressure		4 bar	

Result:

- Valve leaking

Measure:

- Replace the valve insert.

Result:

- Valve leaktight

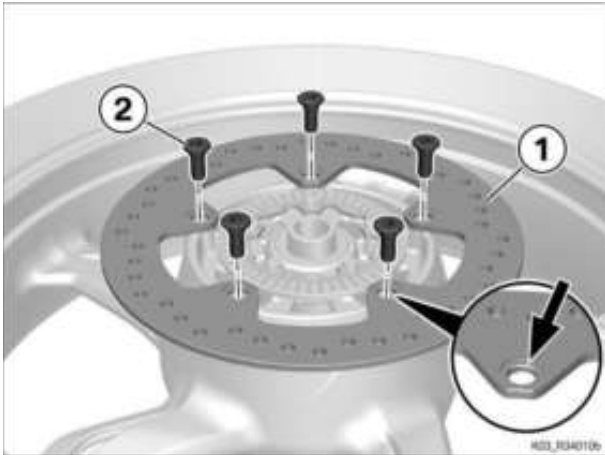
Measure:

- Correct the tyre pressure.

 Technical data			
Tyre pressure, rear	with cold tyre; one-up and two-up	1.9 bar	

- Check the tyre and make sure the line is at a uniform distance from the rim flange all the way round.

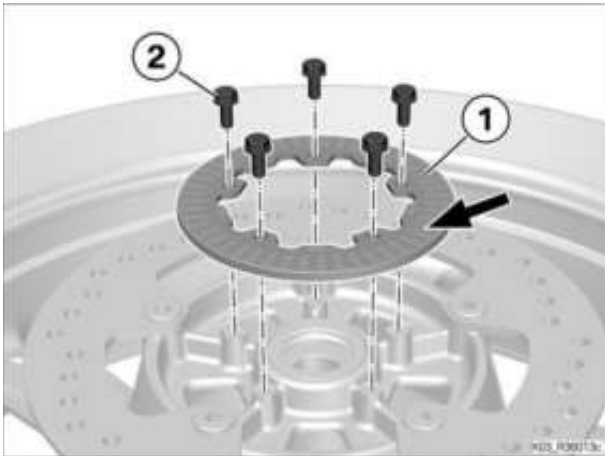
(-) Installing rear brake disc



- Lay brake disc (1) on the wheel rim with recess for screw head (arrow) to the outside.
- Install screws (2).

 Tightening torques		
Brake disc to rear wheel		
M8 x 20,5 Thread-locking compound (Loctite 243, Medium strength)	Tightening sequence: tighten in diagonally opposite sequence	
	32 Nm	

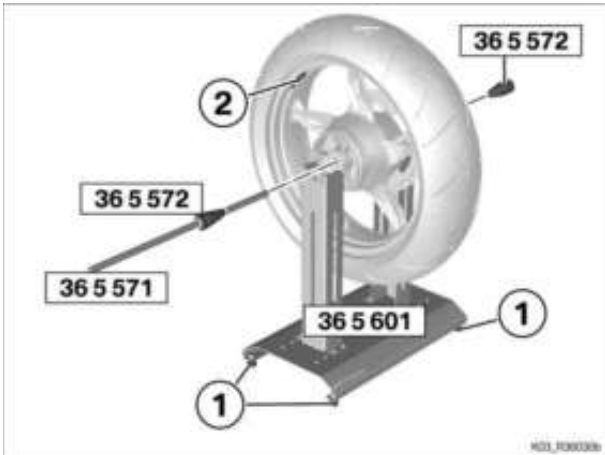
(-) Installing rear sensor ring



- Hold sensor ring in position (1), making sure that segments (arrow) point outside.
- Install screws (2).

 Tightening torques		
Sensor ring to rear wheel		
M5 x 12	4.5 Nm	

(-) Statically balancing rear wheel



- Plumb balancing jig (No. 36 5 601) by adjusting adjustable feet (1).
- Remove old adhesive weights (2).
- Insert balancing shaft (No. 36 5 571) into the rear wheel.
- Place the rear wheel on the balancing jig and allow it to come to rest.
- Clean the attachment points for the adhesive weights.
- Affix **new** adhesive weights (2) opposite the heaviest point of the wheel.

 Technical data			
Permissible rear-wheel imbalance		max 45 g	
Balance weight for the rear wheel		max 80 g	

One half of the weights must be attached to the left and the other half to the right of the wheel rim			
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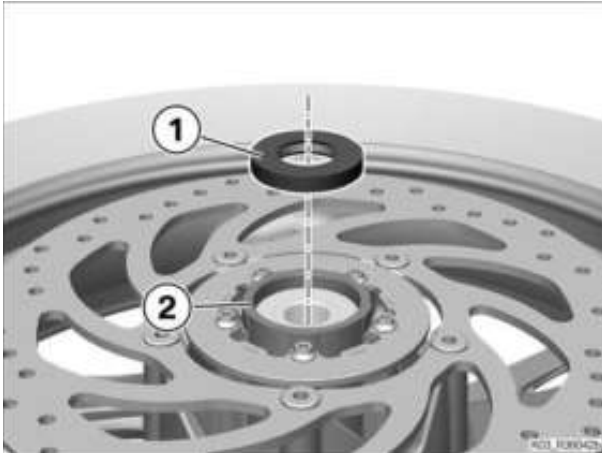
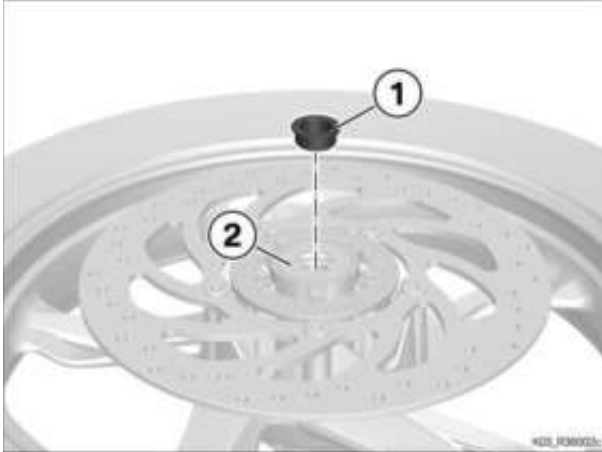
- Repeat the balancing procedure as a check.
- Remove the rear wheel and the balancing shaft.

36 31 851 Renewing front wheel bearing (wheel removed)

Core activity

(-) Removing radial shaft seals, left and right

- Remove spacer bush (1) from radial shaft seal (2).



ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.
- Using a suitable tool, remove left radial shaft seal (1) **carefully** from front wheel rim (2).



ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.
- Using a suitable tool, remove right radial shaft seal (1) **carefully** from front wheel rim (2).

(-) Removing wheel bearings of front wheel

► Reassemble internal puller and reaction support

- Install internal puller (No. 00 8 573) in reaction support (No. 00 8 562).



- Heat the bearing seats.

 Technical data			
Release/mating temperature		100 °C	

ATTENTION

Use of hard or sharp-edged objects in proximity to component
Component damage

- Take care not to scratch components; cover or mask as necessary.

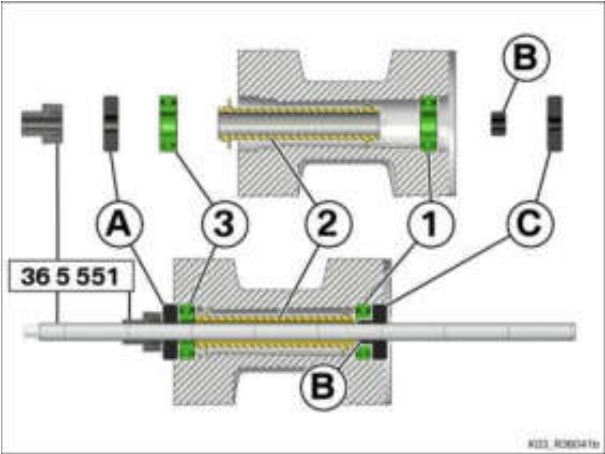
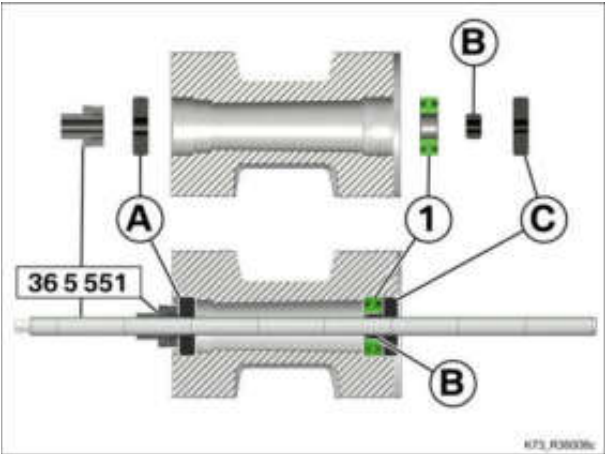
- Remove left and right wheel bearings (1) with reaction support (a) and support ring (No. 31 5 708).
- Remove spacing bushing (2).

(-) Installing wheel bearings of front wheel

- Clean the bearing seats.
- Heat the left bearing seat.

 Technical data			
Release/mating temperature		100 °C	

- **Begin by introducing left bearing (1)** into the bearing seat. Install long spindle with pull-in nut (No. 36 5 551) washer without thread (No. 36 5 554) and washers with thread (No. 36 5 553):
 - Washer (A) dia. 47 mm
 - Washer (B) with thread dia. 20 mm
 - Washer (C) with thread dia. 47 mm
- Pull in **left bearing (1)** until seated.
- Remove washer (A) and pull-in nut.



ATTENTION

Left wheel bearing detached from stop

Damage to bearing, axle or wheel rim. Error in speed measuring if vehicle is fitted with **ABS**

- When pressing in the right wheel bearing, make sure that the left wheel bearing does not come away from the stop of the bearing seat.

- Heat the right bearing seat.

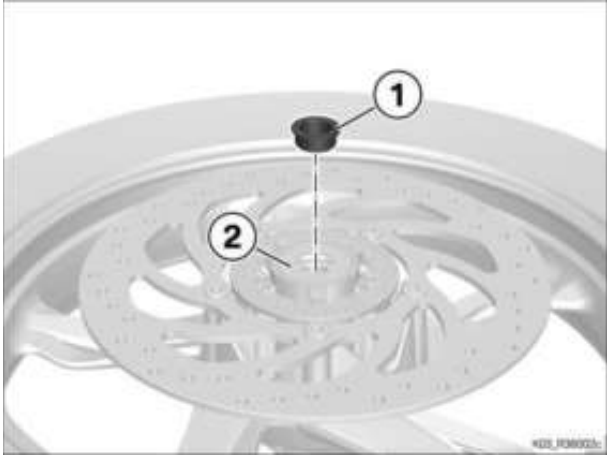
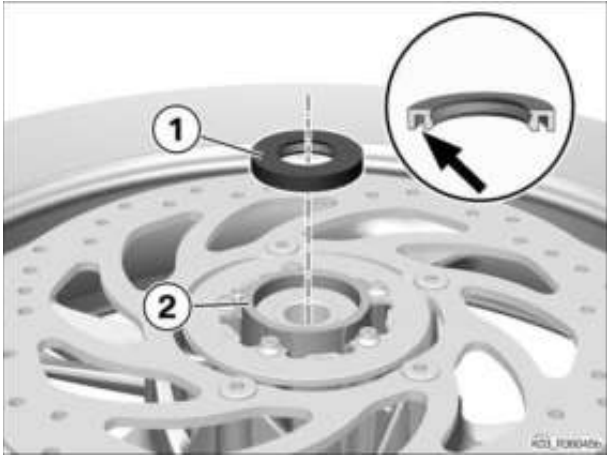
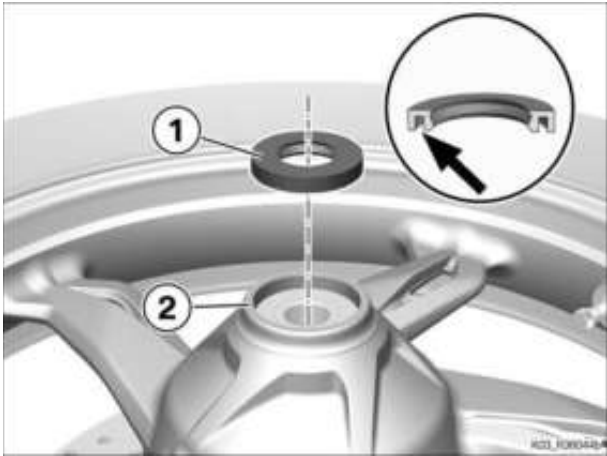
 Technical data			
Release/mating temperature		100 °C	

- Install spacing bushing (2).
- » Spacing bushing (2) sits flat and square on bearing (1).
- Introduce **right** bearing (3) into the bearing seat.
- Install the washers and pull-in nut.
- Washer (A) dia. 47 mm
- Washer (B) with thread dia. 20 mm
- Washer (C) with thread dia. 47 mm
- Pull in bearing (2) until seated against spacing bushing (3).
- Install washer (A) and pull-in nut.
- Pull in bearing (3) until seated against spacing bushing (2).

(-) Installing radial shaft seal

- Install radial shaft seal (1), right with the opening (arrow) toward the bearing until flush with the front wheel rim (2), using a suitable tool.
- Lubricate the sealing lip of radial shaft seal (1).

 Lubricant	



Unirex N3	83 19 2 160 349
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- Install radial shaft seal (1), left with the opening (arrow) toward the bearing until flush with the front wheel rim (2), using a suitable tool.
- Lubricate the sealing lip of radial shaft seal (1).

 Lubricant	
Unirex N3	83 19 2 160 349

- Clean and lubricate spacer bush (1).

 Lubricant	
Unirex N3	83 19 2 160 349

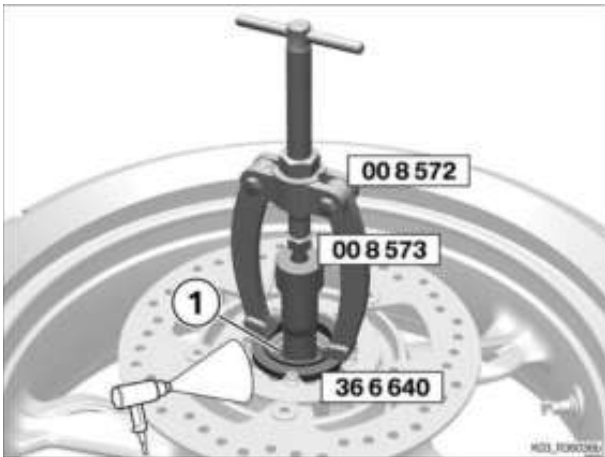
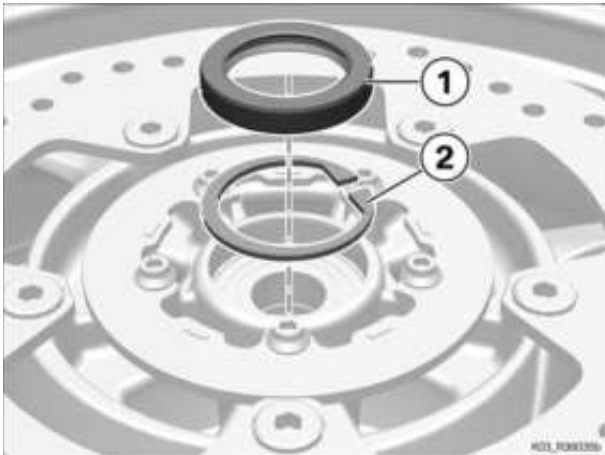
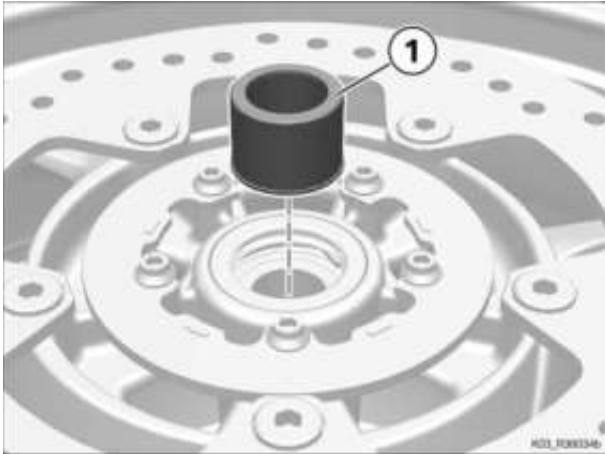
- Install spacer bush (1) in radial shaft seal (2).

 36 31 861 Replace wheel bearing for rear wheel (wheel removed)

Core activity

(-) Removing wheel bearings of rear wheel

- Remove bushing (1).



 ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.

- Using a suitable tool, **carefully** remove shaft sealing ring (1).
- Remove circlip (2).

- Heat the bearing seat.

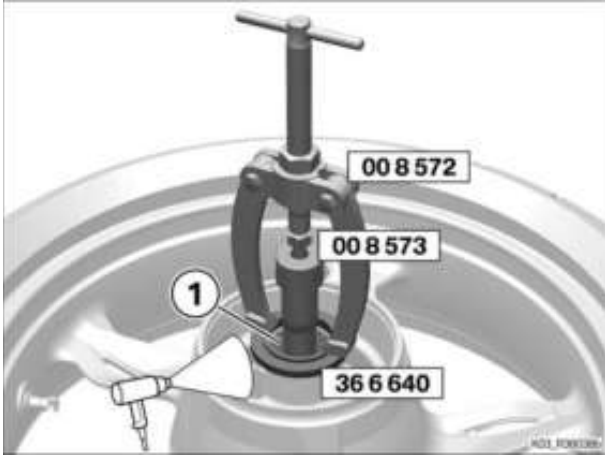
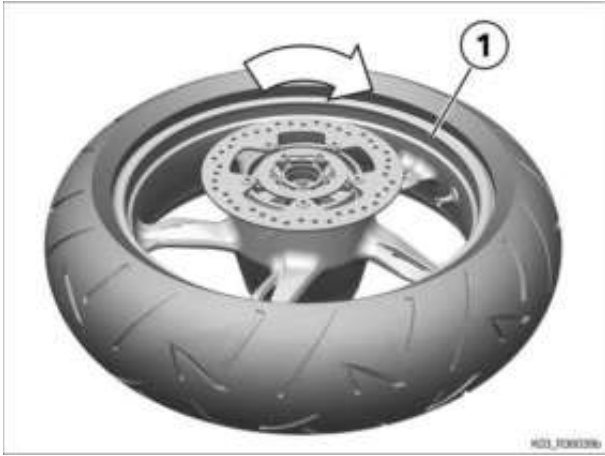
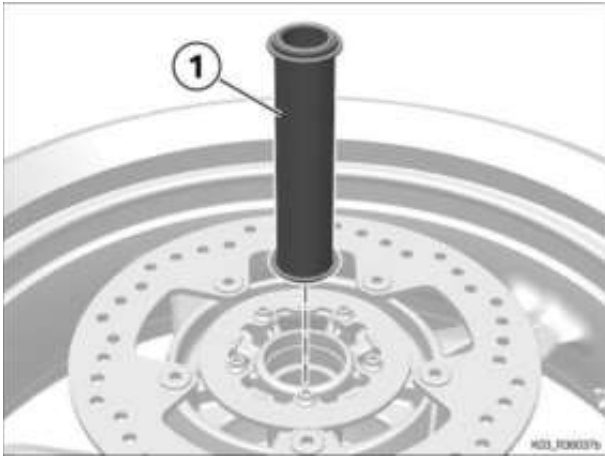


Technical data

Release/mating temperature		100 °C	
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- Remove left wheel bearing (1) with reaction support (No. 00 8 572), internal puller (No. 00 8 573) and support ring (No. 36 6 640).

- Remove tubular spacer (1).



- Turn rear wheel (1) around.

- Heat the bearing seat.

 Technical data			
Release/mating temperature		100 °C	

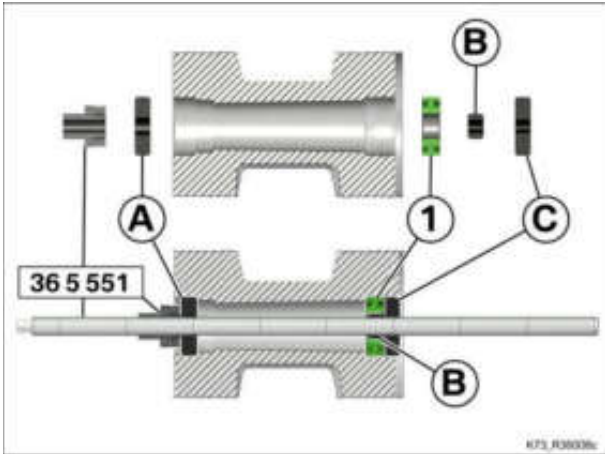
- Remove right wheel bearing (1) with reaction support (No. 00 8 572), internal puller (No. 00 8 573) and support ring (No. 36 6 640).

(-) Installing wheel bearings of rear wheel

- Clean the bearing seats.
- Heat the **left** bearing seat.

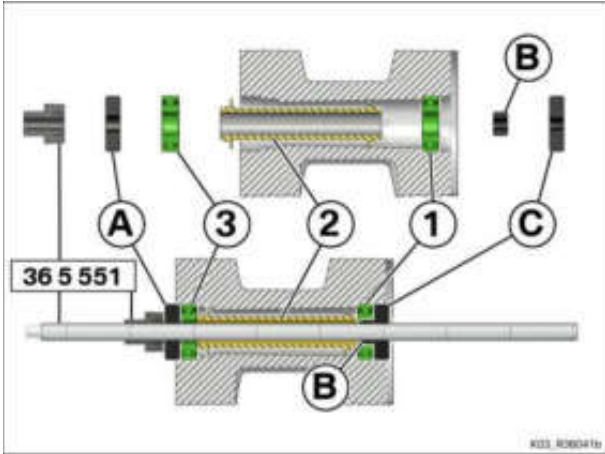
 Technical data			
Release/mating temperature		100 °C	

-



Introduce left bearing (1) into the bearing seat. Install long spindle with pull-in nut (No. 36 5 551) washer without thread (No. 36 5 554) and washers with thread (No. 36 5 553):

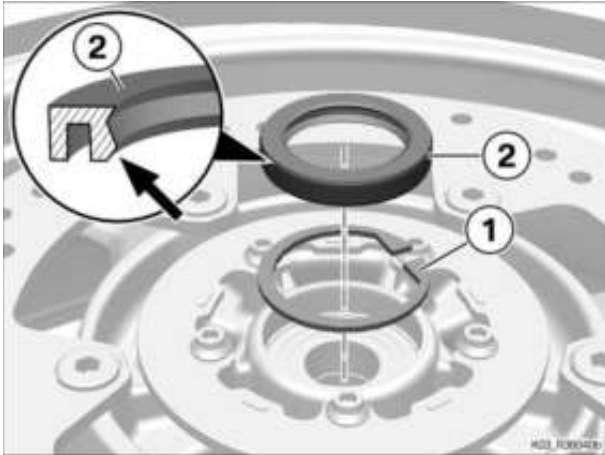
- Washer (A) dia. 42 mm
- Washer (B) with thread dia. 20 mm
- washer (C) with thread dia. 42 mm
- Pull in bearing (1) until seated.
- Remove washer (A) and pull-in nut.



- Heat the **right** bearing seat.

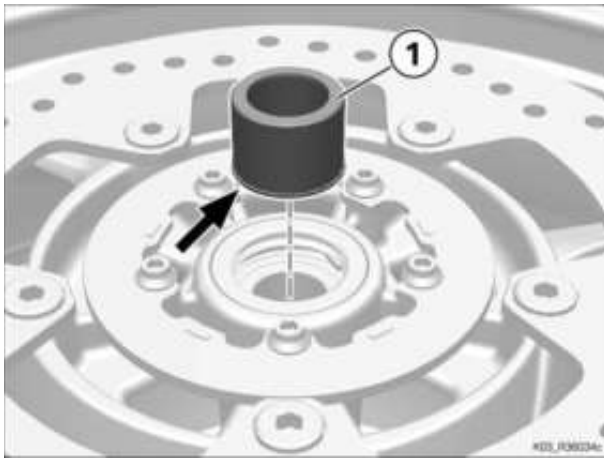
 Technical data			
Release/mating temperature		100 °C	

- Install spacing bushing (2).
- » Spacing bushing (2) sits flat and square on bearing (1).
- Introduce **right** bearing (3) into the bearing seat.
- Install the washers and pull-in nut.
- Washer (A) dia. 42 mm
- Washer (B) with thread dia. 20 mm
- washer (C) with thread dia. 42 mm
- Pull in bearing (2) until seated against spacing bushing (3).
- Install circlip (1).
- Install radial shaft seal (2) with the open side **down**.
- Lubricate the sealing lip (arrow) of radial shaft seal (1).



 Lubricant	
Staburags NBU 30 PTM	07 55 9 056 992

- Install bush (1), with the shoulder (arrow) **down**.



 36 32 501 Renewing front tyre (wheel removed)

Core activity

(-) Changing front tyre

► Removing front tyre

 ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.

- Remove the tyre with commercially available tools.



► Installing front tyre

 ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.

- Use commercially available tools and work to the manufacturer's specifications to fit the tyres, and make sure that the direction-of-rotation arrows on tyre and rim point in the same direction.
- Manufacturer-specific tyre mark for imbalance must be toward the valve.

Check

- Inflate the tyre to test pressure and check the valve for leaks.

 Technical data			
Wheel valve test pressure		4 bar	

Result:

- Valve leaking

Measure:

- Replace the valve insert.

Result:

- Valve leaktight

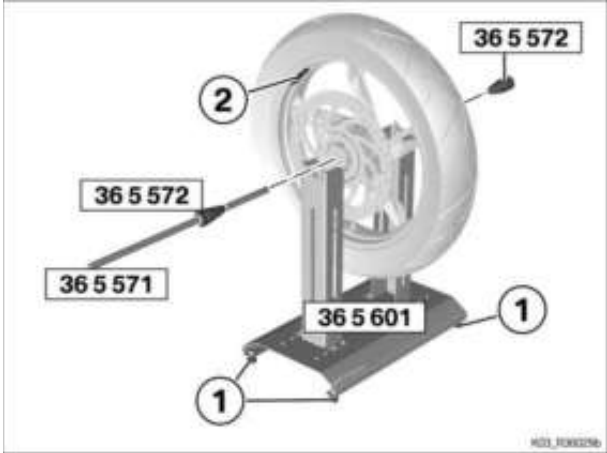
Measure:

- Correct the tyre pressure.

 Technical data			
Tyre pressure, front	with cold tyre; one-up and two-up	1.7 bar	



(-) Statically balancing front wheel



- Plumb balancing jig (No. 36 5 601) by adjusting adjustable feet (1).
- Insert balancing shaft (No. 36 5 571) in front-wheel bearing and secure it with tensioners (No. 36 5 572), making sure that front-wheel bearing is **lightly** preloaded.
- Remove old adhesive weights (2).
- Place the front wheel on the balancing jig and allow it to come to rest.
- Clean the attachment points for the adhesive weights.
- Affix **new** adhesive weights (2) uniformly spaced on both sides of the rim opposite the wheel's heaviest point.

 Technical data			
Permissible front-wheel imbalance		max 5 g	
Balance weight for front wheel One half of the weights must be attached to the left and the other half to the right of the wheel rim		max 80 g	

- Repeat the balancing procedure as a check.
- Remove the front wheel from the balancing jig.
- Remove balancing shaft (No. 36 5 571).

 36 32 511 Removing rear tyre (wheel removed)

 ATTENTION

Re-use of tyre valve

Pressure loss in tyre

- When fitting a new tyre, also install a new tyre valve.

Core activity

(-) Changing rear tyre

► Removing rear tyre

 ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.

- Remove the tyre with commercially available tools.



► Installing rear tyre

 ATTENTION

Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.

- Use commercially available tools and work to the manufacturer's specifications to fit the tyres, and make sure that the direction-of-rotation arrows on tyre and rim point in the same direction.
- Manufacturer-specific tyre mark for imbalance must be toward the valve.

Check

- Inflate the tyre to test pressure and check the valve for leaks.

 Technical data			
Wheel valve test pressure		4 bar	

Result:

- Valve leaking

Measure:

- Replace the valve insert.

Result:

- Valve leaktight

Measure:

- Correct the tyre pressure.

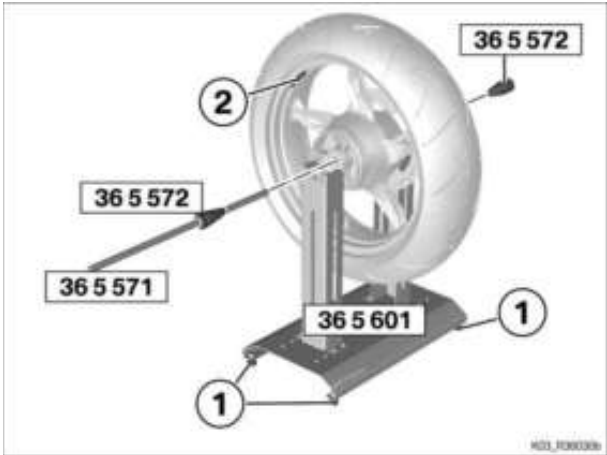
 Technical data			
Tyre pressure, rear	with cold tyre; one-up and two-up	1.9 bar	

- Check the tyre and make sure the line is at a uniform distance from the rim flange all the way round.



(-) **Statically balancing rear wheel**

- Plumb balancing jig (No. 36 5 601) by adjusting adjustable feet (1).
- Remove old adhesive weights (2).
- Insert balancing shaft (No. 36 5 571) into the rear wheel.
- Place the rear wheel on the balancing jig and allow it to come to rest.
- Clean the attachment points for the adhesive weights.
- Affix **new** adhesive weights (2) opposite the heaviest point of the wheel.



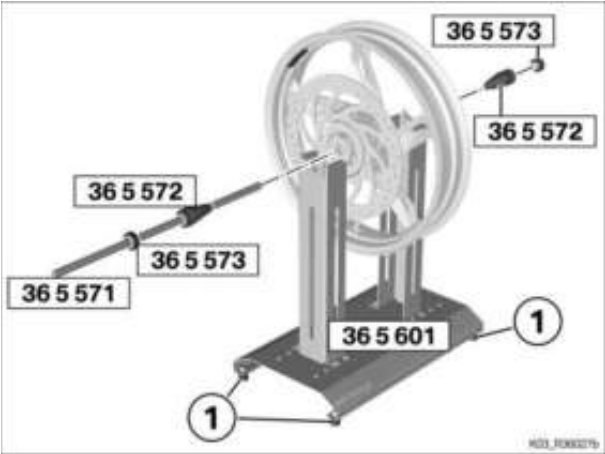
 Technical data			
Permissible rear-wheel imbalance		max 45 g	
Balance weight for the rear wheel One half of the weights must be attached to the left and the other half to the right of the wheel rim		max 80 g	

- Repeat the balancing procedure as a check.
- Remove the rear wheel and the balancing shaft.

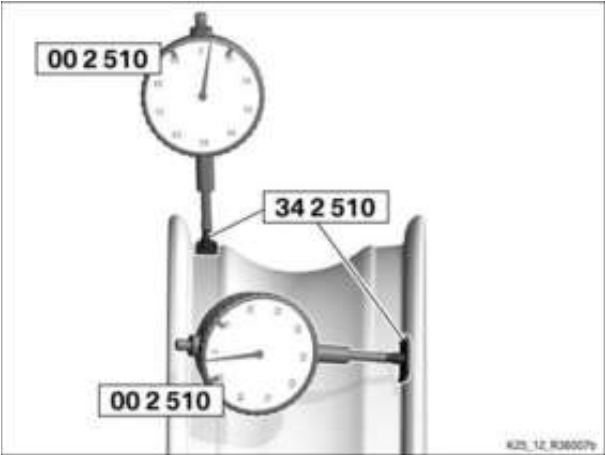
 36 32 528 Checking wheel rims for deformations, dents (tyres removed)

Core activity

(-) Checking runout of front wheel rim



- Plumb balancing jig (No. 36 5 601) by adjusting adjustable feet (1) so that it is perfectly horizontal.
- Insert balancing shaft (No. 36 5 571) in front-wheel bearing and secure it with tensioner (No. 36 5 572), making sure that front-wheel bearing is **lightly** preloaded.
- Push stops (No. 36 5 573) on to balancing shaft (No. 36 5 571) and seat the front wheel in the balancer.
- Use stops (No. 36 5 573) to prevent the front-wheel rim from slipping out of position.



Check

- Set dial gauge (No. 00 2 510) with measuring adapter (No. 34 2 510) on the **machined inner face** and check lateral runout.

 Technical data			
Lateral runout, front wheel		max 0.4 mm	

Result:

- Nominal value exceeded

Measure:

- Replace the wheel rim

Check

- Set the dial gauge on a **machined inner face** and check vertical runout

 Technical data			
Vertical runout, front wheel		max 0.4 mm	

Result:

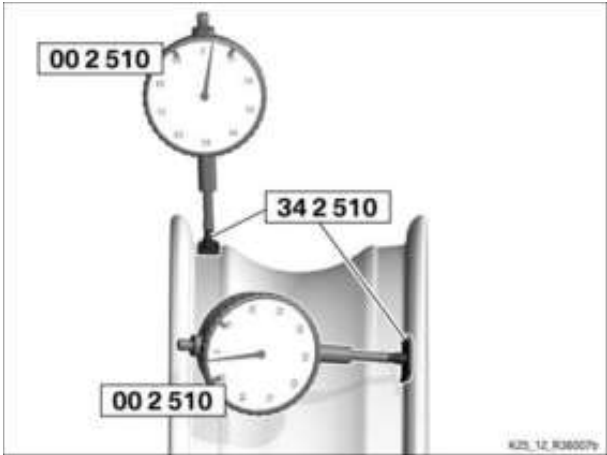
- Nominal value exceeded

Measure:

- Replace the wheel rim

(-) Check the runout of rear wheel rim

- Plumb balancing jig (No. 36 5 601) by adjusting adjustable feet (1) so that it is perfectly horizontal.
- Insert balancing shaft (No. 36 5 571) in front-wheel bearing and secure it with tensioner (No. 36 5 572), making sure that rear-wheel bearing is **lightly** preloaded.
- Push stops (No. 36 5 573) on to balancing shaft (No. 36 5 571) and seat the rear wheel rim in the balancer.
- Use stops (No. 36 5 573) to prevent the rear-wheel rim from slipping out of position.



Check

- Set dial gauge (No. 00 2 510) with measuring adapter (No. 34 2 510) on the **machined inner face** and check lateral runout.

 Technical data			
Lateral runout, rear wheel		max 0.4 mm	

Result:

- Nominal value exceeded

Measure:

- Replace the wheel rim

Check

- Set the dial gauge on a **machined inner face** and check vertical runout

 Technical data			
Vertical runout, rear wheel		max 0.4 mm	

Result:

- Nominal value exceeded

Measure:

- Replace the wheel rim

Technical data 0G02 - G 310 GS			
36 - Wheels and tyres			
Designation	Precondition	Value	Valid
36 30 - Motorcycle wheels			
Balance weight for the rear wheel One half of the weights must be attached to the left and the other half to the right of the wheel rim		max 80 g	
Permissible rear-wheel imbalance		max 45 g	
Balance weight for front wheel One half of the weights must be attached to the left and the other half to the right of the wheel rim		max 80 g	
Permissible front-wheel imbalance		max 5 g	
36 31 - Wheels with bearings			
Rear-wheel type		Aluminium cast wheel	
Rear wheel rim size		4.0 " x 17 "	
Vertical runout, rear wheel		max 0.4 mm	
Lateral runout, rear wheel		max 0.4 mm	
Front wheel type		Aluminium cast wheel	
Front wheel rim size		2.50-19 MTH2	
Vertical runout, front wheel		max 0.4 mm	
Lateral runout, front wheel		max 0.4 mm	
36 32 - Tyres			
Speed category, front/rear tyres	required at least 210 km/h	H	
Tyre designation, rear		150/70 R 17	
Wheel valve test pressure		4 bar	
Tyre pressure, rear	with cold tyre; one-up and two-up	1.9 bar	
Tyre pressure, front	with cold tyre; one-up and two-up	1.7 bar	
Tyre tread depth, front and rear	Wear limit, for Germany only	min 1.6 mm	
	Wear limit, outside Germany	Country-specific legal requirements	
Load index, rear tyre		69	
Load index, front tyre		59	
Tyre designation, front		110/80 R 19	

46 51 050 Replacing rear frame

+ 46 51 563

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing left frame cover

Removing right frame cover

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing luggage carrier

Removing right rear trim panel

Removing the left rear trim panel with the seat lock

Removing tail bottom section

Releasing wiring harness from rear frame

Removing tail section

Releasing battery carrier

Core activity

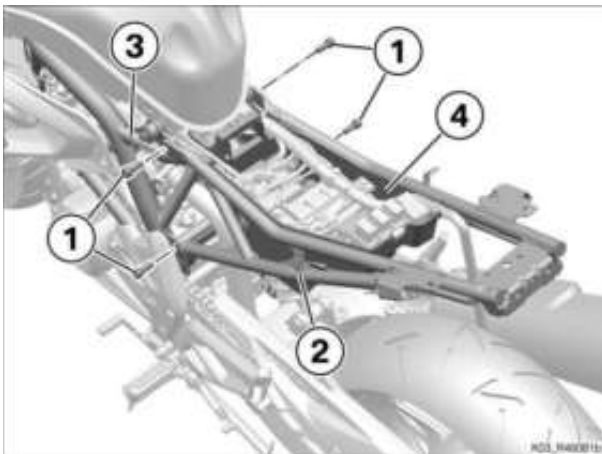
(-) Removing rear frame

ATTENTION

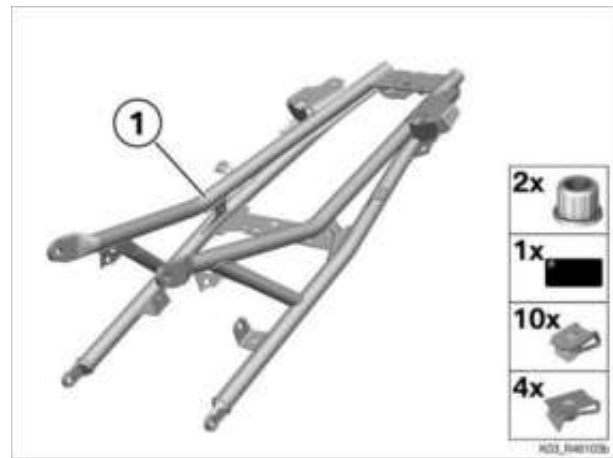
Use of hard or sharp-edged objects in proximity to component

Component damage

- Take care not to scratch components; cover or mask as necessary.



