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:

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- 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 700)

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

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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** . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .
- If necessary, remove exhaust system
- Remove heat shields

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 **27 00 11AZ** , see **27 00 TRANSFER BOX IN GENERAL**

Replace sealing ring.

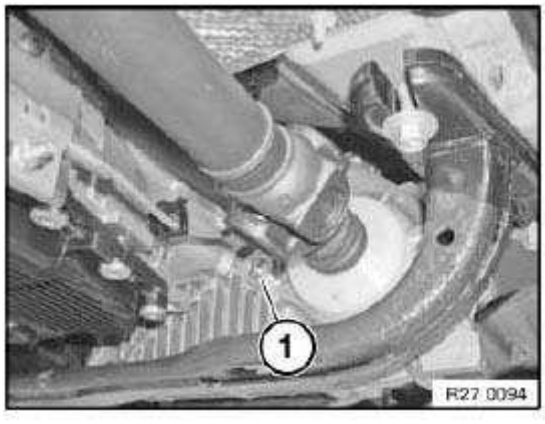

Fig. 1: Identifying Oil Filler Plug
Courtesy of BMW OF NORTH AMERICA, INC.

Changing transfer case oil:

Place oil collecting apparatus underneath.

Remove oil drain plug (1).

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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 **27 00 11AZ** , see **27 00 TRANSFER BOX IN GENERAL**

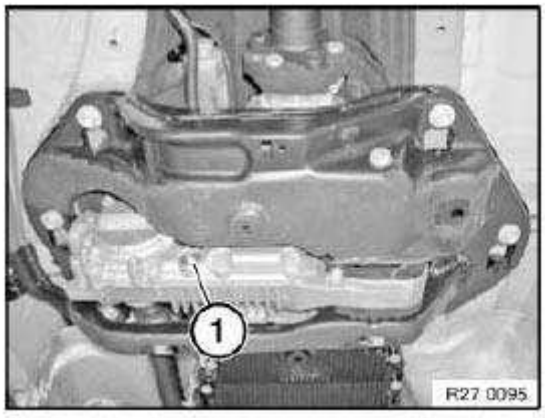

Fig. 2: Identifying Oil Drain Plug
Courtesy of BMW OF NORTH AMERICA, INC.

Undo oil filler plug (1).

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

Tightening torque **27 00 11AZ** , see **27 00 TRANSFER BOX IN GENERAL**

Replace sealing ring.

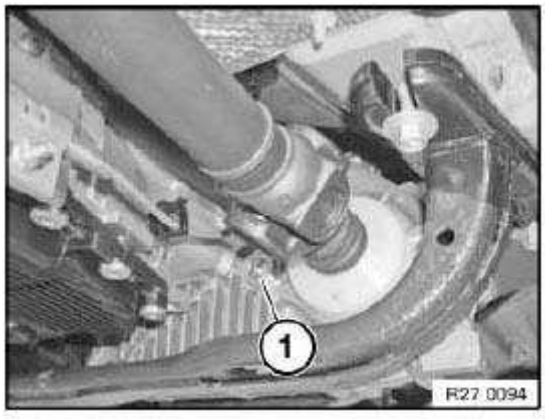

Fig. 3: Identifying Oil Filler Plug
Courtesy of BMW OF NORTH AMERICA, INC.

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TRANSFER CASE

27 10 010 REMOVING AND INSTALLING TRANSFER BOX ATC 700 (AUTOMATIC TRANSMISSION)

IMPORTANT: After replacement, the "Repair" service function must be carried out with in the BMW diagnosis system.

WARNING: Danger to life!
Mount securing fixture for vehicle on lifting platform to prevent the vehicle from slipping off or tilting down.

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

Filler plug (1):

Tightening torque **27 00 11AZ** , see **27 00 TRANSFER BOX IN GENERAL**

Oil level up to filler edge of filler plug (1).

Use only **approved gear oil** . See **TRANSFER CASE - OPERATING FLUIDS** .

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

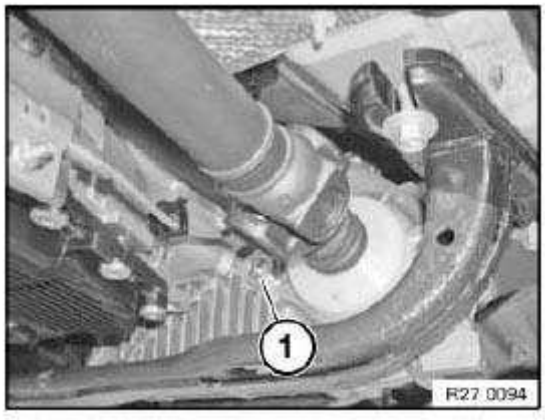

Fig. 4: Identifying Oil Filler Plug
Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks:

- Remove **underbody protection** . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .
- Remove exhaust system bracket from transmission and transfer box
- Remove **propeller shaft** . See **26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT**

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(INSERTED) COMPLETELY (N54) or **26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT (INSERTED) COMPLETELY (N63)** .

