

2007-08 SUSPENSION**Integrated Suspension Systems - Repair Instructions - X5****00 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! See 00 Danger of Poisoning If Oil Is Ingested/Absorbed Through The Skin
Risk of injury if oil comes into contact with eyes and skin! See 00 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.

00 RAISING VEHICLE WITH TROLLEY JACK

IMPORTANT: Observe the following trolley-jack-related instructions:

1. Use only BMW-distributed/approved trolley jacks which have rubber plate contact points.
2. Trolley jacks must be regularly serviced and always checked for functional reliability before they are used!
3. Check the rubber plate on the trolley jack prior to each use, replacing if necessary.

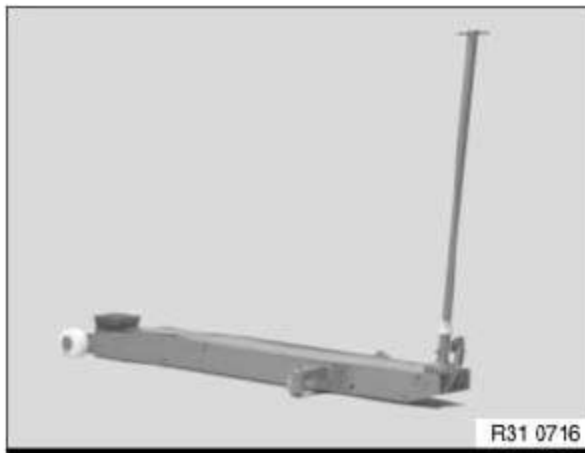


Fig. 1: Identifying Trolley Jack

Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: The vehicle may be raised with a trolley jack only at the following jacking points!

1. Car jacking point
2. Side car jacking points
3. Rear differential

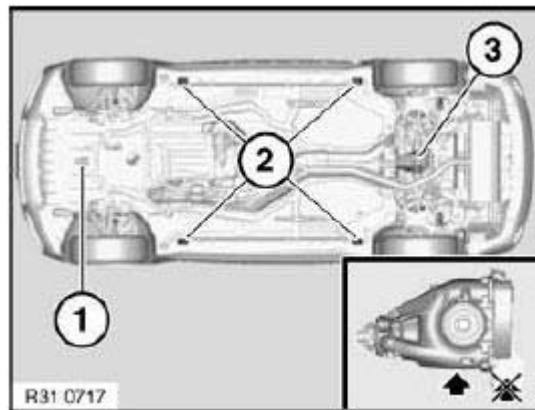
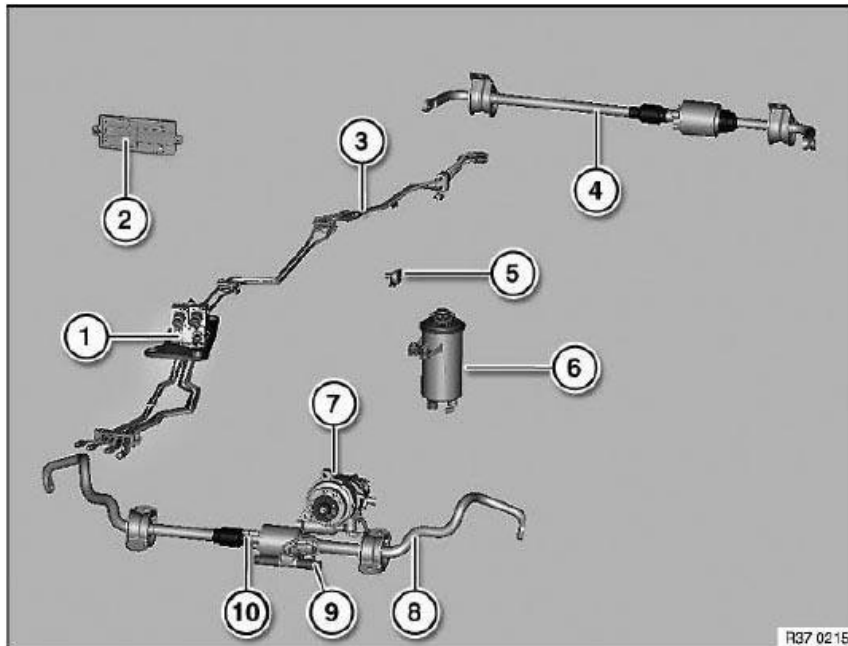


Fig. 2: Identifying Jacking Points
Courtesy of BMW OF NORTH AMERICA, INC.

Risk of damage: It is not permitted to raise the vehicle at the rear differential cover!

37 ... OVERVIEW OF DYNAMIC DRIVE (ARS)



- | | | | |
|---|--|----|---------------------------------|
| 1 | <u>Valve block</u> | 8 | <u>Active stabilizer, front</u> |
| 2 | <u>Control unit</u> | 9 | <u>Spring-type actuator</u> |
| 3 | Pipes | 10 | <u>Pressure relief valve</u> |
| 4 | <u>Active stabilizer, rear</u> | | |
| 5 | <u>Transversal acceleration sensor</u> | | |
| 6 | <u>Level switch</u> (on fluid reservoir) | | |
| 7 | <u>Auxiliary steering pump</u> | | |

Fig. 3: Overview Of Dynamic Drive (ARS)
 Courtesy of BMW OF NORTH AMERICA, INC.

1. Valve block. See **37 20 001 Removing and Installing/Replacing DYNAMIC DRIVE Valve Block**
2. Control unit. See **37 14 055 Removing and Installing/Replacing DYNAMIC DRIVE Control Unit**
3. Pipes
4. Active stabilizer, rear. See **37 12 220 Removing and Installing/Replacing Rear Active Stabilizer**
5. Transversal acceleration sensor. See **37 14 610 Removing and Installing / Replacing Transversal-Acceleration Sensor**
6. Level switch (on fluid reservoir). See **32 41 ... REPLACING LEVEL SWITCH FOR DYNAMIC DRIVE FLUID RESERVOIR**
7. Auxiliary steering pump. See **32 41 009 CHECKING FUNCTION OF POWER STEERING VANE PUMP**
8. Safety precautions & general information. See **00 LIFTING VEHICLE WITH A LIFTING PLATFORM**
9. Active stabilizer, front. See **37 11 010 Removing and Installing/Replacing Front Active Stabilizer**

10. Spring-type actuator. See **37 11 ... Replacing Pressure Relief Valve For Active Stabilizer At Front**
11. Pressure relief valve. See **37 11 ... Replacing Pressure Relief Valve For Active Stabilizer At Front**
12. Initial Dynamic Drive operation. See **37 10 001 Initial Operation With Test Run of Dynamic Drive**
13. Troubleshooting. See **90 Troubleshooting**

37 ... OVERVIEW OF VERTICAL DYNAMICS MANAGEMENT (VDM)

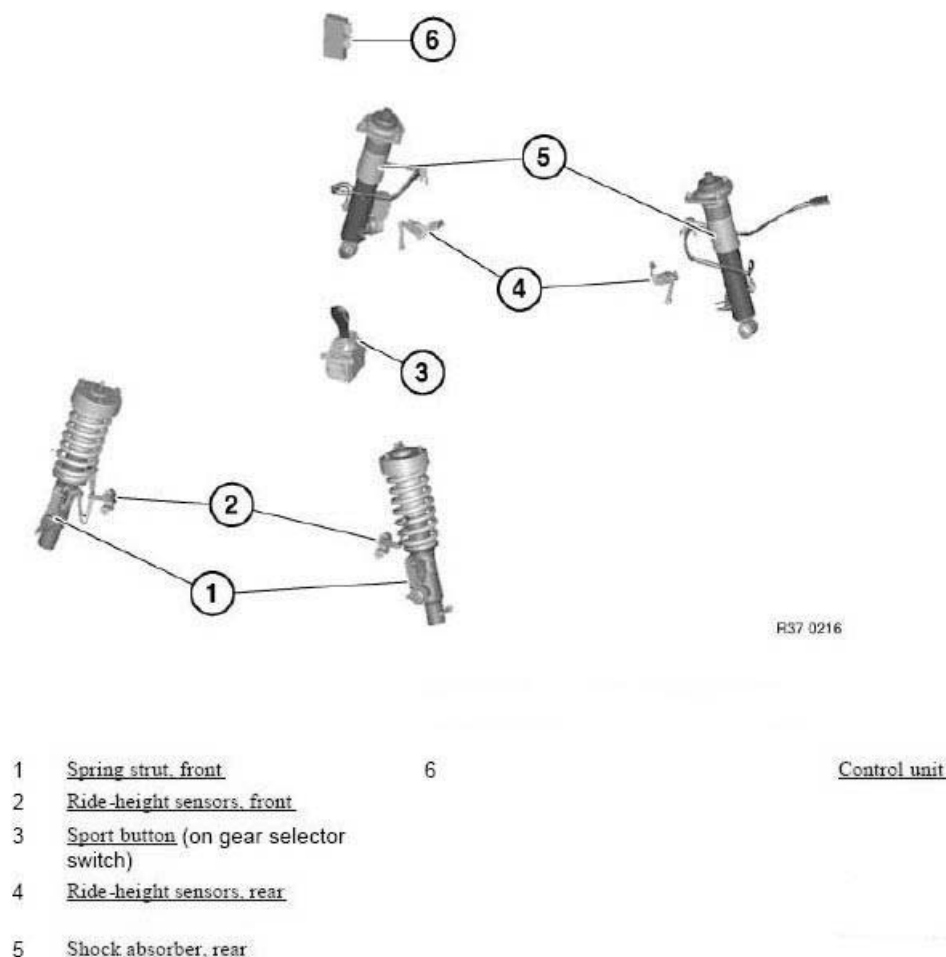
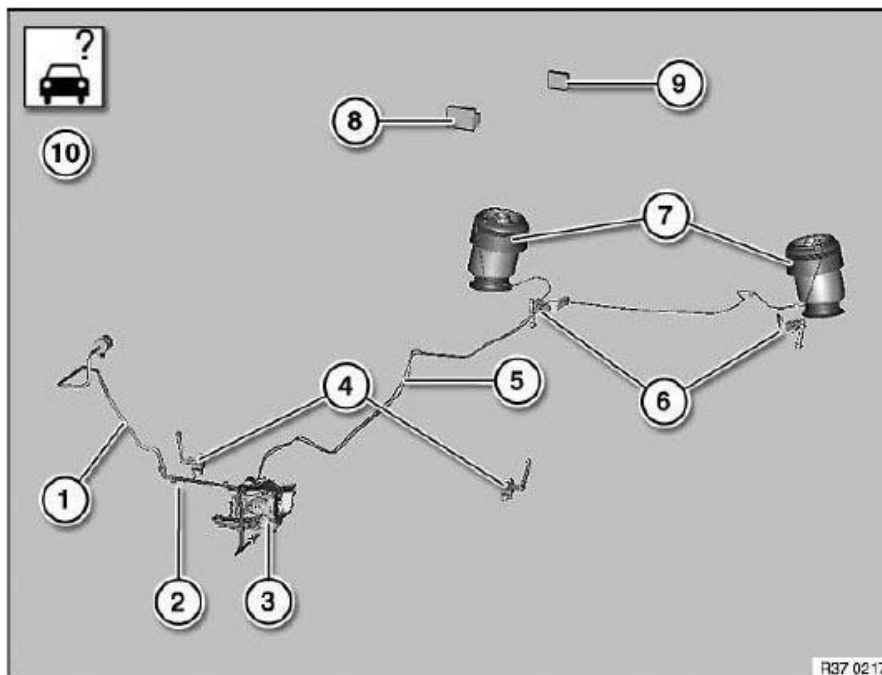


Fig. 4: Overview Of Vertical Dynamics Management (VDM)
 Courtesy of BMW OF NORTH AMERICA, INC.

1. Spring strut, front. See **31 31 000 REMOVING AND INSTALLING COMPLETE LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER**
2. Ride-height sensors, front. See **37 14 511 Replacing Front Ride-Height Sensor**
3. Sport button (on gear selector switch). See **61 31 214 REMOVING AND INSTALLING/REPLACING SWITCH FOR ELECTRONIC DAMPER CONTROL (SPORT BUTTON)**
4. Ride-height sensors, rear. See **37 14 512 Replacing Rear Ride-Height Sensor**
5. Shock absorber, rear. See **33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT**

OR RIGHT SHOCK ABSORBER

6. Safety precautions & general information. See **00 LIFTING VEHICLE WITH A LIFTING PLATFORM**
7. Control unit. See **37 15 ... Removing and Installing/Replacing Control Unit For Vertical Dynamics Management**
8. Carry out ride-height-calibration. See **37 12 012 Carrying Out Ride-Height-Calibration**
9. Carry out vertical acceleration sensor adjustment. See **37 Performing Vertical Acceleration Sensor Adjustment (Vertical Dynamics Management)**

37 OVERVIEW OF RIDE-HEIGHT CONTROL SYSTEM

- | | | | |
|---|-----------------------------------|----|------------------------|
| 1 | <u>Upper vent line</u> | 8 | <u>Control unit</u> |
| 2 | <u>Lower vent line</u> | 9 | <u>Relays</u> |
| 3 | <u>Air supply unit</u> | 10 | <u>Troubleshooting</u> |
| 4 | <u>Ride-height sensors, front</u> | | |
| 5 | <u>Pipes</u> | | |
| 6 | <u>Ride-height sensors, rear</u> | | |
| 7 | <u>Air springs</u> | | |
- Draining/filling air spring system
Carry out ride-height-calibration

Fig. 5: Overview Of Ride-Height Control System
Courtesy of BMW OF NORTH AMERICA, INC.

2. Lower vent line. See [37 12 ... Replacing Lower Vent Line](#)
3. Air supply unit. See [37 22 540 Replacing Air Supply Unit](#)
4. Ride-height sensors, front. See [37 14 512 Replacing Rear Ride-Height Sensor](#)
5. Pipes. See [37 12 ... Replacing Pipes For Air Springs](#)
6. Ride-height sensors, rear. See [37 14 512 Replacing Rear Ride-Height Sensor](#)
7. Air springs. See [37 12 155 Removing and Installing/Replacing Left Or Right Air Spring](#)
8. Safety precautions & general information. See [31 33 095 MEASURING RIDE-LEVEL HEIGHT OF VEHICLE](#)
9. Control unit. See [37 14 525 Removing and Installing/Replacing Control Unit For Air Supply Unit](#)
10. Relays. See [61 36 540 REMOVING AND INSTALLING/REPLACING AIR SUPPLY UNIT RELAY](#)
11. Troubleshooting. See [37 00 ... Checking Air Springs For Damage](#)
12. Draining/filling air spring system. See [37 00 100 Draining/filling Air Spring System](#)
13. Carry out ride-height-calibration. See [37 12 012 Carrying Out Ride-Height-Calibration](#)

37 PERFORMING VERTICAL ACCELERATION SENSOR ADJUSTMENT (VERTICAL DYNAMICS MANAGEMENT)

NOTE: Vertical acceleration sensor adjustment must be performed after replacement of the spring strut/shock absorber with damper satellites.

Connect vehicle to BMW diagnosis system.

Select and perform vertical [acceleration sensor](#) adjustment under Service functions.

37 00 ... NOTES ON AIR SPRING SYSTEM

Components / Pipes

IMPORTANT: Maintain the highest possible standards of cleanliness around the pipe connections when dismantling and assembling components/pipes. Even the tiniest dirt particles on the pipe connections or damage to the pipes can result in leaks in the air spring system!
Do not kink, twist or crush lines.

Pipe connections must be sealed off with adhesive tape immediately after they have been removed. The adhesive tape may only be removed shortly before the connection is reinstalled.

Air spring strut / air spring:

NOTE: If a vehicle has been driven with a depressurized air spring strut/air spring, the air spring strut/air spring must always be replaced.

Check air spring strut/air spring for damage. See 37 00 ... Checking Air Springs For Damage

37 00 ... CHECKING AIR SPRINGS FOR DAMAGE

NOTE: If a vehicle has been driven with depressurized air springs, the air springs must always be replaced.

Lift vehicle.

Air spring is OK:

1. when the gaiter cannot be pressed in by hand
2. when no visible damage (e.g. kinks, cracks, porous areas, etc.) is discernible
3. when the rolling fold is uniform



Fig. 6: Identifying Air Spring

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: If one of the above-mentioned points fails the test, then the air spring (see 37 12 155 Removing and Installing/Replacing Left Or Right Air Spring) must be replaced.

37 00 100 DRAINING/FILLING AIR SPRING SYSTEM

WARNING: Danger of injury!

Drain the air spring system before carrying out any work on the air supply unit, air pipes and air springs! Danger of injury if this instruction is not complied with!

IMPORTANT: Risk of damage!

To fill the air springs, raise the vehicle until the wheels are freely suspended.

NOTE: Read and comply with notes on air spring system. See 37 00 ... Notes on Air Spring System

Deactivating air spring system:

- Fold down passenger compartment fuse box. See 61 13 050 REMOVING AND INSTALLING/REPLACING INTERIOR FUSE BOX
- Pull out fuse (F32) for air supply unit



Fig. 7: Identifying Fuse (F32)

Courtesy of BMW OF NORTH AMERICA, INC.