- Remove screws (1).
- Disengage rear frame (2) from main frame (3).
- Remove rear frame (2) and while doing so, pay attention to battery tray (4).



(-) Replacing rear frame

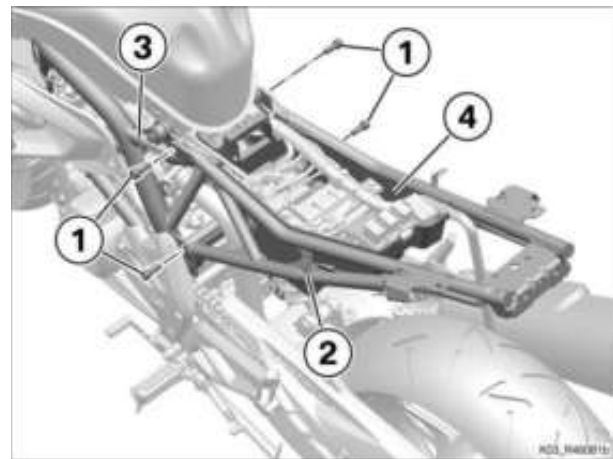
- Transfer reusable small parts to the new part (1) or replace these small parts if necessary.
- 1 x country specific label
- 6 x flat nut, M5
- 2 x caps
- **Replace flat nuts, M8.**
- 4 x flat nut, M8

(-) Installing rear frame

ATTENTION

Use of hard or sharp-edged objects in proximity to component
Component damage

- Take care not to scratch components; cover or mask as necessary.



- Clean the threads.
- Insert battery tray (4) in rear frame (2).
- Position rear frame (2) on main frame (3) and align.
- Install screws (1).

Tightening torques		
Rear frame to main frame		
M10 x 1.25 x 25 Thread-locking compound (Loctite 243, Medium strength)	45 Nm	

Follow-up work

- Securing battery carrier
- Installing tail section
- Securing wiring harness at rear frame
- Installing tail bottom section
- Installing the left rear trim panel with the seat lock
- Installing right rear trim panel
- Installing luggage carrier
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel

Installing seat

Installing right frame cover

Installing left frame cover

Final check of work performed

 46 51 120 Removing/installing frame

+ 46 51 575

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing engine spoiler

Installing engine lifter

Removing seat

Removing left frame cover

Removing right frame cover

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing top front-wheel cover

Removing front mask with windscreen

Removing instrument panel

Removing front panel carrier and fairing bracket

Removing fuel tank

Removing left radiator cowl

Removing engine control unit

Removing the controller

Removing right radiator cowl

Draining coolant

Removing expansion tank

Remove radiator with hoses

Removing idle actuator

Remove the intake air silencer

Remove the secondary air system shift valve and loosen the grounding cable from cylinder head

Disconnect connector for the oxygen sensor

Removing exhaust system

Removing pinion cover

Relieving chain tension

Removing pinion

Disengaging shift lever

Removing the left passenger seat catch support

Drain the front brake system

Draining rear brake circuit

Releasing brake-fluid reservoir, rear

Disconnecting brake lines from pressure modulator

Removing the right passenger seat catch support

Feed out cables for side-stand switch, wheel speed sensor line and rear brake lines

Removing rear-wheel cover

Releasing spring strut

Remove the swinging arm

Disengaging the throttle cable from pulley and from the holder for the carbon canister

Loosen clutch cable from manual controls for clutch control

Loosen the main wiring harness from right main frame

Loosen the main wiring harness from left main frame

Removing carbon canister with holder

Loosen feed line for alternator from main frame

Removing handlebars with top fork bridge and operating elements

Release the line for front wheel speed sensor

Removing the brake lines

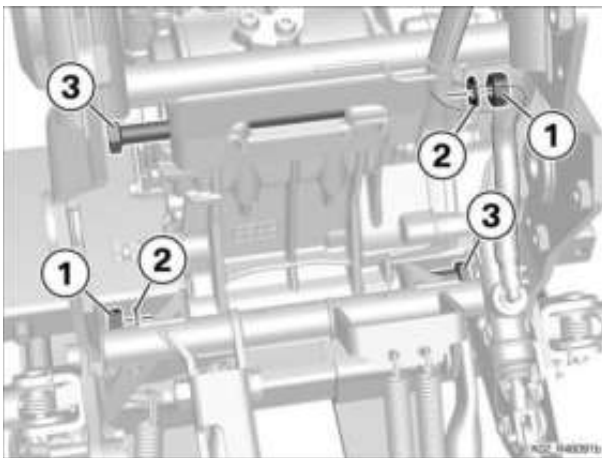
Removing front suspension with front wheel

Removing rear frame

Remove waste water hose from main frame

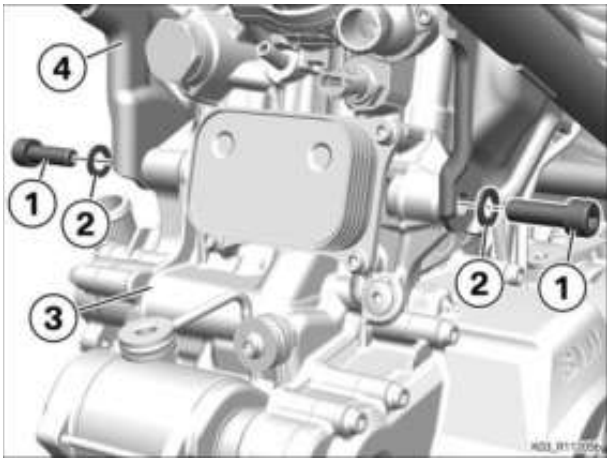
Core activity

(-) Removing main frame

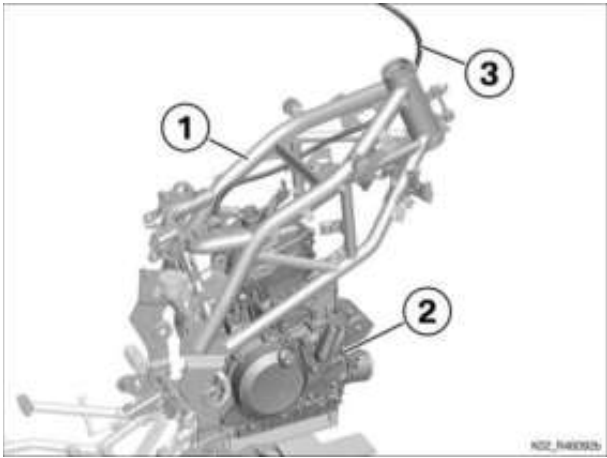


- Remove nuts (1) and washers (2) and while doing so, hold screws (3).
- Remove screws (3).

- Remove screws (1) and washers (2).
- Adjust engine (3) and main frame (4) with one another, if necessary.
- » Screws (1) are not tightened.

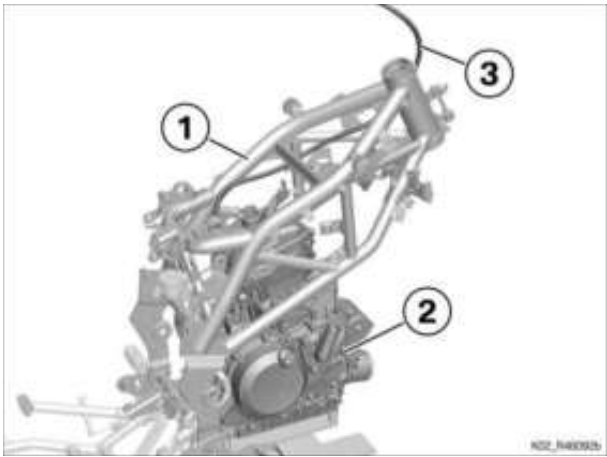


- Remove main frame (1) from engine (2), taking care on clutch cable (3).



(-) Installing main frame

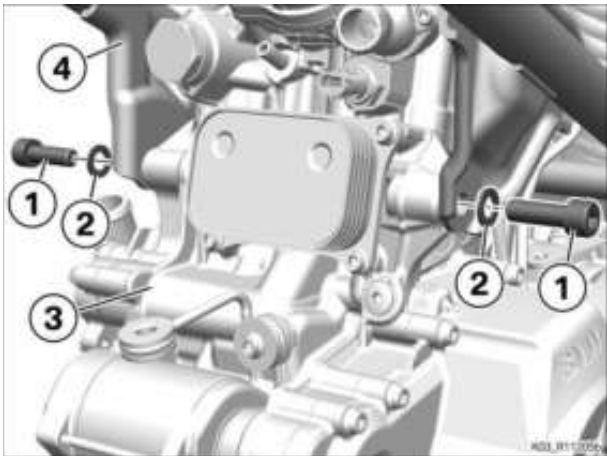
- Remove main frame (1) from engine (2), taking care on clutch cable (3).



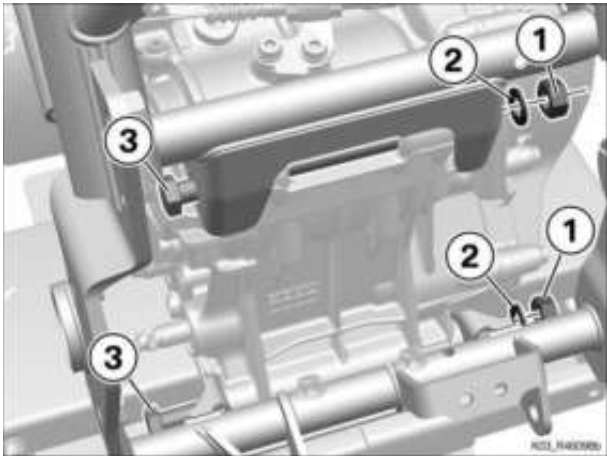
- Clean the threads.
- Apply thread-locking compound to screws (1).

 Thread-locking compound	
Loctite 270, High strength	83 19 2 210 337

- If required, align engine (3) in frame (4).



- Install screws (1) and washer (2), leaving them loose.

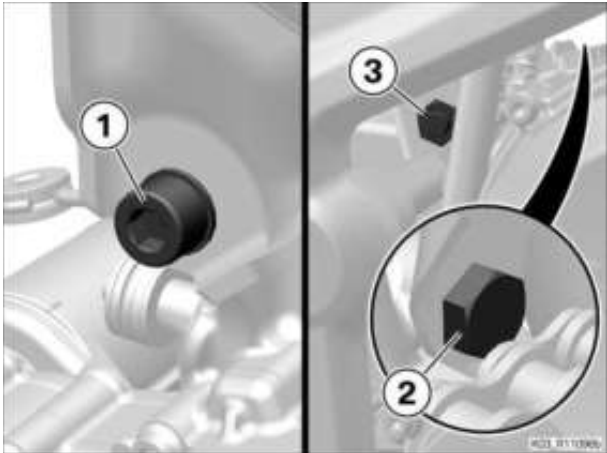


- Clean the threads.
- Apply thread-locking compound to screws (1).

 Thread-locking compound	
Loctite 270, High strength	83 19 2 210 337

- Insert screws (3) from the left.
- Install screws (1) and washer (2), leaving them loose.

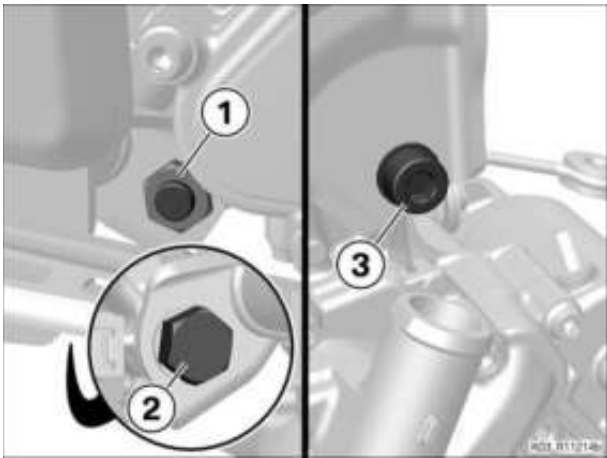
(-) Tighten engine screws



- Tighten screw (1).
- Tighten nut (2) while counter-holding screw (3).

- Tighten nut (1) while counter-holding screw (2).
- Tighten screw (3).

 Tightening torques	
Engine to frame	
Thread-locking compound (Loctite 270, High strength)	Tightening sequence: 1st step



	Attach the screw locking agent, loosely turn the screws with washers	
Engine to frame at front left, M10 x 30	Tightening sequence: 2nd step	
	45 Nm	
Engine to frame at top rear, M10 x 150	Tightening sequence: 3rd step	
	Nut, 45 Nm	
Engine to frame at bottom rear, M10 x 150	Tightening sequence: 4th step	
	Nut, 45 Nm	
Engine front right to frame, M10 x 30	Tightening sequence: 5th step	
	45 Nm	

Follow-up work

- Install dirty water hose in main frame
- Installing rear frame
- Installing front suspension with front wheel
- Install brake line
- Secure line for front wheel speed sensor
- Install handlebars with top fork bridge and armature
- Secure feed line of alternator to the main frame
- Mount carbon canister with holder
- Install main wiring harness to main frame left.
- Install main wiring harness to main frame right.
- Secure clutch cable in manual controls for clutch control
- Checking/adjusting clutch play
- Securing the throttle cable in holder for carbon canister and in the pulley
- Installing swinging arm
- Securing spring strut
- Tightening the spring strut
- Installing rear-wheel cover
- Route rear brake lines, wheel speed sensor line and cable for side-stand switch
- Installing the right passenger seat catch support
- Securing brake lines to pressure modulator
- Securing rear brake-fluid reservoir
- Filling/bleeding rear brake circuit

- Filling/bleeding front brake system
- Installing the left passenger seat catch support
- Securing selector lever
- Installing pinion
- Adjust chain sag
- Installing pinion cover
- Installing exhaust system
- Connect connector for oxygen sensor
- Installing secondary air system shift valve and securing the grounding cable to the cylinder head
- Install the intake air silencer
- Installing idle actuator
- Install radiator with hoses
- Filling cooling system
- Installing right radiator cowl
- Install controller
- Installing engine control unit
- Installing left radiator cowl
- Installing fuel tank
- Installing front panel carrier and fairing bracket
- Installing instrument panel
- Installing front mask with windscreen
- Installing top front-wheel cover
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing right frame cover
- Installing left frame cover
- Installing seat
- Removing engine lifter
- Installing engine spoiler
- Checking headlight beam throw
- Final check of work performed

 46 51 180 Checking motorcycle with frame- measuring system

+ 46 51 676

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing one screw from handlebar clamp

Core activity

(-) Checking vehicle with frame measuring system

- Use the frame measuring system recommended by **BMW Motorrad**.

Follow-up work

Installing screw of handlebar clamp

Final check of work performed

46 51 520 Replacing frame (frame removed)

Preparatory work

Removing the holder

Removing chain roller

Removing side-stand switch

Removing tension springs for side stand

Removing side stand

Removing the gearshift lever with the gearshift linkage

Removing front left footrest

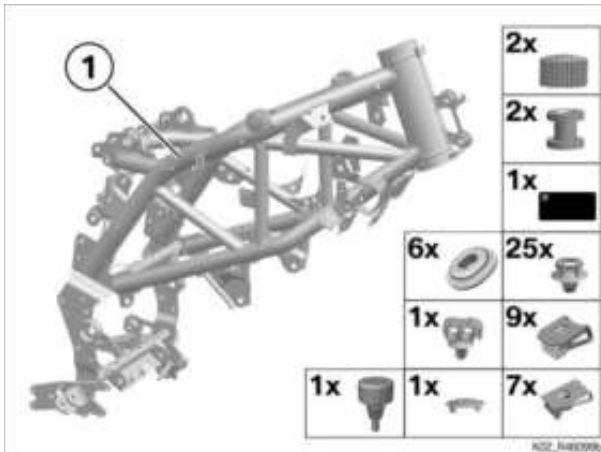
Removing front right footrest

Removing the holder for the exhaust system

Removing footbrake cylinder

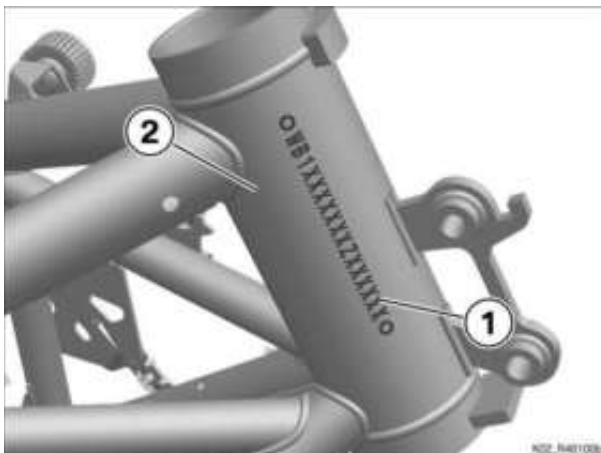
Core activity

(-) Replacing frame



• Transfer reusable small items to new part (1) or replace the small items as necessary.

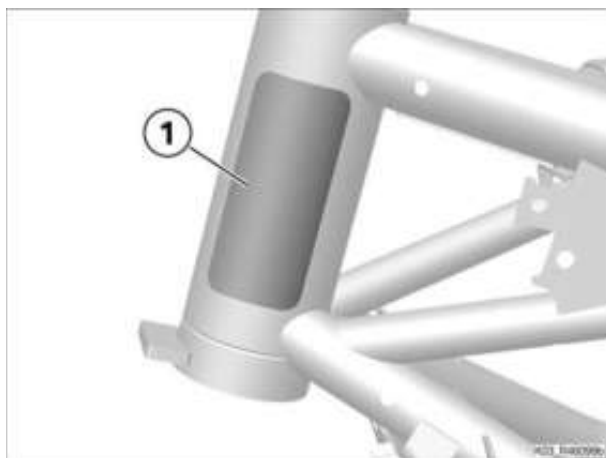
- 1 x buffer
- 6 x grommet
- 1 x brake-line holder
- 1 x protective cap
- 2 x spacer buffer
- 2 x rubber part
- 1 x country specific label
- 25 x cable-tie holder
- 9 x flat nut, M5
- 6 x flat nut, M6



• Transfer Vehicle Identification Number (VIN) (1) to new frame (2), using number and letter punches, and spray the area with clear lacquer to seal it.

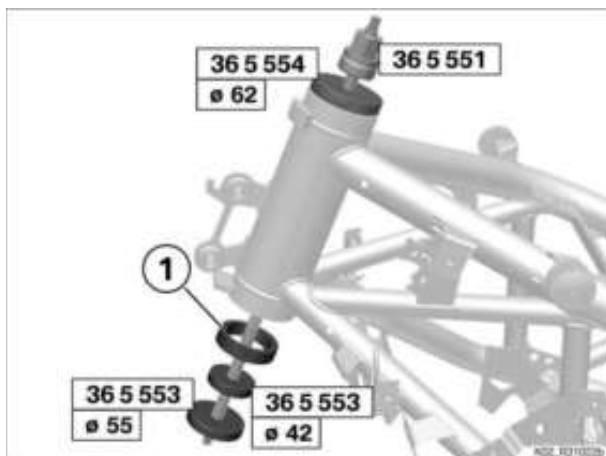
• Allow the clear lacquer to dry and apply adhesive film over the VIN.

• Dispose of the defective frame in accordance with locally applicable legislation.

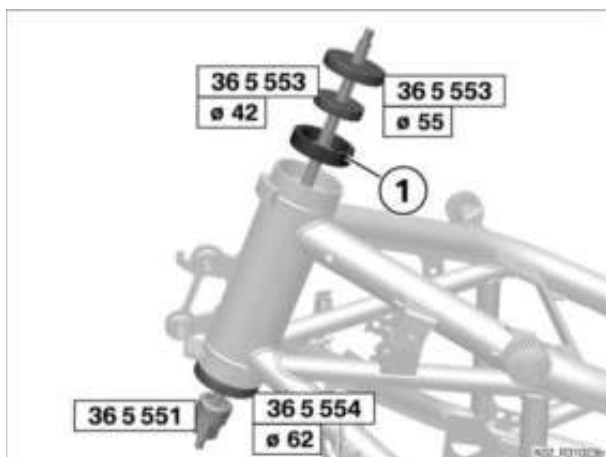


- Clean the surface for the adhesive and affix protective film (1).

► Installing outer races of steering-head bearing



- Clean bearing seats in frame.
- Install bottom bearing shell (1) with long spindle (No. 36 5 551), contact discs 55 mm and 42 mm with thread (No. 36 5 553) and contact disc 62 mm without thread (No. 36 5 554) up to the limit position.

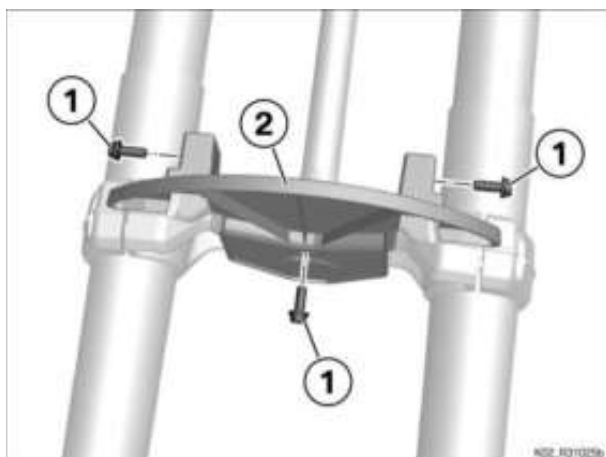
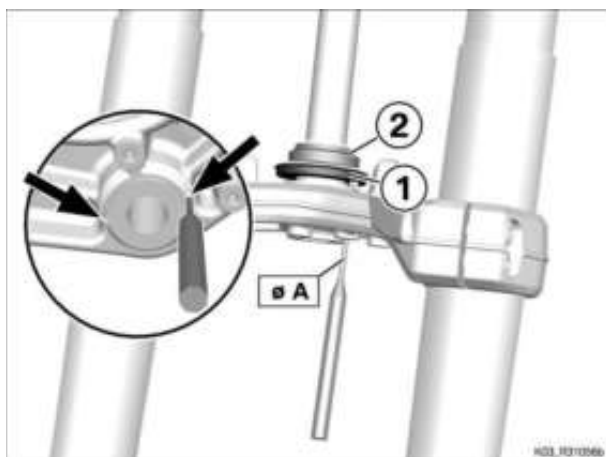
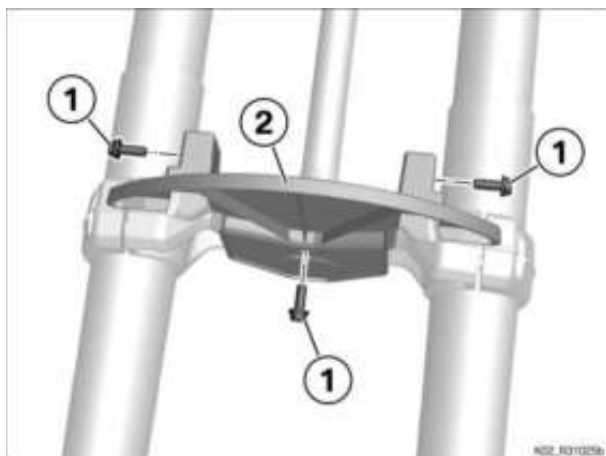


- Install top bearing shell (1) with long spindle (No. 36 5 551), contact discs 55 mm and 42 mm with thread (No. 36 5 553) and 62 mm contact disc (No. 36 5 554) up to the limit position.



► Removing inner ring for steering-head bearing from fork bridge

- Remove screws (1) and remove cover (2).



ATTENTION

Driving out steering-head bearing with a punch that is too small

Damage to fork bridge

- Use a punch that is a snug fit the hole.
- Remove dust cap (1) and inner ring (2) using a punch, while doing so, avoid a tilting of the inner ring (2) by using the existing bore holes (Arrow) alternately.



Technical data

Diameter (A) of punch

5 mm

- Position cover (2) and install screws (1).

Installing inner ring for steering-head bearing on fork bridge

- Clean seat of inner ring (1).
- Install new dust cap (2).
- Install inner ring (1) with suitable pipe to the limit position.



Follow-up work

Installing footbrake cylinder

Installing the holder for the exhaust system

Installing front right footrest

Install the front left footrest

Installing the gearshift lever with gearshift linkage

Installing side stand

Installing tension springs for side stand

Installing side-stand switch

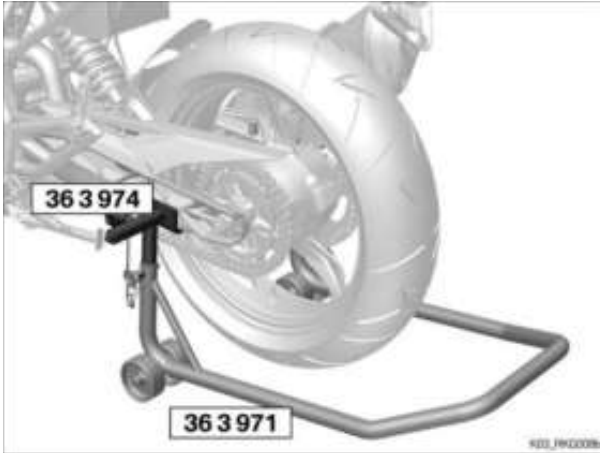
Installing chain roller

Installing holder

46 52 510 Removing and installing the rear-wheel stand special tool (motorcycles without centre stand)

Core activity

(-) Placing motorcycle on rear-wheel stand



- Insert mounts (No. 36 3 974) into basic stand (No. 36 3 971), use the pins to adjust the height.
- Manoeuvre the rear-wheel stand into position, making sure that the axle is not blocked.
- Seat mounts (No. 36 3 974) against the swinging arm and tighten the clamping screws to secure.

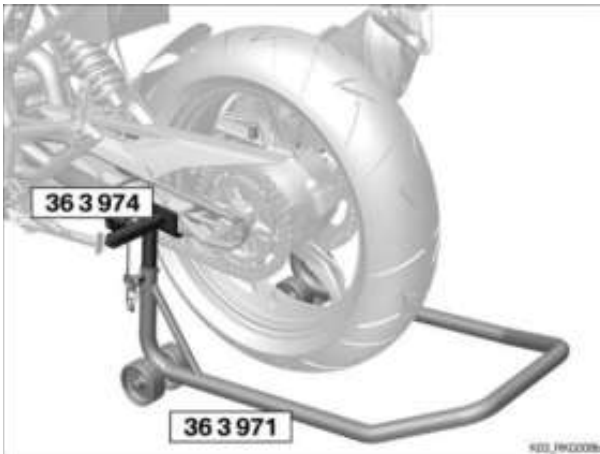
ATTENTION

Vehicle toppling to side

Risk of damage to parts if vehicle topples

- Make sure that the vehicle is secured so that it cannot topple sideways.
-
- Hold the motorcycle upright and at the same time press the stand down until the motorcycle is level and the handle of the rear-wheel stand is on the ground.

(-) Removing motorcycle from rear-wheel stand



- Extend the side stand.

ATTENTION

Vehicle toppling to side

Risk of damage to parts if vehicle topples

- Make sure that the vehicle is secured so that it cannot topple sideways.
-
- If applicable, remove the straps.
 - Secure the vehicle to ensure that it cannot topple and slowly lower it, remove rear-wheel stand (No. 36 3 971).
 - Place the motorcycle on its side stand.

46 53 000 Removing/installing or replacing side stand

+ 46 53 601

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Disengaging switch for side stand

Core activity

(-) Removing side stand

► Removing tension springs for side stand

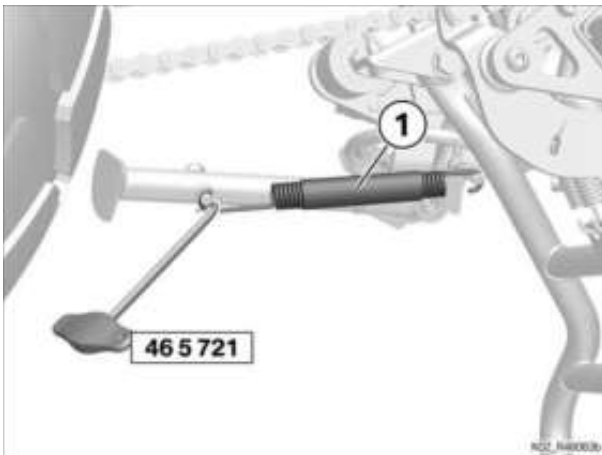
CAUTION

Components spring-loaded

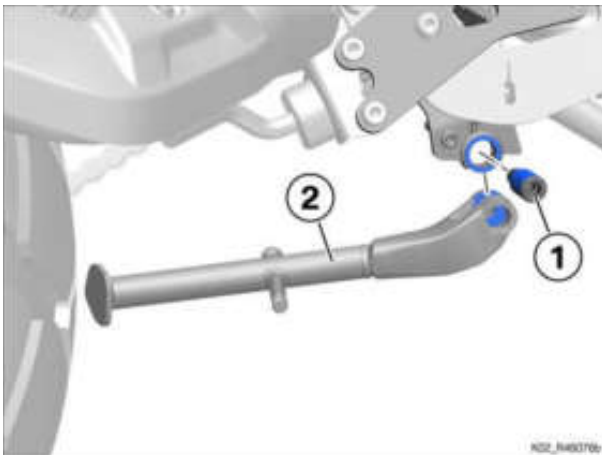
Risk of injury caused by flying parts

- Wear safety goggles.
- Carefully relieve and, as applicable, apply spring tension.

- Remove tension springs (1), using hook (No. 46 5 721).

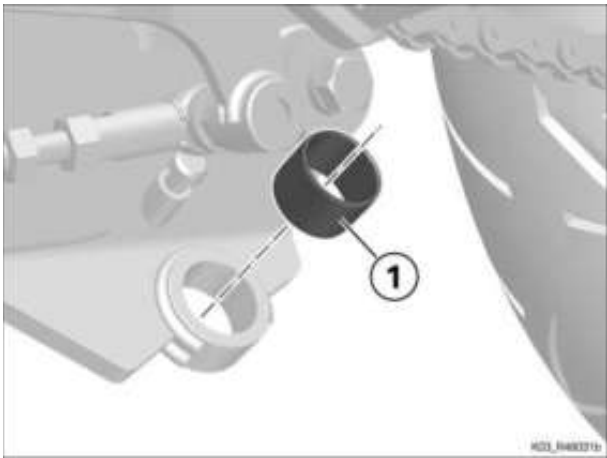


- Remove screw (1).
- Remove side stand (2).



(-) Check the bearing bushing

- Check bearing bushing (1) for scores, damage, etc.



Check

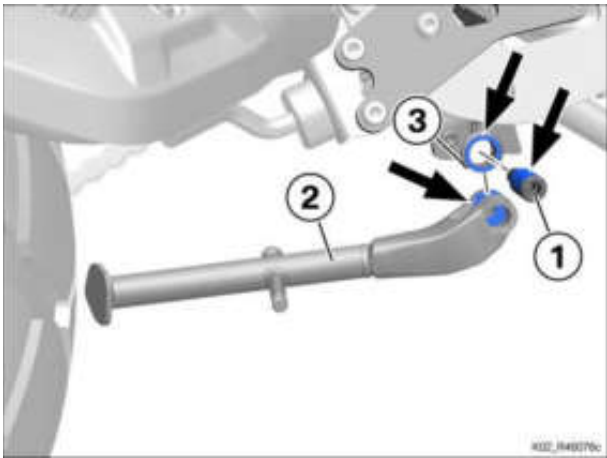
Result:

- Bearing bushing is worn.

Measure:

=> 46 53 501, Replacing pivot mount for side stand (side stand removed)
(Billed as a separate item)

(-) Installing side stand



- Lubricate screw (1), side stand (2) and pivot mount (3) at the points indicated (arrows).

 Lubricant	
Klüberplex BE 11-462	83 22 0 397 761

- Clean the threads.
- Hold side stand (2) in position.
- Install handlebar end plug (1).

 Tightening torques		
Side stand to frame		
M10 Thread-locking compound (Loctite 243, Medium strength)	38 Nm	

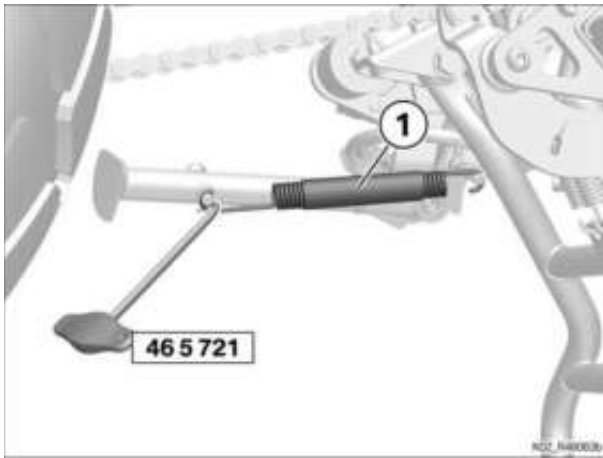
► Installing tension springs for side stand

 CAUTION

Components spring-loaded

Risk of injury caused by flying parts

- Wear safety goggles.
- Carefully relieve and, as applicable, apply spring tension.



- Install tension springs (1), using hook (No. 46 5 721).



Follow-up work

Securing side-stand switch

Final check of work performed

 46 53 007 Replacing side stand pivot

+ 46 53 507

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

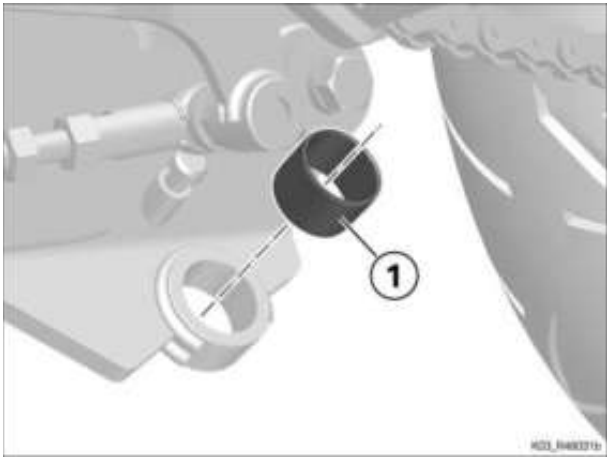
Disengaging switch for side stand

Removing side stand

Core activity

(-) Replacing bearing bushing of side stand

- Replace bearing bushing (1), using a suitable tool.
- Lubricate bearing bushing (1).



 Lubricant	
Klüberplex BE 11-462	83 22 0 397 761

Follow-up work

Installing side stand

Securing side-stand switch

Final check of work performed

46 53 011 Renewing tension spring for prop stand

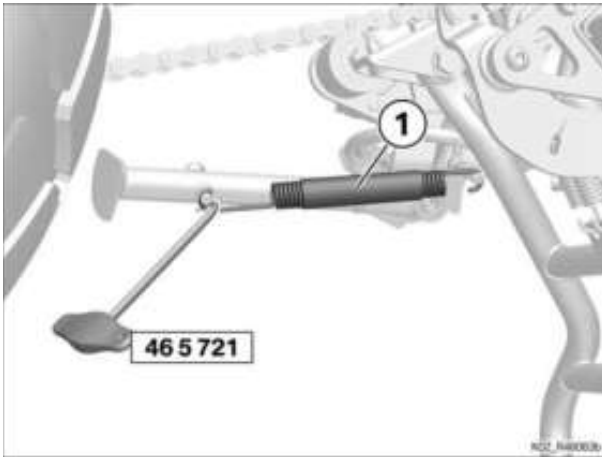
+ 46 53 602

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

(-) Removing tension springs for side stand



CAUTION

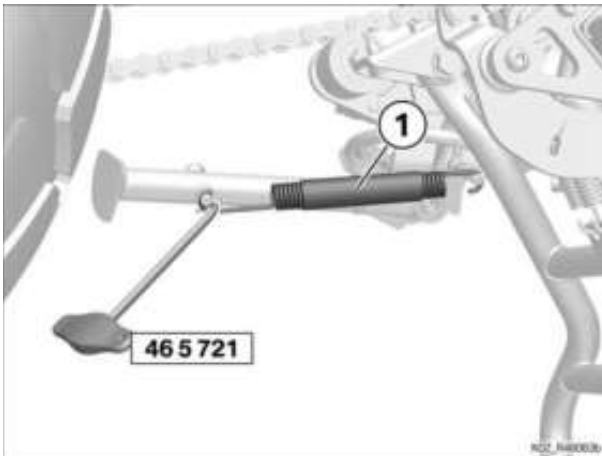
Components spring-loaded

Risk of injury caused by flying parts

- Wear safety goggles.
- Carefully relieve and, as applicable, apply spring tension.

