

2000-05 CLUTCHES**Z4 & 3-Series****APPLICATION**

For manual transmission applications, see SERVICING article.

DESCRIPTION

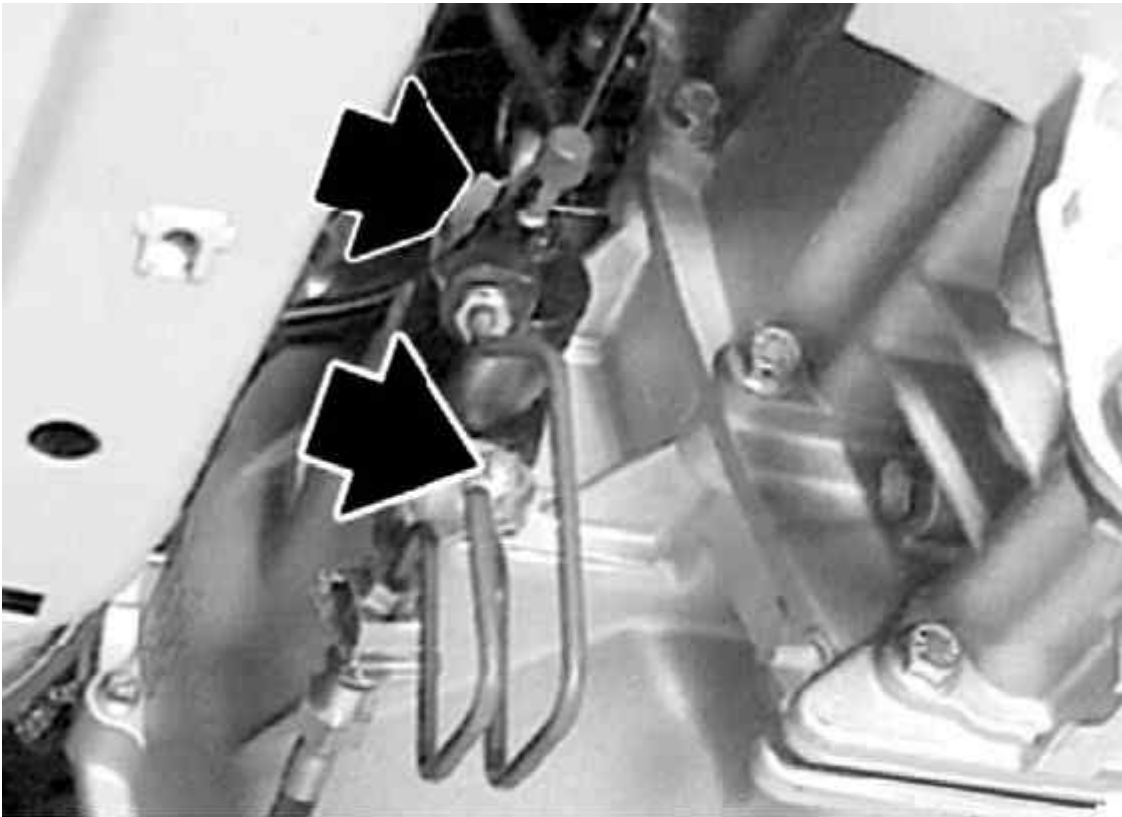
A specially developed Dual-Mass Flywheel (ZMS) is used with the H-gearbox. Because the 6-speed manual transmission has more gears, the flywheel is modified to compensate for vibration and noise. In this flywheel, the 2 masses are connected via inner and outer dampers (rubber like damping material). The masses are now supported by a plain bearing (no longer in a ball bearing). The plain bearing requires less space and enables an additional inner damper to be used. The transmission input shaft is supported through the flywheel in a needle bushing with a roller pilot bearing. The flywheel is connected to the crankshaft flange with Torx socket bolts. Beginning 3/2003, BMW introduced new heavy metal-free friction linings which satisfy the requirements of used car regulations.

BLEEDING

1. Remove transmission underbody protection if necessary. Remove micro filter housing as necessary. See CABIN AIR FILTER or CABIN AIR FILTER - Z4 . Unfasten nuts and remove clutch slave cylinder (pressure line remains connected). See Fig. 1 . Fit special tool (21 5 030) on clutch slave cylinder (1). Press piston rod (2) with aid of spindle completely into clutch slave cylinder. See Fig. 2 . Connect bleeder unit to brake fluid expansion tank.

NOTE: **Check relevant operating instructions for each device.**

2. Charging pressure should not exceed 2 bar. Connect bleeder hose to bleeder valve (1). See Fig. 3 . Hold clutch slave cylinder in illustrated position 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.
3. 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.
4. Slowly retract piston rod (2) of clutch slave cylinder (1) with special tool (21 5 030). See Fig. 4 . Remove special tool (21 5 030) from clutch slave cylinder (1). Fit clutch slave cylinder to transmission. See Fig. 5 . During installation, replace self-locking nuts. Correct brake fluid level in expansion tank with DOT 4 brake fluid.



G00386959

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

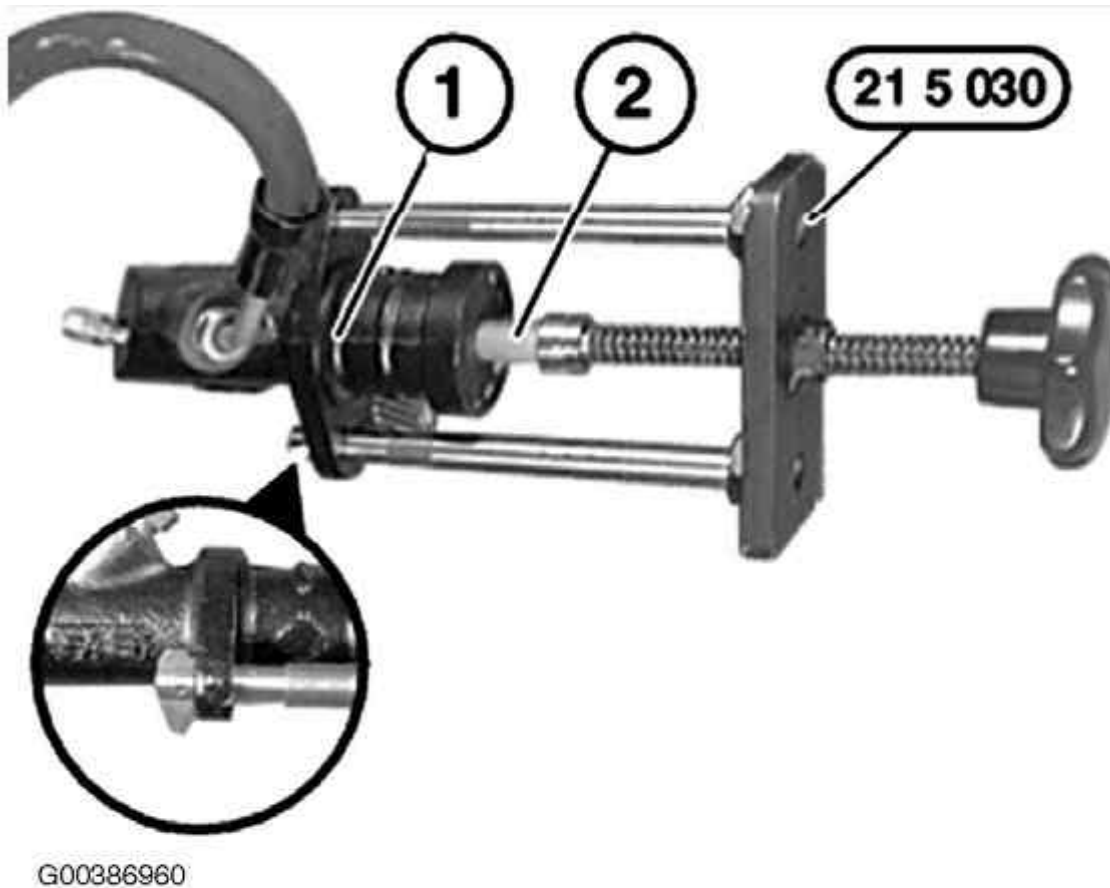
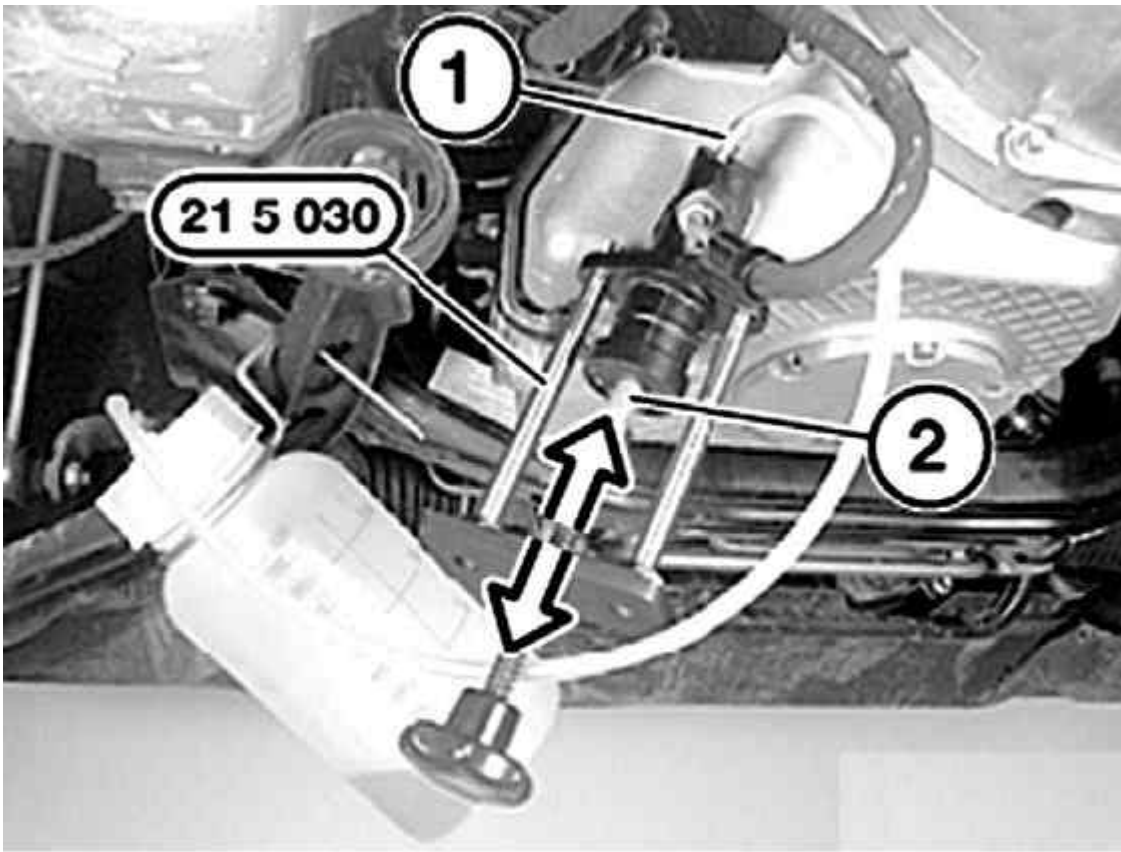
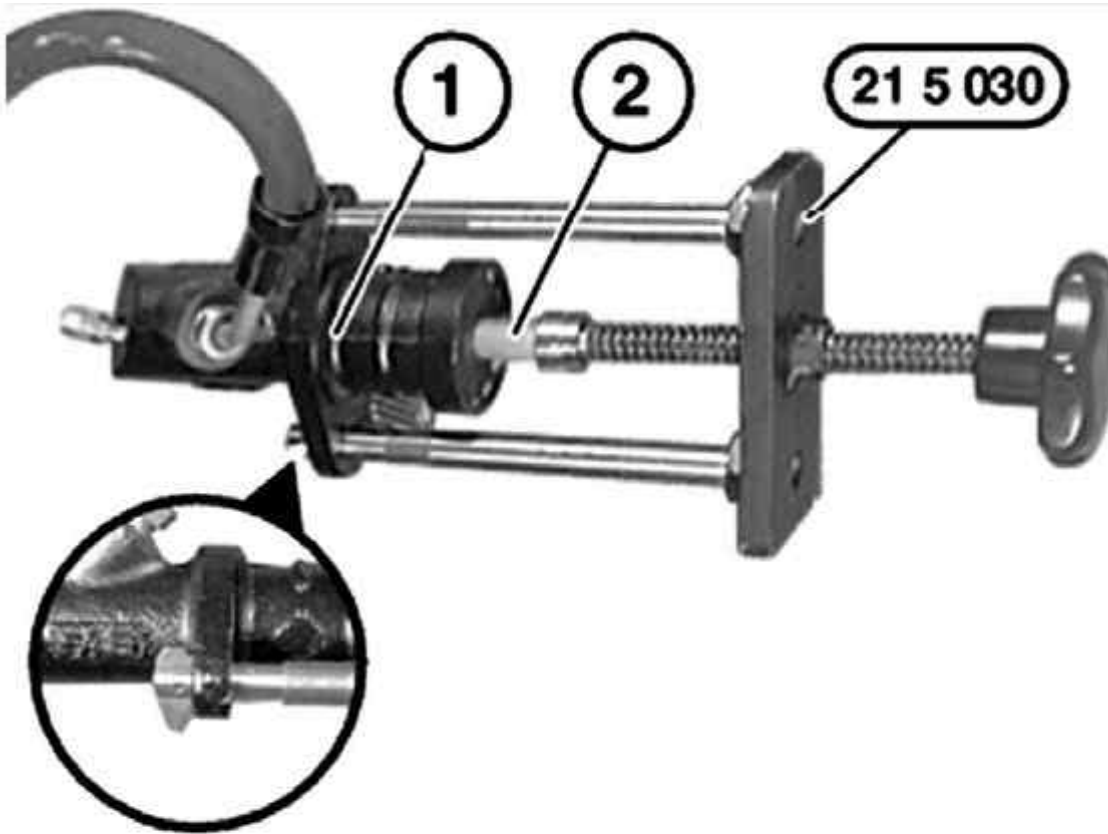


Fig. 2: Pressing Piston Rod With Aid Of Spindle Completely Into Clutch Slave Cylinder
Courtesy of BMW OF NORTH AMERICA, INC.



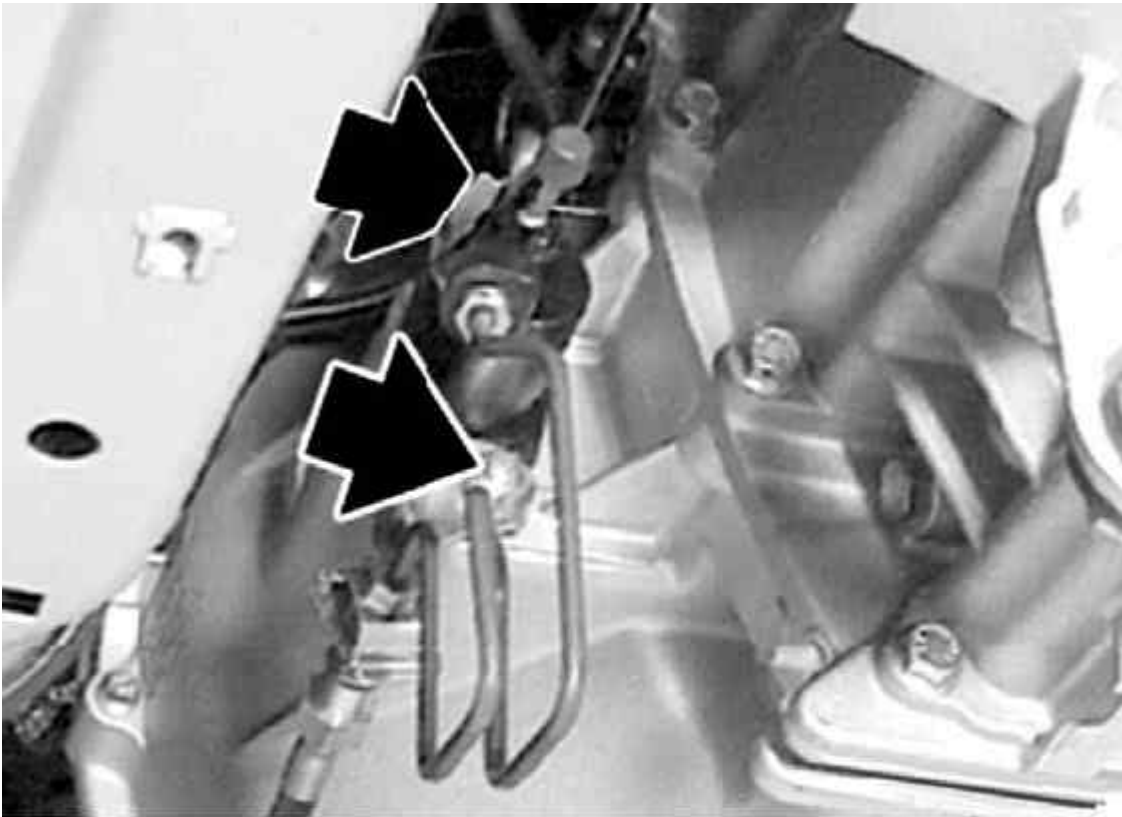
G00386961

Fig. 3: Connecting Bleeder Hose To Bleeder Valve
Courtesy of BMW OF NORTH AMERICA, INC.



G00386962

Fig. 4: Slowly Retracting Piston Rod Of Clutch Slave Cylinder
Courtesy of BMW OF NORTH AMERICA, INC.



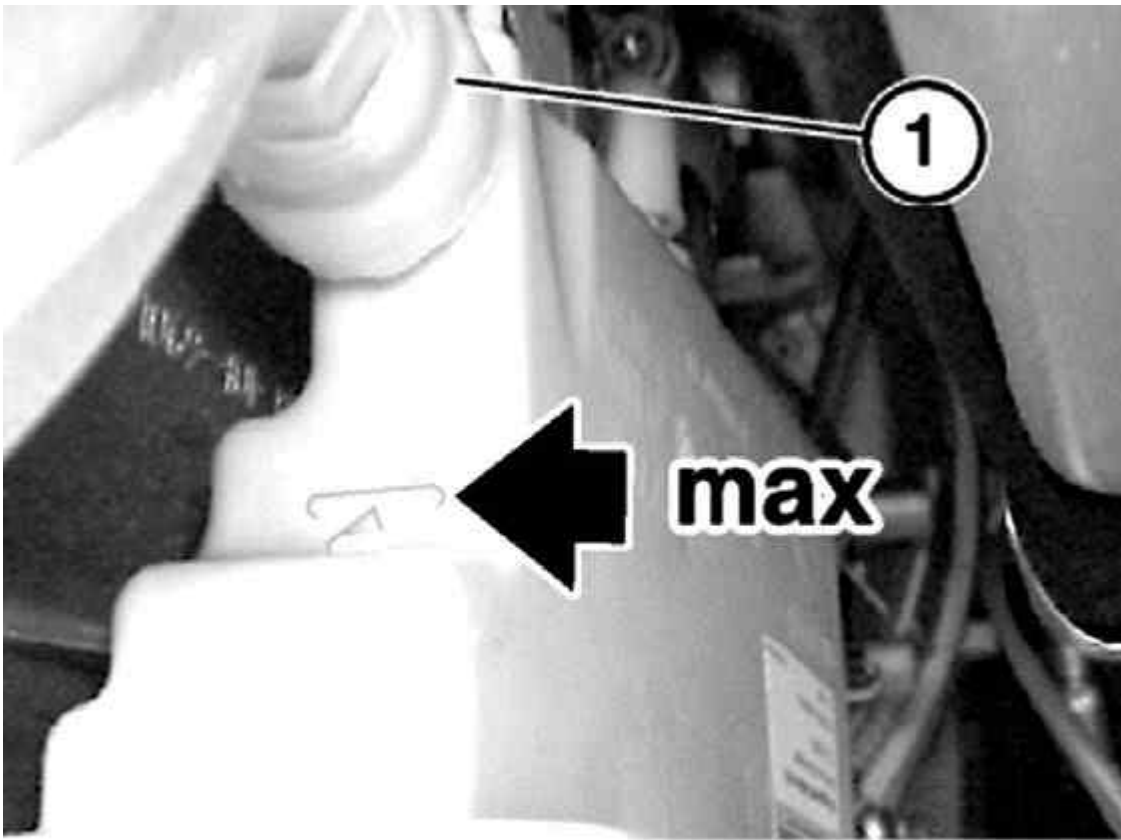
G00386963

Fig. 5: Installing Clutch Slave Cylinder To Transmission
Courtesy of BMW OF NORTH AMERICA, INC.

CHECKING/TOPPING OFF FLUID LEVEL IN HYDRAULIC SYSTEM

GS6S37BZ/GS6S53BZ/SMG

1. Method 1: Switch on ignition. Bleed hydraulic system. See **BLEEDING** . Open filler screw (1). Fill expansion tank up to MAX marking with DOT 4 brake fluid. See **Fig. 6** .
2. Method 2: Depressurize hydraulic system in accordance with BMW diagnosis system. Open filler screw (1). Add BMW DOT 4 hydraulic fluid up to lower edge of filler cap. See **Fig. 6** .

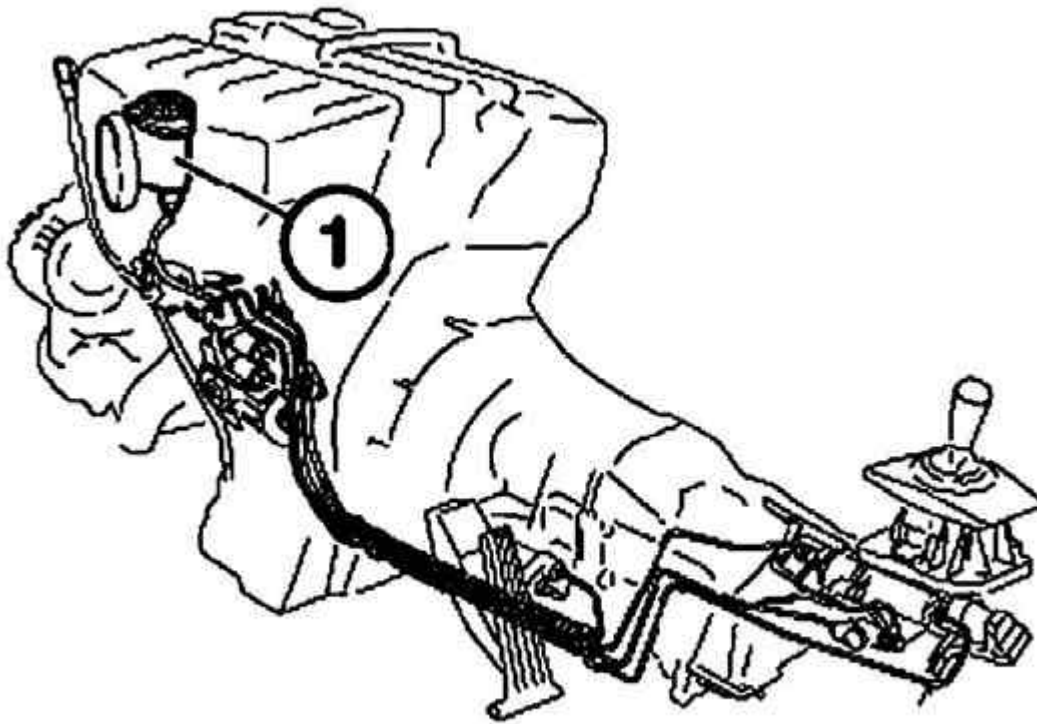


G00386955

Fig. 6: Identifying Filler Screw & MAX Mark
Courtesy of BMW OF NORTH AMERICA, INC.

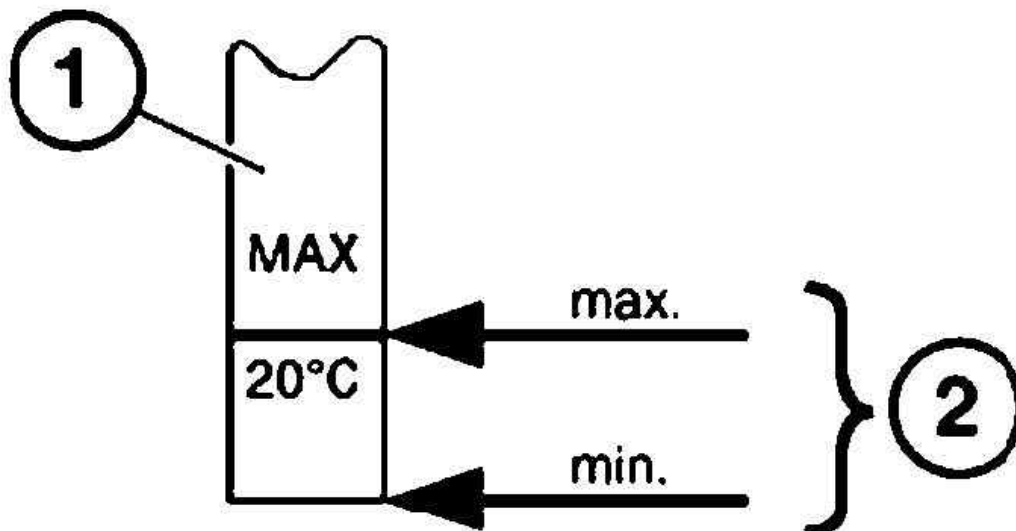
S6S420G/SMG

Turn on ignition. Press brake pedal. Move selector lever from position "0" to "R" or "0" to "E" until hydraulic pump is activated. Wait until hydraulic pump shuts down. Open expansion tank (1). See **Fig. 7** . Fill expansion tank up to MAX marking (2) on dipstick (1). See **Fig. 8** . Check with dipstick on cap by screwing in cap.



G00387004

Fig. 7: Identifying Expansion Tank
Courtesy of BMW OF NORTH AMERICA, INC.



G00387005

Fig. 8: Identifying Dipstick Markings

Courtesy of BMW OF NORTH AMERICA, INC.

ADJUSTMENTS

CLUTCH PEDAL

Clutch pedal stroke and free play are adjusted automatically.

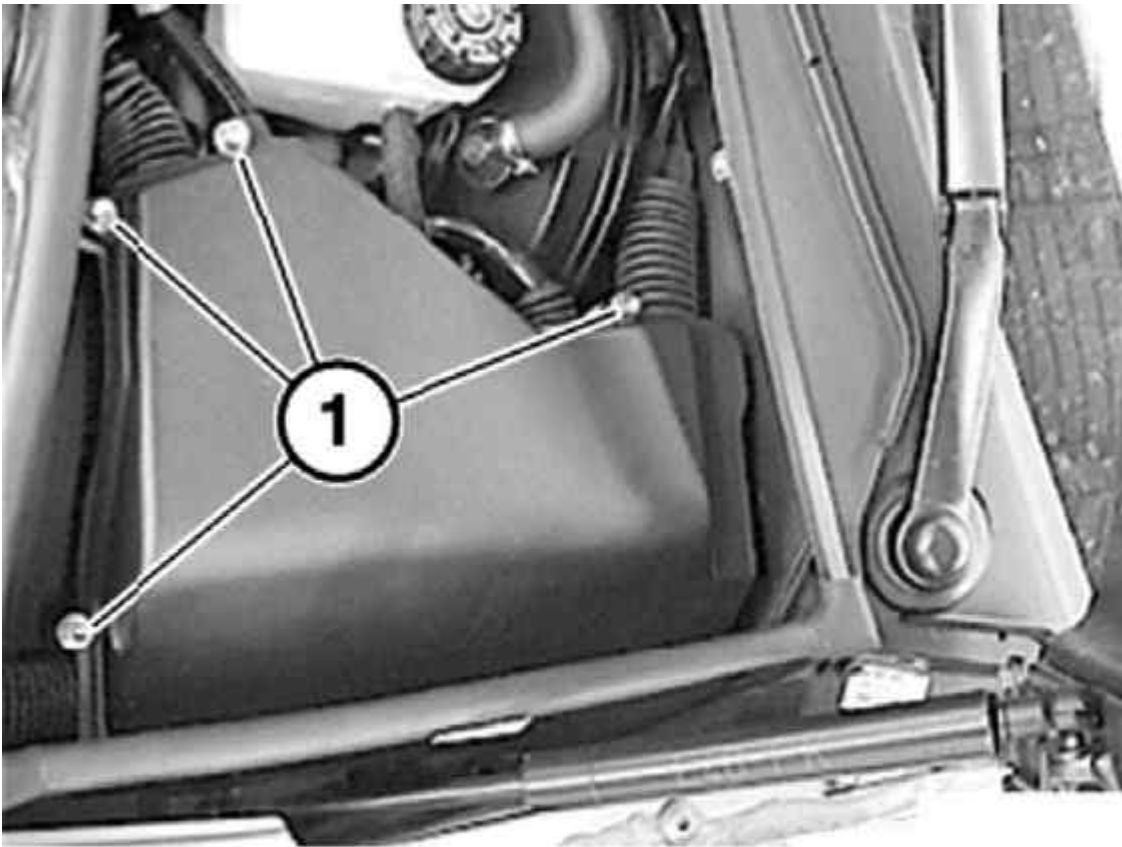
PRESSURE RELEASE IN HYDRAULIC UNIT (S6S420G/SMG)

NOTE: Numbers in text refer to numbers in figures.

NOTE: Using DIS tester, read out fault memory and clear fault codes.

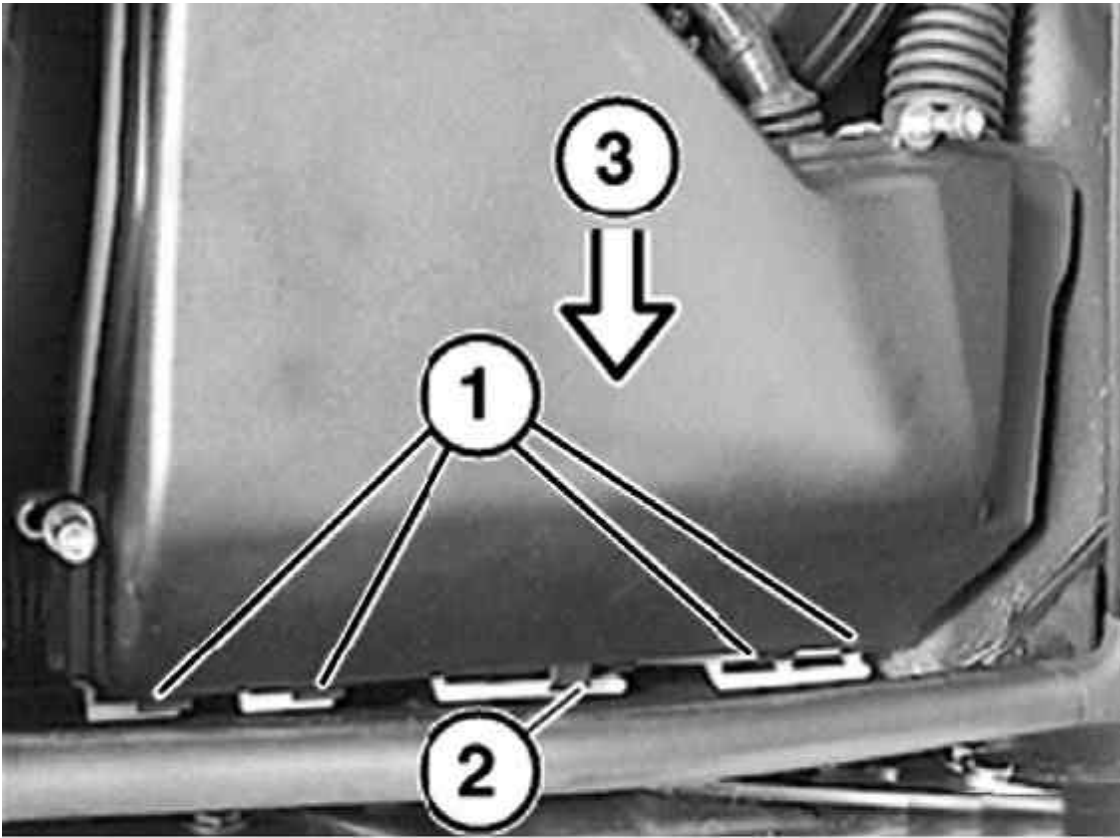
1. Release screws (1). Remove cover. See **Fig. 9**. During installation, correctly install wiring harness with grommet in cover (for water tightness). Suspend cover (3) in hinges of underside of electronics box (1). Make sure upper stop (2) is correctly installed above hinges of electronics box lower section. See **Fig. 10**.
2. Detach relay (1) of hydraulic pump. See **Fig. 11**. During installation, before inserting relay (1), start following service functions: TRANSMISSION ACTUATOR and CLUTCH SLAVE CYLINDER. Turn on ignition. Press brake pedal. Move selector lever as often as necessary from position "0" to "R" or "0" to "E" until transmission stops performing gearshifts. Check accumulator pre-pressurizing pressure via

DIS. Note that residual pressure drops after a brief period.



G00386981

Fig. 9: Removing Screws & Cover (M3)
Courtesy of BMW OF NORTH AMERICA, INC.



G00386982

Fig. 10: Suspending Cover In Hinges Of Underside Of Electronics Box (M3)
Courtesy of BMW OF NORTH AMERICA, INC.



G00386983

Fig. 11: Detaching Hydraulic Pump Relay (M3)
Courtesy of BMW OF NORTH AMERICA, INC.

TROUBLESHOOTING

1. If clutch is slipping, check for:

- Clutch pressure too low.
- Lining too heavily worn.
- Lining oiled.

Also, check for leaks at:

- Engine:
 - a. Crankshaft Radial Seal At Front & Rear Including End Cover
 - b. Oil Sump
 - c. Cylinder Head Gasket At Cylinder Head
 - d. Oil Filler Cap
 - e. Timing Case Cover
 - f. Flywheel Mounting Bolts
- Cooling System:

- a. Hoses & Connections
- b. Heating Valves
- c. Sealing Plugs On Engine Block
- Steering Unit:
 - a. Steering Gear
 - b. Servo Pump
 - c. Hydraulic Lines & Connections
- Transmission:
 - a. Drive Shaft Radial Seal
 - b. Sealing Plugs Of Countershaft
- Release Bearing:
 - a. Clutch Was Overheated
 - b. Clutch Is Not An Original Equipment BMW Part

If problem is found, replace clutch and repair leaks as necessary.

2. If clutch sticks/slips, check for:
- a. Lining not to specification.
 - b. Lining oiled.
 - 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.

If engine, speed characteristics not okay:

- a. Engine management not okay.
- b. Check engine control unit.

