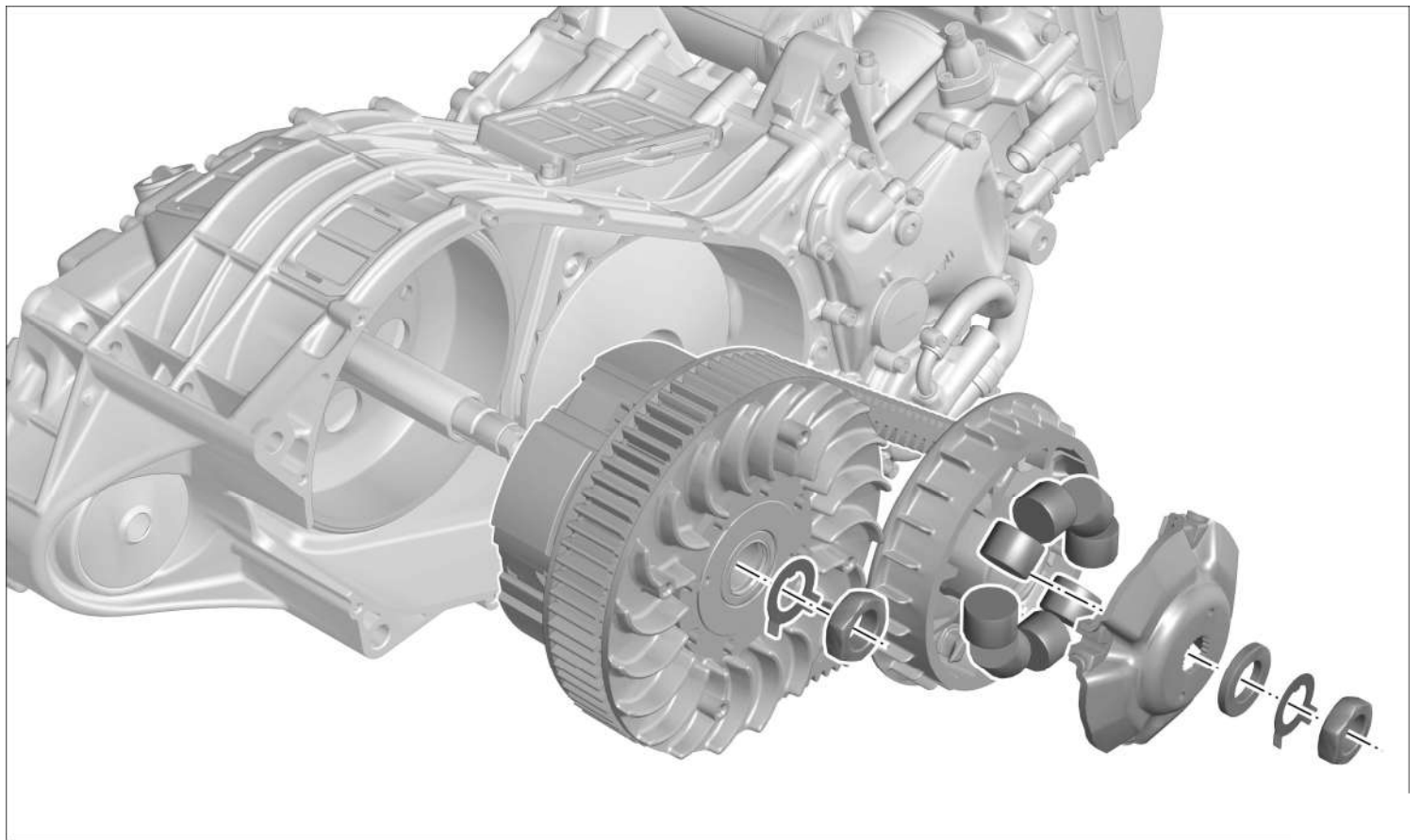
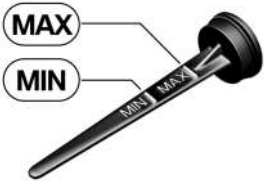
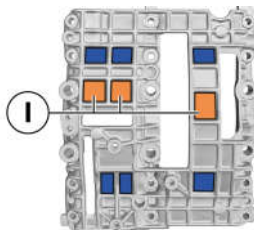
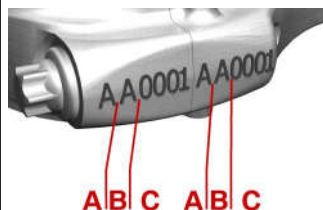
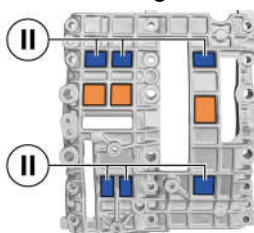


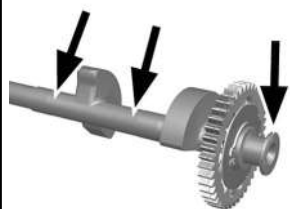
C650GT



Technical data 0133 - C 650 GT			
00 - General maintenance and construction groups			
Designation	Precondition	Value	Valid
Length of motorcycle		2218 mm	
Top speed		175 km/h	
Width of motorcycle	Across mirrors	916 mm	
Height of motorcycle	over windscreen at DIN unladen weight	1410 mm	
Unladen weight	DIN unladen weight, ready for road, 90 % load of fuel, without optional extras	261 kg	
Front-seat height	Without rider	805 mm	
Rider's inside-leg arc, heel to heel	Without rider	1910 mm	
Permissible gross weight		445 kg	
Maximum payload		184 kg	
Permissible wheel load, front		max 170 kg	
Permissible wheel load, rear		max 275 kg	
Exhaust emissions standard		EU 3	
Starting capability on uphill gradients at permissible gross weight		20 %	
Wheel load, rear, at unladen weight		132 kg	
Wheel load, front, at unladen weight		129 kg	

Technical data 0133 - C 650 GT			
11 - Engine			
Designation	Precondition	Value	Valid
Engine type		652EA	
Engine design		Two-cylinder four-stroke DOHC engine, 4 valves actuated by bucket tappets, two balancing shafts, liquid cooling, dry-sump lubrication	
Compression ratio		11.6:1	
Location of engine number		Crankcase, left, below alternator	
Nominal output	at engine speed 7500 min ⁻¹	44 kW	
Cylinder bore		79 mm	
Torque	at engine speed 6000 min ⁻¹	66 Nm	
Piston stroke		66 mm	
Displacement		647 cm ³	
Compression test pressure Measured warm, throttle valve fully open	Good	≥15 bar	
	Normal	14...15 bar	
	Poor	≤11 bar	
Maximum engine speed		max 8500 min ⁻¹	
Engine oil, capacity	with filter change	approx. 3.1 l	
	Fluids and lubricants		
	Viscosity class		
Engine oil capacity of oil tank	with filter change	approx. 2.8 l	
	Fluids and lubricants		
	Viscosity class		
Engine oil, specified level 	Engine at regular operating temperature	Between MIN and MAX marks	
Engine oil, quantity for topping up	Difference between MIN and MAX	max 0.5 l	
11 11 - Engine block			
Projecting length of thread of tie bolt	Replace the tie bolt, lubricate with engine oil	77 mm	
11 21 - Crankshaft with bearings			
Identifier for crankshaft-bearing shells Bearing shells in crankcase top section	A	Bearing shell red	
	B	Bearing shell green	
	C	Bearing shell black	

Identifier for crankshaft-bearing shells Bearing shells in bearing frame	1	Bearing shell red	
	2	Bearing shell green	
	3	Bearing shell black	
Bearing journal diameter in crankshaft main bearing Tolerance group 	Marks on the crankshaft	A/B/C	
Mark for classification of the crankshaft bearings on the bearing frame (underside) 	Mark I (inside): identifier for main bearing bores	1/2/3	
11 24 - Conrod with bearings			
Overview of conrod marks 	A	Production date, year	
	B	Production date, month	
	C	Serial number	
11 27 - Balancing shaft			
Mark for classification of the balancing-shaft bearings on the bearing frame (underside) 	Mark II (outside): identifier for balancing-shaft bores	1/2	
Identifier for balancing-shaft bearing shells on the bearing frame	1	Bearing shell blue/yellow	
	2	Bearing shell red/brown	
Identifier for balancing-shaft bearing shells on the balancing shaft	A	Bearing shell blue/yellow	
	B	Bearing shell red/brown	
Mark for classification of the balancing-shaft bearings for identifying the bearing shells in the top section of the crankcase	Marks on the balancing shaft	A/B	

**11 34 - Valves with springs**

Inlet valve clearance	Engine cold max 35 °C	0.20 $^{+0.04}_{-0.04}$ mm	
Exhaust valve clearance	Engine cold max 35 °C	0.28 $^{+0.04}_{-0.04}$ mm	

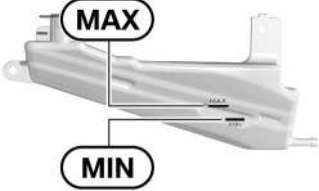
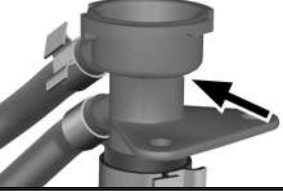
11 40 - Oil supply

Operating pressure in engine oil system	Engine temperature	operating temperature (fan running, oil-level indicator active)	
	at idle speed	1.5 $^{+1.5}_{-0.5}$ bar	
	- at engine speed approx. 3500 min ⁻¹	4.5 $^{+1.5}_{-1.5}$ bar	

Technical data 0133 - C 650 GT			
12 - Engine electrical system			
Designation	Precondition	Value	Valid
12 12 - Ignition wiring, spark plugs			
Spark plugs, manufacturer and designation		NGK LMAR8D-J	
Electrode gap of spark plug		0.8 ^{+0.1} _{-0.1} mm	

Technical data 0133 - C 650 GT			
13 - Fuel preparation and control			
Designation	Precondition	Value	Valid
Recommended fuel grade		Super unleaded max. 10 % ethanol, E10 95 ROZ/RON 89 AKI	

Technical data 0133 - C 650 GT			
16 - Fuel supply			
Designation	Precondition	Value	Valid
Usable fuel capacity		approx. 16 l	
Fuel reserve		approx. 3 l	

Technical data 0133 - C 650 GT			
17 - Cooling			
Designation	Precondition	Value	Valid
Cooling system - test pressure	Test pressure must remain unchanged min 5 min	1.5 bar	
Specified coolant level in expansion tank 	engine cold	Between MIN and MAX marks	
Coolant capacity (total)		1.5 l	
	General consumable (Antifreeze and corrosion inhibitor)		
Specified coolant level in radiator 	Engine cold	Bottom edge of overflow bowl	
Coolant, frost protection		min -30 °C	
17 11 - Radiator with fasteners			
Coolant thermostat, opening temperature		85 °C	

Technical data 0133 - C 650 GT			
21 - Clutch			
Designation	Precondition	Value	Valid
Clutch type		Centrifugal clutch	
21 21 - Clutch with driver plate			
Minimum height, clutch lining	Projection past lining backer	min 2.5 mm	

Technical data 0133 - C 650 GT			
23 - Gearbox			
Designation	Precondition	Value	Valid
Oil capacity, gearbox		250 ml	
	Gear oil (Castrol SAF-XO)		

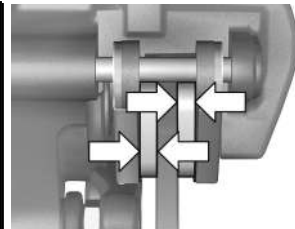
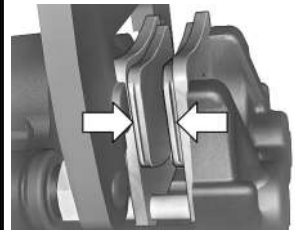
Technical data 0133 - C 650 GT			
24 - Automatic gearbox			
Designation	Precondition	Value	Valid
Gearbox type		CVT (Continuously Variable Transmission)	
24 21 - Input, intermediate and output shafts			
Primary transmission ratio		1:1.06	
Transmission ratio, secondary transmission		1:2.72	
24 81 - CVT adjustment			
Transmission ratio, CVT		1:10.7...4.6	

Technical data 0133 - C 650 GT			
31 - Front axle, front-wheel steering			
Designation	Precondition	Value	Valid
Type of front suspension		Upside-down telescopic fork	
Spring travel, front	At wheel	115 mm	
Fork oil, capacity per fork leg		390 ml	
	Telescopic fork oil (Telescopic fork oil SAE 7.5)		
Fork oil level, right (air cushion)	right fork leg fully compressed, compression spring and spacer removed	130 mm	
	Telescopic fork oil (Telescopic fork oil SAE 7.5)		

Technical data 0133 - C 650 GT			
32 - Steering			
Designation	Precondition	Value	Valid
32 73 - Bowden cables			
Setting of throttle-cable play	at outermost diameter of rubber grip, engine cold max 35 °C	3 mm	
Setting, throttle-closer cable Forward idle travel against closer spring	at outermost diameter of rubber grip, engine cold max 35 °C	3 mm	

Technical data 0133 - C 650 GT			
33 - Rear axle, rear-wheel drive and rear-wheel guidance			
Designation	Precondition	Value	Valid
Type of final drive		Chain drive in oil bath	
Type of rear suspension		Cast aluminium single swinging arm	
Spring travel, rear	At wheel	115 mm	
Oil capacity, swinging arm		500 ml	
	Gear oil (Castrol SAF-XO)		
33 54 - Spring strut, mounting parts			
Basic setting of spring preload, rear	Full load of fuel, with rider 85 kg	increase 4 clicks from the lowest preload setting	
Type of rear suspension		Direct-pivot spring strut with adjustable spring preload	
33 82 - Traction drive, chain pinion, belt pinion			
Secondary transmission ratio		1.688	
Final drive, number of teeth Pinion / sprocket		16 / 27	
33 83 - Traction drive, chain, belt			
Chain deflection		max 15 mm	

Technical data 0133 - C 650 GT			
34 - Brakes			
Designation	Precondition	Value	Valid
Brake fluid level, front 	Brake-fluid reservoir horizontal	It is impermissible for the brake fluid level to drop below the MIN mark.	
Hydraulic fluid (Brake fluid, DOT4)			
Brake fluid level, rear 	Brake-fluid reservoir horizontal	It is impermissible for the brake fluid level to drop below the MIN mark.	
Hydraulic fluid (Brake fluid, DOT4)			
34 11 - Front brake			
Brake disc diameter, front		270 mm	
Brake-pad material, front		Sintered metal	
Type of front brake		Hydraulically actuated twin-disc brake with 2-piston floating calipers	
Brake-pad wear limit, front 	Friction pad only, without backing plate. The wear indicators (grooves) must be clearly visible.	min 1.0 mm	
Brake disc lateral runout, front	At circumference	max 0.15 mm	
Brake disc thickness, front	When new	5.0 mm	
	Wear limit	4.5 mm	
Brake disc thickness, front	Wear limit	min 4.5 mm	
Play of brake controls Front brake	at end of lever	approx. 11.5 mm	
34 21 - Rear brake			
Type of rear brake	Brake for riding	Hydraulically actuated disc brake with 2-piston floating caliper	
	Parking brake	Bowden-cable-actuated disc brake with 1-piston floating caliper	
Brake-pad material, rear		Organic material	
Brake disc diameter, rear		270 mm	
Brake disc thickness, rear	When new	5.0 mm	
	Wear limit	4.5 mm	
Brake disc thickness, rear	Wear limit	min 4.5 mm	
Brake-pad wear limit, rear	Friction pad only,	min 1.0 mm	

	without backing plate.		
Brake disc lateral runout, rear	At circumference	max 0.15 mm	
 Brake-pad wear limit of parking brake	The wear indicators (grooves) must be clearly visible.	min 1.0 mm	
Play of brake controls Rear brake	at end of lever	approx. 11 mm	

Technical data 0133 - C 650 GT			
36 - Wheels and tyres			
Designation	Precondition	Value	Valid
36 30 - Motorcycle wheels			
Permissible front-wheel imbalance		max 5 g	
Permissible rear-wheel imbalance		max 5 g	
Balancing weight for front wheel Weight must be divided equally across both sides and weights attached to rim on left and right.		max 80 g	
Balancing weight for rear wheel Weight must be divided equally across both sides and weights attached to rim on left and right.		max 80 g	
36 31 - Wheels with bearings			
Front wheel type		Cast aluminium, MT H2	
Front wheel rim size		3.50" x 15"	
Rear-wheel type		Cast aluminium, MT H2	
Vertical runout, front wheel		max 1.5 mm	
Lateral runout, front wheel		max 1.5 mm	
Rear wheel rim size		4.50" x 15"	
Vertical runout, rear wheel		max 1.5 mm	
Lateral runout, rear wheel		max 1.5 mm	
36 32 - Tyres			
Tyre designation, front		120/70 R15	
Speed category, front/rear tyres	required at least 180 km/h	S	
Load index, rear tyre		min. 64	
Load index, front tyre		min. 47	
Tyre pressure, front	Tyre cold	2.4 bar	
Tyre designation, rear		160/60 R 15	
Tyre pressure, rear	One-up, tyre cold	2.5 bar	
	two-up and/or with luggage, tyre cold	2.9 bar	
Tyre tread depth, front and rear	Wear limit, for Germany only	min 1.6 mm	
	Wear limit, outside Germany	Country-specific legal requirements	
Wheel valve test pressure		4 bar	
Recommended tyre sets		Your authorised BMW Motorrad dealer will be happy to supply an up-to-date list of the approved wheel/tyre combinations, or you can check the information posted on the bmw-motorrad.com website.	

Technical data 0133 - C 650 GT			
46 - Frame and mounted components			
Designation	Precondition	Value	Valid
46 51 - Motorcycle frame			
Frame type		Bridge-type steel frame with cast light-alloy bolt-on side parts	
Type plate location		Steering head, front right	
Position of the Vehicle Identification Number		Frame tube, front right	

Technical data 0133 - C 650 GT			
61 - General vehicle electrics			
Designation	Precondition	Value	Valid
61 13 - Plug, terminal			
Fuse holder	Fuse 9: Control unit, instrument panel / ignition switch	30 A	
	Fuse 10: Control unit, anti-lock brake system (ABS)	30 A	
Fuse box	Fuse 1: DME main relay	15 A	
	Fuse 2: Control unit, digital engine electronics (DME)	10 A	
	Fuse 3: control unit, anti-theft alarm (DWA) / tyre pressure monitoring (RDC)	4 A	
	Fuse 4: Brake light switches, front brake / rear brake / plug for optional accessories / socket in front stowage compartment	5 A	
	Fuse 5: Fan	7.5 A	
	Fuse 6: Socket in rear stowage compartment	5 A	
	Fuse 7: Number-plate light	4 A	
	Fuse 8: Control unit, digital engine electronics (DME) / anti-lock brake system (ABS) / instrument panel	4 A	
Electrical rating of on-board sockets	Socket in rear stowage compartment	max 7.5 A	
61 21 - Battery with holder			
Battery type		AGM (Absorbent Glass Mat) battery	
Battery rated voltage		12 V	
Battery rated capacity		12 Ah	

Technical data 0133 - C 650 GT			
63 - Lights			
Designation	Precondition	Value	Valid
63 10 - Front lights, position lights and side lights			
Bulb for parking light		LED	
63 12 - Headlight			
Bulb for high-beam headlight		H7 / 12 V / 55 W	
Bulbs for the low-beam headlight		H7 / 12 V / 55 W	
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	Vehicle loaded with 85 kg	7.5 cm	
63 13 - Flashing turn indicators, front			
Bulbs for flashing turn indicators, front		LED	
63 21 - Rear-light cluster			
Bulb for tail light/brake light		LED / PR-21W / 12 V / 21 W	
63 23 - Flashing turn indicators, rear			
Bulbs for flashing turn indicators, rear		LED	
63 26 - Number-plate light			
Bulb for number-plate light		W5W / 12 V / 5 W	

Technical data 0133 - C 650 GT			
65 - Audio, navigation, information systems			
Designation	Precondition	Value	Valid
65 75 - Anti-theft alarm			
Battery type for remote control		CR 2032 lithium	
Activation time on arming		15 s	
Alarm duration		26 s	
Temperature range		-40...85 °C	
Operating voltage		9...16 V	
Battery voltage for remote control		3 V	
Reception standby for signal from remote control	after ignition OFF	1 h	
Activation time between two alarms		12 s	
Range of the remote control		10 m	
Signal frequency	Broadband	25 kHz	
Transmission frequency		433.92 MHz	

00 60 257 Installing steering stop

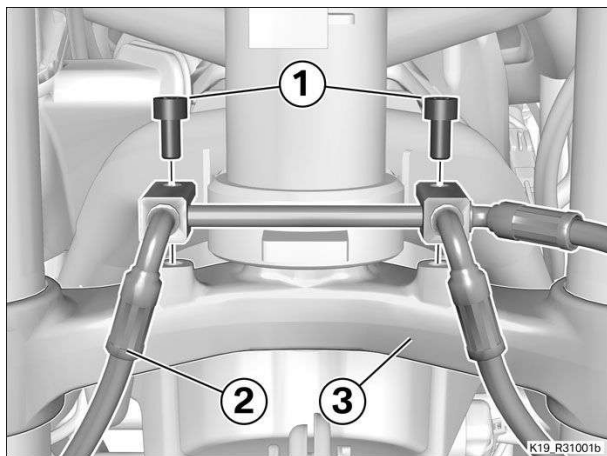
Core activity

(-) Preparatory work

- Set the windscreen to the highest position.
- Remove the instrument carrier with instrument panel.

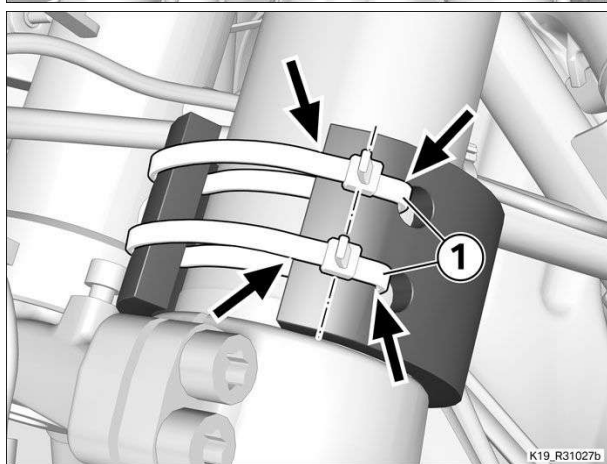
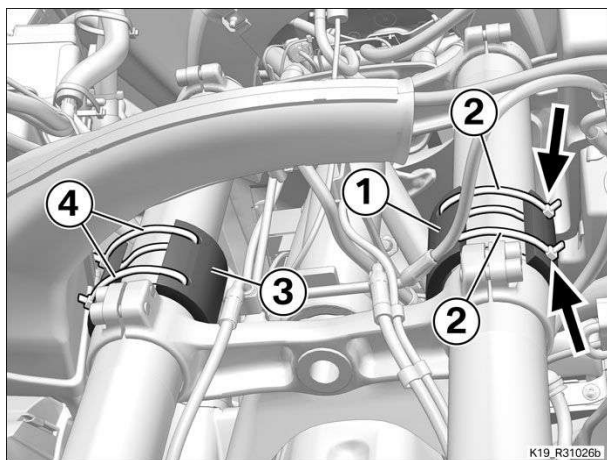
(-) Disengaging brake line

- Remove screws (1), disengage brake line (2) from fork bridge (3).



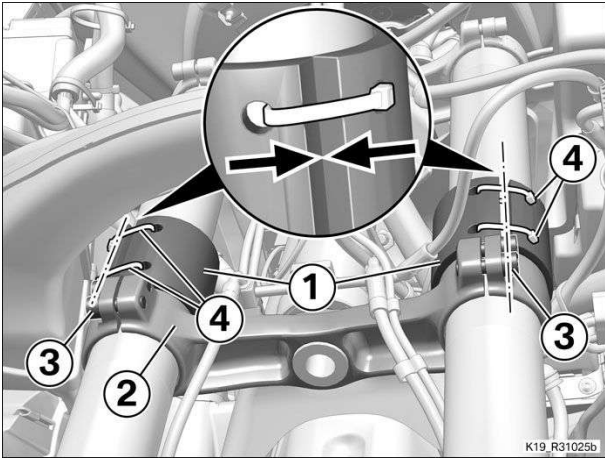
(-) Installing steering stops

- Insert steering stop (1) and connect cable ties (2), **do not tighten**.
- » Steering stop (1) can still be moved.
- The cable tie heads (arrows) must be seated against steering stop (1).
- Install steering stop (3) with cable ties (4) in the same way, **do not tighten**.



- Centre the heads of cable ties (1) between the edge and the holes (arrows).

- Push steering stops (1) until **fully seated** against bottom fork bridge (2).



- Align the gaps of steering stops (1) with **screw heads (3)**.

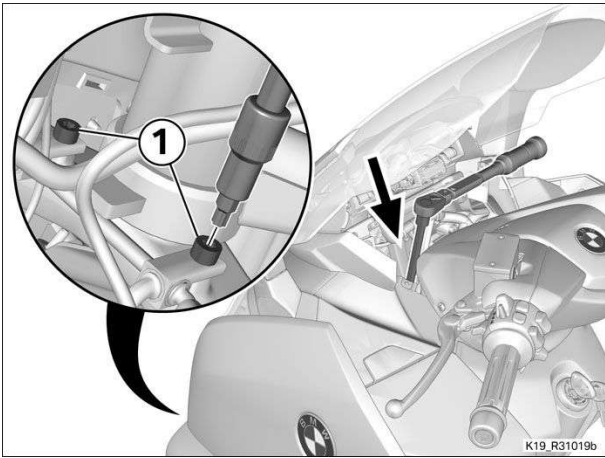
ATTENTION

Component collision due to projecting cable ties.

Restricted clearance of the steering stop.

- Cut off the projecting ends of the cable ties flush at the heads.
-
- Alternately tighten cable ties (4) until the **edges (arrows)** of steering stops (1) **touch** and there is no longer a visible gap.
 - Cut off the ends of cable ties (3).

(-) Securing screws (brake line to fork bridge) with thread-locking compound



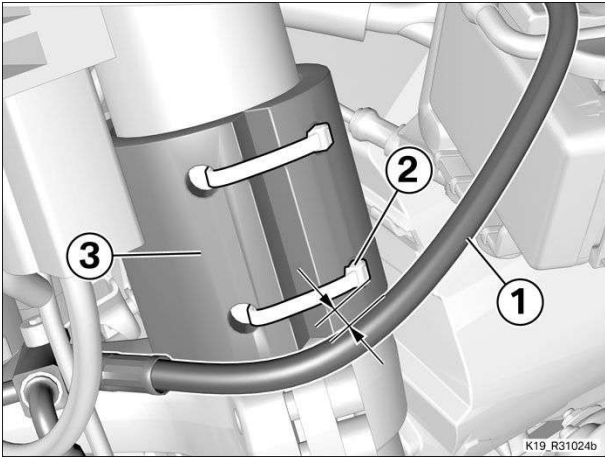
- Clean screws (1) and apply thread-locking compound.

 Thread-locking compound	
Loctite 270, High strength	83 19 2 210 337

- Insert screws (1) **by hand**.
- Tighten screws (1), working from above through the hole (arrow).

 Tightening torques		
Brake line to bottom fork bridge		
M6 x 12	8 Nm	
Thread-locking compound (Loctite 270, High strength)		

(-) Checking clearance of steering stop



- Turn the handlebars **all the way to the right** and make sure that brake line (1) cannot touch head of cable tie (2), there must be a visible gap.
- If necessary, remove steering stop (3) and reposition.
- Turn the handlebars **all the way to the left** and check operation of the steering lock.

(-) Finishing work

- Install the instrument carrier with instrument panel.

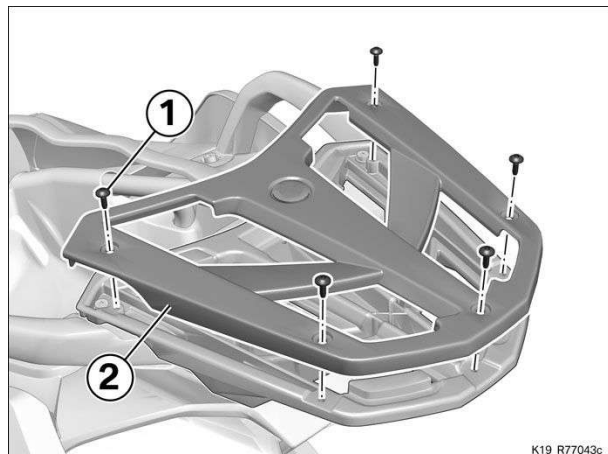
00 60 268 Checking and, if necessary, replacing brackets and threaded fasteners of luggage carrier

Construction status:

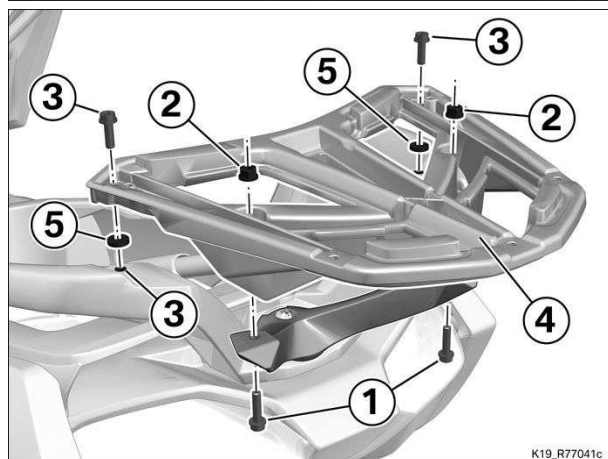
January 2014

Core activity

(-) Checking luggage carrier and rear grab handle, replacing bracket



- Remove screws (1) and remove luggage-carrier top section (2).



- Remove screws (1) and nuts (2).
- Remove screws (3) and remove luggage-carrier bottom section (4).
- Remove spacers (5).

Check

- Check luggage-carrier bottom section (4) for cracks in the vicinity of the threaded fasteners.

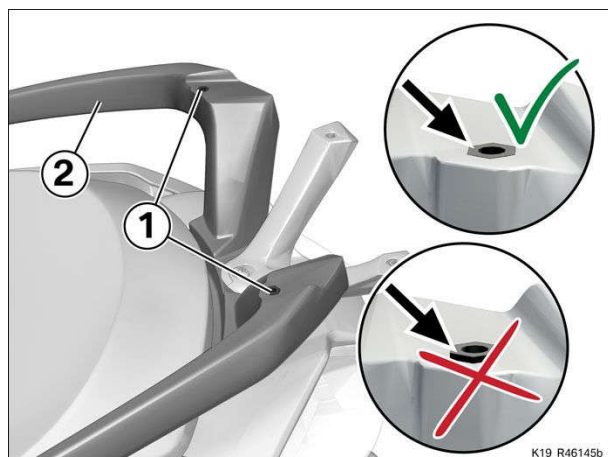
Result:

- Cracks are perceptible.

Measure:

- Replace the luggage-carrier bottom section.

Check



- Check threaded bushes (1) in rear grab handle (2). They must be countersunk or flush (arrow).
- Tighten the screws until hand-tight and check that threaded bushes (1) are secure.

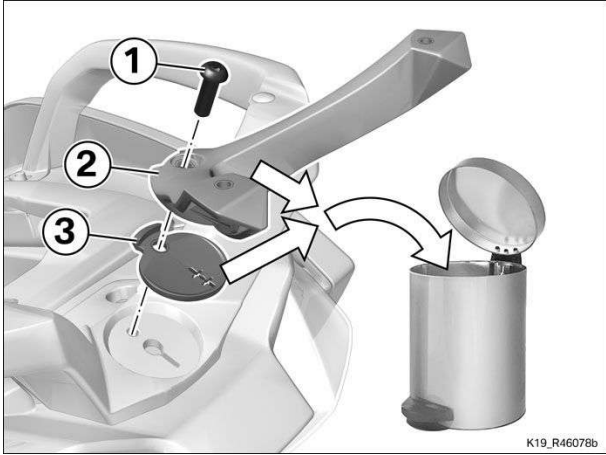
Result:

- Threaded bushes project or are loose in the rear grab handle.

Measure:

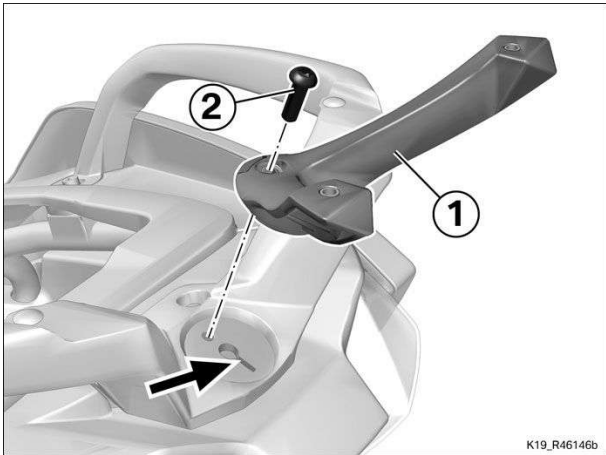
=> 46 72 501, Replacing rear grab handle (Billed as a separate item)

(-) Removing and disposing of bracket for luggage carrier



- Remove screw (1).
- Remove bracket (2) and spacer (3) and dispose of the parts in the appropriate manner.

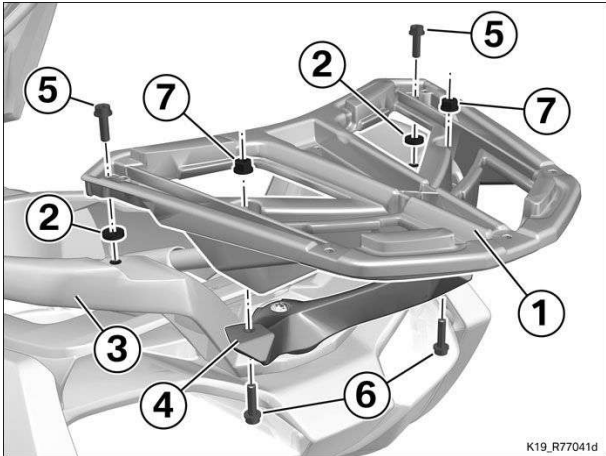
(-) Installing bracket (modified, without spacer) for luggage carrier



- Clean the threads.
- Hold bracket (1) in position, noting the locator (arrow).
- Install screw (2) with thread-locking compound and tighten until hand-tight.

 Thread-locking compound	
Loctite 270, High strength	83 19 2 210 337

(-) Installing luggage-carrier bottom section

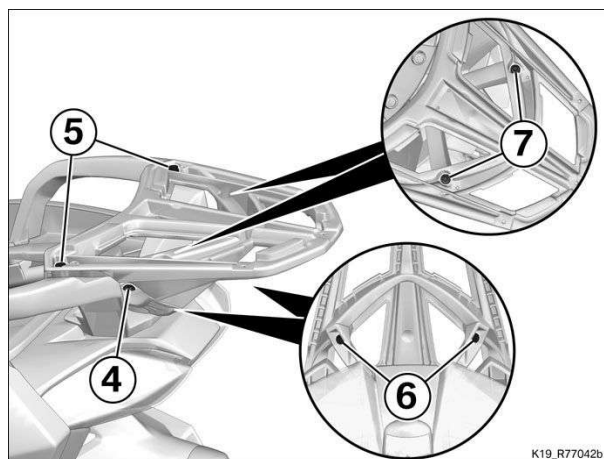


- Clean the threads.
- Apply thread-locking compound to all the screws.

 Thread-locking compound	
Loctite 270, High strength	83 19 2 210 337

- Position luggage-carrier bottom section (1) with spacers (2) on the rear grab handle (3) and bracket (4).
- Hand-tighten screws (5).
- Install screws (6) and **new** nuts (7) and tighten until hand-tight.

(-) Installing luggage-carrier bottom section



- Tighten screws (5).



- Tighten screw (4).

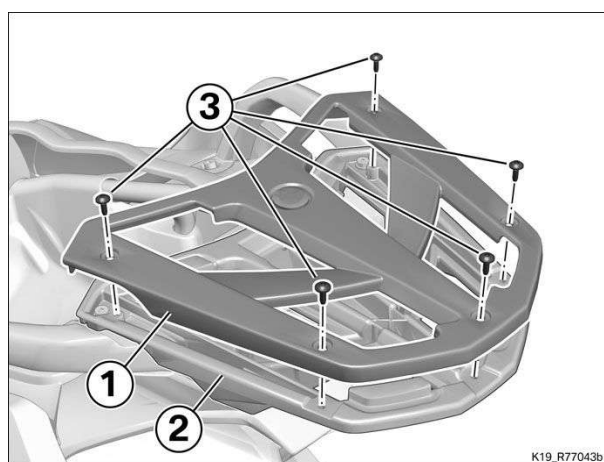


- Tighten screws (6) with nuts (7).



(-) Installing luggage-carrier top section

- Position luggage-carrier top section (1) on luggage-carrier bottom section (2) and install screws (3).



Finishing work

Final check of work performed

00 60 270 Checking and, if necessary, replacing brackets and threaded fasteners of luggage carrier (backrest installed)

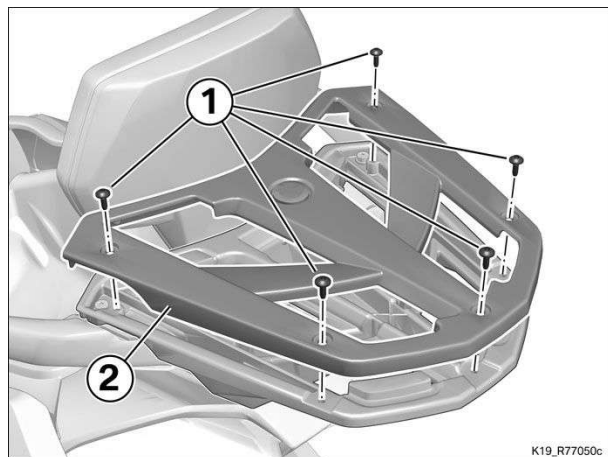
Construction status:

January 2014

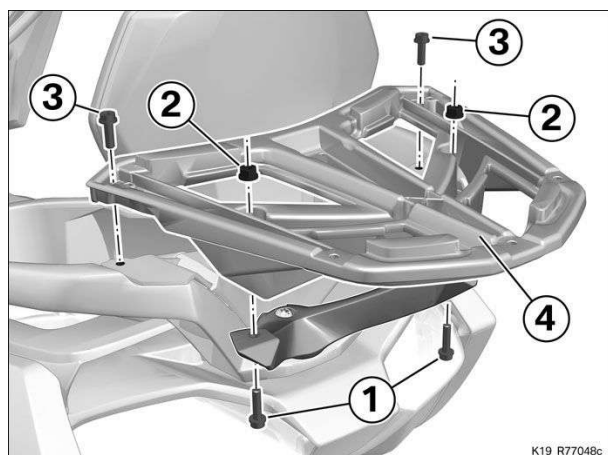
Core activity

(-) Checking luggage carrier, bracket and rear grab handle

- Remove screws (1) and remove luggage-carrier top section (2).



- Remove screws (1) and nuts (2).
- Remove screws (3) and remove luggage-carrier bottom section (4).
- Remove spacers (5).



Check

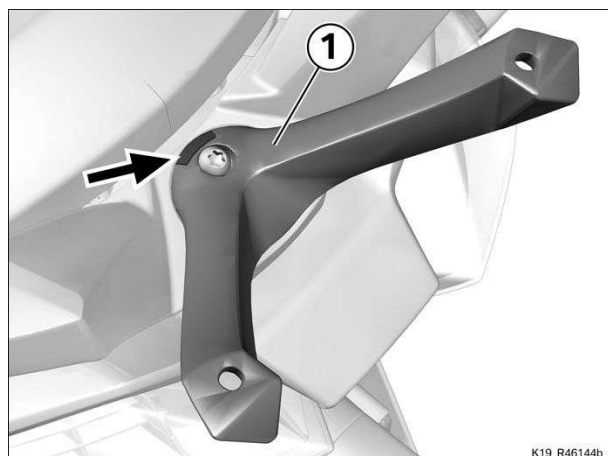
- Check luggage-carrier bottom section (4) for cracks in the vicinity of the threaded fasteners.

Result:

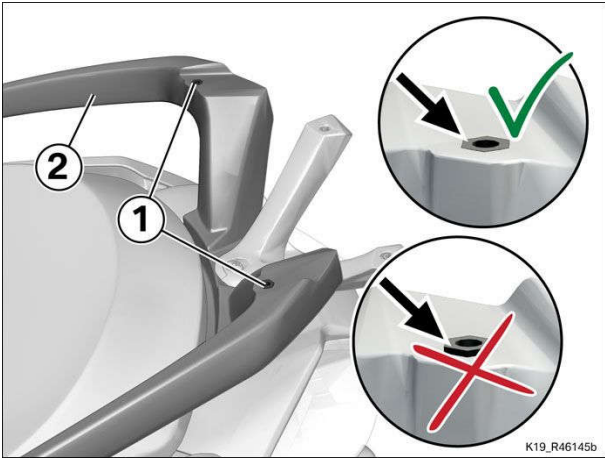
- Cracks are perceptible.

Measure:

- Replace the luggage-carrier bottom section.
- Check bracket (1) for cracks, particularly at the front (arrow).
- If cracks are visible, replace bracket (1).



- Check threaded bushes (1) in rear grab handle (2). They must be



countersunk or flush (arrow).

- Tighten the screws until hand-tight and check that threaded bushes (1) are secure.

Check

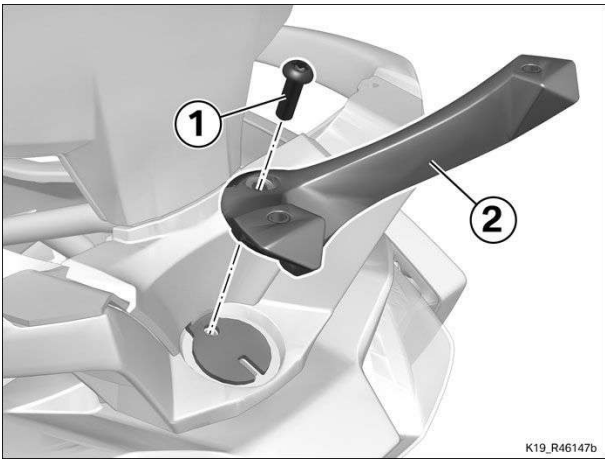
Result:

- Threaded bushes project or are loose in the rear grab handle.

Measure:

=> 46 72 501, Replacing rear grab handle (Billed as a separate item)

(-) Removing bracket for luggage carrier



- Remove screw (1).
- Remove bracket (2).

(-) Installing bracket for luggage carrier

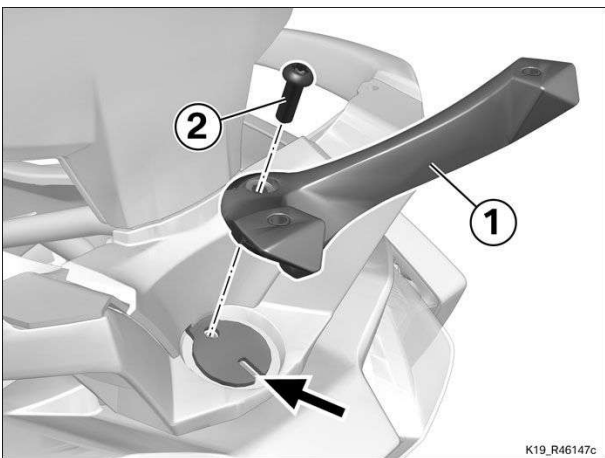
- Clean the threads.
- Hold bracket (1) in position, noting the locator (arrow).
- Install screw (2) with thread-locking compound and tighten until hand-tight.



Thread-locking compound

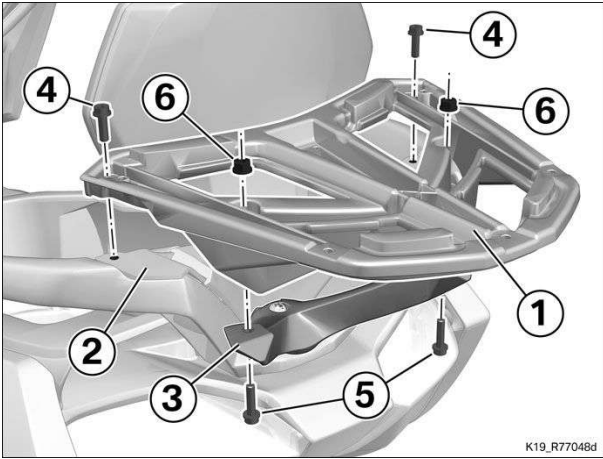
Loctite 270, High strength

83 19 2 210 337



(-) Installing luggage-carrier bottom section

- Clean the threads.



- Apply thread-locking compound to all the screws.



Thread-locking compound

Loctite 270, High strength

83 19 2 210 337

- Position luggage-carrier bottom section (1) on retaining plate (2) and bracket (3).
- Install screws (4) and tighten until hand-tight.
- Install screws (5) and **new** nuts (6) and tighten until hand-tight.

(-) Installing luggage-carrier bottom section

- Tighten screws (4).



Tightening torques

- Tighten screw (3).

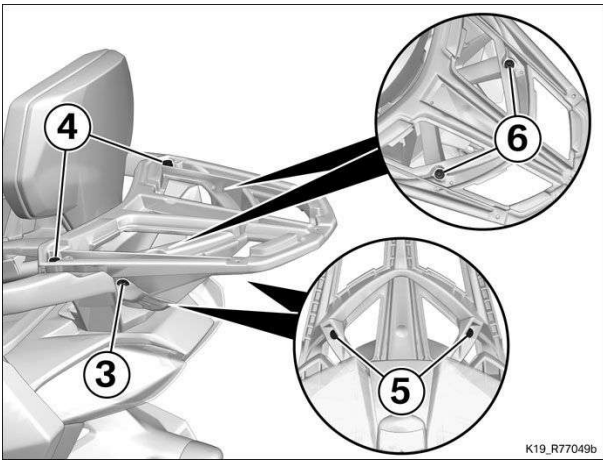


Tightening torques

- Tighten screws (5) with nuts (6).



Tightening torques



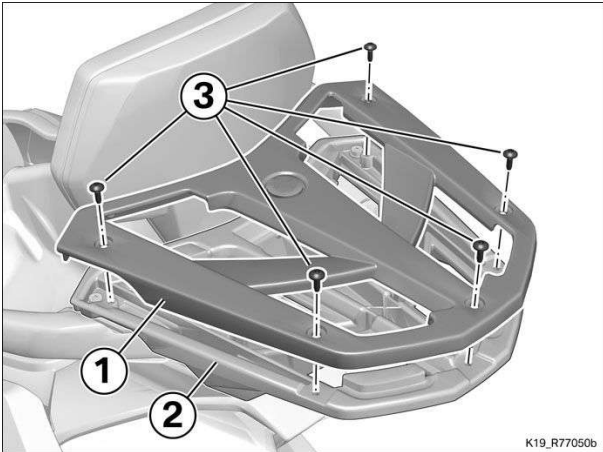
(-) Installing luggage-carrier top section

- Position luggage-carrier top section (1) on luggage-carrier bottom section (2) and install screws (3).



Tightening torques

- Note the maximum payload of the luggage carrier, see Rider's Manual.



Finishing work

Final check of work performed

00 60 288 Replacing timing-chain tensioner

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing front right footplate insert and footrest plate

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing top right side panel

Removing bottom right fairing panel

Removing right side panel

Removing rear footplate

Removing air deflector

Disengaging expansion tank for coolant

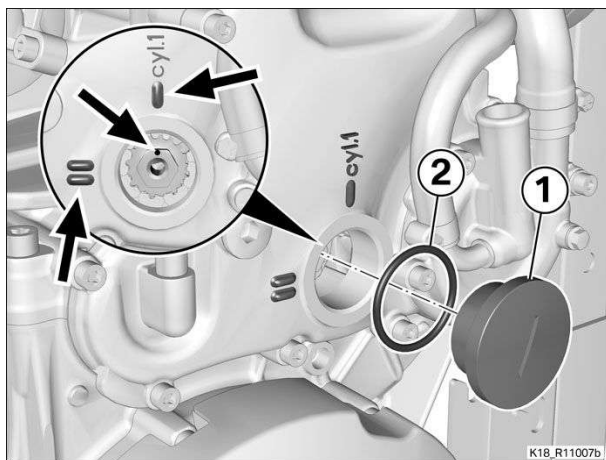
Disengaging and lowering radiator

Removing ignition coils

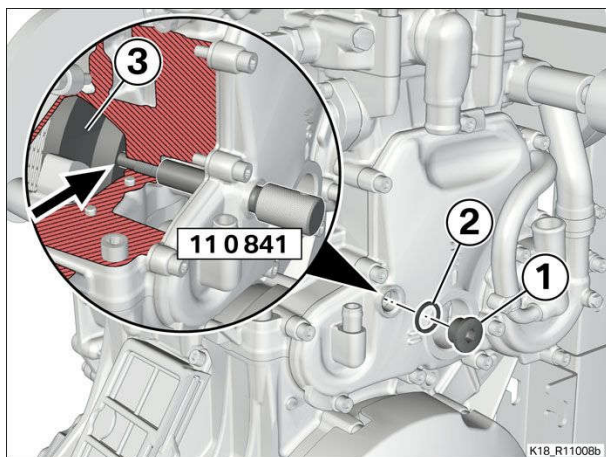
Removing cylinder head cover

Core activity

(-) Setting engine to firing TDC and securing it in position

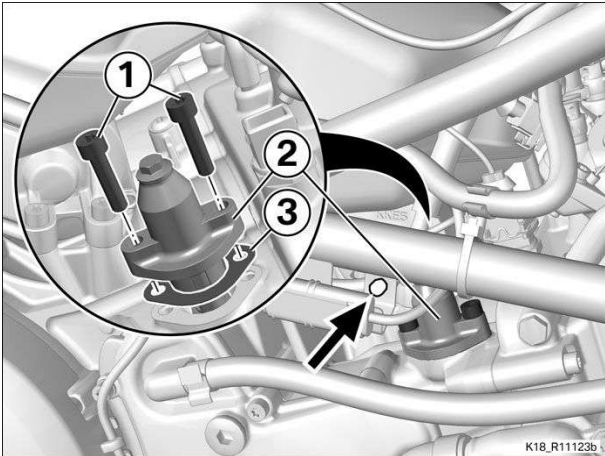


- Remove screw (1) with seal (2).
- Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward one of the line marks (arrow).
- » The corresponding cylinder 1 (alternator side) or 2 (timing-chain side) is at TDC.



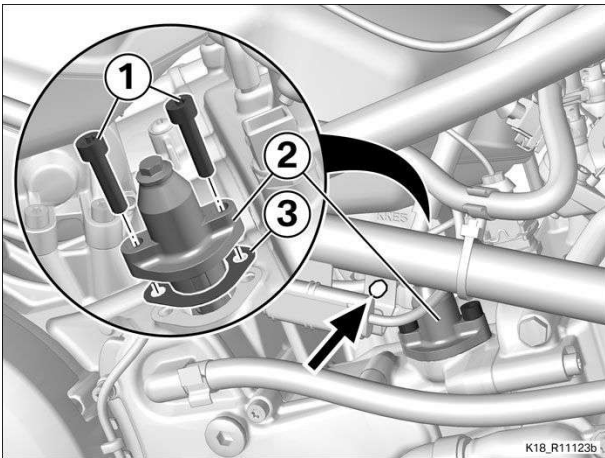
- Remove screw (1) and seal (2).
- Make sure that the hole (arrow) in crankshaft (3) is visible.
- Insert locking pin, making sure that it engages in the hole (arrow) in crankshaft (3).

(-) Removing timing-chain tensioner



- Disengage the cable holder (arrow).
- Remove screws (1), taking care to **slacken them uniformly** to prevent the component from tilting.
- Remove timing-chain tensioner (2) and gasket (3).

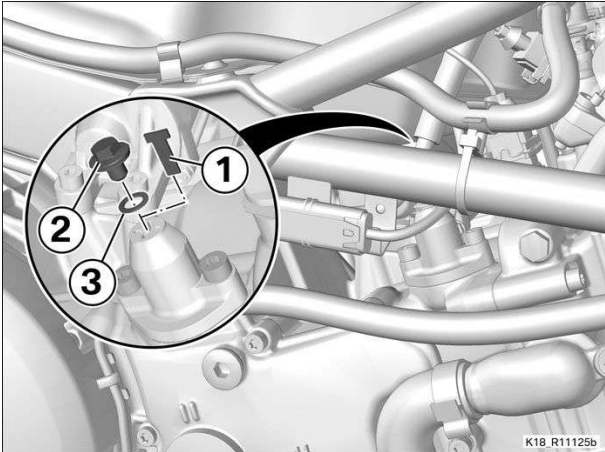
(-) Install the new timing-chain tensioner



- Clean the sealing faces.
- Position timing-chain tensioner (2) with a **new** gasket (3).
- Install screws (1), taking care to **tighten them uniformly** to prevent the component from tilting.

 Tightening torques		
Chain tensioner in crankcase		
M6 x 25	10 Nm	

- Secure the cable holder (arrow).



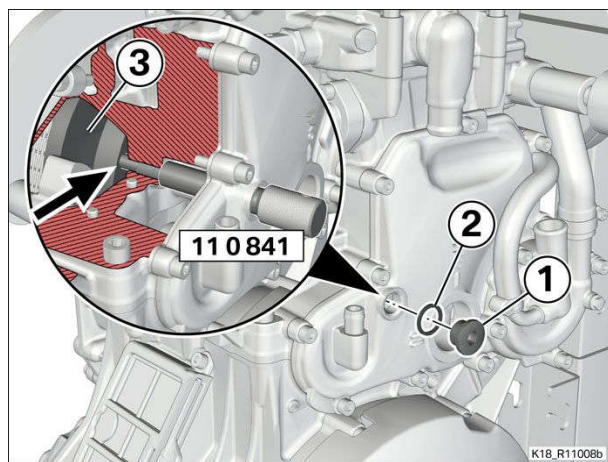
- Remove locking plate (transportation locking device) (1).
- » Timing chain is tensioned.
- Install screw (2) with **new** sealing ring (3).

 Tightening torques		
Threaded plug in chain tensioner		
M6 x 6	9 Nm	

(-) Removing locator for TDC position

- Remove locking pin (No. 11 0 841) from the hole (arrow) in crankshaft (3).
- Install new seal (2) and screw (1).

 Tightening torques		
Threaded plug (hole for locking pin) to engine cover, right		
M16 x 1.5	20 Nm	



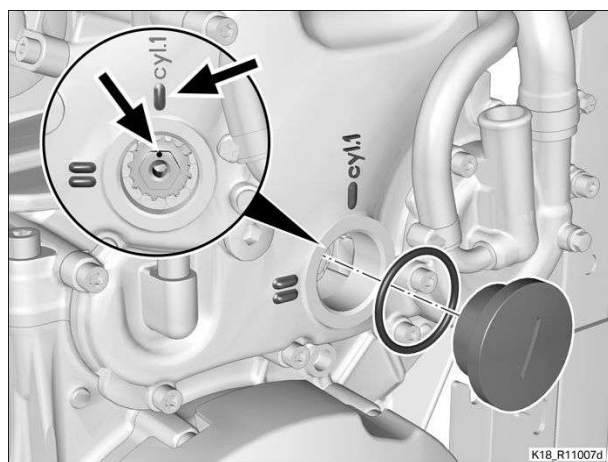
(-) Checking timing

⚠ ATTENTION

Barring of the engine not in compliance with correct procedure.

Component damage

- Bar the engine carefully. Stop the rotational movement if resistance is perceptible.



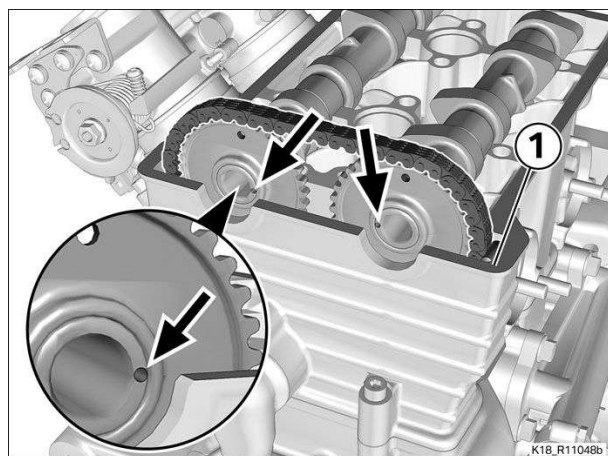
- Carefully turn the engine through several full revolutions of the crankshaft and set the crankshaft to the TDC position.

- Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward one of the marks I (arrow).

» Cylinder 1 (alternator side) is at firing TDC (valves closed).

Check

- Note the marks (arrows) on the camshafts:
- The holes (arrows) are **toward each other** and parallel to sealing face (1).



Result:

- Marks are not correct.

Measure:

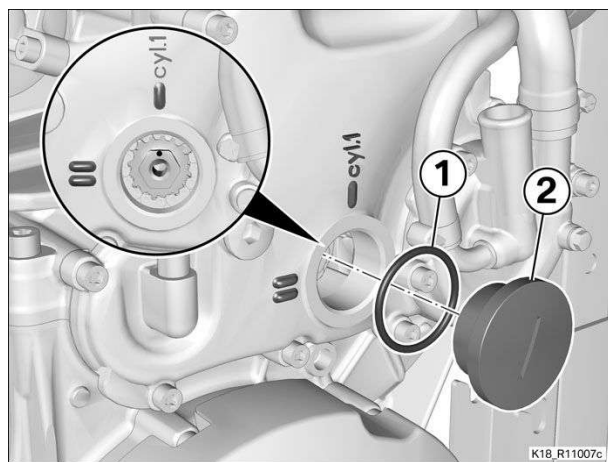
- Install camshafts correctly.

(-) Installing threaded plug (crankshaft)

- Check sealing ring (1); replace if necessary.
- Install screw (2) with sealing ring (1).



Tightening torques



Threaded plug (crankshaft) to engine cover, right

M36 x 1.5

20 Nm

Finishing work

Installing cylinder head cover

Installing ignition coils

Securing radiator

Securing expansion tank for coolant

Installing air deflector

Installing right footplate

Installing right side panel

Installing bottom right fairing panel

Installing top right side panel

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing front right footplate insert and footrest plate

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

 00 98 000 Vehicle transport/recovery

Core activity

(-) Securing Maxi-Scooter for transportation

- Use masking tape or soft cloths to protect all components that straps can come into contact with against scratches.

ATTENTION

Vehicle can topple sideways.

Risk of damage to parts if vehicle topples.

- Make sure that the vehicle is secured so that it cannot topple sideways.

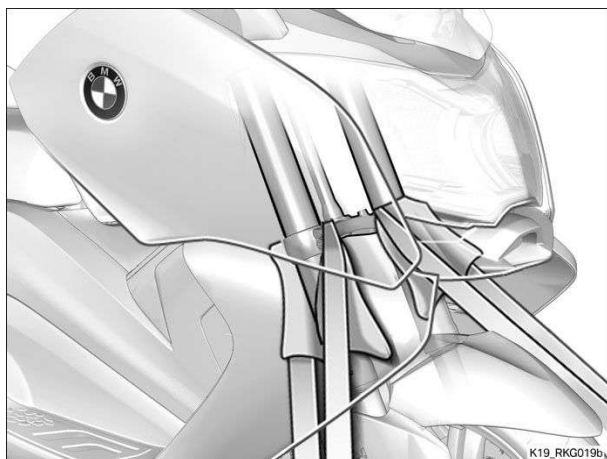


ATTENTION

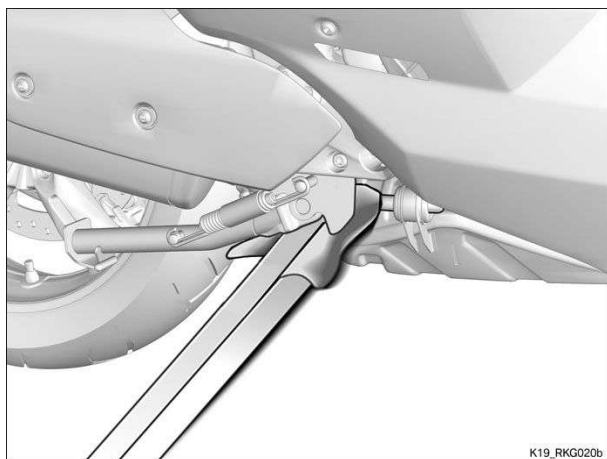
Trapping of components.

Component damage

- Do not trap components such as brake lines or cable legs.



- At the front, secure the straps to the bottom fork bridge on both sides.



- At the rear, secure the straps to the retaining plates of the centre stand on both sides and tighten the straps.

- Tighten all the straps uniformly; the suspension of the **Maxi-Scooter** should be compressed as tightly as possible front and rear.

11 00 040 Testing compression with BMW Motorrad diagnostic system

+ 11 00 567

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing front left footrest plate

Removing left side panel

Removing air deflector

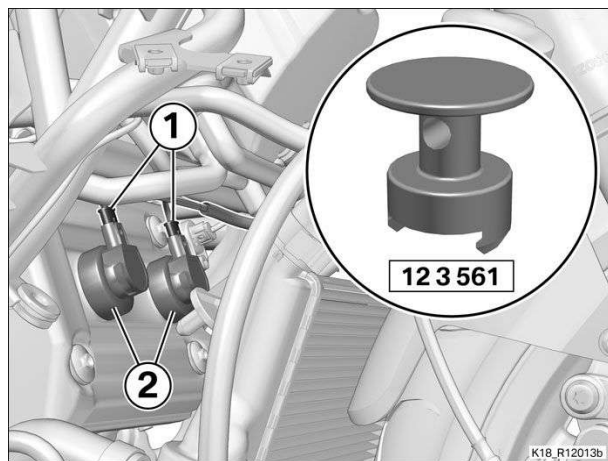
Disengaging expansion tank for coolant

Disengaging and lowering radiator

Core activity

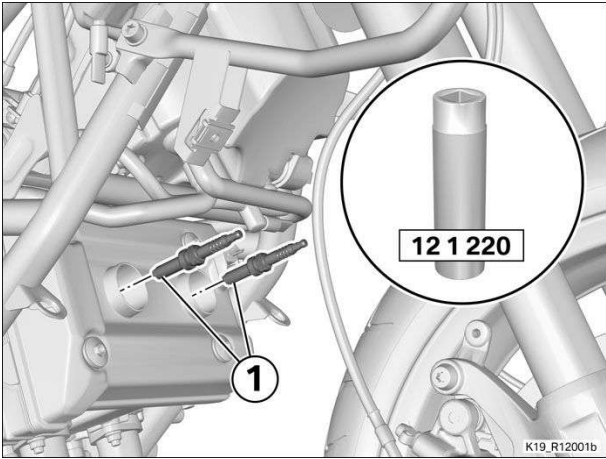
(-) Removing ignition coils

- Disconnect plug (1).
- Remove ignition coils (2) with puller (No. 12 3 561).



(-) Removing spark plugs

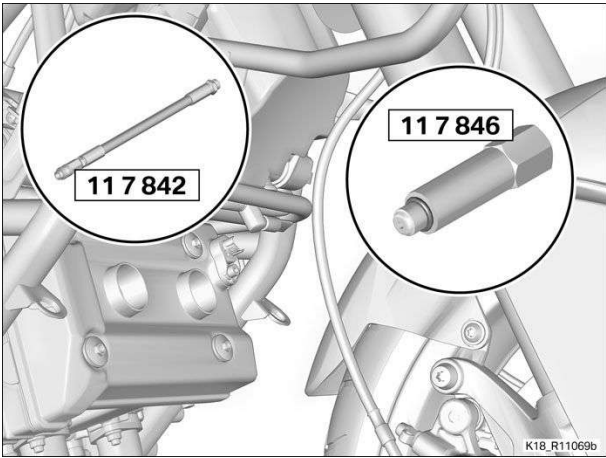
- Clean the spark-plug recess with compressed air.
- Remove spark plugs (1) with spark-plug wrench (No. 12 1 220).



(-) **Testing compression with BMW Motorrad diagnostic system**

Check

- Secure diagnosis adapter **with non-return valve** (No. 11 7 846) and hose (No. 11 7 842).
- Connect the **MBOX** and select the following functions:
 - Preset measurements
 - Pressure
 - Compression
- Connect **0-25 bar** pressure sensor and calibrate.
- Switch on the ignition and crank the engine with the throttle valve open until the pressure reading stops rising.
- Read the measured value and switch off the ignition.



 Technical data			
Compression test pressure Measured warm, throttle valve fully open	Good	≥15 bar	
	Normal	14...15 bar	
	Poor	≤11 bar	

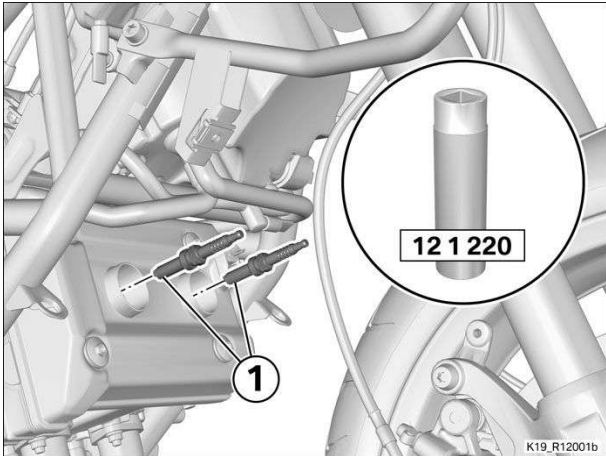
Result:

- Compression is below normal.

Measure:

- Pinpoint the cause of the fault.
- Possible causes:
 - Valves leaking
 - Piston and cylinder leaking
 - Cylinder-head gasket defective
- Adopt the same procedure to check the compression of the other cylinder.
- Remove the tools.

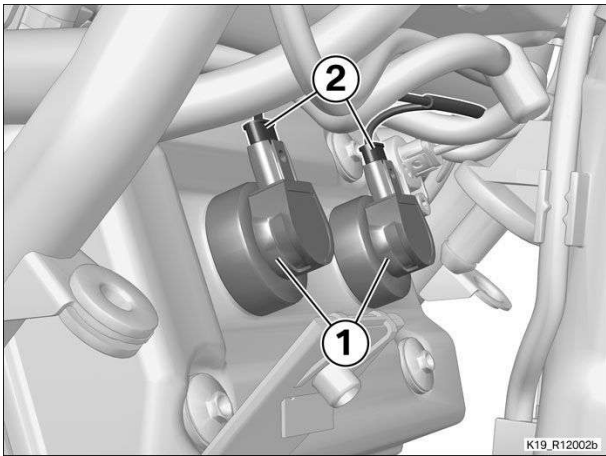
(-) Installing spark plugs



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

 Tightening torques			
Spark plug to cylinder head			
M10 x 1	12 Nm		
 Technical data			
Spark plugs, manufacturer and designation		NGK LMAR8D-J	

(-) Installing ignition coils



- Install ignition coils (1).
- Connect plug (2).

Finishing work

- Securing radiator
- Securing expansion tank for coolant
- Installing air deflector
- Installing left side panel
- Installing front left footrest plate
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

11 00 050 Removing/installing engine

+ 11 00 541

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing left footplate

Removing left footplate carrier

Draining engine oil

Removing top right side panel

Disconnecting battery leads

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing underbody panel

Removing air deflector for radiator

Draining coolant from engine

Disengaging expansion tank for coolant

Removing radiator

Removing right footplate carrier

Removing silencer with cover

Removing exhaust manifold with oxygen sensor

Removing left sound-absorbing hood

Disengaging side stand with pivot mount

Installing engine lifter

Disengaging brake hose and sensor cable

Draining oil from swinging arm

Removing swinging-arm housing cover

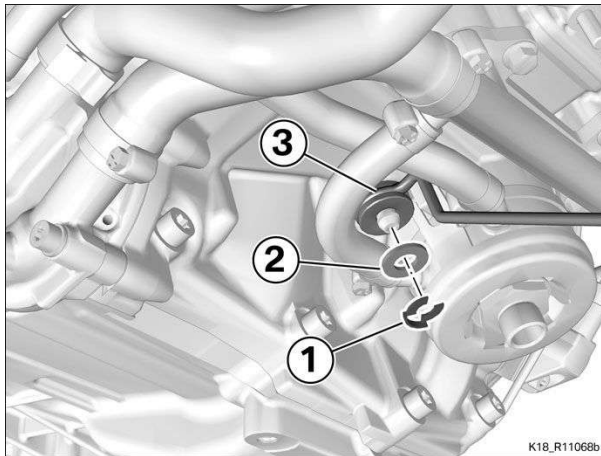
Removing bottom chain channel

Removing chain tensioner rail

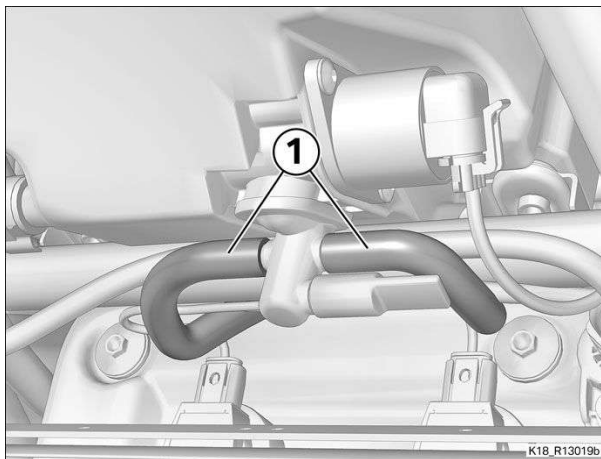
Removing top chain channel
Disengage the judder damper
Removing rear wheel
Disengaging rear brake caliper and parking brake
Removing judder-damper housing and output shaft
Removing spring strut
Removing rear wheel swinging arm
Removing left frame side section
Removing right frame side section with centre stand
Removing pinion cover
Removing chain and pinion

Core activity

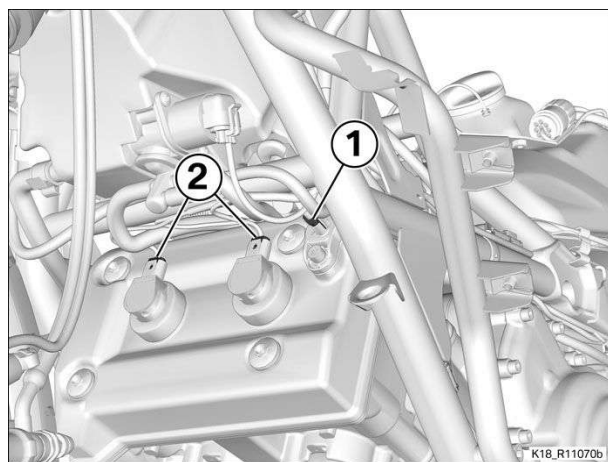
(-) Preparations for engine removal



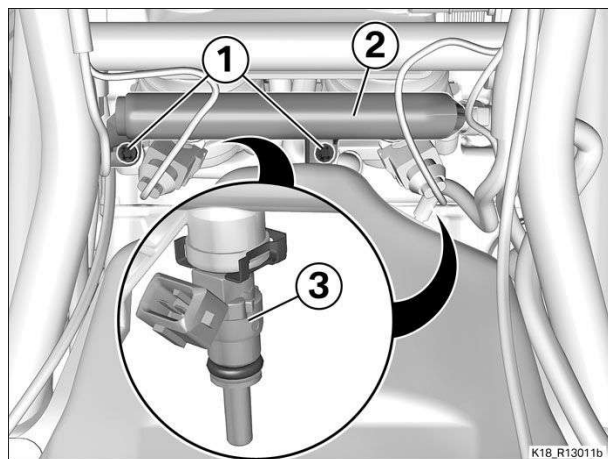
- Remove the following components:
 - Snap retainer (1)
 - Washer (2)
 - Radiator strut (3)



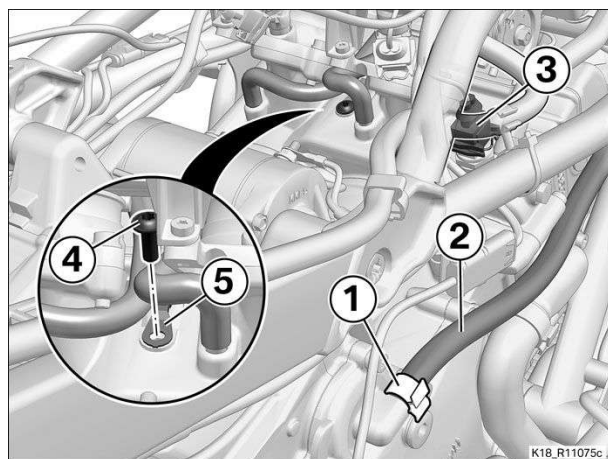
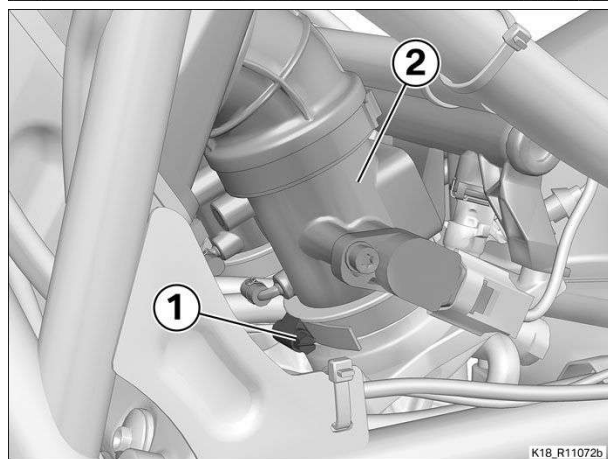
- Disengage hoses (1).
- Disconnect plug (1) for the camshaft sensor.
- Disconnect plugs (2) for the ignition coils.



- Remove screws (1) and disengage injection rail (2) with injection nozzles (3) from the engine.

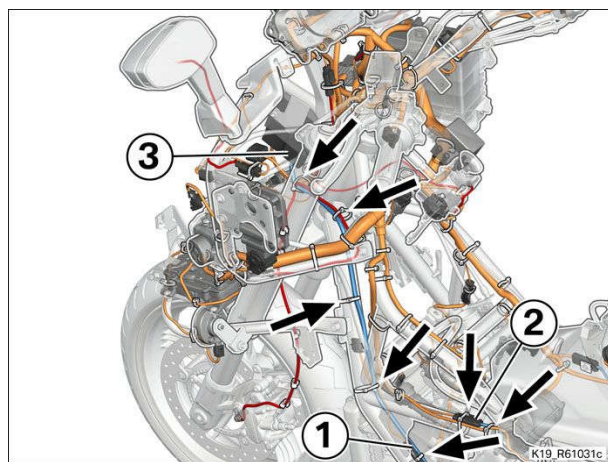


- Slacken clamps (1) on left and right and disengage throttle-valve assembly (2) from the engine.



- Open clip (1) and disconnect hose (2).
- Disconnect plug (3) for the temperature sensor.
- Remove screw (4) and disengage ground connection (5).

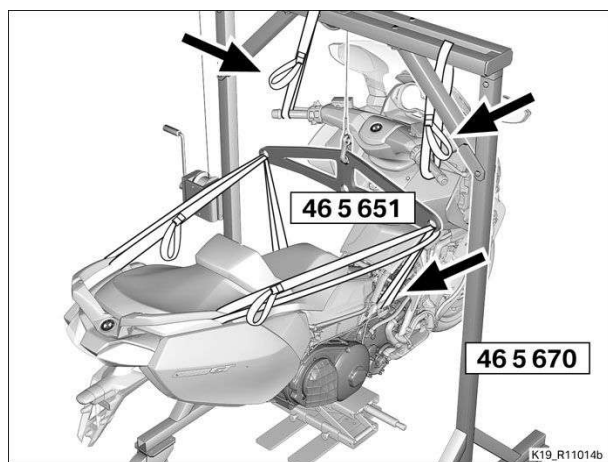
- Cut through the cable ties (arrows).



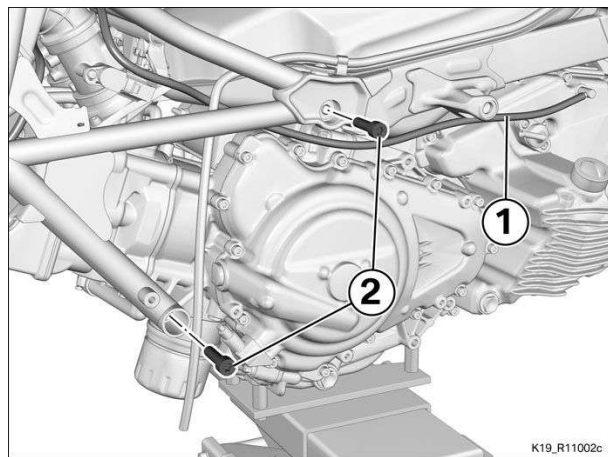
Disconnect plug (1) for the crankshaft sensor.

- Disconnect plug (2) for the oil-level sensor.
- Disconnect plug (3) for the voltage regulator and work it down and clear of the vehicle.

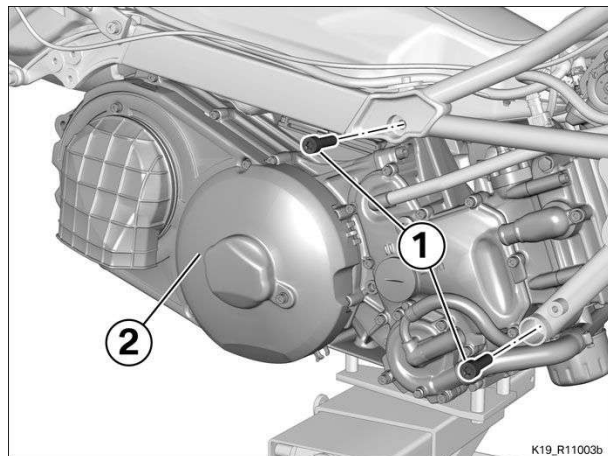
(-) Removing engine



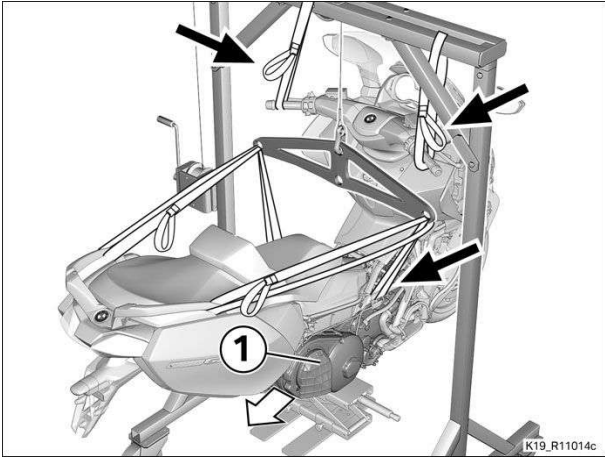
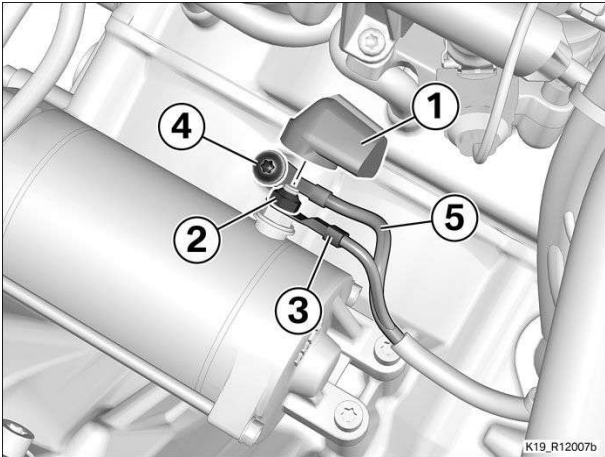
- Secure cross-member (No. 46 5 651) to crane (No. 46 5 670).
- Position crane (No. 46 5 670) above the **Maxi-Scooter**.
- Secure two straps to **engine bearer** (frame triangle) (arrow) on left and right and connect the straps to cross-member (No. 46 5 651).
- Use straps to secure the handlebar grips to the crane (arrows).
- Use straps to secure the grab handles to the crane.



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



- Remove screws (1).
- Lower engine (2) **carefully**.



ATTENTION

Work on components with permanent power supply (terminal 30).
Risk of short-circuit. Voltage peaks.

- Disconnect the ground lead from the battery.
 - Insulate the end of the ground lead.
-
- Remove cap (1) and nut (2), disconnect cable (3).
 - Remove screw (4) and disengage ground connection (5).
-
- Raise the **Maxi-Scooter** until engine (1) is separated from the frame.
 - Work engine (1) to the rear to remove (direction of arrow).
 - Additionally secure the **Maxi-Scooter** to prevent it toppling and park it safely.

(-) Replacing engine

- Transfer the small items to the new component.

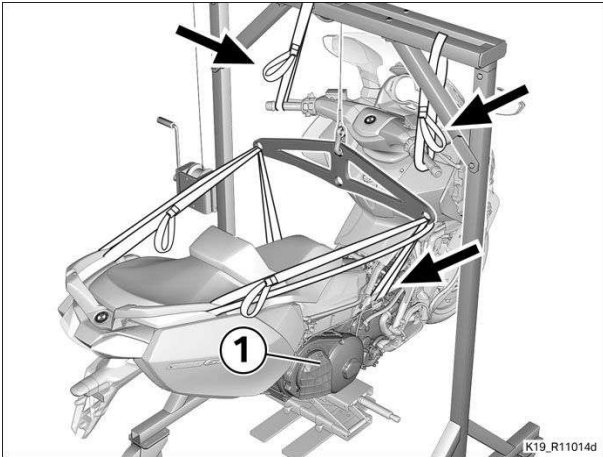
 Tightening torques		
Footplate carrier to engine		
Right, M8 x 20	19 Nm	
Left, M6 x 16	8 Nm	

- Pour the engine oil into the engine.

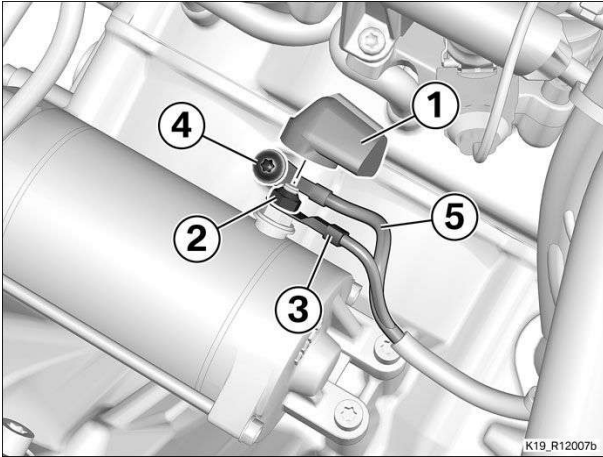
 Technical data			
Engine oil, capacity	with filter change	approx. 3.1 l	
	Fluids and lubricants		
	Viscosity class		

- After completing work, check the engine oil level; adjust as necessary:
- Engine at regular operating temperature
- Place the Scooter on its centre stand
- Allow the engine to idle for one minute

(-) Installing engine



- Secure the **Maxi-Scooter** to cross-member (No. 46 5 651) and crane (No. 46 5 670) (arrows).
- Secure the grab handles to the cross-member.
- Carefully position the **Maxi-Scooter** with the crane (No. 46 5 670) above engine (1).

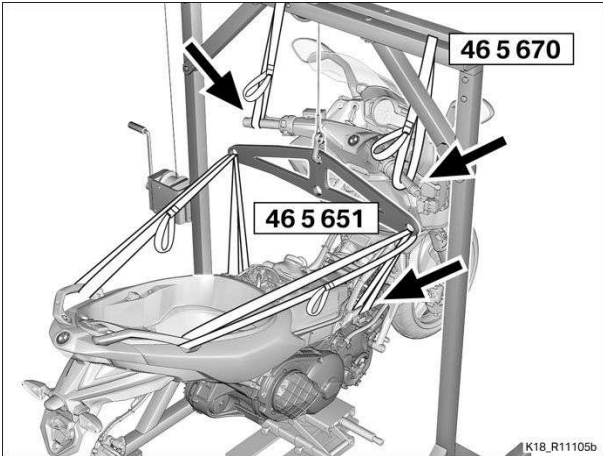


- Secure cable (3) with nut (2).

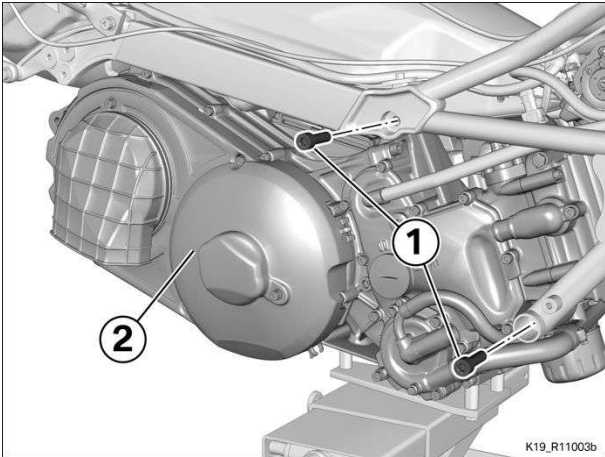
 Tightening torques		
Wiring harness (positive contact) to starter		
M6, Replace nut Thread-locking compound (mechanical)	8 Nm	

- Install cap (1).
- Secure ground connection (5) with screw (4).

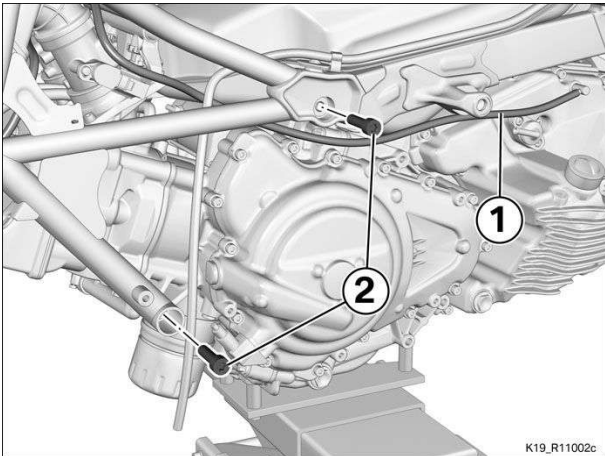
 Tightening torques		
Wiring harness (earth lead) to crankcase		
M6 x 12	8 Nm	



- Position the **Maxi-Scooter** carefully on the engine, if necessary slightly raise engine (1).
- Work engine (2) into position and insert screws (1), but do not tighten.



- Tighten screws (2) on left and right.



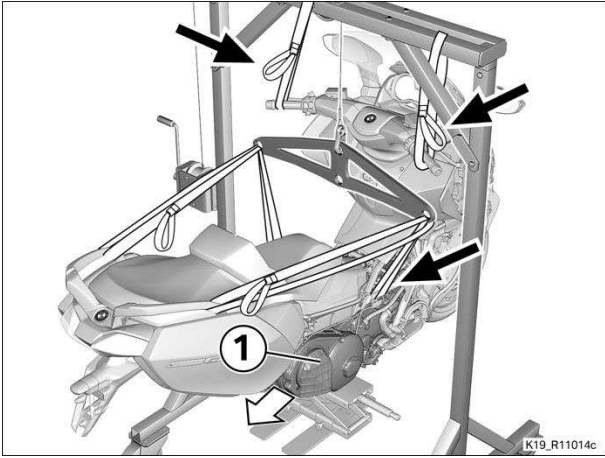
 Tightening torques

Engine to frame

M10 x 35

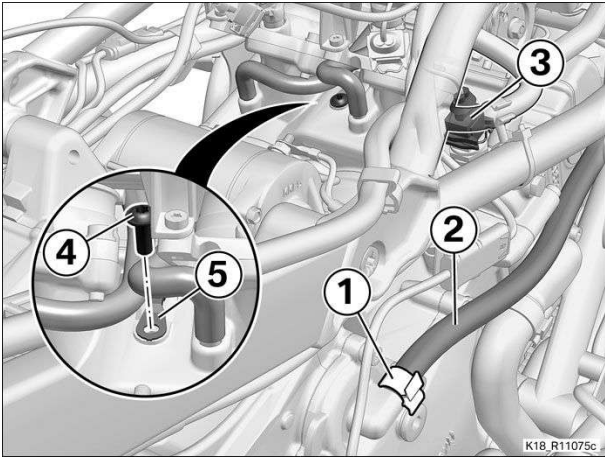
38 Nm

- Connect vent hose (1).



- Remove the straps from cross-member (No. 46 5 651).
- Remove the straps from the handlebar grips (arrows).
- Disengage the straps from engine bearer (frame triangle) (arrow) on left and right and remove cross-member (No. 46 5 651) with crane (No. 46 5 670).

(-) Finishing work for engine installation



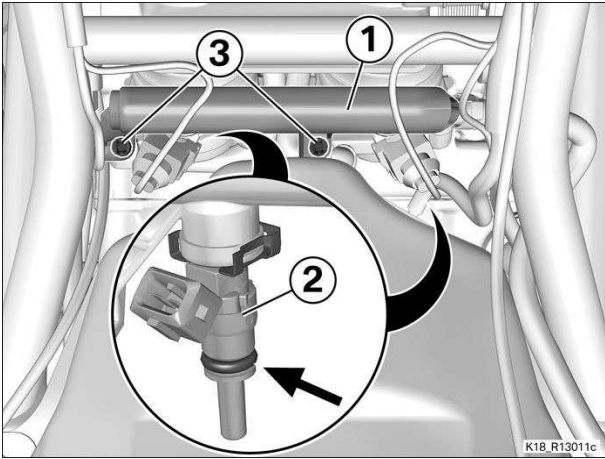
- Secure hose (2) with clip (1).
- Connect plug (3) for the temperature sensor.
- old ground connector (4) in position and secure with screw (5).

 Tightening torques

Wiring harness (earth lead) to crankcase

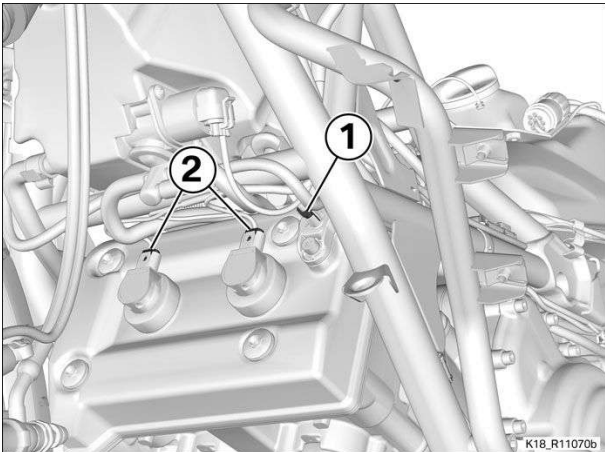
M6 x 12

8 Nm

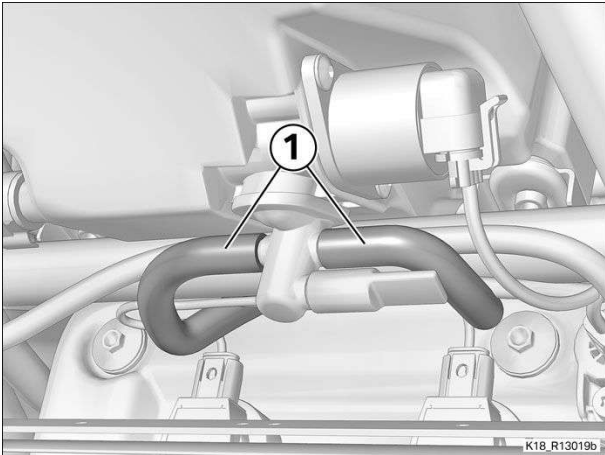


- Secure injection rail (1) with injection nozzles (2) to the engine, noting the sealing rings (arrow).
- Install screws (3).

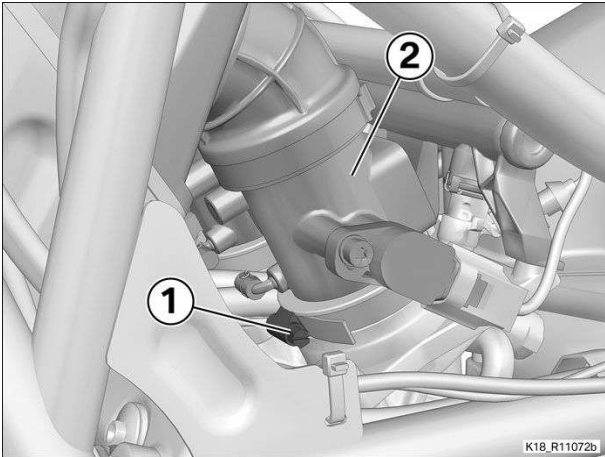
Tightening torques		
In action rail to adapter for throttle valve		
M5 x 12	3 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		



- Connect plug (1) for the camshaft sensor.
- Connect plugs (2) for the ignition coils.

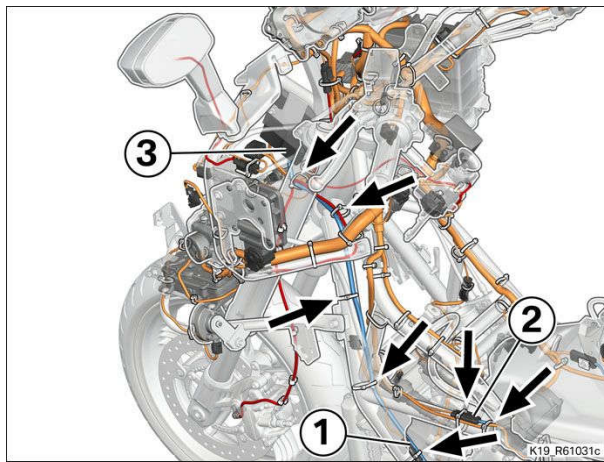
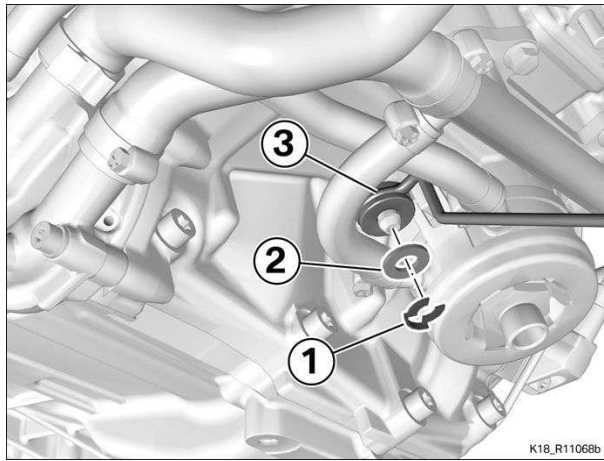


- Secure hoses (1).



- Secure throttle-valve assembly (2) to the engine.
- Tighten clamps (1) on left and right.

- Secure radiator strut (3) with washer and snap retainer (1).



- Connect plug (1) for the crankshaft sensor.
- Connect plug (2) for the oil-level sensor.
- Connect plug (3) for the voltage regulator.
- Close the cable ties (arrows).

Finishing work

Removing shaft sealing ring in output shaft

Replacing shaft sealing ring and felt ring for pinion cover

Replacing shaft sealing ring in swinging-arm cover

Installing pinion cover

Installing left and right frame side sections

Installing rear swinging arm

Installing spring strut

Replacing shaft sealing ring in swinging arm

Installing sprocket and output shaft

Securing rear brake caliper and parking brake

Installing rear wheel

Tightening judder damper

Installing swinging-arm housing cover

Pouring oil into swinging arm

Securing brake hose and sensor cable

Removing engine lifter

Installing side stand complete with pivot mount and switch

Installing sound-absorbing hood

Installing exhaust manifold with oxygen sensor

Installing silencer with cover and bracket
Install the right footplate carrier
Installing radiator
Securing expansion tank for coolant
Filling cooling system
Checking cooling system for leaks
Installing air deflector for radiator
Installing underbody panel
Installing right footplate
Installing rear right footplate insert and footrest plate
Installing centre right footplate insert and footrest plate
Installing right side panel
Installing bottom right fairing panel
Installing front right footplate insert and footrest plate
Connecting battery leads
Checking, if necessary correcting date
Connecting **MW Motorrad** diagnostic system to **Maxi-Scooter**
Performing vehicle test with **MW Motorrad** diagnostic system,
reading out fault memory and resetting adaptation values
Disconnecting **MW Motorrad** diagnostic system from **Maxi-Scooter**
Installing top right side panel
Installing left footplate carrier
Installing left footplate
Installing rear left footplate insert and footrest plate
Installing centre left footplate insert and footrest plate
Installing left side panel
Installing bottom left fairing panel
Installing front left footplate insert and footrest plate
Installing top left side panel
Installing centre cover
Closing seat
Installing filler cap flap
Checking basic setting and braking effect of parking brake
Pouring engine oil into engine
Final check of work performed

11 00 103 Disassembling and assembling engine (engine removed)

+ 11 00 648

ATTENTION

Timing chain jumping off sprocket.

Component damage

- Do not attempt to turn the engine without chain tensioners fitted.

Preparatory work

Removing CVT cover

Removing CVT complete with clutch

Removing oil filter

Securing engine to engine-repair stand

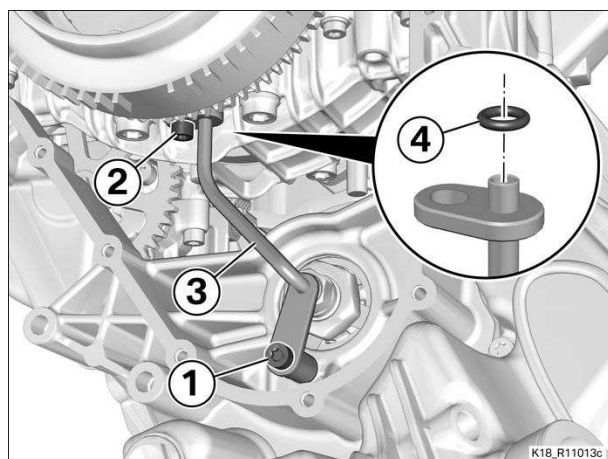
Relieving tension on and locating chain tensioner

Removing right crankcase cover

Removing left crankcase cover

Core activity

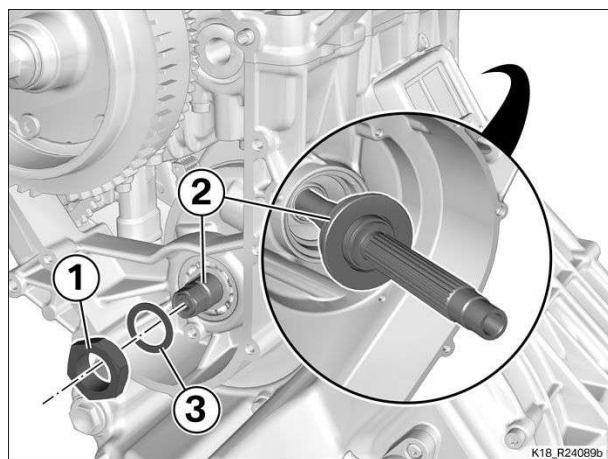
(-) Removing oil line to CVT input shaft



- Remove the following components:

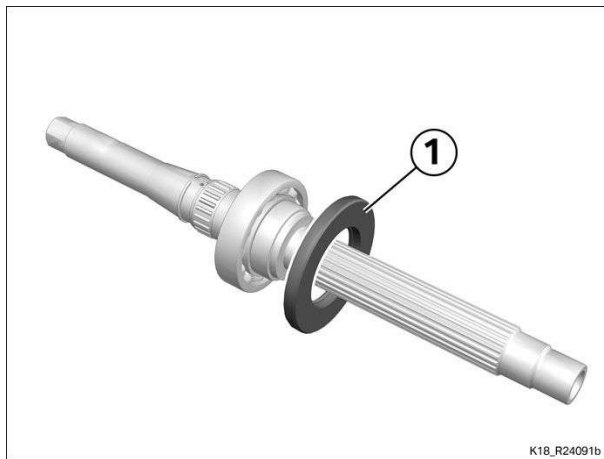
- Screws (1) and (2)
- Oil line (3)
- Sealing ring (4)

(-) Removing CVT drive shaft



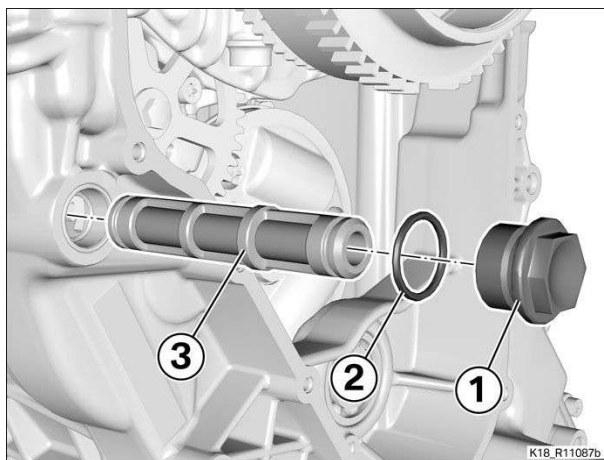
- Remove nut (1) and washer (3).
- Secure nut (1) and turn the hexagon of CVT input shaft (2) **clockwise**.
- Work CVT input shaft (3) to the right to remove (**light** taps with a rubber-headed mallet).

- Remove sealing ring (1).

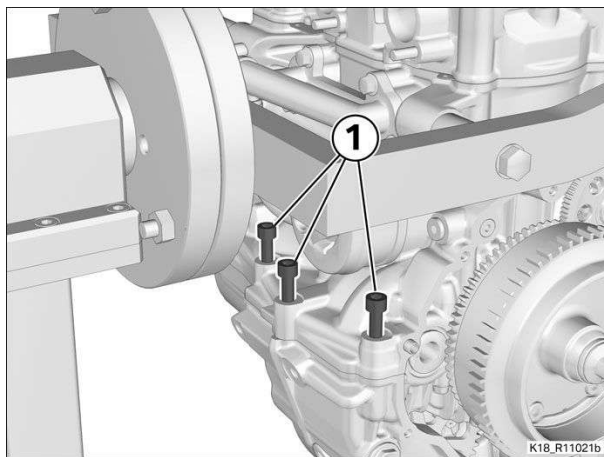


(-) Removing bottom crankcase half

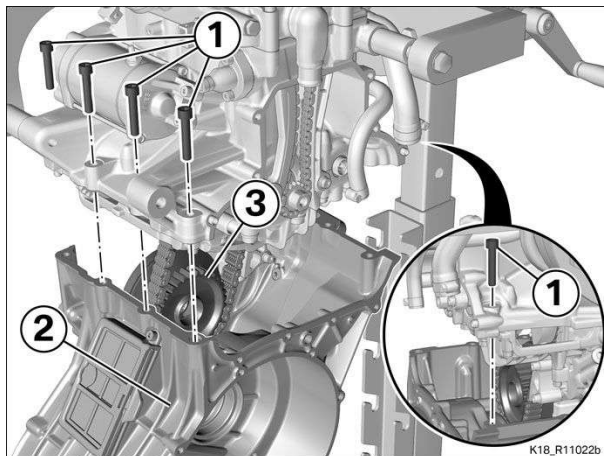
- Remove screw (1) with sealing ring (2).
- Remove oil intake pipe (3).



- Remove screws (1).

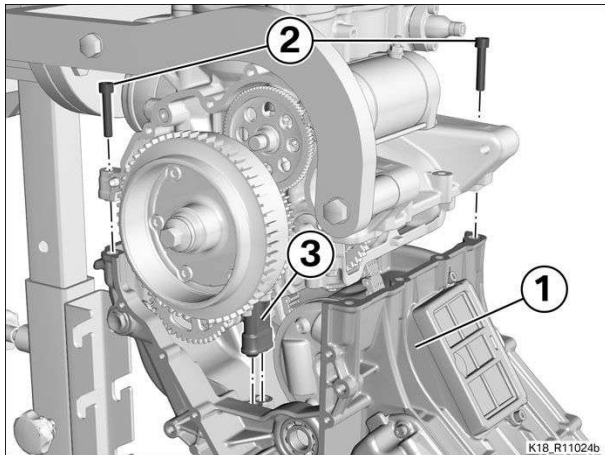
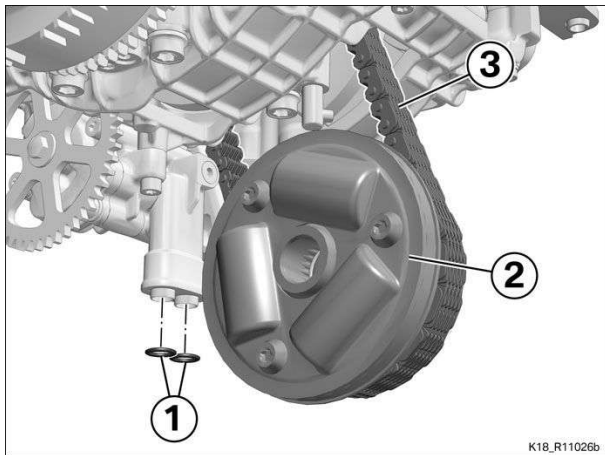


- Remove screws (1), remove bottom crankcase half (2).
- Remove judder damper (3).



(-) Installing bottom crankcase half

- Clean all sealing faces.
- Replace sealing rings (1).
- Install judder damper (2) in drive chain (3).



- Seal bottom half of engine block (1).

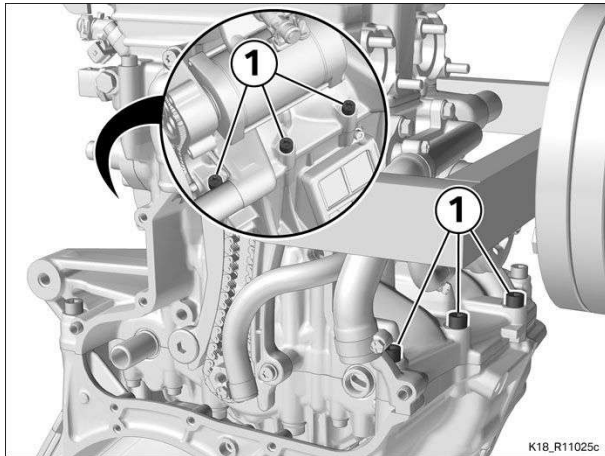


Sealant

Dow Corning

07 58 0 397 777

- Hold engine-block half (1) in position and locate it in this position with 2 opposing screws (2), **do not tighten**.
- Check that oil pump union (3) is correctly positioned and tighten screws (2) until hand-tight.
- Install screws (1) and tighten until hand-tight.



- Tighten the screws in the sequence indicated (1) to (8).



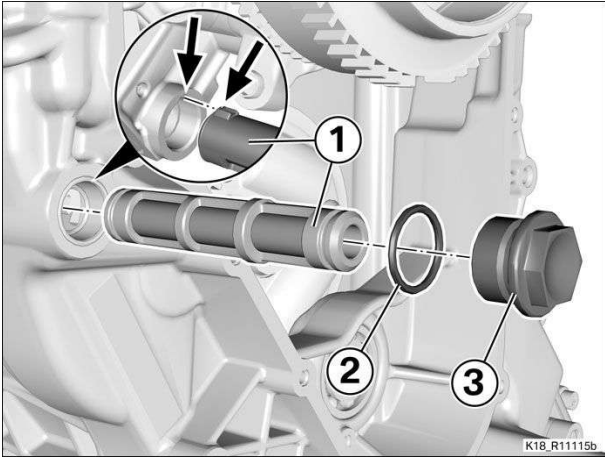
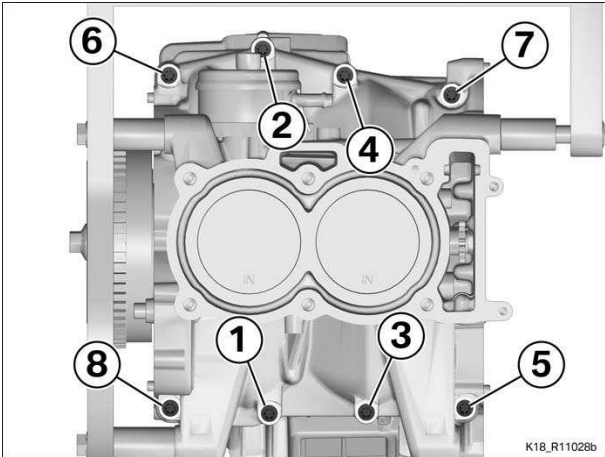
Tightening torques

Assembly of crankcase

M8 x 50

See repair manual

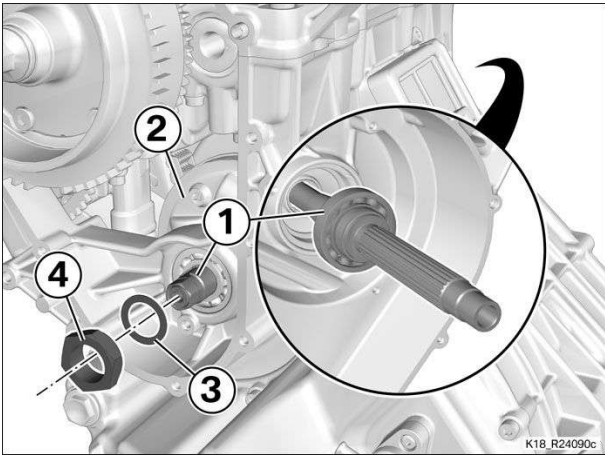
23 Nm



- Install oil intake pipe (1), noting the locator (arrows).
- Install **new** sealing ring (2) and screw (3).

Tightening torques		
Threaded plug to crankcase/gearbox cover		
M20 x 1.5	15 Nm	

(-) Installing CVT input shaft



- Install drive shaft (1), noting judder damper (2).
- Clean the threads.
- Install washer (3).

ATTENTION

Shelf life of micro-encapsulated screws overshot.
Insufficient securing effect.

- Use additional thread locking.

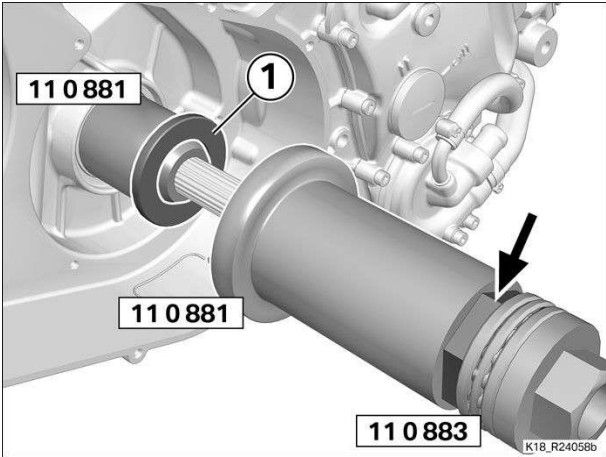
- Install nut (4), counter-holding at hexagon of drive shaft (1).

Tightening torques		
CVT input shaft to crankcase		
M20 x 1.5	150 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		

- Clean seat of radial shaft seal (1).

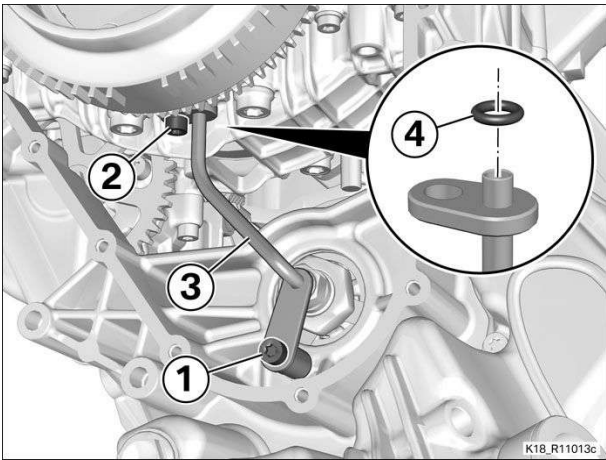
NOTICE

The **outside** of the shaft sealing ring must be dry on installation; if necessary clean the seat in the housing.



- Lightly lubricate only the sealing lip of radial shaft seal (1) with engine oil, all other surfaces must be dry and free of grease on installation.
- Insert sliding sleeve (No. 11 0 881) and **new** radial shaft seal (1).
- Screw on assembly tool (No. 11 0 881) with thrust nut (No. 11 0 883) **until seated**; in this process counter-hold at the hexagon (arrow) to prevent the mandrel from turning.
- Remove the tools.

(-) Installing oil line to CVT input shaft



- Insert oil line (3) with **new** sealing ring (4).
- Install screws (1) and (2).

Tightening torques		
Oil line (CVT input shaft) to engine		
M6 x 16	10 Nm	
M6 x 40	10 Nm	

Finishing work

- Installing left crankcase cover
- Installing right crankcase cover
- Releasing locator for timing-chain tensioner
- Separating engine from engine-repair stand
- Installing oil filter
- Installing CVT complete with clutch
- Installing CVT cover

 **11 00 209 Oil change, engine, with filter**
+ 11 00 611

Preparatory work

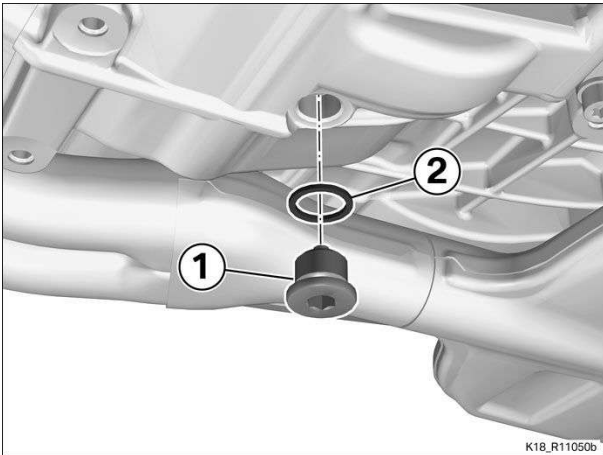
Removing rear left footrest plate and oil filler panel

Core activity

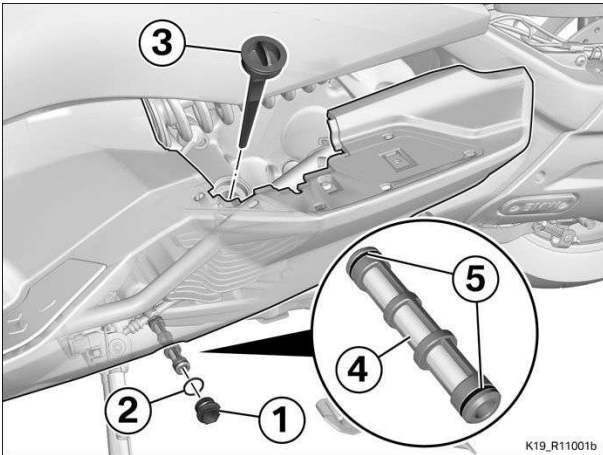
(-) Changing engine oil with filter

► **Draining off all engine oil**

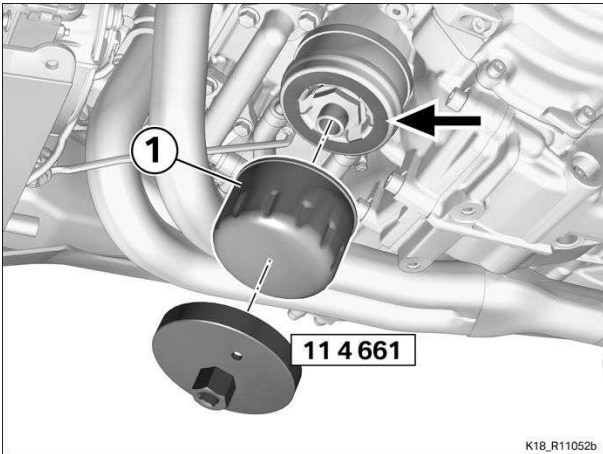
- Remove screw (1) with sealing ring (2) and drain off the oil into a suitable container.



- Remove screw (1) with sealing ring (2).
- Remove oil dipstick (3) and drain the oil **from the oil tank** into a suitable container.
- Remove oil strainer (4) and sealing rings (5).

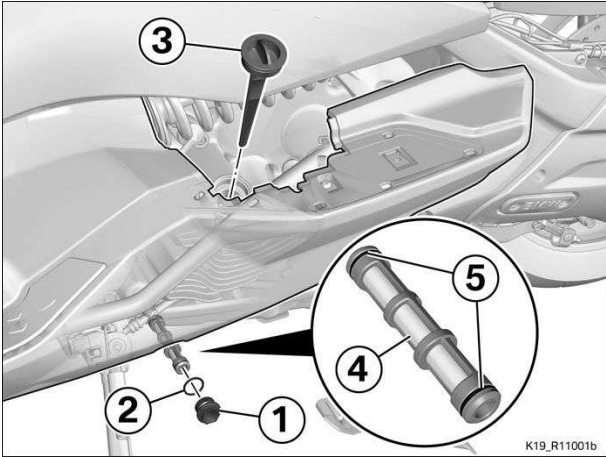
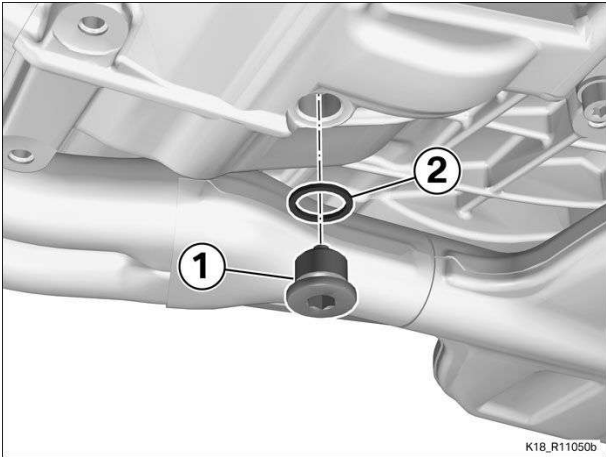


- Remove oil filter (1), using oil filter wrench (No. 11 4 661).
- Allow all the oil to drain off.
- Clean the sealing face (arrow).
- Install new oil filter (1), using oil filter wrench (No. 11 4 661).



 Tightening torques		
Oil filter to engine		
Lubricate seal with engine oil	11 Nm	

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



 Tightening torques		
Oil drain plug in crankcase		
M16 x 1.5	28 Nm	

- Clean oil strainer (4), check sealing rings (5); replace if necessary.
- Install oil strainer (4).
- Install screw (1) with sealing ring (2).

 Tightening torques		
Threaded plug to crankcase/gearbox cover		
M20 x 1.5	15 Nm	

- Pour in correct quantity of engine oil and install dipstick (3).

 Technical data			
Engine oil, capacity	with filter change	approx. 3.1 l	
	Fluids and lubricants		
	Viscosity class		

- After completing work, check the engine oil level; adjust as necessary:
 - Engine at regular operating temperature
 - Place the **Maxi-Scooter** on its centre stand
 - Allow the engine to idle for one minute
 - Switch off the engine
- Remove the oil dipstick and **seat it** on oil filler opening, but **do not engage the threads**.
- Check the oil level on the oil dipstick.

 Technical data			
Engine oil, specified level	Engine at regular operating temperature	Between MIN and MAX marks	
			

Finishing work

Installing rear left footrest plate and oil filler panel

Final check of work performed

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

+ 11 12 821

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing front left footrest plate

Removing left side panel

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing air deflector

Disengaging expansion tank for coolant

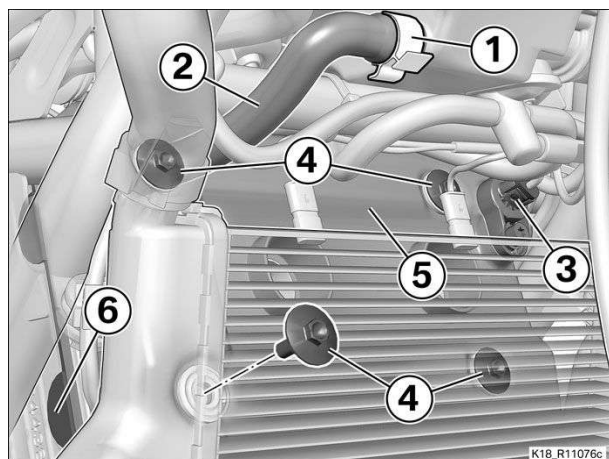
Disengaging and lowering radiator

Removing ignition coils

Core activity

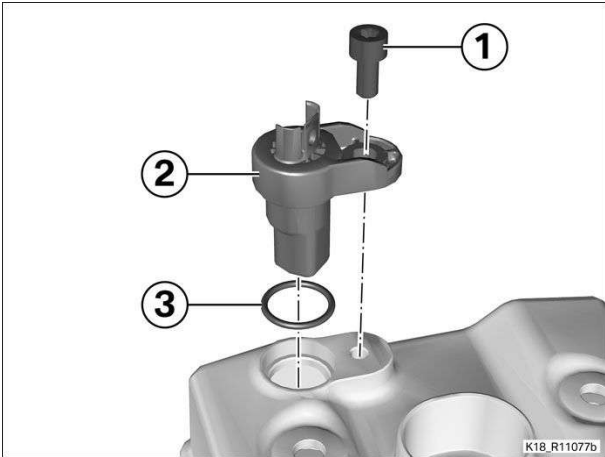
(-) Removing cylinder head cover

- Open hose clip (1) and disconnect breather hose (2).
- Disconnect plug (3) for the camshaft sensor.
- Remove the following components:
 - Screws (4)
 - Cylinder head cover (5)
 - Seal (6)



(-) Replacing cylinder-head cover

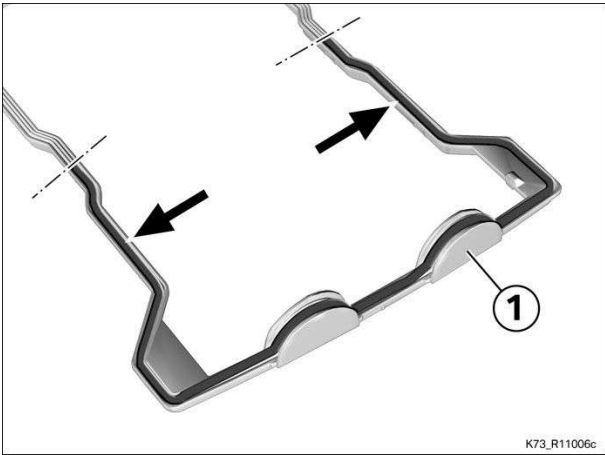
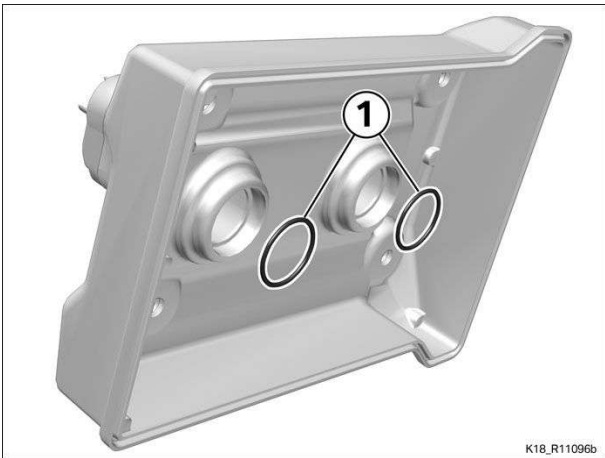
- Remove screw (1), remove camshaft sensor (2) and seal (3).
- Transfer camshaft sensor (2) with **new** seal (3) to the new part.
- Install screw (1).



Tightening torques		
Camshaft sensor to cylinder head cover		
M6 x 16	10 Nm	

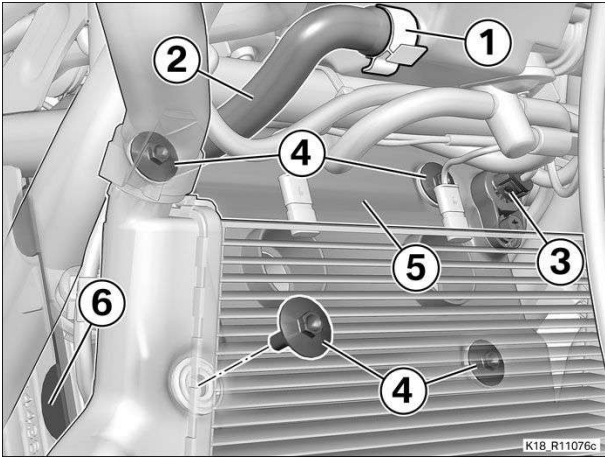
(-) Installing cylinder head cover

- Replace sealing rings (1).



- Seal the new gasket (1) in the area shown (arrows).

Sealant		
Dow Corning	07 58 0 397 777	



- Secure gasket (6) in cylinder head cover (5) with surface sealant.

Sealant		
Dow Corning	07 58 0 397 777	

- Install cylinder head cover (5).
- Check that gasket (6) is correctly positioned and install screws (4).

Tightening torques		
Cylinder head cover to cylinder head		

M6	tighten in diagonally opposite sequence	
	10 Nm	

- Connect plug (3) for the camshaft sensor.

NOTICE

Discontinuation of the camshaft sensor with its wiring-harness plug from model year 2014 onward.

- Secure breather hose (2) with hose clip (1).

Finishing work

Installing ignition coils

Securing radiator

Securing expansion tank for coolant

Installing air deflector

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing left side panel

Installing front left footrest plate

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

11 12 516 Removing/installing cylinder head or replacing cylinder head gasket (engine removed)

ATTENTION

Timing chain jumping off sprocket.

Component damage

- Do not attempt to turn the engine without chain tensioners fitted.

Preparatory work

Securing engine to engine-repair stand

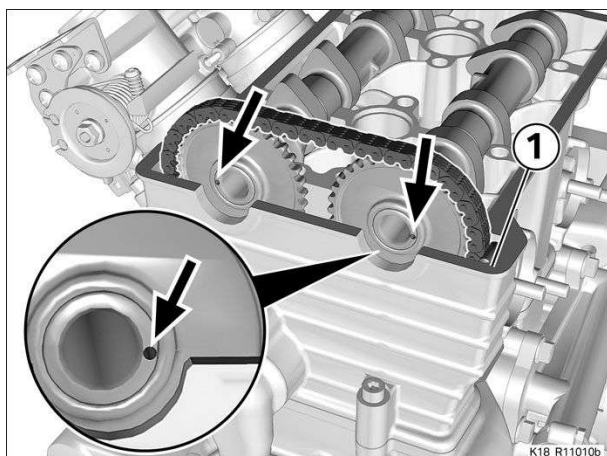
Removing ignition coils

Removing cylinder head cover

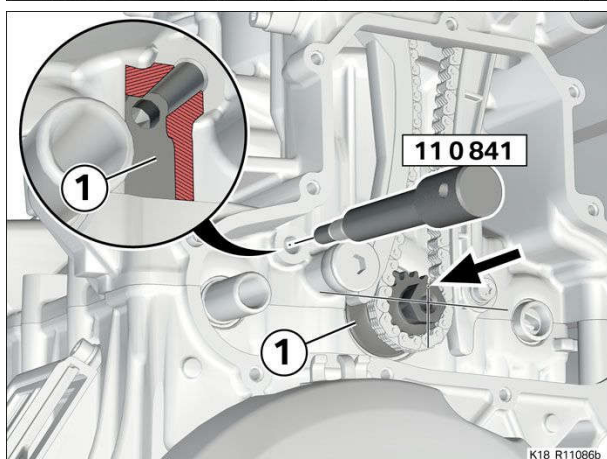
Removing right crankcase cover

Core activity

(-) Setting cylinder 1 to overlap TDC and securing (for camshaft removal)



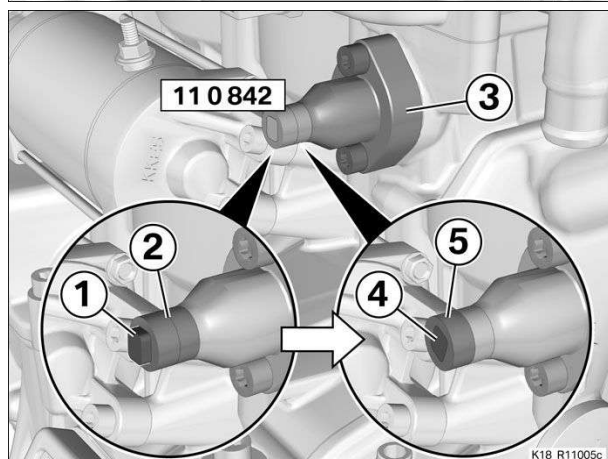
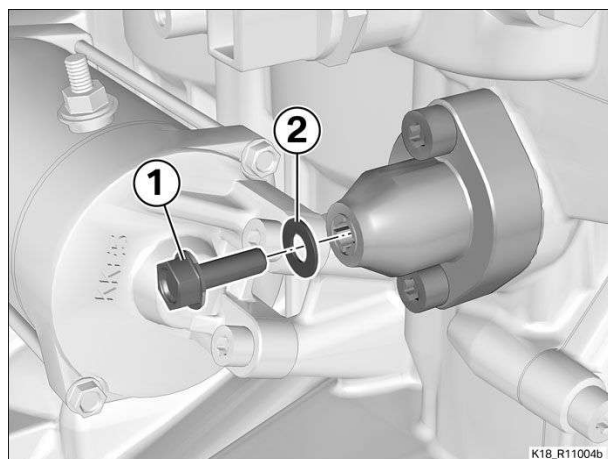
- Turn the engine in the normal direction of rotation until the marks (arrows) are pointing away from each other and parallel with sealing face (1).



- Make sure that the mark (arrow) in crankshaft (1) is pointing vertically up.
- Install locking pin (No. 11 0 841) in hole in crankshaft (1).

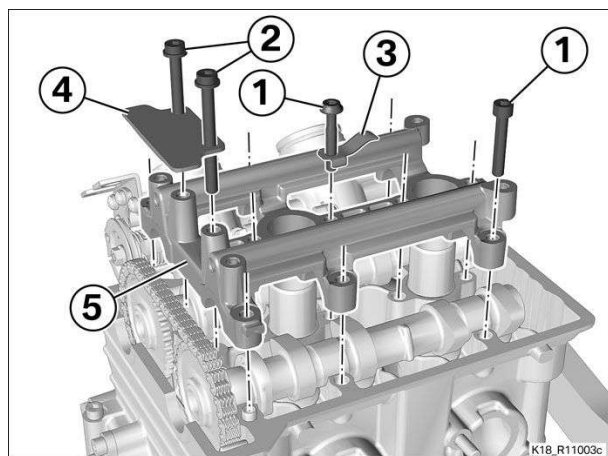
(-) Relieving tension on and locating chain tensioner

- Remove screw (1) and seal (2).



- Prepare pretensioning tool (No. 11 0 842):
- Pull out lock (1) and turn it.
- » Lock (1) is seated on turnable ring (2) and is held in position.
- Install pretensioning tool (No. 11 0 842) in chain tensioner (3) until seated.
- Turn lock (4) until it engages and is flush with top turnable ring (5).
- Turn **top** turnable ring (5) **clockwise** until the tension is off the chain tensioner.

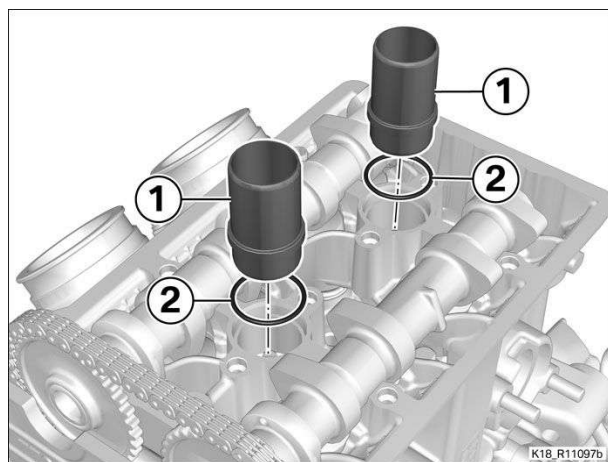
(-) Removing camshaft bearing cap



- Back off screws (1) and (2) uniformly step by step and remove.
- Remove contact spring (3) and chain guide (4).
- Remove bearing cap (5).

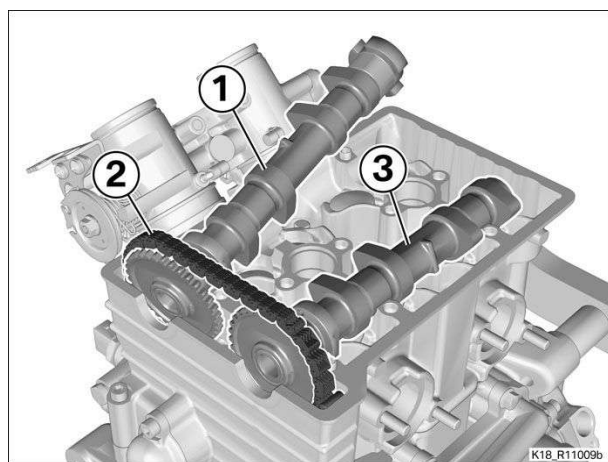
(-) Removing spark-plug tubes

- Remove spark-plug tubes (1) with sealing rings (2).



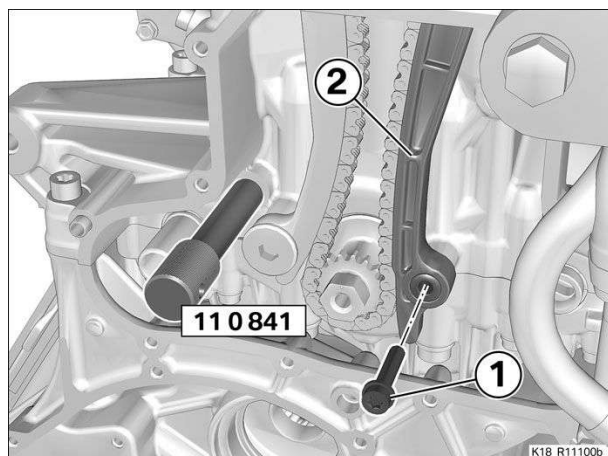
(-) Removing camshafts

- Slightly lift inlet camshaft (1) and disengage it from timing chain (2).
- Remove inlet camshaft (1).
- Remove exhaust camshaft (3).



(-) Disengaging timing-chain rail

- Remove screw (1).
- Disengage timing-chain rail (2).



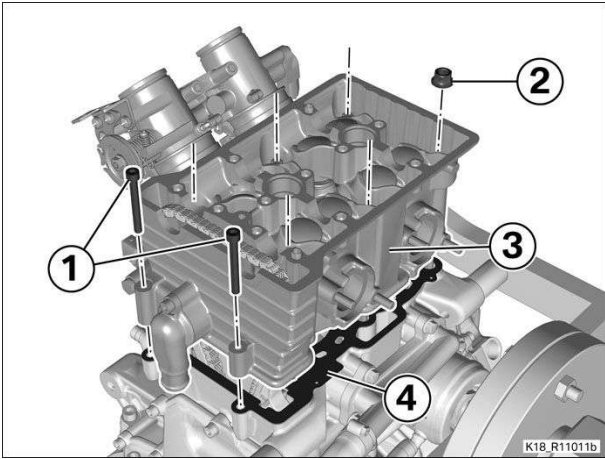
(-) Removing cylinder head

- Remove the following components:

NOTICE

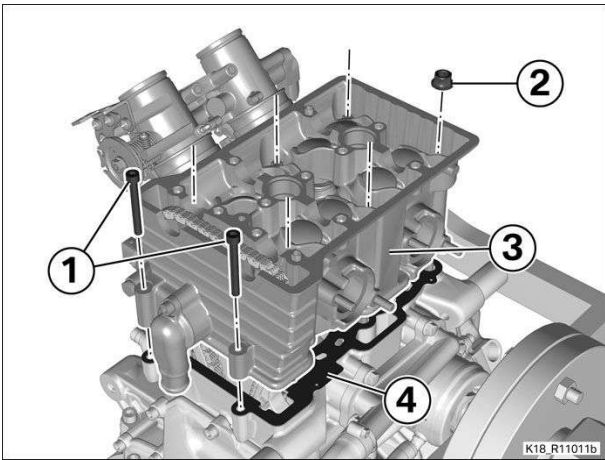
The sealing compound forms a strong bond and in some instances engine components can be difficult to separate. Separate the engine components by tapping them with a rubber mallet, without damaging cooling ribs or other parts of the crankcase.

- Screws (1)



- Slacken nuts (2) **step by step, working from the inside toward the outside.**
- Cylinder head (3)
- Gasket (4)

(-) Installing cylinder head



- Clean the sealing face.
- Install the following components:
 - new seal (4)
 - Cylinder head (3)
 - Nuts (2)
 - Screws (1)
- Tighten nuts (2) uniformly **step by step, working from the inside toward the outside.**

 Tightening torques		
Cylinder head to crankcase		
M10, Thread oiled	Tightening torque, 30 Nm	
	1st additional angle of rotation, 90°	
	2nd additional angle of rotation, 90°	

- Tighten screws (1).

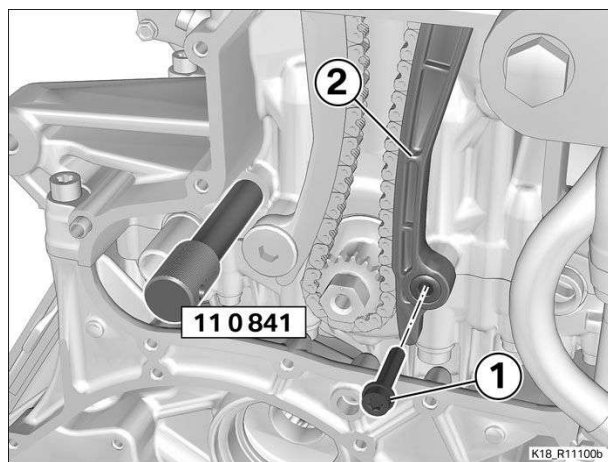
 Tightening torques		
Cylinder head to crankcase		
M6 x 50	10 Nm	

(-) Securing timing-chain rail

- Secure timing-chain rail (2) with screw (1).

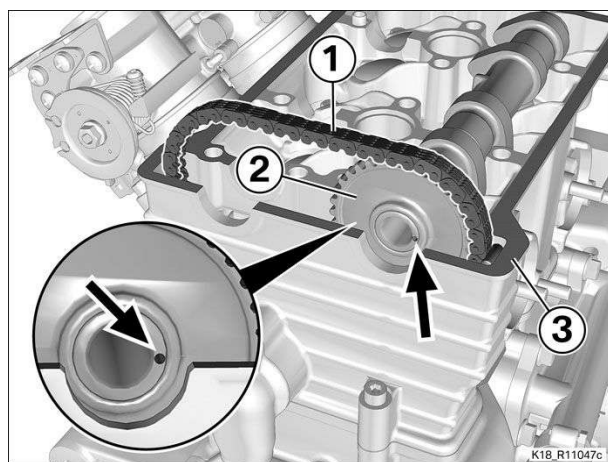
 Tightening torques		
Chain slide rail to crankcase		
M6 x 30	10 Nm	

•

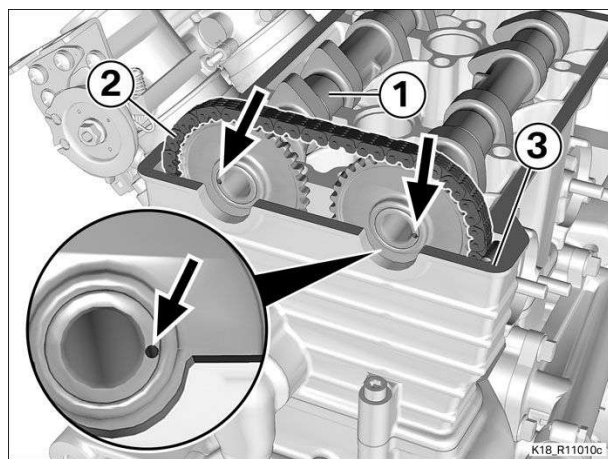


Make sure that the timing chain is routed correctly.

(-) Installing camshafts



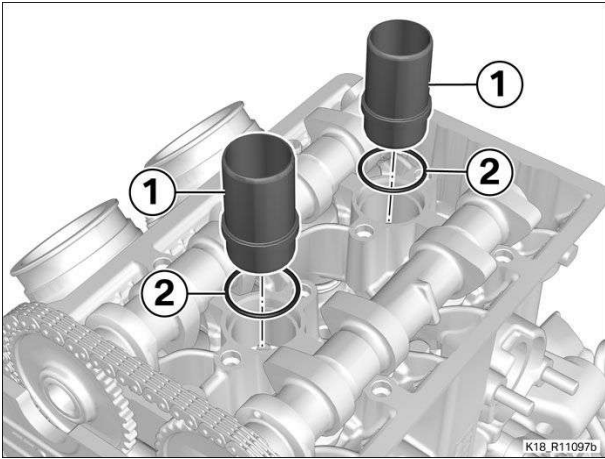
- Lubricate the bearing seats with engine oil.
- Pull timing chain (1) taut on exhaust side and insert exhaust camshaft (2), noting the marks.
- The hole (arrow) is pointing out and is parallel to sealing face (1).



- Insert inlet camshaft (1) in timing chain (2), noting the marks
- The holes (arrows) are apart and parallel to the sealing face (3).

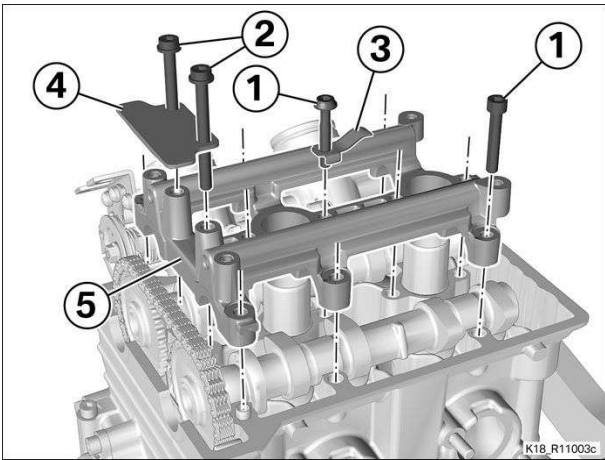
(-) Installing spark-plug tubes

- Replace sealing rings (2).
- Install spark-plug tubes (1)



(-) Installing camshaft bearing cap

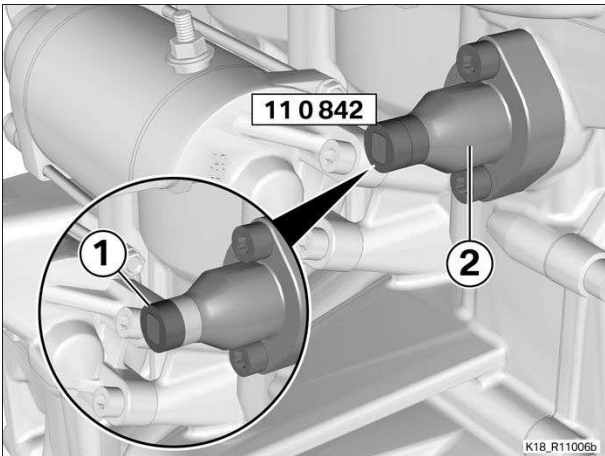
- Lubricate all bearing seats with engine oil.
- Place the following components in position:
 - Camshaft bearing cap (5)
 - Chain guide (4)
 - Contact spring (3)
- **Press down on** camshaft bearing cap (5) and install screws (1) and (2) and tighten until hand-tight.
- Tighten screws (1) and (2) **uniformly and step by step** in diagonally opposite sequence.



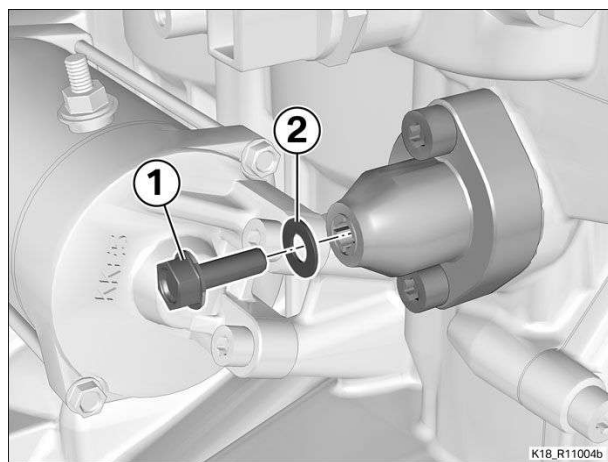
Tightening torques		
Camshaft bearing cap to cylinder head		
M6 x 35	10 Nm	
M6 x 60	10 Nm	

(-) Releasing locator for timing-chain tensioner

- Slightly raise top turning ring (1).
- » Timing-chain tensioner (2) turns to the working position.
- Remove pretensioning tool (No. 11 0 842).



- Install screw (1) with seal (2).



(-) Removing crankshaft locator

- Remove locking pin (No. 11 0 841).

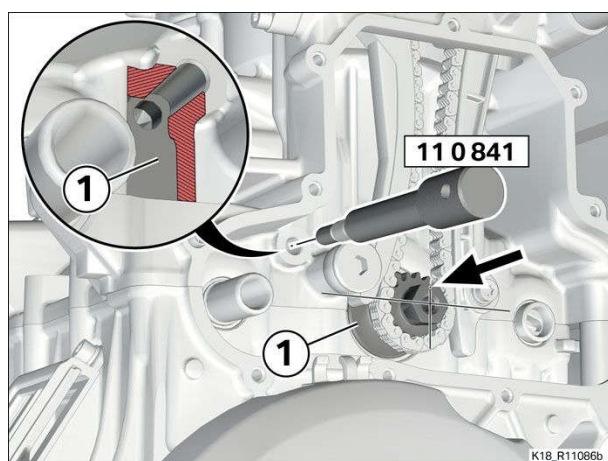
(-) Checking timing

⚠ ATTENTION

Arranging the engine not in compliance with correct procedure.

Component damage

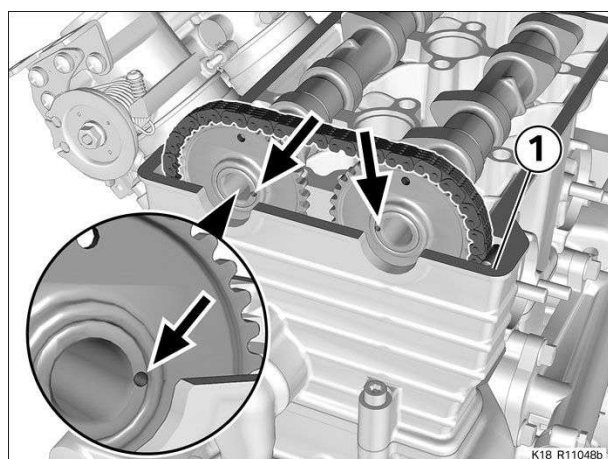
- Bar the engine carefully. Stop the rotational movement if resistance is perceptible.



- Carefully turn the engine through two full revolutions of the crankshaft and bring cylinder No. 1 (alternator side) to the TDC position.
- Make sure that the mark (arrow) in crankshaft (1) is pointing vertically up.
- If applicable, install locking pin (No. 11 0 841) in the hole (arrow) in crankshaft (1).

Check

- Note the marks (arrows) on the camshafts:
- The holes (arrows) are **toward each other** and parallel to sealing face (1).
- » Cylinder 1 (alternator side) is at firing TDC (valves closed).



Result

- Marks are not correct.

Measure

- Install camshafts correctly.
- If applicable, remove locking pin (No. 11 0 841).

finishing work

Installing right crankcase cover

Installing cylinder head cover

Installing ignition coils

Separating engine from engine-repair stand

11 12 641 Replacing cylinder head (cylinder head removed)

ATTENTION

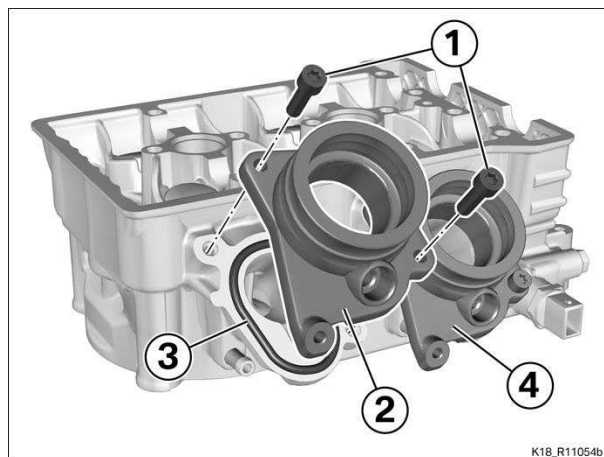
Installation of a camshaft bearing cap that has already been run-in a new cylinder head.

Component damage

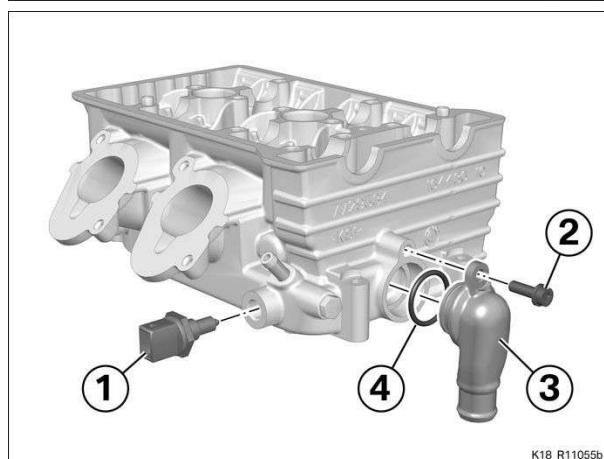
- Install a correct, new camshaft bearing cap.

Core activity

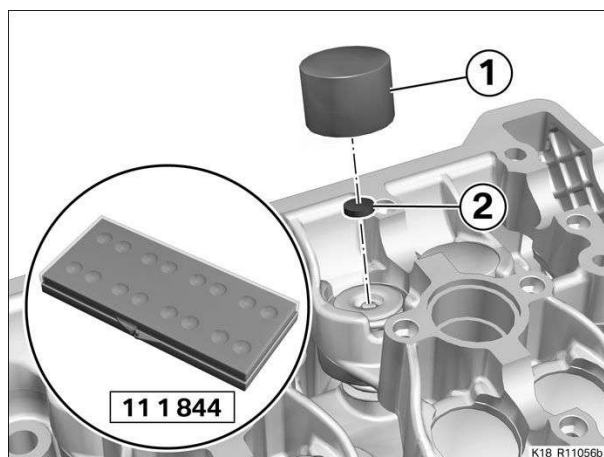
(-) Disassembling cylinder head



- Remove the following components:
 - Screws (1)
 - Intake stub (2)
 - Seal (3)
- Remove intake stub (4) in the same way.



- Remove temperature sensor (1).
- Remove the following components:
 - Screw (2)
 - Angled adapter (3)
 - Gasket (4)

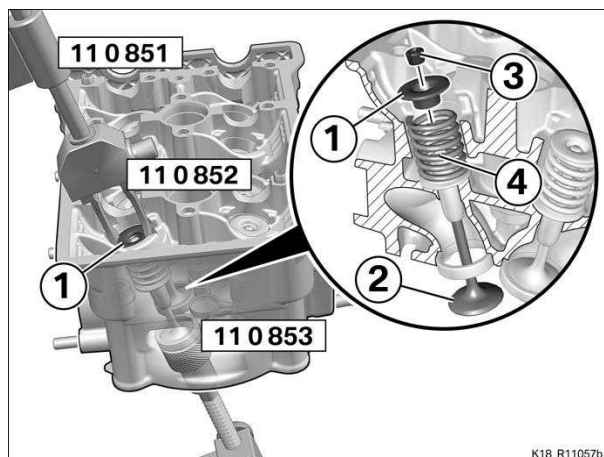


(-) Removing bucket tappet

- Remove bucket tappets (1) and adjustment plates (2); sort the plates into their corresponding positions in tray (No. 11 1 844).

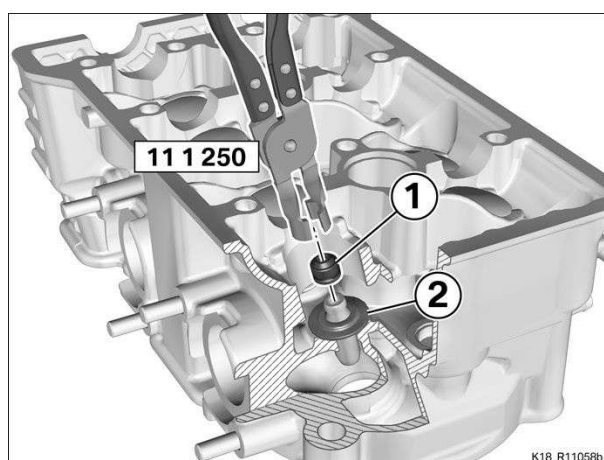
NOTICE

Make a note of which bucket tappets belong to which valve.



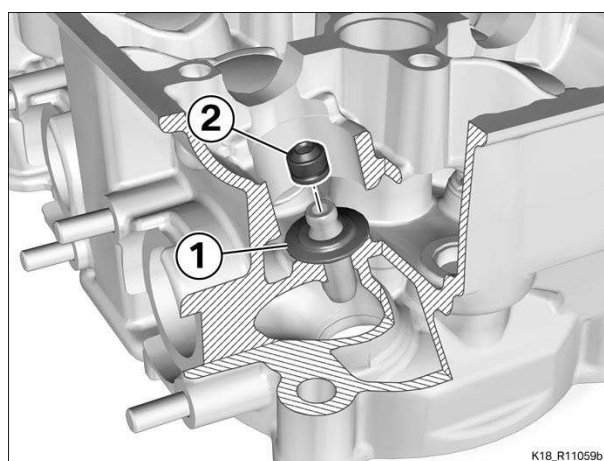
(-) Removing valves

- Secure mount (No. 11 0 853) to valve spring compressor (No. 11 0 851).
- Adjust thrust cage (No. 11 0 852) for spring retainer (1).
- Secure thrust cage (No. 11 0 852) to valve spring compressor (No. 11 0 851).
- Position valve spring compressor on spring retainer (1) and valve (2), press down spring retainer (1).
- Remove valve collets (3) and remove the clamp.
- Remove valve (2), spring retainer (1) and valve spring (4).



(-) Removing valve stem seals and spring retainers

- Remove valve stem seal (1) with pliers (No. 11 1 250).
- Remove spring retainer (2).

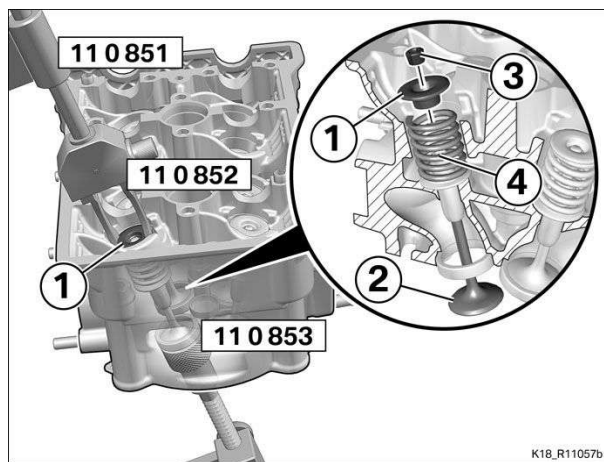


(-) Installing bottom spring retainer and valve stem seal

- Install spring retainer (1).
- Use a suitable tool to install valve stem seal (2) until seated.

(-) Installing valves

- Lubricate the components with engine oil.
- Secure mount (No. 11 0 853) to valve spring compressor (No. 11 0 851).
- Adjust thrust cage (No. 11 0 852) for spring retainer (1) and secure on valve-spring compressor (No. 11 0 851).
- Insert valve (2).



- Install valve spring (4) and spring retainer (1).
- Position clamp on spring retainer (1), press down spring retainer (1).
- Install valve collets (3) and remove the clamp.

(-) Checking valves for leaks

Check



WARNING

Fuel is highly flammable and hazardous to health.

Risk of fire. Health hazard.

- Comply with the pertinent safety regulations.

-
- Fill intake or exhaust port with fuel.

Result:

- Fuel escapes at the valve heads.

Measure:

- Rework valve / valve seat.

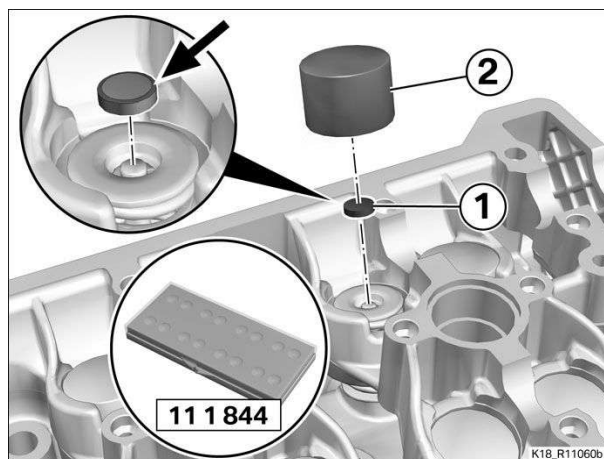
Result:

- No fuel escapes at the valve heads.

Measure:

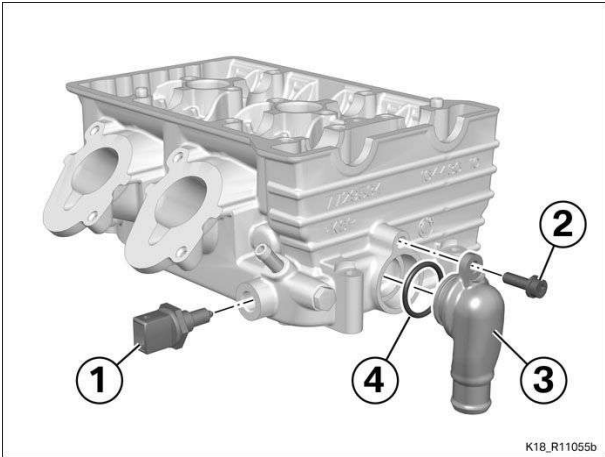
- No rework needed.

(-) Installing bucket tappet



- Lubricate the components with engine oil.
- Install adjustment plate (1) from tray (No. 11 1 844), noting the sorting sequence.
- Chamfer (arrow) faces toward bucket tappet (2).
- Install bucket tappet (2).

(-) Assembling new cylinder head

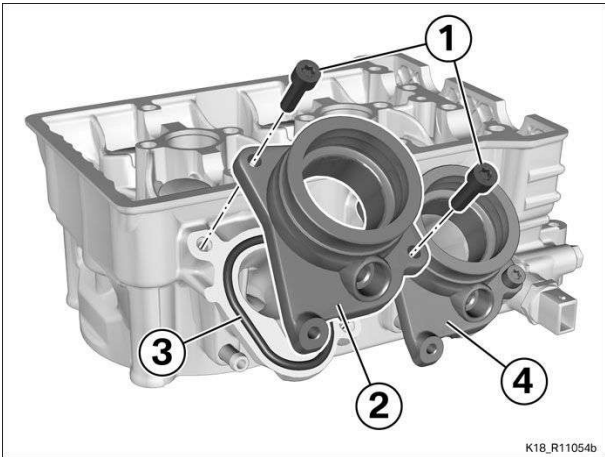


- Install temperature sensor (1).

 Tightening torques		
Temperature sensor to cylinder head		
M12 x 1,5	15 Nm	

- Secure **new** gasket (4) and coolant pipe (3) with screw (2).

 Tightening torques		
Coolant pipe to cylinder head		
M6 x 25	10 Nm	



- Place intake stub (4) in position with new gasket (3).
- Install screws (1).

 Tightening torques		
Air intake to cylinder head		
M6 x 25	10 Nm	

- Install intake stub (4) in the same way.