- Remove **front propeller shaft** . See **26 20 000 REMOVING AND INSTALLING FRONT PROPELLER SHAFT (N52K, M57T2, N54)** or **26 20 000 REMOVING AND INSTALLING FRONT PROPELLER SHAFT (N63)** .
- Support transmission.
- Remove **transmission cross-member** . See **22 32 050 REPLACING CROSSMEMBER FOR TRANSMISSION MOUNTING (N54)** or **22 32 050 REPLACING CROSSMEMBER FOR TRANSMISSION MOUNTING (N63)** .

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

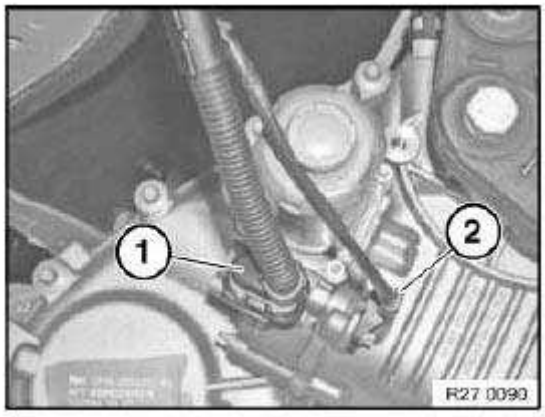

Fig. 5: Identifying Servomotor Plugs
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw connection of transfer case.

Tightening torque **27 00 9AZ** , see **27 00 TRANSFER BOX IN GENERAL**

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.

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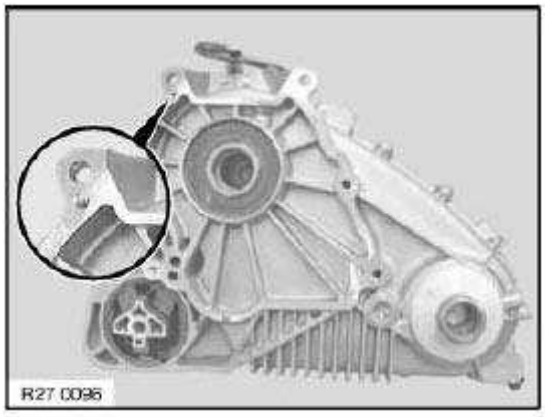

Fig. 6: Identifying Dowel Pin Position
Courtesy of BMW OF NORTH AMERICA, INC.

27 10 020 INSTALLING REPLACEMENT TRANSFER BOX (ATC 350)

Special tools required

- 22 1 044
- 22 1 046
- **33 4 460**

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

Recycling:

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

Necessary preliminary work: Drain transmission oil at oil drain plug, Tightening torque, see 27 10 2AZ in **27 00 TRANSFER BOX IN GENERAL** . Remove transfer box.

Modify following parts: Covers and protective caps, Drive shaft transportation retainer, Vent hose of transfer box.

Bolt special tool 22 1 044 to transfer box. Insert special tool 22 1 046 with pins into opening of rubber mount. Draw in rubber mount with special tool 33 4 460.

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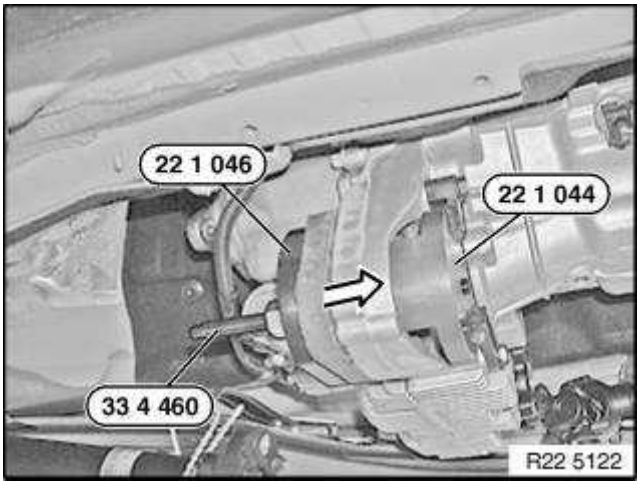

Fig. 7: Draw In Rubber Mount With Special Tool 33 4 460
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note: Pay attention to installation position of rubber mount (1).