If problem is found, replace clutch, check engine/transmission contact face, adapter sleeves and cover plate for damage, replace engine and transmission suspension, install original equipment BMW part as necessary,

3. If clutch does not separate, check for:
- 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.

If problem is found, replace clutch plate, evenly sand flywheel with sandpaper and replace clutch plate, replace guide bearing in crankshaft, replace faulty parts and bleed clutch hydraulics, replace clutch, or clean guide sleeve, remove and install release unit.

4. If clutch makes noise, check for:
 - a. Imbalance of clutch and clutch plate too great.
 - b. Torsional-vibration damper defective.
 - c. Release unit defective.
 - d. Guide bearing for transmission input shaft in crankshaft defective.
 - e. Clutch rivet connection loose.

If problem is found, replace clutch plate or dual mass flywheel, release unit, guide bearing in crankshaft or clutch as necessary.

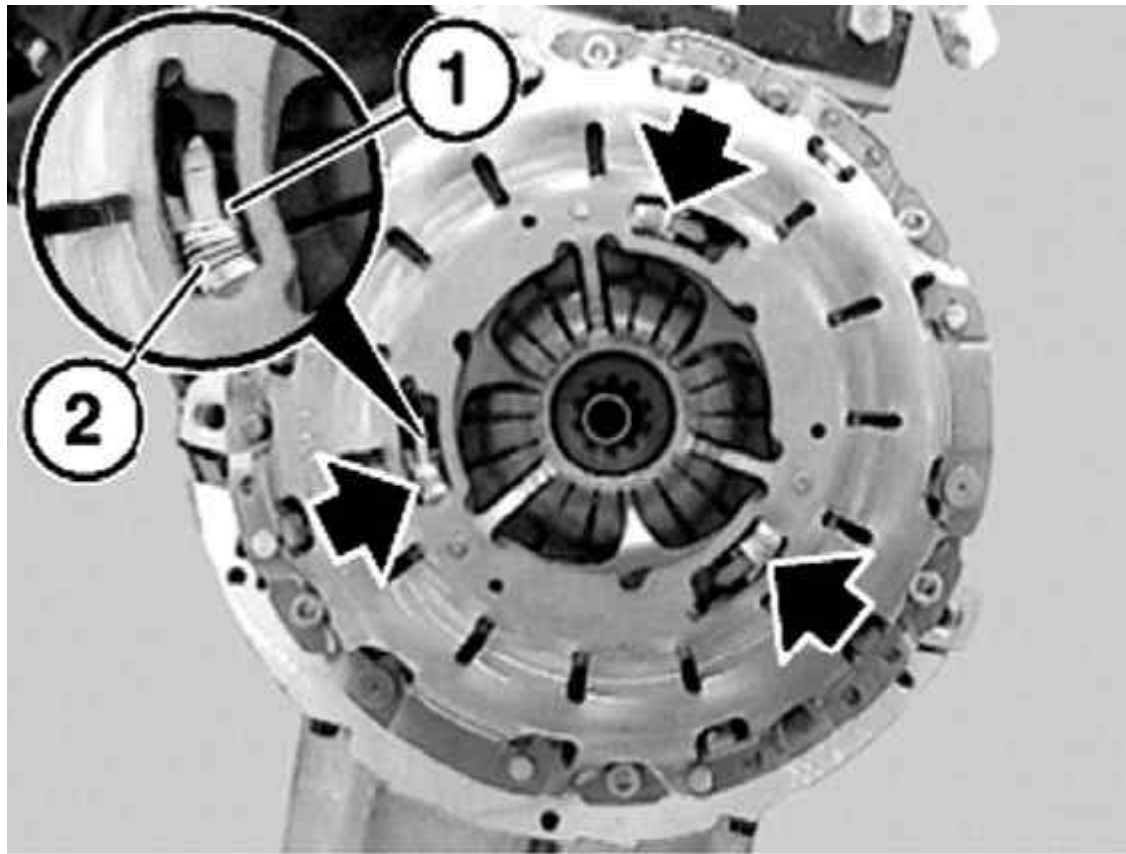
REMOVAL & INSTALLATION

CLUTCH

NOTE: **Numbers in text refer to numbers in figures.**

Removal & Installation

1. Remove transmission. See appropriate MANUAL TRANSMISSION removal article. To identify clutch, note 3 openings each with a pressure piece (1) of a ring and a pressure spring (2).

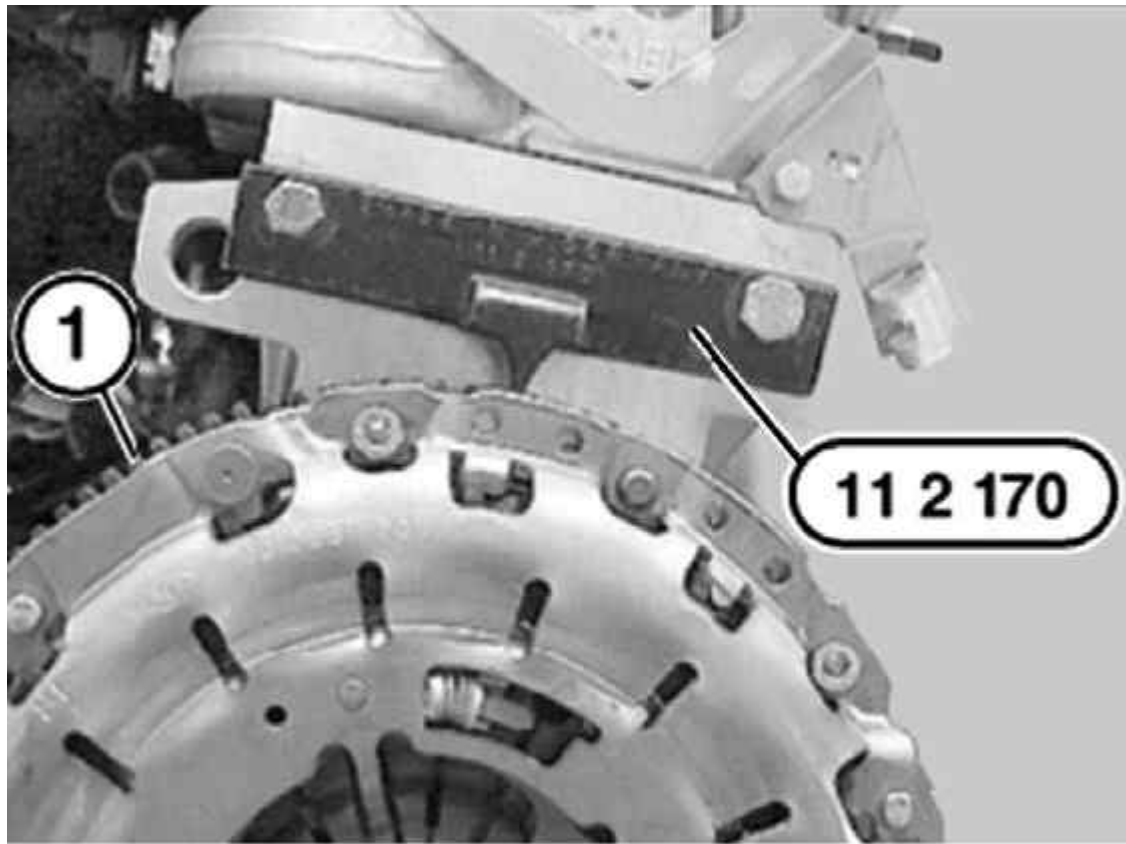


G00386920

Fig. 12: Identifying Clutch

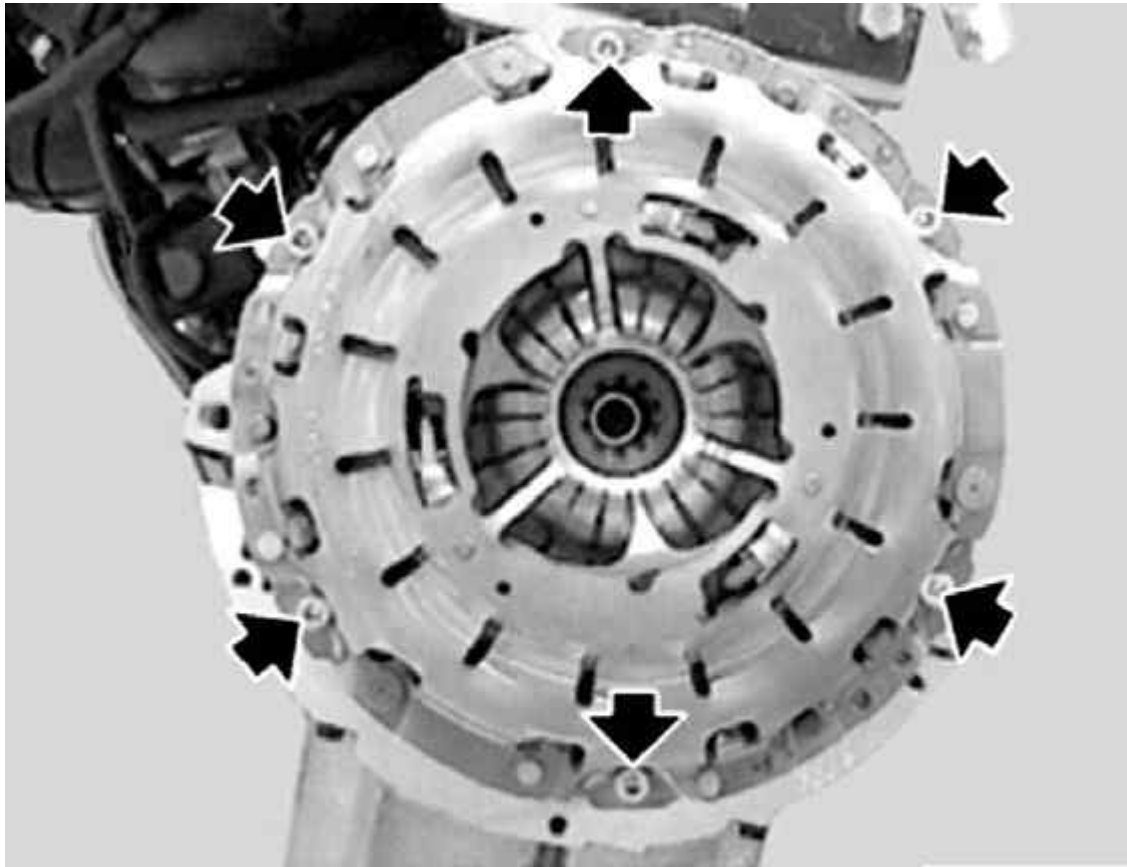
Courtesy of BMW OF NORTH AMERICA, INC.

2. Block flywheel (1) with special tool 11 2 170. See **Fig. 13** . Unfasten bolts and remove SAC clutch from flywheel. See **Fig. 14** . Do not use a special tool to detach SAC clutch from flywheel. Remove clutch plate (1) from flywheel. See **Fig. 15** . Clean flywheel, check for wear and damage. Replace damaged flywheel. Check grooved ball bearing in crankshaft for ease of movement and tightness and if necessary replace grooved ball bearing. Always replace clutch plates fouled by oil or cleaning agent. Check clutch plate for damage and friction rust in hub profile and replace if necessary. Check clutch disk for wear and measure lining protrusion at lining rivets at closing head (A) in each case. Rivet connection: A = closing head, B = swage head. See **Fig. 16** . Replace clutch plate if lining protrusion at closing head (A) is less than 1 mm. Push clutch disk onto the cleaned transmission input shaft and check for easy movability. Do not clean SAC clutch with high pressure cleaner or washing machine as this may impair function of adjustment unit. Clean friction surface only. Check SAC for wear and damage and replace if necessary.



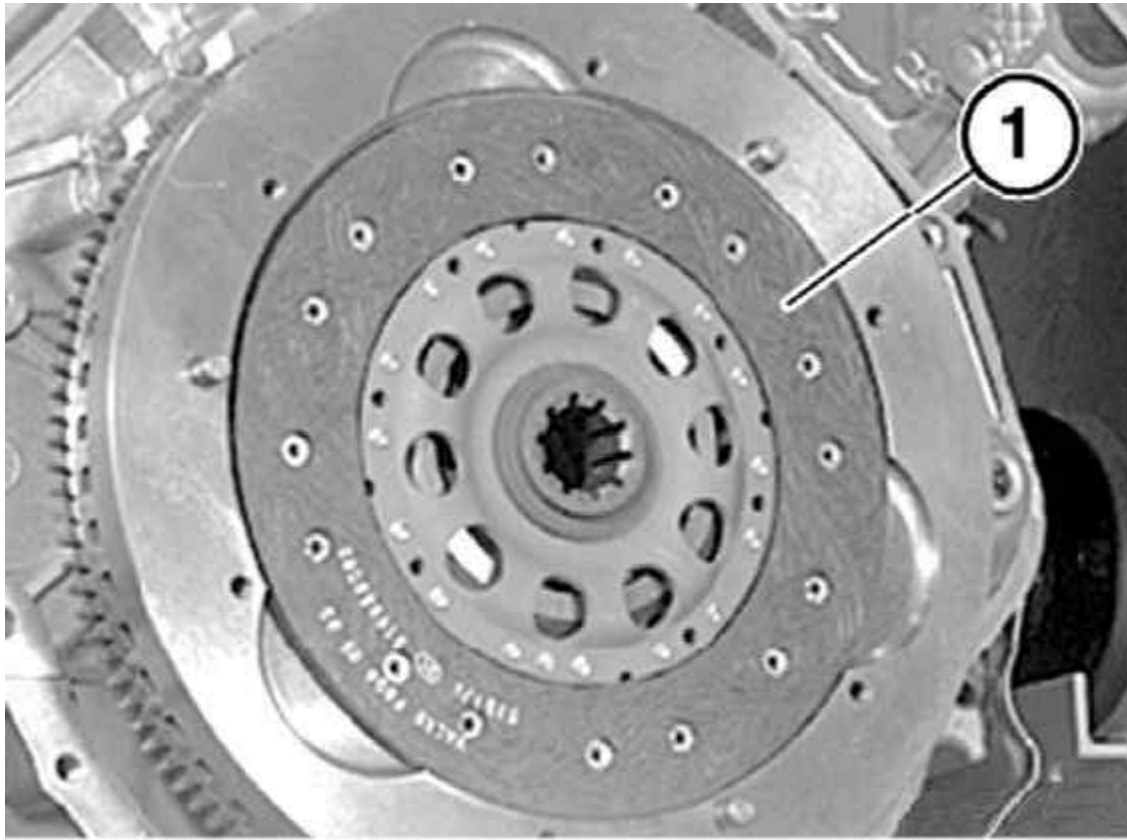
G00386921

Fig. 13: Blocking Flywheel
Courtesy of BMW OF NORTH AMERICA, INC.



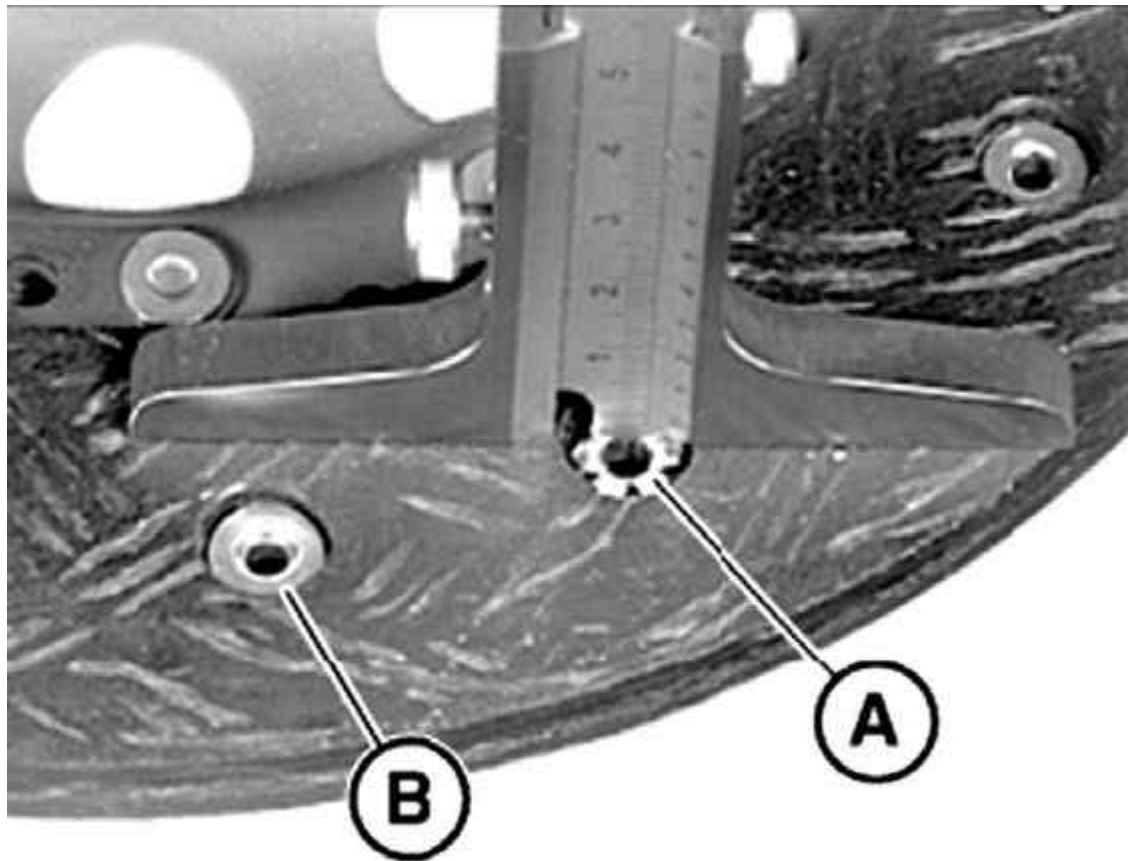
G00386923

Fig. 14: Removing SAC Clutch From Flywheel
Courtesy of BMW OF NORTH AMERICA, INC.



G00386924

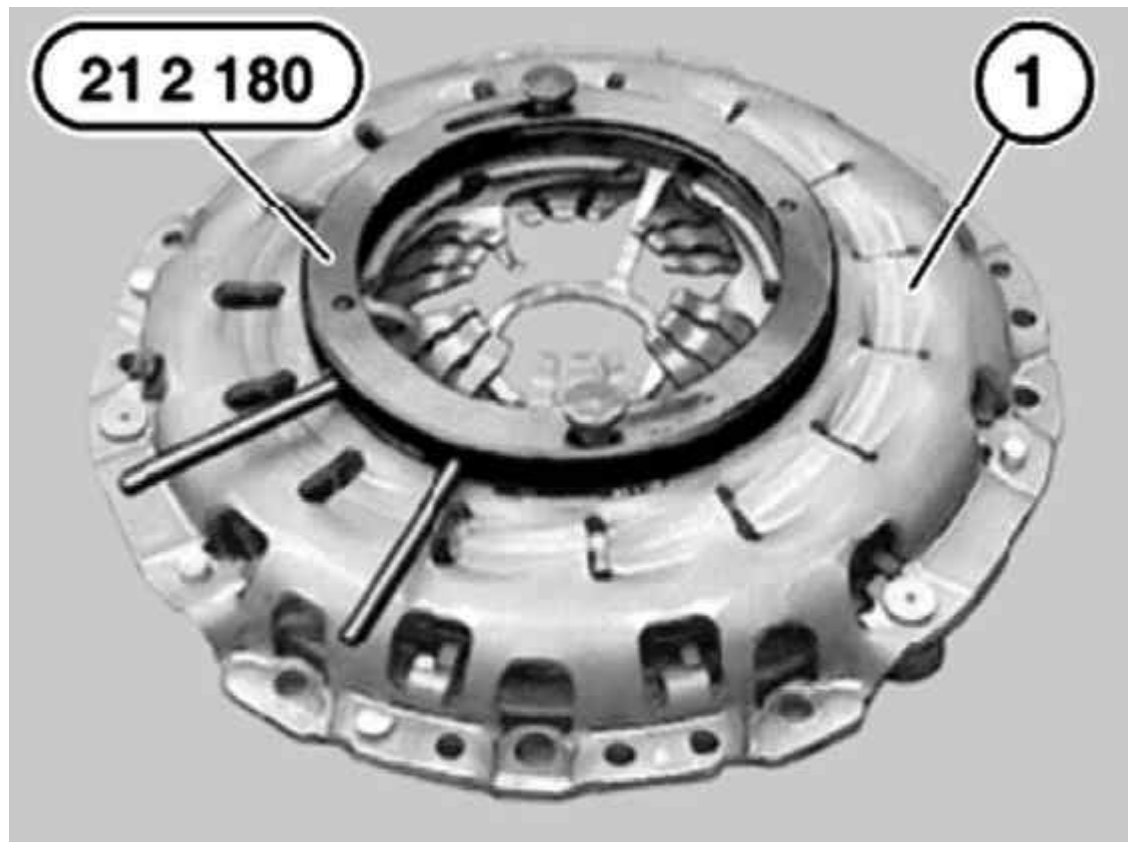
Fig. 15: Removing Clutch Plate From Flywheel
Courtesy of BMW OF NORTH AMERICA, INC.



G00386925

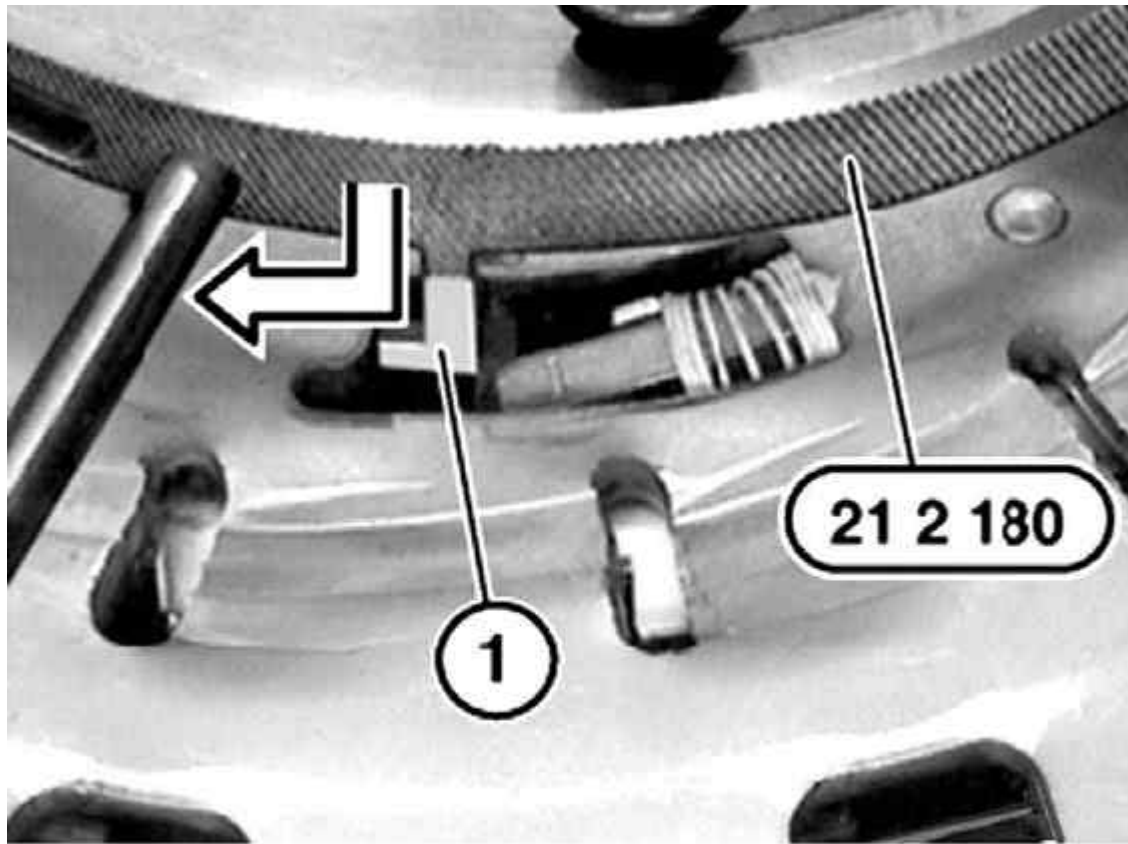
Fig. 16: Measuring Clutch Plate Wear
Courtesy of BMW OF NORTH AMERICA, INC.

3. To reinstall removed SAC clutch and clutch plate, set SAC clutch (1) down on a clean surface. See **Fig. 17**. Install special tool 21 2 180 in SAC clutch (1). Locking hooks (1) of special tool 21 2 180 must engage in openings in SAC clutch. See **Fig. 18**. Press special tool (21 2 180) together at handles (1) as far as it will go and grip firmly. At same time tighten down knurled screws (2). See **Fig. 19**. Adjustment ring of SAC clutch is now secured in its original position (wear position). Do not reset adjustment ring to new position. Insert special tool 21 2 170 only in area of bores for dowel pins. See **Fig. 20**. Fit special tool 21 2 170 and tighten down at knurled screw (1). See **Fig. 21**. Screw in spindle (1) until diaphragm spring (2) is pretensioned up to stop. See **Fig. 22**. Handle clutch disk carefully, using care to not touch surfaces of friction pads. Install clutch plate in correct position. Note designation for "engine side" and "transmission side". Center clutch plate (1) with special tool. See **Fig. 23**. On vehicles manufactured from 4/03, note color marking when fitting clutch with balance marking. Position color marking (1) on dual-mass flywheel and color marking (2) on clutch pressure plate as closely as possible to each other. See **Fig. 24**. Maximum possible angle error is 60 degrees. On all vehicles, fit SAC clutch (1) on flywheel. Pay attention to dowel pins (2). See **Fig. 25**. SAC clutch (1) must be secured by way of dowel pins (2).



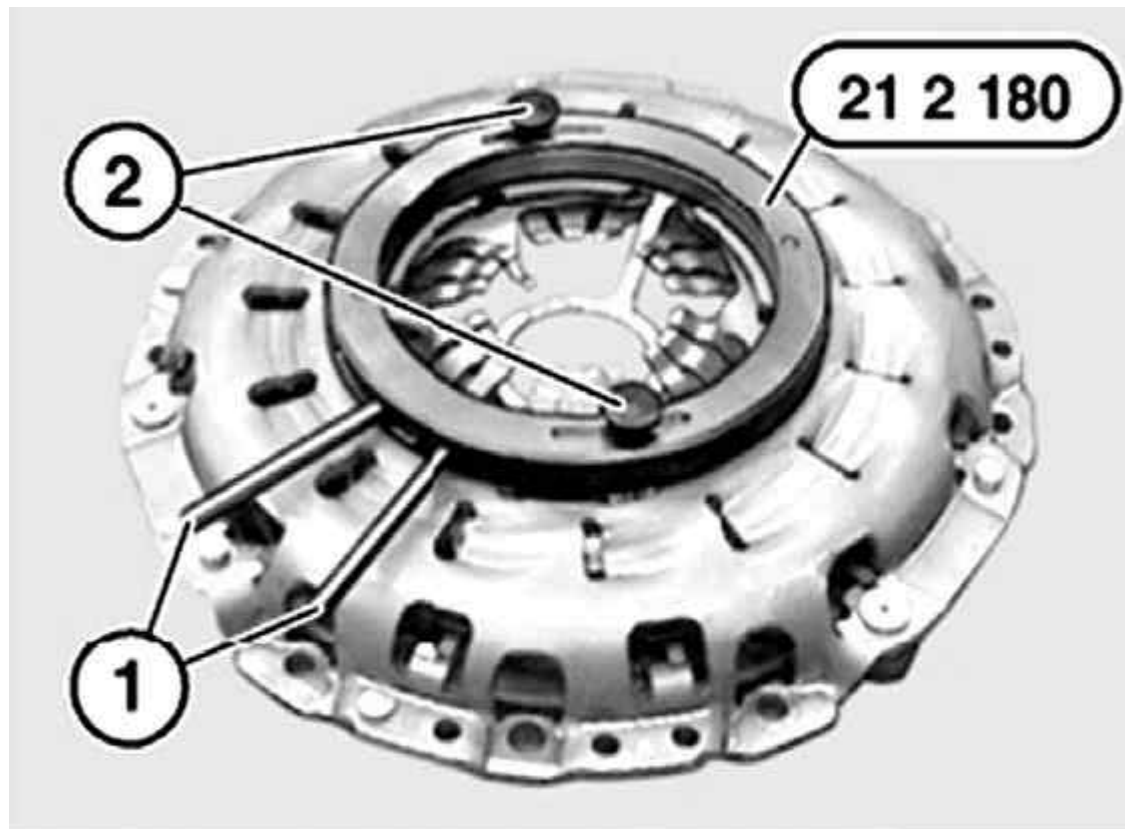
G00386926

Fig. 17: Setting SAC Clutch Down On A Clean Surface
Courtesy of BMW OF NORTH AMERICA, INC.



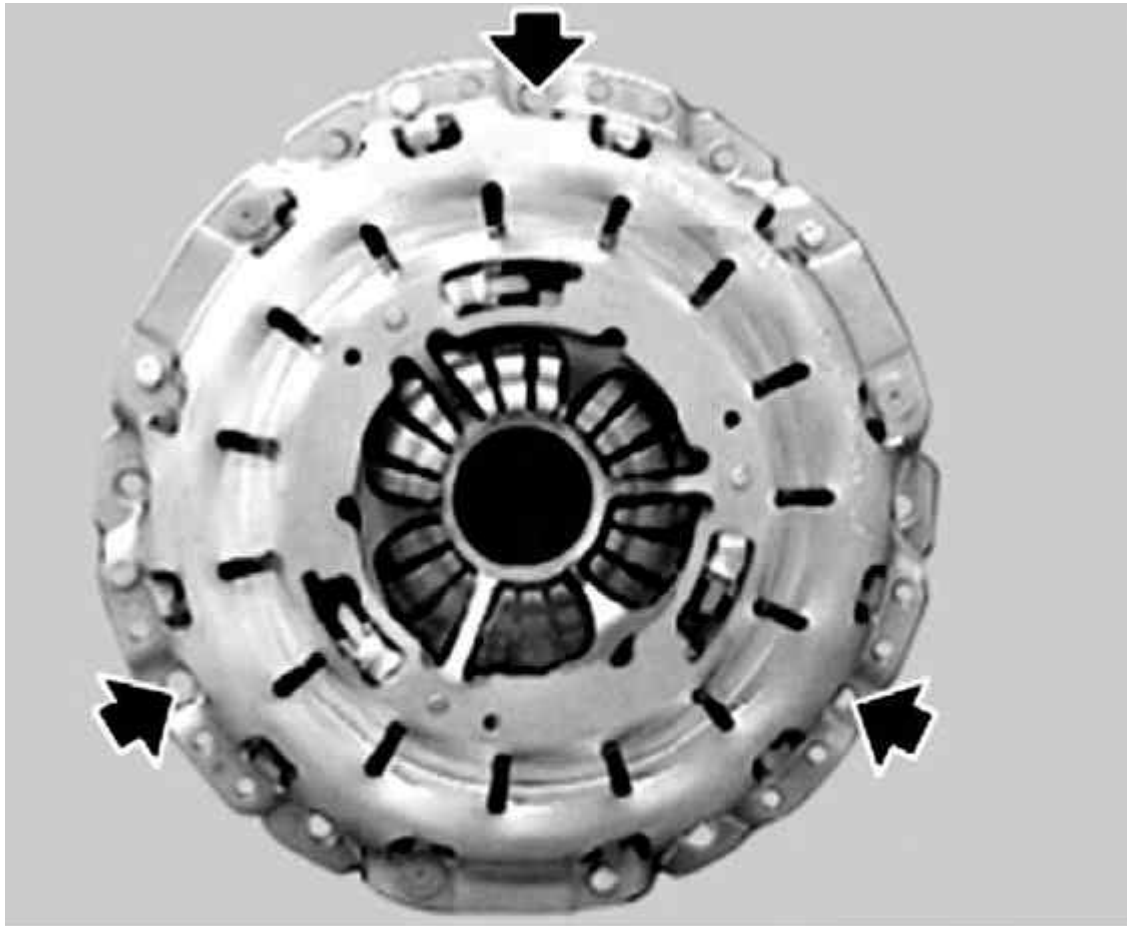
G00386927

Fig. 18: Identifying Locking Hooks Of Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.



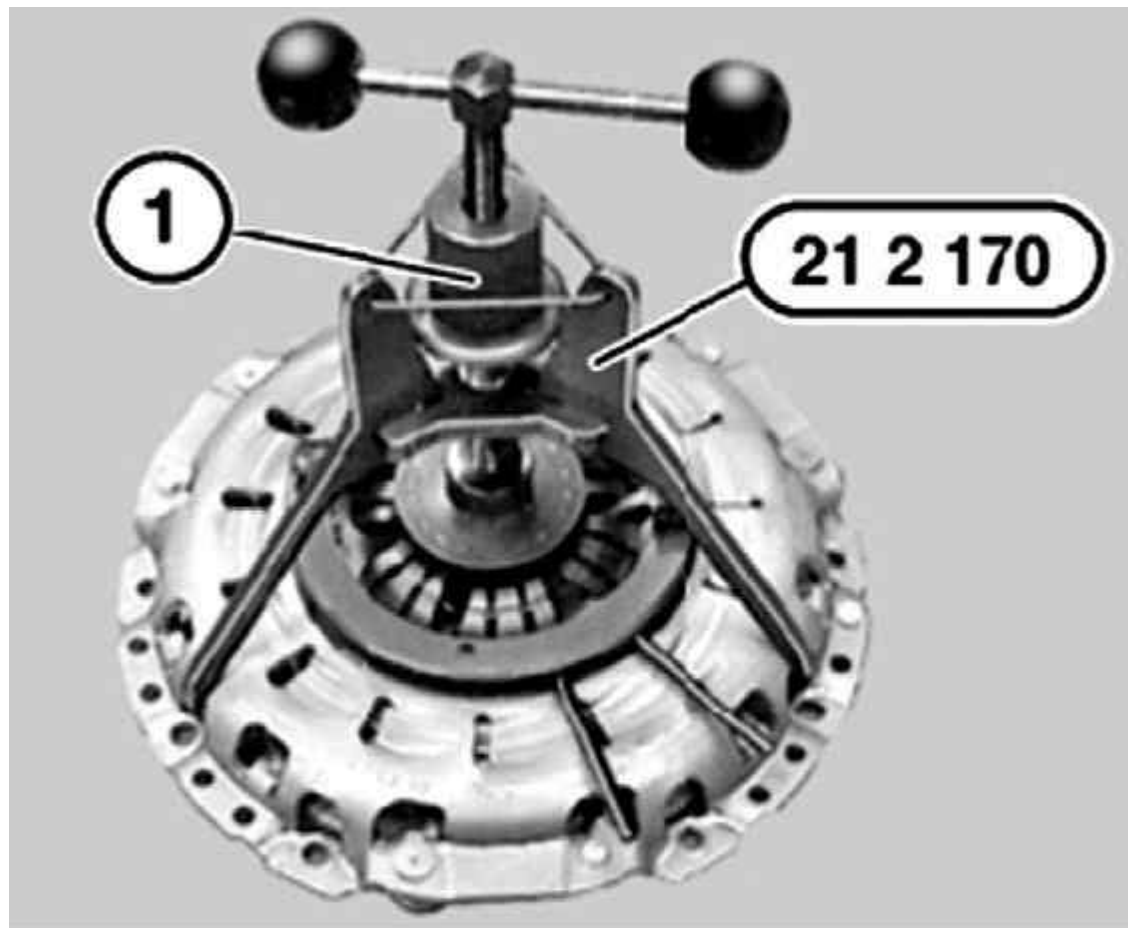
G00386928

Fig. 19: Pressing Special Tool At Handles & Tightening Knurled Screws
Courtesy of BMW OF NORTH AMERICA, INC.