Draining air spring system:

- Connect BMW diagnosis system
- Switch ignition on
- Drain air springs with aid of BMW diagnosis system (Service functions: menu item "Venting procedure")
- Raise vehicle until wheels are freely suspended
- Remove ignition key



Fig. 8: Identifying BMW Diagnosis System (DIS)
Courtesy of BMW OF NORTH AMERICA, INC.

Activating and filling air spring system:

- Raise vehicle until wheels are freely suspended
- Check air spring lower section (1) for correct engagement in wheel carrier, correct if necessary

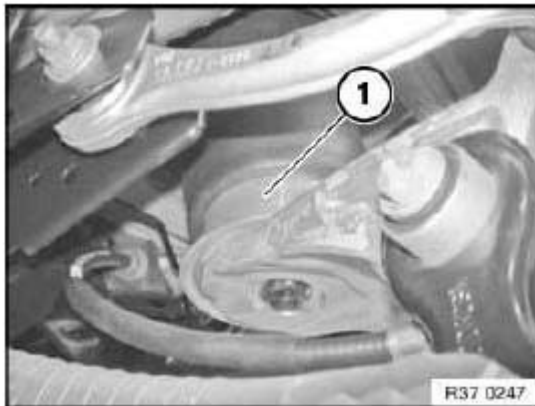


Fig. 9: Identifying Air Spring Lower Section
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

First raise the vehicle (until the wheels are freely suspended) and then activate the air spring system by inserting the fuse. Failure to comply may result in damage to the air springs!



Fig. 10: Identifying Fuse (F32)
Courtesy of BMW OF NORTH AMERICA, INC.

- Insert fuse (F32) in corresponding slot in fuse box
- Connect BMW diagnosis system

- Switch ignition on
- Fill air springs using BMW diagnosis system (control unit functions)
- Lower vehicle
- Clear fault memory

37 10 001 INITIAL OPERATION WITH TEST RUN OF DYNAMIC DRIVE

NOTE: The Service function Initial operation of Dynamic Drive must be carried out after:

- Work on the Dynamic Drive system which involved opening hydraulic lines
- Replacement / Programming / Coding Dynamic Drive control unit
- Replacement lateral acceleration sensor
- Parameters and zero point of new sensors have been learned

Bleeding power steering:

IMPORTANT: Adhere to the utmost cleanliness. Do not allow any dirt to enter the hydraulic system.

Using contaminated equipment to add fluid may introduce dirt particles into the fluid reservoir and significantly reduce the service life of the power steering system. Do not use any filler funnels or similar!

Use only Pentosin CHF11S from original containers!

The fill level may only be checked or adjusted when the engine is stopped! The fluid temperature should be approx. 20°C here.

Ensure that the cap is fully screwed in prior to the fill level check.

NOTE: To avoid mix-ups when filling with hydraulic fluid, mark the fluid reservoirs or their caps with identification marks.

CHF Pentosin CHF11S

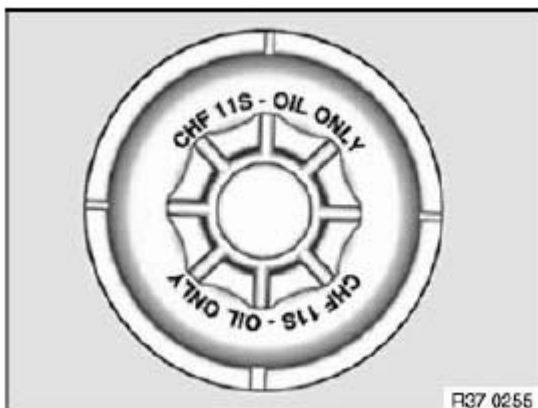


Fig. 11: Identifying CHF Pentosin CHF11S

Courtesy of BMW OF NORTH AMERICA, INC.

1. Thoroughly clean fluid reservoir and its immediate surroundings
2. Check and correct fill level

NOTE: The fill level can come to rest above the "MAX" mark when the engine is at normal operating temperature. This is dictated by the design in that the marking on the dipstick is referred to a fluid temperature of 20°C. With the engine at normal operating temperature (approx. 50-60°C fluid temperature) adjust a fill height 15 mm above the "MAX" mark. Do not under any circumstances draw off the fluid to the "MAX" mark when the engine is at normal operating temperature.

Hydraulic fluid: BMW Service Operating Fluids

3. Start engine
4. Turn steering wheel left and right twice in each case up to full lock; if necessary, top up hydraulic fluid (e.g. if hydraulic system is completely drained)
5. Move steering wheel to straight-ahead position and turn off engine
6. Check and correct fill level with engine stopped
7. Check hydraulic system for leaks

Performing initial operation with test run:

WARNING: Danger of injury!

Vehicle executes heavy rolling motions during initial operation! Therefore observe the following instructions without fail:

- Do not allow any persons to remain in the vehicle or directly on the vehicle
- Keep the vehicle doors closed.
- Maintain a safety distance around the vehicle of 1 m to persons, objects, walls etc.
- Vehicle must be standing horizontally with all wheels on a firm surface
- Do not under any circumstances carry out initial operation on a lifting platform, wheel alignment analyzer or similar!
- Avoid heavy loads

1. Check load; if necessary, remove load from the vehicle
2. Bring engine up to operating temperature

NOTE: Hydraulic fluid temperature must be between 50°C and 70°C (vehicle at normal operating temperature)

3. Connect vehicle to DIS or MoDiC
4. Start initial operation in **SERVICE FUNCTIONS**. Follow instructions in DIS.
5. Check and correct fill level with engine stopped

37 12 012 CARRYING OUT RIDE-HEIGHT-CALIBRATION

NOTE: Ride-height-calibration must be carried out after the following work:

- Removal/replacement of ride-height sensor or its control rod
- Replacement of wiring harness
- Replacement of air supply unit control unit
- Replacement of Vertical Dynamics Management control unit

Connect BMW diagnosis system.

Switch on ignition.

Carry out ride-height-calibration (menu item: "Service function").

Version with Run Flat Indicator: initialize Run Flat Indicator. See **36 11 500 INITIALIZING RUN FLAT INDICATOR (RPA)**

Version with Tyre Pressure Control: carry out resetting. See **36 11 503 RDC RESETTING**



Fig. 12: Identifying BMW Diagnosis System (DIS)

Courtesy of BMW OF NORTH AMERICA, INC.

Special tools required:

- 00 2 261 see **00 2 261 ADAPTER (2X)**
- 00 2 262 see **00 2 262 TENSIONING STRAP (2X)**

WARNING: Danger to life!

Mount securing fixture for vehicle on lifting platform to prevent the vehicle from slipping off or tilting down.

Observe the following directions and instructions when handling the special tool:

1. Prior to each use, check the special tools for defects, modifications and operational reliability.
2. Damaged/modified special tools must not be used!
3. No changes or modifications may be made to the special tools!
4. Keep special tools dry, clean and free of grease.
5. Impact screwdrivers may not be used!

IMPORTANT: Risk of corrosion!

**Touch up paintwork damage.
Re-establish wax layer.**

Remove vehicle jack fixture with a suitable tool from side frame.

Installation:

Check fixture for damage, replace if necessary.

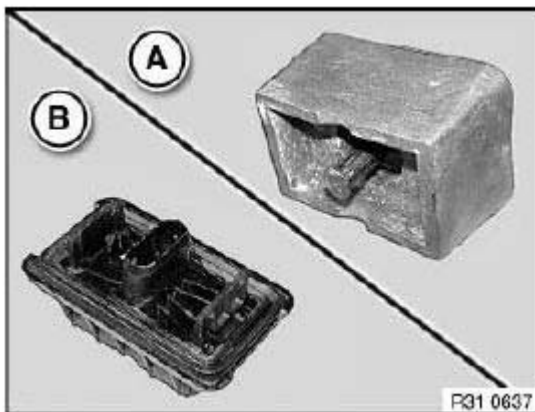


Fig. 13: Identifying Vehicle Jack Fixture

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Following states can be selected on special tool 00 2 261. See **00 2 261 ADAPTER (2X)**

- A. Vehicle unsecured
- B. Vehicle secured (after special tool is lashed to lifting platform arm)

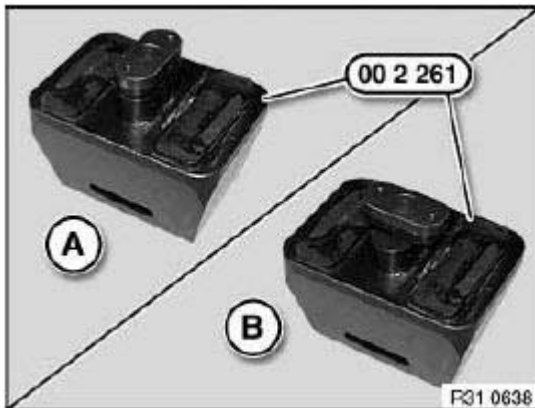


Fig. 14: Identifying Special Tool (00 2 261)

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: The following procedure must always be carried out on the left and right sides.

Insert special tool 00 2 261 (see **00 2 261 ADAPTER (2X)**) into opening in side frame with 3/8" extension and secure ratchet to body. To do so, turn lock through 90° up to stop.

WARNING: Danger to life!

Check stopping of special tool 00 2 261 (see **00 2 261 ADAPTER (2X)**) on side frame, correct attachment if necessary.

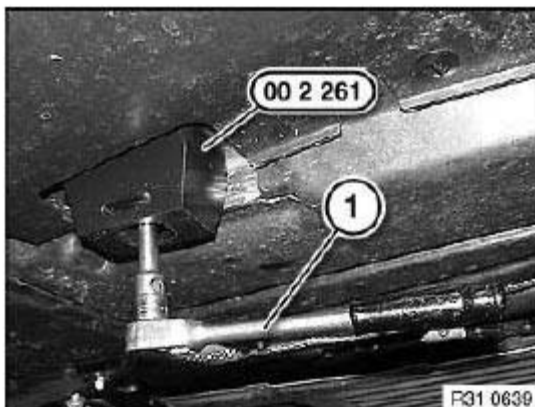


Fig. 15: Identifying Special Tool (00 2 261)

Courtesy of BMW OF NORTH AMERICA, INC.

Lash special tool 00 2 261 (see **00 2 261 ADAPTER (2X)**) with tensioning strap 00 2 262 crosswise (as pictured) to lifting platform arm.

WARNING: Danger to life!

Carry out tensile and visual inspection of tensioning strap 00 2 262 (see 00 2 262 TENSIONING STRAP (2X)), correct position if necessary.

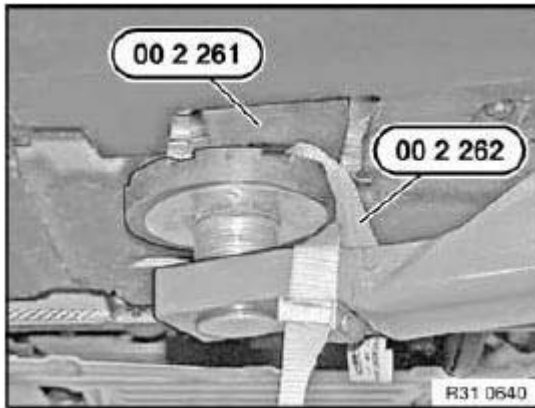


Fig. 16: Identifying Special Tool (00 2 261) And (00 2 262)
 Courtesy of BMW OF NORTH AMERICA, INC.

11 FRONT CONTROL AND SUSPENSION

37 11 ... REPLACING PRESSURE RELIEF VALVE FOR ACTIVE STABILIZER AT FRONT

WARNING: Danger of poisoning (see 00 DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN) if oil is ingested/absorbed through the skin!
Risk of injury (see 00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN) if oil comes into contact with eyes and skin!

IMPORTANT: Adhere to the utmost cleanliness. Do not allow any dirt to enter the hydraulic system.
 Close off pipe connections with plugs.

NOTE: Replace pressure relief valves in pairs only.

Necessary preliminary tasks:

- Remove front underbody protection. See 51 47 491 REMOVING AND INSTALLING/REPLACING REAR UNDERBODY PROTECTION
- Remove both stabilizer links from stabilizer. See 37 11 ... Replacing Pressure Relief Valve For Active Stabilizer At Front

IMPORTANT: Risk of damage!

First adjust minimum distance (A) = 3 mm between control line (1) and

oscillating motor (2).

Then adjust control line (3) with minimum distance (B) = 8 mm to control line (1).

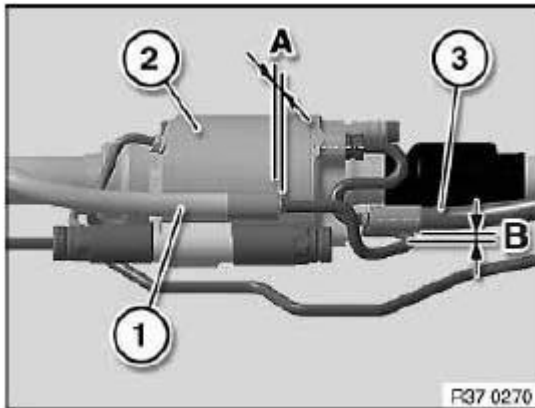


Fig. 17: Identifying Control Line And Oscillating Motor
Courtesy of BMW OF NORTH AMERICA, INC.

Mark installation position of control lines to oscillating motor.

Release banjo nuts (1) and remove control lines (2) from oscillating motor.

Seal control lines (2) and connections of oscillating motor with sealing plugs.

Installation:

Control lines are protected against being mixed up by different thread diameters on the oscillating motor connection.

Tightening torque, see 37 14 18AZ in **37 14 ELECTRIC COMPONENTS**

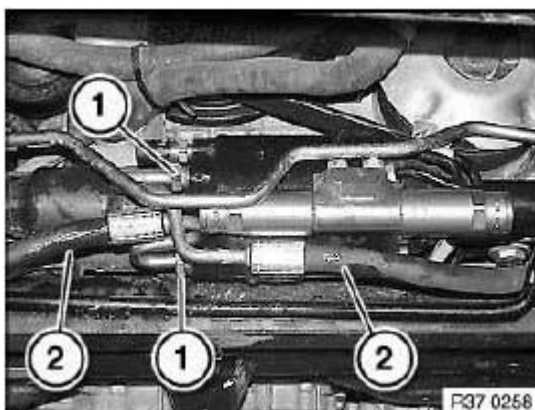


Fig. 18: Identifying Banjo Nuts And Control Lines
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Pressure relief valve consists of filter cartridge (1) and fitting (2).
If necessary, stabilizer leg must be turned to facilitate removal.

Clean tool with brake cleaner.

Unclip filter cartridge (1) and release fitting (2).

Installation:

Install first fitting (2) and then filter cartridge (1).

Remove both protective caps (of red rubber with pull band).

Tightening torque, see 37 14 24AZ in **37 14 ELECTRIC COMPONENTS**

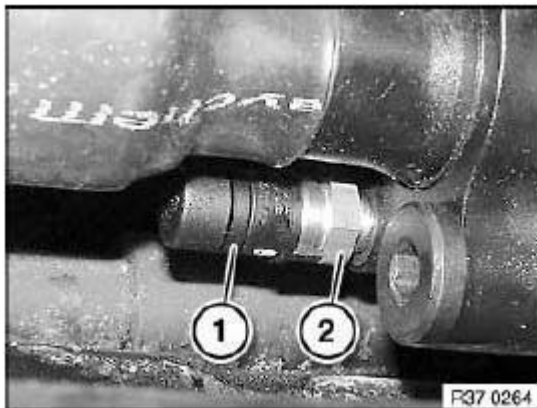


Fig. 19: Identifying Filter Cartridge
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Fill and bleed hydraulic system. See **32 13 006 BLEEDING POWER STEERING (VERSION WITH DYNAMIC DRIVE)**
- Check pipe connections for leaks
- Carry out initial DYNAMIC DRIVE operation. See **37 10 001 Initial Operation With Test Run of Dynamic Drive**

37 11 ... REPLACING SPRING-TYPE ACTUATOR FOR ACTIVE STABILIZER AT FRONT

Special tools required:

- 37 1 160

WARNING: Danger of poisoning (see ^{2809 of 3160} **00 DANGER OF POISONING IF OIL IS**

INGESTED/ABSORBED THROUGH THE SKIN) if oil is ingested/absorbed through the skin!

Risk of injury (see00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN) if oil comes into contact with eyes and skin!

IMPORTANT: Adhere to the utmost cleanliness. Do not allow any dirt to enter the hydraulic system.

Close off pipe connections with plugs.

NOTE: Replace spring-type actuators in pairs only.