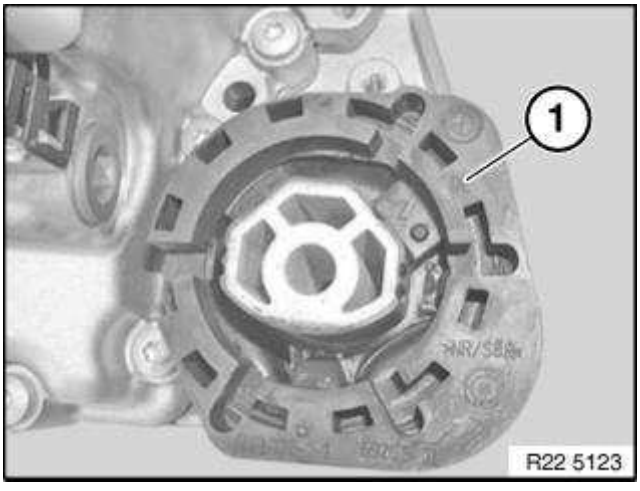

Fig. 8: Pay Attention To Installation Position Of Rubber Mount (1)
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: After completing work, check transmission oil level and top up if necessary. Release filler plug (1). Check oil level. Tightening torque 27 10 2AZ. Pour in transmission oil up to lower edge of opening for filler plug (1). Use only the approved transmission oil. See TRANSFER CASE - OPERATING FLUIDS .

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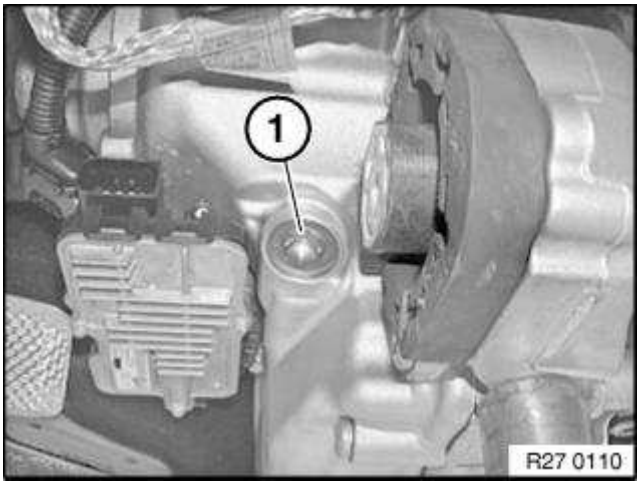

Fig. 9: Pour In Transmission Oil Up To Lower Edge Of Opening For Filler Plug (1)
Courtesy of BMW OF NORTH AMERICA, INC.

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

27 10 020 INSTALLING REPLACEMENT TRANSFER BOX (ATC 700)

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

Recycling:

Catch and dispose of escaping transmission fluid. 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 **27 00 11AZ** , see **27 00 TRANSFER BOX IN GENERAL**

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

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

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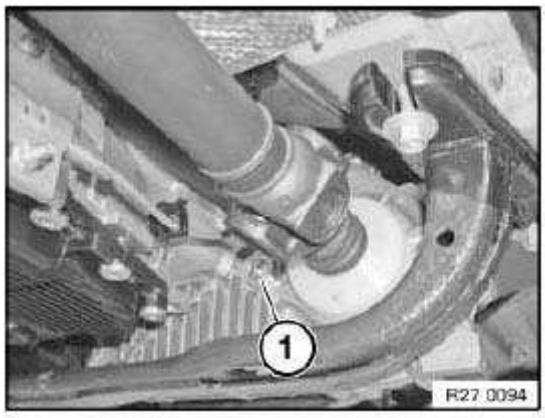

Fig. 10: Identifying Oil Filler Plug
Courtesy of BMW OF NORTH AMERICA, INC.

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

Necessary preliminary tasks:

- Drain **transmission oil** at oil drain plug

  Tightening torque, **27 00 11AZ** , see **27 00 TRANSFER BOX IN GENERAL**

- Remove **transfer box**

Modify following parts:

- Covers and protective caps
- Drive shaft transportation lock
- Vent hose of transfer box

27 10 070 REPLACING OUTPUT FLANGE ON TRANSFER BOX AT REAR (ATC700)

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

NOTE:

- **Operations for removing output flange are identical to replacing radial shaft seal**

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).

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Fig. 11: Identifying Measurement A Of Output Flange
Courtesy of BMW OF NORTH AMERICA, INC.