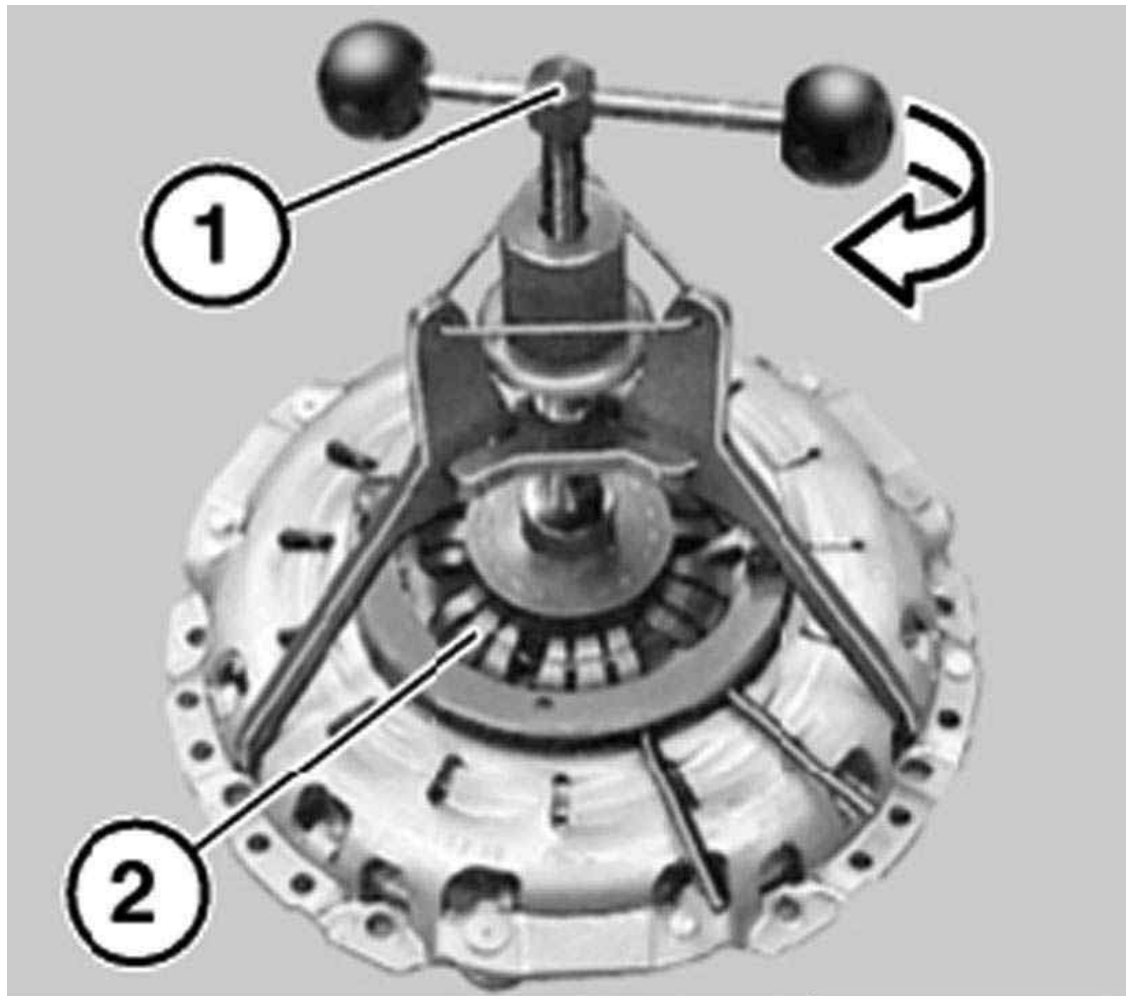
G00386929

Fig. 20: Identifying Area Of Bores For Dowel Pins
Courtesy of BMW OF NORTH AMERICA, INC.



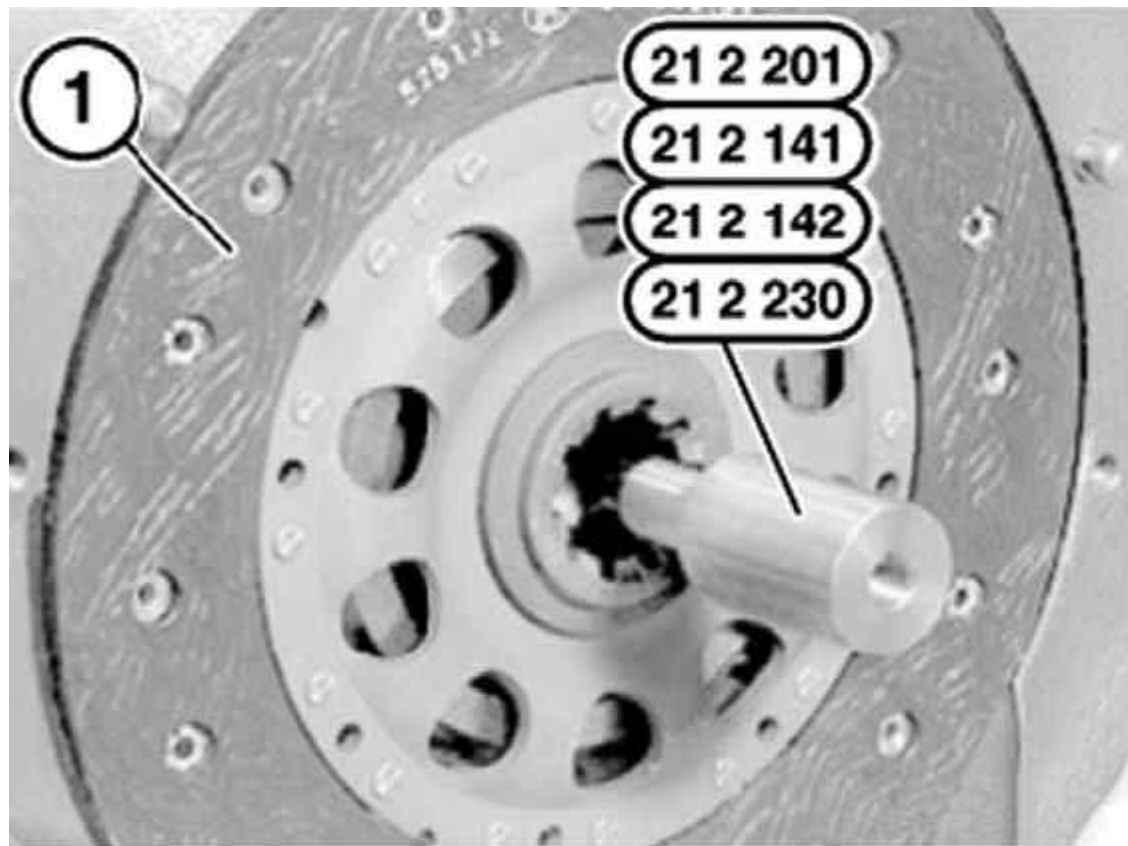
G00386930

Fig. 21: Installing Special Tool & Tightening At Knurled Screw
Courtesy of BMW OF NORTH AMERICA, INC.



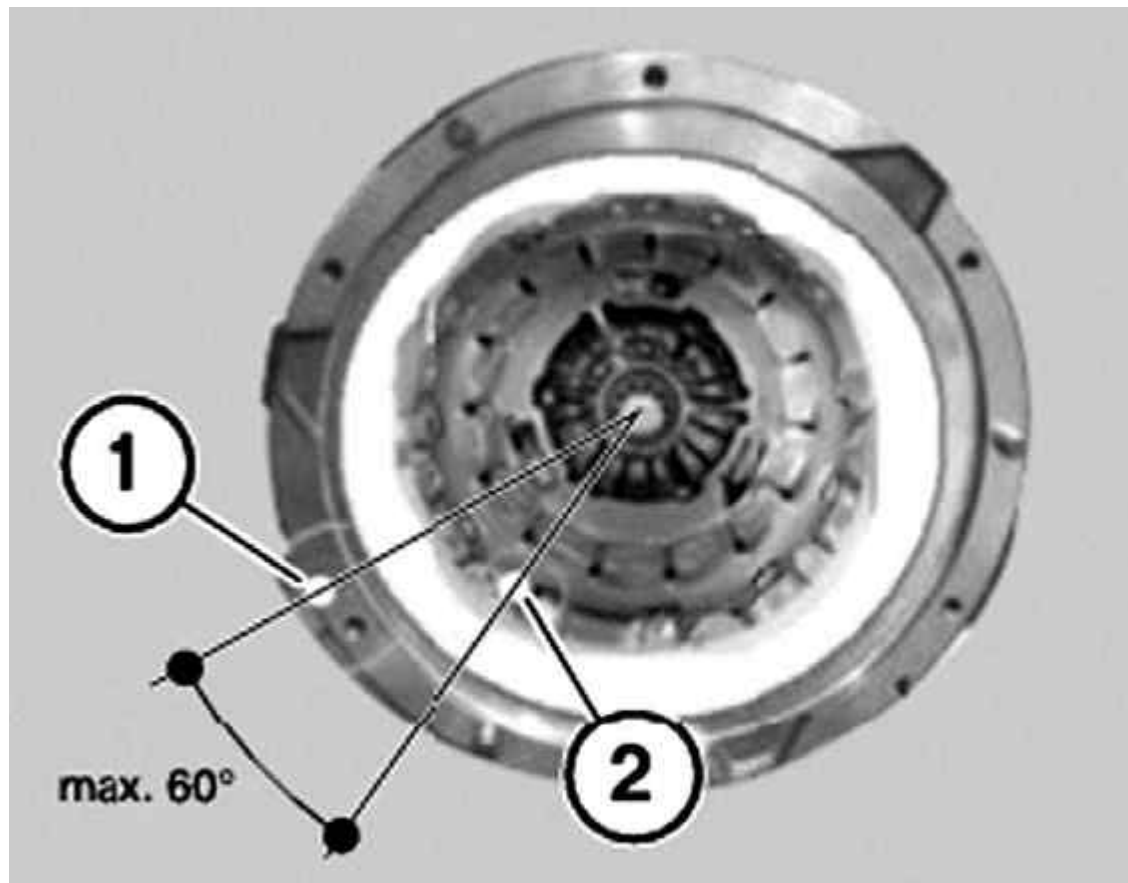
G00386931

Fig. 22: Screwing In Spindle Until Diaphragm Spring Is Pretensioned
Courtesy of BMW OF NORTH AMERICA, INC.



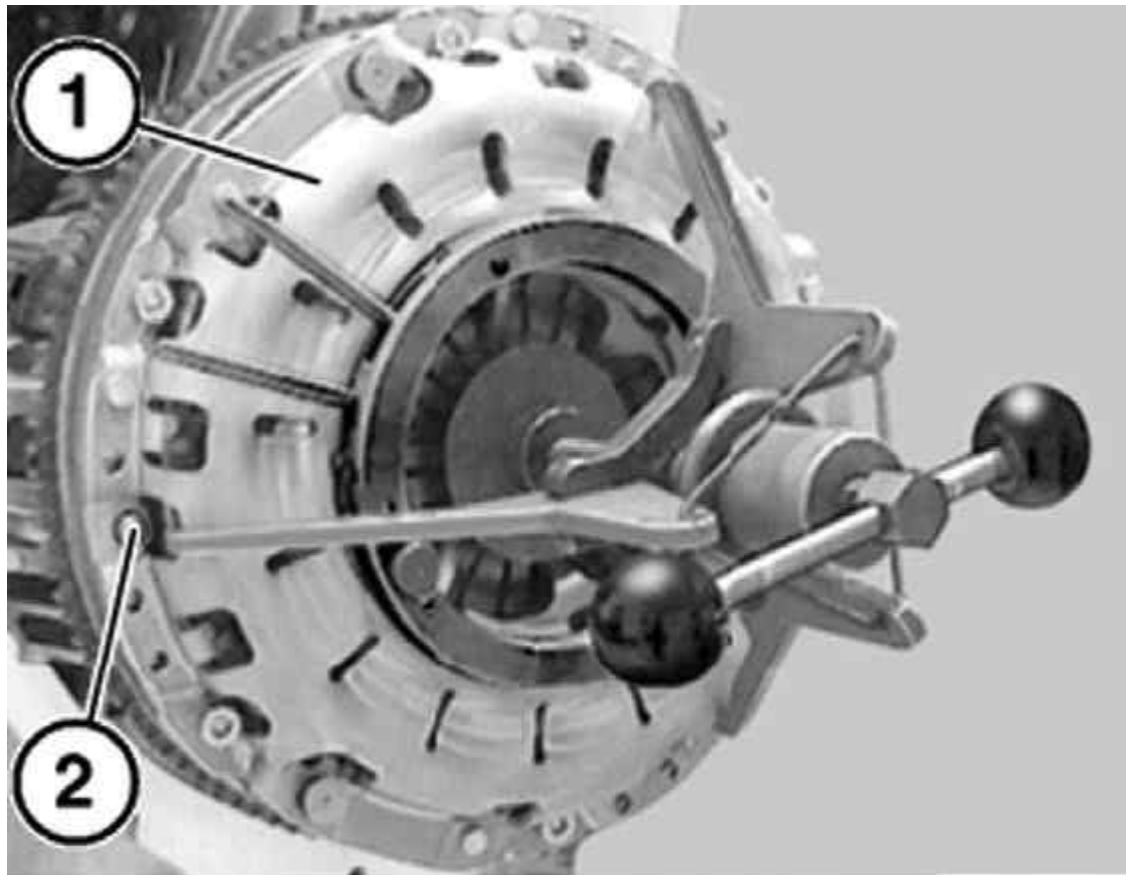
G00386932

Fig. 23: Centering Clutch Plate With Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.



G00386980

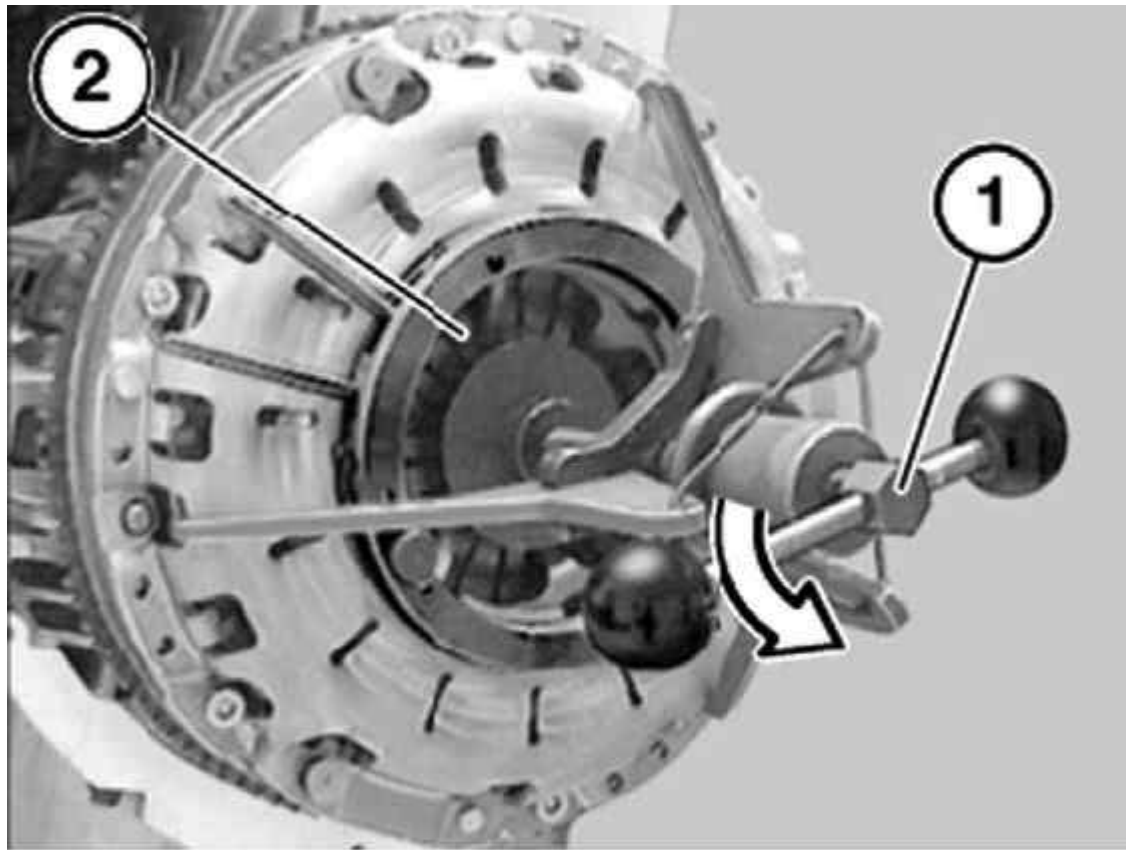
Fig. 24: Positioning Color Marking
Courtesy of BMW OF NORTH AMERICA, INC.



G00386933

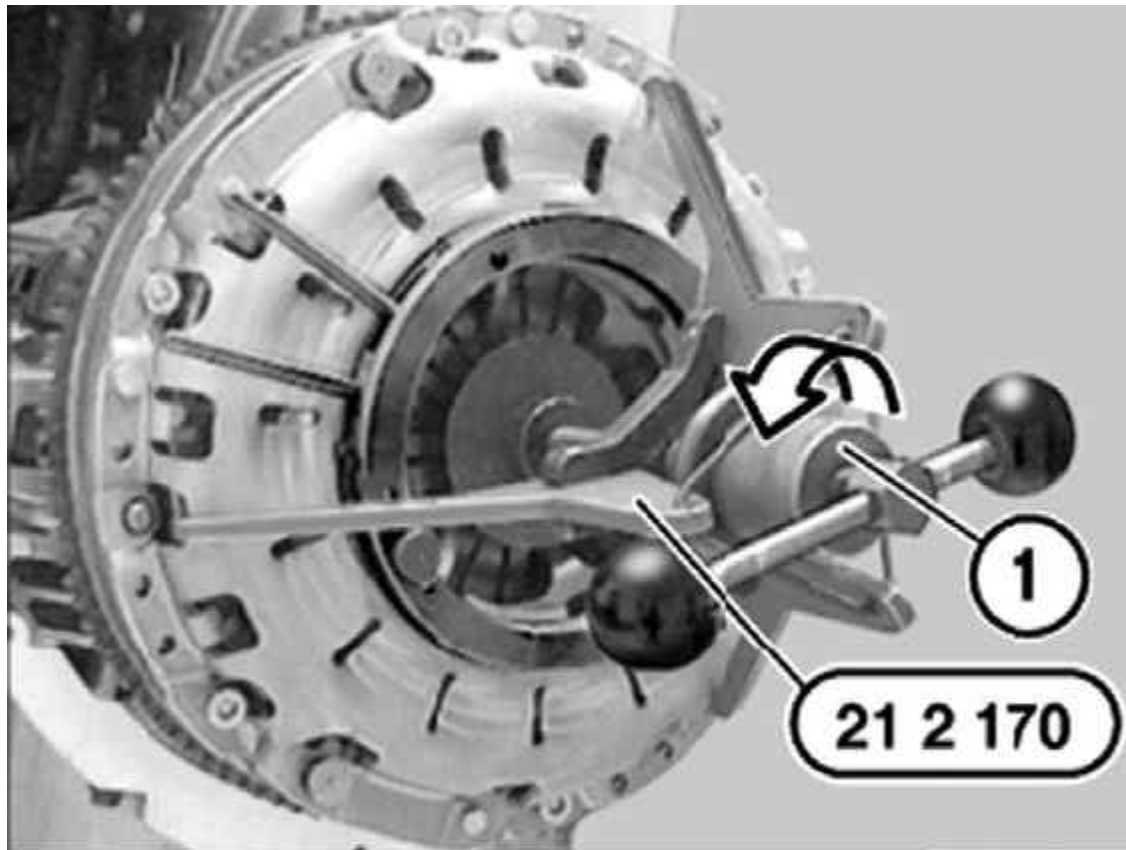
Fig. 25: Identifying Clutch & Dowel Pins**Courtesy of BMW OF NORTH AMERICA, INC.**

4. Insert screws and tighten down. Release spindle (1) until tension is completely removed from diaphragm spring (2). See **Fig. 26** . Release knurled screw (1) and remove special tool (21 2 180). See **Fig. 27** . Release knurled screws (2) and remove special tool (21 2 180) from SAC clutch. See **Fig. 28** . Withdraw special tool from clutch plate with aid of accompanying screw (1). See **Fig. 29** .



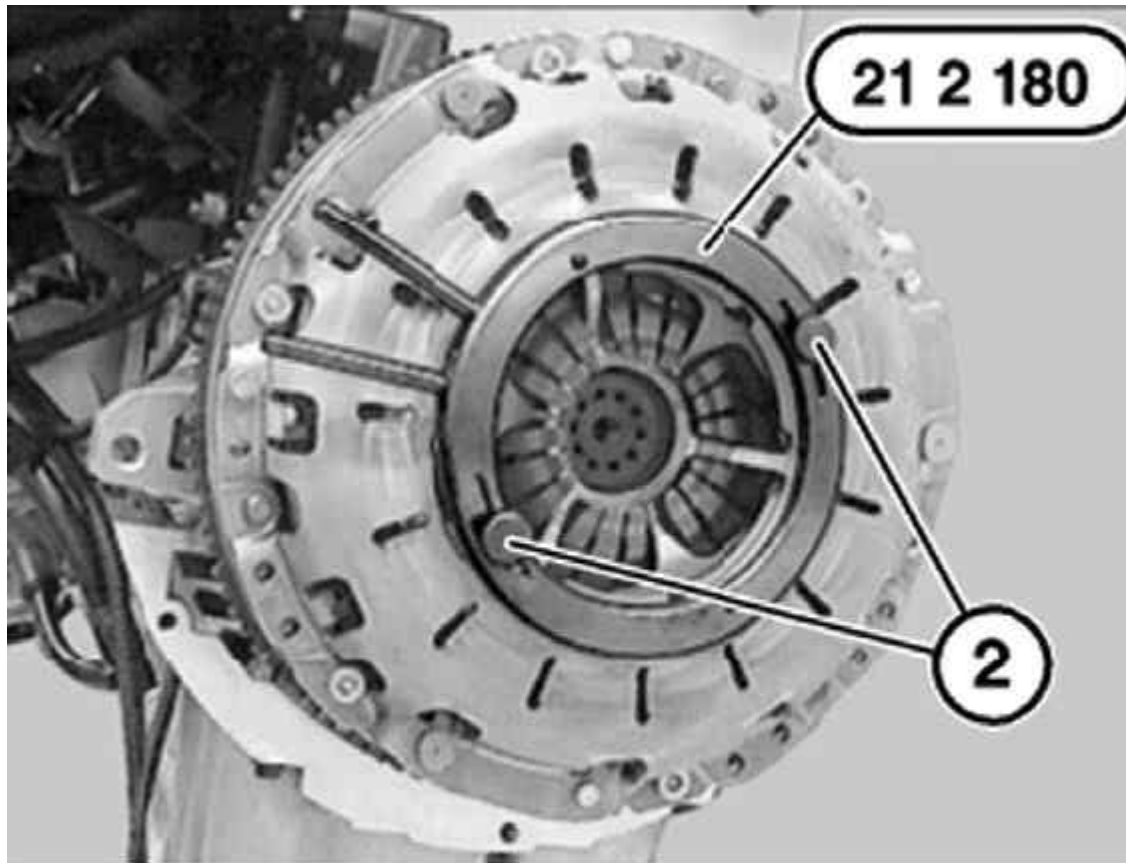
G00386934

Fig. 26: Releasing Spindle Until No Tension Is Present At Diaphragm Spring
Courtesy of BMW OF NORTH AMERICA, INC.



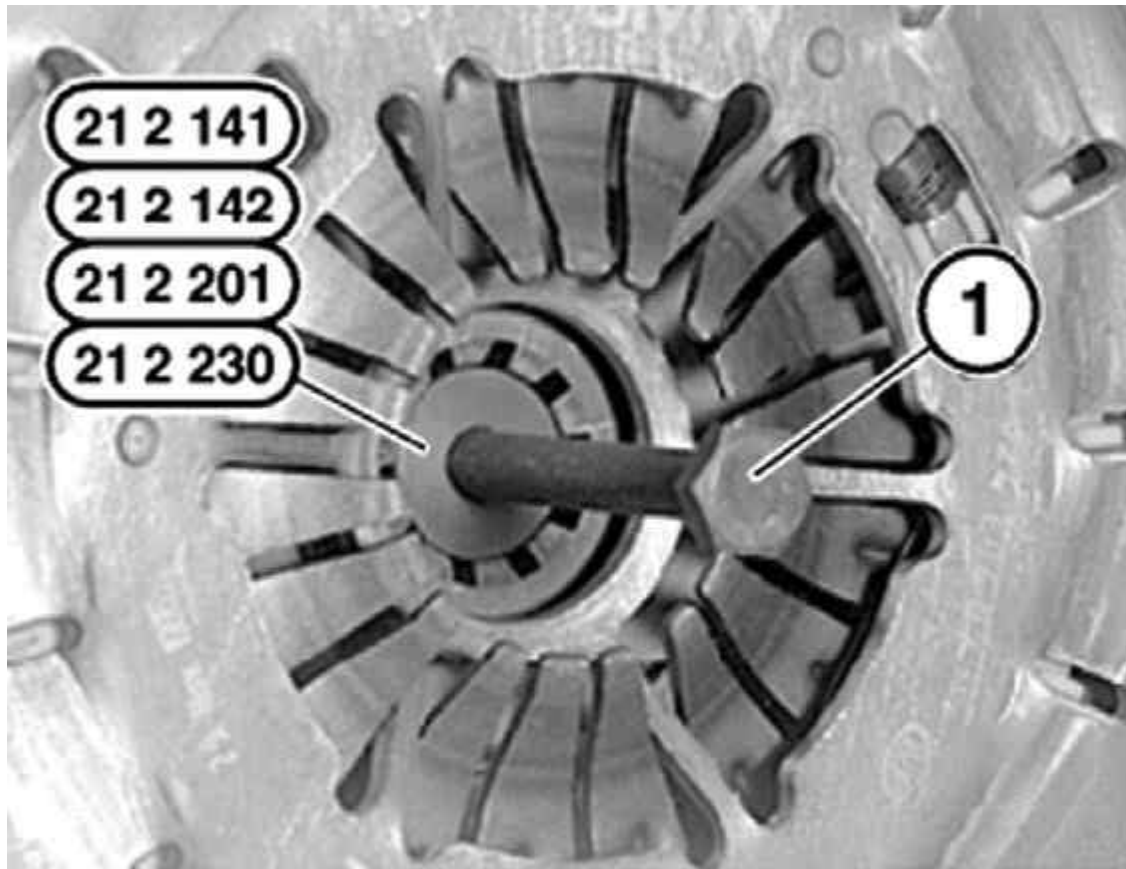
G00386935

Fig. 27: Releasing Knurled Screw & Special Tool From Clutch
Courtesy of BMW OF NORTH AMERICA, INC.



G00386936

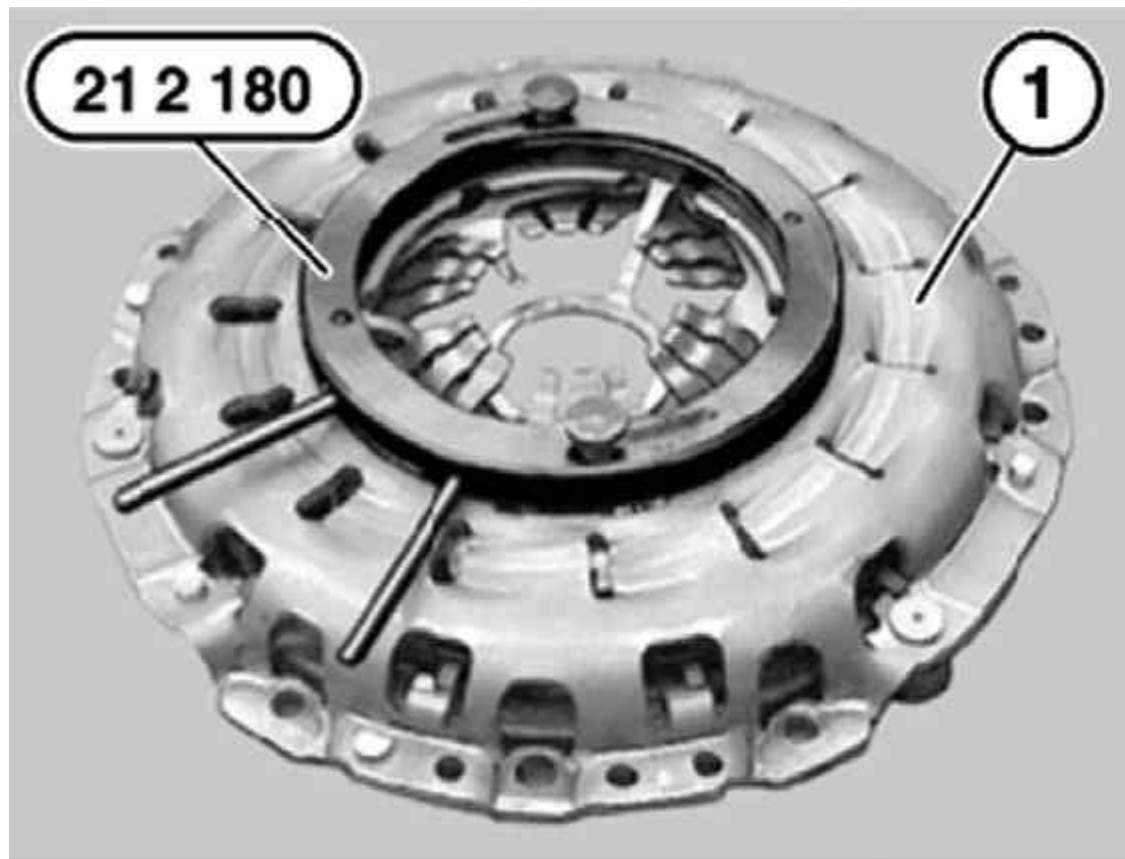
Fig. 28: Releasing Knurled Screws & Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.



G00386937

Fig. 29: Removing Special Tool From Clutch Plate Using
Courtesy of BMW OF NORTH AMERICA, INC.

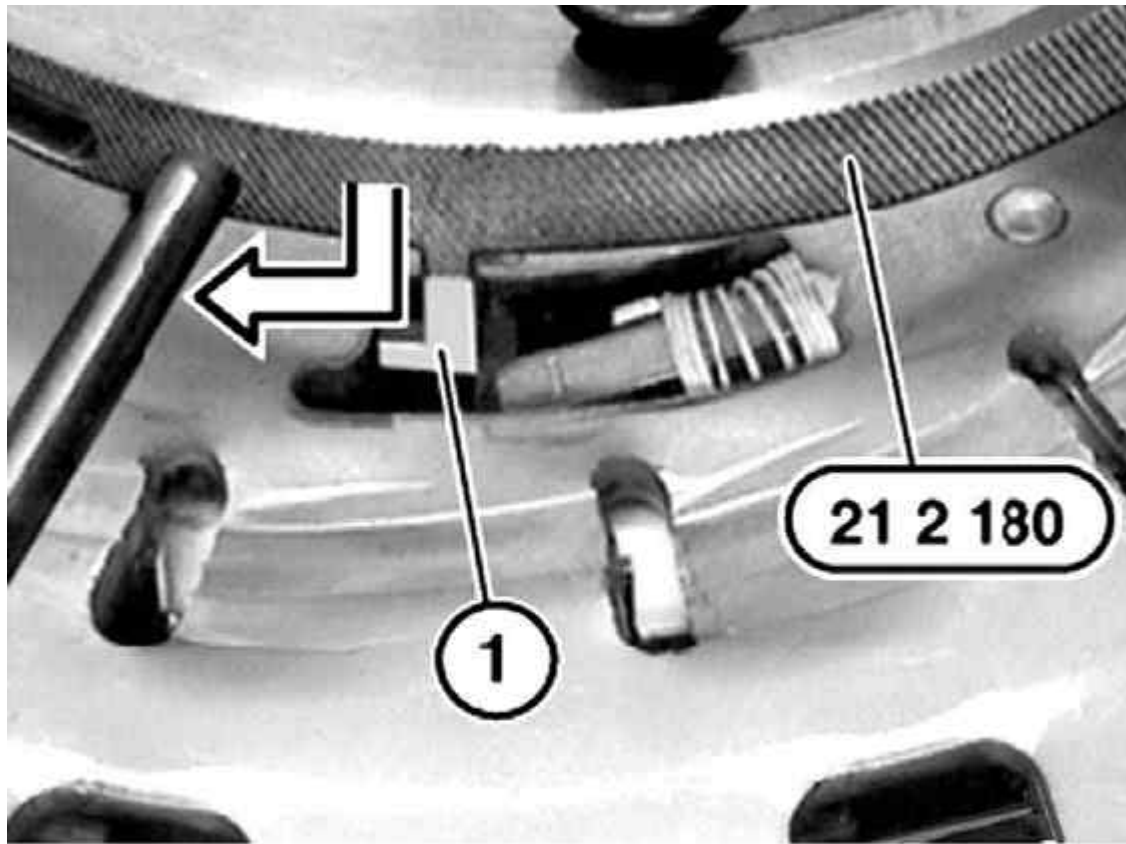
5. Before installing an SAC clutch which has been in service with a new clutch plate, always reset adjustment ring in new position. Set SAC clutch down on a clean surface. Install special tool (21 2 180) in SAC clutch (1). See Fig. 30 .



