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NOT FOR RESALE

DIFFERENTIALS

1. General Description

A: SPECIFICATION

When replacing a rear differential assembly, select the correct one according to the following table.

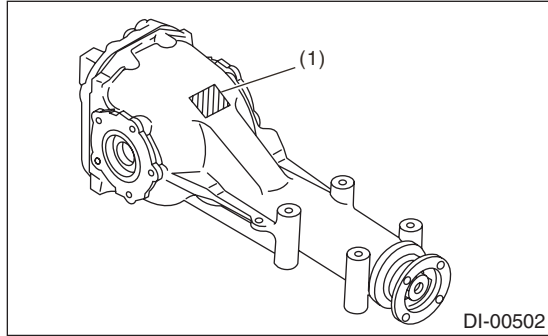
NOTE:

Using a different rear differential assembly will cause the drive train and tires to drag or emit abnormal noise when AWD is selected.

Model	2.5i, OUTBACK		WRX	
	AT	MT	AT	MT
Rear differential type	T-type (Model without LSD)		T-type (Model with LSD)	
LSD type	—		Viscous coupling	
Identification	EH	EG	P1	ER
Type of gear	Hypoid gear			
Gear ratio (Number of gear teeth)	4.111 (37/9)	3.900 (39/10)	3.900 (39/10)	3.700 (37/10)
Oil capacity	0.8 ℓ (0.8 US qt, 0.7 Imp qt)			
Rear differential gear oil	GL-5			

Model	STI
	6MT
Rear differential type	T-type (Model with LSD)
LSD type	Torsen
Identification	HR
Type of gear	Hypoid gear
Gear ratio (Number of gear teeth)	3.545 (39/11)
Oil capacity	1.0 ℓ (1.1 US qt, 0.9 Imp qt)
Rear differential gear oil	GL-5

• Identification



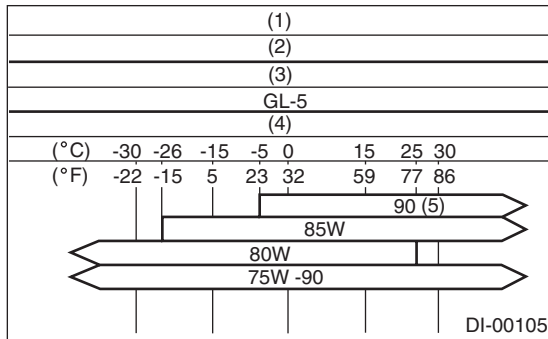
(1) Type (paint)

• Rear differential gear oil

Recommended oil

CAUTION:

Each oil manufacturer uses different basic oil and additives. Thus, do not mix two or more brands.



- (1) Item
- (2) Rear differential gear oil
- (3) API standard
- (4) SAE viscosity No. and applicable temperature
- (5) STI model

1. SERVICE DATA

Drive pinion bearing preload (For new bearing)	Measure with spring measurement. (Measured from the companion flange bolt) N (kgf, lbf)	T-type (Except for STI model)	17.7 — 38.8 (1.8 — 4.0, 4.0 — 8.7)
		T-type (STI model)	24.1 — 38.6 (2.5 — 3.9, 5.4 — 8.7)
	Measure with torque wrench N-m (kgf-m, ft-lb)	T-type (Except for STI model)	0.67 — 1.47 (0.07 — 0.15, 0.49 — 1.08)
		T-type (STI model)	0.98 — 1.57 (0.10 — 0.16, 0.7 — 1.16)
Side gear backlash		mm (in)	0.10 — 0.20 (0.004 — 0.008)
Side bearing standard width		mm (in)	20.00 (0.7874)
Hypoid driven gear to drive pinion backlash		mm (in)	0.10 — 0.20 (0.004 — 0.008)
Driven gear rear face runout limit		mm (in)	0.05 (0.0020) or less

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2. ADJUSTING PARTS

Except for STI model

Drive pinion bearing preload (For new bearing)	Measure with spring measurement. (Measured from the companion flange bolt) N (kgf, lbf)	17.7 — 38.8 (1.8 — 4.0, 4.0 — 8.7)	
	Measure with torque wrench N·m (kgf-m, ft-lb)	0.67 — 1.47 (0.07 — 0.15, 0.49 — 1.08)	
Preload adjusting spacer	Part No.	Length mm (in)	
	383695201	56.2 (2.213)	
	383695202	56.4 (2.220)	
	383695203	56.6 (2.228)	
	383695204	56.8 (2.236)	
	383695205	57.0 (2.244)	
	383695206	57.2 (2.252)	
Preload adjusting washer	Part No.	Length mm (in)	
	383705200	2.59 (0.1020)	
	383715200	2.57 (0.1012)	
	383725200	2.55 (0.1004)	
	383735200	2.53 (0.0996)	
	383745200	2.51 (0.0988)	
	383755200	2.49 (0.0980)	
	383765200	2.47 (0.0972)	
	383775200	2.45 (0.0965)	
	383785200	2.43 (0.0957)	
	383795200	2.41 (0.0949)	
	383805200	2.39 (0.0941)	
	383815200	2.37 (0.0933)	
	383825200	2.35 (0.0925)	
	383835200	2.33 (0.0917)	
383845200	2.31 (0.0909)		
Pinion height adjusting washer	Part No.	Thickness mm (in)	
	383495200	3.09 (0.1217)	
	383505200	3.12 (0.1228)	
	383515200	3.15 (0.1240)	
	383525200	3.18 (0.1252)	
	383535200	3.21 (0.1264)	
	383545200	3.24 (0.1276)	
	383555200	3.27 (0.1287)	
	383565200	3.30 (0.1299)	
	383575200	3.33 (0.1311)	
	383585200	3.36 (0.1323)	
	383595200	3.39 (0.1335)	
	383605200	3.42 (0.1346)	
	383615200	3.45 (0.1358)	
	383625200	3.48 (0.1370)	
	383635200	3.51 (0.1382)	
	383645200	3.54 (0.1394)	
	383655200	3.57 (0.1406)	
383665200	3.60 (0.1417)		
383675200	3.63 (0.1429)		
383685200	3.66 (0.1441)		

