Repair manual

C1
C1 200

BMW Motorrad
After Sales

Published by BMW Motorrad
After Sales
UX-VS-2

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Printed in Germany 03/01

Preface

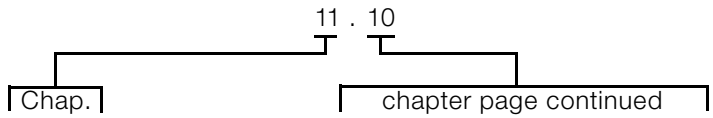
This Repair Manual is intended to assist you in performing all essential maintenance and repair operations to a professional standard. In its role as a reference source for service personnel, it supplements and expands upon the theoretical and hands-on instruction provided at our training centres to enhance the quality of our service.

A new edition of this manual will be issued in response to required revisions or the need to incorporate additional information (supplements).

The illustrations and descriptions contained in this manual apply exclusively to standard, unmodified BMW Motorcycles and/or BMW Motorcycles equipped with factory-approved BMW accessories and options.

- The Repair Manual's structure reflects the logical sequence in which the operations it describes will be performed: removal, dismantling, repairs, assembly and installation.

- The individual chapters in this manual correspond to the motorcycle's individual assembly groups.



A reference arrow with chapter and page calls your attention to additional information contained in another section of the manual.
e.g. ➠ ..... Refer to Assembly Group 46

- Group "00" describes the operations carried out in the course of each Inspection. The various inspection routines are numbered I, II, III and IV. To help in maintaining a continuous, logical work sequence, these same numerical designations are employed to identify the subsequent sections describing the actual repair operations.

- Use of the BMW special tools needed for certain operations is described in the work instructions.

When the need arises, repair instructions are also issued in the form of Service Information Bulletins. This information is then incorporated into subsequent editions of the repair manual. We also recommend the lavishly illustrated Electronic Parts Catalogue as a supplementary source of information.

When individual steps within an overall operation only apply to motorcycles with specific accessories or optional equipment, the options to which the steps refer are identified by brackets at the start of the line, such as **[with heated grips]**.

Please devote your careful attention to the following pages with their explanations describing the symbols used in the manual and their significance.

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How to use this manual

Each chapter starts with a table of contents.

Following the table of contents is a table containing the techical data and specifications for the chapter's subject.

Chapter 00 describes maintenance procedures and provides general information as well as the pre-delivery inspection; it furnishes all torque specifications along with listings of fluids and lubricants.

Explanation of symbols

This repair manual for the C1 employs the following symbols; please refer to the table for their meanings.

Special notices for more efficient procedures


Note:
These special notices help technicians work more efficiently when operating, inspecting, adjusting and maintaining motorcycles.


Attention:
Special information and precautionary notices to prevent damage to the motorcycle. Failure to observe these mandatory precautions may invalidate the warranty.


Warning:
Precautions intended to protect the rider and/or other individuals against injury as well as potentially fatal hazards.

Contents

The titles of the operations described in this chapter ..... together with the page numbers

Operations

- Operations
- A dot or period identifies individual procedures described under a title

– Previous operations
– The hyphen identifies procedures described in more detail under a different title or in another chapter

Remove means:
to completely unscrew a retaining component (such as a bolt or screw)
or
to detach a component (such as an injection rail) and move it enough to gain access to assemblies installed behind it (such as a throttle-valve).

Loosen means:
to unscrew an attachment (such as a bolt or screw) without removing it entirely from its threaded socket or retainer


Torque specifications:
These data are indicated whenever torques deviate from the standards defined in DIN EN 24 014 and DIN 912 ISO.

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00 Pre-delivery check
00 Maintenance

11 Engine

12 Engine electrics

13 Fuel preparation and control

16 Fuel tank and lines

17 Radiator

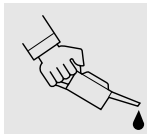
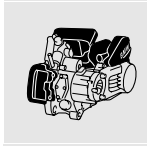
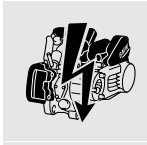
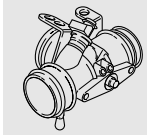
18 Exhaust system

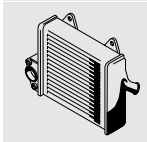
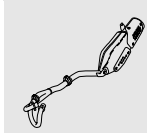
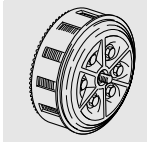
21 Clutch

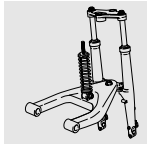
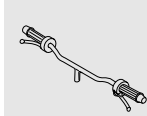
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>> Continuation

Group / Chapter

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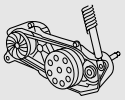
61 General electrical equipment

62 Instruments

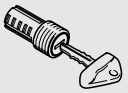
63 Lights

65 Optional extras

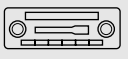
72 Seat belts










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BMW Motorrad
Maintenance schedule
C1, C1 200

Customer	Licence No.	Mileage
Job Order No.	Date	Mechanic's signature

	BMW Inspection at 10,00 km/600 miles	BMW Maintenance Service every 7,500 km/4,500 miles	BMW Inspection every 15,000 km/ 9,000 miles	BMW Annual Service
MoDiTeC/DIS plus, read fault code memory	☐	☐	☐	☐
Change the engine oil while at regular operating temperature and replace the oil filter element **If the vehicle is ridden for short distances only or at outside temperatures below 0° C (32° F): every 3 months or after every 3,000 km (1,800 miles) at the latest**	☐	☐	☐	☐
Clean oil strainer and magnetic plug	☐	☐	☐	☐
Change transmission fluid **every 30,000 km/18,000 miles or 3 years*)**			■	■
Inspect coolant level, top up if necessary, inspect hoses for damage, chafing points	☐		☐	
Change the coolant **every 2 years*)**				■
Check valve clearances and adjust if necessary *)	☐	☐	☐	
Replacing spark plug		☐	☐	
Replace air filter element **shorten change interval if severely dirty or dusty**		■	■	
Drain condensate drain hose from air manifold				☐
Brake hoses and connections: check condition and routing		☐	☐	
Check operation of brake system and check for leaks; repair/replace as necessary*)		☐	☐	
Inspect brake fluid level at front/rear	☐	☐	☐	
Examine brake pads and discs for wear, renew if necessary*)		☐	☐	
Renew **brake fluid** at least **once a year**				■
Replace variator belt		☐	☐	
Check clutch liner, replace if necessary*)			☐	
Cleaning mesh filter of variator		☐	☐	
Grease driving variator (greased version)		☐	☐	
Check and clean driving variator (ungreased version, replace variator if necessary)			☐	
Replace complete driving variator **every 22,500 km/14,000 miles, greased version only**		■		
Check wheel bearings for play; replace if necessary*)			☐	
Checking that leading-link mounts are free of play	☐			☐
Battery: check battery acid level, if necessary add distilled water				☐
Clean and grease the battery terminals, if necessary				☐
Check freedom of movement of Bowden cables, check for abrasion and damage			☐	☐
Easy-lift mechanism: – Check operation of mechanism and check freedom of movement – Inspect Bowden cables for damage and signs of wear and chafing, ensuring that mechanism moves freely without binding; check free travel and adjust as required *)	☐	☐	☐	☐
Check windscreen washer system; adjust nozzles if necessary and top up washer fluid in reservoir	☐	☐	☐	
Check windscreen wiper; replace wiper blade if necessary *)		☐	☐	☐
Safety elements: check cable for release, belt buckles, belt strap, inertia reels, and belt locks	☐	☐	☐	☐
Check crash element for damage	☐	☐	☐	☐
Inspect shoulder bar for damage, replace deformation element if necessary*)	☐	☐	☐	☐
Replace fuel filter **every 37,500 km/22,500 miles**		■		
Only ABS: Replace seal in brake master cylinder **every 30,000 km/18,000 miles*)**			■	
Check tightness of bolts and nuts at engine mountings and quick-release axles	☐			
Final inspection with road safety and functional check: – Clutch engagement, steering, front and rear brake – Condition of tyres and wheels, tyre inflation pressure – Lights and signalling equipment, telltale and warning lights, instruments – If necessary, test ride		☐	☐	☐

***) Write up on separate invoice; ■ Not part of standard service procedure**

BMW recommends Castrol

BMW Motorrad
Pre-delivery Check
C1, C1 200

Customer _____ Registration number _____ Order no. _____ Signature of mechanic _____	**BMW** **Pre-delivery Check**
Inspect transportation packaging for damage	☐
C1: – Unpack – Inspect for damage – Attach parts – Clean	☐
Battery: – Remove – Pour in electrolyte – Charge – Grease terminals – Install (mark date of installation)	☐
Inspect complete scope of supply: – Toolkit – Documentation – Keys – Scope of optional equipment	☐
Inspect tyre inflation pressure	☐
Pour in fuel	☐
Operational check as final inspection: – Engine idling – Clutch, clutch engagement – Steering – Seat belt – Easy-lift mechanism – Brakes, front and rear – Lights and signalling equipment, telltale and warning lights, instruments – Set headlight – If necessary, test ride	☐

BMW recommends Castrol

BMW Motorrad
Service data
C1, C1 200

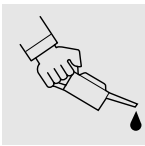
Item	Specified value	Unit of measure or specification
Oil capacities		
Engine (with filter)	1.0 (0.22)	litres (Imp pints) 15W40
Gearbox	0.090 (0.020)	litres (Imp pints) API GL 4
Coolant		
Cooling system	1.25 (2.2)	litres (Imp pints)
Expansion tank	0.2 (0.35)	litres (Imp pints)
		Mixing ratio: Water: 50% Antifreeze: 50% Protection down to –25 °C (-13 °F)
Windshield washer fluid	1.0 (1.8)	litres (Imp pints) Water and cleaning product, antifreeze as required
Brake fluid		DOT 4
Valve clearances	Inlet: 0.05...0.14	mm
Measured cold, maximum 35 °C (95 °F)	(0.002...0.006)	(in)
	Exhaust: 0.20...0.29	mm
	(0.009...0.010)	(in)
Spark plugs		NGK CR8 EB
Electrode gap	0.8...0.9	mm
	(0.031...0.035)	(in)
Idle speed	1 900	rpm
Tyre pressures (tyres cold)	Front/rear	
Solo	1.9/2.1 (27.6/30.5)	bar (psi)
Full load	1.9/2.4 (27.6/34.8)	bar (psi)
Tightening torques:		
Engine oil drain plug	20	Nm
Oil strainer to engine	30	Nm
Engine water drain plug	10	Nm
Oil filter cover	10	Nm
Camshaft gears to camshaft	30	Nm (Loctite 243)
Guide rail to camshaft support	10	Nm (Loctite 243)
Chain tensioner plug	35	Nm
Camshaft bearing bridge	10	Nm
Valve cover	10	Nm
Machine bolt TDC setting	15	Nm
Spark plug	15	Nm
Driving variator	60	Nm (Loctite 243)
Driving variator cover	4	Nm
Driven variator	60	Nm
Locknut of clutch to driven variator	50	Nm (Loctite 243)
Variator cover to power train link	10	Nm
Ventilation cover for variator	9	Nm
Front stub axle	30	Nm
Clamping bolts for front stub axle	21	Nm
Brake calliper at fork slider tube	41	Nm
Bleed screw in brake calliper	14	Nm
Cover of handbrake control	Hand-tight	Nm
Rear stub axle, **use nut only once**	130	Nm
Exhaust to cylinder head	15	Nm
Auxiliary link to power train link M8	21	Nm
Auxiliary link to power train link M10	60	Nm (Loctite 243)
Silencer to auxiliary link	21	Nm
Suspension strut to power train link/brake calliper holder	21	Nm
Link mounting to power train link	73	Nm
Tubular link to frame	73	Nm
Stand to frame	41	Nm
Rubber element to tubular link	42	Nm
Cladding bolts	2.8	Nm

Order no. 01 71 0 136 450 UX-VS-2, 03.2001 Printed in Germany

00 Tightening torques operating fluids

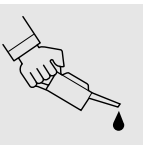
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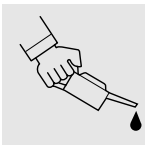
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Torque specifications

Model		C1
Connection		
11 Engine		
Oil drain plug, magnetic	Nm	20
Threaded plug, oil strainer	Nm	30
Oil filter cover	Nm	10
Threaded TDC set plug	Nm	15
Alternator		
Alternator cover up to engine no.: 745 594	Nm	10
Alternator cover from engine no.: 745 595	Nm	12
Ignition trigger, Tapite screw	Nm	6 LOCTITE 243
Holder for alternator cable, Tapite screw	Nm	6 LOCTITE 243
Reluctor to crankshaft, locking fluid	Nm	30 LOCTITE 243
One-way clutch, locking fluid	Nm	30 LOCTITE 243
Alternator to cover	Nm	10
Chain tensioning rail, locking fluid	Nm	10 LOCTITE 243
Cylinder head		
Cylinder head cover	Nm	10
Collar nut	Nm	30 ±1
Securing screw	Nm	10
Spark plug	Nm	15
Camshaft sprockets, locking fluid	Nm	30 LOCTITE 243
Bearing cap	Nm	10
Chain guide, locking fluid	Nm	10 LOCTITE 243
Plug for chain tensioner	Nm	35
Vent screw	Nm	9
Dual temperature sensor, locking fluid	Nm	15 LOCTITE 243
Housing		
Starter motor	Nm	10
Oil pressure switch, locking fluid	Nm	12 LOCTITE 243
Oil pressure valve	Nm	30
Stud (tie bolt)	Nm	10
Housing screws	Nm	10
Oil pump, Tapite screw	Nm	6 LOCTITE 243
Water-pump housing, Tapite screw	Nm	6 LOCTITE 243
Spring strut at bottom	Nm	21





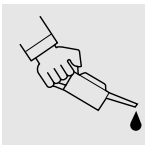
Model		C1
Connection		
12 Engine electrical system		
Spark plug	Nm	15
Ignition coil to frame	Nm	5
Ignition trigger, Tapite screw	Nm	6 LOCTITE 243
Reluctor to crankshaft, locking fluid	Nm	30 LOCTITE 243
One-way clutch, locking fluid	Nm	30 LOCTITE 243
Alternator to cover	Nm	10
Starter motor	Nm	10
Model		**C1**
Connection		
13 Fuel injection system		
Fuel filter clamp	Nm	5
Holder for injection nozzle (self-tapping)	Nm	4 LOCTITE 243
Pressure regulator clamp	Nm	9
BMS control unit	Nm	5
Intake manifold	Nm	9
Air plenum clamp	Nm	Hand-tight
Air filter housing (inner/outer)	Nm	9
Throttle cable	Nm	8
Spring strut at bottom	Nm	21
Model		**C1**
Connection		
16 Fuel tank		
Fuel filter clamp	Nm	5
Bracket, fuel tank to frame	Nm	9
Union nut (fuel-pump unit)	Nm	20
Baseplate to frame Bracket for washer fluid reservoir on frame	Nm	9
Bracket for washer fluid reservoir/ABS control unit on frame	Nm	9
Model		**C1**
Connection		
17 Cooling system		
Drain plug	Nm	10
Vent screw	Nm	9
Bracket for seat latch, right, to frame	Nm	42
Bracket for seat latch, left, to frame	Nm	5

Model		C1
Connection		
17 Cooling system		
Expansion tank to frame upright	Nm	3
Front frame to cross brace	Nm	14
Air duct to fan shroud	Nm	9
Radiator to front frame	Nm	9
Fan shroud to radiator	Nm	9
Air duct to front frame	Nm	9
Filler bowl to front frame	Nm	9
Coolant pipe clamp to frame	Nm	9
Screw clamp on engine	Nm	Hand-tight
Bleeder screw to engine	Nm	9
Model		**C1**
Connection		
18 Silencer (muffler)		
Shield to holder	Nm	5
Exhaust pipe to cylinder head	Nm	15
Silencer to auxiliary swing arm	Nm	21
Oxygen sensor to silencer	Nm	23
Model		**C1**
Connection		
21 Clutch		
Vent cover for variator	Nm	9
Variator cover	Nm	10
Driven variator (clutch drum)	Nm	60
Locknut on driven variator, locking fluid	Nm	50 LOCTITE 243
Model		**C1**
Connection		
24 Gearbox		
Variator		
Vent cover for variator	Nm	9
Variator cover	Nm	10
Drive variator, locking fluid	Nm	60 LOCTITE 243
Cover, drive variator	Nm	4
Driven variator (clutch drum)	Nm	60
Locknut of driven variator, locking fluid	Nm	50 LOCTITE 243



Model		C1
Connection		
24 Gearbox		
Gearbox		
Gearbox cover	Nm	11
Gearbox drain plug	Nm	20
Gearbox filler plug	Nm	5
Model		**C1**
Connection		
31 Front forks		
Fork cross brace to frame (screw stud) locking fluid	Nm	83 LOCTITE 243
Leading link to telescopic tube cross brace locking fluid	Nm	127 LOCTITE 2701
Brake line bracket on fork cross brace	Nm	5
Fork stanchion to fork cross brace	Nm	52
Handlebar to fork cross brace	Nm	21
Leading-link joints	Nm	41
Clamp screws for leading-link joints	Nm	9
Spring strut to leading link	Nm	41
Ball joint to telescopic fork cross brace	Nm	230
Clamp of telescopic tube to telescopic tube cross brace	Nm	25
Eyebolts	Nm	8
Lock to easy-lift mechanism	Nm	4
Model		**C1**
Connection		
32 Steering		
ABS sensor to telescopic tube	Nm	9
Combination switch	Nm	4
Brake light switch	Nm	Hand-tight
Throttle cable	Nm	8
Clamp screw for brake lever fitting	Nm	9
Brake line to brake lever fitting	Nm	18
Handlebar to fork cross brace	Nm	21
Locknut for handlebar lever pivot pin	Nm	3

Model		C1
Connection		
33 Final-drive unit		
Top suspension strut	Nm	41
Spring strut at bottom	Nm	21
Auxiliary swing arm to brake caliper holder M, screw locking fluid10	Nm	60 LOCTITE 243
Auxiliary swing arm to brake caliper mount M8	Nm	21



Model		C1
Connection		
34 Brakes		
Brake caliper at telescopic tube	Nm	41
Banjo bolt to brake caliper	Nm	18
Bleed screw in brake caliper	Nm	14
6-point nut to final-drive shaft (rear wheel), **use only once**	Nm	130
Auxiliary swing arm to brake caliper holder, M10 bolt, with locking fluid	Nm	60 LOCTITE 243
Auxiliary swing arm to brake caliper mount, M8	Nm	21
Auxiliary swing arm to powertrain cradle	Nm	21
Expansion tank cap	Nm	1
Suspension strut to brake caliper carrier	Nm	21
ABS sensor to brake caliper carrier	Nm	9
ABS sensor to telescopic tube	Nm	9
Brake disc	Nm	21
ABS reluctor ring	Nm	5
Baseplate to frame Bracket for washer fluid reservoir on frame	Nm	9
Brake lines to ABS control unit, M12x1	Nm	18
Brake lines to ABS control unit, M10x1	Nm	18
Union, brake hose/brake line	Nm	18
Bracket on frame joint	Nm	5
Brake line to brake lever fitting	Nm	18
All fasteners, brake line to frame	Nm	5



Model		C1
Connection		
36 Wheels		
Stub axle, locking fluid	Nm	30
Quick-release axle clamp screws	Nm	21
Brake caliper at telescopic tube	Nm	41
6-point nut to final-drive shaft (rear wheel), **use only once**	Nm	130
Auxiliary swing arm to brake caliper holder, locking fluid, M10	Nm	60 LOCTITE 243
Auxiliary swing arm to powertrain cradle, M8	Nm	21
Spring strut at bottom	Nm	21
Model		**C1**
Connection		
46 Frame		
Body panels to body panels	Nm	2,8
Body panels to frame	Nm	2,8
Lightweight foam element to frame	Nm	5
Foam part to cross member	Nm	5
Air plenum to rear wheel mudguard	Nm	12
Roof/windscreen to cross bar	Nm	5
Windscreen to bracket	Nm	5
Bracket, wiper motor to roof frame	Nm	5
Rear mudguard to powertrain cradle	Nm	12
Air filter housing to powertrain cradle	Nm	12
Crash element shoulder bar to frame	Nm	9
Holder, crash element to frame	Nm	9
Rear frame to frame	Nm	21
Suspension strut to rear frame	Nm	41
Joint		
Nut to frame, front left, M28	Nm	105
Screw to frame, front left, M28	Stage 1	20
Screw to frame, front left, M28	Stage 2	Back off 1/2 turn
Screw to frame, front right	Nm	73
Rubber bush to frame	Nm	42
Rubber bush to joint	Nm	42
Powertrain cradle to joint	Nm	73
Joint swinging arms to each other	Nm	73
Easy-lift mechanism		
Spring strut to leading link	Nm	41
Articulated-lever mechanism to frame	Nm	21

Model		C1
Connection		
46 Frame		
Attachment of control cam of large hand lever, locking fluid	Nm	2 LOCTITE 243
Stand to frame	Nm	41
Switch (easy-lift mechanism) stand to frame	Nm	8
Spring holder (easy-lift mechanism) to frame	Nm	21
Bowden cable retaining bracket to frame	Nm	21
Lock of Bowden cable	Nm	8
Auxiliary swing arm to powertrain cradle	Nm	21
Eyebolt to frame	Nm	8
Shoulder bar		
Seat to frame	Nm	21
Head restraint to frame	Nm	21
Shoulder bar, top, to frame M10	Nm	41
Shoulder bar, top, to frame M8	Nm	21
Shoulder bar, bottom, to frame M6 (clamping screw)	Nm	9
Roof frame		
Front roof bar (clamp)	Nm	21
Rear roof bar (clamp)	Nm	21
Roof frame cross brace	Nm	21
Mirror brackets	Nm	5
Luggage system		
Top bracket to frame	Nm	8
Bracket to rear frame	Nm	21
Top bracket to bracket	Nm	21
Lock carrier	Nm	5
Head restraint to frame	Nm	21
Model		**C1**
Connection		
51 Equipment		
Ignition lock to frame	Nm	9
Seat latch	Nm	9
Seat bench lock to left rear side panel	Nm	3
Striker on rear storage compartment	Nm	3
Lock cylinder on rear storage compartment	Nm	7
Striker of storage compartment	Nm	3
Lock cylinder on storage compartment	Nm	7
Lock bolt for luggage rail	Nm	3



Model		C1
Connection		
51 Equipment		
Mirror bracket to frame	Nm	5
Mirror to mirror bracket	Nm	4
Cover on mirror arm	Nm	3
Model		**C1**
Connection		
52 Seats		
Seat to frame	Nm	21
Seat lock	Nm	9
Backrest	Nm	Hand-tight
Head restraint to frame	Nm	21
Model		**C1**
Connection		
61 Electrical equipment		
Combination switch	Nm	4
Battery cable to battery	Nm	3
Battery cable to starter relay	Nm	3
Control current cables to starter relay	Nm	0,4
Voltage regulator to frame	Nm	12
BMS control unit to frame	Nm	5
Wipe/wash sensor to frame	Nm	3
Earth cable to frame	Nm	5
Wiper arms	Nm	9
Clamp, cable harness to frame	Nm	5
Horn to frame	Nm	8
Windscreen wiper motor to bracket	Nm	5
Wiper motor bracket to roof frame	Nm	5
Stationary shaft, wiper motor	Nm	9
Cable to starter	Nm	5
Bracket of starter relay to frame	Nm	5
Bracket of wiring harness to frame	Nm	5

Model		C1
Connection		
62 Instruments		
Instrument cluster to instrument panel	Nm	3
Cable clamp to instrument cluster	Nm	1
Cable terminal to instrument cluster	Nm	0.5
Model		**C1**
Connection		
63 Lights		
Front/rear turn signal lens	Nm	2
Front turn signal to fairing	Nm	2
Rear turn signal to license plate holder	Nm	3
Headlight subframe	Nm	9
Taillamp cluster	Nm	5
Model		**C1**
Connection		
65 Optional extras		
Alarm system		
Control unit	Nm	Hand-tight
Motion sensor	Nm	Hand-tight
Bracket/ignition coil	Nm	5
Fun audio system		
Volume control	Nm	Hand-tight
Amplifier	Nm	2
Speaker front trim panel	Nm	2
Speaker bracket	Nm	4
Model		**C1**
Connection		
72 Seat belts		
Seat belt inertia reel to frame	Nm	42
Belt buckle to belt-buckle mount	Nm	42
Belt-buckle mount to frame	Nm	42
Secondary mudguard	Nm	5

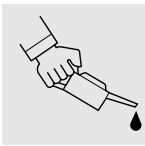
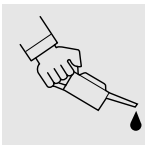


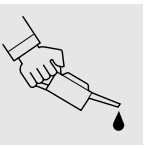
Table of service products



Item	Use	Order number	Quantity
Lubricant			
StaburagsNBU30PTM	High-performance lubricating paste	07 55 9 056 992	75 g (2.65 oz) tube
Optimoly MP 3	High-performance lubricating paste	07 55 9 062 476	100 g (3.53 oz) tube
Optimoly TA	High-temperature assembly paste	18 21 9 062 599	100 g (3.53 oz) tube
Silicone grease 300, heavy	Insulation grease	07 58 9 058 193	10 g (0.35 oz) tube
Retinax EP2	Wheel, steering head and taper roller bearing grease	83 22 9 407 845	100 g (3.53 oz) tube
Contact spray	Contact spray	81 22 9 400 208	300 ml (0.53 Imp pint/ 0.32 US quart) spray
Chain spray	Drive chain	72 60 2 316 676 72 60 2 316 667	50 ml (0.088 Imp pint/ 0.053 US quart) spray 300 ml (0.53 Imp pint/ 0.32 US quart) spray
Shell HDX2	Variator rollers driven variator (pins and bearing)	11 00 7 660 830	400 g (14.12 oz) tube
Klüber paste 46 MR 401	against fretting corrosion spacer, variator shaft spline, clutch drum crankshaft and outer disc Shaft seal seats Ball-bearing seats, shaft journals, bearing shells, outer ø Small-end bore, piston pin	11 00 7 660 831	60 g (2.12 oz) tube
MOLYKOTE 111	Water pump, water pump chamber, shaft seals	11 00 7 660 832	100 g (3.53 oz) tube
Never Seez Compound	Oxygen sensor	83 23 9 407 830	100 g (3.53 oz) tube
Sealants			
3-Bond 1110 B	Surface sealant	07 58 9 056 998	5 g (0.18 oz) tube
3-Bond 1209	Surface sealant	07 58 9 062 376	30 g (1.06 oz) tube
omni VISC 1002	Surface sealant (max. 200 °C/392 °F)	07 58 1 465 170	90 g (3.18 oz) tube
Loctite 574	Surface sealant	81 22 9 407 301	50 ml (0.088 Imp pint/ 0.053 US quart) tube
Curil K 2	Heat-conductive sealant	81 22 9 400 243	250 g (8.83 oz) can

Item	Use	Order number	Quantity
Hylomar SQ 32 M	Permanently elastic sealant	81 22 9 400 339	100 g (3.53 oz) tube
Adhesives and retainers			
Loctite 648	Joint adhesive (low clearance)	07 58 9 067 732	5 g (0.18 oz) bottle
Loctite 638	Joint adhesive (greater clearance)	07 58 9 056 030	10 ml (0.018 Imp pint/ 0.010 US quart) bottle
Loctite 243	Thread retainer, medium-strength	07 58 9 056 031	10 ml (0.018 Imp pint/ 0.010 US quart) bottle
Loctite 270	Thread retainer, strong	81 22 9 400 086	10 ml (0.018 Imp pint/ 0.010 US quart) bottle
Loctite 2701	Thread retainer, strong	33 17 2 331 095	10 ml (0.018 Imp pint/ 0.010 US quart) bottle
Loctite 454	Cyanacrylate adhesive (gel)	07 58 9 062 157	20 g (0.71 oz) tube
Cleaners			
Brake cleaner	Brake cleaner	83 11 9 407 848	600 ml (1.056 Imp pint/ 0.634 US quart) spray
Metal Polish	Polish for chrome-plated parts	82 14 9 400 890	100 g (3.53 oz) tube
Testing agents			
Penetrant MR 68	Crack testing agent for aluminium housings	83 19 9 407 855	500 ml (0.880 Imp pint/ 0.528 US quart) spray
Developer MR 70	Crack testing agent for aluminium housings	81 22 9 407 495	500 ml (0.880 Imp pint/ 0.528 US quart) spray
Installation aids			
BMW cooling spray	Cooling components before assembly	83 19 9 407 762	300 ml (0.53 Imp pint/ 0.32 US quart) spray





00 Pre-delivery check

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Check transport container for damage

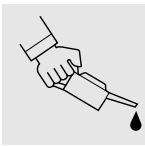
- Inspect the transport container immediately for damage as soon as the C1 is delivered, remembering to check for collateral damage if indicated

Damage in Germany

- Record the damage on the consignment waybill
- Read transport damage information sheet
- Inform supplier (freight expediter, rail, etc.) and
  Bavaria Wirtschaftsagentur GmbH
  Abteilung ZW - 12
  80788 München
  Tel. 089/143 276 32
  Fax. 089/143 276 39
  immediately

Damage in export markets

- Record damage on the consignment waybill
- National response arrangements apply
  Submit questions to:
  Bavaria Wirtschaftsagentur GmbH
  Abteilung ZW - 12
  80788 München
  Tel. +49 89 143 276 32
  Fax. +49 89 143 276 39
- Inform supplier (freight expediter, etc.) immediately





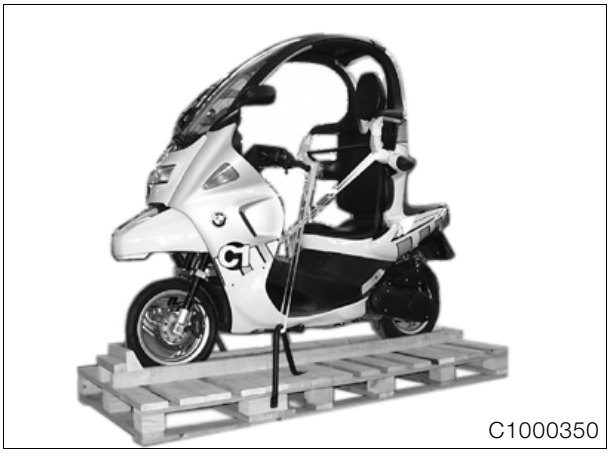
C1000340

Unpack C1

- Open shipping container at strap holes (enlarged openings) on left and right sides
- Remove any enclosed packages

– Luggage rack

- Cut open along the line indicated (follows path of strap)
- Dismantle shipping container



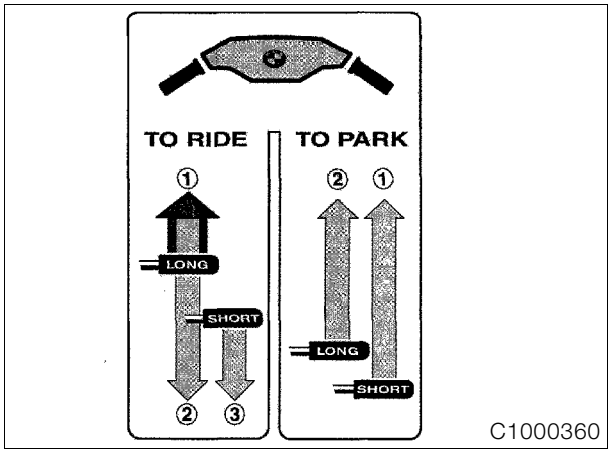
C1000350

Attention:
Loosen straps without yet removing!

- Loosen straps

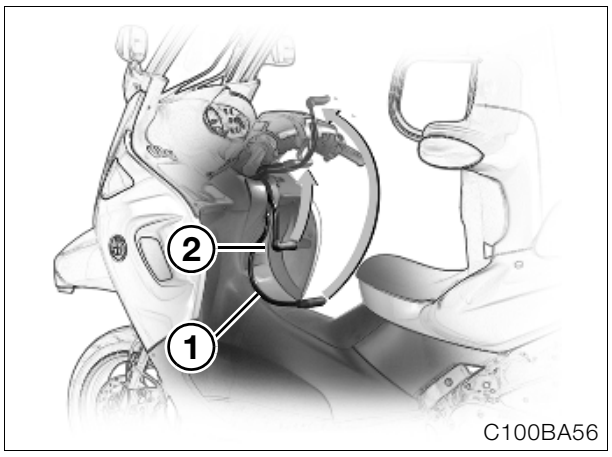
Attention:
Ensure that it will be possible to fold out the stand!

Place C1 on stand



C1000360

Note:
Note instruction plate on instrument trim!



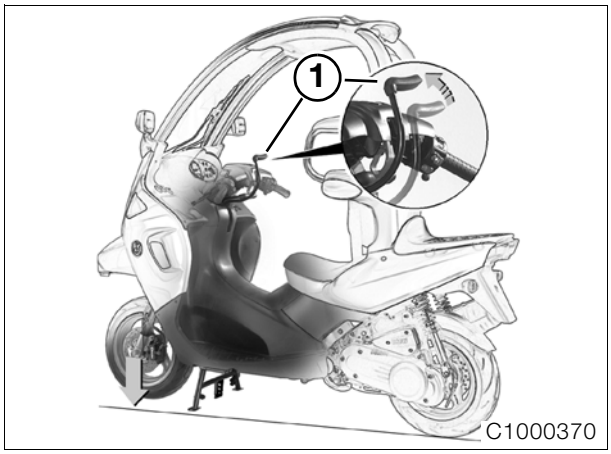
C100BA56

Attention:
Excessive strain can damage the easy-lift mechanism!

- Hold C1 vertical
- Centre the handlebar
- Pull up short lever (2) on easy-lift mechanism

– The stand extends

Note:
The easy-lift mechanism has overload protection. Fold out the stand with foot if necessary!



C1000370

- Push up long lever (1) on easy-lift mechanism until it reaches the end of its travel

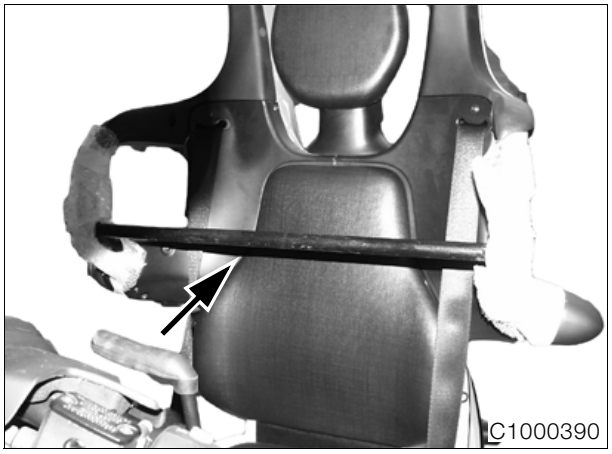
– The front wheel lifts clear of the ground
– Keep a firm grip on the lever

- Slowly move the long lever (1) back until the detent engages
- Check to verify that the C1 is standing securely

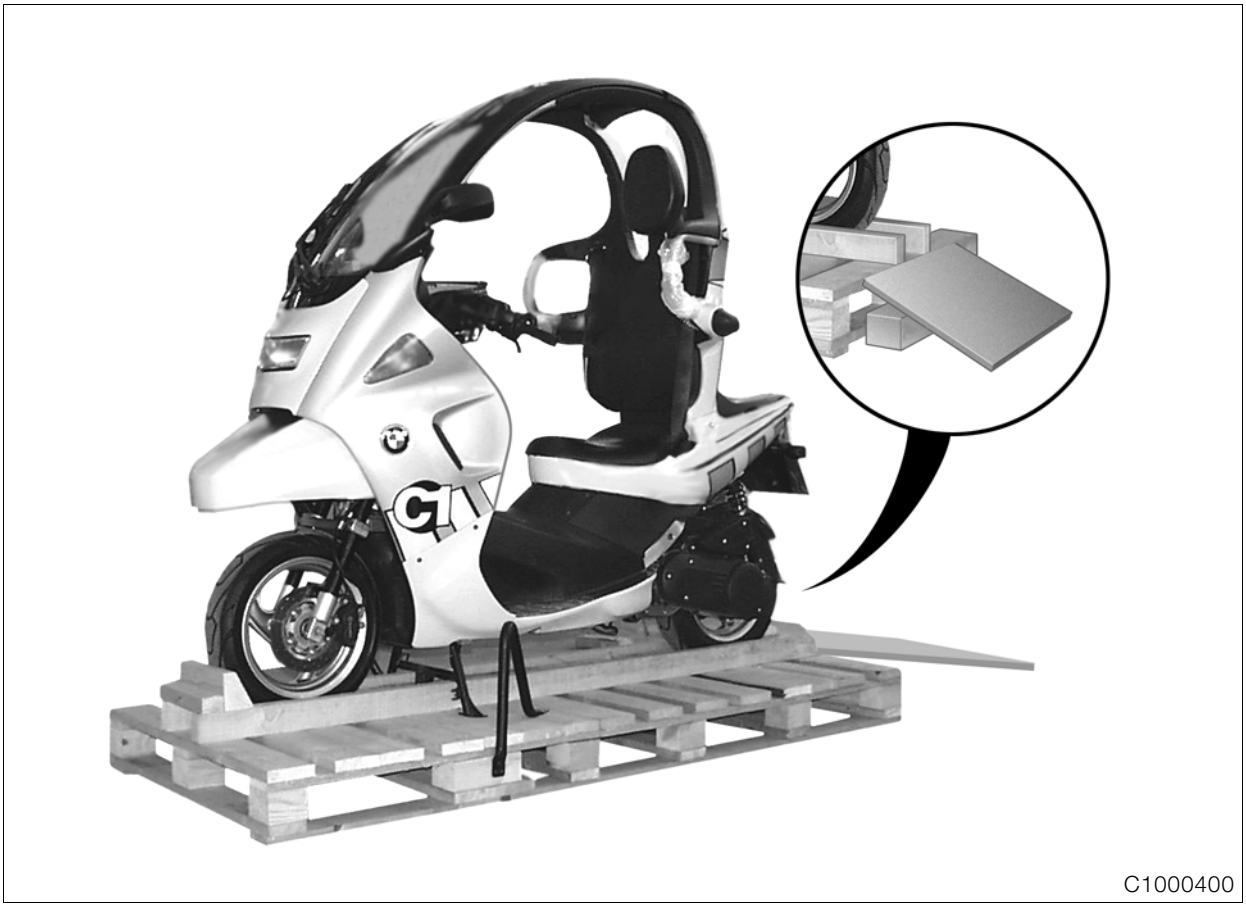


C1000380

- Release and remove straps


C1000390

- Remove cross member (arrow, shipping brace)



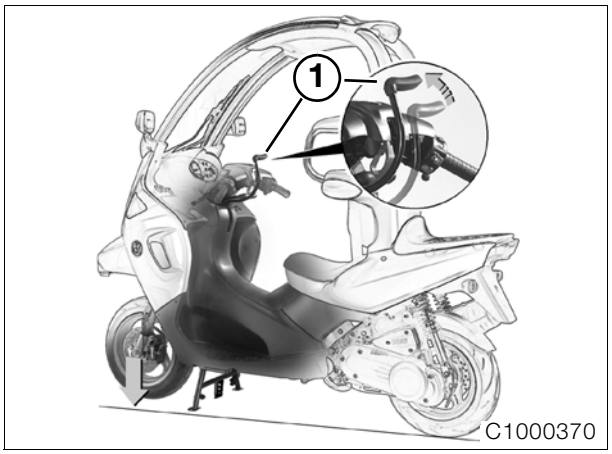
Attention:
Use ramp to avoid damage.

- Use ramp from motorcycle hoist, etc.

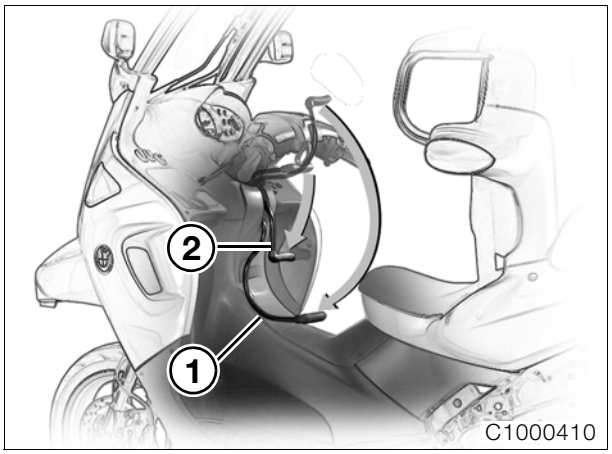
Attention:
Clear away any nails lying on the bottom of the shipping container or the shop floor.

Take the C1 from the stand

Attention:
The stand must be folded all the way back before the vehicle is rolled down!
Excessive strain can damage the easy-lift mechanism!



- Remove weight from vehicle
- Release long lever (1) from the detent mechanism by
  – first moving the lever (1) on the easy-lift mechanism all the way forward and up, and then slowly pushing it downward
  – Keep a firm grip on the lever
  – The front wheel is lowered to the ground



- Hold C1 vertical
- Push short lever (2) on easy-lift mechanism downward
  – The stand retracts
- Ensure that the long lever (1) is locked at the bottom
- Check that the stand is fully retracted

Note:
The easy-lift mechanism has overload protection. If necessary, use your foot to retract the stand.

- Push C1 off the pallet backwards

Attention:
Make sure the surface under the vehicle is level and firm!
Do not park the C1 on slopes of more than 6°/12%, as the stand may fail to provide secure support.

- Place C1 on stand (➟ 00.19)

Attention:
Do not cut adhesive tape - can damage shoulder bar!



- Remove protective wrap from shoulder bar
- Dispose of the shipping materials through ecologically sound channels, refer to bikebox

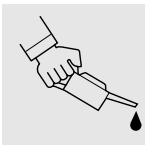
Check C1 for damage

- Record and problems
- "Early warning card" to
  BMW Motorrad, UX-VS-1
  Fax number 089/382 332 20
  +49 89 382 332 20
- Rectify problems
- Order any necessary parts via the electronic parts catalogue
- Submit expense claims through GW system (Stage 4) Diagnosis codes:

– Missing parts 10 01 00 00 00
– Damaged parts 10 02 00 00 00
– Incorrect parts delivery 10 03 00 00 00

If required components are not available through the electronic parts catalogue, please contact the C1 support staff at UX-VS-2
Phone: 089/382 375 82
+49 89 382 375 82

Check package contents to determine whether consignment is complete



- Optional equipment
- Open rear storage compartment
- Check contents of enclosed package:
- On-board tool kit:

– Screwdriver with dual insert
– Pair of universal pliers
– Spark plug spanner
– 1 angled Allen wrench
  Torx T25
– Roadside assistance kit

- Vehicle documentation

– Rider's Manual
– Service and technology manual
– Remove directory of European dealers from the factory equipment package and enclose
– BMW roadside assistance service sticker (domestic only)

- Vehicle keys, 2

Please submit urgent queries and questions concerning technical issues to the C1 support staff at UX-VS-2
Phone: 089/382 375 82
+49 89 382 375 82



Fill and charge the battery

- Open cover of rear storage compartment
– Remove battery cover
– Remove the battery

➠ .....See Group 61

Warning:
Battery acid is extremely caustic.
Protect your eyes, face, hands, clothing and the paintwork!

- Pull off battery vent hose
- Remove battery
- Fill battery with electrolyte, continuing until it reaches upper graduation (arrow)
- Allow the battery to stand for at least an hour
- Shake the battery slightly to allow the remaining air bubbles to escape
- Refill to upper graduation as necessary
- Recharge the battery or allow to stand for 24 hours

Charge current (amps)
.....10 % of rated capacity (Ah)

- Use distilled water to top up the electrolyte, continuing until it reaches the upper graduation
- Make a note of the charging date on the battery

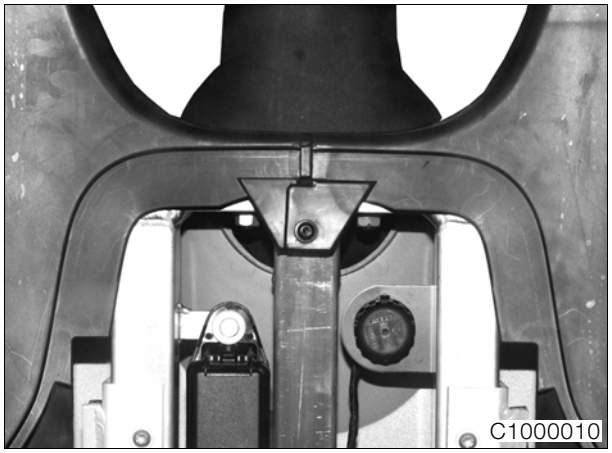
Attention:
Start by tightening the battery' positive terminal, then proceed to the negative side!

- Apply acid-resistant grease to the bettary terminals
- Installing the battery
- Install battery cover
- Close rear storage compartment

Fluids and lubricants:
Acid-resistant grease .....from Bosch

Torque specification:
Battery cable to battery terminals..... 3 Nm

Use BMW MoDiTeC/DIS plus to access stored error codes



- Open seat by inserting ignition key in lock at the left rear
- Release backrest mount and remove backrest
- Connect diagnosis unit to diagnosis plug
- Access stored error codes
- Carry out any repair operations indicated
- Install backrest

Check tyre inflation pressures

- Check/correct tyre inflation pressures

Tyre inflation pressures:

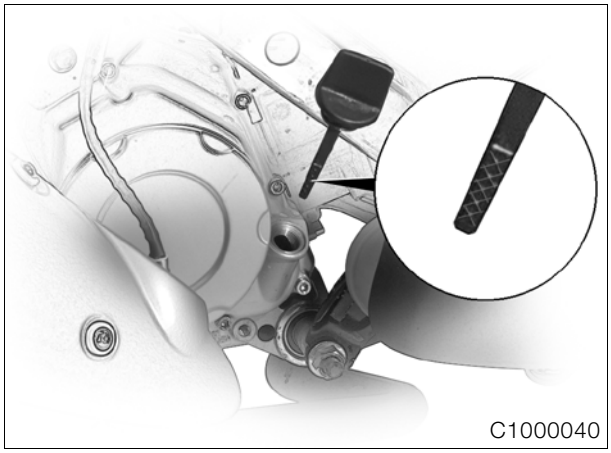
One-up..... Front 1.9 bar (27.56 psi)
.....Rear 2.1 bar (30.46 psi)

Full load ..... Front 2.1 bar (30.46 psi)
.....Rear 2.4 bar (34.81 psi)

Add fuel

- Open the seat
- Pour in fuel

Operation check as final inspection



- Check engine oil
- Safety belt release mechanism
- Clutch engagement speed
- Steering
- Front and rear brakes
- Check lights and signalling equipment:

– Front and rear parking lamps
– Instrument illumination
– Headlamp, high beam, headlamp flasher
– Brake lamp (actuation of front and rear brakes)
– Left/right turn signals
– Horn
– Indicator and warning lights
– Instruments

- Check any optional equipment to confirm that it is operational, check ABS, carry out driving test. When vehicle is ridden for at least 10 seconds at over 30 km/h (19 miles/h) the ABS warning lamp will come on if there any problems in the ABS
- Conduct road test as required
- Confirm delivery in service and technology manual
- Respond to problems by refering to "Checking C1 for defects"

Final cleaning

- Cleaning the C1



Note:
Do not use steam cleaners or high-pressure spray wands. High water pressure can lead to damage affecting seals as well as the hydraulic and electrical systems.

Note:
To ensure optimal orientation of every licence plate, the licence plate holder is not equipped with sockets!

Vehicle delivery

To promote optimal levels of safety and foster satisfaction, the customer should be acquainted with the C1 as part of the delivery process.

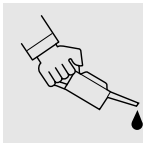
- Show/explain the following to the customer:
  - On-board literature and its storage location
  - Owner's manual for description of functions
  - Service and technology for service activities on the C1
  - On-board tools and their location
  - Operation of the easy-lift mechanism
  - Safety belt use - starting lockout
  - Central belt release mechanism
  - Starting with rear brake engaged - clutch engagement speed
  - Windscreen wiper and washer fluid refill cap location
  - Oil and brake fluid level checks
  - Mirror adjustment
  - Controls
  - Instruments and warning lamps
  - Any optional equipment

- The customer must be informed of the following:
  - Break-in information and service intervals
  - Helmet laws
  - Safety check

00 Maintenance

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Maintenance intervals

1,000 km/600 miles Inspection
BMW Break-in Inspection after the initial 1,000 km/ 600 miles

BMW Service
At the end of the first 7,500 km/4,500 miles and then at intervals of 15,000 km/9,000 miles,(at 22,500 km, 37,500 km.../13,500 miles, 22,500 miles...)

BMW Inspection
At the end of the first 15,000 km/9,000 miles and then at intervals of additional 15,000 km/ 9,000 miles,(at 30,000 km, 45,000 km.../18,000 miles, 27,000 miles...)

BMW Annual Service
Although many service operations are scheduled according to milage, many procedures (such as brake fluid changes) should be carried out at least once a year, regardless of elapsed milage.
If these operations are not performed in the course of a standard, milage-based Service or Inspection, an extra visit for an Annual Service will be required.

The codes for service and maintenance intervals in this repair manual are as follows:

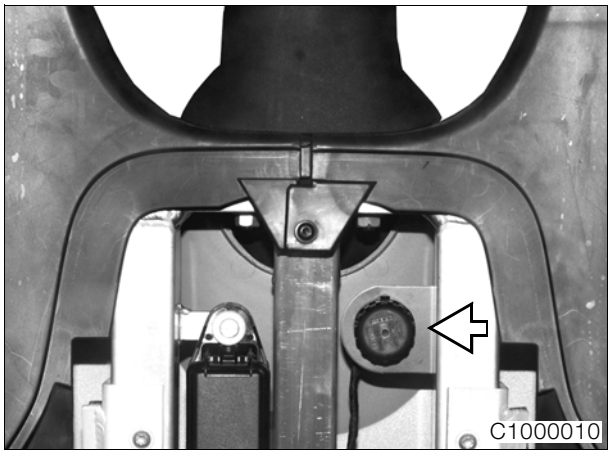
– BMW Inspection at 1,000 km/600 miles ..... **I**
– BMW Maintenance Service every 7,500 km/4,500 miles ..... **II**
– BMW Inspection every 15,000 km/9,000 miles **III**
– BMW Annual Service ..... **IV**

Operations specified for extended-milage vehicles:
Replacement of complete drive variator (➟ 00.58)
➟ ..... Refer to Assembly Group 24
..... for more information
Vehicles with ABS: replace handbrake fittings (rubber diaphragm on brake master cylinder) (➟ 00.64)
➟ ..... Refer to Assembly Group 32
..... for more information
Replace fuel filter (➟ 00.63)
➟ ..... Refer to Assembly Group 16
..... for more information

Reading out BMW MoDiTeC/DIS and error codes stored in ECU

(Inspections I, II, III and IV)

- Open the seat
- Remove the backrest



- Connect **BMW** MoDiTeC/DIS plus diagnosis cable to diagnostic interface (arrow)

Note:
Follow the instructions in the diagnosis program.

Engine oil change

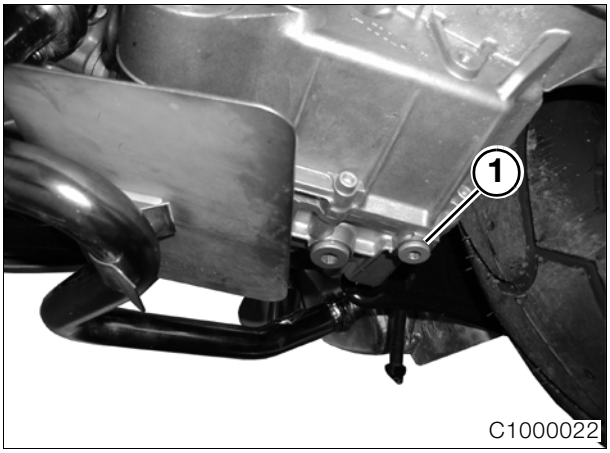
(Inspections I, II, III and IV)

Drain engine oil and clean magnetic plug



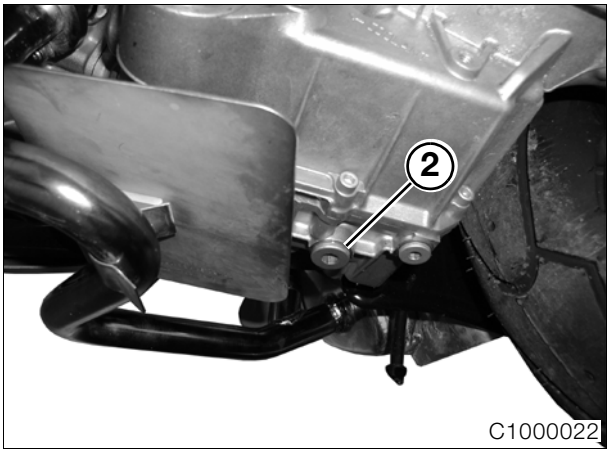
Note:
Drain the engine oil only after the engine has warmed to normal operating temperature!

Attention:
Observe all safety precautions when allowing an internal-combustion engine to run in an enclosed area!



- Unscrew magentic oil drain plug (1)
- Clean magnet

Clean oil filter screen

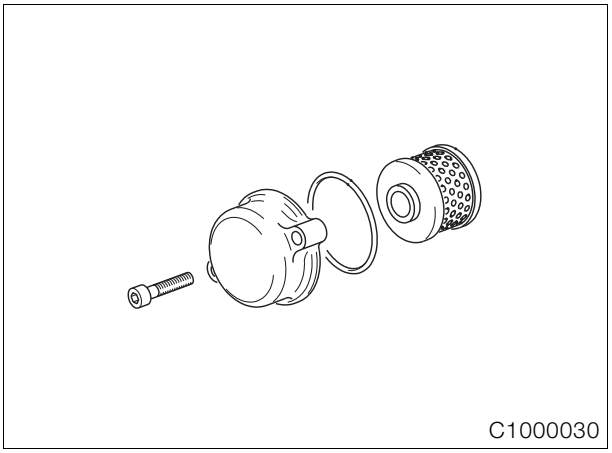


- Unscrew oil filter screen bolt (2)
- Clean oil filter screen

Replace oil filter element



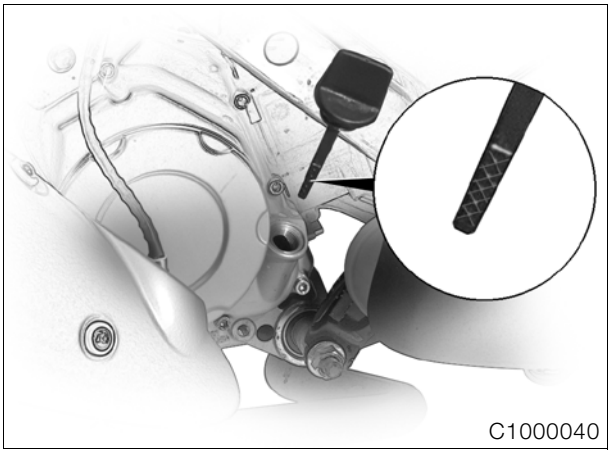
- Secure oil guard **BMW No. 11 7 661** to the exhaust
- Unscrew oil filter cover bolts (arrows)


C1000030

- Replace oil filter element

Refill engine with oil

Note:
Replace drain plug seal rings!


C1000040

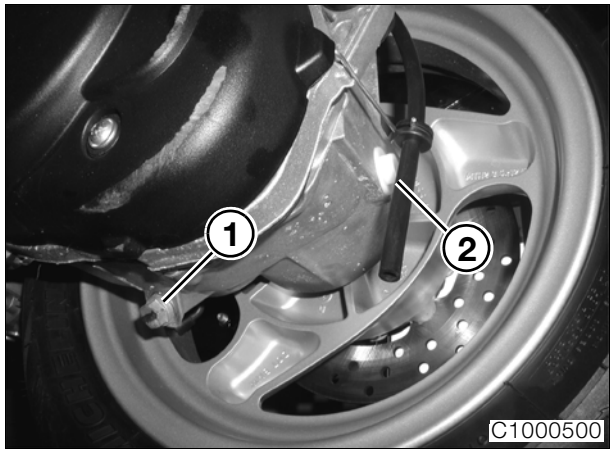
- Add engine oil through oil filler neck
- Add oil up to the MAX mark on the dipstick
- Run the engine briefly, then switch it off and check oil level again: add oil if necessary
- Check coolant level and top up as required

Fluids and lubricants:
Engine oil ..... 1.0 l/1.76 Imp pints
Brand-name HD oil, API classification SF, SG or SH; suffix letters CD or CE are approved; alternatively, brand-name HD oil with CCMC classification G4 or G5; suffix PD2 is permitted.

Tightening torque:
Oil filter cover ..... 10 Nm
Magnetic oil drain plug ..... 20 Nm
Oil filter screen attachment bolt ..... 30 Nm

Gearbox oil change

(Inspection III, IV) every 30,000 km/18,000 miles or every 3 years



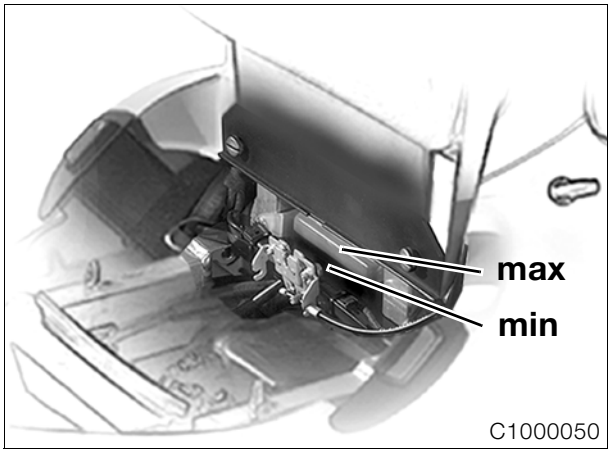
C1000500

- Unscrew oil drain plug (1)
- Pour gearbox oil in filler opening (2)

Fluids and lubricants:
GL 4 gear lubricant ..... 0.09 l/0.16 Imp pints

Checking coolant

(Inspections I and III)



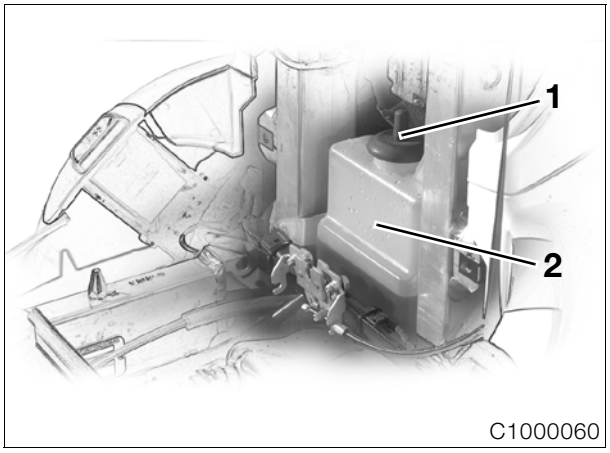
Note:
Check coolant level only with the engine cold!

- Open the seat and check the coolant level

Maximum level ..... **"max"**
Minimum level ..... **"min"**

Adding coolant

– Remove the backrest



- Remove cap (1) from expansion tank (2)

Attention:
Add or refill coolant only when engine is cold. Add coolant to expansion tank only if a small quantity has been lost. Otherwise refill with coolant (➡ 17.15).

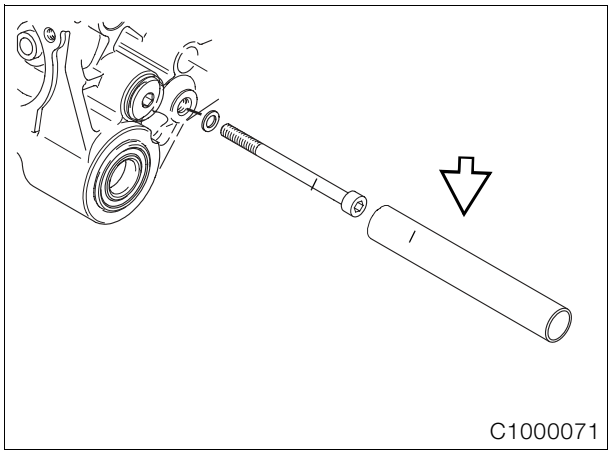
- Reinstall cap (1)

Change coolant

(Inspection IV, every 2 years)

Drain coolant

– Remove front fairing panel
– Loosen radiator cap



- Slip hose (arrow) over screw head
- Remove drain plug
- Drain coolant

Note:
Replace drain plug seal!

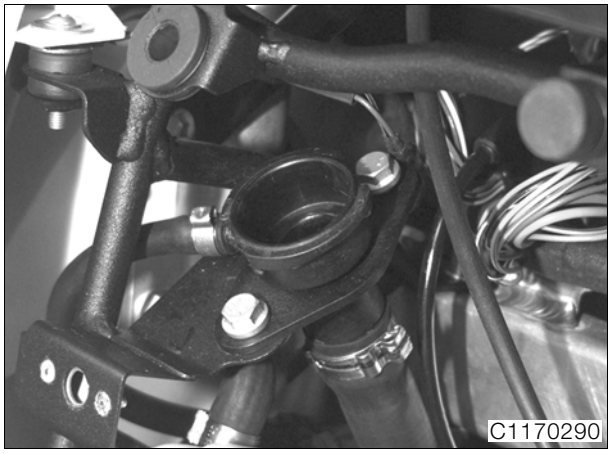
- Tighten drain plug

Torque specification:
Drain plug..... 10 Nm

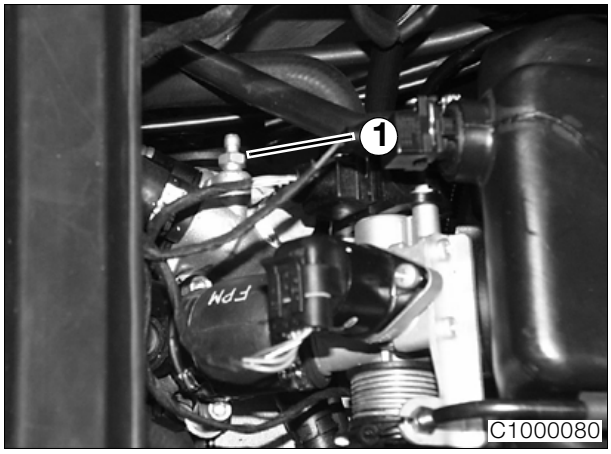
Draining expansion tank

Note:
If powerplant cradle is pivoted expansion tank may be accessed under lock fitting. Alternatively, draw off coolant with a syringe or similar.

Adding coolant



- Pour coolant into filler neck



- Open vent screw (1) in cylinder head to bleed air from system, reclosing only after coolant starts to emerge
- To top up coolant in expansion tank
- Run the engine briefly, then stop it, recheck coolant level and top up if necessary

Capacities:
Cooling system ..... 1.25 l/2.20 Imp pints
Expansion tank ..... 0.2 l/0.35 Imp pints

Attention:
Use only nitrite-free extended-duty antifreeze with corrosion inhibitor!

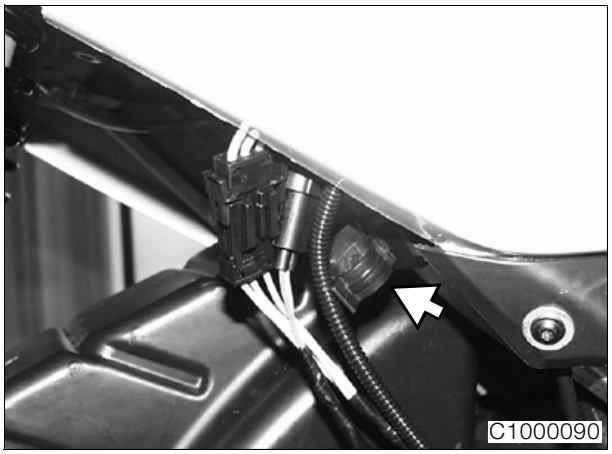
Mixture ratio:
Water 50%
Antifreeze.....50%
Protection down to .....–25 °C/77 °F

Checking valve clearances

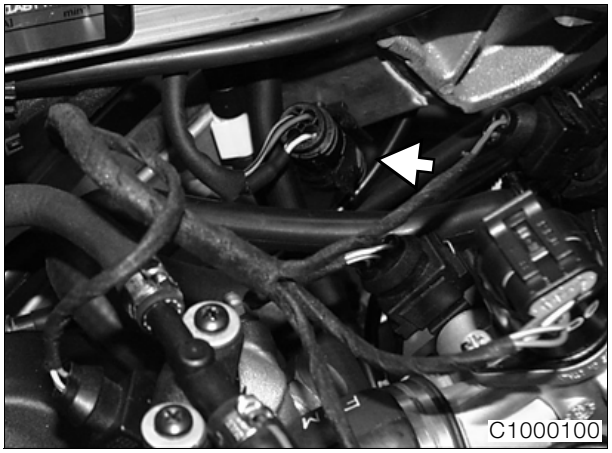
(Inspections I, II and III)

Swivel out powertrain cradle

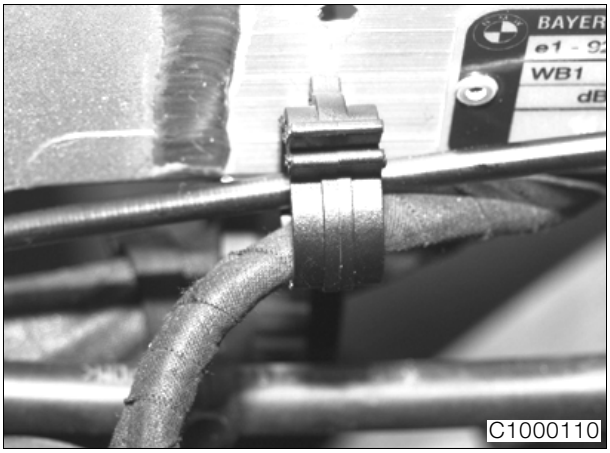
- Secure front wheel



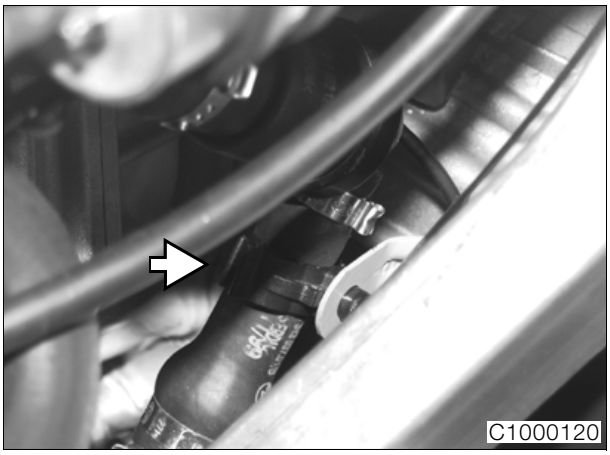
- Remove wiring from clip (arrow):
  - Alternator
  - Ignition unit
- Open the seat



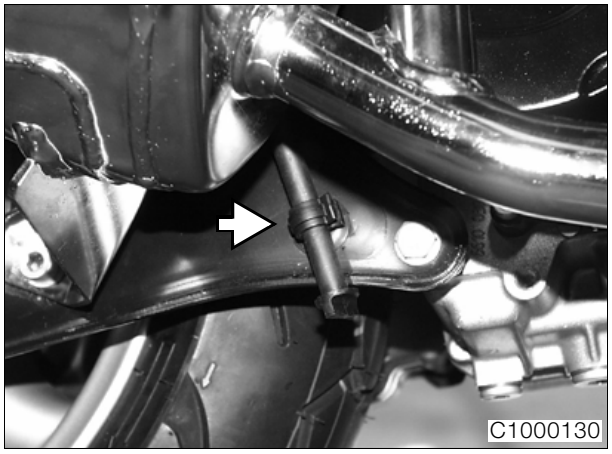
- Release clip and disconnect plug from oxygen sensor (arrow)



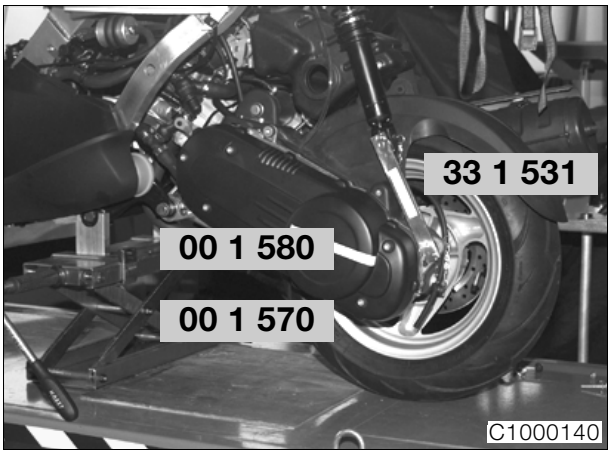
- Remove wiring from clip:
  - Injector
  - Air temperature sensor
  - Idle actuator
  - Coolant temperature sensor in cylinder head



- Release coolant hose from clamp at injector and on variator cover bracket (arrow)



- Remove hose from bracket on intake-air plenum chamber (arrow)



- Position vehicle jack **BMW No. 00 1 570** with attachment **BMW No. 00 1 580** at separation point
- Raise the vehicle slightly
- Install fixture, **BMW No. 33 1 531,** between left spring strut and powertrain cradle
- Remove lower end of right spring strut from brake caliper holder

Attention:
To avoid stretching hoses and lines, do not swivel the powertrain cradle more than 20°!

- Lift C1 no further than stop: powertrain cradle swivels down

When installing:

- Install the cylinder head cover before swiveling the powertrain cradle back into place

Attention:
Ensure that gasket and cover are free of oil!

- Installing cylinder head cover

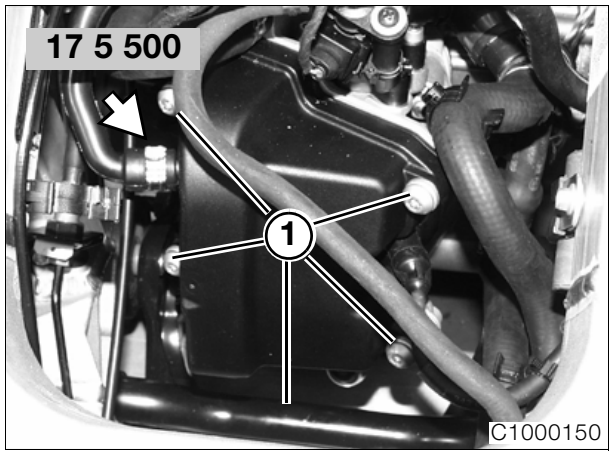
Attention:
When lowering note positions of struts and intake-air plenum chamber!

Note:
Ensure that the detent engages to secure the long lever on the easy-lift mechanism. If necessary, move the lever to the drive position first, and then move it to the park position.

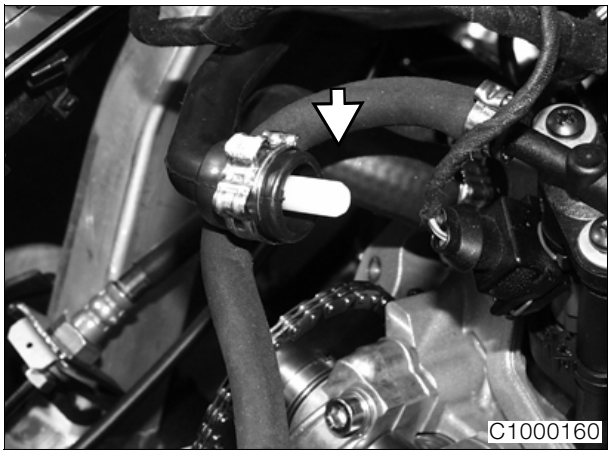
Tightening torque:
Cylinder head cover ..... 10 Nm
Strut, lower ..... 21 Nm

Checking valve clearances

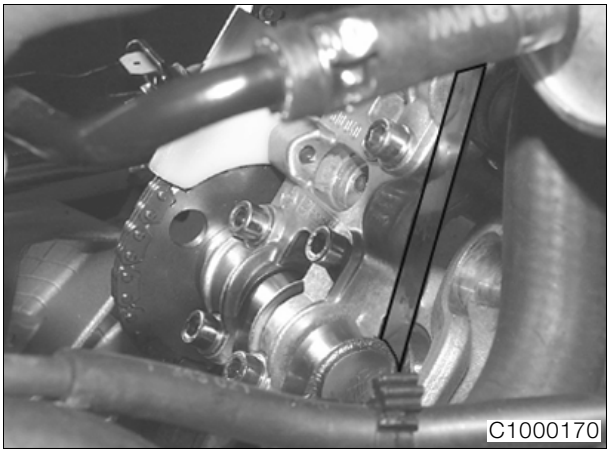
– Remove left and right service covers
– Swivel out powerplant cradle



- Open hose clamp (arrow) with pliers **BMW No. 17 5 500**
- Unscrew cylinder head cover bolts (1)



- Watch throttle (arrow)
- Remove spark plug
- Use camshafts to rotate engine until the lobes are pointing outward



- Measure valve clearance using single feeler gauge blade
- Record the valve clearances
- and adjust valve clearance as indicated (replace valve lifters)

Specified clearances:

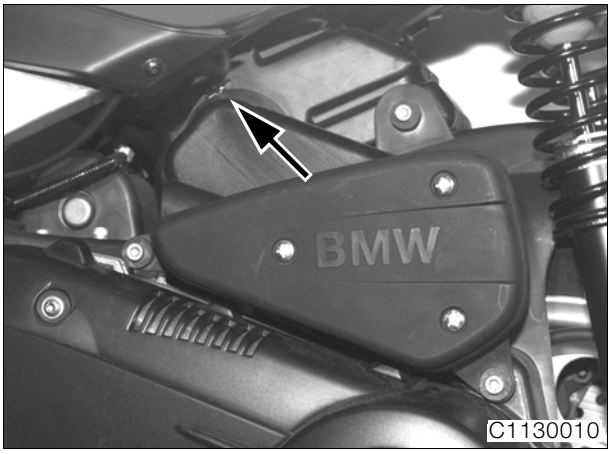
	IV left mm (in)	IV right mm (in)	EV left mm (in)	EV right mm (in)
Spec. clearance	0.05 (0.00197) 0.09 (0.00354)	0.05 (0.00197) 0.09 (0.00354)	0.20 (0.00787) 0.29 (0.01147)	0.20 (0.00787) 0.29 (0.01147)
Clearance, measured (used)	0.15 (0.00590)		0.15 (0.00590)	
Difference	0.01 (0.00039)		-0.05 (-0.00197)	

Inlet valve clearance.....0.05…0.09 mm
..... (0.00197…0.00354 in)
Exhaust valve clearance.....0.20…0.29 mm
..... (0.00787…0.01147 in)

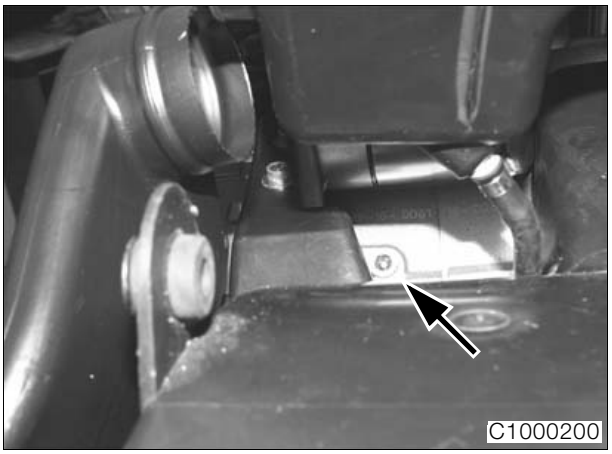
Adjusting valve clearances

To foster enhanced clarity, some of the illustrations show components with the powerplant cradle removed

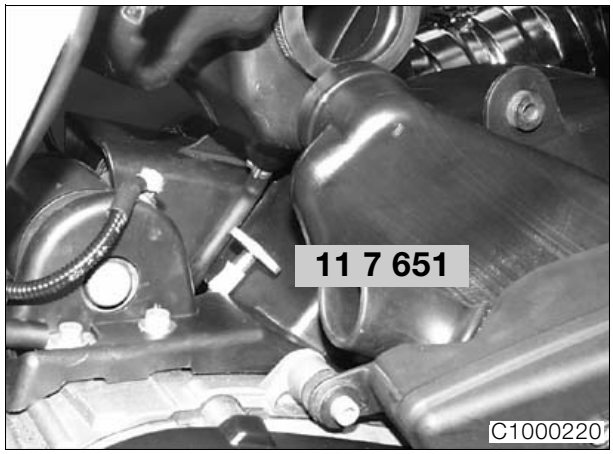
- Swivel out powerplant cradle
- Checking valve clearances



- Loosen hose clamp (arrow) on intake-air plenum chamber

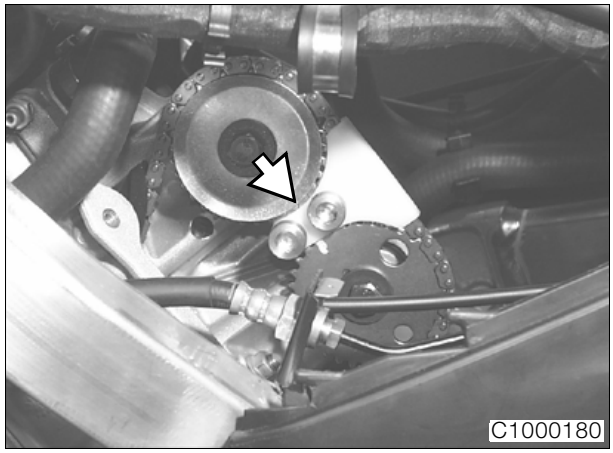


Note:
Watch for dirt and contamination around the starter/ threaded plug (arrow) - no contamination in engine!

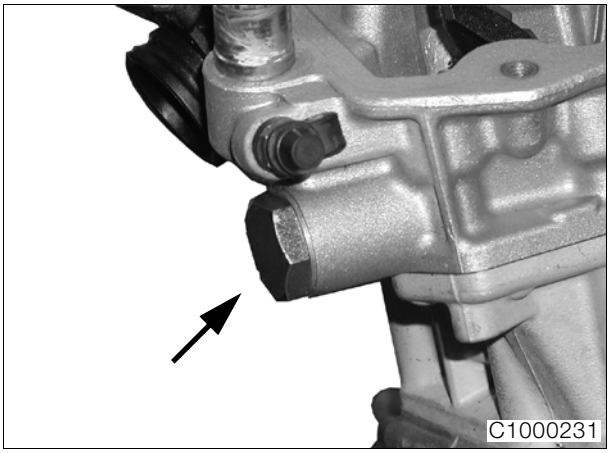


- Remove Allen bolt adjacent to starter and use special bolt, **BMW No. 11 7 651,** to lock at TDC

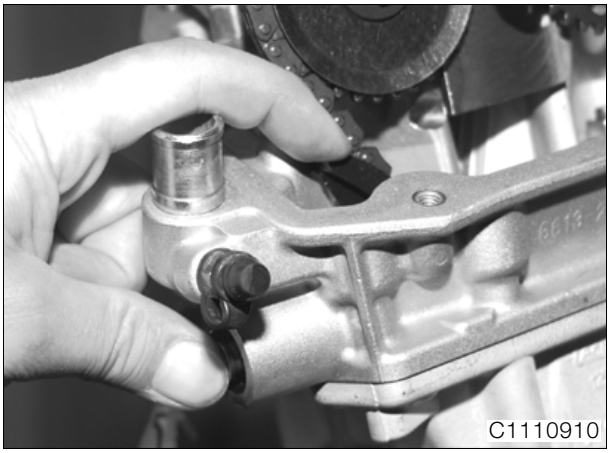
Note:
Because the round cover plate can rotate against the gear, the TDC mark should always be made on the gear itself - not on the cover plate



- Use a coloured marker to mark TDC (arrow) on the inlet camshaft's sprocket



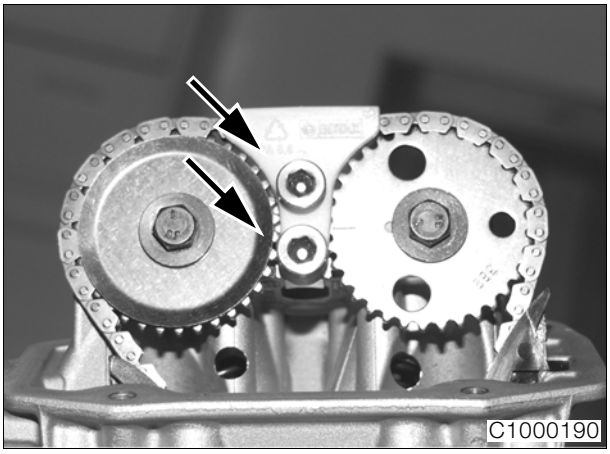
- Release chain tensioner bolt (arrow)



- Press chain tensioner to the outside using chain tensioning rail

Note:
The bolts on the chain guide mechanism are secured with thread-locking compound!

Note:
Watch bolt length and take care to install in correct positions,
lettering is to the outside, use coloured marker to identify end as necessary!



- Detach mounts (arrows) from chain guide and remove

Note:
The camshafts can also be removed and installed with the sprockets in place!

Note:
The camshaft sprocket is secured with locking compound!

- Undo bolts and remove camshaft sprokets

Note:
Make sure that the timing chain does not drop into the housing. Use a retainer to keep timing chain tensioned at all times!

- Secure the timing chain to prevent it from falling

Note:
Note the length of the bolts used to attach the camshaft bearing cap!



- Remove 8 bolts
- Remove camshaft bearing cap
- Removing camshafts
- Remove camshaft bearing seat
- Remove the tappet
- Record the figures on the bottoms of the tappets

Sample calculation:

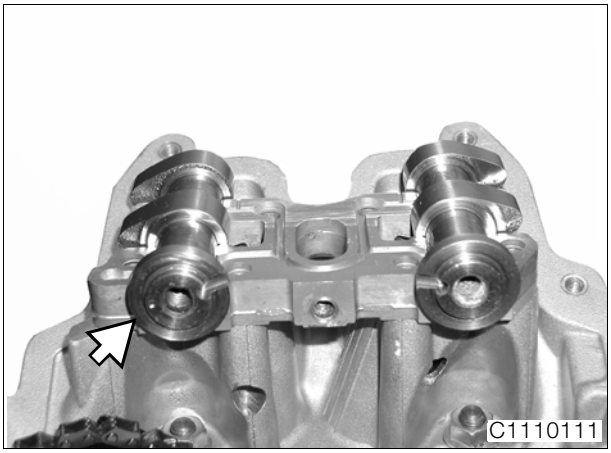
	IV left mm (in)	**IV right mm (in)**	**EV left mm (in)**	**EV right mm (in)**
Spec. clearance	0.05 (0.00197) 0.14 (0.00551)	0.05 (0.00197) 0.14 (0.00551)	0.20 (0.00787) 0.29 (0.01147)	0.20 (0.00787) 0.29 (0.01147)
Clearance, measured (used)	0.15 (0.00590)		0.15 (0.00590)	
Difference	0.01 (0.00039)		-0.05 (-0.00197)	
Bucket, measured (used)	**2.80** (0.11023)		**2.80** (0.11023)	
Bucket specification (new)	2.81 (0.11062)		2.75 (0.10826)	
Bucket, measured (new)	2.85 (0.11220)		2.75 (0.10826)	
Clearance specification (new)	0.10 (0.00394)		0.20 (0.00787)	
Clearance, measured (new)				

- Subtract negative difference of bucket (old)
- Add positive difference of bucket (old)
- Note sizes of available bucket tappets

Note:
The bucket tappets are available in sizes ranging from 2.50 mm (0.09842 in) to 3.20 mm (0.12598 in) in 5/100ths graduations.
Should it prove impossible to adjust the valve clearance with the smallest bucket tappet (2.50 mm/ 0.09842 in) the cylinder head will have to be replaced (➟ 11.40).
If it is not possible to adjust the valve clearance with the largest bucket tappet (3.20 mm/0.12598 in) the valve seat will have to be reground (➟ 11.30).

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following operations:

Attention:
The grooves in the bearing caps are oil passages!
Note the lengths of the camshaft bearing cap bolts!



Attention:
Align bearing caps, make sure that bearing caps and bearing seats are correctly aligned. Run a finger along the joint to check alignment!

- Remove traces of Loctite from threads of camshafts and chain guide
- Coat threads of fasteners for chain guide and camshaft gear with Loctite
- The inlet camshaft bears a punch mark (arrow) as identification
- Make sure that the camshafts turn easily and smoothly

Note:
Always renew the screw plug's sealing ring!

- Install chain tensioner (➟ 11.33)

Attention:
Remove TDC set bolt, **BMW No. 11 7 651.**

- Turn the engine over several times by hand
- Check valve clearance and adjust as necessary

Note:
Install cover seal, ensuring that it and groove in cylinder head cover are free of oil!

- Install the cylinder head cover before installing the powertrain cradle

Attention:
When lowering note the positions of the spring struts!

Note:
Make sure the long lever of the easy-lift mechanism engages. If necessary, move the lever to the drive position first, and then move it to the park position!

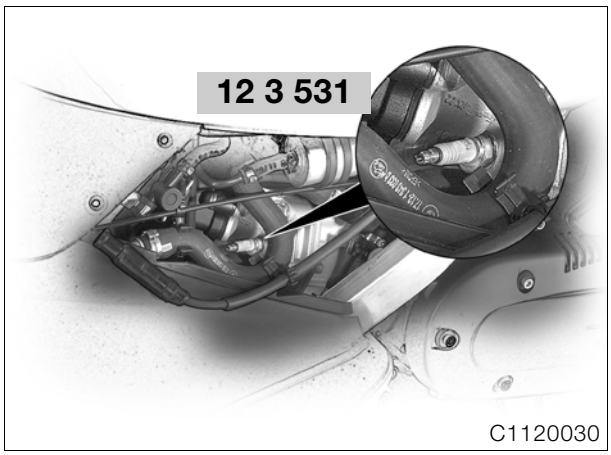
Fluids and lubricants:
Guide rail..... Loctite 243
Camshaft sprocket..... Loctite 243

Torque specification:
Guide rail attachment..... 10 Nm
Camshaft sprockets..... 30 Nm
Camshaft bearing cap bolt..... 10 Nm
TDC bolt socket plug..... 15 Nm
Chain tensioner plug..... 35 Nm
Lower strut mount..... 21 Nm

Replace spark plug

(Inspections II and III)

– Remove left service cover



C1120030

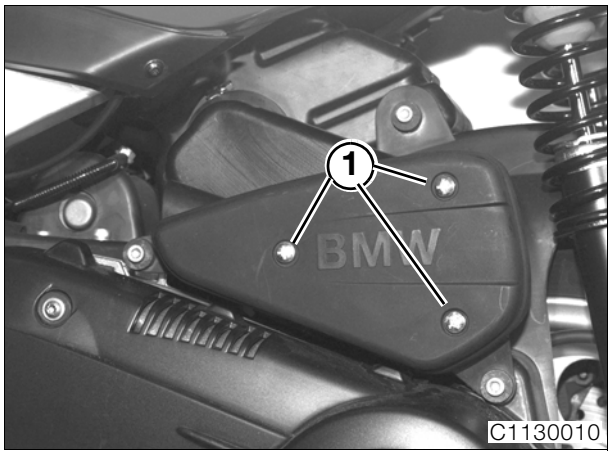
- Disconnect spark plug cap
- Use spark-plug wrench, **BMW No. 12 3 531,** to remove spark plug

Torque specification:
Spark plugs..... 15 Nm

Fluids and lubricants:
Spark plug .....NGK CR 8EB

Replacing air cleaner element

(Inspections II and III)

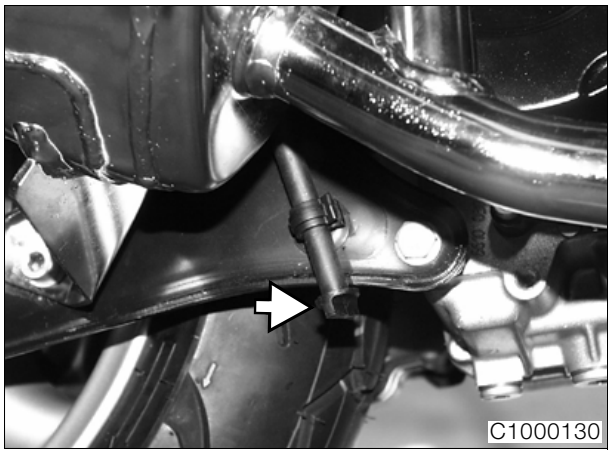


- Remove fasteners (1) securing cover to air filter housing
- Replace air filter element

Empty drain pipe from intake-air plenum chamber

(Inspection IV)

- Empty the drain pipe from the air cleaner housing



- Remove plug (arrow) and allow oil which has drained out to escape
- Assembly is the reverse of the dismantling procedure

Checking brake lines

(Inspections II and III)

Attention:
Refer to and observe the precautions for handling brake fluid!

- Check brake calipers, unions and lines on brake system for correct operation, leaks, damage and incorrect positioning; repair or replace as necessary
- Check the brake fluid level and top up if necessary

Checking brake lines
- Examine all brake lines for damage and correct routing

Checking brake system operation and inspect for leaks

(Inspections II and III)
- Check condition and routing of all lines and connections

Checking brake fluid level

(Inspections I, II and III)

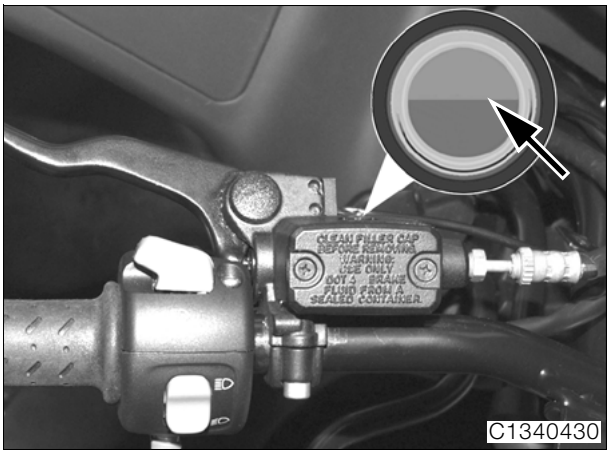
Checking fluid level in the closed brake fluid reservoir

The procedure for checking the level in the left brake fluid reservoir is described below. The procedure for checking the level in the right brake fluid reservoir is basically the same.

Attention:
The fluid level in the brake fluid reservoir must be at the “MAX” mark with new brake pads. It is not possible to verify that the fluid is at maximum level through the sight glass. For details on the correct procedure see **Checking fluid level in the open brake fluid reservoir!**

- Turn the handlebars at full left-hand lock

Note:
The volume of the brake fluid (MIN/MAX) is sufficient for lining thicknesses from new to the wear limit. It is not normally necessary to top up the fluid to accommodate lining wear.
A level below MIN indicates the possibility of other system defects!



- Check the level of brake fluid through the sight glass

Minimum level (arrow)
..... slightly above the centre of the sight glass
wear limit with worn brake pads

Warning:
The brake fluid level must never be allowed to fall below the MIN mark (arrow) used to identify the absolute minimum level. Otherwise, there is a danger that air will be drawn into the brake system during operation!

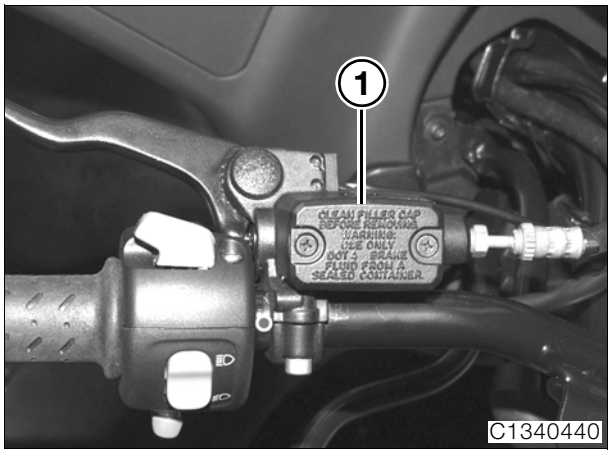
Checking fluid level in the open brake fluid reservoir

The procedure for checking the level in the left brake fluid reservoir is described below. The procedure for checking the level in the right brake fluid reservoir is basically the same.

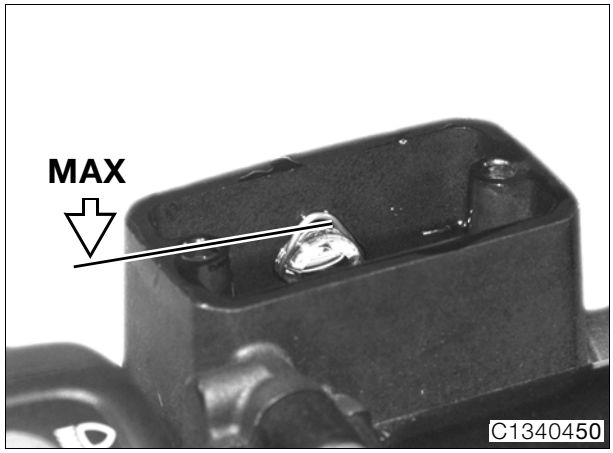
Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid attacks paintwork!

Note:
Do not remove the reservoir cap unless the handlebar is turned all the way to the right!

- Turn the handlebar all the way to the right
- Secure the handlebar in the full lock position



- Remove reservoir cap (1) with diaphragm



Specification:
Specified level with new pads
..... Upper edge on inside of sight glass

Attention:
When adding brake fluid, do not allow it to enter the holes for the reservoir cap screws!

- If the brake fluid level does not come up to the top of the sight glass with new brake pads installed top up the fluid level and, if necessary, check the brake system for leaks

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following operations:

Note:
Wipe the rim of the reservoir, the rubber boot and the cover to remove brake fluid, and carefully reassemble the components!

- Hand-tighten cap on reservoir
- Check operation of the brake system

Operating fluid:
Brake fluid.....DOT 4

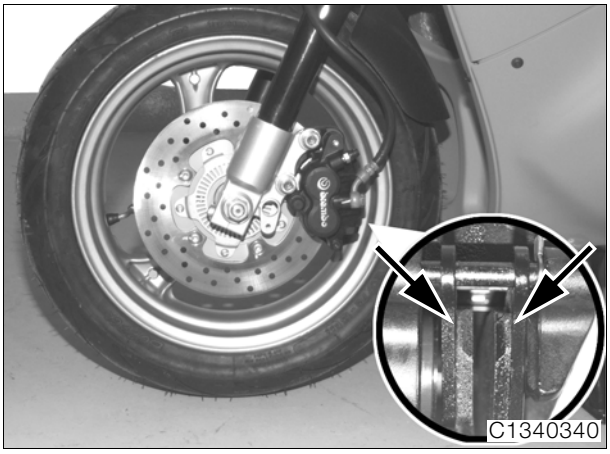
Checking brake pads and discs for wear/replacing

(Inspections II and III)

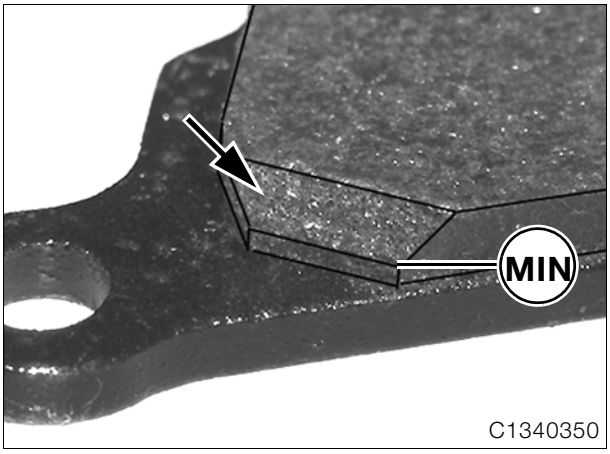
Checking brake pads for wear

Warning:
Never allow brake pads to wear below the minimum specified thickness!
Always replace pads as a complete set!

Front brake pads

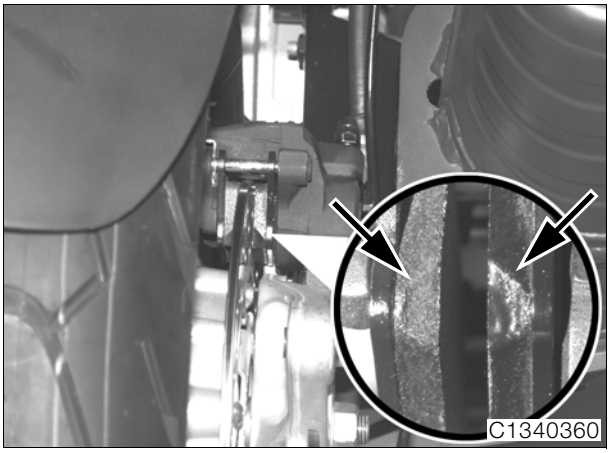


- Visually inspect the brake pads from behind and below
– Replace the brake pads if a wear mark (arrows) is no longer clearly visible

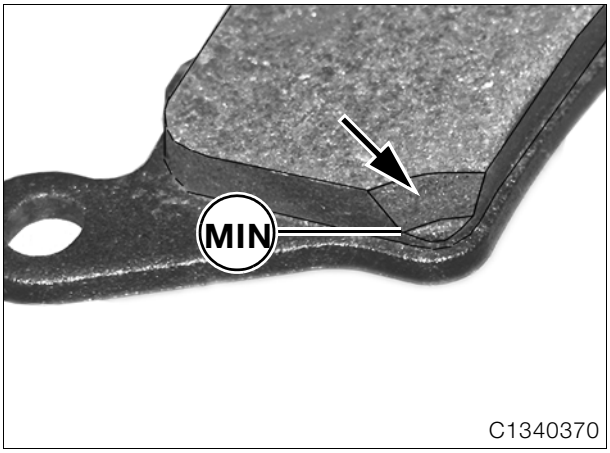


Minimum pad thickness
The brake pads have a clearly visible chamfer (arrow) as a wear indicator

Rear brake pads



- Visually inspect the brake pads from behind
– Replace the brake pads if a wear mark (arrows) is no longer clearly visible



Minimum pad thickness
The brake pads have a clearly visible chamfer (arrow) as wear indicator

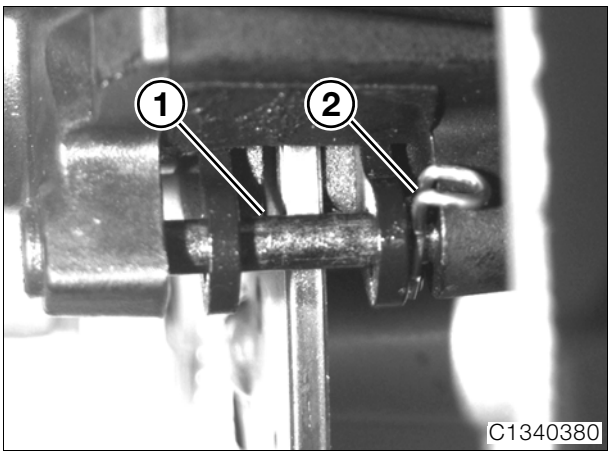
Replacing brake pads

Front brake

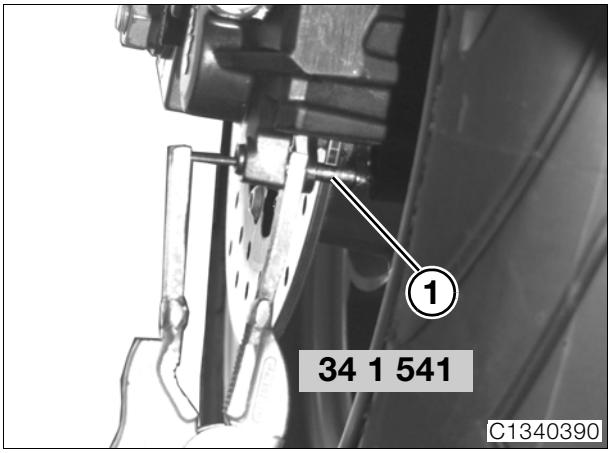
Attention:
Never separate the two sections of the brake caliper!

- Firmly press the brake caliper against the brake disc in order to force back the brake pads and pistons

Note:
If the brake pads/pistons cannot be forced back in this way, this can indicate a defect in the brake system!



- Remove the cotter pin (2) from the dowel pin (1)



- Remove dowel pin (1) with drift punch or pliers, **BMW No. 34 1 541**
- Remove the brake pads.

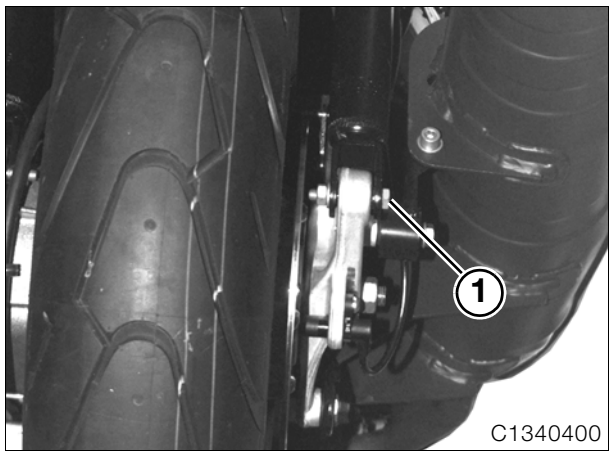
When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Do not damage the brake pads when installing!

- Checking operation of the brake system

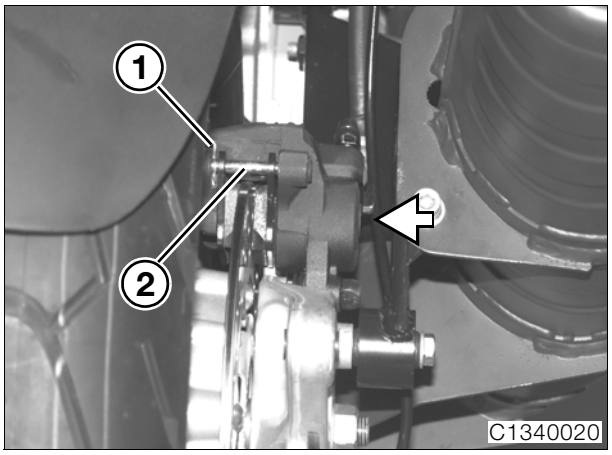
Attention:
The fluid level in the brake fluid reservoir must be at the “MAX” mark after the brake pads have been changed. It is not possible to determine whether the fluid is at the specified maximum level using the sight glass. For details on the correct procedure see **Checking fluid level in the open brake fluid reservoir!**

Attention:
Never separate the brake caliper sections!



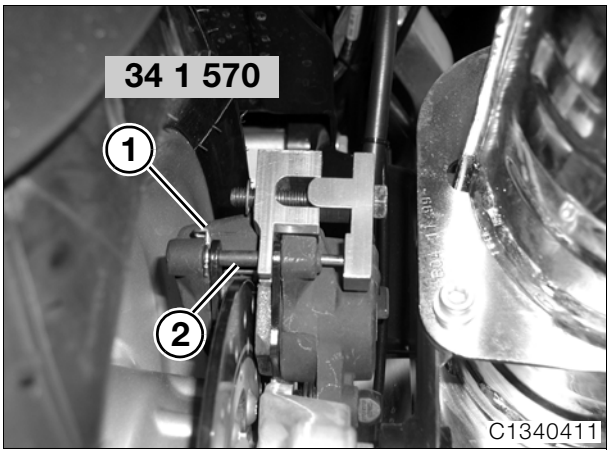
- Detach the lower end of the strut (1) and tie it up out of the way

Attention:
Avoid scratching or otherwise damaging the wheel rim, mask off brake caliper if necessary!

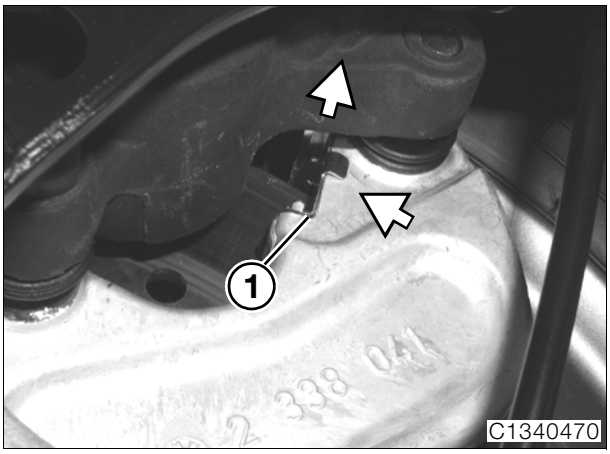


- Firmly press the brake caliper against the brake disc in order to force back the brake pads and pistons

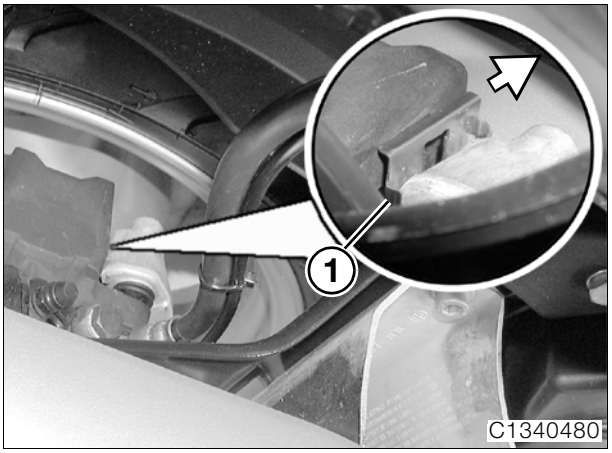
Note:
If the brake pads/pistons cannot be forced back in this way, this may indicate a defect in the brake system!



- Remove the cotter pin (1) from dowel pin (2)
- Remove dowel pin (2) with extractor, **BMW No. 34 1 570**
- Pull out the brake pads toward the rear



- Pull support plate (1) back and up



- Remove support plate (1) to the inside

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following operations:

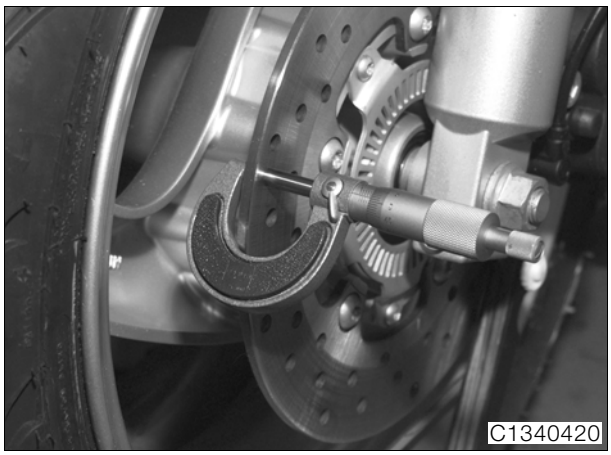
Attention:
Always replace the backplate!
Ensure that the backplate seats correctly!
Take care to avoid damaging brake pads when installing!

- Install new backplate
- Use a long-nosed punch to install the dowel pin
- Check the operation of the brake system

Attention:
The fluid level in the brake fluid reservoir must be at the “MAX” mark after the brake pads have been changed. It is not possible to determine whether the brake fluid is at the specified maximum level through the sight glass. For details on the correct procedure see **Checking fluid level in the open brake fluid reservoir!**

Checking the brake discs

- Carefully check the brake discs for cracking, damage, deformation and scoring



- Measure the thickness of the brake discs at several points with a caliper gauge

Wear data:
Front brake discs ..... 4.0 mm/0.15748 in
Rear brake disc..... 4.0 mm/0.15748 in

Replacing brake fluid

(Inspection IV)



Attention:
Protect trim panels against contact with brake fluid!

Attention:
Observe all precautions for handling brake fluid!

Attention:
To ensure continued safety the brake fluid must be changed annually!
The brakes must be bled and checked to ensure that they are in full working order!

Vehicles with ABS

Attention:
On vehicles with **ABS** the brake system service operations in the repair manual must be supplemented by bleeding operations performed using the **BMW** MoDiTeC/DIS plus with the ABS control units toolbox.
There is a danger that residual air will remain in the ABS control circuits if **BMW** MoDiTeC/DIS plus is not used.

- Connect a commercially-available suction device to the brake fluid bleed screws on the caliper
- Force the pistons all the way back into the brake calipers

Note:
This description applies to the brake filling and bleeding units that operate using suction at the bleed fitting on the brake caliper.
If other devices are used, comply with their manufacturers' instructions!

Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid attacks paint!

Drawing off brake fluid/forcing back brake pistons

- Firmly press the brake caliper against the brake disc in order to force back the brake pads and pistons

Note:
If the brake pads/pistons cannot be forced back in this way, there may be some defect in the brake system!

- Connect the brake bleeding device to the bleed screw on the brake caliper
- Open the bleed screw by half a turn
- Draw off brake fluid from the front brake circuit

When installing:

- Installation is the reverse of the removal procedure

Attention:
On vehicles with **ABS** the brake service operations described in the repair manual must be supplemented by bleeding operations using the **BMW** MoDiTeC/DIS plus with the ABS control unit toolbox.
Failure to use the **BMW** MoDiTeC/DIS plus results in a hazard of residual air remaining in the ABS control circuits.

- Add brake fluid until it reaches the top of the sight glass
- Bleed the front brake circuit
- Check the operation of the brake system

Bleed the front brake circuit

Attention:
On vehicles with **ABS** the brake service operations described in the repair manual must be supplemented by bleeding operations using the **BMW** MoDiTeC/DIS plus with the ABS control unit toolbox.
Failure to use the **BMW** MoDiTeC/DIS plus results in a hazard of residual air remaining in the ABS control circuits.

– Add brake fluid until it reaches the top of the sight glass
- Connect the brake bleeding device to the bleed screw on the brake caliper
- **[ABS]** Bleed vehicle with **BMW** MoDiTeC/DIS plus
- Open the bleed screw by half a turn

Attention:
Brake fluid level must not drop below the MIN mark during the bleeding process, otherwise air will be drawn into the brake system. Bleed the system again if this happens!

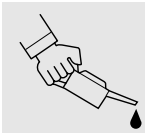
- Continue to extract brake fluid until it emerges clear and free of air bubbles
- Tighten the bleed screw
- Check the operation of the brake system

Operating fluid:
Brake fluid .....DOT 4

Torque specification:
Bleed screw ..... 14 Nm

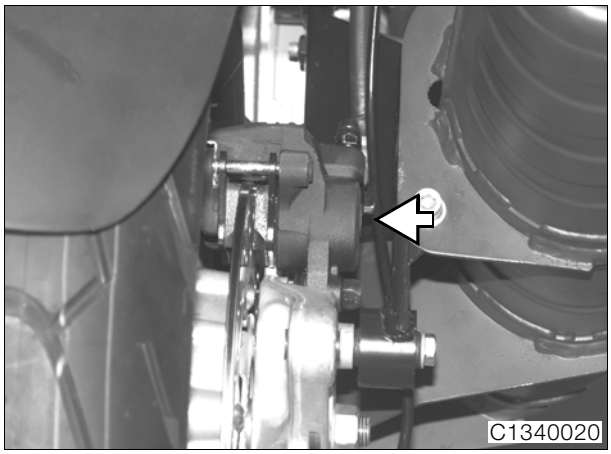
Rear brake

Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid attacks paint!



Drawing off brake fluid/forcing back brake pistons

Attention:
Avoid damaging or scratching the brake caliper; mask it off if necessary!



- Firmly press the brake caliper against the brake disc in order to force back the brake pads and pistons

Note:
If the brake pads/pistons cannot be forced back in this way, there may be some defect in the brake system!

- Connect the brake bleeding device to the bleed screw on the brake caliper
- Extract brake fluid from the rear brake circuit

When installing:
- Installation is the reverse of the removal procedure
– Add brake fluid up to the top of the sight glass
– Bleed the rear brake circuit
- Check the function of the brake system



Bleeding rear brake circuit

Attention:
On vehicles with **ABS** the brake service operations described in the repair manual must be supplemented by bleeding operations using the **BMW** MoDiTeC/DIS plus with the ABS control unit toolbox.
Failure to use the **BMW** MoDiTeC/DIS plus results in a hazard of residual air remaining in the ABS control circuits.

– Add brake fluid until it reaches the top of the sight glass
- Connect the brake bleeding device to the bleed screw on the brake caliper
- **[ABS]** Bleed vehicle with **BMW** MoDiTeC/DIS plus
- Open the bleed screw by half a turn

Attention:
Brake fluid level must not drop below the MIN mark during the bleeding process, otherwise air will be drawn into the brake system. Bleed the system again if this happens!

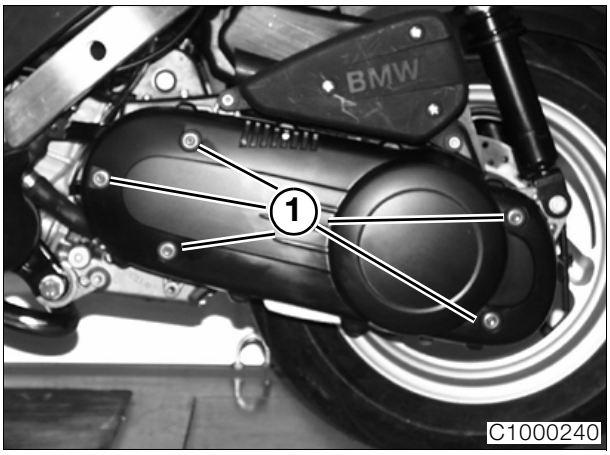
- Extract brake fluid until it emerges clear and free of air bubbles
- Tighten the bleed screw
- Check the operation of the brake system

Operating fluid:
Brake fluid.....DOT 4

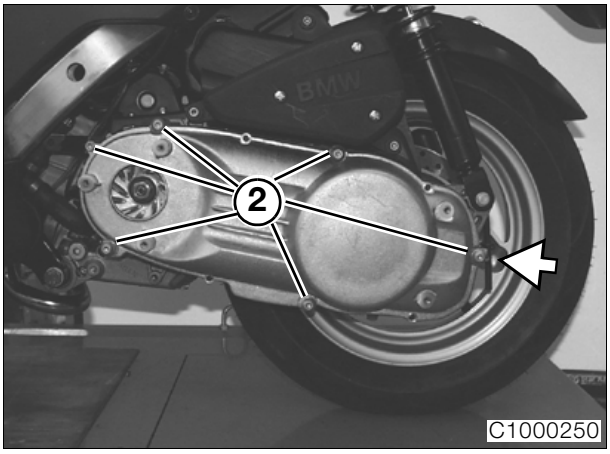
Torque specification:
Bleed screw ..... 14 Nm

Variator drive belt replacement

(Inspections II and III)



- Remove fasteners (1)
- Remove vent cover



- Remove fasteners (2)
- Remove variator cover

When installing:
- Note positions of vent hose and bracket (arrow)

Check belt

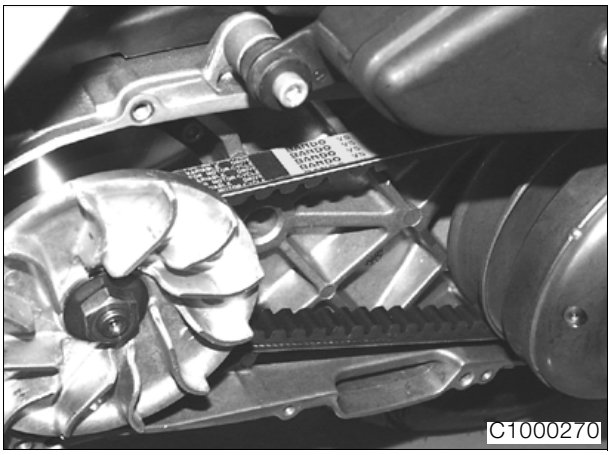
- Check for cracks
- Check width of belt

Wear data:
Belt width ..... 17.8 mm/0.701 in



- Use retainer, **BMW No. 11 7 521,** to apply counterpressure and remove the attachment from the driven variator
- Press variator plates together and turn them anticlockwise
- Remove belt together with driven variator
- Clean housing and variator cover

When installing:
The legend on the belt must be visible from the outside

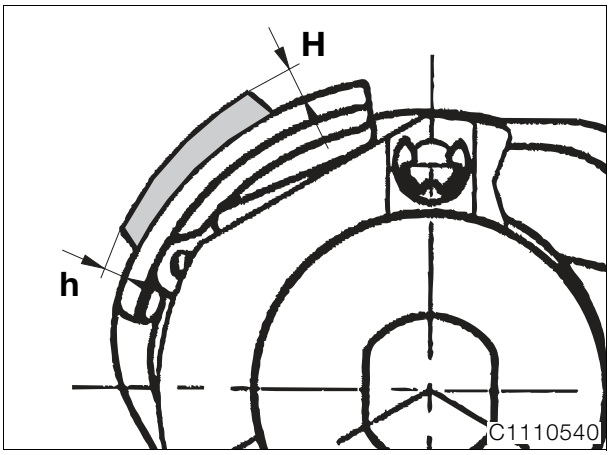


- Make sure the belt is correctly seated
- Install belt together with driven variator
- Check by turning variator manually to ensure that belt is not trapped

Torque specification:
Driven variator mount ..... 60 Nm

Checking clutch lining

(Inspection III)



- Remove bell housing; use puller if necessary
- Check clutch plate lining replace if necessary

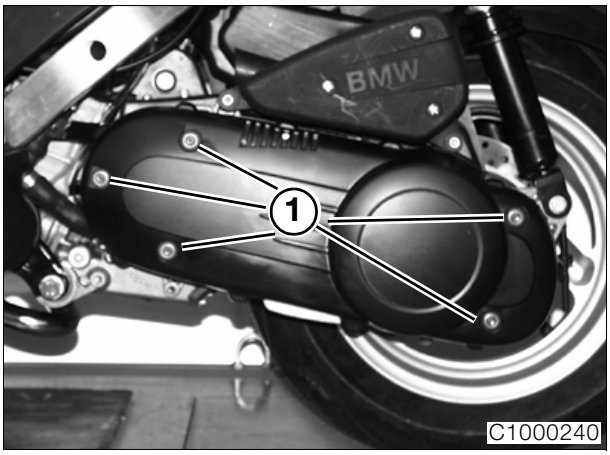
Note:
Replacing driven variator without clutch (➟ 24.6).

➟ ..... See Group 21

Wear data:
Pad, wide H.....4.0 mm/0.15748 in
Pad, narrow h.....2.5 mm/0.09842 in

Clean variator filter screen

(Inspections II and III)



- Remove fasteners (1)
- Remove vent cover

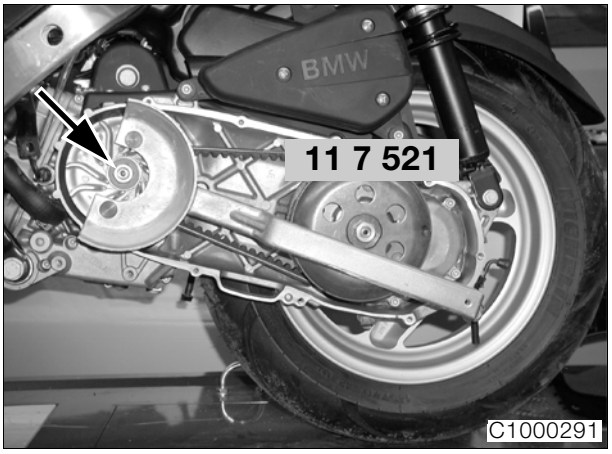


- Remove filter screen from retaining lugs and clean
- Clean inside of vent cap

Drive variator

Remove drive variator

Note:
The following description of variator removal applies to both the lubricated and the unlubricated versions! Note differences during assembly!



Note:
The nut is secured with thread-locking compound!

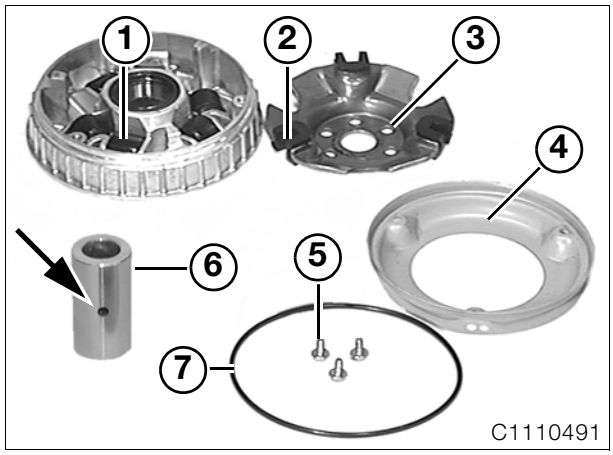
- Undo nut (arrow) using retainer **BMW No. 11 7 521**
- Remove outer washer and drive variator with spacer
- Clean locking compound from threads on crankshaft

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following operations:
- Observe assembly instructions for lubricated (➟ 00.56) and unlubricated variators (➟ 00.58)

Check, clean and grease drive variator (lubricated version)

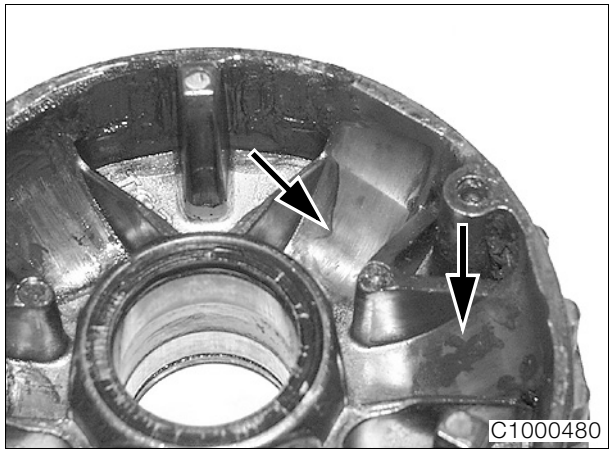
(Inspection II, III) (lubricated version)





- Undo attachment bolts (5) and remove cover (4)
- Remove driver (3) and sliders (2) with spring clips
- Remove rollers (1)
- Clean all parts with shop towels
- Check shaft sealing rings for damage and correct seating
- Check O-ring (7) for damage and flat spots

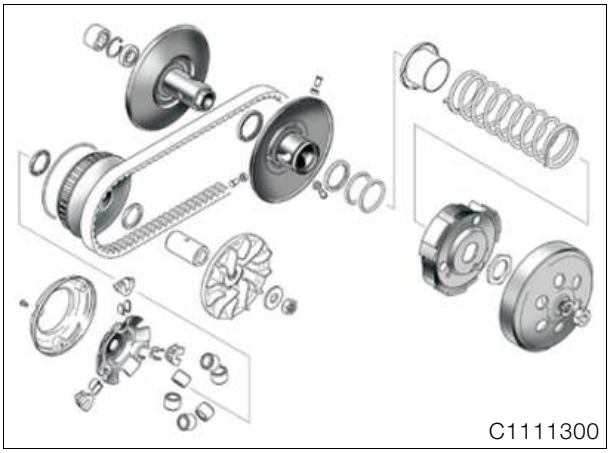
Note:
The bearing tube (7) (spacer) is equipped with a continuous lubrication passage (arrow)! Install only bearing tube with lubrication passage on lubricated versions of the drive variator!



Note:
The rollers in the frame may display flat spots within the wear limits!
Wear within the specified wear limits is acceptable!
Visible, palpable roller wear (arrows) on the drive plate's tracking surfaces is acceptable!

- Conduct visual inspection
- Replace drive variator as required

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following operations:



- Evenly apply approximately 20 g (0.7 oz) of grease to the contact path of the inner plate
- Lightly grease O-ring and install
- Place spring, sliders on transfer elementand grease recesses in sliders

Note:
The bearing tube (spacer) is equipped with a continuous lubrication passage! Install only bearing tube with lubrication passage on lubricated version of drive variator!

- Apply even coat of grease to inside of bearing tube (spacer)
- Spray ground faces of crankshaft stub
- Place transfer element in position
- Check action of transfer element
- Secure variator cover

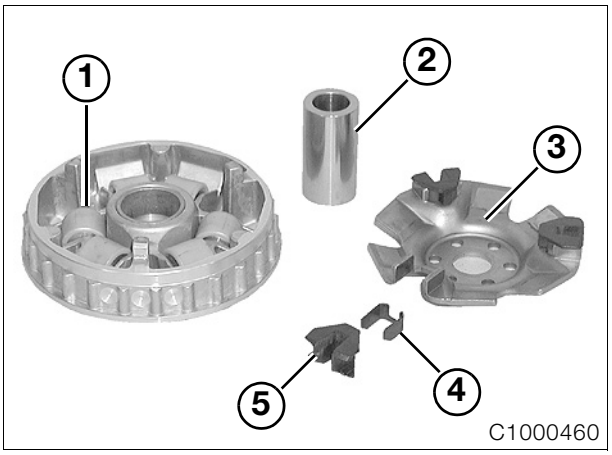
Fluids and lubricants:
Shell Retinax HDX2 .....approximately 20 g (0.7 oz)
Spacer and contact
surface .....Klüber paste 46 MR 401
Crankshaft stub.....Klüber paste 46 MR 401

Torque specification:
Variator cover attachment ..... 4 Nm
Drive variator attachment
(+ LOCTITE 243) ..... 60 Nm
Variator cover..... 10 Nm
Vent cover..... 9 Nm

Check and clean drive variator (unlubricated version)

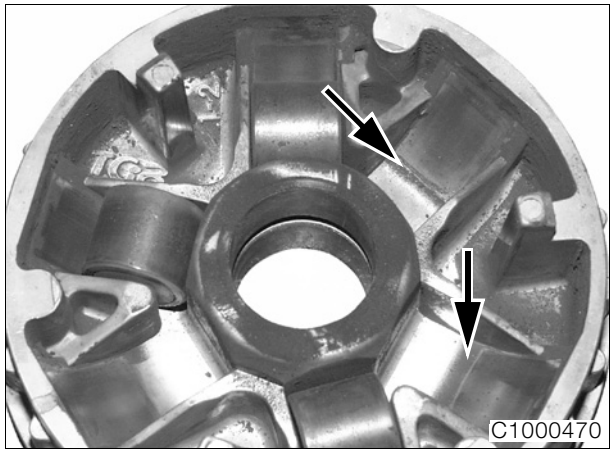
(Inspection II, III) (unlubricated version)





- Remove transfer element (3), then extract sliders (5) with spring (4)
- Remove rollers (1)
- Clean all parts with shop towels

Note:
The bearing tube (2) (spacer) does not have a lubrication passage!

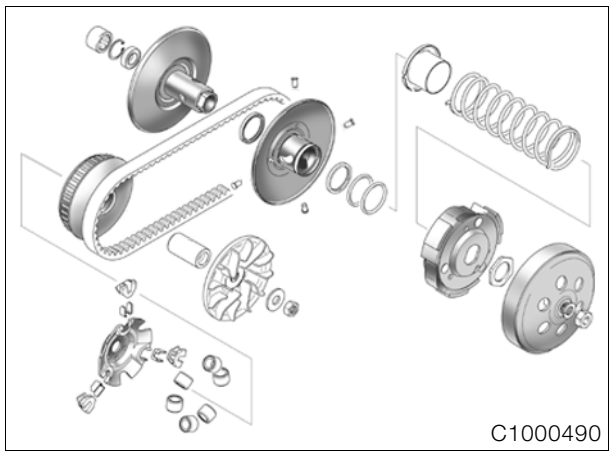


Note:
Flat spots on the rollers that do not not exceed the wear limits are acceptable!
Wear within the specified limits is acceptable!
Visible and palpable contact tracks (arrows) caused by motion of rollers through their travel paths are acceptable!

- Conduct visual inspection
- Replace drive variator as necessary

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following operations:



- Do not lubricate drive variator during assembly or installation - **do not** grease
- Check action of transfer element

Torque specification:

Drive variator mount
(+ LOCTITE 243)..... 60 Nm
Variator cover..... 10 Nm
Vent cover..... 9 Nm

Replacing complete drive variator

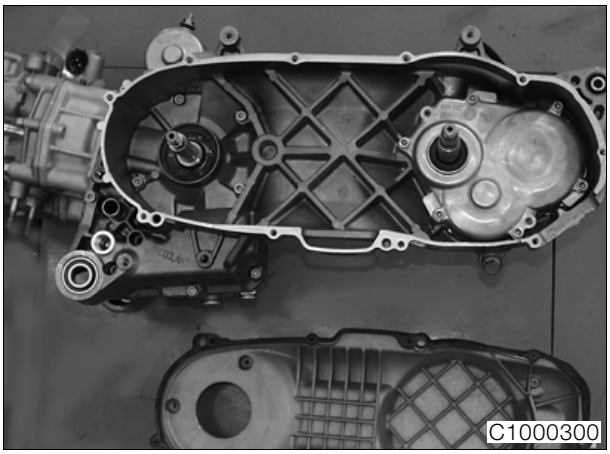
(Inspection II) every 22,500 km (13,500 miles) – lubricated version only



Note:

The nut is secured with thread-locking compound!

- Use retainer **BMW No. 11 7 521** to undo outside plate, then remove drive variator with spacer
- Clean locking compound from crankshaft threads



- Clean housing and variator cover

When installing:
- Observe installation instructions for lubricated (➟ 00.56) and unlubricated variator (➟ 00.58)
- Spray shaft as necessary

Fluids and lubricants:
Shaft ..... Klüber paste 46 MR 401
Mount for drive variator ..... LOCTITE 243

Attention:
Make sure that belt is not trapped between the belt plates!

Torque specification:
Mount, drive variator
(+ LOCTITE 243)..... 60 Nm
Variator cover..... 10 Nm
Vent cover..... 9 Nm

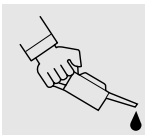
Checking wheel bearing float

(Inspection III)

Note:
Check bearing float with cold bearing only.

- Take the weight off the front/rear wheel
- Tilt the front/rear wheel back and forth on the axle
- It should not be possible to feel any lost motion
- If play is detected in the wheel bearings, replace them

➟ ..... See Group 36

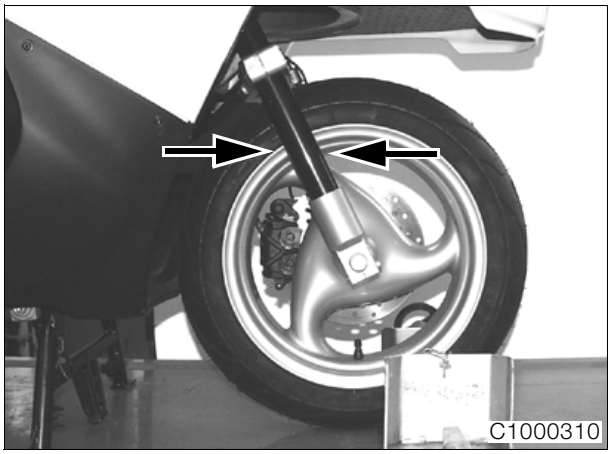


Check to ensure that leading link bearing has zero play

(Inspection I, IV)

Checking steering bearing play

- Relieve load on front wheel



- Move fixed fork tubes forward (arrows)
- If play is detected, check fastener of leading-link mount and adjust if necessary

➠ ..... See Group 31

Check battery electrolyte level - add distilled water if necessary

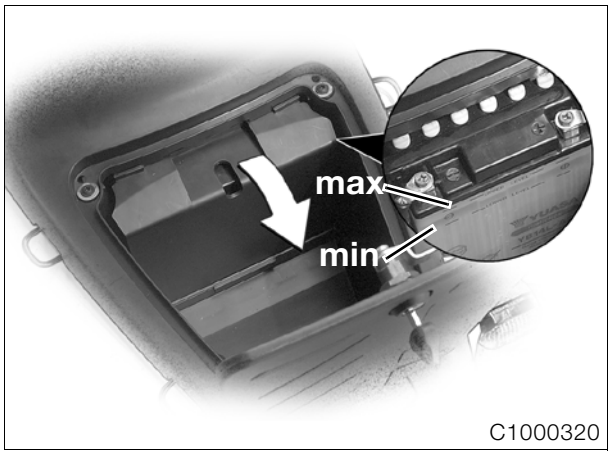
(Inspection IV)

Warning:
Battery acid is extremely caustic.
Protect your eyes, face, hands, clothing and the paintwork!

