

**TRANSMISSION****Transfer Box - Repair Instructions - 528xi, 535xi****TRANSFER CASE, GENERAL****00 DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN****Danger of poisoning!**

Ingesting oil or absorbing through the skin may cause poisoning!

**Possible symptoms are:**

- Headaches
- Dizziness
- Stomach aches
- Vomiting
- Diarrhoea
- Cramps/fits
- Unconsciousness

**Protective measures/rules of conduct:**

- Pour oil only into appropriately marked containers
- Do **not** pour oil into drinking vessels (drinks bottles, glasses, cups or mugs)
- Observe country-specific safety regulations

**First aid measures:**

- Do not induce vomiting.

If the person affected is still conscious, he/she must rinse out their mouth with water, drink plenty of water and consult a doctor immediately.

If the person affected is unconscious, do not administer anything by mouth, place the person in the recovery position and seek immediate medical attention.

**00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN****Danger of injury!**

Contact with eyes or skin may result in injury!

**Possible symptoms are:**

- Impaired sight
- Irritation of the eyes
- Reddening of the skin
- Rough and cracked skin

**Protective measures/rules of conduct:**

- Wear protective goggles
- Wear oil-resistant protective gloves
- Observe country-specific safety regulations

**First aid measures:**

- **Eye contact:** Rinse eyes immediately with plenty of water for at least 15 minutes; if available, use an eye-rinsing bottle. If irritation of the eyes persists, consult a doctor.
- **Skin contact:** Wash off with soap and water immediately. If irritation persists, consult a doctor.

**NOTE:** Do not use solvents/thinners.

**00 SAFETY INSTRUCTIONS FOR HANDLING OIL**

**WARNING: DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN!**  
**RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN!**

**Recycling:**

Observe country-specific waste-disposal regulations.

**Measures if oil is unintentionally released:**

- **Personal precautionary measures:** Danger of slipping! Keep non-involved persons away from the work area. Wear personal protective clothing/equipment.
- **Environmental protection measures:** Prevent oil from draining into drain channels, sewerage systems, pits, cellars, water and the ground.
- **Limiting spread:** Use oil blocks to prevent the surface spread of oil.
- **Cleaning procedure:** Bind and dispose of escaped oil with nonflammable absorbents.

**NOTE:** Do not flush oil away with water or aqueous cleaning agents.

**27 00... REPLENISHING/CHANGING TRANSFER CASE OIL (ATC 300)**

**IMPORTANT:** Use only the approved gear oil in the transfer case. See TRANSFER CASE - OPERATING FLUIDS .  
Failure to comply with this requirement will result in serious damage to the transfer case!

**NOTE:** Only change the oil when the transfer case is at normal operating temperature.

*Necessary preliminary tasks:*

- Remove underbody protection
- If necessary, remove exhaust system
- Remove heat shield

Checking/correcting transfer case oil level:

Undo oil filler plug (1).

Check transfer case oil level.

If necessary, pour in gear oil up to lower edge of opening for oil filler plug (1).

*Installation:*

Tightening torque, 60 N.m.

Replace sealing ring.

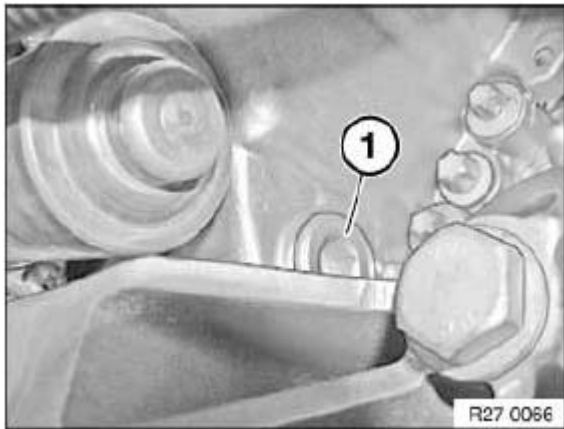


**Fig. 1: Locating Oil Filler Plug**  
Courtesy of BMW OF NORTH AMERICA, INC.

Changing transfer case oil:

Place oil collecting apparatus underneath.

Remove oil drain plug (1).

Drain and dispose of gear oil.

**NOTE:** Observe country-specific waste-disposal regulations Replace sealing ring, screw in oil drain plug (1) and tighten down.

Tightening torque, 60 N.m.

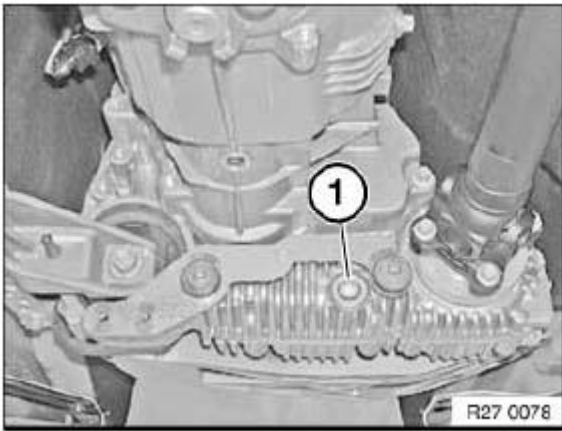


**Fig. 2: Locating Oil Drain Plug**  
Courtesy of BMW OF NORTH AMERICA, INC.

Undo oil filler plug (1).

Pour in gear oil up to lower edge of opening for oil filler plug (1).

Tightening torque, 60 N.m.

Replace sealing ring.