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

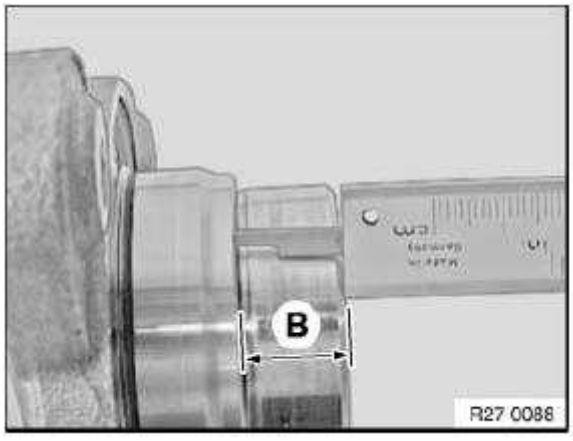

Fig. 12: Identifying Measurement B Of Output Flange
Courtesy of BMW OF NORTH AMERICA, INC.

Determine measurement C, thickness of shim.

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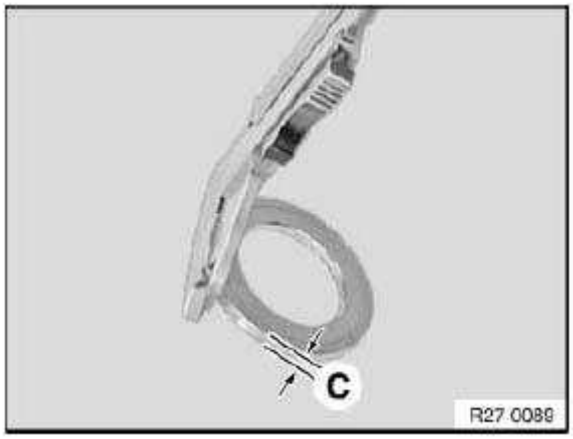

Fig. 13: Identifying Measurement C (Shim Thickness)
Courtesy of BMW OF NORTH AMERICA, INC.

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 700)

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:

- Raise luggage compartment floor trim

Release screws (1).

Remove battery cover (2) towards top.

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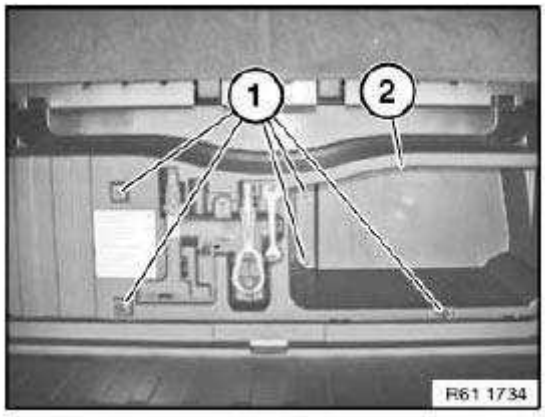

Fig. 14: Identifying Screws And Battery Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect connector (1).

Unscrew nuts.

Remove control unit.

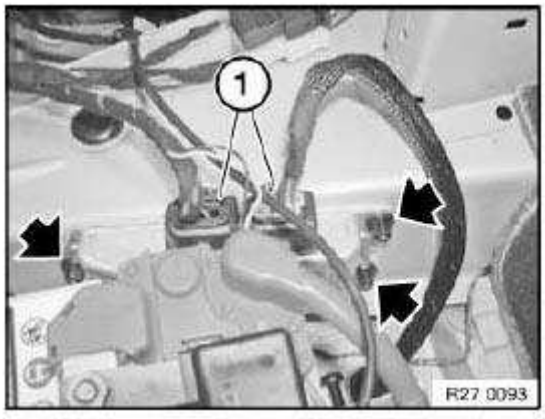

Fig. 15: Identifying Connector And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

27 10 710 REPLACING CLASSIFICATION RESISTOR FOR SERVOMOTOR (ATC 700)

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 (2) and remove resistor.

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Tightening torque **27 00 14AZ** , see **27 00 TRANSFER BOX IN GENERAL**

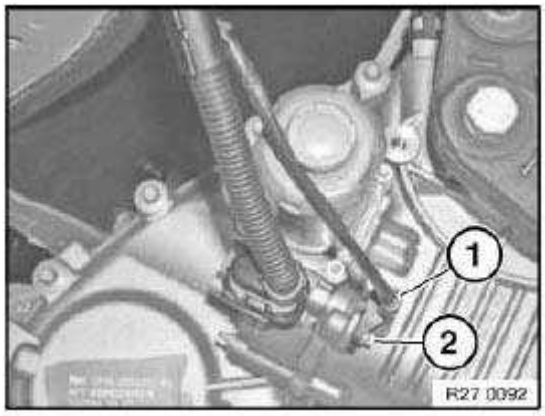

Fig. 16: Identifying Connector And Resistor Screw
Courtesy of BMW OF NORTH AMERICA, INC.