Attention:
Observe precautions for working with battery acid!

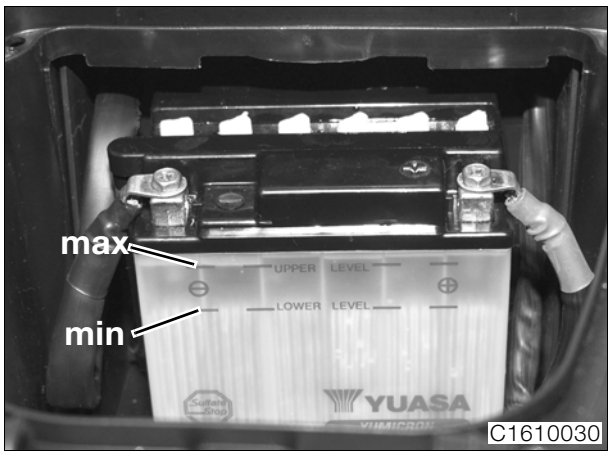
Checking battery electrolyte level

– Open cover of rear storage compartment



- Remove cover from battery compartment
- The electrolyte level must be between:
  Maximum level **"UPPER LEVEL"** and
  Minimum level **"LOWER LEVEL"**

Adding distilled water



- Remove threaded plug

Note:
Never use anything other than distilled water to top up the battery's electrolyte!

- Add distilled water up to the maximum level
- Installation is the reverse of the removal procedure

Clean/grease battery terminals if necessary

(Inspection IV)

– Remove cover from battery compartment
- Clean the battery terminals and grease them with **acid-proof battery grease**

Fluids and lubricants:
Battery terminal .....Acid-resistant battery grease

Checking Bowden cables

(Inspections III and IV)

- Check Bowden cables for damage from rubbing and abrasion
- Check freedom of movement and adjust, if necessary

➠ ..... See Group 32

Throttle cable:
- Move the handlebars all the way from left to right and ensure that throttle valve does not move

Checking easy-lift mechanism

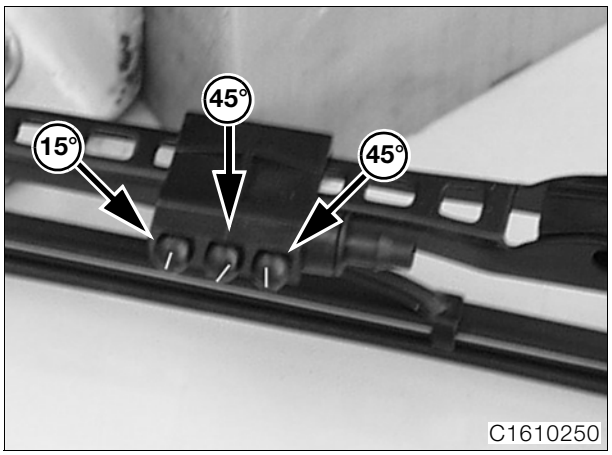
(Inspections I, II, III and IV)

- Check operation of mechanism and check freedom of movement
- Check Bowden cables for damage from rubbing and abrasion
- Check free travel of Bowden cables and adjust as required

Specification:
– The small lever must move up and down between the two limit stops
– Adjust Bowden cables without free travel, allowing the stand springs to hold the stand in its end position (➠ 46.44)

Checking windscreen washer

(Inspections I, II and III)



- Check spray pattern of nozzles; adjust if necessary
- Use a screwdriver to adjust nozzles
- Top up windscreen-washer fluid

Check windscreen wiper

(Inspections II, III and IV)

- Check wiper blade for cracks
- Check action of wiper arms
- Check windscreen wipers and replace wiper blade if necessary

➠ ..... See Group 61

Checking safety elements

(Inspections I, II, III and IV)

Check Bowden cable for central seat-belt release



- Use test gauge, **BMW No. 72 5 501**, to pretension release lever
- Engage seat belts in their buckles with an audible click
- Move the handlebars all the way from left to right and ensure that belt buckles do not disengage
- If necessary, check Bowden cable for central seat-belt release

Check belt straps and belt buckles

- Fully unreel seat belts and check for damage

Check inertia reels

- Once unreeled, belt must reel in automatically when released

Check inertia-reel's detent mechanism to ensure that it engages correctly

- Engage seat belts in their buckles with an audible click
- Pull firmly on belt strap and make sure that inertia reel locks

Examine crash elements

(Inspections I, II, III and IV)

- Examine foam-rubber element from below for damage and cracks; replace if necessary

➠ ..... See Group 46

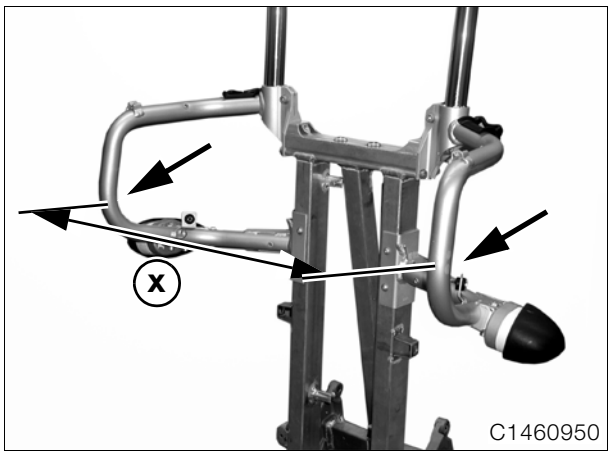
Check shoulder bar and deformation element

(Inspections I, II, III and IV)

- Check deformation element for damage; replace if necessary
- Check shoulder bars for damage; replace if necessary

➠ ..... See Group 46

Measure shoulder bar



- Measure gap (x) between shoulder bars
- Record result

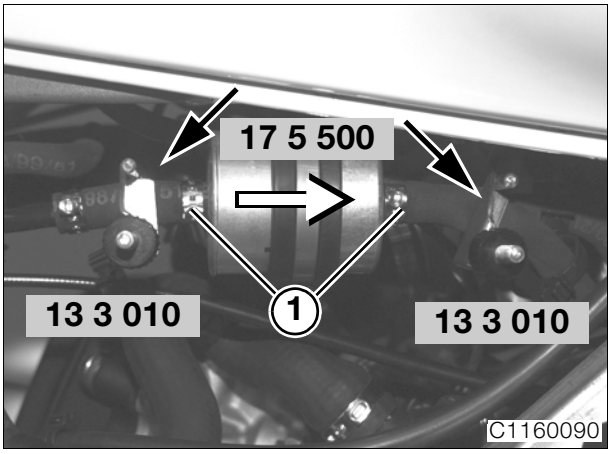
Measurement levels
1 Runout of lower radius (arrows)

Wear data:
Gap "x".....612...616 mm
.....(24.0945...24.2520 in)

Replacing fuel filter

(Inspection II) every 37,500 km (22,500 miles)

– Remove left service cover



- Use clamp, **BMW No. 13 3 010,** to seal off the fuel lines
- Open hose clamp with pliers, **BMW No. 17 5 500**
- Replace fuel filter
- Installation is the reverse of the removal procedure
- Note specified flow direction when installing

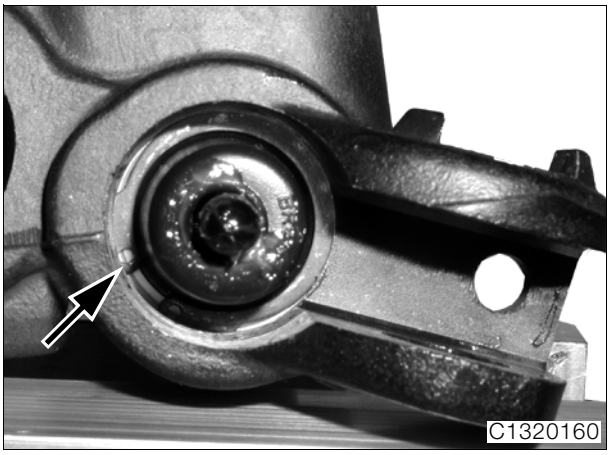
Replacing boot in brake-control assembly (master cylinder), only with optional ABS

(Inspection III) every 30,000 km (18,000 miles)



For greater clarity the illustrations show the brake-control assembly removed

– Drain the brake system
➠ .....Assembly Group 34
– Remove handlebar lever
➠ .....Assembly Group 32



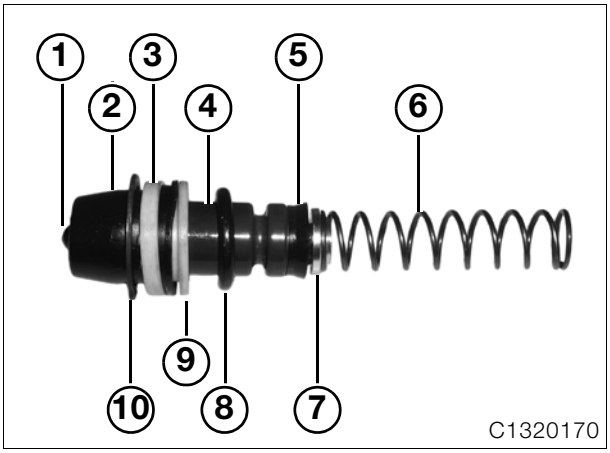
Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid attacks paint. Use a lint-free cloth to close off the open orifice and prevent any residual brake fluid from leaking out!

Note:
If no circlip is present, the entire unit must be replaced.

- Remove circlip (arrow)
- Remove piston
- Remove boot

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Observe correct sequence for individual parts!



1 Stud
2 Rubber boot
3 Outer support ring
4 Pistons
5 Seal
6 Spring
7 Insert
8 O-ring
9 Inner support ring
10 Lock ring

- Install new repair kit

Attention:
When bleeding a brake system that was previously drained, pull the hand brake lever repeatedly during the bleeding operation to counter the - danger that residual air will remain in the brake system!

– Fill/bleed brake system
Front brake (➠ 34.35)
Rear brake (➠ 34.36)

Check mounts

(Inspection I)

Check that bolts and nuts are securely tightened:
- Engine mounts
- Rear wheel
- Front wheel

Attention:
Never re-use the original nut on the rear wheel!

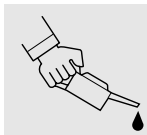
Torque specifications:

Floating axle, front	30 Nm
Floating axle joint	21 Nm
Tube link support bearing	73 Nm
Engine mounts	73 Nm
Rear lug nut (use one time only)	130 Nm

Final inspection with road safety and operation check

(Inspections II, III and IV)

Attention:
Remove the vehicle stand, **BMW No. 00 1 570**.



- Check wheels and tyres
- Check tyre pressures and correct if necessary

Tyre tread depth (recommended minimum)

Warning:
Comply with legal requirements for minimum tread depth!

Front wheel	2 mm/0.0787 in
Rear wheel	3 mm/0.1181 in

Tyre pressures (tyres cold)

Solo

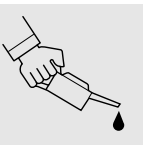
Front wheel	1.9 bar/27.58 psi
Rear wheel	2.1 bar/30.48 psi

With full load

Front wheel	1.9 bar/27.58 psi
Rear wheel	2.4 bar/34.83 psi

Roadworthiness check

- Clutch
- Steering
- Brakes, front and rear
- Condition of tyres and rims, tyre pressures
- Lights and signalling equipment, indicator and warning lights, instruments
- Trial run if necessary



11 Engine

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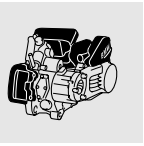
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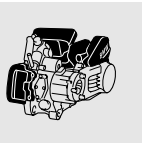
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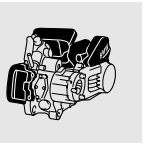
Technical Data		C1	C1 200
Engine, general		Single-cylinder four-stroke, double overhead camshafts driven by roller chain, 4 valves operated by bucket tappets, liquid-cooled cylinder and cylinder head, integral water pump, automatic transmission.	
Layout		1 cylinder, four-stroke	
Engine number		Variator housing output shaft	
Number of cylinders		1	
Stroke	mm (in)	50 (1.96850)	58.4 (2.29921)
Cylinder bore	mm (in)	56.4 (2.22047)	62.0 (2.44094)
Displacement	cm^3 (cu. in.)	125 (10.125)	176 (14.256)
Compression ratio	:1	13.0 ± 0.3	11.5 ± 0.3
Power rating	kW (bhp)	11 (15) at 9,250 rpm	13 (18) at 9,000 rpm
Max. torque	Nm	12 at 6,500 rpm	17 at 6,500 rpm
Idle speed	rpm	1,900	
Max. power at	rpm	9,250	9,000
Max. engine speed	rpm	10,400	
Crankshaft (main) bearings		Plain bearing	
Direction of rotation		Clockwise, looking at ignition system	
Cylinders		Light alloy, Nikasil liners	
Pistons		Smooth-skirt piston	
Lubrication system			
Engine lubrication		Pressurised oil circuit	
Oil filter		Full-flow type	
Oil pump		Eaton pump	
Oil capacity			
Initial filling	l (Imp pint/ US quart)	1 (1.76/1.05)	
Oil change with filter	l (Imp pint/ US quart)	1 (1.76/1.05)	
Min. capacity	l (Imp pint/ US quart)	0.8 (1.41/0.85)	
Oil grades		15W-40	
Winter operation		5W-40	
Oil pressure:			
(idle)	bar (psi)	≥ 0.5 (7.11) (oil temperature 80 °C/176 °F)	
7,500 rpm	bar (psi)	3 (43.54)	
Max. allowed oil consumption	l/100 km (miles per Imp pint/miles per US quart)	0.01 (1.76/1.05)	



Technical Data		C1	C1 200
Crank assembly with conrod			
Main bearing bore diameter			
Installed dimension	mm (in)		
Wear limit	mm (in)	32.07 (1.2626)	
Crankshaft - main bearing play			
Installed dimension	mm (in)	0.030...0.070 (0.001...0.002)	
Wear limit	mm (in)	0.10 (0.0039)	
Main bearing diameter	mm (in)	32.015...32.025 (1.2604...1.2608)	
Wear limit	mm (in)	32.01 (1.2602)	
Runout	mm (in)	0.07 (0.0028)	
Runout at crankshaft journal			
Clutch end	mm (in)	0.05 (0.0020)	
Reluctor end	mm (in)	0.05 (0.0020)	
Runout connecting rod			
Big-end bore	mm (in)	0.016...0.060 (0.0006...0.0024)	
Wear limit	mm (in)	0.07 (0.0028)	
Small-end bore	mm (in)	0.03 (0.0012)	
Connecting rod axial float between crank webs	mm (in)	0.8 (0.0315)	
Axial float at connecting rod bearing			
Installed dimension	mm (in)	0.25...0.33 (0.009...0.012)	
Wear limit	mm (in)	0.80 (0.0315)	
Runout at connecting rod bearing			
Installed dimension	mm (in)	0.016...0.060 (0.0006...0.0024)	
Wear limit	mm (in)	0.07 (0.0028)	
Inside Ø of wristpin end bush			
Installed dimension	mm (in)	15.003...15.008 (0.5907...0.5909)	
Wear limit	mm (in)	15.03 (0.5917)	
Crankshaft axial float	mm (in)	0.2...0.4 (0.007...0.015)	
Cylinder head			
Max. surface irregularity	mm (in)	0.05 (0.0019)	
Camshaft journals I/E	mm (in)	17.969...17.980 (0.7079...0.7078)	
Wear limit	mm (in)	17.96 (0.707)	
Camshaft			
Camshaft bearing bridge I/E	mm (in)	18.02...18.04 (0.709...0.710)	
Wear limit	mm (in)	18.07 (0.711)	
Bearing width	mm (in)	23.8...23.9 (0.93...0.94)	
Wear limit	mm (in)	23.7 (0.93)	

Technical Data		C1	C1 200
Camshaft			
Inlet	°	276	
Exhaust	°	264	
Bearing cap			
Bearing journal diameter	mm (in)	18.01...18.03 (0.709...0.7099)	
Wear limit	mm (in)	18.05 (0.7106)	
Inlet camshaft			
Bearing journal diameter	mm (in)	17.969...17.980 (0.7074...0.7078)	
Wear limit	mm (in)	17.96 (0.7070)	
Exhaust camshaft	mm (in)	17.969...17.980 (0.7074...0.7078)	
Bearing journal diameter	mm (in)	17.96 (0.7070)	
Bucket-type tappet			
Bore Ø in cylinder head	mm (in)	26.007...26.008 (1.02389...1.02393)	
Wear limit	mm (in)	26.04 (1.0252)	
Extl. dia.	mm (in)	25.980...25.993 (1.0228...1.0239)	
Wear limit	mm (in)	25.97 (1.0224)	
Radial play	mm (in)	0.10 (0.0039)	
Valves			
Valve clearances with engine cold (max. 35 °C/95 °F)			
Inlet valve	mm (in)	0.05...0.14 (0.0019...0.0055)	
Exhaust valve	mm (in)	0.20...0.29 (0.0079...0.0114)	
Valve timing (at 1 mm/0.04 in valve clearance)			
Inlet opens		24° before TDC	
Inlet closes		36° after BDC	
Exhaust opens		34° before BDC	
Exhaust closes		14° after TDC	
Valve head dia.			
Inlet	mm (in)	21.2 (0.08346)	
Exhaust	mm (in)	19 (0.7480)	
Stem dia.			
Inlet	mm (in)	3.957...3.981 (0.1558...0.1567)	
Wear limit	mm (in)	3.94 (0.1551)	
Exhaust	mm (in)	5.945...5.960 (0.2340...0.2346)	
Wear limit	mm (in)	5.935 (0.2336)	
Runout	mm (in)	0.06 (0.0023)	
Valve stem rock - installed clearance			
Inlet	mm (in)	0.0160...0.058 (0.0006...0.0023)	
Wear limit	mm (in)	0.130 (0.0051)	
Exhaust	mm (in)	0.031...0.073 (0.0012...0.0029)	
Wear limit	mm (in)	0.145 (0.0057)	

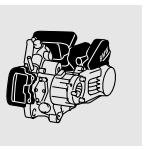




Technical Data		C1	C1 200
Valve guide			
Inlet/exhaust inside diameter	mm (in)	4.002...4.015 (0.1576...0.1581)	
Wear limit	mm (in)	max. 0.5 (0.0197)	
Projection	mm (in)	9.8...10.2 (0.3858...0.4016)	
Valve seat angle			
Inlet	°	45	
Exhaust	°	45	
Included angle between valves			
Inlet	°	16	
Exhaust	°	18	
Valve seat width			
Inlet	mm (in)	1.185...1.215 (0.0466...0.0478)	
Wear limit	mm (in)	2 (0.0787)	
Inspection dimension	mm (in)	1.0...1.4 (0.0394...0.0551)	
Exhaust	mm (in)	1.385...1.415 (0.0545...0.0557)	
Wear limit	mm (in)	2 (0.0787)	
Inspection dimension	mm (in)	1.2...1.6 (0.0472...0.0630)	
Valve seat surface	mm $(in)^2$	0.8 (0.0315)	
Wear limit	mm $(in)^2$	0.6 (0.0236)	
Bucket tappets (wear limit)			
Extl. dia.	mm (in)	25.980...25.993 (1.0228...1.0239)	
Radial play in cylinder head	mm (in)	0.100 (0.0039)	
Guide Ø in cylinder head	mm (in)	26.007...26.008 (1.02389...1.02393)	
Wear limit	mm (in)	26.04 (1.0252)	
Valve spring			
When new (uncompressed)	mm (in)	36.93 (1.4539)	41.0 (1.6142)
Wear limit	mm (in)	36.7 (1.4449)	40.8 (1.6063)
Oil circuit bypass valve			
Compression spring for pressure-relief valve, uncompressed	mm (in)	13.5 (0.5315)	
Wear limit	mm (in)	13.4 (0.5276)	
Pistons			
Clearance, piston and cylinder new	mm (in)	0.013...0.037 (0.0005...0.0015)	
Wear limit	mm (in)	0.060 (0.0024)	
Piston diameter “A”			
Installed dimension	mm (in)	56.37 ± 0.005 (2.2193 ± 0.00002)	61.97 ± 0.005 (2.4398 ± 0.00002)
Piston diameter “B”			
Installed dimension	mm (in)	56.38 ± 0.005 (2.2197 ± 0.00002)	61.98 ± 0.005 (2.4402 ± 0.00002)

Technical Data		C1	C1 200
Piston pin			
Extl. dia.	mm (in)	14.997...15.000 (0.5904...0.5906)	
Wear limit	mm (in)	14.99 (0.5902)	
Installed clearance			
Wear limit	mm (in)	0.04 (0.0016)	
Radial play	mm (in)	0.005...0.018 (0.0002...0.0007)	
Wear limit	mm (in)	0.03 (0.0012)	
Piston wristpin bore diameter	mm (in)	15.003...15.008 (0.5907...0.5909)	
Wear limit	mm (in)	15.03 (0.5917)	
Piston rings			
1st groove taper faced compression ring			
End gap	mm (in)	0.15...0.35 (0.0059...0.0138)	0.20...0.25 (0.0079...0.0098)
Wear limit	mm (in)	0.8 (0.0315)	0.7 (0.0276)
Ring grooves/vertical gap	mm (in)	1.02...1.04 (0.0402...0.0409)	0.064...0.03 (0.0025...0.0012)
Wear limit	mm (in)	0.1 (0.0039)	0.1 (0.0039)
Ring height R thickness	mm (in)	0.975...0.990 (0.0384...0.0390)	0.978...0.990 (0.0385...0.0390)
Wear limit	mm (in)	0.97 (0.0382)	0.97 (0.0382)
Height of groove	mm (in)	1.35 (0.0531)	1.02...1.04 (0.0402...0.0409)
2nd groove taper faced hook scraper ring			
Gap clearance	mm (in)	0.15...0.35 (0.0059...0.0138)	0.20...0.35 (0.0079...0.0138)
Wear limit	mm (in)	0.8 (0.0315)	0.8 (0.0315)
Ring grooves/end clearance	mm (in)	1.22...1.24 (0.0480...0.0488)	0.065...0.03 (0.0026...0.0012)
Wear limit	mm (in)	0.1 (0.0039)	0.1 (0.0039)
Ring height R thickness	mm (in)	1.175...1.190 (0.0463...0.0469)	1.175...1.190 (0.0463...0.0469)
Wear limit	mm (in)	1.17 (0.0461)	1.17 (0.0461)
Height of groove	mm (in)		1.22...1.24 (0.0480...0.0488)
3rd groove oil scraper ring			
Gap clearance	mm (in)	0.4...1.4 (0.015...0.055)	0.2...0.7 (0.0079...0.0276)
Wear limit	mm (in)	1.5 (0.0591)	1.0 (0.0394)
Ring grooves/height	mm (in)	2.01...2.03 (0.079...0.080)	0.01...0.1 (0.0004...0.004)
Wear limit	mm (in)	0.5 (0.0197)	0.2 (0.0079)
Ring height (thickness)	mm (in)	2 (0.0787)	1.85...2.00 (0.0728...0.078)
Height of groove	mm (in)	2.60 (0.1024)	2.01...2.03 (0.0791...0.0799)



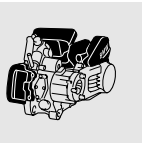


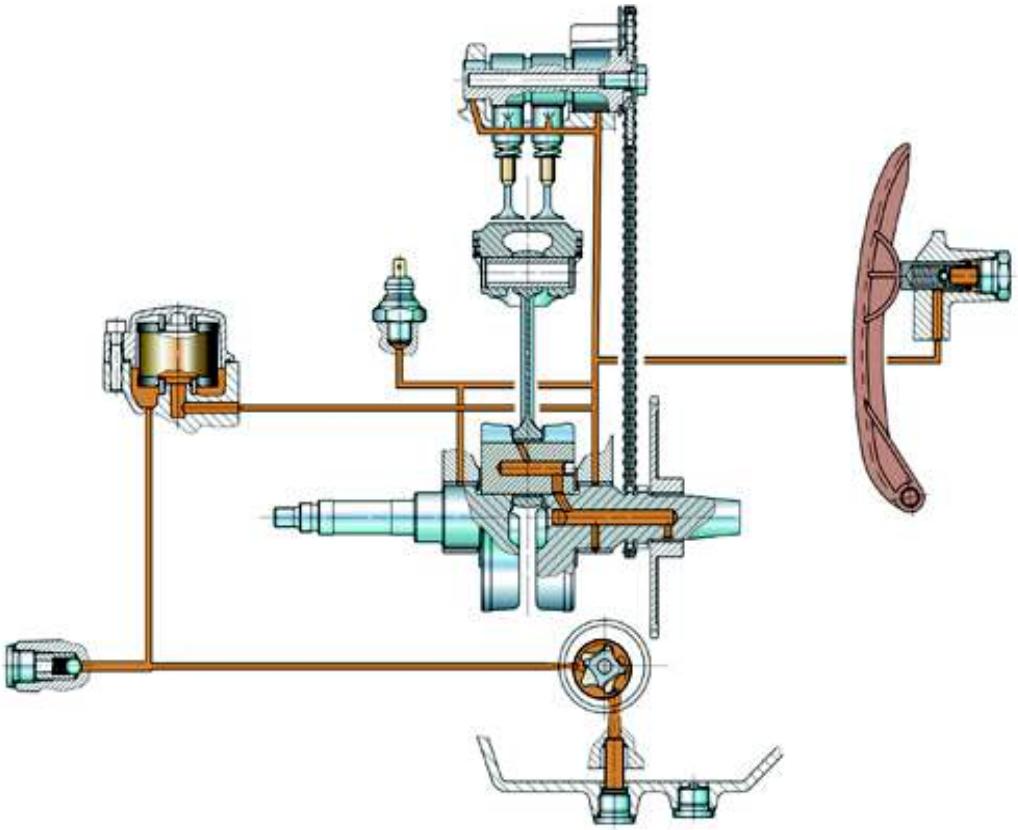
Technical Data		C1	C1 200
Direction of installation		Arrow on piston crown points toward exhaust	
Cylinders			
Bore			
Cylinder “A”	mm (in)	56.388...56.398 (2.2200...2.22204)	61.988...61.997 (2.4404...2.4408)
Cylinder “B”	mm (in)	56.402...56.412 (2.2206...2.2209)	62.003...62.012 (2.4411...2.4414)
Timing chain			
Distance from sealing face to chain tensioner plunger			
Wear limit	mm (in)	6 (0.2362)	
Water pump			
Water-pump shaft bearing in housing	mm (in)	10.05...10.07 (0.395...0.396)	
Wear limit	mm (in)	10.08 (0.3968)	
Oil pump			
Oil-pump gear			
Axial run-out	mm (in)	0.3 (0.0118)	
Oil-pump shaft outside diameter	mm (in)	7.972...7.987 (0.3139...0.3145)	
Wear limit	mm (in)	7.96 (0.3134)	
Wear limit in housing	mm (in)	8.03 (0.3161)	



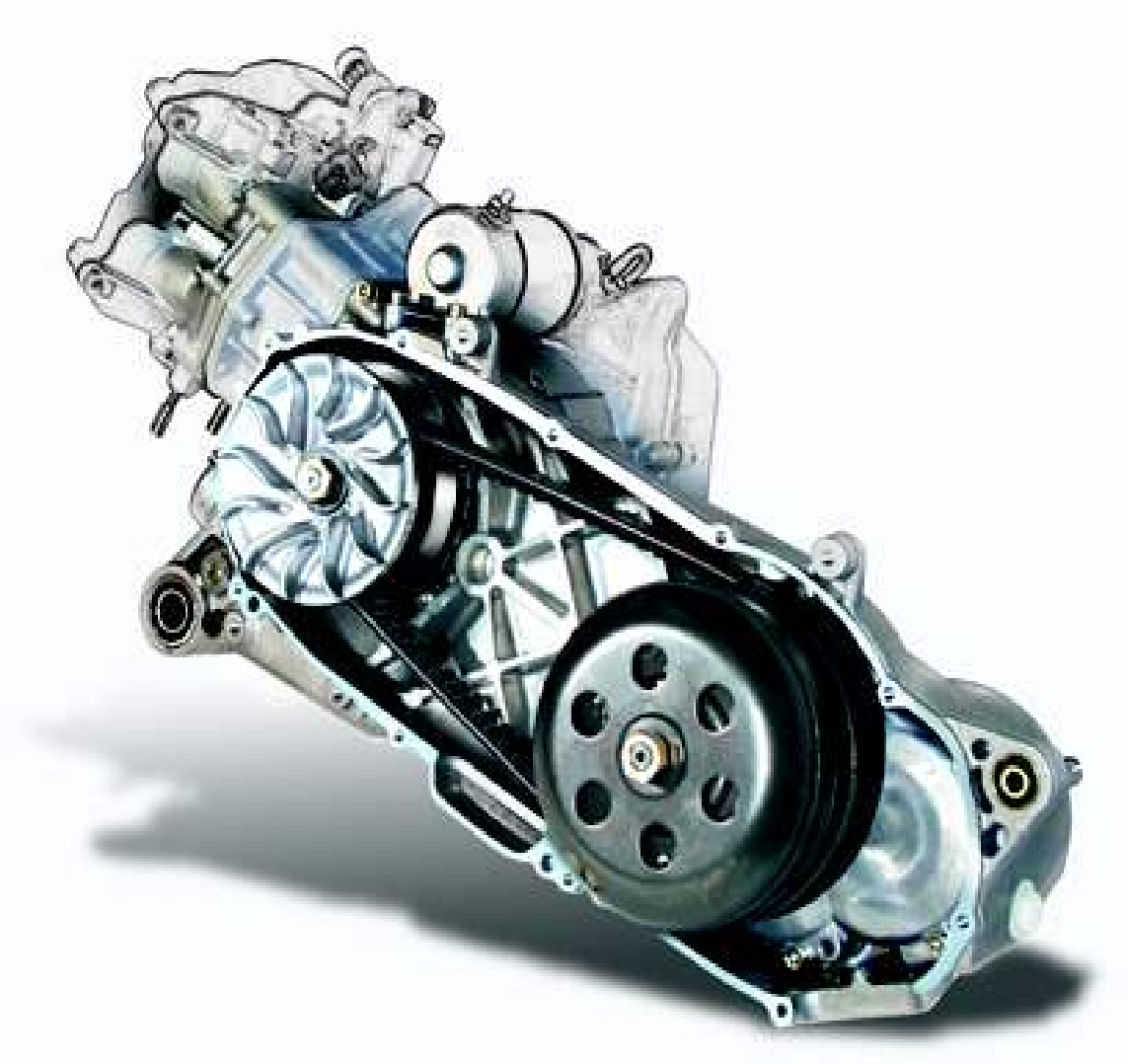
R11C160 engine

C1 lubrication





R11C161 lubrication



R24C161 TSS

Operations performed with powertrain cradle installed

Note:
Operations identified by **#** can also be carried out with the powertrain cradle installed.

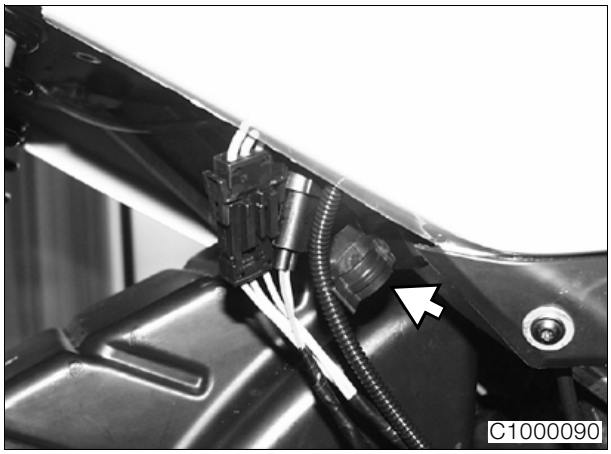
Left side
- Spark plug
- Oil pressure switch
– Drive variator, front
– Driven variator, rear
– Gearbox
➠ .....See Group 24
– Centrifugal coupling
➠ .....See Group 21
– Starter motor
➠ .....See Group 12
- Temperature sensor

Right side
- Timing-chain tensioner
- Chain guide
- Chain guide rail
- Camshafts and camshaft bearings
- Bucket-type tappet
– Magneto ignition
– One-way clutch
➠ .....See Group 12
- Oil pump assembly
- Starter idler gear
- Water pump drive gear
- Water pump

Swivel out powertrain cradle

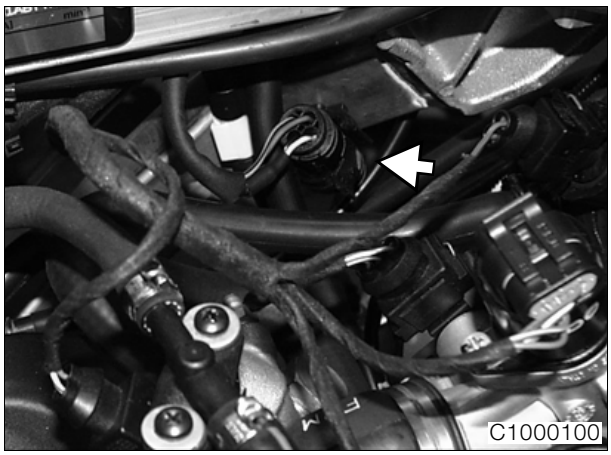
For enhanced clarity some of the illustrations show the components with the powertrain cradle removed.

- Secure front wheel

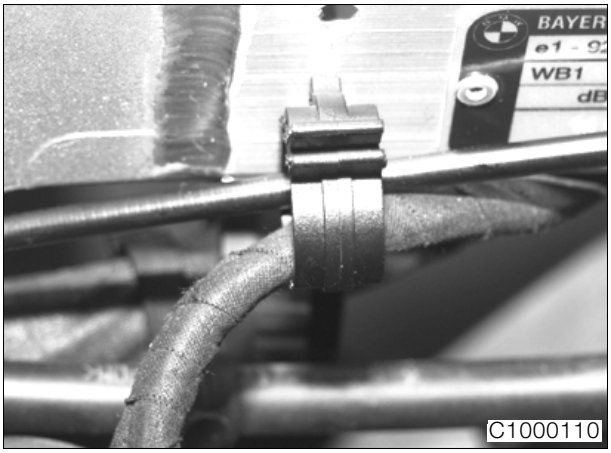


- Remove lines from clip (arrow):
– Alternator
– Ignition signal sensor

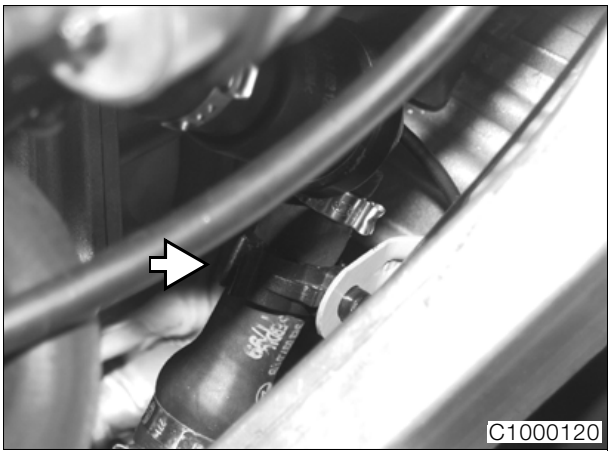
- Open the seat



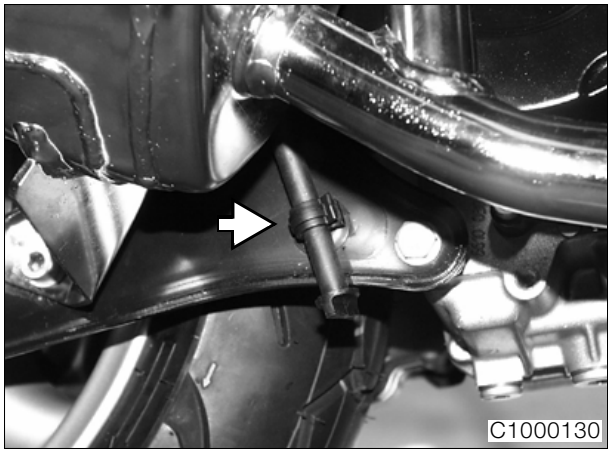
- Open clip and disconnect plug from oxygen sensor (arrow)



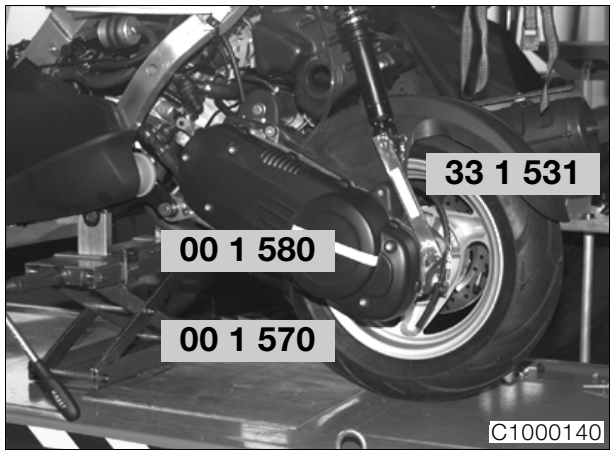
- Remove lines from clips:
– Injector
– Air temperature sensor
– Idle actuator
– Coolant temperature sensor to cylinder head



- Release coolant hose from clip at injector and bracket (arrow) on variator cover



- Remove hose from bracket at intake-air plenum chamber (arrow)



- Position vehicle hoist, **BMW No. 00 1 570,** with attachment **BMW No. 00 1 580,** at separation point
- Slightly raise vehicle with lifter
- Install fitting, **BMW No. 33 1 531,** between left spring strut and powertrain cradle
- Remove lower end of spring strut at brake caliper bracket

Attention:
To avoid overstretching hoses and wiring do not swivel powertrain cradle more than max. 20°!

- Lift C1 no further than travel stop: powertrain cradle swivels down

When installing:

- Install the cylinder head cover before installing the powertrain cradle

Attention:
Make sure that gasket and cover are free of oil!

- Installing cylinder head cover

Attention:
When lowering watch the struts and the duct to the air plenum chamber!

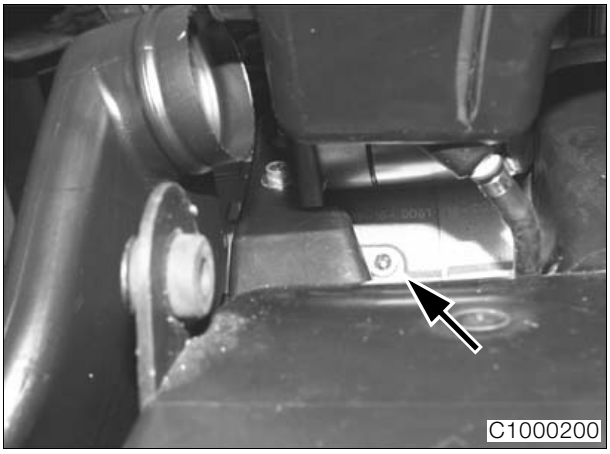
Note:
Make sure the detent for the long lever of the easy-lift mechanism engages! If necessary, move the lever to the drive position first, and then move it to the park position!

Tightening torque:
Cylinder head cover ..... 10 Nm
Strut, bottom ..... 21 Nm

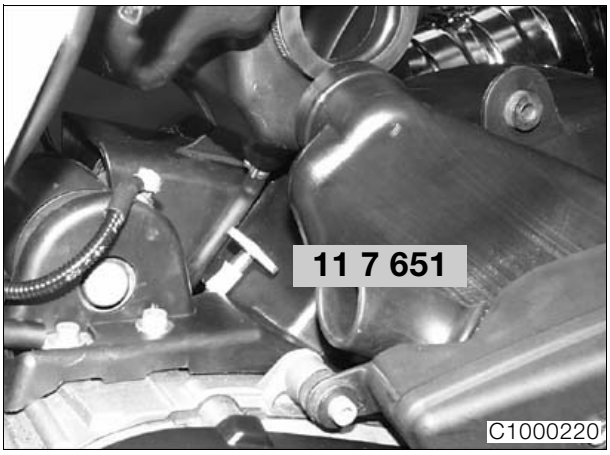
Lock engine at TDC



- Loosen hose clamp (arrow) on intake-air plenum chamber



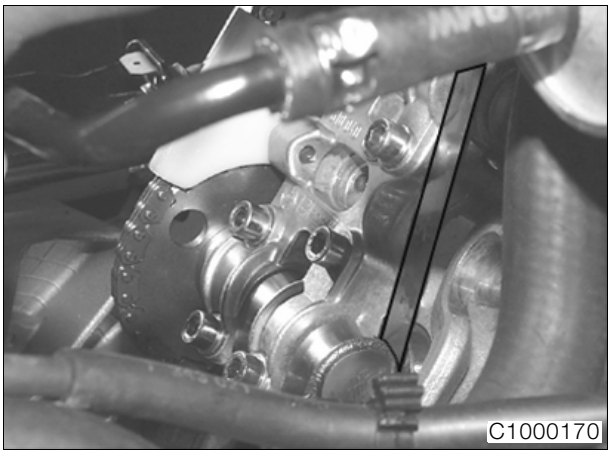
Note:
Watch for dirt and contamination adjacent to the starter/threaded plug (arrow) - do not allow contaminants to enter the engine!



- Undo the Allen bolt adjacent to the starter and use set bolt, **BMW No. 11 7 651,** to lock the engine at TDC

11 34 004 # Checking valve clearances

– Remove left and right service covers
➡ .....See Group 46
– Swivel out powertrain cradle (➡ 11.12)
– Remove cylinder head cover (➡ 11.34)
– Remove spark plug (➡ 12.5)
- Turn over engine at camshafts, continuing until the lobes are pointed outward



- Measure valve clearance using single feeler gauge blade
- Record the valve clearances
- and adjust valve clearance as necessary (replace tappets) (➡ 11.16)

Adjustment data:

	IV left mm (in)	IV right mm (in)	EV left mm (in)	EV right mm (in)
Spec. clearance	**0.05 0.14** (0.0019 0.0055)	**0.05 0.14** (0.0019 0.0055)	**0.20 0.29** (0.0079 0.0114)	**0.20 0.29** (0.0079 0.0114)
Clearance, measured (used)	**0.15** (0.0059)		**0.15** (0.0059)	
Difference	**0.01** (0.00039)		**-0.05** (-0.00197)	

Inlet valve clearance.....0.05...0.14 mm
.....(0.0019...0.0055 in)
Exhaust valve clearance.....0.20...0.29 mm
..... (0.0079 0.0114 in)

When installing:

- Install the cylinder head cover before installing the powertrain cradle

Attention:
Make sure that gasket and cover are free of oil!

- Installing cylinder head cover

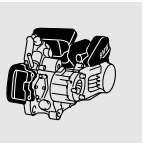
Attention:
When lowering watch the struts and the duct to the intake-air plenum chamber!

Note:
Make sure that detent for long lever of the easy-lift mechanism engages! If necessary, move the lever to the drive position first, and then move it to the park position!

- Swiveling powertrain cradle back

Tightening torque:
Cylinder head cover ..... 10 Nm
Strut, lower ..... 21 Nm

11 34 004 # Adjusting valve clearances



- Swivel out powertrain cradle (➟ 11.12)
- Checking valve clearances (➟ 11.15)
- Removing camshaft bearing caps/camshafts (➟ 11.36)
- Remove tappets
- Record the figures on the bottoms of the tappets

Sample calculation:

	IV left mm (in)	**IV right mm (in)**	**EV left mm (in)**	**EV right mm (in)**
Spec. clearance	0.05 0.14 (0.0019 0.0055)	0.05 0.14 (0.0019 0.0055)	0.20 0.29 (0.0079 0.0114)	0.20 0.29 (0.0079 0.0114)
Clearance, measured (used)	0.15 (0.0059)		0.15 (0.0059)	
Difference	0.01 (0.00039)		-0.05 (-0.0019)	
Bucket, measured (used)	**2.80** (0.1102)		**2.80** (0.1102)	
Bucket specification (new)	2.81 (0.1106)		2.75 (0.1083)	
Bucket, measured (new)	2.85 (0.1122)		2.75 (0.1083)	
Specified clearance (new)	0.10 (0.0039)		0.20 (0.0079)	
Clearance, measured (new)				

- Subtract negative difference of bucket (old)
- Add positive difference of bucket (old)
- Note sizes of available bucket tappets

Note:
The bucket tappets are available in sizes ranging from 2.50 mm (0.09842 in) to 3.20 mm (0.12598) in in 5/100ths graduations.
Should it prove impossible to adjust the valve clearance with the smallest bucket tappet (2.50 mm/ 0.09842 in) the cylinder head will have to be replaced (➟ 11.40).
Should it prove impossible to adjust the valve clearance with the largest bucket tappet (3.20 mm/ 0.12598 in), it will be necessary to regrind the valve seat (➟ 11.30).

When installing:
- While installation is basically the reversal of the removal procedure, special attention should be devoted to the following points:

- Observe installation instructions for camshaft bearing caps/camshafts (➟ 11.37)

Attention:
Remove TDC set bolt, **BMW No. 11 7 651!**

- Turn the engine over several times by hand
- Recheck valve clearances

11 00 060 Removing and installing powertrain cradle

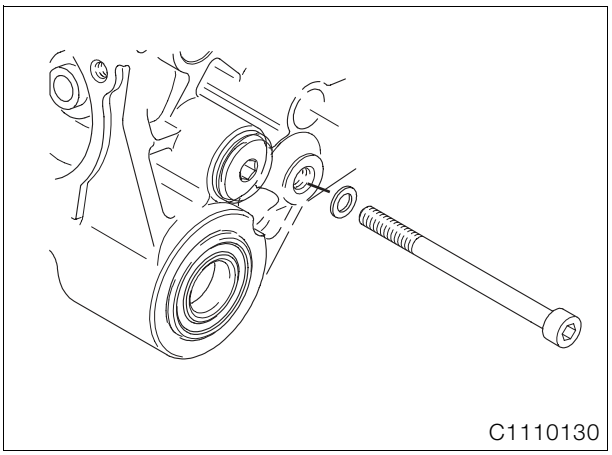
– Remove left service cover
– Remove the right rear side section



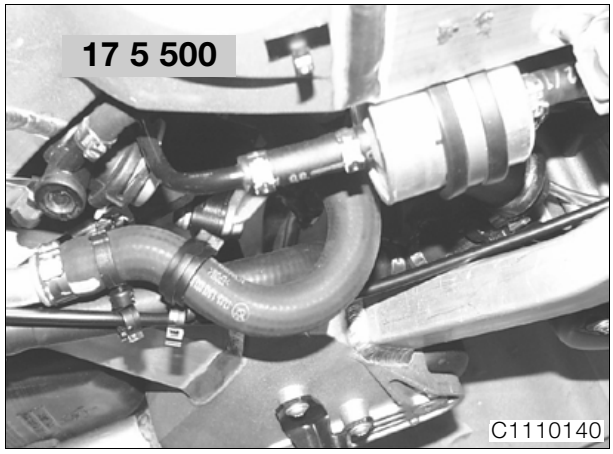
- Disconnect cables and lines:
– Air temperature to intake air silencer
– Oxygen sensor
– Ignition signal sensor
– Alternator
– Idle actuator
– Water temperature
– Starter - and + cables
– Oil pressure switch

Note:
Pull both cables through toward the right and disengage the clip on the water hose.

- Disconnect spark plug cap
- Remove screws securing injector valve
- Disengage throttle cable from cam disc



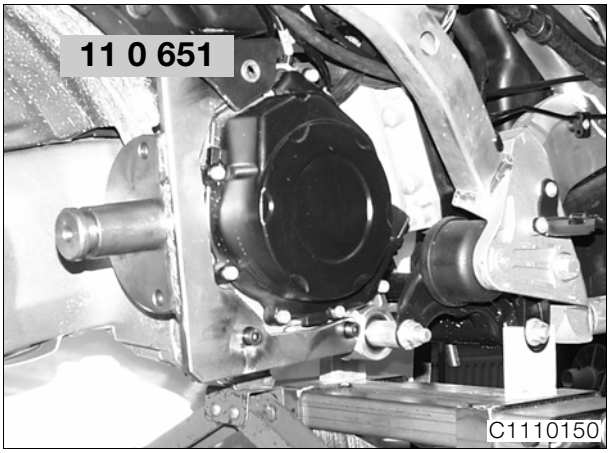
- Use hose to drain coolant from drain plug



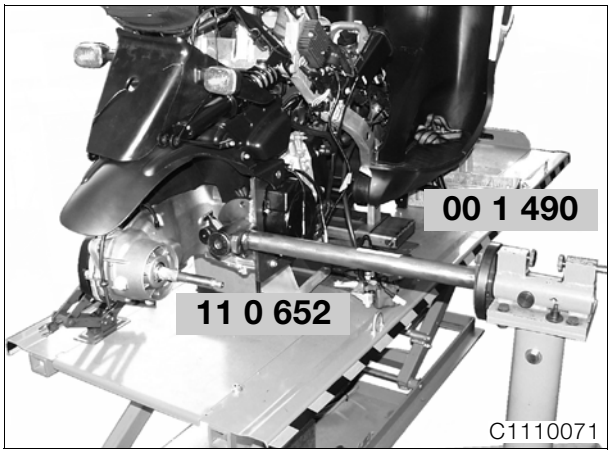
- Open hose clamps at return hose and in front of distributor
– Remove silencer (muffler)
➠ .....See Group 18
– Remove secondary swing arm
➠ .....See Group 33
- Remove lug nut
- Position floor jack on powertrain cradle beneath gearbox and raise the jack until the rear wheel is clear of the ground
- Detach bottom of strut and tie it up out of the way

Note:
Swing the brake anchor forward and pull the bushing out of the wheel. Pull brake anchor with brake caliper carefully away from the brake disc. Remove brake anchor with brake caliper.

– Remove rear wheel
➠ .....See Group 36



- Support the weight of the vehicle on floor jack positioned beneath frame
- Secure assembly brace, **BMW No. 11 0 651,** to powertrain cradle



- Remove fastener securing suspension and remove axle
- Detach the spring struts from the powertrain cradle and tie up out of the way
- Using extension, **BMW No. 11 0 652**, and stand, **BMW No. 00 1 490**, pull powertrain cradle to the rear to remove

When installing:

- While installation is the reversal of the removal procedure, special attention should be devoted to the following points:

1 Adding coolant
2 Slacken vent plug in cylinder head until liquid emerges, then retighten vent plug
3 Pour in remainder of coolant
4 Briefly let engine run, then correct coolant level in expansion tank

Warning:
Never re-use the original 6-point lug nut on the rear wheel

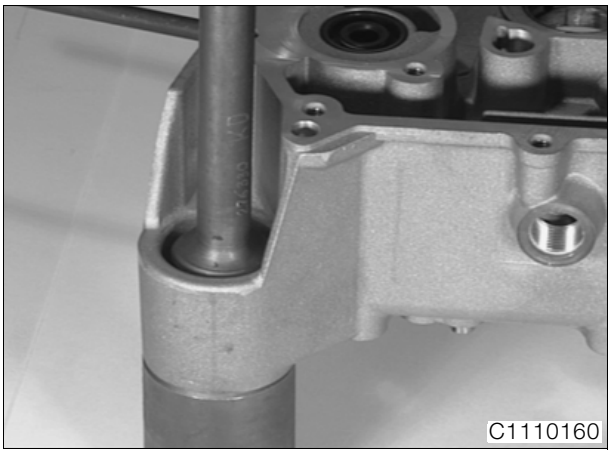
Fluids and lubricants:
Loctite 243
Shell Retinax EP2

Torque specification:

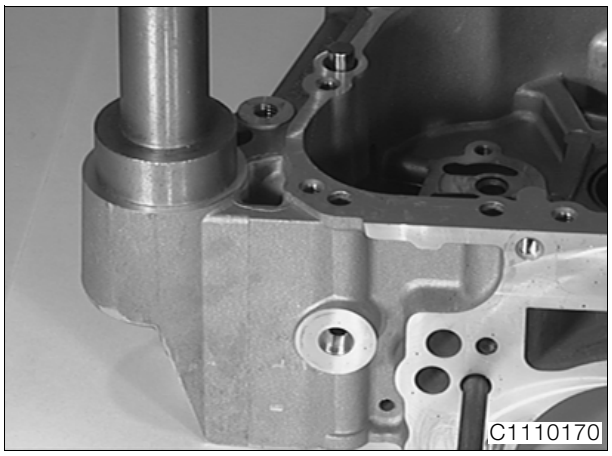
Powertrain cradle mount to separation point	73 Nm
Injector mount (+Loctite 243)	4 Nm
Drain plug	10 Nm
Vent screw	9 Nm
Throttle cable attachment	8 Nm
Auxiliary swing arm mount	21 Nm
Auxiliary swing arm mount M10 (+ Loctite 243)	60 Nm
6-point nut for input shaft	130 Nm
Lower strut mount	21 Nm
Silencer mount on auxiliary swing arm	21 Nm
Attachment, exhaust pipe to cylinder head	21 Nm

Replacing grooved ball bearing for engine mount

– Housing halves separated
- Using a pipe D=24.5 mm (0.9646 in) or a 19 mm (0.7480 in) socket and working from the inside, press out the bearing



- Using a mandrel D=34 mm (1.3386 in) or a 27 mm (1.0630 in) socket and working from the outside, press in the bearing



11 11 015 # Replacing ignition cover

– Remove the right rear side panel
- Drain engine oil
- Remove fastener securing silencer to auxiliary swing arm
- Slacken fasteners securing exhaust to cylinder head
- Swing silencer to the outside and secure in this position
- Disconnect cables under rear side section from ignition sensor and generator
- Remove 9 securing screws and lift off cover
- Remove stator

When installing:
- Always install a new seal
- Use 3-Bond 1209 to seal the grommets in cable passage

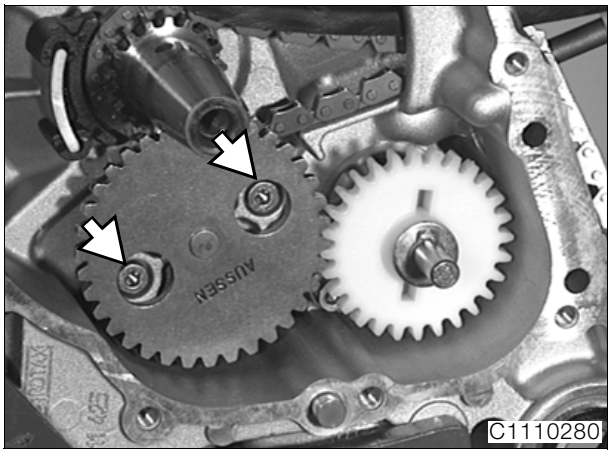
Fluids and lubricants:
Rubber grommet 3-Bond 1209

Torque specification:
Cover to housing
to Engine No.: 745 594 (8.8) ..... 10 Nm
starting with Engine No.: 745 595 (10.9) ..... 12 Nm

Replacing oil pump

11 11 300 Removing and installing oil pump

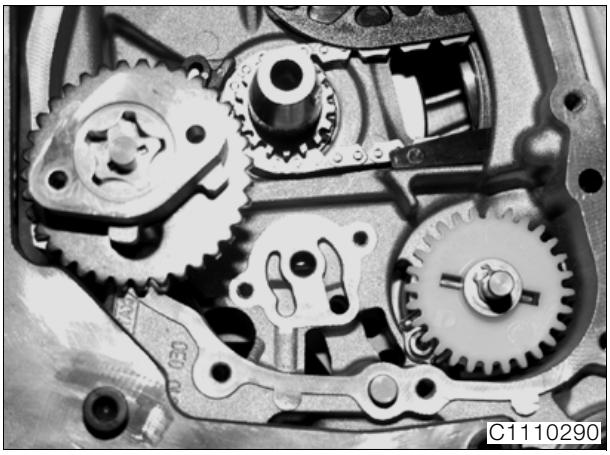
– Remove reluctor (➠ 12.8)



- Turn over the engine until the attachment bolts (arrows) come into view
- Release bolts and remove pump

When installing:

- The outer rotor bears a punch mark for identification



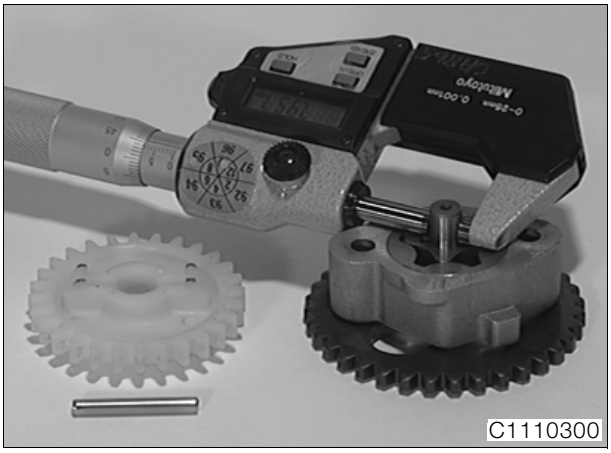
Note:
Make sure that punch mark is toward inside of pump housing!

- Liberally coat oil-pump channels and preassembled pump with oil before installing
- Note position of gearwheel (arrow)
- Coat threads of self-tapping screws with Loctite prior to installation (Tapite screws)
- Turn pump so that tooth-edge gap can be checked
- Check axial float of pump

Fluids and lubricants:
Tapite bolts ..... Loctite 243

Torque specification:
Oil pump ..... 6 Nm

Measuring oil pump



- Check tooth edges of oil pump gear for deformation
- Measure protrusions of needle roller
- Check runout of oil pump gear relative to shaft
- Check oil pump shaft for wear

Wear data:

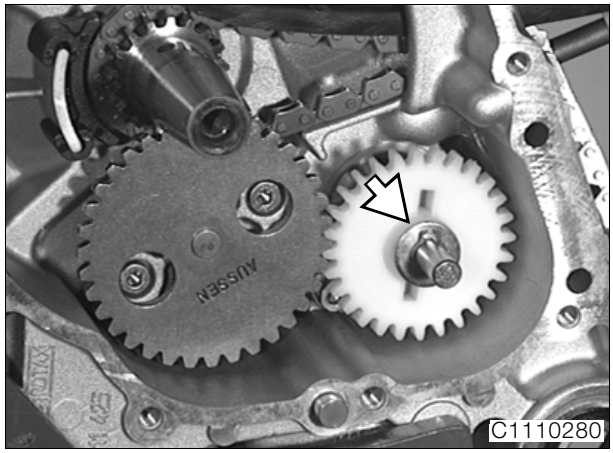
Runout .....max. 0.3 mm (0.0118 in)
Oil pump shaft.....min. 7.96 mm (0.3133 in)
Housing diameter..... 8.03 mm (0.3161 in)

Water pump removal, installation, replacement

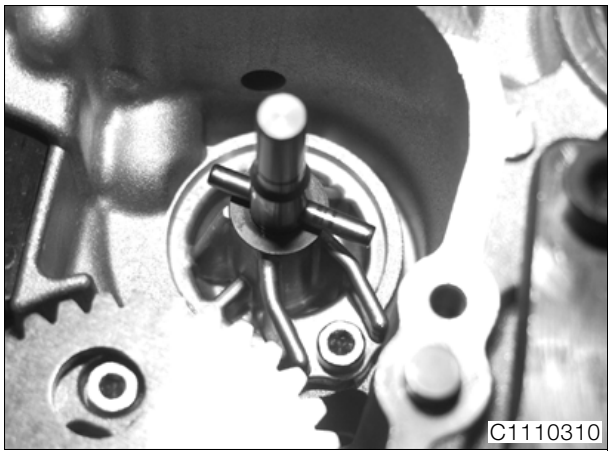
Removing water pump

– Drain coolant
- Slip a length of hose (fuel line or similar) over screw and tool and release the fastener
- Undo radiator plug and remove attachment

– Remove reluctor



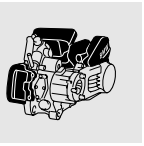
- Remove circlip and washer (arrow)
- Press water pump gear out of fitting in needle roller



- Remove needle roller and washer
- Remove screw

Note:
Working from left side of engine, slide a plastic rod into the water pipe and use it to remove the pump shaft.

Attention:
Do not use a metal rod, as it would damage the water pump gear!



- Remove pump housing

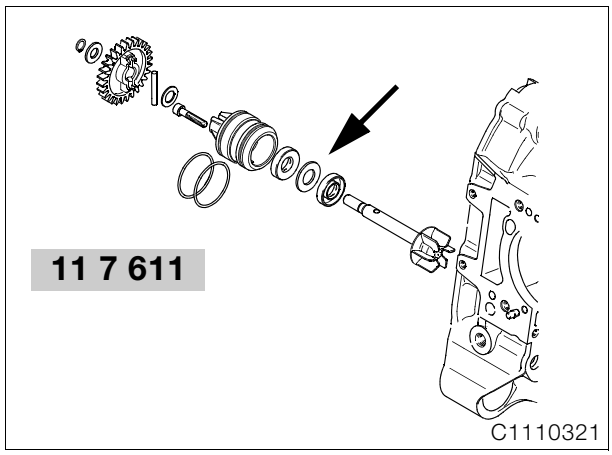
Attention:
A damaged water-pump shaft can lead to leakage if installed again!

- Remove O-rings
- Check contact zones of the two sealing rings on the water pump shaft for tracking, damage and wear

Wear data:
Housing internal Ø ..... 10.08 mm (0.3969 in)

- Check water pump impeller for damage and deformation

Replacing shaft oil seals



- Use a screwdriver to remove oil seals from housing

When installing:

Note:
Before installing, coat outside of shaft oil seals with petroleum spirit; do not oil!

- Coat shaft seal extruded edges with MOLYKOTE 111

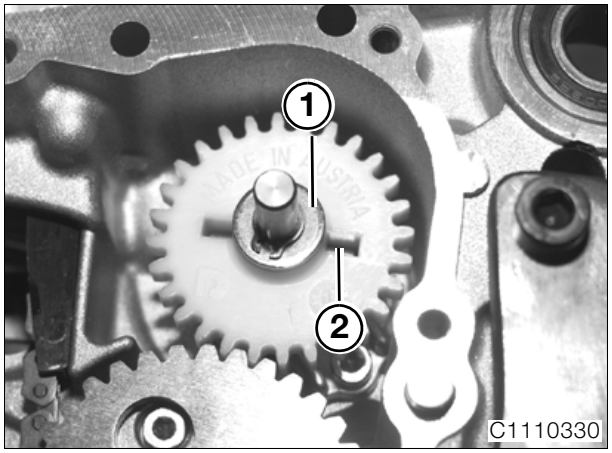
Attention:
Install shaft seals with flat surfaces facing each other!

- Use drift punch, **BMW No. 11 7 611,** and shim to install first shaft seal
- Install shim (arrow)
- Install second shaft seal without shim

Note:
Make sure that the water drain passage is not obstructed!

Install water pump

- Prior to installation coat the inner extruded edge seals with MOLYKOTE 111
- Fill cavity with MOLYKOTE 111
- Install water pump with O-rings oiled
- Liberally oil water pump shaft prior to installation
- Coat threads of self-tapping screws with Loctite prior to installation (Tapite screws)
- Turn water pump shaft by hand and make sure it rotates smoothly with no stiction or excess resistance



- Install thrust washer (1)
- Slide needle roller (2) into shaft, ensure that projection is even
- Press water pump gear onto needle roller

Note:
Water pump gear must engage with an audible click and must mesh with teeth of oil pump gear!

- Install thrust washer

Attention:
Install a new circlip!

Fluids and lubricants:
Tapite bolts ..... Loctite 243
Water pump ..... MOLYKOTE 111

Torque specification:
Water pump housing ..... 6 Nm

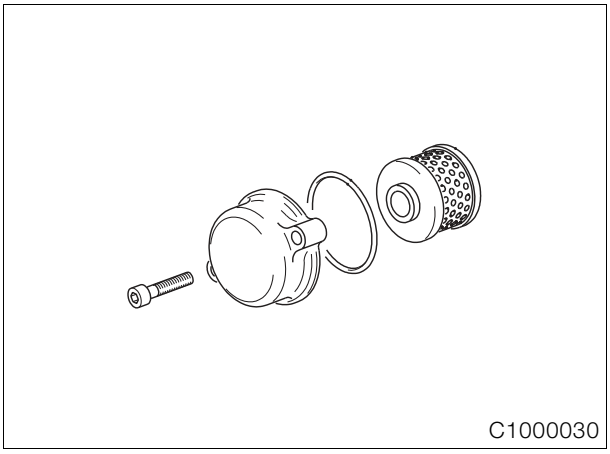
12 61 000 # Replacing oil pressure switch

When installing:
- Remove all traces of old thread-locking compound from the threads
- Always install a new seal

Fluids and lubricants:
Oil-pressure switch ..... Loctite 243

Torque specification:
Oil pressure switch..... 12 Nm

11 41 220 # Replacing oil filter


C1000030

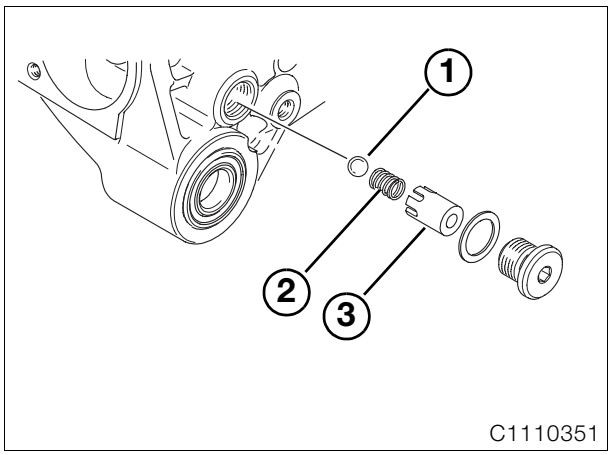
- Place drain plate, **BMW No. 11 7 661,** on exhaust pipe
- Remove securing screws
- Remove oil filter cover with O-ring
- Remove oil filter

When installing:
- Installation is the reverse of the removal procedure
- Use new O-ring

Torque specification:
Threaded plug..... 10 Nm

11 11 296 # Replacing pressure-relief (bypass) valve

– Drain the oil



C1110351

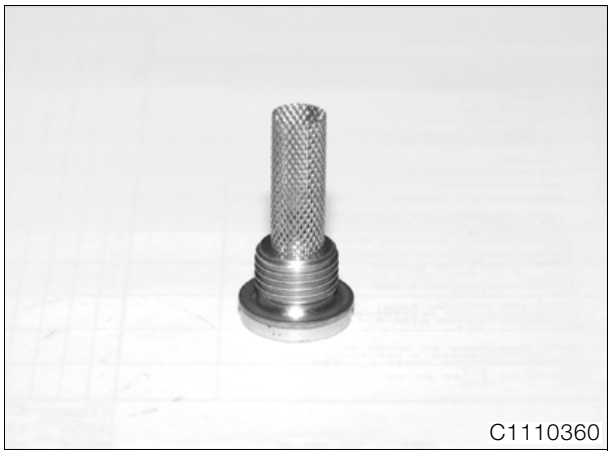
- Unscrew drain plug
- Remove valve housing (3), spring (2), ball (1)
- Check joint surface (arrow) for signs of contamination
- Check ball for damage
- Clean valve housing
- Check extended length of spring

Wear data:
Spring length..... 13.4 mm (0.5276 in)

When installing:
- Installation is the reverse of the removal procedure
- Install with new seal

Torque specification:
Threaded plug..... 30 Nm

Replacing filter screen



- Open drain plug
- Remove and clean oil filter screen
- Clean drain plug

When installing:

- Dip one side of the oil filter screen in grease and attach to the drain plug
- Slip a new sealing ring over filter screen and install together

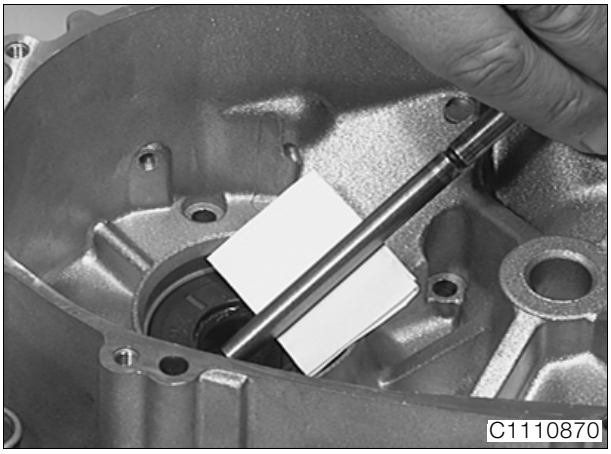
Torque specification:

Drain plug..... 30 Nm

11 11 240 Replacing oil seal on crankshaft

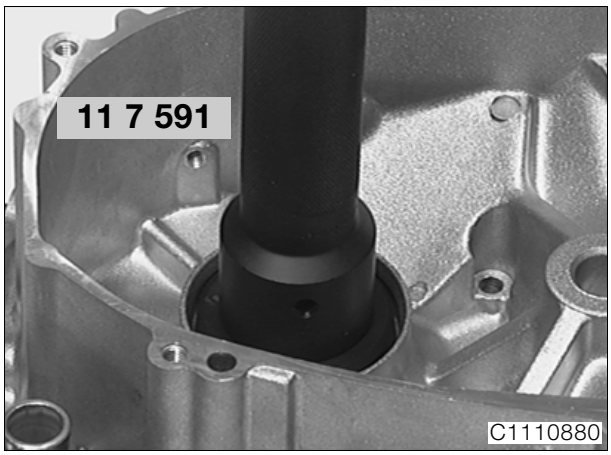
Removing crankshaft oil seal

– Separate housing sections



- Use a screwdriver as a lever to prise out the oil seal

Installing crankshaft oil seal

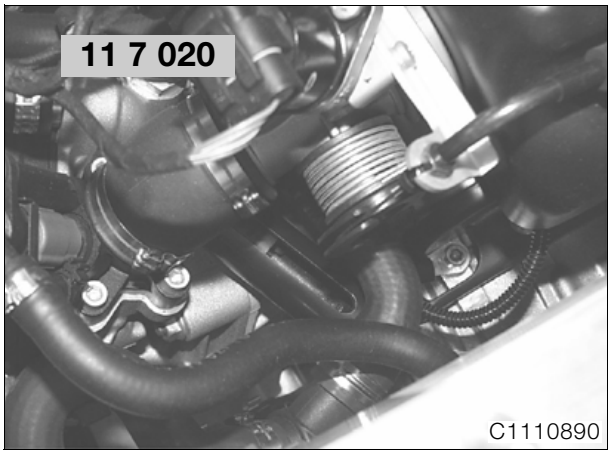


- Use assembly punch, **BMW No. 11 7 591,** to install the oil seal with the extruded edge on the inside

Cylinder head

13 62 019 # Dual temperature sensor removal, installation, replacement

– Drain coolant
– Remove left service cover
– Disconnect plug



- Use special socket attachment, **BMW No. 11 7 020,** to remove dual temperature sensor

Torque specification:
Dual temperature sensor
(+ Loctite 243) ..... 15 Nm

Bucket tappet removal, installation, replacement

To improve clarity some of the illustrations show the components with the cylinder head removed.

Attention:
Note individual positions of bucket tappets and mark them, seizurehazard.

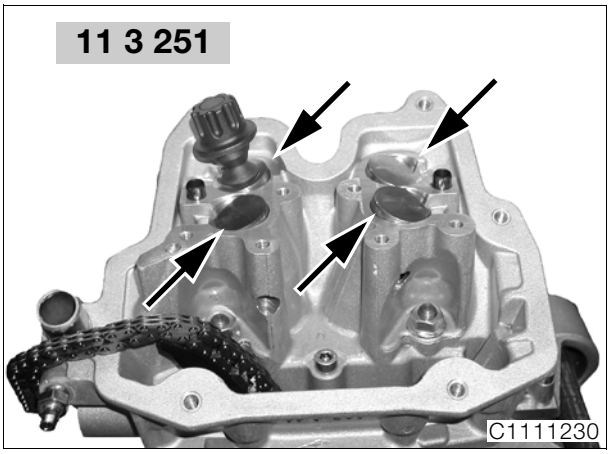
– Swivel out powertrain cradle (➟ 11.12)
– Remove cylinder head cover (➟ 11.34)
– Lock engine at TDC (➟ 11.14)
– Remove guide rail (➟ 11.38)

Note:
Camshafts can also be removed and installed with the sprockets attached.

– Removing camshaft sprockets (➟ 11.35)
– Removing camshafts and camshaft bearing caps (➟ 11.36)

Note:
Ensure that the timing chain does not drop into the housing. Use retainer to keep timing chain tensioned at all times!

- Secure the timing chain to prevent it from falling



- Use rubber suction cup, **BMW No. 11 3 251,** to extract the bucket tappets (arrows)
- Inspect bucket tappets and their guides to ensure that all components are in good condition

When installing:

- While installation is basically just a reversal of the removal procedure, special attention should be devoted to the following points:

Attention:
Install bucket tappets in their original locations, seizure hazard.

- Thoroughly oil the bucket tappet contact surfaces and install them in their original positions in the cylinder head
- Follow installation instructions for camshaft bearing caps/camshafts (➡ 11.37)

- Turn the engine over several times by hand

– Check valve clearances (➡ 11.15) adjust as indicated (➡ 11.16)

Wear data:

Bore ..... max. 26.04 mm (1.0252 in)
Radial clearance..... max. 0.10 mm (0.0049 in)

Fluids and lubricants:

Guide rail ..... Loctite 243
Camshaft sprocket ..... Loctite 243

Torque specification:

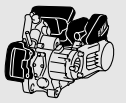
Guide rail mount ..... 10 Nm
Camshaft sprocket mounts ..... 30 Nm
Camshaft bearing caps ..... 10 Nm
Threaded plug for TDC set bolt ..... 15 Nm
Threaded plug for chain tensioner ..... 35 Nm
Lower strut mount ..... 21 Nm

Inlet and exhaust valve

Removing valves

– Swivel out powertrain cradle (➡ 11.12)
– Remove cylinder head cover (➡ 11.34)
– Remove spark plug (➡ 12.5)
– Lock engine at TDC (➡ 11.14)
– Remove guide rail (➡ 11.38)

Note:
The camshafts can also be removed and installed with the sprockets attached.



– Remove chain tensioner (➡ 11.33)
– Remove camshaft sprockets (➡ 11.35)
– Remove camshafts and camshaft bearing cap (➡ 11.36)

Note:
Take care to ensure that the timing chain does not fall into the housing! Secure the timing chain to keep it tight!

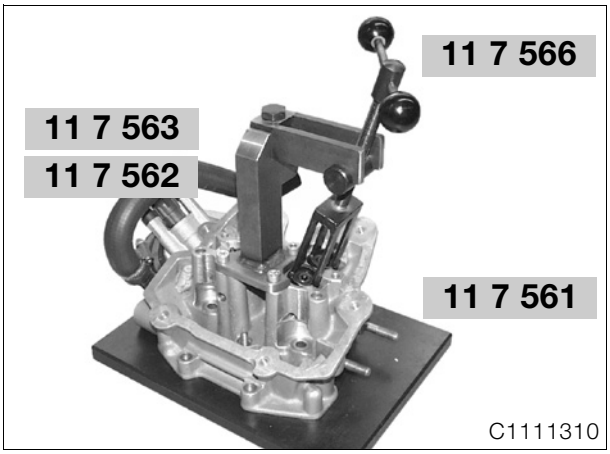
- Secure the timing chain to prevent it from falling

– Removing cylinder head (➡ 11.40)

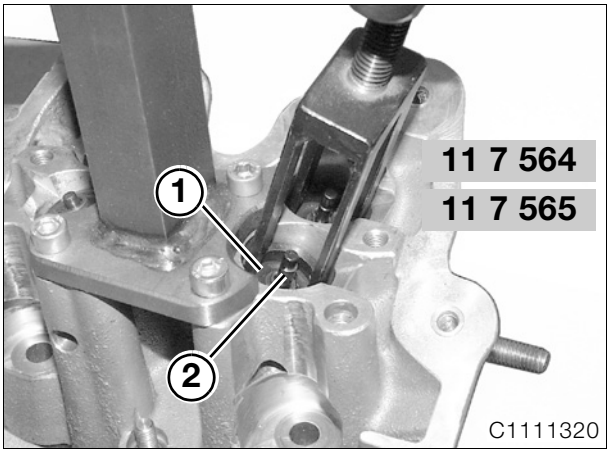
Attention:
Always note the original positions of all bucket tappets, inlet and exhaust valves, valve springs, valve caps and collets, marking them as necessary!

– Removing bucket tappets (➡ 11.26)

Note:
Tap the valve cap with a plastic hammer to facilitate removal of the valve collets.



- Screw cylinder head to baseplate, **BMW No. 11 7 561**
- Tighten support bar, **BMW No. 11 7 563**, knurled nut, **BMW No. 11 7 562**, pressure rod, **BMW No. 11 7 566,** and pressure plate



Note:
The new version of the valve spring is tapered. Use the appropriate special tool for each valve spring version:
Cylindrical valve spring:
pressure plate, **BMW No. 11 7 564**,
Tapered valve spring:
pressure plate, **BMW No. 11 7 564**, with adapter, **BMW No. 11 7 565**

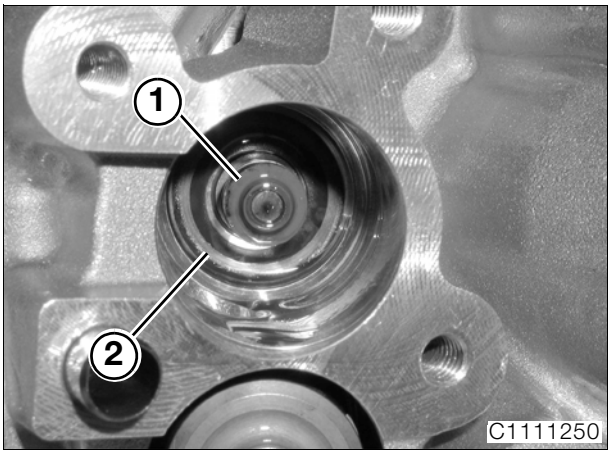
- Use pressure plate to compress valve springs
- Use screwdriver to press apart the valve collets (2) for removal
- Release pressure on the valve spring
- Remove valve spring cap (1) and valve spring
- Remove valves by extracting downward

Note:
Inspect valve guide before removing valve stem seal (➡ 11.29).

Attention:
Do not damage sliding surfaces of bucket tappets, potential seizure hazard!



- Pull off valve stem seal (1) with pliers, **BMW No. 11 1 480**



- Remove valve spring washer (2) from cylinder head
- Clean cylinder head to remove combustion residue, etc.
- Inspect threads on spark plug and in the socket to ensure that they are in good condition
- Check mating surfaces for warpage and distortion as well as general damage

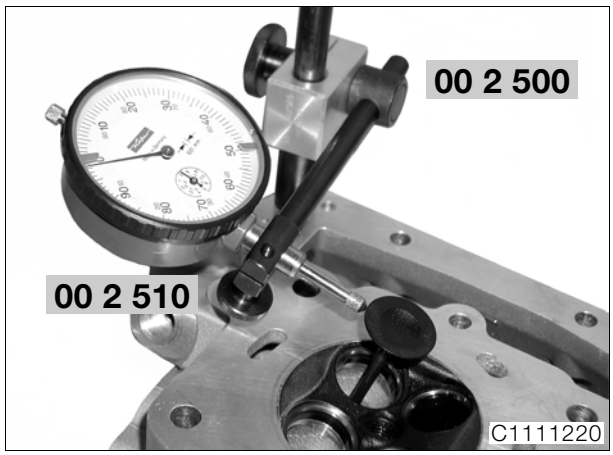
Note:
If necessary peel off mating surface on a suitable plate.

- Clean camshaft oil passages

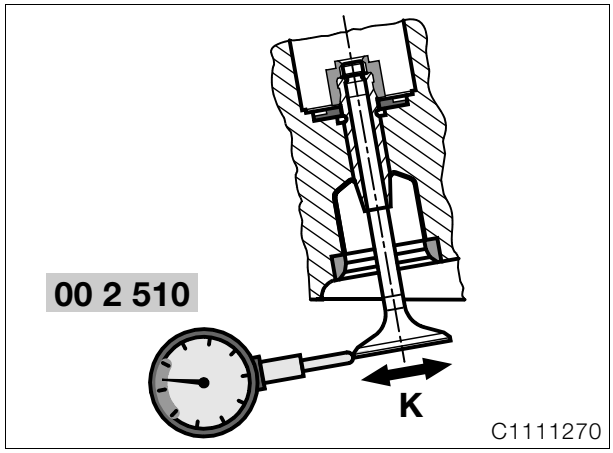
Wear data:
Mating surface distortion..... max. 0.05 mm
..... (0.0019 in)

Check valve guide for wear

- Insert new valve into valve guide from the combustion chamber, continuing until it is against the valve stem seal



- Attach dial gauge stand, **BMW No. 00 2 500,** to cylinder head

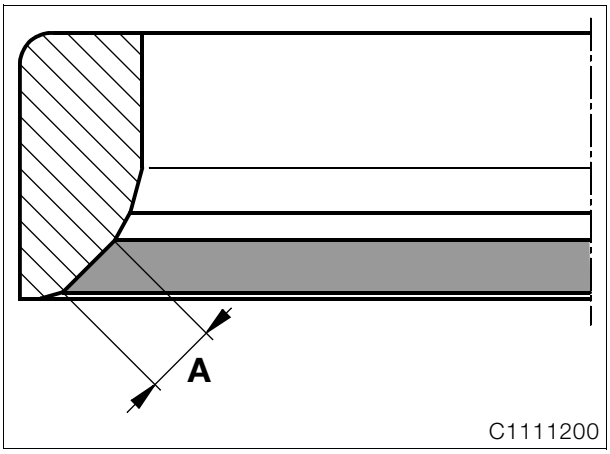


- Measure maximum tilt "K" with dial gauge, **BMW No. 00 2 510,** at a right angle to the valve axis, at a transverse angle to the camshaft axis

Wear data:
Tilt "K"..... max. 0.5 mm
..... (0.0019 in)
Valve guide internal Ø ..... max. 4.015 mm
..... (0.1581 in)

Check valve seat for wear

- Apply Prussian blue or similar paste to the valve seat inserts
- Install the correct valve and turn under gentle pressure

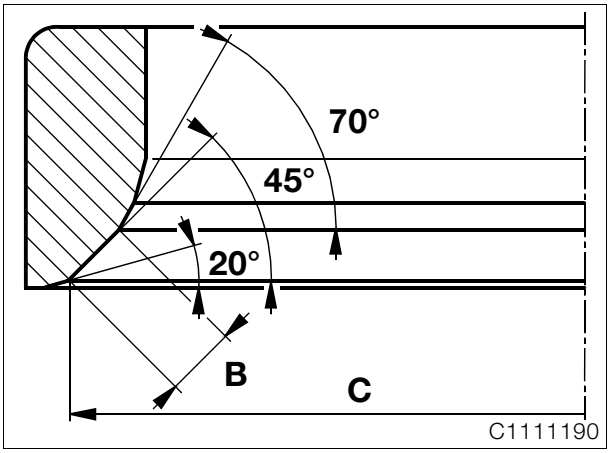


- Check valve seat width "A" and contact pattern for wear

Wear dimension for valve seat width "A":
Inlet valve ..... 2.0 mm (0.0787 in)
Exhaust valve ..... 2.0 mm (0.0787 in)

- The seat can be reground if the seat width wear limit has been reached or if the contact pattern is not satisfactory

Regrinding valve seats



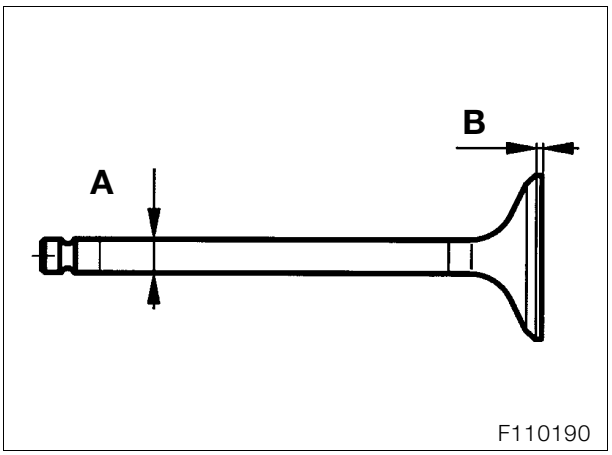
- Regrind valve seat with rotary valve seat grinder

Note:
Valve guide inside Ø 4.002...4.015 mm (0.1576...0.1581 in).

Inspection dimension for valve seat width "B":
Inlet valve ..... 1.0...1.2 mm
..... (0.0394...0.0472 in)
Exhaust valve ..... 1.2...1.6 mm
..... (0.0472...0.0630 in)

Inspection dimension for valve seat Ø "C":
Inlet valve ..... 20.2 mm (0.7953 in)
Exhaust valve ..... 18.0 mm (0.7087 in)

Check valve for wear



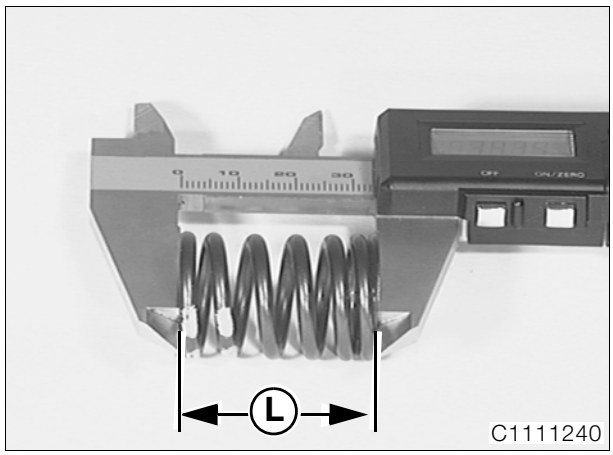
- Check stem diameter and seat width on valve spring cap
- Check valve for runout

Wear dimension for valve:
Valve stem Ø "A" .....min. 3.95 mm (0.1555 in)
Valve stem runout .....max. 0.06 mm (0.0024 in)
Valve seat surface "B" ..... 0.6 mm (0.0236 in)

Note:
Remove carbon deposits from valve, use grinding stone to remove burrs from collet grooves.

- Check collet grooves

Check valve springs for wear



- Check valve springs for breakage, deformation and loss of tension

Wear dimensions C1:
Extended spring length "L" ..... min. 36.7 mm
.....(min. 1.4449 in)

Wear dimensions C1 200:
Extended spring length "L" ..... min. 40.8 mm
.....(min. 1.6063 in)

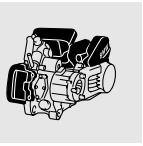
Note:
The new version of the valve spring is tapered. Always install tapered valve springs with the smaller diameter at the top! Use only one type of valve spring!

- Check grooves for collets

Install valves

- While installation is basically just a reversal of the removal procedure, special attention should be devoted to the following points:

Attention:
Install bucket tappets, inlet and exhaust valves, valve springs, valve spring caps and collets in their original positions, seizure hazard!



Attention:
The new version of the valve spring is tapered. Always install tapered valve springs with the small diameter end at the top! Use only one valve spring version!

Note:
Apply some grease to the valve collets to ease assembly.

Attention:
When releasing the valve springs ensure that the valve collets seat correctly in the grooves and that the valve springs assume their correct positions against seat and cap - visual inspection!
Valve springs that are mounted at an angle will always lead to broken valve stems!

- Install bucket tappets (➡ 11.26)
- Install camshaft bearing cap/camshafts according to instructions (➡ 11.37)
- Installing cylinder head (➡ 11.40)

Attention:
Remove TDC set bolt, **BMW No. 11 7 651**

- Turn the engine over several times by hand

Note:
If it is not possible to obtain the correct valve clearance using the smallest bucket tappet (2.50 mm/ 0.09842 in) the cylinder head must be replaced (➡ 11.40).
If is is not possible to obtain the correct valve clearance using the largest bucket tappet (3.20 mm/ 0.12598 in) the valve seat must be reground (➡ 11.30).

- Check valve clearance (➡ 11.15) adjust as indicated (➡ 11.16)

Fluids and lubricants:

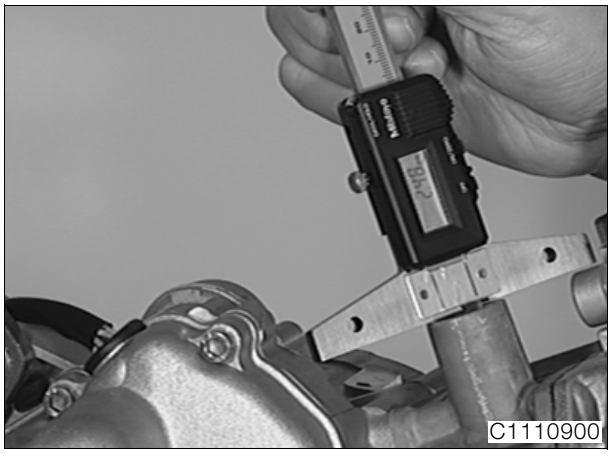
Guide rail	Loctite 243
Camshaft sprocket	Loctite 243
Coolant	

Torque specification:

Cylinder head collar nut	30 ±1 Nm
Cylinder head bolt	10 Nm
Guide rail mount	10 Nm
Camshaft sprocket mount	30 Nm
Camshaft bearing cap mount	10 Nm
Threaded plug for TDC set bolt	15 Nm
Threaded plug for chain tensioner	35 Nm
Cylinder head cover mount	10 Nm
Lower strut mount	21 Nm

Check timing chain

– Turn crankshaft to top dead centre and secure in this position (➠ 11.14)



- Undo chain tensioner threaded plug and remove together with seal
- Use depth gauge to determine depth "A"

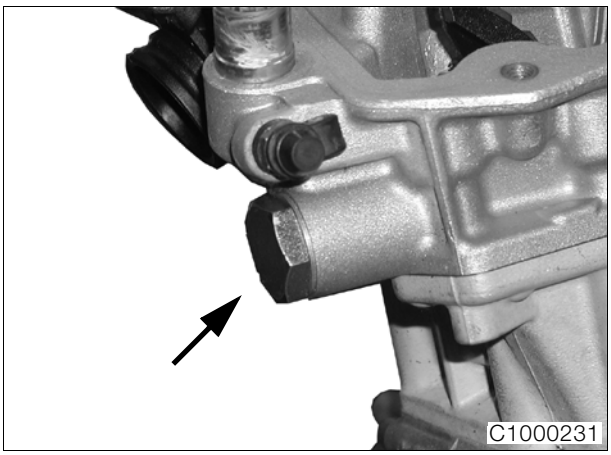
Wear data:
Dimension "A" .....max. 6 mm (0.2362 in)

Note:
If reading exceeds depth "A" check the following components: Timing chain, chain rails.

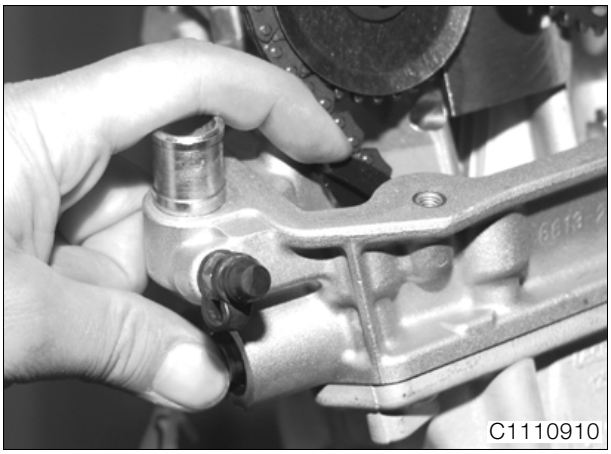
11 31 080 # Replacing chain tensioner

For enhanced clarity some of the illustrations show the components with the powertrain cradle removed

– Remove cylinder head cover (➠ 11.34)



- Release bolt (arrow) for chain tensioner



- Press chain tensioner to the outside with chain tensioner rail

When installing:

Note:
Always replace seal on threaded plug!

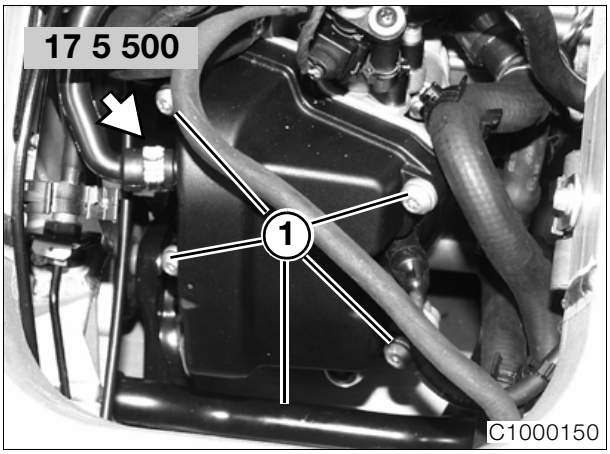
- Install liberally oiled chain tensioner with flat surface toward chain
- Turn engine through at least one full revolution

– Check valve clearances

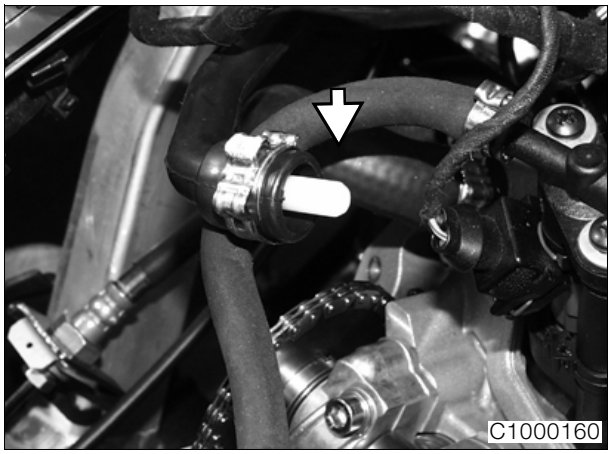
Torque specification:
Threaded plug ..... 35 Nm

Cylinder head cover removal and installation

– Swivel out powertrain cradle (➠ 11.12)



- Open hose clamp (arrow) with pliers, **BMW No. 17 5 500**.
- Undo attachment bolts (1) on valve cover



- Watch throttle (arrow)

When installing:

- Before installing, clean cylinder head gasket and groove for gasket in cylinder head cover

Attention:
Install with no oil on gasket or in recess within the cylinder head cover!

Torque specification:
Cylinder head cover ..... 10 Nm

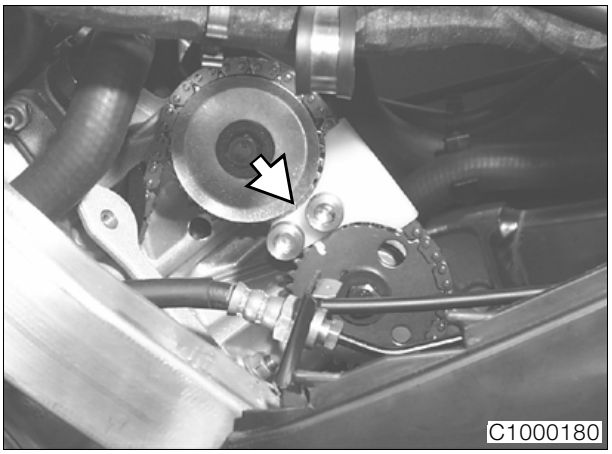
Camshaft, camshaft sprocket, camshaft bearing cap

Removing and installing camshaft sprockets

For enhanced clarity some of the illustrations show the components with the powertrain cradle removed

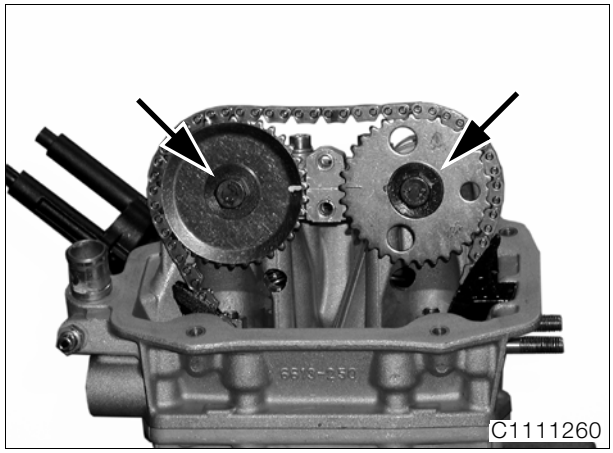
– Swivel out powertrain cradle (➡ 11.12)
– Remove cylinder head cover (➡ 11.34)
– Lock engine at TDC (➡ 11.14)

Note:
As the round cover plate can rotate against the camshaft sprocket when installed, the TDC mark should always be made on the sprocket itself - not the cover plate. The camshaft sprockets are identical.



- Use a coloured marker to mark TDC (arrow) on the inlet camshaft's sprocket

– Remove chain tensioner (➡ 11.33)
– Remove guide rail (➡ 11.38)



Note:
The camshaft sprocket is secured with locking compound!

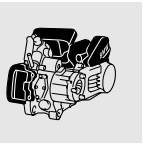
- Undo the camshaft sprocket attachments (arrows)
- Remove camshaft sprockets

Note:
Make sure that the timing chain does not drop into the housing. Use a retainer to keep timing chain tensioned at all times!

- Secure the timing chain to prevent it from falling

When installing:

- While installation basically consists of performing the dismantling operations in reverse sequence, special attention should be directed toward the following additional points:
- Remove traces of thread-locking compound from threads of camshafts and chain rail
- The inlet camshaft bears a punch mark (arrow) as identification
- Make sure that the camshafts turn easily and smoothly



Note:
Always replace the threaded plug's seal ring!

- Install chain tensioner

Attention:
Remove TDC set bolt, **BMW No. 11 7 651!**

- Turn the engine over several times by hand
- Check valve clearance and adjust as necessary
- Install the cylinder head cover before installing the powertrain cradle

Attention:
When installing, note the correct positions of the spring struts!

Note:
Make sure the detent for the long lever of the easy-lift mechanism engages. If necessary, move the lever to the drive position first, and then move it to the park position!

Fluids and lubricants:
Loctite 243

Torque specifications:

Guide rail	10 Nm
Camshaft sprockets	30 Nm
TDC set bolt threaded plug	15 Nm
Threaded plug for chain tensioner	35 Nm
Lower strut mount	21 Nm

11 31 035 Camshaft bearing cap/camshaft removal, installation, replacement

For enhanced clarity some of the illustrations show the components with the powertrain cradle removed.

- Swivel out powertrain cradle (➡ 11.12)
- Remove cylinder head cover (➡ 11.34)
- Lock engine at TDC (➡ 11.14)
- Remove guide rail (➡ 11.38)

Note:
Camshafts can also be removed and installed with the camshaft sprockets attached.

- Removing camshaft sprockets (➡ 11.35)

Note:
Make sure that the timing chain does not drop into the housing. Use a retainer to keep timing chain tensioned at all times!

- Secure timing chain to prevent it from falling

Note:
Note lengths of bolts used to mount camshaft bearing caps!

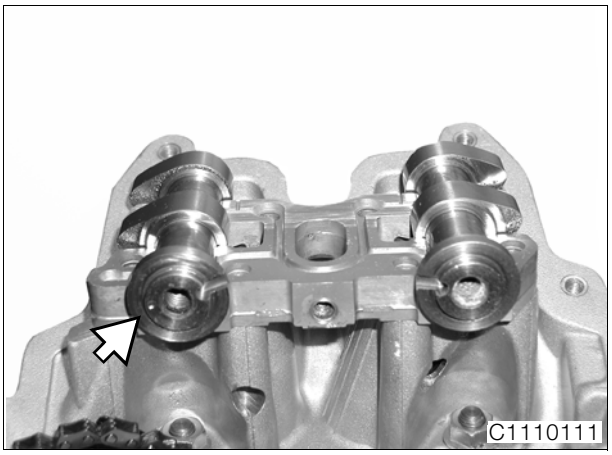


- Remove 8 securing bolts
- Remove camshaft bearing cap
- Removing camshafts
- Remove camshaft bearing seat

When installing:

- While installation basically consists of performing the dismantling operations in reverse sequence, special attention should be directed toward the following additional points:

Attention:
The grooves in the bearing caps are oil passages! Note lengths of bolts used to mount camshaft bearing caps!



Attention:
Align bearing caps, making sure that bearing caps and bearing seats are correctly aligned. Run a finger along the join to check alignment!

- Remove traces of thread-locking compound from threads of camshafts and chain rail
- The inlet camshaft bears a punch mark (arrow) as identification
- Make sure that the camshafts turn easily and smoothly
- Install chain tensioner

Attention:
Remove TDC set bolt, **BMW No. 11 7 651!**

- Turn the engine over several times by hand
- Check valve clearances and adjust as required
- Install the cylinder head cover before swiveling back the powertrain cradle

Attention:
When installing, note the correct positions of the spring struts!

Note:
Make sure the detent for the long lever of the easy-lift mechanism engages. If necessary, move the lever to the drive position first, and then move it to the park position!

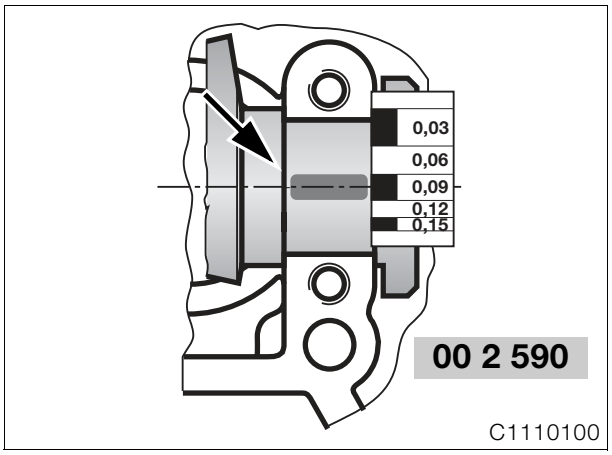
Fluids and lubricants:

Guide rail	Loctite 243
Camshaft sprocket	Loctite 243

Torque specification:

Guide rail mount	10 Nm
Camshaft sprockets	30 Nm
Camshaft bearing cap mount	10 Nm
Threaded plug for TDC set bolt	15 Nm
Threaded plug for chain tensioner	35 Nm
Lower strut mount	21 Nm

Checking camshafts
– Camshaft removed



- Lobe height mweasurement
- Use Plastigage (arrow), **BMW No. 00 2 590,** to check clearance of camshaft after installation

Wear data:
Inlet lobe height.....min. 33.00 mm (1.2992 in)
Exhaust lobe height.....min. 32.15 mm (1.2657 in)
Installed clearance .....max. 0.100 mm (0.0039 in)

Replacing chain rails

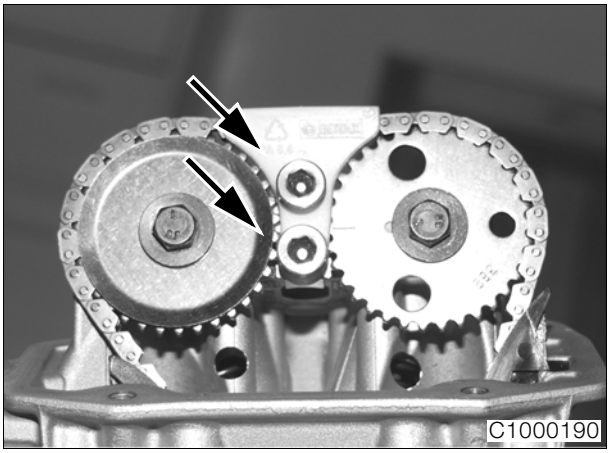
Chain rail replacement

For enhanced clarity some of the illustrations show the components with the powertrain cradle removed.

– Swivel out powertrain cradle (➡ 11.12)
– Remove cylinder head cover (➡ 11.34)

Note:
Chain rail bolts are secured with thread-locking compound!

Note:
Watch installation positions and bolt lengths, lettering to the outside, identify with coloured marker as necessary!



- Undo and remove chain rail bolts (arrows)

When installing:
- While installation basically consists of performing the dismantling operations in reverse sequence, special attention should be directed toward the following additional points:
- Clean chain guide threads to remove Loctite residue
- Turn the engine over several times by hand
- Install the cylinder head cover before returning the powertrain cradle to its original position

Attention:
When installing, note the correct positions of the spring struts!

Note:
Make sure the detent of the long lever on the easy-lift mechanism engages. If necessary, move the lever to the drive position first, and then move it to the park position!

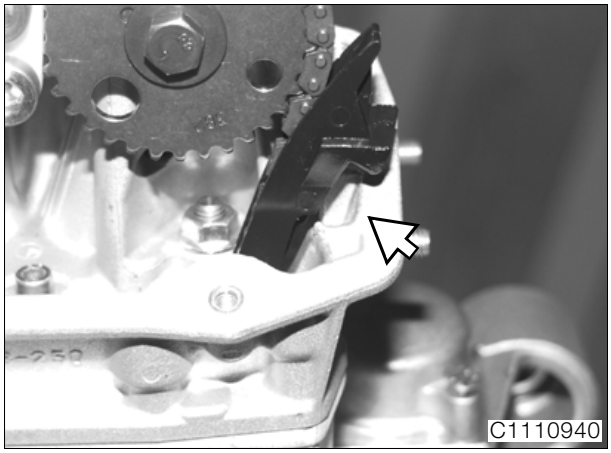
Fluids and lubricants:
Loctite 243

Torque specification:
Guide rail ..... 10 Nm
Lower strut mount ..... 21 Nm

11 31 112 Replacing guide rail

For enhanced clarity some of the illustrations show the components with the powertrain cradle removed.

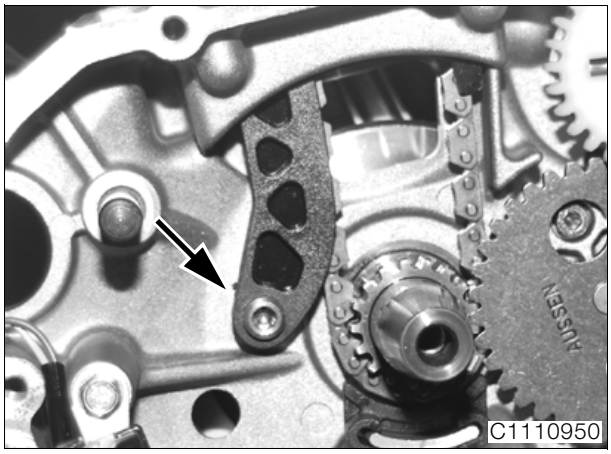
– Swivel out powertrain cradle (➠ 11.12)
– Remove cylinder head cover (➠ 11.34)
– Remove chain tensioner (➠ 11.33)



- Lift guide rail up to remove

When installing:
- When installing, seat rail in recess (arrow)

11 31 101 Replacing chain tensioner rail
– Remove idler pulley
➠ .....See Group 12



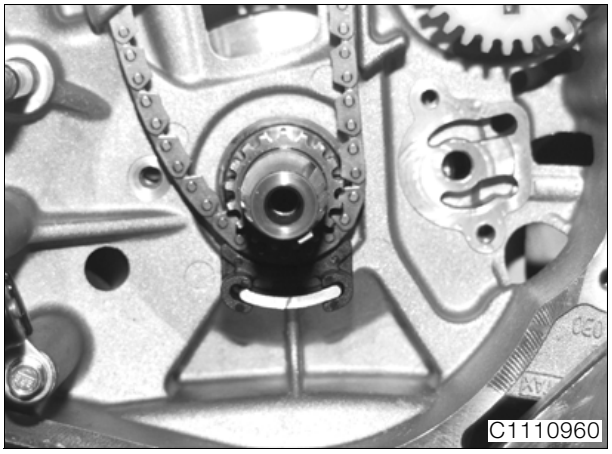
- Undo collar bolt (arrow)
- Remove tensioning rail

When installing:
- Remove all traces of old thread-locking compound from the threads
- Coat threads of collar screw with Loctite and install

Fluids and lubricants:
Collar bolt..... LOCTITE 243

Torque specification:
Collar bolt..... 10 Nm

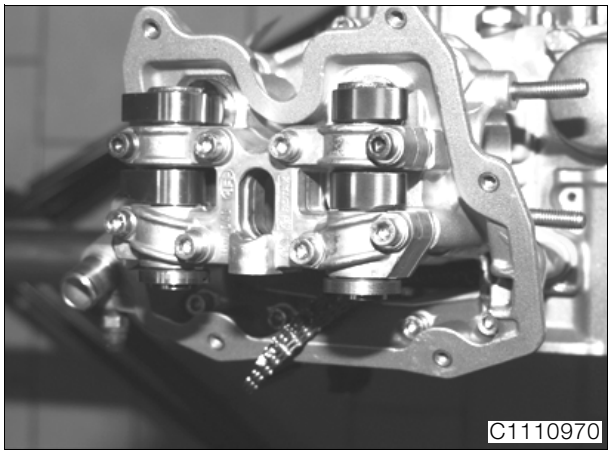
11 31 051 Timing chain removal, installation, replacement
– Remove oil pump



- Use a coloured marker to mark outside of chain
- Note position of chain guide relative to cast brace

Cylinder head removal and installation

- Operations with powertrain cradle installed:
– Drain coolant
➠ .....See Group 17
– Remove exhaust system
➠ .....See Group 18
– Swivel out powertrain cradle (➠ 11.12)
- Disconnect coolant hose
– Remove injector
– Remove throttle valve assembly
➠ .....See Group 13
– Remove camshaft sprockets (➠ 11.35)
– Remove guide rail (➠ 11.39)



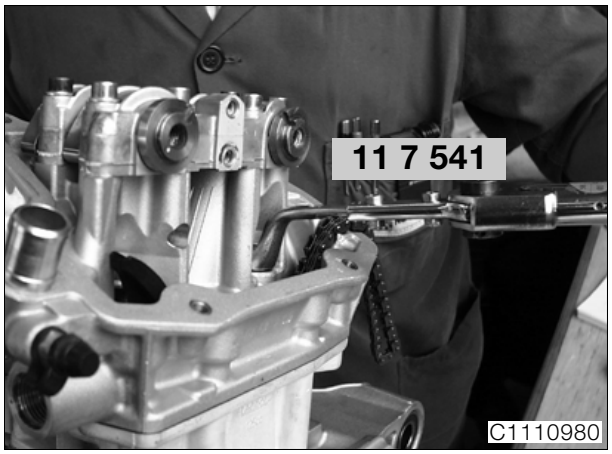
- Remove 8 bolts
- Remove 4 collar nuts

Note:
Watch timing chain!

- Remove cylinder head

When installing:

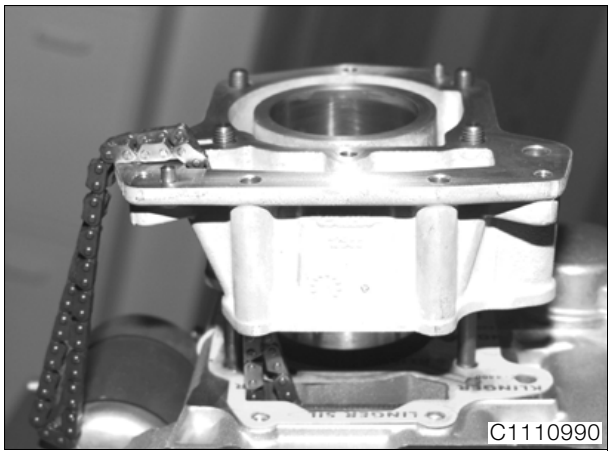
Note:
nstall cylinder head gasket with the inscription on the top side!



- Tighten collar nuts in cross pattern using socket attachment, **BMW No. 11 7 541**

Torque specification:
Collar nut ..... 30 ±1 Nm
Bolt ..... 10 Nm

Cylinder liner removal
– Cylinder head removal



- Slightly raise cylinder

Attention:
Use a shop towel or some similar insulating material to prevent the connecting rod from damaging the cylinder bore during the removal process!

- Use shop towels to guard the bore against damage
- Raise cylinder liner clear of piston

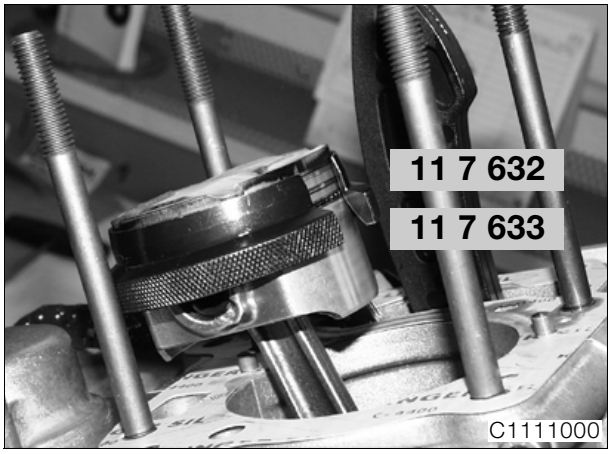
Checking cylinder dimensions

Measurement planes
1 90° to wristpin axis
2 60° to wristpin axis
3 120° to wristpin axis

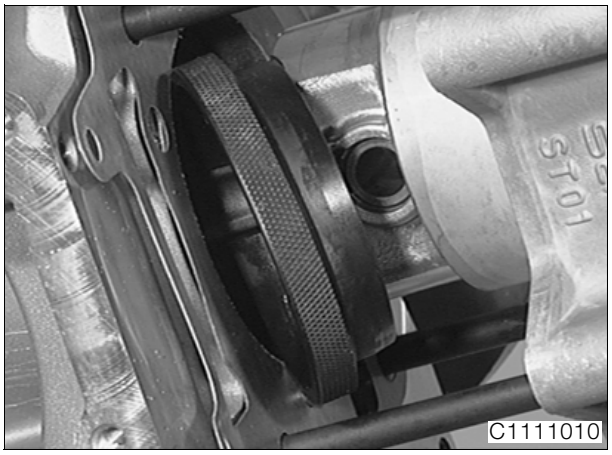
Wear data:
Difference ..... max. 0.02 mm (0.0008 in)

When installing:

Note:
Always install with new seal!



- Secure crankshaft at TDC (➡ 11.14)
- Use ring squeezer sleeve
  C1: **BMW No. 11 7 632**
  C1 200: **BMW No. 11 7 633**



Note:
Do not damage the piston!

- Slide cylinder over the piston
- Carefully slip sleeve up and to one side to remove

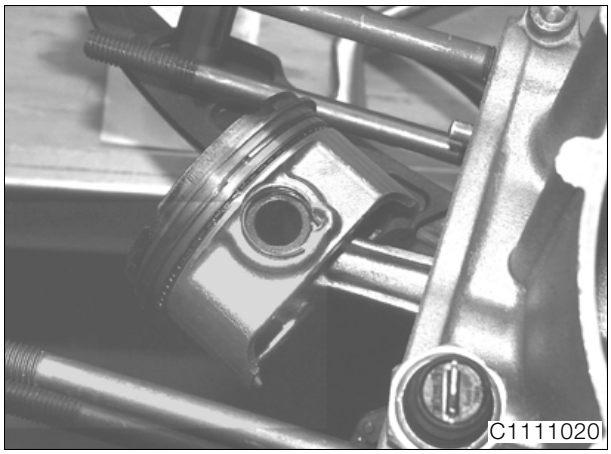
Replacing stud bolts
– Removing cylinder
- Use vise grips to remove studs

When installing:

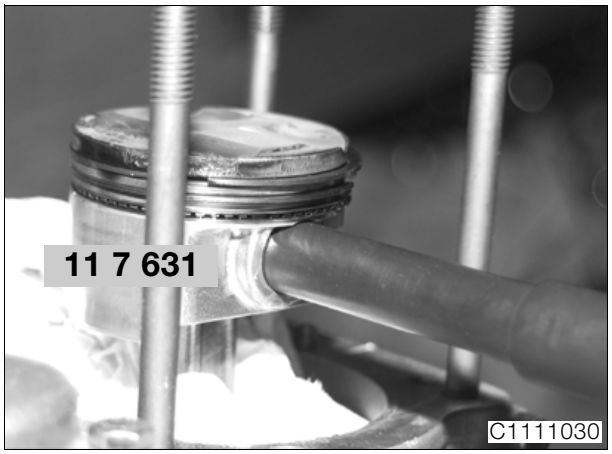
Torque specification:
Stud ..... 10 Nm

11 25 050 Piston removal, installation, replacement

– Removing cylinder



- Remove circlip



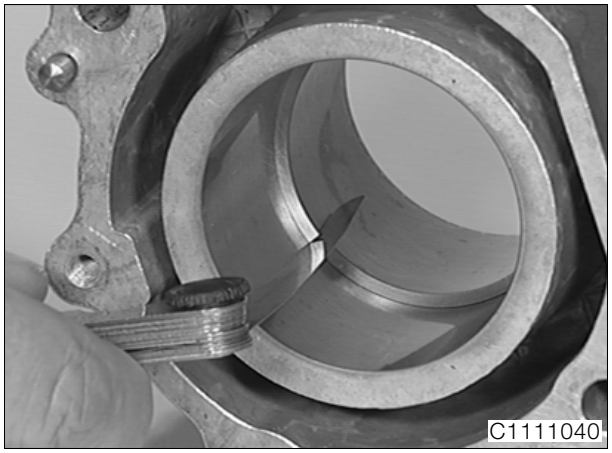
- Use drift punch, **BMW No. 11 7 631,** to drive out wristpin

When installing:
- Make sure that arrow on piston crown points toward silencer

Attention:
Install a new circlip!

- Note correct installed position of circlip

11 25 671 Replacing piston rings
– Removing cylinder
- Remove piston rings



- Checking piston rings
- Measure piston ring gap with piston ring 40 mm (1.5748 in) below top edge of cylinder

Wear data for C1:
Piston ring gap:
Compression ring..... 0.8 mm (0.0315 in)
Chamferred compression ring... 0.8 mm (0.0315 in)
Oil scraper ring..... 1.5 mm (0.0591 in)

Ring thickness:
Compression ring..... 0.97 mm (0.0382 in)
Chamferred compression ring. 1.17 mm (0.0461 in)

Ring float:
Compression ring..... 0.1 mm (0.0039 in)
Chamferred compression ring... 0.1 mm (0.0039 in)

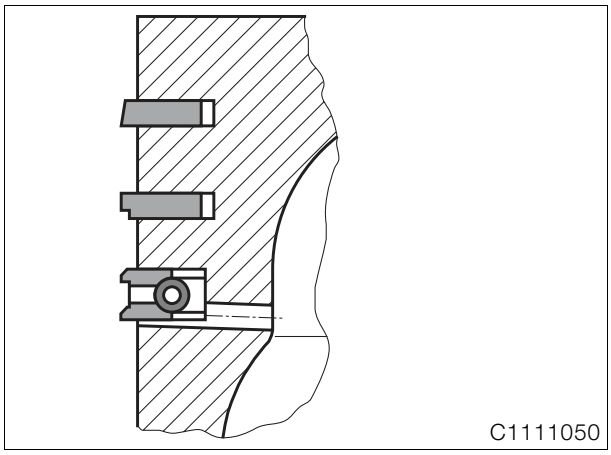
Wear data for C1 200:
Piston ring gap:
Compression ring..... 0.7 mm (0.0276 in)
Chamferred compression ring... 0.8 mm (0.0315 in)
Oil scraper ring..... 1.0 mm (0.0394 in)

Ring thickness:
Compression ring..... 0.97 mm (0.0382 in)
Chamferred compression ring. 1.17 mm (0.0461 in)

Ring float:
Compression ring..... 0.1 mm (0.0039 in)
Chamferred compression ring... 0.1 mm (0.0039 in)

When installing:

- Install with “Top” uppermost
- Turn rings so that gaps are uniformly spaced



Checking piston dimensions
– Removing cylinder

Piston C1



Piston C1 200



- Measure piston diameter 8 mm (0.3150 in) above bottom edge of piston skirt
- Measure diameter of wristpin in piston stroke direction

C1 piston dimensions:
Piston "A" Ø ..... 56.37 mm (2.2193 in)
Piston "B" Ø ..... 56.38 mm (2.2197 in)

Piston dimensions C1 200:
Piston "A" Ø ..... 61.97 mm (2.4398 in)
Piston "B" Ø ..... 61.98 mm (2.4402 in)

Wear values:
Installed clearance ..... 0.06 mm (0.0024 in)
Wristpin bore..... max. 15.03 mm (0.5917 in)

Measuring piston pin

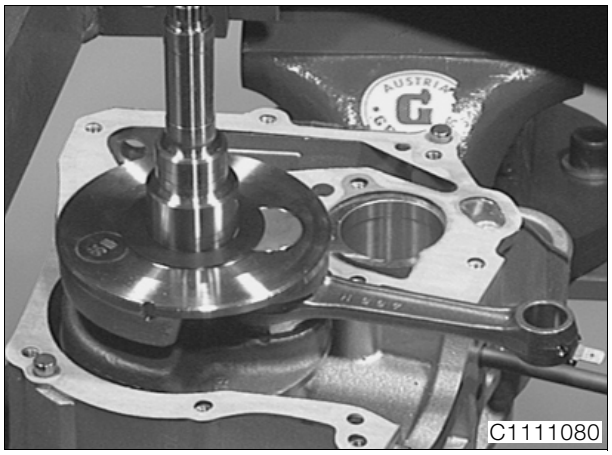


- Measure diameter of pin at both ends and in the middle

Wear data:
Installed clearance ..... 0.04 mm (0.0016 in)
Wristpin diameter ..... 14.99 mm (0.5902 in)

Removing crankshaft

- Removing powertrain cradle (➟ 11.17)
- Support in assembly stand
- Remove starter motor (➟ 12.7)
- Remove drive variator (➟ 24.7)
- Remove reluctor (➟ 12.8)
- Remove cylinder head cover (➟ 11.34)
- Removing cylinder head (➟ 11.40)
- Removing cylinder liner (➟ 11.41)
- Remove cylinder liner base gasket
- Turn variator side to top in assembly stand



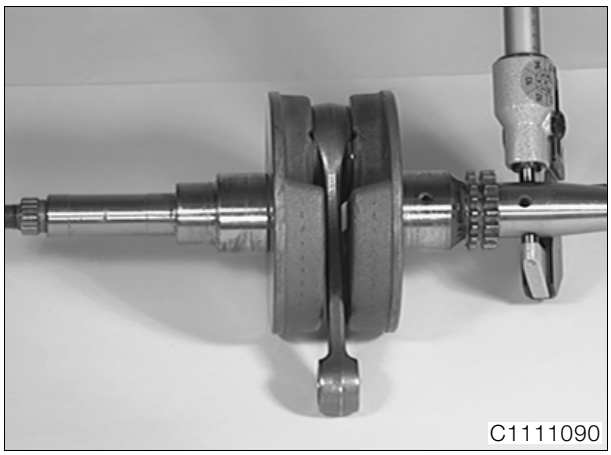
- Remove securing bolts
- Carefully separate sections of housing

Attention:
Take care not to damage bearing shells on splines!

- Removing crankshaft

Note:
Thrust washer might be stuck to inside of housing.

Measuring end float



- Measure between tips

Note:
In direction of stroke and 90° to direction of stroke!

Wear data:

Crankshaft runout	max. 0.05 mm (max. 0.0019 in)
Connecting rod bearing radial gap	max. 0.07 mm (max. 0.0027 in)
Connecting rod bearing end float	max. 0.8 mm (max. 0.0031 in)
Main bearing journal Ø	32.01 mm (1.2602 in)
Crankshaft main bearing radial gap	max. 0.07 mm (max. 0.0027 in)
End float	0.2...0.4 mm (0.0079...0.0158 in)

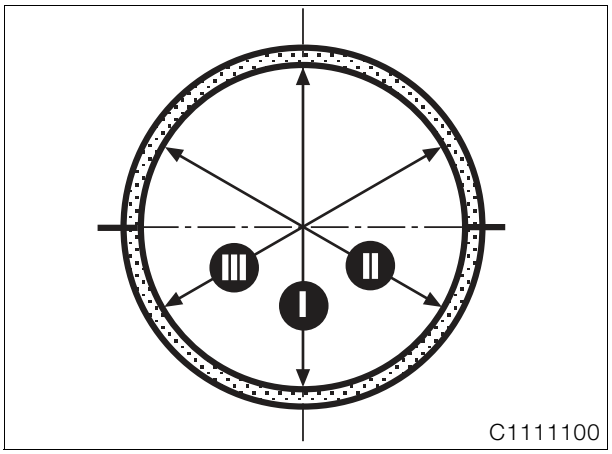
Measuring housing

– Removing crankshaft

General instructions
Room temperature .....20…25 °C (68…77 °F)
Cleaners
- Make sure that lube-oil bores are unobstructed
- Check grooved ball bearings

All grooved ball bearings:
Protrusion over surface ..... min. 0.01 mm
.....(min. 0.0004 in)

Measuring main bearings



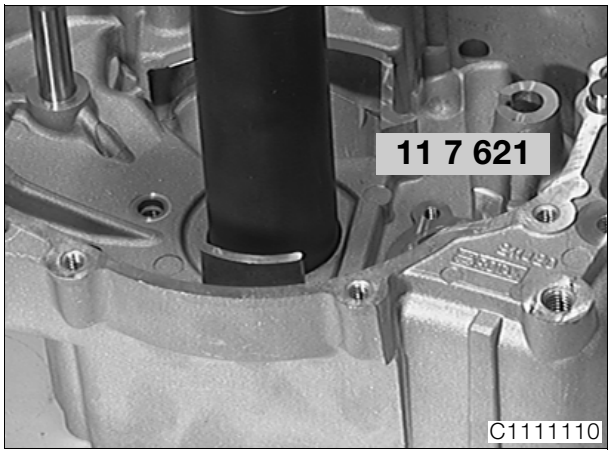
Measurement planes:
1 90° to joint between bearing shells
2 60° offset from this plane
3 120° offset from this plane

Wear data:
Bearing Ø..... 32.07 mm (1.2626 in)

Replacing bearing shells

– Housing sections separated

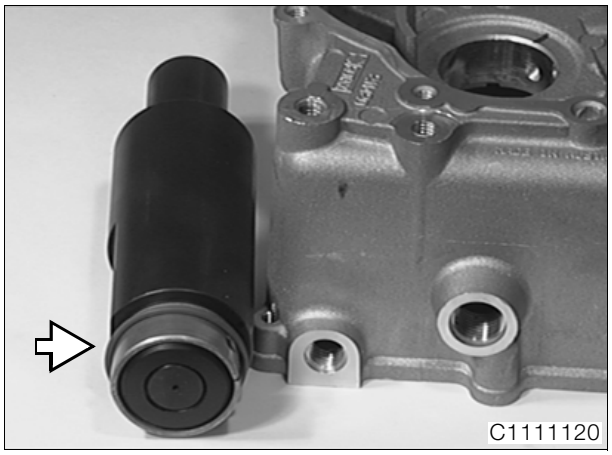
Removing bearing shells



- Support bearing seat with spacer tube D=36 mm (1.4173 in) h=30 mm (1.1811 in)
- Use drift punch, **BMW No. 11 7 621,** to press bearing shells from the outside to the inside

Installing bearing shells

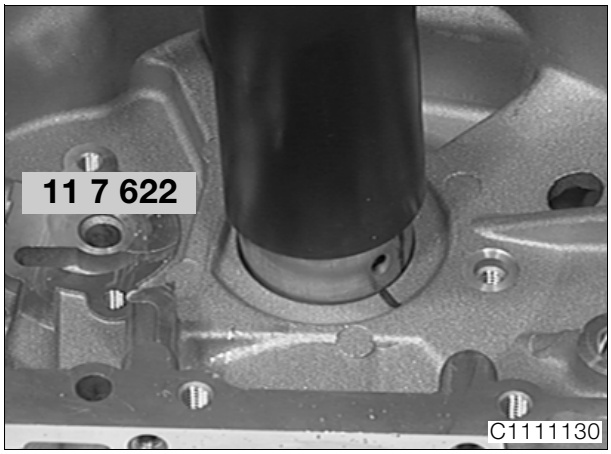
- Note correct installed position



Attention:
Lube-oil bore in housing must be aligned with bore in bearing shell - identify position with a coloured marker!

Note:
Use o-ring (arrow) to secure bearing shells against falling!

- Coat outside

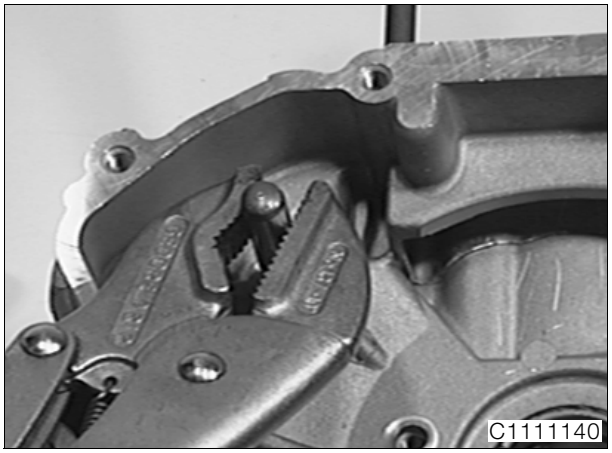


- Support bearing seat with spacer tube D=36 mm (1.4173 in) h=30 mm (1.1811 in)
- Use drift punch, **BMW No. 11 7 622,** to press bearing shells from the outside in, continuing until they seat

Fluids and lubricants:
Bearing shells .....Klüber paste 46 MR 401

Installed dimension:
Offset to oil passage .....max. 0.5 mm (0.0197 in)

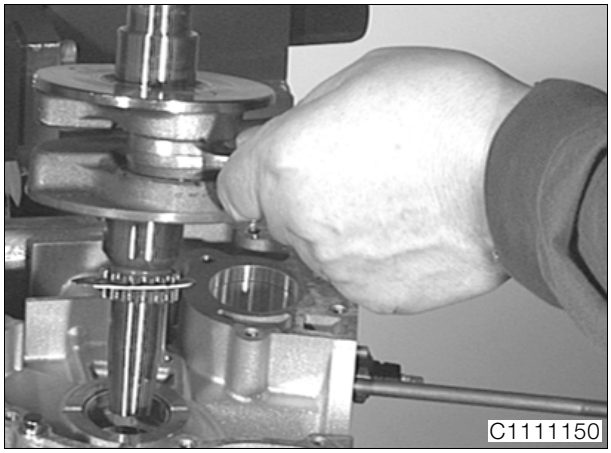
Replacing cylindrical pin for starter double gear



Wear data:
Cylinder pin Ø ..... 9.95 mm (0.3917 in)

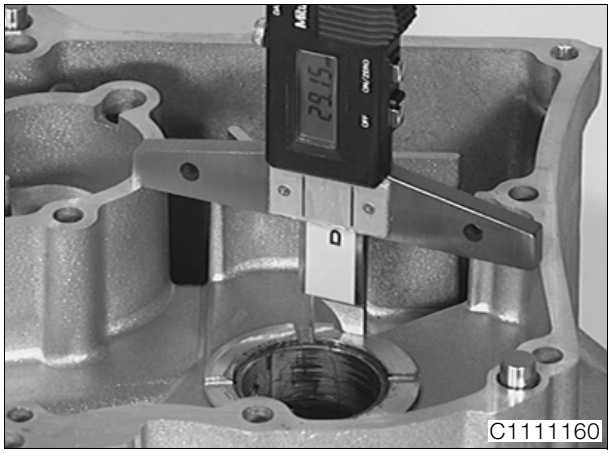
- Heat surrounding zone to approx. 100 °C (212 °F) and use vise grips to remove cylindrical pin
- Install end with small chamfer first and press in until seated

Installing crankshaft

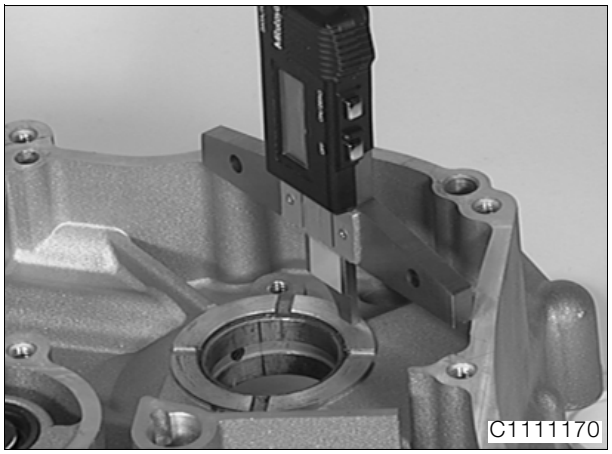


Attention:
Check end float if crankshaft or crankcase has been replaced!