Necessary preliminary tasks:

- Remove front underbody protection. See **51 47 490 REMOVING AND INSTALLING / REPLACING FRONT ASSEMBLY UNDERSIDE PROTECTION**
- Remove both stabilizer links from stabilizer. See **31 35 005 REMOVING AND INSTALLING/REPLACING PUSH ROD (STABILIZER LINK) FOR LEFT/RIGHT STABILIZER**

IMPORTANT: Risk of damage!

First adjust minimum distance (A) = 3 mm between control line (1) and oscillating motor (2).

Then adjust control line (3) with minimum distance (B) = 8 mm to control line (1).

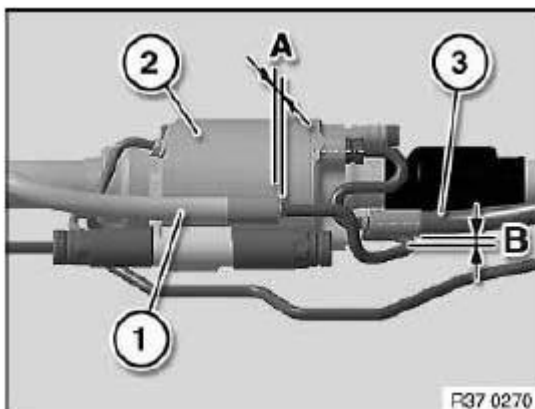


Fig. 20: Identifying Control Line And Oscillating Motor

Courtesy of BMW OF NORTH AMERICA, INC.

Mark installation position of control lines to oscillating motor.

Release banjo nuts (1) and remove control lines (2) from oscillating motor.

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Seal control lines (2) and connections of oscillating motor with sealing plugs.

Installation:

Control lines are protected against being mixed up by different thread diameters on the oscillating motor connection.

Tightening torque, see 37 14 18AZ in **37 14 ELECTRIC COMPONENTS**

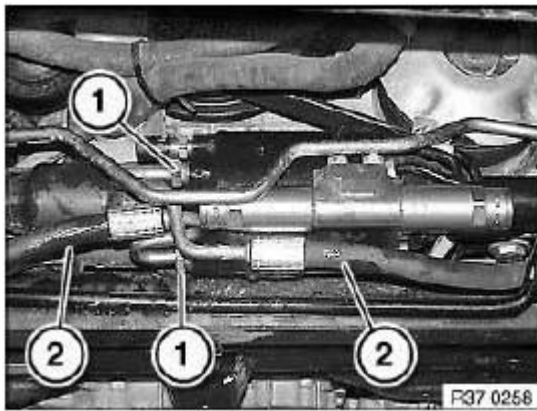


Fig. 21: Identifying Banjo Nuts And Control Lines
Courtesy of BMW OF NORTH AMERICA, INC.

Release spring-type actuator (1) with special tool 37 1 160 ; turn stabilizer leg if necessary.

Tightening torque, see 37 14 23AZ in **37 14 ELECTRIC COMPONENTS**

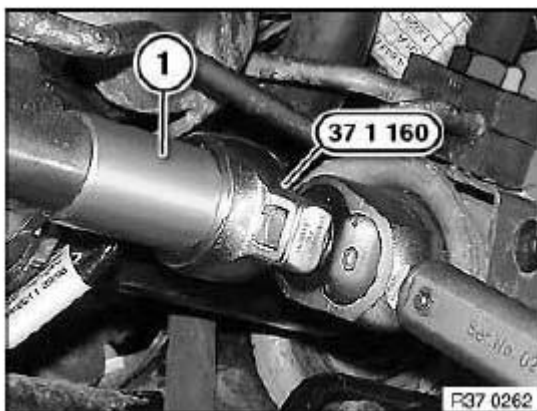


Fig. 22: Identifying Special Tool (37 1 160)
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Remove protective cap.

Fit O-ring (1) only in dry condition.



Fig. 23: Identifying O-Ring

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Fill and bleed hydraulic system. See **32 13 006 BLEEDING POWER STEERING (VERSION WITH DYNAMIC DRIVE)**
- Check pipe connections for leaks
- Carry out initial DYNAMIC DRIVE operation. **37 10 001 Initial Operation With Test Run of Dynamic Drive**

37 11 010 REMOVING AND INSTALLING/REPLACING FRONT ACTIVE STABILIZER

WARNING: Danger of poisoning (see **00 DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN**) if oil is ingested/absorbed through the skin!

Risk of injury (see **00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN**) if oil comes into contact with eyes and skin!

IMPORTANT: Adhere to the utmost cleanliness. Do not allow any dirt to enter the hydraulic system.

Close off pipe connections with plugs.

NOTE: A film of grease on the anti-friction bearing in no way impairs the operational capability of the stabilizer.

In a warranty case you must always provide a fault memory printout, even where there is no fault memory entry, with the defective part.

Necessary preliminary tasks:

- Remove front wheels. See **36 10 300 REMOVING OR INSTALLING FRONT OR REAR WHEEL**
- Remove front underbody protection. See **51 47 490 REMOVING AND INSTALLING / REPLACING FRONT ASSEMBLY UNDERSIDE PROTECTION**

- Remove front right wheel arch cover (front section). See **51 71 038 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (FRONT SECTION)**
- Remove radiator air duct. See **51 71 099 REMOVING AND INSTALLING/REPLACING RADIATOR AIR GUIDE**
- Remove both brake air ducts with holder
- Remove fan cowl. See **17 11 035 REMOVING AND INSTALLING/REPLACING FAN COWL WITH ELECTRIC FAN (N52K)**
- Remove heat exchanger from front axle carrier and tie up. See **17 22 010 REMOVING AND INSTALLING/REPLACING HEAT EXCHANGER FOR AUTOMATIC TRANSMISSION (N52K)**
- Remove both stabilizer links from stabilizer. See **31 35 005 REMOVING AND INSTALLING/REPLACING PUSH ROD (STABILIZER LINK) FOR LEFT/RIGHT STABILIZER**

Remove radiator box from engine carrier, extend out, press upwards and support with workshop jack.

Installation:

Check rubber mounting of radiator box for correct seating.

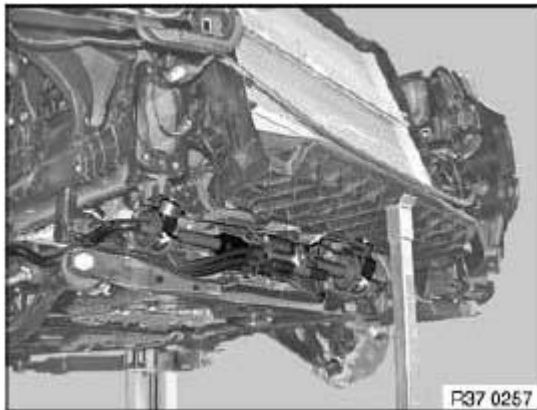


Fig. 24: Identifying Rubber Mounting Of Radiator Box
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

First adjust minimum distance (A) = 3 mm between control line (1) and oscillating motor (2).

Then adjust control line (3) with minimum distance (B) = 8 mm to control line (1).

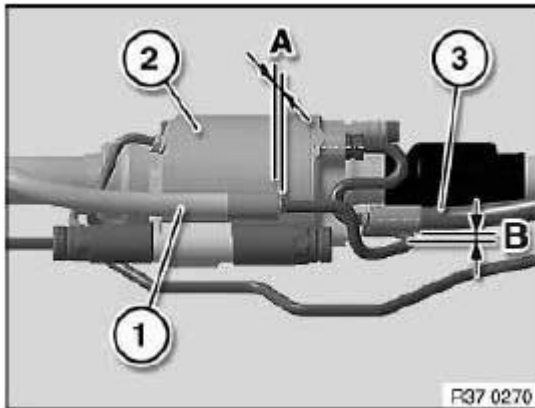


Fig. 25: Identifying Control Line And Oscillating Motor
Courtesy of BMW OF NORTH AMERICA, INC.

Mark installation position of control lines to oscillating motor.

Release banjo nuts (1) and remove control lines (2) from oscillating motor.

Seal control lines (2) and connections of oscillating motor with sealing plugs.

Installation:

Carry over identification to new component.

Control lines are protected against being mixed up by different thread diameters on the oscillating motor connection.

Tightening torque, see 37 14 18AZ in **37 14 ELECTRIC COMPONENTS**

Remove both protective caps (of red rubber with pull band).

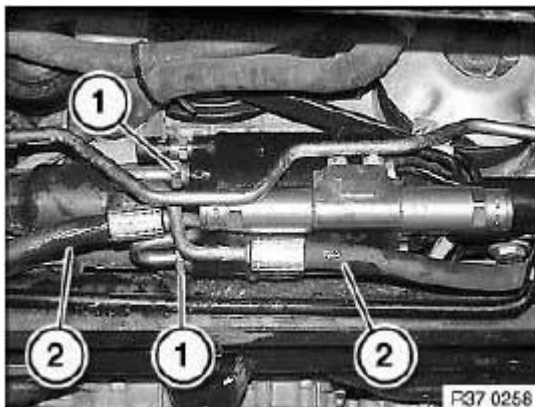


Fig. 26: Identifying Banjo Nuts And Control Lines
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Tightening torque, see 37 14 20AZ in **37 14 ELECTRIC COMPONENTS**

Remove both control lines (2) from upper retaining brackets and tie up.

Remove upper retaining brackets.

Remove stabilizer (3) with rubber mounts from lower retaining brackets.

Replacement: Remove both rubber mounts from stabilizer.

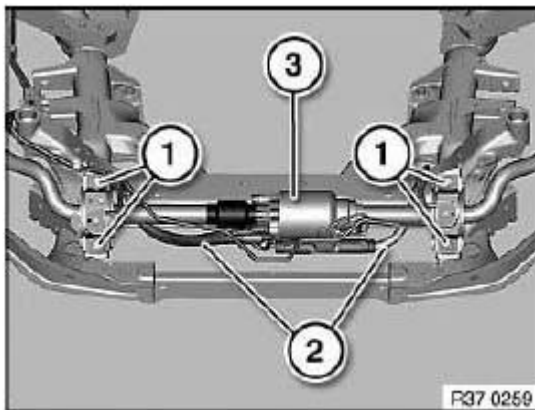


Fig. 27: Identifying Upper Retaining Brackets And Stabilizer
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Rubber lips (1) must be correctly situated between retaining brackets!

Installation:

Check anti-friction bearing (2) for damage; if necessary, replace stabilizer (observe note at start of repair instruction).

Keep contact face for rubber mount on anti-friction bearing clean and free from oil and grease.

Check rubber mount for damage, replace if necessary.

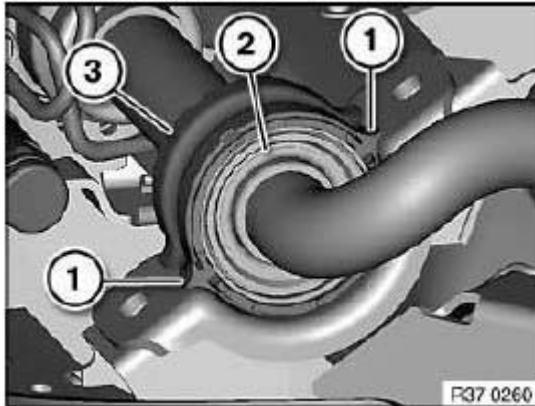


Fig. 28: Identifying Rubber Lips And Anti-Friction Bearing
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: To remove the risk of mix-up after removal of the control lines at the holders, observe the following:

- Holder, left: Stud bolt (1) arranged virtually centrally on the holder
- Holder, right: Stud bolt (1) arranged more to the front of the holder
- Align holders as pictured by way of additional lugs (2); both lugs point in direction of travel to right

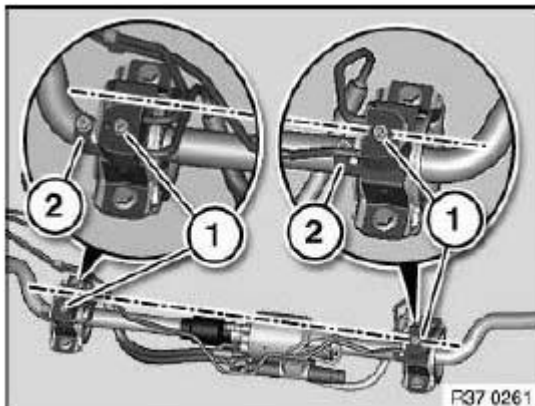


Fig. 29: Identifying Stud Bolt
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Fill and bleed hydraulic system. See **32 13 006 BLEEDING POWER STEERING (VERSION WITH DYNAMIC DRIVE)**
- Check pipe connections for leaks
- Carry out initial Dynamic Drive operation. See **37 10 001 Initial Operation With Test Run of Dynamic Drive**
 2816 of 3160

12 REAR CONTROL SUSPENSION

37 00 ... CHECKING AIR SPRINGS FOR DAMAGE

NOTE: If a vehicle has been driven with depressurized air springs, the air springs must always be replaced.

Lift vehicle.

Air spring is OK:

1. when the gaiter cannot be pressed in by hand
2. when no visible damage (e.g. kinks, cracks, porous areas, etc.) is discernible
3. when the rolling fold is uniform



Fig. 30: Identifying Air Spring

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: If one of the above-mentioned points fails the test, then the air spring must be replaced. See **37 12 155 Removing and Installing/Replacing Left Or Right Air Spring**

37 12 ... REPLACING LOWER VENT LINE

IMPORTANT: Risk of damage!

Extreme cleanliness must be ensured in the connection area of the vent lines during removal and installation. Even the smallest of dirt particles can cause leakage in the air spring system.

Necessary preliminary tasks:

- Remove front right wheel arch cover (rear section). See **51 71 039 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (REAR**

SECTION)

Disconnect quick-connect couplings (1, 3).

Seal connections of air supply unit supply line and upper vent line with sealing plugs.

Unclip lower vent line (2) and feed out.

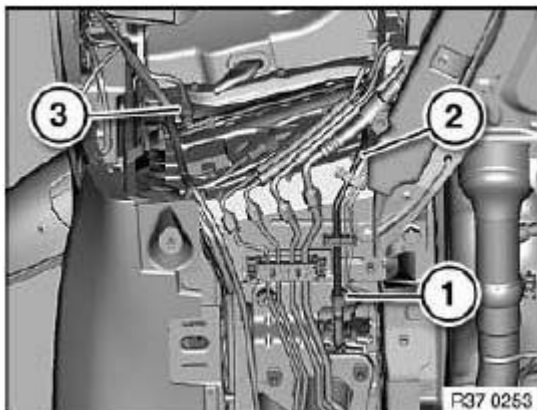


Fig. 31: Identifying Lower Vent Line And Quick-Connect Couplings
Courtesy of BMW OF NORTH AMERICA, INC.

37 12 ... REPLACING PIPES FOR AIR SPRINGS

WARNING: Risk of injury!

Drain the air spring system before carrying out any work on the air supply unit, air pipes and air springs! Danger of injury if this instruction is not complied with!

Risk of damage!

Extreme cleanliness must be ensured in the connection area of the pipes during removal and installation. Even the smallest of dirt particles can cause leakage in the air spring system.

NOTE: Read and comply with notes on air spring system. See 37 00 ... Notes on Air Spring System

Necessary preliminary tasks:

- Deactivate and empty air spring system. See 37 00 100 Draining/filling Air Spring System
- Remove air springs. See 37 12 155 Removing and Installing/Replacing Left Or Right Air Spring
- Remove right underbody panelling. See 51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING
- Remove right tank underride protection. See 51 47 31 00 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING

IMPORTANT: It is not permitted to cut open the protective gaiter to feed through the pipe (with banjo bolt)!

Cut through pipe (2) and pull out of protective gaiter (1).

Installation:

Moisten protective gaiter (1) at pipe opening with water/soapy solution.

Insert pipe (2) through opening in protective gaiter (1).

Install new screwed connection. See **37 13 ... Notes on Fitting A New Pipe Or A Screw Connection**

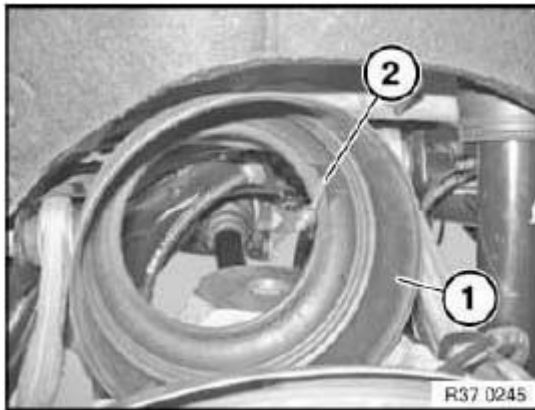


Fig. 32: Identifying Protective Gaiter And Pipe
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not kink, twist or crush new pipes.

To avoid leaks in the air spring system, it is essential to avoid scratches on pipes in particular in the connection area!

Line, air spring, left: "Red"

Line, air spring, right: "Blue"

Unclip pipes (1) up to air supply unit from holders.

NOTE: Picture serves to show the routing of the pipes.