G00386938

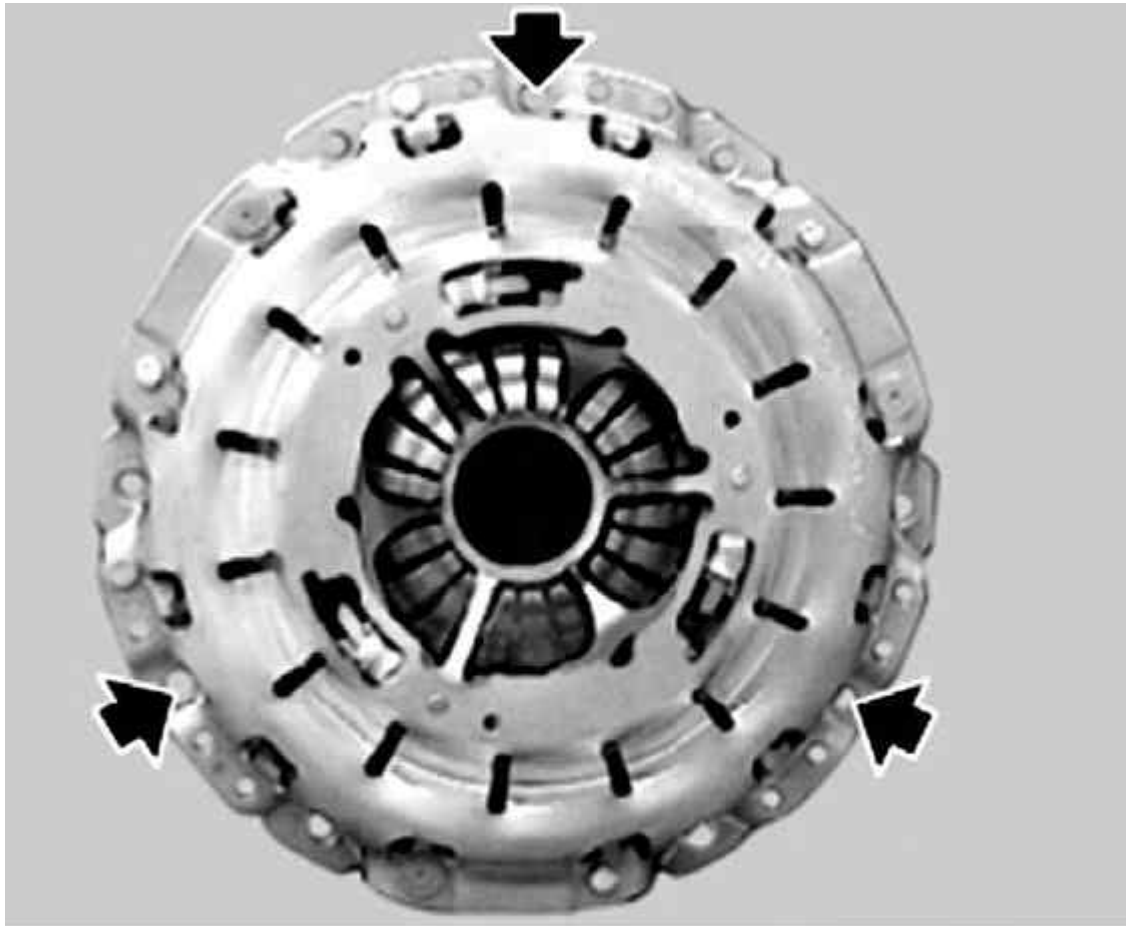
Fig. 30: Installing Special Tool In SAC Clutch
Courtesy of BMW OF NORTH AMERICA, INC.

6. Locking hooks (1) of special tool (21 2 180) must engage in openings in SAC clutch. See **Fig. 31** . Insert special tool (21 2 170) only in area of bores for dowel pins. See **Fig. 32** . Fit special tool (21 2 170) and tighten down at knurled screw (1). See **Fig. 33** . Screw in spindle (1) until adjustment ring of SAC 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. See **Fig. 34** . At same time tighten down knurled screws (2). Adjustment ring of SAC clutch is now secured in new position. See **Fig. 35** . Screw in spindle (1) until diaphragm spring (2) is tensioned to stop. See **Fig. 36** . Handle clutch plate with care, do not touch surfaces of friction linings. Install clutch plate in correct position. Pay attention to text "engine end" and "transmission side".



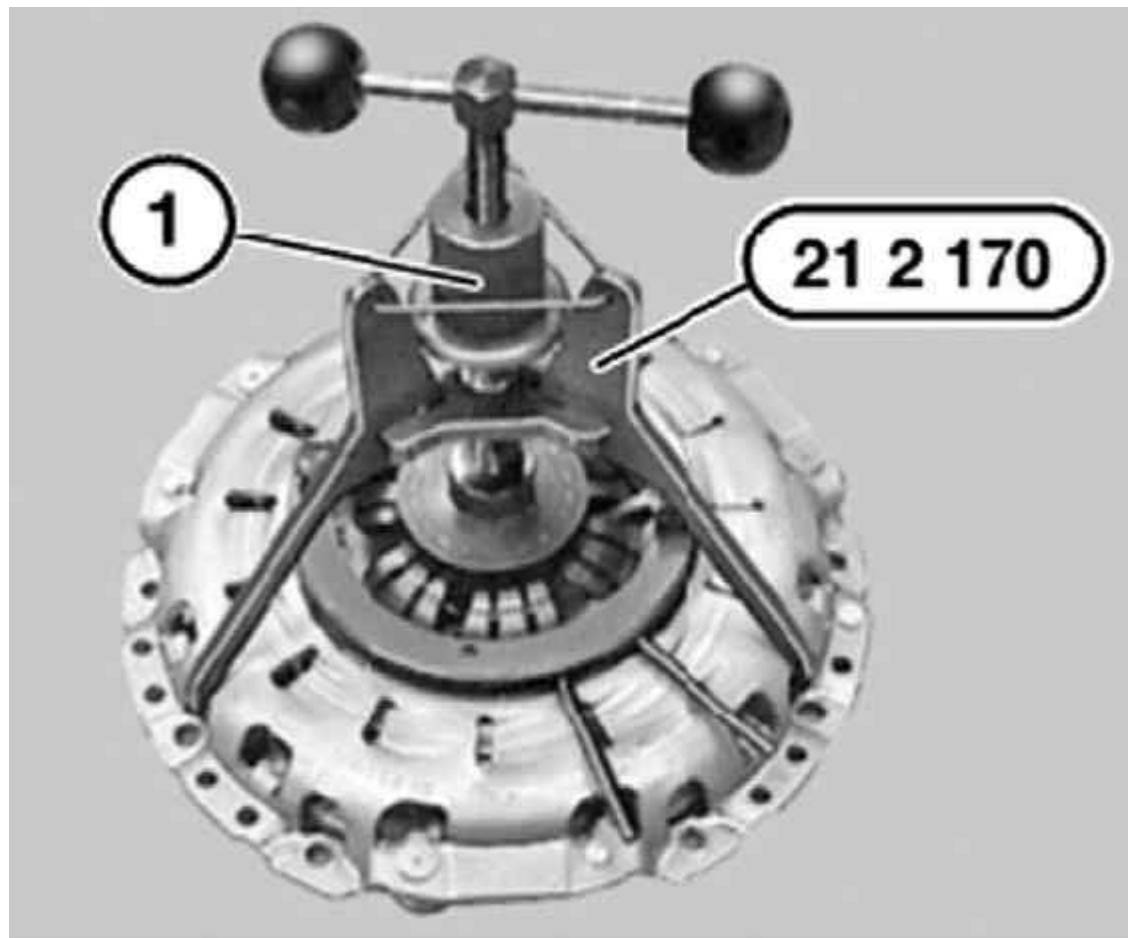
G00386939

Fig. 31: Ensuring Locking Hooks Engage In Openings In SAC Clutch
Courtesy of BMW OF NORTH AMERICA, INC.



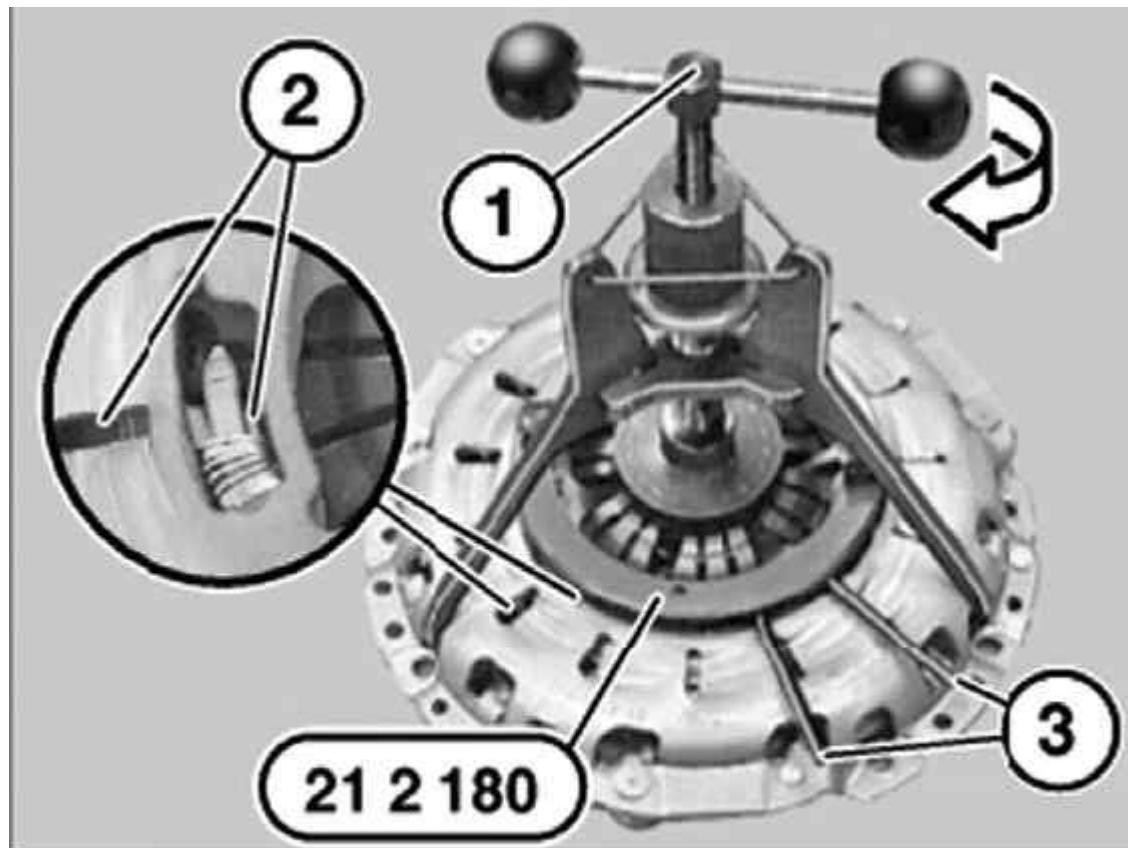
G00386940

Fig. 32: Inserting Special Tool Only In Area Of Bores For Dowel Pins
Courtesy of BMW OF NORTH AMERICA, INC.



G00386941

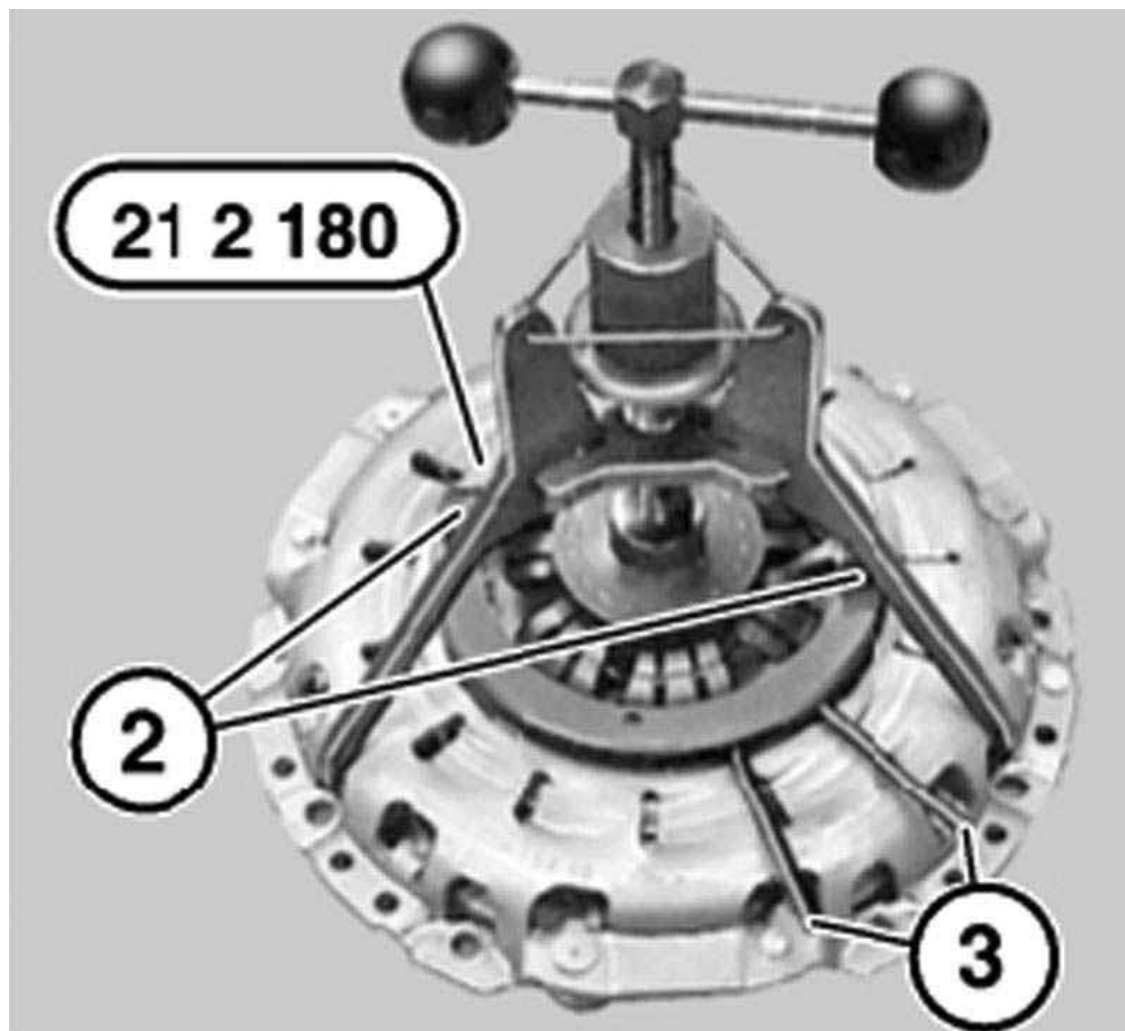
Fig. 33: Installing Special Tool & Tightening Down At Knurled Screw
Courtesy of BMW OF NORTH AMERICA, INC.



G00386942

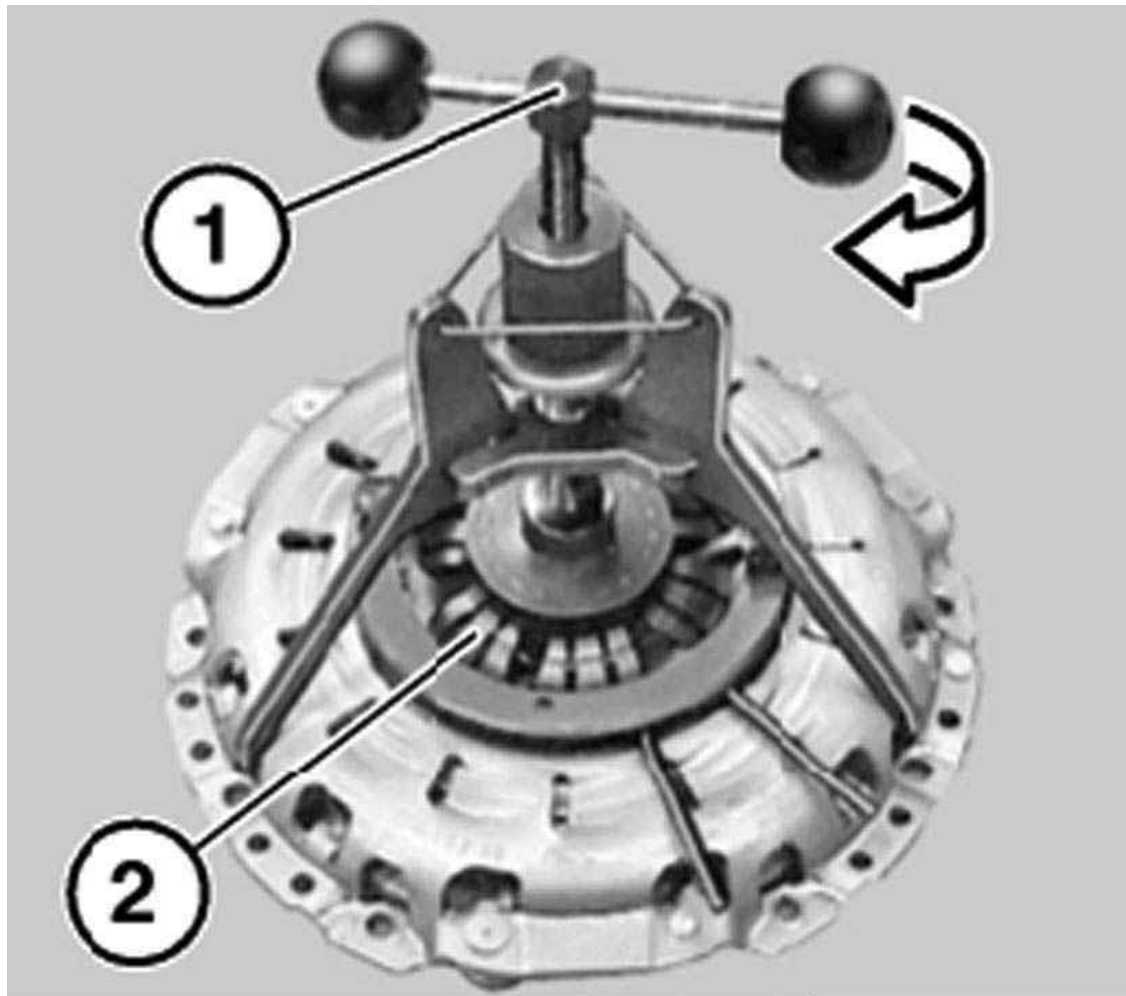
Fig. 34: Screwing In Spindle Until Adjustment Ring Of SAC Clutch Can Be Turned With Special Tool At Handles

Courtesy of BMW OF NORTH AMERICA, INC.



G00386943

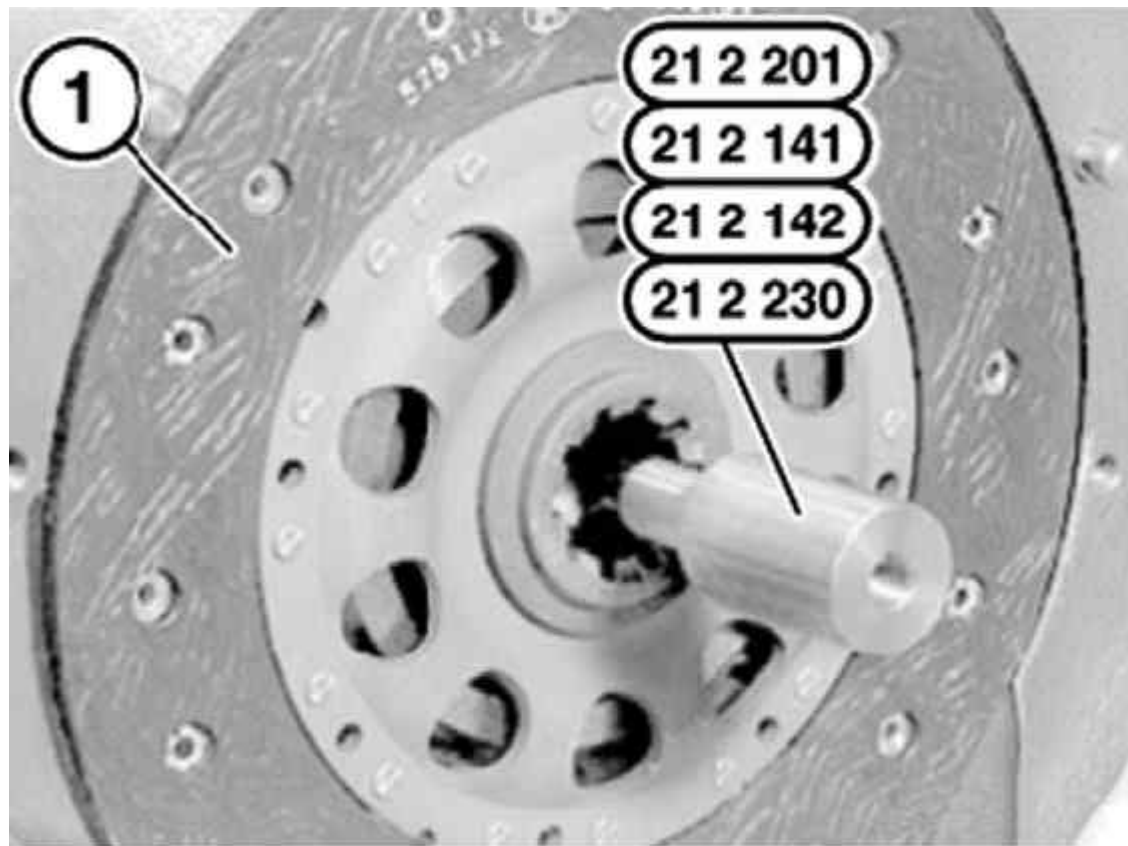
Fig. 35: Securing Adjustment Ring Of SAC Clutch In New Position
Courtesy of BMW OF NORTH AMERICA, INC.



G00386944

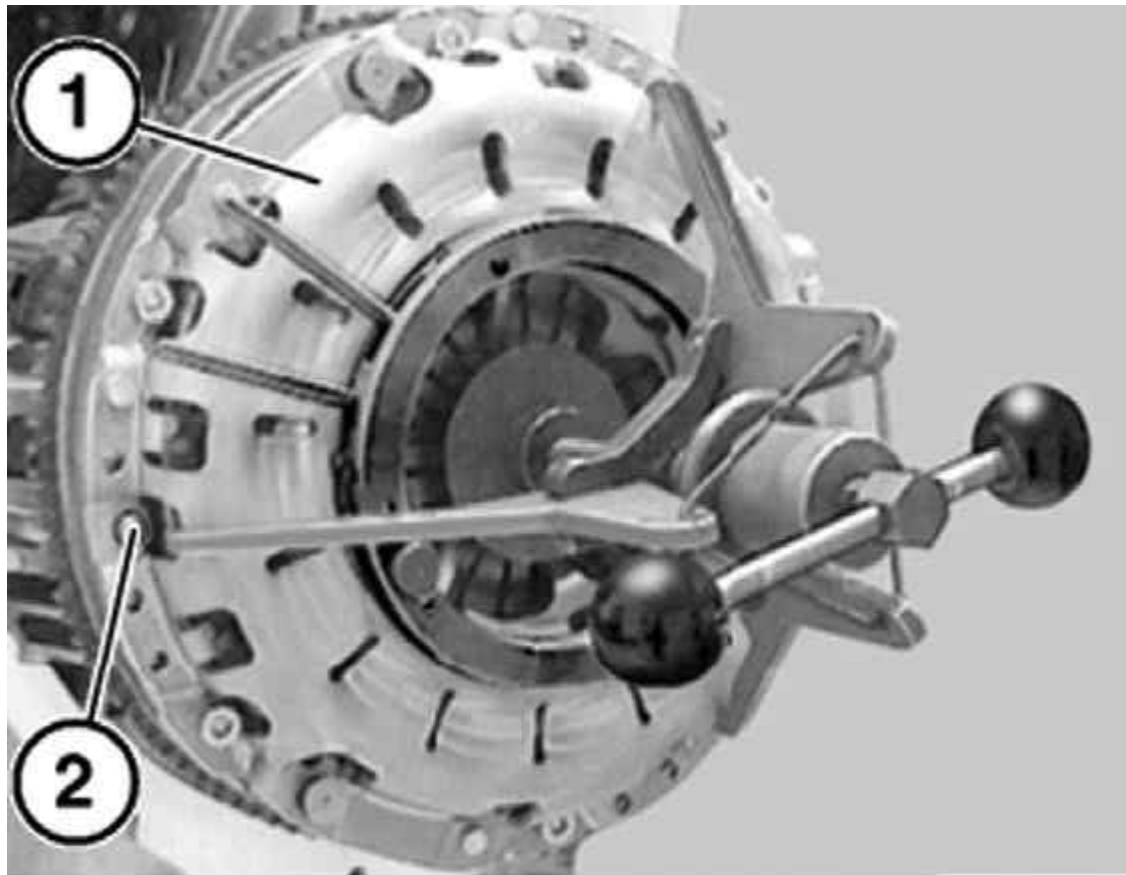
Fig. 36: Screwing In Spindle Until Diaphragm Spring Is Tensioned To Stop
Courtesy of BMW OF NORTH AMERICA, INC.

7. Center clutch plate (1) with special tools. See **Fig. 37** . On vehicles manufactured from 4/03, note color marking when fitting clutch with balance marking. Position color marking (1) on dual-mass flywheel and color marking (2) on clutch pressure plate as closely as possible to each other. See **Fig. 24** . Maximum possible angle error is 60 degrees. Fit SAC clutch (1) on flywheel. Pay attention to dowel pins (2). See **Fig. 38** . SAC clutch (1) must be secured by way of dowel pins (2). Install retaining screws of SAC clutch and tighten down. Release spindle (1) until tension is completely removed from diaphragm spring (2). See **Fig. 39** . Release knurled screw (1) and remove special tool (21 2 170) from SAC clutch. See **Fig. 40** . Release knurled screws (2) and remove special tool (21 2 180) from SAC clutch. See **Fig. 41** . Withdraw special tool from clutch plate with aid of accompanying screw (1). See **Fig. 42** .



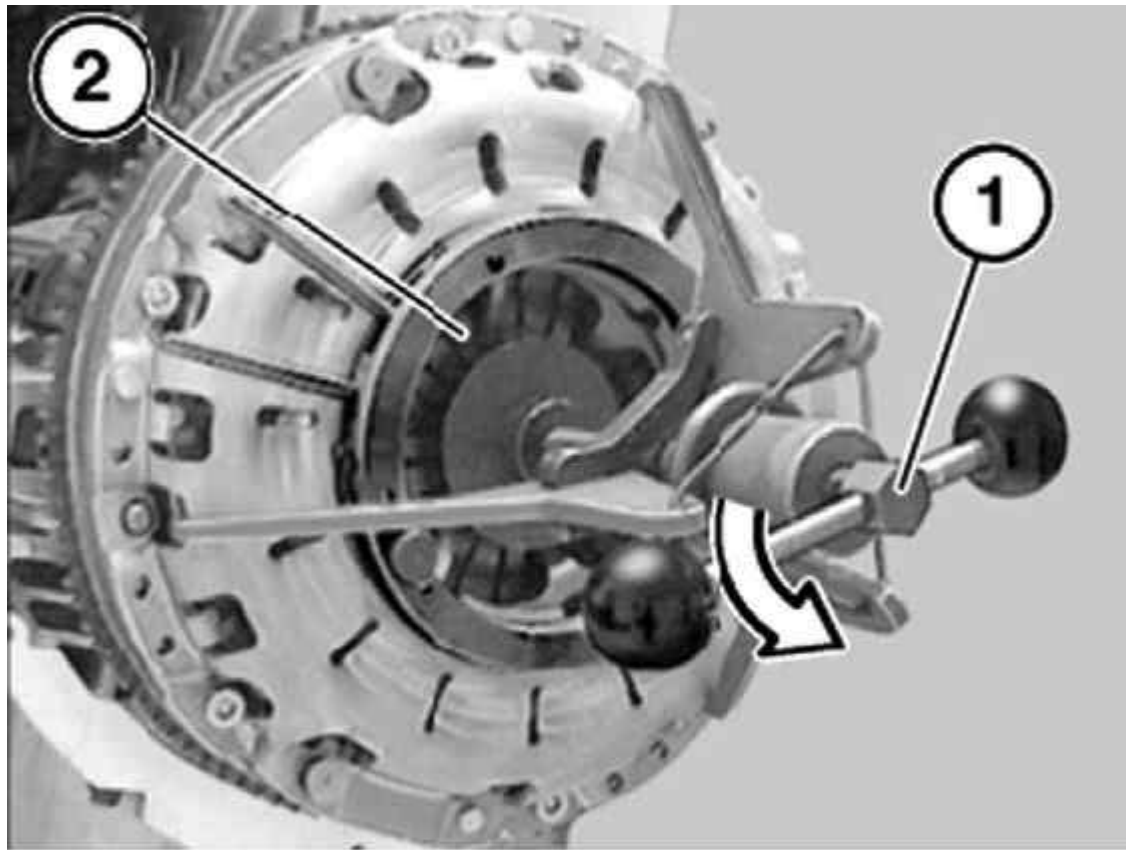
G00386945

Fig. 37: Centering Cutch Plate With Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.



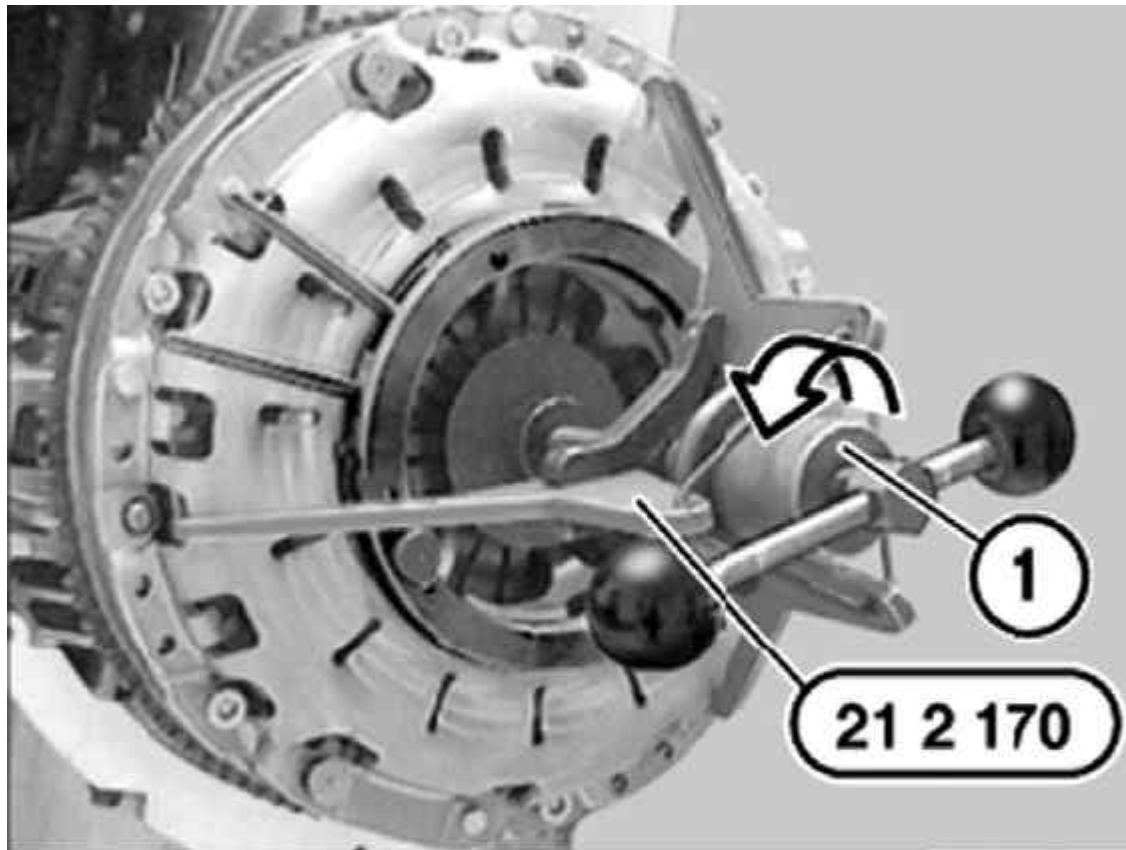
G00386946

Fig. 38: Fitting Clutch On Flywheel & Noting Location Of Dowel Pins
Courtesy of BMW OF NORTH AMERICA, INC.



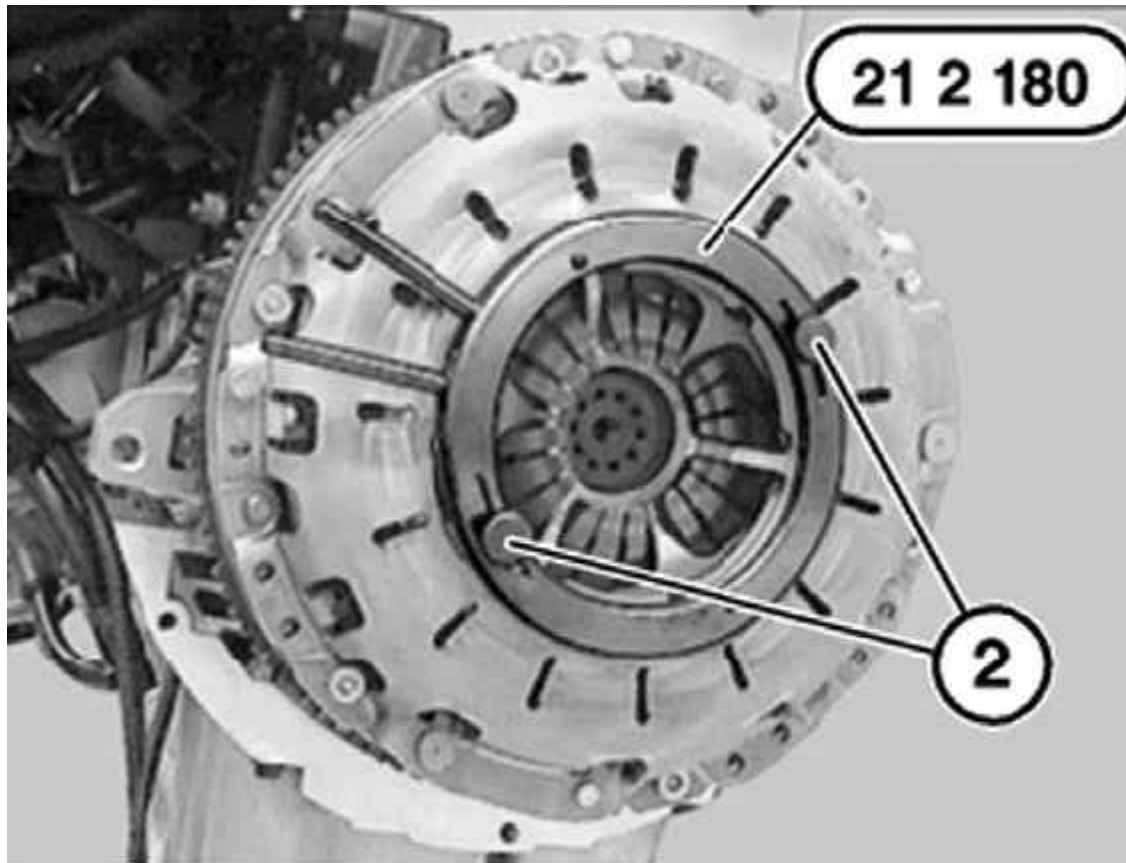
G00386947

Fig. 39: Releasing Spindle Until Tension Is Removed
Courtesy of BMW OF NORTH AMERICA, INC.



