

DRIVE SHAFT AND PROPELLER SHAFT

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DPS

DPS-2

1 DRIVE SHAFT

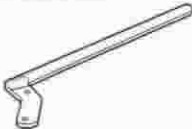
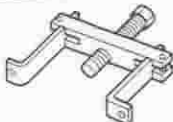
1-1 REMOVAL AND INSTALLATION

WARNING

- Be sure not to operate while the exhaust manifold is hot for danger of burn.

DPS-DST-D-Z-00011

1-1-1 PREPARATION TOOLS

	Shape	Part number, part name	Use
SST		09511-87202-000 Stopper, brake drum	For prevention from turning of hub
		09510-87301-000 Puller, front hub & drum	For separation of hub and drive shaft
		09611-87701-000 Puller, Tie-rod end	For separation of tie-rod end / lower arm and steering knuckle
Tool	Slide hammer		
Instrument	Torque wrench		
Lubricant	MP grease, Gear oil SAE75W-85 or 75W-90(GL-3 or GL-4)(For M/T vehicle), DEXRON®III(or II) (For A/T vehicle)		

DPS-DST-D-P-00011

1-1-2 OPERATION BEFORE REMOVAL

1. Jack up the vehicle.

WARNING

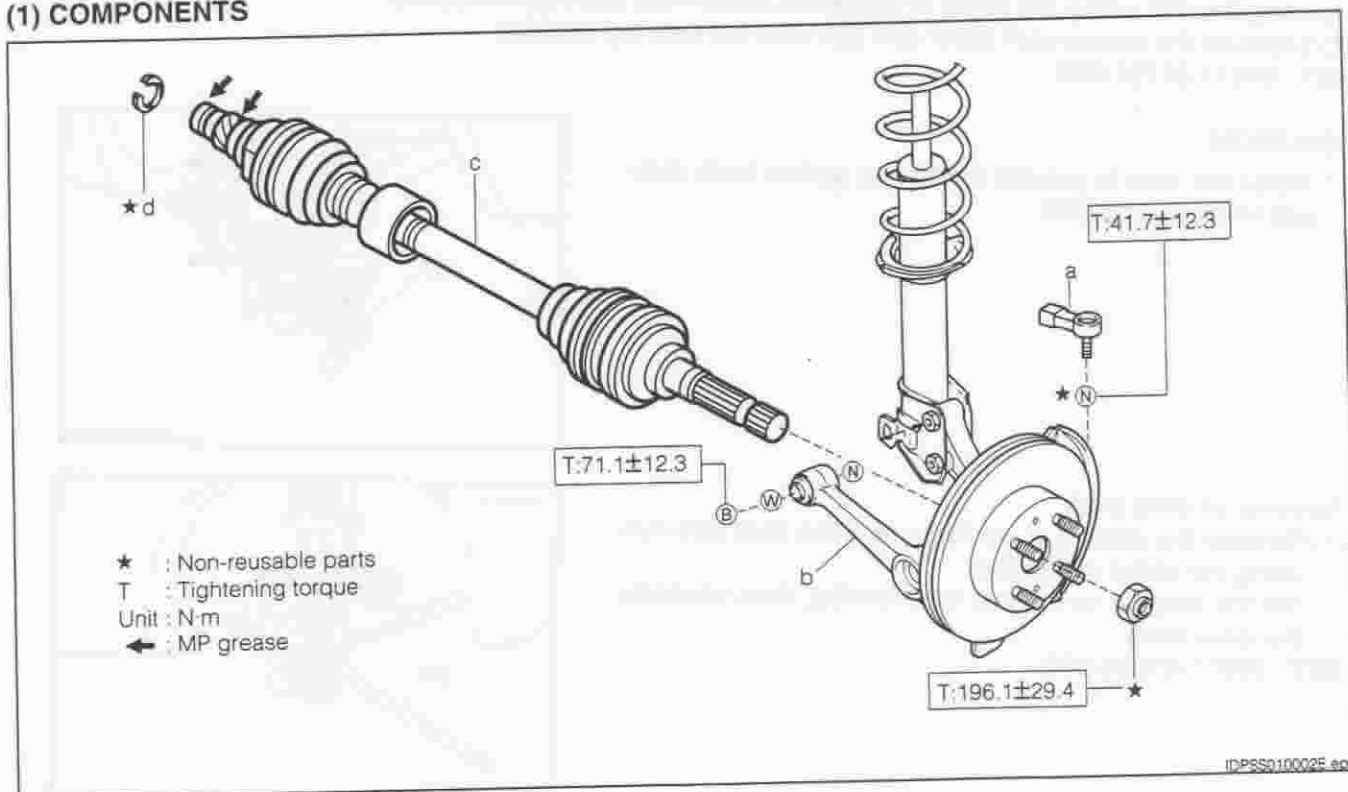
- Keep the position of the jack up point to avoid causing the serious accident due to inclining of the vehicle.

2. Remove the wheel.
3. Drain the transmission oil.
Refer to MT-2
4. Drain the ATF (For A/T vehicle)
Refer to AT-3
5. Remove the stabilizer bar.
Refer to FS-26

DPS-DST-D-B-00011

1-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) COMPONENTS



(2) REMOVAL AND INSTALLATION PROCEDURES

- ① 4 a End S/A, tie-rod
- ② ③ b Arm, lower
- ③ ② c Drive shaft
- 4 1 d Ring, shaft snap

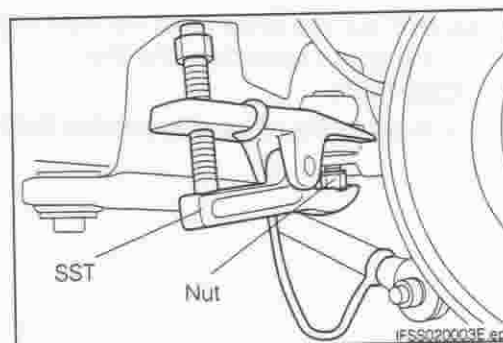
DPS-DST-D-T-00011

1-1-4 POINTS OF REMOVAL

1. Separation of the tie rod end
 - (1) Hang the SST using string or the like to prevent SST from dropping.
 - (2) Separate the tie rod end from the steering knuckle.
- SST: 09611-87701-000

CAUTION

- Install the nuts to prevent the thread portion from damage when set the SST.



DPS-4

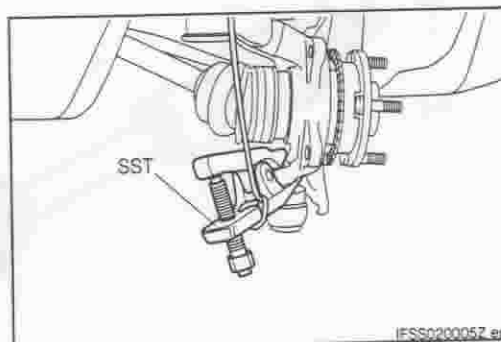
2. Separation of the lower arm separation

- (1) Hang the SST using the string or the like to prevent the SST from dropping.
- (2) Separate the suspension lower arm S/A from the steering knuckle.

SST: 09611-87701-000

CAUTION

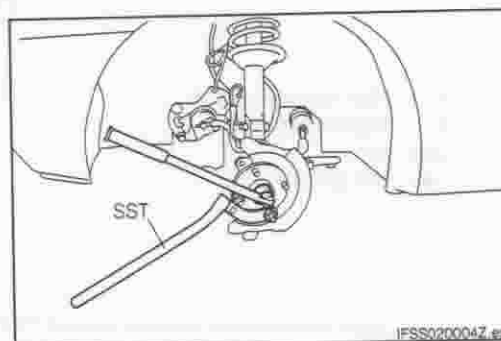
- Install the nuts to prevent the thread portion from damage when set the SST.



3. Removal of drive shaft

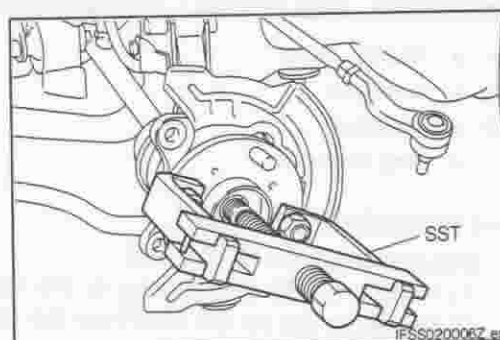
- (1) Release the staking of the lock nut of the front axle hub using the chisel or the like.
- (2) Set the stopper to prevent from turning, then separate the drive shaft.

SST: 09511-87202-000



- (3) Separate the drive shaft Ay from steering knuckle.

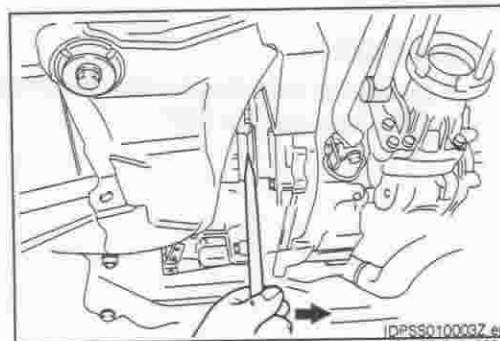
SST: 09510-87301-000



- (4) Pull out the drive shaft Ay from the transmission, using a hub nut wrench or the like.

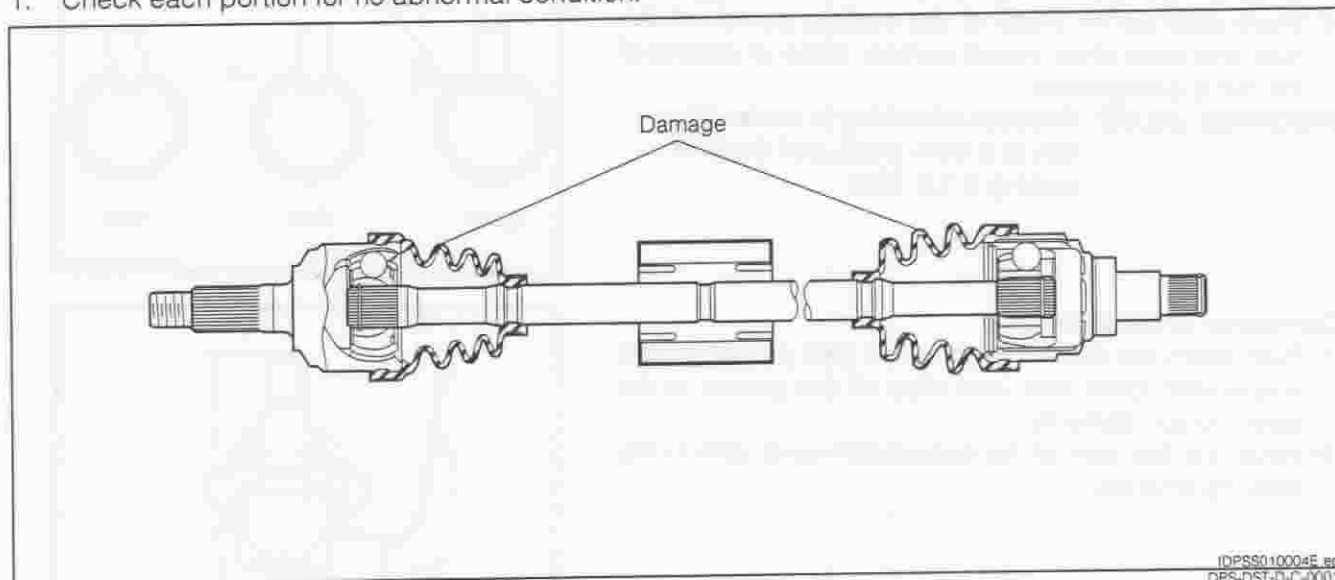
CAUTION

- Prevent the oil seal lip portion from damage.