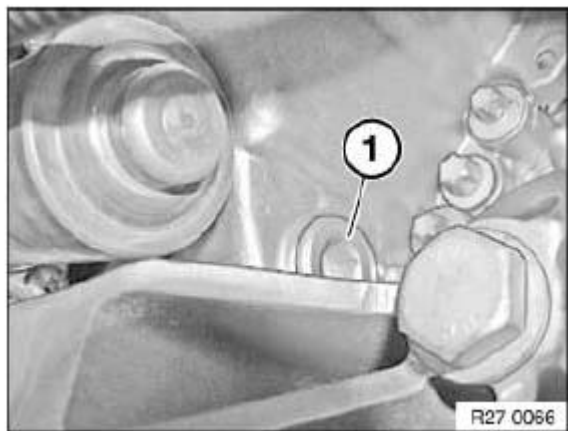


**Fig. 3: Locating Oil Filler Plug**

Courtesy of BMW OF NORTH AMERICA, INC.

## 10 TRANSFER CASE

### 27 10... CHECKING FUNCTION OF FRONT DIFFERENTIAL AND TRANSFER CASE

**NOTE:** Fault diagnosis with DIS Tester.  
Adhere to specified repair sequence in DIS (BMW scan tool).

### 27 10 010 REMOVING AND INSTALLING TRANSFER CASE (ATC 300)

**Special tools required:**

- 00 2 030. See MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS .
- 23 4 050. See MANUAL TRANSMISSION - SPECIAL TOOLS .

**IMPORTANT:** After replacement, the REPAIR service function must be carried out with GT1 (BMW scan tool).

**IMPORTANT:** After completing work, check gear oil level and top up if necessary.

Filler plug (1):

Tightening torque, 60 N.m.

Gear oil level up to filler edge of filler plug (1).

Use only the approved transmission fluid. See TRANSFER CASE - OPERATING FLUIDS .

Failure to comply with this requirement will result in serious damage to the transfer box!

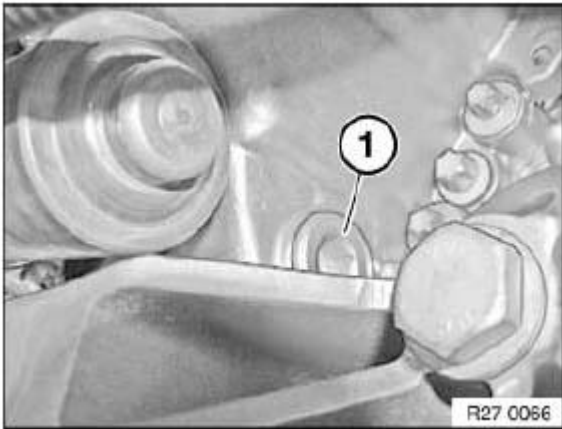


**Fig. 4: Locating Oil Filler Plug**

Courtesy of BMW OF NORTH AMERICA, INC.

*Necessary preliminary tasks:*

- Remove complete exhaust system. See **EXHAUST SYSTEM - REPAIR INSTRUCTIONS** .
- Remove underbody protection
- Remove heat shields

Release screws.

Remove front propeller shaft at output flange of transfer case and tie to one side.

*Installation:*

Replace screws.

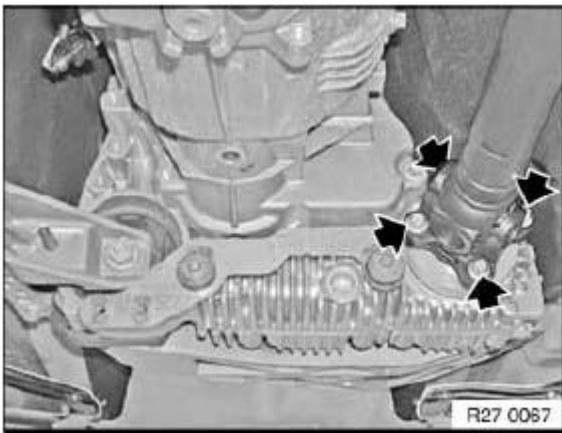


**Fig. 5: Identifying Front Propeller Shaft Screws**

Courtesy of BMW OF NORTH AMERICA, INC.

- Remove propeller shaft from transmission.
- Release center bearing.
- Tie propeller shaft to one side.

Tasks are described in removing propeller shaft. See **26 11 000 REMOVING AND INSTALLING COMPLETE PROPELLER SHAFT (CONSTANT-VELOCITY JOINT)** .

**NOTE:** Support transmission with special tool 00 2 030/23 4 050.

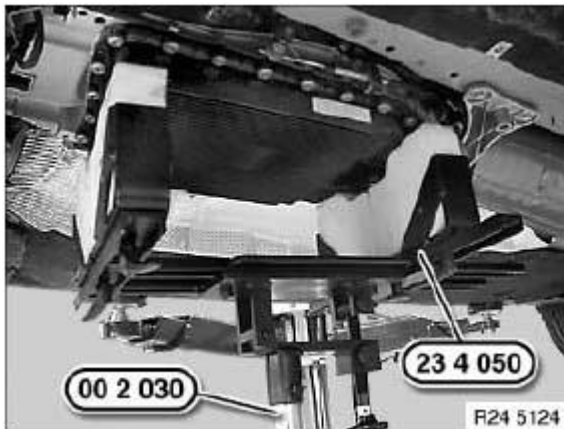


**Fig. 6: Identifying Special Tool (00 2 030) And (23 4 050)**  
Courtesy of BMW OF NORTH AMERICA, INC.

If necessary

Release bolts and remove metal plate (1).

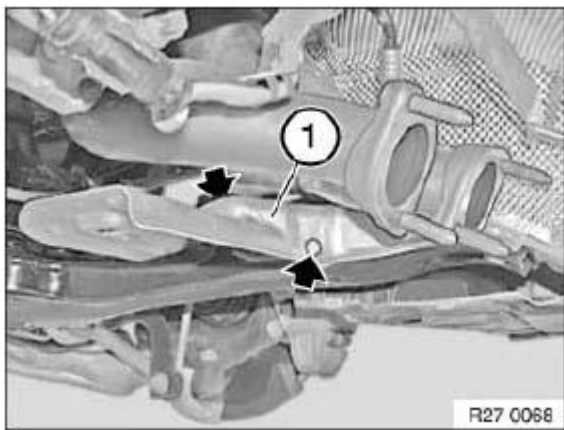


**Fig. 7: Identifying Metal Plate**  
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plugs (1) and (2) from servomotor.

