

TRANSMISSION

Clutch - Repair Instructions

MAINTENANCE AND INSPECTION

21 00 006 BLEEDING CLUTCH HYDRAULIC SYSTEM

Special tools required:

- 21 5 030

Necessary preliminary tasks:

- Remove transmission underbody protection if necessary.
- Remove microfilter housing is necessary.

IMPORTANT: From 08.06 a plastic clutch slave cylinder is installed in the E8X, E9X. Important notes on installation are described in this work step.

Unfasten nuts and remove clutch slave cylinder (pressure line remains connected).

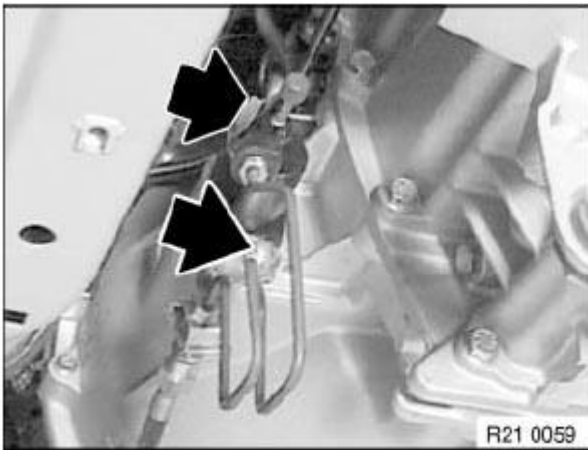


Fig. 1: Locating Clutch Slave Cylinder Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Fit special tool 21 5 030 on clutch slave cylinder (1).

Press piston rod (2) with aid of spindle completely into clutch slave cylinder.

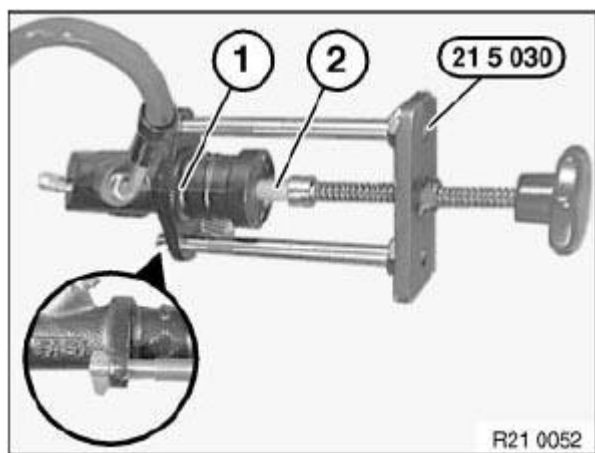


Fig. 2: Fitting Special Tool (21 5 030) On Clutch Slave Cylinder
Courtesy of BMW OF NORTH AMERICA, INC.

Connect bleeder unit to brake fluid expansion tank.

IMPORTANT: Check relevant Operating Instructions for each device.
Charging pressure should not exceed 2 bar.

Connect bleeder hose to bleed valve (1).

Hold clutch slave cylinder in illustrated position (refer to **Fig. 2**) with special tool **21 5 030**.

Open bleeder valve (1).

If bubble-free brake fluid emerges, retract piston rod (2) of clutch slave cylinder with aid of spindle a little and press in again.

If no air bubbles escape, close bleeder valve (1), otherwise repeat procedure.

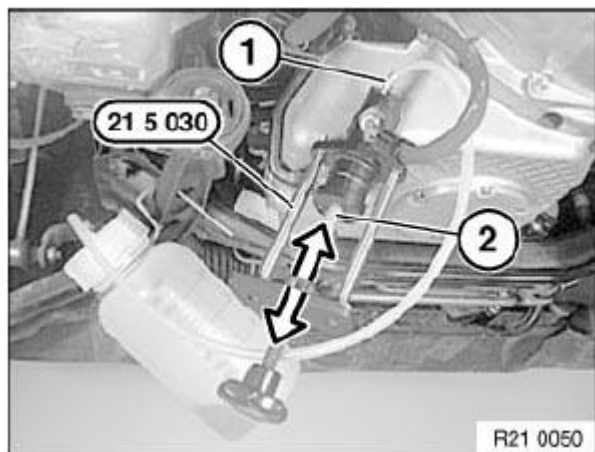


Fig. 3: Identifying Bleeder Valve

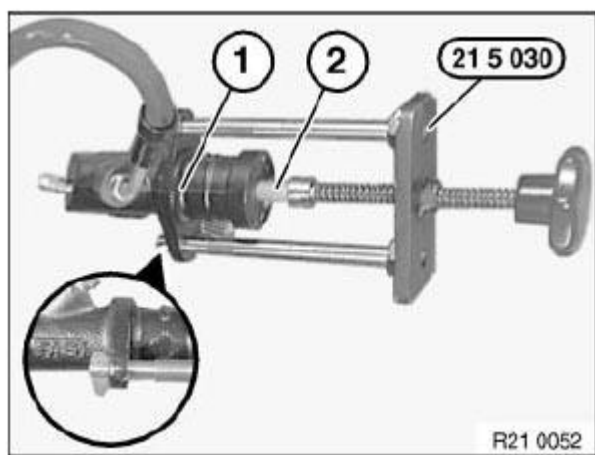
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not under any circumstances remove special tool 21 5 030 from clutch slave cylinder when brake system is pressurized.
Piston with push rod can jump out of clutch slave cylinder.

Switch off bleeder unit or remove from brake fluid expansion tank.

Slowly retract piston rod (2) of clutch slave cylinder (1) with special tool 21 5 030.

Remove special tool 21 5 030 from clutch slave cylinder (1).

**Fig. 4: Fitting Special Tool (21 5 030) On Clutch Slave Cylinder**

Courtesy of BMW OF NORTH AMERICA, INC.

Fit clutch slave cylinder to transmission.

Installation:

Replace self-locking nuts.

Tightening torque **21 52 5AZ** .

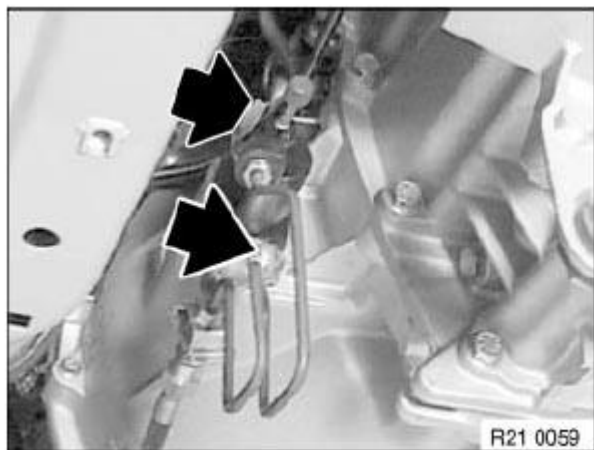


Fig. 5: Locating Clutch Slave Cylinder Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Correct brake fluid level in expansion tank.

CLUTCH WITH DRIVING DISC

11 22 513 REPLACING ROLLER BEARING FOR DUAL-MASS FLYWHEEL

Special tools required:

- 23 4 031
- 23 4 033
- 23 4 035
- 23 4 036
- 23 4 040

Necessary preliminary tasks:

- **Transmission** removed.
- Remove CLUTCH RELEASE BEARING

Pressing out roller bearing:

Install special tool **23 4 031** in front of drive shaft spline teeth.

Screw in grease spindle **23 4 033** completely.

Brass tip must immerse fully into roller bearing.

Press in grease with grease gun **23 4 040** until roller bearing is disengaged from drive shaft.

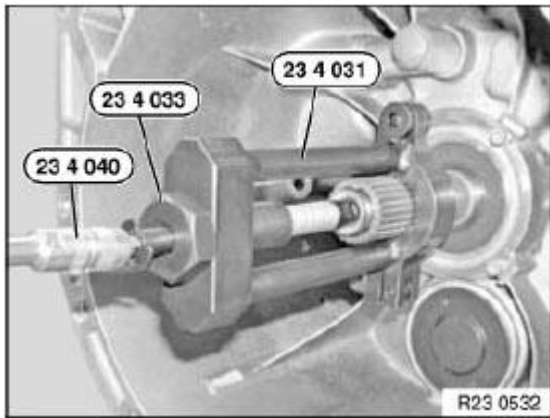


Fig. 6: Identifying Special Tools (23 4 040), (23 4 033) And (23 4 031)
Courtesy of BMW OF NORTH AMERICA, INC.

