

26 Propeller Shaft

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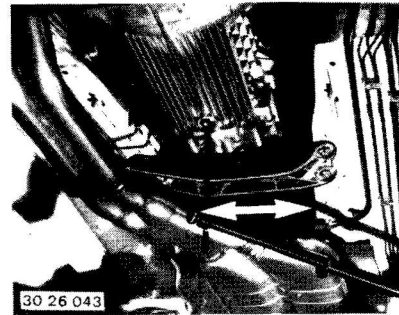
ELIMINATING PROPELLER SHAFT VIBRATION AND NOISE

Requirements:

Elimination of disturbances from faulty engine and transmission mounts, tension in exhaust assembly, etc.. Propeller shaft in perfect optical and mechanical condition. Balance or replace propeller shaft, if balance plates are missing or propeller shaft is suspected to have imbalance (refer to instructions supplied with balancing equipment).

Caution!

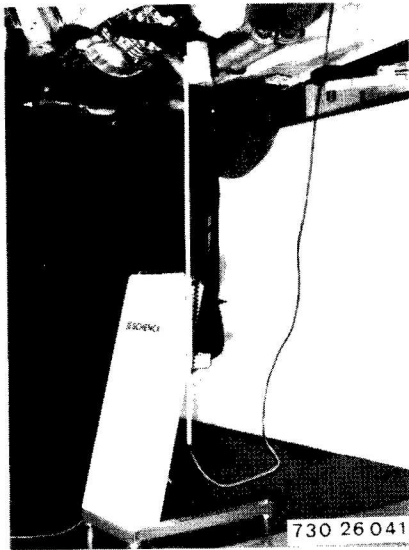
A jacked up car may only be tested operated when the suspension of driven wheels is supported (deflection angle of output shafts). Never exceed the maximum speed specified for a car jacked up or on a dynamometer. Conform with safety regulations!



Move transmission to the side until the special tool gage shows equal spacing on left and right sides.

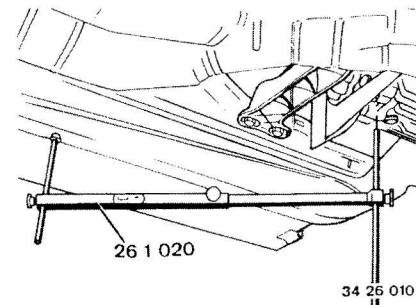
Checking Propeller Shaft Deflection Angle:

Remove exhaust assembly, heat shield and, if applicable, splash guard.



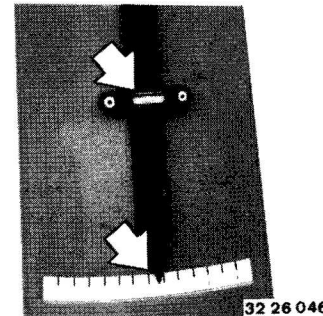
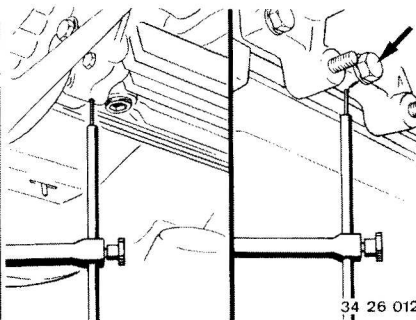
Centering Propeller Shaft:

Loosen the exhaust assembly, engine mounts and transmission cross member. Apply Special Tool 26 1 020.



Application Points:

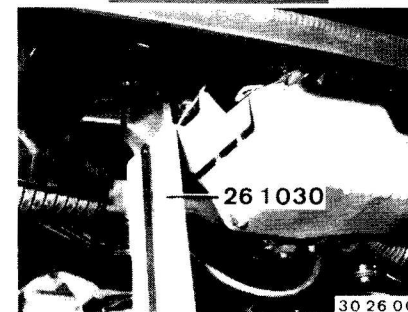
Checkpoints on engine carrier at rear. With manual transmission - middle of cast rib. With automatic transmission - middle bolt of transmission extension. (Punch mark the pertinent checkpoint.)



Place Special Tool 26 1 030 on an engine surface running perpendicular or parallel to the crankshaft. Set the indicator perpendicular with help of the water scale. Read degrees.

Note:

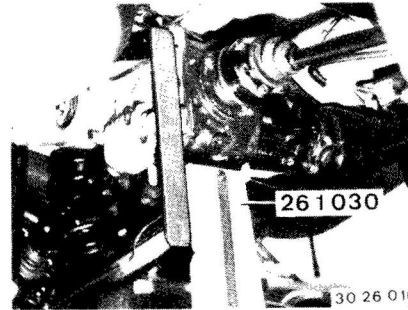
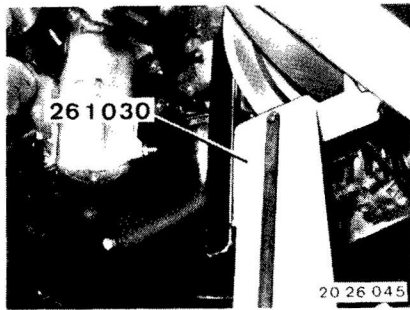
Always apply the gage with the scale in the same direction (e.g. scale right). One graduation = 5°. The position of the car is not important, since only separate angles are compared.



The following bearing surfaces are applicable depending on engine type and version. Place Special Tool 26 1 030 on the oil pan flange and determine the angle of engine inclination.

26-1a

Place Special Tool 26 1 030 and a helping rail (steel ruler) on the vibration damper and measure the angle of engine inclination.



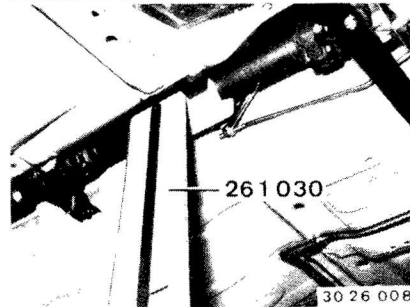
Apply gage on final drive with helping rail (steel ruler) and measure angle. Determine deflection angle* of the universal joint and, if necessary, correct it with shims (up to max. 3 mm or 0.118") on the center mount.

Apply gage on propeller shaft front section and measure angle. Measure deflection angle* of joint disc and, if necessary, correct it with shims (up to max. 3 mm / 0.118") on the transmission suspension or center mount.

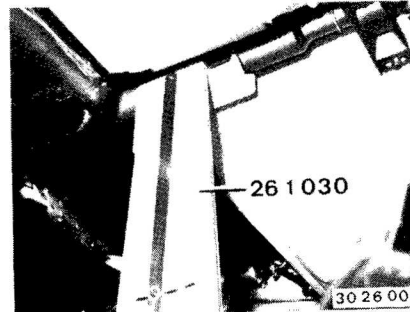
Example:

Engine angle	2° 16'
Propeller shaft angle	- 2° 06'

Joint disc defl. angle	+ 0° 10'
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Apply gage on propeller shaft rear section and measure angle. Determine deflection angle* of center mount and, if necessary, correct it with shims (up to max. 3 mm / 0.118") on transmission suspension or center mount.