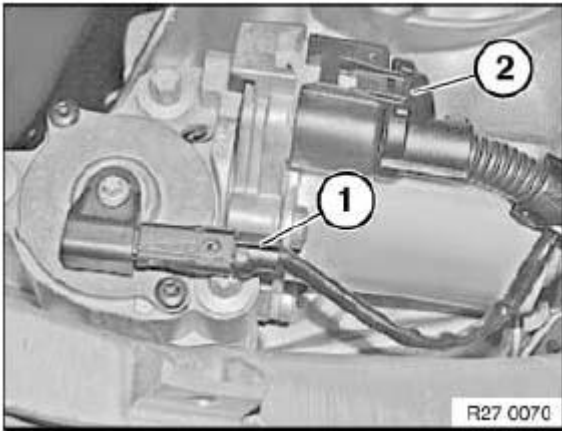


**Fig. 8: Identifying Plugs And Servomotor**  
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws.

Remove transmission crossmember.

Tightening torque, 19 N.m.

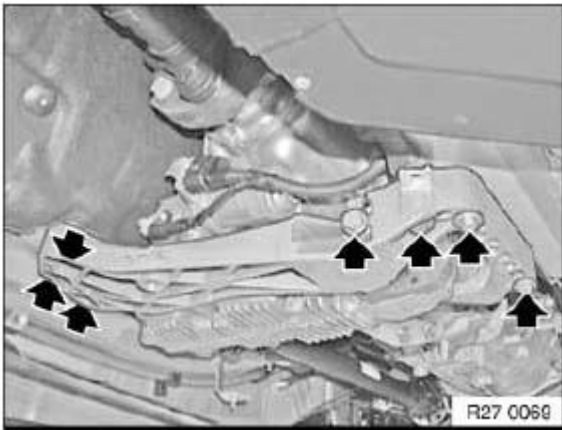


**Fig. 9: Identifying Transmission Crossmember Screws**  
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw connection of transfer case.

Tightening torque, 43 N.m.

Remove transfer case.

*Installation:*

Pay attention to dowel pin (1).

Grease dowel pin (1).

Apply a thin coat of grease to splines.

Grease: WEICON ANTI-SEIZE.

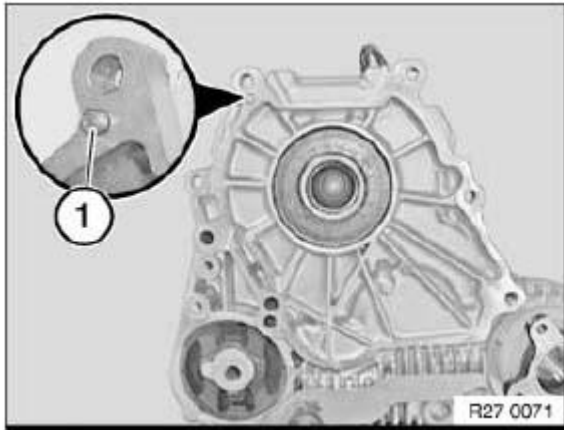


**Fig. 10: Identifying Dowel Pin**

Courtesy of BMW OF NORTH AMERICA, INC.

#### 27 10 020 INSTALLING REPLACEMENT TRANSFER CASE (ATC 300)

**IMPORTANT:** After replacement, the "Repair" service function must be carried out with GT1.

*Recycling:*

Catch and dispose of escaping transmission oil. Observe country-specific waste-disposal regulations.

**IMPORTANT:** After completing work, check transmission oil level and top up if necessary.

**Release filler plug (1).**

**Check oil level.**

**Tightening torque, 60 N.m.**

**Pour in transmission oil up to lower edge of opening for filler plug (1).**

**Use only the approved transmission oil.**

Failure to comply with this requirement will result in serious damage to the transfer case!

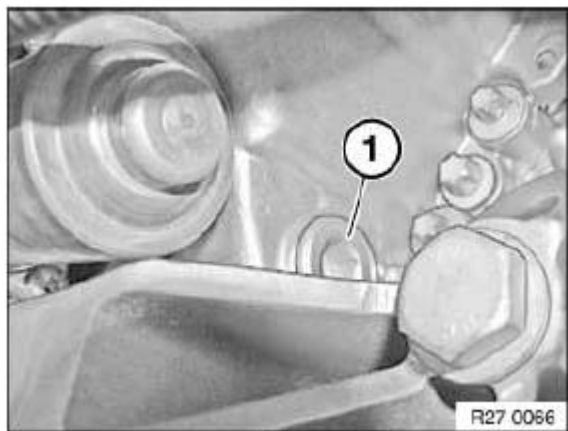


**Fig. 11: Locating Oil Filler Plug**

Courtesy of BMW OF NORTH AMERICA, INC.

*Necessary preliminary tasks:*

- Drain transmission oil at oil drain plug

Tightening torque, 60 N.m.

- Remove transfer case

#### 27 10 050 REPLACING OUTPUT FLANGE FOR FRONT AXLE OUTPUT (ATC 300)

**IMPORTANT:** Do not move vehicle with drive power once propeller shaft has been removed. Replace output flange only in conjunction with a new radial shaft seal. After completion of work, check transmission fluid level. Use only the approved transmission fluid. See TRANSFER CASE - OPERATING FLUIDS . Failure to comply with this requirement will result in serious damage to the transfer box!