Remove special tool 23 4 031.

Remove pressed-in grease (1) from drive shaft completely.

Then reinstall special tool.

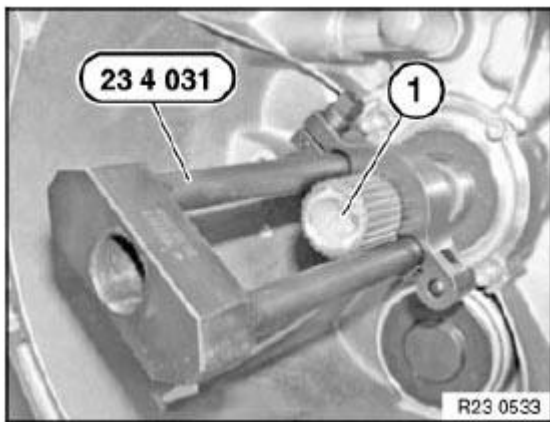


Fig. 7: Identifying Special Tools (23 4 031)
Courtesy of BMW OF NORTH AMERICA, INC.

Pressing in roller bearing:

Slide in pressure spindle 23 4 035.

Attach thrust piece 23 4 036 to pressure spindle.

Push roller bearing (1) onto thrust piece.

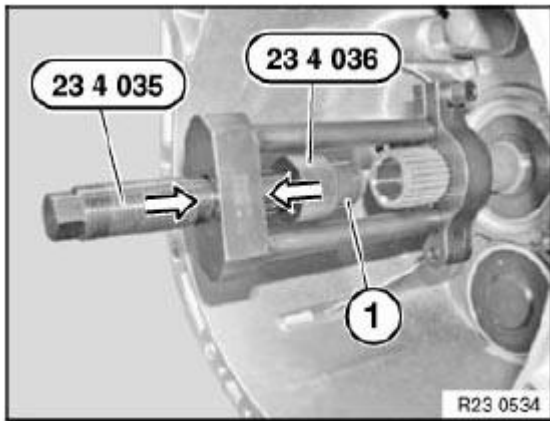


Fig. 8: Identifying Special Tools (23 4 035) And (23 4 036)
Courtesy of BMW OF NORTH AMERICA, INC.

Screw in pressure spindle (1) until roller bearing is fully pressed in.

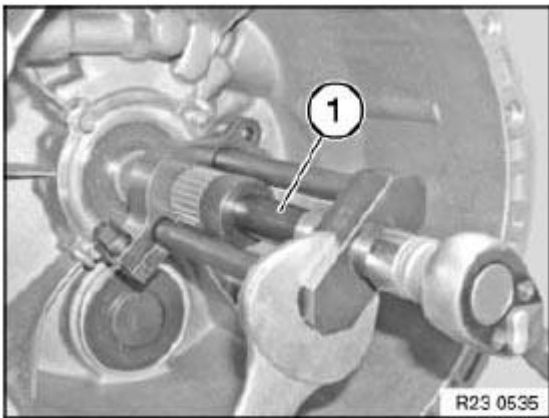


Fig. 9: Screwing Pressure Spindle
Courtesy of BMW OF NORTH AMERICA, INC.

21 21 500 REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240)

Special tools required:

- 11 9 260
- 11 9 265
- 21 2 170
- 21 2 180
- 21 2 270

Necessary preliminary tasks:

Remove **transmission** . See **REMOVING AND INSTALLING TRANSMISSION (GS6-53DZ) N54**
M57T2

Block flywheel with special tools **11 9 260** and **11 9 265** .



Fig. 10: Identifying Special Tools (11 9 260) And (11 9 265)
Courtesy of BMW OF NORTH AMERICA, INC.

N54

Block flywheel with special tools **11 9 260** and **11 9 265** .

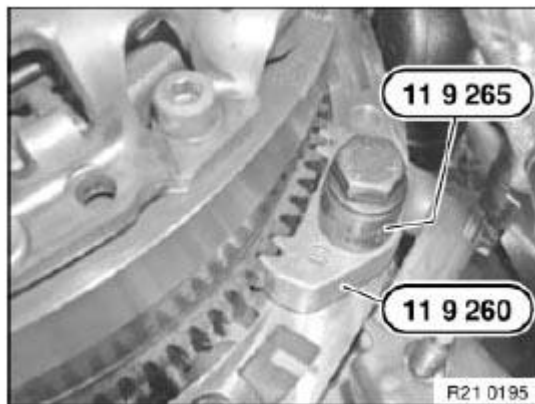


Fig. 11: Identifying Special Tools (11 9 260) And (11 9 265)
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws and remove clutch from flywheel.

Installation:

Clean flywheel and check for wear and damage.

Replace damaged flywheel.

IMPORTANT: Always replace clutch plates fouled e.g. by oil, cleaning agent.

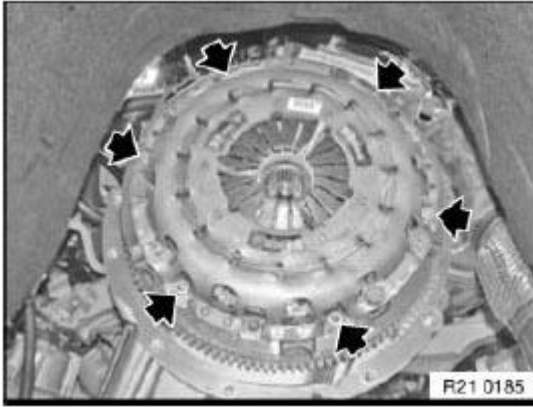


Fig. 12: Locating Flywheel Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Observe the following procedure when installing the removed clutch and clutch plate.

Insert special tool **21 2 180** in clutch.

Press special tool **21 2 180** together at handles (1) as far as it will go and tighten down knurled screws (2).

Adjustment ring of clutch is now secured in its original position (wear position).

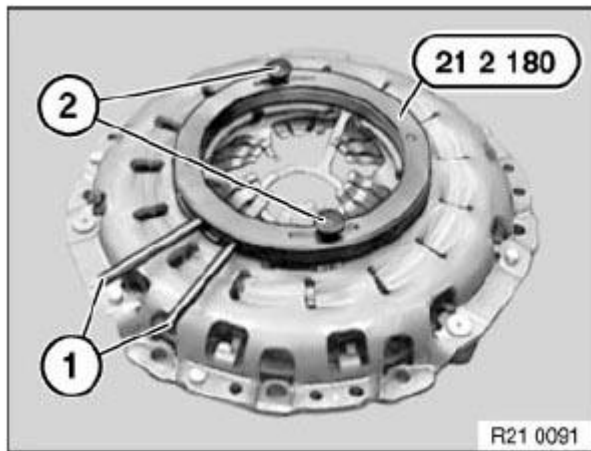


Fig. 13: Identifying Knurled Screws

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Locking hooks (1) of special tool **21 2 180** must engage in openings of pressure spring.

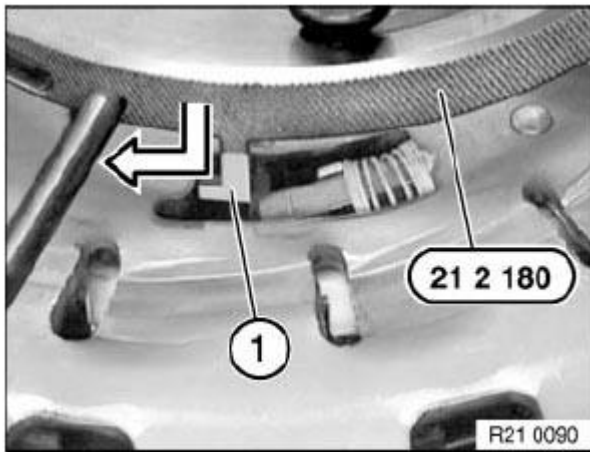


Fig. 14: Locking Hooks Of Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.

Fit special tool 21 2 170 and tighten down at knurled screw (1).

Screw in spindle (2) until diaphragm spring (3) is tensioned on stop.