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Side gear backlash		mm (in)	0.1 — 0.2 (0.004 — 0.008)
Side gear thrust washer (Model without LSD)		Part No.	Thickness mm (in)
		383445201	0.75 — 0.80 (0.0295 — 0.0315)
		383445202	0.80 — 0.85 (0.0315 — 0.0335)
		383445203	0.85 — 0.90 (0.0335 — 0.0354)
Side bearing standard width		mm (in)	— 20.00 (0.7874)
Side bearing retainer shim		Part No.	Thickness mm (in)
		383475201	0.20 (0.0079)
		383475202	0.25 (0.0098)
		383475203	0.30 (0.0118)
		383475204	0.40 (0.0157)
		383475205	0.50 (0.0197)
Limit	mm (in)	Hypoid driven gear to drive pinion backlash	— 0.10 — 0.20 (0.004 — 0.008)
		Driven gear rear face runout limit	0.05 (0.0020)

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STI model

Drive pinion bearing preload (For new bearing)	Measure with spring measurement. (Measured from the companion flange bolt) N (kgf, lbf)	24.1 — 38.6 (2.5 — 3.9, 5.4 — 8.7)	
	Measure with torque wrench N-m (kgf-m, ft-lb)	0.98 — 1.57 (0.10 — 0.16, 0.72 — 1.16)	
Preload adjusting spacer	Part No.	Length mm (in)	
	31454AA130	52.2 (2.055)	
	31454AA140	52.4 (2.063)	
	31454AA150	52.6 (2.071)	
	31454AA160	52.8 (2.079)	
	31454AA170	53.0 (2.087)	
Preload adjusting washer	31454AA180	53.2 (2.094)	
	Part No.	Length mm (in)	
	383705200	2.59 (0.1020)	
	383715200	2.57 (0.1012)	
	383725200	2.55 (0.1004)	
	383735200	2.53 (0.0996)	
	383745200	2.51 (0.0988)	
	383755200	2.49 (0.0980)	
	383765200	2.47 (0.0972)	
	383775200	2.45 (0.0965)	
	383785200	2.43 (0.0957)	
	383795200	2.41 (0.0949)	
	383805200	2.39 (0.0941)	
	383815200	2.37 (0.0933)	
Pinion height adjusting washer	383825200	2.35 (0.0925)	
	383835200	2.33 (0.0917)	
	383845200	2.31 (0.0909)	
	Part No.	Length mm (in)	
	38336AA230	3.09 (0.1217)	
	38336AA240	3.12 (0.1228)	
	38336AA250	3.15 (0.1240)	
	38336AA260	3.18 (0.1252)	
	38336AA270	3.21 (0.1264)	
	38336AA280	3.24 (0.1276)	
	38336AA290	3.27 (0.1287)	
	38336AA300	3.30 (0.1299)	
	38336AA310	3.33 (0.1311)	
	38336AA320	3.36 (0.1323)	
38336AA330	3.39 (0.1335)		
38336AA340	3.42 (0.1346)		
38336AA350	3.45 (0.1358)		
38336AA360	3.48 (0.1370)		
38336AA370	3.51 (0.1382)		
38336AA380	3.54 (0.1394)		
38336AA390	3.57 (0.1406)		
38336AA400	3.60 (0.1417)		
38336AA410	3.63 (0.1429)		
38336AA420	3.66 (0.1441)		
Side bearing standard width	mm (in)	20.00 (0.7874)	

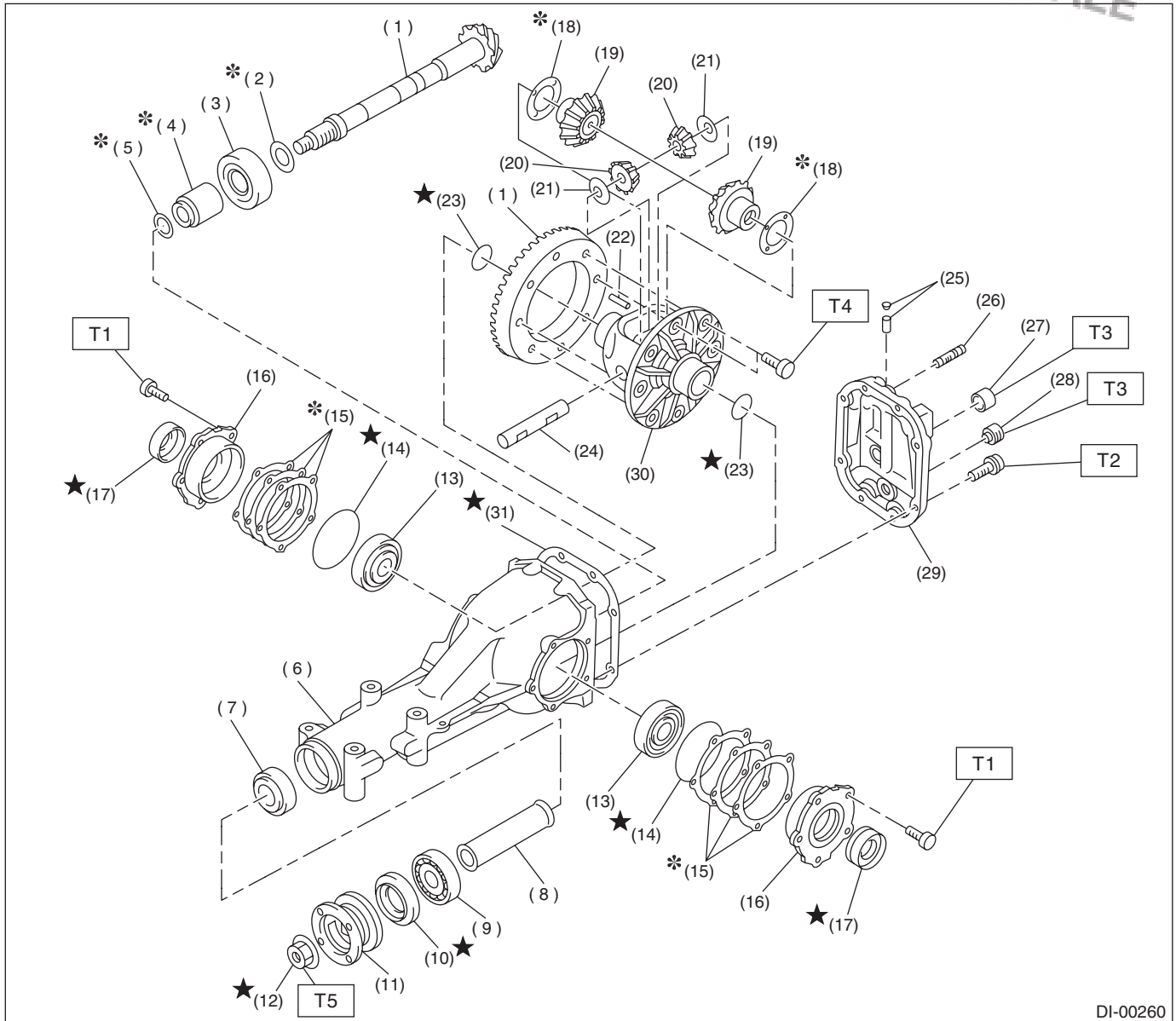
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		Part No.	Thickness mm (in)
Side bearing retainer shim		383475201	0.20 (0.0079)
		383475202	0.25 (0.0098)
		383475203	0.30 (0.0118)
		383475204	0.40 (0.0157)
		383475205	0.50 (0.0197)
Limit	mm (in)	Hypoid driven gear to drive pinion backlash	0.10 — 0.20 (0.004 — 0.008)
		Driven gear rear face runout limit	0.05 (0.0020)