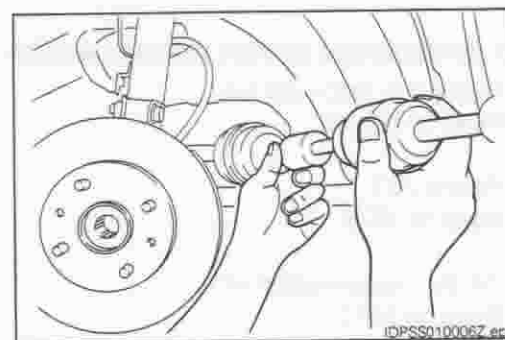
1-1-5 INSPECTION

1. Check each portion for no abnormal condition.



1-1-6 POINTS OF INSTALLATION

1. Installation of drive shaft
(1) Insert the drive shaft into the transaxle.
TOOL: Sliding Hammer

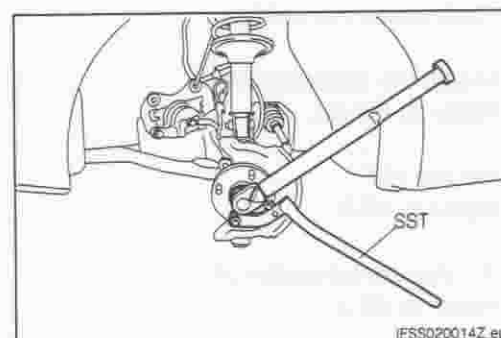


CAUTION

- Prevent the oil seal lip portion from damage.

- (2) Set the stopper to prevent from turning, then install the front axle hub to the drive shaft.

SST: 09551-87202-000

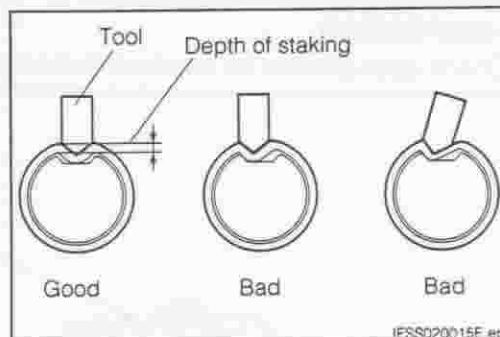


DPS-6

(3) Using the chisel, ensure to stake the nose of the front-wheel drive shaft and the nut as shown in the figure.

(4) There shall be no crack at the staking portion of the nuts and drive shaft thread portion. (flake of plating of the nut is acceptable)

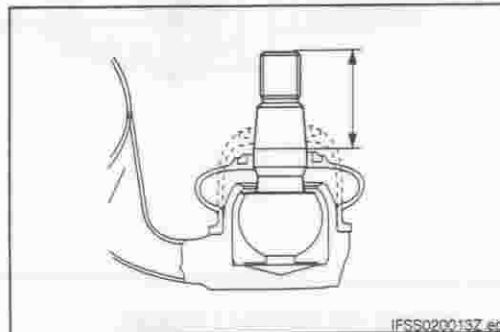
SPECIFIED VALUE: Direction of staking is center direction of a drive shaft, and depth of staking is 3.5 ± 0.5 mm



2. Connection of the lower arm

(1) Push down the dust cover of a ball joint portion on the suspension lower arm, and wipe off the grease at the taper portion perfectly.

(2) Install the ball joint of the suspension lower arm to the steering knuckle.



1-1-7 OPERATION AFTER INSTALLATION

1. Install the stabilizer bar.
Refer to FS-26.
2. Fill the ATF.
Refer to AT-3.
3. Fill the transmission oil.
Refer to MT-2.
4. Install the wheel.
TIGHTENING TORQUE: 103.0 ± 14.7 N·m

5. Jack down the vehicle.

1. Install the stabilizer bar.
Refer to FS-26.
2. Fill the ATF.
Refer to AT-3.
3. Fill the transmission oil.
Refer to AT-3.
4. Install the wheel.
TIGHTENING TORQUE: 103.0 ± 14.7 N·m
5. Jack down the vehicle.

DPS-DST-D-A-00001

DPS-DST-D-A-00011

1-2 DISASSEMBLY AND ASSEMBLY (DOJ-BJ)

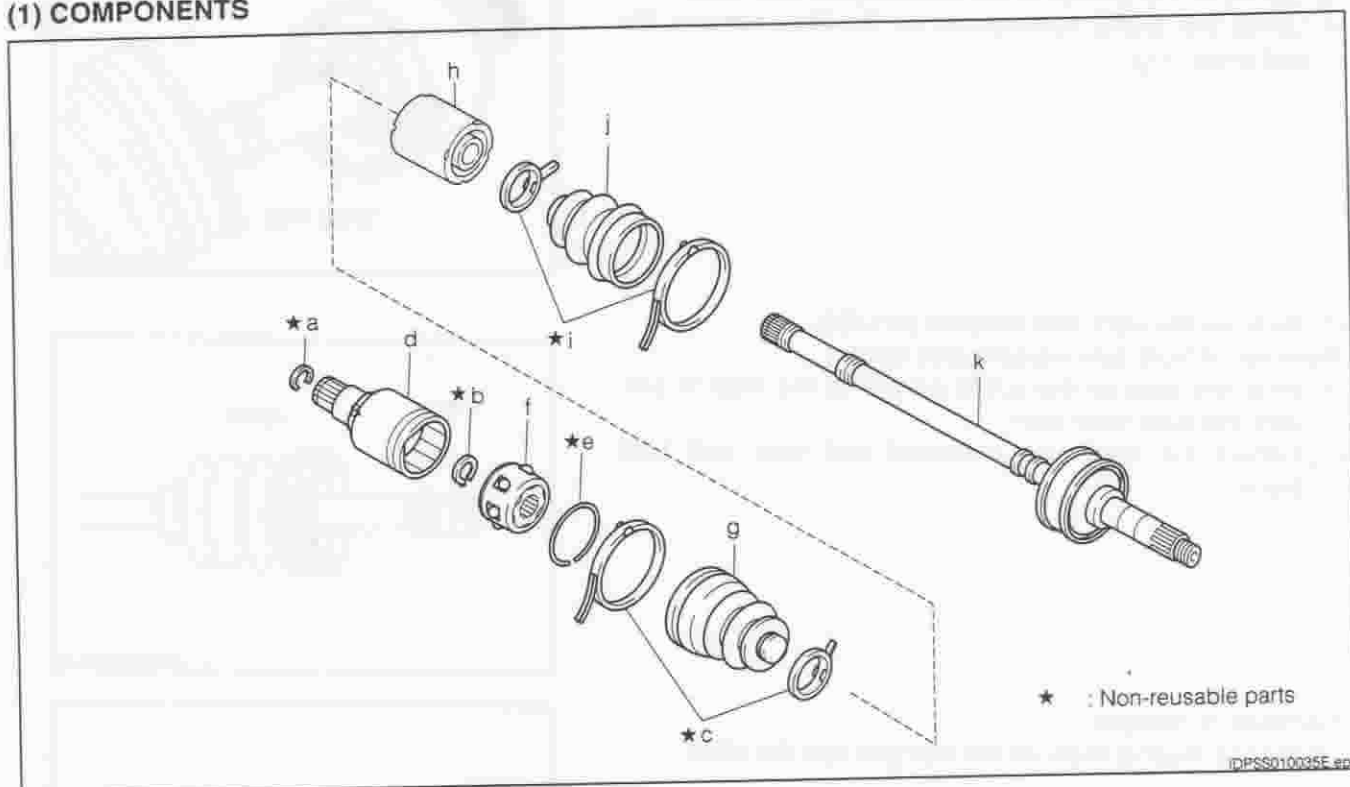
1-2-1 PREPARATION TOOLS

Tool	Snap ring expander, V-block
Lubricant	grease

DPS-DST-B-P-00021

1-2-2 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) COMPONENTS



(2) DISASSEMBLY AND ASSEMBLY PROCEDURE

- 1 11 a Ring, shaft snap
- 2 10 b Ring, hole snap
- 3 ③ c Band, boot
- ④ 8 d Joint S/A, front axle inboard
- 5 7 e Ring, snap
- 6 6 f Ball S/A

- ⑦ 5 g Boot, front axle inboard joint
- ⑧ ④ h Damper
- 9 ③ i Band, boot
- 10 ② j Boot, front axle outboard joint
- 11 1 k Joint S/A, outboard

DPS-DST-B-T-00021

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1-2-3 POINTS OF DISASSEMBLY

1. Removal of front axle inboard joint S/A

- (1) Using the plane screwdriver or the like and remove the boot band.

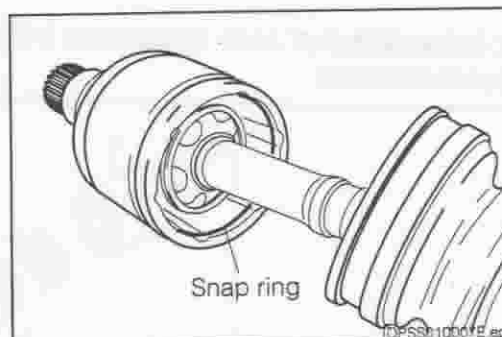
CAUTION

- Prevent the boot from damage during the operation.

- (2) Move the boot slightly.

- (3) Get rid of the grease in the inboard joint and boot.

- (4) Using the plane screwdriver or the like, remove the ball snap ring.

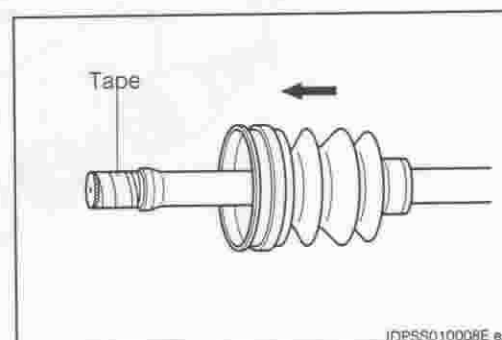


- (5) Remove the front axle inboard joint S/A.

