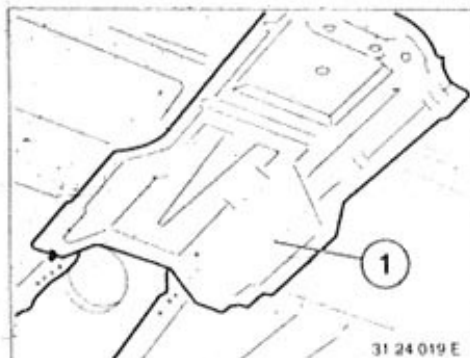


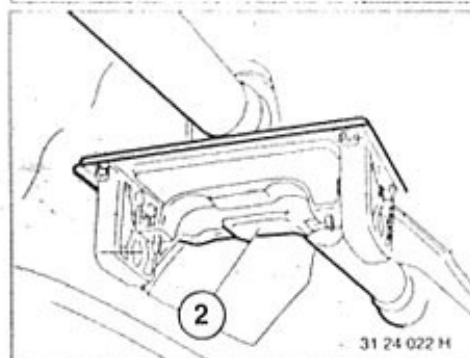
26 Propeller shaft

26 11 000	Propeller shaft – remove and install	26-11/1
030	Propeller shaft – balance (center and adjust deflection angle)	26-11/3
051	Propeller shaft joint disc, front – replace	26-11/5
090	Propeller shaft center – remove and install/replace	26-11/6
160	Propeller shaft c.v. joint – replace	26-11/7
665	Dust cover – replace	26-11/9
26 12 001	Propshaft center, complete – replace	26-12/1
011	Grooved ball bearing in propeller shaft center bearing – replace	26-12/1
500	Propeller shaft center bearing – pre-load/check	26-12/1
	Propeller shaft – troubleshoot	26-90/1



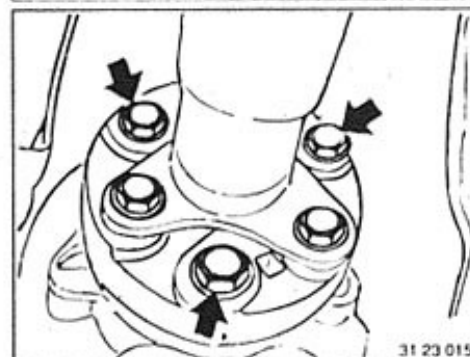
26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT

Remove exhaust assembly – see 18 00 020.
Remove heat shield (1).

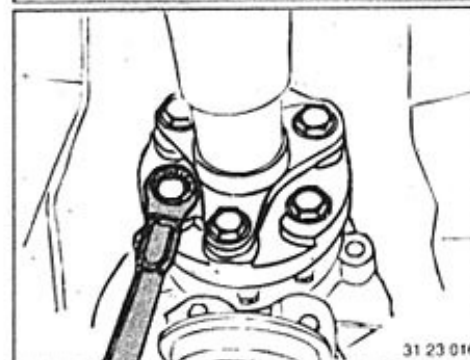


Unscrew exhaust holder (2).

Installation
Tightening torque*.

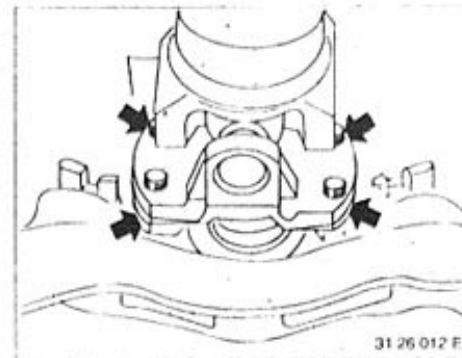


Version with Joint Disc:
Unscrew joint disc on transmission.



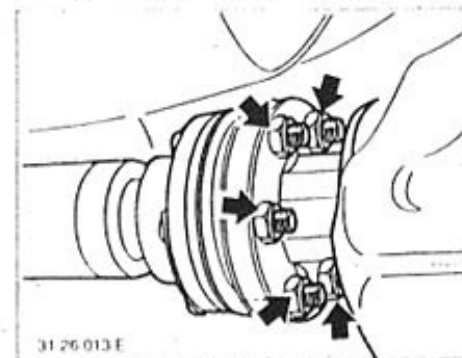
Installation:
Replace stop nuts.
Tighten bolts with specified torque*.

* See Specifications



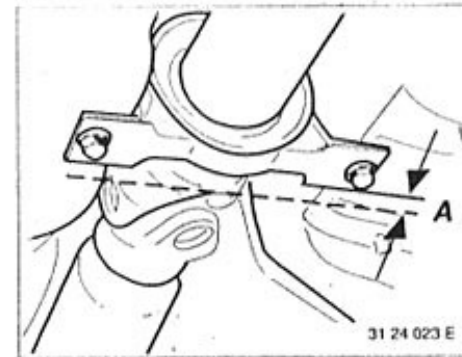
Version with Universal Joint:
Unscrew universal joint on transmission.

Installation
Tightening torque*.