27 10 720 REPLACING SERVOMOTOR (ATC 700)

IMPORTANT: After replacement, the "Repair" service function must be carried out with in the BMW diagnosis system.

Necessary preliminary tasks:

- **Remove transmission cross-member** . See **22 32 050 REPLACING CROSSMEMBER FOR TRANSMISSION MOUNTING (N54)** or **22 32 050 REPLACING CROSSMEMBER FOR TRANSMISSION MOUNTING (N63)** .

Disconnect plugs (1 and 2).

Tightening torque **27 00 14AZ** , see **27 00 TRANSFER BOX IN GENERAL**

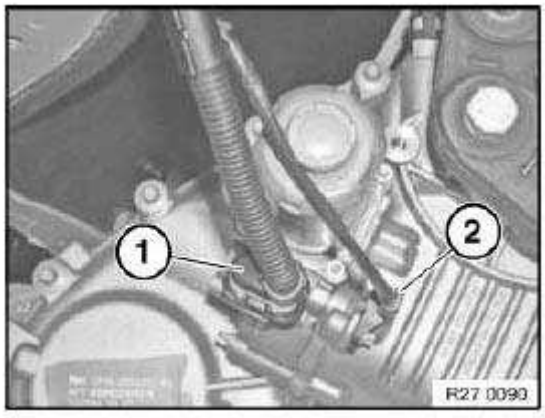

Fig. 17: Identifying Servomotor Plugs
Courtesy of BMW OF NORTH AMERICA, INC.

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Release screws and remove servomotor from transfer box.

Tightening torque **27 00 13AZ** , see **27 00 TRANSFER BOX IN GENERAL**

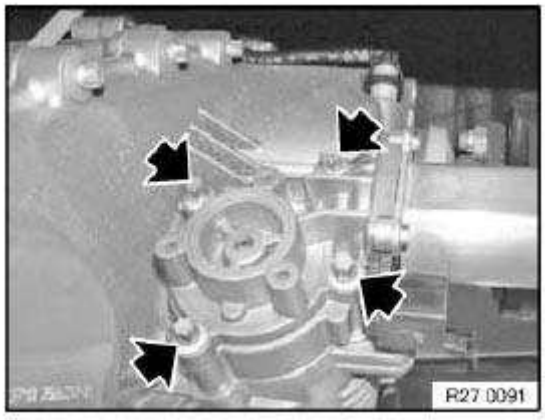

Fig. 18: Identifying Screws Securing Servomotor To Transfer Box
Courtesy of BMW OF NORTH AMERICA, INC.

TRANSMISSION SHAFTS

27 21 010 REPLACING RADIAL SHAFT SEAL FOR DRIVE SHAFT (ATC 700)

Special tools required:

- **23 0 490**
- **27 1 460**

See .

IMPORTANT: After completing 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.

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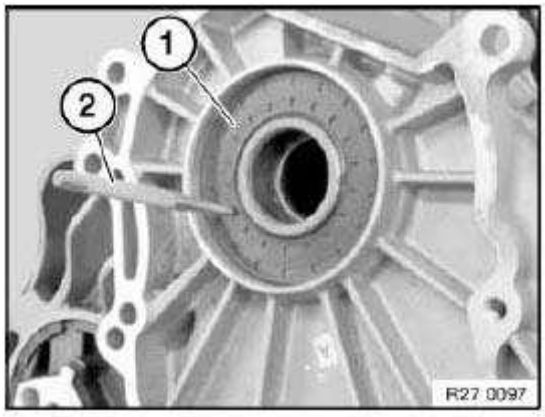

Fig. 19: Driving Hole Into Radial Shaft Seal Using Centre Punch
Courtesy of BMW OF NORTH AMERICA, INC.

Screw in special tool **23 0 490** .

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

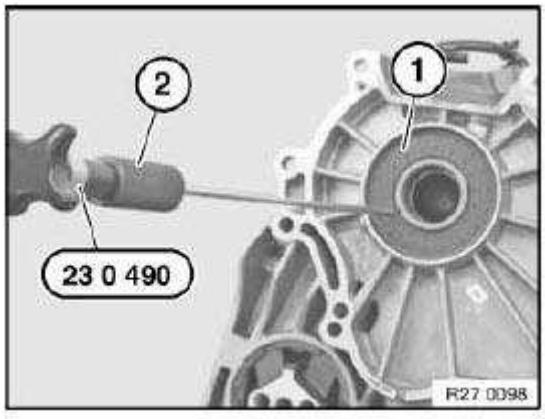

Fig. 20: Driving Out Radial Shaft Seal Using Impact Weight
Courtesy of BMW OF NORTH AMERICA, INC.