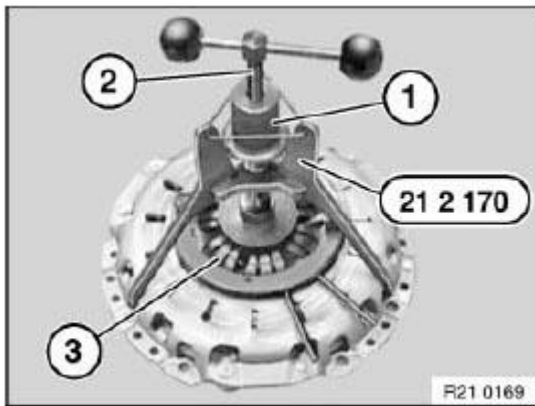


Fig. 15: Identifying Knurled Screws, Spindle And Diaphragm Spring
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Insert special tool 21 2 170 only in area of bores for dowel pins.

Centre clutch plate (1) with special tool 21 2 270.

IMPORTANT: Install clutch plate in correct position.

Note designation for "engine side" / "transmission side". Handle clutch plate with care. Do not touch surfaces of friction linings.

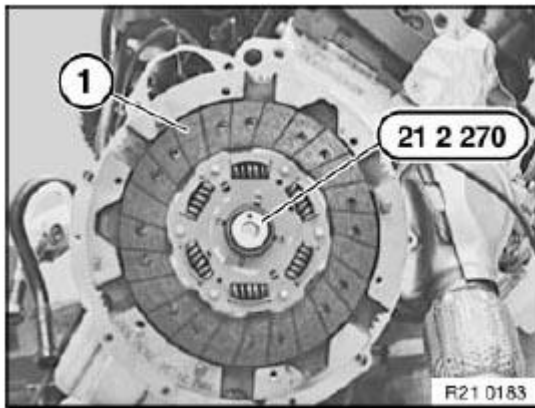


Fig. 16: Identifying Centre Clutch Plate
Courtesy of BMW OF NORTH AMERICA, INC.

Fit clutch (1) to flywheel.

Tightening torque 21 21 1AZ .

NOTE: Clutch (1) must be secured by way of dowel pins (2).

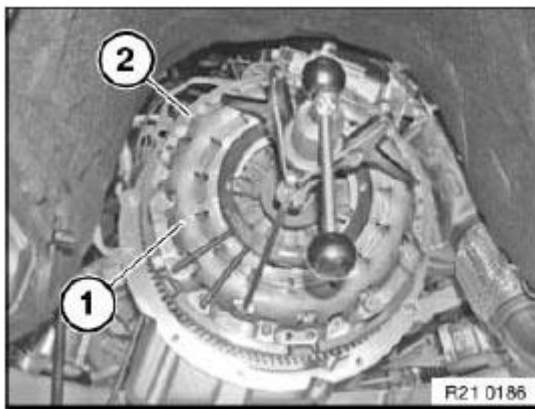


Fig. 17: Identifying Clutch And Dowel Pins
Courtesy of BMW OF NORTH AMERICA, INC.

Release spindle (1) until load is fully removed from diaphragm spring (2) Remove special tools **21 2 170** and **21 2 180** .

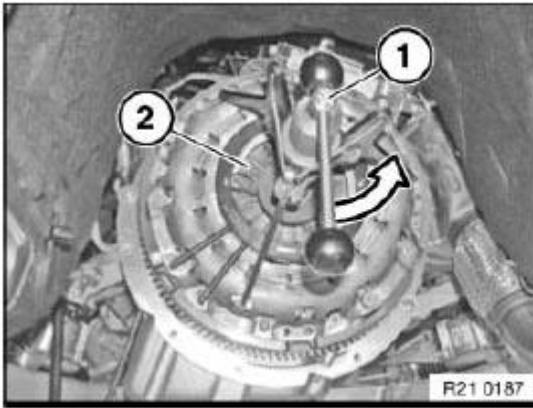


Fig. 18: Identifying Spindle And Diaphragm Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Withdraw special tool from clutch plate with aid of accompanying screw (1).

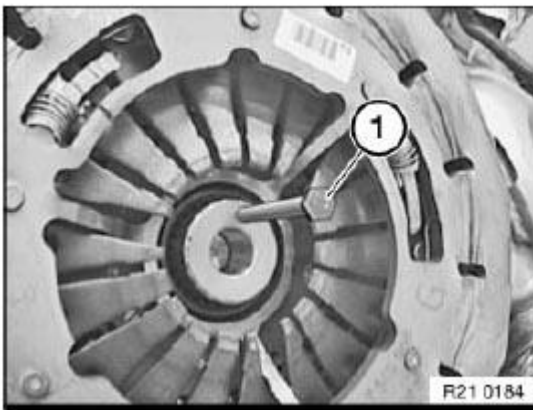


Fig. 19: Identifying Clutch Plate With Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Installing removed clutch with new clutch plate:

IMPORTANT: Before installing a used clutch with a new clutch plate, always reset adjustment ring in new position.

Set clutch down on a clean surface.

Insert special tool **21 2 180** in clutch (1).

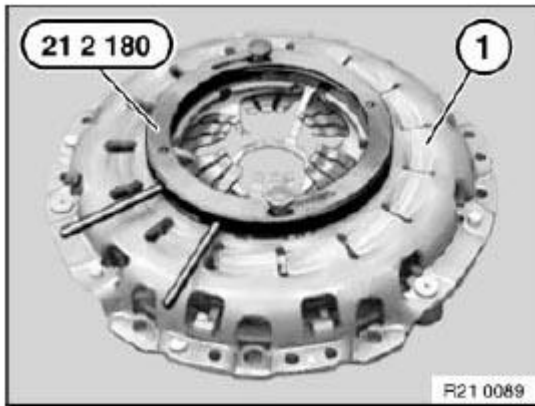


Fig. 20: Identifying Clutch

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Locking hooks (1) of special tool 21 2 180 must engage in openings in clutch.

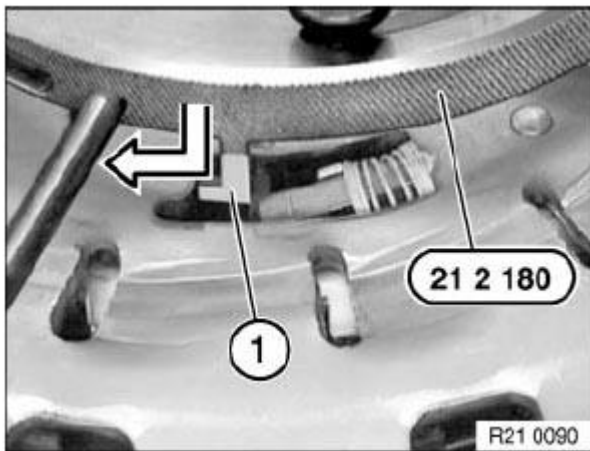


Fig. 21: Identifying Locking Hooks Of Special Tool (21 2 180)

Courtesy of BMW OF NORTH AMERICA, INC.

Fit special tool 21 2 170 and tighten down at knurled screw (1).

NOTE: Insert special tool 21 2 170 only in area of bores for dowel pins.

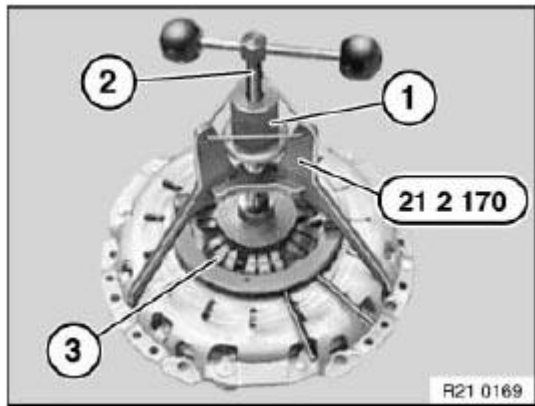


Fig. 22: Identifying Knurled Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Screw in spindle (1) until adjustment ring of clutch (2) can be turned with special tool **21 2 180** at handles (3).

Press special tool **21 2 180** together at handles (3) as far as it will go and grip firmly.

At same time tighten down knurled screws (2).

Adjustment ring of clutch is now secured in new position.

Screw in spindle (1) until diaphragm spring is tensioned on stop.