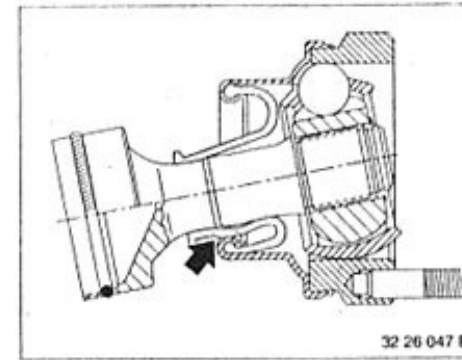
Unscrew constant velocity joint on final drive.

Installation
Replace stop nuts.
Tightening torque*.



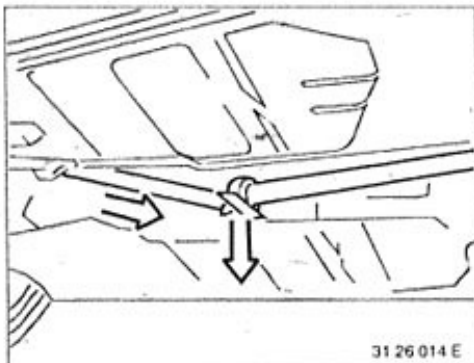
Unscrew center mount.

Installation:
Preload center mount forward by distance $A = 2 \dots 4 \text{ mm}$ (0.079 ... 0.157").
Tightening torque*.

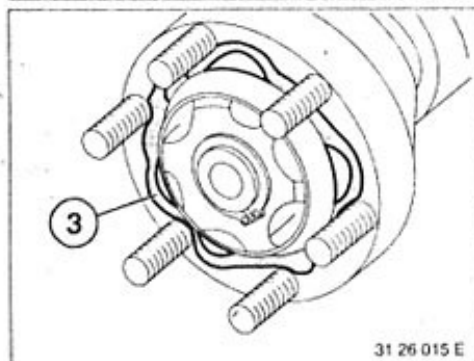


Important!
Never let the propeller shaft fall into the joints. This could lead to damaging the rubber cover of a constant velocity joint in particular or even the joints.

* See Specifications



Bend the propeller shaft down on the center mount and pull it off of the centering pin on a manual transmission or constant velocity joint on the final drive.



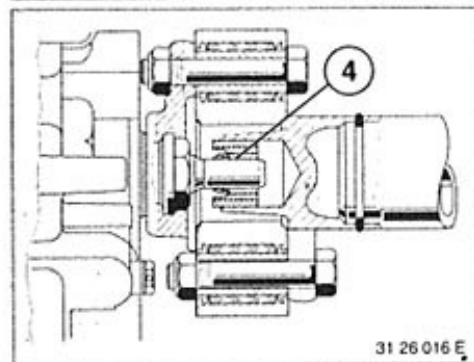
Important!

Check gasket (3).

Inspect gasket (3), replacing if necessary.

The constant velocity joint is not encapsulated, so that the joint must be protected against dirt with a transport cap or similar item.

Check / correct the grease* filling prior to installation.



Installation:

Check center (4).

Replace a damaged center.

Coat center with Molykote Longterm 2 prior to installation.

26 11 030 BALANCING PROPELLER SHAFT (CENTERING AND ADJUSTING DEFLECTION ANGLES)

Vibration or Noise:

Requirements:

Propeller shaft in perfect optical condition.

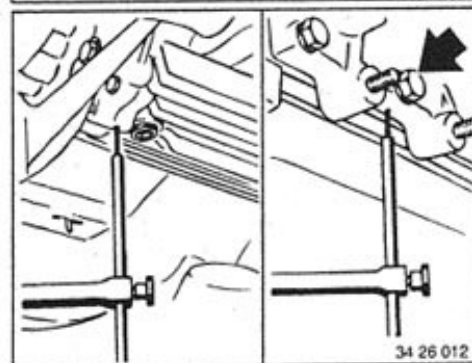
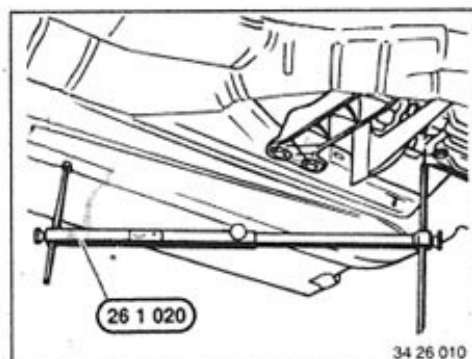
Balance the propeller shaft if balance plates are missing or there is suspicion of propeller shaft imbalance (refer to operating instructions supplied with the balancing machine).

Important!

Test run a jacked-up car only with supported wheel suspension on the driven wheels (deflection angle of output shaft).

Never exceed the top speed specified for a car in jacked-up state or on a dynamometer test stand.

Conform with safety precautions!



Centering Propeller Shaft:

Loosen exhaust assembly, engine rubber mounts and transmission cross member.

Apply Special Tool 26 1 020.

Application Points:

Bore in engine carrier at rear.