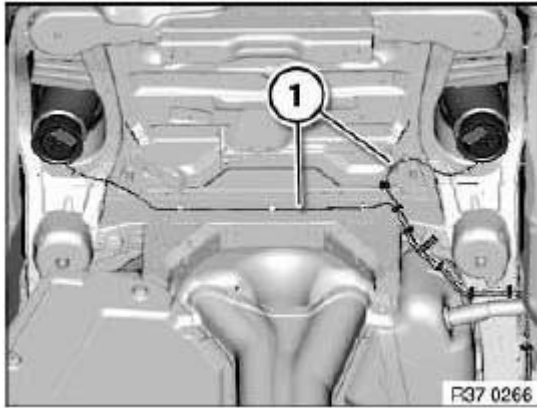


Fig. 33: Identifying Pipes

Courtesy of BMW OF NORTH AMERICA, INC.

Unclip pipes (1) up to air supply unit from holders.

NOTE: Picture serves to show the routing of the pipes.

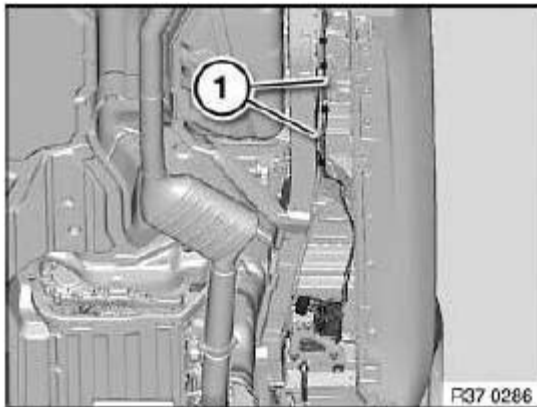


Fig. 34: Identifying Pipes

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Position pipes (1) so that holder (2) is between pipe markings.

The holder variant does not play any role here.

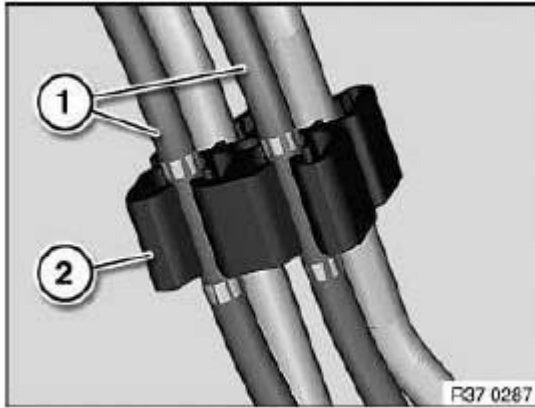


Fig. 35: Identifying Pipes And Holder
 Courtesy of BMW OF NORTH AMERICA, INC.

Release banjo bolts (1, 2).

Seal air supply unit connections with adhesive tape.

Installation:

Install new screwed connections. See **37 13 ... Notes on Fitting A New Pipe Or A Screw Connection**

Carefully screw in banjo bolts by hand to avoid damaging the plastic threads and with it the air supply unit.

Tightening torque, see 37 12 1AZ in **37 12 CONTROL AND SUSPENSION SYSTEMS, REAR**

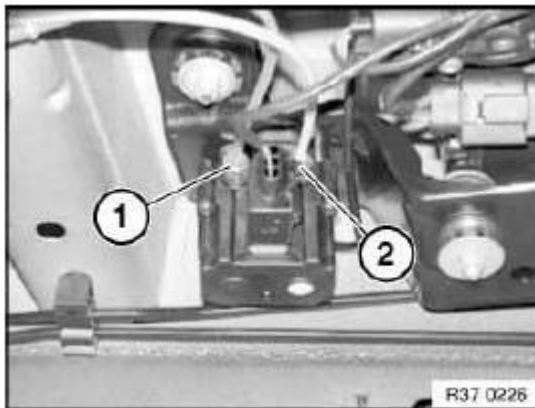


Fig. 36: Identifying Banjo Bolts
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Activate and fill air suspension system. See **37 00 100 Draining/filling Air Spring System**

37 12 ... REPLACING UPPER VENT LINE FOR AIR SUPPLY UNIT**IMPORTANT: Risk of damage!**

Extreme cleanliness must be ensured in the connection area of the vent lines during removal and installation. Even the smallest of dirt particles can cause leakage in the air spring system.

Necessary preliminary tasks:

- Remove trim panel for cover on frame side member on right. See **51 71 447 REMOVING AND INSTALLING OR REPLACING PANEL FOR COVER ON LEFT OR RIGHT SIDE MEMBER**
- Remove front right wheel arch cover (rear section). See **51 71 039 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (REAR SECTION)**
- Remove front right auxiliary turn indicator light. . See **63 13 200 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT AUXILIARY DIRECTION INDICATOR**

Release screw (1).

Twist filler duct (2) in direction of arrow out of fluid reservoir for windscreen washer unit (3) and remove.

If necessary, release vent line (4) at mounting points (5) from fluid reservoir for windscreen washer unit (3).

Release screws.

Press off side panel slightly.

Installation:

Tightening torque (front side panel to body area, A-pillar): 6 N.m.

Tightening torque (front side panel to body area, A-pillar): 6 N.m.

Disconnect quick-connect coupling (1) and seal lower vent line connection with sealing plug.

Remove vent line (2) from fluid reservoir for windscreen washer unit.

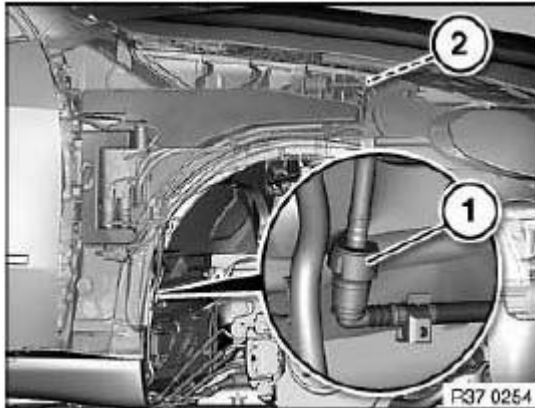


Fig. 37: Identifying Quick-Connect Coupling And Vent Line
Courtesy of BMW OF NORTH AMERICA, INC.

37 12 001 CHECKING FUNCTION OF LEVEL CONTROL SYSTEM

Carry out fault interrogation with BMW diagnosis system.

37 12 012 CARRYING OUT RIDE-HEIGHT-CALIBRATION

NOTE: Ride-height-calibration must be carried out after the following work:

- Removal/replacement of ride-height sensor or its control rod
- Replacement of wiring harness
- Replacement of air supply unit control unit
- Replacement of Vertical Dynamics Management control unit

Connect BMW diagnosis system.

Switch on ignition.

Carry out ride-height-calibration (menu item: "Service function").

Version with Run Flat Indicator: initialize Run Flat Indicator. See **36 11 500 INITIALIZING RUN FLAT INDICATOR (RPA)**

Version with Tyre Pressure Control: carry out resetting. See **36 11 503 RDC RESETTING**



Fig. 38: Identifying BMW Diagnosis System (DIS)
 Courtesy of BMW OF NORTH AMERICA, INC.

37 12 155 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT AIR SPRING

WARNING: Danger of injury!

Drain the air spring system before carrying out any work on the air supply unit, air pipes and air springs! Danger of injury if this instruction is not complied with!

Risk of damage!

Extreme cleanliness must be ensured in the connection area of the pipes during removal and installation. Even the smallest of dirt particles can cause leakage in the air spring system.

NOTE: Read and comply with notes on air spring system. See 37 00 ... Notes on Air Spring System
 In a warranty case, you must always provide a fault memory printout with the defective part, even where there is no fault memory entry.

Necessary preliminary tasks:

- Deactivate and empty air spring system. See 37 00 100 Draining/filling Air Spring System
- Remove rear wheel. See 36 10 300 REMOVING OR INSTALLING FRONT OR REAR WHEEL

Removal:

IMPORTANT: Do not use any tools to remove the lower section of the air spring (1).

Tilt lower section of air spring (1) by hand towards front/side.

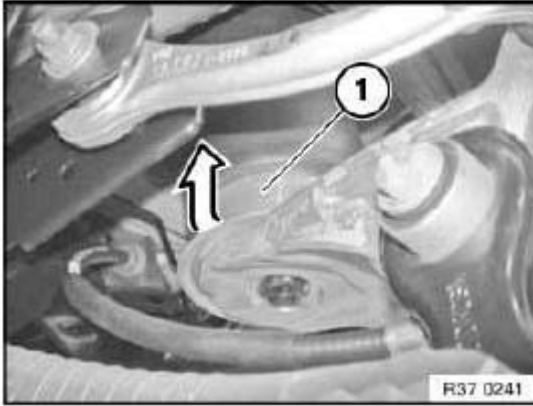


Fig. 39: Identifying Lower Section Of Air Spring
 Courtesy of BMW OF NORTH AMERICA, INC.

Press air spring (1) upwards and turn through $A = 30^\circ$ in counterclockwise direction.

IMPORTANT: Do not kink, twist or crush pipe.

Press air spring (1) together, remove sideways and set down on guide arm.

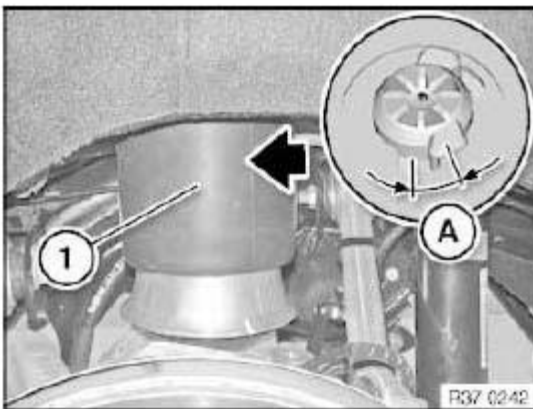


Fig. 40: Identifying Air Spring
 Courtesy of BMW OF NORTH AMERICA, INC.

Release banjo bolt (1).

Seal pipe (2) and connection of air spring with adhesive tape.

NOTE: Banjo bolt (1) remains on pipe (2).

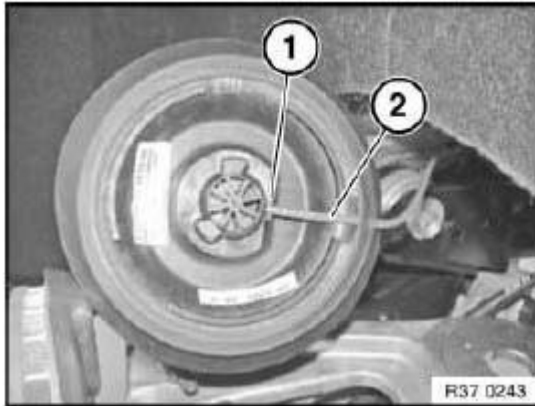


Fig. 41: Identifying Banjo Bolt

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: It is not permitted to cut open the protective gaiter to feed through the pipe (with banjo bolt)!

Remove protective gaiter (1) from air spring.

Unclip pipe (2) from groove of air spring upper section and remove air spring.

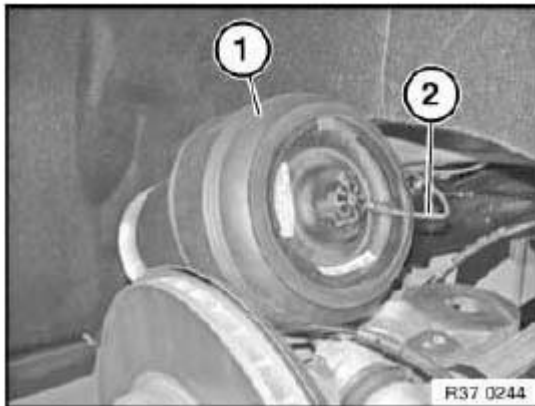


Fig. 42: Identifying Protective Gaiter And Pipe

Courtesy of BMW OF NORTH AMERICA, INC.

If reusing: check protective gaiter (1) for damage.

NOTE: Protective gaiter (1) may be reinstalled in spite of expanded opening (for pipe with banjo nut).

If protective gaiter is damaged: pull pipe (2) with banjo bolt through opening in protective gaiter (1).

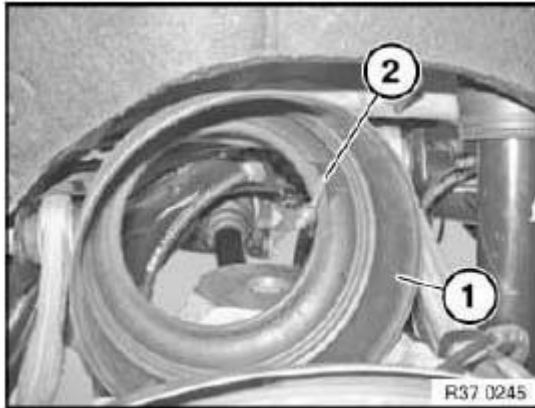


Fig. 43: Identifying Protective Gaiter And Pipe
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check air spring for damage, replace if necessary.

Check pipe for damage, replace if necessary.

NOTE: **Observe notes on fitting a new pipe. See 37 13 ... Notes on Fitting A New Pipe Or A Screw Connection**

When replacing air spring:

IMPORTANT: Replace protective gaiter only if damaged.
It is not permitted to cut open the protective gaiter to feed through the pipe (with banjo bolt)!

Moisten protective gaiter (1) at pipe opening with water/soapy solution.

Insert pipe (2) with banjo bolt through opening in protective gaiter (1).

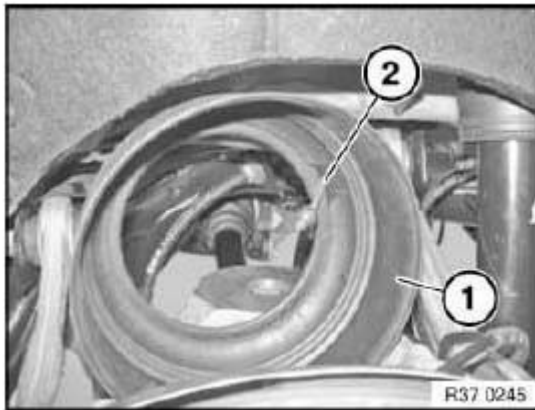


Fig. 44: Identifying Protective Gaiter And Pipe
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Replacement only: Release and dispose of banjo bolt on air spring connection.

Check banjo bolt (1) for dirt, clean if necessary. Then carefully screw in by hand to avoid damaging the plastic thread and with it the air spring.

Tightening torque, see 37 12 1AZ in **37 12 CONTROL AND SUSPENSION SYSTEMS, REAR**

Clip pipe (2) into groove of air spring upper section.

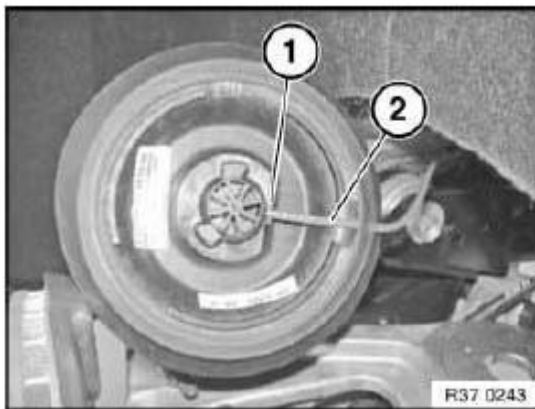


Fig. 45: Identifying Banjo Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Align protective gaiter (1) by way of opening for pipe (2) to upper section of air spring and install.

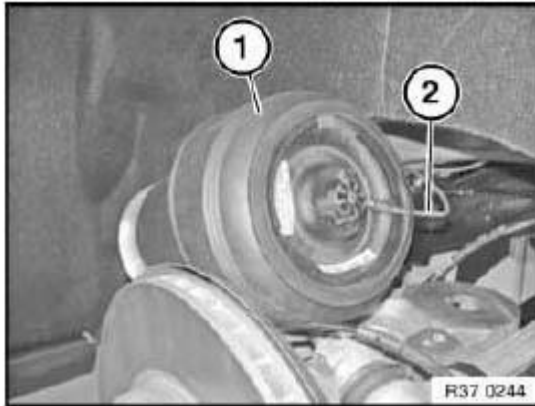


Fig. 46: Identifying Protective Gaiter And Pipe
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not kink, twist or crush pipe.

Insert air spring (1) into locator or frame side member and turn clockwise as far as it will go.

Check air spring (1) for correct installation in locator or frame side member; correct if necessary.

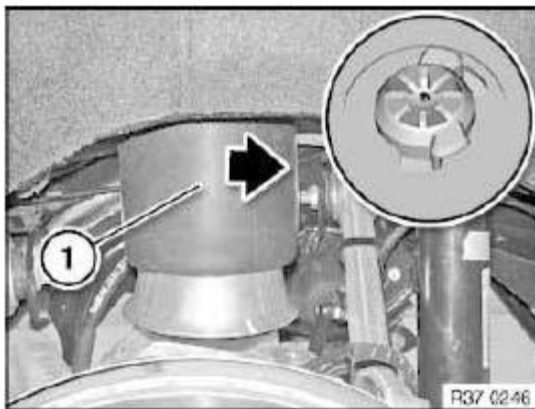


Fig. 47: Identifying Air Spring
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not use any tools to install the lower section of the air spring (1).