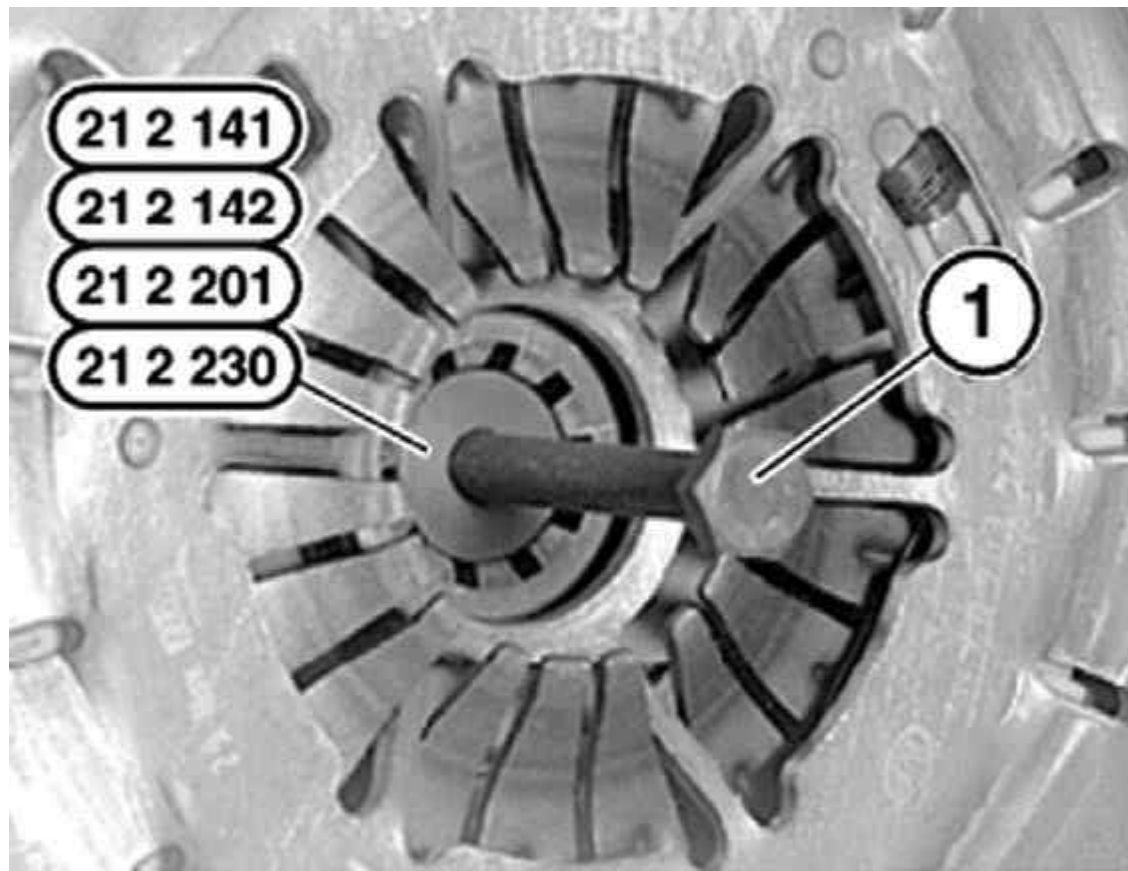
G00386948

Fig. 40: Releasing Knurled Screw
Courtesy of BMW OF NORTH AMERICA, INC.



G00386949

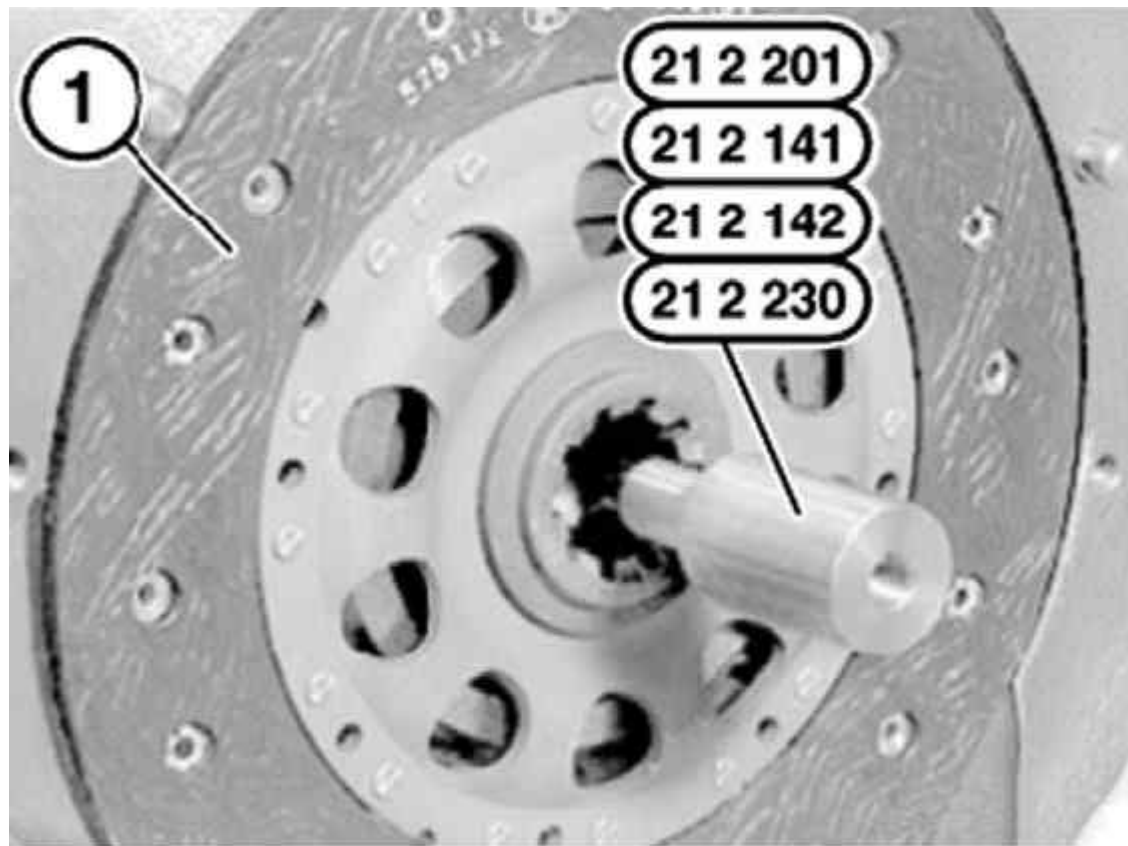
Fig. 41: Releasing Knurled Screws
Courtesy of BMW OF NORTH AMERICA, INC.



G00386950

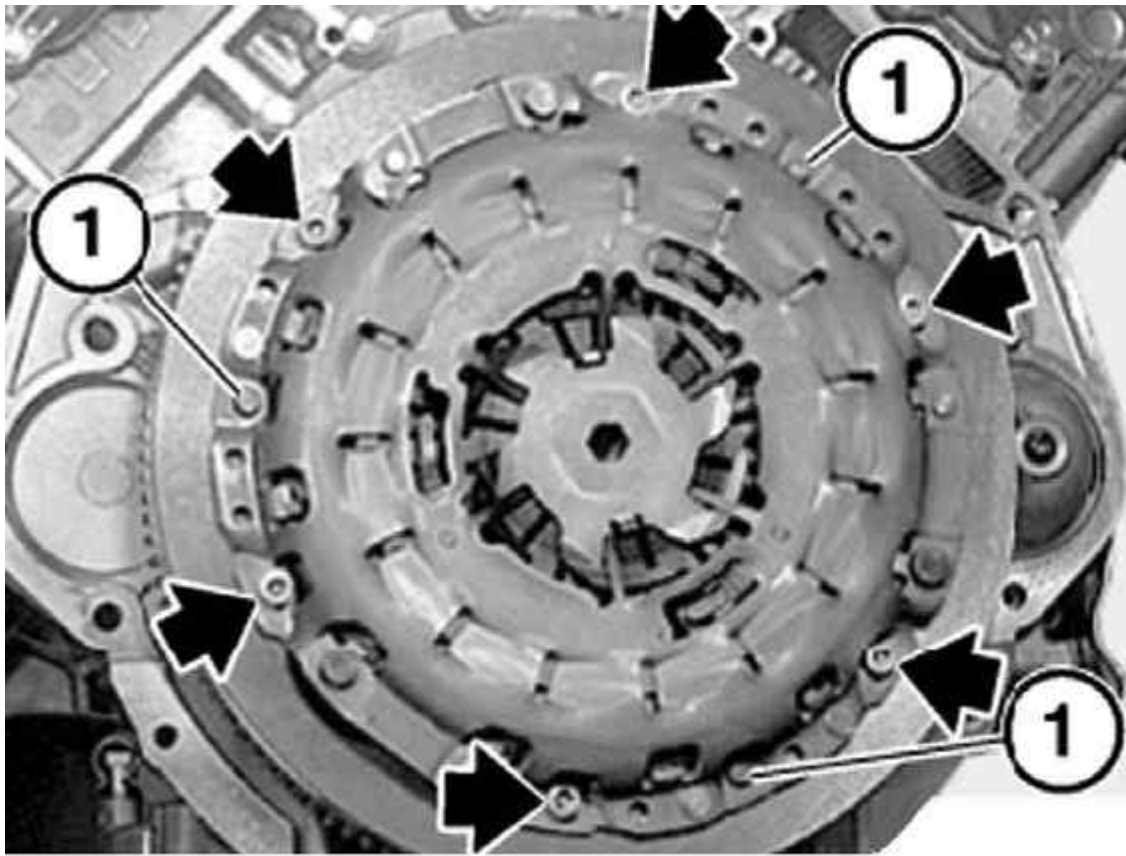
Fig. 42: Withdrawing Special Tool From Clutch Plate
Courtesy of BMW OF NORTH AMERICA, INC.

8. When installing new SAC, handle clutch disk carefully. Do not touch surfaces of friction pads. Install clutch plate (1) in correct position. Note designation for "engine side" and "transmission side". Center clutch plate (1) with special tools. See **Fig. 43** . Push SAC clutch onto dowel pins (1) located in flywheel and screw down. See **Fig. 44** . Locking piece (1) may only be removed with SAC screw-mounted clutch. Carefully unscrew locking piece (1) clockwise or counterclockwise with a hexagon socket wrench (2). See **Fig. 45** . A slight snapping of the plate spring while unscrewing is possible. Withdraw special tool (1) from clutch plate with aid of accompanying screw (2). See **Fig. 46** .



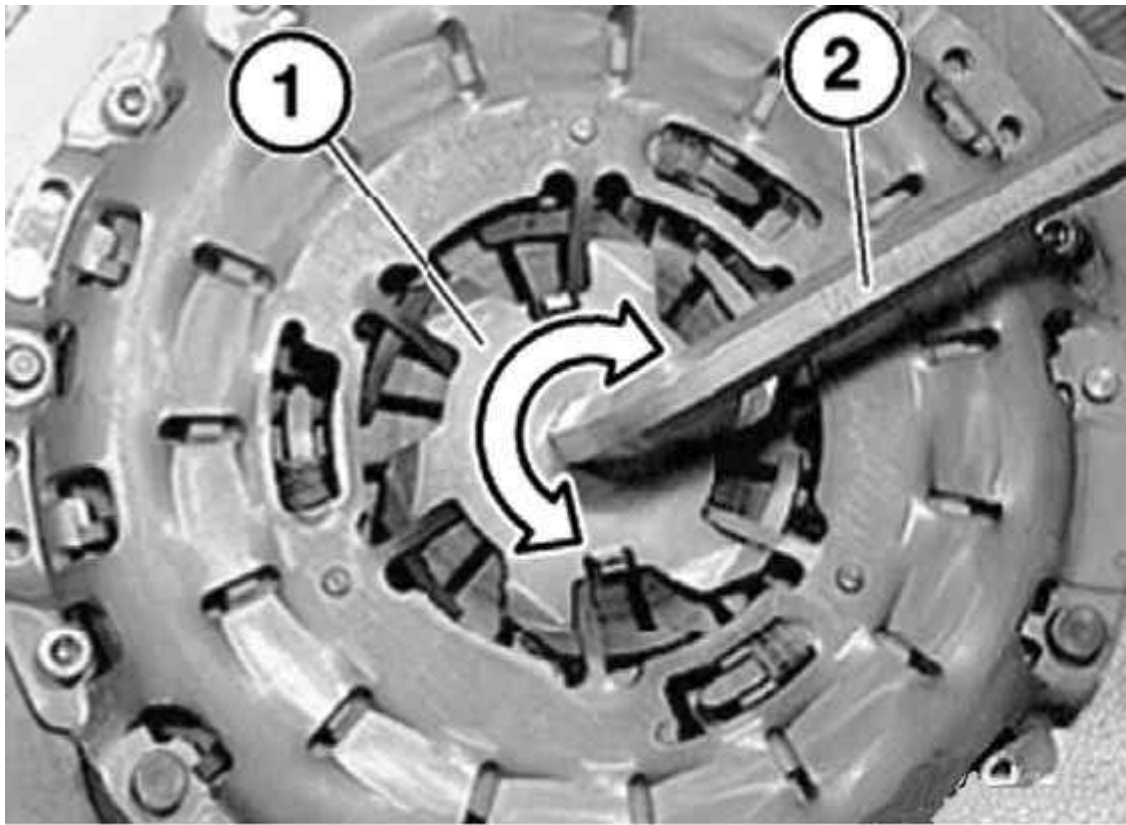
G00386951

Fig. 43: Centering Clutch Plate With Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.



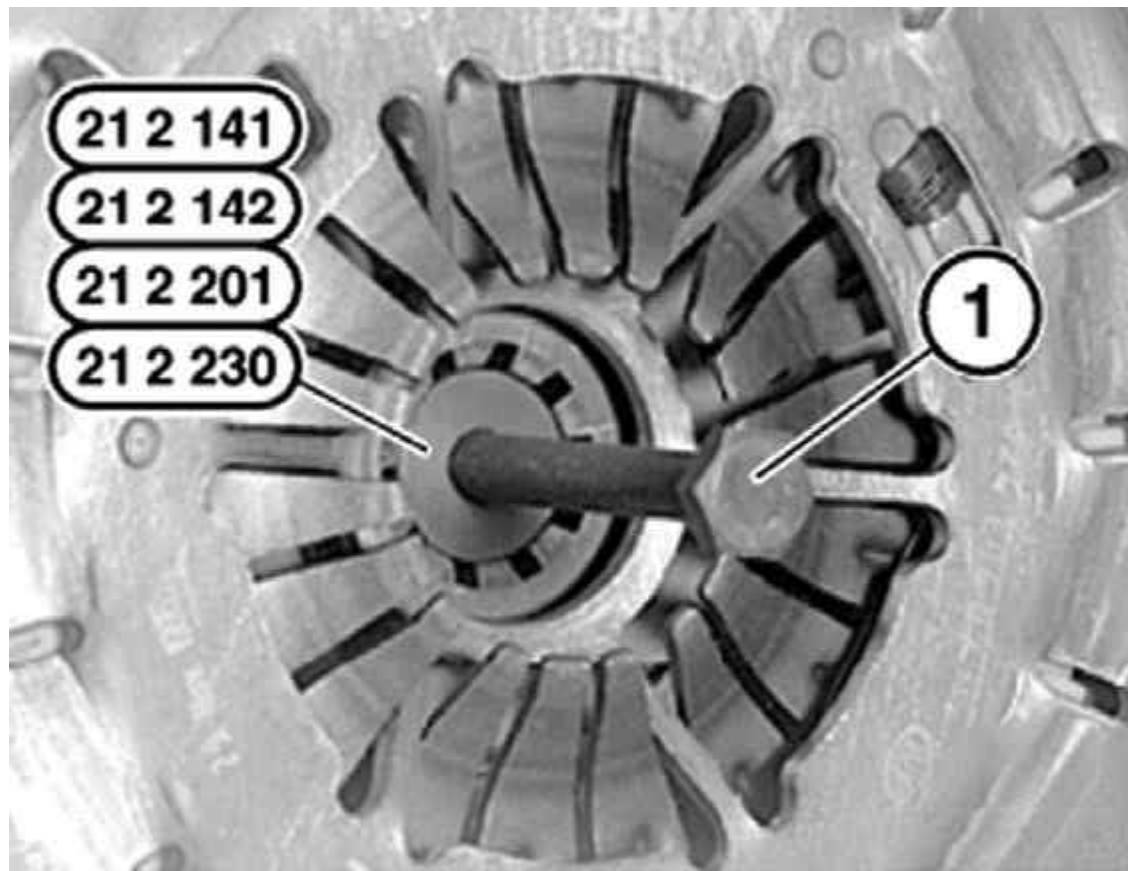
G00386952

Fig. 44: Pushing SAC Clutch Onto Dowel Pins
Courtesy of BMW OF NORTH AMERICA, INC.



G00386953

Fig. 45: Unscrewing Locking Piece
Courtesy of BMW OF NORTH AMERICA, INC.



G00386954

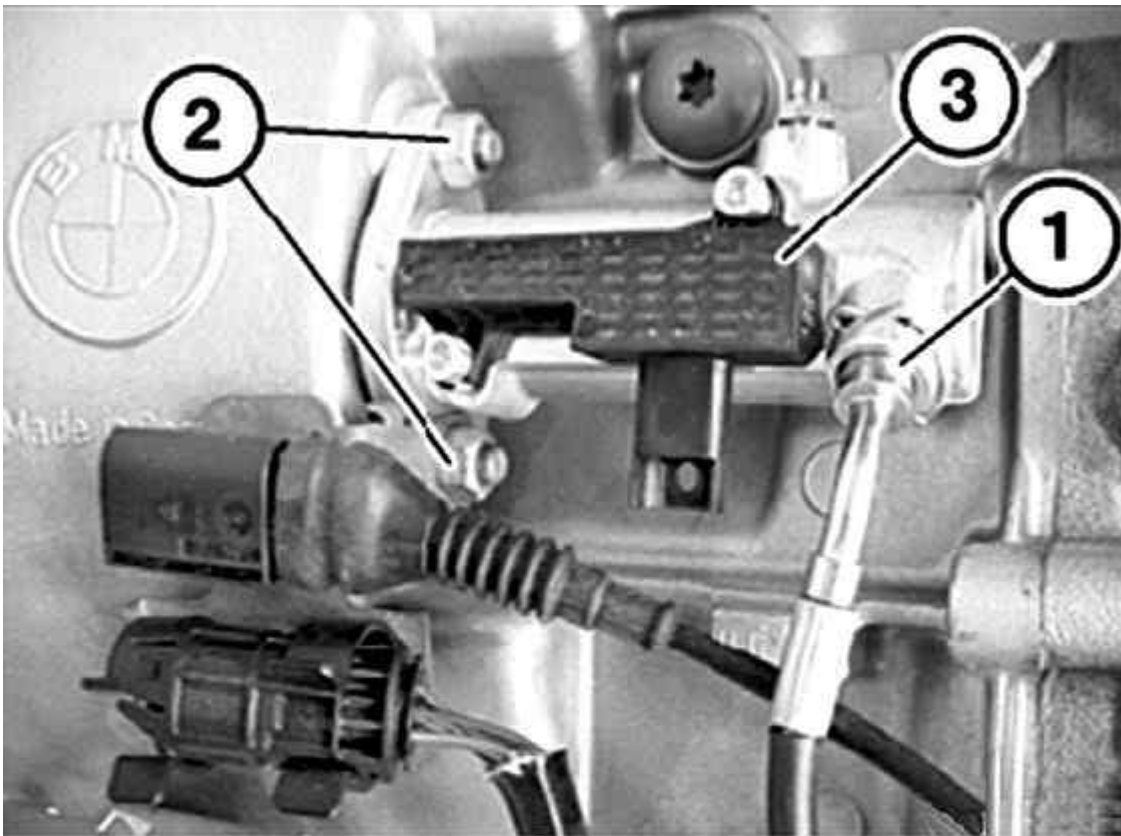
Fig. 46: Removing Special Tool From Clutch Plate
Courtesy of BMW OF NORTH AMERICA, INC.

CLUTCH ACTUATOR (SMG TRANSMISSION)

NOTE: Numbers in text refer to numbers in figures.

NOTE: After completing work, refer to **SERVICE FUNCTIONS** in DIS Tester.

Unlock connector and remove. Unlock and disconnect line (1). During installation, replace sealing ring. Release nuts (2) and remove clutch actuator (3). See **Fig. 47** .



G00386994

Fig. 47: Removing Clutch Actuator
Courtesy of BMW OF NORTH AMERICA, INC.

CLUTCH MASTER CYLINDER

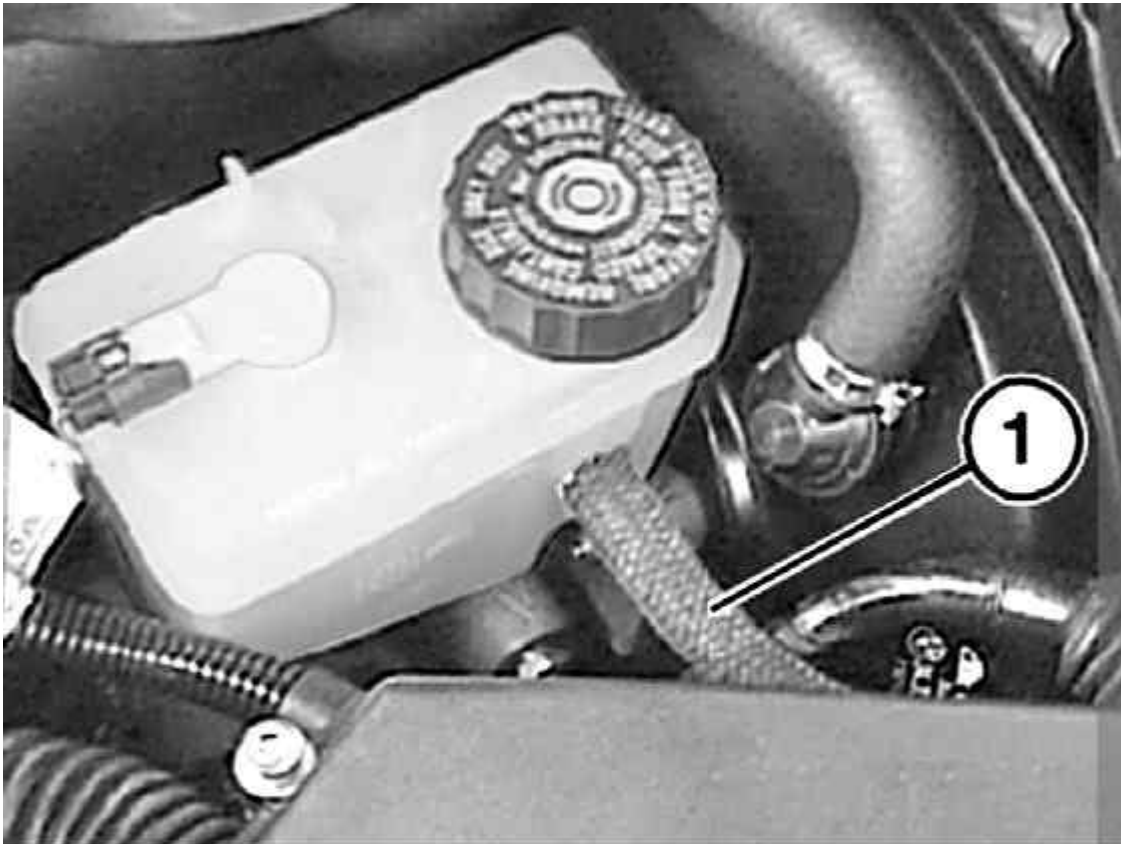
NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

1. Remove trim for instrument panel at bottom left. Draw off brake fluid up to supply hose of clutch hydraulic system (1). See **Fig. 48** . For this purpose, use only a vacuum pipe that is exclusively used for removing brake fluid.
2. Detach supply hose (1) from expansion tank. Press pin (1) out of clutch pedal with a short, thin screwdriver. See **Fig. 49** . During installation, this pin is coded by a straight surface (1). The coding points upwards. Screw pin in with coding upwards. Turn slightly until coding snaps into place. Press in pin until engaged (2). See **Fig. 50** . Unfasten bolts. See **Fig. 51** . Detach retainer (1) with a screwdriver (2). Detach clutch master cylinder (3) from hydraulic line and remove with supply hose. See **Fig. 52** .
3. Lever out shift element (1) from clutch master cylinder (2) with screwdriver. Release plug connection (3) and disconnect plug (4) from shift element (1). See **Fig. 53** . During installation, shift element is secured

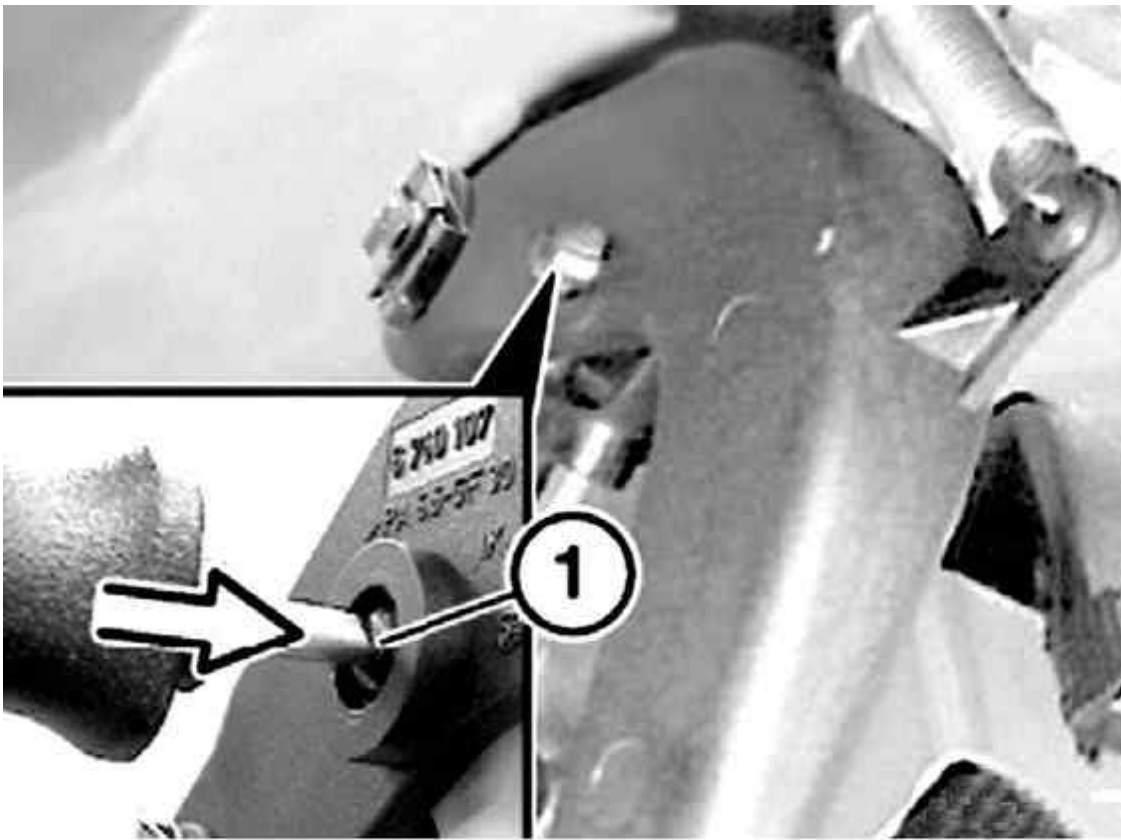
against incorrect installation. Shift element must snap audibly into place. See **Fig. 54** . Disconnect and cap hydraulic lines from clutch master cylinder. Remove master cylinder mount bolts at firewall. Remove master cylinder from vehicle. After completing work, bleed hydraulic system. See **BLEEDING** .

4. To install, reverse removal procedure. Bleed hydraulic system. See **BLEEDING** .



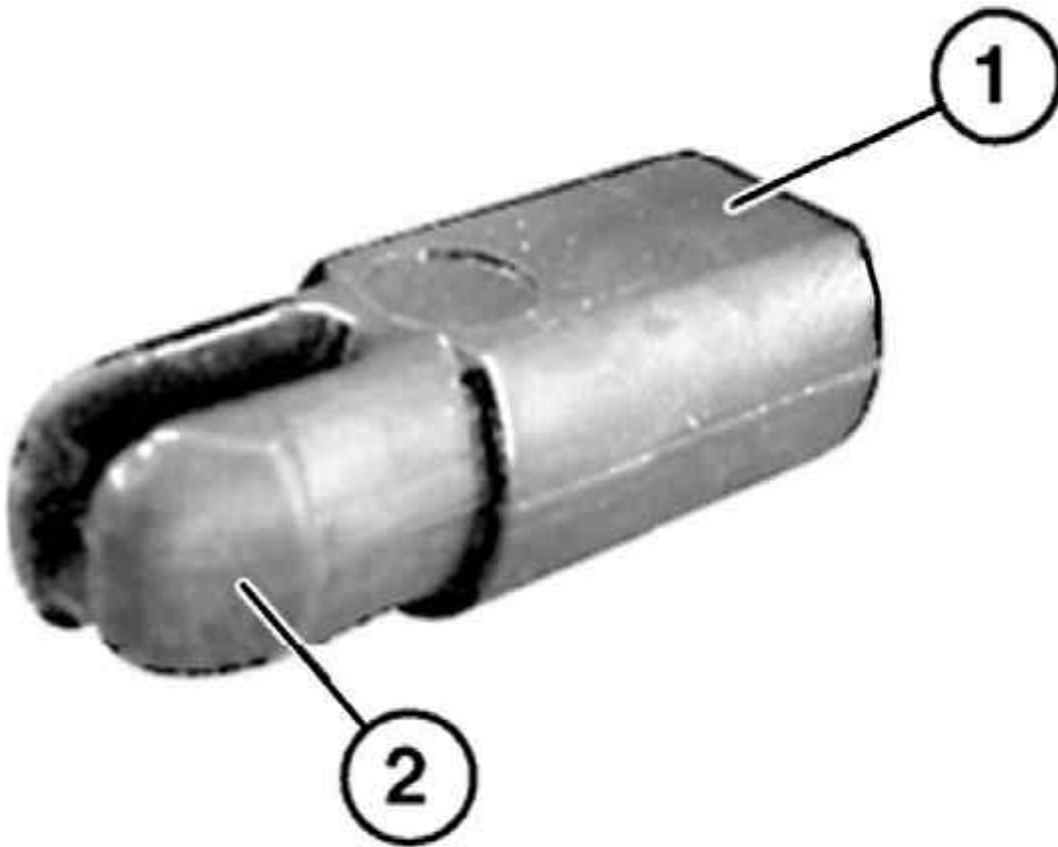
G00386971

Fig. 48: Detaching Supply Hose From Expansion Tank
Courtesy of BMW OF NORTH AMERICA, INC.



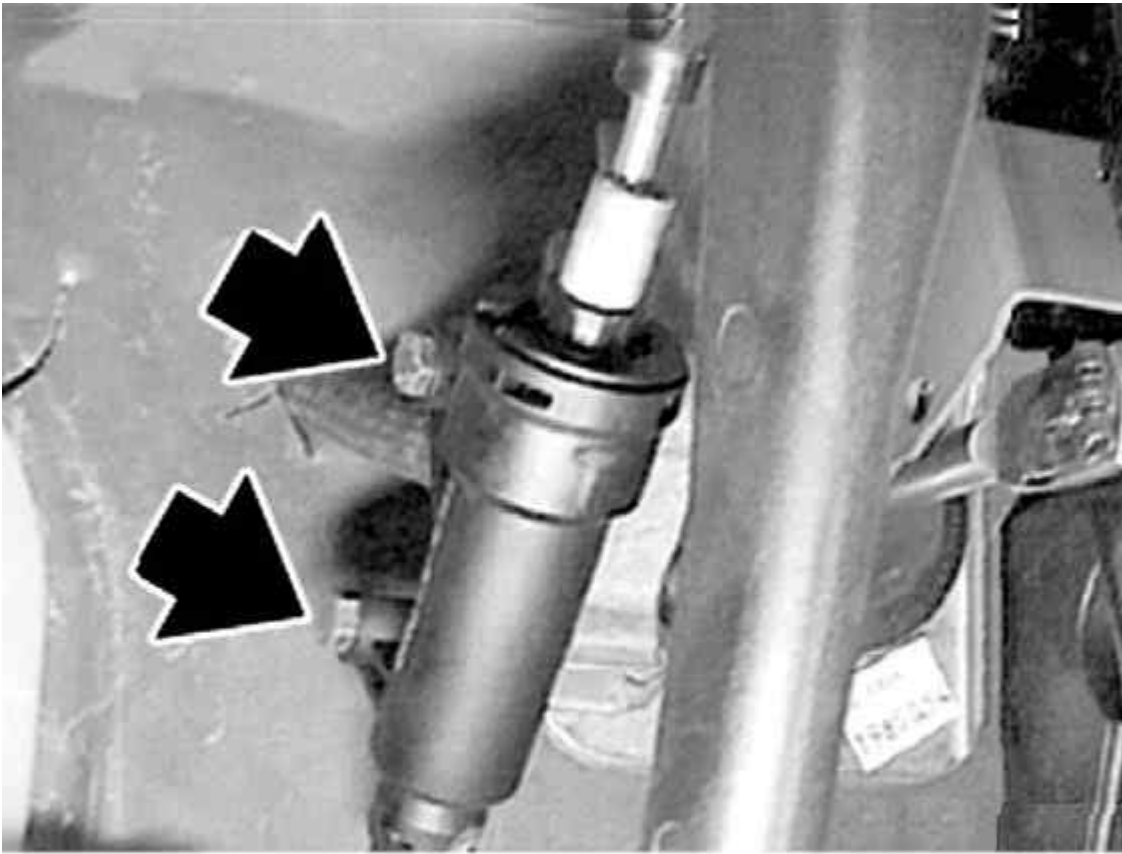
G00386972

Fig. 49: Pressing Pin Out Of Clutch Pedal
Courtesy of BMW OF NORTH AMERICA, INC.