Measuring end float in housing



- Using depth gauge, measure distance from crankcase mating face to flat surface on crankshaft



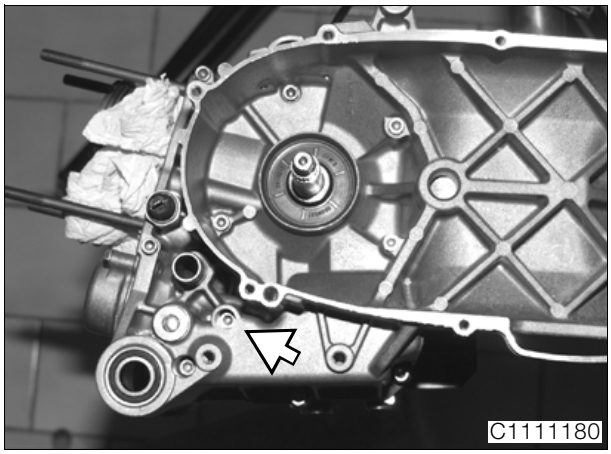
- Add 0.45 mm (0.0177 in) to both measurement results and the thickness of the gasket (compressed)
- Check installed width of crankshaft
- Allow for thickness of thrust washers

Adjusting data:
Crankshaft end float .....0.2...0.4 mm
.....(0.0079...0.0157 in)

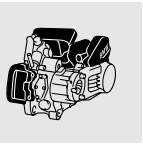
- Correct by changing thickness of washer in drive-side half of crankcase

Joining halves of crankcase

Attention:
Make sure that all bearings of crankshaft are adequately lubricated!



- Working from the inside toward the outside, tighten securing bolts in a cross sequence
- Replace copper seal (arrow)
- Turn crankshaft through several complete revolutions and check freedom of movement



12 Engine electrics

Contents

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Technical Data 3

Replacing spark plug/ignition cable 5

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Replacing ignition coil 6

Replacing starter 7

Replacing alternator 7

Replacing TDC trigger 8

Reluctor removal and installation 8

Replacing one-way clutch 10

Replacing starter double gear 10

Replacing one-way clutch gear 11





Technical Data		C1
Starter motor		
Type		Permanent-magnet motor
Power rating	kW (bhp)	0.6 (0.82)
Spark plug		
NGK		NGK CR 8EB
Thread	metric	M 10 x 1
Electrode gap	mm (in)	0.8 (0.0315)
Wear limit	mm (in)	0.9 (0.0354)
Ignition		
Ignition system		BMW engine-management system (BMW-Motor-Steuerung, BMS)

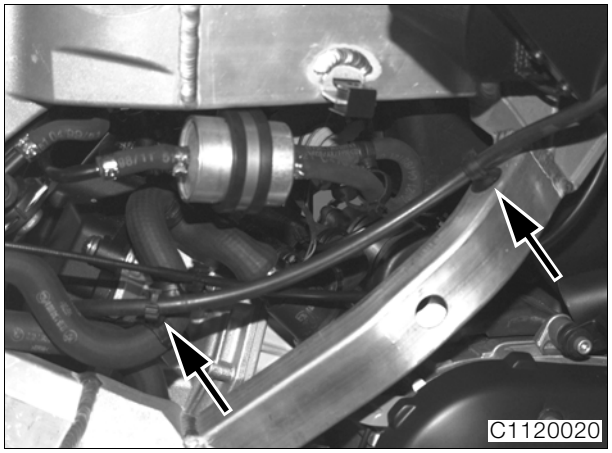




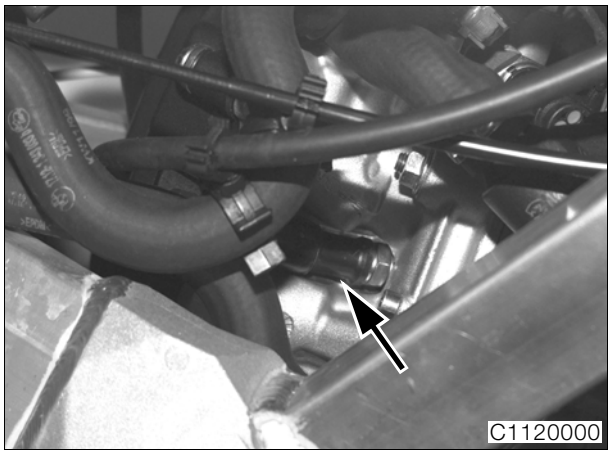
12 12 014 Replacing spark plug/ignition cable

Attention:
Switch off ignition; disconnect earth (ground) cable from battery and insulate it!

– Remove left service cover
➠ .....See Group 46

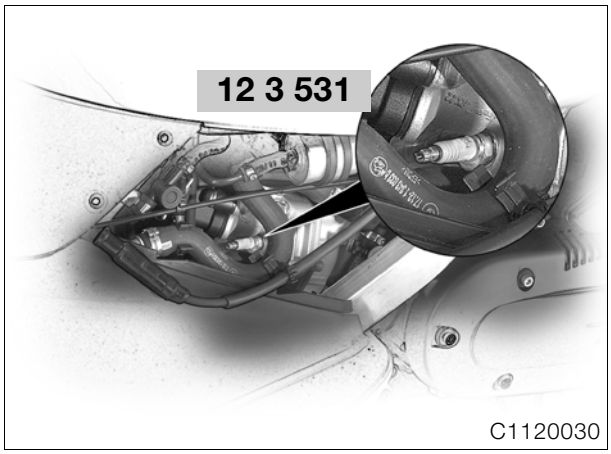


- Release ignition cable from cable clamps (arrows)



- Pull spark plug connector (arrow) off spark plug

12 12 011 Replacing spark plugs



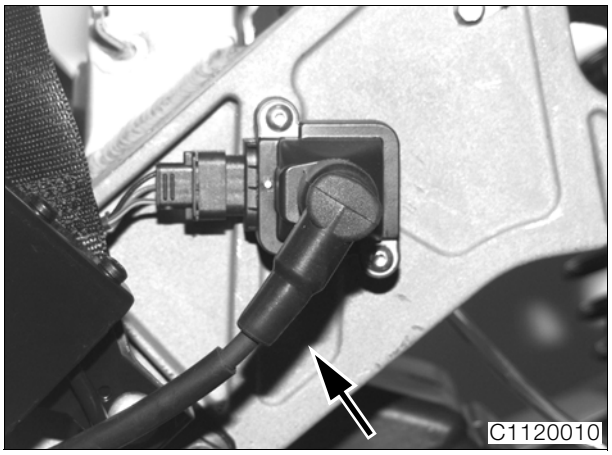
- Use spark plug wrench, **BMW No. 12 3 531,** to remove spark plug

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- When connecting the spark plug cap, make sure it engages with an audible click

Tightening torque:
Spark plug ..... 15 Nm

12 12 085 Replacing ignition cable

– Remove rear left side panel
➠ .....See Group 46



- Disconnect ignition cable (arrow) from ignition coil

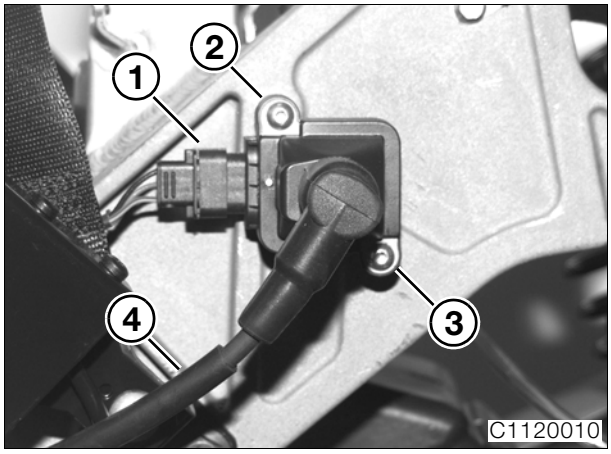
When installing:
- Installation is the reverse of the removal procedure: Pay particular attention to the sequence for securing the fasteners

Attention:
When installing, make sure that the ignition cable is correctly routed and secured

12 13 000 Replacing ignition coil

Attention:
Switch off ignition; disconnect earth (ground) cable from battery and insulate it!

– Remove rear left side panel
➠ .....See Group 46



- Disconnect ignition cable (4) from ignition coil
- Disconnect plug (1) from ignition coil
- Remove fasteners (2, 3)

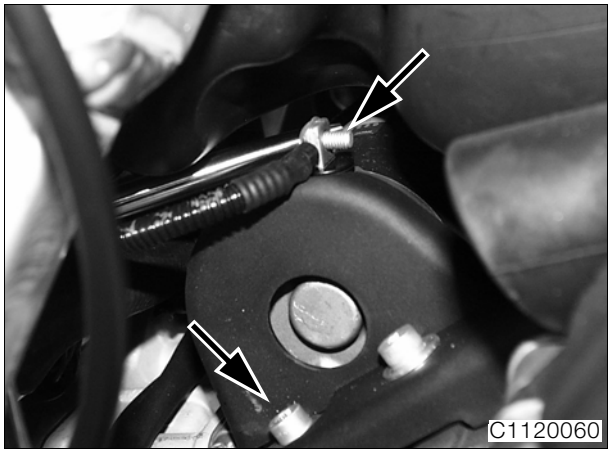
When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Ignition coil mount..... 5 Nm

12 41 020 Replacing starter

Attention:
Disconnect ground cable from battery and insulate it!

- Remove intake-air plenum chamber from rear mudguard
- Remove fasteners securing rear mudguard



- Unsnap discharge hose from plenum chamber on auxiliary swing arm
- Remove the fasteners securing the air filter housing to the powertrain cradle
- Detach positive and negative cables (arrows) from starter
- Press plenum chamber up and to the right, then pull the rear mudguard cover over the starter
- Pull the starter out of the guide

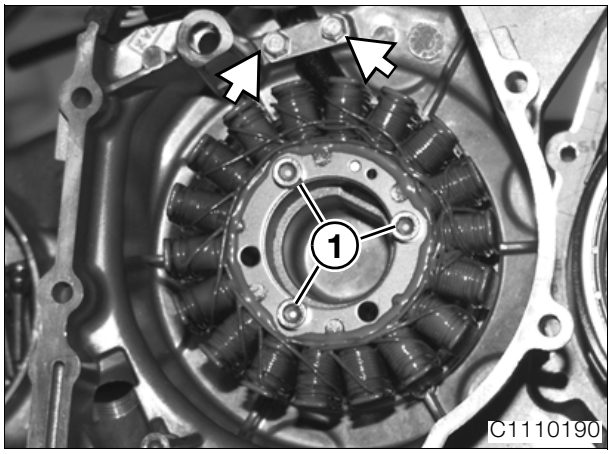
Note:
Grease pinion before installing, oil o-ring!

Fluids and lubricants:
Starter pinion..... Shell HDX2

Torque specification:
Starter to engine ..... 10 Nm

12 11 070 Replacing alternator

– Removing ignition trigger cover
➡ .....See Group 11



- Remove fasteners (arrows)
- Remove bolts (1) and take out alternator

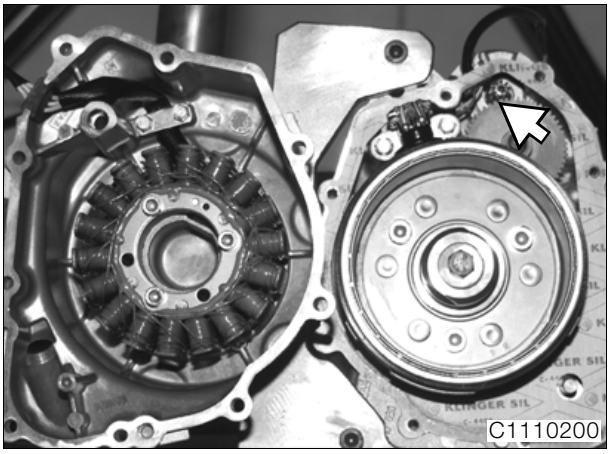
When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Alternator bolts..... 10 Nm
Cable attachments (Tapite bolts)
(+ Loctite 243)..... 6 Nm

12 11 060 Replacing TDC trigger

- Remove securing screws and remove ignition trigger

When installing:
- Make sure that cables are correctly routed



- Cable clip must engage centring fixture (arrow) in cover
- Coat threads of self-tapping screws with Loctite prior to installation (Tapite screws)
- Note direction of installation for trigger

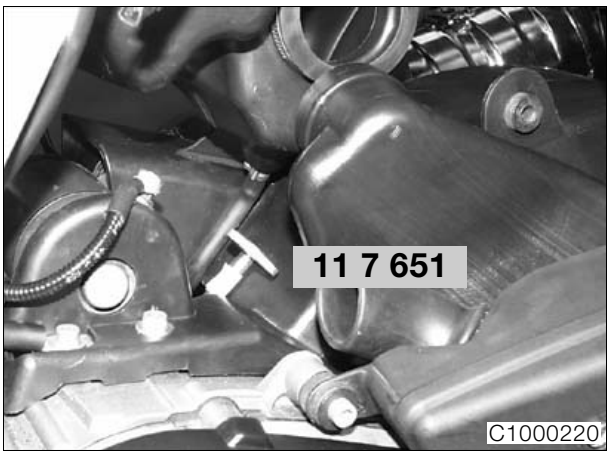
Fluids and lubricants:
Attachment bolt..... LOCTITE 243

Adjustment specification:
Sensor gap .....8 ± 0.4 mm
..... (0.315 ± 0.0157 in)

Torque specification:
Tapite bolts (+ Loctite 243) ..... 6 Nm

Reluctor removal and installation

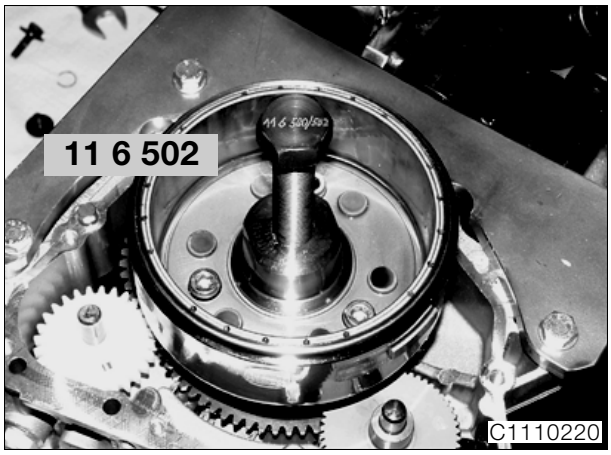
– Remove ignition trigger cover



– Turn crankshaft to TDC and lock in place with set bolt, **BMW No. 11 7 651**
➟ .....See Group 11

Note:
When replacing the one-way clutch, release the attachment bolts before removing the reluctor!

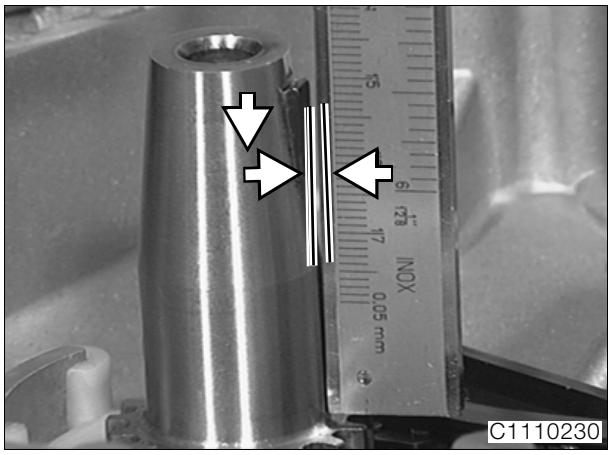
- Remove screw



- Use removal bolt, **BMW No. 11 6 502,** to press off reluctor with one-way clutch
- Check taper and keyway of reluctor

When installing:

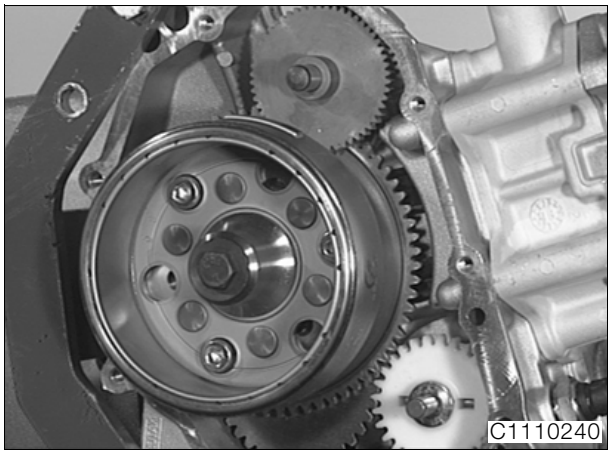
- Remove all traces of old thread-locking compound from the threads



- Install Woodruff key parallel to crankshaft (arrow), not parallel to taper
- Degrease taper and lightly coat with Loctite 648
- Push reluctor with one-way clutch onto crankshaft

Attention:
Do not allow adhesive to penetrate to the bearing seat on the one-way clutch!

Note:
Turning the one-way clutch counter-clockwise opens it. The reluctor housing cannot be pushed onto the crankshaft taper unless the one-way clutch is opened!



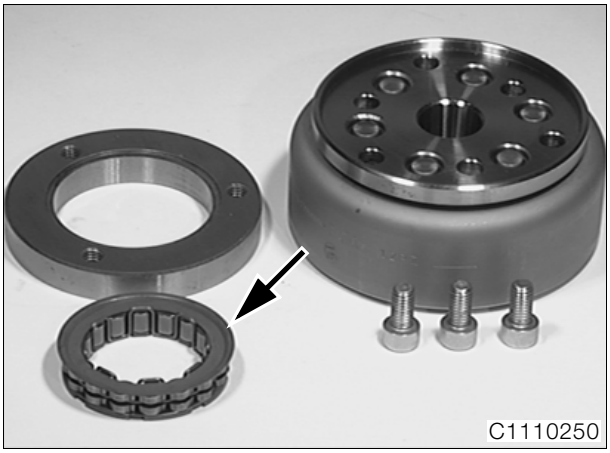
- Install securing screw with washer: coat threads of securing screw with Loctite 243

Fluids and lubricants:
Bolt .....LOCTITE 243
Cone .....LOCTITE 648

Torque specification:
Bolt to crankshaft (+ Loctite 243) ..... 30 Nm

12 11 077 Replacing one-way clutch

– Remove cover
– Remove reluctor



- Loosen the attachment screws on the reluctor housing by supporting the bottom in a vise with protective padding on the jaws
- Check friction face for wear
- Check one-way clutch for damage to the dogs
- Make sure that the circumferential spring is not stretched

When installing:

- The thrust ring (arrow) must snap into place in the recess in the one-way clutch housing
- Remove all traces of old thread-locking compound from the threads

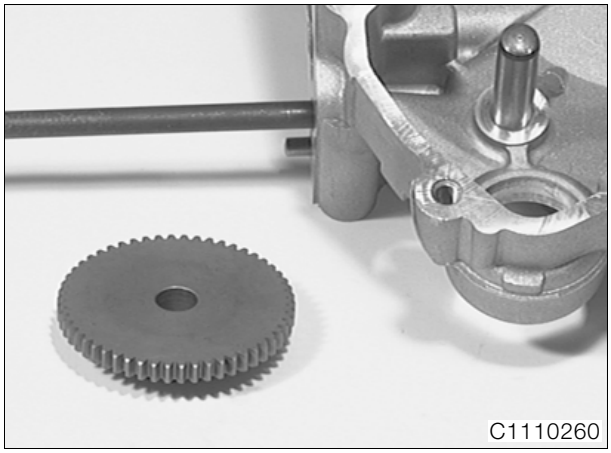
Fluids and lubricants:

Attachment bolts ..... LOCTITE 243

Torque specification:

Attachment bolts ..... 30 Nm

Replacing starter double gear



- Check bearing bore
- Check teeth for distortion, wear and chipping
- Check straight pin

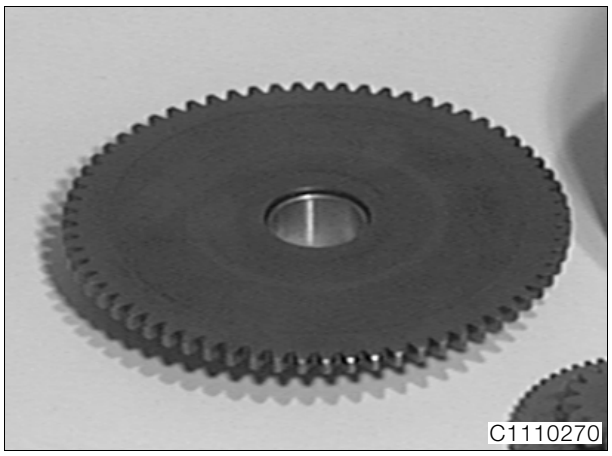
Wear data:

Internal diameter ..... max. 10.08 mm
.....(max. 0.3969 in)
Straight pin ..... max. 9.95 mm
.....(max. 0.3917 in)

When installing:

- Oil straight pin
- Engage with splines of one-way clutch gear
- Mount spacing sleeve on straight pin

Replacing one-way clutch gear



- Measure bearing bore
- Check teeth for distortion, wear and chipping
- Check friction face for wear

Wear data:
Internal diameter ..... max. 22.05 mm
.....(max. 0.8681 in)

Note:
Before installing one-way clutch, check Woodruff key!

- Make sure that the Woodruff key is installed with the flat face parallel to the crankshaft axis, as otherwise it is not possible to install the one-way clutch
- Oil bushing and crankshaft stub before installing



13 Fuel preparation and control

Contents

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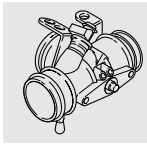
Removing and installing air filter housing 3

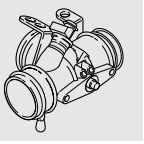
Removing and installing intake-air plenum chamber 3

Removing and installing throttle-valve assembly 5

Injector 6
- Removing and installing injectors 6
- Replacing injector 6
- Replacing injection nozzle holder 7

Replacing BMS control unit 7

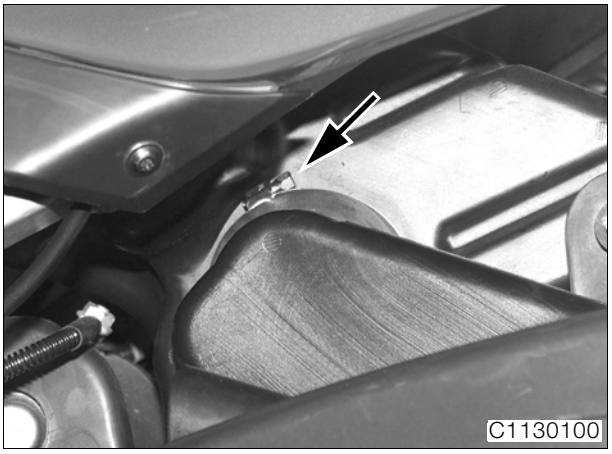




13 72 110 Removing and installing air filter housing



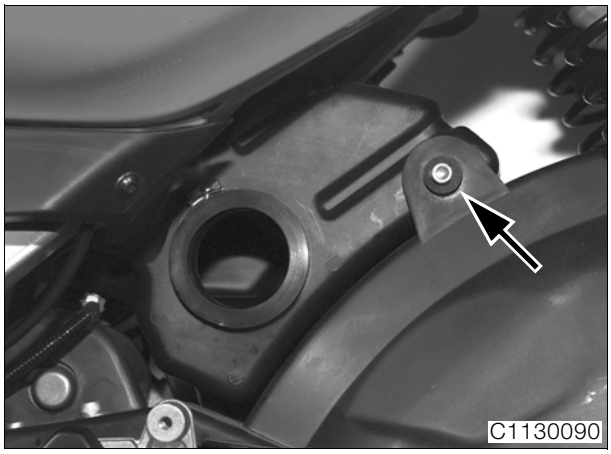
- Remove fasteners (arrows)



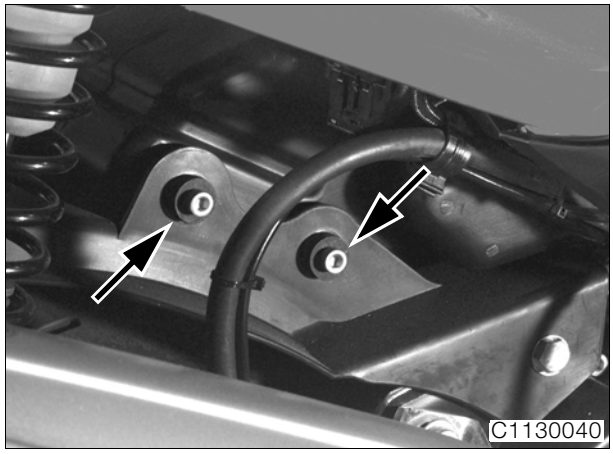
- Loosen hose clamps (arrow) on intake-air plenum chamber

13 72 128 Removing and installing intake-air plenum chamber

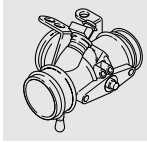
– Remove air filter housing

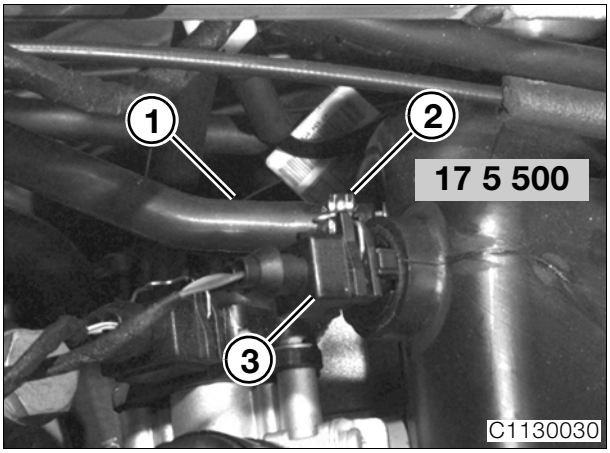


- Remove fastener (arrow)

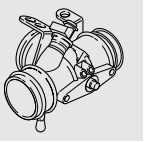


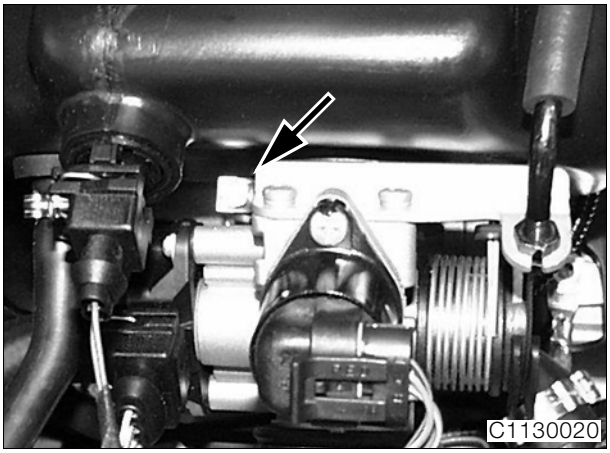
- Remove fasteners (arrows)





- Disconnect plug (3)
- Open hose clamp (2) with pliers, **BMW No. 17 5 500**
- Disconnect hose (1)





- Loosen plenum chamber/throttle valve hose clamp (arrow)



- Use hoist, **BMW No. 00 1 570,** to raise C1 slightly
- Detach the spring struts from the powertrain cradle and tie up out of the way
- Only raise vehicle just enough to allow removal of plenum chamber to the rear
- Remove plenum chamber by pulling to the rear

When installing:

- Installation is the reverse of the removal procedure

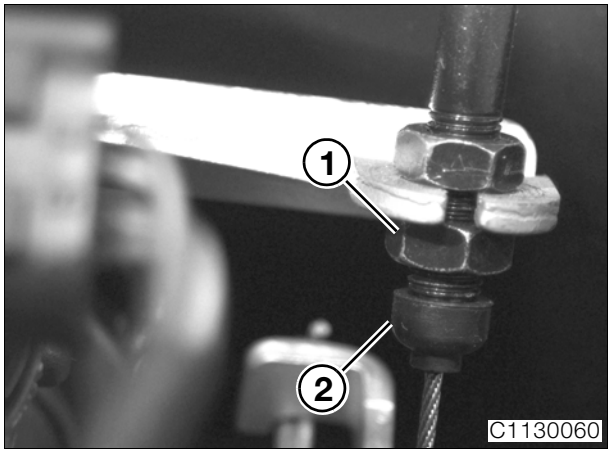
Torque specification:

Plenum chamber mount ..... 9 Nm
Strut mount on powertrain cradle ..... 21 Nm
Hose clamp ..... hand-tight

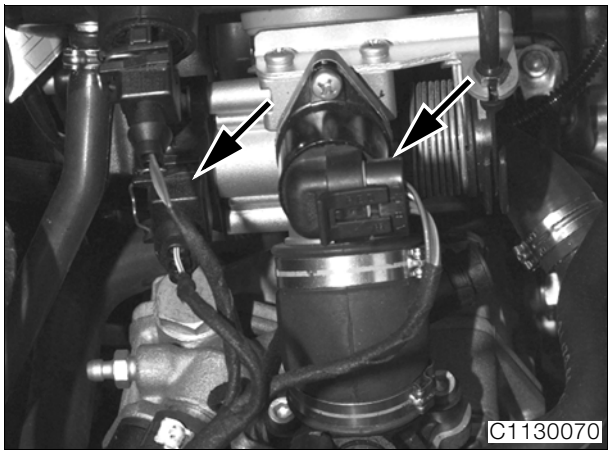
13 54 017 Removing and installing throttle-valve assembly

– Open the seat

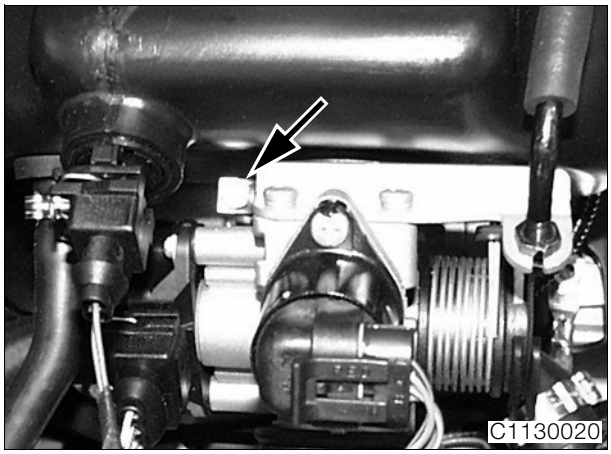
➠ .....See Group 52



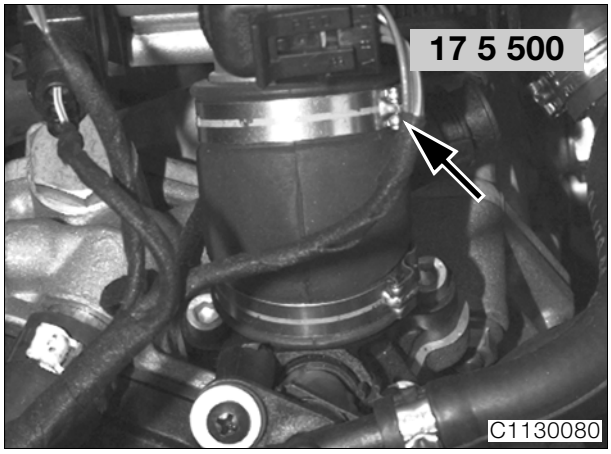
- Pull rubber cap (2) down
- Remove fastener (1) for throttle cable
- Disengage throttle cable from bracket and cam disc



- Disconnect plugs (arrows)



- Loosen plenum chamber/throttle valve hose clamp (arrow)



- Release hose clamp (arrow) on intake air duct with pliers, **BMW No. 17 5 500**
- Pull up rear of throttle valve assembly whilst simultaneously separating from intake-air duct
- Remove throttle valve assembly from plenum chamber by pulling to the front

When installing:

- Installation is the reverse of the removal procedure

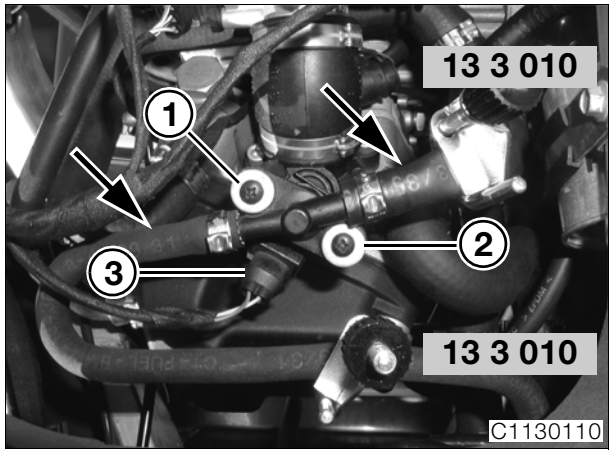
Torque specification:

Throttle cable mount ..... 8 Nm
Hose clamp.....hand-tight

Injector

Removing and installing injectors
– Open the seat
➠ .....See Group 52
– Release front guard plate from frame and fold forward

Warning:
Comply with safety precautions when handling or working with fuel; note that the fuel lines are pressurised!



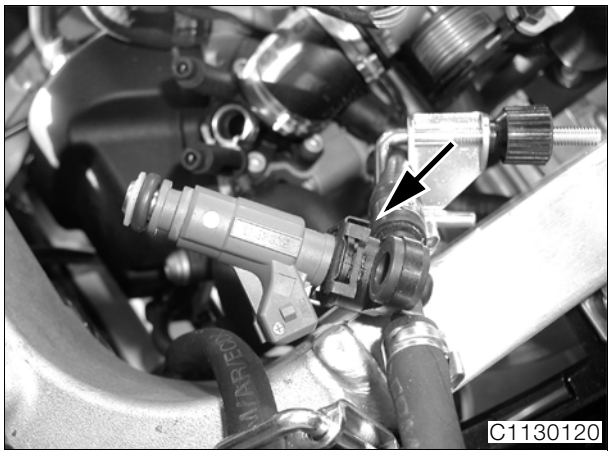
- Use hose clamps, **BMW No. 13 3 010**, to close off fuel hoses (arrows)
- Undo plug-in connection (3)
- Release injector attachments (1, 2)
- Extract injector by pulling up

When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Injector attachment
(+ Loctite 243) ..... 4 Nm

Replacing injector
– Open the seat
➠ .....See Group 52
– Release front guard plate from frame and fold forward
– Remove injector

Warning:
Comply with safety precautions when handling or working with fuel; note that the fuel lines are pressurised!



- Remove spring clip (arrow)
- Remove injector

When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Injector attachment
(+ Loctite 243) ..... 4 Nm

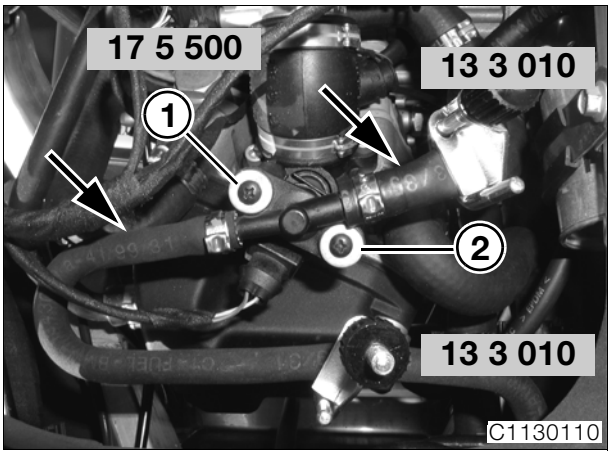
Replacing injection nozzle holder

– Open the seat

➠ .....See Group 52

– Release front guard plate from frame and fold forward

Warning:
Comply with safety precautions when handling or working with fuel; note that the fuel lines are pressurised!



- Use hose clamps, **BMW No. 13 3 010**, to close off fuel hoses (arrows)
- Use pliers, **BMW No. 17 5 500,** to release hose clamps
- Disconnect the fuel hoses
- Release injector attachments (1, 2)
- Remove injection nozzle holder by pulling up

When installing:

- Installation is the reverse of the removal procedure

Torque specification:
Injector attachment
(+ Loctite 243) ..... 4 Nm

13 61 025 Replacing BMS control unit

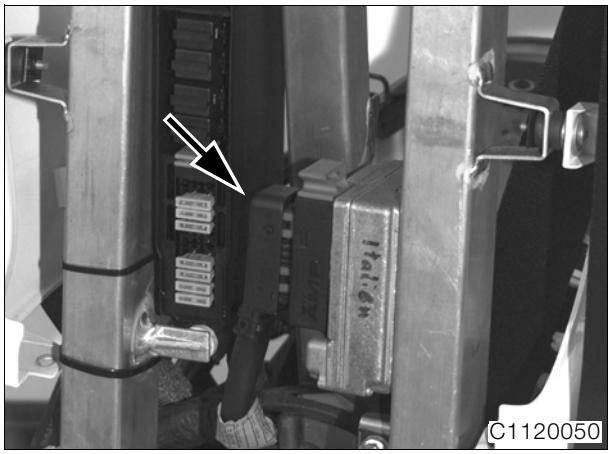
– Open the seat

– Remove the backrest

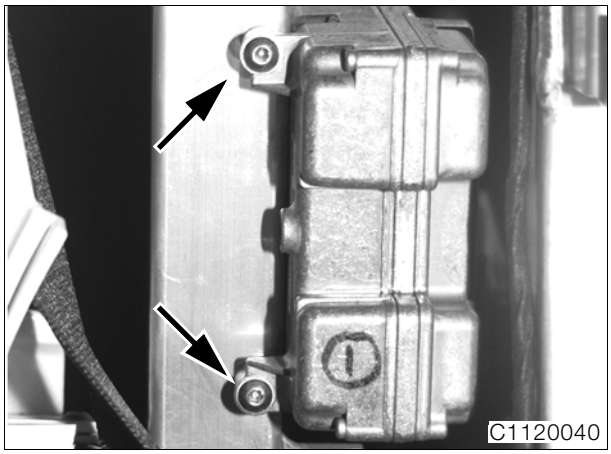
➠ .....See Group 52

– Remove the rear storage compartment

➠ .....See Group 46



- Undo the plug-in connection (arrow) by pulling the red retainer up whilst simultaneously pulling the plug to the right

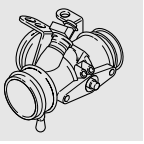


- Remove fasteners (arrows) securing the BMS control unit
- Remove the BMS control unit

When installing:

- Installation is the reverse of the removal procedure

Torque specification:
BMS control unit mount ..... 5 Nm



16 Fuel tank and lines

Contents

Page

Technical Data 3

Removing and installing fuel tank 5

Replacing fuel filter 7

Fuel pump unit 8

Removing, installing fuel pump assembly 8





Technical Data		C1
Tank capacity	l (Imp pint/US quart)	9.7 (17.1/10.3)
including reserve of	l (Imp pint/US quart)	2.5 (4.4/2.6)
Fuel specification		Super (premium), unleaded, 95 octane (RON)
Fuel pump		
Type		Peripheral-gear pump
Rated voltage	V	12
Operating voltage	V	7...14
Fuel pressure	bar (psi)	2.5 (35.57) operating pressure 3.8 (54.07) max
Delivery volume	l/h (Imp gal/US gal/h)	90...40 (19.81/23.78...8.80/10.57)





16 11 030 Removing and installing fuel tank

Attention:
Disconnect earth cable from battery and insulate it!

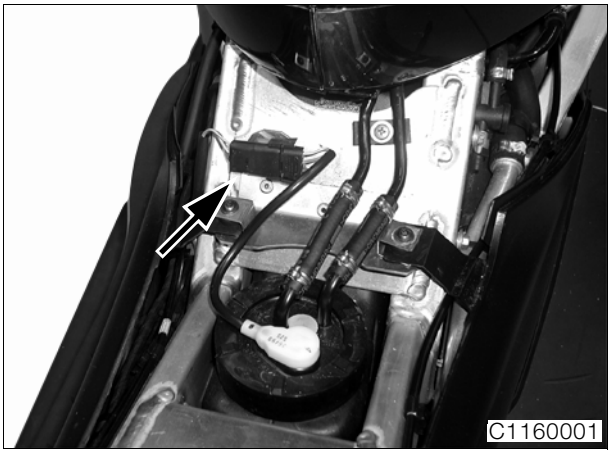
– Open the seat
– Remove left service cover
– Remove top and left tunnel panels

➠ .....See Group 46

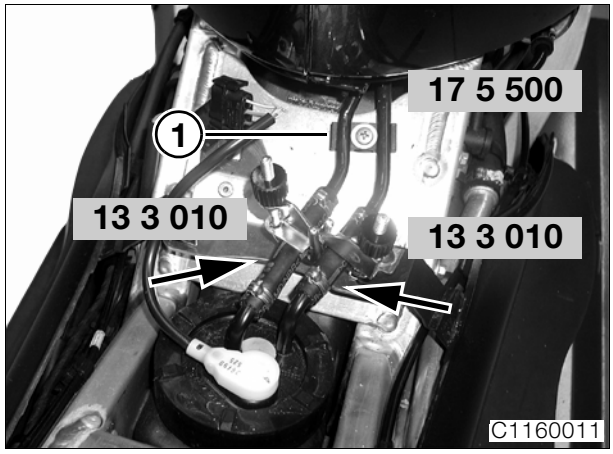
- Release tunnel panel on right from frame
- Release tunnel panel on right from front anchorage point

Warning:
Comply with safety precautions when handling or working with fuel; note that the fuel lines are pressurised!

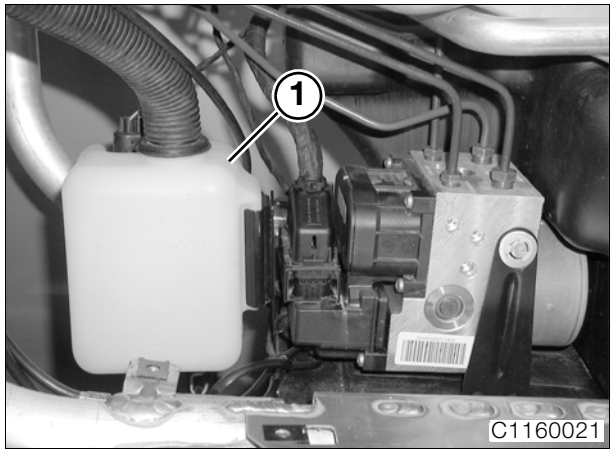
- Remove fuel cap
- Remove overflow guard from fuel filler neck
- Reinstall fuel cap



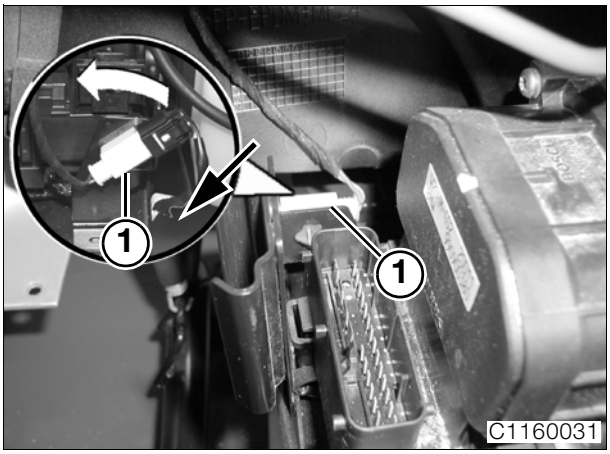
- Disconnect the plugs for fuel pump and fuel-level sensor (arrow)



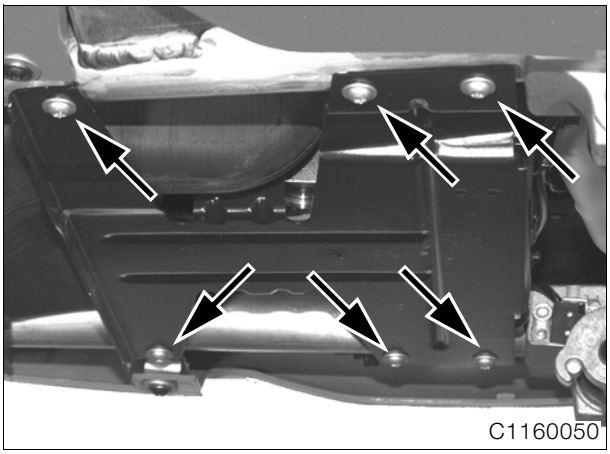
- Use hose clamps, **BMW No. 13 3 010**, to close off fuel hoses (arrows)
- Use pliers, **BMW No. 17 5 500,** to release hose clamp
- Pull fuel lines out of bracket (1)
- Disconnect the fuel hoses



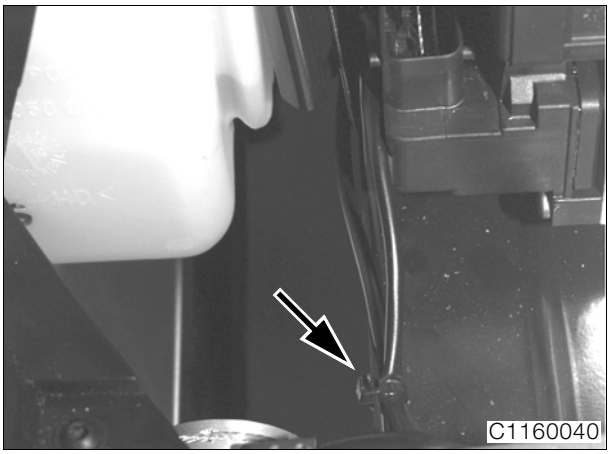
- Remove washer fluid reservoir (1) from bracket



- Turn plug (1) in direction indicated by arrow to remove it from the bracket
- Open cable tie (arrow)



- Remove 6 fasteners (arrows) securing the bracket to the frame, move the bracket down to remove

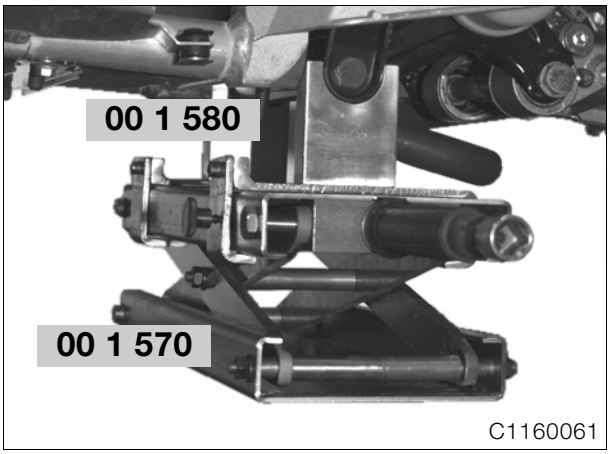


- Cut through cable tie (arrow) of connecting cable for stand switch

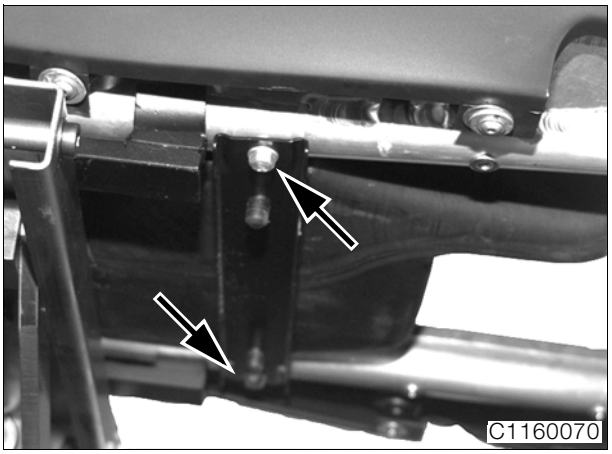
Additional, applies to vehicles with ABS:

– Remove the ABS control unit

➠ .....See Group 34



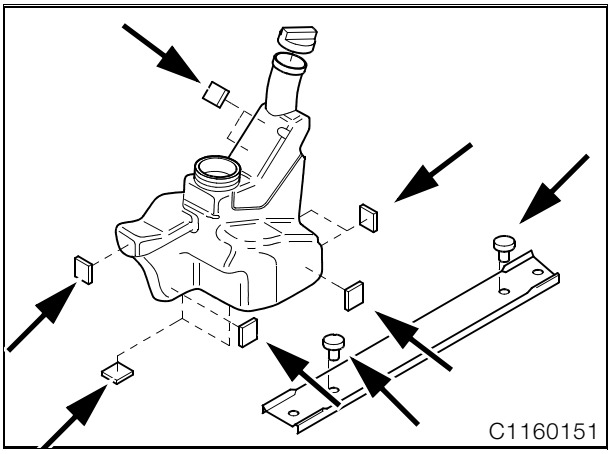
- Use hoist, **BMW No. 00 1 570,** and attachment, **BMW No. 00 1 580**, to lift vehicle



- Remove the fastenings (arrows) for the bracket
- Press down fuel tank
- Use hoist to raise until the fuel tank can be removed from the side

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following operations:



Attention:
Ensure that the fuel tank supports (arrows) (foam rubber) are positioned correctly!
Make sure there is adequate clearance to the right-side tunnel panel!

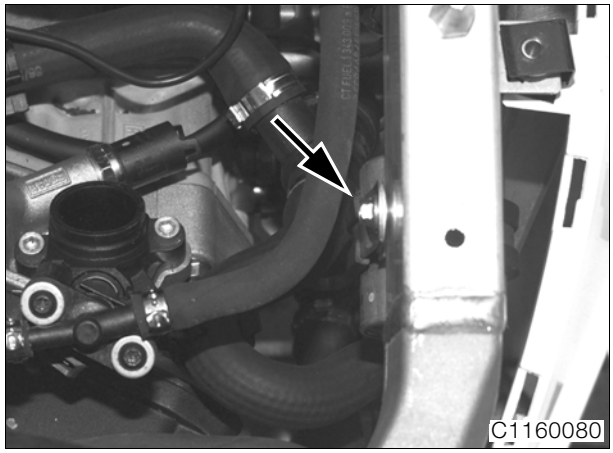
Torque specification:

Bracket, fuel tank to frame	9 Nm
Bracket, washer fluid reservoir/ABS ECU to frame	9 Nm

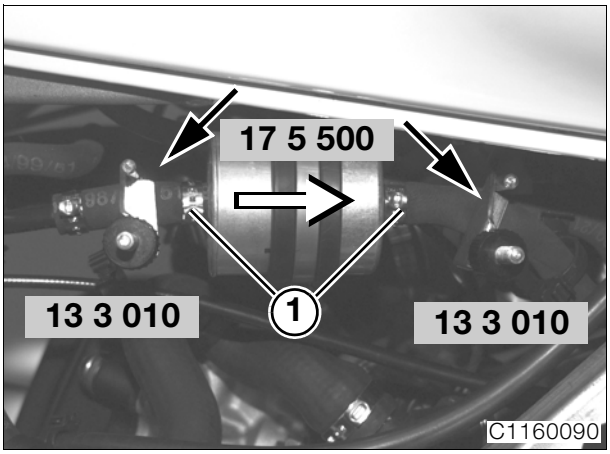
16 12 008 Replacing fuel filter

– Open the seat
– Remove left service cover
➠ .....See Group 46

Warning:
Comply with safety precautions when handling or working with fuel!



- Remove fastener (arrow)



- Use hose clamps, **BMW No. 13 3 010**, to close off fuel hoses (arrows)
- Release hose clamps (1) with pliers, **BMW No. 17 5 500**

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following operations:

Attention:
Note correct direction of flow through fuel filter (indicated by white arrow).
Make sure the hose clamps are correctly positioned.
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion!

Torque specification:
Fuel filter mount..... 5 Nm

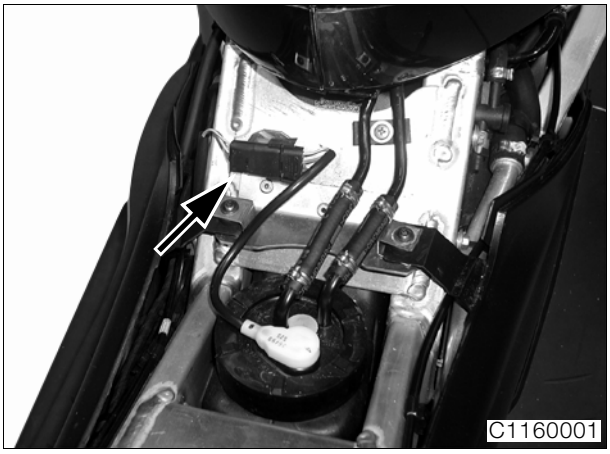
Fuel pump unit

16 14 009 Removing, installing fuel pump assembly

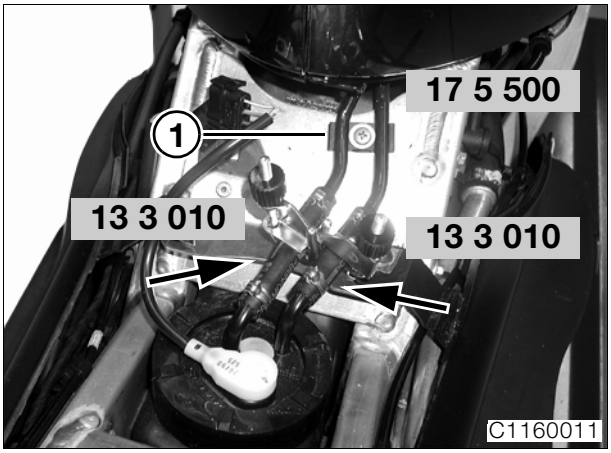
Attention:
Disconnect earth cable from battery and insulate it!

Warning:
Comply with safety precautions when handling or working with fuel.

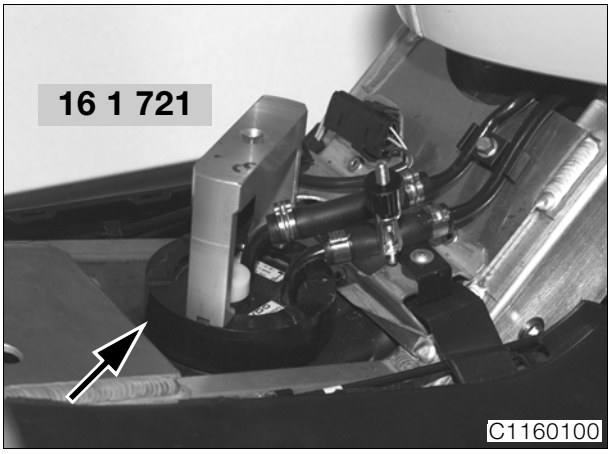
– Remove top tunnel panel
➠ .....See Group 46



- Disconnect the plug for the fuel-pump unit (arrow)



- Use hose clamps, **BMW No. 13 3 010**, to close off fuel hoses (arrows)
- Slacken hose clamps with pliers, **BMW No. 17 5 500**
- Pull fuel lines out of bracket (1)
- Disconnect the fuel hoses



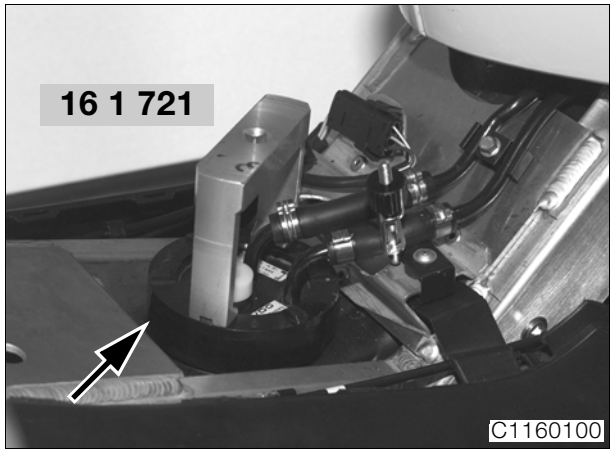
- Loosen union nut (arrow) with spanner, **BMW No. 16 1 721**
- Turn the fuel-pump unit 1/4 counter-clockwise and lift it out to the left

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Take care not to damage the intake filter and the fuel-level sensor!

- Fit the seal and install the fuel-pump unit in the fuel tan



- Tighten union nut (arrow) with spanner, **BMW No. 16 1 721**

Torque specification:
Union nut ..... 20 Nm



17 Radiator

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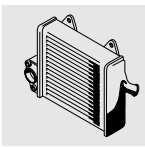
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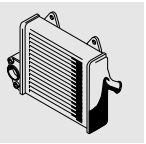
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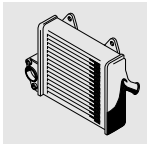
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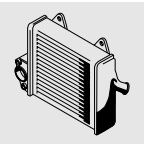
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Technical Data		C1
Cooling-system capacity		
Total capacity	l (Imp pint/US quart)	1.45 (2.55/1.53)
Cooling circuit	l (Imp pint/US quart)	1.25 (2.20/1.3214), top-up capacity approx. 1.2 l (2.1123/1.2685)
Expansion tank	l (Imp pint/US quart)	0.2 (0.35/0.21)
Coolant		Use only nitride-free extended-duty antifreeze with corrosion inhibitor
Mixture ratio		50% antifreeze 50% water
Protection against freezing down to	°C (°F)	-25 (-13)
Thermostat opening temperature	°C (°F)	72...75 (161.6...167)
Fan cut-in temperature	°C (°F)	102 (216)
Activation temperature for coolant warning lamp	°C (°F)	114 (237)
Pressure-relief valve in end cover opens at	bar (psi)	1.5 (0.059)

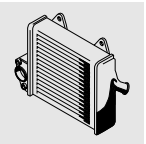




Coolant circuit

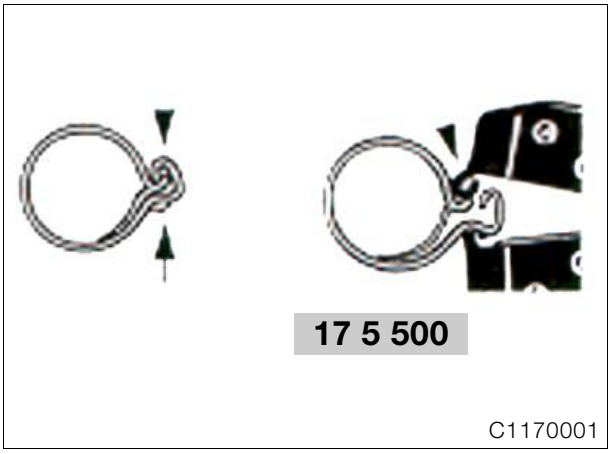


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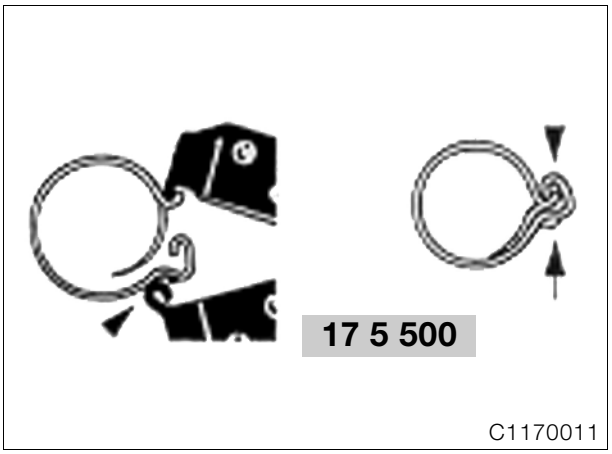
Removing and installing coolant hoses

Opening hose clamps



- Release all hose clamps with pliers, **BMW No. 17 5 500**

Closing hose clamps



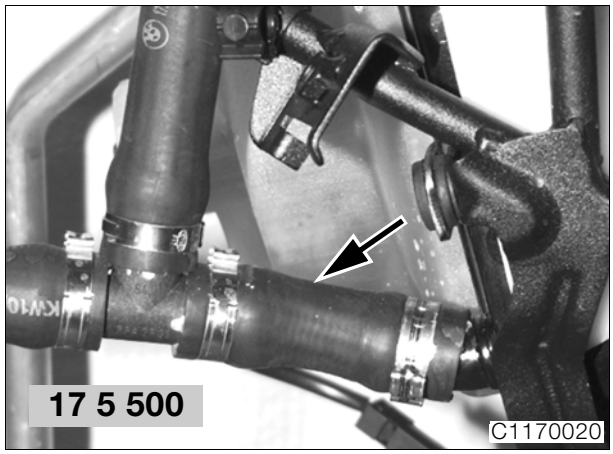
- Reclose all hose clamps with pliers, **BMW No 17 5 500**

Attention:
Always make sure that hose clamps are correctly positioned in order to ensure easy access whenever necessary

17 12 145 Replacing feed hoses to radiator

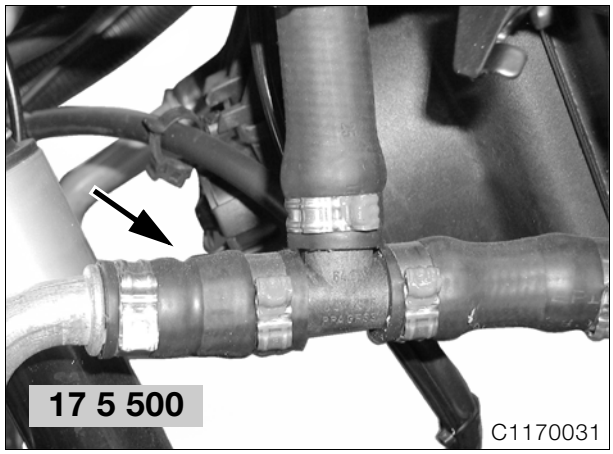
– Remove front fairing panel
– Swing the headlight forward and down
– Remove right side trim panel
➡ .....See Group 46
– Drain coolant (➡ 17.14)

17 12 150 Hose between radiator and elbow

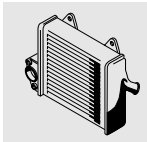


- Remove coolant hose (arrow)

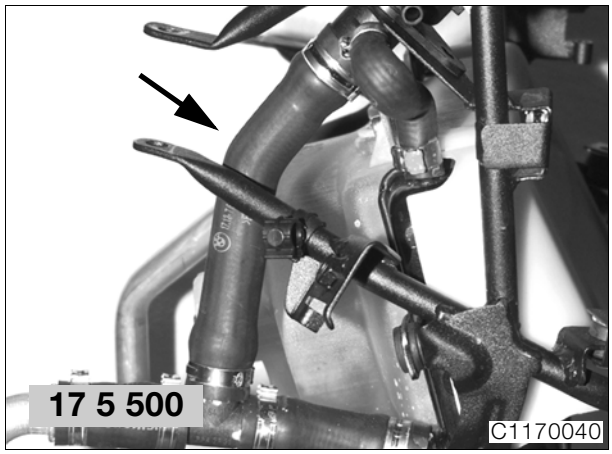
17 12 154 Hose between elbow and coolant pipe



- Remove coolant hose (arrow)

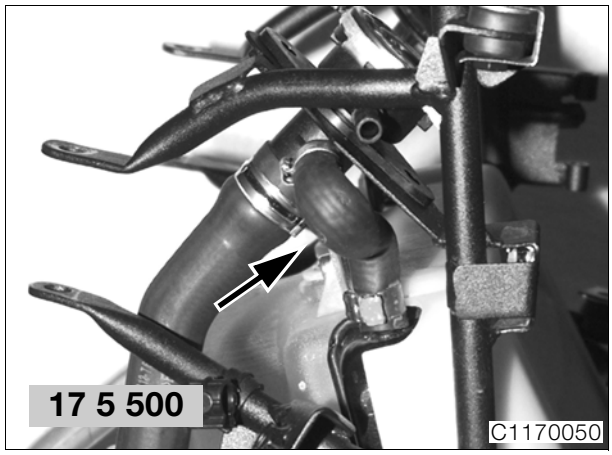


17 12 159 Hose between elbow and refill reservoir



- Remove moulded hose (arrow)

Vent hose

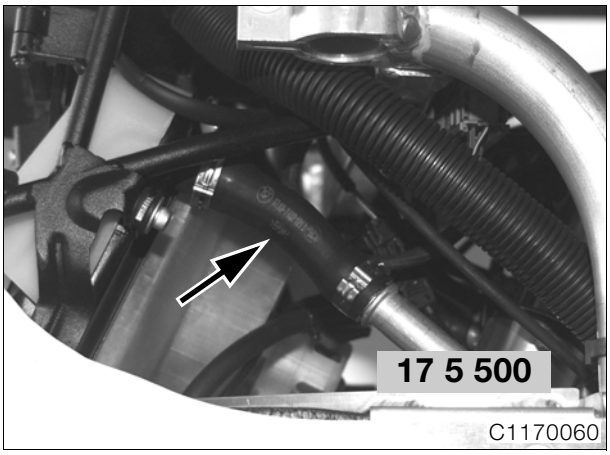


- Remove moulded hose (arrow)

17 12 175 Replacing return hose to radiator

– Remove front fairing panel
– Remove left side trim panel
➠ .....See Group 46
– Drain coolant (➠ 17.14)

17 12 180 Hose between radiator and coolant pipe

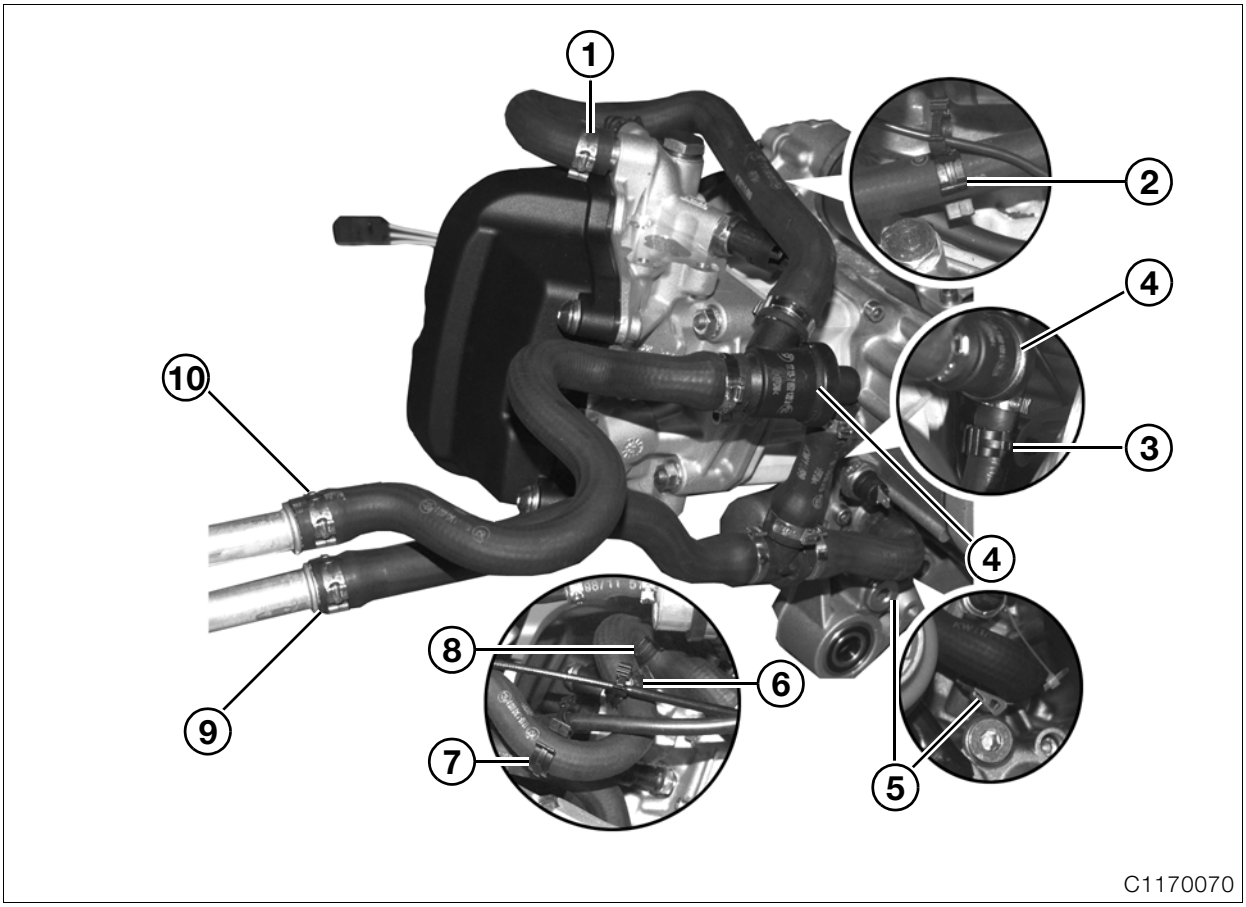


- Remove coolant hose (arrow)

Installing coolant hoses

Attention:
Always make sure that hose clamps are correctly positioned in order to ensure easy access whenever necessary.
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion!

- Installation is the reverse of the removal procedure
- Refill with coolant (➠ 17.15)
- After running the engine check the coolant level and top up if necessary



Replacing coolant hoses on engine

– Open the seat
➠ .....See Group 52
– Remove left service cover
➠ .....See Group 46
– Drain coolant (➠ 17.14)

Remove engine coolant hoses
- Open hose clamps (1, 9, 10)
- Slacken screw clamp (5)
- Release starter cable bracket (2) from custom-moulded hose
- Disconnect spark plug cap
- Remove ignition cable bracket (7)
- Detach bracket (6) for seat-belt central release cable from moulded hose
- Release moulded hose from bracket (8)
- Remove all coolant hoses from engine

17 12 190 Replacing coolant hoses
– Removing engine coolant hoses
- Remove the appropriate moulded hose

11 53 120 Replacing thermostat
– Remove engine coolant hoses
- Remove thermostat (4)

Install engine coolant hoses
- Installation is the reverse of the removal procedure

Attention:
Always make sure that hose clamps (1, 9, 10) are correctly positioned in order to ensure easy access whenever necessary.
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion!

- Adding coolant
- After running the engine check the coolant level and top up if necessary!

Torque specification:
Screw clamp to engine .....hand-tight

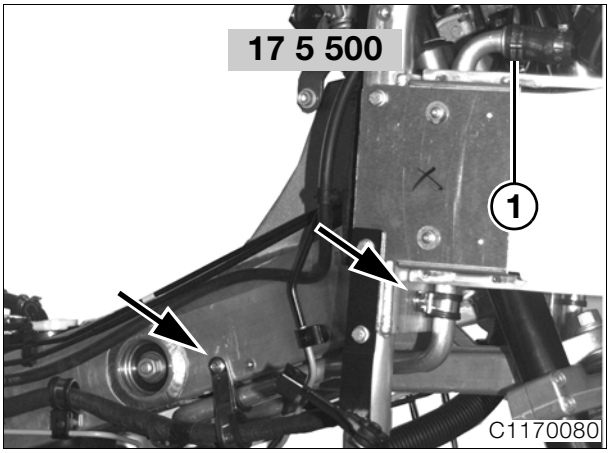
Removing and installing coolant pipes

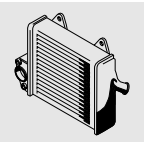
17 12 183 Removing engine coolant feed pipe

– Remove front fairing panel
– Remove left and right running boards
– Remove top, left and right tunnel panels
– Remove right side trim panel
– Remove knee pad

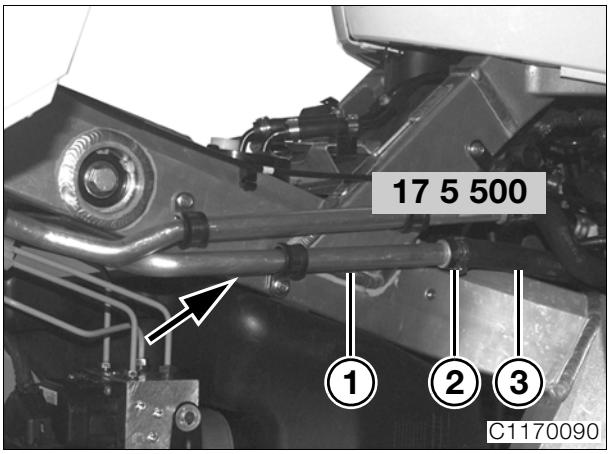
➡ .....See Group 46

– Draining coolant (➡ 17.14)

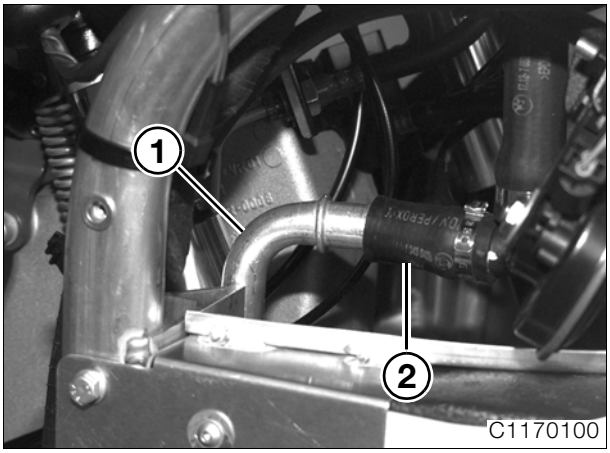




- Remove fasteners (arrows) from frame on the right
- Release hose clamps (1) with pliers, **BMW No. 17 5 500**



- Remove fasteners (arrows) from frame on the left
- Release hose clamps (2) with pliers, **BMW No. 17 5 500**
- Disconnect coolant hose (3) on left from coolant pipe (1)



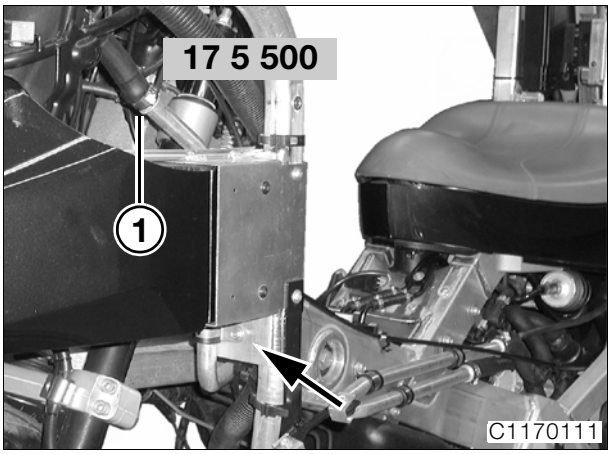
- Turn the handlebars all the way to the right
- Press coolant pipe (1) inward/to rear and pull off coolant hose (2)
- Pull coolant pipe (1) forward to remove

17 12 186 Removing engine coolant return pipe

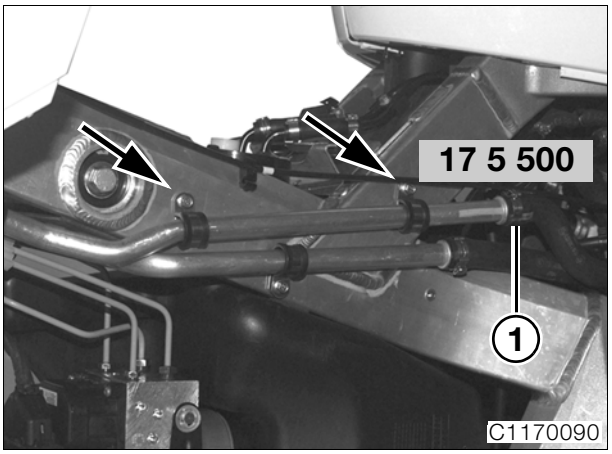
– Remove front fairing panel
– Remove left sill panel
– Remove top and left tunnel panels
– Remove left side trim panel
– Remove knee pad

➟ .....See Group 46

– Drain coolant from return lines (➟ 17.15)



- Remove fastener (arrows) from front frame
- Release hose clamps (1) with pliers, **BMW No. 17 5 500**



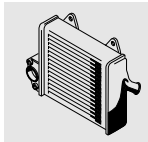
- Remove fasteners (arrows) from frame
- Release hose clamps (1) with pliers, **BMW No. 17 5 500**
- Disconnect coolant hoses from coolant pipe
- Pull coolant pipe forward to remove

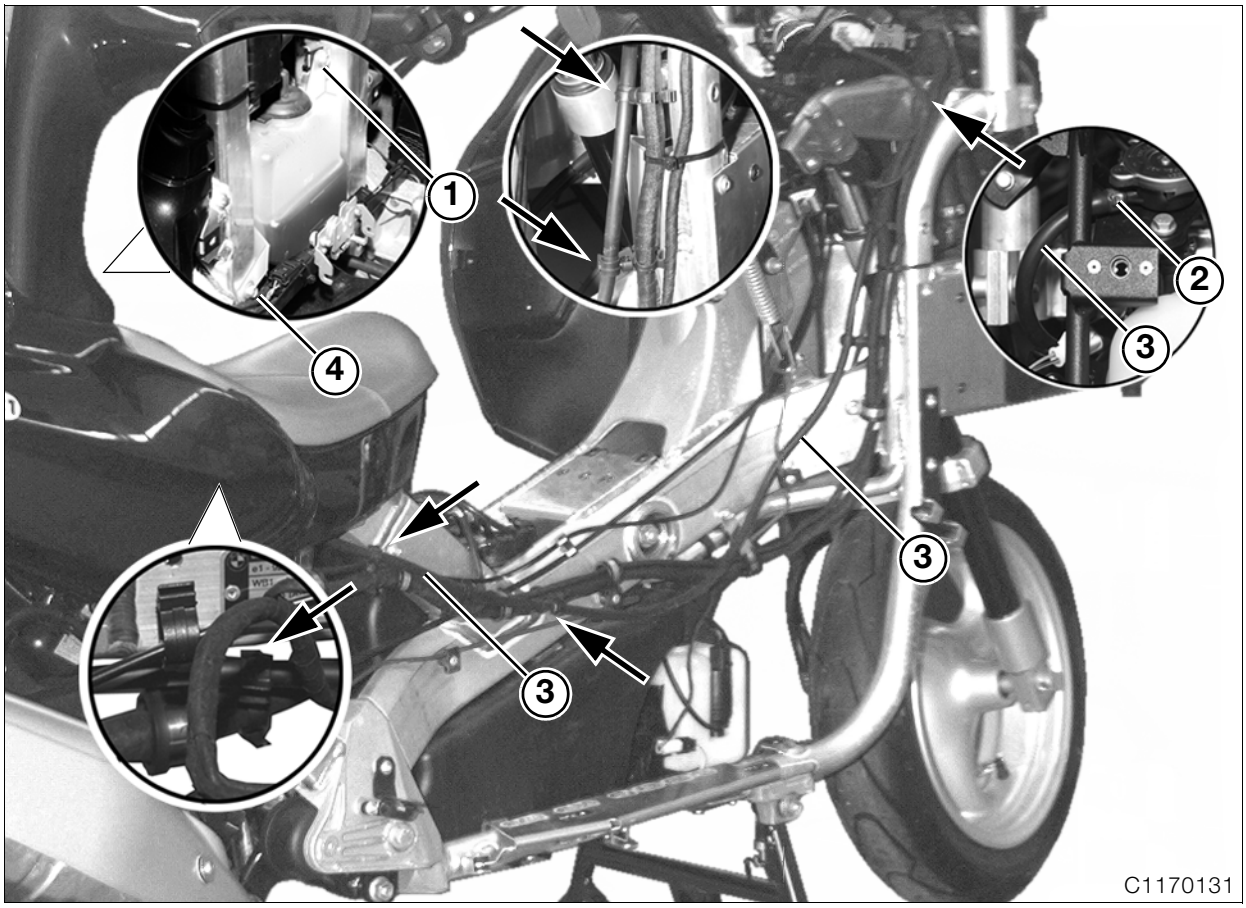
Installing coolant pipes

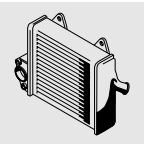
Attention:
Always make sure that hose clamps are correctly positioned in order to ensure easy access whenever necessary.
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion!

- Installation is the reverse of the removal procedure
- Refill with coolant (➟ 17.15)
- After running the engine check the coolant level and top up if necessary

Torque specification:
Coolant pipe to frame ..... 9 Nm







17 12 200 Replacing vapour discharge hose

– Remove front fairing panel
– Swing the headlight forward and down
– Remove right service cover
– Remove right running board
– Remove top and right tunnel panels
– Remove right side trim panel
– Remove knee pad

➠ .....See Group 46

– Open the seat
– Remove the backrest

➠ .....See Group 52

- Disengage the vapour discharge hose (3) from its fasteners (arrows)
- Remove fasteners (1, 4) for expansion tank
- Open hose clip (2) at refill reservoir and disconnect the vapour discharge hose

Note:
Coolant can leak from the coolant expansion tank!

If the expansion tank still contains coolant:
- Clamp vapour discharge hose with clamp, **BMW No. 13 3 010**
- Pull the vapour discharge hose out toward the rear until the end is approximately half-way along the vehicle
- Open the hose and drain off the coolant from the expansion tank

- Lift the expansion tank complete with vapour discharge hose clear of the vehicle
- Open hose clip at expansion tank and disconnect the vapour discharge hose

When installing:

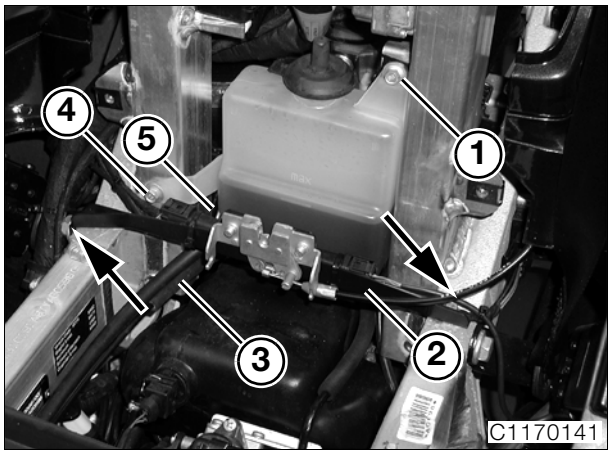
Attention:
Always make sure that hose clamps are correctly positioned in order to ensure easy access whenever necessary.
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion!

- Installation is the reverse of the removal procedure
- Fill the expansion tank with coolant up to the correct level
- After running the engine check the coolant level and top up if necessary

17 11 087 Removing and installing expansion tank

– Open the seat
– Remove the backrest

➠ .....See Group 52



- Remove fasteners (arrows) for bracket (2) of seat latch
- Remove fasteners (1, 4) for expansion tank
- Remove the expansion tank, keeping it below bracket (2) for seat latch
- Slacken hose clamp (5)

Note:
Coolant can escape from the coolant expansion tank!

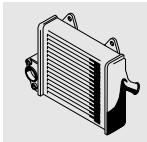
- Remove expansion tank cap
- Drain coolant
- Pull off vapour discharge hose (3)

When installing:
- Installation is the reverse of the removal procedure
- Adding coolant
- After running the engine check the coolant level and top up if necessary

Note:
If the powertrain cradle is out (e.g. for adjusting valves): The expansion tank can be manoeuvred out from below bracket (2) for the seat latch without bracket (2) being released!

Torque specification:

Mount, right seat lock bracket	42 Nm
Mount, left seat lock bracket	5 Nm
Mount, expansion tank	3 Nm

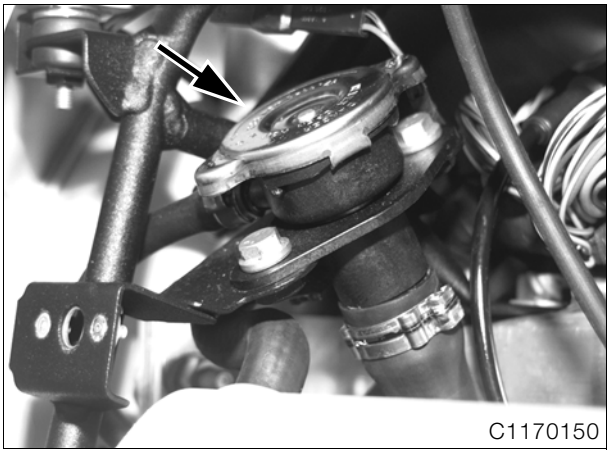


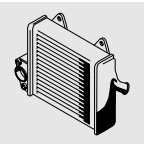
17 00 035 Changing coolant

Note:
Change the coolant at least every 2 years.

Draining coolant

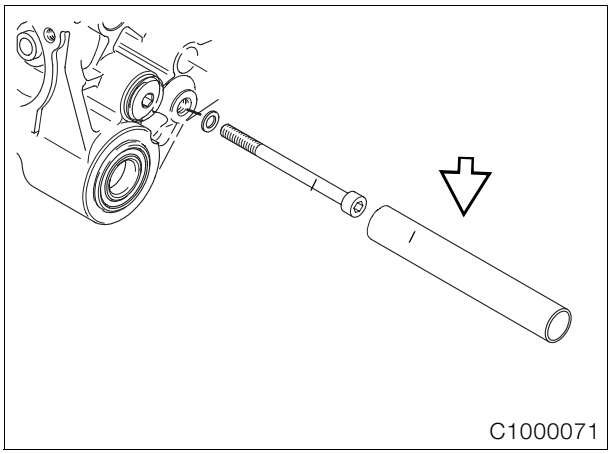
– Remove front fairing panel
– Swing the headlight forward and down
➠ .....See Group 46
– Open the seat
➠ .....See Group 52


C1170150

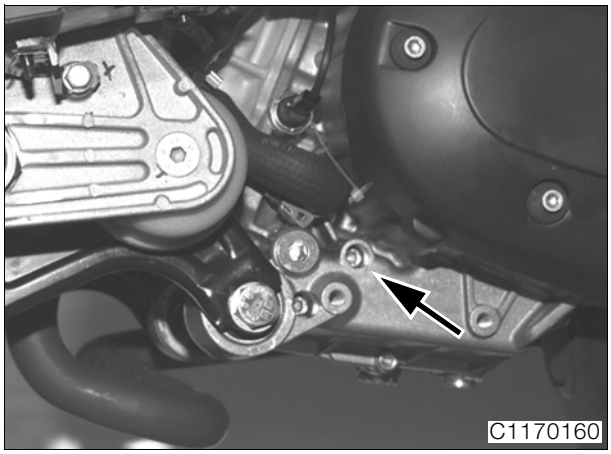


- Remove the filler cap (arrow) from the refill reservoir

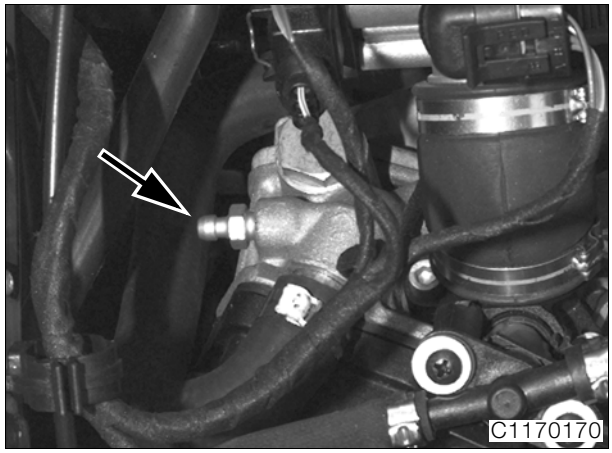
Drain coolant from supply line/engine


C1000071

- Guide hose (arrow) over head of drain screw


C1170160

- Unscrew drain plug (arrow) from engine

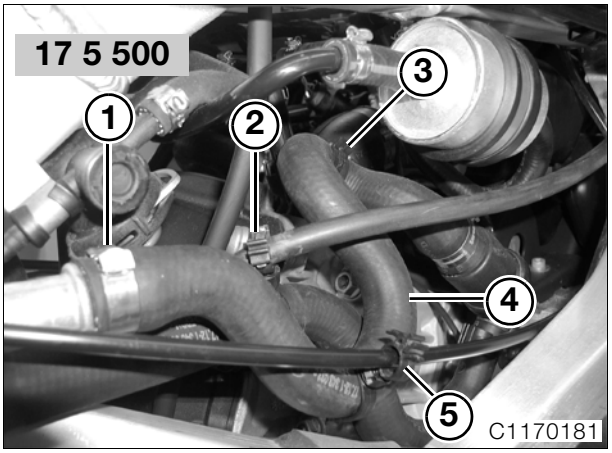

C1170170

- Open vent screw (arrow) in engine
- Drain coolant through hose

Draining coolant from return line

– Remove left service cover

➠ .....See Group 46



- Disconnect spark plug cap
- Remove bracket (2) for ignition cable
- Detach bracket (5) for seat-belt central release cable from moulded hose
- Remove moulded return hose (4) from bracket (3)
- Release hose clamps (1) with pliers, **BMW No. 17 5 500**
- Disconnect moulded hose (4) from coolant pipe

When installing:

- Installation is the reverse of the removal procedure
- Do not reinstall moulded return hose (4) in bracket (3) until system has been refilled with coolant

Draining coolant from expansion tank

– Removing and installing expansion tank

Note:
Remember to drain coolant from the vapour discharge hose as well!

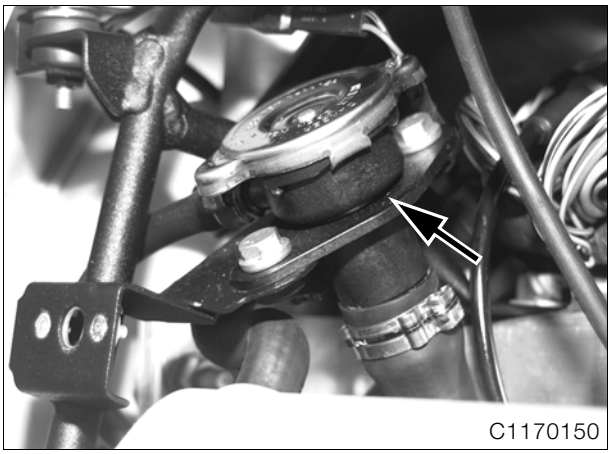
Adding coolant

Add coolant to feed and return lines and engine

- and install custom-moulded return hose on coolant pipe as necessary

Note:
Install new seal ring on drain plug!

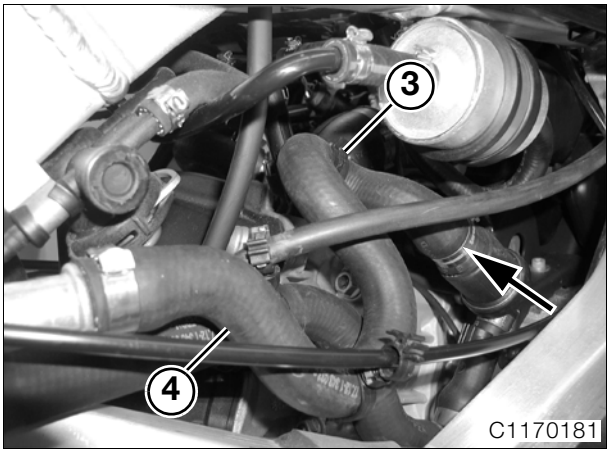
- Tighten drain plug
- Pour the coolant into the refill reservoir until bubble-free coolant escapes from the vent screw on the engine
- Tighten engine vent screw



- Top up coolant until level reaches bottom (arrow) of refill reservoir

Torque specification:

Drain plug ..... 10 Nm
Vent screw ..... 9 Nm

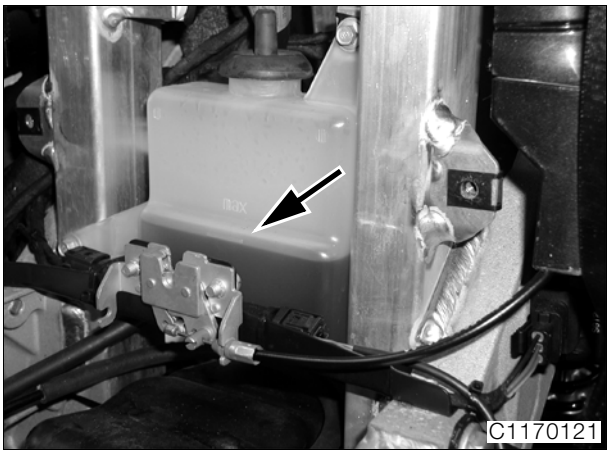


- if necessary, squeeze/move moulded return hose (4) to push trapped air upward in front of the thermostat (arrow)
- Secure moulded return hose (4) in bracket (3)
- Install cap on refill reservoir

Filling expansion tank with coolant

– Open the seat
– Remove the backrest

➠ .....See Group 52



- Top up with coolant to the MAX mark (arrow)
- Install the cap on the expansion tank

Checking coolant level

- Warm up the engine to operating temperature
- Check the coolant level in the refill reservoir and top up if necessary
- Check the coolant level in the expansion tank and top up if necessary

Fluids and lubricants

Coolant
in circuit .....1.25 l (2.2 Imp pint)
in expansion tank .....0.2 l (0.35 Imp pint)

Composition

Use only nitride-free extended-duty antifreeze with corrosion inhibitor

Mixture ratio

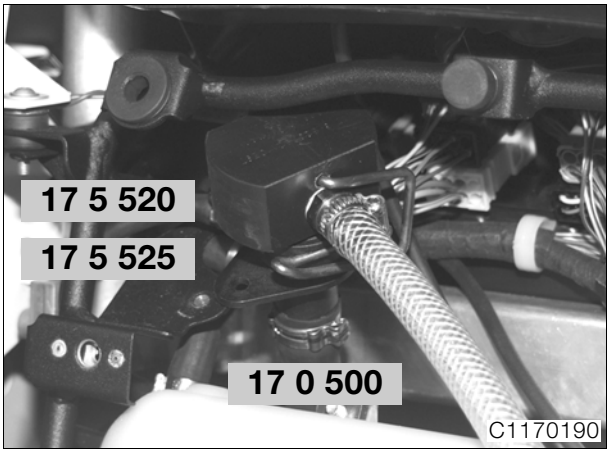
Antifreeze 50%
Water 50%

17 00 501 Checking cooling system for leaks

– Remove front fairing panel

➠ .....See Group 46

- Remove the filler cap from the refill reservoir



- Remove fasteners at refill reservoir
- Attach pump, **BMW No. 17 0 500,** with adapter, **BMW No. 17 5 520,** and spring clamp, **BMW No. 17 5 525,** to refill bag
- Pressure-test the system; the pressure must remain unchanged for at least 5 minutes

Setting:

Test pressure ..... 1 bar (14.5 psi)

When installing:

- Installation is the reverse of the removal procedure

17 11 007 Removing and installing radiator with fan

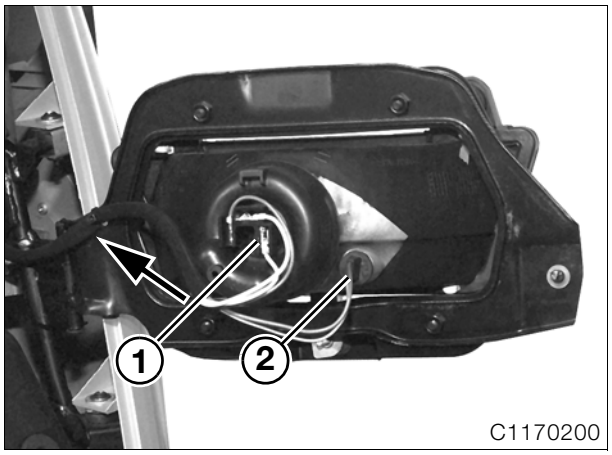
Removing and installing front frame with radiator

- Remove front fairing panel
- Swing the headlight forward and down
- Remove sill panel centre section and left and right sills
- Remove left and right side trim panels
- Remove front crash element

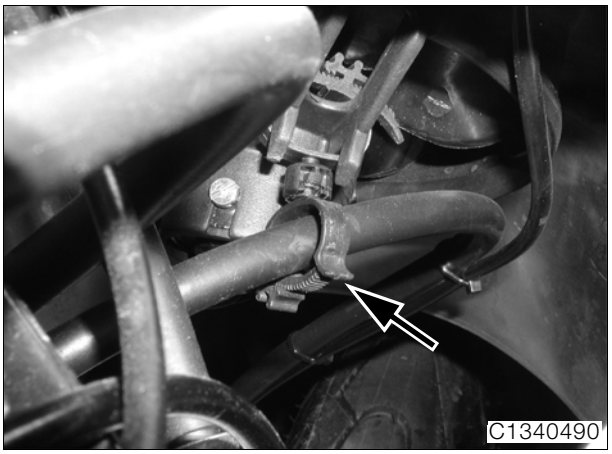
➠ .....See Group 46

- Draining coolant (➠ 17.14)
- Disconnect filler hose for washer fluid from reservoir

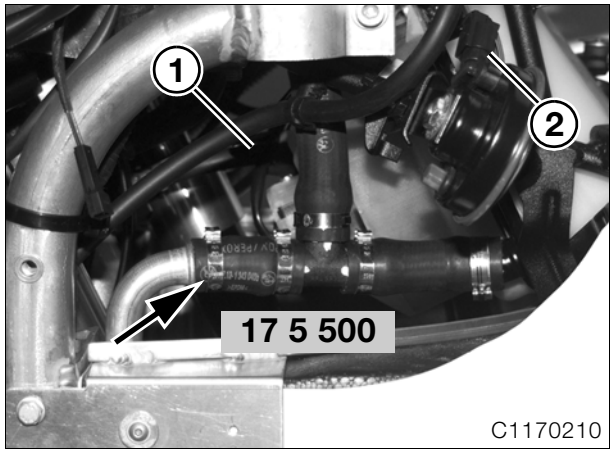
➠ .....See Group 61



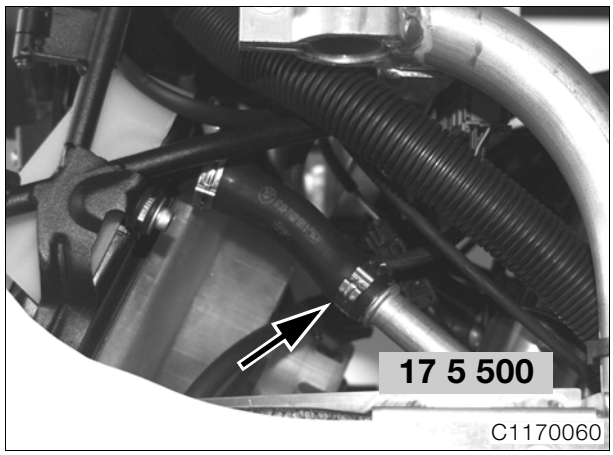
- Disconnect plug (1) from headlight
- Remove parking light (2) from its socket
- Open cable ties (arrows)



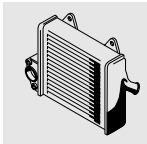
- Open cable clip (arrow)

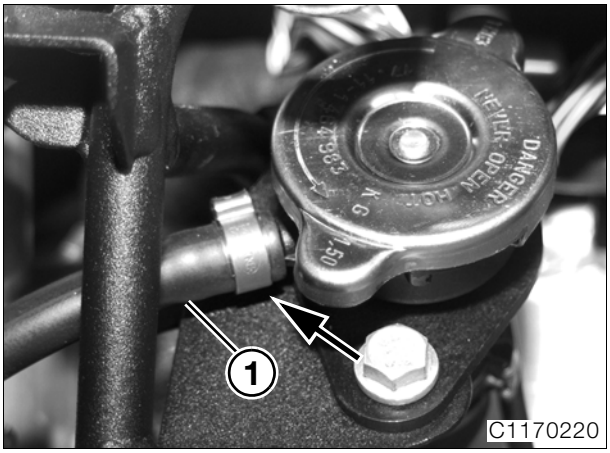


- Disconnect plug (1) from fan motor
- Disconnect plug (2) from horn
- Release right hose clamp (arrow) with pliers, **BMW No. 17 5 500**

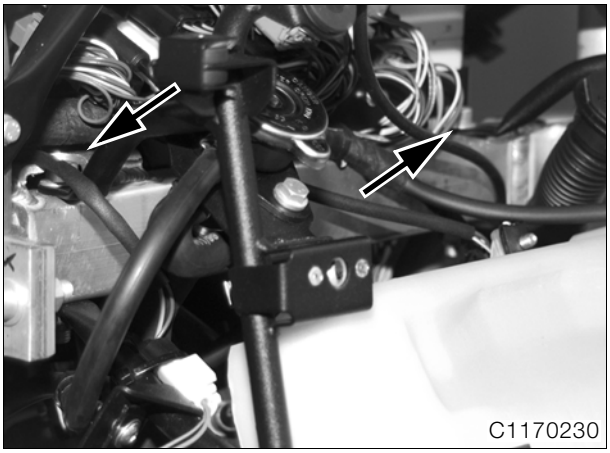


- Release left hose clamp (arrow) with pliers, **BMW No. 17 5 500**





- Release the hose clamp (arrow) securing the vapour discharge hose with the assistance of pliers, **BMW No. 17 5 500**
- Disconnect vapour discharge hose (1)



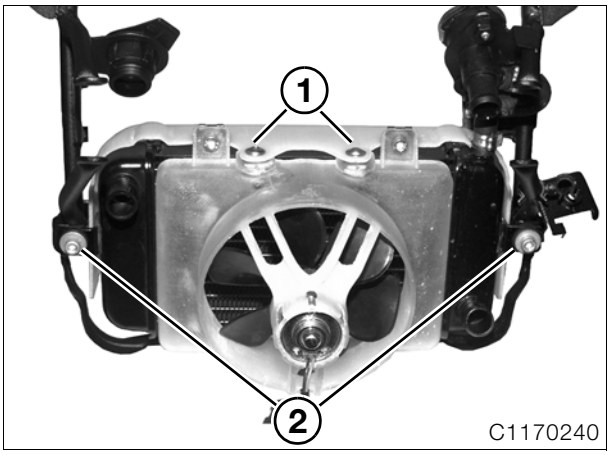
- Remove fasteners (arrows) from front frame
- Remove front frame complete with radiator and headlight

When installing:
- Installation is the reverse of the removal procedure

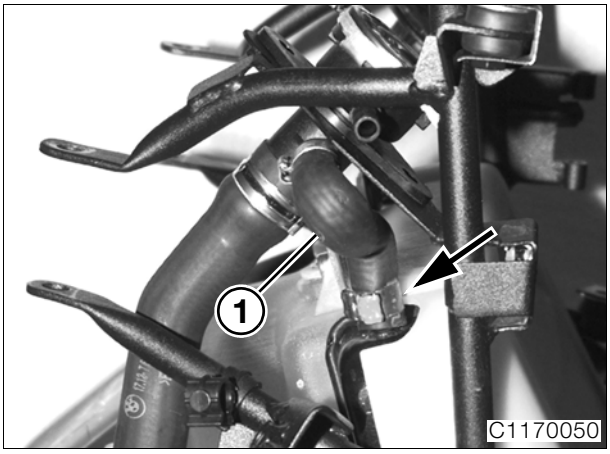
Torque specification:
Front frame mount ..... 14 Nm

Removing and installing radiator with fan shroud in front frame

– Remove front frame with radiator



- Remove fasteners (1) securing air duct
- Remove fasteners (2) from front frame



- Release hose clamp (arrow) with pliers, **BMW No. 17 5 500**
- Disconnect vent hose (1)
- Lift radiator with fan shroud to the rear and up to remove

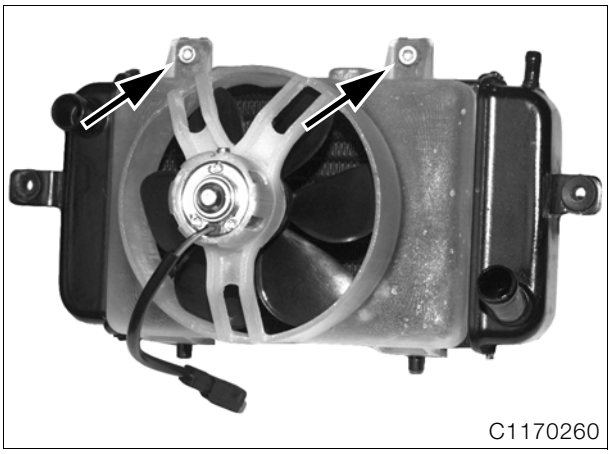
When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following operations:

Attention:
Inspect for abrasion in fan/brake hose!

Torque specification:
Front frame mount ..... 9 Nm
Air duct mount ..... 9 Nm

17 11 029 Replacing radiator

– Remove radiator with fan shroud


C1170260

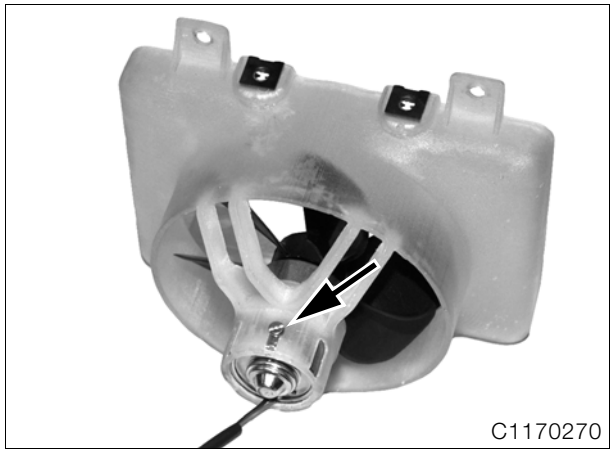
- Remove fasteners (arrows)
- Pull fan shroud to the rear and down to remove

When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Fan shroud mount ..... 9 Nm

17 40 000 Replacing fan

– Remove radiator

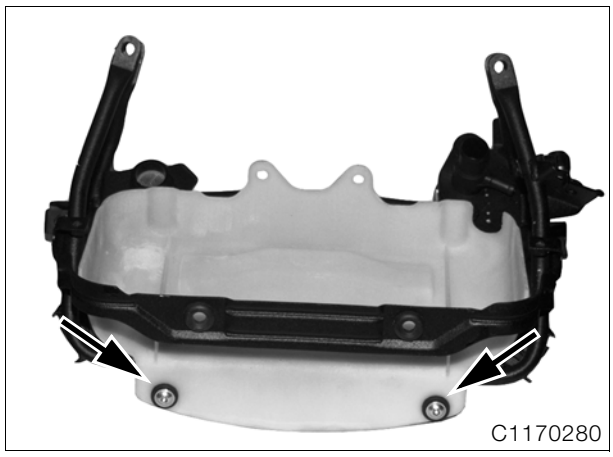

C1170270

- Remove fastener (arrow)
- Push fan forward to remove

When installing:
- Installation is the reverse of the removal procedure

17 11 034 Replacing air duct

– Remove radiator with fan shroud


C1170280

- Remove fasteners (arrows)
- Remove air duct

When installing:
- Installation is the reverse of the removal procedure

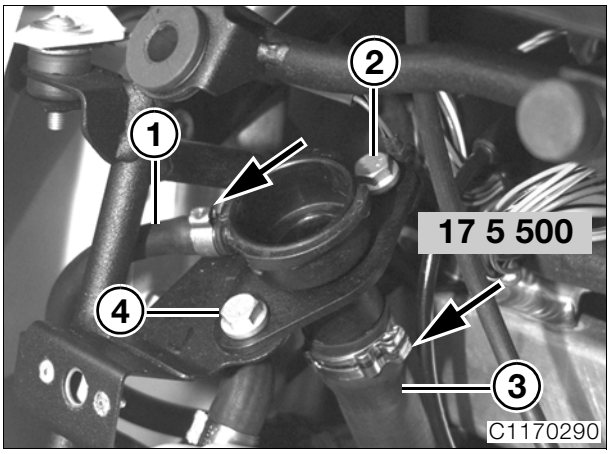
Torque specification:
Air duct mount ..... 9 Nm

17 11 110 Replacing refill reservoir

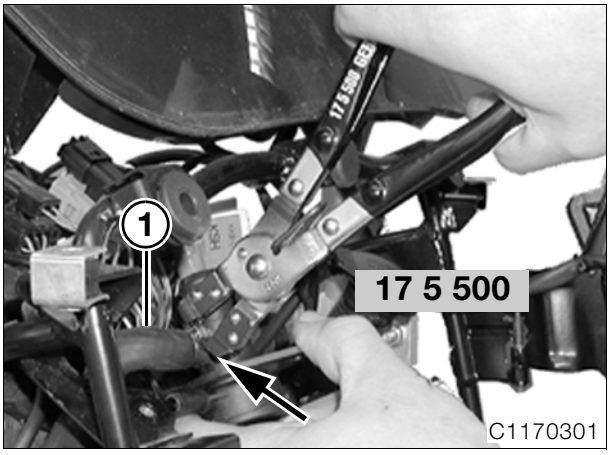
– Remove front fairing panel
– Swing the headlight forward and down

➠ .....See Group 46

- Remove the cap



- Remove fasteners (2, 4) from refill reservoir
- Release hose clamps (arrows) with pliers, **BMW No. 17 5 500**
- Pull refill reservoir to one side
- Disconnect vapour discharge hose (1) from refill reservoir
- Disconnect coolant hose (3) from refill reservoir



- Turn refill reservoir so that hose clamp (arrow) can be opened
- Release hose clamp (arrow) with pliers, **BMW No. 17 5 500**
- Disconnect vent hose (1) from refill reservoir

When installing:

Attention:
Always make sure that hose clamps are correctly positioned in order to ensure easy access whenever necessary.
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion!

- Installation is the reverse of the removal procedure
- Add coolant
- After running the engine check the coolant level and top up if necessary

Torque specification:
Refill reservoir mount ..... 9 Nm

18 Exhaust system

Contents

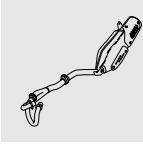
Page

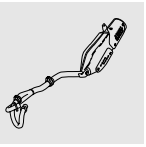
Technical Data 3

Removing and installing silencer heat shield 5

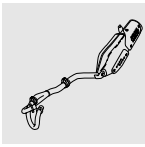
Removing and installing silencer system 5

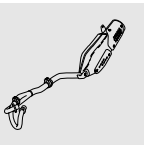
Removing and installing oxygen sensor 7



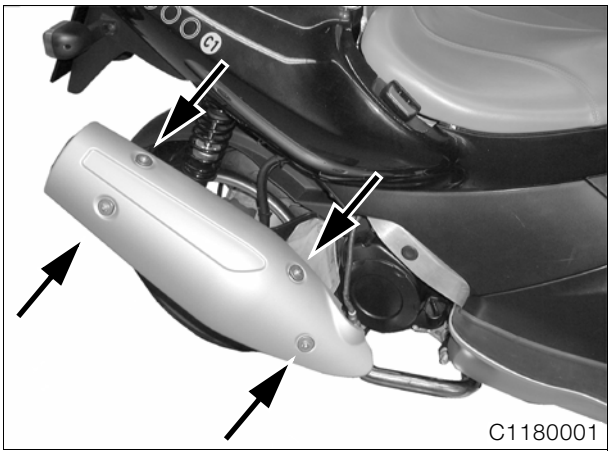


Technical Data	C1
Silencer assembly	
Exhaust-emissions control	3-way catalytic converter
Silencer (muffler)	Reflection/absorption silencer manufactured in of rustproof stainless steel





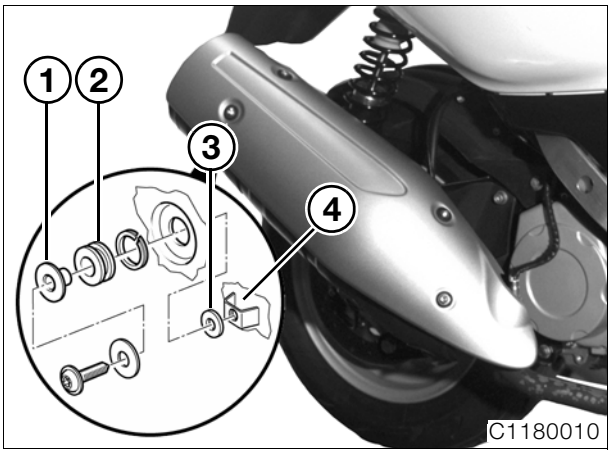
18 12 212 Removing and installing silencer heat shield



- Remove 4 fasteners (arrows)
- Remove exhaust heat shield

When installing:

- Installation is the reverse of the removal procedure: Pay particular attention to the sequence for securing the bolts

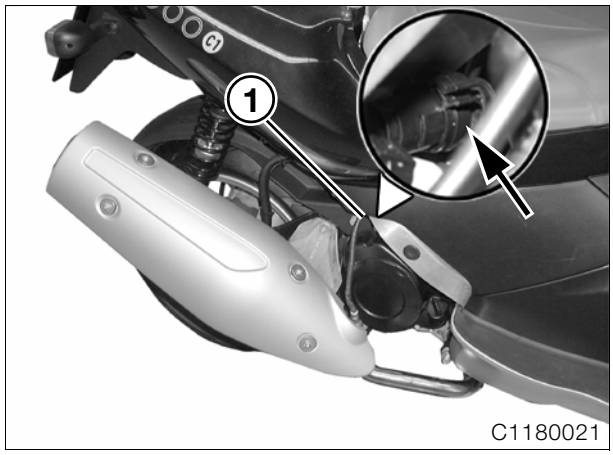


1 Spacing sleeve
2 Rubber grommet
3 Insulating washer
4 Cage nut

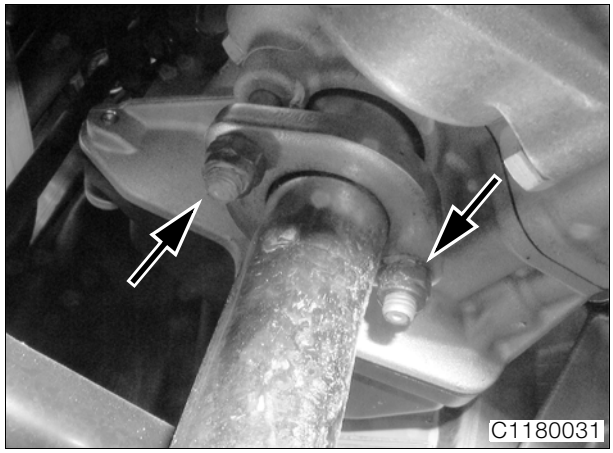
Torque specification:

Exhaust panel mount..... 5 Nm

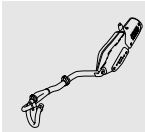
18 00 020 Removing and installing silencer system

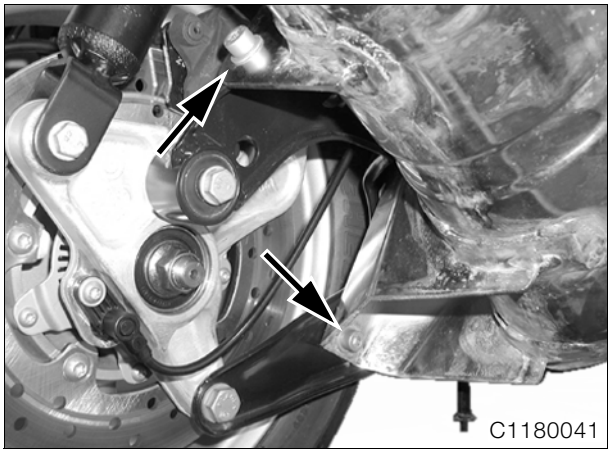


- Open cable clip (arrow)
- Disconnect plug (1) from the oxygen sensor

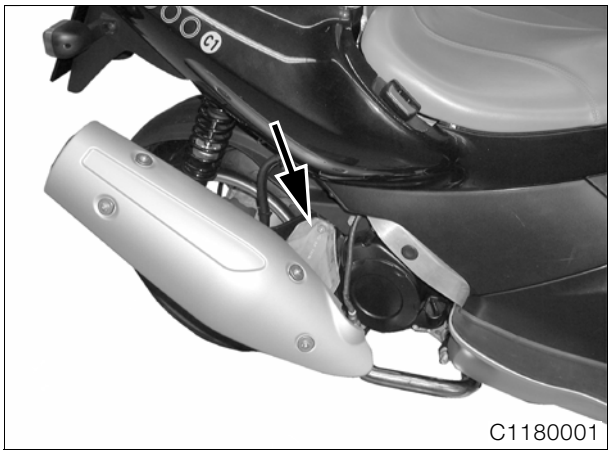


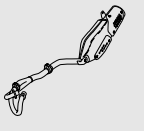
- Undo 2 mounts (arrows) holding silencer to cylinder head





- Remove bottom fasteners (arrows) from auxiliary swing arm





- Remove upper fastener (arrow) from auxiliary swing arm
- Pull silencer to one side and away from the vehicle

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

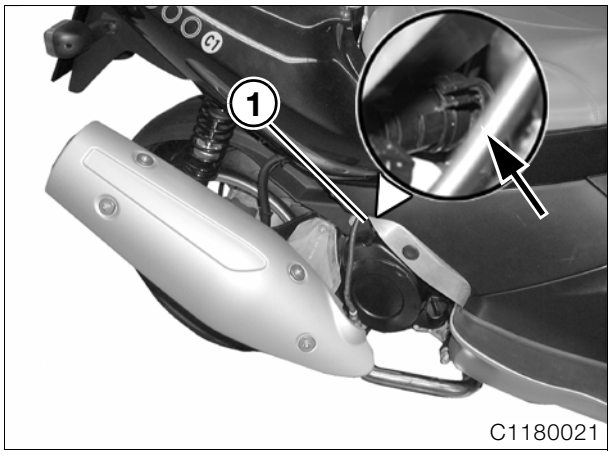
Attention:
When installing, make sure that the oxygen sensor cable is correctly routed and secured!

Note:
Replace the cylinder head gasket!

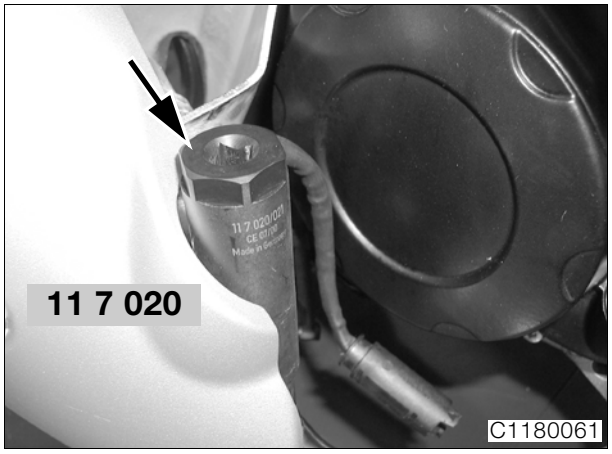
Torque specification:

Silencer to cylinder head	15 Nm
Frame mount	21 Nm

18 30 030 Removing and installing oxygen sensor



- Open cable clip (arrow)
- Disconnect oxygen sensor plug (1)



- Loosen oxygen sensor (arrow) with socket, **BMW No. 11 7 020**
- Remove socket wrench insert
- Remove the oxygen sensor by hand

Attention:
When removing the oxygen sensor, take care not to damage the cable on the exhaust heat shield!

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Note:
Apply a light coating of **Never Seez Compound** to the oxygen sensor's threads before installing!

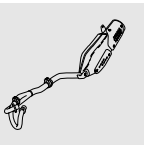
Attention:
When installing the oxygen sensor, take care not to damage the cable on the exhaust heat shield!

- Install oxygen sensor by hand
- Tighten the oxygen sensor with socket wrench insert, **BMW No. 11 7 020**

Attention:
When installing, make sure that the oxygen sensor cable is correctly routed and secured!

Fluids and lubricants:
Never Seez Compound

Torque specification:
Oxygen sensor ..... 23 Nm



21 Clutch

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Technical Data 3

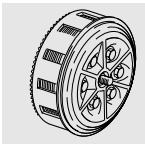
Centrifugal coupling 5

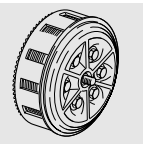
Checking clutch 5

Removing/replacing clutch 5

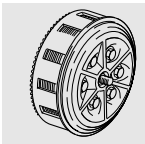
Check spring 6

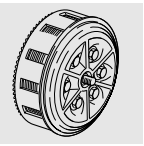
Install clutch 7





Technical Data		C1
Clutch		
Clutch drum		
Intl. dia.	mm (in)	134.0...134.2 (5.2756...5.2835)
Wear limit	mm (in)	134.6 (5.2992)
Clutch lining		
Thin point	mm (in)	3.10 (0.1220)
Wear limit	mm (in)	2.52 (0.0992)
Thick point	mm (in)	4.80 (0.1890)
Wear limit	mm (in)	4.00 (0.1575)
Spring		
Spring length	mm (in)	174 (6.8504)
Wear limit	mm (in)	170 (6.6929)





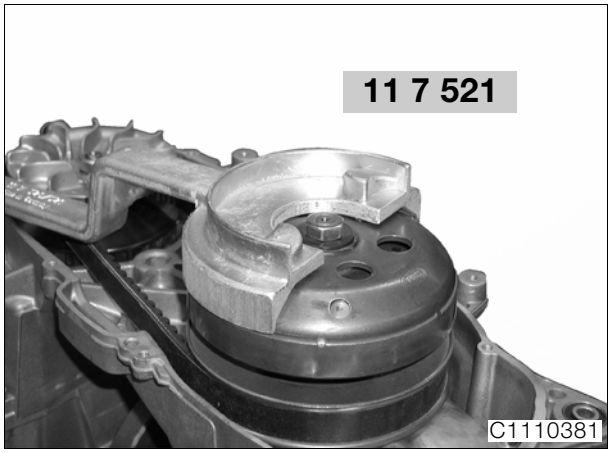
Centrifugal coupling

11 11 235 Checking clutch

To enhance clarity some of the illustrations portray the components with the powertrain cradle removed

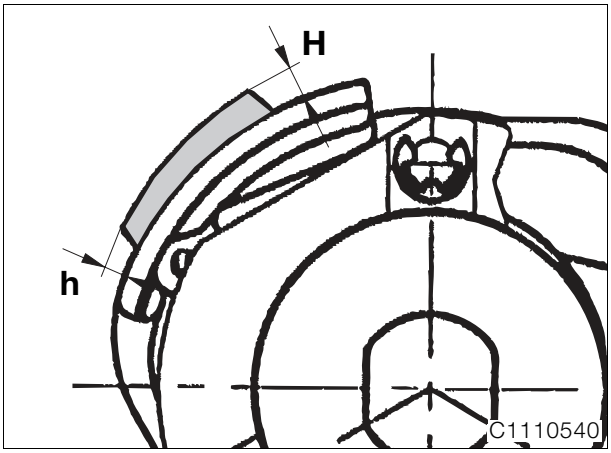
- Remove vent cover
- Remove variator cover

Attention:
Make sure that belt and belt pulleys remain free of oil and grease!



- Release clutch drum nut with retainer, **BMW No. 11 7 521**
- Remove clutch drum, using a puller if necessary
- Clean and dry clutch drum and clutch and check for wear and damage

Attention:
Make sure that linings remain free of oil and grease!



- Measure thickness of clutch lining
- Measure inside Ø of clutch drum

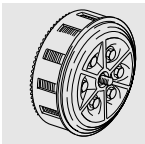
Wear data:
Inside Ø of clutch drum..... 134.6 mm (5.2992 in)
Narrow lining (h) ..... 2.5 mm (0.0984 in)
Wide lining (H) ..... 4.0 mm (0.1575 in)

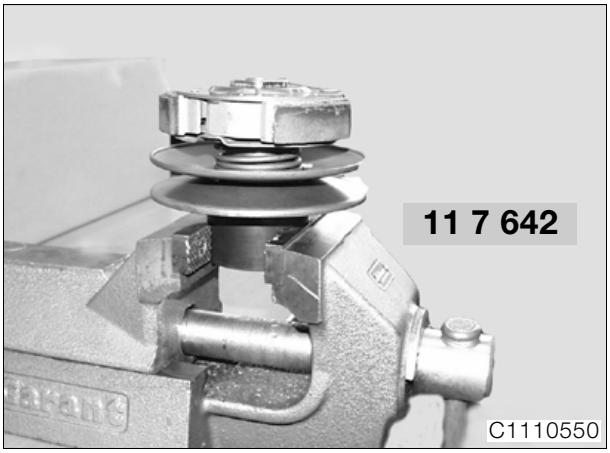
Note:
If the engagement springs are damaged or the centrifugal weights are uneven, replace the clutch!

Removing/replacing clutch

Warning:
Assembly is spring-loaded - injury hazard!

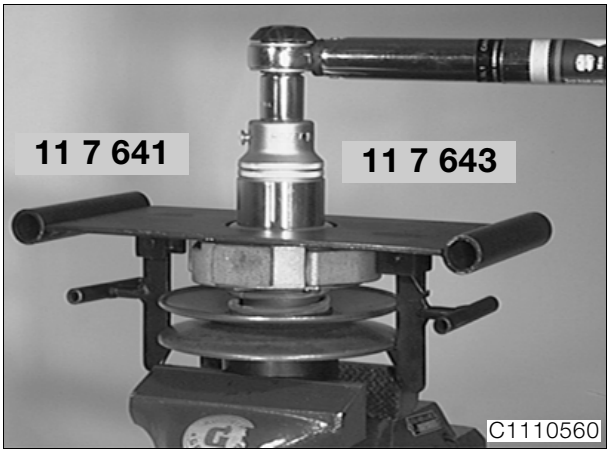
– Removing variator driven plate (➟ 24.6)



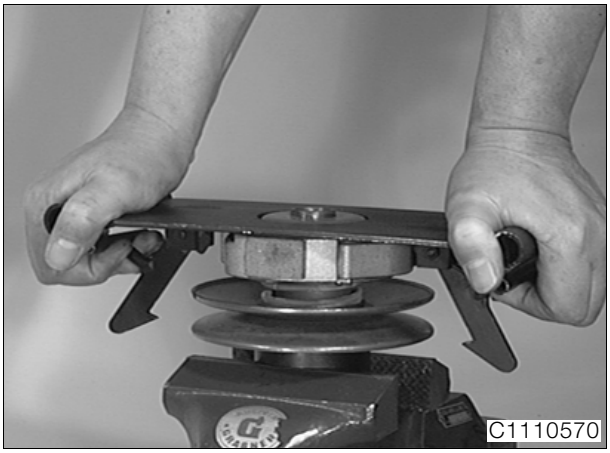


- Clamp assembly stamp, **BMW No. 11 7 642,** into vise
- Locate variator on pins of special assembly tool

Warning:
Make sure that hooks are correctly seated - injury hazard!



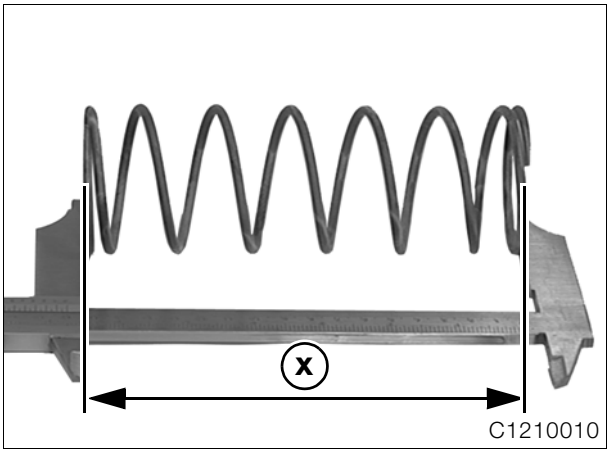
- Allow the hooks on the holder, **BMW No. 11 7 641,** to snap into place on the lower pulley
- Use narrow socket, **BMW No. 11 7 643,** to loosen the nut



- Carefully release and remove retainer
- Remove clutch and spring

Check spring

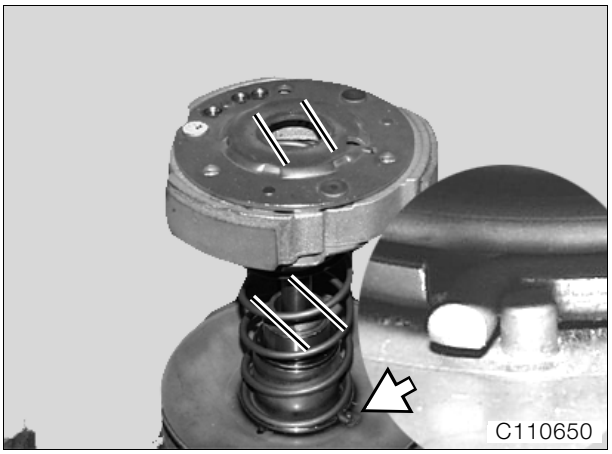
– Remove clutch



- Check length "x" of spring

Wear data:
Length "x" of extended spring ..... min. 170 mm
.....(min. 6.6929 in)

Install clutch



- Position spring on pin (arrow) of guide bow
- Attach clutch at end of spring

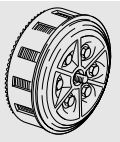
Attention:
Assembly is spring-loaded - injury hazard!

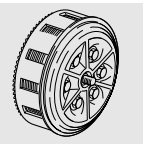
- Install retainer, **BMW No. 11 7 641**
- Turn clutch (parallel lines) counter-clockwise until flats are aligned
- Allow hooks on retainer to snap into place on the bottom of the pulley
- Apply Loctite to threads on locknut
- Use narrow socket, **BMW No. 11 7 643,** to tighten nut

Fluids and lubricants:
Locknut.....LOCTITE 243

Torque specification:
Nut..... 50 Nm
Vent cover..... 9 Nm
Variator cover..... 10 Nm
Clutch drum ..... 60 Nm

Note:
Installing driven variator (➟ 24.9).