11 14 075 Replacing engine-block cover, left

+ 11 14 858

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

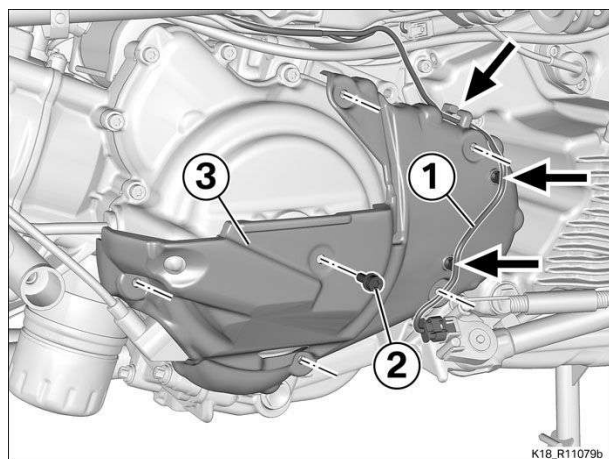
Removing left footplate

Removing left footplate carrier

Draining engine oil from engine block

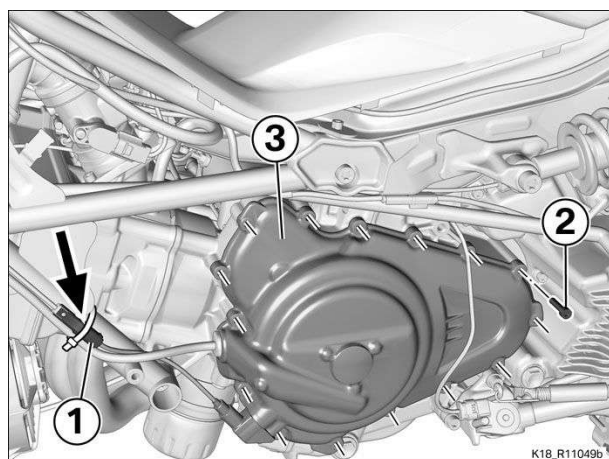
Core activity

(-) Removing left sound-absorbing hood



- Disengage cable (1) (arrows).
- Remove screws (2) and hood (3).

(-) Disengaging left crankcase cover



- Open the cable tie (arrow) and disconnect plug (1) for the crankshaft sensor.
- Remove screws (2).

WARNING

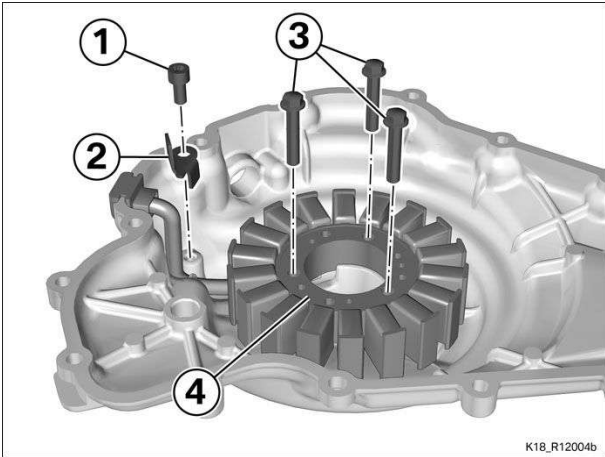
Overstretching of cables and lines.

Malfunctions

- Do not place strain on lines and cables.

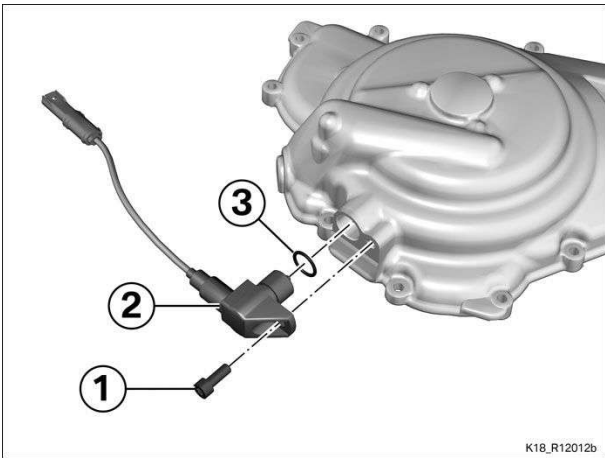
- Disengage cover (3) and ease it aside.

(-) Disengaging stator from crankcase cover



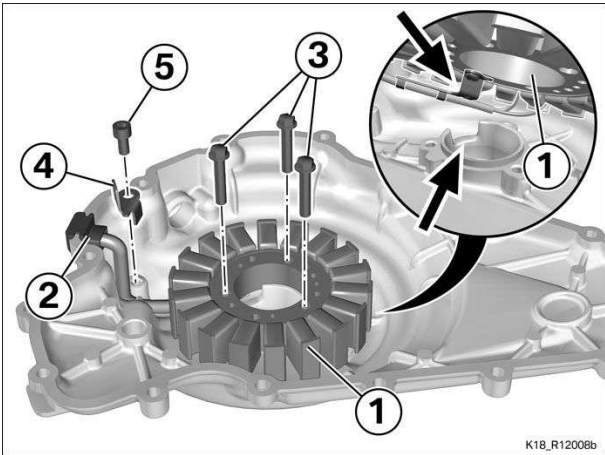
- Remove the following components:
 - Screw (1)
 - Bracket (2)
 - Screws (3)
- Carefully lay aside stator (4).

(-) Replacing left crankcase cover



- Remove the left crankcase cover.
- Remove screw (1) and sensor (2).
- Transfer sensor (2) to the new part, in this process check sealing ring (3); replace if necessary.

Tightening torques		
Crankshaft sensor to engine cover		
M6 x 16	10 Nm	



(-) Securing stator in crankcase cover

- Insert stator (1), noting the position of the cable pigtail (arrows).
- Seal rubber grommet (2).

Sealant		
Dow Corning	07 58 0 397 777	

- Install screws (3).

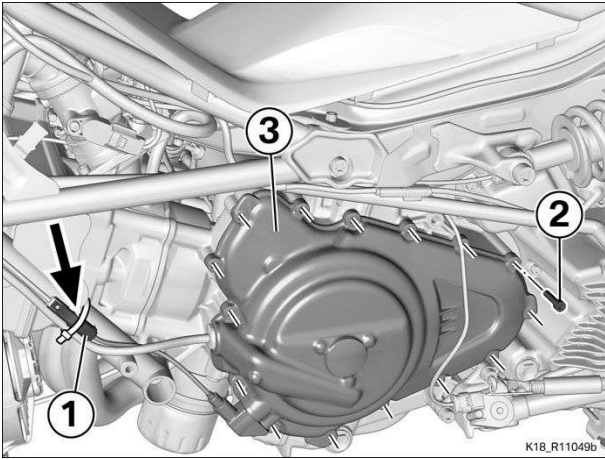
Tightening torques		
Stator to housing cover		
M6 x 30	10 Nm	

- Secure bracket (4) with screw (5).

(-) Securing left crankcase cover

- Clean the sealing faces.
- Apply sealant thinly to the sealing face.

NOTICE



Exercise particularly meticulous care when sealing areas where two sealing faces/joins meet.

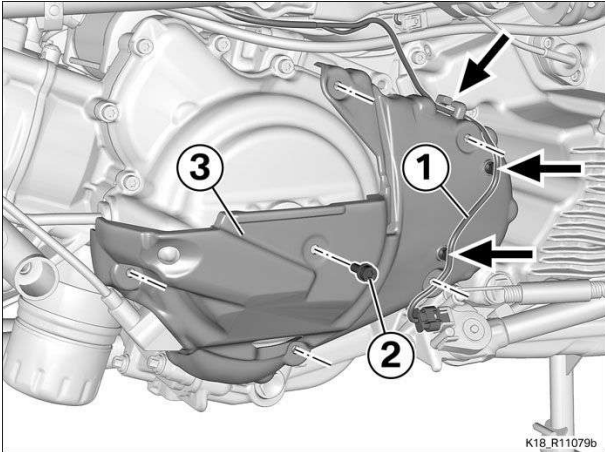
 Sealant	
Dow Corning	07 58 0 397 777

- Install cover (3) and screws (2).

 Tightening torques	
Crankcase cover, left, to crankcase	
M6 x 25	tighten in diagonally opposite sequence
	10 Nm

- Connect plug (1) for the crankshaft sensor and secure it with cable tie (arrow).

(-) Installing sound-absorbing hood



- Secure hood (3) with screws (2).

 Tightening torques	
Sound-absorbing hood to engine cover, right	
M6 x 18	10 Nm

- Secure cable (1) (arrows).

Finishing work

- Pouring engine oil into engine
- Installing left footplate carrier
- Installing left footplate
- Installing rear left footplate insert and footrest plate
- Installing centre left footplate insert and footrest plate
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap

Final check of work performed

11 14 076 Sealing left engine-block cover

+ 11 14 868

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

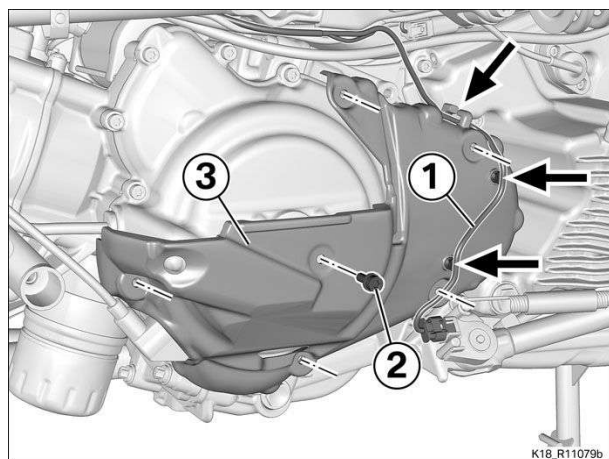
Removing left footplate

Removing left footplate carrier

Draining engine oil from engine block

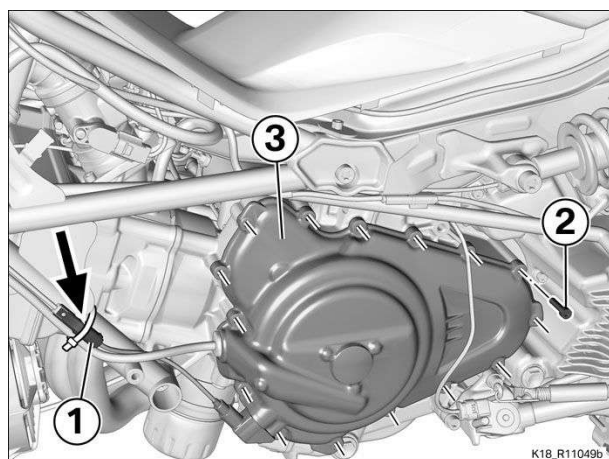
Core activity

(-) Removing left sound-absorbing hood



- Disengage cable (1) (arrows).
- Remove screws (2) and hood (3).

(-) Disengaging left crankcase cover



- Open the cable tie (arrow) and disconnect plug (1) for the crankshaft sensor.
- Remove screws (2).

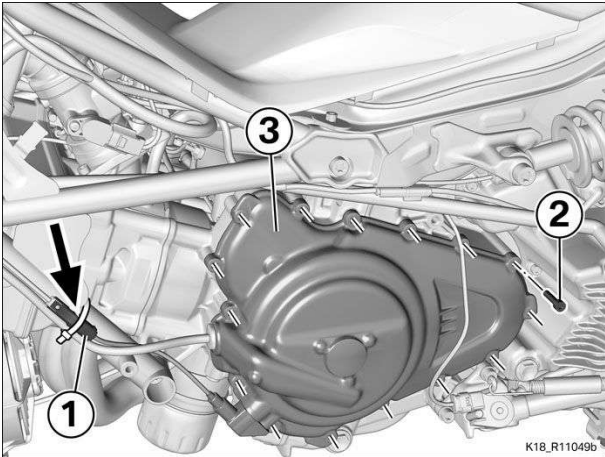
WARNING

Overstretching of cables and lines.

Malfunctions

- Do not place strain on lines and cables.
-
- Disengage cover (3) and ease it aside.

(-) Securing left crankcase cover



- Clean the sealing faces.
- Apply sealant thinly to the sealing face.

NOTICE

Exercise particularly meticulous care when sealing areas where two sealing faces/joins meet.

 Sealant	
Dow Corning	07 58 0 397 777

- Install cover (3) and screws (2).

 Tightening torques		
Crankcase cover, left, to crankcase		
M6 x 25	tighten in diagonally opposite sequence	
	10 Nm	

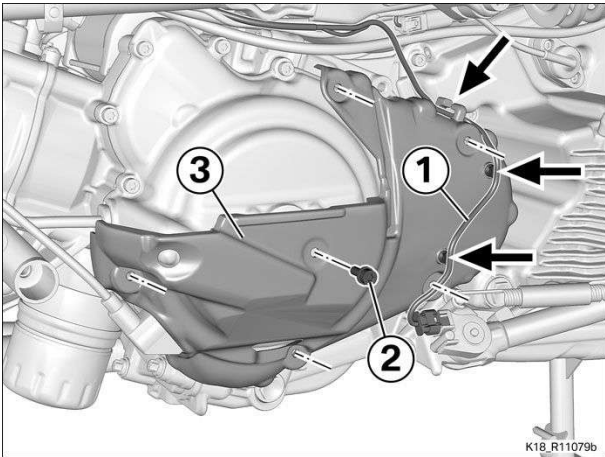
- Connect plug (1) for the crankshaft sensor and secure it with cable tie (arrow).

(-) Installing sound-absorbing hood

- Secure hood (3) with screws (2).

 Tightening torques		
Sound-absorbing hood to engine cover, right		
M6 x 18	10 Nm	

- Secure cable (1) (arrows).



Finishing work

- Pouring engine oil into engine
- Installing left footplate carrier
- Installing left footplate
- Installing rear left footplate insert and footrest plate
- Installing centre left footplate insert and footrest plate
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

11 14 085 Replacing right engine-block cover

+ 11 14 859

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing bottom right fairing panel

Removing front right footplate insert and footrest plate

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footrest plate

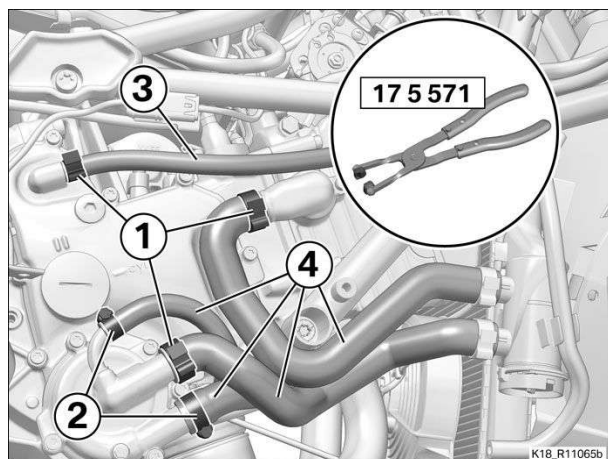
Removing rear footplate

Disengaging right footplate carrier with reservoir

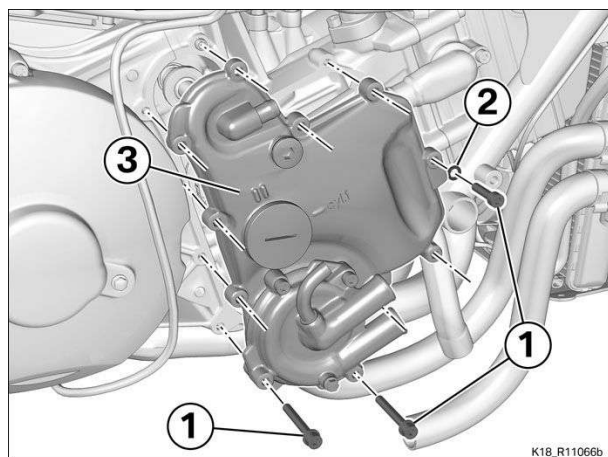
Draining coolant from engine

Core activity

(-) Removing right crankcase cover



- Open clips (1) with pliers (No. 17 5 571).
- Open clips (2).
- Disconnect hoses (3) and (4).



ATTENTION

Contamination due to dripping oil.

Environmental damage, damage to plastic and rubber parts, risk of slipping if oil film forms on ground or floor.

- Catch the dripping oil.

- Place a suitable oil tray in position.
- Remove screws (1), noting sealing washer (2)
- Remove crankcase cover (3).

NOTICE

The sealing compound forms a strong bond and in some instances engine components can be difficult to separate. Separate the engine components by tapping them with a rubber mallet, without damaging cooling ribs or other parts of the crankcase.

(-) Installing right crankcase cover

- Clean all sealing faces.
- Apply sealant thinly to the sealing face.

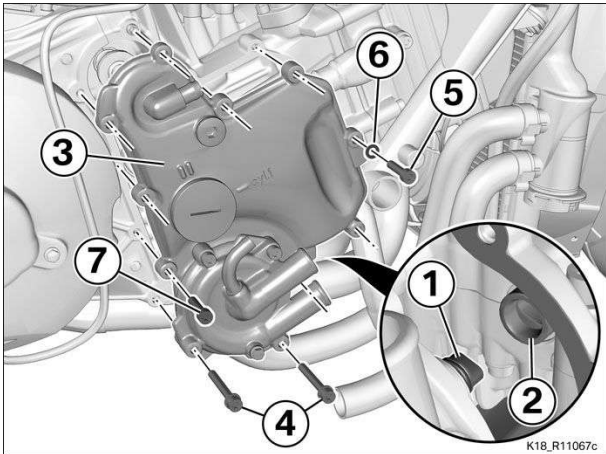
 NOTICE

Exercise particularly meticulous care when sealing areas where two sealing faces/joins meet.



Sealant

Dow Corning	07 58 0 397 777
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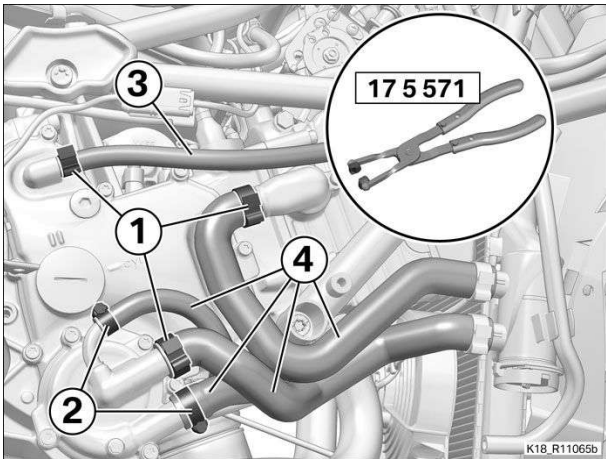


- Align pump shaft (1) with driver (2).
- Carefully set cover (3) in position.
- Install the following parts and tighten until hand-tight:
 - Screws (4)
 - Install screw (5) with new seal (6)
 - Screws (7)
- Tighten screws (4), (5) and (7) in diagonally opposite sequence.



Tightening torques

Crankcase cover, right, to crankcase		
M6 x 25, with sealing washer	10 Nm	
M6 x 30	10 Nm	
M6 x 50	10 Nm	



- Secure hoses (3) and (4).
- Secure clips (2).
- Close clips (1) with pliers (No. 17 5 571).

Finishing work

- Securing right footplate carrier with reservoir
- Filling cooling system
- Checking cooling system for leaks
- Installing right footplate
- Installing rear right footrest plate
- Installing centre right footplate insert and footrest plate

- Installing right side panel
- Installing front right footplate insert and footrest plate
- Installing bottom right fairing panel
- Installing top right side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

11 14 086 Sealing right engine cover

+ 11 14 869

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing bottom right fairing panel

Removing front right footplate insert and footrest plate

Removing right side panel

Removing centre right footplate insert and footrest plate

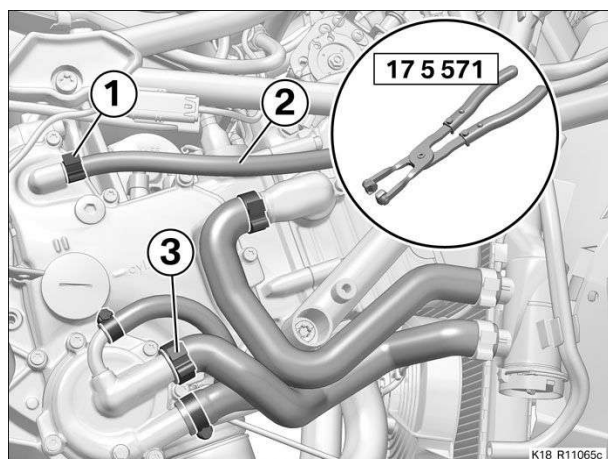
Removing rear right footrest plate

Removing rear footplate

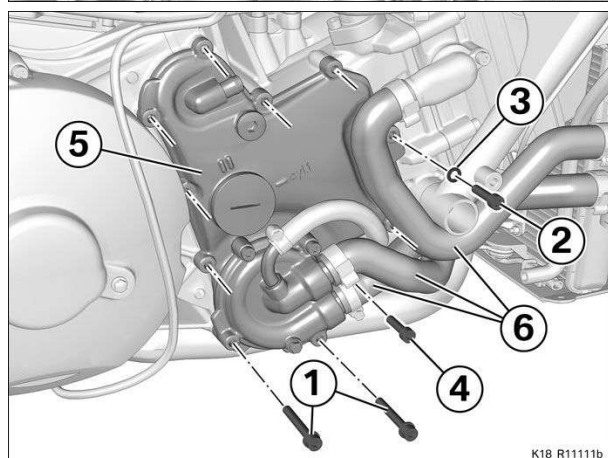
Disengaging right footplate carrier with reservoir

Core activity

(-) Removing right crankcase cover



- Open clip (1) with pliers (No. 17 5 571) and disconnect hose (2).
- Slacken clips (3), **turn them toward the outside** and **retighten**.



ATTENTION

Contamination due to dripping oil.

Environmental damage, damage to plastic and rubber parts, risk of slipping if oil film forms on ground or floor.

- Catch the dripping oil.
- Place a suitable oil tray in position.
- Remove screws (1).
- Remove screw (2), noting sealing washer (3).
- Slacken screw (4) (for subsequent removal together with crankcase cover (5)).
- Separate crankcase cover (5) from the crankcase, taking care **not to put strain** on radiator hoses (6) .

NOTICE

The sealing compound forms a strong bond and in some instances

engine components can be difficult to separate. Separate the engine components by tapping them with a rubber mallet, without damaging cooling ribs or other parts of the crankcase.

(-) Securing right crankcase cover

- Clean all sealing faces.
- Apply sealant thinly to the sealing face.

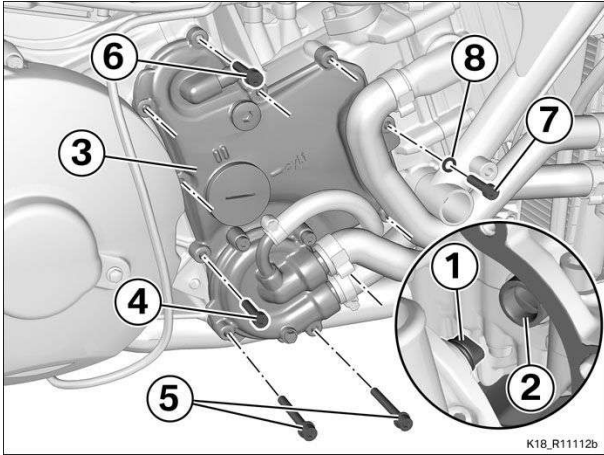
 NOTICE

Exercise particularly meticulous care when sealing areas where two sealing faces/joins meet.



Sealant

Dow Corning	07 58 0 397 777
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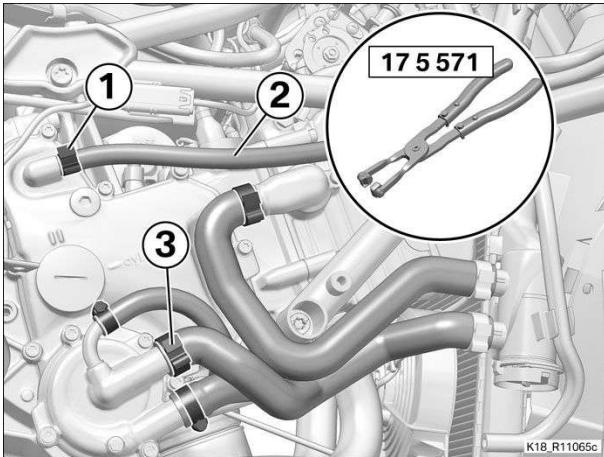


- If applicable, align pump shaft (1) with driver (2).
- Carefully place cover (3) with screws (4) in position.
- Install screws (5).
- Install screw (7) with new sealing ring (8).
- Tighten screws (4) to (7) in diagonally opposite sequence.



Tightening torques

Crankcase cover, right, to crankcase		
M6 x 25, with sealing washer	10 Nm	
M6 x 30	10 Nm	
M6 x 50	10 Nm	



- Connect hose (2).
- Secure clip (1) with pliers (No. 17 5 571).
- Slacken clip (3), turn it to the correct installed position and tighten.

Finishing work

- Checking cooling system for leaks
- Securing right footplate carrier with reservoir
- Installing right footplate
- Installing rear right footrest plate
- Installing centre right footplate insert and footrest plate

- Installing right side panel
- Installing front right footplate insert and footrest plate
- Installing bottom right fairing panel
- Installing top right side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

11 21 501 Replacing crankshaft (engine disassembled)

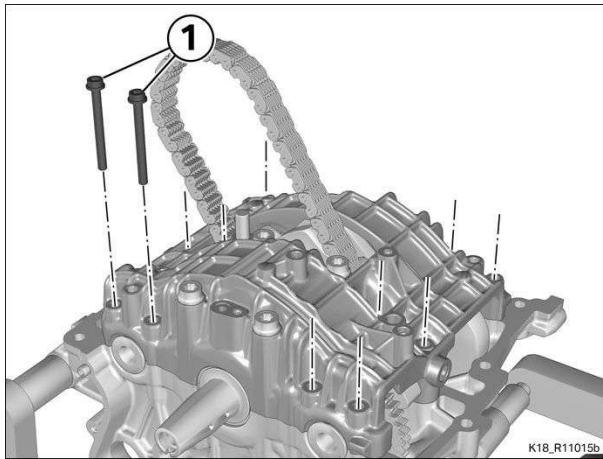
Preparatory work

- Removing ignition coils
- Removing cylinder head cover
- Locking engine in TDC position
- Removing magnetic wheel
- Relieving tension on and locating chain tensioner
- Removing starter gear with idler gear
- Removing oil pump
- Removing crankshaft locator

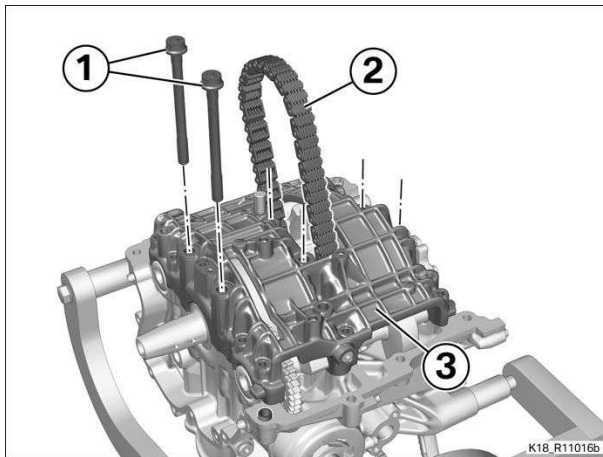
Core activity

(-) Removing bearing frame

- Remove screws (1).

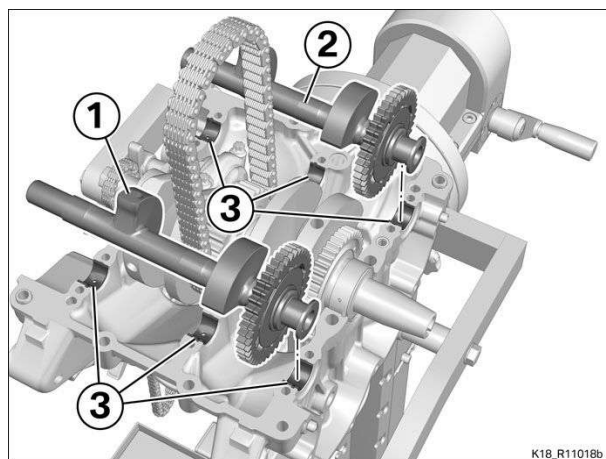


- Remove screws (1).
- Slightly raise drive chain (2) and remove bearing frame (3).



(-) Removing balancing shafts

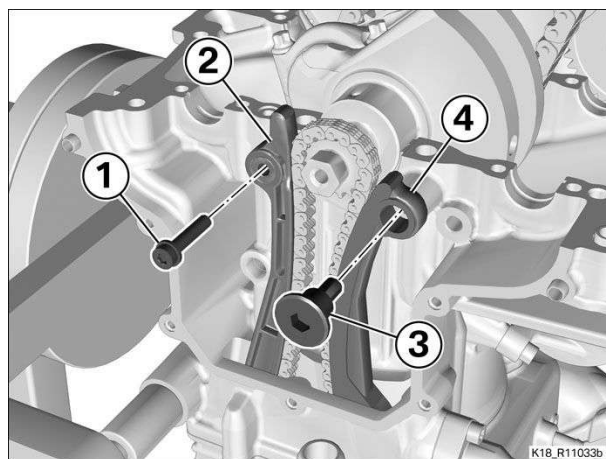
- Remove balancing shafts (1) and (2), noting the bearing shells (3).



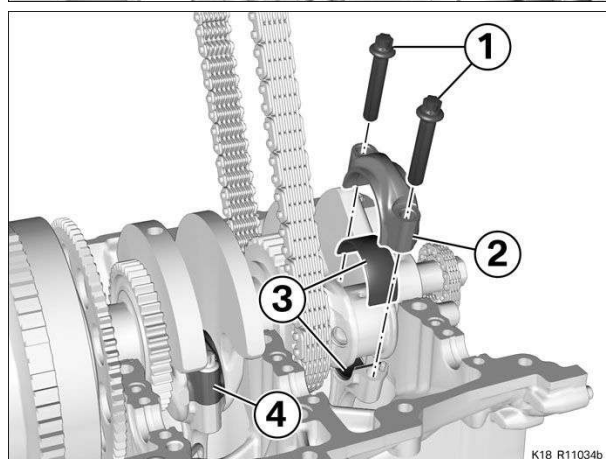
(-) Removing crankshaft

Requirement

- Timing-chain tensioner is backed off



- Remove screw (1) and disengage chain slide rail (2).
- Remove screw (3) and remove chain tensioner rail (4).

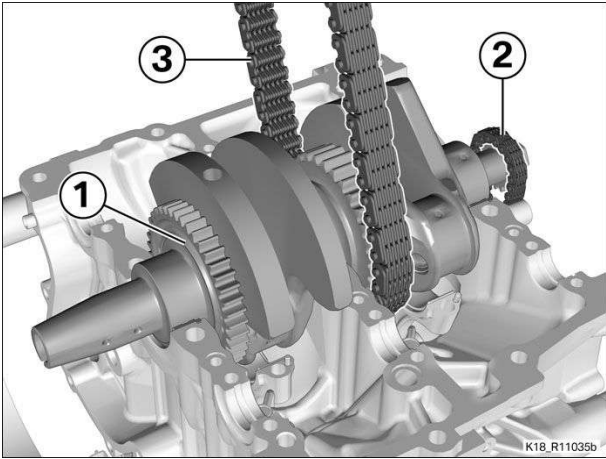


⚠ ATTENTION

Installation of parts that have not worn in together.

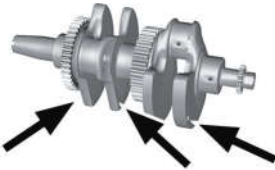
Running in procedure has to be repeated.

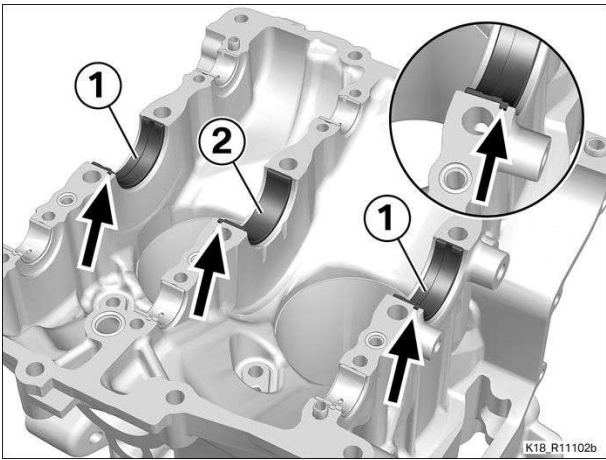
- Do not mix up components.
 - Mark installed positions.
-
- Remove screws (1) and remove conrod bearing cap (2), noting bearing (3).
 - Remove conrod bearing cap (4) in the same way.
-
- Slightly lift crankshaft (1) and disengage timing chain (2).
 - Remove crankshaft (1) and remove primary chain (3).



(-) Identifying and installing bearing shells for crankshaft

- Use the colour codes of the bearing shells in the crankcase top section to match the bearing shells to the marks on the crankshaft.

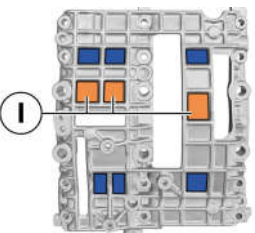
 Technical data			
Bearing journal diameter in crankshaft main bearing Tolerance group 	Marks on the crankshaft	A/B/C	
Identifier for crankshaft-bearing shells Bearing shells in crankcase top section	A	Bearing shell red	
	B	Bearing shell green	
	C	Bearing shell black	

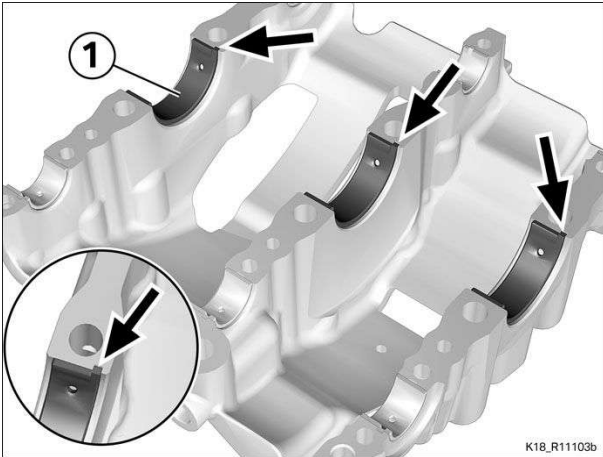


- Install crankshaft bearing shells **with groove (1)** and **without groove (2)**, noting the locating lugs (arrows).

- Use the colour codes of the bearing shells in the bearing frame to match the bearing shells to the marks on the bearing frame

 Technical data			

Mark for classification of the crankshaft bearings on the bearing frame (underside) 	Mark I (inside): identifier for main bearing bores	1/2/3	
Identifier for crankshaft-bearing shells Bearing shells in bearing frame	1	Bearing shell red	
	2	Bearing shell green	
	3	Bearing shell black	

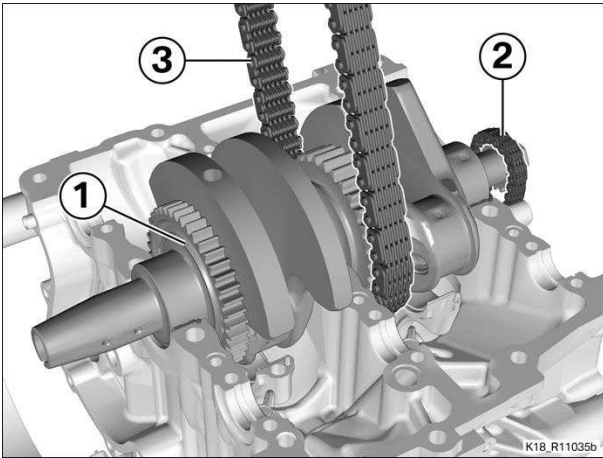


- Install crankshaft bearing shells (1), noting the locating lugs (arrows).

(-) Installing crankshaft

Requirement

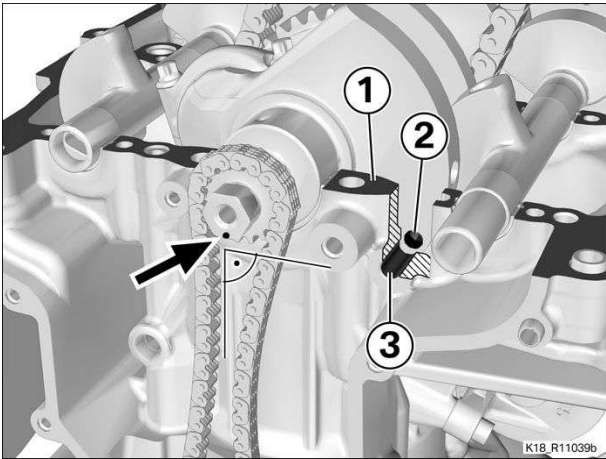
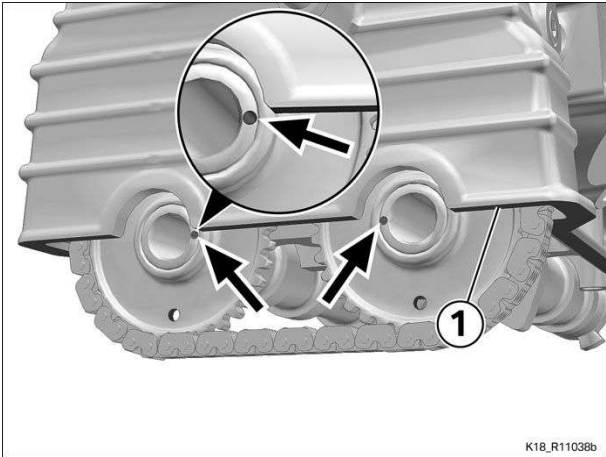
- Timing-chain tensioner is backed off



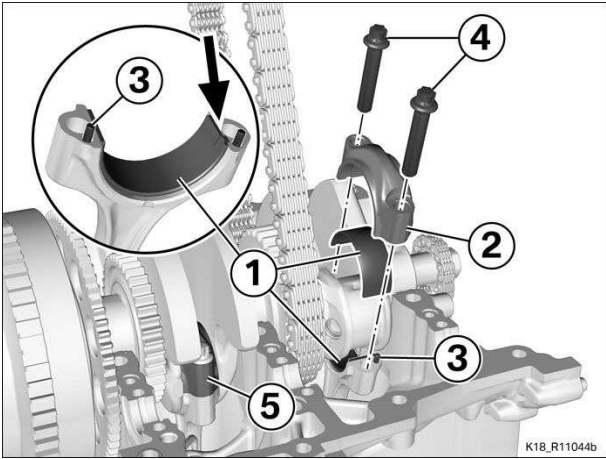
- Loop primary chain (3) over crankshaft (1).
- Insert crankshaft (1) and loop timing chain (2) into position.

► Checking ignition timing; adjusting if necessary

- Adjust the camshafts, noting the marks (arrows):
- The holes (arrows) are toward each other and parallel to sealing face (1).



- Mark (arrow) is at right angles to housing mating face (1).
- Hole (2) in the crankshaft is visible through tapped hole (3).



- If necessary, adjust ignition timing by turning the crankshaft.



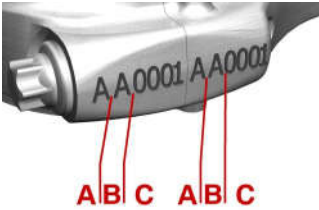
- Insert conrod bearing (1), making sure that the locating lug (arrow) is positioned correctly.

ATTENTION

Installation of parts that have not worn in together.

Running in procedure has to be repeated.

- Do not mix up components.
 - Mark installed positions.
-
- When installing conrod bearing caps (2) make sure that they are correctly matched (matching **serial numbers**).

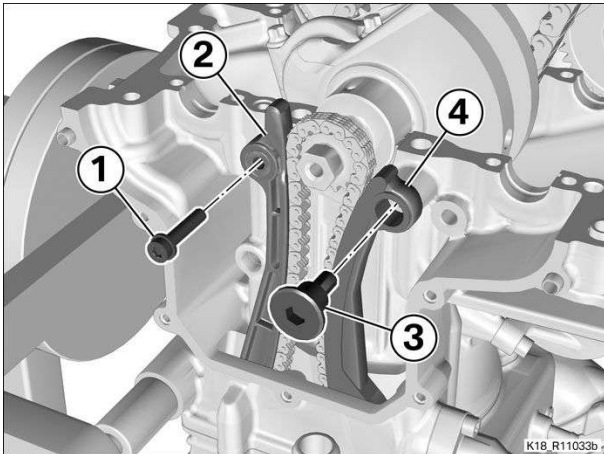
 Technical data			
Overview of conrod marks 	A	Production date, year	
	B	Production date, month	
	C	Serial number	

- Insert conrod bearing cap (2), making sure that locating pins (3) are positioned correctly.
-

Install screws (4).

 Tightening torques		
Conrod bolt		
M x 1, Replace screw	1st tightening tor ue, 5 m	
	2nd tightening tor ue, 20 m	
	Additional angle of rotation, 90	

- Install conrod bearing cap (5) in the same way.
- Secure chain slide rail (2) with screw (1).



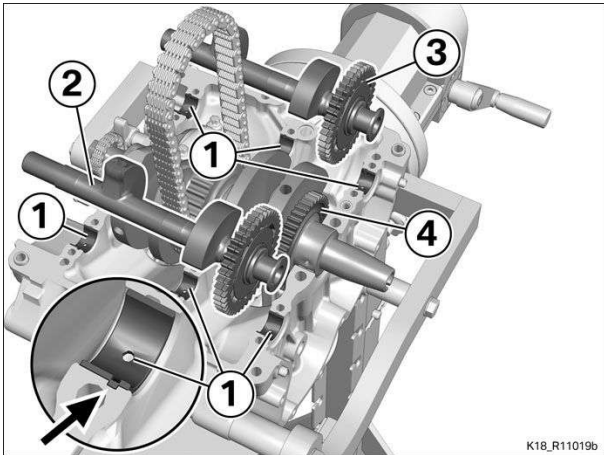
 Tightening torques		
Chain slide rail to crankcase		
M6 x 30	10 m	

- Install chain tensioner rail (4) and secure with screw (3).

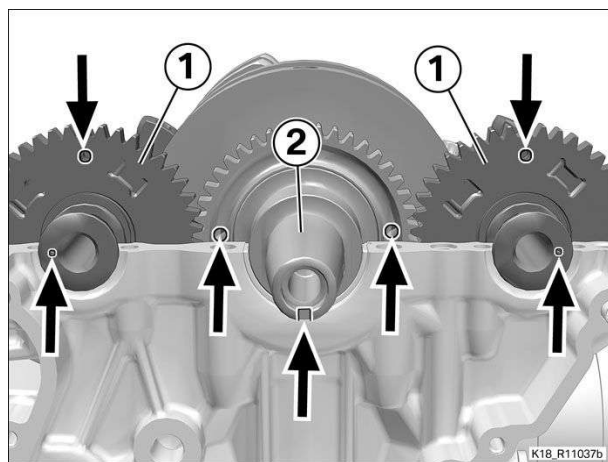
 Tightening torques		
Chain tensioner rail to crankcase		
M	20 m	

(-) Installing balancing shafts

- Install bearing shells (1) noting the position of the sickle-shaped grooves (arrow).
- Lubricate bearing shells (1) with engine oil.
- Install balancing shafts (2) and (3), noting the drive gear (4) on the crankshaft.

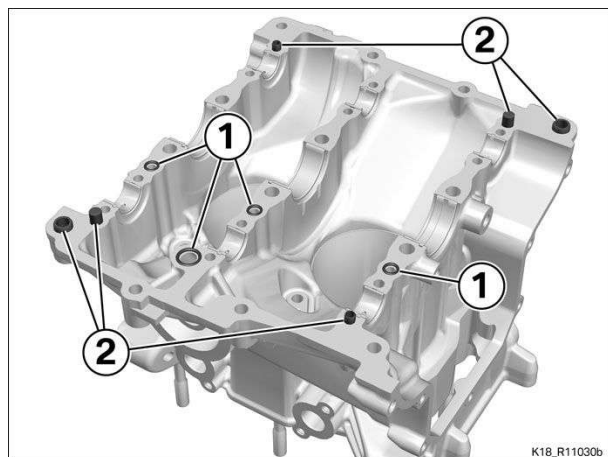
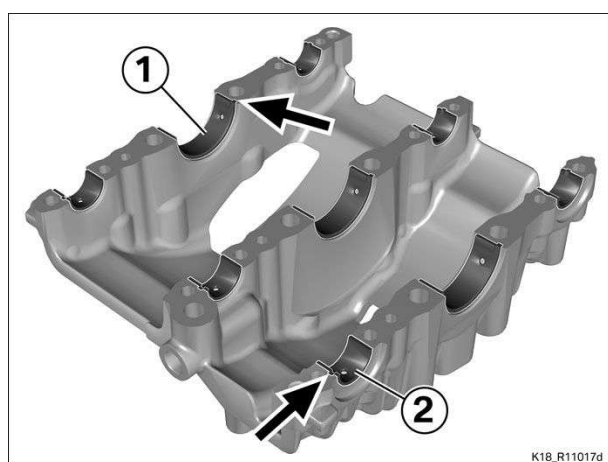


- Check the position of balancing shafts (1) relative to crankshaft (2), noting the marks (arrows):
 - Holes in **balancing shafts (1)** are facing **up and to the outside respectively**
 - Holes in **crankshaft (2)** are **horizontal**, keyway facing vertically **down**
- Correct installed position, as applicable.



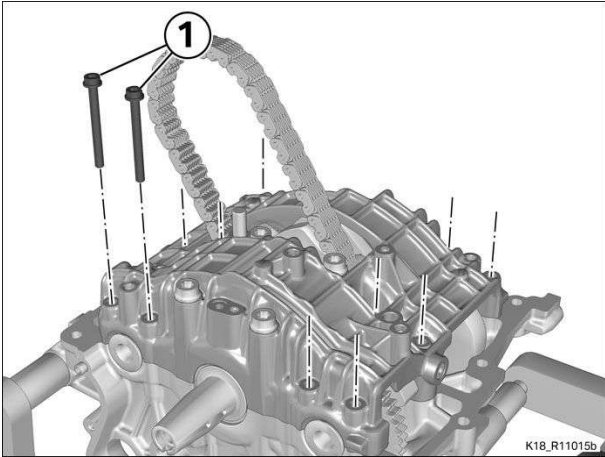
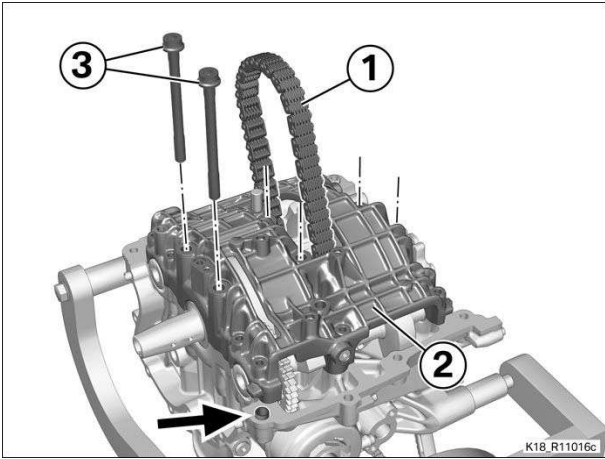
(-) Installing bearing frame

- Lubricate all bearing seats with engine oil.
- When assembling note bearing shells (1) and (2), for example check that the locating lugs (arrows) are correctly positioned.

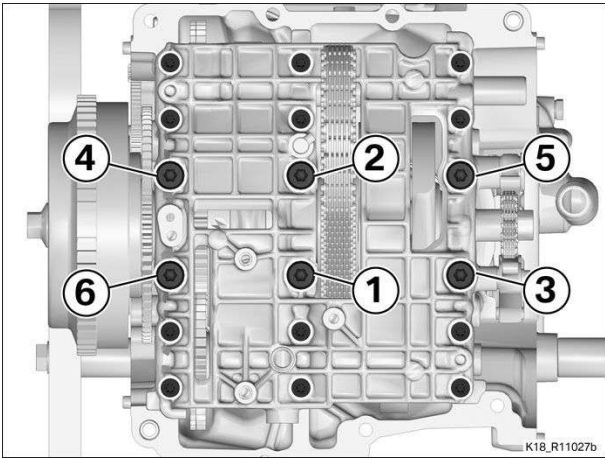


- Replace sealing rings (1).
- When assembling, note locators (2).

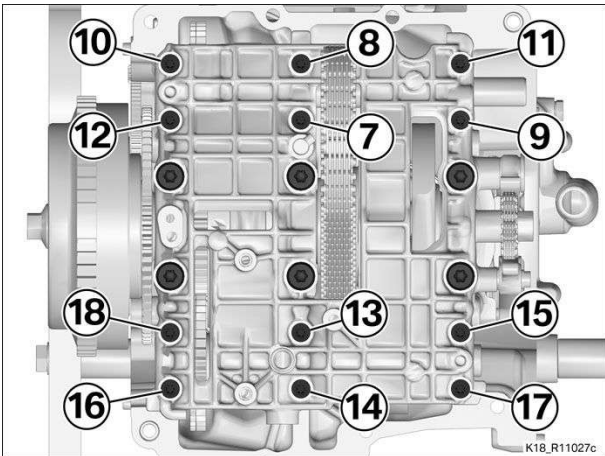
- Slightly raise drive chain (1) and carefully manoeuvre bearing frame (2) into position, noting the locator (arrow).
- Install screws (3) and tighten until hand-tight.



- Install screws (1) and tighten until hand-tight.



- Tighten the screws in the sequence indicated (1) to (1).



Tightening torques		
bearing frame to crankcase (main bearing)		
M9 x 1.25 lubricate with engine oil	1st step	
	1st tightening torque, 3 Nm	
M6 x 60 free of oil	2nd step	
	1st tightening torque, 3 Nm	
M9 x 1.25	3rd step	
	2nd tightening torque, 1 Nm	

M6 x 60	th step	
	2nd tightening tor ue, 10 m	
M9 x 1.25	5th step	
	Additional angle of rotation, 90	

inishing work

- Installing oil pump
- Locking engine in TDC position
- Install the starter gear with idler gear
- Installing magnetic wheel
- Removing crankshaft locator
- Releasing locator for timing-chain tensioner
- Checking timing
- Installing cylinder head cover
- Installing ignition coils

11 25 510 Replacing all pistons (engine removed)

ATTENTION

Timing chain jumping off sprocket.

Component damage

- Do not attempt to turn the engine without chain tensioners fitted.

Preparatory work

Removing CVT cover

Removing CVT complete with clutch

Securing engine to engine-repair stand

Removing ignition coils

Removing cylinder head cover

Removing right crankcase cover

Setting cylinder 1 to overlap TDC and securing (for camshaft removal)

Relieving tension on and locating chain tensioner

Removing camshaft bearing cap

Removing spark-plug tubes

Removing camshafts

Disengaging timing-chain rail

Removing cylinder head

Removing chain slide rail

Removing left crankcase cover

Removing oil line to CVT input shaft

Removing CVT drive shaft

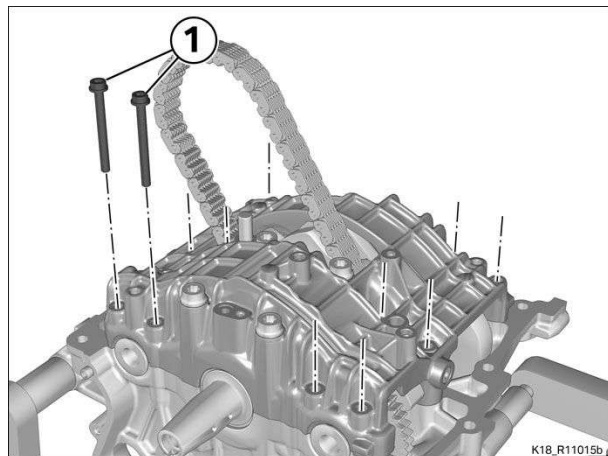
Removing bottom crankcase half

Removing crankshaft locator

Core activity

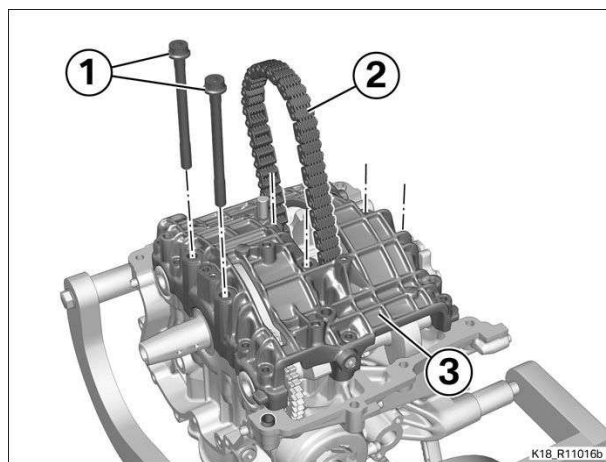
(-) Removing bearing frame

- Remove screws (1).



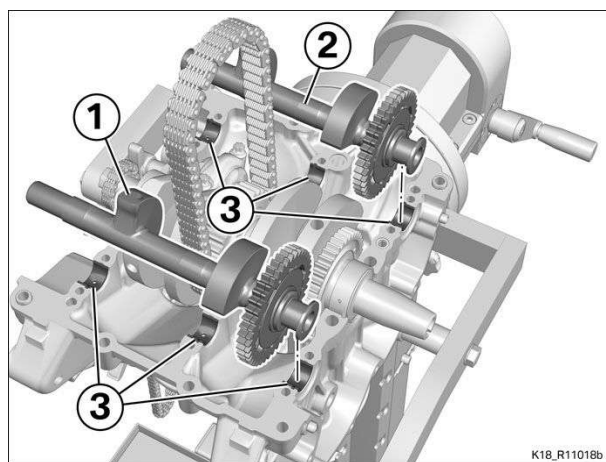
- Remove screws (1).

•



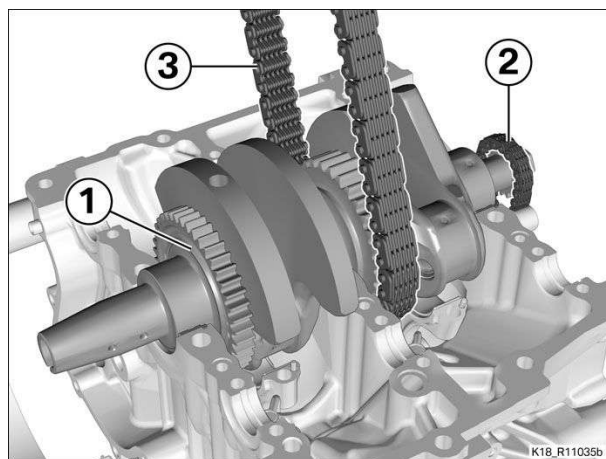
Slightly raise drive chain (2) and remove bearing frame (3).

(-) Removing balancing shafts



- Remove balancing shafts (1) and (2), noting the bearing shells (3).

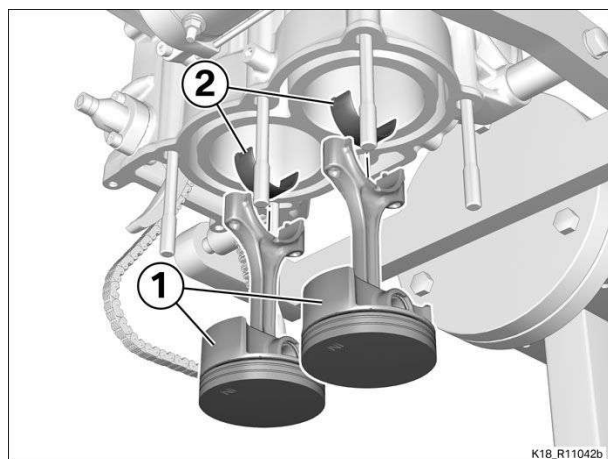
(-) Removing crankshaft



- Slightly lift crankshaft (1) and disengage timing chain (2).
- Remove crankshaft (1) and remove primary chain (3).

(-) Removing piston with conrod

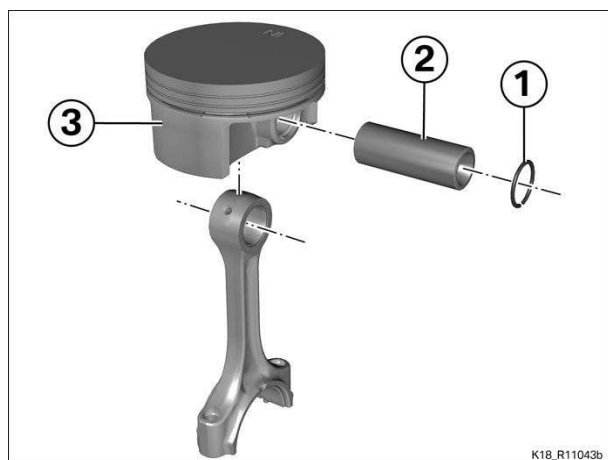
- Remove piston (1) with the conrod, noting conrod bearing (2).



(-) Removing piston

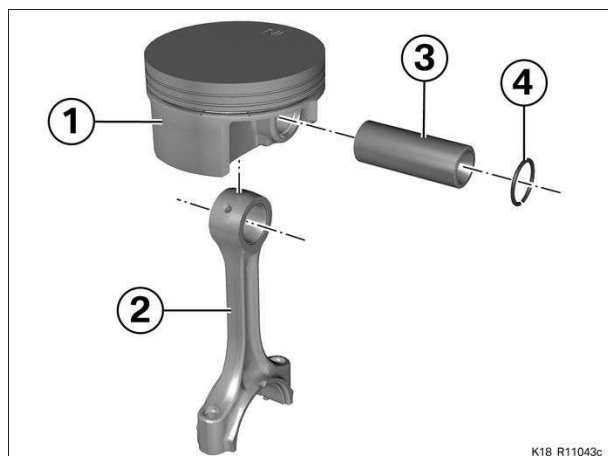
- Remove the following components:

- Circlip (1)
- Piston pin (2)
- Piston (3)



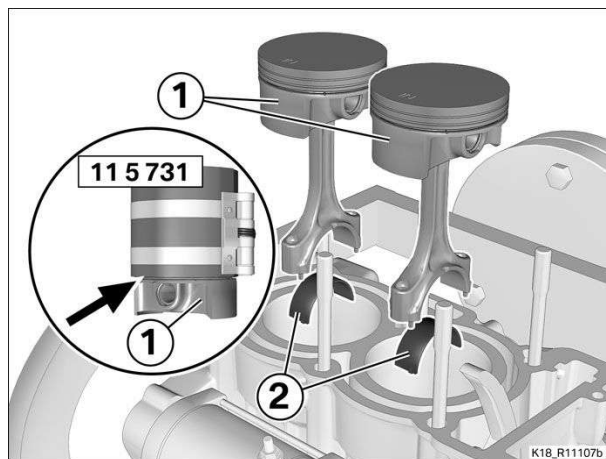
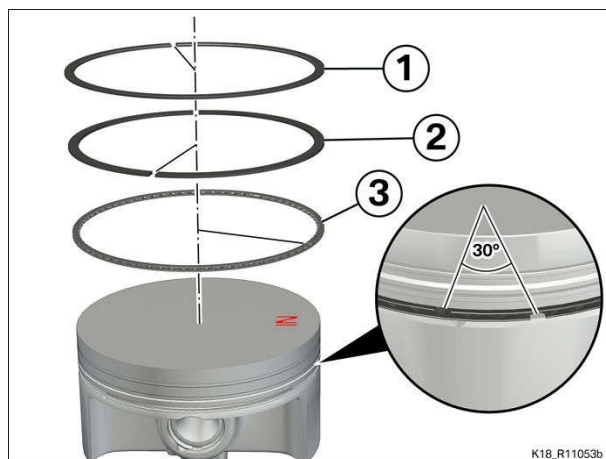
(-) Installing pistons

- Lubricate the components with engine oil.
- Position piston (1) on conrod (2), making sure that installed position is correct.
- Install piston pin (3) and **new** circlip (4).



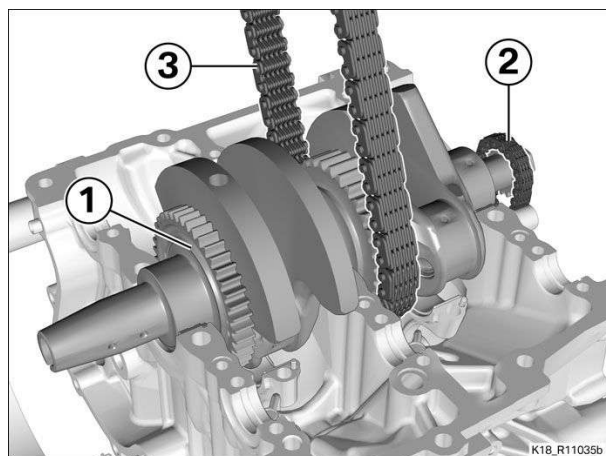
(-) Installing piston with conrod

- Make sure that the gaps of the piston rings are not in line with the piston's axis of tilt.
- Position the other piston rings (1) and (2) so that each gap is **offset 120°** from the top gap of oil wiper ring (3).
- Position the gaps of oil wiper ring (3) so that they are offset approx. 30° from each other (detail).

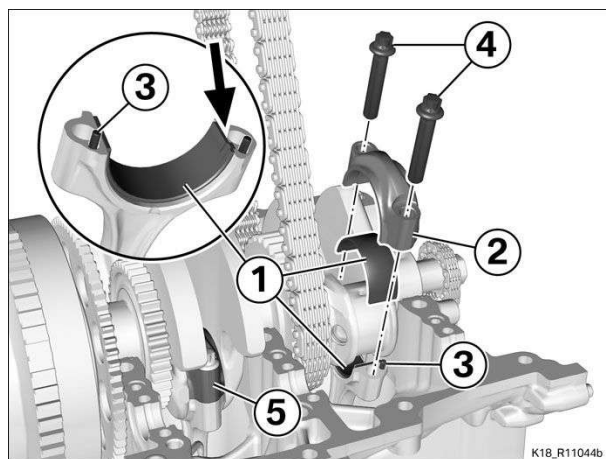


- Secure piston-ring compressor (No. 11 5 731) to piston (1) in such a way that the piston rings are covered (arrow).
- Install each piston (1) with the conrod one after the other, noting conrod bearing (2).

(-) Installing crankshaft



- Loop primary chain (3) over crankshaft (1).
- Insert crankshaft (1) and loop timing chain (2) into position.



ATTENTION

Installation of parts that have not worn in together.

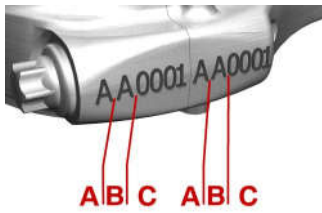
Running in procedure has to be repeated.

- Do not mix up components.
 - Mark installed positions.
-
- Insert conrod bearing (1), making sure that the locating lug (arrow) is positioned correctly.
 - When installing conrod bearing caps (2) make sure that they are correctly matched (matching **serial numbers**).



Technical data

Overview of conrod marks



A	Production date, year	
B	Production date, month	
C	Serial number	

- Insert conrod bearing cap (2), making sure that locating pins (3) are positioned correctly.
- Install screws (1).



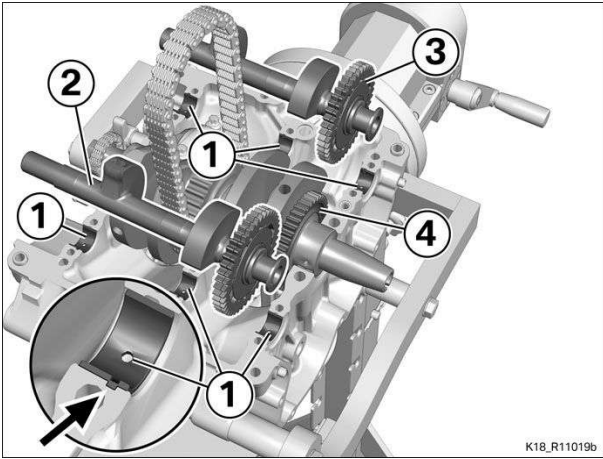
Tightening torques

Conrod bolt

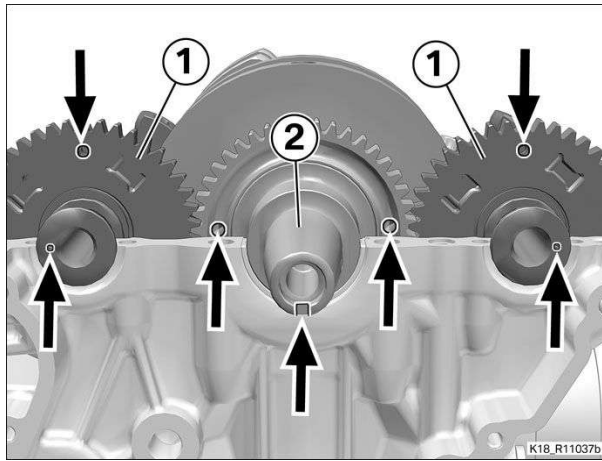
M8 x 1, Replace screw	1st tightening torque, 5 Nm	
	2nd tightening torque, 20 Nm	
	Additional angle of rotation, 90°	

- Install conrod bearing cap (5) in the same way.

(-) Installing balancing shafts

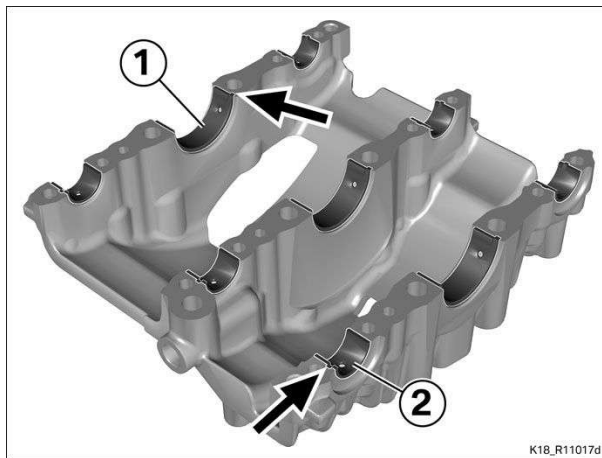


- Install bearing shells (1) noting the position of the sickle-shaped grooves (arrow).
- Lubricate bearing shells (1) with engine oil.
- Install balancing shafts (2) and (3), noting the drive gear (4) on the crankshaft.

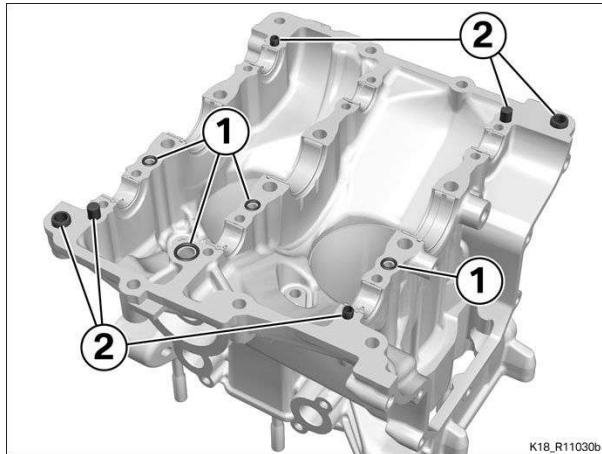


- Check the position of balancing shafts (1) relative to crankshaft (2), noting the marks (arrows):
 - Holes in **balancing shafts (1)** are facing **up and to the outside respectively**
 - Holes in **crankshaft (2)** are **horizontal**, keyway facing vertically **down**
- Correct installed position, as applicable.

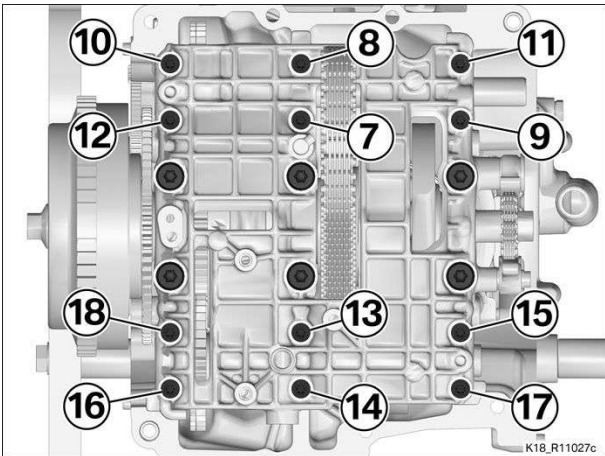
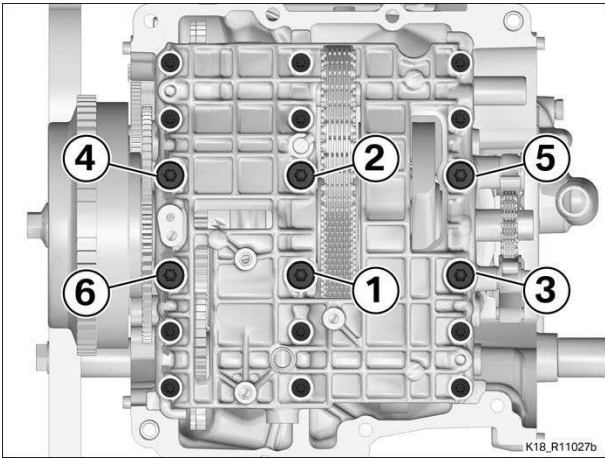
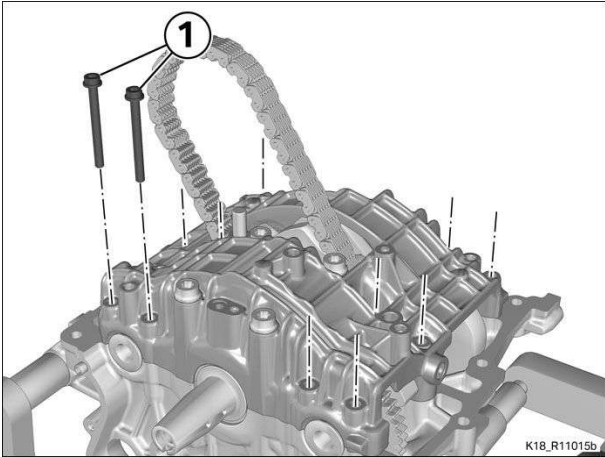
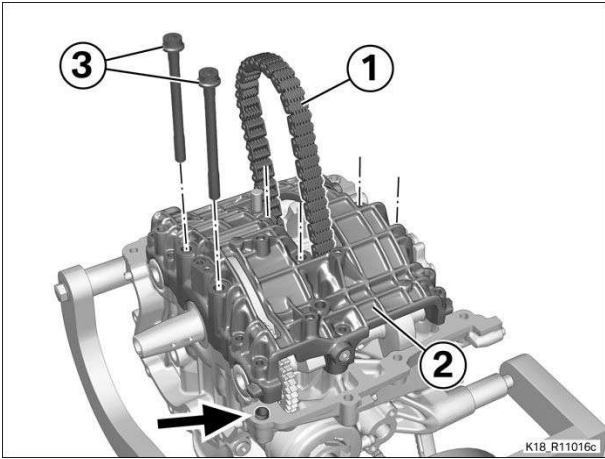
(-) Installing bearing frame



- Lubricate all bearing seats with engine oil.
- When assembling note bearing shells (1) and (2), for example check that the locating lugs (arrows) are correctly positioned.



- Replace sealing rings (1).
- When assembling, note locators (2).
- Slightly raise drive chain (1) and carefully manoeuvre bearing frame (2) into position, noting the locator (arrow).
- Install screws (3) and tighten until hand-tight.



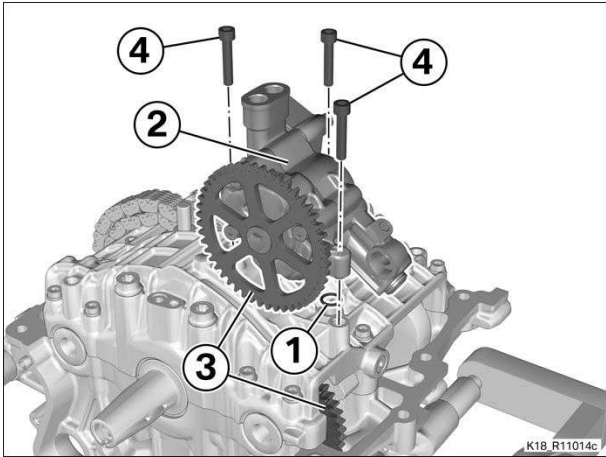
• Install screws (1) and tighten until hand-tight.

• Tighten the screws in the sequence indicated (1) to (18).

Tightening torques		
bearing frame to crankcase (main bearing)		
M9 x 1.25 lubricate with engine oil	1st step	
	1st tightening torque, 3 Nm	
M6 x 60 free of oil	2nd step	
	1st tightening torque, 3 Nm	
M9 x 1.25	rd step	
	2nd tightening torque, 18 Nm	

M6 x 60	th step	
	2nd tightening torque, 10 Nm	
M9 x 1.25	5th step	
	Additional angle of rotation, 90°	

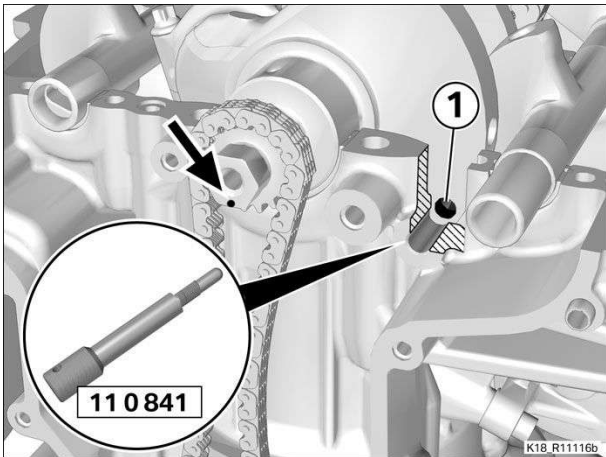
(-) Installing oil pump



- Install sealing ring (1).
- old oil pump (2) in position, noting gearwheels (3).
- Install screws (4).

 Tightening torques		
Oil pump to bearing frame		
M6 x 30	10 Nm	

(-) locking engine in T C position



- Turn the engine in the normal direction of rotation until the mark on the crankshaft (arrow) is vertical and bore in crank web (1) is visible through the tapped hole.
- » Cylinder 1 (alternator side) is at TDC.
- Install locating pin (No. 11 0 841) hand-tight.

inishing work

- Installing chain slide rail
- Installing cylinder head
- Securing timing-chain rail
- Installing camshafts
- Installing spark-plug tubes
- Installing camshaft bearing cap
- Releasing locator for timing-chain tensioner
- Installing cylinder head cover
- Installing ignition coils
- Installing bottom crankcase half
- Removing CVT drive shaft

- Installing oil line to CVT input shaft
- Installing left crankcase cover
- Removing crankshaft locator
- Installing right crankcase cover
- Separating engine from engine-repair stand
- Installing CVT complete with clutch
- Installing CVT cover

11 26 001 Replace reduction gear for starter motor

+ 11 26 608

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footrest plate with footplate insert and oil filler panel.

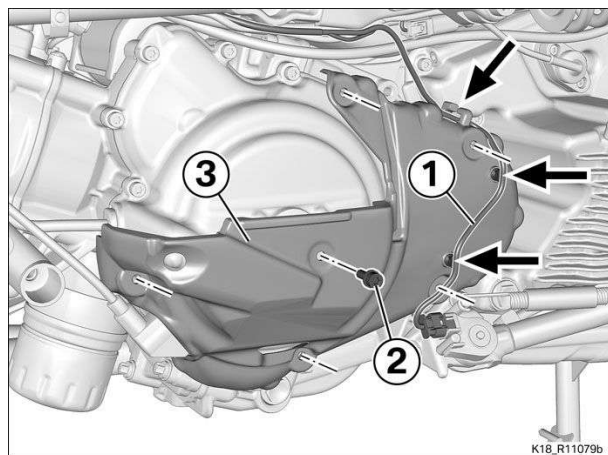
Draining engine oil from engine block

Removing left footplate

Removing left footplate carrier

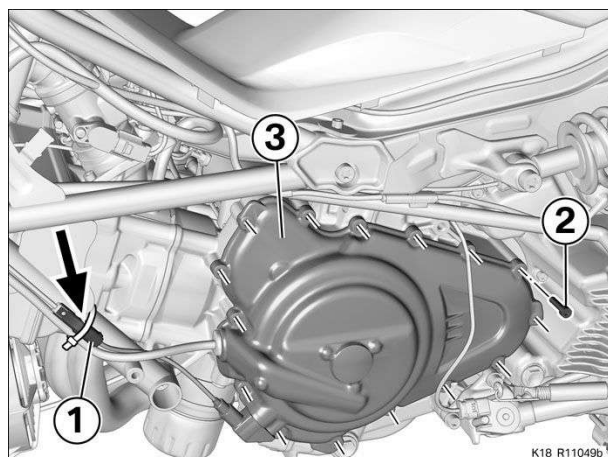
Core activity

(-) Removing left sound-absorbing hood



- Disengage cable (1) (arrows).
- Remove screws (2) and hood (3).

(-) Disengaging left crankcase cover



- Open the cable tie (arrow) and disconnect plug (1) for the crankshaft sensor.
- Remove screws (2).

WARNING

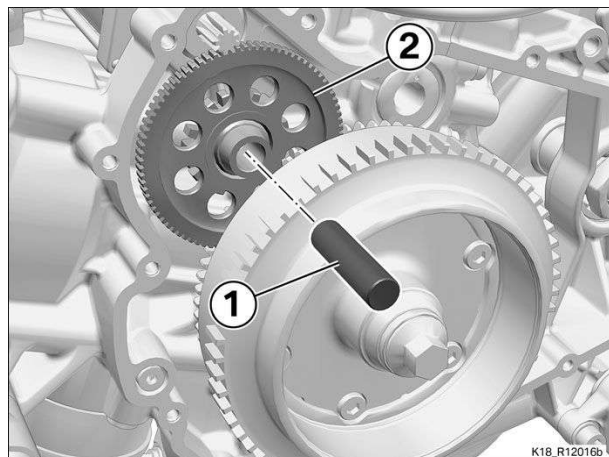
Overstretching of cables and lines.

Malfunctions

- Do not place strain on lines and cables.
-
- Disengage cover (3) and ease it aside.

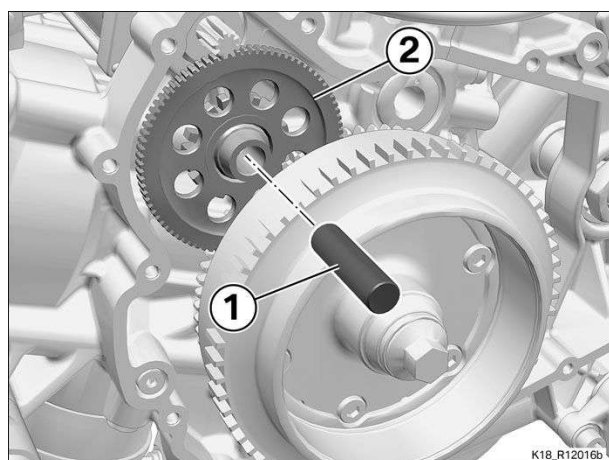
(-) Removing layshaft for starter

- Remove shaft (1) and idler gear (2).



(-) Installing layshaft for starter

- Lubricate the components with engine oil.
- Install idler gear (2) and shaft (1).

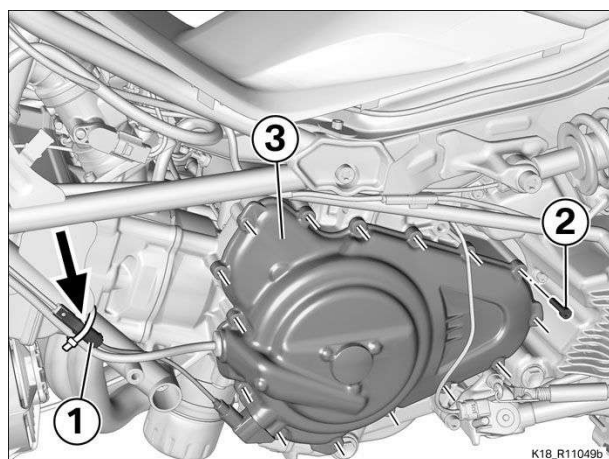


(-) Securing left crankcase cover

- Clean the sealing faces.
- Apply sealant thinly to the sealing face.

NOTICE

Exercise particularly meticulous care when sealing areas where two sealing faces/joins meet.



Sealant

Dow Corning

07 58 0 397 777

- Install cover (3) and screws (2).

 Tightening torques		
Crankcase cover, left, to crankcase		
M6 x 25	tighten in diagonally opposite sequence	
	10 Nm	

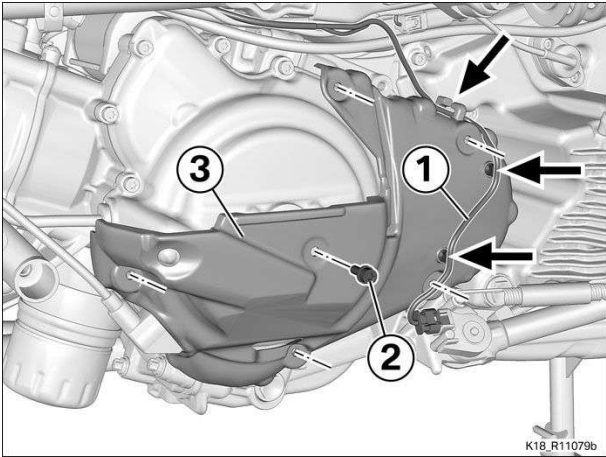
- Connect plug (1) for the crankshaft sensor and secure it with cable tie (arrow).

(-) Installing sound-absorbing hood

- Secure hood (3) with screws (2).

 Tightening torques		
Sound-absorbing hood to engine cover, right		
M6 x 18	10 Nm	

- Secure cable (1) (arrows).



Finishing work

- Installing left footplate carrier
- Installing left footplate
- Pouring engine oil into engine
- Installing rear left footrest plate with footplate insert and oil filler panel
- Installing centre left footplate insert and footrest plate
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

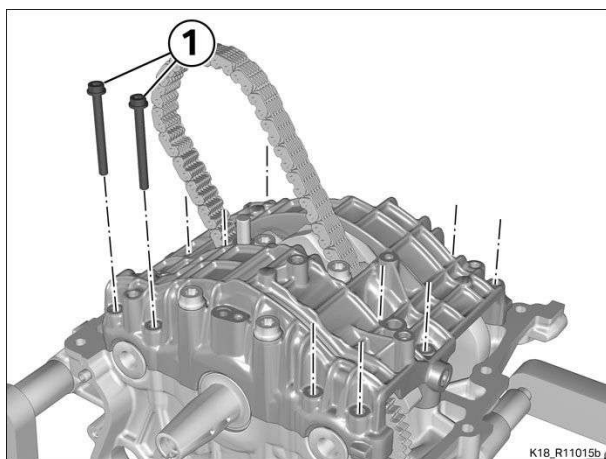
11 27 506 Removing/installing balancing shaft (engine removed)

Preparatory work

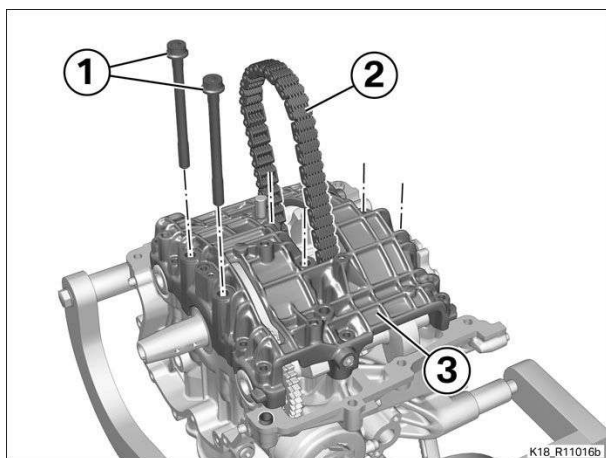
- Removing CVT cover
- Removing CVT complete with clutch
- Securing engine to engine-repair stand
- Removing ignition coils
- Removing cylinder head cover
- Setting engine to firing TDC (for checking valve clearance)
- Relieving tension on and locating chain tensioner
- Removing right crankcase cover
- Removing left crankcase cover
- Removing oil line to CVT input shaft
- Removing CVT drive shaft
- Removing bottom crankcase half
- Removing oil pump

Core activity

(-) Removing bearing frame



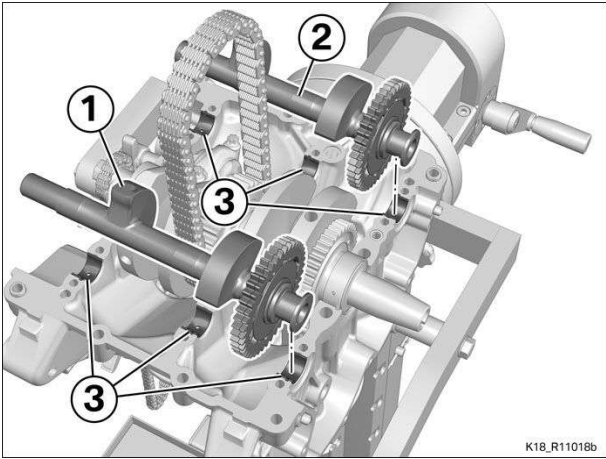
- Remove screws (1).



- Remove screws (1).
- Slightly raise drive chain (2) and remove bearing frame (3).

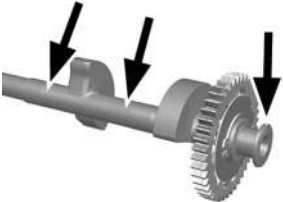
(-) Removing balancing shafts

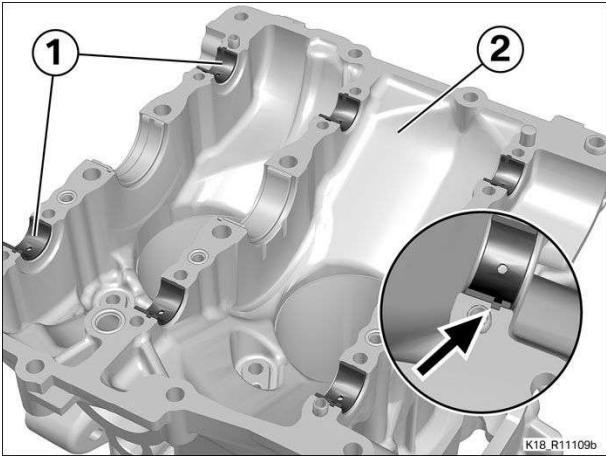
- Remove balancing shafts (1) and (2), noting the bearing shells (3).



(-) Identifying and installing bearing shells for balancing shafts

- Use the colour codes of the bearing shells in the crankcase top section to match the bearing shells to the marks on the balancing shafts.

 Technical data			
Mark for classification of the balancing-shaft bearings for identifying the bearing shells in the top section of the crankcase 	Marks on the balancing shaft	A/B	
Identifier for balancing-shaft bearing shells on the balancing shaft	A	Bearing shell blue/yellow	
	B	Bearing shell red/brown	



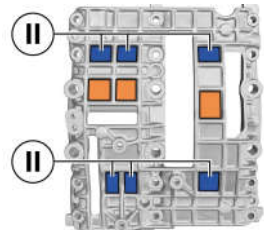
- Insert bearing shells (1) into crankcase top section (2), noting the locators (arrows).

- Use the colour codes of the bearing shells in the bearing frame to match the bearing shells to the marks on the bearing frame.



Technical data

Mark for classification of the balancing-shaft bearings on the bearing frame (underside)



Mark II (outside): identifier for balancing-shaft bores

1/2

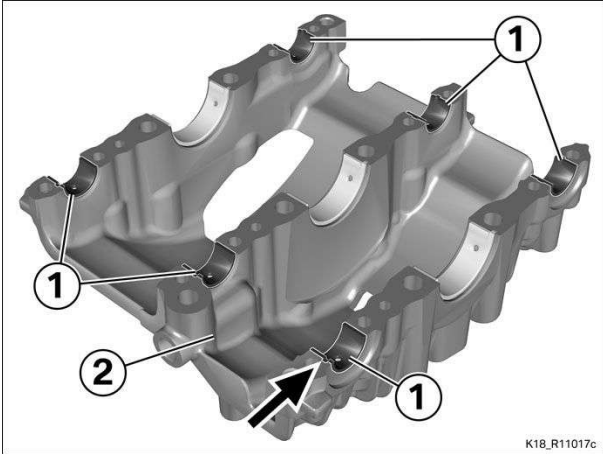
Identifier for balancing-shaft bearing shells on the bearing frame

1

Bearing shell blue/yellow

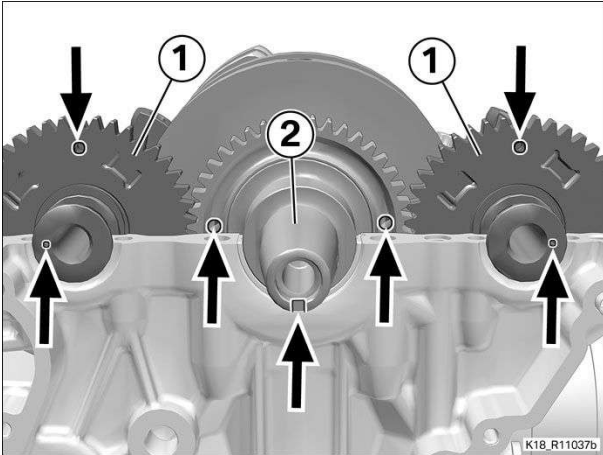
2

Bearing shell red/brown



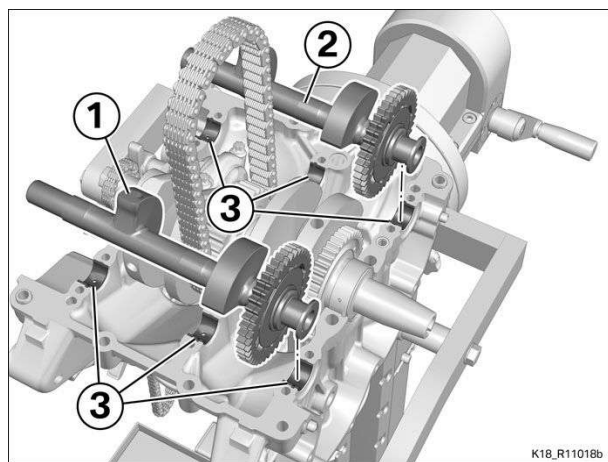
- Insert bearing shells (1) into bearing frame (2), noting the locators (arrows).

(-) Installing balancing shafts



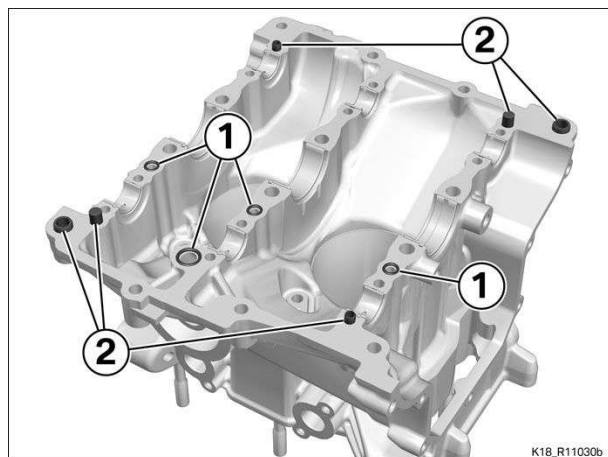
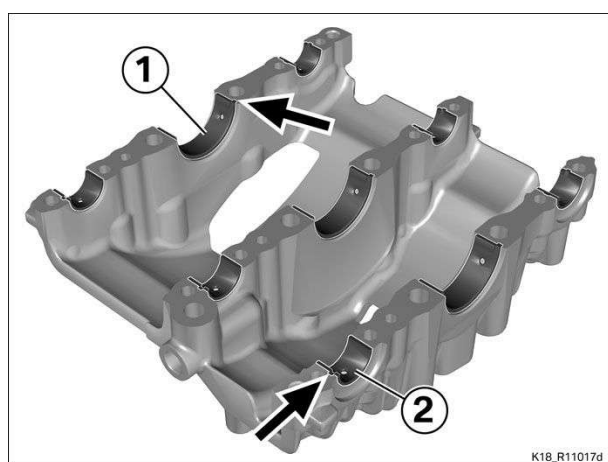
- Check the position of balancing shafts (1) relative to crankshaft (2), noting the marks (arrows):
 - Holes in **balancing shafts (1)** are facing **up and to the outside, respectively**
 - Holes in **crankshaft (2)** are **horizontal**, keyway facing vertically **down**
- Correct installed position, as applicable.

- Lubricate bearing shells (3) with engine oil.
- Install balancing shafts (1) and (2).

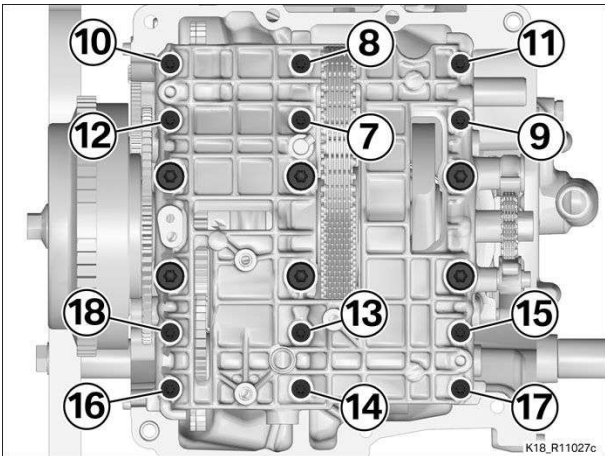
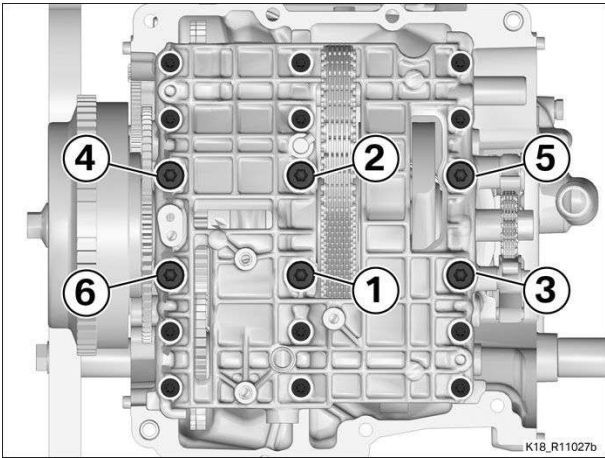
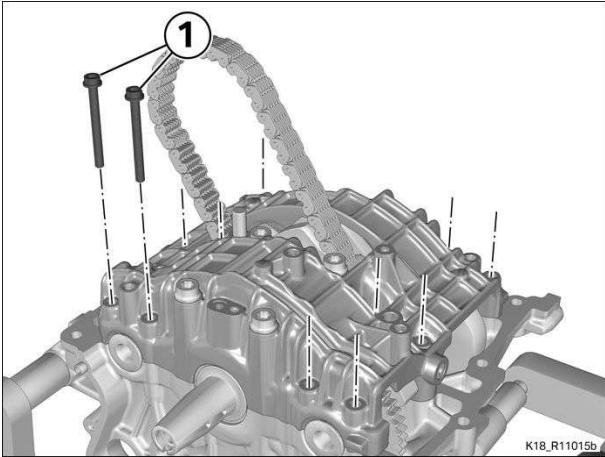
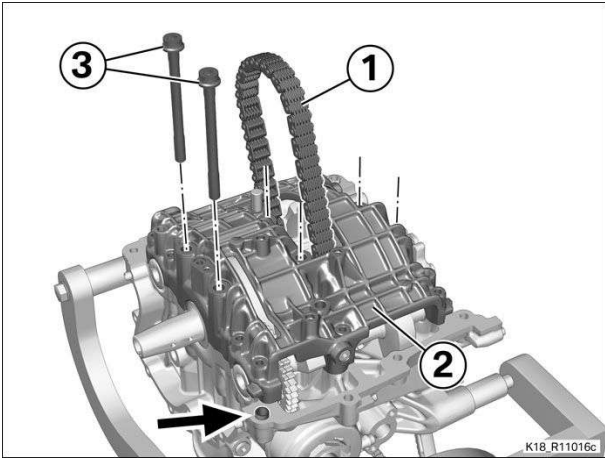


(-) Installing bearing frame

- Lubricate all bearing seats with engine oil.
- When assembling note bearing shells (1) and (2), for example check that the locating lugs (arrows) are correctly positioned.



- Replace sealing rings (1).
- When assembling, note locators (2).
- Slightly raise drive chain (1) and carefully manoeuvre bearing frame (2) into position, noting the locator (arrow).
- Install screws (3) and tighten until hand-tight.



• Install screws (1) and tighten until hand-tight.

• Tighten the screws in the sequence indicated (1) to (18).

 Tightening torques		
Bearing frame to crankcase (main bearing)		
M9 x 1.25 lubricate with engine oil	1st step:	
	1st tightening torque, 3 Nm	
M6 x 60 free of oil	2nd step:	
	1st tightening torque, 3 Nm	
M9 x 1.25	3rd step:	
	2nd tightening torque, 18 Nm	

M6 x 60	th step:	
	2nd tightening torque, 10 Nm	
M9 x 1.25	5th step:	
	Additional angle of rotation, 90	

finishing work

Installing oil pump

Releasing locator for timing-chain tensioner

Checking timing

Installing cylinder head cover

Installing ignition coils

Installing bottom crankcase half

Installing CVT input shaft

Installing oil line to CVT input shaft

Installing left crankcase cover

Installing right crankcase cover

Separating engine from engine-repair stand

Installing CVT complete with clutch

Installing CVT cover

11 31 079 Replacing timing-chain tensioner

+ 11 31 800

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing front left footrest plate

Removing left side panel

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing air deflector

Disengaging expansion tank for coolant

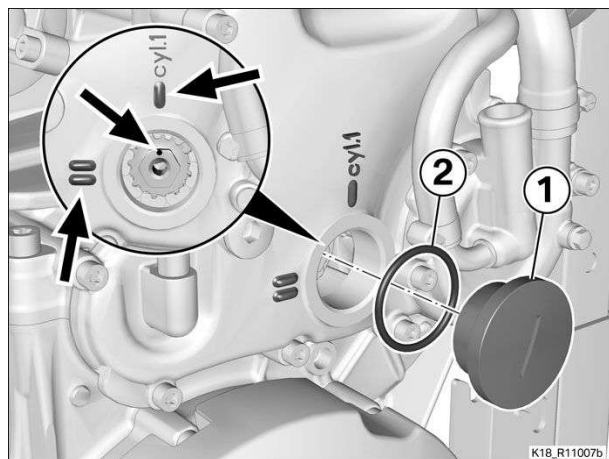
Disengaging and lowering radiator

Removing ignition coils

Removing cylinder head cover

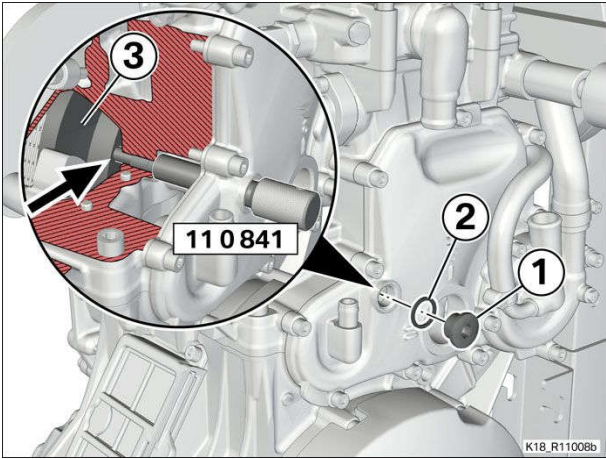
Core activity

(-) Setting engine to firing TDC and securing it in position



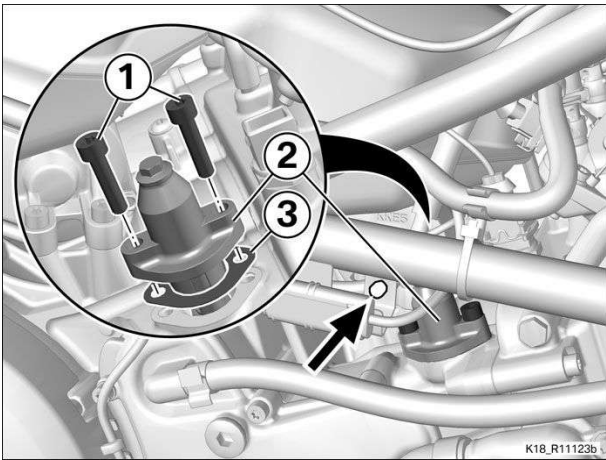
- Remove screw (1) with seal (2).
- Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward one of the line marks (arrow).
- » The corresponding cylinder 1 (alternator side) or 2 (timing-chain side) is at TDC.

- Remove screw (1) and seal (2).
- Make sure that the hole (arrow) in crankshaft (3) is visible.
- Insert locking pin, making sure that it engages in the hole (arrow) in crankshaft (3).



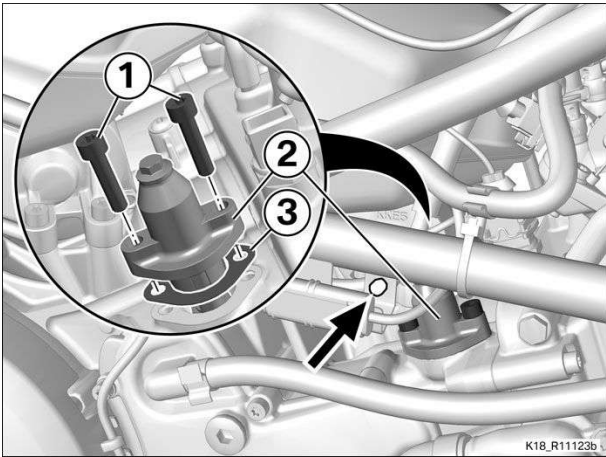
(-) Removing timing-chain tensioner

- Disengage the cable holder (arrow).
- Remove screws (1), taking care to **slacken them uniformly** to prevent the component from tilting.
- Remove timing-chain tensioner (2) and gasket (3).



(-) Install the new timing-chain tensioner

- Clean the sealing faces.
- Position timing-chain tensioner (2) with a **new** gasket (3).
- Install screws (1), taking care to **tighten them uniformly** to prevent the component from tilting.



Tightening torques		
Chain tensioner in crankcase		
M6 x 25	10 Nm	

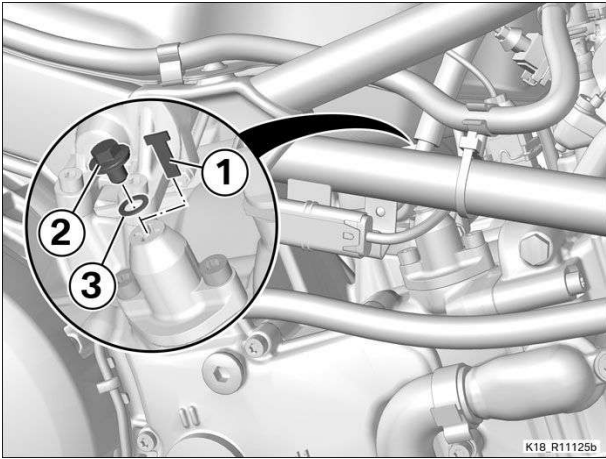
- Secure the cable holder (arrow).

- Remove locking plate (transportation locking device) (1).

» Timing chain is tensioned.

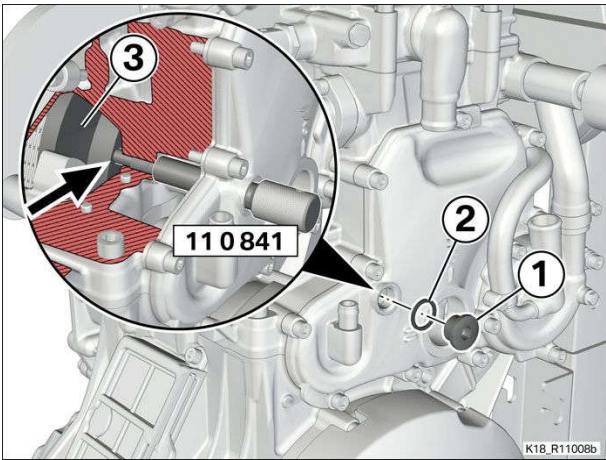
- Install screw (2) with **new** sealing ring (3).

Tightening torques		
Threaded plug in chain tensioner		
M6 x 6	9 Nm	



(-) Removing locator for TDC position

- Remove locking pin (No. 11 0 841) from the hole (arrow) in crankshaft (3).
- Install new seal (2) and screw (1).



Tightening torques		
Threaded plug (hole for locking pin) to engine cover, right		
M16 x 1.5	20 Nm	

(-) Checking timing

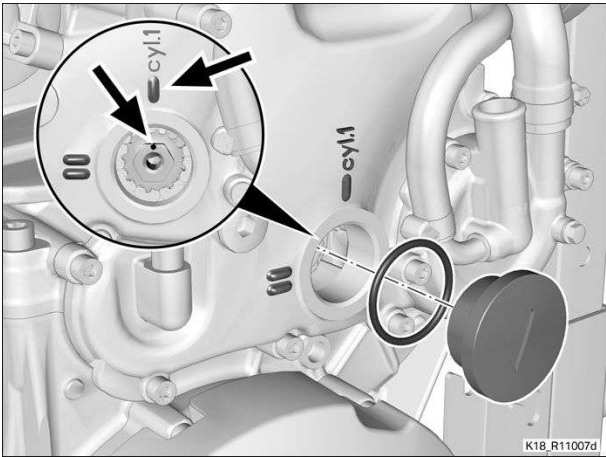
ATTENTION

Barring of the engine not in compliance with correct procedure.

Component damage

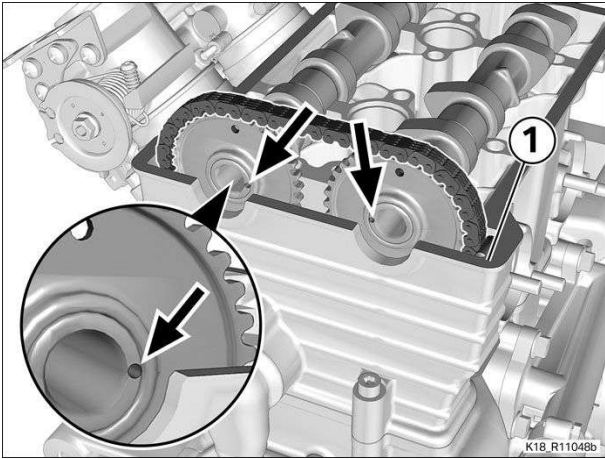
- Bar the engine carefully. Stop the rotational movement if resistance is perceptible.

- Carefully turn the engine through several full revolutions of the crankshaft and set the crankshaft to the TDC position.
 - Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward one of the marks I (arrow).
- » Cylinder 1 (alternator side) is at firing TDC (valves closed).



Check

- Note the marks (arrows) on the camshafts:
- The holes (arrows) are **toward each other** and parallel to sealing face (1).



Result:

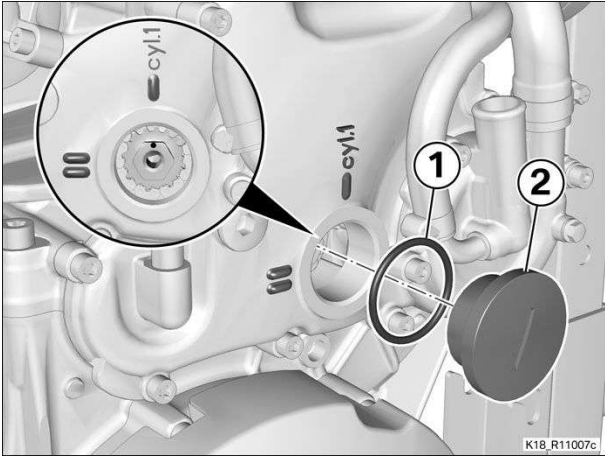
- Marks are not correct.

Measure:

- Install camshafts correctly.

(-) Installing threaded plug (crankshaft)

- Check sealing ring (1); replace if necessary.
- Install screw (2) with sealing ring (1).



 Tightening torques		
Threaded plug (crankshaft) to engine cover, right		
M36 x 1.5	20 Nm	

Finishing work

- Installing cylinder head cover
- Installing ignition coils
- Securing radiator
- Securing expansion tank for coolant
- Installing air deflector
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Installing left side panel
- Installing front left footrest plate

Installing centre cover
Closing seat
Installing filler cap flap
Final check of work performed

11 31 506 Replacing timing-chain tensioning rail (cylinder-head cover removed)

NOTICE

Replace the timing chain and the chain guide as well if a new timing-chain tensioning rail is installed.

Preparatory work

Removing right crankcase cover

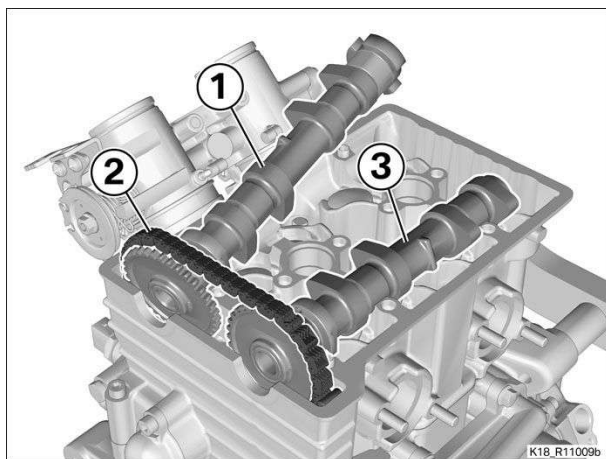
Setting cylinder 1 to overlap TDC and securing (for camshaft removal)

Relieving tension on and locating chain tensioner

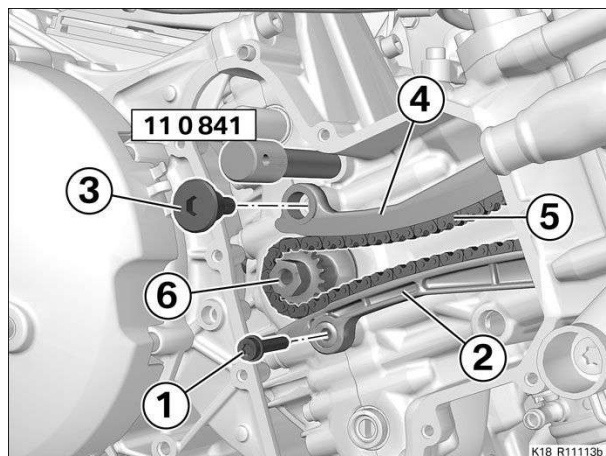
Removing camshaft bearing cap

Core activity

(-) Removing timing chain and camshaft when replacing timing chain



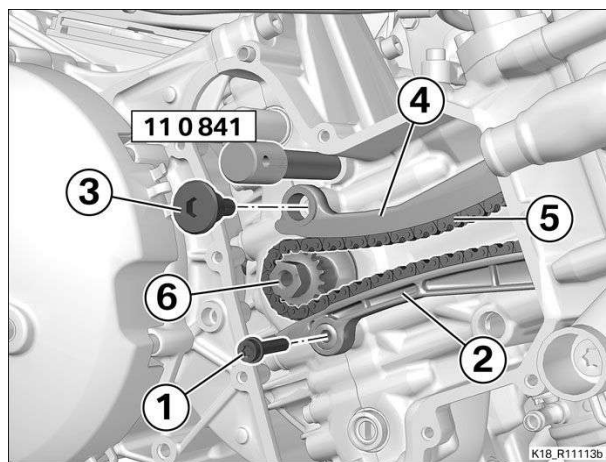
- Disengage inlet camshaft (1) from timing chain (2) and remove.
- Disengage exhaust camshaft (3) from timing chain (2) and remove.
- Secure timing chain (2) to prevent the part from slipping out of reach.



- Remove screw (1) and disengage slide rail (2).
- Remove screw (3) and work chain tensioner rail (4) up out of the timing-chain cavity.
- Disengage timing chain (5) from crankshaft sprocket (6) and remove.

(-) Installing timing chain and camshaft when replacing timing chain

- Working from above, insert new tensioning rail (4) and new timing chain (5) into the timing-chain cavity
- Loop timing chain (5) **pulled taut** on to crankcase sprocket (6) and secure it in position.
- Hold slide rail (2) in position and secure with screw (1), making sure that timing chain (5) is routed correctly.

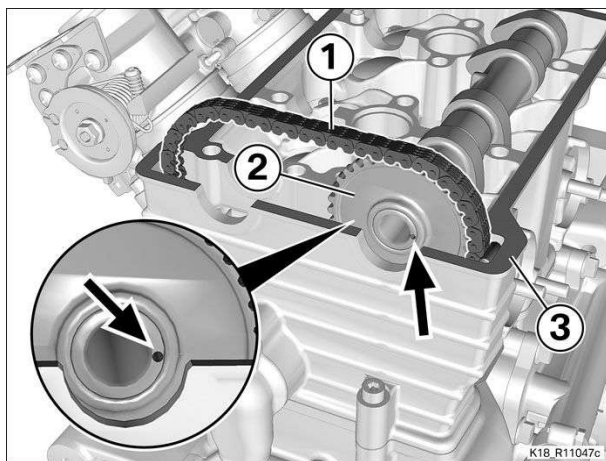


Tightening torques		
Chain slide rail to crankcase		
M6 x 30	10 Nm	

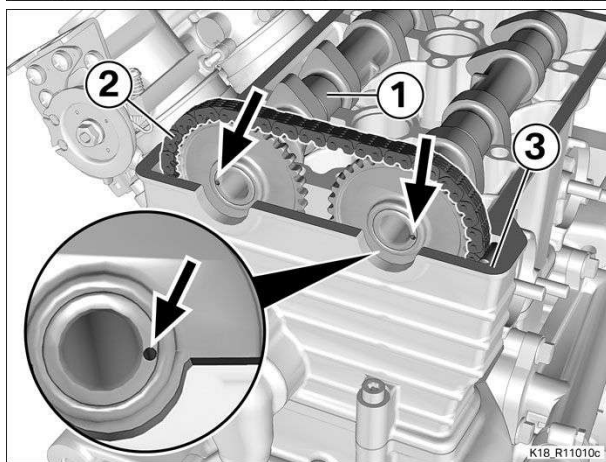
- Secure tensioning rail (4) with screw (3).

Tightening torques		
Chain tensioner rail to crankcase		
M8	20 Nm	

- Lubricate the bearing seats with engine oil.
- Pull timing chain (1) **taut** on exhaust side and insert exhaust camshaft (2), noting the marks.
- The hole (arrow) is pointing **out** and is parallel to sealing face (3).



- Insert inlet camshaft (1) into timing chain (2), noting the marks
- The holes (arrows) are **apart** and parallel to the sealing face .



Finishing work

Installing camshaft bearing cap when replacing timing chain

Removing crankshaft locator

Removing pretensioning tool for timing-chain tensioner

Installing screw for timing-chain tensioner

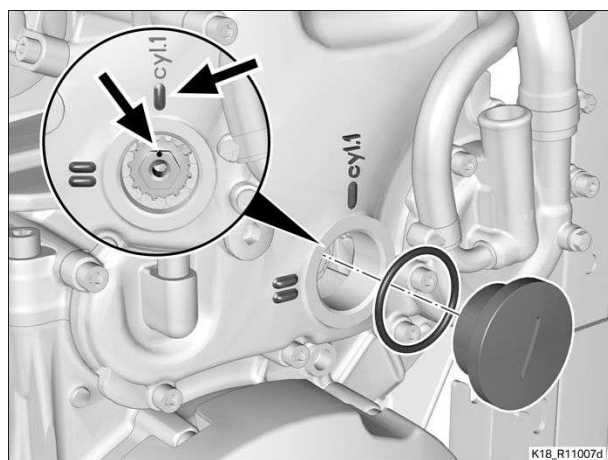
Checking timing

Securing right crankcase cover

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

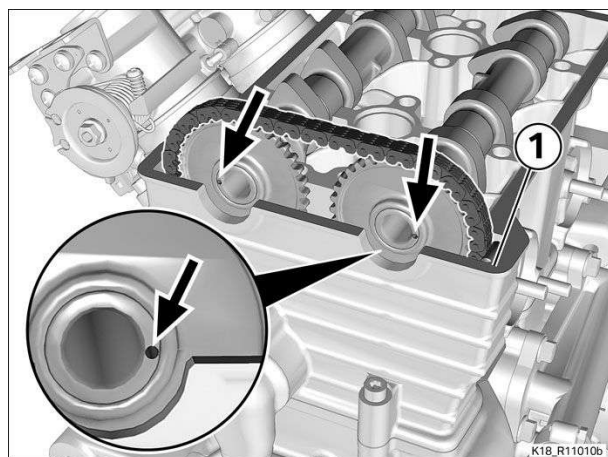
Core activity

(-) Setting cylinder 1 to overlap TDC and securing (for camshaft removal)



- Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward line mark I (arrow).

» Cylinder 1 (alternator side) is at overlap TDC



Check

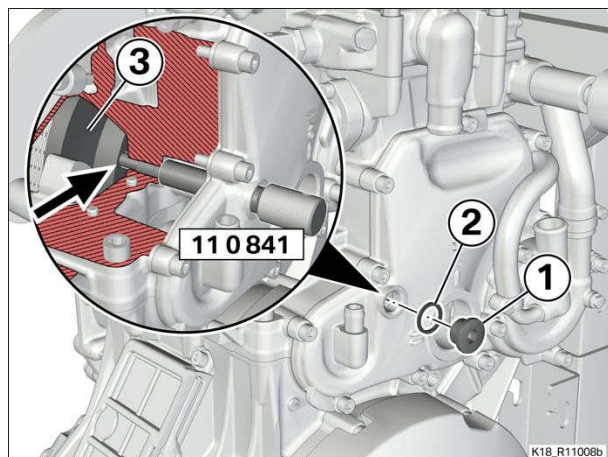
- Note the marks (arrows).
- The holes (arrows) are **apart** and parallel to the sealing face (1).

Result:

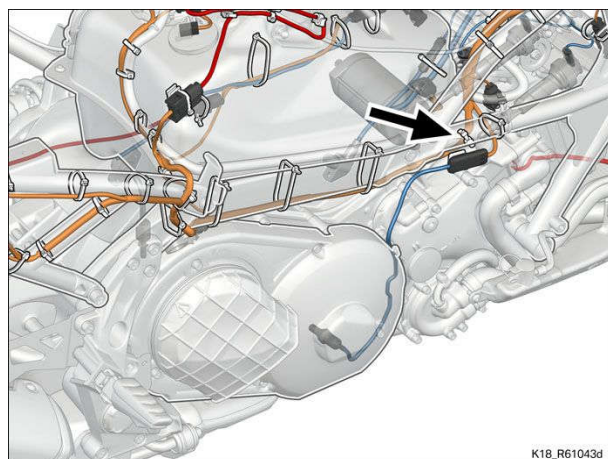
- Marks are not correct.

Measure:

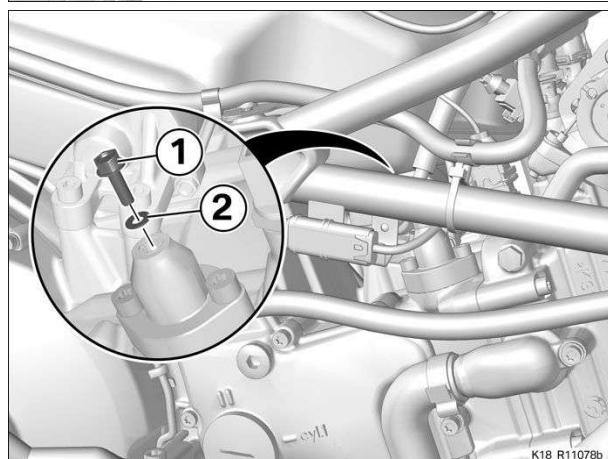
- Turn the engine in its normal direction of rotation until the marks are as shown in the graphic.
- Remove screw (1) and seal (2).
- Make sure that the hole (arrow) in crankshaft (3) is visible.
- Insert locking pin (No. 11 0 841), making sure that it engages in the hole (arrow) in crankshaft (3).



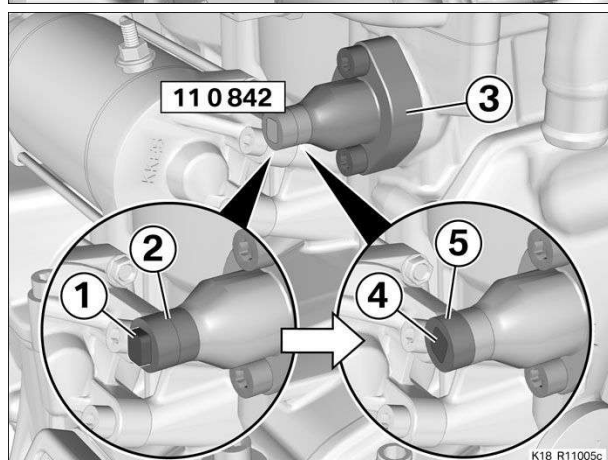
(-) Relieving tension on and locating chain tensioner



- Release the cable (arrow).

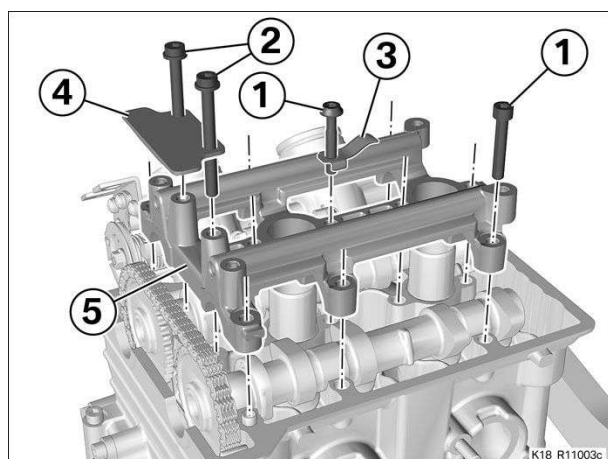


- Remove screw (1) and seal (2).



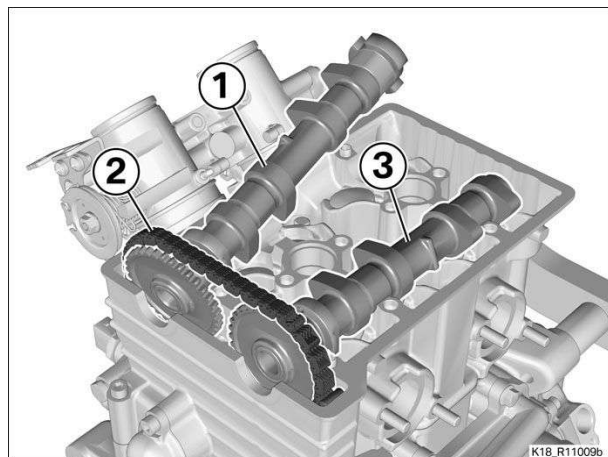
- Prepare pretensioning tool (No. 11 0 842):
- Pull out lock (1) and turn it.
- » Lock (1) is seated on turnable rings (2) and is held in position
- Install pretensioning tool (No. 11 0 842) in chain tensioner (3) until seated.
- Turn lock (4) until it engages and is flush with top turnable ring (5).
- Turn **top** turnable ring (5) **clockwise** until the tension is off the chain tensioner.

(-) Removing camshaft bearing cap



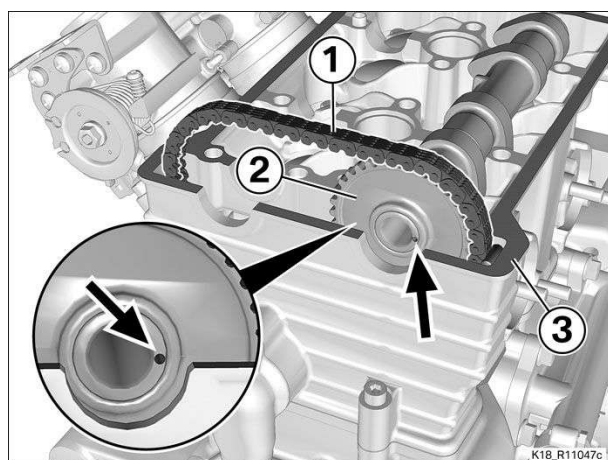
- Back off screws (1) and (2) uniformly step by step and remove.
- Remove contact spring (3) and chain guide (4).
- Remove bearing cap (5).

(-) Removing camshafts

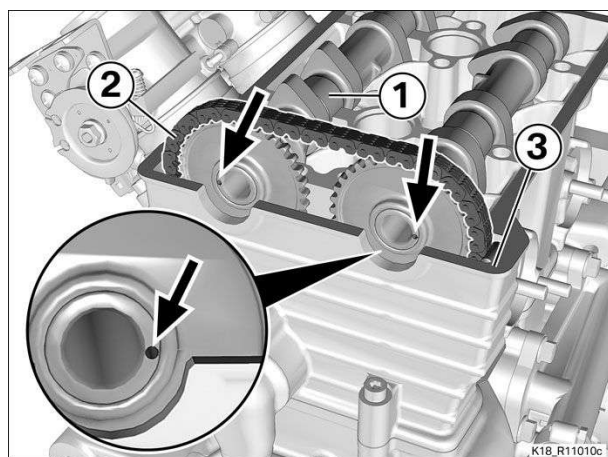


- Slightly lift inlet camshaft (1) and disengage it from timing chain (2).
- Remove inlet camshaft (1).
- Remove exhaust camshaft (3).

(-) Installing camshafts



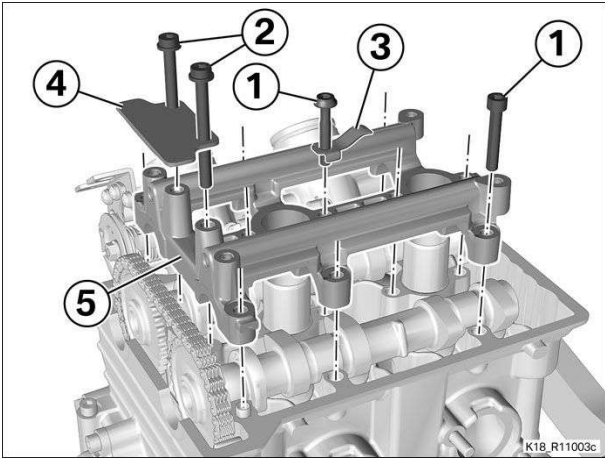
- Lubricate the bearing seats with engine oil.
- Pull timing chain (1) taut on exhaust side and insert exhaust camshaft (2), noting the marks.
- The hole (arrow) is pointing **out** and is parallel to sealing face (1).



- Insert inlet camshaft (1) in timing chain (2), noting the marks
- The holes (arrows) are **apart** and parallel to the sealing face (3).

(-) Installing camshaft bearing cap

- Lubricate all bearing seats with engine oil.
- Place the following components in position:
 - Camshaft bearing cap (5)
 - Chain guide (4)
 - Contact spring (3)
- **Press down on** camshaft bearing cap (5) and install screws (1) and (2) and tighten until hand-tight.

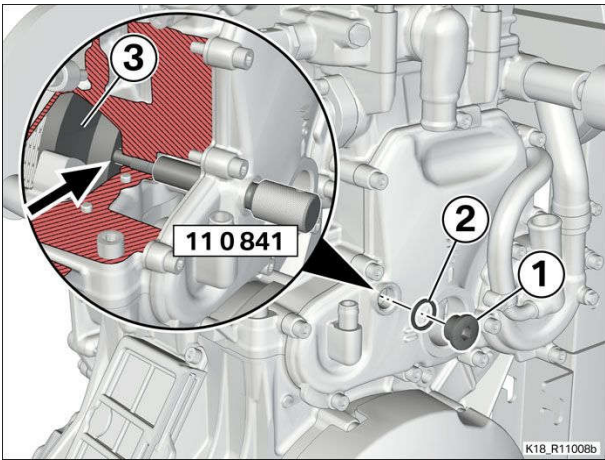


- Tighten screws (1) and (2) **uniformly and step by step** in diagonally opposite sequence.

Tightening torques		
Camshaft bearing cap to cylinder head		
M6 x 35	10 Nm	
M6 x 60	10 Nm	

(-) Removing locator for TDC position

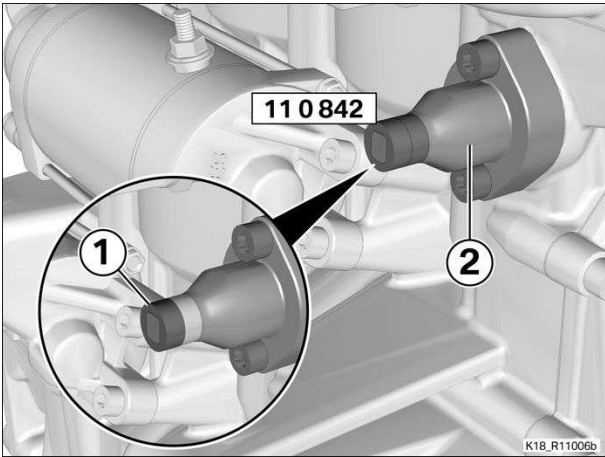
- Remove locking pin (No. 11 0 841) from the hole (arrow) in crankshaft (3).
- Install new seal (2) and screw (1).



Tightening torques		
Threaded plug (hole for locking pin) to engine cover, right		
M16 x 1.5	20 Nm	

(-) Releasing pretensioning tool for timing-chain tensioner

- Slightly raise **top turnable ring** (1) of pretensioning tool (No. 11 0 842).
- » Timing-chain tensioner (2) turns to the working position.

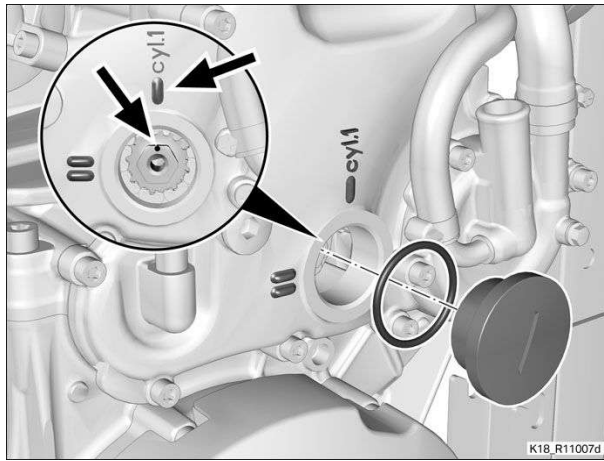


(-) Checking timing

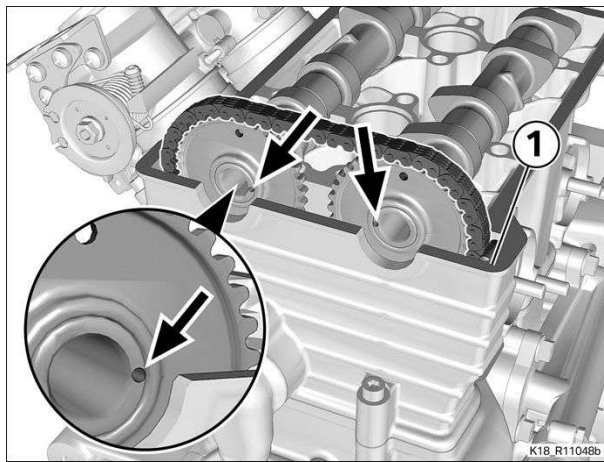
ATTENTION

Barring of the engine not in compliance with correct procedure.
Component damage

- Bar the engine carefully. Stop the rotational movement if resistance is perceptible.
-
- Carefully turn the engine through several full revolutions of the crankshaft and set the crankshaft to the TDC position.



- Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward one of the marks I (arrow).
- » Cylinder 1 (alternator side) is at firing TDC (valves closed).



Check

- Note the marks (arrows) on the camshafts:
- The holes (arrows) are **toward each other** and parallel to sealing face (1).

Result:

- Marks are not correct.

Measure:

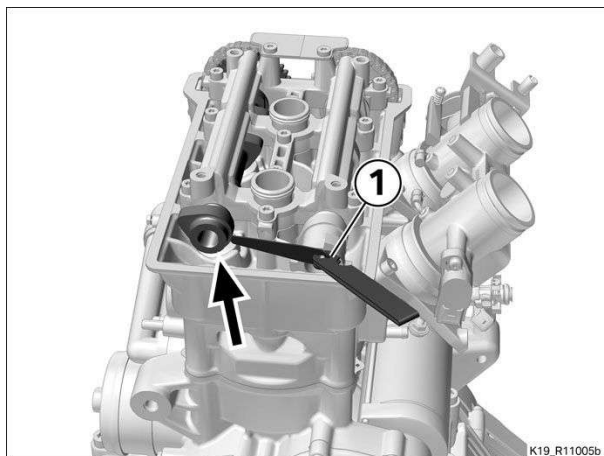
- Install camshafts correctly.

(-) Checking valve clearance

- Using feeler gauge (1), measure clearance between camshaft base circle and bucket tappet (arrow).

Check

- Measure settings for all the valves of the cylinder.



► Noting measured results

- Note down the measured results on a record sheet.

Data sheet, valve clearance

BMW Motorrad

↑

Direction of travel

1

2

3

4

Type:

VIN:

Odometer reading:

Date:

Name:

	Cylinder 1	Cylinder 2	Cylinder 3	Cylinder 4
Exhaust valve				
Specified [mm]				
Measured value [mm]				
Spacers needed				
Inlet valve				
Specified [mm]				
Measured value [mm]				
Spacers needed				

K43HV_R11021b



- Continue turning the engine until the **right cylinder is at firing TDC** (both valves are closed).
- » **Mark on crankshaft** (dot) is toward **line mark II**.
- Check valve clearance in the same way and note down the figure.

 Technical data			
Inlet valve clearance	engine cold max 35 C	0.20 ^{0.04} / _{0.04} mm	
Exhaust valve clearance	engine cold max 35 C	0.28 ^{0.04} / _{0.04} mm	

Result:

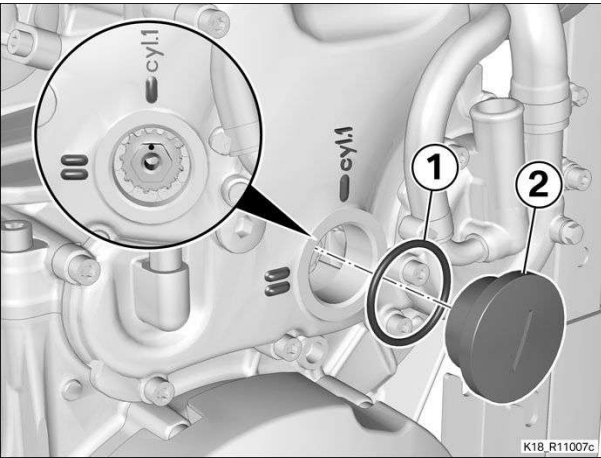
- Valve clearance out of tolerance

Measure:

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

(-) Installing threaded plug (crankshaft)

- Check sealing ring (1) replace if necessary.
- Install screw (2) with sealing ring (1).

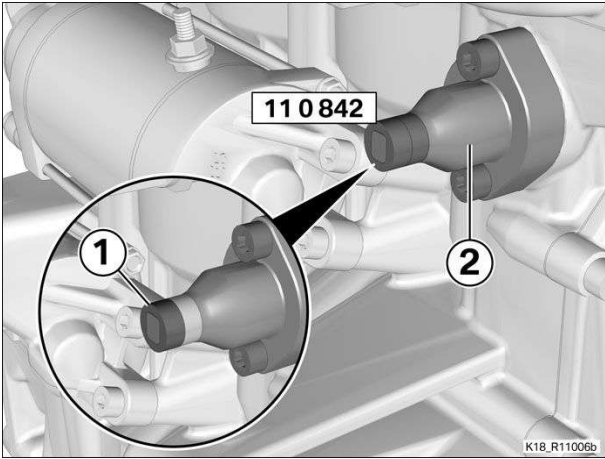


 Tightening torques		
Threaded plug (crankshaft) to engine cover, right		
M36 x 1.5	20 Nm	

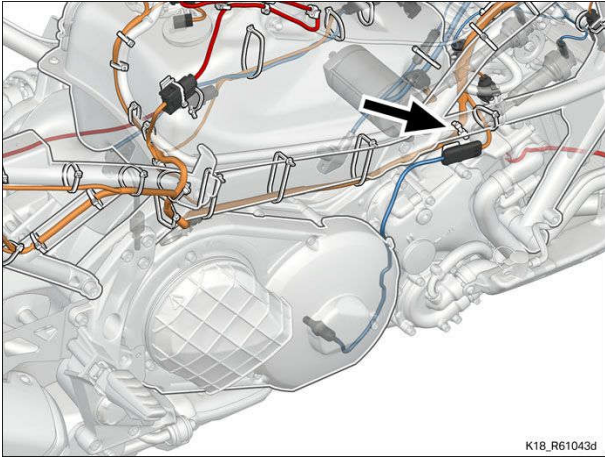
(-) Removing pretensioning tool for timing-chain tensioner

- Slightly raise top turning ring (1).

»

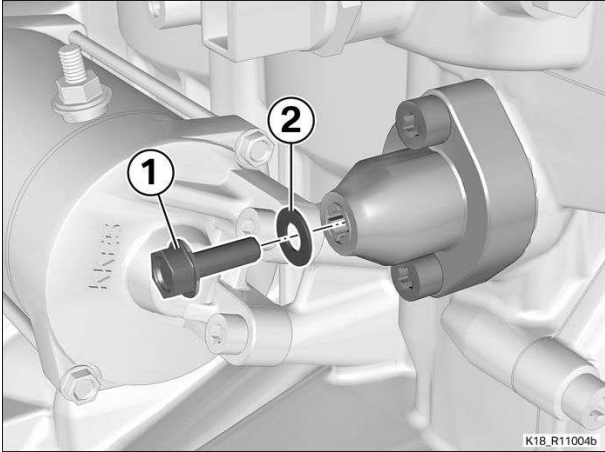


- Timing-chain tensioner (2) turns to the working position.
- Remove pretensioning tool (No. 11 0 842).



- Secure the cable (arrow).

(-) Installing screw for timing-chain tensioner



- Install screw (1) with seal (2).

 Tightening torques		
Threaded plug in chain tensioner		
M6 x 6	9 Nm	

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

NOTICE

Replace the timing-chain tensioning rail and the chain guide as well if a new timing chain is installed.

Preparatory work

Removing right crankcase cover

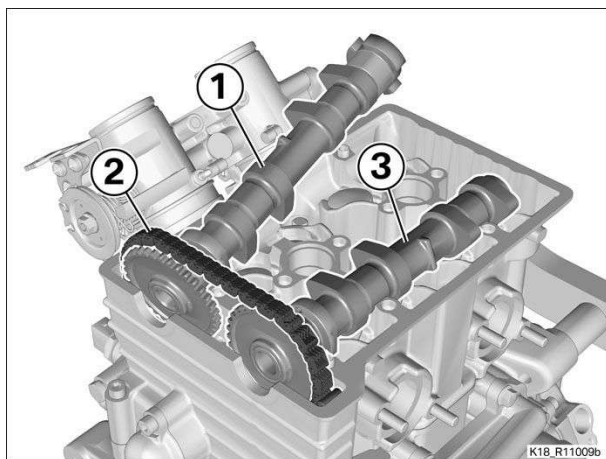
Setting cylinder 1 to overlap TDC and securing (for camshaft removal)

Relieving tension on and locating chain tensioner

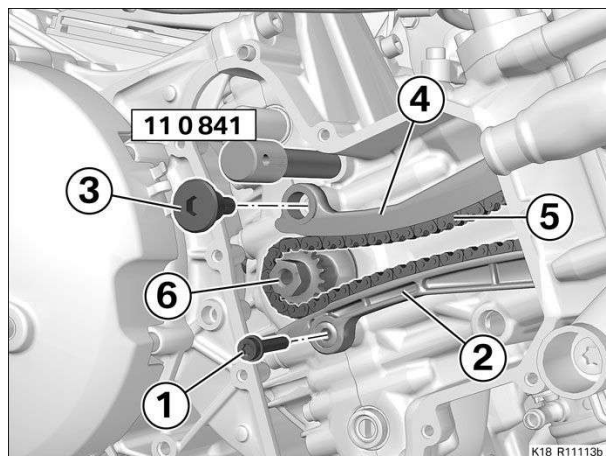
Removing camshaft bearing cap

Core activity

(-) Removing timing chain and camshaft when replacing timing chain



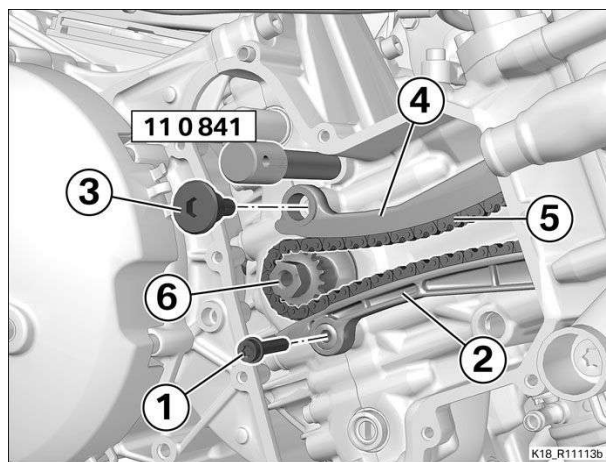
- Disengage inlet camshaft (1) from timing chain (2) and remove.
- Disengage exhaust camshaft (3) from timing chain (2) and remove.
- Secure timing chain (2) to prevent the part from slipping out of reach.



- Remove screw (1) and disengage slide rail (2).
- Remove screw (3) and work chain tensioner rail (4) up out of the timing-chain cavity.
- Disengage timing chain (5) from crankshaft sprocket (6) and remove.

(-) Installing timing chain and camshaft when replacing timing chain

- Working from above, insert new tensioning rail (4) and new timing chain (5) into the timing-chain cavity
- Loop timing chain (5) **pulled taut** on to crankcase sprocket (6) and secure it in position.
- Hold slide rail (2) in position and secure with screw (1), making sure that timing chain (5) is routed correctly.

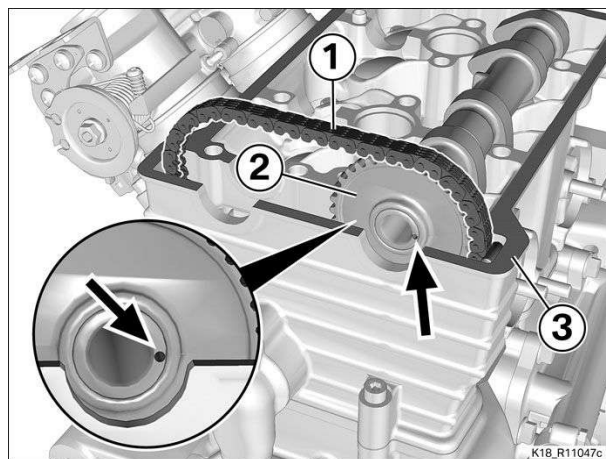


Tightening torques		
Chain slide rail to crankcase		
M6 x 30	10 Nm	

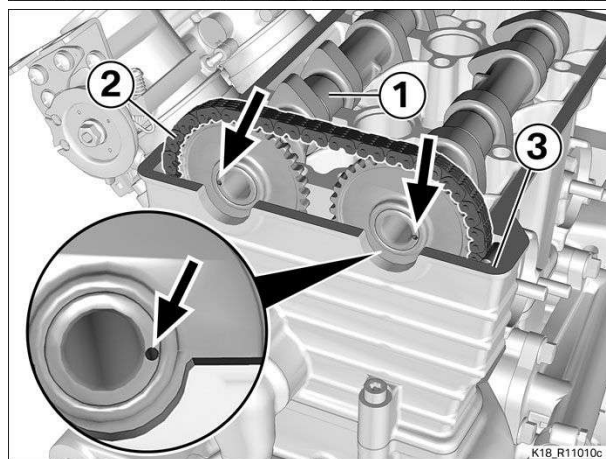
- Secure tensioning rail (4) with screw (3).

Tightening torques		
Chain tensioner rail to crankcase		
M8	20 Nm	

- Lubricate the bearing seats with engine oil.
- Pull timing chain (1) **taut** on exhaust side and insert exhaust camshaft (2), noting the marks.
- The hole (arrow) is pointing **out** and is parallel to sealing face (3).



- Insert inlet camshaft (1) into timing chain (2), noting the marks
- The holes (arrows) are **apart** and parallel to the sealing face .



Finishing work

Installing camshaft bearing cap when replacing timing chain

Removing crankshaft locator

Removing pretensioning tool for timing-chain tensioner

Installing screw for timing-chain tensioner

Checking timing

Securing right crankcase cover

11 34 001 Checking valve clearance

+ 11 34 501

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing front left footrest plate

Removing left side panel

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing air deflector

Disengaging expansion tank for coolant

Disengaging and lowering radiator

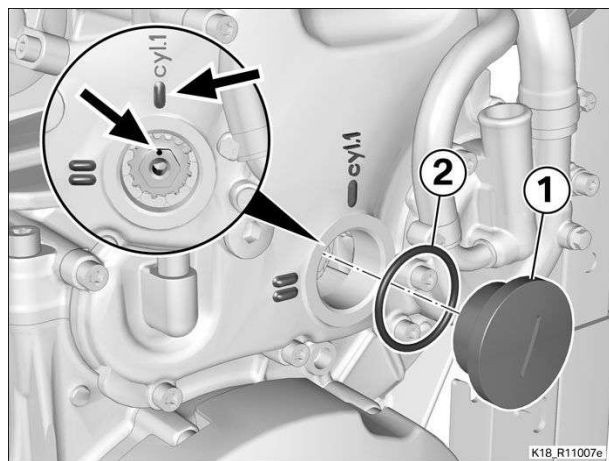
Removing ignition coils

Removing cylinder head cover

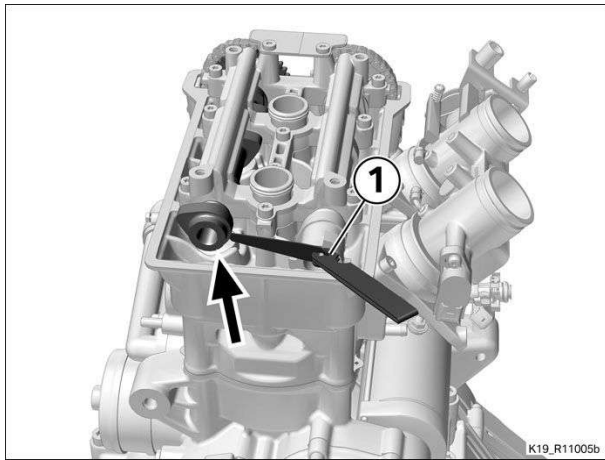
Core activity

(-) Setting engine to firing TDC (for checking valve clearance)

- Remove screw (1) with seal (2).
 - Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward **line mark I** (arrow).
- » **Cylinder 1** (alternator side) is at **firing TDC**.



- Note the marks (arrows).
- The holes (arrows) are toward each other and parallel to sealing face (1).



- Using feeler gauge (1), measure clearance between camshaft base circle and bucket tappet (arrow).

- Measure settings for all the valves of the cylinder.

- Note down the measured results on a record sheet.

Data sheet, valve clearance BMW Motorrad		 Direction of travel		
Type:	VIN:	Odometer reading:	Date:	Name:



- » **Mark on crankshaft** (dot) is toward **line mark II**.

- Check valve clearance in the same way and note down the figure.

2/3

	C		
Exhaust valve clearance	Engine cold max 35 ° C	0.28 ^{+0.04} _{-0.04} mm	

Result:

- Valve clearance out of tolerance

Measure:

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

Finishing work

Installing cylinder head cover

Installing threaded plug (crankshaft)

Installing ignition coils

Securing radiator

Securing expansion tank for coolant

Installing air deflector

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing left side panel

Installing front left footrest plate

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

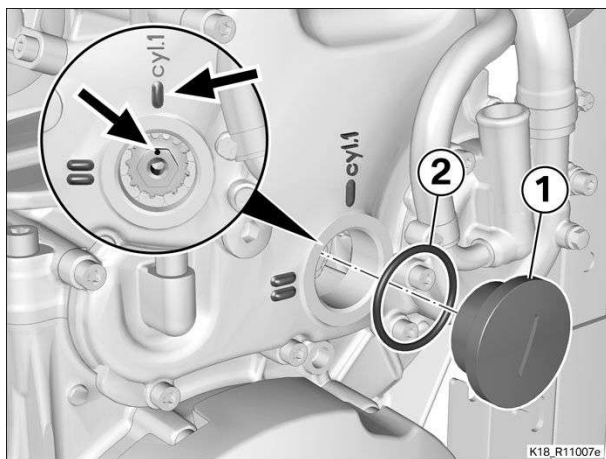
11 34 502 Checking valve clearance (for maintenance)

Preparatory work

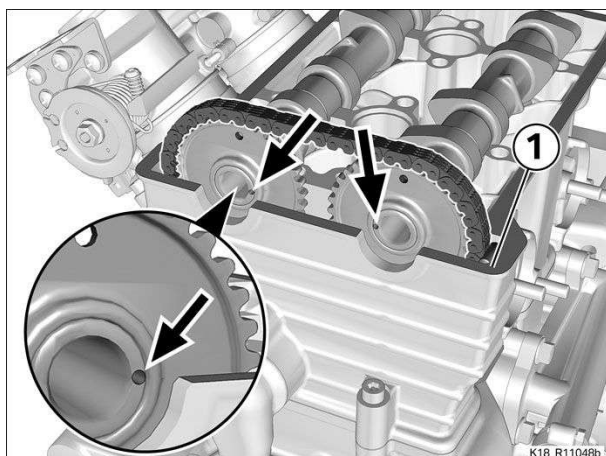
Removing cylinder head cover

Core activity

(-) Setting engine to firing TDC (for checking valve clearance)



- Remove screw (1) with seal (2).
 - Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward line mark I (arrow).
- » Cylinder 1 (alternator side) is at firing TDC.



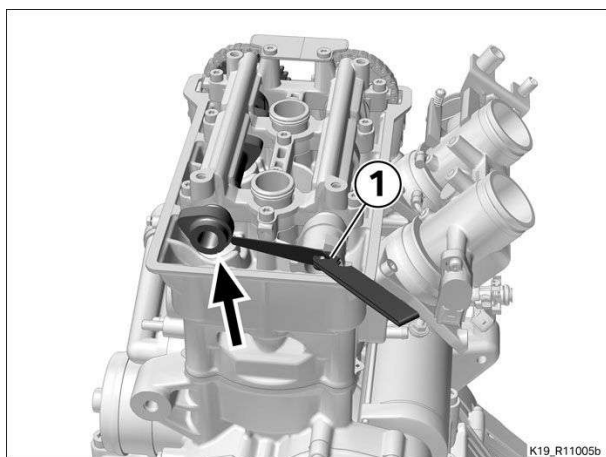
- Note the marks (arrows).
- The holes (arrows) are toward each other and parallel to sealing face (1).

(-) Checking valve clearance

- Using feeler gauge (1), measure clearance between camshaft base circle and bucket tappet (arrow).

Check

- Measure settings for all the valves of the cylinder.



► Noting measured results

- Note down the measured results on a record sheet.

Data sheet, valve clearance BMW Motorrad		 Direction of travel		
Type:	VIN:	Odometer reading:	Date:	Name:

	Cylinder 1	Cylinder 2	Cylinder 3	Cylinder 4
Exhaust valve				
Specified [mm]				
Measured value [mm]				
Spacers needed				
Inlet valve				
Specified [mm]				
Measured value [mm]				
Spacers needed				



- Continue turning the engine until the **right cylinder is at firing TDC** (both valves are closed).

» **Mark on crankshaft** (dot) is toward **line mark II**.

- Check valve clearance in the same way and note down the figure.

 Technical data			
Inlet valve clearance	Engine cold max 35 °C	0.20 ^{+0.04} _{-0.04} mm	
Exhaust valve clearance	Engine cold max 35 °C	0.28 ^{+0.04} _{-0.04} mm	

Result:

- Valve clearance out of tolerance

Measure:

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

Finishing work

Installing cylinder head cover

Installing threaded plug (crankshaft)

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

ATTENTION

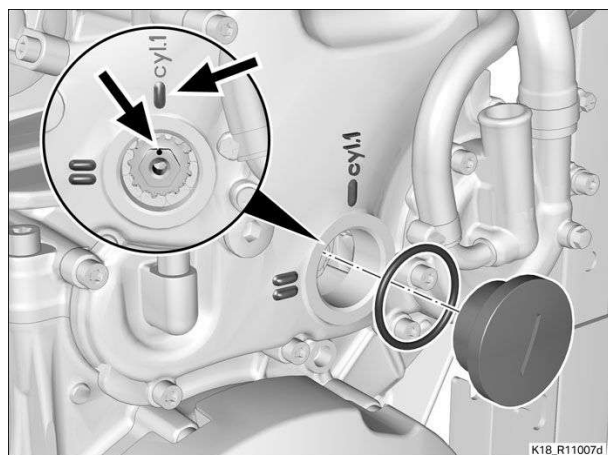
Timing chain jumping off sprocket.

Component damage

- Do not attempt to turn the engine without chain tensioners fitted.

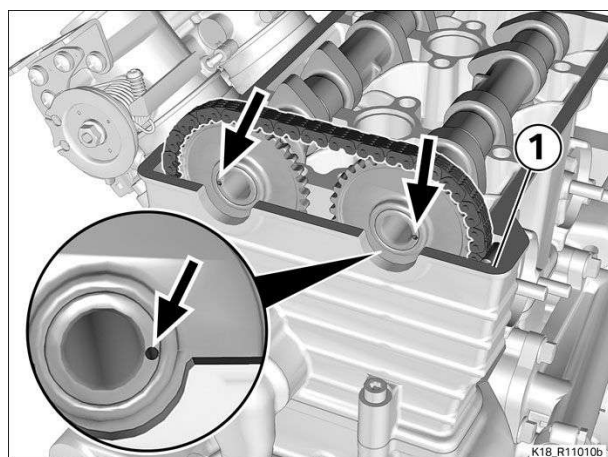
Core activity

(-) Setting cylinder 1 to overlap TDC and securing (for camshaft removal)



- Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward **line mark I** (arrow).

» **Cylinder 1** (alternator side) is at **overlap TDC**



Check

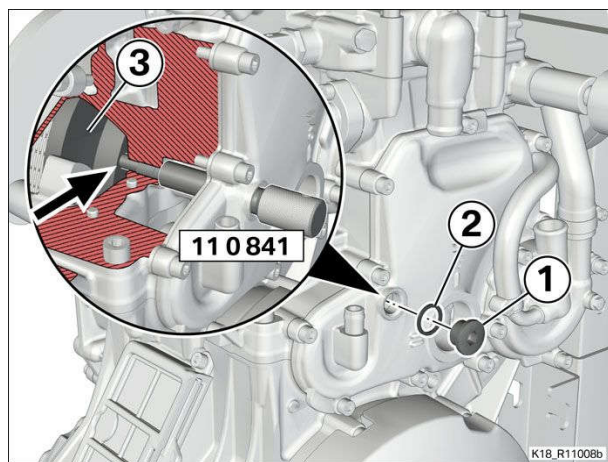
- Note the marks (arrows).
- The holes (arrows) are **apart** and parallel to the sealing face (1).

Result:

- Marks are not correct.

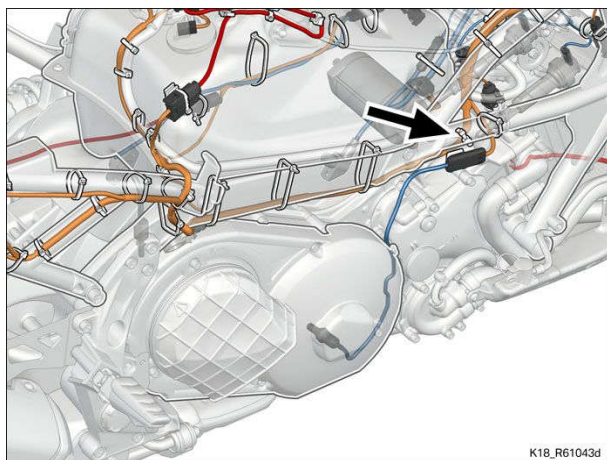
Measure:

- Turn the engine in its normal direction of rotation until the marks are as shown in the graphic.
- Remove screw (1) and seal (2).
- Make sure that the hole (arrow) in crankshaft (3) is visible.
- Insert locking pin (No. 11 0 841), making sure that it engages in the hole (arrow) in crankshaft (3).

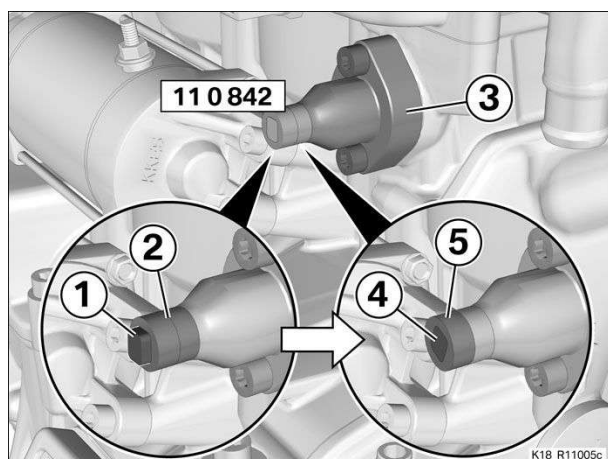
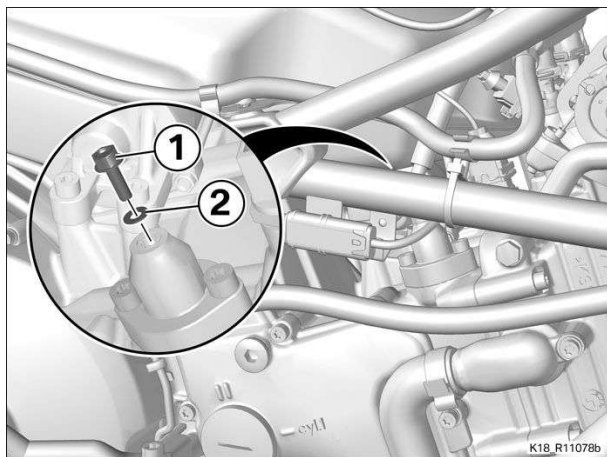


(-) Relieving tension on and locating chain tensioner

- Release the cable (arrow).

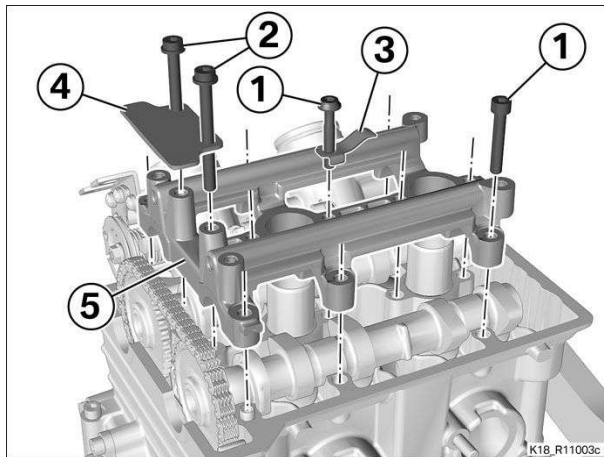


- Remove screw (1) and seal (2).