2. Removal of front axle inboard joint boot

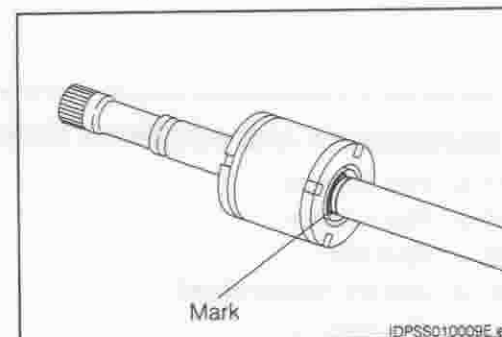
- (1) Wind the tape on the spline portion of the shaft to prevent the boot from burn.

- (2) Extract the front axle outboard joint boot and boot band.

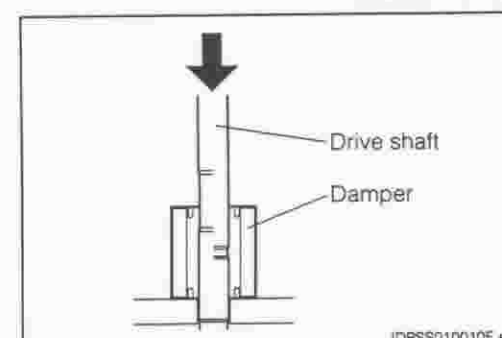


3. Removal of damper

- (1) Put the mating mark on the damper and the shaft.



4. Using the hydraulic press, and remove the damper.

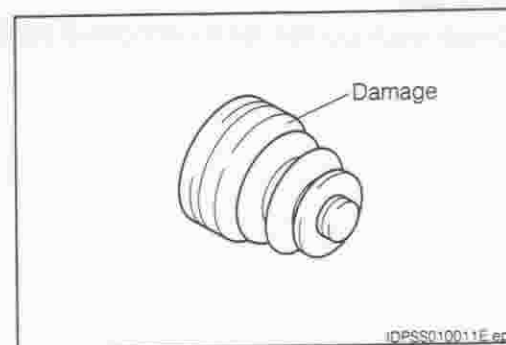


DPS-DST-B-D-00021

1-2-4 INSPECTION

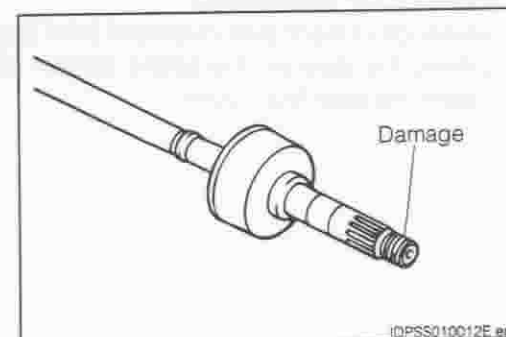
(1) BOOT

1. Check each portion for no abnormal condition.

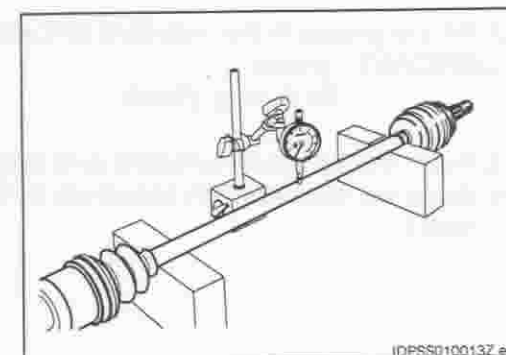


(2) OUT BOARD JOINT S/A

1. Check each portion for no abnormal condition.

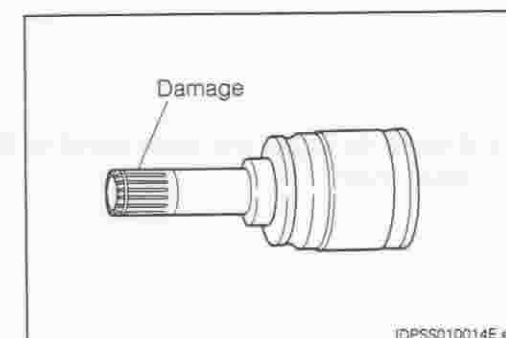


2. Check the runout of the shaft portion.
(1) Support both ends of the shaft.
(2) Measure the runout of the center portion.
ALLOWABLE LIMIT: MAX 1.5mm (RH)
MAX 2.0mm (LH)



(3) FRONT AXLE INBOARD JOINT S/A.

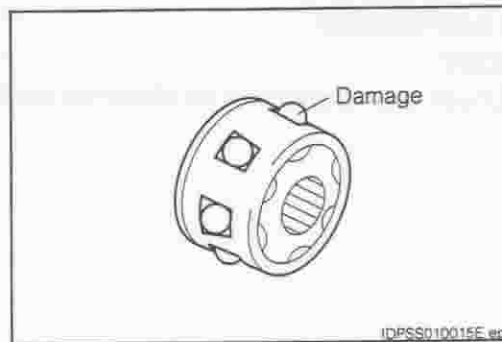
1. Check each portion for no abnormal condition.



DPS-10

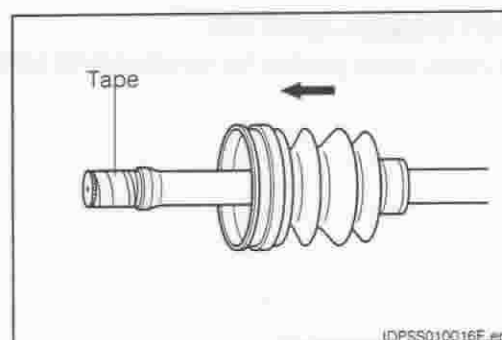
(4) BALL S/A

1. Check each portion for no abnormal condition.



1-2-5 POINTS OF ASSEMBLY

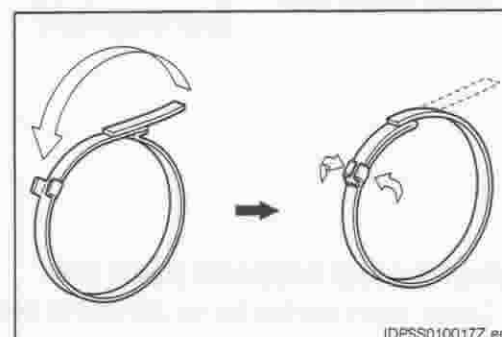
1. Installation of front axle outboard joint boot
- (1) Wind the tape on the spline portion of the shaft to prevent the boot from burn.



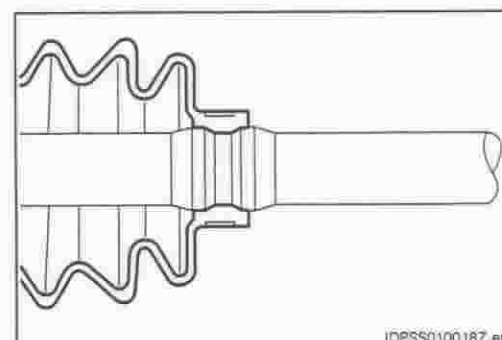
- (2) Fill the grease in the outboard joint and boot.

LUBRICANT: grease
 60 ± 10 g (Total)

- (3) Insert the front axle outboard joint boot and boot band.
- (4) Bend the boot band in sequence of the figure, and install it.



- (5) Ensure to install the boot band to the groove of the drive shaft.

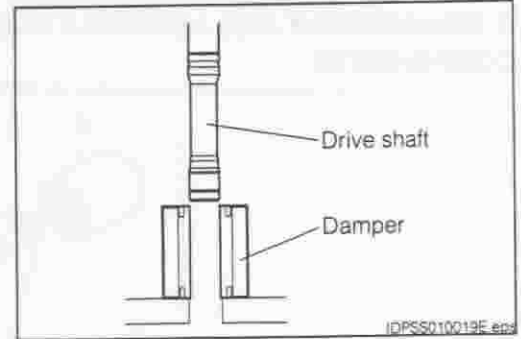


2. Installation of damper

- (1) Using the hydraulic press, and perform the press-fit the damper to the position of the mating mark.

CAUTION

- Perform the press-fit of the joint portion with a straight state.



3. Installation of the front axle inboard joint S/A.

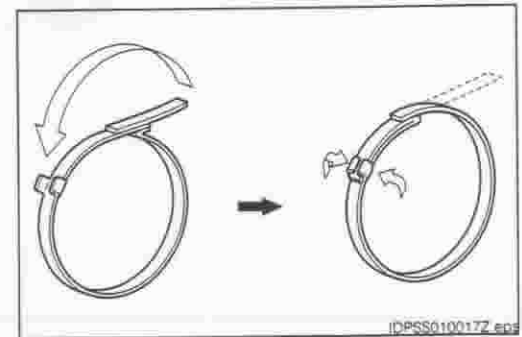
- (1) Fill the grease in the front axle inboard joint and the boot.

LUBRICANT: grease

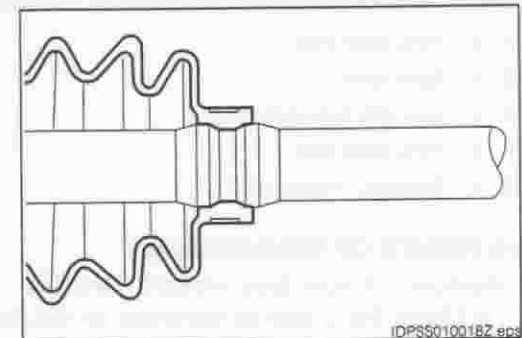
60 ± 10 g (Total)

- (2) Using the plane screwdriver or the like, and install the ball snap ring.

- (3) Bend the boot band in sequence of the figure, and install it.



- (4) Ensure to install the boot band to the groove of the drive shaft.