24 Gearbox

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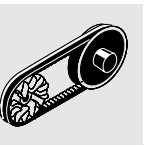
- Checking and measuring variator shaft 26
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- Testing and measuring output shaft 27



Technical Data		C1	C1 200
Automatic gearbox conversion ratios	1:	3.0…0.9	
Transmission		Belt	
Final-drive ratio	1:	9.05	8.37
Gearbox oil capacity	l (Imp pint/US quart)	0.090 (0.16/0.09)	
Variator shaft			
Number of teeth		17	17
Max. allowed run-out measured between tips	mm (in)	0.05 (0.00197)	
Bearing in gearbox cover	mm (in)	24.989...25.000 (0.9838...0.9843)	
Wear limit	mm (in)	24.98 (0.9835)	
Track in gearbox cover for shaft oil sealing ring	mm (in)	19.984...19.993 (0.7868...0.7872)	
Wear limit	mm (in)	19.98 (0.7866)	
Bearing journal, housing, grooved ball bearing	mm (in)	14.983...14.994 (0.5899...0.5903)	
Wear limit	mm (in)	14.98 (0.5898)	
Bearing journal, variator, needle roller bearing	mm (in)	19.6...19.8 (0.7717...0.7795)	
Wear limit	mm (in)	19.5 (0.7677)	
Bearing journal, variator, grooved ball bearing	mm (in)	14.98...14.99 (0.5898...0.5902)	
Wear limit	mm (in)	14.97 (0.5894)	
Idler shaft			
Number of teeth		16/44	17/44
Bearing journal, gearbox cover	mm (in)	19.967...19.980 (0.7861...0.7866)	
Wear limit	mm (in)	19.96 (0.7858)	
Bearing journal, housing	mm (in)	19.767...19.780 (0.7782...0.7787)	
Wear limit	mm (in)	19.76 (0.7779)	
Output shaft			
Number of teeth		56	55
Max. approved run-out measured between tips	mm (in)	0.06 (0.0024)	
Bearing journal, gearbox cover, grooved ball bearing	mm (in)	14.983...14.994 (0.5899...0.5903)	
Wear limit	mm (in)	14.98 (0.5898)	
Bearing journal, housing, grooved ball bearing	mm (in)	24.984...24.993 (0.9836...0.984)	
Wear limit	mm (in)	24.97 (0.9831)	
Shaft oil seal housing	mm (in)	29.93...29.95 (1.1784...1.1791)	
Wear limit	mm (in)	29.92 (1.1779)	



Technical Data		C1	C1 200
Variator belt width	mm (in)	18.5 (0.7283)	
Wear limit	mm (in)	17.8 (0.7008)	
Bearing tube (spacer)			
Length	mm (in)	49.5 (1.9488)	
Extl. dia.	mm (in)	27.020...27.041 (1.0638...1.0646)	
Wear limit	mm (in)	26.95 (1.0610)	
Rollers	mm (in)	19.9...20.1 (0.7835...0.7913)	
Wear limit	mm (in)	19.6 (0.7717)	
Inside drive plate			
Extl. dia.	mm (in)	27.000...27.035 (1.063...1.0644)	
Wear limit	mm (in)	27.05 (1.0650)	
Inside driven plate			
Extl. dia.	mm (in)	33.90...33.98 (1.3346...1.3378)	
Wear limit	mm (in)	33.9 (1.3346)	
Intl. dia.	mm (in)	34.010...34.035 (1.3389...1.3399)	
Wear limit	mm (in)	34.05 (1.3406)	
Grooved ball bearing interference fit in housing	mm (in)	0.01 (0.00039)	



C1 gearbox



R24C160-TSS

Operations with powertrain cradle installed

Note:
Operations identified by **#** can also be carried out with the powertrain cradle installed.

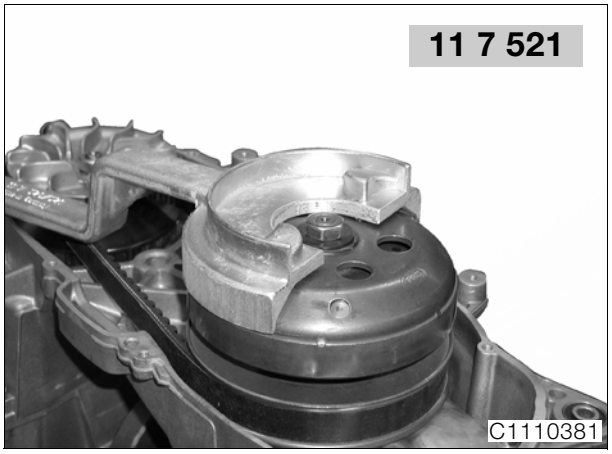
Variator replacement

Removing variator

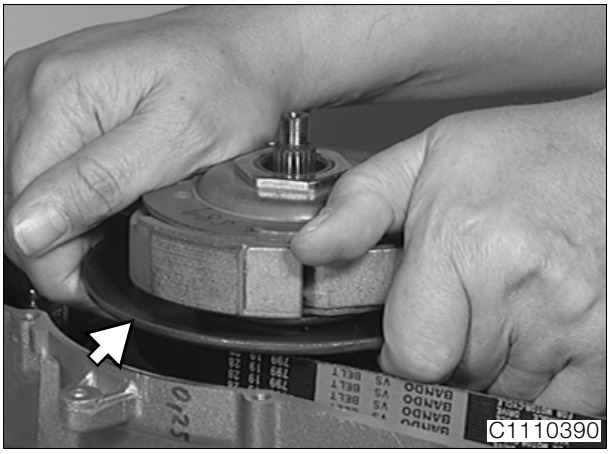
Removing variator driven plate
To enhance clarity some of the illustrations portray the components with the powertrain cradle removed

- Remove vent cover
- Remove variator cover

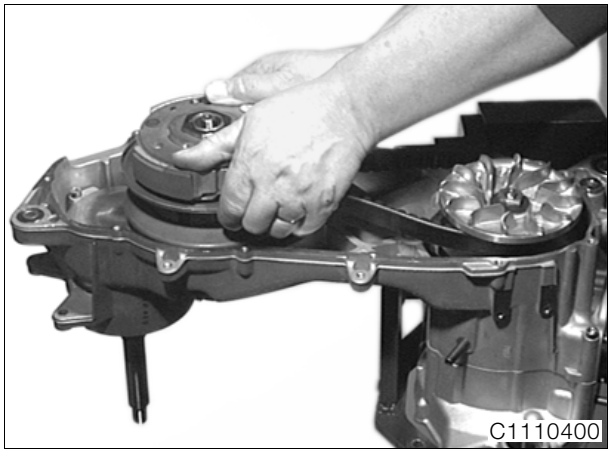
Attention:
Make sure that belt and belt pulleys remain free of oil and grease!



- Release nut from clutch drum using retainer, **BMW No. 11 7 521**
- Remove clutch drum, using a puller if necessary



- To relieve tension on belt, turn outer plate (arrow) of driven variator counterclockwise by hand while simultaneously pressing it against inner plate
- The purpose is to move belt onto small-diameter and hold the two plates apart



- Remove driven variator with belt from variator shaft and out of driven variator

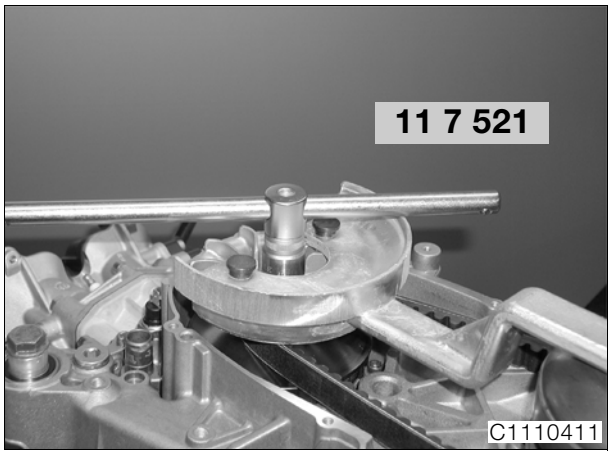
Removing variator drive plate

Note:
The following description of variator drive plate removal applies to both the lubricated and the unlubricated version! Note differences during assembly and installation!

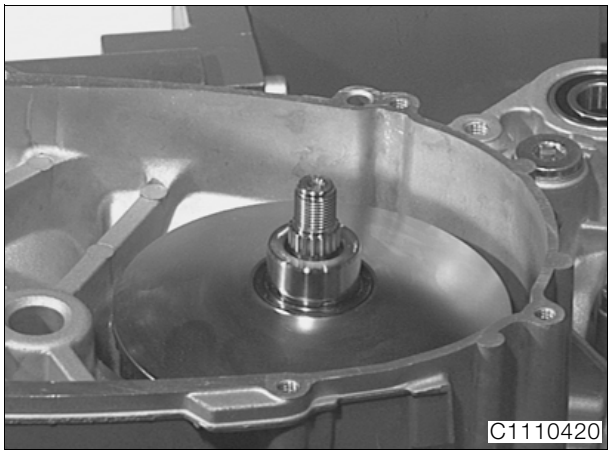
To enhance clarity some of the illustrations portray the components with the powertrain cradle removed

- Remove vent cover
- Remove variator cover

Attention:
Make sure that belt and belt pulleys remain free of oil and grease!



- Use retainer, **BMW No. 11 7 521,** to undo nut on outer plate of drive variator from the crankshaft
- Remove outer plate from crankshaft
- Remove belt



- Remove drive wheel with bearing tube (spacer) from crankshaft

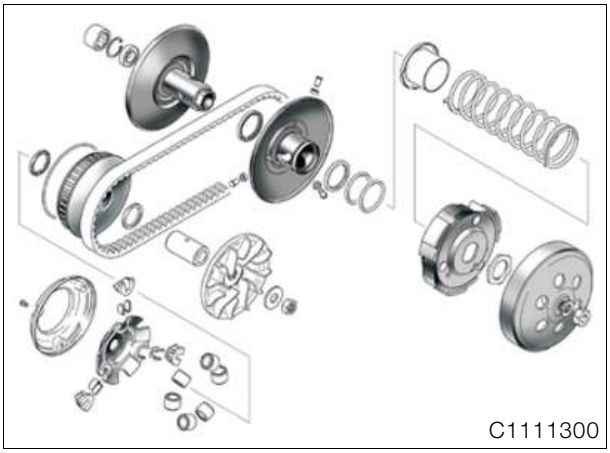
Attention:
Insert a cloth or piece of foam rubber between taper plate and sealing cover to prevent the roller weights from jamming!

Installing variator

Attention:
Make sure the belt contact faces are perfectly clean and free of oil and grease!

Install drive variator (lubricated version)

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



- Apply an even coat of approximately 20 g (0.7 oz) of grease to the curved tracks of the inner plate and install the rollers
- Lightly grease O-ring and install
- Install spring clamp, guides on transfer element and grease the recesses in the guides
- Uniformly grease interior of spacer
- Spray ground faces of crankshaft stub
- Insert transfer element
- Check action of transfer element
- Secure variator cover

Fluids and lubricants:

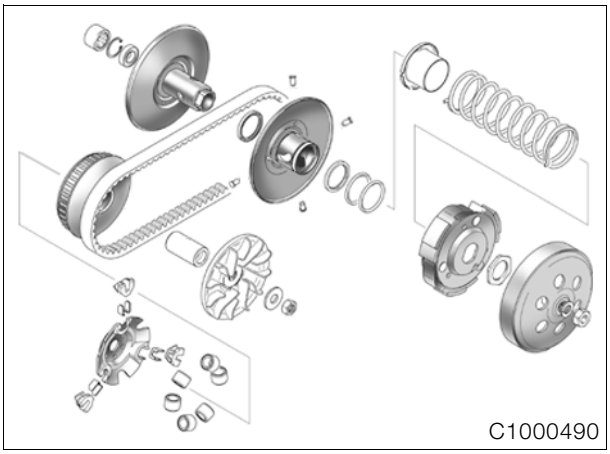
Shell Retinax HDX2 .....approximately 20 g (0.7 oz)
Spacer and running
surface .....Klüber paste 46 MR 401
Crankshaft stub.....Klüber paste 46 MR 401
Drive variator mount ..... Loctite 243

Torque specification:

Variator cover mount..... 4 Nm
Drive variator mount
(+ LOCTITE 243) ..... 60 Nm
Variator cover..... 10 Nm
Vent cover..... 9 Nm

Install drive variator (unlubricated version)

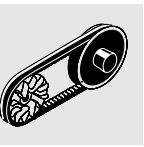
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



- Unlubricated drive variator assembly/installation - **do not** grease
- Check action of transfer element

Torque specification:

Drive variator mount
(+ LOCTITE 243) ..... 60 Nm
Variator cover..... 10 Nm
Vent cover..... 9 Nm



Installing driven variator
For the sake of clarity, these illustrations show the vehicle with the powertrain cradle removed.

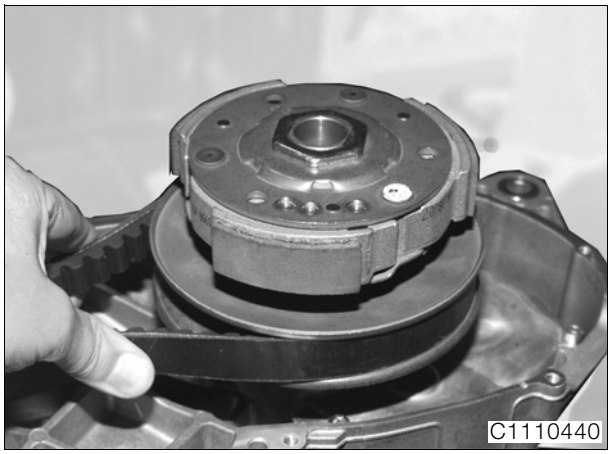
Attention:
Installed position of belt with legend on outside!

- Lay belt in position between the two belt contact faces

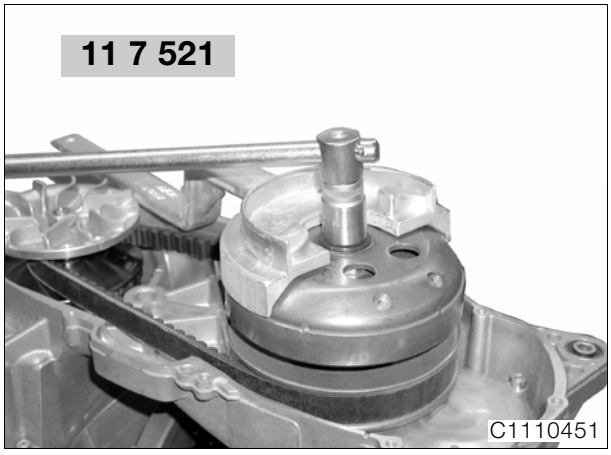


- Grease needle roller
- Spray variator shaft splines
- Check position of spring

Note:
Press up and at the same time turn upper belt pulley clockwise to push belt inward between the two pulleys .



- Squeeze lengths of belt together and install together with driven variator
- Push belt between plates of drive variator
- Mount variator on variator shaft
- Install clutch drum



- Use retainer, **BMW No. 11 7 521,** to apply counterpressure and install nut

Fluids and lubricants:
Needle bush..... Shell HDX2

Torque specification:
Clutch drum ..... 60 Nm

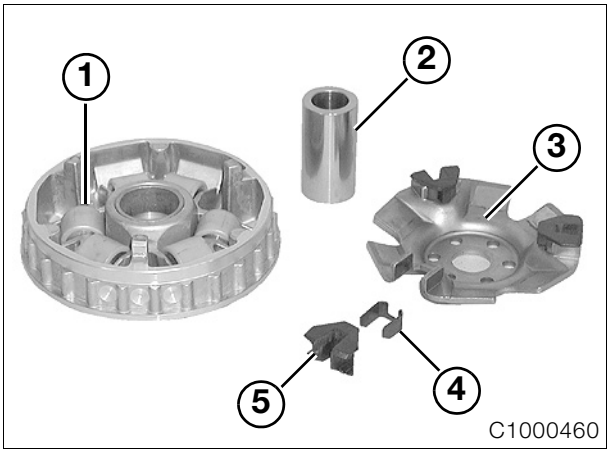
Disassembling, checking and assembling drive variator

Dismantling drive variator

Note:
The new version of the drive variator is installed without grease or lubricant! Note difference during dismantling, test and assembly operations!

Dismantling drive variator (unlubricated version)


C1000450



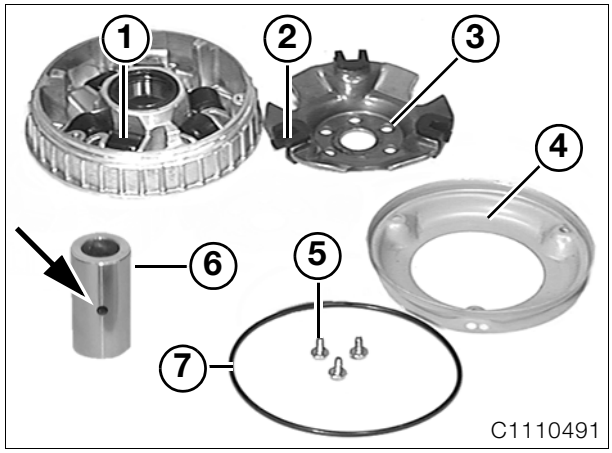
C1000460

- Remove transfer element (3) and extract guides (5) with spring clamp (4)
- Remove rollers (1)
- Clean all parts with a cloth

Note:
There is no lubrication hole in the bearing tube (2) (spacer)!

Dismantle drive variator (lubricated version)


C1000440



C1110491

- Undo attachment bolts (5) and remove cover (4)
- Remove driver (3) and guides (2) with spring clips
- Remove rollers (1)
- Clean all parts with a cloth
- Check shaft oil seals for damage and inspect to ensure that they are seated correctly
- Check O-ring (7) for damage and flat spots

Note:
The bearing tube (7) (spacer) features a continuous lubrication passage (arrow)! Install only bearing tubes with lubrication passage on lubricated version of drive variator!

Inspect individual components of drive variator

Variator cover
- Clean variator cover and check for damage
- Replace as indicated

Checking belt
- Check for cracks and damage
- Replace as indicated

Wear data:
Width.....17.8 mm
..... (0.7008 in)

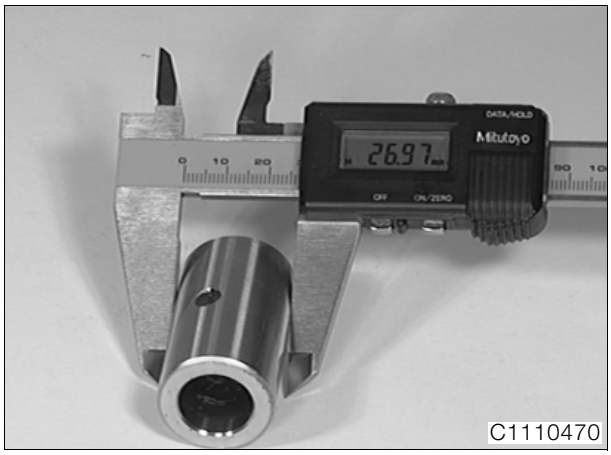
Check crankshaft journal
- Check crankshaft journal for bearing tube (spacer) of inside plate
- Remove all traces of old Loctite from the threads



- Check threads and tooth profiles for damage and distortion

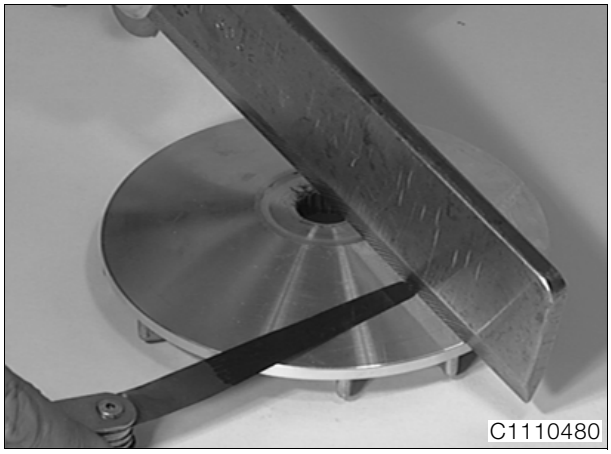
Wear data:
External Ø .....16.95 mm
..... (0.6673 in)

Check bearing tube (spacer)
- Check bearing tube (spacer)



Wear data:
External Ø .....26.95 mm
..... (1.0610 in)

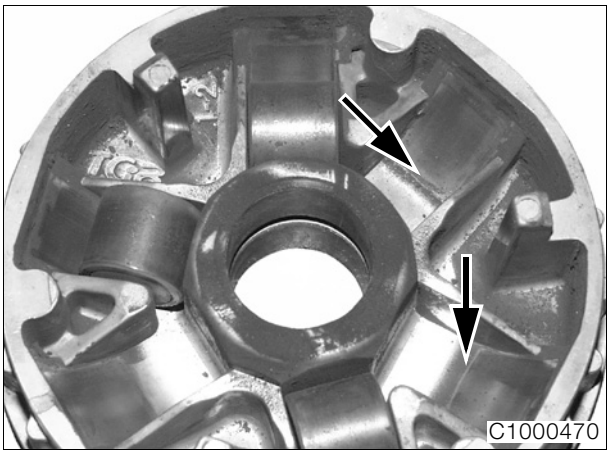
Check primary external plate
- Check friction faces of both side plates for wear and damage



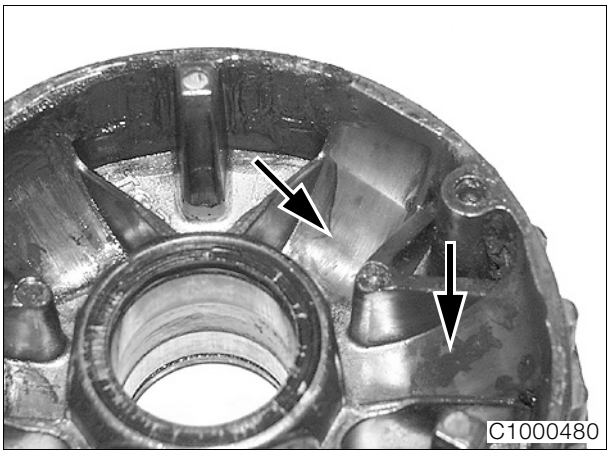
- Check with a precision straightedge and feeler gauge
- Check internal diameter of outside plate

Wear data:
Max. contact surface distortion .....0.5 mm
..... (0.0197 in)
Internal Ø of outer plate.....27.05 mm
..... (1.0650 in)

Check drive wheel unlubricated version



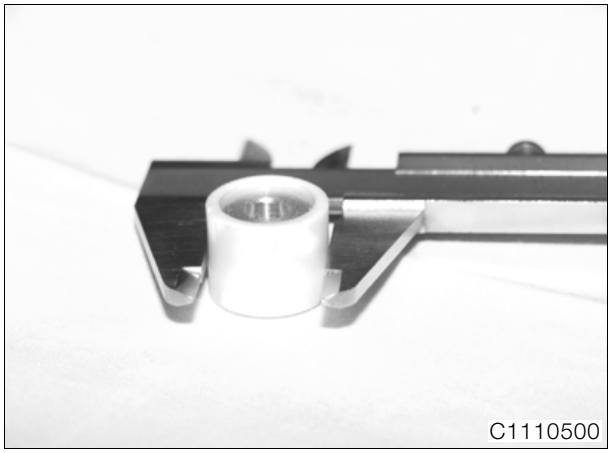
lubricated version



Note:
The rollers may display flat spots within the tolerance range defined by the specified wear limit! Wear within the specified limits is acceptable! Visible, palpable wear marks (arrows) from the action of the rollers in the drive plate's path are acceptable!

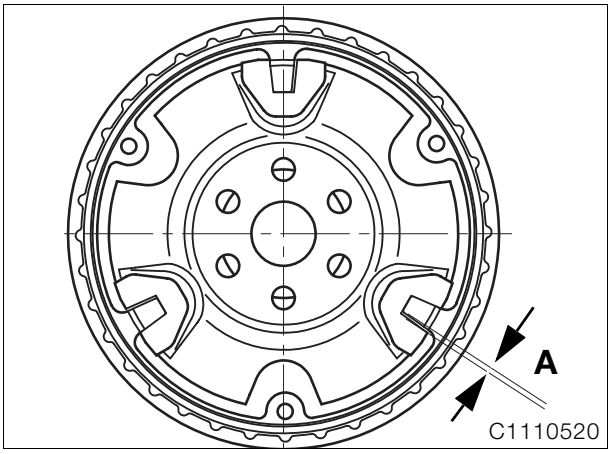
- Conduct visual inspection
- Replace drive plate as indicated

Checking rollers



Wear data:
Ø at flattest point..... min. 19.6 mm
.....(min. 0.7717 in)

Check guides and spring clips for wear



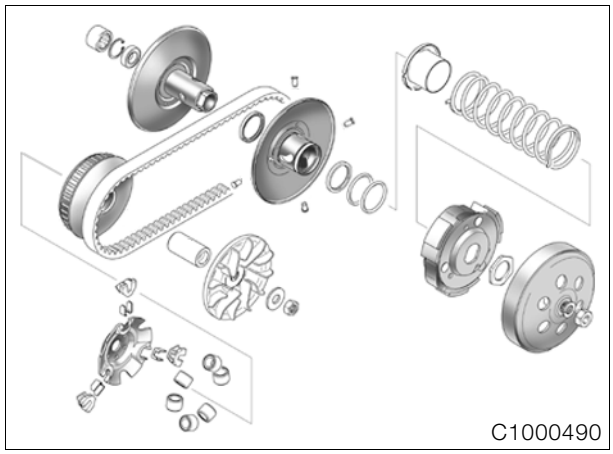
- Mount guides and spring clips on transfer element
- Position transfer element on inner plate
- Press gently in clockwise direction to force against guide rim
- Check clearance "A" between slider and guideway on the other sides with 0.5 mm (0.0197 in) feeler gauge blade
- Replace each slider at which the feeler gauge fits
- Recheck clearances. If the 0.5 mm (0.0197) feeler gauge blade fits with a new slider, the primary inside plate should be replaced
- Check the action of the sliders

Wear data:
Clearance "A" ..... max. 0.5 mm
.....(max. 0.0197 in)

Assemble drive variator

Assembly notice for unlubricated version:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

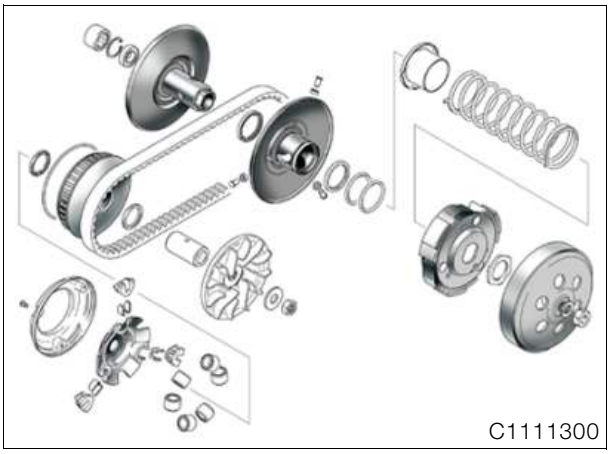


- Assemble drive variator without lubricating - **do not** grease
- Insert transfer element
- Check transfer element to ensure that it slides without undo resistance or stiction



Assembly notice for lubricated version:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



- Apply approximately 20 g (0.7 oz) of grease to the tracks on the inside plate and install rollers
- Lightly grease O-ring and install
- Install spring clamp, sliders on transfer element and grease the recesses in the sliders
- PInsert transfer element
- Check transfer element to ensure that it slids without stiction
- Secure variator cover

Fluids and lubricants:
Shell Retinax HDX2 ..... approximately 20 g (0.7 oz)

Torque specification:
Variator cover mount ..... 4 Nm

Dismantling, testing and assembling drive variator

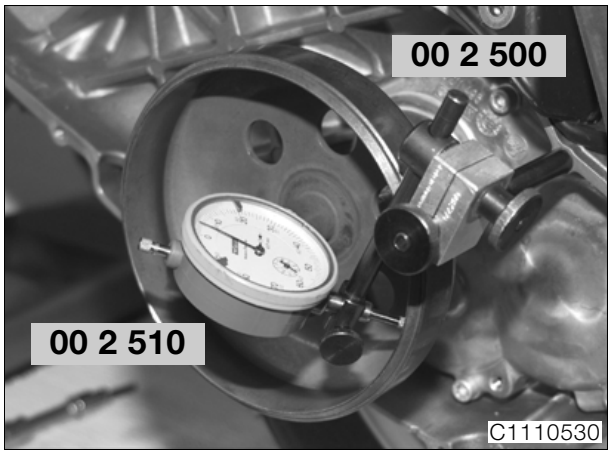
Checking individual components of driven variator

For the sake of clarity, these illustrations show the vehicle with the powertrain cradle removed

Note:
Dismantling is necessary only in the event of a malfunction!

– Checking clutch (➟ 21.5)

Check variator shaft



- Check runout on variator shaft with dial gauge and holder, **BMW No. 00 2 500**

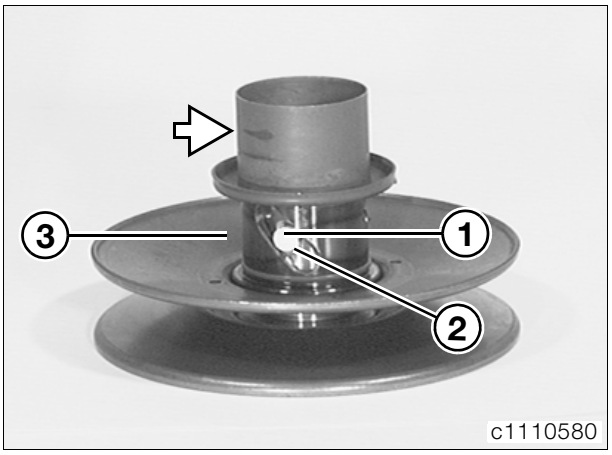
Wear data:
Runout ..... max. 0.3 mm (0.0118 in)

Dismantling driven variator

Warning:
Assembly is spring-loaded - injury hazard!

– Removing/replacing clutch (➟ 21.5)

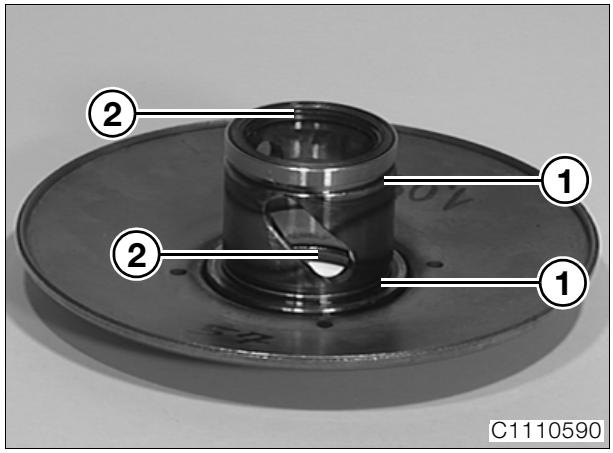
Note:
Further disassembly is necessary only the two plates do not move easily in opposite directions.



- Turn guide cover (arrow) to remove and check for wear

Note:
The new version of the driven variator has 4 guide studs but no guide sleeves! Note when dismantling, testing and assembling!

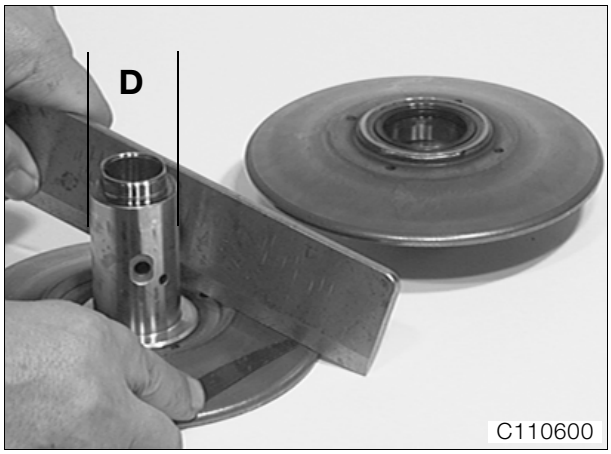
- Press guide studs (1) and guide sleeves (2) from inside to outside to remove
- Remove outer plate (3)



- Remove O-rings (1) and check for damage
- Check both shaft oil seals (2) for damage and correct fit

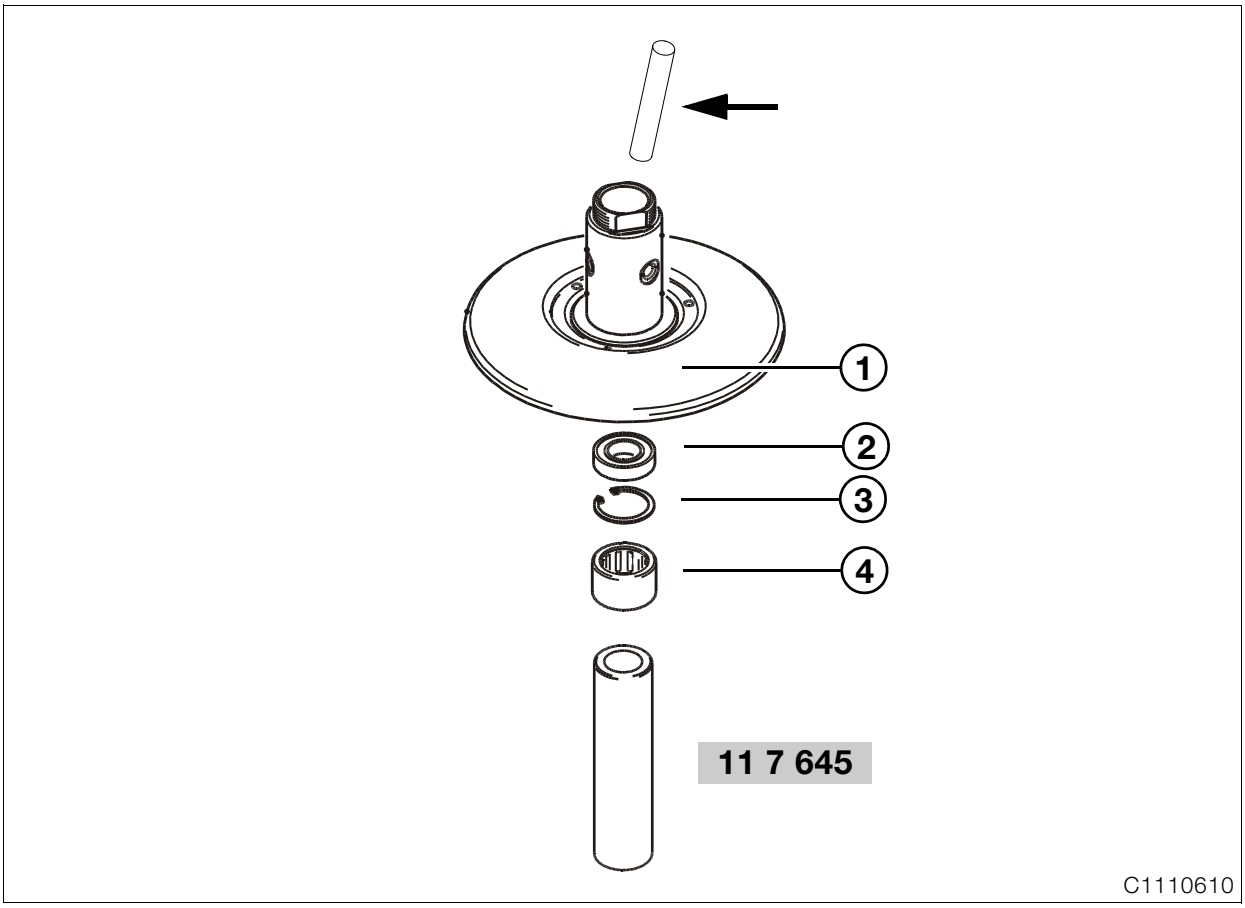
Checking individual components

– Check spring (➟ 21.6)
- Outside Ø "D" of sleeve in the inside plate



- Check friction faces of both side plates for wear and damage with precision straightedge and feeler gauge

Wear data:
Outside Ø "D"..... min. 33.90 mm
.....(min. 1.3346 in)
Max. planar deviation of running surface.....0.5 mm
..... (0.0197 in)



Checking bearing

- Subject inside grooved ball bearing (2) and needle bearing (4) on inside pulley (1) to a visual and manual inspection
- The bearings should turn without noise or resistance
- Check bearings for secure fit

Replace grooved ball bearing and needle bearing for secondary inside plate

- Use support ring, **BMW No. 36 6 610,** and extractor, **BMW No. 00 8 570,** to remove needle bearing (4)
- Remove circlip (3)
- Use drift punch (arrow) to drive out grooved ball bearing (2)
- Use tube, **BMW No. 11 7 645,** to press out needle bearing
- Press out ball bearing



When installing:



- Position grooved ball bearing (2) with open bearing side toward needle bearing and use tube, **BMW No. 11 7 645,** along with a hand press to press it against its seat
- Install the circlip (3)



- Use hand press and assembly press, **BMW No. 11 7 642,** to press in needle bearing (4)
- Check inside diameter of outside plate and inspect guide groove for wear

Wear data:
Inside Ø.....min. 34.05 mm (1.3406 in)

Assembling driven variator
- Pack space between the two shaft oil sealing rings with 4...5 g (0.14...0.18 oz) of grease
- Grease O-rings and insert in grooves



- Use guide sleeve, **BMW No. 11 7 644,** to press outer plate onto inner plate
- Coat guide sleeves and guide pin with grease and insert into 3 recesses in secondary outer plate

Note:
Take care not to damage O-rings!

- Slide on guide cover and position on stud in outside plate

Fluids and lubricants:
Shell Retinax HDX2 ..... 4...5 g (0.14...0.18 oz)

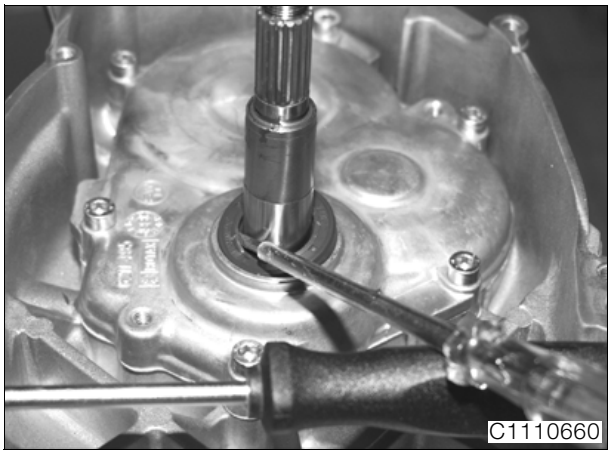
– Installing clutch (➟ 21.7)

Variator - reduction gear unit

23 21 200 Replace shaft oil seal for variator shaft in gearbox cover (shaft installed)

For the sake of clarity, these illustrations show the vehicle with the powertrain cradle removed.

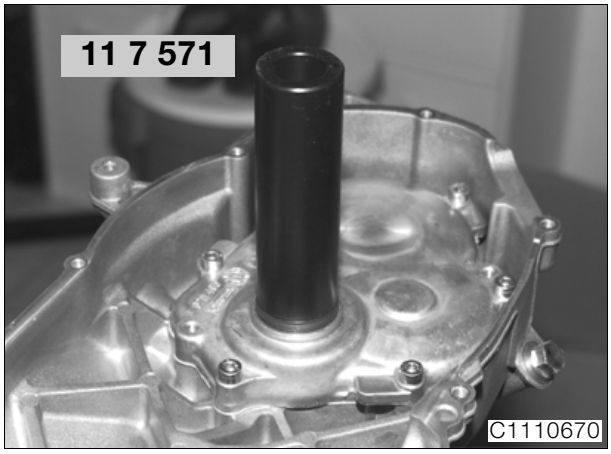
– Removing driven variator (➟ 24.6)



- Use screwdriver as a lever to carefully prise out shaft oil seal

When installing:

Attention:
Spray seats of shaft oil seals

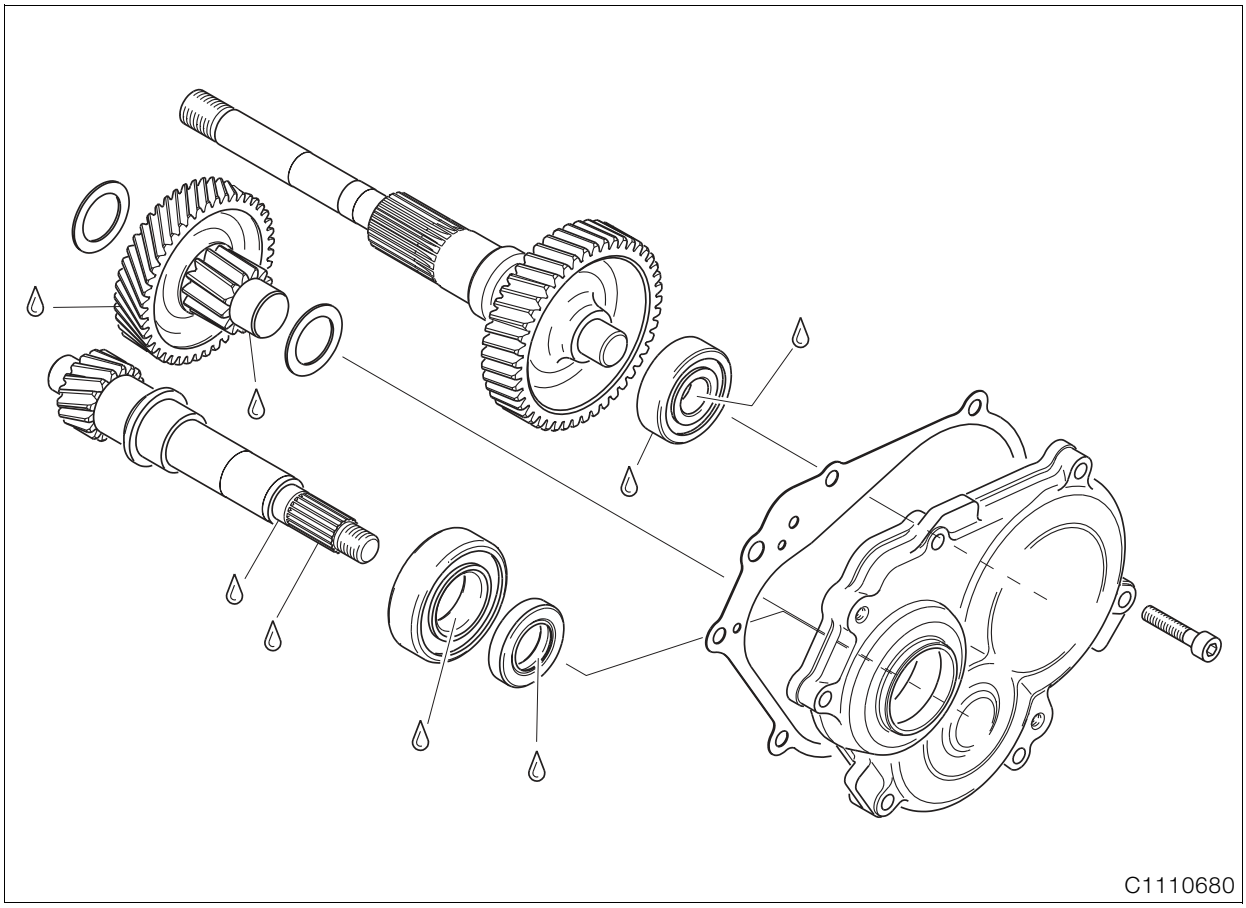


- Uniformly chamfer collar at cover

Attention:
Deburr seat for shaft oil seal and remove metal chippings!

- Install shaft oil seal with tube, **BMW No. 11 7 571**
- Check gearbox oil level and top up as necessary

Fluids and lubricants:
Shaft seats.....Klüber paste 46 MR 401
Shaft oil seal seats.....Klüber paste 46 MR 401
Gearbox lubricant API GL4..... 95 cm^3 (5.80 cu in)



23 00 043 Dismantling and assembling gearbox, checking individual components

 # Operations with powertrain cradle installed
Operations identified by **#** can also be carried out with the powertrain cradle installed.

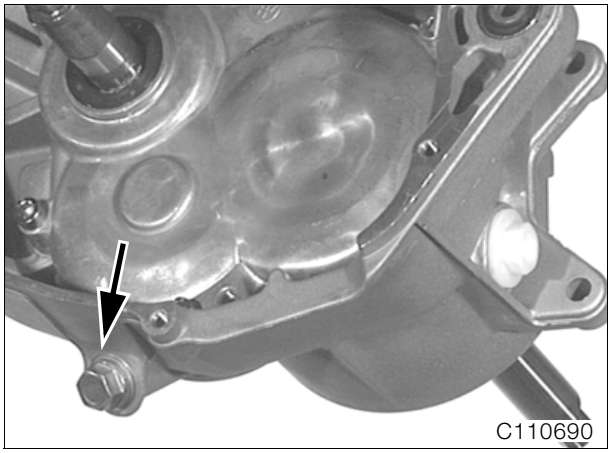
Preparations
For the sake of clarity, these illustrations show the vehicle with the powertrain cradle removed.

– Removing powertrain cradle (➟ 11.17)

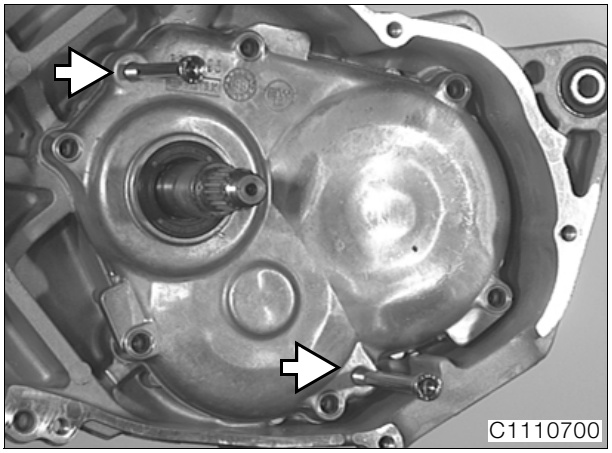
Clean the individual components and check the following parts for wear:
- Bearings and seats of shaft oil seals
- All gears for wear at tooth edges
- Tooth profile of variator and output shafts
- Gears for damage

11 11 018 # Gearbox cover removal

– Remove complete variator assembly
– Drain oil from gearbox



- Open drain plug (arrow)



- Remove securing screws
- Install two M6x70 screws in threaded sockets (arrows) and pull off cover
- Use screwdriver to pry out shaft oil seal

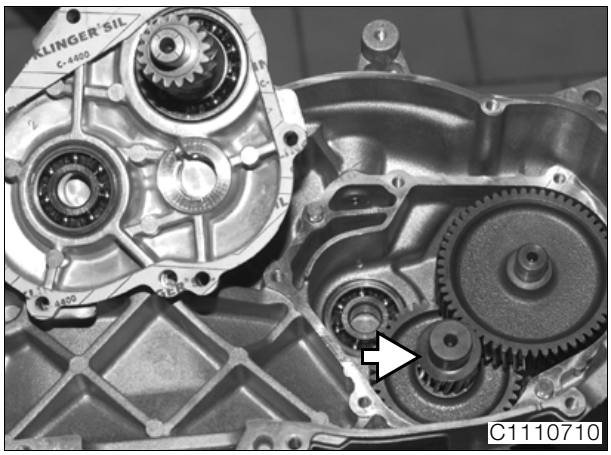
Note:
Remove variator shaft complete with cover!

- Check joint surface for damage
- Check condition of cylindrical rollers
- Check bearings for discolouration

Gearbox shaft removal

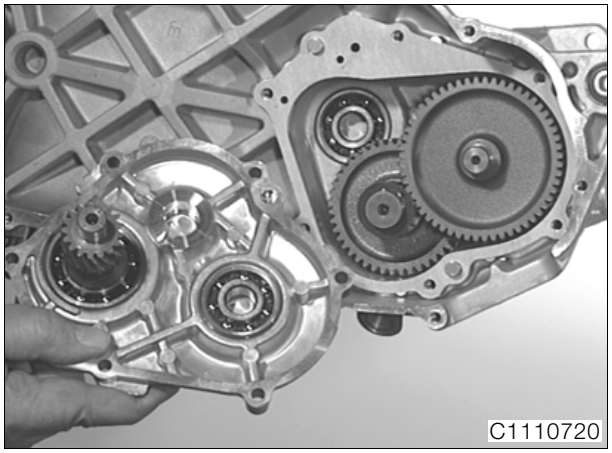
Note:
Additional work necessary if powertrain cradle is to remain installed:
- Remove rear wheel (➟ 36.9)
- Use strut support

– Remove gearbox cover



- Remove thrust washer (arrow) from intermediate shaft
- Remove seal
- Tap output shaft lightly with plastic-headed hammer to release it from interference-fit in grooved ball bearing and shaft oil seal
- Remove intermediate shaft and thrust washer beneath it

When installing:



Note:
Grease one side of a thrust washer for intermediate shaft and attach it to side of large gear!

- Install seal plug with copper seal
- Oil stub of intermediate shaft and install
- Position variator shaft in cover
- Position output shaft in grooved ball bearing
- Mount second thrust washer on intermediate shaft
- Install seal

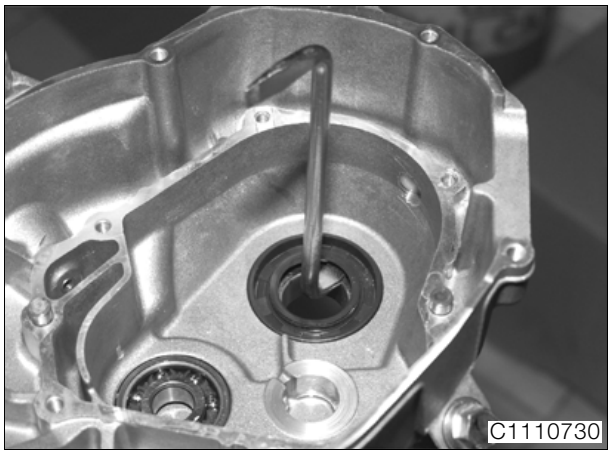
Fluids and lubricants:
shaft oil seal seats..... Klüber paste 46 MR 401
Shaft seats ..... Klüber paste 46 MR 401

Torque specification:
Drain plug..... 20 Nm
Filler plug ..... 5 Nm
Gearbox cover ..... 11 Nm

Replacing housing shaft oil seal on output shaft

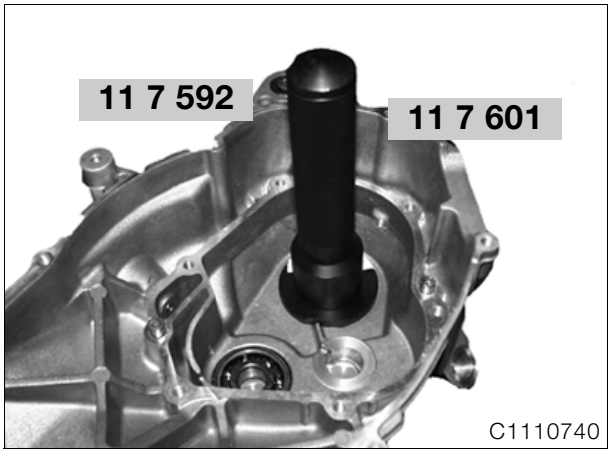
Note:
Additional work necessary if powertrain cradle is to remain installed:
- Remove rear wheel (➡ 36.9)
- Use strut support

– Remove complete variator assembly (➡ 24.6)
– Remove gearbox cover (➡ 24.20)
– Removing gearbox shafts (➡ 24.20)



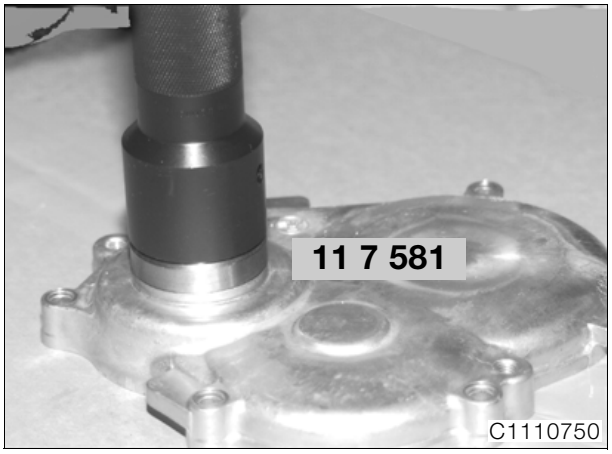
- Pry out shaft oil sealing ring, using an angled screwdriver with a second screwdriver for leverage, or with screwdriver resting on housing

When installing:



- Install shaft oil seal with assembly press, **BMW No. 11 7 592**

Replacing shaft oil seal for variator shaft in gearbox cover (shaft removed)



- Uniformly chamfer collar at cover

Attention:
Deburr shaft oil seal seat - remove gratings spray shaft oil seal seats!

- Insert dry shaft oil seal with drift punch, **BMW No. 11 7 581**, continuing until it seats on machined housing surface

Attention:
Make sure that shaft oil seal does not contact grooved ball bearing - maintain specified gap!

Attention:
Install cover with new seal and tighten fasteners in cross pattern!

When installing:

- Install shaft oil seal with extruded edge seal on the inside

Adjustment specification:

Gap.....0.1...0.3 mm
.....(0.0004...0.0118 in)

Fluids and lubricants:

Shaft oil seal seats.....Klüber paste 46 MR 401

11 11 276 # Replacing grooved ball bearing for variator shaft in gearbox cover

- Remove complete variator assembly (➡ 24.6)
- Remove gearbox cover (➡ 24.20)
- Remove shaft oil seal (➡ 24.22)



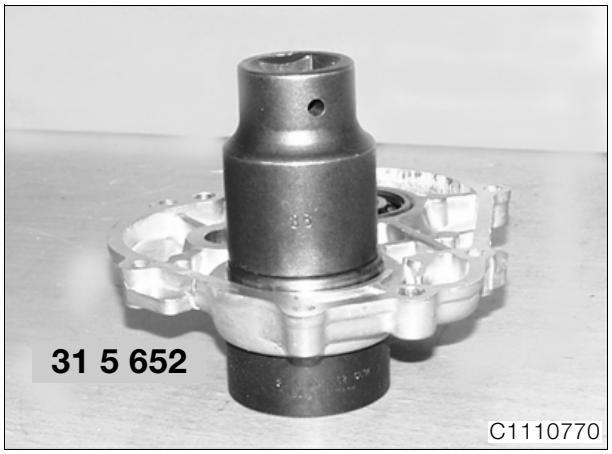
Attention:
To avoid damaging the joint surface use an old gasket and support on blocks!

- Press out grooved ball bearing with tube, **BMW No. 11 7 571**, D=32 mm (1.2598 in) or 24 mm (0.9449 in) socket into gearbox from the outside

When installing:

Attention:
Grease seats of shafts!

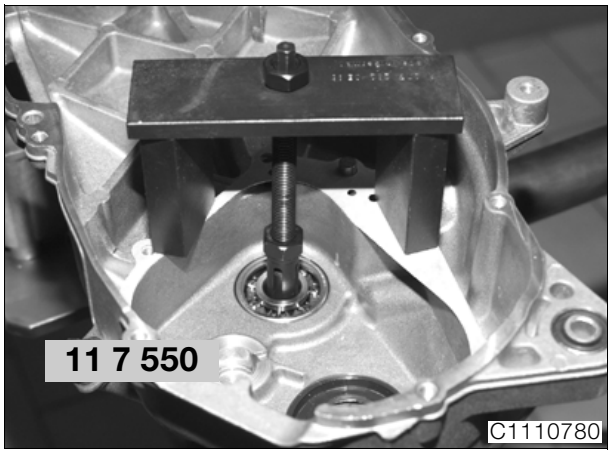
Note:
The open side of the grooved ball bearing must face inward!



- Use spacer tube, **BMW No. 31 5 652,** to support bearing seat on housing and prevent breakage
- Use drift punch, D=50 mm (1.9685 in) or 36 mm (1.4173 in) socket to press grooved ball bearing with lightly oiled outer diameter in until it seats

Fluids and lubricants:
Shaft seats ..... Klüber paste 46 MR 401

11 11 280 # Replacing grooved ball bearing for variator shaft in housing
– Remove complete variator assembly (➟ 24.6)
– Remove gearbox cover (➟ 24.20)
– Removing gearbox shafts (➟ 24.20)



Note:
To avoid damaging the joint surface, lay an old gasket beneath support plate!

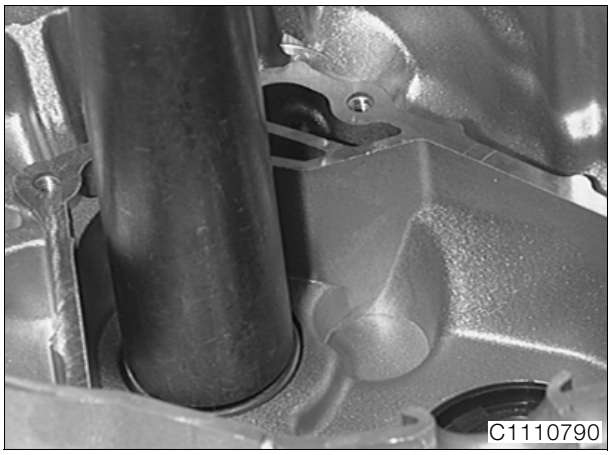
- Remove grooved ball bearing with puller, **BMW No. 11 7 550**



When installing:

Attention:
Grease seats of shafts!

Attention:
The open side of the bearing must face inward!



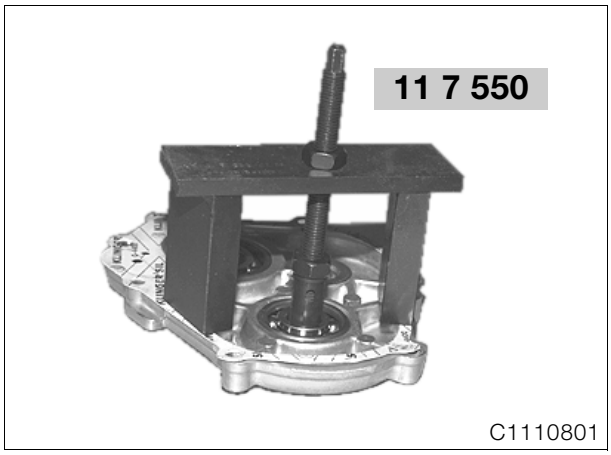
- Use drift punch, D=40 mm (1.5748 in) h=170 mm (6.6929 in) or 30 mm (1.1811 in) socket to press against the outer race of the lightly oiled grooved ball bearing to install

Fluids and lubricants:
Shaft seats ..... Klüber paste 46 MR 401

11 11 284 # Replacing grooved ball bearing for output shaft in cover

– Remove complete variator assembly (➟ 24.6)
– Remove gearbox cover (➟ 24.20)

Note:
To avoid damaging the sealing face, lay an old gasket beneath support plate!

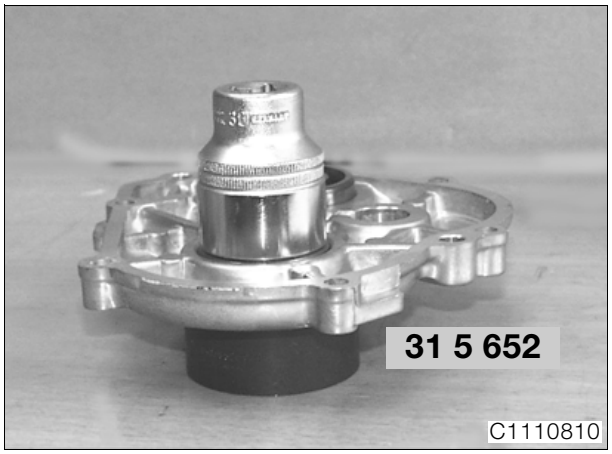


- Remove grooved ball bearing with puller, **BMW No. 11 7 550**

When installing:

Attention:
Grease seats of shafts!

Attention:
The open side of the bearing must face inward, toward output shaft!



- Use spacer tube, **BMW No. 31 5 652,** to support bearing seat against housing and prevent breakage
- Use drift punch, D=40 mm (1.5748 in) or 30 mm (1.1811 in) socket, to press the race of the lightly oiled grooved ball bearing to install

Fluids and lubricants:
Shaft seats ..... Klüber paste 46 MR 401

11 11 288 Replacing grooved ball bearing for output shaft in housing

- Removing powertrain cradle (➟ 11.17)
- Separate the housing sections (➟ 11.45)
- Remove output shaft oil seal (➟ 24.21)



Note:
To avoid damaging the sealing face, use an old gasket and support on blocks!

- Use punch D=42 mm (1.6534 in) or 24 mm (0.9449 in) socket **BMW No. 11 7 571** to press out by pushing from the outside into the gearbox

When installing:

- Use spacer tube, **BMW No. 31 5 652,** to support bearing seat against housing and prevent breakage



Attention:
Grease seats of shafts!

- Use punch D=50 mm (1.9685 in) h=200 mm (7.8740 in) or 36 mm (1.4173 in) socket to press outer race of lightly oiled grooved ball bearing in until it seats

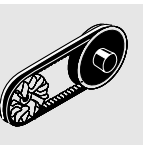
Fluids and lubricants:
Shaft seats ..... Klüber paste 46 MR 401

Checking dimensions of gearbox shafts

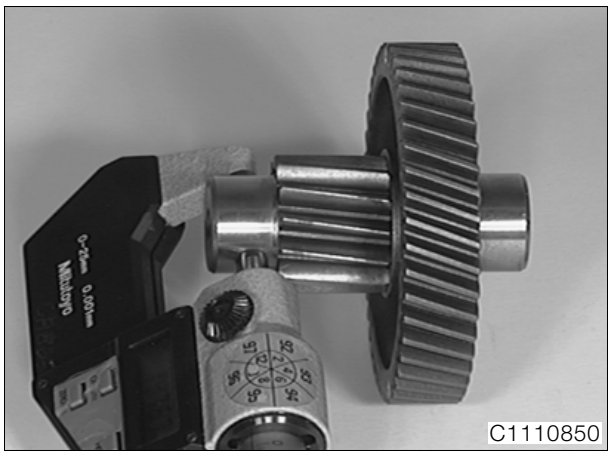
Checking and measuring variator shaft



1 Measure between tips
Approved runout .....max. 0.05 mm (0.0020 in)
2 Gearbox cover grooved ball bearing seat
Ø.....min. 24.98 mm (0.9835 in)
3 Track in gearbox cover, shaft oil seal
Ø.....min. 19.98 mm (0.7866 in)
4 Bearing journal, housing, grooved ball bearing
Ø.....min. 14.98 mm (0.5898 in)
5 Bearing journal, variator, needle roller bearing
Ø..... 19.50 mm (0.7677 in)
6 Bearing journal, variator, grooved ball bearing
Ø.....min. 14.97 mm (0.5894 in)

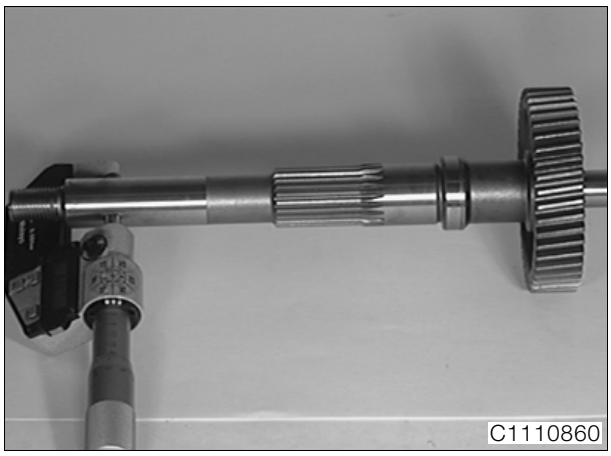


Testing and measuring intermediate shaft

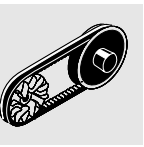


1 Bearing journal, gearbox cover
Ø.....min. 19.96 mm (0.7858 in)
2 Bearing journal, housing
Ø.....min. 19.76 mm (0.7779 in)

Testing and measuring output shaft



1 Measure between tips
Approved runout .....max. 0.06 mm (0.0024 in)
2 Bearing journal, gearbox cover, grooved ball bearing
Ø.....min. 14.98 mm (0.5898 in)
3 Bearing journal, housing, grooved ball bearing
Ø.....min. 24.97 mm (0.9831 in)
4 Track of shaft oil seal
Ø.....min. 29.92 mm (1.1780 in)



31 Front forks

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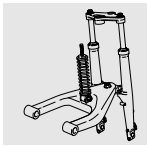
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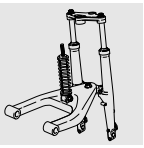
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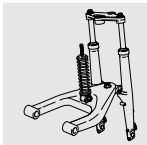
Removing leading link 23

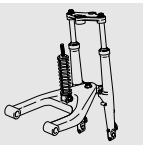
Replacing left and right taper-fit ball bearings for leading link 25

Installing leading link 25



Technical Data		C1
Front suspension		
Type		Telelever with anti-dive, leading link centrally mounted in main frame
Telescopic fork with fixed tube		
Fixed fork tube surface		Hard chrome plated
Fixed tube extl. dia.	mm (in)	32 (1.2598)
Max. approved fixed fork tube runout	mm (in)	0.1 (0.0040)
Telescopic-fork oil		
Telescopic fork oil - approved grades		BMW telescopic fork oil
Capacity per fork	l (Imp pint/US quart)	0.320 (0.563/0.338)
Chassis data		
Castor in normal-load position	mm (in)	113 (4.4488)
Steering angle, unladen weight	°	38
Total suspension travel		
at wheel	mm (in)	75 (2.9528)
at spring strut	mm (in)	37.5 (1.4764)
Spring strut		
Type		Spring strut with coil spring and single-tube gas-filled shock absorber, non-adjustable





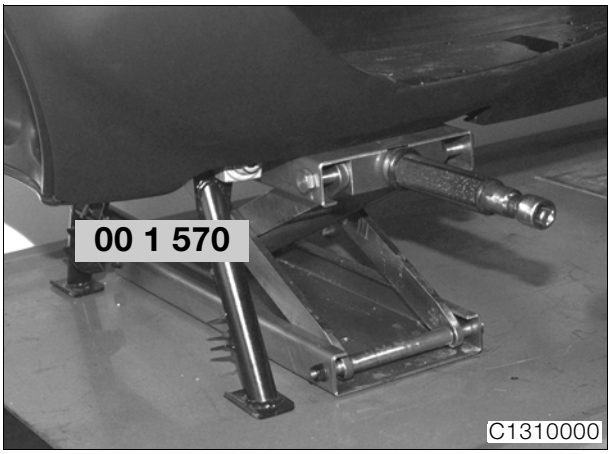
Removing and installing telescopic forks and fork cross brace

– Remove top tunnel panel
– Remove handlebar trim
– Remove instrument binnacle trim

➠ .....See Group 46

31 42 025 Removing telescopic fork

⚠ Attention:
Do not operate the brake lever when the brake caliper has been removed
Protect painted parts from scratching: apply adhesive masking tape if necessary!

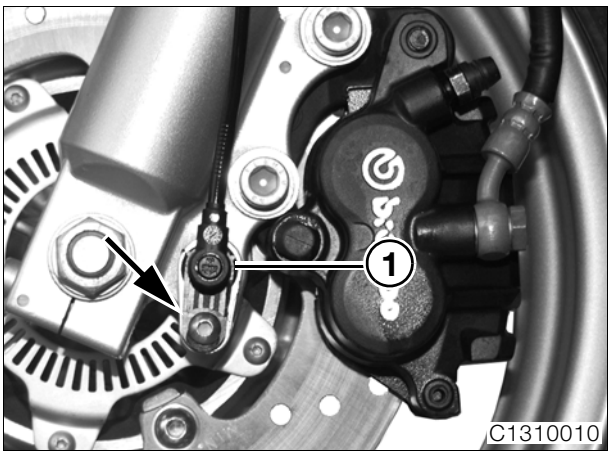


- Use hoist, **BMW No. 00 1 570,** to raise vehicle

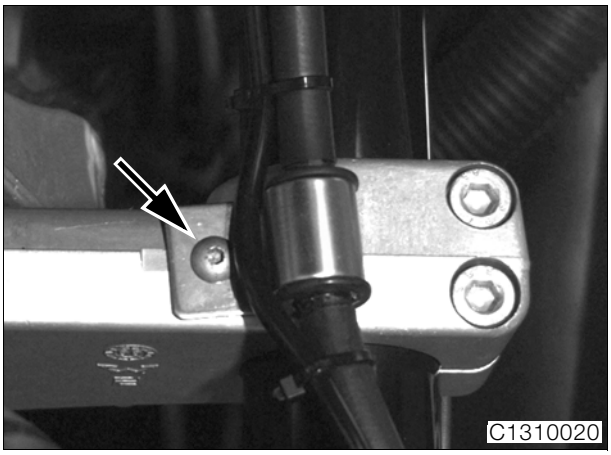
– Lower the front wheel (move the large lever of the easy-lift mechanism down)
– Remove the brake caliper
– Remove front wheel

➠ .....See Group 36

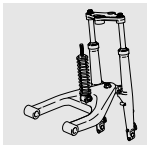
Additional work: vehicles with ABS:

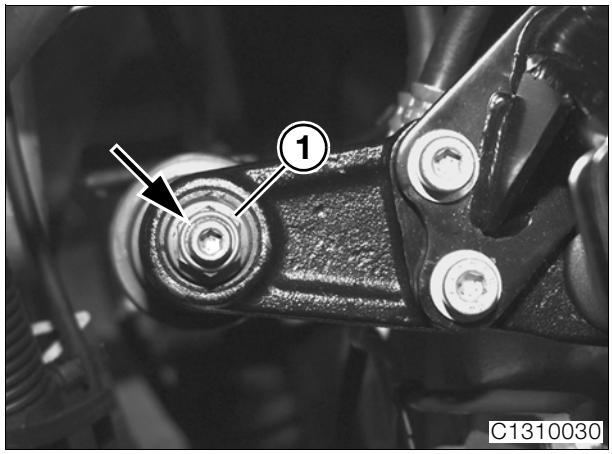


- Remove fastener (arrow) for ABS sensor
- Remove ABS sensor (1)



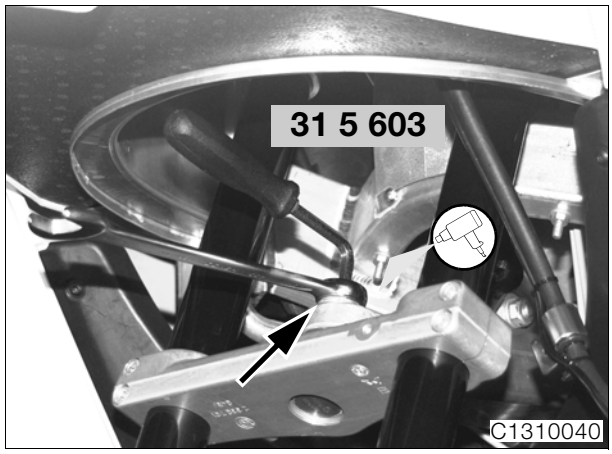
- Remove fastener (arrow) securing brake hose/ ABS connecting cable to fork cross brace



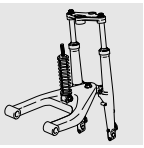


- Remove fasteners (1) for fixed tubes on left and right from fork cross brace, while holding Allen bolt (arrow) on fixed tube to prevent it from turning

Attention:
The fasteners are secured with thread-locking compound; heat to max. 120 °C (248 °F) to facilitate removal!



- Using angled 21 mm box-end spanner and Allen socket, **BMW No. 31 5 603**, detach leading link (arrow) from fork cross brace
- Pull the telescopic forks down to remove



31 42 202 Removing and installing fixed tube

- Pull the fixed tube out of the telescoping tube

Note:
Note that telescopic fork oil can escape!

- Drain off the telescopic fork oil

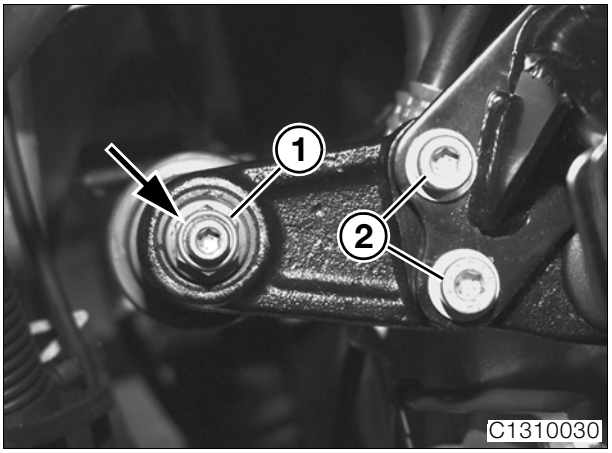
When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Take care not to damage the seals on the telescoping tubes!

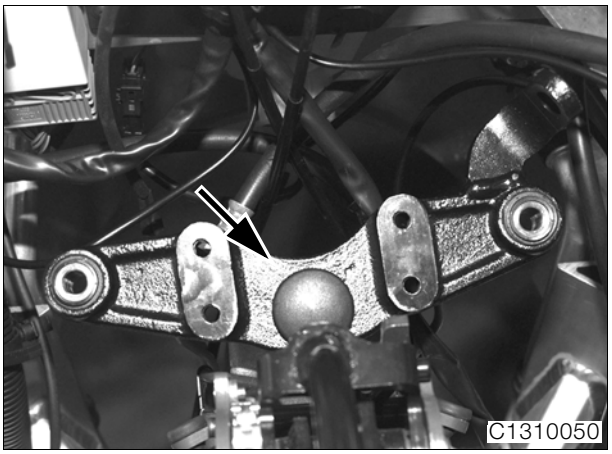
Fluids and lubricants:
BMW Telescopic fork oil.....0.32 l/telescopic tube
..... (0.56 Imp pints/telescopic tube)

31 42 028 Removing fork cross brace

Attention:
Protect painted parts from scratching: apply adhesive masking tape if necessary!

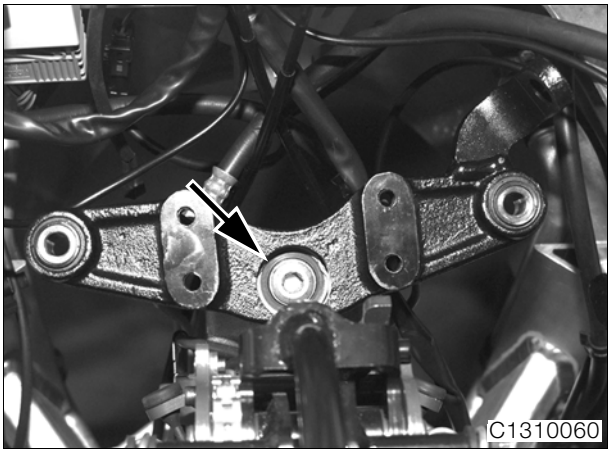


- Remove fasteners (2) for handlebar on left and right from fork cross brace
- Tie up the handlebar out of the way
- Remove fasteners (1) for fixed tubes on left and right from fork cross brace, while holding Allen bolt (arrow) on fixed tube to prevent it from turning

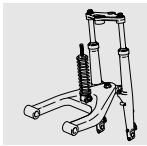


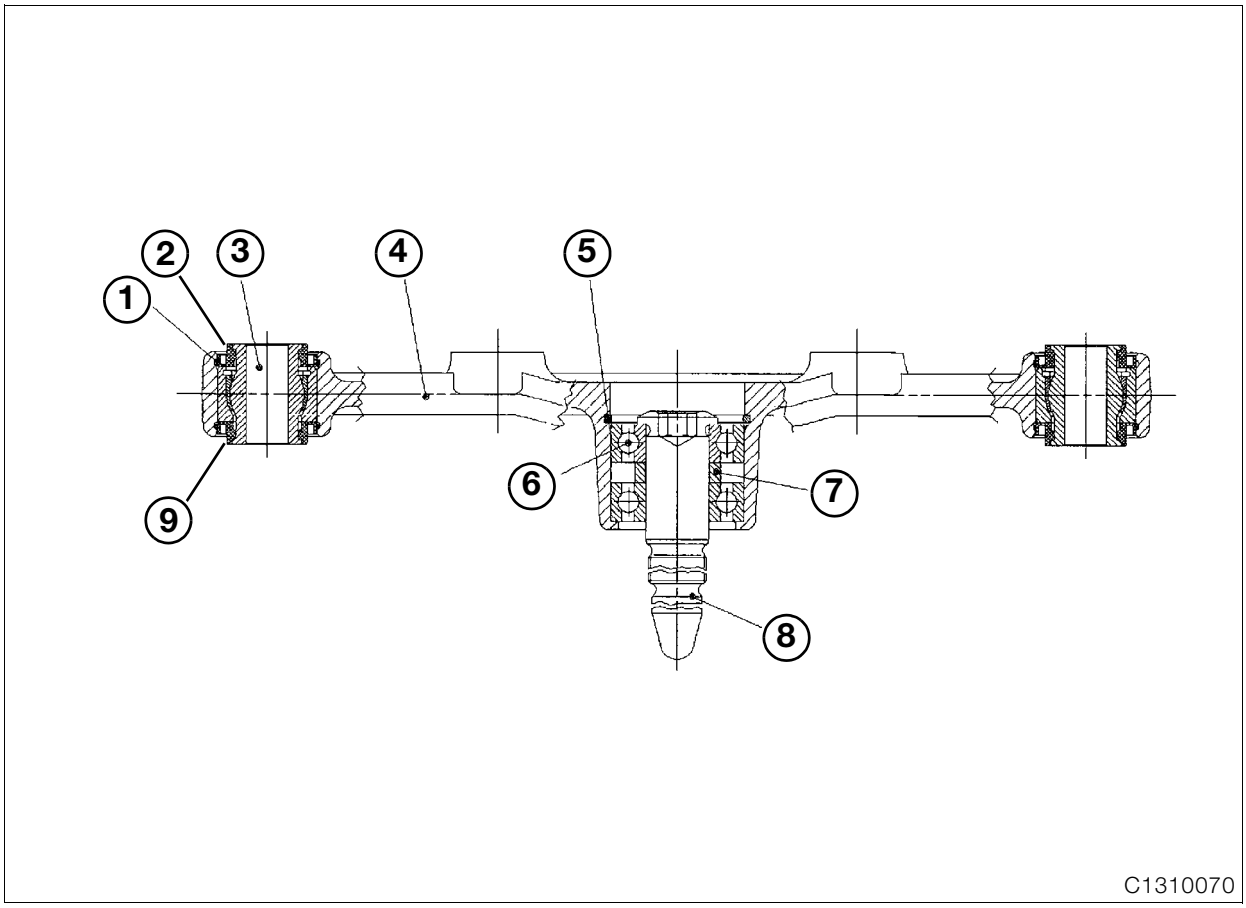
- Remove protective cap (arrow)

Attention:
The fastener is secured with thread-locking compound; heat if necessary, but take care not to overheat lines and cables!



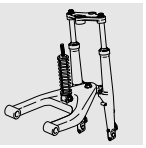
- Slacken stud (arrow); the fork cross brace is removed as a unit
- Removing fork cross brace





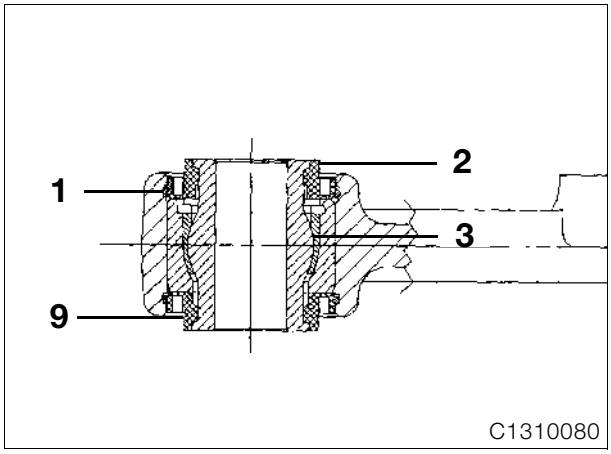
Fork cross brace; components

1 Stop ring on pot-type joint bearing
2 Dust boot, upper pot-type joint bearing
3 Pot-type joint bearing
4 Fork cross brace
5 Lock ring
6 Fork cross brace bearing
7 Spacer sleeve
8 Stud
9 Dust boot, lower pot type joint bearing

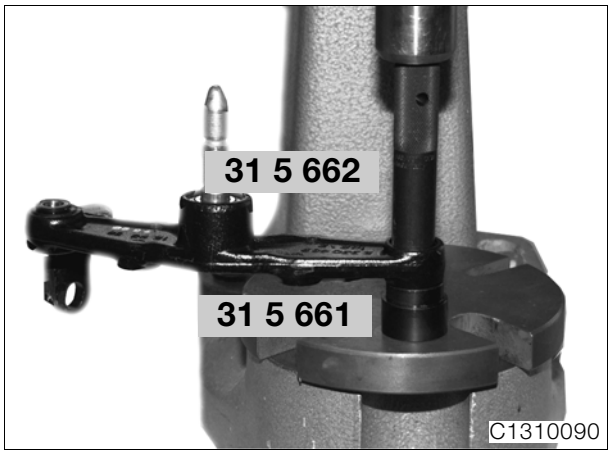


31 42 528 Dismantling fork cross brace

Removing pot-type joints



- Remove dust boot (2)
- Remove stop ring (1)

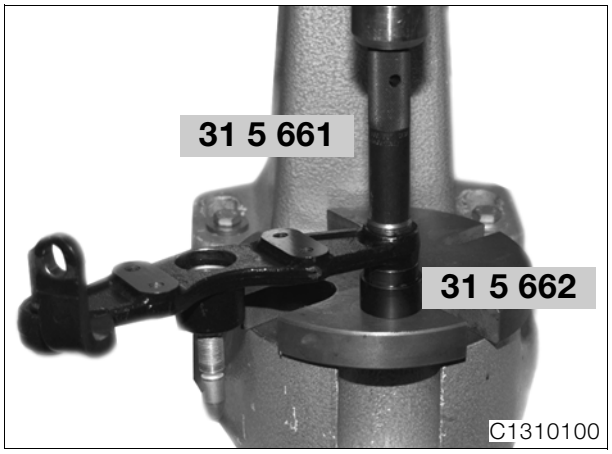


- Press out pot-type joint (3) with dust boot (9) using mandrel, **BMW No. 31 5 661**, and sleeve, **BMW No. 31 5 662**

Installing pot-type joints

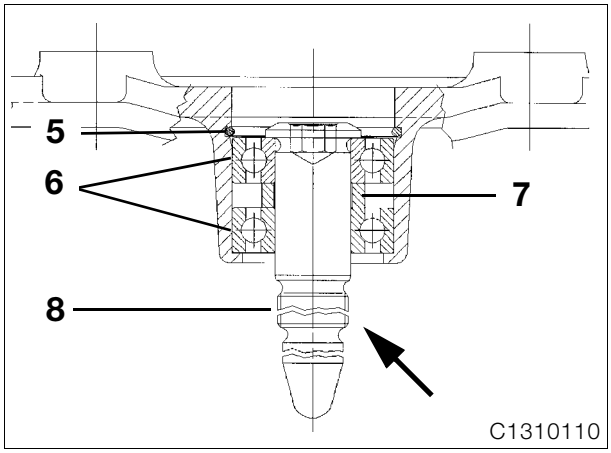
Note:
Always fit new dust boots (2, 9)!

- Remove dust boot (9) from new pot-type joint



- Press pot-type joint bearing in against seat (3) with drift punch, **BMW No.31 5 661**, and sleeve, **BMW No. 31 5 662**
- Install dust boot (9)
- Install stop ring (1)
- Install dust boot (2)

31 42 529 Removing ball bearing with stud



Note:
Take care not to damage threads (arrow)!

- Remove lock ring (5)
- Heat fork cross brace to 100 °C (212°F)

Warning:
To avoid injury always wear protective leather gloves when handling heated parts!

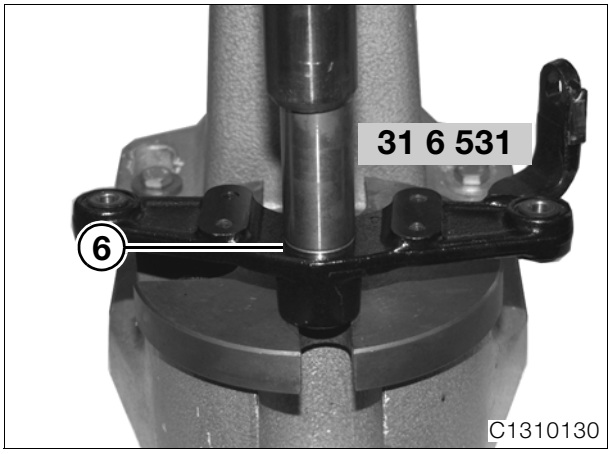
- Press out stud (8)



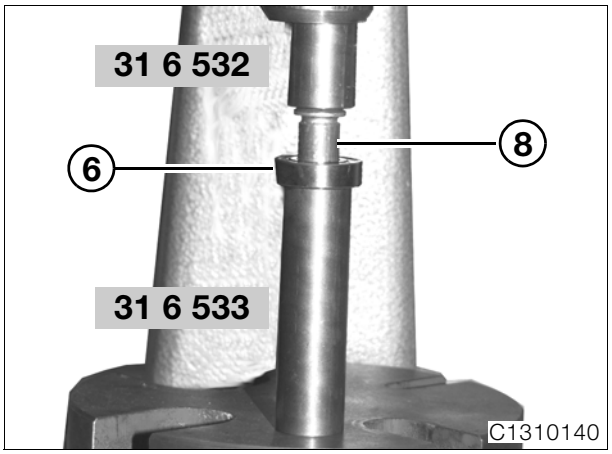
- Press out ball bearing (6) with sleeve, **BMW No. 31 6 533**
- Press ball bearing (6) and spacer sleeve (7) off stud (8)

Installing ball bearing and stud

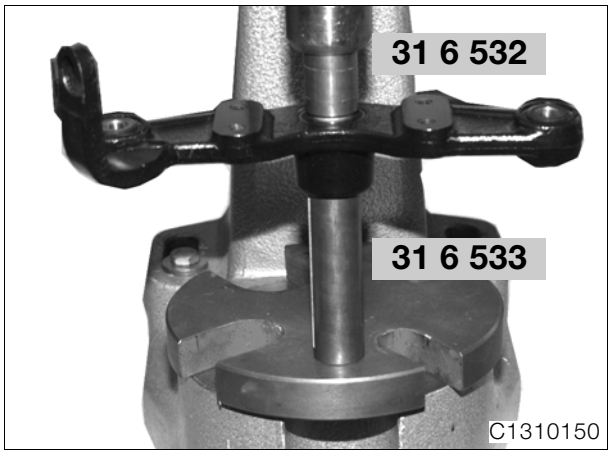
Note:
Always fit new bearing when reinstalling!



- Press in ball bearing (6) against its seat in the fork cross brace with drift punch, **BMW No. 31 6 531**



- Press ball bearing (6) onto threaded stud (8) using drift punch, **BMW No. 31 6 532,** and sleeve, **BMW No. 31 6 533**

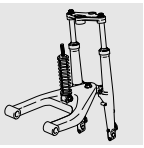


- Install spacer sleeve (7) and pre-assembled threaded stud (8) in fork cross brace with drift punch, **BMW No. 31 6 532,** and sleeve, **BMW No. 31 6 533**
- Install circlip (5)

Installing fork cross brace

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Remove all traces of old thread-locking compound from the threads

Torque specification:
Fork cross brace to frame (threaded stud)
(+ Loctite 243) ..... 83 Nm



Installing telescopic fork

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Remove all traces of old thread-locking compound from the threads
- Tighten the fastener securing the brake line to the telescoping tube cross brace

Attention:
Check that the system moves freely by compressing/extending the suspension in the straight-ahead position and with the steering turned to the full lock positions!

Attention:
When installing new telescopic forks, check the clearance of the ABS sensor!

Additional operations when installing new telescopic forks

- Checking ABS/wheelspeed sensor gap, adjusting as required

➠ .....See Group 34

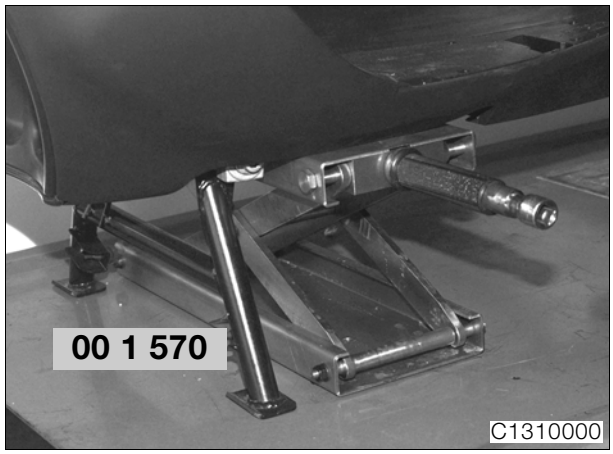
Fluids and lubricants:
BMW Telescopic fork oil.....0.32 l/telescopic tube ..... (0.56 Imp pints/telescopic tube)

Torque specification:
Leading link to telescopic tube brace (+ Loctite 2701) ..... 127 Nm
Brake hose to telescopic tube brace ..... 5 Nm
Fork stationary tube to fork cross brace ..... 52 Nm
Handlebar to fork cross brace ..... 21 Nm
ABS sensor ..... 9 Nm

31 42 045 Replacing seal rings for telescoping tube

Removing telescopic tube cross brace with telescopic tubes

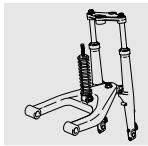
Attention:
Do not operate the handbrake lever when the brake caliper has been removed.
Protect painted parts from scratching: apply adhesive masking tape if necessary!

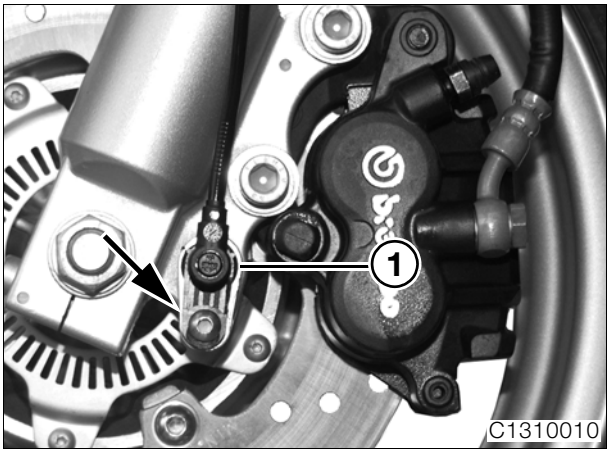


- Raise vehicle with hoist, **BMW No. 00 1 570**
- Lower the front wheel (move the large lever of the easy-lift mechanism down)

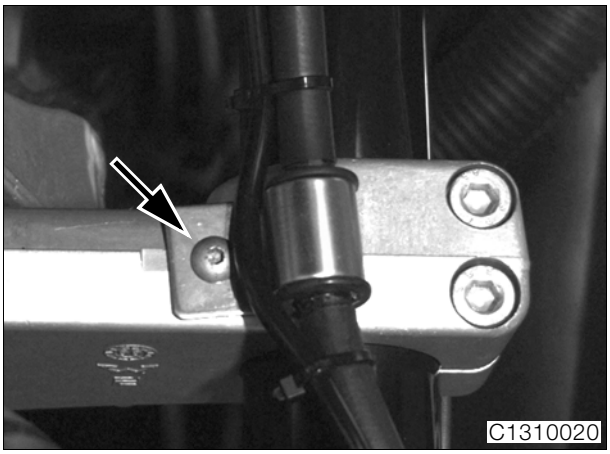
– Remove the brake caliper

➠ .....See Group 34



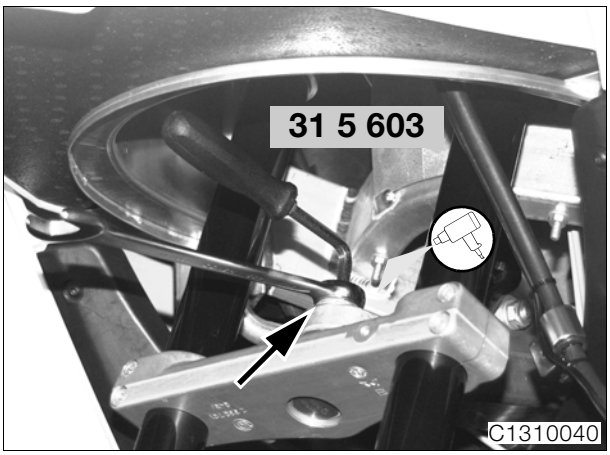


- Unbolt (arrow) ABS wheelspeed sensor
- Remove ABS wheelspeed sensor (1)



- Detach (arrow) bracket for brake hose/sensor connection wire at telescopic tube cross brace

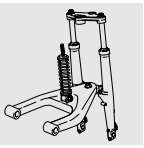
Attention:
The fasteners are secured with thread-locking compound; heat to max. 120 °C (248 °F) to facilitate removal!



- Using an angled 21 mm box-end spanner and Allen wrench, **BMW No. 31 5 603**, release fastener (arrow) securing leading link to fork cross brace

Note:
Telescopic fork oil can run out!
Stationary tubes remain on vehicle!

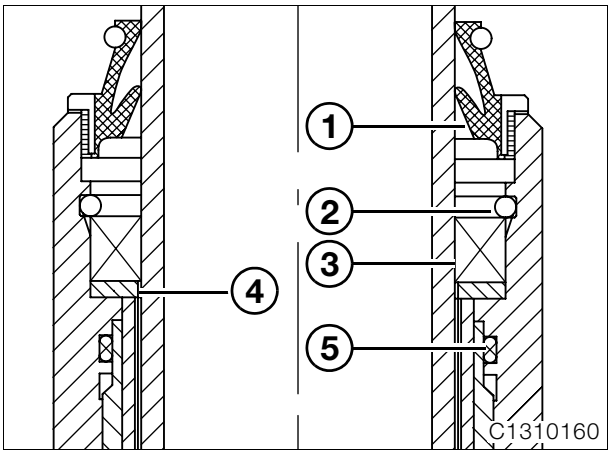
- Remove telescopic tube cross brace complete with telescopic tubes and front wheel by extracting downward
- Drain off the telescopic fork oil



31 42 171 Replacing telescopic tube seal

Remove seal

Attention:
Do not scrape the telescoping tube – mask it off if necessary!



- Lever out the dust boot (1)
- Remove retaining ring (2)
- Carefully lever out seal ring (3) with a screwdriver

Note:
Replace with new sealing ring (5) (➟ 31.14)!

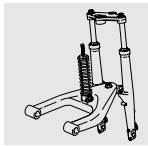
Install seal

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Do not forget washer (4)!



- Install new seal ring against its seat using punch, **BMW No. 31 3 631,** and adapter, **BMW No. 11 7 601**
- Install telescopic tube cross brace with telescopic tubes and front wheel

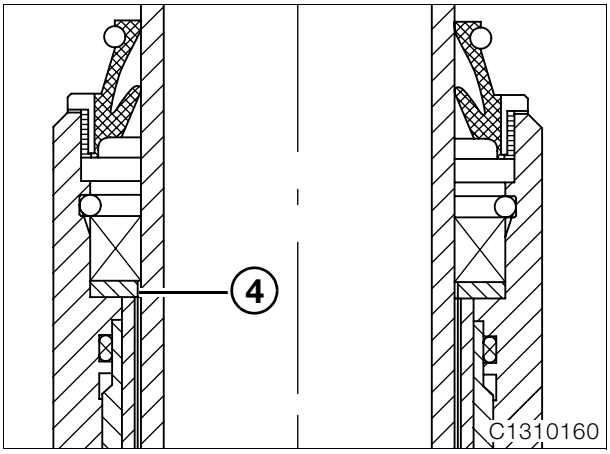


Replace seal telescopic tube/seal holder

Remove seal holder

Attention:
Do not scrape the telescoping tube – mask it off if necessary!

– Remove telescopic tube cross brace with telescopic tubes (➟ 31.11)
- Remove front wheel
– Remove telescopic tube seal (➟ 31.13)



Attention:
Washer (4) must be removed!

- Remove washer (4)



- Remove seal holder (arrow) with puller **BMW No. 00 8 400** and support **BMW No. 31 5 711**

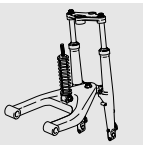
Install seal holder

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Never install anything other than new seal holder and new gaskets/seals!
Take care to avoid tilting seal holder during installation!



- Place telescopic fork on a firm support surface
- Use drift punch, **BMW No. 31 5 712,** to mount and seat new seal holder
– Installing telescopic tube seal (➟ 31.13)
- Install front wheel
– Install telescopic tube cross brace with telescopic tubes (➟ 31.18)



Replace guide bush

– Remove telescopic tube cross brace with telescopic tubes (➟ 31.11)
- Remove front wheel
– Remove telescopic tube seal (➟ 31.13)



- Place support ring, **BMW No. 36 6 610,** on seal holder
- Extract guide bush (arrow) with puller, **BMW No. 00 8 572,** and internal extractor, **BMW No. 00 8 563**

Note:
Residual oil from telescopic fork can be allowed to run out!
Plastic tube liners are mounted loose within telescopic tube!

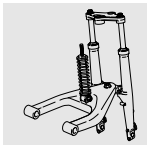
- Turn around telescopic fork and remove plastic tube liners (2x)

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Do not tilt guide bush during installation!



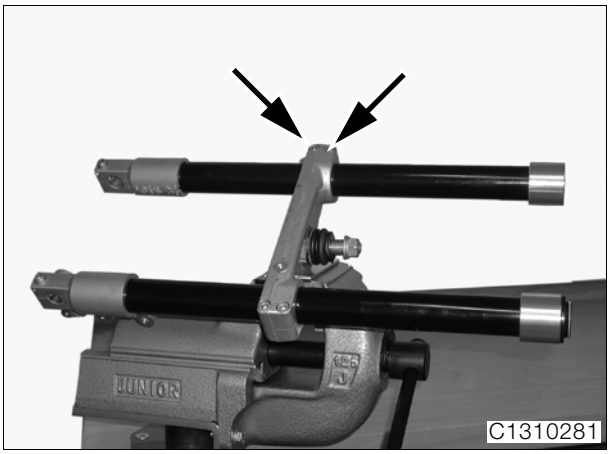
- Place telescopic fork on a solid support surface and install new guide bush with drift punch, **BMW No. 31 5 712**, continuing until it seats firmly
– Install telescopic tube seal (➟ 31.13)
- Install front wheel
– Install telescopic tube cross brace with telescopic tubes (➟ 31.18)



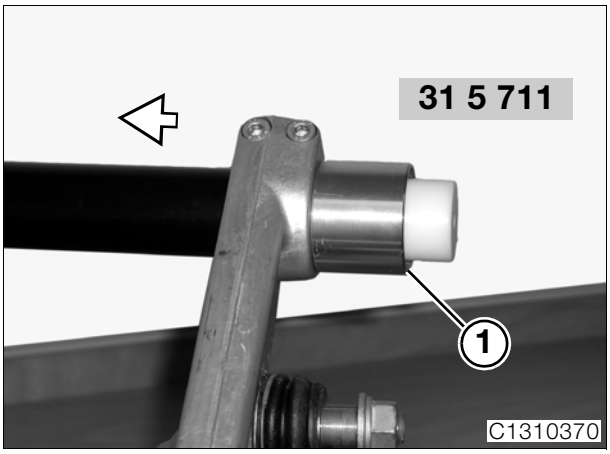
Replacing telescopic tube

The following section describes the procedure for the right telescopic tube. The operations for the left telescopic tube are basically the same.

– Removing telescopic tube cross brace with telescopic tubes (➟ 31.11)
- Remove front wheel
– Remove telescopic tube seal (➟ 31.13)

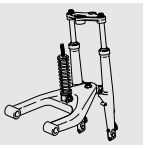


- Release telescopic tube clamp (arrows)



- Drive out seal holder (1) in direction indicated by arrow using support, **BMW No. 31 5 711**
- Remove telescopic tube

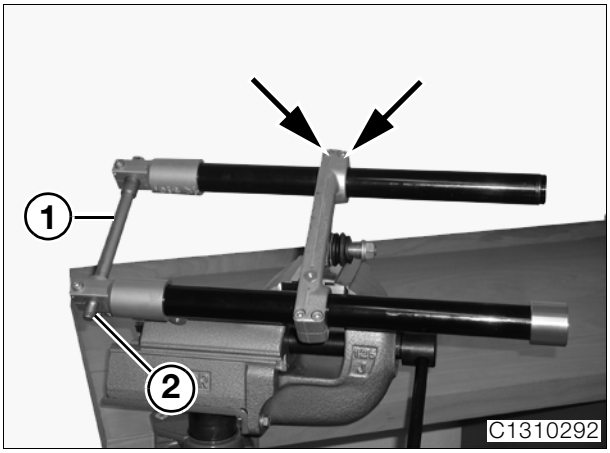
Note:
The remaining fork oil can be allowed to run out



When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Note:
The following installation instructions apply exclusively to replacement of **one** telescopic tube! If both telescopic tubes are being replaced, refer to section on telescopic tube cross brace replacement (➟ 31.17).

- Install telescopic tube



- Insert floating axle (1) through both telescopic tubes while adjusting new telescopic tube

Note:
The threads on the (2) floating axle must be completely visible!

- Turn floating axle (1) through several rotations
- Tighten clamp (arrows) for telescopic tube to specified torque
- Turn floating axle to check

Note:
After the clamp screws are tightened the floating axle (1) should still be easy to rotate and to remove!

– Install seal holder (➟ 31.14)
– Install telescopic tube seal (➟ 31.13)
● Install front wheel
– Install telescopic tube cross brace with telescopic tubes (➟ 31.18)

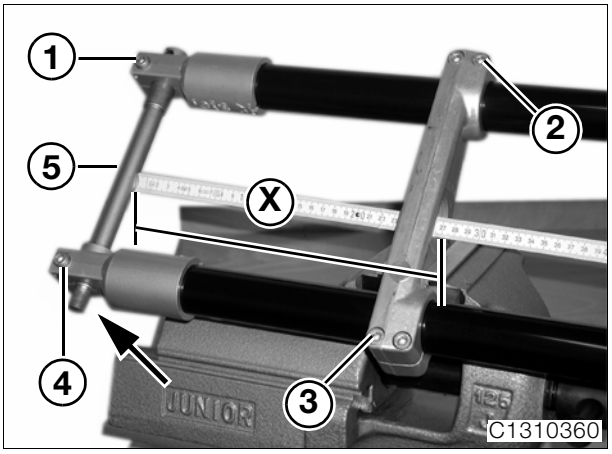
Torque specification:
Clamp, telescopic tube ..... 25 Nm

Replacing telescopic tube cross brace

– Remove telescopic tube cross brace with telescopic tubes (➟ 31.11)
● Remove front wheel
– Remove ball joint (➟ 31.18)
– Remove seals from both telescopic tubes (➟ 31.13)
– Remove telescopic tubes (➟ 31.16)

Note:
The remaining fork oil can be allowed to run out!

When installing:
● While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
● Install telescopic tubes



● Insert floating axle (5) through both telescopic tubes while turning the floating axle (5) through several rotations

Note:
The threads (arrow) must be completely visible!

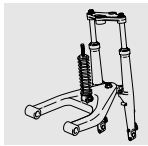
● Tighten clamps on (1, 4) floating axle
● Adjust telescopic tubes to dimension "x"
● Tighten clamp on (3) telescopic tube to specified torque
● Loosen clamp (1, 4) on floating axle
● Turn floating axle while adjusting second telescopic tube
● Tighten clamp (3) on telescopic tube to specified torque
● Check installation by rotating floating axle (5)

Note:
After tightening the floating axle (5) should still be easy to turn and to remove!

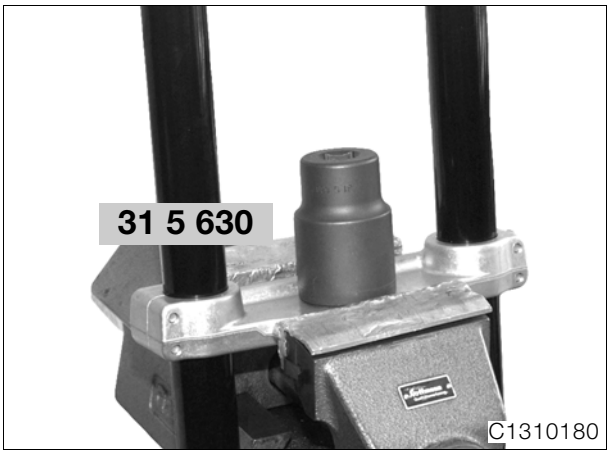
– Install seal holder (➟ 31.14)
– Install telescopic tube seal (➟ 31.13)
● Install front wheel
– Install telescopic tube cross brace with telescopic tubes (➟ 31.18)

Torque specification:
Telescopic tube clamp ..... 25 Nm

Adjustment specifications:
Adjustment dimension for upper floating axle to contact surface of ball joint "x" .....268.9 ± 1 mm
..... (10.5866 ± 0.0394 in)



31 42 055 Replacing ball joint



Warning:
Note that high torque has to be applied to loosen the ball joint fastener!

- Release the ball joint fastener with the 46 mm (1.8110 in) socket, **BMW No. 31 5 630**

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Coat ball joint attachment with **Optimoly TA** and use 46 mm (1.8110 in) socket, **BMW No. 31 5 630,** to tighten to telescopic tube cross brace (1)

Fluids and lubricants:
Optimoly TA

Torque specification:
Ball joint to telescopic tube cross brace..... 230 Nm

Installing telescopic tube cross brace with telescopic tubes

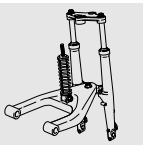
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Take care not to damage the seals on the telescoping tubes!

- Remove all traces of old thread-locking compound from the threads

Fluids and lubricants:
BMW Telescopic fork oil.....0.32 l/telescopic tube
..... (0.56 Imp pints/telescopic tube)

Torque specification:
Leading link to telescopic tube cross brace
(+ Loctite 2701)..... 127 Nm
Mount for brake line on telescopic tube
cross brace..... 5 Nm



31 42 020 Measuring telescopic fork

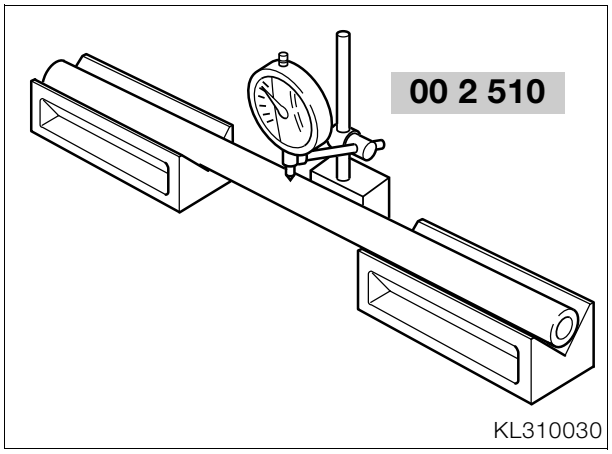
Attention:
After an accident, always examine the telescopic forks for cracks and signs of damage!

Examining telescoping tube cross brace and fork cross brace

- Check telescoping tube cross brace and fork cross brace for surface irregularities

Attention:
Replace telescoping tube cross brace/fork cross brace if deformed!

Checking runout of fixed tube



- Place both ends of fixed tube in V-blocks
- Turn fixed fork tube slowly and measure it with dial gauge, **BMW No. 00 2 510**

Attention:
Do not straighten distorted fixed tubes: always replace them!

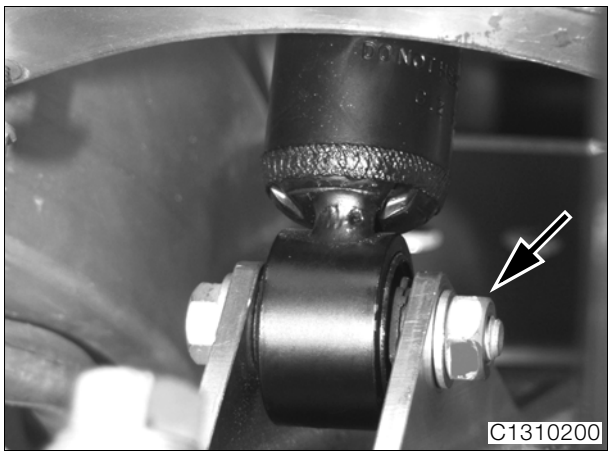
Adjustment specifications:
Allowed runout: .....max 0.1 mm (0.0040 in)

31 42 420 Removing and installing front spring strut

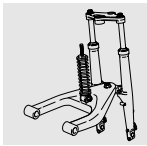
– Remove instrument trim
➠ .....See Group 46



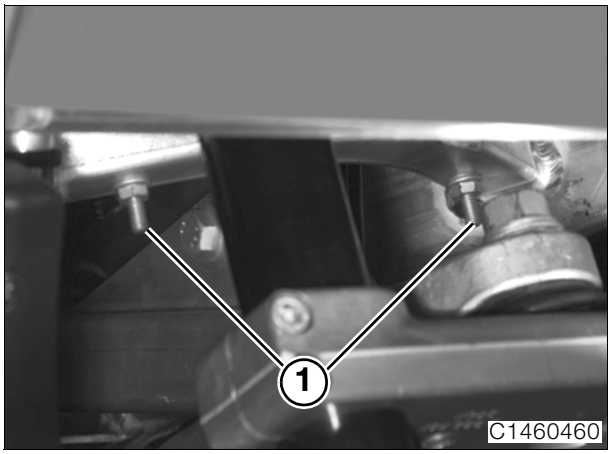
- Position hoist, **BMW No. 00 1 570,** so that stand can still be folded up
- Lift C1 with hoist, **BMW No. 00 1 570,** so that the front wheel is free and the C1 is supported securely
- Lower front wheel (easy-lift mechanism - move large lever up and then down)



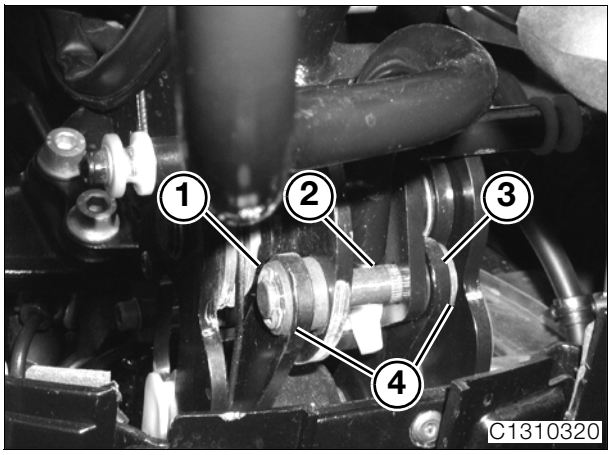
- Remove fastener (arrow) securing spring strut to leading link



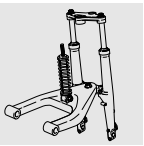
Note:
On the new version of the articulated joint only one spring is installed, on the right. The operations for removing the left spring do not apply to the new version!



- Release eye bolt attachment(s) (1)
- Detach spring(s) at top

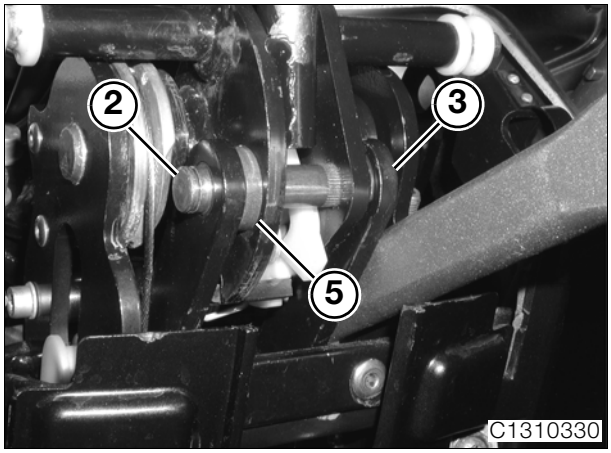


- Easy-lift mechanism - to snap the large lever into position at the top, first move the lever all the way to the top, then move it down
- Remove circlips (1) and washers (4)

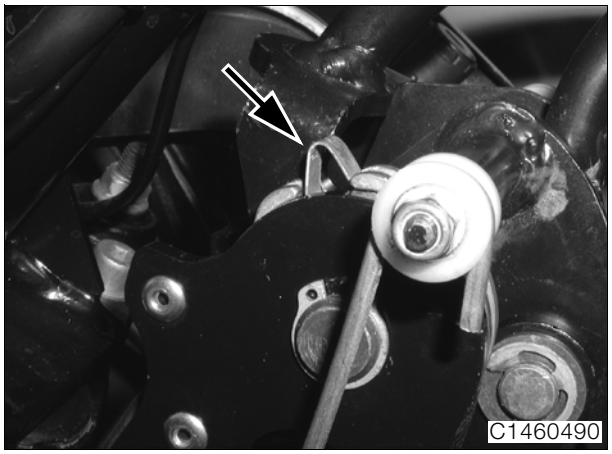


Attention:
When knocking out studs - do not damage groove for circlips!
Do not lose washers!

Note:
The studs are knurled on the right side!

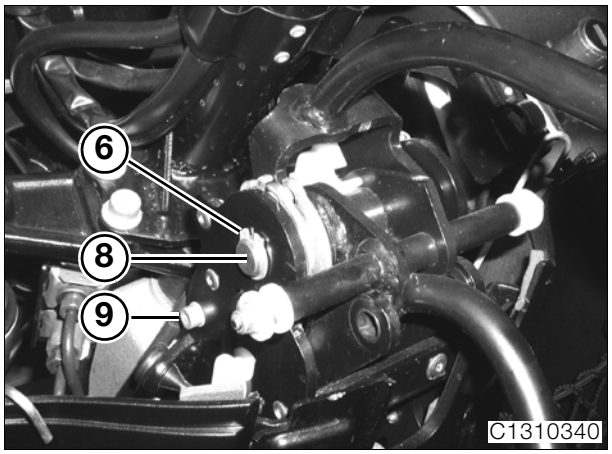


- Support thrust washer (3)
- Knock stud (2) to the right to remove
- Remove washer (5)

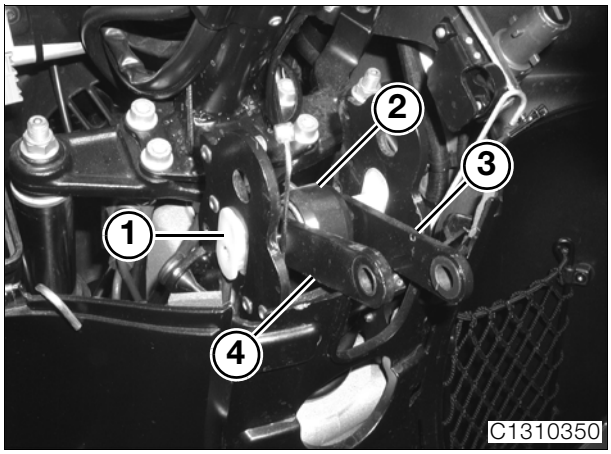


Note:
The new version of the curved washer is closed on one side. The retaining clip is deleted on the curved washers closed on one side.

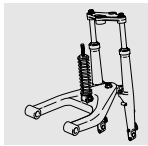
- or remove retaining clip (arrow)



- Remove circlip (6)
- Remove stud (8) by knocking to the right
- Remove large lever on easy-lift mechanism
- Detach stand cables from easy-lift mechanism's small lever and remove lever
- Release lock attachment (9) and remove lock

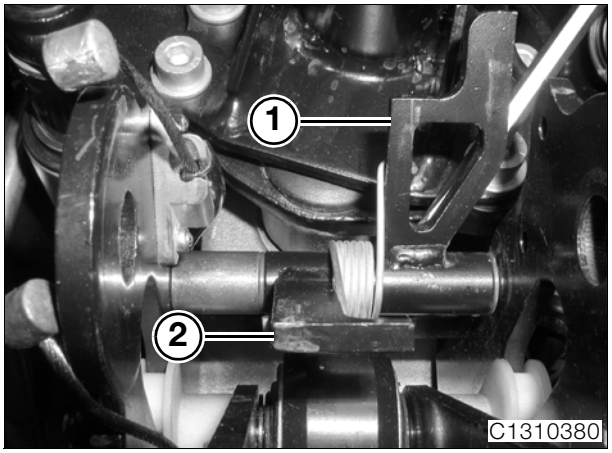


- Lift strut (2)
- Remove guides (1) and thrust washers (3, 4)
- Remove strut axle
- Remove strut by lifting upward



When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



- Before installing the lever check the guide (1) and support (2) to ensure that components movely freely with no excess friction or resistance
- Ensure that guide (1) and support (2) are positioned correctly
- When installing the small lever ensure that the guide (1) is pointed upward and that the right curved washer on the small lever seats securely against its contact surface
- When installing the large lever ensure that the large lever is installed over the support (2)

Attention:
Use caution to avoid damaging plastic sleeves!

Note:
The knurled side of the stud is on the right!

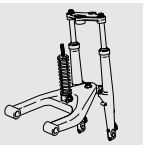
- Operation check

– Check cable free travel before operating stand, adjust as necessary

➠ .....See Group 46

Torque specification:

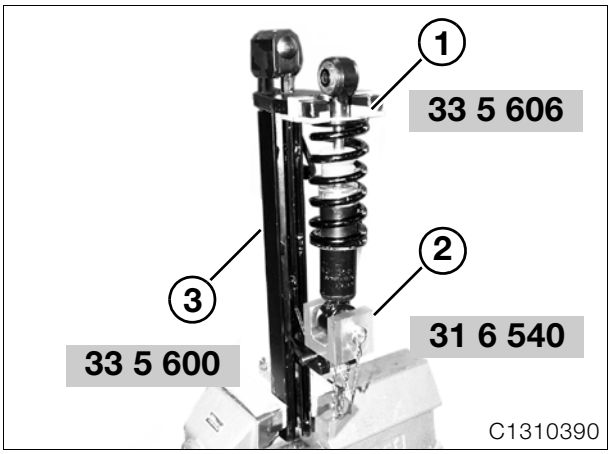
Detent mount ..... 4 Nm
Strut to leading link ..... 41 Nm
Eye bolt mount ..... 8 Nm



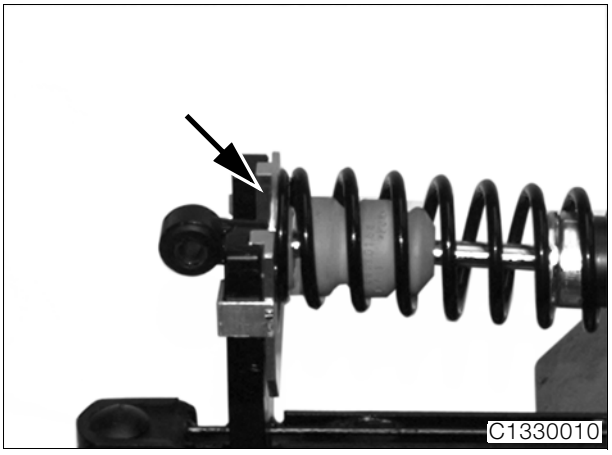
Replacing spring/shock absorber

– Removing strut (➟ 31.19)

Warning:
The spring strut is spring-loaded: proceed carefully when disassembling - injury hazard!



- Compress spring with device (3) **BMW No. 33 5 600**, adapter (2), **BMW No. 31 5 540**, adapter (1), **BMW No. 33 5 606**



- Remove retaining plate (arrow)
- Release and remove spring

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Install end of spring opposite the slot in the retaining plate, ensuring that the entire surface of the end of the spring rests securely against the retaining plate
- Check to verify that spring is installed correctly

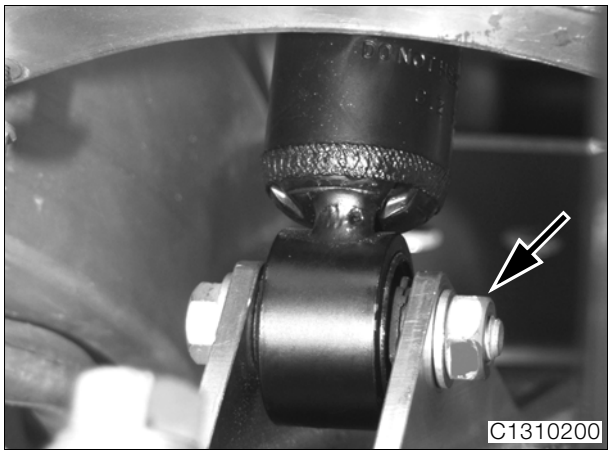
31 42 405 Removing and installing leading link

Removing leading link

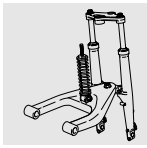
– Remove upper left and right tunnel panels
➟ .....See Group 46

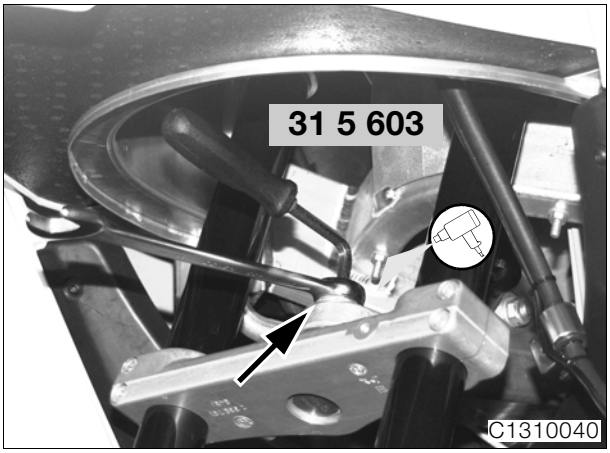


- Raise vehicle wirth hoist, **BMW No. 00 1 570**
- Lower the front wheel (move the large lever of the easy-lift mechanism down)

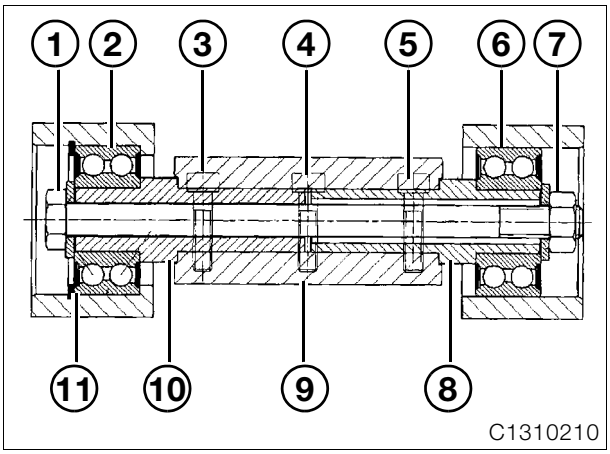


- Disconnect spring strut from leading link

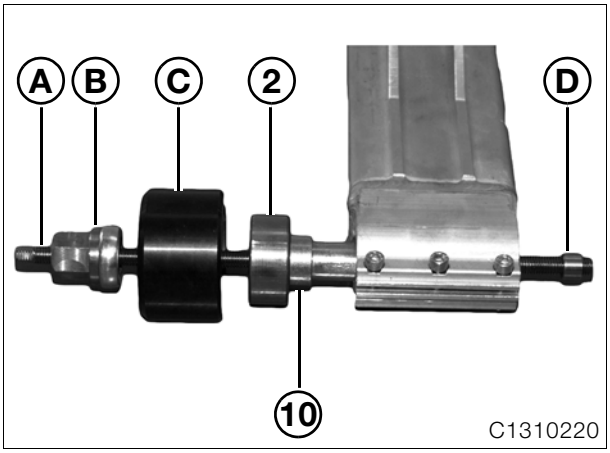




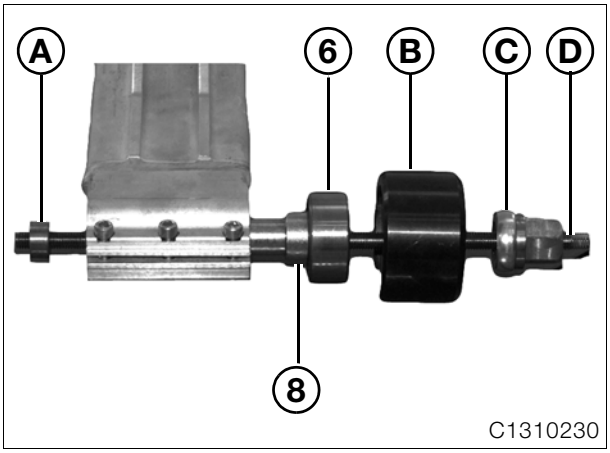
- Detach the leading link from the telescoping tube cross brace



- Slacken fasteners (3-5) securing leading-link pivot joints
- Remove fasteners (1, 7) securing leading-link pivot joints
- Remove retaining ring (11)

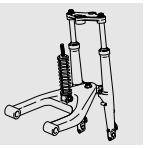


- Extract bearing with (2) leading link pivot joint (10) on left with
  threaded rod (A) M10, **BMW No. 31 5 701**,
  nut (B) M10 with bearing, **BMW No. 31 5 702**,
  puller support (C), **BMW No. 31 5 696**,
  puller support (D), **BMW No. 31 5 703**



- Extract bearing (6) with leading link pivot joint (8) on right with
  threaded rod (D) M10, **BMW No. 31 5 701**,
  nut (C) M10 with bearing, **BMW No. 31 5 702**,
  puller support (B), **BMW No. 31 5 696**,
  puller support (A), **BMW No. 31 5 704**,

- Pull the leading link forward to remove



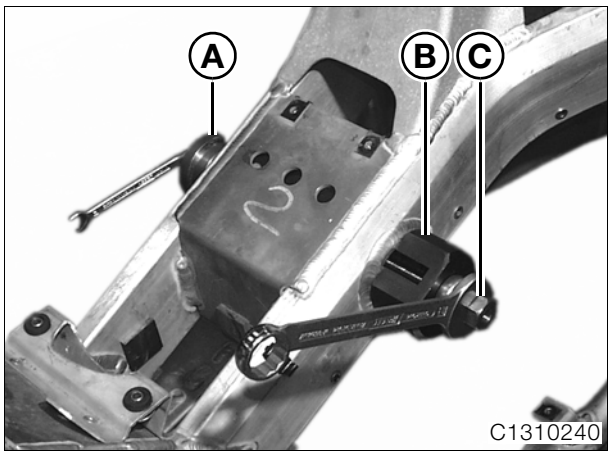
31 42 850 Replacing left and right taper-fit ball bearings for leading link

– Removing leading link
- Pull taper-fit ball bearings (2, 6) off leading-link pivot joints (10, 8)

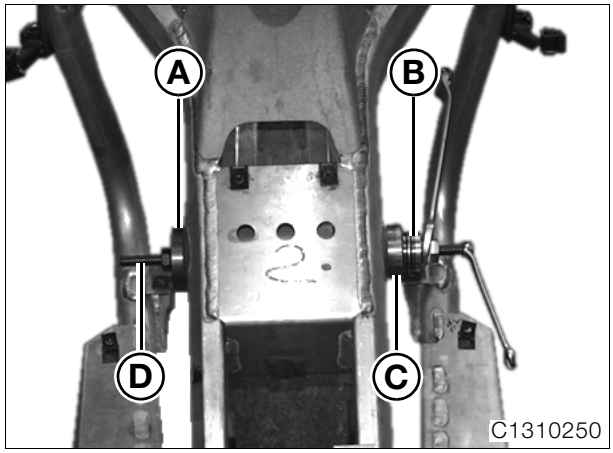
Installing leading link

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Remove all traces of old thread-locking compound from the threads
- Apply assembly grease to the outside diameter of the taper fit ball bearings

Attention:
Keep the taper fit ball bearing aligned with its housing!