- Remove tension springs (1), using hook (No. 46 5 721).

(-) Installing tension springs for side stand



CAUTION

Components spring-loaded

Risk of injury caused by flying parts

- Wear safety goggles.
- Carefully relieve and, as applicable, apply spring tension.

- Install tension springs (1), using hook (No. 46 5 721).

Follow-up work

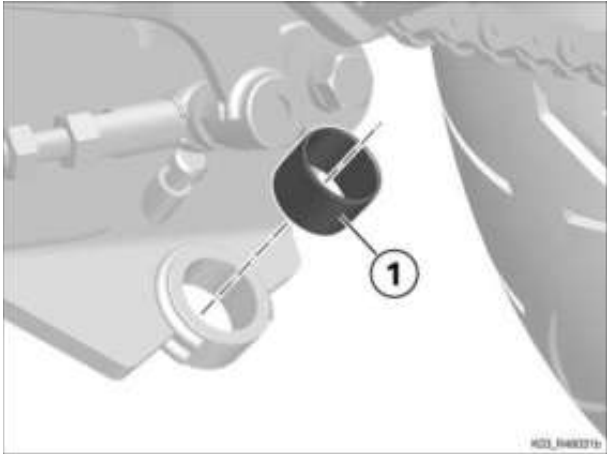
Final check of work performed

 46 53 501 Replacing pivot mount for side stand (side stand removed)

Core activity

(-) Replacing bearing bushing of side stand

- Replace bearing bushing (1), using a suitable tool.
- Lubricate bearing bushing (1).



	
Lubricant	
Klüberplex BE 11-462	83 22 0 397 761

46 54 200 Removing/installing or replacing luggage carrier

+ 46 54 505

Preparatory work

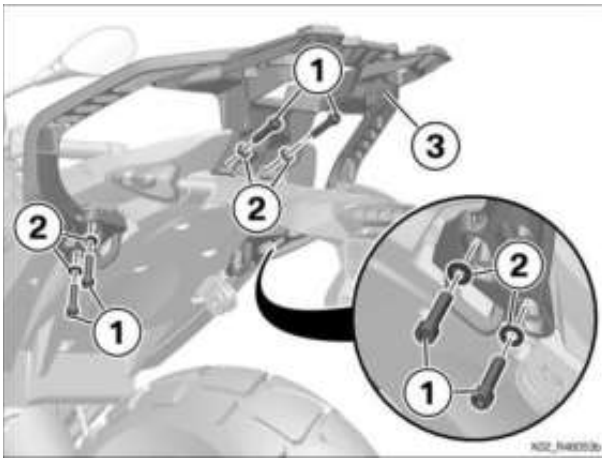
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Core activity

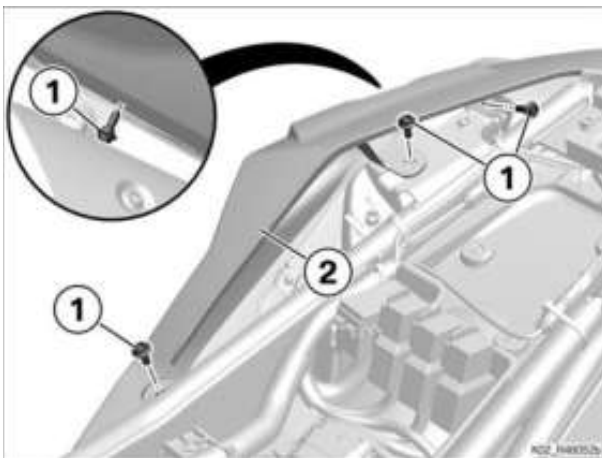
(-) Removing luggage carrier

- Remove screws (1) with washers (2) and remove luggage carrier (3).



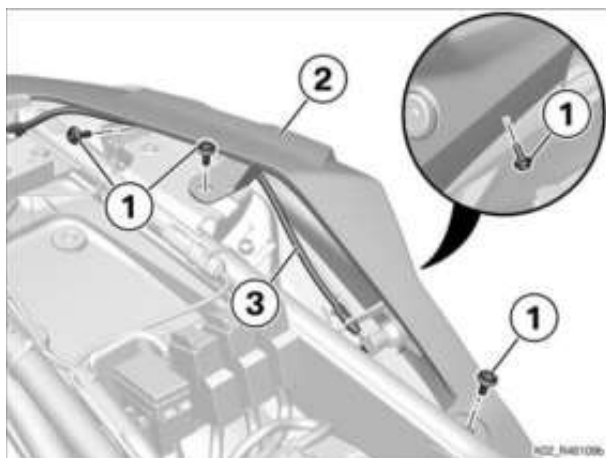
(-) Removing right rear trim panel

- Remove screws (1) and remove rear trim panel (2).



(-) Removing left rear trim panel

- Remove screws (1) and disengage rear trim panel (2) and let it hang on Bowden cable (3).



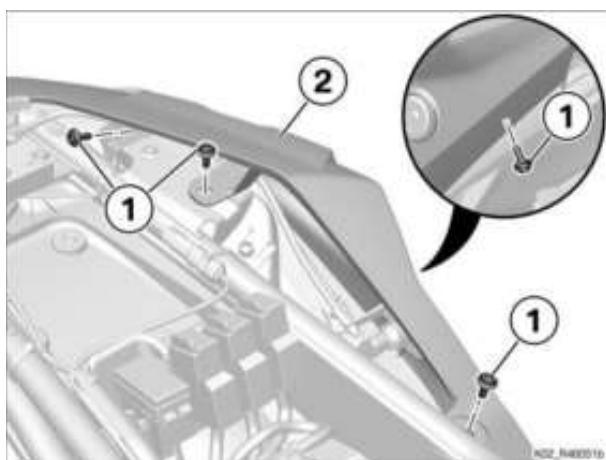
(-) Replacing the M8 flat nut on rear frame

- Replace M8 flat nuts (1).



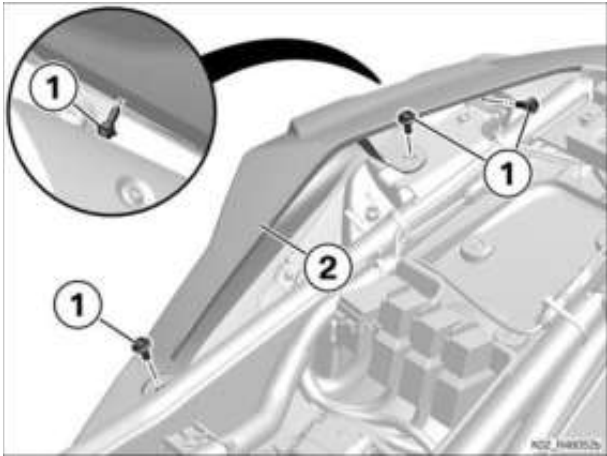
(-) Securing left rear trim panel

- Position rear trim panel (2) and install screws (1).



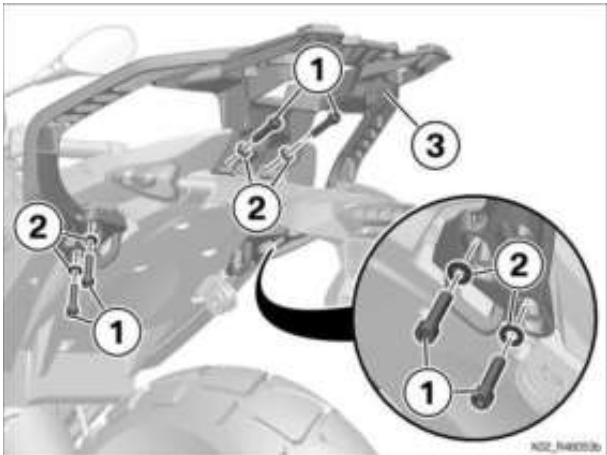
(-) Installing right rear trim panel

- Position rear trim panel (2) correctly and install screws (1).



(-) Installing luggage carrier

- Place luggage carrier (3) in position.
- Install screws (1) with washers (2).



 Tightening torques		
Luggage carrier to rear frame		
M8 x 35, Renew flat nuts	19 Nm	

Follow-up work

Installing seat

Final check of work performed

46 61 021 Replacing air guide

+ 46 61 521

Preparatory work

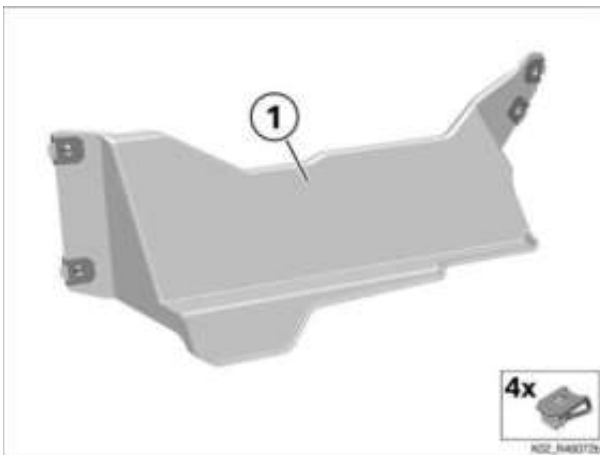
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing air guide

Core activity

(-) Replacing the air duct

- Remount flat nuts on new air duct (1).



Follow-up work

Installing air guide

Final check of work performed

 46 61 030 Remove/install or replace top front wheel cover

+ 46 61 505

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

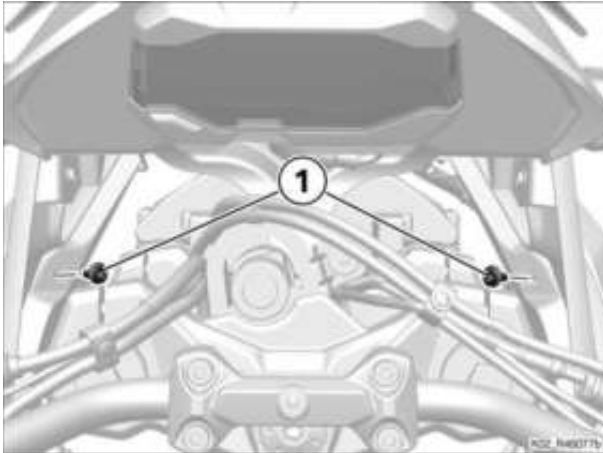
Removing the cover for right intake snorkel

Removing cover for fuel tank

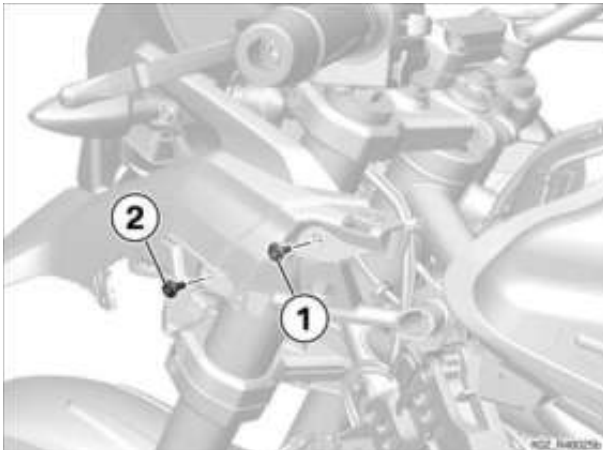
Core activity

(-) Removing top front-wheel cover

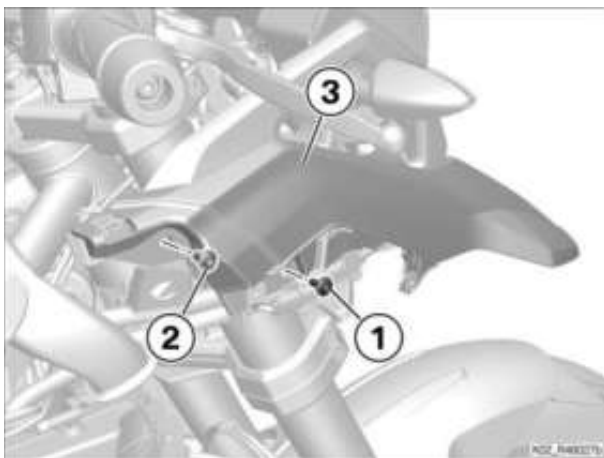
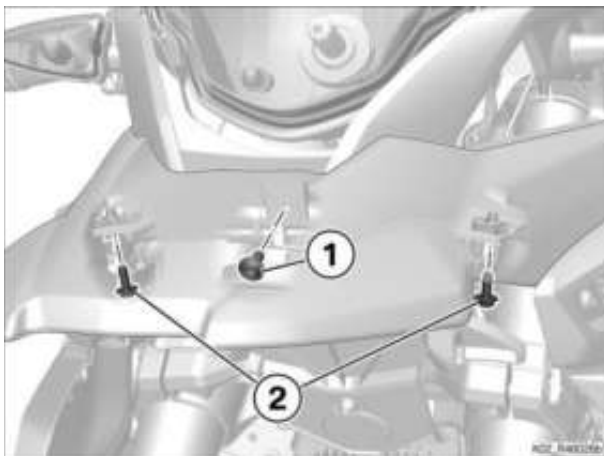
- Remove screws (1).



- Remove bolt without collar (1).
- Remove bolt with collar (2).



- Remove bolt with collar (1).
- Remove bolt without collar (2).



- Remove bolt with collar (1).
- Remove bolt without collar (2).
- Remove top front-wheel cover (3).

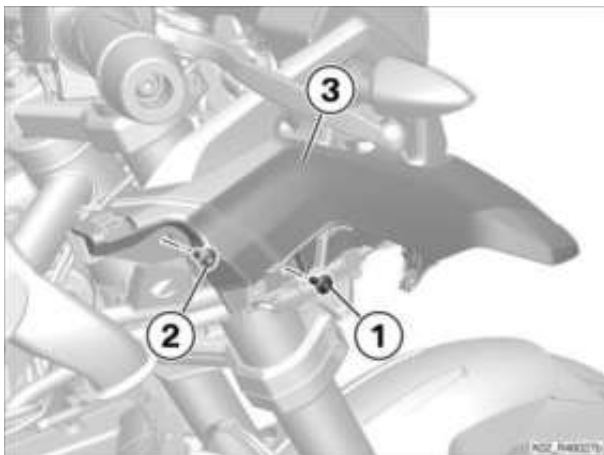
(-) Installing top front-wheel cover

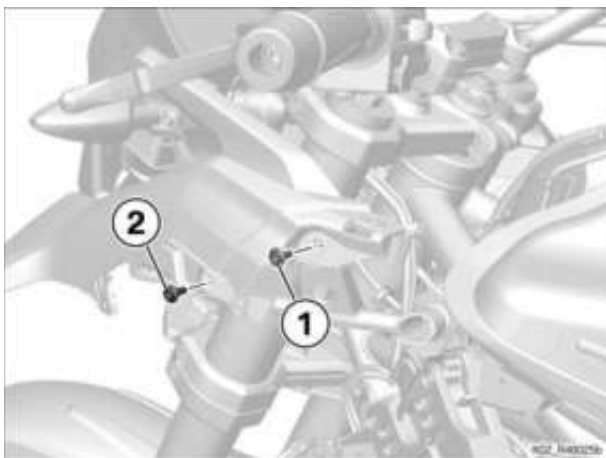
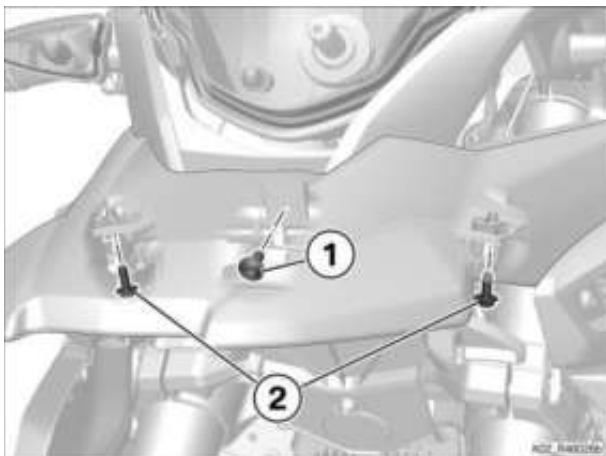
ATTENTION

Use of hard or sharp-edged objects in proximity to component

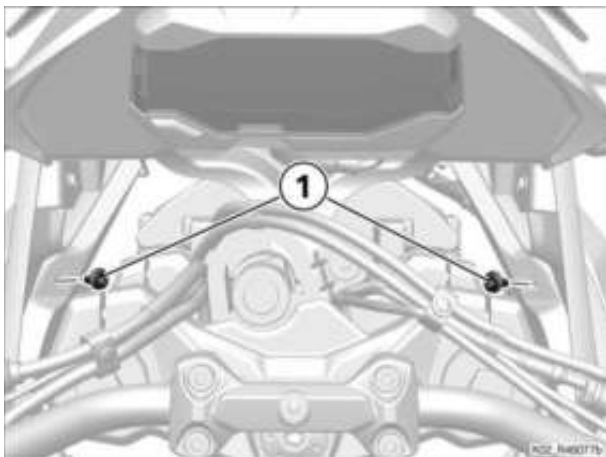
Component damage

- Take care not to scratch components; cover or mask as necessary.
-
- Position top front-wheel cover (3) correctly and install bolt without collar (2).
 - Install screw with collar (1).
-
- Install screws without collar (2).
 - Install screw with collar (1).





- Install screw with collar (2).
- Install screw without collar (1).



- Install screws (1).

Follow-up work

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

 46 61 037 Removing/installing front-wheel cover, bottom

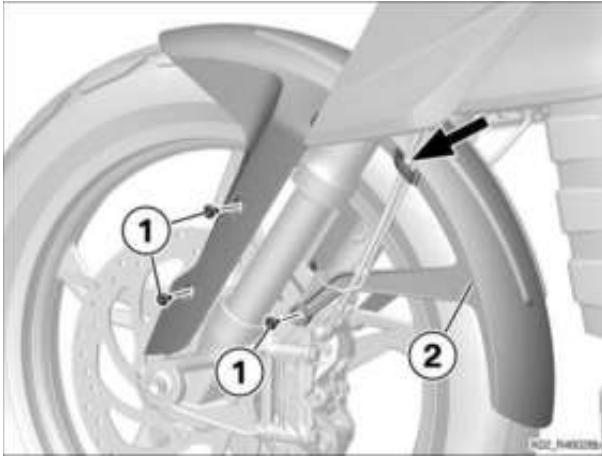
+ 46 61 506

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

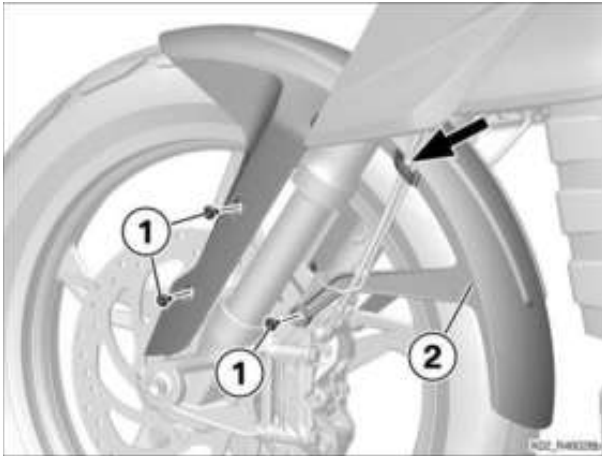
Core activity

(-) Removing front-wheel cover



- Remove screws (1) on left and right.
- Detach brake hose and cable (arrow).
- Work front-wheel cover (2) forward to remove.

(-) Installing front-wheel cover



- Hold the front-wheel cover (2) in the correct position and install screws (1) on left and right.
- Attach brake hose and cable (arrow).

Follow-up work

Final check of work performed

46 62 000 Replacing rear-wheel cover

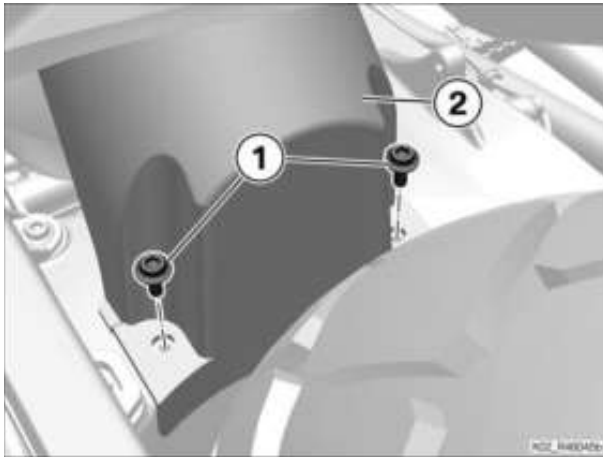
+ 46 62 502

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

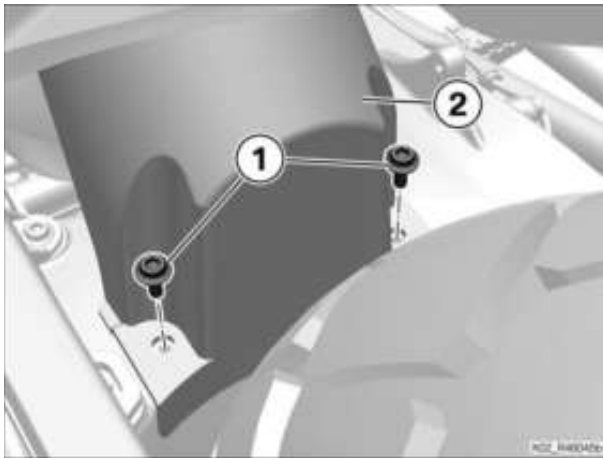
Core activity

(-) Removing rear-wheel cover



- Remove screws (1) and remove rear wheel cover (2).

(-) Installing rear-wheel cover



- Hold rear wheel cover (2) in position and install screws (1).

Follow-up work

Final check of work performed

46 62 050 Renewing number plate carrier

+ 46 62 508

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing luggage carrier

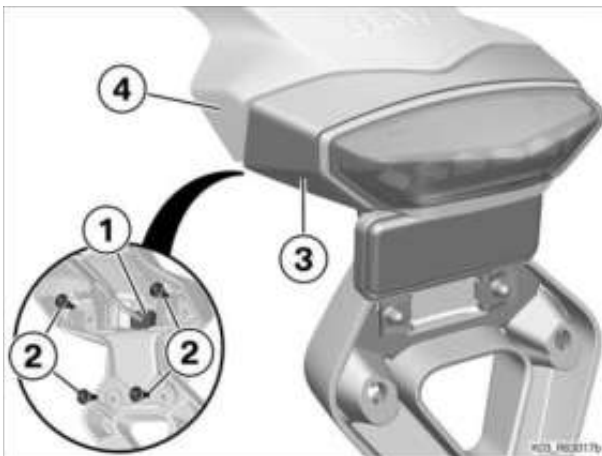
Removing right rear trim panel

Removing left rear trim panel

Removing tail bottom section

Core activity

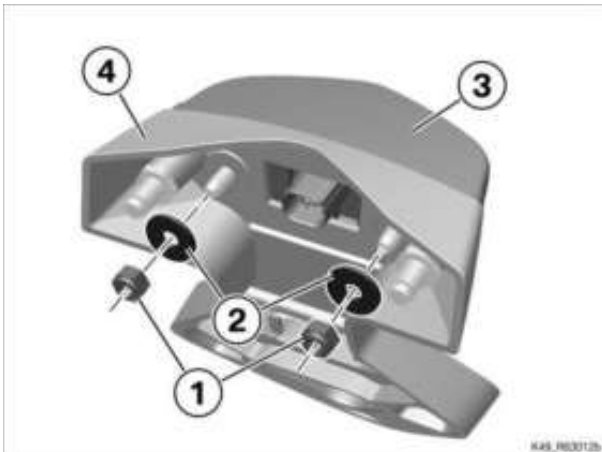
(-) Removing number plate carrier with rear light



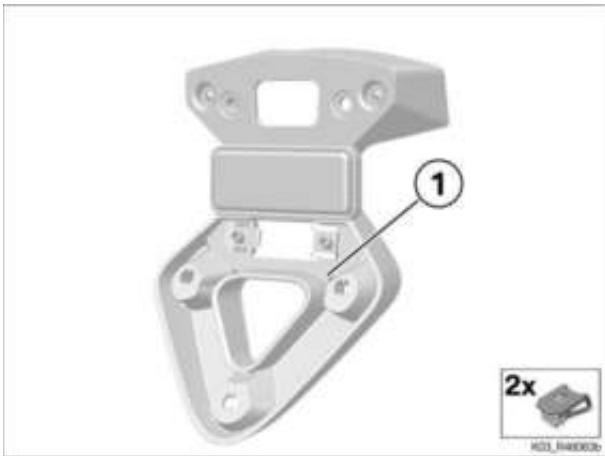
- Disconnect connector (1) for rear light.
- Remove screws (2).
- Remove number plate carrier with rear light (3) from tail section (4).

(-) Replacing number-plate carrier

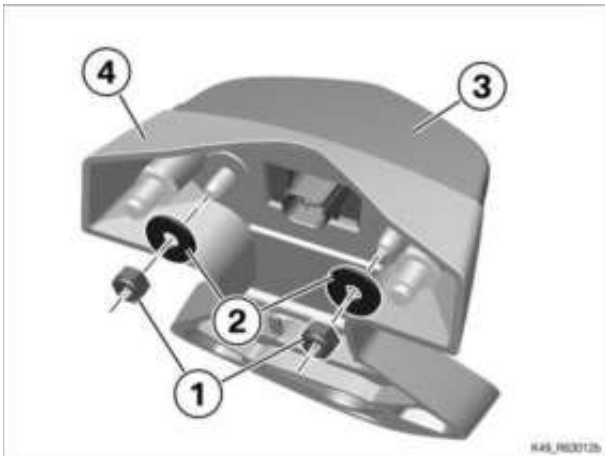
► Removing rear-light unit



- Remove nuts (1) and washers (2).
- Remove rear light (3) from number plate carrier (4).



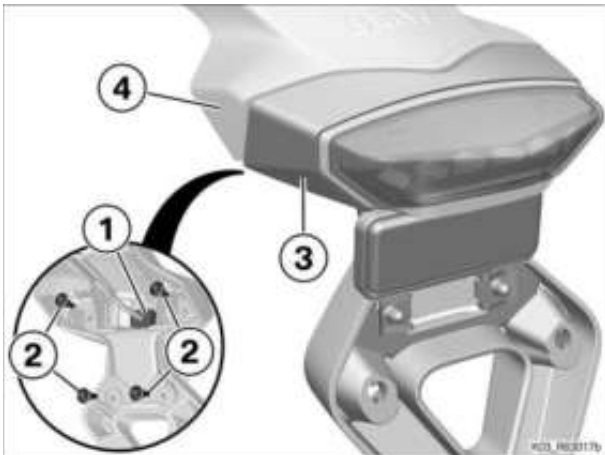
- Convert reusable small parts on new part (1) or renew by new ones.



► Installing rear-light unit

- Insert rear light (3) in number plate carrier (4).
- Install washers (2) and nuts (1).

 Tightening torques		
Rear light to number-plate carrier		
M6	4 Nm	



◀ (-) Installing the number plate carrier with rear light

- Position number plate carrier with rear light (3) on tail section (4).
- Install screws (2).
- Connect connector (1) for rear light.

Follow-up work

- Replacing the M8 flat nut on rear frame
- Installing tail bottom section
- Installing left rear trim panel
- Installing right rear trim panel

Installing luggage carrier

Installing seat

Final check of work performed

46 62 054 Replacing bottom section of tail

+ 46 62 514

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

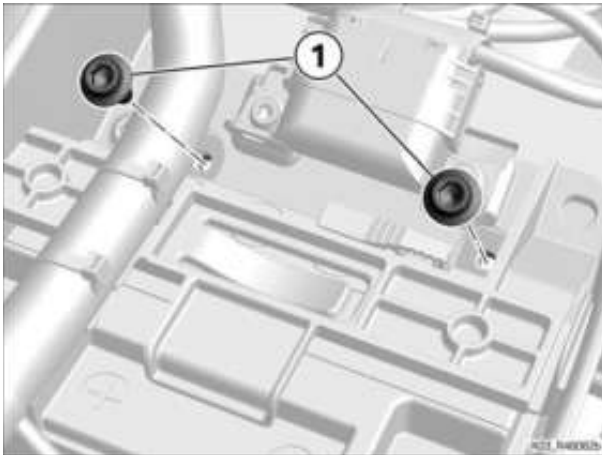
Removing luggage carrier

Removing right rear trim panel

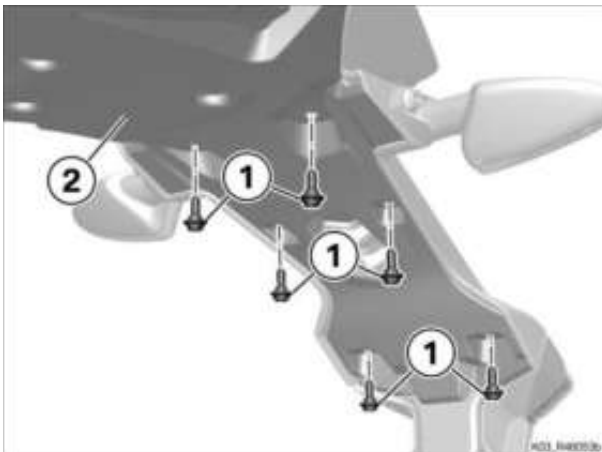
Removing left rear trim panel

Core activity

(-) Removing tail bottom section



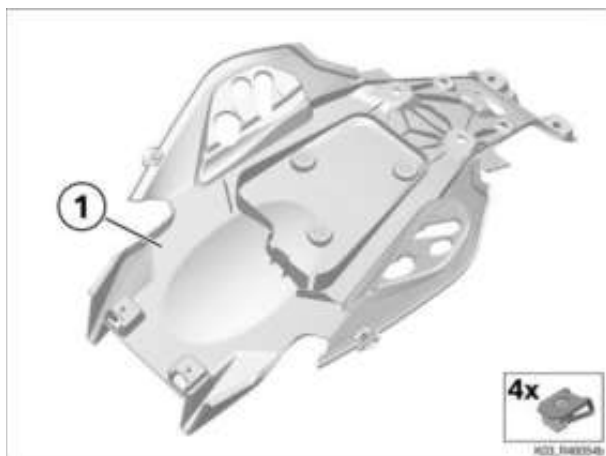
- Remove screws (1).



- Remove screws (1) and remove tail bottom section (2).

(-) Replace the tail bottom section

- Convert reusable small parts on new part (1) or renew by new ones.



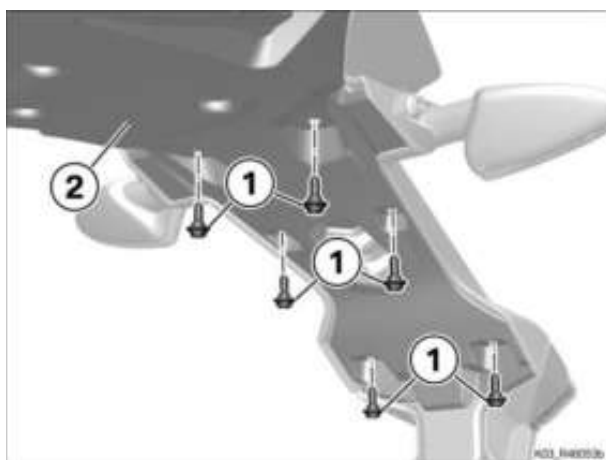
(-) Replacing the M8 flat nut on rear frame

- Replace M8 flat nuts (1).

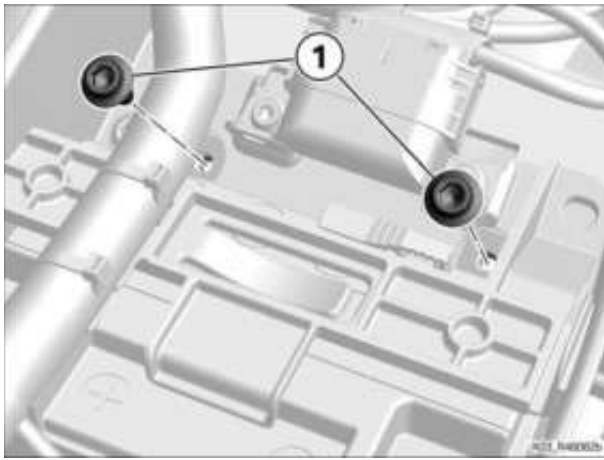


(-) Installing tail bottom section

- Hold rear trim panel (2) in position and install screws (1).



- Install screws (1).



Follow-up work

Securing left rear trim panel

Installing right rear trim panel

Installing luggage carrier

Installing seat

Final check of work performed

46 62 055 Replacing rear section

+ 46 62 509

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing luggage carrier

Removing right rear trim panel

Removing left rear trim panel

Removing tail bottom section

Removing number plate carrier with rear light

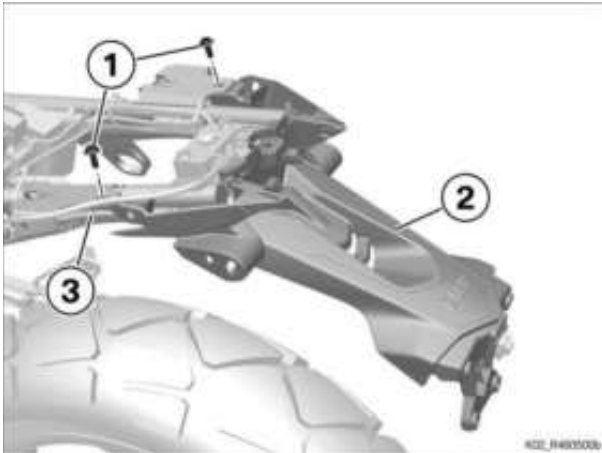
Removing rear left flashing turn indicator

Removing rear right flashing turn indicator

Core activity

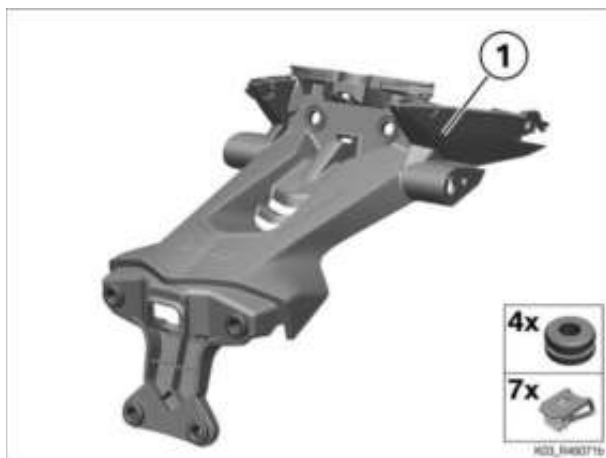
(-) Removing tail section

- Remove screws (1).
- Remove tail section (2) from rear frame (3).



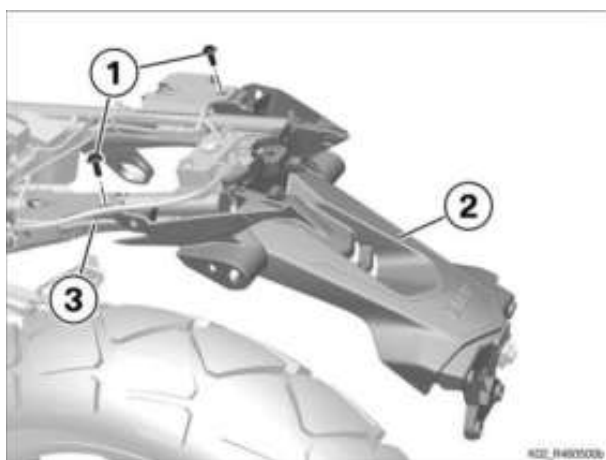
(-) Replacing tail section

- Transfer reusable small items to new part (1) or replace the small items as necessary.



(-) Installing tail section

- Position tail section (2) on rear frame (3).
- Install screws (1).



Follow-up work

Replacing the M8 flat nut on rear frame

Installing rear right turn indicator

Installing rear left turn indicator

Installing the number plate carrier with rear light

Installing tail bottom section

Securing left rear trim panel

Installing right rear trim panel

Installing luggage carrier

Installing seat

Final check of work performed

46 63 018 Replacing left badge carrier

+ 46 63 713

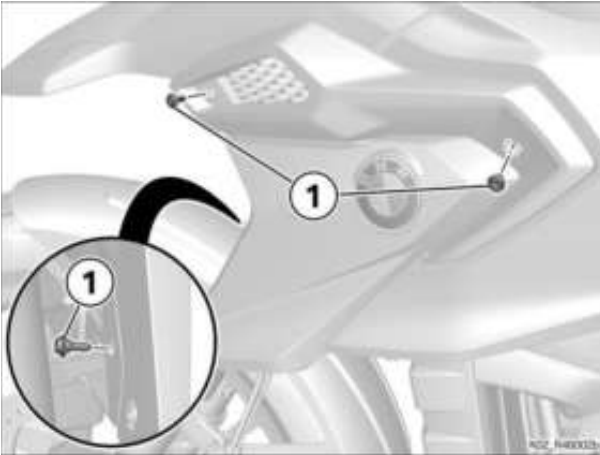
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

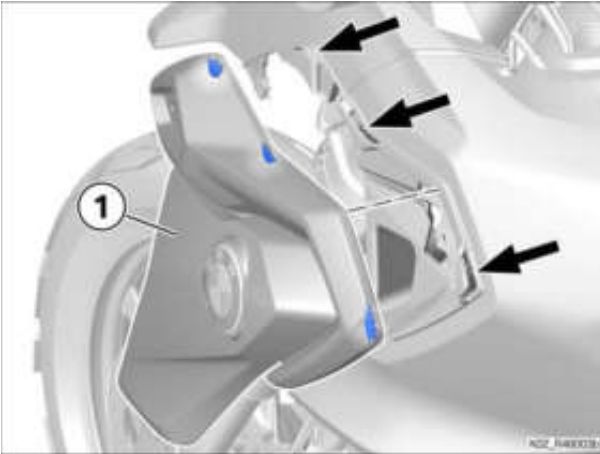
Core activity

(-) Removing cover for left intake snorkel

- Remove screws (1).