1-3 DISASSEMBLY AND ASSEMBLY (TJ-BJ) /NSK

1-3-1 PREPARATION TOOLS

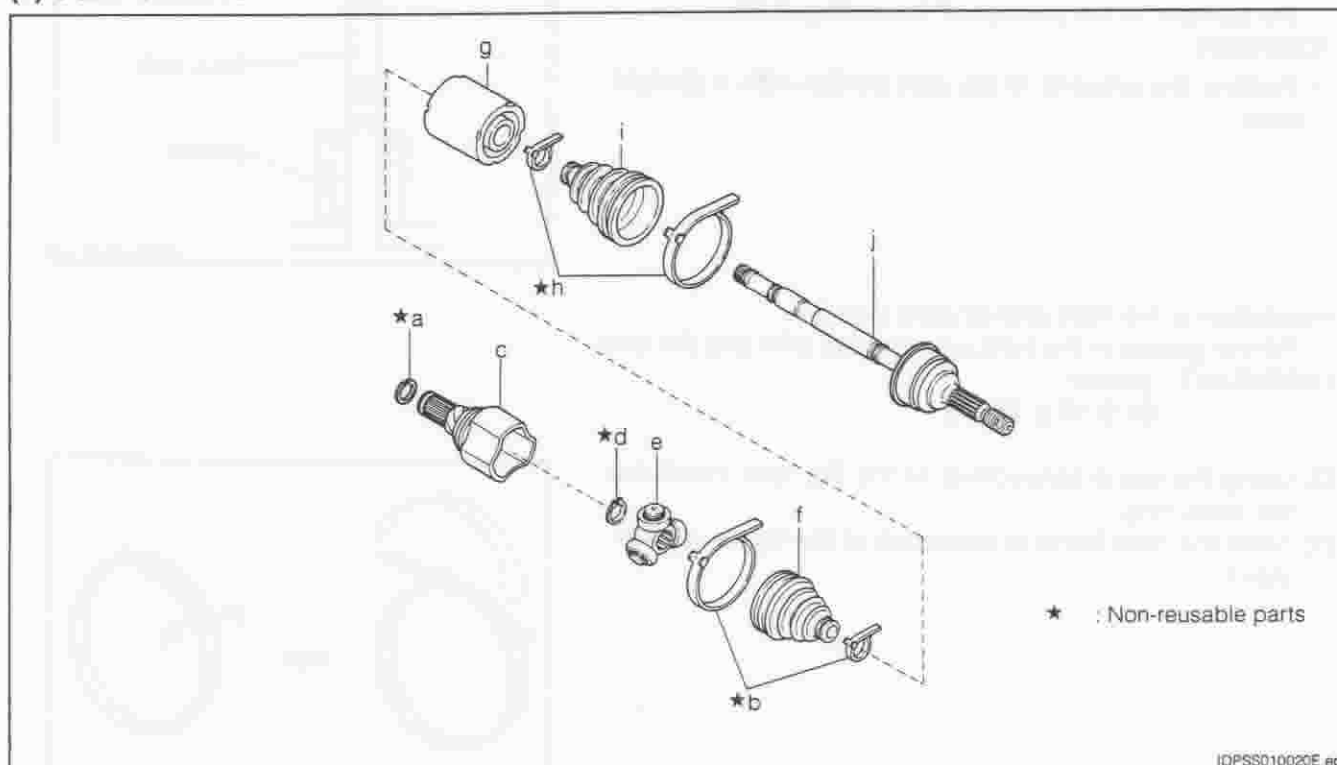
Tool	Snap ring expander, V-block
Lubricant	grease

DPS-DST-G-P-00021

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1-3-2 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) COMPONENTS



(2) DISASSEMBLY AND ASSEMBLY PROCEDURE

- | | | | | | | | |
|---|----|---|-------------------------------|----|---|---|---------------------------------|
| 1 | 10 | a | Ring, shaft snap | ⑥ | ⑤ | f | Boot, front axle inboard joint |
| 2 | ⑨ | b | Band, boot | ⑦ | ④ | g | Damper |
| ③ | ⑧ | c | Joint S/A, front axle inboard | 8 | ③ | h | Band, boot |
| 4 | 7 | d | Ring, shaft snap | ⑨ | 2 | i | Boot, front axle outboard joint |
| ⑤ | ⑥ | e | Tripod Ay, inboard joint | 10 | 1 | j | Joint S/A, outboard |

DPS-DST-G-T-00021

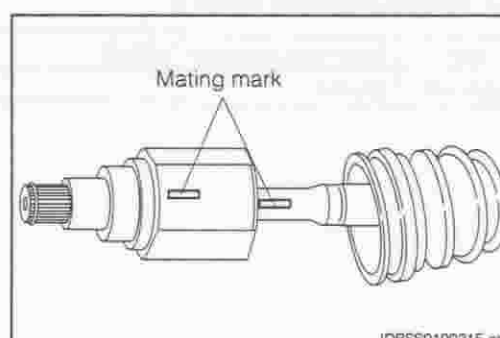
1-3-3 POINTS OF DISASSEMBLY

- Removal of front axle inboard joint S/A.
 - Using the plane screwdriver or the like and remove the boot band.

CAUTION

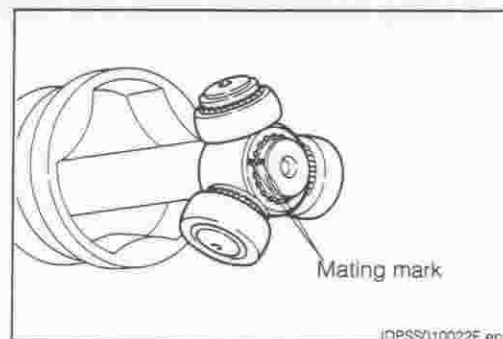
- Prevent the boot from damage during the operation.

- Move the boot slightly.
- Get rid of the grease in the inboard joint and boot.
- Put the mating mark on the inboard joint tripod and the shaft.
- Remove the front axle inboard joint S/A.



2. Removal of inboard joint tripod Ay

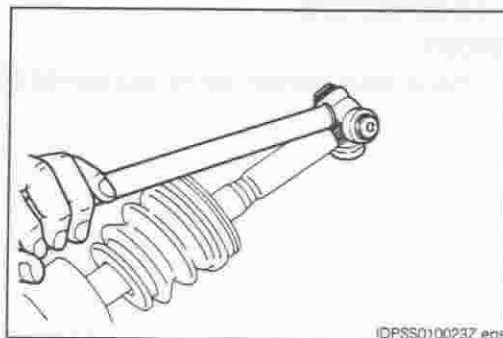
- (1) Using the snap ring pliers or the like, remove the shaft snap ring.
- (2) Put the mating mark on the inboard joint tripod and the shaft.



- (3) Using the brass bar or the like, remove the inboard joint tripod Ay.

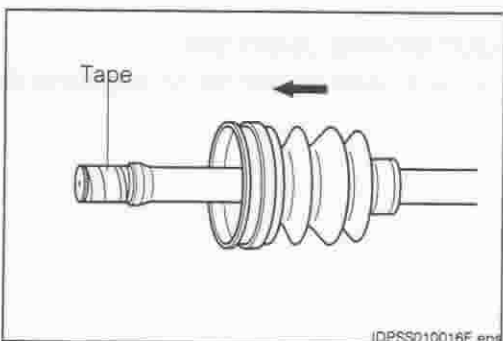
CAUTION

- Do not get the brass bar to touch with the roller portion of the inboard joint tripod.



3. Removal of front axle inboard joint boot

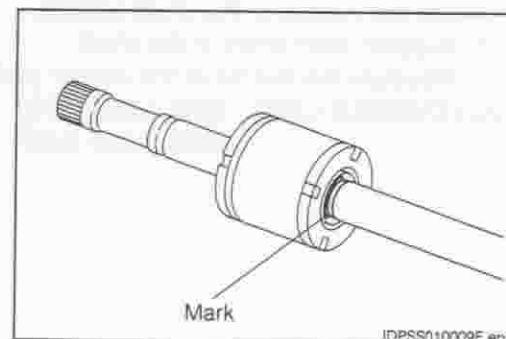
- (1) Wind the tape on the spline portion of the shaft to prevent the boot from damage.



- (2) Extract the front axle outboard joint boot and boot band.

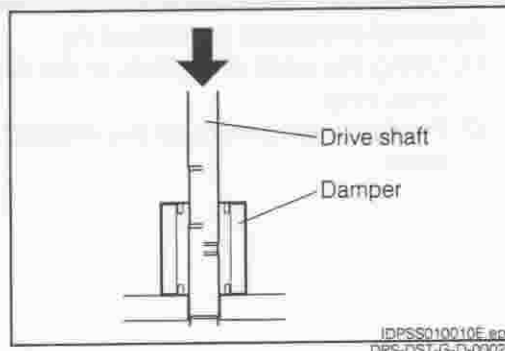
4. Removal of damper

- (1) Put the mating mark on the damper and the shaft.



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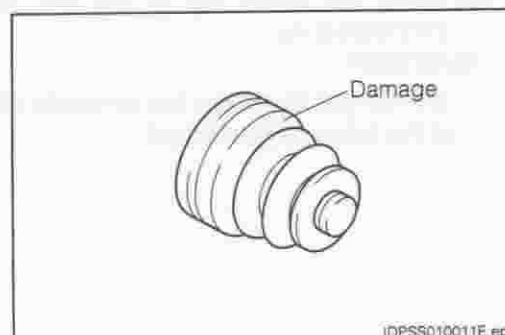
(2) Using the hydraulic press, and remove the damper.



1-3-4 INSPECTION

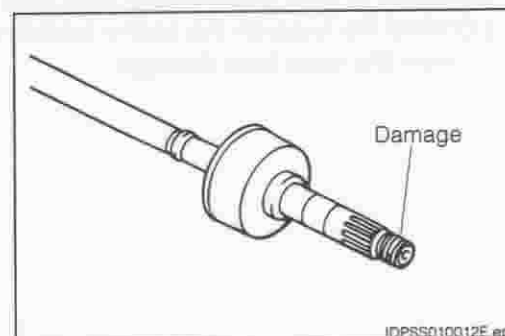
(1) BOOT

1. Check each portion for no abnormal condition.

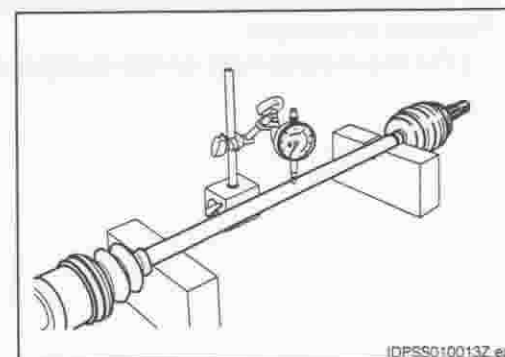


(2) OUT BOARD JOINT S/A

1. Check each portion for no abnormal condition.

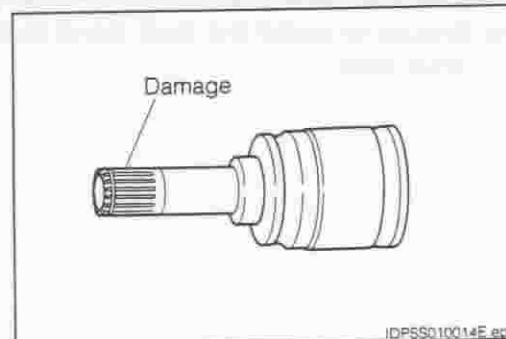


2. Check the runout of the shaft portion.
(1) Support both ends of the shaft.
(2) Measure the runout of the center portion.
ALLOWABLE LIMIT: MAX 1.5mm (RH)
MAX 2.0mm (LH)



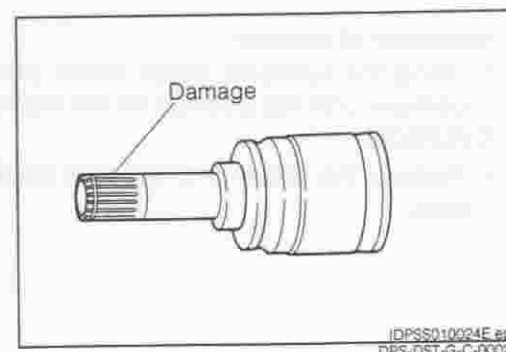
(3) FRONT AXLE INBOARD JOINT S/A.