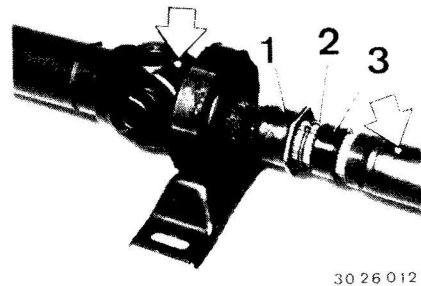
Note:

When correcting a deflection angle by installing shims, remember that the deflection angles of the adjacent joints will also change.

In general joints should have as small as possible deflection angles.

* See Specifications

* See Specifications



30 26 012

Hard Movement on Slide:

– Slide on Center Mount –

Important!

The propeller shaft was balanced in assembled state and must not be turned in the slide. Mark position of propeller shaft sections to each other.

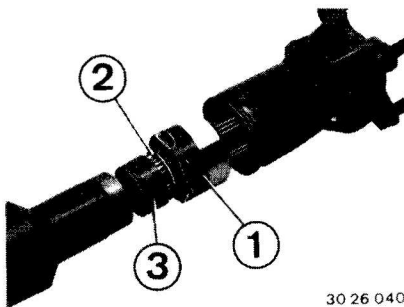
Remove threaded sleeve (1), washer (2) and rubber ring (3).

Check rubber ring, replacing if necessary.

Disconnect propeller shaft on slide.

Clean and lubricate keyway with Molykote Longterm 2.**

Assemble propeller shaft that marks are in one plane.



30 26 040

Hard Movement on Slide:

– Propeller Shaft for All Wheel Drive –

Important!

The propeller shaft was balanced in assembled state and must not be turned in the slide. Mark position of propeller shaft sections to each other.

Remove threaded sleeve (1), washer (2) and rubber ring (3).

Check rubber ring, replacing if necessary.

Disconnect propeller shaft on slide.

Clean and lubricate keyway with Molykote Longterm 2.**

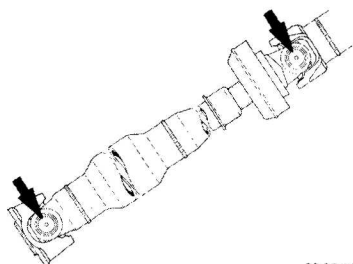
Assemble propeller shaft that marks are in one plane.

Installation:

Check seal in dust cap, replacing if necessary.



30 26 039

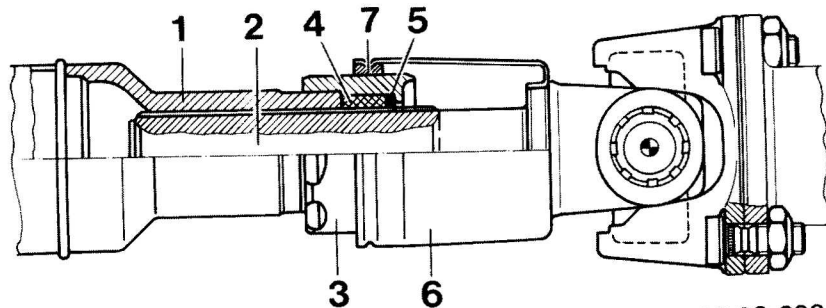


30 26 025

Note:

Propeller shaft sections are mounted in such a manner that universal joints are in one plane.

If the slide had been disassembled by mistake without marking, it will only mean the possibility of installing the propeller shaft wrong by 180° because of balancing.



30 26 038

- 1 Front propeller shaft section
- 2 Rear propeller shaft section
- 3 Clamping nut
- 4 Clamp
- 5 Washer
- 6 Dust cap
- 7 Seal



26 1040

30 26 000

After finishing installation:

Tighten threaded sleeve with Special Tool 26 1 040.

Tightening torque*.

* See Specifications

** Source of Supply: HWB

** Source of Supply: HWB

26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT

Remove and install primary and final mufflers 18 12 000.
Unscrew heat shield.

Since 1983 Models:
Unscrew connector.

Installation:
Also bolt on holder for oxygen sensor plug.

Unscrew heat shield.
Installation:
Check for sufficient space between tank and heat shield.

Unscrew threaded sleeve several turns with Special Tool 26 1 040.

Installation:
Tighten threaded sleeve with Special Tool 26 1 040 after finishing installation.
Tightening torque*.

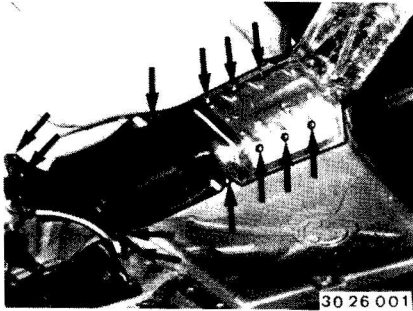
Cars with 4 HP 22 Automatic Transmission:

Support transmission with Special Tools 20 0 120 and 00 2 020.
Unscrew transmission suspension.

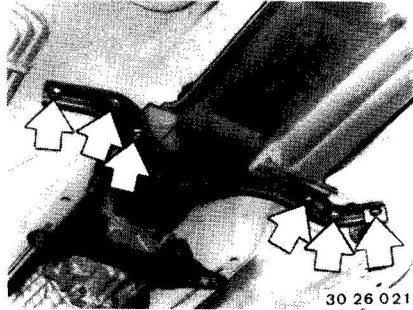
Cars with Manual Transmission and Vibration Damper on Output Flange!

Support transmission.
Unscrew transmission suspension.
Lower transmission.

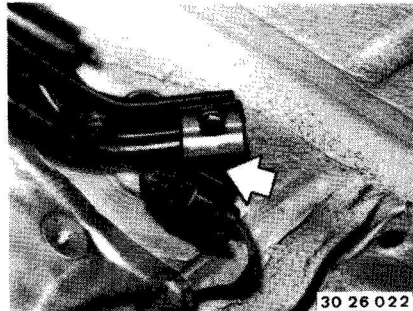
Unscrew propeller shaft on transmission.