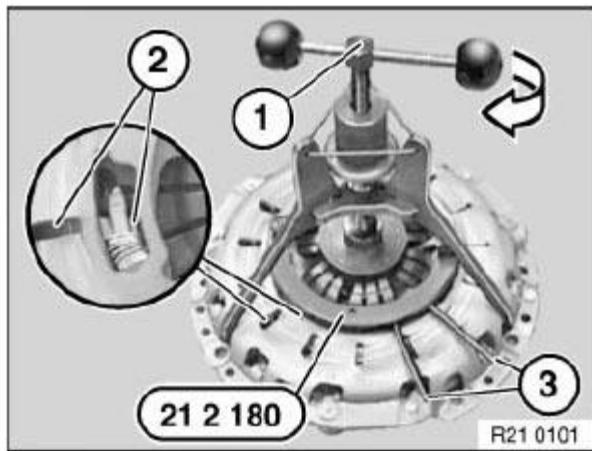


Fig. 23: Screwing Spindle And Ring Of Clutch

Courtesy of BMW OF NORTH AMERICA, INC.

Centre clutch plate (1) with special tool **21 2 270**.

IMPORTANT: Install clutch plate in correct position.

Note designation for "engine side" / "transmission side". Handle clutch plate

with care. Do not touch surfaces of friction linings.

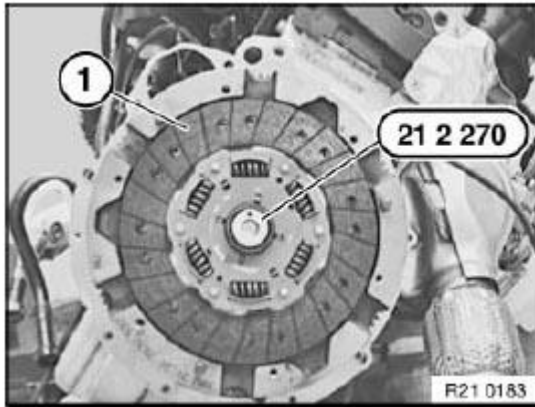


Fig. 24: Identifying Centre Clutch Plate With Special Tool (21 2 270)
Courtesy of BMW OF NORTH AMERICA, INC.

Fit clutch (1) to flywheel.

Tightening torque **21 21 1AZ** .

IMPORTANT: Clutch (1) must be secured by way of dowel pins (2).

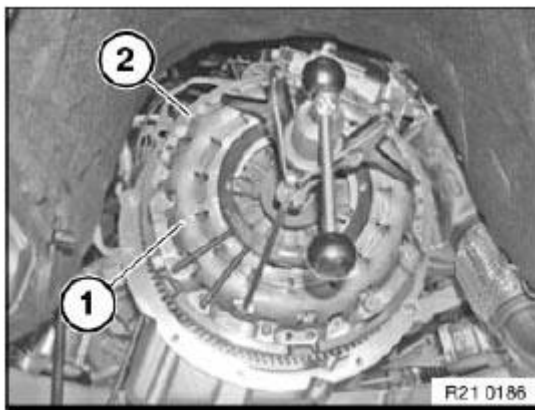


Fig. 25: Identifying Clutch And Dowel Pins
Courtesy of BMW OF NORTH AMERICA, INC.

Release spindle (1) until load is fully removed from diaphragm spring (2)

Remove special tools **21 2 170** and **21 2 180** .

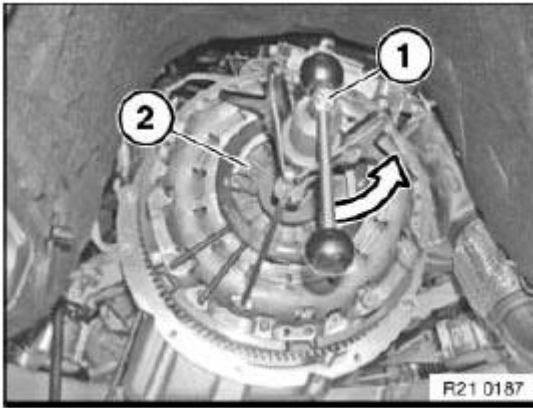


Fig. 26: Identifying Spindle And Diaphragm Spring
 Courtesy of BMW OF NORTH AMERICA, INC.

Withdraw special tool from clutch plate with aid of accompanying screw (1).

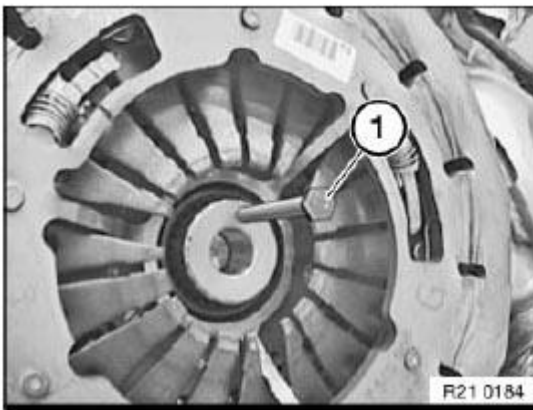


Fig. 27: Identifying Accompanying Screw
 Courtesy of BMW OF NORTH AMERICA, INC.

Installing new clutch

IMPORTANT: Locking piece may only be removed clutch is screwed down!

Centre clutch plate (1) with special tool 21 2 270.

IMPORTANT: Install clutch plate in correct position.

Note designation for "engine side" / "transmission side". Handle clutch plate with care. Do not touch surfaces of friction linings.

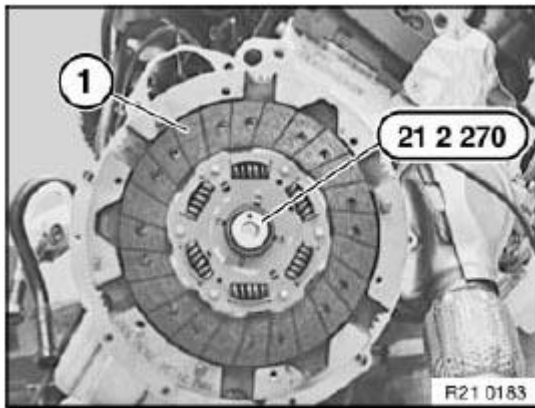


Fig. 28: Identifying Centre Clutch Plate With Special Tool (21 2 270)
Courtesy of BMW OF NORTH AMERICA, INC.

Fit clutch to flywheel.

Tightening torque **21 21 1AZ** .

IMPORTANT: Clutch must be secured by way of dowel pins (1).

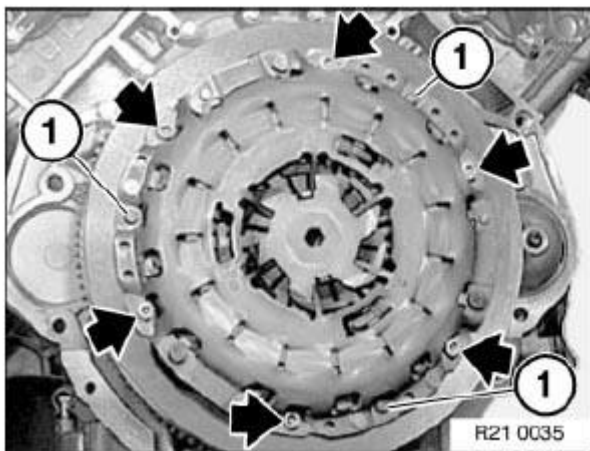


Fig. 29: Identifying Clutch With Dowel Pins
Courtesy of BMW OF NORTH AMERICA, INC.

Carefully unscrew locking piece (1) clockwise or counterclockwise with a 14 mm WAF hexagon socket wrench (2).

NOTE: A slight snapping of the plate spring while unscrewing the lock is possible.