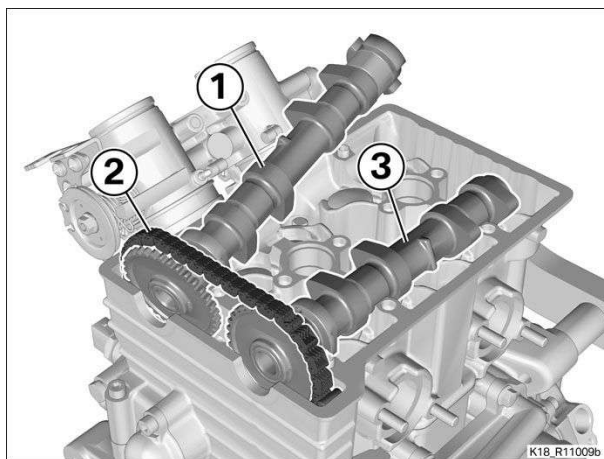
- Prepare pretensioning tool (No. 11 0 842):
 - Pull out lock (1) and turn it.
- » Lock (1) is seated on turnable rings (2) and is held in position
- Install pretensioning tool (No. 11 0 842) in chain tensioner (3) until seated.
- Turn lock (4) until it engages and is flush with top turnable ring (5).
- Turn **top** turnable ring (5) **clockwise** until the tension is off the chain tensioner.

(-) Removing camshaft bearing cap



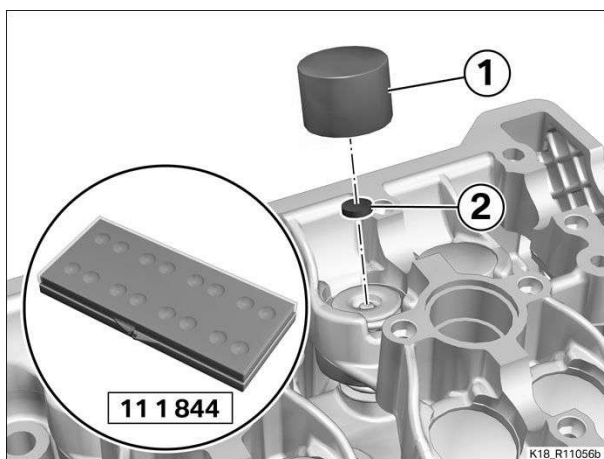
- Back off screws (1) and (2) uniformly step by step and remove.
- Remove contact spring (3) and chain guide (4).
- Remove bearing cap (5).

(-) Removing camshafts



- Slightly lift inlet camshaft (1) and disengage it from timing chain (2).
- Remove inlet camshaft (1).
- Remove exhaust camshaft (3).

(-) Adjusting valve clearance



- Mark the installed position of each bucket tappet (1).

NOTICE

Make a note of which bucket tappets belong to which valve.

- Remove bucket tappet (1).

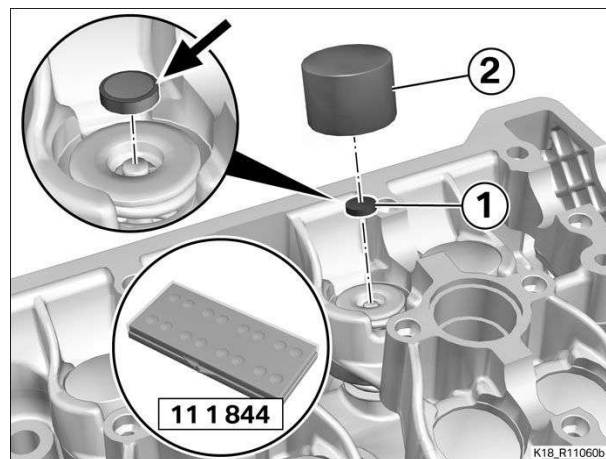
NOTICE

Take care when removing the bucket tappets; the adjustment plates can drop into the engine.

- Remove adjustment plates (2) and place them, correctly sorted, in tray (No. 11 1 844).
- Check the thickness of shims (2) on removal with a caliper gauge.
- Before installing, check the thickness of each new shim.

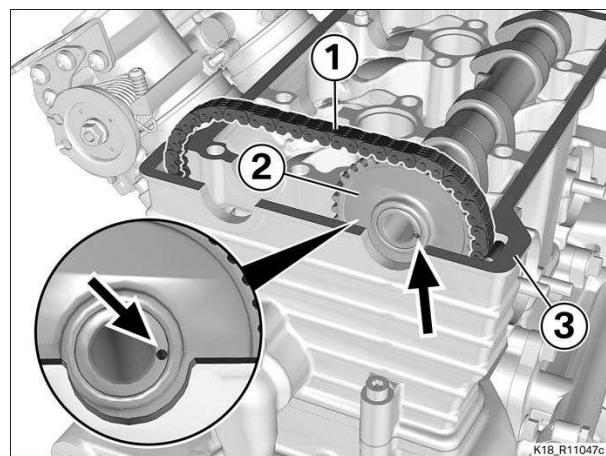
Data sheet, valve clearance BMW Motorrad																																																	
Type:	VIN:	Odometer reading:	Date:	Name:																																													
<table border="1"> <thead> <tr> <th></th> <th>Cylinder 1</th> <th>Cylinder 2</th> <th>Cylinder 3</th> <th>Cylinder 4</th> </tr> </thead> <tbody> <tr> <td>Exhaust valve</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Specified [mm]</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Measured value [mm]</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Spacers needed</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Inlet valve</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Specified [mm]</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Measured value [mm]</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Spacers needed</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Cylinder 1	Cylinder 2	Cylinder 3	Cylinder 4	Exhaust valve					Specified [mm]					Measured value [mm]					Spacers needed					Inlet valve					Specified [mm]					Measured value [mm]					Spacers needed				
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K43HV_R11021b

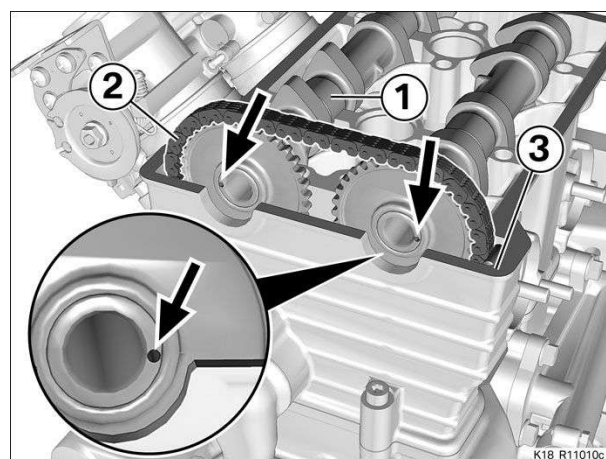


- Change adjustment plates (1) to suit the measured values; note that the chamfer (arrow) must **face up**.
- Install bucket tappets (2) in their respective, correct locations.

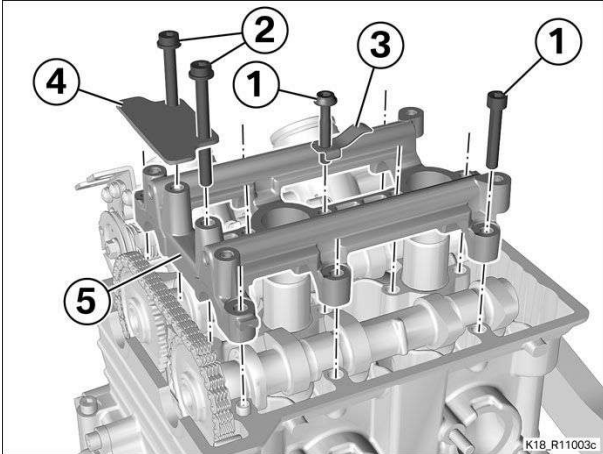
(-) Installing camshafts



- Lubricate the bearing seats with engine oil.
- Pull timing chain (1) taut on exhaust side and insert exhaust camshaft (2), noting the marks.
- The hole (arrow) is pointing **out** and is parallel to sealing face (1).



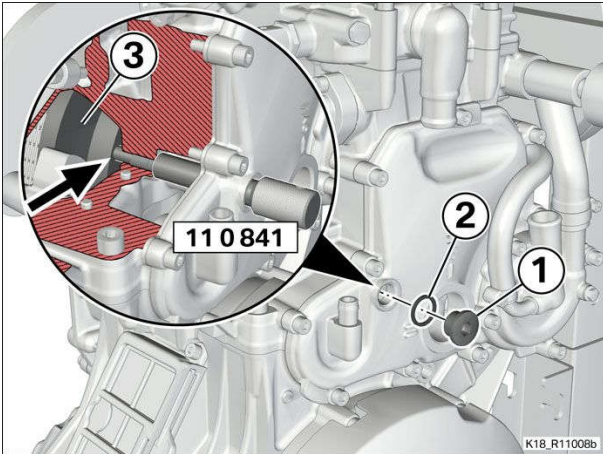
- Insert inlet camshaft (1) in timing chain (2), noting the marks
- The holes (arrows) are **apart** and parallel to the sealing face (3).



(-) Installing camshaft bearing cap

- Lubricate all bearing seats with engine oil.
- Place the following components in position:
 - Camshaft bearing cap (5)
 - Chain guide (4)
 - Contact spring (3)
- **Press down on** camshaft bearing cap (5) and install screws (1) and (2) and tighten until hand-tight.
- Tighten screws (1) and (2) **uniformly and step by step** in diagonally opposite sequence.

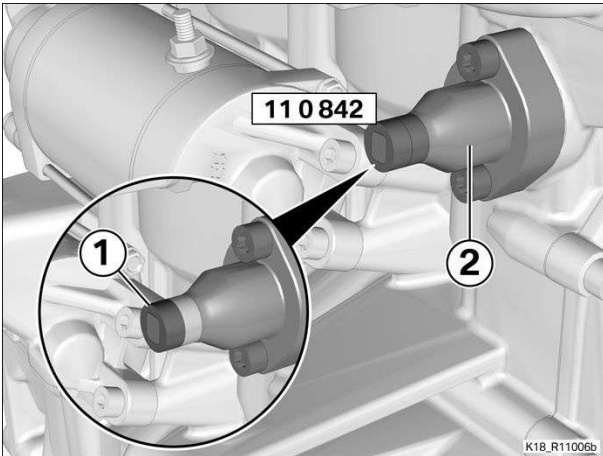
Tightening torques		
Camshaft bearing cap to cylinder head		
M6 x 35	10 Nm	
M6 x 60	10 Nm	



(-) Removing locator for TDC position

- Remove locking pin (No. 11 0 841) from the hole (arrow) in crankshaft (3).
- Install new seal (2) and screw (1).

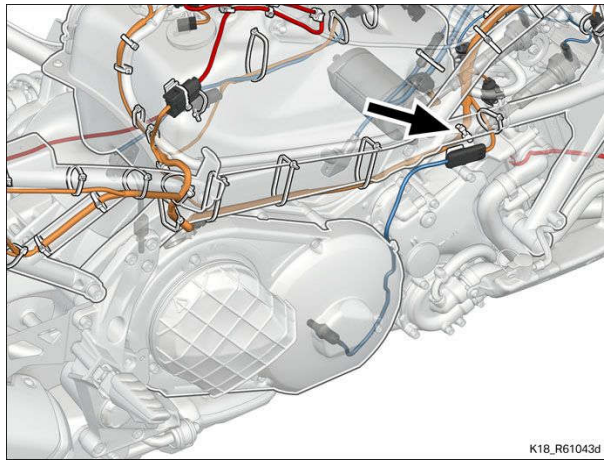
Tightening torques		
Threaded plug (hole for locking pin) to engine cover, right		
M16 x 1.5	20 Nm	



(-) Removing pretensioning tool for timing-chain tensioner

- Slightly raise top turning ring (1).
- » Timing-chain tensioner (2) turns to the working position.
- Remove pretensioning tool (No. 11 0 842).

- Secure the cable (arrow).

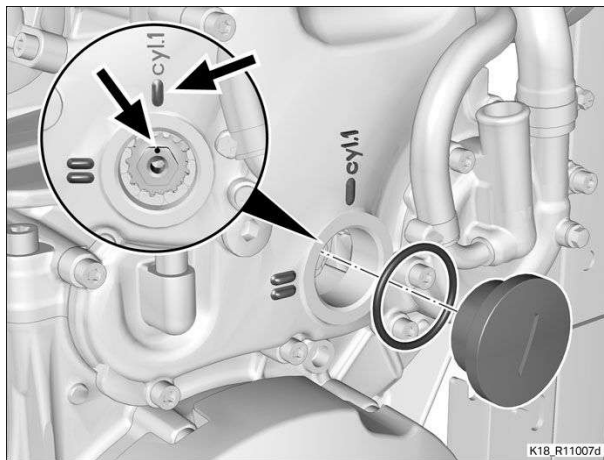


(-) Checking timing

⚠ ATTENTION

Turning of the engine not in compliance with correct procedure.
Component damage

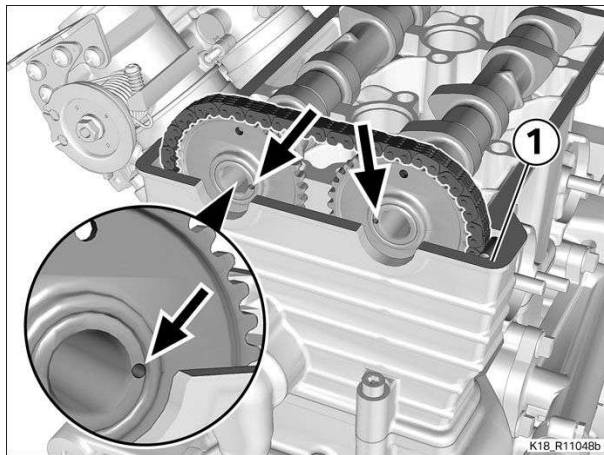
- Bar the engine carefully. Stop the rotational movement if resistance is perceptible.



- Carefully turn the engine through several full revolutions of the crankshaft and set the crankshaft to the TDC position.
 - Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward one of the marks I (arrow).
- » Cylinder 1 (alternator side) is at firing TDC (valves closed).

Check

- Note the marks (arrows) on the camshafts:
- The holes (arrows) are **toward each other** and parallel to sealing face (1).



Result:

- Marks are not correct.

Measure:

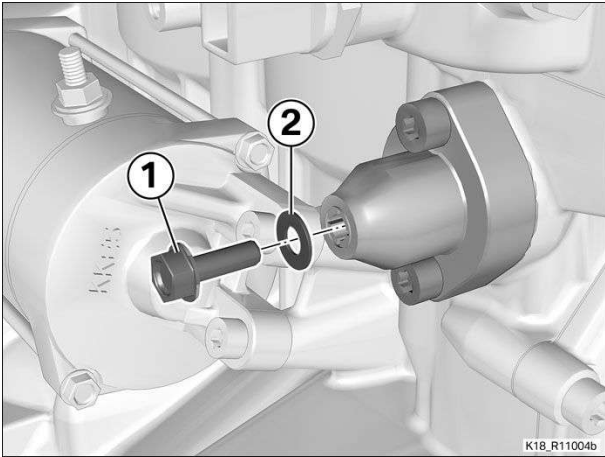
- Install camshafts correctly.

(-) Rechecking valve clearance

- After assembly and turning the engine through several complete revolutions, recheck the clearance of all valves; if necessary repeat the adjustment procedure.

 Technical data			
Inlet valve clearance	ngine cold max 35 C	0.20 $\begin{smallmatrix} 0.04 \\ 0.04 \end{smallmatrix}$ mm	
xhaust valve clearance	ngine cold max 35 C	0.28 $\begin{smallmatrix} 0.04 \\ 0.04 \end{smallmatrix}$ mm	

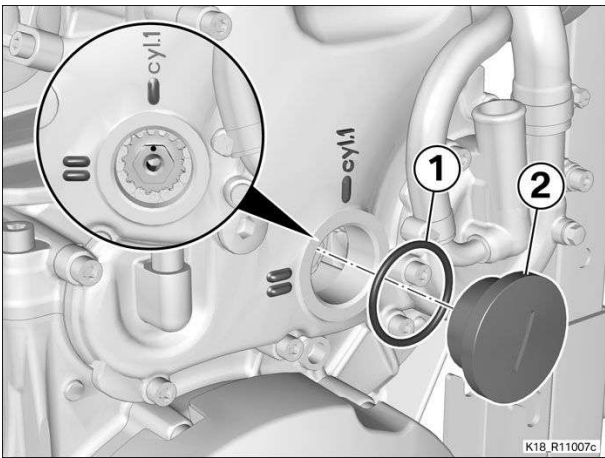
(-) Installing screw for timing-chain tensioner



- Install screw (1) with seal (2).

 Tightening torques		
Threaded plug in chain tensioner		
M6 x 6	9 Nm	

(-) Installing threaded plug (crankshaft)



- Check sealing ring (1); replace if necessary.
- Install screw (2) with sealing ring (1).

 Tightening torques		
Threaded plug (crankshaft) to engine cover, right		
M36 x 1.5	20 Nm	

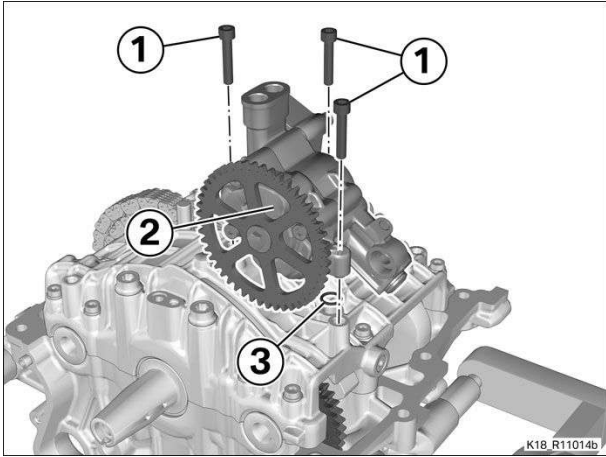
 11 41 502 Replacing oil pump (engine disassembled)

Preparatory work

Removing chain guide

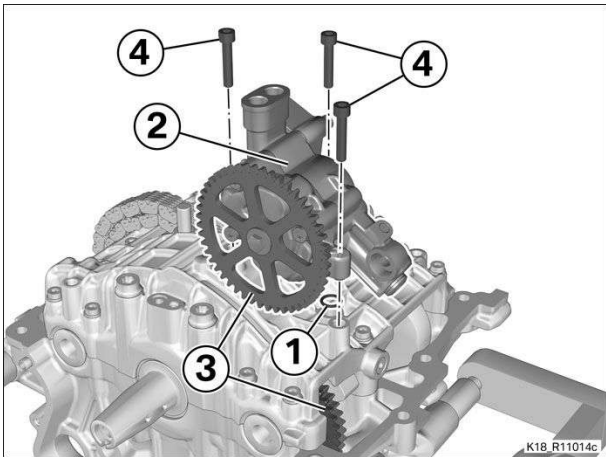
Core activity

(-) Removing oil pump



- Remove screws (1).
- Remove oil pump (2), noting sealing ring (3).

(-) Installing oil pump



- Install sealing ring (1).
- Hold oil pump (2) in position, noting gearwheels (3).
- Install screws (4).

 Tightening torques		
Oil pump to bearing frame		
M6 x 30	10 Nm	

Finishing work

Installing chain guide

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

+ 11 61 578

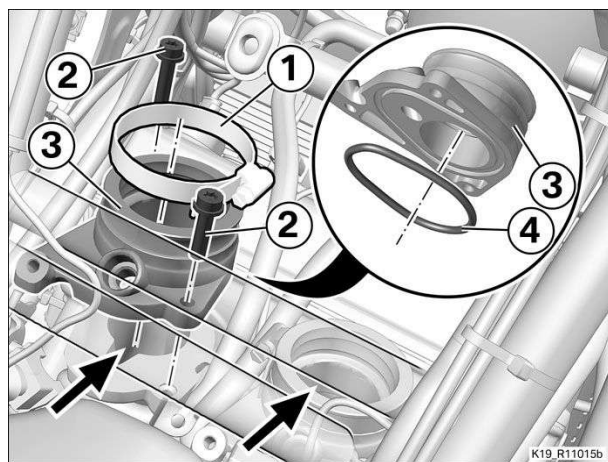
Preparatory work

Removing filler cap flap
Removing centre cover
Opening seat
Removing centre trim panel
Removing handlebar trim
Removing top handlebar cover
Removing bottom handlebar cover
Removing instrument panel with carrier
Removing top left fairing side panel
Removing front left footrest plate
Removing bottom left fairing panel
Removing left side panel
Removing left footplate
Removing top right side panel
Removing front right footplate insert and footrest plate
Removing bottom right fairing panel
Removing right side panel
Removing centre right footplate insert and footrest plate
Removing rear right footplate insert and footrest plate
Removing rear footplate
Removing leg guard
Remove the intake air pipe
Disengaging ignition switch/steering lock
Removing intake air silencer
Removing throttle valve
Disengaging injection line with injection valves

Core activity

(-) Removing air intake stub

- Remove clip (1).
- Remove screws (2) and air intake (3), noting seal (4).
- Use a clean cloth to plug the intake ducts (arrows).

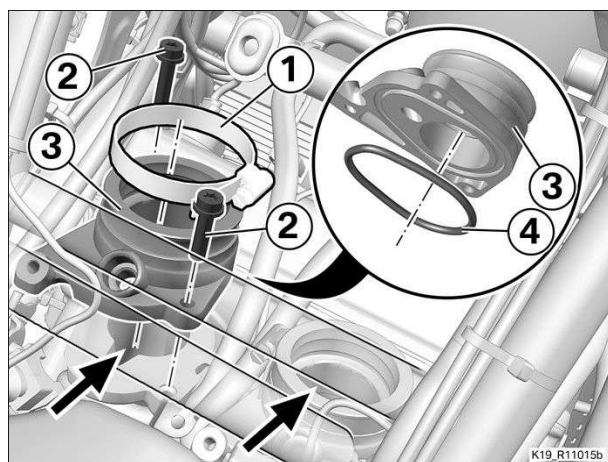


(-) Installing air intake stub

- Remove the cloth from the intake ducts (arrows).
- Check seal (4); replace if necessary.
- Hold air intake stub (3) in position and secure it with screws (2).

Tightening torques		
Air intake to cylinder head		
M6 x 25	10 Nm	

- Place clip (1) in position.



Finishing work

- Securing injection line with injection valves
- Installing throttle valve
- Checking play of throttle cable
- Installing intake air silencer
- Securing ignition switch/steering lock
- Installing intake air pipe
- Installing leg guard
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Installing left footplate
- Installing left side panel
- Installing bottom left fairing panel
- Removing front left footrest plate

Installing top left side panel
Installing centre trim panel
Installing instrument panel with carrier
Installing bottom handlebar cover
Installing top handlebar cover
Installing handlebar trim
Installing centre trim panel
Closing seat
Installing centre cover
Installing filler cap flap
Final check of work performed

 11 78 000 Replacing oxygen sensor
+ 11 78 500

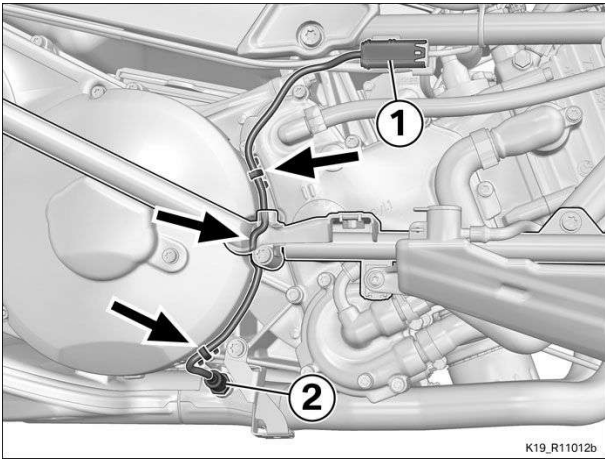
Preparatory work

- Removing filler cap flap
- Opening seat
- Removing centre cover
- Removing front right footplate insert and footrest plate
- Removing centre right footplate insert and footrest plate
- Removing rear right footplate insert and footrest plate
- Removing top right side panel
- Removing bottom right fairing panel
- Removing right side panel
- Removing rear footplate

Core activity

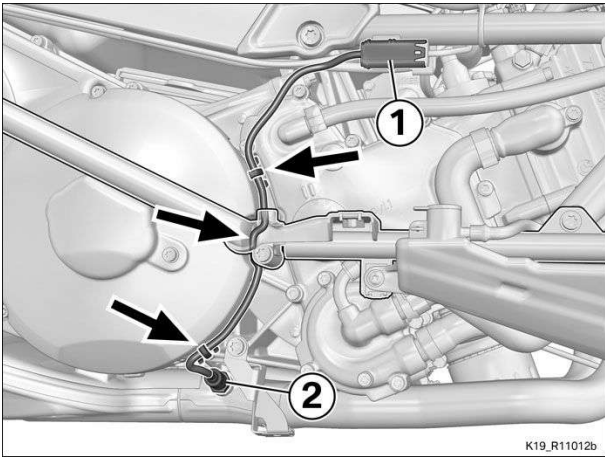
(-) Removing oxygen sensor

- Disconnect connector (1), noting the locators (arrows).
- Remove oxygen sensor (2).



(-) Installing oxygen sensor

- Install oxygen sensor (2).



 Tightening torques		
Oxygen sensor to exhaust manifold		
M12 x 1.25	25 Nm	
Lubricate thread, Lubricant (Optimoly TA)		

 ATTENTION

Routing of oxygen-sensor cable not in compliance with correct procedure.

Damage to oxygen-sensor cable when vehicle is ridden.

- Make sure that the oxygen-sensor cable is routed correctly.

- Route the cable, noting the locators (arrows).

- Connect and secure plug (1).

Finishing work

Installing right footplate

Installing right side panel

Installing bottom right fairing panel

Connecting **BMW Motorrad** diagnostic system to **Maxi-Scooter**

Performing vehicle test with **BMW Motorrad** diagnostic system, reading out fault memory and resetting adaptation values

Disconnecting **BMW Motorrad** diagnostic system from **Maxi-Scooter**

Installing top right side panel

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing front right footplate insert and footrest plate

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

12 00 014 Performing vehicle test with BMW Motorrad diagnostic system

+ 12 00 516

Preparatory work

Opening seat

Removing top right side panel

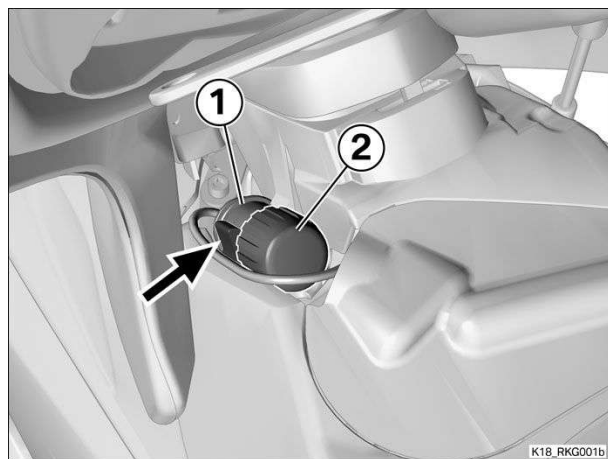
Core activity

(-) Connecting BMW Motorrad diagnostic system to Maxi-Scooter

- Connect the **BMW Motorrad** battery charger to the **battery**.

NOTICE

When carrying out diagnosis and programming, use a battery charger with 30 A approved by **BMW Motorrad** that ensures an **on-board system voltage of 13 V**.



- Disengage diagnosis plug (1) from the holder (arrow) and remove protective cap (2).
- Connect diagnosis plug (1) to the **BMW Motorrad** diagnostic system.

NOTICE

See the information about the **BMW Motorrad** diagnostic system for all further instructions.

(-) Performing vehicle test with BMW Motorrad diagnostic system

- Perform the vehicle test with the **BMW Motorrad** diagnostic system and read out the **fault memory**.

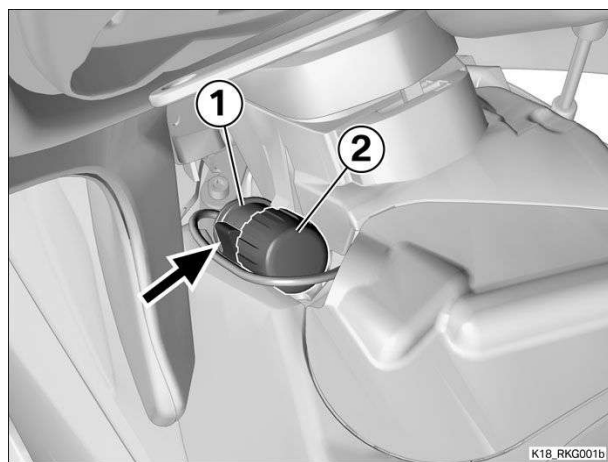
NOTICE

When working with the **BMW Motorrad** diagnostic system, always follow the instructions it issues.

- Follow instructions or use the diagnosis options, as applicable.

(-) Disconnecting BMW Motorrad diagnostic system from Maxi-Scooter

- Close all diagnostic programs and switch off the ignition.
- Disconnect the **BMW Motorrad** diagnostic system from diagnosis plug (1) and install cap (2).
- Secure diagnosis plug (1) in the holder (arrow).
- Disconnect the **BMW Motorrad** battery charger from the **Maxi-Scooter**.



Finishing work

Installing top right side panel

Closing seat

Final check of work performed

12 12 011 Renewing all spark plugs

+ 12 12 513

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing front left footrest plate

Removing left side panel

Removing air deflector

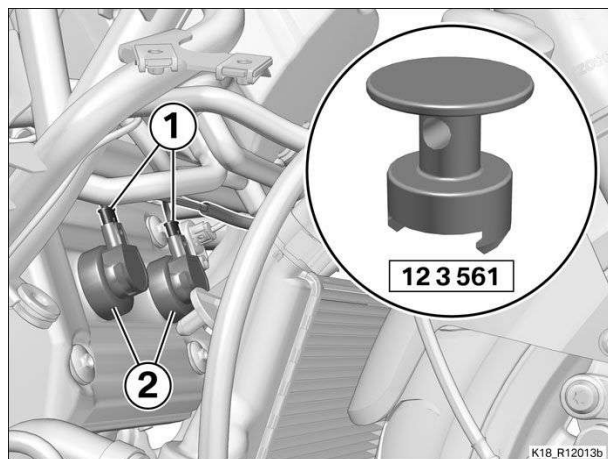
Disengaging expansion tank for coolant

Disengaging and lowering radiator

Core activity

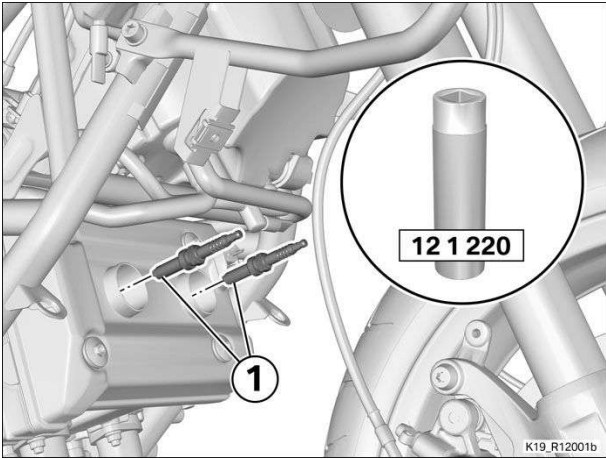
(-) Removing ignition coils

- Disconnect plug (1).
- Remove ignition coils (2) with puller (No. 12 3 561).



(-) Removing spark plugs

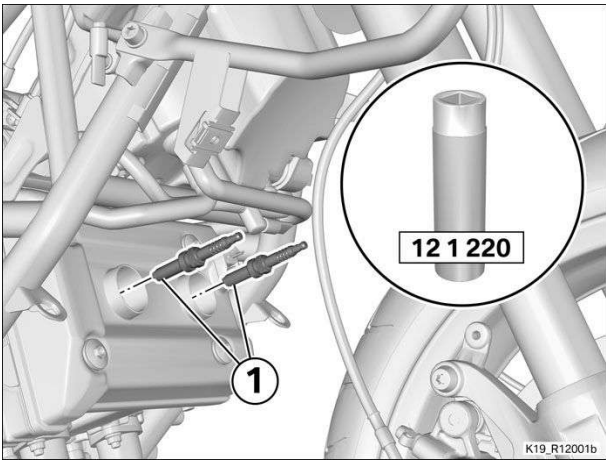
- Clean the spark-plug recess with compressed air.
- Remove spark plugs (1) with spark-plug wrench (No. 12 1 220).



(-) Installing spark plugs

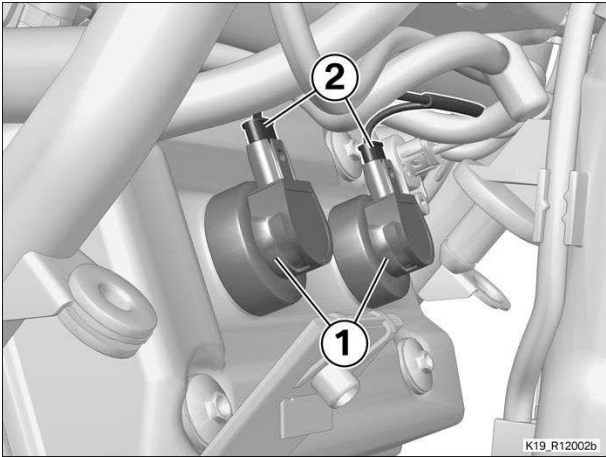
- Install spark plugs (1) with spark-plug wrench (No. 12 1 220).

 Tightening torques			
Spark plug to cylinder head			
M10 x 1	12 Nm		
 Technical data			
Spark plugs, manufacturer and designation		NGK LMAR8D-J	



(-) Installing ignition coils

- Install ignition coils (1).
- Connect plug (2).



Finishing work

- Securing radiator
- Securing expansion tank for coolant
- Installing air deflector
- Installing left side panel
- Installing front left footrest plate
- Installing right footplate

Installing rear right footplate insert and footrest plate
Installing centre right footplate insert and footrest plate
Installing right side panel
Installing bottom right fairing panel
Installing front right footplate insert and footrest plate
Installing top right side panel
Installing centre cover
Closing seat
Installing filler cap flap
Final check of work performed

12 12 509 Replace all spark plugs (for maintenance)

Preparatory work

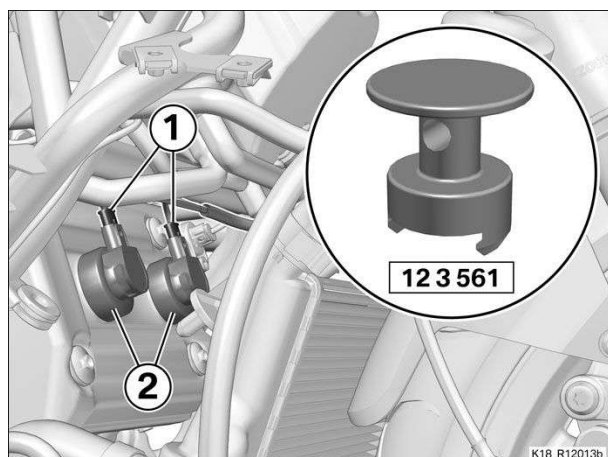
Removing air deflector

Disengaging expansion tank for coolant

Disengaging and lowering radiator

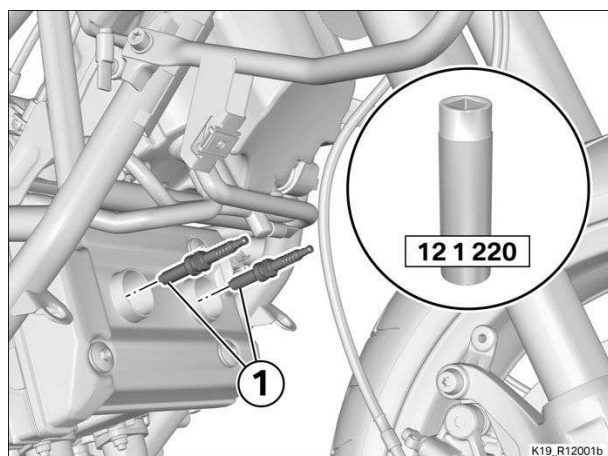
Core activity

(-) Removing ignition coils



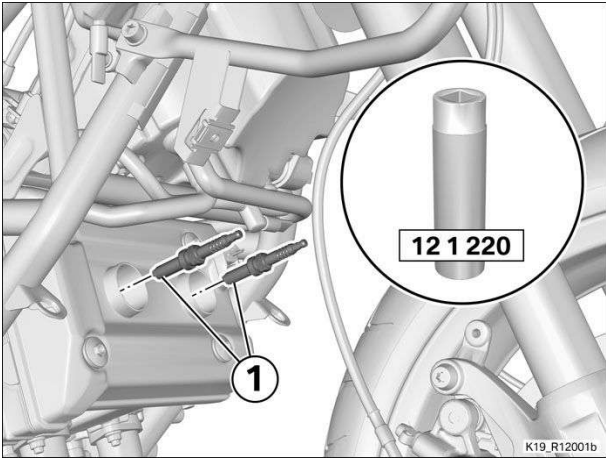
- Disconnect plug (1).
- Remove ignition coils (2) with puller (No. 12 3 561).

(-) Removing spark plugs



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

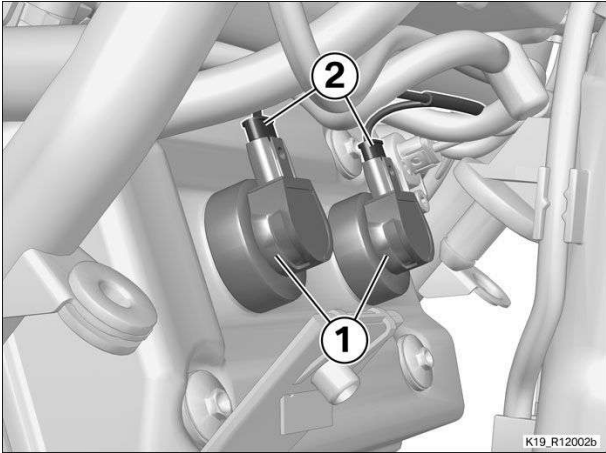
(-) Installing spark plugs



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

 Tightening torques			
Spark plug to cylinder head			
M10 x 1	12 Nm		
 Technical data			
Spark plugs, manufacturer and designation		NGK LMAR8D-J	

(-) Installing ignition coils



- Install ignition coils (1).
- Connect plug (2).

Finishing work

- Securing radiator
- Securing expansion tank for coolant
- Installing air deflector
- Final check of work performed

12 13 155 Replacing direct ignition coil

+ 12 13 655

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing front left footrest plate

Removing left side panel

Removing air deflector

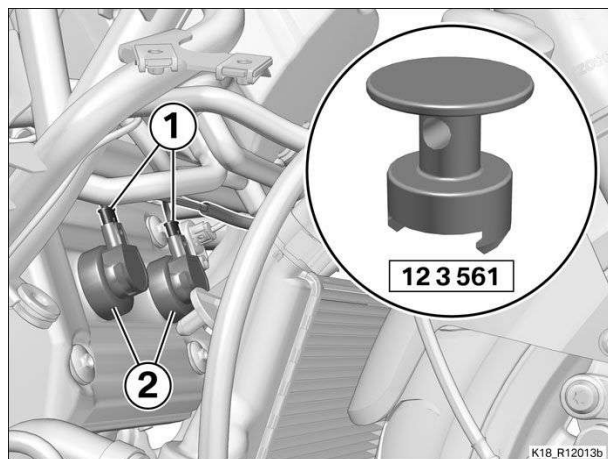
Removing expansion tank for coolant

Disengaging and lowering radiator

Core activity

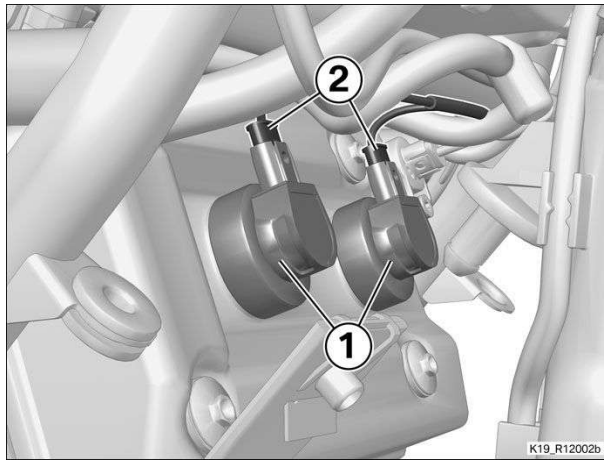
(-) Removing ignition coils

- Disconnect plug (1).
- Remove ignition coils (2) with puller (No. 12 3 561).



(-) Installing ignition coils

- Install ignition coils (1).
- Connect plug (2).



Finishing work

Securing radiator

Installing expansion tank for coolant

Installing air deflector

Installing left side panel

Installing front left footrest plate

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Connecting **BMW Motorrad** diagnostic system to **Maxi-Scooter**

Performing vehicle test with **BMW Motorrad** diagnostic system, reading out fault memory and resetting adaptation values

Disconnecting **BMW Motorrad** diagnostic system from **Maxi-Scooter**

Installing top right side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

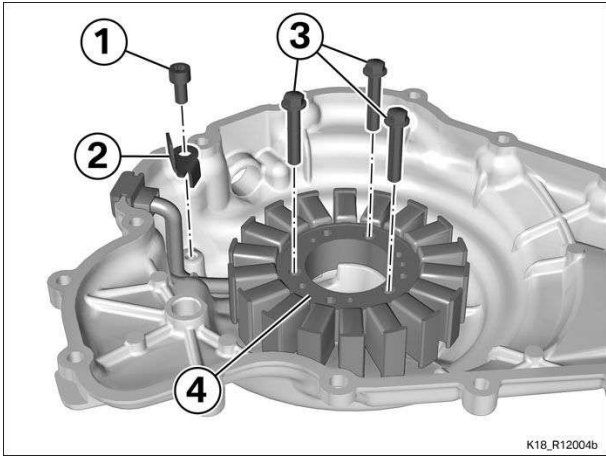
 12 31 021 Replacing stator
+ 12 31 684

Preparatory work

- Removing filler cap flap
- Opening seat
- Removing centre cover
- Removing top left fairing side panel
- Removing front left footplate insert and footrest plate
- Removing bottom left fairing panel
- Removing left side panel
- Removing centre left footplate insert and footrest plate
- Removing rear left footrest plate with footplate insert and oil filler panel.
- Draining engine oil from engine block
- Removing left footplate
- Removing left footplate carrier
- Removing left sound-absorbing hood
- Removing left crankcase cover

Core activity

(-) Removing stator



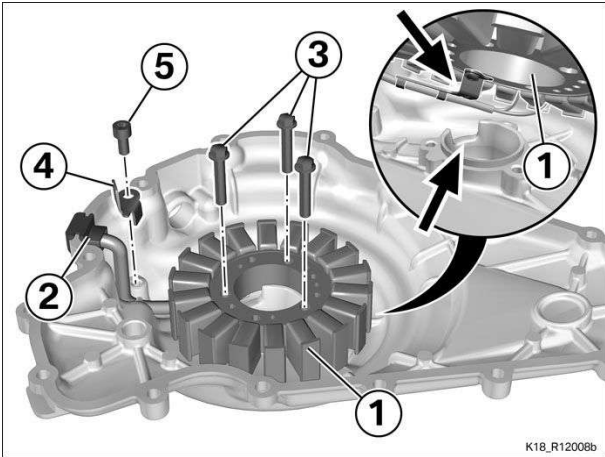
- Remove the following components:
- Screw (1)
- Bracket (2)
- Screws (3)
- Stator (4)

(-) Installing stator

- Insert stator (1), noting the position of the cable pigtail (arrows).
- Seal rubber grommet (2).

 Sealant	
Dow Corning	07 58 0 397 777

- Install screws (3).



 Tightening torques		
Stator to housing cover		
M6 x 30	10 Nm	

• Secure bracket (4) with screw (5).

 Tightening torques		
Holder for alternator cable to crankcase cover		
M6 x 12	10 Nm	

Finishing work

- Installing left crankcase cover
- Installing sound-absorbing hood
- Installing left footplate carrier
- Installing left footplate
- Pouring engine oil into engine
- Installing rear left footrest plate with footplate insert and oil filler panel
- Installing centre left footplate insert and footrest plate
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

12 31 022 Replace generator

+ 12 31 673

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footrest plate with footplate insert and oil filler panel.

Draining engine oil from engine block

Removing left footplate

Removing left footplate carrier

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

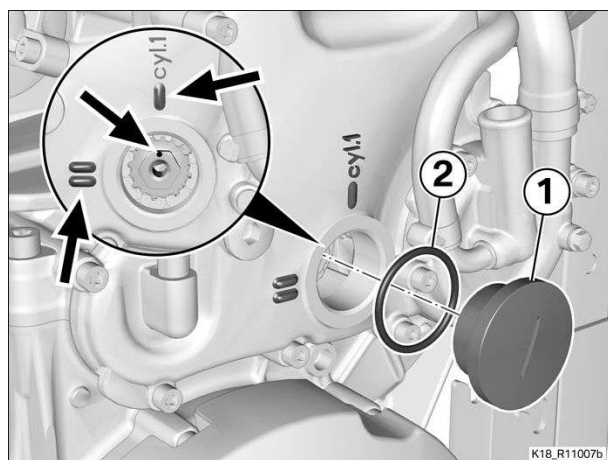
Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing underbody panel

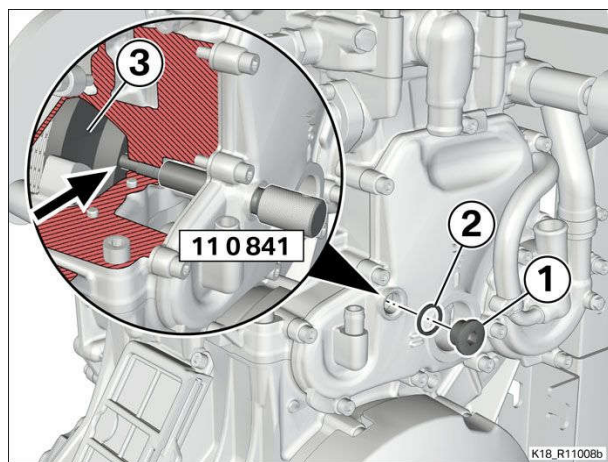
Core activity

(-) Setting engine to firing TDC and securing it in position



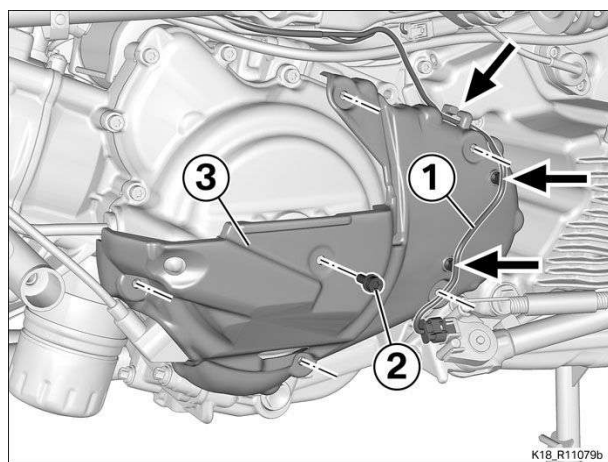
- Remove screw (1) with seal (2).
- Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward one of the line marks (arrow).
- » The corresponding cylinder 1 (alternator side) or 2 (timing-chain side) is at TDC.

- Remove screw (1) and seal (2).
- Make sure that the hole (arrow) in crankshaft (3) is visible.
- Insert locking pin, making sure that it engages in the hole (arrow) in crankshaft (3).



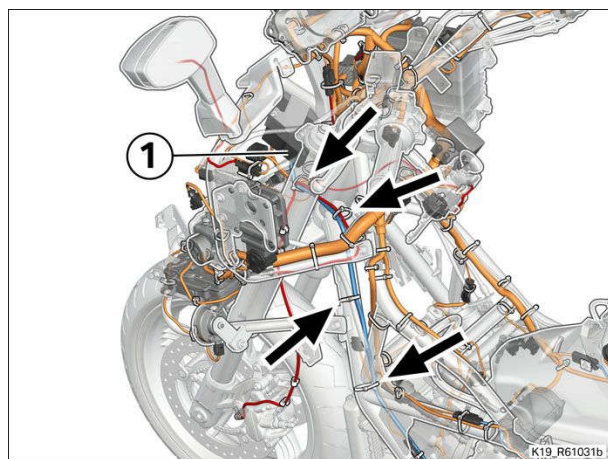
(-) Removing left sound-absorbing hood

- Disengage cable (1) (arrows).
- Remove screws (2) and hood (3).



(-) Removing left crankcase cover

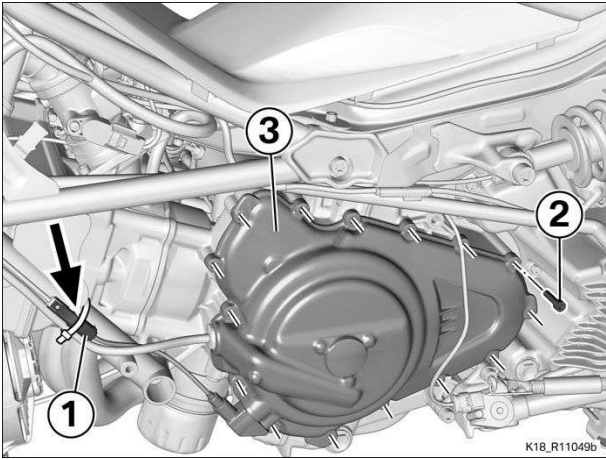
- Disconnect plug (1) for the regulator and disengage the cable (arrows).



- Open the cable tie (arrow) and disconnect plug (1) for the crankshaft sensor.
- Remove screws (2) and cover (3).

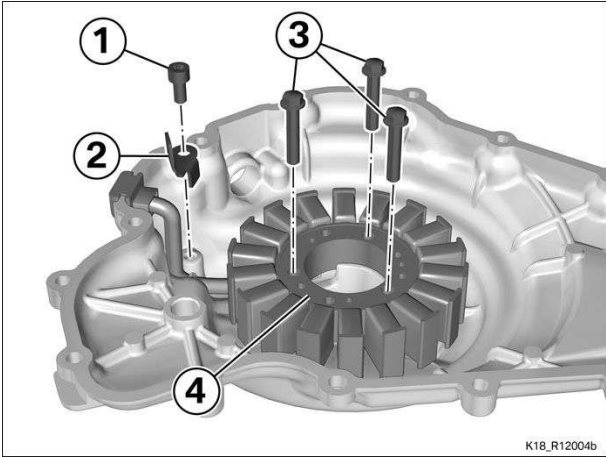
NOTICE

The sealing compound forms a strong bond and in some instances engine components can be difficult to separate. Separate the engine components by tapping them with a rubber mallet, without damaging cooling ribs or other parts of the crankcase.



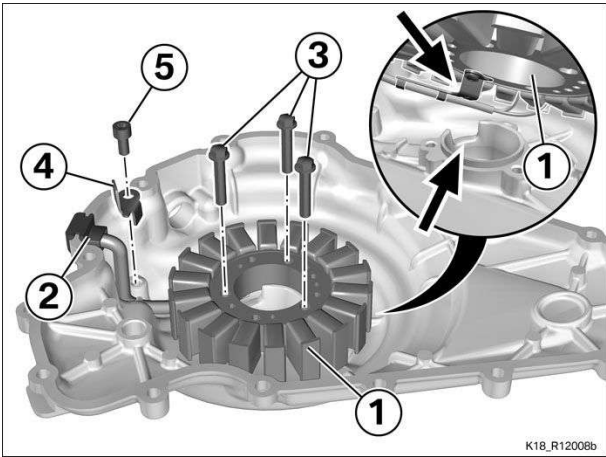
(-) Removing stator

- Remove the following components:
 - Screw (1)
 - Bracket (2)
 - Screws (3)
 - Stator (4)



(-) Installing stator

- Insert stator (1), noting the position of the cable pigtail (arrows).
- Seal rubber grommet (2).



 Sealant	
Dow Corning	07 58 0 397 777

- Install screws (3).

 Tightening torques		
Stator to housing cover		
M6 x 30	10 Nm	

- Secure bracket (4) with screw (5).

 Tightening torques		
Holder for alternator cable to crankcase cover		
M6 x 12	10 Nm	

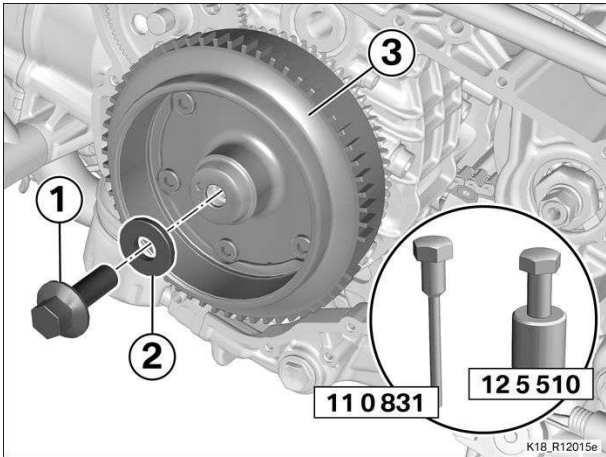
(-) Removing magnetic wheel

Requirement

- Engine locked.



- Insert screw (No. 11 0 831) (Order No. 83 30 2 297 981) into puller (No. 12 5 510).
- Remove screw (1) and washer (2).
- Remove magnetic wheel (3) with puller (No. 12 5 510).



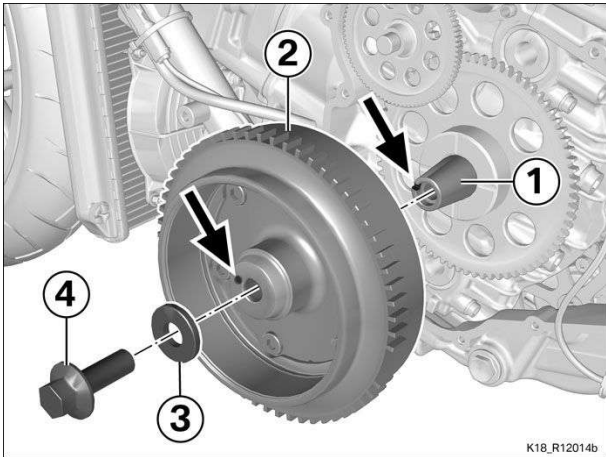
(-) Installing magnetic wheel

Requirement

- Engine locked.



- Carefully clean the tapers of crankshaft (1) and magnetic wheel (2).
- Place magnetic wheel (2), noting the locator (arrows).
- Install washer (3) and screw (4)



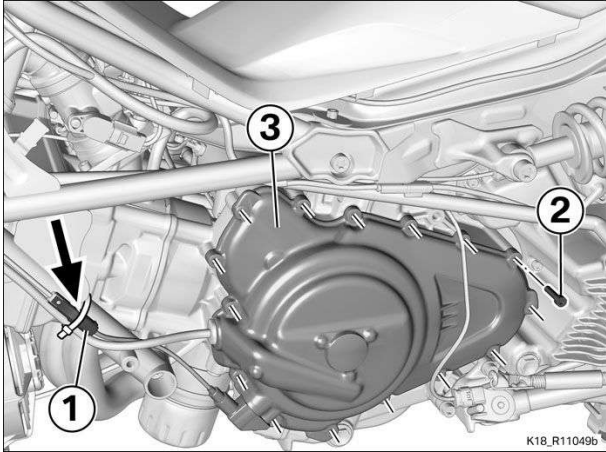
 Tightening torques		
Magnetic gear to crankshaft		
M12 x 1	150 Nm	

(-) Installing left crankcase cover

- Clean the sealing faces.
- Apply sealant thinly to the sealing face.

 Sealant	
Dow Corning	07 58 0 397 777

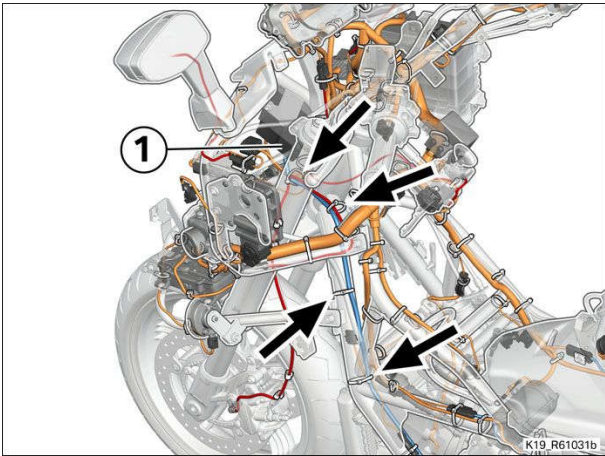
- Install cover (3) and screws (2).



 Tightening torques		
Crankcase cover, left, to crankcase		
M6 x 25	tighten in diagonally	

	opposite sequence	
	10 Nm	

- Connect plug (1) for the crankshaft sensor and secure it with cable tie (arrow).
- Route the cable, connect plug (1) for the regulator and secure the cable (arrows).

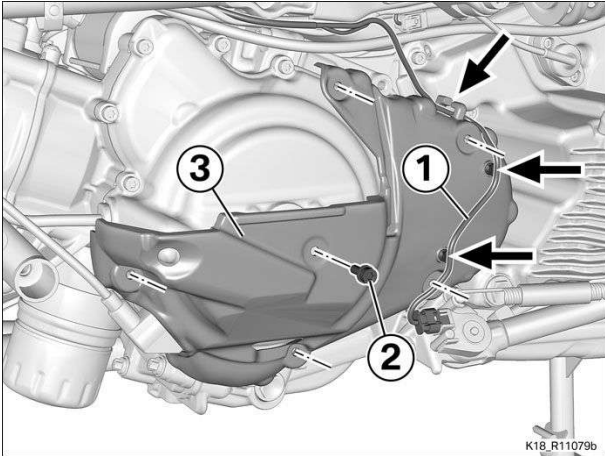


(-) Installing sound-absorbing hood

- Secure hood (3) with screws (2).

Tightening torques		
Sound-absorbing hood to engine cover, right		
M6 x 18	10 Nm	

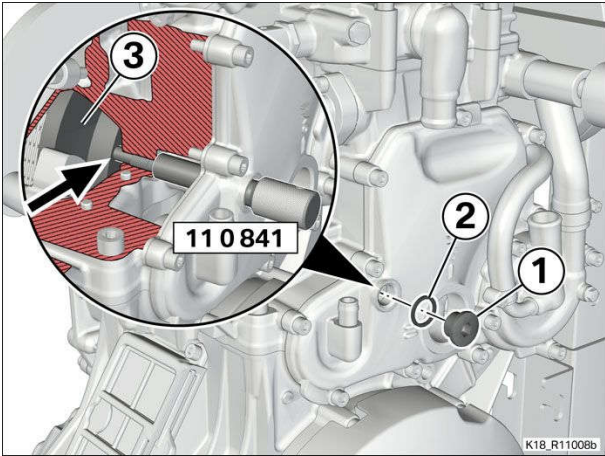
- Secure cable (1) (arrows).



(-) Removing locator for TDC position

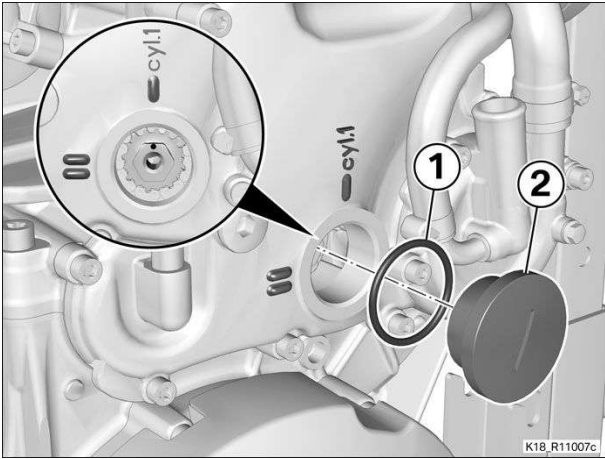
- Remove locking pin (No. 11 0 841) from the hole (arrow) in crankshaft (3).
- Install new seal (2) and screw (1).

Tightening torques		
Threaded plug (hole for locking pin) to engine cover, right		
M16 x 1.5	20 Nm	



(-) Installing threaded plug (crankshaft)

- Check sealing ring (1); replace if necessary.
- Install screw (2) with sealing ring (1).



Tightening torques		
Threaded plug (crankshaft) to engine cover, right		
M36 x 1.5	20 Nm	

finishing work

- Installing underbody panel
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Installing left footplate carrier
- Installing left footplate
- Pouring engine oil into engine
- Installing rear left footrest plate with footplate insert and oil filler panel
- Installing centre left footplate insert and footrest plate
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

12 31 023 Replacing magnetic wheel

+ 12 31 685

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footrest plate with footplate insert and oil filler panel.

Draining engine oil from engine block

Removing left footplate

Removing left footplate carrier

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

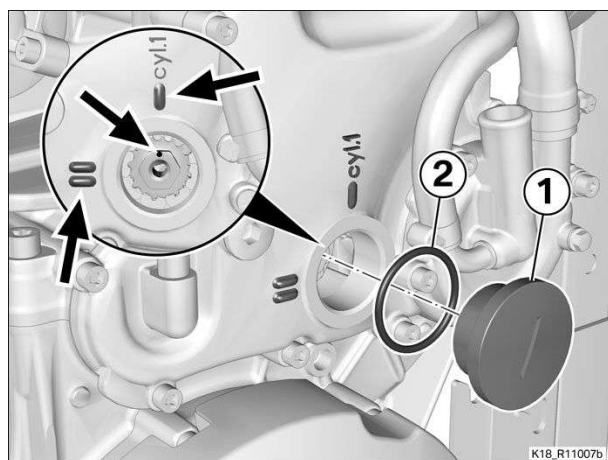
Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing underbody panel

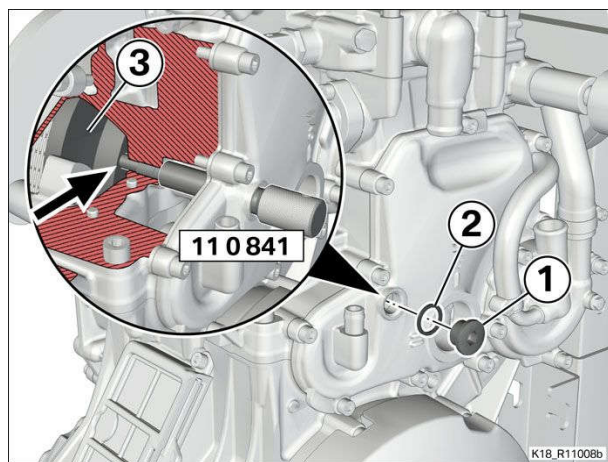
Core activity

(-) Setting engine to firing TDC and securing it in position



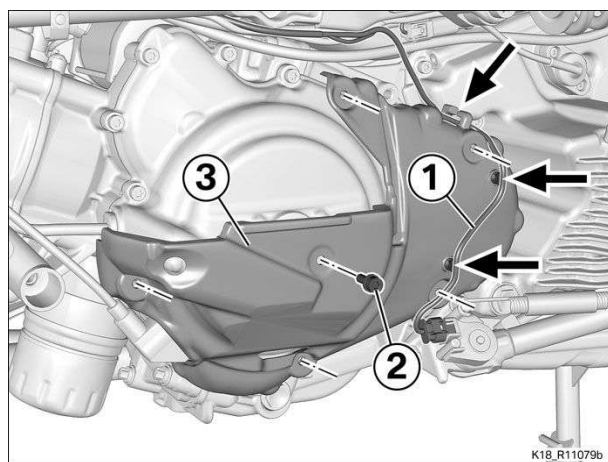
- Remove screw (1) with seal (2).
- Turn the engine in the normal direction of rotation until the mark on crankshaft (arrow) points toward one of the line marks (arrow).
- » The corresponding cylinder 1 (alternator side) or 2 (timing-chain side) is at TDC.

- Remove screw (1) and seal (2).
- Make sure that the hole (arrow) in crankshaft (3) is visible.
- Insert locking pin, making sure that it engages in the hole (arrow) in crankshaft (3).



(-) Removing left sound-absorbing hood

- Disengage cable (1) (arrows).
- Remove screws (2) and hood (3).



(-) Disengaging left crankcase cover

- Open the cable tie (arrow) and disconnect plug (1) for the crankshaft sensor.
- Remove screws (2).

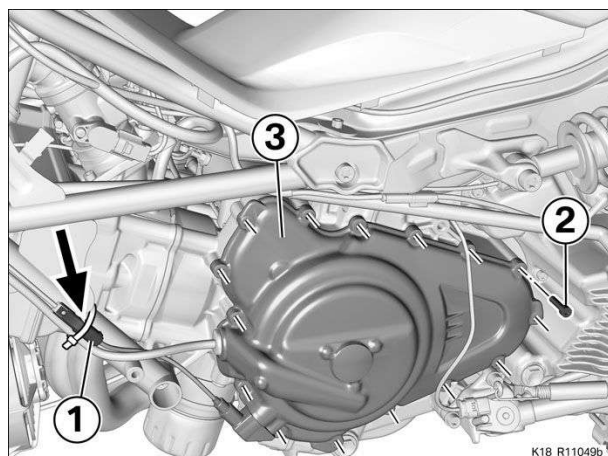


WARNING

Overstretching of cables and lines.

Malfunctions

- Do not place strain on lines and cables.
-
- Disengage cover (3) and ease it aside.



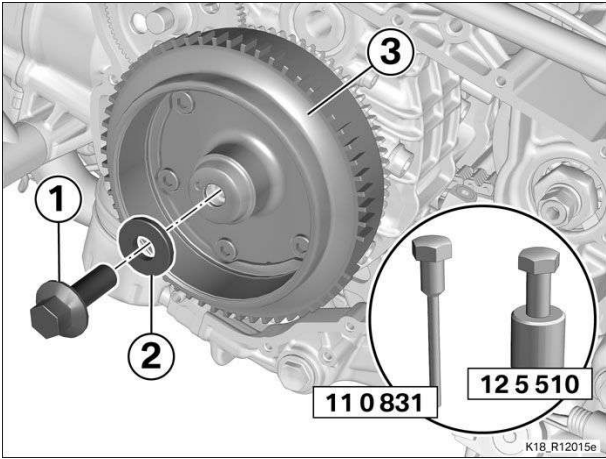
(-) Removing magnetic wheel

Requirement

- Engine locked.



- Insert screw (No. 11 0 8 3 1) (Order No. 83 30 2 297 981) into puller (No. 12 5 5 10).
- Remove screw (1) and washer (2).
- Remove magnetic wheel (3) with puller (No. 12 5 5 10).



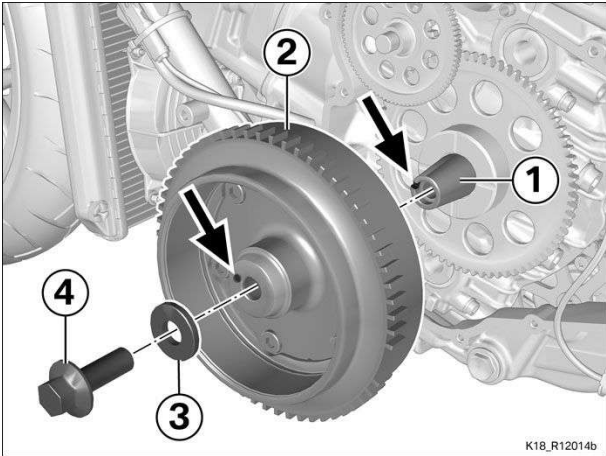
(-) Installing magnetic wheel

Requirement

- Engine locked.



- Carefully clean the tapers of crankshaft (1) and magnetic wheel (2).
- Place magnetic wheel (2), noting the locator (arrows).
- Install washer (3) and screw (4)



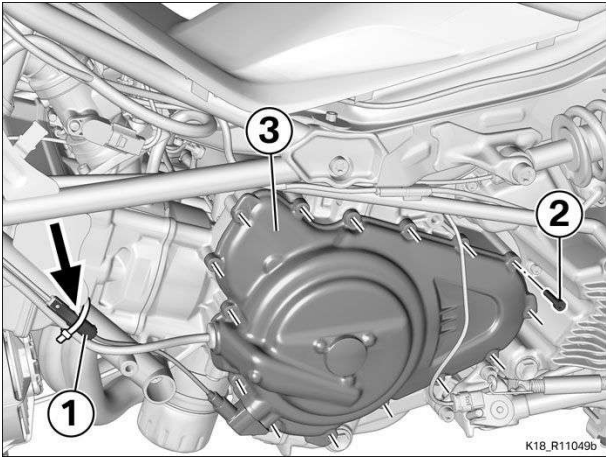
 Tightening torques		
Magnetic gear to crankshaft		
M12 x 1	150 Nm	

(-) Securing left crankcase cover

- Clean the sealing faces.
- Apply sealant thinly to the sealing face.

 NOTICE

Exercise particularly meticulous care when sealing areas where two sealing faces/joins meet.



 Sealant	
Dow Corning	07 58 0 397 777

- Install cover (3) and screws (2).

 Tightening torques		
Crankcase cover, left, to crankcase		
M6 x 25	tighten in diagonally	

	opposite sequence	
	10 Nm	

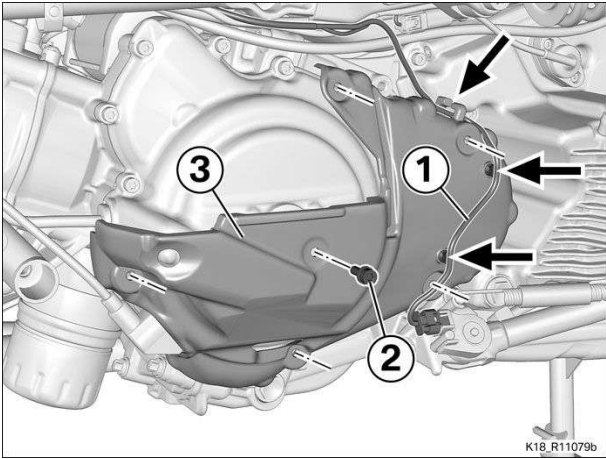
- Connect plug (1) for the crankshaft sensor and secure it with cable tie (arrow).

(-) Installing sound-absorbing hood

- Secure hood (3) with screws (2).

 Tightening torques		
Sound-absorbing hood to engine cover, right		
M6 x 18	10 Nm	

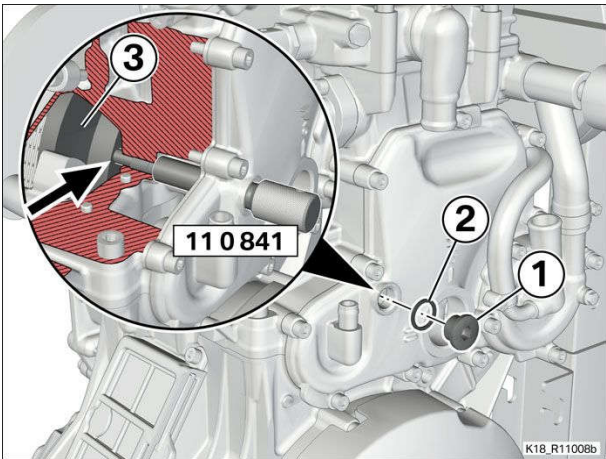
- Secure cable (1) (arrows).



(-) Removing locator for TDC position

- Remove locking pin (No. 11 0 841) from the hole (arrow) in crankshaft (3).
- Install new seal (2) and screw (1).

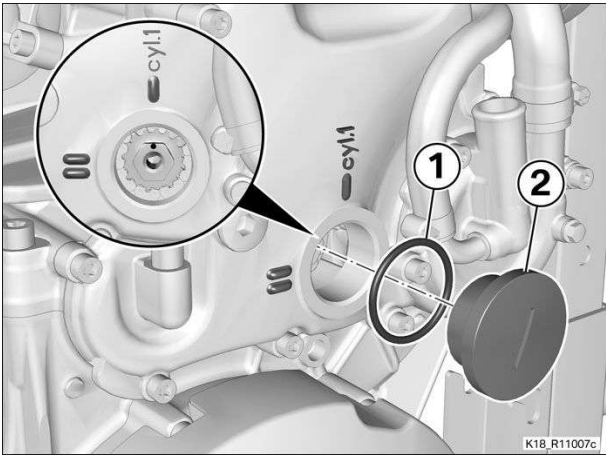
 Tightening torques		
Threaded plug (hole for locking pin) to engine cover, right		
M16 x 1.5	20 Nm	



(-) Installing threaded plug (crankshaft)

- Check sealing ring (1); replace if necessary.
- Install screw (2) with sealing ring (1).

 Tightening torques		
Threaded plug (crankshaft) to engine cover, right		
M36 x 1.5	20 Nm	



Finishing work

Installing underbody panel

- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Installing left footplate carrier
- Installing left footplate
- Pouring engine oil into engine
- Installing rear left footrest plate with footplate insert and oil filler panel
- Installing centre left footplate insert and footrest plate
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

 12 32 000 Removing/installing voltage regulator

+ 12 32 500

Construction status:
February 2014

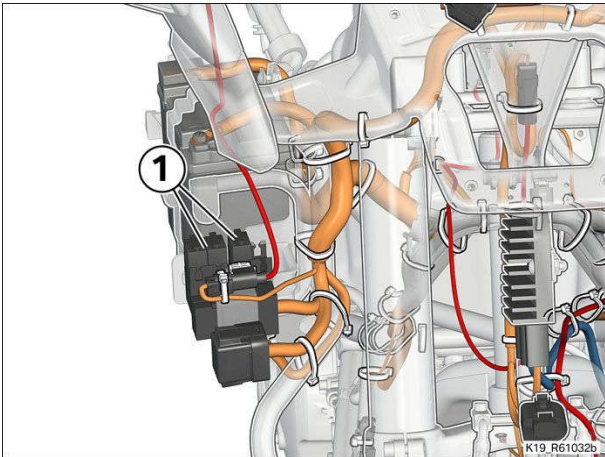
Preparatory work

Removing top right side panel

Core activity

(-) Removing voltage regulator

- Disengage relay carrier (1).



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

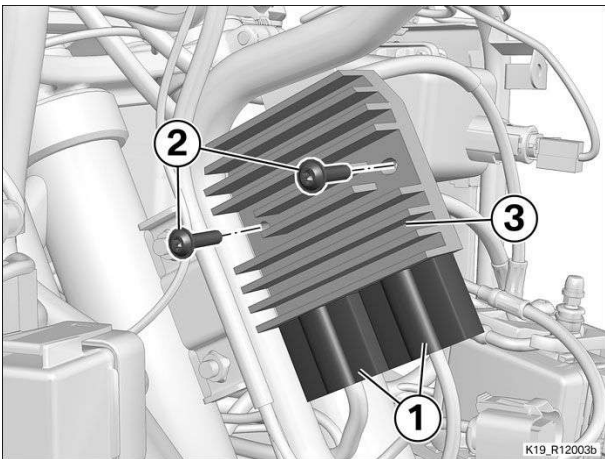
 ATTENTION

Hard or sharp-edged objects.

Component damage

- Take care not to scratch components; cover or mask as necessary.

- Remove voltage regulator (3) by working it **down**, taking care not to damage the front wheel cover.

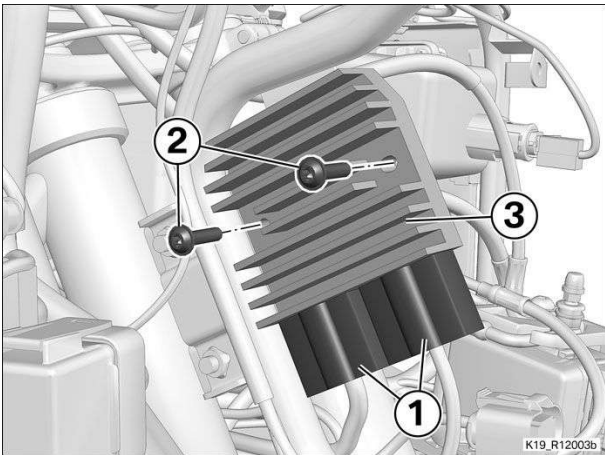


(-) Installing voltage regulator

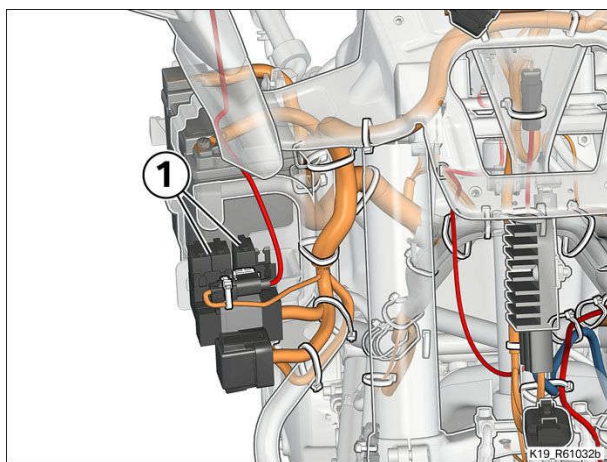
- Hold voltage regulator (3) in position.

 Tightening torques		
Voltage regulator to fairing bracket		
M6 x 25	8 Nm	

- Install screws (2).
- Connect plug (1).



- Secure relay holder (1).



Finishing work

Installing top right side panel

Final check of work performed

12 41 025 Replacing starter

+ 12 41 528

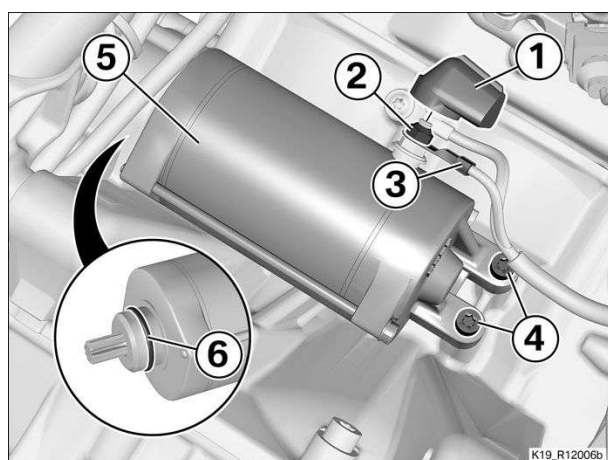
Preparatory work

Removing top right side panel
Disconnecting battery leads
Removing filler cap flap
Opening seat
Removing centre cover
Removing front right footrest plate
Removing right side panel
Removing front left footrest plate
Removing left side panel
Removing hinge
Removing fuel-pump cover
Removing cover for fuel tank
Removing seat
Removing carpet for luggage compartment
Removing left rear trim panel
Removing right rear trim panel
Removing rear grab handle
Disengaging rear light with cover
Removing top luggage-compartment cover
Removing fuel tank
Removing heat shield foil

Core activity

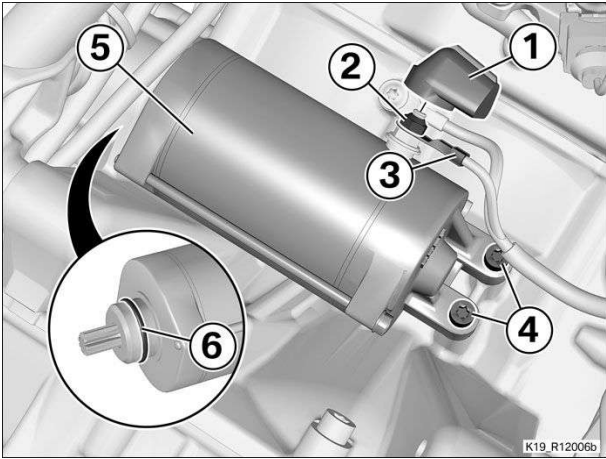
(-) Removing starter

- Remove safety cap (1).
- Remove nut (2) and disconnect positive lead (3).
- Remove screws (4).
- Remove starter (5), noting O-ring (6).



(-) Installing starter

- Lubricate O-ring (6).



Lubricant

Klüberpaste 46 MR 401	11 00 7 660 831
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- Install starter (5).
- Install screws (4).



Tightening torques

Starter to crankcase		
M6 x 25	10 Nm	

- Hold positive lead (3) in position and install nut (2).



Tightening torques

Wiring harness (positive contact) to starter		
M6, Replace nut Thread-locking compound (mechanical)	8 Nm	

- Install safety cap (1).

Finishing work

- Installing heat shield foil
- Securing fuel tank
- Installing top luggage-compartment cover
- Securing rear light with cover
- Installing rear grab handle
- Installing right rear trim panel
- Installing left rear trim panel
- Installing carpet for luggage compartment
- Installing seat
- Installing cover for fuel tank
- Installing fuel-pump cover
- Installing hinge
- Installing left side panel
- Installing front left footrest plate
- Installing right side panel
- Installing front right footrest plate
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Connecting battery leads
- Installing top right side panel

Checking, if necessary correcting date

Final check of work performed

12 61 001 Replacing oil-level/oil-temperature sensor

+ 12 61 567

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing front left footplate insert and footrest plate

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing top left fairing side panel

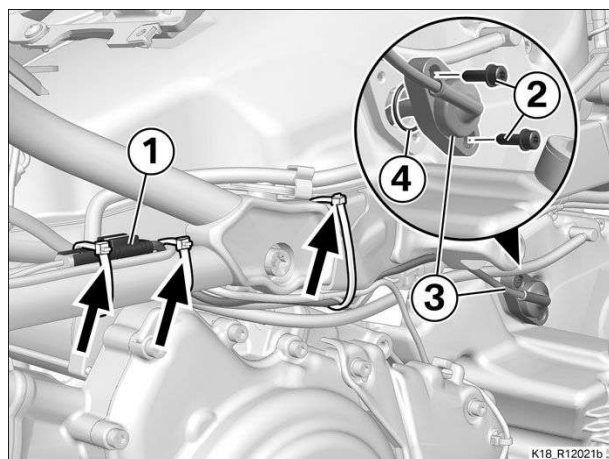
Removing bottom left fairing panel

Removing left side panel

Removing left footplate

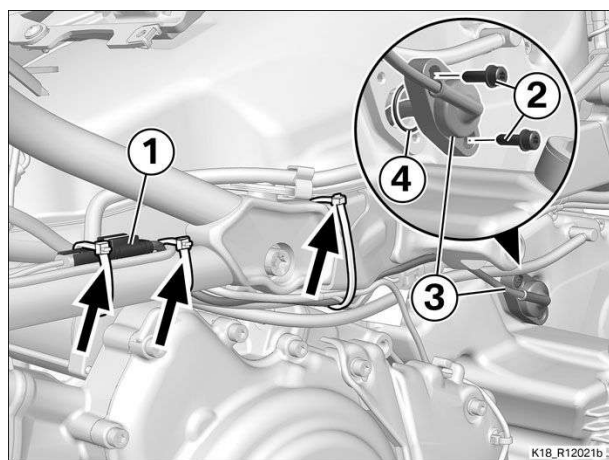
Core activity

(-) Removing oil-level/oil-temperature sensor



- Remove the cable ties (arrows).
- Disconnect plug (1) for the oil-level/oil-temperature sensor.
- Remove screws (2).
- Remove oil-level/oil-temperature sensor (3) with sealing ring (4).

(-) Installing oil-level/oil-temperature sensor



- Clean the threads.
- Install oil-level/oil-temperature sensor (3), noting sealing ring (4).
- Install screws (2).
- Connect plug (1) for the oil-level/oil-temperature sensor.
- Install the cable tie (arrow).

Finishing work

Installing left footplate

Installing left side panel

- Installing bottom left fairing panel
- Installing top left side panel
- Installing rear left footplate insert and footrest plate
- Installing centre left footplate insert and footrest plate
- Installing front left footplate insert and footrest plate
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

 12 62 010 Replacing coolant-temperature sensor

+ 12 62 510

Preparatory work

- Removing filler cap flap
- Opening seat
- Removing front right footrest plate
- Removing centre cover
- Removing right side panel

Core activity

(-) Removing coolant-temperature sensor

- Disconnect connector (1).

 CAUTION

Working on hot cooling system.

Risk of burn injury

- Always allow the cooling system to cool down before starting work.

- Remove coolant-temperature sensor (2).

(-) Installing coolant-temperature sensor

- Install coolant-temperature sensor (2).

 Tightening torques		
Temperature sensor to cylinder head		
M12 x 1,5	15 Nm	

- Connect plug (1).

Finishing work

- Connecting **BMW Motorrad** diagnostic system to **Maxi-Scooter**
- Performing vehicle test with **BMW Motorrad** diagnostic system, reading out fault memory and resetting adaptation values
- Disconnecting **BMW Motorrad** diagnostic system from **Maxi-Scooter**
- Installing right side panel
- Installing centre cover
- Installing front right footrest plate
- Closing seat
- Installing filler cap flap
- Final check of work performed

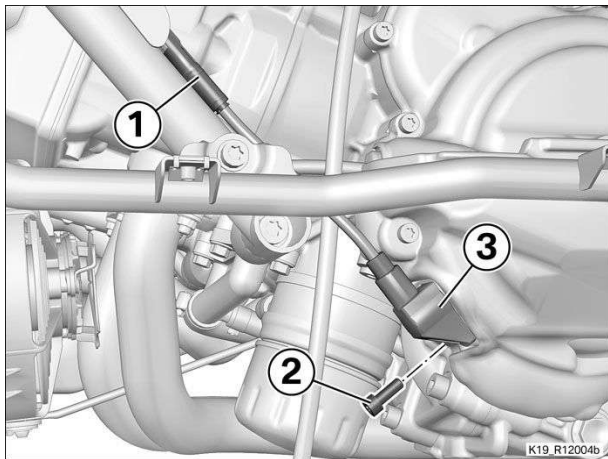
 12 72 001 Replacing crankshaft sensor
+ 12 72 501

Preparatory work

- Removing filler cap flap
- Opening seat
- Removing centre cover
- Removing front left footplate insert and footrest plate
- Removing centre left footplate insert and footrest plate
- Removing rear left footplate insert and footrest plate
- Removing top left fairing side panel
- Removing bottom left fairing panel
- Removing left side panel
- Removing left footplate

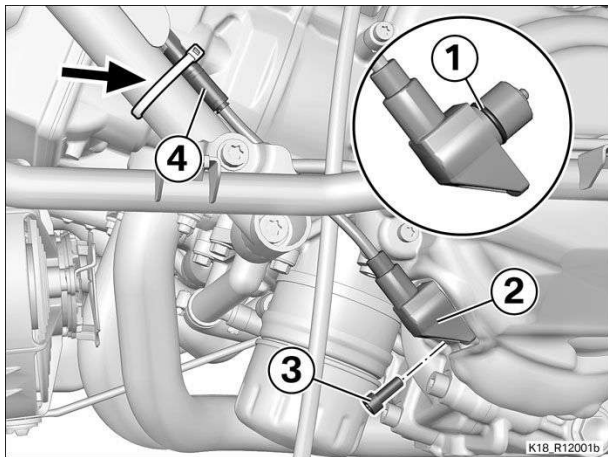
Core activity

(-) Removing crankshaft sensor



- Disconnect plug (1).
- Remove screw (2).
- Remove crankshaft sensor (3).

(-) Installing crankshaft sensor



- Check sealing ring (1); replace if necessary.
- Install crankshaft sensor (2).
- Install screw (3).

 Tightening torques		
Crankshaft sensor to engine cover		
M6 x 16	10 Nm	

- Connect and secure plug (4).

Finishing work

- Installing left footplate
- Installing left side panel

- Installing bottom left fairing panel
- Installing top left side panel
- Installing rear left footplate insert and footrest plate
- Installing centre left footplate insert and footrest plate
- Installing front left footplate insert and footrest plate
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

 12 72 020 Replacing camshaft sensor
+ 12 72 520

 NOTICE

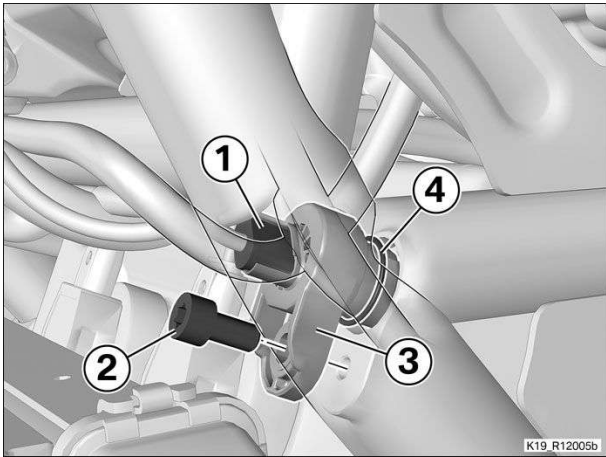
Discontinuation of the camshaft sensor with its wiring-harness plug from model year 2014 onward.

Preparatory work

Removing air deflector

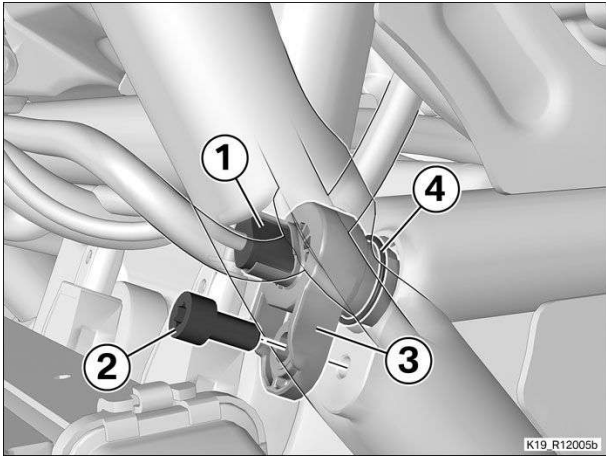
Core activity

(-) Removing camshaft sensor



- Disconnect plug (1).
- Remove screw (2).
- Remove camshaft sensor (3) with seal (4).

(-) Installing camshaft sensor



- Install camshaft sensor (3) with new seal (4).
- Install screw (2).

 Tightening torques		
Camshaft sensor to cylinder head cover		
M6 x 16	10 Nm	

- Connect plug (1).

Finishing work

Installing air deflector

Final check of work performed

13 53 000 Renewing injector pipe

+ 13 53 500

Preparatory work

Removing filler cap flap

Removing centre cover

Opening seat

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing left footplate

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

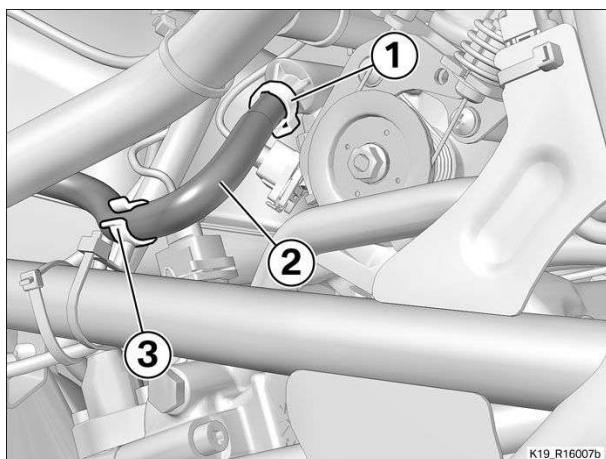
Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing underbody panel

Core activity

(-) Removing injection line



- Use a screwdriver to ease open hose clip (1).
- Disengage fuel feed hose (2) from holder (3).

- Disconnect plug (1) for the injection valves.

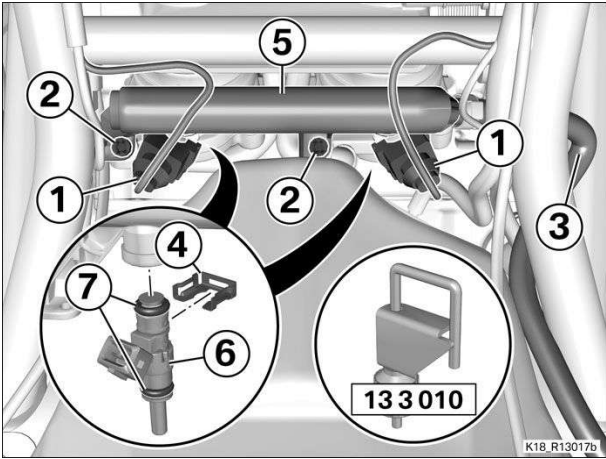
- Remove screws (2).

ATTENTION

Escape of fuel when pressurised fuel lines are opened.

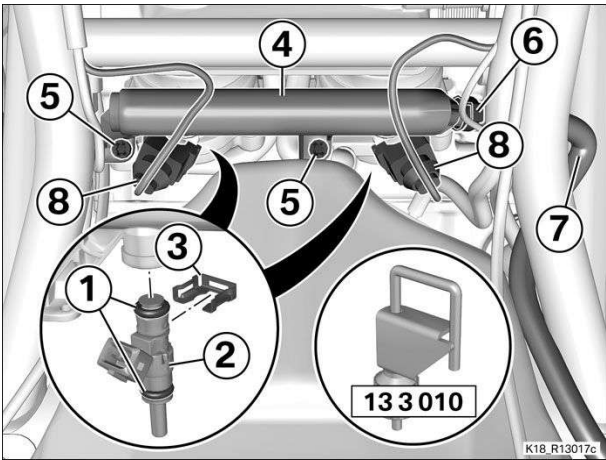
Damage to component surfaces.

- Employ suitable means to catch escaping fuel.



- Seal off fuel feed hose (3) with hose clamp (No. 13 3 010).
- Disengage fuel feed hose (3) from injection line (5).
- Remove injection line (5) with injection valves (6), noting O-rings (7).
- Remove spring clips (4).
- Remove injection valves (6) with O-rings (7) from injection line (5).

(-) Installing injection line



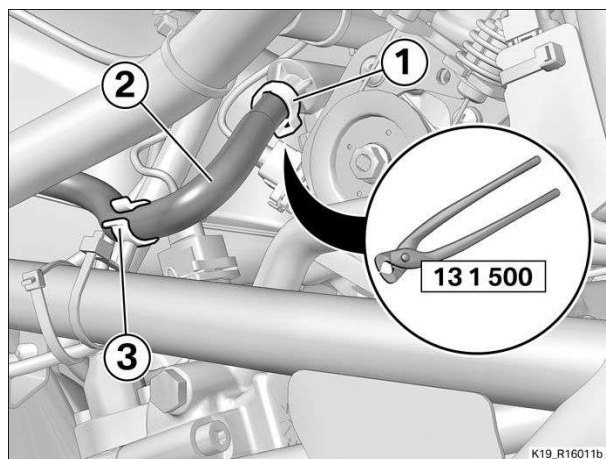
- Clean the threads.
- Replace O-rings (1) and lubricate

 Care products	
Rubber care product	83 12 0 397 018

- Secure injection valves (2) with spring clips (3) in new injection line (4), noting O-rings (1).
- Insert injection line (4), noting O-rings (1).
- Install screws (5).

 Tightening torques		
Injection rail to adapter for throttle valve		
M5 x 12	3 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		

- Position hose clip (6) on fuel feed hose (7).
- Connect fuel feed hose (7) to injection line (4).
- Remove hose clamp (No. 13 3 010) from fuel feed hose (7).
- Connect plug (8) for the injection valves.
- Align hose clip (1) so that it is accessible but there is no possibility of other components chafing against it.
- Secure hose clip (1) with pliers (No. 13 1 500).
- Secure fuel flow hose (2) in holder (3).



Finishing work

Installing underbody panel

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing left footplate

Installing rear left footplate insert and footrest plate

Installing centre left footplate insert and footrest plate

Installing left side panel

Installing bottom left fairing panel

Installing front left footplate insert and footrest plate

Installing top left side panel

Closing seat

Installing centre cover

Installing filler cap flap

Final check of work performed

 13 54 016 Removing/installing power reduction

+ 13 54 528

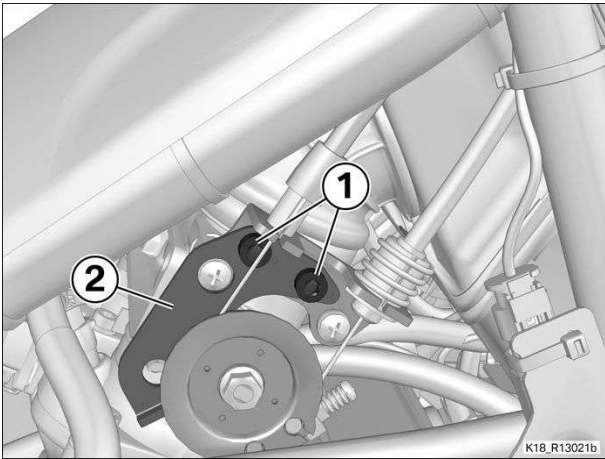
Preparatory work

- Removing filler cap flap
- Removing centre cover
- Opening seat
- Removing top right side panel
- Removing front right footplate insert and footrest plate
- Removing bottom right fairing panel
- Removing right side panel
- Removing centre right footplate insert and footrest plate
- Removing rear right footplate insert and footrest plate
- Removing rear footplate

Core activity

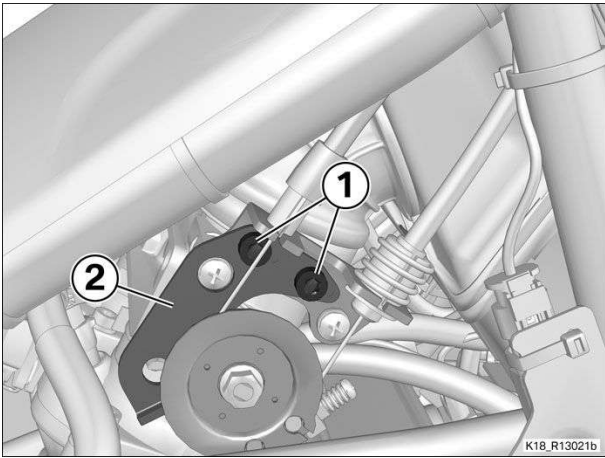
(-) Removing power-output restrictor (sheet-metal stop)

- Remove screws (1) and remove sheet-metal stop (2).



(-) Installing power-output restrictor (sheet-metal stop)

- Clean the threads of screws (1).
- Insert sheet-metal stop (2) and secure with screws (1).



 Tightening torques		
Metal stop (power reduction) to throttle valve		
M5 x 12	3 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		

- Check that the throttle cables are in working order and move freely.

Finishing work

Checking play of throttle cable

- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Closing seat
- Installing centre cover
- Installing filler cap flap
- Final check of work performed

13 54 017 Replacing complete throttle-valve assembly

+ 13 54 521

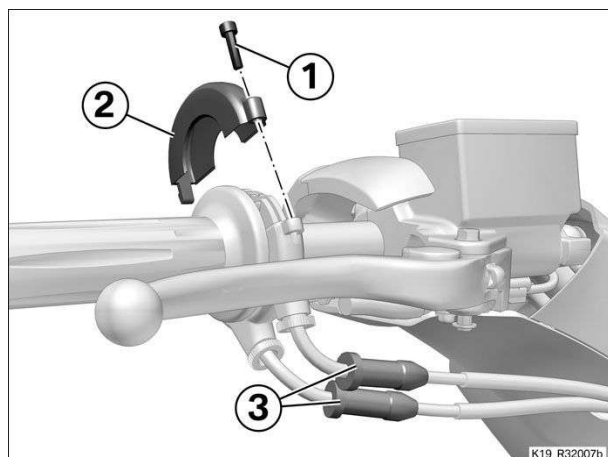
Preparatory work

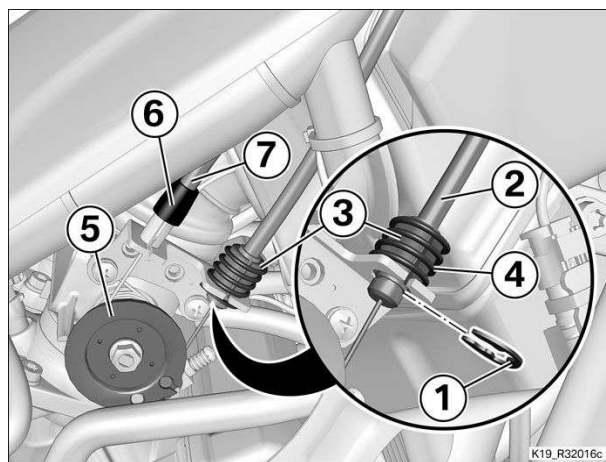
- Removing filler cap flap
- Removing centre cover
- Opening seat
- Removing centre trim panel
- Removing handlebar trim
- Removing top handlebar cover
- Removing bottom handlebar cover
- Removing instrument panel with carrier
- Removing top left fairing side panel
- Removing front left footplate insert and footrest plate
- Removing bottom left fairing panel
- Removing left side panel
- Removing left footplate
- Removing top right side panel
- Removing front right footplate insert and footrest plate
- Removing bottom right fairing panel
- Removing right side panel
- Removing centre right footplate insert and footrest plate
- Removing rear right footplate insert and footrest plate
- Removing rear footplate
- Removing leg guard
- Remove the intake air pipe
- Disengaging ignition switch/steering lock
- Removing intake air silencer

Core activity

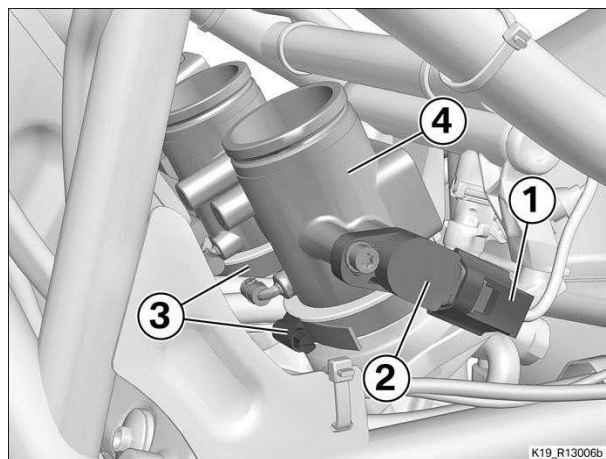
(-) Removing throttle valve

- Remove screw (1) and remove cover (2).
- Slacken adjusting screws (3) and set play to maximum.



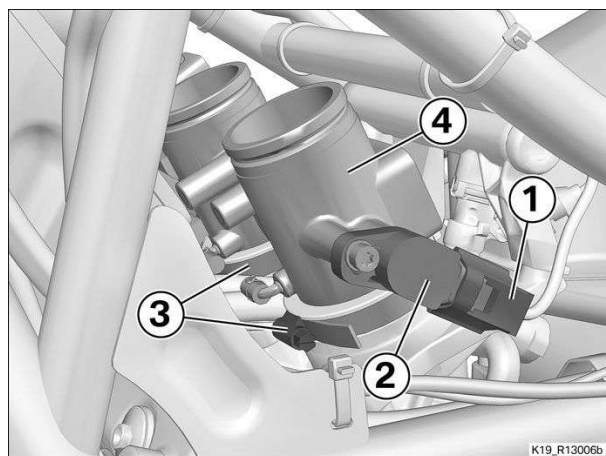


- Remove lock washer (1) and disengage throttle-closer cable (2) from holder (3), noting spring (4).
- Disengage throttle-closer cable (2) from cable pull (5).
- Push rubber grommet (6) up along throttle cable (7).
- Disengage throttle cable (7) from holder (3).
- Disengage throttle cable (7) from cable pull (5).

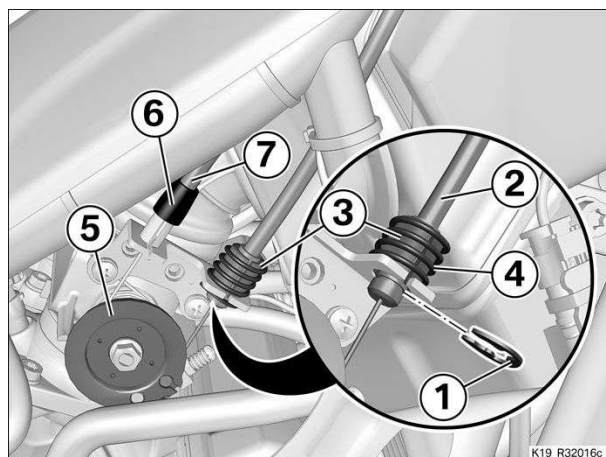


- Disconnect plug (1) from throttle-valve sensor (2).
- Slacken clips (3) and remove throttle-valve assembly (4).

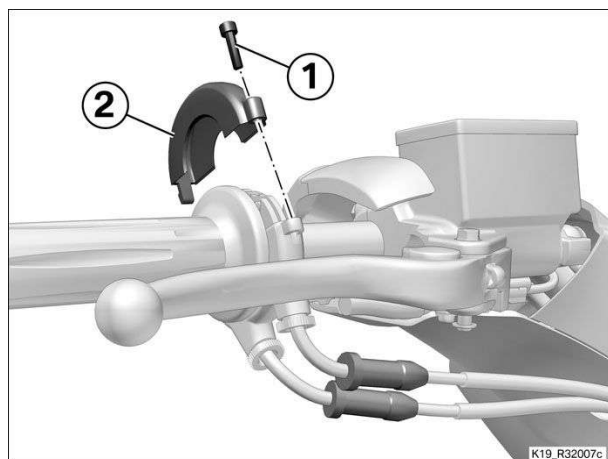
(-) Installing throttle valve



- Hold throttle-valve assembly (4) in position and secure it with clips (3)
- Connect plug (1) to throttle-valve sensor (2)



- Secure throttle cable (7) in cable pull (5).
- Seat throttle cable (7) in holder (3) and secure with rubber grommet (6).
- Seat throttle-closer cable (2) in holder (3), noting spring (4).
- Install lock washer (1).
- Install throttle-closer cable (2) in cable pull (5).



- Place cover (1) in position and secure with screw (2).

Finishing work

Checking play of throttle cable

Installing intake air silencer

Securing ignition switch/steering lock

Installing intake air pipe

Installing leg guard

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing left footplate

Installing left side panel

Installing bottom left fairing panel

Installing front left footplate insert and footrest plate

Installing top left side panel

Installing centre trim panel

Installing instrument panel with carrier

Installing bottom handlebar cover

Installing top handlebar cover

Installing handlebar trim

Installing centre trim panel

Connecting **BMW Motorrad** diagnostic system to **Maxi-Scooter**

Performing vehicle test with **BMW Motorrad** diagnostic system, reading out fault memory and resetting adaptation values

Disconnecting **BMW Motorrad** diagnostic system from **Maxi-Scooter**

Installing top right side panel

Closing seat

Installing centre cover

Installing filler cap flap

Final check of work performed

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

 NOTICE

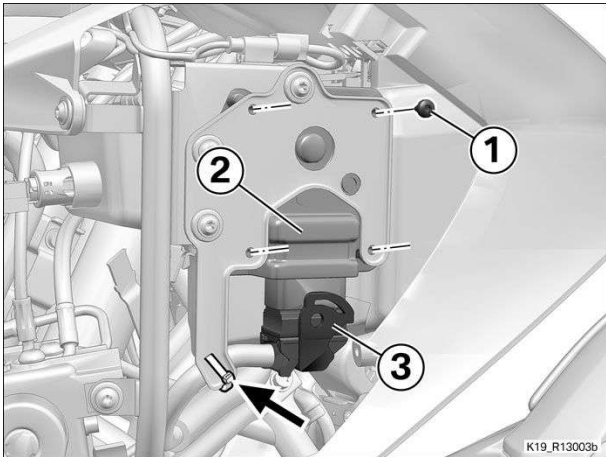
Before removal, test the control unit with the **BMW Motorrad** diagnostic system and make a backup copy of the data.

Preparatory work

Removing top left fairing side panel

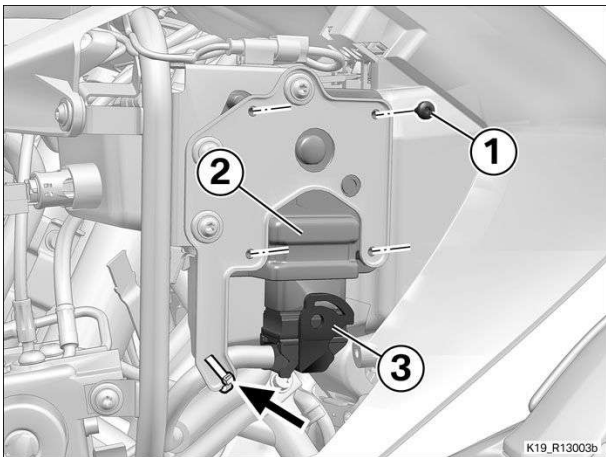
Core activity

(-) Remove the control unit



- Open the cable tie (arrow).
- Remove screws (1).
- Disengage control unit (2) and disconnect plug (3).

(-) Installing control unit



- Connect plug (3).
- Secure control unit (2) with screws (1).

 Tightening torques		
Control unit to bracket		
M5 x 10	6 Nm	

- Secure the cable tie (arrow).

Finishing work

Installing top left side panel

=> 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

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

Core activity

(-) Programming engine-management control unit

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

 13 62 010 Replacing intake-air temperature sensor

+ 13 62 501

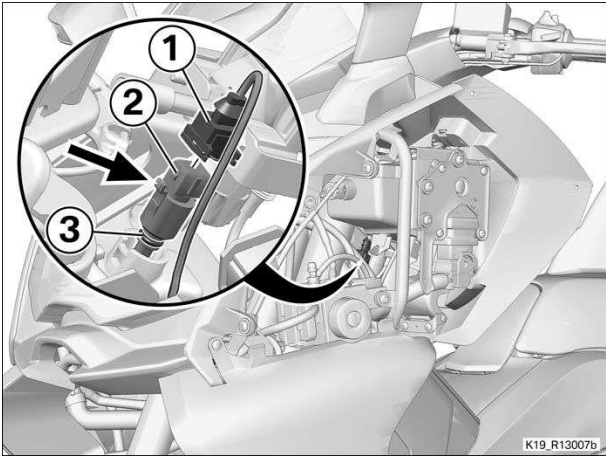
Preparatory work

Removing top left fairing side panel

Core activity

(-) Removing intake-air temperature sensor

- Disconnect plug (1) for the intake-air temperature sensor.
- Press the retainer (arrow) and remove sensor (2) with O-ring (3).



(-) Installing intake-air temperature sensor

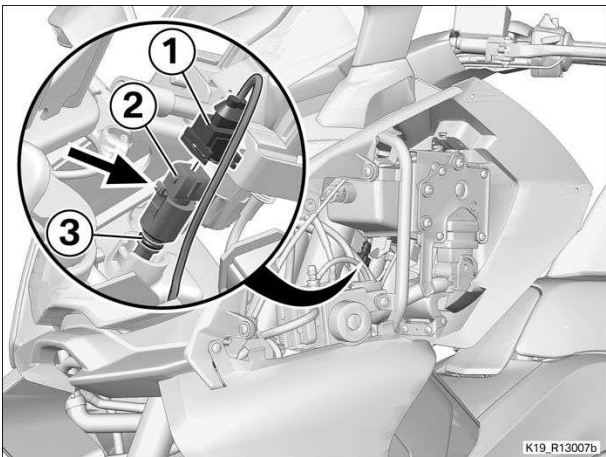
- Check O-ring (3) for damage; replace if necessary.
- Lubricate O-ring (3).



Care products

Rubber care product	83 12 0 397 018
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- Install sensor (2) with O-ring (3).
- » The locking tab (arrow) engages with an audible click.
- Connect plug (1) for the intake-air temperature sensor.



Finishing work

Installing top left side panel

Removing top right side panel

Opening seat

Connecting **BMW Motorrad** diagnostic system to **Maxi-Scooter**

Performing vehicle test with **BMW Motorrad** diagnostic system, reading out fault memory and resetting adaptation values

Disconnecting **BMW Motorrad** diagnostic system from **Maxi-Scooter**

Closing seat

Installing top right side panel

Final check of work performed

13 63 002 Replacing throttle-valve sensor

+ 13 63 525

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

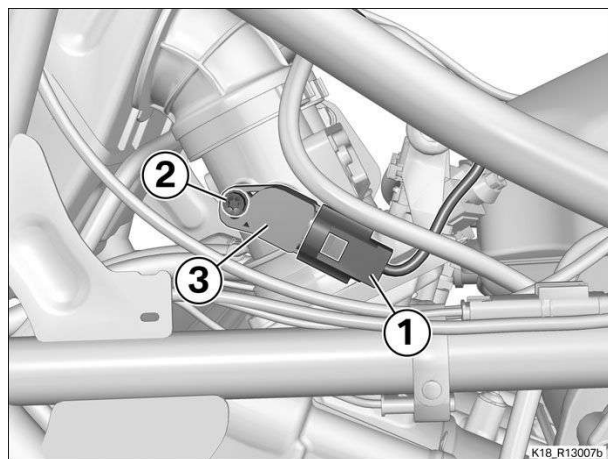
Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing left footplate

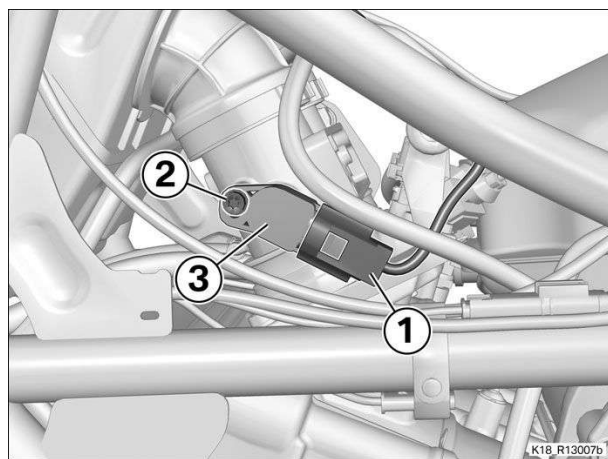
Core activity

(-) Removing throttle-valve switch



- Disconnect plug (1).
- Remove screw (2).
- Remove throttle-valve switch (3).

(-) Installing throttle-valve switch



- Install throttle-valve switch (3).
- Engage screw (2), **do not tighten**.
- Connect plug (1).

(-) Adjusting throttle-valve switch (potentiometer)

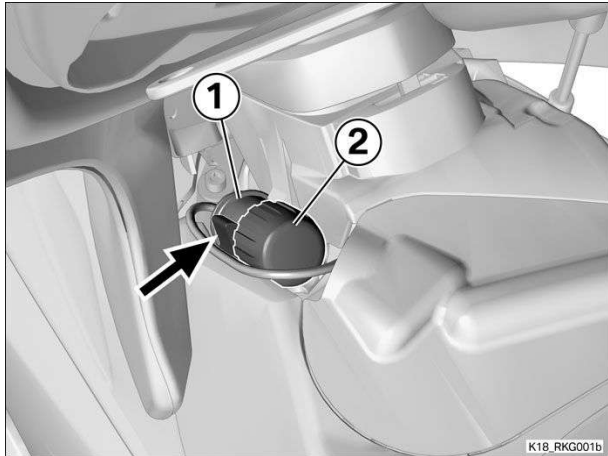
Connecting BMW Motorrad diagnostic system to Maxi-Scooter



- Connect the **BMW Motorrad** battery charger to the **battery**.

 NOTICE

When carrying out diagnosis and programming, use a battery charger with 30 A approved by **BMW Motorrad** that ensures an **on-board system voltage of 13 V**.



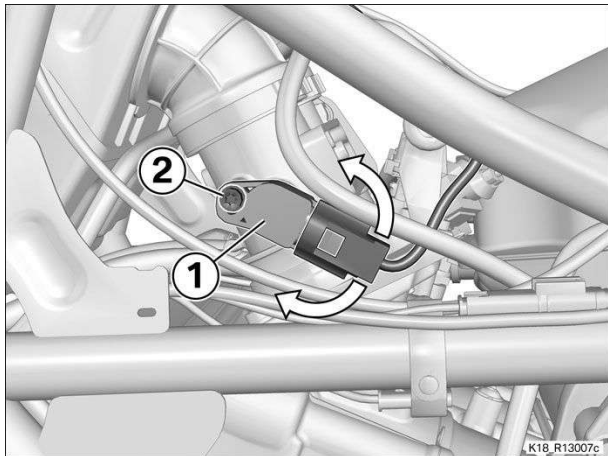
- Disengage diagnosis plug (1) from the holder (arrow) and remove protective cap (2).
- Connect diagnosis plug (1) to the **BMW Motorrad** diagnostic system.

 NOTICE

See the information about the **BMW Motorrad** diagnostic system for all further instructions.



- Open the **Service functions** program.
- Run the **"Adjust throttle-valve sensor"** service program.
- Turn potentiometer (1) until the value is OK.
- Tighten screw (2).



 Tightening torques		
Throttle-valve switch (potentiometer) to throttle-valve stub		
M5 x 16	4 Nm	

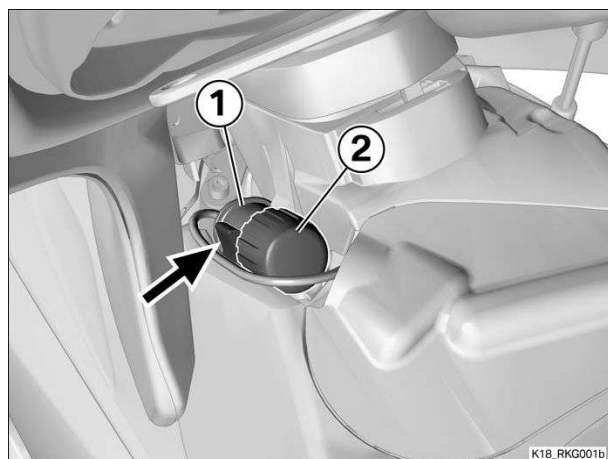
► **Performing vehicle test with BMW Motorrad diagnostic system, reading out fault memory and resetting adaptation values**

- Perform the vehicle test and read out the fault memory.
 - Perform all requisite repair work.
 - Reset the adaptation values.
- » This is the only way of ensuring correct operation of the motorcycle.



► **Disconnecting BMW Motorrad diagnostic system from Maxi-Scooter**

- Close all diagnostic programs and switch off the ignition.
- Disconnect the **BMW Motorrad** diagnostic system from diagnosis plug (1) and install cap (2).
- Secure diagnosis plug (1) in the holder (arrow).



- Disconnect the **BMW Motorrad** battery charger from the **Maxi-Scooter**.



Finishing work

Installing left footplate

Installing rear left footplate insert and footrest plate

Installing centre left footplate insert and footrest plate

Installing left side panel

Installing bottom left fairing panel

Installing front left footplate insert and footrest plate

Installing top left side panel

Connecting **BMW Motorrad** diagnostic system to **Maxi-Scooter**

Performing vehicle test with **BMW Motorrad** diagnostic system, reading out fault memory and resetting adaptation values

Disconnecting **BMW Motorrad** diagnostic system from **Maxi-Scooter**

Installing top right side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

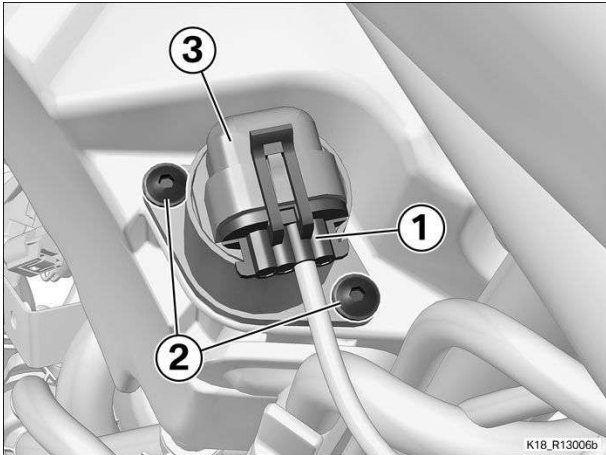
 **13 63 020 Replace idle actuator**
+ 13 63 520

Preparatory work

Removing air deflector

Core activity

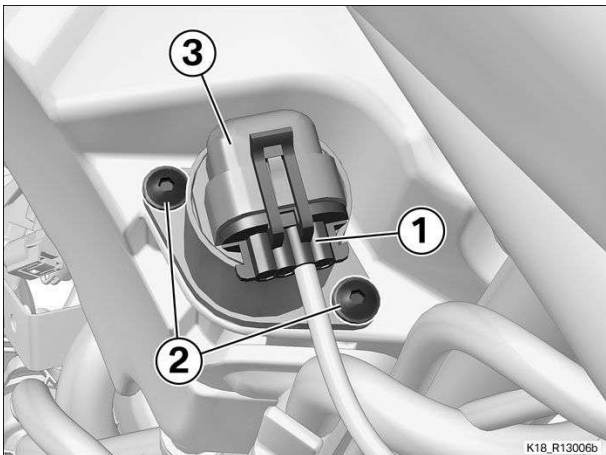
(-) Removing idle actuator



- Disconnect plug (1)
- Remove screws (2).
- Remove idle actuator (3).

(-) Installing idle actuator

- Hold idle actuator (3) in position.
- Install screws (2).



 Tightening torques		
Idle actuator to intake air silencer		
Screw for plastic, 5 x 20	2.5 Nm	

- Connect plug (1).

Finishing work

Installing air deflector

Final check of work performed

13 64 165 Renewing one injector

+ 13 64 501

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing centre trim panel

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing left footplate

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing underbody panel

Core activity

(-) Removing injection valves

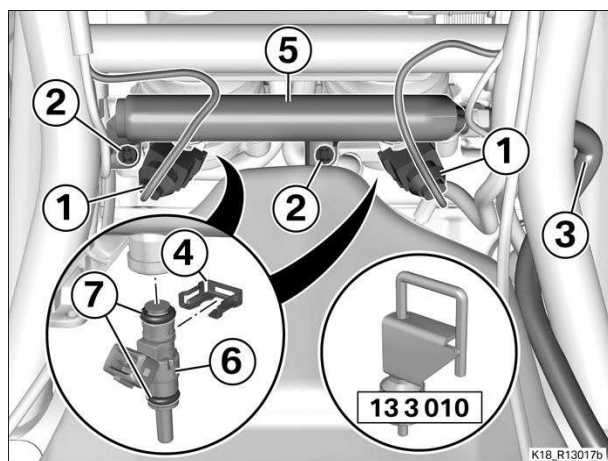
- Disconnect plug (1) for the injection valves.
- Remove screws (2).

ATTENTION

Escape of fuel when pressurised fuel lines are opened.

Damage to component surfaces.

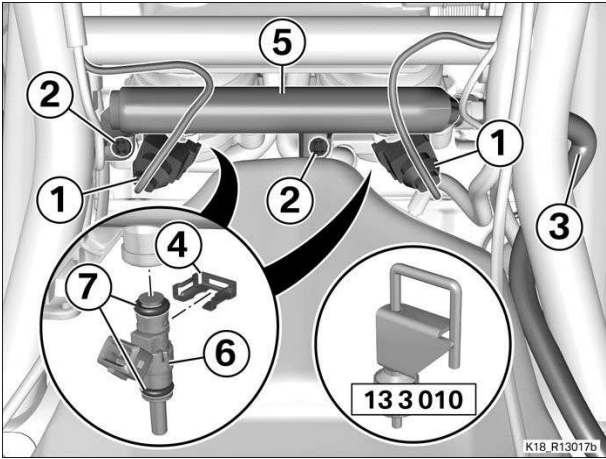
- Employ suitable means to catch escaping fuel.



- Seal off feed hose (3) with hose clamp (No. 13 3 010).
- Remove spring clip (4).
- Disengage injection rail (5) from injection valves (6).
- Remove injection valve (6) with O-rings (7).

(-) Installing injection valve

- Check O-rings (7) for damage; replace if necessary.
- Lubricate O-rings (7).



Care products

Rubber care product	83 12 0 397 018
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- Install injection valve (6) in injection rail (5), noting O-ring (6).
- Install spring clip (4).
- Insert injection rail (5).
- Install screws (2).



Tightening torques

Injection rail to adapter for throttle valve		
M5 x 12	3 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		

- Connect plug (1) for the injection valve.
- Remove hose clamp (No. 13 3 010) from hose (3).

Finishing work

Installing underbody panel

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Connecting **BMW Motorrad** diagnostic system to **Maxi-Scooter**

Performing vehicle test with **BMW Motorrad** diagnostic system, reading out fault memory and resetting adaptation values

Disconnecting **BMW Motorrad** diagnostic system from **Maxi-Scooter**

Installing top right side panel

Installing left footplate

Installing rear left footplate insert and footrest plate

Installing centre left footplate insert and footrest plate

Installing left side panel

Installing bottom left fairing panel

Installing front left footplate insert and footrest plate

Installing top left side panel

Installing centre trim panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

13 71 010 Replace intake-air silencer

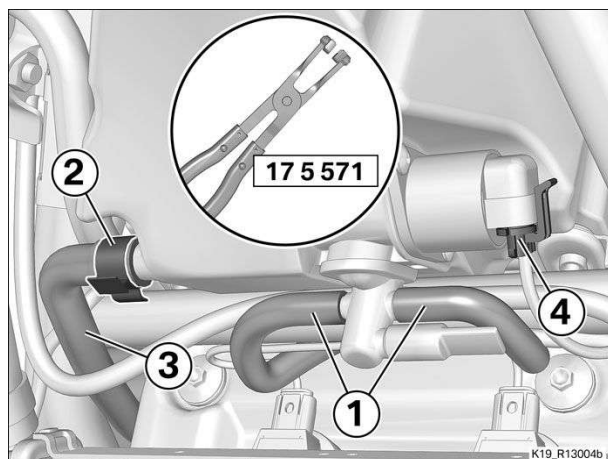
+ 13 71 510

Preparatory work

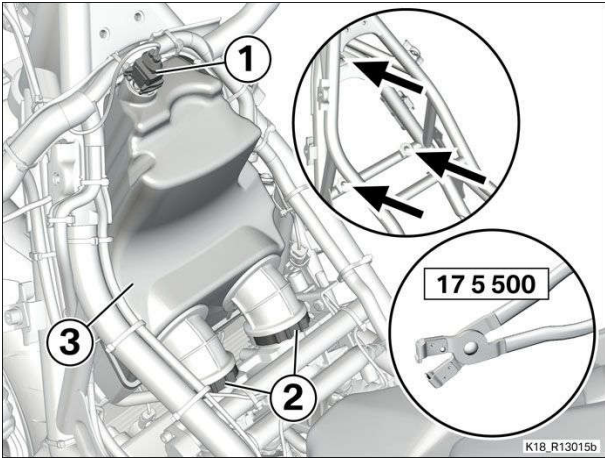
- Removing filler cap flap
- Removing centre cover
- Opening seat
- Removing centre trim panel
- Removing handlebar trim
- Removing top handlebar cover
- Removing bottom handlebar cover
- Removing instrument panel with carrier
- Removing top left fairing side panel
- Removing front left footrest plate
- Removing bottom left fairing panel
- Removing left side panel
- Removing top right side panel
- Removing front right footplate insert and footrest plate
- Removing bottom right fairing panel
- Removing right side panel
- Removing centre right footplate insert and footrest plate
- Removing rear right footplate insert and footrest plate
- Removing rear footplate
- Removing leg guard
- Remove the intake air pipe
- Disengaging ignition switch/steering lock

Core activity

(-) Removing intake air silencer

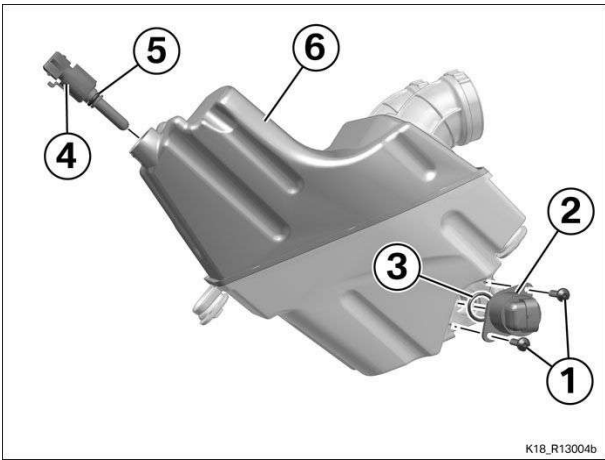


- Disconnect hoses (1).
- Open clip (2) with pliers (No. 17 5 571) and disconnect hose (3).
- Disconnect plug (4) for the idle actuator.
- Disconnect plug (1) for the intake-air temperature sensor.
- Open clips (2) with pliers (No. 17 5 500).



- Remove intake air silencer (3), noting the locators (arrows).

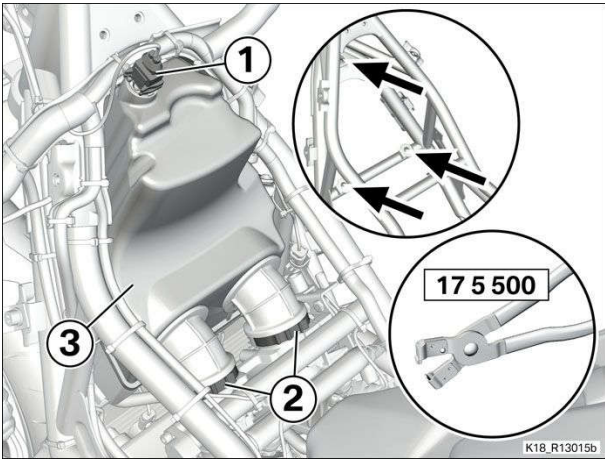
(-) Replacing intake air silencer



- Remove the following components:
 - Screw (1)
 - Idle actuator (2)
 - O-ring (3)
 - Air-temperature sensor (4) with O-ring (5)
- Replace intake air silencer (6).
- Check O-rings (5) and (3) for damage; replace if necessary.
- Transfer the reusable parts removed to new intake air silencer (6).

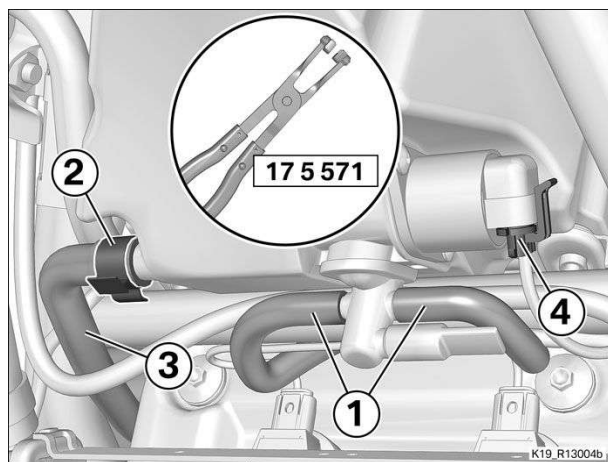
Tightening torques		
Idle actuator to intake air silencer		
Screw for plastic, 5 x 20	2.5 Nm	

(-) Installing intake air silencer



- Install intake air silencer (3), noting the locators (arrows).
- Secure clips (2) with pliers (No. 17 5 500), making sure that clips (2) are correctly seated.
- Connect plug (1) for the intake-air temperature sensor.

- Connect plug (4) for the idle actuator.
- Connect hose (3) and close hose clip (2) with pliers (No. 17 5 571).
- Secure hoses (1).



Finishing work

Securing ignition switch/steering lock

Installing intake air pipe

Installing leg guard

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing left side panel

Installing bottom left fairing panel

Removing front left footrest plate

Installing top left side panel

Installing centre trim panel

Installing instrument panel with carrier

Installing bottom handlebar cover

Installing top handlebar cover

Installing handlebar trim

Installing centre trim panel

Closing seat

Installing centre cover

Installing filler cap flap

Final check of work performed

13 71 020 Replacing air intake duct

+ 13 71 520

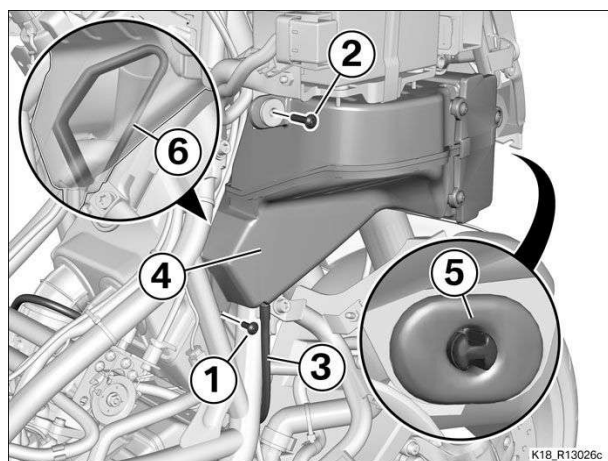
Preparatory work

Removing filler cap flap
Removing centre cover
Opening seat
Removing top left fairing side panel
Removing front left footplate insert and footrest plate
Removing bottom left fairing panel
Removing windscreen
Removing left slipstream deflector
Removing right slipstream deflector
Removing top instrument carrier
Removing left mirror
Removing top right side panel
Removing battery
Removing right mirror
Disengaging battery holder
Removing front right footplate insert and footrest plate
Removing bottom right fairing panel
Removing right side panel
Removing centre right footplate insert and footrest plate
Removing rear right footplate insert and footrest plate
Removing rear footplate
Removing complete headlight
Disengaging coolant filler neck

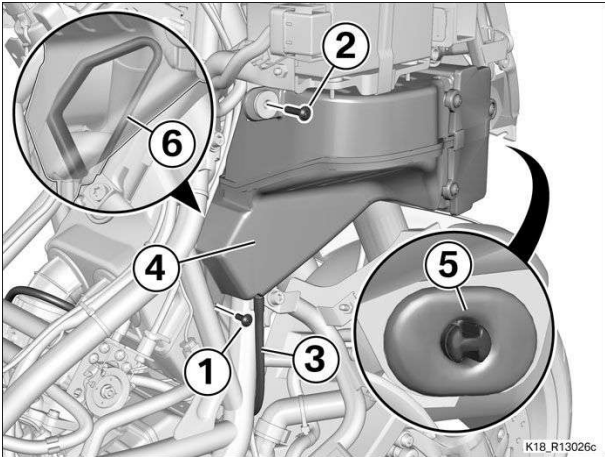
Core activity

(-) Remove the intake air pipe

- Remove screws (1) and (2).
- Disconnect hose (3).
- Remove intake air pipe (4), noting rubber grommet (5) and rubber seal (6).



(-) Installing intake air pipe



- Install intake air pipe (4), noting rubber seal (6) and rubber grommet (5).

 Care products	
Rubber care product	83 12 0 397 018

- Connect hose (3).
- Install screws (2) and (1).

 Tightening torques	
Air intake duct to fairing bracket	
M6 x 25	8 Nm
Air intake duct to intake air silencer	
M6 x 16	5 Nm

Finishing work

- Securing coolant filler neck
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing headlight
- Installing top instrument carrier
- Installing left slipstream deflector
- Install the right slipstream deflector
- Installing windscreen
- Installing right mirror
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Securing battery holder
- Installing battery
- Installing top right side panel
- Closing seat
- Installing centre cover
- Installing filler cap flap

Checking setting for low-beam headlight

Checking, if necessary correcting date

Final check of work performed

13 72 001 Renewing air cleaner insert

+ 13 72 532

Preparatory work

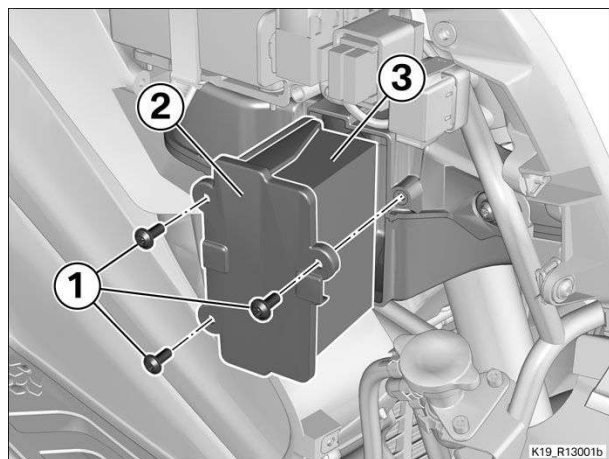
Removing top right side panel

Removing front right footrest plate

Removing bottom right fairing panel

Core activity

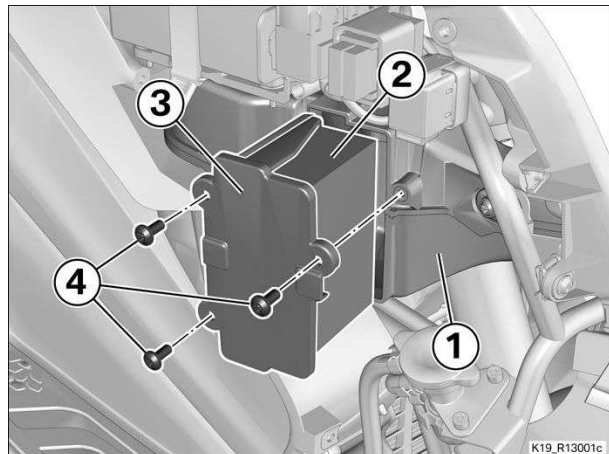
(-) Removing air filter



• Remove the following components:

- Screws (1)
- Cover (2)
- Air filter (3)

(-) Installing air filter



• Clean the inside of intake air silencer (1).

• Install the following components:

- Air filter (2)
- Cover (3)
- Screws (4)

Finishing work

Installing bottom right fairing panel

Installing front right footrest plate

Installing top right side panel

Final check of work performed

13 72 505 Replace air filter cartridge (for maintenance)

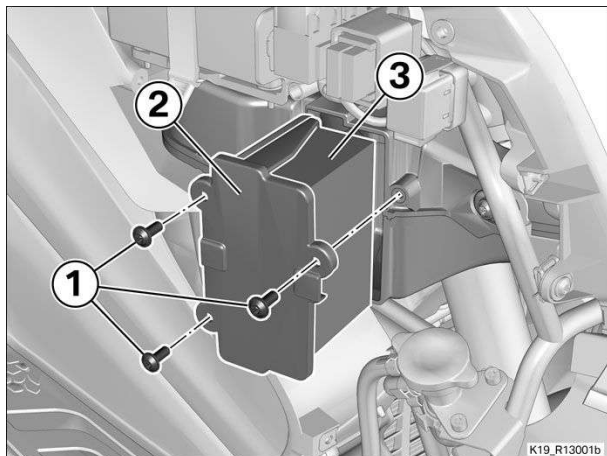
Preparatory work

Removing front right footrest plate

Removing bottom right fairing panel

Core activity

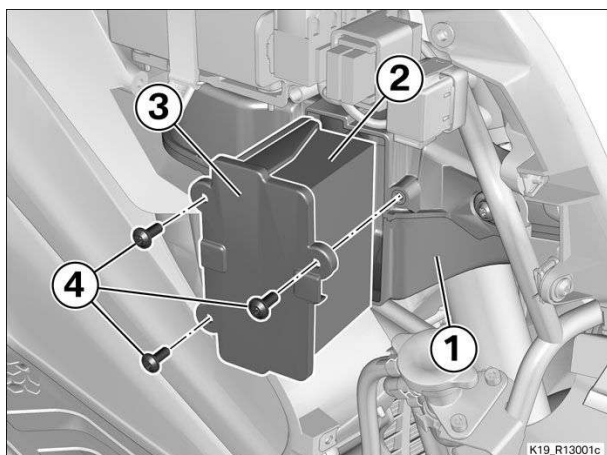
(-) Removing air filter



- Remove the following components:

- Screws (1)
- Cover (2)
- Air filter (3)

(-) Installing air filter



- Clean the inside of intake air silencer (1).

- Install the following components:

- Air filter (2)
- Cover (3)
- Screws (4)

Finishing work

Installing bottom right fairing panel

Installing front right footrest plate

16 11 030 Removing/installing fuel tank

+ 16 11 533

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing front right footrest plate

Removing right side panel

Removing front left footrest plate

Removing left side panel

Removing hinge

Removing fuel-pump cover

Removing cover for fuel tank

Removing seat

Removing carpet for luggage compartment

Removing left rear trim panel

Removing right rear trim panel

Removing rear grab handle

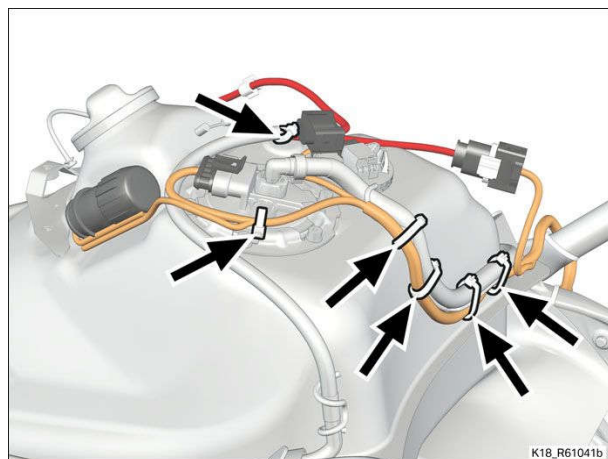
Disengaging rear light with cover

Removing top luggage-compartment cover

Core activity

(-) Removing fuel tank

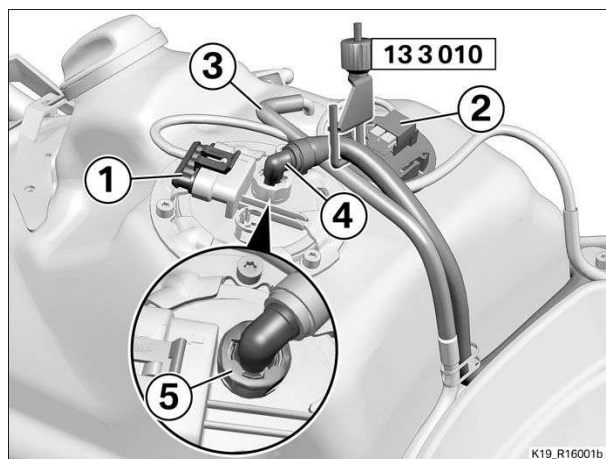
- Open the cable ties (arrows).



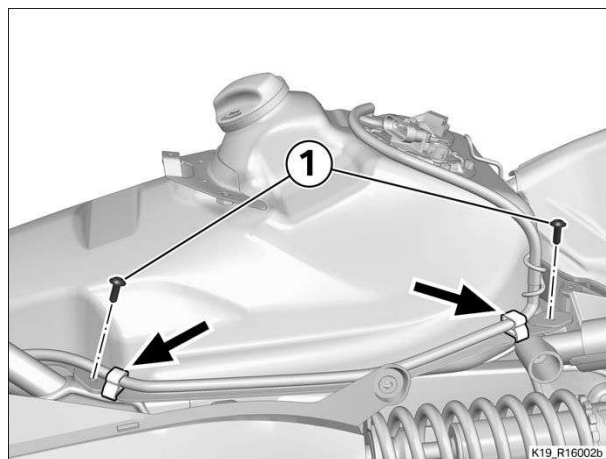
- Disconnect plug (1) for the fuel pump.
- Disconnect plug (2) for the fuel-level sensor.
- Disconnect breather hose (3) from the fuel tank.
- Seal off fuel hose (4) with hose clamp (No. 13 3 010).

ATTENTION

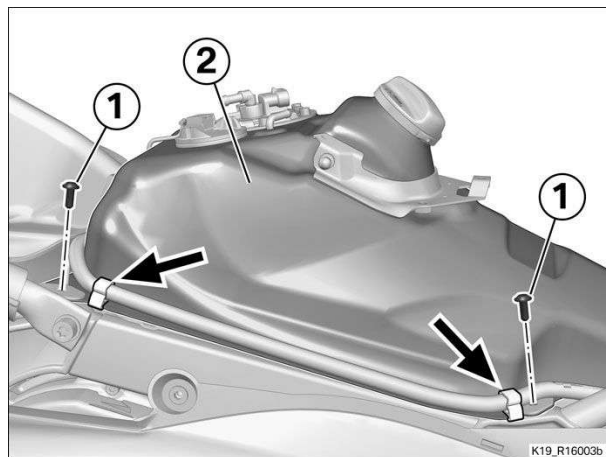
Escape of fuel when pressurised fuel lines are opened.
Damage to component surfaces.



- Employ suitable means to catch escaping fuel.
- Press retaining ring (5) down and pull out fuel hose (4).

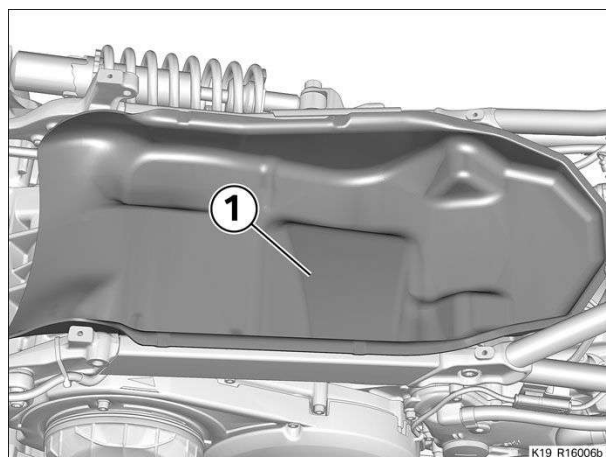


- Remove the line holders (arrows).
- Remove screws (1).

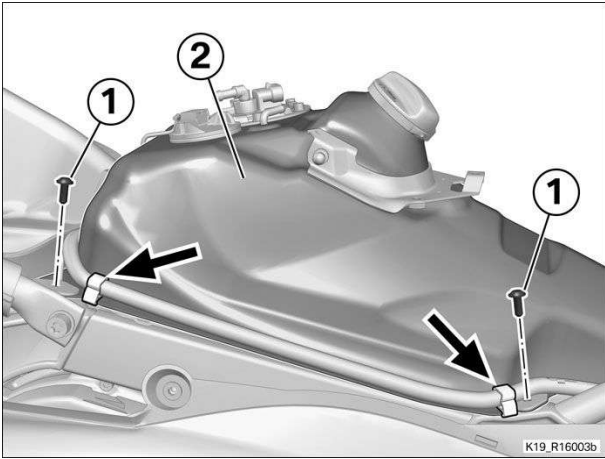


- Remove the line holders (arrows).
- Remove screws (1) and fuel tank (2).

(-) Installing fuel tank



- Make sure that heat shield (1) is correctly positioned.



ATTENTION

Crushed or disconnected hoses.

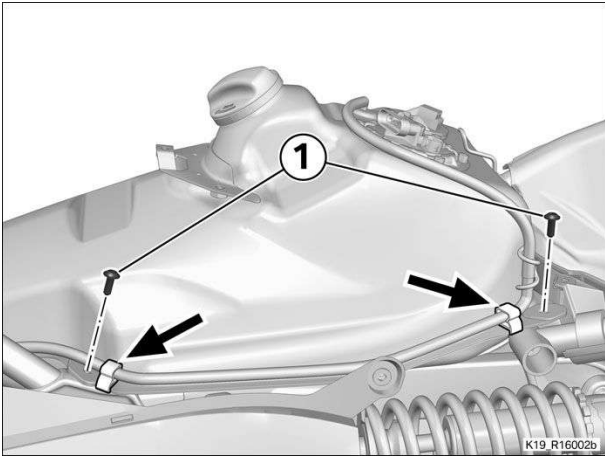
Malfunctions

- Do not crush or seal off hoses.

- Place fuel tank (2) in position, secure screws (1) on left and right.
- Tighten screws (1).

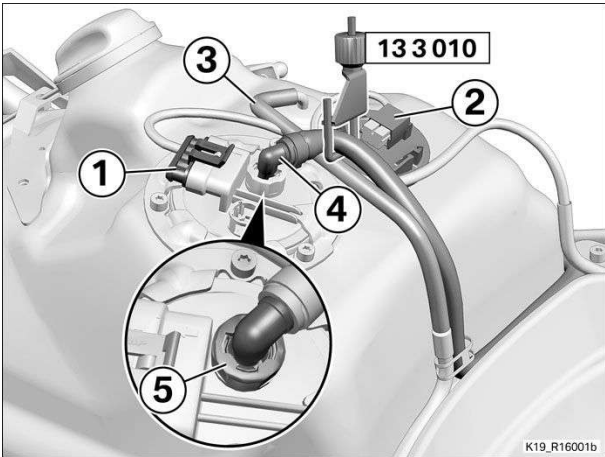
 Tightening torques		
Fuel tank to frame		
M6 x 16	8 Nm	

- Secure the line holders (arrows).
- Tighten screws (1).



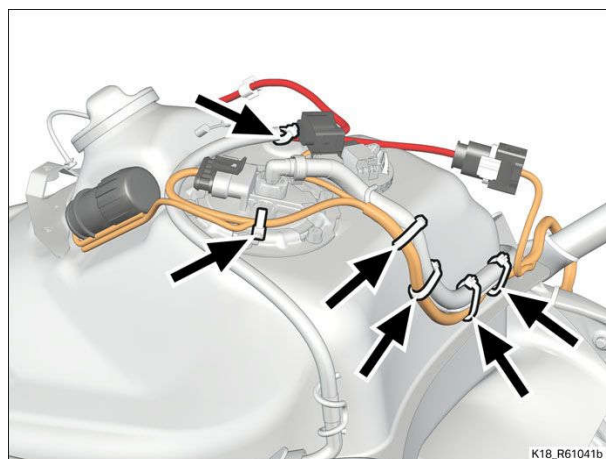
 Tightening torques		
Fuel tank to frame		
M6 x 16	8 Nm	

- Secure the line holders (arrows).



- Secure fuel hose (4), making sure that retaining ring (5) engages.
- Remove hose clamp (No. 13 3 010) from fuel hose (4).
- Connect vent hose (3).
- Connect plug (2) for the fuel-level sensor.
- Connect plug (1) for the fuel-pump unit.

- Close the cable ties (arrows).



Finishing work

Installing top luggage-compartment cover

Securing rear light with cover

Installing rear grab handle

Installing right rear trim panel

Installing left rear trim panel

Installing carpet for luggage compartment

Installing seat

Installing cover for fuel tank

Installing fuel-pump cover

Installing hinge

Installing left side panel

Installing front left footrest plate

Installing right side panel

Installing front right footrest plate

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

 17 00 010 Checking cooling system for leaks (with cooling system tester)
+ 17 00 502

Preparatory work

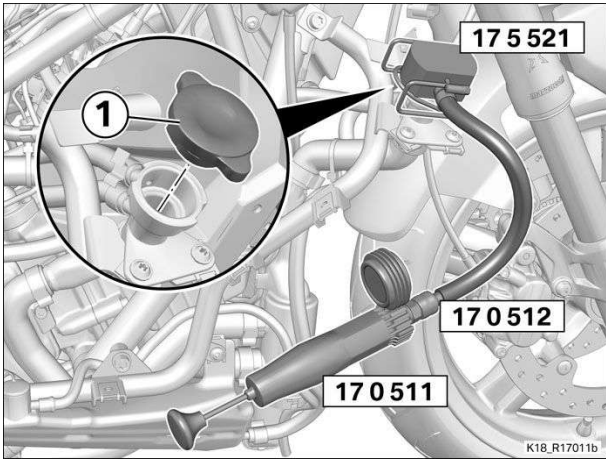
- Removing filler cap flap
- Opening seat
- Removing centre cover
- Removing top right side panel
- Removing front right footplate insert and footrest plate
- Removing bottom right fairing panel
- Removing right side panel
- Removing centre right footplate insert and footrest plate
- Removing rear right footplate insert and footrest plate
- Removing rear footplate

Core activity

(-) Checking cooling system for leaks

Check

- If applicable, remove cap (1).
- Secure pump (No. 17 0 511), adapter (No. 17 0 512), hose, main element (No. 17 5 521), plug (No. 17 5 522) and spring clip (No. 17 5 523) to the filler neck (arrow).
- Apply the test pressure to the cooling system.



 Technical data			
Cooling system - test pressure	Test pressure must remain unchanged min 5 min	1.5 bar	

Result:

- Cooling system is losing pressure.

Measure:

- Rectify the leak.
- Remove the tools.
- Install cap (1).

Finishing work

- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate

Installing top right side panel
Installing centre cover
Closing seat
Installing filler cap flap
Final check of work performed

 17 00 020 Checking coolant composition
+ 17 00 503

 CAUTION

Working on hot cooling system.

Risk of burn injury

- Always allow the cooling system to cool down before starting work.

Preparatory work

Removing centre right footplate insert and footrest plate

Core activity

(-) Checking coolant composition

- Remove cap (1).



General consumable

Antifreeze and corrosion inhibitor	83 19 2 211 191
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Check

- Check the ability of the coolant to resist freezing temperatures by checking the coolant composition in expansion tank (2).



Technical data

Coolant, frost protection		min -30 °C	
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Result:

- Ability to resist freezing temperatures is not ensured.

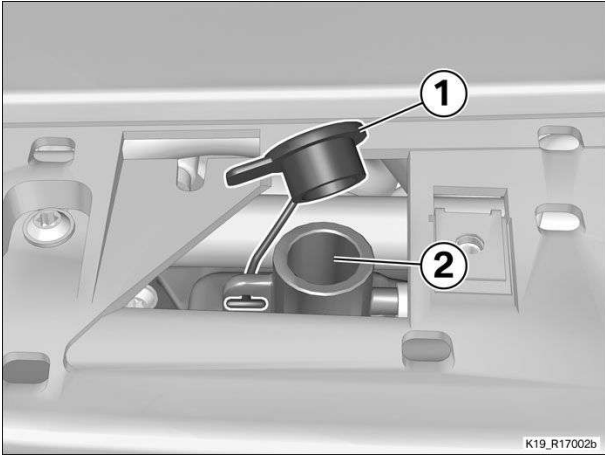
Measure:

- If necessary, increase the proportion of antifreeze until ability to resist freezing temperatures is ensured (start the engine and allow it to run briefly to make sure that the antifreeze mixes thoroughly).
- Install cap (1).

Finishing work

Installing centre right footplate insert and footrest plate

Final check of work performed



17 00 035 Draining coolant, refilling/bleeding system

+ 17 00 504

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing underbody panel

Core activity

(-) Draining coolant from engine

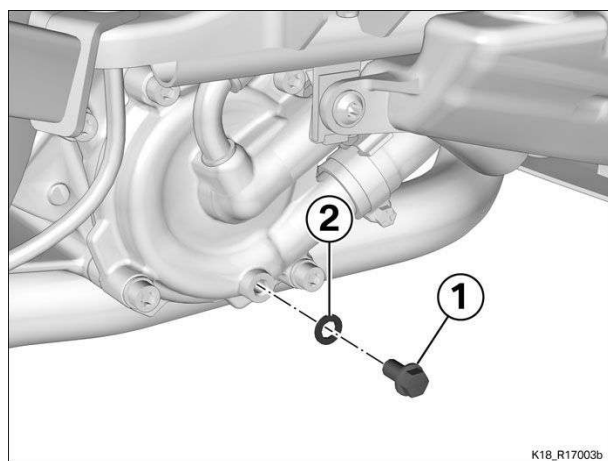
CAUTION

Working on hot cooling system.

Risk of burn injury

- Always allow the cooling system to cool down before starting work.

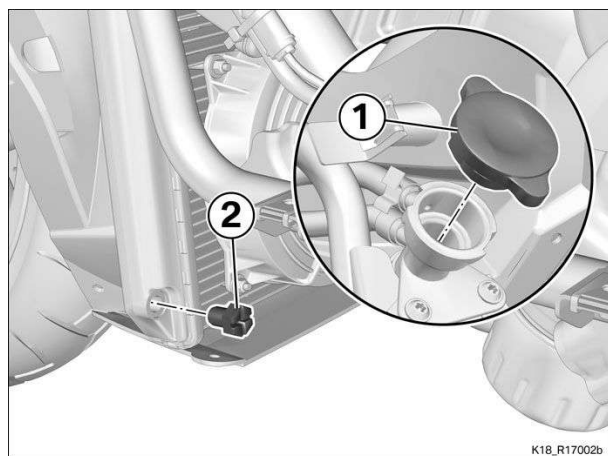
- Remove coolant drain plug (1) and seal (2), drain off the coolant.



(-) Draining coolant from radiator

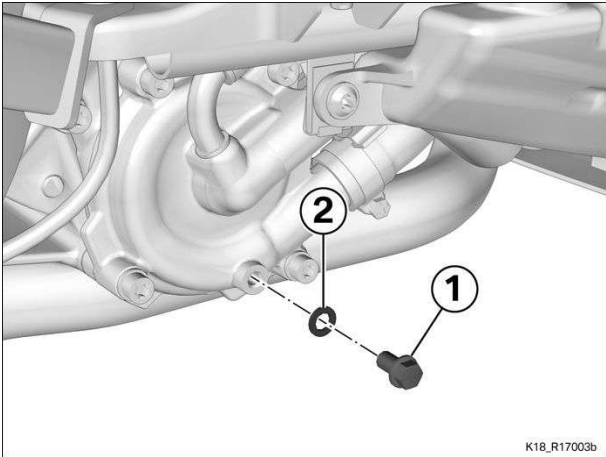
- Remove cap (1).

- Remove coolant drain plug (2) and drain the coolant.



(-) Filling cooling system

-

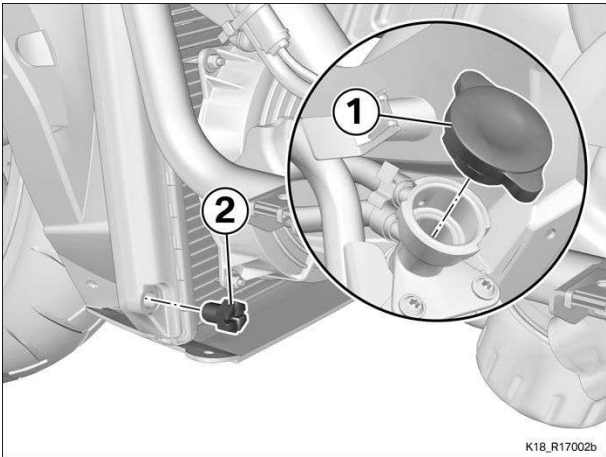


Install screw (1) with **new** sealing ring (2).

 Tightening torques		
Drain plug to coolant pump		
M6 x 10	10 Nm	

- If the system is not refilled with fresh coolant, check the coolant to ensure that the proportion of antifreeze is sufficient to ensure resistance to freezing temperatures.

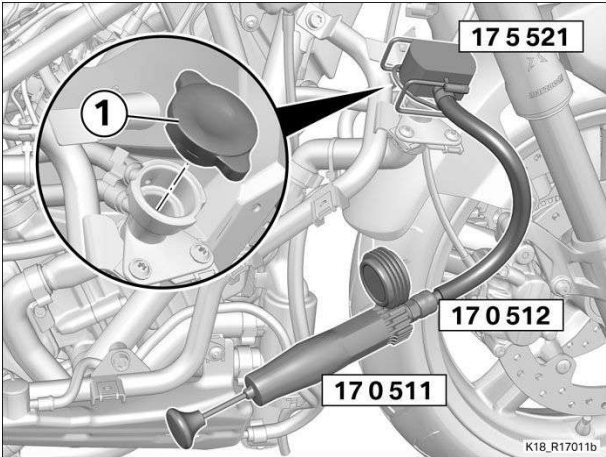
 Technical data			
Coolant, frost protection		min -30 °C	



- Install coolant drain plug (2).
- If applicable, remove cap (1) and pour in coolant to correct level.

 Technical data			
Specified coolant level in radiator	Engine cold	Bottom edge of overflow bowl	
			
Coolant capacity (total)		1.5 l	
General consumable (Antifreeze and corrosion inhibitor)			

(-) Checking cooling system for leaks



Check

- If applicable, remove cap (1).
- Secure pump (No. 17 0 511), adapter (No. 17 0 512), hose, main element (No. 17 5 521), plug (No. 17 5 522) and spring clip (No. 17 5 523) to the filler neck (arrow).
- Apply the test pressure to the cooling system.

 Technical data			
Cooling system - test pressure	Test pressure must remain	1.5 bar	

	unchanged min 5 min	
--	---------------------	--

Result:

- Cooling system is losing pressure.

Measure:

- Rectify the leak.
- Remove the tools.
- Install cap (1).