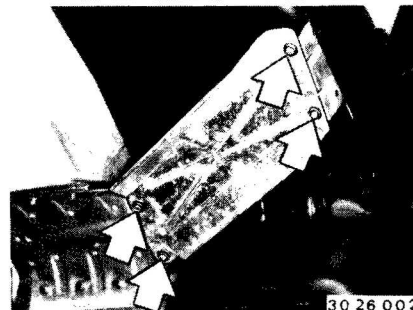
30 26 001



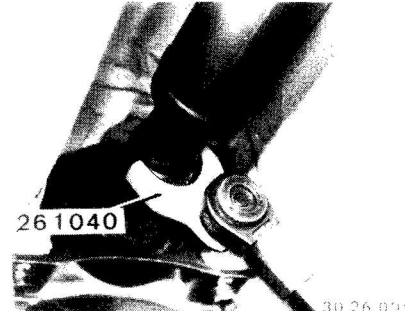
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30 26 022

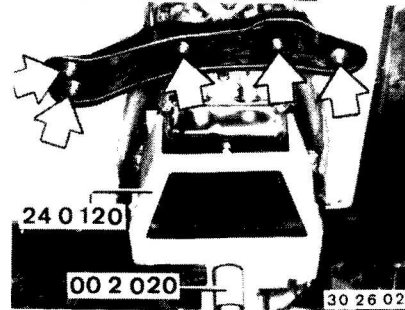


30 26 002



26 1 040

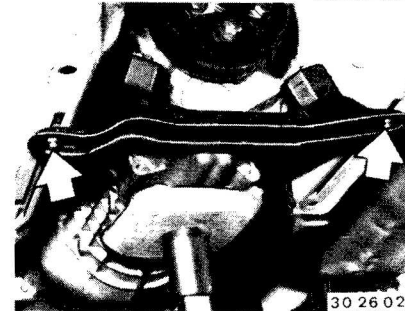
30 26 020



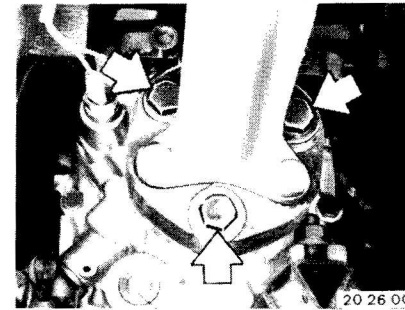
24 0 120

00 2 020

30 26 020

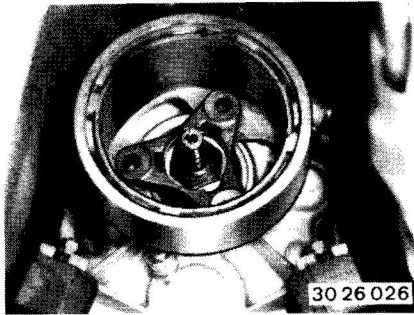


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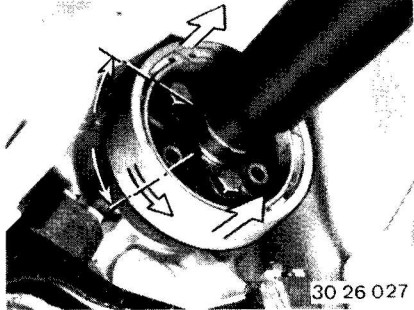
20 0 120

* See Specifications



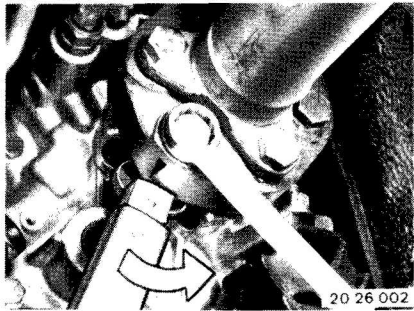
Version with Bolted Vibration Damper:
The vibration damper is mounted on the transmission end output flange.

30 26 026



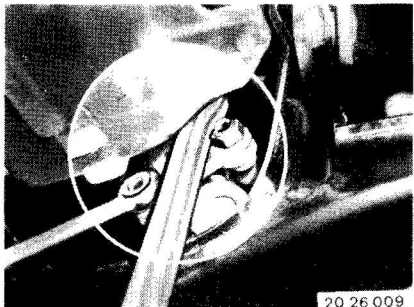
Unscrew propeller shaft on the transmission, turn the vibration damper 60° and place it on the rubber coupling. The vibration damper is taken off together with the propeller shaft.

30 26 027



Installation:
Replace stop nuts.
Tightening torque*.
Important!
If possible by design, only turn the nuts or bolts on the flange end to avoid tension in joint coupling.

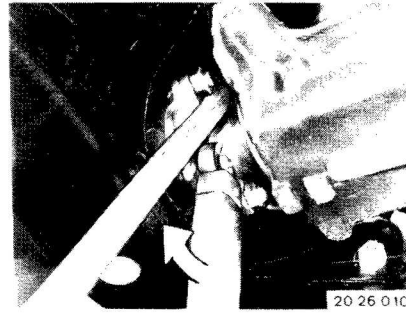
20 26 002



20 26 009

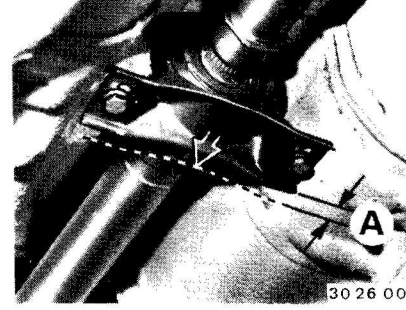
Unscrew propeller shaft on the final drive.

* See Specifications



20 26 010

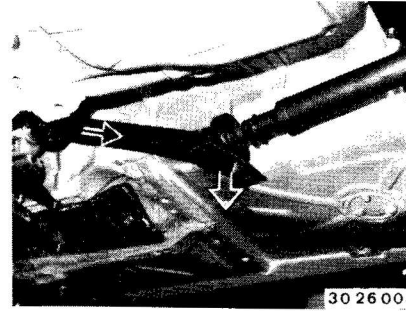
Installation:
Replace stop nuts.
Tightening torque*.



30 26 003

Unscrew center mount.

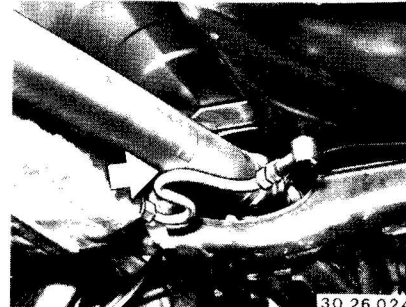
Installation:
Preload the center mount in forward direction by distance A = 4 to 6 mm (0.157 to 0.236").



30 26 004

Bend down and pull propeller shaft out of centering pin on transmission. If applicable, slide propeller shaft together completely on the slide.

Installation:
Propeller shafts are balanced in assembled state and therefore may only be replaced as complete assemblies. Check the center, lubricating with Molykote Longterm 2 if necessary. Replace a damaged center.



30 26 024

Caution!
Never let the propeller shaft bear on the fuel tank connecting line.

* See Specifications

26 11 000 REMOVING AND INSTALLING REAR PROPELLER SHAFT — All Wheel Drive —

Caution!