Press lower section of air spring (1) by hand into wheel carrier until it can be seen and heard to snap into place.

NOTE: In so doing, make sure that orientation lug is correctly aligned to groove in wheel carrier.

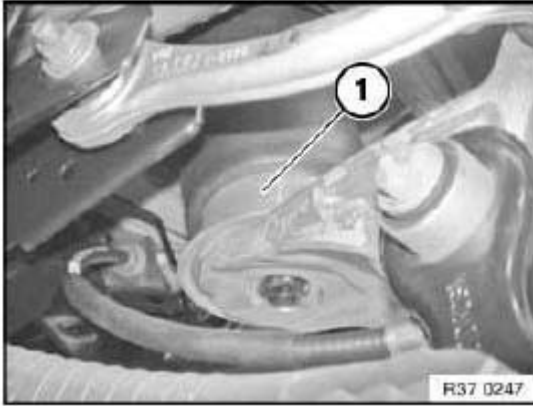


Fig. 48: Identifying Air Spring Lower Section
 Courtesy of BMW OF NORTH AMERICA, INC.

Check air spring for uniform formation of rolling lobe (1).

If necessary, slide rolling lobe (1) by hand downwards and shape on lower section of air spring (2).

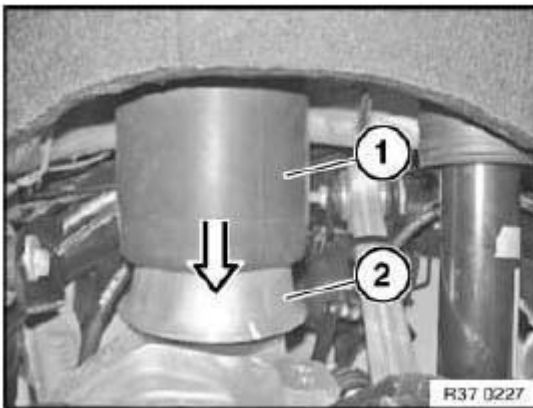


Fig. 49: Identifying Rolling Lobe
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Activate and fill air suspension system. See **37 00 100 Draining/filling Air Spring System**

37 12 220 REMOVING AND INSTALLING/REPLACING REAR ACTIVE STABILIZER

WARNING: Danger of poisoning if oil is ingested/absorbed through the skin! See **00 DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN**

Risk of injury if oil comes into contact with eyes and skin! See **00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN**

Scalding hazard!

This work may only be carried out on an exhaust system which has cooled down.

IMPORTANT: Adhere to the utmost cleanliness. Do not allow any dirt to enter the hydraulic system.
Close off pipe connections with plugs.

NOTE: A film of grease on the anti-friction bearing in no way impairs the operational capability of the stabilizer.
In a warranty case you must always provide a fault memory printout, even where there is no fault memory entry, with the defective part.

Necessary preliminary tasks:

- Remove left rear wheel. See **36 10 300 REMOVING OR INSTALLING FRONT OR REAR WHEEL**
- Remove stabilizer link on both sides from stabilizer. See **33 55 040 REPLACING STABILIZER LINKS FOR STABILIZER**

Release screws (1) and remove protective plate (2).

Tightening torque, see 37 14 19AZ in **37 14 ELECTRIC COMPONENTS**

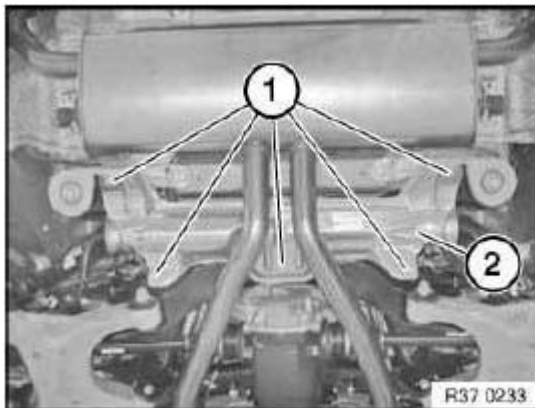


Fig. 50: Identifying Screws And Protective Plate
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!
Adjust minimum distance (A) = 2.5 mm between control line and oscillating motor.

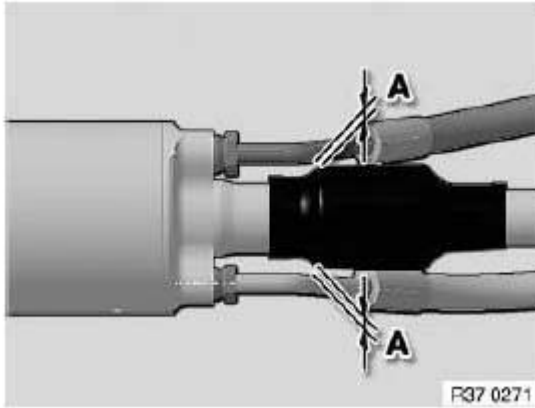


Fig. 51: Identifying Minimum Distance Between Control Line And Oscillating Motor
 Courtesy of BMW OF NORTH AMERICA, INC.

Mark installation position of control lines to oscillating motor.

Release banjo nuts (1) and remove control lines from oscillating motor.

Seal control lines and connections of oscillating motor with sealing plugs.

Installation:

Carry over identification to new component.

Control lines are protected against being mixed up by different thread diameters on the oscillating motor connection.

Tightening torque, see 37 14 18AZ in **37 14 ELECTRIC COMPONENTS**

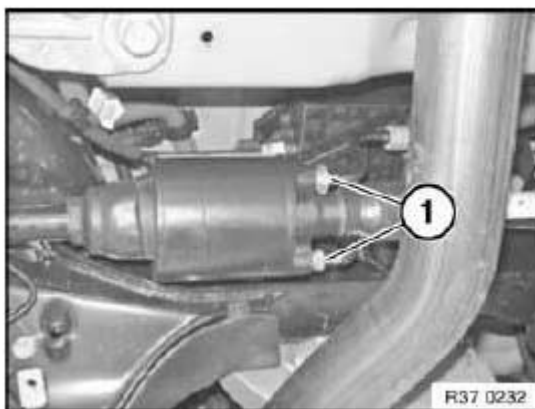


Fig. 52: Identifying Banjo Nuts
 Courtesy of BMW OF NORTH AMERICA, INC.

Release left and right screws (1).

Remove stabilizer from rear axle carrier and feed out at side.

Installation:

Check anti-friction bearing on both sides for damage; if necessary, replace stabilizer (observe note at start of repair instruction).

Keep contact face for rubber mount on anti-friction bearing clean and free from oil and grease.

Check rubber mount for damage, replace if necessary.

Tightening torque, see 37 14 21AZ in **37 14 ELECTRIC COMPONENTS**

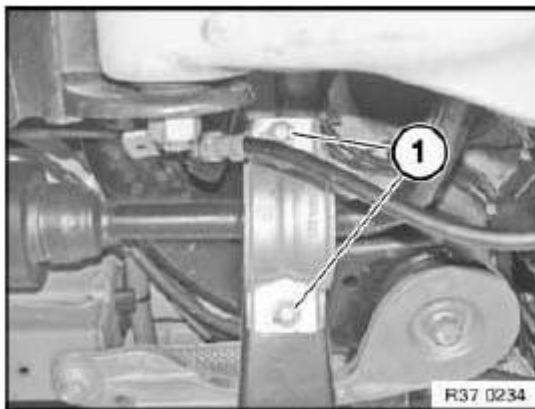


Fig. 53: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Fill and bleed hydraulic system. See **32 13 006 BLEEDING POWER STEERING (VERSION WITH DYNAMIC DRIVE)**
- Check pipe connections for leaks
- If necessary, carry out initial Dynamic Drive operation. See **37 10 001 Initial Operation With Test Run of Dynamic Drive**

13 CONNECTING LINES

37 13 ... NOTES ON FITTING A NEW PIPE OR A SCREW CONNECTION

**IMPORTANT: Do not kink, twist or crush lines.
Do not disassemble screw connection!**

Insert complete new screw connection consisting of toothed ring (1), banjo bolt (2) and assembly plug (3) into air spring/pipe connection of air supply unit.

Tightening torque, see 37 12 3AZ in **37 12 CONTROL AND SUSPENSION SYSTEMS, REAR**

Remove assembly plug (3).

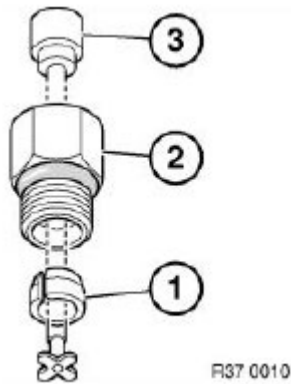


Fig. 54: Identifying Banjo Bolt And Assembly Plug
 Courtesy of BMW OF NORTH AMERICA, INC.

Slide new pipe (1) into banjo bolt (2) up to marking.

Check installation position of pipe (1) by pulling back slightly.

NOTE: The toothed ring (3) has engaged correctly when the pipe (1) cannot be pulled back.

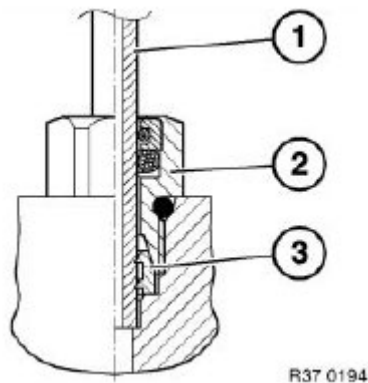


Fig. 55: Identifying Pipe And Banjo Bolt
 Courtesy of BMW OF NORTH AMERICA, INC.

Fitting new pipes:

IMPORTANT: To avoid leaks in the air spring system, it is essential to avoid scratches on

pipes in particular in the connection area!

37 13 100 REMOVING AND INSTALLING/REPLACING PRESSURE LINES FOR OSCILLATING MOTOR/FRONT AXLE

Remove front pressure lines (1) (from oscillating motor to junction I at side in wheel arch). See **37 13 110 Removing and Installing/Replacing Pressure Lines For Oscillating Motor/Rear Axle**

Remove rear pressure lines (2) (from junction I to valve block). See **37 13 110 Removing and Installing/Replacing Pressure Lines For Oscillating Motor/Rear Axle**

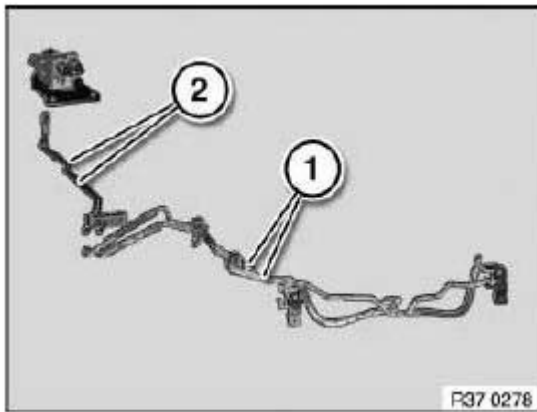


Fig. 56: Identifying Front And Rear Pressure Lines

Courtesy of BMW OF NORTH AMERICA, INC.

37 13 110 REMOVING AND INSTALLING/REPLACING PRESSURE LINES FOR OSCILLATING MOTOR/REAR AXLE

Remove front pressure lines (1) (from valve block to junction I on vehicle underbody)

Remove middle pressure line (2) (from junction I to junction III on vehicle underbody)

Remove rear pressure lines (3) (from junction II on vehicle underbody to oscillating motor)

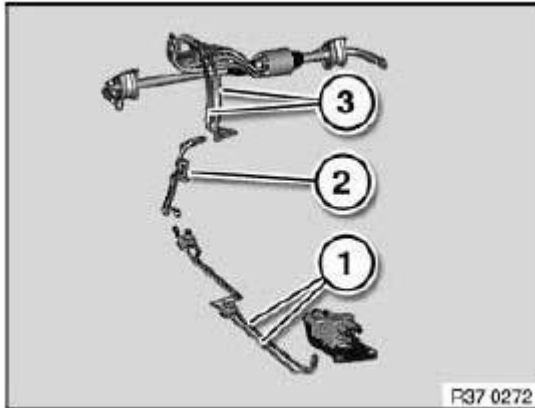


Fig. 57: Identifying Front, Middle And Rear Pressure Lines
 Courtesy of BMW OF NORTH AMERICA, INC.

14 ELECTRICAL COMPONENTS

34 52 550 REMOVING AND INSTALLING/REPLACING DSC YAW SENSOR

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

IMPORTANT: Do not kink floor panelling under any circumstances!

Necessary preliminary tasks:

- Remove right front seat. See 52 14 000 REMOVING AND INSTALLING LEFT OR RIGHT FRONT SEAT
- Lift floor panelling and fold back to one side

Remove floor inlay (2).

Unfasten screws.

Tightening torque, see 34 51 2AZ in 34 51 SLIP CONTROL SYSTEM (DSC)

Disconnect plug connection and remove yaw sensor (1).

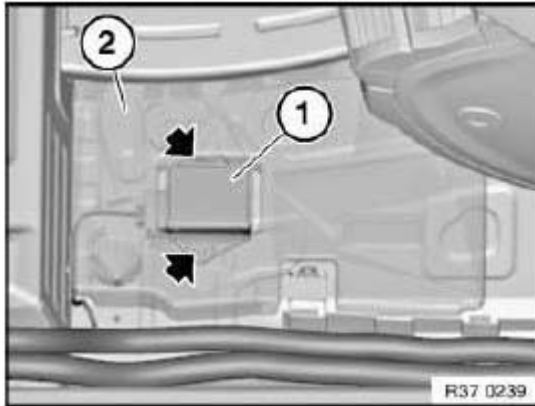


Fig. 58: Identifying Floor Inlay And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Carry out calibration/adjustment of DSC sensor.

37 10 001 INITIAL OPERATION WITH TEST RUN OF DYNAMIC DRIVE

NOTE: The Service function Initial operation of Dynamic Drive must be carried out after:

- Work on the Dynamic Drive system which involved opening hydraulic lines
- Replacement / Programming / Coding Dynamic Drive control unit
- Replacement lateral acceleration sensor
- Parameters and zero point of new sensors have been learned

Bleeding power steering:

IMPORTANT: Adhere to the utmost cleanliness. Do not allow any dirt to enter the hydraulic system.

Using contaminated equipment to add fluid may introduce dirt particles into the fluid reservoir and significantly reduce the service life of the power steering system. Do not use any filler funnels or similar!

Use only Pentosin CHF11S from original containers!

The fill level may only be checked or adjusted when the engine is stopped! The fluid temperature should be approx. 20°C here.

Ensure that the cap is fully screwed in prior to the fill level check.

NOTE: To avoid mix-ups when filling with hydraulic fluid, mark the fluid reservoirs or their caps with identification marks.

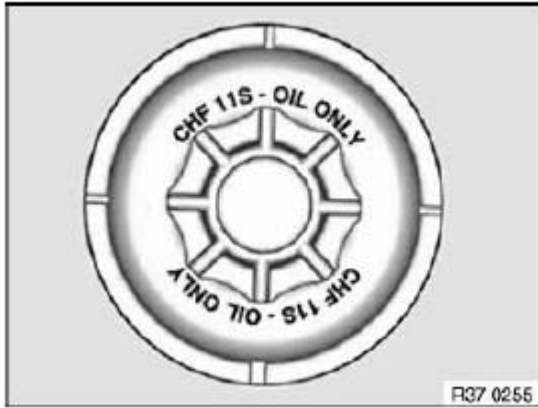


Fig. 59: Identifying CHF Pentosin CHF11S

Courtesy of BMW OF NORTH AMERICA, INC.

1. Thoroughly clean fluid reservoir and its immediate surroundings
2. Check and correct fill level

NOTE: The fill level can come to rest above the "MAX" mark when the engine is at normal operating temperature. This is dictated by the design in that the marking on the dipstick is referred to a fluid temperature of 20°C. With the engine at normal operating temperature (approx. 50-60°C fluid temperature) adjust a fill height 15 mm above the "MAX" mark. Do not under any circumstances draw off the fluid to the "MAX" mark when the engine is at normal operating temperature.

3. Start engine
4. Turn steering wheel left and right twice in each case up to full lock; if necessary, top up hydraulic fluid (e.g. if hydraulic system is completely drained)
5. Move steering wheel to straight-ahead position and turn off engine
6. Check and correct fill level with engine stopped
7. Check hydraulic system for leaks

Performing initial operation with test run:

WARNING: Danger of injury!

Vehicle executes heavy rolling motions during initial operation! Therefore observe the following instructions without fail:

- Do not allow any persons to remain in the vehicle or directly on the vehicle
- Keep the vehicle doors closed.
- Maintain a safety distance around the vehicle of 1 m to persons, objects, walls etc.