1. Check each portion for no abnormal condition.



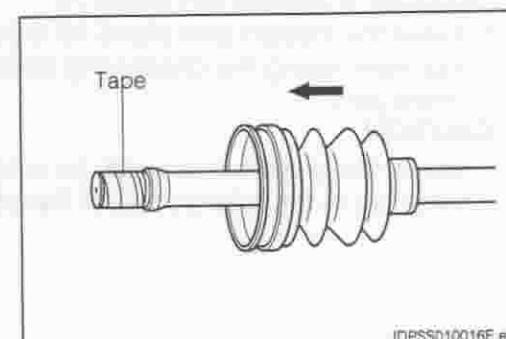
(4) INBOARD JOINT TRIPOD AY

1. Check each portion for no abnormal condition.



1-3-5 POINTS OF ASSEMBLY

1. Installation of front axle outboard joint boot
 - (1) Wind the tape on the spline portion of the shaft to prevent the boot from damage.

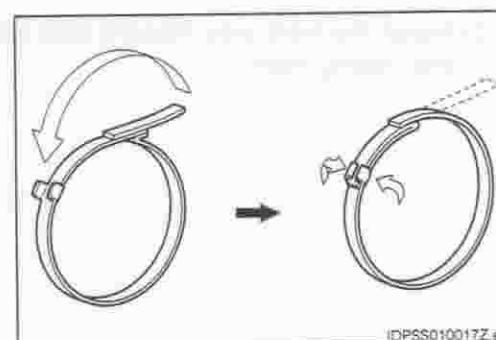


- (2) Fill the grease in the outboard joint and boot.

LUBRICANT: Grease

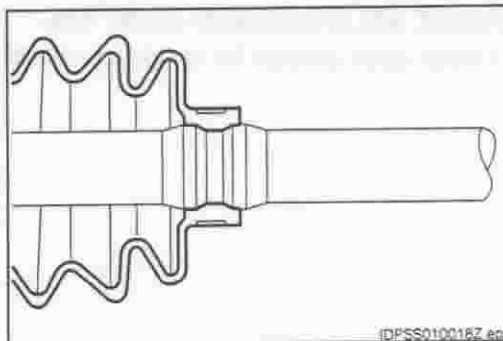
60 ± 10 g (Total)

- (3) Insert the front axle outboard joint boot and boot band.
- (4) Bend the boot band in sequence of the figure, and install it.



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- (5) Ensure to install the boot band to the groove of the drive shaft.

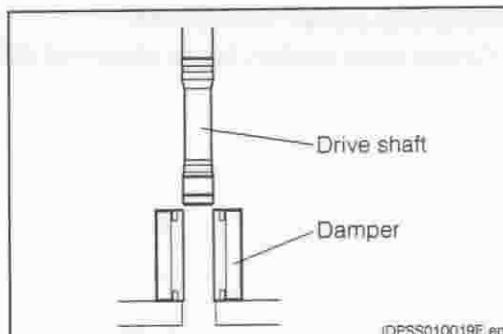


2. Installation of damper

- (1) Using the hydraulic press, insert the drive shaft to the damper until the position on the mating mark.

CAUTION

- Perform the press-fit of the joint portion with a straight state.

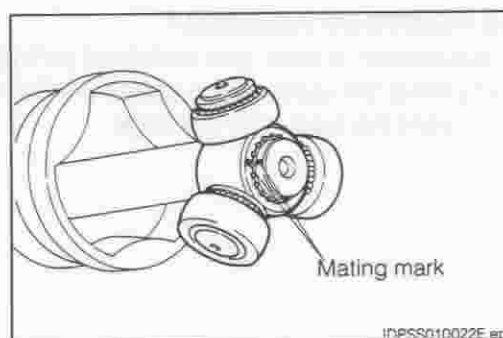


3. Installation of inboard joint tripod Ay

- (1) Install the inboard joint tripod Ay to the position of mating mark facing the chamfering portion toward the outboard joint.

CAUTION

- When the brass bar is used, be sure not to apply the brass bar to the roller portion of the inboard joint tripod.



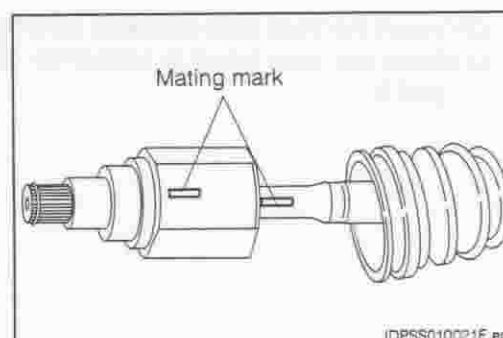
4. Installation of front axle inboard joint S/A

- (1) Fill the grease in the front axle inboard joint and the boot.

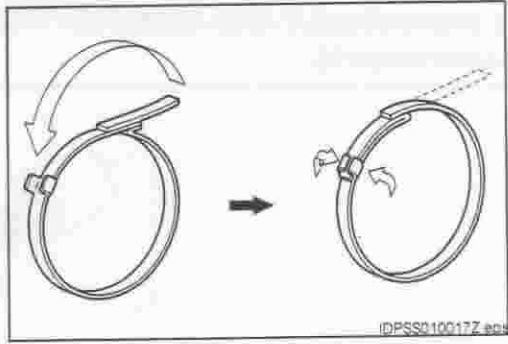
LUBRICANT: Grease

60 ± 10 g (Total)

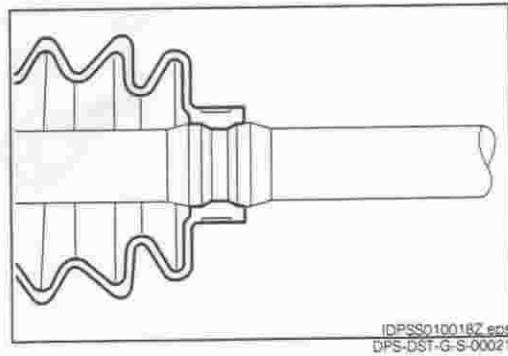
- (2) Install the front axle inboard joint S/A to the position of the mating mark.



(3) Bend the boot band in sequence of the figure, and install it.



(4) Ensure to install the boot band to the groove of the drive shaft.



1-4 DISASSEMBLY AND ASSEMBLY (TJ-BJ) /DSN

NOTE

- The inboard boot band is different in the shape between the factory setting product and the supplies.

DPS-DST-H-Z-00021

1-4-1 PREPARATION TOOLS

	Shape	Part number, part name	Use
SST		*09648-97201-000 Plier A, drive shaft boots band	For installation of boots band
		*09648-97202-000 Plier B, drive shaft boots band	For installation of boots band
Tool	Snap ring expander, V-block		
Lubricant	Grease		

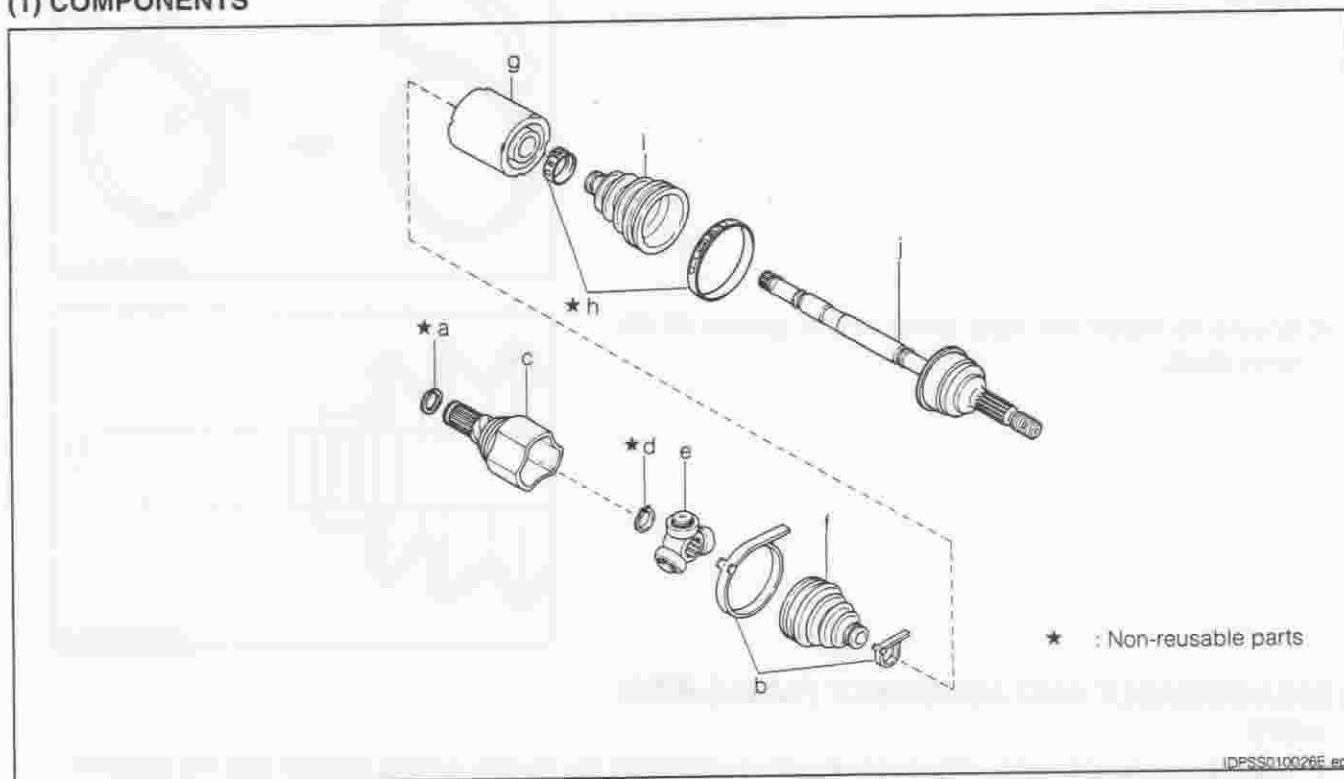
The "*" mark shows a newly provided part.

DPS-DST-H-P-00021

DPS-18

1-4-2 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) COMPONENTS



(2) DISASSEMBLY AND ASSEMBLY PROCEDURE

- | | | | | | | | |
|---|----|---|-------------------------------|----|---|---|---------------------------------|
| 1 | 10 | a | Ring, shaft snap | 6 | 5 | f | Boot, front axle inboard joint |
| ② | ⑨ | b | Band, boot | ⑦ | ④ | g | Damper |
| ③ | ⑧ | c | Joint S/A, front axle inboard | ⑧ | ③ | h | Band, boot |
| 4 | 7 | d | Ring, shaft snap | 9 | ② | i | Boot, front axle outboard joint |
| ⑤ | ⑥ | e | Tripod Ay, inboard joint | 10 | 1 | j | Joint S/A, outboard |

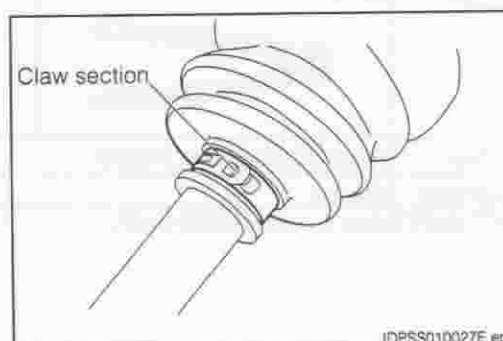
DPS-DST-H-T-00021

1-4-3 POINTS OF DISASSEMBLY

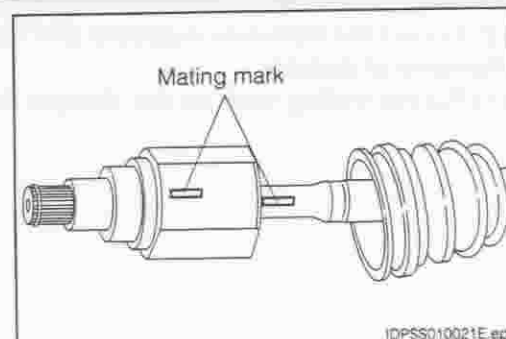
- Removal of front axle inboard joint S/A
(1) Using the chisel and hammer, raise the claw of band.
Then, remove the boot band.