B: COMPONENT

1. REAR DIFFERENTIAL WITHOUT LSD



DI-00260

- | | | |
|---|---------------------------------|------------------------|
| (1) Hypoid driven gear and drive pinion set | (13) Side bearing | (26) Stud bolt |
| (2) Pinion height adjusting washer | (14) O-ring | (27) Oil filler plug |
| (3) Rear bearing | (15) Side bearing retainer shim | (28) Oil drain plug |
| (4) Bearing preload adjusting spacer | (16) Side bearing retainer | (29) Rear cover |
| (5) Bearing preload adjusting washer | (17) Side oil seal | (30) Differential case |
| (6) Differential carrier | (18) Side gear thrust washer | (31) Gasket |
| (7) Front bearing | (19) Side gear | |
| (8) Spacer | (20) Pinion mate gear | |
| (9) Pilot bearing | (21) Pinion mate gear washer | |
| (10) Front oil seal | (22) Pinion shaft lock pin | |
| (11) Companion flange | (23) Snap ring | |
| (12) Self-locking nut | (24) Pinion mate shaft | |
| | (25) Air breather cap | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 10.5 (1.1, 7.7)

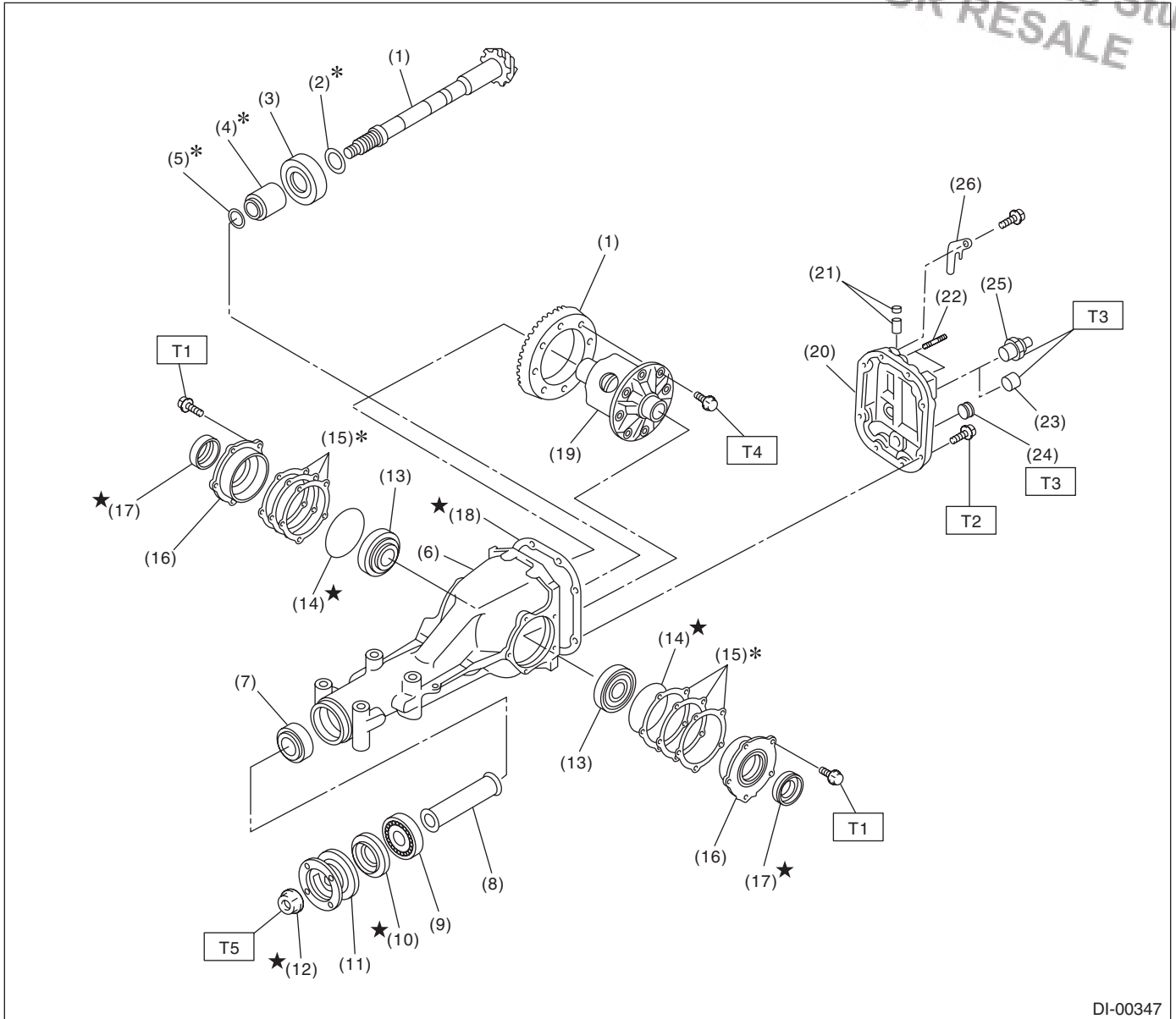
T2: 29.5 (3.0, 21.8)