- Vehicle must be standing horizontally with all wheels on a firm surface
 - Do not under any circumstances carry out initial operation on a lifting platform, wheel alignment analyzer or similar!
 - Avoid heavy loads
1. Check load; if necessary, remove load from the vehicle
 2. Bring engine up to operating temperature
- NOTE:** Hydraulic fluid temperature must be between 50°C and 70°C (vehicle at normal operating temperature)
3. Connect vehicle to BMW DIS or MoDiC diagnostic hardware.
 4. Start initial operation in SERVICE FUNCTIONS. Follow instructions in DIS.
 5. Check and correct fill level with engine stopped

37 14 055 REMOVING AND INSTALLING/REPLACING DYNAMIC DRIVE CONTROL UNIT

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

Necessary preliminary tasks:

- Disconnect battery negative lead. See 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD
- Remove side cover on instrument panel. See 51 45 ... REPLACING SIDE COVER ON INSTRUMENT PANEL

Disconnect plug connection (1).

Release screw (2).

Tightening torque 37 14 8AZ, see 37 14 ELECTRIC COMPONENTS

Remove Dynamic Drive control unit (3) from side.

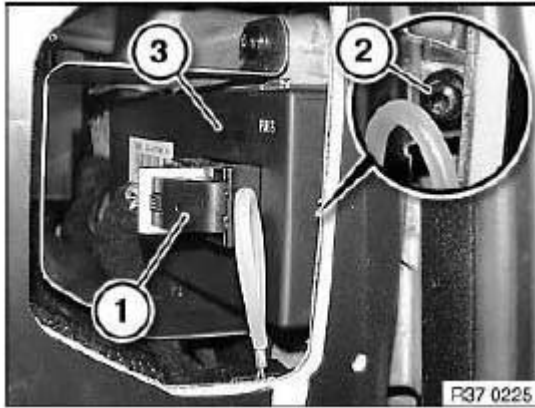


Fig. 60: Identifying Dynamic Drive Control Unit And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Insert control unit (1) with lug (2) into corresponding opening in support tube. Engagement stud (3) must rest correctly in opening of lug (2).

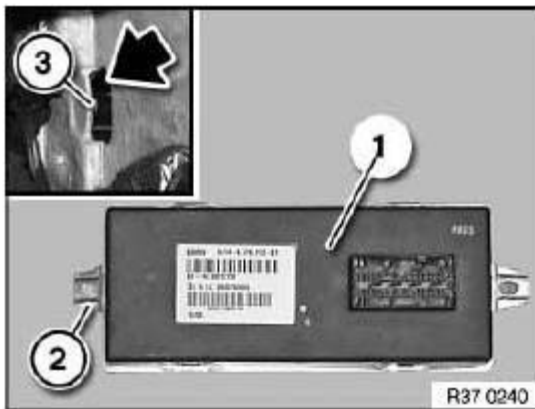


Fig. 61: Identifying Control Unit With Lug
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Replacement only: Carry out programming/coding. See **CODING & PROGRAMMING**
- Carry out steering angle sensor adjustment/adjustment for active front steering. See **61 31 996 CARRY OUT STEERING ANGLE SENSOR ADJUSTMENT**
- Only when replacing / programming / coding: Carry out initial DYNAMIC DRIVE operation. See **37 10 001 Initial Operation With Test Run of Dynamic Drive**

IMPORTANT: Observe safety instructions for raising the vehicle. See 00 LIFTING VEHICLE WITH A LIFTING PLATFORM

NOTE: Jointed rod on upper control arm, see 37 14 5AZ in 37 14 ELECTRIC COMPONENTS

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

Necessary preliminary tasks:

- Detach coolant expansion tank and place to one side. See 17 11 100 REMOVING AND INSTALLING/REPLACING COOLANT EXPANSION TANK (N62TU/N52K)

NOTE: Level switch can slip out when coolant expansion tank is removed.

Release screw (1).

Installation:

Align ride-height sensor holder by means of lug (2) to opening under screw (1).

Tightening torque, see 37 14 1AZ in 37 14 ELECTRIC COMPONENTS

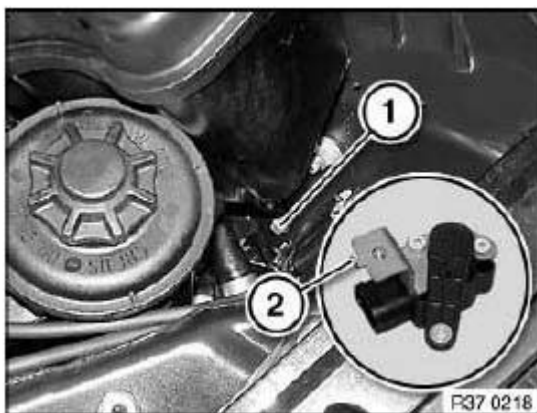


Fig. 62: Identifying Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release nut (2) and disconnect jointed rod.

Installation:

Sensor lever (3) must point from ride-height sensor to left front wheel.

Replace self-locking nut.

Tightening torque, see 37 14 4AZ in **37 14 ELECTRIC COMPONENTS**

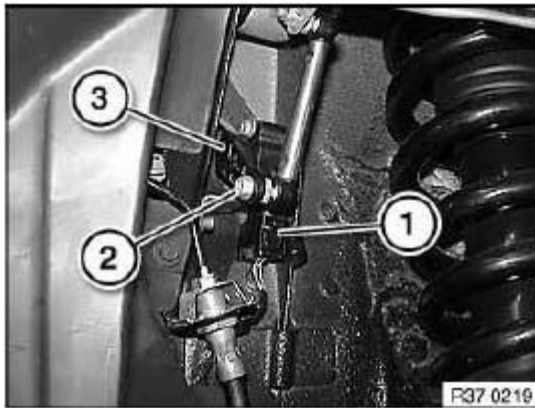


Fig. 63: Identifying Plug Connection And Lever
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and remove holder (2).

Tightening torque, see 37 14 3AZ in **37 14 ELECTRIC COMPONENTS**

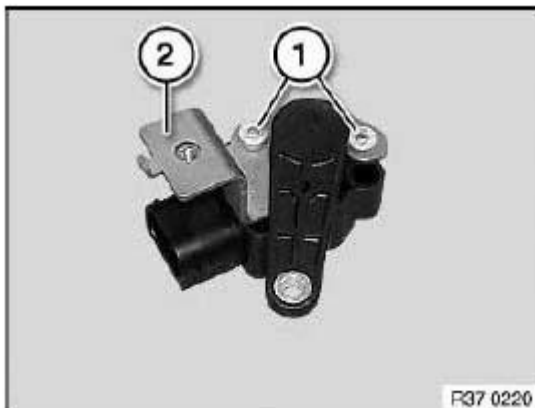


Fig. 64: Identifying Screws And Holder
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Carry out ride-height-calibration. See **37 12 012 Carrying Out Ride-Height-Calibration**
- Check headlight adjustment, correct if necessary. See **63 10 004 ADJUSTING HEADLIGHTS**

IMPORTANT: Observe safety instructions for raising the vehicle 00 ... LIFTING VEHICLE WITH A LIFTING PLATFORM

NOTE: Ride-height sensor holder on rear axle carrier, see 37 14 2AZ in 37 14 ELECTRIC COMPONENTS
Jointed rod on swinging arm, see 37 14 6AZ in 37 14 ELECTRIC COMPONENTS

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

Disconnect plug connection (1).

Release nut (2) and disconnect jointed rod.

Installation:

Sensor lever (3) must point from ride-height sensor to respective rear wheel.

Replace self-locking nut.

Tightening torque, see 37 14 4AZ in 37 14 ELECTRIC COMPONENTS

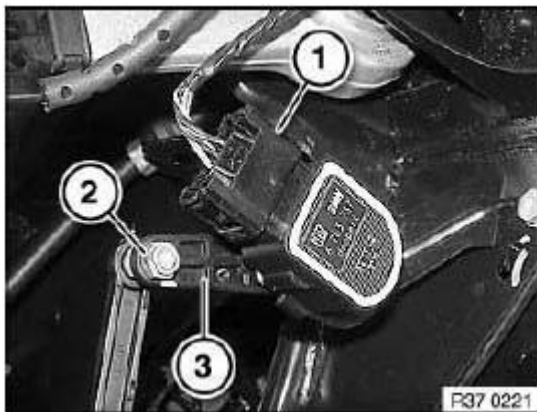


Fig. 65: Identifying Plug Connection And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and remove ride-height sensor (2).

Tightening torque, see 37 14 3AZ in 37 14 ELECTRIC COMPONENTS



Fig. 66: Identifying Ride-Height Sensor And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Carry out ride-height-calibration. See **37 12 012 Carrying Out Ride-Height-Calibration**
- Check headlight adjustment, correct if necessary. See **63 10 004 ADJUSTING HEADLIGHTS**

37 14 525 REMOVING AND INSTALLING/REPLACING CONTROL UNIT FOR AIR SUPPLY UNIT

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

Necessary preliminary tasks:

- Remove ignition key
- Disconnect battery negative lead. See **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD**
- Remove flap in luggage compartment panel on right. See **51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT**

Lift back insulating mat (1).

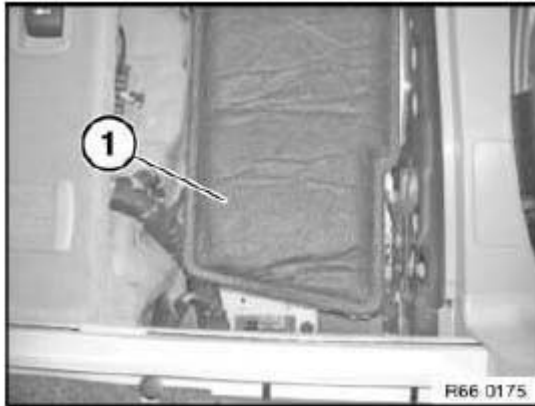


Fig. 67: Identifying Insulating Mat

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Unlock catch (2) and remove control unit (3).

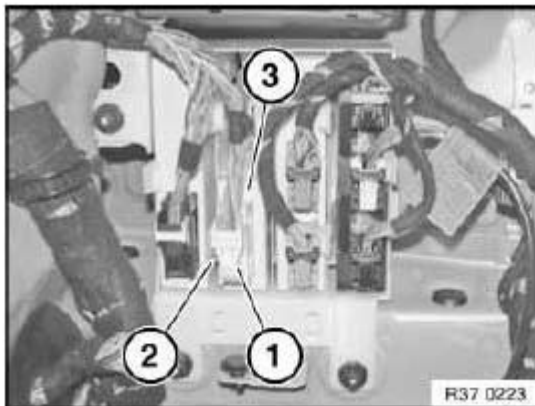


Fig. 68: Identifying Control Unit And Catch

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Replacement only: Carry out programming/coding. See **CODING & PROGRAMMING**
- Replacement only: Carry out ride-height-calibration. See **37 12 012 Carrying Out Ride-Height-Calibration**

37 14 610 REMOVING AND INSTALLING / REPLACING TRANSVERSAL-ACCELERATION SENSOR

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

DISCHARGE)

IMPORTANT: Do not kink floor panelling under any circumstances!

Necessary preliminary tasks:

- Remove right front seat. See **52 14 000 REMOVING AND INSTALLING LEFT OR RIGHT FRONT SEAT**
- Lift carpet and fold back to one side
- Remove floor inlay

Release nuts (1), disconnect plug connection (2) and remove lateral acceleration sensor (3).

Installation:

Replace self-locking nuts.

Tightening torque 37 14 7AZ, see **37 14 ELECTRIC COMPONENTS**

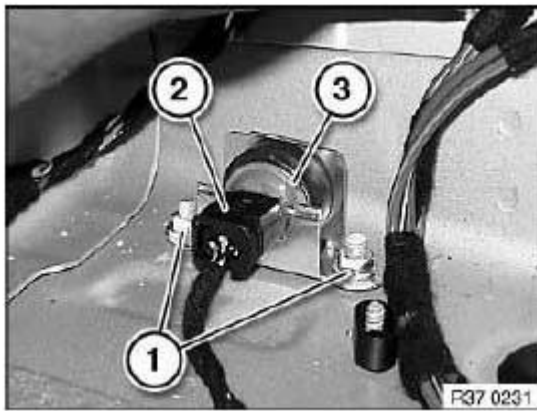


Fig. 69: Identifying Plug Connection And Lateral Acceleration Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- If necessary, carry out initial Dynamic Drive operation. See **37 10 001 Initial Operation With Test Run of Dynamic Drive**

37 15 ... REMOVING AND INSTALLING/REPLACING CONTROL UNIT FOR VERTICAL DYNAMICS MANAGEMENT

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

Necessary preliminary tasks:

- Remove ignition key
- Disconnect battery negative lead. See **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD**
- Remove flap in luggage compartment panel on right. See **51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT**

Lift back insulating mat (1).

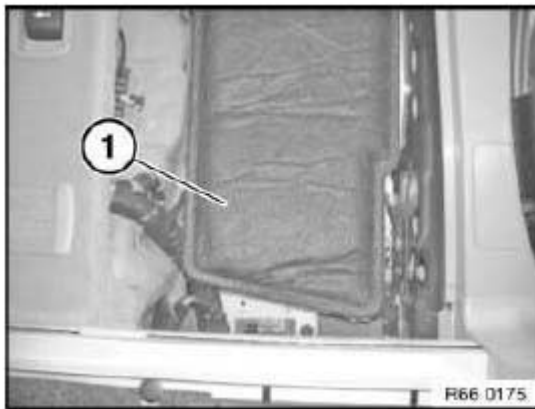


Fig. 70: Identifying Insulating Mat
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Unlock catches (2) and remove control unit (3).

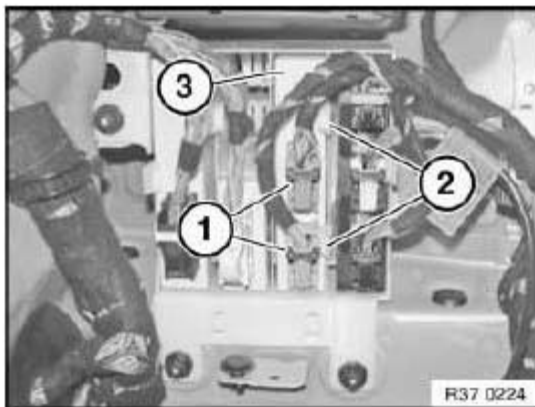


Fig. 71: Identifying Control Unit And Catches
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Replacement only: Carry out programming/coding. See **CODING & PROGRAMMING**
- Replacement only: Carry out ride-height-calibration. See **37 12 012 Carrying Out Ride-Height-Calibration**

61 36 540 REMOVING AND INSTALLING/REPLACING AIR SUPPLY UNIT RELAY

After completing work:

- Clear fault memory

Necessary preliminary tasks:

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

Release screw (1) and fold down fuse box.

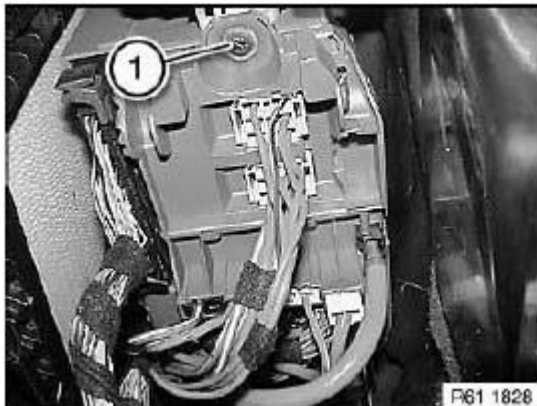


Fig. 72: Identifying Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Pull relay (1) from fuse box.

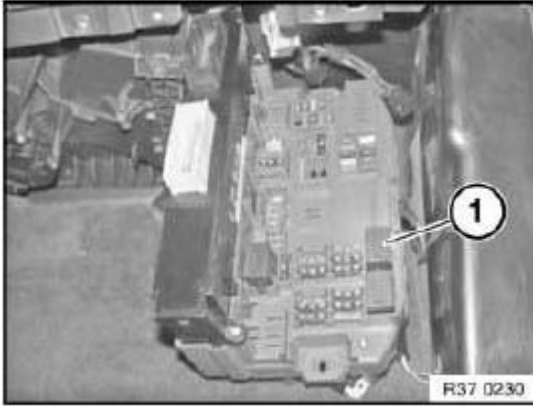


Fig. 73: Identifying Relay

Courtesy of BMW OF NORTH AMERICA, INC.

15 ELECTRONIC DAMPING FOR

37 15 ... REMOVING AND INSTALLING/REPLACING CONTROL UNIT FOR VERTICAL DYNAMICS MANAGEMENT

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

Necessary preliminary tasks:

- Remove ignition key
- Disconnect battery negative lead. See 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD
- Remove flap in luggage compartment panel on right. See 51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT

Lift back insulating mat (1).