Finishing work

Installing underbody panel

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

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

+ 17 11 508

Preparatory work

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

Removing front left footrest plate

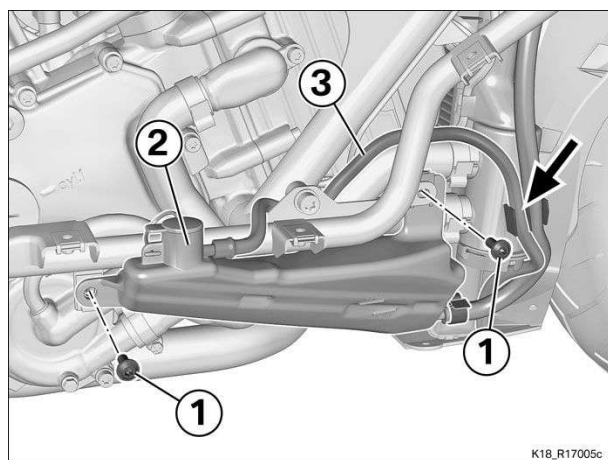
Removing left side panel

Removing air deflector

Core activity

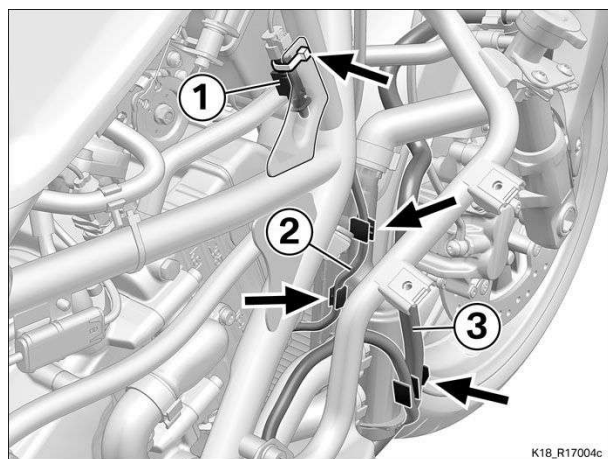
(-) Disengaging expansion tank for coolant

- Remove screws (1) and disengage expansion tank (2).
- Disengage vent hose (3) from the holder (arrow).

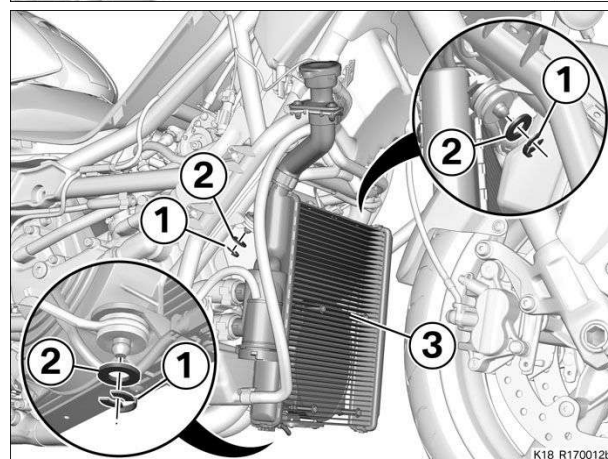
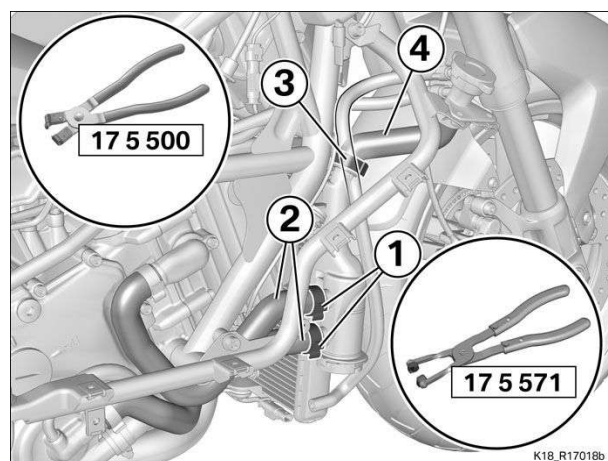


(-) Removing radiator

- Open the cable tie (arrow) and disconnect plug (1) for the fan.
- Disengage cable (2) for the fan from the holder (arrows).
- Disengage hose (3) from the holder (arrow).

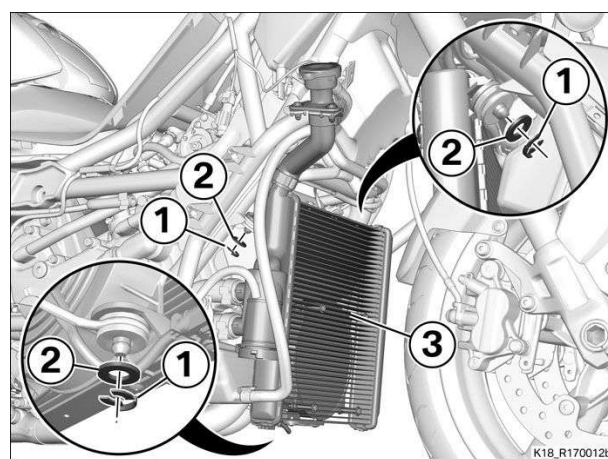


- Release clips (1) with pliers (No. 17 5 571) and disconnect hoses (2).
- Open clip (3) with pliers (No. 17 5 500) and disconnect hose (4).

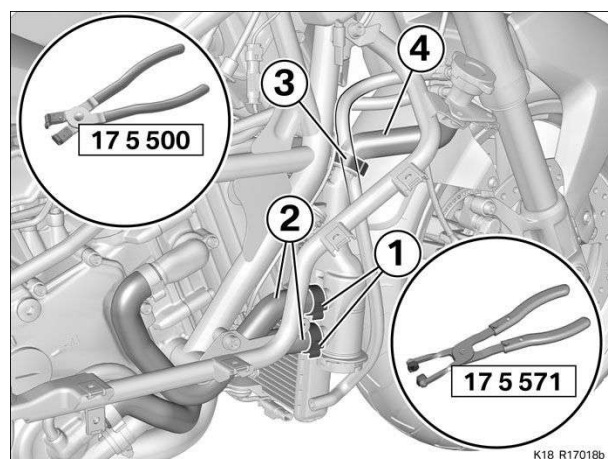


- Remove retaining clips (1) and washers (2).
- Remove radiator (3), noting the lines.
- Drain the remaining coolant from radiator (5).

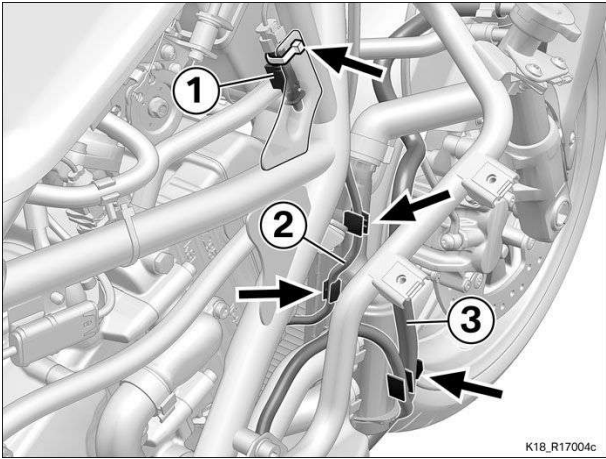
(-) Installing radiator



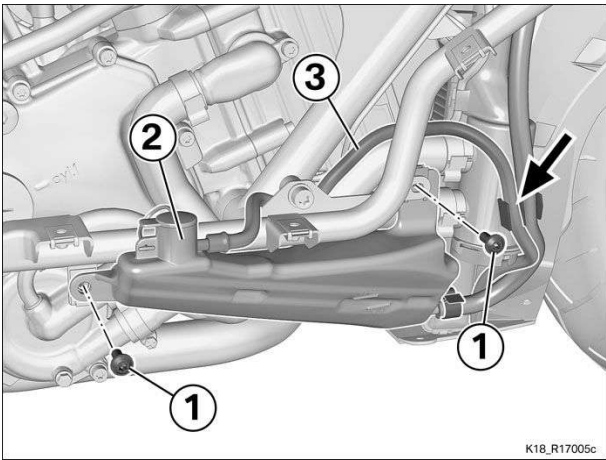
- Insert radiator (3), noting the lines.
- Install washers (2) and retaining clips (1).



- Install hose (4) and clip (3) with pliers (No. 17 5 500).
- Install hoses (2) and clips (1) with pliers (No. 17 5 571).



- Secure hose (3) in the holder (arrow).
- Route cable (2) for the fan and secure it in the holders (arrows).
- Connect plug (1) for the fan and secure it with cable tie (arrow).



(-) Securing expansion tank for coolant

- Seat breather hose (3) in the holder (arrow), making sure that routing is correct.
- Secure expansion tank (2) with screws (1).

 Tightening torques		
Expansion tank to footplate carrier		
M6 x 16	8 Nm	

Finishing work

- Installing air deflector
- Installing left side panel
- Installing front left footrest plate
- Final check of work performed

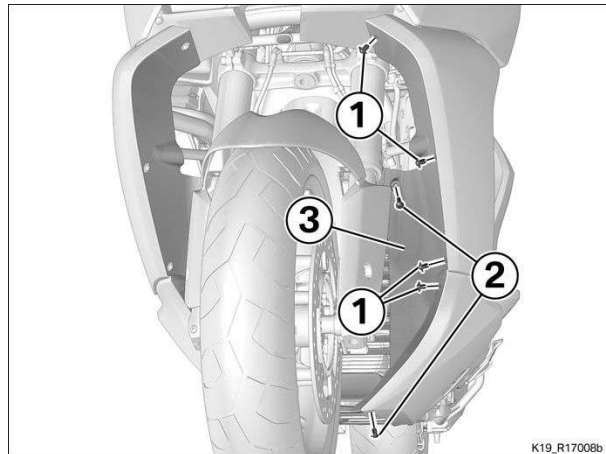
17 11 037 Replacing air inlet duct for radiator

+ 17 11 545

Core activity

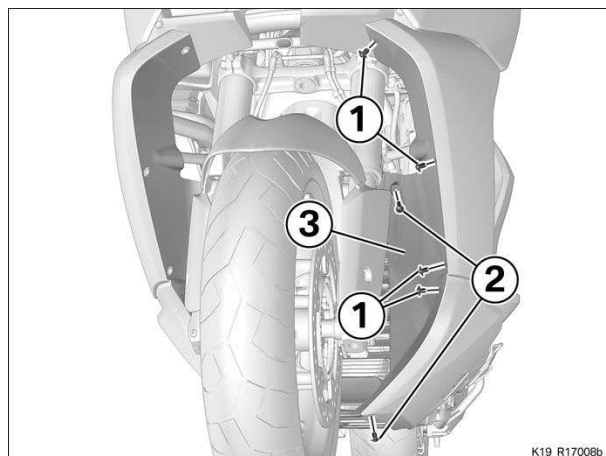
(-) Removing air deflector

- Remove body-bound rivets (1) and screws (2) on left and right.
- Remove air deflector (3).



(-) Installing air deflector

- Insert air deflector (3).
- Install screws (2) and body-bound rivets (1) on left and right.



Finishing work

Final check of work performed

 17 12 114 Replacing all coolant lines for heat exchanger (without draining/refilling coolant system)

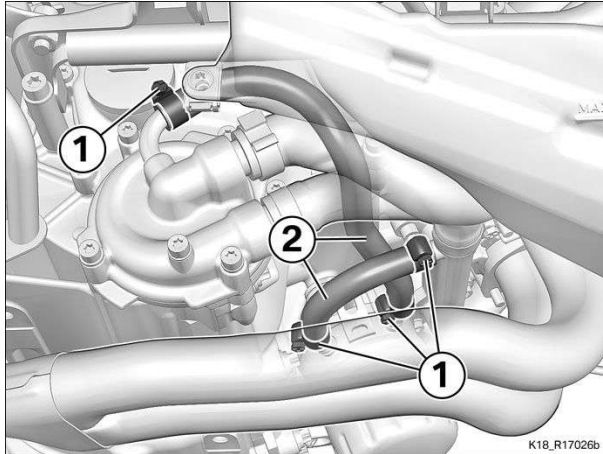
+ 17 12 614

Preparatory work

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

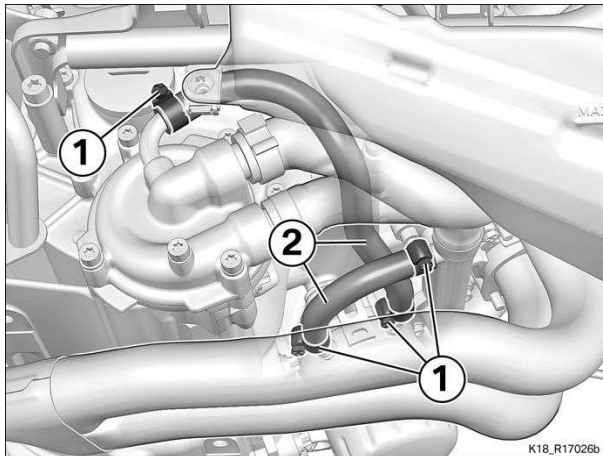
Core activity

(-) Removing coolant lines for heat exchanger



- Open hose clips (1)
- Remove coolant lines (2).

(-) Installing coolant lines for heat exchanger



- Install coolant lines (2).
- Tighten hose clamps (1).

Finishing work

Final check of work performed

17 13 001 Replace expansion tank

+ 17 13 501

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing front right footplate insert and footrest plate

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing top right side panel

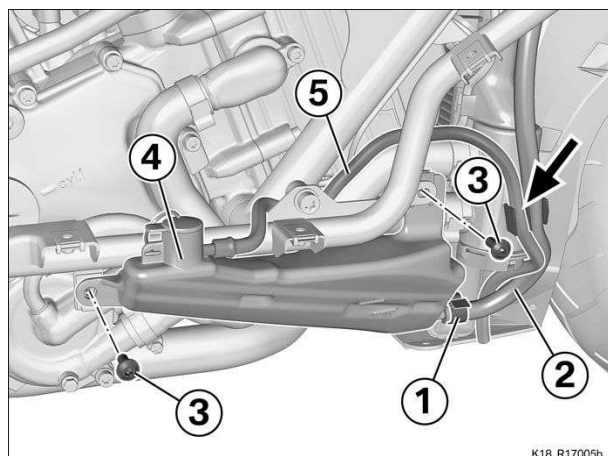
Removing bottom right fairing panel

Removing right side panel

Removing rear footplate

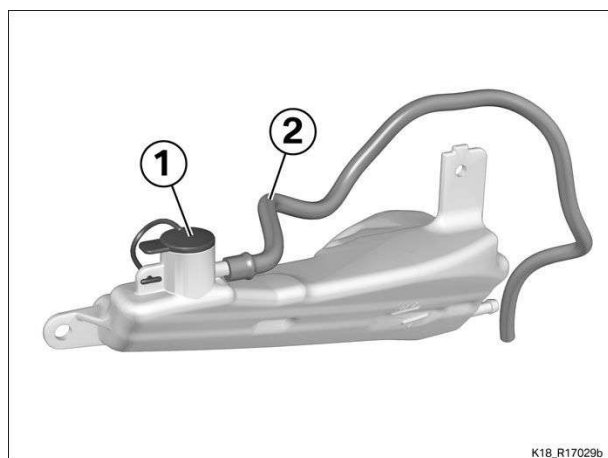
Core activity

(-) Removing expansion tank for coolant



- Place a tray in position to catch the coolant.
- Open clip (1) and disconnect hose (2); plug the hose with a suitable tool and catch escaping coolant in a suitable manner.
- Remove screws (3).
- Disengage breather hose (5) from the holder (arrow) and remove expansion tank (4).

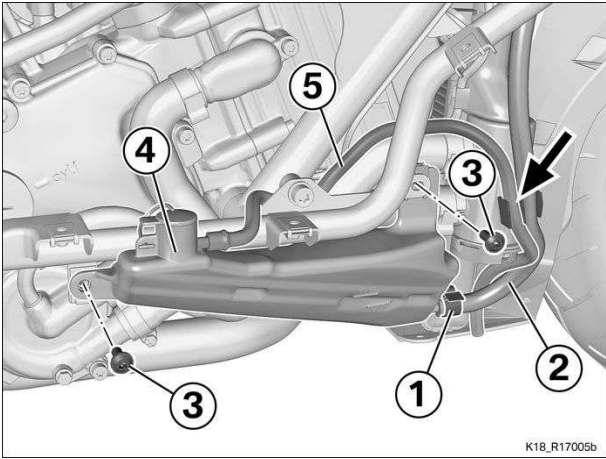
(-) Replacing expansion tank for coolant



- Transfer cap (1), hose (2) and small items to the new part.

(-) Installing expansion tank for coolant

- Secure expansion tank (4) with screws (3).



Tightening torques		
Expansion tank to footplate carrier		
M6 x 16	8 Nm	

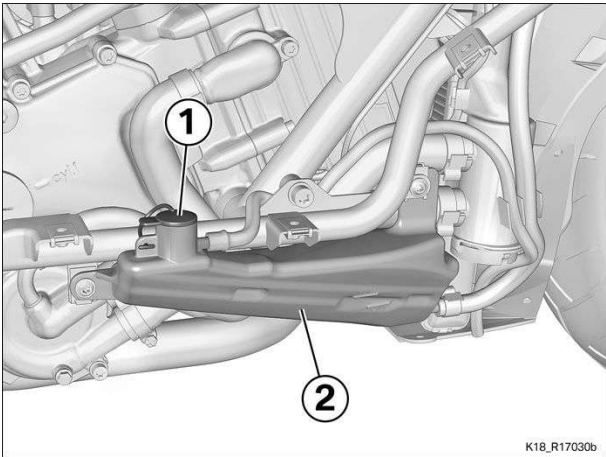
- Connect hose (2) and secure with clip (1).
- Seat breather hose (5) in the holder (arrow), making sure that routing is correct (see graphic).

(-) **Filling expansion tank**

- If the system is not refilled with fresh coolant, check the coolant to ensure that the proportion of antifreeze is sufficient to ensure resistance to freezing temperatures.

Technical data			
Coolant, frost protection		min -30 °C	

- Disengage cap (1) and fill expansion tank (2) with coolant.



Technical data			
Specified coolant level in expansion tank	engine cold	Between MIN and MAX marks	

- Secure cover (1).

Finishing work

- Installing right footplate
- Installing right side panel
- Installing bottom right fairing panel
- Installing top right side panel
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing front right footplate insert and footrest plate
- Installing centre cover
- Closing seat
- Installing filler cap flap

Final check of work performed

 17 21 006 Replacing heat exchanger (without draining/refilling coolant system)
+ 17 21 506

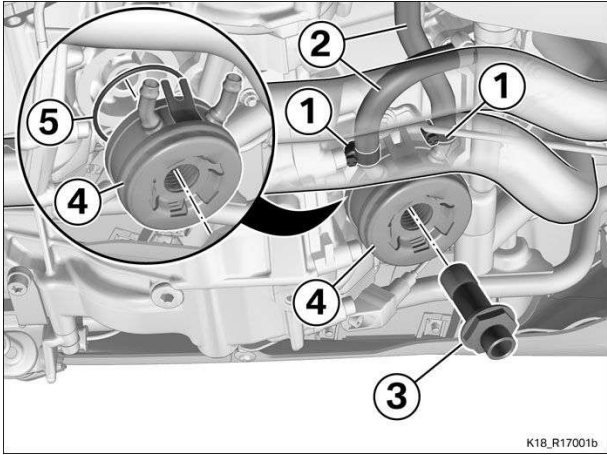
Preparatory work

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

Removing oil filter

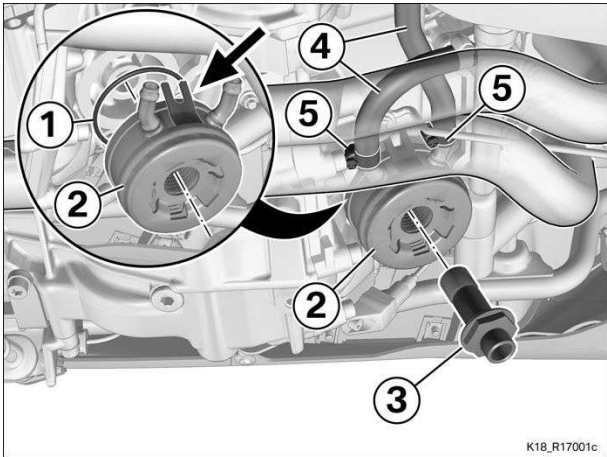
Core activity

(-) Remove the heat exchanger



- Open clips (1) and disconnect hoses (2).
- Remove the following components:
 - oil filter adapter (3)
 - heat exchanger (4)
 - sealing ring (5)

(-) Installing heat exchanger



- Clean the sealing faces.
- Install sealing ring (1) and heat exchanger (2), noting the locator (arrow).
- Install oil filter union (3).

 Tightening torques		
Oil filter adapter to crankcase		
M20 x 1.5	35 Nm	

- Connect hoses (4) and secure with clips (5).

Finishing work

Installing oil filter

Pouring engine oil into engine

Final check of work performed

 17 40 000 Removing/installing or replacing fan
+ 17 40 500

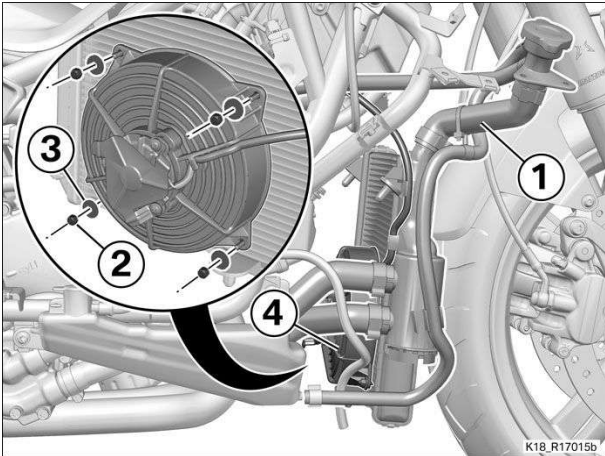
Preparatory work

- Removing filler cap flap
- Opening seat
- Removing top right side panel
- Removing front right footplate insert and footrest plate
- Removing bottom right fairing panel
- Removing centre right footplate insert and footrest plate
- Removing rear right footplate insert and footrest plate
- Removing centre cover
- Removing right side panel
- Removing rear footplate
- Removing air deflector
- Disengaging and lowering radiator

Core activity

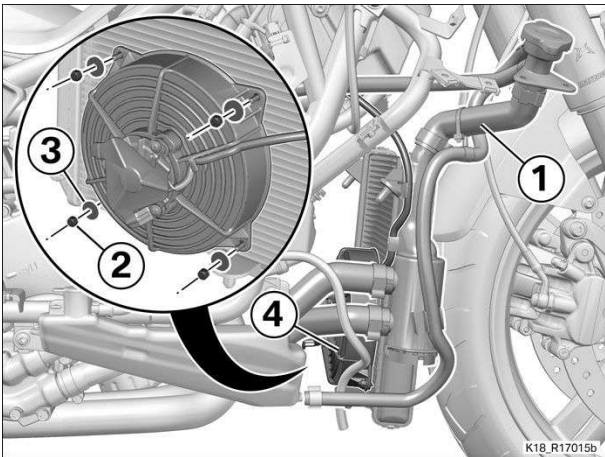
(-) Removing fan

- Push radiator (1) forward and remove nuts (2) with washers (3).
- Remove fan (4).



(-) Installing fan

- Position fan (4) on radiator (1).
- Install washers (3) and nuts (2).



 Tightening torques		
Radiator cowl to radiator		
M4 x 35, Screw		
M4, Replace nut	2 Nm	
Thread-locking compound (mechanical)		

Finishing work

Securing radiator
Installing air deflector for radiator
Installing right footplate
Installing right side panel
Installing centre cover
Installing rear right footplate insert and footrest plate
Installing centre right footplate insert and footrest plate
Installing bottom right fairing panel
Installing front right footplate insert and footrest plate
Installing top right side panel
Closing seat
Installing filler cap flap
Final check of work performed

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

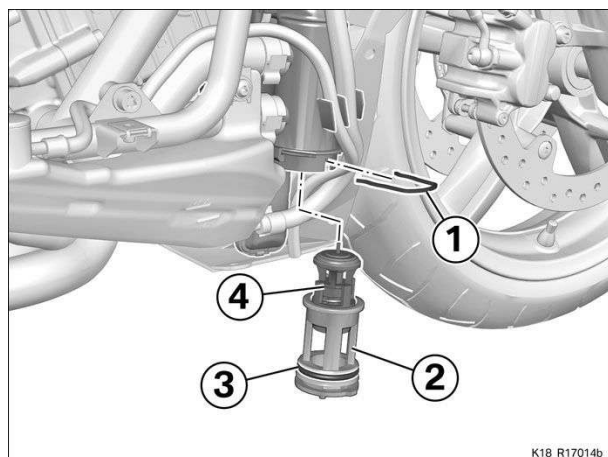
+ 17 65 500

Preparatory work

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

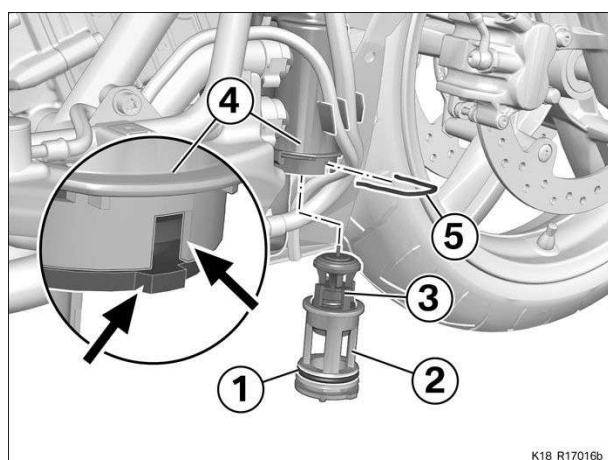
Core activity

(-) Removing thermostat



- Remove spring clip (1).
- Remove thermostatic cap (2) with sealing ring (3).
- Remove thermostatic insert (4).

(-) Installing thermostat



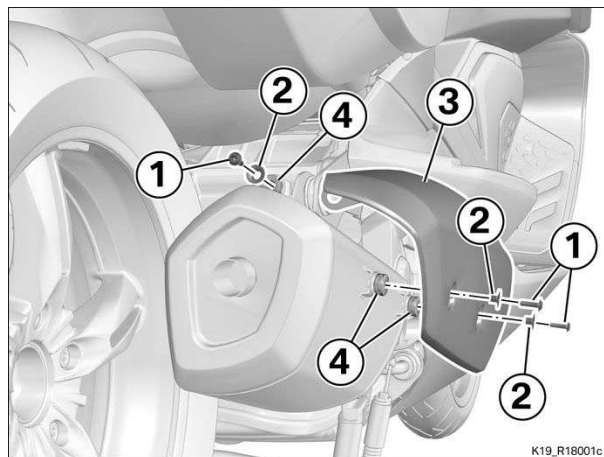
- Install thermostat insert (3).
- Check sealing ring (1); replace if necessary.
- Lubricate sealing ring (1) with coolant and install.
- Install thermostatic cap (2) in radiator (4), noting the locators (arrows).
- Install spring clip (5).

18 51 000 Replacing silencer

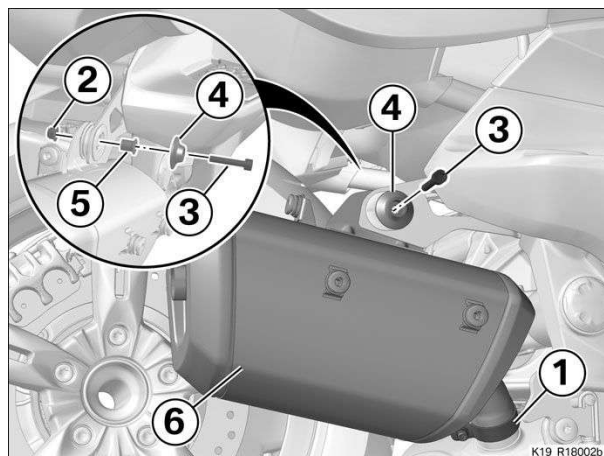
+ 18 51 500

Core activity

(-) Removing silencer



- Remove screws (1), shouldered bushings (2) and cover (3), noting insulating washers (4).



- Release clip (1).
- Remove nut (2), screw (3), washer (4) and, if applicable, bushing (5).
- Remove silencer (6).

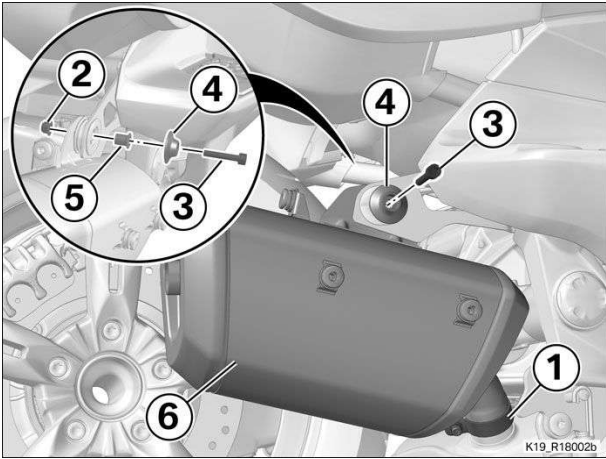
(-) Replacing silencer

- Secure clip (1) to the new part.



(-) Installing silencer

- Lubricate the inside of silencer pipe and clamp (1).



Lubricant

Optimoly TA	18 21 9 062 599
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- Hold silencer (6) in position.
- Install nut (2), screw (3), washer (4) and, if applicable, bushing (5).



Tightening torques

Silencer to bracket		
M8 x 30	20 Nm	

- Turn clamp (1) to the position shown and tighten.



Tightening torques

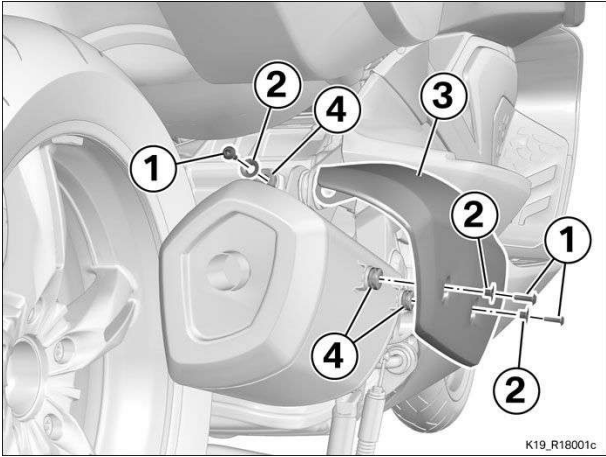
End silencer to front silencer		
M8 x 30	19 Nm	

- Install cover (3), shouldered bushings (2) and screws (1), noting insulating washers (4).



Tightening torques

Cover to rear silencer		
M6 x 16	8 Nm	



Finishing work

Final check of work performed

18 51 001 Replacing exhaust manifold

+ 18 51 502

Preparatory work

Removing filler cap flap

Opening seat

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing centre cover

Removing right side panel

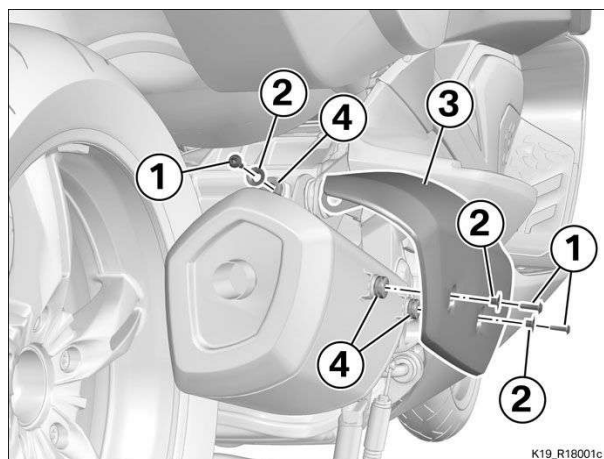
Removing rear footplate

Removing air deflector

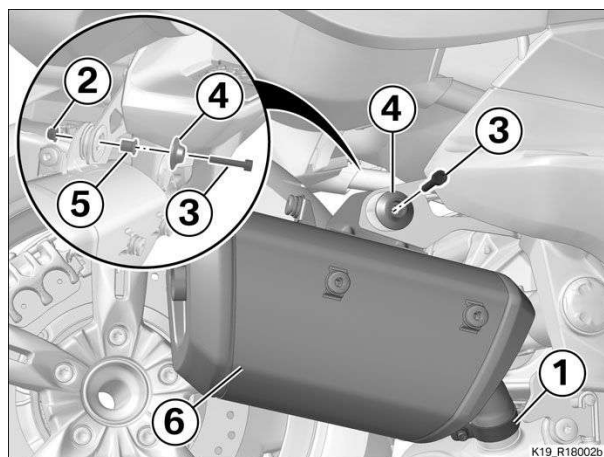
Disengaging and lowering radiator

Core activity

(-) Removing silencer



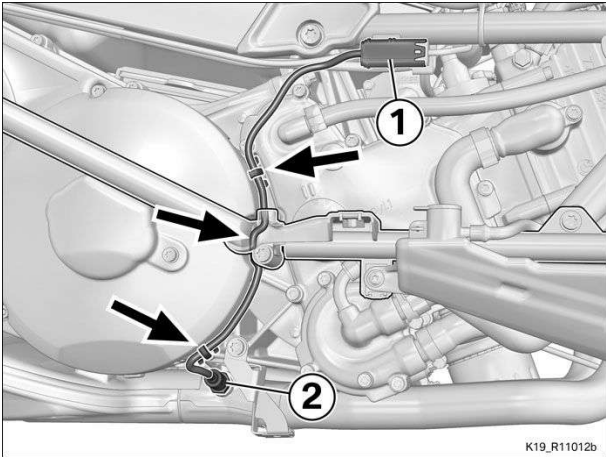
- Remove screws (1), shouldered bushings (2) and cover (3), noting insulating washers (4).



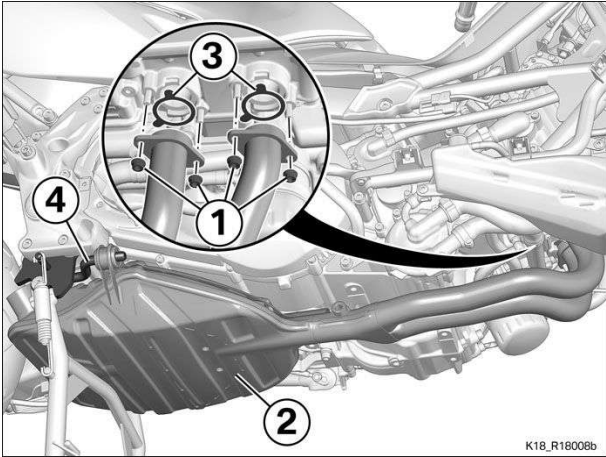
- Release clip (1).
- Remove nut (2), screw (3), washer (4) and, if applicable, bushing (5).
- Remove silencer (6).

(-) Removing exhaust manifold

- Disengage the cable for oxygen sensor (1) (arrows).



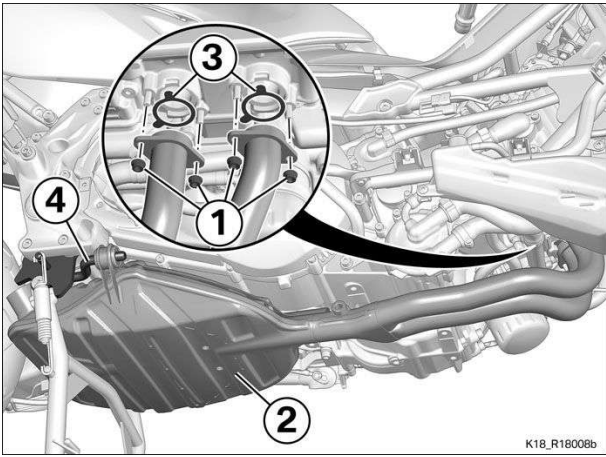
- Disengage sensor housing (2).



- Remove nuts (1) and disengage exhaust manifold (2).
- Remove exhaust manifold (2) and gaskets (3); if applicable lubricate retaining pins (4).

 Installation tool	
Silicone spray	83 19 2 208 609

(-) Installing exhaust manifold



- Lubricate retaining pins (5).

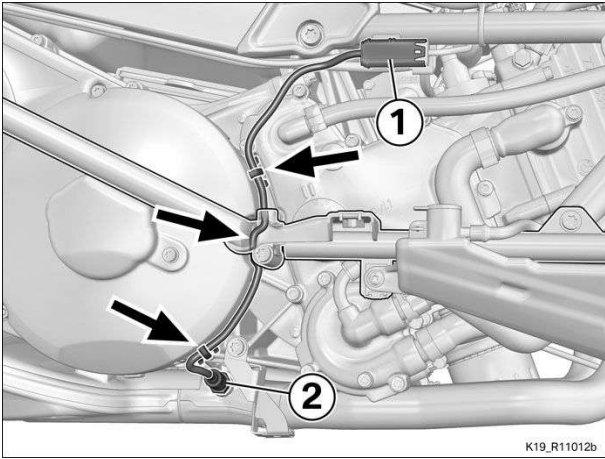
 Installation tool	
Silicone spray	83 19 2 208 609

- Install **new** gaskets (4) and seat exhaust manifold (3) on retaining pins (5).
- Secure exhaust manifold (3) with nuts (2).

 Tightening torques		
Manifold to cylinder head		
M7	14 Nm	

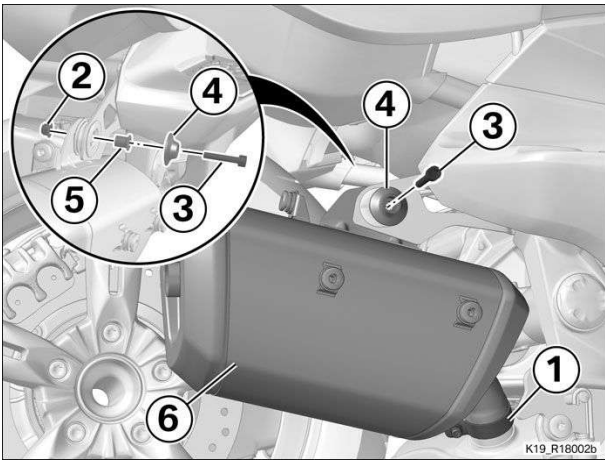
- Connect plug (1) for the oxygen sensor, making sure that the routing of the cable is correct.
- Secure sensor housing (2).

 Tightening torques		
Oxygen sensor to exhaust manifold		
M12 x 1.25	25 Nm	
Lubricate thread, Lubricant		



(Optimoly TA)

- Secure cable for oxygen sensor (1) (arrows).



(-) Installing silencer

- Lubricate the inside of silencer pipe and clamp (1).



Lubricant

Optimoly TA

18 21 9 062 599

- Hold silencer (6) in position.
- Install nut (2), screw (3), washer (4) and, if applicable, bushing (5).



Tightening torques

Silencer to bracket

M8 x 30

20 Nm

- Turn clamp (1) to the position shown and tighten.

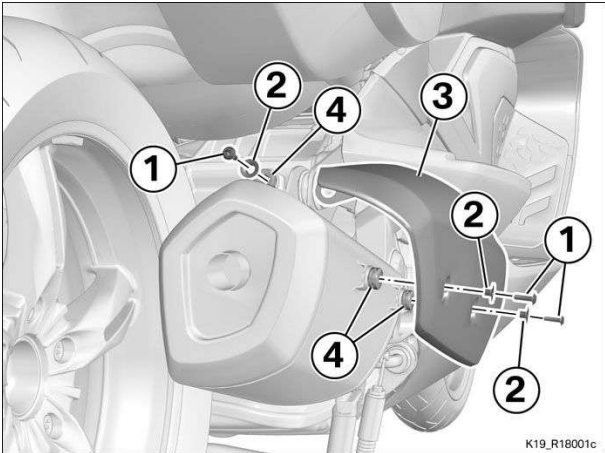


Tightening torques

End silencer to front silencer

M8 x 30

19 Nm



- Install cover (3), shouldered bushings (2) and screws (1), noting insulating washers (4).



Tightening torques

Cover to rear silencer

M6 x 16

8 Nm

Finishing work

Securing radiator

Installing air deflector for radiator

- Installing right footplate
- Installing right side panel
- Installing centre cover
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Closing seat
- Installing filler cap flap
- Final check of work performed

21 21 000 Removing and installing or replacing clutch

+ 21 21 606

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing rear right footplate carrier

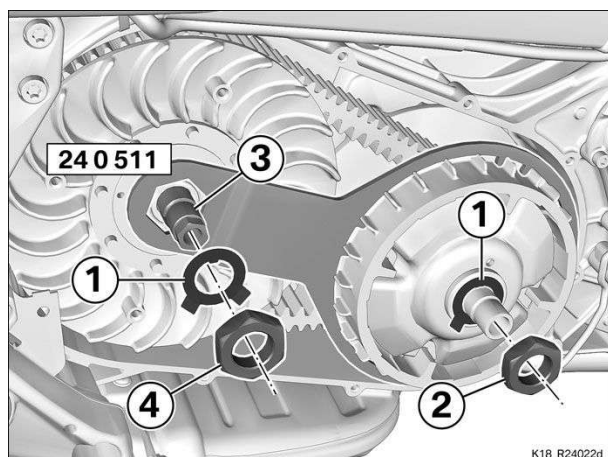
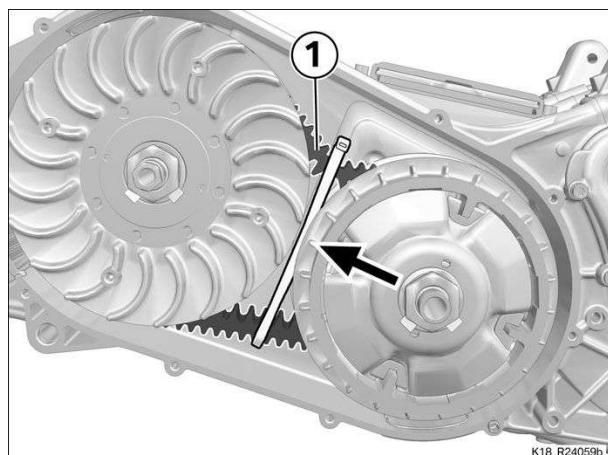
Removing CVT sound-absorbing hood

Removing CVT cover

Core activity

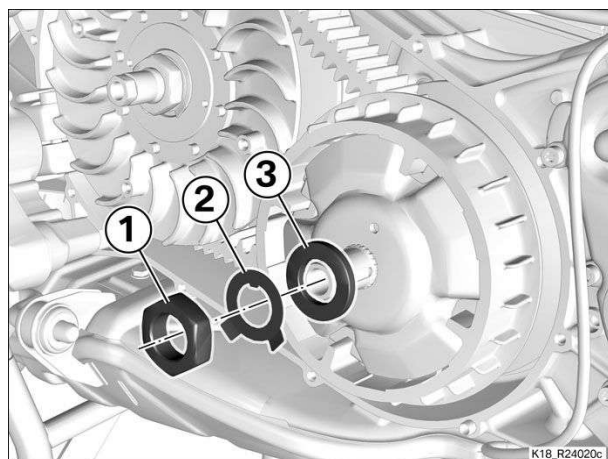
(-) Slackening threaded fasteners of CVT adjuster unit and CVT output

- If applicable, secure drive belt (1) with a cable tie (arrow).



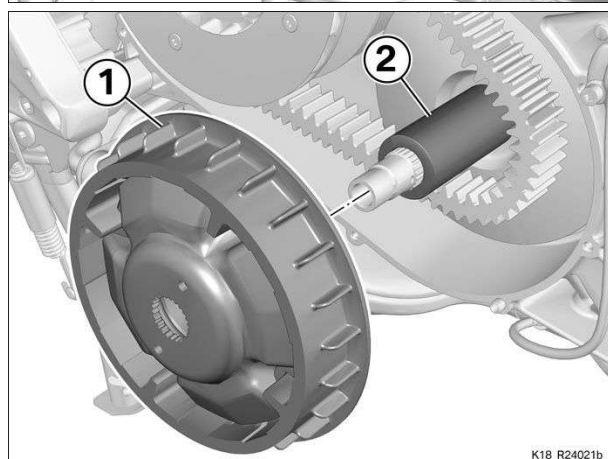
- Bend up tabs of lock washer (1)
- Engage holder (No. 24 0 511).
- Slacken nut (2).
- Turn shaft (3) **clockwise** to slacken nut (4).
- Remove holder (No. 24 0 511).

(-) Removing CVT adjuster unit



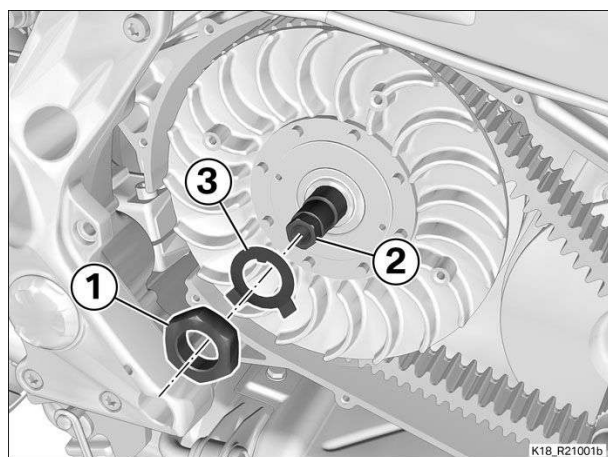
- Remove the following components:

- Nut (1)
- Lock washer (2)
- Spacer (3)



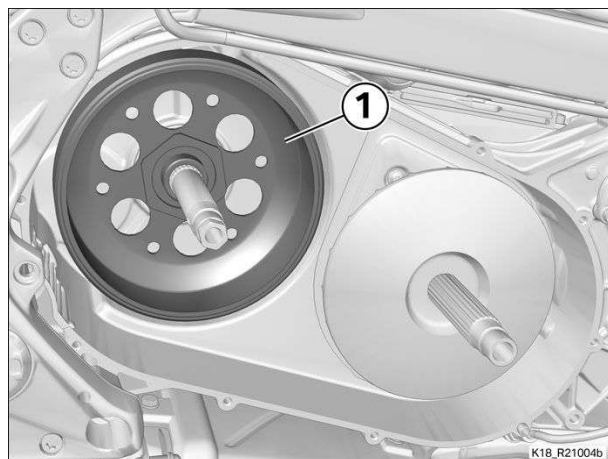
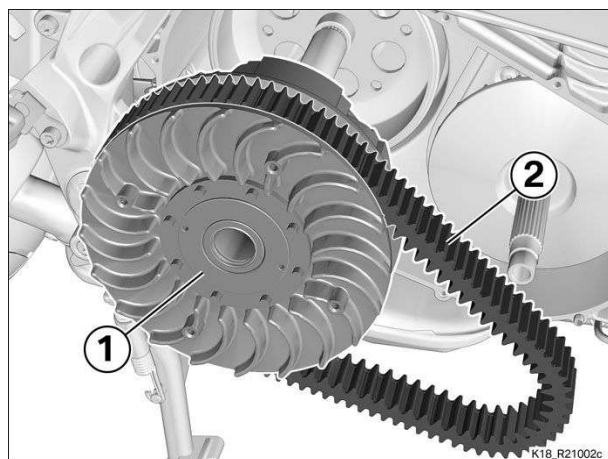
- Remove CVT adjuster unit (1) and sleeve (2).

(-) Removing CVT output with drive belt and clutch bell



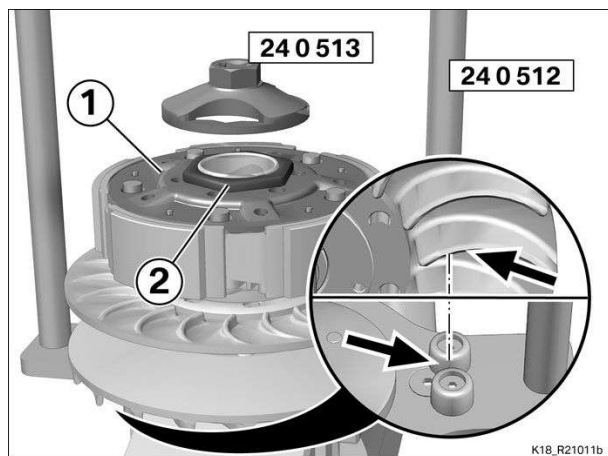
- Remove nut (1), while counter-holding at shaft (2) if necessary.
- Remove lock washer (3).

- Remove CVT output (1) with drive belt (2).

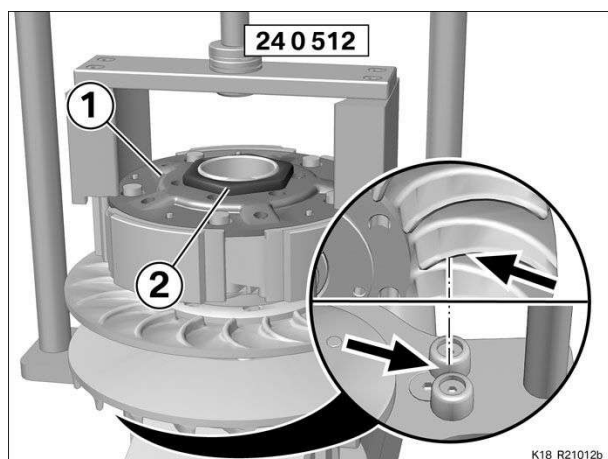


- Remove clutch bell (1).

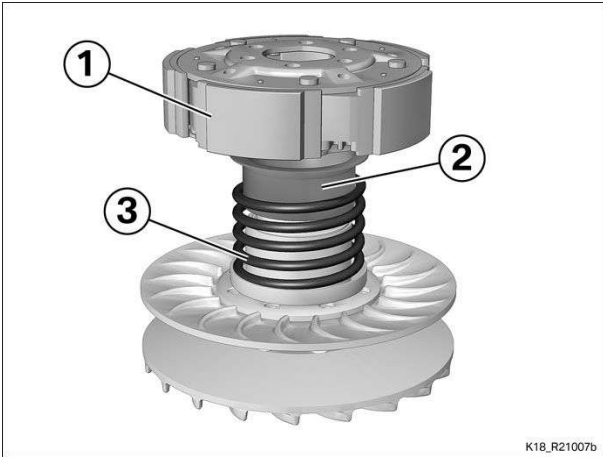
(-) Removing clutch package



- Insert clutch package (1) with CVT output in pretensioning tool (No. 24 0 512), making sure that CVT output (1) is secured so that it cannot twist out of position.
- Slipstream deflectors engage the retainers (arrows).
- **Slacken** nut (2) with socket (No. 24 0 513), securing the socket so that it cannot slip.

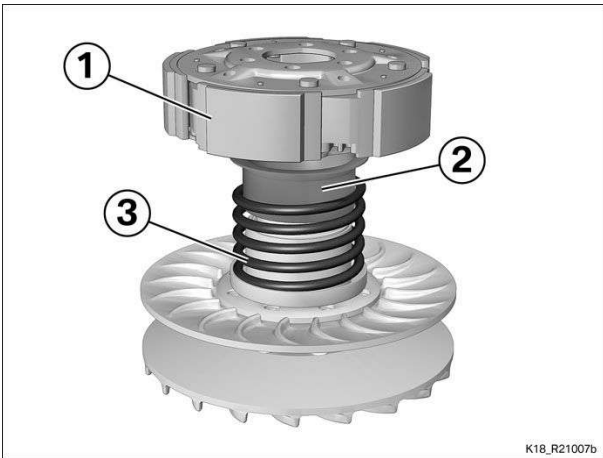


- **Pretension** clutch package (1) with pretensioning tool (No. 24 0 512) .
- Remove nut (2).
- Relieve the tension on pretensioning tool (No. 24 0 512) and remove clutch package (1) with the CVT output.

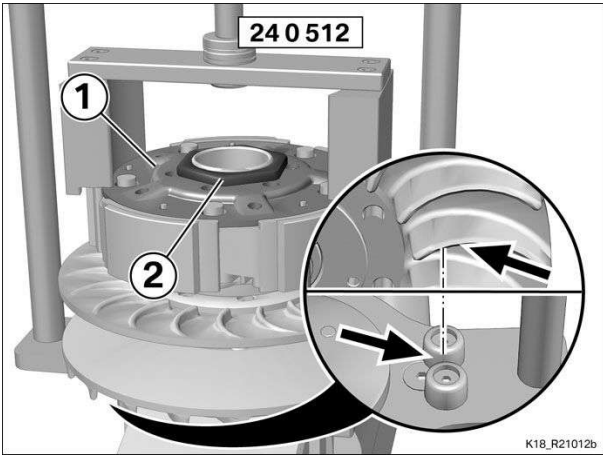


- Remove clutch package (1), spring sleeve (2) and spring (3).

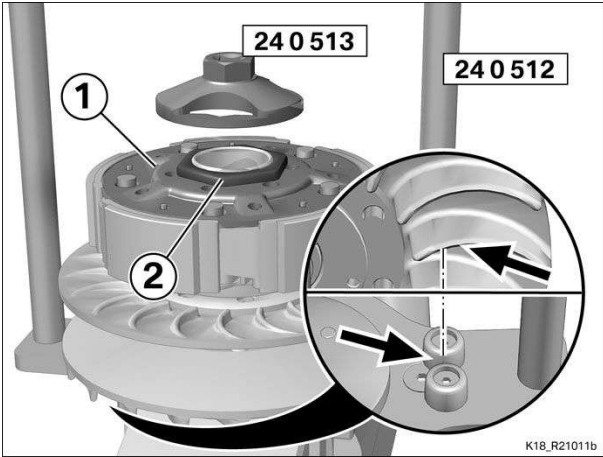
(-) Installing clutch package



- Place spring (3), spring sleeve (2) and clutch package (1) in position.



- Insert clutch package (1) with CVT output into pretensioning tool (No. 24 0 512), noting the locator in the pretensioning tool.
- Slipstream deflectors engage the retainers (arrows).
- Pretension clutch package (1) with pretensioning tool (No. 24 0 512) and tighten nut (2) until hand-tight.
- Relieve tension on pretensioning tool (No. 24 0 512).



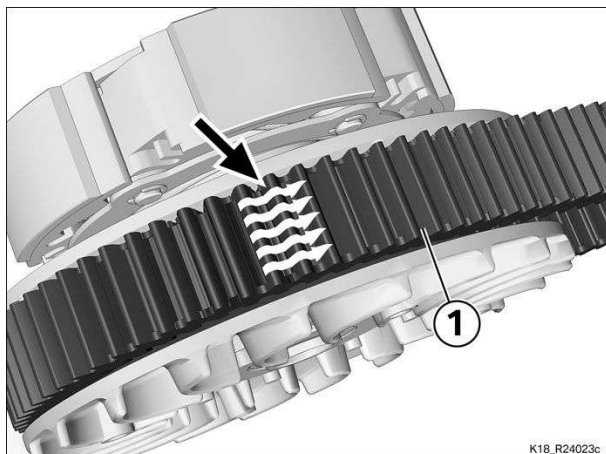
- Tighten nut (2) with socket wrench insert (No. 24 0 513).

 Tightening torques		
Clutch package to CVT output		
M48 x 1	85 Nm	

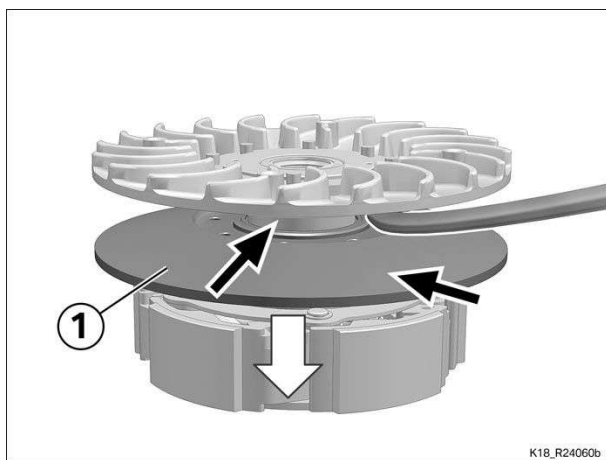
- Remove clutch package (1) with CVT output from the pretensioning tool.

(-) Installing CVT output with drive belt and clutch bell

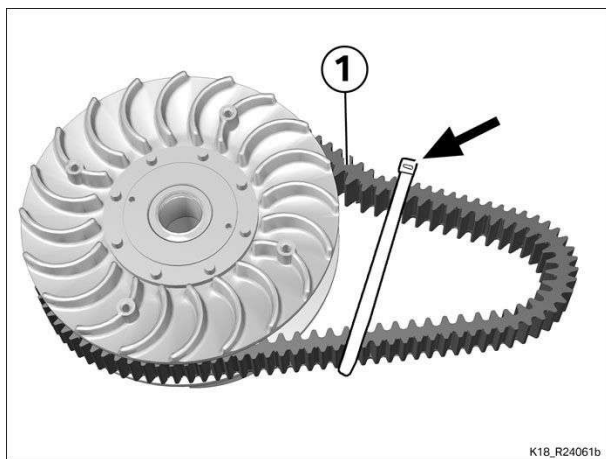
► Installing drive belt in CVT output



- When installing drive belt (1), make sure that the direction of rotation (arrow) is correct: **arrows point in direction of rotation.**



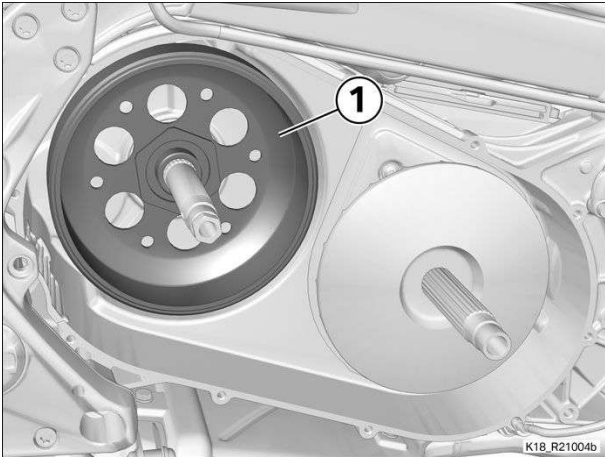
- Use a tyre lever to hold down thrust washer (1), taking care not to damage the friction faces (arrows).



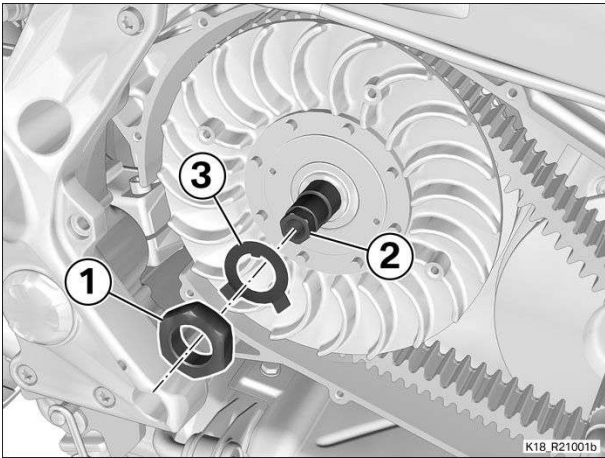
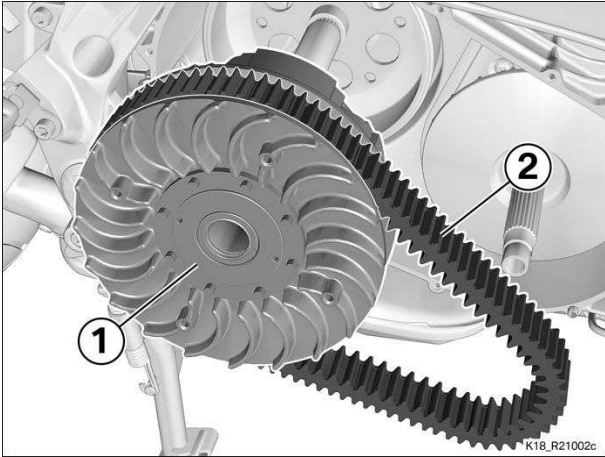
- Pull drive belt (1) as tight to the pulley as possible and secure the loose end with a cable tie (arrow).
- » Drive belt (1) is secured to permit subsequent assembly of the CVT adjuster unit.



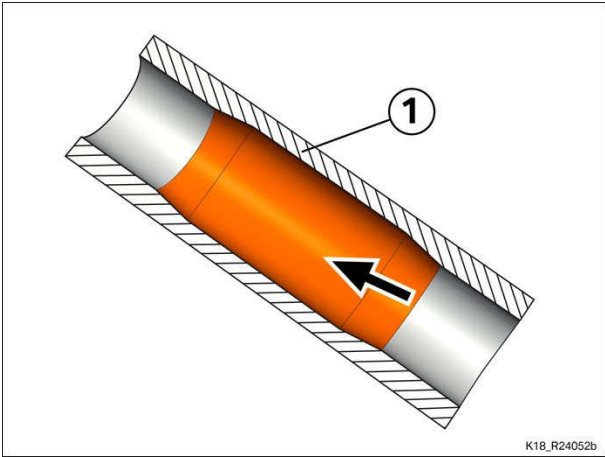
- Install clutch bell (1).



- Install CVT output (1) with drive belt (2).



- Position lock washer (3) on shaft (2).
- Install nut (1) and tighten until hand-tight.



(-) Installing CVT adjuster unit

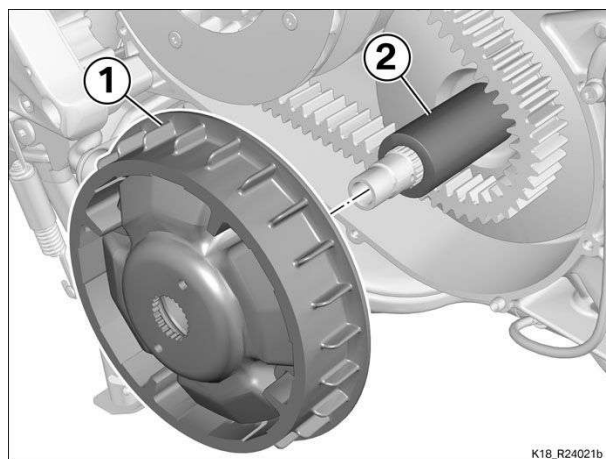
- Clean CVT spacing sleeve (1).
- Lubricate the cavity (arrow).



ubricant

Unirex N3

83 19 2 160 349

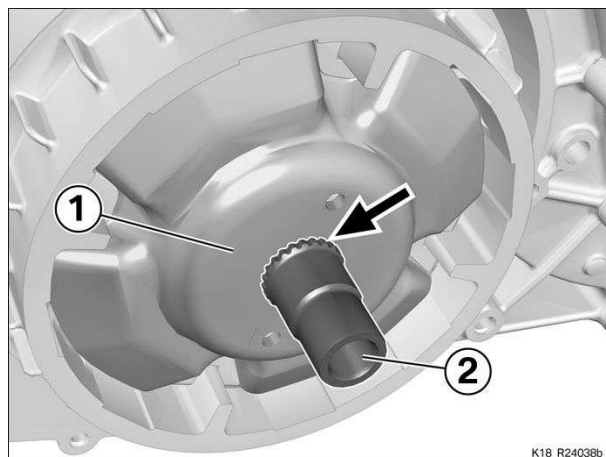


- Install CVT spacing sleeve (2) and **removing escaping grease**.

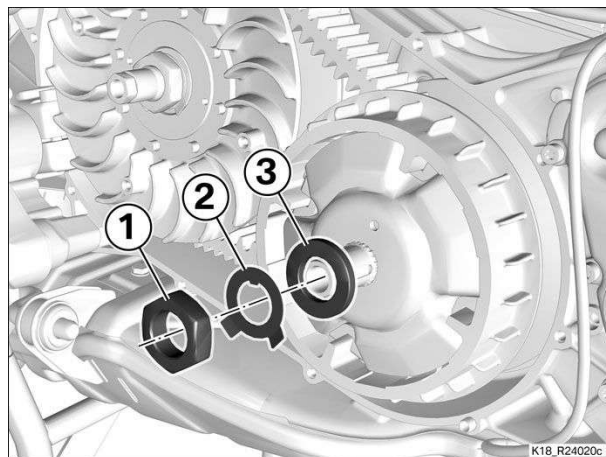


The friction faces of the CVT belt, CVT belt and coupling must be clean and free of grease.

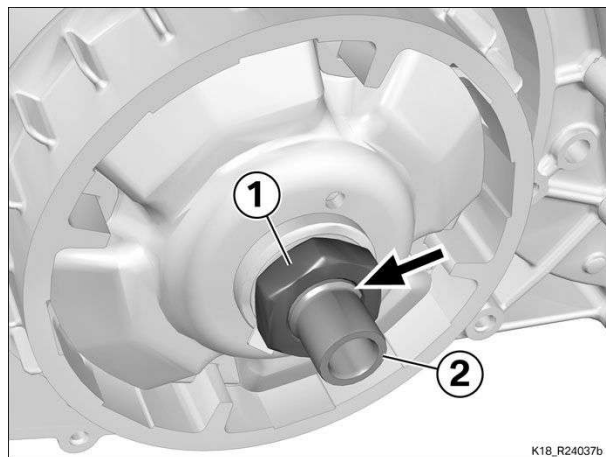
- Install CVT adjuster unit (1).



- Make sure that engagement of the splines (arrow) between guide plate (1) and CVT shaft (2) is correct.

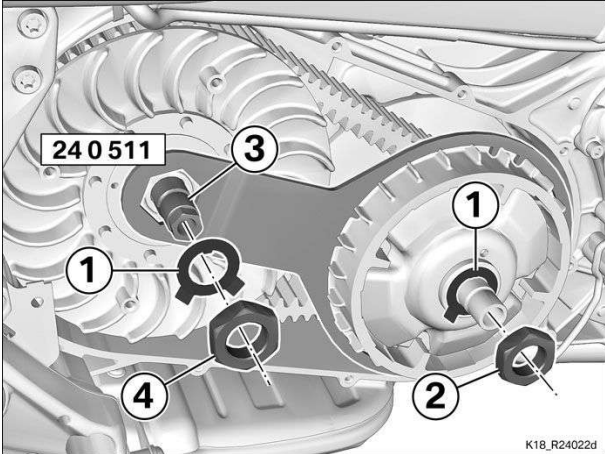


- Install spacer (3) and lock washer (2).
- Install nut (1) and tighten until **hand-tight**.



- Make sure that installation is correct: with nut (1) installed, the groove (arrow) in CVT shaft (2) must be visible.

(-) Securing threaded fasteners of CVT adjuster unit and CVT



output

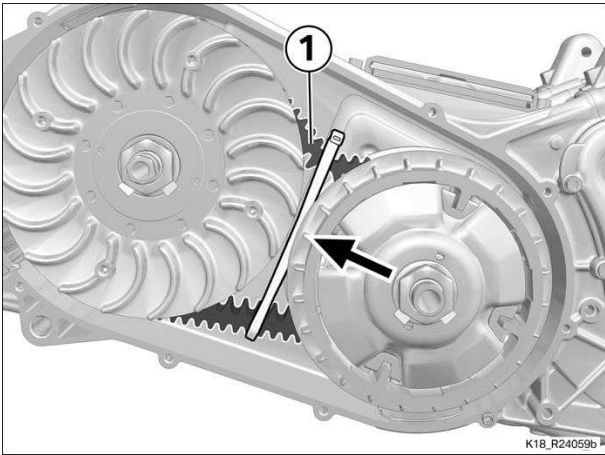
- Engage holder (No. 24 0 511).
- Tighten nut (2).

 Tightening torques		
CVT (front) to CVT input shaft		
M22 x 1.5, secure with lock washer	100 Nm	

- Turn shaft (3) to tighten nut (4).

 Tightening torques		
CVT output to CVT output shaft		
M22 x 1.5, secure with lock washer	100 Nm	

- Remove holder (No. 24 0 511).
- Bend up the tabs of locking washer (1).
- If applicable, remove the cable tie (arrow) from drive belt (1).



inishing work

- Installing CVT cover
- Installing CVT sound-absorbing hood
- Installing rear right footplate carrier
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Removing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap

inal check of work performed

21 21 001 Checking clutch

+ 21 21 614

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing rear right footplate carrier

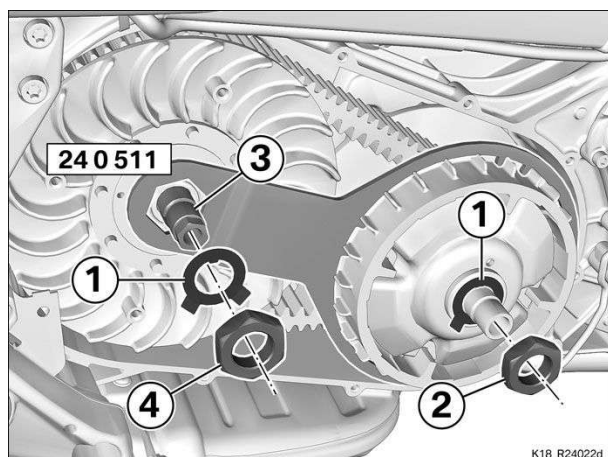
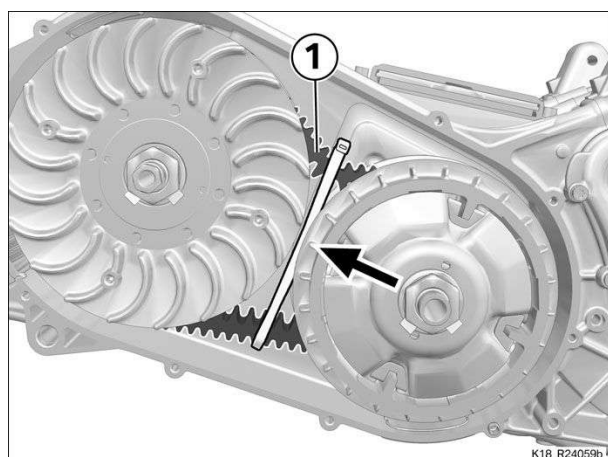
Removing CVT sound-absorbing hood

Removing CVT cover

Core activity

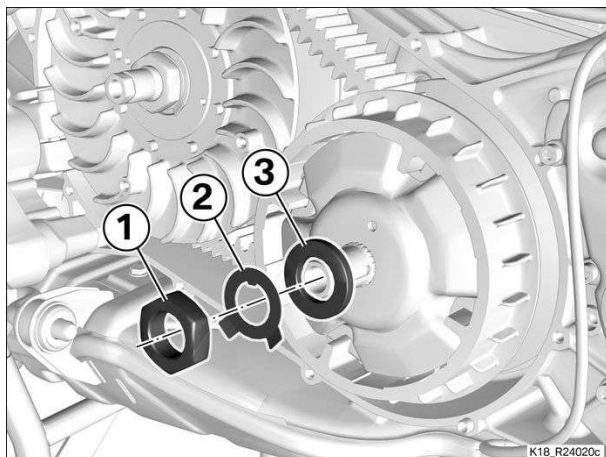
(-) Slackening threaded fasteners of CVT adjuster unit and CVT output

- If applicable, secure drive belt (1) with a cable tie (arrow).



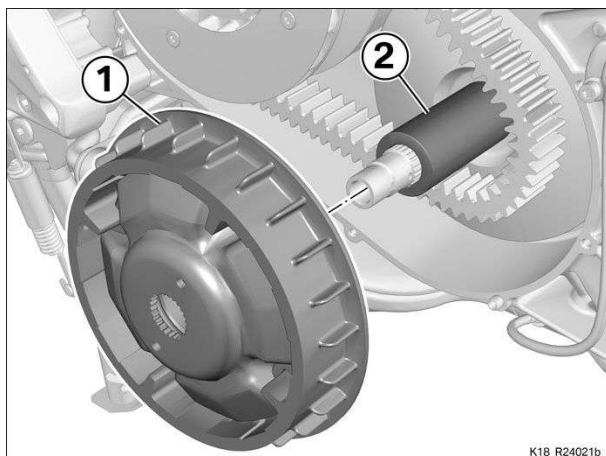
- Bend up tabs of lock washer (1)
- Engage holder (No. 24 0 511).
- Slacken nut (2).
- Turn shaft (3) **clockwise** to slacken nut (4).
- Remove holder (No. 24 0 511).

(-) Removing CVT adjuster unit



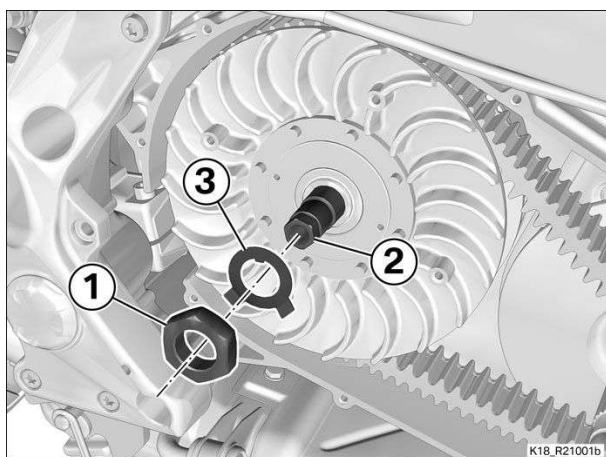
- Remove the following components:

- Nut (1)
- Lock washer (2)
- Spacer (3)



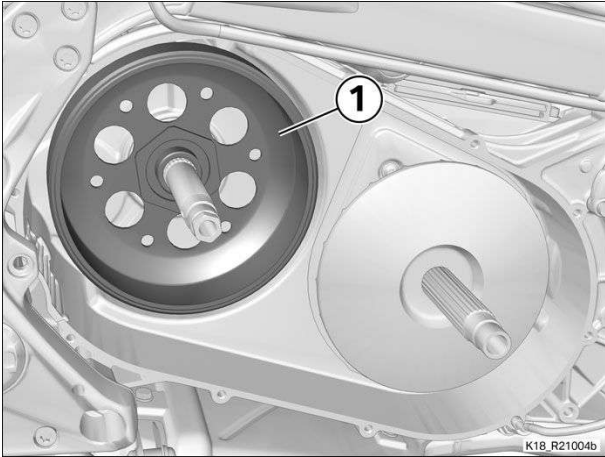
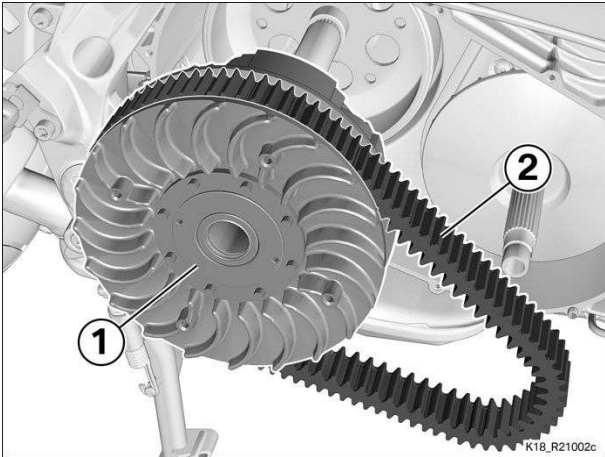
- Remove CVT adjuster unit (1) and sleeve (2).

(-) Removing CVT output with drive belt and clutch bell



- Remove nut (1), while counter-holding at shaft (2) if necessary.
- Remove lock washer (3).

- Remove CVT output (1) with drive belt (2).



- Remove clutch bell (1).

(-) Checking clutch

Check

- Check clutch (1) and clutch bell (2) for wear.

 Technical data			
Minimum height, clutch lining	Projection past lining backer	min 2.5 mm	

Result:

- Clutch linings are worn or damaged, clutch bell shows scoring on friction face.

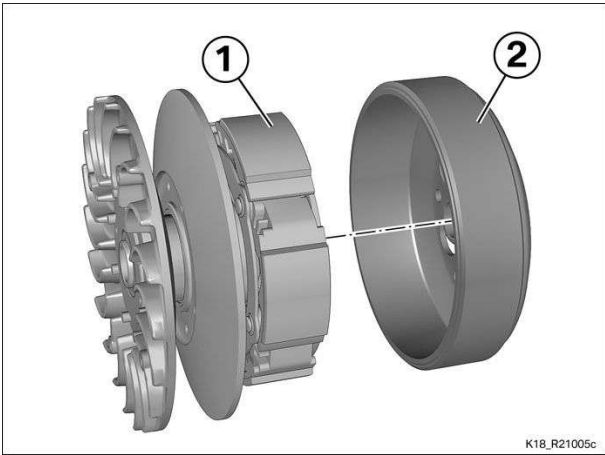
Measure:

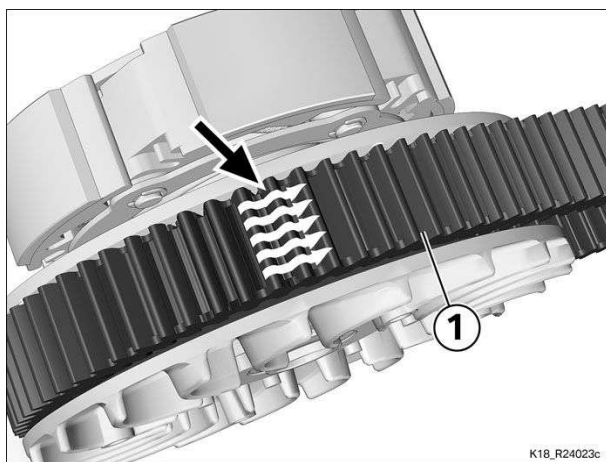
=> 21 21 511, Replacing clutch package (CVT output removed) (Billed as a separate item)

(-) Installing CVT output with drive belt and clutch bell

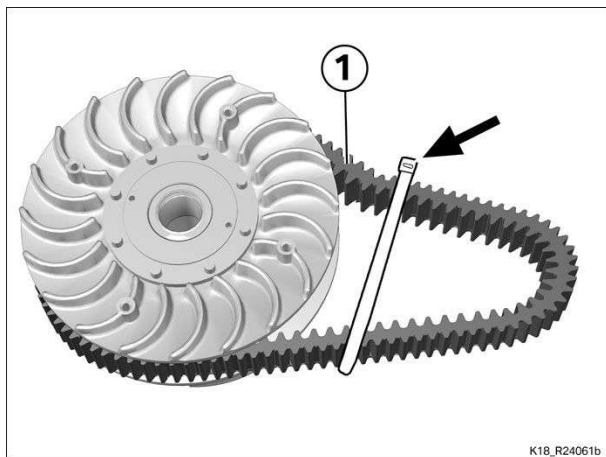
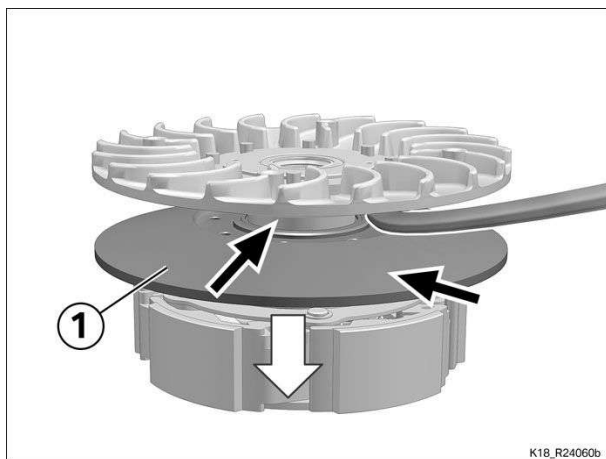
► Installing drive belt in CVT output

- When installing drive belt (1), make sure that the direction of rotation (arrow) is correct: **arrows point in direction of rotation.**

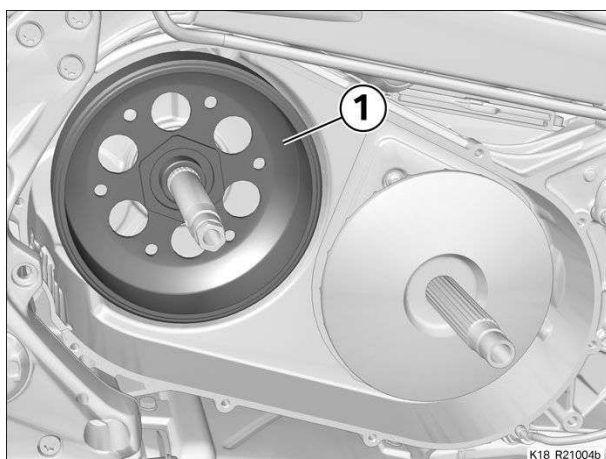




- Use a tyre lever to hold down thrust washer (1), taking care not to damage the friction faces (arrows).

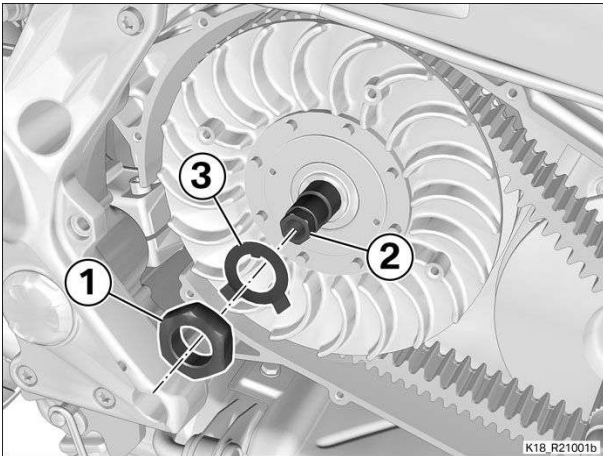
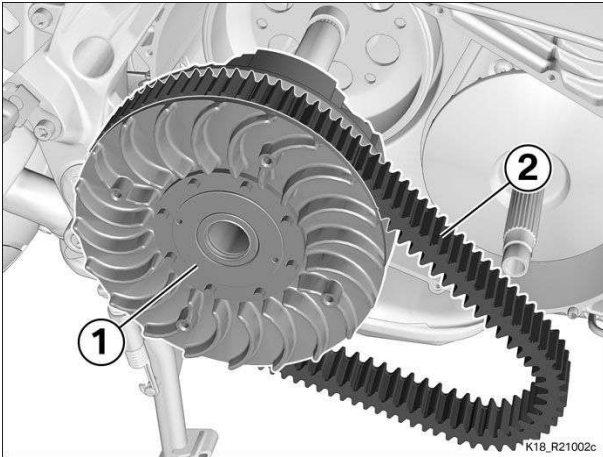


- Pull drive belt (1) as tight to the pulley as possible and secure the loose end with a cable tie (arrow).
- » Drive belt (1) is secured to permit subsequent assembly of the CVT adjuster unit.



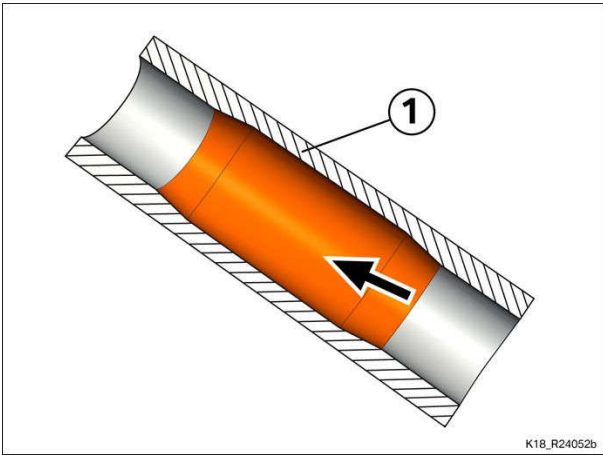
- Install clutch bell (1).

- Install CVT output (1) with drive belt (2).



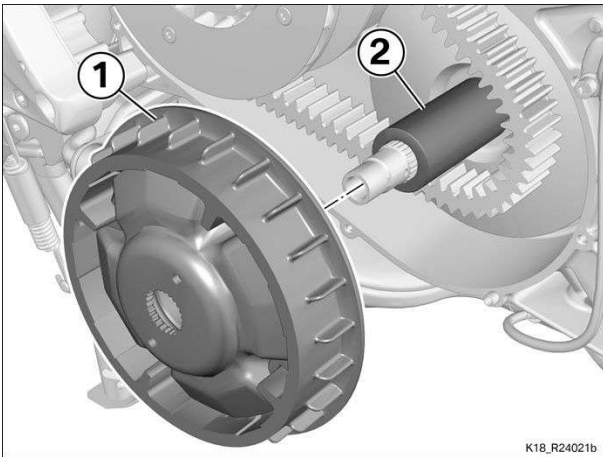
- Position lock washer (2) on shaft (3).
- Install nut (1) and tighten until hand-tight.

(-) Installing CVT adjuster unit



- Clean CVT spacing sleeve (1).
- Lubricate the cavity (arrow).

Lubricant	
Unirex N3	83 19 2 160 349

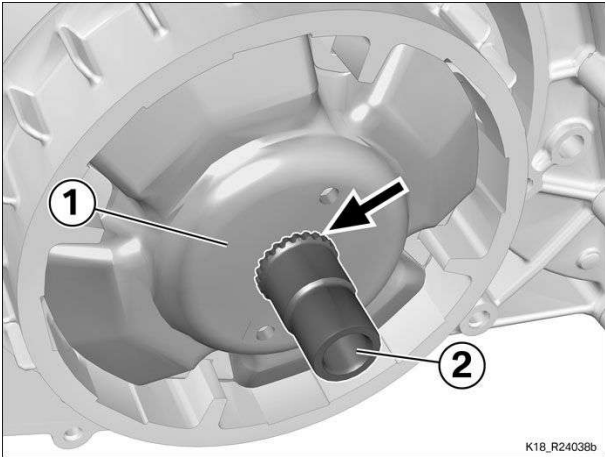


- Install CVT spacing sleeve (2) and removing escaping grease.

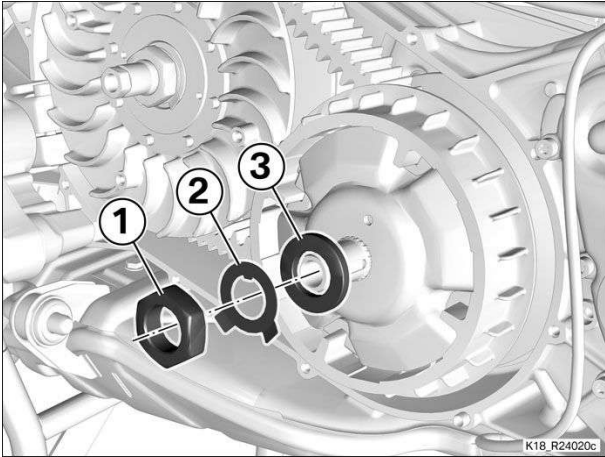
NOTICE

The friction faces of the CVT belt, CVT belt and coupling must be clean and free of grease.

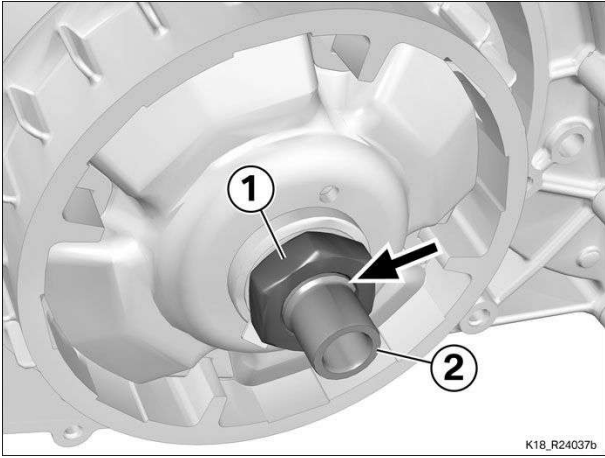
- Install CVT adjuster unit (1).



- Make sure that engagement of the splines (arrow) between guide plate (1) and CVT shaft (2) is correct.



- Install spacer (3) and lock washer (2).
- Install nut (1) and tighten until **hand-tight**.



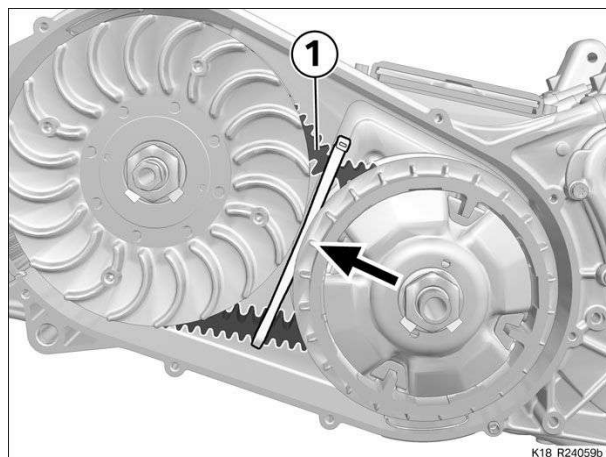
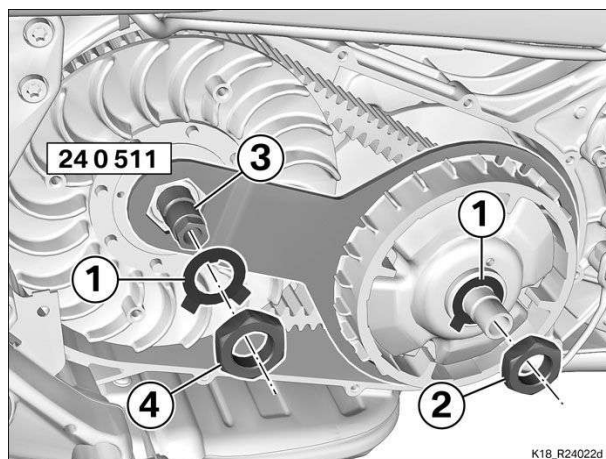
- Make sure that installation is correct: with nut (1) installed, the groove (arrow) in CVT shaft (2) must be visible.

(-) Securing threaded fasteners of CVT adjuster unit and CVT output

- Engage holder (No. 24 0 511).
- Tighten nut (2).

Tightening tor ues		
CVT (front) to CVT input shaft		
M22 x 1.5, secure with lock washer	100 Nm	

- Turn shaft (3) to tighten nut (4).



Tightening torques		
CVT output to CVT output shaft		
M22 x 1.5, secure with lock washer	100 Nm	

- Remove holder (No. 24 0 511).
- Bend up the tabs of locking washer (1).
- If applicable, remove the cable tie (arrow) from drive belt (1).

Finishing work

Installing CVT cover

Installing CVT sound-absorbing hood

Installing rear right footplate carrier

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing centre cover

Closing seat

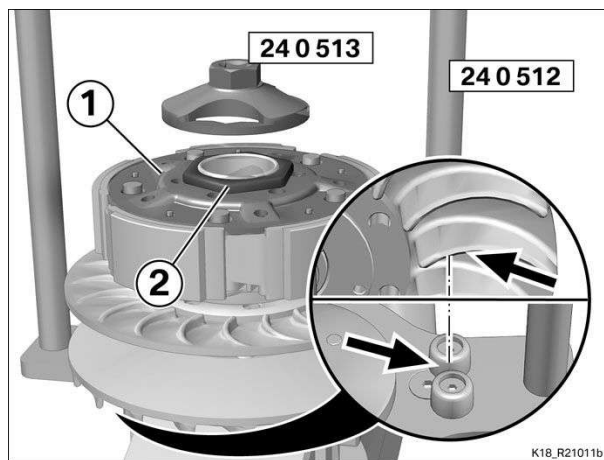
Installing filler cap flap

Final check of work performed

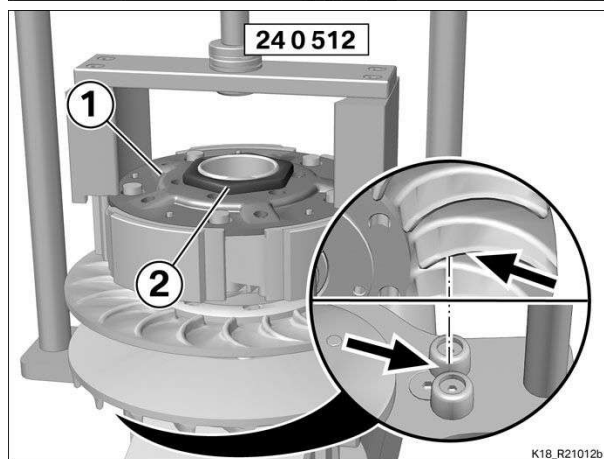
21 21 511 Replacing clutch package (CVT output removed)

Core activity

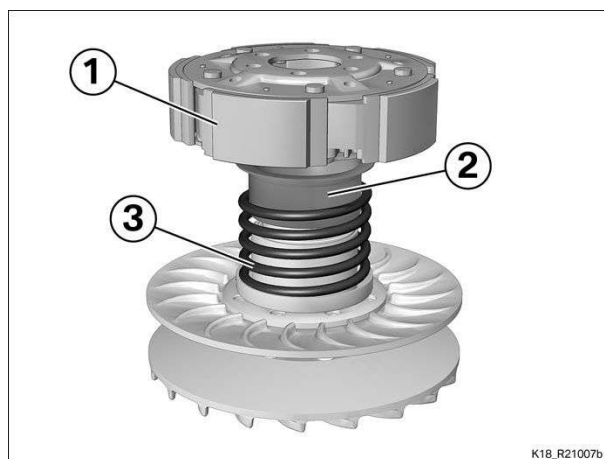
(-) Removing clutch package



- Insert clutch package (1) with CVT output in pretensioning tool (No. 24 0 512), making sure that CVT output (1) is secured so that it cannot twist out of position.
- Slipstream deflector engage the retainers (arrows).
- **Slacken** nut (2) with socket (No. 24 0 513), securing the socket so that it cannot slip.



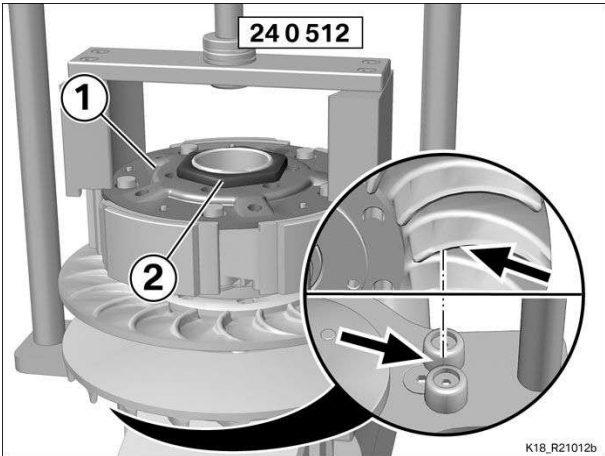
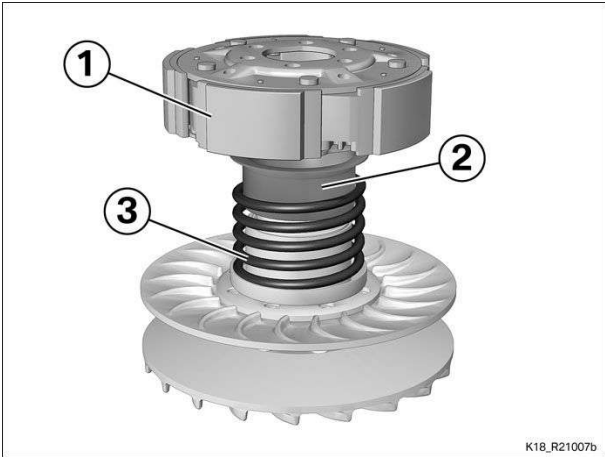
- **Pretension** clutch package (1) with pretensioning tool (No. 24 0 512) .
- Remove nut (2).
- Relieve the tension on pretensioning tool (No. 24 0 512) and remove clutch package (1) with the CVT output.



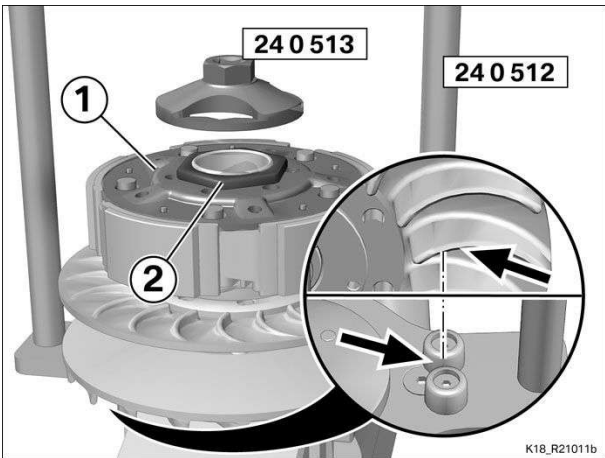
- Remove clutch package (1), spring sleeve (2) and spring (3).

(-) Installing clutch package

- Place spring (3), spring sleeve (2) and clutch package (1) in position.



- Insert clutch package (1) with CVT output into pretensioning tool (No. 24 0 512), noting the locator in the pretensioning tool.
- Slipstream deflectors engage the retainers (arrows).
- Pretension clutch package (1) with pretensioning tool (No. 24 0 512) and tighten nut (2) until hand-tight.
- Relieve tension on pretensioning tool (No. 24 0 512).



- Tighten nut (2) with socket wrench insert (No. 24 0 513).

 Tightening torques		
Clutch package to CVT output		
M48 x 1	85 Nm	

- Remove clutch package (1) with CVT output from the pretensioning tool.

 21 21 600 Check clutch (clutch removed)

Core activity

(-) Checking clutch

Check

- Check clutch (1) and clutch bell (2) for wear.



Technical data

Minimum height, clutch lining	Projection past lining backer	min 2.5 mm	
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Result:

- Clutch linings are worn or damaged, clutch bell shows scoring on friction face.

Measure:

=> 21 21 511, Replacing clutch package (CVT output removed) (Billed as a separate item)

24 11 001 Removing/installing CVT cover

+ 24 11 501

Preparatory work

Removing filler cap flap

Removing centre cover

Opening seat

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

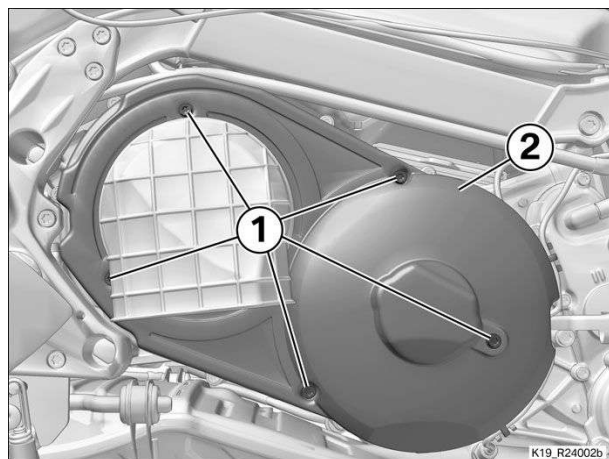
Removing rear footplate

Removing rear right footplate carrier

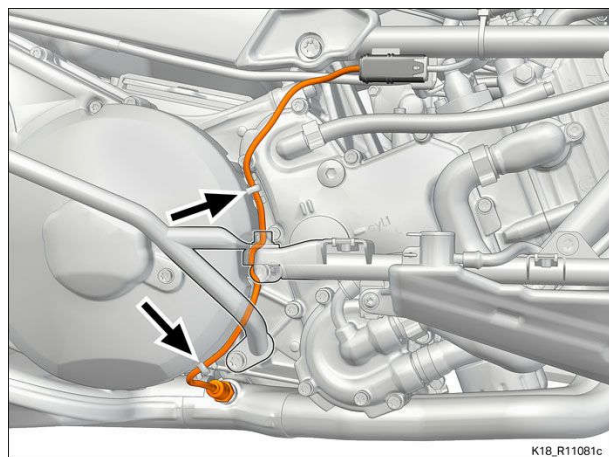
Core activity

(-) Removing CVT sound-absorbing hood

- Remove screws (1) and disengage sound-absorbing hood (2).

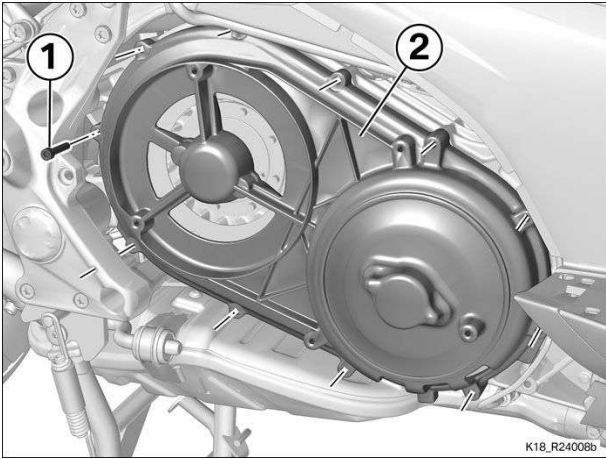


- Disengage the cable (arrows) and remove the sound-absorbing hood.



(-) Removing CVT cover

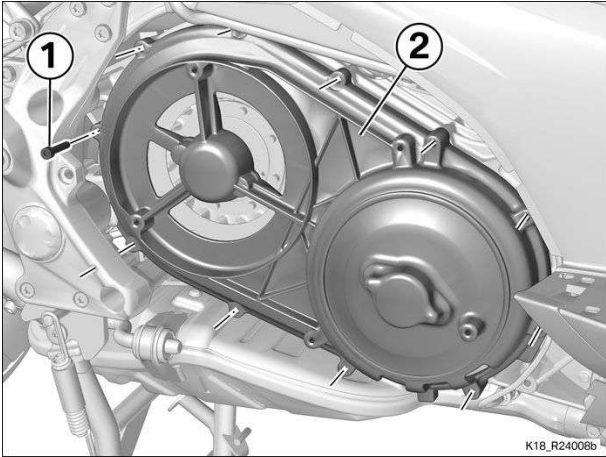
- Remove screws (1) and remove cover (2).



(-) Installing CVT cover

- Install cover (2) and secure with screws (1).

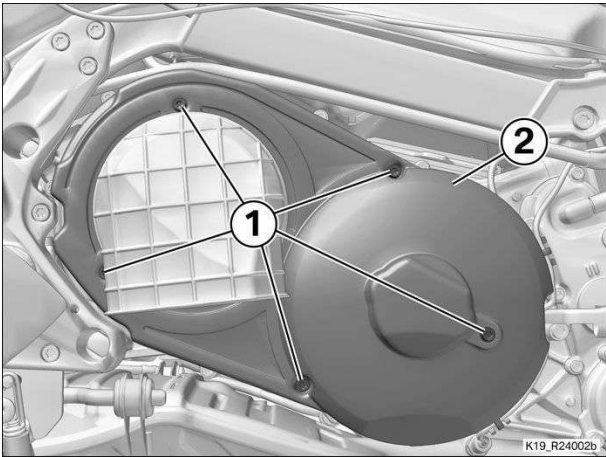
 Tightening torques		
CVT cover to crankcase		
M6 x 45	10 Nm	



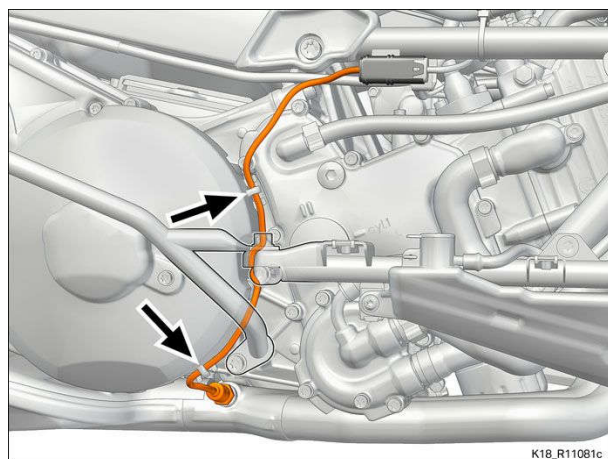
(-) Installing CVT sound-absorbing hood

- Secure CVT sound-absorbing hood (2) with screws (1).

 Tightening torques		
Sound-absorbing hood to CVT cover		
M6 x 18	10 Nm	



- Secure the cable (arrows).



Finishing work

- Installing rear right footplate carrier
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

24 11 002 Removing/installing or sealing secondary gearbox cover

+ 24 11 502

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing left footplate

Removing left footplate carrier

Draining engine oil from oil tank

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing underbody panel

Removing air deflector for radiator

Disengaging and lowering radiator

Removing silencer

Installing engine lifter

Draining oil from swinging arm

Removing swinging-arm housing cover

Removing bottom chain channel

Removing chain tensioner rail

Removing top chain channel

Disengage the judder damper

Removing rear wheel

Disengaging rear brake caliper and parking brake

Disengaging brake hose and sensor cable

Removing judder-damper housing and output shaft

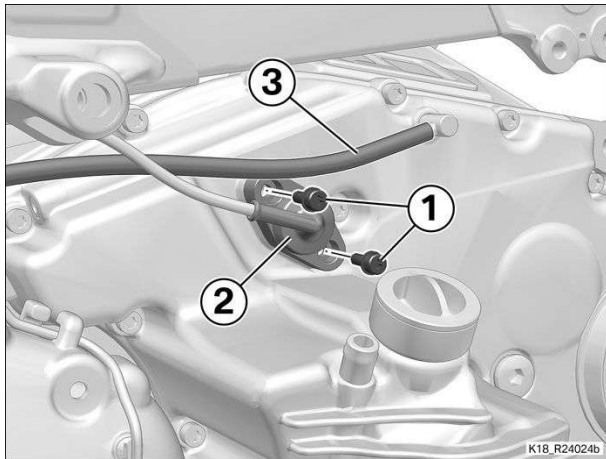
Removing spring strut

Removing rear wheel swinging arm

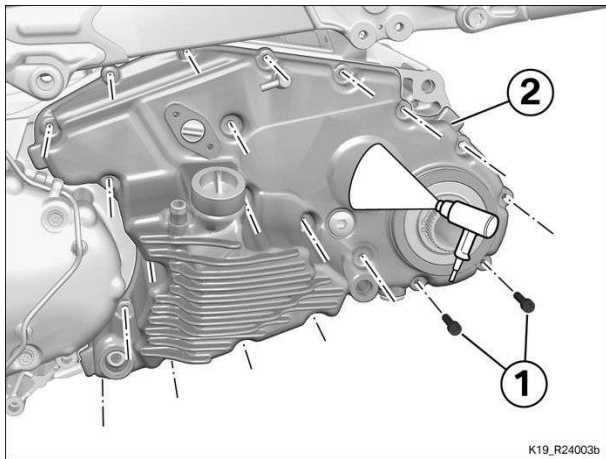
- Removing left frame side section
- Removing pinion cover
- Removing chain and pinion
- Disengaging side stand complete with pivot mount and switch
- Releasing right centre-stand mount
- Releasing exhaust manifold
- Draining gearbox oil

Core activity

(-) Removing secondary gearbox cover



- Remove screws (1) and remove oil-level sensor (2).
- Disconnect hose (3).



- Heat the bearing seat.

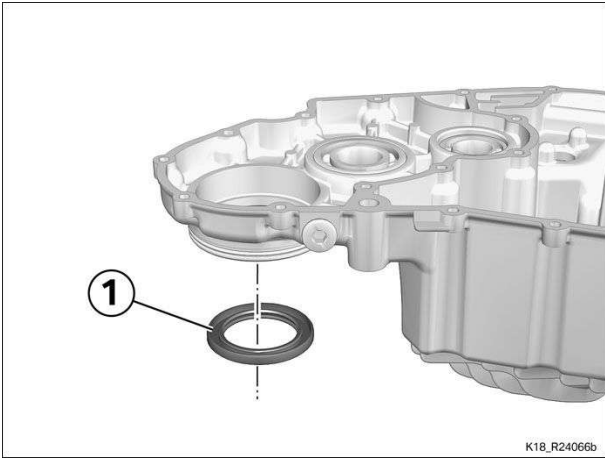
 Technical data			
Release/mating temperature		80 °C	

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

 NOTICE

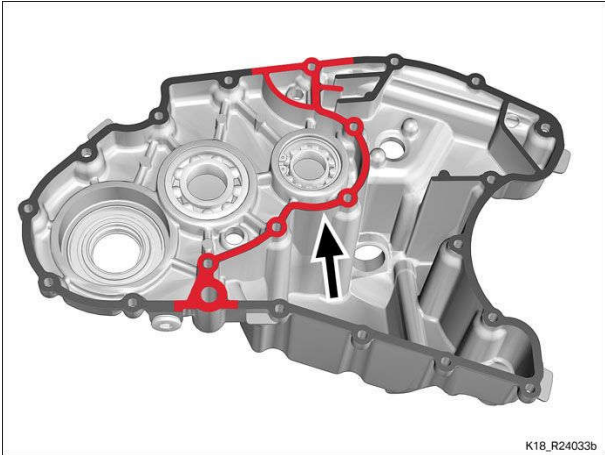
The sealing compound forms a strong bond and in some instances engine components can be difficult to separate. Separate the engine components by tapping them with a rubber mallet, without damaging cooling ribs or other parts of the crankcase.

(-) Removing rotary shaft seal



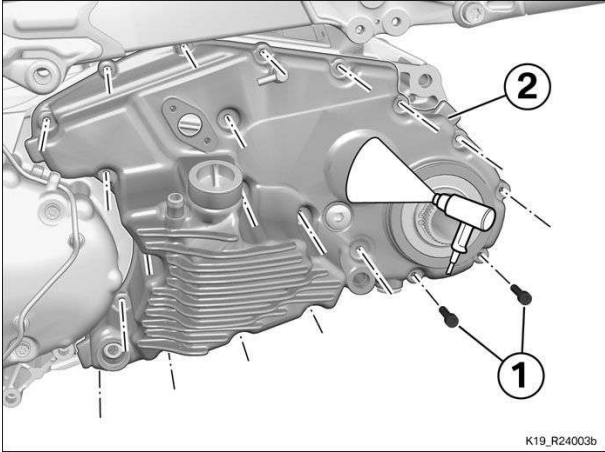
- Using a suitable tool, remove sealing ring (1).

(-) Installing secondary gearbox cover



- Clean the sealing faces.
- Thinly apply sealing compound to the sealing face, paying particular attention to the partition (arrow).

 Sealant	
Dow Corning	07 58 0 397 777



- Heat the bearing seat.

 Technical data			
Release/mating temperature		80 °C	

- Install cover (2) and secure with screws (1).

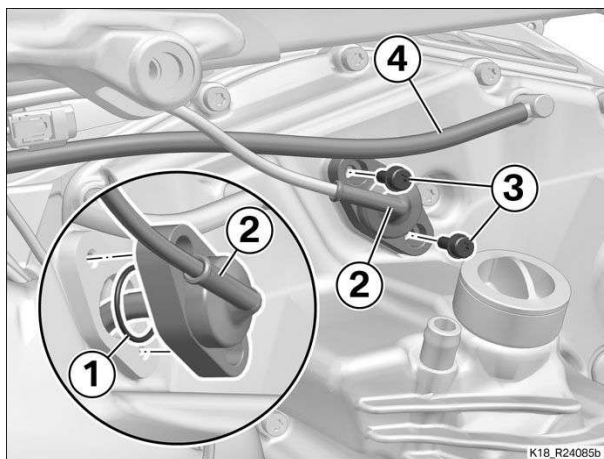
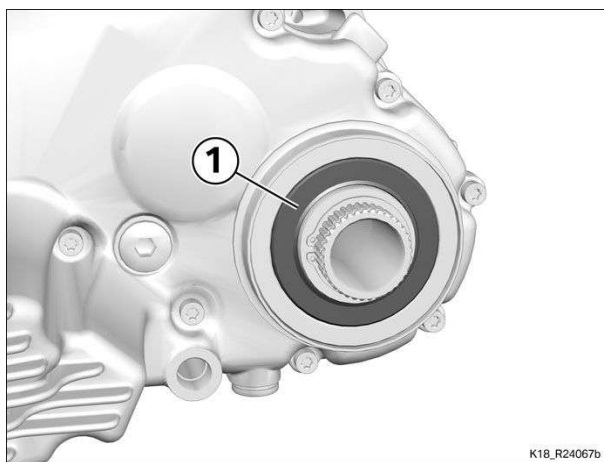
 Tightening torques		
Gearbox cover to crankcase		
M6 x 25	tighten in diagonally opposite sequence	
	10 Nm	

- Lightly lubricate only the sealing lip of shaft sealing ring (1) with gear oil, all other surfaces must be dry and free of grease on installation.

 NOTICE

The **outside** of the shaft sealing ring must be dry on installation; if necessary clean the seat in the housing.

- Using a suitable tool, install sealing ring (1) **flat**.

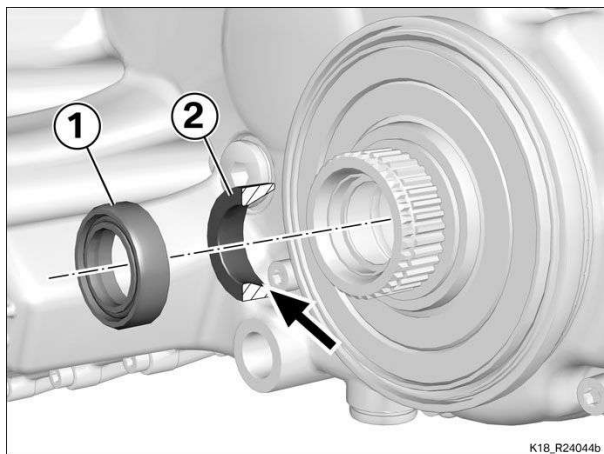


- Replace O-ring (1).
- Insert oil-level sensor (2) and install screws (3).

 Tightening torques		
Oil-level sensor to gearbox cover		
M5 x 16	5 Nm	

- Connect hose (4).

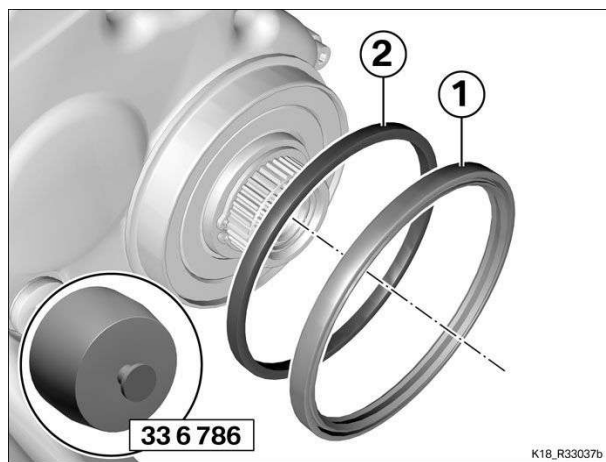
(-) Removing shaft sealing ring in output shaft



- Remove shaft sealing ring (1).
- Note bushing (2); the tapered end (arrow) must **face toward the inside**.
- Install **new** shaft sealing ring (1) with the open side **facing out** until seated

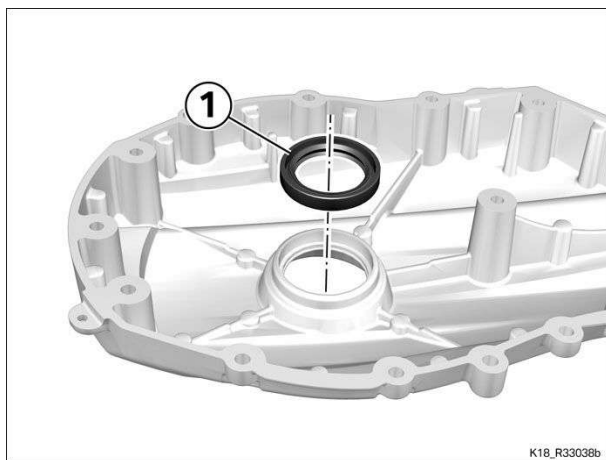
(-) Replacing shaft sealing ring and felt ring for pinion cover

- Replace shaft sealing ring (1) and felt ring (2), when installing use sliding sleeve (No. 33 6 786).
- Install shaft sealing ring (1) with the **open side toward the swinging arm**.



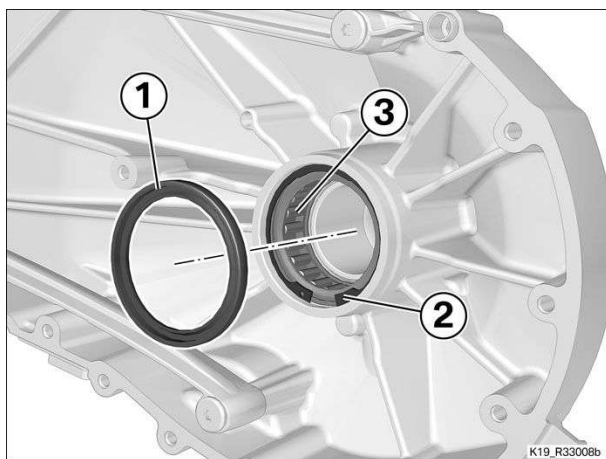
(-) Replacing shaft sealing ring in swinging-arm cover

- Use a suitable tool to remove shaft sealing ring (1).
- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.



(-) Replacing shaft sealing ring in swinging arm

- Remove shaft sealing ring (1) with a suitable tool, using circlip (2) as a tool rest; do not under any circumstances apply the tool to bearing (3).
- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.



Finishing work

Pouring engine oil into oil tank

Fill the gearbox with oil to correct level

Securing exhaust header

Securing right centre-stand mount

Securing side stand complete with pivot mount and switch

Installing pinion and chain

Installing pinion cover

- Installing left frame side section
- Installing rear swinging arm
- Installing spring strut
- Installing sprocket and output shaft
- Securing rear brake caliper and parking brake
- Installing rear wheel
- Tightening judder damper
- Installing chain tensioner rail
- Installing bottom chain channel
- Installing top chain channel
- Installing swinging-arm housing cover
- Pouring oil into swinging arm
- Securing brake hose and sensor cable
- Installing silencer
- Securing radiator
- Installing air deflector for radiator
- Installing underbody panel
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Removing engine lifter
- Installing left footplate carrier
- Installing left footplate
- Installing rear left footplate insert and footrest plate
- Installing centre left footplate insert and footrest plate
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

24 11 003 Replacing CVT sound-absorbing hood

+ 24 11 503

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

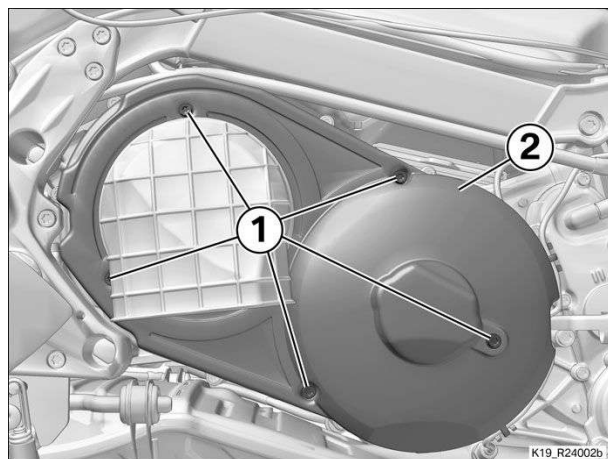
Removing rear footplate

Removing rear right footplate carrier

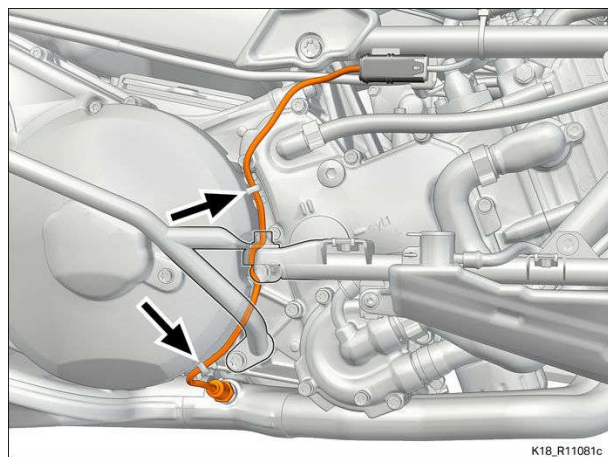
Core activity

(-) Removing CVT sound-absorbing hood

- Remove screws (1) and disengage sound-absorbing hood (2).

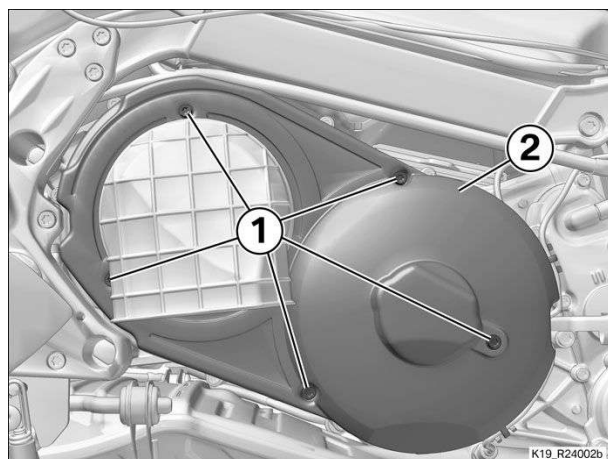


- Disengage the cable (arrows) and remove the sound-absorbing hood.

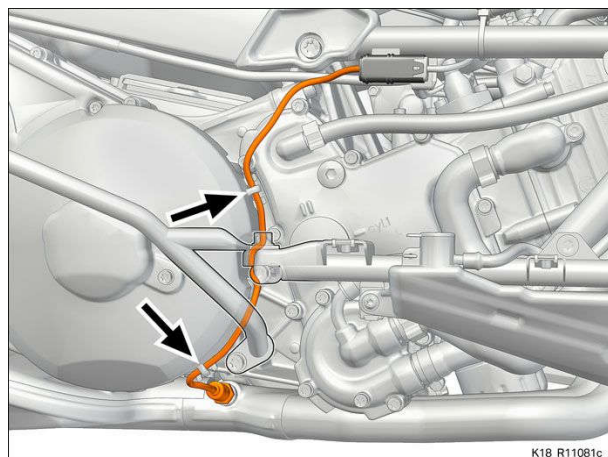


(-) Installing CVT sound-absorbing hood

- Secure CVT sound-absorbing hood (2) with screws (1).



 Tightening torques		
Sound-absorbing hood to CVT cover		
M6 x 18	10 Nm	



- Secure the cable (arrows).

Finishing work

Installing rear right footplate carrier

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

24 11 004 Replacing rear CVT dust filter

+ 24 11 504

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

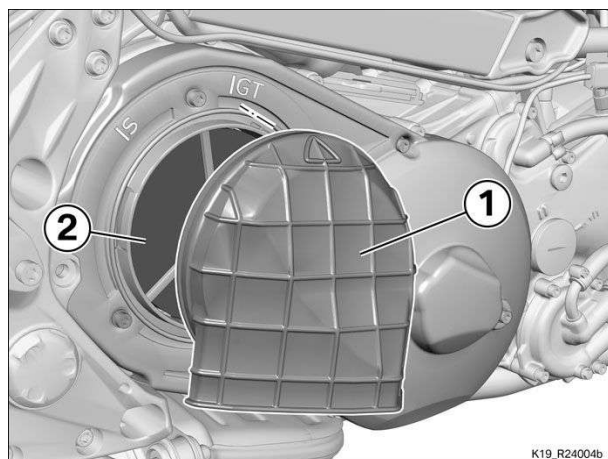
Removing rear right footplate insert and footrest plate

Removing rear footplate

Core activity

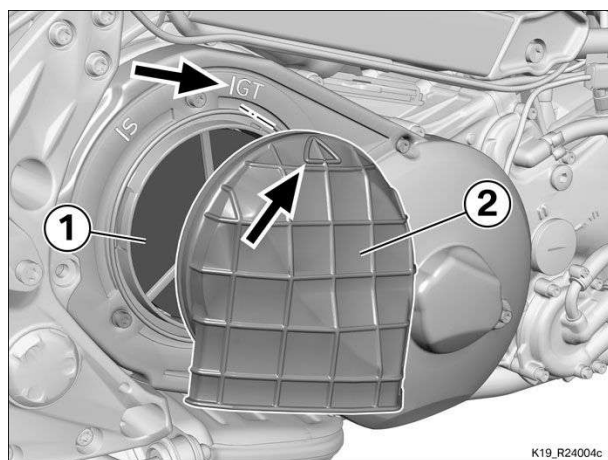
(-) Removing CVT dust filter

- Remove intake air pipe (1).
- Remove filter (2).



(-) Installing CVT dust filter

- Install filter (1).
- Install intake air pipe (2); if applicable align the marks (arrow).



Finishing work

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

24 11 006 Replacing front CVT dust filter

+ 24 11 506

NOTICE

Clean the area with compressed air prior to removal of the CVT dust filter.

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

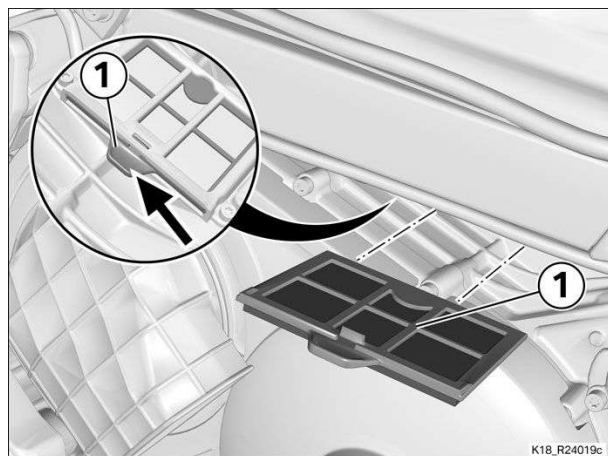
Removing rear right footplate insert and footrest plate

Removing rear footplate

Core activity

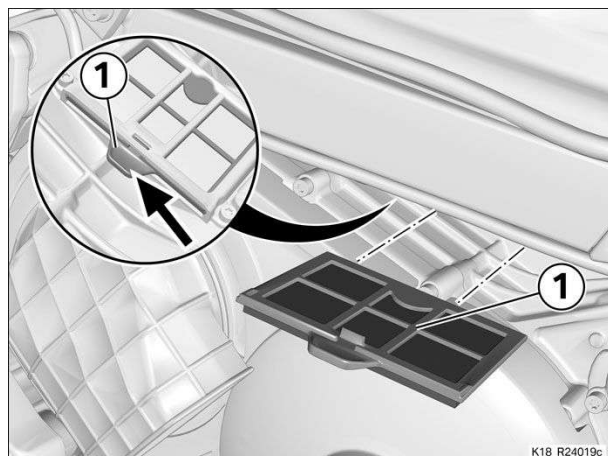
(-) Removing CVT dust filter

- Clear area above filter (1) **with compressed air**.
- Push the lever (arrow) down and remove filter (1).



(-) Installing CVT dust filter

- Install filter (1), making sure that the lever (arrow) engages.



Finishing work

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

24 21 004 Sealing gearbox output shaft

+ 24 21 504

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing left footplate

Removing left footplate carrier

Draining engine oil from oil tank

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing underbody panel

Removing air deflector for radiator

Disengaging and lowering radiator

Removing silencer

Installing engine lifter

Draining oil from swinging arm

Removing swinging-arm housing cover

Removing bottom chain channel

Removing chain tensioner rail

Removing top chain channel

Disengage the judder damper

Removing rear wheel

Disengaging rear brake caliper and parking brake

Disengaging brake hose and sensor cable

Removing judder-damper housing and output shaft

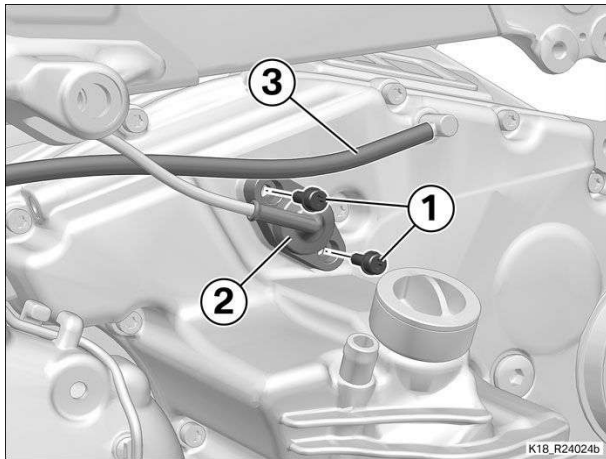
Removing spring strut

Removing rear wheel swinging arm

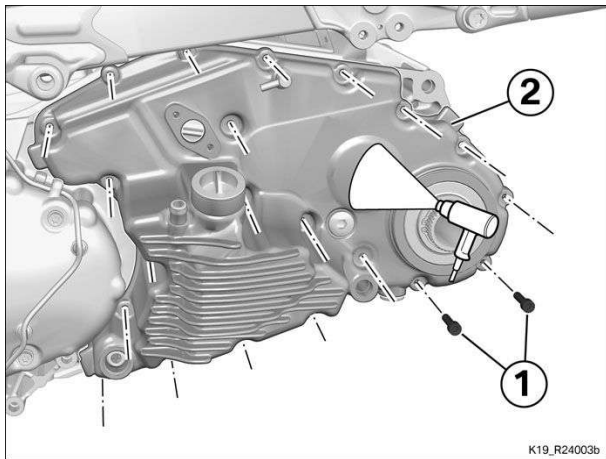
- Removing left frame side section
- Removing pinion cover
- Removing chain and pinion
- Disengaging side stand complete with pivot mount and switch
- Releasing right centre-stand mount
- Releasing exhaust manifold
- Draining gearbox oil

Core activity

(-) Removing secondary gearbox cover



- Remove screws (1) and remove oil-level sensor (2).
- Disconnect hose (3).



- Heat the bearing seat.

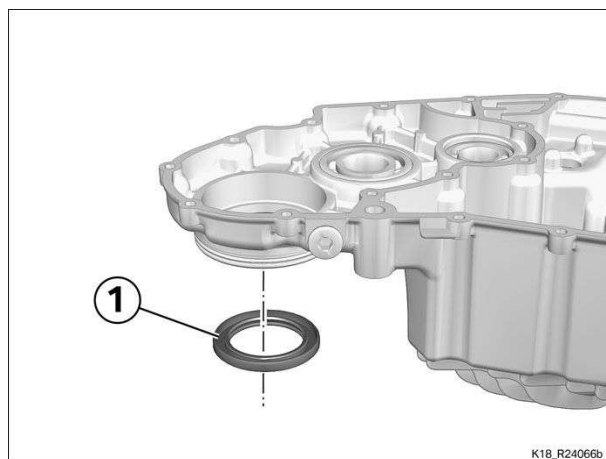
 Technical data			
Release/mating temperature		80 °C	

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

 NOTICE

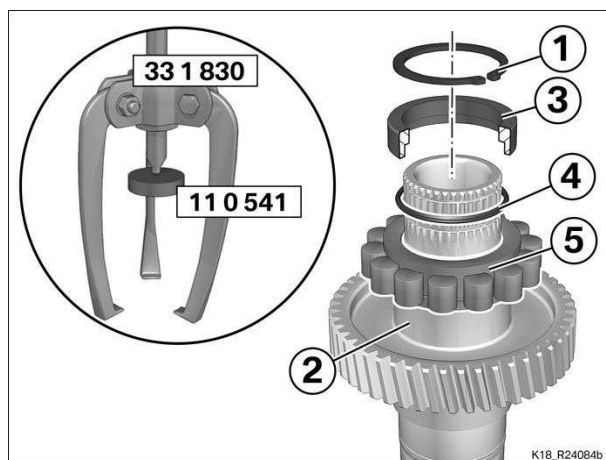
The sealing compound forms a strong bond and in some instances engine components can be difficult to separate. Separate the engine components by tapping them with a rubber mallet, without damaging cooling ribs or other parts of the crankcase.

(-) Removing rotary shaft seal



- Using a suitable tool, remove sealing ring (1).

(-) Disassemble the gearbox output shaft



- Remove circlip (1).
- Position a suitable support, e.g. drift (No. 11 0 541) on gearbox output shaft (2).
- Remove spacing sleeve (3), O-ring (4) and bearing (5) with puller (No. 33 1 830).

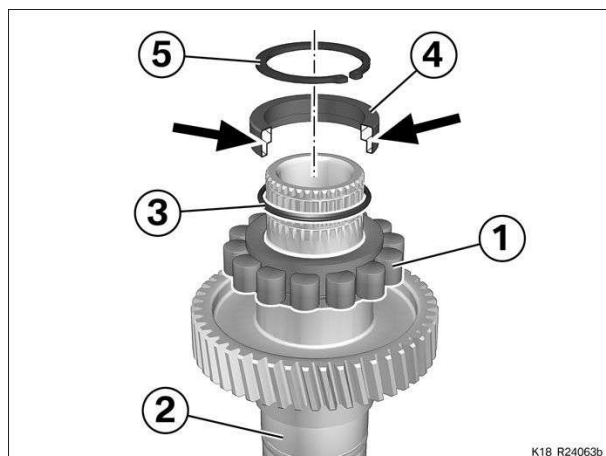
(-) Assembling gearbox output shaft

⚠ ATTENTION

Installation not in compliance with correct procedure.

Damage to roller bearings.

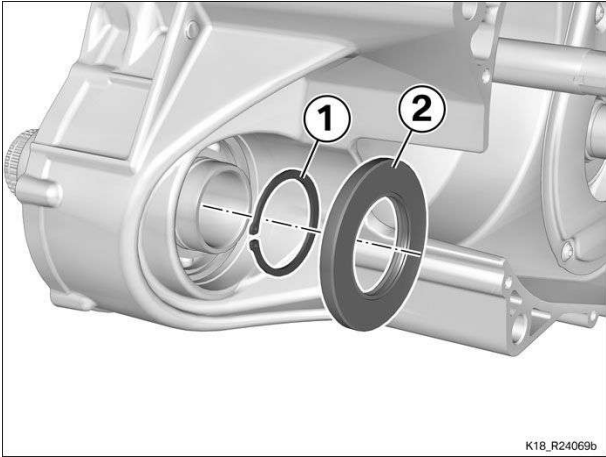
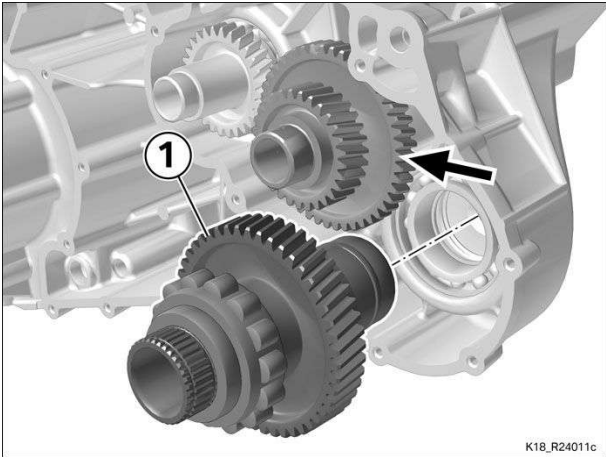
- When installing, apply pressure to the bearing inner race only.



- Using a suitable tool, press new bearing (1) on to gearbox output shaft (2).
- Install new O-ring (3) (sits on bearing (1)).
- Using a suitable tool, press on new spacing sleeve (4), shoulder (arrow) is toward bearing (1).
- Install new circlip (5) in **bottom** groove.

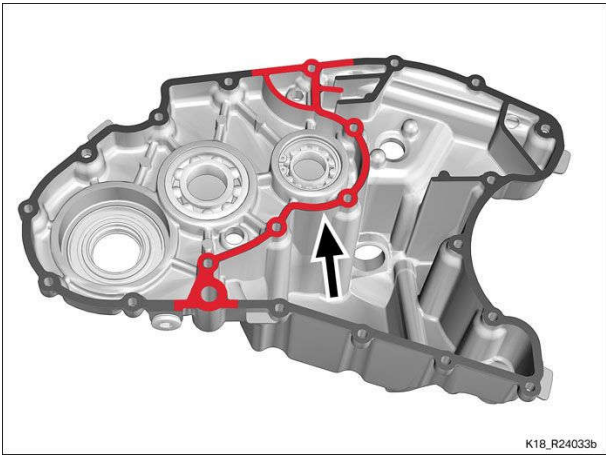
(-) Installing gearbox output shaft

- Install gearbox output shaft (1), making sure the teeth engage (arrow).



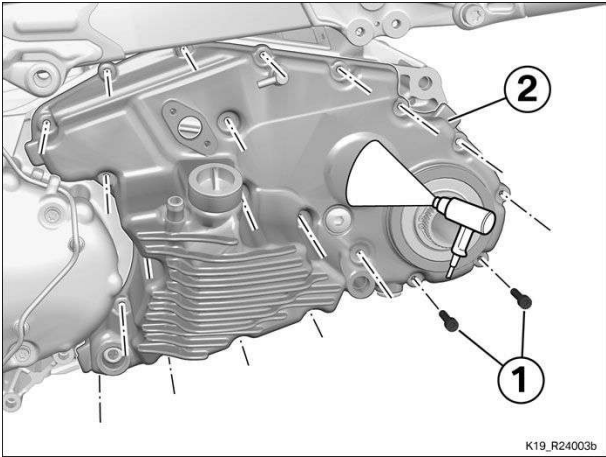
- Install circlip (1).
- Install shaft sealing ring (2) with a suitable tool, for example socket wrench insert (No. 36 3 681).

(-) Installing secondary gearbox cover



- Clean the sealing faces.
- Thinly apply sealing compound to the sealing face, paying particular attention to the partition (arrow).

 Sealant	
Dow Corning	07 58 0 397 777



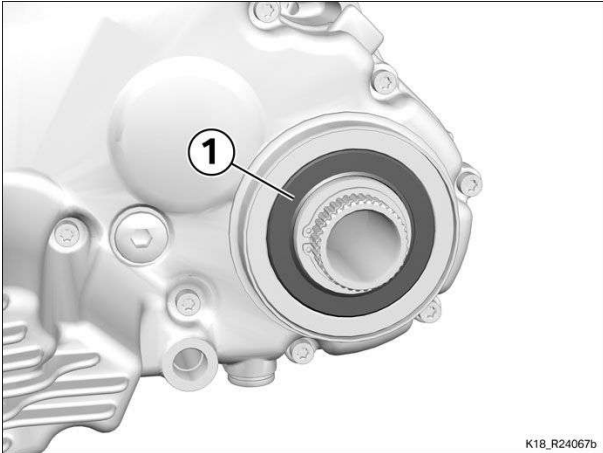
- Heat the bearing seat.

 Technical data			
Release/mating temperature		80 °C	

- Install cover (2) and secure with screws (1).

 Tightening torques		
Gearbox cover to crankcase		
M6 x 25	tighten in	

	diagonally opposite sequence	
	10 Nm	

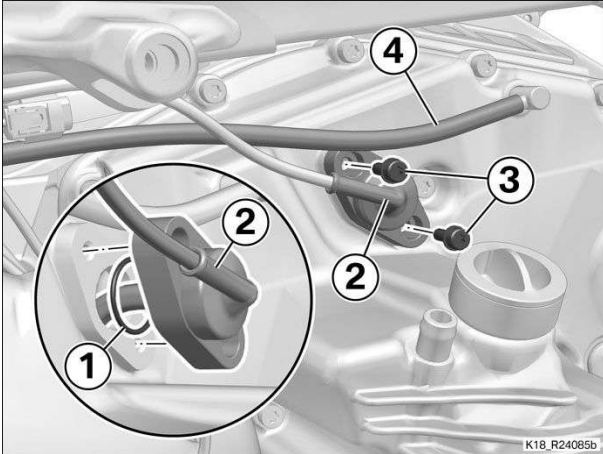


- Lightly lubricate only the sealing lip of shaft sealing ring (1) with gear oil, all other surfaces must be dry and free of grease on installation.

NOTICE

The **outside** of the shaft sealing ring must be dry on installation; if necessary clean the seat in the housing.

- Using a suitable tool, install sealing ring (1) **flat**.

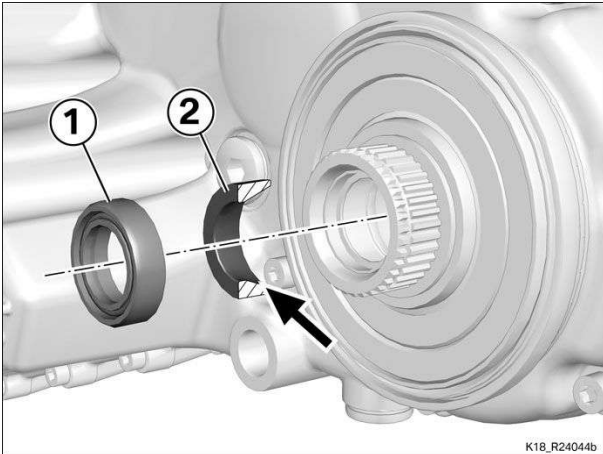


- Replace O-ring (1).
- Insert oil-level sensor (2) and install screws (3).

 Tightening torques		
Oil-level sensor to gearbox cover		
M5 x 16	5 Nm	

- Connect hose (4).

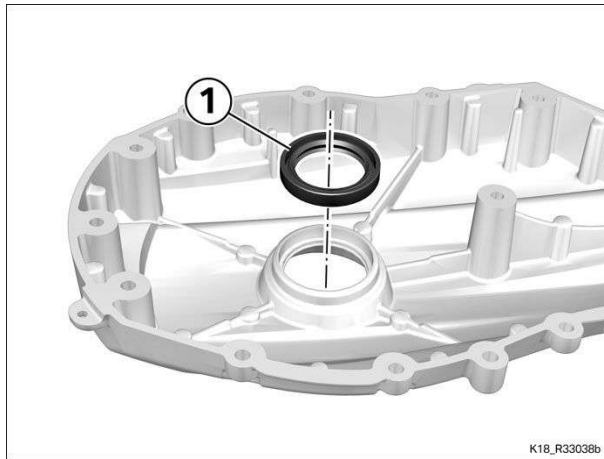
(-) Removing shaft sealing ring in output shaft



- Remove shaft sealing ring (1).
- Note bushing (2); the tapered end (arrow) must **face toward the inside**.
- Install **new** shaft sealing ring (1) with the open side **facing out** until seated

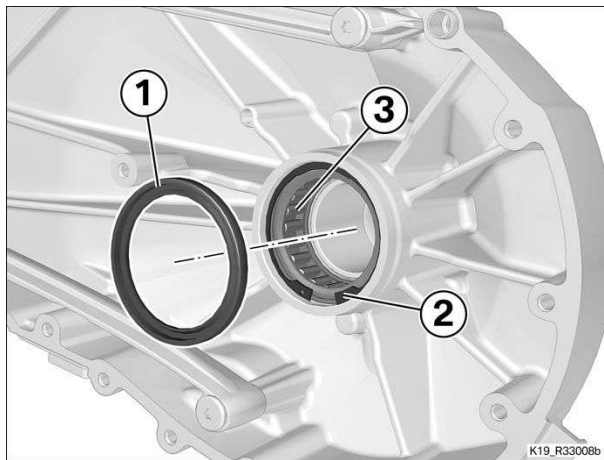
(-) Replacing shaft sealing ring in swinging-arm cover

- Use a suitable tool to remove shaft sealing ring (1).
- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.



(-) Replacing shaft sealing ring in swinging arm

- Remove shaft sealing ring (1) with a suitable tool, using circlip (2) as a tool rest; do not under any circumstances apply the tool to bearing (3).
- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.



finishing work

Pouring engine oil into oil tank

Fill the gearbox with oil to correct level

Securing exhaust header

Securing right centre-stand mount

Securing side stand complete with pivot mount and switch

Installing pinion and chain

Installing pinion cover

Installing left frame side section

Installing rear swinging arm

Installing spring strut

Installing sprocket and output shaft

Securing rear brake caliper and parking brake

Installing rear wheel

Tightening judder damper

Installing chain tensioner rail

Installing bottom chain channel

Installing top chain channel

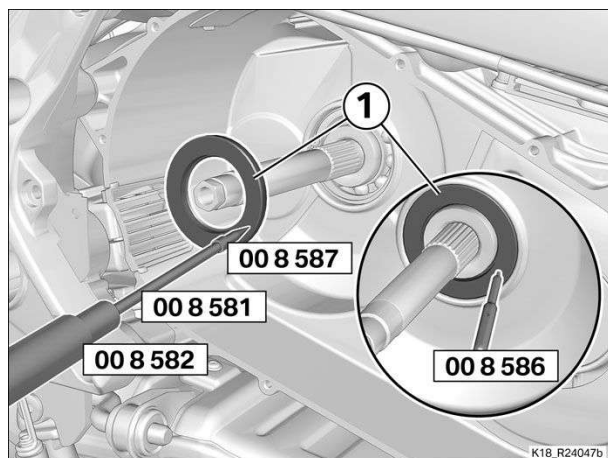
Installing swinging-arm housing cover

Pouring oil into swinging arm
Securing brake hose and sensor cable
Installing silencer
Securing radiator
Installing air deflector for radiator
Installing underbody panel
Installing right footplate
Installing rear right footplate insert and footrest plate
Installing centre right footplate insert and footrest plate
Installing right side panel
Installing bottom right fairing panel
Installing front right footplate insert and footrest plate
Installing top right side panel
Removing engine lifter
Installing left footplate carrier
Installing left footplate
Installing rear left footplate insert and footrest plate
Installing centre left footplate insert and footrest plate
Installing left side panel
Installing bottom left fairing panel
Installing front left footplate insert and footrest plate
Installing top left side panel
Installing centre cover
Closing seat
Installing filler cap flap
Final check of work performed

24 21 500 Sealing CVT output shaft (CVT removed)

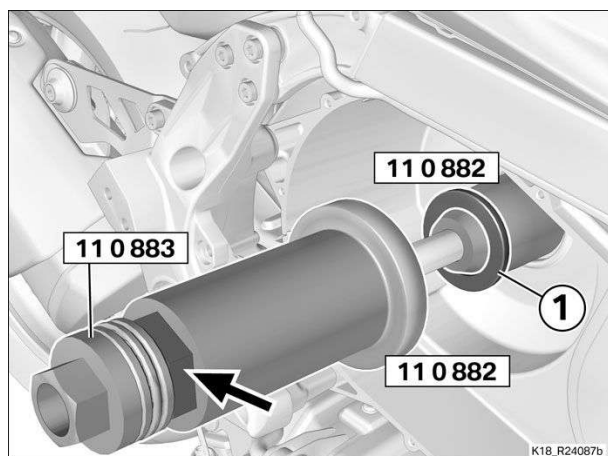
Core activity

(-) Removing radial shaft seal of CVT output shaft



- Drill into radial shaft seal (1), using drill stop (No. 00 8 586).
- Remove radial shaft seal (1) with pull rod (No. 00 8 581), impact weight (No. 00 8 582) and adapter, tapping screw (No. 00 8 587).
- Carefully remove all metal particles.

(-) Installing shaft sealing ring of CVT output shaft



- Clean seat of radial shaft seal (1).

NOTICE

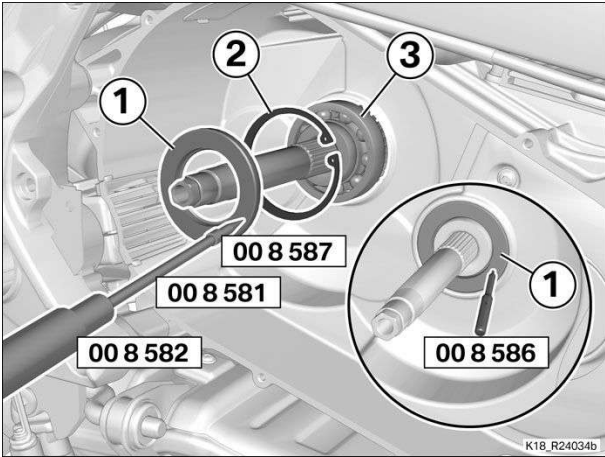
The **outside** of the shaft sealing ring must be dry on installation; if necessary clean the seat in the housing.

- Lightly lubricate only the sealing lip of radial shaft seal (1) with gear oil, all other surfaces must be dry and free of grease on installation.
- Insert sliding sleeve (No. 11 0 882) and radial shaft seal (1).
- Screw on assembly tool (No. 11 0 882) with thrust nut (No. 11 0 883) **until seated**; in this process counter-hold at the hexagon (arrow) to prevent the mandrel from turning.
- Remove the tools.

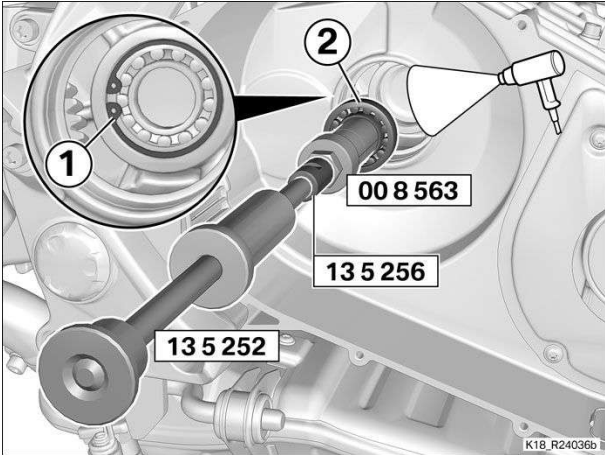
 24 21 501 Replacing CVT output shaft (CVT removed)

Core activity

(-) Removing CVT output shaft with bearings



- Drill into shaft sealing ring (1), using drill stop (No. 00 8 586).
- Remove shaft sealing ring (1) with pull rod (No. 00 8 581), impact weight (No. 00 8 582) and adapter, tapping screw (No. 00 8 587).
- Remove circlip (2).
- Remove CVT output shaft with bearing (3).

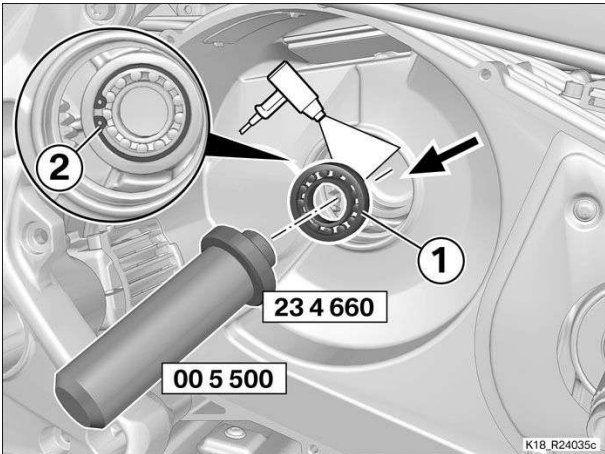


- Use a cloth to cover the opening underneath circlip (1).
- Remove circlip (1).
- Heat seat of bearing (2).

 Technical data			
Release/mating temperature		80 °C	

- Remove bearing (2) with internal puller (No. 00 8 563), threaded adapter (No. 13 5 252) and adapter (No. 13 5 256).

(-) Install the CVT output shaft with bearings

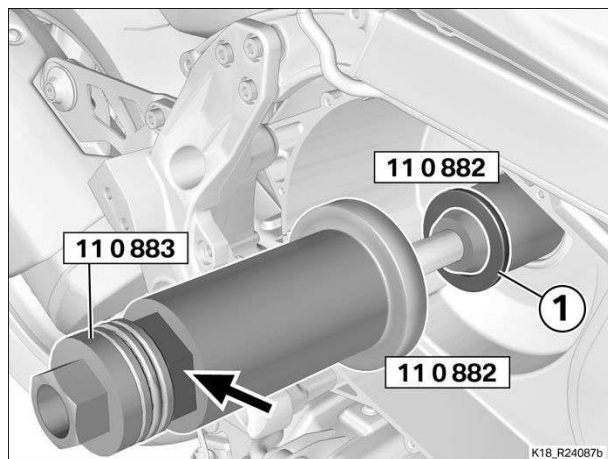
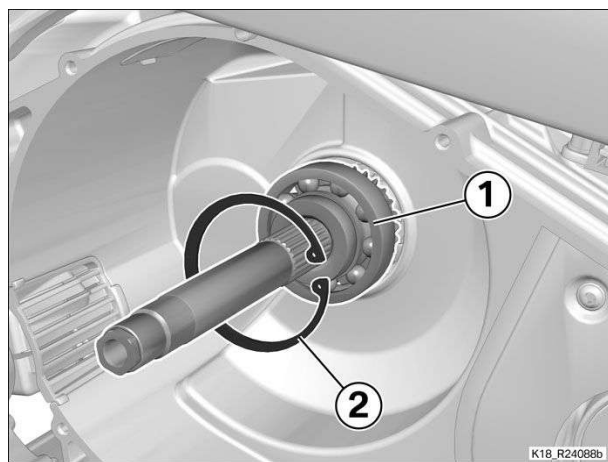


- Heat seat of bearing (1).

 Technical data			
Release/mating temperature		80 °C	

- Install bearing (1) with drift (No. 23 4 660) and handle (No. 00 5 500).
- Install circlip (2).
- Remove the cloth from the opening underneath circlip (2).

- Install CVT output shaft (1) with bearing, **making sure that teeth engagement is correct.**
- Install circlip (2).



- Clean seat of radial shaft seal (1).

NOTICE

The **outside** of the shaft sealing ring must be dry on installation; if necessary clean the seat in the housing.

- Lightly lubricate only the sealing lip of radial shaft seal (1) with gear oil, all other surfaces must be dry and free of grease on installation.
- Insert sliding sleeve (No. 11 0 882) and radial shaft seal (1).
- Screw on assembly tool (No. 11 0 882) with thrust nut (No. 11 0 883) **until seated**; in this process counter-hold at the hexagon (arrow) to prevent the mandrel from turning.
- Remove the tools.

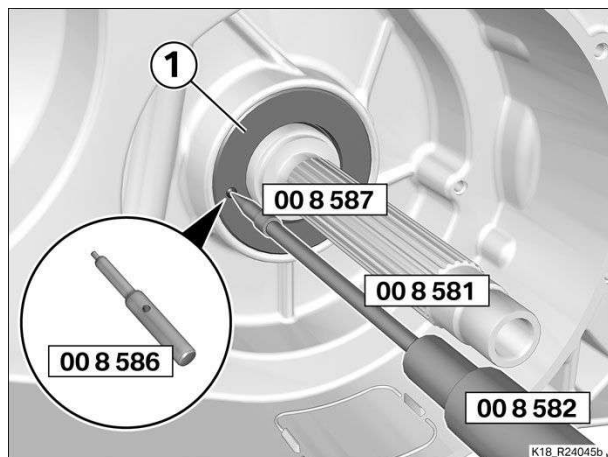
24 21 502 Sealing CVT input shaft (CVT (removed))

Preparatory work

Removing air guide plate

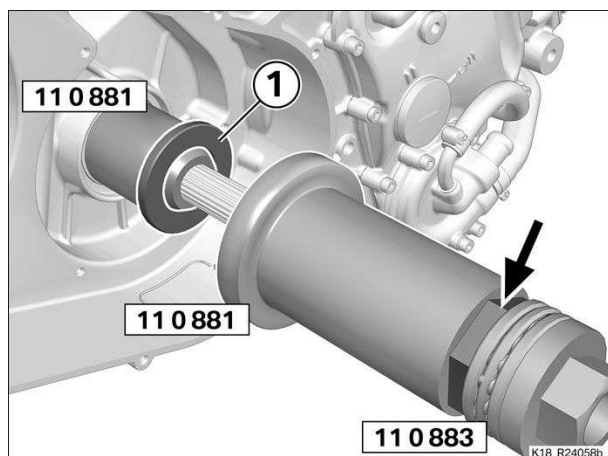
Core activity

(-) Removing radial shaft seal of CVT input shaft



- Drill into radial shaft seal (1), using drill stop (No. 00 8 586).
- Remove radial shaft seal (1) with pull rod (No. 00 8 581), impact weight (No. 00 8 582) and adapter, tapping screw (No. 00 8 587).
- Carefully remove all metal particles.

(-) Installing shaft sealing ring of CVT input shaft



- Clean seat of radial shaft seal (1).

NOTICE

The **outside** of the shaft sealing ring must be dry on installation; if necessary clean the seat in the housing.

- Lightly lubricate only the sealing lip of radial shaft seal (1) with engine oil, all other surfaces must be dry and free of grease on installation.
- Insert sliding sleeve (No. 11 0 881) and radial shaft seal (1).
- Screw on assembly tool (No. 11 0 881) with thrust nut (No. 11 0 883) **until seated**; in this process counter-hold at the hexagon (arrow) to prevent the mandrel from turning.
- Remove the tools.

Finishing work

Installing air guide plate

24 21 503 Replacing CVT input shaft (CVT (removed))

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

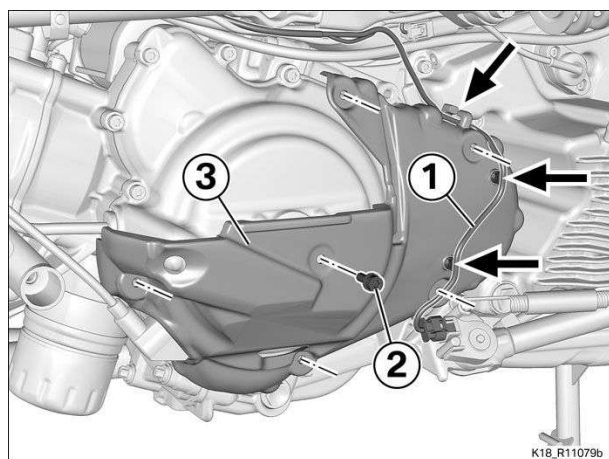
Removing left footplate

Removing left footplate carrier

Draining engine oil from engine block

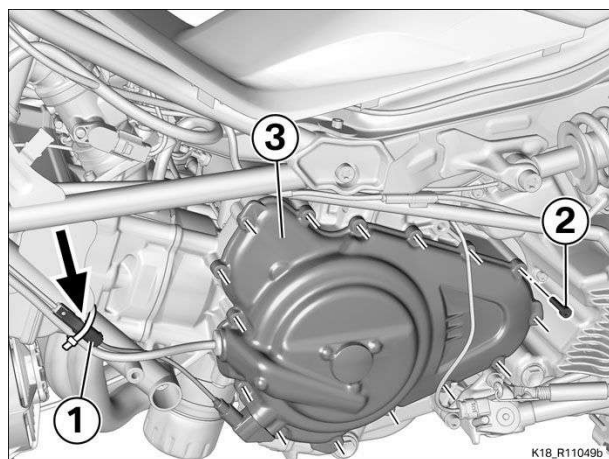
Core activity

(-) Removing left sound-absorbing hood



- Disengage cable (1) (arrows).
- Remove screws (2) and hood (3).

(-) Disengaging left crankcase cover



- Open the cable tie (arrow) and disconnect plug (1) for the crankshaft sensor.
- Remove screws (2).



WARNING

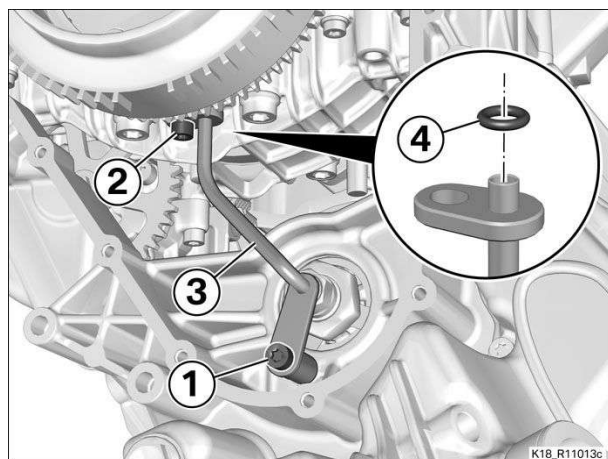
Overstretching of cables and lines.

Malfunctions

- Do not place strain on lines and cables.
-
- Disengage cover (3) and ease it aside.