Operation is identical to Replacing radial shaft seal for front axle output.

#### 27 10 070 REPLACING OUTPUT FLANGE ON TRANSFER CASE AT REAR (ATC300)

**IMPORTANT:** After completing work, check gear oil level and top up if necessary. Use only the approved gear oil in this transfer case. See TRANSFER CASE - OPERATING FLUIDS .

**NOTE:**

- Operations for removing output flange are identical to replacing radial shaft seal (M/T) or 27 21 020 REPLACING RADIAL SHAFT SEAL FOR OUTPUT FLANGE, AUTOMATIC (ATC 300)

*Installation:*

- Thickness of new shim must be determined before output flange is installed

Determine and note down measurement A of output flange (previous and new).

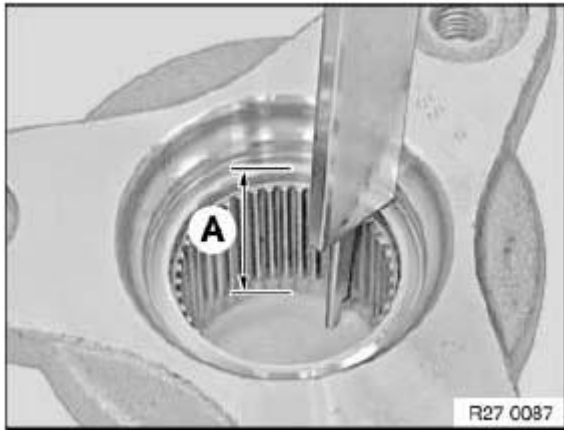


**Fig. 12: Identifying Output Flange Dimension**  
Courtesy of BMW OF NORTH AMERICA, INC.

Determine and note down measurement B of output flange (previous and new).

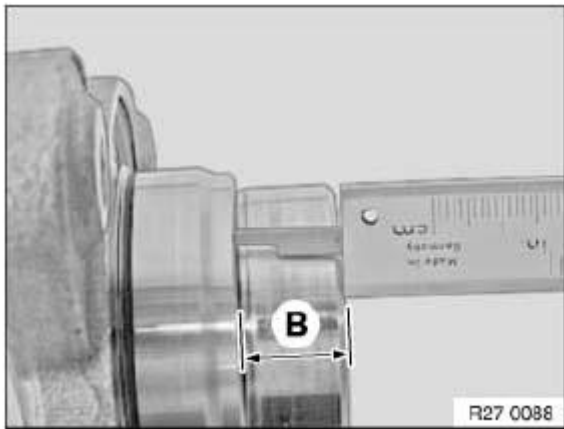


**Fig. 13: Identifying Output Flange Dimension**  
Courtesy of BMW OF NORTH AMERICA, INC.

Determine measurement C, thickness of shim.

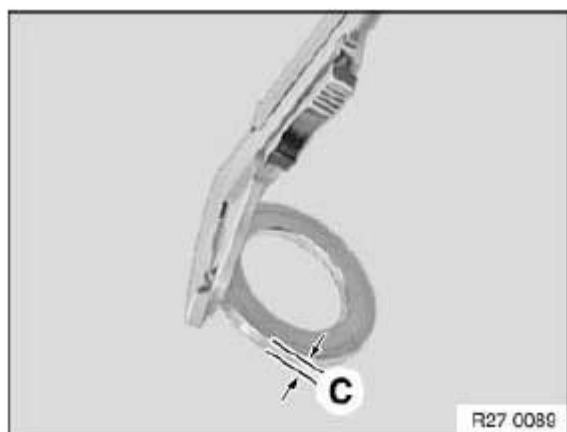


**Fig. 14: Identifying Shim Thickness**

Courtesy of BMW OF NORTH AMERICA, INC.

*Installation:*

Calculate thickness of new shim:

1. Add measurement A of output flange (previous) and measurement C of shim (previous)

Then subtract measurement B (previous) from result A+C (previous)

2. Subtract measurement B from measurement A of output flange (new)
3. Then subtract result of step 2 from result of step 1.

**27 10 700 REMOVING AND INSTALLING/REPLACING CONTROL UNIT FOR TRANSFER BOX (ATC 300)**

**IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection). See 61 35... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .**

○ **Replacement:**

Before and after replacement, execute the "Repair" service function with the BMW diagnosis system.

*Necessary preliminary tasks:*

- Remove trim for instrument panel, bottom right. See **51 45 181 REMOVING AND INSTALLING/REPLACING BOTTOM RIGHT TRIM FOR INSTRUMENT PANEL** .

Remove side trim panel (1) and entrance strip trim (2).

Pull back floor trim (carpet) towards rear.

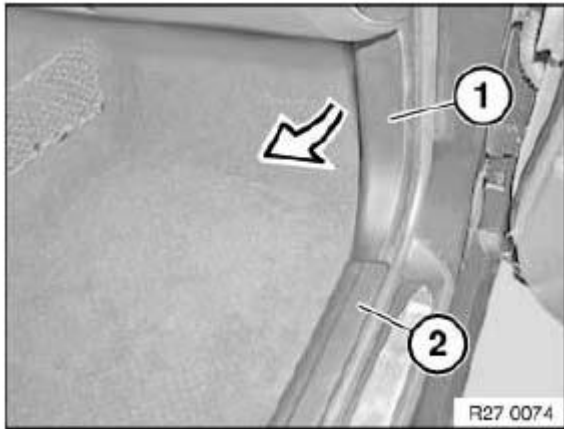


**Fig. 15: Identifying Side Trim Panel And Entrance Strip Trim**  
Courtesy of BMW OF NORTH AMERICA, INC.

Remove inlay (1).