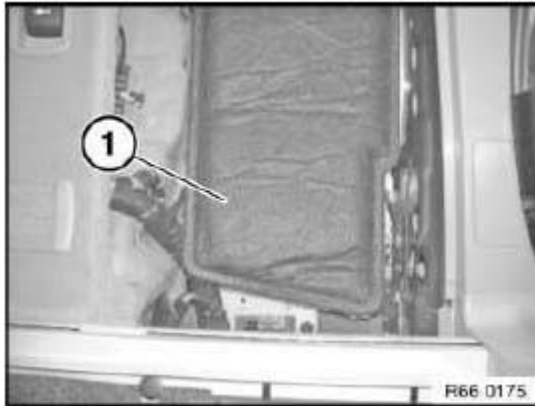


Fig. 74: Identifying Insulating Mat

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Unlock catches (2) and remove control unit (3).

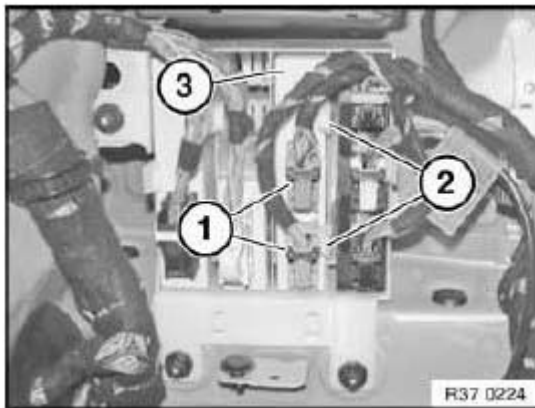


Fig. 75: Identifying Control Unit And Catches

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Replacement only: Carry out programming/coding. See **CODING & PROGRAMMING**
- Replacement only: Carry out ride-height-calibration. See **37 12 012 Carrying Out Ride-Height-Calibration**

22 PUMP ASSEMBLY WITH CONNECTOR

37 12 ... REPLACING LOWER VENT LINE

IMPORTANT: Risk of damage!

Extreme cleanliness must be ensured in the connection area of the vent lines during removal and installation. Even the smallest of dirt particles can cause leakage in the air spring system.

Necessary preliminary tasks:

- Remove front right wheel arch cover (rear section). See **51 71 039 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (REAR SECTION)**.

Disconnect quick-connect couplings (1, 3).

Seal connections of air supply unit supply line and upper vent line with sealing plugs.

Unclip lower vent line (2) and feed out.

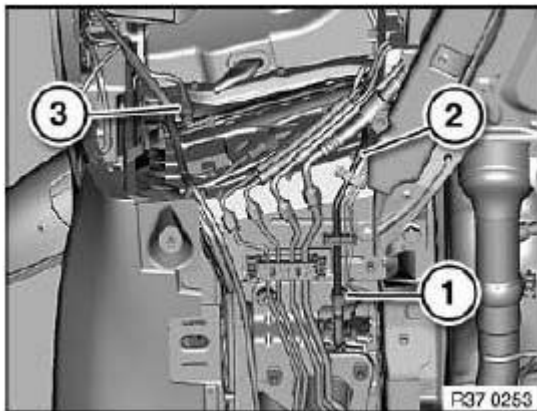


Fig. 76: Identifying Lower Vent Line And Quick-Connect Couplings
Courtesy of BMW OF NORTH AMERICA, INC.

37 12 ... REPLACING UPPER VENT LINE FOR AIR SUPPLY UNIT

IMPORTANT: Risk of damage!

Extreme cleanliness must be ensured in the connection area of the vent lines during removal and installation. Even the smallest of dirt particles can cause leakage in the air spring system.

Necessary preliminary tasks:

- Remove trim panel for cover on frame side member on right. See **51 71 447 REMOVING AND INSTALLING OR REPLACING PANEL FOR COVER ON LEFT OR RIGHT SIDE MEMBER**
- Remove front right wheel arch cover (rear section). See **51 71 039 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (REAR SECTION)**

- Remove front right auxiliary turn indicator light. See **63 13 200 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT AUXILIARY DIRECTION INDICATOR**

Release screw (1).

Twist filler duct (2) in direction of arrow out of fluid reservoir for windscreen washer unit (3) and remove.

If necessary, release vent line (4) at mounting points (5) from fluid reservoir for windscreen washer unit (3).

Release screws.

Press off side panel slightly.

Installation:

Tightening torque (front side panel to body area, A-pillar): 6 N.m.

Tightening torque (front side panel to body area, A-pillar): 6 N.m.

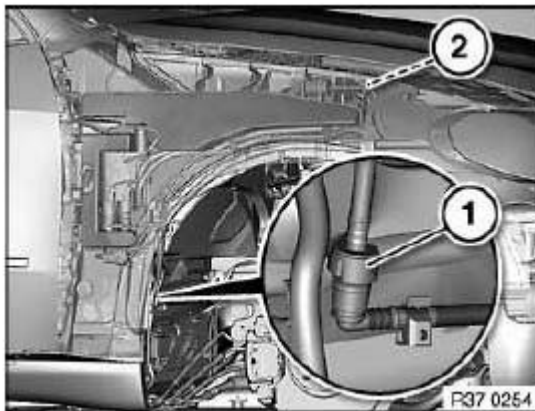


Fig. 77: Identifying Quick-Connect Coupling And Vent Line
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect quick-connect coupling (1) and seal lower vent line connection with sealing plug.

Remove vent line (2) from fluid reservoir for windscreen washer unit.

37 20 001 REMOVING AND INSTALLING/REPLACING DYNAMIC DRIVE VALVE BLOCK

Special tools required:

- 13 5 020
- 37 1 151
- 37 1 152

WARNING: Danger of poisoning if oil is ingested/absorbed through the skin! See 00 DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN

Risk of injury if oil comes into contact with eyes and skin! See 00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN

IMPORTANT: Adhere to the utmost cleanliness. Do not allow any dirt to enter the hydraulic system.

NOTE: In a warranty case you must always provide a fault memory printout, even where there is no fault memory entry, with the defective part. In addition, the valve block openings must be sealed with the protective caps (of the new part).

Necessary preliminary tasks:

- Draw off and dispose of hydraulic fluid from fluid reservoir
- Partially remove front right wheel arch cover (rear section). See 51 71 039 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (REAR SECTION)
- Remove right underbody panelling. See 51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING

Removing valve block:

Disconnect plug connections (1) and expose wiring harness up to valve block.

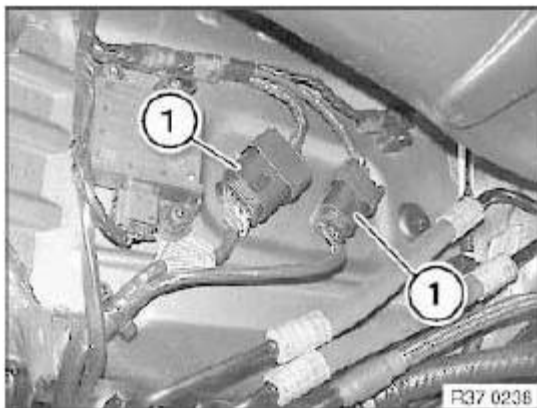


Fig. 78: Identifying Plug Connections

Courtesy of BMW OF NORTH AMERICA, INC.

Release screw pins (1), open holder and suspend hydraulic lines to one side.

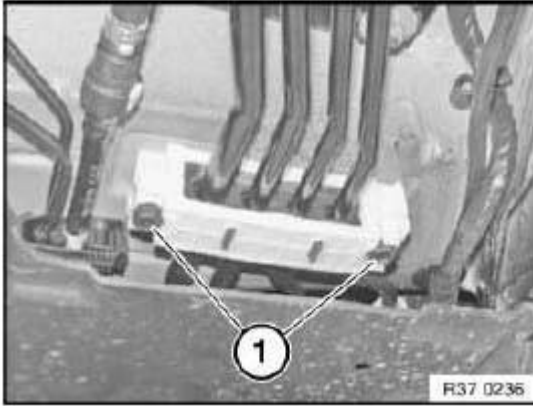


Fig. 79: Identifying Screw Pins

Courtesy of BMW OF NORTH AMERICA, INC.

Open holder (1) and remove control lines to rear axle oscillating motor.

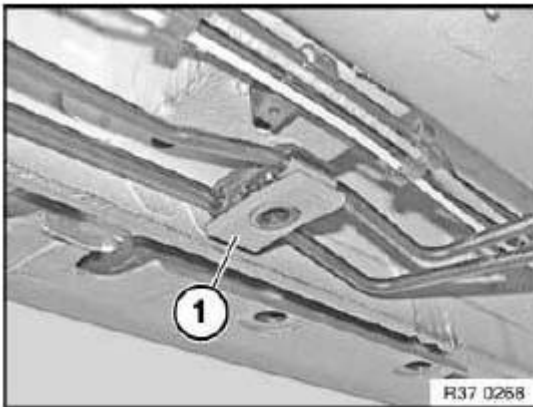


Fig. 80: Identifying Control Lines And Holder

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Hydraulic line and connection on valve block must be fitted with suitable sealing plugs immediately after removal!

Release hollow nuts of control lines (1, 2) to front axle oscillating motor with special tool 37 1 151.

Release hollow nuts of control lines (3, 4) to rear axle oscillating motor with special tool 37 1 151.

Release hollow nut of pressure line (5) with special tool 13 5 020.

Release hollow nut of return line (6) with special tool 37 1 152.

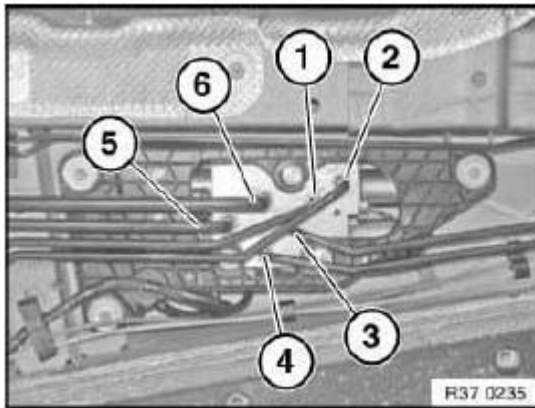


Fig. 81: Identifying Hollow Nut Of Return Line
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip wiring harness (1).

Release nuts (2) and remove valve block.

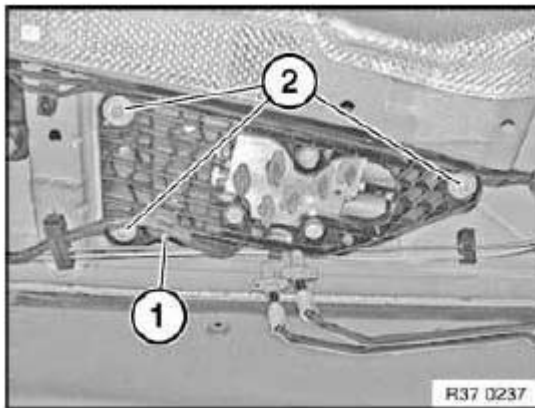


Fig. 82: Identifying Wiring Harness And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Installing valve block:

Replace self-locking nuts.

Mount valve block with nuts (2) on body.

Tightening torque 37 14 10AZ.

Secure wiring harness (1) to valve block holder.

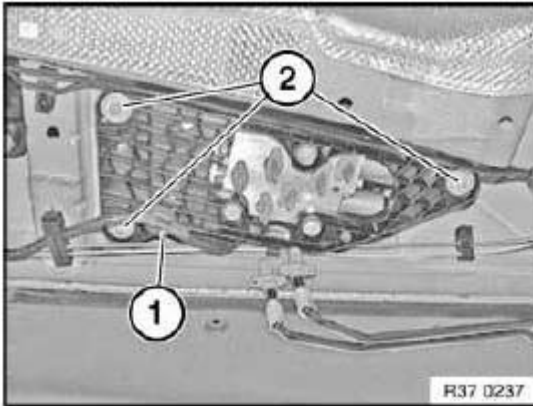


Fig. 83: Identifying Wiring Harness And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: When assembling, make sure that only the sealing plugs of the line to be fitted are removed.
Do not damage sealing surfaces of hydraulic lines.

NOTE: Make sure hydraulic lines are laid without tension and with sufficient spacing to adjoining components.

Installation sequence for hydraulic lines:

1. Install control lines (3, 4)

Tightening torque 35 N.m.

2. Install pressure line (5)

Tightening torque 35 N.m.

3. Install return line (6)

Tightening torque 35 N.m.

4. Install control lines (1, 2)

Tightening torque 35 N.m.

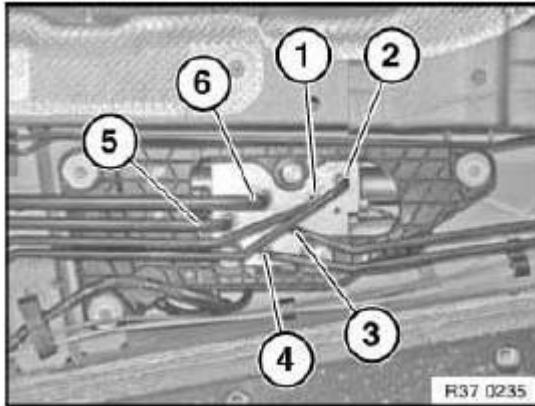


Fig. 84: Identifying Hollow Nut Of Return Line
Courtesy of BMW OF NORTH AMERICA, INC.

Check seating and position of line holder (1), correct if necessary.

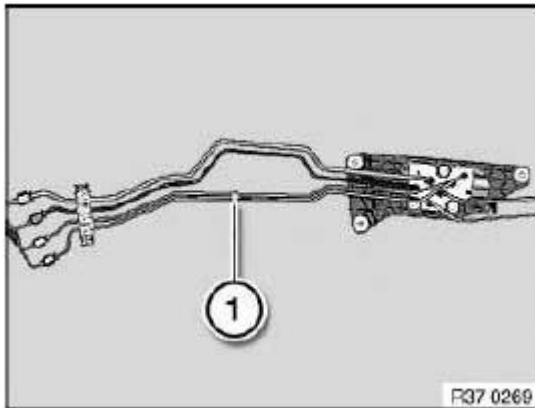


Fig. 85: Identifying Line Holder
Courtesy of BMW OF NORTH AMERICA, INC.

Replace screw pins (1).

Insert hydraulic lines in holder and seal holder with screw pins (1).

Tightening torque 35 N.m.

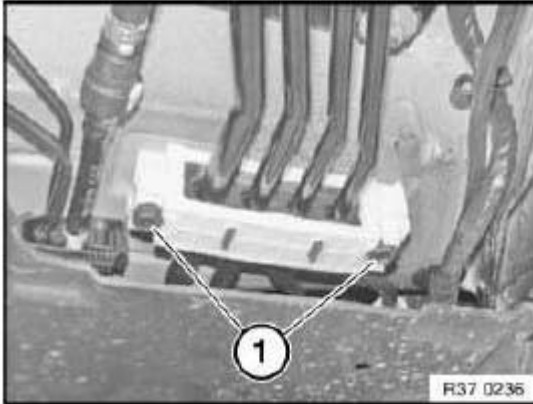


Fig. 86: Identifying Screw Pins

Courtesy of BMW OF NORTH AMERICA, INC.

Insert control lines in holder (1) and seal holder.

NOTE: Replace damaged holder.

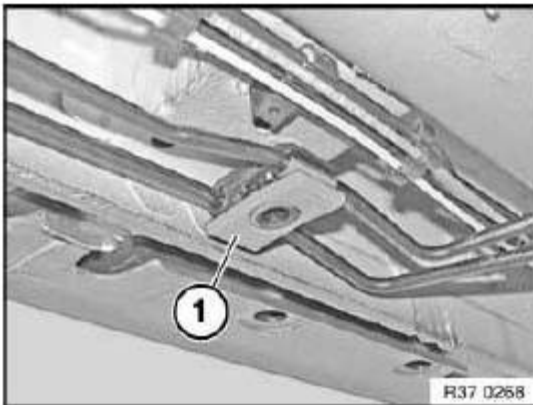


Fig. 87: Identifying Control Lines And Holder

Courtesy of BMW OF NORTH AMERICA, INC.

Connect plug connections (1) and lay wiring harness up to valve block.

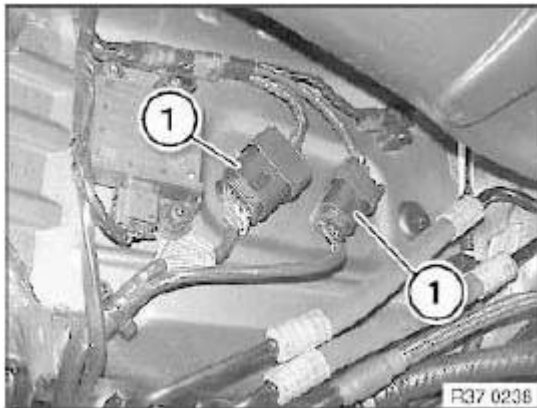


Fig. 88: Identifying Plug Connections

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Fill and bleed hydraulic system. See **32 13 006 BLEEDING POWER STEERING (VERSION WITH DYNAMIC DRIVE)**
- Check pipe connections for leaks
- Carry out initial Dynamic Drive operation. See **37 10 001 Initial Operation With Test Run of Dynamic Drive**

37 22 ... REPLACING AIR SUPPLY UNIT (VERSION WITH DYNAMIC DRIVE)

WARNING: Danger of injury!