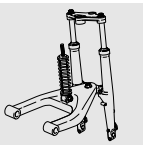
- Position leading link pivot joint with tapered ball bearing on left and pull in with threaded rod M10, **BMW No. 31 5 701**, nut (C) M10 with bearing, **BMW No. 31 5 702**, insertion sleeve (A), **BMW No. 31 5 705**, puller support (B), **BMW No. 31 5 696**, continuing until it seats
- Install the retaining ring



- Position leading link pivot joint with tapered ball bearing on right and use threaded rod (D) M10, **BMW No. 31 5 701**, nut (B) M10 with bearing, **BMW No. 31 5 702**, insertion sleeve (C), **BMW No. 31 5 706**, insertion sleeve (A), **BMW No. 31 5 705**, continuing until it seats

Torque specification:

Leading link pivot mount	41 Nm
Clamp, leading link pivot	9 Nm
Leading link to telescopic tube cross brace (+ Loctite 2701)	127 Nm
Strut to leading link	41 Nm



32 Steering

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Heated grip, removing and installing on right 7

Removing and installing left/right brake-control assemblies 8

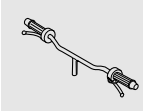
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Replacing seal in brake unit (master cylinder) with optional ABS only 10

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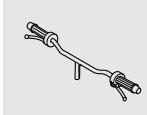
Removing and installing handlebar 11

Replacing throttle cable 13



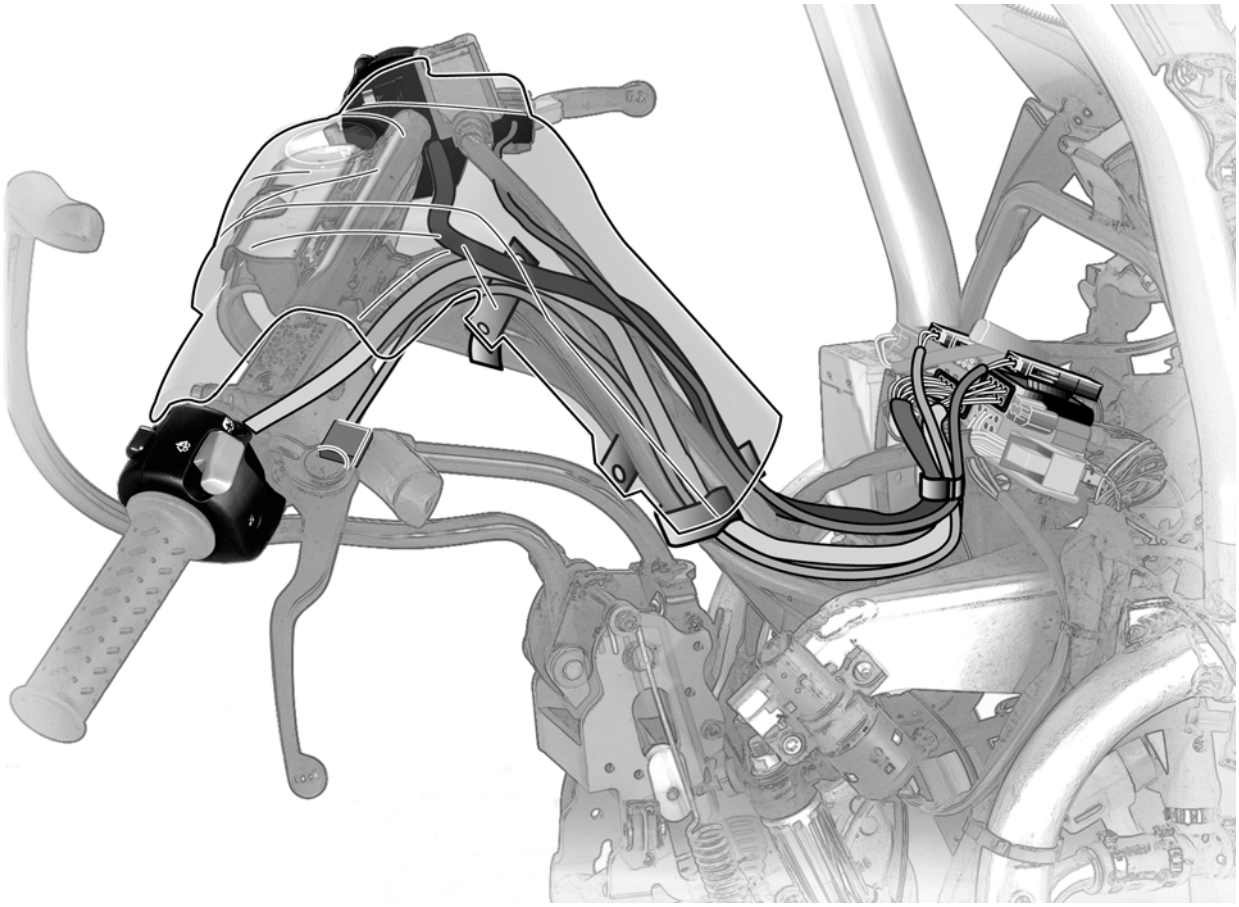


Technical Data		C1
Type		Single-piece tubular handlebar
Handlebar tube diameter	mm (in)	22 (0.8661)
Steering lock angle	°	38
Width of handlebar	mm (in)	650 (25.5906)





General view of handlebar

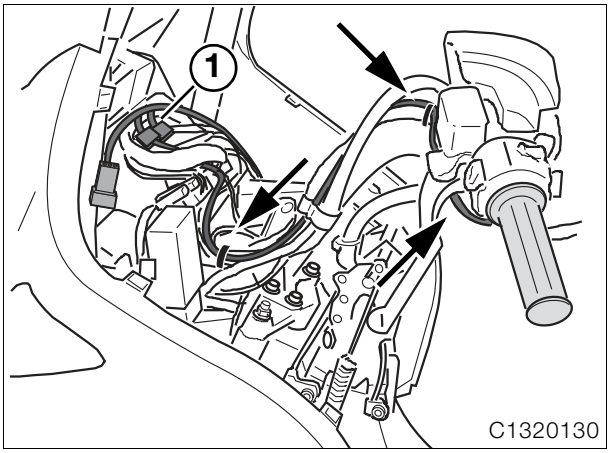


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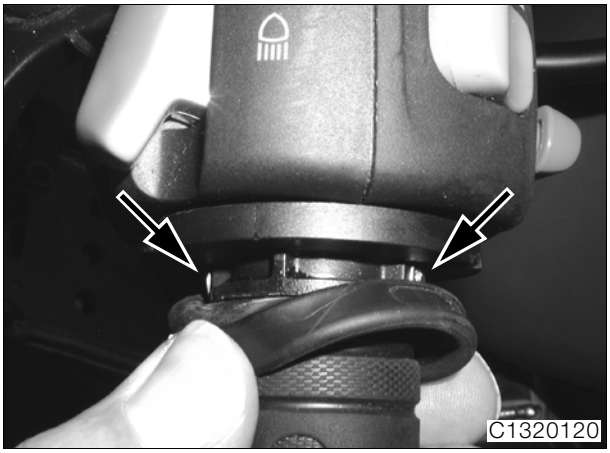
Heated grips

Heated grip, removing and installing on left side

– Remove handlebar trim
– Remove instrument trim
➠ .....See Group 46



- Disconnect plug (1)
- Open cable ties (arrows)
- Remove wiring harness from bracket on handlebar



- Undo fasteners (arrows)
- Remove heated grip

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

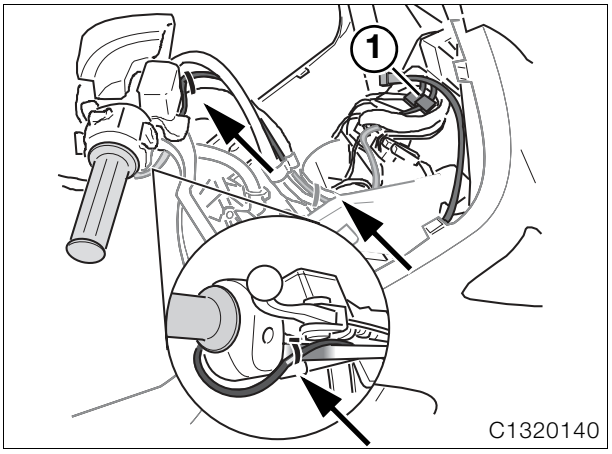
Attention:
Make sure that all lines and cables are correctly routed!

Torque specification:
Mount for combination switch ..... 4 Nm

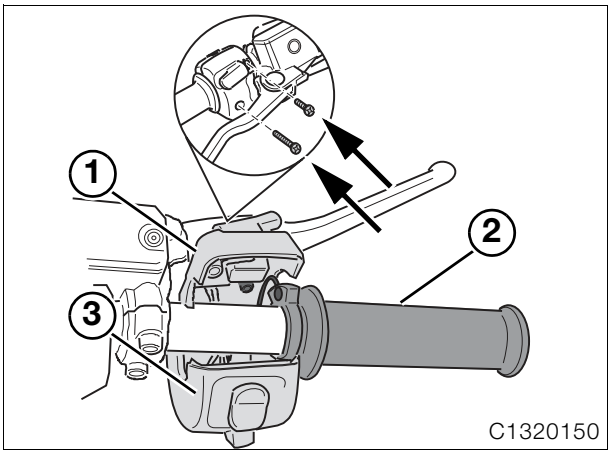
Heated grip, removing and installing on right

– Remove handlebar trim
– Remove instrument trim

➠ .....See Group 46



- Disconnect plug (1)
- Open cable ties (arrows)
- Remove wiring harness from bracket on handlebar

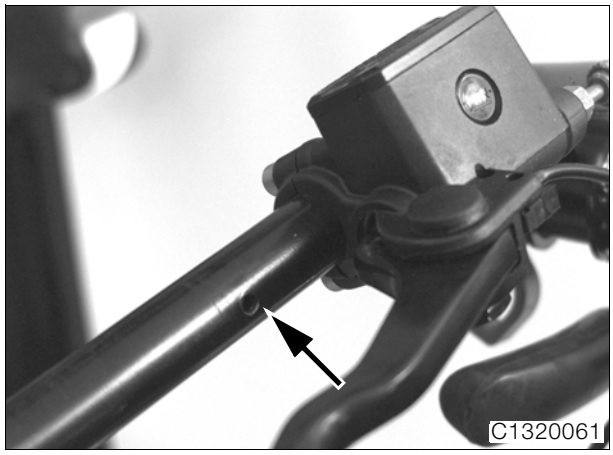


- Remove fasteners (arrows)
- Fold back rear section of combination switch (3)
- Lift front part of combination switch (1) slightly to the front whilst simultaneously detaching the heated throttle twist grip (2) from the combination switch
- Slide heated throttle twist grip (3) to the right and release Bowden cable from curved washer
- Remove heated throttle twist grip

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Ensure that lines and Bowden cable are routed correctly!
Install combination switch with the antitwist mechanism in the correct location.
Ensure adequate clearance between combination switch and brake fitting!



- Secure front section of combination switch in socket (arrow)
- Checking throttle cable play, adjusting if necessary

Adjustment data:
Move the handlebars all the way from left to right and ensure that throttle valve does not move

Torque specification:
Combination switch mount..... 4 Nm

32 72 118/120 Removing and installing left/right brake-control assemblies

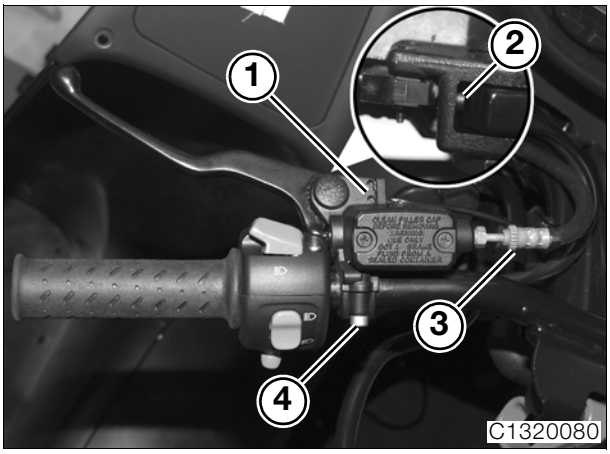
The procedure for removing and installing the left brake-control assembly is described below. The procedure for removing and installing the right brake-control assembly is basically the same.

– Remove handlebar trim

➠ .....See Group 46

Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid destroys paint!

Left brake-control assembly:
– Drain the rear brake circuit
Right brake-control assembly:
– Drain the front brake circuit



- Disconnect brake line (3) from brake lever assembly
- Remove 2 fasteners (1) for brake-light switch

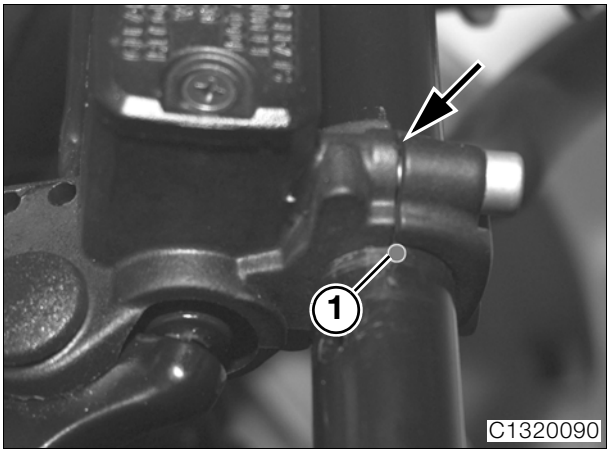
Note:
Remove plunger (2) for brake-light switch!

- Slacken clamping screws (4) on brake-control assembly

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Warning:
Make sure that the gap at the clamp is of uniform width!

Attention:
Make sure that lines and cables are correctly routed. Ensure adequate clearance between the combination switch and the brake fitting!



- Align the hand fitting with punch mark (1)
- Tighten clamping screws evenly
- Make sure that the gap (arrow) at the clamp is of uniform width

Left brake-control assembly:
– Fill and bleed the rear brake circuit
Right brake-control assembly:
– Fill and bleed the front brake circuit

➠ .....See Group 34

Adjustment data:
Adjust the brake-light switch so that the brake light comes on no later than when the brake pads contact the brake disc

Torque specification:
Brake-control assembly clamp screws..... 9 Nm
Brake hose to brake-control assembly..... 18 Nm

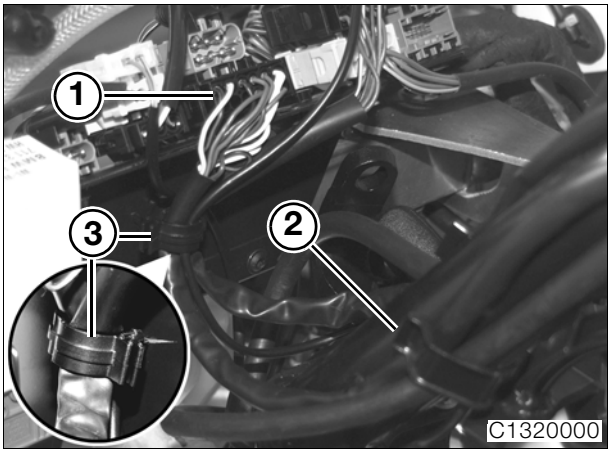
Replacing left/right brake lamp switch

This section describes the procedure for the left-side brake lamp switch. The operations for the brake lamp switch on the right side are essentially the same.

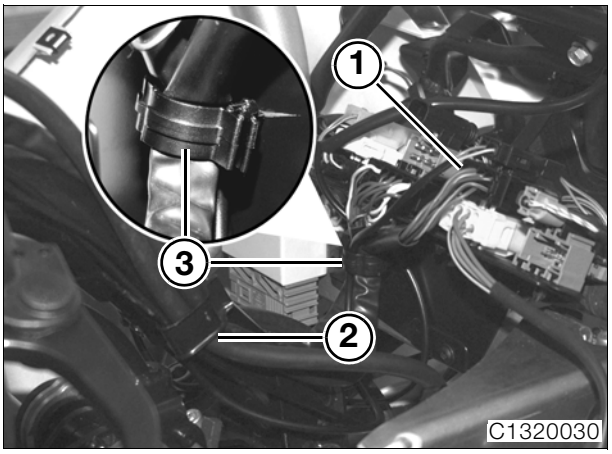
– Remove handlebar trim
– Remove instrument trim

➠ .....See Group 46

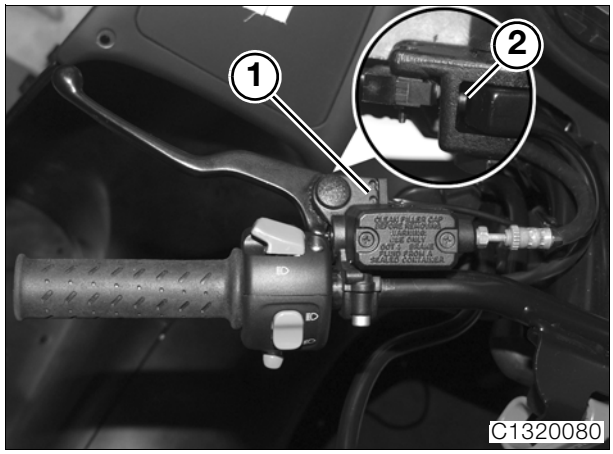
Left brake lamp switch:



Right brake lamp switch:



- Disconnect plug (1)
- Open cable clip (3)
- Remove cable harness from bracket (2) on handlebar



- Remove 2 fasteners (1) for brake-light switch

Note:
Remove plunger (2) for brake-light switch!

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that lines and cables are correctly routed. Ensure adequate clearance between combination switch and brake lever assembly!

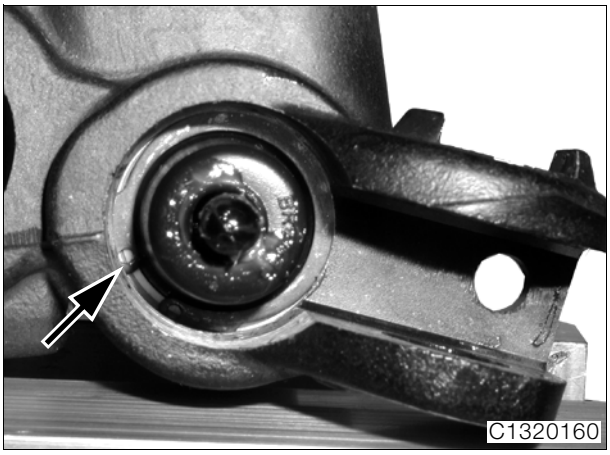
Adjustment data:
Adjust the brake-light switch so that the brake light comes on no later than when the brake pads contact the brake disc.

Torque specification:
Brake lamp switch (M2).....hand-tight

Replacing seal in brake unit (master cylinder) with optional ABS only

For enhanced clarity the illustrations show the components with the brake unit removed

Left brake-control assembly:
– Drain the rear brake circuit
Right brake-control assembly:
– Drain the front brake system
➠ .....See Group 34
– Remove handlebar lever



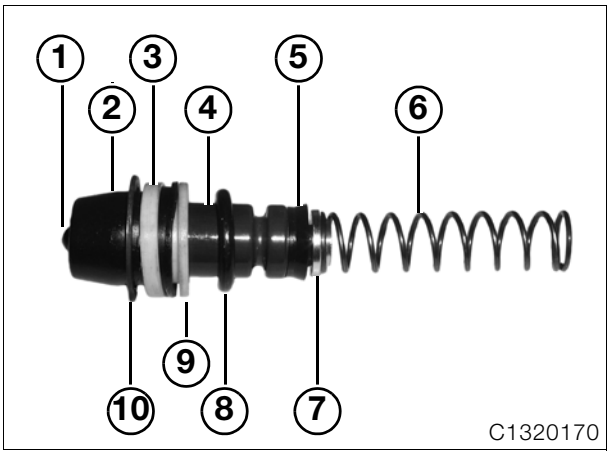
Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid destroys paint. Use a lint-free cloth to close off the open bore and prevent residual brake fluid from running out!

Note:
If no circlip is present, the entire brake unit must be replaced.

- Remove circlip (arrow)
- Remove piston
- Remove seal

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Take care to install the components in the right sequence!



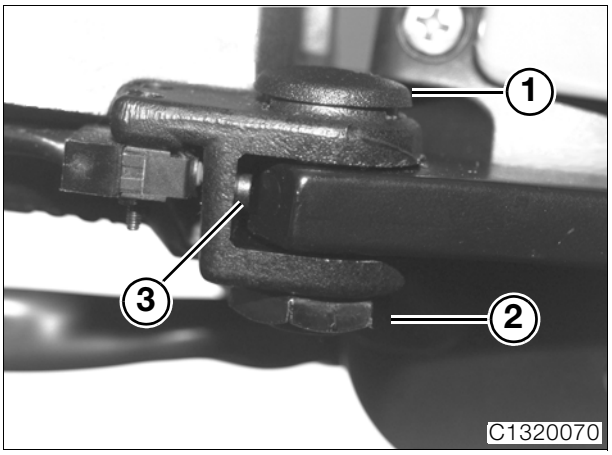
1 Plunger
2 Rubber boot
3 Outer lockring
4 Pistons
5 Dust boot
6 Spring
7 Insert
8 O-ring
9 Inner thrust washer
10 Lock ring

- Install new repair kit

Attention:
When bleeding a previously drained brake system always pull the handbrake lever repeatedly - danger of residual air remaining in system!

– Filling/bleeding brake system
Front brake (➠ 34.35)
Rear brake (➠ 34.36)

32 72 072/074 Removing and installing left and right handlebar levers



- Remove cover (1)
- Remove locknut (2)
- Working from below, press out the pivot pin

Note:
Watch plunger (3) for brake-light switch

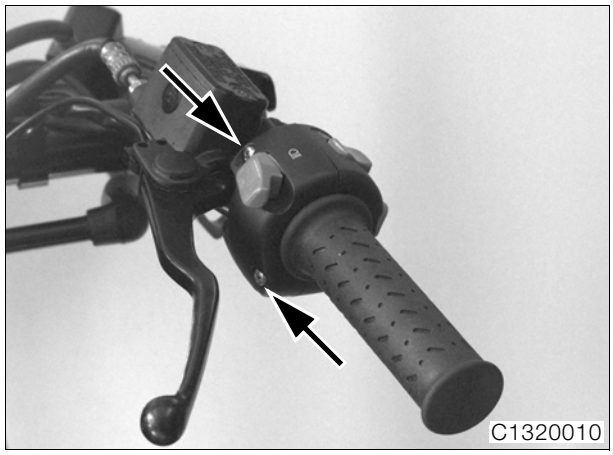
- Remove handlebar lever

When installing:
- Installation is the reverse of the removal procedure

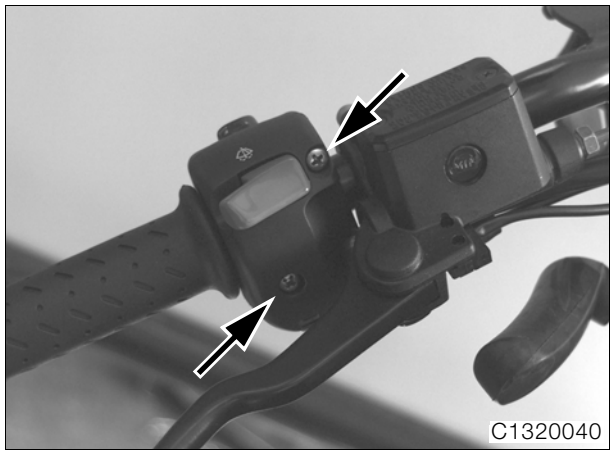
Torque specification:
Lever joint pin securing nut ..... 3 Nm

32 71 008 Removing and installing handlebar

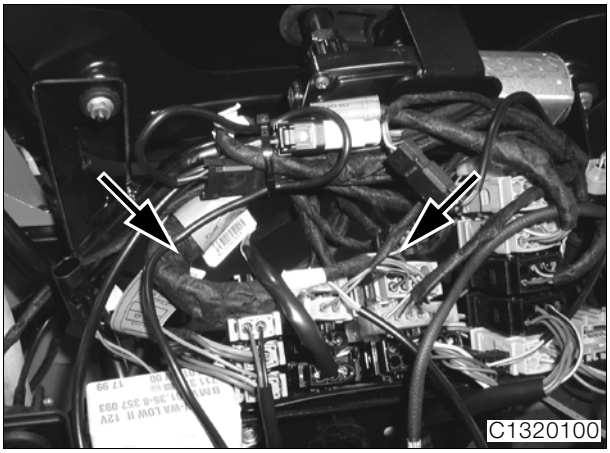
– Remove handlebar trim
– Remove instrument trim
➠ .....See Group 46
– Remove seat-belt central release mechanism
➠ .....See Group 72
- Slacken clamping screws for brake-control assemblies
- Remove brake-control assemblys from handlebar



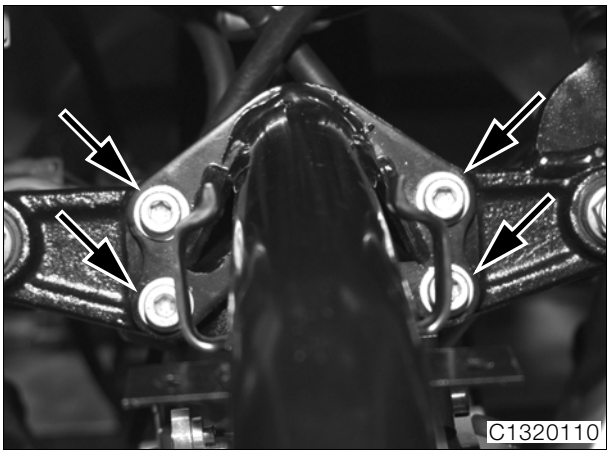
- Detach combination switch (arrows) on left
- Release left side of combination switch from handlebar
- Remove left grip
– Remove left heated grip as necessary (➠ 32.6)



- Release combination switch (arrows) on right
- Remove right side of combination switch from handlebar
– or remove heated grip on right (➠ 32.7)



- Remove connection cable, brake lines and Bowden cable from brackets (arrows)



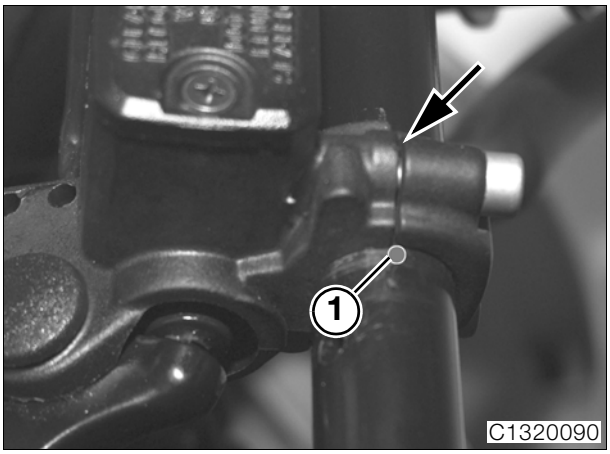
- Remove the fasteners (arrows) securing the handlebar

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Warning:
Make sure that the gaps at the clamps for the brake-control assemblys are of uniform width!

Attention:
Ensure that lines and Bowden cables are routed correctly!
Ensure that brake switch and combination switch are positioned correctly!
Ensure adequate clearance between combination switch and brake-control assembly!



- Align the hand fittings with the punch marks (1)
- Uniformly tighten clamping screws
- Make sure that the gap (arrow) at the clamp is of uniform width
- Check throttle cable play, adjusting if necessary

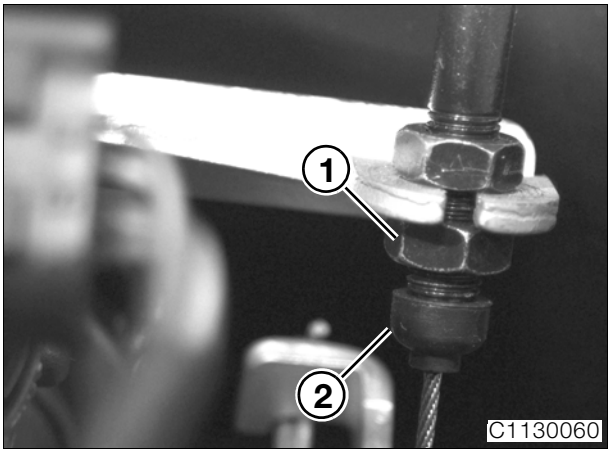
Adjustment data:
Move the handlebars all the way from left to right and ensure that throttle valve does not move

Torque specification:

Handlebar mount	21 Nm
Brake-control assembly pinch bolts	9 Nm
Combination switch mount	4 Nm

32 72 305 Replacing throttle cable

– Remove handlebar trim
– Remove instrument trim
– Open the seat
➠ .....See Group 46
– Remove combination switch on right



- Pull rubber cap (2) down
- Remove fastener (1) for throttle cable
- Disengage throttle cable from holder and cam disc
- Remove throttle cable

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Check throttle cable play, adjusting if necessary

Adjustment data:
Move the handlebars all the way from left to right and ensure that throttle valve does not move

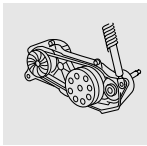
Torque specification:
Combination switch mount..... 4 Nm
Throttle cable mount ..... 8 Nm



33 Rear wheel drive

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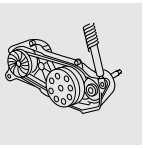
Removing auxiliary swing arm 5

Replacing Silentblocks 5

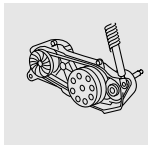
Installing auxiliary swing arm 5

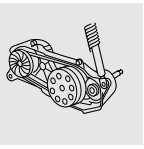
Removing and installing left/right spring strut 6

Replacing spring/shock absorber 7



Technical Data		C1
Rear suspension		
Spring strut		Coil spring with single-tube gas-filled shock absorber
Suspension travel		
at wheel	mm (in)	85 (3.3465)
at spring strut	mm (in)	100 (3.937)





Auxiliary swing arm

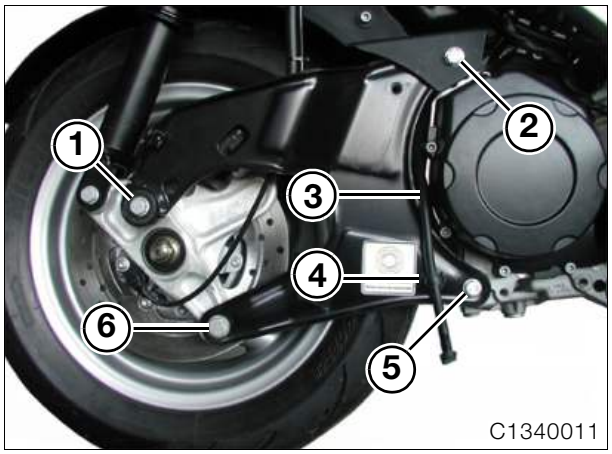
Removing auxiliary swing arm

– Remove silencer assembly

➠ .....See Group 18

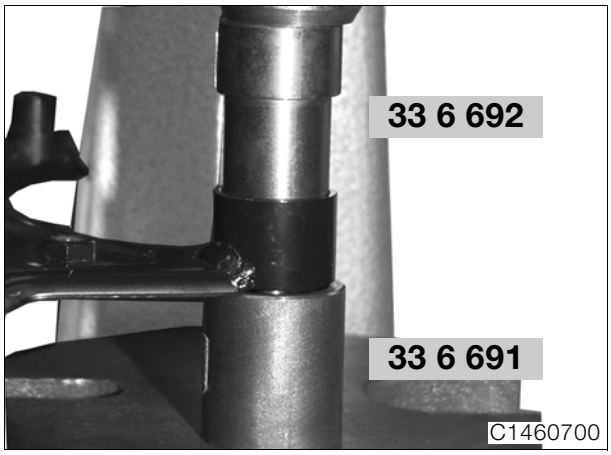


- Use hoist, **BMW No. 00 1 570,** to raise C1 slightly



- Disengage vent hose (3) from clip (4)
- Remove fasteners (1, 2, 5, 6) on auxiliary swing arm and remove it

33 17 180 Replacing Silentblocks



- Use drift, **BMW No. 33 6 691,** and sleeve, **BMW No. 33 6 692,** to remove Silentblock

When installing:

- Installation is the reverse of the removal procedure

Installing auxiliary swing arm

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Install the ABS sensor wire carefully and secure it with cable ties!

Torque specification:

Auxiliary swing arm mount M8	21 Nm
Auxiliary swing arm mount M10 (+ Loctite 243)	60 Nm

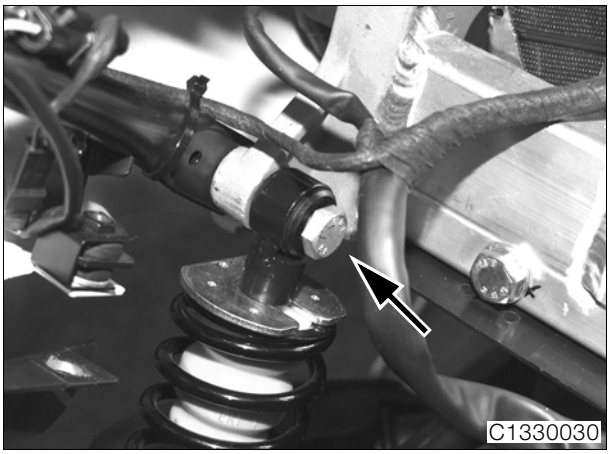
33 52 100 Removing and installing left/ right spring strut

The procedure for removing and installing the left spring strut is described below. The procedure for removing and installing the right spring strut is basically the same.

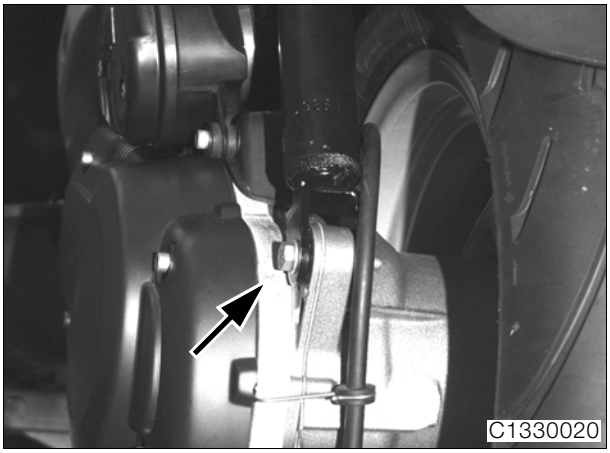
– Remove the rear storage compartment
➟ .....See Group 46



- Use hoist, **BMW No. 00 1 570,** to raise C1 slightly



- Remove mount (arrow) securing spring strut to frame



- Remove fastener (arrow) securing spring strut to swing arm
- Remove spring strut

When installing:
- Installation is the reverse of the removal procedure

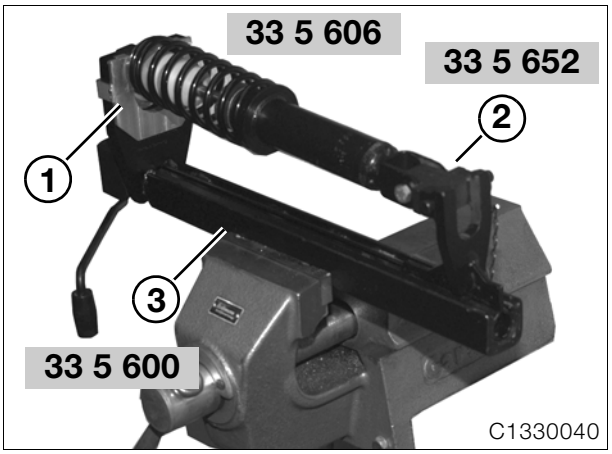
Torque specification:

Upper strut mount	41 Nm
Lower strut mount	21 Nm

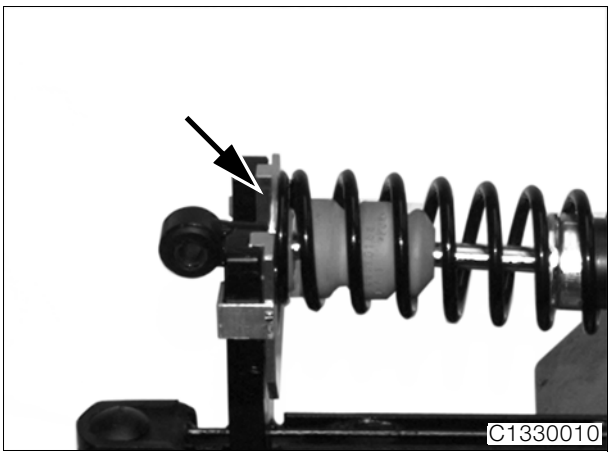
Replacing spring/shock absorber

– Remove spring strut

Attention:
The spring strut is spring-loaded: proceed carefully when disassembling - injury hazard!

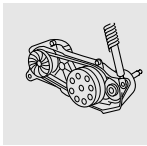


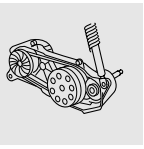
- Compress spring with device (3), **BMW No. 33 5 600**, adapter (2), **BMW No. 33 5 652**, adapter (1), **BMW No. 33 5 606**



- Remove retaining plate (arrow)
- Release and remove spring

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Install end of spring opposite slot in the retaining plate, ensuring that the entire end of the spring seats securely against the plate
- Check spring to ensure correct installation





34 Brakes

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Replacing brake caliper carrier bearing 5

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Brake hose between right brake handlebar fitting and brake line, ABS control unit 22

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Checking fluid level in the closed brake fluid reservoir 33

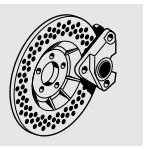
Checking fluid level in the open brake fluid reservoir 34

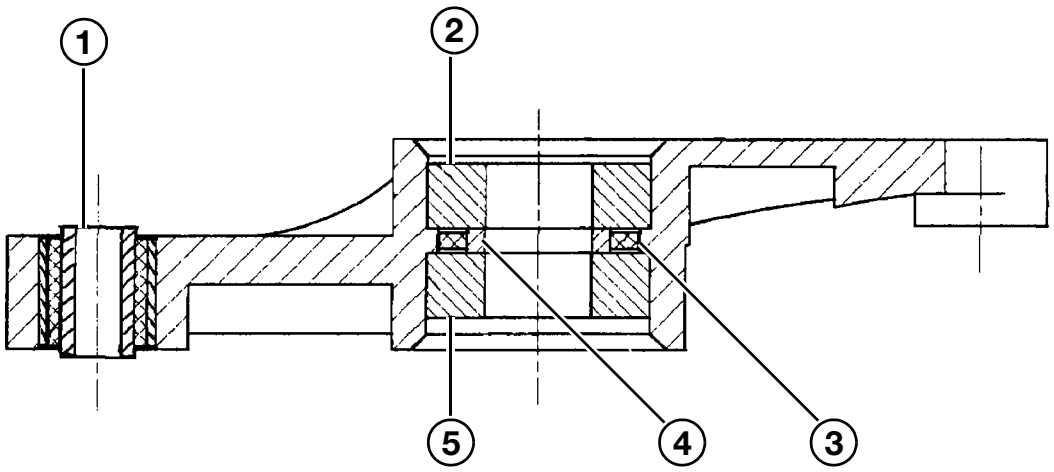
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Front brake 35
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Rear brake 36
- Drawing off brake fluid/forcing back brake pistons 36
- Bleeding rear brake circuit 36

Technical Data		C1
Brake fluid		DOT 4
Brake actuation		Hydraulic
Front wheel		
Front brake		2-piston floating caliper with fixed brake disc
Brake disc diameter, fixed	mm (in)	220 (8.6614)
Brake disc thickness	mm (in)	4.5 (0.1772)
Minimum thickness	mm (in)	4.0 (0.1575)
Max. approved lateral runout	mm (in)	0.25 (0.0098)
Brake pad surface area	cm^2 (sq in)	2x23.4 (2x0.9213)
Minimum lining thickness	mm (in)	1.0 (0.0394)
2-piston brake caliper, diameter	mm (in)	30/32 (1.18/1.26)
Piston diameter in handlebar lever master cylinder	mm (in)	13 (0.5118)
Rear wheel		
Rear brake		Single-piston floating caliper with fixed brake disc
Brake disc diameter, fixed	mm (in)	220 (8.6614)
Brake disc thickness	mm (in)	4.5 (0.1772)
Minimum thickness	mm (in)	4.0 (0.1575)
Max. approved lateral runout	mm (in)	0.25 (0.0098)
Brake pad surface area	cm^2 (sq in)	2x14.57 (2x0.5736)
Minimum lining thickness	mm (in)	1.0 (0.0394)
Single-piston brake caliper, diameter	mm (in)	34 (1.3386)
Piston diameter in handlebar lever master cylinder	mm (in)	13 (0.5118)





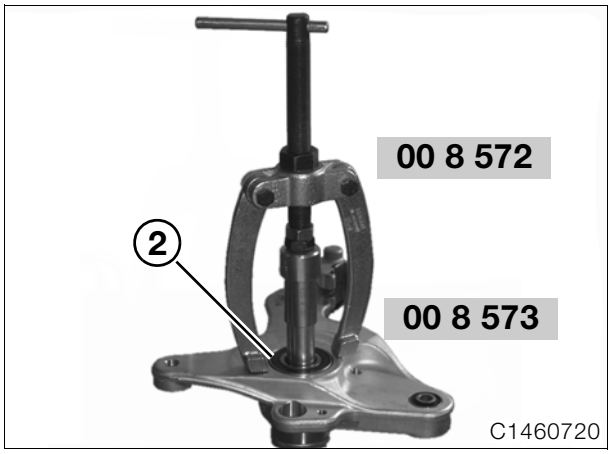
C1460710

Brake caliper backplate

34 21 050 Removing brake-caliper carrier

– Remove brake caliper, but do not disconnect brake hose (➟ 34.8)

34 21 550 Replacing brake caliper carrier bearing



C1460720

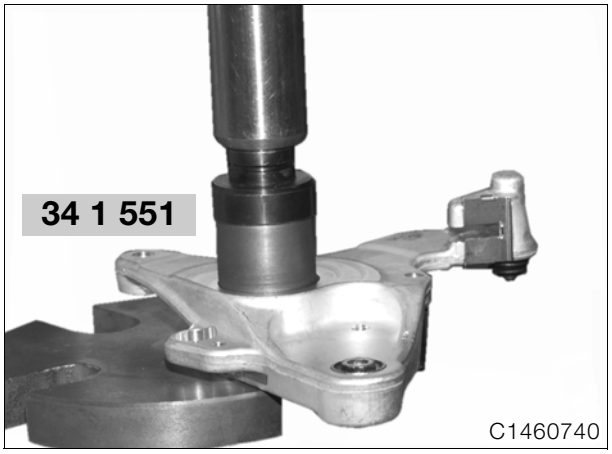
- Remove bearing (2) with extractor, **BMW No. 00 8 572,** and internal extractor, **BMW No. 00 8 573**

- Remove spacer sleeve (4)
- Remove alignment washer (3)



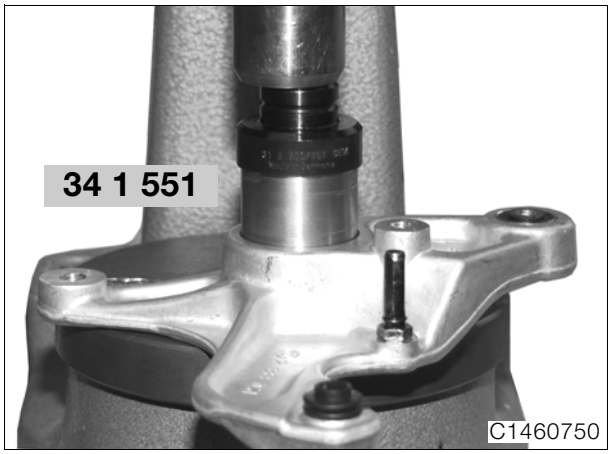
- Remove bearing on opposite side (5) with drift punch, **BMW No. 36 5 530**

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



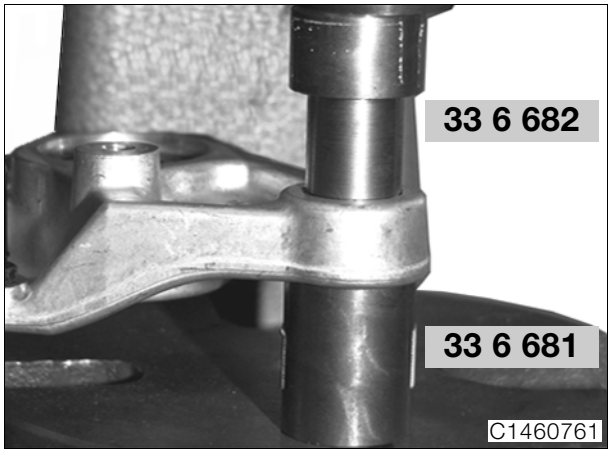
- Install bearing (2) with drift punch, **BMW No. 34 1 551,** continuing until it seats securely
- Install centring washer (3) and spacer sleeve (4)

Attention:
When pressing in the second bearing, make sure that the other bearing is not forced off its seat



- Install bearing (5) with drift punch, **BMW No. 34 1 551**

Replacing rubber bush



- Remove rubber bush with drift punch, **BMW No. 33 6 681,** and sleeve, **BMW No. 33 6 682**

When installing:
- Installation is the reverse of the removal procedure

Installing brake-caliper carrier

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Warning:
Never re-use the original 6-point nut on the final-drive shaft!

Attention:
Check ABS sensor gap, when ABS sensor, reluctor, brake caliper support, caliper support bearing, or final-drive shaft shim is replaced!

- Check the ABS sensor gap and adjust if necessary

➠ .....See Group 34

Attention:
Install the ABS sensor wire carefully and secure it with cable ties!

Torque specification:

Auxiliary swing arm mount M8	21 Nm
Auxiliary swing arm mount M10 (+ Loctite 243)	60 Nm
Strut mount	21 Nm
6-point nut for final-drive shaft (use only once)	130 Nm

Front brake caliper

34 11 222 Removing and installing brake caliper

Warning:
Do not separate the brake caliper halves!

Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle or with the brake pads!

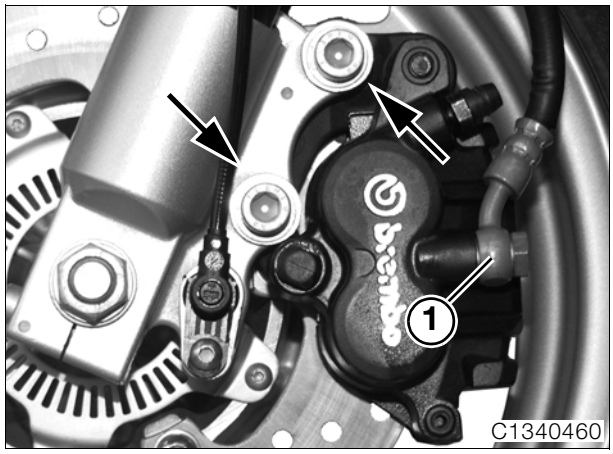
– Drain the brake system

Attention:
Avoid scratching the wheel rim; if necessary mask off the brake caliper!

- Firmly press the brake caliper against the brake disc to force back the brake pads and pistons

Note:
If the brake pads/pistons cannot be forced back in this way, this can indicate a defect in the brake system!

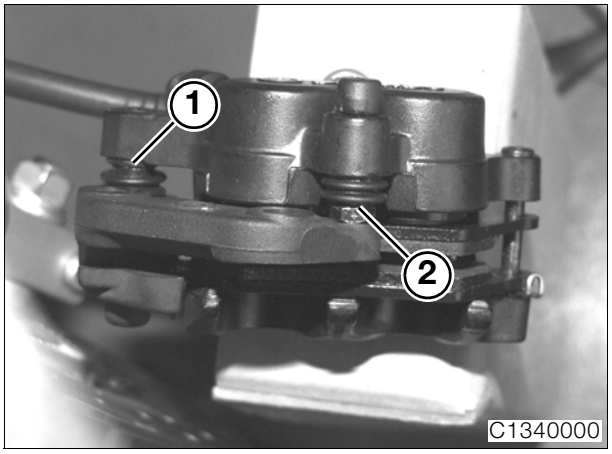
– Remove the brake pads



- Slacken banjo bolt (1) for brake hose and remove brake hose
- Remove fasteners (arrows) securing brake caliper

Attention:
Do not operate the brake with the brake caliper removed!

- Carefully remove the brake caliper



- Release dust boot (1) from brake-caliper carrier
- Detach dust boot (2) from brake caliper
- Pull brake caliper from its carrier

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Do not damage the brake pads when installing.

- If necessary, press the brake pads/pistons fully back with resetting tool, **BMW No. 34 1 500**
- Fit new seal rings on banjo bolt (1)

– Fill and bleed the brake system

Torque specifications:

Brake caliper to telescopic tube	41 Nm
Banjo bolt to brake caliper	18 Nm
Bleed screw	14 Nm

Rear brake caliper

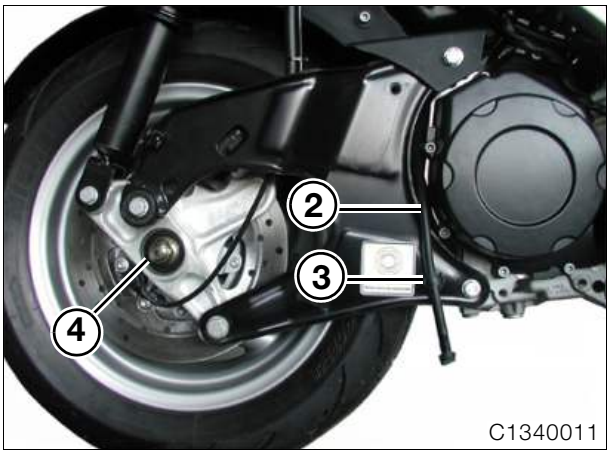
34 21 222 Removing and installing rear brake caliper

Warning:
Do not separate the brake caliper halves!

Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid attacks paint!

– Remove silencer assembly

➟ .....See Group 18



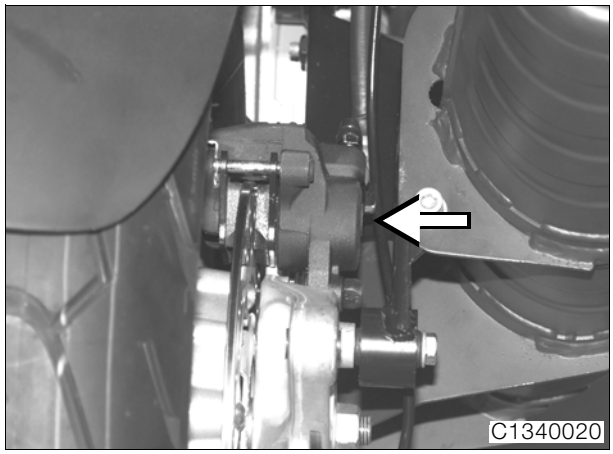
- Remove 6-point nut (4) on final-drive shaft
- Disengage vent hose (2) from clip (3)



- Use hoist, **BMW No. 00 1 570,** to raise C1 so that rear wheel is free and C1 is securely supported



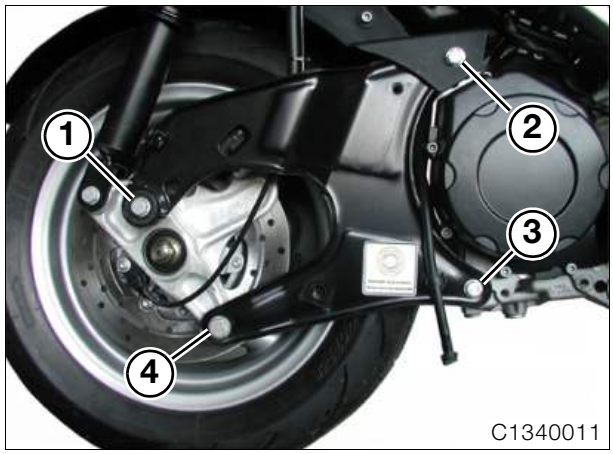
- Remove fastener (1) from bottom of spring strut and tie the spring strut up out of the way



- Firmly press the brake caliper against the brake disc in order to force back the brake pads and pistons

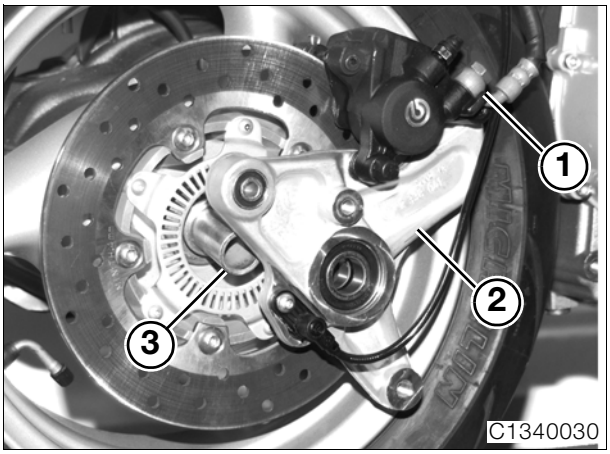
Note:
If the brake pads/pistons cannot be forced back in this way, this may indicate a defect in the brake system!

– Remove the brake pads



- Remove fasteners (1-4) of auxiliary swing arm and remove it

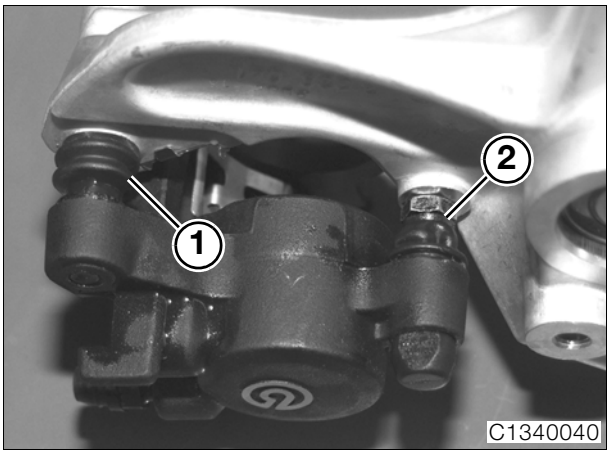
– Drain the brake system



- Release banjo bolt (1) on brake hose and remove hose
- Pull rear wheel with spacer (3) and brake-caliper carrier (2) far enough off the drive axle to permit the brake-caliper carrier to be turned forward
- Pull spacer (3) off the drive axle

Attention:
Avoid scratching the wheel rim; if necessary mask off the brake caliper!

- Carefully pull brake-caliper carrier (2) with brake caliper off the brake disc



- Detach dust boot (1) from brake caliper
- Detach dust boot (2) from brake-caliper carrier
- Remove brake caliper from its carrier

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Warning:
Never re-use the original 6-point nut on the final-drive shaft!

Attention:
Do not damage the brake pads when installing!

- If necessary, press the brake pads/pistons fully back with resetting tool, **BMW No. 34 1 500**
- Fit new sealing rings on banjo bolt for brake hose

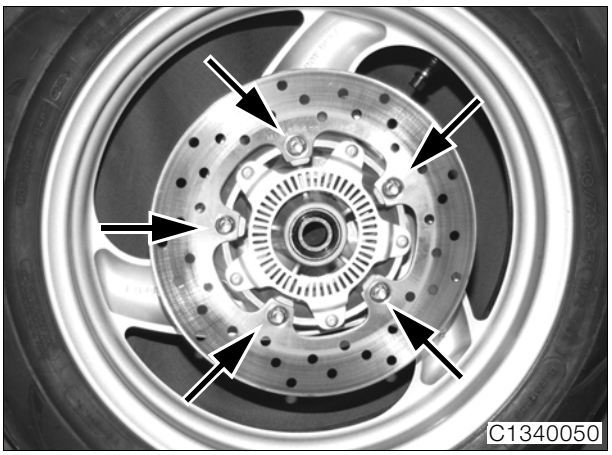
– Fill and bleed the brake system

Torque specifications:

6-point nut on final-drive shaft	130 Nm
Auxiliary swing arm mount M8	21 Nm
Auxiliary swing arm mount M10 (+Loctite 243)	60 Nm
Strut mount	21 Nm
Banjo bolt to brake caliper	18 Nm
Bleed screw to brake caliper	14 Nm
ABS sensor to brake caliper support	9 Nm

34 11 240 Removing and installing front brake disc

– Remove front wheel
➠ .....See Group 36



- Remove 5 fasteners (arrows) securing the brake disc
- Remove brake disc

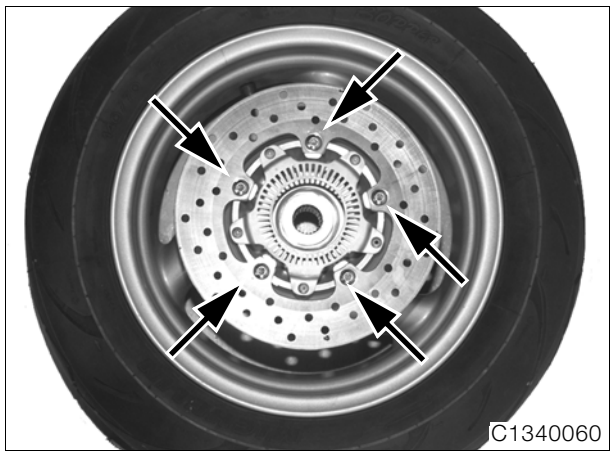
When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Degrease the brake disc before installing!

Torque specification:
Brake disc ..... 21 Nm

34 21 301 Removing and installing rear brake disc

– Remove rear wheel
➠ .....See Group 36



- Remove 5 fasteners (arrows) securing the brake disc
- Remove brake disc

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

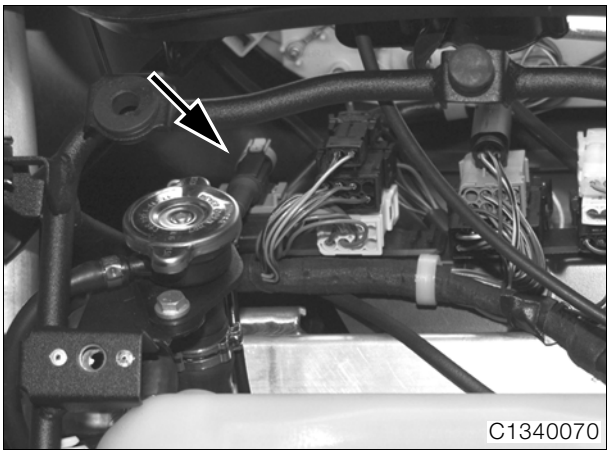
Attention:
Degrease the brake disc before installing!

Torque specification:
Brake disc ..... 21 Nm

34 52 044 Front ABS wheelspeed sensor, removal and installation

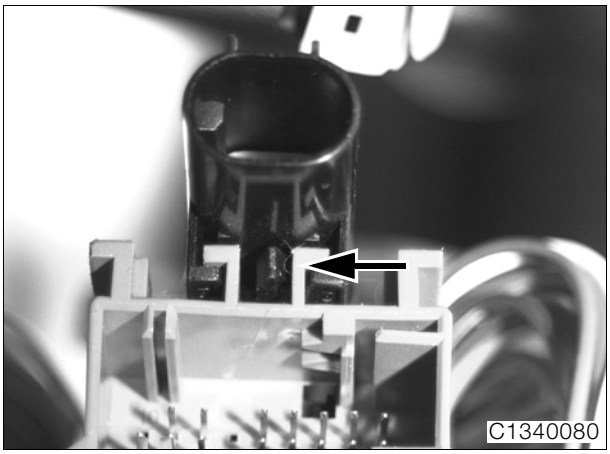
– Remove front fairing panel
– Swing the headlight forward and down
➠ .....See Group 46

Attention:
Disconnect ground cable from battery and insulate it!

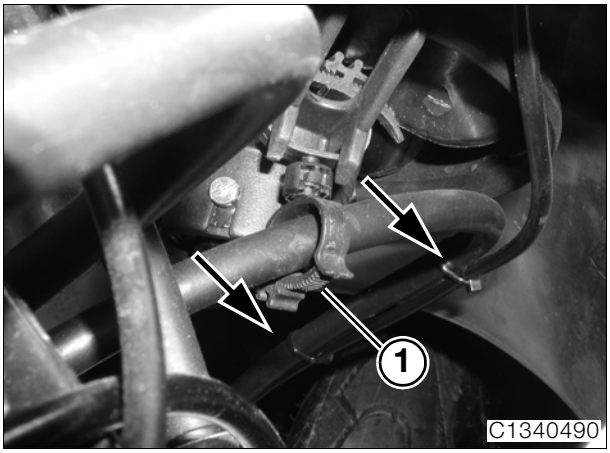


- Disconnect plug (arrow)

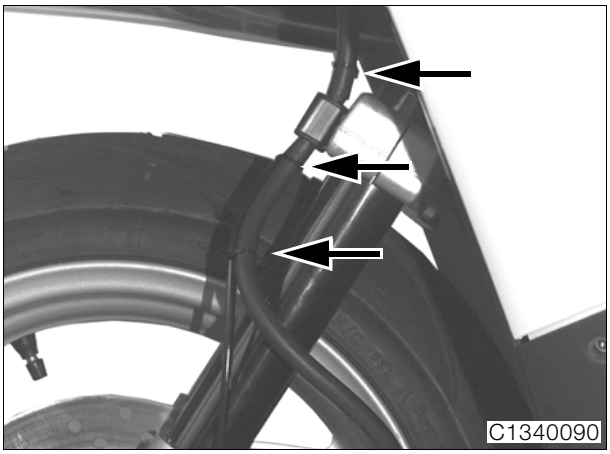
For enhanced clarity the illustrations portray components with the instrument trim removed! The plug is disconnected from the front!



- Unlatch the connector as indicated by the arrow
- Disconnect ABS sensor cable

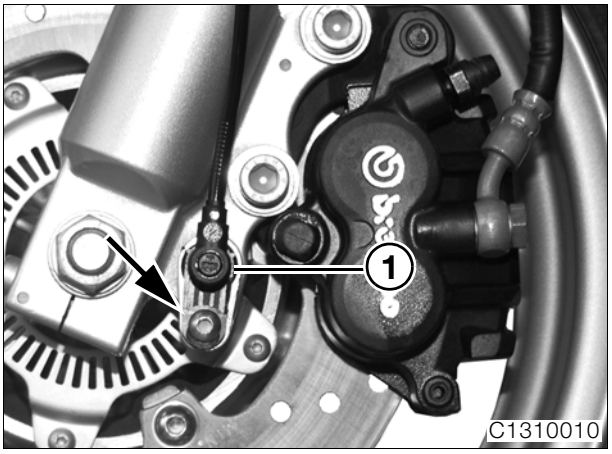


- Open cable clip (1)
- Open cable ties (arrows)



- Open cable ties (arrows)

Note:
Clean ABS sensor and its socket before removing/ installing!



- Release ABS sensor (arrow) (1) attachment
- Remove ABS sensor (1)

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Install the ABS sensor wire carefully and secure it with cable ties!

Attention:
When installing a new ABS sensor, always check the sensor gap!

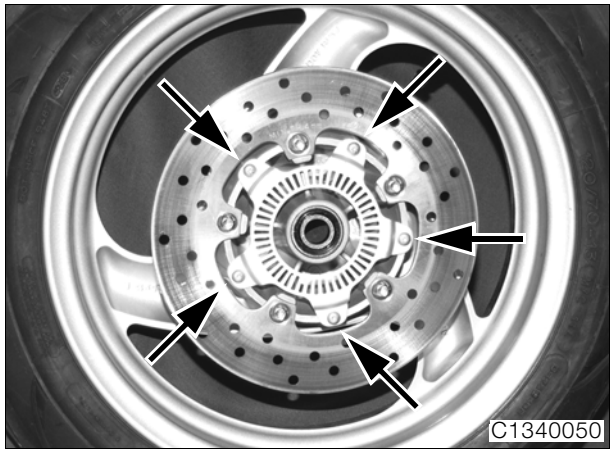
– Check the ABS sensor gap and adjust if necessary (➠ 34.15)

Torque specification:
ABS sensor attachment ..... 9 Nm

Adjustment data:
ABS sensor gap .....min 0.3 mm (0.0118 in)

34 51 100 Replacing front ABS reluctor

– Remove front wheel
➠ .....See Group 36



- Remove 5 fasteners (arrows) securing the ABS reluctor
- Remove the ABS reluctor

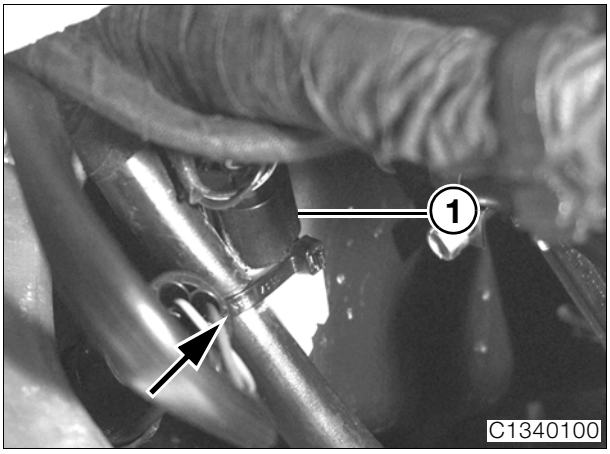
When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Check the ABS sensor gap and adjust if necessary

Torque specification:
ABS reluctor attachment ..... 5 Nm

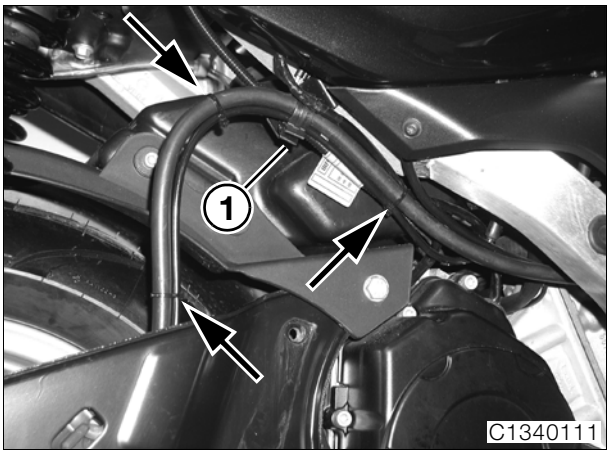
34 52 111 Removing and installing rear ABS sensor

Attention:
Disconnect earth cable from battery and insulate it!

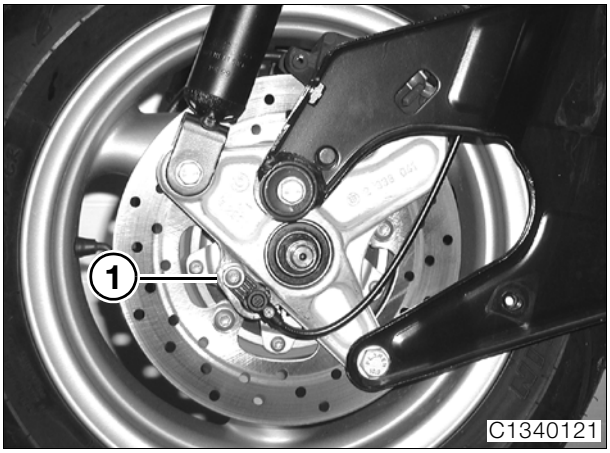
– Open the seat
➟ .....See Group 52



- Open cable tie for ABS sensor cable (arrow)
- Disconnect plug (1)



- Release wire tie from ABS sensor wire (arrows)
- Open cable clip (1)



- Remove fastener (1) for ABS sensor

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Install the ABS sensor wire carefully and secure it with cable ties!

Attention:
When installing a new ABS sensor, always check the sensor gap!

– Check the ABS sensor gap and adjust if necessary (➟ 34.15)

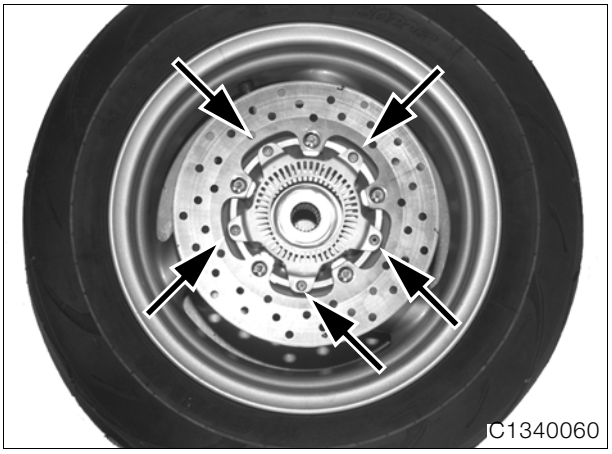
Torque specification:
ABS sensor attachment ..... 9 Nm

Adjustment data:
ABS sensor gap .....min 0.3 mm (0.0118 in)

34 51 109 Replacing rear ABS reluctor

– Remove rear wheel

➠ .....See Group 36



- Remove 5 fasteners (arrows) securing the ABS reluctor
- Remove the ABS reluctor

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Check the ABS sensor gap and adjust if necessary

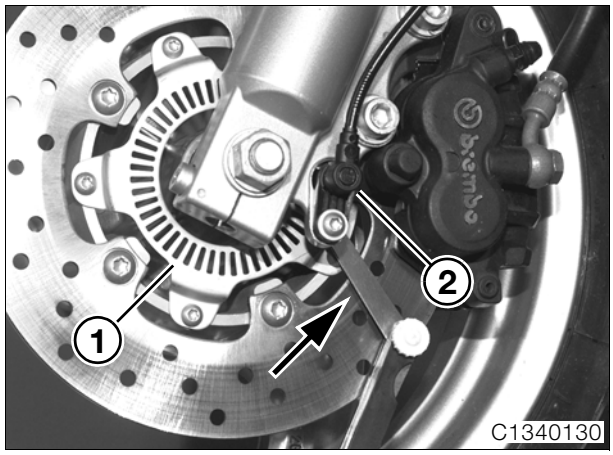
Torque specification:

ABS reluctor attachment ..... 5 Nm

Checking and adjusting ABS wheelspeed sensor gap

36 30 300 Front wheel

Attention:
Check ABS wheelspeed sensor gap when ABS sensor, reluctor, wheel bearing, front wheel, floating axle shim or telescopic fork is replaced!

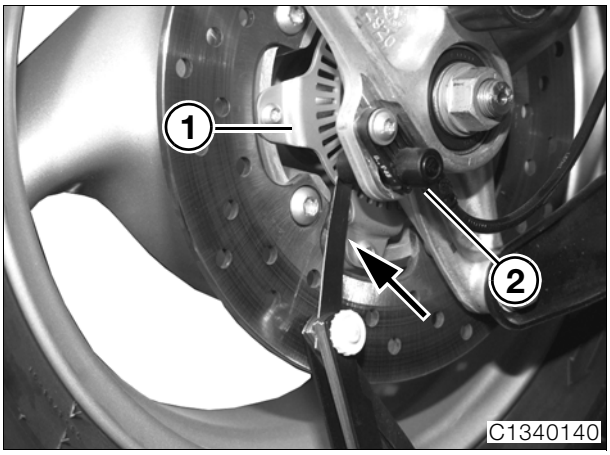


- Use feeler gauge to check gap between ABS wheelspeed sensor (2) and reluctor (1) at three points at120° intervals (arrow), adjust with shims as necessary

Adjustment data:

ABS sensor gap .....min 0.3 mm (0.0118 in)

Attention:
Check ABS sensor gap when ABS sensor, reluctor, brake caliper support, brake caliper support bearing or final-drive shaft shim is replaced!



- Use feeler gauge to check gap between ABS wheelspeed sensor (2) and reluctor (1) at three points separated by 120° (arrow), adjust with shims as necessary

Adjustment data:
ABS sensor gap .....min 0.3 mm (0.0118 in)

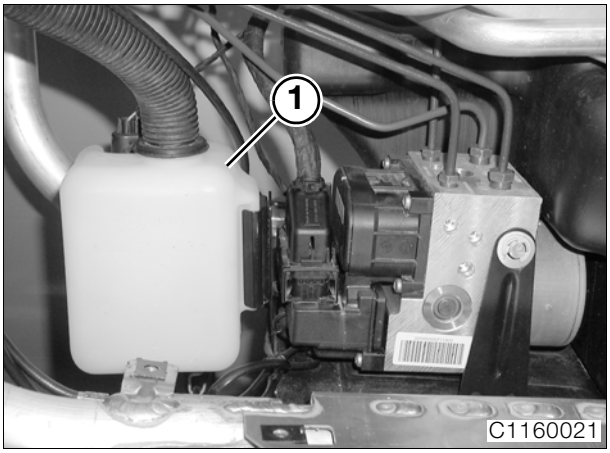
34 51 050 Removing and installing ABS control unit

Warning:
All work on the ABS control unit must be carried out at an officially authorised BMW service facility!

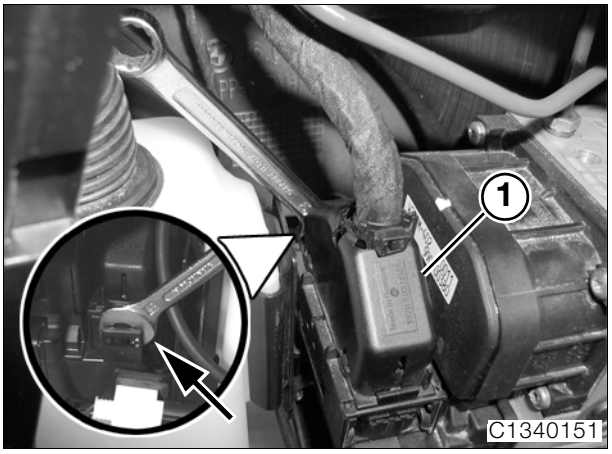
Attention:
Disconnect the negative battery cable first, then disconnect the positive cable!

– Drain front/rear brake curcuits
– Remove top and left tunnel panels

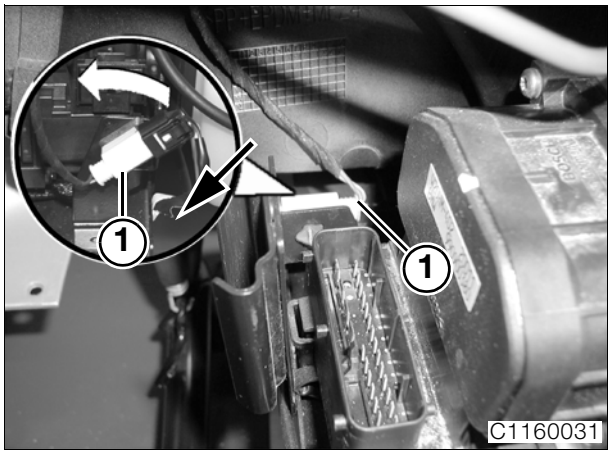
➠ .....See Group 46



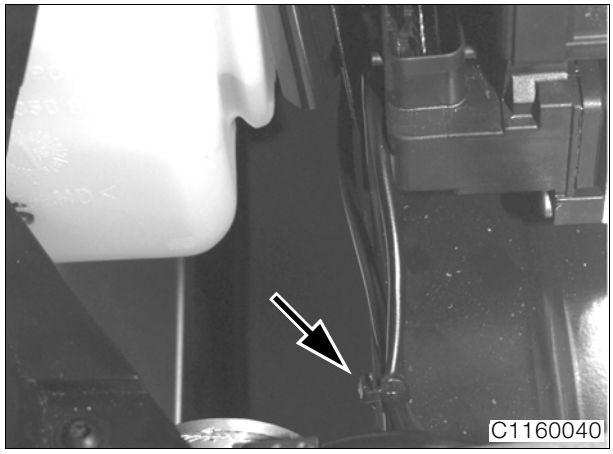
- Remove washer fluid reservoir (1) from bracket



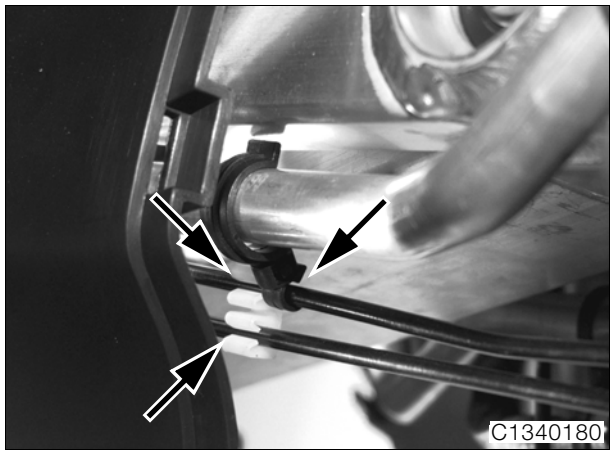
- Disconnect plug (1) from ABS control unit by moving detent (arrow) on plug (1) to the right with an open-ended 1mm spanner and pulling it up at the same time



- Turn plug (1) in direction indicated by arrow to remove it from its bracket
- Open cable tie (arrow)



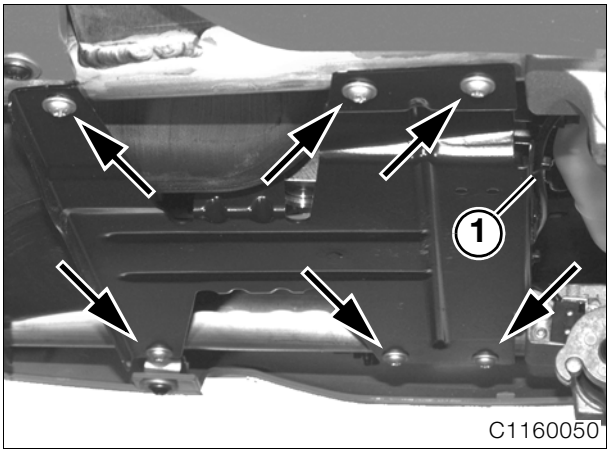
- Cut through cable tie (arrow) of connecting cable for stand switch



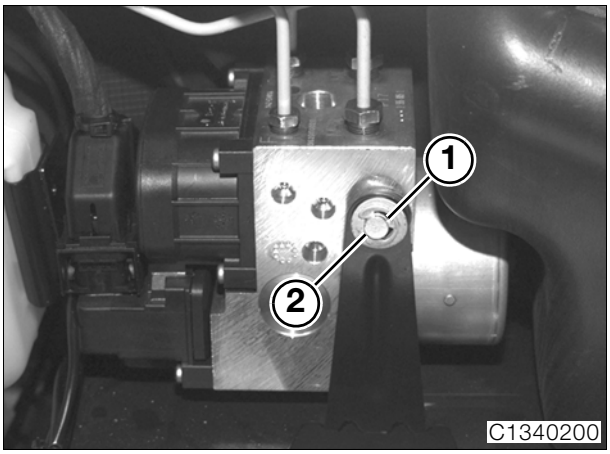
- Remove brake lines from brackets (arrows)

Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid attacks paint! Wrap clean cloths around open pressure lines to prevent residual brake fluid from escaping!

- Disconnect brake lines from ABS control unit



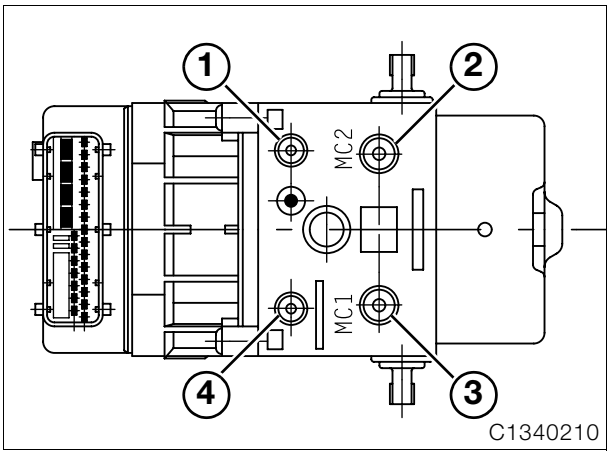
- Remove the fasteners (arrows) for the bracket
- Open cable tie (1) holding connecting cable to stand switch
- Remove ABS control unit bracket by pulling down



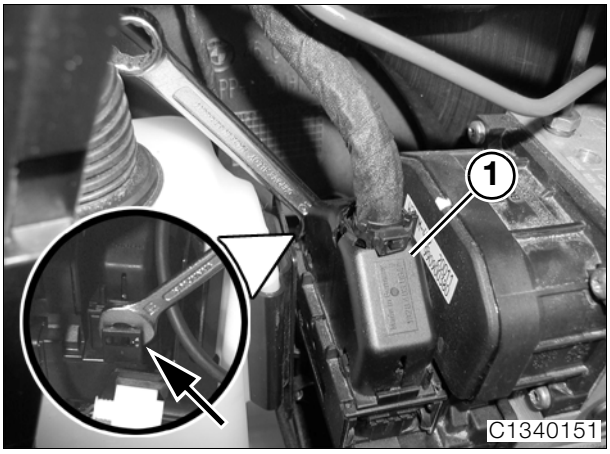
- Remove the circlip (1) from the fastener for the ABS control unit
- Remove the fastener (2) for the ABS control unit
- Remove ABS control unit from its holder

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



- Install the brake lines in the following sequence: 2, 1, 3, 4

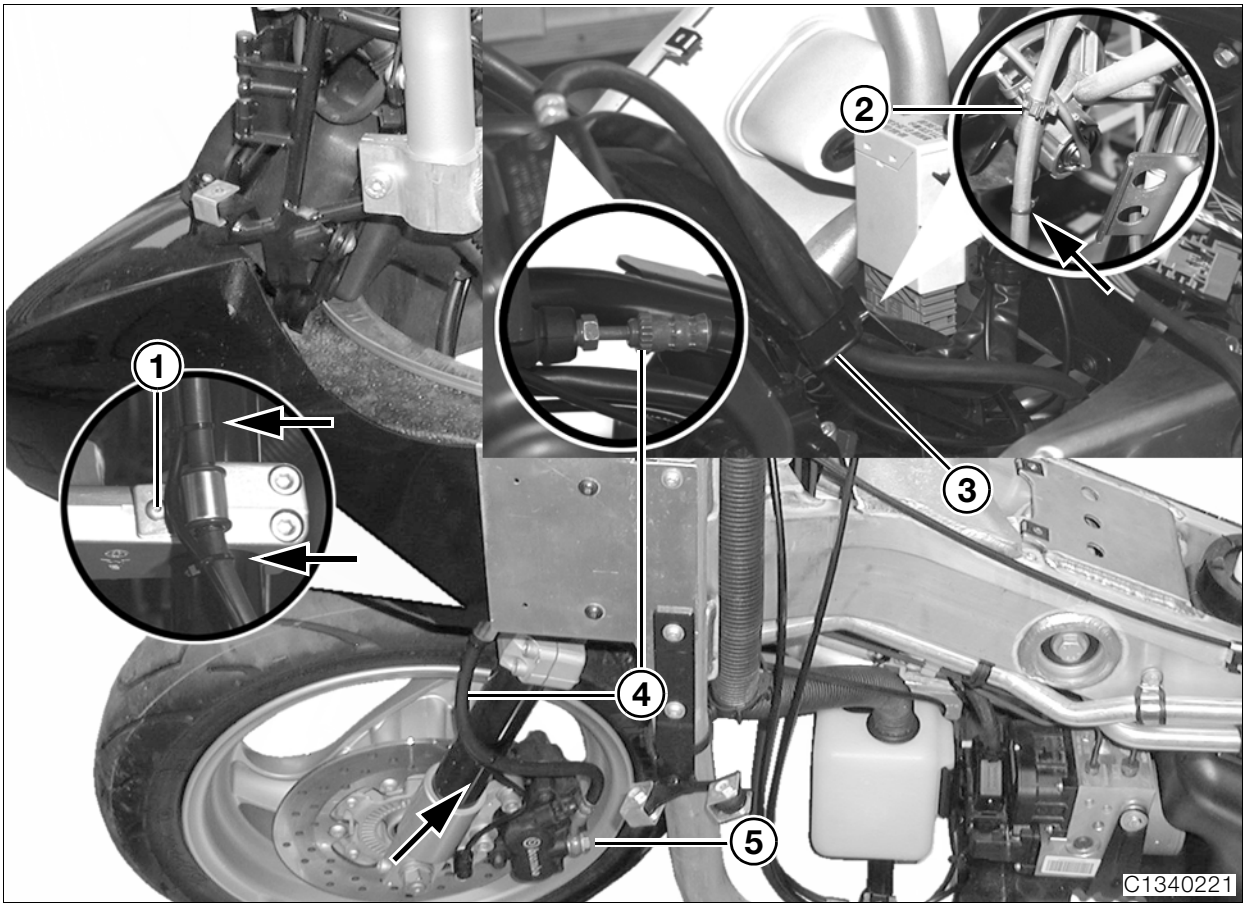


- Connect plug (1) to ABS control unit by first opening detent (arrow) on plug, positioning the plug on the ABS control unit, pushing it to the left and pressing slightly down until the detent engages with an audible click
- Make sure that all lines and are correctly routed and secured in place with cable ties

– Fill and bleed the brake system

Torque specifications:

Bracket to frame	9 Nm
Brake lines to ABS control unit M12x1	18 Nm
Brake lines to ABS control unit M10x1	18 Nm
Bleed screw on brake caliper	14 Nm



Removing and installing front brake lines/hoses

– Remove handlebar trim
– Remove instrument trim
– Remove knee pad

➠ .....See Group 46

– Drain the front brake circuit

Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid attacks paint! Wrap clean shop towels around open pressure lines to prevent residual brake fluid from escaping!

Replacing front brake hose – without ABS

- Disconnect brake hose (4) from right brake fitting
- Release brake hose from holder (3)
- Remove fasteners (1)
- Open cable clip (2)
- Open cable ties (arrows)
- Remove banjo bolt (5) from brake caliper
- Remove brake hose (4)

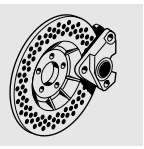
When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

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e **Attention:**

Make sure that all lines and the Bowden cables are correctly routed and that cables will not be subject to rubbing and abrasion!
Pay special attention to routing of brake hose at fan!

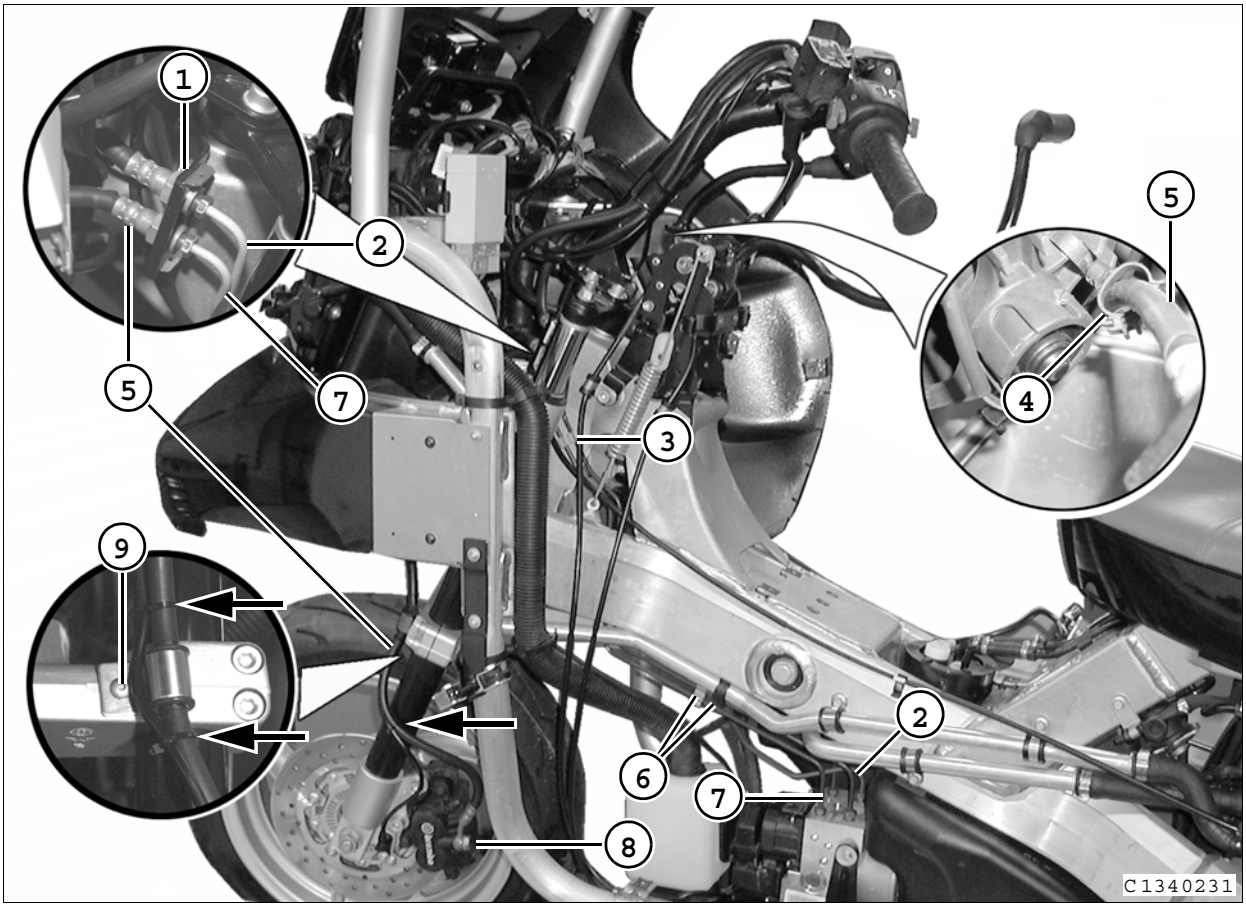


- Fit new seals on banjo bolt (5)

– Fill and bleed the brake system

X **Torque specification:**

Brake hose to
telescopic tube cross brace .....5 Nm
Banjo bolt to brake caliper .....18 Nm
Bleed screw on brake caliper.....14 Nm



Removing front brake lines/hoses – (with ABS)

Brake hose between front wheel and brake line, ABS control unit

- Open cable ties (arrows) for ABS sensor wire
- Release cable clamp (4) on fan
- Remove banjo bolt (8) from brake caliper
- Remove fastener (9) securing brake hose to telescoping tube cross brace
- Disconnect brake hose (5) at interface (1)
- Remove brake hose bracket by pulling down
- Remove brake hose

Brake line between brake hose, front wheel and ABS control unit

- Remove top and left tunnel panels

a .....See Group 46

- Remove brake line (7) from brackets (3, 6)
- Remove brake line (7)

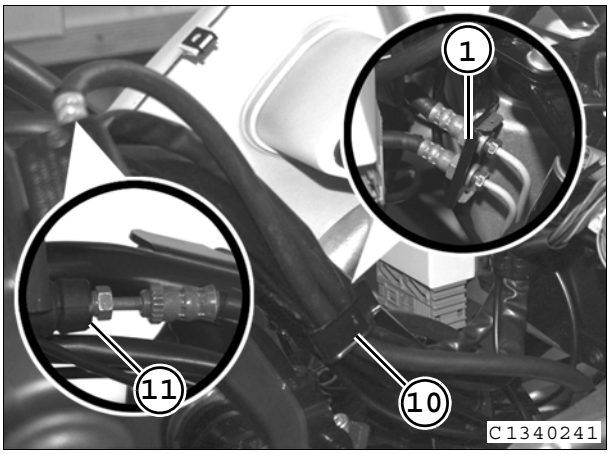
Brake line between brake hose, right brake handlebar fitting and ABS control unit

- Remove top and left tunnel panels

a .....See Group 46

- Remove brake line (2) from brackets (3, 6)
- Remove brake line (2)

Brake hose between right brake handlebar fitting and brake line, ABS control unit



- Release brake hose from holder (10)
- Disconnect brake hose at interface (1)
- Remove brake hose bracket by extracting upward
- Disconnect brake hose from right brake-control assembly (11)
- Remove brake hose

Installing front brake lines/hoses – (with ABS)

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Fit new sealing rings on brake line/hose!
Route and secure the brake hoses so that they do not rub or become kinked when the handlebar is turned.
Make sure that all lines and the Bowden cables are correctly routed and that cables will not be subject to rubbing or abrasion.

- Fit new sealing rings on banjo bolt

– Fill and bleed the brake system

Torque specifications:

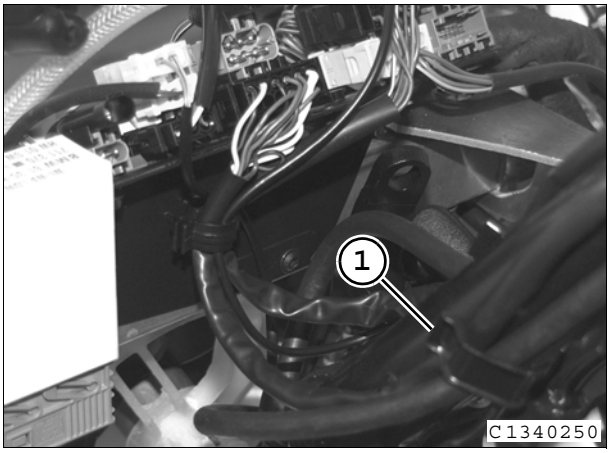
Brake hose to telescopic tube cross brace	5 Nm
Brake hose/line joint	18 Nm
Brake hose to brake control assembly	18 Nm
Banjo bolt to brake caliper	18 Nm
Bleed screw on brake caliper	14 Nm
Brake lines to ABS control unit M 12x1	18 Nm
Brake lines to ABS control unit M 10x1	18 Nm

Removing and installing rear brake lines/hoses

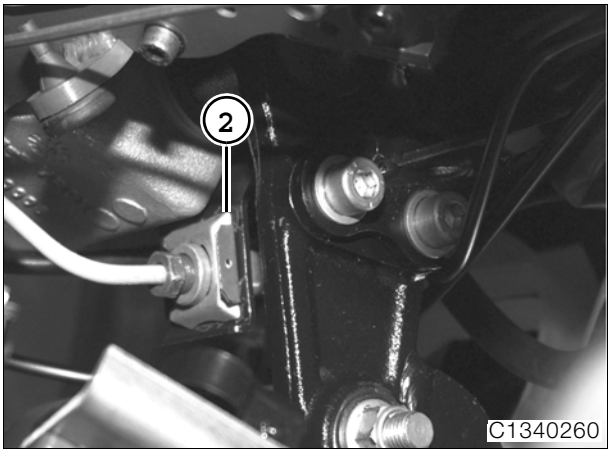
Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid attacks paint! Wrap clean shop towels around open pressure lines to prevent residual brake fluid from escaping!

Brake hose between brake unit on left and brake line

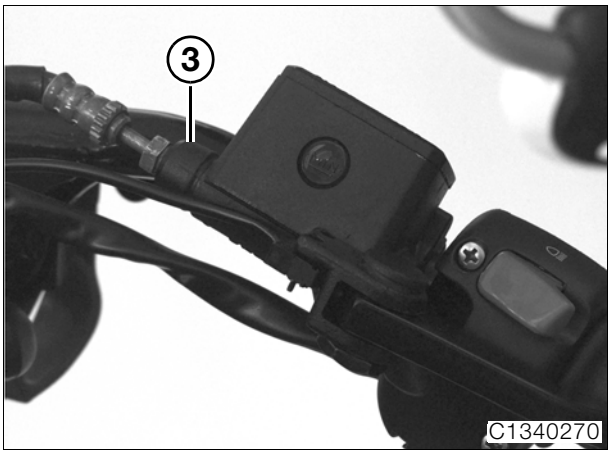
– Remove handlebar trim
– Remove instrument trim
– Remove knee pad
a .....See Group 46
– Drain the rear brake circuit



- Release brake hose from bracket (1)



- Disconnect brake hose at union (2)
- Remove brake hose securing plate by extracting upward



- Disconnect brake hose from left brake-control assembly (3)
- Remove brake hose

When installing:

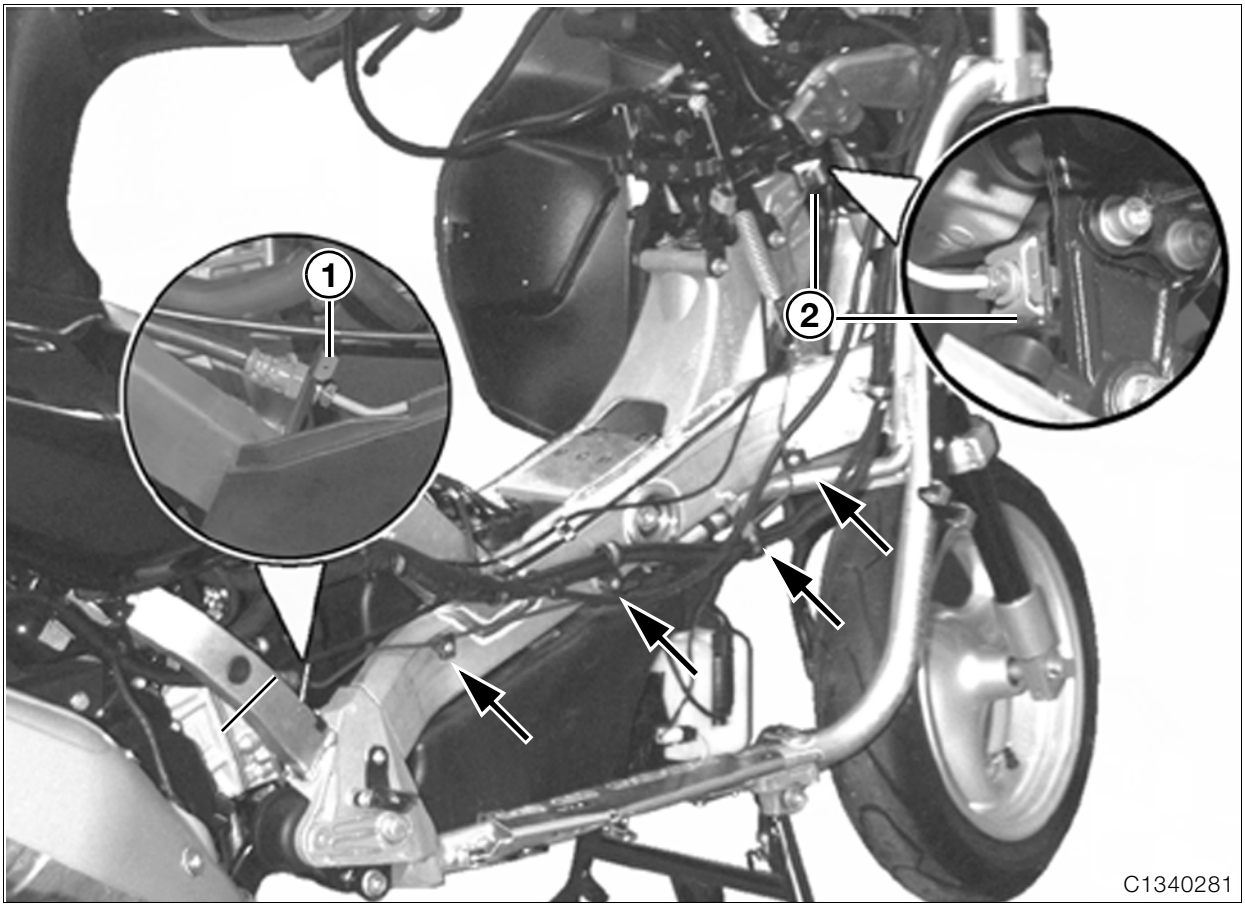
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that all lines and the Bowden cables are correctly routed and that cables will not be subject to rubbing and abrasion!

– Fill and bleed the brake system

Torque specification:

Brake hose/line joint..... 18 Nm
Brake hose to brake unit..... 18 Nm



Brake line between brake hose, left brake-control assembly, and brake hose to brake caliper - without ABS

– Remove instrument trim
– Remove knee pad
– Remove top and right tunnel panels
– Remove right service cover

➠ .....See Group 46

– Drain the rear brake circuit

Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid attacks paint! Wrap clean shop towels around open pressure lines to prevent residual brake fluid from escaping!

- Disconnect brake line at union (1, 2)
- Remove brake hose brackets by extracting upward
- Remove fasteners (arrows) securing brake line
- Remove brake line

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that all lines and the Bowden cables are correctly routed and that cables will not be subject to rubbing and abrasion!

– Fill and bleed the brake system

Torque specifications:

Brake hose/line joint..... 18 Nm
Brake line to frame ..... 5 Nm

Brake lines between brake hose, left brake-control assembly, and brake hose to brake caliper - with ABS

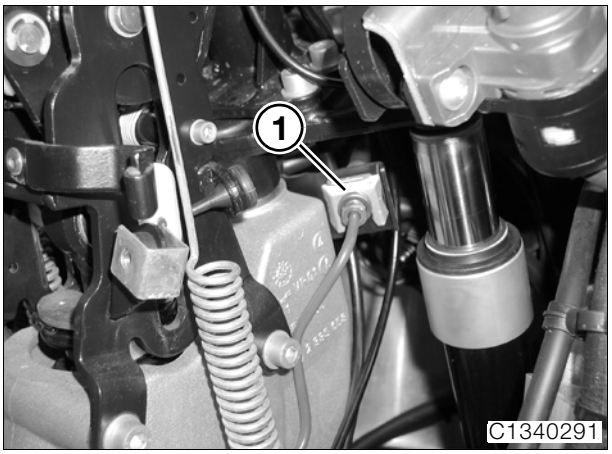
Brake lines between brake hose, brake handle-bar fitting and ABS control unit

– Remove instrument trim
– Remove knee pad
– Remove top, left and right tunnel panels

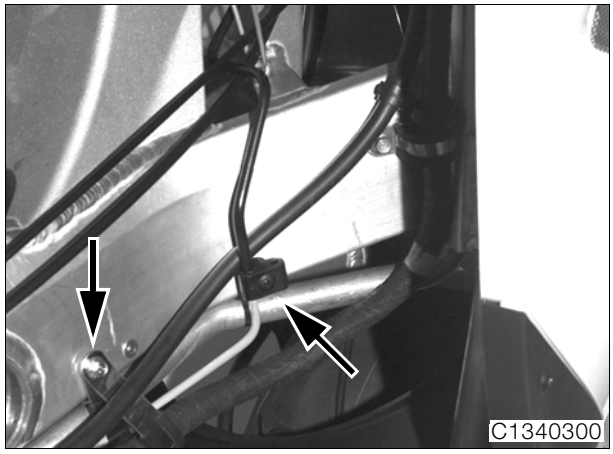
➠ .....See Group 46

– Drain front/rear brake circuits

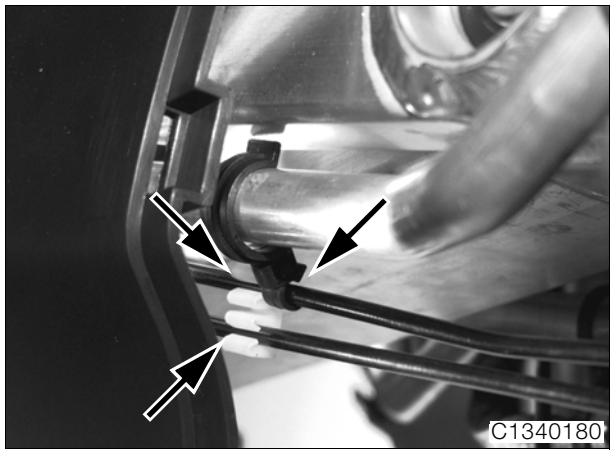
Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid destroys paint! Wrap clean shop towels around open pressure lines to prevent residual brake fluid from escaping!



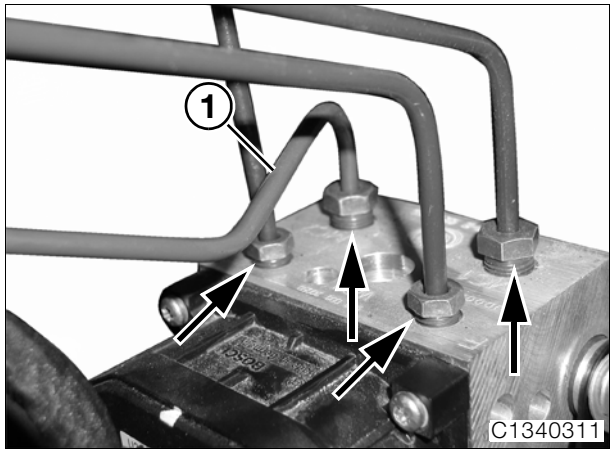
- Disconnect brake line at union (1)
- Remove brake hose bracket by extracting upward



- Remove fasteners (arrows) securing brake line



- Unclip brake lines for front brake from brackets (arrows)

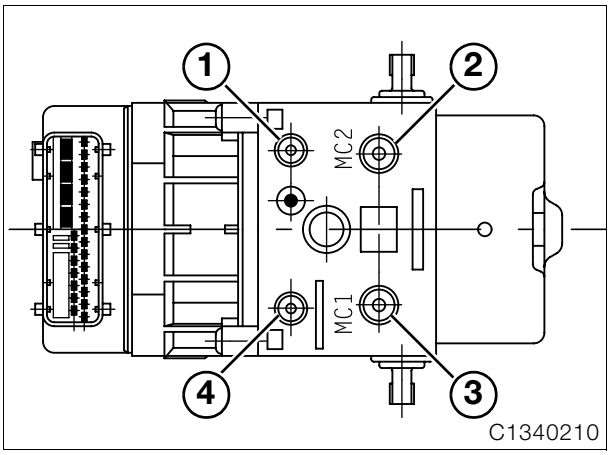


- Disconnect brake lines (arrows) from ABS control unit
- Remove brake line (1)

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that all lines and the Bowden cables and vapour discharge line are correctly routed.
Make sure the hoses will not be exposed to rubbing and abrasion!



- Connect the brake lines to the ABS control unit in the following sequence: 2, 1, 3, 4
- Make sure that all lines and are correctly routed and secured in place with cable ties

– Fill and bleed the brake system

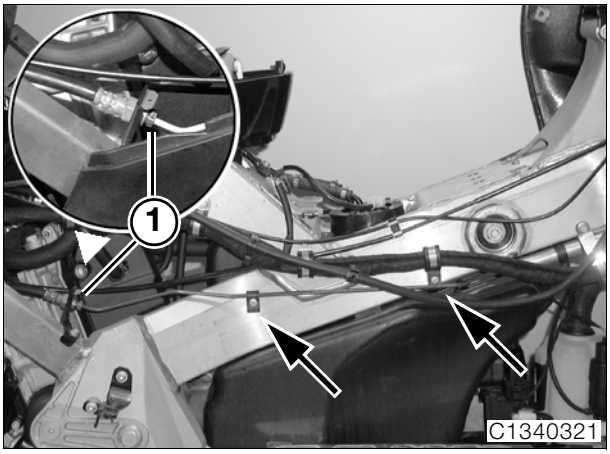
Torque specifications:

Brake line to frame	5 Nm
Brake lines to ABS control unit M12x1	18 Nm
Brake lines to ABS control unit M10x1	18 Nm
Bleed screw on brake caliper	14 Nm

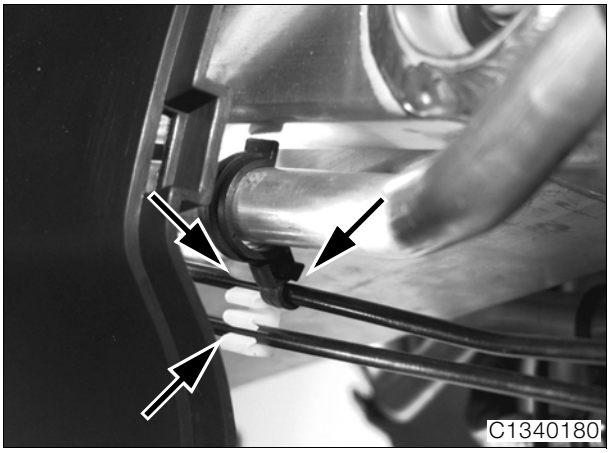
Brake lines between ABS control unit and brake hose to brake caliper

– Remove right service cover
– Remove top, left and right tunnel panels
➠ .....See Group 46
– Drain the rear brake system

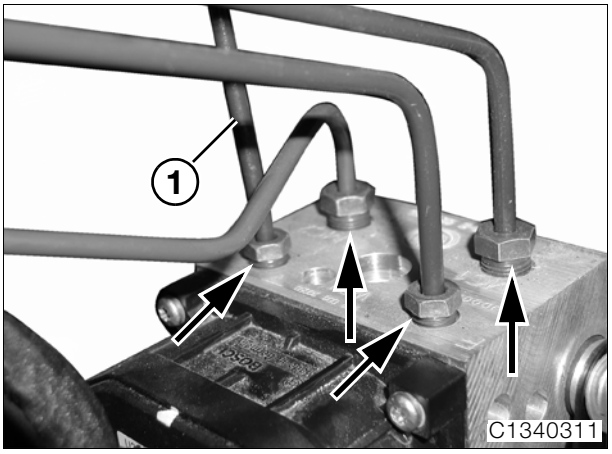
Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid destroys paint! Wrap clean shop towels around open pressure lines to prevent residual brake fluid from escaping!



- Disconnect brake line at union (1)
- Remove fasteners (arrows) securing brake line



- Remove brake lines for front brake from brackets (arrows)

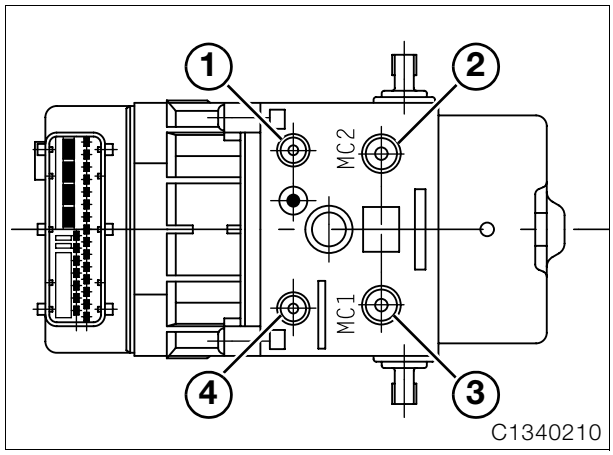


- Disconnect brake lines (arrows) from ABS control unit
- Remove brake line (1)

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that all lines and the Bowden cables and vapour discharge line are correctly routed.
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion!



- Connect the brake lines to the ABS control unit in the following sequence: 2, 1, 3, 4
- Make sure that all lines and are correctly routed and secured in place with cable ties

– Fill and bleed the brake system

Torque specifications:

Brake line to frame	5 Nm
Brake lines to ABS control unit M12x1	18 Nm
Brake lines to ABS control unit M10x1	18 Nm
Bleed screw to brake caliper	14 Nm



Brake hose between brake line and brake caliper

– Remove right service cover

➠ .....See Group 46

– Drain the rear brake circuit

Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid destroys paint! Wrap clean shop towels around open pressure lines to prevent residual brake fluid from escaping!

- Disconnect brake hose at union (3)
- Release cable clamp (2) and detach brake hose

Supplementary operation for vehicles with ABS:
- Open cable ties (arrows)
- Remove banjo bolt (1)
- Remove brake hose

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that lines and cables are correctly routed. Make sure the hoses will not be subject to abrasion from rubbing!

- Fit new sealing rings on banjo bolt (1)

– Fill and bleed the brake system

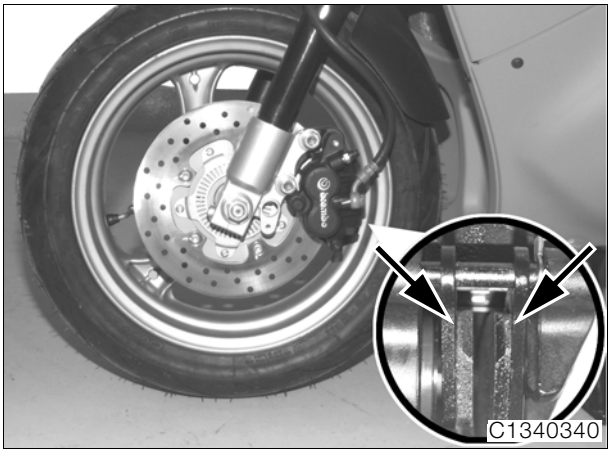
Torque specification:
Brake hose/line joint..... 18 Nm
Banjo bolt to brake caliper ..... 18 Nm

Checking brake pads and discs for wear/replacing

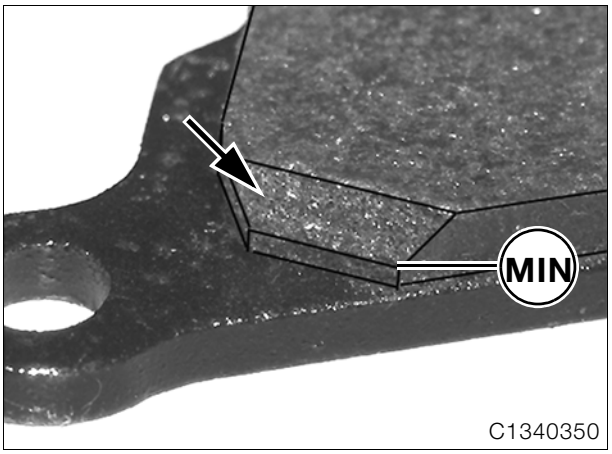
Checking brake pads for wear

Warning:
Never allow brake pads to wear below the specified minimum thickness!
Always replace pads as a complete set!

34 11 008 Front brake pads

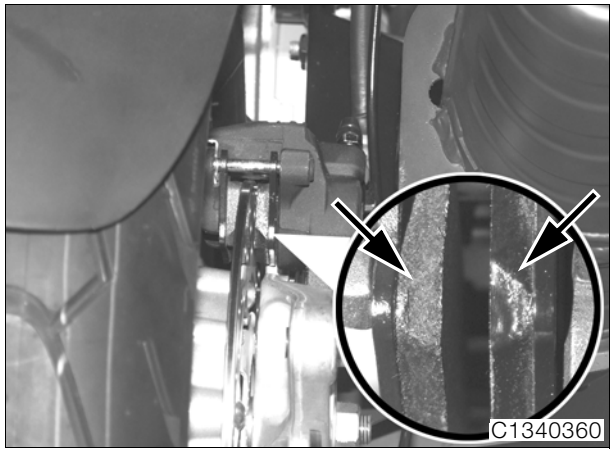


- Visually inspect the brake pads from behind and below
– Replace the brake pads if a wear mark (arrows) is no longer clearly visible

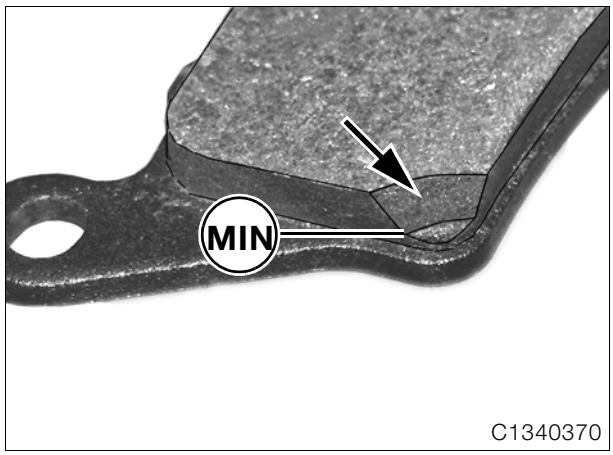


Minimum pad thickness
The brake pads have a clearly visible chamfer (arrow) as wear indicator

Rear brake pads



- Visually inspect the brake pads from behind
– Replace the brake pads if a wear mark (arrows) is no longer clearly visible



Minimum pad thickness
The brake pads have a clearly visible chamfer (arrow) as wear indicator

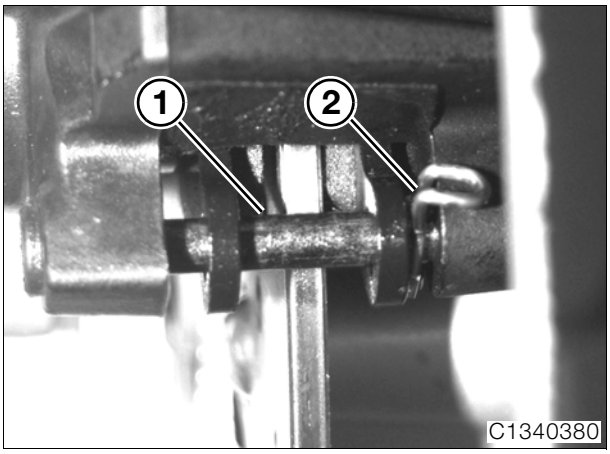
Replacing brake pads

Front brake

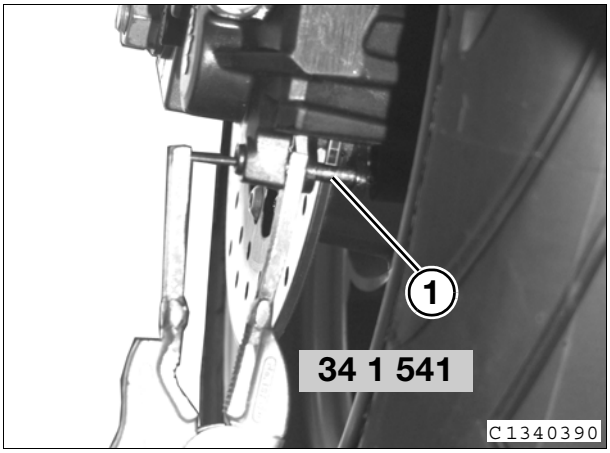
Attention:
Do not separate the brake caliper halves!

- Firmly press the brake caliper against the brake disc in order to force back the brake pads and pistons

Note:
If the brake pads/pistons cannot be forced back in this way, this may indicate a defect in the brake system!



- Remove the cotter pin (2) from dowel pin (1)



- Remove dowel pin (1) with punch or pliers, **BMW No. 34 1 541**
- Remove the brake pads

When installing:

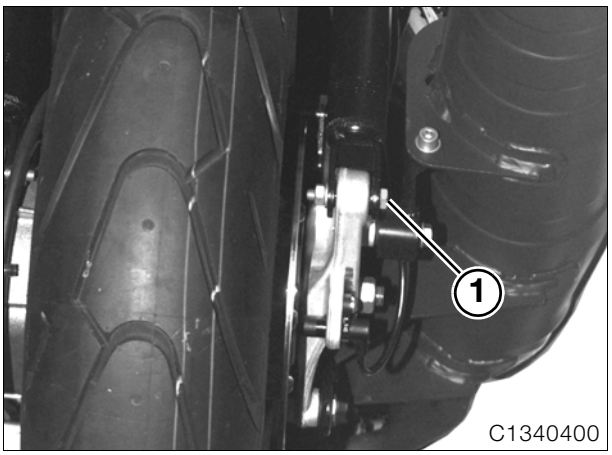
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Avoid damaging the brake pads when installing!

- Check the operation of the brake system

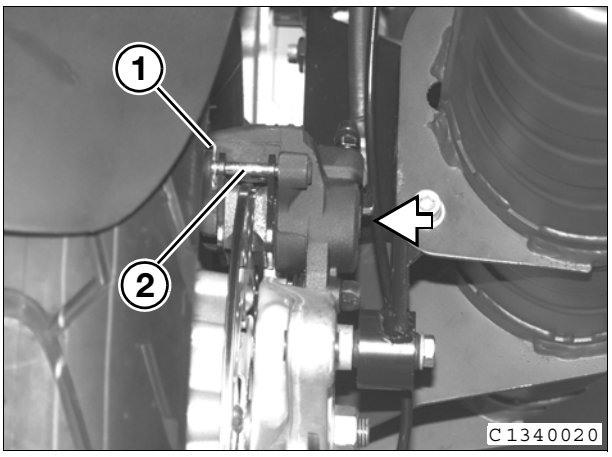
Attention:
The fluid level in the brake fluid reservoir must be at the “MAX” mark after the brake pads have been changed. It is not possible to check the maximum fill level at the inspection glass. For details of the correct procedure see **Checking fluid level in the open brake fluid reservoir!**

Attention:
Never attempt to separate the two caliper sections!



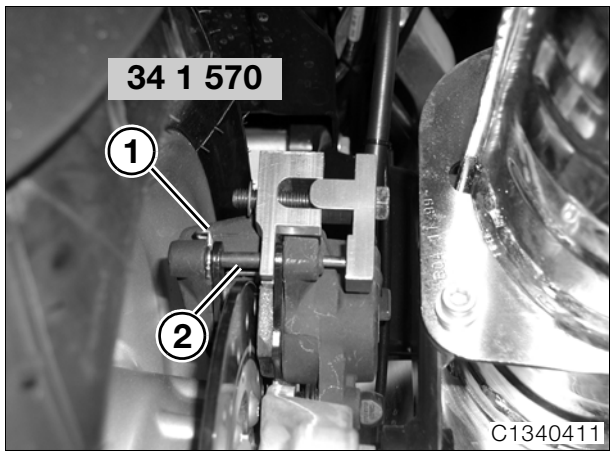
- Detach lower end of strut (1) and tie the strut up out of the way

Attention:
Do not scratch or damage wheel rim, mask off brake caliper as necessary!

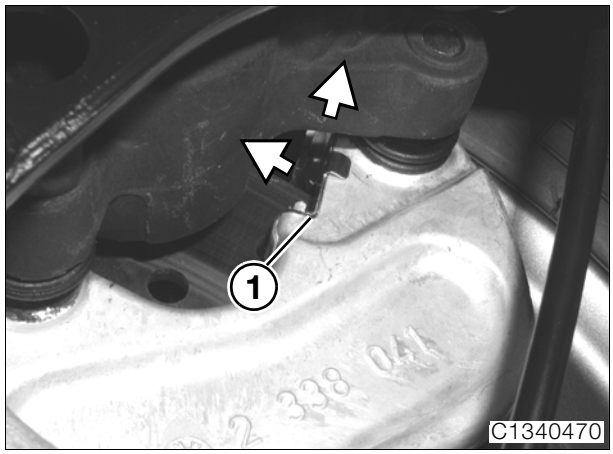


- Firmly press the brake caliper against the brake disc in order to force back the brake pads and pistons

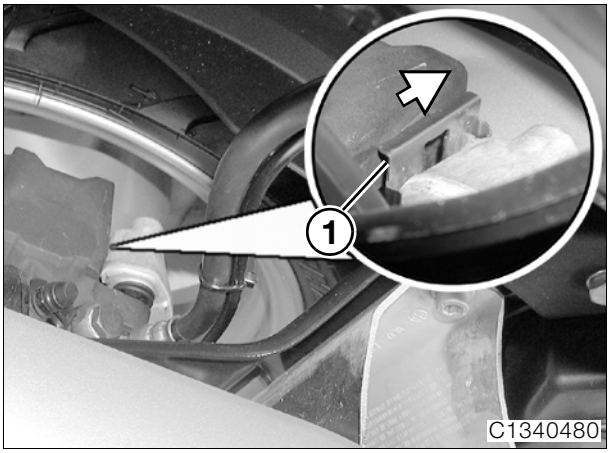
Note:
If the brake pads/pistons cannot be forced back in this way, this may indicate a defect in the brake system!



- Remove the cotter pin (1) from the dowel pin (2)
- Remove dowel pin (2) with extraction tool, **BMW No. 34 1 570**
- Lift out the brake pads toward the rear



- Pull support plate (1) upward and back



- Remove support plate (1) to the inside

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

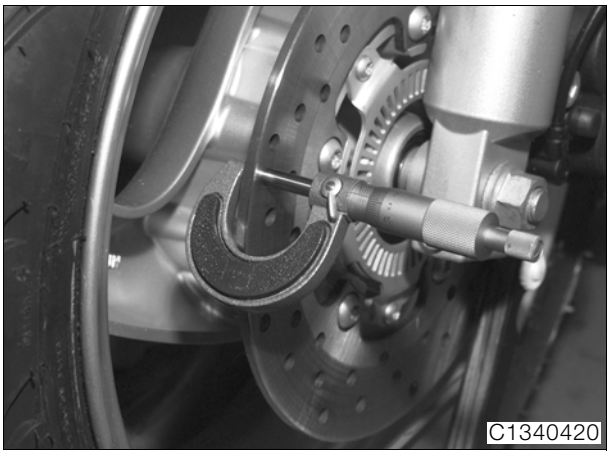
Attention:
Always use new support plate!
Ensure that support plate seats correctly!
Avoid damaging the brake pads when installing!

- Install new support plate
- Use a long-nosed punch to install the dowel pin
- Check the operation of the brake system

Attention:
The fluid level in the brake fluid reservoir must be at the “MAX” mark after the brake pads have been changed. It is not possible to check the maximum fill level at the inspection glass. For details of the correct procedure see **Checking fluid level in the open brake fluid reservoir!**

Checking the brake discs

- Carefully inspect the brake discs for cracking, damage, deformation and scoring



- Measure the thickness of the brake discs at several points with a caliper gauge

Wear data:
Front brake discs ..... 4.0 mm (0.1575 in)
Rear brake disc..... 4.0 mm (0.1575 in)

Checking brake fluid level

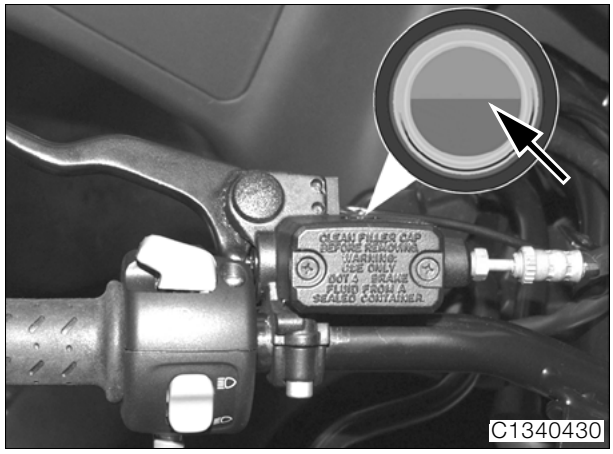
Checking fluid level in the closed brake fluid reservoir

The procedure for checking the level in the left brake fluid reservoir is described below. The procedure for checking the level in the right brake fluid reservoir is the same.

Attention:
The fluid level in the brake fluid reservoir must be at the “MAX” mark with new brake pads. It is not possible to check the maximum fill level at the inspection glass. For details of the correct procedure see **Checking fluid level in the open brake fluid reservoir!**

- Turn the handlebars to full left lock

Note:
The volume of the brake fluid (MIN/MAX) is sufficient for lining thicknesses from new to the wear limit. It is not normally necessary to top up the fluid to accommodate lining wear.
Level below minimum indicates that other problems may be present!



- Check the level of brake fluid in the sight glass

Minimum level (arrow)
..... slightly above centre of sight glass with pads worn to wear limit

Warning:
Never allow brake fluid level to fall below minimum graduation (arrow)! Otherwise, there is a danger that air will be drawn into the braking system as the brakes are operated!

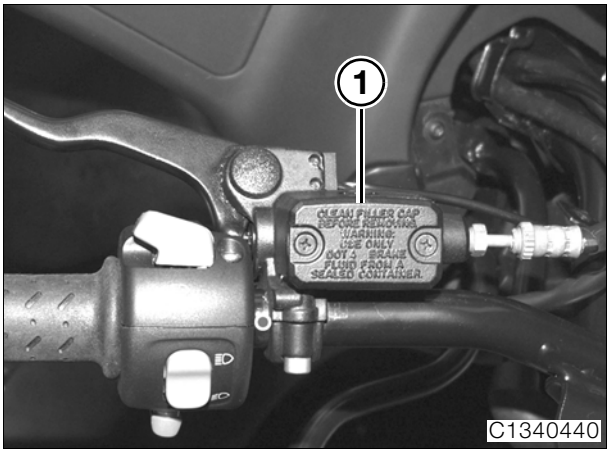
Checking fluid level in the open brake fluid reservoir

The procedure for checking the level in the left brake fluid reservoir is described below. The procedure for checking the level in the right brake fluid reservoir is essentially the same.

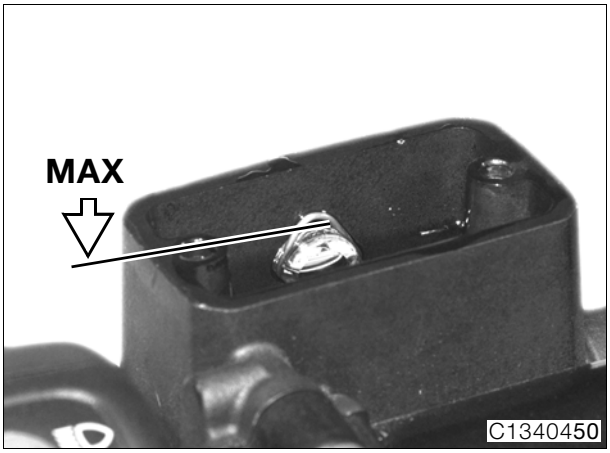
Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid destroys paint!

Note:
Do not remove the reservoir cap unless the handlebar is turned all the way to the right!

- Turn the handlebar all the way to the right
- Secure the handlebar in the full lock position



- Remove reservoir lid (1) with diaphragm



Adjustment data:
Specified level with a new pads
..... Upper edge of sight glass on inside

Attention:
When adding brake fluid, do not allow it to enter the holes for the reservoir cap screws!

- If the brake fluid level does not come up to the top of the sight glass with new brake pads installed top up the fluid and, if necessary, check the brake system for leaks

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Note:
Wipe the rim of the reservoir, the rubber diaphragm and the cover to remove brake fluid, then carefully reassemble the components!

- Hand-tighten cap on reservoir
- Check the operation of the brake system

Fluids and lubricants:
Brake fluid.....DOT 4

Torque specification:
Reservoir cap..... 1 Nm

34 00 034 Replacing brake fluid and bleeding brake system

Note:
This description applies for the brake filling and bleeding unit with extraction of the brake fluid by a partial vacuum at the brake caliper.
If other devices are used, comply with their manufacturers' instructions!

Front brake

Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid destroys paint!

Drawing off brake fluid/forcing back brake pistons

- Firmly press the brake caliper against the brake disc in order to force back the brake pads and pistons

Note:
If the brake pads/pistons cannot be forced back in this way, this could indicate a defect in the brake system!

- Connect the brake bleeding device to the bleed screw on the brake caliper
- Open the bleed screw by half a turn
- Draw off brake fluid from the front brakes

When installing:

- Installation is the reverse of the removal procedure
- Add brake fluid up to the top of the sight glass
- Bleed the front brake circuit
- Check the operation of the brake system

Bleeding front brake circuit

Attention:
On vehicles with **ABS** the brake system service operations described in the repair manual must be supplemented by bleeding using
BMW MoDiTeC/DIS plus with ABS control unit toolbox.
There is a danger that residual air will remain in the ABS system's control circuits if the
BMW MoDiTeC/DIS plus is not used.

- Add brake fluid up to the top of the sight glass

Attention:
When bleeding the brake system pull the brake lever repeatedly - danger that residual air will remain in the brake system!

- Connect the brake bleeding device to the bleed screw on the brake caliper
- **[ABS]** Bleeding vehicle with **BMW** MoDiTeC/DIS plus
- Open the bleed screw by half a turn

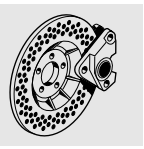
Attention:
When bleeding the brake system pull the brake lever repeatedly!

Attention:
Brake fluid level must not drop below the MIN mark during the bleeding process, otherwise air will be drawn into the brake system. Bleed the system again if this happens!

- Draw off brake fluid until it emerges clear and free from air bubbles
- Tighten the bleed screw
- Check the operation of the brake system

Fluids and lubricants:
Brake fluid ..... DOT 4

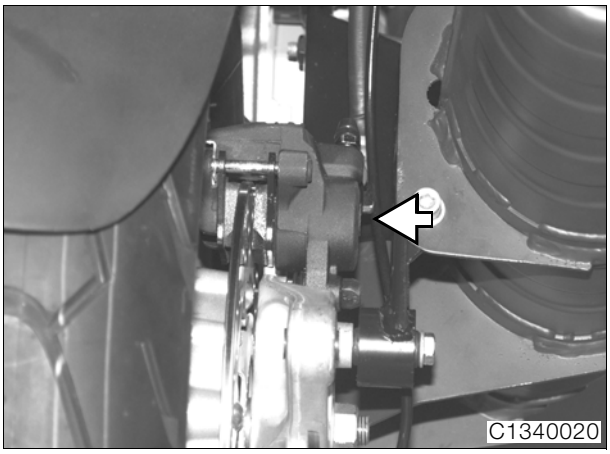
Torque specification:
Bleed screw ..... 14 Nm



Attention:
Do not allow brake fluid to come into contact with painted parts of the motorcycle - brake fluid destroys paint!

Drawing off brake fluid/forcing back brake pistons

Attention:
Avoid damaging or scratching the brake caliper; if necessary mask off the brake caliper!



- Firmly press the brake caliper against the brake disc in order to force back the brake pads and pistons

Note:
If the brake pads/pistons cannot be forced back in this way, this could indicate a defect in the brake system!

- Connect the brake bleeding device to the bleed screw on the brake caliper
- Draw off brake fluid from the rear brakes

When installing:
- Installation is the reverse of the removal procedure
– Add brake fluid up to the top of the sight glass
– Bleed the rear brake circuit
- Check the operation of the brake system

34 00 035 Bleeding rear brake circuit

Attention:
On vehicles with **ABS** the brake system service operations described in the repair manual must be supplemented by bleeding using
BMW MoDiTeC/DIS plus with ABS control unit toolbox.
There is a danger that residual air will remain in the ABS system's control circuits if the
BMW MoDiTeC/DIS plus is not used.

– Add brake fluid up to the top of the sight glass

Attention:
When bleeding the brake system pull the brake lever repeatedly - danger that residual air will remain in the brake system!

- Connect the brake bleeding device to the bleed screw on the brake caliper
- **[ABS]** Bleeding vehicle with **BMW** MoDiTeC/DIS plus
- Open the bleed screw by half a turn

Attention:
Brake fluid level must not drop below the MIN mark during this bleeding process, otherwise air will be drawn into the brake system. Bleed the system again if this happens!