T3: 49 (5.0, 36.2)

T4: 103 (10.5, 76)

T5: 181.5 (18.5, 134)

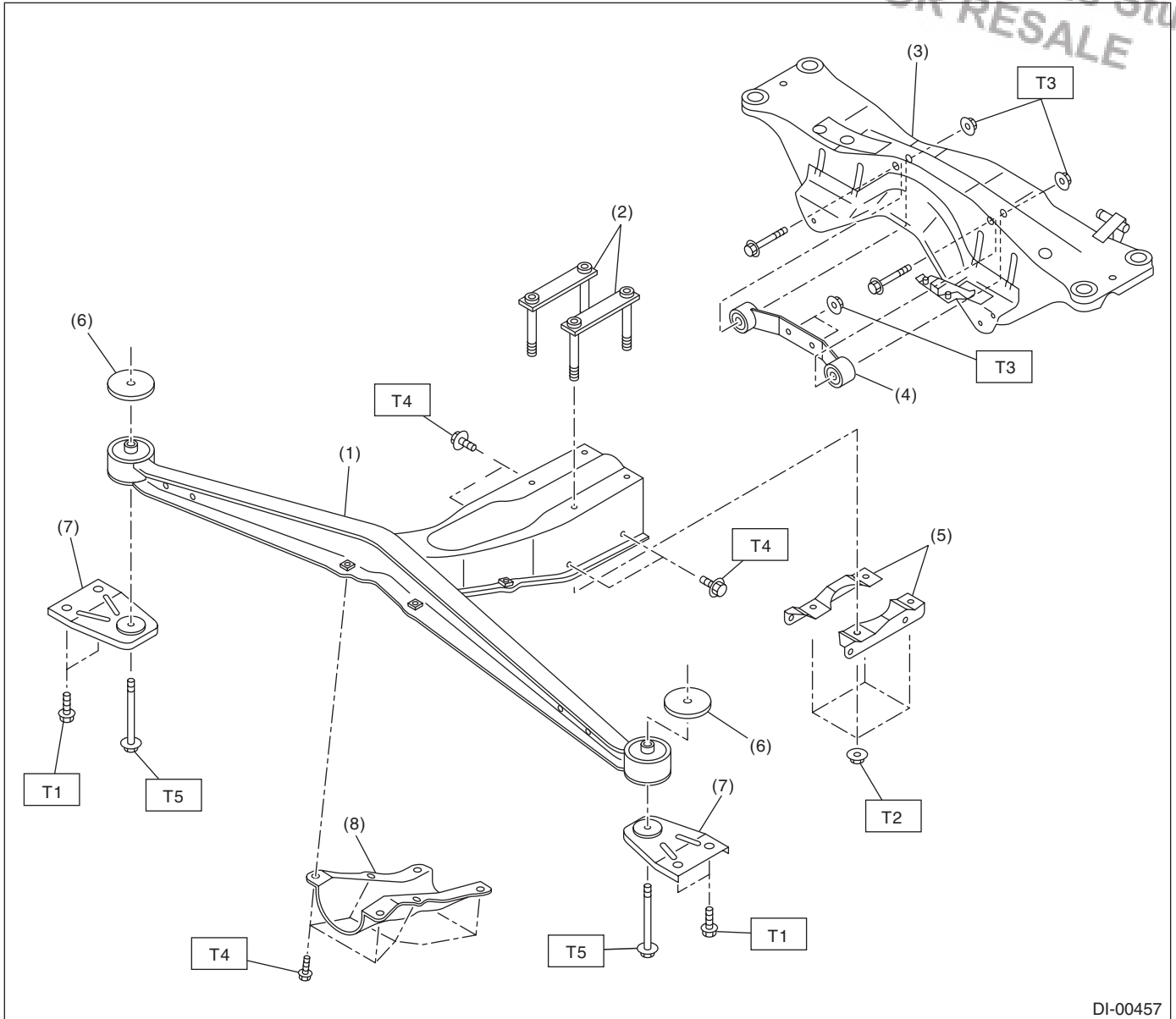
2. REAR DIFFERENTIAL WITH LSD



DI-00347

- | | | |
|---|---|---|
| (1) Hypoid driven gear and drive pinion set | (14) O-ring | (24) Oil drain plug |
| (2) Pinion height adjusting washer | (15) Side bearing retainer shim | (25) Oil filler plug (Rear differential oil temperature switch) (STI model) |
| (3) Rear bearing | (16) Side bearing retainer | (26) Stay ground (STI model) |
| (4) Bearing preload adjusting spacer | (17) Side oil seal | |
| (5) Bearing preload adjusting washer | (18) Gasket | |
| (6) Differential carrier | (19) Differential case (Viscous coupling type) (Except for STI model) | Tightening torque: N·m (kgf·m, ft·lb) |
| (7) Front bearing | (19) Differential case (Mechanical type) (STI model) | T1: 10.5 (1.1, 7.7) |
| (8) Collar | | T2: 29.5 (3.0, 21.8) (except for STI model) |
| (9) Pilot bearing | (20) Rear cover | 44 (4.5, 32.5) (STI model) |
| (10) Front oil seal | (21) Air breather cap | T3: 49 (5.0, 36.2) |
| (11) Companion flange | (22) Stud bolt | T4: 103 (10.5, 76) |
| (12) Self-locking nut | (23) Oil filler plug | T5: 181.5 (18.5, 134) |
| (13) Side bearing | | |

3. REAR DIFFERENTIAL MOUNTING SYSTEM



DI-00457

- | | |
|-------------------------------|--------------------------------------|
| (1) Differential front member | (5) Differential mount lower bracket |
| (2) Plate | (6) Stopper |
| (3) Crossmember | (7) Differential mount bracket |
| (4) Differential rear member | (8) Differential mount front cover |

Tightening torque: N·m (kgf·m, ft·lb)

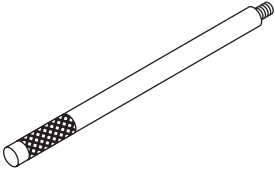
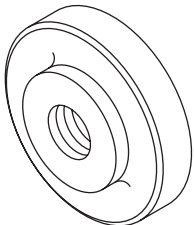
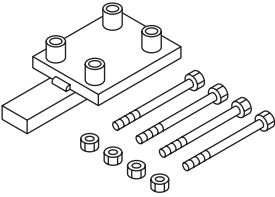
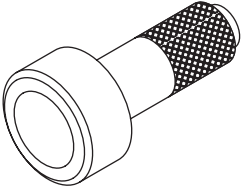
- T1: 33 (3.4, 24.3)**
T2: 50 (5.1, 36.9)
T3: 70 (7.1, 51.6)
T4: 90 (9.2, 66.4)
T5: 100 (10.2, 73.8)

C: CAUTION

- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine gear oil, grease or the equivalent. Do not mix gear oil, grease, etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Apply gear oil onto sliding or revolving surfaces before installation.
- Before installing the O-ring or snap ring, apply a sufficient amount of gear oil to avoid damage and deformation.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or cloth between the part and the vise.