Never operate car on its own engine power after removal of the propeller shaft (this would damage the central lock in the transfer box).

Remove exhaust assembly 18 00 020.
Unscrew heat shields.

Loosen threaded sleeve several turns with Special Tool 26 1 060 or 26 1 040.

Installation:

Tighten threaded sleeve with Special Tool 26 1 060 or 26 1 040 after finishing installation.

Tightening torque*.

Unscrew propeller shaft on transfer box.

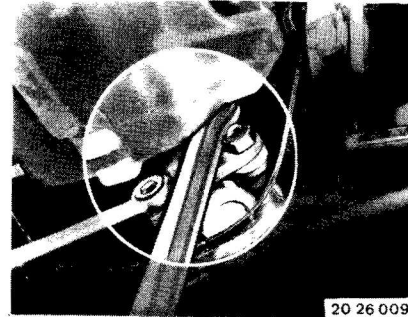
Installation:

Replace stop nuts.
Tightening torque*.

Important!

Only turn nuts or bolts on flange end whenever possible by design, to avoid tension in the joint coupling.

* See Specifications

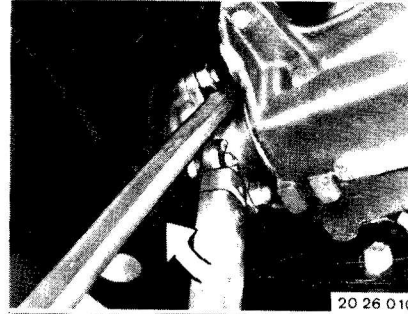


20 26 009

Unscrew propeller shaft on final drive.

Installation:

Replace stop nuts.
Tightening torque*.



20 26 010

Push propeller shaft together and pull out of centering pin on transfer box.
Remove propeller shaft.

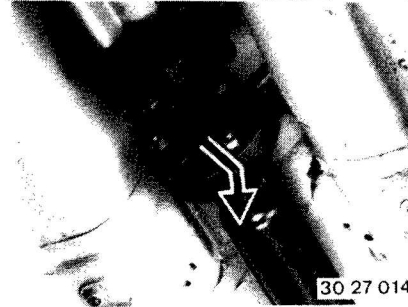
Note:

Propeller shafts are balanced in assembled state and may only be replaced as such.

Never disconnect propeller shafts on slide.

Caution!

Don't let the propeller shaft rest on the fuel tank connecting line.



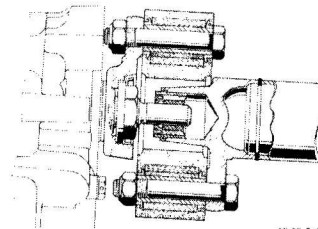
30 27 014

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Installation:

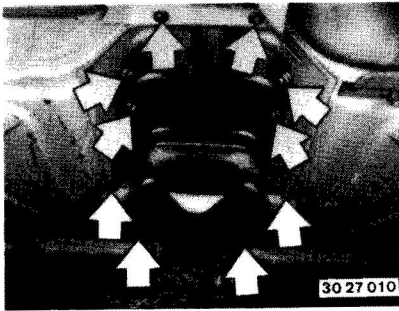
Check center, lubricating with Molykote Longterm 2 if necessary.

Replace a damaged center.

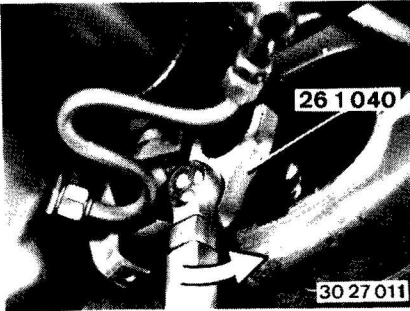


30 26 016

* See Specifications

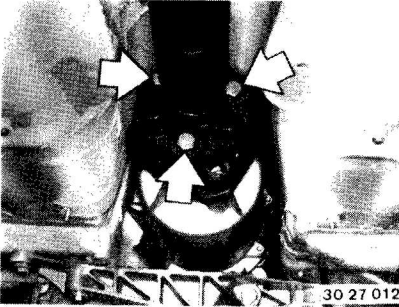


30 27 010

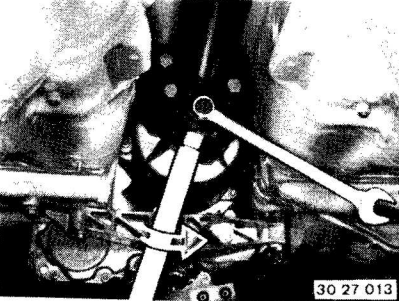


26 1 040

30 27 011



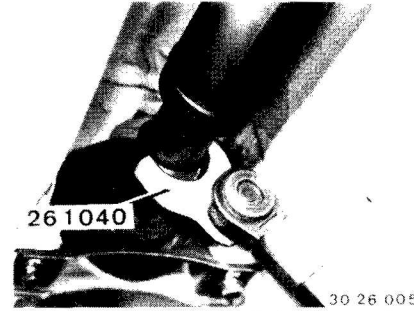
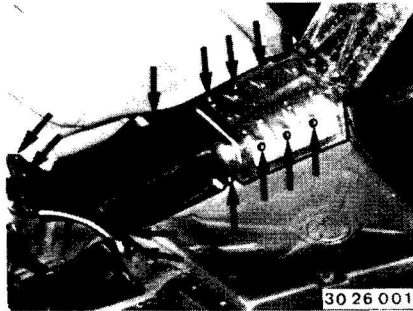
30 27 012



30 27 013

26 11 051 REPLACING JOINT DISC FOR REAR PROPELLER SHAFT

Remove primary and final mufflers 18 12 000.
Unscrew heat shield.

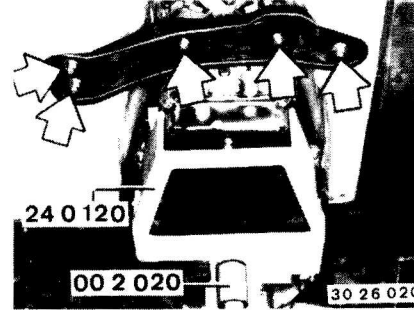
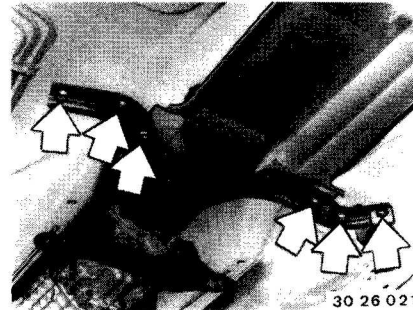


Loosen threaded sleeve several turns with Special Tool 26 1 040.

Installation:

Tighten threaded sleeve with Special Tool 26 1 040 after finishing installation.
Tightening torque*.