Drain the air spring system before carrying out any work on the air supply unit, air pipes and air springs! Danger of injury if this instruction is not complied with!

Risk of damage!

Extreme cleanliness must be ensured in the connection area of the pipes during removal and installation. Even the smallest of dirt particles can cause leakage in the air spring system.

NOTE: Read and comply with notes on air spring system. See **37 00 ... Notes on Air Spring System**

Necessary preliminary tasks:

- Deactivate and empty air spring system. See **37 00 100 Draining/filling Air Spring System**
- Remove right underbody panelling. See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING**
- Remove right tank underride protection. See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING**

Release screw pins (1) and open holder.

Installation:

Replace screw pins.

Tightening torque, see 37 14 22AZ in **37 14 ELECTRIC COMPONENTS**

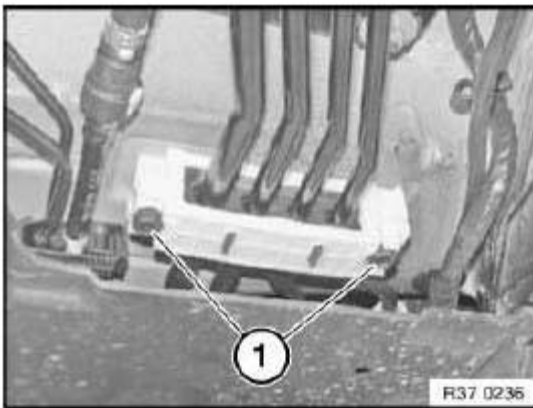


Fig. 89: Identifying Screw Pins

Courtesy of BMW OF NORTH AMERICA, INC.

Expose control lines (1) up to front tension strut.

Remove connecting line for valve block from holder (3).

Release nuts (2) and remove valve block from body.

Installation:

Replace self-locking nuts.

Tightening torque, see 37 14 10AZ in **37 14 ELECTRIC COMPONENTS**

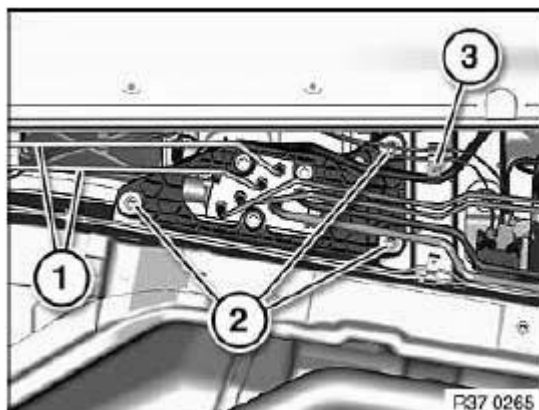


Fig. 90: Identifying Control Lines And Nuts
 Courtesy of BMW OF NORTH AMERICA, INC.

Further procedure is identical to:

- Replacing air supply unit. See 37 22 540 Replacing Air Supply Unit

After installation:

- Activate and fill air suspension system. See 37 00 100 Draining/filling Air Spring System

37 22 540 REPLACING AIR SUPPLY UNIT

WARNING: Danger of injury!

Drain the air spring system before carrying out any work on the air supply unit, air pipes and air springs! Danger of injury if this instruction is not complied with!

Risk of damage!

Extreme cleanliness must be ensured in the connection area of the pipes during removal and installation. Even the smallest of dirt particles can cause leakage in the air spring system.

NOTE: Read and comply with notes on air spring system. See 37 00 ... Notes on Air Spring System

Necessary preliminary tasks:

- Deactivate and empty air spring system. See 37 00 100 Draining/filling Air Spring System
- Remove right underbody panelling. See 51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING

IMPORTANT: Do not kink, twist or crush lines

Disconnect plug connections (1-3).

Disconnect quick-connect coupling (4) and seal both lines with adhesive tape.

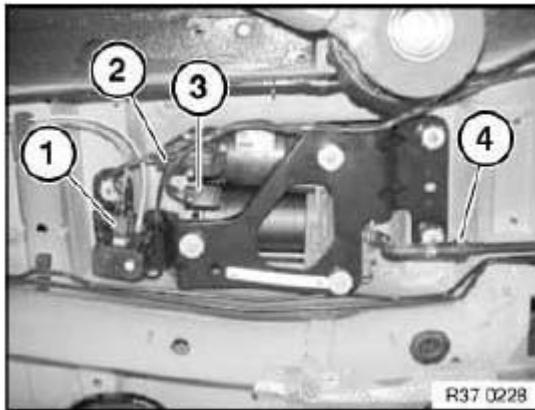


Fig. 91: Identifying Quick-Connect Coupling And Plug Connections
Courtesy of BMW OF NORTH AMERICA, INC.

Release banjo bolts (1, 2).

Lay pipes to one side and seal off with adhesive tape.

Installation:

Check banjo bolts for dirt, clean if necessary. Then carefully screw in banjo bolts by hand to avoid damaging the plastic threads and with it the air supply unit.

Tightening torque, see 37 12 1AZ in **37 12 CONTROL AND SUSPENSION SYSTEMS, REAR**

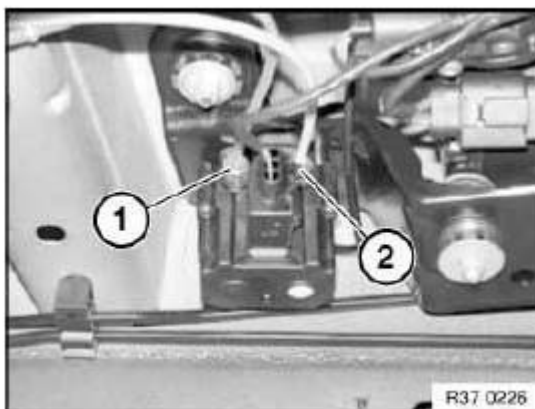


Fig. 92: Identifying Banjo Bolts
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nuts (1).

Remove air supply unit (2).

Installation:

Replace self-locking nuts.

Tightening torque, see 37 22 1AZ in **37 22 PUMP UNIT WITH RESERVOIR**

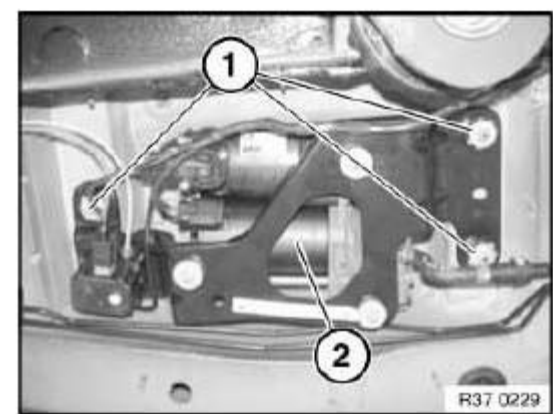


Fig. 93: Identifying Air Supply Unit And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Activate and fill air suspension system. See **37 00 100 Draining/filling Air Spring System**

90 TROUBLESHOOTING

37 90 ... TROUBLESHOOTING ON DYNAMIC DRIVE (ARS)

TROUBLESHOOTING CHART

Fault	Cause	Remedy
Noises (banging, rattling) during straight-ahead driving and gentle steering through centre	Screw connections on front axle/rear axle loose	Refer to 31 90... FRONT AXLE TROUBLESHOOTING , 33 90 ... REAR AXLE TROUBLESHOOTING
	Stabilizer link loose or defective	1. Check stabilizer link joints for damage/play; if necessary, replace stabilizer link. See 33 55 040 REPLACING STABILIZER LINKS FOR STABILIZER 2. Tighten down screw connections to torque
	Stabilizer screw connection loose	Tighten down screw connections as specified in repair instruction. See 37 11

	<u>010 Removing and Installing/Replacing Front Active Stabilizer, 37 12 220</u> <u>Removing and Installing/Replacing Rear Active Stabilizer</u>
Hydraulic lines installed distorted	1. Check whether hydraulic lines are installed in holders twisted (when system is depressurized, hydraulic lines must be guided in holders virtually without elastic distortion of decoupling elements) 2. Align all hydraulic lines for Dynamic Drive. See <u>32 41 ... REPLACING RETURN LINE FOR DYNAMIC DRIVE (N62TU, N52)</u>
Hydraulic lines fitted too closely or have insufficient clearance (elastic movement of line during pressure build-up)	1. Check whether hydraulic lines are fitted too closely or have insufficient clearance (for minimum clearance, see <u>32 41 ... REPLACING RETURN LINE FOR DYNAMIC DRIVE (N62TU, N52)</u> 2. Align all hydraulic lines for Dynamic Drive as specified in repair instruction. See <u>32 41 ... REPLACING RETURN LINE FOR DYNAMIC DRIVE (N62TU, N52)</u>
Line holders loose	1. Check whether line holders are correctly screwed and holder halves are correctly engaged 2. Fit all line holders as specified in repair instruction. See <u>32 41 ... REPLACING RETURN LINE FOR DYNAMIC DRIVE (N62TU, N52)</u>
Decoupling elements of hydraulic lines must not be damaged or missing	1. Check whether decoupling elements (rubber) are present and correctly fitted or damaged 2. Replace/fit decoupling elements
Decoupling elements of valve block holder damaged or missing	1. Check whether decoupling elements (rubber) are present and correctly fitted or damaged 2. Replace valve block. See <u>37 20 001 Removing and Installing/Replacing DYNAMIC</u>

		<u>DRIVE Valve Block</u>
	Line holders on hydraulic lines missing or fitted in incorrect position	1. Check whether line holders are present and fitted in correct position 2. Fit line holders as specified in repair instruction. See <u>37 13 100 Removing and Installing/Replacing Pressure Lines For Oscillating Motor/Front Axle, 37 13 110 Removing and Installing/Replacing Pressure Lines For Oscillating Motor/Rear Axle</u>
	Curve deviation of spring-type actuators	1. Check during test drive on a level road surface whether noises occur during slight steering from straight-ahead direction 2. If other causes are ruled out and noise is reproducible during test drive, replace spring-type actuators in pairs. See <u>37 11 ... Replacing Spring-Type Actuator For Active Stabilizer At Front</u>
	Valve block does not conform to specifications	1. Carry out initial Dynamic Drive operation. See <u>37 10 001 Initial Operation With Test Run of Dynamic Drive</u> 2. If other causes are ruled out or if diagnosis faults are detected, replace valve block. See <u>37 20 001 Removing and Installing/Replacing DYNAMIC DRIVE Valve Block</u>
Rattling noises during excitation provided by road surface and straight-ahead driving (without altering steering wheel position) and Noises occur to a large extent independently of temperature influences and Noises occur to a large extent independently of temperature influences	Screw connections on front axle/rear axle loose	Refer to <u>31 90... FRONT AXLE TROUBLESHOOTING , 33 90 ... REAR AXLE TROUBLESHOOTING</u>
	Stabilizer link loose/defective	1. Check stabilizer link joints for damage; if necessary, replace stabilizer link. See <u>33 55 040 REPLACING STABILIZER LINKS FOR STABILIZER</u> 2. Tighten down screw connections to torque
	Stabilizer screw connection loose	Tighten down screw connections as specified in repair instruction. See <u>37 11</u>

	<u>010 Removing and Installing/Replacing Front Active Stabilizer, 37 12 220</u> <u>Removing and Installing/Replacing Rear Active Stabilizer</u>
Hydraulic lines installed distorted	1. Check whether hydraulic lines are installed in holders twisted (when system is depressurized, hydraulic lines must be guided in holders virtually without elastic distortion of decoupling elements) 2. Align all hydraulic lines for Dynamic Drive as specified in repair instruction. See <u>32 41 ... REPLACING RETURN LINE FOR DYNAMIC DRIVE (N62TU, N52)</u>
Hydraulic lines fitted too closely or have insufficient clearance (elastic movement of line during pressure build-up)	1. Check whether hydraulic lines are fitted too closely or have insufficient clearance (for minimum clearance, see repair instruction) 2. Align all hydraulic lines for Dynamic Drive as specified in repair instruction. See <u>32 41 ... REPLACING RETURN LINE FOR DYNAMIC DRIVE (N62TU, N52)</u>
Line holders loose	1. Check whether line holders are correctly screwed and holder halves are correctly engaged 2. Fit all line holders as specified in repair instruction. See <u>32 41 ... REPLACING RETURN LINE FOR DYNAMIC DRIVE (N62TU, N52)</u>
Decoupling elements of hydraulic lines must not be damaged or missing	1. Check whether decoupling elements (rubber) are present and correctly fitted or damaged 2. Replace or fit decoupling elements
Decoupling elements of valve block holder damaged or missing	1. Check whether decoupling elements (rubber) are present and correctly fitted or damaged 2. Replace valve block. See <u>37 20 001 Removing and Installing/Replacing DYNAMIC</u>

		<u>DRIVE Valve Block</u>
	Line holders on hydraulic lines missing or fitted in incorrect position	1. Check whether line holders are present and fitted in correct position 2. Fit all line holders as specified in repair instruction. See <u>37 13 100 Removing and Installing/Replacing Pressure Lines For Oscillating Motor/Front Axle, 37 13 110 Removing and Installing/Replacing Pressure Lines For Oscillating Motor/Rear Axle</u>
Rattling noises during excitation provided by road surface and straight-ahead driving (without altering steering wheel position) and Noises occur to a large extent independently of temperature influences and Noises occur to a large extent independently of temperature influences	Protective rubber caps (red with pull band) not removed from pressure relief valve	1. Check whether protective rubber caps (red) are present on pressure relief valve 2. Pull protective rubber caps (red) off pressure relief valve, do not remove/damage air filter elements (black plastic) in so doing
	Pressure relief valve faulty (contaminated, fouled with oil)	1. Check whether oil and dirt residues are present on air filter element (black plastic) 2. Replace pressure relief valves in pairs. See <u>37 11 ... Replacing Pressure Relief Valve For Active Stabilizer At Front</u>
	Curve deviation of spring-type actuators	1. Check during test drive whether noises occur during straight-ahead driving and one-side excitation provided by road surface on front axle 2. If other causes are ruled out and noise is reproducible during test drive, replace spring-type actuators in pairs. See <u>37 11 ... Replacing Spring-Type Actuator For Active Stabilizer At Front</u>
	Valve block does not conform to specifications	1. Carry out initial Dynamic Drive operation. See <u>37 10 001 Initial Operation With Test Run of Dynamic Drive</u> 2. If other causes are ruled out or if diagnosis faults are detected, replace valve block. See <u>37 20 001</u>

		<u>Removing and Installing/Replacing DYNAMIC DRIVE Valve Block</u>
Rattling noises during excitation provided by road surface and straight-ahead driving (without altering steering wheel position) and Noises only at higher temperatures (i.e. from outside temperatures from 25° C or in event of greatly heated-up vehicle at operating temperature)	Pressure relief valve faulty	1. Check during test drive whether noises occur during straight-ahead driving and one-side excitation provided by road surface on front axle 2. If other causes are ruled out and noise is reproducible during test drive, replace pressure relief valves in pairs. See <u>37 11 ... Replacing Pressure Relief Valve For Active Stabilizer At Front</u>
Noises (hissing)	Flow noise of hydraulic fluid in damaged hydraulic lines	1. Check whether hydraulic lines are crushed or bent 2. Rectify identified defects on hydraulic lines. See <u>32 41 ... REPLACING RETURN LINE FOR DYNAMIC DRIVE (N62TU, N52)</u>
	Flow noise of hydraulic fluid in valve block not conforming to specifications	1. Carry out initial Dynamic Drive operation. <u>37 10 001 Initial Operation With Test Run of Dynamic Drive.</u> 2. If a fault on valve block was diagnosed during initial operation, replace valve block. See <u>37 20 001 Removing and Installing/Replacing DYNAMIC DRIVE Valve Block</u>
Pump noise from engine compartment depending on engine speed or only during cornering	Dynamic Drive pressure line has impaired function or is damaged	1. Check whether Dynamic Drive pressure line between power steering pump and valve block is crushed or bent 2. Replace Dynamic Drive pressure line. See <u>32 41 ... REPLACING PRESSURE LINE FOR DYNAMIC DRIVE (N62TU)</u>
	Power steering pump defective	1. Check whether power steering pump and pump drive are damaged 2. If other causes are ruled out, replace power steering pump. See <u>32 41 037</u>

REMOVING AND
INSTALLING/REPLACING
POWER STEERING PUMP FOR
POWER STEERING GEAR
WITH DYNAMIC DRIVE (N62,
N62TU)