- Avoid damaging the mating surface of the case.

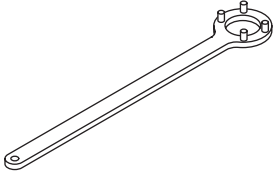
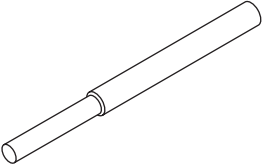
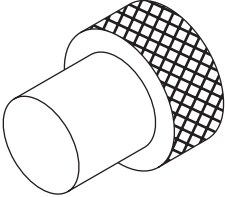
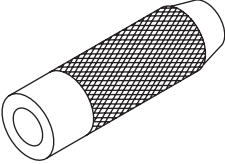
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-398477701</p>	398477701	HANDLE	Used for installing the front and rear bearing cones.
 <p>ST-398477702</p>	398477702	DRIFT	Used for press-fitting the bearing race (front) of the differential carrier.
 <p>ST-398217700</p>	398217700	ATTACHMENT SET	Stand for rear differential carrier disassembly and assembly.
 <p>ST-498447120</p>	498447120	INSTALLER	Used for installing the front oil seal.

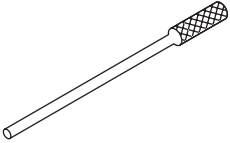
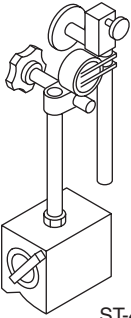
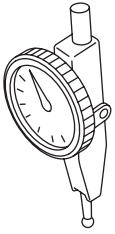
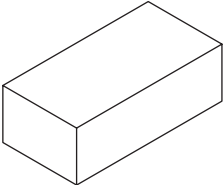
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498427200</p>	498427200	FLANGE WRENCH	<ul style="list-style-type: none"> • Used for preventing rotation of companion flange when loosening and tightening self-lock nut. • For models except for STI model.
 <p>ST-398467700</p>	398467700	DRIFT	Used for removing pinion, pilot bearing and front bearing cone.
 <p>ST-399780104</p>	399780104	WEIGHT	Used for installing the front bearing cone and the pilot bearing companion flange.
 <p>ST-899580100</p>	899580100	INSTALLER	Used for press-fitting the front bearing cone and pilot bearing.

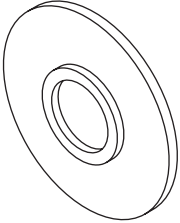
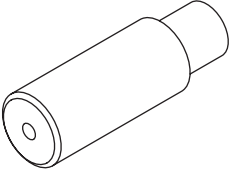
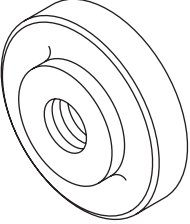
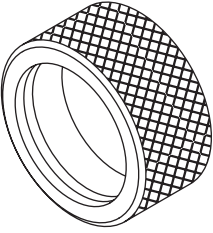
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-899904100</p>	899904100	STRAIGHT PIN REMOVER	Used for driving out differential pinion shaft lock pin.
 <p style="text-align: center;">ST-498247001</p>	498247001	MAGNET BASE	<ul style="list-style-type: none"> • Used for measuring backlash between side gear and pinion, and hypoid gear. • Used together with the DIAL GAUGE (498247100).
 <p style="text-align: center;">ST-498247100</p>	498247100	DIAL GAUGE	<ul style="list-style-type: none"> • Used for measuring backlash between side gear and pinion, and hypoid gear. • Used together with the MAGNET BASE (498247001).
 <p style="text-align: center;">ST-398507704</p>	398507704	BLOCK	Used for adjusting pinion height and preload.