(-) Removing oil line to CVT input shaft

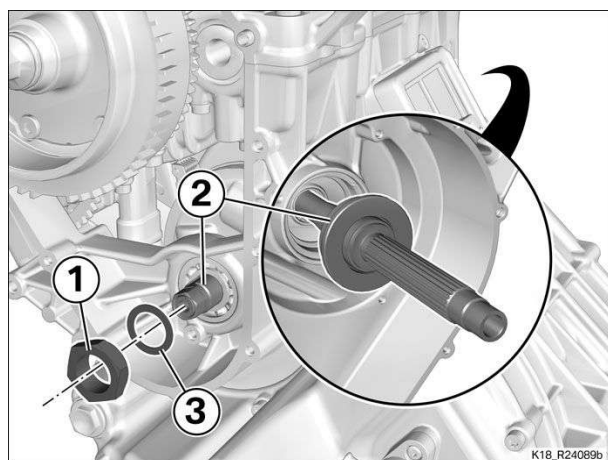
-



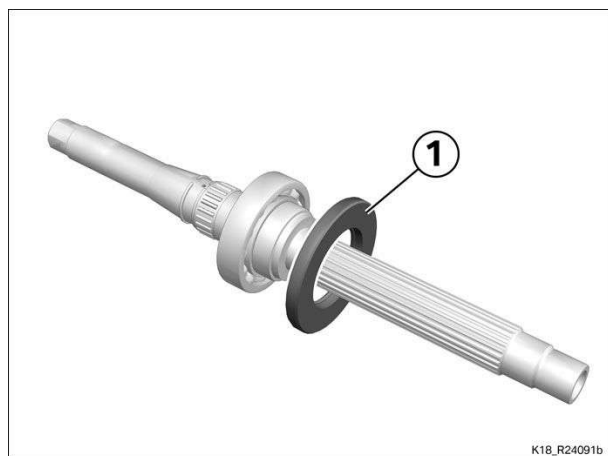
Remove the following components:

- Screws (1) and (2)
- Oil line (3)
- Sealing ring (4)

(-) Removing CVT drive shaft



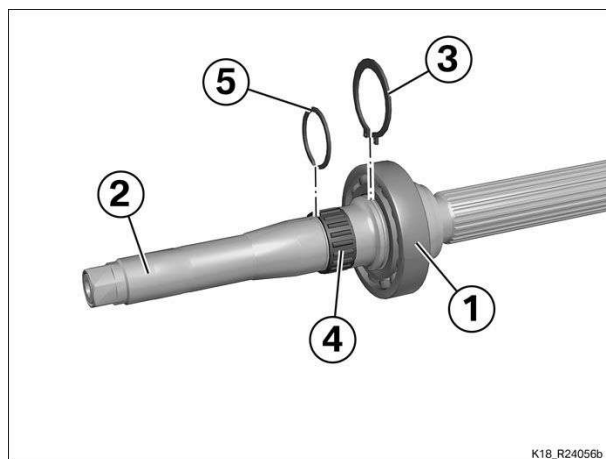
- Remove nut (1) and washer (3).
- Secure nut (1) and turn the hexagon of CVT input shaft (2) **clockwise**.
- Work CVT input shaft (3) to the right to remove (**light** taps with a rubber-headed mallet).



- Remove sealing ring (1).

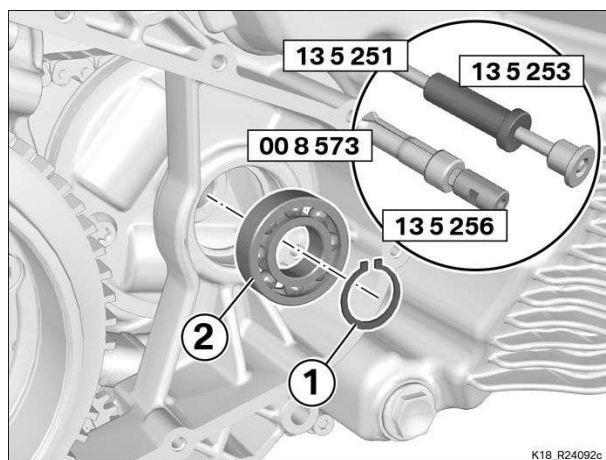
(-) Replacing CVT input shaft

- Press bearing (1) on to CVT input shaft (2).
- Install circlip (3) and bearing (4).
- Lubricate bearing (4) with engine oil.
- Install circlip (5).



(-) Removing bearing for CVT input shaft (magnetic-gear end)

- Remove circlip (1).
- Secure internal puller (No. 00 8 573) to threaded adapter (No. 13 5 256).
- Secure threaded adapter (No. 13 5 256) to pull rod (No. 13 5 251) and impact weight (No. 13 5 253).
- Remove bearing (2) with internal puller (No. 00 8 573).



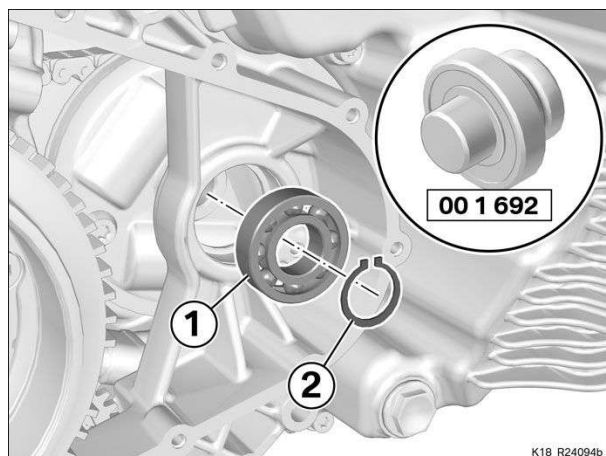
(-) Installing bearing for CVT input shaft (magnetic-gear end)

⚠ ATTENTION

Installation not in compliance with correct procedure.

Damage to roller bearings.

- When installing, apply pressure to the bearing outer race only.
- Install **new** bearing (1) with drift (No. 00 1 692) and handle (No. 00 5 500).
- Install circlip (2).



(-) Installing CVT input shaft

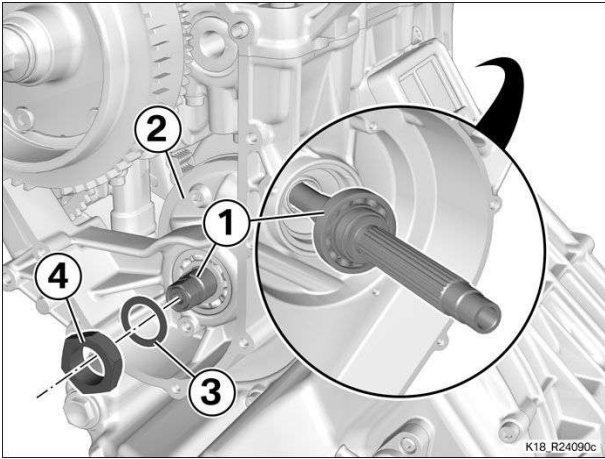
- Install drive shaft (1), noting judder damper (2).
- Clean the threads.
- Install washer (3).

⚠ ATTENTION

Shelf life of micro-encapsulated screws overshoot.

Insufficient securing effect.

•



Use additional thread locking.

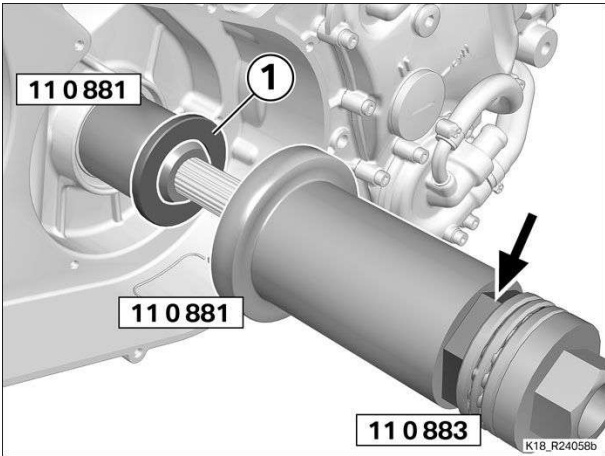
- Install nut (4), counter-holding at hexagon of drive shaft (1).

 Tightening torques		
CVT input shaft to crankcase		
M20 x 1.5 Thread-locking compound (Micro-encapsulated) or, Thread-locking compound (Loctite 243, Medium strength)	150 Nm	

- Clean seat of radial shaft seal (1).

 NOTICE

The **outside** of the shaft sealing ring must be dry on installation; if necessary clean the seat in the housing.



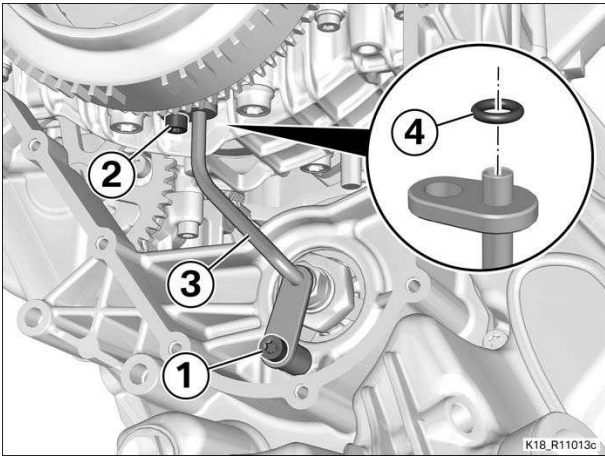
- Lightly lubricate only the sealing lip of radial shaft seal (1) with engine oil, all other surfaces must be dry and free of grease on installation.

- Insert sliding sleeve (No. 11 0 881) and **new** radial shaft seal (1).
- Screw on assembly tool (No. 11 0 881) with thrust nut (No. 11 0 883) **until seated**; in this process counter-hold at the hexagon (arrow) to prevent the mandrel from turning.

- Remove the tools.

(-) Installing oil line to CVT input shaft

- Insert oil line (3) with **new** sealing ring (4).
- Install screws (1) and (2).



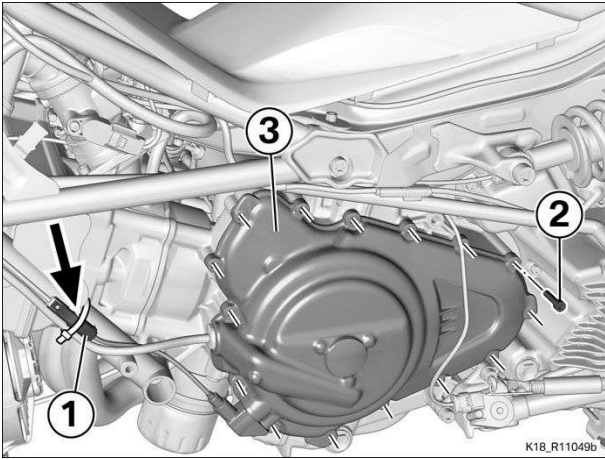
 Tightening torques		
Oil line (CVT input shaft) to engine		
M6 x 16	10 Nm	
M6 x 40	10 Nm	

(-) Securing left crankcase cover

- Clean the sealing faces.
- Apply sealant thinly to the sealing face.

 NOTICE

Exercise particularly meticulous care when sealing areas where two sealing faces/joins meet.



Sealant

Dow Corning

07 58 0 397 777

- Install cover (3) and screws (2).



Tightening torques

Crankcase cover, left, to crankcase

M6 x 25

tighten in
diagonally
opposite
sequence

10 Nm

- Connect plug (1) for the crankshaft sensor and secure it with cable tie (arrow).

(-) Installing sound-absorbing hood

- Secure hood (3) with screws (2).



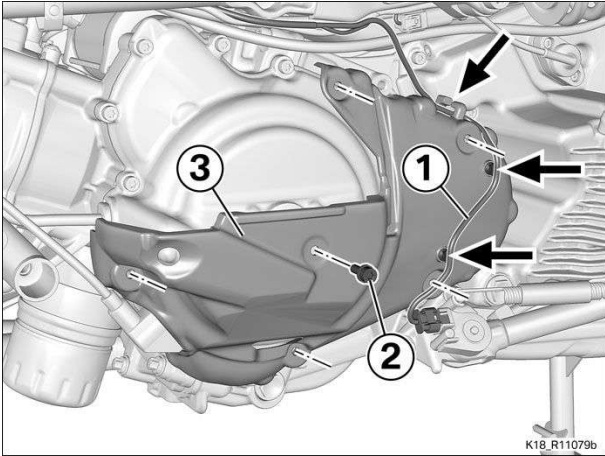
Tightening torques

Sound-absorbing hood to engine cover, right

M6 x 18

10 Nm

- Secure cable (1) (arrows).



Finishing work

Pouring engine oil into engine

Installing left footplate carrier

Installing left footplate

Installing rear left footplate insert and footrest plate

Installing centre left footplate insert and footrest plate

Installing left side panel

Installing bottom left fairing panel

Installing front left footplate insert and footrest plate

Installing top left side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

24 80 000 Removing/installing or replacing CVT

+ 24 80 500

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing rear right footplate carrier

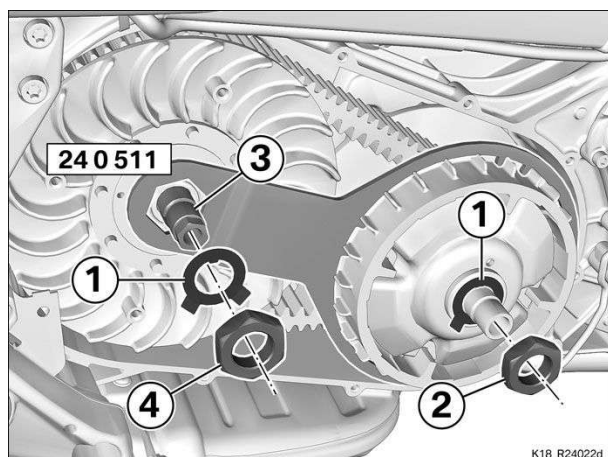
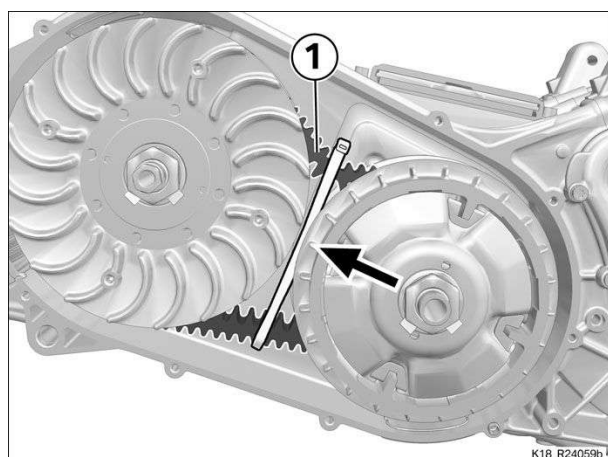
Removing CVT sound-absorbing hood

Removing CVT cover

Core activity

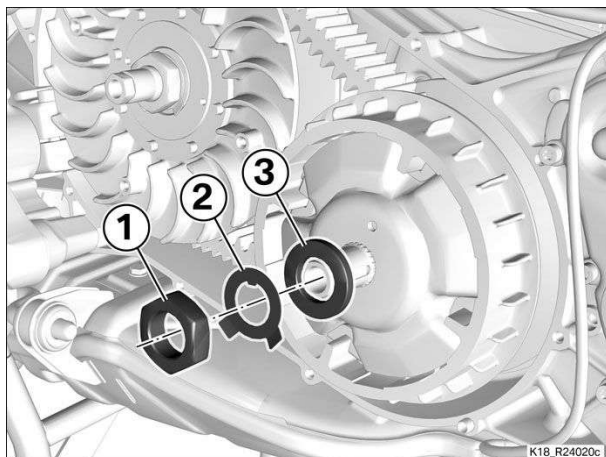
(-) Slackening threaded fasteners of CVT adjuster unit and CVT output

- If applicable, secure drive belt (1) with a cable tie (arrow).



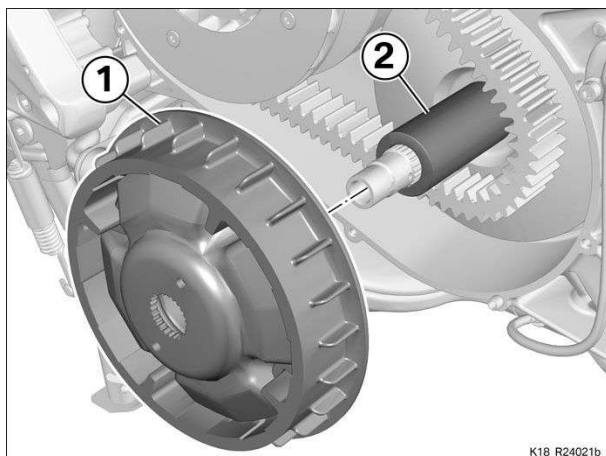
- Bend up tabs of lock washer (1)
- Engage holder (No. 24 0 511).
- Slacken nut (2).
- Turn shaft (3) **clockwise** to slacken nut (4).
- Remove holder (No. 24 0 511).

(-) Removing CVT adjuster unit



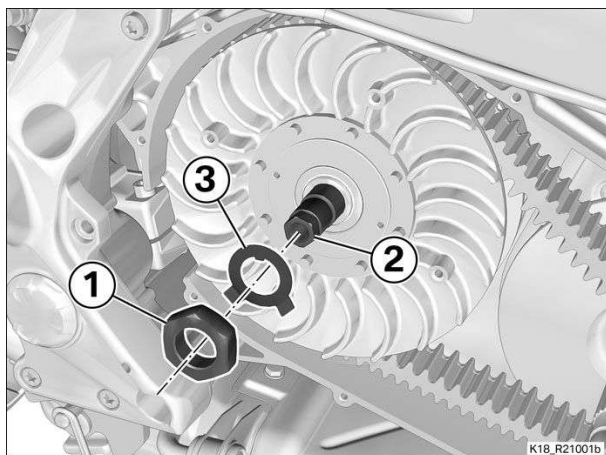
- Remove the following components:

- Nut (1)
- Lock washer (2)
- Spacer (3)



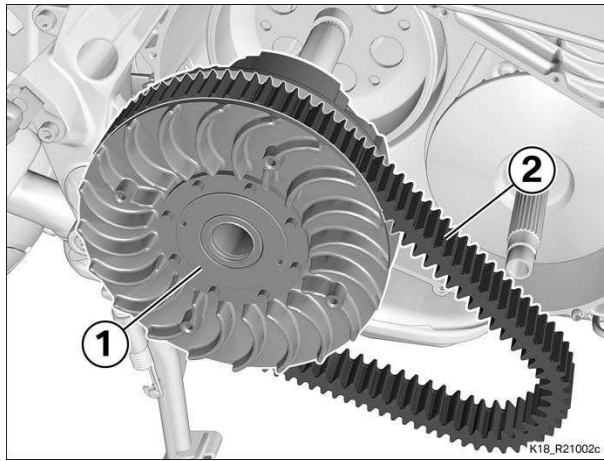
- Remove CVT adjuster unit (1) and sleeve (2).

(-) Removing CVT output with drive belt



- Remove nut (1), while counter-holding at shaft (2) if necessary.
- Remove lock washer (3).

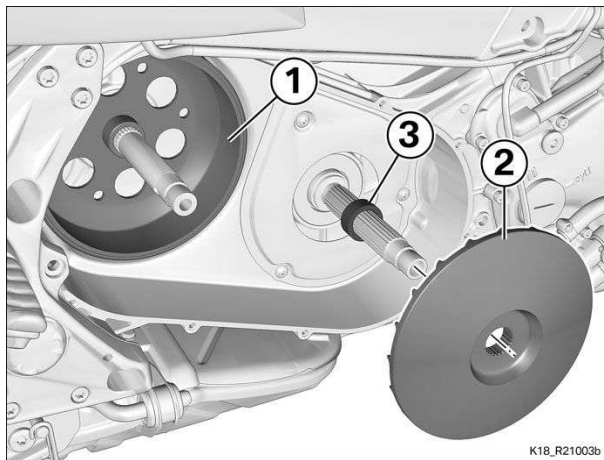
- Remove CVT output (1) with drive belt (2).



(-) Removing clutch bell and CVT thrust plate

- Remove the following components:

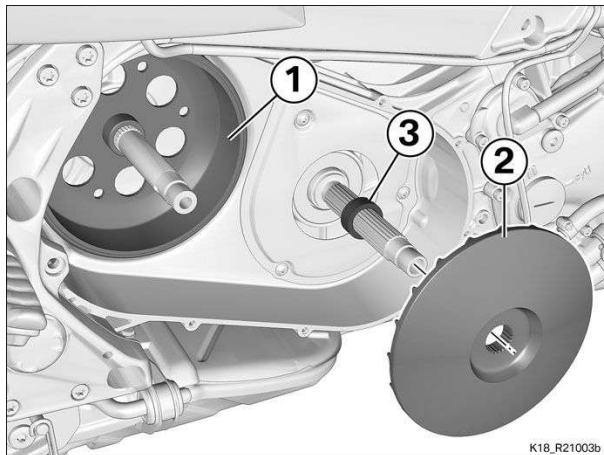
- Clutch bell (1)
- CVT thrust plate (2)
- Sleeve (3)



(-) Installing clutch bell and CVT thrust plate

- Install the following components:

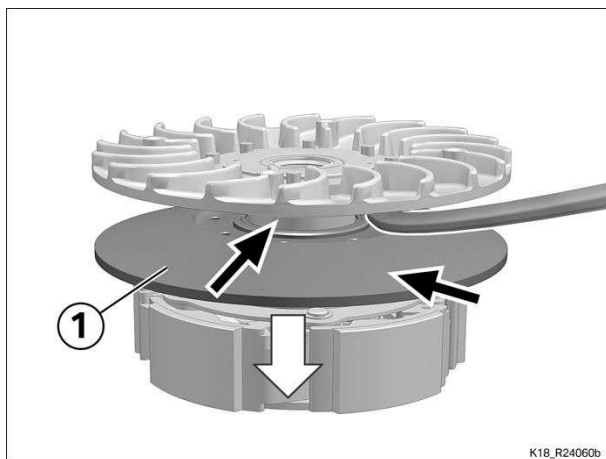
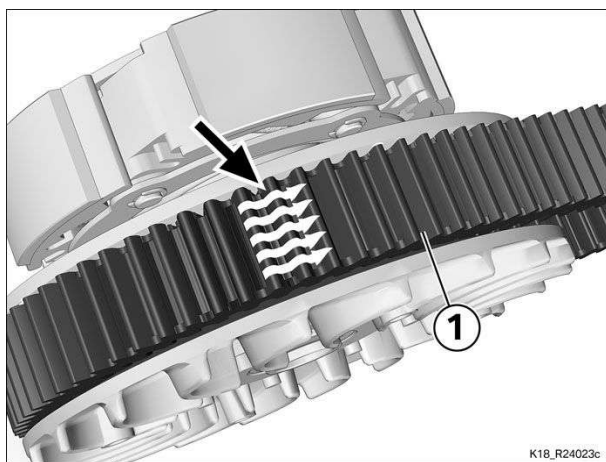
- Sleeve (3)
- CVT thrust plate (2)
- Clutch bell (1)



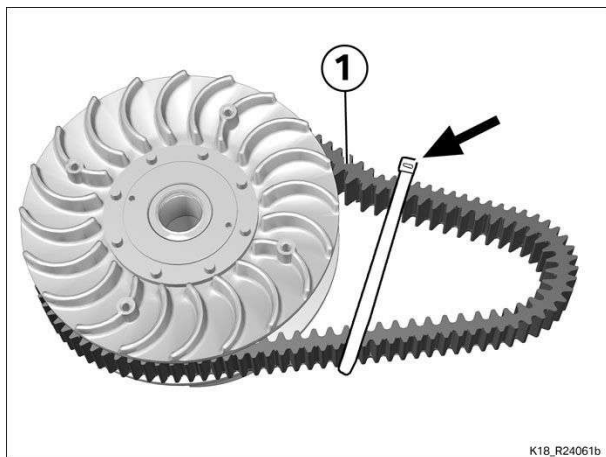
(-) Installing CVT output with drive belt and clutch bell

► Installing drive belt in CVT output

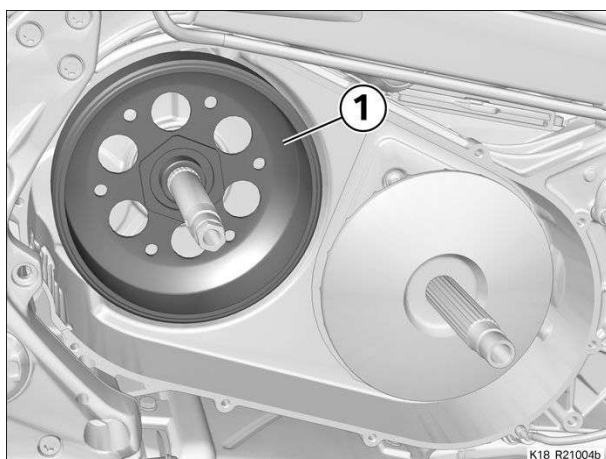
- When installing drive belt (1), make sure that the direction of rotation (arrow) is correct: **arrows point in direction of rotation.**



- Use a tyre lever to hold down thrust washer (1), taking care not to damage the friction faces (arrows).

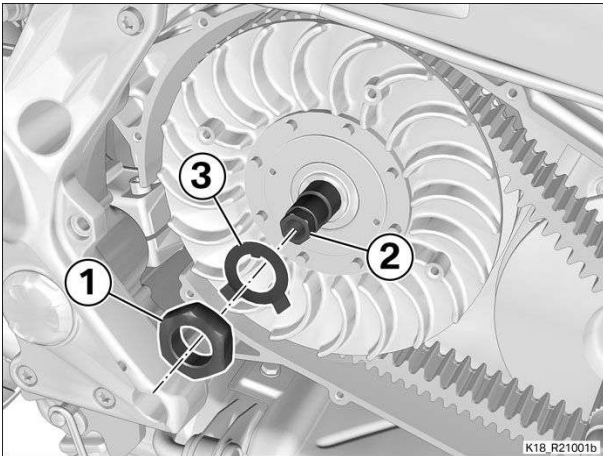
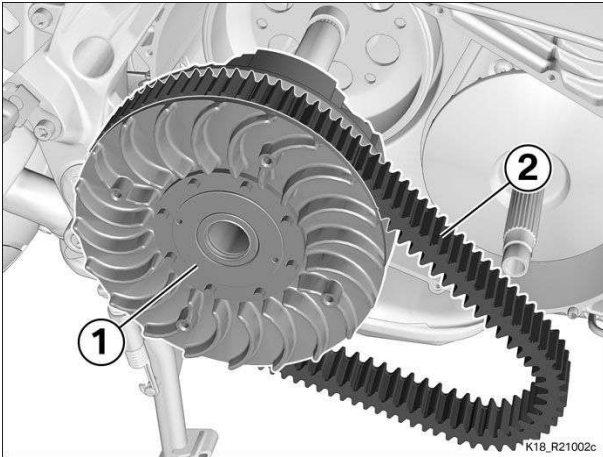


- Pull drive belt (1) as tight to the pulley as possible and secure the loose end with a cable tie (arrow).
- » Drive belt (1) is secured to permit subsequent assembly of the CVT adjuster unit.



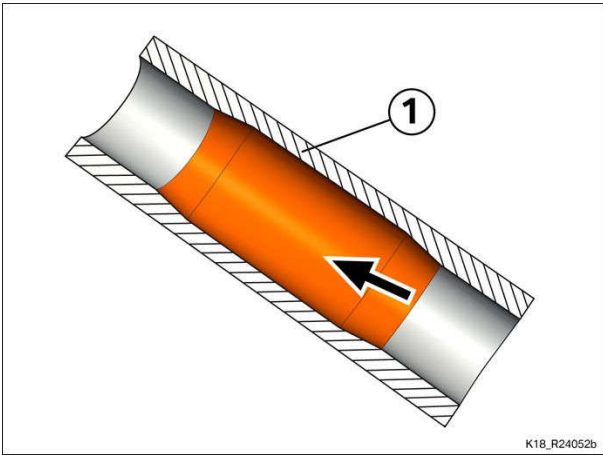
- Install clutch bell (1).

- Install CVT output (1) with drive belt (2).



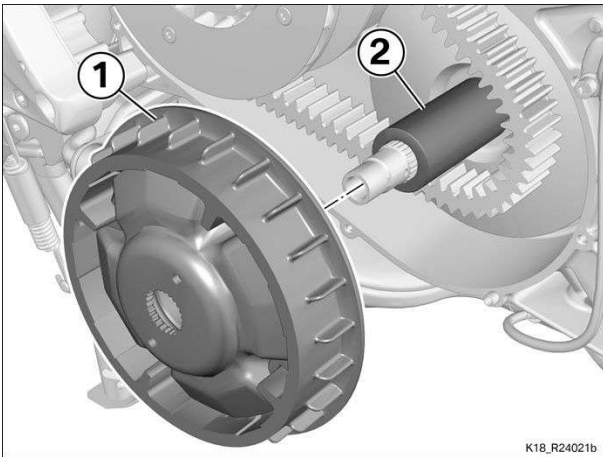
- Position lock washer (3) on shaft (2).
- Install nut (1) and tighten until hand-tight.

(-) Installing CVT adjuster unit



- Clean CVT spacing sleeve (1).
- Lubricate the cavity (arrow).

Lubricant	
Unirex N3	83 19 2 160 349

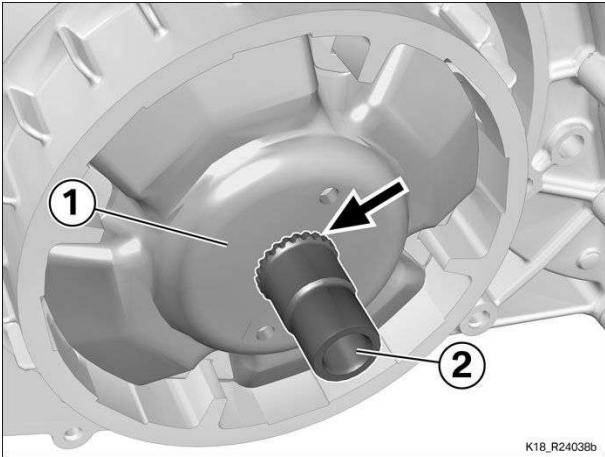


- Install CVT spacing sleeve (2) and **removing escaping grease.**

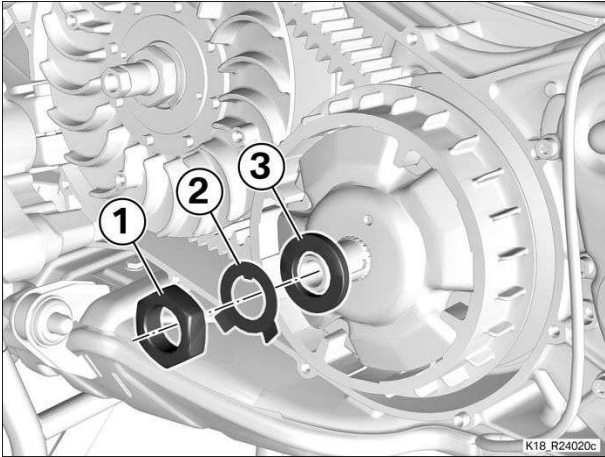
NOTICE

The friction faces of the CVT belt, CVT belt and coupling must be clean and free of grease.

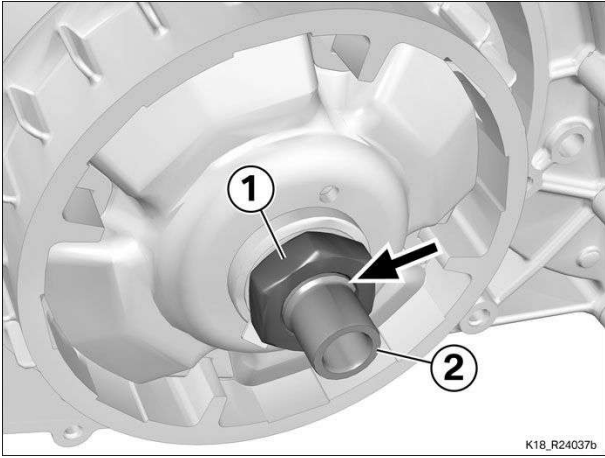
- Install CVT adjuster unit (1).



- Make sure that engagement of the splines (arrow) between guide plate (1) and CVT shaft (2) is correct.



- Install spacer (3) and lock washer (2).
- Install nut (1) and tighten until **hand-tight**.



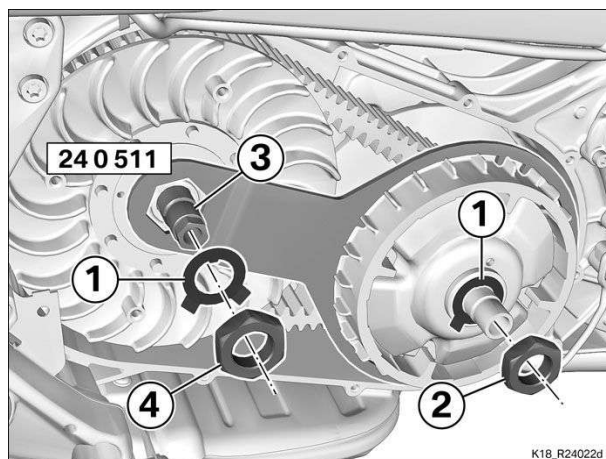
- Make sure that installation is correct: with nut (1) installed, the groove (arrow) in CVT shaft (2) must be visible.

(-) Securing threaded fasteners of CVT adjuster unit and CVT output

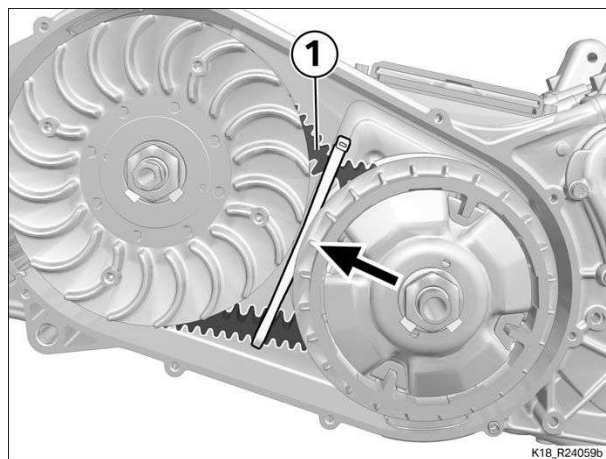
- Engage holder (No. 24 0 511).
- Tighten nut (2).

 Tightening tor ues		
CVT (front) to CVT input shaft		
M22 x 1.5, secure with lock washer	100 Nm	

- Turn shaft (3) to tighten nut (4).



K18_R24022d



K18_R24059b

Tightening torques		
CVT output to CVT output shaft		
M22 x 1.5, secure with lock washer	100 Nm	

- Remove holder (No. 24 0 511).
- Bend up the tabs of locking washer (1).
- If applicable, remove the cable tie (arrow) from drive belt (1).

Finishing work

Installing CVT cover

Installing CVT sound-absorbing hood

Installing rear right footplate carrier

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

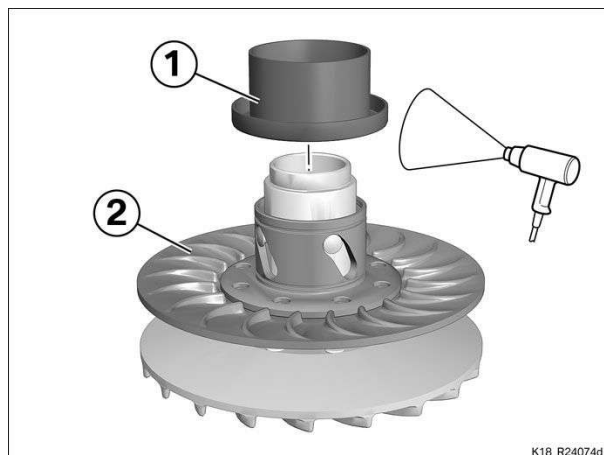
📁 24 81 501 Disassembling/assembling CVT output (CVT removed)

Preparatory work

Removing clutch package

Core activity

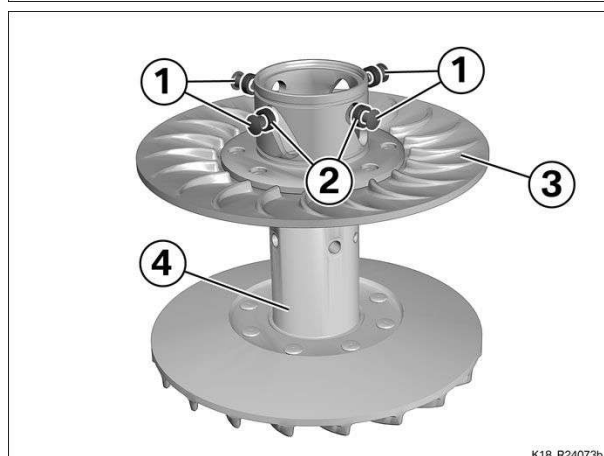
(-) Disassembling CVT output



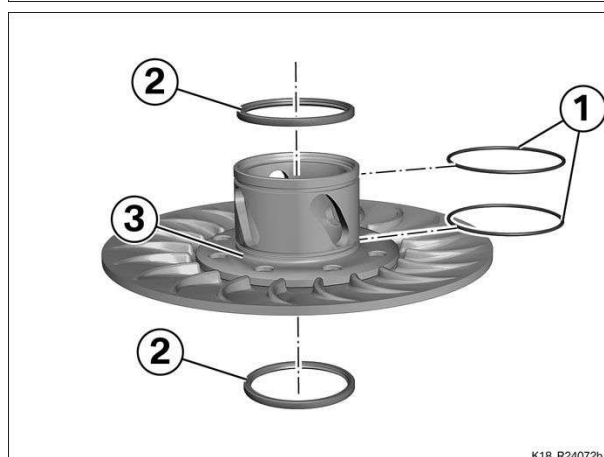
- Heat shouldered bushing (1).

Technical data			
Release/mating temperature		80 °C	

- Pry shouldered bushing (1) off left variator plate (2) and remove.

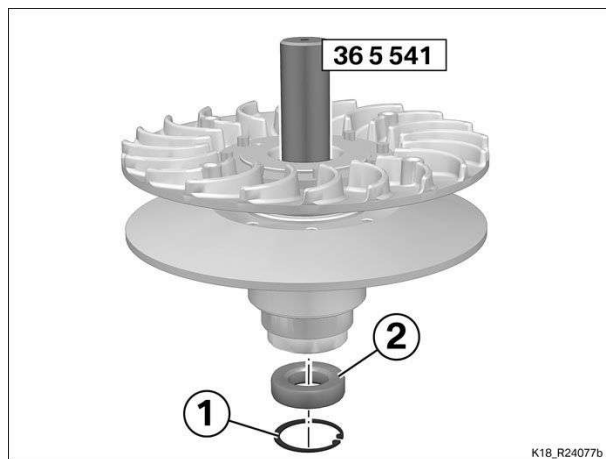
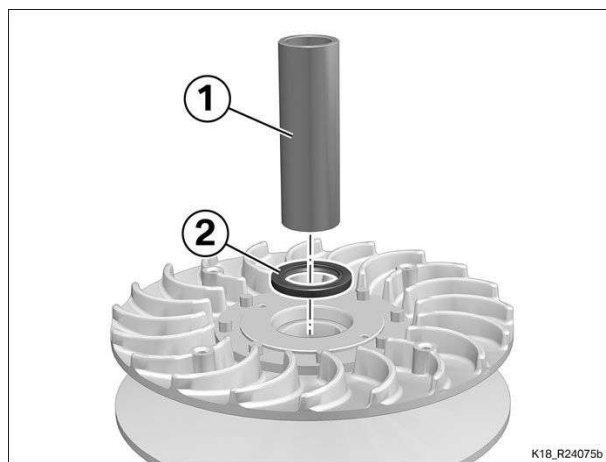


- Remove guide pins (1) and guide rollers (2).
- Remove left variator plate (3) from right variator plate (4).
- Clean variator plate (4), remove all traces of lubricant.

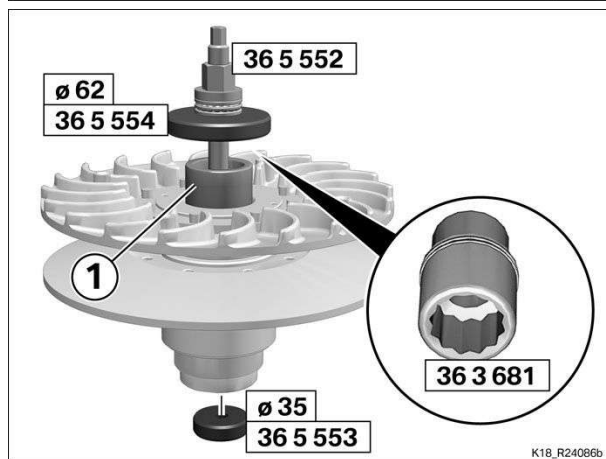


- Remove O-rings (1).
- Remove sealing rings (2).
- Clean variator plate (3), remove all traces of lubricant.

- Remove spacing sleeve (1).
- Using a suitable tool, remove sealing ring (2).



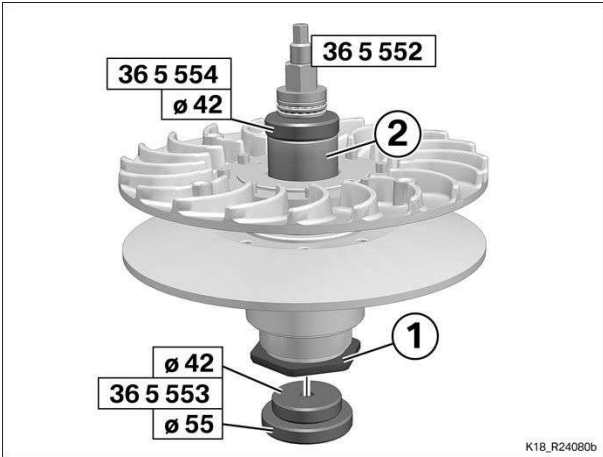
- Remove circlip (1).
- Drive out bearing (2) with drift (No. 36 5 541).



- Engage socket (No. 36 3 681) over needle bearing (1).
- Remove needle bearing (1) with short spindle with pull-in nut (No. 36 5 552), washer without thread (No. 36 5 554) and washers with thread (No. 36 5 553).
 - Washer without thread, dia. 62 mm
 - Washer with thread, dia. 35 mm
- » Needle bearing (1) is drawn into socket.
- Remove the tools.

(-) Assembling CVT output

- Clean the bearing seats.
- Engage nut (1), allowing it to project slightly in order to protect the threads.
- Install bearing (2) with short spindle with pull-in nut (No. 36 5 552), washer without thread (No. 36 5 554) and washers with thread (No. 36 5 553):
 - Washer dia. 42 mm
 - Washer with thread, dia. 42 mm
 - Washer with thread, dia. 55 mm
- Pull in bearing (2) until seated; alternatively note installed depth.



Technical data

Installation depth of
the needle roller
bearing in the
variator plate

7 mm

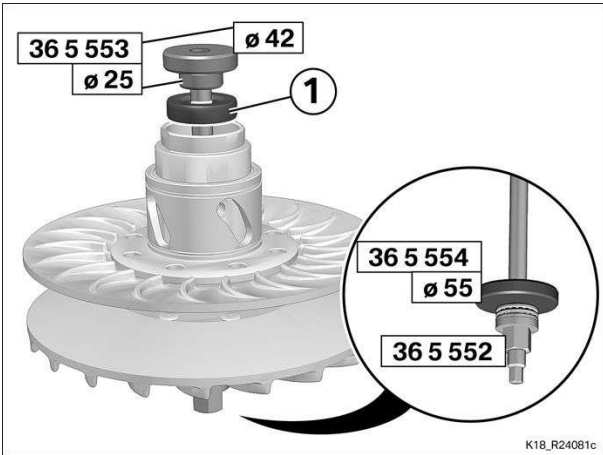
- Remove tools and nut (1).
- Pack bearing (2) with lubricant.



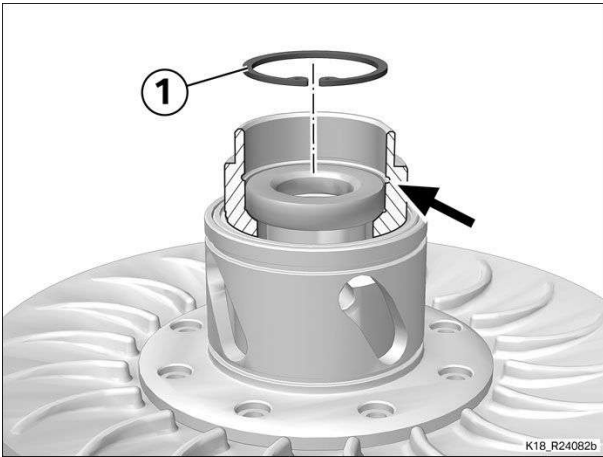
Lubricant

Acid-free friction-bearing grease

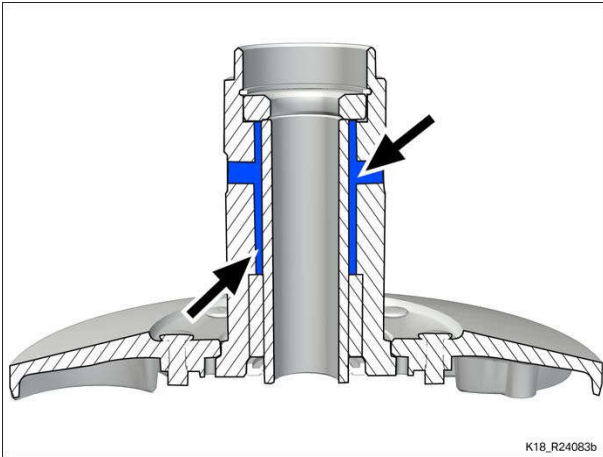
81 22 9 407 174



- Install bearing (1) with short spindle with pull-in nut (No. 36 5 552), washer without thread (No. 36 5 554) and washers with thread (No. 36 5 553):
 - Washer without thread, dia. 55 mm
 - Washer with thread, dia. 42 mm
 - Washer with thread, dia. 25 mm
- Pull in bearing (1) until seated.
- Remove the tools.



- Install circlip (1) in the groove (arrow).



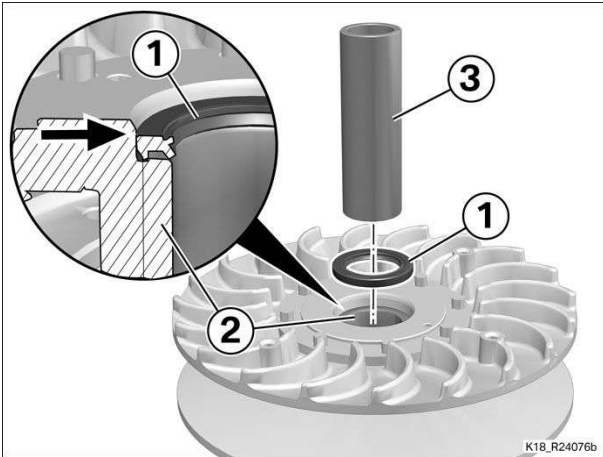
- Pack the spaces (arrows) with lubricant (grease gun).



Lubricant

Unirex N3

83 19 2 160 349



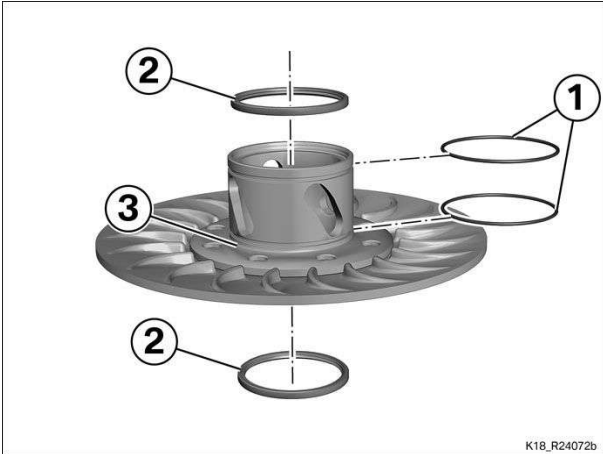
- Pack sealing lips of sealing ring (1) with lubricant.



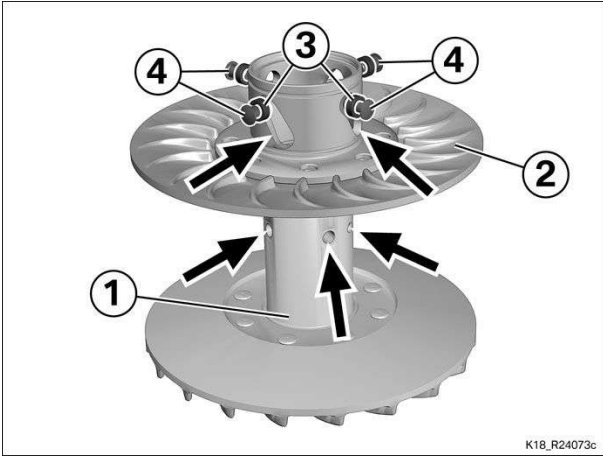
Lubricant

Unirex N3	83 19 2 160 349
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- Using a suitable tool install sealing ring (1) **open side in** until seated on needle roller bearing (2); sealing ring (1) must be flush with the chamfer (arrow).
- Install spacing sleeve (3).



- Install **new** O-rings (1).
- Lubricate **new** sealing rings (2) with engine oil.
- Install **new** sealing rings (2) with the **open side facing in**.
- Clean variator plate (3), remove all traces of lubricant.



- Position left variator plate (1) on right variator plate (2).
- Lubricate the guide grooves and lube bores (arrows), repeatedly turning the variator plates to spread the lubricant.



Lubricant

Unirex N3	83 19 2 160 349
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- Lubricate guide rollers (3) and guide pins (4).



Lubricant

Unirex N3	83 19 2 160 349
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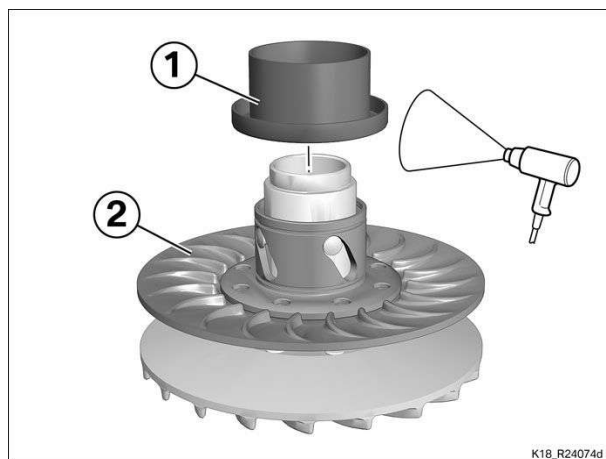
- Align guide grooves and lube bores (arrows) and install guide rollers (3) with guide pins (4).
- Heat shouldered bushing (1).



Technical data

Release/mating temperature		80 °C	
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- Push shouldered bushing (1) on to left variator plate (2) until seated.



- **Carefully remove** all traces of lubricate from the outside of the CVT output.

NOTICE

The friction faces of the CVT belt, CVT belt and coupling must be clean and free of grease.

Finishing work

Installing clutch package

24 82 000 Replacing CVT belt

+ 24 82 500

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Installing rear right footplate insert and footrest plate

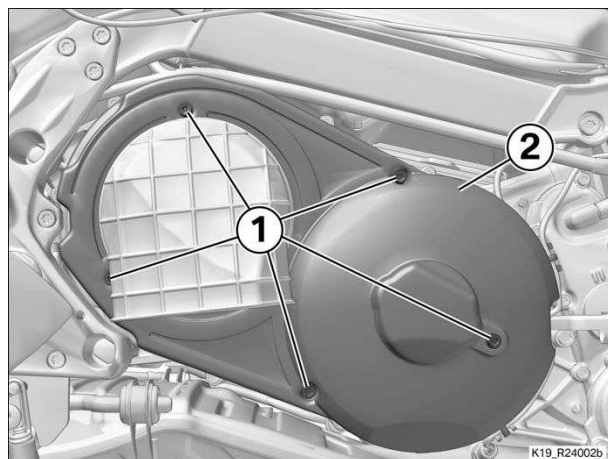
Removing rear footplate

Removing rear right footplate carrier

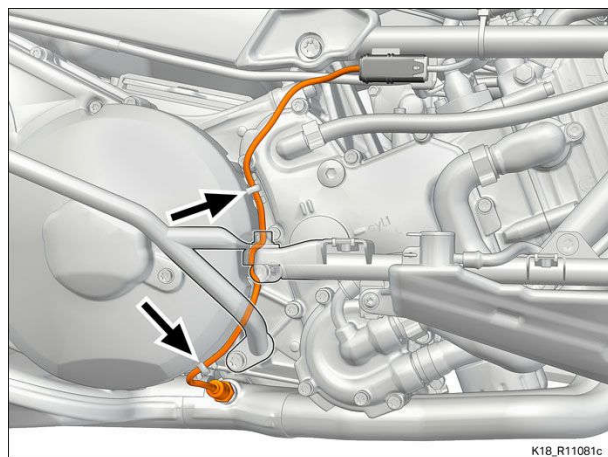
Core activity

(-) Removing CVT sound-absorbing hood

- Remove screws (1) and disengage sound-absorbing hood (2).

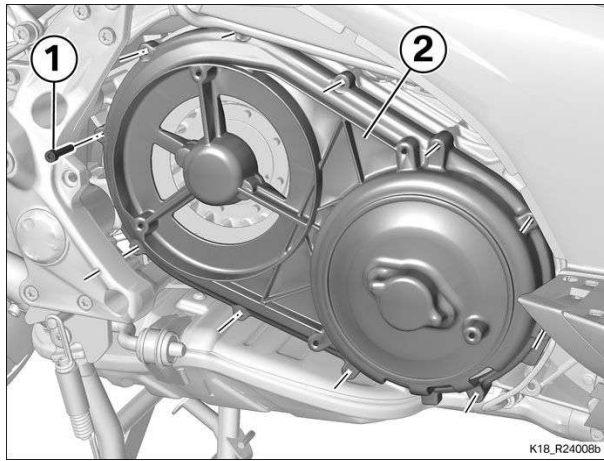


- Disengage the cable (arrows) and remove the sound-absorbing hood.



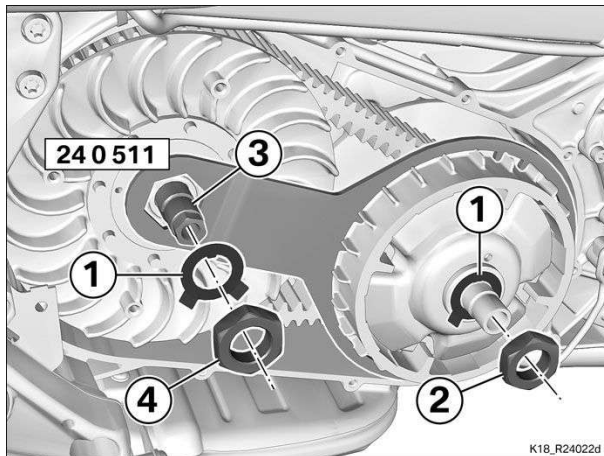
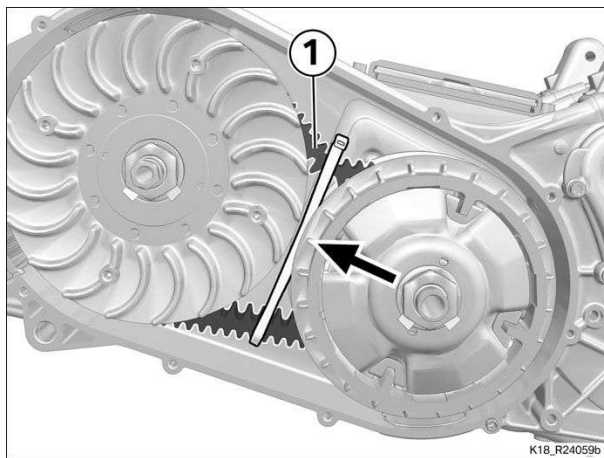
(-) Removing CVT cover

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



(-) Slackening threaded fasteners of CVT adjuster unit and CVT output

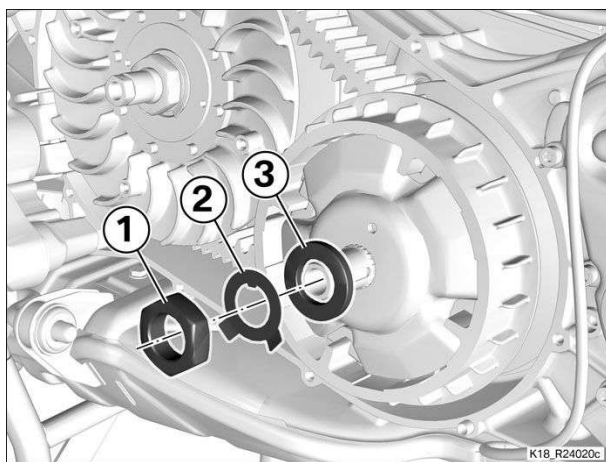
- If applicable, secure drive belt (1) with a cable tie (arrow).



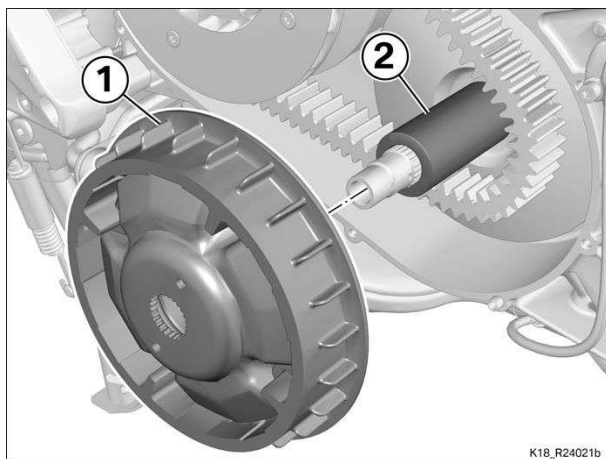
- Bend up tabs of lock washer (1)
- Engage holder (No. 24 0 511).
- Slacken nut (2).
- Turn shaft (3) **clockwise** to slacken nut (4).
- Remove holder (No. 24 0 511).

(-) Removing CVT adjuster unit

- Remove the following components:
 - Nut (1)
 - Lock washer (2)
 - Spacer (3)

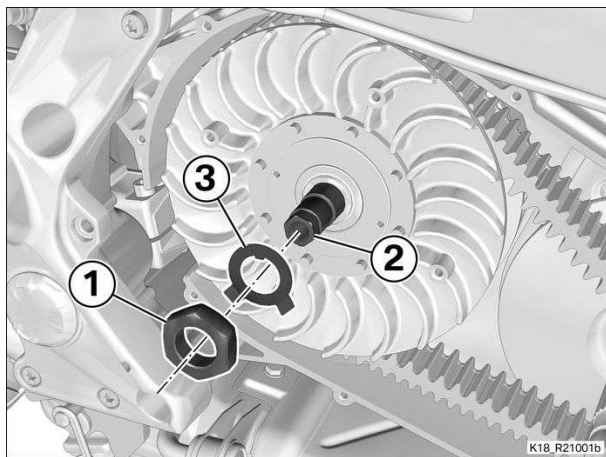


- Remove CVT adjuster unit (1) and sleeve (2).

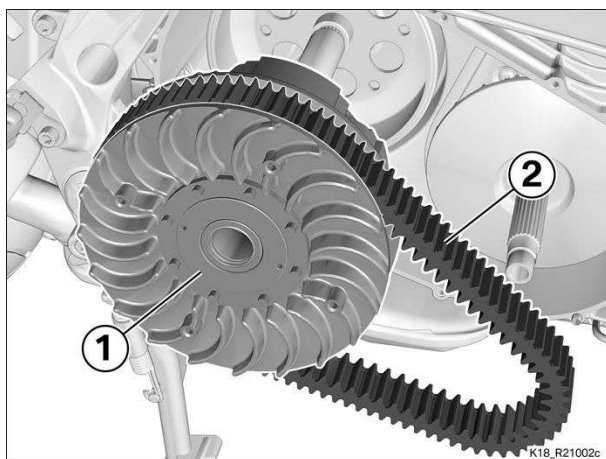


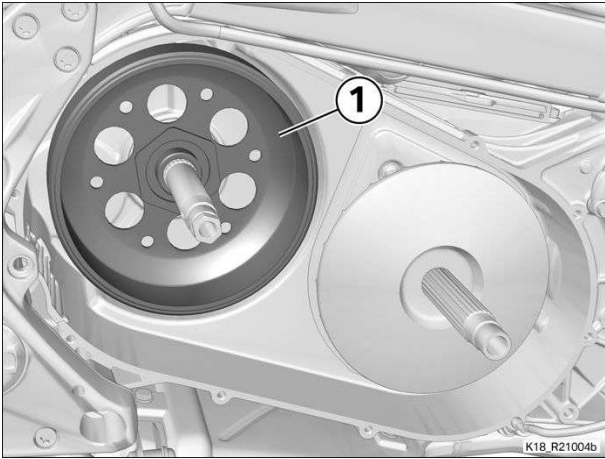
(-) Removing CVT output with drive belt and clutch bell

- Remove nut (1), while counter-holding at shaft (2) if necessary.
- Remove lock washer (3).



- Remove CVT output (1) with drive belt (2).





- Remove clutch bell (1).

(-) Checking clutch

Check

- Check clutch (1) and clutch bell (2) for wear.

 Technical data			
Minimum height, clutch lining	Projection past lining backer	min 2.5 mm	

Result:

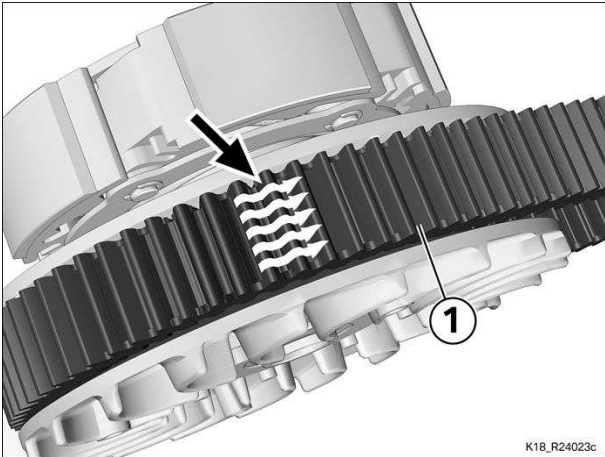
- Clutch linings are worn or damaged, clutch bell shows scoring on friction face.

Measure:

=> 21 21 511, Replacing clutch package (CVT output removed) (Billed as a separate item)

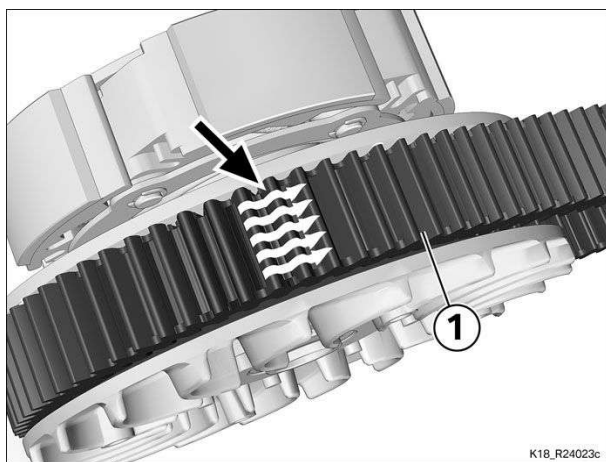
(-) Replacing CVT belt

- When installing belt (1), make sure that the direction of rotation (arrow) is correct: **arrows point in direction of rotation.**

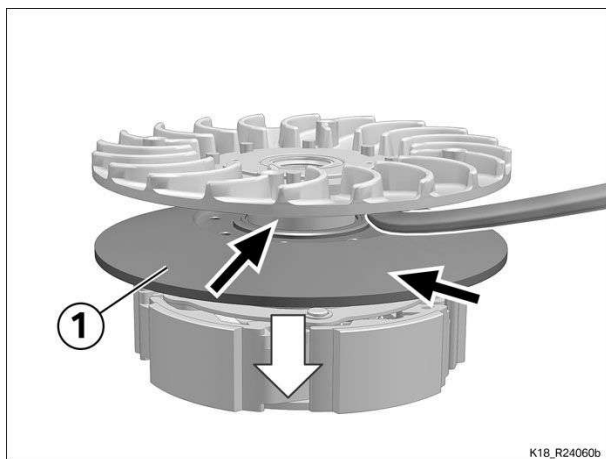


(-) Installing CVT output with drive belt and clutch bell

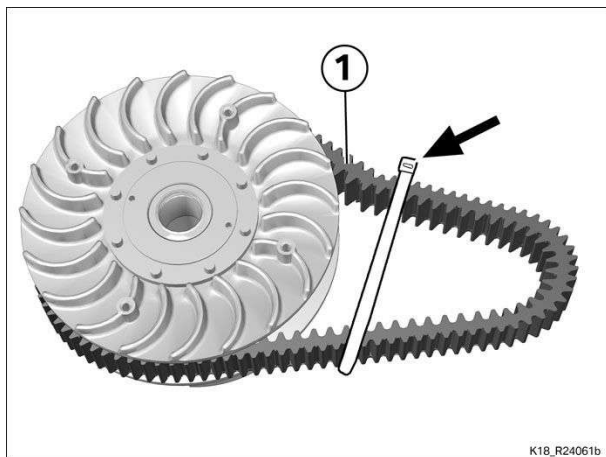
- Installing drive belt in CVT output



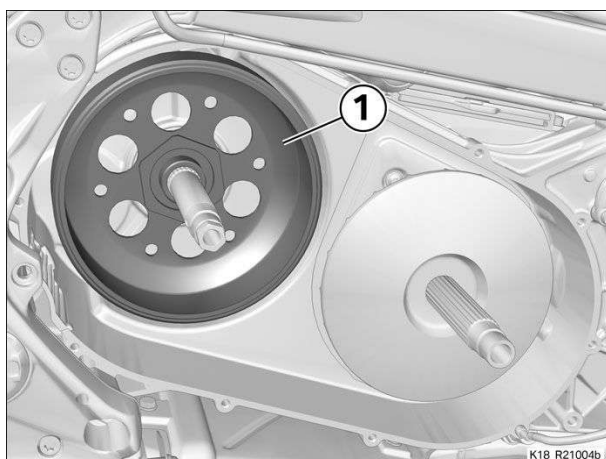
- When installing drive belt (1), make sure that the direction of rotation (arrow) is correct: **arrows point in direction of rotation.**



- Use a tyre lever to hold down thrust washer (1), taking care not to damage the friction faces (arrows).

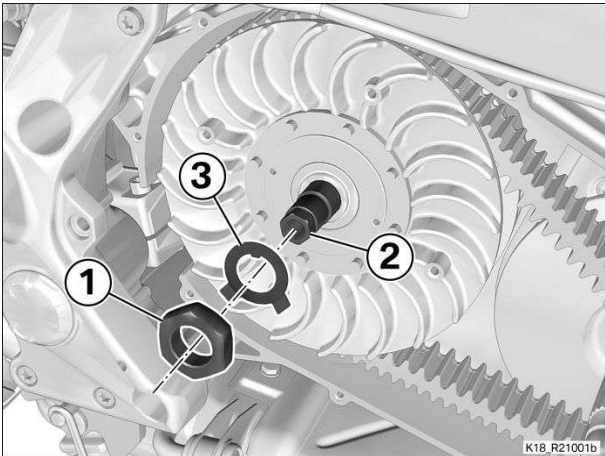
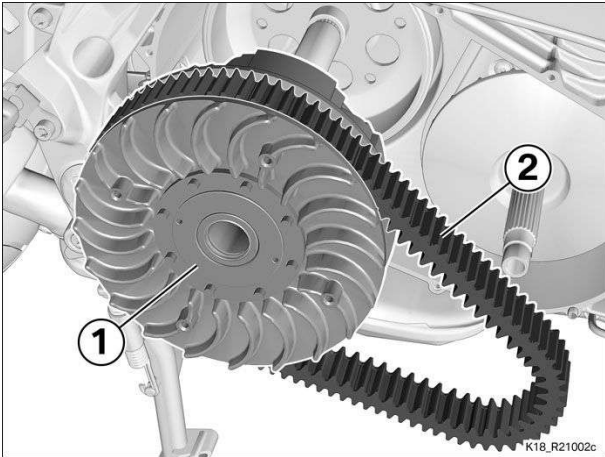


- Pull drive belt (1) as tight to the pulley as possible and secure the loose end with a cable tie (arrow).
- » Drive belt (1) is secured to permit subsequent assembly of the CVT adjuster unit.



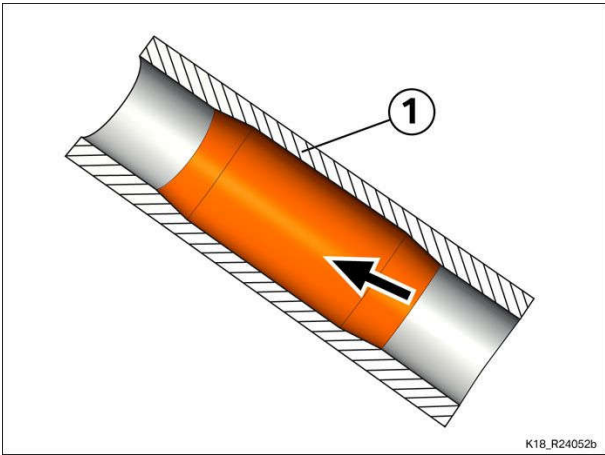
- Install clutch bell (1).

- Install CVT output (1) with drive belt (2).



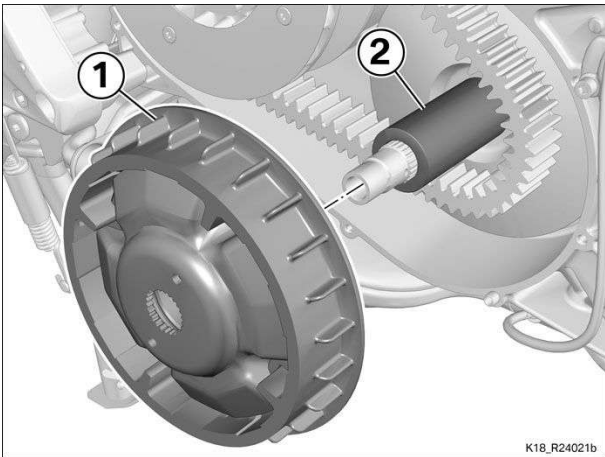
- Position lock washer (3) on shaft (2).
- Install nut (1) and tighten until hand-tight.

(-) Installing CVT adjuster unit



- Clean CVT spacing sleeve (1).
- Lubricate the cavity (arrow).

 lubricant	
Unire N3	83 19 2 160 349

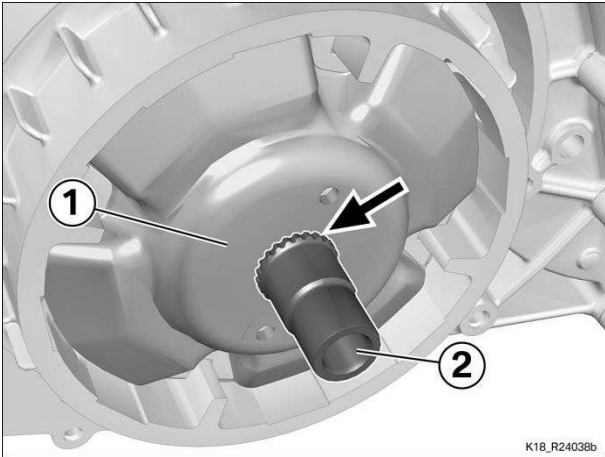


- Install CVT spacing sleeve (2) and **removing escaping grease.**

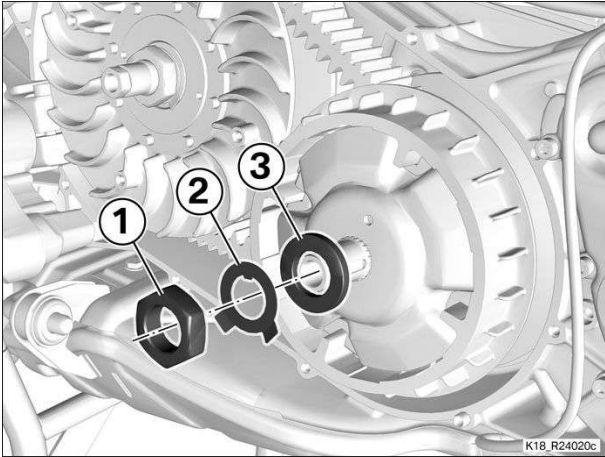
 **TIC**

The friction faces of the CVT belt, CVT belt and coupling must be clean and free of grease.

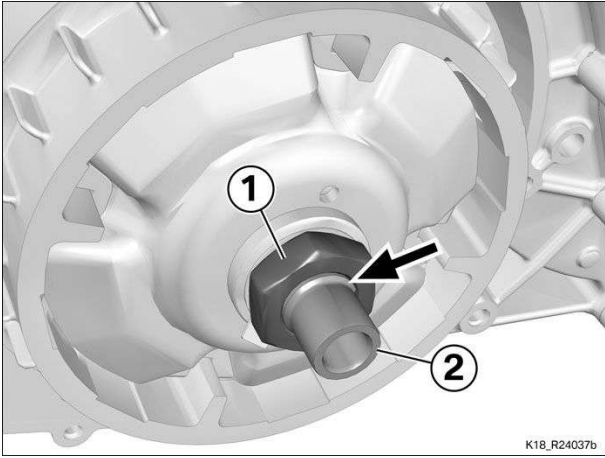
- Install CVT adjuster unit (1).



- Make sure that engagement of the splines (arrow) between guide plate (1) and CVT shaft (2) is correct.



- Install spacer (3) and lock washer (2).
- Install nut (1) and tighten until **hand-tight**.



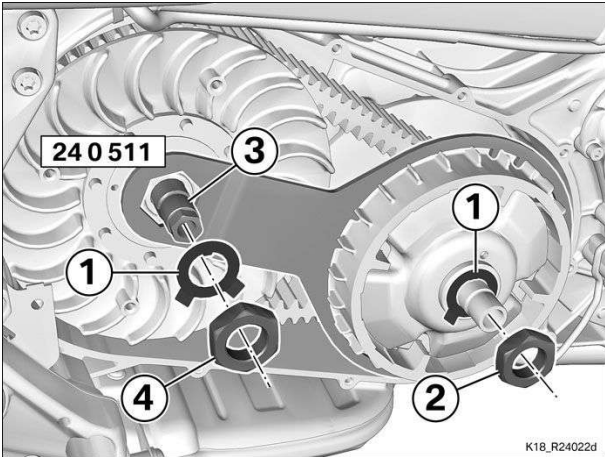
- Make sure that installation is correct: with nut (1) installed, the groove (arrow) in CVT shaft (2) must be visible.

(-) Securing threaded fasteners of CVT adjuster unit and CVT output

- Engage holder (No. 24 0 511).
- Tighten nut (2).

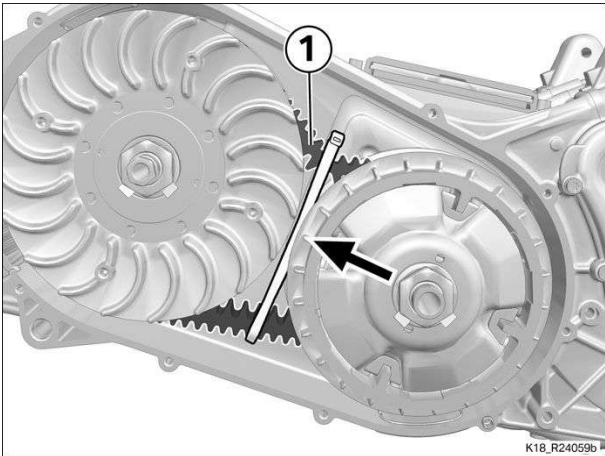
 Tightening tor ues		
CVT (front) to CVT input shaft		
M22 1.5, secure with lock washer	100 Nm	

- Turn shaft (3) to tighten nut (4).



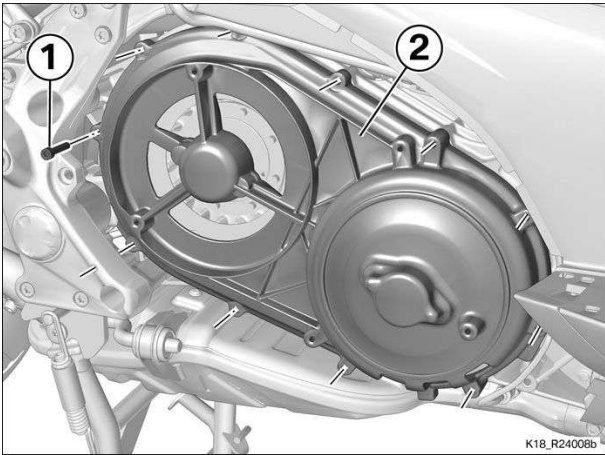
 Tightening torques		
CVT output to CVT output shaft		
M22 1.5, secure with lock washer	100 Nm	

- Remove holder (No. 24 0 511).
- Bend up the tabs of locking washer (1).
- If applicable, remove the cable tie (arrow) from drive belt (1).



(-) Installing CVT cover

- Install cover (2) and secure with screws (1).

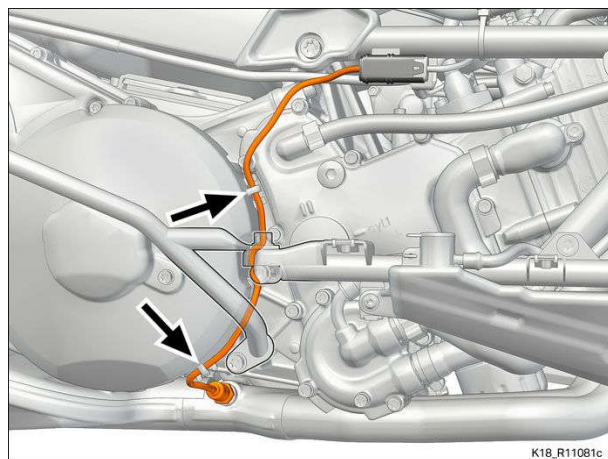
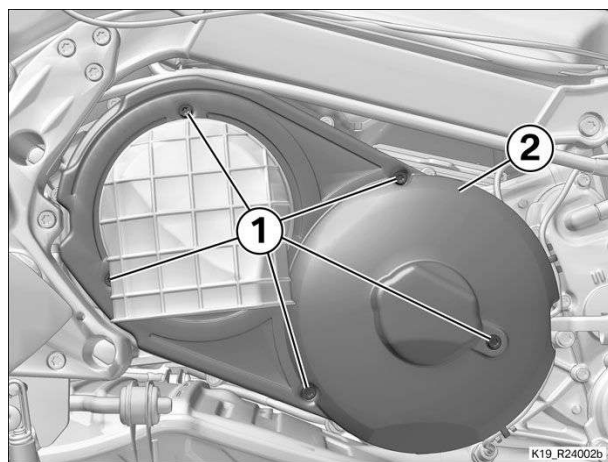


 Tightening torques		
CVT cover to crankcase		
M6 45	10 Nm	

(-) Installing CVT sound-absorbing hood

- Secure CVT sound-absorbing hood (2) with screws (1).

 Tightening torques		
Sound-absorbing hood to CVT cover		
M6 18	10 Nm	



- Secure the cable (arrows).

finishing work

Installing rear right footplate carrier

Installing right footplate

Installing rear right footplate insert and footrest plate

Installing centre right footplate insert and footrest plate

Installing right side panel

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing centre cover

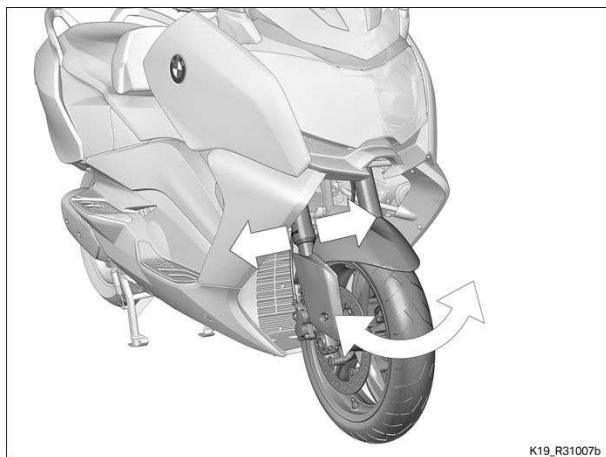
Closing seat

Installing filler cap flap

Final check of work performed

31 42 011 Checking steering-head bearing

+ 31 42 511



Core activity

(-) Checking steering-head bearing

ATTENTION

Vehicle can topple sideways.

Risk of damage to parts if vehicle topples.

- Make sure that the vehicle is secured so that it cannot topple sideways.

- Raise the **Maxi-Scooter** with a suitable lifter to take the weight off the front wheel.

Check

- Take a grip of **slider tubes (1)** and pull the forks back and forth.

Result:

- Steering-head bearing evinces play.

Measure:

=> 31 42 514, Adjusting steering-head bearing (with checking steering-head bearing) (Billed as a separate item)

Check

- Turn the handlebars to full left and right lock.

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.

Result:

- Dirt or old, solidified grease makes the handlebars stiff, or there is a perceptible notching effect when the handlebars reach the straight-ahead position.

Measure:

=> 31 42 879, Replacing both steering-head bearings (Billed as a separate item)

Finishing work

Final check of work performed

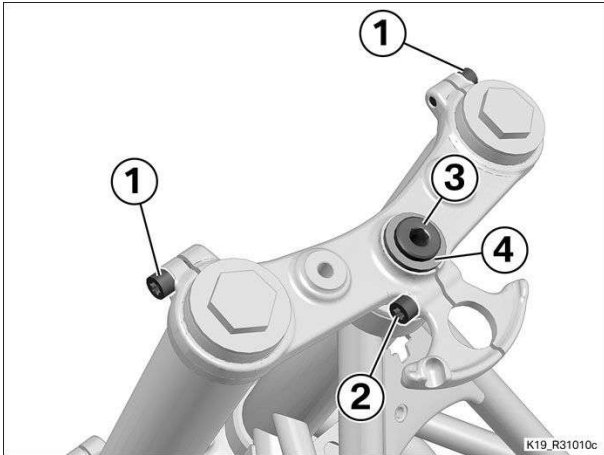
 31 42 028 Replace upper fork bridge
+ 31 42 528

Preparatory work

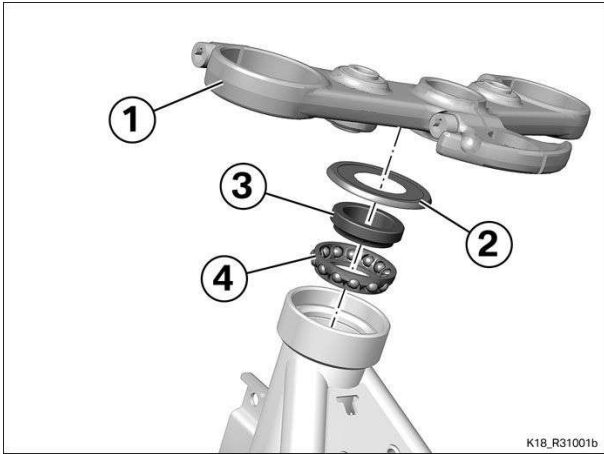
- Securing forks of **Maxi-Scooter**
- Removing handlebar trim
- Removing top handlebar cover
- Removing bottom handlebar cover
- Removing top left fairing side panel
- Removing top right side panel
- Removing handlebars

Core activity

(-) Removing top fork bridge



- Loosen screws (1) and (2).
- Remove adjusting screw (3) with washer (4).



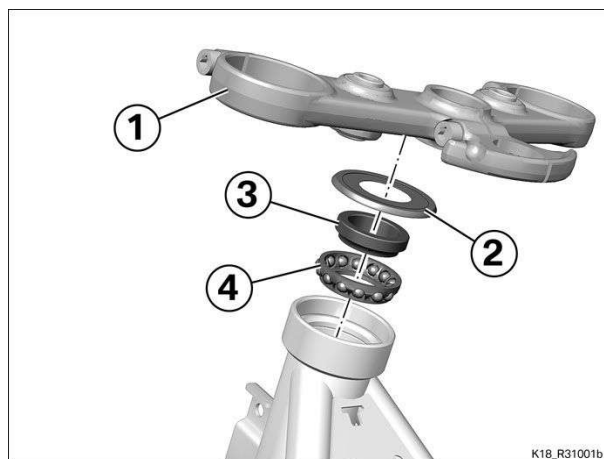
- Remove fork bridge (1).
- Remove the following components:
 - Washer (2)
 - Bearing shell (3)
 - Bearing race (4)

(-) Installing top fork bridge

- Clean and lubricate bearing shell (3) and bearing ring (4).

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

- Install the following components:



- Bearing race (4)
- Bearing shell (3)
- Washer (2)
- Fork bridge (1)



- Install washer (1) and adjusting screw (2) and **tighten until hand-tight.**

Finishing work

Releasing fork locator

Securing handlebars

Adjusting steering-head bearing play

Installing top left side panel

Installing top right side panel

Installing bottom handlebar cover

Installing top handlebar cover

Installing handlebar trim

Final check of work performed

31 42 029 Replace lower fork bridge

+ 31 42 527

WARNING

Premature reaching of tightening torque due to traces of thread-locking compound.

Risk of crash due to loose fork clamps.

- Check the fork-leg clamps for residual traces of old thread-locking compound as specified.

Preparatory work

Installing engine lifter

Disengaging intake air pipe

Removing top left fairing side panel

Removing top right side panel

Removing both brake calipers

Releasing front wheel-speed sensor

Removing front-wheel cover

Removing front wheel

Removing handlebar trim

Removing top handlebar cover

Removing bottom handlebar cover

Disengaging brake line

Removing left fork leg

Removing right fork leg

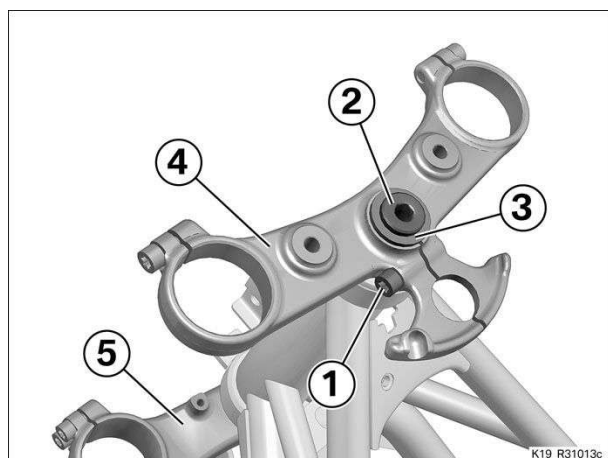
Checking threaded fasteners of bottom fork-leg clamps for traces of thread-locking compound

Removing handlebars

Core activity

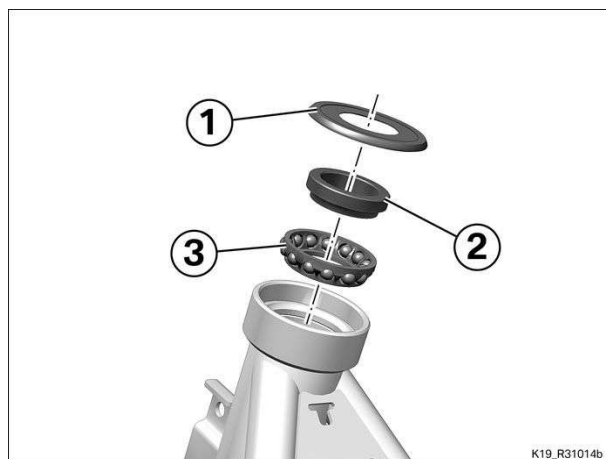
(-) Removing top and bottom fork bridges

- Slacken screw (1).
- Remove adjusting screw (2), noting washer (3)
- Remove top fork bridge (4) and bottom fork bridge (5).

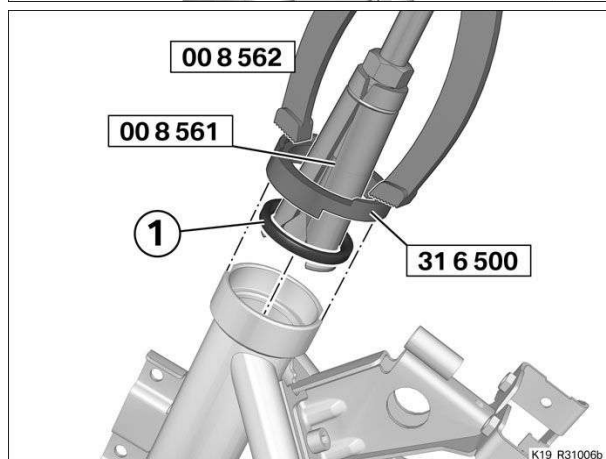


(-) Removing top steering-head bearing

- Remove the following components:

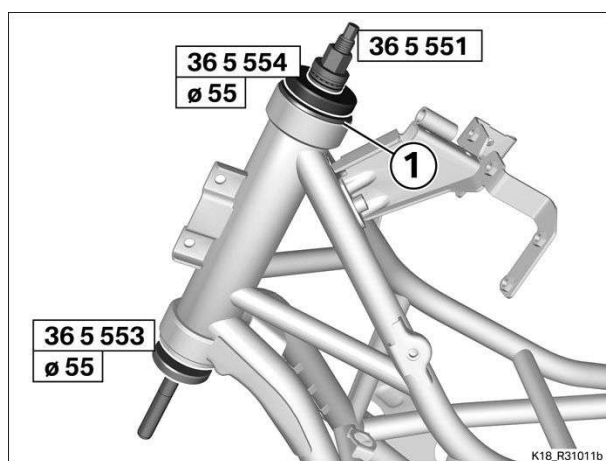


- Dust cap (1)
- Inner race (2)
- Bearing race (3)



- Remove bearing outer race (1) with reaction support (No. 00 8 562), internal puller 37-46mm (No. 00 8 561) and protective ring (No. 31 6 500).

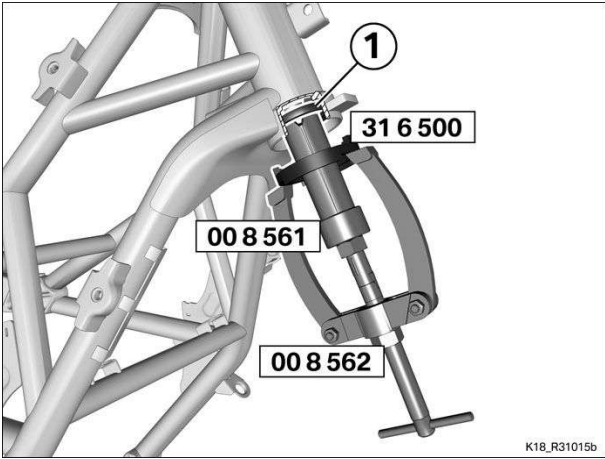
(-) Installing top steering-head bearing (bearing outer race) in frame



- Install new bearing outer race (1) until seated, using spindle long (No. 36 5 551), disc 55 mm with thread (No. 36 5 553) and disc 55 mm (No. 36 5 554).
- Remove the tools.

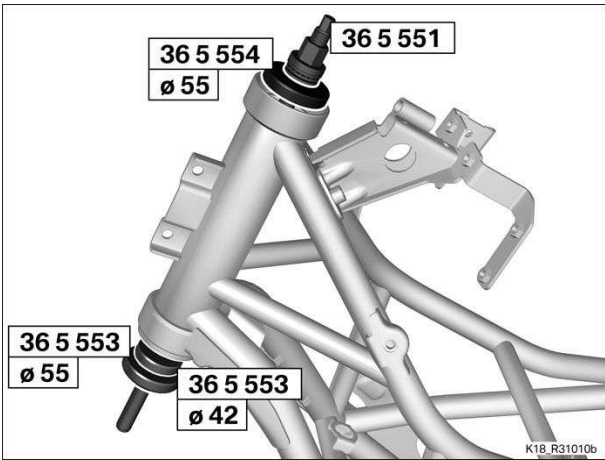
(-) Removing bottom steering-head bearing

- Remove bearing outer race (1) with reaction support (No. 00 8 562), internal puller 37-46mm (No. 00 8 561) and support ring (No. 31 6 500).



(-) Installing bottom steering-head bearing (inner race)

- Install new bearing outer race until seated, using spindle (No. 36 5 551), discs 55 mm and 42 mm with thread (No. 36 5 553) and disc 55 mm without thread (No. 36 5 554).
- Remove the tools.

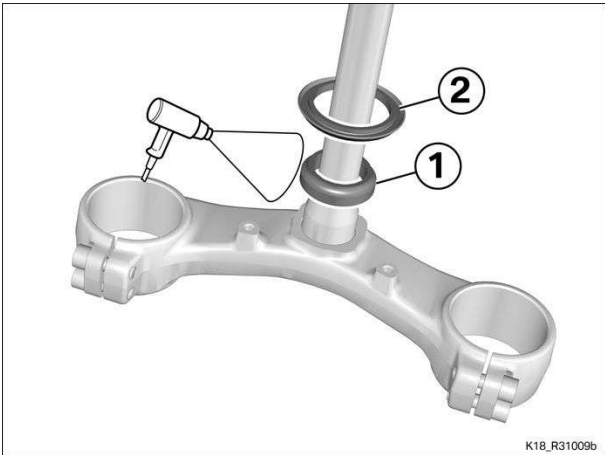


(-) Installing bottom steering-head bearing (inner race)

- Heat inner race (1).

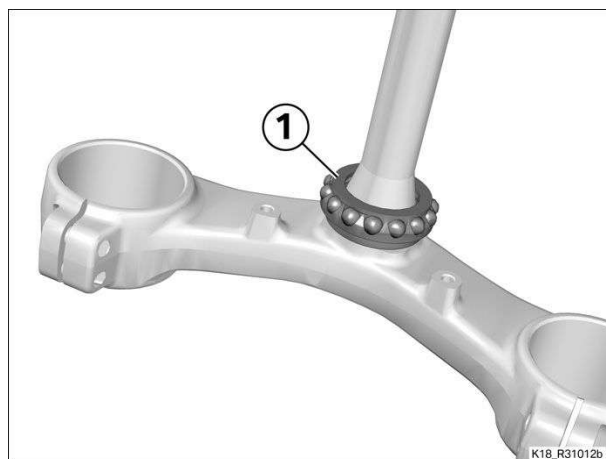
 Technical data			
Release/mating temperature		80 °C	

- Install inner ring (1) until seated.
- Allow inner ring (1) to cool down and install dust cap (2).



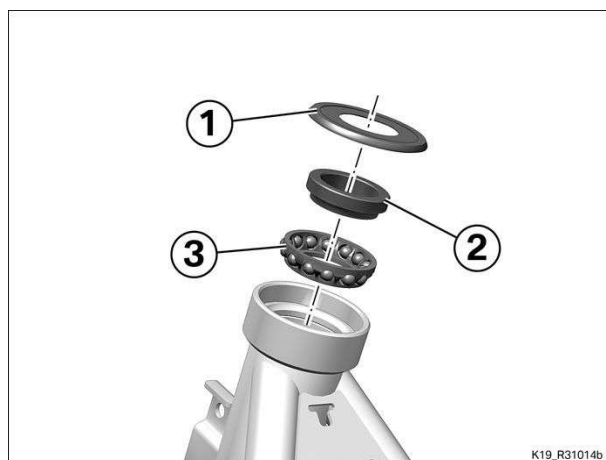
- Lubricate new bearing race (1) and install.

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



(-) Installing top and bottom fork bridges

- Lubricate new bearing shell (2) and bearing ring (3).



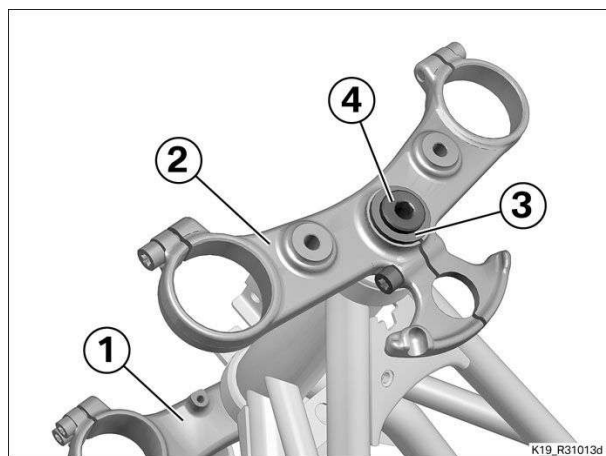
Lubricant

Acid-free friction-bearing grease

81 22 9 407 174

- Install the following components:

- Bearing race (3)
- Bearing shell (2)
- Washer (1)



- Place bottom fork bridge (1) and top fork bridge (2) in position.
- Lay washer (3) in position and install adjusting screw (4) and **tighten until hand-tight.**

Finishing work

Securing handlebars

Securing brake line to bottom fork bridge

Installing left fork leg

Install the right fork leg

Installing front wheel

Securing both brake calipers

Securing front wheel-speed sensor

Installing front-wheel cover

Adjusting steering-head bearing play
Installing bottom handlebar cover
Installing top handlebar cover
Installing handlebar trim
Installing top left side panel
Installing top right side panel
Securing intake air pipe
Removing engine lifter
Final check of work performed

31 42 321 Replacing both steering-head bearings

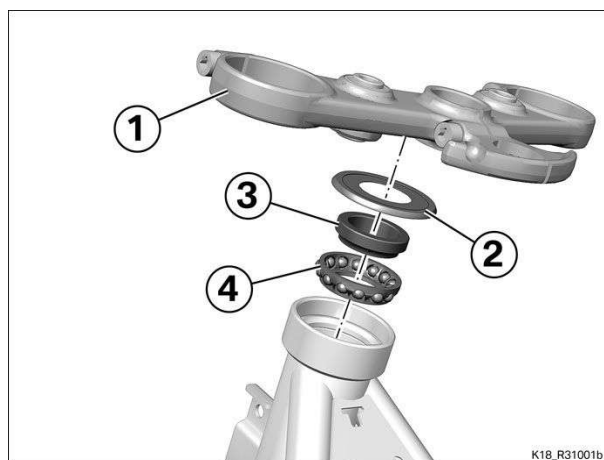
+ 31 42 879

Preparatory work

Installing engine lifter
Removing handlebar trim
Removing top handlebar cover
Removing bottom handlebar cover
Removing top left fairing side panel
Removing top right side panel
Removing both brake calipers
Releasing front wheel-speed sensor
Removing front-wheel cover
Removing front wheel
Disengaging brake line
Removing handlebars
Removing forks with bottom fork bridge

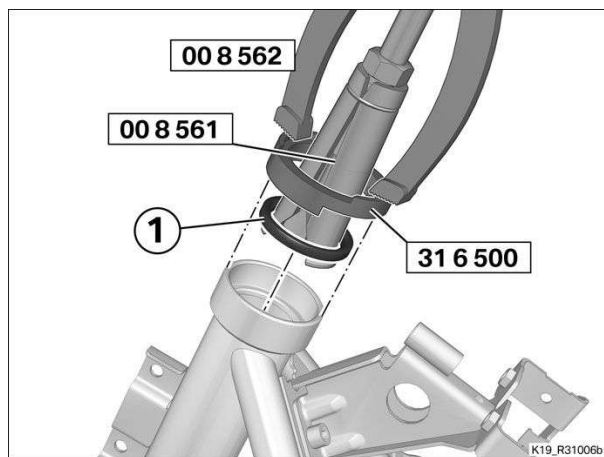
Core activity

(-) Removing fork bridge and top steering-head bearing



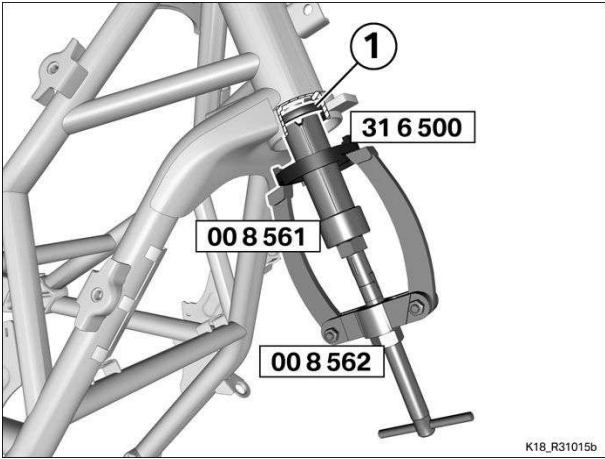
• Remove the following components:

- Fork bridge (1)
- Dust cap (2)
- Inner race (3)
- Bearing race (4)



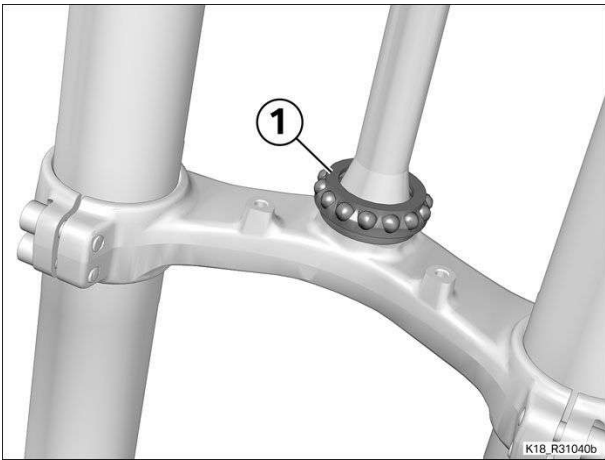
• Remove bearing outer race (1) with reaction support (No. 00 8 562), internal puller 37-46mm (No. 00 8 561) and protective ring (No. 31 6 500).

(-) Removing bottom steering-head bearing

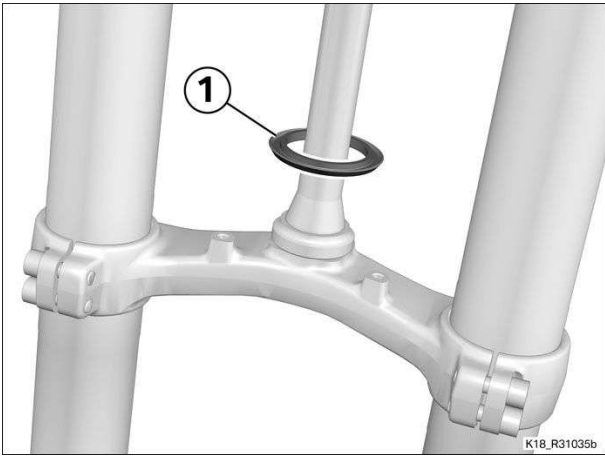


- Remove bearing outer race (1) with reaction support (No. 00 8 562), internal puller 37-46mm (No. 00 8 561) and support ring (No. 31 6 500).

(-) Removing bottom steering-head bearing



- Remove bearing ring (1).



- Remove dust cap (1).

- Lubricate the threads of puller (No. 31 3 701).

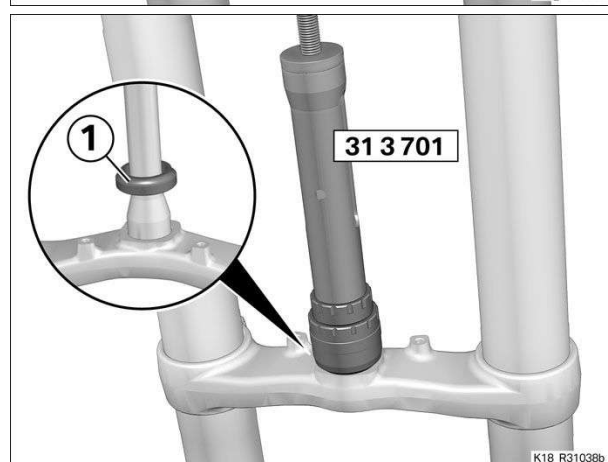
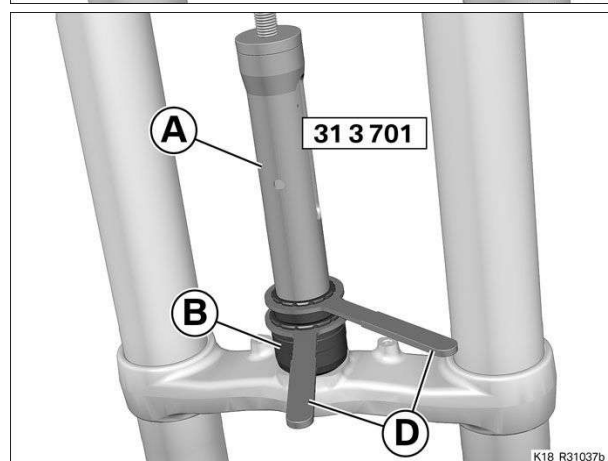
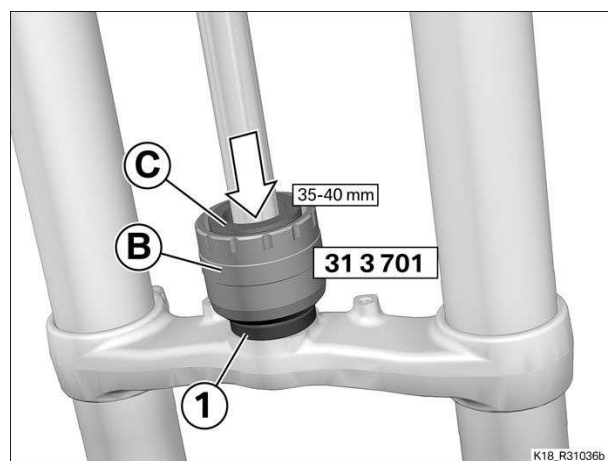


Lubricant

Optimoly TA

18 21 9 062 599

- Insert adapter dia. 35 - 40 mm (C) into nut (B) (No. 31 3 701) and press on to inner bearing race (1).



- Place puller (A) (No. 31 3 701) in position and screw it into nut (B).
- Tighten puller (A) and nut (B) with ring spanners (D).

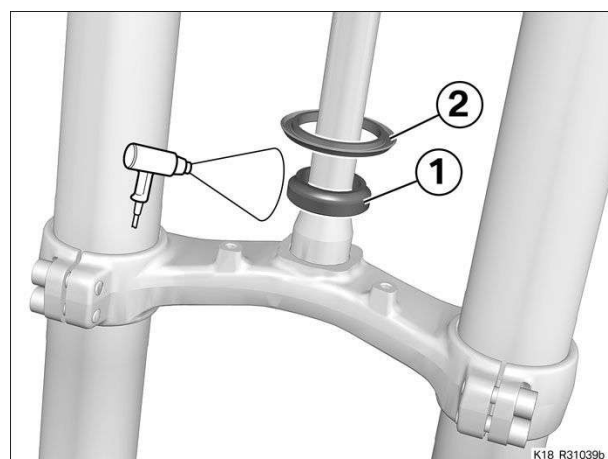
- Remove inner bearing race (1) with puller (No. 31 3 701).

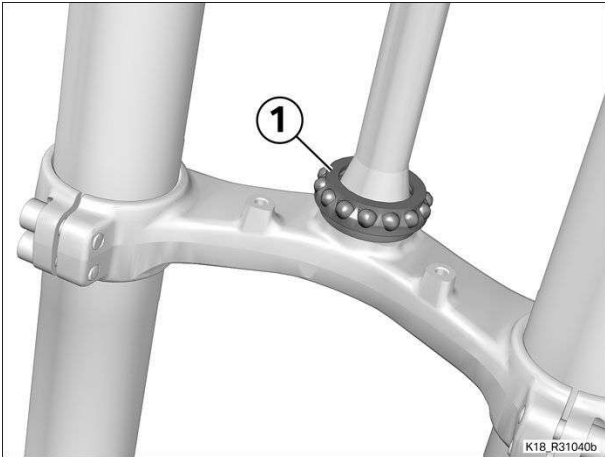
(-) Installing bottom steering-head bearing (inner race)

- Heat inner race (1).

 Technical data			
Release/mating temperature		80 °C	

- Install inner ring (1) **until seated**.
- Allow inner ring (1) to cool down and install dust cap (2).

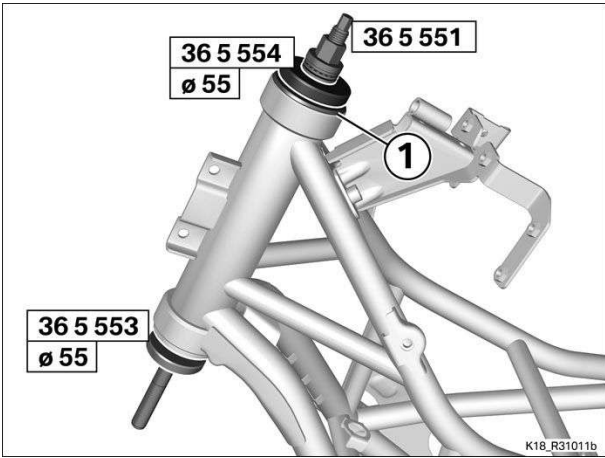




- Lubricate new bearing race (1) and install.

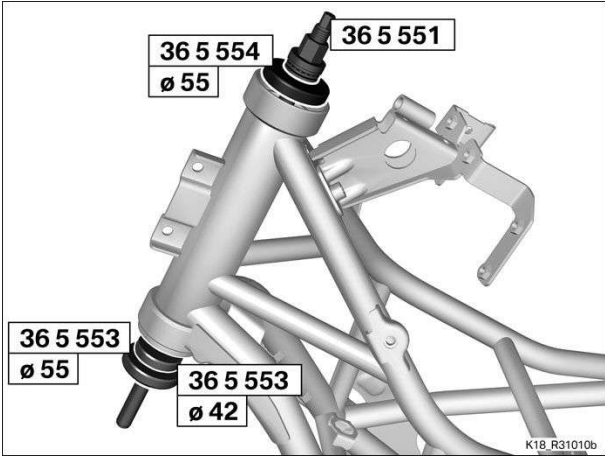
 Lubricant	
Acid-free friction-bearing grease	81 22 9 407 174

(-) Installing top steering-head bearing (bearing outer race) in frame



- Install new bearing outer race (1) until seated, using spindle long (No. 36 5 551), disc 55 mm with thread (No. 36 5 553) and disc 55 mm (No. 36 5 554).
- Remove the tools.

(-) Installing bottom steering-head bearing (inner race)



- Install new bearing outer race until seated, using spindle (No. 36 5 551), discs 55 mm and 42 mm with thread (No. 36 5 553) and disc 55 mm without thread (No. 36 5 554).
- Remove the tools.

Finishing work

- Installing forks with steering-head bearing and top fork bridge
- Securing handlebars
- Securing brake line to bottom fork bridge
- Installing front wheel
- Installing front-wheel cover
- Securing both brake calipers

Securing front wheel-speed sensor
Adjusting steering-head bearing play
Installing bottom handlebar cover
Installing top handlebar cover
Installing handlebar trim
Installing top left side panel
Installing top right side panel
Removing engine lifter
Final check of work performed

31 42 341 Removing/installing left fork leg

+ 31 42 841

WARNING

Premature reaching of tightening torque due to traces of thread-locking compound.

Risk of crash due to loose fork clamps.

- Check the fork-leg clamps for residual traces of old thread-locking compound as specified.

Preparatory work

Installing engine lifter

Removing top left fairing side panel

Removing both brake calipers

Releasing front wheel-speed sensor

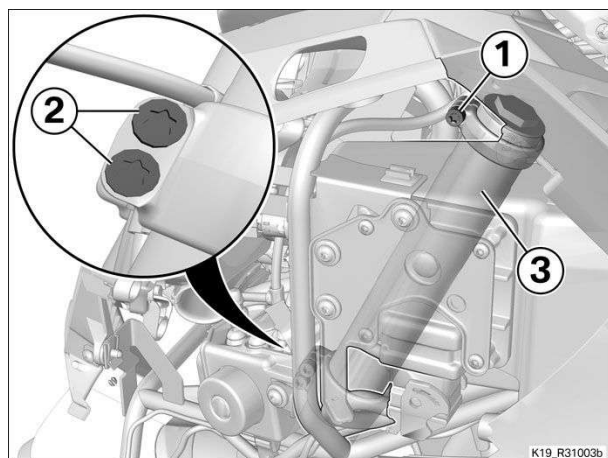
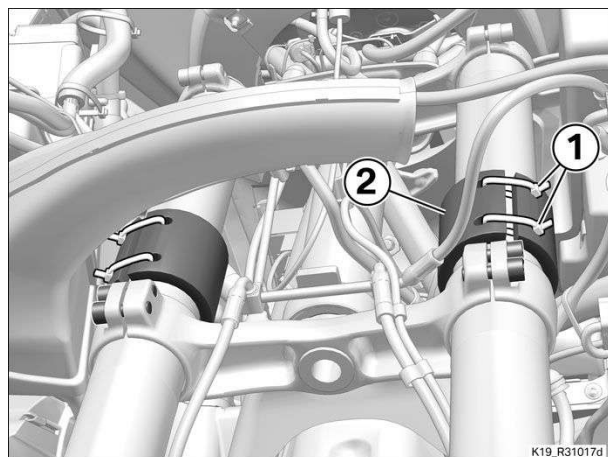
Removing front-wheel cover

Removing front wheel

Core activity

(-) Removing left fork leg

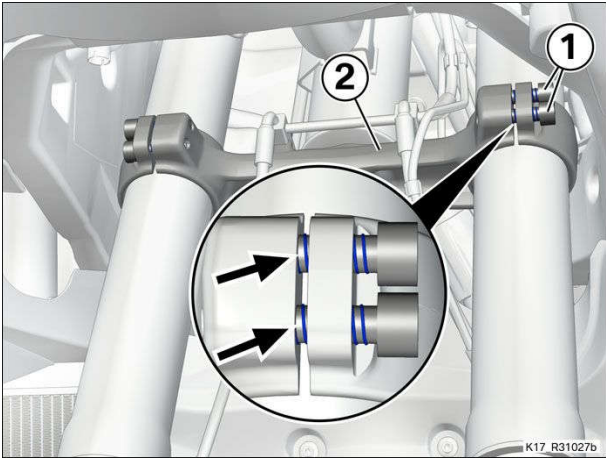
- Remove cable ties (1) and remove steering stop (2).



- Slacken screws (1) and (2).
- Carefully work fork leg (3) down, easing the clamps apart in the process if necessary.

(-) Checking threaded fasteners of bottom fork-leg clamps for traces of thread-locking compound

Check



- Examine loosened screws (1) of bottom fork bridge (2) for traces of thread-locking compound (arrows).

Result:

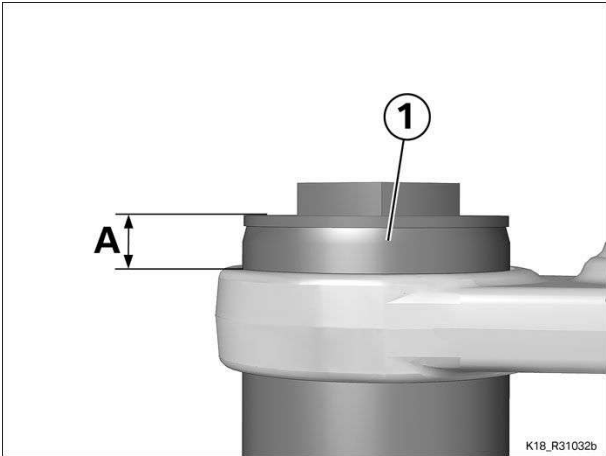
- Traces of thread-locking compound are present on the fork-leg clamping screws.

Measure:

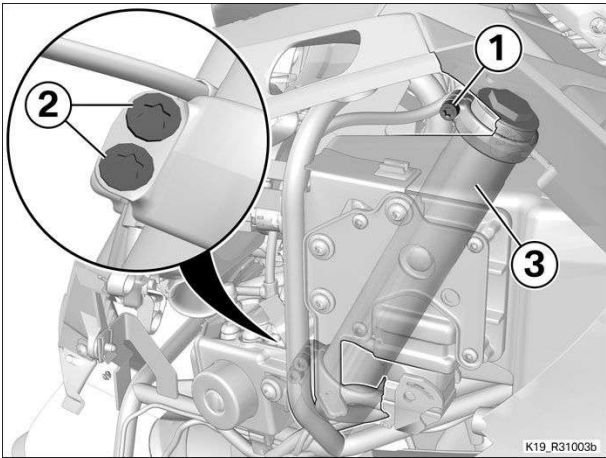
- Remove screws (1).
- Thoroughly clean the threads of screws (1) and the tapped bores in fork bridge (2).

(-) Installing left fork leg

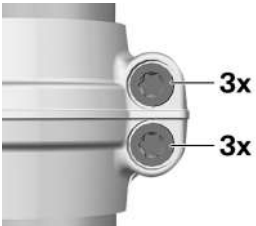
- Insert fork leg (1), noting projection (A).

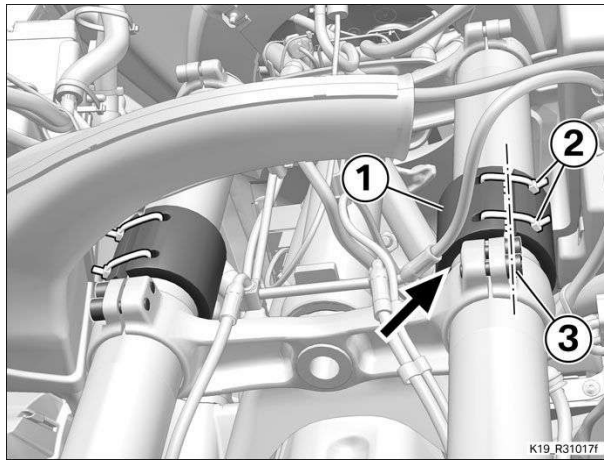


 Technical data			
Projection of fixed fork tube in top fork bridge	from fork bridge to top edge of sealing cap	10 mm	

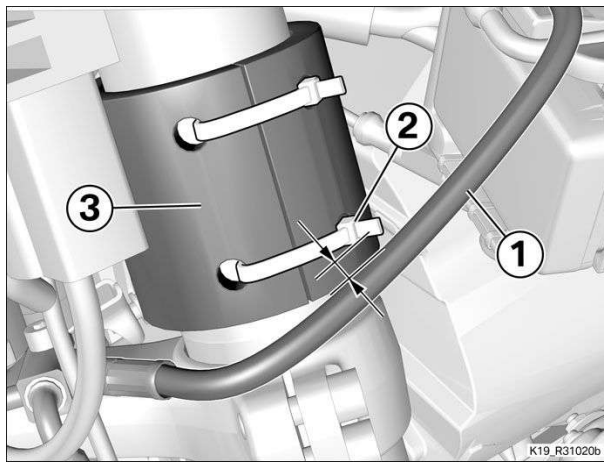


- Turn fork leg (3) to correct alignment, with label **facing out**.
- Tighten screws (2) and (1).

 Tightening torques		
Fork leg to top fork bridge		
M8 x 25	19 Nm	
Fork leg to bottom fork bridge		
M8 x 25	Tighten screws six times in alternate sequence	
		
	19 Nm	



- Secure steering stop (1) with cable tie (2), **do not tighten**.
- The latches (arrows) of cable ties (2) must be **on the outside**.
- Slide steering stop (1) **all the way down**.
- Align the gap of steering stop (1) with **screw heads (3)**.
- Alternately tighten cable ties (2) until they touch the edges of steering stop (1) and there is no longer a visible gap.



- Turn the handlebars **all the way to the right** and make sure that brake line (1) cannot come into contact with cable tie (2), there must be a visible gap.
- If necessary, remove steering stop (3) and reposition correctly.
- Turn the handlebars **all the way to the left** and check operation of the steering lock.

Finishing work

Installing front wheel

Installing front-wheel cover

Securing both brake calipers

Securing front wheel-speed sensor

Installing top right side panel

Removing engine lifter

Final check of work performed

31 42 342 Removing/installing right fork leg

+ 31 42 842

WARNING

Premature reaching of tightening torque due to traces of thread-locking compound.

Risk of crash due to loose fork clamps.

- Check the fork-leg clamps for residual traces of old thread-locking compound as specified.

Preparatory work

Installing engine lifter

Removing top right side panel

Removing both brake calipers

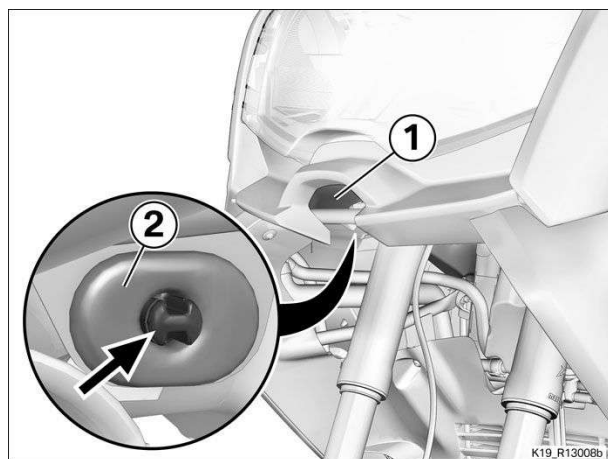
Removing front-wheel cover

Removing front wheel

Core activity

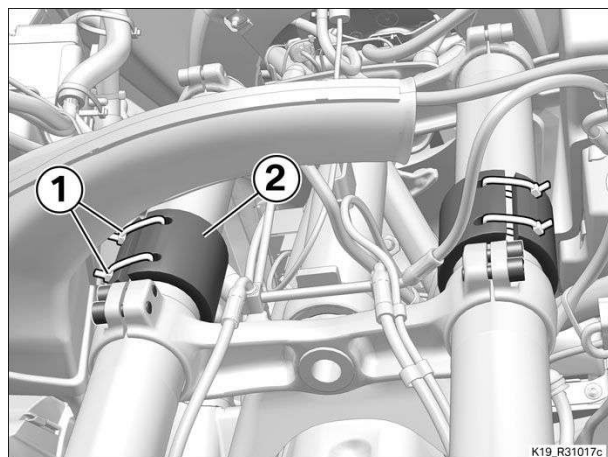
(-) Disengaging intake air pipe

- Carefully disengage the lug (arrow) of intake air pipe (1) from locator (2).

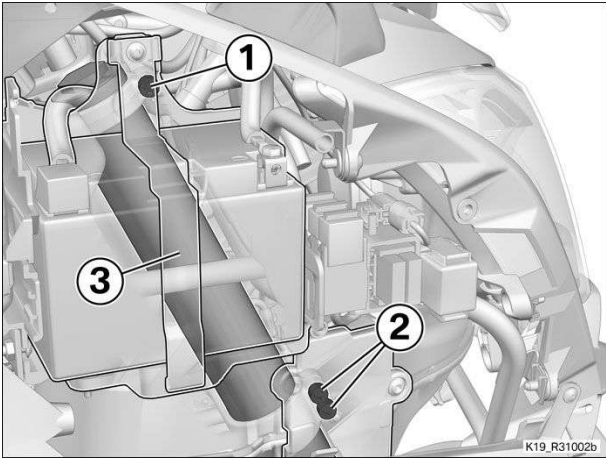


(-) Removing right fork leg

- Remove cable ties (1) and remove steering stop (2).



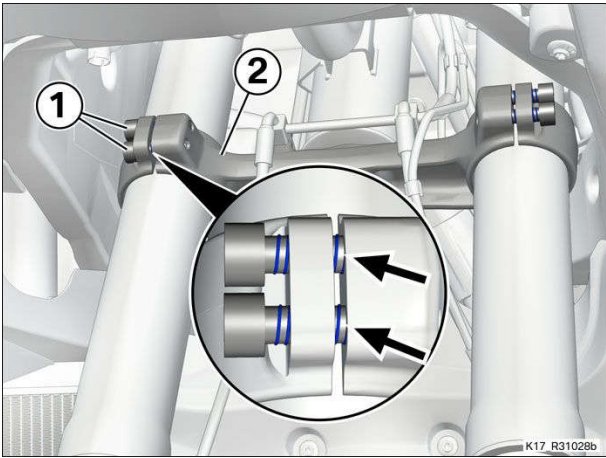
- Slacken screws (1) and (2).
- Carefully work fork leg (3) down, easing the clamps apart in the process if necessary.



(-) Checking threaded fasteners of bottom fork-leg clamps for traces of thread-locking compound

Check

- Examine loosened screws (1) of bottom fork bridge (2) for traces of thread-locking compound (arrows).



Result:

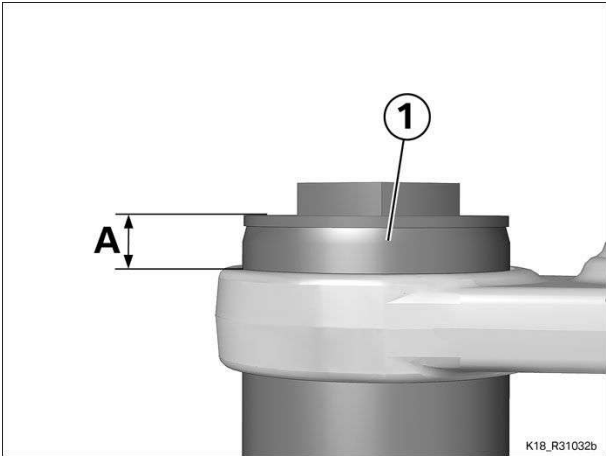
- Traces of thread-locking compound are present on the fork-leg clamping screws.

Measure:

- Remove screws (1).
- Thoroughly clean the threads of screws (1) and the tapped bores in fork bridge (2).

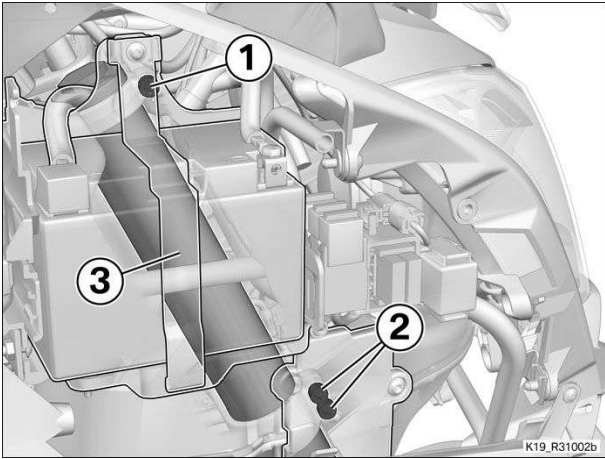
(-) Install the right fork leg

- Insert fork leg (1), noting projection (A).

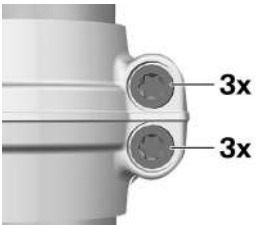


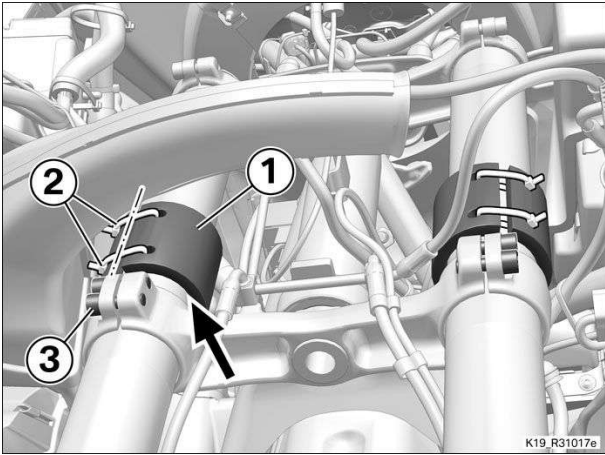
 Technical data			
Projection of fixed fork tube in top fork bridge	from fork bridge to top edge of sealing cap	10 mm	

- Turn fork leg (3) to correct alignment, with label **facing out**.



- Tighten screws (1) and (2).

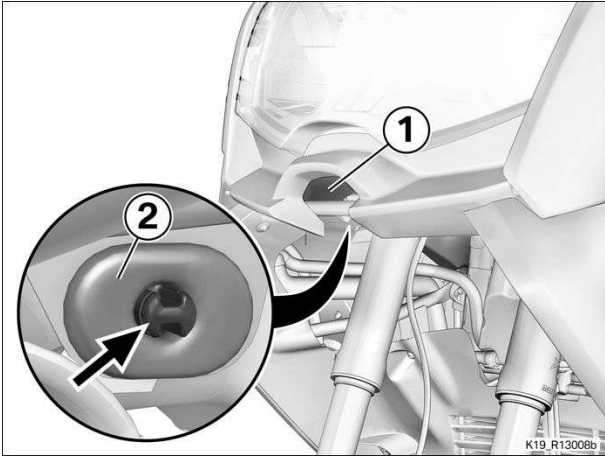
Tightening torques		
Fork leg to top fork bridge		
M8 x 25	19 Nm	
Fork leg to bottom fork bridge		
M8 x 25	Tighten screws six times in alternate sequence	
		
	19 Nm	



- Secure steering stop (1) with cable tie (2), **do not tighten**.
- The latches (arrows) of cable ties (2) must be **on the outside**.
- Slide steering stop (1) **all the way down**.
- Align the gap of steering stop (1) with **screw heads (3)**.
- Alternately tighten cable ties (2) until the gap is very narrow.
- Alternately tighten cable ties (2) until they touch the edges of steering stop (1) and there is no longer a visible gap.

(-) Securing intake air pipe

- Engage the lug (arrow) of intake air pipe (1) in locator (2).



Finishing work

- Installing front wheel
- Installing front-wheel cover
- Securing both brake calipers
- Installing top right side panel
- Removing engine lifter
- Final check of work performed

 31 42 514 Adjusting steering-head bearing (with checking steering-head bearing)

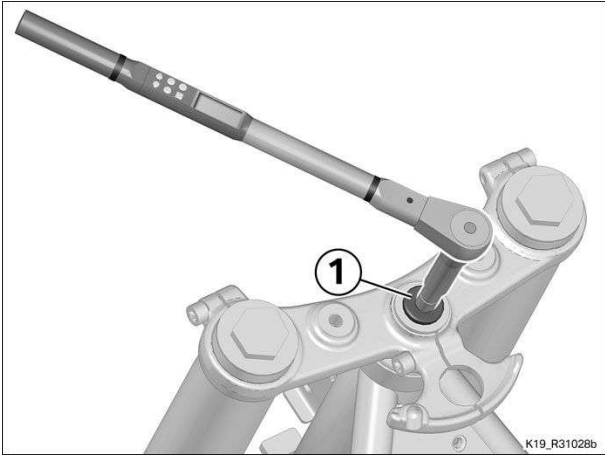
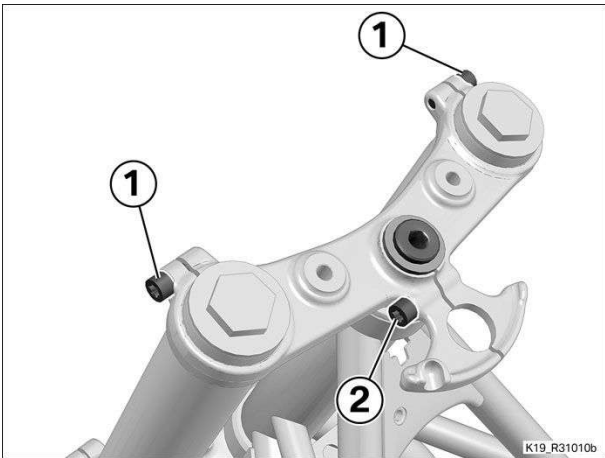
Preparatory work

- Removing top left fairing side panel
- Removing top right side panel
- Removing handlebar trim
- Removing top handlebar cover

Core activity

(-) Adjusting steering-head bearing play

- Lower the **Maxi-Scooter** until **the forks are supported**:
 - Front wheel contacts the ground
 - Forks are not yet compressed
- Slacken clamping screws (1) and (2).



- Use an electronic torque wrench/angle-of-rotation tightening tool when adjusting steering-head play.

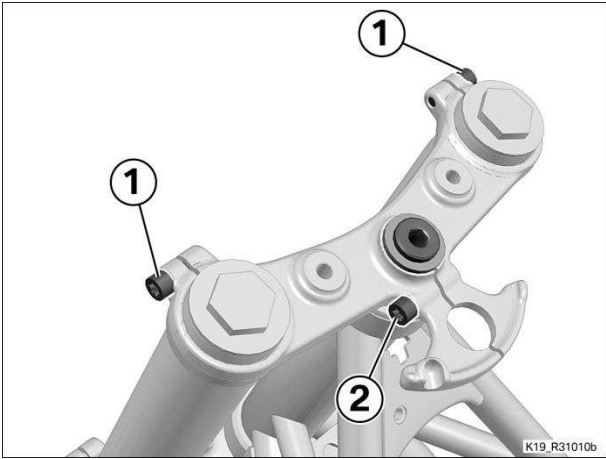
Workshop equipment

Electronic torque wrench/angle-of-rotation tightening tool

- Using an electronic torque wrench / angle-of-rotation tightening tool, initially tighten and then slacken steering-head screw (1), then retighten it to specification.

 Tightening torques		
Adjusting screw (steering-head adjustment) to fork bridge		
M18 x 1	Tightening torque, 30 Nm	
	Swing the forks 3x to left/right through full arc of travel	
	Loosen, 60°	
	Tightening torque (forks turned fully to right), 20 Nm	

- Tighten clamping screws (1) and (2).



 Tightening torques		
Fork leg to top fork bridge		
M8 x 25	19 Nm	
Fork bridge, top, to adjusting screw (steering-head adjustment)		
M8 x 35	19 Nm	

- Complete the process by rechecking the setting.

Finishing work

Installing top handlebar cover

Installing handlebar trim

Installing top left side panel

Installing top right side panel

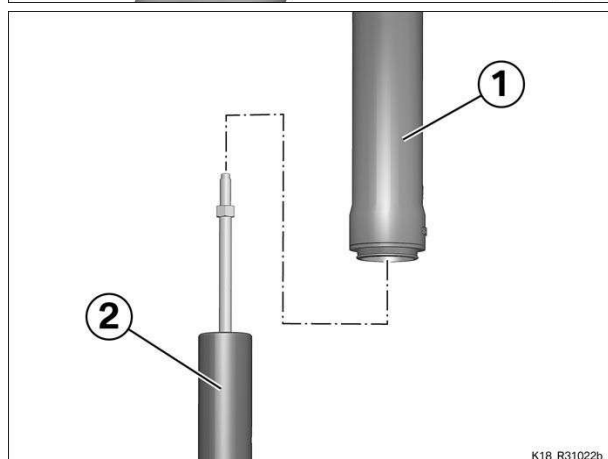
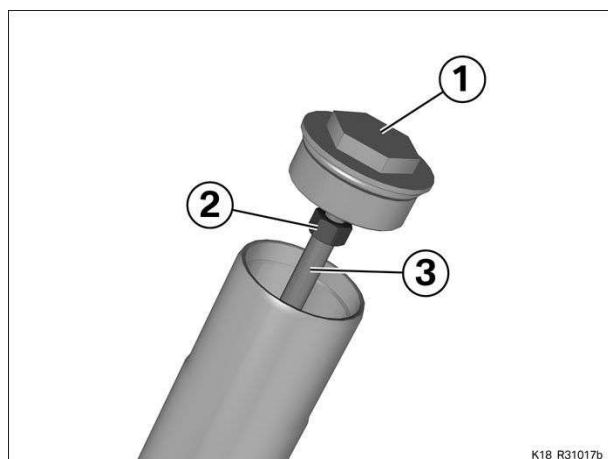
Final check of work performed

31 42 516 Disassembling and assembling left fork fork leg (fork leg removed)

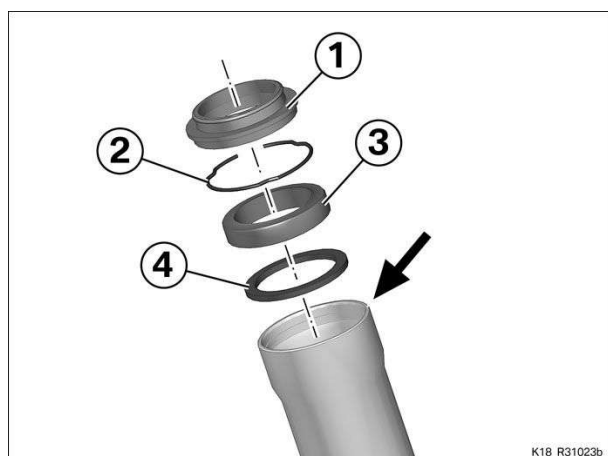
Core activity

(-) Disassembling left fork leg

- Firmly and repeatedly compress the fork leg to free any dirt that may be inside.
- Clamp the fork bottom in a vice with protective jaws.
- Slacken sealing cap (1).
- Move locknut (2) on rod (3) all the way down, counter-hold in this way.
- Remove sealing cap (1).
- Allow all the oil to drain off.



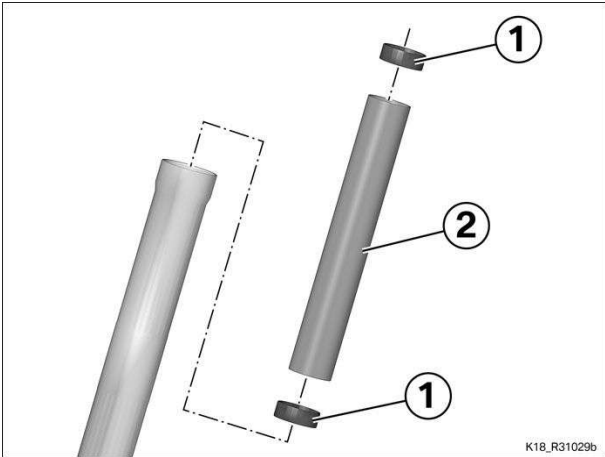
- Remove slider tube (1) from fixed fork tube (2).



- Remove sealing boot (1) and circlip (2).
- Pad the edge (arrow) to prevent damage.
- Remove sealing ring (3) with a suitable tool, such as a tyre lever.
- Remove washer (4).

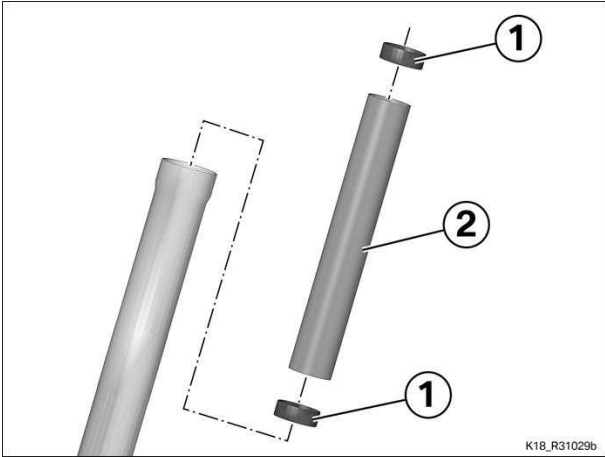
(-) Removing slide bushes from slider tube

- Remove slide bushes (1) and tube (2) with a suitable tool.



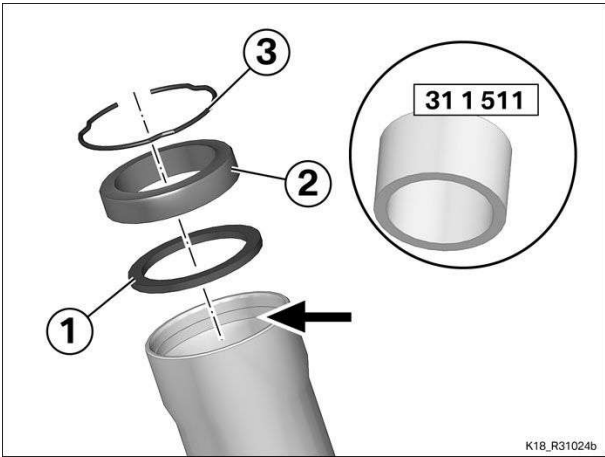
(-) Installing slide bushes in slider tube

- Install slide bushes (1) and tube (2) with a suitable tool.



(-) Assembling left fork leg

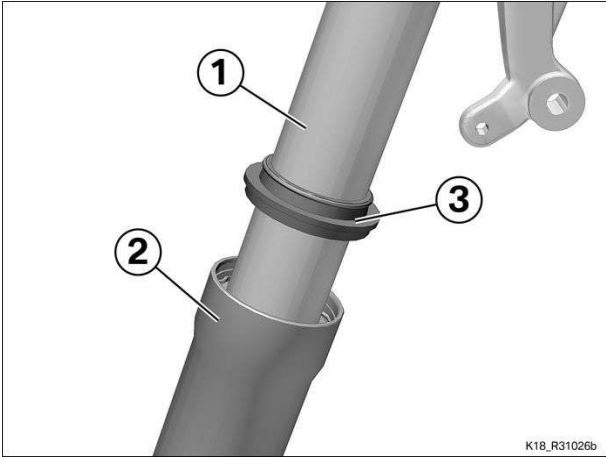
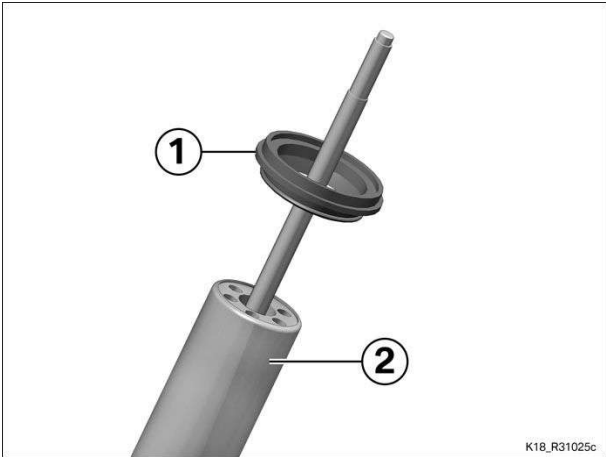
- Install washer (1).
- Install shaft sealing ring (2) (lettering up) with sleeve (No. 31 1 511).
- Install circlip (3) in the **bottom** groove (arrow).



- Pack the grease chamber of sealing boot (1) with grease.

 Lubricant	
Unirex N3	83 19 2 160 349

- Slip sealing boot (1) on to fixed fork tube (2).



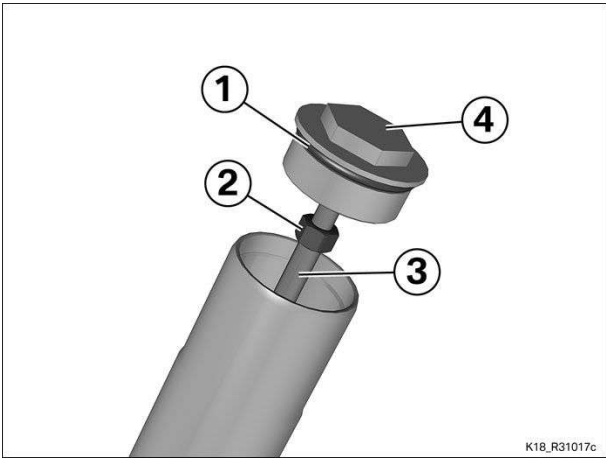
- Lubricate fixed fork tube (1) with Fork oil and insert into slider tube (2).
- Install boot (3).

► Pouring oil into left fork leg

- Pour in the correct quantity of oil.

 Technical data			
Fork oil, capacity per fork leg			390 ml
	Telescopic fork oil (Telescopic fork oil SAE 7.5)		

- Compress and extend the piston rod a few times to make sure that the damper is completely filled.
- Check sealing ring (1); replace if necessary.
- Move locknut (2) on rod (3) all the way down, install cover (4).
- Secure cover (4) with locknut (2).



 Tightening torques		
Locknut to cover		
M8	15 Nm	

- Tighten cap (4).

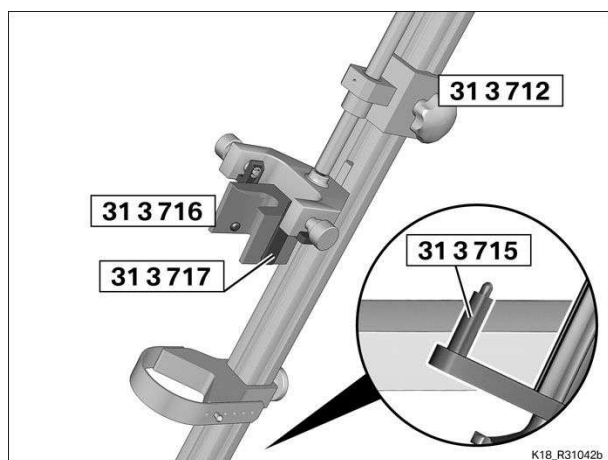
 Tightening torques		
Cap to slider tube		
	20 Nm	



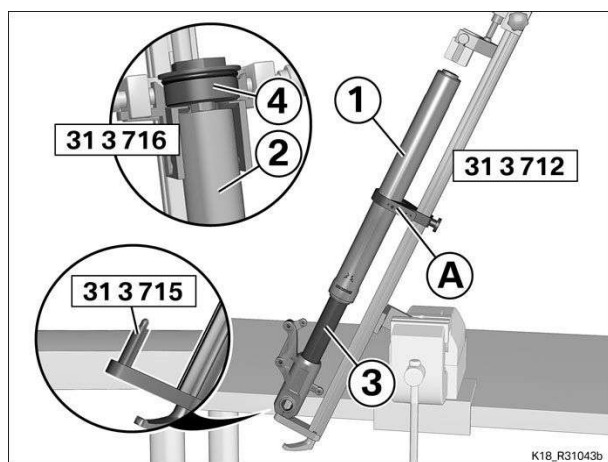
31 42 517 Disassembling and assembling right fork fork leg (fork leg removed)

Core activity

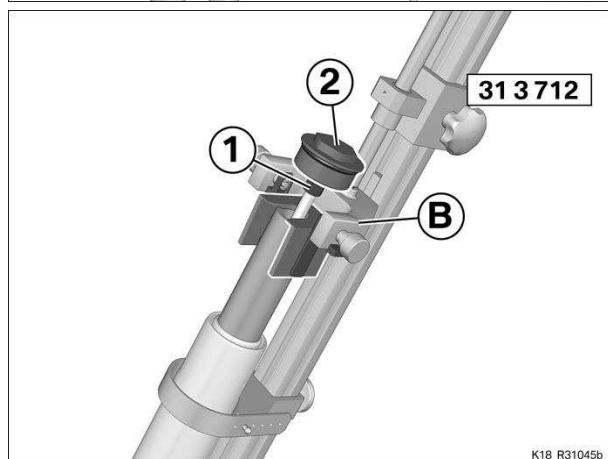
(-) Disassembling right fork leg



- Secure mount (No. 31 3 715) and extensions (No. 31 3 717) on pretensioning tool (No. 31 3 712).
- Insert adapter (No. 31 3 716) into extensions (No. 31 3 717).

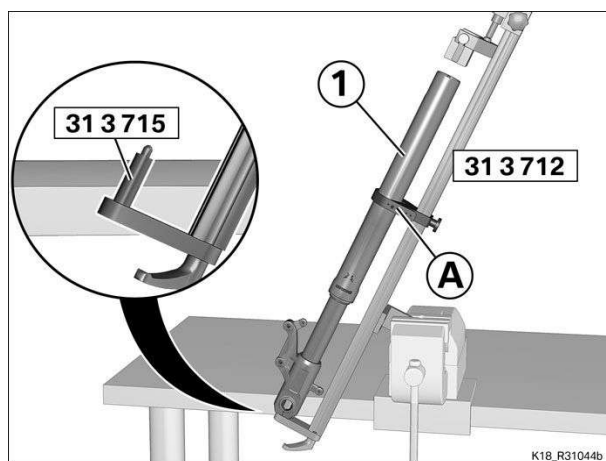


- Firmly and repeatedly compress the fork leg to free any dirt that may be inside.
- Disengage fixed fork tube (1) and press sleeve (2) down.
- Insert the fork leg into mount (No. 31 3 715) and adapter (No. 31 3 716) (between sleeve (2) and fork cap (4)).
- Secure fork leg (1) in pretensioning tool (No. 31 3 712) with rubber retainer (A).

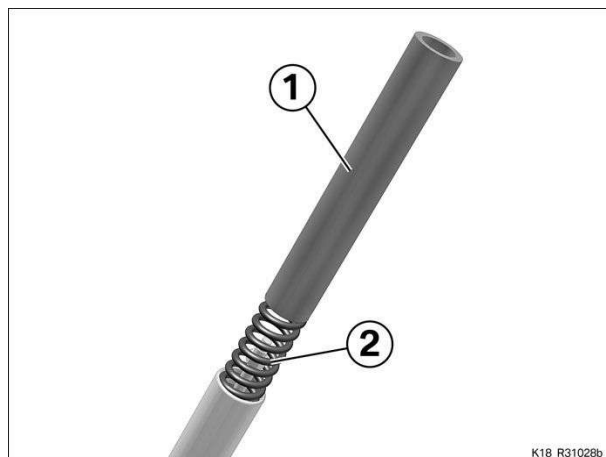


- Operate hold-down tool (B) of pretensioning tool (No. 31 3 712) until locknut (1) is accessible.
- Locate locknut (1) with an open-ended spanner and remove fork cap (2).
- Relieve hold-down tool (B).

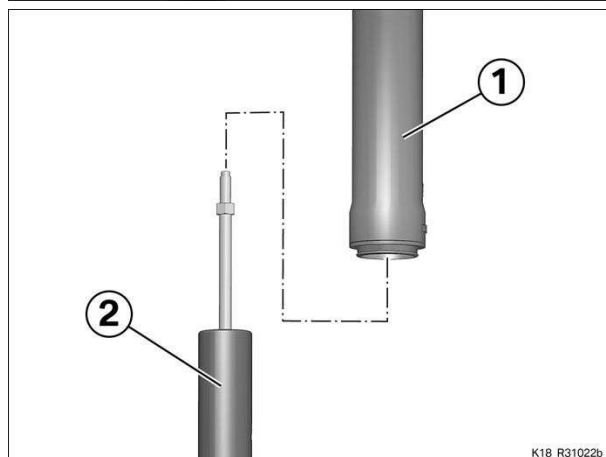
- Disengage rubber retainer (A) and remove fork leg (1) from pretensioning tool (No. 31 3 712).



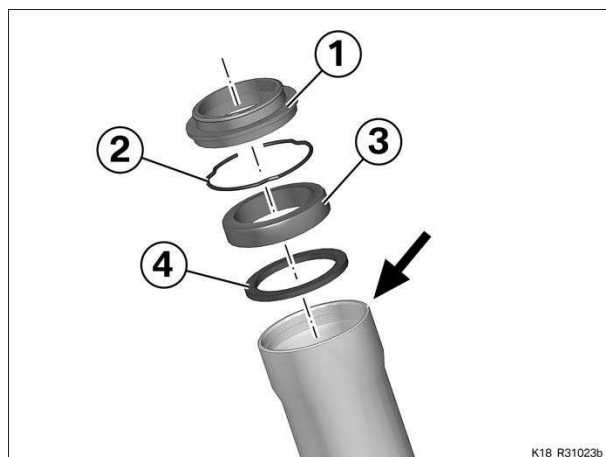
- Remove sleeve (1) and spring (2).
- Allow all the oil to drain off.



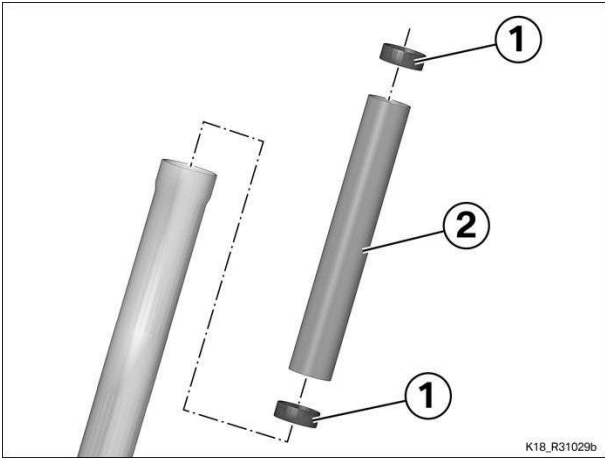
- Remove slider tube (1) from fixed fork tube (2).



- Remove sealing boot (1) and circlip (2).
- Pad the edge (arrow) to prevent damage.
- Remove sealing ring (3) with a suitable tool, such as a tyre lever.
- Remove washer (4).

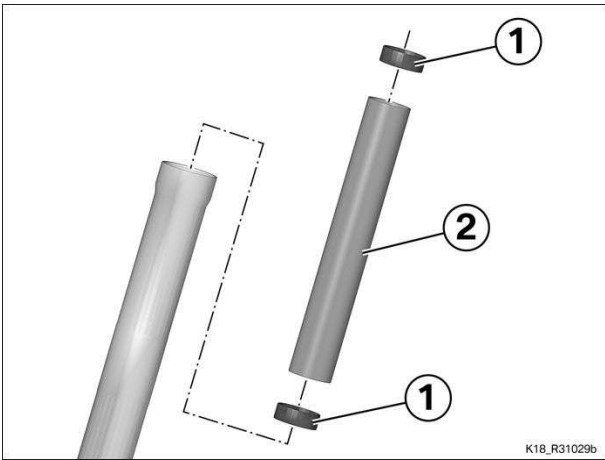


(-) Removing slide bushes from slider tube



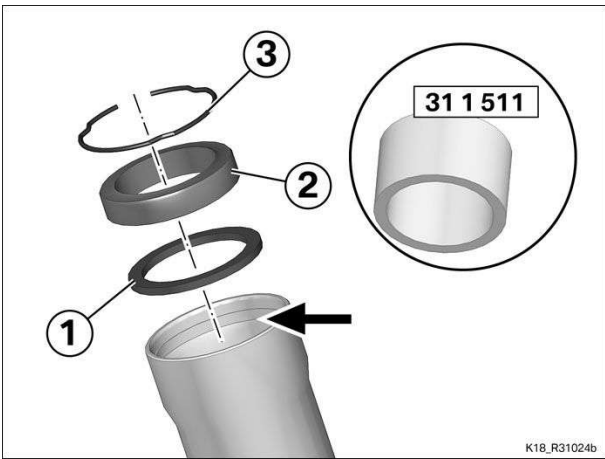
- Remove slide bushes (1) and tube (2) with a suitable tool.

(-) Installing slide bushes in slider tube



- Install slide bushes (1) and tube (2) with a suitable tool.

(-) Assembling right fork leg



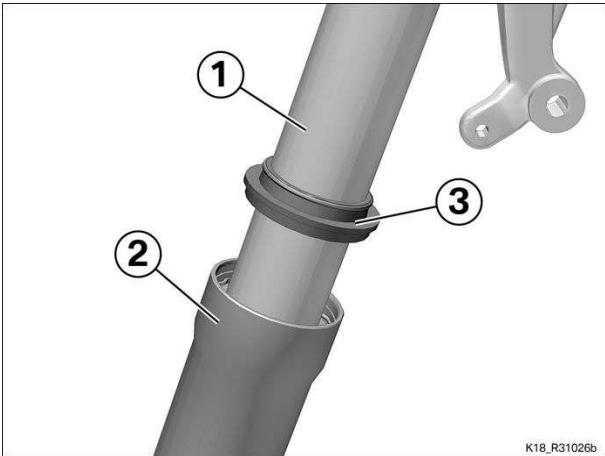
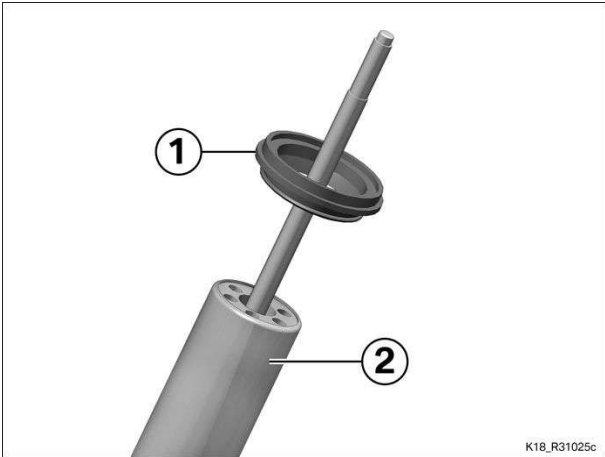
- Install washer (1).
- Install shaft sealing ring (2) (lettering up) with sleeve (No. 31 1 511).
- Install circlip (3) in the **bottom** groove (arrow).
- Lubricate parts with fork oil.

 Telescopic fork oil	
Telescopic fork oil SAE 7.5	83 19 2 182 459

- Pack the grease chamber of sealing boot (1) with grease.

 Lubricant	
Unirex N3	83 19 2 160 349

- Slip sealing boot (1) on to slider tube (2).



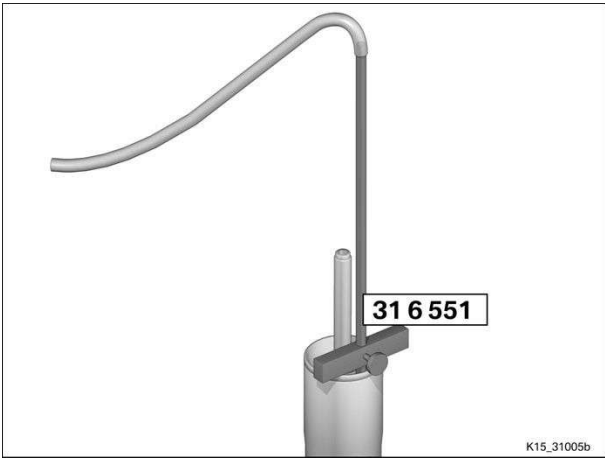
- Lubricate slider tube (1) with fork oil and install it in fixed fork tube (2).
- Install boot (3).

► Pouring oil into right fork leg

- Pour in the correct quantity of oil.

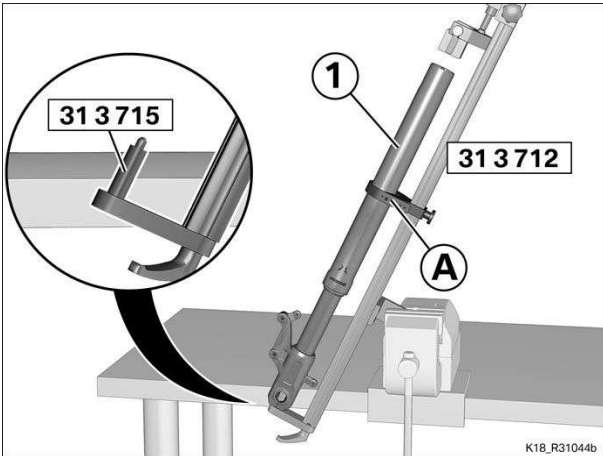
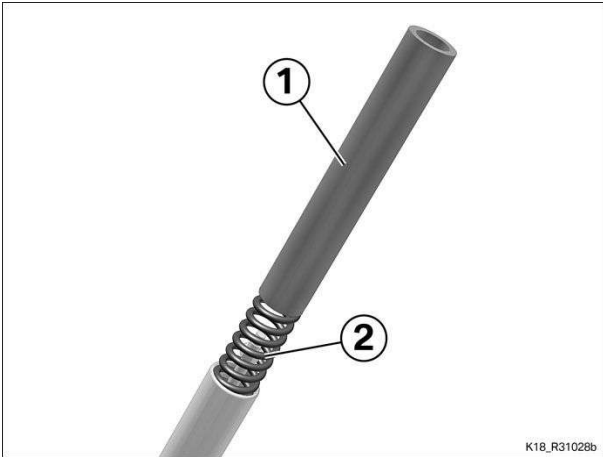
 Technical data			
Fork oil, capacity per fork leg		390 ml	
Telescopic fork oil (Telescopic fork oil SAE 7.5)			

- Compress and extend the piston rod a few times to make sure that the damper is completely filled.
- Allow the oil to settle for a few minutes.
- Push fixed fork tube all the way in.
- Use dipstick (No. 31 6 551) to correct the fluid level.