Since 1983 Models:
Unscrew connector.

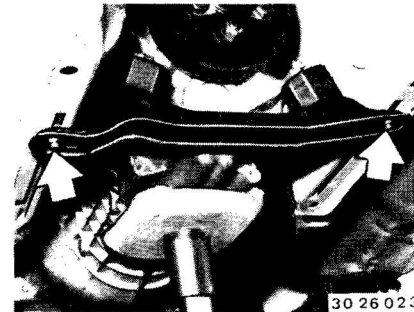


Cars with 4 HP 22 Automatic Transmission:

Support transmission with Special Tools 24 0 120 and 00 2 020.
Unscrew transmission suspension.

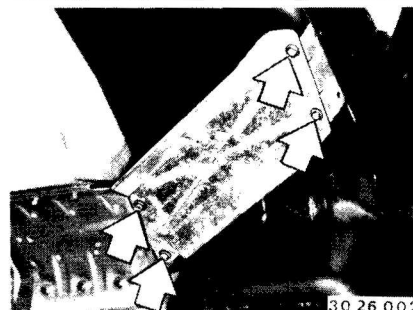


Installation:
Also bolt on holder for oxygen sensor plug.

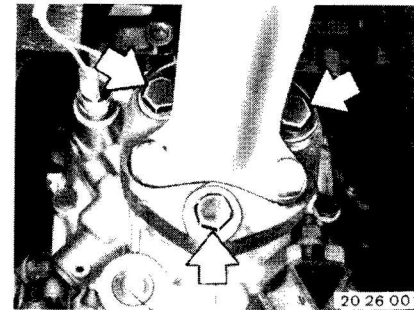


Cars with Manual Transmission and Vibration Damper on Output Flange:

Support transmission.
Unscrew transmission suspension.
Lower transmission.

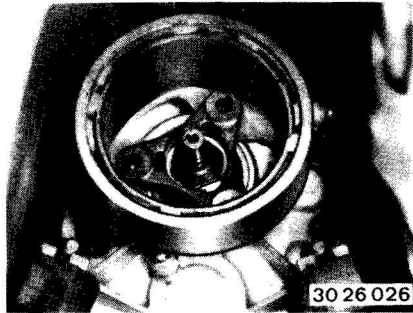


Unscrew heat shield.
Installation:
Check for sufficient space between tank and heat shield.



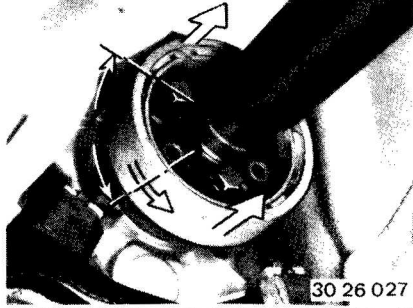
Unscrew propeller shaft on transmission.

* See Specifications



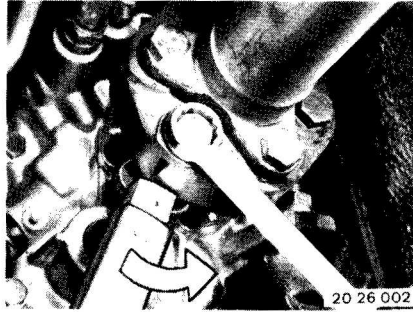
30 26 026

Version with Bolted Vibration Damper:
The vibration damper is mounted on the transmission end output flange.



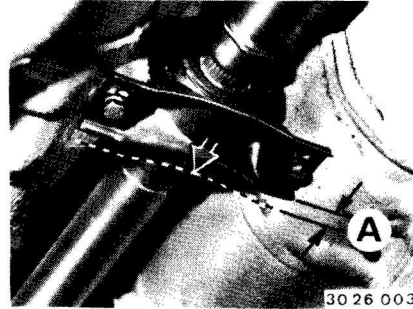
30 26 027

Unscrew propeller shaft on transmission, turn vibration damper 60° and place on rubber coupling. The vibration damper is taken off together with the propeller shaft.



20 26 002

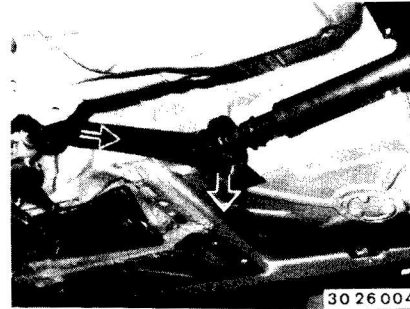
Installation:
Replace stop nuts.
Tightening torque*.
Important!
Only turn nuts and bolts on flange side whenever permitted by design, to avoid stress in the coupling.



30 26 003

Unscrew center mount.
Installation:
Preload center mount forward by distance A = 4 to 6 mm (0.157 to 0.236").

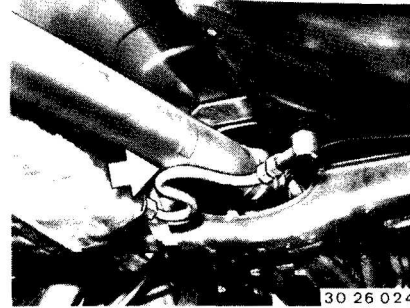
* See Specifications



30 26 004

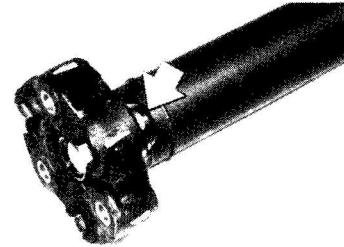
Bend propeller shaft down and pull out of centering pin on transmission. Push propeller shaft together completely on slide if necessary.

Note:
Propeller shaft was balanced in assembled state and may only be replaced as such. Do not disconnect propeller shaft on slide.



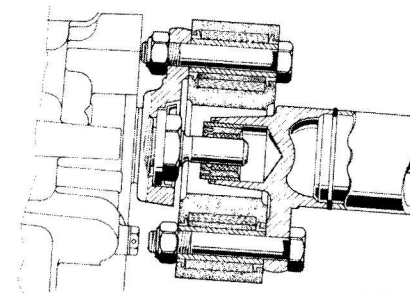
30 26 024

Caution!
Don't let propeller shaft rest on fuel tank connecting line.



30 26 019

Replace coupling. Install coupling that arrows face flange arms. Tightening torque*.



30 26 018

Installation:
Check center, lubricating with Molykote Longterm 2 if necessary. Replace a damaged center.

* See Specifications

26 11 051 REPLACING JOINT DISC FOR REAR PROPELLER SHAFT — All Wheel Drive —

Remove exhaust assembly 18 00 020.
Unscrew heat shields.

Loosen threaded sleeve several turns with Special Tool 26 1 060 or 26 1 040.

Installation:

Tighten threaded sleeve with Special Tool 26 1 060 or 26 1 040 after finishing installation.