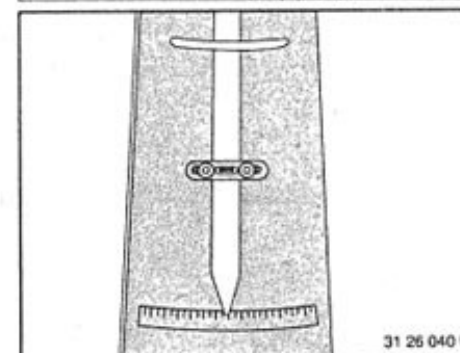
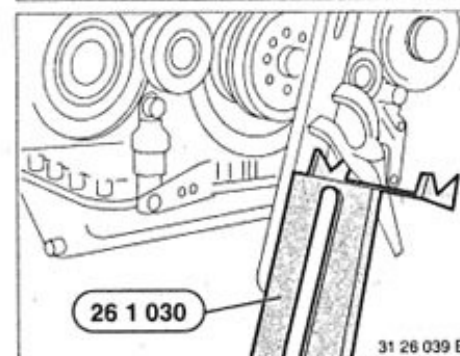
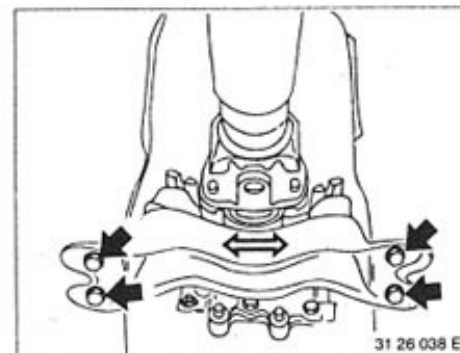
Manual Transmission:

– cast rib at center

Automatic Transmission:

– center bolt of transmission extension

Punch mark measuring points.



Move transmission sideways until special tool gage shows same distance on the left and right sides. Mount cross member. Tightening torque*.

Checking Deflection Angle of Propeller Shaft:

Unscrew splash guard.

Clamp helping rail (steel ruler) on pulley in vertical position with a clamping pliers.

Apply Special Tool 26 1 030 on the helping rail.

Set the indicator perpendicular with help of the water scale. Read degrees.

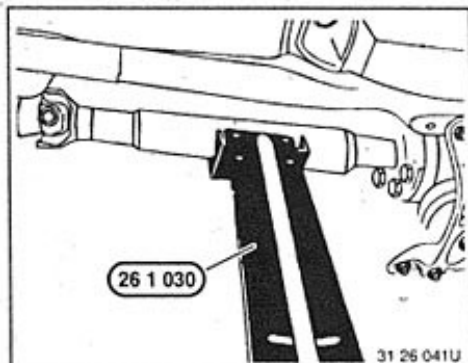
Note:

Always apply the special tool with the scale in the same direction (e.g. scale right).

One graduation = 5°.

The position of the car is not important, since only separate angles are compared.

* See Specifications



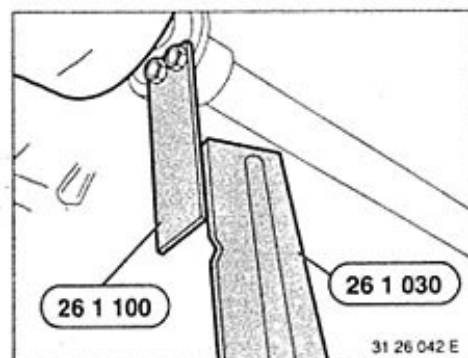
Place special tool on front propeller shaft section and measure the angle. Determine deflection angle* of joint coupling and, if necessary, correct by installing max. 3 mm (0.118") thick shims on transmission suspension or on center mount.

Example:

Engine angle	2° 16'
Propeller shaft angle	- 2° 06'
Joint coupling defl. angle	+ 0° 10'

Note:

When correcting deflection angles by installing shims, remember that this will change the deflection angle of neighboring joints. In general a small as possible deflection angle on joints would be ideal.



Unscrew two nuts on constant velocity joint.

Mount Special Tool 26 1 100 on constant velocity joint.

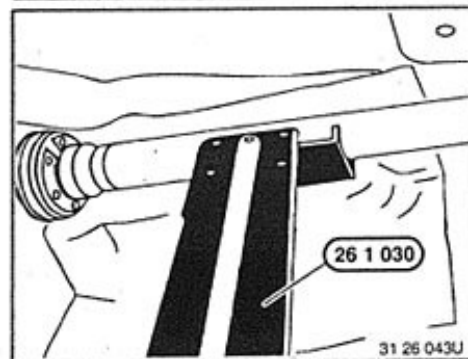
Place Special Tool 26 1 030 on Special Tool 26 1 100.

Measure the deflection angle*.

Installation:

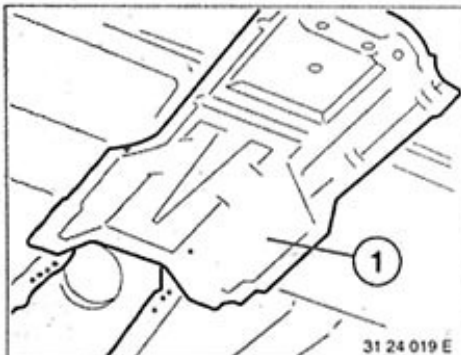
Replace stop nuts.

Tightening torque*.