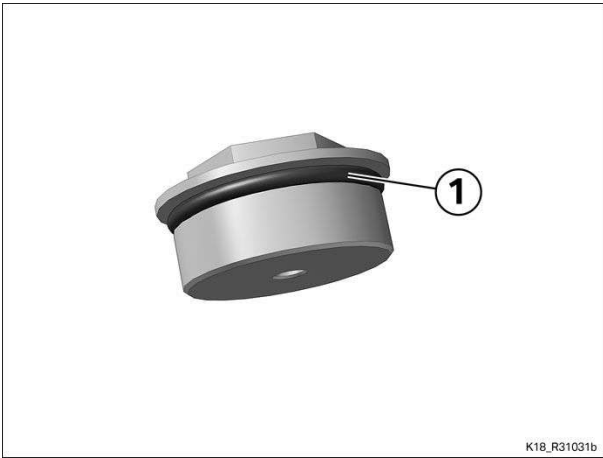


 Technical data			
Fork oil level, right (air cushion)	right fork leg fully compressed, compression spring and spacer removed	130 mm	
Telescopic fork oil (Telescopic fork oil SAE 7.5)			

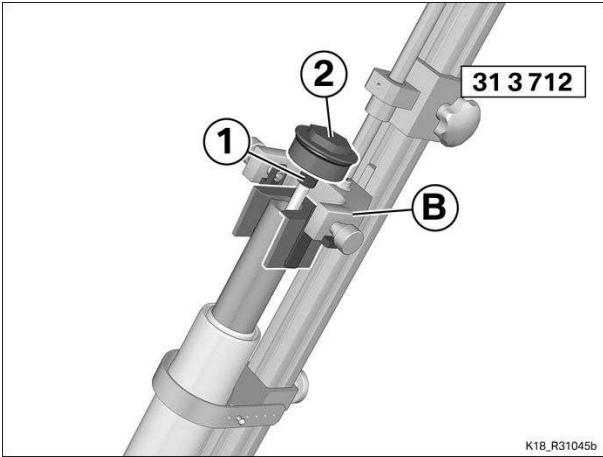
- Install spring (2) and sleeve (1).



- Seat fork leg (1) in mount (No. 31 3 715).
- Secure fork leg (1) with rubber retainer (A) in pretensioning tool (No. 31 3 712).



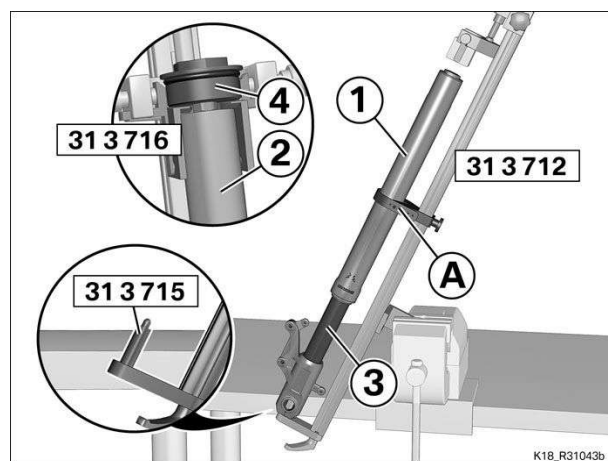
- Check sealing ring (1); replace if necessary.



- Operate hold-down tool (B) of pretensioning tool (No. 31 3 712) until locknut (1) is accessible.
- Screw fork cap (2) on **all the way**.
- Locate locknut (1) with an open-ended spanner and tighten fork cap (2).

 Tightening torques		
Locknut to cover		
M8	15 Nm	

- Relieve hold-down tool (B).
- Remove fork leg (3) from adapter (No. 31 3 716), mount (No. 31 3 715) and pretensioning tool (No. 31 3 712).



» Sleeve (2) is seated against fork cap (4)

• Screw fixed fork tube (1) and fork cap (4) together until hand-tight.

» Fork cap can be tightened only with the fork leg installed. Comply with specified tightening torque.



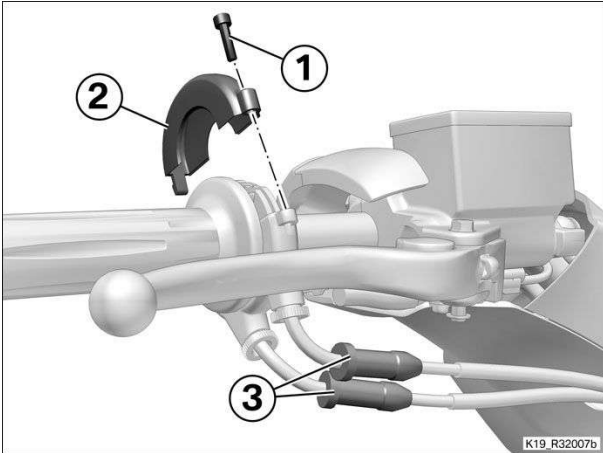
 32 72 001 Replacing throttle twistgrip
+ 32 72 620

Preparatory work

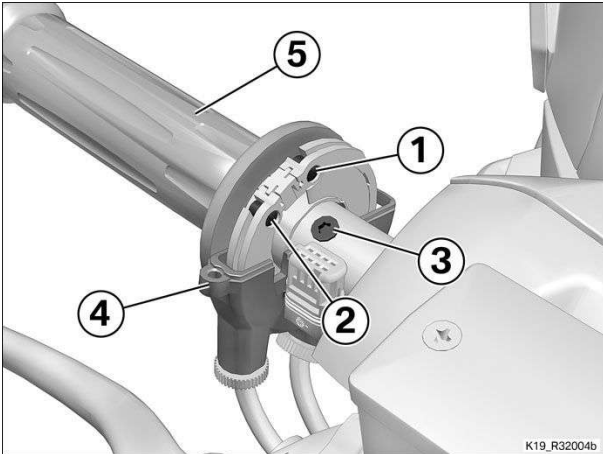
- Removing right handlebar weight
- Removing right multifunction switch

Core activity

(-) Removing throttle twistgrip

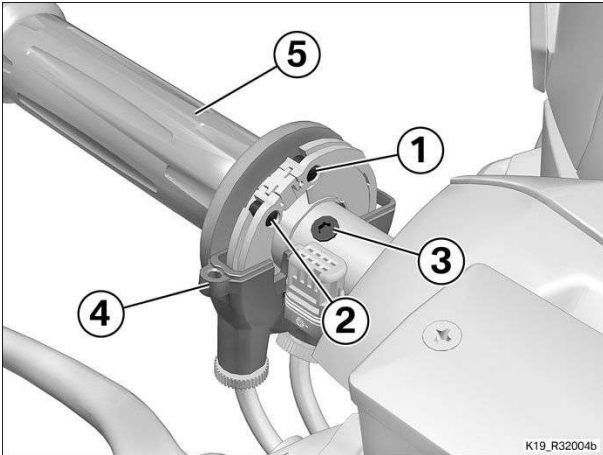


- Remove screw (1) and remove cover (2).
- Slacken adjusting screws (3) and set play to maximum.



- Disengage throttle-closer cable (1).
- Disengage throttle-opener cable (2).
- Remove screw (3).
- Disengage throttle-cable guide (4) and remove throttle twistgrip (5).

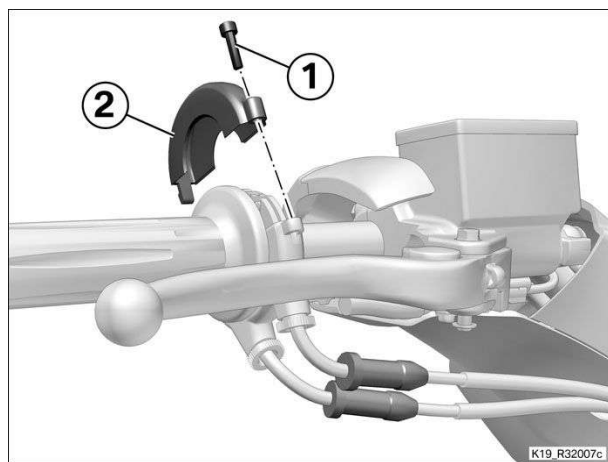
(-) Installing throttle twistgrip



- Install throttle twistgrip (5).
- Install screw (3).

 Tightening torques		
Handlebar grip to handlebar		
M3.5 x 30	1 Nm	

- Hold throttle-cable guide (4) in position.
- Engage throttle-opener cable (2) and throttle-closer cable (1).
- Secure cover (2) with screw (1).



Finishing work

Installing right multifunction switch

Installing right handlebar weight

Adjusting throttle-cable play.

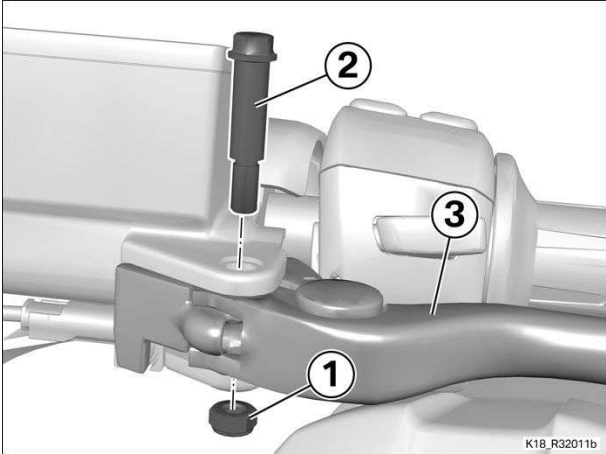
Final check of work performed

 32 72 075 Replacing lever for rear-wheel brake
+ 32 72 575

Core activity

(-) Removing handbrake lever

- Remove nut (1) and screw (2).
- Remove handbrake lever (3).



(-) Installing handbrake lever

- Lubricate the bearing seats.



Lubricant

Teflon spray	83 23 0 154 884
--------------	-----------------

- Insert handbrake lever (3).
- Install bolt (2) with nut (1).



Tightening torques

Brake lever to handlebar fitting		
M6	tighten the screw first, then the nut	
	6 Nm	

Finishing work

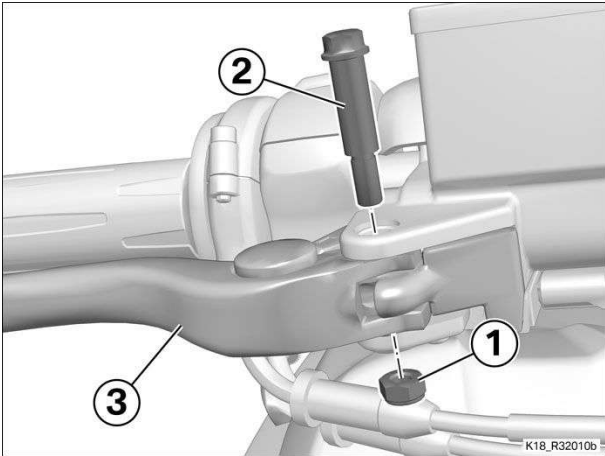
Final check of work performed

 32 72 076 Replacing lever for front-wheel brake
+ 32 72 576

Core activity

(-) Removing handbrake lever

- Remove nut (1) and screw (2).
- Remove handbrake lever (3).



(-) Installing handbrake lever

- Lubricate the bearing seats.



Lubricant

Teflon spray	83 23 0 154 884
--------------	-----------------

- Insert handbrake lever (3).
- Install bolt (2) with nut (1).



Tightening torques

Brake lever to handlebar fitting		
M6	tighten the screw first, then the nut	
	6 Nm	

Finishing work

Final check of work performed

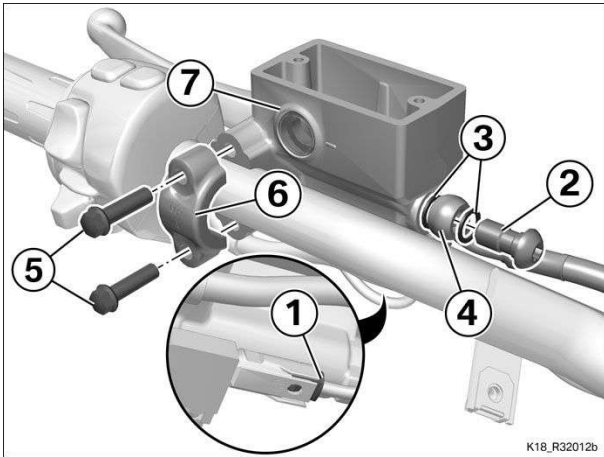
 32 72 077 Replacing brake handlebar fitting for rear wheel
+ 32 72 577

Preparatory work

- Removing handlebar trim
- Removing top handlebar cover
- Removing bottom handlebar cover
- Draining brake-fluid reservoir for rear brake

Core activity

(-) Removing handbrake lever fitting for rear wheel



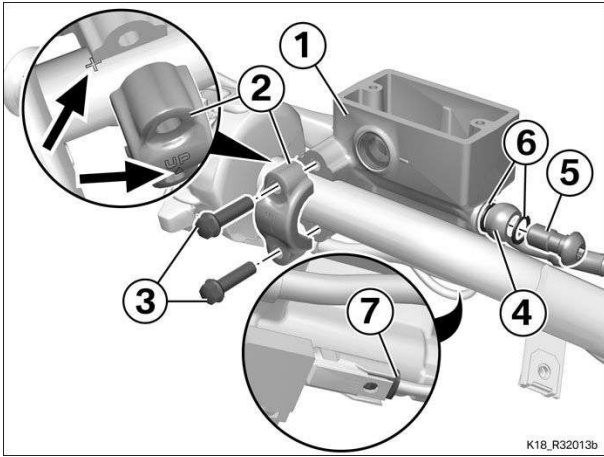
- Disconnect plug (1) for the brake-light switch.
- Remove banjo bolt (2) and sealing rings (3).
- Disengage brake line (4).

 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.
-
- Remove screws (5), remove clamp (6) and handbrake lever fitting (7).

(-) Install the handbrake lever fitting for rear wheel



- Hold handbrake lever fitting (1) with camp (2) in position, noting the marks (arrows).
- » Gap aligned with mark on handlebar, arrow on clamping block up.
- Install screws (3).
 - Tighten screws (3), alternating repeatedly, until both screws are tightened to the specified tightening torque.

 Tightening torques		
Handlebar fitting to handlebar		
M5 x 22	tighten top until fully closed	
	10 Nm	

- Secure brake line (4) with banjo bolt (5) and **new** sealing rings (6).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	

- Connect plug (7) for the brake-light switch.

Finishing work

Filling and bleeding rear brake-fluid reservoir

Installing bottom handlebar cover

Installing top handlebar cover

Installing handlebar trim

Final check of work performed

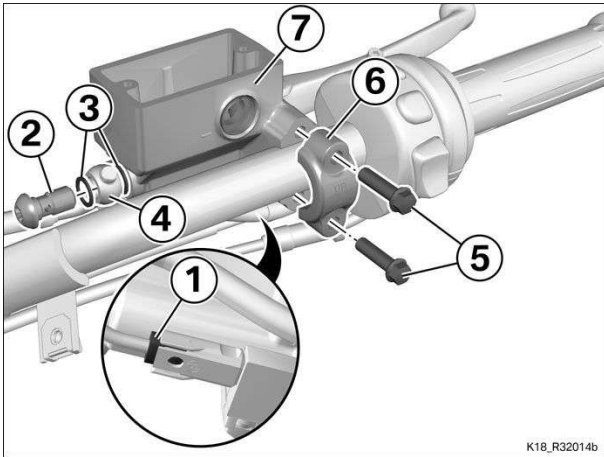
 32 72 078 Replacing brake handlebar fitting for front wheel
+ 32 72 578

Preparatory work

- Removing handlebar trim
- Removing top handlebar cover
- Removing bottom handlebar cover
- Draining brake-fluid reservoir for front brake

Core activity

(-) Removing handbrake lever fitting for front wheel



- Disconnect plug (1) for the brake-light switch.

 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.

- Remove banjo bolt (2) and sealing rings (3).
- Disengage brake line (4).

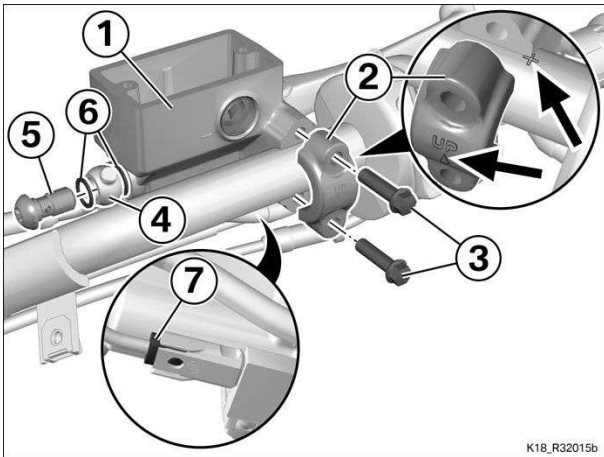
 ATTENTION

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.

- Remove screws (5), remove clamp (6) and handbrake lever fitting (7).

(-) Installing handbrake lever fitting for front wheel



- Hold handbrake lever fitting (1) with camp (2) in position, noting the marks (arrows).
- » Gap aligned with mark on handlebar, arrow on clamping block up.
- Install screws (3).
- Tighten screws (3), alternating repeatedly, until both screws are tightened to the specified tightening torque.

 Tightening torques		
Handlebar fitting to handlebar		
M5 x 22	tighten top until fully closed	
	10 Nm	

- Secure brake line (4) with banjo bolt (5) and **new** sealing rings (6).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	

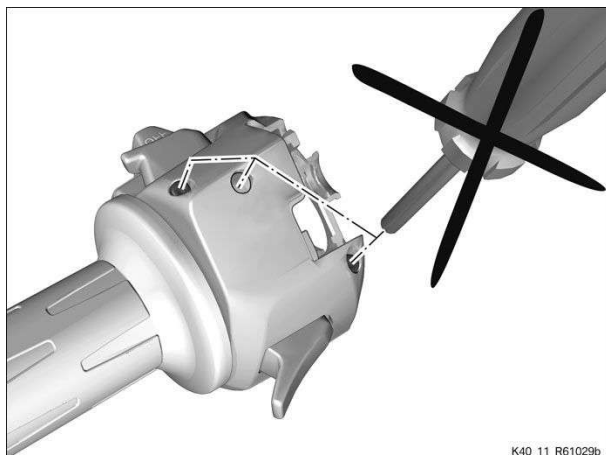
- Connect plug (7) for the brake-light switch.

Finishing work

- Filling and bleeding front brake-fluid reservoir
- Installing bottom handlebar cover
- Installing top handlebar cover
- Installing handlebar trim
- Final check of work performed

32 72 097 Replacing left handlebar grip

+ 32 72 632



ATTENTION

Opening of switch unit.

Damage to the conductors coated with protective sealing lacquer.

- Do not separate the top and bottom parts of the switch unit.

Preparatory work

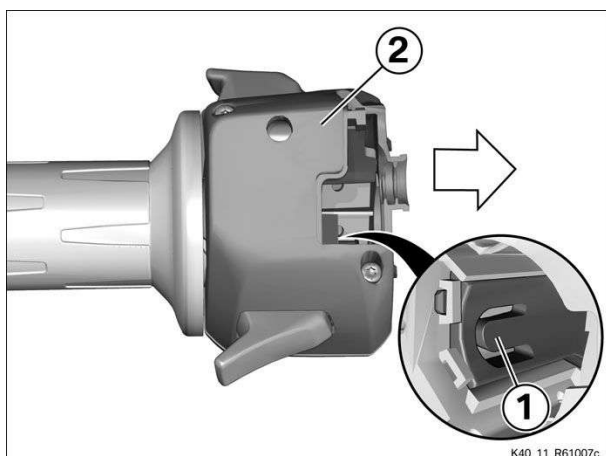
Removing handlebar weight

Removing left handlebar grip with multifunction switch

Core activity

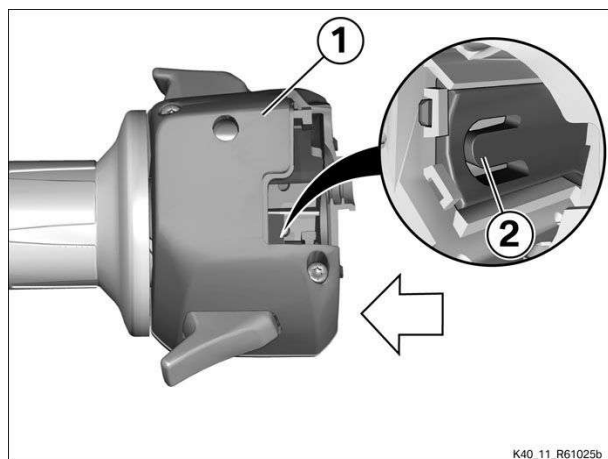
(-) Removing multifunction switch from left handlebar grip

- Carefully push up retainer (1).
- Remove multifunction switch (2) from the handlebar grip.



(-) Installing multifunction switch on left handlebar grip

- Push multifunction switch (1) on to the handlebar grip.
- » Retainer (2) engages.



Finishing work

Installing left handlebar grip with multifunction switch

Installing handlebar weight

Final check of work performed

33 35 000 Replacing rear wheel swinging arm

+ 33 35 501

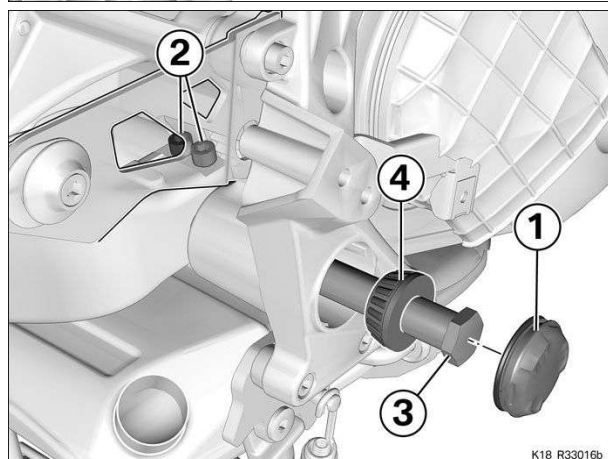
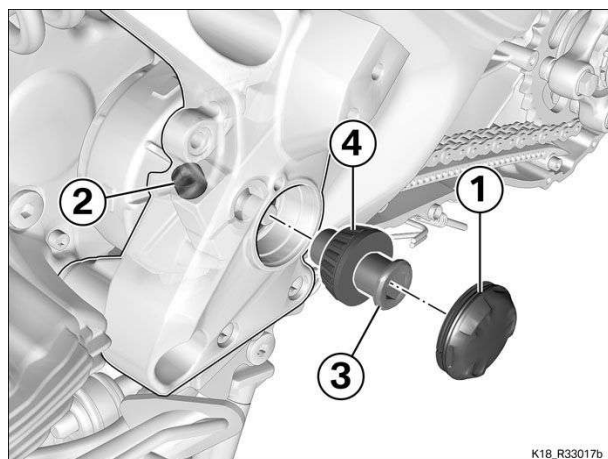
Preparatory work

Installing engine lifter
Removing filler cap flap
Opening seat
Removing centre cover
Removing top left fairing side panel
Removing front left footplate insert and footrest plate
Removing bottom left fairing panel
Removing left side panel
Removing centre left footplate insert and footrest plate
Removing rear left footplate insert and footrest plate
Removing left footplate
Removing spring strut
Removing left footplate carrier
Removing silencer
Disengaging brake hose and sensor cable
Removing swinging-arm housing cover
Disengage the judder damper
Removing top chain channel
Remove the chain slide rail
Removing bottom chain channel
Removing chain tensioner rail
Removing rear wheel
Disengaging rear brake caliper and parking brake
Removing judder-damper housing and output shaft
Disengaging brake hose and sensor cable

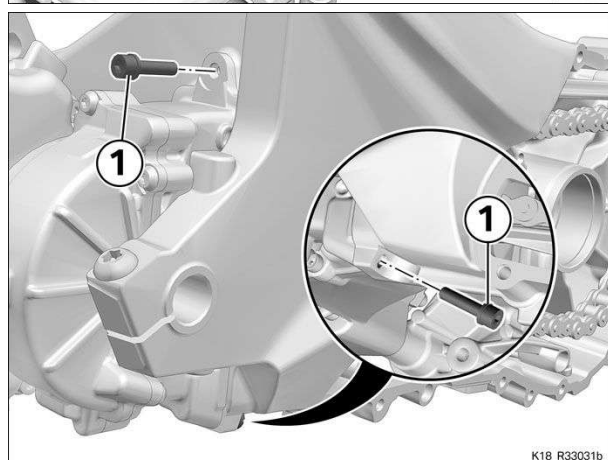
Core activity

(-) Removing rear wheel swinging arm

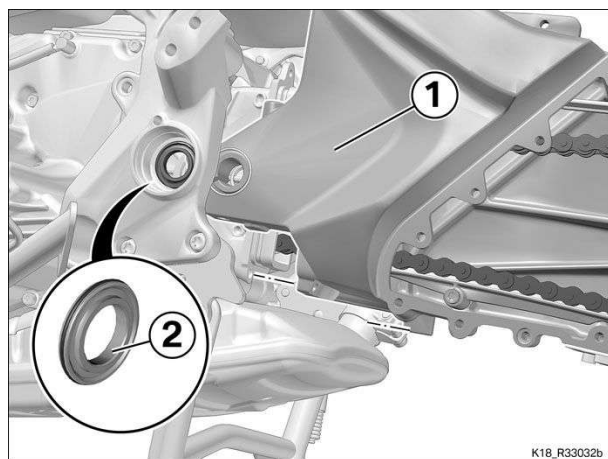
- Remove bearing cap (1).
- **Slacken** screw (2), but do not remove it.
- Remove threaded sleeve (3).
- Remove inner bearing race (4).



- Remove bearing cap (1).
- Slacken screws (2), but **do not remove**.
- Remove swinging-arm shaft (3) and inner bearing race (4).

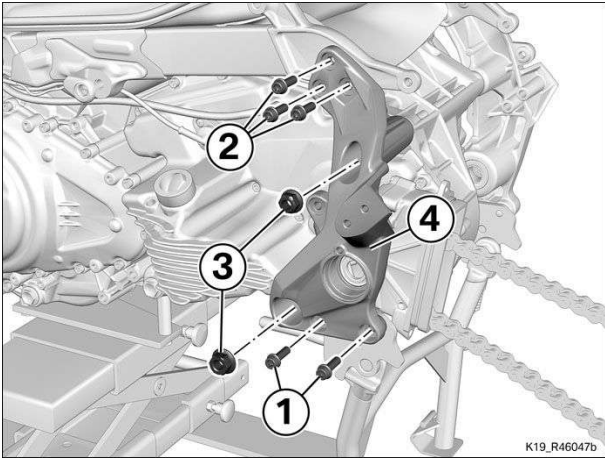


- **Support the swinging arm** and remove screws (1).



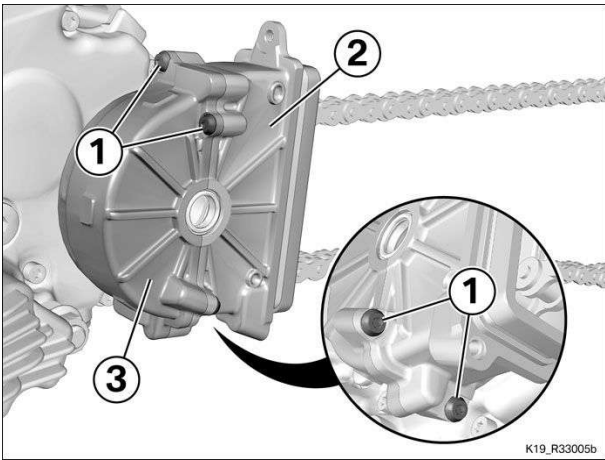
- Remove swinging arm (1), remove spacer (2).

(-) Removing left frame side section



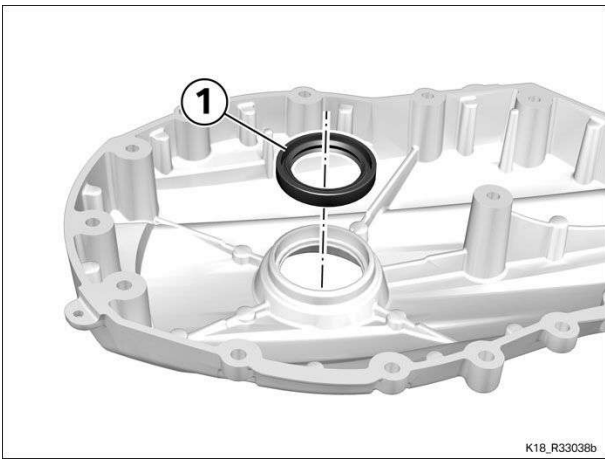
- Remove screws (1) and (2).
- Remove nuts (3).
- Remove left frame side section (4).

(-) Removing pinion cover



- Remove screws (1).
- Work rear pinion cover (2) to the rear over the chain.
- Remove front pinion cover (3).

(-) Replacing shaft sealing ring in swinging-arm cover

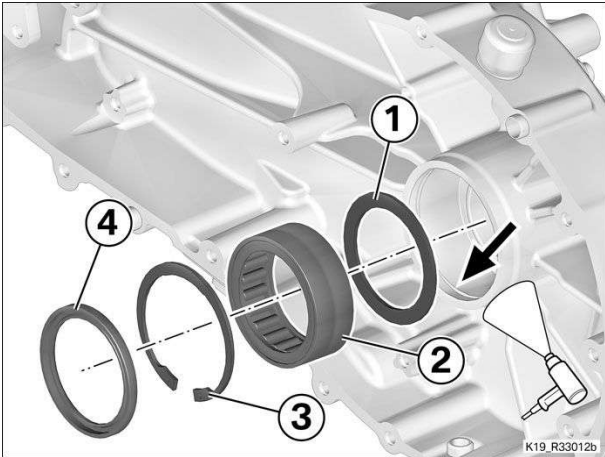


- Use a suitable tool to remove shaft sealing ring (1).
- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.

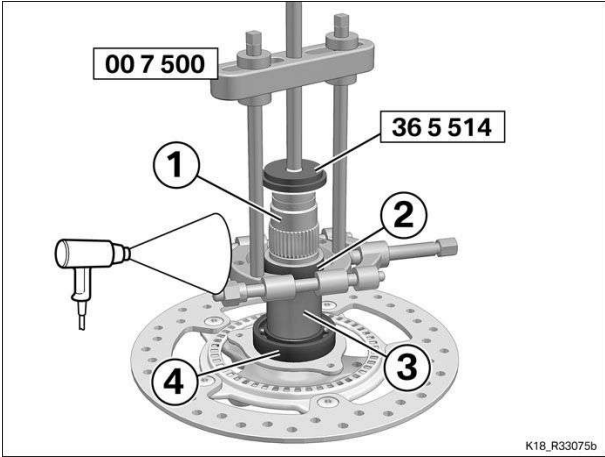
(-) Preparing rear wheel swinging arm and output shaft for installation

- Insert spacer (1).
- Heat bearing seat of bearing (2).

 Technical data			
Release/mating temperature		80 °C	



- Press in new bearing (2) until seated in new part, using a suitable tool that applies pressure only to the outer bearing race.
- Install new circlip (3) in the groove (arrow).
- Drive in a new shaft sealing ring (4), with the open side toward the chain, until seated.



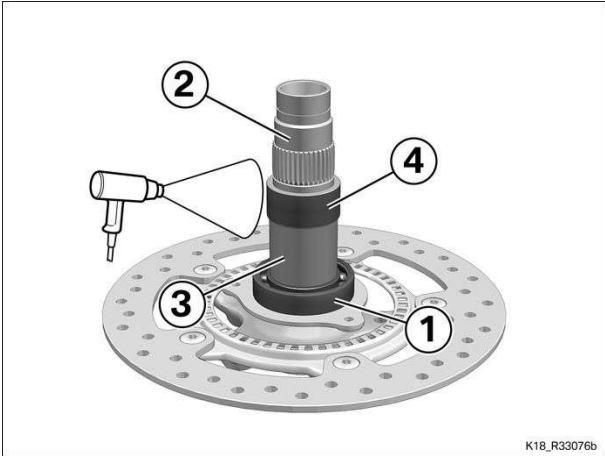
- Insert thrust piece (No. 36 5 514) into output shaft (1).
- Heat inner race (2).

 Technical data			
Release/mating temperature		100 °C	

- Remove inner ring (2) with puller/separators (No. 00 7 500).
- Remove spacing sleeve (3).
- Check grooved ball bearing (4) for damage and year; replace if necessary and remove with puller/separators (No. 00 7 500).

 Technical data			
Release/mating temperature		100 °C	

- If necessary, carefully heat grooved ball bearing (1).



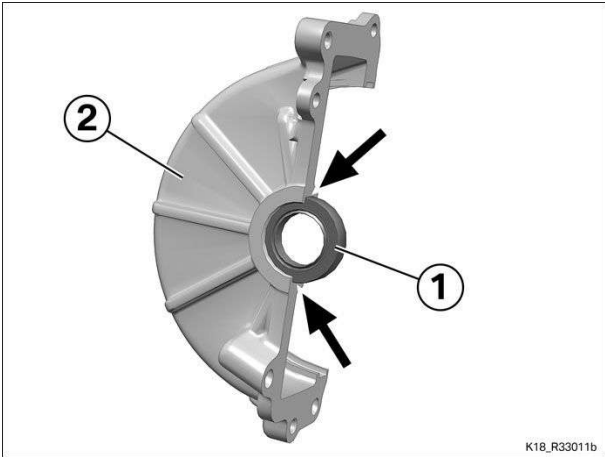
 Technical data			
Release/mating temperature		80 °C	

- If applicable, press grooved ball bearing (1) on to output shaft (2) until seated, using a suitable tool.
- Place spacing sleeve (3) in position.
- Heat inner race (4).

 Technical data			
Release/mating temperature		100 °C	

- Press inner ring (4) on to output shaft (2) until seated, using a suitable tool.
- Allow the components to cool down.

(-) Installing pinion cover



- Install **new** sealing ring (1) in front pinion cover (2) (open side toward the inside).
- Clean the sealing face and seal, taking particular care at the corners (arrows).

 NOTICE

When using fluids and lubricants, always comply with specifications such as flash time or drying time.

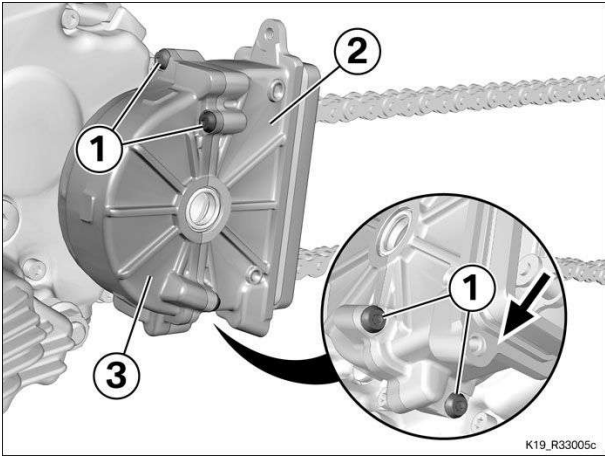
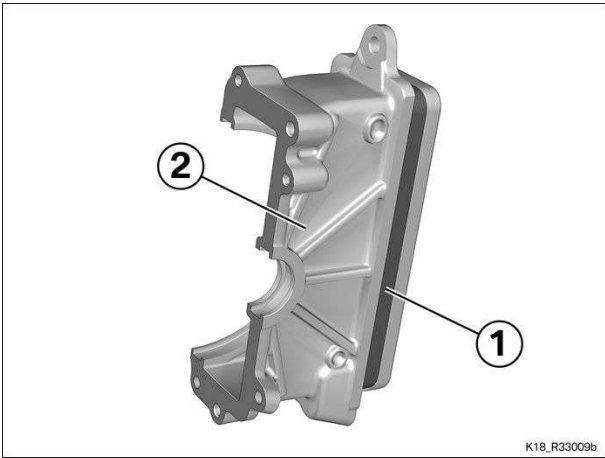
See the data sheets/product information publications for more details.



Sealant

Dow Corning	07 58 0 397 777
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- Clean the sealing face.
- Install **new** square-section sealing ring (1) on rear pinion cover (2).



- Install front pinion cover (3).
- Work rear pinion cover (2) over the chain.
- Install screws (1), noting the tightening sequence.



Tightening torques

Pinion cover, front section to rear section		
M5 x 16	Tightening sequence: 1st: top (from front), 2nd bottom (from behind)	
	4.5 Nm	

- Seal the sealing face (arrow) against the swinging arm.

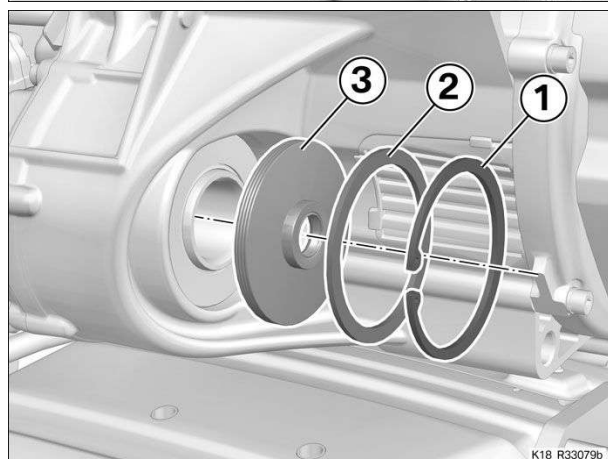
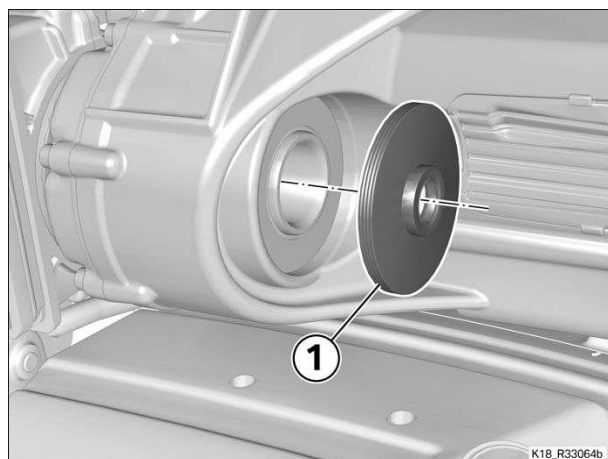


Sealant

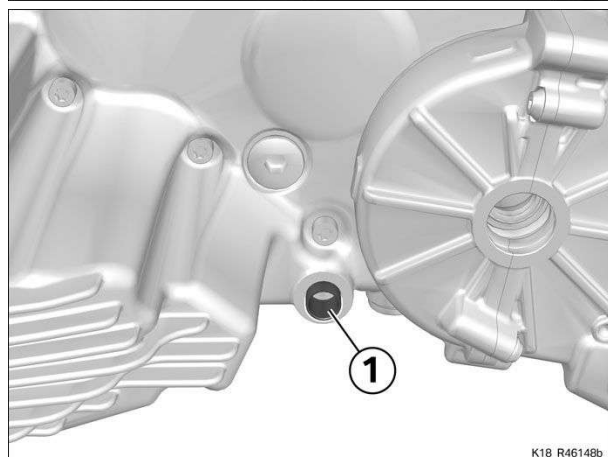
Dow Corning	07 58 0 397 777
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(-) Installing left frame side section

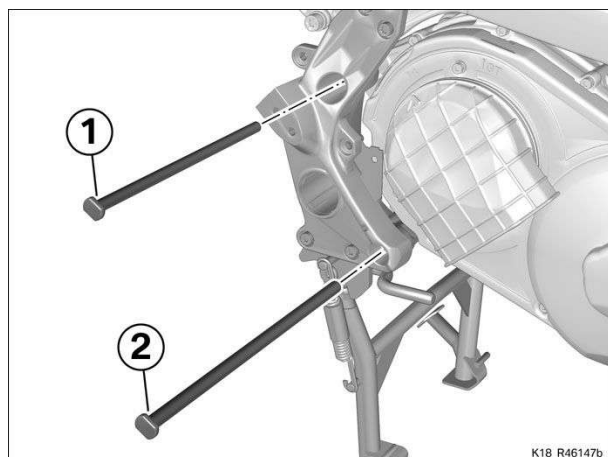
- Remove sealing washer (1).



- Remove circlip (1) and support ring (2).
- Remove sealing washer (3).

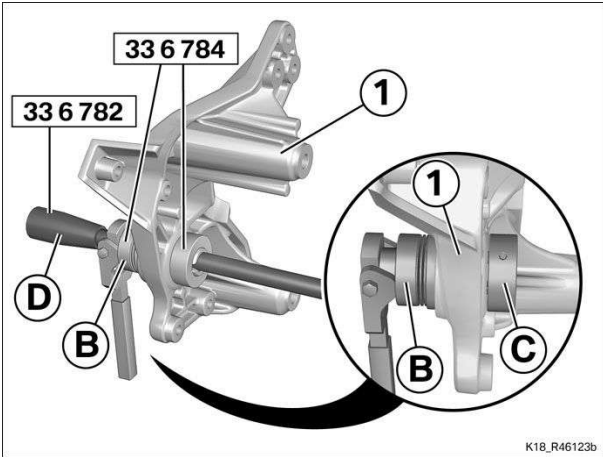


- If applicable, install fitted bushing (1).

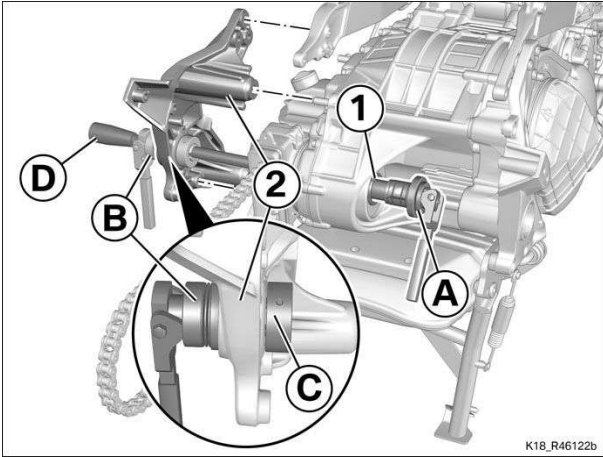


- Make sure that screws (1) and (2) are fully seated.

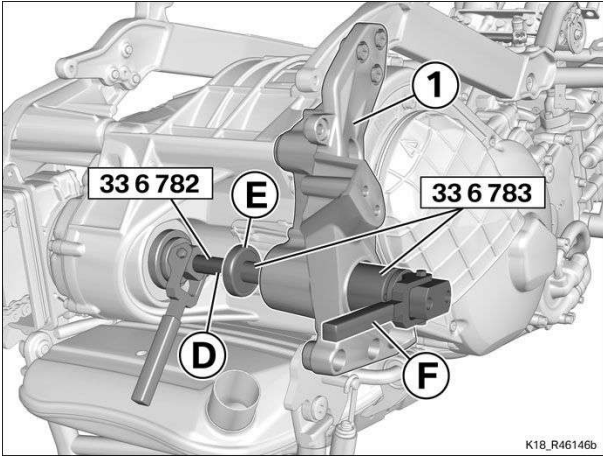
- Insert adjusting tools (B) and (C) (No. 33 6 784) into the **removed** left frame side section (1) and preload.



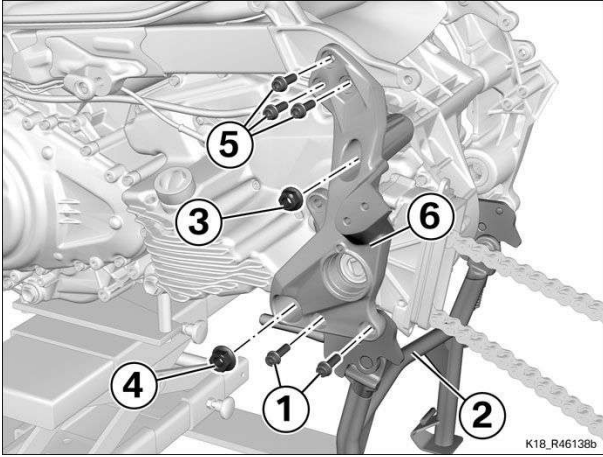
- Insert adjusting tool (D) (No. 33 6 782) into the **removed** left frame side section (1).



- Insert adjusting tool (A) (No. 33 6 785) into gearbox shaft (1) and preload.
- Hold left frame side section (2) in position with tools (B), (C) and (D) installed.



- Insert adjusting tools () and () (No. 33 6 783) into right frame side section (1) and preload.
- Insert shaft (D) **until seated**.



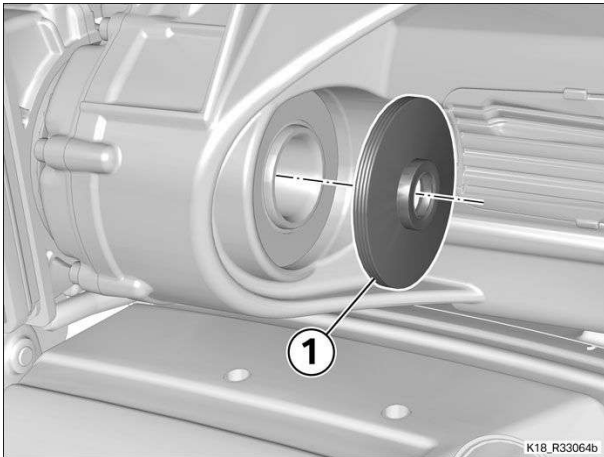
- Insert screws (1) into centre stand (2).
- Install screws (5).
- Secure right frame side section (6) with nuts (3) and (4).

 Tightening torques		
rame side section to engine		
M10 x 230, Screw		
M10, Replace nut	56 Nm	
Thread-locking compound (mechanical)		
M12 x 297, Screw		
M12, Replace nut	96 Nm	

Thread-locking compound (mechanical)		
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- Tighten screws (1) and (5).

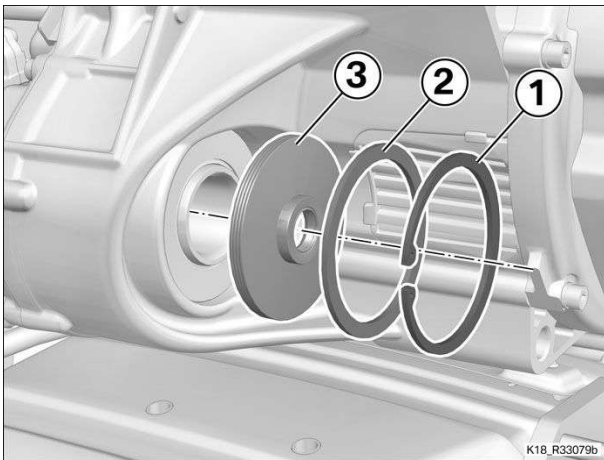
 Tightening torques		
Frame side section to frame		
M8 x 25 - 10.9	22 Nm	
Centre-stand mount to frame side section		
M8 x 25 - 10.9	22 Nm	



- Remove the shaft and adjusting tools.
- Clean the seat of sealing washer (1).
- Thinly apply adhesive to the **outer sealing face** of sealing washer (1).

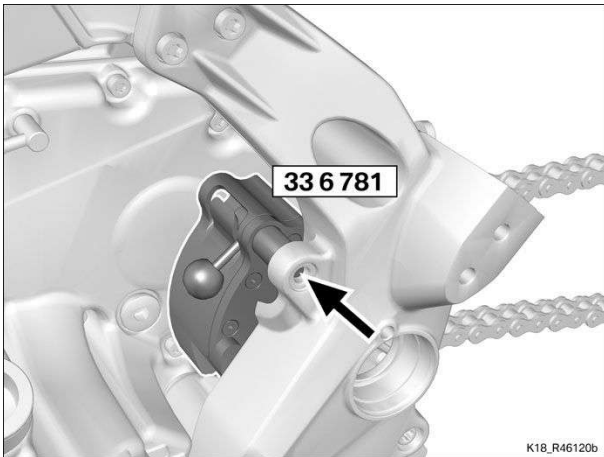
 Adhesive		
Loctite 5970	83 19 0 404 517	

- Install sealing washer (1).

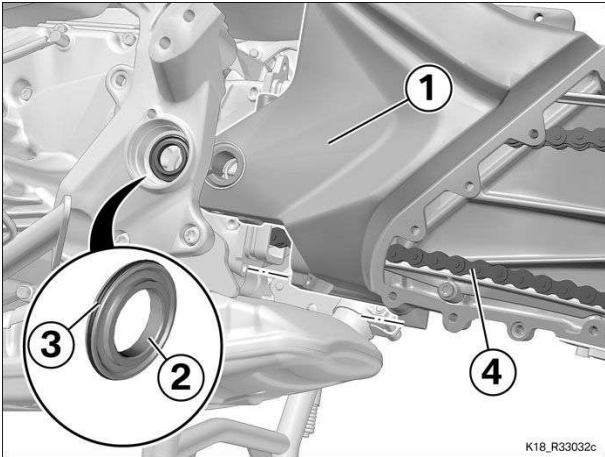


- Clean the seat of sealing washer (3).
- Install sealing washer (3).
- Install circlip (2) and support ring (1).

(-) Installing rear swinging arm



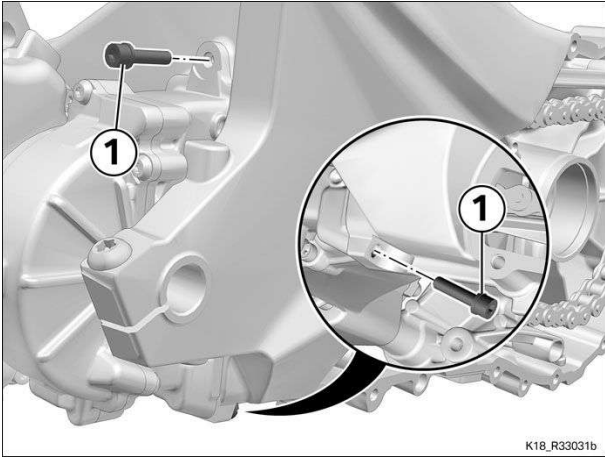
- Insert locator (No. 33 6 781) and secure it with the retainer (arrow) in the hole.
- **Support the installed swinging arm**, to ensure that excessive strain is not placed on the retainer (arrow).



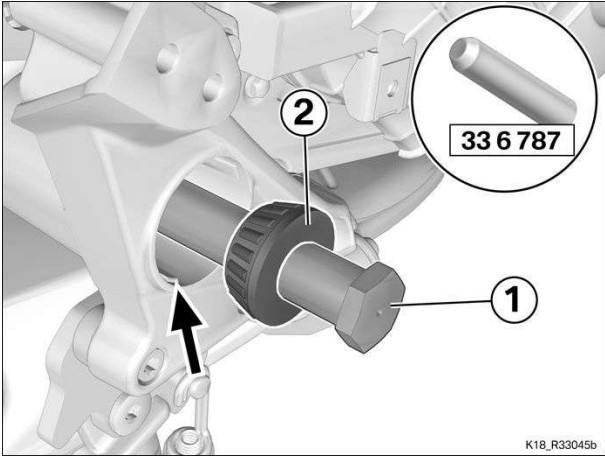
- Check sealing ring (3); replace if necessary.
- Install spacer (2).
- Insert chain (4) into swinging arm (1).
- Hold swinging arm (1) in position, noting spacing washer (2).

 NOTICE

Make sure that the brake hose is routed above the swinging arm.



- Install screws (1).



- Clean the bearing seat (arrow).
- Lubricate inner bearing race (2).

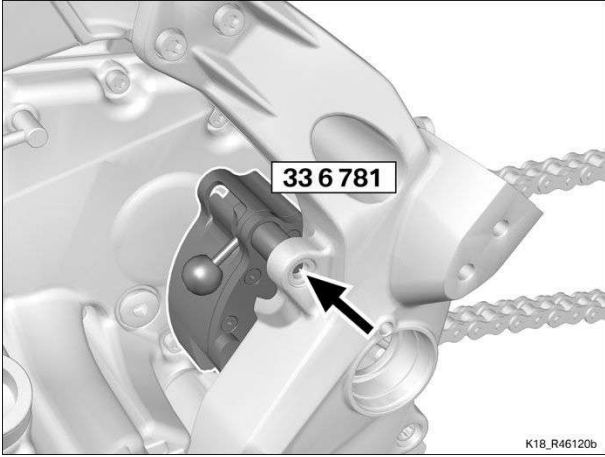


lubricant

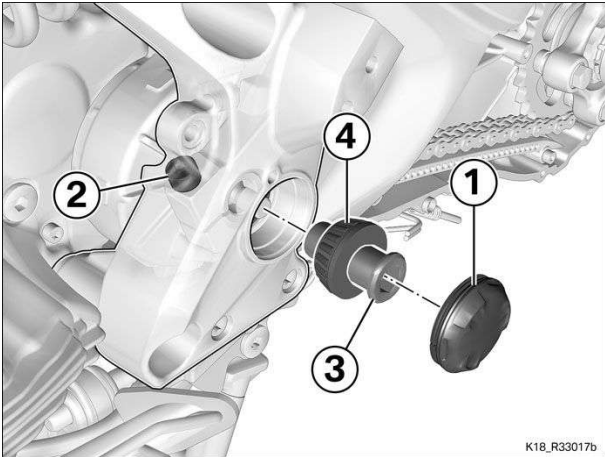
Acid-free friction-bearing grease

81 22 9 407 174

- Position sliding sleeve (No. 33 6 787) on swinging-arm shaft (1).
- Install inner bearing race (2) and swinging-arm shaft (1).
- Remove sliding sleeve (No. 33 6 787).
- Remove locator (No. 33 6 781), while **raising the swinging arm slightly** to ensure that excessive strain is not placed on the retainer (arrow).



- Clean the bearing seat.
-



ubricate inner bearing race (4).



ubricant

Acid-free friction-bearing grease

81 22 9 407 174

- Tighten threaded bush (3).



Tightening torques

Threaded bush to swinging-arm shaft (torquing specification for swinging-arm pivot bearing)

M12 x 1

Tightening torque,
10 Nm

slacken

Tightening torque,
7 Nm

- Push the swinging arm all the way to the left and tighten screw (2).



Tightening torques

Swinging arm, left, to threaded bush

M10 x 50

38 Nm

- Install bearing cap (1).
- Tighten screws (1).



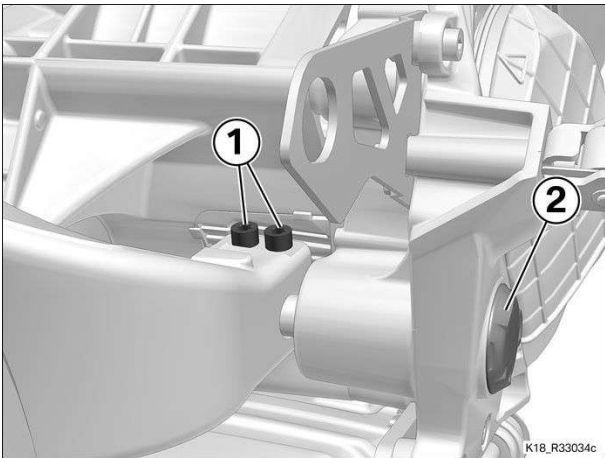
Tightening torques

Swinging arm, right, to swinging-arm shaft

M8 x 50

19 Nm

- Install bearing cap (2).



inishing work

- Installing spring-strut swivel bearing
- Installing spring strut
- Installing sprocket and output shaft
- Securing rear brake caliper and parking brake
- Installing rear wheel
- Tightening judder damper
- Securing brake hose and sensor cable
- Installing chain slide rail
- Installing top chain channel

- Installing chain tensioner rail
- Installing bottom chain channel
- Installing swinging-arm housing cover
- Installing silencer
- Installing left footplate carrier
- Installing left footplate
- Installing rear left footplate insert and footrest plate
- Installing centre left footplate insert and footrest plate
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Removing engine lifter
- Final check of work performed

33 35 001 Replacing swinging-arm bearing

+ 33 35 502

ATTENTION

Change of position, pinion cover/swinging arm.

Leak at pinion cover.

- Avoid changing the relative positions of the pinion cover/swinging arm.
- Replace the swinging-arm pivot mounts in turn; one end must always remain fixed in position by the quick-release axle or threaded sleeve.

Preparatory work

Removing cover for silencer

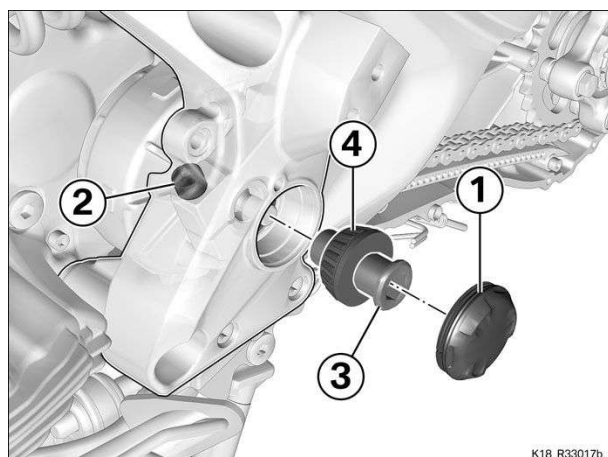
Removing rear left footrest plate and oil filler panel

Disengaging spring strut from swinging arm

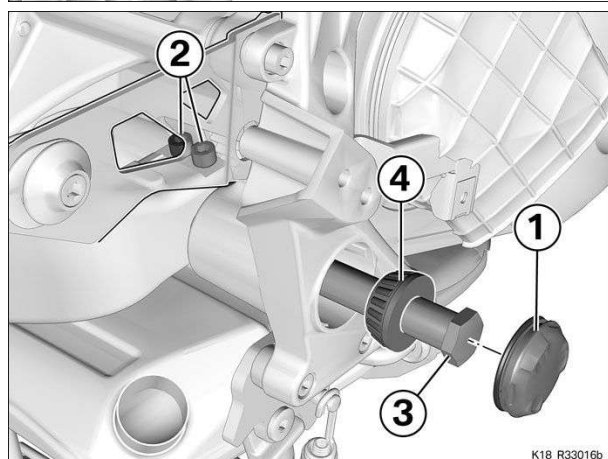
Core activity

(-) Removing left swinging-arm bearing

- Support the swinging arm with scissor-type lifter (No. 00 1 571).
- Remove bearing cap (1).
- Slacken screw (2), but **do not remove it**.
- Remove threaded sleeve (3) and bearing inner race (4).

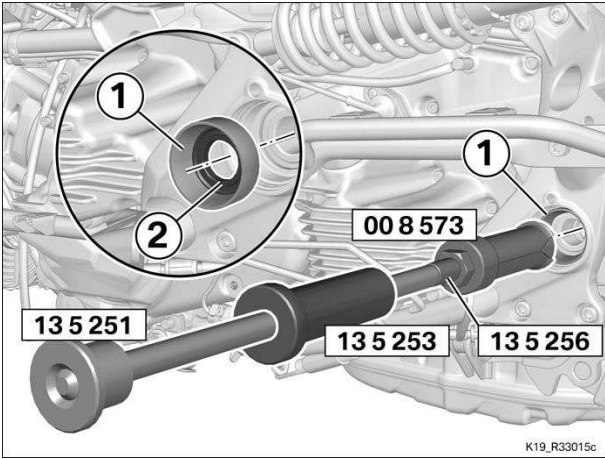


K18_R33017b



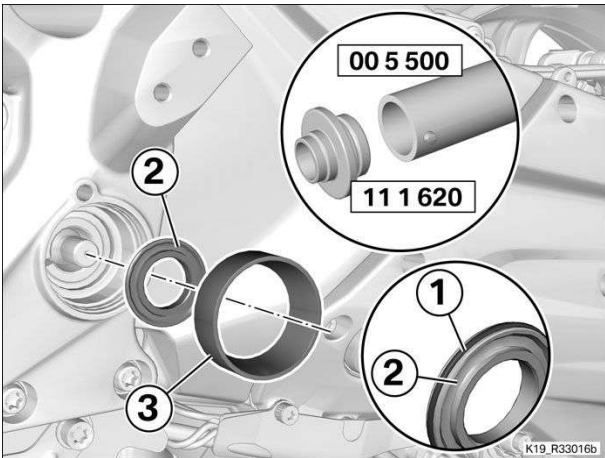
K18_R33016b

- Remove bearing cap (1).
- Slacken screws (2), but **do not remove**.
- Ease swinging-arm shaft (3) **out just far enough** to permit removal of the left bearing, and use a suitable tool to press right bearing inner race (4) **into the bearing seat**.
- Remove bearing outer race (1) and spacer (2) with internal puller (No. 00 8 573), threaded adapter (No. 13 5 256), pull rod (No. 13 5 251) and impact weight (No. 13 5 253).



(-) Install the left swinging-arm bearing

- Replace O-ring (1) on spacer (2).
- Install spacer (2), using handle (No. 00 5 500) and drift (No. 11 1 620).
- Install new bearing shell (3) until seated, using handle (No. 00 5 500) and drift (No. 11 1 620).



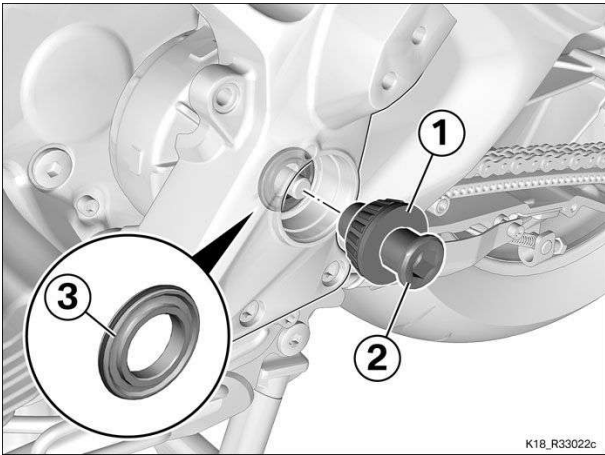
- Lubricate new bearing (1).



Lubricant

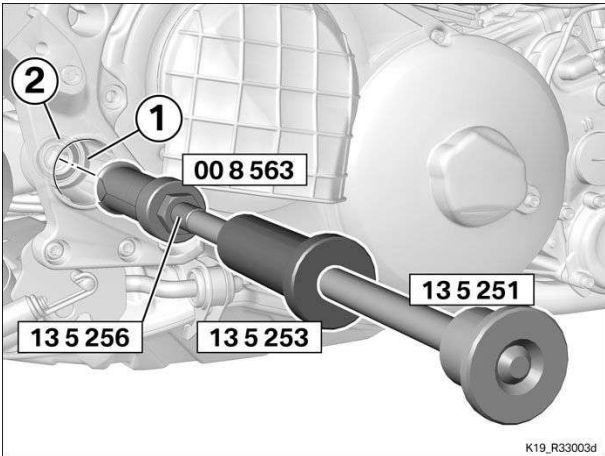
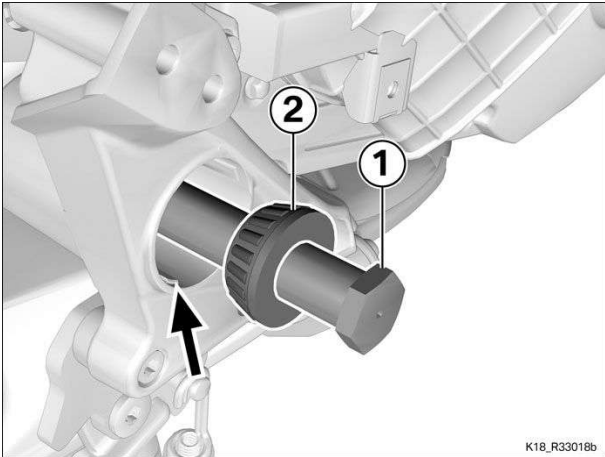
Acid-free friction-bearing grease	81 22 9 407 174
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- Install bearing (1) and bearing stud (2), noting spacer (3).



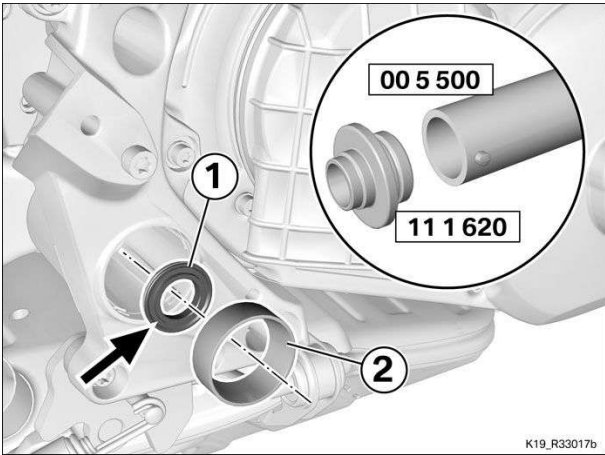
(-) Removing right swinging-arm bearing

- Remove swinging-arm shaft (1) and bearing inner race (2), clean the bore (arrow).



- Remove bearing outer race (1) with internal puller (No. 00 8 563), threaded adapter (No. 13 5 256), pull rod (No. 13 5 251) and impact weight (No. 13 5 253).
- Remove shaft sealing ring (2) and install replacement.

(-) Install the right swinging-arm bearing



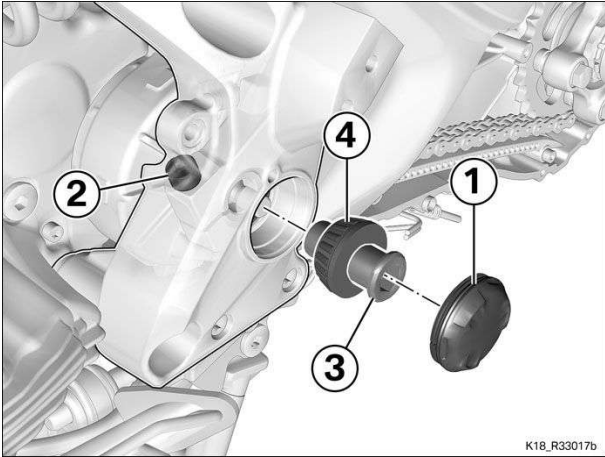
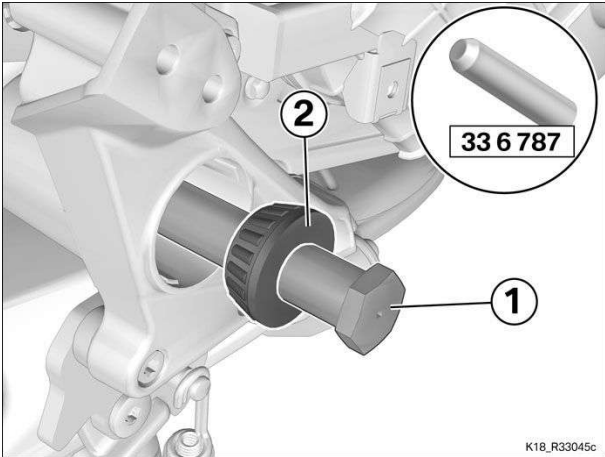
- Pack **new** shaft sealing ring (1) with grease on the inside (arrow).
- |  Lubricant | |
|---|-----------------|
| Acid-free friction-bearing grease | 81 22 9 407 174 |
- Install shaft sealing ring (1) using handle (No. 00 5 500) and drift (No. 11 1 620) just far enough to hold it in position in the frame section; it is subsequently pressed into its final position by bearing shell (2).
 - Install bearing shell (2), using handle (No. 00 5 500) and drift (No. 11 1 620).
 - Make sure that shaft sealing ring (1) does not project at the rear; if necessary press from the rear against bearing shell (2).

(-) Installing swinging-arm shaft

- Lubricate **right** bearing inner race (2).

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

- Clean and thinly lubricate swinging-arm shaft (1).



Lubricant

Acid-free friction-bearing grease	81 22 9 407 174
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- Position sliding sleeve (No. 33 6 787) on swinging-arm shaft (1).
- Install inner bearing race (2) and swinging-arm shaft (1).
- Remove sliding sleeve (No. 33 6 787).

- Lubricate **left** bearing inner race (4) and install.



Lubricant

Acid-free friction-bearing grease	81 22 9 407 174
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- Install threaded bush (3).

NOTICE

Make sure that correct tightening torque is applied, because this is how bearing play is set.



Tightening torques

Threaded bush to swinging-arm shaft (torquing specification for swinging-arm pivot bearing)		
M12 x 1	Tightening torque, 10 Nm	
	slacken	
	Tightening torque, 7 Nm	

- **Push the swinging arm all the way to the left** and tighten screw (2).



Tightening torques

Swinging arm, left, to threaded bush		
M10 x 50	38 Nm	

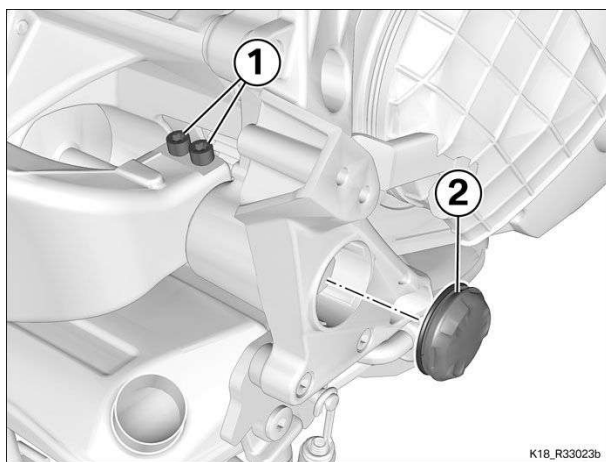
- Install **left** bearing cap (1).
- Tighten screws (1).



Tightening torques

Swinging arm, right, to swinging-arm shaft		
M8 x 50	19 Nm	

- Install **right** bearing cap (2)



Finishing work

Securing spring strut to swinging arm

Installing rear left footrest plate and oil filler panel

Installing cover for silencer

Final check of work performed

33 35 004 Replacing swinging-arm housing cover

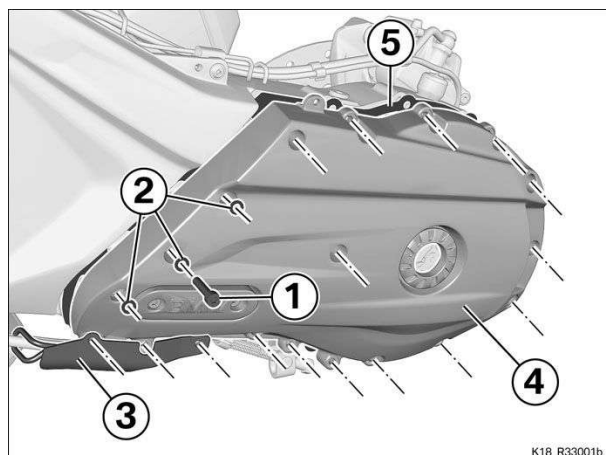
+ 33 35 504

Preparatory work

Draining oil from swinging arm

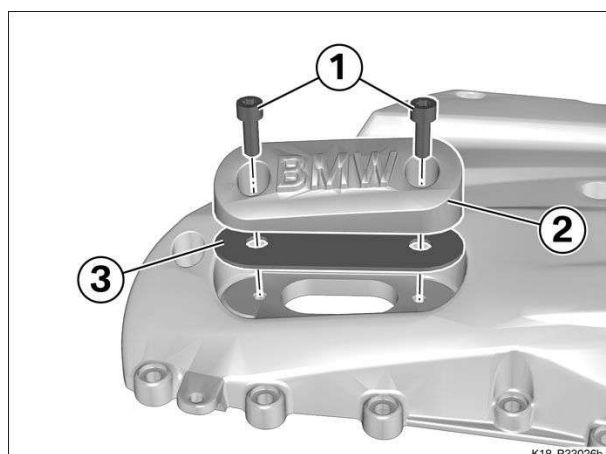
Core activity

(-) Removing swinging-arm housing cover

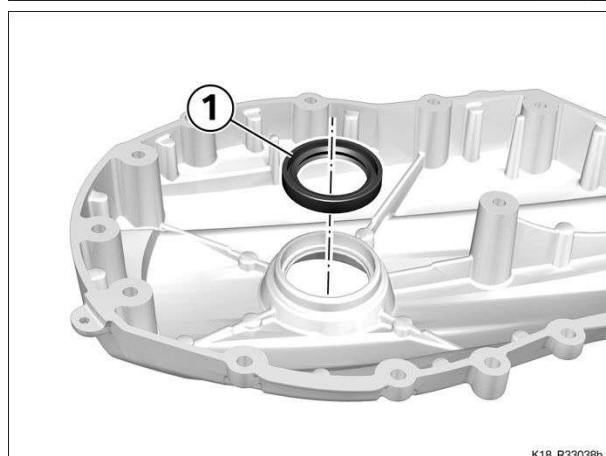


- Remove screws (1), noting sealing rings (2).
- Remove Bowden-cable holder (3).
- Remove swinging-arm housing cover (4).
- Remove seal (5).

(-) Replacing swinging-arm housing cover



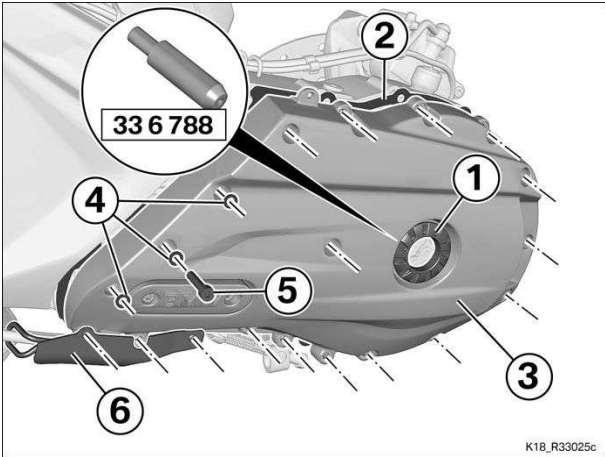
- Remove the following components:
 - Screws (1)
 - Service cover (2)
 - Seal (3)
- Secure service cover (2) to the new part.



- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.

(-) Installing swinging-arm housing cover

- Insert sliding sleeve (No. 33 6 788) in swinging-arm housing cover (3)



(shoulder to the inside).

- Place swinging-arm housing cover (3) in position with a **new** gasket (2).
- Install sealing washers (4) and screws (5), noting Bowden-cable holder (6).

Tightening torques		
Swinging-arm housing cover to rear wheel swinging arm		
M6 x 30	tighten in diagonally opposite sequence	
	12 Nm	

- Remove sliding sleeve (No. 33 6 788) and install cover (1).

Finishing work

Pouring oil into swinging arm

Final check of work performed

 33 54 000 Replacing rear spring strut
+ 33 54 500

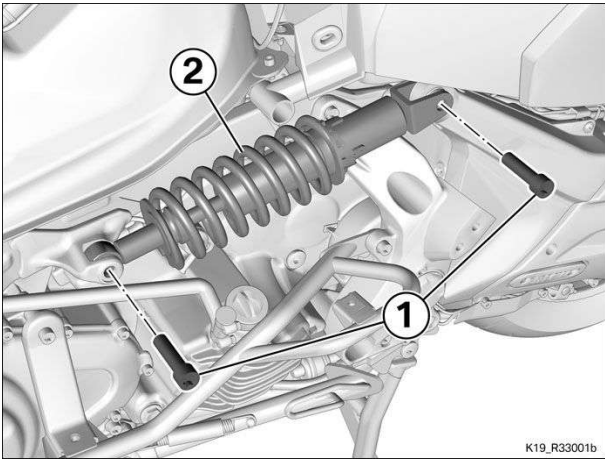
Preparatory work

- Removing filler cap flap
- Opening seat
- Removing centre cover
- Removing top left fairing side panel
- Removing front left footplate insert and footrest plate
- Removing bottom left fairing panel
- Removing left side panel
- Removing centre left footplate insert and footrest plate
- Removing rear left footplate insert and footrest plate
- Removing left footplate

Core activity

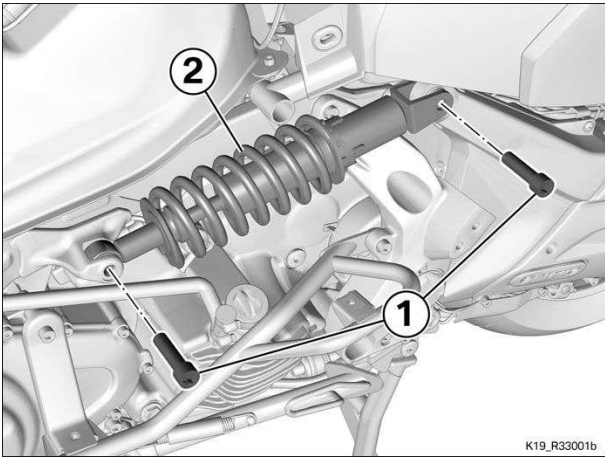
(-) Removing spring strut

- Support the rear wheel with wedges (No. 36 5 521).
- Remove screws (1) and remove spring strut (2).



(-) Installing spring strut

- Insert spring strut (2) and install screws (1).



 Tightening torques		
Spring strut to frame and swinging arm		
M12 x 45	66 Nm	

Finishing work

- Installing left footplate
- Installing rear left footplate insert and footrest plate

Installing centre left footplate insert and footrest plate

Installing left side panel

Installing bottom left fairing panel

Installing front left footplate insert and footrest plate

Installing top left side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

33 54 006 Replacing bottom spring strut pivot mount

+ 33 54 509

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

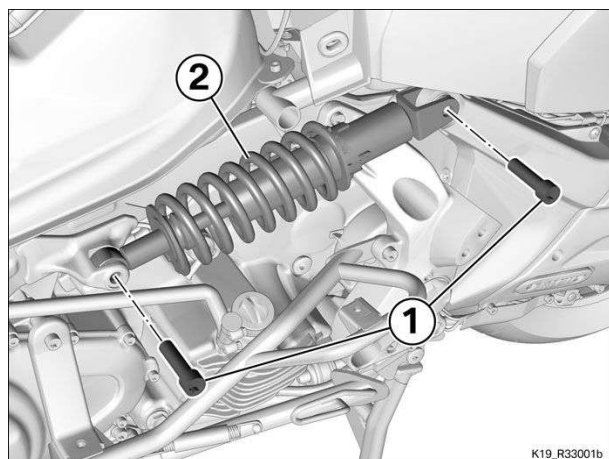
Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing left footplate

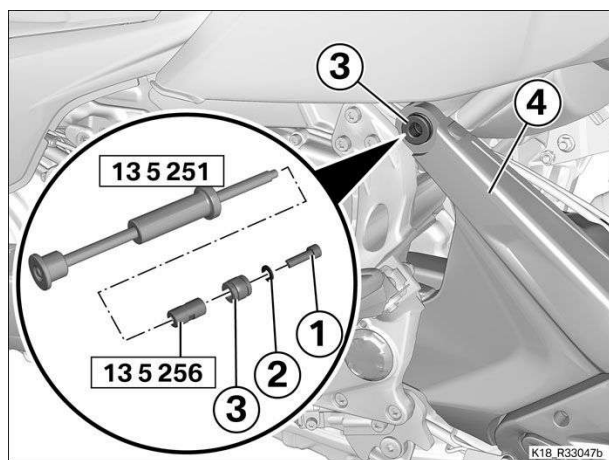
Core activity

(-) Removing spring strut



- Support the rear wheel with wedges (No. 36 5 521).
- Remove screws (1) and remove spring strut (2).

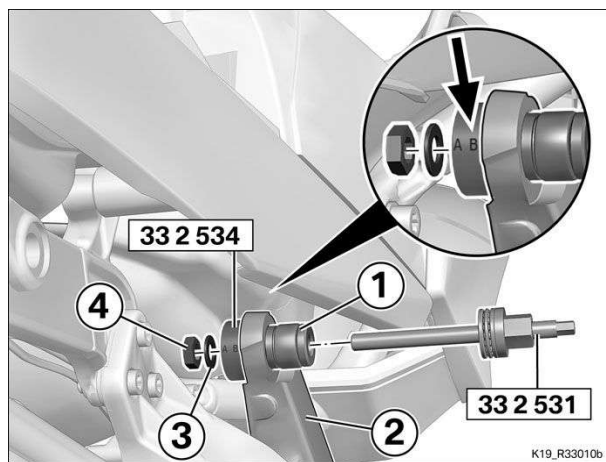
(-) Removing spring-strut swivel bearing



- From behind, insert a suitable M10 screw (1) with washer (2) into spring-strut swivel bearing (2).
- Connect screw (1) to adapter (No. 13 5 256) and pull rod (No. 13 5 252).
- Remove spring-strut swivel bearing (3) from swinging arm (4) with pull rod (No. 13 5 252).

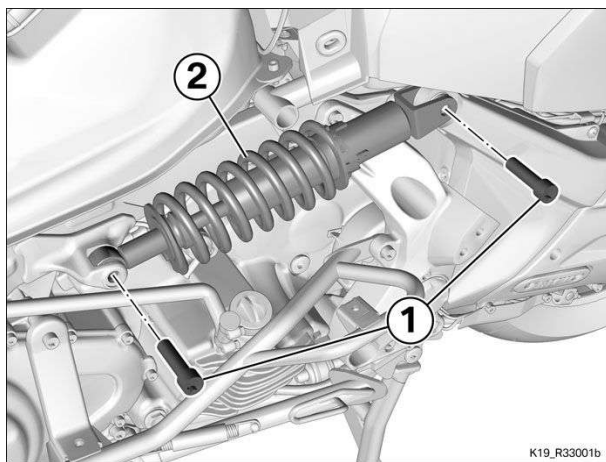
(-) Installing spring-strut swivel bearing

- Position spring-strut swivel bearing (1) in swinging arm (2).
-



From behind, position washer (No. 33 2 534) on swinging arm (2) and install spindle with thrust nut (No. 33 2 531).

- **B mark** (arrow) to swinging arm (2)
- Install suitable washer (3) and nut (4) and tighten until hand-tight.
- Pull spring-strut swivel bearing (1) into swinging arm (2) until seated.



(-) Installing spring strut

- Insert spring strut (2) and install screws (1).



Tightening torques

Spring strut to frame and swinging arm		
M12 x 45	66 Nm	

Finishing work

Installing left footplate

Installing rear left footplate insert and footrest plate

Installing centre left footplate insert and footrest plate

Installing left side panel

Installing bottom left fairing panel

Installing front left footplate insert and footrest plate

Installing top left side panel

Installing centre cover

Closing seat

Installing filler cap flap

Final check of work performed

33 81 000 Replacing chainset

+ 33 81 500

ATTENTION

Incorrect chain tension of a new chain.

Component damage

- Use chain tensioning rail with basic size.

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing left footplate

Removing left footplate carrier

Removing silencer

Installing engine lifter

Draining oil from swinging arm

Removing swinging-arm housing cover

Removing bottom chain channel

Removing chain tensioner rail

Removing top chain channel

Disengage the judder damper

Removing rear wheel

Disengaging rear brake caliper and parking brake

Disengaging brake hose and sensor cable

Removing judder-damper housing and output shaft

Removing spring strut

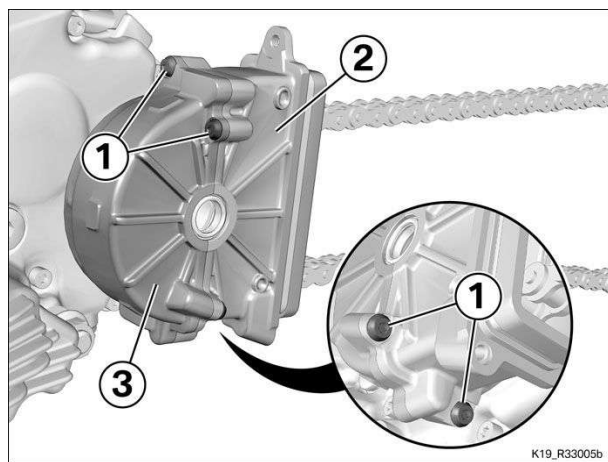
Removing rear wheel swinging arm

Removing left frame side section

Core activity

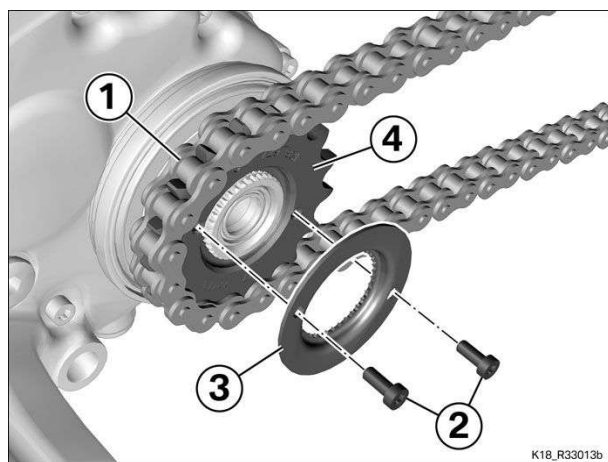
(-) Removing pinion cover

- Remove screws (1).
- Work rear pinion cover (2) to the rear over the chain.
- Remove front pinion cover (3).



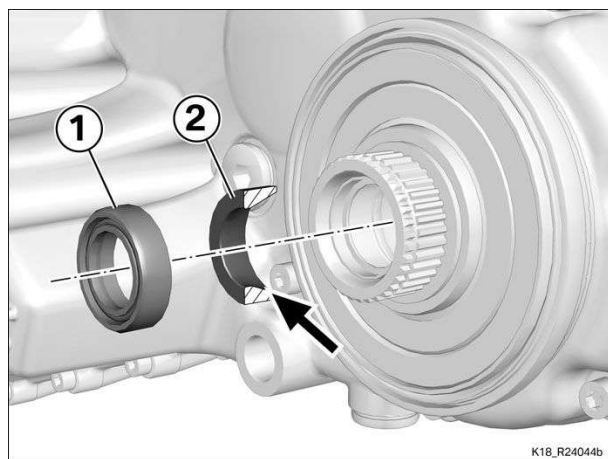
(-) Removing chain and pinion

- Remove chain (1).
- Remove screws (2).
- Turn locking plate (3) until the teeth are clear and remove.
- Remove pinion (4).



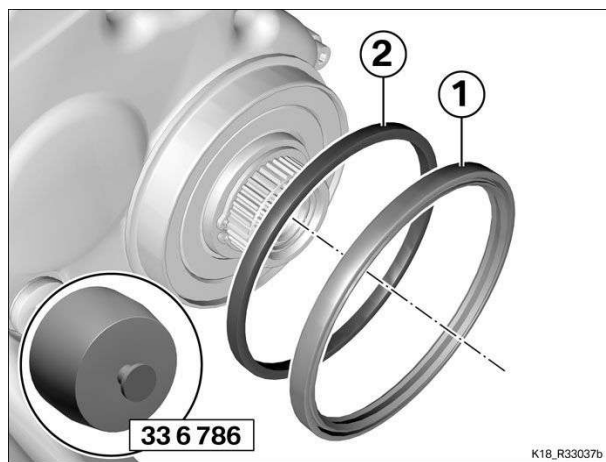
(-) Removing shaft sealing ring in output shaft

- Remove shaft sealing ring (1).
- Note bushing (2); the tapered end (arrow) must **face toward the inside**.
- Install **new** shaft sealing ring (1) with the open side **facing out** until seated



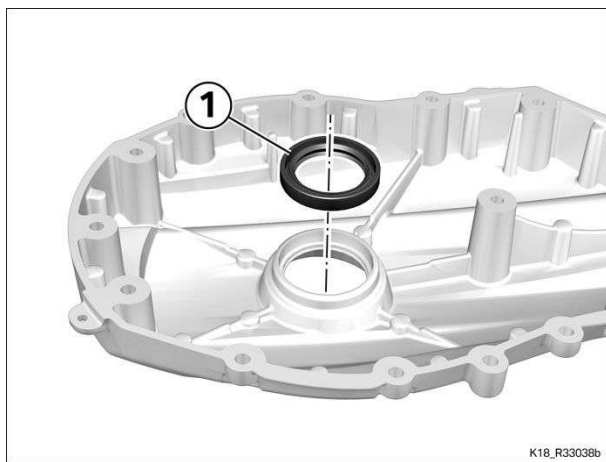
(-) Replacing shaft sealing ring and felt ring for pinion cover

- Replace shaft sealing ring (1) and felt ring (2), when installing use sliding sleeve (No. 33 6 786).
- Install shaft sealing ring (1) with the **open side toward the swinging arm**.



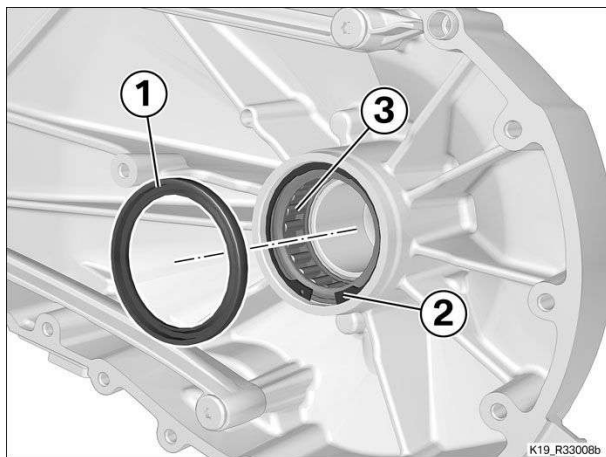
(-) Replacing shaft sealing ring in swinging-arm cover

- Use a suitable tool to remove shaft sealing ring (1).
- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.



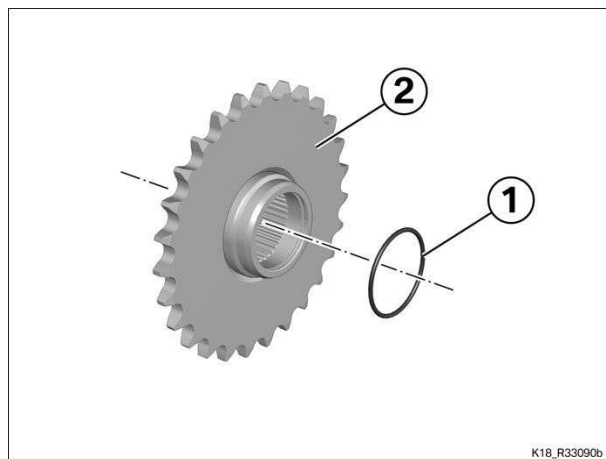
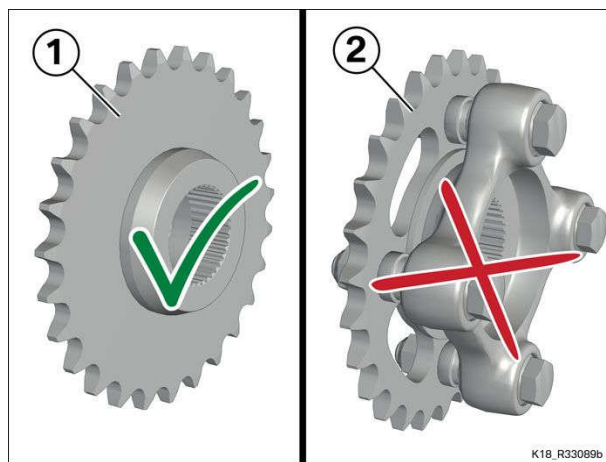
(-) Replacing shaft sealing ring in swinging arm

- Remove shaft sealing ring (1) with a suitable tool, using circlip (2) as a tool rest; do not under any circumstances apply the tool to bearing (3).
- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.



(-) Replacing sprocket

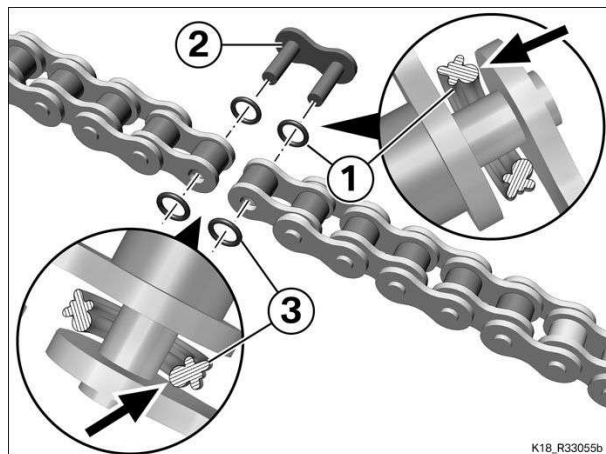
- Replace sprocket (1); from now on it is not permissible to install the sprocket with judder damper (2).



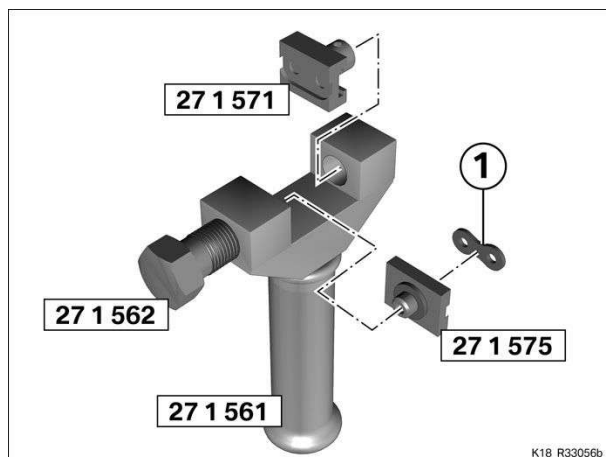
- Install **new** O-ring (1) in sprocket (2) and lubricate thinly.

 Gear oil	
Castrol SAF-XO	33 11 7 695 240

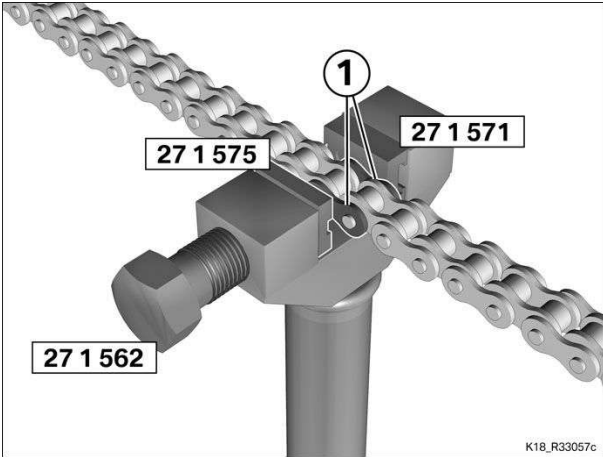
(-) Joining chain



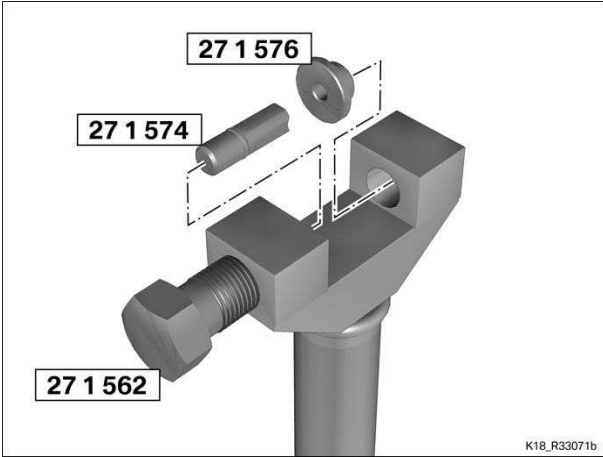
- Seat sealing rings (1) on chain joining link (2), with the **thick sealing bead (arrow)** toward the **outside link plate** of chain joining link (2).
- Insert chain joining link (2).
- Install sealing rings (1), **thick sealing bead (arrow)** facing **out**.



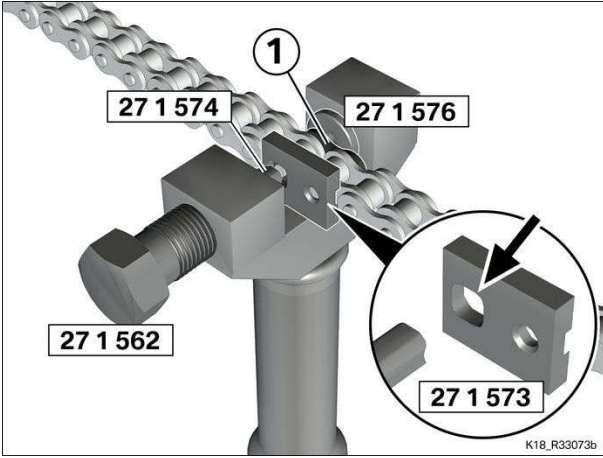
- Position insert (No. 27 1 571) in chain splitting and joining tool (No. 27 1 561).
- Position outside link plate of chain joining link (1) in insert (No. 27 1 575).
- Position insert (No. 27 1 575) in thrust screw (No. 27 1 562).



- Seat chain joining link (1) with insert (No. 27 1 571) and insert (No. 27 1 575).
- Tighten thrust screw (No. 27 1 562) until fully tightened.
- Back off the thrust screw and remove insert (No. 27 1 575) and insert (No. 27 1 571).



- Insert rivet die (No. 27 1 574) in thrust screw (No. 27 1 562).
- Position insert with bore (No. 27 1 576) in the chain splitting and joining tool.

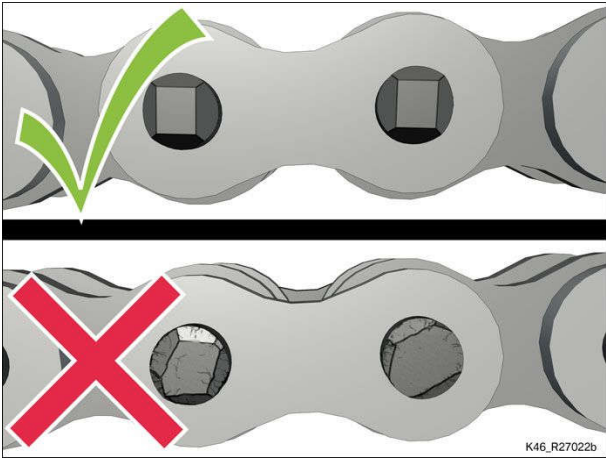


- Position insert (No. 27 1 573) with the square head (arrow) on chain joining link (1).
- Press-fit chain joining link (1) with rivet die (No. 27 1 574).

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 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.

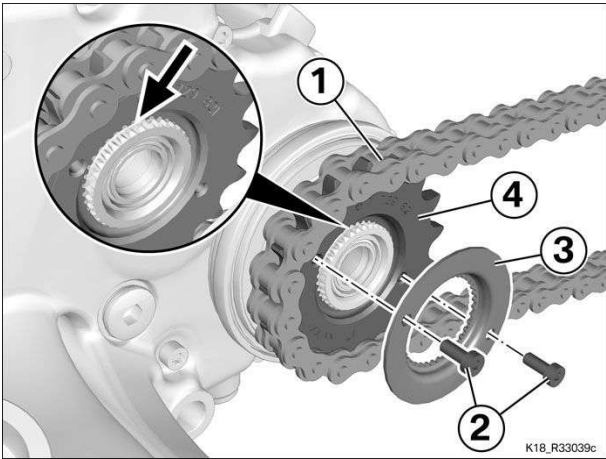
Measure

- Remove the chain joining link and again install a **new chain joining link**.



(-) Installing pinion and chain

- Install **new** pinion (4), lettering toward the outside.
- Seat retainer (3) in the key seat (arrow).
- Turn retainer (3) until screws (2) can be installed.
- Install screws (2).



Tightening torques		
Retaining plate to pinion		
M5	12	5 Nm

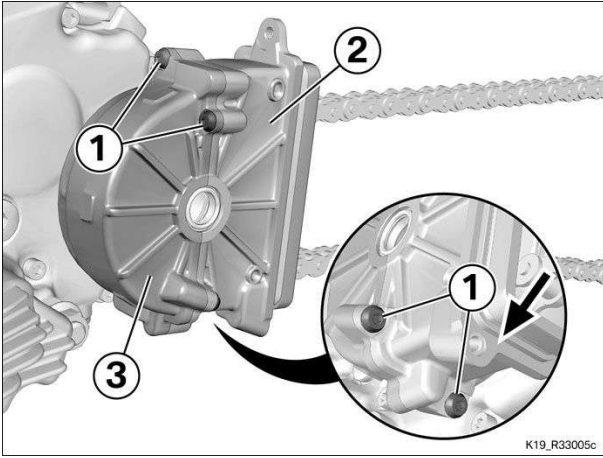
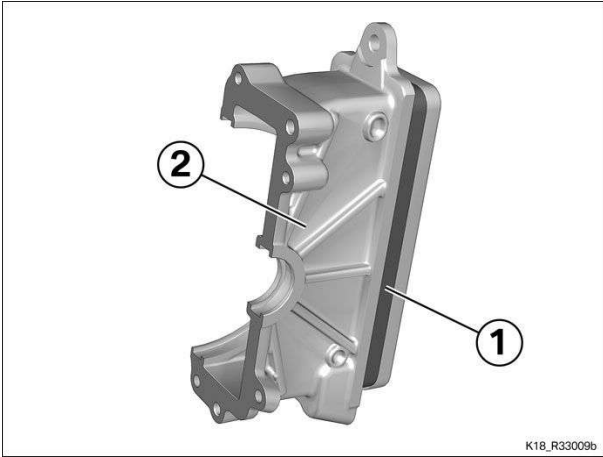
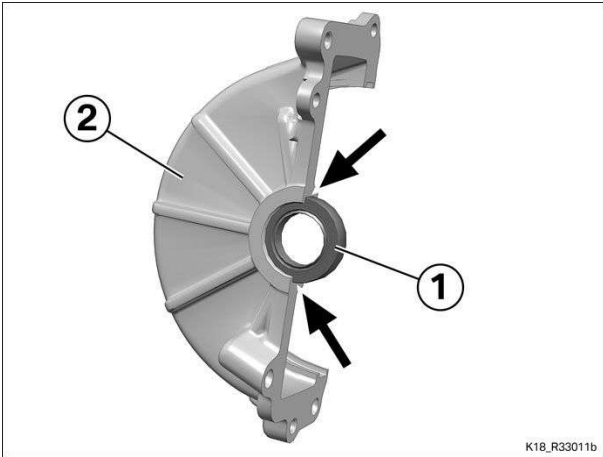
- Install chain (1).

(-) Installing pinion cover

- Install **new** sealing ring (1) in front pinion cover (2) (open side toward the inside).
- Clean the sealing face and seal, taking particular care at the corners (arrows).

NOTICE

When using fluids and lubricants, always comply with specifications such



as flash time or drying time.
See the data sheets/product information publications for more details.

 Sealant	
Dow Corning	07 58 0 397 777

- Clean the sealing face.
- Install **new** square-section sealing ring (1) on rear pinion cover (2).

- Install front pinion cover (3).
- Work rear pinion cover (2) over the chain.
- Install screws (1), noting the tightening sequence.

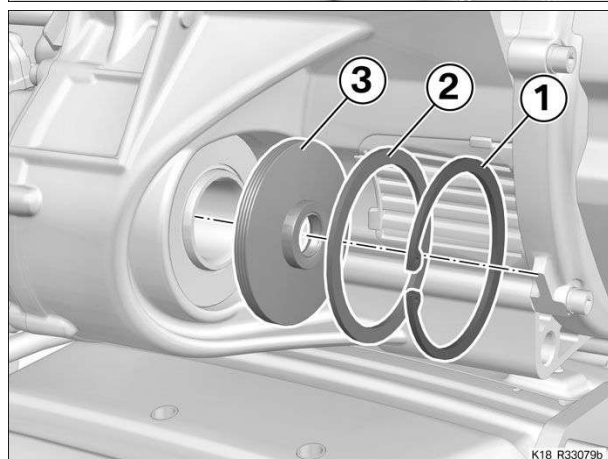
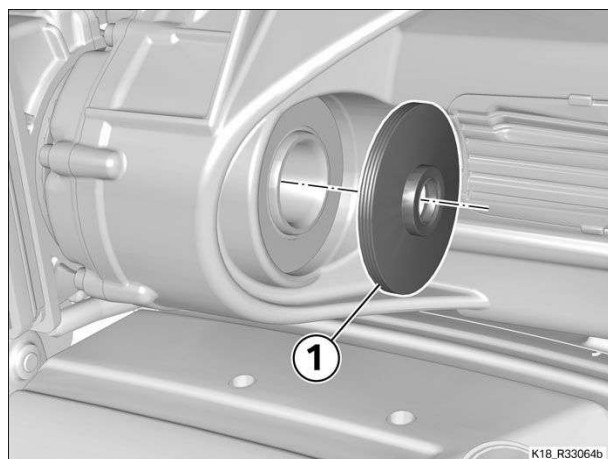
 Tightening torques		
Pinion cover front section to rear section		
M5 16	Tightening sequence 1st top (from front) and bottom (from behind)	
	4.5 Nm	

- Seal the sealing face (arrow) against the swinging arm.

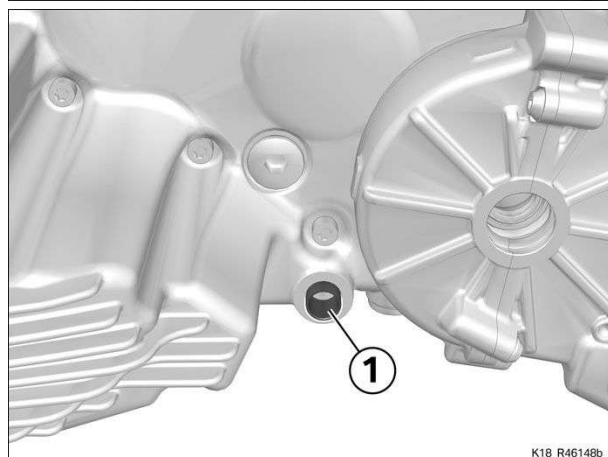
 Sealant	
Dow Corning	07 58 0 397 777

(-) Installing left frame side section

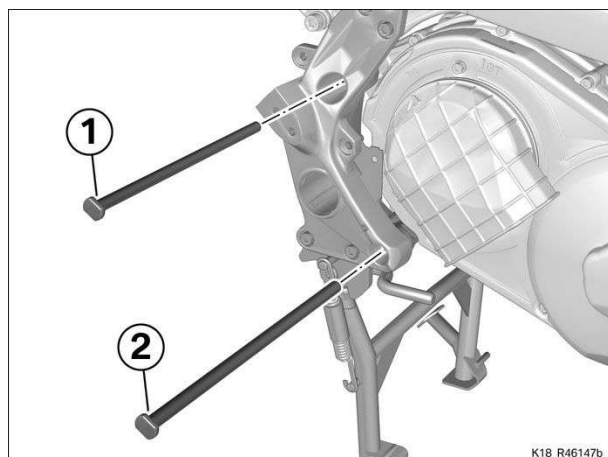
- Remove sealing washer (1).



- Remove circlip (1) and support ring (2).
- Remove sealing washer (3).

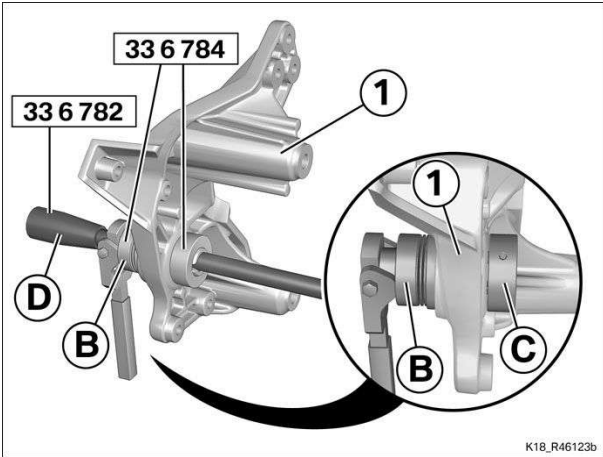


- If applicable, install fitted bushing (1).

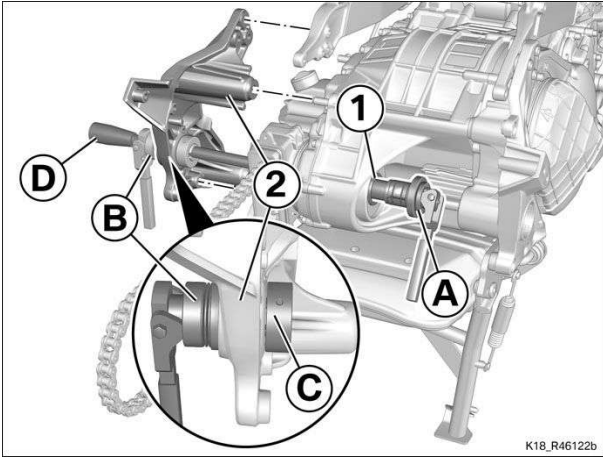


- Make sure that screws (1) and (2) are fully seated.

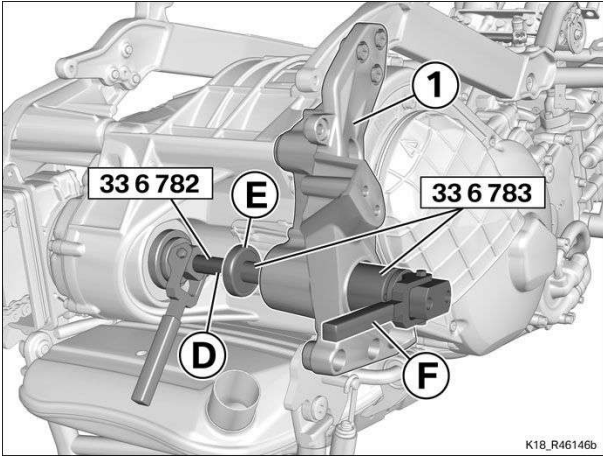
- Insert adjusting tools (B) and (C) (No. 33 6 784) into the **removed** left frame side section (1) and preload.



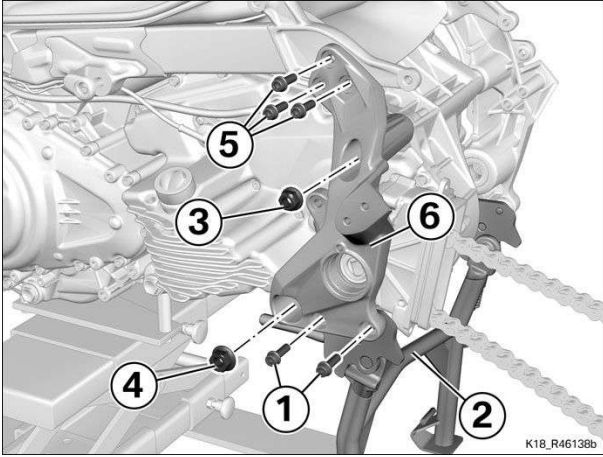
- Insert adjusting tool (D) (No. 33 6 782) into the **removed** left frame side section (1).



- Insert adjusting tool (A) (No. 33 6 785) into gearbo shaft (1) and preload.
- old left frame side section (2) in position with tools (B), (C) and (D) installed.



- Insert adjusting tools () and (F) (No. 33 6 783) into right frame side section (1) and preload.
- Insert shaft (D) **until seated**.



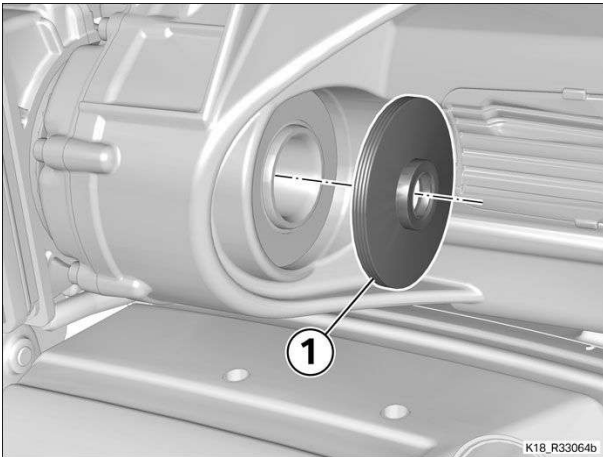
- Insert screws (1) into centre stand (2).
- Install screws (5).
- Secure right frame side section (6) with nuts (3) and (4).

Tightening torques		
rame side section to engine		
M10 230, Screw		
M10, Replace nut	56 Nm	
Thread-locking compound (mechanical)		
M12 297, Screw		
M12, Replace nut	96 Nm	

Thread-locking compound (mechanical)		
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- Tighten screws (1) and (5).

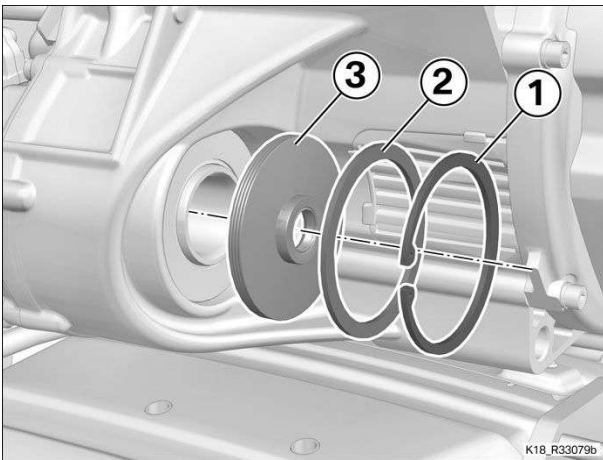
 Tightening torques		
Frame side section to frame		
M8 25 - 10.9	22 Nm	
Centre-stand mount to frame side section		
M8 25 - 10.9	22 Nm	



- Remove the shaft and adjusting tools.
- Clean the seat of sealing washer (1).
- Thinly apply adhesive to the **outer sealing face** of sealing washer (1).

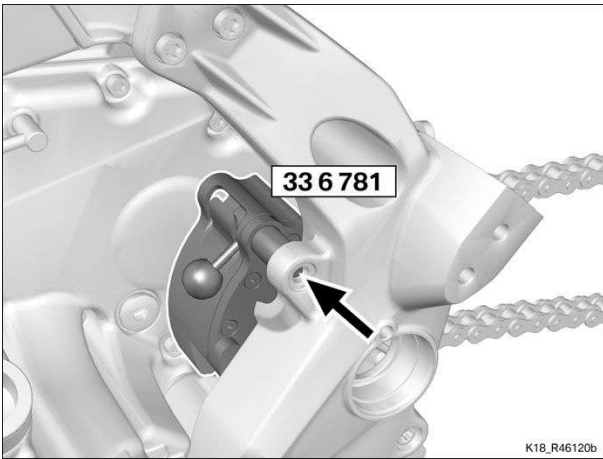
 Adhesive	
octite 5970	83 19 0 404 517

- Install sealing washer (1).

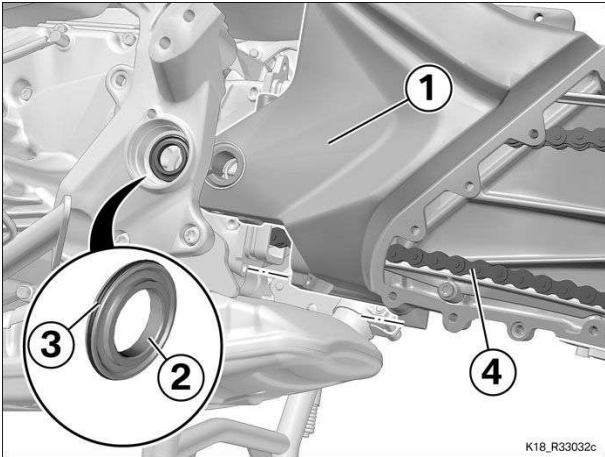


- Clean the seat of sealing washer (3).
- Install sealing washer (3).
- Install circlip (2) and support ring (1).

(-) Installing rear swinging arm



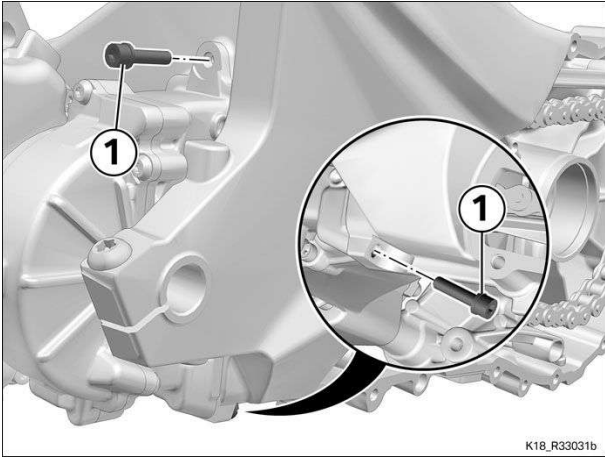
- Insert locator (No. 33 6 781) and secure it with the retainer (arrow) in the hole.
- **Support the installed swinging arm**, to ensure that excessive strain is not placed on the retainer (arrow).



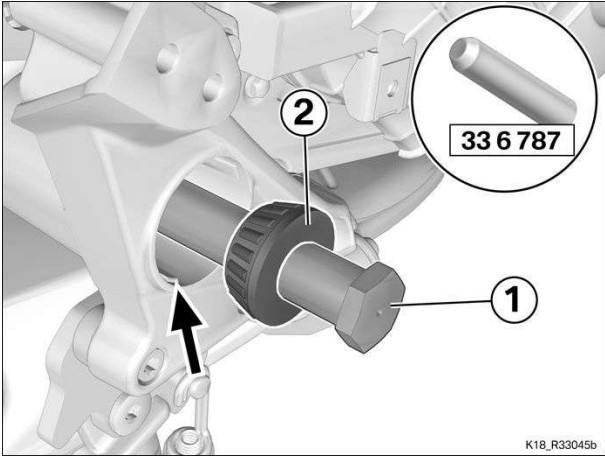
- Check sealing ring (3); replace if necessary.
- Install spacer (2).
- Insert chain (4) into swinging arm (1).
- old swinging arm (1) in position, noting spacing washer (2).

 NOTICE

Make sure that the brake hose is routed above the swinging arm.



- Install screws (1).



- Clean the bearing seat (arrow).
- lubricate inner bearing race (2).

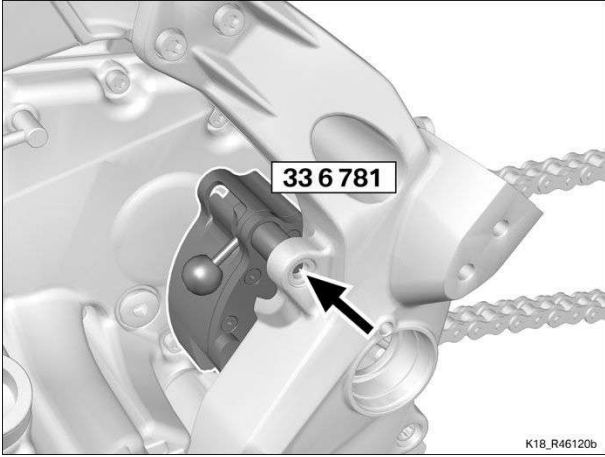


lubricant

Acid-free friction-bearing grease

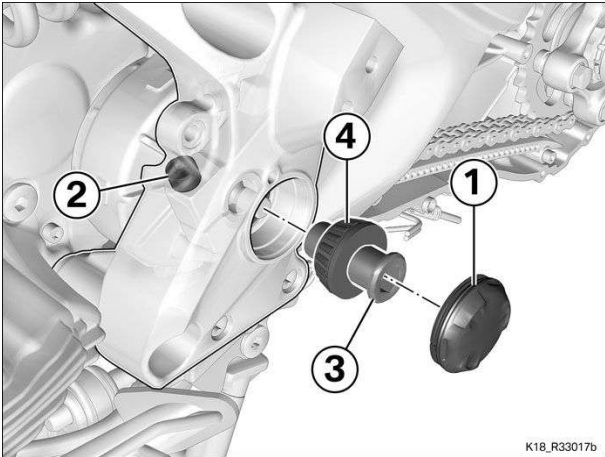
81 22 9 407 174

- Position sliding sleeve (No. 33 6 787) on swinging-arm shaft (1).
- Install inner bearing race (2) and swinging-arm shaft (1).
- Remove sliding sleeve (No. 33 6 787).
- Remove locator (No. 33 6 781), while **raising the swinging arm slightly** to ensure that excessive strain is not placed on the retainer (arrow).



- Clean the bearing seat.

•



lubricate inner bearing race (4).



lubricant

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

- Tighten threaded bush (3).



Tightening torques

Threaded bush to swinging-arm shaft (torquing specification for swinging-arm pivot bearing)

M12 1	Tightening torque, 10 Nm	
	slacken	
	Tightening torque, 7 Nm	

- Push the swinging arm all the way to the left and tighten screw (2).



Tightening torques

Swinging arm left to threaded bush

M10 50	38 Nm	
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- Install bearing cap (1).
- Tighten screws (1).

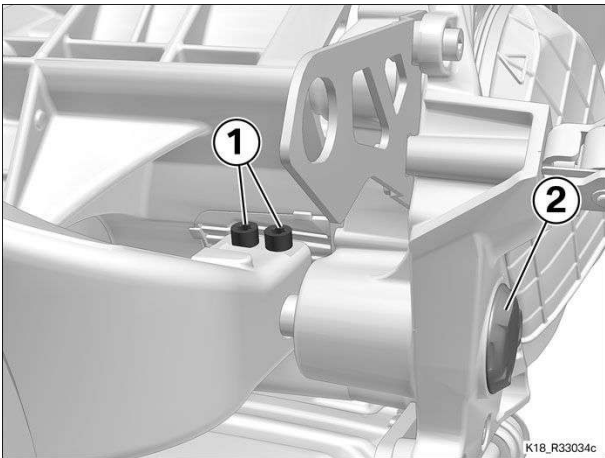


Tightening torques

Swinging arm right to swinging-arm shaft

M8 50	19 Nm	
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- Install bearing cap (2).



(-) Installing spring strut

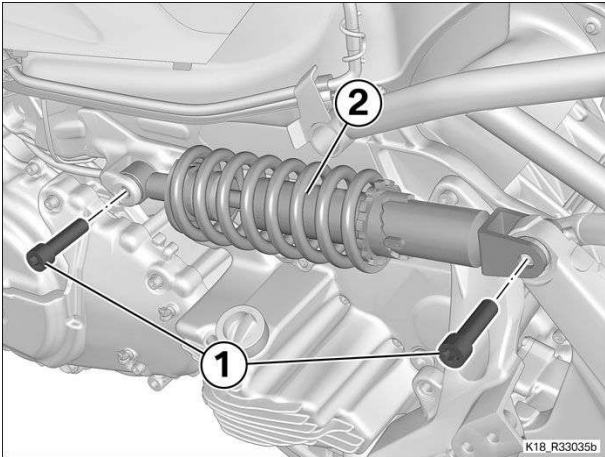
- Insert spring strut (2) and install screws (1).



Tightening torques

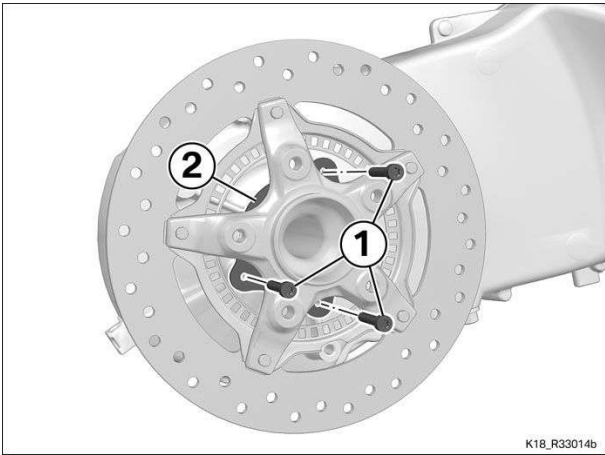
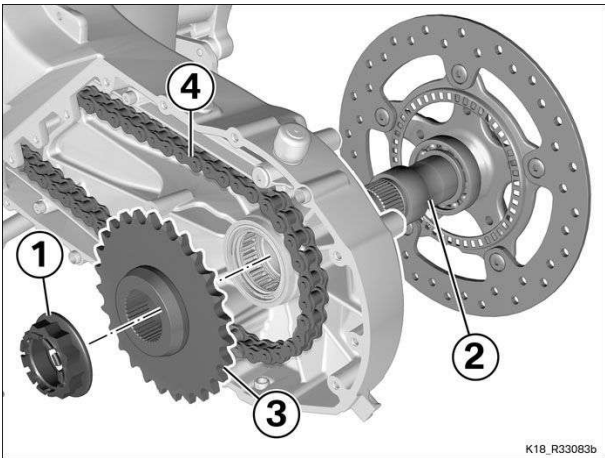
Spring strut to frame and swinging arm

M12 45	66 Nm	
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(-) Installing sprocket and output shaft

- Insert sprocket (3) into chain (4).
- Insert output shaft (2) into sprocket (3).
- Clean the threads and install **new** nut (1) and tighten until hand-tight.



- Secure retaining plate (2) with screws (1).

 Tightening torques			
Retaining plate for grooved ball bearing to rear wheel swinging arm			
M6	35	8 Nm	

inishing work

- Securing rear brake caliper and parking brake
- Installing rear wheel
- Tightening judder damper
- Installing chain tensioner rail
- Installing bottom chain channel
- Installing top chain channel
- Installing swinging-arm housing cover
- Pouring oil into swinging arm

- Securing brake hose and sensor cable
- Installing silencer
- Removing engine lifter
- Installing left footplate carrier
- Installing left footplate
- Installing rear left footplate insert and footrest plate
- Installing centre left footplate insert and footrest plate
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

33 81 501 Replacing chainset (for maintenance)

ATTENTION

Incorrect chain tension of a new chain.

Component damage

- Use chain tensioning rail with basic size.
-

Preparatory work

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing centre cover

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert

Removing left footplate

Removing left footplate carrier

Removing underbody panel

Removing silencer with cover

Installing engine lifter

Draining oil from swinging arm

Removing swinging-arm housing cover

Removing bottom chain channel

Removing chain tensioner rail

Removing top chain channel

Disengage the judder damper

Removing rear wheel

Disengaging rear brake caliper and parking brake

Disengaging brake hose and sensor cable

Removing judder-damper housing and output shaft

Removing spring strut

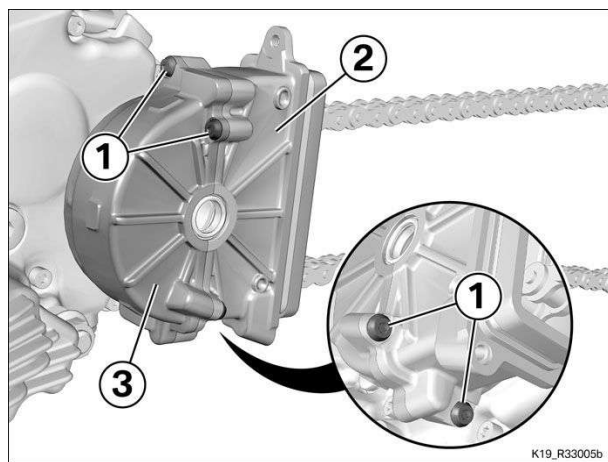
Removing rear wheel swinging arm

Removing left frame side section

Core activity

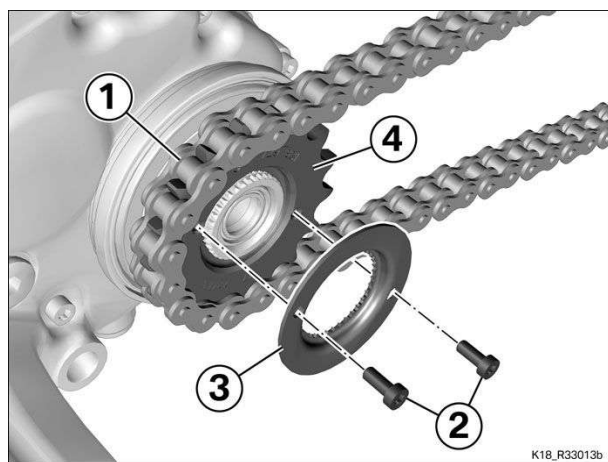
(-) Removing pinion cover

- Remove screws (1).
- Work rear pinion cover (2) to the rear over the chain.
- Remove front pinion cover (3).



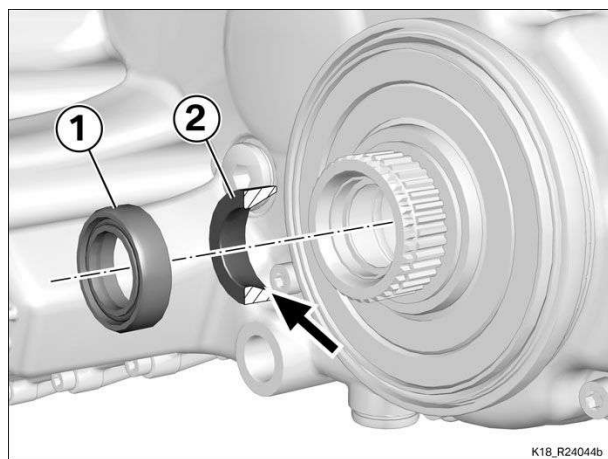
(-) Removing chain and pinion

- Remove chain (1).
- Remove screws (2).
- Turn locking plate (3) until the teeth are clear and remove.
- Remove pinion (4).



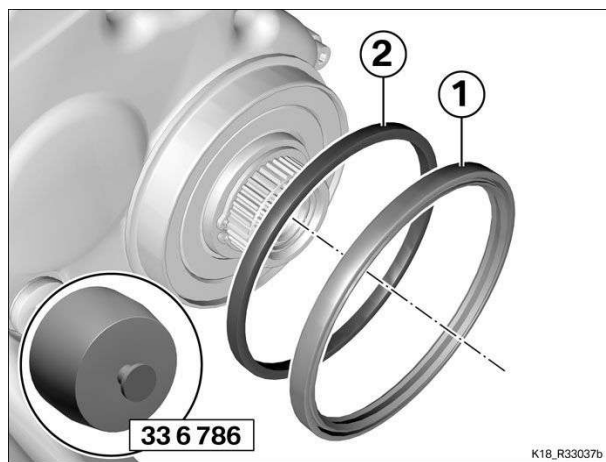
(-) Removing shaft sealing ring in output shaft

- Remove shaft sealing ring (1).
- Note bushing (2); the tapered end (arrow) must **face toward the inside**.
- Install **new** shaft sealing ring (1) with the open side **facing out** until seated



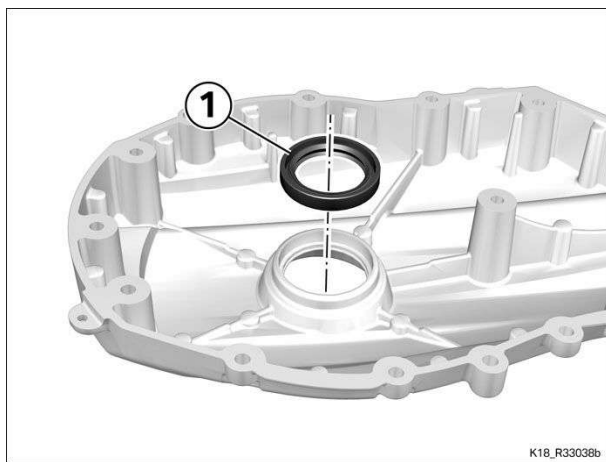
(-) Replacing shaft sealing ring and felt ring for pinion cover

- Replace shaft sealing ring (1) and felt ring (2), when installing use sliding sleeve (No. 33 6 786).
- Install shaft sealing ring (1) with the **open side toward the swinging arm**.



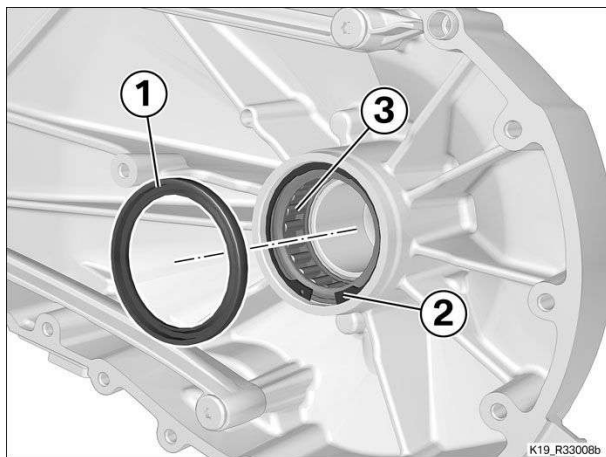
(-) Replacing shaft sealing ring in swinging-arm cover

- Use a suitable tool to remove shaft sealing ring (1).
- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.



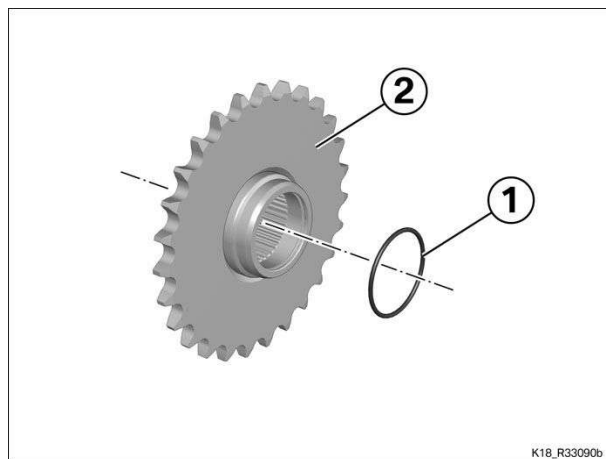
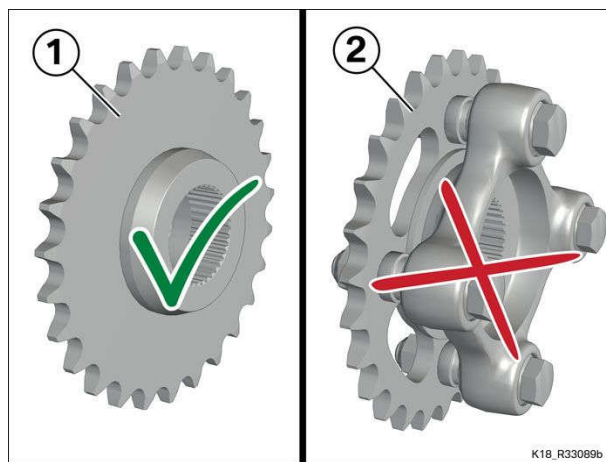
(-) Replacing shaft sealing ring in swinging arm

- Remove shaft sealing ring (1) with a suitable tool, using circlip (2) as a tool rest; do not under any circumstances apply the tool to bearing (3).
- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.



(-) Replacing sprocket

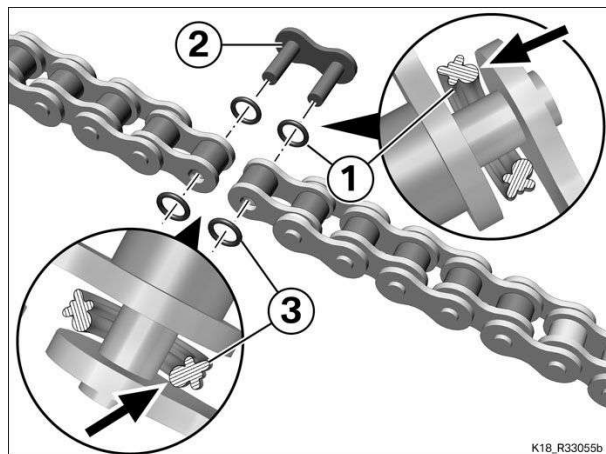
- Replace sprocket (1); from now on it is not permissible to install the sprocket with judder damper (2).



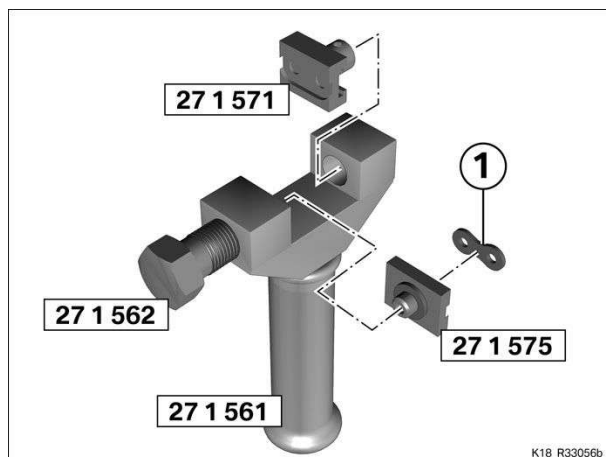
- Install **new** O-ring (1) in sprocket (2) and lubricate thinly.

 Gear oil	
Castrol SAF-XO	33 11 7 695 240

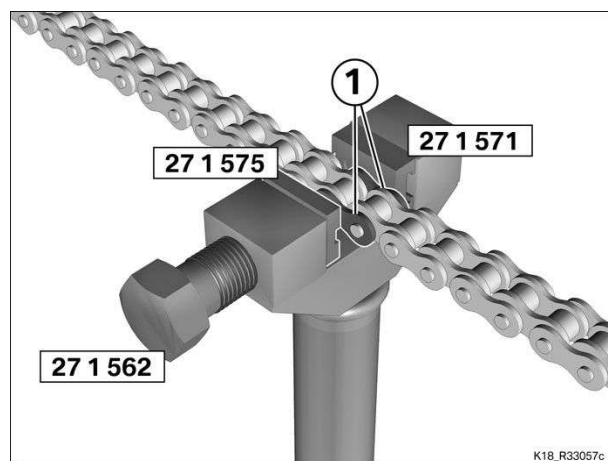
(-) Joining chain



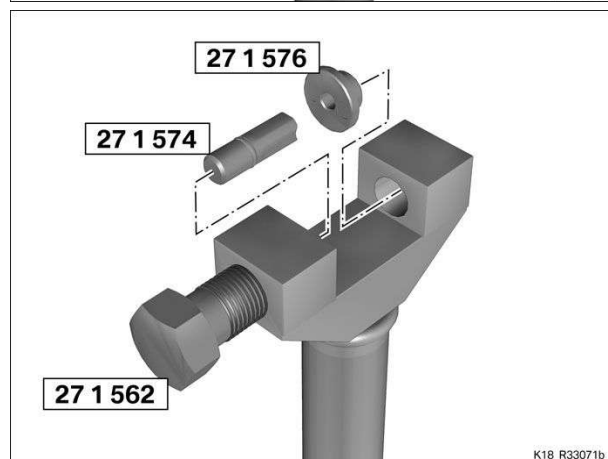
- Seat sealing rings (1) on chain joining link (2), with the **thick sealing bead** (arrow) toward the **outside link plate** of chain joining link (2).
- Insert chain joining link (2).
- Install sealing rings (1), **thick sealing bead** (arrow) facing **out**.



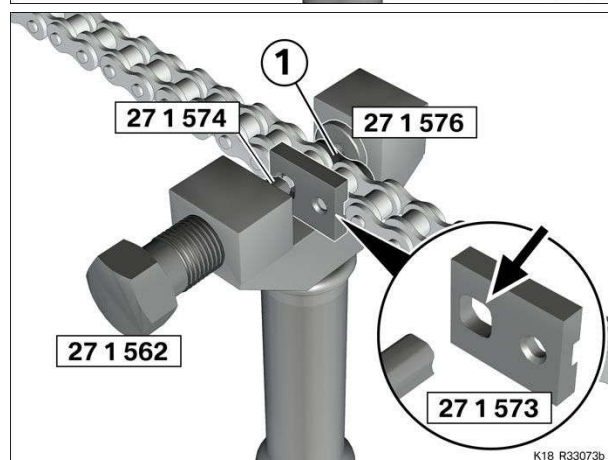
- Position insert (No. 27 1 571) in chain splitting and joining tool (No. 27 1 561).
- Position outside link plate of chain joining link (1) in insert (No. 27 1 575).
- Position insert (No. 27 1 575) in thrust screw (No. 27 1 562).



- Seat chain joining link (1) with insert (No. 27 1 571) and insert (No. 27 1 575).
- Tighten thrust screw (No. 27 1 562) **until fully tightened**.
- Back off the thrust screw and remove insert (No. 27 1 575) and insert (No. 27 1 571).



- Insert rivet die (No. 27 1 574) in thrust screw (No. 27 1 562).
- Position insert **with bore** (No. 27 1 576) in the chain splitting and joining tool.



- Position insert (No. 27 1 573) **with the square head (arrow)** on chain joining link (1).
- Press-fit chain joining link (1) with rivet die (No. 27 1 574).

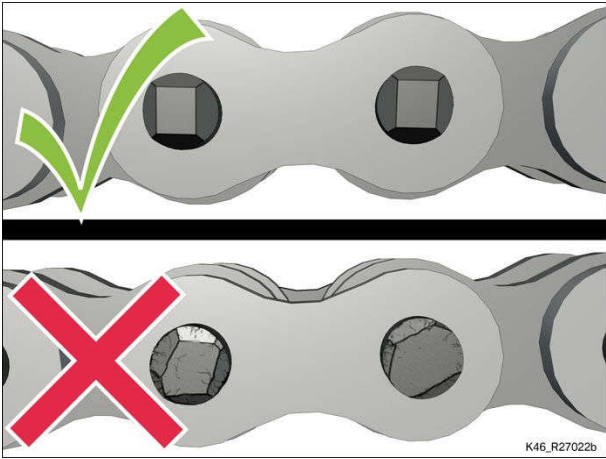


Technical data

Tightening torque for installing rivets in chain joining link		50 Nm	
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- 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 chain link



Check

Result

- Pin head not adequately secured.

Measure

- Repeat the process step and seat the pin head more securely.

Check

Result

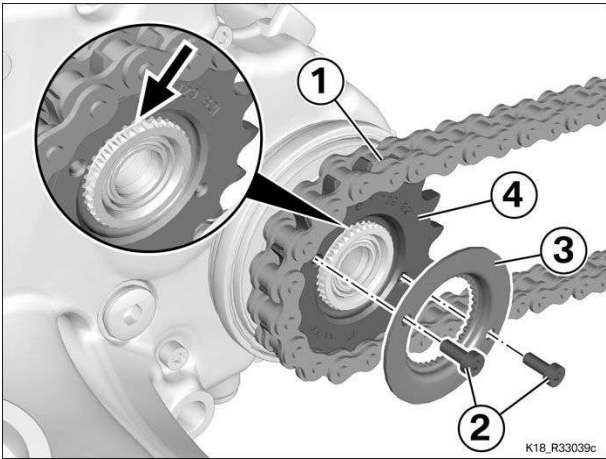
- Pin head cracked, irregularly flattened or rounded.

Measure

- Remove the chain joining link and again install a **new chain joining link**.



(-) Installing pinion and chain



- Install **new** pinion (4), lettering toward the outside.
- Seat retainer (3) in the key seat (arrow).
- Turn retainer (3) until screws (2) can be installed.
- Install screws (2).

 Tightening torques		
Retaining plate to pinion		
M5	12	5 Nm

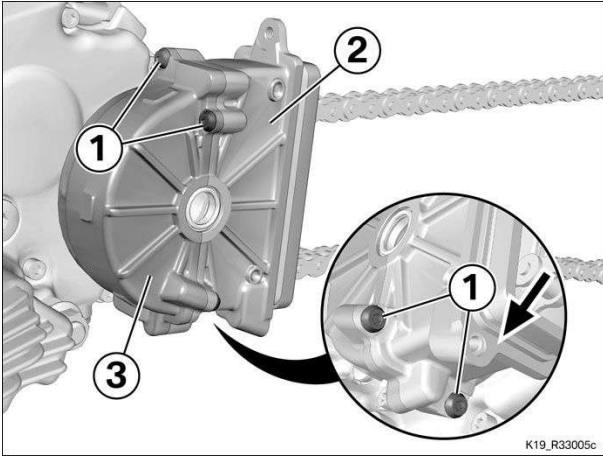
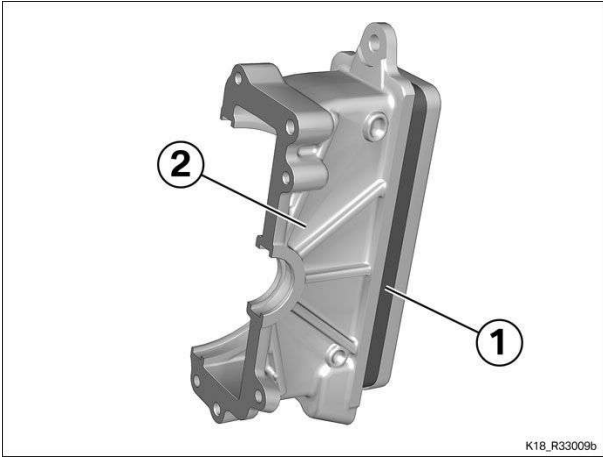
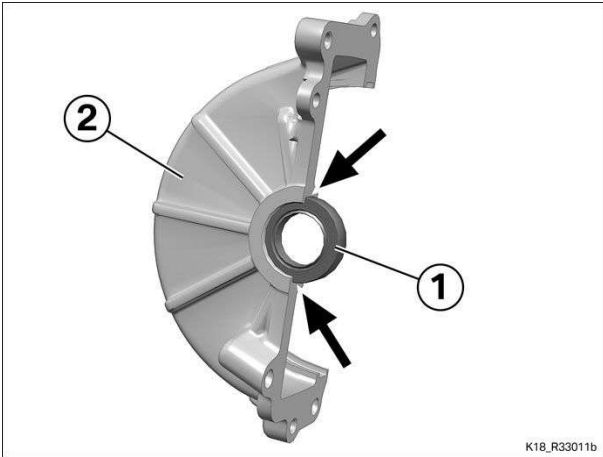
- Install chain (1).

(-) Installing pinion cover

- Install **new** sealing ring (1) in front pinion cover (2) (open side toward the inside).
- Clean the sealing face and seal, taking particular care at the corners (arrows).

 NOTICE

When using fluids and lubricants, always comply with specifications such



as flash time or drying time.
See the data sheets/product information publications for more details.

 ealant	
Dow Corning	07 58 0 397 777

- Clean the sealing face.
- Install **new** square-section sealing ring (1) on rear pinion cover (2).

- Install front pinion cover (3).
- Work rear pinion cover (2) over the chain.
- Install screws (1), noting the tightening sequence.

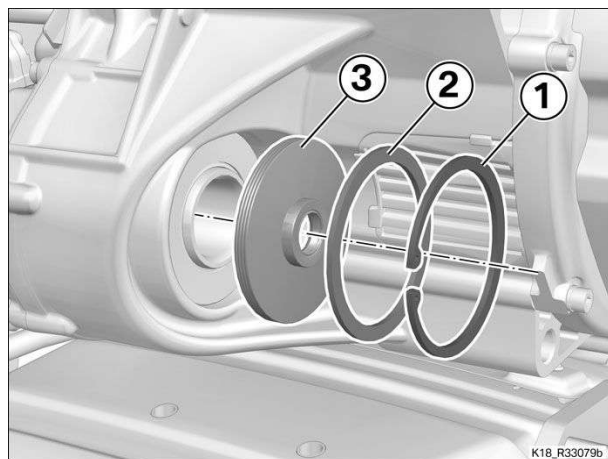
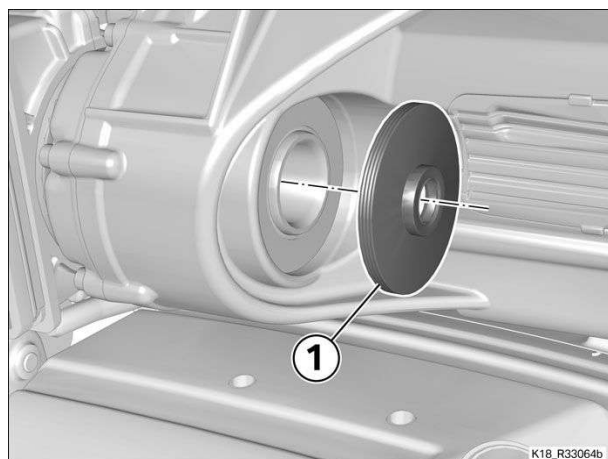
 Tightening torques		
Pinion cover front section to rear section		
M5 16	Tightening sequence 1st top (from front) nd bottom (from behind)	
	4.5 Nm	

- Seal the sealing face (arrow) against the swinging arm.

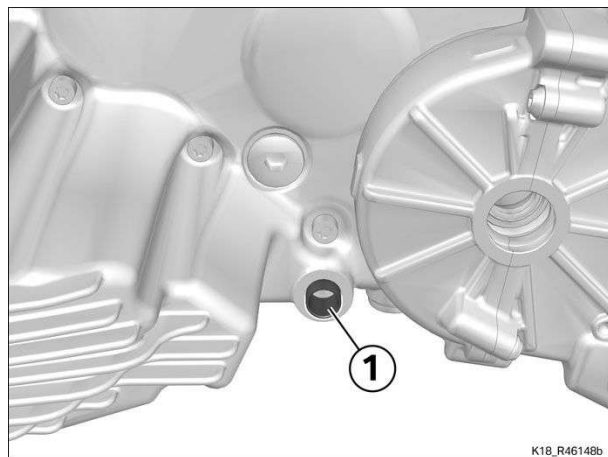
 ealant	
Dow Corning	07 58 0 397 777

(-) Installing left frame side section

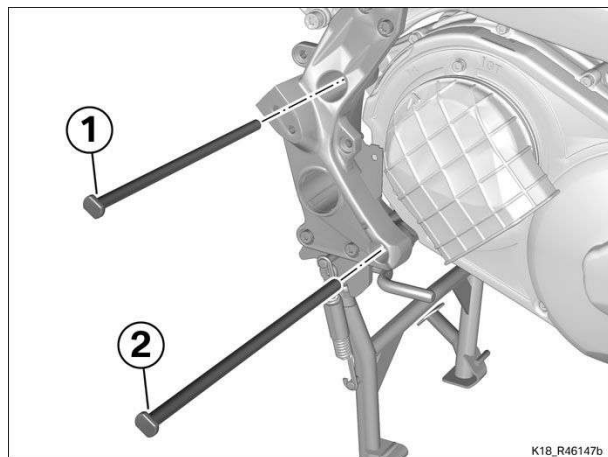
- Remove sealing washer (1).



- Remove circlip (1) and support ring (2).
- Remove sealing washer (3).

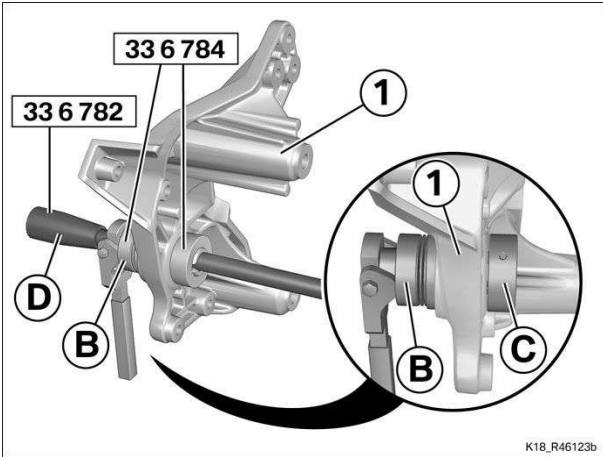


- If applicable, install fitted bushing (1).

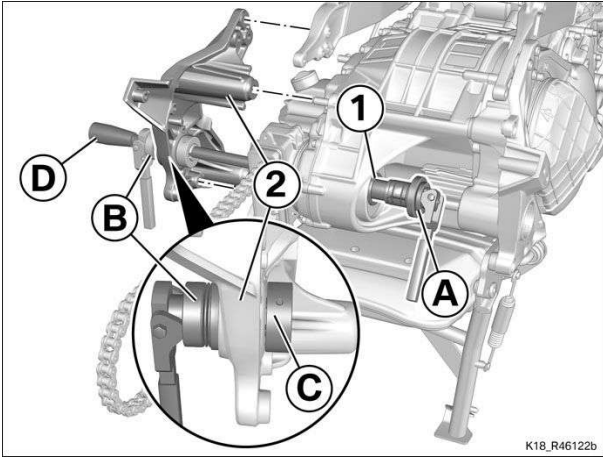


- Make sure that screws (1) and (2) are fully seated.

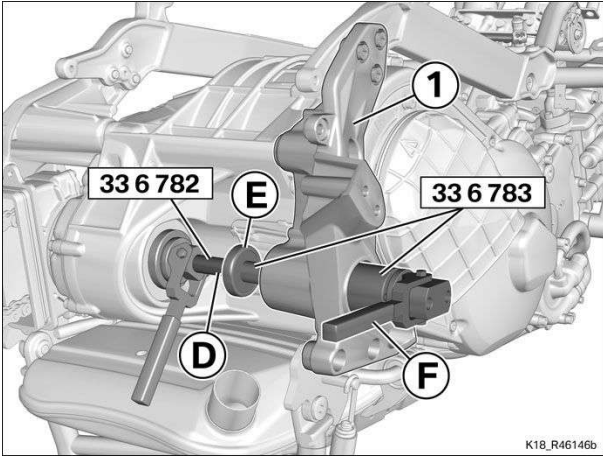
- Insert adjusting tools (B) and (C) (No. 33 6 784) into the **removed** left frame side section (1) and preload.



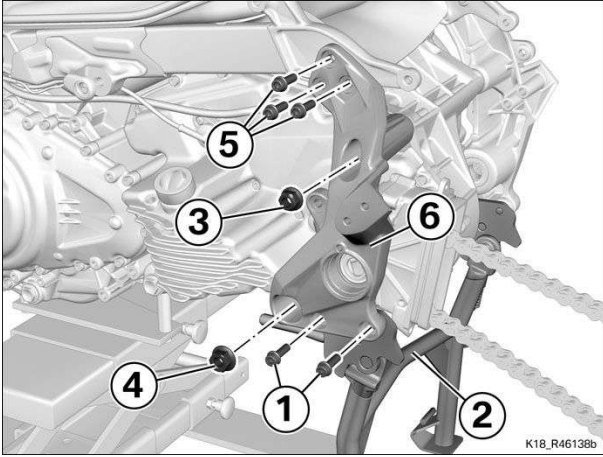
- Insert adjusting tool (D) (No. 33 6 782) into the **removed** left frame side section (1).



- Insert adjusting tool (A) (No. 33 6 785) into gearbo shaft (1) and preload.
- old left frame side section (2) in position with tools (B), (C) and (D) installed.



- Insert adjusting tools () and (F) (No. 33 6 783) into right frame side section (1) and preload.
- Insert shaft (D) **until seated**.



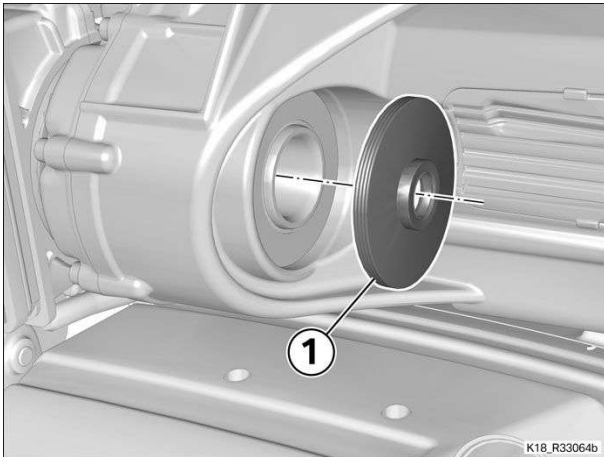
- Insert screws (1) into centre stand (2).
- Install screws (5).
- Secure right frame side section (6) with nuts (3) and (4).

Tightening torques		
rame side section to engine		
M10 230, Screw		
M10, Replace nut	56 Nm	
Thread-locking compound (mechanical)		
M12 297, Screw		
M12, Replace nut	96 Nm	

Thread-locking compound (mechanical)		
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- Tighten screws (1) and (5).

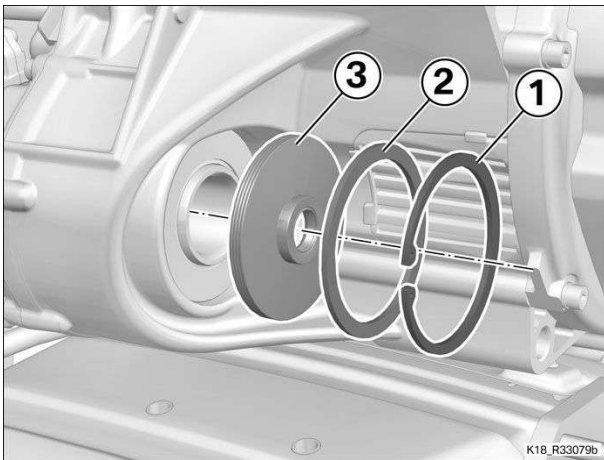
 Tightening torques		
Frame side section to frame		
M8 25 - 10.9	22 Nm	
Centre-stand mount to frame side section		
M8 25 - 10.9	22 Nm	



- Remove the shaft and adjusting tools.
- Clean the seat of sealing washer (1).
- Thinly apply adhesive to the **outer sealing face** of sealing washer (1).

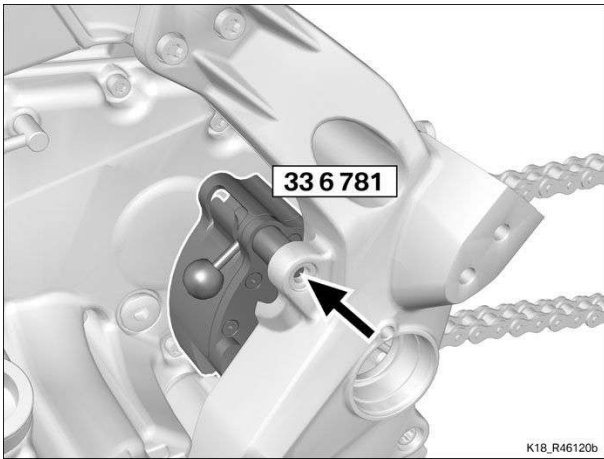
 Adhesive	
octite 5970	83 19 0 404 517

- Install sealing washer (1).

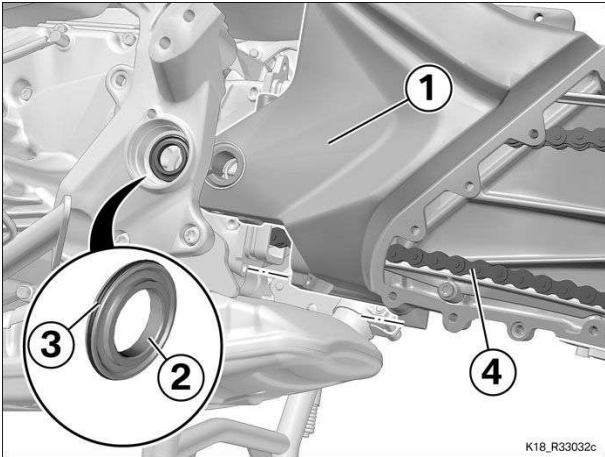


- Clean the seat of sealing washer (3).
- Install sealing washer (3).
- Install circlip (2) and support ring (1).

(-) Installing rear swinging arm



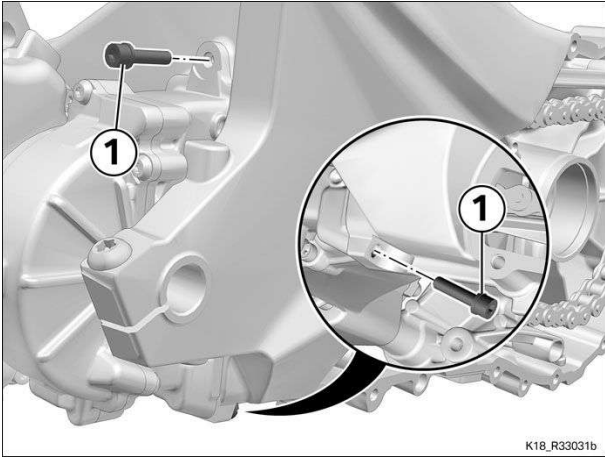
- Insert locator (No. 33 6 781) and secure it with the retainer (arrow) in the hole.
- **Support the installed swinging arm**, to ensure that excessive strain is not placed on the retainer (arrow).