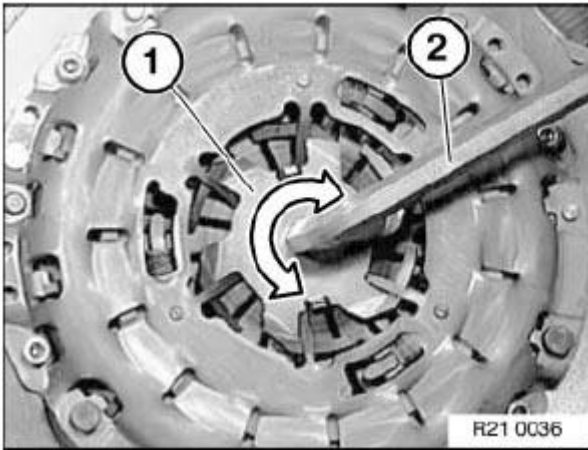


Fig. 30: Unscrewing Locking Piece

Courtesy of BMW OF NORTH AMERICA, INC.

Withdraw special tool from clutch plate with aid of accompanying screw (1).

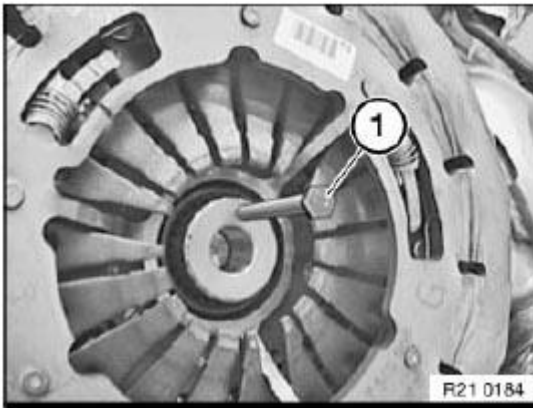


Fig. 31: Identifying Accompanying Screw

Courtesy of BMW OF NORTH AMERICA, INC.

CLUTCH RELEASE CONTROL WITH LEVER

21 51 500 REMOVING AND INSTALLING OR REPLACING CLUTCH RELEASE BEARING/LEVER

NOTE: (transmission removed)

New version (except M models)

Release bearing and release lever have been combined to form a single release module.

If possible, do not disassemble the release module. Otherwise there is a risk of the release module being **incorrectly** reassembled.

Installation:

Make sure that the correct cam (1) of the release bearing is on the sliding surface (2) of the release lever.

The positioning in relation to each other is identified by white dots on the cam (1) and the sliding surface (2).

NOTE: Do not grease sliding surfaces (2).

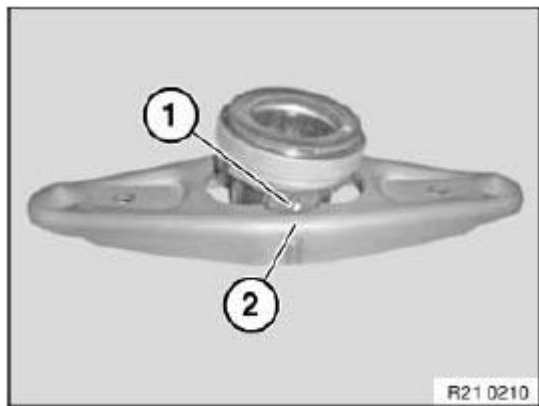


Fig. 32: Identifying Correct Cam Of Release Bearing And Sliding Surface Of Release Lever
Courtesy of BMW OF NORTH AMERICA, INC.

Fig. A: Cam (1) of release bearing (A=12 mm) is on sliding surface of release lever.

This version is for 4-cylinder gasoline engines.

Fig. B: Cam (1) of release bearing (A=7 mm) is on sliding surface of release lever.

This version is for 6-cylinder gasoline and diesel engines.

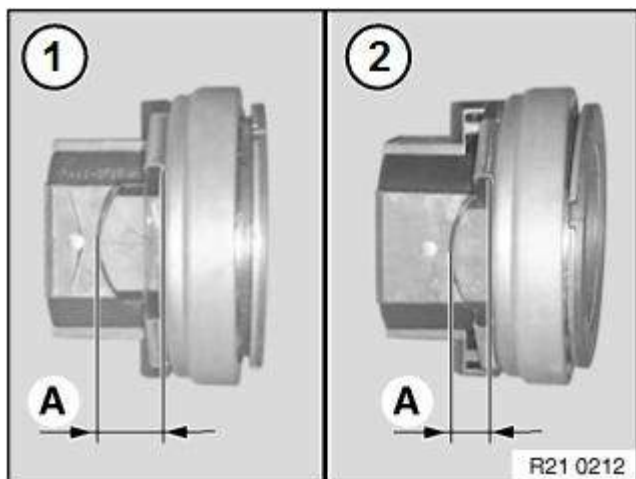


Fig. 33: Checking Release Bearing Dimension
Courtesy of BMW OF NORTH AMERICA, INC.

Remove release module (1) from spring wire clip.

Remove release module.

NOTE: Illustration similar.

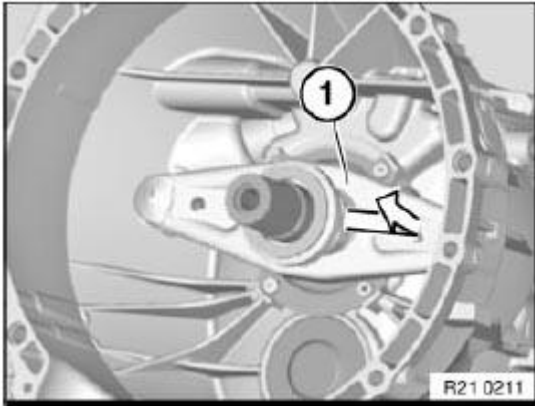


Fig. 34: Identifying Release Module
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check spring wire clip (5) and ball pin (6) for damage and replace if necessary.

NOTE: Illustration similar.

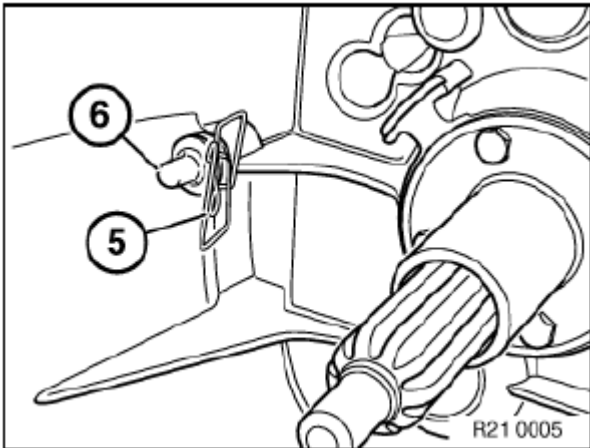


Fig. 35: Identifying Spring Wire Clip And Ball Pin
Courtesy of BMW OF NORTH AMERICA, INC.

Previous version

Detach release bearing (1).

Installation:

Clean all sliding surfaces on clutch release bearing, check for damage and replace if necessary.

Do **not** grease clutch release bearing.

Sliding surfaces (2) of clutch release bearing must rest on sliding surfaces (3) of release lever.

Apply a thin coating of grease to sliding surfaces (2) of release bearing.

Grease , refer to BMW Service Operating Fluids.

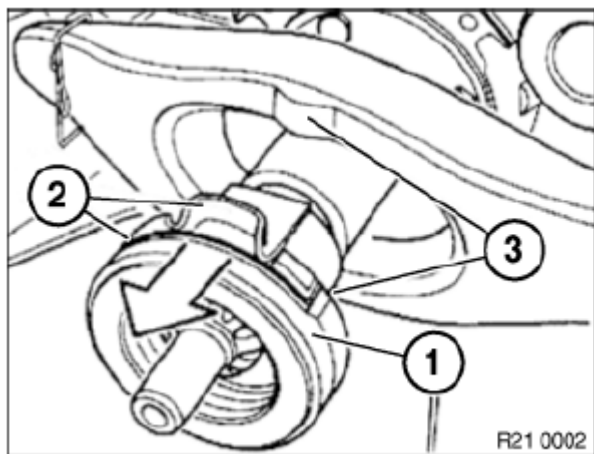


Fig. 36: Detaching Release Bearing

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Illustration similar

IMPORTANT: On E60/E61 M5 and E63/E64 M6 only - apply a light coating of grease to guide sleeve.

Previous clutch release bearing:

Clutch release bearing with moving thrust plate (1).

Swivel motion of thrust plate (1) possible.