Drive in radial shaft seal with special tool **27 1 460** .

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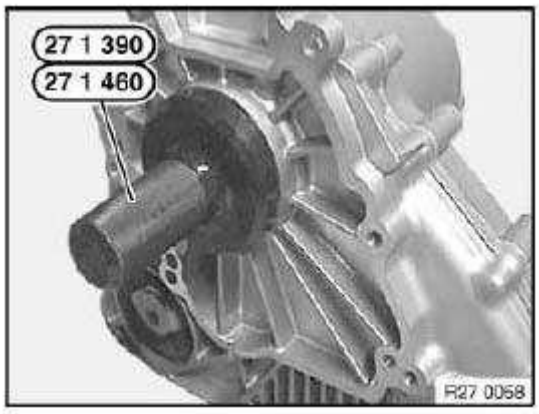

Fig. 21: Driving In Radial Shaft Seal Using Special Tool 27 1 460
Courtesy of BMW OF NORTH AMERICA, INC.

Add final details to vehicle.

Check oil level.

Check transmission for leaks.

27 21 020 REPLACING RADIAL SHAFT SEAL FOR OUTPUT FLANGE (ATC 700)

Special tools required:

- **23 0 490**
- **27 1 480**

IMPORTANT: After completing 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 **propeller shaft** . See **26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT (INSERTED) COMPLETELY (N54)** or **26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT (INSERTED) COMPLETELY (N63)** .
- Release exhaust system bracket
- Remove **transmission cross-member** . See **22 32 050 REPLACING CROSSMEMBER FOR TRANSMISSION MOUNTING (N54)** or **22 32 050 REPLACING CROSSMEMBER FOR TRANSMISSION MOUNTING (N63)** .

Release retaining ring (1).

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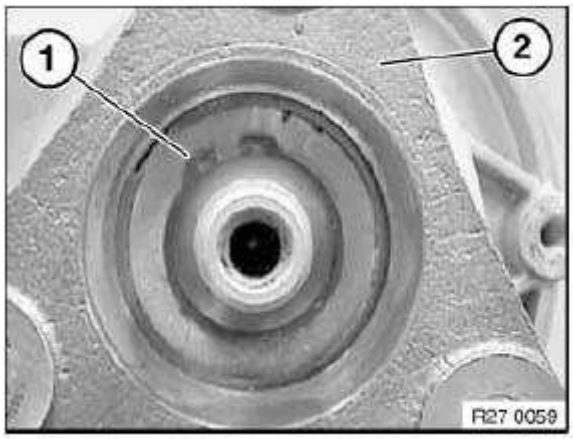

Fig. 22: Identifying Retaining Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace O-ring in output flange.

Check that O-ring is in correct position.

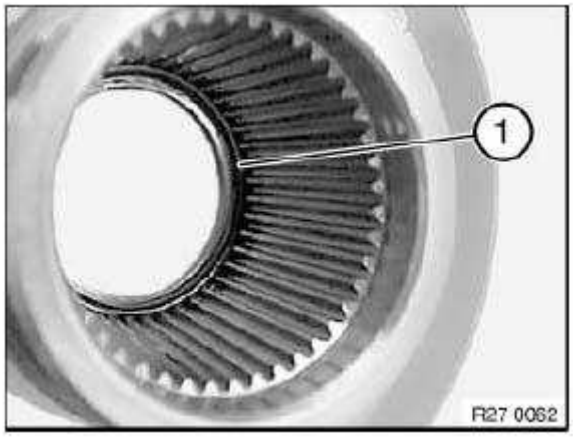

Fig. 23: Identifying O-Ring In Output Flange
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: The propeller shaft may move when the output flange is pushed on. The retaining ring can thus no longer be fitted.

Installation:

- Push on output flange
- Using 2 screwdrivers, press output flange downwards or output shaft (2) upwards until groove for retaining ring is completely visible.

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- Fit retaining ring.

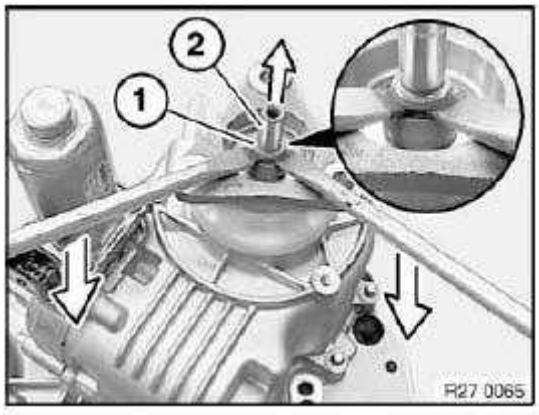

Fig. 24: Installing Retaining Ring
Courtesy of BMW OF NORTH AMERICA, INC.