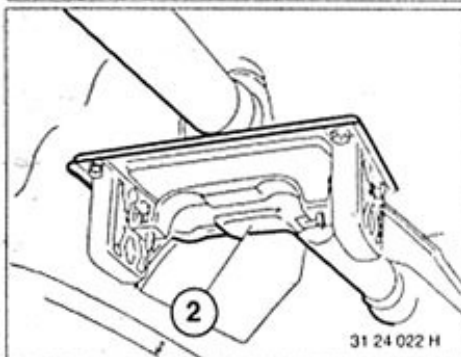
Place special tool on rear propeller shaft section and measure the angle. Determine deflection angle* of center mount and, if necessary, correct by installing max. 3 mm (0.118") thick shims on the transmission suspension or center mount.

* See Specifications



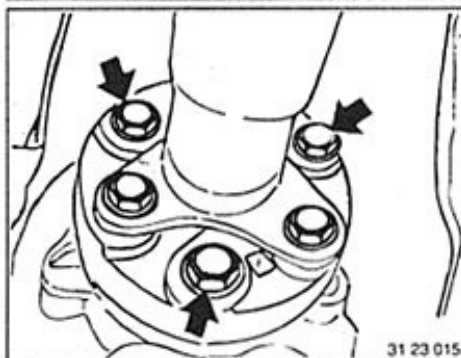
26 11 051 REPLACING JOINT DISC FOR FRONT END OF PROPELLER SHAFT

Remove exhaust assembly – see 18 00 020.
Remove heat shield (1).

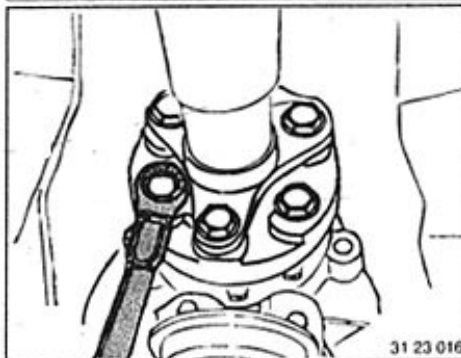


Unscrew exhaust holder (2).

Installation:
Tightening torque*.

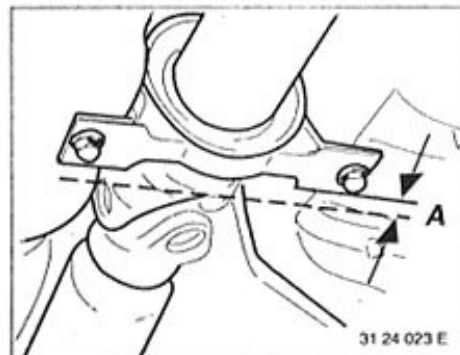


Unscrew joint disc on transmission.



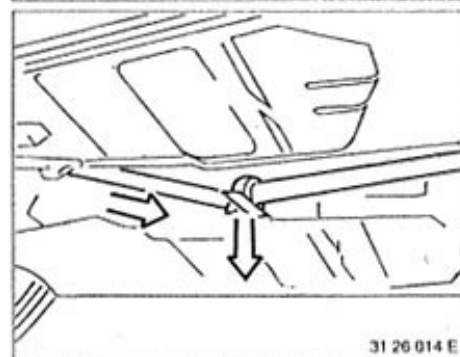
Installation:
Replace stop nuts.
Tighten bolts with specified torque*.

* See Specifications

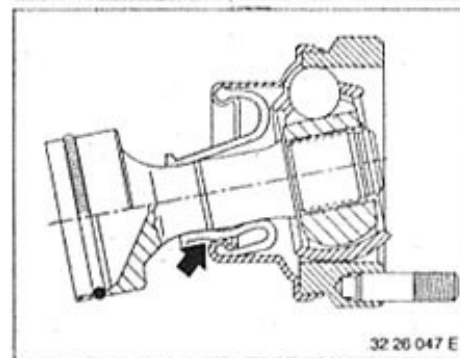


Unscrew center mount.

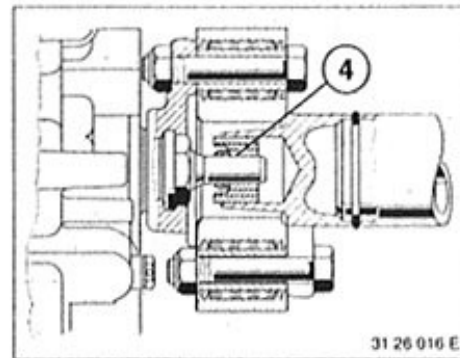
Installation:
Preload center mount forward by distance $A = 2 \dots 4 \text{ mm}$ (0.079 ... 0.157").
Tightening torque*.



Bend propeller shaft down at the center mount and pull it off of the centering pin on a manual transmission.

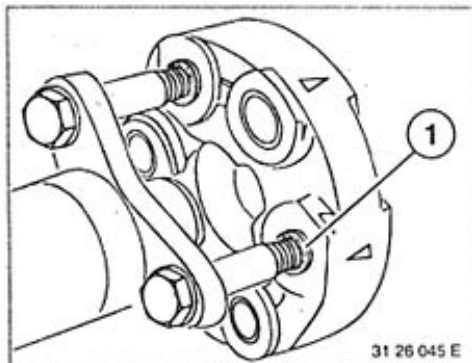


Important!
Never let the propeller shaft fall into the joints. This would lead to damaging the rubber cover of a constant velocity joint in particular.