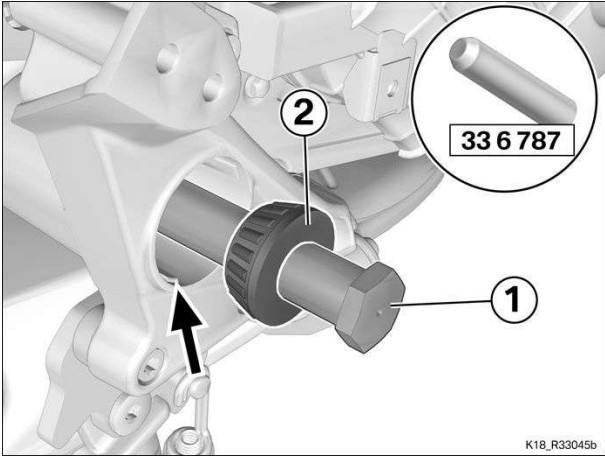
- Check sealing ring (3); replace if necessary.
- Install spacer (2).
- Insert chain (4) into swinging arm (1).
- old swinging arm (1) in position, noting spacing washer (2).

 NOTICE

Make sure that the brake hose is routed above the swinging arm.



- Install screws (1).



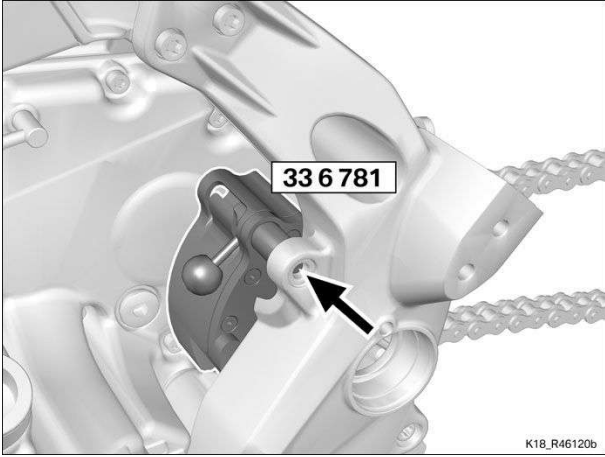
- Clean the bearing seat (arrow).
- lubricate inner bearing race (2).



lubricant

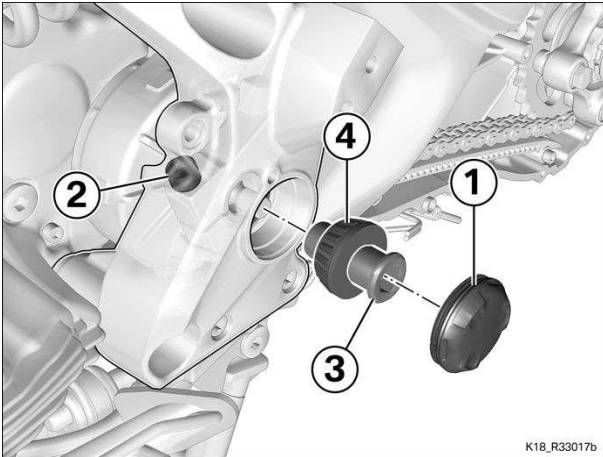
Acid-free friction-bearing grease	81 22 9 407 174
-----------------------------------	-----------------

- Position sliding sleeve (No. 33 6 787) on swinging-arm shaft (1).
- Install inner bearing race (2) and swinging-arm shaft (1).
- Remove sliding sleeve (No. 33 6 787).
- Remove locator (No. 33 6 781), while **raising the swinging arm slightly** to ensure that excessive strain is not placed on the retainer (arrow).



- Clean the bearing seat.

•



lubricate inner bearing race (4).



lubricant

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

- Tighten threaded bush (3).



Tightening torques

Threaded bush to swinging-arm shaft (torquing specification for swinging-arm pivot bearing)

M12 1	Tightening torque, 10 Nm	
	slacken	
	Tightening torque, 7 Nm	

- Push the swinging arm all the way to the left and tighten screw (2).



Tightening torques

Swinging arm left to threaded bush

M10 50	38 Nm	
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- Install bearing cap (1).
- Tighten screws (1).

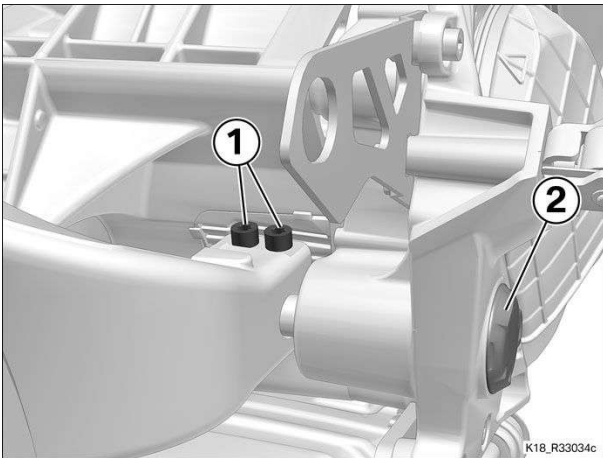


Tightening torques

Swinging arm right to swinging-arm shaft

M8 50	19 Nm	
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- Install bearing cap (2).



(-) Installing spring strut

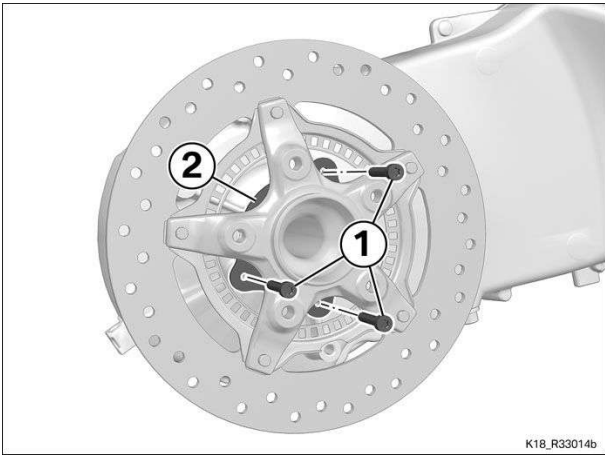
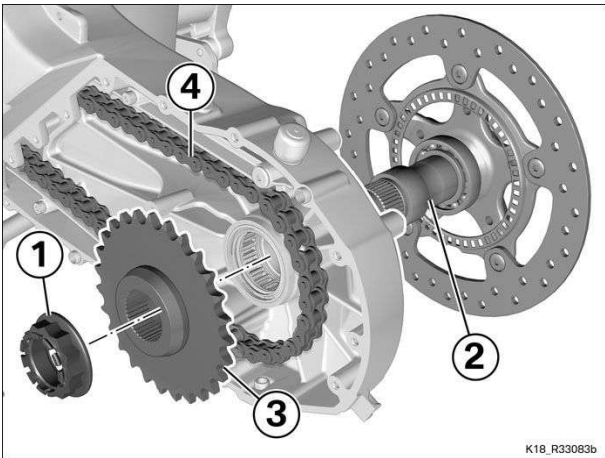
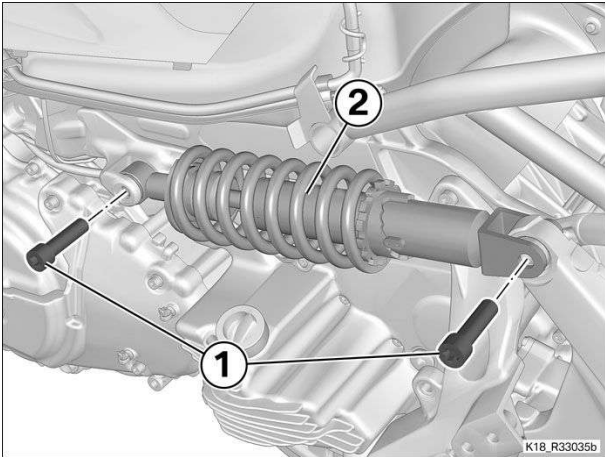
- Insert spring strut (2) and install screws (1).



Tightening torques

Spring strut to frame and swinging arm

M12 45	66 Nm	
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(-) Installing sprocket and output shaft

- Insert sprocket (3) into chain (4).
- Insert output shaft (2) into sprocket (3).
- Clean the threads and install **new** nut (1) and tighten until hand-tight.

- Secure retaining plate (2) with screws (1).

 Tightening torques			
Retaining plate for grooved ball bearing to rear wheel swinging arm			
M6	35	8 Nm	

inishing work

- Securing rear brake caliper and parking brake
- Installing rear wheel
- Tightening judder damper
- Installing chain tensioner rail
- Installing bottom chain channel
- Installing top chain channel
- Installing swinging-arm housing cover
- Pouring oil into swinging arm

- Securing brake hose and sensor cable
- Installing silencer with cover and bracket
- Removing engine lifter
- Installing left footplate carrier
- Installing underbody panel
- Installing left footplate
- Installing rear left footplate insert
- Installing centre left footplate insert and footrest plate
- Installing centre cover
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Final check of work performed

33 83 000 Adjusting chain tension

+ 33 83 500

NOTICE

Chain tension can be adjusted by installing an oversize chain tensioner rail.

Preparatory work

Draining oil from swinging arm

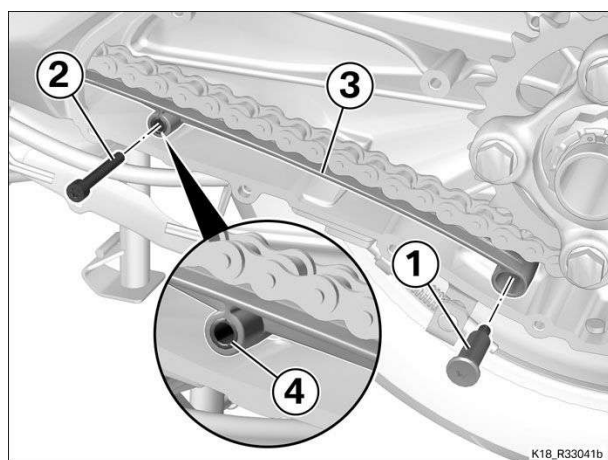
Removing swinging-arm housing cover

Removing bottom chain channel

Core activity

(-) Removing chain tensioner rail

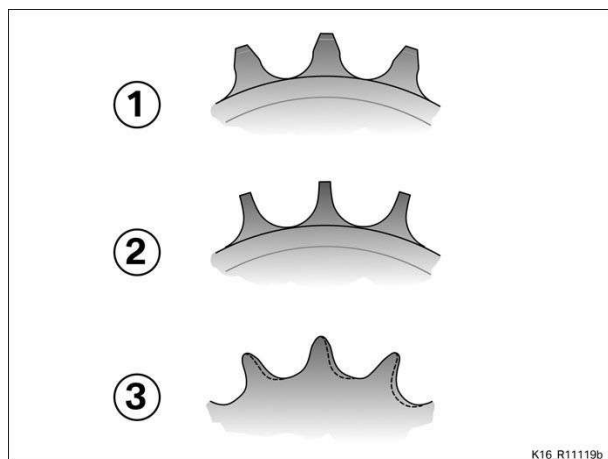
- Remove screws (1) and (2).
- Remove chain tensioner rail (3), noting sleeve (4).



(-) Checking chain sprocket

Check

- Check chain sprocket for deformation and wear.



Result:

- Fig. 1: No signs of deformation or only slight deformation of the teeth is perceptible.

Measure:

- Chain sprocket is OK.

Result:

- Fig. 2: Deformation at the teeth is perceptible.

Measure:

- Replace the chain sprocket, chain pinion and chain.
=> 33 81 500, Replacing chainset (Billed as a separate item)

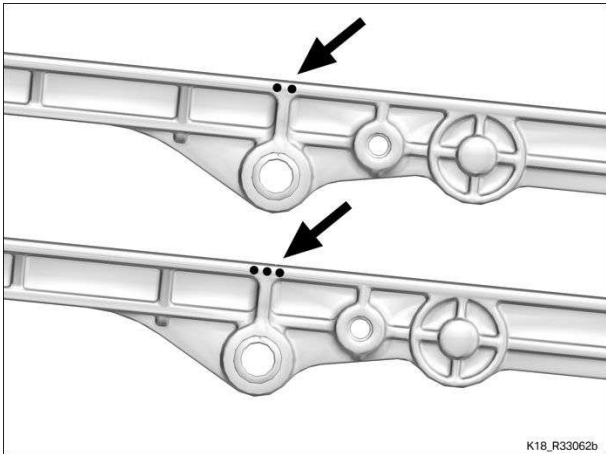
Result:

- Fig. 3: Severe wear at the teeth is perceptible.

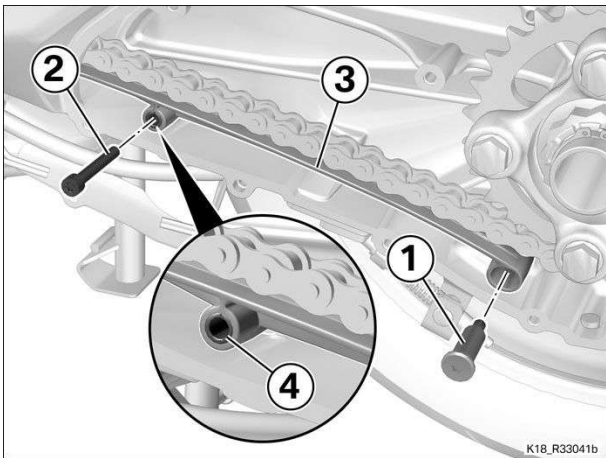
Measure:

- Replace the chain sprocket, chain pinion and chain.
=> 33 81 500, Replacing chainset (Billed as a separate item)

(-) Installing chain tensioner rail (oversize)



- To adjust chain sag, select the next largest chain tensioner rail (number of dots).
- Chain tensioner rails are available in 4 stages; the number of dots (arrow) corresponds to the stage.



- Clean the threads.
- Transfer sleeve (4) to the new part.
- Insert oversize chain tensioner rail (3).
- Install screws (1) and (2).

Tightening torques		
Chain tensioner rail to rear wheel swinging arm		
Front, M6 x 40 Thread-locking compound (Micro-encapsulated) or, Thread-locking compound (Loctite 243, Medium strength)	8 Nm	
Collared screw at rear, M6	8 Nm	

Finishing work

- Installing bottom chain channel
- Installing swinging-arm housing cover
- Pouring oil into swinging arm
- Final check of work performed

33 83 001 Checking chain for wear

+ 33 83 501

Core activity

(-) Check chain sag

► Checking chain sag (without mark on chain channel)

- Remove screws (1), cover (2) and gasket (3).

Check

- Lift chain (4) and measure distance (A) between **underside** of chain (4) and chain rail (5).

Technical data			
Chain deflection		max 15 mm	

- Turn the rear wheel and repeat this measurement at several points along the chain.

Result:

- Measured chain sag is out of tolerance.

Measure:

- Adjust chain tension (install a thicker tensioning rail).

=> 33 85 508, Replacing chain tensioner rail (Billed as a separate item)

- Install gasket (3), cover (2) and screws (1).



► Checking chain sag (arrow mark on chain channel)

- Remove screws (1), cover (2) and gasket (3).

Check

- Push chain (4) up and check whether the **chain underside** reaches the wear mark (arrow) on chain channel (5).
- Turn the rear wheel and repeat this measurement at several points along the chain.

Result:

- Chain underside goes past the wear mark.

Measure:

- Adjust chain tension (install a thicker tensioning rail).

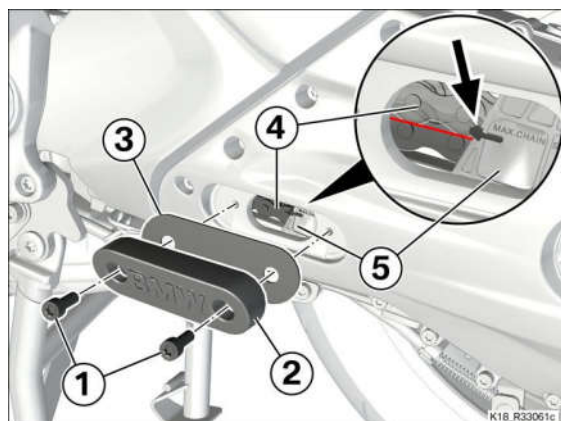
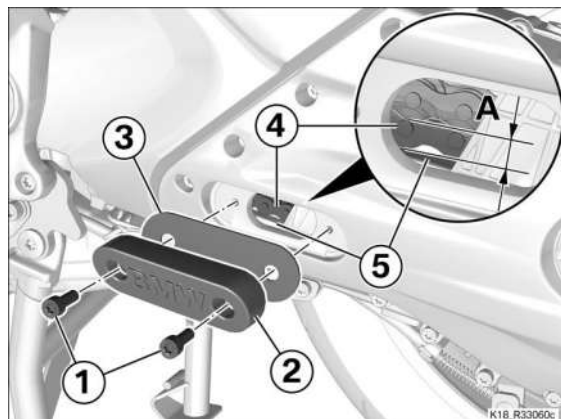
=> 33 85 508, Replacing chain tensioner rail (Billed as a separate item)

- Install gasket (3), cover (2) and screws (1).



Finishing work

Final check of work performed



33 83 002 Replacing chain

+ 33 83 502

Preparatory work

Draining oil from swinging arm

Removing swinging-arm housing cover

Removing bottom chain channel

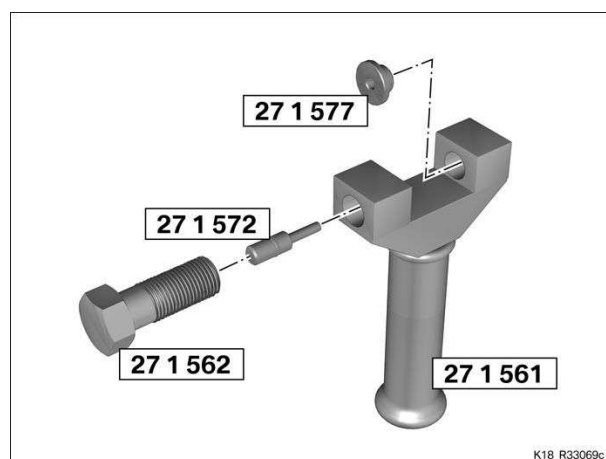
Removing chain tensioner rail

Removing top chain channel

Remove the chain slide rail

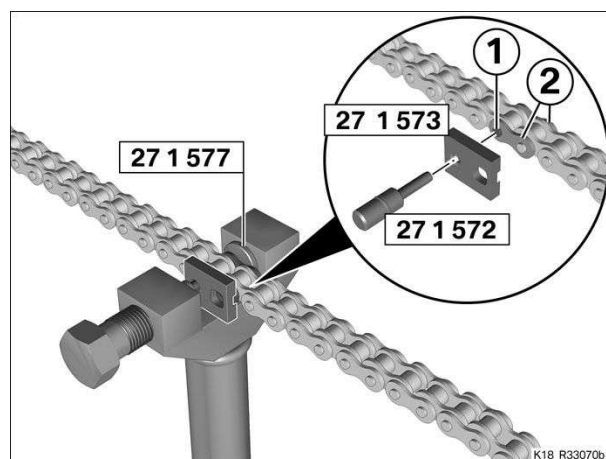
Core activity

(-) Preassembling chain splitting/joining tool for splitting drive chain



- 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).

(-) Splitting drive chain

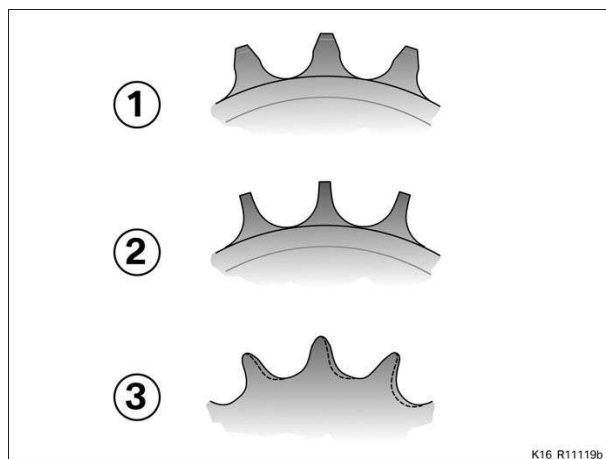


- Secure locator for press-out pin (No. 27 1 573) **with hole** over chain rivet (1).
- Press out chain rivet (1) with press-out pin (No. 27 1 572).
- Remove the tool and separate chain link plates (2).
- Take **removed** chain rivet (1) out of the tool.

(-) Checking chain sprocket

Check

- Check chain sprocket for deformation and wear.



Result:

- Fig. 1: No signs of deformation or only slight deformation of the teeth is perceptible.

Measure:

- Chain sprocket is OK.

Result:

- Fig. 2: Deformation at the teeth is perceptible.

Measure:

- Replace the chain sprocket, chain pinion and chain.

=> 33 81 500, Replacing chainset (Billed as a separate item)

Result:

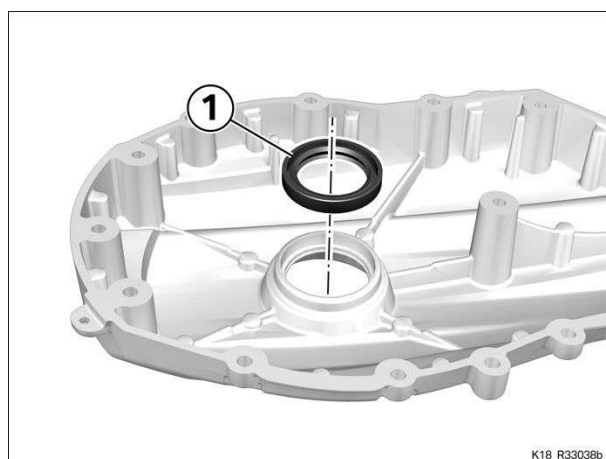
- Fig. 3: Severe wear at the teeth is perceptible.

Measure:

- Replace the chain sprocket, chain pinion and chain.

=> 33 81 500, Replacing chainset (Billed as a separate item)

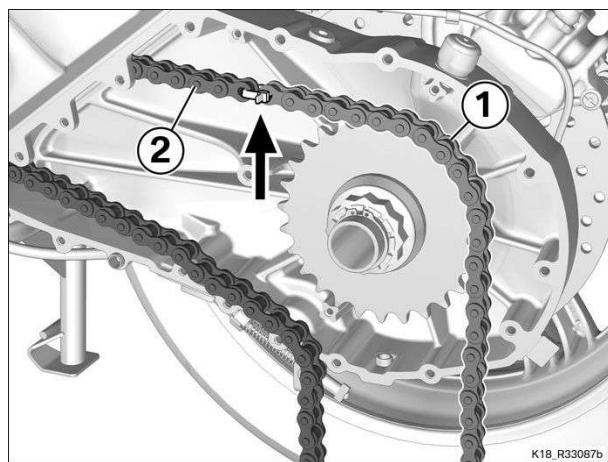
(-) Replacing shaft sealing ring in swinging-arm cover



- Use a suitable tool to remove shaft sealing ring (1).
- Drive in a new shaft sealing ring (1), with the open side toward the chain, until seated.

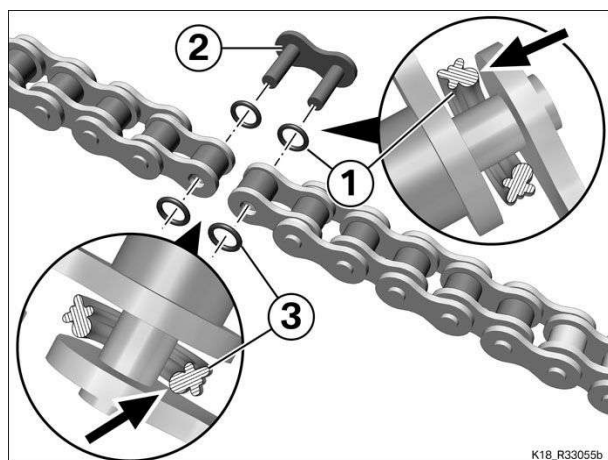
(-) Installing chain

- Attach new chain (1) to old chain (2) with a cable tie (arrow), making sure that the **lock of the cable tie is facing toward the outside**.
- Pull new chain (1) over front pinion, cut through the cable tie and

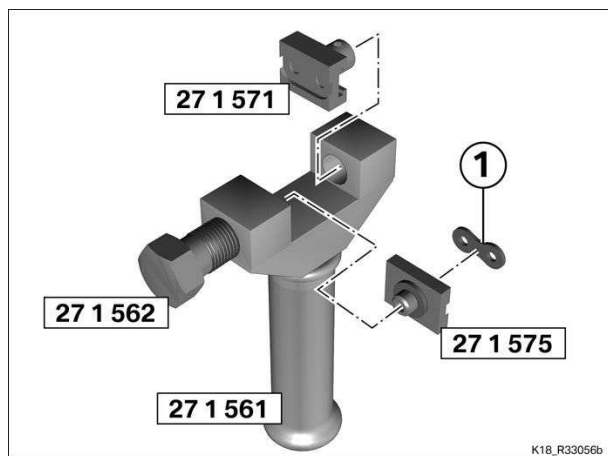


remove old chain (2).

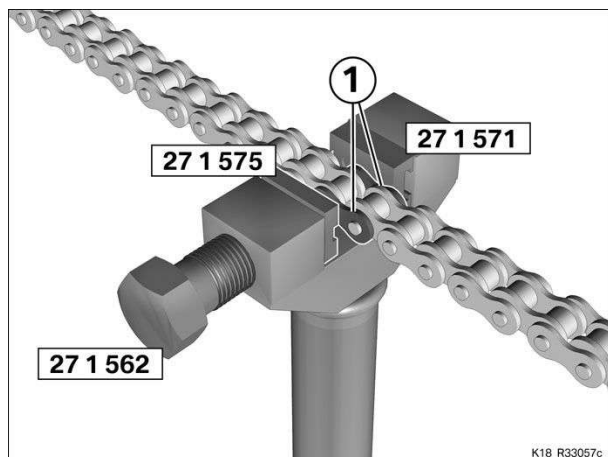
(-) Joining chain



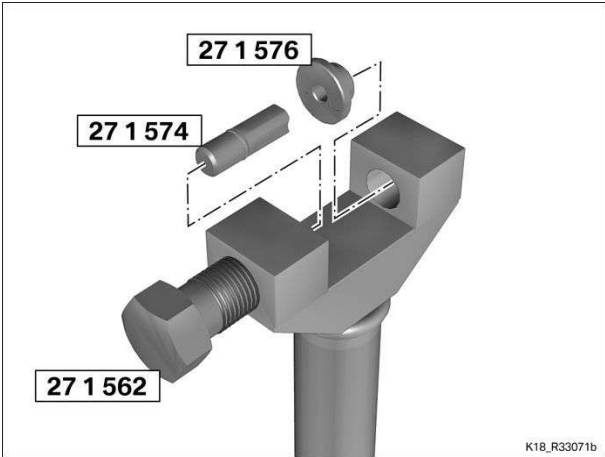
- Seat sealing rings (1) on chain joining link (2), with the **thick sealing bead (arrow)** toward the **outside link plate** of chain joining link (2).
- Insert chain joining link (2).
- Install sealing rings (1), **thick sealing bead (arrow)** facing out.



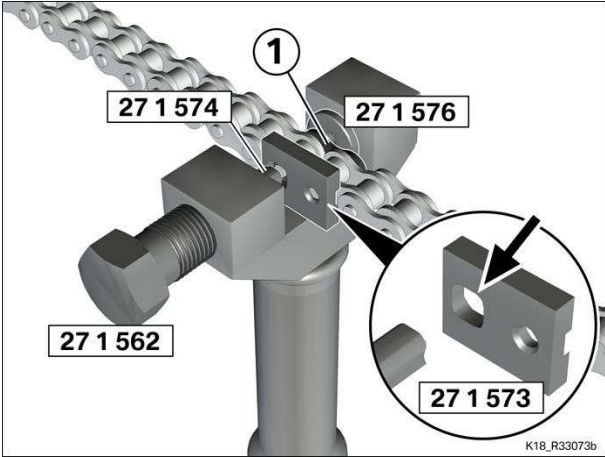
- Position insert (No. 27 1 571) in chain splitting and joining tool (No. 27 1 561).
- Position outside link plate of chain joining link (1) in insert (No. 27 1 575).
- Position insert (No. 27 1 575) in thrust screw (No. 27 1 562).



- Seat chain joining link (1) with insert (No. 27 1 571) and insert (No. 27 1 575).
- Tighten thrust screw (No. 27 1 562) until fully tightened.
- Back off the thrust screw and remove insert (No. 27 1 575) and insert (No. 27 1 571).



- Insert rivet die (No. 27 1 574) in thrust screw (No. 27 1 562).
- Position insert **with bore** (No. 27 1 576) in the chain splitting and joining tool.

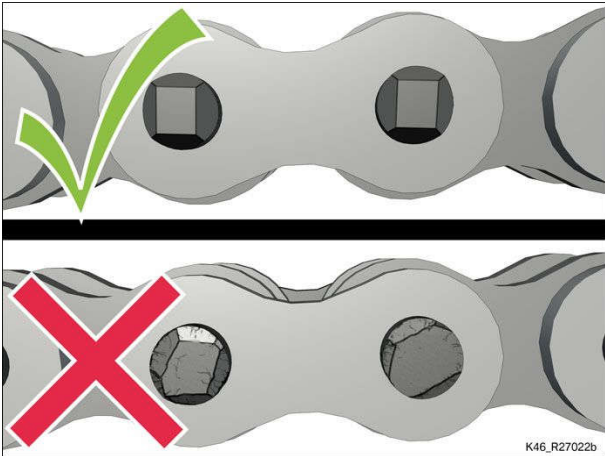


- Position insert (No. 27 1 573) **with the square head** (arrow) on chain joining link (1).
- Press-fit chain joining link (1) with rivet die (No. 27 1 574).

 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 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 joining link and again install a **new chain joining link**.



Finishing work

Installing chain slide rail

Installing top chain channel

Installing chain tensioner rail

Installing bottom chain channel

Installing swinging-arm housing cover

Pouring oil into swinging arm

Final check of work performed

33 85 001 Replacing chain slide rail

+ **33 85 501**

Construction status:

June 2014

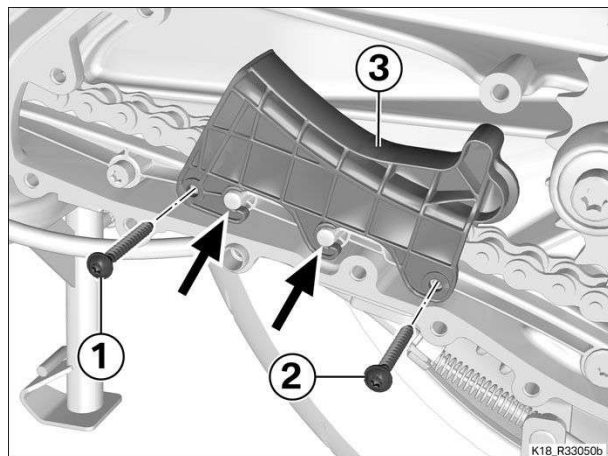
Preparatory work

Draining oil from swinging arm

Removing swinging-arm housing cover

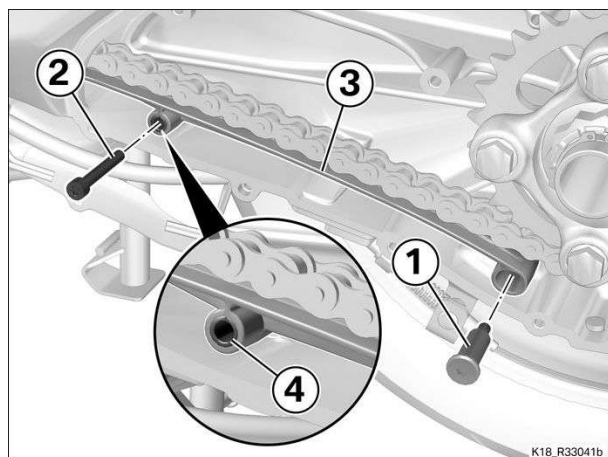
Core activity

(-) Removing bottom chain channel



- Remove screws (1) and (2).
- Disengage chain channel (3) from the holders (arrows) and remove.

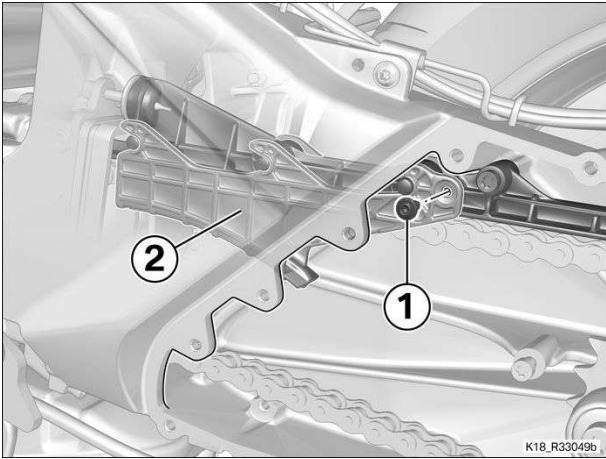
(-) Removing chain tensioner rail



- Remove screws (1) and (2).
- Remove chain tensioner rail (3), noting sleeve (4).

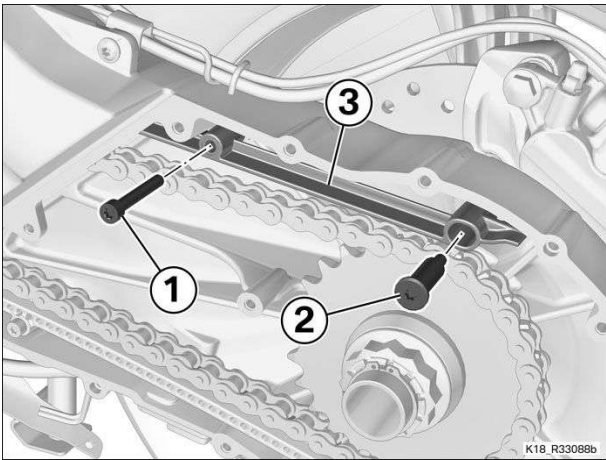
(-) Removing top chain channel

- Remove screw (1).
- Remove chain channel (2).



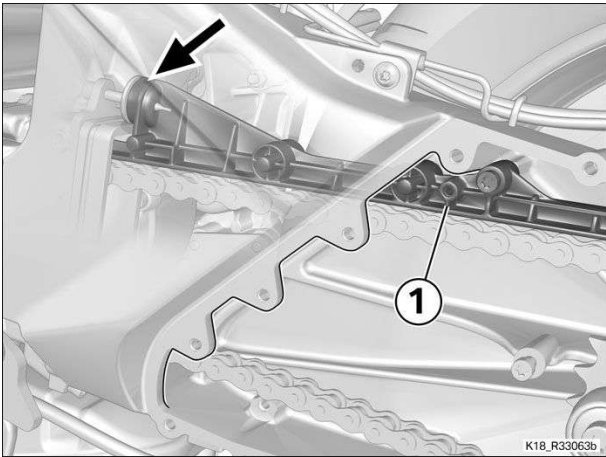
(-) Remove the chain slide rail

- Remove screws (1) and (2).
- Remove chain slide rail (3).



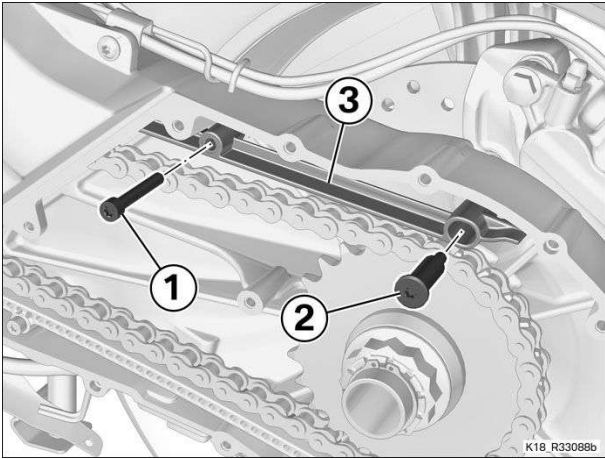
(-) Installing chain slide rail

- Clean the threads.
- Work chain slide rail (1) into position, noting the locator (arrow).



- Secure chain slide rail (3) with screws (1) and (2).

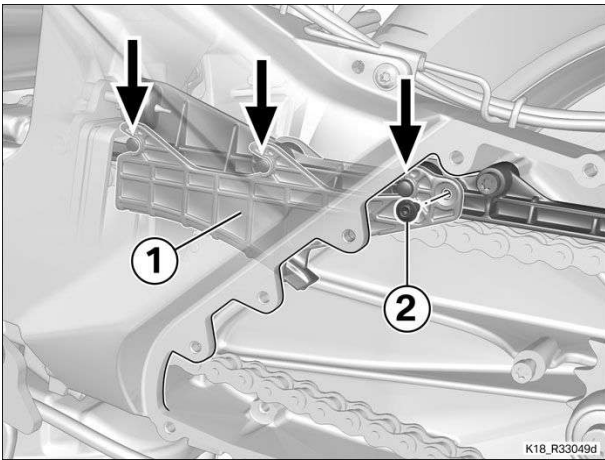
 Tightening torques		
Chain slide rail to rear wheel swinging arm		
Front, M6 x 40	8 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		



Collared screw at rear, M6	8 Nm	
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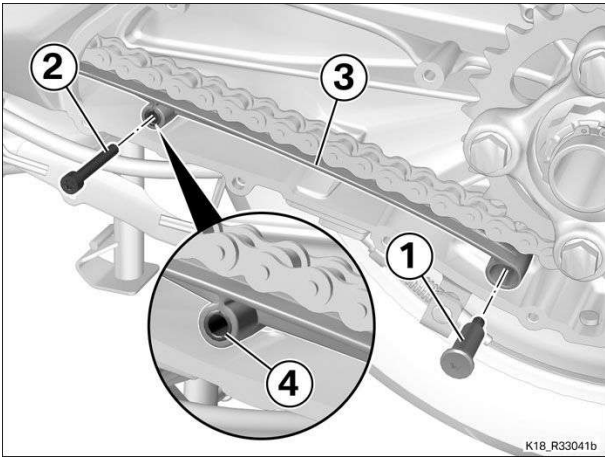
(-) Installing top chain channel

- Secure chain channel (1) in the holders (arrows).
- Install screw (2).



(-) Installing chain tensioner rail

- Clean the threads.
- Insert chain tensioner rail (3), noting sleeve (4).
- Install screws (1) and (2).



 Tightening torques		
Chain tensioner rail to rear wheel swinging arm		
Front, M6 x 40	8 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		
Collared screw at rear, M6	8 Nm	

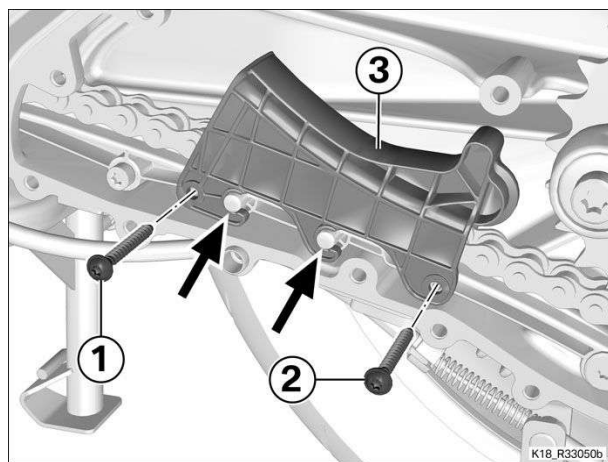
(-) Installing bottom chain channel

 ATTENTION

Re-use of chain channel after disengagement.

Loosening of threaded fasteners.

- Renew the chain channel if it has been disengaged.



Secure **new** chain channel (3) in the holders (arrows).

- Install screws (1) and (2).

Finishing work

Installing swing-arm housing cover

Pouring oil into swing arm

Final check of work performed

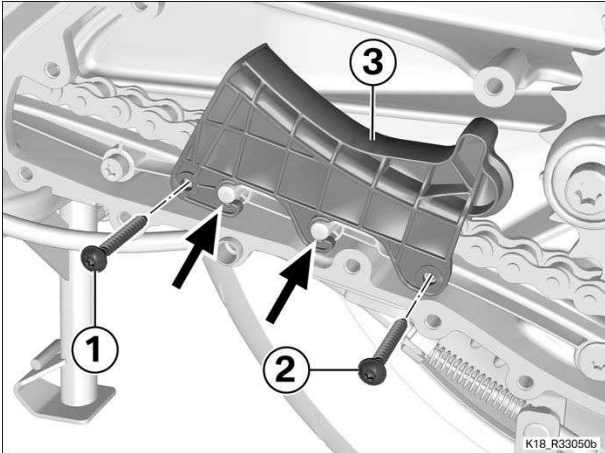
 33 85 003 Replacing chain tensioner rail
+ 33 85 508

Preparatory work

Draining oil from swinging arm
Removing swinging-arm housing cover

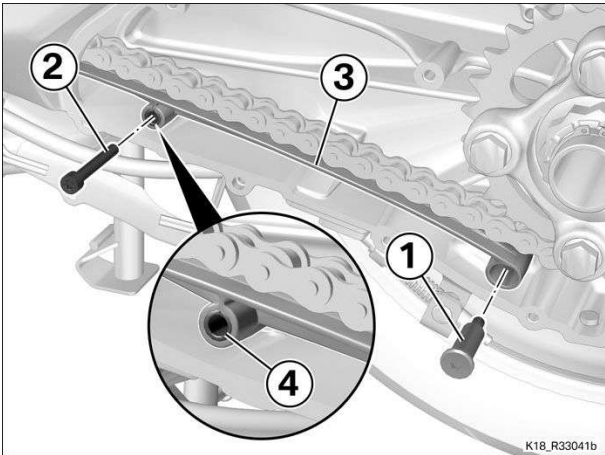
Core activity

(-) Removing bottom chain channel



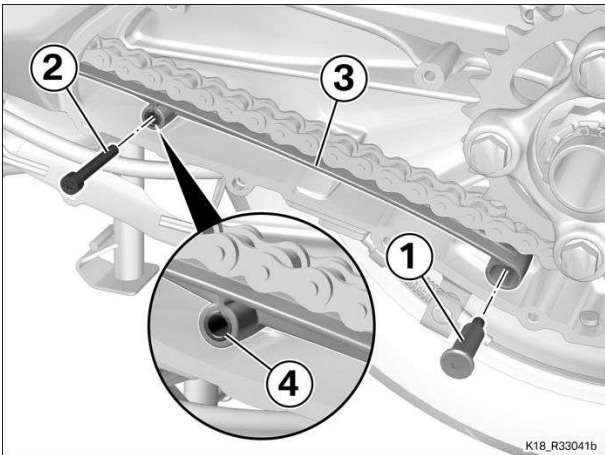
- Remove screws (1) and (2).
- Disengage chain channel (3) from the holders (arrows) and remove.

(-) Removing chain tensioner rail



- Remove screws (1) and (2).
- Remove chain tensioner rail (3), noting sleeve (4).

(-) Installing chain tensioner rail



- Clean the threads.
- Insert chain tensioner rail (3), noting sleeve (4).
- Install screws (1) and (2).

 Tightening torques		
Chain tensioner rail to rear wheel swinging arm		
Front, M6 x 40	8 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound		

(Loctite 243, Medium strength)

Collared screw at rear, M6

8 Nm

(-) Installing bottom chain channel

ATTENTION

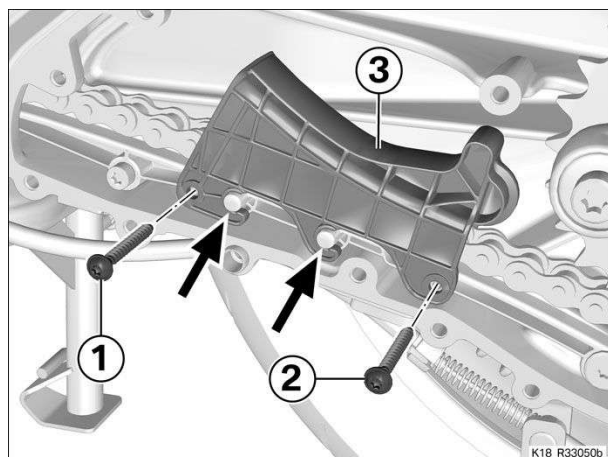
Re-use of chain channel after disengagement.

Loosening of threaded fasteners.

- Renew the chain channel if it has been disengaged.

- Secure **new** chain channel (3) in the holders (arrows).

- Install screws (1) and (2).



Finishing work

Installing swinging-arm housing cover

Pouring oil into swinging arm

Final check of work performed

34 00 010 Change brake fluid in entire system

+ 34 00 504

Core activity

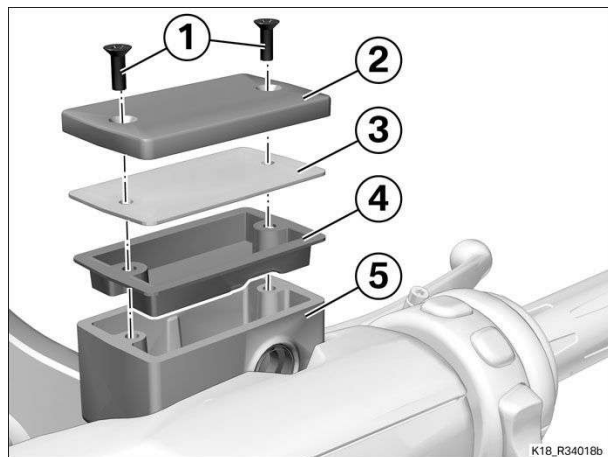
(-) Changing brake fluid, front, and bleeding brake system

- Set the brake lever to maximum span.

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.



- Remove the following components:

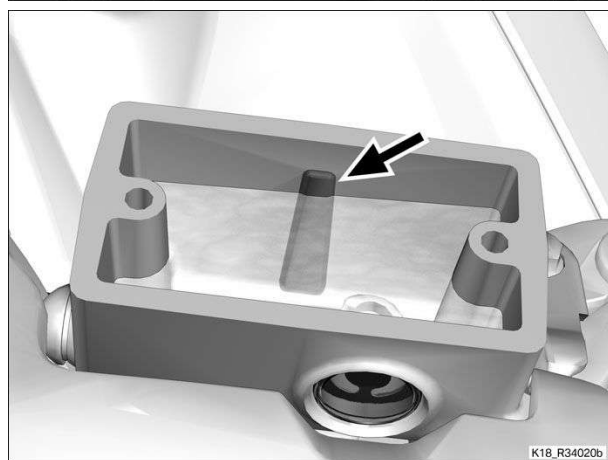
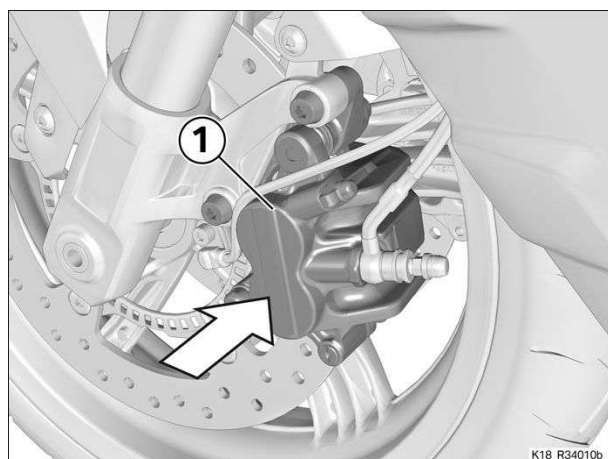
- Screws (1)
- Cover (2)
- Support plate (3)
- Diaphragm (4)

- Draw off the old fluid and clean reservoir (5).

- Push back brake caliper (1) by hand.

» The brake pistons are pushed back.

- Draw off the excess brake fluid that was forced back into the reservoir.



- Turn the handlebars to a position in which the brake fluid reservoir is horizontal.

WARNING

Brake fluid is hygroscopic.

Reduction of boiling point if stored in open container.

- Use only fresh brake fluid from an unopened container.

- Top up with fresh brake fluid to the MAX mark (arrow).

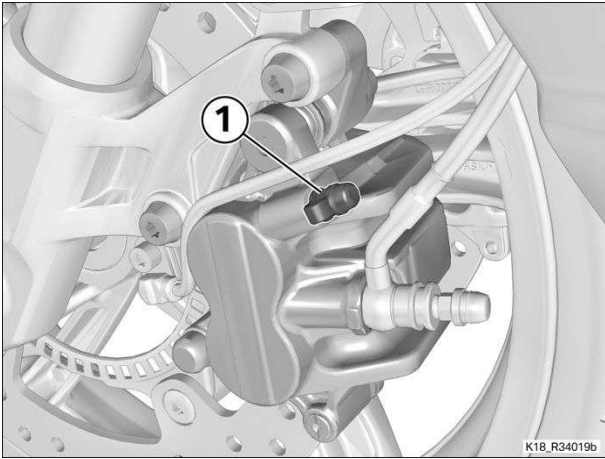


Hydraulic fluid

Brake fluid, DOT4

- Connect the brake bleeding device to bleed screw (1).

- Slightly open bleed screw (1).



 WARNING

Air bubbles difficult to recognise in brake fluid drawn off by vacuum extraction.

Air in the brake system.

- In the final step, bleed the system manually (without vacuum extraction) until the fluid emerging is bubble-free.

- Continue bleeding the brake system until fresh brake fluid emerges
- Close bleed screw (1).

 Tightening torques		
Bleed screw in filling banjo bolt/brake caliper, right		
in filling banjo bolt, M8	10 Nm	
in brake caliper, right	6 Nm	

- Repeat the fluid-change procedure/procedure for bleeding the brakes at the right brake caliper.
- Operate the brake lever to seat the brake pistons.
- Turn the handlebars to a position in which the brake fluid reservoir is horizontal.

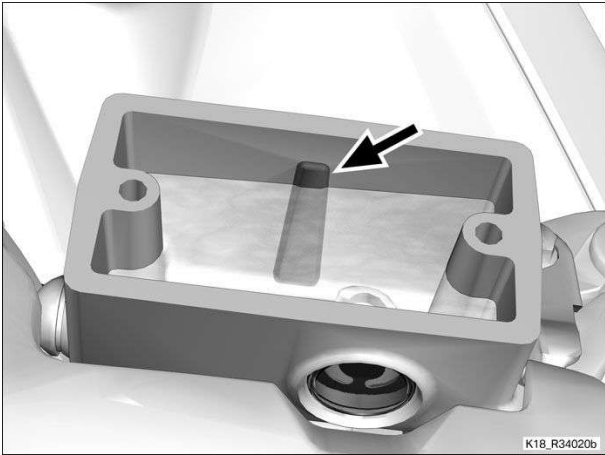
 WARNING

Brake fluid is hygroscopic.

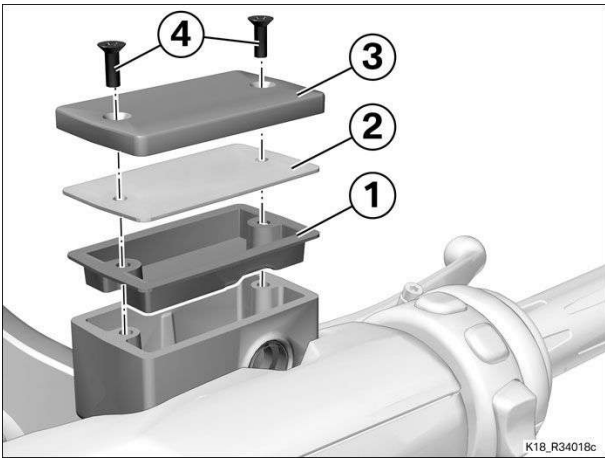
Reduction of boiling point if stored in open container.

- Use only fresh brake fluid from an unopened container.

- Top up with fresh brake fluid to the MAX mark (arrow).



 Hydraulic fluid	
Brake fluid, DOT4	



- Prior to assembly, remove all traces of brake fluid from all components.
- Install the following components:
 - Diaphragm (1)
 - Support plate (2)
 - Cover (3)
 - Screws (4)

Check

- Check brake pressure by operating the brakes.

Result:

- Low brake pressure

Measure:

- Repeat the bleeding process without vacuum extraction.

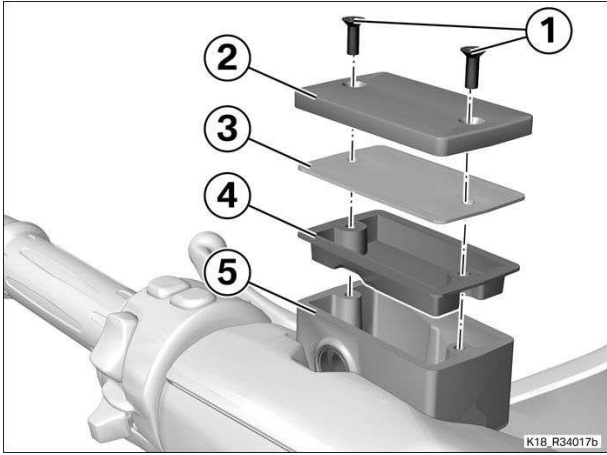
(-) Changing brake fluid, rear, and bleeding brake system

- Set the brake lever to maximum span.

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.



- Remove the following components:

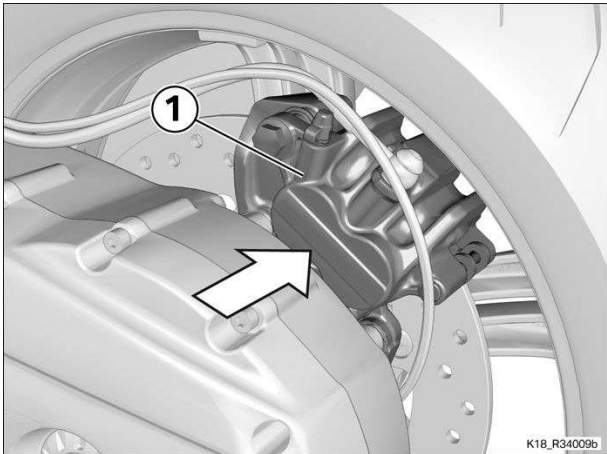
- Screws (1)
- Cover (2)
- Support plate (3)
- Diaphragm (4)

- Draw off the old fluid and clean reservoir (5).

- Push back brake caliper (1) by hand.

» The brake piston is pushed back.

- Draw off the excess brake fluid that was forced back into the reservoir.



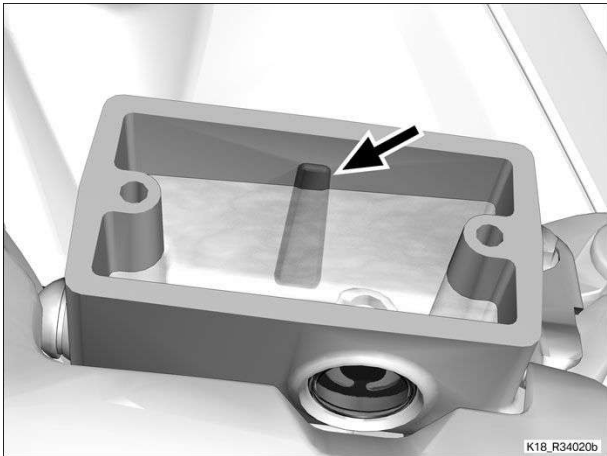
WARNING

Brake fluid is hygroscopic.

Reduction of boiling point if stored in open container.

- Use only fresh brake fluid from an unopened container.

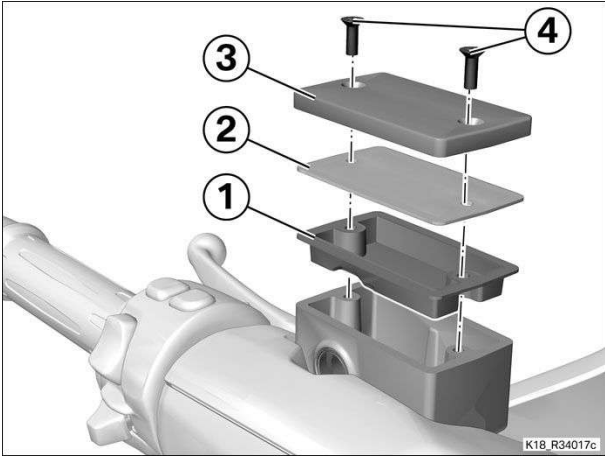
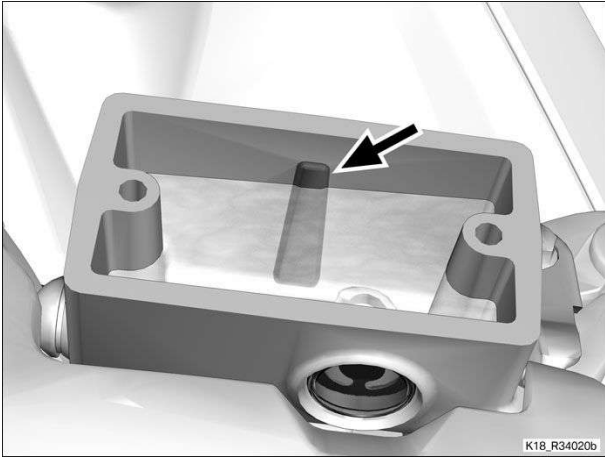
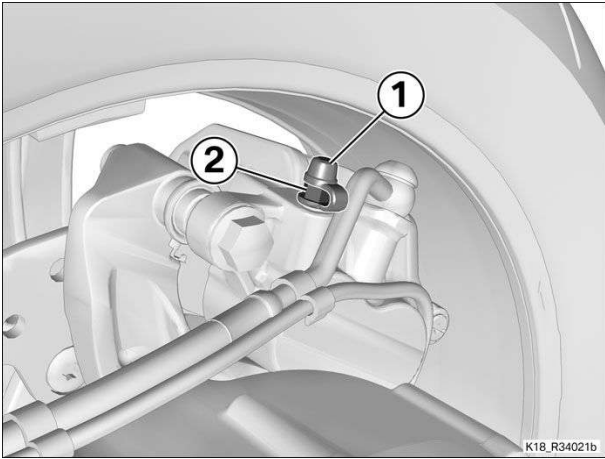
- Top up with fresh brake fluid to the MAX mark (arrow).



Hydraulic fluid

Brake fluid, DOT4

- Remove cap (1) and connect the brake bleeding device to bleed screw (2).
- Open bleed screw (2) by half a turn.
- Continue bleeding the brakes until new brake fluid emerges; top up



with fresh brake fluid as necessary.

- Close bleed screw (2) and remove the brake bleeding device.

 Tightening torques		
Bleed screw to brake caliper, rear		
	6 Nm	

- Secure cap (1).

- Operate the brake several times until the brake pads are bedded.
- Top up with fresh brake fluid to the MAX mark (arrow).

 Hydraulic fluid	
Brake fluid, DOT4	

- Prior to assembly, remove all traces of brake fluid from all components.
- Install the following components:
 - Diaphragm (1)
 - Support plate (2)
 - Cover (3)
 - Screws (4)

Check

- Check brake pressure by operating the brakes.

Result:

- Low brake pressure

Measure:

- Repeat the bleeding process without vacuum extraction.

Finishing work

Final check of work performed

34 00 033 Bleeding front brake system

+ 34 00 507

Core activity

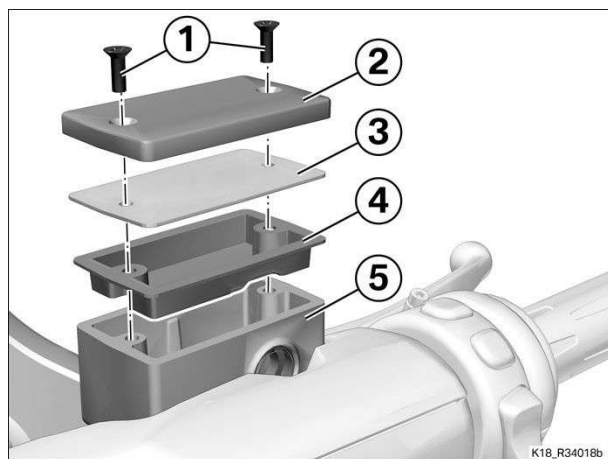
(-) Filling and bleeding front brake system

- Set the brake lever to maximum span.

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.



- Remove the following components:

- Screws (1)
- Cover (2)
- Support plate (3)
- Diaphragm (4)

- Draw off the old fluid and clean reservoir (5).

- Turn the handlebars to a position in which the brake fluid reservoir is horizontal.

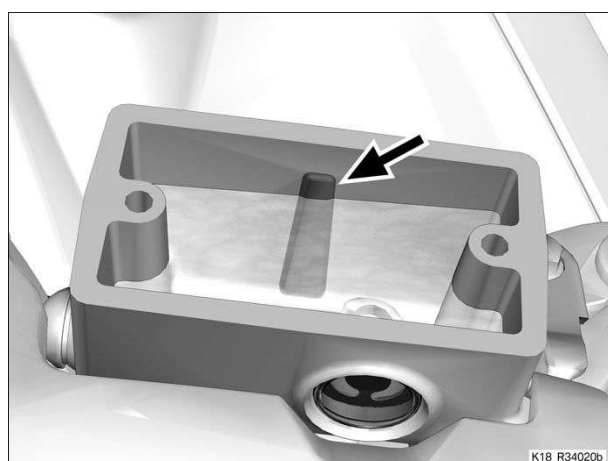
WARNING

Brake fluid is hygroscopic.

Reduction of boiling point if stored in open container.

- Use only fresh brake fluid from an unopened container.

- Top up with fresh brake fluid to the MAX mark (arrow).



Hydraulic fluid

Brake fluid, DOT4

- Connect the brake bleeding device to bleed screw (1).
- Slightly open bleed screw (1).

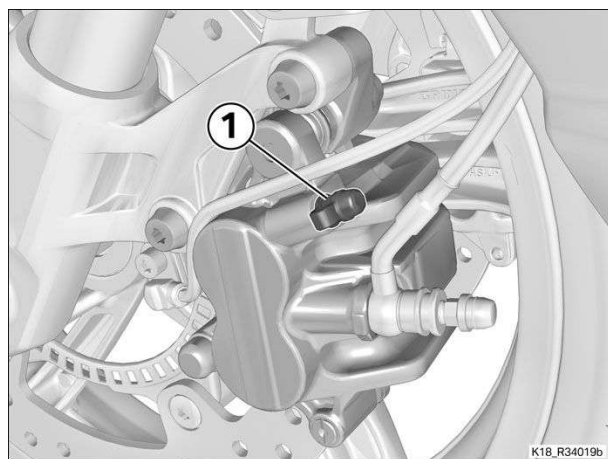
WARNING

Air bubbles difficult to recognise in brake fluid drawn off by vacuum extraction.

Air in the brake system.

- In the final step, bleed the system manually (without vacuum extraction) until the fluid emerging is bubble-free.

- Continue bleeding the brake system until fresh brake fluid emerges.
- Close bleed screw (1).



 Tightening torques		
Bleed screw in filling banjo bolt/brake caliper, right		
in filling banjo bolt, M8	10 Nm	
in brake caliper, right	6 Nm	

- Repeat the fluid-change procedure/procedure for bleeding the brakes at the right brake caliper.
- Operate the brake lever to seat the brake pistons.
- Turn the handlebars to a position in which the brake fluid reservoir is horizontal.

 WARNING

Brake fluid is hygroscopic.

Reduction of boiling point if stored in open container.

- Use only fresh brake fluid from an unopened container.

- Top up with fresh brake fluid to the MAX mark (arrow).

 Hydraulic fluid	
Brake fluid, DOT4	

- Prior to assembly, remove all traces of brake fluid from all components.
- Install the following components:
 - Diaphragm (1)
 - Support plate (2)
 - Cover (3)
 - Screws (4)

Check

- Check brake pressure by operating the brakes.

Result:

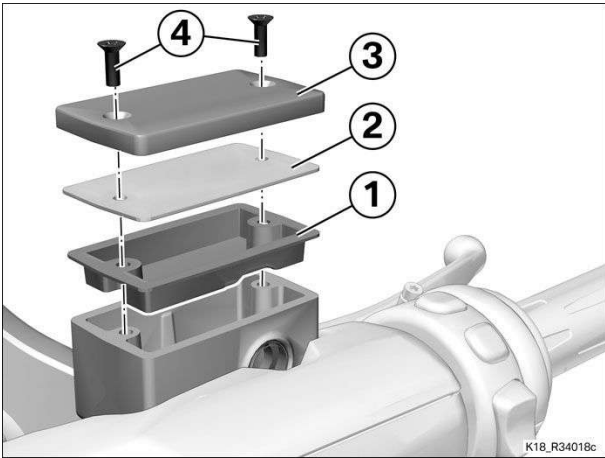
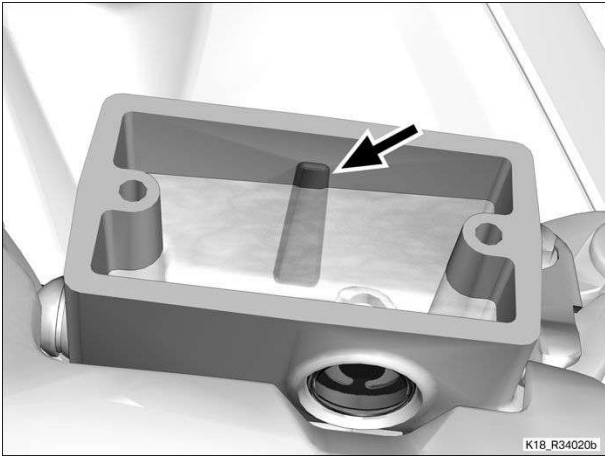
- Low brake pressure

Measure:

- Repeat the bleeding process without vacuum extraction.

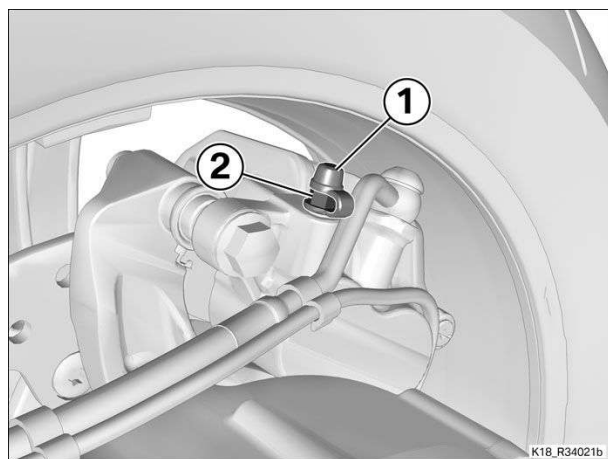
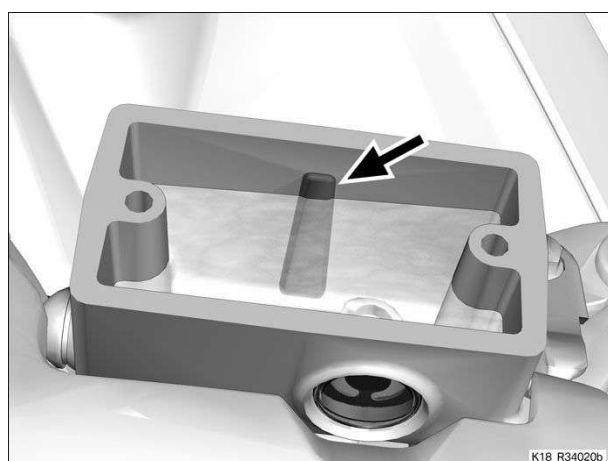
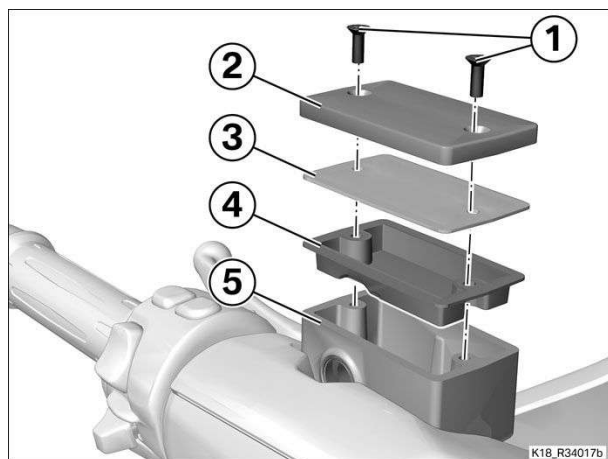
Finishing work

Final check of work performed



34 00 035 Bleeding rear brake system

+ 34 00 509



Core activity

(-) Filling and bleeding rear brake system

- Set the brake lever to maximum span.

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.

- Remove the following components:

- Screws (1)
- Cover (2)
- Support plate (3)
- Diaphragm (4)

- Draw off the old fluid and clean reservoir (5).

- Turn the handlebars to a position in which the brake fluid reservoir is horizontal.

WARNING

Brake fluid is hygroscopic.

Reduction of boiling point if stored in open container.

- Use only fresh brake fluid from an unopened container.

- Top up with fresh brake fluid to the MAX mark (arrow).



Hydraulic fluid

Brake fluid, DOT4	
-------------------	--

- Remove cap (1) and connect the brake bleeding device to bleed screw (2).

- Slightly open bleed screw (2).

WARNING

Air bubbles difficult to recognise in brake fluid drawn off by vacuum extraction.

Air in the brake system.

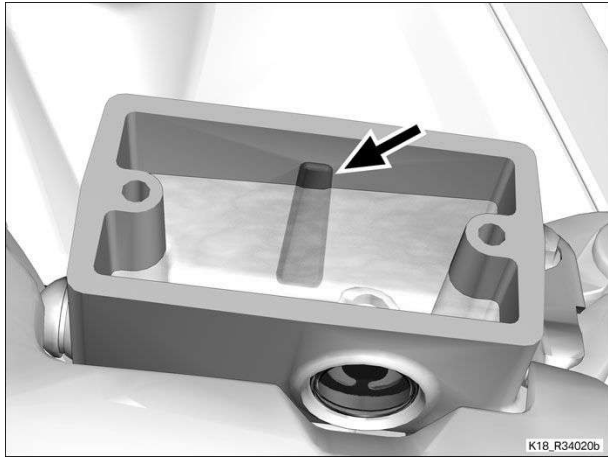
- In the final step, bleed the system manually (without vacuum extraction) until the fluid emerging is bubble-free.

- Continue bleeding the brake system until fresh brake fluid emerges.

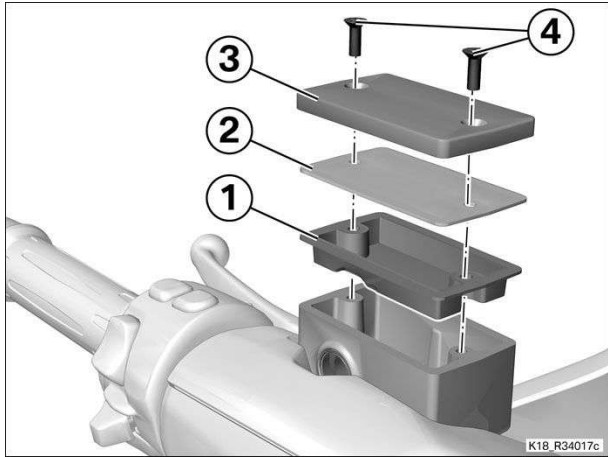
- Close bleed screw (2).

 Tightening torques		
Bleed screw to brake caliper, rear		
	6 Nm	

- Secure cap (1).
- Operate the brake lever to seat the brake pistons.
- Turn the handlebars to a position in which the brake fluid reservoir is horizontal.
- Top up with fresh brake fluid to the MAX mark (arrow).



 Hydraulic fluid	
Brake fluid, DOT4	



- Prior to assembly, remove all traces of brake fluid from all components.
- Install the following components:
 - Diaphragm (1)
 - Support plate (2)
 - Cover (3)
 - Screws (4)

Check

- Check brake pressure by operating the brakes.

Result:

- Low brake pressure

Measure:

- Repeat the bleeding process without vacuum extraction.

Finishing work

Final check of work performed

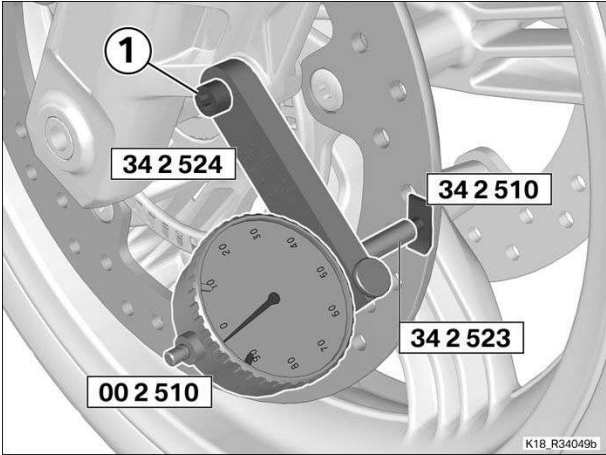
 34 11 001 Measuring front brake-disc run-out
+ 34 11 844

Preparatory work

- Installing engine lifter
- Removing both brake calipers

Core activity

(-) Measuring front brake-disc runout



- Raise the front wheel clear of the ground so that it can turn freely.
- Clean the brake disc.
- Seat dial gauge (No. 00 2 510) in dial-gauge holder (No. 34 2 524) and install extension (No. 34 2 523) and measuring adapter (No. 34 2 510).
- Position the dial-gauge holder on the brake caliper mount and install screw (1).
- Align dial gauge in such a way that the measuring adapter 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 runout.

 Technical data			
Brake disc lateral runout, front	At circumference	max 0.15 mm	

Result:

- Lateral runout is excessive.

Measure:

- Check positioning of the brake disc/wheel rim.
- Check the wheel rim for damage.
- If necessary, check the brake disc.

Finishing work

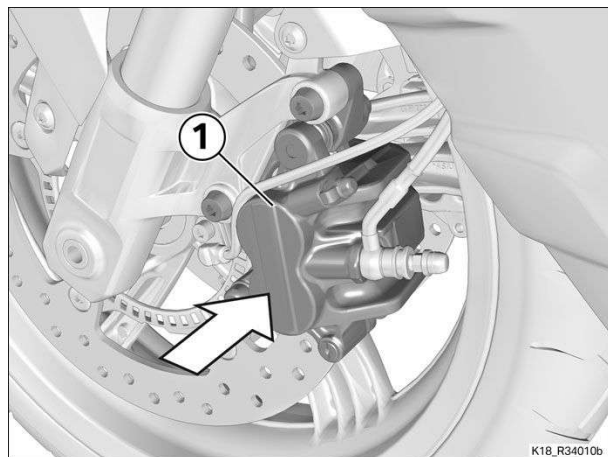
- Securing both brake calipers
- Removing engine lifter
- Final check of work performed

34 11 008 Replacing front brake pads

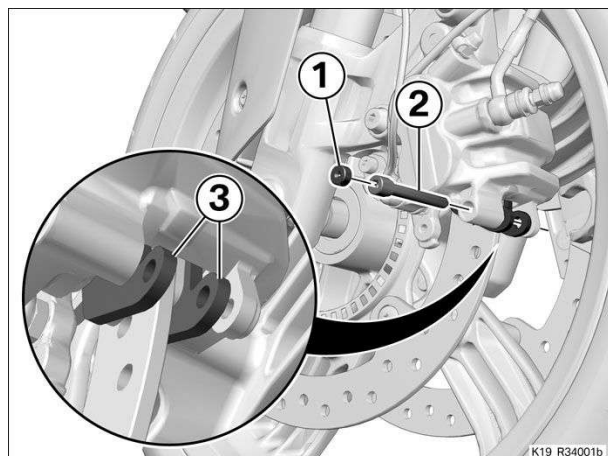
+ 34 11 832

Core activity

(-) Removing front brake pads



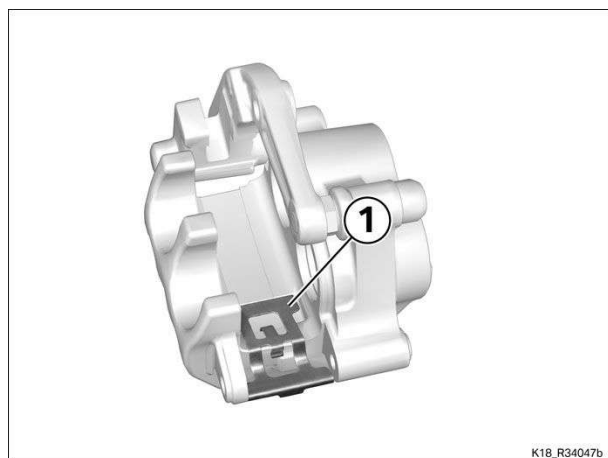
- Press back brake caliper (1).
- » The brake pistons are pushed back.



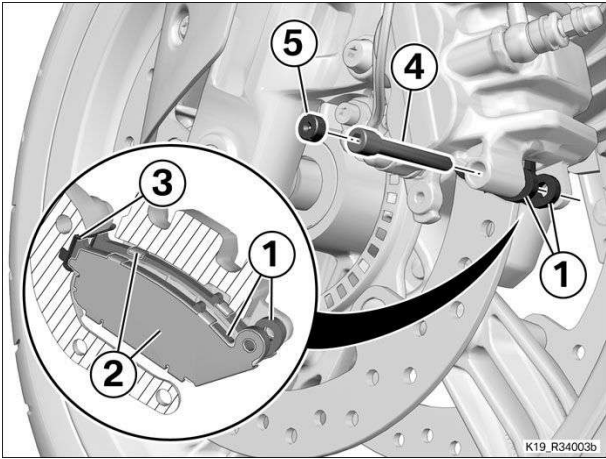
- Remove the following components:
 - Threaded plug (1)
 - Pin (2)
 - Brake pads (3)

- Remove the brake pads on the right-hand side in the same way.

(-) Installing front brake pads



- Note plate (1).
- Install brake pads (1), noting plates (2) and (3).
- Install pin (4) and threaded plug (5).



 Tightening torques		
Pad retaining pin to brake caliper		
M10 x 1	17 Nm	
Threaded plug (pad retaining pin) to brake caliper		
M10 x 1	2.5 Nm	

- Install the brake pads on the right-hand side in the same way.

Finishing work

Bedding in brake pads

Final check of work performed

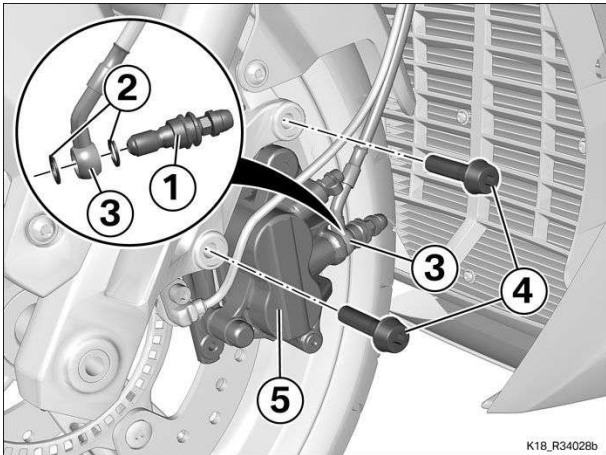
 34 11 060 Replacing front brake caliper (without bleeding brakes)
+ 34 11 560

Preparatory work

Drain the front brake system
Removing front brake pads

Core activity

(-) Removing front brake caliper



 ATTENTION

Brake fluid on painted surfaces, plastic and rubber components.

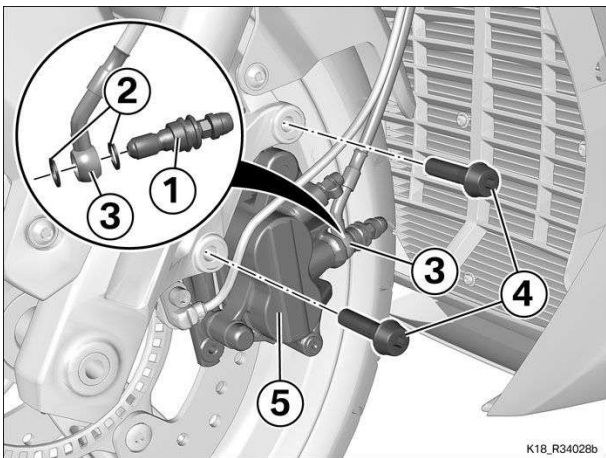
Material damage

• Do not allow brake fluid to come into contact with painted surfaces, plastic or rubber components.

- Remove banjo bolt (1) with sealing rings (2).
- Disengage brake line (3) and seal the openings.
- Remove screws (4) and remove brake caliper (5).

(-) Installing front brake caliper

- Secure brake caliper (5) with screws (4).



 Tightening torques		
Brake caliper to fork leg		
M8 x 32	28 Nm	

- 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	

Finishing work

Installing front brake pads

=> Bleeding front brake system (Description in item: 34 00 507, Billed as a separate item)

Final check of work performed

 34 21 031 Measuring rear brake-disc run-out

+ 34 21 774

Preparatory work

- Removing silencer
- Removing rear wheel
- Releasing brake caliper

Core activity

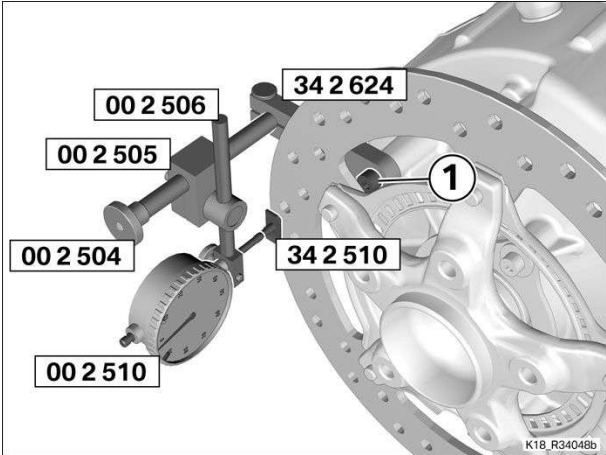
(-) Measuring rear brake-disc runout

Requirement

- No burrs or scoring on brake disc, brake disc thickness above minimum.
- No play in wheel bearing.



- Raise the rear wheel clear of the ground so that it can turn freely.
- Clean the brake disc.
- Secure the dial-gauge holder (No. 34 2 524) to the brake caliper with screw (1).
- Insert extension (No. 00 2 504) with clamping bush (No. 00 2 506) in dial-gauge holder (No. 34 2 524).
- Insert dial gauge (No. 00 2 510) into clamping bush (No. 00 2 506) and install measuring adapter (No. 34 2 510).
- Align dial gauge in such a way that the measuring adapter 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 runout.

 Technical data			
Brake disc lateral runout, rear	At circumference	max 0.15 mm	

Result:

- Lateral runout is excessive.

Measure:

- Check positioning of the brake disc/wheel rim.
- Check the wheel rim for damage.
- If necessary, check the brake disc.

Finishing work

Securing brake caliper

Installing rear wheel

Installing silencer

Final check of work performed

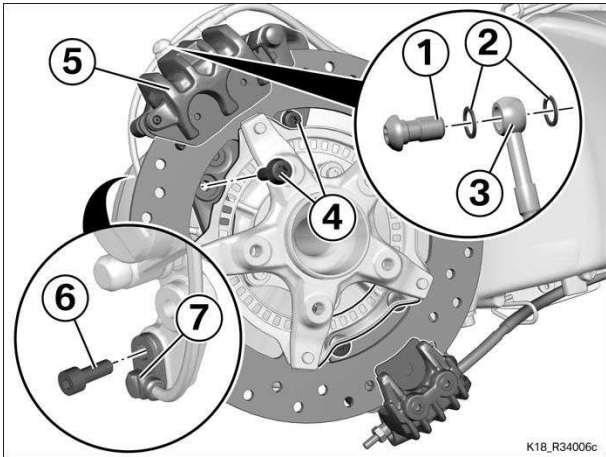
 34 21 060 Replacing rear brake caliper (without bleeding brakes)
+ 34 21 560

Preparatory work

- Draining rear brake system
- Removing silencer
- Removing rear wheel
- Removing rear brake pads

Core activity

(-) Removing rear brake caliper

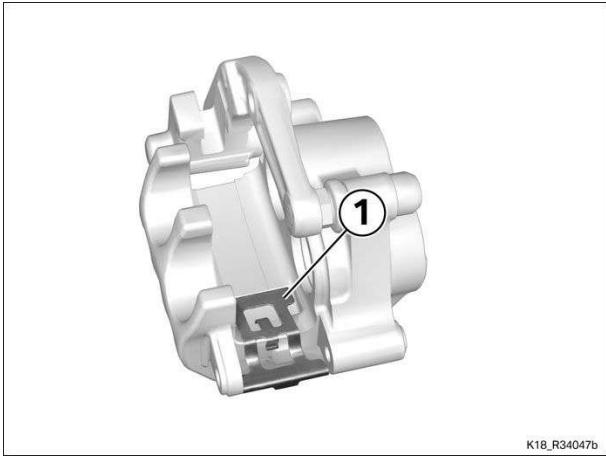


 ATTENTION

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.
-
- Remove banjo bolt (1) with sealing rings (2).
 - Disengage brake line (3) and seal the openings.
 - Remove screws (4) and remove brake caliper (5).
 - Remove screw (6) and disengage wheel-speed sensor (7).

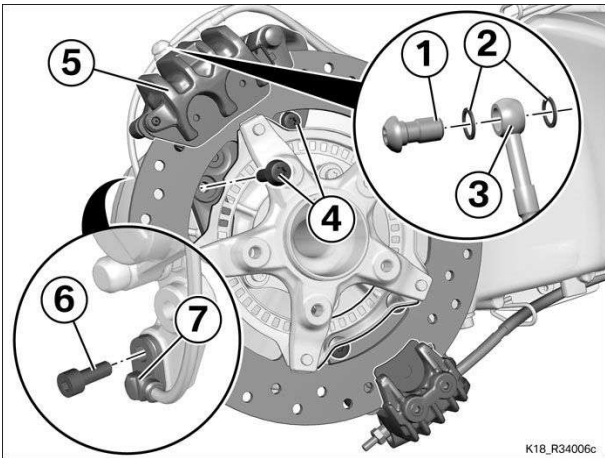
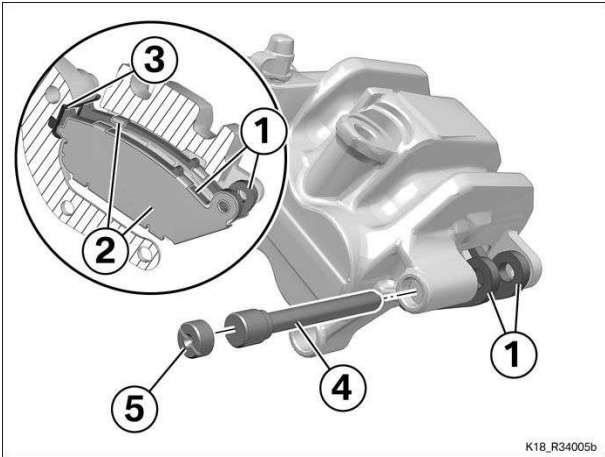
(-) Installing brake pads in rear brake caliper



- Note plate (1).

- Install brake pads (1), noting plates (2) and (3).
- Install pin (4) and threaded plug (5).

 Tightening torques		
Pad retaining pin to brake caliper		
M10 x 1	17 Nm	
Threaded plug (pad retaining pin) to brake caliper		
M10 x 1	2.5 Nm	



(-) Installing rear brake caliper

- Secure wheel-speed sensor (7) with screw (6).

 Tightening torques		
Wheel-speed sensor to fork/brake caliper, rear		
M6 x 16	8 Nm	

 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.

- Hold brake caliper (5) in position and install screws (4).

 Tightening torques		
Brake caliper, rear, to rear wheel swinging arm		
M8 x 32	28 Nm	

- Hold brake line (3) in position at brake caliper (5) and install screw (1) with new seals (2).

 Tightening torques		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	

Finishing work

Installing rear wheel

Installing silencer

=> Bleeding rear brake system (Description in item: 34 00 509, Billed as a separate item)

Final check of work performed

 34 21 195 Adjusting parking brake
+ 34 21 779

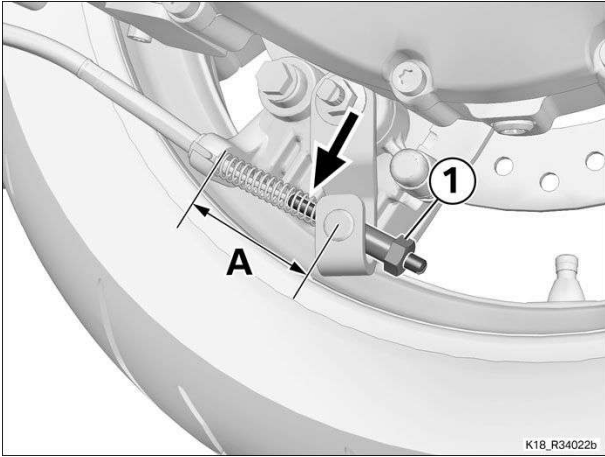
Core activity

(-) Adjusting parking brake

► **Adjust the cable for parking brake (basic setting)**

Check

- With the side stand **retracted**, measure distance **(A)**.



 Technical data			
Basic setting of parking brake	Distance from Bowden cable connection to centre of lever pivot mount with side stand retracted	56 mm	

Result:

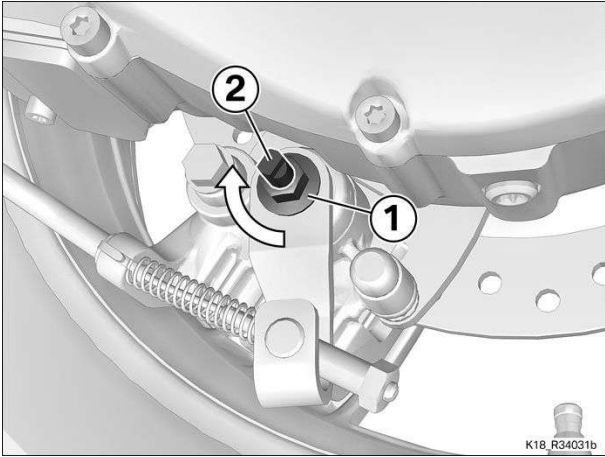
- Result not OK

Measure:

- Adjust the parking brake by turning nut **(1)**; if necessary counter-hold at the hexagon **(arrow)**.



- **Extend the side stand.**
- Slacken locknut **(1)**.
- Tighten adjusting screw **(2)** by turning it clockwise.

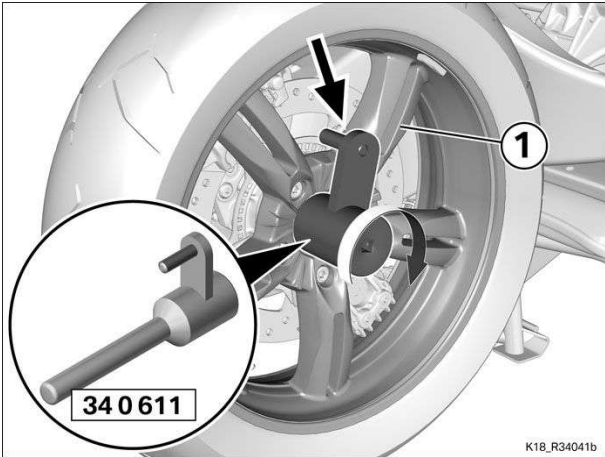


 Tightening torques		
Adjusting screw to brake caliper (parking brake)		
	1 Nm	

- Tighten locknut **(1)**, counter-holding adjusting screw **(2)** to prevent it from turning.

 Tightening torques		
Locknut (adjusting screw) to brake caliper (parking brake)		
	18 Nm	

- Install special tools **(No. 34 0 611)** in rear-wheel axle, seating the pin against the spoke **(arrow)**.
- Turn rear wheel **(1)** in the forward direction of travel by applying torque.



Check

 Technical data			
Braking effect of parking brake	measured at rear wheel with side stand extended	>180 Nm	

Result:

- Rear wheel can be turned.

Measure:

- Increase braking effect of the parking brake (slacken locknut and turn the adjusting screw clockwise)

 Tightening torques		
Locknut (adjusting screw) to brake caliper (parking brake)		
	18 Nm	

- Extend and retract the side stand 10 times, then recheck the braking effect.

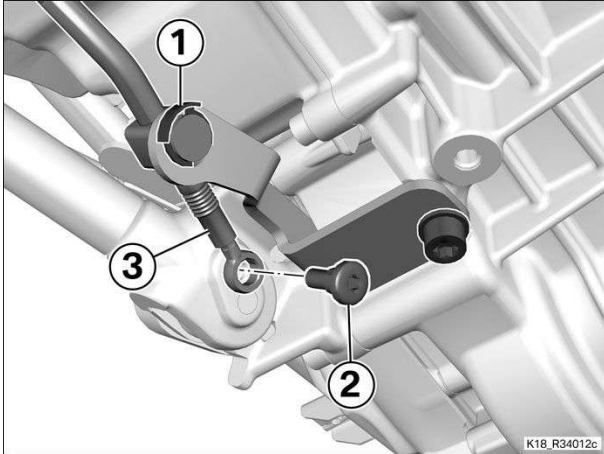
Finishing work

Final check of work performed

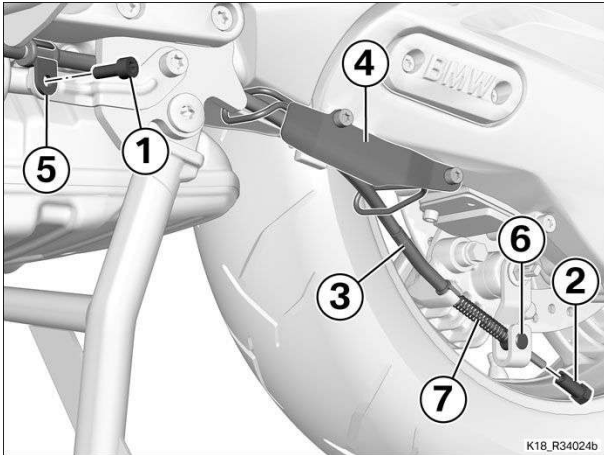
 34 21 197 Replacing Bowden cable for parking brake
+ 34 21 777

Core activity

(-) Removing Bowden cable for parking brake

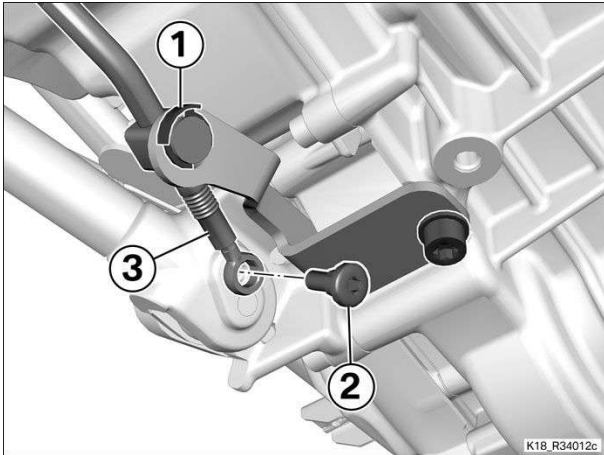


- Remove circlip (1) and screw (2).
- Disengage Bowden cable (3).



- Remove screw (1).
- Remove adjusting screw (2).
- Remove the following parts from Bowden cable (3):
 - Holder (4)
 - Holder (5)
 - Pin (6)
 - Spring (7)
- Remove Bowden cable (3).

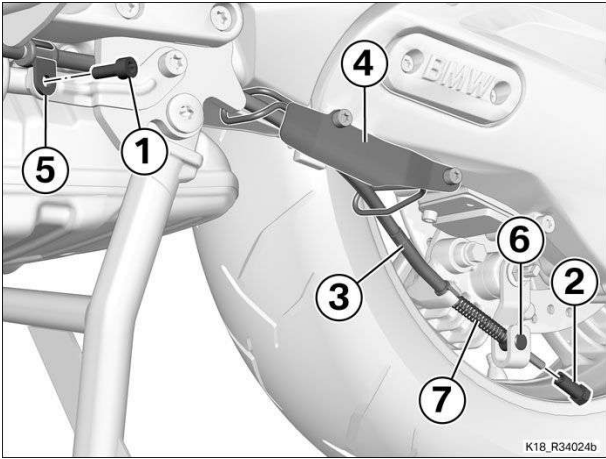
(-) Installing Bowden cable for parking brake



- Clean the threads.
- Secure Bowden cable (3) with circlip (1) and screw (2).

 Tightening torques		
Cable (parking brake) to side stand		
M6 x 16	12 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 270, High strength)		

- Seat Bowden cable (3) in bracket (4).
- Seat Bowden cable (3) in spring (7) and pin (6).
- Secure bracket (5) with screw (1).
- Install adjusting screw (2) and tighten until hand-tight.

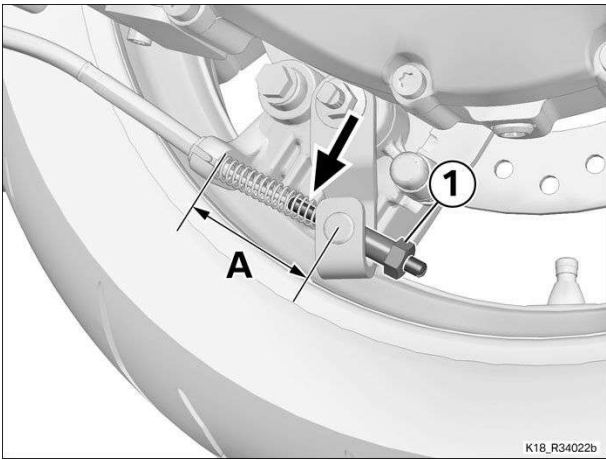


(-) Adjusting parking brake

► Adjust the cable for parking brake (basic setting)

Check

- With the side stand **retracted**, measure distance (A).



 Technical data			
Basic setting of parking brake	Distance from Bowden cable connection to centre of lever pivot mount with side stand retracted	56 mm	

Result:

- Result not OK

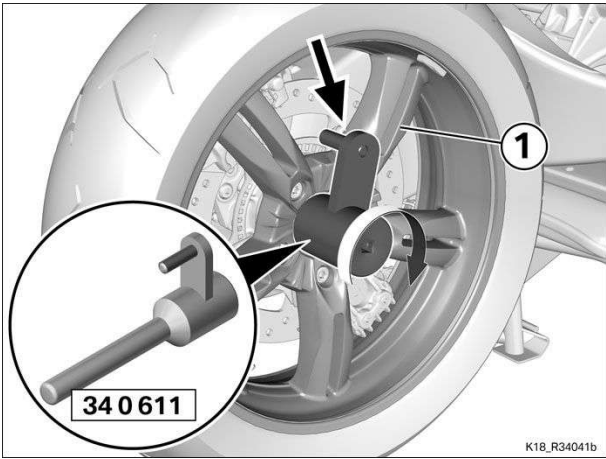
Measure:

- Adjust the parking brake by turning nut (1); if necessary counter-hold at the hexagon (arrow).

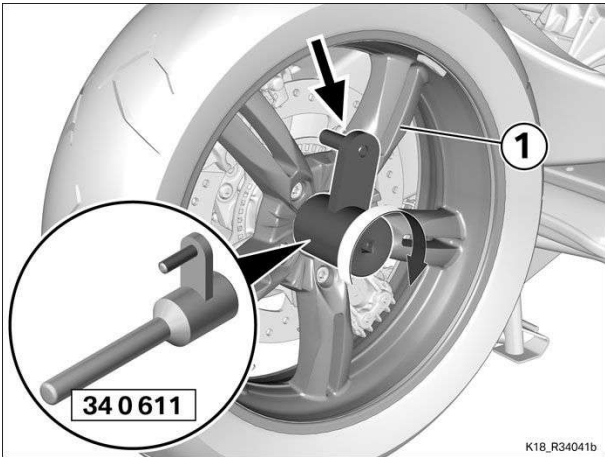
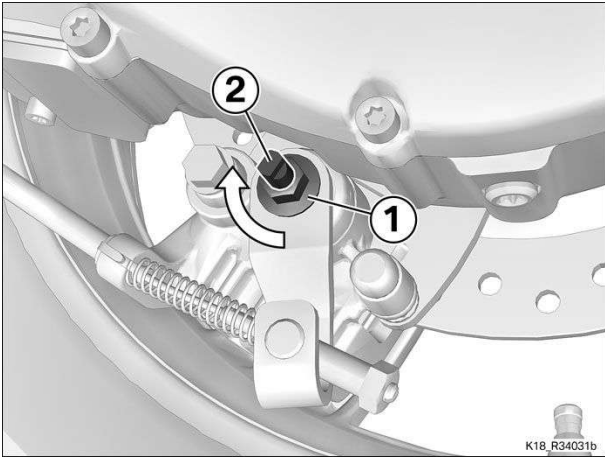


- Extend the side stand.
- Install special tools (No. 34 0 611) in rear-wheel axle, seating the pin against the spoke (arrow).
- Turn rear wheel (1) in the forward direction of travel by applying torque.

Check



 Technical data			
Braking effect of parking brake	measured at rear wheel with side stand extended	>180 Nm	



Result:

- Parking brake not working correctly.

Measure:

- Adjust the parking brake.
- **Extend the side stand.**
- Slacken locknut (1).
- Tighten adjusting screw (2) by turning it clockwise.

 Tightening torques		
Adjusting screw to brake caliper (parking brake)		
	1 Nm	

- Tighten locknut (1), counter-holding adjusting screw (2) to prevent it from turning.

 Tightening torques		
Locknut (adjusting screw) to brake caliper (parking brake)		
	18 Nm	

- Install special tools (No. 34 0 611) in rear-wheel axle, seating the pin against the spoke (arrow).
- Turn rear wheel (1) in the forward direction of travel by applying torque.

Check

 Technical data			
Braking effect of parking brake	measured at rear wheel with side stand extended	>180 Nm	

Result:

- Rear wheel can be turned.

Measure:

- Increase braking effect of the parking brake (slacken locknut and turn the adjusting screw clockwise)

 Tightening torques		
Locknut (adjusting screw) to brake caliper (parking brake)		
	18 Nm	

- **Extend and retract the side stand 10 times, then recheck the braking effect.**

Finishing work

Final check of work performed

 34 21 198 Replacing brake caliper for parking brake
+ 34 21 776

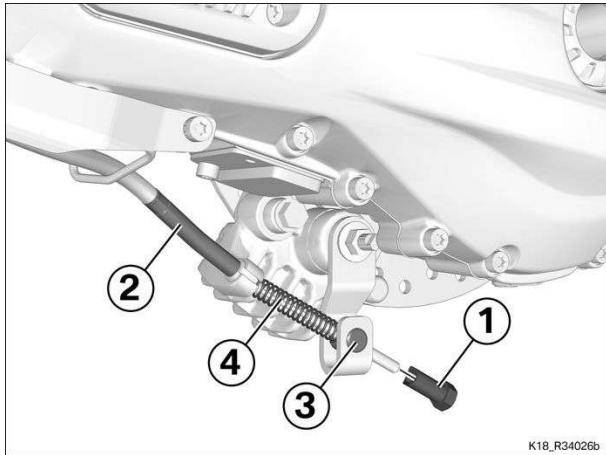
Preparatory work

Removing silencer

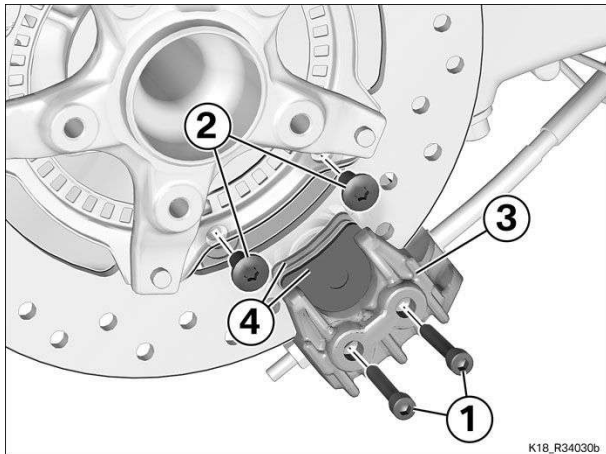
Removing rear wheel

Core activity

(-) Removing brake caliper for parking brake



- Remove adjusting screw (1).
- Disengage Bowden cable (2), remove stud (3) and spring (4).



- Remove screws (1) and (2).
- Release brake caliper for parking brake (3).
- Remove brake caliper for parking brake (3) with brake pads (4).

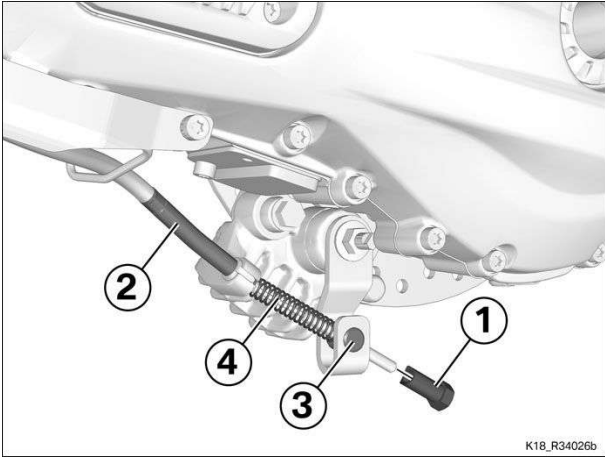
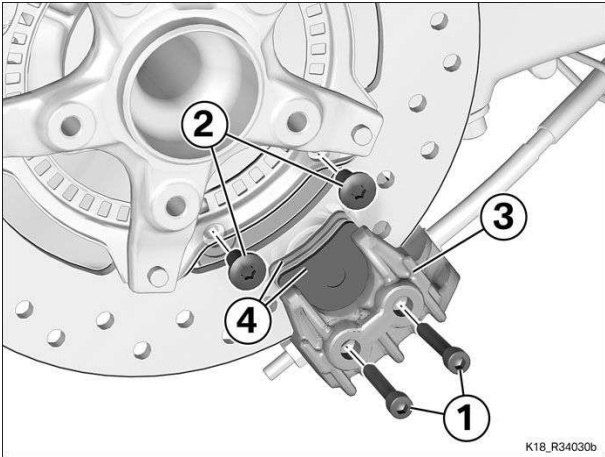
(-) Replacing brake caliper for parking brake

- Re-use the brake pads in the new part, or install new brake pads as applicable.

(-) Installing brake caliper for parking brake

- Clean the threads.
- Install brake pads (4) and install screws (1) to hold them in position.
- Hold brake caliper for parking brake (3) in position.
- Install screws (2) and (1) and tighten.

 Tightening torques		
Brake caliper (parking brake) to swinging arm		
M8 x 25	30 Nm	

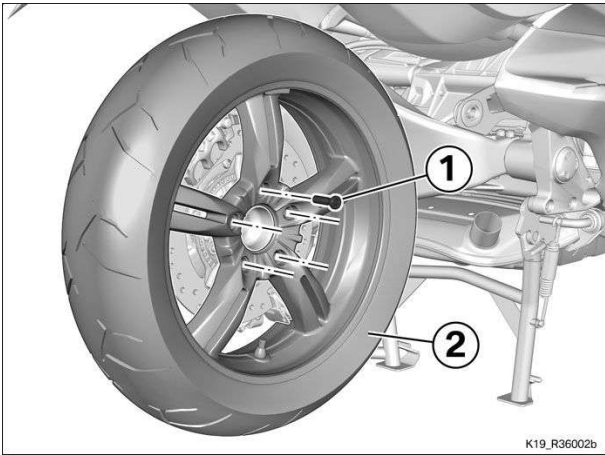


Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		
Pad retaining pins to brake caliper (parking brake)		
	18 Nm	

- Install the following components:
- Bowden cable (2)
- Spring (4)
- Pin (3)
- Adjusting screw (1)

(-) Installing rear wheel

- Hold rear wheel (2) in position and install screws (1).



Tightening torques		
Rear wheel to output shaft		
M10 x 1.25 x 40	Tighten in diagonally opposite sequence	
	60 Nm	

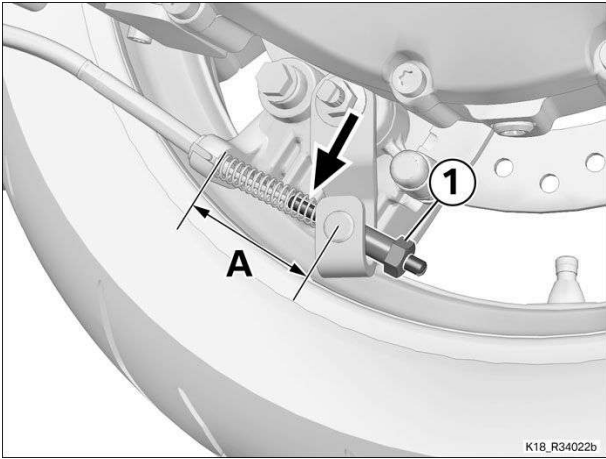
(-) Adjusting parking brake

- Adjust the cable for parking brake (basic setting)

Check

- With the side stand **retracted**, measure distance (A).

Technical data		
Basic setting of parking brake	Distance from Bowden cable	56 mm



	connection to centre of lever pivot mount with side stand retracted		
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Result:

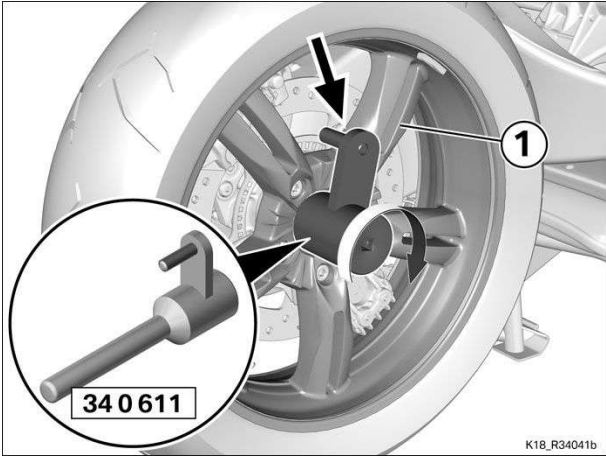
- Result not OK

Measure:

- Adjust the parking brake by turning nut (1); if necessary counter-hold at the hexagon (arrow).



- Extend the side stand.
- Install special tools (No. 34 0 611) in rear-wheel axle, seating the pin against the spoke (arrow).
- Turn rear wheel (1) in the forward direction of travel by applying torque.



Check

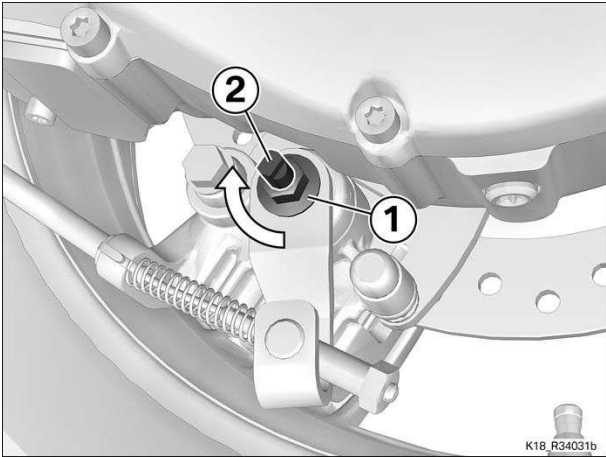
 Technical data			
Braking effect of parking brake	measured at rear wheel with side stand extended	>180 Nm	

Result:

- Parking brake not working correctly.

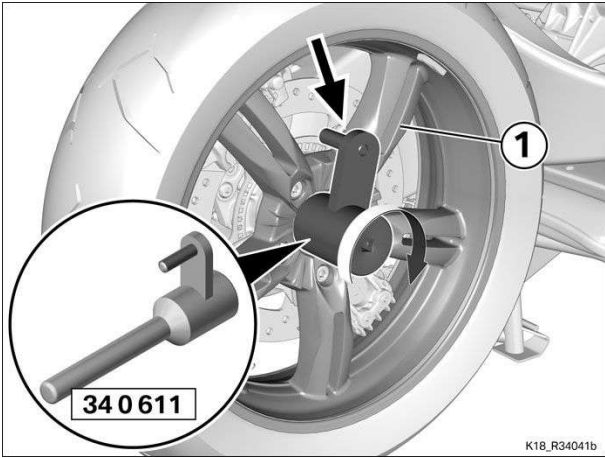
Measure:

- Adjust the parking brake.
- **Extend the side stand.**
- Slacken locknut (1).
- Tighten adjusting screw (2) by turning it clockwise.



 Tightening torques		
Adjusting screw to brake caliper (parking brake)		
	1 Nm	

- Tighten locknut (1), counter-holding adjusting screw (2) to prevent it from turning.



 Tightening torques		
Locknut (adjusting screw) to brake caliper (parking brake)		
	18 Nm	

- Install special tools (No. 34 0 611) in rear-wheel axle, seating the pin against the spoke (arrow).
- Turn rear wheel (1) in the forward direction of travel by applying torque.

Check

 Technical data			
Braking effect of parking brake	measured at rear wheel with side stand extended	>180 Nm	

Result:

- Rear wheel can be turned.

Measure:

- Increase braking effect of the parking brake (slacken locknut and turn the adjusting screw clockwise)

 Tightening torques		
Locknut (adjusting screw) to brake caliper (parking brake)		
	18 Nm	

- Extend and retract the side stand 10 times, then recheck the braking effect.

Finishing work

Installing silencer

Final check of work performed

 34 21 199 Replacing brake pads for parking brake
+ 34 21 775

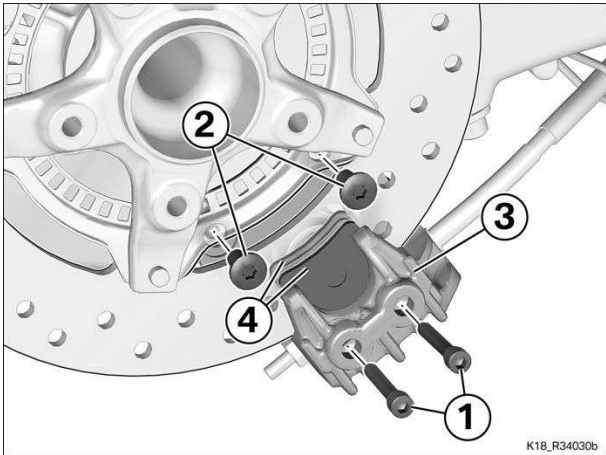
Preparatory work

Removing silencer

Removing rear wheel

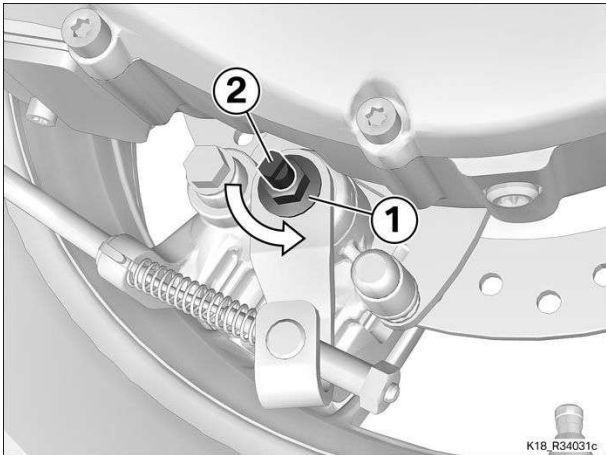
Core activity

(-) Removing brake pads

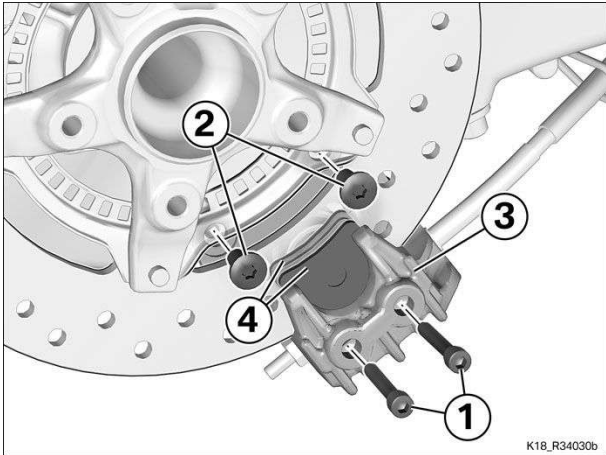


- Remove screws (1) and (2).
- Release brake caliper (3).
- Remove brake pads (4).

(-) Installing brake pads



- If brake pads do not fit into the brake caliper, back off the brake caliper:
 - Slacken locknut (1).
 - Turn adjusting screw (2) counter-clockwise to slacken.



- Clean the threads.
- Install brake pads (4) and install screws (1) to hold them in position.
- Hold brake caliper (3) in position.
- Install screws (2) and (1) and tighten.

 Tightening torques		
Brake caliper (parking brake) to swinging arm		
M8 x 25	30 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		

Pad retaining pins to brake caliper (parking brake)		
	18 Nm	

Finishing work

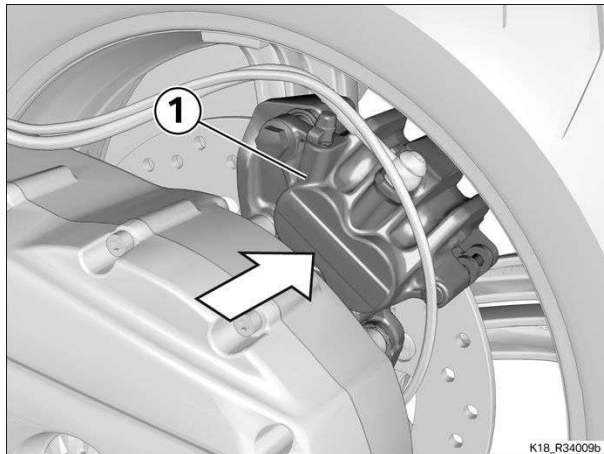
- Installing rear wheel
- Adjusting parking brake
- Installing silencer
- Final check of work performed

34 21 200 Replacing rear brake pads

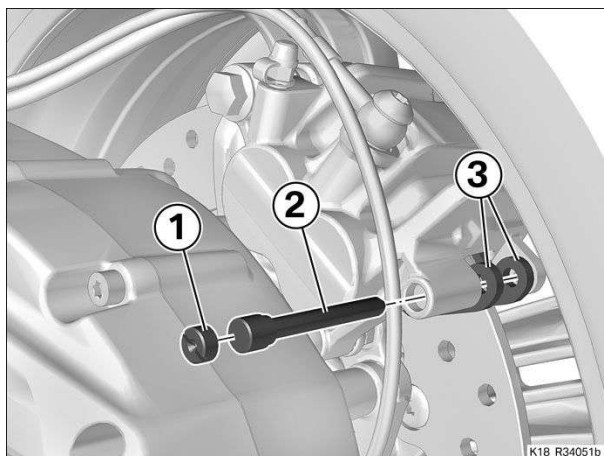
+ 34 21 769

Core activity

(-) Removing rear brake pads

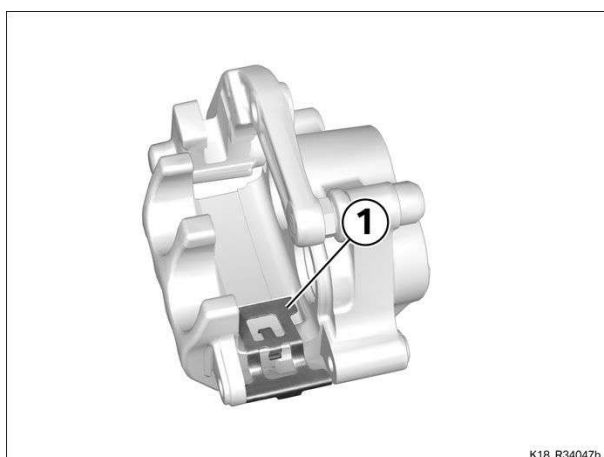


- Press back brake caliper (1).
- » The brake pistons are pushed back.



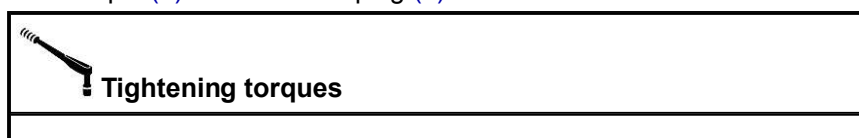
- Remove the following components:
 - Threaded plug (1)
 - Pin (2)
 - Brake pads (3)

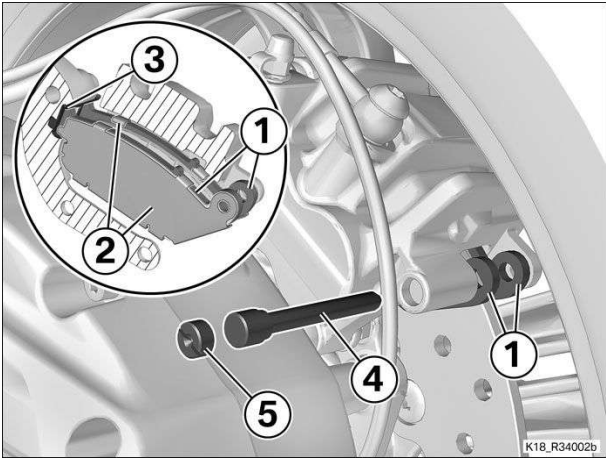
(-) Installing rear brake pads



- Note plate (1).

- Install brake pads (1), noting plates (2) and (3).
- Install pin (4) and threaded plug (5).





Pad retaining pin to brake caliper		
M10 x 1	17 Nm	
Threaded plug (pad retaining pin) to brake caliper		
M10 x 1	2.5 Nm	

- Operate the brake several times until the brake pads are bedded.

Finishing work
 Final check of work performed

34 21 301 Removing/installing rear brake disc

+ 34 21 772

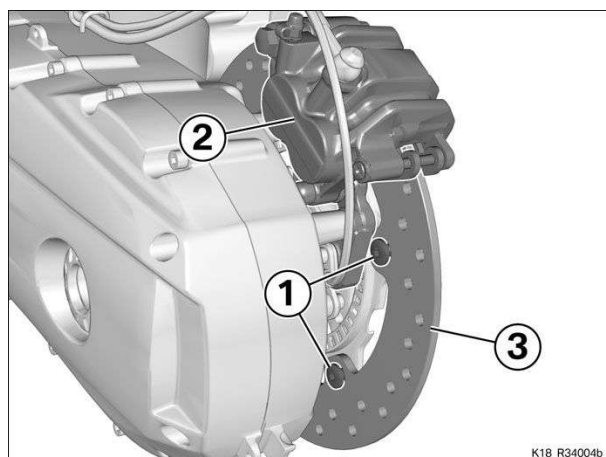
Preparatory work

Removing silencer

Removing rear wheel

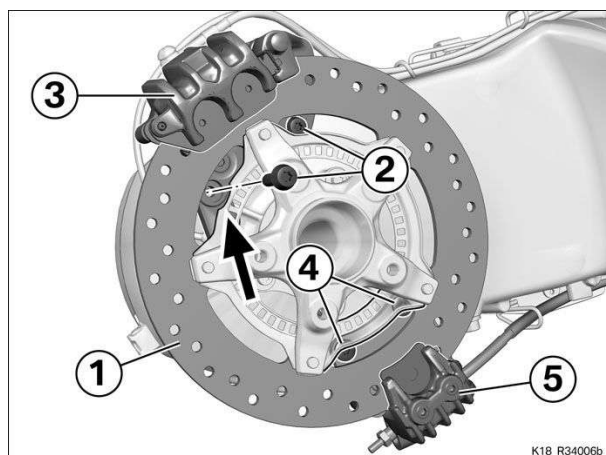
Core activity

(-) Removing brake disc

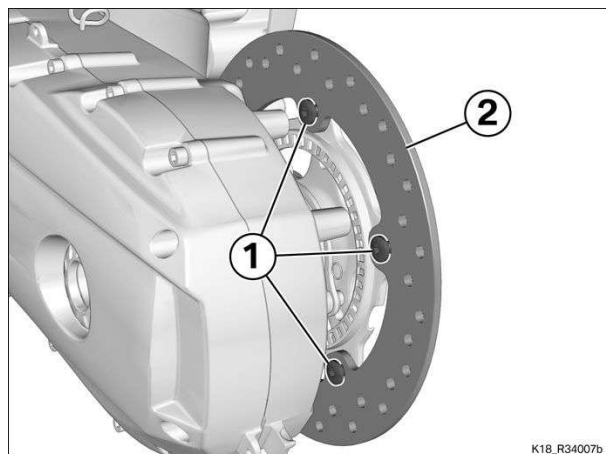


- **Slacken** screws (1) one after the other, operating rear-wheel brake (2) each time a screw has to be slackened.
- Take care to slacken screws (1) only to the extent that when brake disc (3) is turned, the screws do not come into contact with brake (2).

► Disengaging rear brake caliper and parking brake

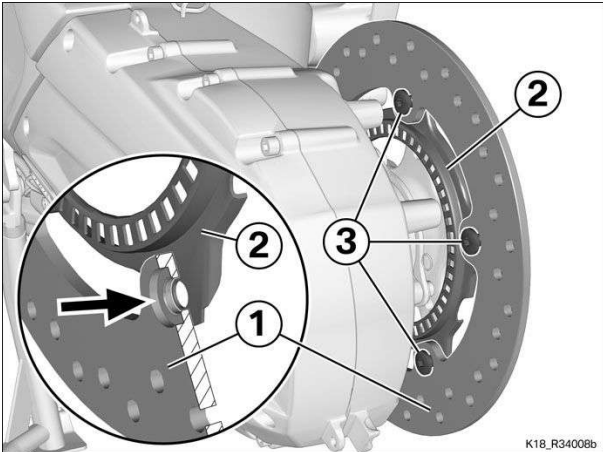


- Turn brake disc (1) until the recess (arrow) is located over one of the screws (2).
- Remove screws (2) and disengage brake caliper (3).
- Move brake caliper (3) to one side and secure it so that it cannot fall.
- Remove screws (4) in the same way and disengage parking brake (5).



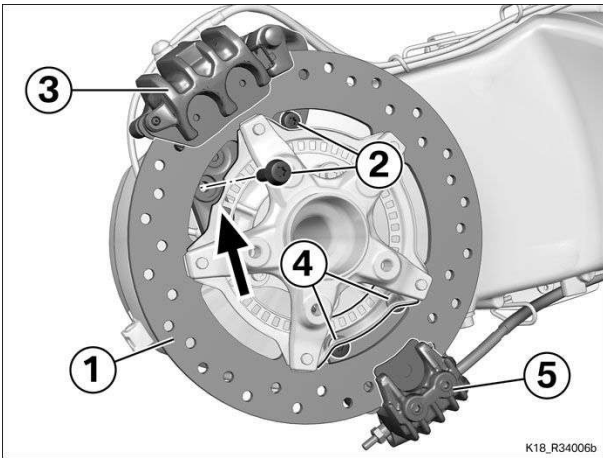
- Remove screws (1) one after the other and remove brake disc (2).

(-) Installing rear brake disc



- Clean the threads.
- Clean the mating faces of brake disc (1).
- Place brake disc (1) with sensor ring (2) in position, the shoulder (arrow) is up.
- Install **new** screws (3) one after the other and tighten until hand-tight.

► **Securing rear brake caliper and parking brake**



- Place brake caliper (3) in position.
- Turn brake disc (1) until the recess (arrow) is located over one of the screws (2).
- Install screws (2).

Tightening torques		
Brake caliper, rear, to rear wheel swinging arm		
M8 x 32	28 Nm	

- Place parking brake (5) in position and install screws (4) in the same way.

Tightening torques		
Brake caliper (parking brake) to swinging arm		
M8 x 25	30 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		

- After completing all work, operate the brake until the brake pads are bedded.

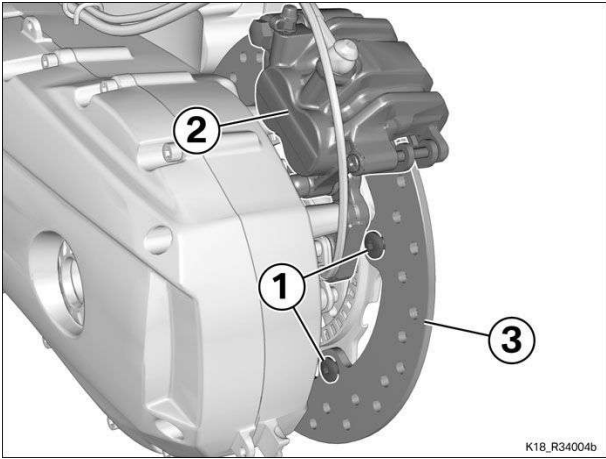


- When turning brake disc (3) make sure that screws (1) do not come into contact with brake (2).
- Tighten screws (1) one after the other.

NOTICE

Operating the side stand / parking brake can block the output shaft.

Tightening torques		
Brake disc to wheel flange		
M8 x 15.5, Replace screw	tighten in	



Thread-locking compound (Micro-encapsulated)	diagonally opposite sequence	
	1st tightening torque, 12 Nm	
	2nd tightening torque, 30 Nm	

Finishing work

- Installing rear wheel
- Checking basic setting and braking effect of parking brake
- Installing silencer
- Final check of work performed

36 23 001 Replacing wheel-speed sensor, front

+ 36 23 601

Preparatory work

Removing top left fairing side panel

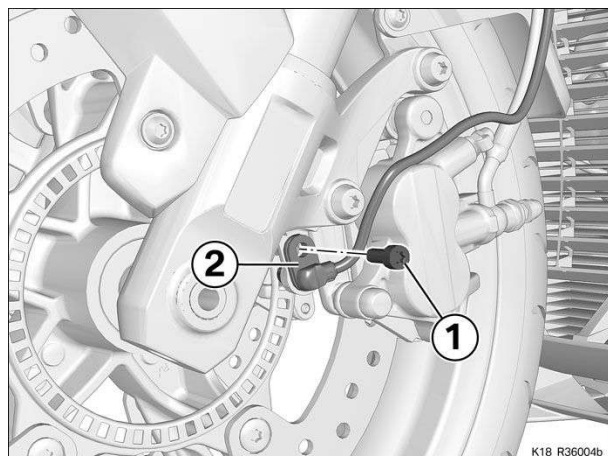
Removing front left footrest plate

Removing bottom left fairing panel

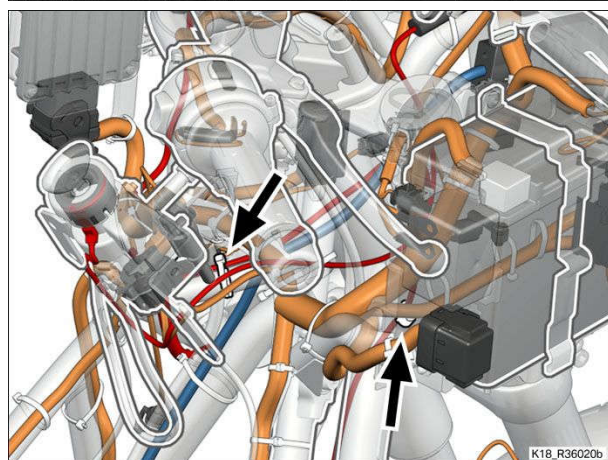
Core activity

(-) Removing wheel-speed sensor

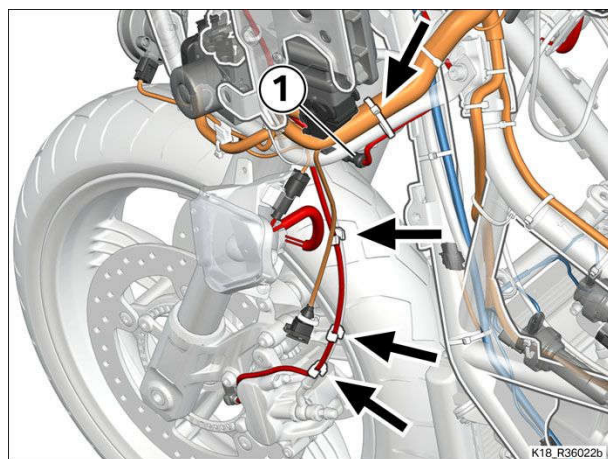
- Remove screw (1) and disengage wheel-speed sensor (2).



- Release the sensor cable (arrows).

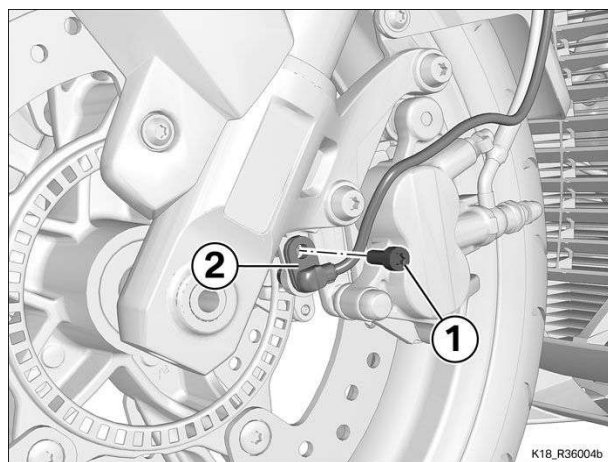


- Release the sensor cable (arrows).
- Disconnect plug (1) for the wheel-speed sensor and remove the sensor.



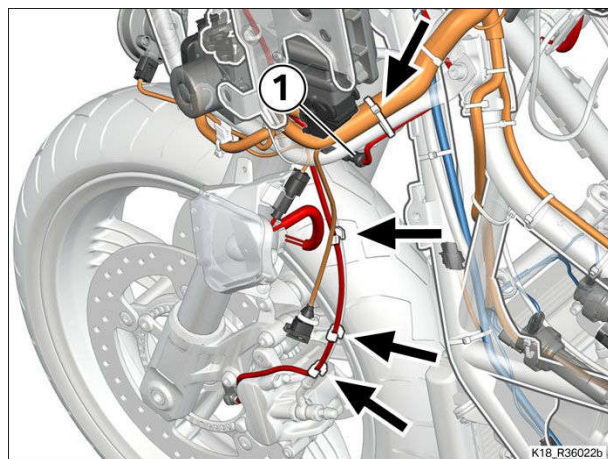
(-) Installing front wheel-speed sensor

-

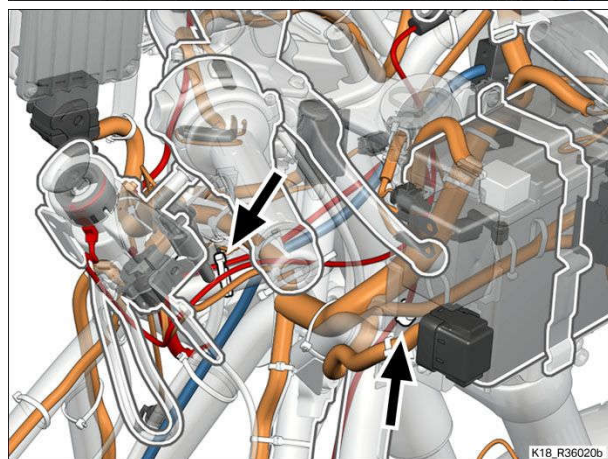


Insert wheel-speed sensor (2) and install screw (1).

 Tightening torques		
Wheel-speed sensor to fork/brake caliper, rear		
M6 x 16	8 Nm	



- Secure the sensor cable (arrows).
- Connect plug (1) for the wheel-speed sensor.



- Secure the sensor cable (arrows).

Finishing work

Installing bottom left fairing panel

Installing front left footrest plate

Installing top left side panel

Final check of work performed

 36 23 003 Replacing sensor ring, front
+ 36 23 603

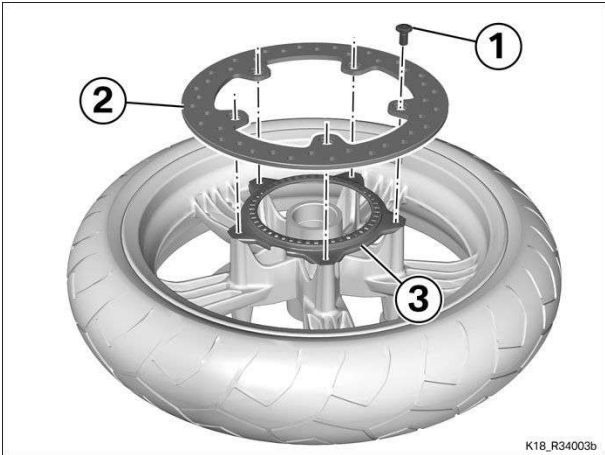
Preparatory work

- Installing engine lifter
- Removing both brake calipers
- Removing front wheel

Core activity

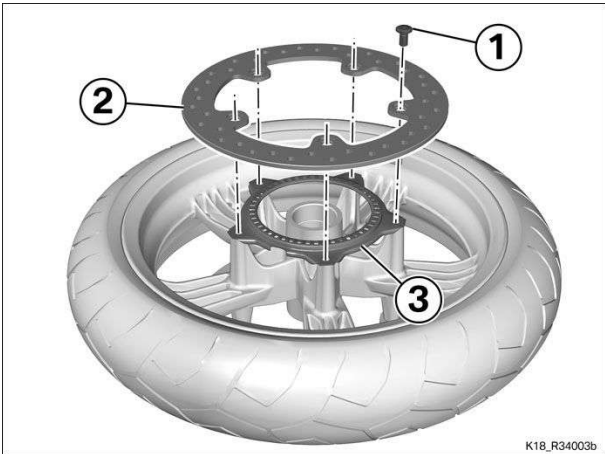
(-) Removing front sensor ring

- Remove screws (1) and brake disc (2).
- Remove sensor ring (3).



(-) Installing front sensor ring

- Clean the threads.
- Place sensor ring (3) in position.
- Install brake disc (2) and screws (1).



 Tightening torques		
Brake disc to front wheel		
M8 x 15.5, Replace screw Thread-locking compound (Micro-encapsulated)	30 Nm	

Finishing work

- Installing front wheel
- Securing both brake calipers
- Removing engine lifter
- Final check of work performed

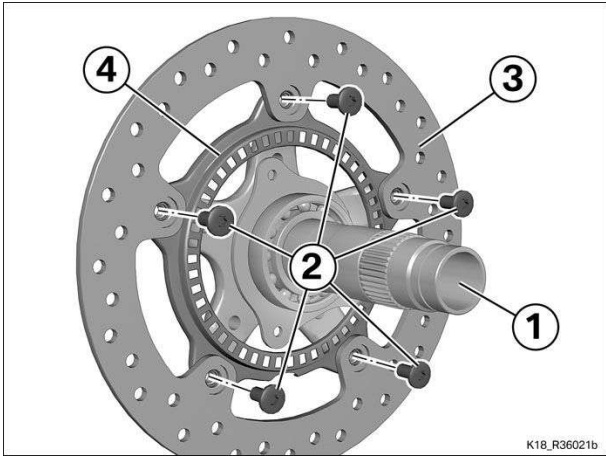
 36 23 004 Replacing sensor ring, rear
+ 36 23 604

Preparatory work

- Removing silencer
- Removing rear wheel
- Draining oil from swinging arm
- Removing swinging-arm housing cover
- Disengage the judder damper
- Disengaging rear brake caliper and parking brake
- Removing judder-damper housing and output shaft

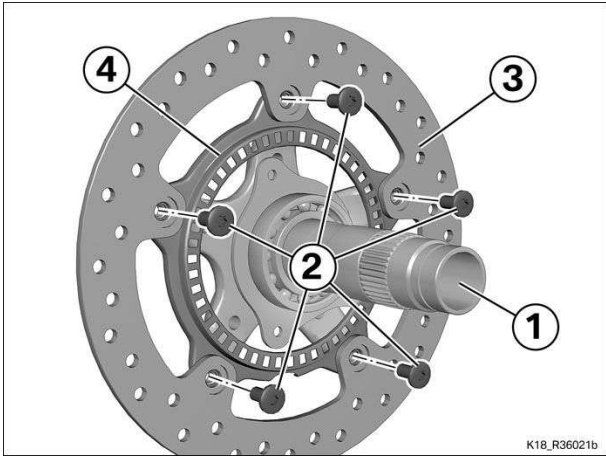
Core activity

(-) Removing rear sensor ring



- Carefully clamp drive shaft (1) in a vice fitted with aluminium jaws.
- Remove the following components:
 - Screws (2)
 - Brake disc (3)
 - Sensor ring (4)

(-) Installing rear sensor ring



- Clean the threads.
- Clean the mating faces of sensor ring (4).
- Place sensor ring (4) and brake disc (3) on shaft (1) as illustrated.
- Install screws (2).

 Tightening torques		
Brake disc to wheel flange		
M8 x 15.5, Replace screw Thread-locking compound (Micro-encapsulated)	tighten in diagonally opposite sequence	
	1st tightening torque, 12 Nm	
	2nd tightening torque, 30 Nm	

Finishing work

- Replacing shaft sealing ring in swinging arm

Installing sprocket and output shaft
Securing rear brake caliper and parking brake
Tightening judder damper
Installing swinging-arm housing cover
Pouring oil into swinging arm
Installing rear wheel
Installing silencer
Final check of work performed

 36 30 300 Removing/installing front wheel
+ 36 30 628

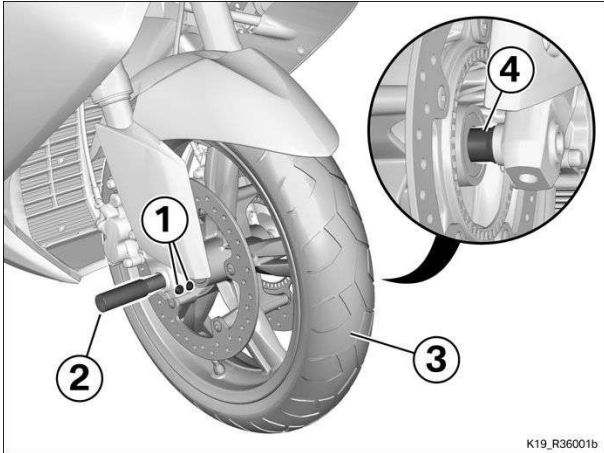
Preparatory work

Installing engine lifter

Removing both brake calipers

Core activity

(-) Removing front wheel



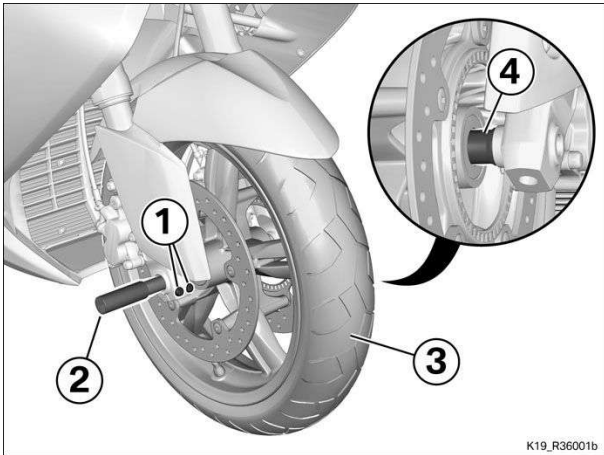
- Slacken clamping screws (1).
- Remove quick-release axle (2).

 NOTICE

Do not damage the wheel-speed sensor when removing and installing the wheel.

- Remove front wheel (3), noting spacing sleeve (4).

(-) Installing front wheel



- Clean and lubricate quick-release axle (2).

 Lubricant	
Optimoly TA	18 21 9 062 599

- Install front wheel (3), noting spacing sleeve (4).

 NOTICE

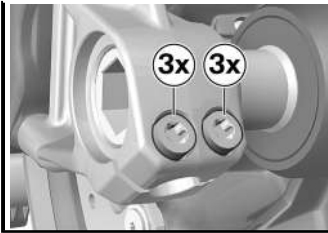
Do not damage the wheel-speed sensor when removing and installing the wheel.

- Install quick-release axle (2).

 Tightening torques		
Quick-release axle in axle holder		
M18 x 1,5	30 Nm	

- Tighten clamping screws (1).

 Tightening torques		
Clamping screws (quick-release axle) in telescopic forks		
M6 x 30	Tighten screws six times in alternate	



sequence

8 Nm

Finishing work

Securing both brake calipers

Removing engine lifter

Final check of work performed

 36 30 320 Removing/installing rear wheel
+ 36 30 629

Preparatory work

Removing silencer

Core activity

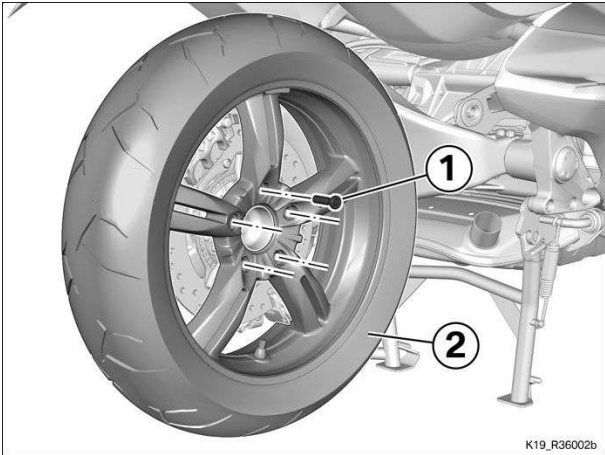
(-) Removing rear wheel

- Remove screws (1).

 NOTICE

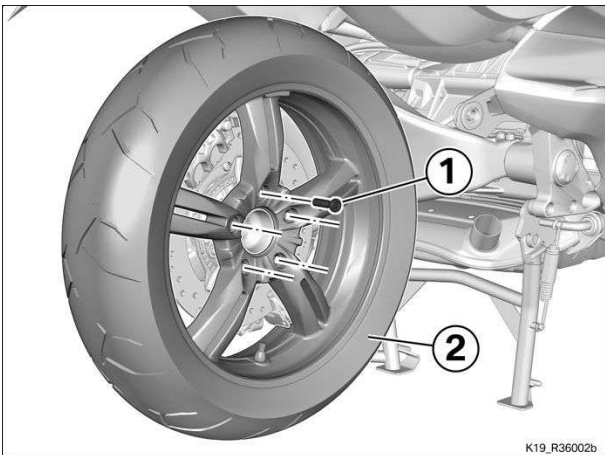
Operating the side stand / parking brake can block the output shaft.

- Remove rear wheel (2).



(-) Installing rear wheel

- Hold rear wheel (2) in position and install screws (1).



 Tightening torques		
Rear wheel to output shaft		
M10 x 1.25 x 40	Tighten in diagonally opposite sequence	
	60 Nm	

Finishing work

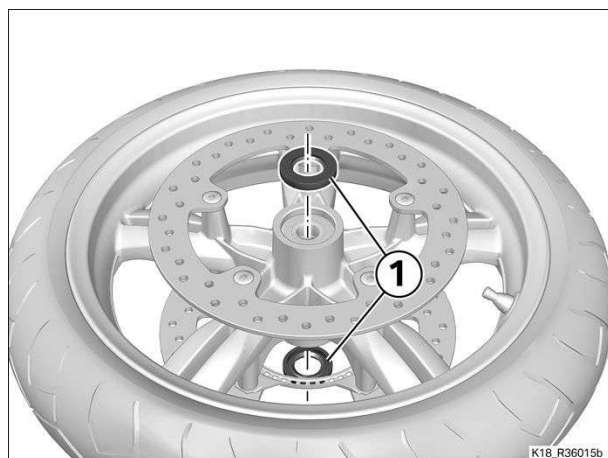
Installing silencer

Final check of work performed

36 31 851 Renewing front wheel bearing (wheel removed)

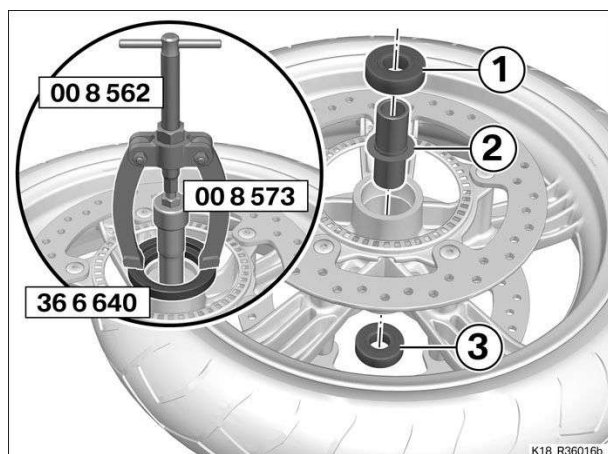
Core activity

(-) Removing left and right shaft sealing rings



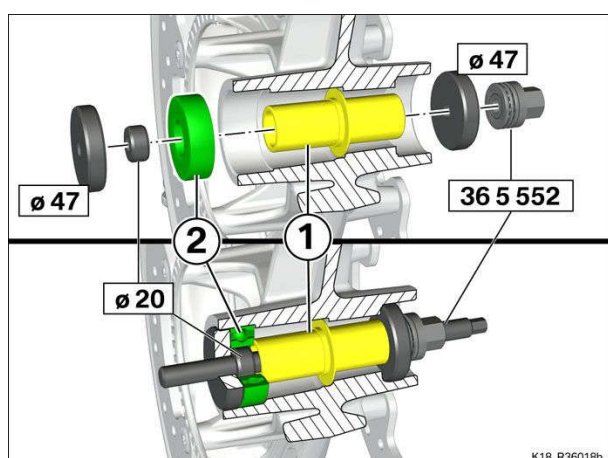
- Using a suitable tool, **carefully** remove shaft sealing rings (1) on left and right.

(-) Removing wheel bearings of front wheel

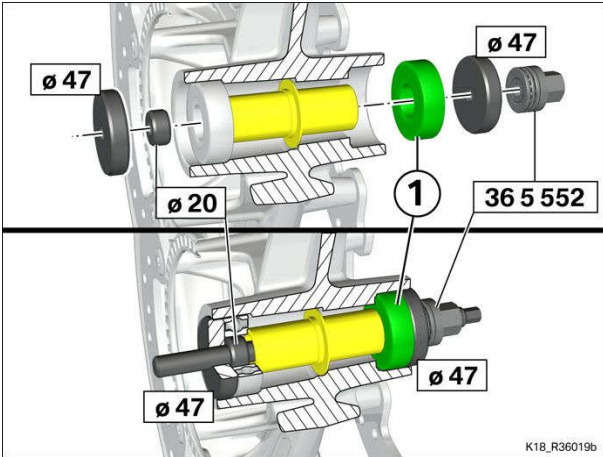


- Remove left wheel bearing (1) with reaction support (No. 00 8 562), internal puller (No. 00 8 573) and support ring (No. 36 6 640).
- Remove spacing bushing (2).
- Remove right wheel bearing (3) in the same way.

(-) Installing wheel bearings

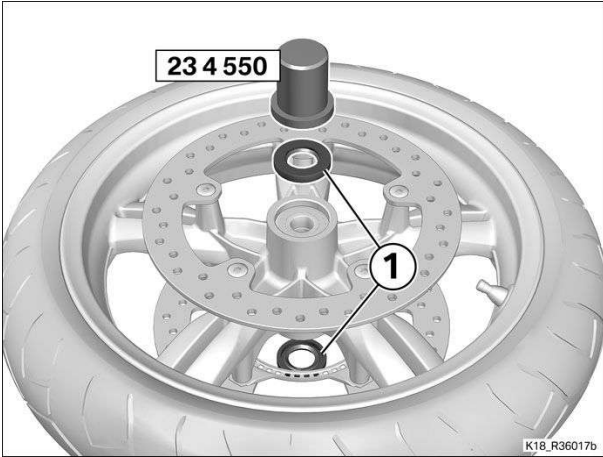


- Clean the bearing seats.
- Install bushing (1).
- **Introduce left** bearing (2) into the bearing seat.
- Install short spindle with pull-in nut (No. 36 5 552) washer without thread (No. 36 5 554) and washers with thread (No. 36 5 553):
 - Washer dia. 47 mm
 - Washer with thread, dia. 20 mm
 - Washer with thread, dia. 47 mm
- Pull in bearing (2) until seated.
- Remove the tools.
- Introduce **right** bearing (1) into the bearing seat.
- Install short spindle with pull-in nut (No. 36 5 552) washer without thread (No. 36 5 554) and washers with thread (No. 36 5 553):



- Washer dia. 47 mm
- Washer with thread, dia. 20 mm
- Washer with thread, dia. 47 mm
- Pull in bearing (1) until seated.
- Remove the tools.

(-) Installing shaft sealing rings



- Install shaft sealing rings (1) on left and right with drift (No. 23 4 550) until the rings are flush with the rim.
- Lubricate friction faces of shaft sealing rings (1).

 Installation tool	
Silicone spray	83 19 2 208 609

Finishing work

Final check of work performed

 36 32 501 Renewing front tyre (wheel removed)

Core activity

(-) Removing front tyre

- Use commercially available tools to strip the tyre off the rim.

(-) Replacing rubber valve

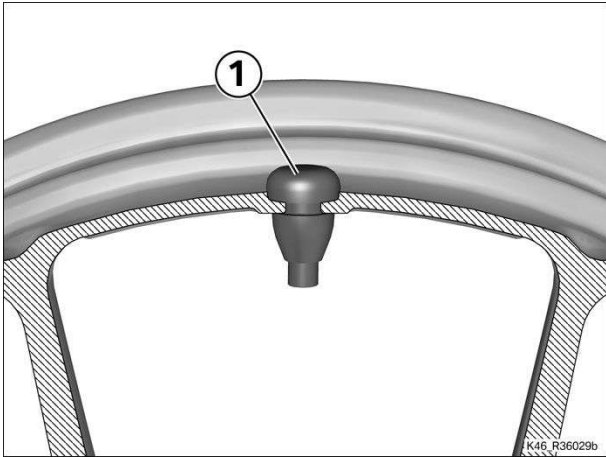
 ATTENTION

Re-use of tyre valve

Pressure loss in tyre.

- When fitting a new tyre, also install a new tyre valve.

- Use a suitable tool to remove rubber valve (1).
- 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

Hard or sharp-edged objects.

Component damage

- Take care not to scratch components; cover or mask as necessary.
- Install the tyre in accordance with the manufacturer's instructions, using commercially available tools. 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

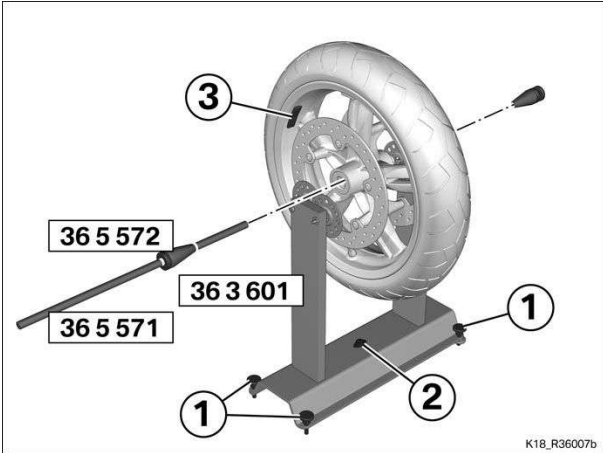
Measure:

- Adjust the air pressure

 Technical data			
Tyre pressure, front	Tyre cold	2.4 bar	

- Check the tyre and make sure the line is at a uniform distance from the rim flange all the way round.

(-) Static balancing of front wheel



- Align balancer (No. 36 3 601) with knurled screws (1) and level gauge (2).
- 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.
- Place the front wheel on the balancer and allow it to come to rest.
- Clean the attachment points for the adhesive weights.
- Affix adhesive weights (3) opposite the heaviest point of the wheel.

 Technical data			
Permissible front-wheel imbalance		max 5 g	
Balancing weight for front wheel		max 80 g	
Weight must be divided equally across both sides and weights attached to rim on left and right.			

- Repeat the balancing procedure as a check.

 36 32 511 Removing rear tyre (wheel removed)

Core activity

(-) Removing rear tyre

- Use commercially available tools to strip the tyre off the rim.

(-) Replacing rubber valve

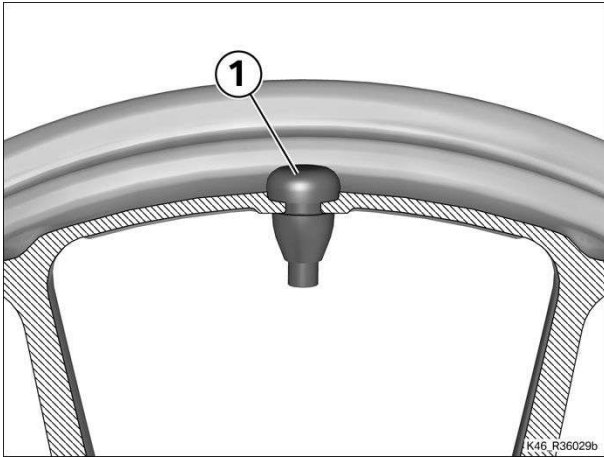
 ATTENTION

Re-use of tyre valve

Pressure loss in tyre.

- When fitting a new tyre, also install a new tyre valve.

- Use a suitable tool to remove rubber valve (1).
- 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

Hard or sharp-edged objects.

Component damage

- Take care not to scratch components; cover or mask as necessary.
- Install the tyre in accordance with the manufacturer's instructions, using commercially available tools. 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:

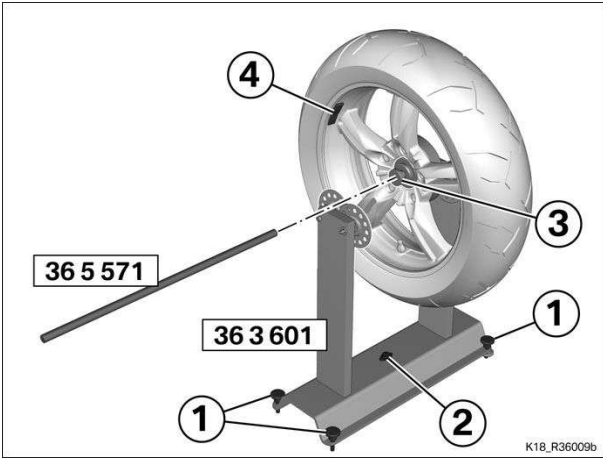
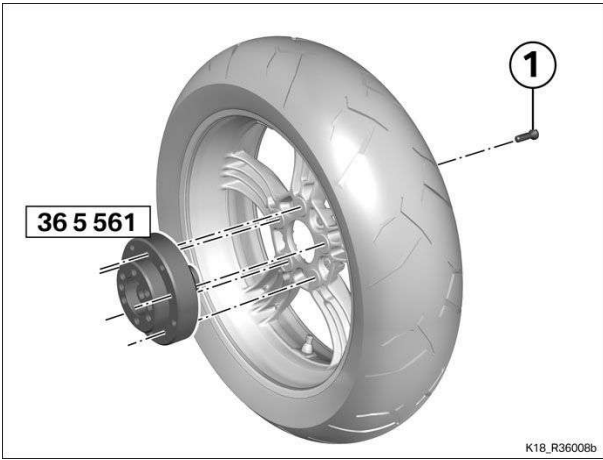
- Adjust the air pressure

 Technical data			
Tyre pressure, rear	One-up, tyre cold	2.5 bar	
	two-up and/or with luggage, tyre cold	2.9 bar	

- Check the tyre and make sure the line is at a uniform distance from the rim flange all the way round.

(-) Static balancing of rear wheel

- Secure balancing adapter (No. 36 5 561) with wheel studs (1).



- Align balancer (No. 36 3 601) with knurled screws (1) and level gauge (2).
- Introduce balancing shaft (No. 36 5 571) into the rear wheel and secure it with tensioning device (3).
- Place the rear wheel on the balancer and allow it to come to rest.
- Clean the attachment points for the adhesive weights.
- Affix adhesive weights (4) **opposite the heaviest point of the wheel.**

 Technical data			
Permissible rear-wheel imbalance		max 5 g	
Balancing weight for rear wheel		max 80 g	
Weight must be divided equally across both sides and weights attached to rim on left and right.			

- Repeat the balancing procedure as a check.