- Draw off brake fluid until it emerges clear and free from air bubbles
- Tighten the bleed screw
- Check the operation of the brake system

Fluids and lubricants:
Brake fluid .....DOT 4

Torque specification:
Bleed screw ..... 14 Nm

36 Wheels and tyres

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Removing left/right wheel bearings 7

Installing right/left wheel bearings 8

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Removing rear wheel 9

Installing rear wheel 10

Static balancing of front and rear wheels 11

Static balancing of front wheel 11

Static balancing of rear wheel 11

Checking front/rear wheel rim for runout 12

Checking front wheel rim for runout 12

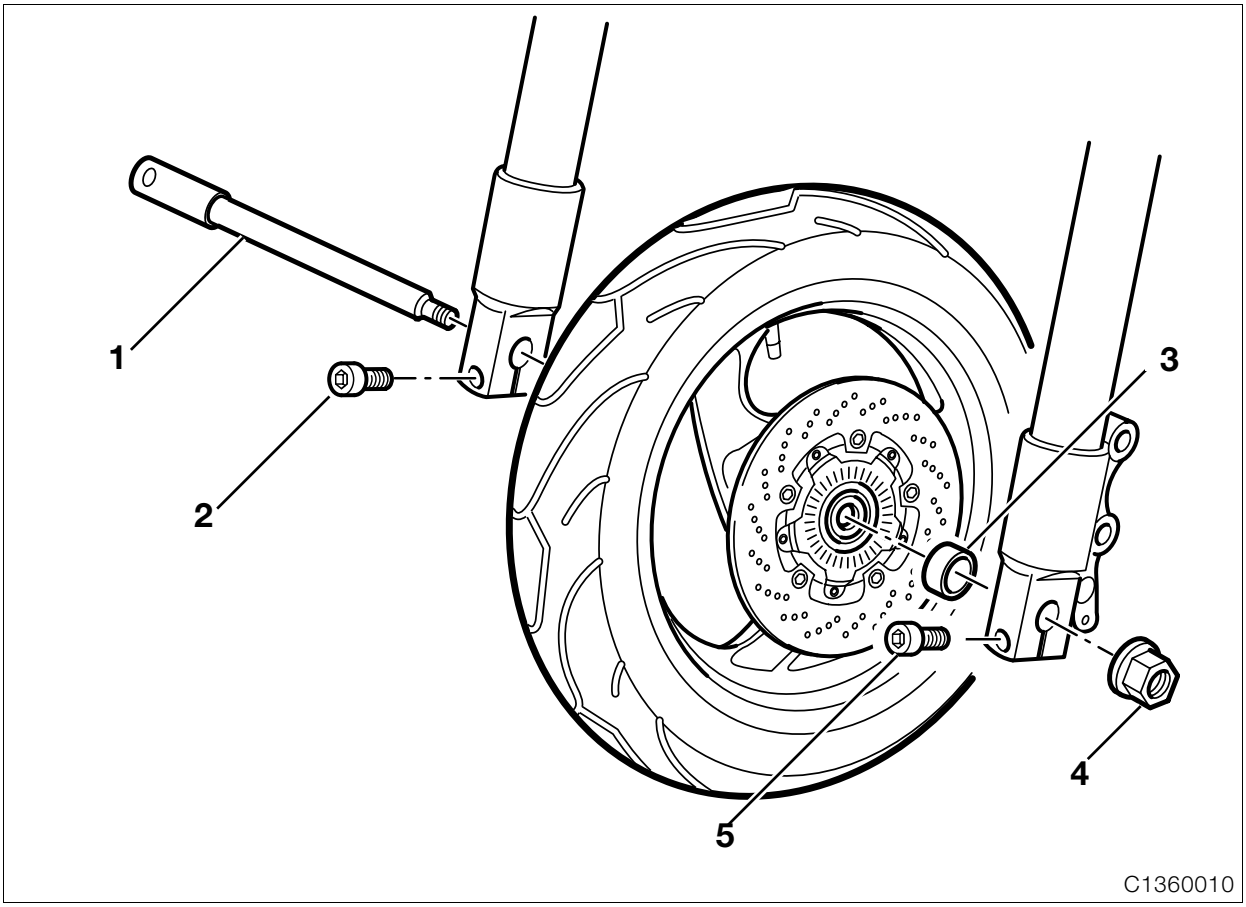
Checking rear wheel rim for runout 13





Technical Data		C1
Rim size		
Front		3.50“ J x13“ MT H 2
Rear		3.50“ J x12“ MT H 2
Vertical runout		
Front	mm (in)	0.3 (0.0118 in)
Rear	mm (in)	0.3 (0.0118 in)
Lateral runout		
Front	mm (in)	0.3 (0.0118 in)
Rear	mm (in)	0.3 (0.0118 in)
Tyre size		
Front		120/70 - 13 M/C 53 P TL (Pirelli) 120/70 - 13 M/C 53 L TL (Michelin) 120/70 - 13 M/C 53 L TL (Bridgestone)
Rear		140/70 - 12 65 P Reinforced TL (Pirelli) 140/70 - 12 60 L TL (Michelin) 140/70 - 12 65 L TL (Bridgestone)
Tyre pressures (tyres cold)		
Solo		
Front	bar (psi)	1.9 (27.58)
Rear	bar (psi)	2.1 (30.48)
Two-up or with load		
Front	bar (psi)	1.9 (27.58)
Rear	bar (psi)	2.4 (34.83)
Wheel bearing lubrication		Brand-name anti-friction bearing grease, working temperature range -30...+140 °C, (-22...284 °F) drip point 150...230 °C, (302...446 °F) high corrosion protection, good resistance to water and oxidation, e.g., Shell Retinax EP2

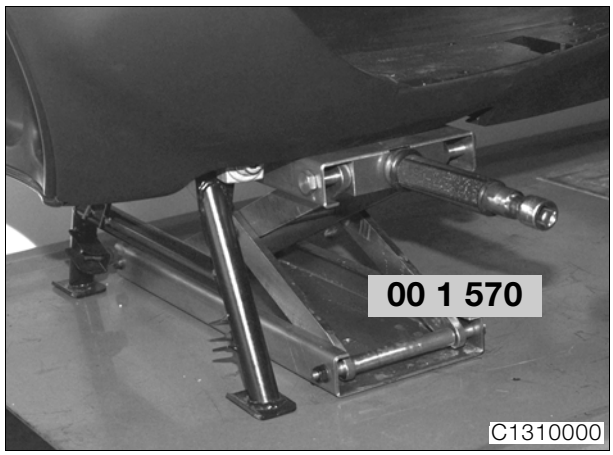




36 30 300 Removing and installing front wheel

Attention:
Avoid scratching the wheel rim; if necessary mask off the brake caliper
Do not tilt the brake caliper!

Note:
Do not pull handbrake lever with brake caliper removed/front wheel removed!



- Raise C1 with hoist, **BMW No. 00 1 570,** so that the front wheel is free of the ground and the C1 is securely supported

– Remove the brake caliper

➠ .....See Group 34

- Unscrew 6-point nut (4)
- Slacken pinch bolts (2, 5) in telescopic forks
- Pull out quick-release axle (1), note position of spacer (3)
- Remove front wheel

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Grease quick-release axle (1) lightly with **Shell Retinax EP2**
- Remove all traces of old thread-locking compound from the threads



Attention:
Check ABS wheelspeed sensor gap whenever sensor, reluctor, wheel bearing, front wheel, floating axle shim or telescopic fork is replaced!

- Check and, if necessary, adjust ABS wheelspeed sensor gap

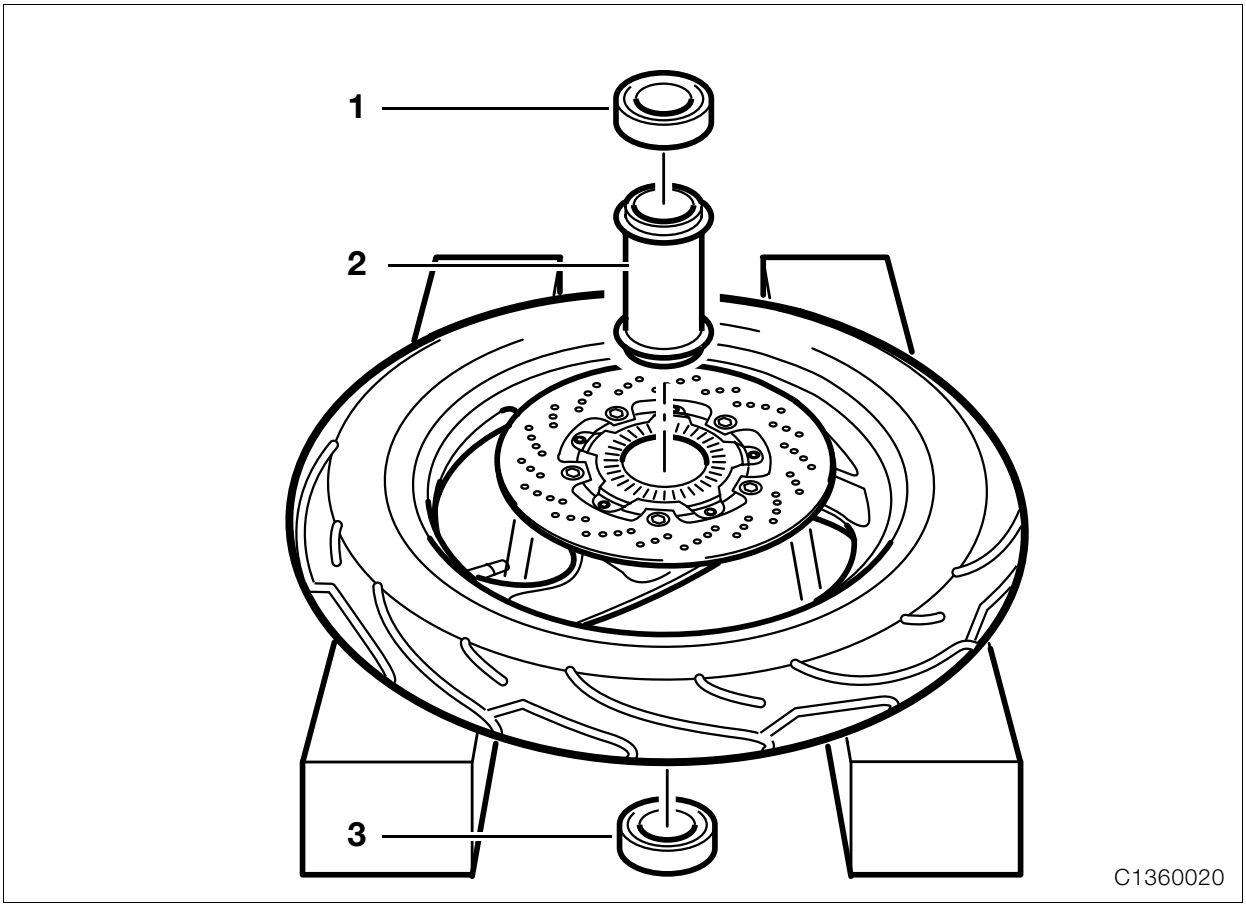
➠ .....See Group 34

Note:
Begin by tightening the quick-release axle (1). Press down on the forks and release them; repeat this action several times and then tighten the pinch bolts (2, 5).

Fluids and lubricants:
Shell Retinax EP2

Torque specifications:

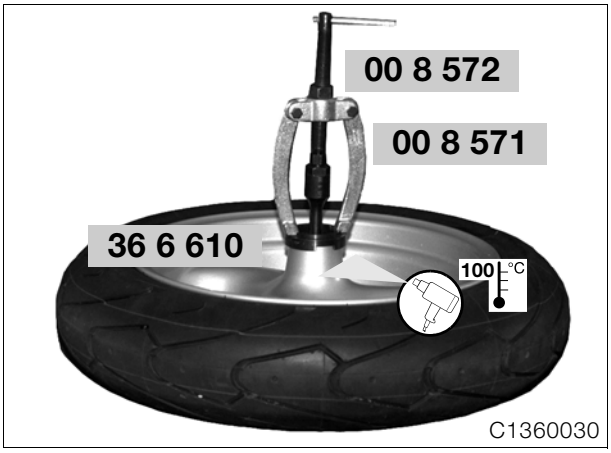
Floating axle	30 Nm
Clamp screws for floating axle	21 Nm
Brake caliper to telescopic tube	41 Nm



36 31 396 Replacing wheel bearings

Removing left/right wheel bearings

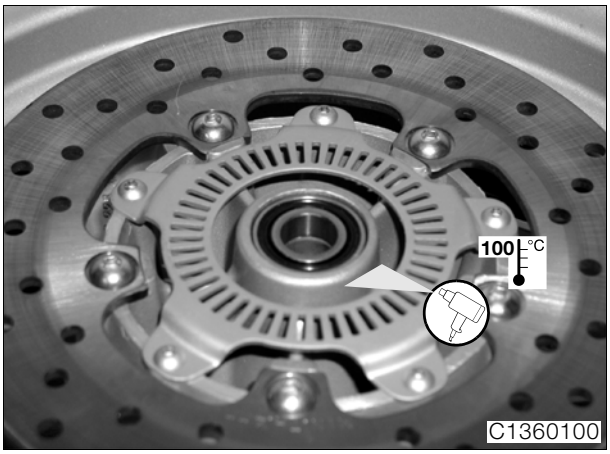
- Lay the front wheel rim on two wooden blocks so that the brake disc is free



- Place support ring, **BMW No. 36 6 610**, on right wheel hub

Note:
You can use thermometer, **BMW No. 00 1 900,** to check heat rise.

- Heat bearing seat to 100 °C (212 °F)
- Pull out wheel bearing (3) with puller, **BMW No. 00 8 572**, and internal puller 21/2, **BMW No. 00 8 571**
- Remove spacer sleeve (2)

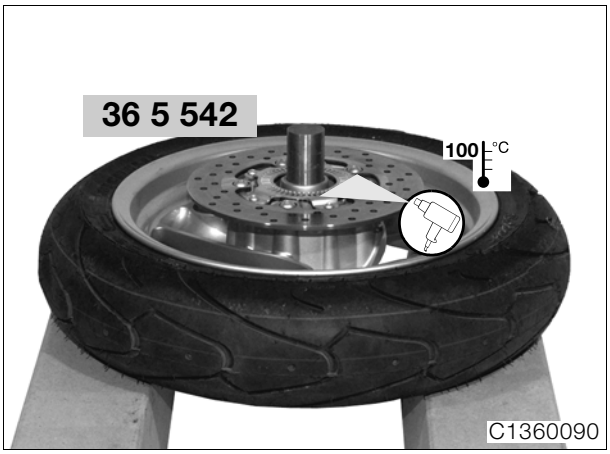


- Heat left wheel bearing seat to 100 °C (212 °F)



- Drive out left wheel bearing (1) with drift punch, **BMW No. 36 5 541**

Installing right/left wheel bearings



- Chill wheel bearings with chilling spray, for example
- Heat bearing seat to 100 °C (212 °F)
- Use drift punch, **BMW No. 36 5 542,** to press in wheel bearing until it seats securely
- Install the spacer sleeve

Attention:
When pressing in the second wheel bearing, make sure that the other wheel bearing is not forced off its seat!

- Chill the wheel bearing
- Heat bearing seat to 100 °C (212 °F)
- Press in second wheel bearing with drift punch, **BMW No. 36 5 542**, continuing until contact with the bearing seat/the spacer sleeve's inner ring

Attention:
Check ABS wheelspeed sensor gap when front wheel is installed with new wheel bearings!

Additional operations when installing wheel with new wheel bearings:

- Check and, if necessary, adjust ABS wheelspeed sensor gap

➠ .....See Group 34

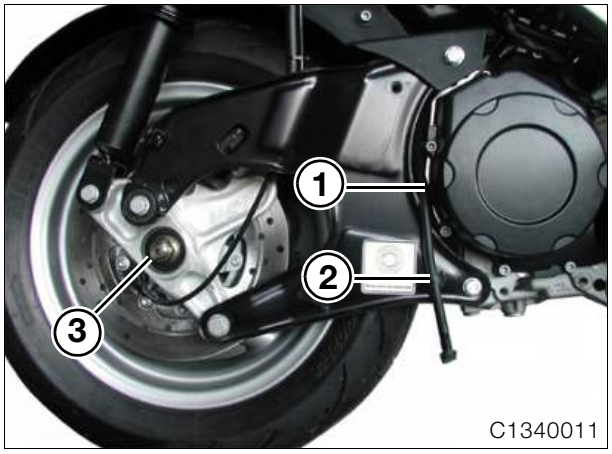
36 30 320 Removing and installing rear wheel

Removing rear wheel

Attention:
Avoid scratching the wheel rim; if necessary mask off the brake caliper.
Do not tilt the brake caliper!

Note:
Do not pull handbrake lever with brake caliper removed/rear wheel removed!

– Remove silencer assembly
➠ .....See Group 18

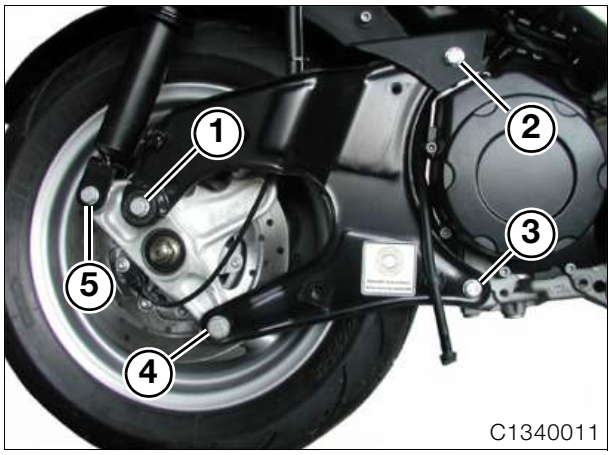


Note:
Apply rear brake to loosen the 6-point nut (3).

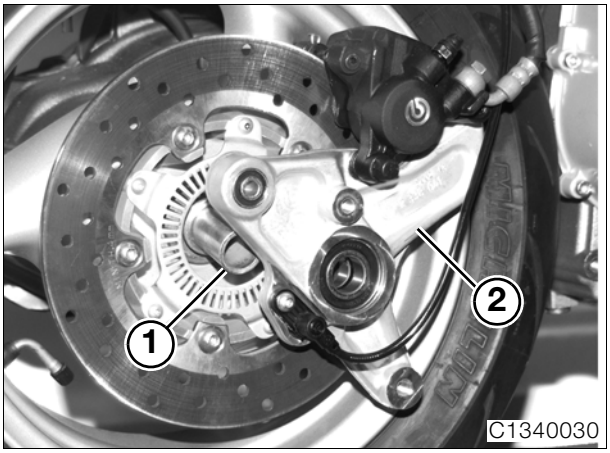
- Unscrew 6-point nut (3)
- Disengage vent hose (1) from clip (2)

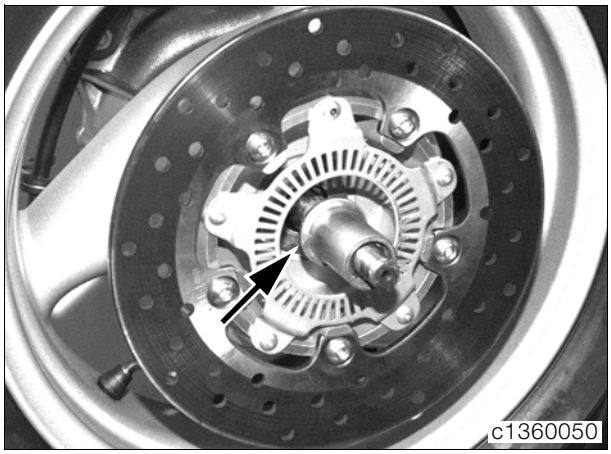


- Use hoist, **BMW No. 00 1 570,** to lift C1 until it is securely supported with the rear wheel free of the ground



- Detach lower end of strut assembly (5) and tie it up out of the way
- Detach auxiliary swing arm (1-4) and remove it





- Pull rear wheel with spacer (1) and brake-caliper carrier (2) far enough off the drive axle to permit the brake-caliper carrier to be turned forward
- Pull spacer (1) off the drive axle
- Carefully remove brake-caliper carrier (2) with brake caliper from brake disc; if necessary, press brake caliper against brake disc to force back brake pads/piston
- Remove rear wheel from drive axle

Installing rear wheel

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Grease drive axle lightly with **Shell Retinax EP2**
- Push rear wheel far enough onto drive axle to permit installation of spacer sleeve
- Install spacer sleeve with collar (arrow) toward the inside
- Install brake-caliper carrier with brake caliper
- Push rear wheel together with spacer sleeve and brake-caliper carrier fully onto final-drive axle
- Remove all traces of old thread-locking compound from the threads

Warning:
Never re-use the original 6-point nut on the drive axle!

- Manually install new 6-point nut on the drive axle

Attention:
Check gap of ABS sensor when ABS sensor, reluctor, brake caliper support, brake caliper support bearing, or final-drive shaft shim is replaced!

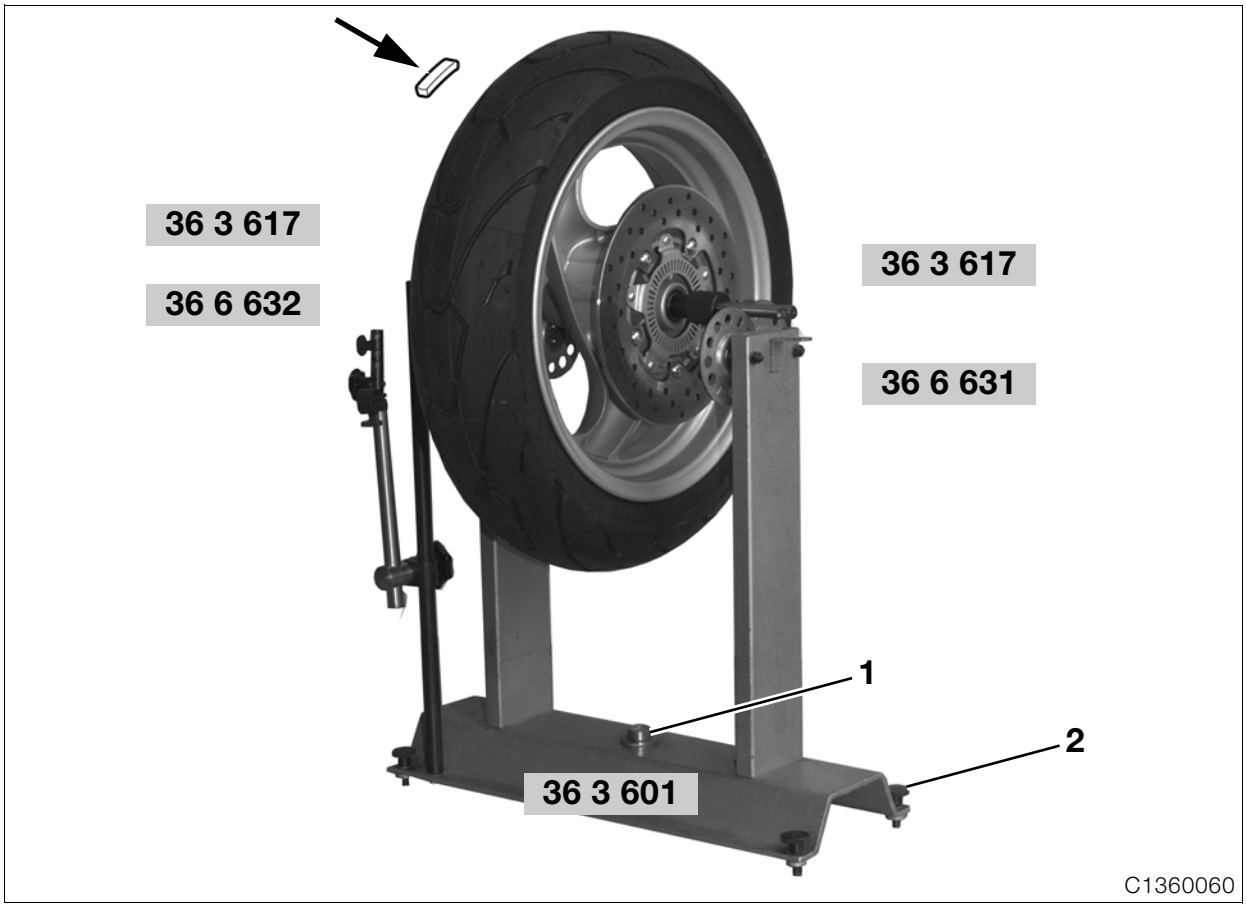
- Check the ABS sensor gap and adjust if necessary

➠ .....See Group 34

Fluids and lubricants:
Shell Retinax EP2

Torque specification:

6-point nut on final-drive axle shaft	130 Nm
Mount for auxiliary swing arm M8	21 Nm
Mount, auxiliary swing arm M10 (+ Loctite 243)	60 Nm
Lower strut mount	21 Nm



36 30 028 Static balancing of front and rear wheels

36 30 008 Static balancing of front wheel

Note:
The front wheel can also be balanced dynamically

- Level balancing rig, **BMW No. 36 3 601**, using knurled-head screws (2) and spirit level (1)
- Insert the balancing shaft,**BMW No. 36 3 617,** through the front wheel
- Use knurled nut **BMW No. 36 3 617,** to turn balance shaft hand-tight
- Place front wheel on balancer **BMW No. 36 3 601**
- Rotate the front wheel and allow it to come to a hal
- Clean the attachment points for the adhesive weights

Attention:
Maximum balance weight is 45 g (1.587 oz)!

- Affix the adhesive weights (arrows) uniformly spaced on both sides of the rim opposite the wheel's heaviest point
- Repeat the balancing procedure as a check

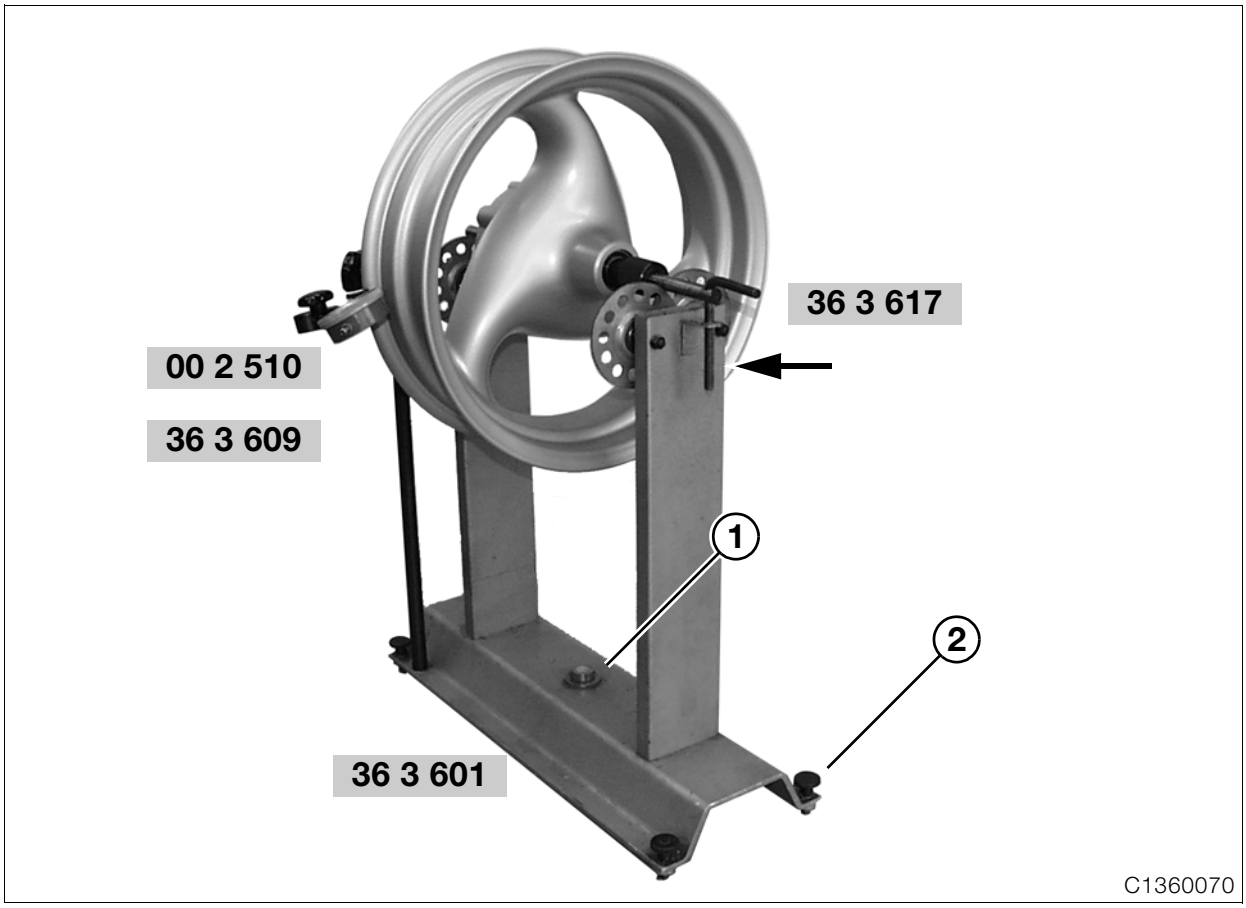
36 30 018 Static balancing of rear wheel

Note:
The rear wheel can also be balanced dynamically

- Level balancing rig, **BMW No. 36 3 601**, using knurled-head screws (2) and spirit level (1)
- Insert balance shaft **BMW No. 36 3 617,** with slider **BMW No. 36 3 632,** through rear wheel
- Use knurled nut **BMW No. 36 3 631,** to pull in balance shaft hand-tight
- Place the rear wheel on the balancer, **BMW No. 36 3 601**
- Rotate the rear wheel and allow it to come to a hal
- Clean the attachment points for the adhesive weights

Attention:
Maximum balance weight is 45 g (1.587 oz)!

- Affix the adhesive weights (arrows) uniformly spaced on both sides of the rim opposite the wheel's heaviest point
- Repeat the balancing procedure as a check



36 32 528 Checking front/rear wheel rim for runout

Checking front wheel rim for runout

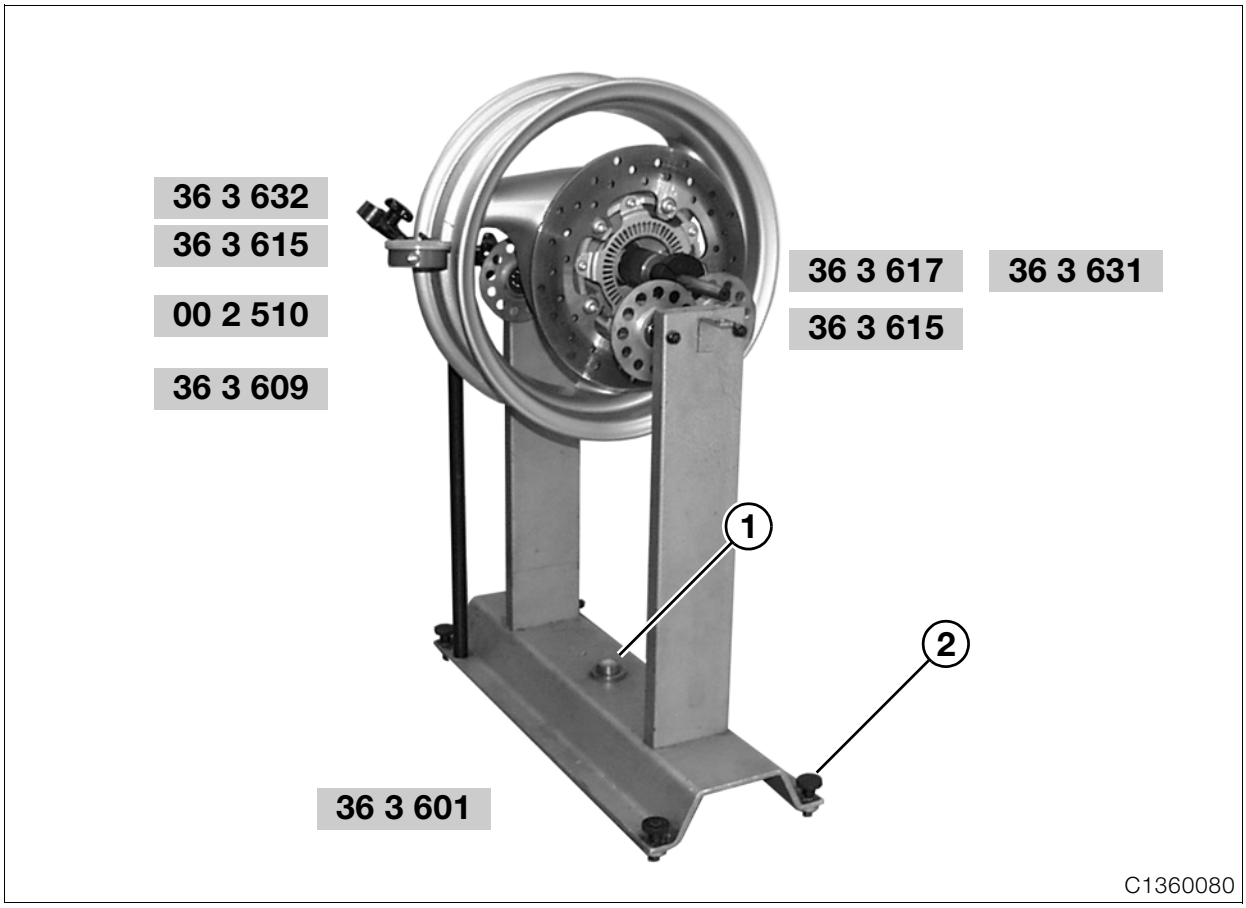
– Remove tyre
– Level balancing rig, **BMW No. 36 3 601**, using knurled-head screws (2) and spirit level (1)
- Insert the balancing shaft, **BMW No. 36 3 617**, through the front-wheel rim
- Use knurled nut, **BMW No. 36 3 617,** to torque balance shaft until it is hand-tight
- Place front wheel rim on balancer, **BMW No. 36 3 601**
- Lock the balancing shaft at the balancing stand with the pin (arrow) to prevent it from turning
- Install dial gauge, **BMW No. 00 2 510,** in the dial gauge stand, **BMW No. 36 3 609,** of the balancing unit and adjust for the desired measurement procedure

Note:

Apply the dial gauge, **BMW No. 00 2 510**, only to the machined inner surface of the wheel rim

- Measure radial and lateral run-out

Adjustment data:
Maximum wheel rim runout:
Vertical runout..... 0.3 mm (0.0118 in)
Wobble ..... 0.3 mm (0.0118 in)



Checking rear wheel rim for runout

– Remove tyre
– Level balancing rig, **BMW No. 36 3 601**, using knurled-head screws (2) and spirit level (1)
- Insert balance shaft, **BMW No. 36 3 617,** with slider, **BMW No. 36 3 632,** through the rear wheel rim
- Turn knurled nut, **BMW No. 36 3 631,** until balance shaft is hand-tight
- Place the rear-wheel rim on the balancing stand, **BMW No. 36 3 601**
- Use two discs, **BMW No. 36 3 615,** to secure balance shaft against sliding sideways in the balance mechanism
- Mount dial gauge, **BMW No. 00 2 510,** in the dial gauge stand, **BMW No. 36 3 609,** and adjust for the desired measurement

Note:

Apply the dial gauge, **BMW No. 00 2 510**, only to the machined inner surface of the wheel rim!

- Measure radial run-out and lateral run-out

Adjustment data:
Maximum wheel rim runout:
Vertical runout..... 0.3 mm (0.0118 in)
Wobble ..... 0.3 mm (0.0118 in)



46 Frame

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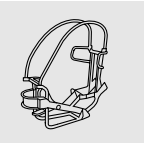
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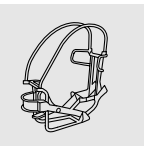
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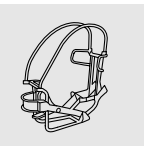
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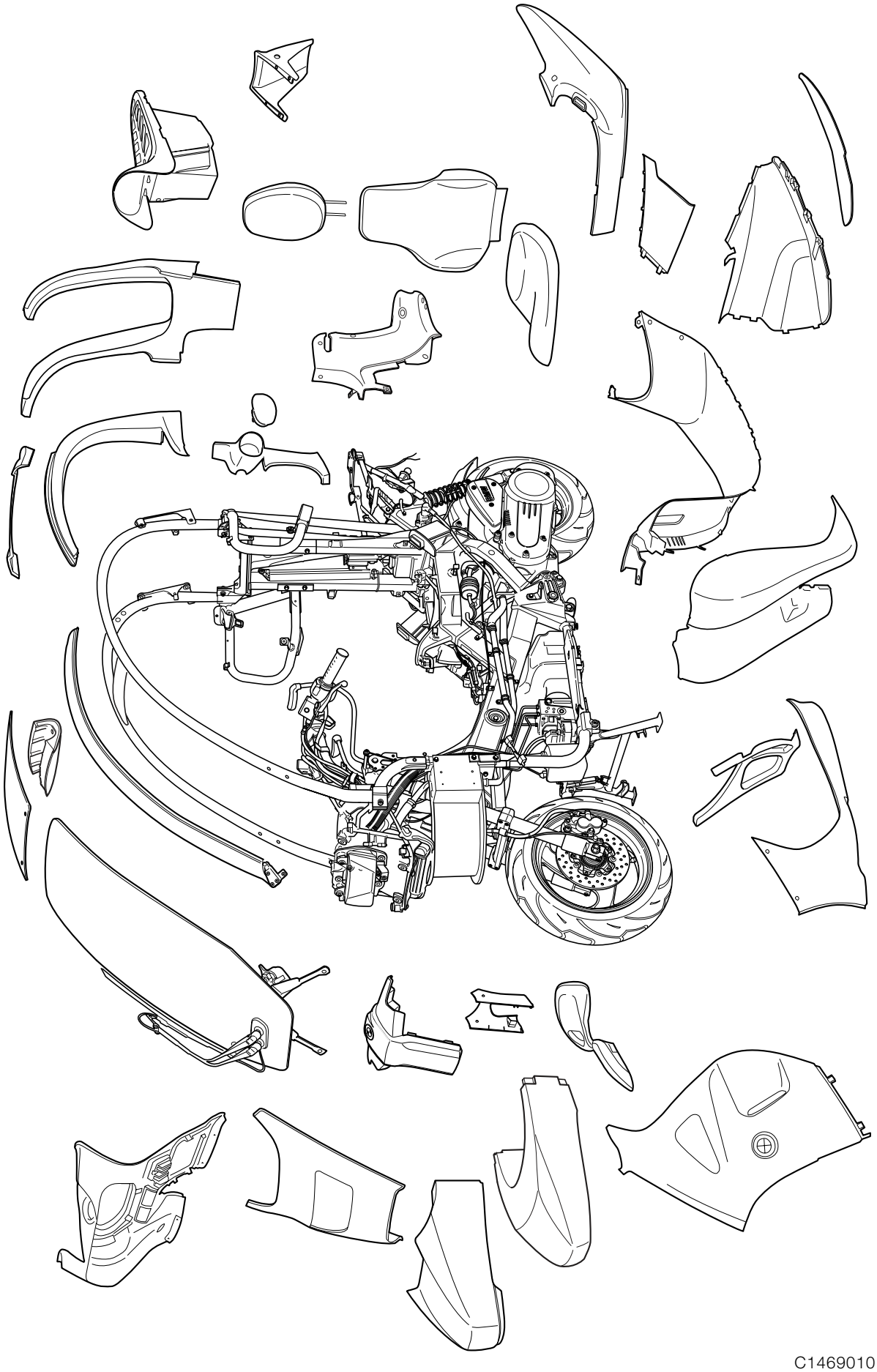


Technical Data		C1
Frame		
Frame		Central frame made of extruded aluminium sections and die-cast components; roof frame and shoulder bars bolted; engine carried on vibration-damping mounts in frame
Type plate location		On frame under the seat
Frame No. location		On frame under the seat
Maximum height (windshield)	mm (in)	1766 (69.5276)
Maximum width (over mirrors)	mm (in)	1026 (40.3937)
Maximum width (without mirrors)	mm (in)	850 (33.4646)
Maximum length	mm (in)	2075 (81.6929)
Seat height	mm (in)	701 (27.5982)
Wheelbase (unladen) normal position	mm (in)	1488 (58.5827)
Dry weight (unladen weight conforming to EU Directive)	kg (lbs)	179 (394.6)
Curb weight (ready for road)	kg (lbs)	185 (407.8)
Approved gross vehicle weight	kg (lbs)	360 (793.7)
Maximum load	kg (lbs)	175 (385.8)
Steering head angle	°	28° 6’ 40’’
Axle load distribution at standard setting		
front/rear	%	48/52
Castor (in normal-load position)	mm (in)	113 (4.4488)
Wheel track offset	mm (in)	12 (0.4724)

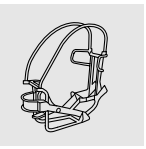




C1 - Trim Overview



C1469010



C1 - Trim mount

– Tighten trim components to specified torque

When installing:

Attention:
When installing trim components always ensure that the foam rubber and/or rubber backing materials are positioned correctly!

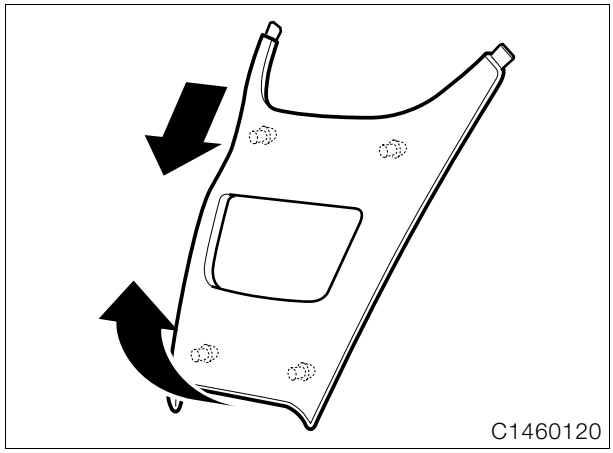
Torque specification:

Trim to frame	2.8 Nm
Trim to trim	2.8 Nm

Exception:

Seat to frame	21 Nm
Intake-air plenum chamber to rear mudguard	12 Nm
Mudguard to powertrain cradle	12 Nm
Air filter to powertrain cradle	12 Nm
Rear mudguard to powertrain cradle	12 Nm

46 63 329 Removing and installing front trim

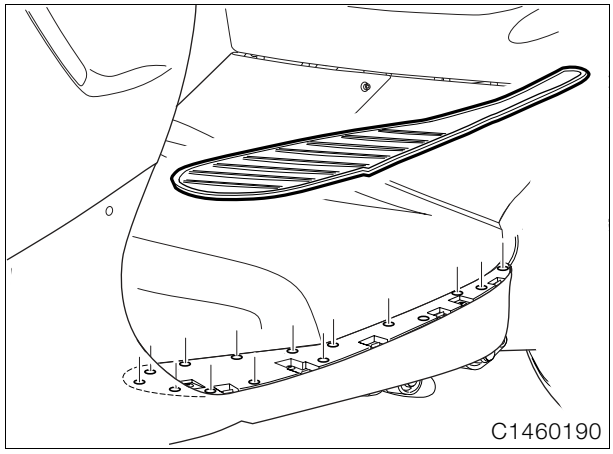


- Pull forward at bottom as indicated by arrow and disengage from pins

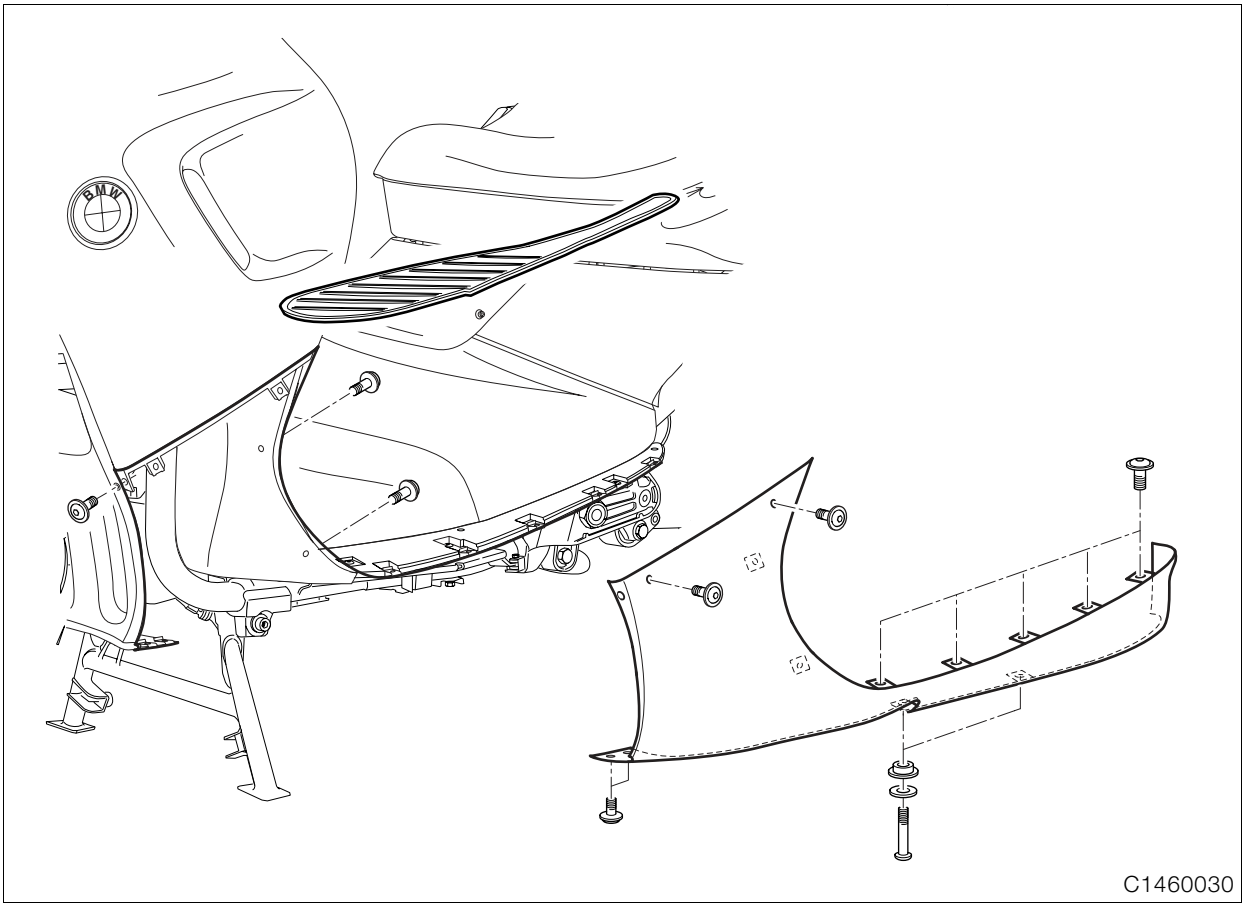
When installing:
Apply acid-free grease to rubber bush and pins

- Engage lugs at top
- As indicated by the arrows, press in bottom of panel until pins engage in rubber bushes

46 63 346 Running board cover removal and installation



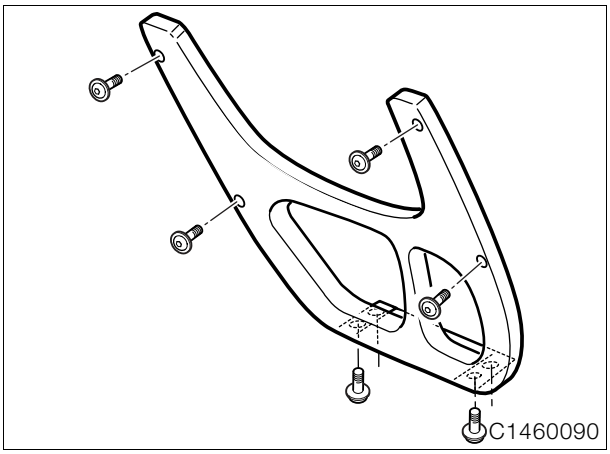
- Unhook pins



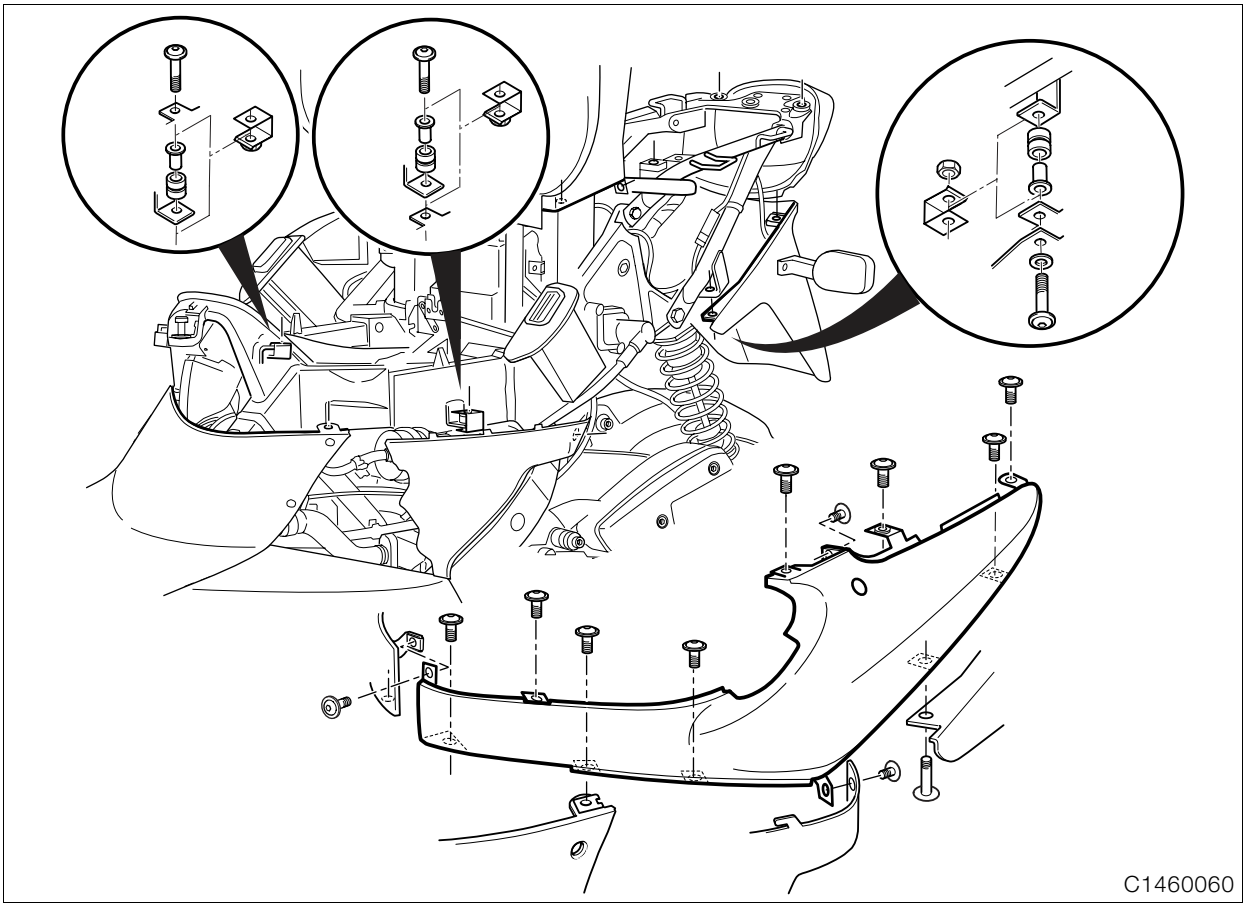
46 63 225 Left and right lower panel removal, installation, replacement

- Panel for running board
- Remove securing screws:
  2x at bottom in frame
  5x in tunnel, inside
  2x knee, inside
  3x in running board, centre
  2x side trim panel

46 63 327 Panel centre section removal, installation, replacement



- Remove 8 securing screws

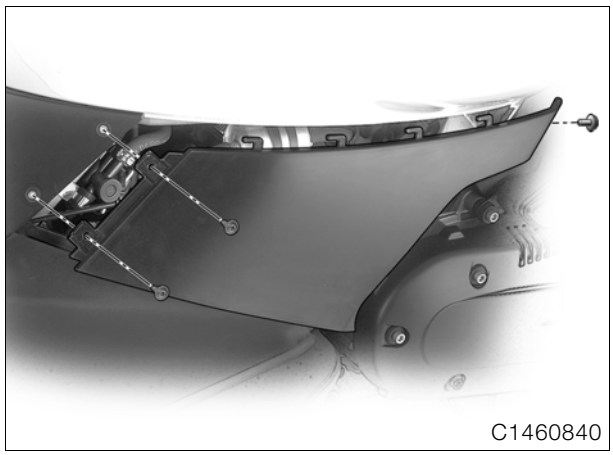

C1460060

46 63 221 Rear side trim removal, installation, replacement

- Remove the rear storage compartment
- Remove seat (➠ 52.3)
- Remove service cover
- Before removing left rear side panel: disengage Bowden cable for seat lock from striker mechanism
- Remove 9 securing screws
- When installing, note seat-belt buckle cover

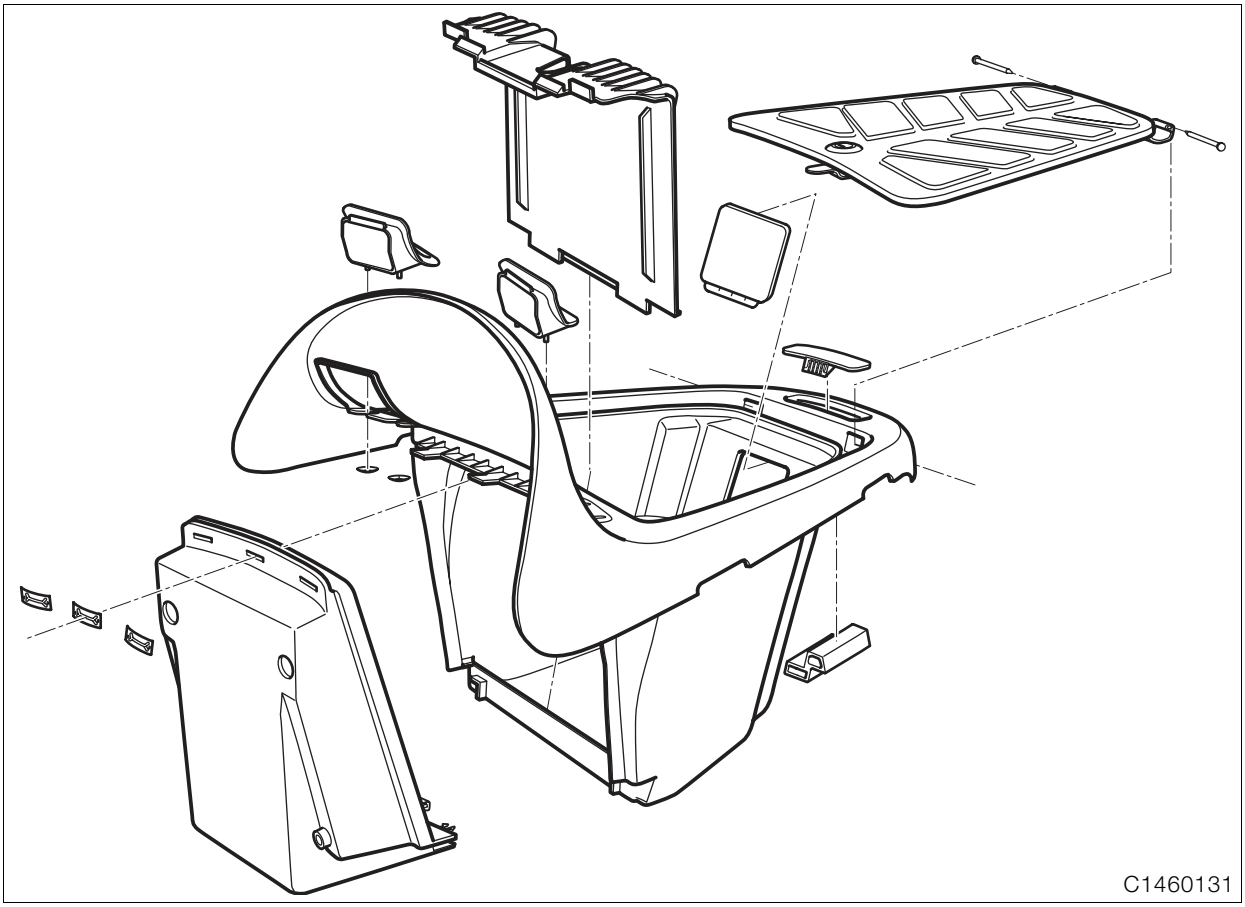
46 63 223 Service hatch removal and installation

The following section describes the procedures for the left-side service hatch. The operations for the right side are essentially the same.


C1460840

- Remove 3 securing screws
- Pull cover to the rear and down to remove

When installing:
- Simultaneously press forward and back when installing



Rear storage compartment cover

46 54 349 Replacing seal on rear storage compartment

61 21 109 Replacing battery compartment

– Remove the rear storage compartment

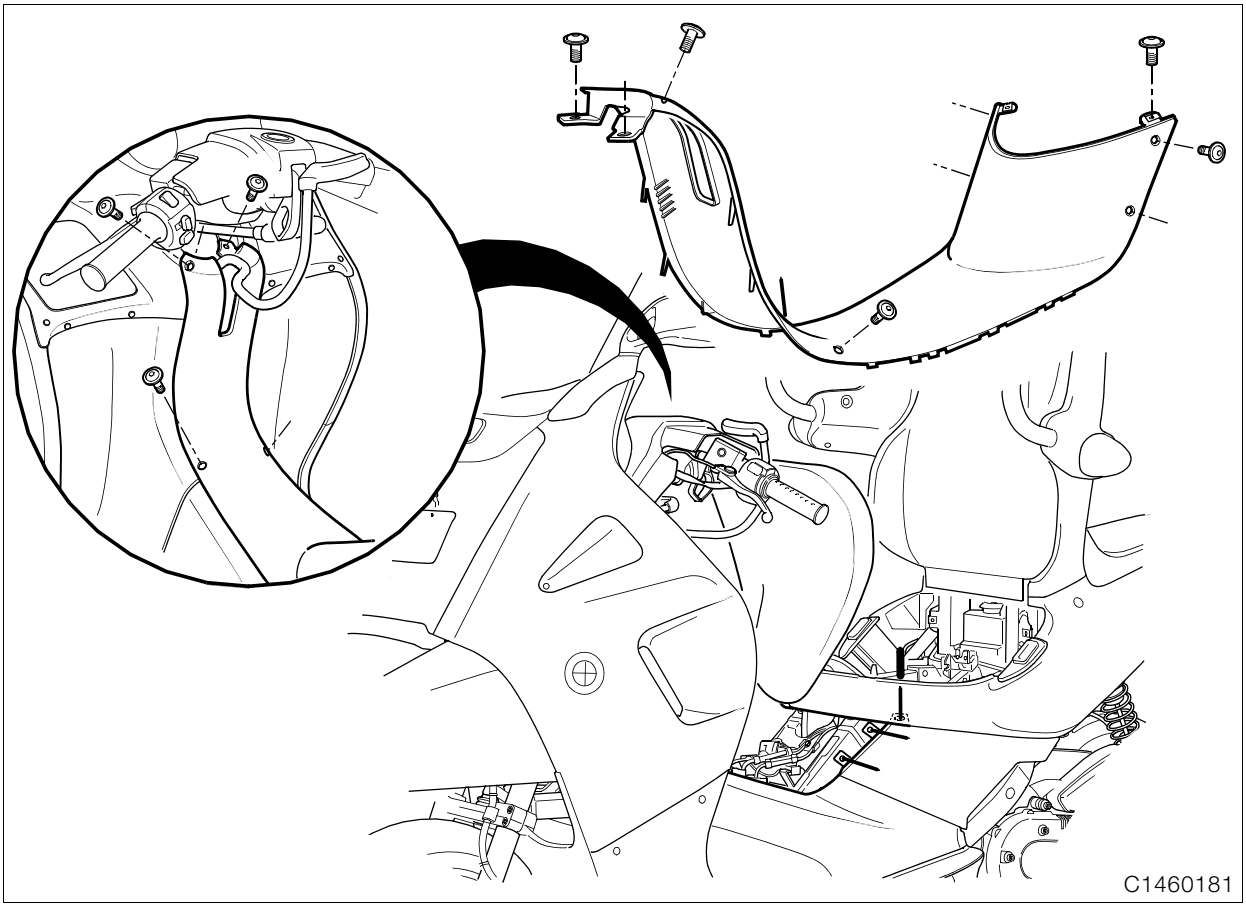
- Remove 3 metal tab retainers
- Dismantle into individual components

46 54 340 Remove the rear storage compartment

– Remove the battery

➠ .....See Group 61

- Open cover
- Remove 5 securing screws

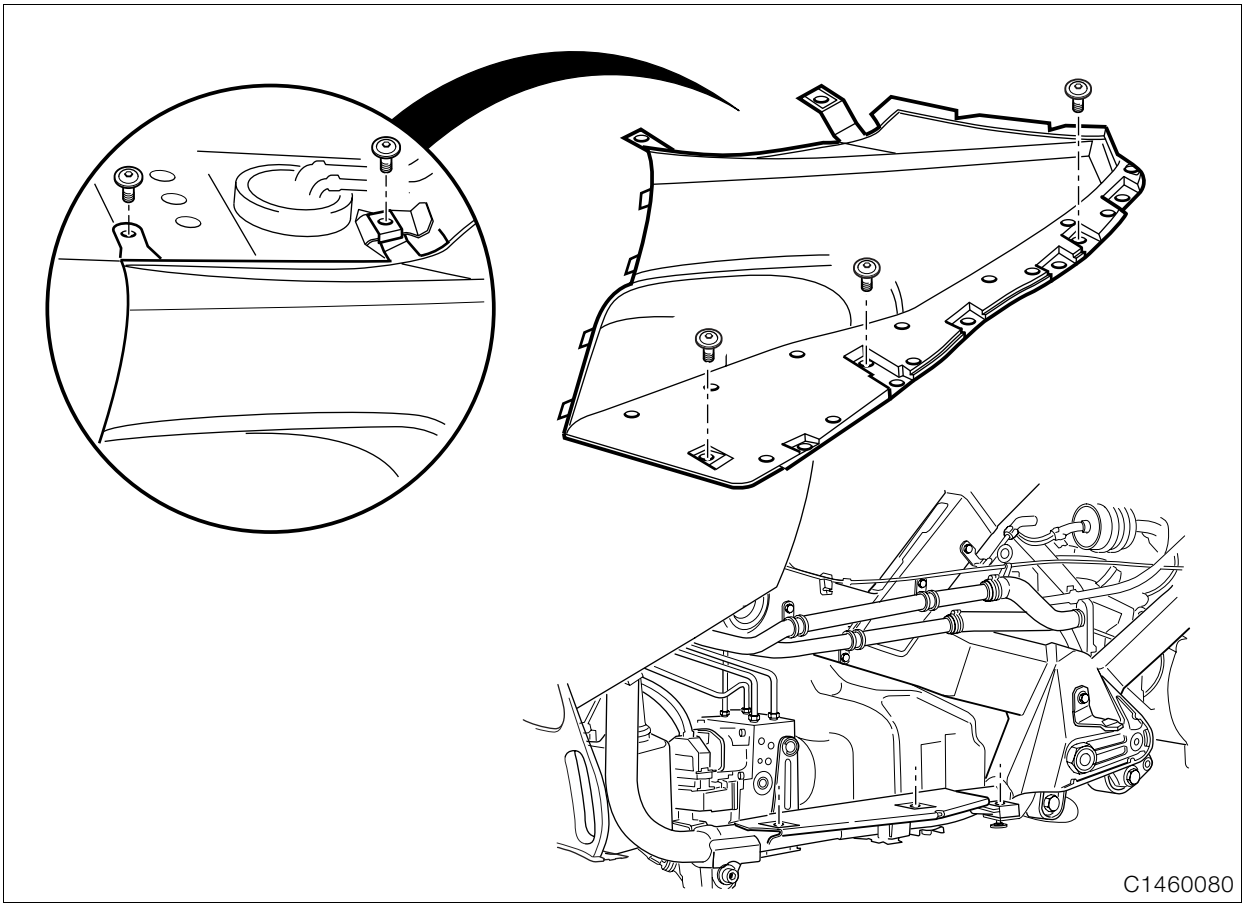


46 63 231 Upper tunnel removal, installation, replacement

- Turn the handlebars all the way to the left or right

Remove securing screws:

- 4x to instrument trim
- 2x on tunnel on left and right
- 4x from service cover
- Open the seat (➠ 52.3)
- 2x from rear side panels

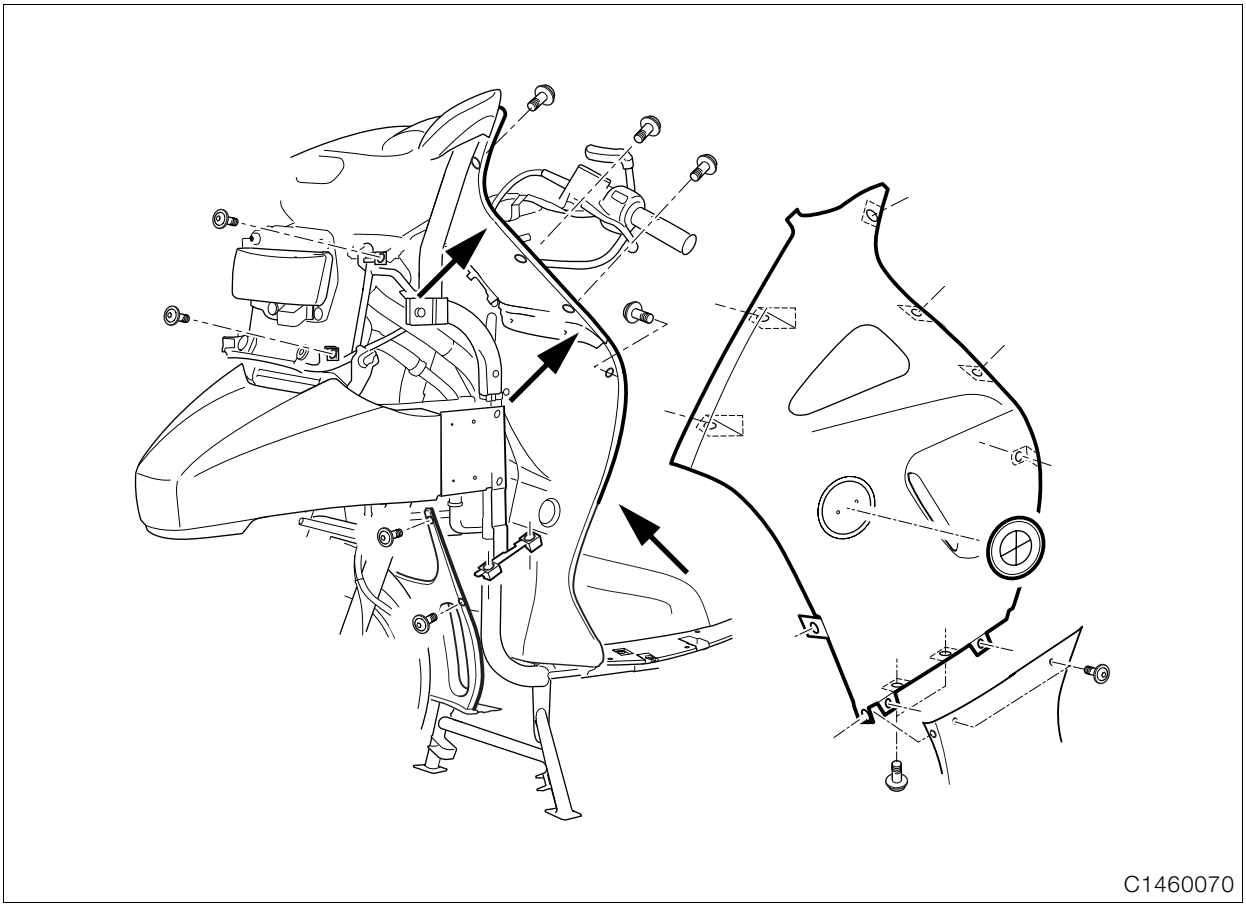


46 63 228 Left/right tunnel removal, installation, replacement

– Remove service cover
– Remove top tunnel panel
– Remove rubber mat
– Remove running board

Remove securing screws:

- 3x from running board
- 2x to front frame with disposable washer



C1460070

46 63 333 Side panel removal, installation, replacement

– Remove front fairing panel
– Remove running board

Remove securing screws:

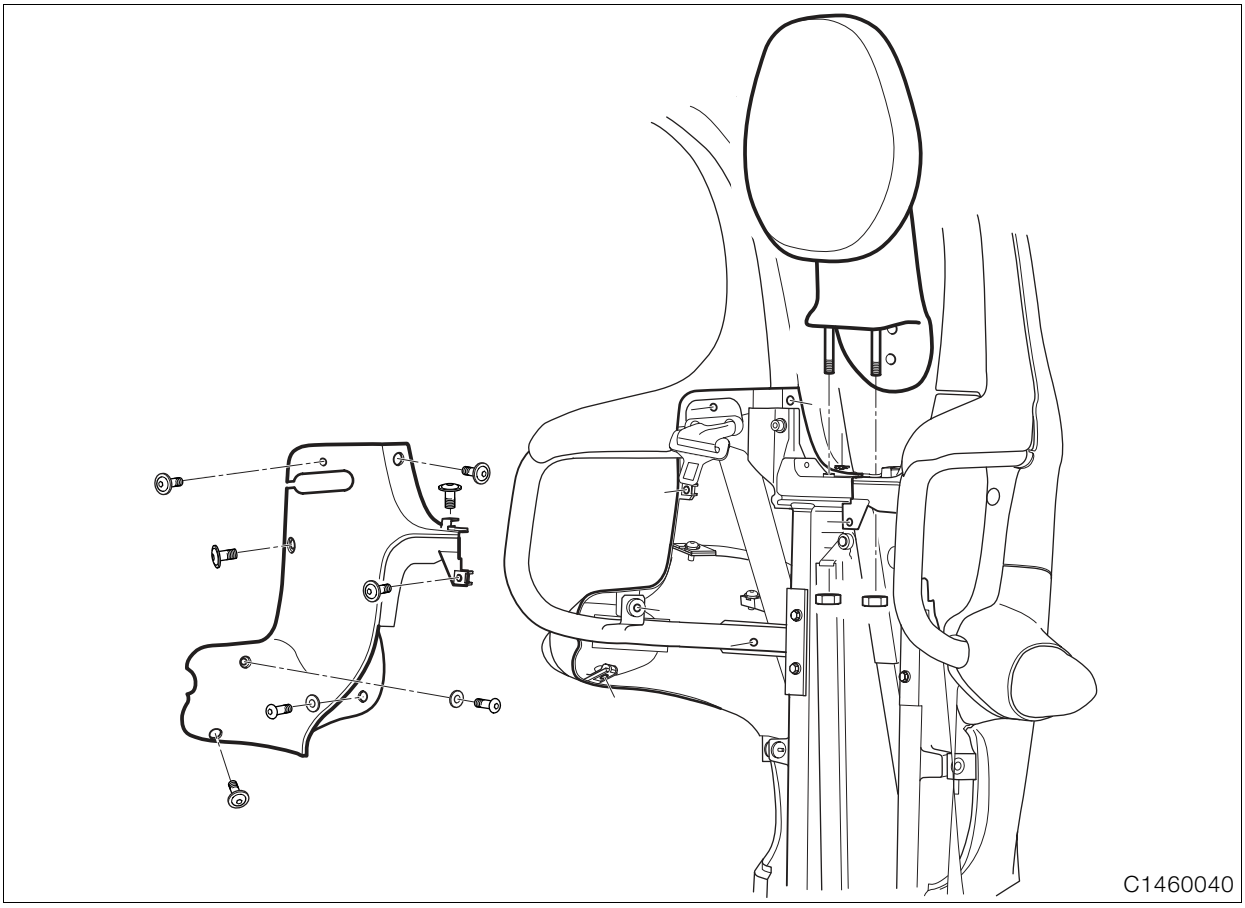
- 2x from front frame
- 1x running board centre
- 2x from holder
- 3x to instrument trim
- 1x knee, inside

When installing:

Attention:
When installing ensure that cord gasket (arrows) seats correctly!

51 14 050 Replacing plaque for side panel

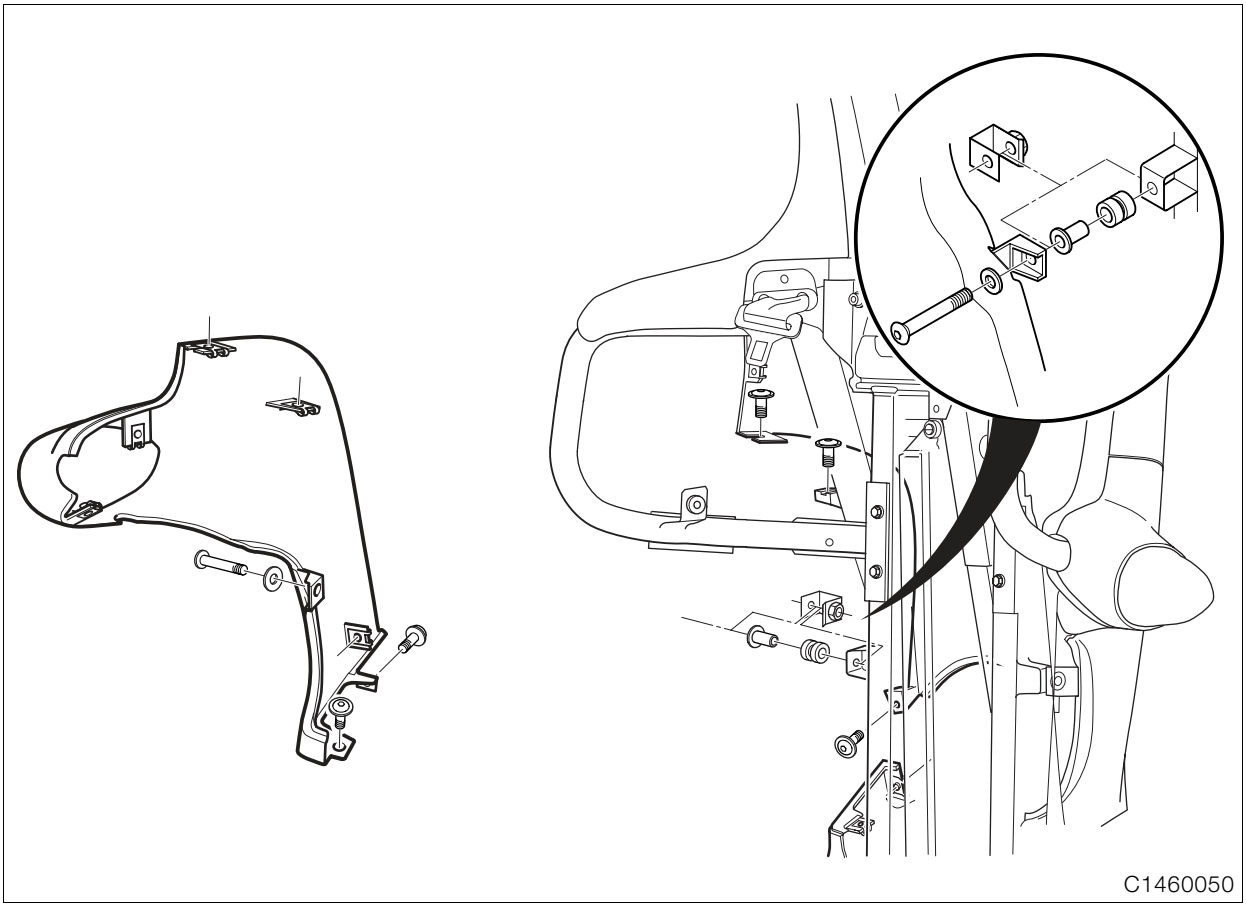
Note:
Plaque is secured by double-sided adhesive tape and located by two pins.



C-pillar inner trim removal, installation, replacement

– Remove head restraint
- Release attachments
- Remove belt trim

Note:
Do not pull the belt strap - risk of damage!



46 63 348 Shoulder bar external trim, removal, installation, replacement

– Remove C-pillar inside trim

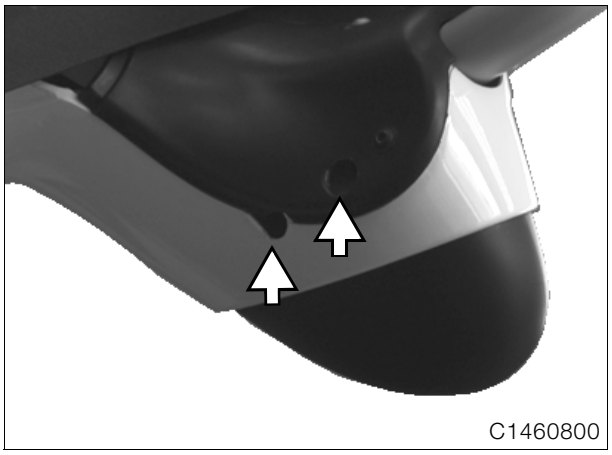
Release attachments:

- 3x from backrest support
- 1x from shoulder bar
- 1x from frame section
- 2x rear side section

When installing:

Attention:
During installation ensure that the seal between the trim and the shoulder bar's crash element is positioned correctly!

46 51 160 Shoulder bar crash element, left or right, removal and installation



- Remove 2 fasteners (arrows)

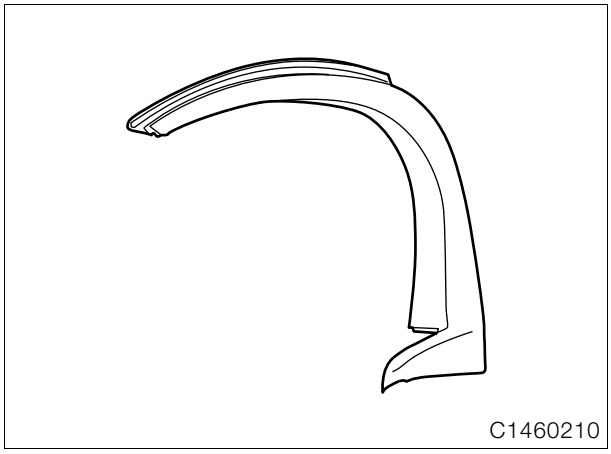
When installing:

Attention:
When installing ensure that the seal between the crash element and the trim is positioned correctly!

Torque specification:
Crash element to frame..... 9 Nm

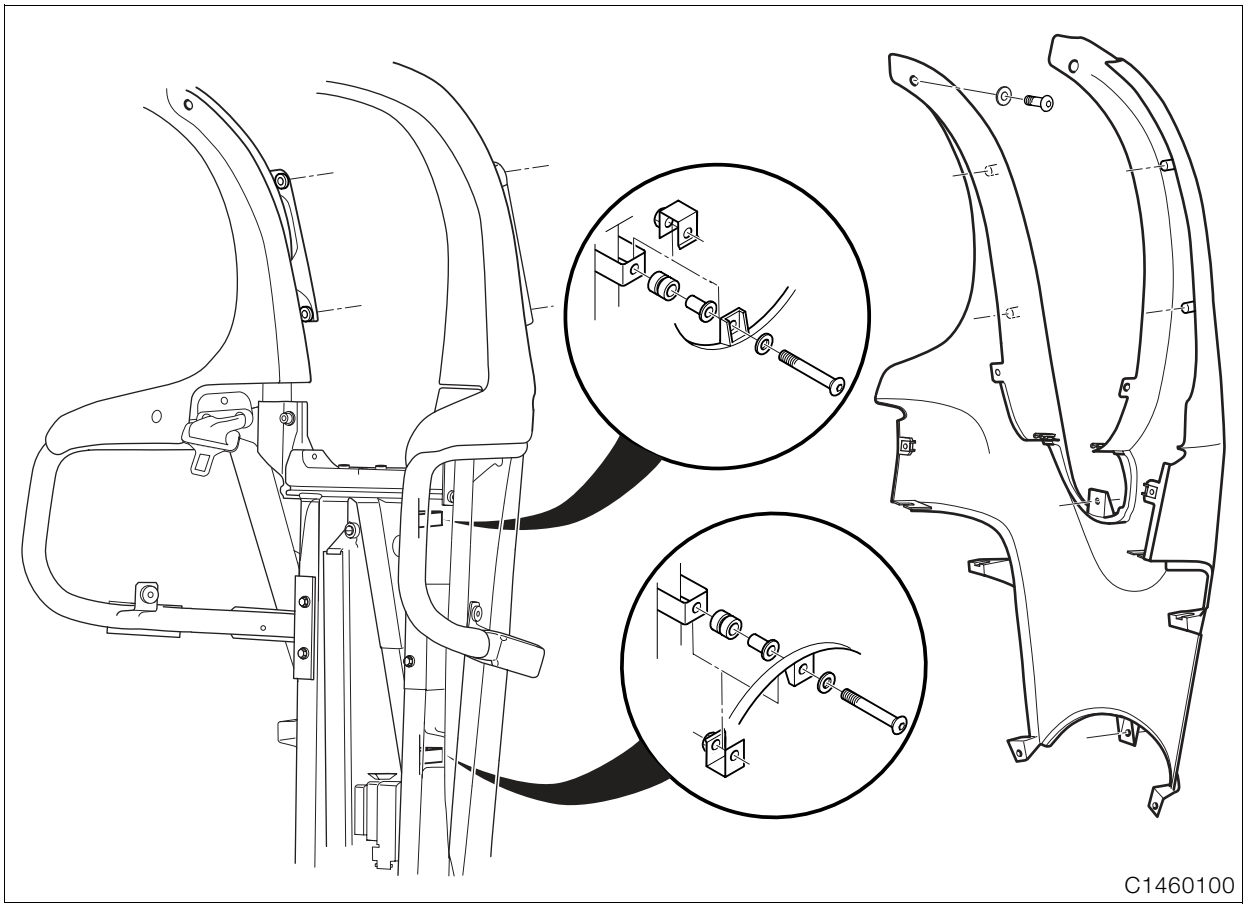
46 51 170 C-pillar foam element, removal, installation, replacement

– Remove head restraint
– Remove lightweight foam element from transverse brace



- Remove foam rubber covers
- Remove 8 fasteners

Torque specification:
Foam rubber to frame..... 5 Nm



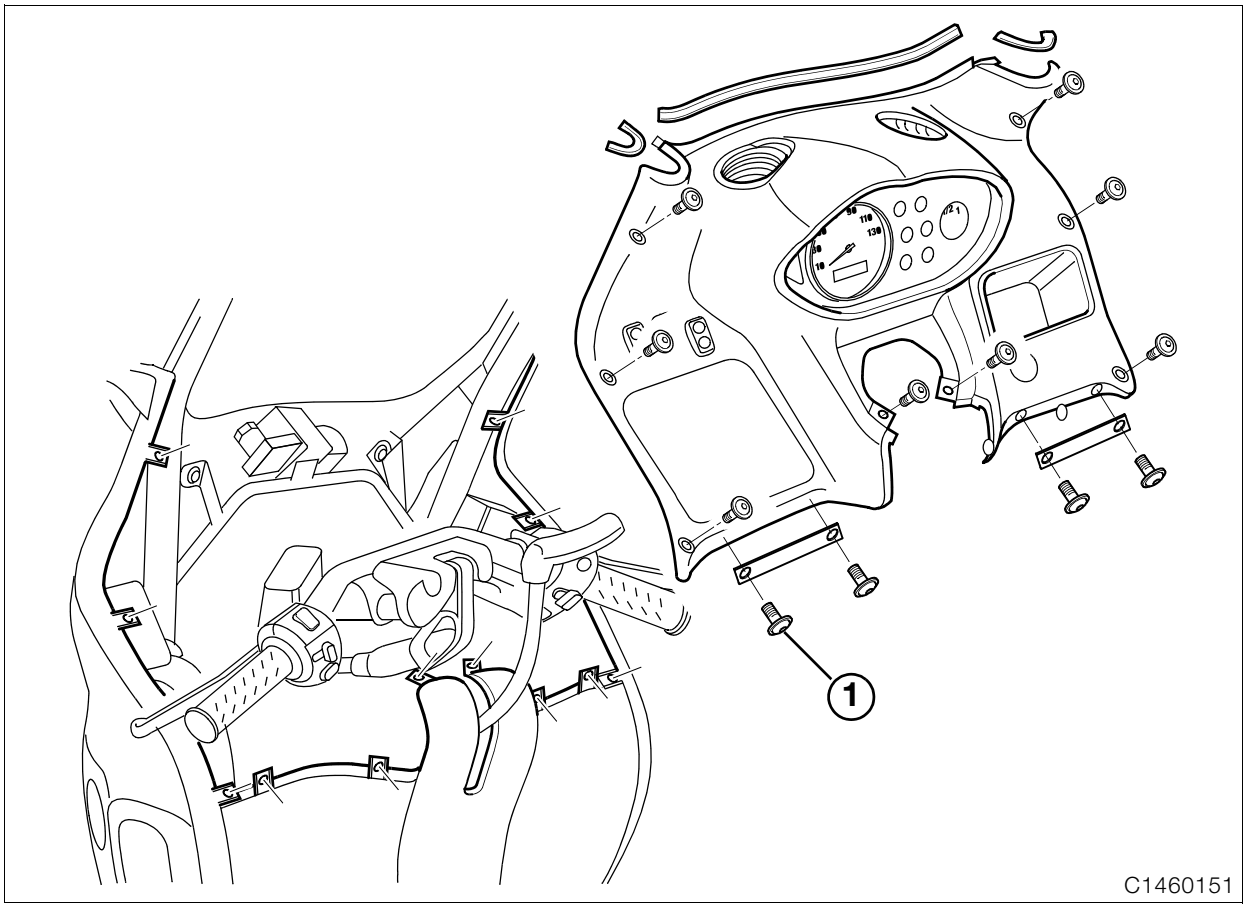
46 63 323 Rear trim removal, installation, replacement

- Remove spoiler
- Remove head restraint
- C-pillar inside trim, left and right
- Remove the rear storage compartment

Note:
It is not necessary to remove the belt trim!

Release attachments:
- 2x from rear centre strut
- 2x from roof frame at top
- 2x pins in frame strut above shoulder bars

Torque specification:
Head restraint ..... 21 Nm

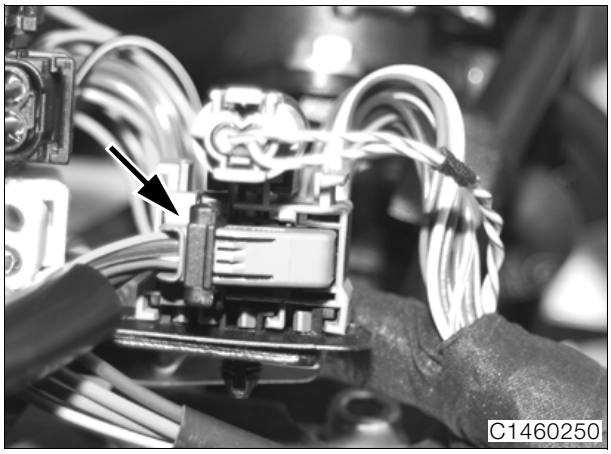


46 63 232 Instrument trim removal, installation and replacement

– Remove front 4 fasteners at top of tunnel panel
- Turn ignition lock cover 45° to the left and remove



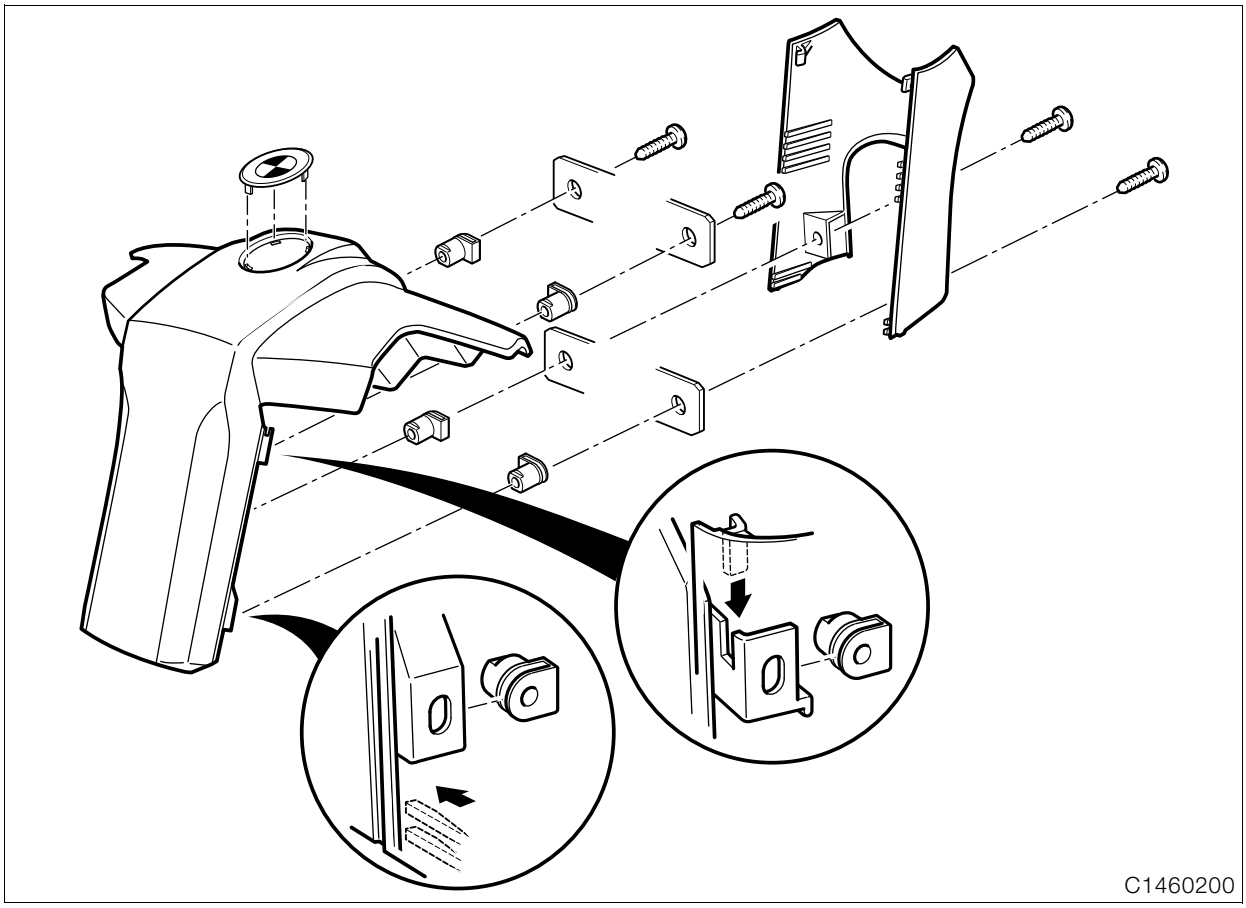
- Disconnect headlight wiring
- disconnect wiring to heater module and hazard warning flashers as necessary



- Release the detent (arrow) to disconnect the wiring to the instrument cluster from the wiring harness

When installing:

Attention:
Note short screw (1) after large storage compartment is installed!

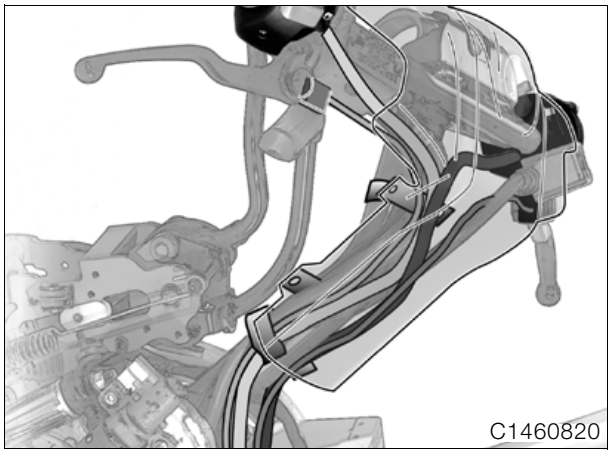


46 63 405 Impact panel removal, installation, replacement

Lower handlebar cover

- Release four screws
- Slide lower panel upward and extract outward

Attention:
When removing the top section, watch the wiring installed below!



- Remove upper section with impact panel

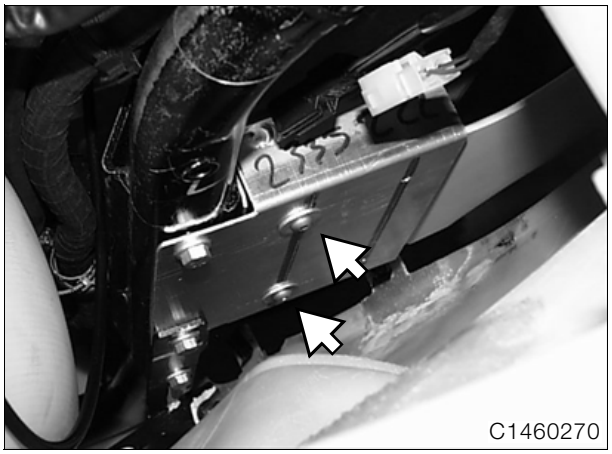
51 14 050 Replacing badge

- Remove badge
- Align new badge at the centre and bond into place with adhesive

46 63 328 Crash element trim removal, installation, replacement

51 11 001 Crash element removal, installation, replacement

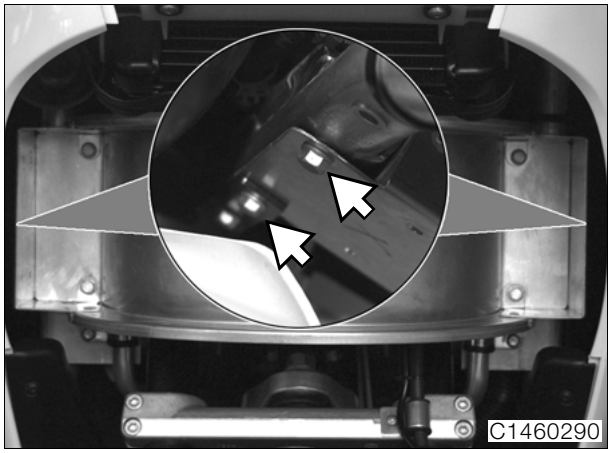
– Removing instrument trim



- Release attachments (arrows) on the opposite side as well
- Remove trim and crash element

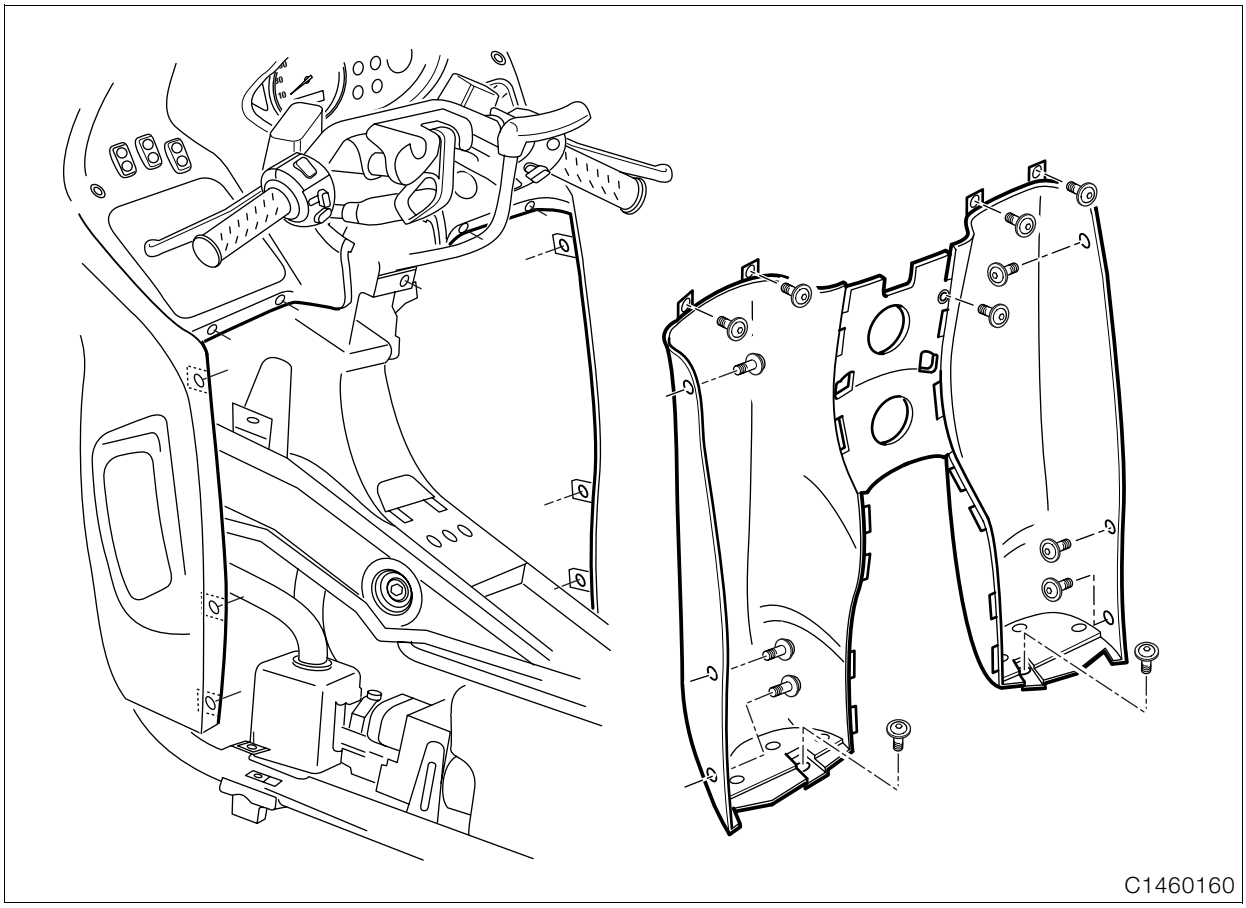
51 11 005 Replacing holder for crash element

– Remove crash element



- Release 4 outer and 4 inner attachments (arrows) and remove bracket

Torque specification:
Crash element bracket to frame ..... 9 Nm



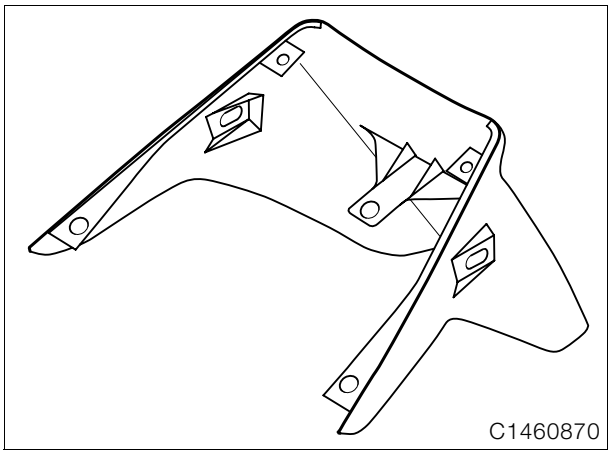
46 63 246 Knee trim removal, installation, replacement

– Remove centre, left and right tunnel panels
– Release 4 attachments on instrument trim

When installing:

Make sure that round-section sealing cord is correctly seated

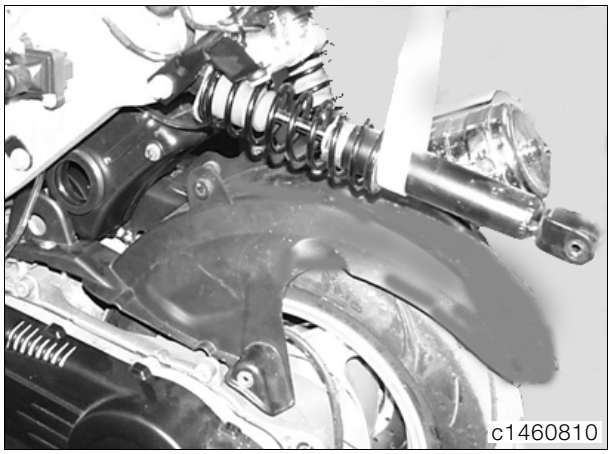
46 62 050 Licence plate bracket removal, installation, replacement



- Remove 5 securing screws
- Disconnect cables from turn indictors and tail-lamp cluster

46 62 000 Rear mudguard removal, installation, replacement

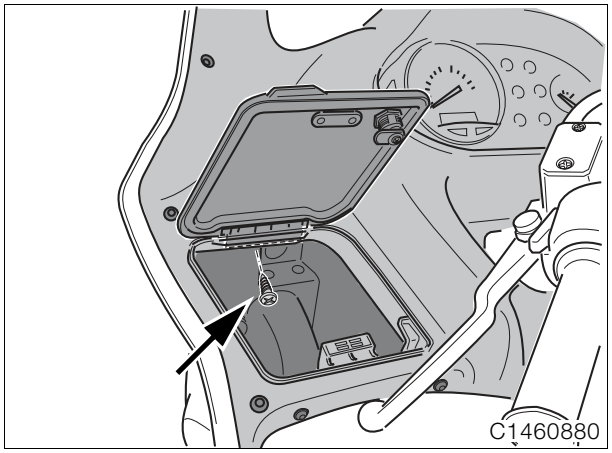
– Remove the rear stowage compartment
– Disconnect battery
– Detach lower end of left spring strut and pivot the strut to the rear



- Disconnect positive and negative leads from the starter motor
- Release clip securing air filter to intake air silencer
- Remove securing screws
- Remove fasteners securing intake air silencer to rear mudguard
- Push the intake air silencer up
- Watch the vent hose on the intake air silencer
- Pull rear mudguard to the rear until it is clear of the tyre

Large storage compartment

Replacing cover



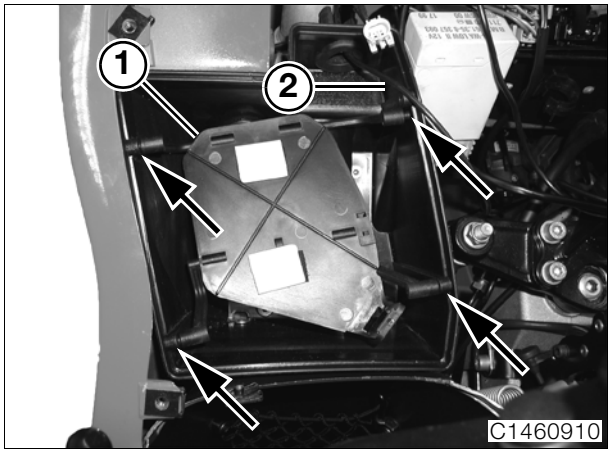
- Release screws (arrow)
- Unlock cover and remove by extracting upward

When installing:

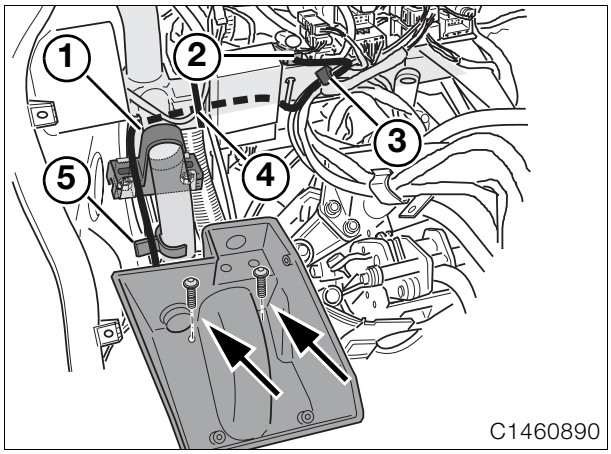
- Installation is the reverse of the removal procedure

Storage compartment removal and installation

– Remove instrument trim



- Remove sound system module (1) from bracket (arrows) as necessary
- Remove sound system wiring (2) from rubber grommet as necessary

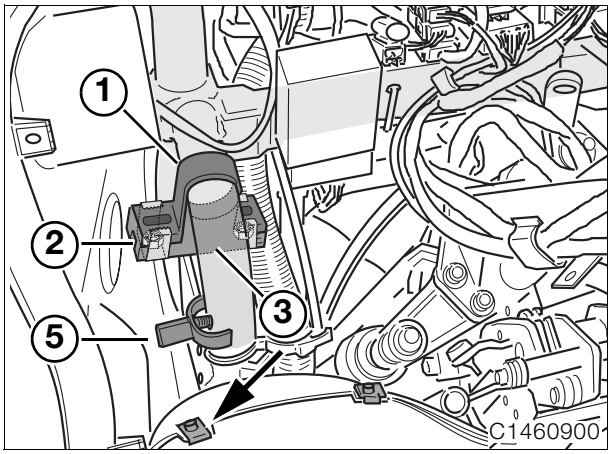


- Open cable clip (3)
- Open cable tie (4)
- Disconnect plug (2)
- Remove fasteners (arrows)
- Remove storage compartment by extracting out the top
- Remove clamp (1)
- Remove alignment element

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that lines and cables are correctly routed. Avoid potential contact areas that could lead to rubbing and abrasion!

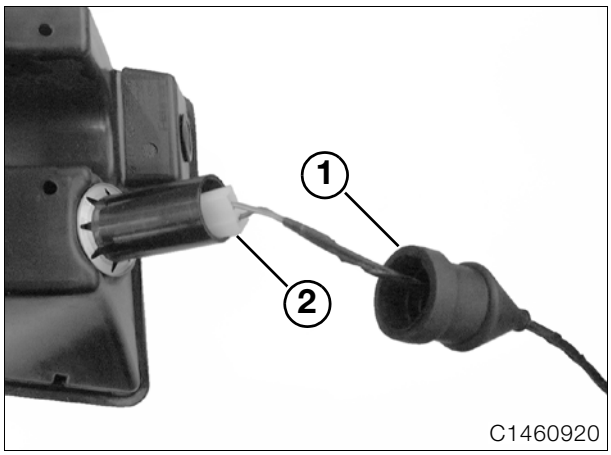


- Install nuts (2) in the bottom section of the clamp (3)
- Position the lower (3) and upper sections (1) of the clamp on the vehicle frame and retain with two strips of tape
- Install storage compartment and insert screws in their sockets without yet tightening them
- Install the instrument trim, using the shorter screw at the mounting point (arrow)
- Align storage compartment with instrument trim
- Tighten down storage compartment mounts

Attention:
Make sure that the seal between front windscreen and roof is correctly positioned!

Replacing the power socket

– Remove the instrument trim
– Remove the storage compartment



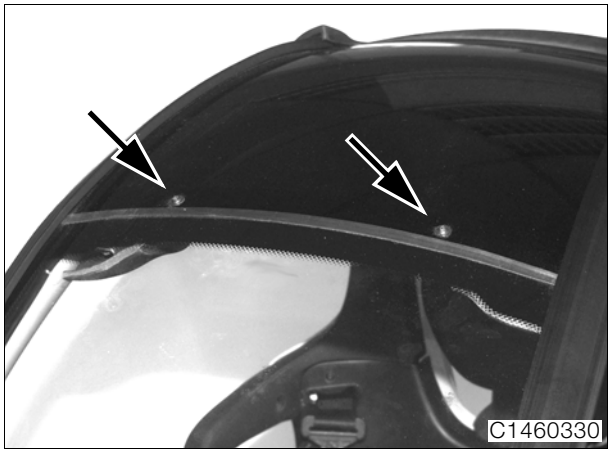
- Pull off the rubber grommet (1)
- Disconnect plug (2)
- Remove socket toward the inside

When installing:

- Installation is the reverse of the removal procedure

46 63 040 Roof removal and installation

- Remove the backrest
- Remove head restraint
- Remove spoiler
- Remove inside trim on C-pillars
- Remove lightweight foam elements from left and right C-pillars
- Remove lightweight foam element from cross brace



- Remove fasteners (arrows) from top of windscreen

Attention:
Do not scratch the roof frame – mask it off if necessary!

- Starting at the rear and working forward to the windscreen, pry left and right A-pillar trim out of the retaining clips
- Pull the roof to the rear until it is clear of the A-pillar trim

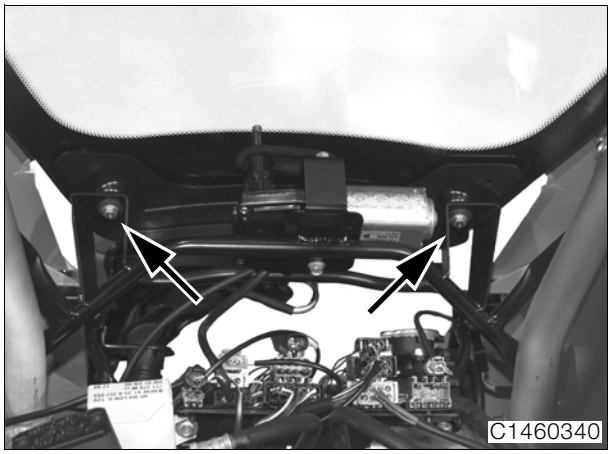
When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that the seal between front windscreen and roof is correctly positioned!

Torque specification:
Windscreen attachment ..... 5 Nm

51 31 001 Windscreen removal and installation

- Remove front fairing panel
- Remove left and right mirrors
- Disengage side trim panels from front frame at left and right
- Remove wiper arms (➠ 61.22)
- Remove instrument trim
- Remove roof



- Remove fasteners (arrows) from bottom of windscreen

Attention:
Do not scratch the roof frame – mask it off if necessary!

- Starting at the top and working down, pry A-pillar trim out of the retaining clips
- Disengage tube for windscreen washer fluid
- Lift windscreen up to remove

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that the seal between windscreen and roof is correctly positioned!

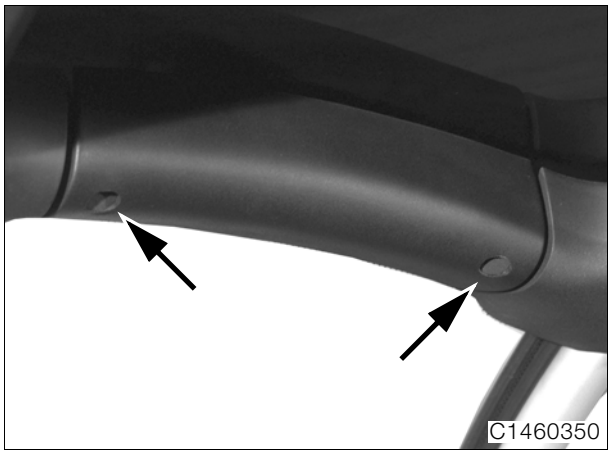
- Replace damaged clips
- Align clips parallel to the roof frame

Note:
Insert windscreen in the rubber grommets at the attachment points without the shims!

- Position left/right A-pillar trim against the windscreen and press on the clips from below until you hear them snap into place
- Install spacers in rubber grommets and install the fasteners
- Install roof
- Tighten fasteners on front windscreen

Torque specification:
Windscreen attachment ..... 5 Nm

46 63 041 Cross brace foam element; removal, installation, replacement



- Remove foam rubber covers (arrows)
- Remove 2 fasteners

When installing:

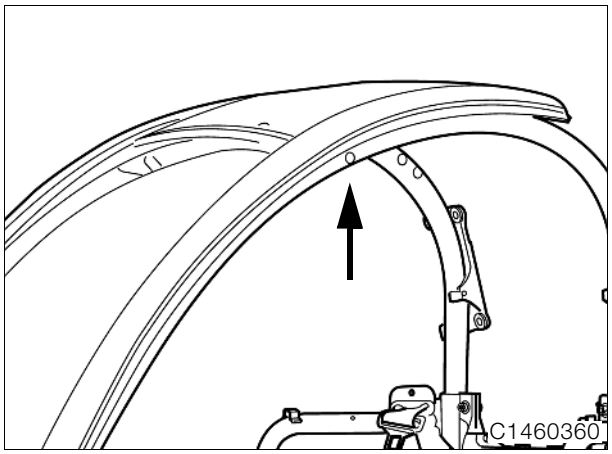
- Installation is the reverse of the removal procedure

Torque specification:
Cross brace foam element ..... 5 Nm

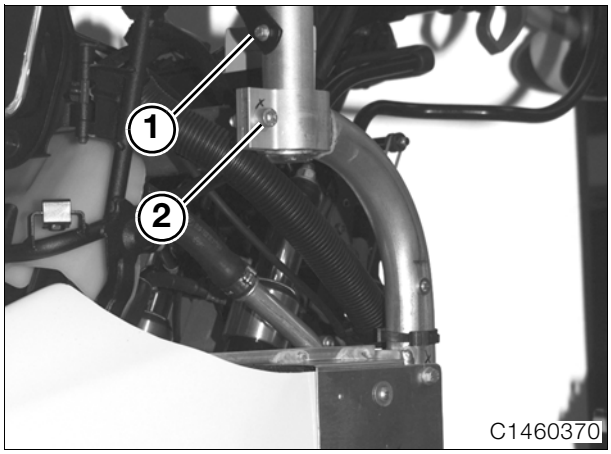
46 51 165 Roof bar replacement

The procedure for replacing the left roof bar is described below. The procedure for replacing the right roof bar is essentially the same.

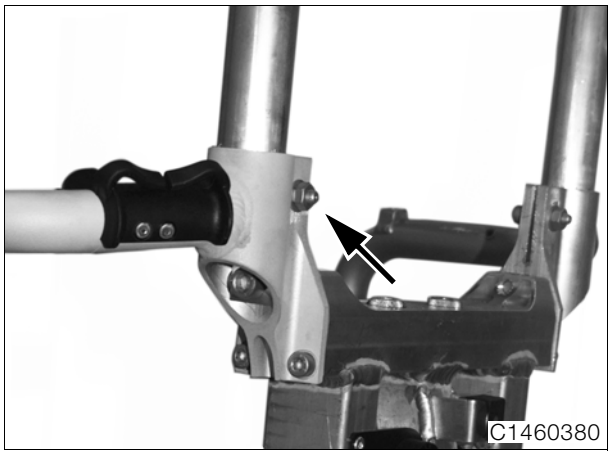
- Remove front fairing panel
- Remove left and right mirrors
- Disengage side trim panels from front frame at left and right
- Remove wiper arms
- Remove instrument trim
- Remove the backrest
- Remove head restraint
- Remove the storage compartment
- Remove the rear panel
- Remove spoiler
- Remove lightweight foam element from cross brace
- Remove inside trim of C-pillars
- Remove lightweight foam elements from left and right C-pillars
- Remove roof
- Remove front windscreen
- Remove mirror brackets



- Remove fastener (arrow) for cross brace



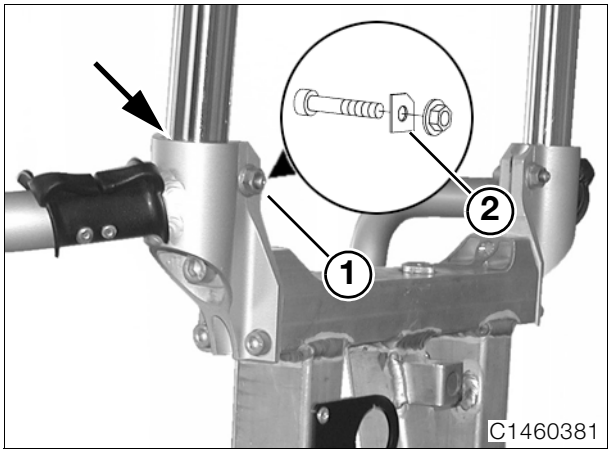
- Remove fastener (1) securing subframe for front windscreen/wiper motor to roof bar
- Release clamp (2) securing frame at front

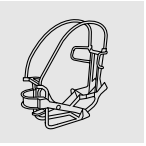


- Slacken clamp (arrow) for shoulder bar
- Lift up roof bar and remove

When installing:

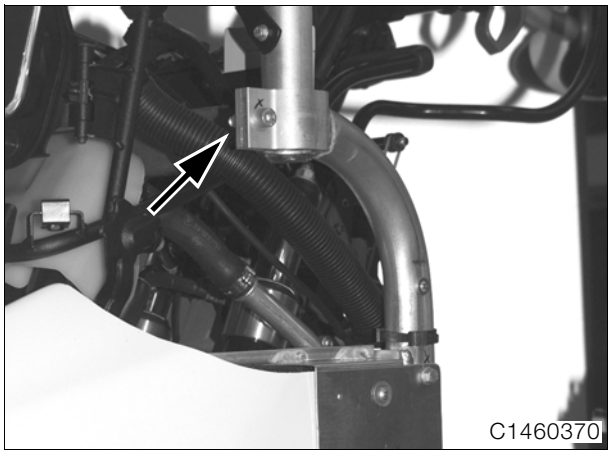
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:





Attention:
Note installed position of washer (2)!

- Install roof bar in rear clamp (arrow) and gently tighten screw (1)
- Install rear trim
- Align roof bar with rear trim
- Tighten retainer for rear roof bar



- Install roof bar in front retainer (arrow) and tighten gently
- Install mirror bracket
- Install side trim
- Align the front of the roof bar with the mirror bracket centred in the side trim's recess
- Tighten down front roof bar retainer

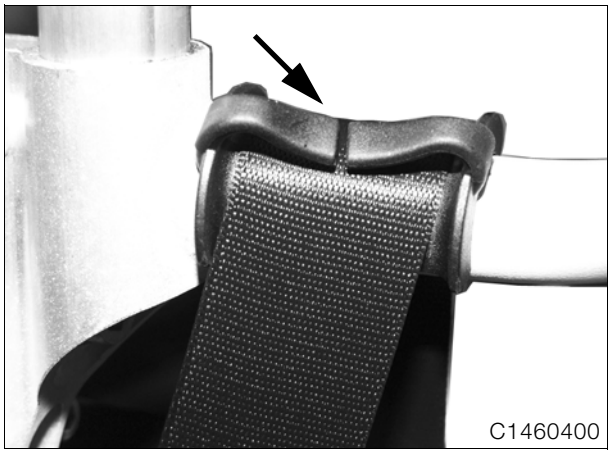
Torque specification:

Front roof bar retainer	21 Nm
Rear roof bar retainer	21 Nm
Cross brace retainer	21 Nm
Windscreen attachment	5 Nm
Mirror bracket attachment	5 Nm

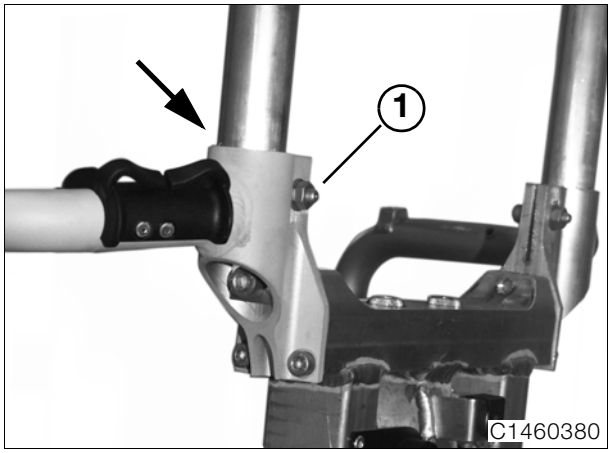
46 51 172 Shoulder bar replacement

The procedure for replacing the left shoulder bar is described below. The procedure for replacing the right shoulder bar is essentially the same.

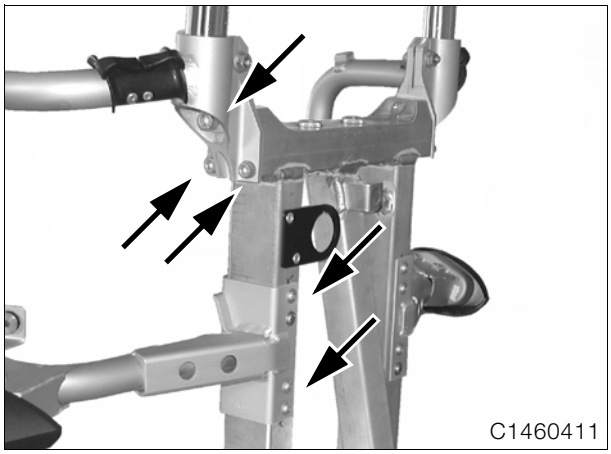
- Remove the backrest
- Remove head restraint
- Remove the rear storage compartment
- Remove the rear panel
- Remove inside trim from left C-pillar
- Remove lightweight foam element from left C-pillar
- Remove trim panel from left shoulder bar
- Remove left crash element



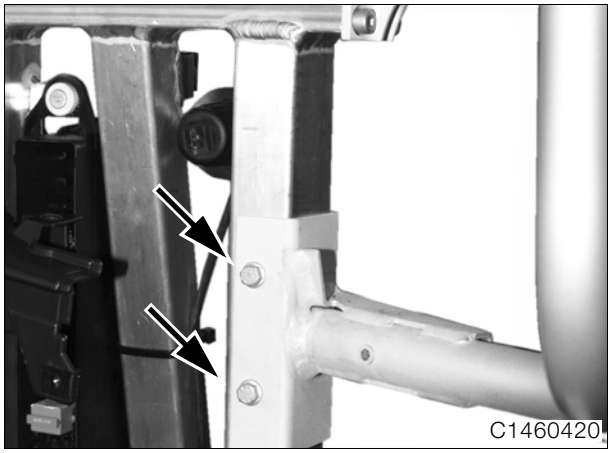
- Disengage seat beat from guide (arrow)



- Mark the roof bar above the retainer (arrow)
- Release the roof bar retainer (1)



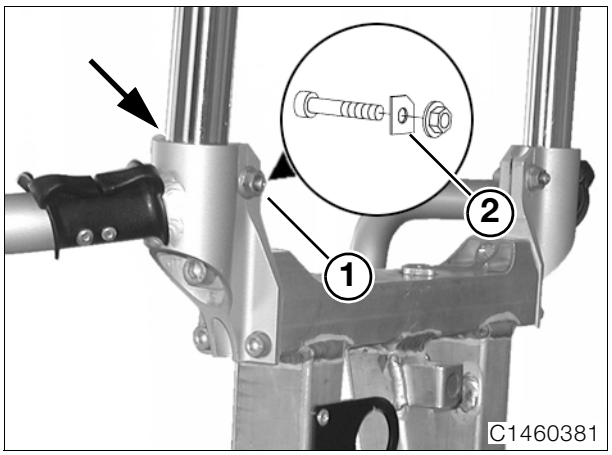
- Remove 3 fasteners (arrows) from frame at top
- Remove 4 fasteners (arrows) from frame at rear



- Remove 2 fasteners (arrows) from frame at front
- Pull the shoulder bar down to remove

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



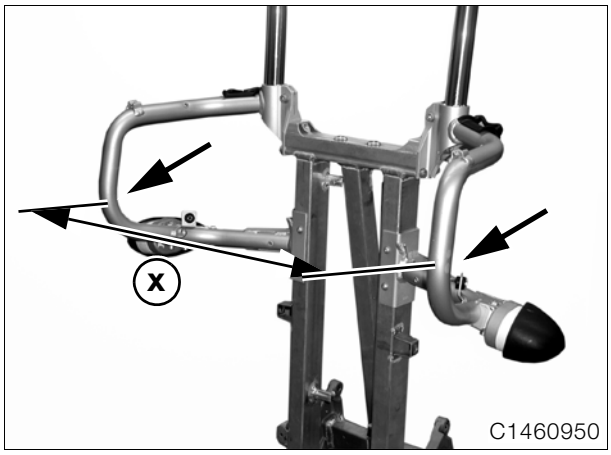
Attention:
Note installed position of washer (2)!

- Insert roof bar as far as the marking (arrow)
- Tighten roof bar retainer (1)

Torque specification:

Roof bar retainer	21 Nm
Shoulder bar mount M10 (top)	41 Nm
Shoulder bar mount M8 (top)	21 Nm
Shoulder bar mount M6 (bottom)	9 Nm
Side crash element attachment	9 Nm

Checking shoulder bar alignment

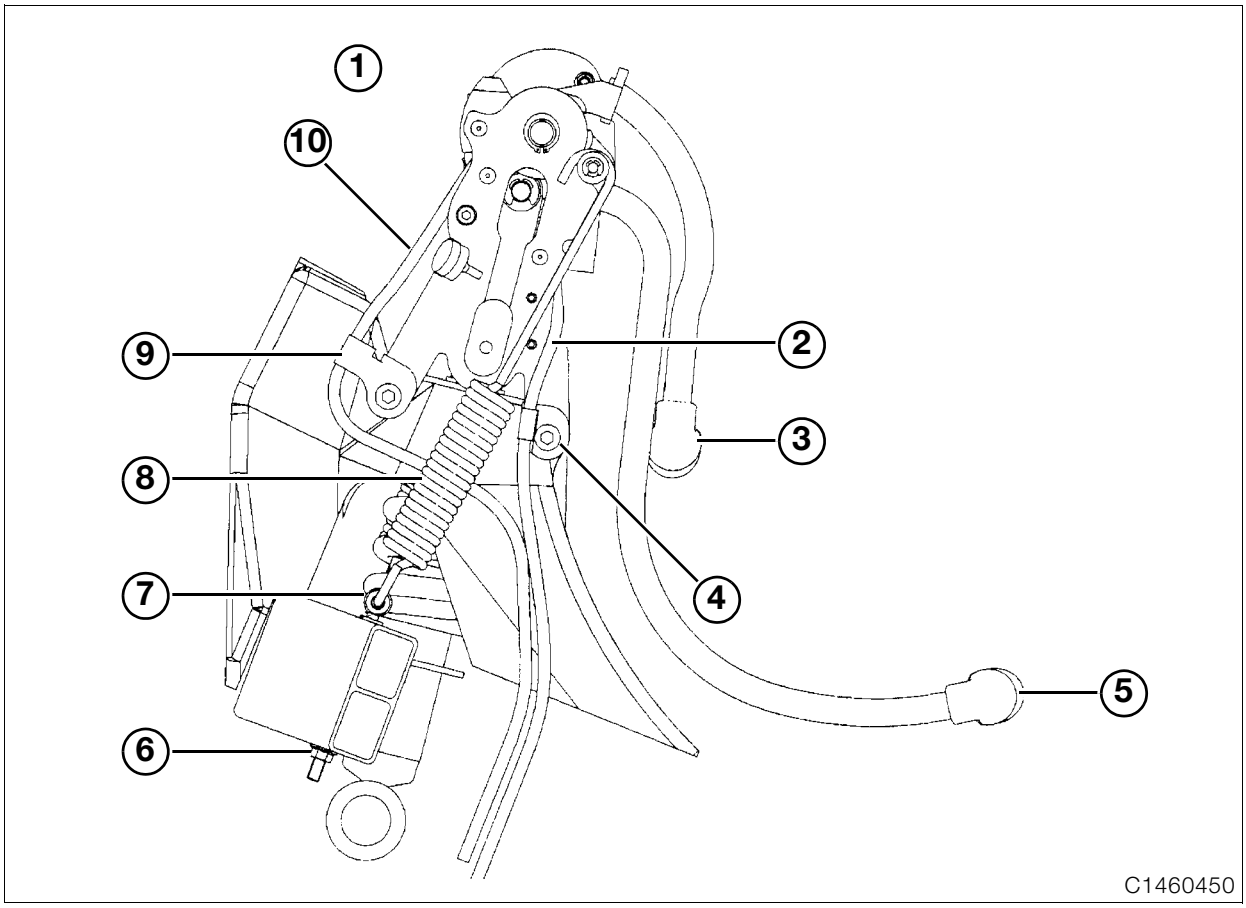


- Measure gap "x" between the shoulder bars
- Record the result

Measurement planes:
1 Runout on lower radius (arrows)

Wear data:

Gap "x"	612...616 mm (24.0945...24.2520 in)



Articulated joint mechanism

Overview

1 Articulated joint mechanism with spring strut, front
2 Bowden cable for extending stand
3 Lever for retracting/extending stand
4 Bowden cable retainer, rear
5 Lever for lifting/lowering front wheel
6 Fastener, eyebolt
7 Eyebolts
8 Spring(s)
9 Bowden cable retainer, front
10 Bowden cable for retracting stand

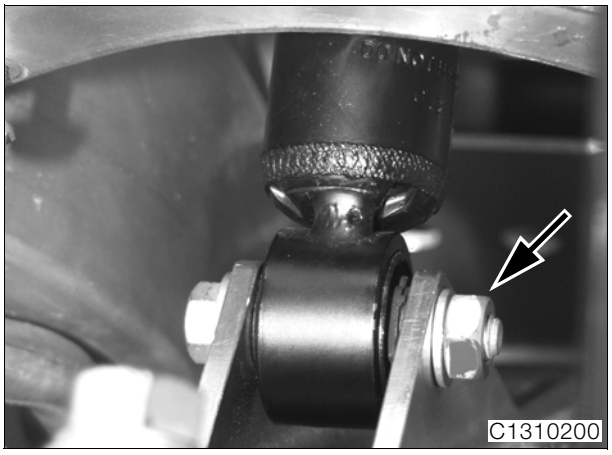
Note:
The new version of the articulated joint mechanism incorporates but a single spring, on the right (8). The operations associated with removal of the left-side spring are thus redundant on the new version!

46 52 005 Removing and installing articulated joint mechanism

- Remove instrument trim
- Remove top and left tunnel panels
- Remove knee pad
- Remove running board centre section

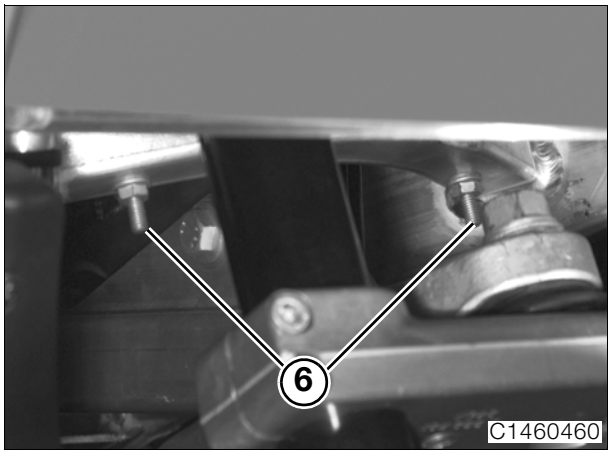


- Install the hoist, **BMW No. 00 1 570,** so that the support stand can be retracted
- Use hoist, **BMW No. 00 1 570,** to raise C1 until the front wheel is clear of the ground and the C1 is standing securely
- Lower the front wheel (easy-lift mechanism - start by moving the large lever up (5) then moving it down)

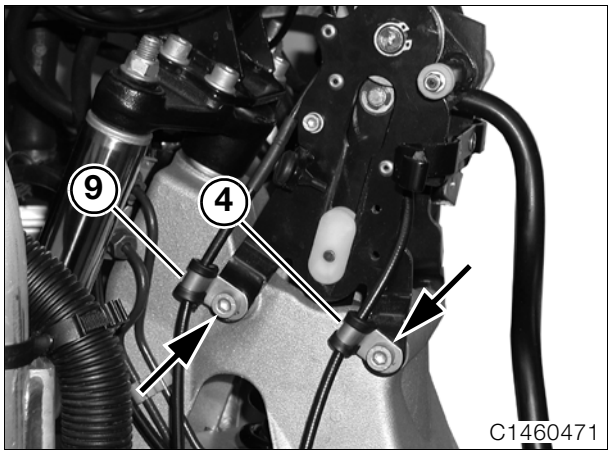


- Remove fastener (arrow) securing spring strut to leading coupling

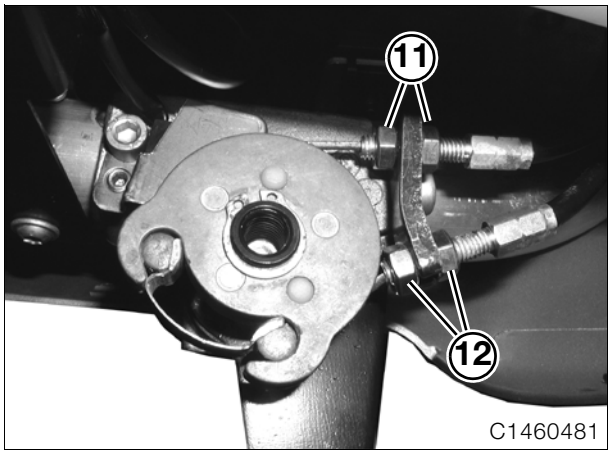
Note:
The new version of the articulated joint mechanism incorporates but a single spring, on the right (8). The operations associated with removal of the left-side spring are thus redundant on the new version!