G00386973

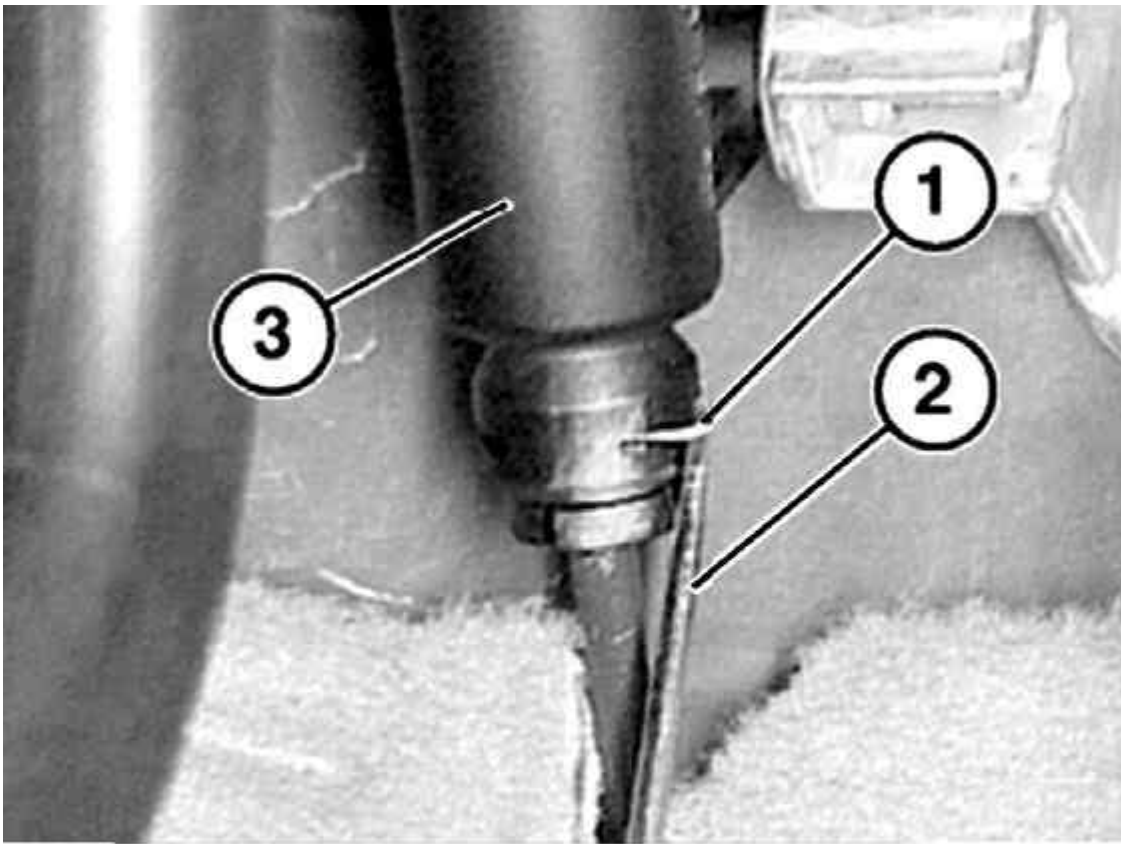
Fig. 50: Identifying Pin Straight Surface & Pressing In Pin Until Engaged
Courtesy of BMW OF NORTH AMERICA, INC.



G00386974

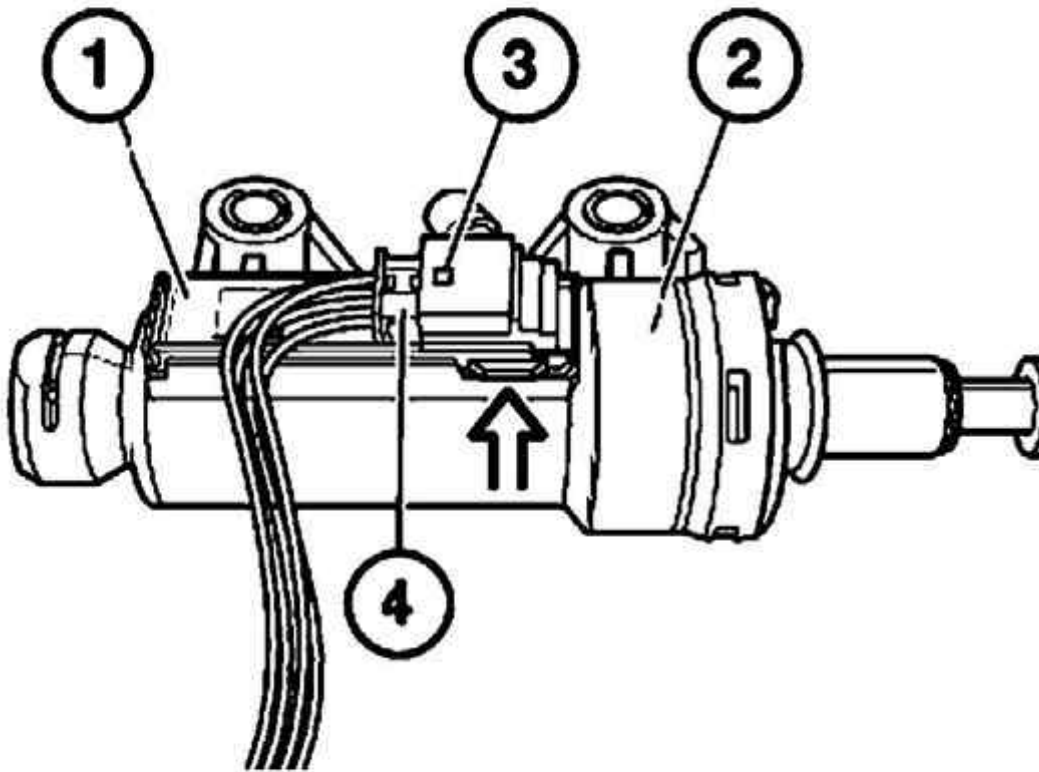
Fig. 51: Unfastening Bolts

Courtesy of BMW OF NORTH AMERICA, INC.



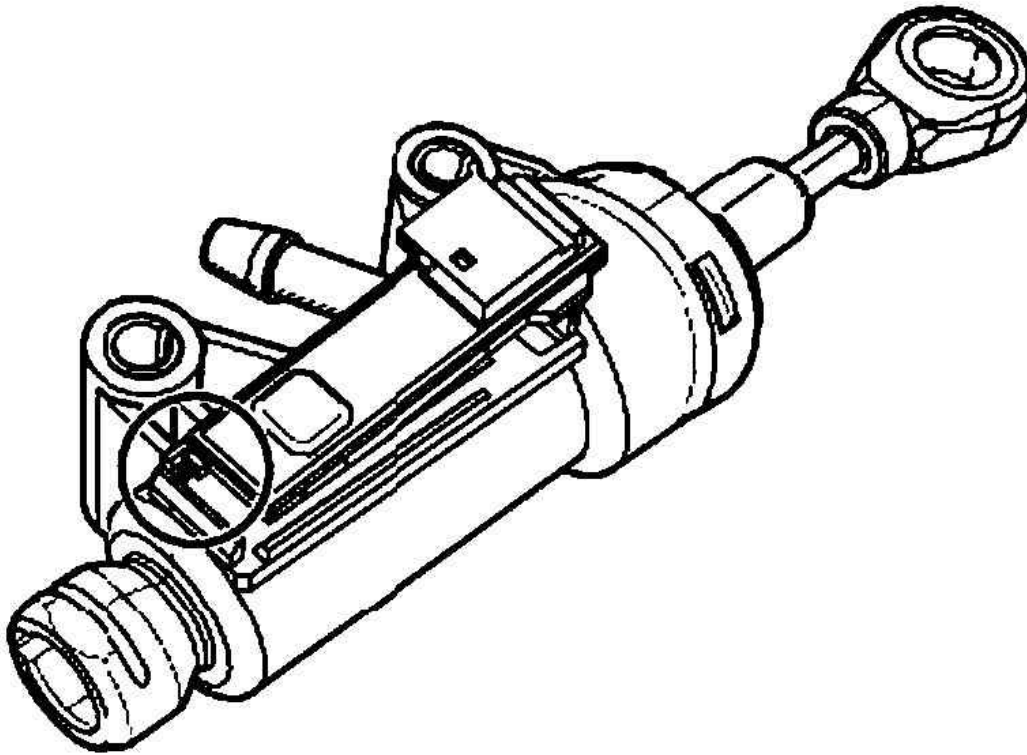
G00386975

Fig. 52: Detaching Clutch Master Cylinder From Hydraulic Line
Courtesy of BMW OF NORTH AMERICA, INC.



G00386976

Fig. 53: Levering Out Shift Element
Courtesy of BMW OF NORTH AMERICA, INC.



G00386977

Fig. 54: Shift Element Snapping Audibly Into Place
Courtesy of BMW OF NORTH AMERICA, INC.

CLUTCH RELEASE BEARING/LEVER

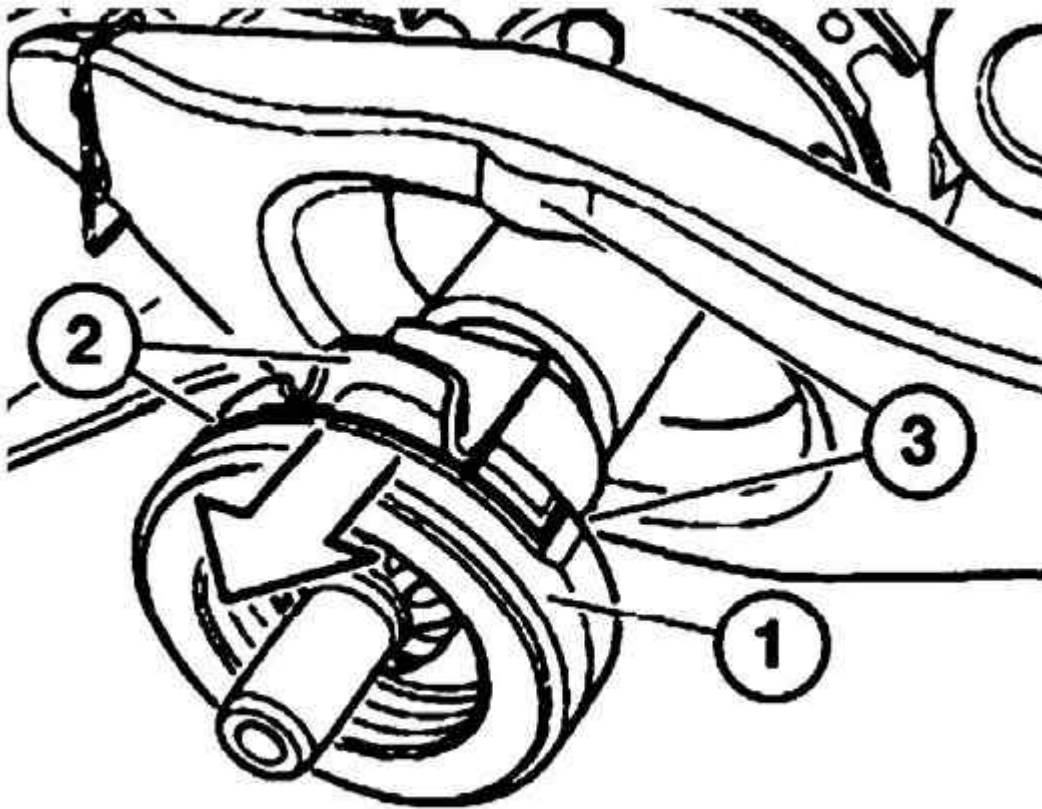
NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

1. Remove transmission. See appropriate MANUAL TRANSMISSION REMOVAL article. Remove release bearing (1). See **Fig. 55**.
2. During installation, clean all sliding surfaces on clutch release bearing, check for damage and replace if necessary. Do not grease clutch release lever. Sliding surfaces (2) of clutch release bearing must rest on sliding surfaces (3) of release lever. Lightly grease sliding surfaces (2) of release bearing. If a new clutch release bearing is installed, go to next step.
3. New clutch release bearing: clutch release bearing with moving thrust plate (1) and swivel motion of thrust plate (1) possible. See **Fig. 56**. During installation, lightly grease sliding surfaces of release

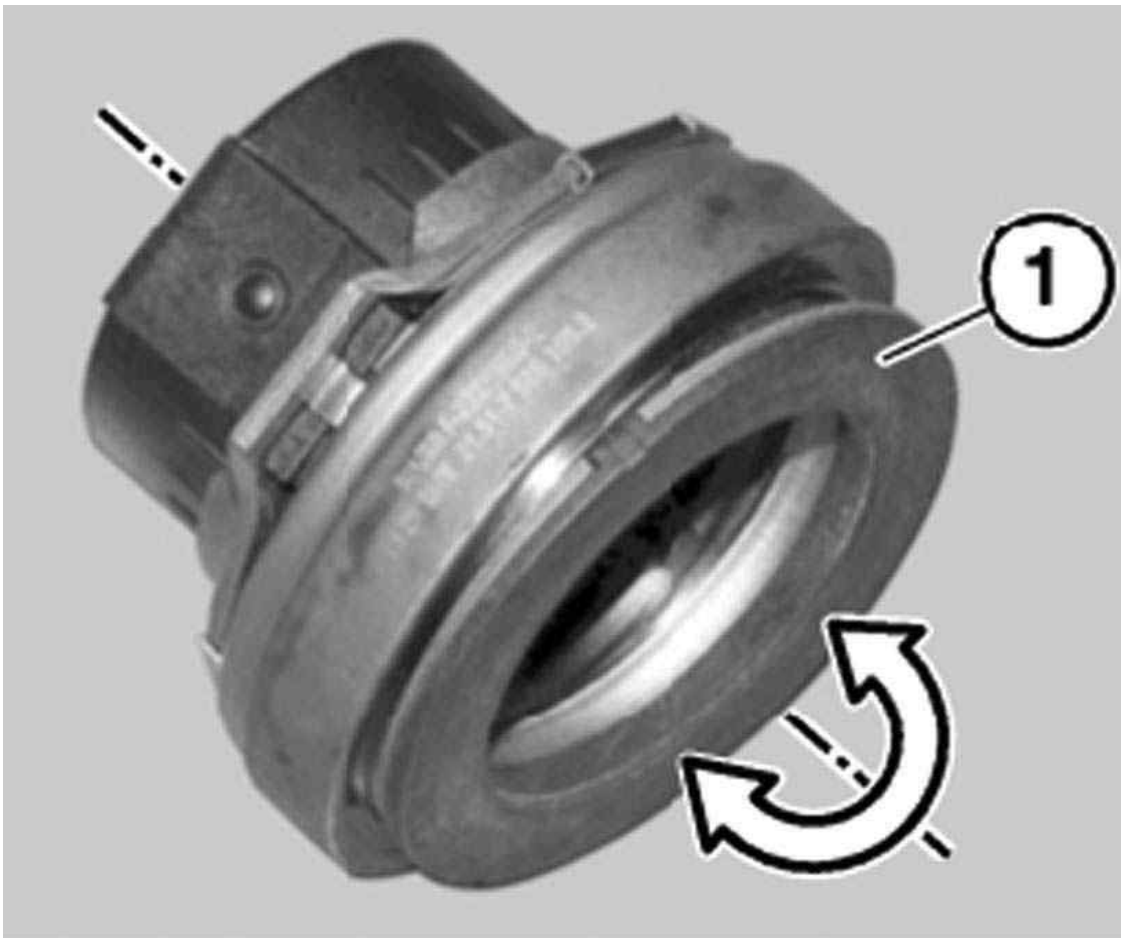
bearing. A previously used clutch release bearing: clutch release bearing with rigidly positioned thrust plate (1) and swivel motion of thrust plate (1) is not possible. See **Fig. 57** . Withdraw release lever (4) from spring wire clip (5) and remove. See **Fig. 58** . Clean release lever. Do not grease release lever. Lightly grease release lever at sliding surfaces (1 and 2) only. See **Fig. 59** .

4. During installation, check spring wire clip (5) and ball pin (6) for damage and replace if necessary. See **Fig. 60** . Lightly grease ball pin (6). Note that spring wire clip and ball pin must always be replaced on the S6S420G transmission. Clean guide sleeve (7). See **Fig. 61** . Do not grease guide sleeve. If guide sleeve is greased, the release lever can stick on the guide sleeve.



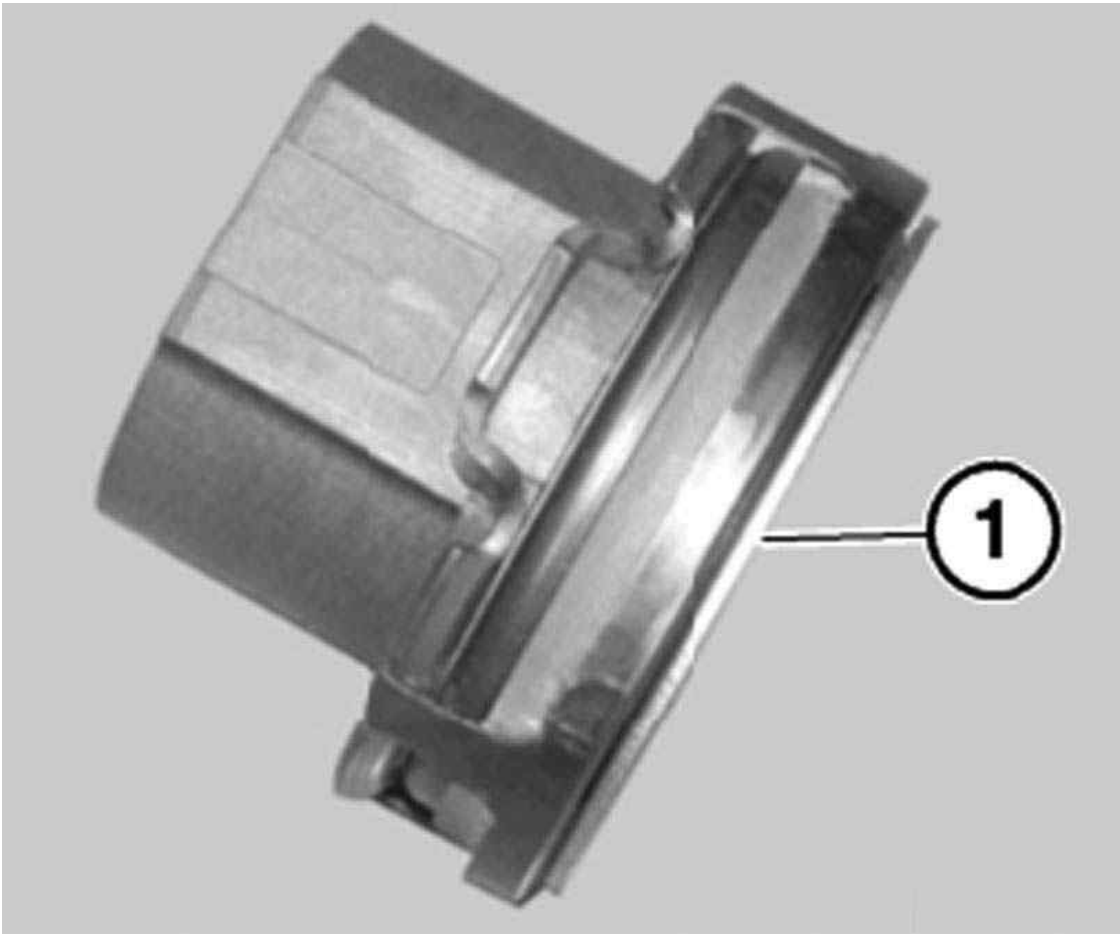
G00386964

Fig. 55: Release Bearing, Sliding Surfaces Of Release Bearing & Release Lever
Courtesy of BMW OF NORTH AMERICA, INC.



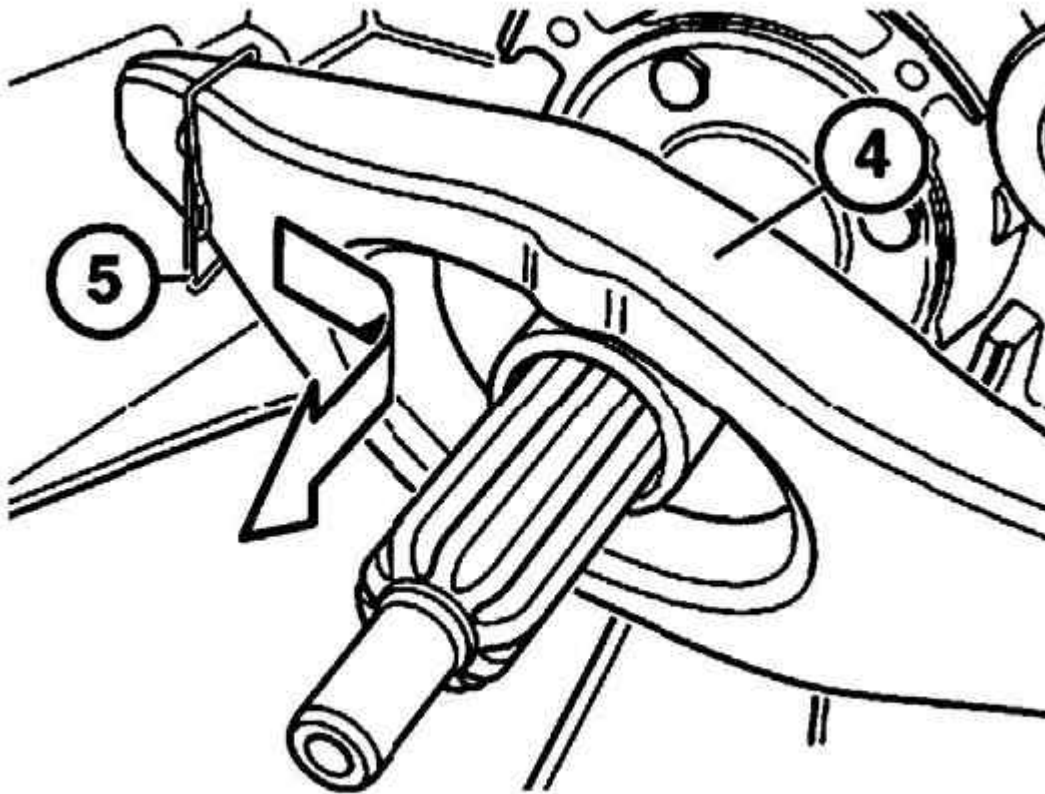
G00386965

Fig. 56: Clutch Release Bearing With Moving/Swivel Motion
Courtesy of BMW OF NORTH AMERICA, INC.



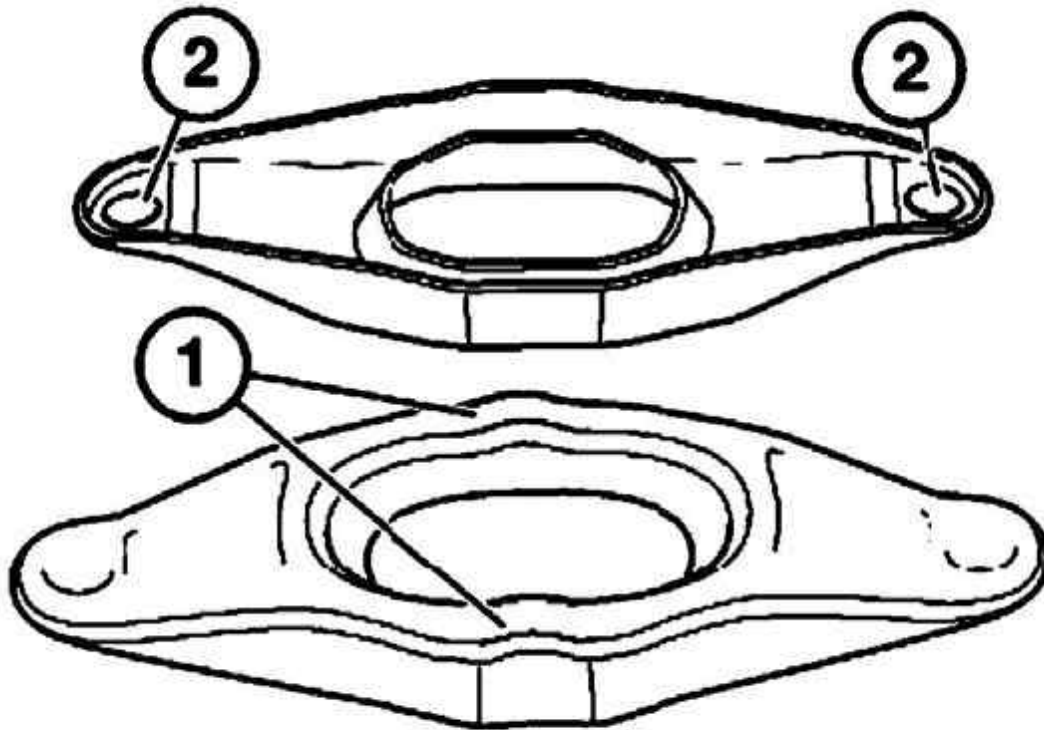
G00386966

Fig. 57: Clutch Release Bearing With Rigid Thrust Plate & No Swivel Motion
Courtesy of BMW OF NORTH AMERICA, INC.



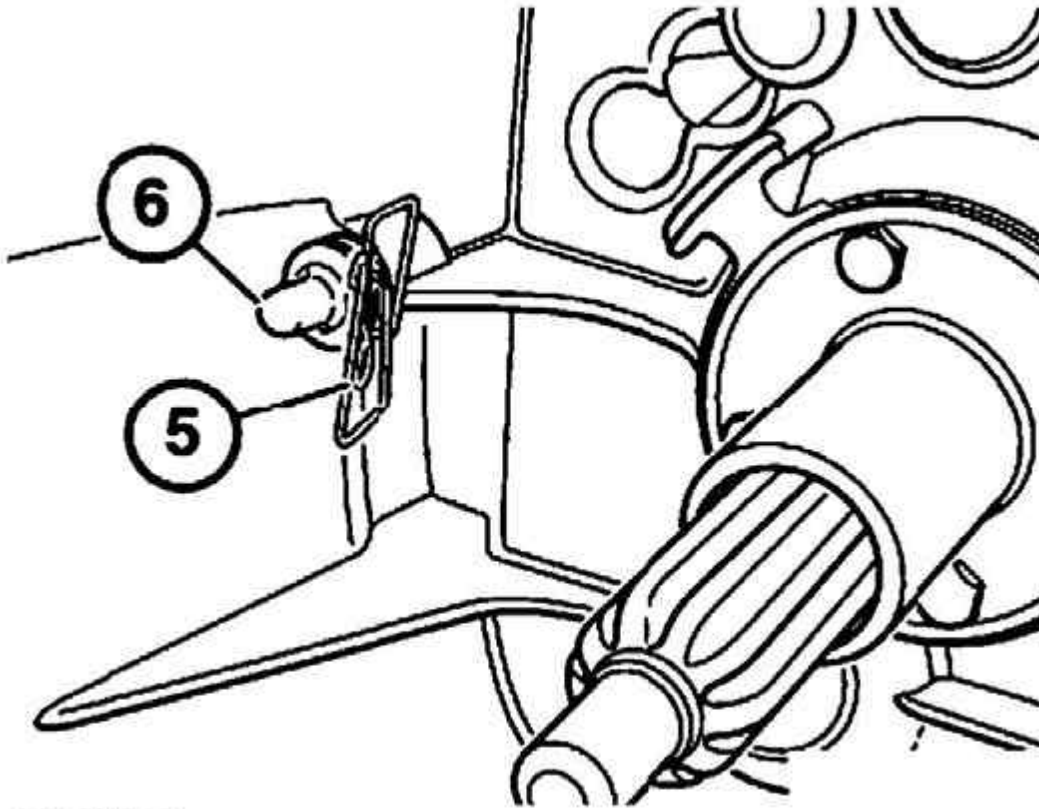
G00386967

Fig. 58: Withdrawing Release Lever From Spring Wire Clip
Courtesy of BMW OF NORTH AMERICA, INC.



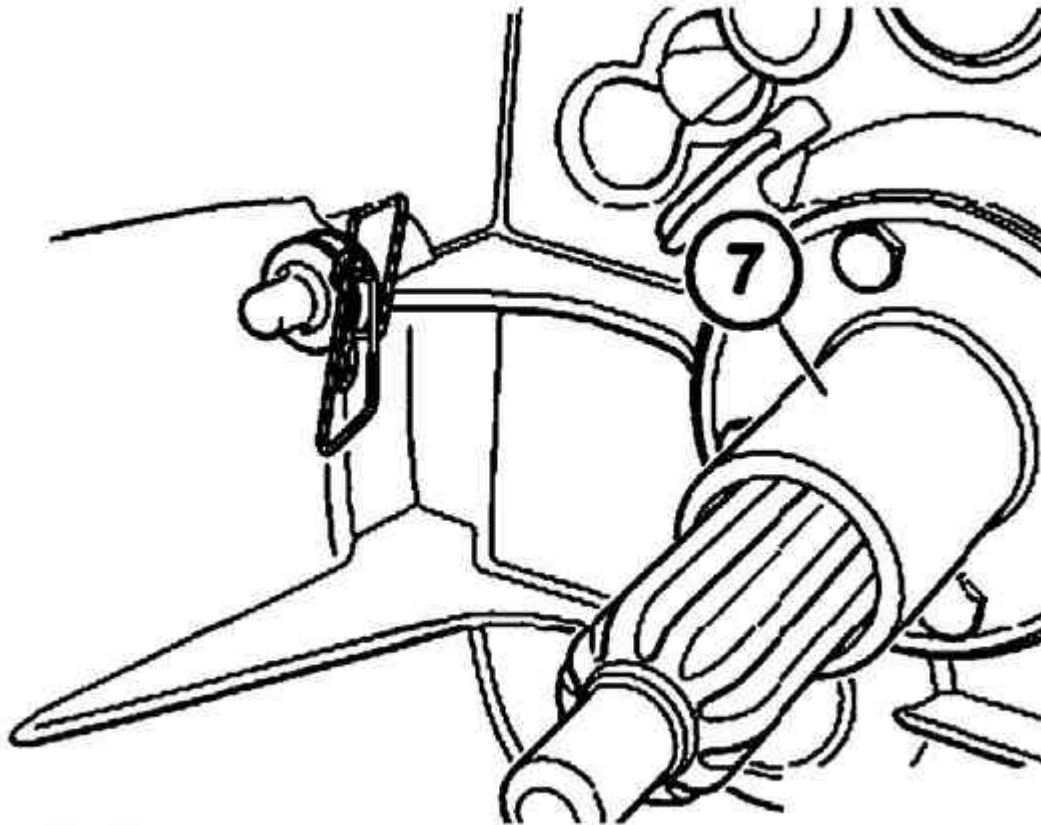
G00386968

Fig. 59: Lightly Greasing Release Lever At Sliding Surfaces
Courtesy of BMW OF NORTH AMERICA, INC.



G00386969

Fig. 60: Checking Spring Wire Clip & Ball Pin For Damage
Courtesy of BMW OF NORTH AMERICA, INC.



G00386970

Fig. 61: Cleaning Guide Sleeve
Courtesy of BMW OF NORTH AMERICA, INC.

CLUTCH SLAVE CYLINDER

NOTE: Numbers in text refer to numbers in figures.

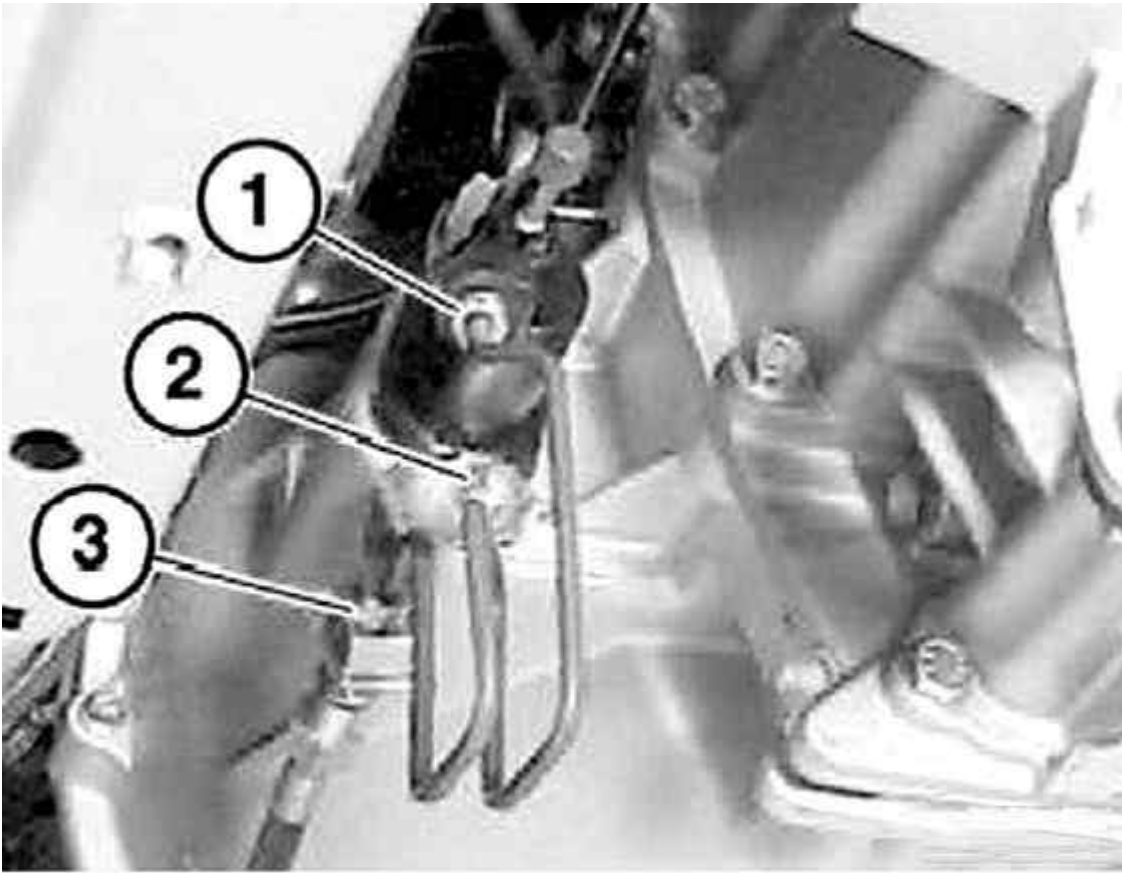
Removal & Installation

1. Seal supply hose to clutch master cylinder with special tool (13 3 010). See **Fig. 62** . Remove transmission underbody protection if necessary. Release union screw (1) on hydraulic line. Release nut (2) and remove hydraulic line (3) with bracket. See **Fig. 63** .
2. Release nut and remove clutch slave cylinder. See **Fig. 64** . During installation, clean thrust member (1) and contact face on release lever (2). Lightly grease thrust member (1) on contact face (3). See **Fig. 65** .
3. Bleed hydraulic system. See **BLEEDING** .