Tightening torque*.

Unscrew propeller shaft on power divider.

Installation:

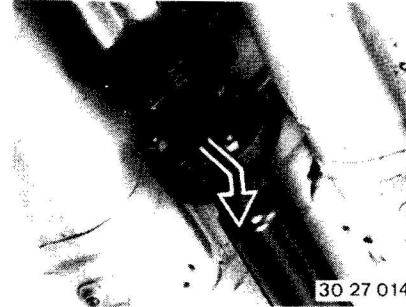
Replace stop nuts.

Tightening torque*.

Important!

Only tighten nuts or bolts on flange end whenever possible by design, to avoid tension in joint disc.

* See Specifications

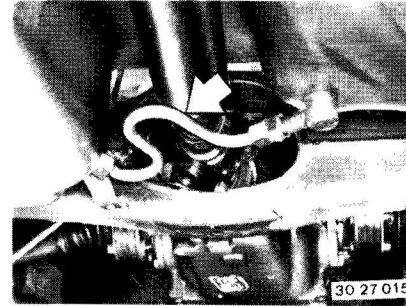


30 27 014

Push propeller shaft together and pull out of centering pin on power divider.

Note:

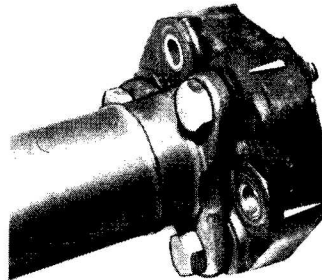
Propeller shafts are balanced in assembled state and may only be replaced as such. Never disconnect propeller shafts on slide.



30 27 015

Caution!

Don't let propeller shaft rest on fuel tank connecting line.



20 26 036

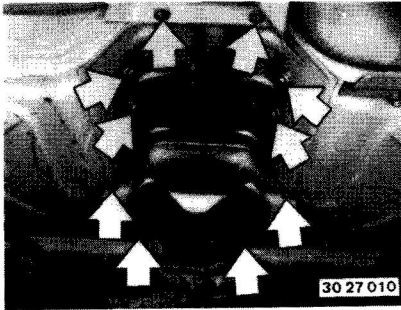
Replace joint disc.

Install joint disc that arrows face flange arms. Tightening torque*.

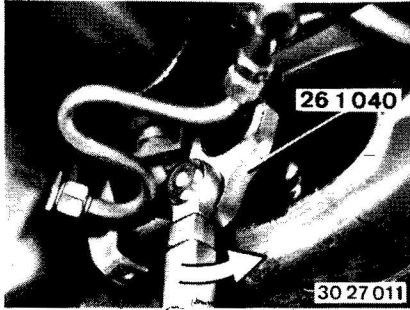
Important!

Only tighten nuts or bolts on flange end whenever possible by design, to avoid tension in joint disc.

* See Specifications

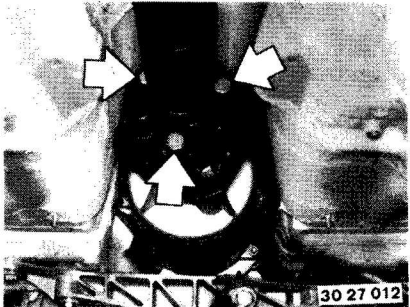


30 27 010

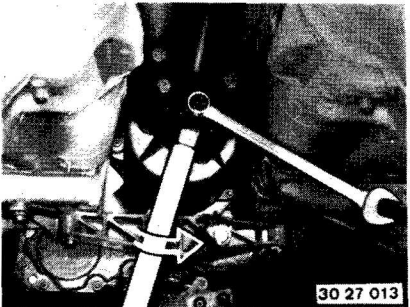


26 1 040

30 27 011



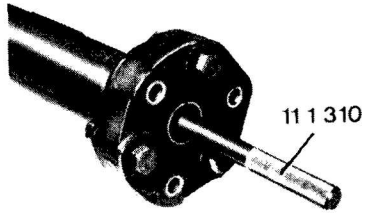
30 27 012



30 27 013

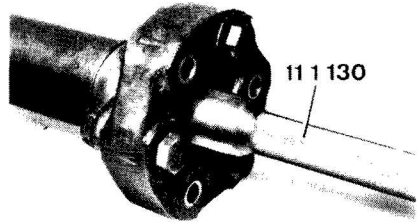
26 11 501 REPLACING FRONT CENTER
FOR PROPELLER SHAFT
— Propeller Shaft Removed —

Remove propeller shaft — see 26 11 000.
Pack center with a viscous grease.
Insert a 14 mm (0.551") diameter mandrel.
Apply hammer knocks on mandrel to produce
pressure and drive out the center.



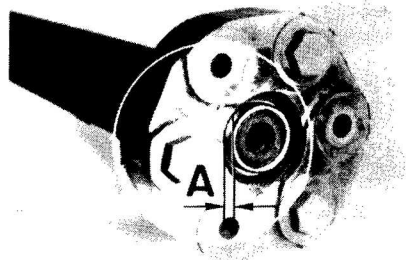
20 26 018

Lubricate center with Molykote Longterm 2
and drive in with Special Tool 11 1 130.
Sealing lip faces out.



20 26 019

Protrusion A = 4.5 mm (0.177").

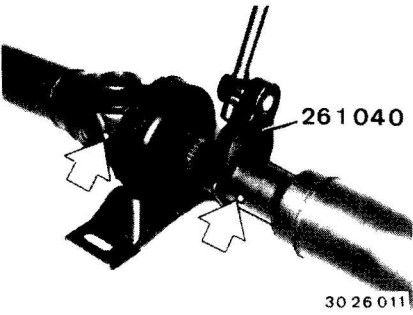


20 26 020

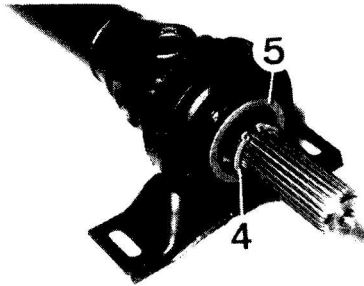
26 12 001 REPLACING PROPELLER SHAFT CENTER MOUNT ASSEMBLY

Remove propeller shaft 26 11 000.
 Unscrew threaded sleeve with Special Tool 26 1 040.
 Pull off front propeller shaft section.
Important!
 Propeller shaft was balanced in assembled state and must not be turned in slide.
 Punch mark an unmarked propeller shaft.

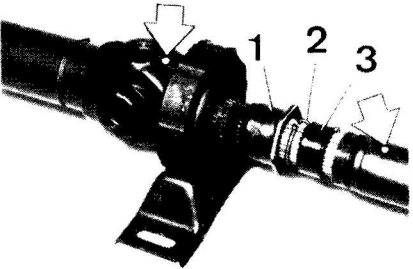
Lift out circlip (4) and remove dust guard (5).