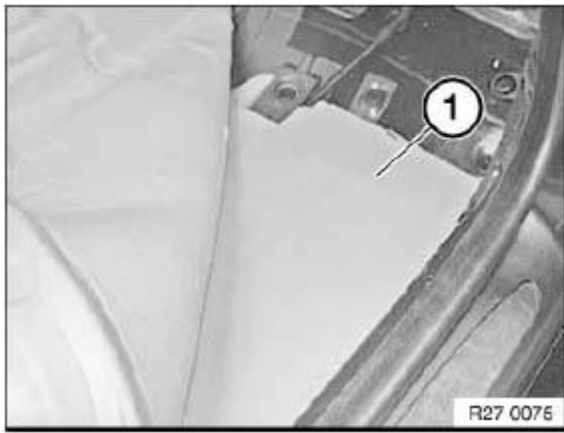


**Fig. 16: Identifying Inlay**  
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws.

Tightening torque, 8 N.m.

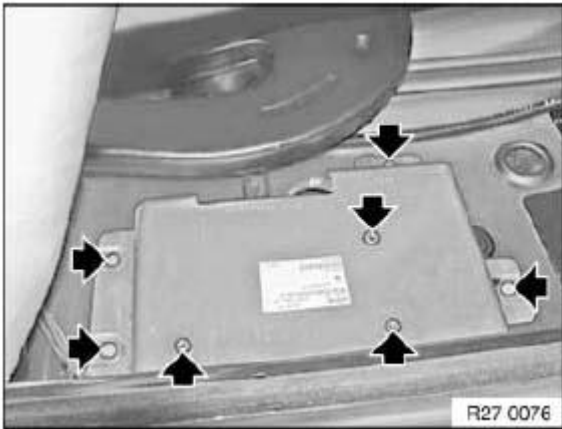


**Fig. 17: Locating Screws**

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect connector (1).

Modify control unit.

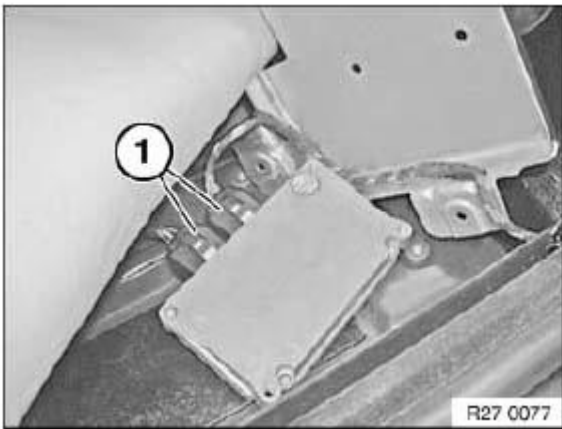


**Fig. 18: Identifying Control Unit Connector**

Courtesy of BMW OF NORTH AMERICA, INC.

## 27 10 710 REPLACING CLASSIFICATION RESISTOR FOR SERVOMOTOR (ATC 300)

**IMPORTANT:** Delete previous resistance values when replacing the resistor.  
Using BMW diagnosis system, work through test program in accordance with instructions.

Disconnect connector (1).

Release screw (3) and remove resistor.

Tightening torque, 5 N.m.

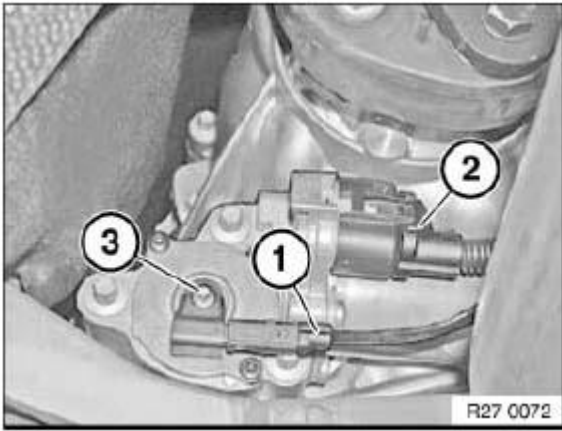


**Fig. 19: Identifying Connector And Screws**  
Courtesy of BMW OF NORTH AMERICA, INC.

#### 27 10 720 REPLACING SERVOMOTOR (ATC 300)

**IMPORTANT:** After replacement, the "Repair" service function must be carried out with GT1.

Disconnect plugs (1 and 2).

Release screw (3) and turn resistor counterclockwise.

Tightening torque, 5 N.m.

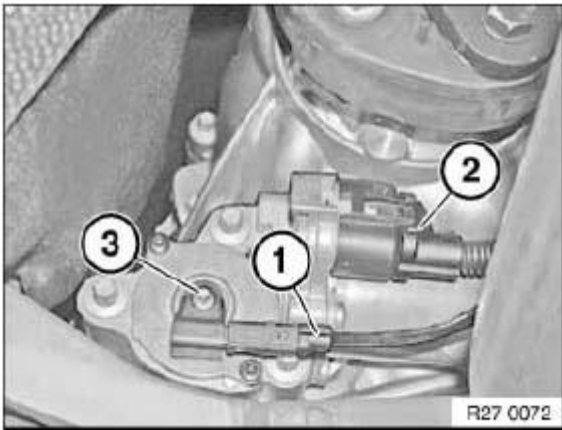


**Fig. 20: Identifying Connector And Screws**  
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and remove servomotor from transfer case.

Tightening torque, 22 N.m.

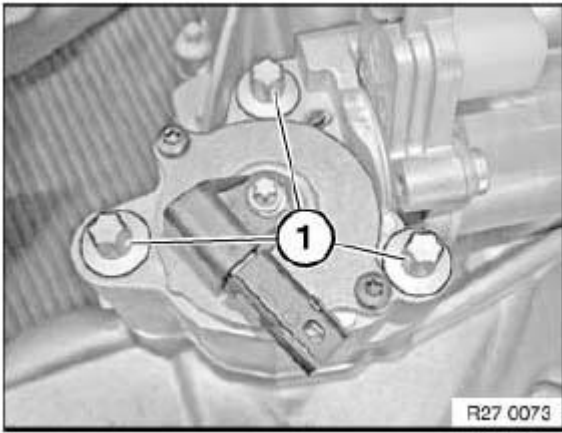


**Fig. 21: Identifying Screws**

Courtesy of BMW OF NORTH AMERICA, INC.