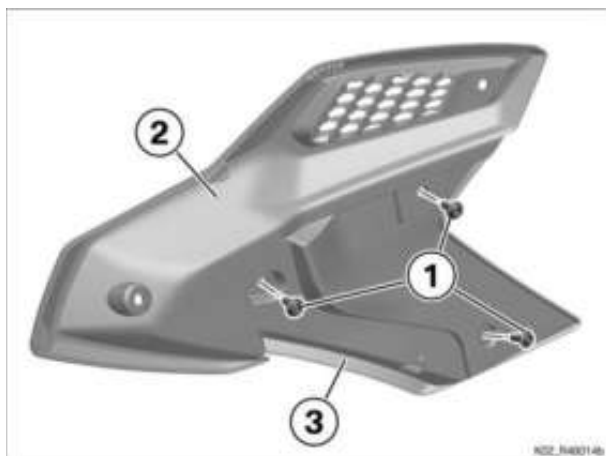


- Detach cover for intake snorkel (1) out of retaining lugs (arrow) to the top rear and remove.



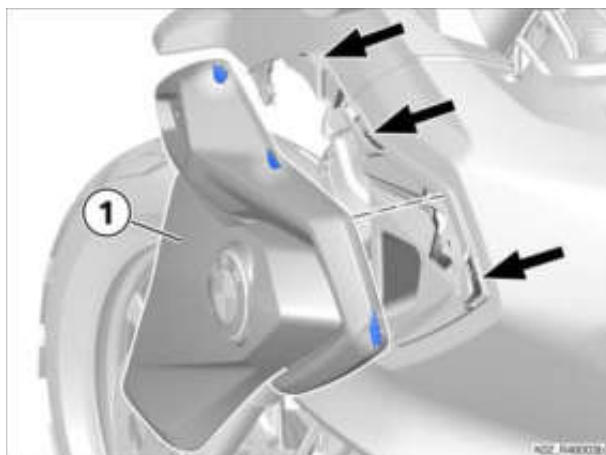
(-) Replacing badge carrier, left

- Remove screws (1).
- Remove cover for intake snorkel (2) from badge holder (3).



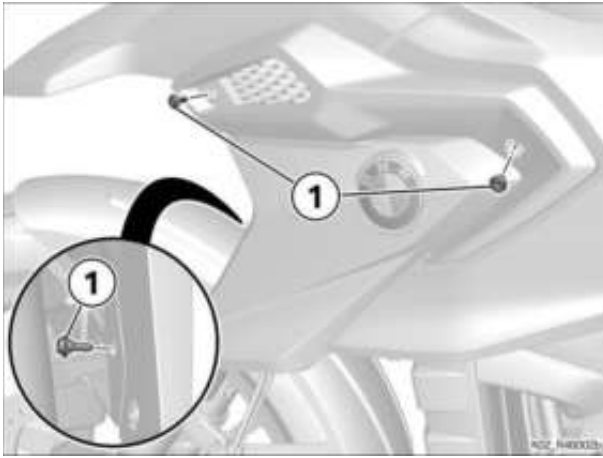
- Remount flat nuts (1) from old onto new badge holder (2).
- Remove badge (3) from badge holder (2), loosening the locators (arrow) while doing so.
- Install badge (3) in new badge holder (2), making sure that the locators (arrows) engage.

(-) Installing cover for left intake snorkel



- Position cover for intake snorkel (1) and attach in retaining lugs (arrows).

- Install screws (1).



Follow-up work

Final check of work performed

46 63 025 Replacing left radiator cowl

+ 46 63 526

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

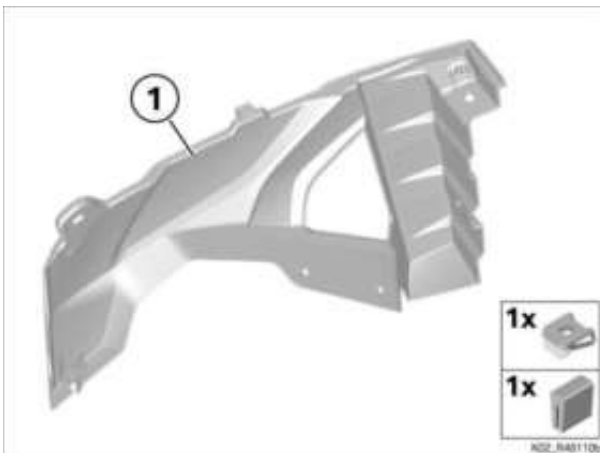
Removing cover for fuel tank

Removing left radiator cowl

Core activity

(-) Replacing left radiator cowl

- Convert reusable small parts on new part (1) or renew by new ones.



Follow-up work

Installing left radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

46 63 031 Replacing windscreen

+ 46 63 830

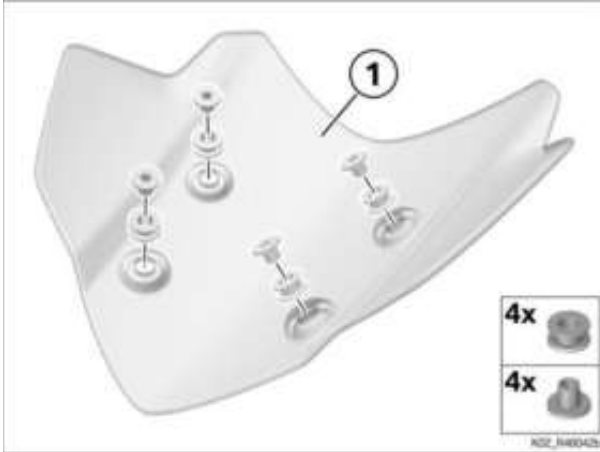
Preparatory work

Removing windscreen

Core activity

(-) Replacing windscreen

- Convert reusable small parts on new part (1) or renew by new ones.



Follow-up work

Install the windscreen

Final check of work performed

46 63 059 Replacing front panel carrier

+ 46 63 733

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing top front-wheel cover

Removing front mask with windscreen

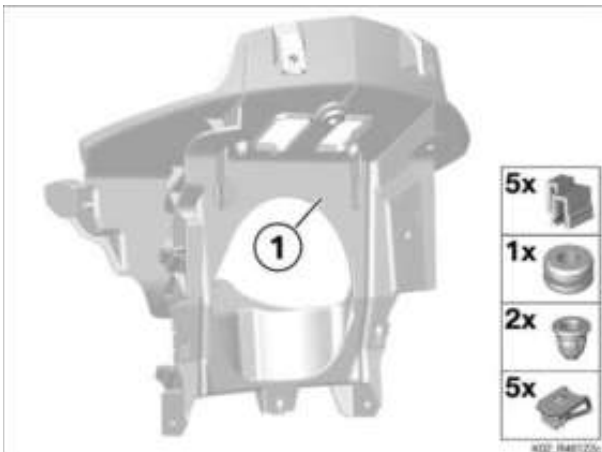
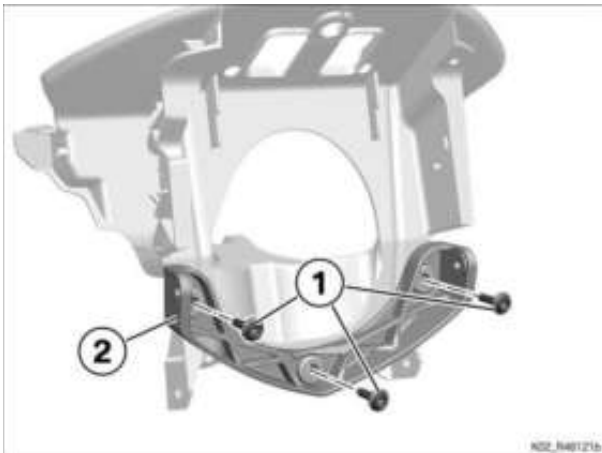
Removing instrument panel

Removing front panel carrier

Core activity

(-) Replacing front panel carrier

- Remove screws (1) and transfer headlight holder (2) to the new part.



- Convert reusable small parts on new part (1) or renew by new ones.

Follow-up work

Installing front panel carrier

Installing instrument panel

Installing front mask with windscreen

Installing top front-wheel cover

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Checking headlight beam throw

Final check of work performed

46 63 063 Replace cover for left intake snorkel

+ 46 63 663

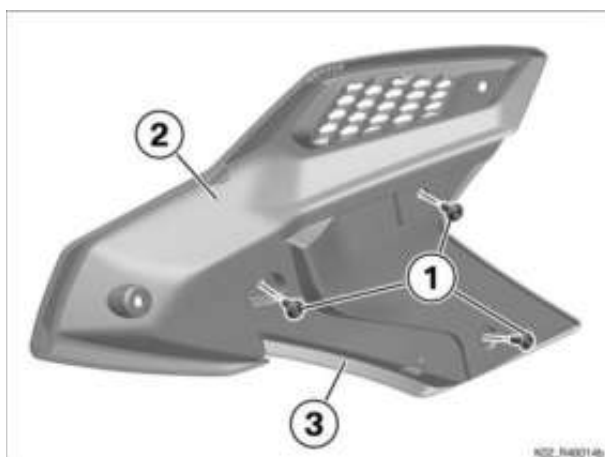
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing cover for left intake snorkel

Core activity

(-) Replacing the cover for the left intake snorkel



- Remove screws (1).
- Remove cover for intake snorkel (2) from badge holder (3).



- Remount flat nut (1) on new cover for intake snorkel (2).

Follow-up work

Installing cover for left intake snorkel

Final check of work performed

 46 63 066 Replace cover for left frame

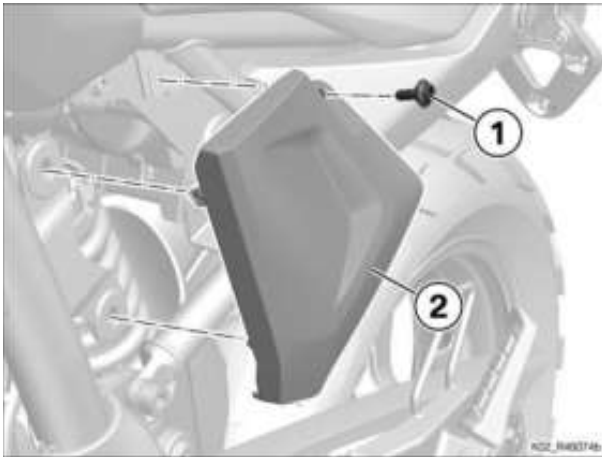
+ 46 63 766

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

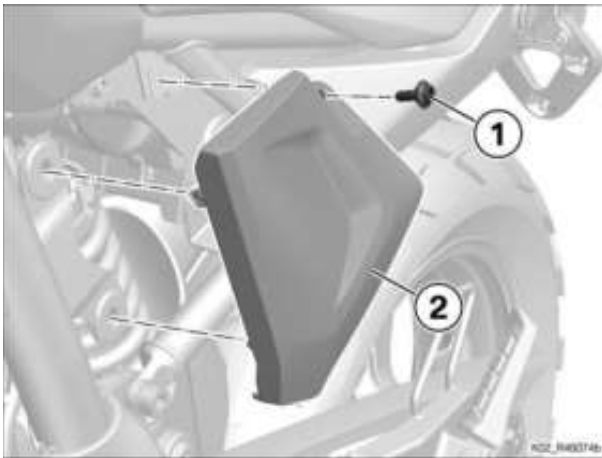
Core activity

(-) Removing left frame cover



- Remove screw (1) and remove frame cover (2).

(-) Installing left frame cover



- Hold frame cover (2) in position and install screw (1).

Follow-up work

Final check of work performed

46 63 191 Replacing front left cover

+ 46 63 979

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

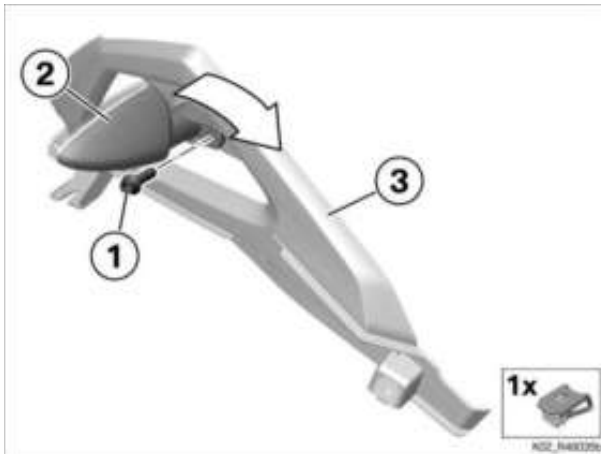
Removing top front-wheel cover

Removing windscreen

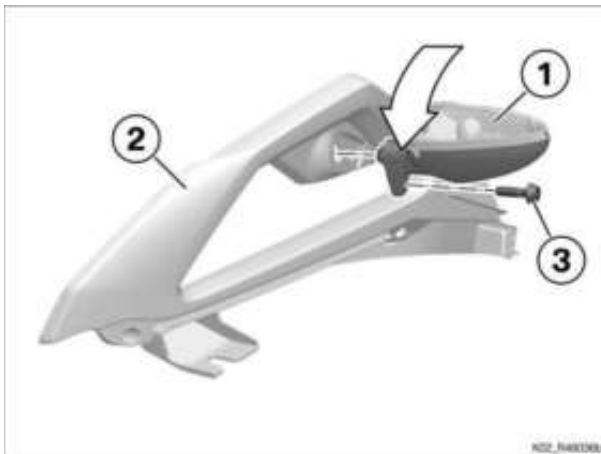
Removing the left front trim panel

Core activity

(-) Replacing front left cover



- Remove screw (1).
- Turn turn indicator (2) in the direction of arrow and remove from cover (3).
- Convert reusable small parts on new part (3) or renew by new ones.



- Position turn indicator (1) on cover (2) and turn in the direction of arrow.
- Install screw (3).

Follow-up work

Installing left front trim panel

Install the windscreen

Installing top front-wheel cover

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

46 63 198 Replace mount securing fairing to frame

+ 46 63 858

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing top front-wheel cover

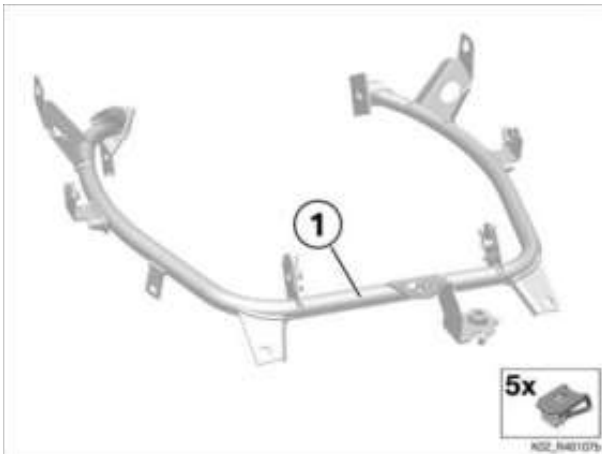
Removing front mask with windscreen

Removing fairing bracket

Core activity

(-) Replacing fairing bracket

- Convert reusable small parts on new part (1) or renew by new ones.



Follow-up work

Installing fairing bracket

Installing front mask with windscreen

Installing top front-wheel cover

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

46 63 200 Replacing fuel-tank cover, middle

+ 46 63 860

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

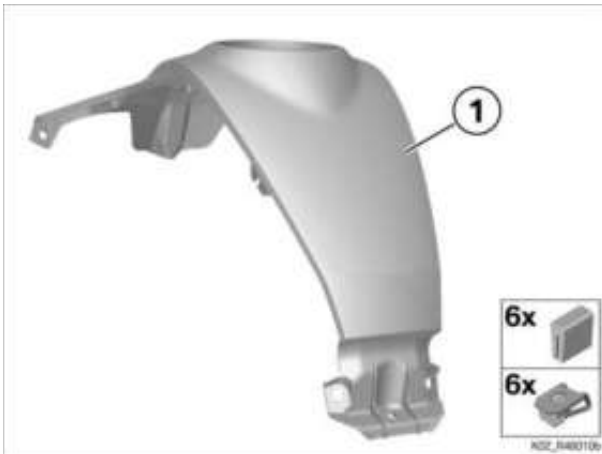
Removing cover for fuel tank

Removing centre cover for fuel tank

Core activity

(-) Replacing centre cover for fuel tank

- Transfer reusable small items to new part (1) or replace the small items as necessary.



Follow-up work

Assembling the cover for the fuel tank

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

46 63 204 Replacing fuel-tank cover, left

+ 46 63 704

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

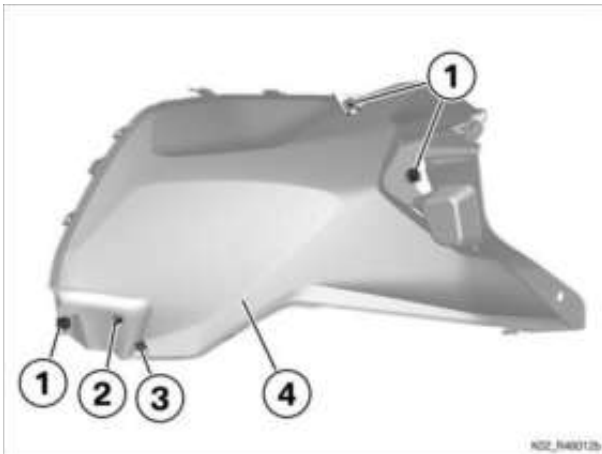
Removing cover for fuel tank

Removing left cover for fuel tank

Core activity

(-) Replacing left cover for fuel tank

- Transfer flat nuts (1) and rubber buffers (2) and (3) from old to new cover (4).



Follow-up work

Installing left cover for fuel tank

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

 46 71 299 Renewing left footrest plate

+ 46 71 829

Preparatory work

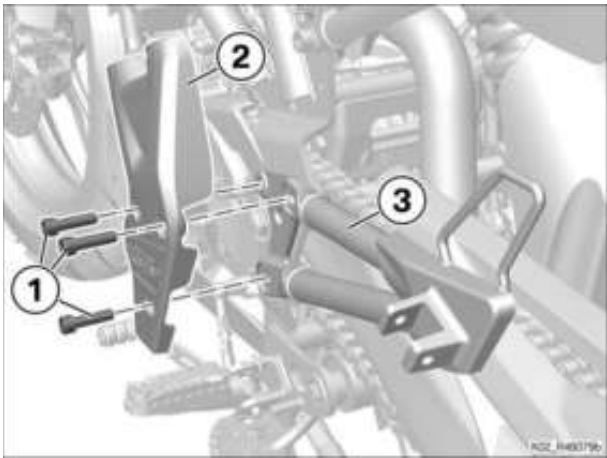
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing rear left footrest

Core activity

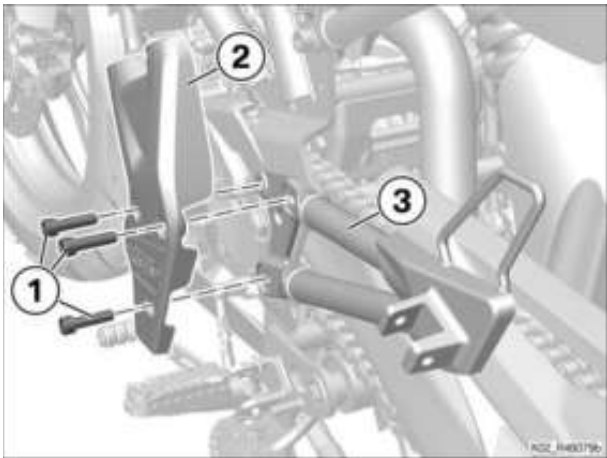
(-) Removing left footrest plate

- Remove screws (1) with cover (2).
- Remove footrest plate (3).



(-) Installing left footrest plate

- Clean the threads.
- Hold footrest plate (2) in position.
- Install screws (1).



 Tightening torques		
Footrest plate to main frame		
M8 x 30 Thread-locking compound (Loctite 243, Medium strength)	1st tightening torque, 24 Nm	
	Loosen and tighten screws individually .	
	2nd tightening torque, 24 Nm	

Follow-up work

Installing rear left footrest

Final check of work performed

 46 71 312 Renewing right footrest plate

+ 46 71 830

Preparatory work

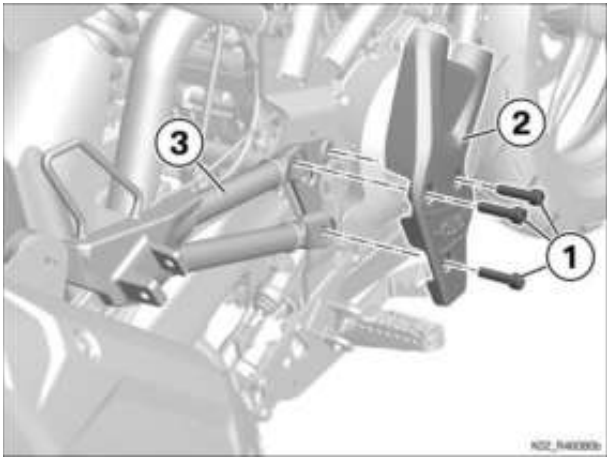
=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

Removing silencer

Removing rear right footrest

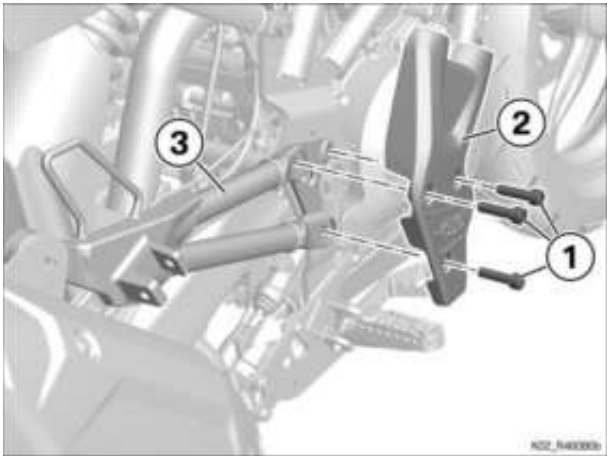
Core activity

(-) Removing right footrest plate



- Remove screws (1) with cover (2).
- Remove footrest plate (3).

(-) Installing right footrest plate



- Clean the threads.
- Hold footrest plate (3) in position.
- Install screws (1) with cover (2).

 Tightening torques		
Footrest plate to main frame		
M8 x 30 Thread-locking compound (Loctite 243, Medium strength)	1st tightening torque, 24 Nm	
	Loosen and tighten screws individually .	
	2nd tightening torque, 24 Nm	

Follow-up work

Installing rear right footrest

Securing the exhaust system

Final check of work performed

 51 16 044 Replacing left mirror

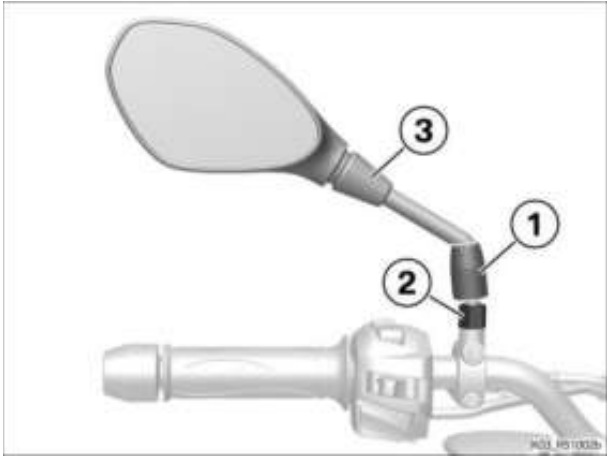
+ 51 16 554

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

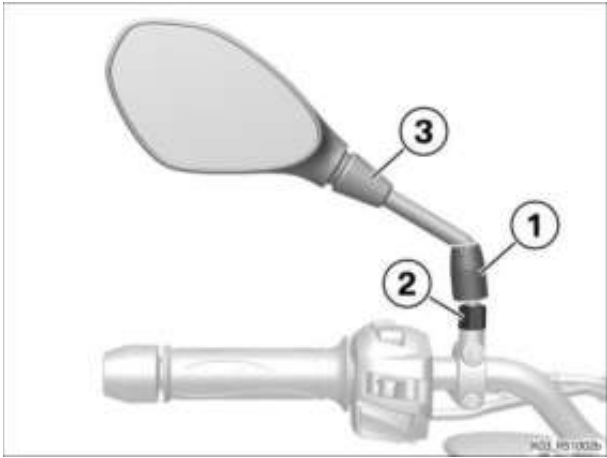
(-) Removing left mirror



- Push cap (1) upwards.
- Loosen lock nut (2) and remove entire mirror (3).

(-) Installing left mirror

- Install mirror completely (3) and tighten lock nut (2).



 Tightening torques		
Left mirror (lock nut) to adapter		
M10 x 1.25	22 Nm	

- Push rubber caps (1) down.

Follow-up work

Final check of work performed

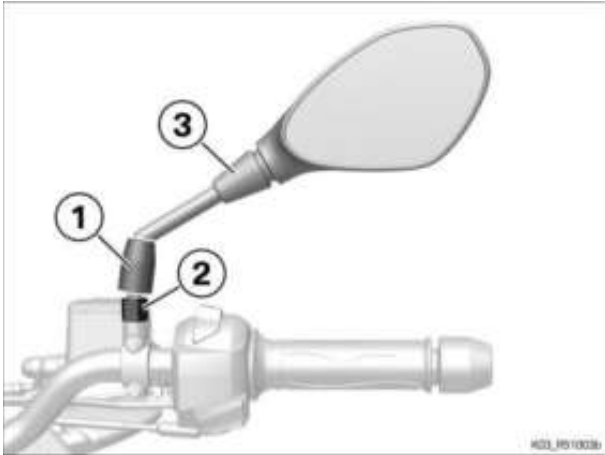
 51 16 045 Replacing right mirror
+ 51 16 555

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

(-) Removing right mirror



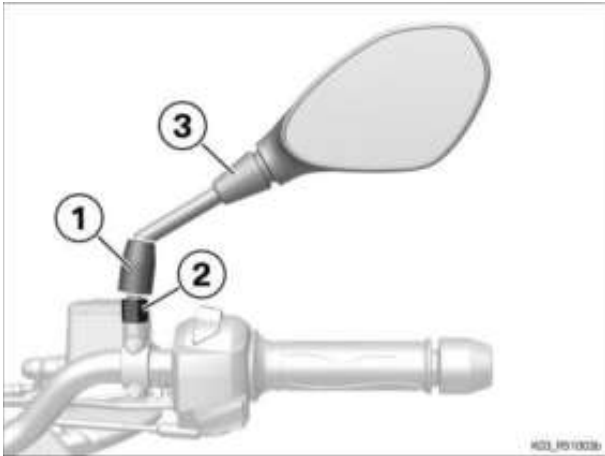
- Push rubber cap (1) upwards.

 NOTICE

The screw connection of the right mirror is **left-hand thread**.

- Loosen lock nut (2) and remove entire mirror (3).

(-) Installing right mirror



- Install mirror completely (3) and tighten lock nut (2).

 NOTICE

The screw connection of the right mirror is **left-hand thread**.

 Tightening torques		
Right mirror (lock nut) to adapter		
M10 x 1.25	Left-hand thread, 22 Nm	

- Push rubber caps (1) down.

Follow-up work

Final check of work performed

51 25 017 Replacing Bowden cable for seat lock

+ 51 25 565

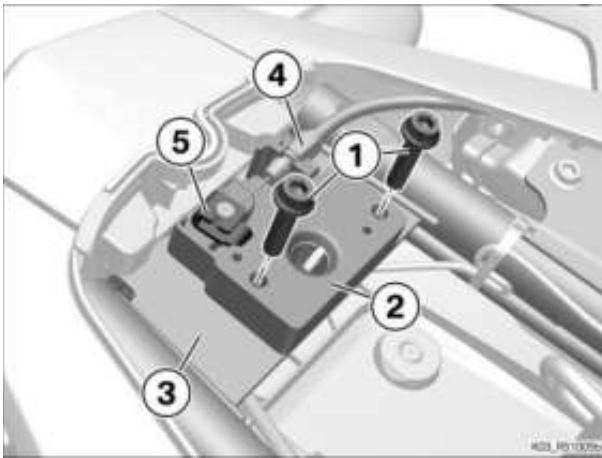
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

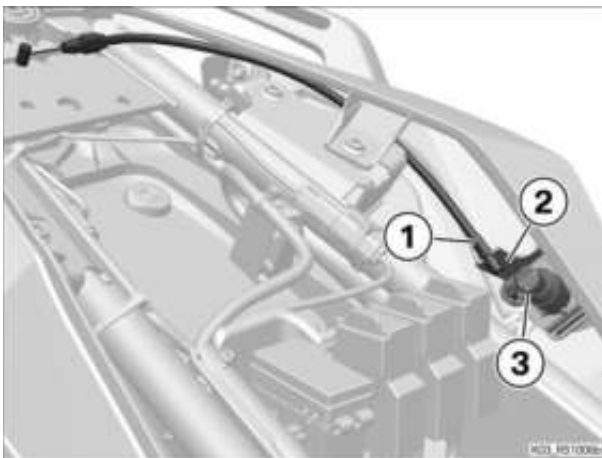
Core activity

(-) Removing holder for seat



- Remove screws (1) and loosen holder for seat (2) from rear frame (3).
- Loosen Bowden cable (4) from holder for seat (2) and lock pin (5).

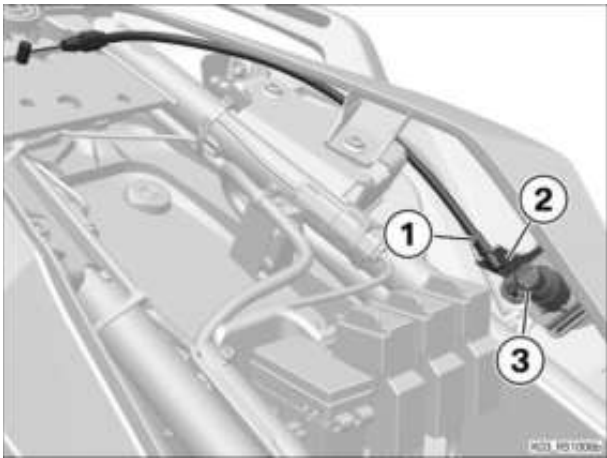
(-) Removing Bowden cable for seat latch



- Remove Bowden cable (1) from rear trim panel (2) and lock pin (3).

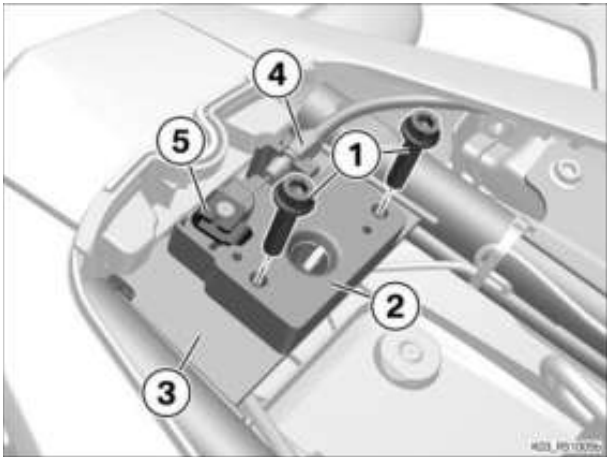
(-) Installing Bowden cable for seat latch

- Install Bowden cable (1) in lock pin (3) and rear trim panel (2).



(-) Install holder for motorcycle seat

- Secure Bowden cable (4) in lock pins (5) and secure holder for motorcycle seat (2).
- Hold holder for motorcycle seat (2) in position on rear frame (3) and install screws (1).



 Tightening torques		
Bracket for seat to rear frame		
M6 x 25	8 Nm	

Follow-up work

Installing seat

Final check of work performed

 51 25 040 Removing/installing or replacing ignition switch/steering lock

+ 51 25 594

Preparatory work

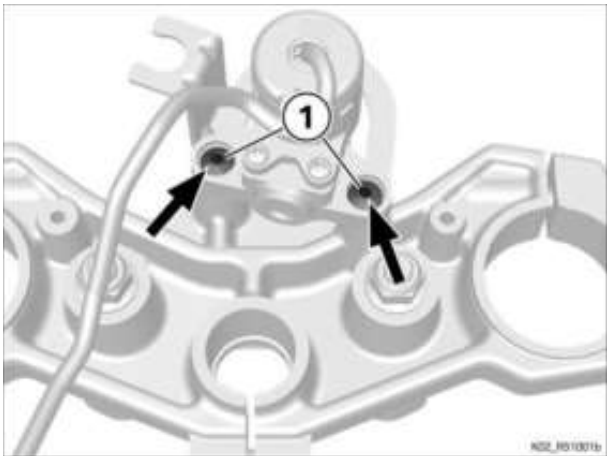
=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

- Removing seat
- Removing cover for left intake snorkel
- Removing the cover for right intake snorkel
- Removing cover for fuel tank
- Loosen cable for ignition steering lock
- Removing handlebars
- Removing top fork bridge

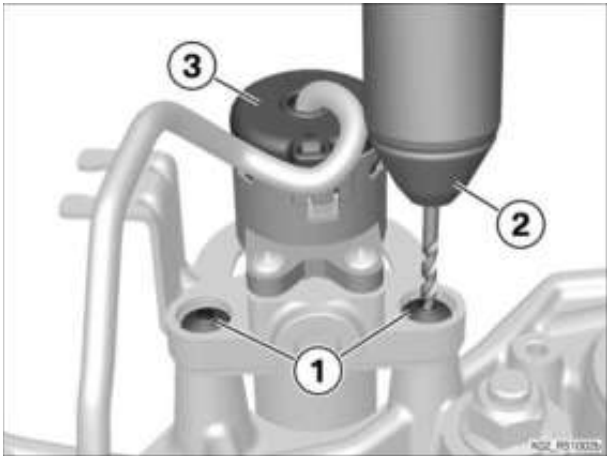
Core activity

(-) Removing ignition switch/steering lock

- Punch-mark shear screws (1) in centre (arrows).

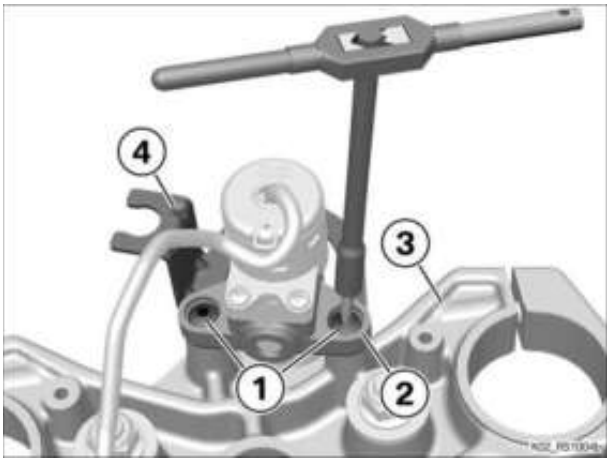


- Remove shear screws (1) by first **pre-drilling bore holes with a 2 mm drill** and then **drilling out to 6 mm**, making sure there is ample clearance between drill chuck (2) and ignition steering lock (3).

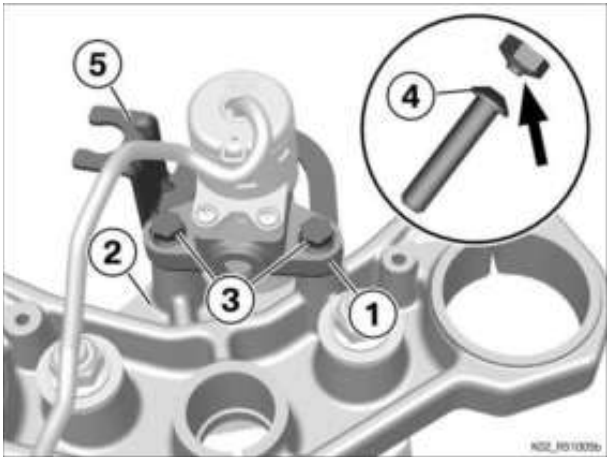


 Technical data			
Ignition switch/steering lock - drilling depth for drilling out tamper-proof shear screws	(Pilot) hole diameter 2 mm	min 5 mm	
	Hole diameter 6 mm	5 mm	

- Remove shear screws (1) with a suitable screw extractor.



- Remove ignition steering lock (2) with holder (4) from top fork bridge (3).



- Position ignition steering lock (1) with holder (5) on top fork bridge (2).
- Install shear screws (3) and tighten until the tool engagement (arrow) shears off head (4).

Tightening torques		
Ignition/steering lock to fork bridge		
Shear screw, M6 x 20, Replace screw	Tighten screw until screw-head shears off.	