CAUTION

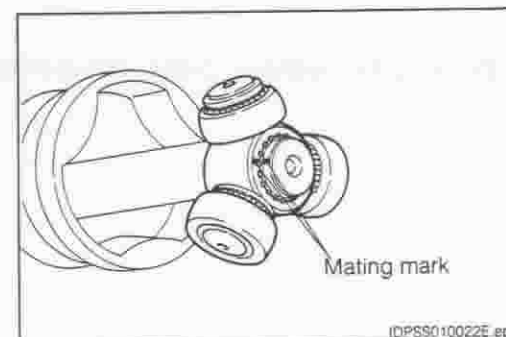
- Prevent the boot from damage during the operation.



- (2) Move the boot slightly.
- (3) Get rid of the grease in the inboard joint and boot.
- (4) Put the mating mark on the inboard joint tripod and the shaft.
- (5) Remove the front axle inboard joint S/A.



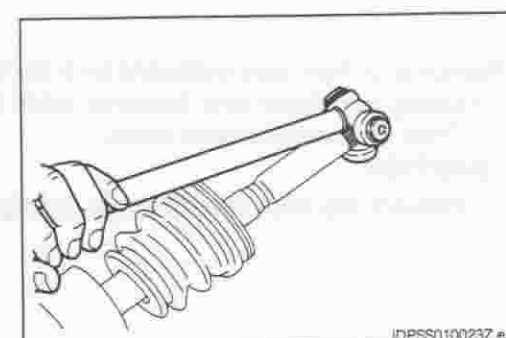
2. Removal of inboard joint tripod Ay
 - (1) Using the snap ring pliers or the like, remove the shaft snap ring.
 - (2) Put the mating mark on the inboard joint tripod and the shaft.



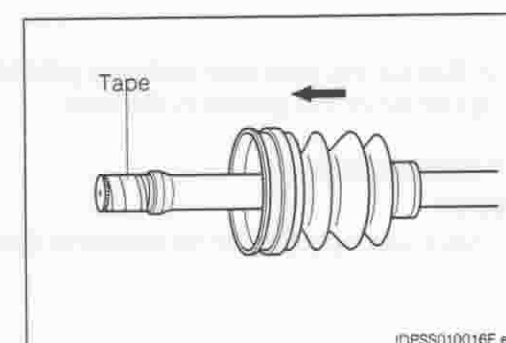
- (3) Using the brass bar or the like, remove the inboard joint tripod Ay.

CAUTION

- Do not touch the brass bar to the roller portion of the inboard joint tripod.



3. Removal of front axle inboard joint boot
 - (1) Wind the tape on the spline portion of the shaft to prevent the boot from damage.

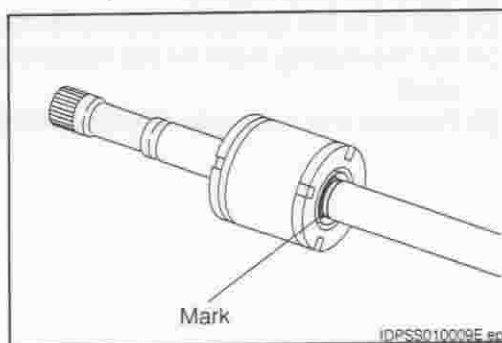


DPS-20

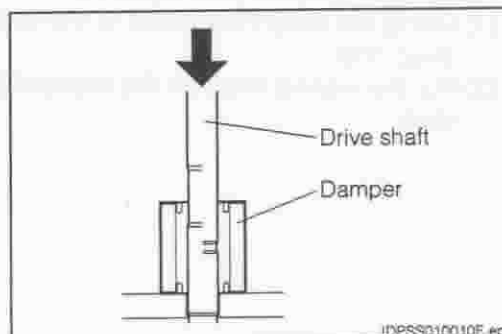
(2) Extract the front axle outboard joint boot and boot band.

4. Removal of damper

(1) Put the mating mark on the damper and the shaft.



(2) Using the hydraulic press, remove the damper.

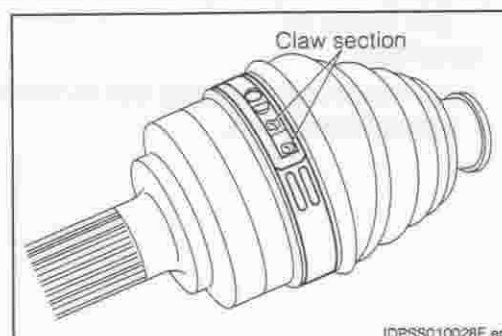


5. Removal of front axle outboard joint boot

(1) Using the chisel and hammer, raise the claw of band.
Then, remove the boot band.

CAUTION

- Prevent the boot from damage during the operation.



(2) Extract the front axle outboard joint boot and band.

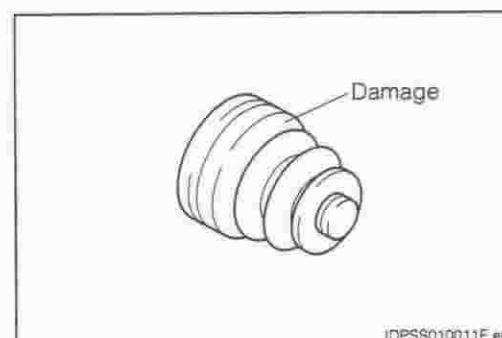
(3) Get rid of the grease in the boot.

DPS-DST-H-D-00021

1-4-4 INSPECTION

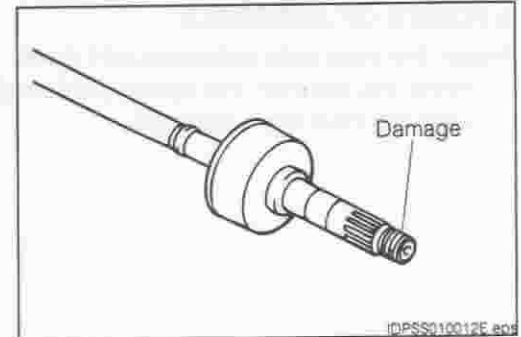
(1) BOOT

1. Check each portion for no abnormal condition.



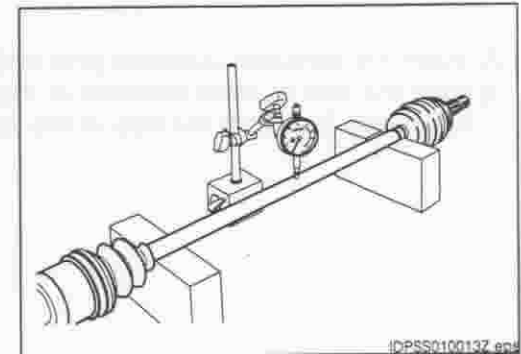
(2) OUT BOARD JOINT S/A

1. Check each portion for no abnormal condition.



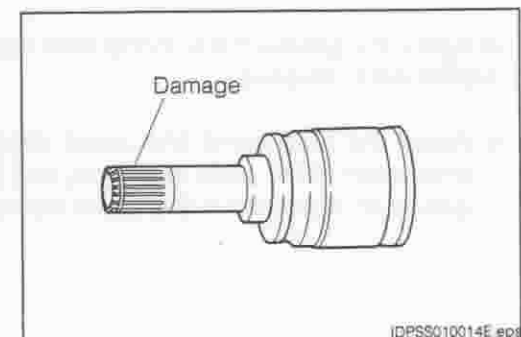
2. Check the runout of the shaft portion.
 - (1) Support both ends of the shaft.
 - (2) Measure the runout of the center portion.

ALLOWABLE LIMIT: MAX 1.5mm (RH)
MAX 2.0mm (LH)



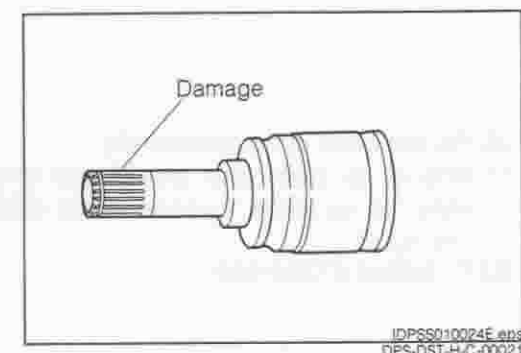
(3) FRONT AXLE INBOARD JOINT S/A.

1. Check each portion for no abnormal condition.



(4) INBOARD JOINT TRIPOD AY

1. Check each portion for no abnormal condition.

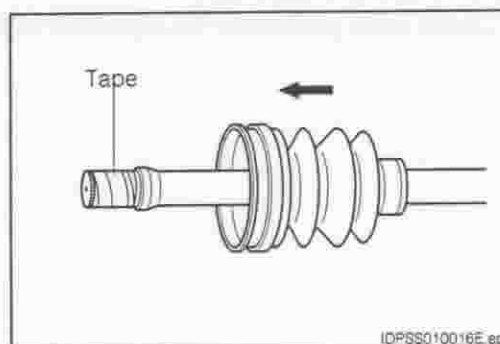


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1-4-5 POINTS OF ASSEMBLY

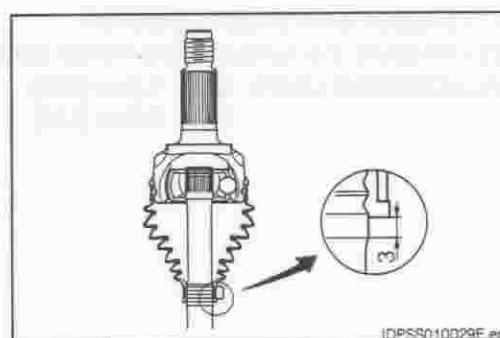
1. Install the front axle outboard joint boot.

- (1) Wind the tape on the spline portion of the shaft to prevent the boot from damage.



(2) Insert the front axle outboard joint boot and boot band.