## 21 TRANSMISSION SHAFTS

### 27 10 070 REPLACING OUTPUT FLANGE ON TRANSFER CASE AT REAR (ATC300)

**IMPORTANT:** After completing work, check gear oil level and top up if necessary.  
Use only the approved gear oil in this transfer case. See TRANSFER CASE - OPERATING FLUIDS .

**NOTE:**

- Operations for removing output flange are identical to replacing radial shaft seal or 27 21 020 REPLACING RADIAL SHAFT SEAL FOR OUTPUT FLANGE, AUTOMATIC (ATC 300).

*Installation:*

- Thickness of new shim must be determined before output flange is installed

Determine and note down measurement A of output flange (previous and new).

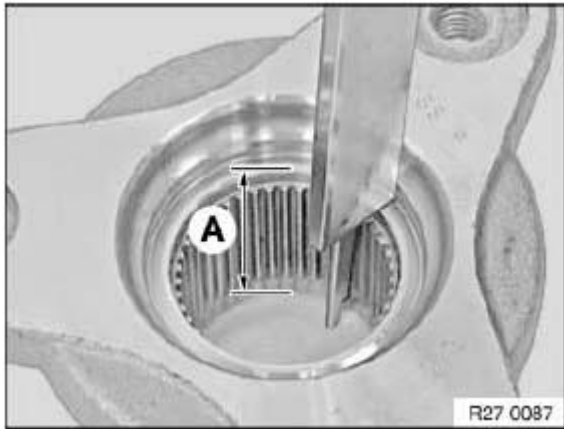


**Fig. 22: Identifying Output Flange Dimension**  
Courtesy of BMW OF NORTH AMERICA, INC.

Determine and note down measurement B of output flange (previous and new).

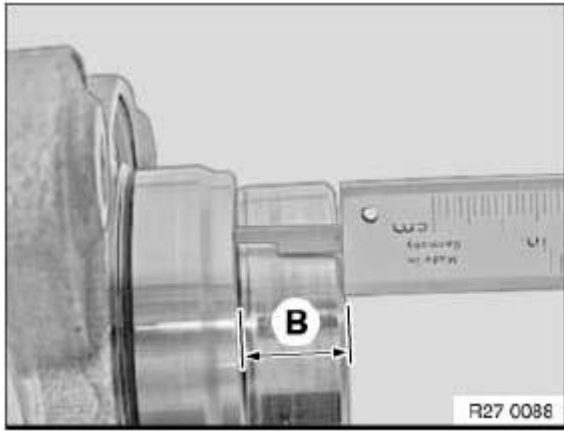


**Fig. 23: Identifying Output Flange Dimension**  
Courtesy of BMW OF NORTH AMERICA, INC.

Determine measurement C, thickness of shim.

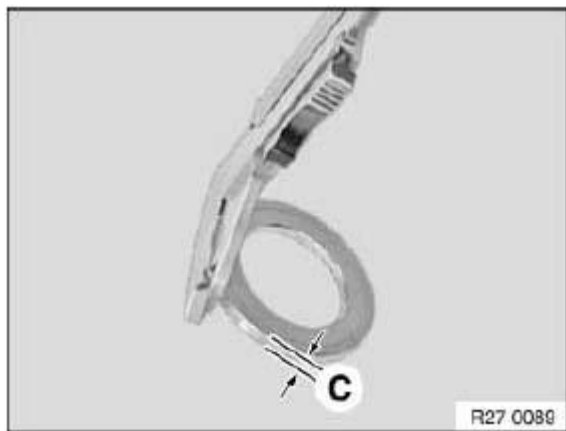


**Fig. 24: Identifying Shim Thickness**

Courtesy of BMW OF NORTH AMERICA, INC.

*Installation:*

Calculate thickness of new shim:

1. Add measurement A of output flange (previous) and measurement C of shim (previous)

Then subtract measurement B (previous) from result A+C (previous)

2. Subtract measurement B from measurement A of output flange (new)
3. Then subtract result of step 2 from result of step 1.

**27 21 010 REPLACING RADIAL SHAFT SEAL FOR DRIVE FLANGE (ATC 300)**

**Special tools required:**

- 23 0 490. See MANUAL TRANSMISSION - SPECIAL TOOLS .
- 27 1 430. See Fig. 27.

**IMPORTANT:** After completion of work, check gear oil level and top up if necessary.  
Use only approved gear oil in this transfer box. See TRANSFER CASE - OPERATING FLUIDS .

*Necessary preliminary tasks:*

- Remove transfer box.

Drive a hole into radial shaft seal (1) using a center punch (2).

**IMPORTANT:** Do not use a drill as drillings may result in transmission malfunction.

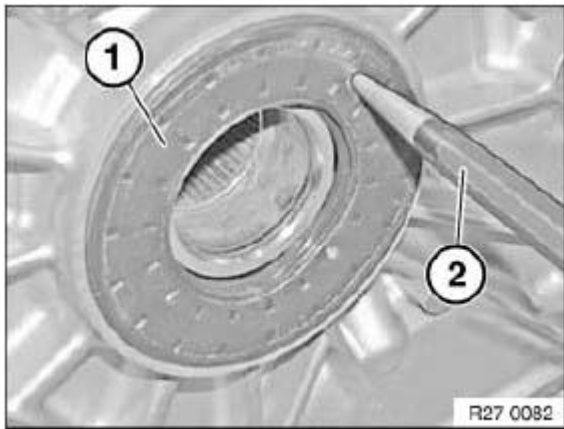


**Fig. 25: Identifying Radial Shaft Seal And Center Punch**  
Courtesy of BMW OF NORTH AMERICA, INC.

Screw special tool 23 0 490 into radial shaft seal.