Installation:
Check center (4).
Replace a damaged center.
Coat the center with Molykote Long-term 2 prior to installation.

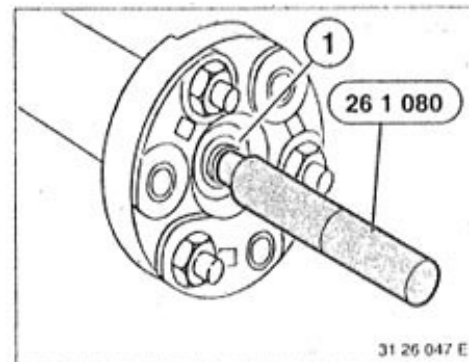
See Specifications



Replace joint disc.

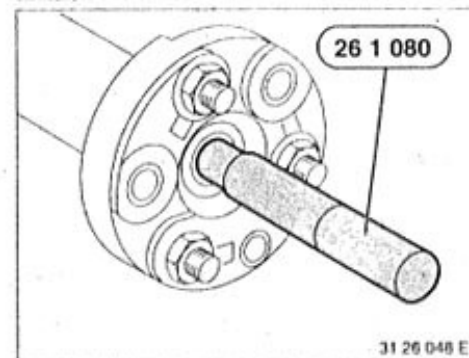
Important!

The joint disc must be installed that the arrows or embossment (1) on the sleeve face the flange arms. Tightening torque*.

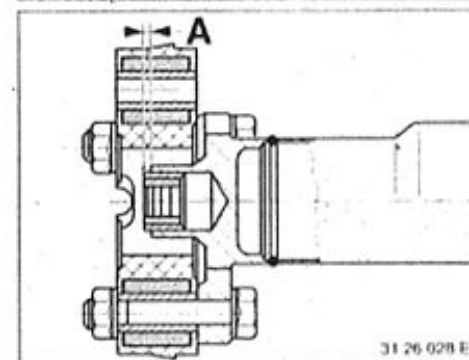


26 11 090 REMOVING AND INSTALLING OR REPLACING CENTER FOR PROPELLER SHAFT

Unscrew propeller shaft at transmission and center mount - refer to 26 11 000. After unscrewing, suspend front end of propeller shaft from car on a piece of wire and bolt propeller shaft to center mount. Fill center with viscous grease and drive out using Special Tool 26 1 080. Pressure on the grease filling will force out center bearing (1).



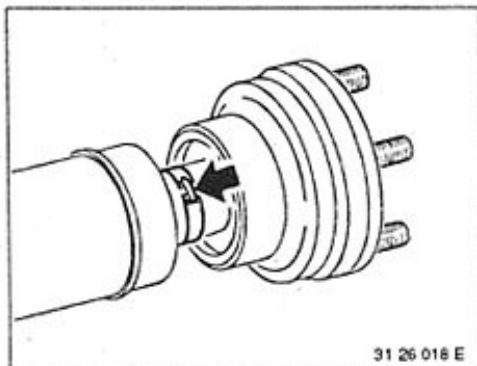
Lubricate center with Molykote Longterm 2** and drive it in using Special Tool 26 1 080. The sealing lip faces out.



Protrusion A = 4.2 mm.

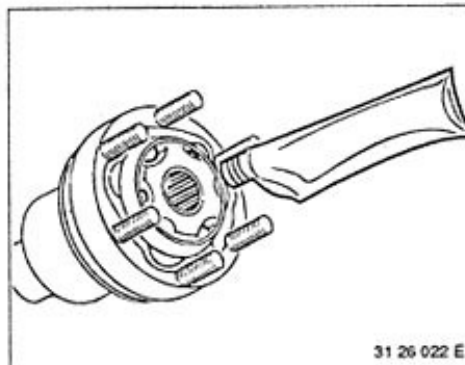
* Refer to Specifications

** Source of Supply: BMW Parts



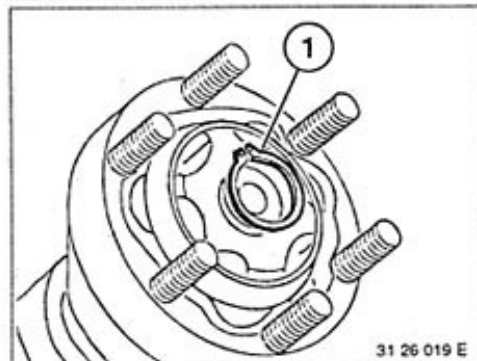
26 11 160 REPLACING CONSTANT VELOCITY JOINT FOR PROPELLER SHAFT

Remove propeller shaft - refer to 26 11 000.
Remove hose clamp.



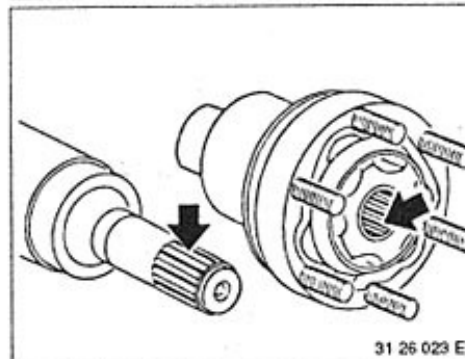
Fill new constant velocity joint with 80 grams of grease**.