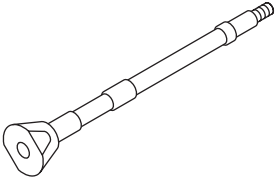
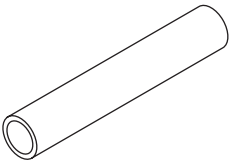
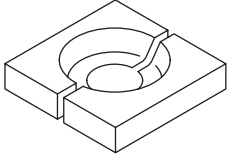
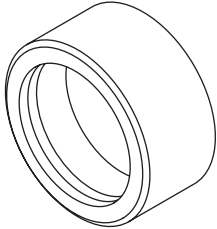
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-398177700</p>	<p>398177700</p>	<p>INSTALLER</p>	<p>Used for installing the rear bearing cone.</p>
 <p>ST-398457700</p>	<p>398457700</p>	<p>ATTACHMENT</p>	<p>Used for removing the side bearing retainer.</p>
 <p>ST-398477703</p>	<p>398477703</p>	<p>DRIFT 2</p>	<p>Used for press-fitting bearing race (rear) of differential carrier.</p>
 <p>ST-398437700</p>	<p>398437700</p>	<p>DRIFT</p>	<p>Used for installing the side oil seal.</p>

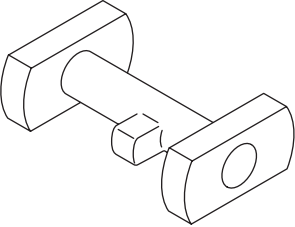
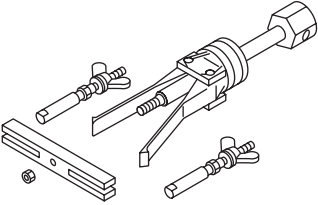
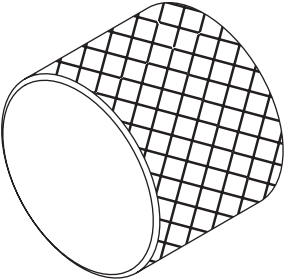
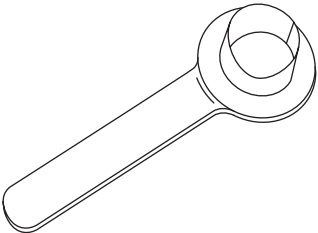
General Description

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398507702</p>	398507702	DUMMY SHAFT	Used for adjusting pinion height and preload.
 <p style="text-align: center;">ST-398507703</p>	398507703	DUMMY COLLAR	Used for adjusting pinion height and preload.
 <p style="text-align: center;">ST-398517700</p>	398517700	REPLACER	Used for removing rear bearing cone.
 <p style="text-align: center;">ST-398487700</p>	398487700	DRIFT	Used for press-fitting side bearing cone.

General Description

DIFFERENTIALS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-398507701</p>	398507701	DIFFERENTIAL CARRIER GAUGE	Used for adjusting pinion height.
 <p>ST-398527700</p>	398527700	PULLER ASSY	<ul style="list-style-type: none"> • Used for removing front oil seal. • Used for removing side bearing cup.
 <p>ST-398227700</p>	398227700	WEIGHT	Used for installing side bearing.
 <p>ST28099PA090</p>	28099PA090	OIL SEAL PROTECTOR	<ul style="list-style-type: none"> • Used for installing the rear drive shaft to the rear differential. • For oil seal protection

General Description

DIFFERENTIALS

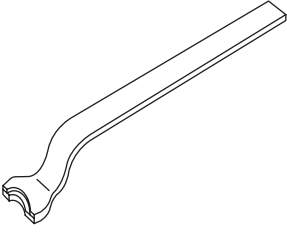
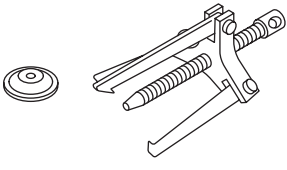
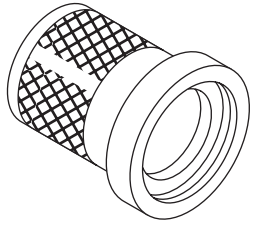
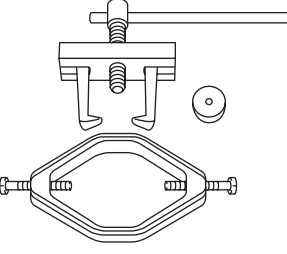
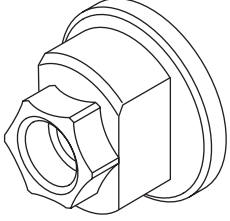
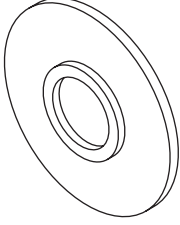
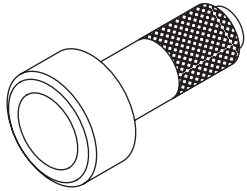
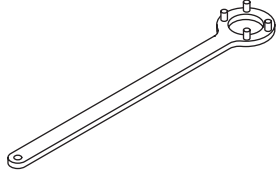
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST28099PA100</p>	<p style="text-align: center;">28099PA100</p>	<p>DRIVE SHAFT REMOVER</p>	<p>Used for removing the rear drive shaft from rear differential.</p>
 <p style="text-align: center;">ST-399703600</p>	<p style="text-align: center;">399703600</p>	<p>PULLER ASSY</p>	<p>Used for removing companion flange.</p>
 <p style="text-align: center;">ST-899874100</p>	<p style="text-align: center;">899874100</p>	<p>INSTALLER</p>	<p>Used for installing the companion flange.</p>
 <p style="text-align: center;">ST18759AA000</p>	<p style="text-align: center;">18759AA000</p>	<p>PULLER ASSY</p>	<p>Used for removing the differential side bearing cone.</p>

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498937110	498937110	HOLDER	<ul style="list-style-type: none"> • Used for installing the pilot bearing. • For STI model.
 ST18674AA000	18674AA000	INSTALLER	<ul style="list-style-type: none"> • Used for installing the rear bearing cone. • For STI model.
 ST-398417700	398417700	DRIFT	Used for installing side bearing race.
 ST18633AA000	18633AA000	WRENCH COMPL	<ul style="list-style-type: none"> • Used for preventing rotation of companion flange when loosening and tightening self-lock nut. • For STI model.