46 51 050 Replacing rear frame

+ 46 51 563

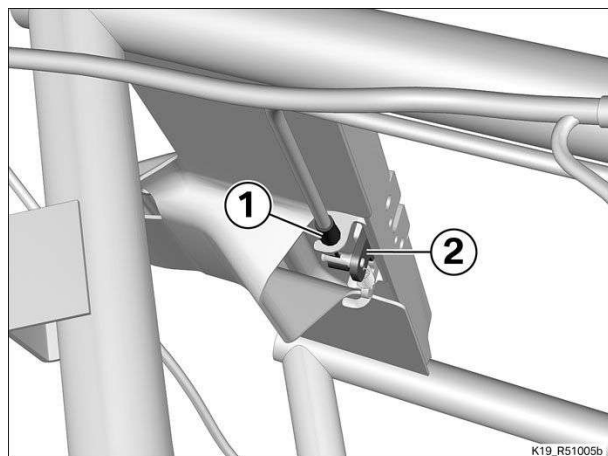
Preparatory work

Removing filler cap flap
Opening seat
Removing centre cover
Removing front left footrest plate
Removing left side panel
Removing front right footrest plate
Removing right centre footrest plate
Removing rear right footplate insert and footrest plate
Removing right side panel
Removing hinge
Removing fuel-pump cover
Removing cover for fuel tank
Removing carpet for luggage compartment
Removing left rear trim panel
Removing right rear trim panel
Removing rear grab handle
Removing rear trimmer with rear-light unit
Removing number-plate carrier
Removing top luggage-compartment cover
Removing luggage-compartment base

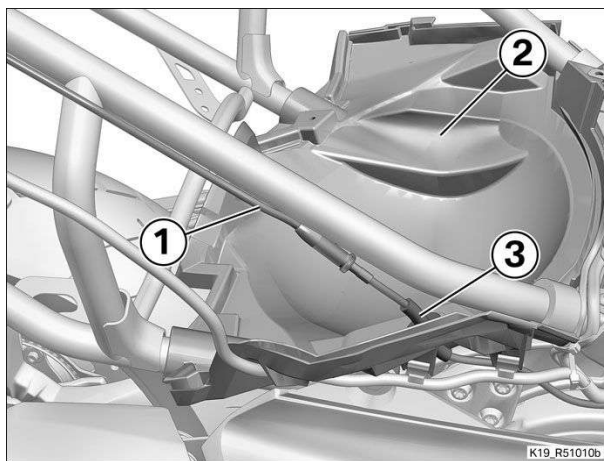
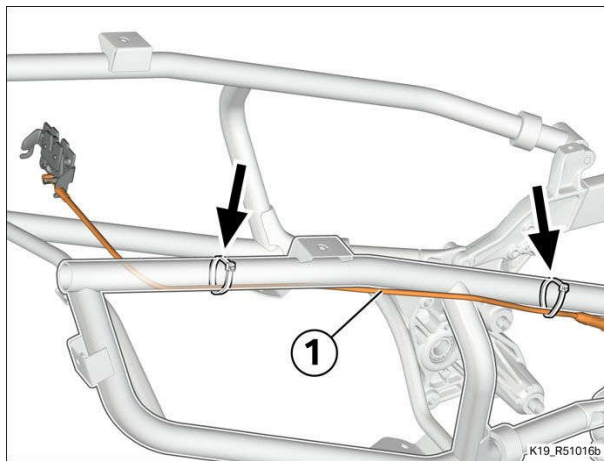
Core activity

(-) Disengaging Bowden cable for seat latch

- Disengage Bowden cable (1) from seat latch (2).

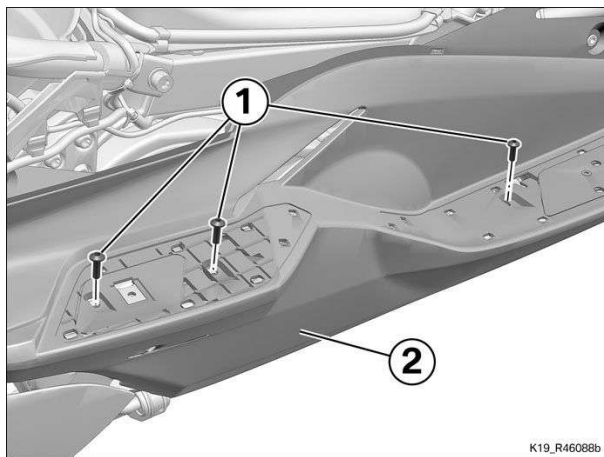


- Remove the cable tie (arrow) from Bowden cable (1).

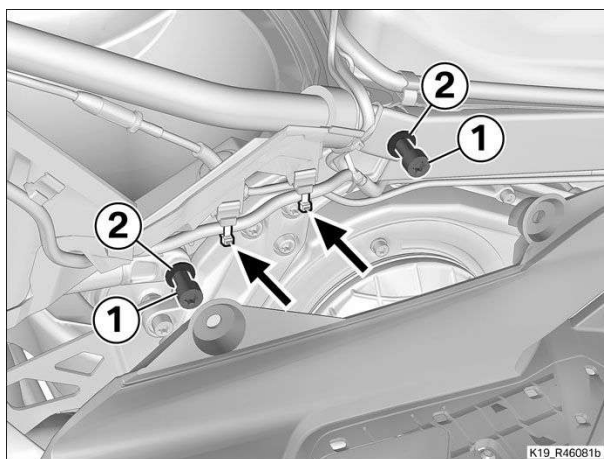


- Work Bowden cable (1) through front luggage-compartment base (2), noting rubber grommet (3).

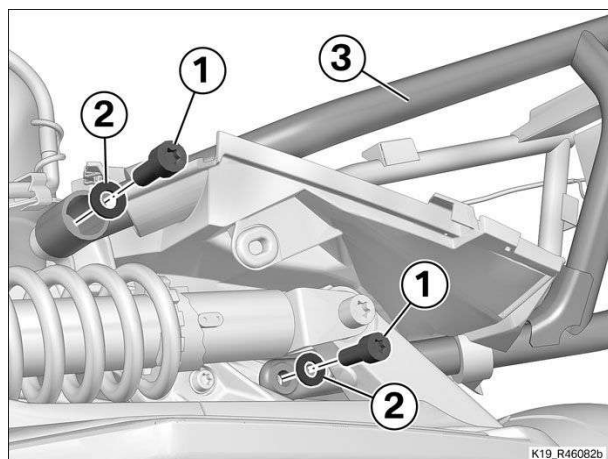
(-) Removing rear frame



- Remove screws (1).
- Ease footplate (2) **carefully** aside.

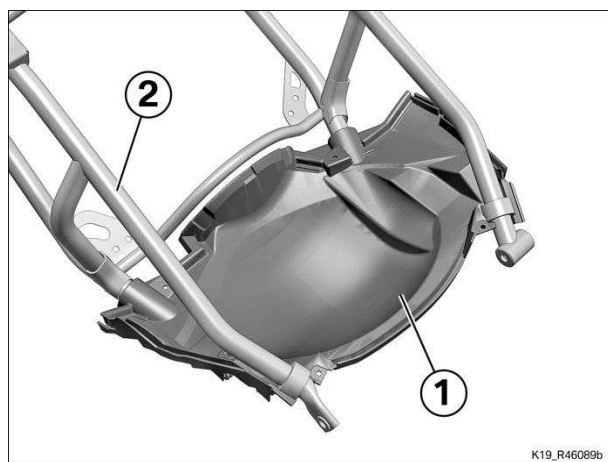


- Open cable ties (arrows).
- Remove screws (1) and washers (2).



- Remove the following components:
- Screws (1)
- Washers (2)
- Rear frame (3)

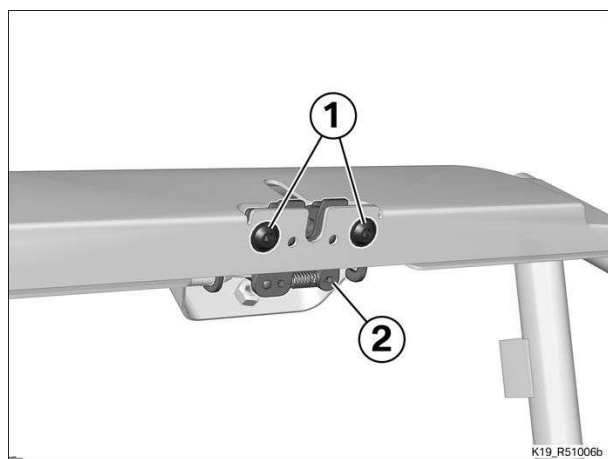
(-) Removing front luggage-compartment base



- Working **carefully**, remove (1) from rear frame (2).

(-) Changing rear frame

► Removing seat latch



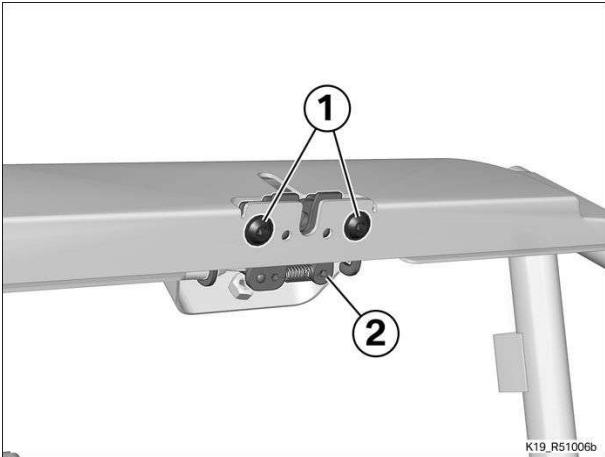
- Remove screws (1).
- Remove seat latch (2).



- Transfer the reusable small items from the old rear frame to the new frame.

► Installing seat latch

- Insert seat latch (2).
- Install screws (1).

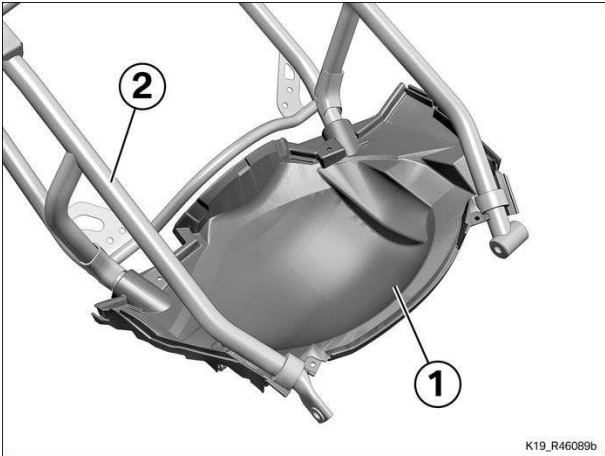


Tightening torques		
Seat lock to rear frame		
M6 x 12	8 Nm	



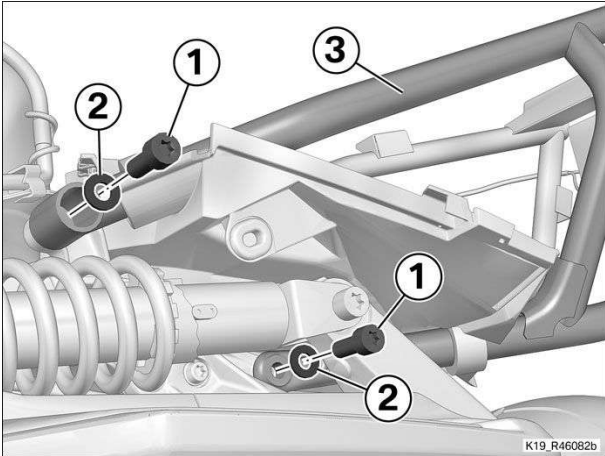
(-) Installing front luggage-compartment base

- Insert luggage-compartment base (1) into rear frame (1) and align.



(-) Installing rear frame

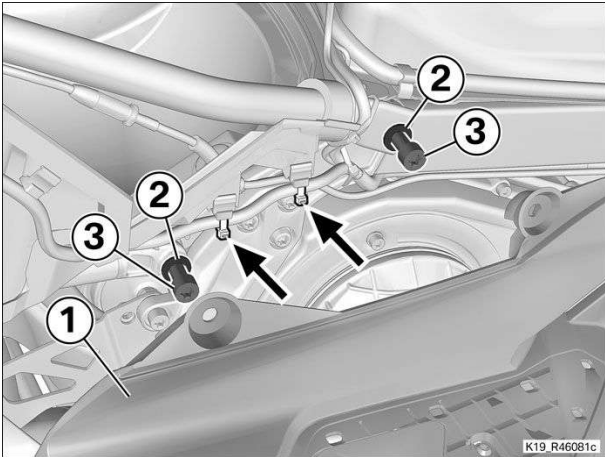
- Hold rear frame (3) in position.
- Install washers (2) and screws (1).



Tightening torques		
Rear frame to main frame/frame side section		
M10 x 25 Thread-locking compound (Micro-encapsulated) or, Thread-locking compound (Loctite 243, Medium strength)	38 Nm	

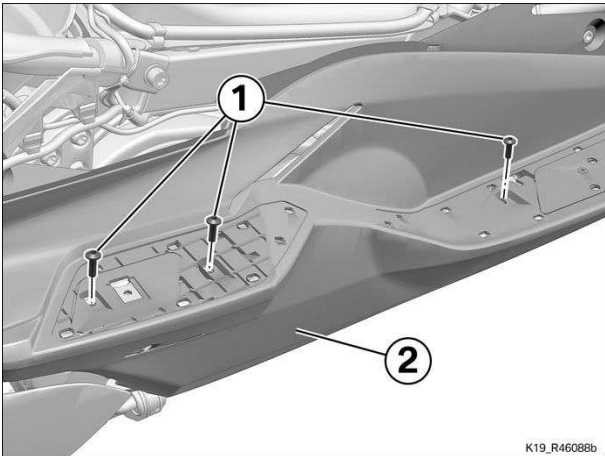
- Ease footplate (1) **carefully** aside.
- Install washers (2) and screws (3).

Tightening torques		
Rear frame to main frame/frame side section		
M10 x 25 Thread-locking compound (Micro-encapsulated)	38 Nm	



or, Thread-locking compound (Loctite 243, Medium strength)		
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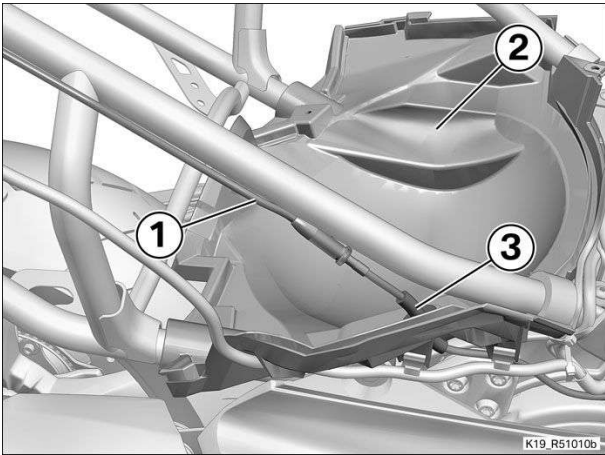
- Close the cable ties (arrows).



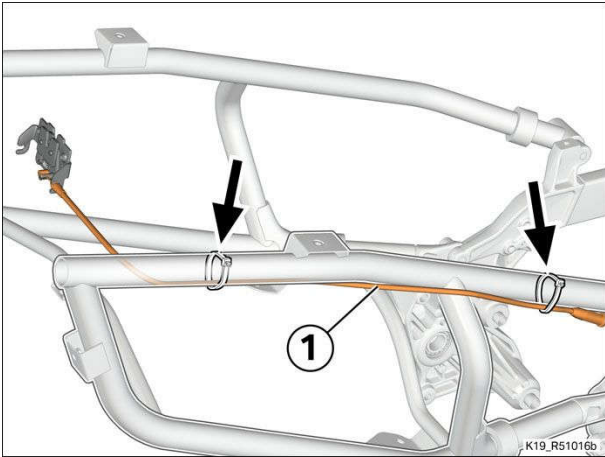
- Re-align footplate (2) carefully with the **Maxi-Scooter**.
- Install screws (1).

 Tightening torques		
General threaded fastener for fairing panels		
M6	2 Nm	

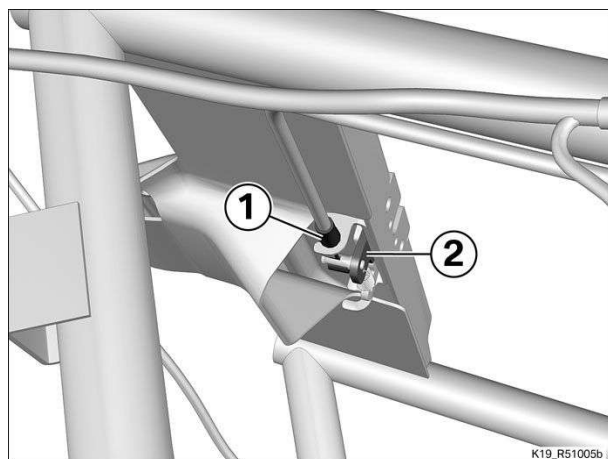
(-) Securing Bowden cable for seat latch



- Route Bowden cable (1) through front luggage-compartment base (2), noting rubber grommet (3).



- Secure Bowden cable (1) with cable tie (arrow).



- Secure Bowden cable (1) to seat latch (2).

finishing work

- Installing luggage-compartment base
- Installing top luggage-compartment cover
- Installing number-plate carrier
- Installing rear trimmer with rear-light unit
- Installing rear grab handle
- Installing right rear trim panel
- Installing left rear trim panel
- Installing carpet for luggage compartment
- Installing cover for fuel tank
- Installing fuel-pump cover
- Installing hinge
- Installing right side panel
- Installing rear right footplate insert and footrest plate
- Installing right centre footrest plate
- Installing front right footrest plate
- Installing left side panel
- Installing front left footrest plate
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

46 51 120 Removing/installing frame

+ 46 51 575

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Installing engine lifter

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing left side panel

Removing left footplate

Removing left footplate carrier

Removing top right side panel

Disconnecting battery leads

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing right side panel

Removing rear footplate

Removing underbody panel

Removing hinge

Removing fuel-pump cover

Removing cover for fuel tank

Removing complete tail assembly

Removing fuel tank with seat

Disengaging expansion tank for coolant

Disengaging coolant filler neck

Removing right footplate carrier

Removing air deflector for radiator

Disengaging and lowering radiator

Draining coolant from engine

Removing centre trim panel

Removing windscreen

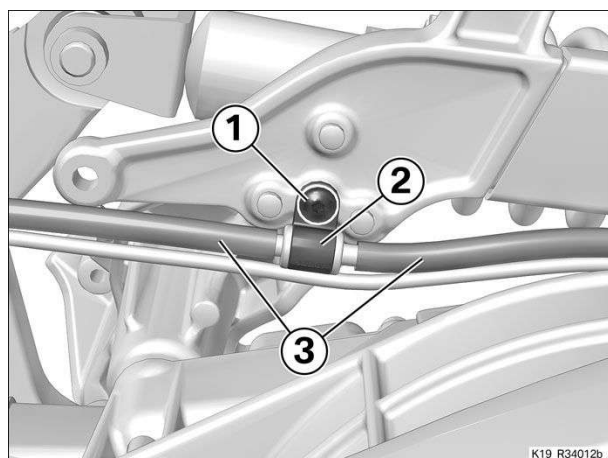
Removing handlebar trim

Removing top handlebar cover

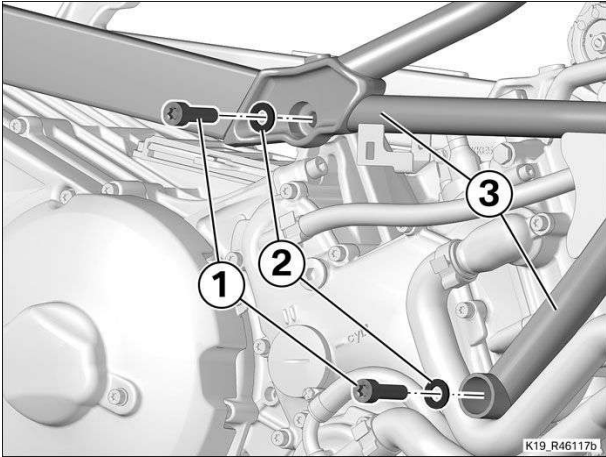
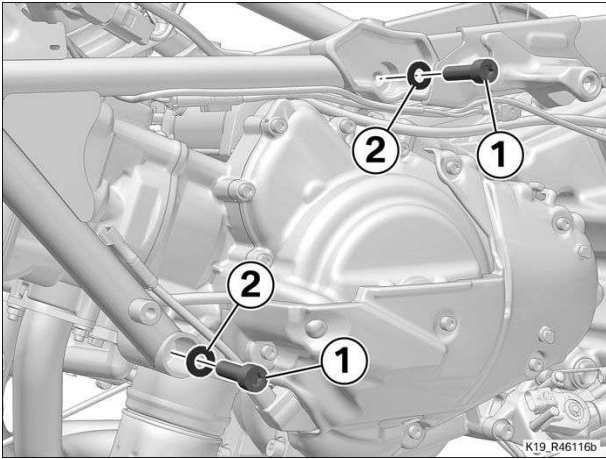
Removing bottom handlebar cover
Disconnecting plugs of left multifunction switch
Disconnecting plug of right multi-function switch
Removing handlebars
Removing instrument panel with carrier
Removing leg guard
Releasing front wheel-speed sensor
Removing left brake caliper
Removing right brake caliper
Disengaging brake line
Removing front-wheel cover
Removing front wheel
Removing forks with steering-head bearing and top fork bridge
Disengaging ignition switch/steering lock
Remove the intake air pipe
Removing intake air silencer
Removing silencer with cover
Removing rear wheel
Draining rear brake system
Disengaging rear brake hose from brake caliper
Disengaging brake hose and sensor cable
Releasing spring strut
Disengaging left frame side section
Disengaging right frame side section
Preparations for frame removal
Removing complete nose assembly

Core activity

(-) Removing main frame



- Remove screw (1).
- Remove holder (2) with brake line (3).
- Remove screws (1) and washers (2).



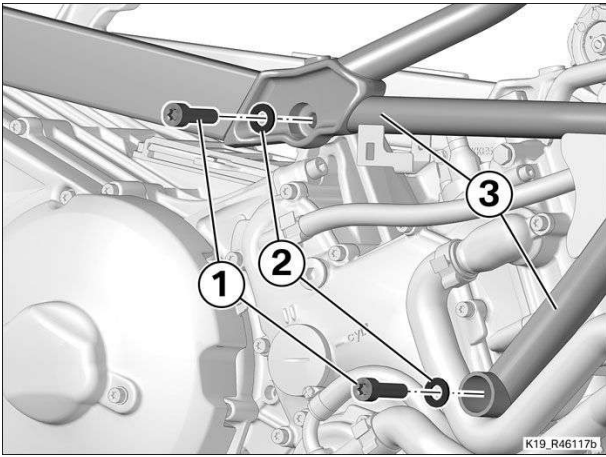
- Remove screws (1) and washers (2).
- Carefully remove frame (3).

(-) Installing main frame

 ATTENTION

Incorrect routing of hoses, cables and Bowden cables.
Malfunction. Component damage.

- Make sure that routing is correct.
- Consult the function diagrams and overviews.

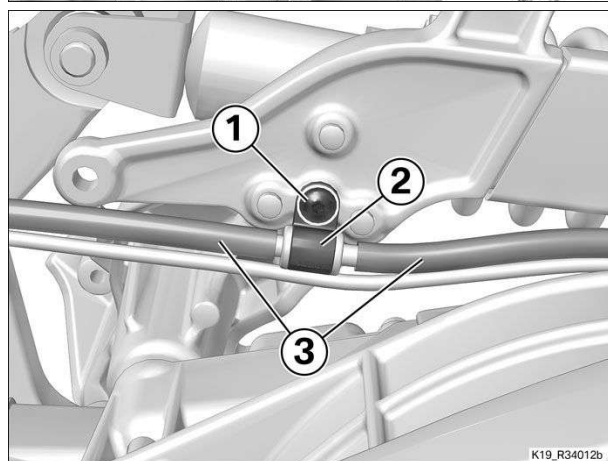
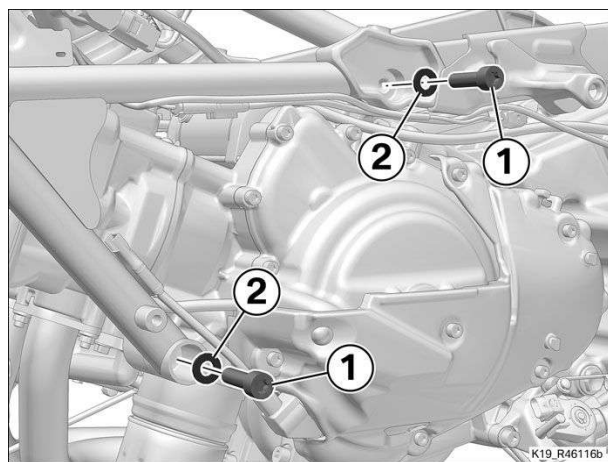


- Carefully manoeuvre frame (3) into position.
- Install screws (1) with washers (2).

 Tightening torques		
Engine to frame		
M10 x 35	38 Nm	

- Install screws (1) with washers (2).

 Tightening torques		
Engine to frame		
M10 x 35	38 Nm	



- Hold brake line (3) in position with holder (2).
- Install screw (1).

 Tightening torques		
Brake hose to main frame		
M5 x 12	5 Nm	

Finishing work

Installing complete nose assembly

Finishing work for frame removal

Securing right frame side section

Securing left frame side section

Securing spring strut

Securing brake hose to rear brake caliper

Securing brake hose and sensor cable

Installing rear wheel

Installing silencer with cover and bracket

Installing intake air silencer

Installing intake air pipe

Securing ignition switch/steering lock

Installing forks with steering-head bearing and top fork bridge

Installing front wheel

Installing front-wheel cover

Securing brake line to bottom fork bridge

Securing right brake caliper

Securing left brake caliper

Securing front wheel-speed sensor

- Adjusting steering-head bearing play
- Installing leg guard
- Installing instrument panel with carrier
- Installing handlebars
- Connecting plugs for right multifunction switch
- Connecting plugs for left multifunction switch
- Filling and bleeding rear brake system
- Installing bottom handlebar cover
- Installing top handlebar cover
- Installing handlebar trim
- Installing centre trim panel
- Installing windscreen
- Adjusting throttle-cable play.
- Securing radiator
- Installing air deflector for radiator
- Filling cooling system
- Installing fuel tank with seat
- Installing cover for fuel tank
- Installing fuel-pump cover
- Installing hinge
- Installing complete tail
- Install the right footplate carrier
- Securing expansion tank for coolant
- Securing coolant filler neck
- Installing right footplate
- Installing underbody panel
- Installing right side panel
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Connecting battery leads
- Installing top right side panel
- Installing left footplate carrier
- Installing left footplate
- Installing left side panel
- Installing rear left footplate insert and footrest plate
- Installing centre left footplate insert and footrest plate
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate

Installing top left side panel
Installing centre cover
Closing seat
Installing filler cap flap
Removing engine lifter
Checking setting for low-beam headlight
Checking, if necessary correcting date
Final check of work performed

 46 51 180 Checking motorcycle with frame- measuring system
+ 46 51 676

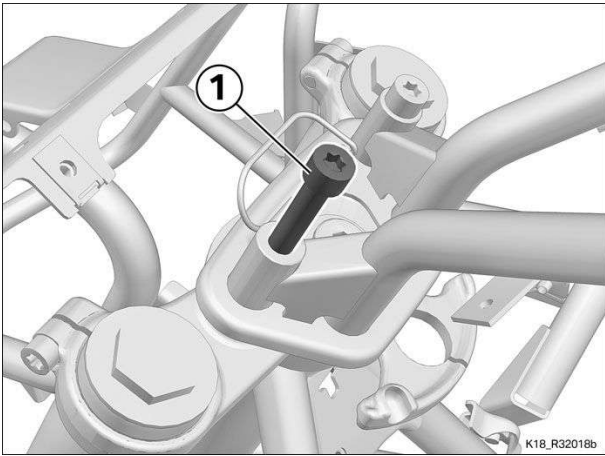
Preparatory work

- Removing handlebar trim
- Removing top handlebar cover
- Removing instrument panel with carrier
- Removing right side panel
- Removing rear grab handle

Core activity

(-) Removing screw for handlebar attachment (for frame measuring system)

- Remove **left** screw (1).



(-) Checking motorcycle with frame-alignment measuring system

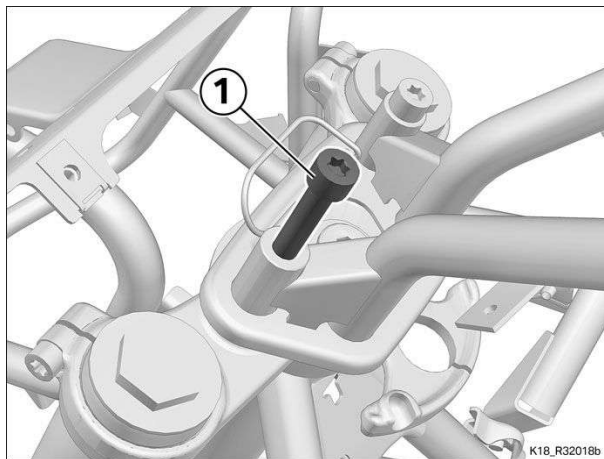
- Use only the frame gauge recommended by **BMW Motorrad**.



(-) Installing screw for handlebar attachment (for frame measuring system)

- Install **left** screw (1).

 Tightening torques			
Handlebars to fork bridge			



M10 x 55

41 Nm

Finishing work

Installing instrument panel with carrier

Installing top handlebar cover

Installing handlebar trim

Installing right side panel

Installing rear grab handle

Final check of work performed

46 51 520 Replacing frame (frame removed)

Preparatory work

Removing bottom steering-head bearing

Core activity

(-) Replacing frame

- Transfer reusable small items to the new frame.
- Clean the attachment area and affix the adhesive type plate.
- Dispose of the old frame in accordance with locally applicable legislation.

Finishing work

Installing bottom steering-head bearing (inner race)

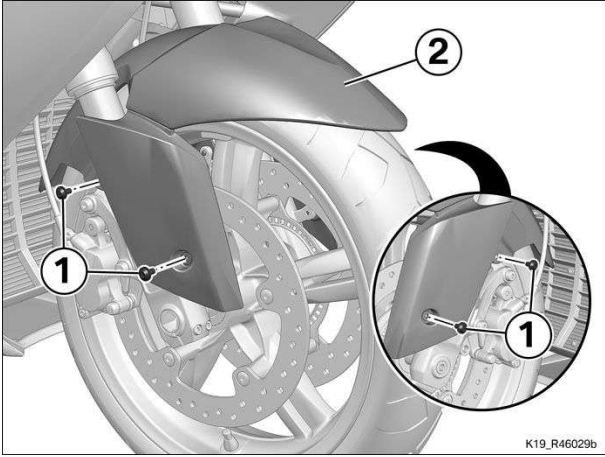
Final check of work performed

 **46 61 000 Removing/installing front-wheel cover**
+ 46 61 500

Core activity

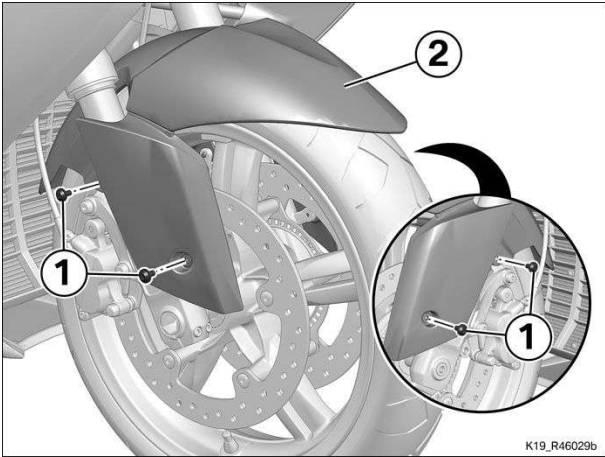
(-) Removing front-wheel cover

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



(-) Installing front-wheel cover

- Hold wheel cover (2) in position and install screws (1).



 Tightening torques		
Wheel cover to forks		
M5 x 14.5	5 Nm	

Finishing work

Final check of work performed

 46 61 008 Removing/installing rear front-wheel cover
+ 46 61 502

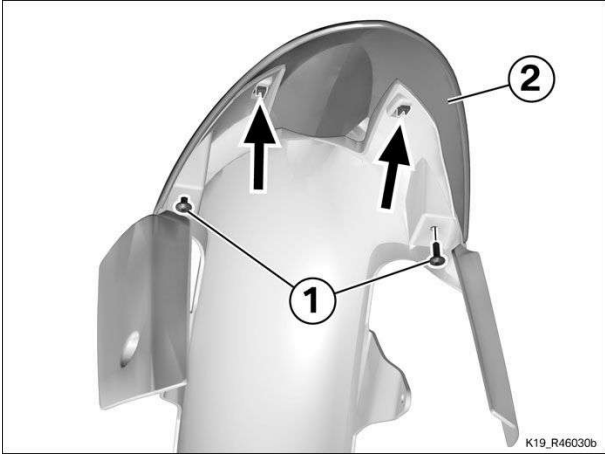
Preparatory work

Removing front-wheel cover

Core activity

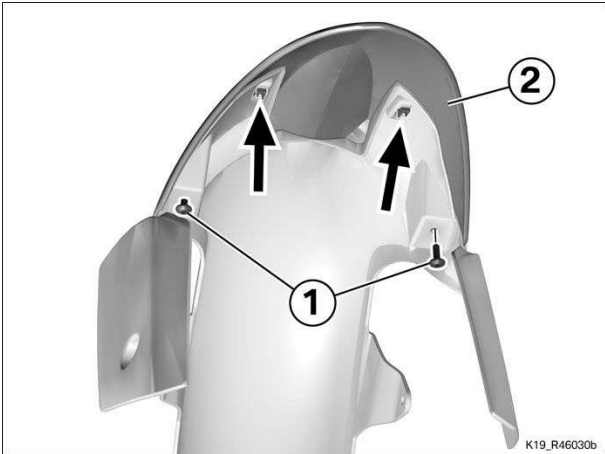
(-) Removing front section of wheel cover

- Remove screws (1).
- Remove front section (2), noting the locators (arrows).



(-) Installing front section of wheel cover

- Install front section (2), noting the locators (arrows).
- Install screws (1).



 Tightening torques		
Wheel cover, front, to wheel cover, rear		
M5 x 16	2 Nm	

Finishing work

Installing front-wheel cover

Final check of work performed

 46 62 050 Renewing number plate carrier

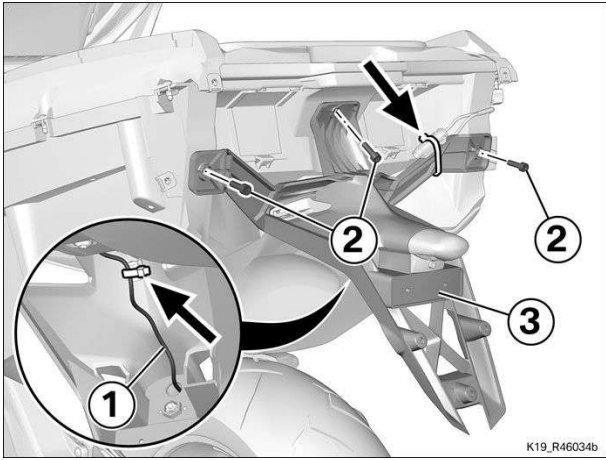
+ 46 62 508

Preparatory work

- Opening seat
- Removing carpet for luggage compartment
- Removing left rear trim panel
- Removing right rear trim panel
- Removing rear grab handle
- Removing rear trimmer with rear-light unit

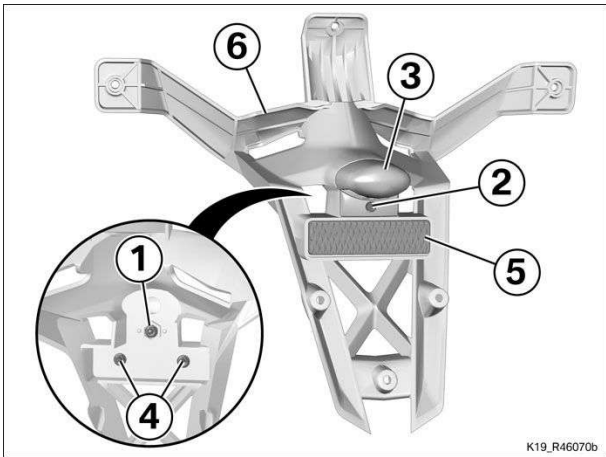
Core activity

(-) Removing number-plate carrier



- Cut through the cable ties (arrows).
- Disengage socket (1) for the number-plate light.
- Remove screws (2).
- Remove license-plate carrier (3).

(-) Replacing number-plate carrier

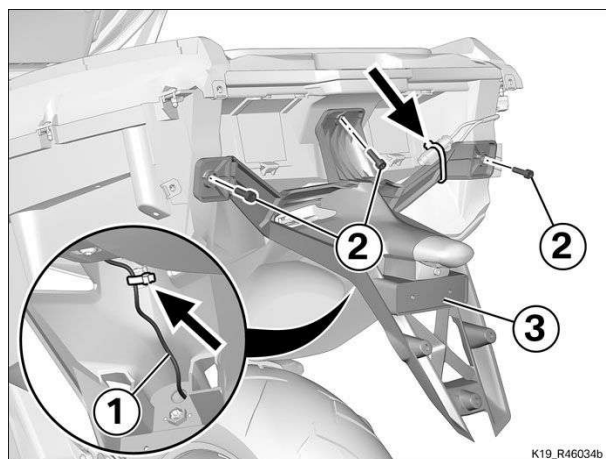


- Remove nut (1).
- Remove screw (2) with number-plate light (3).
- Remove nuts (4) and remove reflector (5).
- Substitute the new number-plate carrier for old number-plate carrier (6).
- Hold reflector (5) in position.
- Install nuts (4).
- Hold number-plate light (3) in position with screw (2).
- Install nut (1).

(-) Installing number-plate carrier

- Clean the threads.
- Secure number-plate carrier (3) with screws (2).

 Tightening torques		
Number-plate carrier to rear frame		



M6 x 16

Thread-locking compound (Micro-encapsulated)

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

2.5 Nm

- Secure socket (1) for the number-plate light.
- Close the cable ties (arrows).

Finishing work

Installing rear trimmer with rear-light unit

Installing rear grab handle

Installing right rear trim panel

Installing left rear trim panel

Installing carpet for luggage compartment

Closing seat

Final check of work performed

46 63 003 Removing/installing leg guard

+ 46 63 991

Preparatory work

Removing filler cap flap
Removing centre cover
Opening seat
Removing centre trim panel
Removing handlebar trim
Removing top handlebar cover
Removing bottom handlebar cover
Removing instrument panel with carrier
Removing top left fairing side panel
Removing front left footplate insert and footrest plate
Removing bottom left fairing panel
Removing left side panel
Removing top right side panel
Removing front right footplate insert and footrest plate
Removing bottom right fairing panel
Removing right side panel
Removing centre right footplate insert and footrest plate
Removing rear right footplate insert and footrest plate
Removing rear footplate

Core activity

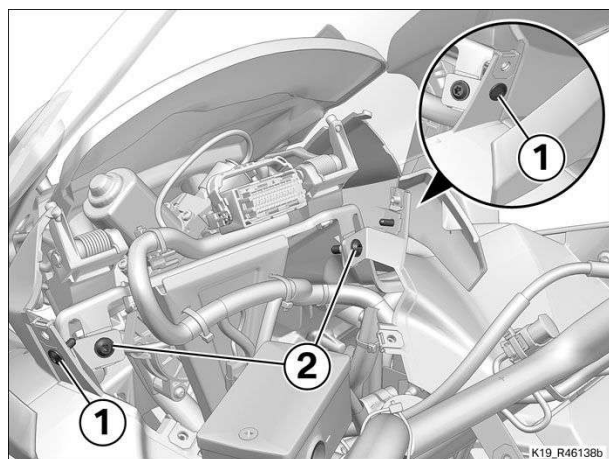
(-) Removing leg guard

Requirement

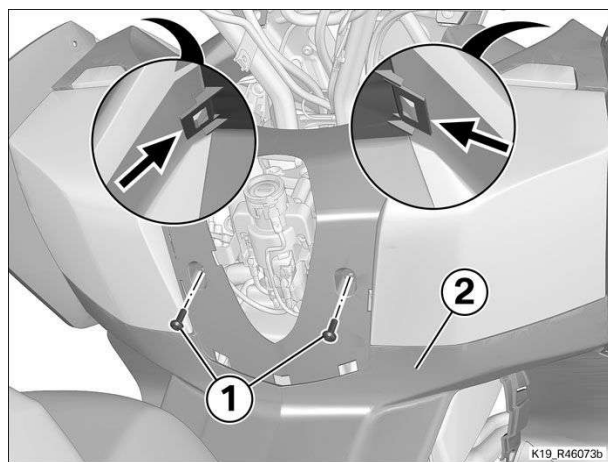
- Slipstream deflectors are opened out.



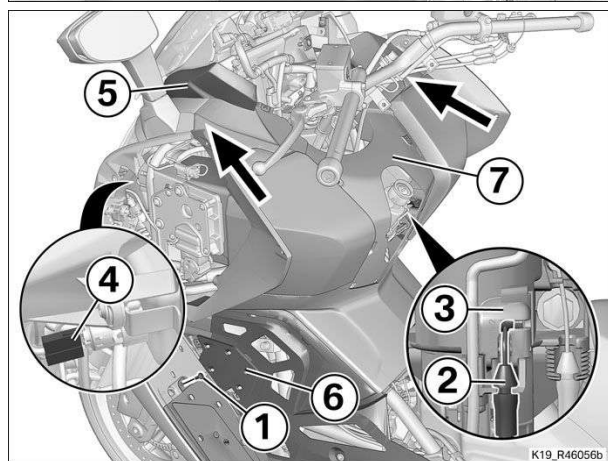
- Remove screws (1) and (2).



- Remove screws (1).
- **Inside** leg guard (2), disengage the locators (arrows) on left and right.



- Carefully disengage leg guard (2).



- Remove screw (1).
- Disengage Bowden cable for stowage-compartment lid (2) from steering-lock housing (3).
- Disconnect plug (4) for the on-board socket.
- Affix masking tape to the area around slipstream deflector (5) (arrows).

⚠ ATTENTION

Hard or sharp-edged objects.

Component damage

- Take care not to scratch components; cover or mask as necessary.

- **Carefully** lift footplate (6) and remove leg guard (7).

(-) Installing leg guard

Requirement

- Slipstream deflectors are opened out.



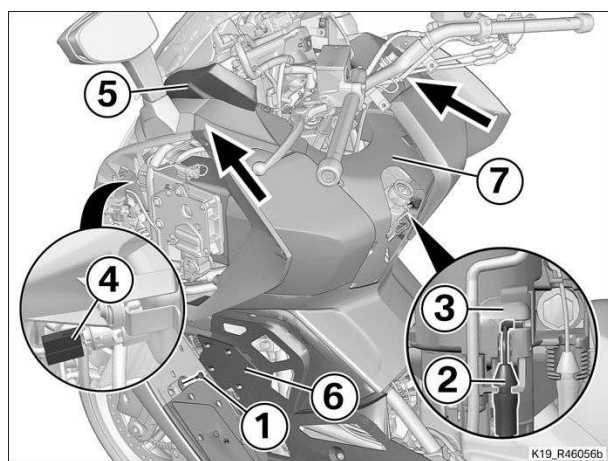
- If necessary, affix masking tape to the area around slipstream deflector (5).

⚠ ATTENTION

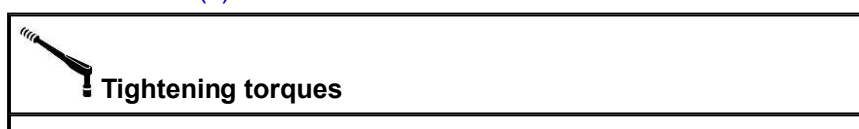
Hard or sharp-edged objects.

Component damage

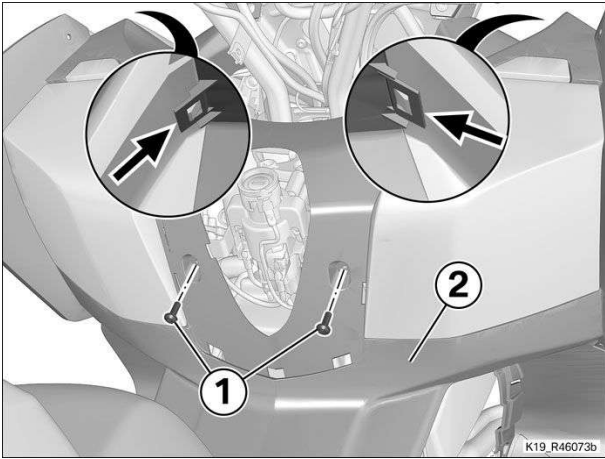
- Take care not to scratch components; cover or mask as necessary.



- Carefully lift footplate (6) and insert leg guard (7).
- Engage Bowden cable for stowage-compartment lid (2) in Bowden cable at steering-lock housing (3).
- Connect plug for on-board socket (4).
- Install screw (1).
- Secure leg guard (2) at the locators (arrows).
- Install screws (1).

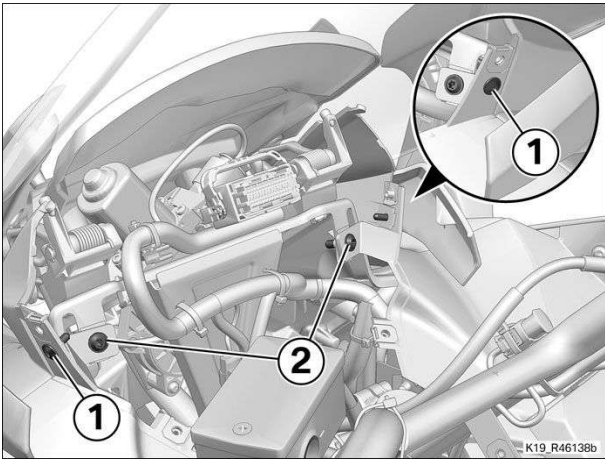


⚠ Tightening torques



General threaded fastener for fairing panels		
M6	2 Nm	

- Install screws (1) and (2).



Tightening torques		
General threaded fastener for fairing panels		
M6	2 Nm	

- Check that luggage compartment latching mechanism is in working order and remove the adhesive tape.

Finishing work

- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing instrument panel with carrier
- Installing bottom handlebar cover
- Installing top handlebar cover
- Installing handlebar trim
- Installing centre trim panel
- Closing seat
- Installing centre cover

Installing filler cap flap

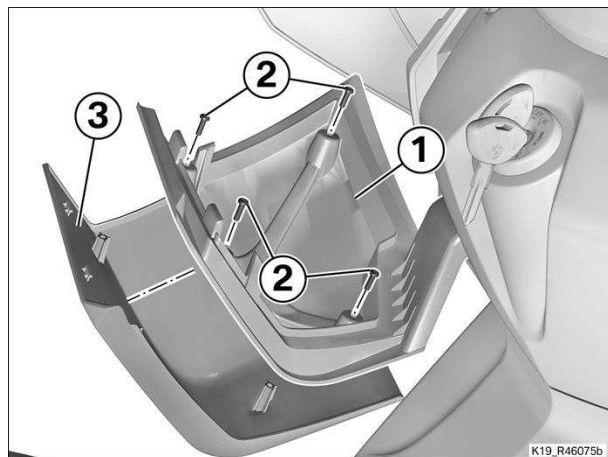
Final check of work performed

 46 63 004 Replacing cover for stowage-compartment lid, left or right

+ 46 63 507

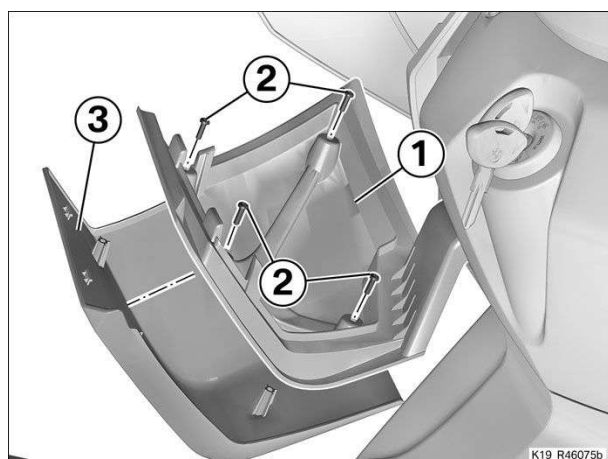
Core activity

(-) Removing cover for stowage-compartment lid



- Open stowage-compartment lid (1)
- Remove screws (2).
- Remove cover (3).

(-) Installing cover for stowage-compartment lid



- Hold cover panel (3) in position.
- Install screws (2).
- Close stowage-compartment lid (1) until it latches with an audible click.

Finishing work

Final check of work performed

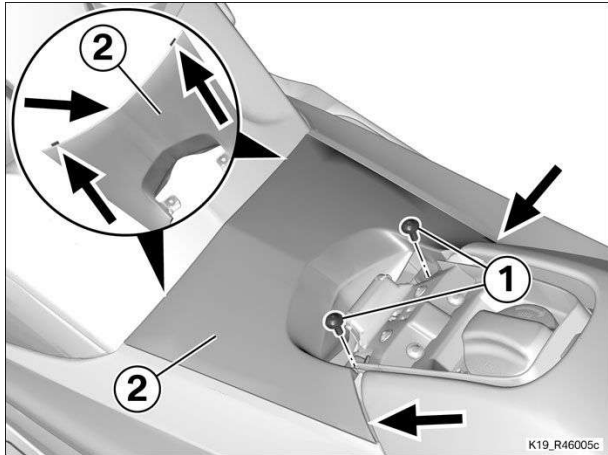
 **46 63 006 Replacing centre cover**
+ 46 63 512

Preparatory work

Removing filler cap flap

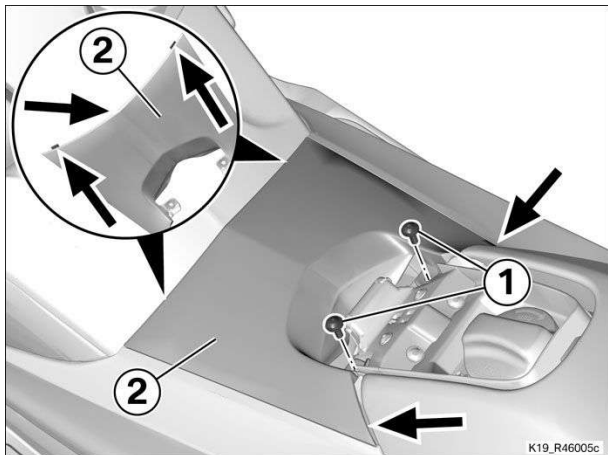
Core activity

(-) Removing centre cover



- Remove screws (1).
- Slide cover (2) to the rear and disengage, noting the retainers (arrows).
- Remove cover (2).

(-) Installing centre cover



- Install cover (2), noting the retaining lugs (arrows).
- Install screws (1).

 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	

Finishing work

Installing filler cap flap

Final check of work performed

46 63 019 Replacing tail cover, centre section

+ 46 63 982

Preparatory work

Opening seat

Removing rear grab handle

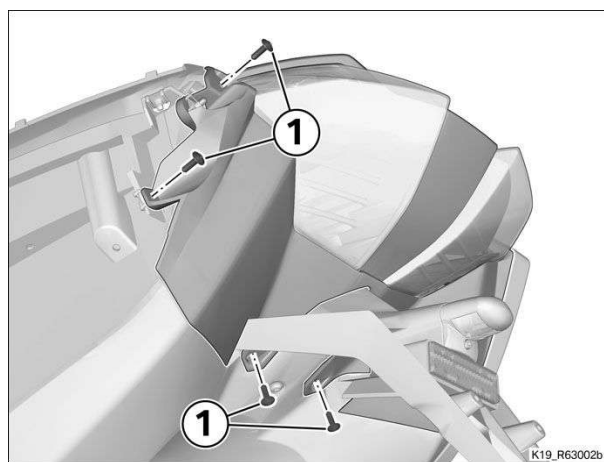
Removing carpet for luggage compartment

Removing right rear trim panel

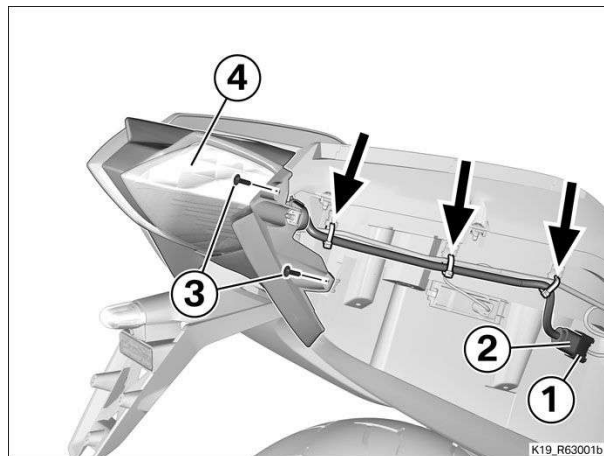
Removing left rear trim panel

Core activity

(-) Removing rear trimmer with rear-light unit



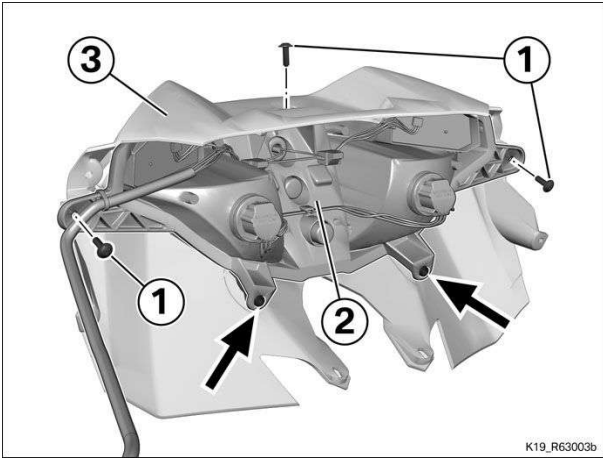
- Remove screws (1).



- Open the cable ties (arrows) and disconnect plug (1) for the rear light.
- Disconnect plug receptacle (2).
- Remove screws (3).
- Remove rear trimmer with rear light (4).

(-) Removing rear-light unit

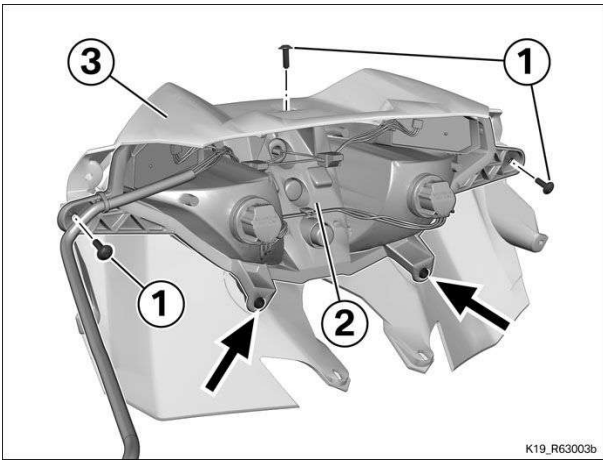
- Remove screws (1).
- Remove rear light (2) from centre rear trimmer (3), noting the locators (arrows).



(-) Installing rear-light unit

- Insert rear light (2) into centre rear trimmer (3), noting the locators (arrows).
- Install screws (1).

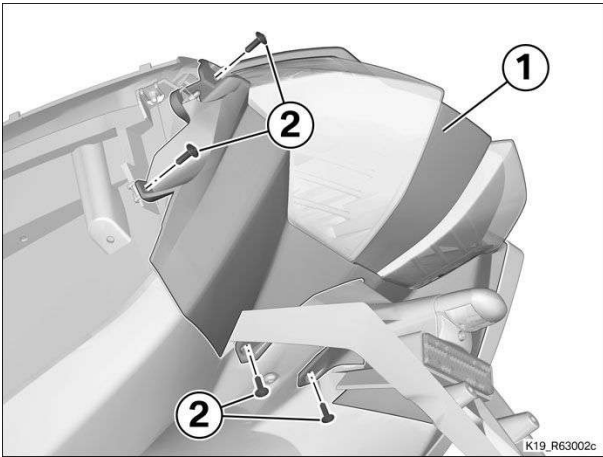
 Tightening torques		
Rear light to rear finisher		
M5 x 16, Replace screw Thread-locking compound (mechanical)	2 Nm	



(-) Installing rear trimmer with rear-light unit

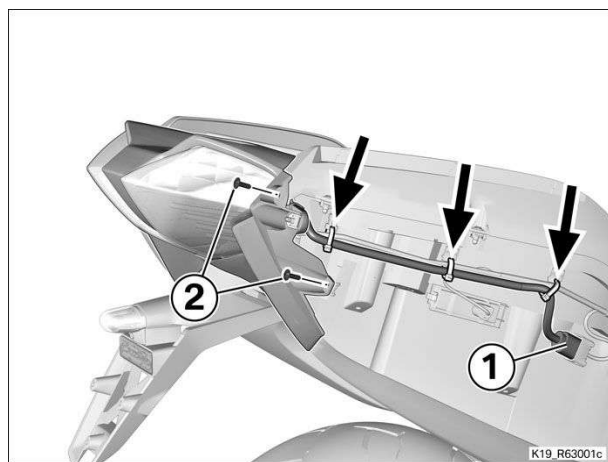
- Install rear trimmer with rear light (1).
- Install screws (2).

 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	



- Connect plug (1) for the rear light and secure.
- Secure the wiring harness (arrows).
- Install screws (2).

 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	



Finishing work

Installing right rear trim panel

Installing left rear trim panel

Installing carpet for luggage compartment

Installing rear grab handle

Closing seat

Final check of work performed

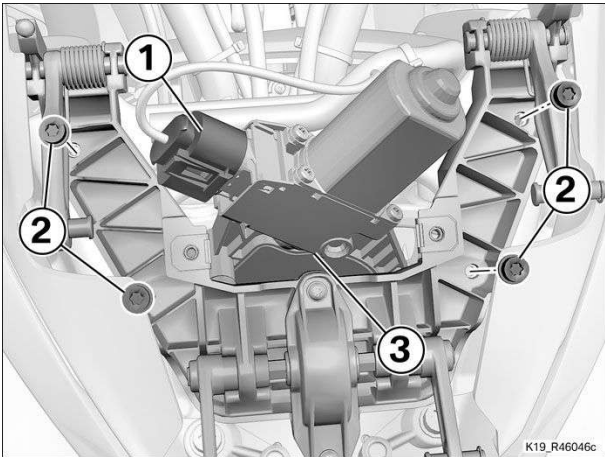
 46 63 030 Replacing windscreen adjuster
+ 46 63 710

Preparatory work

- Removing windscreen
- Raising windscreen holder
- Removing windscreen holder
- Removing instrument carrier

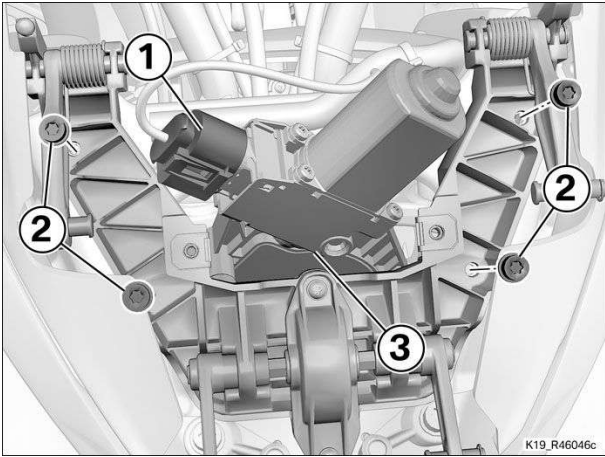
Core activity

(-) Removing windscreen adjuster with drive



- Disconnect plug (1) for the windscreen adjuster.
- Remove screws (2).
- Remove windscreen adjuster with drive (3).

(-) Installing windscreen adjuster with drive



- Install windscreen adjuster with drive (3) and secure with screws (2).

 Tightening torques		
Windscreen adjuster to fairing bracket		
M6 x 16	8 Nm	
Thread-locking compound (Micro-encapsulated)		
or, Thread-locking compound (Loctite 243, Medium strength)		

- Connect plug (1) for windscreen adjuster (3).

Finishing work

- Removing top right side panel
- Preparation for initialising/calibrating new parts
- Installing top right side panel
- Installing top instrument carrier
- Installing windscreen holder
- Installing windscreen
- Final check of work performed

 46 63 031 Replacing windscreen
+ 46 63 830

Core activity

(-) Removing windscreen

- Remove screws (1) and covers (2), remove windscreen (3).

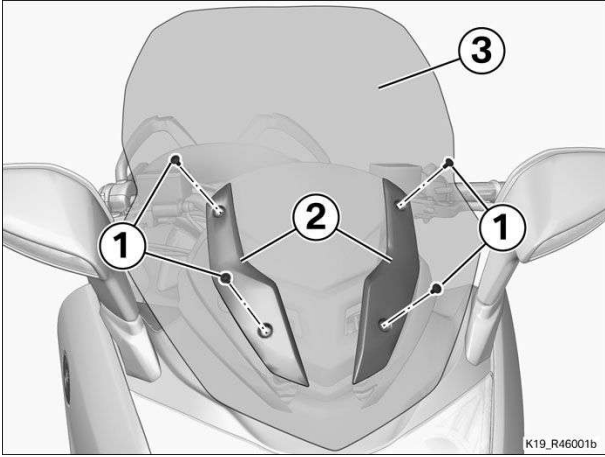
 ATTENTION

Unsuitable windscreen attachment.

Detachment of windscreen.

- Install only covers with large holes and the corresponding collared screws.

- if applicable, substitute collared screws for the raised-head screws.



(-) Installing windscreen

 ATTENTION

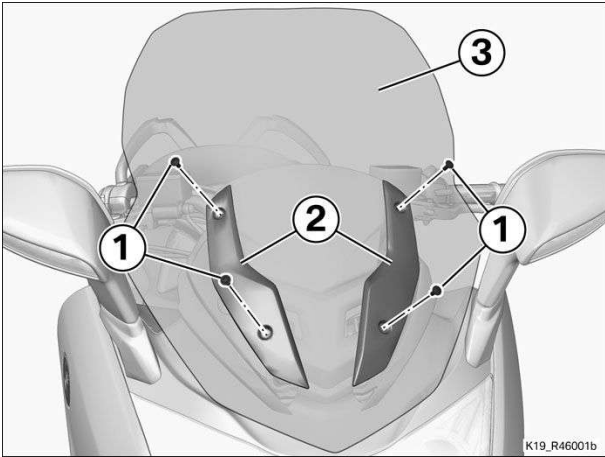
Unsuitable windscreen attachment.

Detachment of windscreen.

- Install only covers with large holes and the corresponding collared screws.

- Hold windscreen (3) and cover (2) in position.

- Install screws (1).



 Tightening torques		
Windscreen with cover to windscreen adjuster		
Collared screw, M5 x 20,5	5 Nm	

Finishing work

Final check of work performed

46 63 039 Removing/installing windscreen holder

$$+ 46\,63\,836$$

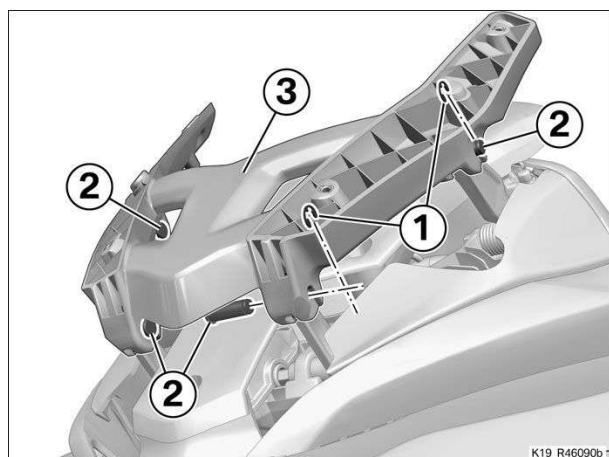
Preparatory work

Removing windscreen

Raising windscreen holder

Core activity

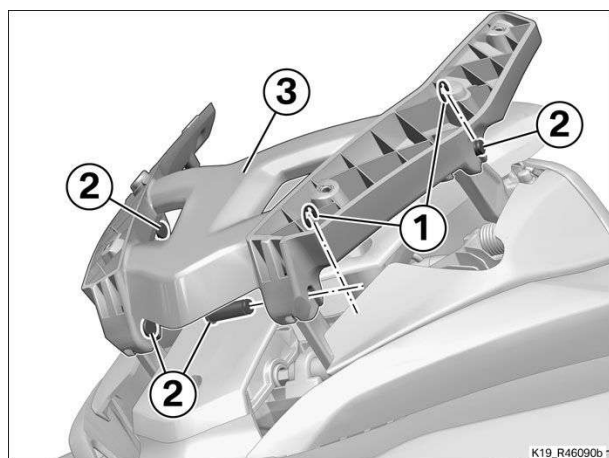
(-) Removing windscreen holder



- Remove clips (1) **on left and right.**
- Remove pin (2).
- Remove windscreen holder (3).

(-) Installing windscreen holder

- Clean and lubricate pin (2).



Lubricant

MP 3 paste	07 55 9 062 476
------------	-----------------

- Hold windscreen holder (3) in position.
- Install pins (2) and clips (1) **on left and right** (short pins at front).

Finishing work

Installing windscreen

Final check of work performed

46 63 134 Removing/installing or replacing instrument carrier

+ 46 63 847

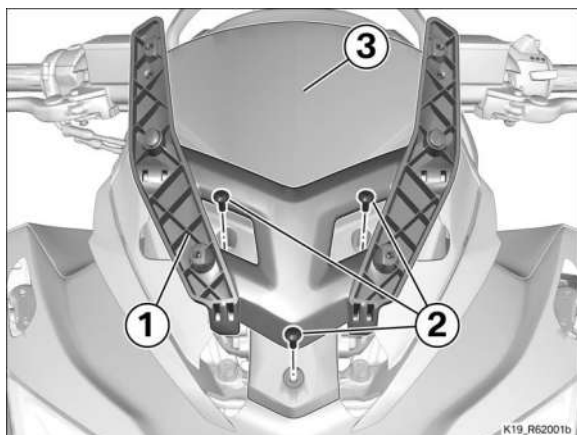
Preparatory work

Removing windscreen

Raising windscreen holder

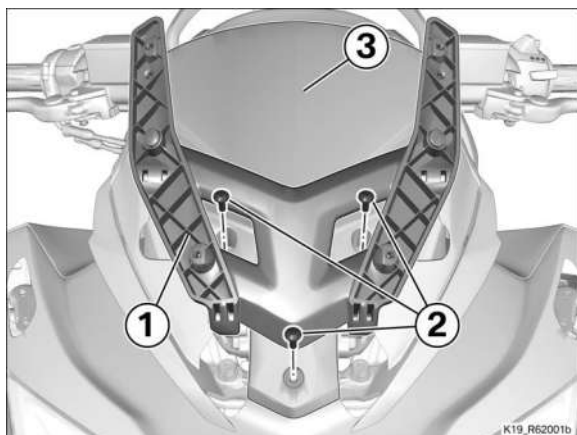
Core activity

(-) Removing top instrument carrier

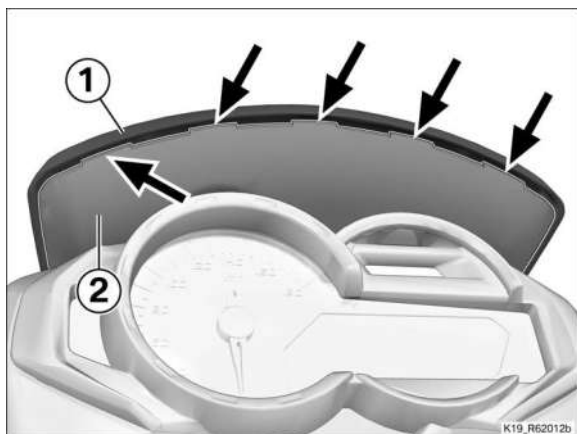


- Raise windscreen holder (1).
- Remove screws (2) and remove top instrument carrier (3).

(-) Installing top instrument carrier



- If applicable, raise windscreen holder (1).
- Insert top instrument carrier (3) and install screws (2).



- Make sure that top instrument carrier (1) is correctly secured by means of the locators (arrows) to bottom instrument carrier (2).

Finishing work

Installing windscreen

Final check of work performed

46 63 144 Removing/installing or replacing footplate, left

+ 46 63 997

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing front left footplate insert and footrest plate

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing top left fairing side panel

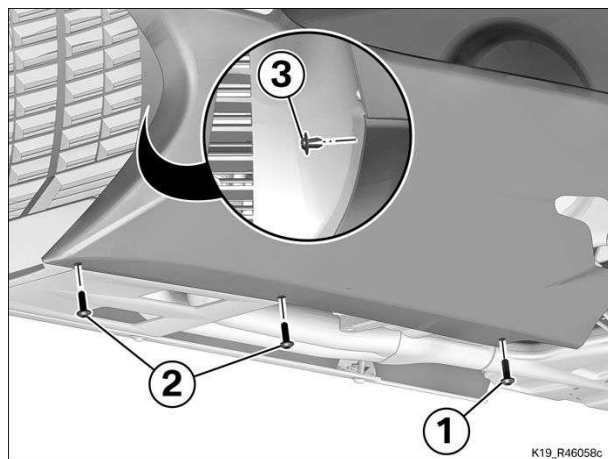
Removing bottom left fairing panel

Removing left side panel

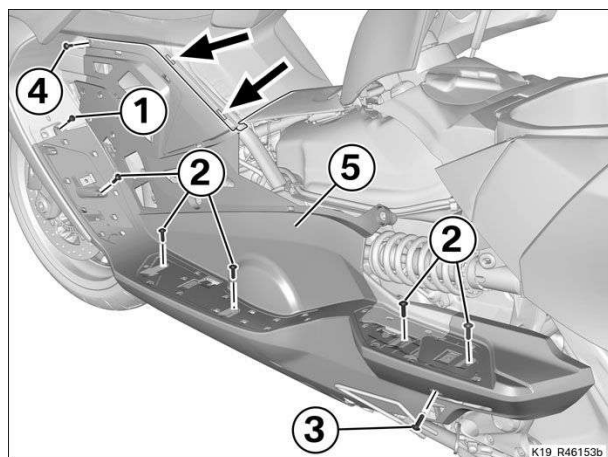
Core activity

(-) Removing left footplate

- Remove screws (1) and (2).
- Remove body-bound rivet (3).

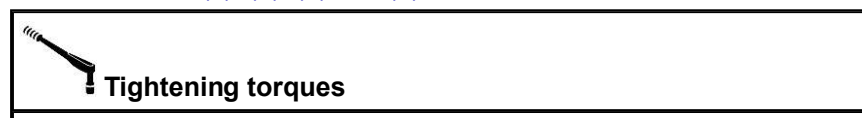


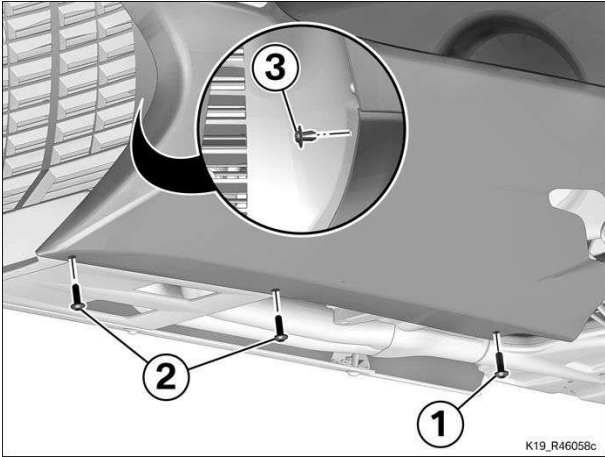
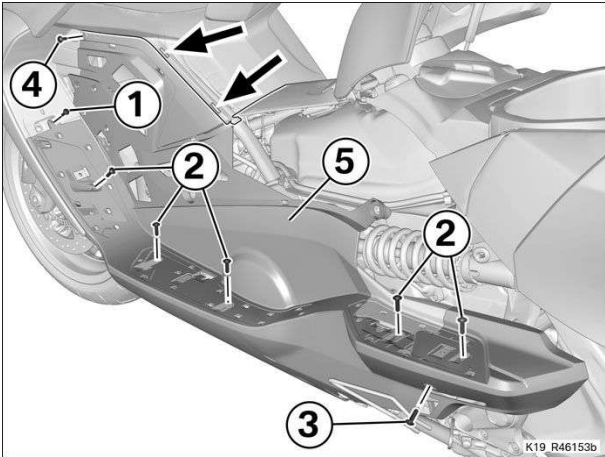
- Remove screws (1), (2), (3) and (4).
- Remove footplate (5), noting the locator (arrows).



(-) Installing left footplate

- Install footplate (5), noting the locators (arrows).
- Install screws (1), (2), (3) and (4).





General threaded fastener for fairing panels		
M5	2 Nm	
General threaded fastener for fairing panels		
M6	2 Nm	

- Install screws (1) and (2)

 Tightening torques		
General threaded fastener for fairing panels		
M6	2 Nm	

- Install body-bound rivet (3).

Finishing work

- Installing left side panel
- Installing bottom left fairing panel
- Installing top left side panel
- Installing rear left footplate insert and footrest plate
- Installing centre left footplate insert and footrest plate
- Installing front left footplate insert and footrest plate
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

46 63 146 Removing/installing or replacing footplate, right

+ 46 63 998

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing front right footplate insert and footrest plate

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing top right side panel

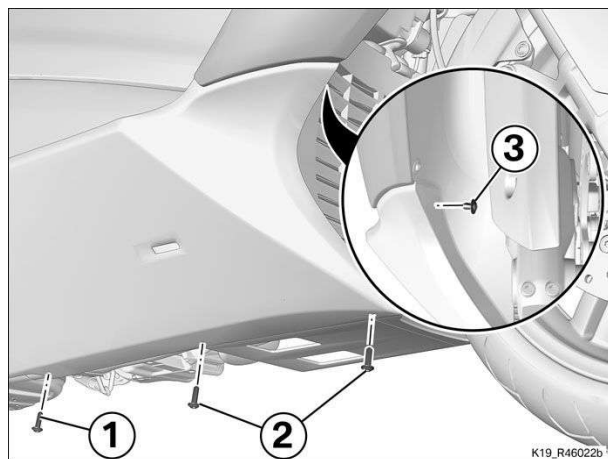
Removing bottom right fairing panel

Removing right side panel

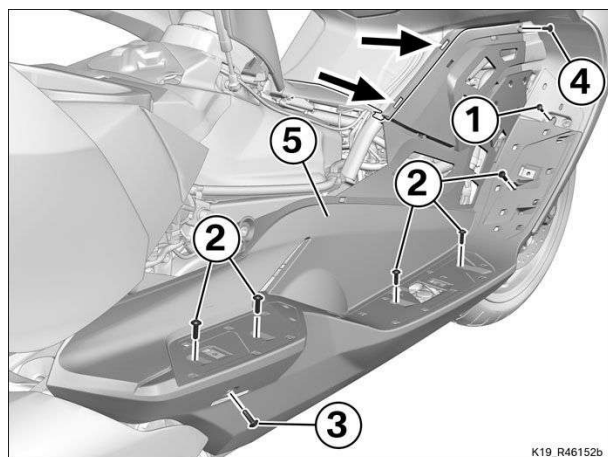
Core activity

(-) Removing rear footplate

- Remove screws (1) and (2).
- Remove body-bound rivet (3).

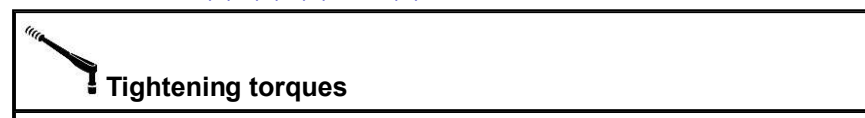


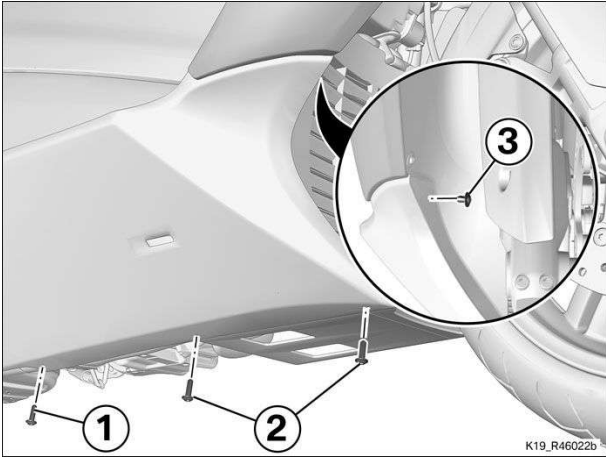
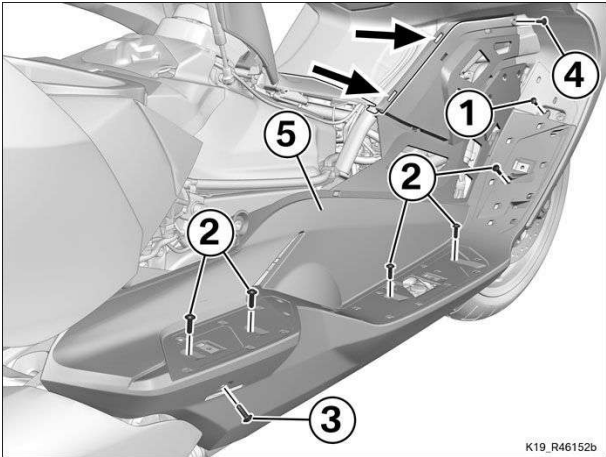
- Remove screws (1), (2), (3) and (4).
- Remove footplate (5), noting the locator (arrows).



(-) Installing right footplate

- Install footplate (5), noting the locators (arrows).
- Install screws (1), (2), (3) and (4).





General threaded fastener for fairing panels

M5	2 Nm	
General threaded fastener for fairing panels		
M6	2 Nm	

- Install screws (1) and (2).

 Tightening torques		
General threaded fastener for fairing panels		
M6	2 Nm	

- Install body-bound rivet (3).

Finishing work

- Installing right side panel
- Installing bottom right fairing panel
- Installing top right side panel
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing front right footplate insert and footrest plate
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

46 63 194 Replacing cover of fuel tank

+ 46 63 984

Preparatory work

Opening seat

Removing filler cap flap

Removing centre cover

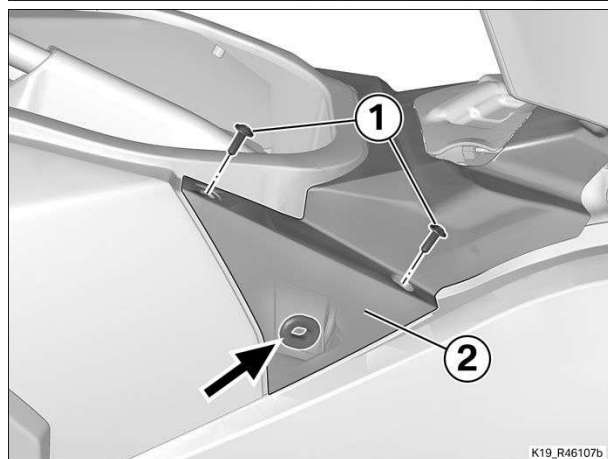
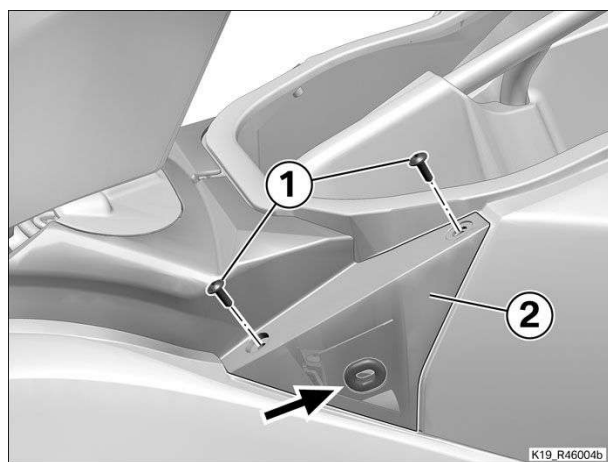
Removing hinge for filler cap flap

Removing fuel-pump cover

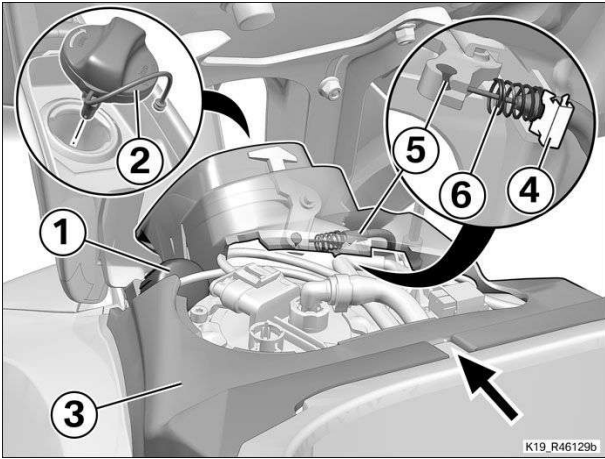
Core activity

(-) Removing cover for fuel tank

- Remove screws (1).
- Disengage cover of fuel tank (2), noting the locator (arrow).



- Remove screws (1).
- Disengage cover of fuel tank (2), noting the locator (arrow).



- Disengage diagnostic socket (1).
- Remove fuel filler cap with retaining strap (2).
- Disengage cover (3) from the locator (arrow) and raise it slightly.
- Remove clip (4) and disengage Bowden cable (5), noting spring (6).

⚠ WARNING

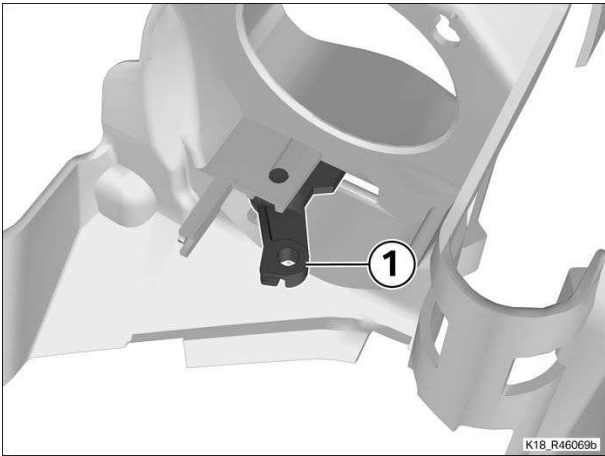
Fuel is highly flammable and hazardous to health.
Risk of fire. Health hazard.

- Comply with the pertinent safety regulations.

- Secure fuel filler cap (2).

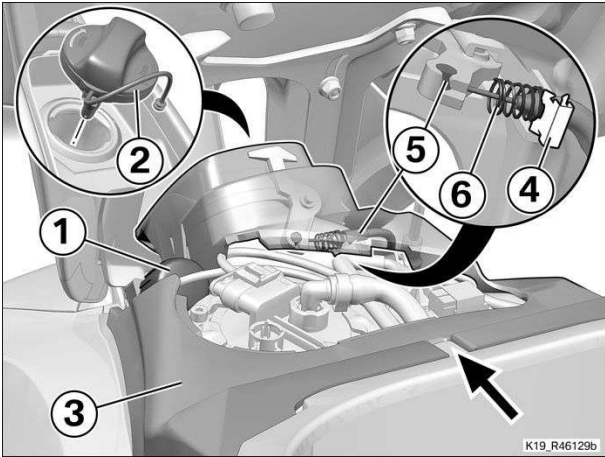
(-) Replacing cover of fuel tank

- Transfer small parts and filler cap flap latch (1) to the new part.



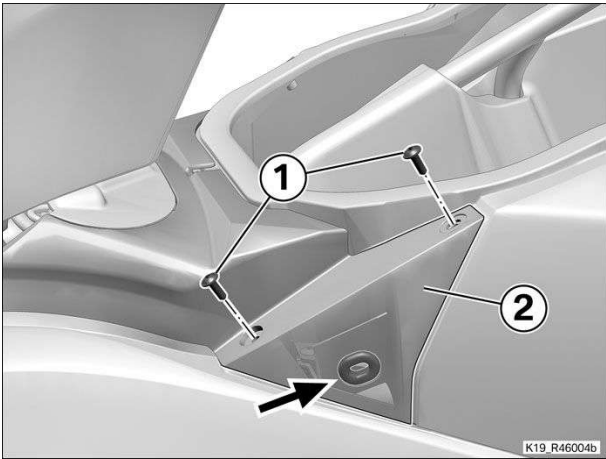
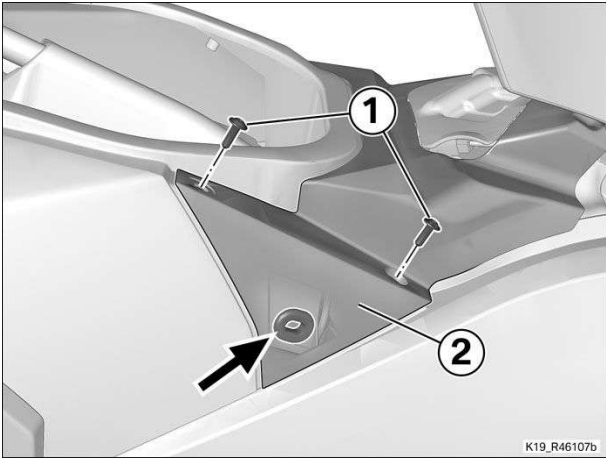
(-) Installing cover for fuel tank

- Remove fuel-tank cap (2).
- Secure Bowden cable (5) and spring (6), install clip (4).
- Install cover (3), noting the locator (arrow).
- Install fuel filler cap with retaining strap (2).
- Secure diagnostic socket (1).



- Secure cover (2), noting the locator (arrow).
- Install screws (1).

 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	



- Secure cover (2), noting the locator (arrow).
- Install screws (1).

 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	

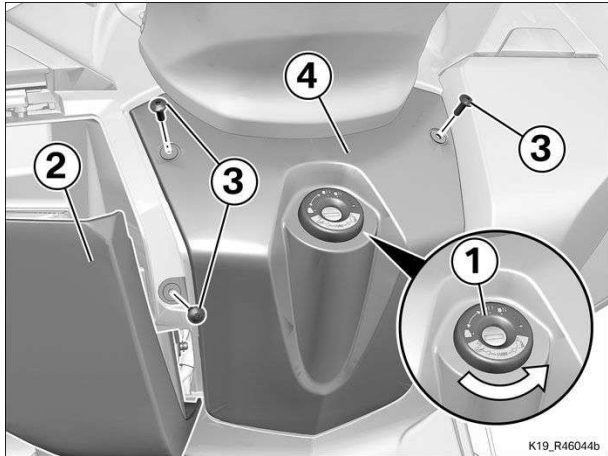
Finishing work

- Installing fuel-pump cover
- Installing hinge for filler cap flap
- Installing centre cover
- Installing filler cap flap
- Closing seat
- Final check of work performed

 46 63 196 Removing/installing or replacing centre trim panel
+ 46 63 856

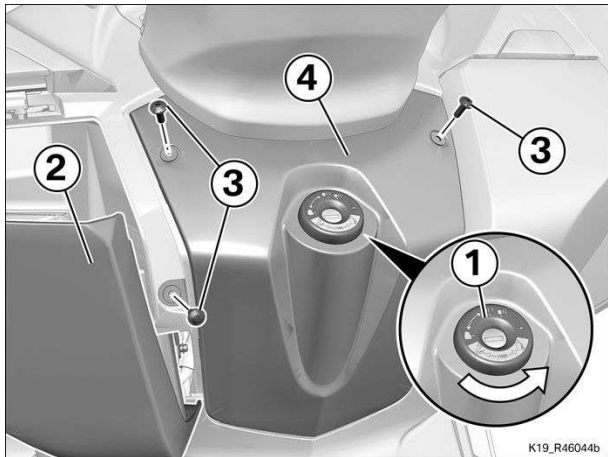
Core activity

(-) Removing centre trim panel



- Turn ignition/steering lock ring (1) counter-clockwise to release and remove.
- Open stowage-compartment lid (2).
- Remove screws (3).
- Remove centre trim panel (4).

(-) Installing centre trim panel



- Insert centre trim panel (4).
- Install screws (3).

 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	

- Close stowage-compartment lid (2).
- Install ignition/steering lock ring (1) and turn it clockwise to secure.

Finishing work

Final check of work performed

46 63 198 Replace mount securing fairing to frame

+ 46 63 858

Preparatory work

Removing filler cap flap

Opening seat

Removing centre cover

Removing top left fairing side panel

Removing front left footplate insert and footrest plate

Removing bottom left fairing panel

Removing left side panel

Removing centre left footplate insert and footrest plate

Removing rear left footplate insert and footrest plate

Removing left footplate

Removing top right side panel

Removing front right footplate insert and footrest plate

Removing bottom right fairing panel

Removing right side panel

Removing centre right footplate insert and footrest plate

Removing rear right footplate insert and footrest plate

Removing rear footplate

Removing underbody panel

Removing air deflector for radiator

Removing windscreen

Removing left slipstream deflector

Removing right slipstream deflector

Removing top instrument carrier

Removing instrument panel with covers

Removing battery

Removing right mirror

Removing left mirror

Removing complete headlight

Removing windscreen adjuster with windscreen holder

Removing battery holder

Disengaging coolant filler neck

Remove the intake air pipe

Removing horn

Disengaging pressure modulator with bracket

Disengaging control unit with bracket

Removing voltage regulator

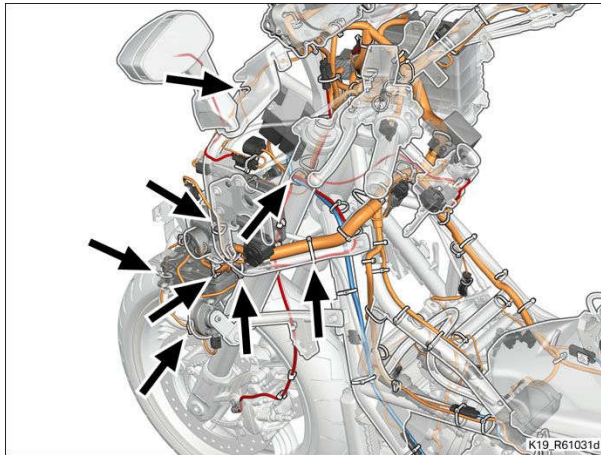
Disengaging ambient-temperature sensor
Disengaging plug for additional power socket

Core activity

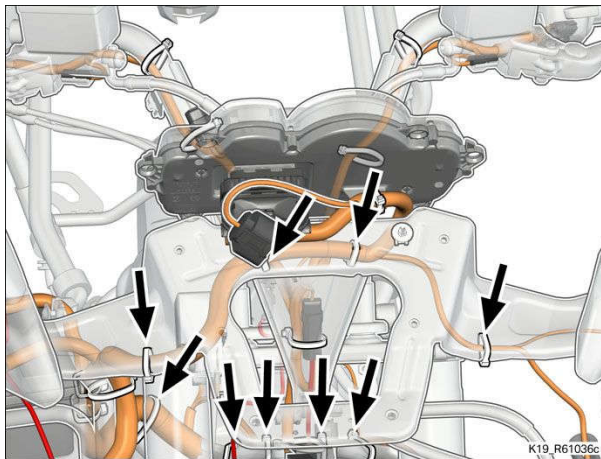
(-) Removing fairing bracket from frame

Requirement

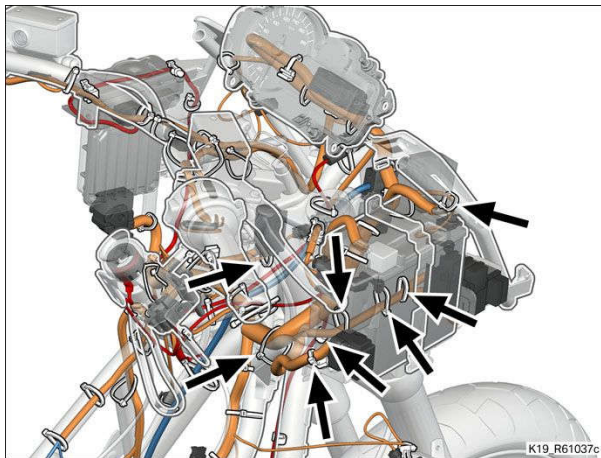
- Handlebars turned to the left.



- Mark wiring harness routing and cut through the cable ties (arrows).
- Release the wiring harness.

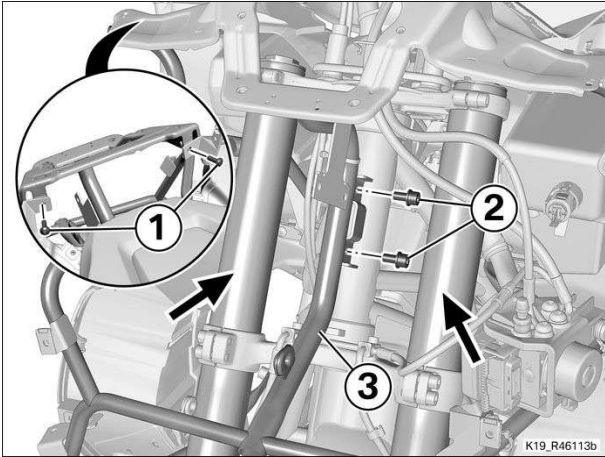
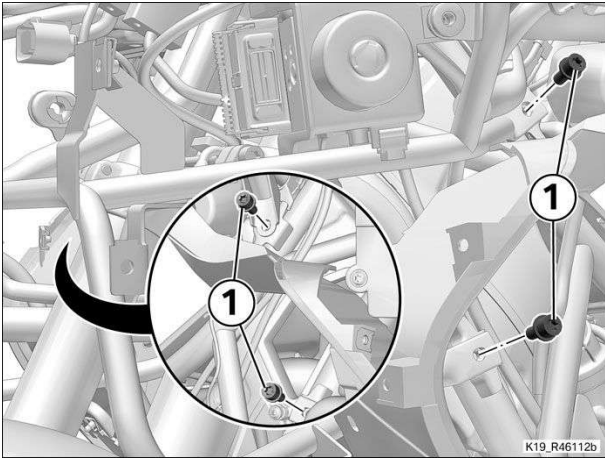


- Mark wiring harness routing and cut through the cable ties (arrows).
- Release the wiring harness.



- Mark wiring harness routing and cut through the cable ties (arrows).
- Release the wiring harness.

- Remove screws (1) on left and right.



- Remove screws (1) and (2).

ATTENTION

Hard or sharp-edged components.

Scratches and damage to paintwork.

- Use a suitable soft cover or mask off the areas at risk.

- Work fairing bracket (3) clear, noting both fork legs (arrows).
- Remove fairing bracket (3).

(-) Securing fairing bracket to frame

Requirement

- Handlebars turned to the left.



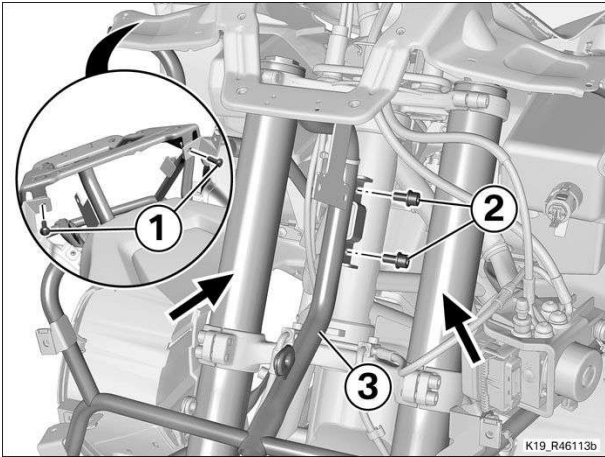
ATTENTION

Hard or sharp-edged components.

Scratches and damage to paintwork.

- Use a suitable soft cover or mask off the areas at risk.

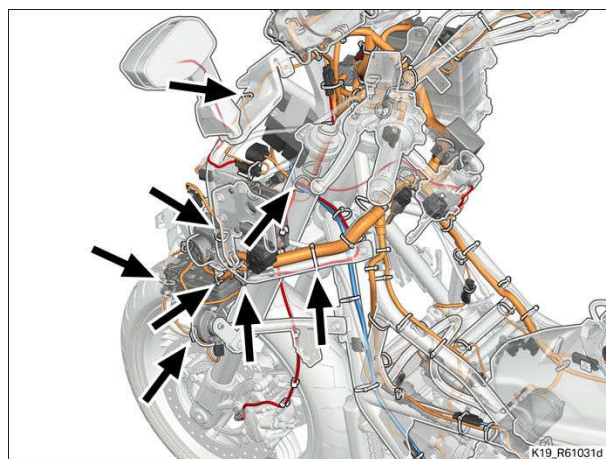
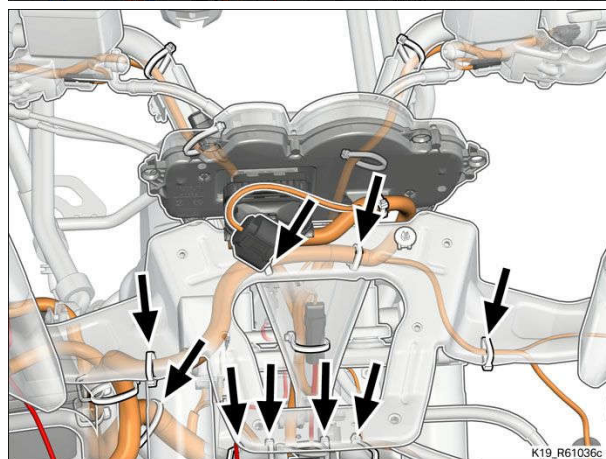
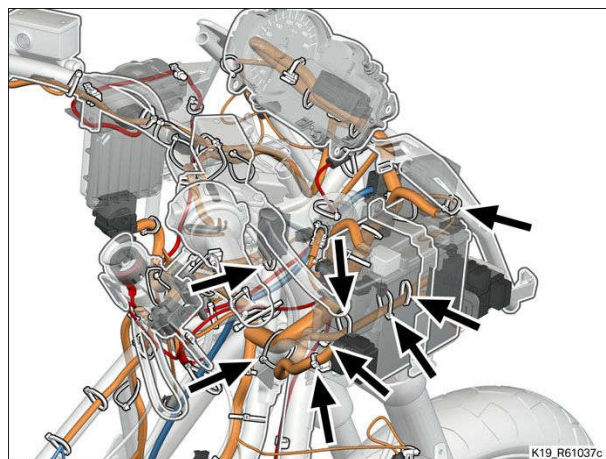
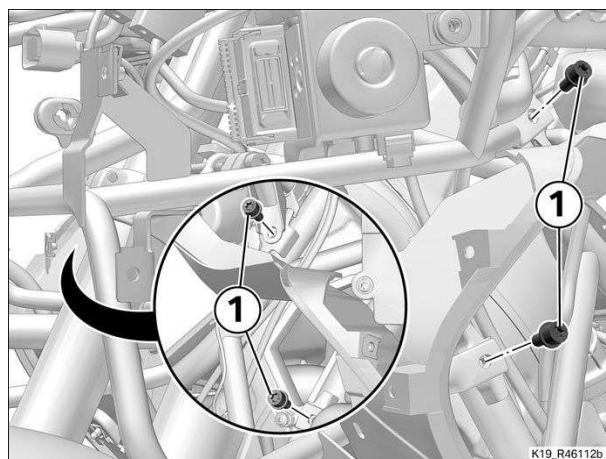
- Work fairing bracket (3) into position, noting both fork legs (arrows).
- Install screws (2) and (1).



 Tightening torques		
Front panel carrier to frame		
M8 x 16	19 Nm	

- Install screws (1).

 Tightening torques		
Front panel carrier to frame		
M8 x 16	19 Nm	



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.

- Route the wiring harness on the right side.
- Close the cable ties ([arrows](#)).

- Close the cable ties ([arrows](#)).

- Route the wiring harness on the left side.
- Close the cable ties ([arrows](#)).

Finishing work

- Securing plug for additional power socket
- Securing ambient-temperature sensor
- Installing voltage regulator
- Securing control unit with bracket
- Securing pressure modulator with bracket
- Installing horn
- Installing intake air pipe
- Securing coolant filler neck
- Installing battery holder
- Installing headlight
- Installing windscreen adjuster with windscreen holder
- Installing instrument panel with covers
- Installing top instrument carrier
- Install the right slipstream deflector
- Installing left slipstream deflector
- Installing windscreen
- Installing left mirror
- Installing right mirror
- Installing battery
- Installing air deflector for radiator
- Installing underbody panel
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Installing left footplate
- Installing rear left footplate insert and footrest plate
- Installing centre left footplate insert and footrest plate
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Checking setting for low-beam headlight
- Checking, if necessary correcting date

inal check of work performed

46 63 212 Replacing headlight carrier

+ 46 63 712

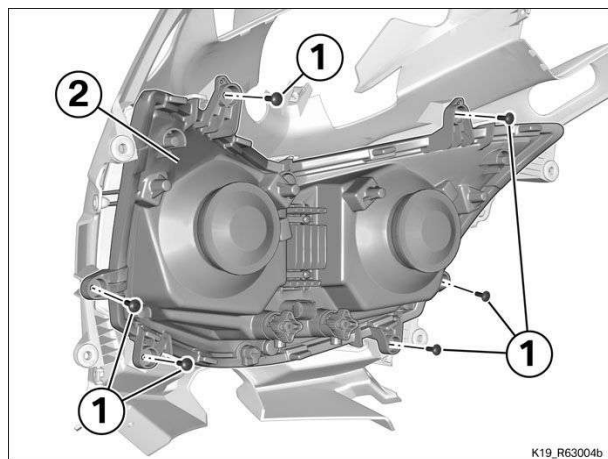
Preparatory work

- Removing top left fairing side panel
- Removing front left footplate insert and footrest plate
- Removing bottom left fairing panel
- Removing top right side panel
- Removing front right footplate insert and footrest plate
- Removing bottom right fairing panel
- Removing windscreen
- Raising windscreen holder
- Removing left mirror
- Removing battery
- Removing right mirror
- Removing left slipstream deflector
- Removing right slipstream deflector
- Removing top instrument carrier
- Removing complete headlight

Core activity

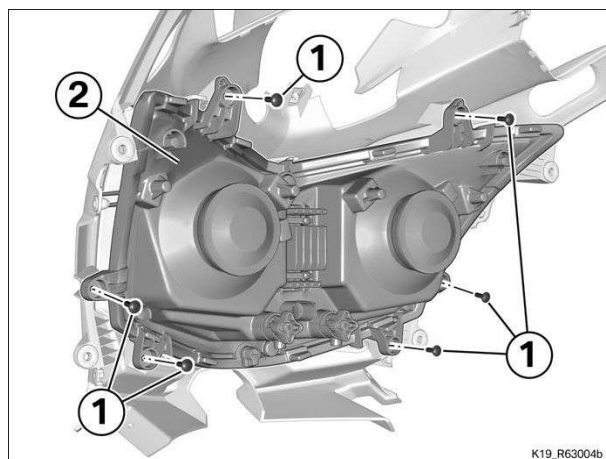
(-) Removing headlight from carrier

- Remove screws (1), remove headlight (2).



(-) Installing headlight in carrier

- Secure headlight (2) with screws (1).



Finishing work

Installing headlight

Installing top instrument carrier

Install the right slipstream deflector

Installing left slipstream deflector

Installing windscreen

Installing right mirror

Installing battery

Installing left mirror

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing bottom left fairing panel

Installing front left footplate insert and footrest plate

Installing top left side panel

Checking setting for low-beam headlight

Checking, if necessary correcting date

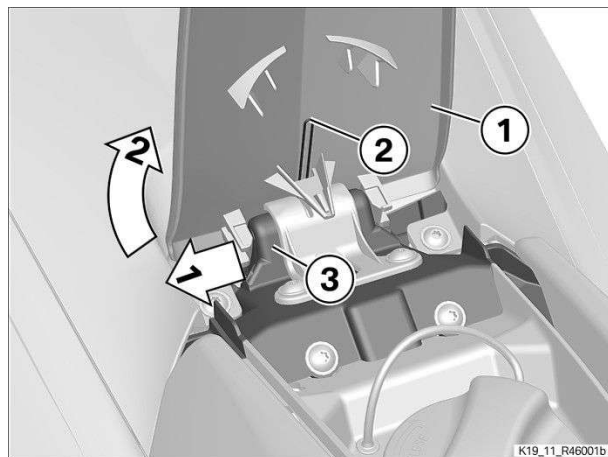
Final check of work performed

46 63 308 Replacing flip cap for fuel filler cap

+ 46 63 931

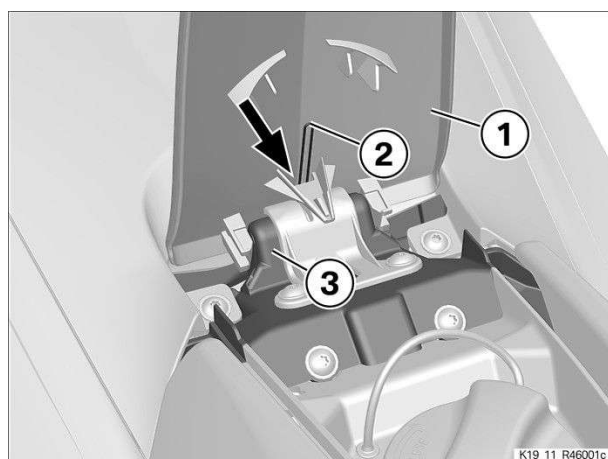
Core activity

(-) Removing filler cap flap



- Push fuel filler flap (1) to the left and work it forward to disengage (arrows), noting spring (2).
- Remove fuel filler flap (1) from hinge (3).

(-) Installing filler cap flap



- Place fuel filler flap (1) in position, inserting spring (2) into the opening (arrow).
- Secure fuel filler flap (1) at hinge (3) and close.

Finishing work

Final check of work performed

46 63 318 Renewing the cover of the storage compartment

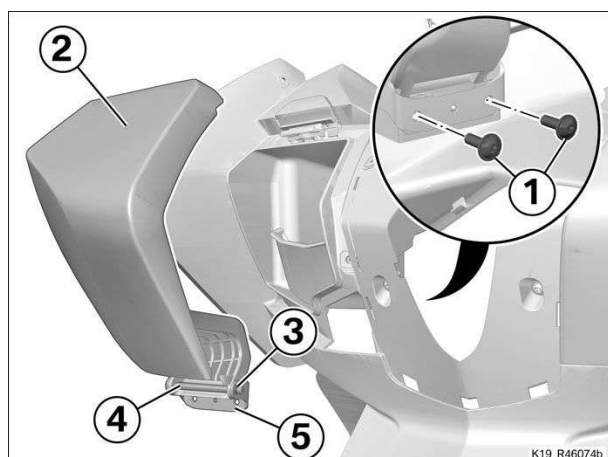
+ 46 63 893

Preparatory work

- Removing filler cap flap
- Removing centre cover
- Opening seat
- Removing centre trim panel
- Removing handlebar trim
- Removing top handlebar cover
- Removing bottom handlebar cover
- Removing instrument panel with carrier
- Removing top left fairing side panel
- Removing front left footplate insert and footrest plate
- Removing bottom left fairing panel
- Removing left side panel
- Removing top right side panel
- Removing front right footplate insert and footrest plate
- Removing bottom right fairing panel
- Removing right side panel
- Removing centre right footplate insert and footrest plate
- Removing rear right footplate insert and footrest plate
- Removing rear footplate
- Removing leg guard

Core activity

(-) Removing storage compartment lid

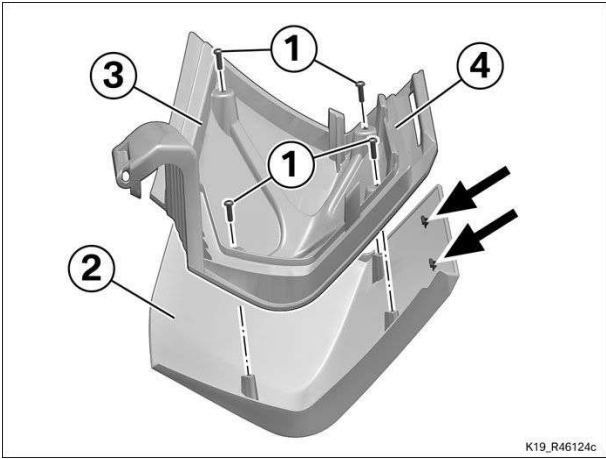


- Remove the following components:

- Screws (1)
- Stowage-compartment lid (2)
- Spring washer (3)
- Pin (4)
- Holder (5)

(-) Replacing stowage-compartment lid

- Remove screws (1) and remove cover panel (2) from stowage-compartment lid (3), noting the locators (arrows).
- Position cover panel (2) on new stowage-compartment lid (3), noting



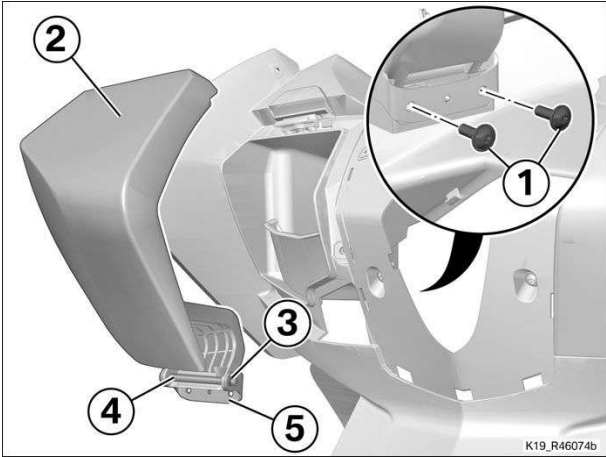
the locators (arrows).

- Install screws (1).

 Tightening torques		
Cover to stowage-compartment lid		
4 x 14, Screw for plastic	1.5 Nm	

- Glue the seal to sealing face (4).

(-) Installing storage compartment lid



- Install the following components:

- Holder (5)
- Pin (4)
- Spring washer (3)
- Stowage-compartment lid (2)

- Install and tighten screws (1).

 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	

Finishing work

- Installing leg guard
- Installing right footplate
- Installing rear right footplate insert and footrest plate
- Installing centre right footplate insert and footrest plate
- Installing right side panel
- Installing bottom right fairing panel
- Installing front right footplate insert and footrest plate
- Installing top right side panel
- Installing left side panel
- Installing bottom left fairing panel
- Installing front left footplate insert and footrest plate
- Installing top left side panel
- Installing instrument panel with carrier
- Installing bottom handlebar cover
- Installing top handlebar cover
- Installing handlebar trim
- Installing centre trim panel

Closing seat

Installing centre cover

Installing filler cap flap

Final check of work performed

 46 63 321 Replacing left or right rear trim panel

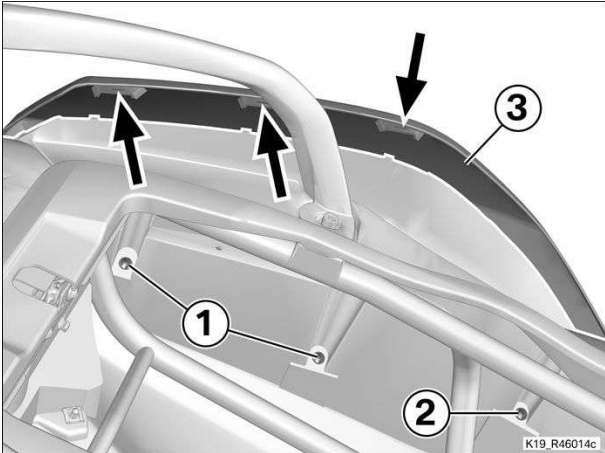
+ 46 63 896

Preparatory work

- Opening seat
- Removing carpet for luggage compartment

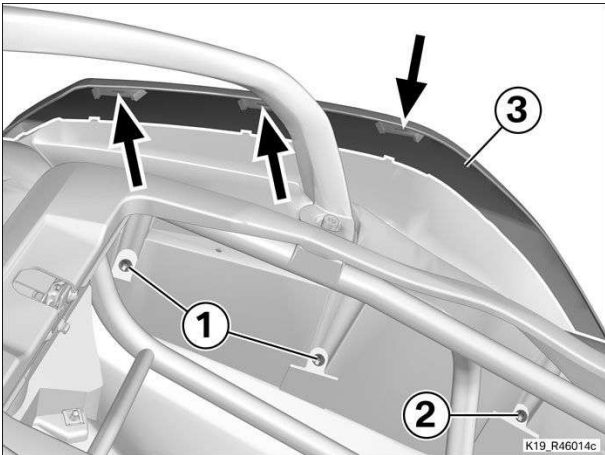
Core activity

(-) Removing left rear trim panel



- Remove screws (1).
- Remove body-bound rivet (2).
- Work rear trimmer (3) up and remove, noting the locators (arrows).

(-) Installing left rear trim panel



- Install rear trim panel (3), noting the locators (arrows).
- Install body-bound rivet (2).
- Install screws (1).

 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	

Finishing work

- Installing carpet for luggage compartment
- Closing seat
- Final check of work performed

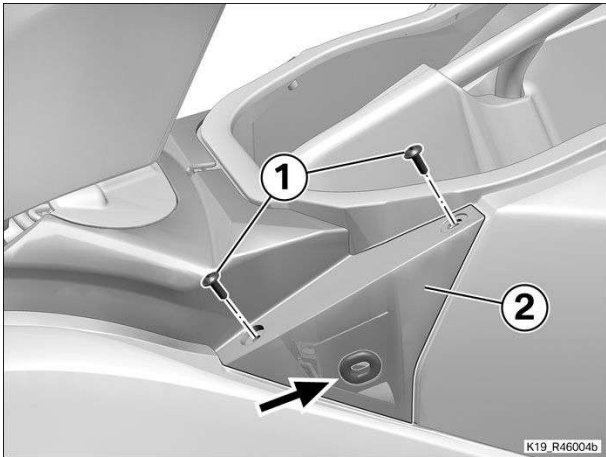
 46 63 330 Replacing side section of panelling on left or right
+ 46 63 897

Preparatory work

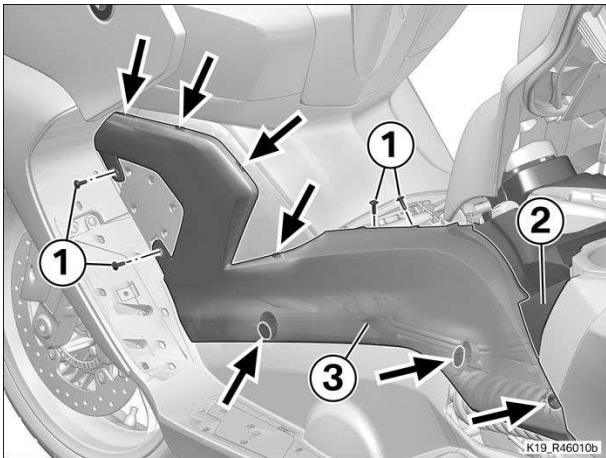
- Removing filler cap flap
- Opening seat
- Removing centre cover
- Removing front left footrest plate

Core activity

(-) Removing left side panel



- Remove screws (1).
- Disengage cover of fuel tank (2), noting the locator (arrow).



- Remove screws (1).
- Disengage cover for fuel tank (2) from side panel (3).

 ATTENTION

Hard or sharp-edged objects.

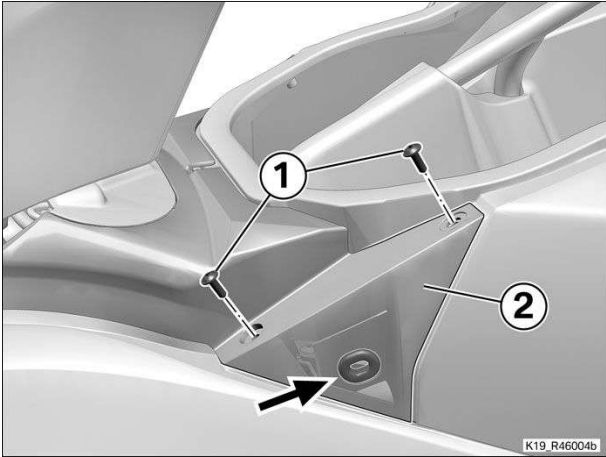
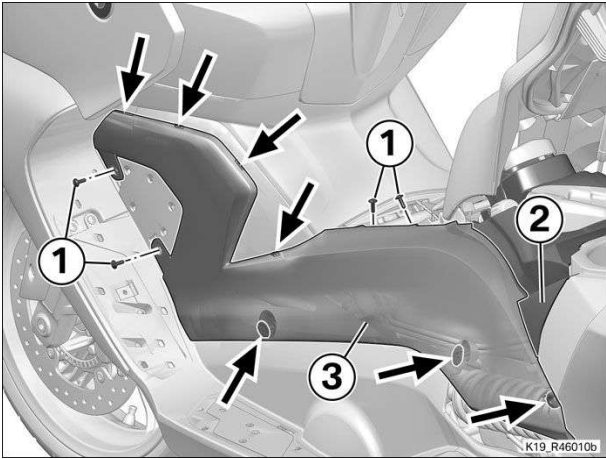
Component damage

- Take care not to scratch components; cover or mask as necessary.
-
- Disengage side panel (3) from the locators (arrows) and remove, noting cover of fuel tank (2).

(-) Installing left side panel

- Insert side panel (3) **underneath** fuel-tank cover (2) and secure, noting the locators (arrows).
- Install screws (1).

 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	



- Secure cover of fuel tank (2), noting the locator (arrow).
- Install screws (1).

Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	

Finishing work

- Installing front left footrest plate
- Installing centre cover
- Closing seat
- Installing filler cap flap
- Final check of work performed

46 63 343 Replace inner cover for instruments

+ 46 63 907

Preparatory work

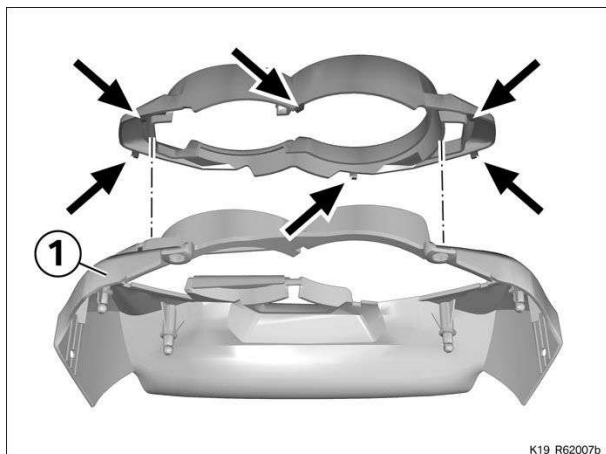
Removing instrument panel with carrier

Removing instrument panel

Core activity

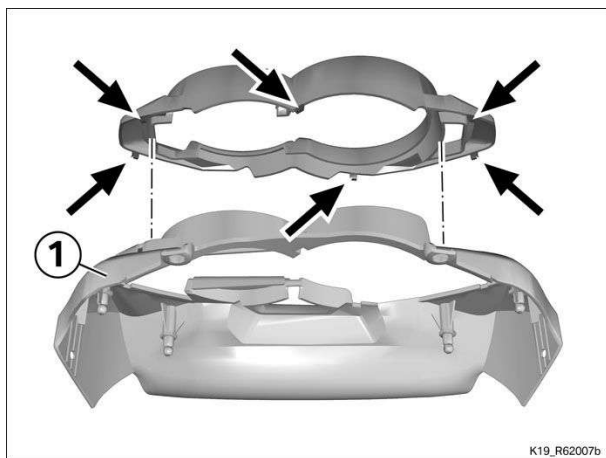
(-) Removing inboard cover

- Remove inboard cover (1), noting the locators (arrows).



(-) Installing inboard cover

- Install inboard cover (1), noting the locators (arrows).



Finishing work

Installing instrument panel

Installing instrument panel with carrier

Final check of work performed

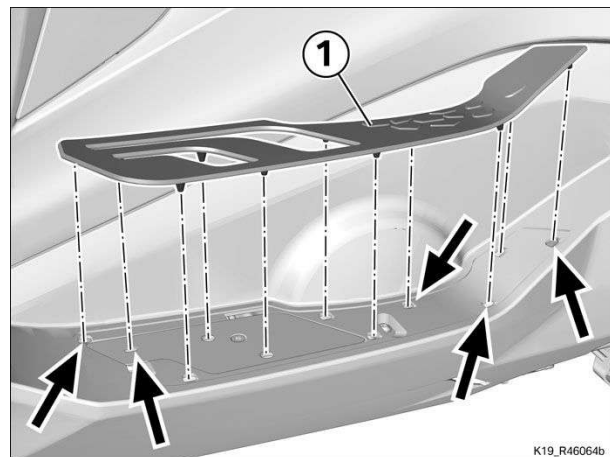
46 63 346 Replacing footrest plate, centre left or right

+ 46 63 790

Core activity

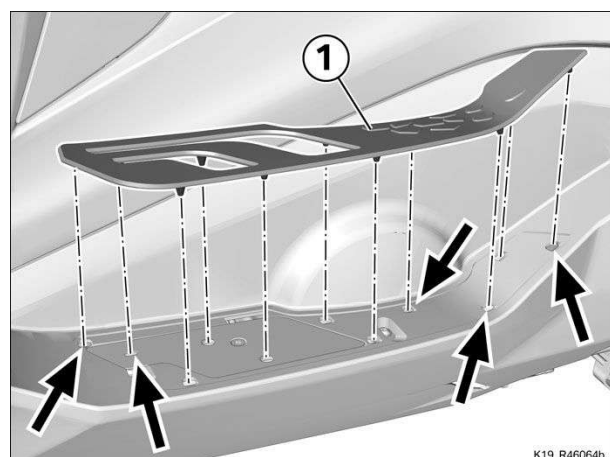
(-) Removing left centre footrest plate

- Remove footrest plate (1) (noting the locators (arrows)).



(-) Installing left centre footrest plate

- Install footrest plate (1), noting the locators (arrows).



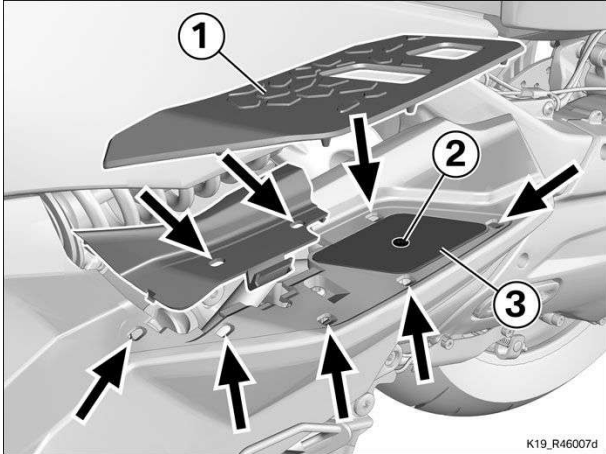
Finishing work

Final check of work performed

 46 63 355 Replacing footrest insert, rear left or right
+ 46 63 994

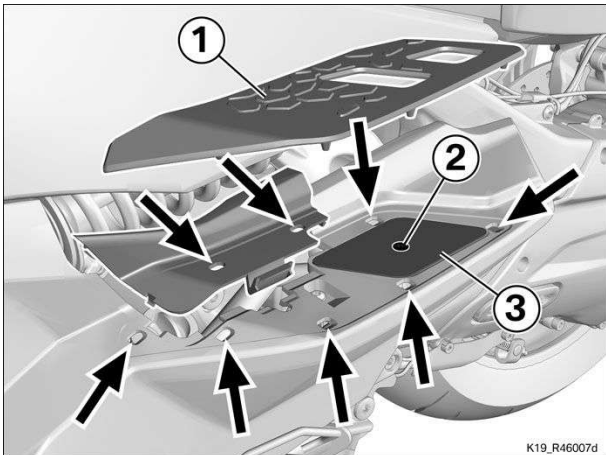
Core activity

(-) Removing rear left footplate insert and footrest plate



- Remove the following components:
 - Footrest plate (1), noting the locators (arrows).
 - Screw (2)
 - Footplate insert (3)

(-) Installing rear left footplate insert and footrest plate



- Install footplate insert (3) and screw (2).

 Tightening torques		
Footplate insert to carrier		
M6 x 16	5 Nm	

- Install footrest plate (1), noting the locators (arrows)).

Finishing work

Final check of work performed

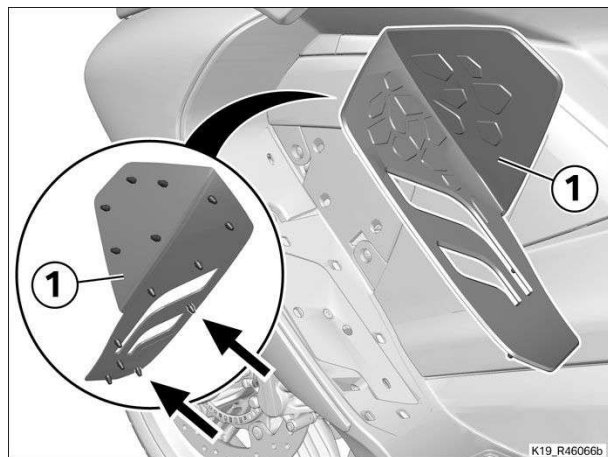
 46 63 356 Replacing footrest plate, front left or right

+ 46 63 993

Core activity

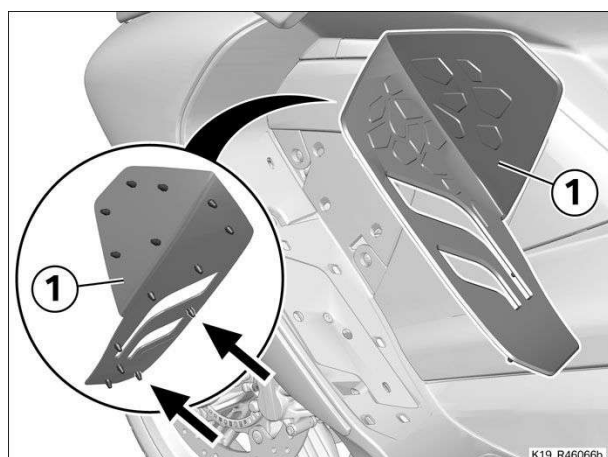
(-) Removing front left footrest plate

- Remove footrest plate (1) (noting the locators (arrows)).



(-) Installing front left footrest plate

- Install footrest plate (1), noting the locators (arrows).



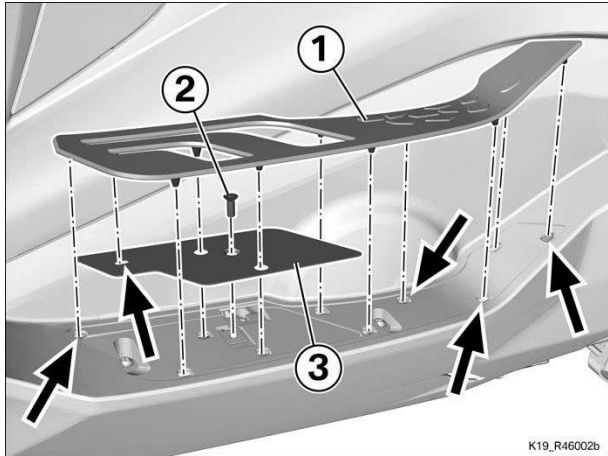
Finishing work

Final check of work performed

 46 63 357 Replacing footrest insert, centre left or right
+ 46 63 513

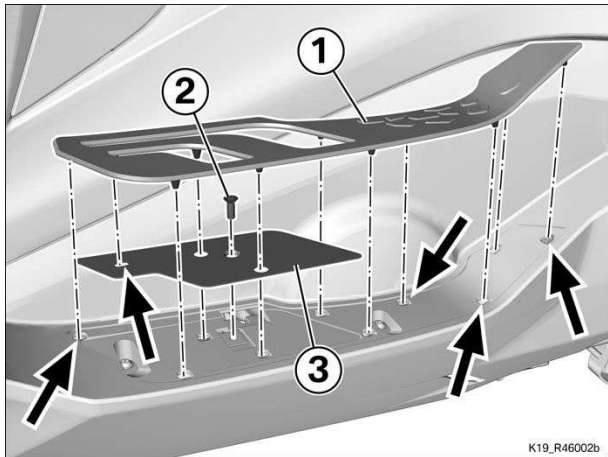
Core activity

(-) Removing centre left footplate insert and footrest plate



- Remove the following components:
 - Footrest plate (1), noting the locators (arrows).
 - Screw (2)
 - Footplate insert (3)

(-) Installing centre left footplate insert and footrest plate



- Install footplate insert (3) and screw (2).

 Tightening torques		
Footplate insert to carrier		
M6 x 16	5 Nm	

- Install footrest plate (1), noting the locators (arrows)).

Finishing work

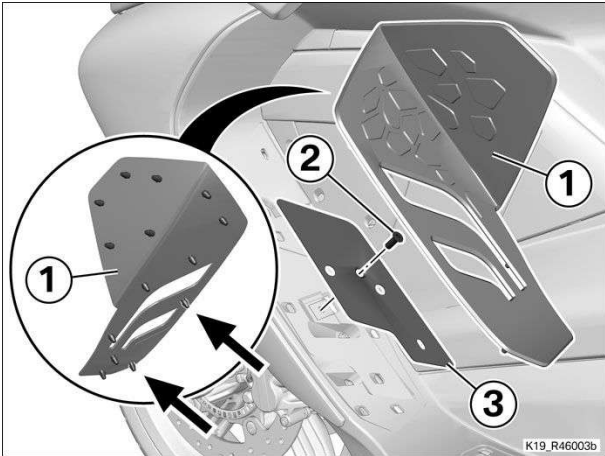
Final check of work performed

 46 63 358 Replacing footrest insert, front left or right
+ 46 63 514

Core activity

(-) Removing front left footplate insert and footrest plate

- Remove the following components:
 - Footrest plate (1), noting the locators (arrows).
 - Screw (2)
 - Footplate insert (3)

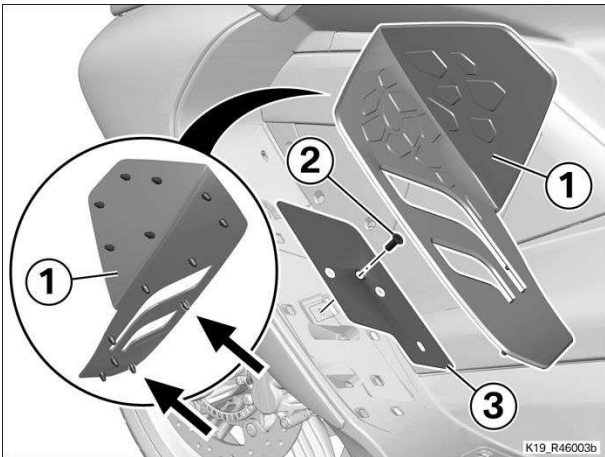


(-) Installing front left footplate insert and footrest plate

- Install footplate insert (3) and screw (2).

 Tightening torques		
Footplate insert to carrier		
M6 x 16	5 Nm	

- Install footrest plate (1), noting the locators (arrows)).



Finishing work

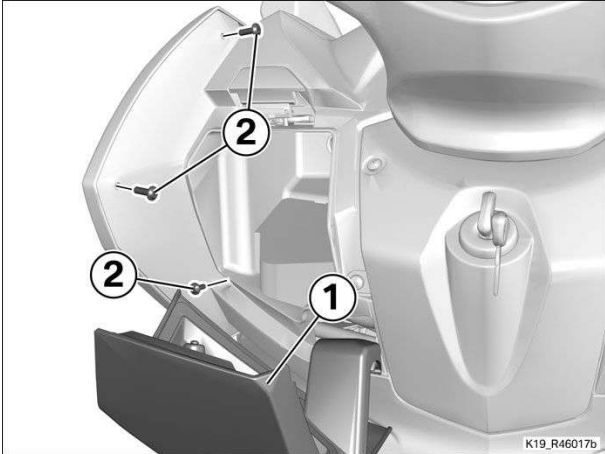
Final check of work performed

 46 63 359 Replacing left top side panel
+ 46 63 515

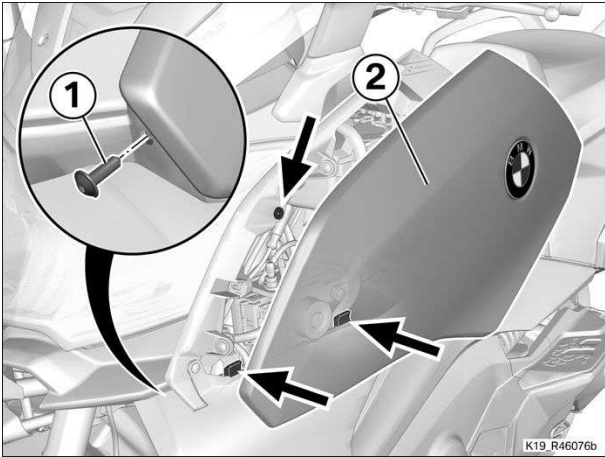
Core activity

(-) Removing top left fairing side panel

- Open stowage-compartment lid (1).
- Remove screws (2).



- Remove screw (1).
- Remove top side panel (2), noting the locators (arrows).



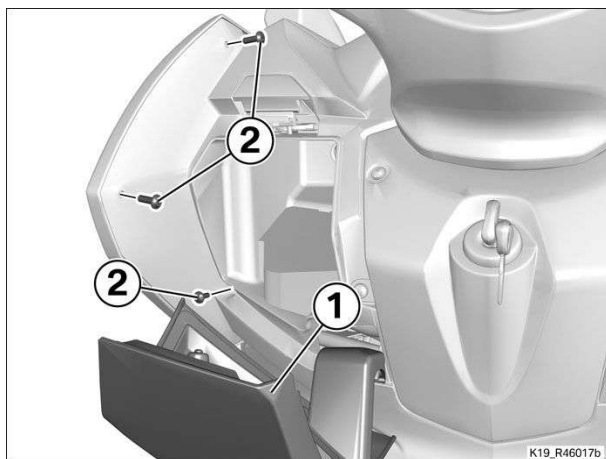
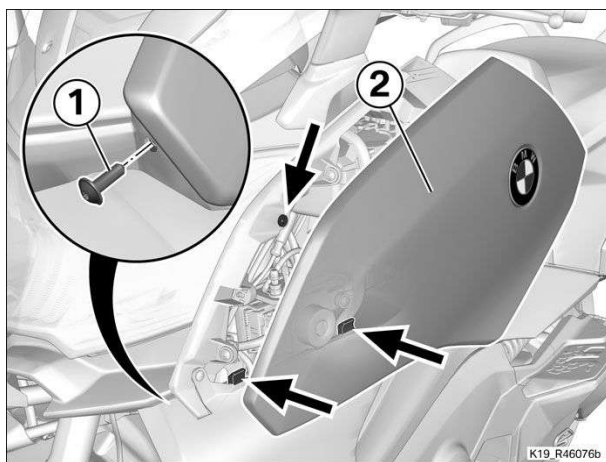
(-) Installing BMW badge

- Clean and degrease the gluing face.
- Affix the badge, making sure it is correctly aligned.

 Technical data			
Hold-down time for bonding	at room temperature	approx. 5 s	

(-) Installing top left side panel

- Install top side panel (2), noting the locators (arrows).
- Install screw (1).



- Install screws (2).
- Close stowage-compartment lid (1).

Finishing work

Final check of work performed

 46 63 392 Replacing handlebar cover, bottom
+ 46 63 510

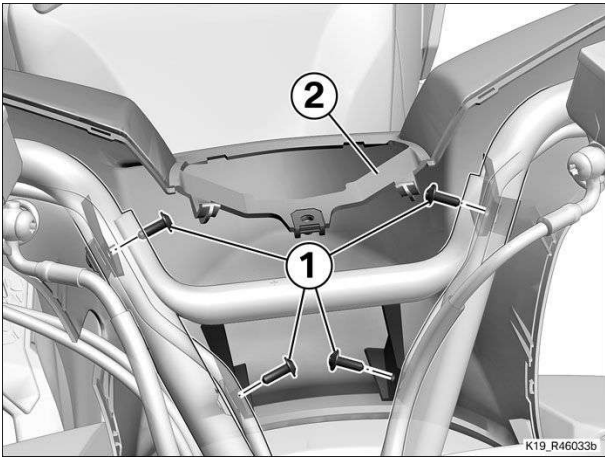
Preparatory work

- Removing handlebar trim
- Removing top handlebar cover

Core activity

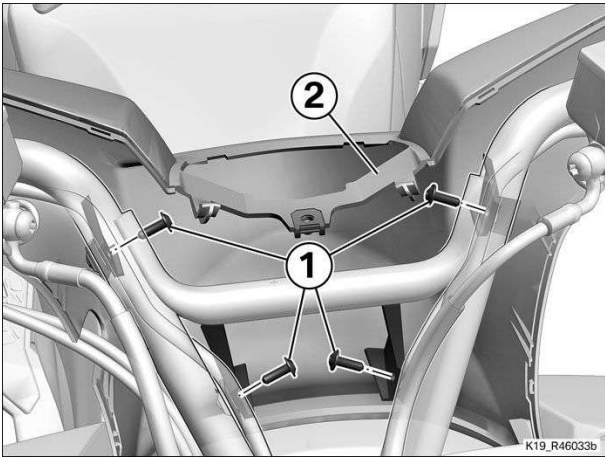
(-) Removing bottom handlebar cover

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



(-) Installing bottom handlebar cover

- Secure handlebar cover (2) with screws (1).



 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	

Finishing work

- Installing top handlebar cover
- Installing handlebar trim
- Final check of work performed

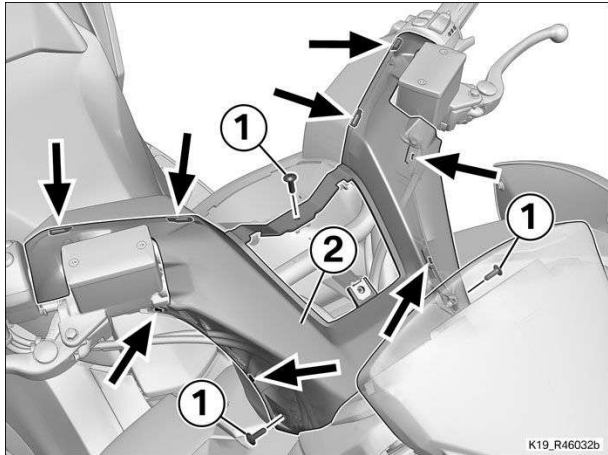
 46 63 398 Replacing handlebar top cover
+ 46 63 562

Preparatory work

Removing handlebar trim

Core activity

(-) Removing top handlebar cover



- Remove screws (1).
- Remove handlebar cover (2), noting the locators (arrows).

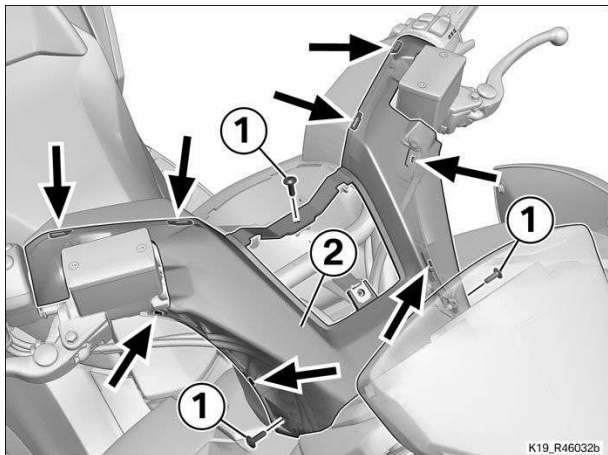
(-) Installing top handlebar cover

 ATTENTION

Kinking and chafing, lines and Bowden cables not routed in compliance with correct procedure.

Malfunction

- Make sure that routing and securing of the lines and Bowden cables are correct.



- Install handlebar cover (2), noting the locators (arrows).
- Install screws (1).

 Tightening torques		
General threaded fastener for fairing panels		
M5	2 Nm	

Finishing work

Installing handlebar trim

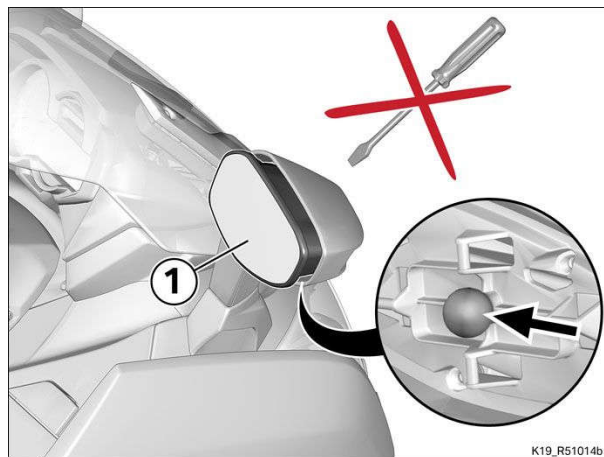
Final check of work performed

51 16 041 Replace mirror glass

+ 51 16 541

Core activity

(-) Removing mirror glass



- **Without using tools**, disengage mirror glass (1) from the ball head (arrow) and remove.

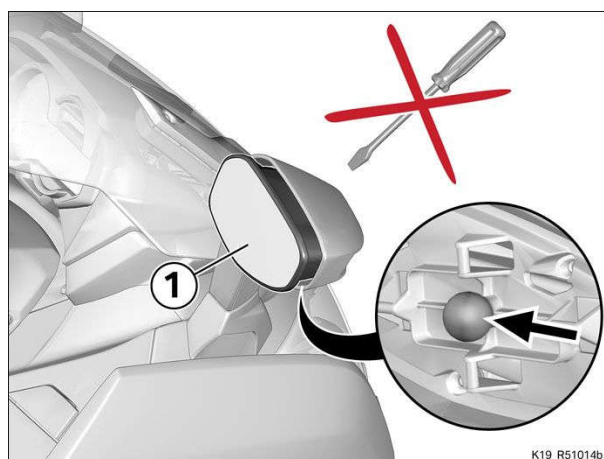
(-) Installing mirror glass

ATTENTION

Lubricated rubber mounts or detent pins.

Mirror can disengage too easily from the mounting.

- Do not lubricate rubber mount and detent pin.
-
- Install mirror glass (1), making sure that it latches securely on the ball head (arrow).



Finishing work

Final check of work performed

62 11 199 Replacing instrument cluster (without (testing software/programming)

+ 62 11 510

NOTICE

Do not, **under any circumstances** temporarily install control units from other vehicles by way of testing.

The possible consequences include:

Coding data could be overwritten.

The control units could malfunction.

NOTICE

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

Preparatory work

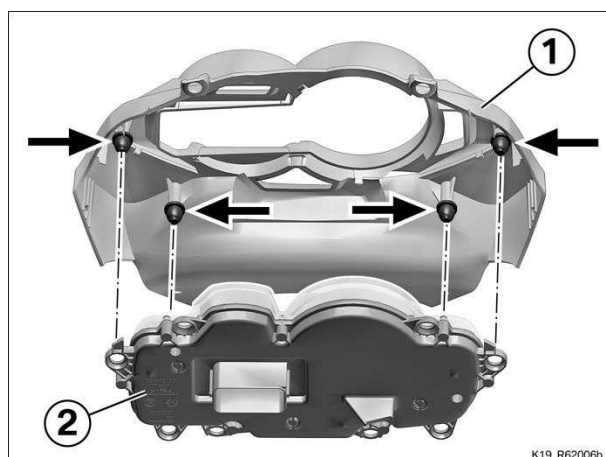
Removing instrument panel with carrier

Removing bottom instrument carrier

Core activity

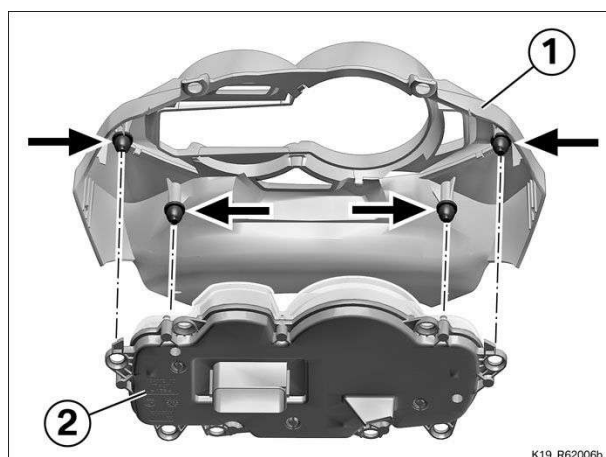
(-) Removing instrument panel

- Disengage inner trim (1) from the locators (arrows) and remove instrument panel (2).



(-) Installing instrument panel

- Secure instrument panel (2) in inner cover (1), noting the locators (arrows).



Finishing work

Installing bottom instrument carrier

Installing instrument panel with carrier

**=> 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

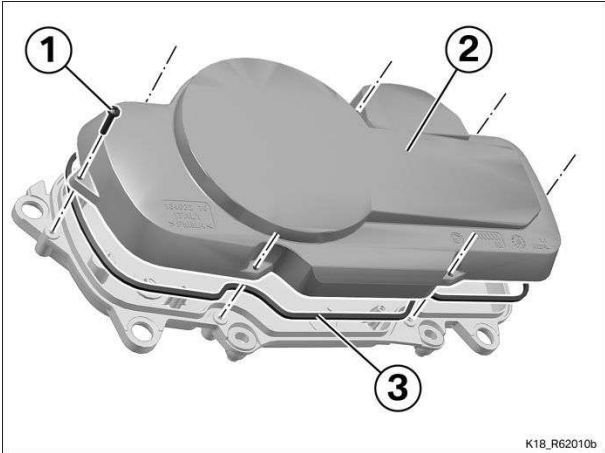
 62 11 205 Replace lens for instrument cluster
+ 62 11 505

Preparatory work

Removing instrument panel with carrier
Removing instrument panel

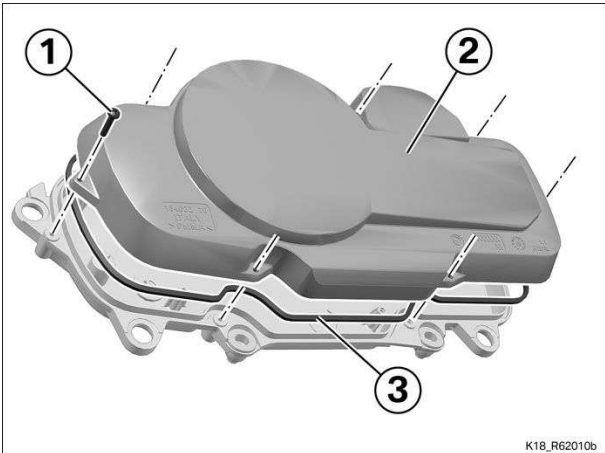
Core activity

(-) Removing cover for instrument panel



- Remove the following components:
 - Screws (1)
 - Cover (2)
 - Seal (3)

(-) Installing cover for instrument panel



- Check seal (3); replace if necessary.
- Install seal (3).
- Secure cover (2) with screws (1).

 Tightening torques		
Glass cover for instrument panel		
Screw for plastic, 2.5 x 13	0.3 Nm	

Finishing work

Installing instrument panel
Installing instrument panel with carrier
Final check of work performed

 **63 12 000 Adjust headlight**
+ 63 12 500

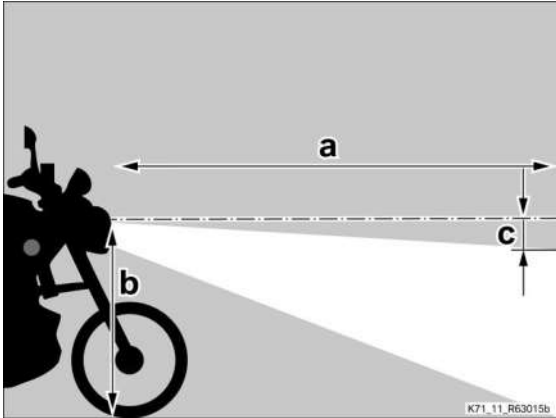
Core activity

(-) Checking setting for low-beam headlight

- Position the Maxi Scooter on a smooth, level surface.
- Set the spring preload to the basic setting.
- Apply the rider's weight to the Maxi Scooter.
- Start the engine and check that the headlight setting.

Check

- Distances:
 - (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	Vehicle loaded with 85 kg	7.5 cm	

Result:

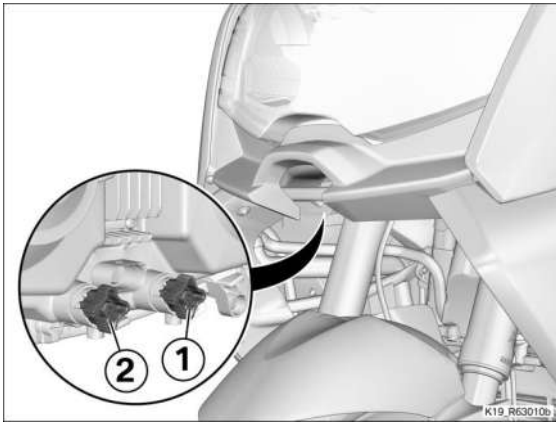
- Setting for low-beam headlight not correct.

Measure:

- Adjust the headlight setting (beam throw).

► Correcting headlight beam angle

- Correct beam throw for the **low-beam headlight** by turning **right** adjusting screw (1).
- If necessary, the beam throw of the **high-beam headlight** can be corrected by turning **left** adjusting screw (2).



Finishing work

Final check of work performed

63 12 091 Replacing headlight

+ 63 12 637

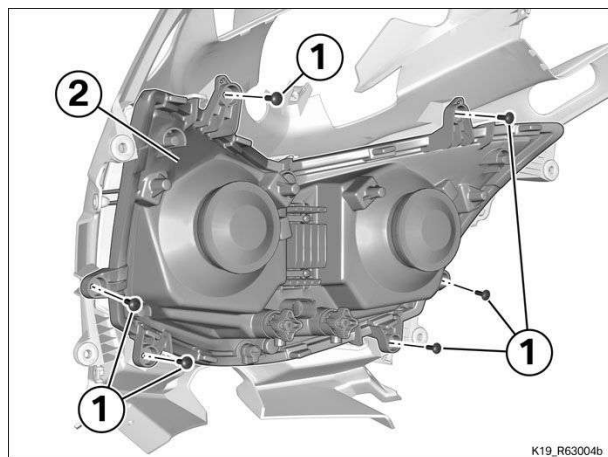
Preparatory work

Removing top right side panel
Removing front right footplate insert and footrest plate
Removing bottom right fairing panel
Removing top left fairing side panel
Removing front left footplate insert and footrest plate
Removing bottom left fairing panel
Removing left mirror
Removing battery
Removing right mirror
Removing windscreen
Removing left slipstream deflector
Removing right slipstream deflector
Removing top instrument carrier
Removing complete headlight

Core activity

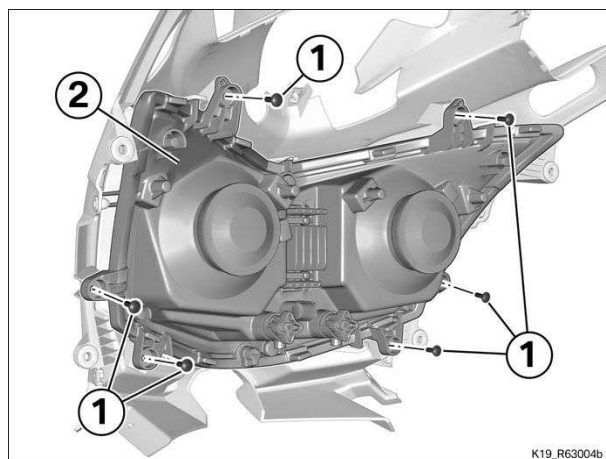
(-) Removing headlight from carrier

- Remove screws (1), remove headlight (2).



(-) Installing headlight in carrier

- Secure headlight (2) with screws (1).



Finishing work

Installing headlight

Installing top instrument carrier

Installing left slipstream deflector

Install the right slipstream deflector

Installing windscreen

Installing right mirror

Installing battery

Installing left mirror

Installing bottom right fairing panel

Installing front right footplate insert and footrest plate

Installing top right side panel

Installing bottom left fairing panel

Installing front left footplate insert and footrest plate

Installing top left side panel

Checking setting for low-beam headlight

Checking, if necessary correcting date

Final check of work performed

63 13 012 Renewing complete front left or right flashing turn indicator

+ 63 13 501

Preparatory work

Removing top right side panel

Removing battery

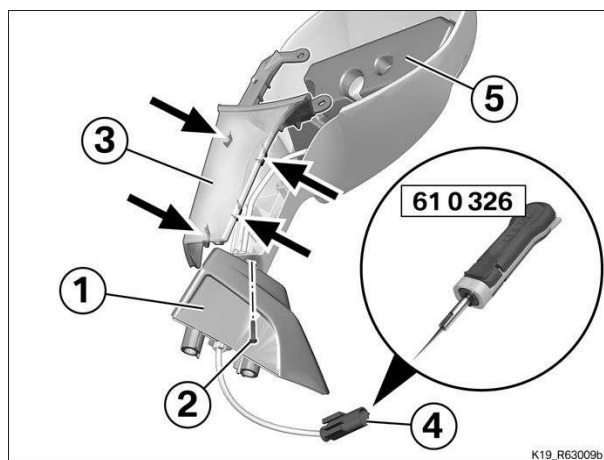
Removing mirror glass

Removing backing plate

Removing right mirror

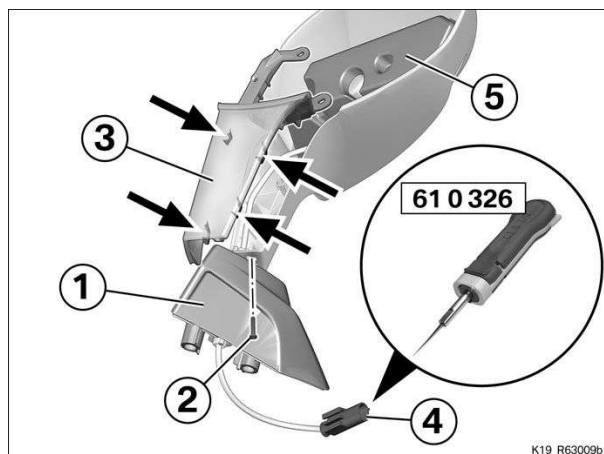
Core activity

(-) Removing LED flashing turn indicators



- Turn the mirror base (arrow) until screw (2) is visible and remove screw (2).
- Remove cover (3), noting the locators (arrows).
- Unpin plug (4) with unlatching tool (No. 61 0 326).
- Remove LED flashing turn indicator (5) with cable.

(-) Installing LED turn indicators



- Insert LED flashing turn indicator (5), routing the cable through mirror base (1).
- Pin the cable into plug (4):
 - Wire colour **white** or **brown** into slot 1
 - Wire colour **blue** or **green** into slot 2
- Install cover (3), noting the locators (arrows).
- Install screw (2).
- Turn back mirror base (1).

Finishing work

Installing right mirror

Installing backing plate

Installing mirror glass

Installing battery

Installing top right side panel

Checking, if necessary correcting date

Final check of work performed

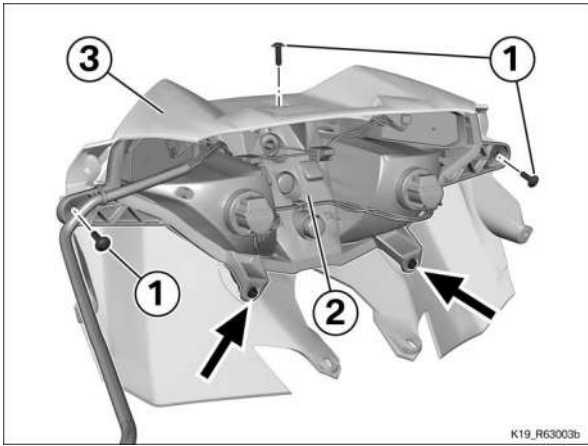
 63 21 380 Removing and installing or replacing complete rear light
+ 63 21 502

Preparatory work

- Opening seat
- Removing carpet for luggage compartment
- Removing left rear trim panel
- Removing right rear trim panel
- Removing rear grab handle
- Removing rear trimmer with rear-light unit

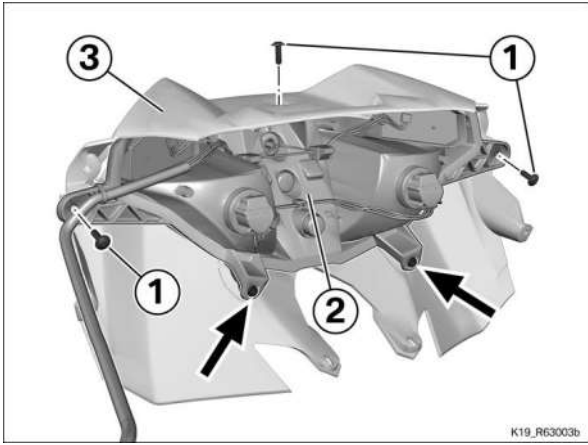
Core activity

(-) Removing rear-light unit



- Remove screws (1).
- Remove rear light (2) from centre rear trimmer (3), noting the locators (arrows).

(-) Installing rear-light unit



- Insert rear light (2) into centre rear trimmer (3), noting the locators (arrows).
- Install screws (1).

 Tightening torques		
Rear light to rear finisher		
M5 x 16, Replace screw Thread-locking compound (mechanical)	2 Nm	

Finishing work

- Installing rear trimmer with rear-light unit
- Installing rear grab handle
- Installing right rear trim panel
- Installing left rear trim panel
- Installing carpet for luggage compartment
- Closing seat
- Final check of work performed

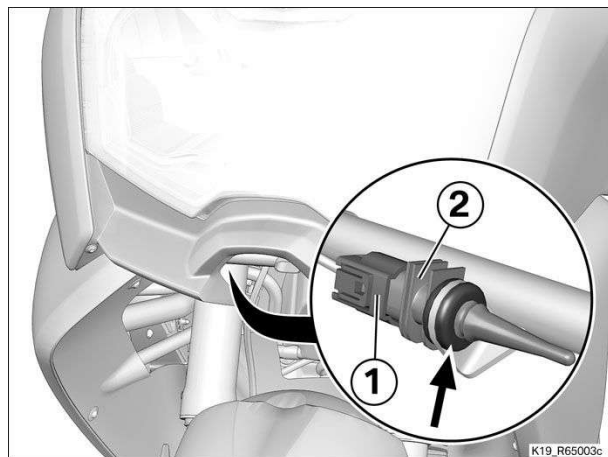
65 81 050 Replacing ambient-temperature sensor

+ 65 81 550

Core activity

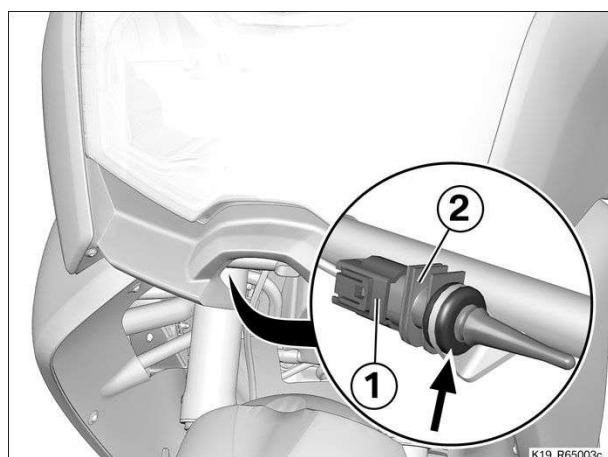
(-) Removing ambient-temperature sensor

- Disconnect plug (1) and disengage ambient-temperature sensor (2) from the holder (arrow).



(-) Installing ambient-temperature sensor

- Connect plug (1) and secure ambient-temperature sensor (2) in the holder (arrow).



Finishing work

Final check of work performed