30 26 011



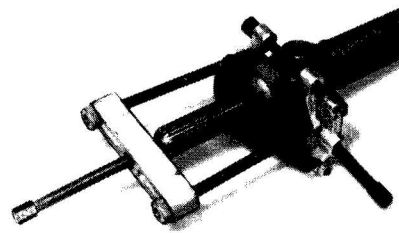
30 26 014



30 26 012

Installation:
 Lubricate slide with Molykote Longterm 2**.
 Slide on threaded sleeve (1), washer (2) and rubber ring (3).
 Assemble propeller shaft that punch marks are aligned.

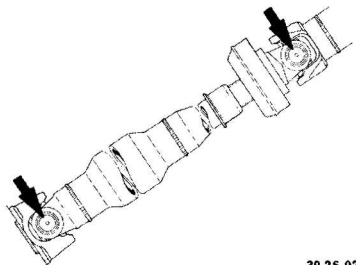
Pull off center mount complete with grooved ball bearing.



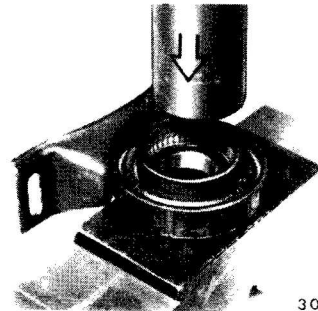
20 26 032

Note:
 Propeller shaft sections are mounted to have universal joints in one plane.
 If slide had been taken apart without punch marking, only wrong installation by 180° is possible because of balancing.

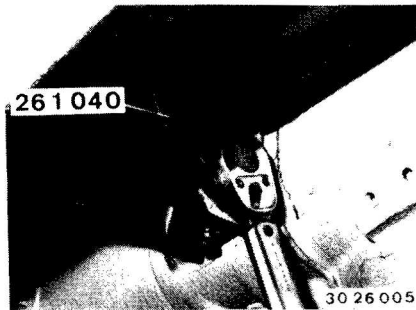
Press grooved ball bearing into center mount.



30 26 025



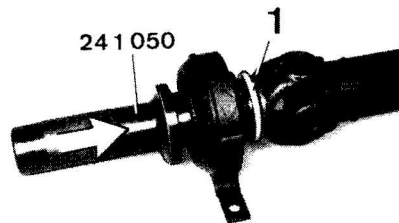
30 26 015



30 26 005

Installation:
 Tighten threaded sleeve with Special Tool 26 1 040 after finishing installation.
 Tightening torque*.

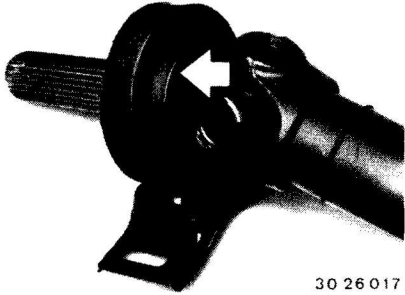
Slide on dust guard (1).
 Press on center mount with Special Tool 24 1 050.



20 26 034

* See Specifications
 ** Source: HWB

Installation:
Check installed position of dust guard – flush
with center mount.
Important!
Check clearance of center mount.



30 26 017

26 20 000 REMOVING AND INSTALLING FRONT PROPELLER SHAFT — All Wheel Drive —

Caution!
Never operate car on its own engine power after removal of the propeller shaft (this would damage the central lock in the transfer box).

Remove all six bolts.

Installation:

Replace stop nuts.
Tightening torque*.

Important!

Only turn nuts or bolts on flange end whenever possible by design, to avoid tension in joint disc.

Push back propeller shaft.
Remove joint disc with centering disc.

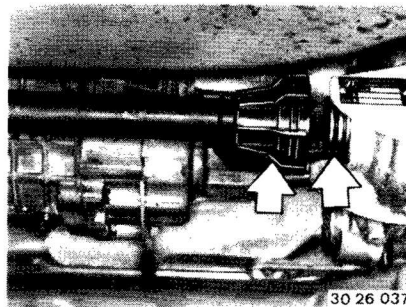
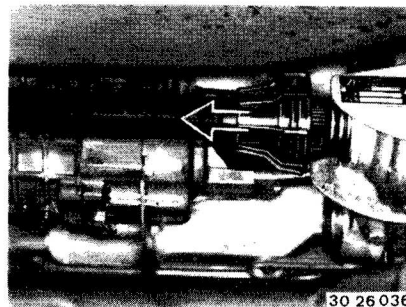
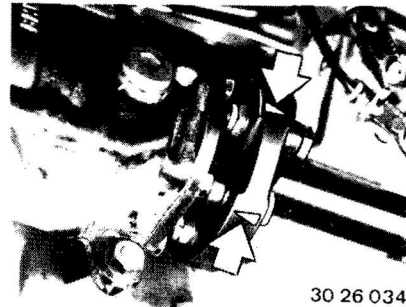
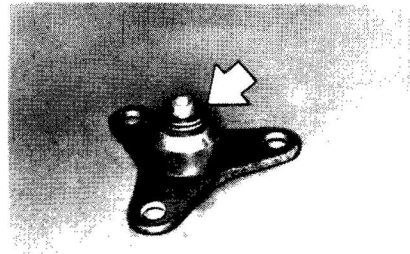
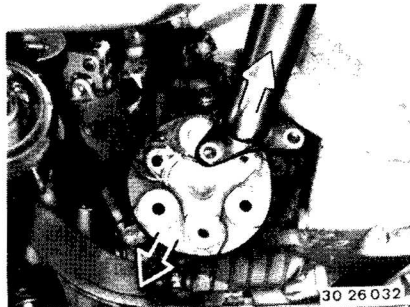
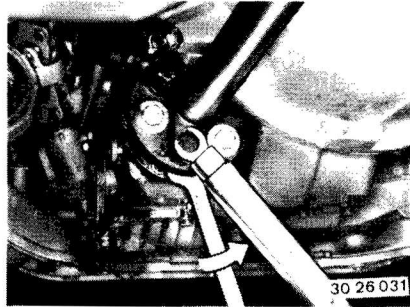
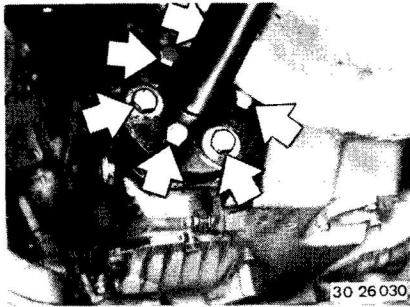
Installation:
Mount centering disc on flange of propeller shaft.

Installation:
Check seal, replacing if necessary.

Installation:
Install joint disc that arrows face flange arms.