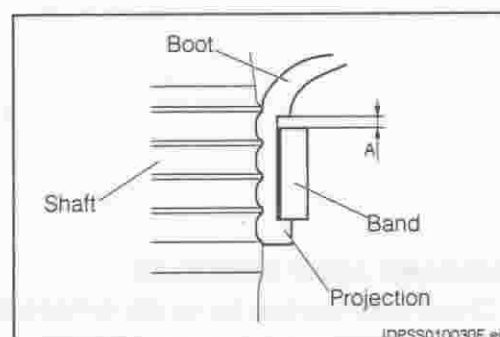
- (3) Mate the end of small diameter of the boot to the position where 3 mm from the step of the shaft as figure.



(4) Apply the grease thinly in the boot band (the small diameter side).

LUBRICANT: Grease

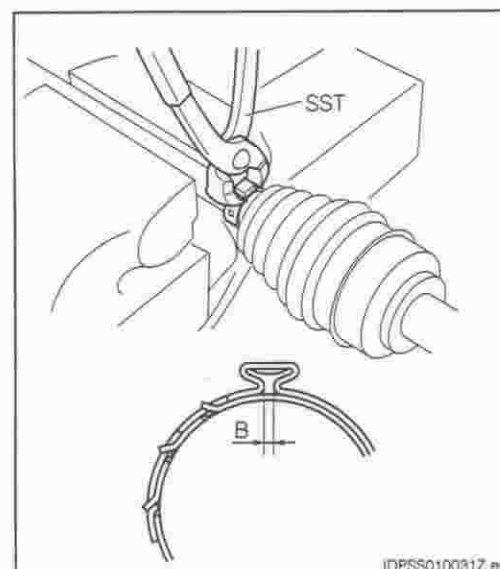
- (5) Apply the boot band (the small diameter side) to the protrusion of the boot end face, and install so that the gap at an A portion in the figure can be made.



(6) Fix the drive shaft horizontally.

- (7) Ensure to stake the boot band (the small diameter side) so as to be touched firmly with the B portion of the figure.

SST: 09648-97202-000



CAUTION

- The boot band (the small diameter side) shall not protrude from the installed portion of the band.
- When the boot band is protruded, remove the band, then install once again using the new boot and band.

(8) Fill up the grease in the boot

LUBRICANT: Grease

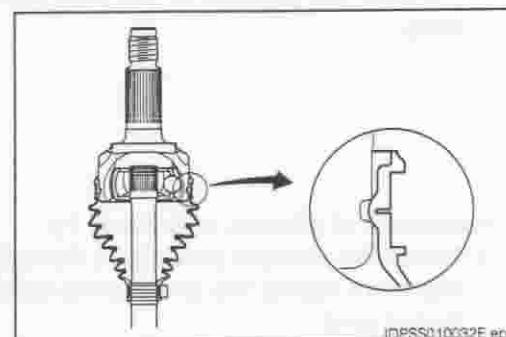
2WD		80^{+10}_{-0} g
4WD	RH	90^{+10}_{-0} g
	LH	80^{+10}_{-0} g

(9) Install the large diameter portion of the boot mating with the convex portion of the inner boot large diameter portion and the concave portion of the outer race of the outboard joint.

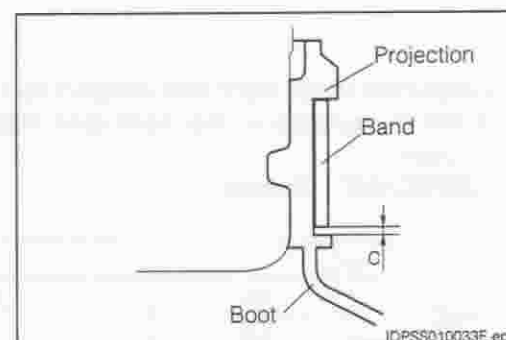
(10) Apply the grease thinly in the boot band (the large diameter side) .

LUBRICANT: Grease

(11) Apply the boot band (the large diameter side) to the protrusion of the boot end face, and install so that the gap at a C portion in the figure can be made.



IDPSS010032E.eps

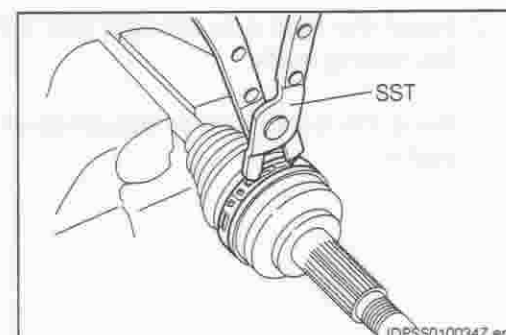


IDPSS010033E.eps

(12) Fix the drive shaft horizontally.

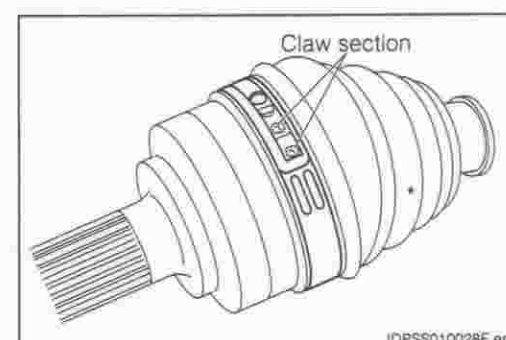
(13) Tighten the boot band (the large diameter side) mating and catching the hole of the boot band (the large diameter side) and the concave portion of the SST.

SST: 09648-97201-000



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(14) Ensure to catch on the claw and the hole of the band in two places.



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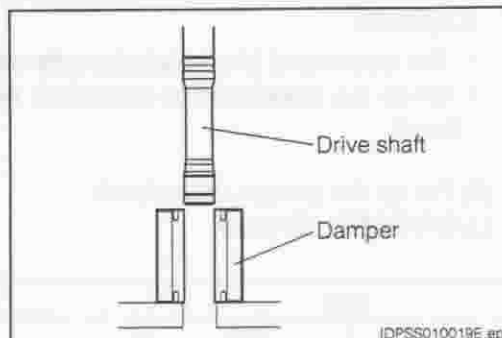
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2. Installation of damper

- (1) Using the hydraulic press, insert the drive shaft to the damper until the position on the mating mark.

CAUTION

- Perform the press-fit of the joint portion with a straight state.

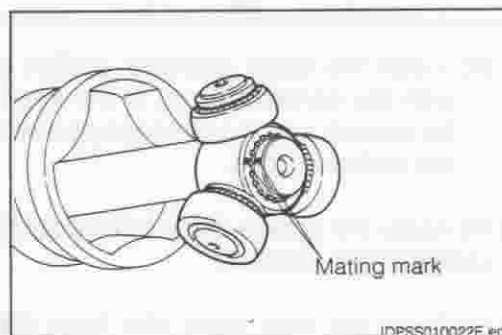


3. Installation of inboard joint tripod Ay

- (1) Install the inboard joint tripod Ay to the position of mating mark facing the chamfering portion toward the outboard joint.

CAUTION

- When the brass bar is used, be sure not to apply the brass bar to the roller portion of the inboard joint tripod.

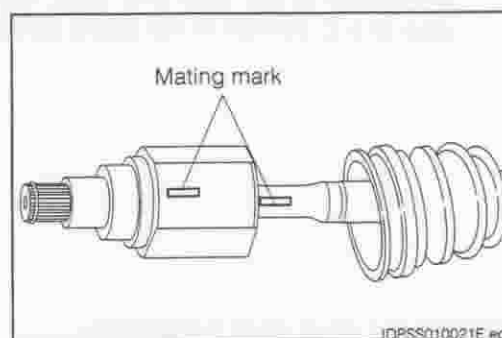


4. Installation of the front axle inboard joint S/A.

- (1) Fill the grease in the front axle inboard joint and the boot.

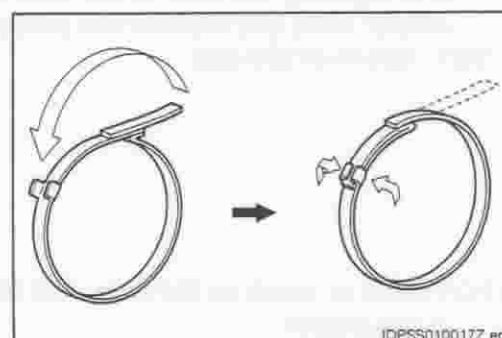
LUBRICANT: Grease

2WD		$90 \pm 10 \text{ g}$
4WD	RH	$100 \pm 10 \text{ g}$
	LH	$90 \pm 10 \text{ g}$

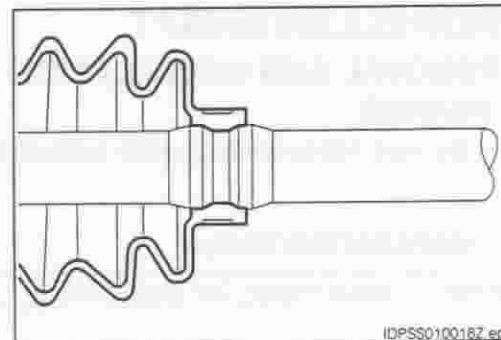


- (2) Install the front axle inboard joint S/A to the position of the mating mark.

- (3) Bend the boot band in sequence of the figure, and install it.



- (4) Ensure to install the boot band to the groove of the drive shaft.



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2 PROPELLER SHAFT

2-1 REMOVAL AND INSTALLATION

WARNING

- Be sure not to operate while exhaust manifold is hot for danger of burn.

DPS-PST-D-Z-00011

2-1-1 PREPARATION TOOLS

Interment	Torque wrench, Dial gauge, V-block
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DPS-PST-D-P-00011