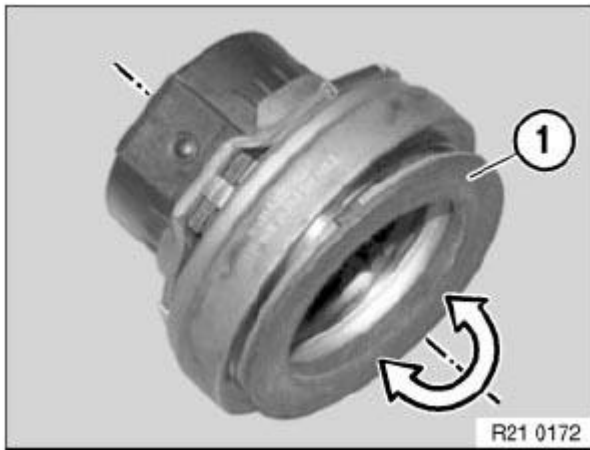


Fig. 37: Identifying Swivel Motion Of Thrust Plate
Courtesy of BMW OF NORTH AMERICA, INC.

Withdraw release lever (4) from spring wire clip (5) and remove.

Installation:

Clean release lever.

NOTE: Illustration similar.

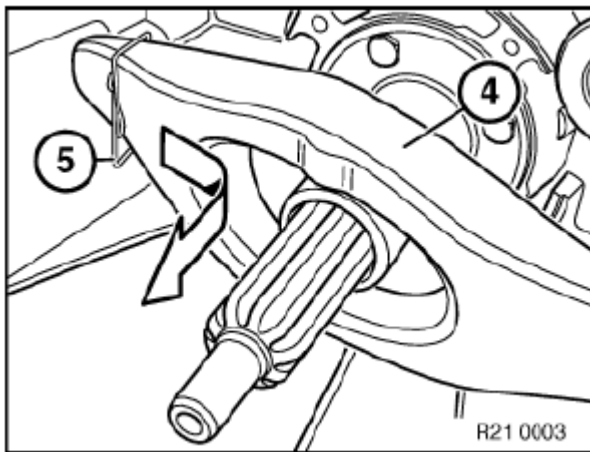


Fig. 38: Identifying Release Lever From Spring Wire Clip
Courtesy of BMW OF NORTH AMERICA, INC.

Previous release lever

Installation:

Apply a thin coating of grease to release lever at sliding surfaces (1 and 2) only.

Grease , refer to BMW Service Operating Fluids.

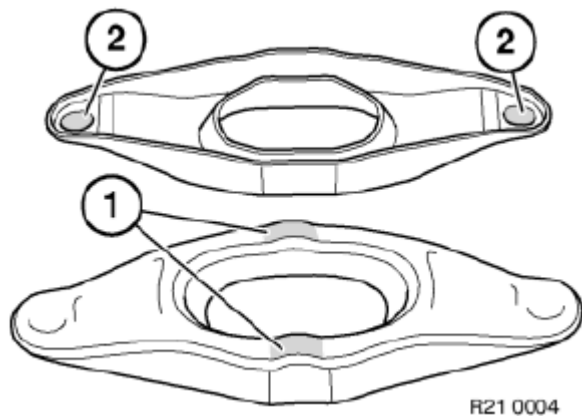


Fig. 39: Identifying Grease Applying Area
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check spring wire clip (5) and ball pin (6) for damage and replace if necessary.

Apply a thin coating of grease to ball pin (6).

Grease , refer to BMW Service Operating Fluids.

NOTE: The spring wire clip and ball pin must always be replaced on the S6S 420G transmission.
Illustration similar.

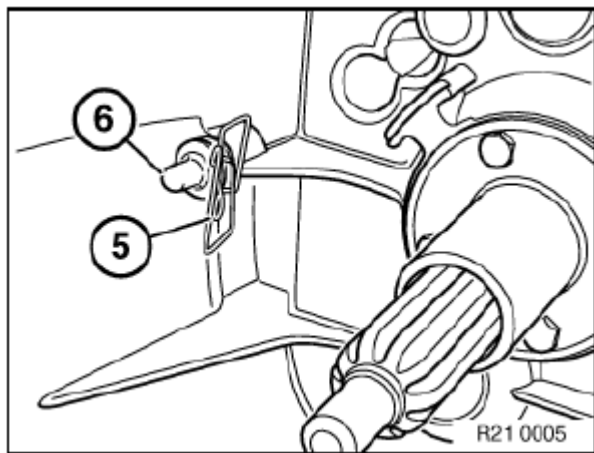


Fig. 40: Identifying Spring Wire Clip And Ball Pin
Courtesy of BMW OF NORTH AMERICA, INC.

Clean guide sleeve (7).

Note on installation: (except for E60/E61 M5 and E63/E64 M6)

Do **not** grease guide sleeve.

If guide sleeve is greased, the release lever can stick on the guide sleeve.

NOTE: Illustration similar.

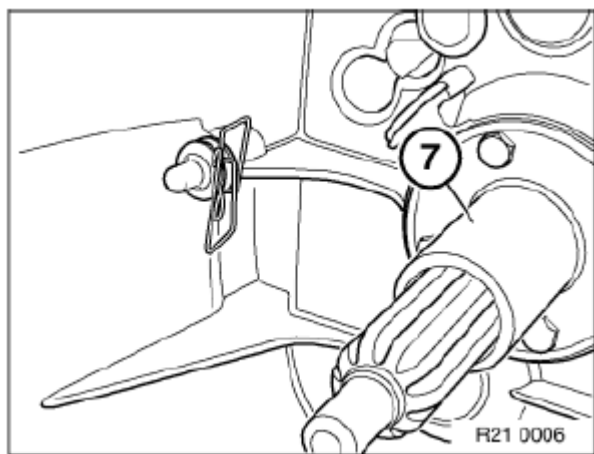


Fig. 41: Identifying Guide Sleeve

Courtesy of BMW OF NORTH AMERICA, INC.

CLUTCH OPERATION

21 52 500 REMOVING AND INSTALLING/REPLACING CLUTCH MASTER CYLINDER

NOTE: After completing work, bleed CLUTCH HYDRAULIC SYSTEM.

Necessary preliminary tasks:

- Remove **trim panel** for pedal assembly. See REMOVING AND INSTALLING/REPLACING PANEL FOR PEDALS
- Remove **microfilter housing** on left. See REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT MICROFILTER HOUSING LOWER SECTION
- Remove **light module** . See REMOVING AND INSTALLING (REPLACING) LIGHT MODULE

Draw off brake fluid up to supply hose of clutch hydraulic system (1). For this purpose, use only a vacuum pipe that is exclusively used for removing brake fluid.

Detach supply hose (1) from expansion tank.

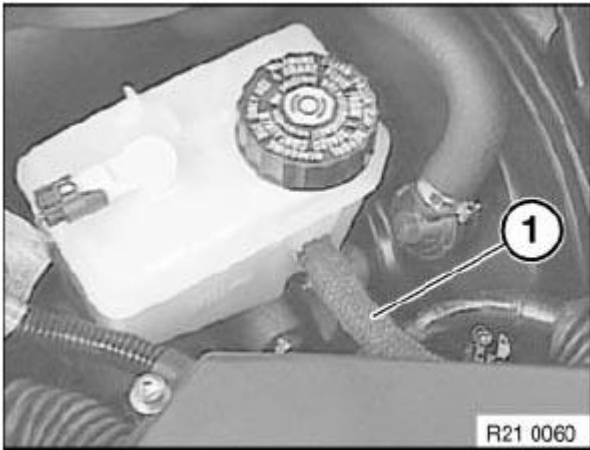


Fig. 42: Identifying Supply Hose Of Clutch Hydraulic System
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect spring (1).

NOTE: Illustration shows component removed.

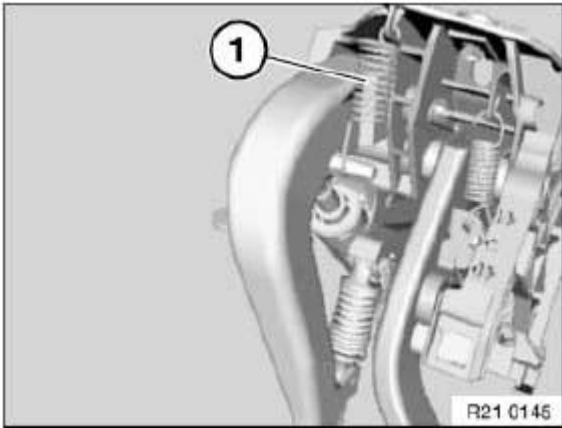


Fig. 43: Identifying Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Remove retainer (1) using screwdriver and press out pin.