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.

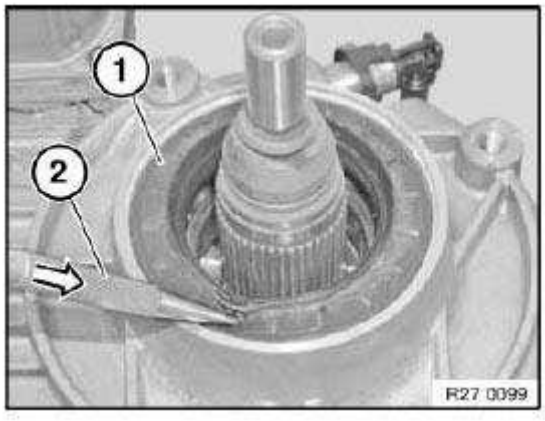

Fig. 25: Driving Hole Into Radial Shaft Seal Using Centre Punch
Courtesy of BMW OF NORTH AMERICA, INC.

Screw in special tool **23 0 490** .

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

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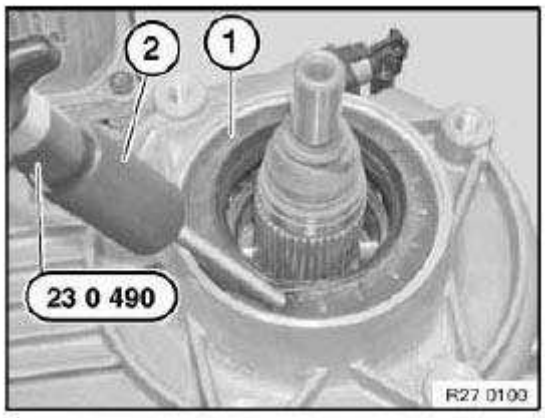

Fig. 26: Driving Out Radial Shaft Seal Using Impact Weight
Courtesy of BMW OF NORTH AMERICA, INC.

Drive in radial shaft seal with special tool **27 1 480** .

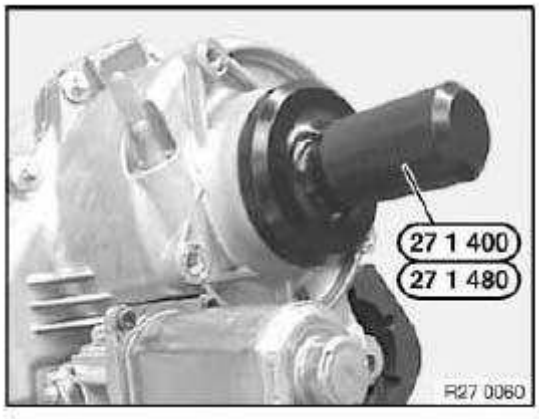

Fig. 27: Driving In Radial Shaft Seal Using Special Tool 27 1 480
Courtesy of BMW OF NORTH AMERICA, INC.

Add final details to vehicle.

Check oil level.

Check transmission for leaks.

27 21 030 REPLACING RADIAL SHAFT SEAL FOR FRONT AXLE OUTPUT (ATC 700)

Special tools required:

- **23 0 490**
- **27 1 470**

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

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

Necessary preliminary tasks:

- Remove front **propeller shaft** . See **26 20 000 REMOVING AND INSTALLING FRONT PROPELLER SHAFT (N52K, M57T2, N54)** or **26 20 000 REMOVING AND INSTALLING FRONT PROPELLER SHAFT (N63)** .

Remove protective cap (1) with a screwdriver.

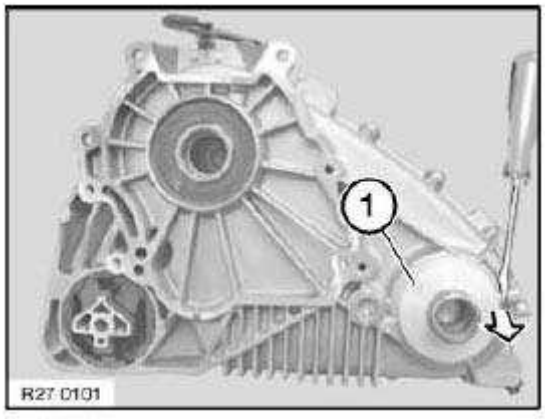

Fig. 28: Removing Protective Cap Using Screwdriver
Courtesy of BMW OF NORTH AMERICA, INC.

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.