Note:
Don't cant the inner race with the cage as the balls would fall out.



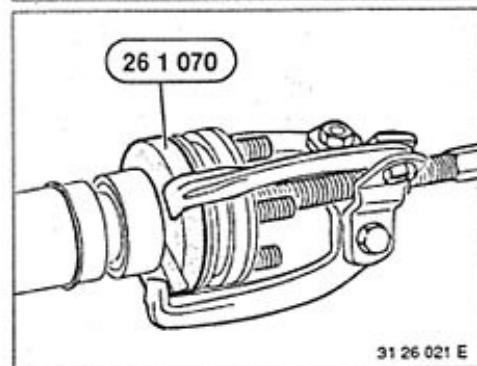
Lift out circlip (1).

Installation:
Replace circlip.

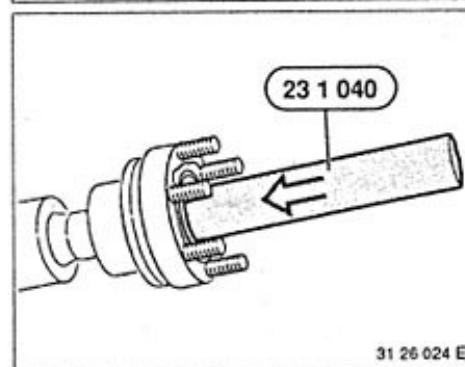


Clean splines to remove grease and then apply a coat of bolt cement**.

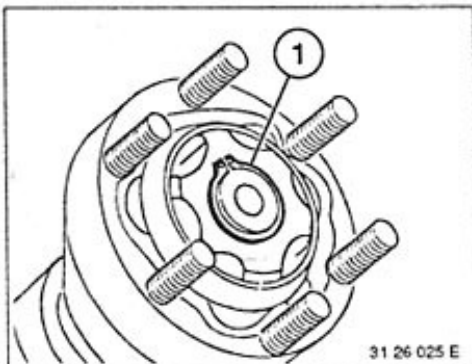
Important!
Keep bolt cement out of the ball grooves.



Push back cover.
Apply Special Tool 26 1 070.
Pull off constant velocity joint using a standard puller.

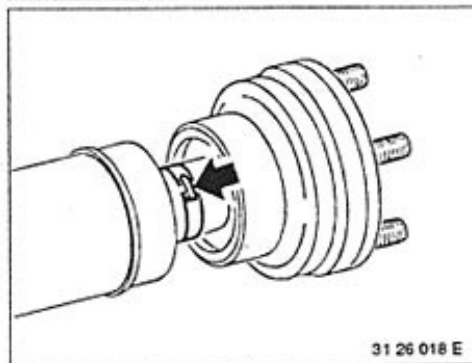


Knock constant velocity joint on to the propeller shaft using Special Tool 23 1 040.



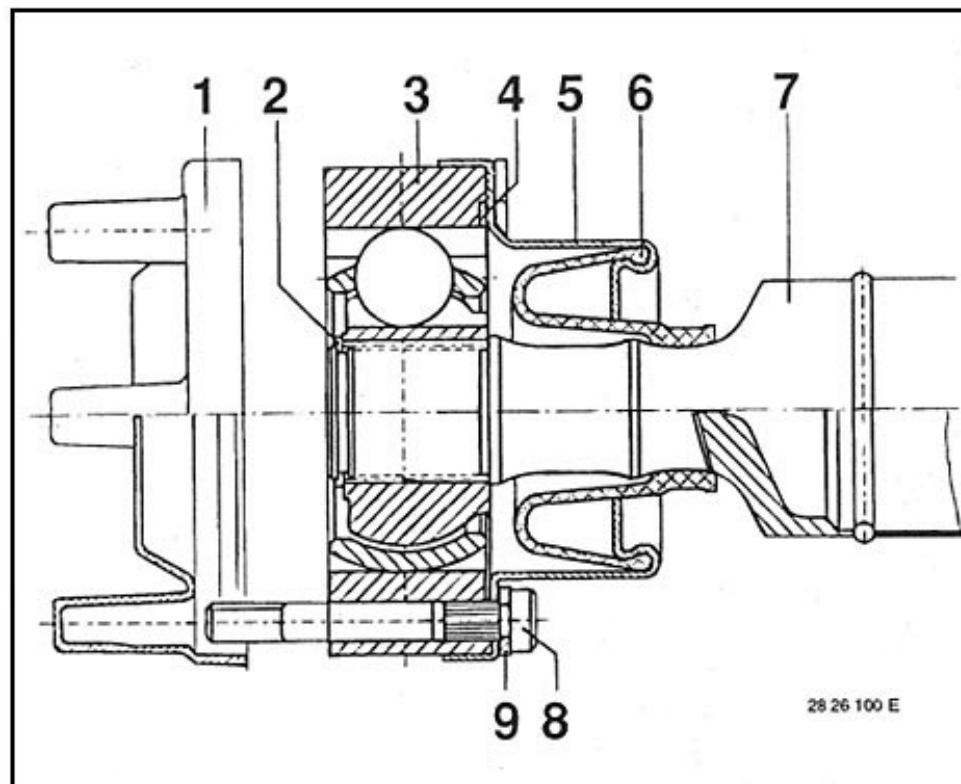
Install circlip (1).