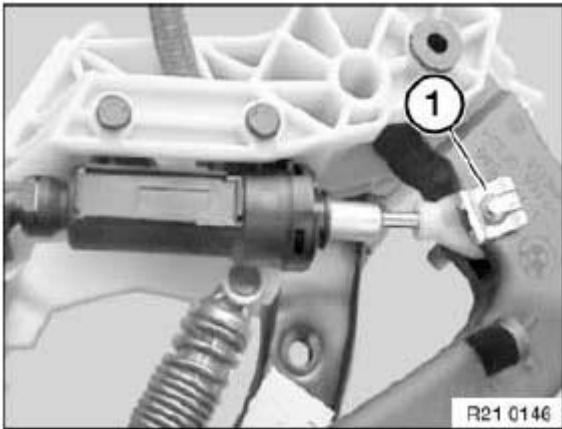


Fig. 44: Removing Retainer

Courtesy of BMW OF NORTH AMERICA, INC.

Detach retainer (1) with a screwdriver (2).

NOTE: Do not foul carpet with brake fluid.

Detach hydraulic line from clutch master cylinder.

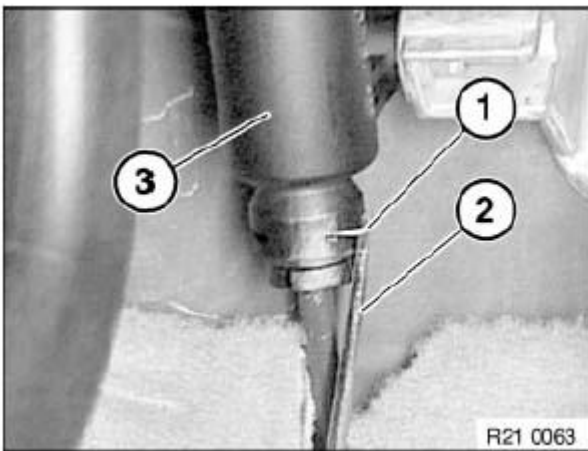


Fig. 45: Identifying Retainer With Screwdriver

Courtesy of BMW OF NORTH AMERICA, INC.

Remove lock (1) from pin with aid of screwdriver (2).

Lever out pin (3) with aid of screwdriver.

Remove clutch master cylinder.

Installation:

Replace pin.

Press in pin until lock (1) can be seen to snap into place.

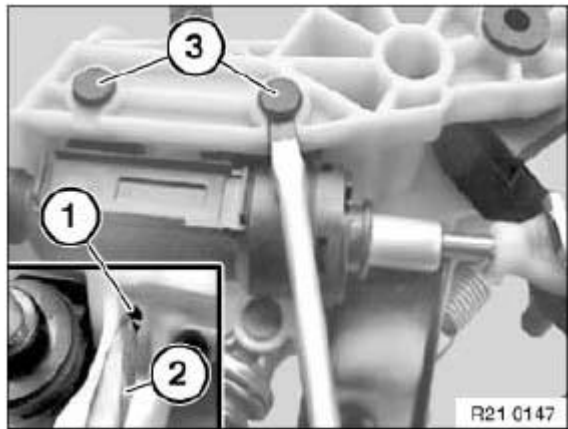


Fig. 46: Levering Out Pin

Courtesy of BMW OF NORTH AMERICA, INC.

Detach supply hose (1) from clutch master cylinder.

IMPORTANT: Do not pull supply hose completely into interior.

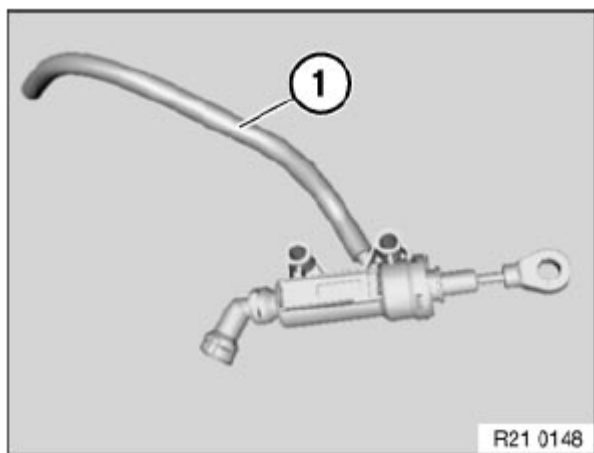


Fig. 47: Identifying Supply Hose From Clutch Master Cylinder

Courtesy of BMW OF NORTH AMERICA, INC.

Lever out shift element (1) from clutch master cylinder (2) with screwdriver.

Release plug connection (3) and disconnect plug (4) from shift element (1).

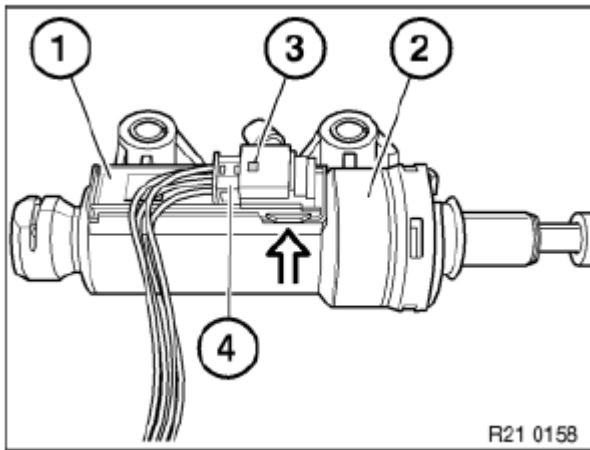


Fig. 48: Identifying Shift Element From Clutch Master Cylinder
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Shift element is secured against incorrect installation.

Shift element must snap audibly into place.

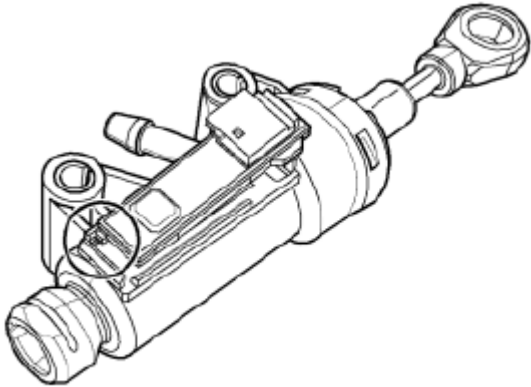


Fig. 49: Identifying Shift Element
 Courtesy of BMW OF NORTH AMERICA, INC.

21 52 510 REMOVING AND INSTALLING OR REPLACING CLUTCH SLAVE CYLINDER

Special tools required:

- **13 3 010**

NOTE: After completing work bleed **CLUTCH HYDRAULIC SYSTEM**.

IMPORTANT: From 08.06 a plastic clutch slave cylinder is installed in the E81, E87 and E9X. Important notes on installation are described in this work step.

Seal supply hose to clutch master cylinder with special tool 13 3 010 .

NOTE: Illustration shows E46.

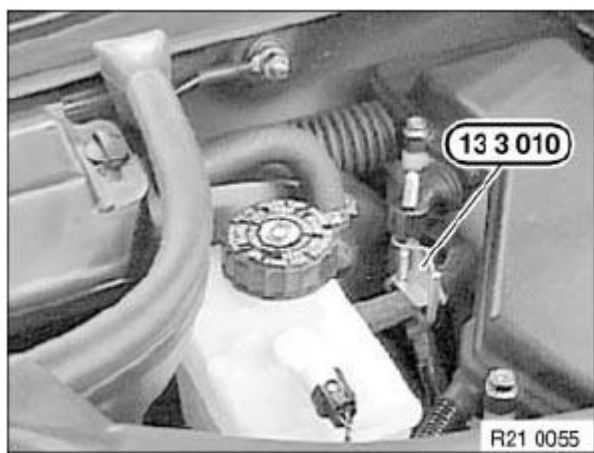


Fig. 50: Identifying Special Tools (13 3 010)
Courtesy of BMW OF NORTH AMERICA, INC.