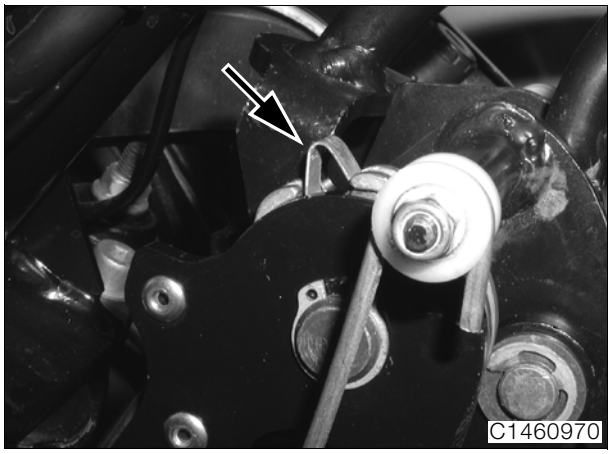
- Release eye bolt(s) (6)
- Detach spring(s)
- Mark left/right springs as necessary



- Remove 2 fasteners (arrows) of articulated-lever mechanism
- Remove Bowden cable retainers (4,9) rear and front

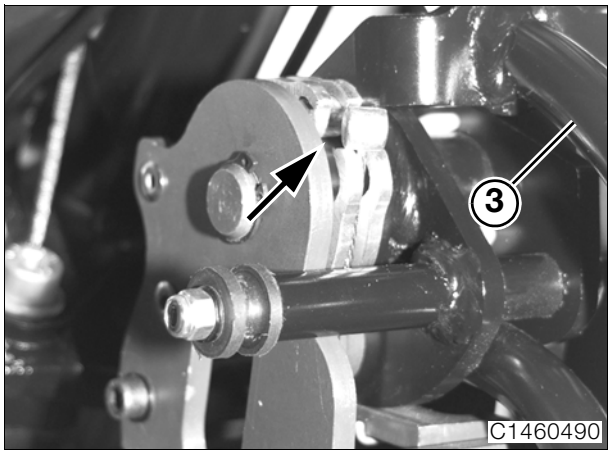


- Loosen the locknuts (11, 12) on the adjustment screws all the way
- Push adjusting screws as far as possible through holders; if necessary adjust positions of locknuts

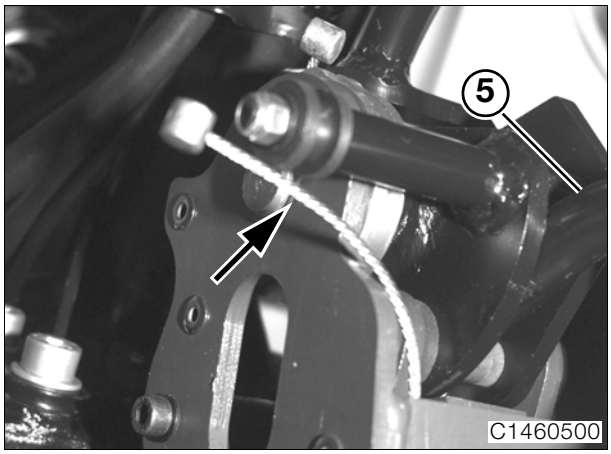


Note:
The new version of the cable pulley is closed on one side. The retaining clip has been deleted from the version with the closed side.

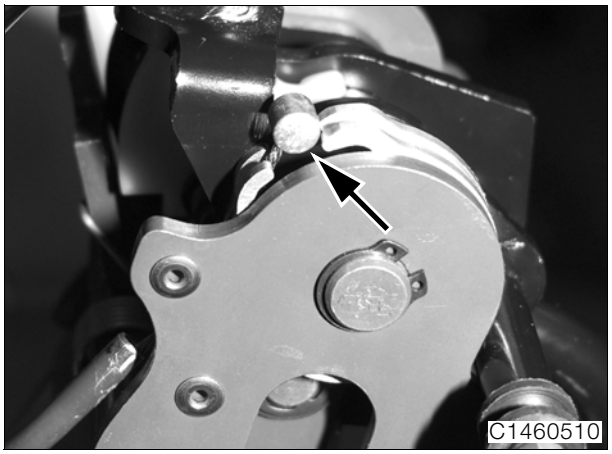
- Remove retaining clip (arrow) where installed



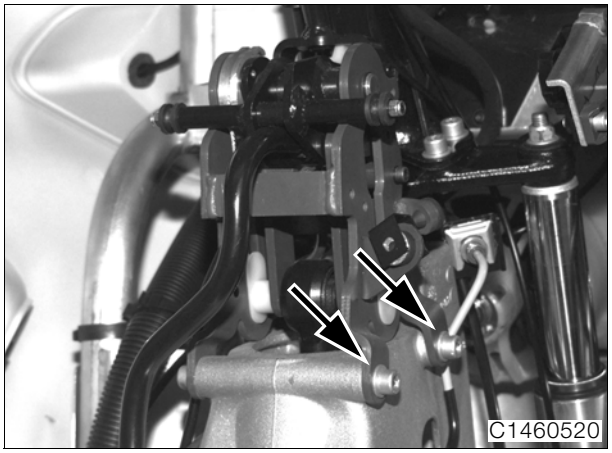
- Move lever (3) (easy-lift mechanism: extend/retract stand) down while manually retracting the stand
- Detach stand Bowden cable (arrow) from cable pulley
- Move lever (3) (easy-lift mechanism: extend/retract stand) up while manually extending the stand



- Release Bowden cable (arrow) for extending stand from articulated-lever mechanism; if necessary slightly raise lever (5) (easy-lift mechanism, lift/lower front wheel)
- Remove Bowden cable from articulated-lever mechanism



- Detach stand Bowden cable (arrow) from cable pulley and extract from the pulley by pulling at an angle
- Remove Bowden cable from articulated-lever mechanism



- Remove fasteners (arrows) from articulated-lever mechanism on right
- Lift up articulated-lever mechanism to remove

When installing:

- Installation is the reverse of the removal procedure: Pay particular attention to the following:

Attention:

Install the eyebolts (bottom anchors for springs) with the eyes parallel to the vehicle's front-to-rear axis. Do not mix up left and right-side springs!
Make sure that the Bowden cables for extending/retracting stand, seat-belt central release and throttle actuation are correctly routed.
Bowden cables on cable pulley - align stand correctly!
Make sure the hoses will not rub und wear during operation!

Adjustment data:

Take up all play at the Bowden cables so that the stand is held in its limit positions by the springs

Torque specification:

Strut attachment	41 Nm
Eye bolt attachment	8 Nm
Articulated joint mechanism attachment	21 Nm
Bowden cable locknuts	8 Nm

Articulated joint hand lever mechanism removal and installation

Large hand lever removal and installation

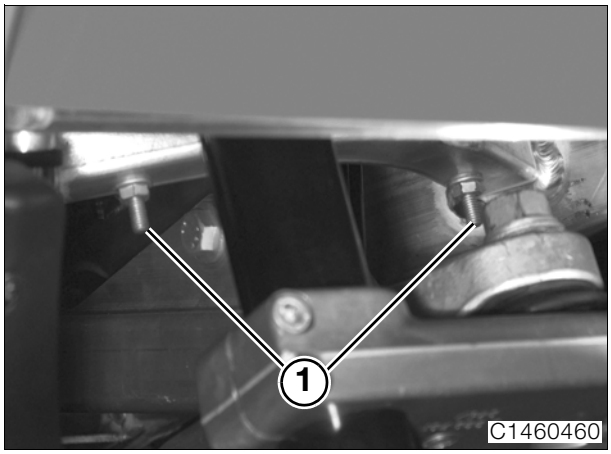
– Remove instrument trim

➠ .....See Group 46

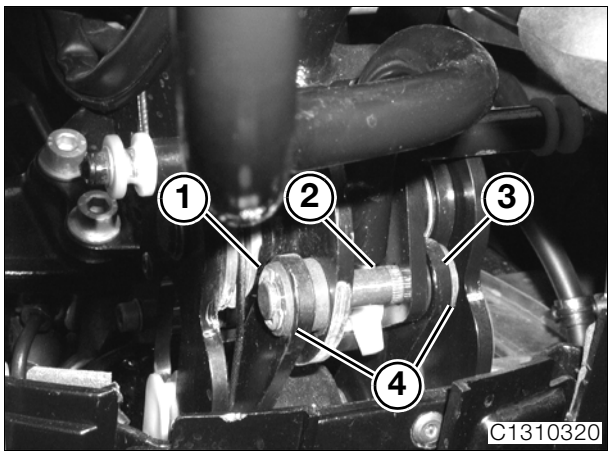


- Position hoist, **BMW No. 00 1 570,** to allow retraction of the stand
- Use hoist, **BMW No. 00 1 570,** to raise C1 so that front wheel is clear and the C1 is securely supported
- Lower the front wheel (easy-lift mechanism - start by moving the large lever up, then move it down)

Note:
The new version of the articulated joint mechanism incorporates but a single spring, on the right (8). The operations associated with removal of the left-side spring are thus redundant on the new version!



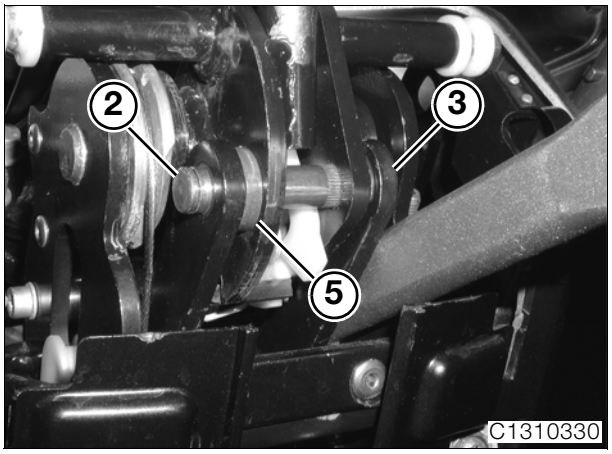
- Release eye bolt mount(s) (1)
- Detach spring(s) at top



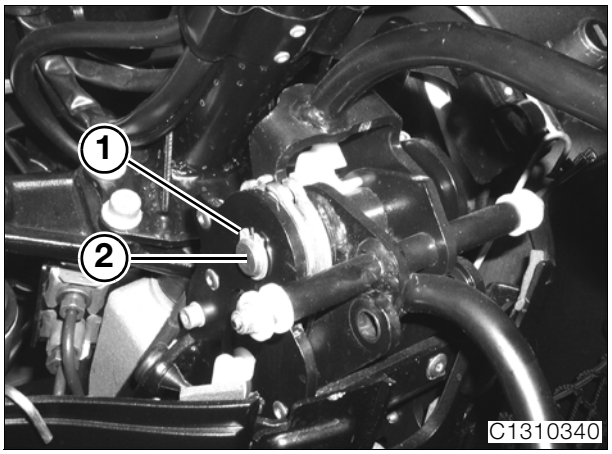
- Easy-lift mechanism - snap large lever into place by first moving it all the way up, and then moving it down
- Support the front wheel and position C1 without weight on the large lever (pointing up)
- Remove circlips (1) and washers (4)

Attention:
When tapping out the stud do not damage the groove for the circlips!
Do not lose the washers!

Note:
The studs are knurled on the right side



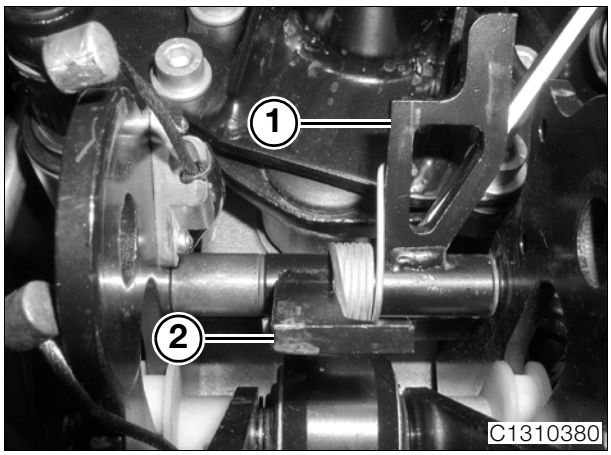
- Support thrust washer (3)
- Tap stud (2) to the right to remove
- Remove washer (5)



- Remove circlip (1)
- Remove stud (2) by tapping to the right
- Remove large lever from easy-lift mechanism

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



- Before installing the lever check the guide (1) and support (2) to ensure that components movely freely with no excess friction or resistance
- When installing the large lever ensure that it is above the support (2)

Attention:
Do not damage plastic sleeves!

Note:
The knurled side of the stud is on the right side!

- Checking operation

– Check the free travel in the Bowden cable for the stand mechanism, adjust as indicated (➟ 46.44)

Torque specification:
Eye bolt attachment ..... 8 Nm

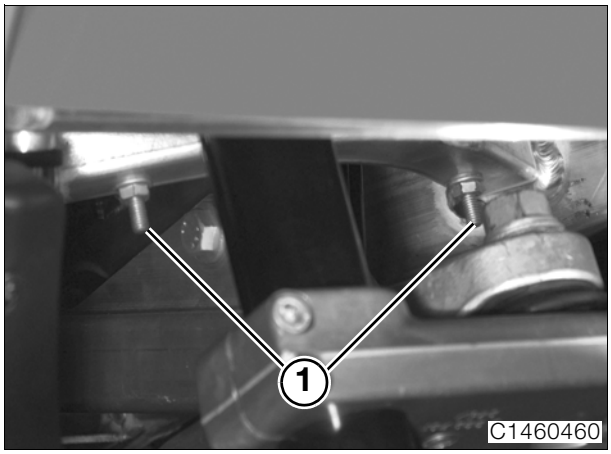
Small hand lever removal/installation

– Remove instrument trim (➠ 46.20)

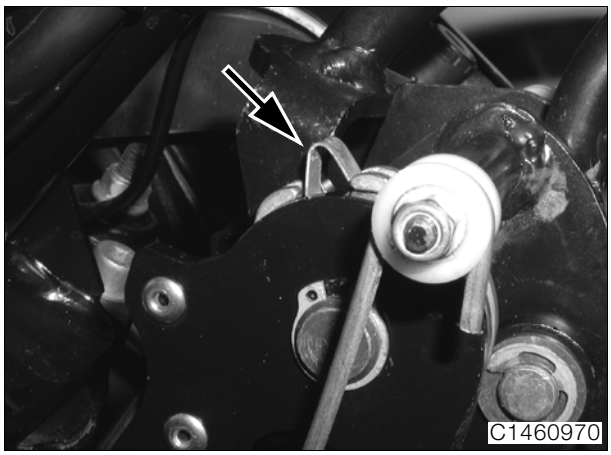


- Install hoist, **BMW No. 00 1 570**, positioning so that the stand can be retracted
- Use hois,t **BMW No. 00 1 570,** to lift C1 (support - start by moving large lever up, then move it down), then ensure that C1 is standing securely
- Lower front wheel (easy-lift mechanism - start by moving large lever up, then move it down)

Note:
The new version of the articulated joint mechanism incorporates but a single spring, on the right (8). The operations associated with removal of the left-side spring are thus redundant on the new version!



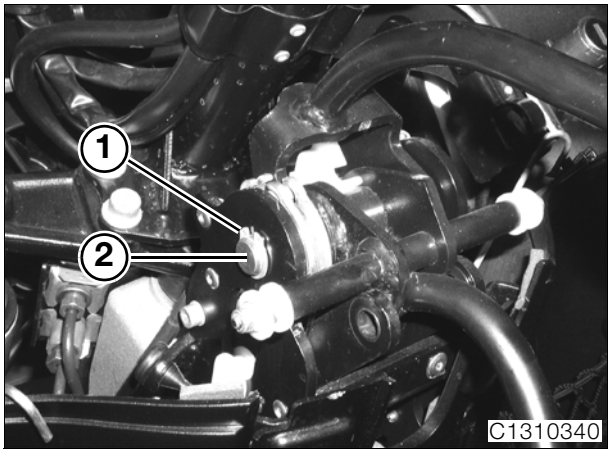
- Release eye bolt attachment(s) (1)
- Detach spring(s) at top



Note:
The new version of the cable pulley is enclosed on one side. The retaining clamp is not installed on the washer that is enclosed on one side!

- Remove retaining clamp (arrow) if installed
- Lift the large lever slightly and use hoist to position C1 with the large lever horizontal, supporting front wheel as necessary

Note:
The stud is knurled on the right!



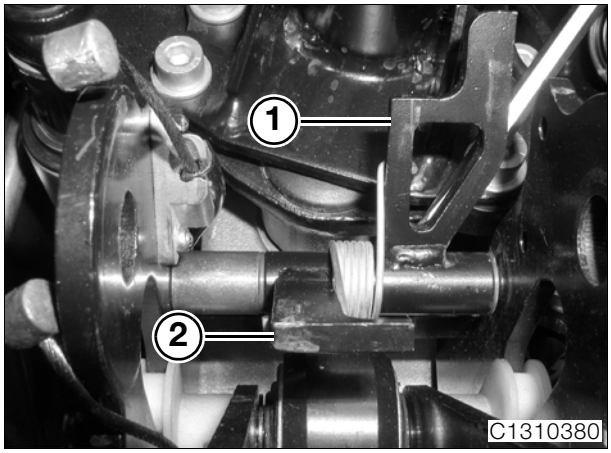
- Remove circlip (1)

Attention:
When tapping out the stud - take care not to damage the groove for the circlip!

- Remove stud (2) by tapping to the right
- Fold the large lever on the easy-lift mechanism down to retract
- Detach the stand Bowden cables from the easy-lift mechanism's small lever
- Remove the lever

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



- Before installing the lever check the guide (1) and support (2) to ensure that components movely freely with no excess friction or resistance
- Ensure that the guide (1) and the support (2) are installed in the correct positions
- When installing the small lever ensure that the guide (1) is on the top and that it is positioned against the right side of the small lever
- When installing the large lever ensure that it is above the support (2)

Attention:
Take care to avoid damaging the plastic sleeves!

Note:
The knurled side of the stud is on the right!

- Checking operation

– Bowden cable free travel in stand control, checking, adjusting as necessary (➟ 46.44)

Torque specification:
Eye bolt attachment ..... 8 Nm

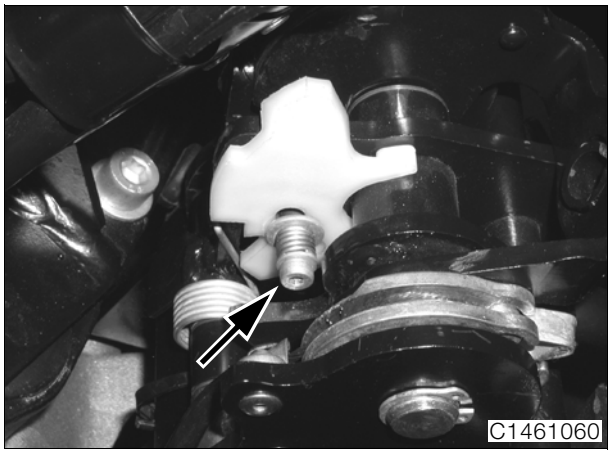
Replacing control disc for large hand lever

For enhanced clarity some of the illustrations show the components with the hand lever removed

– Remove instrument trim (➡ 46.20)



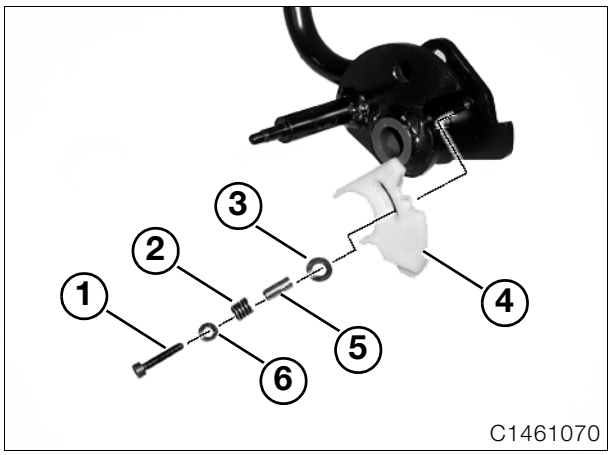
- Position hoist, **BMW No. 00 1 570,** to allow the stand to be retracted
- Use hoist, **BMW No. 00 1 570,** to raise C1 so that the front wheel clears the ground and C1 is standing securely
- Lower front wheel (easy-lift mechanism - move the large lever up, then down)
- Fold in the stand (easy-lift mechanism - move small lever down)



- Use a short Allen wrench (3 mm/0.118 in) to undo the bolt (arrow)
- Remove individual components in attachment mechanism and control disc

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



1 Allen bolt (M4)
2 Spring
3 Large disc
4 Control disc
5 Guide sleeve
6 Small disc

- Ensure that components are installed in correct positions

Torque specification:

Control disc attachment
(+ Loctite 243) ..... 2 Nm

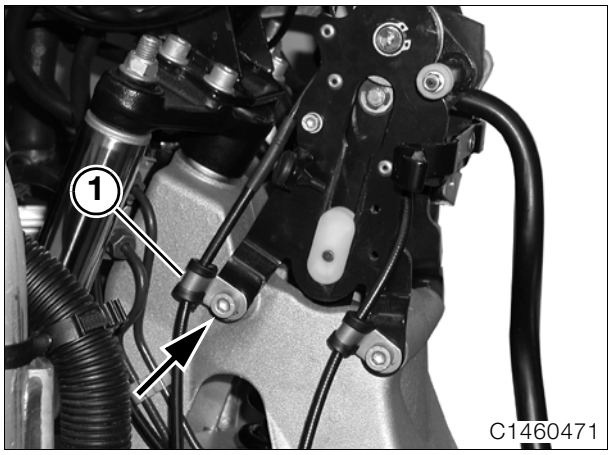
Replace stand Bowden cables

- Remove instrument trim
- Remove top and left tunnel panels
- Remove knee pad
- Remove sill centre section

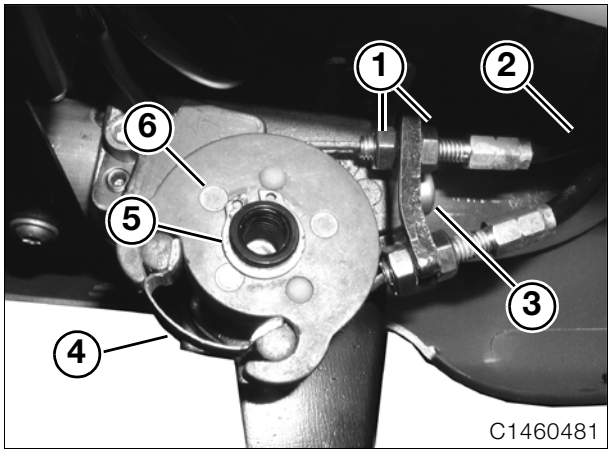


- Position hoist, **BMW No. 00 1 570**, so that the stand can be retracted
- Use hoist, **BMW No. 00 1 570,** to raise C1 until the front wheel clears the ground, positioning so that C1 is standing securely
- Lower front wheel (easy-lift mechanism - start by moving large lever (5) up, then down)

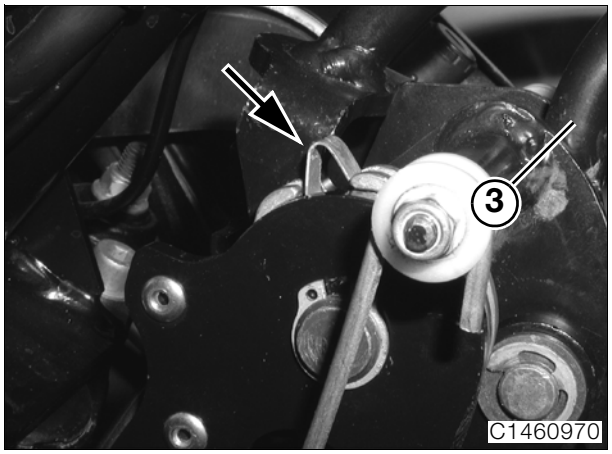
46 52 053 Removing Bowden cable for retracting stand



- Remove fastener (arrow) from articulated-lever mechanism
- Remove Bowden cable retainer (1)

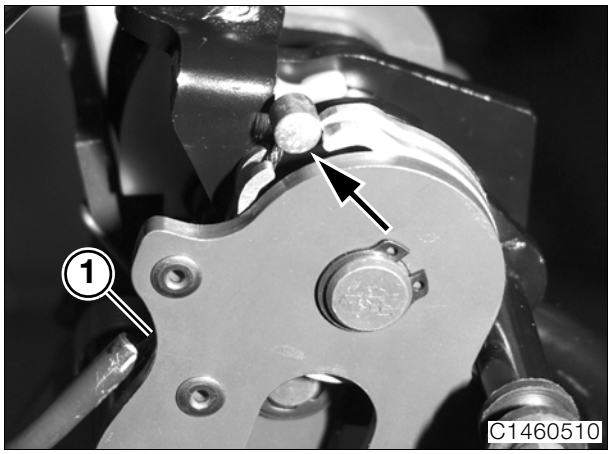


- Remove retainer (4)
- Remove fastener (3) for retainer on stand Bowden cable
- Remove lock ring (5)
- Remove stand cable pulley (6)
- Fully slacken locknut (1) of adjusting screw
- Push adjusting screws as far as possible through holders; if necessary adjust positions of locknuts
- Remove Bowden cable (2) from cable pulley
- Move lever (easy-lift mechanism: extend/retract stand) down and then raise it again



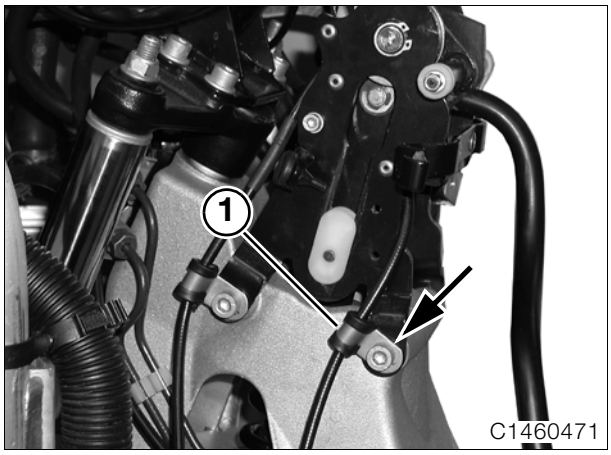
Note:
The new version of the cable pulley is enclosed on one side. The retaining clamp is not installed with the disc enclosed on one side!

- Remove retaining clamp (arrow) if installed

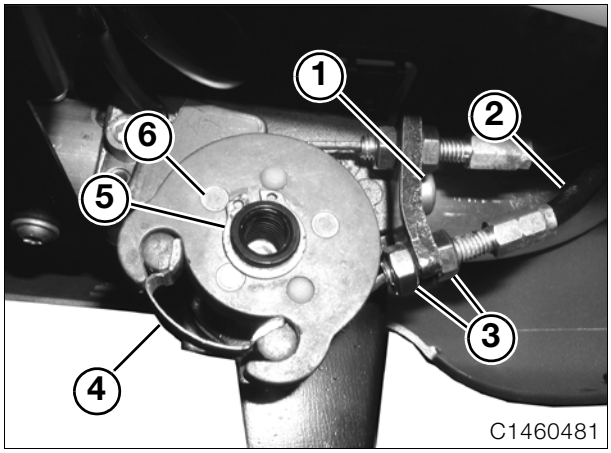


- Detach Bowden cable from retainer (1) in articulated joint
- Release Bowden cable (arrow) from cable pulley and remove from articulated joint cable pulley by extracting at an angle
- Remove Bowden cable

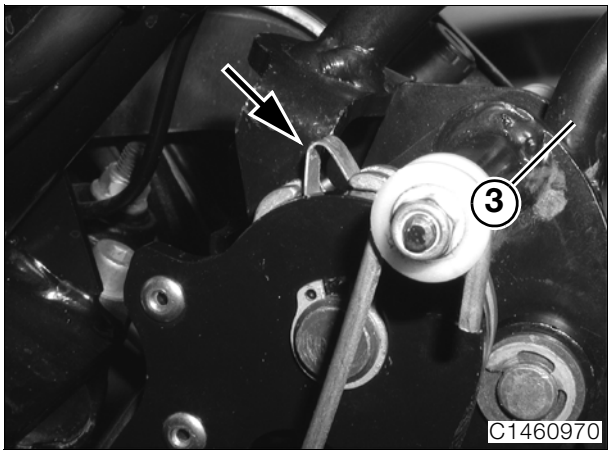
46 52 050 Removing Bowden cable for extending stand



- Remove fastener (arrow) from articulated-lever mechanism
- Remove Bowden cable retainer (1)

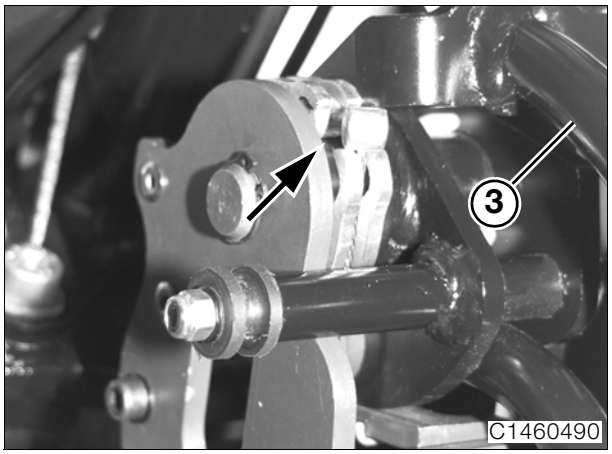


- Remove retaining clamp (4)
- Fully slacken locknut (3) on adjusting screw
- Remove fastener (1) for stand Bowden cable bracket
- Remove lock ring (5)
- Remove stand cable pulley (6)
- Push adjusting screws as far as possible through holders; if necessary adjust positions of locknuts
- Release Bowden cable (2) from cable pulley
- Disengage Bowden cable from second retainer in articulated-lever mechanism

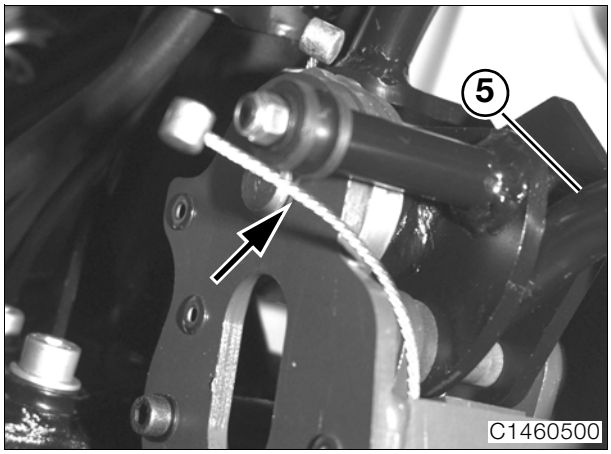


Note:
The new version of the cable pulley is enclosed on one side. The retaining clamp is not installed with the disc enclosed on one side!

- Remove retaining clamp (arrow)



- Move lever (3) (easy-lift mechanism: extend/retract stand) down and then raise it again
- Release Bowden cable (arrow) from articulated joint cable pulley



- Extract Bowden cable (arrow) from articulated joint mechanism, moving lever (5) gently upward (raise/lower front wheel auxiliary support) as necessary
- Remove Bowden cable

Bowden cable installation/adjustment

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

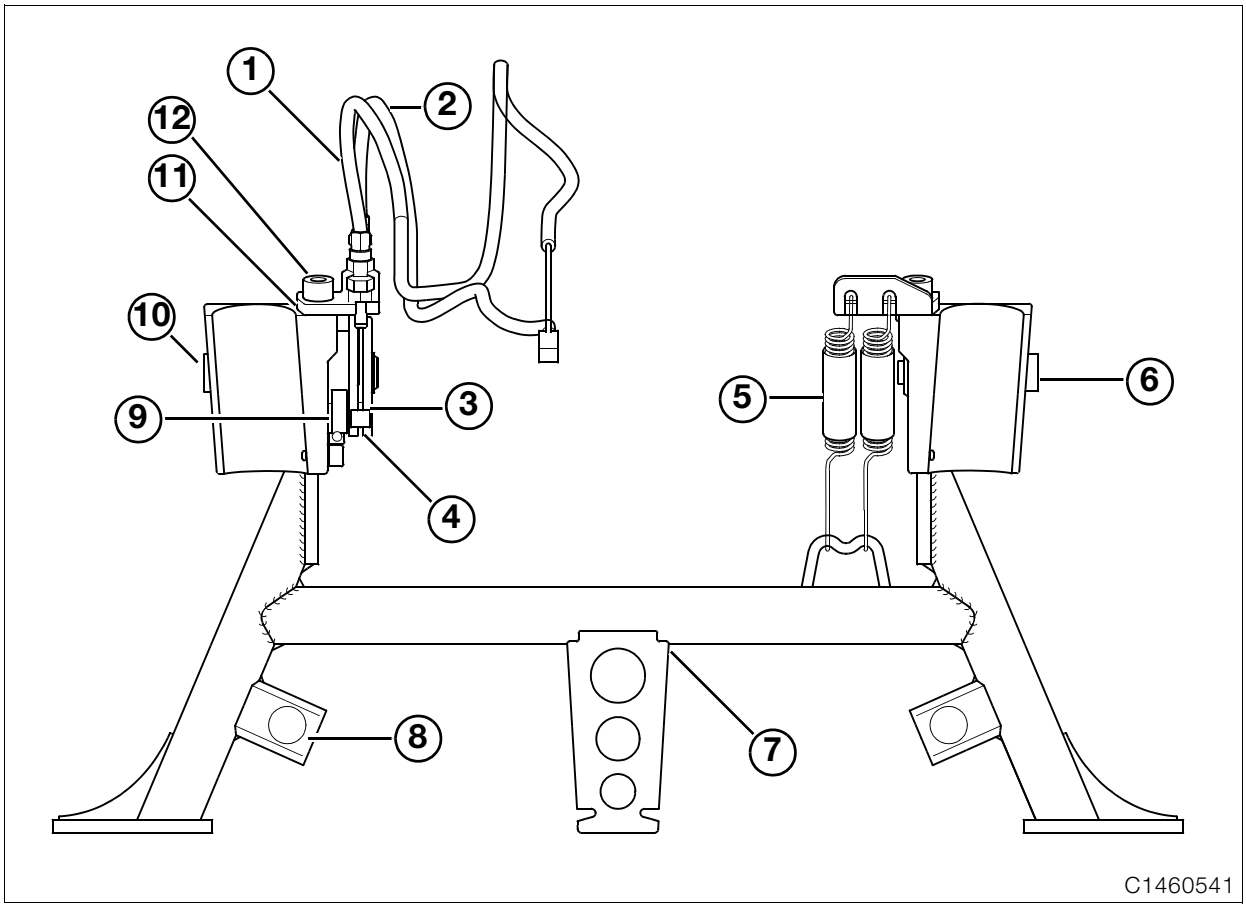
Attention:
Install the eyebolts (bottom anchors for springs) with the eyes parallel to the vehicle's front-to-rear axis.
Make sure that the Bowden cables for extending/retracting stand and seat-belt central release are correctly routed.
Ensure that Bowden cables and stand cable pulley are aligned correctly!
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion

- Adjust Bowden cables
- Extend and retract the stand several times
- Check Bowden-cable settings; adjust if necessary

Adjustment data:
Adjust Bowden cables without free travel, allowing the stand springs to hold the stand in its end position

Torque specification:

Articulated joint attachment	21 Nm
Eye bolt attachment	8 Nm
Stand Bowden cable bracket	21 Nm
Bowden cable locknuts	8 Nm



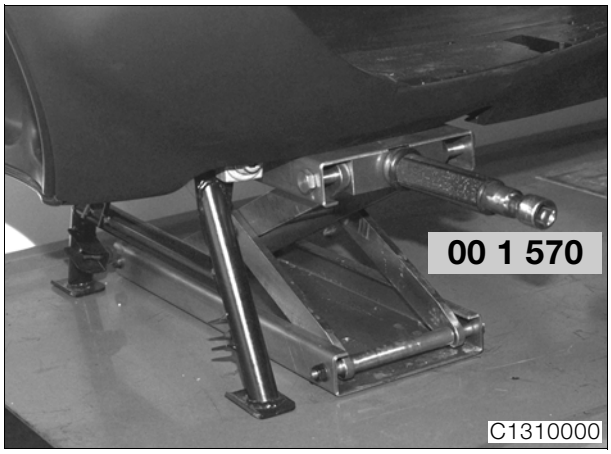
Stand

Overview

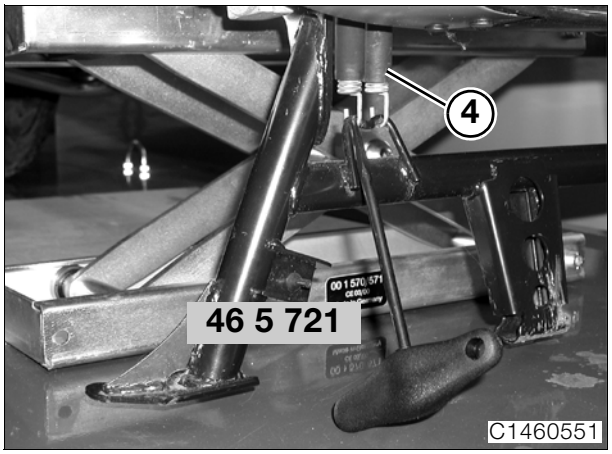
1 Bowden cable for retracting stand
2 Bowden cable for extending stand
3 Cable pulley
4 Retaining clamp
5 Tension springs
6 Fastener for stand, right
7 Stand
8 Rubber stop
9 Stand switch
10 Fastener for stand, left
11 Bowden cable retainer
12 Fastener, Bowden cable bracket

46 52 000 Removing/installing stand

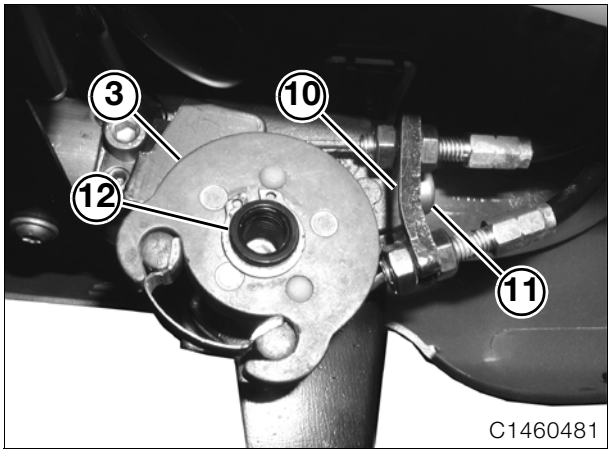
– Remove running board centre section



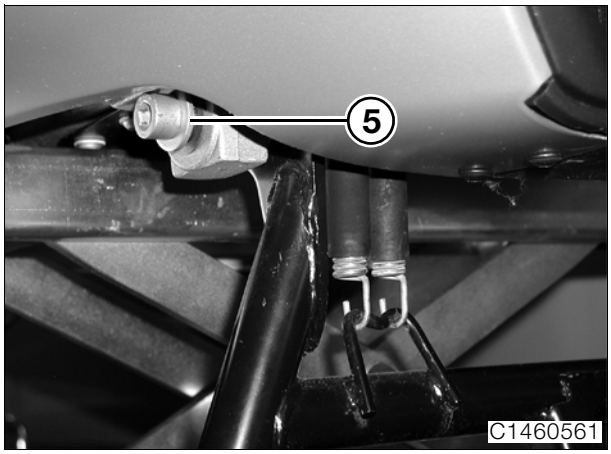
- Use hoist, **BMW No. 00 1 570,** to raise C1 so that stand can be moved and C1 is supported securely



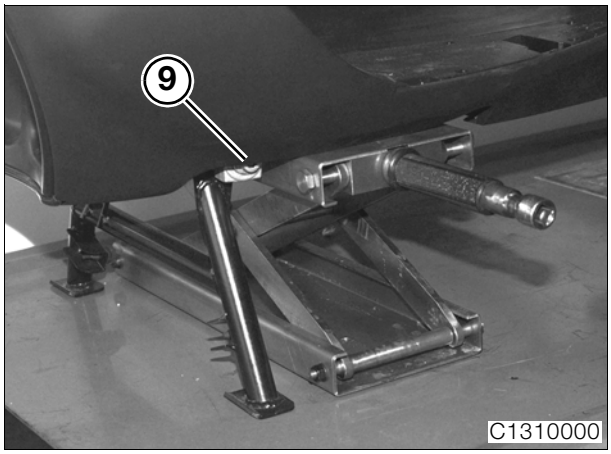
- Remove springs (4) with hook, **BMW No. 46 5 721**



- Remove fastener (11) for Bowden cable bracket (10)
- Remove circlip (12)
- Remove cable pulley (3), loosening Bowden cable locknuts as required



- Remove right fastener (5) for stand



- Remove left fastener (9) for stand

Attention:
Take care not to damage the switch when removing the stand!

- Pull the stand down to remove

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Take care not to damage the switch when installing the stand!
Make sure that the tension springs are correctly positioned!
Ensure that Bowden cables are correctly aligned with cable pulley - stand!
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion!

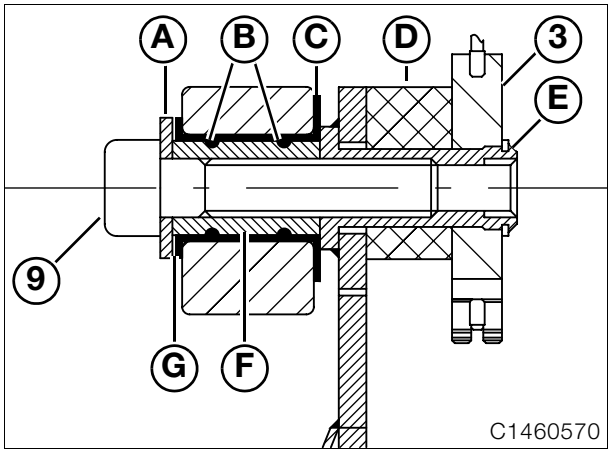
– Grease the stand bearings
– Adjust play of Bowden cables to zero and recheck the setting

Torque specification:

Stand attachment	41 Nm
Bowden cable bracket	21 Nm
Bowden cable locknuts	8 Nm

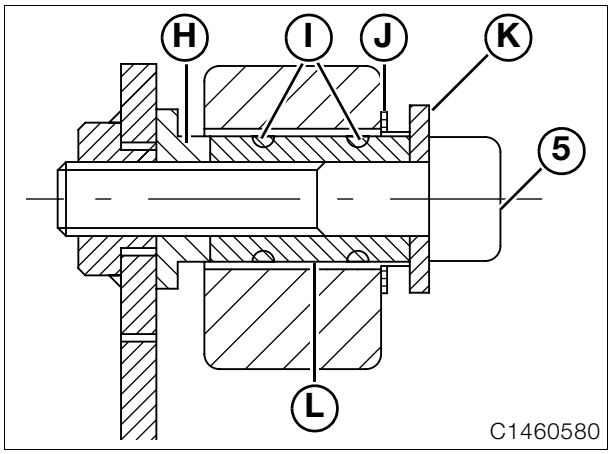
Stand bearings

Overview, left



A Disc
B O-rings
C Thrust washer
D Lobe/overload guard transfer element
3 Cable pulley
E Cable pulley circlip
F Bush
G Bush in frame
9 Fastener for stand, left

Overview, right



H Shoulder bush
I O-rings
J Bush in frame
K Disc
5 Fastener for stand, right
L Bush

Greasing the bearings
– Remove stand
- Remove bearing bushings (F, L)

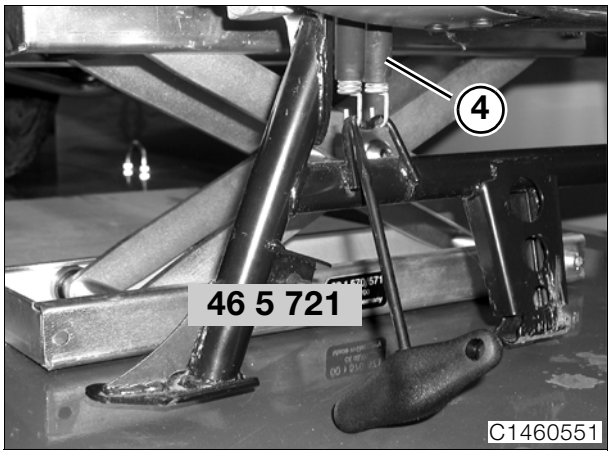
When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Note:
Always install new O-rings (B, I)!

- Grease bushes with**Shell Retinax EP2**

Fluids and lubricants:
Shell Retinax EP2

46 52 011 Replacing tension spring(s)

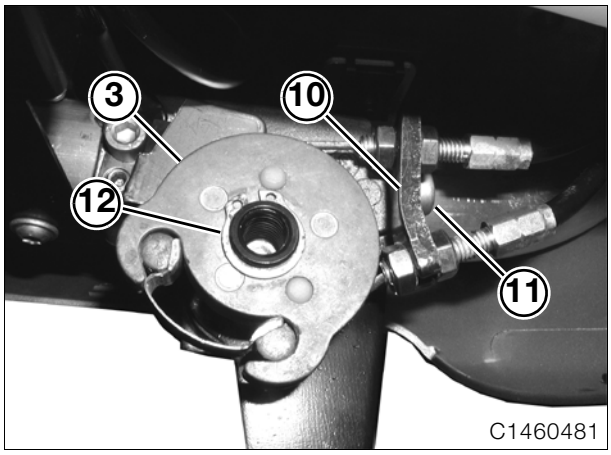


- Remove spring(s) (4) with hook, **BMW No. 46 5 721**

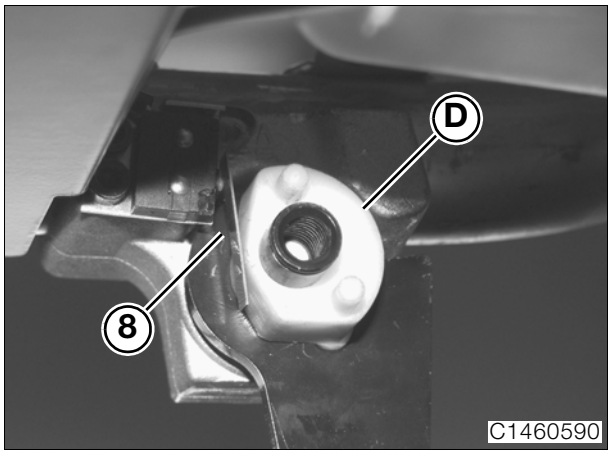
When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Note:
Make sure that the tension springs are correctly positioned.
The open side of the hook eye must face toward the rear on the stand!

46 52 013 Lobe/overload guard transfer element replacement



- Remove fastener (11) for retainer of Bowden cable (10)
- Remove circlip (12)
- Remove cable pulley (3), loosening Bowden cable locknuts as necessary



Attention:
When removing lobe/overload guard transfer element (D) do not damage switch (8)!

- Remove lobe/overload guard transfer element (D)

When installing:

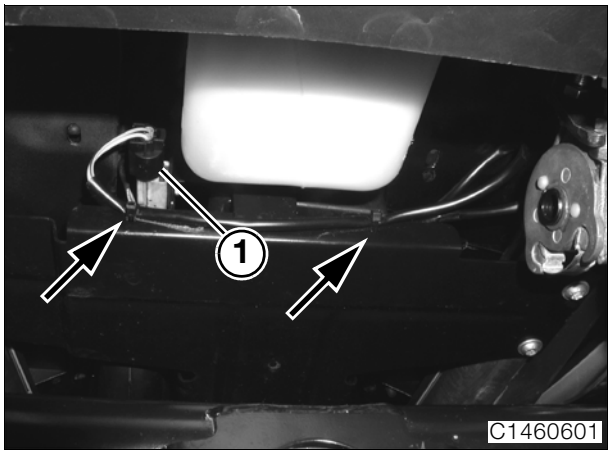
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
When installing lobe/overload guard transfer element do not damage switch!
Ensure that Bowden cables on cable pulley - stand are aligned correctly!
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion!

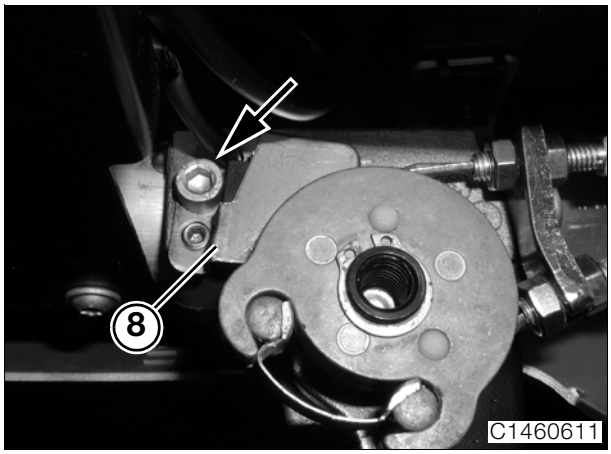
– Adjust play of Bowden cables to zero and recheck the setting

Torque specification:
Bowden cable bracket ..... 21 Nm
Bowden cable locknuts ..... 8 Nm

Replacing stand switch



- Open cable ties (arrows)
- Disconnect plug (1)



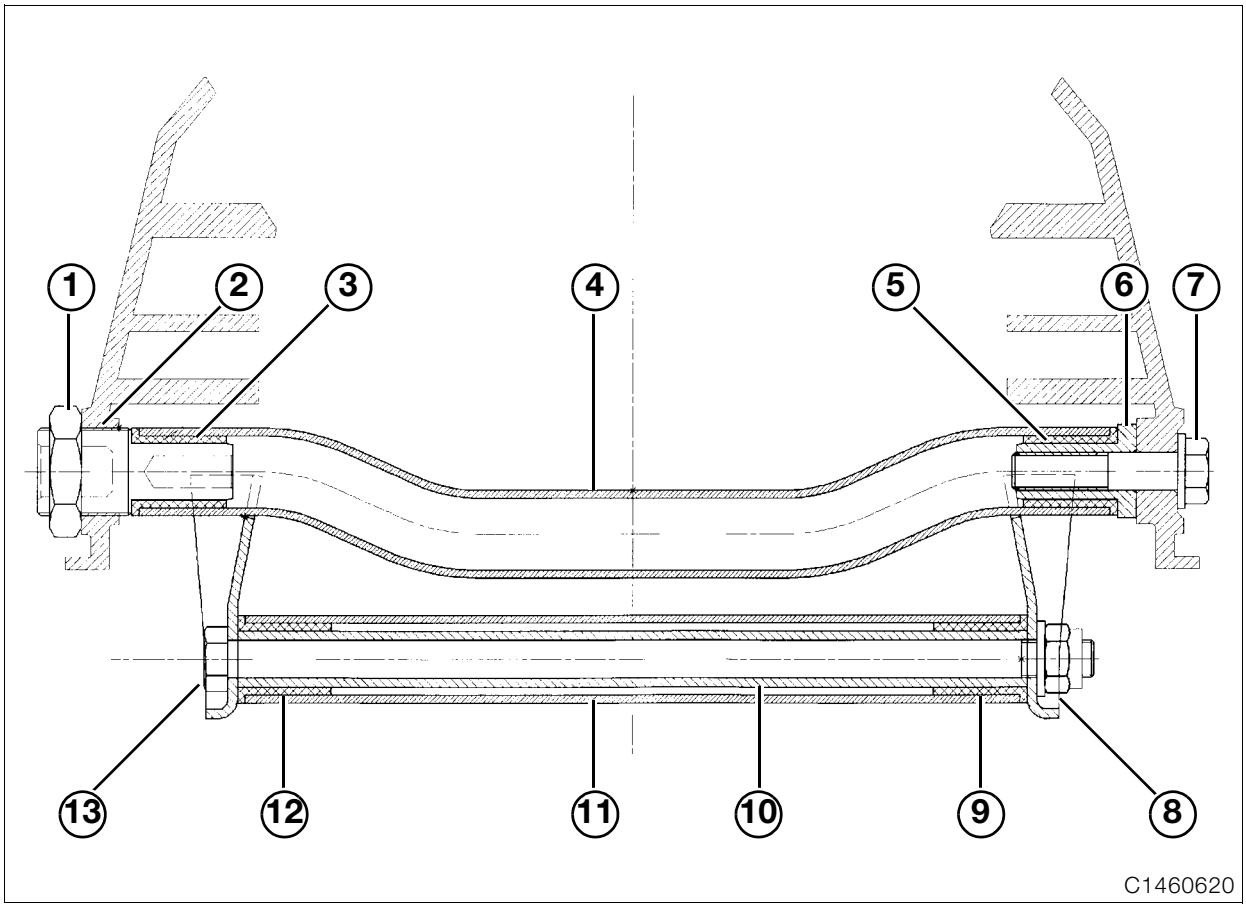
- Loosen switch cover attachment (8) (arrow)
- Remove cover (8) and switch

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure the connecting cable is correctly routed!
Make sure the hoses are routed well away from any components that could cause rubbing and abrasion!

Torque specification:
Switch cover ..... 8 Nm



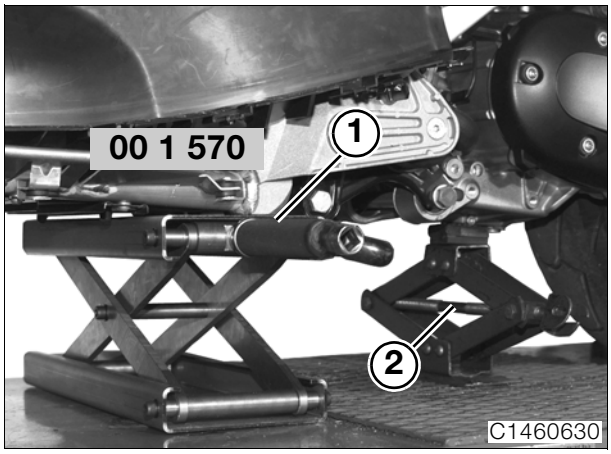
Powertrain cradle

Overview

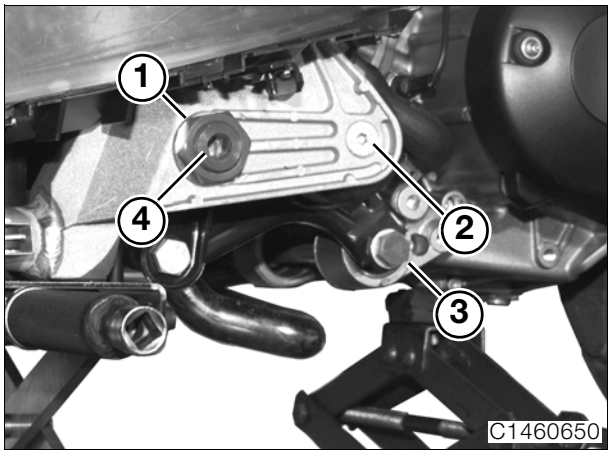
Locknut for bearing pin, left M28x1.5 (1)
Bering pin, left (2)
Bearing bushing (3)
Coupling for swing arm bearing mount (4)
Bearing bush (5)
Bearing sleeve, right (6)
Hex screw, M12x1.5x55 (7)
Hex nut, M12 (8)
Bearing bush (9)
Spacer sleeve (10)
Tubular swing arm (11)
Bearing bushing (12)
Pin, joint (13)

Attention:
The protrusion on the right is less than on the left on the swing arm coupling (4)!
Note swing arm bearing configuration when installing coupling (4)!

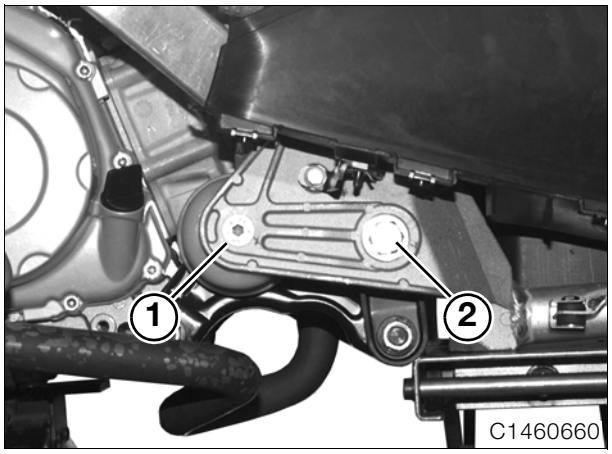
46 71 020 Removing powertrain cradle mounts



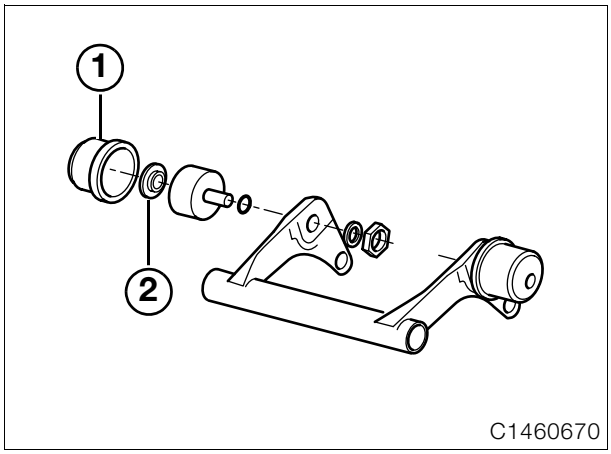
- Raise C1 slightly with hoist (1), **BMW No. 00 1 570,** and ensure that C1 is standing securely
- Use hoist (2) to support engine



- Loosen locknut (1)
- Remove engine attachment (3)
- Undo rubber bush mount (2) on left of frame
- Remove left bearing pin (4)



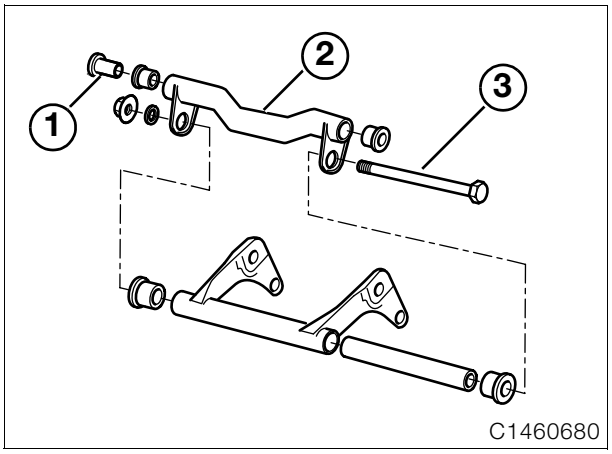
- Undo rubber bush mount (1) on right of frame
- Remove fastener (2) for coupling of swing arm mount on right
- Lower the powertrain cradle mount and remove



- Watch protective caps (1) on rubber bush and washer (2)

Coupling for swing arm bearing

Replacing bearing sleeve, right
– Removing powertrain cradle mounts



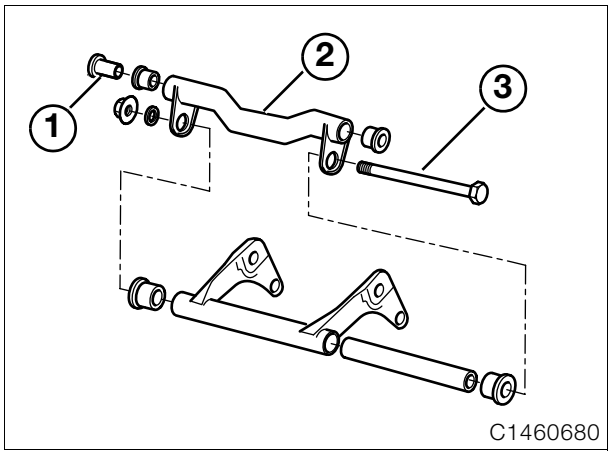
- Remove bolt (3) for joint
- Remove coupling (2) for swing arm bearing
- Remove bearing sleeve (1) on right

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
The protrusion on the right is shorter than on the left on the swing arm coupling (2)!
Watch the swing arm coupling (2) during installation!

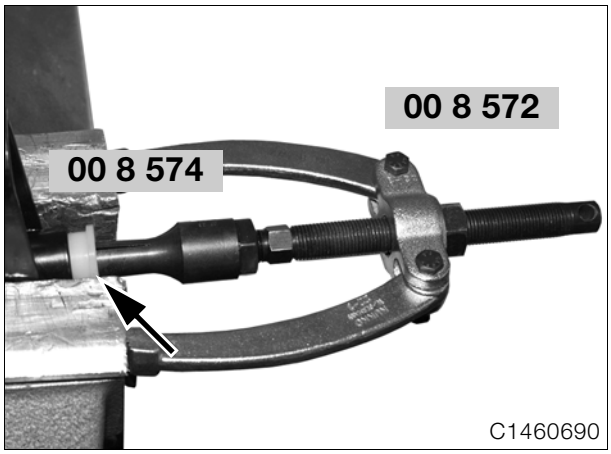
Torque specification:
Coupling stud..... 73 Nm

Replacing left/right bush
– Removing powertrain cradle mounts



- Remove bolt (3) for joint
- Remove swing-arm coupling (2)
- Note bearing sleeve (1) on right

Additional operation: bush on right:
– Remove bearing sleeve on right (1)



- Remove bearing sleeve (arrow) on left/right with extractor, **BMW No. 00 8 572,** and internal extractor (21/3), **BMW No. 00 8 574**

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

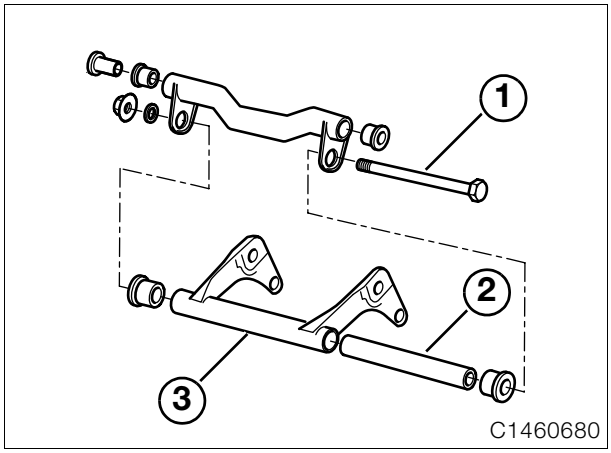
Attention:
The protrusion on the right is shorter than on the left on the swing arm coupling (2)!
Watch the swing arm coupling (2) during installation!

Torque specification:
Coupling stud..... 73 Nm

Tubular swing arm

– Removing powertrain cradle mounts

Removing and installing spacer bush for tubular swing arm



- Remove bolt (1) for joint
- Remove tubular swing arm (3)
- Remove spacer sleeve (2)

When installing:

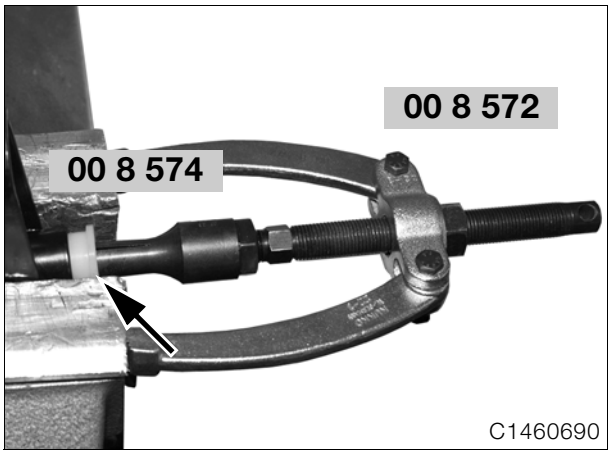
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
The protrusion on the right is shorter than on the left on the swing arm coupling (2)!
Watch the swing arm coupling during installation!

Torque specification:
Coupling stud..... 73 Nm

Replacing left/right bearing bushings for tubular swinging arm

– Remove spacer bushing



- Pull out bearing sleeve (arrow) on left/right with extractor, **BMW No. 00 8 572,** and internal extractor (21/3), **BMW No. 00 8 574**

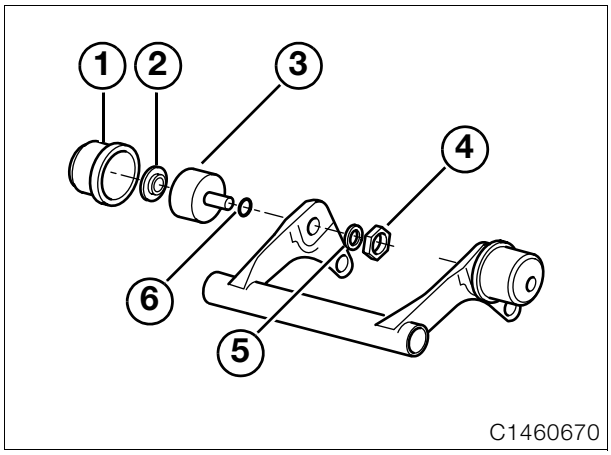
When installing:

- Installation is the reverse of the removal procedure

Torque specification:

Coupling stud..... 73 Nm

46 71 023 Replacing right/left Silentblocs for tubular swing arm



- Remove fastener (4)
- Remove rubber bushing (3)

When installing:

- Installation is the reverse of the removal procedure

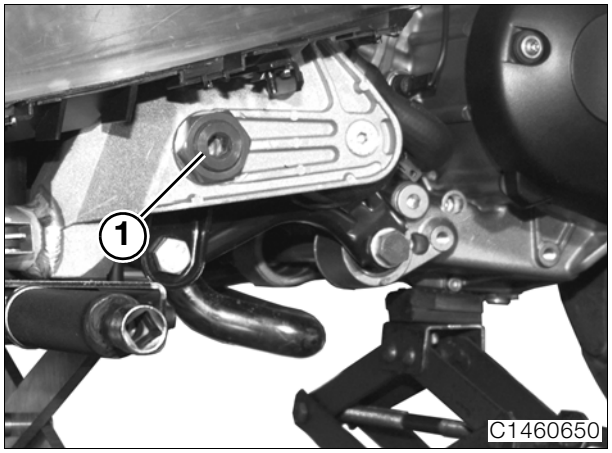
Torque specification:

Rubber bushing attachment..... 42 Nm

Installing powertrain cradle mounts

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Installing and adjusting coupling for swing arm mounts

Adjustment data:



- Tighten swing arm coupling (1) on left to specified torque then loosen half a turn

Torque specification:

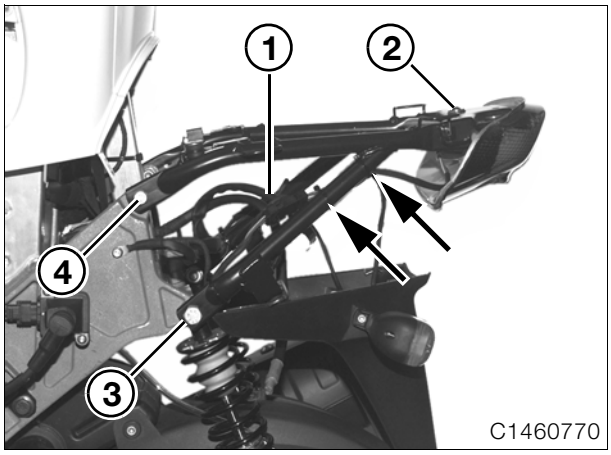
Engine mount	73 Nm
Rubber bushing mount	42 Nm
Fastener for coupling, swing arm mount, right	73 Nm
Swing arm coupling on left	
1.	20 Nm
2.	Loosen 1/2 turn
Locknut on left bearing pin	105 Nm

46 51 050 Rear frame member replacement

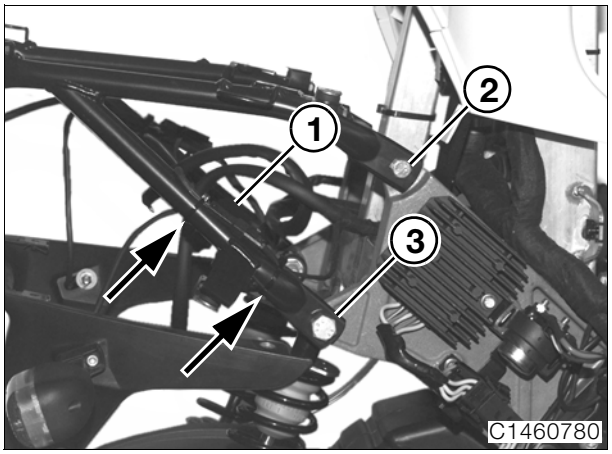
– Remove the rear storage compartment
– Remove left and right rear side trim panels



- Raise C1 slightly with hoist, **BMW No. 00 1 570**



- Open cable ties (arrows)
- Disconnect plugs (1) for left turn indicator and taillamp cluster
- Remove fastener (2) for taillamp cluster
- Remove taillamp cluster
- Remove fastener (4) of rear frame
- Remove fastener (3) securing spring strut to rear frame



- Open cable ties (arrows)
- Disconnect plug (1) for right turn indicator
- Remove fastener (2) for rear frame member
- Remove fastener (3) securing spring strut to rear frame member
- Remove rear frame

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that all cables are correctly routed and secured in place with cable ties!

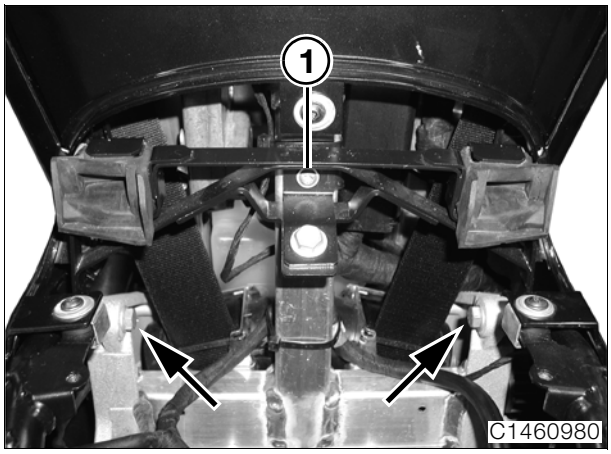
Torque specification:

Rear frame member mount	21 Nm
Strut to rear frame member	41 Nm

Luggage system bracket

Bracket removal and installation

– Remove the rear storage compartment



- Undo mounts (arrows) at bracket/rear frame member
- Undo upper bracket mount (1) on frame
- Remove bracket

When installing:

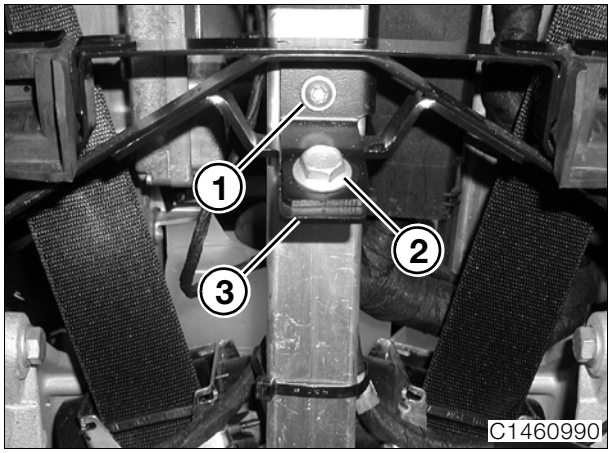
- Installation is the reverse of the removal procedure

Torque specification:

Bracket to frame	8 Nm
Bracket to rear frame	21 Nm

Upper bracket removal and installation

– Remove the rear storage compartment



- Undo upper bracket to bracket mount (2)
- Undo upper bracket mount (1) on frame
- Remove upper bracket (3)

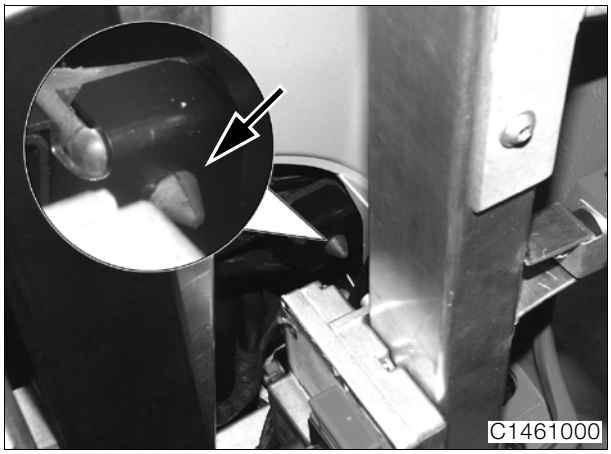
When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Upper bracket to frame ..... 8 Nm
Upper bracket to bracket ..... 21 Nm

Support base removal and installation

The following section describes the procedures for left-side rubber support base. The operations for the right side are essentially the same.

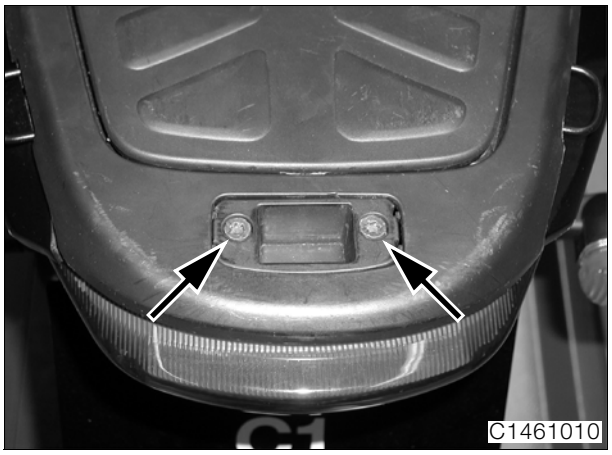
– Remove the backrest
– Remove the rear storage compartment



- Remove support base by extracting to the rear (arrow)

When installing:
- Installation is the reverse of the removal procedure

Luggage system lock carrier removal and installation



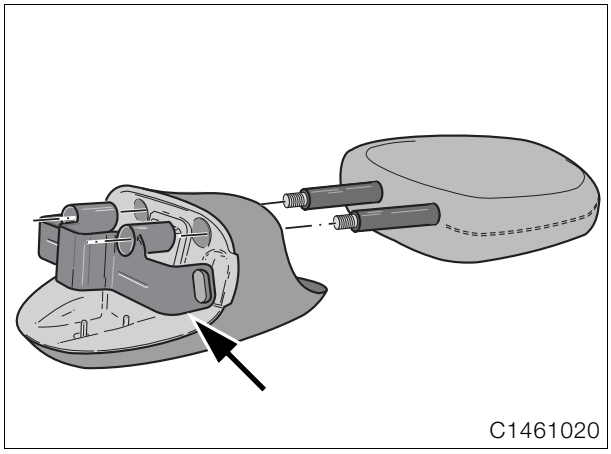
- Remove fasteners (arrows)

When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Lock carrier mount ..... 5 Nm

Luggage hook replacement

– Remove the backrest
– Remove head restraint
➠ .....See Group 52



- Luggage hook removal (arrow)

When installing:
- Installation is the reverse of the removal procedure

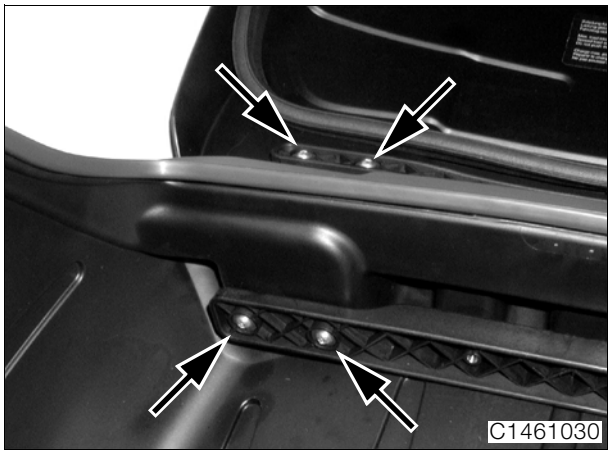
Torque specification:
Head restraint mount ..... 21 Nm

Topcase

Hinge replacement

The following describes the procedures for the left-side hinge. The operations for the right side are essentially similar.

– Remove Topcase and place on a soft support surface
– Open lid



- Remove fasteners (arrows)
- Remove hinge

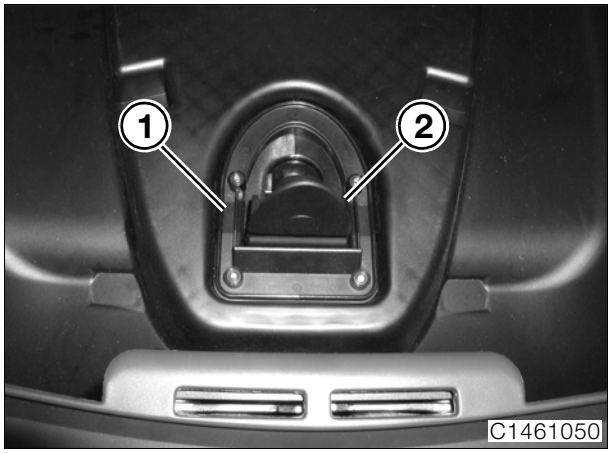
When installing:
- Installation is the reverse of the removal procedure

Replacing inside lock

– Remove Topcase and place on a soft support surface
– Open lid

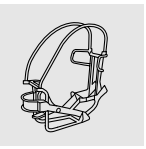


- Remove fasteners (arrows)



- Remove retainer (1)
- Remove lock (2)

When installing:
- Installation is the reverse of the removal procedure



51 Equipment

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Replacing seat lock 3

Rear storage compartment lock barrel replacement 4

Replacing lock barrel on large/small storage compartment 4

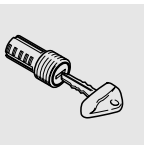
Replacing Topcase lock barrel 5

Replacing lock barrel on luggage rail 5

Mirror removal and installation 6

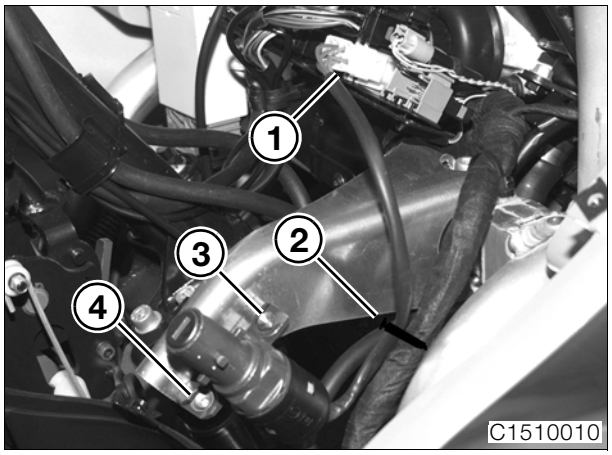
Mirror bracket removal and installation 7





51 25 040 Removing ignition switch/ steering lock

– Remove right side trim panel
– Removing instrument trim
➠ .....See Group 46



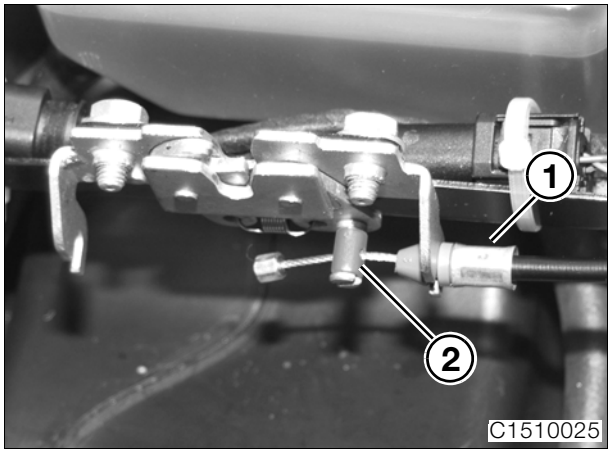
- Open cable tie (2)
- Separate orange plug-in connection (1)
- Drill out permanent screw (3)
- Remove fastener (4)
- Remove ignition lock

When installing:
- Installation is the reverse of the removal procedure

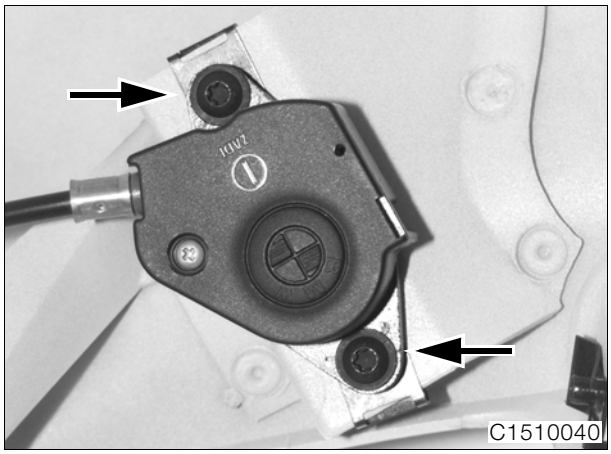
Torque specification:
Ignition lock attachment ..... 9 Nm

51 25 050 Replacing seat lock

– Open the seat
– Remove rear left side panel
➠ .....See Group 46



- Unclip retainer (2)
- Disengage Bowden cable (1)



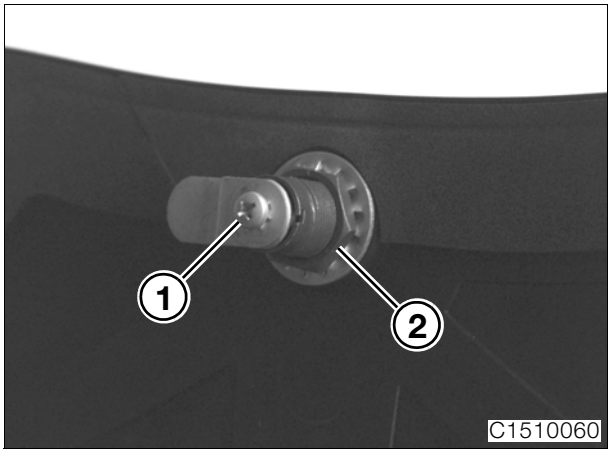
- Remove fasteners (arrows) securing seat lock
– Remove Bowden cable, if applicable

When installing:
- Installation is the reverse of the removal procedure

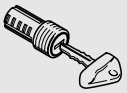
Torque specification:
Seat lock attachment ..... 3 Nm

51 47 000 Rear storage compartment lock barrel replacement

– Open the rear storage compartment
➠ .....See Group 46



- Release mount (1) remove lock bolt
- Undo attachment (2) on lock barrel
- Remove lock barrel



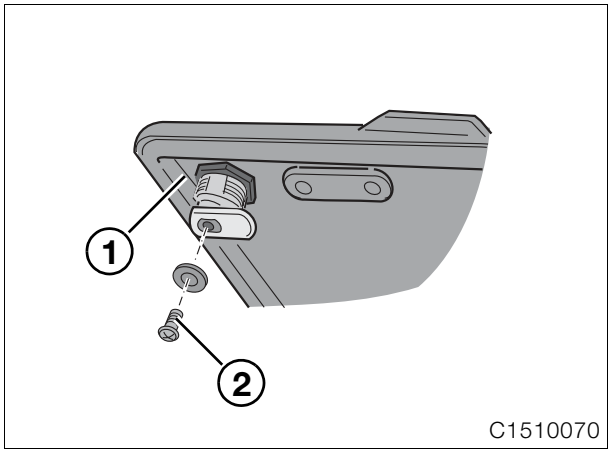
When installing:
- Installation is the reverse of the removal procedure

Torque specification:

Lock bolt mount	3 Nm
Lock barrel mount	7 Nm

Replacing lock barrel on large/small storage compartment

– Open storage compartment



- Release mount (2), remove lock bolt
- Undo mount (1) for lock barrel
- Remove lock barrel

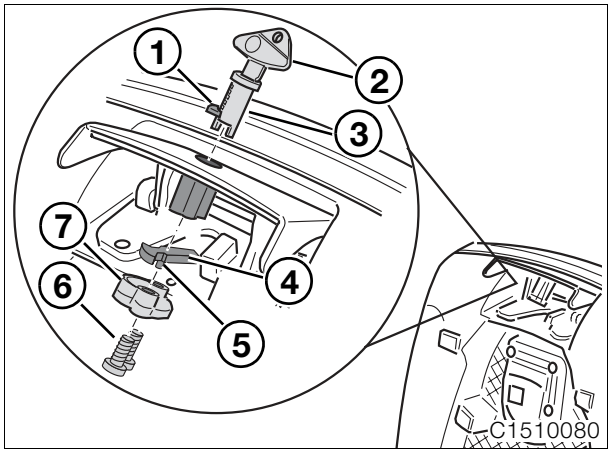
When installing:
- Installation is the reverse of the removal procedure

Torque specification:

Lock bolt mount	3 Nm
Lock barrel mount	7 Nm

Replacing Topcase lock barrel

– Remove Topcase and place it on a soft support surface
– Open lid



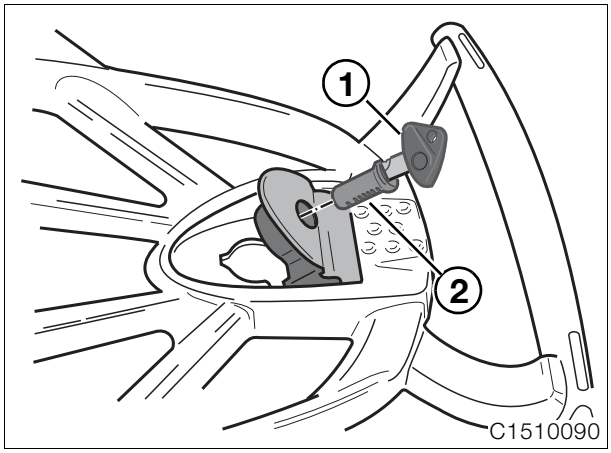
- Insert key (2) in the lock barrel (3)
- Remove fasteners (6)
- Remove end cap (7) and bolt (4)
- Use a screwdriver to press in the retainers (1) and then press the lock barrel (3) out of the housing

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Insert the bolt (4) with the pin (5) in the end cap (7) and mount both components with the screws (6)

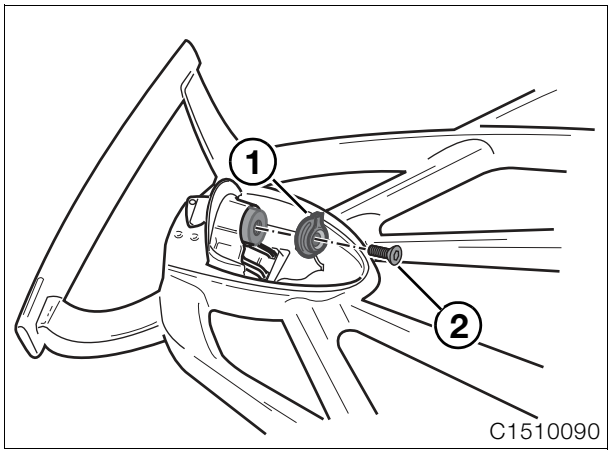
Attention:
Never extract the key from the lock barrel while it is removed, as this would cause the tumblers to jump out!

Torque specification:
End cap mount..... 3 Nm

Replacing lock barrel on luggage rail



- Open lock
- Insert the key (1) in the lock barrel (2)



- Release the attachment (2) and remove the lock bolt (1)
- Remove the lock barrel



When installing:

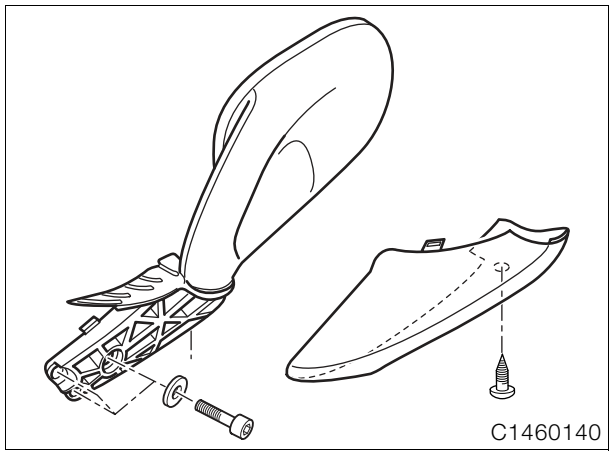
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Never extract the key from the lock barrel when it is removed, as the tumblers would spring out!

Torque specification:
Lock bolt attachment ..... 3 Nm



51 16 042 Mirror removal and installation



- Remove Phillips screw from housing
- 3x from adapter

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Note:
Note clip with projection!

Torque specification:
Mirror attachment..... 4 Nm
Cover attachment..... 3 Nm

51 16 045 Mirror bracket removal and installation

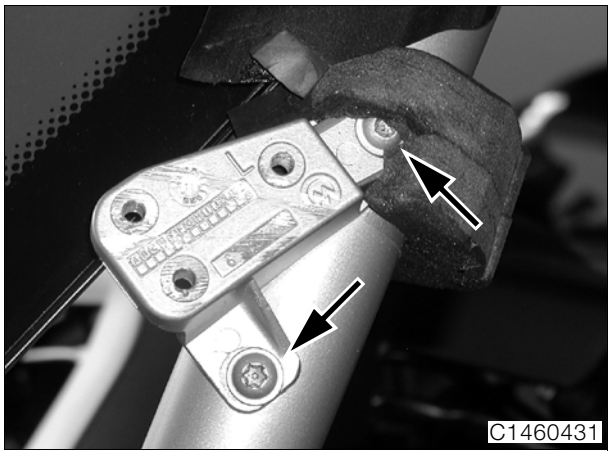
The procedure for removing and installing the left mirror bracket is described below. The procedure for removing and installing the right mirror bracket is essentially identical.

– Remove front fairing panel
– Remove left and right mirrors
– Removing upper side trim on left/right front frame
– Remove instrument trim

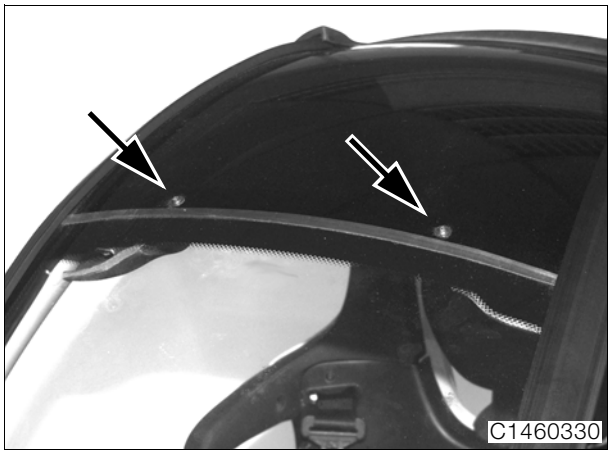
➠ .....See Group 46

Attention:
Avoid damaging or scratching the windscreen; if necessary mask it off!

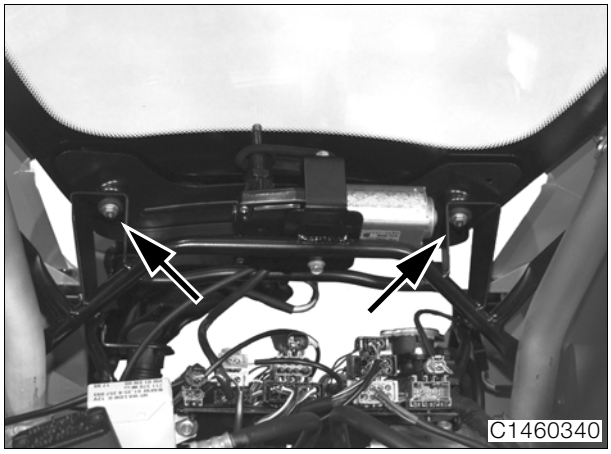
– Remove wiper arms (➠ 61.22)



- Remove fasteners (arrows) for outer mirror bracket



- Loosen attachments (arrows) at top of windscreen



- Remove fasteners (arrows) from bottom of windscreen

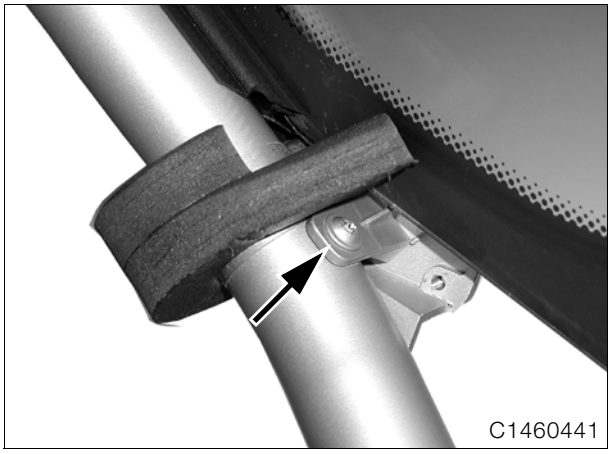
Attention:
Do not scratch the roof frame – mask it off if necessary!

Attention:
Carefully lever the A-pillar trim from the clips, using caution to avoid placing the windscreen under tension - it can break!

- Carefully prise out the A-pillar trim, starting at the bottom at working up to the edge of the roof

Attention:
Avoid placing the windscreen uner tension - it can break!

- Move A-pillar trim to the side to release from the windscreen



- Carefully lift the windscreen forward, continuing until the inner mirror bracket attachment (arrow) can be loosened with an angled Torxspanner
- Remove mirror brackets

When installing:
- Installation is the reverse of the removal procedure, but pay particular attention to the following:

Note:
Ensure that the water drain passage is routed correctly!

Torque specification:
Mirror bracket attachment ..... 5 Nm

52 Seat

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Remove seat 3

Heated seat removal, installation, replacement 3

Install seat 3

Backrest removal, installation, replacement 4

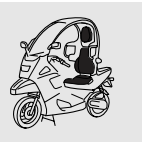
Head restraint removal, installation, replacement 4

Replacing badge 4

Seat lock replacement 5

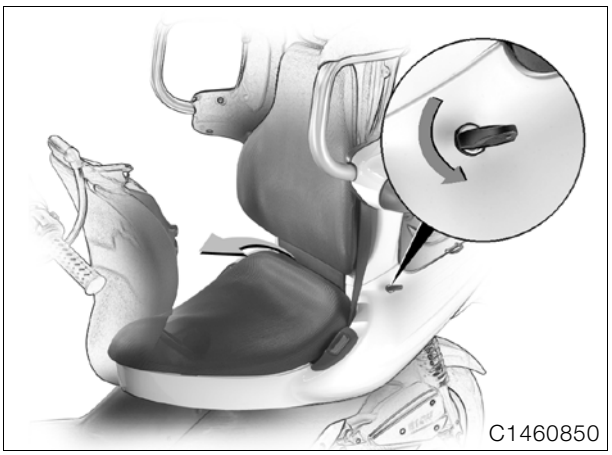
Seat lock Bowden cable removal and intallation 5





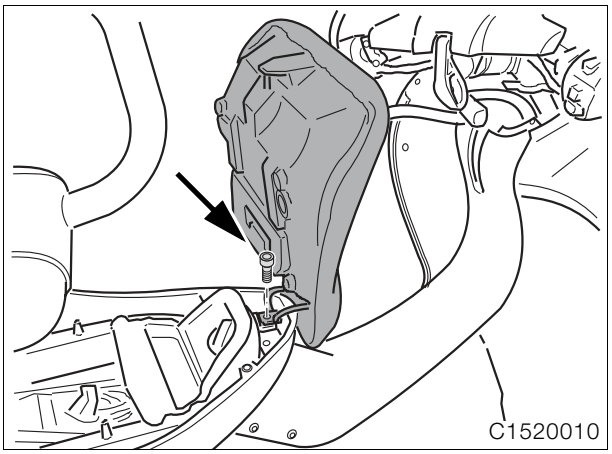
52 53 059 Seat removal, installation, replacement

Open the seat



- Open seat lock with key and fold seat forward

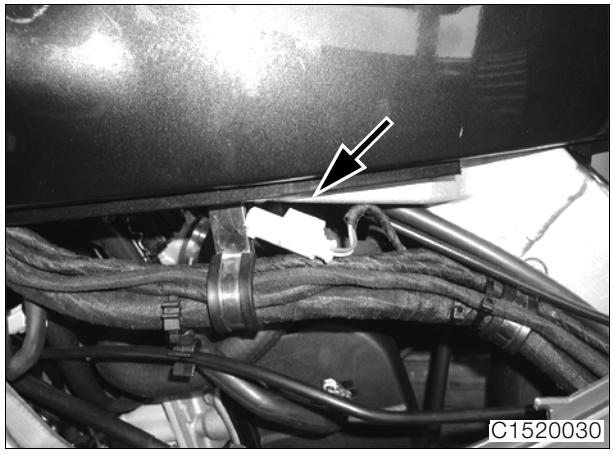
Remove seat



- Release seat (arrow) mount

Heated seat removal, installation, replacement

– Remove left service cover
➠ .....See Group 46



- Disconnect plug (arrow)

– Remove seat

Install seat

When installing:

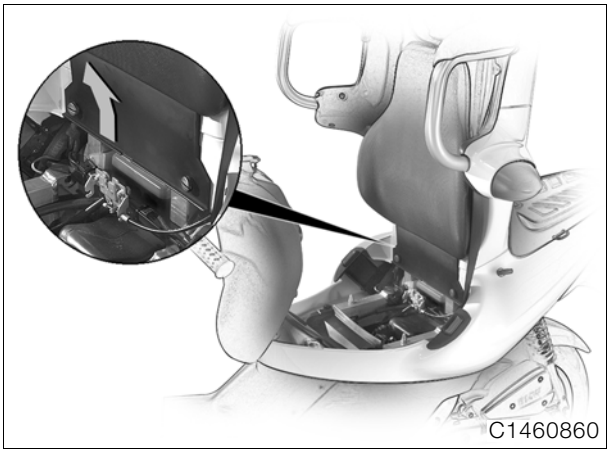
- Installation is the reverse of the removal procedure

Torque specification:

Seat mount ..... 21 Nm

Backrest removal, installation, replacement

– Open the seat (➟ 52.3)



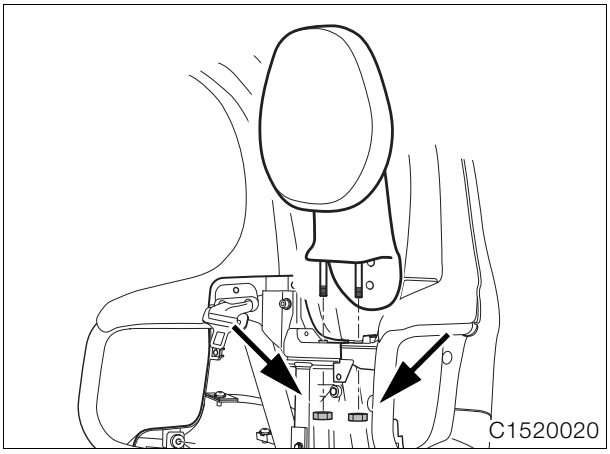
- Remove securing screws
- Pull backrest from its bracket

When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Attach backrest.....hand-tight

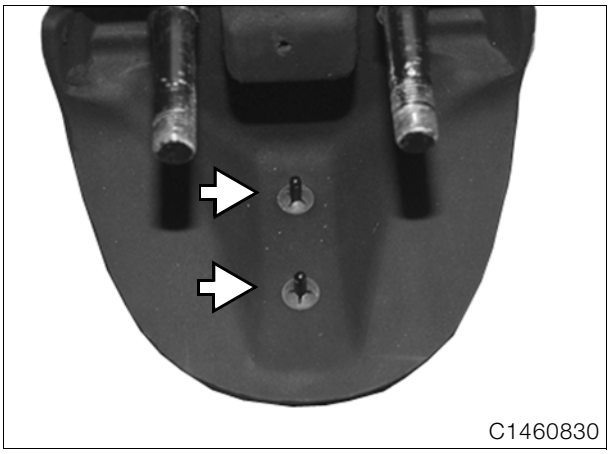
Head restraint removal, installation, replacement

– Remove the backrest



- Remove fasteners (arrows)
- Remove head restraint by extracting upward

51 14 050 Replacing badge
– Remove head restraint

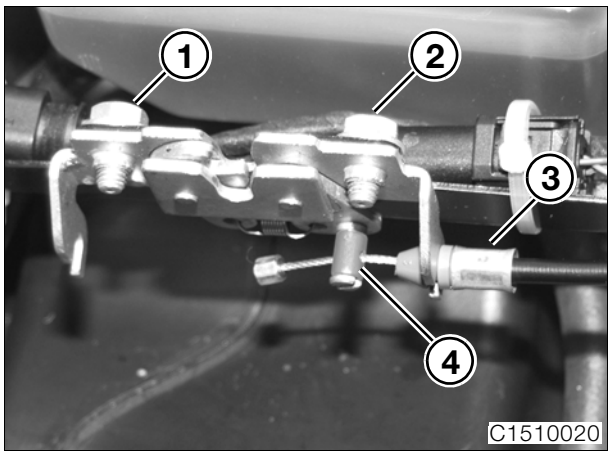


- Remove clips (arrows) and replace badge
- Install new clips

Torque specification:
Head restraint ..... 21 Nm

51 25 252 Seat lock replacement

– Open the seat (➟ 52.3)



- Unclip retainer (4)
- Detach Bowden cable (3)
- Remove fasteners (1, 2)

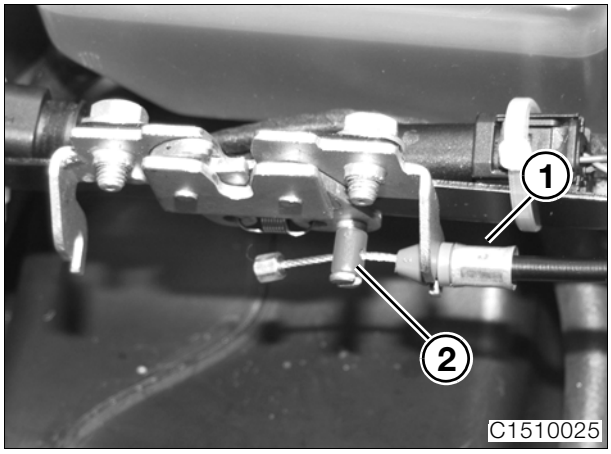
When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Seat lock mount ..... 9 Nm

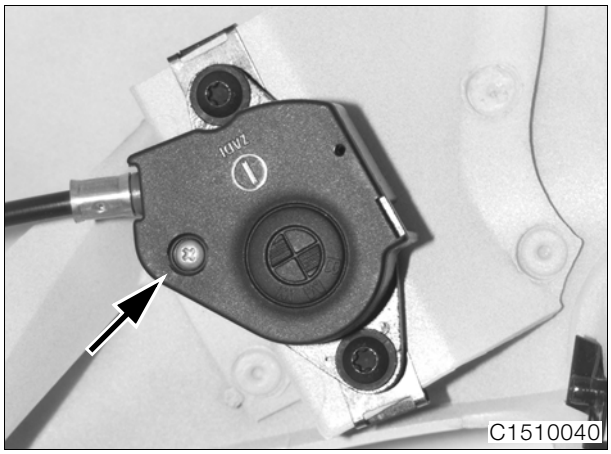
Adjustment data:
Seat lock ..... no play

Seat lock Bowden cable removal and intallation

– Open the seat (➟ 52.3)
– Remove rear left side panel
➟ .....See Group 46

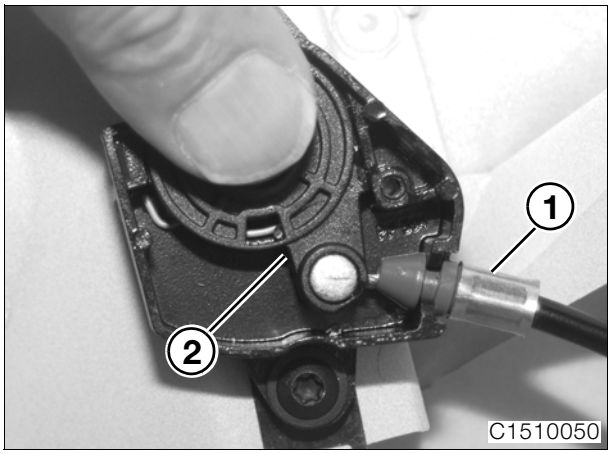


- Unclip retainer (2)
- Detach Bowden cable (1)



- Remove fastener (arrow) securing cover of seat lock

Attention:
The lever is spring-loaded: use caution when removing the cover of the seat lock!



- Apply thumb pressure to hold lever (2) in position
- Detach Bowden cable (1) from lever (2)

When installing:
- Installation is the reverse of the removal procedure

Adjustment data:
Seat lock ..... without play



61 General electrical equipment

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Replacing wipe/wash sensor 8

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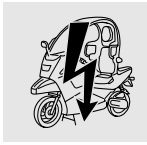
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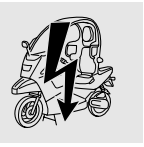
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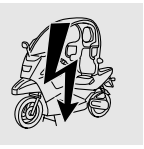
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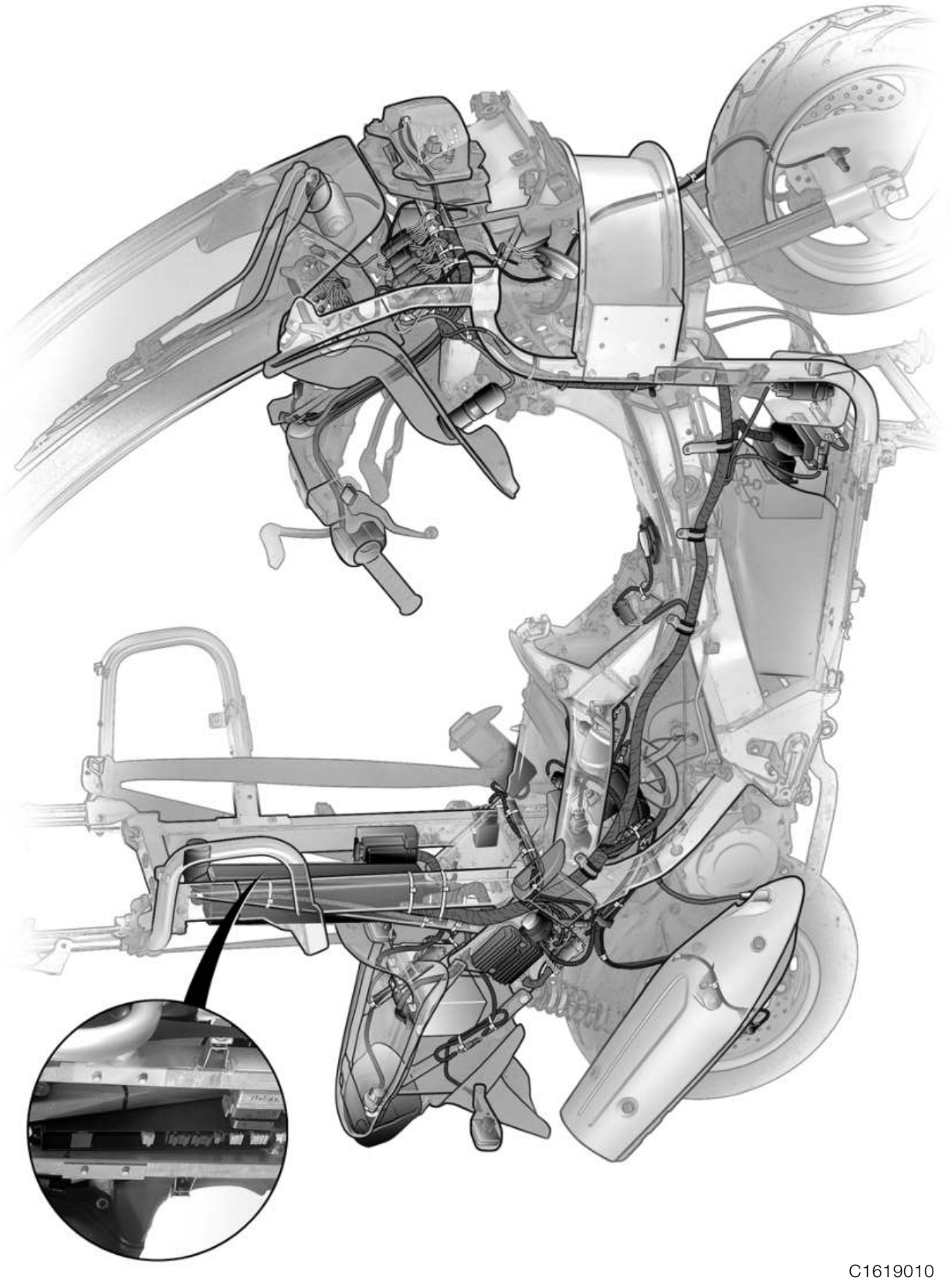
Technical Data		C1
General electrical equipment		
Battery		12 V 14 Amp/h
Fuses	A A	4 15
Lights		
Headlight		Rectangular, with halogen bulb and manual beam adjustment
Bulbs		
High beam/low beam		H4 halogen, 12 V 60/55 W, asymmetric
Parking light		12 V 5 W
Brake light/rear light		12 V 21/5 W Type P25-2
Flashing turn indicator		
Front		12 V 21 W Type P25-1
Rear		12 V 10 W Type P25-1
Map-reading light		12 V 5 W
Indicator lights/instrument lighting		12 V 1,7 W
Windscreen wipe/wash system		
Pump		
Pressure	bar (psi)	1.5 (21.77)
Voltage	V	12...14
Current	A	2.6
Washer fluid reservoir		
Contents	l (Imp pint/US quart)	0.7 (1.23/0.74)





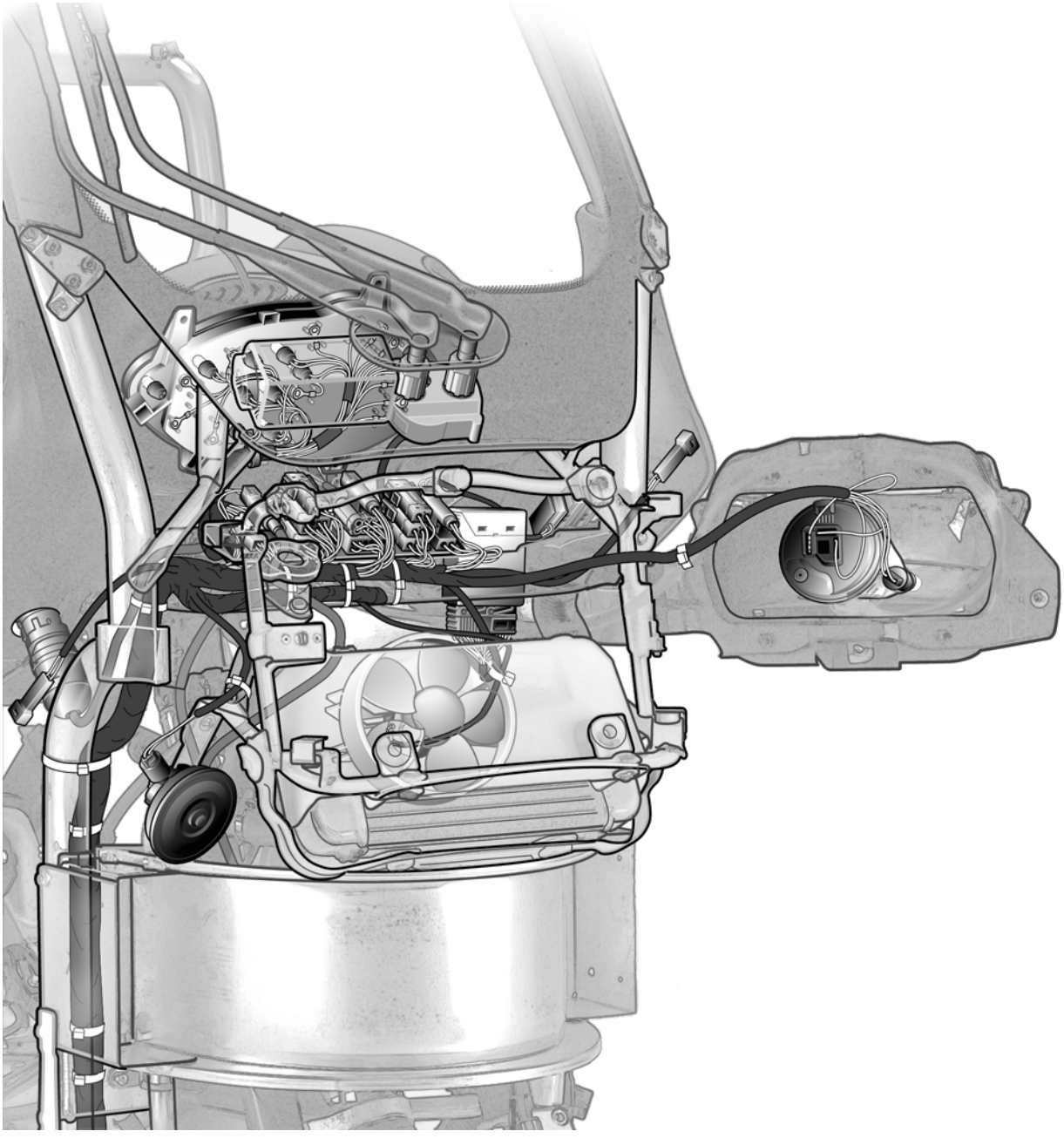
Wiring harness

General view, from right



C1619010

General view, from front



C1619020

61 11 100 Replacing wiring harness

- Remove front fairing panel
- Remove right side trim panel
- Remove right service cover
- Remove top and right tunnel panels
- Remove instrument trim
- Remove knee pad
- Swing the headlight forward and down

➠ .....See Group 46

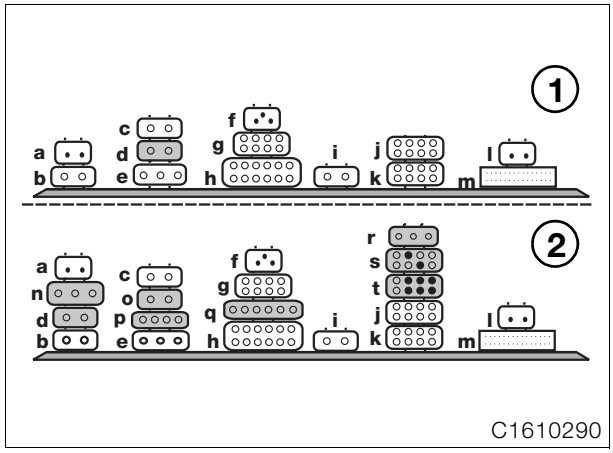
When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Ensure that front loom on wiring harness is routed correctly, avoid potential rubbing and abrasion points!



Wiring harness section plug connections

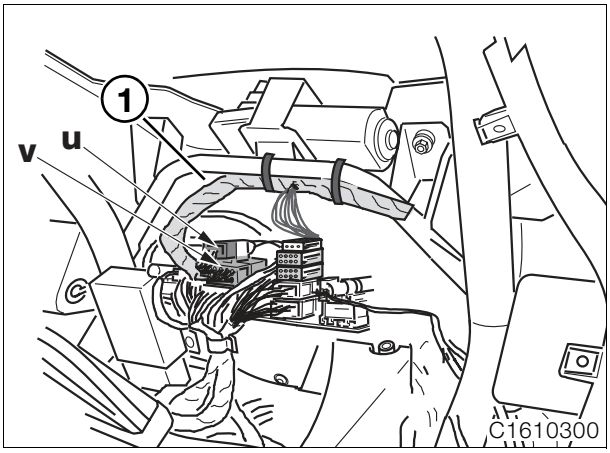


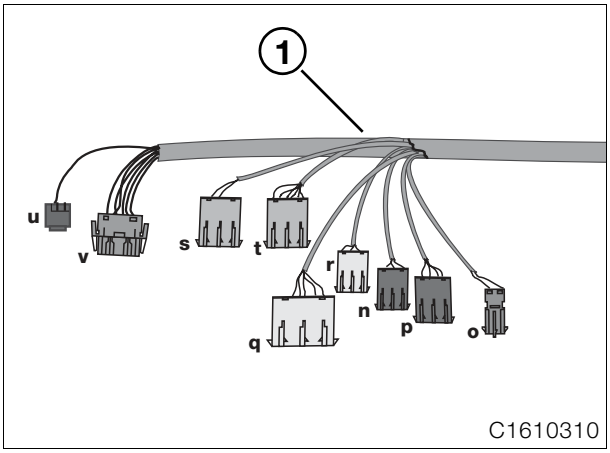
Plug connection locations:
View of standard vehicle (1)
View (2) with adapter cable for options

Connections:

a	Headlamp switch (black, 2-terminals)
b	Socket (blue, 2-terminals))
c	Left brake lamp switch (white, 2-terminals)
d	Fan motor (yellow, 2-terminals)
e	Windscreen wiper motor (black, 3-terminals)
f	Central electrical system module (black, 3-terminals)
g	Central electrical system module (gray, 8-terminals)
h	Combination switch, left (black, 12-terminals, with 9 terminals assigned)
i	Brake lamp switch, right (black, 2-terminals)
j	Combination switch, right (black, 8-terminals)
k	Ignition lock (orange, 8-terminals)
l	ABS-/wheelspeed sensor (gray, 2-terminals)
m	Instrument cluster (blue, 18-terminals)
n	Sound system (black, 3-terminals)
o	Heater pack (red, 2-terminals)
p	Navigation system (black, 4-terminals)
q	Alarm system (white, 6-terminals)
r	On-board computer (white, 3-terminals)
s	Map lamp (gray, 8-terminals with 2 terminals assigned)
t	Hazard warning flashers (gray, 8-terminals with 6 terminals assigned)

Adapter cable for optional equipment





- Connect adapter cable (1) with the two plugs **u** and **v** to the vehicle

– Plug **u** to connection **f**

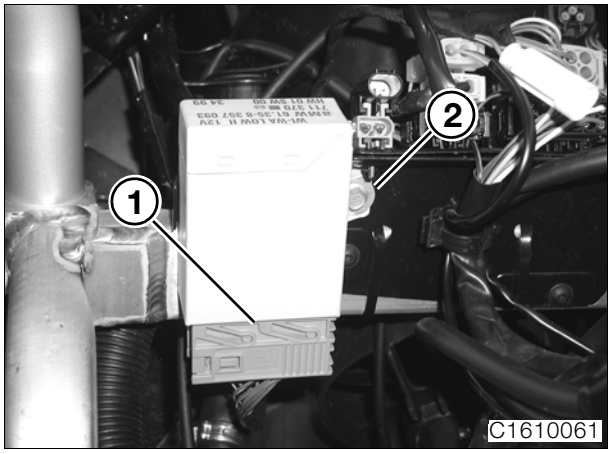
– Plug **v** to connection **g**

Wipe/wash sensor

61 35 050 Replacing wipe/wash sensor

– Remove instrument trim

➠ .....See Group 46



- Disconnect plug (1) by pulling the latch to the right while pulling the plug down
- Remove fastener (2)
- Remove wipe/wash sensor

When installing:

- Installation is the reverse of the removal procedure

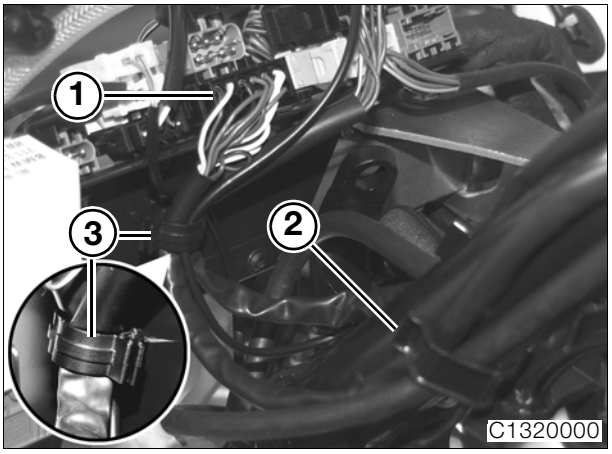
Torque specification:

Wiper/washer sensor attachment..... 3 Nm

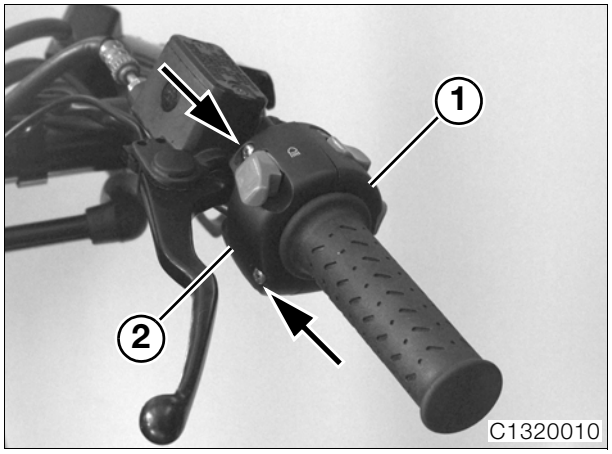
Combination switch

32 72 053 Combination switch, left, removal and installation

– Remove handlebar trim
– Remove instrument trim
➠ .....See Group 46



- Disconnect plug (1)
- Open cable clip (3)
- Remove cable harness from holder (2) on handlebar

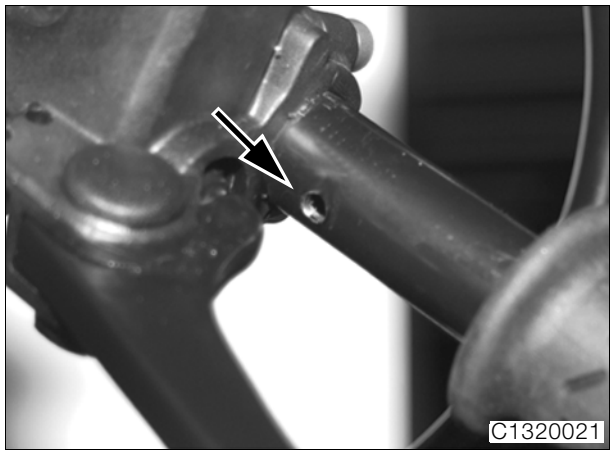


- Remove fasteners (arrows)
- Fold away rear section of combination switch (1)
- Apply gentle force to the handbrake lever whilst simultaneously removing the front section of the combination switch (2) from its retainer

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure that lines and cables are correctly routed.
Make sure that the anti-twist lock is correctly seated in the bore.
Ensure adequate clearance between combination switch and brake unit!

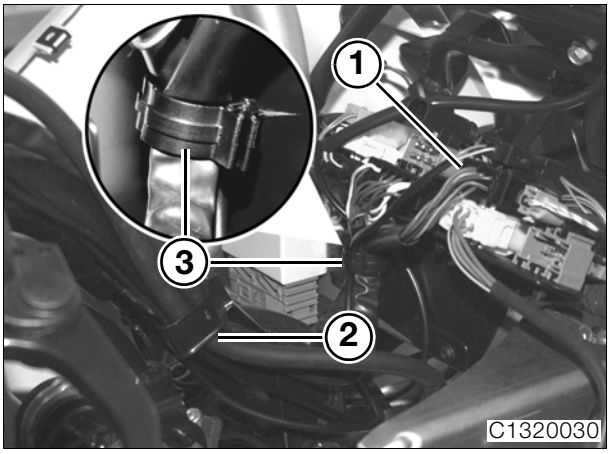


- Mount front section of combination switch in socket (arrow)

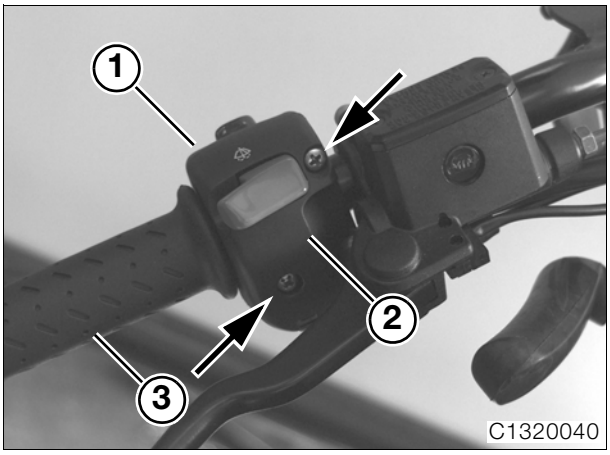
Torque specification:
Combination switch mount..... 4 Nm

32 72 110 Combination switch, right, removal and installation

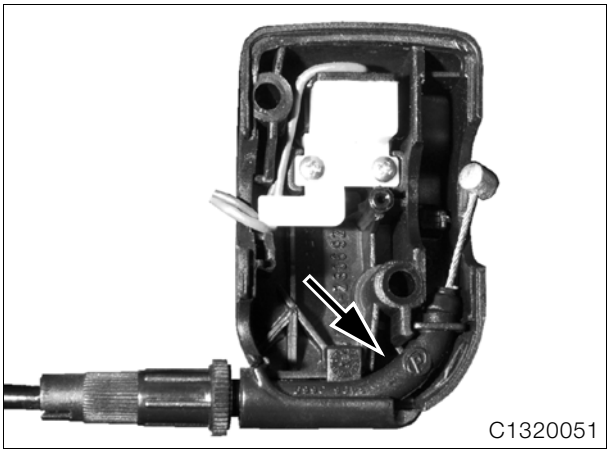
– Remove handlebar trim
– Remove instrument trim
➠ .....See Group 46



- Disconnect plug (1)
- Open cable clip (3)
- Remove cable harness from bracket (2) on handlebar



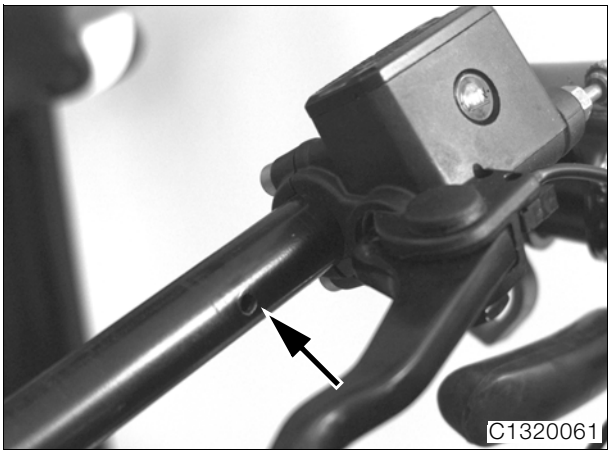
- Remove fasteners (arrows)
- Fold back rear section of combination switch (1)
- Gently raise front section of handlebar fitting (2) toward the front whilst simultaneously detaching throttle twist grip (3) from combination switch
- Slide throttle twist grip (3) to the right and detach Bowden cable from cam plate
- Remove throttle twistgrip
- Apply gentle pressure to the handbrake lever whilst simultaneously removing the front section of the combination switch (2) from its retainer



- Remove Bowden ccable (arrow) from front section of the combination switch

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Ensure that Bowden cable and all lines are routed correctly!
Make sure that the anti-twist lock is correctly seated in the bore!
Ensure adequate clearance between combination switch and brake fitting!



- Mount front section of combination switch in socket (arrow)
- Checking throttle cable play, adjusting if necessary

Adjustment data:
Move the handlebars all the way from left to right and ensure that throttle valve does not move

Torque specification:
Combination switch attachment ..... 4 Nm

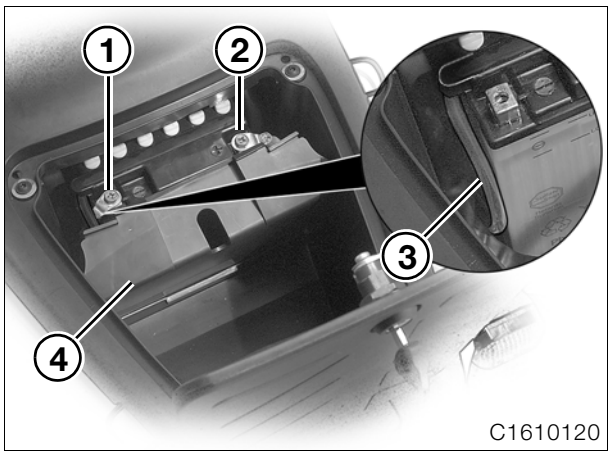
Battery

Warning:
Battery acid is exceedingly caustic.
Protect your eyes, face, hands, clothing and the paintwork!

61 21 010 Remove the battery

Attention:
Take care not to damage cables and breather hose when removing.
Only disconnect the battery with the ignition switched off to avoid short-circuiting.
Start by disconnecting the battery's **negative** cable (–), the proceed to remove the **positive** cable (+)!

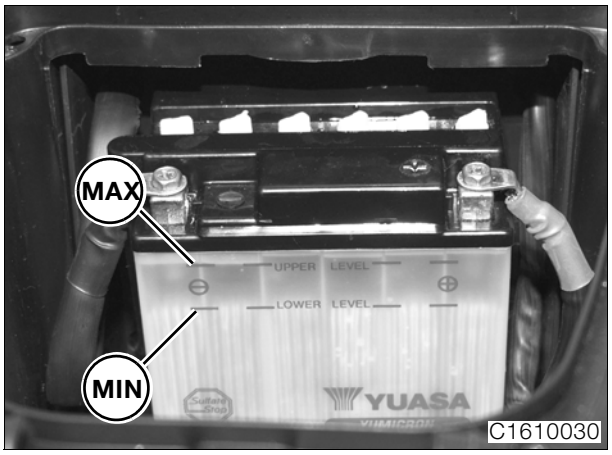
- Open the rear storage compartment



- Press cover (4) down and to the rear to unlock and remove
- Disconnect battery vent hose (3)
- Remove fastener (1) securing battery **negative** cable (-)
- Remove fasteners (2) securing battery **positive** cable (+)
- Lift the battery toward the rear to remove
- Keep the battery upright at all times

61 21 011 Filling and charging the battery

Battery sulphuric acid..... specific gravity 1.28



- Top up the battery acid to the “MAX” mark
- Allow the battery to stand for at least an hour
- Shake the battery slightly to allow the remaining air bubbles to escape
- If necessary, top up again to the MAX mark with battery acid
- Recharge the battery or allow it to stand for 24 hours

Charge current (amps)
..... 10% the value of the nominal capacity (Ah)

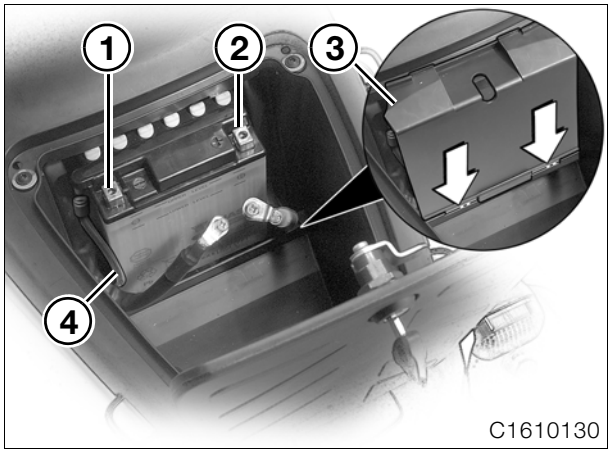
- Check the electrolyte level and, if necessary, top up with distilled water to the “MAX” mark
- Replace the battery caps securely
- Record the charging date on the battery



Installing the battery

Attention:
To avoid short circuits, reconnect the battery only with the ignition switched off
Connect the **positive** battery lead (+) first, then connect the **negative** battery lead (–).
Make sure that the battery vent pipe is not kinked or blocked.
Battery acid is highly caustic. Do not permit acid vapour to come into contact with vehicle components.

- Grease the battery terminals with acid-proof grease
- Install the battery in the rear storage compartment



- Connect vent hose (4)
- Connect the **positive** battery cable (+) (2)
- Connect the **negative** battery cable (-) (1)
- Install cover (3)
- Make sure that cover (3) is securely seated
- Close rear storage compartment

Note:
Disconnecting the battery deletes the trip odometer reading and the clock setting!