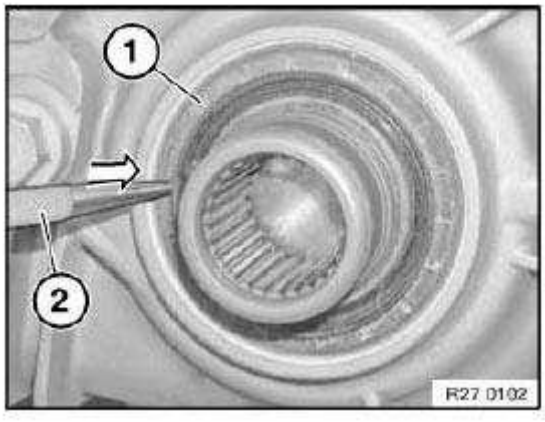

Fig. 29: Driving Hole Into Radial Shaft Seal Using Centre Punch
Courtesy of BMW OF NORTH AMERICA, INC.

Screw in special tool **23 0 490** .

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

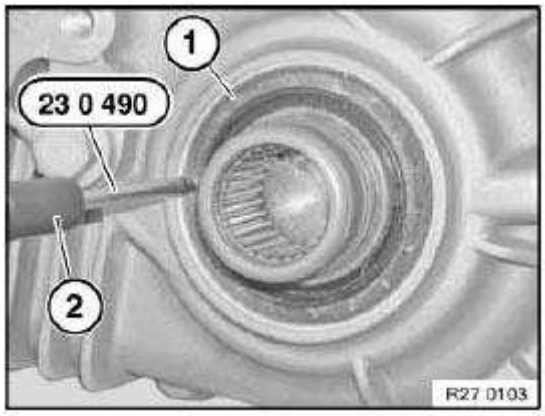

Fig. 30: Driving Out Radial Shaft Seal Using Impact Weight
Courtesy of BMW OF NORTH AMERICA, INC.

Drive in radial shaft seal with special tool **27 1 470** .

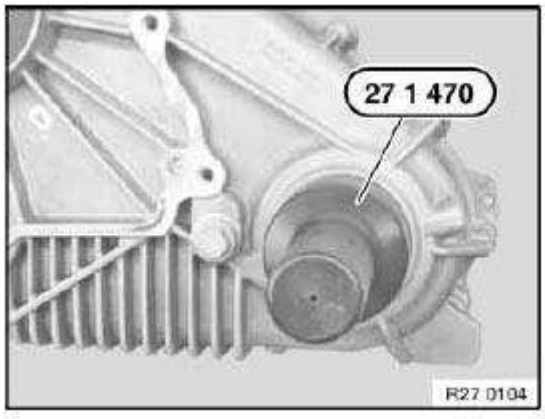

Fig. 31: Driving In Radial Shaft Seal Using Special Tool 27 1 470
Courtesy of BMW OF NORTH AMERICA, INC.

Add final details to vehicle.

Check oil level.

Check transmission for leaks.

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Transfer Box - Tightening Torques - X6

TRANSFER CASE, GENERAL

27 00 TRANSFER BOX IN GENERAL

TRANSFER BOX IN GENERAL-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening Specification
7AZ Plug	E30/E34	M24 x 1.5	33 Nm
	E30/E34	M14 x 1.5	33 Nm
	E30/E34	M18 x 1.5	23 Nm
8AZ Transmission cross member to rubber mounts	E30/E34	M12	80 Nm
Transmission cross member to body	E30/E34	M8	24 Nm
9AZ Transfer box to transmission	E53/E46/E83/E60/E61/E90/E91/E92/E70/E71	M10	43 Nm
10AZ Transmission cross member to rubber mounts	E46/E53/E83	M12	74 Nm
Transmission cross member to rubber mounts	E60/E61/E90/E91/E92	M12	68 Nm
Transmission cross-member to body	E53	M10	41 Nm
Transmission cross-member to body	E46/E83	M8	21 Nm
Transmission cross-member to body	E60/E61/E90/E91/E92	M8	19 Nm
11AZ Plug	E53/E46/E83	M18	33 Nm
Oil filler and drain plugs	E60/E61/E90/E91/E92/E70/E71	M22	60 Nm
12AZ Vibration damper to transfer box	E53	M8	23 Nm
Vibration damper to transfer box	E83	M8	20.5 Nm

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13AZ Servomotor to transfer box	E53/E83/E60/E61/E90/E91/E92/E70/E71	M8	22 Nm
14AZ Resistor to transfer case	E53/E83/E60/E61/E90/E91/E92/E70/E71	M5	5 Nm
15AZ Control unit holder to floor pan	E60/E61/E90/E91/E92	M6	8 Nm

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