Remove transmission underbody protection if necessary.

Release union screw (1) on hydraulic line.

Release nut (2) and remove hydraulic line (3) with bracket.

Installation:

Tightening torque 21 52 1AZ .

NOTE: Illustration similar.
Version with throttle valve, tightening torque 21 52 12AZ .

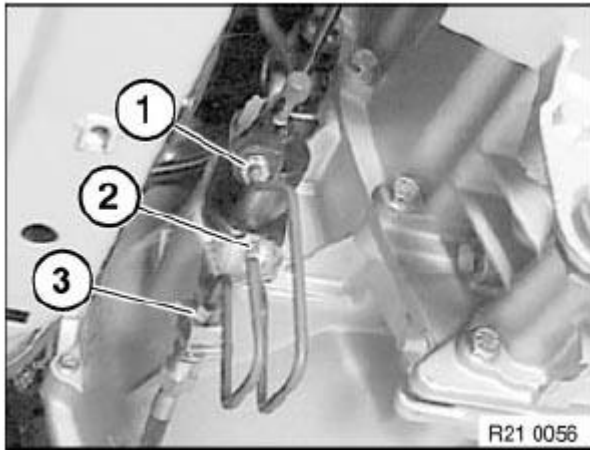


Fig. 51: Identifying Union Screw And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut and remove clutch slave cylinder.

Installation:

Tightening torque **21 52 5AZ** .

IMPORTANT: N47 with H-transmission only

Clutch slave cylinder must not rest at the side on the transmission.

Failure to comply with this instruction may result in leaks at the clutch slave cylinder.

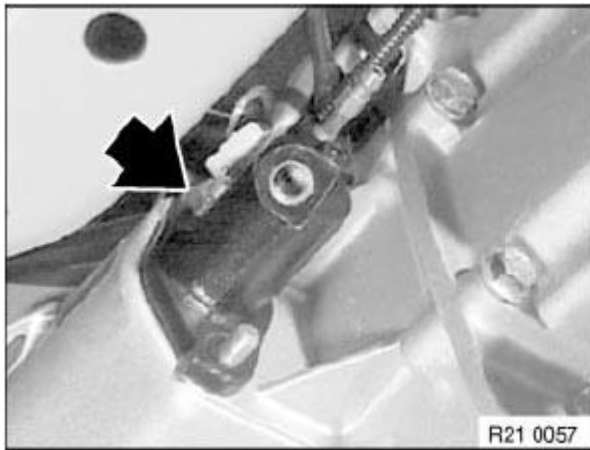


Fig. 52: Identifying Clutch Slave Cylinder Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Clean thrust member (1) and contact face on release lever (2).

Lightly grease thrust member (1) on contact face (3).

Grease , refer to BMW Service Operating Fluids.

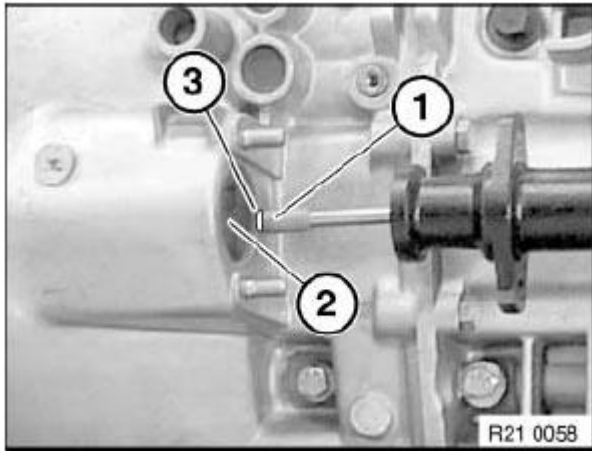


Fig. 53: Identifying Thrust Member And On Contact Face
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Spacer between fuel line and pressure hose of clutch slave cylinder must be correctly fitted.

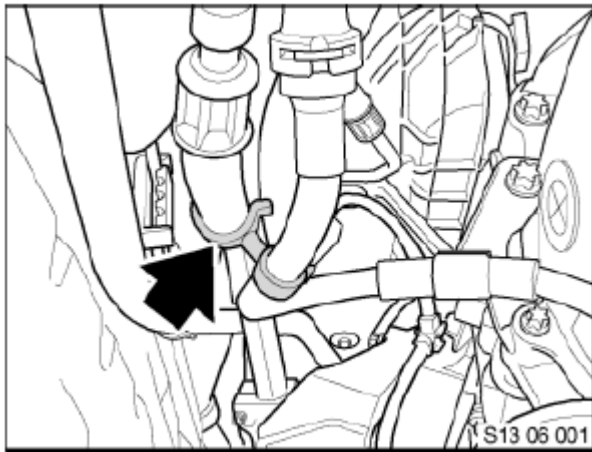


Fig. 54: Identifying Spacer Between Fuel Line And Pressure Hose Of Clutch Slave
Courtesy of BMW OF NORTH AMERICA, INC.

TROUBLESHOOTING

21 90... TROUBLESHOOTING THE CLUTCH

TROUBLESHOOTING CHART

Fault	Cause	Remedy
Clutch slipping	a) Clutch pressure too low. b) Lining too heavily worn. c) Lining oiled- Leaks: ○ Engine Crankshaft radial seal at front and rear incl. end cover, oil sump, cylinder head gasket, cylinder head, oil filler cap, timing case cover, flywheel mounting bolts ○ Cooling system Hoses and connections, heating valves, sealing plugs on engine block ○ Steering unit Steering gear, servo pump, hydraulic lines and connections ○ Transmission Drive shaft radial seal, sealing plugs of countershaft ○ Release bearing	a) Replace clutch Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240)</u> . b) Replace clutch plate Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240)</u> . c) Carefully rectify leaks, clean oil contamination and replace clutch plate Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240)</u> . d) Replace clutch Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240)</u> . e) Install original-equipment BMW part.
	d) Clutch was overheated. e) Clutch is not an original equipment BMW part.	
	a) Lining not acc. to specification.	a) Replace clutch plate Refer to <u>REMOVING AND INSTALLING/REPLACING</u>

Clutch stick/slip	b) Lining oiled: Causes: refer to "clutch slipping, point c" c) Release unit presses on one side. d) Clutch presses at an angle. e) Crankshaft does not align with transmission input shaft. f) Engine and transmission suspension defective. g) Clutch plate not an original equipment BMW part. h) Engine, speed characteristics not O.K. i) Engine management not OK (particularly on diesel engine).	<u>CLUTCH (SAC 240).</u> b) Replace clutch plate Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240).</u> c) Check release lever. d) Replace clutch Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240).</u> e) Check engine/transmission contact face, adapter sleeves and cover plate for damage. f) Replace engine and transmission suspension. g) Install original-equipment BMW part. h) Eliminate causes according to engine test. i) Check engine control unit.
Clutch releases poorly (Gear difficult to engage)		
Clutch does not separate (Gear cannot be engaged)	a) Lining of clutch plate broken. b) Lining rusted onto flywheel. c) Guide bearing for transmission input shaft in crankshaft defective. d) Leak in clutch hydraulic system. e) Tangential leaf springs of clutch bent down. f) Release unit binds on guide sleeve.	a) Replace clutch plate Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240).</u> b) Evenly sand flywheel with sandpaper (120-180 grain) and replace clutch plate. c) Replace guide bearing in crankshaft. d) Replace faulty parts and bleed clutch hydraulics Refer to <u>BLEEDING CLUTCH HYDRAULIC SYSTEM.</u> e) Replace clutch Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240).</u> f) Clean guide sleeve, remove and install release unit Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240).</u>

TROUBLESHOOTING CHART

Fault	Cause	Remedy
Clutch noise	a) Imbalance of clutch and clutch plate too great.	a) Replace clutch/clutch plate Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240).</u>
	b) Torsional-vibration damper defective.	b) Replace clutch plate Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240).</u> or if necessary replace dual-mass flywheel,
	c) Release unit defective.	c) Replace release unit Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240).</u>
	d) Guide bearing for transmission input shaft in crankshaft defective.	d) Replace guide bearing in crankshaft.
	e) Clutch rivet connection loose.	e) Replace clutch Refer to <u>REMOVING AND INSTALLING/REPLACING CLUTCH (SAC 240).</u>