Follow-up work

- Install the top fork bridge
- Securing handlebars
- Adjusting steering-head bearing play
- Secure cable for ignition steering lock
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Final check of work performed

51 25 050 Removing/installing or replacing seat lock

+ 51 25 595

NOTICE

Ignition steering lock, fuel filler cap and seat lock are available solely with preassembled lock barrels.

Lock barrels cannot be exchanged or encoded individually.

When individual components are replaced, there is no single key locking system.

A single key locking system set is available.

Preparatory work

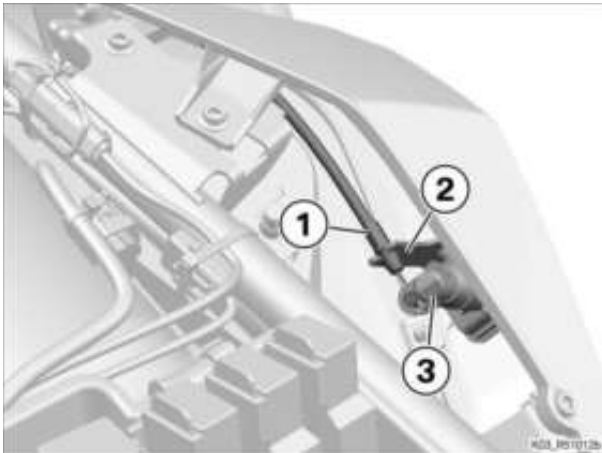
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

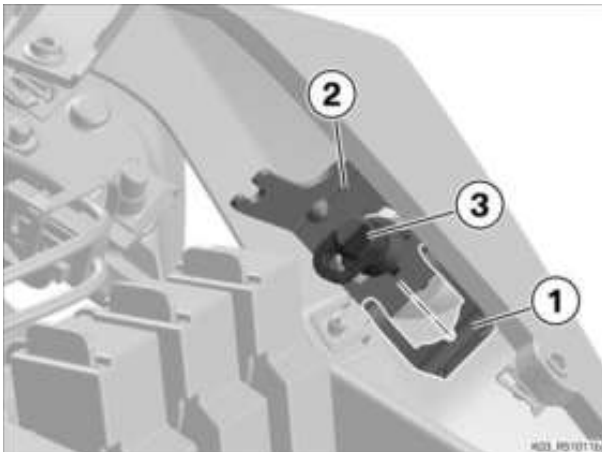
Core activity

(-) Remove the seat lock

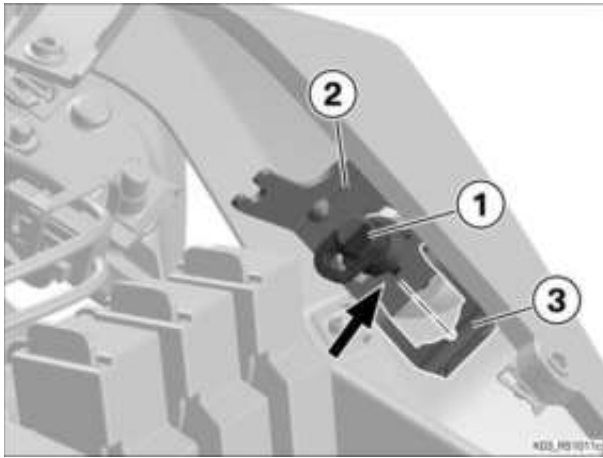
- Relieve Bowden cable (1) (operate lock pin with hand) and detach from bolt catch (2) and seat lock (3).



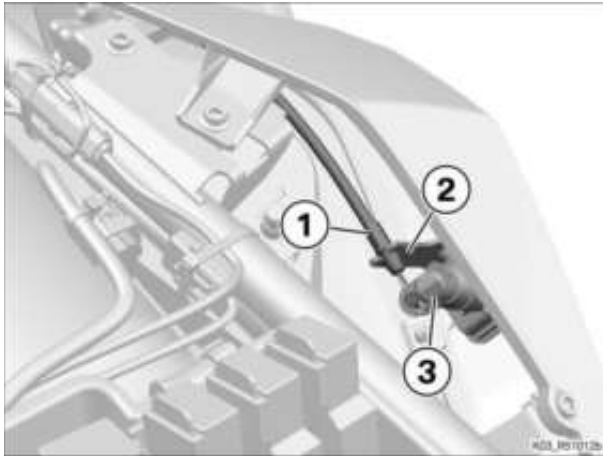
- Remove lock plate (1), bolt catch (2) and seat lock (3).



(-) Installing seat lock



- Install seat lock (1), paying attention to the lug (arrow).
- Install lock holder (2) and lock plate (3).



- Attach Bowden cable (1) in seat lock (3) and lock holder (2).

Follow-up work

Installing seat

Final check of work performed

 51 25 091 Install a single key locking system set

+ 51 25 605

Preparatory work

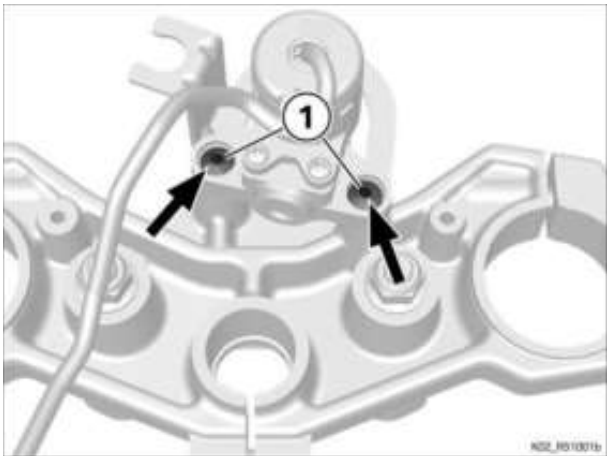
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

- Removing seat
- Removing cover for left intake snorkel
- Removing the cover for right intake snorkel
- Removing cover for fuel tank
- Loosen cable for ignition steering lock
- Removing handlebars
- Removing top fork bridge

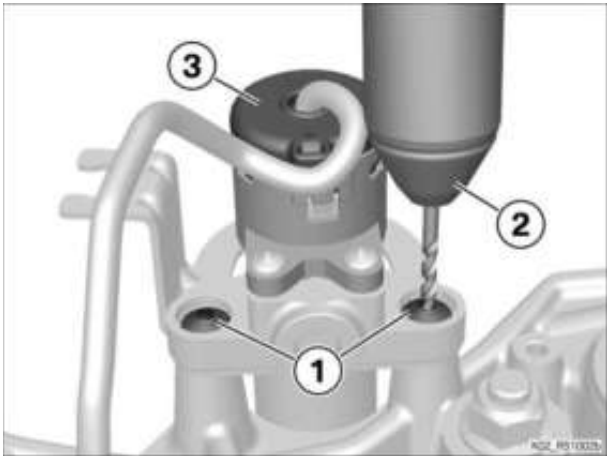
Core activity

(-) Removing ignition switch/steering lock

- Punch-mark shear screws (1) in centre (arrows).

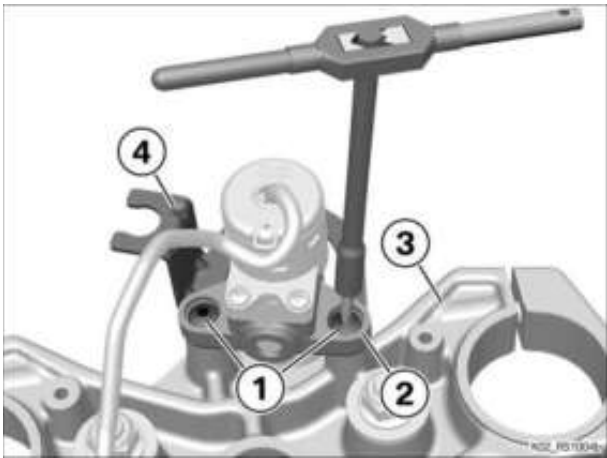


- Remove shear screws (1) by first **pre-drilling bore holes with a 2 mm drill** and then **drilling out to 6 mm**, making sure there is ample clearance between drill chuck (2) and ignition steering lock (3).



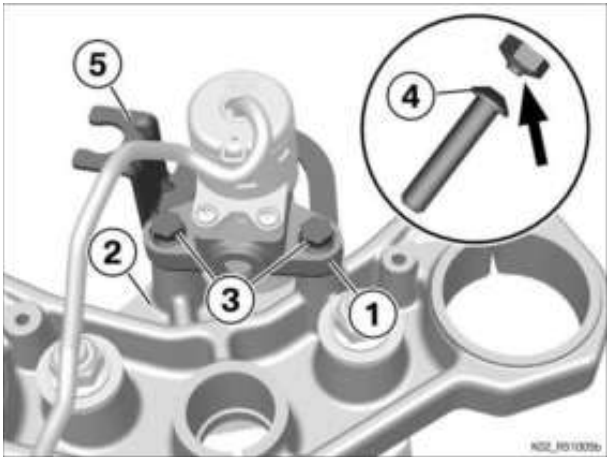
 Technical data			
Ignition switch/steering lock - drilling depth for drilling out tamper-proof shear screws	(Pilot) hole diameter 2 mm	min 5 mm	
	Hole diameter 6 mm	5 mm	

- Remove shear screws (1) with a suitable screw extractor.



- Remove ignition steering lock (2) with holder (4) from top fork bridge (3).

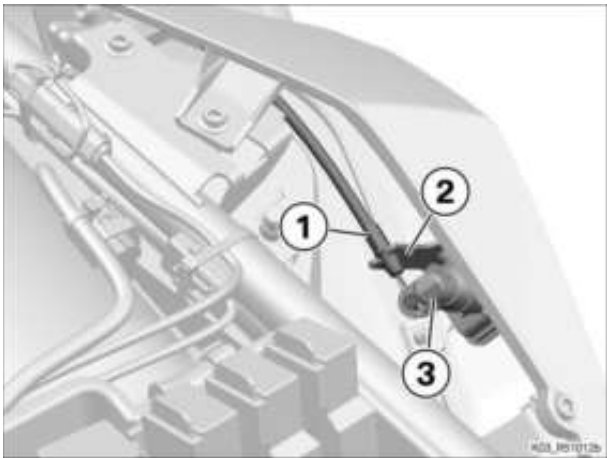
(-) Installing ignition switch/steering lock



- Position ignition steering lock (1) with holder (5) on top fork bridge (2).
- Install shear screws (3) and tighten until the tool engagement (arrow) shears off head (4).

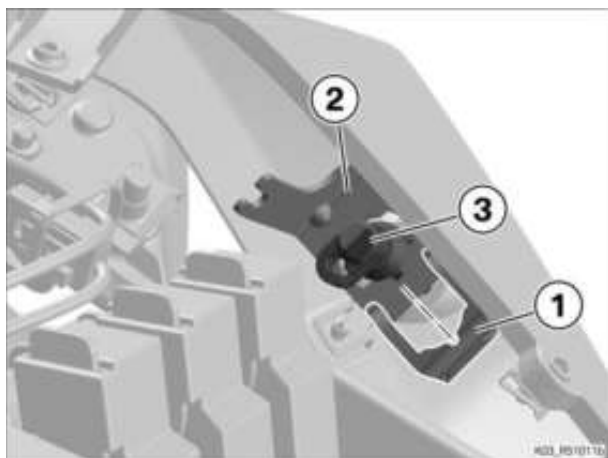
Tightening torques		
Ignition/steering lock to fork bridge		
Shear screw, M6 x 20, Replace screw	Tighten screw until screw-head shears off.	

(-) Remove the seat lock



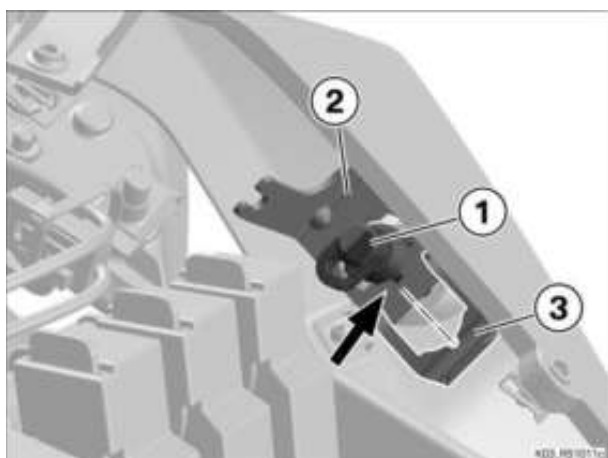
- Relieve Bowden cable (1) (operate lock pin with hand) and detach from bolt catch (2) and seat lock (3).

- Remove lock plate (1), bolt catch (2) and seat lock (3).

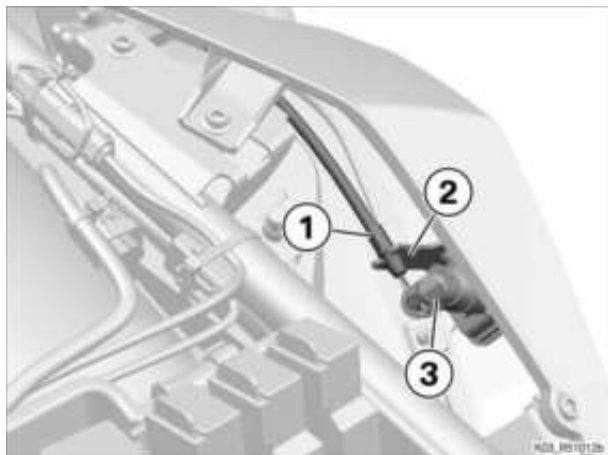


(-) Installing seat lock

- Install seat lock (1), paying attention to the lug (arrow).
- Install lock holder (2) and lock plate (3).

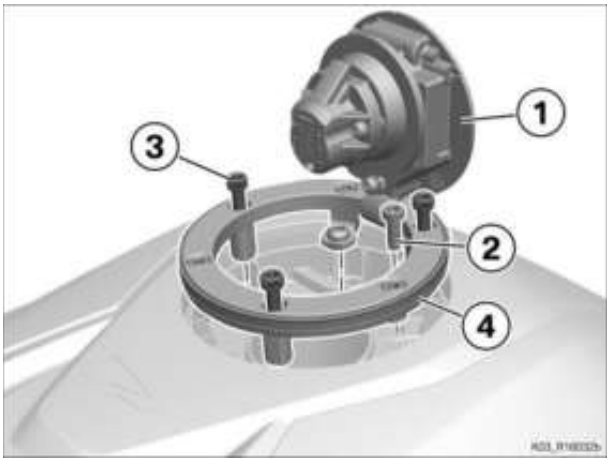


- Attach Bowden cable (1) in seat lock (3) and lock holder (2).



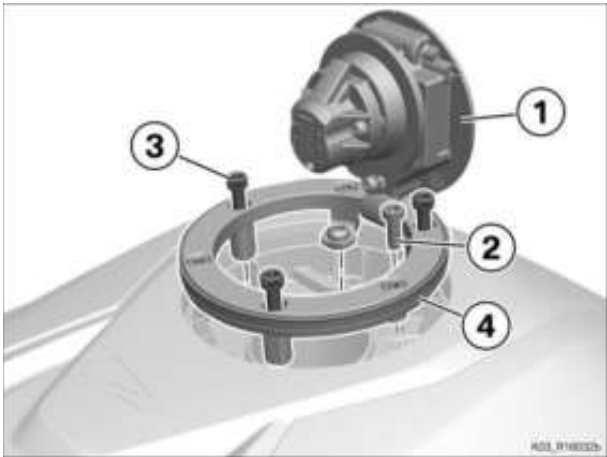
(-) Removing cap for fuel tank

- Open lid for fuel tank (1).
- Remove screw (2) and screws (3).
- Remove lid for fuel tank (1) completely with gasket (4).



(-) Installing cap for fuel tank

- Fit lid for fuel tank (1) with gasket (4).
- Install screws (3) and bolt (2).



 Tightening torques		
Lid for fuel tank to fuel tank		
M5 x 14	4.5 Nm	
M5 x 30	4.5 Nm	

- Close lid for fuel tank (1).

Follow-up work

- Install the top fork bridge
- Securing handlebars
- Adjusting steering-head bearing play
- Secure cable for ignition steering lock
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Final check of work performed

 52 53 385 Replacing holder for dual seat on frame

+ 52 53 589

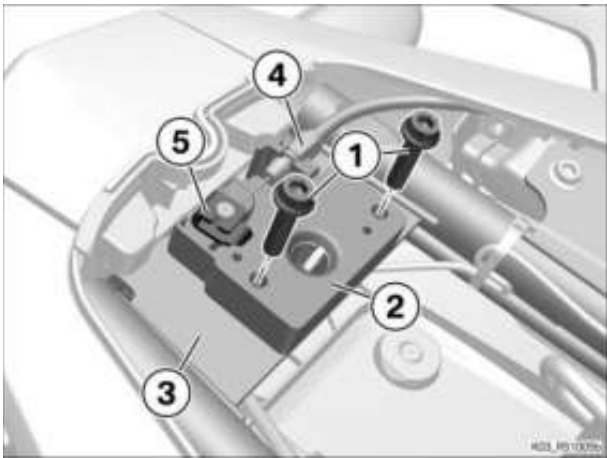
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

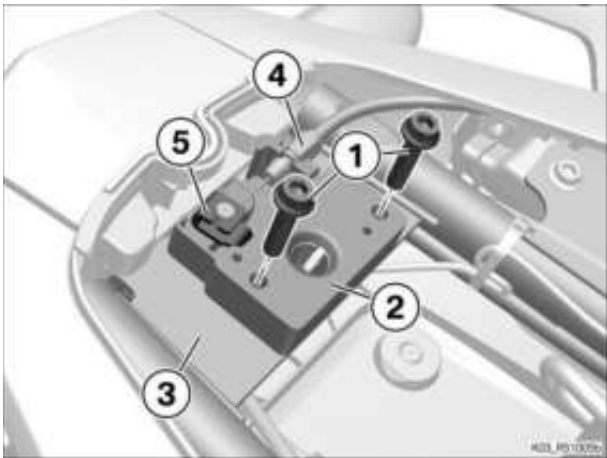
Core activity

(-) Removing holder for seat



- Remove screws (1) and loosen holder for seat (2) from rear frame (3).
- Loosen Bowden cable (4) from holder for seat (2) and lock pin (5).

(-) Install holder for motorcycle seat



- Secure Bowden cable (4) in lock pins (5) and secure holder for motorcycle seat (2).
- Hold holder for motorcycle seat (2) in position on rear frame (3) and install screws (1).

 Tightening torques		
Bracket for seat to rear frame		
M6 x 25	8 Nm	

Follow-up work

Installing seat

Final check of work performed

61 11 013 Wiring-harness repair

+ 61 11 513

Core activity

(-) Installing wiring harness repair kit

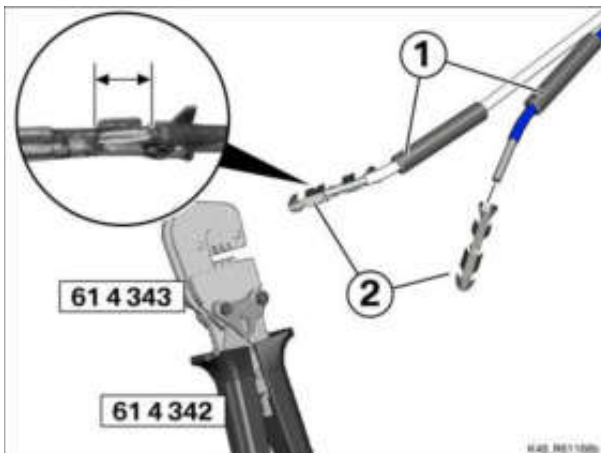
- Cut out the defective plug or length of cable, if possible making the cut at some point along a straight run where the wiring harness can be firmly secured.
- Cut the individual cores **staggered** along the length of a shrink-on hose (1) so that the repaired points are not beside each other.
- Correlate the numbered cores of the repair kit with the corresponding cable colours of the original plug and cut them back to the appropriate staggered lengths.

NOTICE

The cables are not colour-coded; instead, they have code numbers to ensure the universal usability of the repair kits.

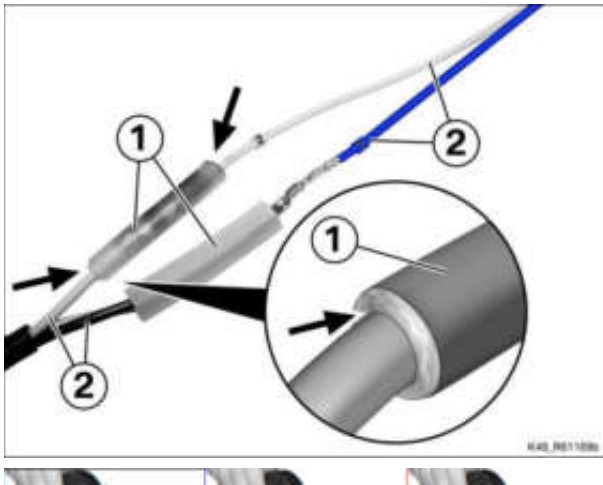


- Set stripping pliers (No. 61 0 511) to the correct wire diameter.
- Use stripping pliers (No. 61 0 511) to strip the ends of the wires.



- Slip shrink-on hoses (1) into position.
- Insert the ends of the wires into the corresponding crimp connectors (2), note that **insulation and core** must both be secured (detail).
- Secure crimp connectors (2) with pliers (No. 61 4 342) with crimping head (No. 61 4 343) to the stripped ends of the wires, noting the cable cross-section.

- Slip shrink-on hose (1) into position over the repair and heat the hose.
- » Shrink-on hose (1) contracts to a tight fit.
- » Hot glue (arrows) escapes between shrink-on hose (1) and wire (2).



- Wrap fibre-reinforced insulating tape (No. 61 0 631) around the repair.

ATTENTION

Electrical wiring not routed in compliance with correct procedure

Open circuit and chafing

- Carefully route electrical wiring correctly.
- Make sure that no lines can chafe or are kinked on installation.

-
- Secure the repair to the vehicle.

61 11 100 Removing/installing or replacing main wiring harness

+ 61 11 509

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing left frame cover

Removing right frame cover

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing top front-wheel cover

Removing front mask with windscreen

Releasing front wiring harness

Removing fuel tank

Removing right radiator cowl

Removing the left radiator cowl with the air duct

Removing expansion tank

Removing idle actuator

Remove the intake air silencer

Removing engine control unit

Removing luggage carrier

Removing right rear trim panel

Removing bolt of left rear trim panel

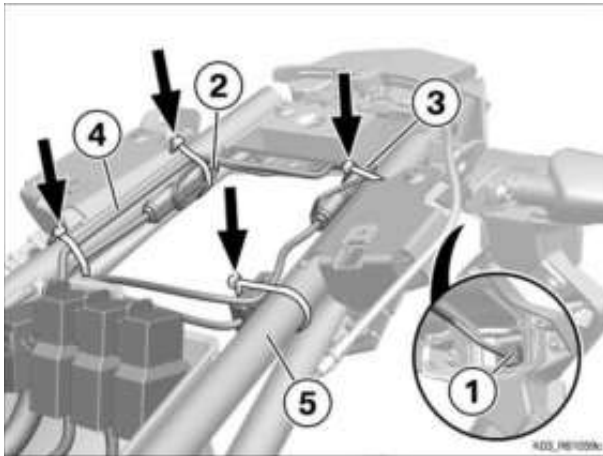
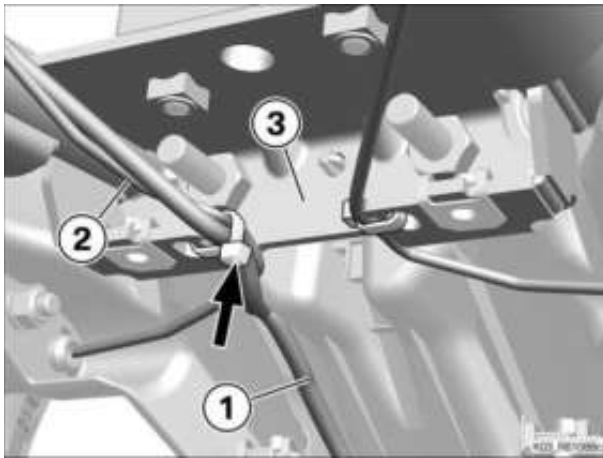
Removing tail bottom section

Core activity

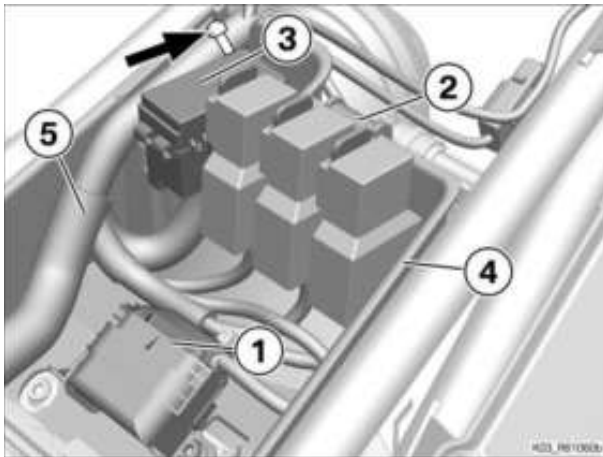
(-) Removing main wiring harness

► Loosen main wiring harness in the rear area

- Remove cable strap (arrow).
- Release cable (1) for right turn indicator and cable (2) for rear light of rear frame (3).



- Remove the cable straps (arrows).
- Disconnect connector (1) for the rear light.
- Disconnect plug (2) for the right flashing turn indicator.
- Disconnect plug (3) for the left flashing turn indicator.
- Loosen main wiring harness (4) from rear frame (5).



- Remove cable strap (arrow).
- Release **OBD**-diagnostic connector (1).
- Loosen relay carrier (2) and fuse box (3) from battery tray (4).
- Release main wiring harness (5) from battery tray (4).

- Remove cable strap (arrow).

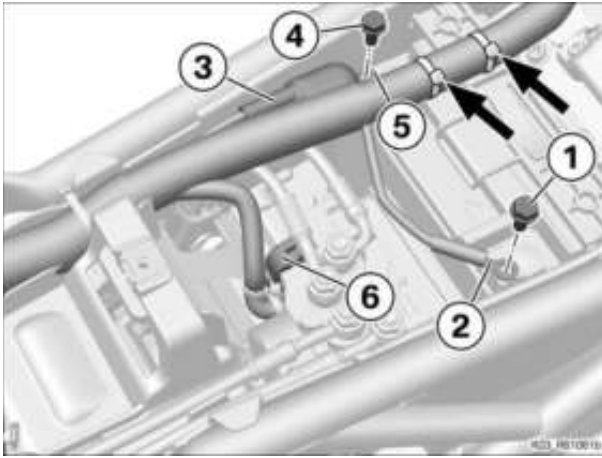
ATTENTION

Battery not disconnected in accordance with correct procedure

Risk of short-circuit

- Always proceed in compliance with the specified disconnection sequence.

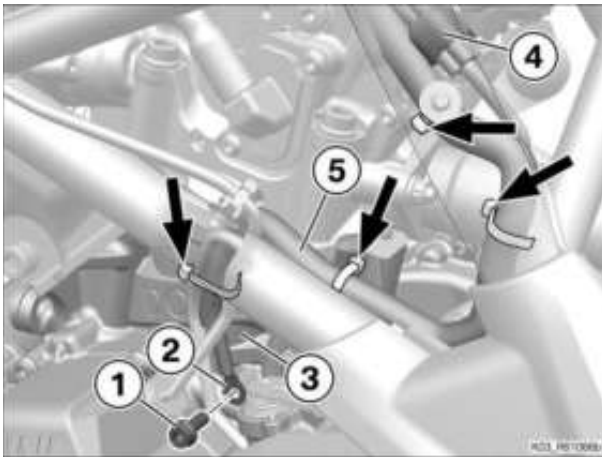
- Remove bolt (1) and disengage negative terminal (2).
- Move rubber grommet (3).



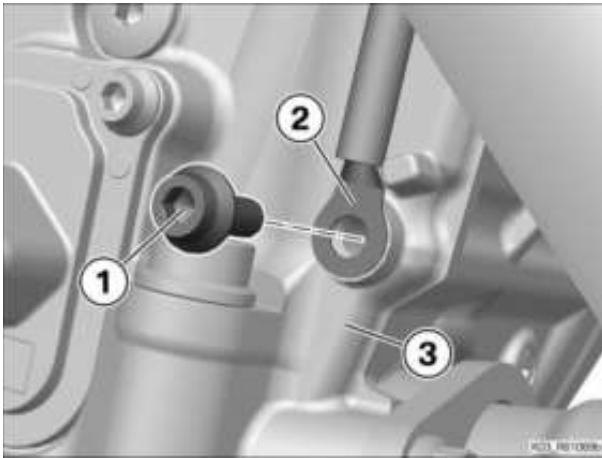
- Remove bolt (4) and disengage positive terminal (5).
- Disconnect connector (6) for the pressure modulator.



► Loosen the main wiring harness from left main frame

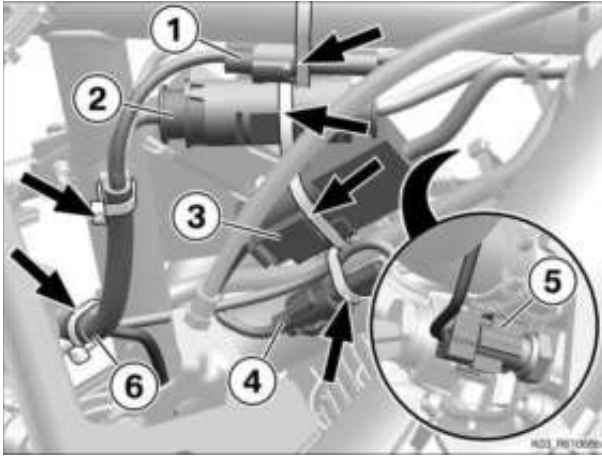
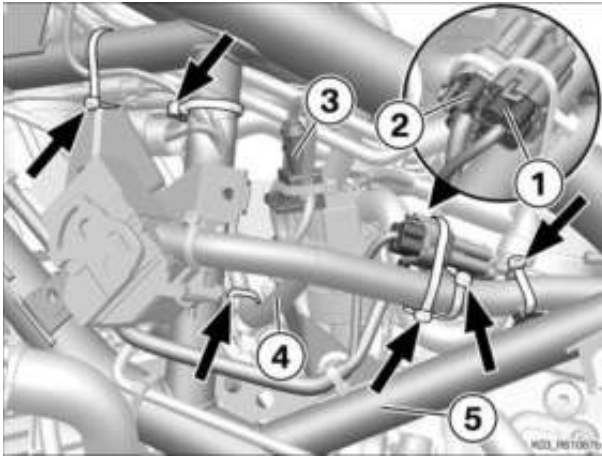


- Remove the cable straps (arrows).
- Remove screw (1).
- Loosen cable shoe (2) from engine housing (3).
- Disconnect plug (4) for the gearbox potentiometer.
- Feed out main wiring harness (5).



- Remove screw (1).
- Loosen cable shoe (2) from cylinder head (3).

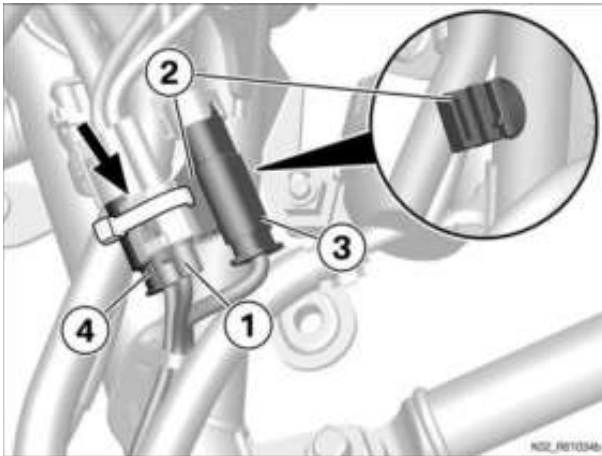
- Open cable straps (arrows).
- Disconnect connector (1) and (2) for the left multifunction switch.
- Disconnect connector (3) for the secondary air system shift valve.
- Loosen main wiring harness (4) from main frame (5).



- Remove the cable straps (arrows).
- Disconnect connector (1) for the clutch switch.
- Disconnect connector (2) and (3) and (4) for alternator.
- Disconnect connector (5) for the coolant-temperature sensor.
- Feed out main wiring harness (6).

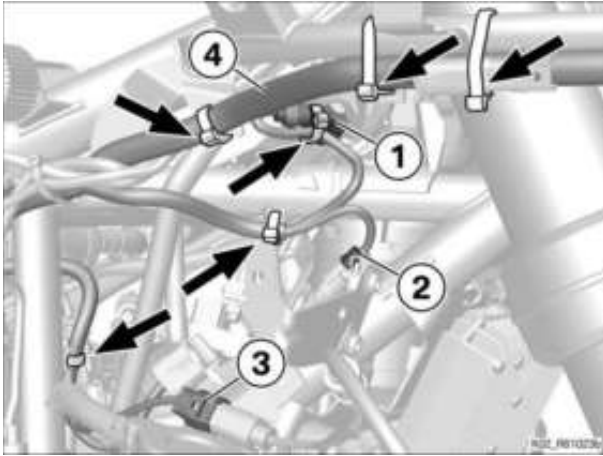
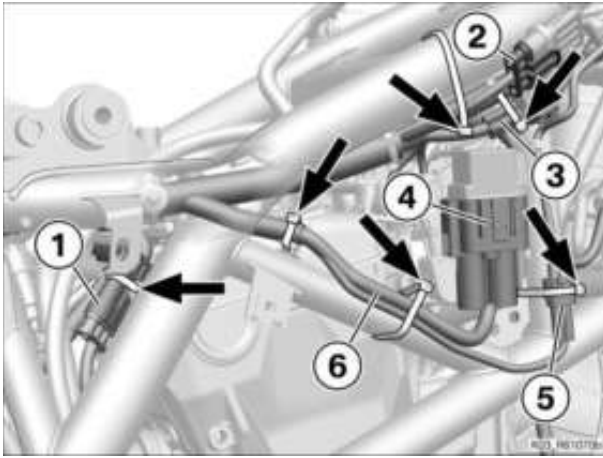


▶ Loosen the main wiring harness from right main frame

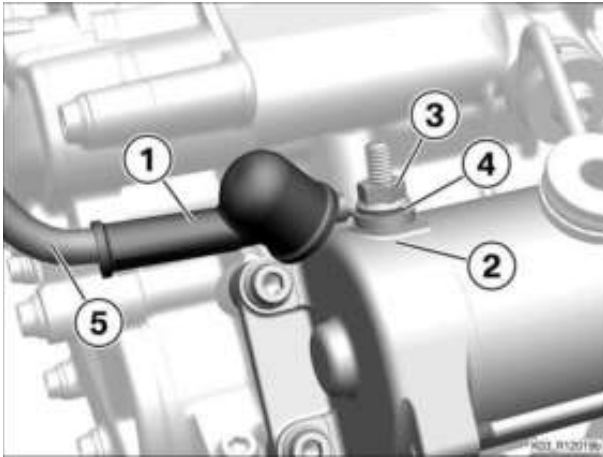


- Remove cable strap (arrow).
- Loosen and disconnect connector (1) for rear brake light switch from holder (2).
- Disconnect cable (3) for side stand switch.
- Disconnect connector (4) for the rear wheel-speed sensor.

- Remove the cable straps (arrows).
- Disconnect connector (1) for the oxygen sensor.
- Disconnect connector (2) for the ignition switch/steering lock.
- Disconnect plug (3) for the right multifunction switch.
- Loosen holder (4) for starter motor relay.
- Disconnect connector (5) for the brake-light switch.
- Loosen main wiring harness (6).



- Remove the cable straps (arrows).
- Disconnect connector (1) for the tank vent valve.
- Disconnect connector (2) for the fan.
- Release connector (3) for front wheel speed sensor.
- Loosen main wiring harness (4).

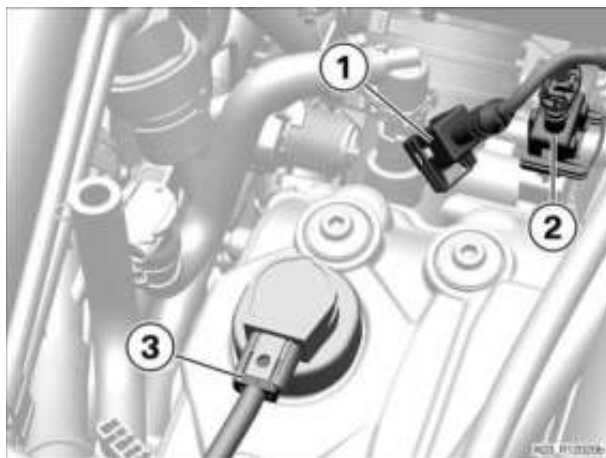
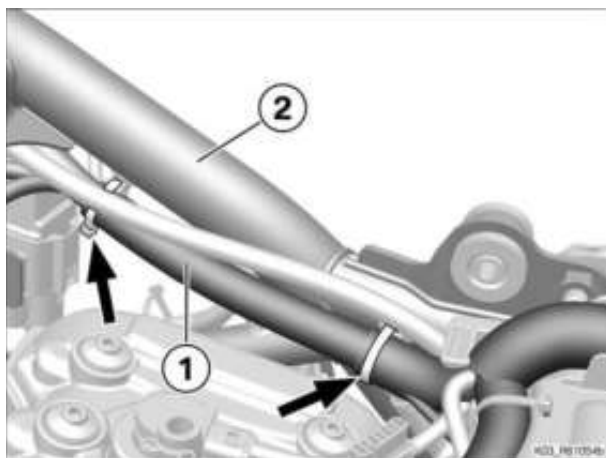


- Loosen rubber grommet (1) from starter motor (2).
- Remove nut (3).
- Loosen cable shoe (4) with wiring harness (5) from starter motor (2).