Note:
Check for correct and tight fit.



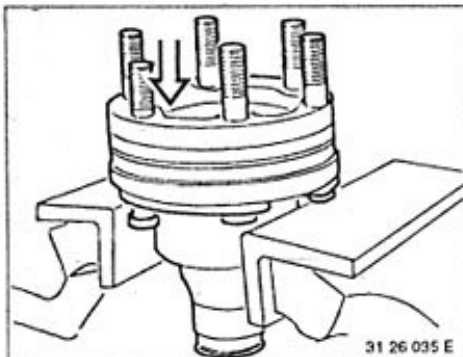
Pull dust cover on to propeller shaft.
Install and tighten hose clamp on the dust cover.

CONSTANT VELOCITY JOINT



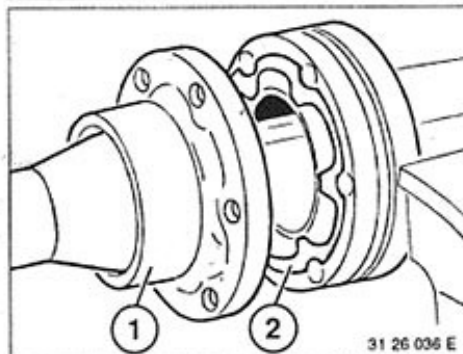
- 1 Transport cap
- 2 Circlip
- 3 Constant velocity joint
- 4 Gasket
- 5 End cover

- 6 Dust cover
- 7 Propeller shaft
- 8 Bolt
- 9 Washer

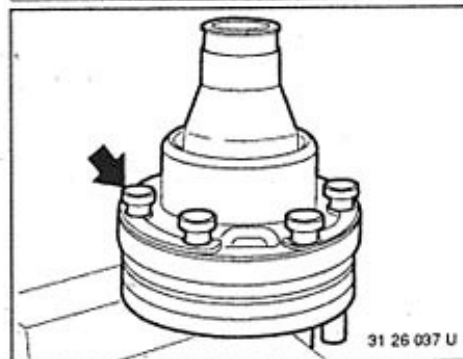


26 11 665 REPLACING DUST COVER
- Constant Velocity Joint
Removed -

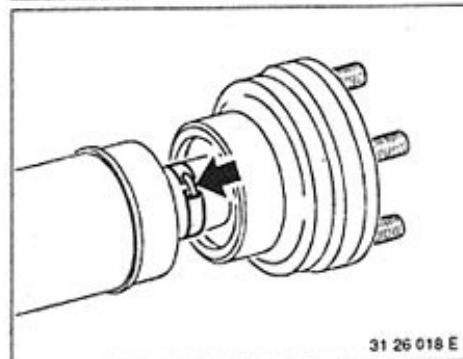
Knock out fillister head bolts using a plastic hammer.
 Remove washers.



Pull or knock off end cover (1).
 Check gasket (2) between constant velocity joint and end cover.
 Check / correct grease filling*.

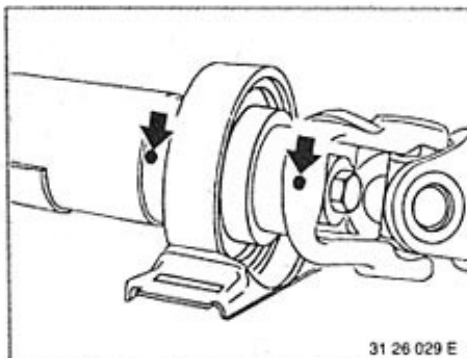


Mount new end cover with dust cover on propeller shaft or constant velocity joint.
 Install washers and fillister head bolts.
 Knock in fillister head bolts to fit tight using a plastic hammer.



Pull dust cover onto propeller shaft.
 Install and tighten hose clamp on dust cover.

* Refer to Specifications

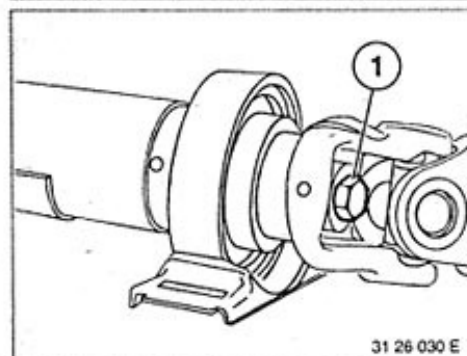


26 12 001 REPLACING PROPELLER SHAFT CENTER MOUNT ASSEMBLY

Remove propeller shaft – see 26 11 000.
Mark position of front propeller shaft section to rear propeller shaft section.

Important!

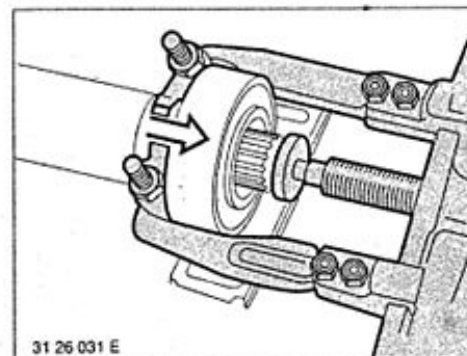
Propeller shaft was balanced in assembled state so that propeller shaft sections must not be turn when installed.