Drive out radial shaft seal (1) with impact weight (2).

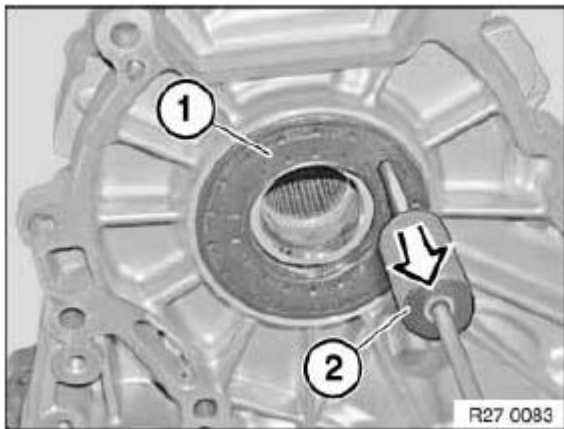


**Fig. 26: Identifying Radial Shaft Seal And Impact Weight**  
Courtesy of BMW OF NORTH AMERICA, INC.

*Installation:*

Coat sealing lips of new radial seal with clean transmission oil.

Drive in radial shaft seal with special tool 27 1 430.

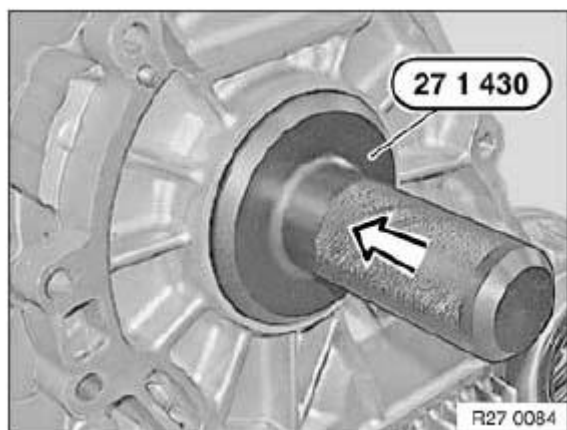


**Fig. 27: Identifying Special Tool (27 1 430)**

Courtesy of BMW OF NORTH AMERICA, INC.

Add final details to vehicle.

Check oil level.

Check transmission for leaks.

#### **27 21 020 REPLACING RADIAL SHAFT SEAL FOR OUTPUT FLANGE (ATC 300)**

**IMPORTANT:** After completion of work, check transmission oil level and top up if necessary. Use only the approved gear oil in this transfer box. See TRANSFER CASE - OPERATING FLUIDS .

**NOTE:** Operations are identical for removed transfer case.

#### **27 21 020 REPLACING RADIAL SHAFT SEAL FOR OUTPUT FLANGE, AUTOMATIC (ATC 300)**

**Special tools required:**

- 27 1 440. See Fig. 31.

**IMPORTANT:** After completing work, check gear oil level and top up if necessary. Use only the approved transmission oil in this transfer case. See TRANSFER CASE - OPERATING FLUIDS .

*Necessary preliminary tasks:*

- Remove transfer case.

Release retaining ring (1).

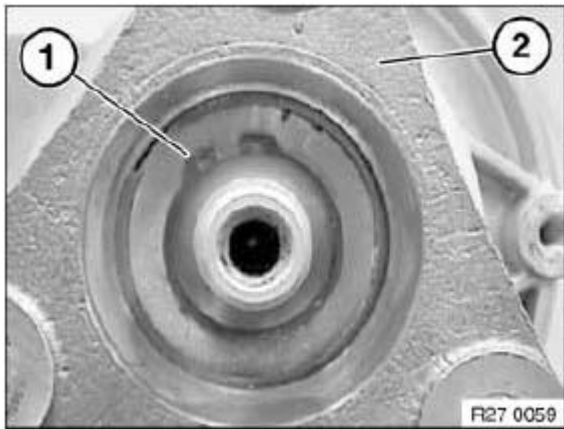


**Fig. 28: Identifying Retaining Ring**

Courtesy of BMW OF NORTH AMERICA, INC.

Release output flange with three-claw extractor tool.

Lever radial shaft seal out of housing with a suitable tool.

**IMPORTANT: Do not damage housing.**

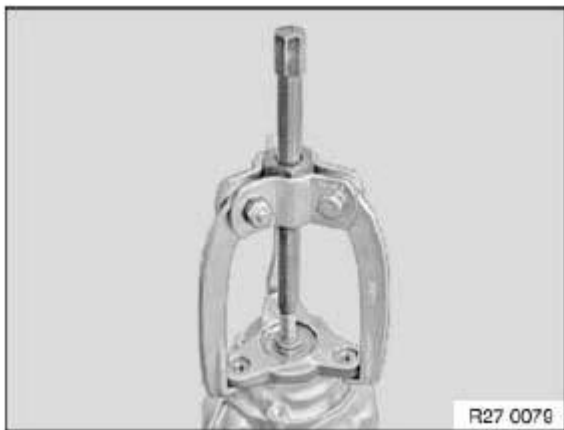


**Fig. 29: Identifying Three-Claw Extractor Tool**

Courtesy of BMW OF NORTH AMERICA, INC.

*Installation:*

Replace O-ring in output flange.

Check that O-ring is in correct position.