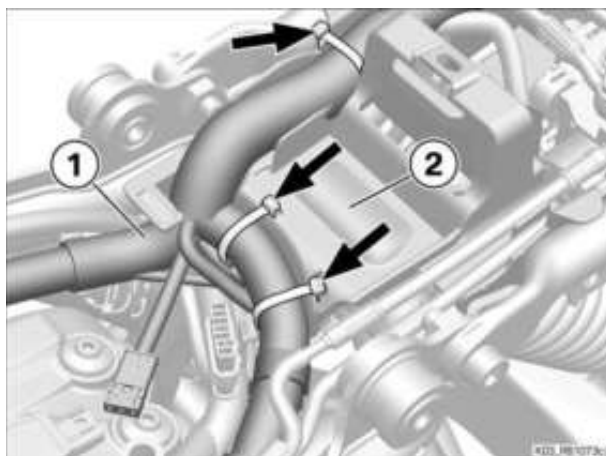


► **Loosen main wiring harness in area of the cylinder head**

- Remove the cable straps (arrows).
- Loosen wiring harness (1) from frame (2).



- Disconnect plug (1) for the injection valve.
- Disconnect plug (2) for the throttle-valve potentiometer.
- Disconnect connector (3) for the direct ignition coil.

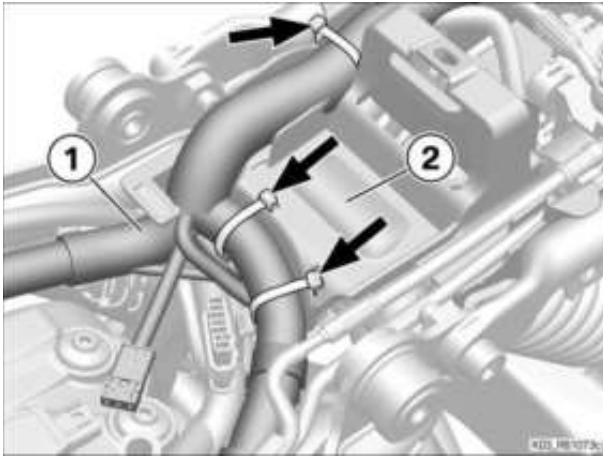


- Remove the cable straps (arrows).
- Loosen main wiring harness (2) from battery tray (3).

- Remove main wiring harness.

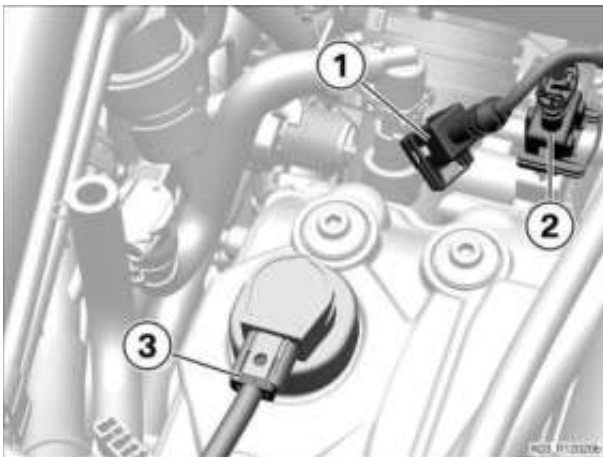
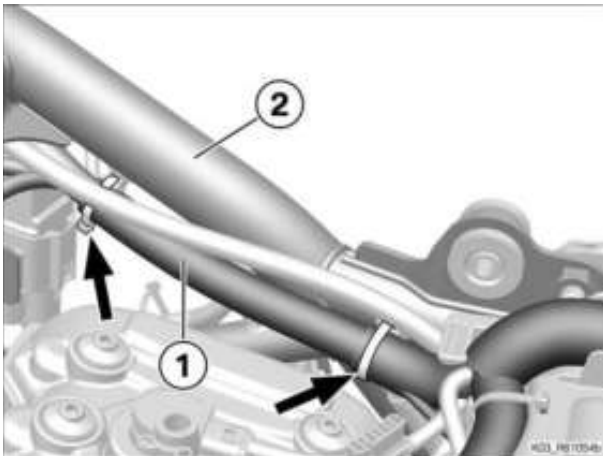
(-) Installing main wiring harness

- Route main wiring harness (2) in battery tray (3).
- Close the cable strap (arrows).



► **Install main wiring harness in area of the cylinder head**

- Lay wiring harness (1) on frame (2).
- Close the cable strap (arrows).

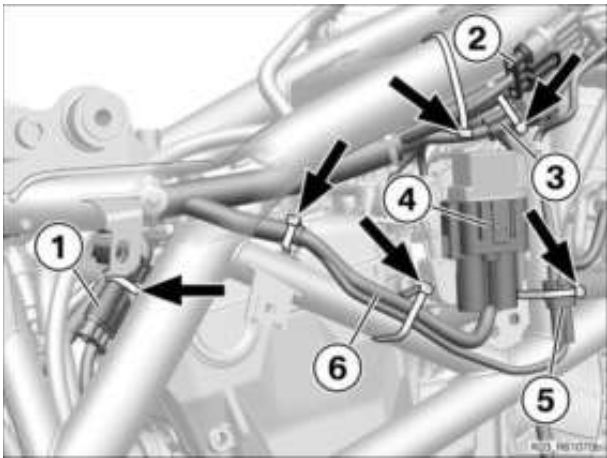


- Connect connector (3) for the direct ignition coil.
- Connect plug (2) for the throttle-valve potentiometer.
- Connect plug (1) for the injection valve.

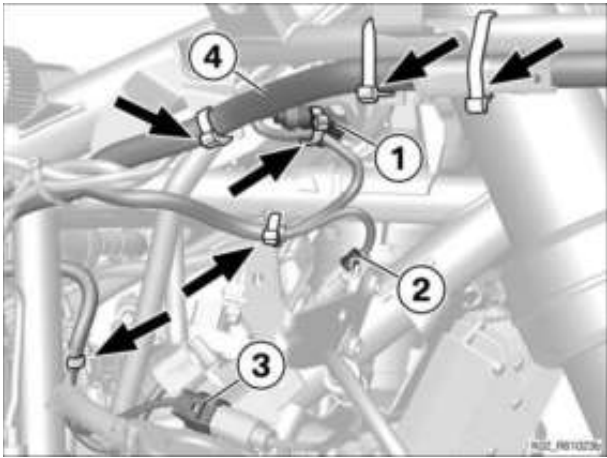


► **Install main wiring harness to main frame right.**

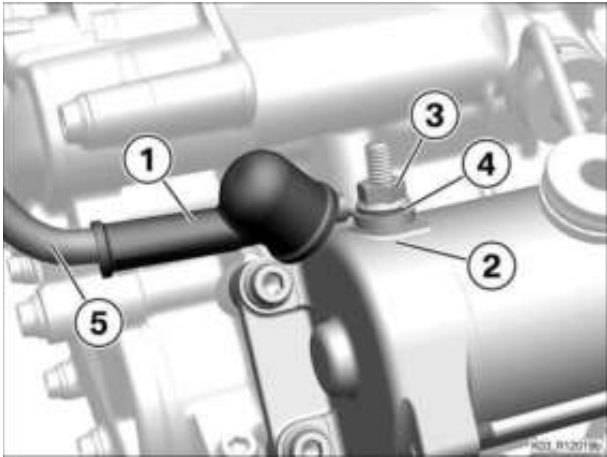
- Route main wiring harness (6).
- Secure plug (5) for the brake-light switch.
- Install holder (4) for starter motor relay.
- Connect plug (3) for the right multifunction switch.
- Connect connector (2) for the ignition switch/steering lock.
- Connect connector (1) for the oxygen sensor.



- Close the cable strap (arrows).



- Route main wiring harness (4).
- Connect connector (3) for the front wheel-speed sensor.
- Connect connector (2) for the fan.
- Connect connector (1) for the tank vent valve.
- Close the cable strap (arrows).

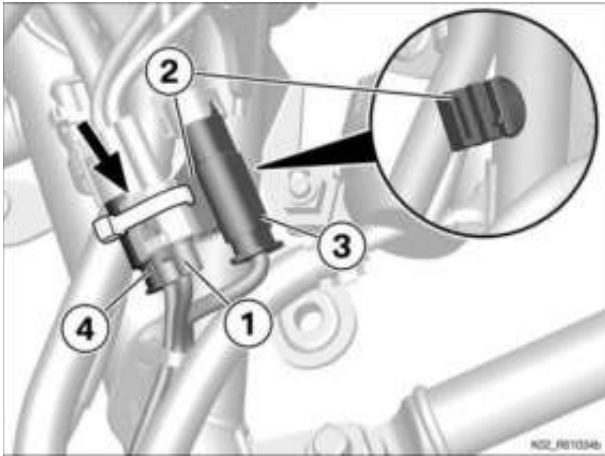


- Set cable shoe (4) with wiring harness (5) to starter motor (2).
- Install nut (3).

 Tightening torques		
Wiring harness (positive wire) to starter motor		
M6	4.5 Nm	

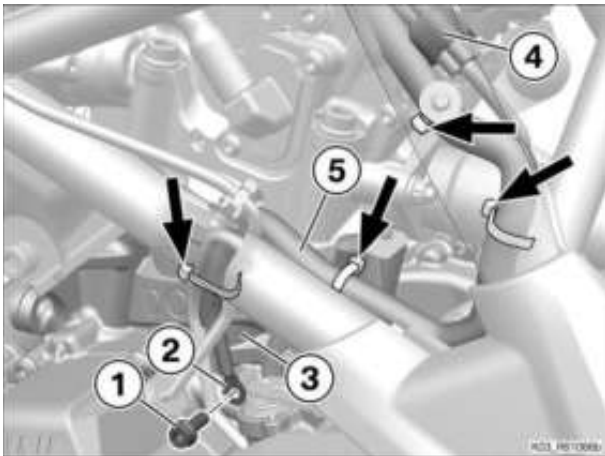
- Install rubber grommet (1) to starter motor (2).

- Connect connector (1) for the brake-light switch.
- Secure connector (1) with cable strap (arrow) to bracket (2).
- Connect cable (3) for side stand switch.
- Connect connector (4) for the rear wheel-speed sensor.



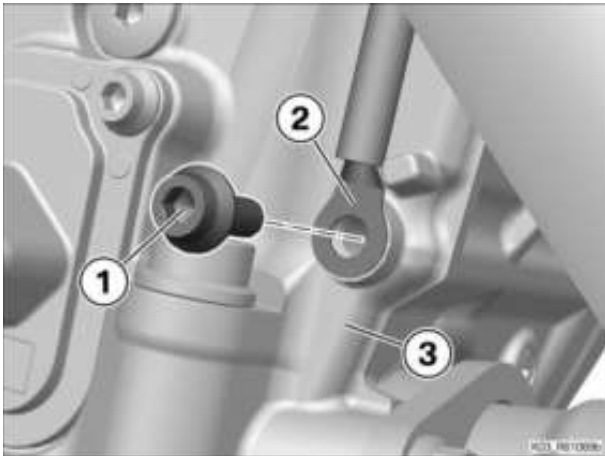
► Install main wiring harness to main frame left.

- Route main wiring harness (5).
- Connect plug (4) for the gearbox potentiometer.
- Set cable shoe (2) on engine housing (3).
- Install handlebar end plug (1).



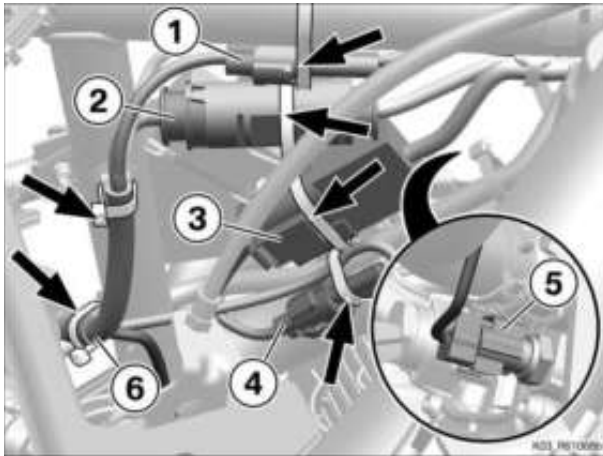
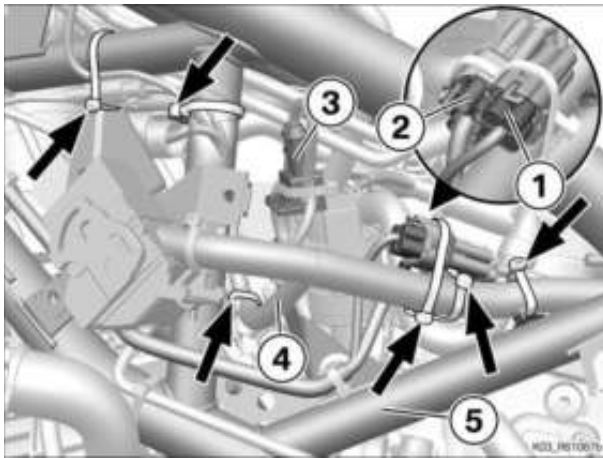
 Tightening torques		
Wiring harness to crankcase		
M6 x 16	10 Nm	

- Close the cable strap (arrows).
- Set cable shoe (2) on engine housing (3).
- Install handlebar end plug (1).



 Tightening torques		
Wiring harness to cylinder head		
M5 x 12	6 Nm	

- Install main wiring harness (4) on main frame (5).
- Connect connector (3) for secondary air system shift valve.
- Connect connector (1) and (2) for the left multifunction switch.
- Close the cable strap (arrows).



- Route main wiring harness (6).
- Connect connector (5) for the coolant-temperature sensor.
- Connect connector (2,) (3) and (4) for alternator.
- Connect connector (1) for the clutch switch.
- Close the cable strap (arrows).



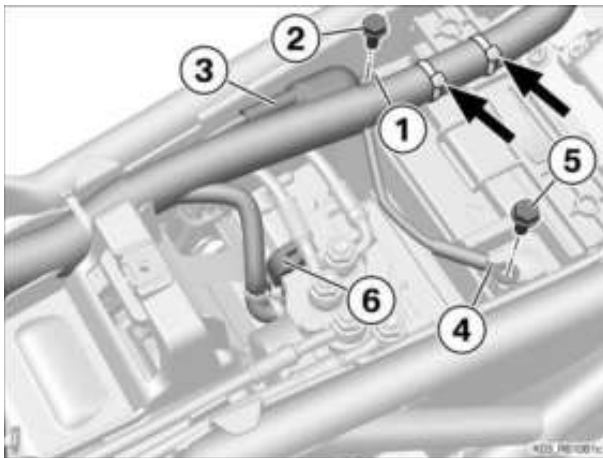
► Secure main wiring harness to rear frame

⚠ ATTENTION

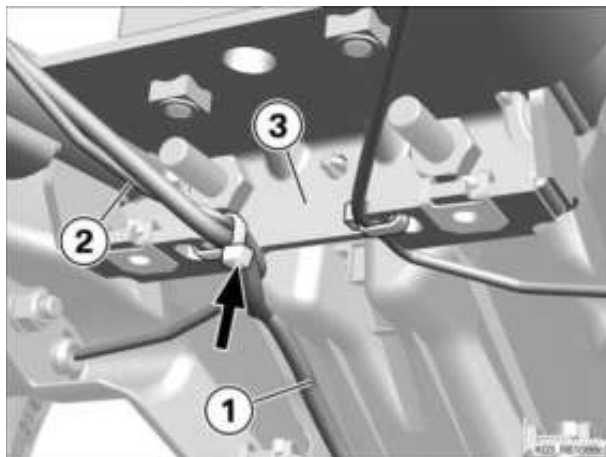
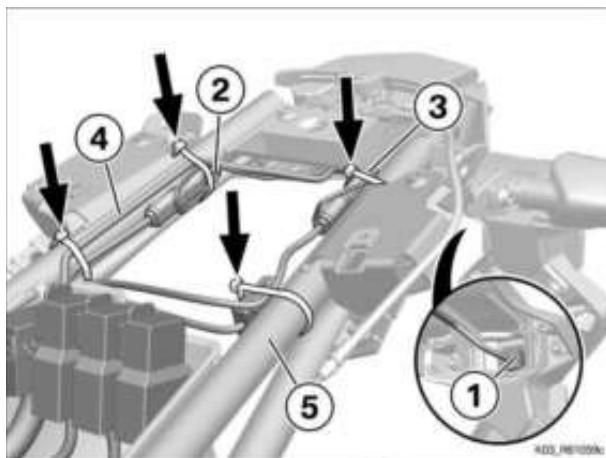
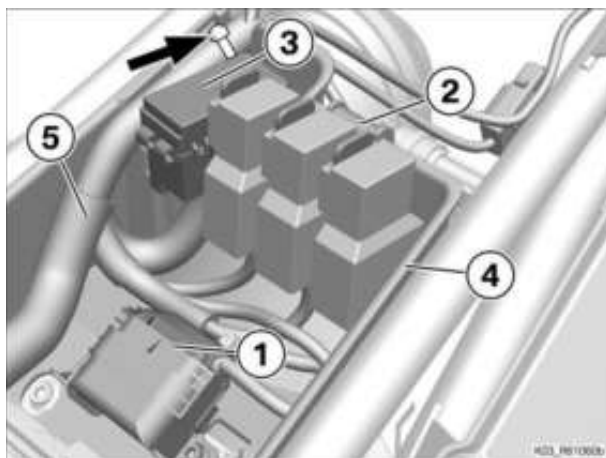
Battery not connected in accordance with correct procedure

Risk of short-circuit

- Always proceed in compliance with specified installation sequence.



- Hold positive terminal (1) in position and install bolt (2).
- Secure rubber grommet (3).
- Hold negative terminal (4) in position and install bolt (5).
- Connect connector (6) for the pressure modulator.
- Close the cable strap (arrows).
- Route main wiring harness (5) to battery tray (4).
- Secure relay carrier (2) and fuse box (3) to battery tray (4).
- Secure **OBD**-diagnostic connector (1).
- Secure the cable strap (arrow).



- Route main wiring harness (4) to rear frame (5).
- Connect connector (3) for the left flashing turn indicator.
- Connect connector (2) for the right flashing turn indicator.
- Connect connector (1) for the rear light.
- Close the cable strap (arrows).

- Secure cable (1) for right turn indicator and cable (2) for rear light with cable straps (arrow) to rear frame (3).

Follow-up work

Installing tail bottom section
 Install bolt of left rear trim panel
 Installing right rear trim panel
 Installing luggage carrier
 Installing engine control unit
 Install the intake air silencer

Installing idle actuator
Installing expansion tank
Installing the left radiator cowl with the air duct
Installing right radiator cowl
Installing fuel tank
Securing front wiring harness
Installing front mask with windscreen
Installing top front-wheel cover
Installing cover for fuel tank
Installing cover for right intake snorkel
Installing cover for left intake snorkel
Installing right frame cover
Installing left frame cover
Installing seat
Final check of work performed

61 21 128 Removing/installing battery carrier

+ 61 21 526

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

=> Draining/filling/bleeding rear brake system (Description in item: 34 00 584, Billed as a separate item)

Removing left frame cover

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing fuel tank

Loosen wiring harness from rear end

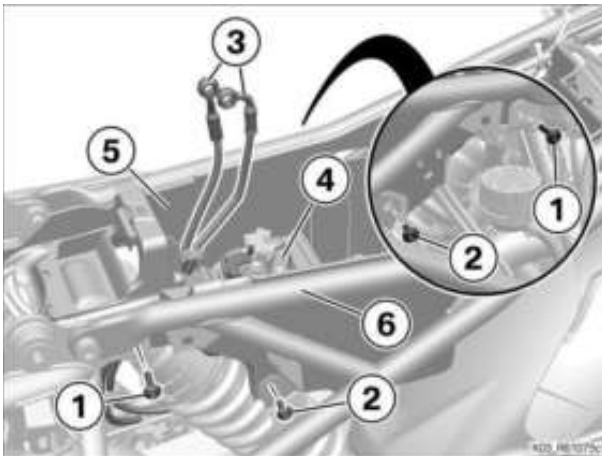
Disconnecting brake lines from pressure modulator

Releasing pressure modulator

Core activity

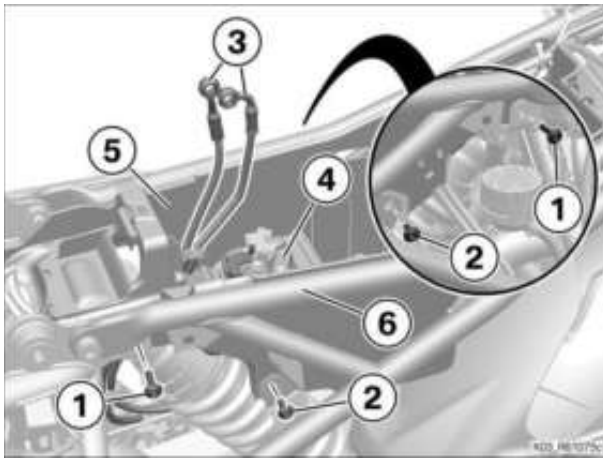
(-) Removing battery carrier

- Remove screws (1) and (2).
- Disconnect brake lines (3) and the pressure modulator (4) and allow to dangle to the side.
- Remove battery tray (5) from rear frame (6).



(-) Installing battery carrier

- Raise brake lines (3) and pressure modulator (4).
- Insert battery tray (5) in rear frame (6) and while doing so, feed brake lines (3) into battery tray (5).
- Install long screws (1) and short screws (2).



Follow-up work

- Securing pressure modulator
- Securing brake lines to pressure modulator
- Secure main wiring harness in rear end
- Installing fuel tank
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing left frame cover
- Installing seat
- Setting calendar date
- Final check of work performed

61 31 006 Replacing microswitch for rear brake

+ 61 31 547

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

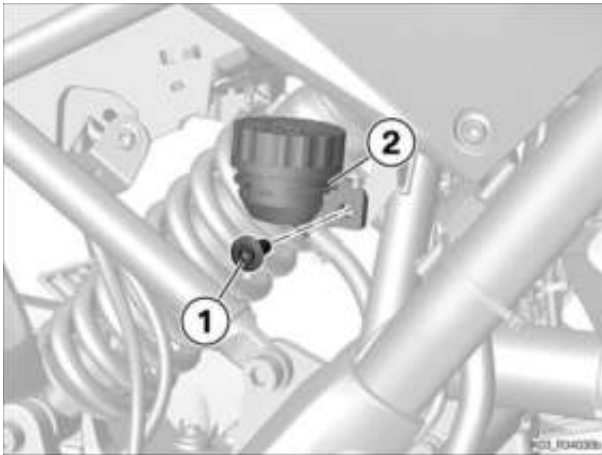
Removing right frame cover

Core activity

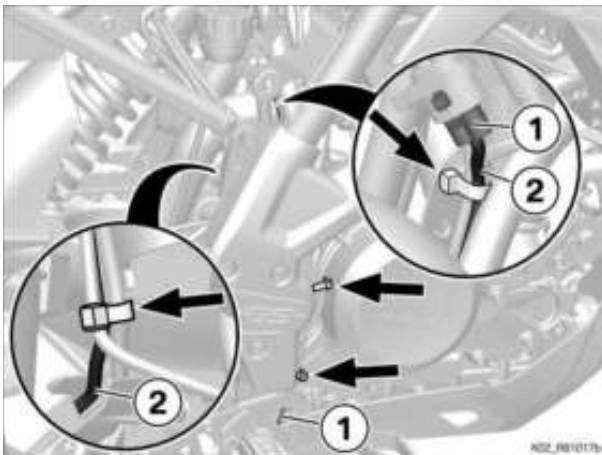
(-) Removing microswitch for rear brake

► Disengaging rear reservoir

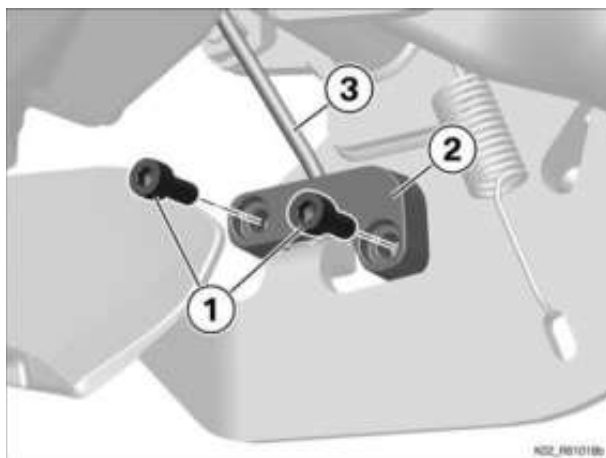
- Remove screw (1).
- Disengage reservoir (2).



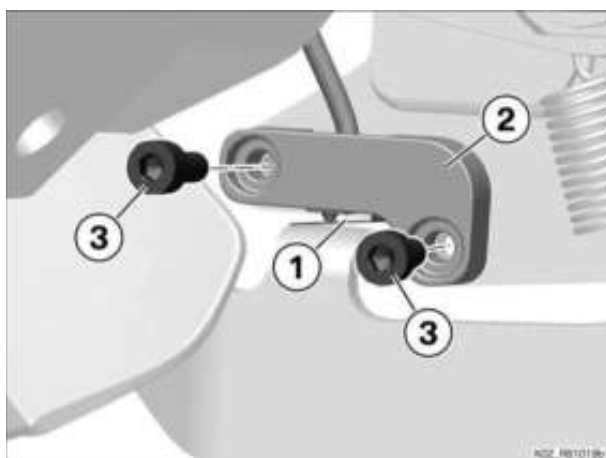
- Remove the cable straps (arrows).
- Disconnect plug connection (1) for the microswitch.
- Work cable (2) for the microswitch clear.



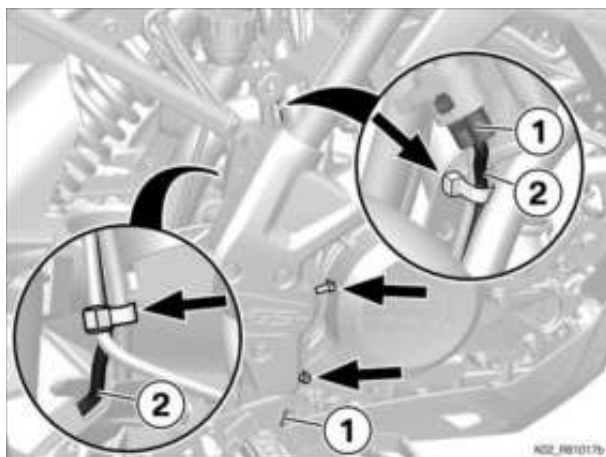
- Remove screws (1).
- Remove microswitch (2) with cable (3).



(-) Installing microswitch for rear brake



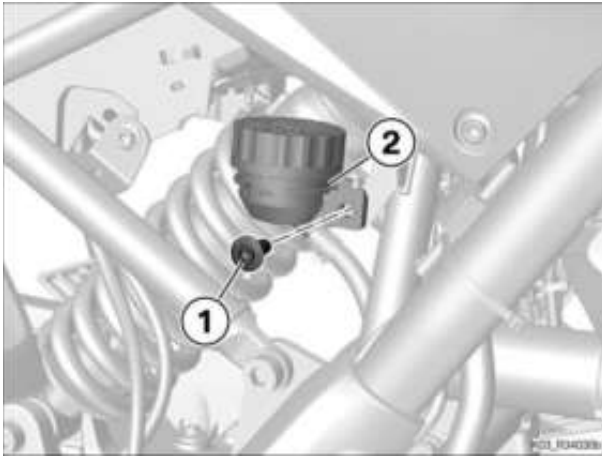
- Move switch tongue (1) when installing microswitch (2).
- » Switch tongue (1) is not bent out of shape.
- Install screws (3).



- Work cable (2) for the microswitch into place and route it correctly.
- Connect plug connection (1) for the microswitch.
- Close the cable strap (arrows).

► Secure expansion tank, rear

- Hold expansion tank (2) in position.
- Install handlebar end plug (1).



Follow-up work

Installing right frame cover

Final check of work performed

61 31 007 Replacing microswitch for front brake

+ 61 31 548

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

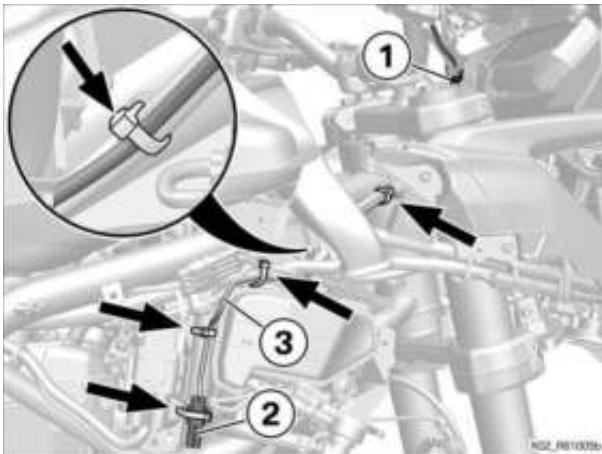
Removing the cover for right intake snorkel

Removing cover for fuel tank

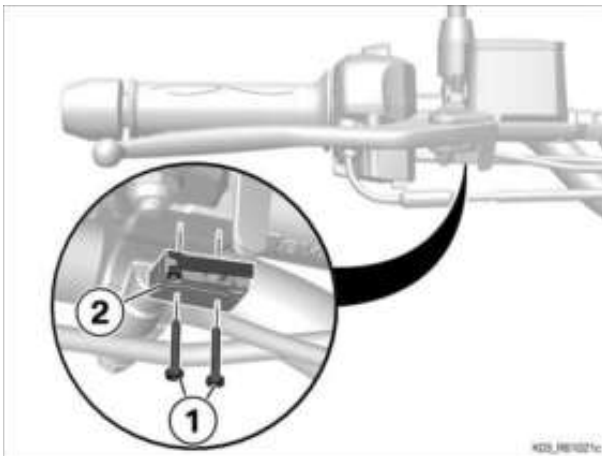
Removing right radiator cowl

Core activity

(-) Removing microswitch for front brake



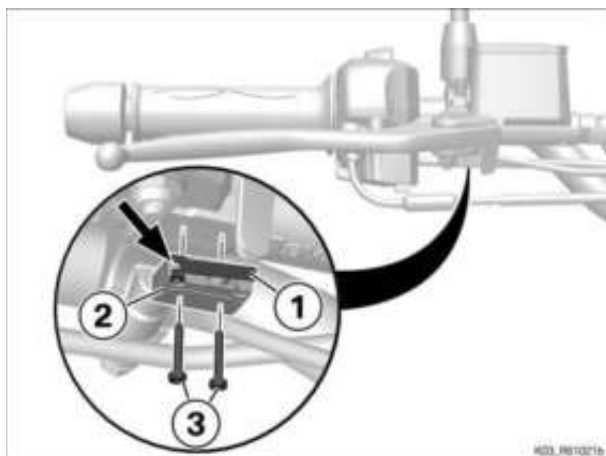
- Remove the cable straps (arrows).
- Remove rubber strap (1).
- Disconnect plug connection (2) for the microswitch.
- Work cable (3) for the microswitch clear.



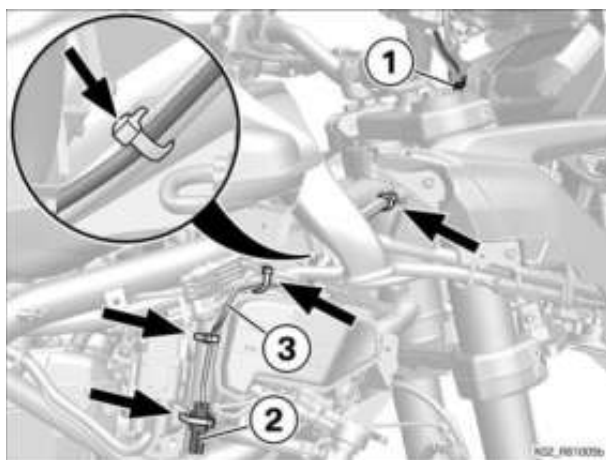
- Remove screws (1).
- Remove microswitch (2).

(-) Installing microswitch for front brake

- Move switch tongue (1) when installing microswitch (2).
- » Switch tongue (1) is not bent out of shape.



- Hold microswitch (2) in position, taking care to position the relay lever (arrow) of switch tongue (1) as shown here.
- Install screws (3).



- Work cable (3) for the microswitch into place and route it correctly.
- Connect plug connection (2) for the microswitch.
- Install rubber retainer (1).
- Close the cable strap (arrows).

Follow-up work

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

61 31 063 Renewing complete multi-function switch on left handlebar

+ 61 31 904

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

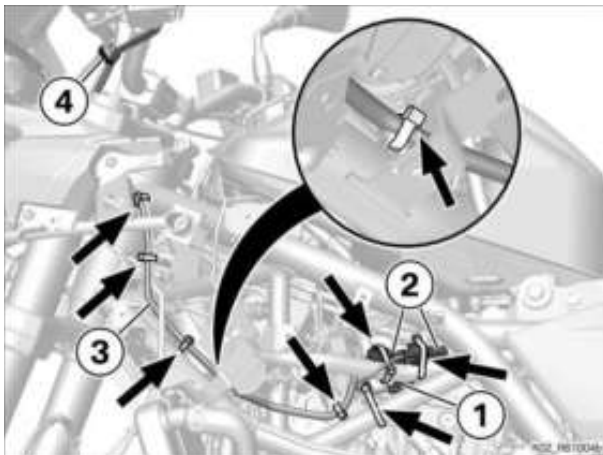
Removing cover for fuel tank

Removing left radiator cowl

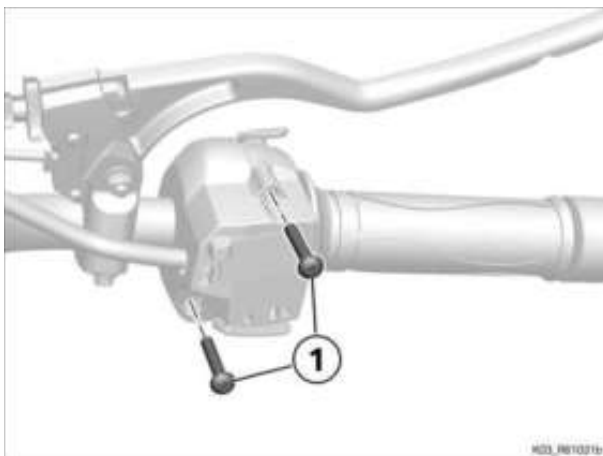
Disengage the engine control unit

Core activity

(-) Removing left multifunction switch



- Remove the cable straps (arrows).
- Remove rubber strap (4).
- Disconnect plug connections (1) and (2) for the multifunction switch.
- Work cable (3) clear of the motorcycle.



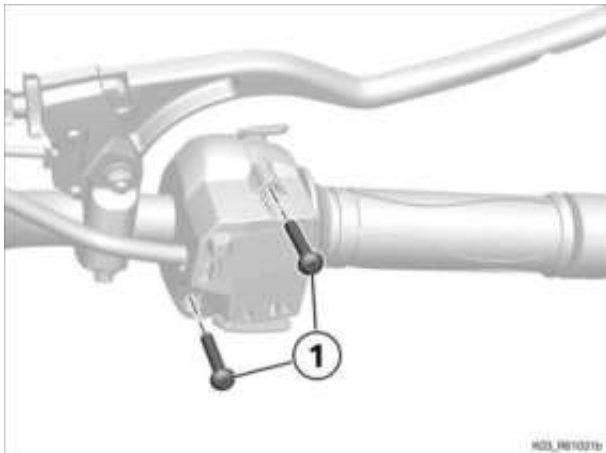
- Remove screws (1).
- Separate housing halves of multifunction switch (1), noting the lug (arrow).
- Remove multifunction switch (1).



(-) Installing left multifunction switch

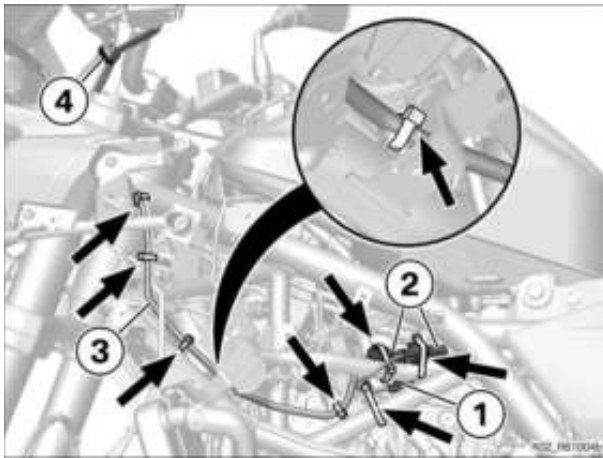


- Hold multifunction switch (1) in position.
- Join housing halves of multifunction switch (1), making sure that the lug (arrow) engages the hole in the handlebar.



- Install screws (1).

- Work cable (3) into position and route it correctly.
- Connect plug connections (1) and (2).
- Close the cable strap (arrows).
- Install rubber retainer (4).