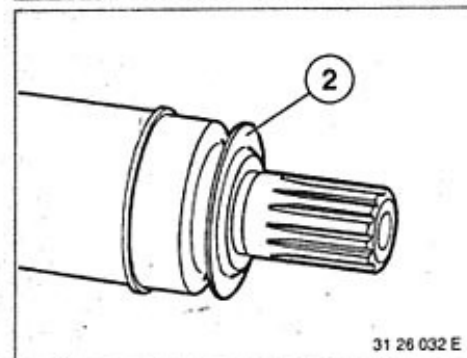
Unscrew bolt (1).
Pull off front propeller shaft section.

Installation:

Assemble propeller shaft that punch marks are opposite each other.
Lock bolt (1) with a bolt cement**.
Tightening torque*.



Pull off center mount complete with the grooved ball bearing, using a standard puller.

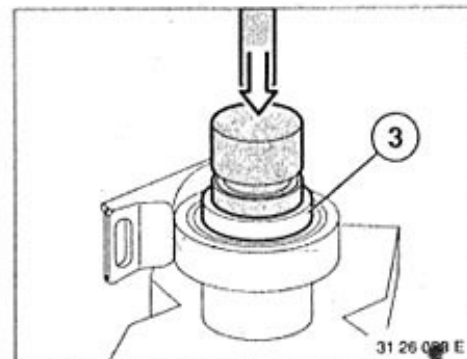


Installation:

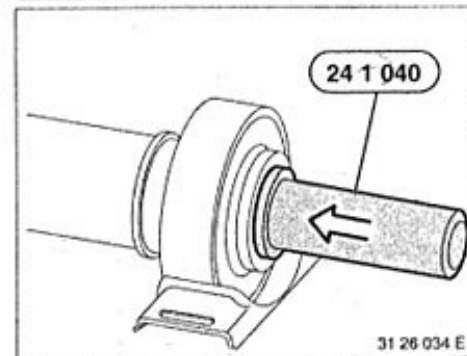
Check installed direction of dust cover (2).

* See Specifications

** Source of Supply: HWB



Press grooved ball bearing (3) into center mount.



Knock in center mount bearing with Special Tool 24 1 040.

Important!

Check for free movement of the center mount bearing.

26 12 011 REPLACING GROOVED BALL BEARING IN PROPELLER SHAFT CENTER MOUNT

Contained In "Replacing Propeller Shaft Center Mount Assembly" – see 26 12 001.

26 12 500 CHECKING PRELOAD OF PROPELLER SHAFT CENTER MOUNT

Contained In "Removing and Installing Propeller Shaft" – see 26 11 000.

TROUBLESHOOTING PROPELLER SHAFT

Condition	Cause	Correction
Drumming noise from non-moving car	a) Propeller shaft without influence.	a) Check engine tuning, remove tension in exhaust assembly.
Vibration when moving off in forward or reverse (center mount knocks through)	a) Propeller shaft not aligned precisely. b) Runout on centering pin, transmission or final drive flanges. c) Center mount rubber damaged. d) Universal joint worn or seized. e) Engine/transmission suspension not okay. f) Joint disc rubber damaged.	a) Align propeller shaft – see 26 00 030. b) Check runout* of centering pin and flanges with a dial gage. Align/replace final drive flange. c) Replace center mount – see 26 12 011. d) Check clearance and movement, replacing propeller shaft if necessary – see 26 11 000. e) Check and align or replace mounts. f) Replace joint disc – see 26 11 051.
Vibration at 40 ... 50 km/h (25 ... 30 mph)	a) Propeller shaft not aligned precisely. b) Runout on centering pin, transmission or final drive flanges. c) Center mount rubber damaged. d) Universal joints worn or seized. e) Joint disc rubber damaged.	a) Align propeller shaft – see 26 00 030. b) Check runout* of centering pin and flanges with a dial gage. Align/replace final drive flange. c) Replace center mount – see 26 12 011. d) Check clearance and movement, replacing propeller shaft if necessary – see 26 11 000. e) Replace joint disc – see 26 11 051.

* See Specifications

TROUBLESHOOTING PROPELLER SHAFT

Condition	Cause	Correction
Drumming noise from 60 km/h (35 mph) on	a) Propeller shaft not aligned precisely or installed with tension. b) Center bearing damaged. c) Runout on centering pin, transmission or final drive flanges. d) Offcenter due to worn flange bores (loose bolts). e) Excessive propeller shaft imbalance; balance plates missing. f) Universal joints worn or seized.	a) Align propeller shaft – see 26 00 030. b) Replace center – see 26 11 501. c) Check runout* of centering pin and flanges with a dial gage. Align/replace final drive flange. d) Replace transmission or final drive flange. e) Check clearance and movement, replacing propeller shaft if necessary – see 26 11 000. f) Check clearance and movement, replacing propeller shaft if necessary – see 26 11 000.
Center mount loud while operating car	a) Center mount not perpendicular to propeller shaft; no or insufficient preload b) Center mount grooved ball bearing not okay.	a) Align center mount to be perpendicular to propeller shaft; preload forward by 2 ... 4 mm (0.079 ... 0.157"). b) Replace grooved ball bearing – see 26 12 011.

* See Specifications