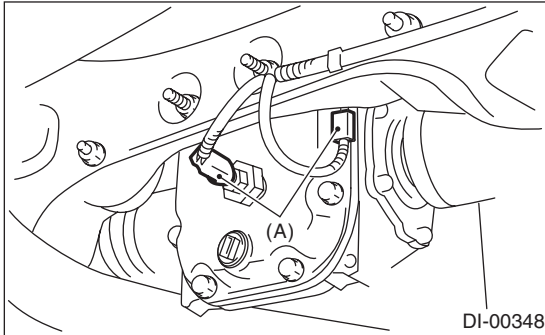
2. GENERAL TOOL

TOOL NAME	REMARKS
Transmission jack	Used for assembly/disassembly of the rear differential.
Puller	Used for removing the side bearing retainer.
Thickness gauge	Used for measuring clearance.

2. Differential Gear Oil

A: INSPECTION

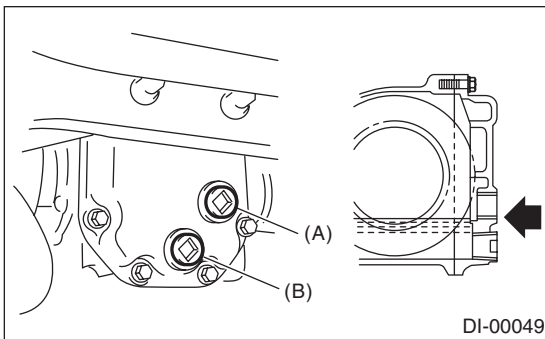
1) Disconnect the oil temperature switch connector. (STI model)



(A) Connector

2) Remove the filler plug or the rear differential oil temperature switch, and then check the gear oil. Replace the gear oil if it is contaminated or deteriorated. <Ref. to DI-20, REPLACEMENT, Differential Gear Oil.>

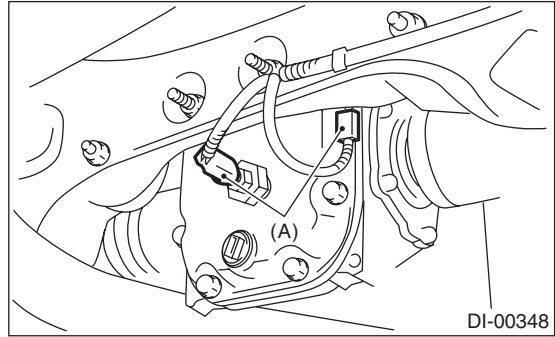
3) Check that the gear oil level is up to the bottom of the filler plug hole. If the level is low, refill up to the bottom of filler plug.



(A) Filler plug
(B) Drain plug

B: REPLACEMENT

1) Lift up the vehicle.
2) Disconnect the oil temperature switch connector. (STI model)

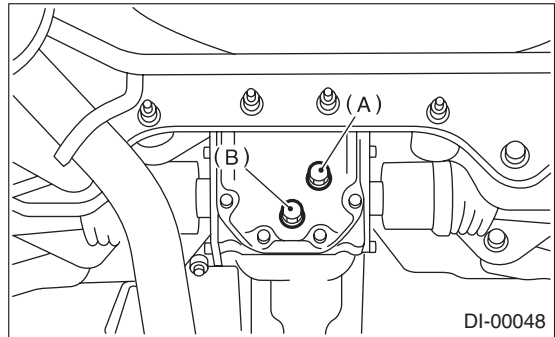


(A) Connector

3) Remove the oil drain plug and filler plug, and drain the gear oil.

CAUTION:

Be careful not to burn your hands, because gear oil becomes extremely hot after running.



(A) Filler plug
(B) Drain plug

4) Tighten the oil drain plug.

NOTE:

Apply liquid gasket to the drain plug.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

49 N·m (5.0 kgf·m, 36.2 ft·lb)

5) Fill the differential carrier with gear oil to the bottom of filler plug.

NOTE:

Carefully refill oil while watching the level. Excessive or insufficient oil must be avoided.

Recommended gear oil:

GL-5 (75W-90) or equivalent

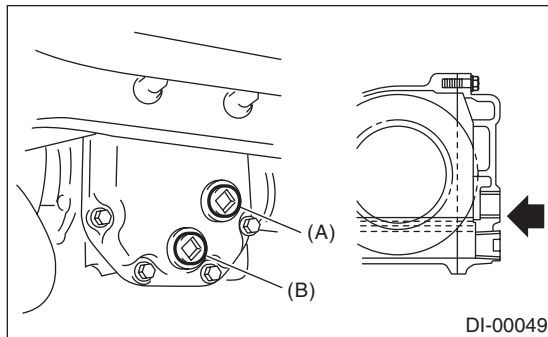
Oil capacity:

Except for STI model:

0.8 ℓ (0.8 US qt, 0.7 Imp qt)

STI model:

1.0 ℓ (1.1 US qt, 0.9 Imp qt)



- (A) Filler plug
- (B) Drain plug

6) Install the filler plug or the rear differential oil temperature switch.