- Set the clock

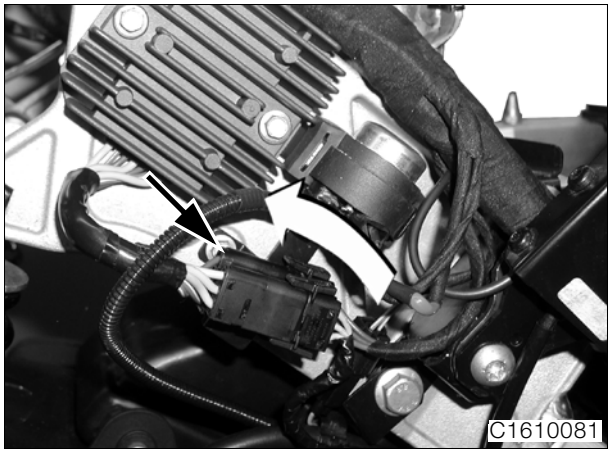
Operating fluids:
Acid-proof grease for battery terminals,
..... e.g. Bosch Ft 40 V1

Torque specification:
Battery cable attachments ..... 3 Nm

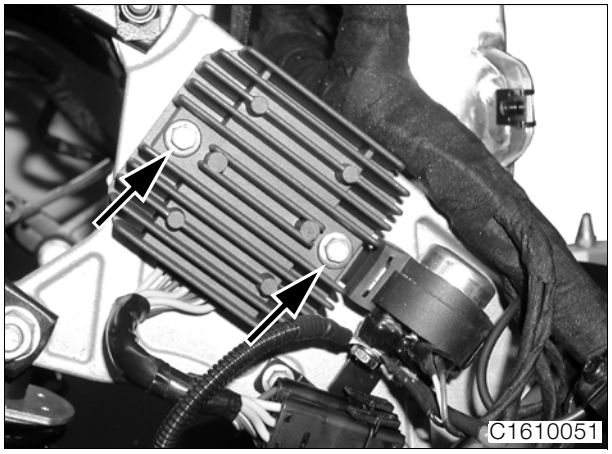
Voltage regulator

61 31 046 Replacing voltage regulator

– Remove right rear side trim panel
➠ .....See Group 46



- Turn plug-in connections to the rear in the direction indicated by the arrow and detach
- Separate plug-in connections (arrow)



- Remove fasteners (arrows)
- Remove voltage regulator

When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Voltage regulator attachment ..... 12 Nm

Starter relay

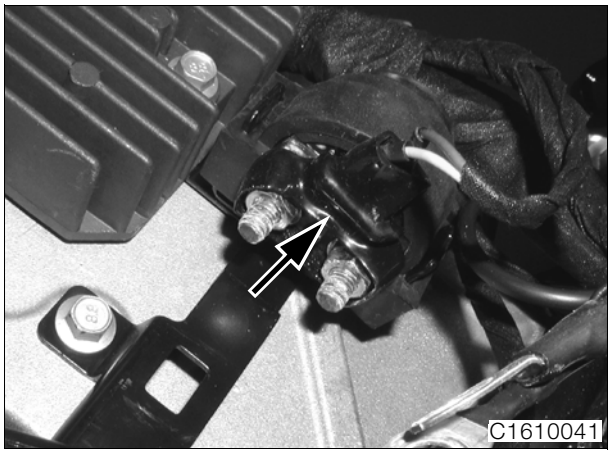
61 31 390 Replacing starter relay

Attention:
Disconnect earth (ground) lead from battery and insulate it!

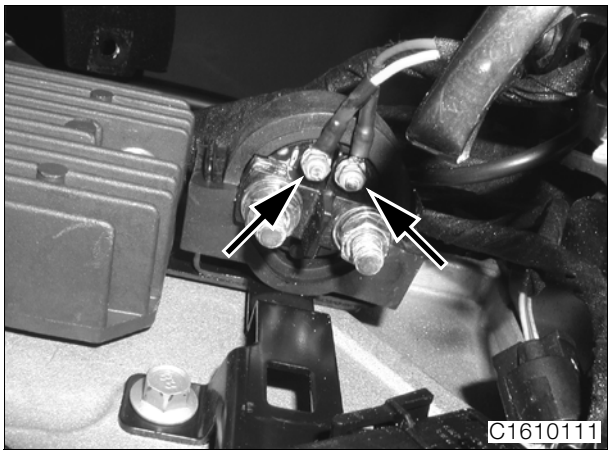
– Remove right rear side trim panel
➠ .....See Group 46



- Remove fasteners (arrows) for battery cables



- Remove protective cap (arrow)



- Remove fasteners for control cable
- Lift starter relay to the right and remove

When installing:

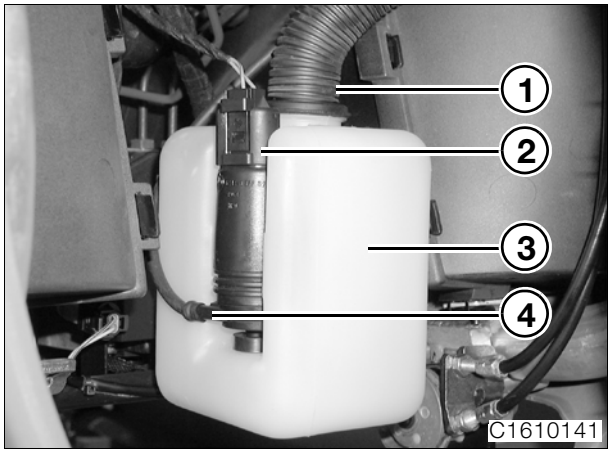
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
Make sure all cables are reconnected to their original terminals.

Torque specification:
Battery cable attachment ..... 3 Nm
Control cable attachment ..... 0.4 Nm

67 12 001 Removing and installing wipe/wash pump and replacing fluid reservoir

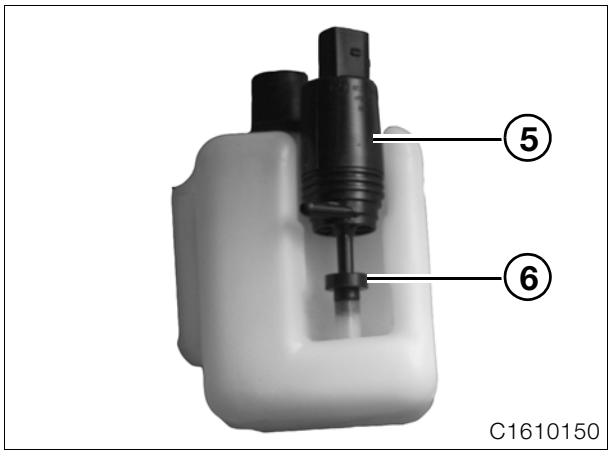
– Remove front fairing panel
– Swing the headlight forward and down
– Remove sill centre section
➠ .....See Group 46



- Disconnect plug (2)
- Disconnect filler hose (1)
- Pull fluid reservoir up to remove

Note:
Fluid can escape from reservoir.
Hold the reservoir (3) upright to prevent the fluid from leaking out!

- Disconnect delivery hose (4)
- Remove fluid reservoir (3) and drain if necessary



- Pry pump (5) up to remove

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Make sure that the seal with intake filter (6) between pump and reservoir is correctly seated!
- Make sure that hoses are correctly routed!
- Make sure that delivery hose is not kinked!

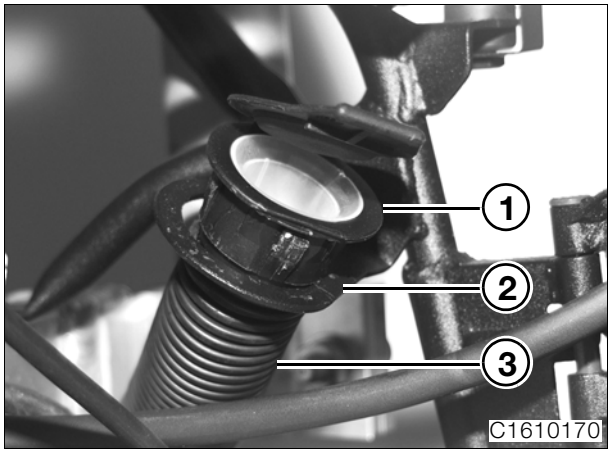
Replacing intake strainer

– Remove pump
- Remove intake filter with seal (6)

When installing:
- Installation is the reverse of the removal procedure

31 67 002 Removing and installing filler funnel

– Remove front fairing panel
➠ .....See Group 46
– Swing the headlight forward and down



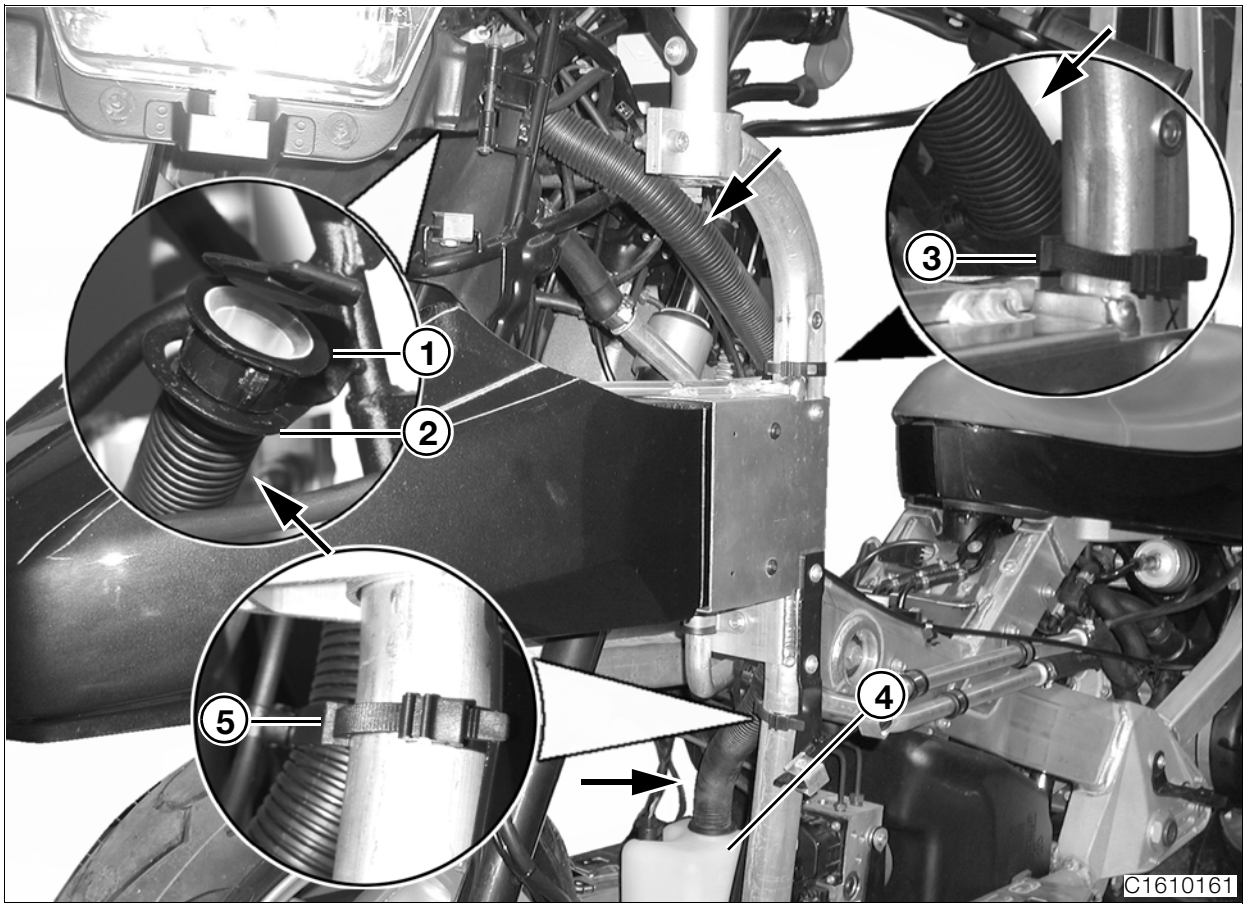
- Pry filler funnel (1) out of holder (2)
- Disconnect filler hose (3) from filler funnel‹

When installing:
- Installation is the reverse of the removal procedure

61 68 003 Replacing filler strainer

– Remove front fairing panel
➠ .....See Group 46
– Swing the headlight forward and down
- Open cap on filler funnel
- Remove filler strainer

When installing:
- Installation is the reverse of the removal procedure



Filler hose

Removing and installing filler hose

For the sake of clarity, these illustrations show the vehicle withcertain trim panels removed!

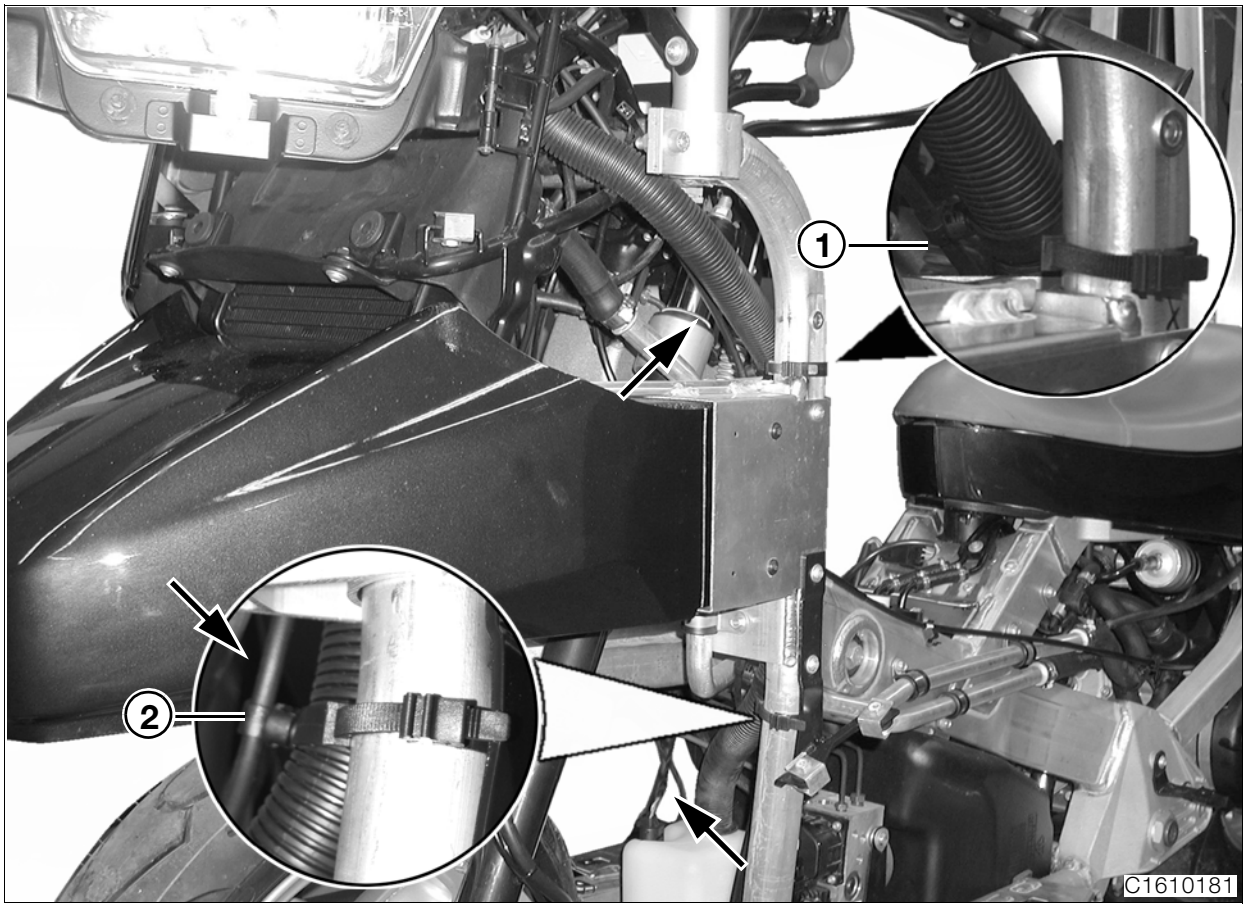
– Remove front fairing panel
– Swing the headlight forward and down
– Remove sill centre section

➠ .....See Group 46

- Disconnect filler hose (arrows) from fluid reservoir (4)
- Turn the handlebars all the way to the right
- Open cable clips (3, 5) on frame
- Pry filler funnel (1) out of holder (2)
- Disconnect filler hose (arrow) from filler funnel
- Pull filler hose down to remove

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Make sure the hoses are routed well away from any components that could cause rubbing and abrasion
- Install filler hose from below
- Pass filler hose through holder of filler funnel
- Connect filler funnel to filler hose
- Press filler funnel into its holder
- Secure filler hose, starting at the top and working down



Removing and installing delivery hose

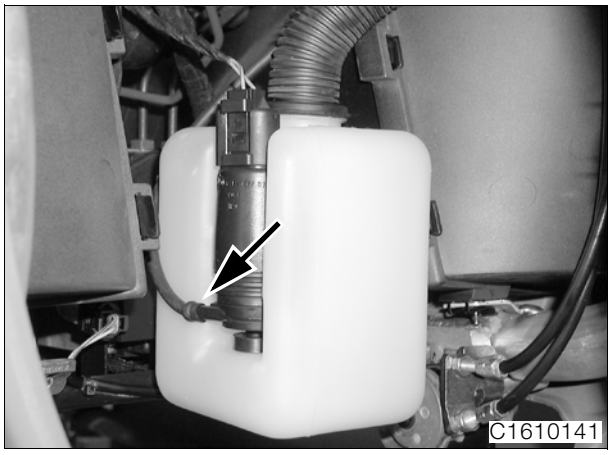
61 66 000 Hose between pump and interface at front windscreen

For the sake of clarity, these illustrations show the vehicle withcertain trim panels removed.

– Remove instrument trim
– Remove front fairing panel
– Swing the headlight forward and down
– Remove sill centre section

➠ .....See Group 46

Note:
Fluid can escape from reservoir.
If necessary, remove the reservoir from its holder and hold it upright to prevent fluid from leaking out!



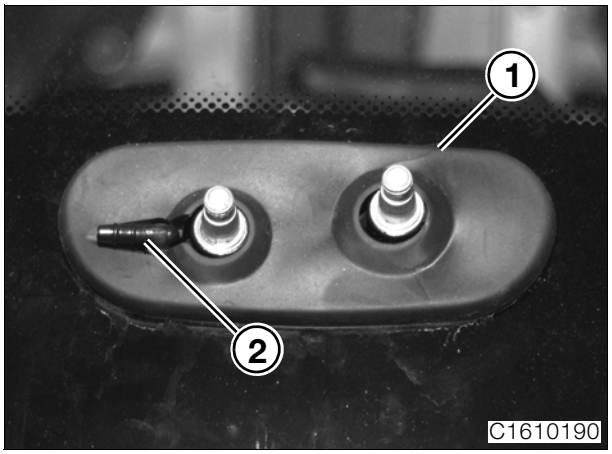
- Pull delivery hose (arrows) from pump
- Turn the handlebars all the way to the right
- Unclip delivery hose from holders (1, 2) at filler hose

– Remove wiper arms (➠ 61.22)

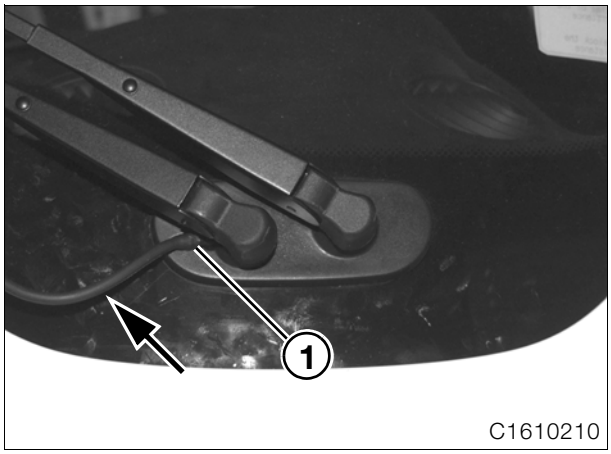
Attention:
Avoid damaging or scratching the windscreen; if necessary mask it off!

61 61 002 Hose between interface at front windscreen and spray nozzles

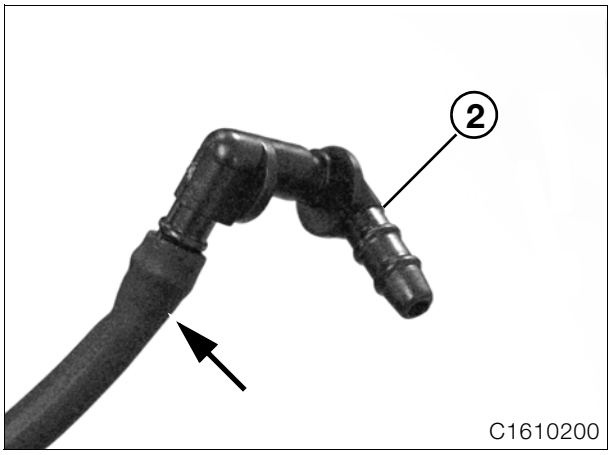
- Swing wiper clear of windscreen



- Remove rubber grommet (1) from windscreen
- Remove passage (2)

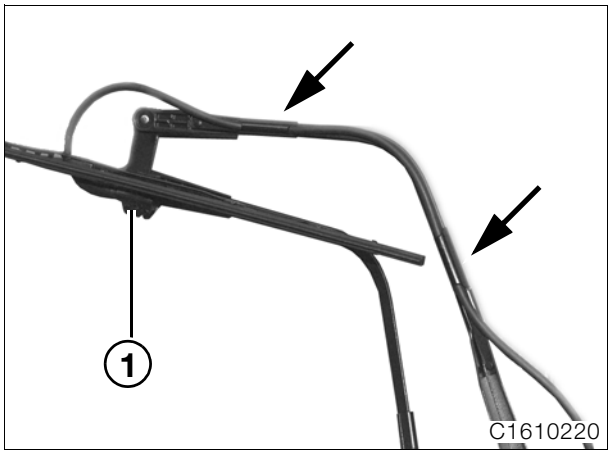


- Disconnect delivery hose (arrow) from passage (1)



- Disconnect delivery hose (arrow) from passage (2)

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Make sure that hoses are routed correctly and are free of kinks

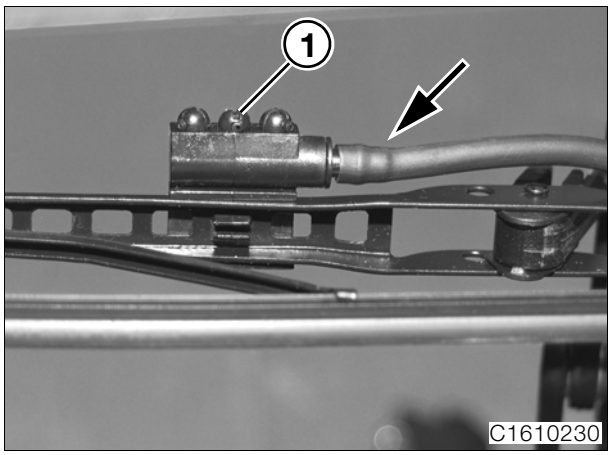


- Remove holders (arrows) from wiper arm
- Disconnect delivery hose from spray nozzle (1)

When installing:
- Installation is the reverse of the removal procedure

61 61 005 Replacing spray nozzles

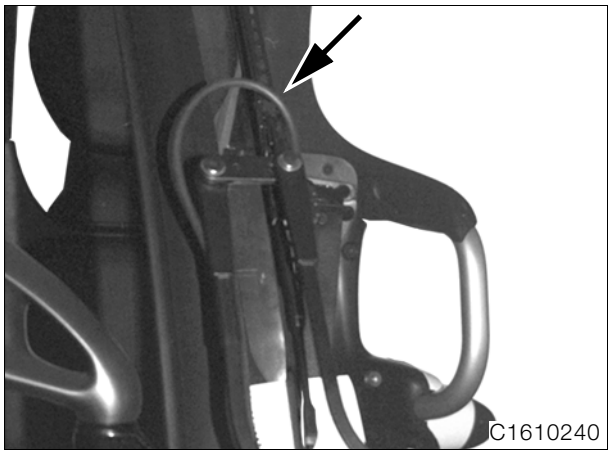
- Fold wiper out from windscreen



- Unclip spray nozzles (1) from wiper arm
- Disconnect delivery hose (arrow) from spray nozzles

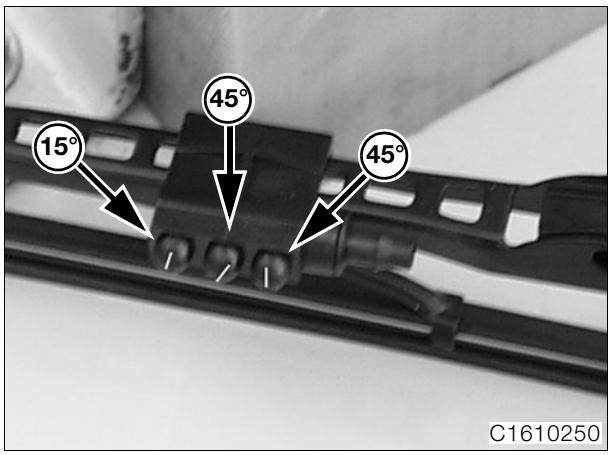
When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Attach spray nozzle to the fourth recess on the wiper arm



- Make sure that hoses are correctly routed

Adjusting spray nozzles

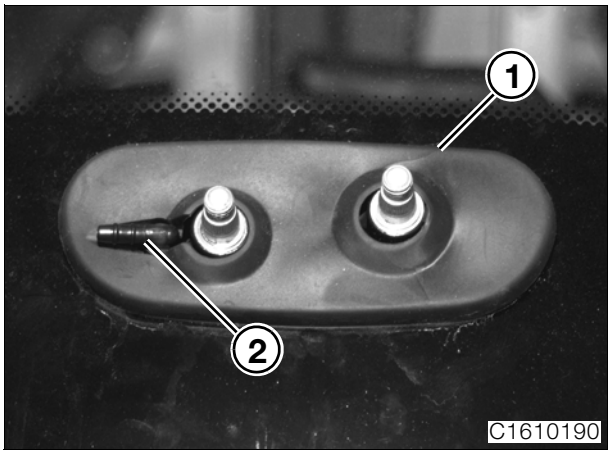


- Using a screwdriver, adjust the spray nozzles (arrows) to ensure satisfactory cleaning even when the vehicle is travelling at maximum speed

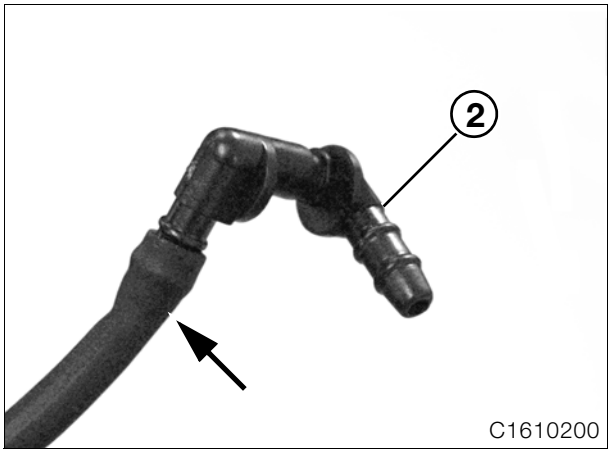
Replacing passage in front windscreen

– Remove wiper arms (➠ 61.22)

Attention:
Avoid damaging or scratching the windscreen; if necessary mask it off!



- Remove rubber grommet (1) from windscreen
- Remove passage (2)



- Disconnect delivery hose (arrow) from passage (2)

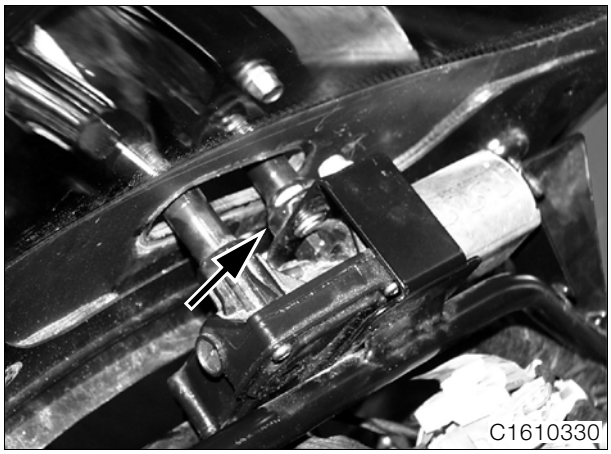
When installing:
- Installation is the reverse of the removal procedure

Wiper motor replacement

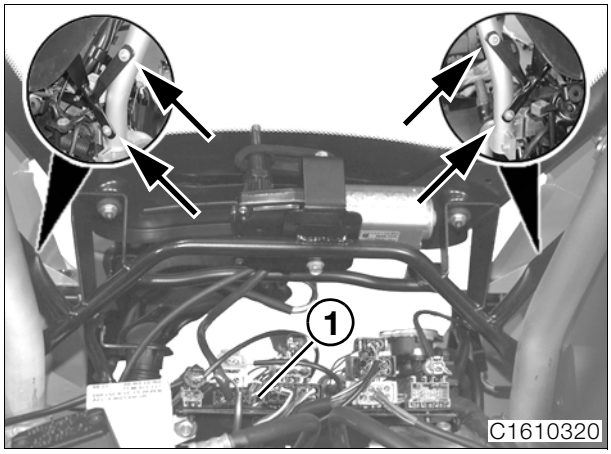
– Remove front fairing panel
– Remove left and right mirrors
– Detach side trim on left and right of front frame at top
– Remove instrument trim
➠ .....See Group 46

Attention:
Avoid damaging or scratching the windscreen; if necessary mask it off!

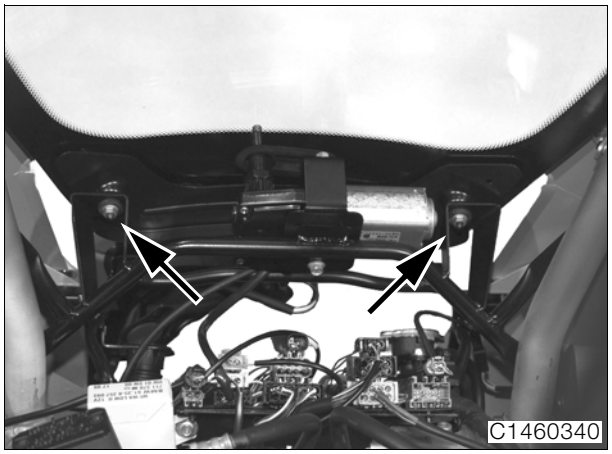
– Remove wiper arms (➠ 61.22)
– Remove rubber grommet (1) from windscreen (➠ 61.20)



- Remove stationary shaft (arrow) from wiper motor

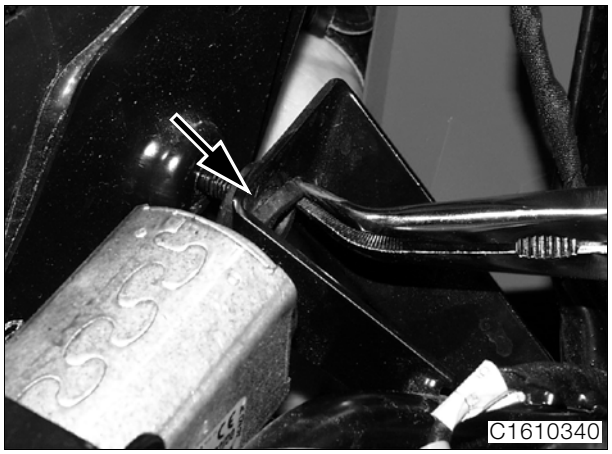


- Disconnect plug (1)
- Avoid placing the windscreen under tension (arrows) while detaching windscreen wiper motor bracket

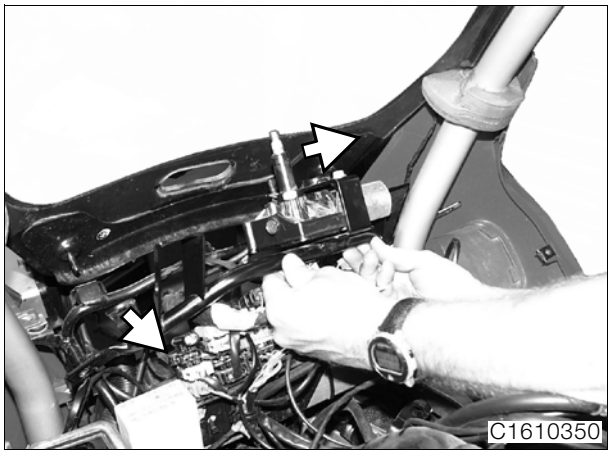


- Remove fasteners (arrows) from bottom of windscreen

Attention:
Avoid placing any stress or tension on the windscreen, as it could fracture!



- Remove sleeves and rubber bushes (arrow) on left and right sides
- Carefully lift the windscreen to the front, continuing until the windscreen wiper motor bracket can be removed out the side



- Slide the bracket to the right and remove to the rear
- Remove windscreen wiper motor

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

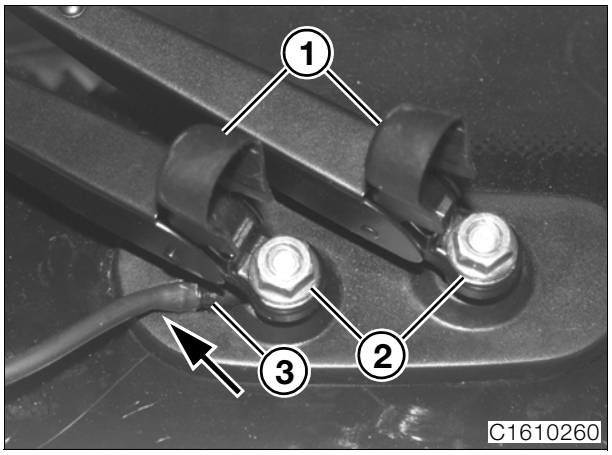
Note:
Ensure that the water passage is routed correctly!

Torque specification:

Bracket to frame	5 Nm
Windscreen wiper motor	5 Nm
Stationary shaft nut	9 Nm

61 61 000 Removing and installing wiper arms

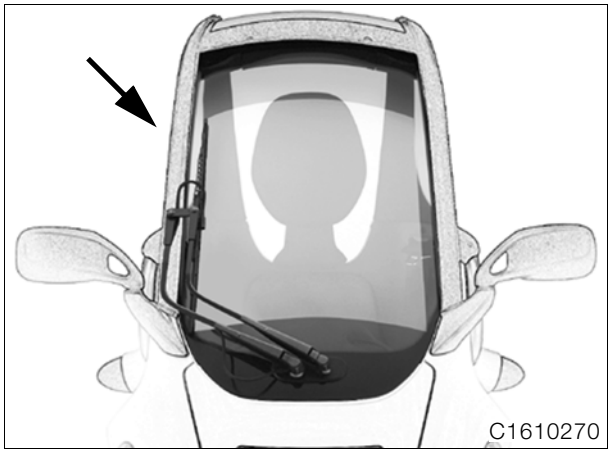
Attention:
Avoid damaging or scratching the windscreen; if necessary mask it off!



- Disconnect delivery hose (arrow) from passage (3)
- Fold up guard caps (1)
- Remove fasteners (2)
- Use open-end 13 mm spanner to pry off wiper arms
- Remove holders (arrows) from wiper arm
- Disconnect delivery hose from spray nozzle (1)

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



- Install wiper blade parallel to A-pillar trim (arrow) on the right
- Check the wiper's swept range

Torque specification:
Wiper arm attachment..... 9 Nm

62 Instruments

Contents

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Technical Data 3

Instrument cluster 5

Wiring colours 5

Removing and installing instrument panel 6

Replacing wiring harness 6

Fuel gauge replacement 7

Speedometer replacement 7

Indicator and warning lights 8

Replacing bulbs 8

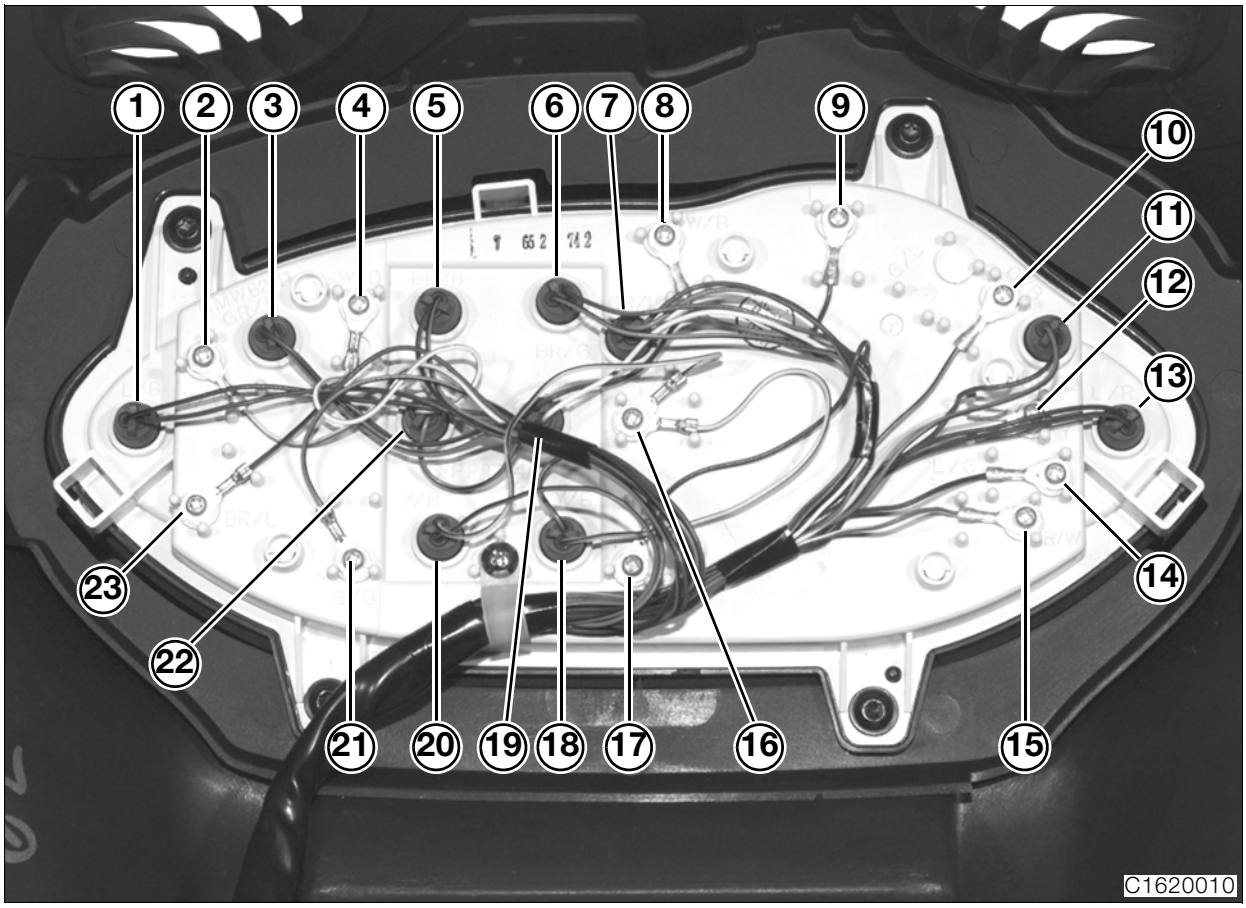




Technical Data	C1
Instruments	
Speedometer and fuel-gauge lamp	12 V 1.7 W
Flashing turn indicators, coolant temperature, engine-oil pressure, ABS, high-beam indicator	12 V 1.7 W







Instrument cluster

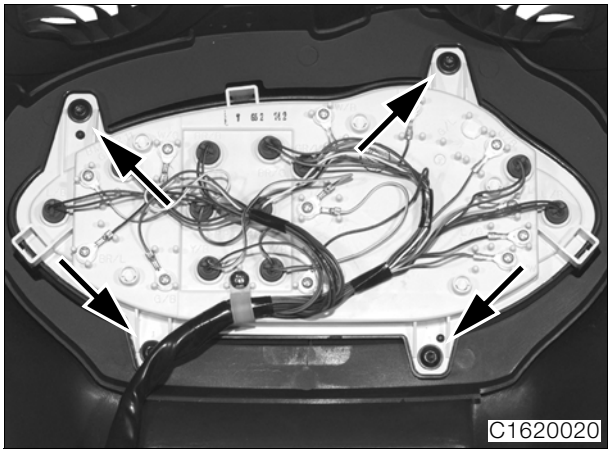
Wiring colours

violet/black - brown/violet (1)
yellow/violet (2)
gray/violet - brown/violet (3)
white/green (4)
brown/black - green/black (5)
brown/green - green/black (6)
gray/violet - brown/violet (7)
white/black (8)
violet (9)
green/black (10)
gray/violet - brown/violet (11)
yellow (12)
violet/red - brown/violet (13)
violet/green (14)
red/white (15)
yellow/black (16)
brown/violet (17)
yellow/black - green/black (18)
white - brown/violet (19)
yellow/black - green/black (20)
green/black (21)
white/green - green/black (22)
brown/violet (23)

62 11 200 Removing and installing instrument panel

– Remove handlebar trim
– Remove instrument trim

➠ .....See Group 46



- Remove 4 fasteners (arrows) securing instrument cluster
- Remove instrument cluster

When installing:

- Installation is the reverse of the removal procedure

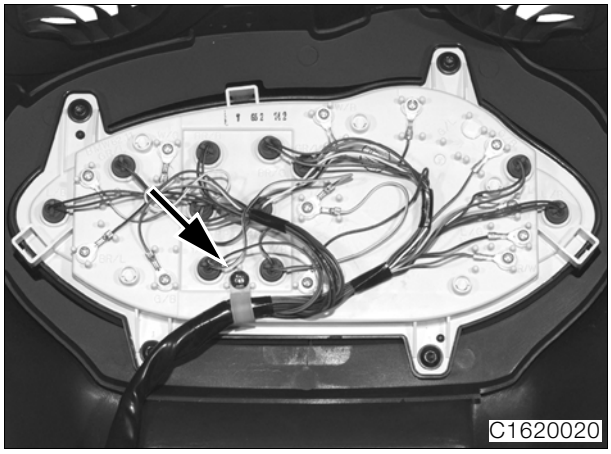
Torque specification:

Instrument cluster ..... 3 Nm

Replacing wiring harness

– Remove handlebar trim
– Remove instrument trim

➠ .....See Group 46



- Remove fastener (arrow) for cable clip
- Remove fasteners for cable tab connector
- Carefully ease out bulb sockets
- Remove wiring harness

When installing:

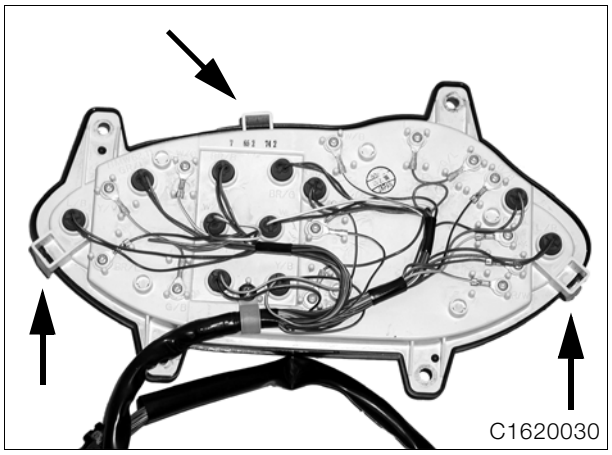
- Installation is the reverse of the removal procedure

Torque specification:

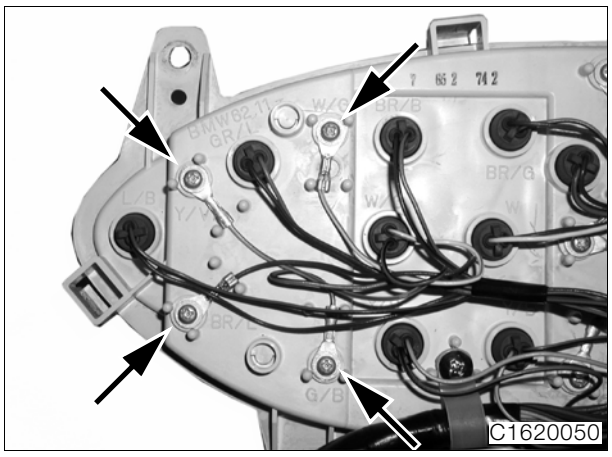
Cable clamp..... 1 Nm
Wire terminal ..... 0.5 Nm

Fuel gauge replacement

– Remove instrument cluster



- Unsnap front cover of instrument cluster from attachment (arrows)



- Detach wire terminal (arrows)
- Remove fuel gauge

When installing:

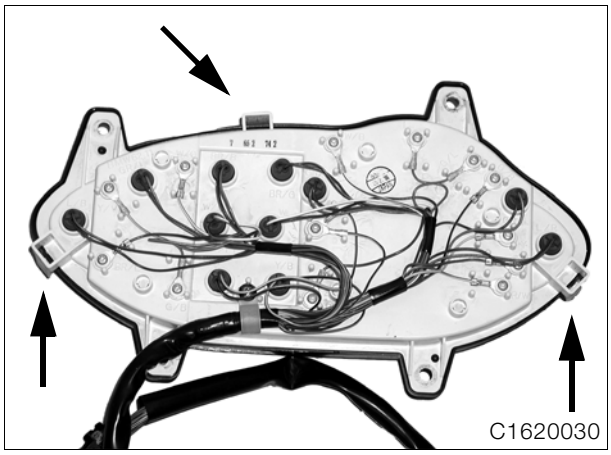
- Installation is the reverse of the removal procedure

Torque specification:

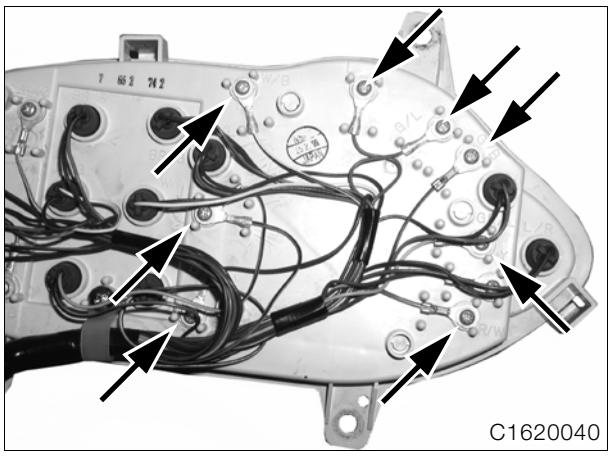
Wire terminal ..... 0.5 Nm

Speedometer replacement

– Remove instrument cluster



- Unsnap front cover of instrument cluster from attachment (arrows)



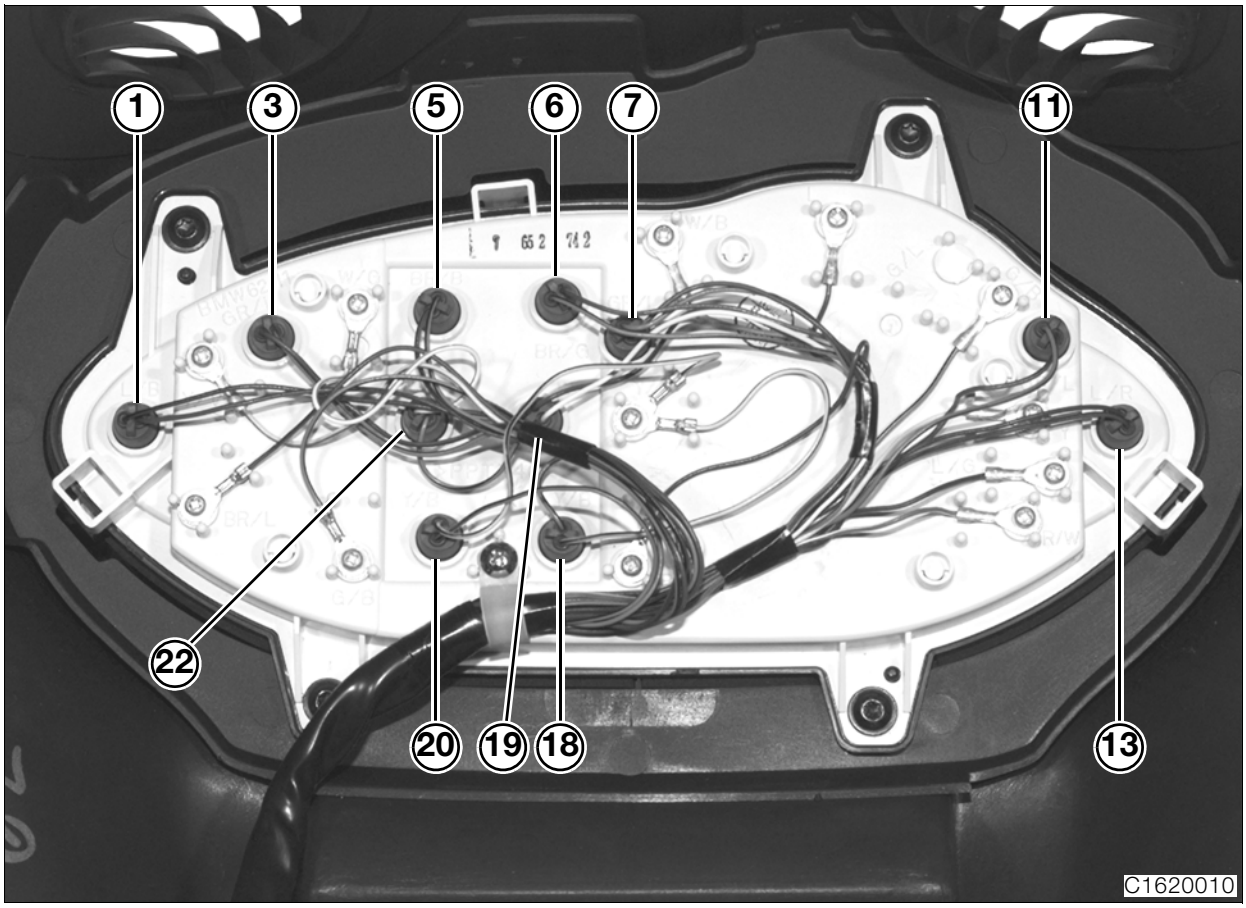
- Release wire terminal (arrows)
- Remove speedometer

When installing:

- Installation is the reverse of the removal procedure

Torque specification:

Wire terminal ..... 0.5 Nm



Indicator and warning lights

Right turn signal indicator lamp (1)
Light for fuel gauge (3)
Coolant temperature indicator lamps (5)
Engine oil pressure indicator lamps (6)
Speedometer light (7, 11)
Left turn signal indicator lamps (13)
ABS indicator lamps (18)
Fuel indicator lamps (19)
ABS indicator lamps (20)
High beam indicator lamps (22)

62 99 181 Replacing bulbs

– Remove handlebar trim
– Remove instrument trim

➠ .....See Group 46

Attention:
Do not damage the instrument cluster!

Note:
Bulbs can be released from their holders by pulling the cables.
Never touch the glass of the bulb with the fingers!

- Carefully ease out bulb socket
- Pull the bulb out of its socket

When installing:

- Installation is the reverse of the removal procedure

63 Lights

Contents

Page

Technical Data 3

Headlight 5

Removing and installing headlight 5

Replacing intermediate frame 5

Replacing headlight bezel 6

Replacing high-beam/low-beam bulb 6

Replacing parking light bulb 7

Checking headlight beam angle 7

Height adjustment 7

Lateral adjustment 8

Turn signal 8

Replacing front left/right turn signal 8

Replacing front left/right turn signal bulb 9

Replacing left/right rear turn signal 9

Replacing rear left/right turn signal bulb 10

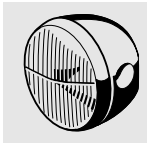
Rear lights 10

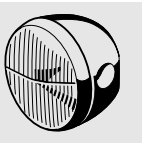
Replacing taillamp cluster 10

Replacing bulb for brake light/rear light 11

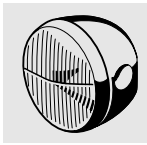
Map light 12

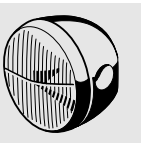
Map light bulb replacement 12





Technical Data	C1
Lights	
Headlight	Rectangular, with halogen bulb and manual beam adjustment
Bulbs	
High beam/low beam	H4 halogen, 12 V 60/55 W, asymmetric
Parking light	12 V 5 W
Brake light/rear light	12 V 21/5 W Type P25-2
Turn signals	
Front	12 V 21 W Type P25-1
Rear	12 V 10 W Type P25-1
Map light	12 V 5 W
Indicator lights/instrument lighting	12 V 1.7 W



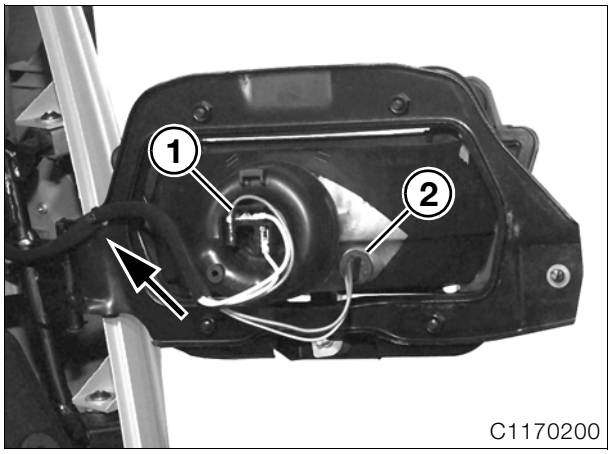


Headlight

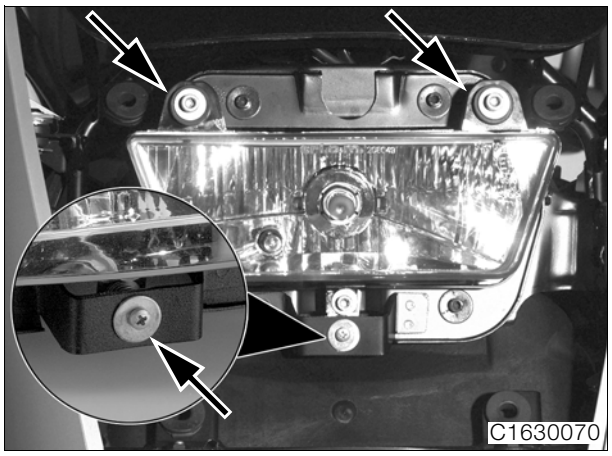
– Remove front fairing panel
– Swing the headlight forward and down
➠ .....See Group 46

Note:
Do not touch inside of reflector or glass on bulbs with bare fingers!

63 12 090 Removing and installing headlight



- Undo wire tie (arrow)
- Disconnect plug (1) for headlight
- Pull bulb holder (2) for parking light out of headlight housing
- Push headlight back



- Remove fasteners (arrows)
- Remove headlight

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

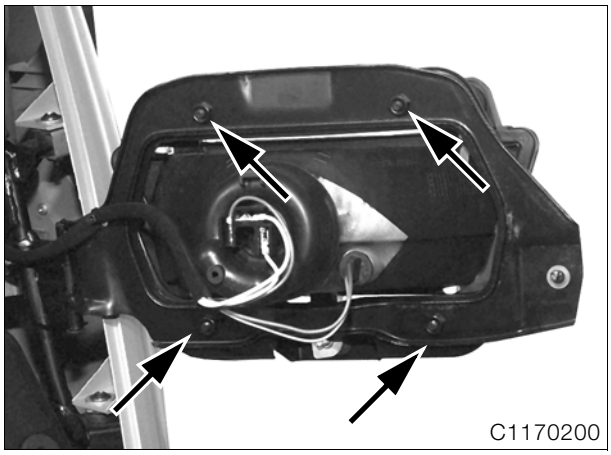
Attention:
When installing, make sure that the wiring harness is correctly routed and secured!

– Secure wiring harness with cable ties
➠ .....See Group 61
- Adjust headlight

Setting:
... -10 cm (- 3.9 in) over a distance of 10 m (32.8 ft)

Replacing intermediate frame

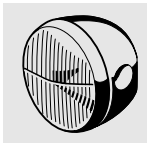
– Remove headlight



- Remove fasteners (arrows) securing subframe
- Remove subframe

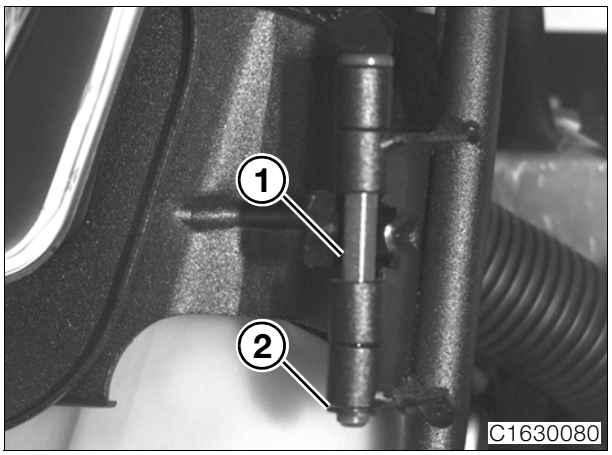
When installing:
Installation is the reverse of the removal procedure

Torque specification:
Subframe attachment..... 9 Nm



Replacing headlight bezel

– Remove headlight
– Remove subframe



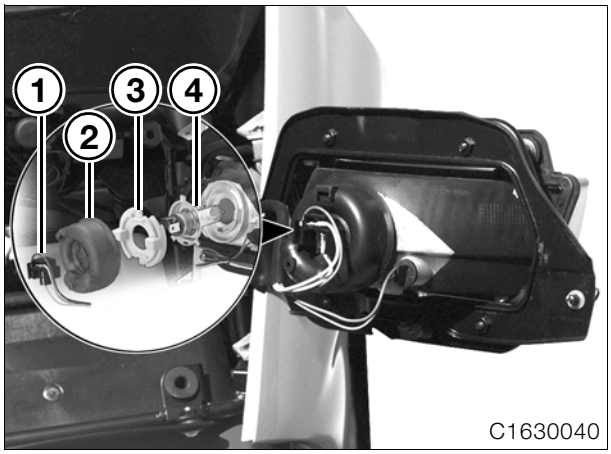
- Remove locking device (2)
- Push shaft (1) up to remove
- Remove swivel frame

When installing:
Installation is the reverse of the removal procedure

Torque specification:
Subframe attachment ..... 9 Nm

63 12 241/250 Replacing high-beam/low-beam bulb

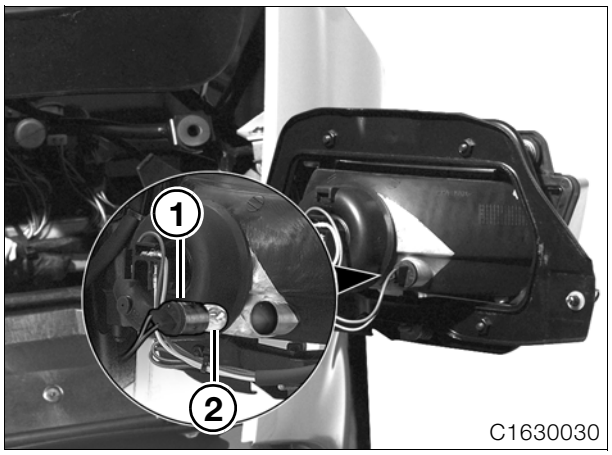
Note:
Never touch inside of reflector and glass on bulbs with bare fingers!



- Disconnect plug (1)
- Remove rubber cap (2)
- Turn retaining ring (3) counter-clockwise to release and remove
- Remove H4 bulb (4)

When installing:
- Installation is the reverse of the removal procedure

63 99 161 Replacing parking light bulb



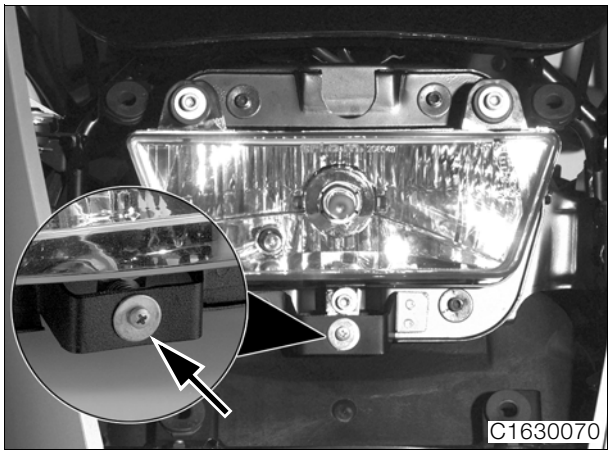
- Pull bulb holder (1) out of headlight housing
- Pull bulb (2) out of socket

When installing:
- Installation is the reverse of the removal procedure

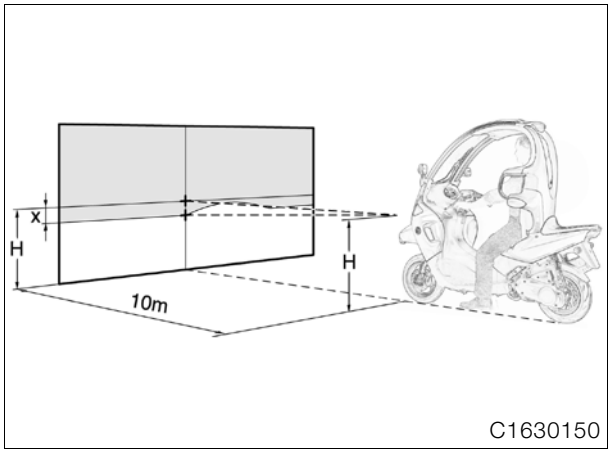
Checking headlight beam angle

– Remove front fairing panel
➠ .....See Group 46

Height adjustment
- Load C1 with 1 rider (75 kg/165 lb) for the adjustment

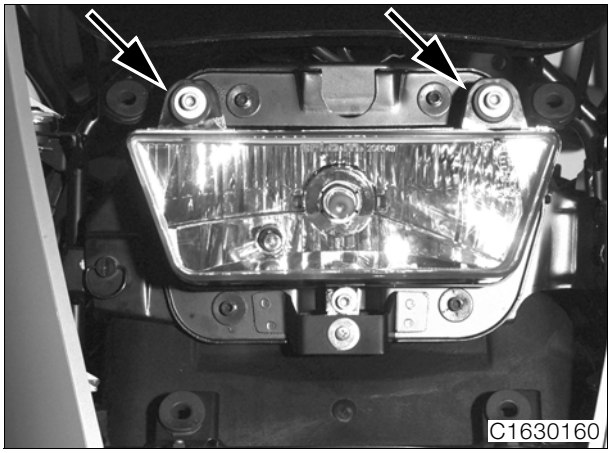


- Adjust headlamp beam range at adjustment screw (arrow)



Adjustment data:
X .....10 cm (3.9 in) at distance of 10 m (32.80 ft)

Lateral adjustment



- Set lateral adjustment at adjustment screws (arrows)

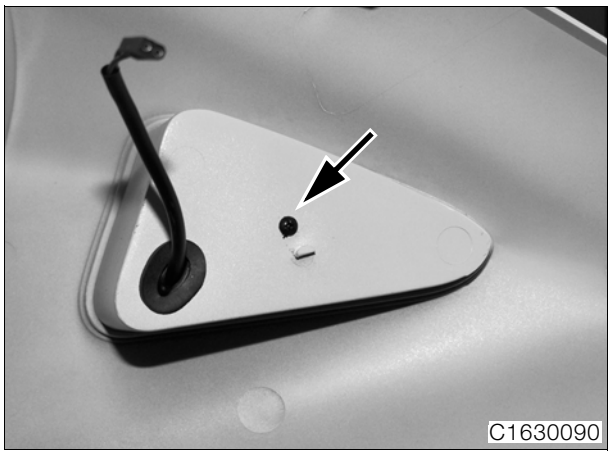
Turn signal

63 13 170 Replacing front left/right turn signal

The procedure for removing and installing the left turn indicator is described below. The procedure for replacing the right turn indicator is essentially the same.

– Remove front fairing panel
– Remove left side trim panel

➠ .....See Group 46



- Remove fastener (arrow)
- Remove turn signal

When installing:

- Installation is the reverse of the removal procedure

Torque specification:

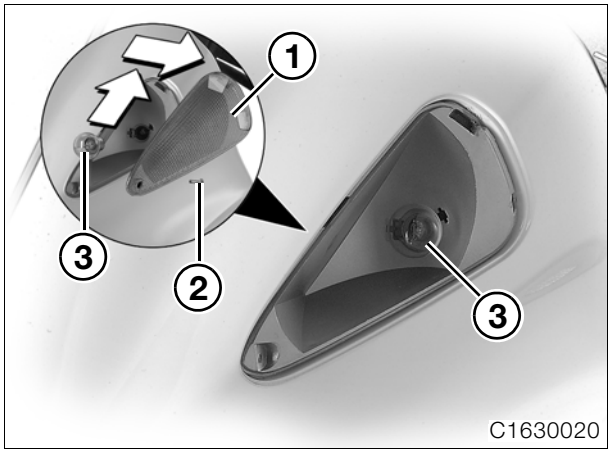
Turn signal attachment..... 2 Nm

63 99 271 Replacing front left/right turn signal bulb

The procedure for the left turn signal is described below. The procedure for replacing the right turn signal is essentially the same.

Attention:
Always switch off the ignition before changing bulbs!

Note:
Never touch inside of reflector and glass on bulbs with bare fingers!



- Remove fastener (2)
- Remove lens (1)
- Press bulb (3) back and disengage by turning it counter-clockwise
- Remove bulb

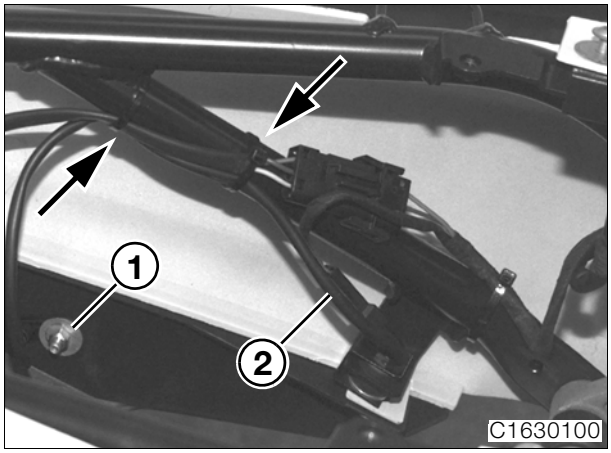
When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Lens attachment ..... 2 Nm

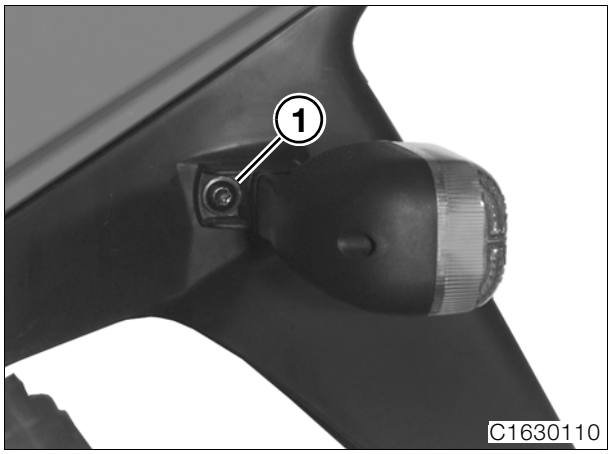
63 23 020 Replacing left/right rear turn signal

The procedure for the left turn signal is described below. The procedure for replacing the right turn signal is essentially the same.

– Remove the rear storage compartment
➟ .....See Group 46



- Open cable ties (arrows)
- Disconnect plug (2)



- Remove fastener (1)
- Remove turn signal

When installing:
- Installation is the reverse of the removal procedure

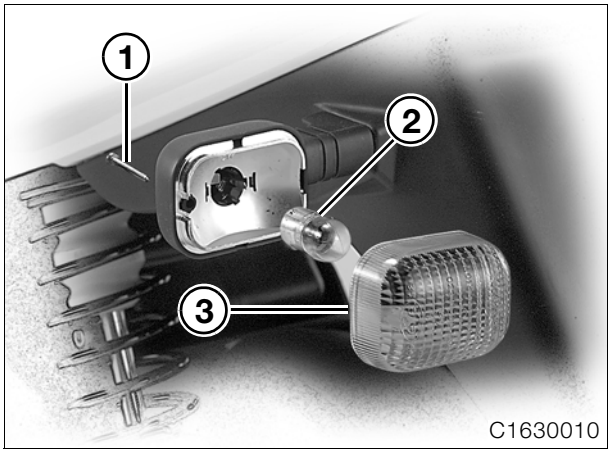
Torque specification:
Turn signal attachment..... 3 Nm

63 99 321 Replacing rear left/right turn signal bulb

The procedure for the left turn signal is described below. The procedure for replacing the right turn signal is essentially the same.

Attention:
Always switch off the ignition before changing bulbs!

Note:
Never touch inside of reflector and glass on bulbs with bare fingers!



- Remove fastener (1)
- Remove lens (3)
- Press bulb (2) forward and disengage by turning it counter-clockwise
- Remove bulb

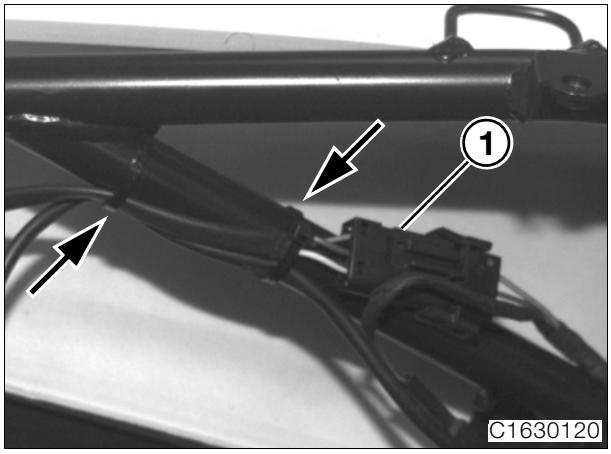
When installing:
- Installation is the reverse of the removal procedure

Torque specification:
Lens attachment ..... 2 Nm

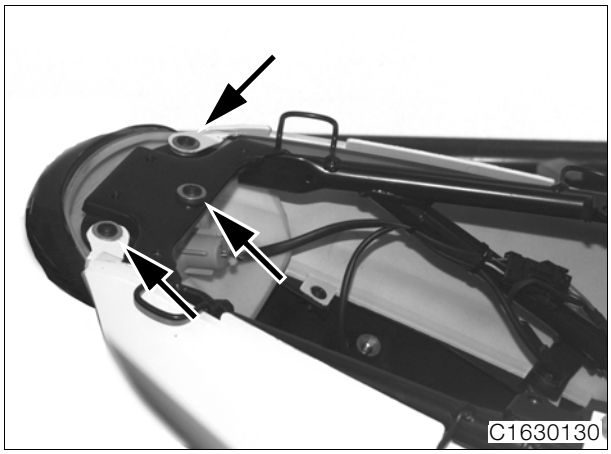
Rear lights

63 21 380 Replacing taillamp cluster

– Remove the rear storage compartment
➟ .....See Group 46



- Open cable ties (arrows)
- Disconnect plug (1)



- Remove fastener (arrows)
- Remove taillamp cluster

When installing:
- Installation is the reverse of the removal procedure

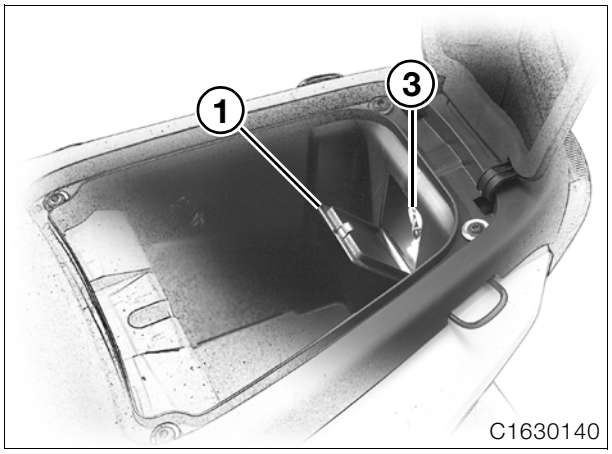
Torque specification:
Taillamp attachment..... 5 Nm

63 99 381 Replacing bulb for brake light/ rear light

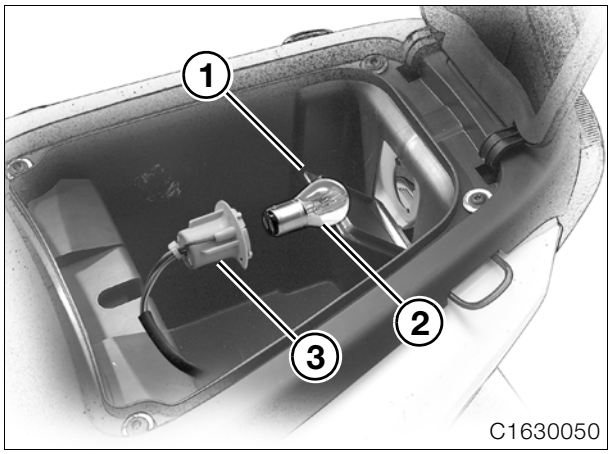
Attention:
Always switch off the ignition before changing bulbs!

Note:
Never touch inside of reflector or glass on bulbs with bare fingers!

– Open the rear storage compartment
➠ .....See Group 46



- Remove cover (1)
- Turn bulb holder (3) counter-clockwise to disengage and remove

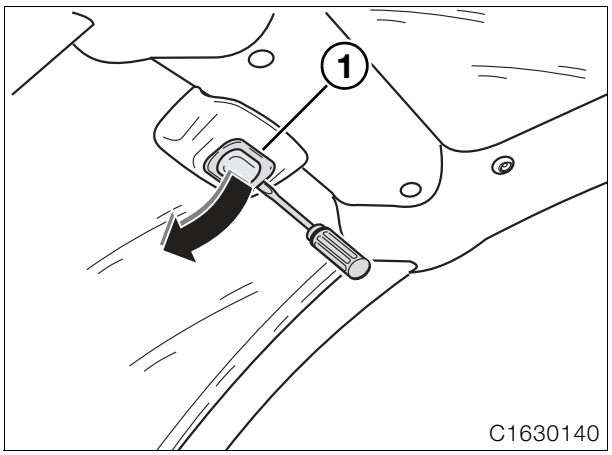


- Press bulb (2) in and disengage by turning it counter-clockwise
- Remove bulb

When installing:
- Installation is the reverse of the removal procedure

Map light

Map light bulb replacement



- Use a small screwdriver to carefully prise the map lamp (1) from its housing
- Extract the bulb from its socket

When installing:
- Installation is the reverse of the removal procedure

65 Optional extras

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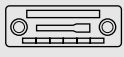
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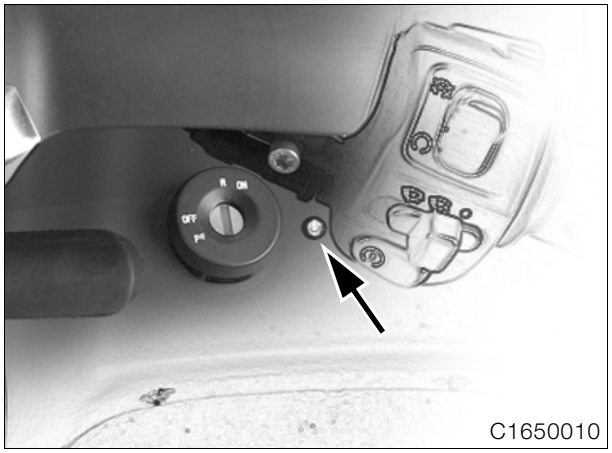
Audio module replacement 14





Alarm system (DWA)

Service and maintenance notice



Note:
If a silver button (arrow) (LED indicator) is installed adjacent to the ignition lock, this indicates that the vehicle is equipped with an alarm system!

It is important to remember the alarm system during all service and maintenance operations. Procedures vary according to the operating mode to which the system is set.

Applies to all service and maintenance operations
Before commencing operations with:

system in mode A or B
- Deactivate the alarm function (➡ 65.4)

Mode C
- Reprogram the alarm system to mode B (➡ 65.6)

Note:
The alarm system activates itself automatically in mode C!

When working with BMW MoDiTeC/DIS plus diagnostic system
Before starting operations with:

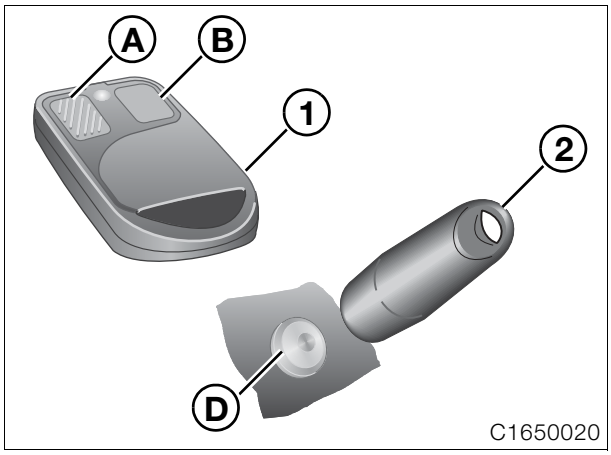
system in mode A
- Reprogram system to mode B (➡ 65.6)

Mode B
- Deactivate alarm function (➡ 65.4)

Mode C
- Program system to mode B (➡ 65.6)

Note:
Return the system to its original operational status following completion of service work.

Activating and checking operation of alarm system



Activating the system
- Extract the ignition key, the immobilizer automatically assumes operational status after 15 seconds
- The turn signals flash briefly
- The alarm function is inactive. You can switch on the ignition (LED indicator lamp (D) lights up), but not start the engine
- The current supply to the starter relay is interrupted, and the emergency off function is active

Deactivating the immobilizer
With the ignition on, deactivate the **immobilizer** by pressing the button (A) on the remote control unit or sticking the inductive key (2) on the indicator LED (D) on the vehicle.
– The vehicle is ready to start

Supplementary (manual) activation of the alarm function (with immobilizer already active)
- With the vehicle immobilizer activated and the ignition off, press button (A) on the remote control unit (1) or place the inductive key (2) on the indicator LED (D); this activates the alarm function in addition to the immobilizer
– The turn signals flash twice
– After 15 seconds the indicator LED (D) starts to flash
– Now the alarm mode is activated in addition to the immobilizer
– After an additional 50 seconds the motion sensor starts to operate

Note:
Now attempts to start the vehicle, disconnect a battery cable or move the vehicle will trigger an alarm lasting 30 seconds; the siren sounds, the turn signals flash, the current supply to the starter relay is interrupted and the emergency off function is activated.

Deactivating the immobilizer and alarm functions
- With the ignition **off, press** button (A) on the remote control unit (1) on place inductive key (2) on the indicator LED (D)
– Simultaneous deactivation of immobilizer and alarm functions
– Turn signals flash briefly
– The system is now deactivated and the indicator LED is off

Note:
After deactivation you have 15 seconds to switch on the ignition; after this period the immobilizer automatically resumes active operation.

The is the system's mode A (basic factory setting with automatic activation of the vehicle immobilizer and manual activation of the alarm function)

Programming the alarm system

It is possible to modify the standard factory settings by programming in selected functions for buzzer, panic alarm and tone type. Automatic activation of the immobilizer and automatic activation of the alarm function can be set to mode A, B or C according to customer preference.

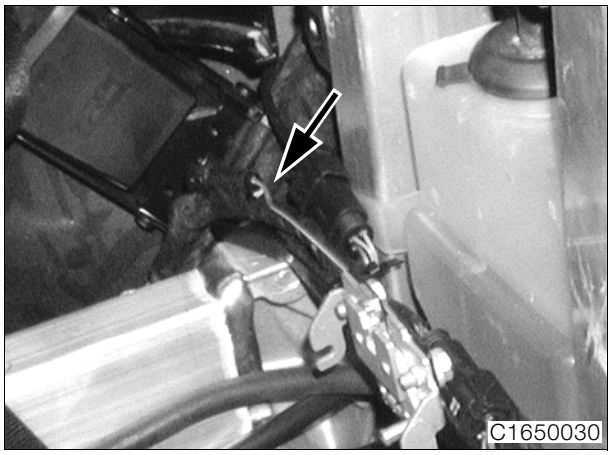
Mode A:
Buzzer ..... OFF
Panic alarm ..... OFF
Tone type ..... VARIABLE PITCH
Automatic activation - immobilizer ..... ON
Automatic activation - alarm function ..... OFF

Mode B:
Buzzer ..... ON
Panic alarm ..... ON
Tone type ..... VARIABLE PITCH
Automatic activation - immobilizer ..... OFF
Automatic activation - alarm function ..... OFF

Mode C:
Buzzer ..... ON
Panic alarm ..... ON
Tone type ..... VARIABLE PITCH
Automatic activation - immobilizer ..... ON
Automatic activation - alarm function ..... ON

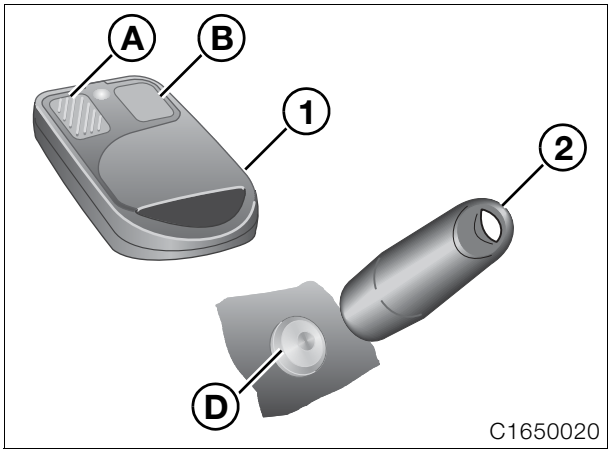
Note:
Program the system using button (A) and button (B) on the remote control unit (1). Programming is possible only with the system deactivated.

Activating the programming mode
– Deactivate the alarm system (the turn signals flash briefly, the indicator LED goes out)
– Open the seat
– Open rear storage compartment cover
– Remove battery cover
– Deactivate the alarm system again if necessary



- Connect the negative lead of the programmer plug (arrow, brown/white wire) with a wire to earth (battery –) **within** 12 seconds
- Press button (A) on the remote control unit
– The buzzer sounds twice with an extended tone
– The turn signals flash twice
– Indicator LED is off
- Switch on the ignition **within** 12 seconds
– The buzzer emits three sequential tones of different pitch
– The programming mode is active
- Remove the wire between the programming plug (brown/white wire) and earth (battery –)

Programming the system



Note:
The alarm system is designed to accomodate open programming on 10 channels, although only 5 channels have to be programmed, and the unassigned ones can be skipped by pressing the button (A) or (B). Each time the system arrives at a new channel the indicator LED (D) lights up and the buzzer sounds to confirm the new status:
Button (A) = high tone
Button (B) = low tone

Channels are always programmed in the following sequence:

Channel	Function	Button (A)	Button (B)
1	Buzzer	ON	OFF
2	Not used	as desired	
3	Not used	as desired	
4	Not used	as desired	
5	Panic alarm	ON	OFF
6	Not used	as desired	
7	Tone type	variable pitch	constant
8	Automatic immobilizer activation	ON	OFF
9	Automatic alarm mode activation	ON	OFF
10	Not used	as desired	

Attention:
When the "automatic activation of immobilizer ON" mode is programmed, the "automatic activation of the alarm function" can be programmed to ON or OFF.
When the "automatic activation of the alarm function ON" is programmed, the "automatic activation of the immobilizer" mode must also be set to ON.

Note:
Refer to the supplementary owner's manual for the alarm system for additional information on programming and encoding spare inductive keys and remote control units

Programming the system to mode B
– Activating programming mode (➟ 65.5)

Note:
The indicator LED-(D) lights up and the buzzer sounds to confirm activation of the button on the remote controller (1) and selection of a specific channel:
Button (A) = high buzzer tone
Button (B) = low buzzer tone

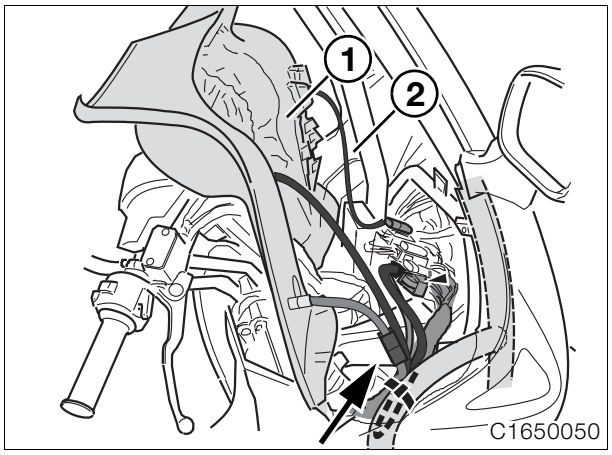
- Press button (A) on remote control unit (buzzer ON)
- Press button (A) (without function)
- Press button (A) (without function)
- Press button (A) (without function)
- Press button (A) (without function)
- Press button (A) (panic alarm ON)
- Press button (A) (without function)
- Press button (A) (variable-pitch-ton)
- Press button (B) (automatic immobilizer activation OFF)
- Press button (B) (automatic activation of alarm function OFF)
- Press button (without function)

– The buzzer sounds three times, the settings have been adopted by the system
- Switch off the ignition
- Press button (A)

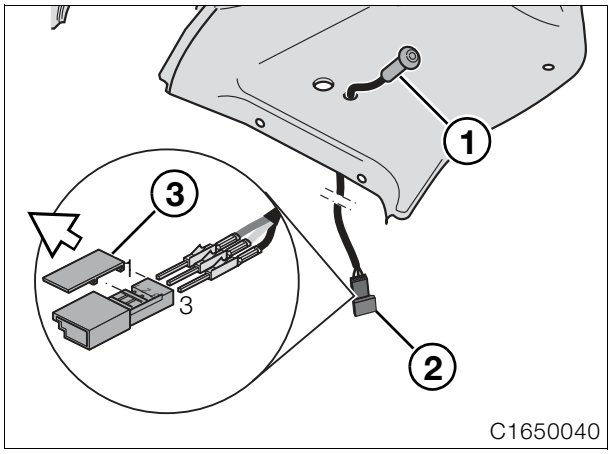
– The buzzer sounds
– The turn signals flash briefly
– The system has now been reprogrammed to mode B, deactivated and the indicator-LEDs (D) go out

Indicator LED replacement

– Deactivate alarm system (➠ 65.4)



- Remove instrument trim far enough to gain access to the plug-in connection (arrow)
- Disconnect plug



- Open plug housing (2) by sliding cover (3) to the side
- Remove wire
- Remove indicator LED (1)

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

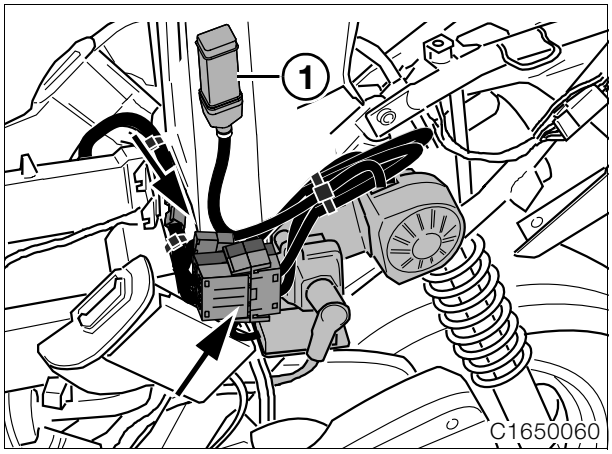
⚠ Attention:
When installing ensure that the wiring is routed correctly! Avoid potential areas of rubbing and abrasion!

- Correctly install wire in plug housing

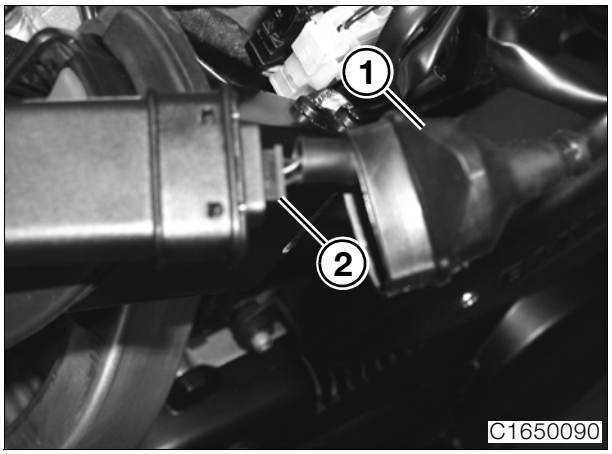
Socket	**wire colour**
1	red
2	white
3	black

Control unit replacement

– Deactivate the alarm system (➠ 65.4)
– Remove seat
– Remove the backrest
➠ .....See Group 52
– Remove rear left side panel
➠ .....See Group 46

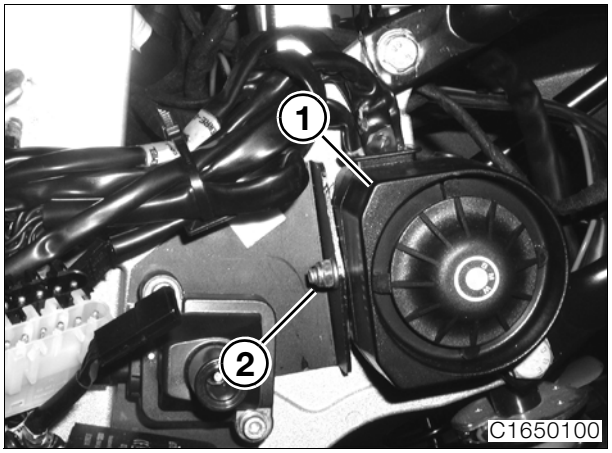


- Separate plug-in connections (arrows)
- Remove receiver (1) from key fob



- Pull rubber cap (1) from receiver
- Disconnect plug (2)

For enhanced clarity the illustrations show the components with the ignition cable removed.



- Remove fastener (2)
- Remove control unit (1)

When installing:

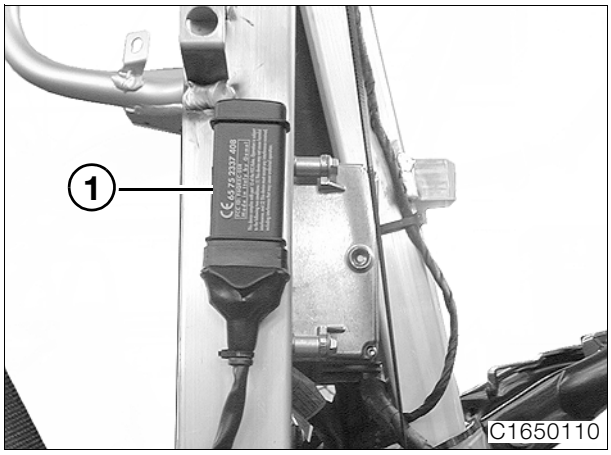
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
When installing take pains to ensure that all wiring is routed correctly! Position to avoid potential rubbing and abrasion!

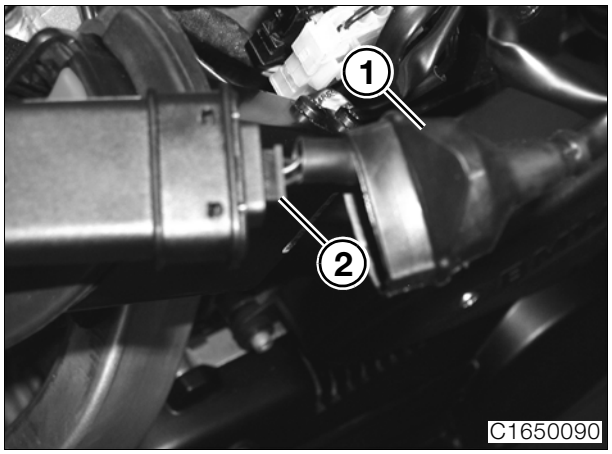
Torque specification:
Control unit .....hand-tight

Receiver replacement

– Deactivate alarm system (➟ 65.4)
– Remove seat
– Remove the backrest
➟ .....See Group 52
– Remove rear left side panel
➟ .....See Group 46



- Remove receiver (1) from key fob



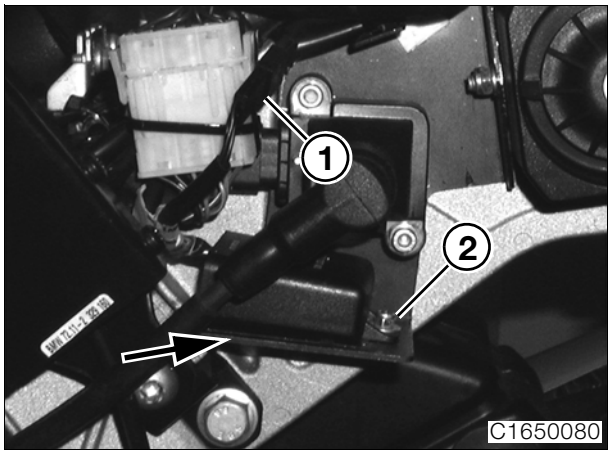
- Remove rubber cap (1) from receiver
- Disconnect plug (2)

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
When installing take pains to ensure that all wiring is routed correctly! Position to avoid potential rubbing and abrasion!

Motion sensor replacement

– Deactivate alarm system (➟ 65.4)
– Remove seat
– Remove the backrest
➟ .....See Group 52
– Remove rear left side panel
➟ .....See Group 46



- Disconnect plug (1)
- Remove fastener (2)

Note:
A tape strip with adhesive backing on both sides (arrow) serves as a supplementary attachment for the motion sensor!

- Motion sensor removal

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

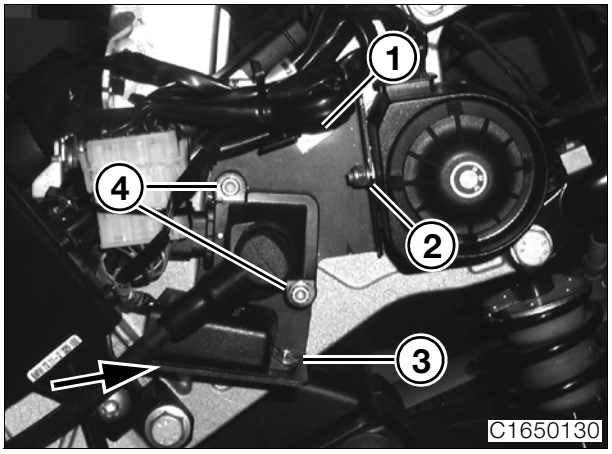
Attention:
All adhesive surfaces must be clean, dry and free of grease and oil!
When installing take pains to ensure that all wiring is routed correctly! Position to avoid potential rubbing and abrasion!

- Always use new self-locking nut

Torque specification:
Attach motion sensor .....hand-tight

Replacing alarm system bracket

– Deactivate alarm system (➟ 65.4)
– Remove seat
– Remove the backrest
➟ .....See Group 52
– Remove rear left side panel
➟ .....See Group 46



- Detach (2) control unit
- Detach motion sensor (3)

Note:
A tape strip featuring adhesive backing on both sides serves as a supplementary attachment for the motion sensor (arrow)!

- Release motion sensor from bracket
- Detach (4) ignition coil

Note:
The bracket is also adhesive-bonded to the frame at point (1)!

- Remove bracket

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
All adhesive surfaces must be clean, dry and free of grease and oil!
When installing take pains to ensure that all wiring is routed correctly! Position to avoid potential rubbing and abrasion!

- Always use new self-locking nut

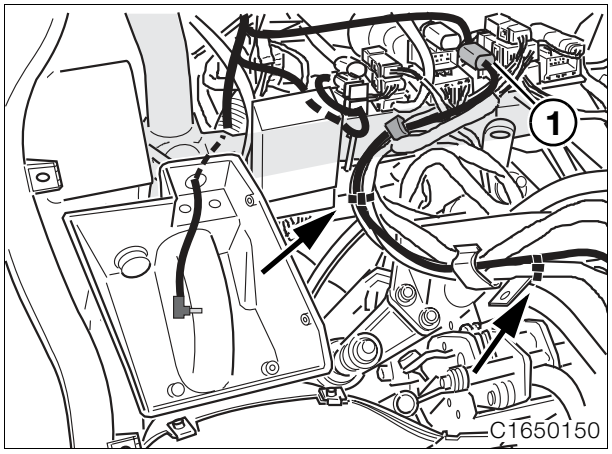
Torque specification:
Motion sensor .....hand-tight
Control unit .....hand-tight
Ignition coil bracket..... 5 Nm

Fun audio system

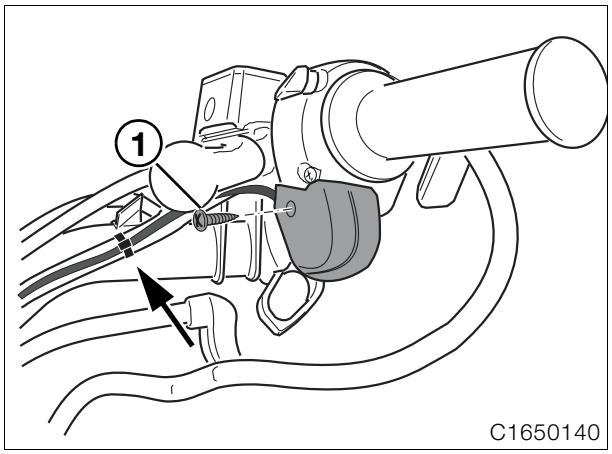
Volume control replacement

– Remove instrument trim

➠ .....See Group 46



- Open cable ties (arrows)
- Disconnect plug (1)



- Open cable tie (arrow)
- Remove fastener (1)
- Slide controller forward and remove together with wiring harness

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
When installing take pains to ensure that all wiring is routed correctly! Position to avoid potential rubbing and abrasion!

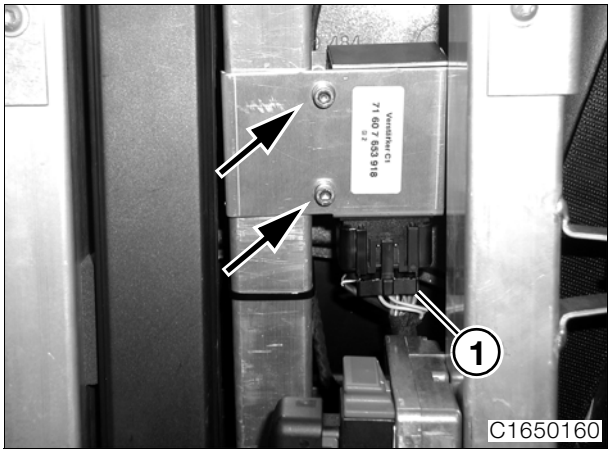
Torque specification:
Volume control attachment .....hand-tight

Amplifier replacement

– Remove the backrest

➠ .....See Group 52

- Mark installed position



- Remove fasteners (arrows)
- Slide amplifier to the left behind the vehicle frame and then extract forward to remove
- Disconnect plug (1)

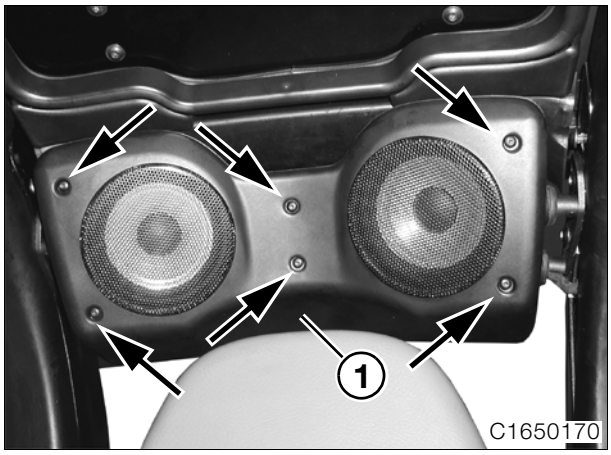
When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

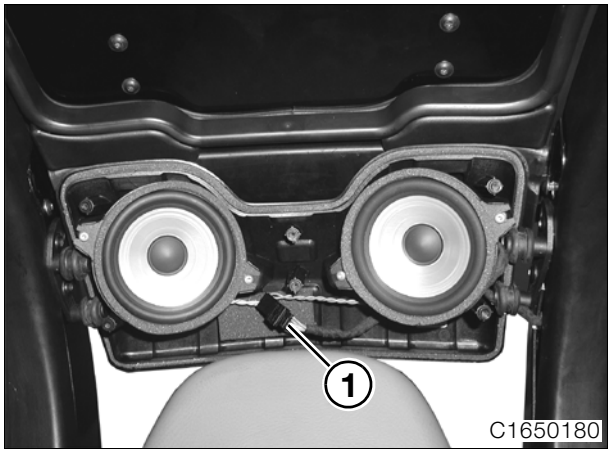
Attention:
When installing take pains to ensure that amplifier is positioned correctly and that all wiring is routed as specified! Position to avoid potential rubbing and abrasion!

Torque specification:
Amplifier attachment ..... 2 Nm

Speaker removal, installation, replacement



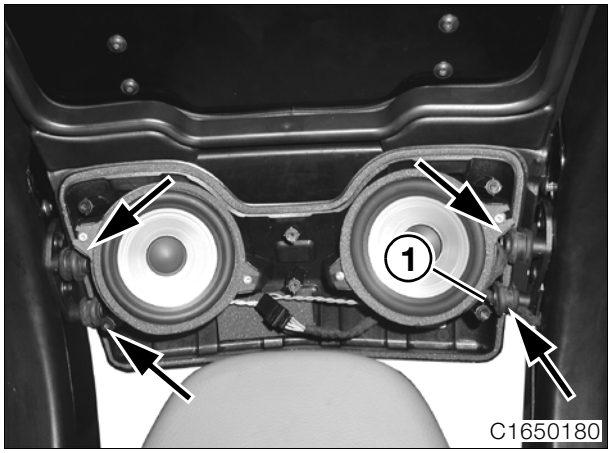
- Remove fasteners (arrows)
- Remove front trim (1) toward the front



- Disconnect plug (1)
- Pull speakers to the rear to remove

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



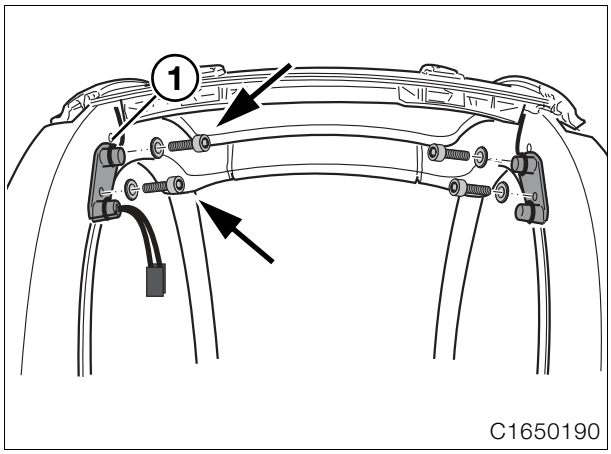
Attention:
The rubber grommets (arrows) must seat securely in the surrounding groove in the housing!
The speaker cable runs through the rubber grommet (1). Do not crimp during installation of front trim!
Position to avoid rubbing and abrasion!

Torque specification:
Front trim attachment ..... 2 Nm

Replacing left/right speaker brackets

The following section provides a portrayal of the procedural sequence to pursue when extracting the speaker located upon the left side of this vehicle. The operations for the bracket on the right side are essentially the same.

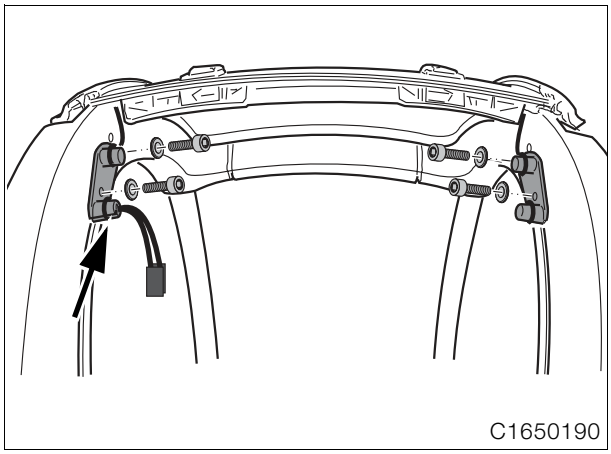
– Speaker removal
- Remove rubber grommets



- Remove fasteners (arrows)
- Remove bracket (1)

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:



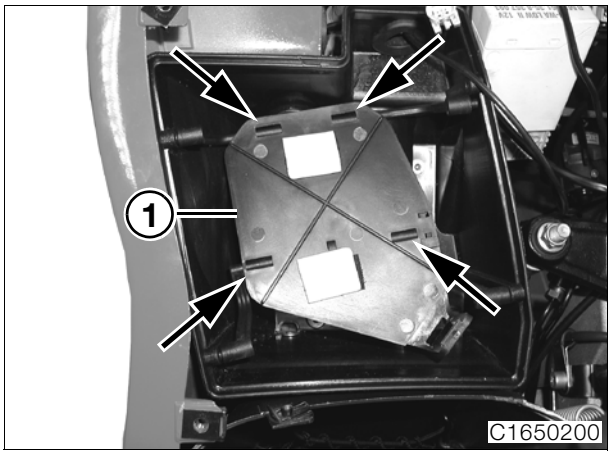
Attention:
Insert speaker in the groove (arrows) of the bracket on the left!
Route to avoid rubbing and abrasion!

Torque specification:
Speaker bracket attachment ..... 4 Nm

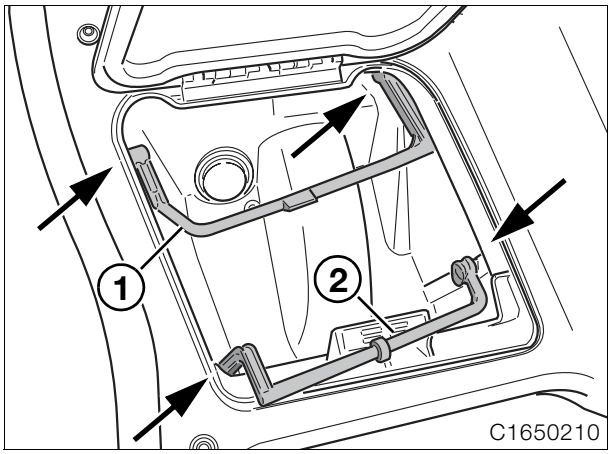
Audio module replacement

- Open main storage compartment
- Remove audio unit

For enhanced clarity to illustration shows the components with the audio module removed.



- Unsnap retainer plate (1) from brackets (arrows)



- Remove front (1) and rear (2) rod by moving to the inside out of the supports (arrows) in the storage compartment

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:
- Allow rods to snap securely into place in the retainingplate

Note:
Bond the soft felt tape strip for the Velcro attachments onto the audio unitBond the tape to the retaining plate.

72 Seat belts

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Checking operation of central belt release mechanism 4

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Replacing Bowden cable with belt buckles on left/right 5

Replacing indicator switches for seat belt 5

Replacing 3-point seat belt 6

Replacing 2-point seat belt 8

Replacing guide for seat belt at shoulder bar 9





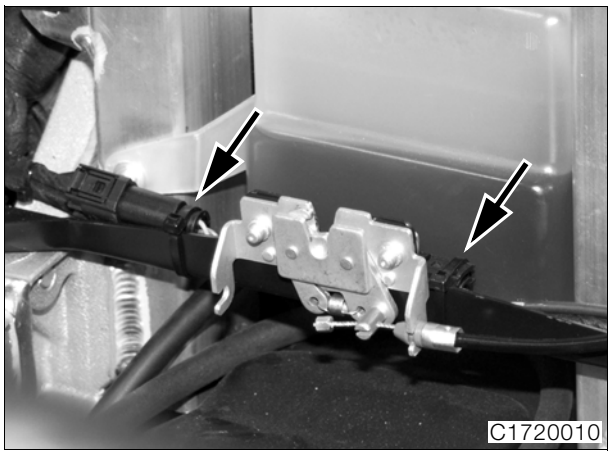
Seat belts

72 11 020 Removing and installing central belt release mechanism

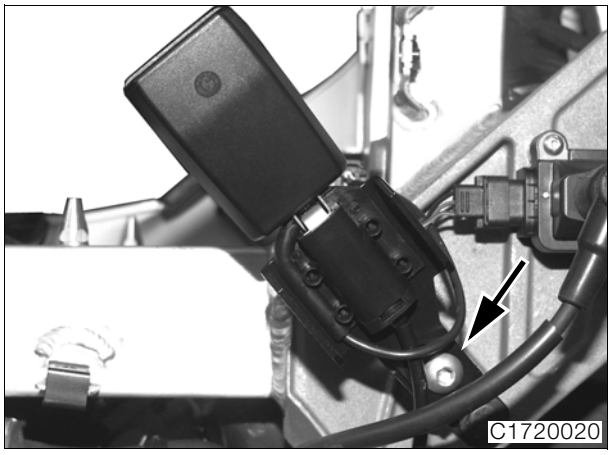
– Open the seat
– Remove instrument trim
– Remove top tunnel panel
– Remove left and right service covers
– Remove left and right rear side trim panels

➠ .....See Group 46

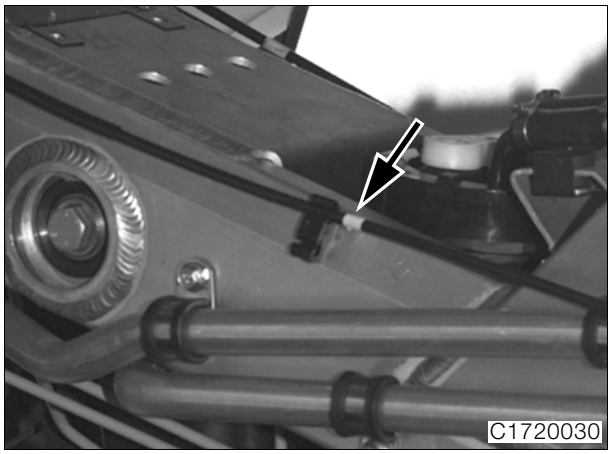
- Loosen top, left and right tunnel panels



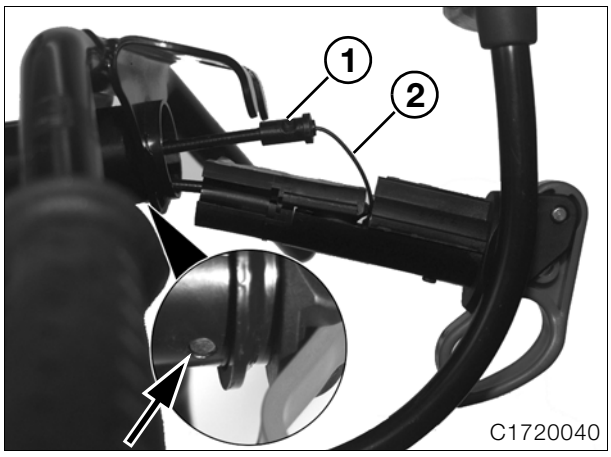
- Release cable ties (arrows)
- Disconnect plug connection for seat-belt switch



- Detach left/right belt buckle attachment (arrow)



- Mark Bowden cable (arrow) on left/right of bracket
- Use 11 mm (0.433 in) open-end spanner to release Bowden cables from holders
- Pull Bowden cables as far forward as possible



Attention:
Press in dowel pin (arrow) just far enough to allow extraction of the release assembly to the rear - it can break!

- Press dowel pin (arrow) on release assembly whilst simultaneously removing the release assembly by extracting to the rear, pull on Bowden cable as required
- Detach Bowden cable (2) on left/right
- Remove core of Bowden cable (1)

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

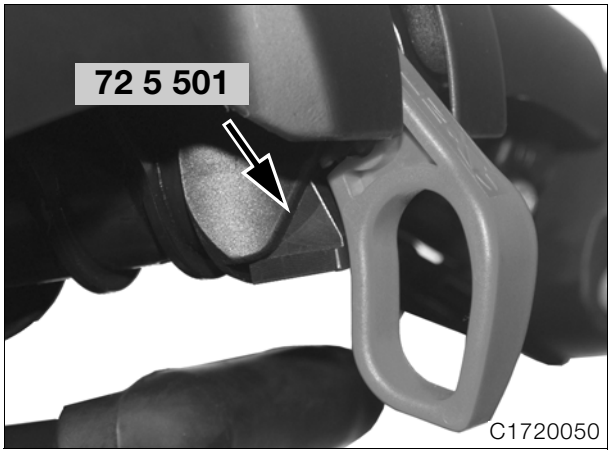
Attention:
Note marks on Bowden cables.
When installing, make sure that the Bowden cables and the cables are correctly routed.
Make sure that the Bowden cables are free of kinks.
Make sure that the locking pin of the release unit is correctly seated in the bore - visual inspection.

- Check operation of central belt release mechanism

Torque specification:
Belt buckle attachment ..... 42 Nm

Checking operation of central belt release mechanism

- Engage the seat belts in their buckles



- Use test template (arrow), **BMW No. 72 5 501,** to pretension the red lever
- Turn the handlebars all the way to the right and the left

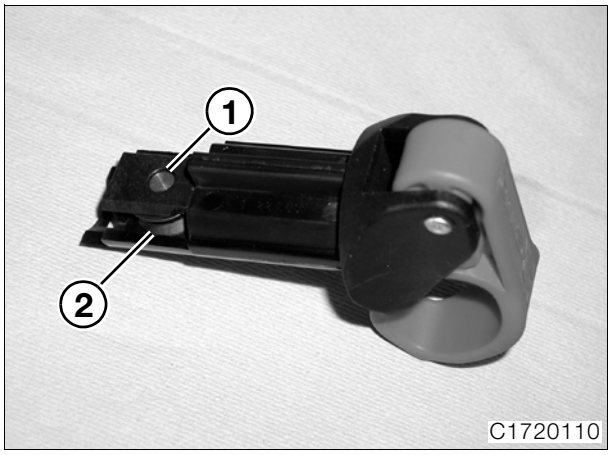
Note:
Make sure that the seat belts are not released from the buckles; if necessary check and correct the routing of the Bowden cables

Inertia reel replacement

– Removing central belt release mechanism



- Remove upper section (arrow) by pulling upward



- Remove brass rod (1)
- Extract reel (2) out the side

When installing:

- Installation is the reverse of the removal procedure

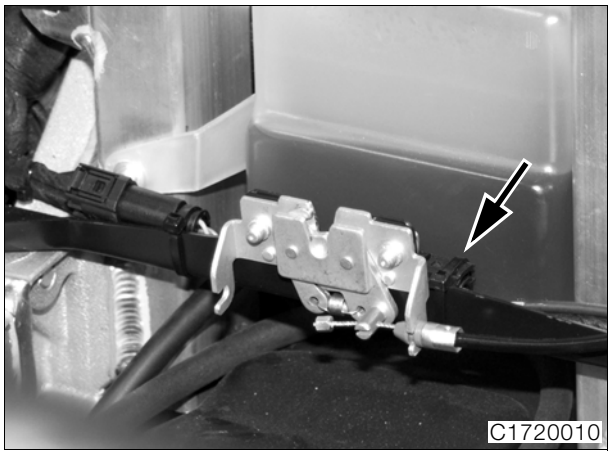
Replacing Bowden cable with belt buckles on left/right

Note:
Belt buckles and Bowden cables cannot be replaced individually

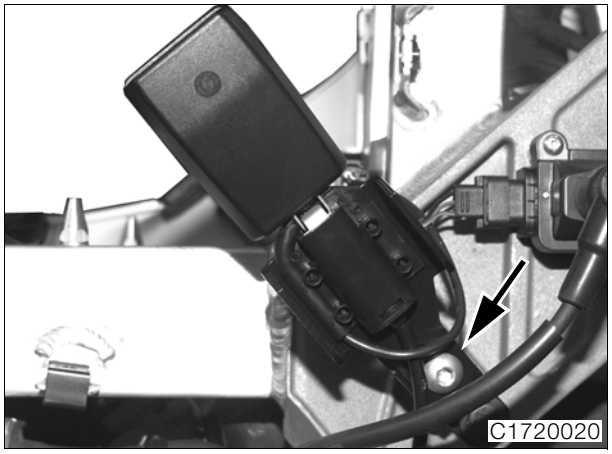
– Open the seat
– Remove instrument trim
– Remove top tunnel panel
– Remove left and right service covers
– Remove left and right rear side trim panels

➠ .....See Group 46

- Loosen top, left and right tunnel panels
- Removing central belt release mechanism



- Undo cable tie (arrow)
- Disconnect plug connection for seat-belt switch



- Detach left/right belt buckle (arrow)

When installing:
- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
When installing, make sure that the Bowden cable and the cable are correctly routed.
Make sure that the Bowden cables are free of kinks.
Additional information for right buckle do not crimp or damage safety belt!

- Check operation of central belt release mechanism

Torque specification:
Belt buckle attachment ..... 42 Nm

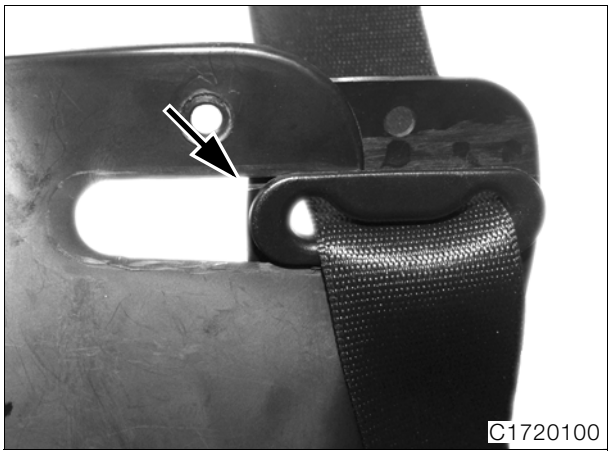
Replacing indicator switches for seat belt

Note:
The control switches are an integral component of the belt buckles and cannot be replaced separately, replace belt buckle as necessary

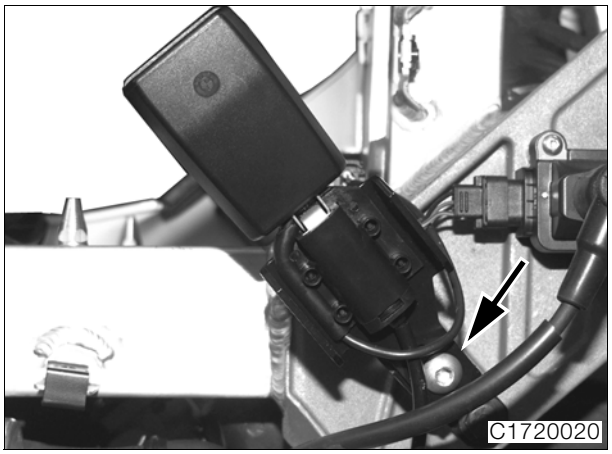
72 11 003 Replacing 3-point seat belt

– Open the seat
– Remove the backrest
– Remove head restraint
– Remove the rear storage compartment
– Remove left service cover
– Remove rear left side panel
– Remove the rear panel
– Remove left C-pillar trim panel
– Remove rear left side panel
– Remove inside trim from left C-pillar

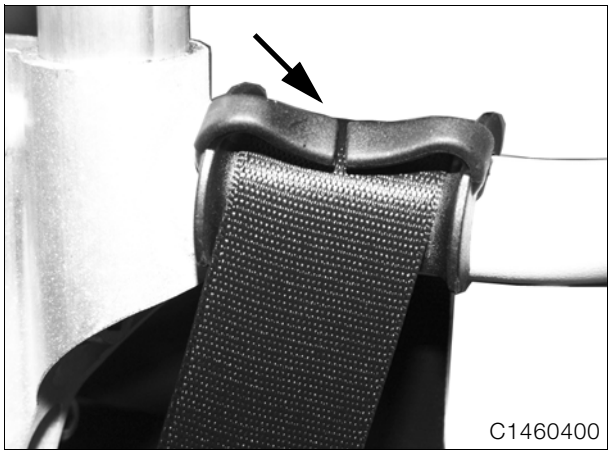
➠ .....See Group 46



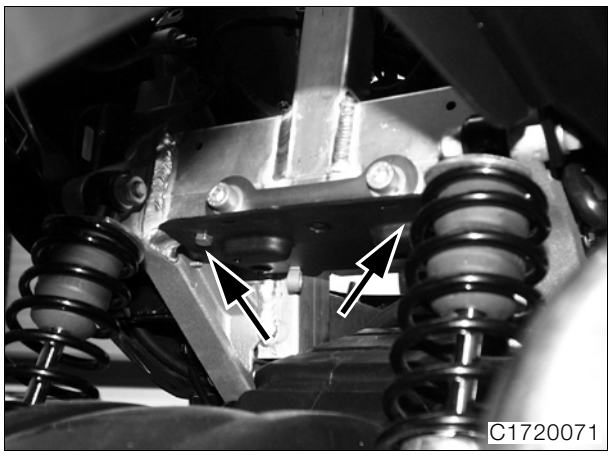
- Use a dull tool to pull off the belt passage (arrow) in inner trim on the C-pillar by removing to the side



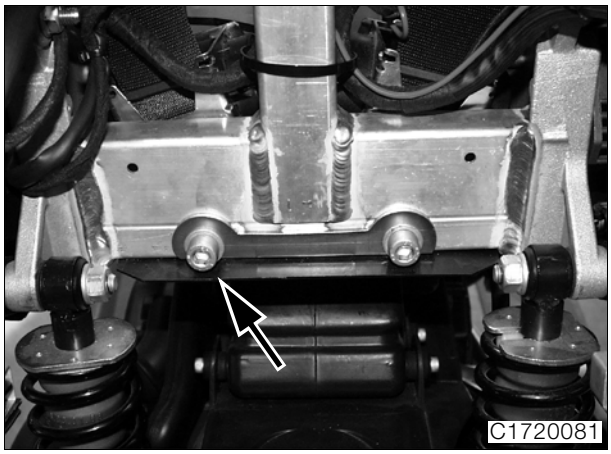
- Detach belt buckle (arrow)

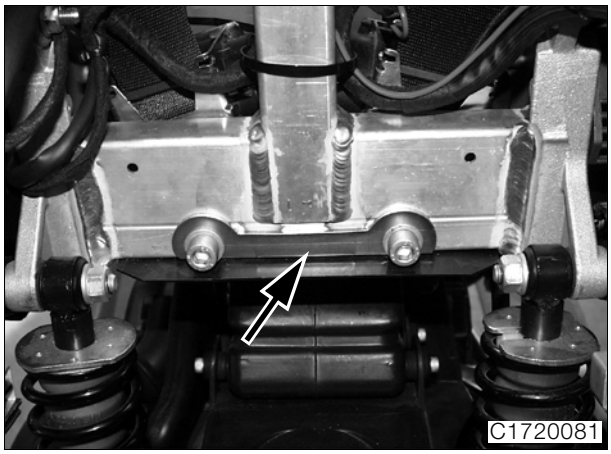


- Disengage seat belt from guide (arrow) at shoulder bar



- Detach secondary mudguard (arrows)
- Remove secondary mudguard





- Detach inertia reel (arrow)
- Pull inertia reel down and to the rear to remove

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
When installing, make sure that the seat belt, Bowden cable and cable are correctly routed.
Make sure that the Bowden cables are free of kinks.
Do not trap the seat belt or damage it!

- Always install reinforcement plate (arrow), retrofit as necessary
- Check operation of central belt release mechanism

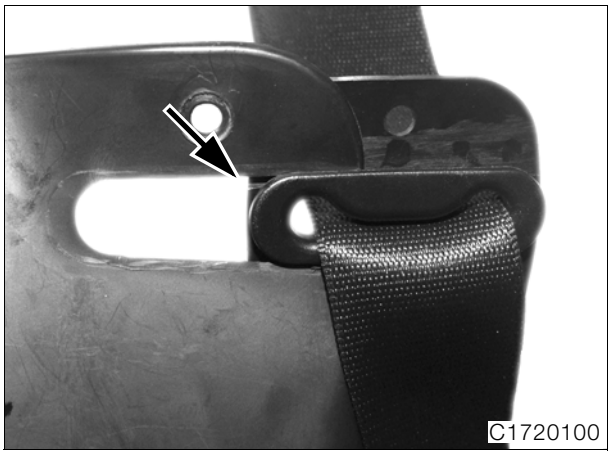
Torque specification:

Belt buckle attachment ..... 42 Nm
Inertia reel attachment..... 42 Nm
Secondary mudguard attachment ..... 5 Nm

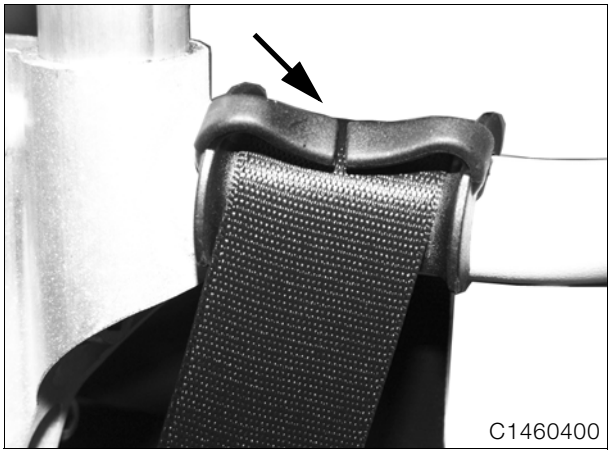
72 11 002 Replacing 2-point seat belt

– Open the seat
– Remove the backrest
– Remove head restraint
– Remove the rear storage compartment
– Remove the rear panel
– Remove right C-pillar trim panel
– Remove inside trim from right C-pillar

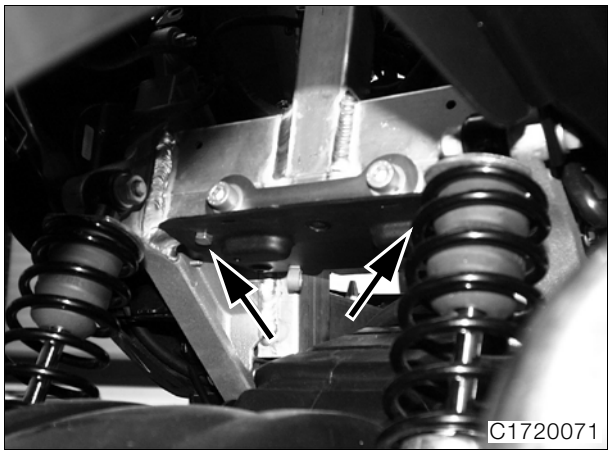
➠ .....See Group 46



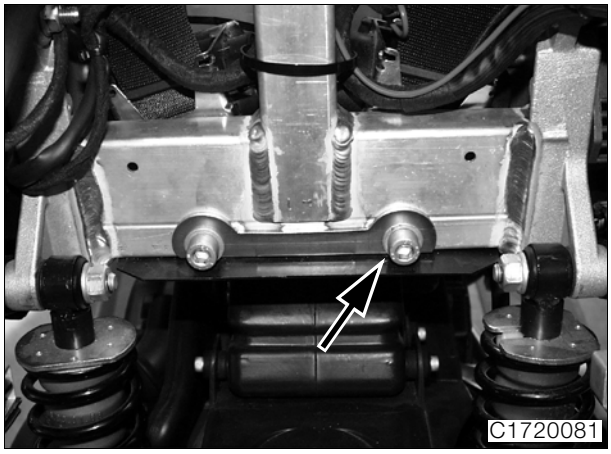
- Use a dull tool to pull the belt passage (arrow) in the interior trim of the C-pillar to one side



- Disengage seat belt from guide (arrow) at shoulder bar



- Detach secondary mudguard (arrows)
- Remove secondary mudguard

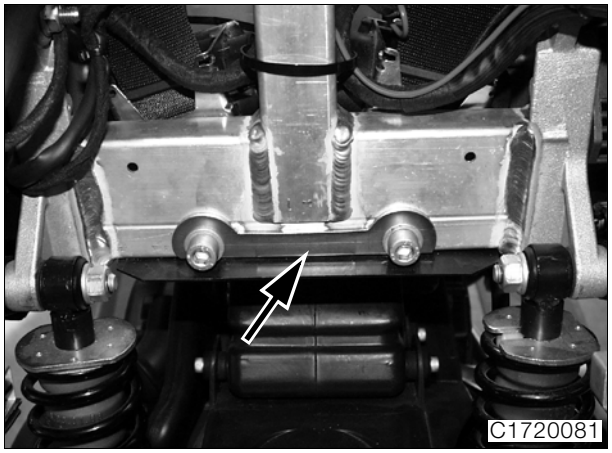


- Detach inertia reel (arrows)
- Pull inertia reel down and to the rear to remove

When installing:

- While installation is basically a reversal of the removal process, careful attention should be directed toward the following:

Attention:
When installing, make sure that the seat belt, Bowden cable and cable are correctly routed.
Make sure that the Bowden cables are free of kinks.
Do not trap the seat belt or damage it!



- Always install reinforcement plate (arrow), retrofit as necessary
- Check operation of central belt release mechanism

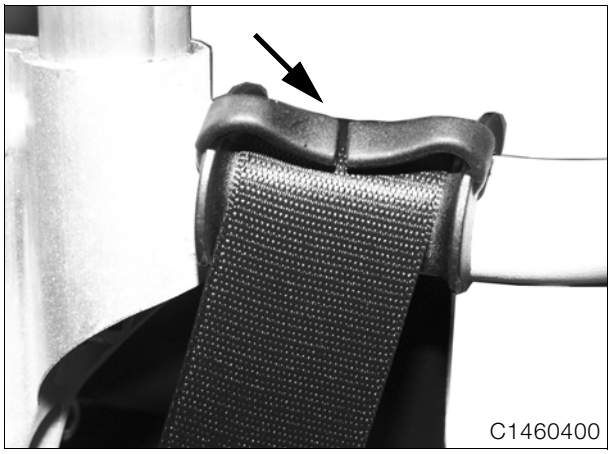
Torque specification:
Inertial reel unit attachment ..... 42 Nm
Secondary mudguard attachment ..... 5 Nm

Replacing guide for seat belt at shoulder bar

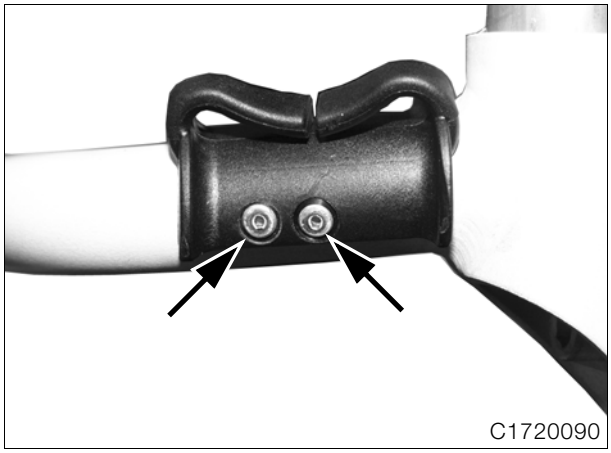
The procedure for replacing the left belt guide is described below. The procedure for the right belt guide is similar.

– Remove the backrest
– Remove head restraint
– Remove the rear storage compartment
– Remove the rear panel
– Remove inside trim from left C-pillar
– Remove lightweight foam element from left C-pillar

➟ .....See Group 46



- Disengage seat beat from guide (arrow)



- Drill out pop rivets (arrows)

When installing:

- Installation is the reverse of the removal procedure