G00386916

Fig. 62: Sealing Supply Hose To Clutch Master Cylinder
Courtesy of BMW OF NORTH AMERICA, INC.



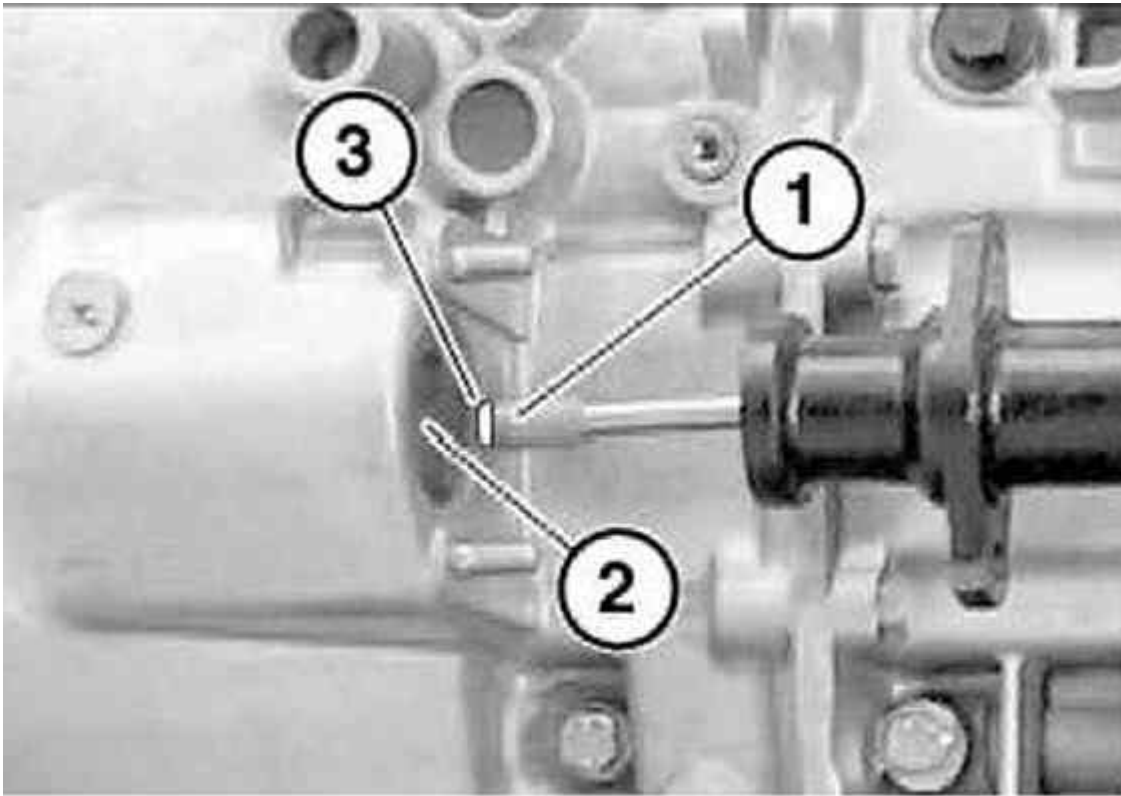
G00386917

Fig. 63: Removing Union Screw, Nut & Hydraulic Line
Courtesy of BMW OF NORTH AMERICA, INC.



G00386918

Fig. 64: Releasing Nut & Removing Clutch Slave Cylinder
Courtesy of BMW OF NORTH AMERICA, INC.



G00386919

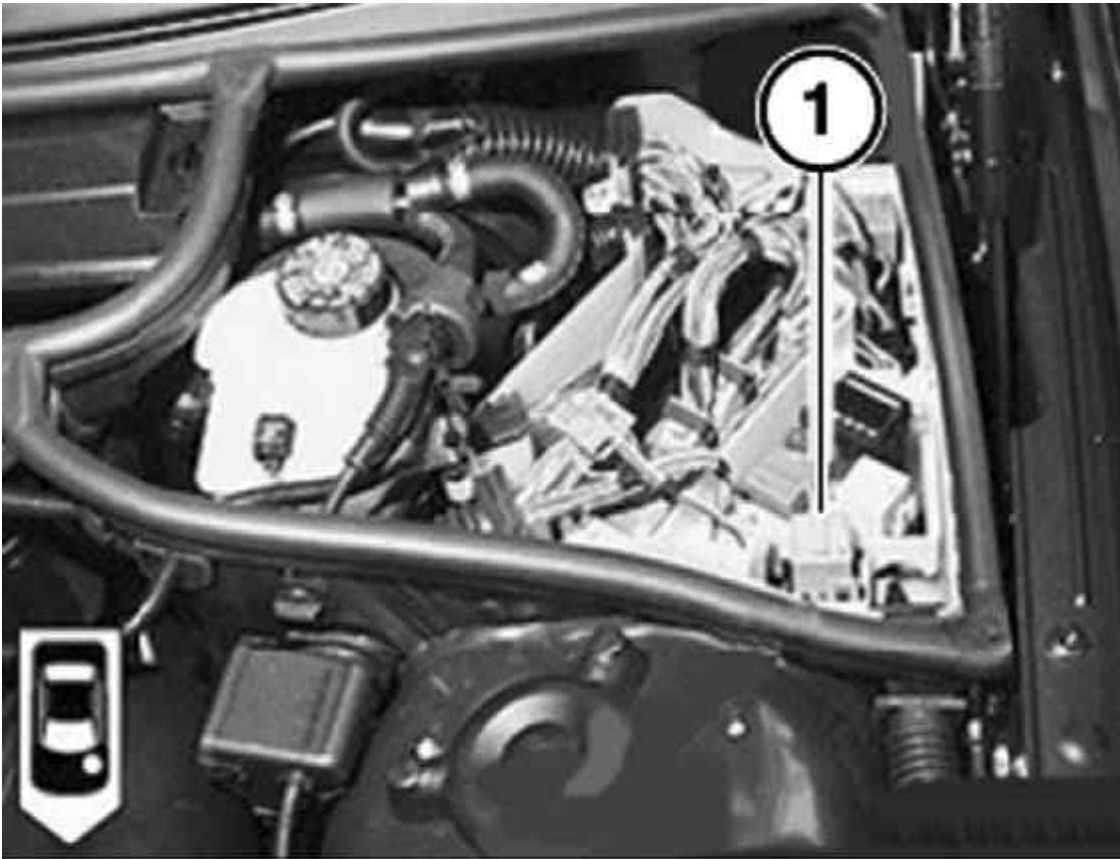
Fig. 65: Identifying Thrust Member, Release Lever & Contact Face
Courtesy of BMW OF NORTH AMERICA, INC.

HYDRAULIC PUMP RELAY (SMG TRANSMISSION)

NOTE: Numbers in text refer to numbers in figures.

NOTE: After completing work, refer to **SERVICE FUNCTIONS** in DIS Tester.

Release screws (1). See **Fig. 9** . Remove electronics box cover. During installation, correctly install wiring harness with grommet in electronics box cover (watertightness). Engage electronics box cover (3) in hinges on underside of box. See **Fig. 10** . Then correctly install upper stop (2) above hinges on underside of electronics box. Remove hydraulic pump relay (1). See **Fig. 66** .



G00386995

Fig. 66: Removing Relay

Courtesy of BMW OF NORTH AMERICA, INC.

HYDRAULIC UNIT (SMG TRANSMISSION)**NOTE:** Numbers in text refer to numbers in figures.**NOTE:** After completing work, refer to **SERVICE FUNCTIONS** in DIS Tester.

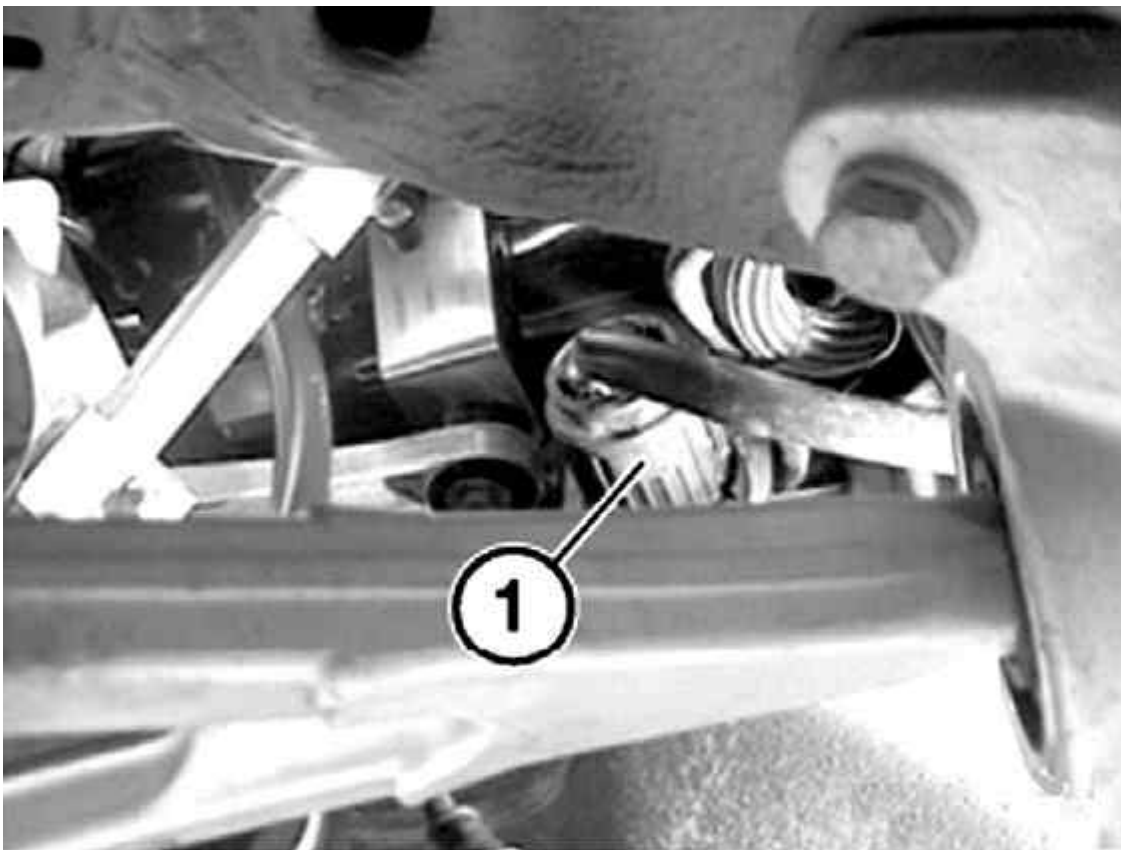
1. Depressurize hydraulic system. See **PRESSURE RELEASE IN HYDRAULIC UNIT (S6S420G/SMG)** . Disconnect battery. Remove intake air manifold. Unlock plug (1) on hydraulic unit from below and detach. See **Fig. 67** . Release screw from below. See **Fig. 68** . Release additional screw. See **Fig. 69** . Clean connection points before disconnecting lines. Disconnect hydraulic lines (1). Plug tapped holes with suitable plastic caps. Remove connecting hose on hydraulic unit by pressing clamping ring (2) downward and at the same time pulling connecting hose up and out. See **Fig. 70** .
2. Disconnect plug (1) of carbon canister. See **Fig. 71** . Release screw on manifold support (1). Pull manifold support (1) upwards a little. Lift out hydraulic unit (2). See **Fig. 72** . During installation, align

manifold support (1) before tightening screw. To do so, fit manifold and align manifold support (1). Tighten screw. If necessary, repeat this procedure several times until manifold support (1) is aligned. See **Fig. 73** .

3. During installation, observe installation position of hydraulic lines and observe color coding. See **Fig. 74** .

- A = (Blue) Shift travel "FORWARD".
- B = (Yellow) Clutch slave cylinder.
- C = (Green) Selection angle sensor.
- D = (Black) Shift travel "BACK".

Clean connection points before disconnecting lines. Guide pin of hydraulic unit must engage in lower retaining fixture.

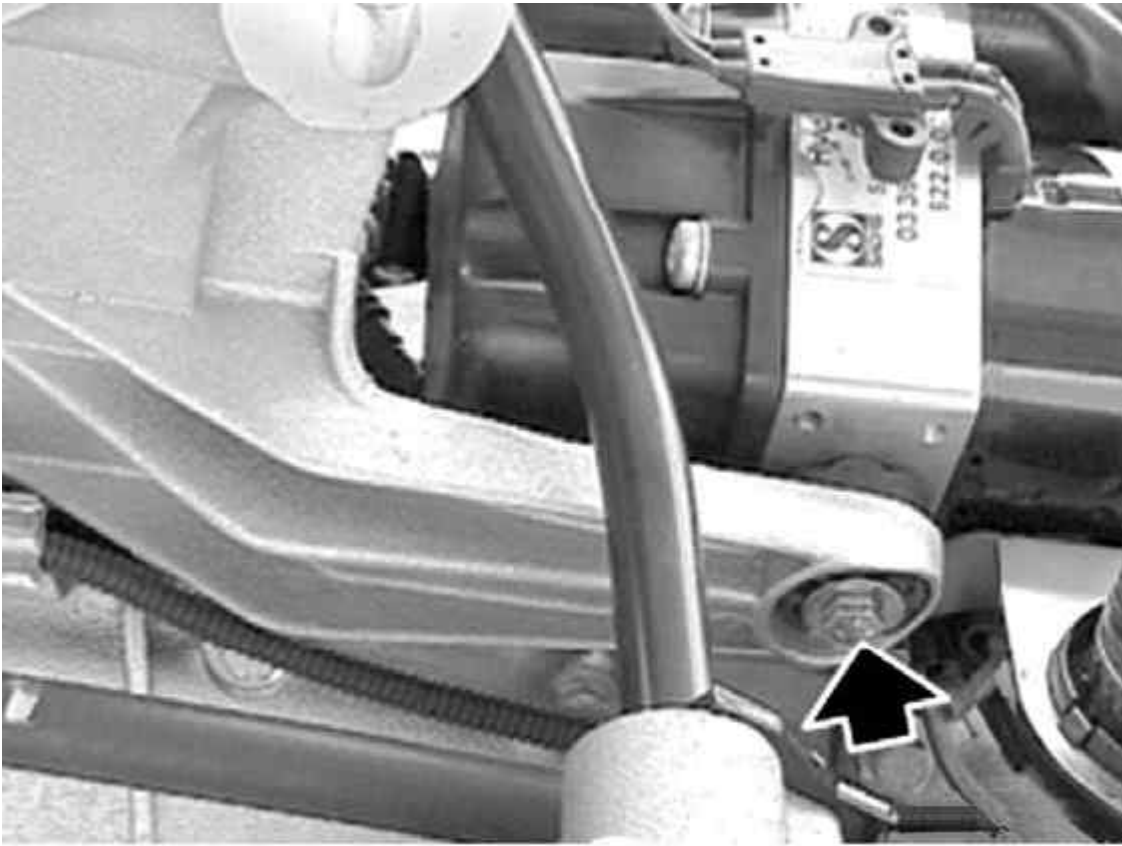


G00386996

Fig. 67: Unlocking Plug On Hydraulic Unit From Below
Courtesy of BMW OF NORTH AMERICA, INC.

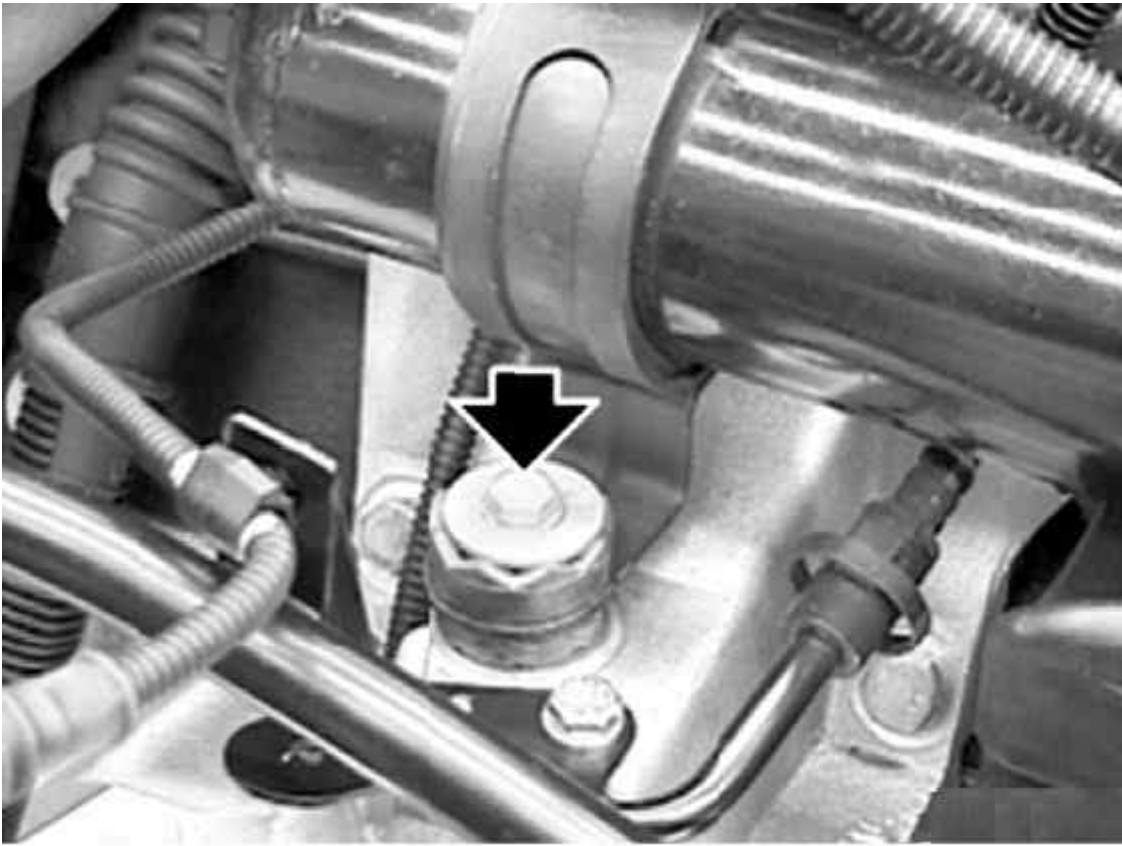
2005 BMW Z4

2000-05 CLUTCHES Z4 & 3-Series



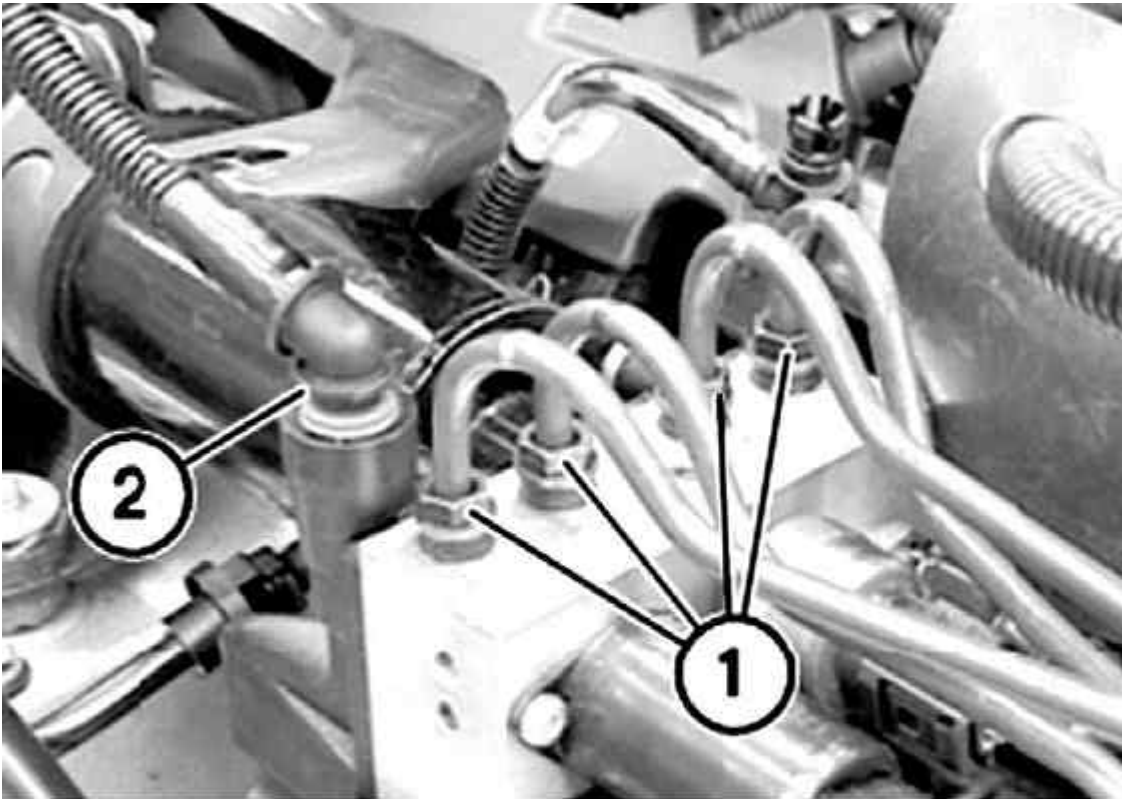
G00386997

Fig. 68: Identifying Screw From Below
Courtesy of BMW OF NORTH AMERICA, INC.



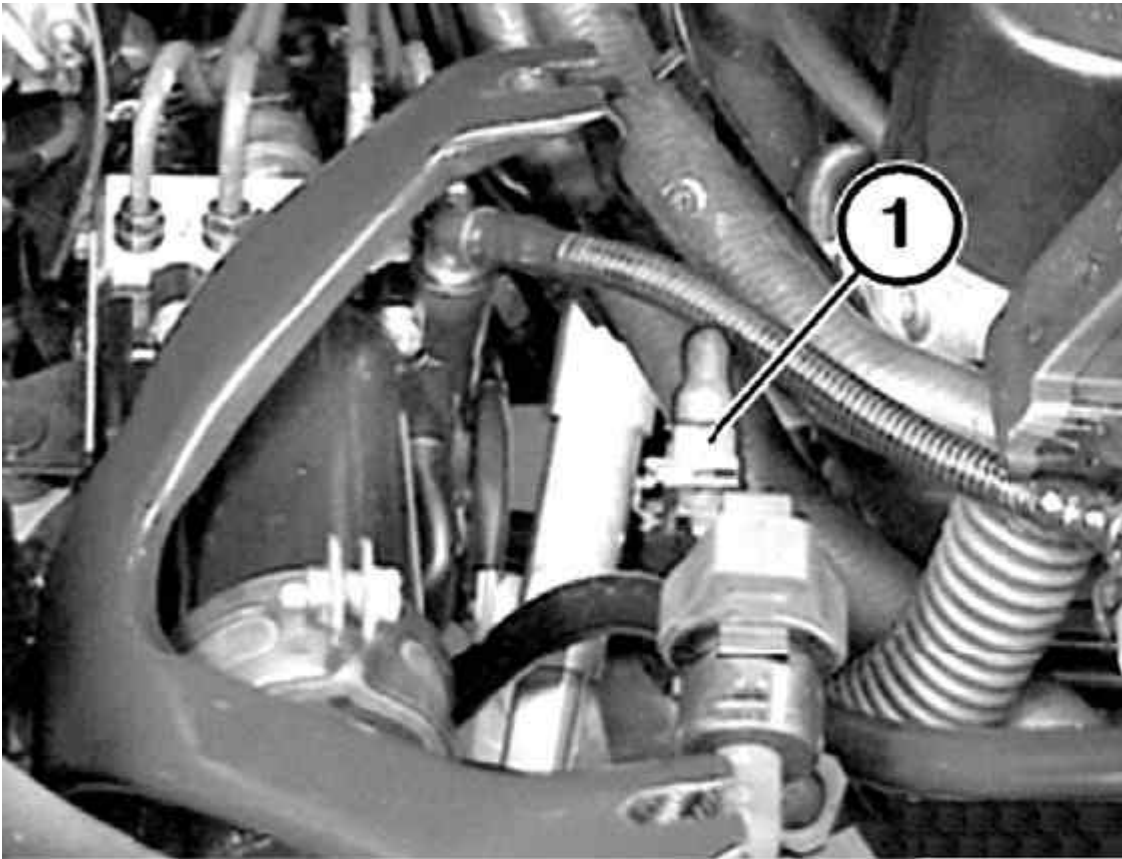
G00386998

Fig. 69: Releasing Additional Screw
Courtesy of BMW OF NORTH AMERICA, INC.



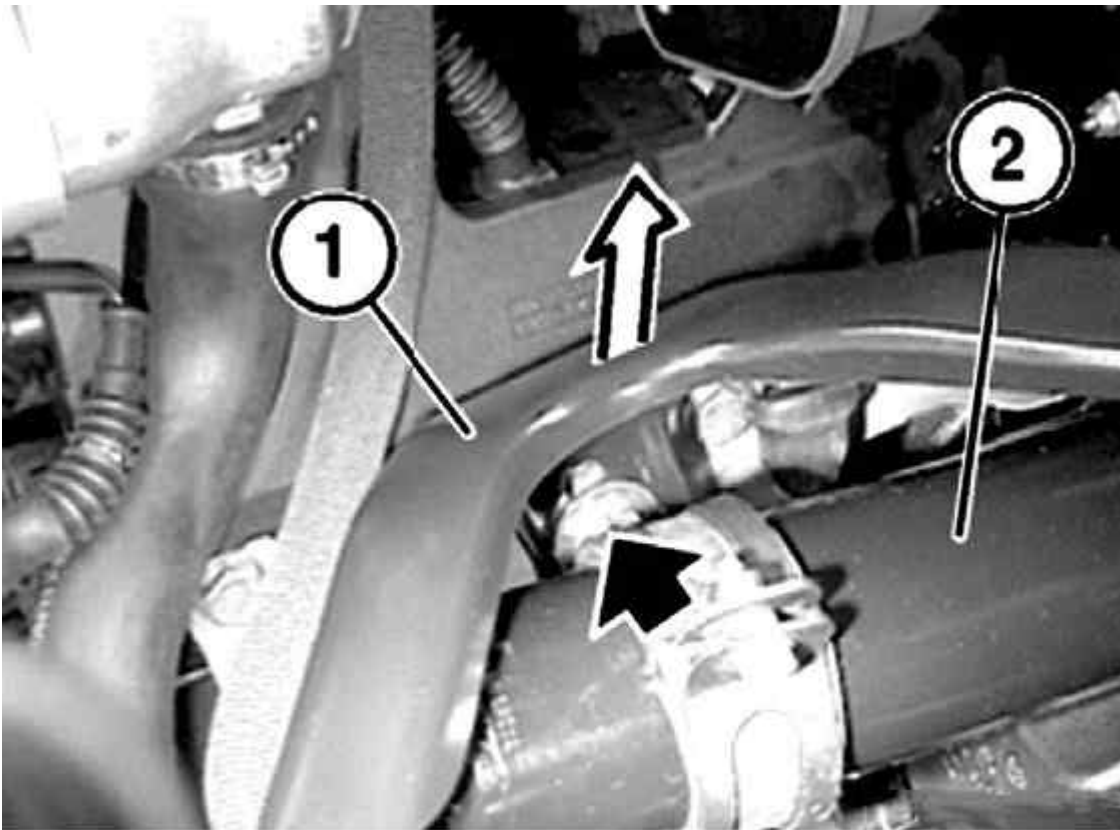
G00386999

Fig. 70: Disconnecting Hydraulic Lines & Pressing Clamping Ring Downward
Courtesy of BMW OF NORTH AMERICA, INC.



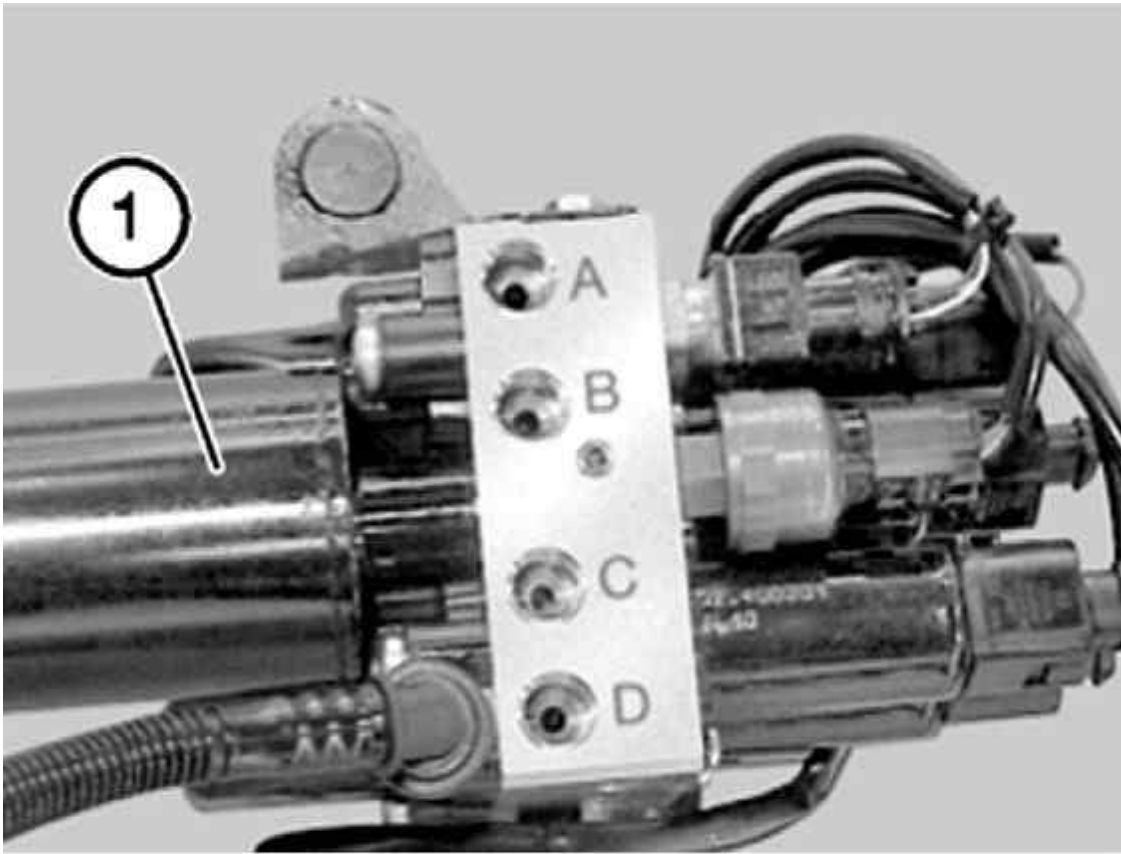
G00387000

Fig. 71: Disconnecting Carbon Canister Plug
Courtesy of BMW OF NORTH AMERICA, INC.



G00387001

Fig. 72: Pulling Manifold Support Upward & Lifting Out Hydraulic Unit
Courtesy of BMW OF NORTH AMERICA, INC.



G00387002

Fig. 73: Aligning Manifold Support
Courtesy of BMW OF NORTH AMERICA, INC.

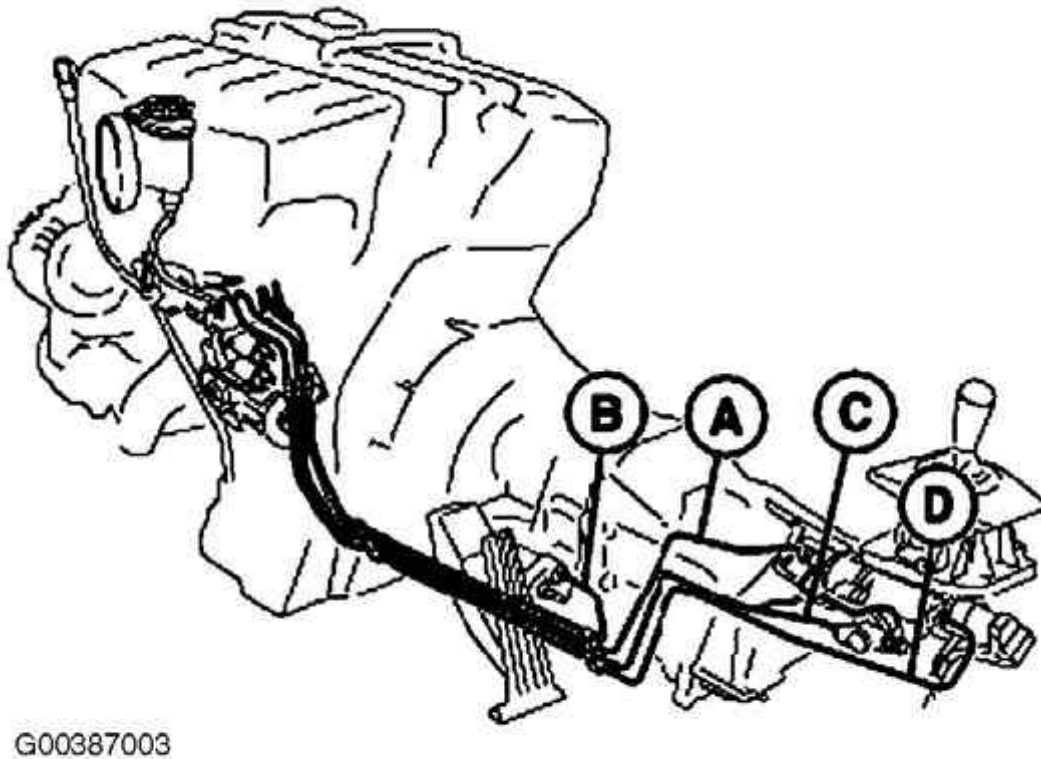


Fig. 74: Installation Position Of Hydraulic Lines
Courtesy of BMW OF NORTH AMERICA, INC.