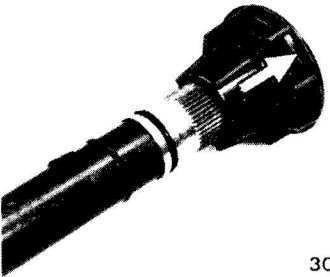
Installation:
Pull propeller shaft and cap off of transfer box.

Installation:
Check gap and seal, replacing if necessary.
Slide cap on to transfer box after finishing installation.



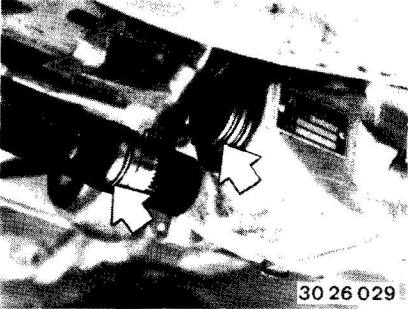
26 20 020 REPLACING CAP FOR FRONT
PROPELLER SHAFT
— All Wheel Drive —

Remove front propeller shaft 26 20 000.
Pull off cap.



30 26 028

Installation:
Check seals on propeller shaft and power
divider.



30 26 029

26 - 14

26 20 051 REPLACING JOINT DISC FOR FRONT PROPELLER SHAFT — All Wheel Drive —

Remove all six bolts.

Installation:

Replace stop nuts.
Tightening torque*.

Important!

Only turn nuts or bolts on flange end when-
ever possible by design, to avoid tension in
joint disc.

Push back propeller shaft.

Remove joint disc with centering disc.

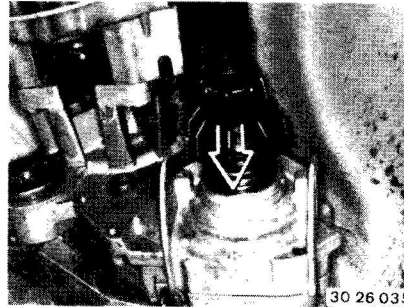
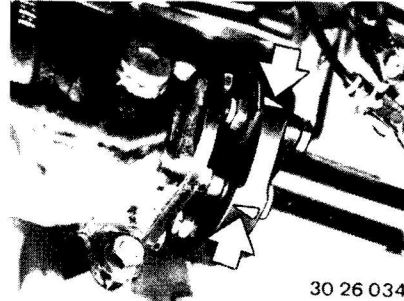
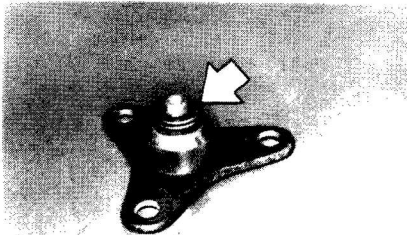
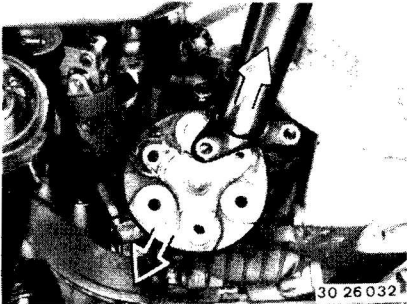
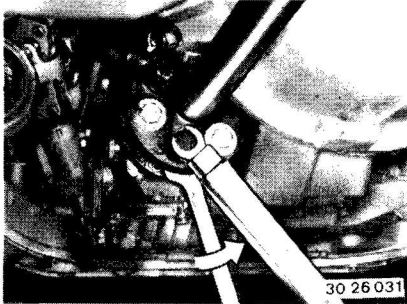
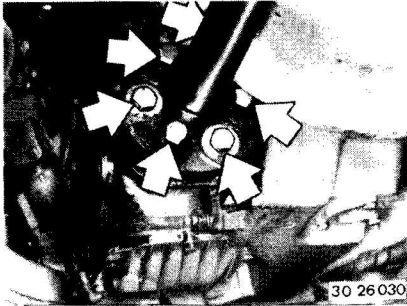
Installation:

Mount centering disc on flange of propeller
shaft.

Installation:

Check seal, replacing if necessary.

* See Specifications



Installation:

Install joint disc that arrows face flange arms.

Installation:

Slide cap on to power divider after finishing
installation.

26 - 15

TROUBLESHOOTING PROPELLER SHAFT

Condition	Cause	Correction
Drumming (stationary car)	Propeller shaft without influence	Check engine tuning, remove stress in exhaust line
Vibration while moving off forward/reverse (center mount knocking)	Propeller shaft not aligned precisely	Align propeller shaft (S. I. 26 01 77 (235))
	Runout on centering pin, transmission or final drive flanges	Check centering pin and flanges for runout with dial gage – see Specifications; offset or replace final drive flange
	Center mount rubber damaged. Propeller shaft axial compensation.	Replace center mount – 26 12 001. Important! Tighten screw-on bushing to correct torque* with Special Tool 26 1 040.
	Universal joints worn or seized	Check clearance and movement, replacing propeller shaft if necessary – 26 11 000
	Engine/transmission suspension not okay	Check mounts, aligning or replacing if necessary
	Joint coupling rubber damaged	Replace joint coupling – 26 11 051
Vibration at 40 to 50 km/h (25 to 30 mph)	Propeller shaft not aligned precisely	Align propeller shaft
	Runout on centering pin, transmission or final drive flanges	Check centering pin and flanges for runout with dial gage – see Specifications; offset or replace final drive flange
	Center mount rubber damaged. Propeller shaft axial compensation.	Replace center mount – 26 12 001. Important! Tighten screw-on bushing to correct torque* with Special Tool 26 1 040
	Universal joints worn or seized	Check clearance and movement, replacing propeller shaft if necessary – 26 11 000
	Joint coupling rubber damaged	Replace joint coupling – 26 11 051

* See Specifications

TROUBLESHOOTING PROPELLER SHAFT

Condition	Cause	Correction
Drumming from 60 km/h (35 mph) on	Propeller shaft not aligned precisely or installed with stress – axial compensator	Align propeller shaft or check movement of axial compensator, lubricating slide with Molykote Longterm 2 and tightening screw-on bushing to correct torque* if necessary
	Center damaged	Replace center – 26 11 501
	Runout on centering pin, transmission or final drive flanges	Check centering pin and flanges for runout with dial gage – see Specifications; offset or replace final drive flange
	Centering error due to worn flange bores (loose bolts)	Replace transmission or final drive flange
	Excessive propeller shaft imbalance; balance plate missing	Balance or replace propeller shaft – see 26 11 000
	Universal joints worn or seized	Check clearance and movement, replacing propeller shaft if necessary
Center mount noise while driving	Center mount not perpendicular to propeller shaft; no or insufficient preload	Preload center mount 4 to 6 mm (0.157 to 0.236”) in forward direction at right angle to propeller shaft
	Center mount grooved ball bearing not okay	Replace grooved ball bearing – 26 12 001