Follow-up work

Securing engine control unit

Installing left radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

61 31 073 Renewing complete multi-function switch on right handlebar

+ 61 31 905

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

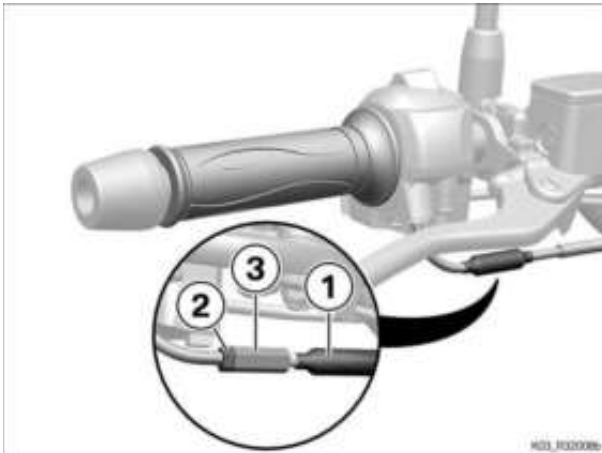
Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

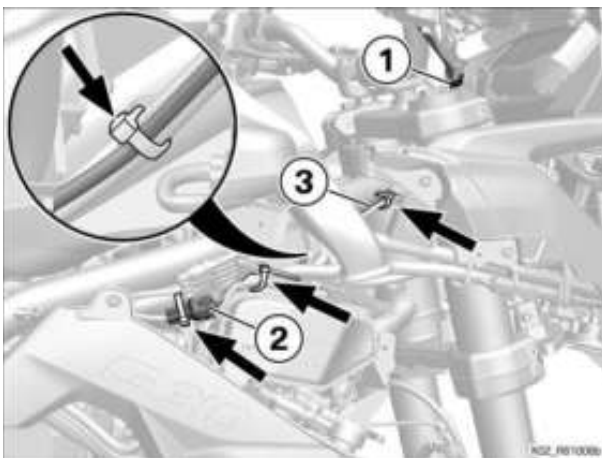
Core activity

(-) Increasing the play at the accelerator Bowden cable



- Push back rubber grommet (1)
 - Loosen lock nut (2) and screw in adjusting nut (3).
- » The maximum play on accelerator Bowden cable has been set.

(-) Removing right multifunction switch

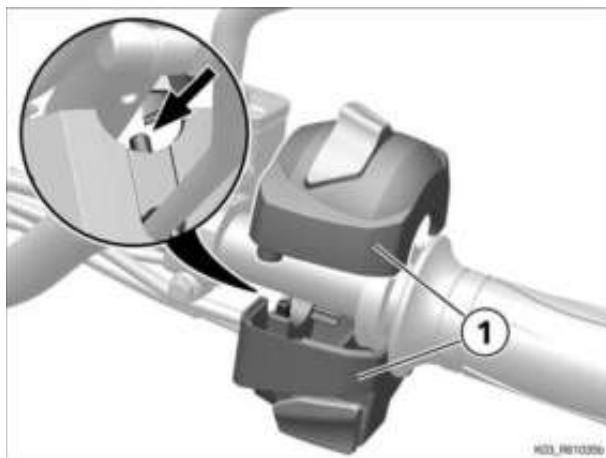


- Remove the cable straps (arrows).
- Remove rubber strap (1).
- Disconnect plug connection (2) and work cable (3) clear.

- Remove screw (1) and disengage retaining plate (2).
- Remove screws (3).

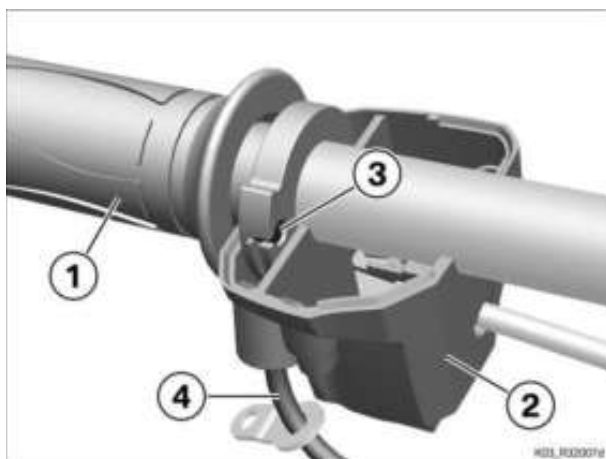


- Separate housing halves of multifunction switch (1), noting the lug (arrow).

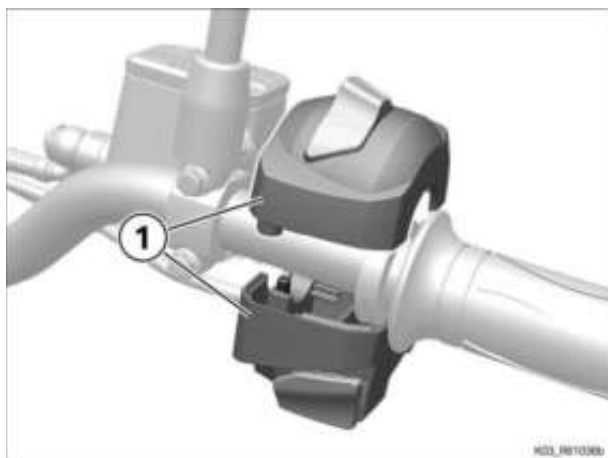


► Release the throttle cable

- Twist throttle grip (1) to the front.
- Disengage multifunction switch (2).
- Detach nipple (3) from throttle grip (1).
- Loosen throttle cable (4) from multifunction switch (4).

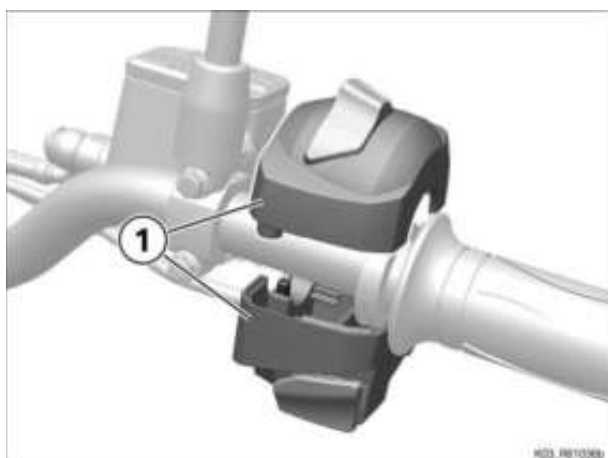


- Remove complete multifunction switch (1).



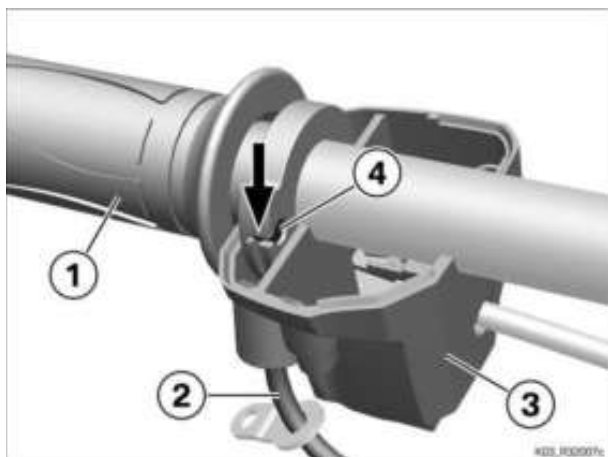
(-) Installing right multifunction switch

- Hold multifunction switch (1) in position.

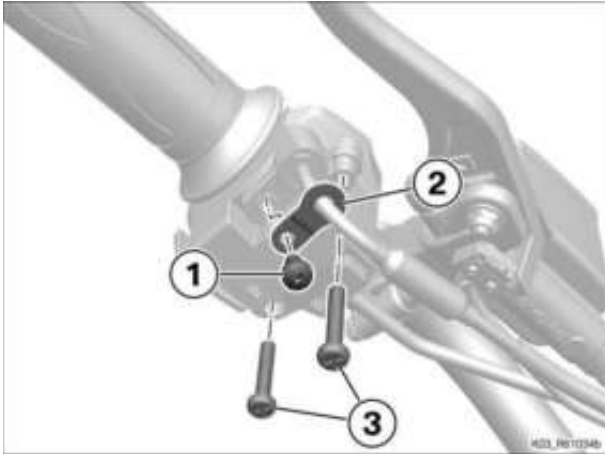
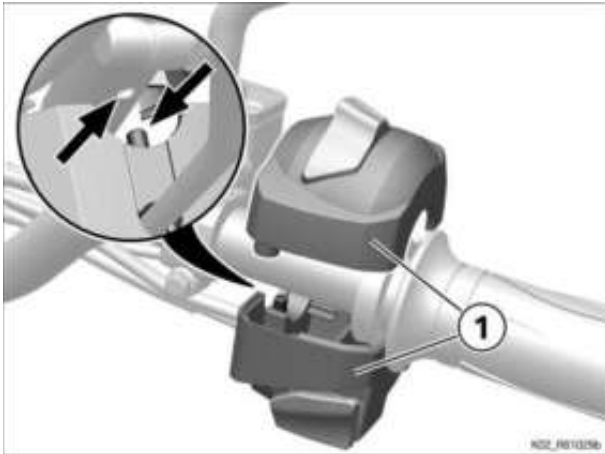


► Attach throttle cable

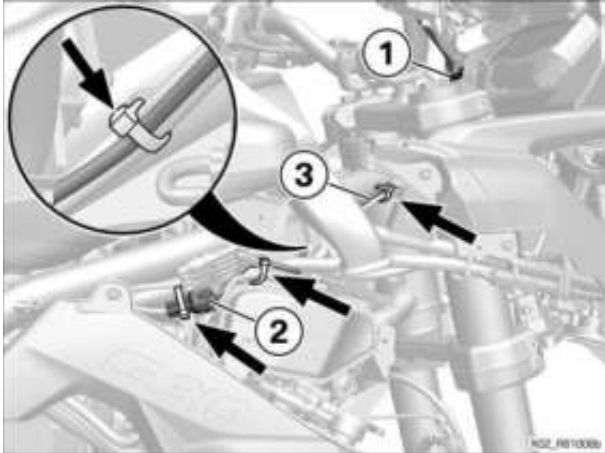
- Position throttle grip (1) such that the mounting for throttle cable (Arrow) points to the bottom.
- Feed throttle cable (2) into multifunction switch (3) and attach nipple (4).



- Join housing halves of multifunction switch (1), making sure that the lug (arrows) engages in the bore hole on the handlebar.



- Install screws (3).
- Hold retaining plate (2) in position and install screw (1).



- Work cable (3) into position and route it correctly.
- Connect plug connection (2) and install rubber strap (1).
- Close the cable strap (arrows).

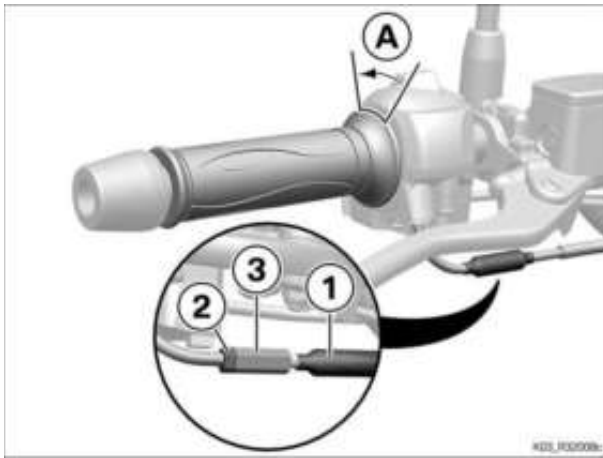
(-) Adjusting throttle cable

 NOTICE

Check throttle-cable play with the engine cold; adjust if necessary.

- Adjust throttle-cable play with adjusting screw (3).

 Technical data			
Setting of throttle-cable play	Engine is cold on the	1...2 mm	



outer diameter of the rubber grip max 35 ° C		
--	--	--

- In different handlebar positions, check throttle-cable play (A) at the throttle grip and check that the throttle valve reaches its end stop (clearly audible click), if necessary, adjust again.
- Tighten locknut (2).
- Position rubber grommet (1).

Follow-up work

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

61 31 295 Removing/installing or replacing clutch switch

+ 61 31 911

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

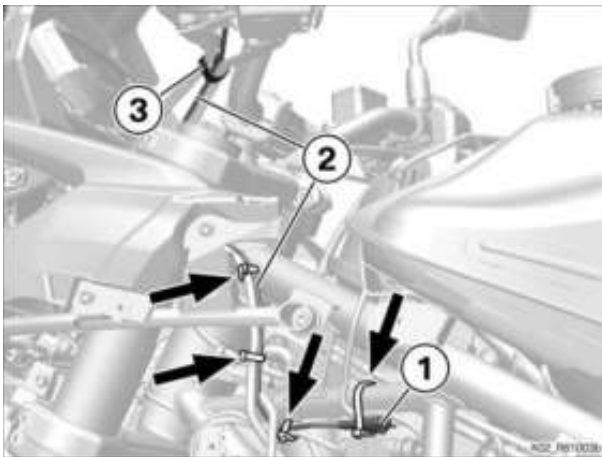
Removing cover for fuel tank

Removing left radiator cowl

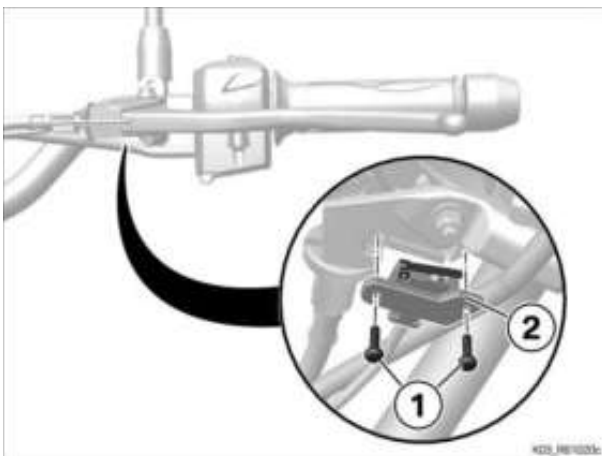
Disengage the engine control unit

Core activity

(-) Removing clutch switch



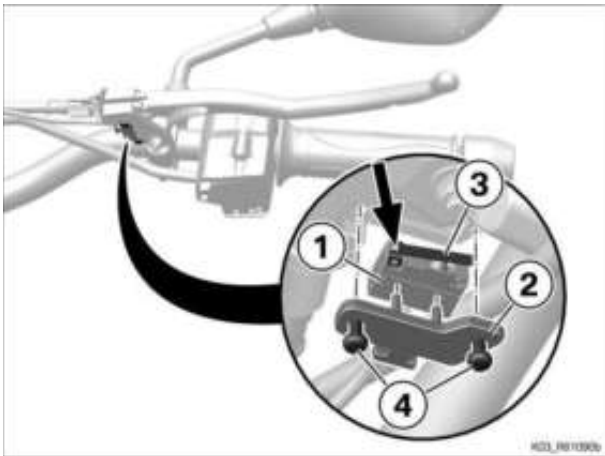
- Remove the cable straps (arrows).
- Remove rubber strap (3).
- Disconnect plug connection (1) for the clutch switch.
- Work cable (2) for the clutch switch clear.



- Remove screws (1).
- Remove clutch switch (2).

(-) Install the clutch switch

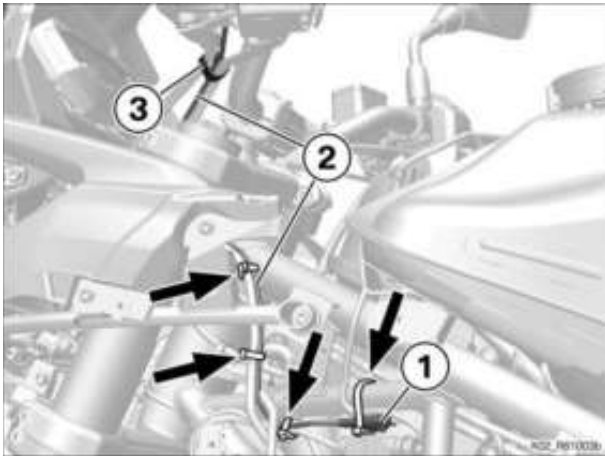
•



Position clutch switch (1) in holder (2) and while doing so, position the relay lever (arrow) of the switch tongue (3) in the front direction of travel.

- Operate switch tongue (3) when installing clutch switch (1) by hand.
- » Switch tongue (3) is not bent out of shape.
- Install screws (4).

 Tightening torques		
Microswitch to clutch lever fitting		
M3	0.8 Nm	



- Work cable (2) for the clutch switch into place and route it correctly.
- Connect plug connection (1) for the clutch switch.
- Install rubber retainer (3).
- Close the cable strap (arrows).

Follow-up work

- Securing engine control unit
- Installing left radiator cowl
- Installing cover for fuel tank
- Installing cover for right intake snorkel
- Installing cover for left intake snorkel
- Installing seat
- Final check of work performed

 61 31 302 Replacing switch for side stand

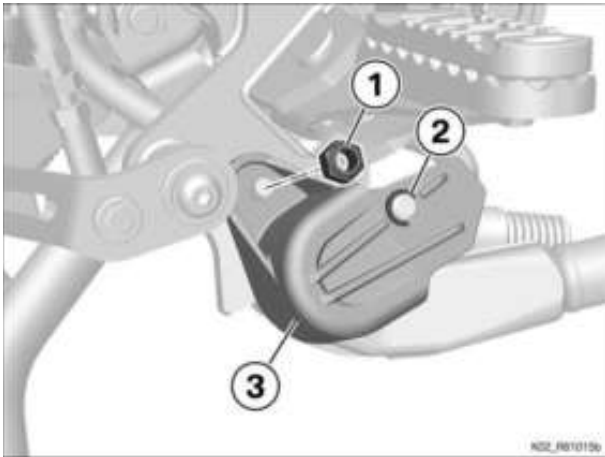
+ 61 31 913

Preparatory work

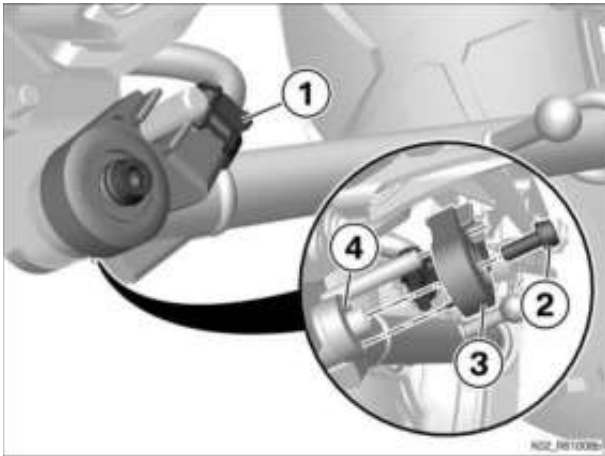
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

(-) Removing side-stand switch



- Remove nut (1).
- Remove circlip (2).
- Remove cover (3).

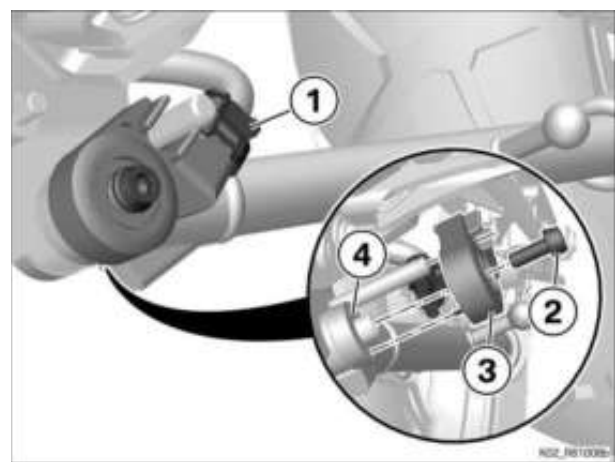


- Disconnect connector (1) for the side-stand switch.
- Remove bolt (2) and remove side-stand switch (3) from side stand (4).

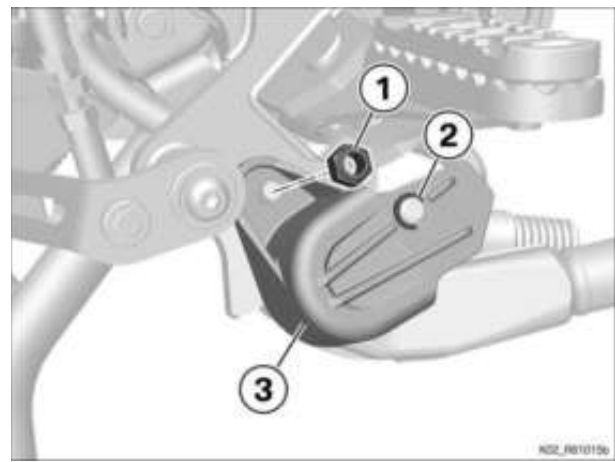
(-) Installing side-stand switch

- Clean the threads.
- Position side-stand switch (3) on side stand (4) and install bolt (2).

 Tightening torques		
Side-stand switch to side-stand screw		
M6 x 16, Replace screw	6 Nm	
Thread-locking compound (Micro-encapsulated)		



- Connect connector (1) for the side-stand switch.



- Position cover (3) and install nuts (1).

 Tightening torques		
Cover for side-stand switch to frame		
M6, Replace nut	3 Nm	
Thread-locking compound (mechanical)		

- Install circlip (2).

Follow-up work

Final check of work performed

61 35 503 Setting service-due date with BMW Motorrad diagnostic system (for maintenance)

Core activity

(-) Setting the service date with BMW Motorrad diagnosis system

- Start diagnosis system and perform the vehicle test.
- Select **Activities** from the menu, call up the **Service schedules** and set the service date.

 61 35 504 Setting service countdown distance with BMW Motorrad diagnostic system (for maintenance)

Core activity

(-) Setting the service for remaining distance with BMW Motorrad diagnosis system

- Start diagnosis system and perform the vehicle test.
- Select **Activities** from the menu, call up the **Service schedules** and set the countdown distance.



61 35 505 Setting service-due date and service countdown distance with BMW Motorrad diagnostic system (for maintenance)

Core activity

(-) Setting the service date and service for remaining distance with BMW Motorrad diagnosis system

- Start diagnosis system and perform the vehicle test.
- Select **Activities** from the menu, call up the **Service schedules** and set the service date and the countdown distance.

61 36 001 Replacing starter relay

+ 61 36 560

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

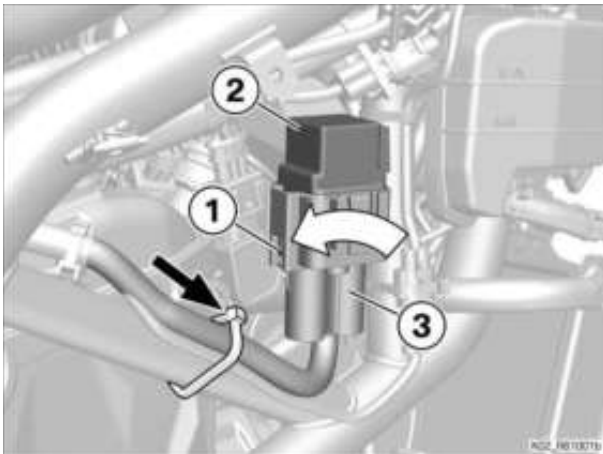
Removing cover for fuel tank

Removing right radiator cowl

Core activity

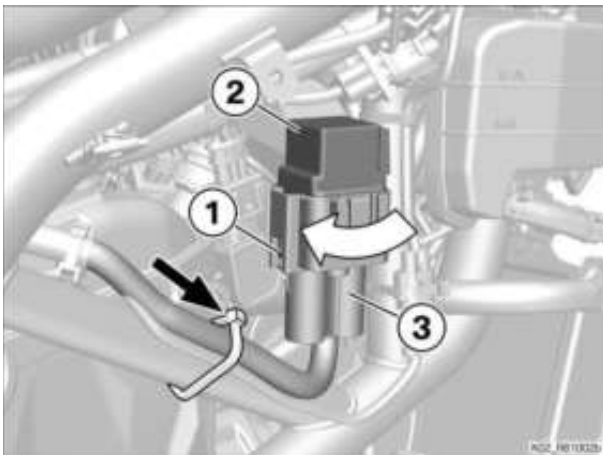
(-) Removing starter relay

- Remove cable strap (arrow).
- Turn relay carrier (3) in the direction of arrow.
- Unlock lock (1) and remove starter motor relay (2) from relay carrier (3).



(-) Installing starter relay

- Install starter motor relay (2) in relay carrier (3) paying attention to the correct seating of lock (1).
- Position relay carrier (3) correctly and turn in direction of arrow.
- Install new cable strap (arrow).



Follow-up work

Installing right radiator cowl

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

62 11 199 Replacing instrument cluster (without (testing software/programming)

+ 62 11 510

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

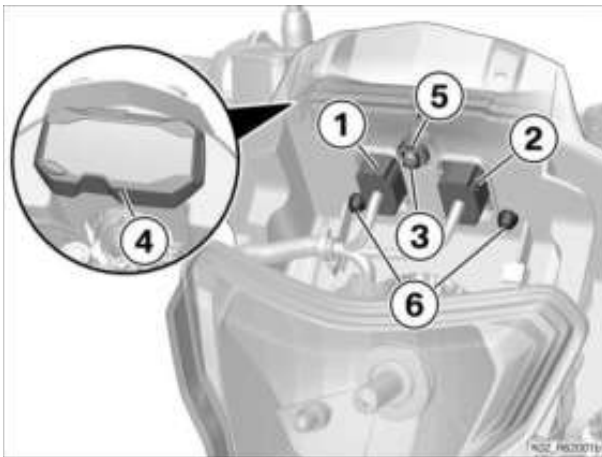
Removing cover for fuel tank

Removing top front-wheel cover

Removing front mask with windscreen

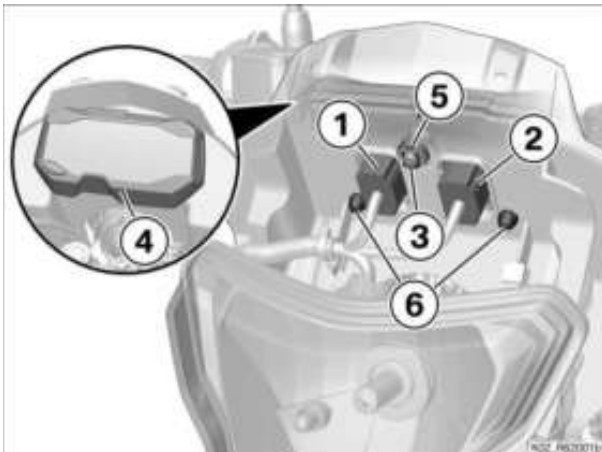
Core activity

(-) Removing instrument panel



- Disconnect plugs (1) and (2) for the instrument panel.
- Remove retaining clip (3).
- Remove instrument cluster (4) from rubber grommet (5) and remove retaining grommets (6).

(-) Installing instrument panel



- Install instrument cluster (4) in rubber grommet (5) and retaining grommets (6).
- Install retaining clip (3).
- Connect plugs (1) and (2) for the instrument panel.

Follow-up work

Installing front mask with windscreen

Installing top front-wheel cover

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

=> Testing software (Description in item: 61 00 502, Billed as a separate item)

=> Programming control units of vehicle (along with testing software) (Description in item: 61 00 510, Billed as a separate item)

Final check of work performed

 63 12 000 Adjust headlight

+ 63 12 500

Core activity

(-) Checking headlight beam throw

- Stop the motorcycle on a smooth, level surface.
- Bring spring preload to basic setting.
- Apply the rider's weight to the motorcycle.
- Switch on ignition and check headlight adjustment.

Check

- Settings for headlight beam throw aiming device:
 - (a): distance between headlight and vertical surface
 - (b): height of centre of headlight
 - (c): distance to light/dark cut-off
- Check the setting of **beam throw**.

 Technical data			
Distance between headlight and vertical surface For headlight adjustment		5 m	
Distance between light/dark cut-off and mark at height of centre of headlight	Suspension set to basic setting and vehicle loaded with 85 kg	5 cm	

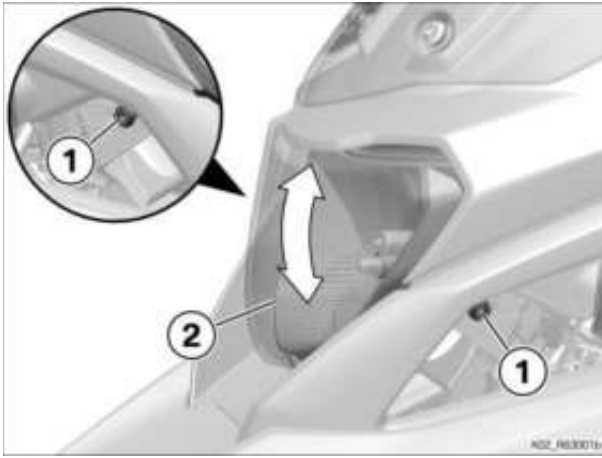
Result:

- Headlight beam angle not correct.

Measure:

► Correcting headlight beam angle

- Release screws (1) on left and right.
- Turn headlight (2) on screw axis to correct height adjustment, if required.
- Tighten screws (1) while counter-holding the headlight (2).



63 12 091 Replacing headlight

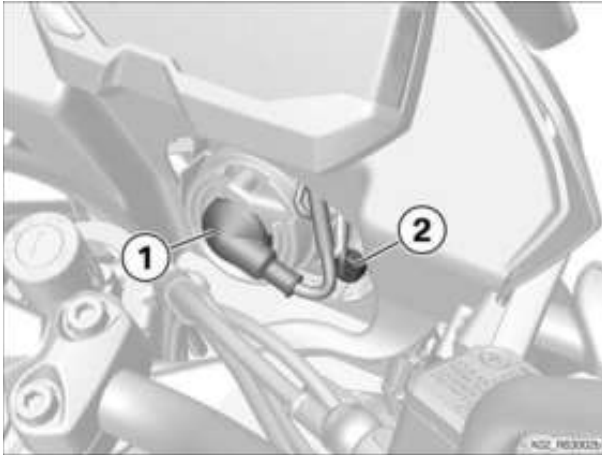
+ 63 12 637

Preparatory work

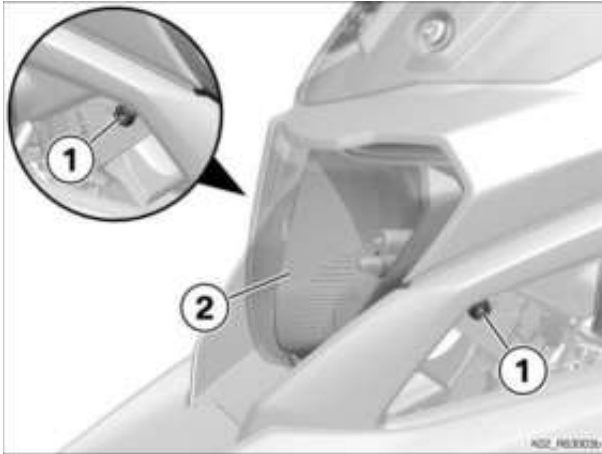
=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Core activity

(-) Removing headlight



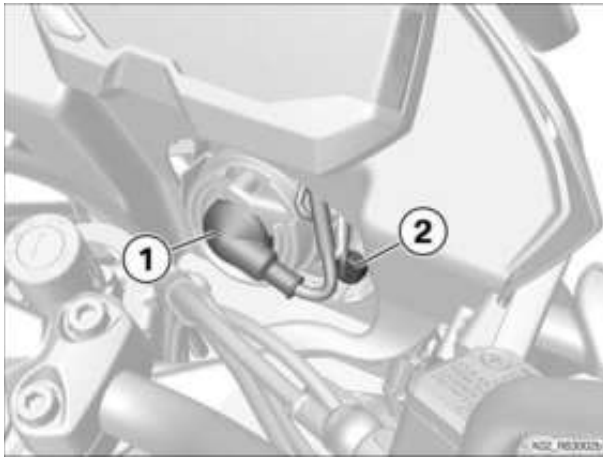
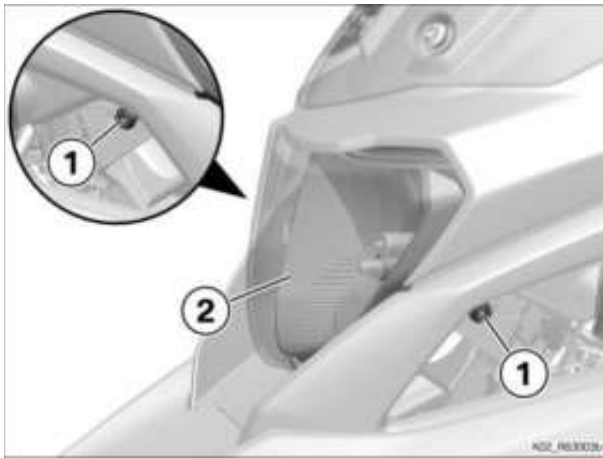
- Disconnect connector (1) for the headlight.
- Loosen side-light socket (2) and let it hang from the cable.



- Remove screws (1) on left and right.
- Remove headlight (2) to the front.

(-) Installing headlight

- Hold headlight (2) in position and install screws (1).



- Install sidelight bulb socket (2).
- Connect connector (1) for the headlight.

Follow-up work

Checking headlight beam throw

Final check of work performed

63 12 385 Removing/installing or replacing cover for headlight

+ 63 12 645

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

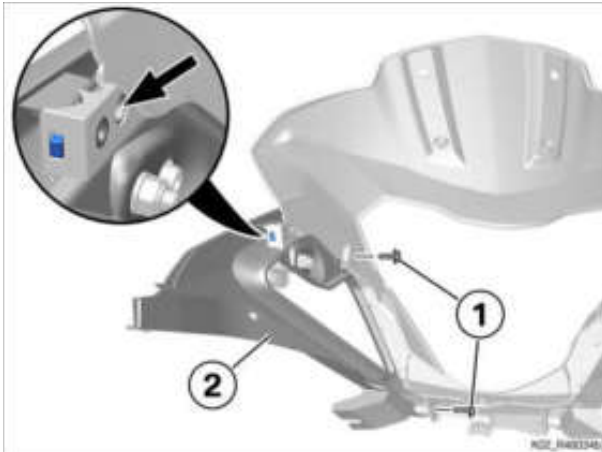
Removing top front-wheel cover

Removing windscreen

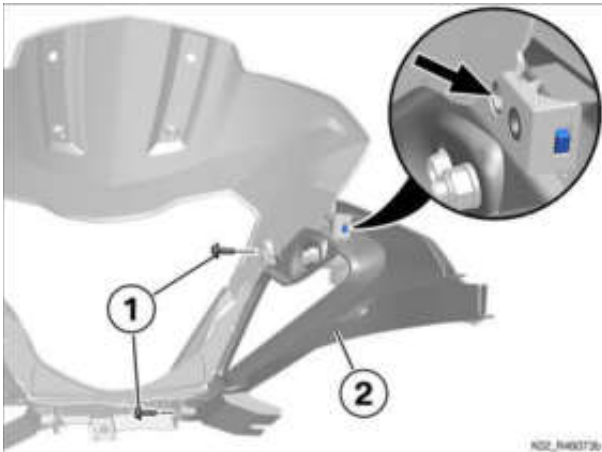
Removing the front mask

Core activity

(-) Removing headlight bezel



- Remove screws (1).
- Unhook front trim panel (2) from holder (arrow) and remove to the front.

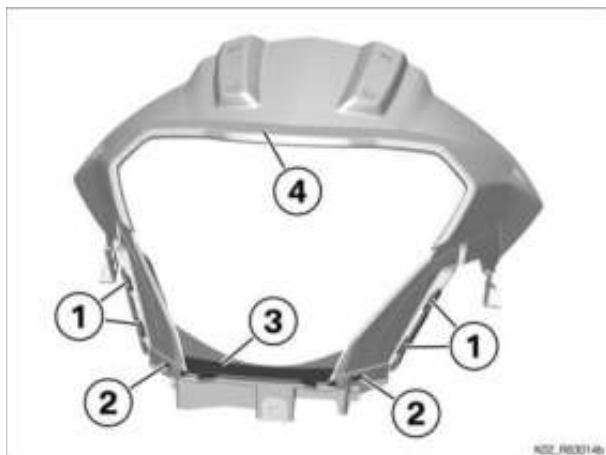


- Remove screws (1).
- Unhook front trim panel (2) out of holder (arrow) and remove to the front.

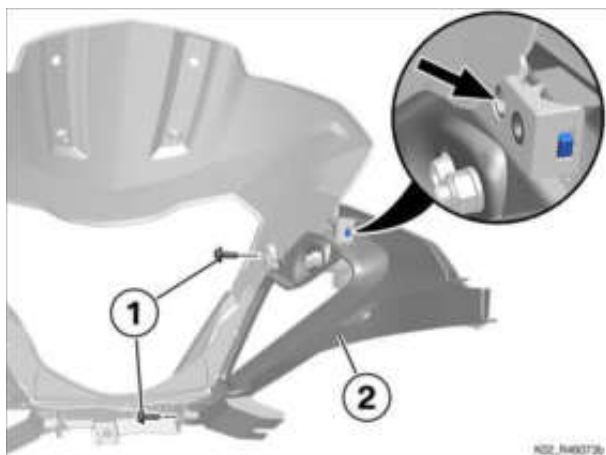
(-) Replacing the headlight trim



- Remount flat nut (1) from the old to the new top headlight cover (2).