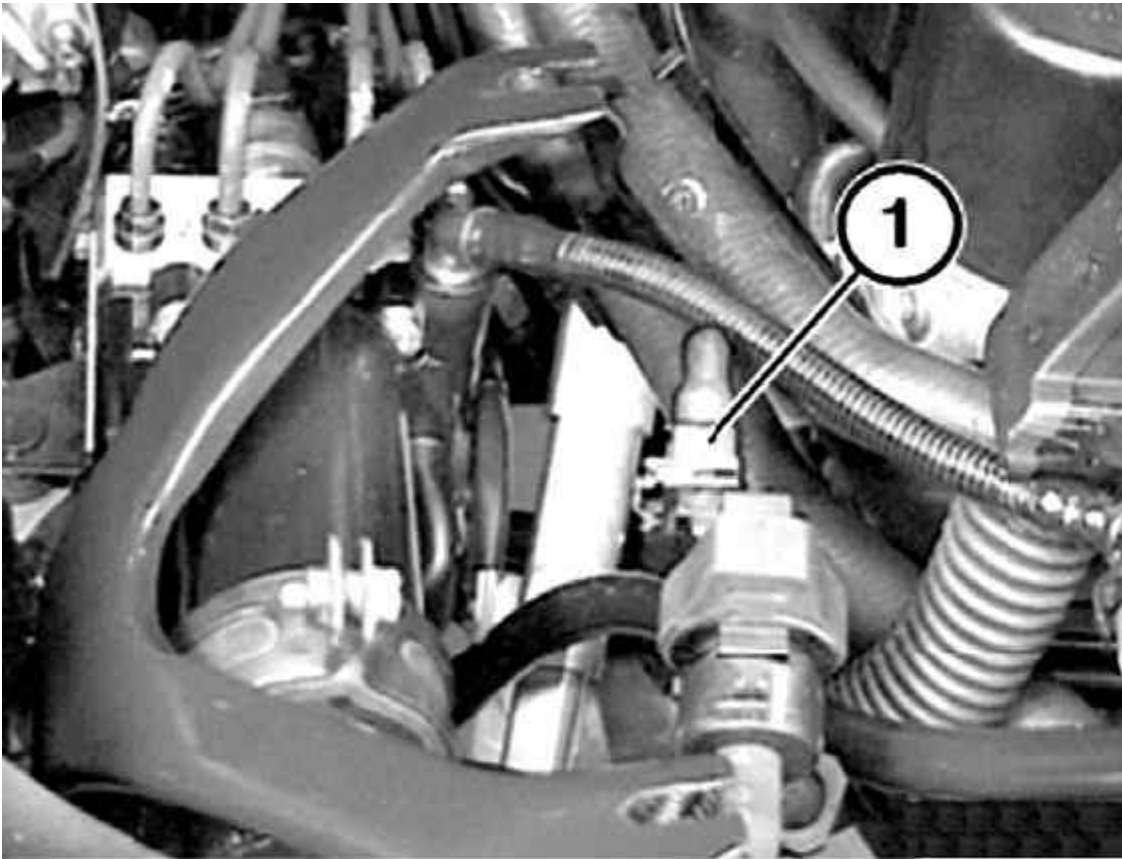
PRESSURE ACCUMULATOR (SMG TRANSMISSION)

NOTE: Numbers in text refer to numbers in figures.

NOTE: After completing work, refer to **SERVICE FUNCTIONS** in DIS Tester.

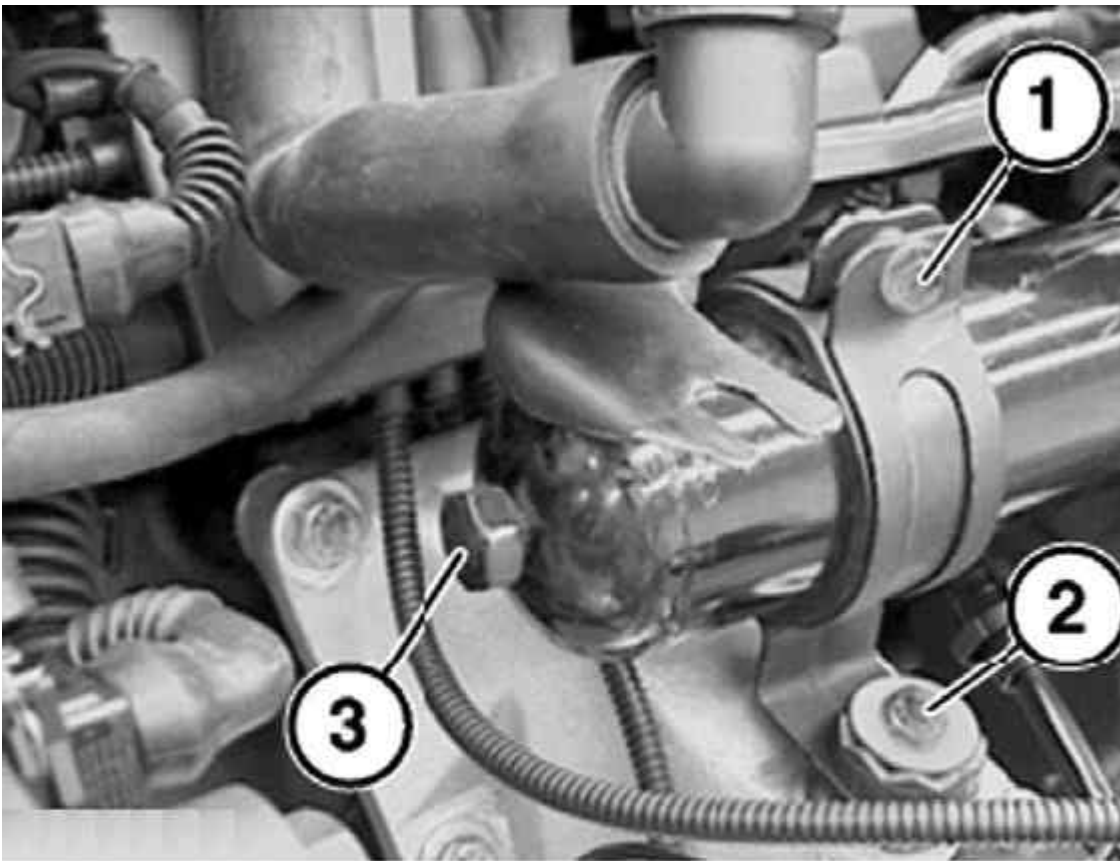
Removal & Installation

Depressurize hydraulic system. See **PRESSURE RELEASE IN HYDRAULIC UNIT (S6S420G/SMG)** . Disconnect battery. Remove intake air manifold. Disconnect plug (1) of carbon canister. See **Fig. 75** . Clean connection point/screw-on surfaces of piston accumulator and hydraulic unit before releasing. Unscrew screws (1) and (2). Release pressure accumulator at hexagon head (3). See **Fig. 76** . Remove pressure accumulator. During installation, observe installation position of sealing ring (1). See **Fig. 77** .



G00387006

Fig. 75: Disconnecting Plug Of Carbon Canister
Courtesy of BMW OF NORTH AMERICA, INC.



G00387007

Fig. 76: Releasing Screws & Pressure Accumulator At Hexagon Head
Courtesy of BMW OF NORTH AMERICA, INC.



G00387008

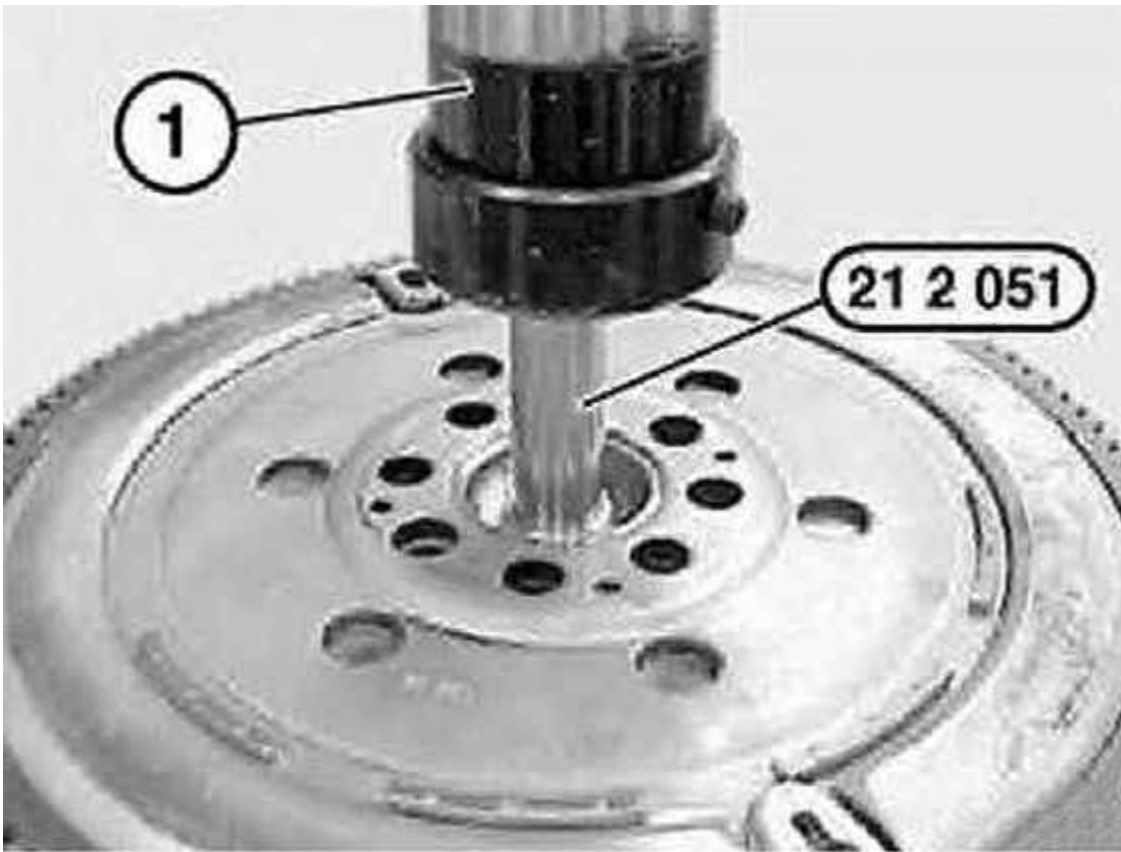
Fig. 77: Locating Installation Position Of Sealing Ring
Courtesy of BMW OF NORTH AMERICA, INC.

ROLLER BEARING FOR DUAL MASS FLYWHEEL

Removal & Installation

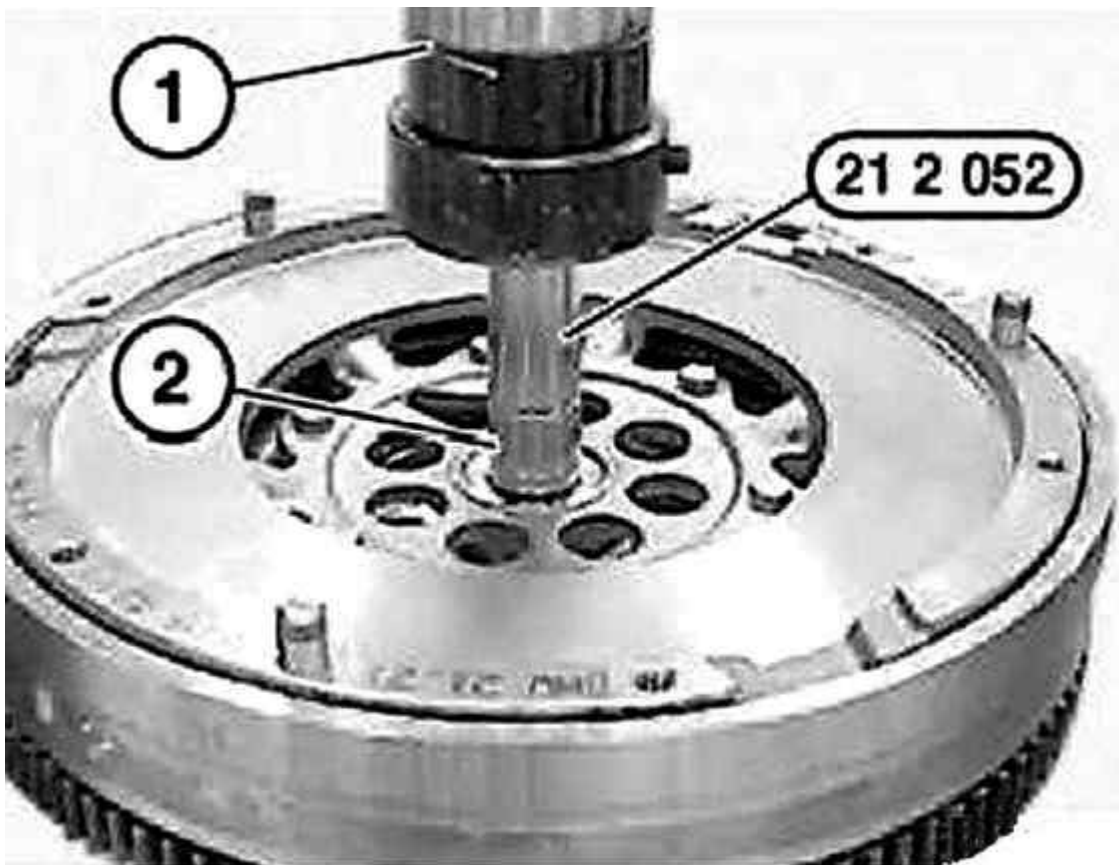
Remove flywheel. See ENGINE MECHANICAL article. Using hydraulic press (1) and special tool 212051, press out dual-mass flywheel downwards on engine side. See **Fig. 78** . Use care as there is a risk of damage: roller bearing must not be driven out. Push roller bearing (2) onto special tool 212052. Using hydraulic press (1), press roller bearing into dual-mass flywheel as far as it will go on clutch side. See **Fig. 79** . Observe press-in instruction:

- a. Roller bearing must not be driven in.
- b. Roller bearing mounting force/travel monitored:
 - Minimum 2000N 1 mm before end of pressing in.
 - Maximum 15000N during entire press-in procedure.



G00387014

Fig. 78: Pressing Out Dual-Mass Flywheel
Courtesy of BMW OF NORTH AMERICA, INC.



G00387015

Fig. 79: Pressing In Dual-Mass Flywheel
Courtesy of BMW OF NORTH AMERICA, INC.

SOLENOID VALVE (CLUTCH/GEARSHIFT SMG TRANSMISSION)

NOTE: Numbers in text refer to numbers in figures.

NOTE: Using DIS tester, reduce pressure in system. Disconnect hydraulic pump relay while working on system. After completing work, refer to **SERVICE FUNCTIONS** in DIS Tester.

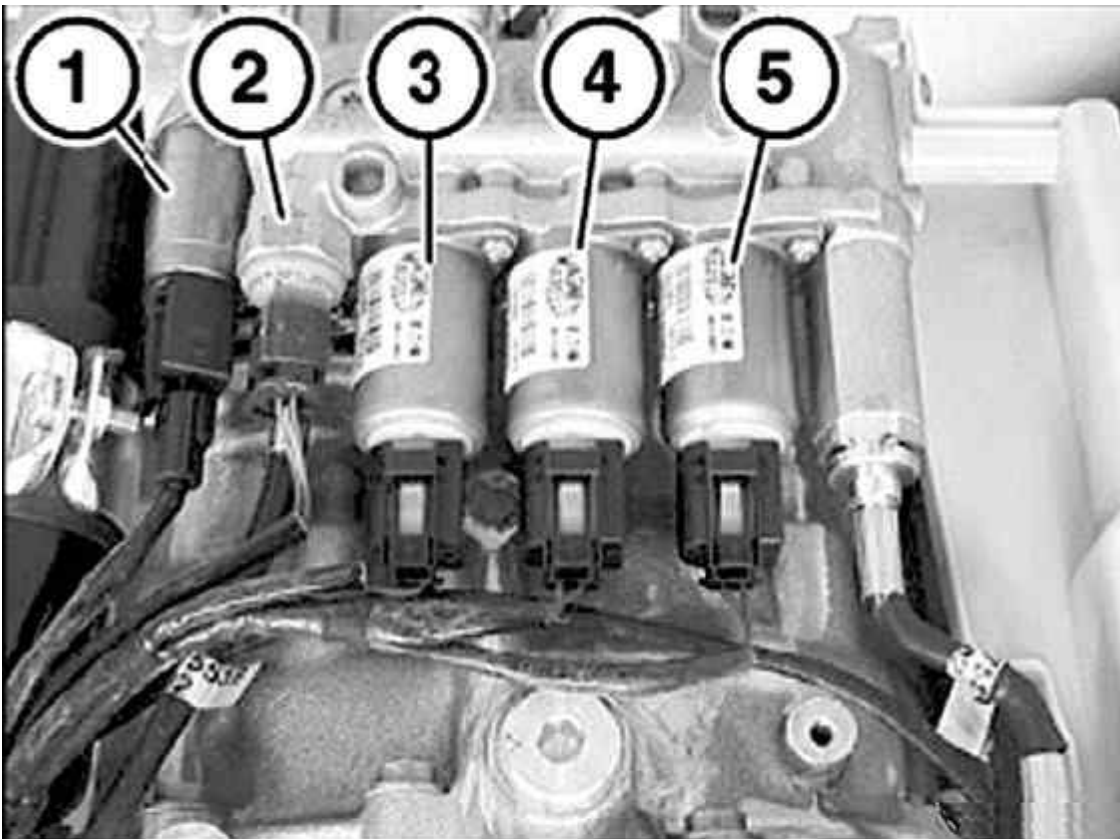
Removal & Installation

1. Procedure is identical for all solenoid valves:
 - Solenoid Valve EV3.
 - Pressure Sensor.
 - Solenoid Valve EV2.
 - Solenoid Valve EV1.

- Solenoid Valve EV0.

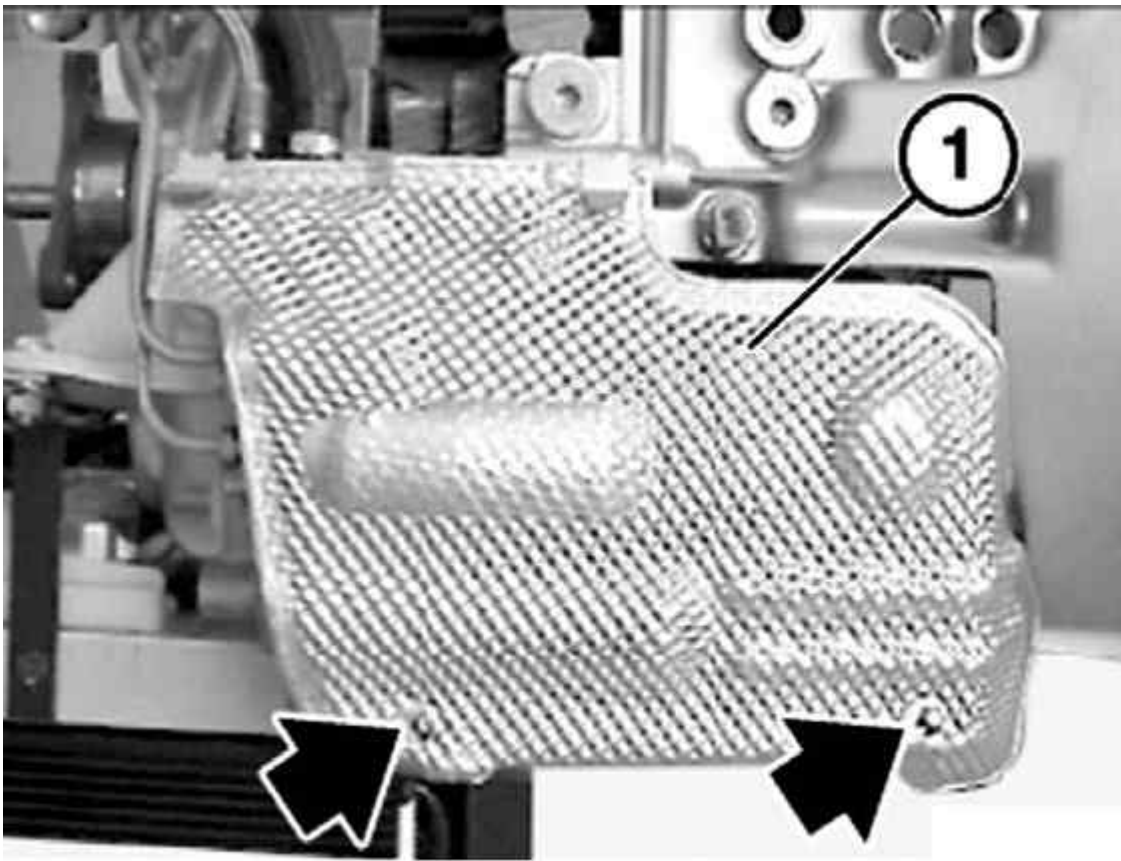
See **Fig. 80** .

2. Release nuts and remove heat shield (1). See **Fig. 81** . Release screws (1) and remove protective plate. See **Fig. 82** . Release screws (2). See **Fig. 83** . Remove screws (1) and (2). See **Fig. 84** . Lower valve block until screws of solenoid valve are accessible.
3. Detach plug from solenoid valve. Release screws (1) and pull solenoid valve out. See **Fig. 85** . During installation, replace sealing ring.



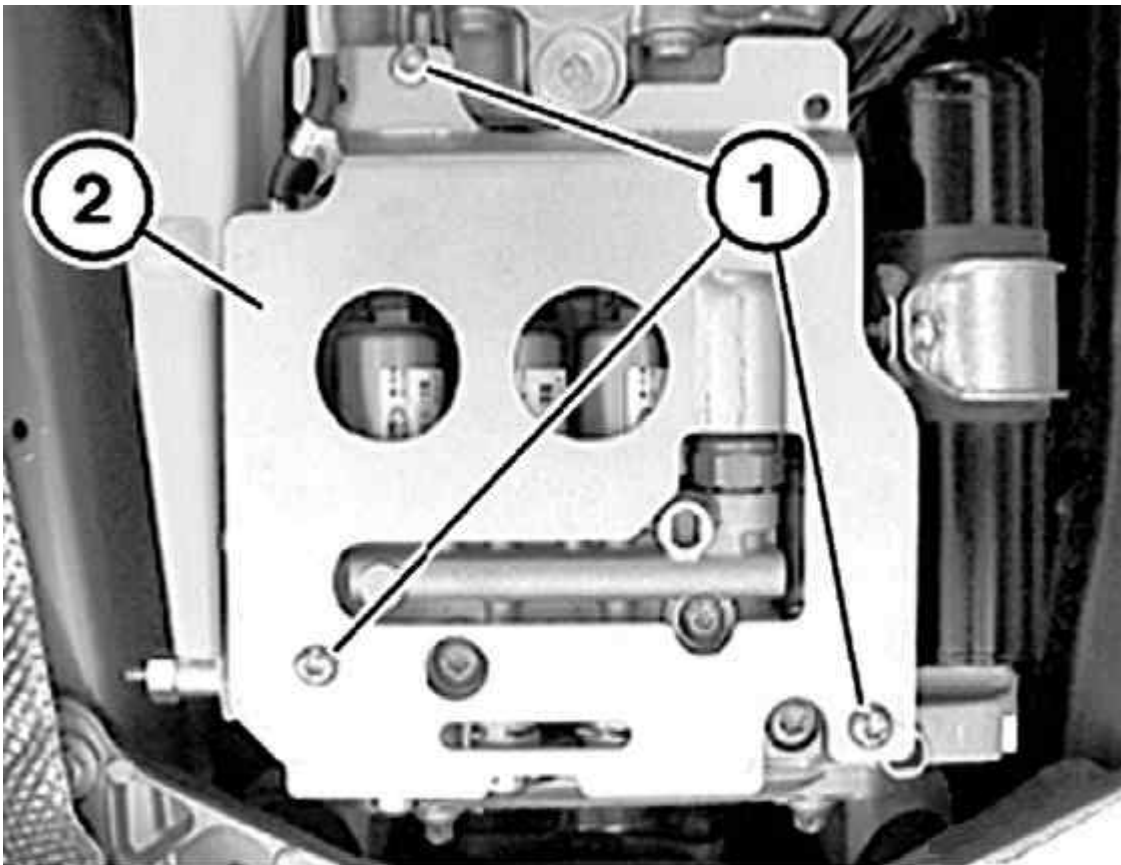
G00387013

Fig. 80: Identifying Solenoid Valves
Courtesy of BMW OF NORTH AMERICA, INC.



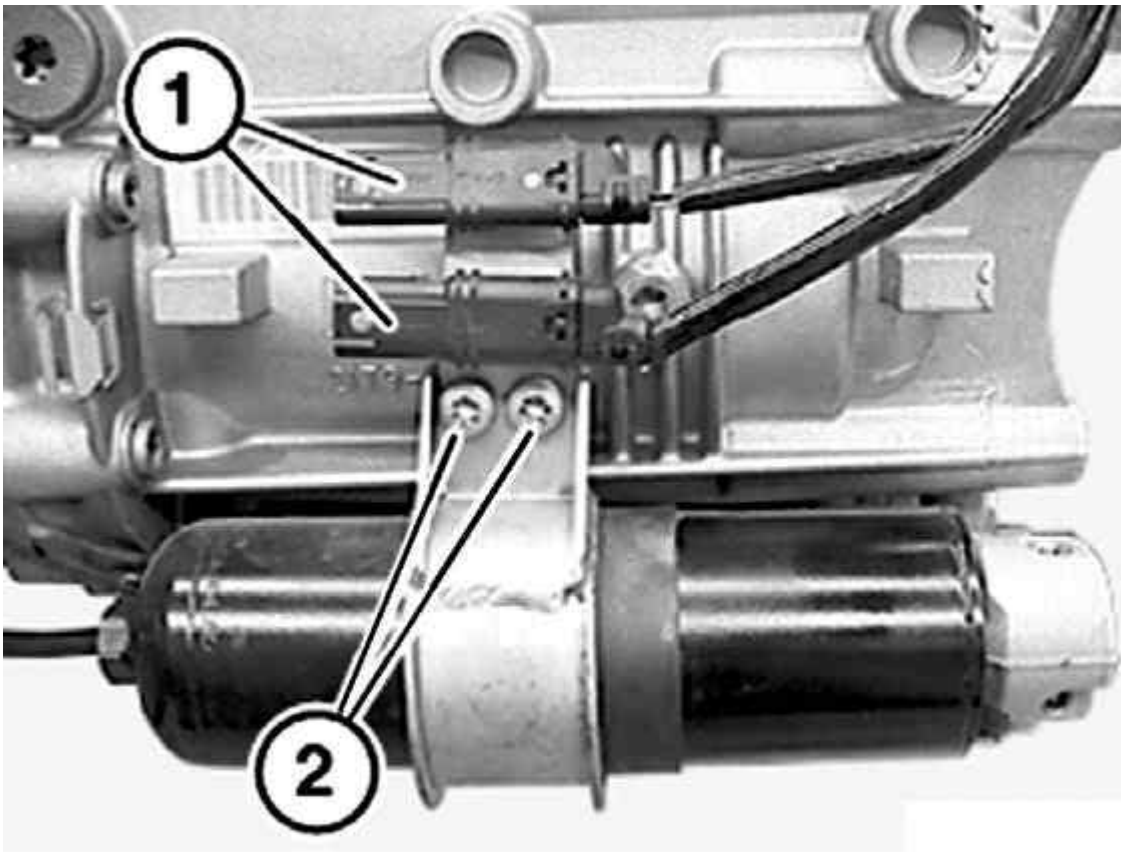
G00386989

Fig. 81: Releasing Nuts & Removing Heat Shield
Courtesy of BMW OF NORTH AMERICA, INC.



G00386990

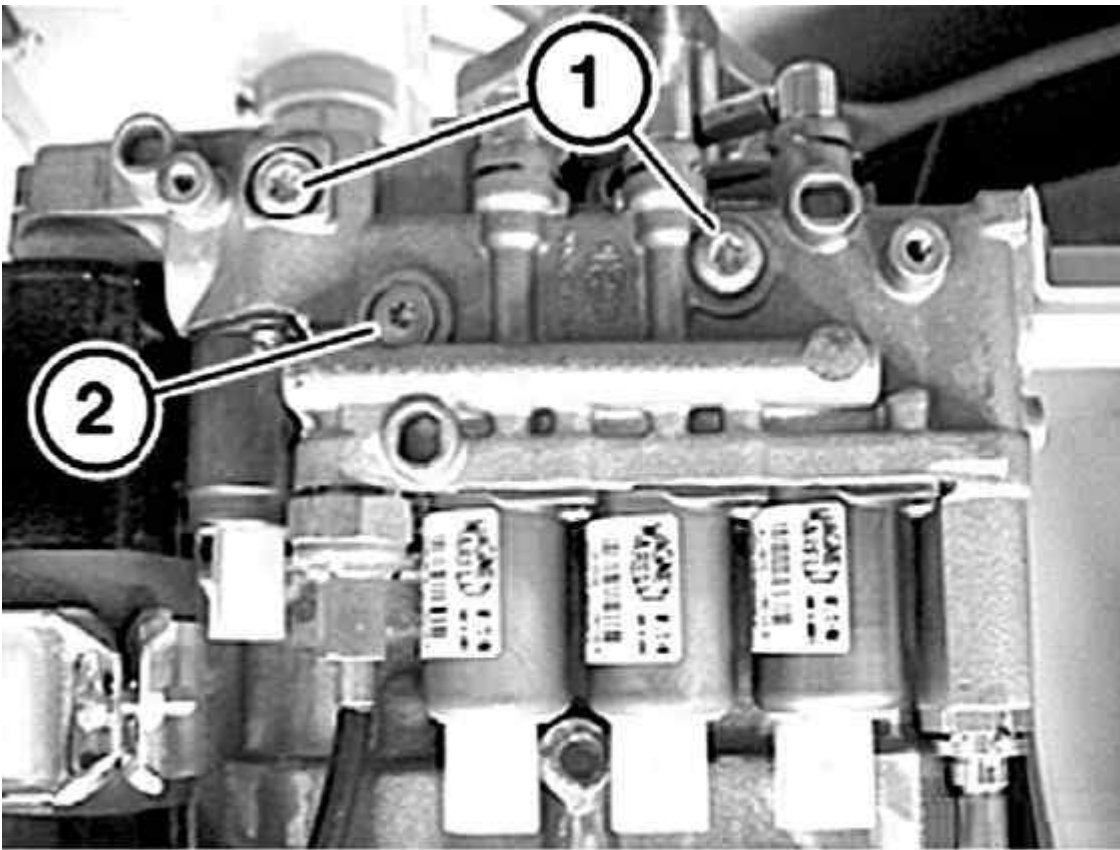
Fig. 82: Releasing Screws & Removing Protective Plate
Courtesy of BMW OF NORTH AMERICA, INC.



G00386991

Fig. 83: Releasing Screws

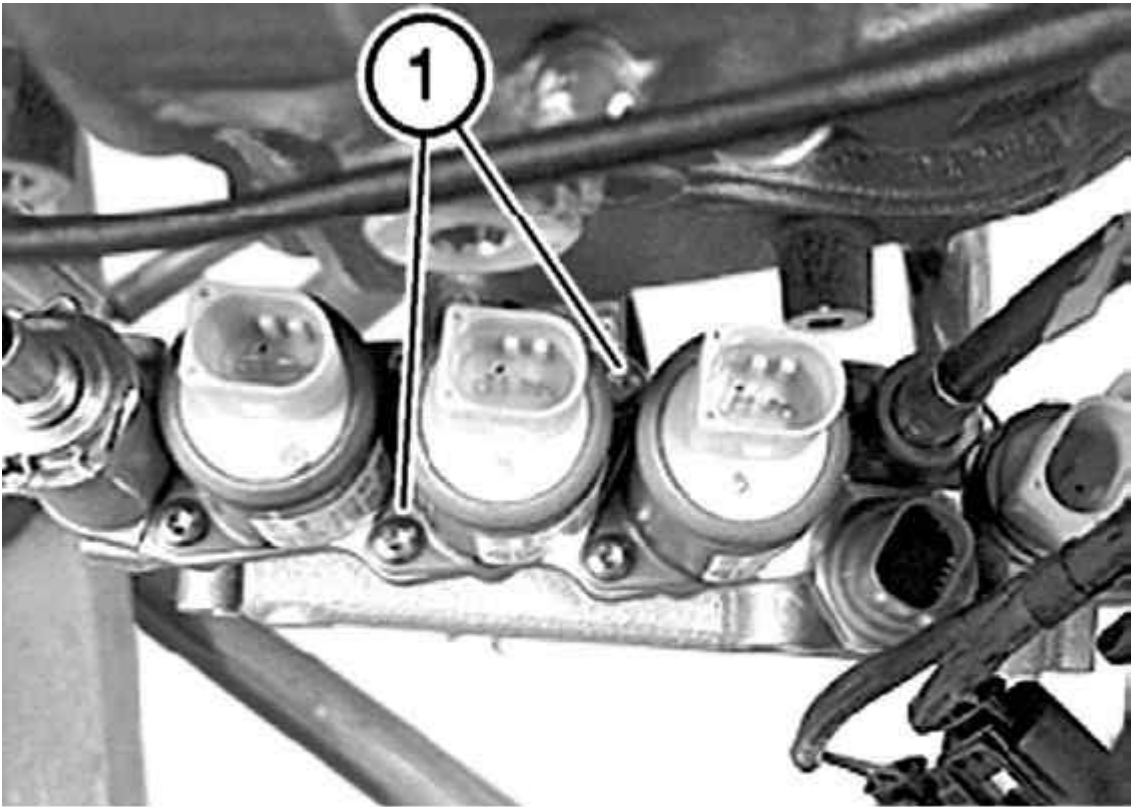
Courtesy of BMW OF NORTH AMERICA, INC.



G00386992

Fig. 84: Removing Screws

Courtesy of BMW OF NORTH AMERICA, INC.



G00386993

Fig. 85: Releasing Screws & Pulling Out Solenoid Valve
 Courtesy of BMW OF NORTH AMERICA, INC.

OVERHAUL

NOTE: Overhaul information is not provided.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Clutch Housing To Crankcase	
M8	20 (27)
M10	38 (51)
M12	63 (86)
Clutch To Flywheel	
M8/8.8	18 (25)
M8/10.9	25 (34)
Clutch Master Cylinder To Bearing Block	16 (22)

2005 BMW Z4
2000-05 CLUTCHES Z4 & 3-Series

Clutch Master Cylinder Fitting Screw	16 (22)
Clutch Master Cylinder To Pedal Assembly	88 (10)
Clutch Slave Cylinder To Clutch Housing/Transmission Case	16 (22)
Hydraulic Pipes Coupling Bolts	10 (14)
Hydraulic Unit Pressure Accumulator	30 (40)
	INCH Lbs. (N.m)
Clutch Position Sensor To Clutch Slave Cylinder	22 (2.5)