2-1-2 OPERATION BEFORE REMOVAL

1. Jack up the vehicle.

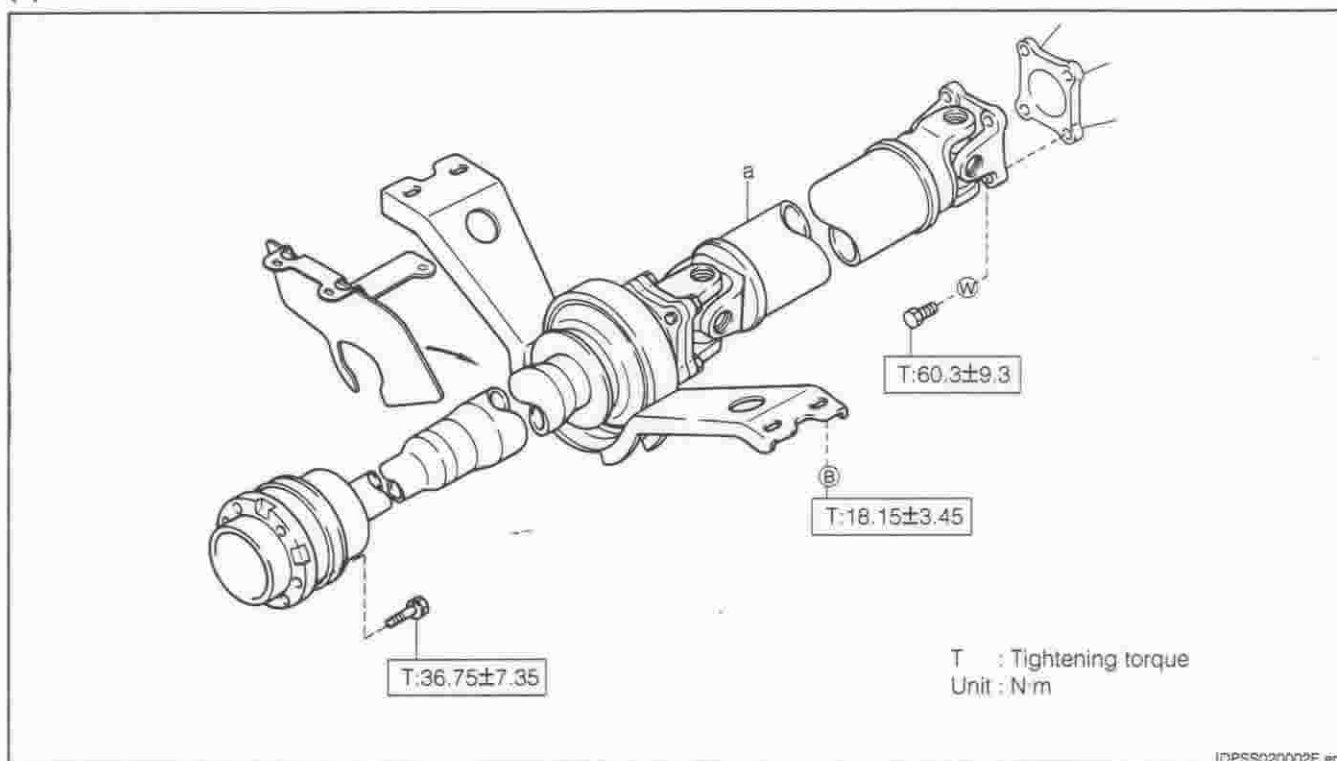
WARNING

- Keep the position of the back up point to avoid causing serious accident due to inclining of the vehicle.

DPS-PST-D-B-00011

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) COMPONENTS



(2) REMOVAL AND INSTALLATION PROCEDURES

- ① ① a Shaft Ay, Propeller W/ center bearing

DPS-PST-D-T-00011

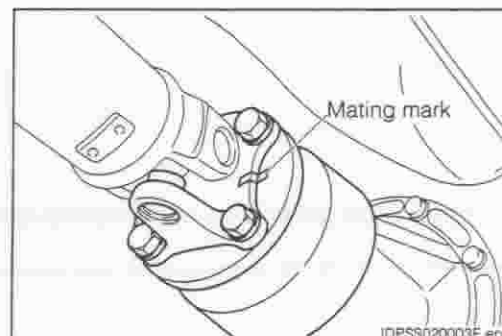
2-1-4 POINTS OF REMOVAL

1. Removal of propeller shaft Ay

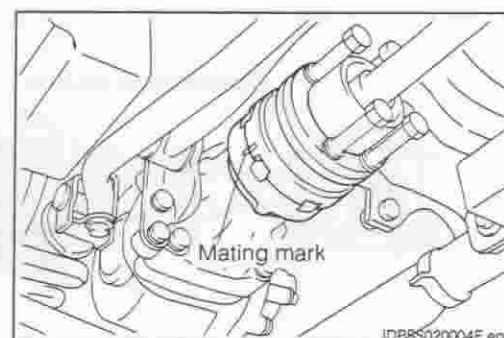
CAUTION

- Be very careful not to apply load to the center support bearing and second joint section.

2. Put mating marks on the flange yoke of propeller shaft Ay and the companion flange of the differential carrier Ay.



3. Put mating marks on the flange yoke of propeller shaft Ay and the companion flange of the transfer.



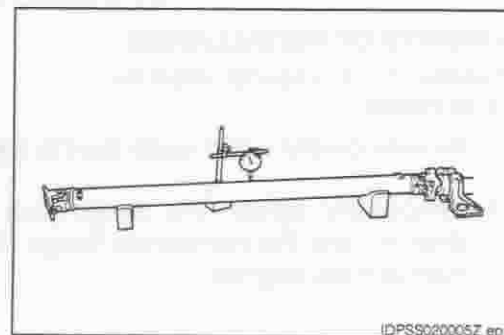
4. Remove the propeller shaft Ay.

DPS-PST-D-0-00011

2-1-5 INSPECTION

(1) PROPELLER SHAFT AY

1. Check the runout of the propeller shaft and the propeller intermediate shaft.
 - (1) Support both ends of the shaft to be checked.
 - (2) Measure the runout of the center portion.

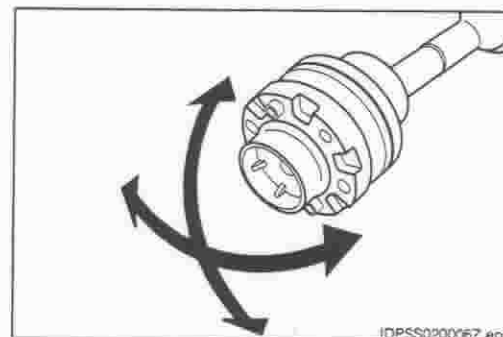


ALLOWABLE LIMIT: MAX 0.5mm (measure it in shaft central portion)

2. Check the state by moving the cross groove joint portion up and down, left and right, and axial direction.

SPECIFIED VALUE: There shall be no remarkably excessive play.

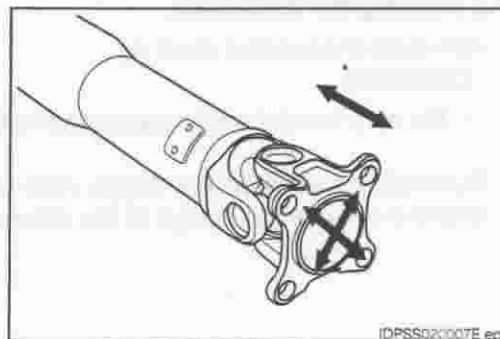
The joint portion shall be rotated smoothly and shall be no bindings.



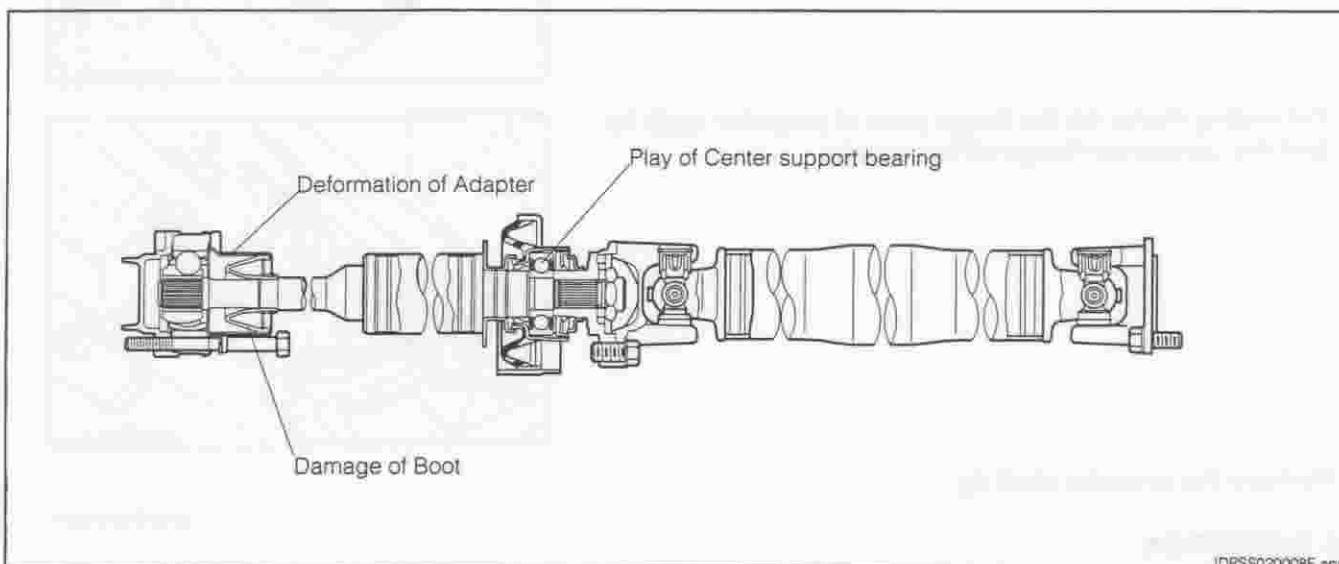
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3. Check the state by moving hook type joint portion up and down, left and right, and axial direction.

SPECIFIED VALUE: There shall be no excessive play.
The joint portion shall be rotated smoothly and shall be no bindings.



4. Check each portion for no abnormal condition.



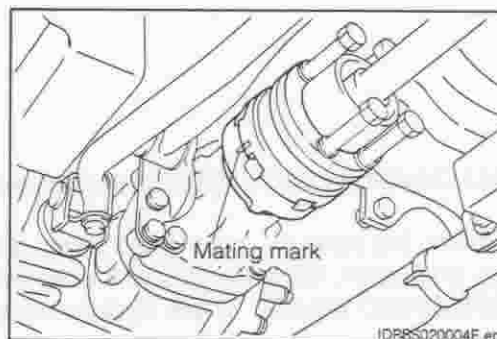
2-1-6 POINTS OF INSTALLATION

1. Installation of propeller shaft Ay

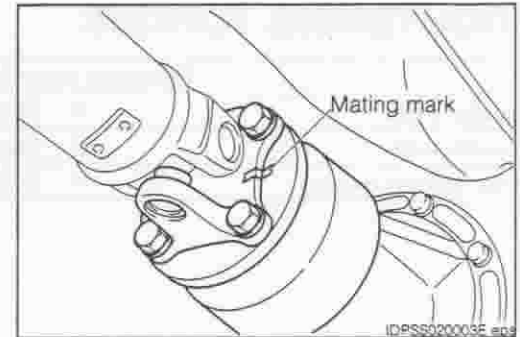
CAUTION

- Be very careful not to apply load to the center support bearing and second joint section.

- (1) Temporarily tighten the flange yolk of the propeller shaft Ay and the companion flange of the transfer with mating mark aligned.



- (2) Regularly tighten the flange yolk of the propeller shaft Ay and the companion flange of the differential carrier Ay with mating mark aligned.



- (3) Regularly tighten the flange yolk of the propeller shaft Ay and the companion flange of the transfer.
(4) Temporarily tighten the center support bearing portion of propeller shaft Ay.

DPS-PST-D-S-00011

2-1-7 OPERATION AFTER INSTALLATION

1. Jack down the vehicle.
2. Make the vehicle curb weight corresponding state.
3. Regularly tighten the center support bearing portion of propeller shaft Ay.

DPS-PST-D-A-00011

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3 TIGHTENING TORQUE

Tightening components		N·m	kgf·cm
Propeller shaft	× Transfer	36.75 ± 7.35	375 ± 75
Propeller shaft	× Rear differential	60.3 ± 9.3	615 ± 95
Center support bearing	× Body	18.15 ± 3.45	185 ± 35

DPS-TOE-Z-Z-00011