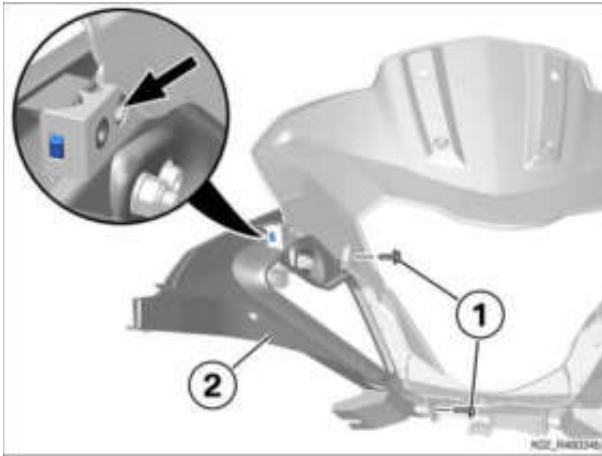
- Unlock latch mechanisms (1).
- Unlock latch mechanisms (2) using a suitable tool.
- Remove bottom headlight cover (3) from top headlight cover (4).
- Remount bottom headlight cover (3) on top headlight cover (4).



(-) Installing headlight cover

- Position front trim panel (2) and hook into holder (arrow).
- Install screws (1).

- Position front trim panel (2) and hook into holder (arrow).
- Install screws (1).



Follow-up work

Installing the front mask

Install the windscreen

Installing top front-wheel cover

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

 63 13 002 Replacing front left flashing turn indicator

+ 63 13 521

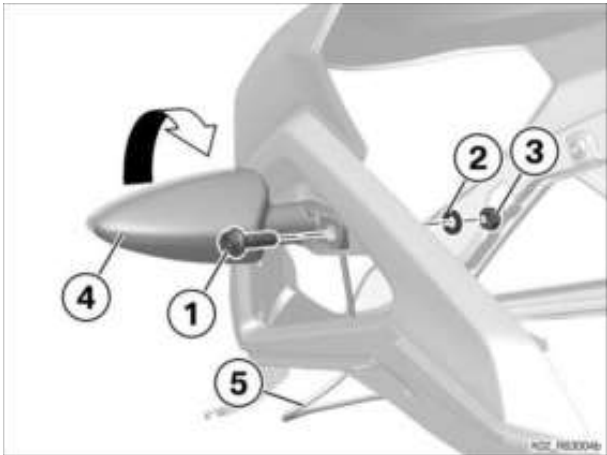
Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

- Removing seat
- Removing cover for left intake snorkel
- Removing the cover for right intake snorkel
- Removing cover for fuel tank
- Removing top front-wheel cover
- Removing front mask with windscreen

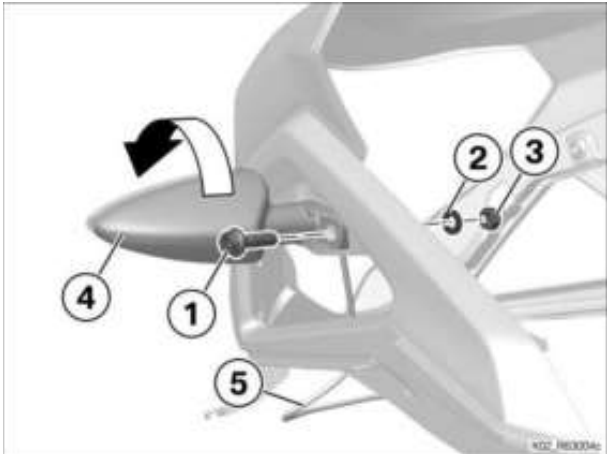
Core activity

(-) Removing front left flashing turn indicator



- Remove screw (1) with washer (2) and nut (3).
- Turn turn indicator (4) in direction of arrow and remove and while doing so, feed out cable (5).

(-) Installing front left flashing turn indicator



- Feed in cable (5) and move turn indicator (4) in direction of arrow and install.
- Install bolt (1) with washer (2) and nut (3) while counter-holding nut (3).

 Tightening torques		
Turn indicator to front mask		
M6 x 20	4 Nm	

Follow-up work

Installing front mask with windscreen

Installing top front-wheel cover

Installing cover for fuel tank

Installing cover for right intake snorkel

Installing cover for left intake snorkel

Installing seat

Final check of work performed

 63 21 380 Removing and installing or replacing complete rear light
+ 63 21 502

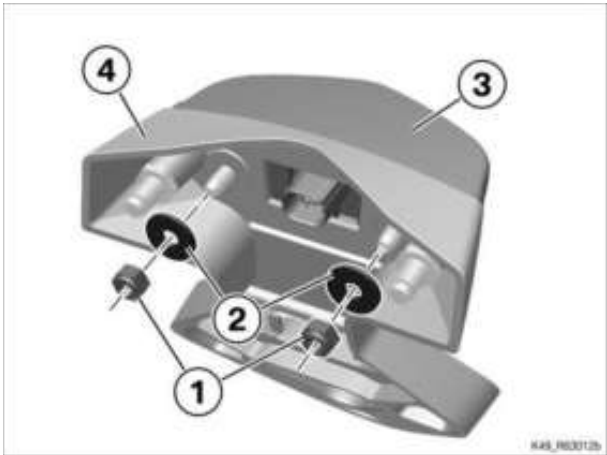
Preparatory work

=> **Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)**

- Removing seat
- Removing luggage carrier
- Removing right rear trim panel
- Removing left rear trim panel
- Removing tail bottom section
- Removing number plate carrier with rear light

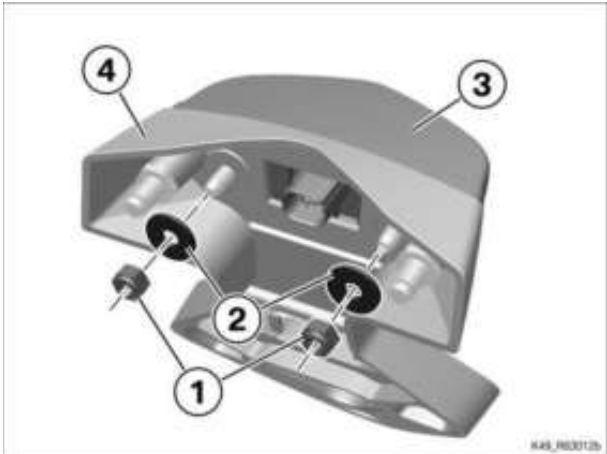
Core activity

(-) Removing rear-light unit



- Remove nuts (1) and washers (2).
- Remove rear light (3) from number plate carrier (4).

(-) Installing rear-light unit



- Insert rear light (3) in number plate carrier (4).
- Install washers (2) and nuts (1).

 Tightening torques		
Rear light to number-plate carrier		
M6	4 Nm	

Follow-up work

Replacing the M8 flat nut on rear frame

Installing the number plate carrier with rear light

Installing tail bottom section

Securing left rear trim panel

Installing right rear trim panel

Installing luggage carrier

Installing seat

Final check of work performed

63 23 012 Replacing left rear turn indicator

+ 63 23 501

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing luggage carrier

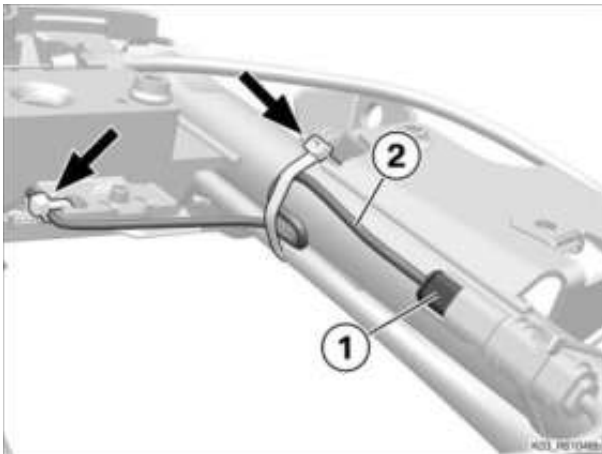
Removing right rear trim panel

Removing left rear trim panel

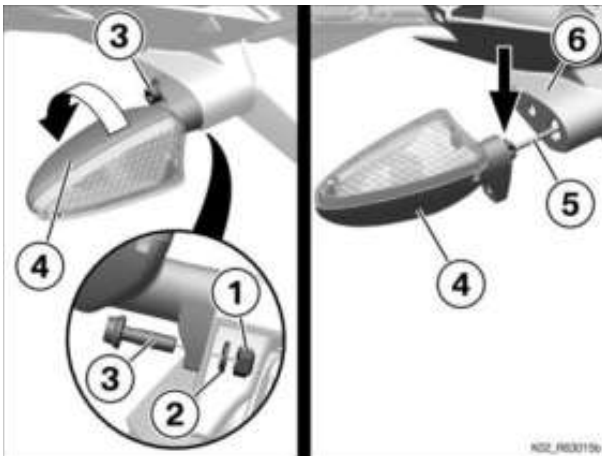
Removing tail bottom section

Core activity

(-) Removing rear left flashing turn indicator



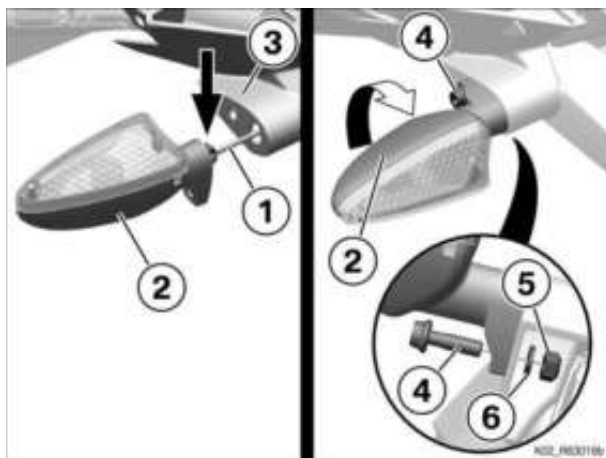
- Remove the cable straps (arrows).
- Disconnect plug (1) for the left flashing turn indicator.
- Work cable (2) clear of the motorcycle.



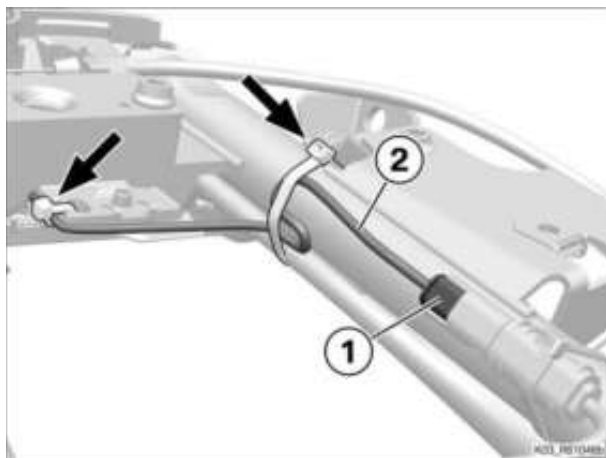
- Remove nut (1) with washer (2).
- Remove screw (3).
- Turn the turn indicator (4) so that the turn indicator glass points toward the top.
- Remove turn indicator (4) with cable (5) out of number plate carrier (6) and while doing so, pay attention to lug (arrow).

(-) Installing rear left turn indicator

- Install cable (1) with turn indicator (2) in number plate carrier (3), paying attention to the lug (arrow).



- Turn turn indicator (2) so that the turn indicator glass points toward the rear.
- Install screw (4).
- Install nut (5) with washer (6).



- Route cable (2) into position.
- Connect connector (1) for the left flashing turn indicator.
- Close the cable strap (arrows).

Follow-up work

Replacing the M8 flat nut on rear frame

Installing tail bottom section

Securing left rear trim panel

Installing right rear trim panel

Installing luggage carrier

Installing seat

Final check of work performed

77 44 064 Fit adapter plate for topcase light

+ 77 44 564

Equipment trim-level variant:

Adapter plate for topcaseLight^{OA}

Luggage carrier^{OA}

NOTICE

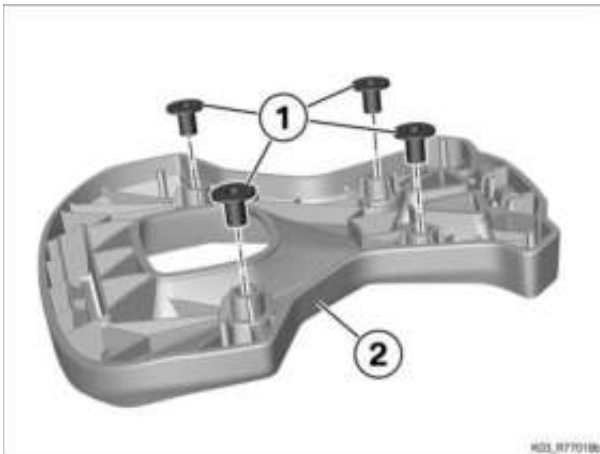
Fitting the adapter plate for topcase **Light** is possible only in conjunction with luggage rack.

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

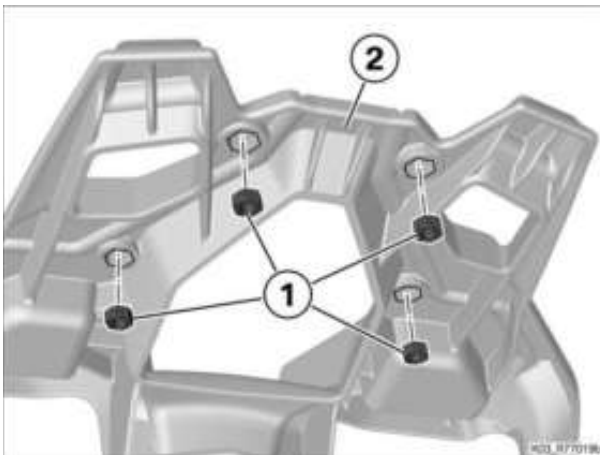
Core activity

(-) Install shouldered bushings in adapter plate for topcase Light

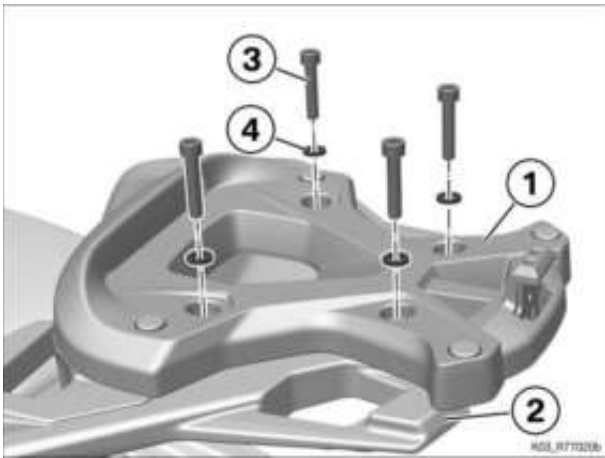


- Insert shouldered bushings (1) into adapter plate (2).

(-) Install adapter plate for topcase Light



- Install nuts (1) in luggage rack (2).



- Position adapter plate (1) for topcase **Light** on luggage rack (2) and install screws (3) with washers (4).

 Tightening torques		
Adapter plate for topcase Light on luggage rack		
M6 x 30	8 Nm	

Follow-up work

Final check of work performed

77 51 151 Installing LED flashing turn indicators

+ 77 51 651

Equipment trim-level variant:

LED flashing turn indicators^{OA}

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

Removing cover for fuel tank

Removing top front-wheel cover

Removing front mask with windscreen

Removing luggage carrier

Removing right rear trim panel

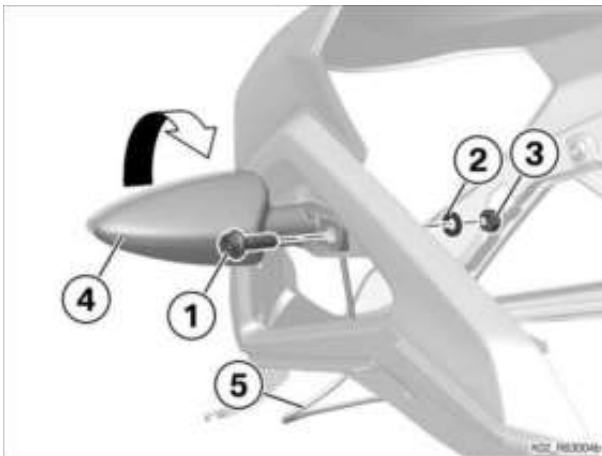
Removing left rear trim panel

Removing tail bottom section

Core activity

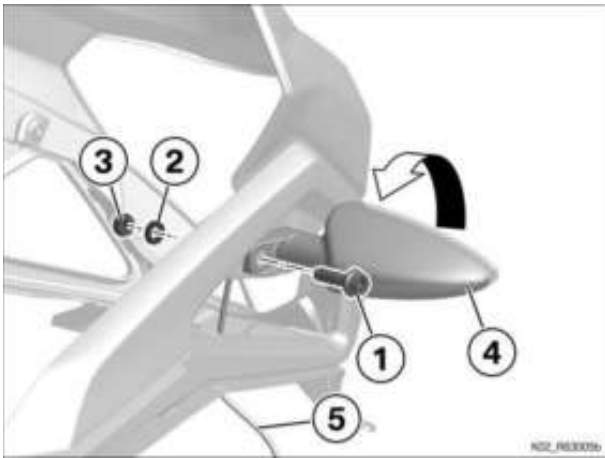
(-) Removing front left flashing turn indicator

- Remove screw (1) with washer (2) and nut (3).
- Turn turn indicator (4) in direction of arrow and remove and while doing so, feed out cable (5).



(-) Removing front right flashing turn indicator

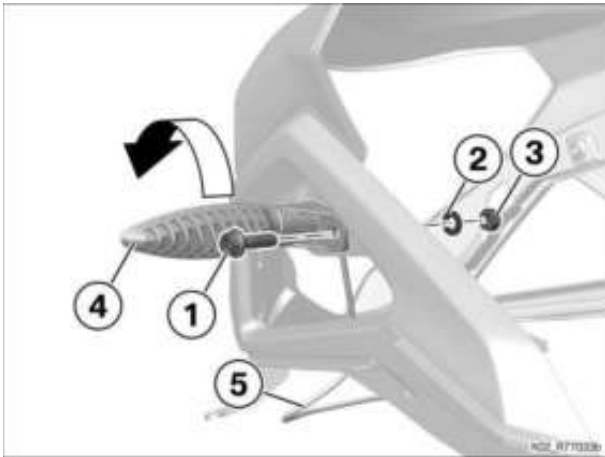
- Remove bolt (1) with washer (2) and nut (3).
- Turn turn indicator (4) in direction of arrow and remove and while doing so, feed out cable (5).



(-) Installing front left flashing turn indicator

- Feed in cable (5) and move turn indicator (4) in direction of arrow and install.
- Install screw (1) with washer (2) and nut (3) counter-holding nut (3).

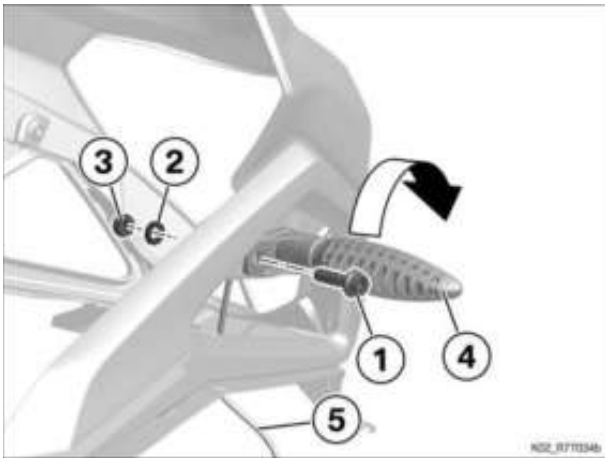
 Tightening torques		
Turn indicator to front mask		
M6 x 20	4 Nm	



(-) Installing front right flashing turn indicator

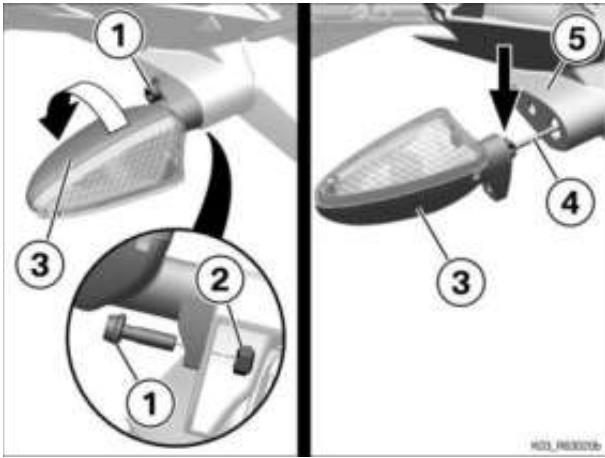
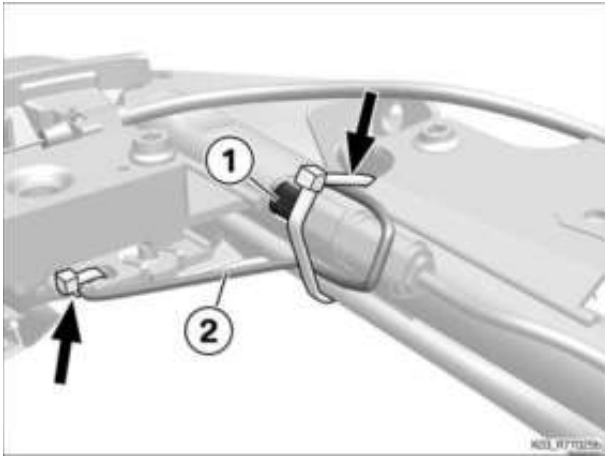
- Feed in cable (5) and move turn indicator (4) in direction of arrow and install.
- Install screw (1) with washer (2) and nut (3) counter-holding nut (3).

 Tightening torques		
Turn indicator to front mask		
M6 x 20	4 Nm	



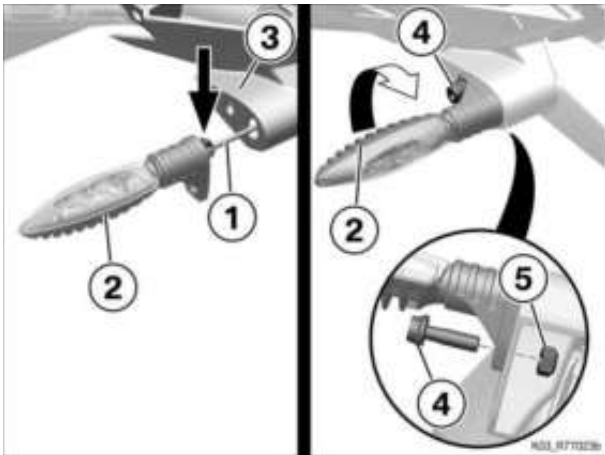
(-) Removing rear left flashing turn indicator

- Remove the cable ties (arrows).
- Disconnect plug (1) for the left flashing turn indicator.
- Work cable (2) clear of the motorcycle.



- Remove screw (1) and nut (2).
- Turn turn indicator (3) so that the turn indicator glass points toward the top.
- Remove turn indicator (3) with cable (4) out of number plate carrier (5) and while doing so, pay attention to lug (Arrow).

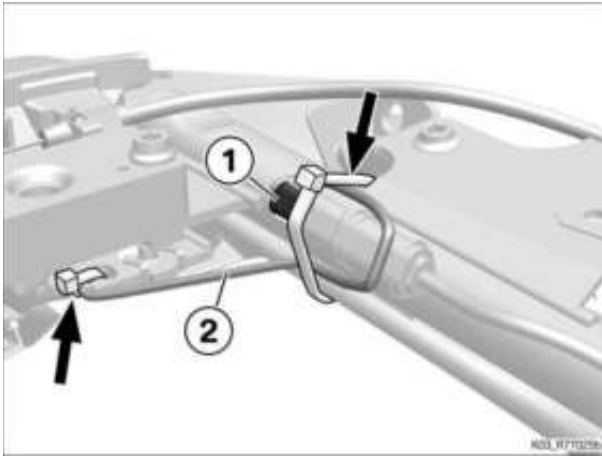
(-) Installing rear left LED flashing turn indicator



- Install cable (1) with LED flashing turn indicator (2) in number plate carrier (3), paying attention to the lug (arrow).
- Turn LED flashing turn indicator (2) in such a way that the turn indicator glass points toward the rear.
- Install screw (4) and nut (5).

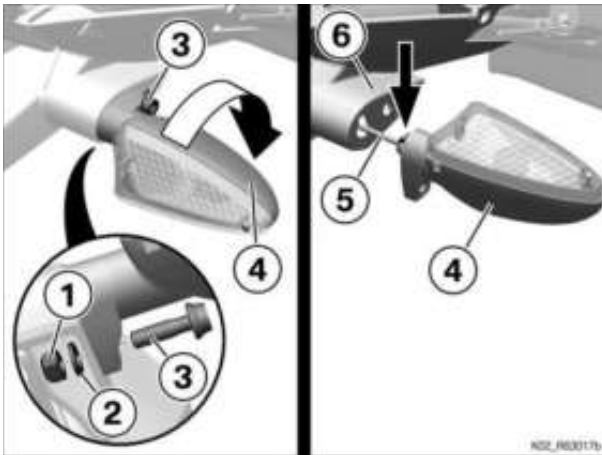
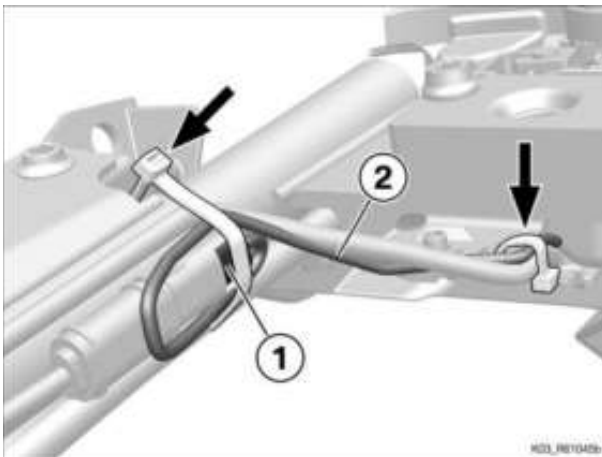
 Tightening torques		
Flashing turn indicator to number-plate carrier		
M6 x 20	4 Nm	

- Route cable (2) into position.
- Connect connector (1) for the left LED flashing turn indicator.
- Close the cable ties (arrows).



(-) Removing rear right flashing turn indicator

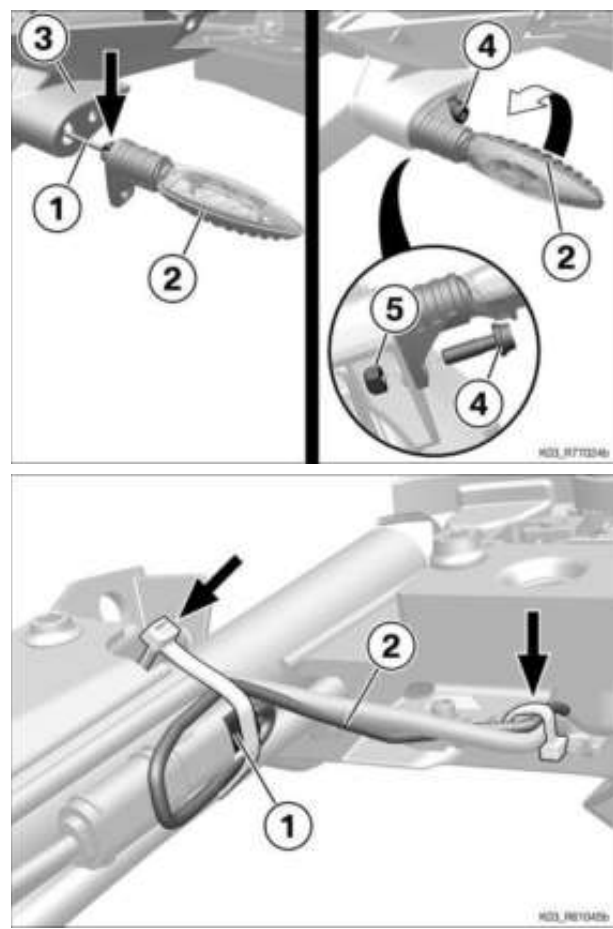
- Remove the cable straps (arrows).
- Disconnect plug (1) for the right flashing turn indicator.
- Work cable (2) clear of the motorcycle.



- Remove nut (1) with washer (2).
- Remove screw (3).
- Turn the turn indicator (4) so that the turn indicator glass points toward the top.
- Remove turn indicator (4) with cable (5) out of number plate carrier (6) and while doing so, pay attention to lug (arrow).

(-) Installing rear right LED flashing turn indicator

- Install cable (1) with LED flashing turn indicator (2) in number plate carrier (3), paying attention to the lug (arrow).
- Turn LED flashing turn indicator (2) in such a way that the turn indicator glass points toward the rear.
- Install screw (4) and nut (5).



 Tightening torques		
Flashing turn indicator to number-plate carrier		
M6 x 20	4 Nm	

- Route cable (2) into position.
- Connect connector (1) for the right LED flashing turn indicator.
- Close the cable ties (arrows).

Follow-up work

- Installing tail bottom section
- Securing left rear trim panel
- Installing right rear trim panel
- Installing luggage carrier
- Installing seat
- Final check of work performed

 77 52 201 Installing navigation system

+ 77 52 701

Preparatory work

=> Removing and installing the rear-wheel stand special tool (motorcycles without centre stand) (Description in item: 46 52 510, Billed as a separate item)

Removing seat

Removing cover for left intake snorkel

Removing the cover for right intake snorkel

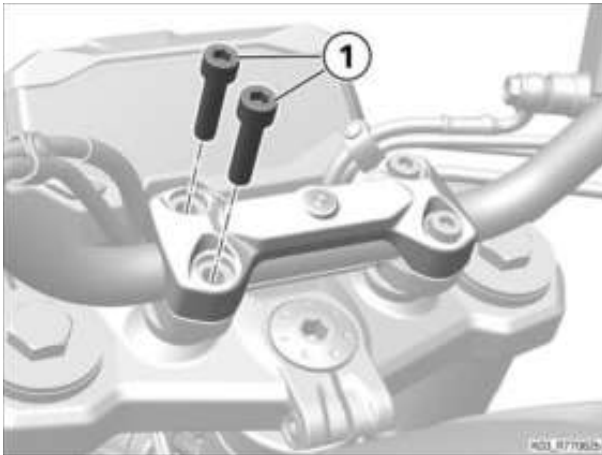
Removing cover for fuel tank

Removing top front-wheel cover

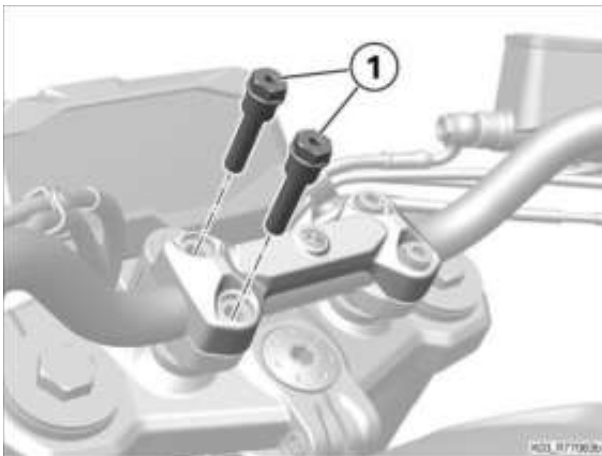
Removing front mask with windscreen

Core activity

(-) Installing mounting bolts for handlebar clamping block



- Remove screws (1) from left handlebar clamping block.



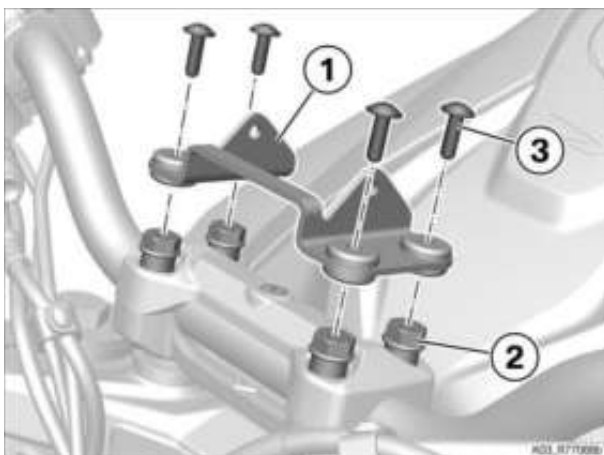
- Install mounting bolts (1) for left handlebar clamping block.

- Remove screws (1) from right handlebar clamping block.



- Install mounting bolts (1) for right handlebar clamping block.

(-) Install holder for navigation system



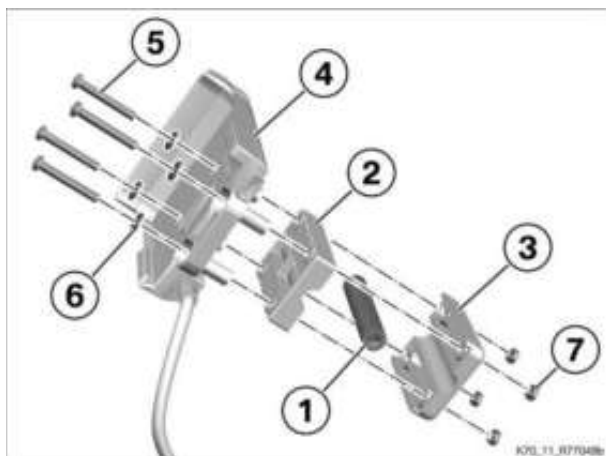
- Position holder for navigation system (1) on the handlebar clamping block (2).
- Install screws (3).

(-) Mount the Mount Cradle on clamping block

- Position cross-member (1) between clamping block upper section (2) and -lower section (3).
- Screw **Mount Cradle** (4) with screws (5), washers (6) and nut (7) onto the clamping block.



Tightening torques

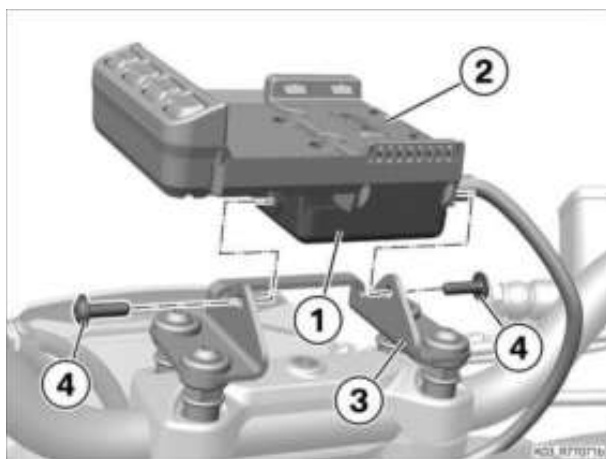


(-) Install clamping bracket with Mount Cradle in bracket top section

- Insert clamping block (1) with mounted **Mount Cradle** (2) into bracket upper section (3).
- Position **Mount Cradle** (2) and install it with screws (4).



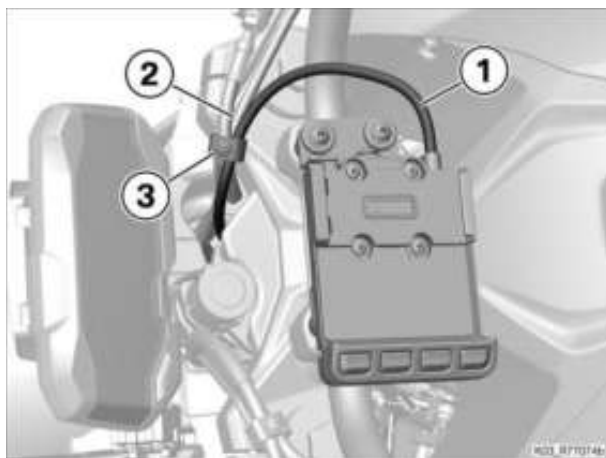
Tightening torques



(-) Route access line of the Mount Cradle and connect

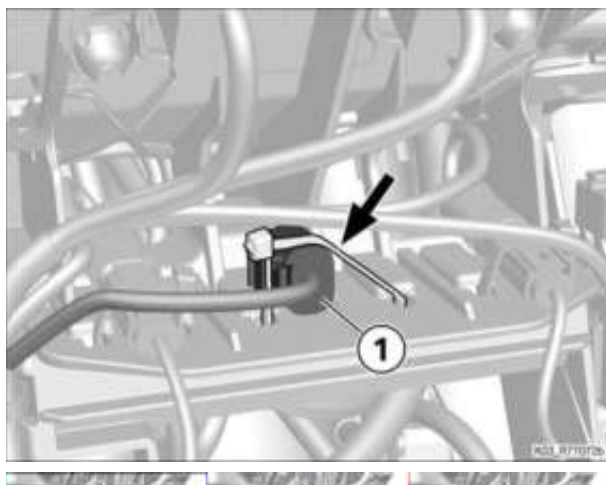
NOTICE

When routing the cable ensure freedom of movement of handlebars.



- Route access line (1) of the **Mount Cradle** along the line bundle (2) downwards and secure with rubber band (3).

- Remove cable strap (arrow) expose connector for optional accessories (1).



- Connect connector (1) for adapter cable (2) to connector for optional accessories (3).
- Lay down access line (4) of the **Mount Cradle** under the front panel carrier (5) to the front and connect connector (6) with connector (7) of the adapter cable(2) .
- Secure plug connections using cable straps (arrows).

Follow-up work

Installing front mask with windscreen
Installing top front-wheel cover
Installing cover for fuel tank
Installing cover for right intake snorkel
Installing cover for left intake snorkel
Installing seat
Final check of work performed