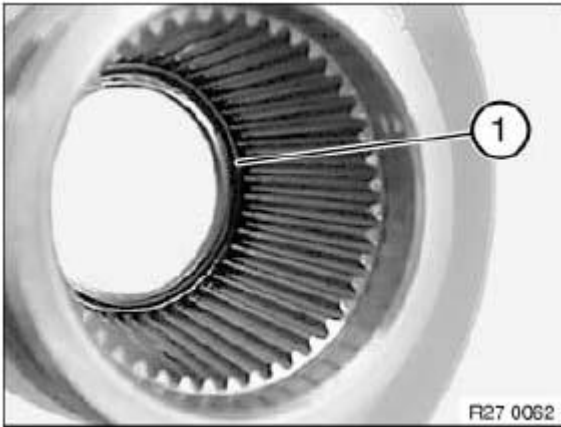


**Fig. 30: Identifying O-Ring**

Courtesy of BMW OF NORTH AMERICA, INC.

*Installation:*

Coat sealing lips of new radial seal with clean transmission oil.

Drive in radial shaft seal with special tool 27 1 440.

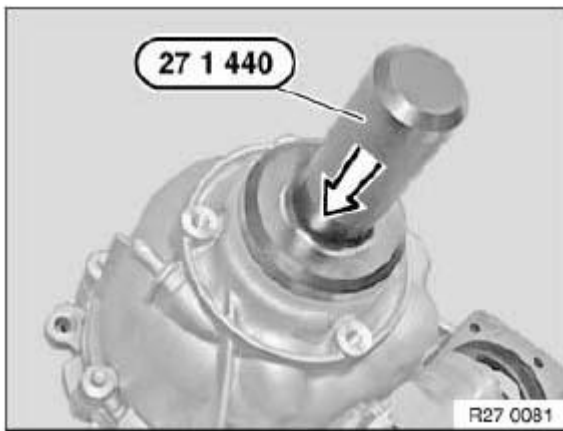


**Fig. 31: Identifying Special Tool (27 1 440)**

Courtesy of BMW OF NORTH AMERICA, INC.

*Installation:*

- Push on output flange
- Press down output flange using 2 screwdrivers
- Fit washer
- Continue pressing output flange down until retaining groove is completely visible
- Fit retaining ring

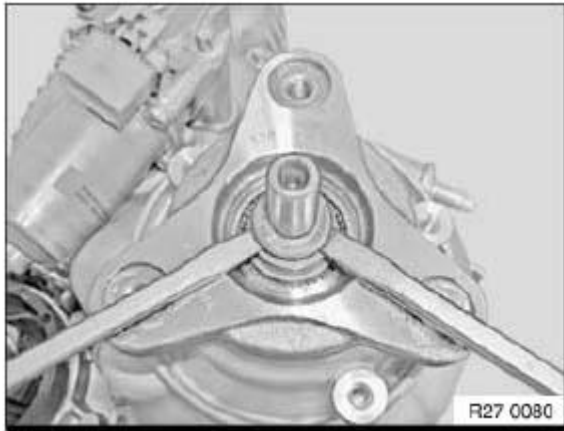


**Fig. 32: Pressing Output Flange**

Courtesy of BMW OF NORTH AMERICA, INC.

## 27 21 030 REPLACING RADIAL SHAFT SEAL FOR FRONT AXLE OUTPUT (ATC 300)

### Special tools required:

- 27 1 450. See **Fig. 34**.

**IMPORTANT:** After completion of work, check transmission oil level.

Use only the approved gear oil in this transfer case. See **TRANSFER CASE - OPERATING FLUIDS** .

### *Necessary preliminary tasks:*

- Remove front propeller shaft. See **26 11 000 REMOVING AND INSTALLING COMPLETE PROPELLER SHAFT (CONSTANT-VELOCITY JOINT)** .

Lever output flange (1) out of housing with screwdriver (2).

Lever radial shaft seal out of housing with a suitable tool.

**IMPORTANT:** Do not damage housing.

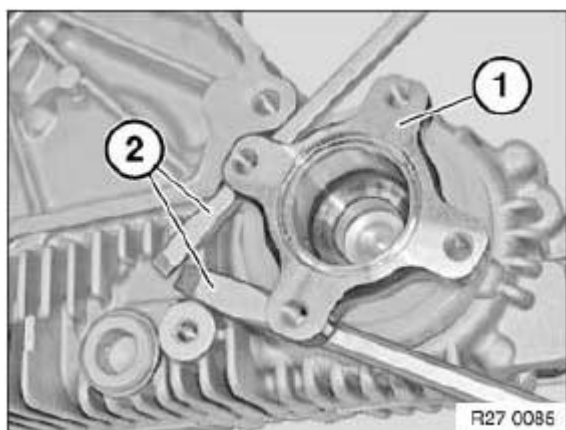


**Fig. 33: Identifying Output Flange And Screwdriver**  
Courtesy of BMW OF NORTH AMERICA, INC.

Drive in radial shaft seal with special tool 27 1 450.

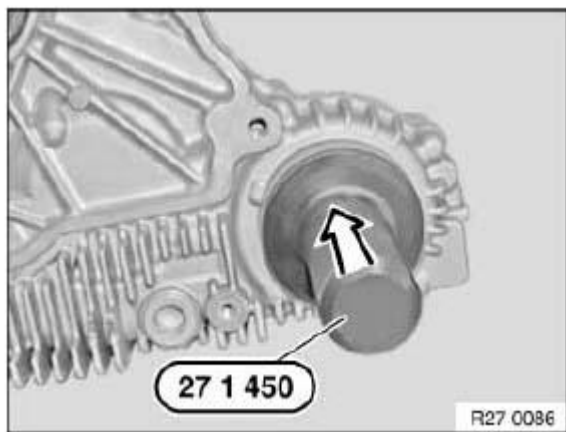


**Fig. 34: Identifying Special Tool (27 1 450)**  
Courtesy of BMW OF NORTH AMERICA, INC.