NOTE:

Apply liquid gasket to the filler plug or the rear differential oil temperature switch.

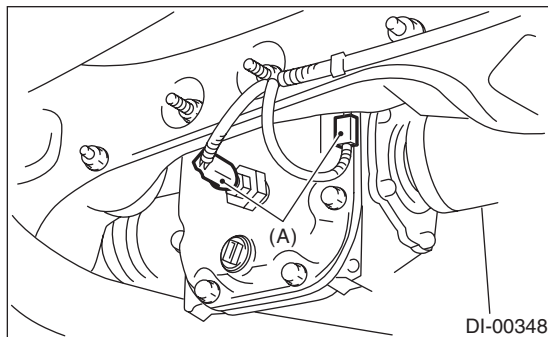
Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

49 N·m (5.0 kgf·m, 36.2 ft·lb)

7) Connect the oil temperature switch connector. (STI model)



- (A) Connector

3. Front Differential Assembly

A: NOTE

1. AT MODEL

For front differential of automatic transmissions, refer to the "AT" section. <Ref. to 4AT-96, Front Differential Assembly.>

2. MT MODEL

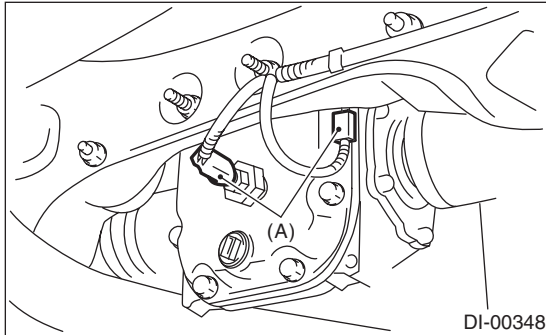
For front differential of the manual transmission, refer to "5MT" or "6MT" section. <Ref. to 5MT-68, Front Differential Assembly.> <Ref. to 6MT-97, Front Differential Assembly.>

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4. Rear Differential

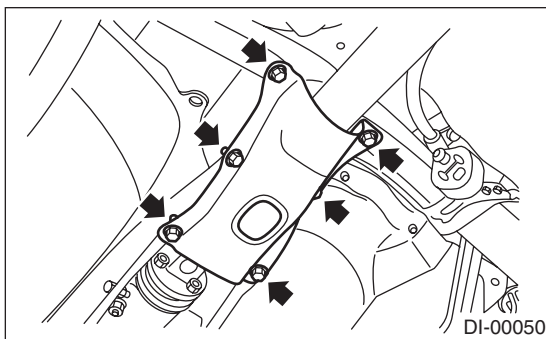
A: REMOVAL

- 1) Set the vehicle on a lift.
- 2) Disconnect the ground cable from battery.
- 3) Shift the select lever or gear shift lever to neutral.
- 4) Release the parking brake.
- 5) Loosen the wheel nuts.
- 6) Lift up the vehicle.
- 7) Remove the wheels.
- 8) Disconnect the connector from the oil temperature switch. (STI model)



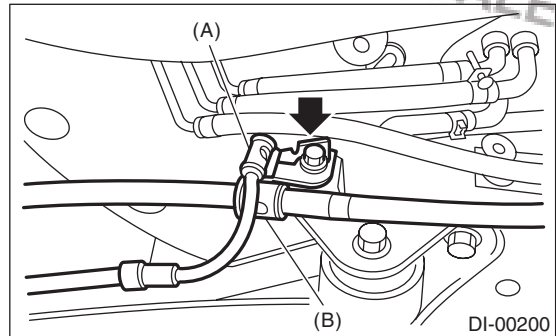
(A) Connector

- 9) Remove the rear exhaust pipe and muffler. SOHC model <Ref. to EX(H4SO)-8, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(H4SO)-9, REMOVAL, Muffler.> DOHC turbo model <Ref. to EX(H4DOTC)-15, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(H4DOTC)-17, REMOVAL, Muffler.>
- 10) Remove the front cover of the rear differential mount.



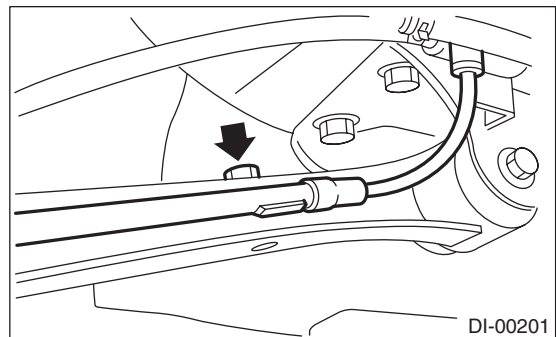
- 11) Remove the propeller shaft. <Ref. to DS-15, REMOVAL, Propeller Shaft.>
- 12) Remove the rear differential protector. (If equipped)
- 13) Remove the DOJ of rear drive shaft from rear differential.

- (1) Remove the ABS wheel speed sensor cable clamp and the parking brake cable clamp from bracket.

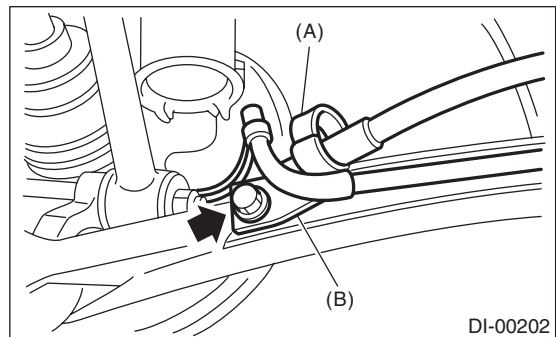


(A) ABS wheel speed sensor cable clamp
(B) Parking brake cable clamp

- (2) Remove the ABS wheel speed sensor cable clamp from the trailing link.



- (3) Remove the ABS wheel speed sensor cable clamp and the parking brake cable guide from the trailing link.

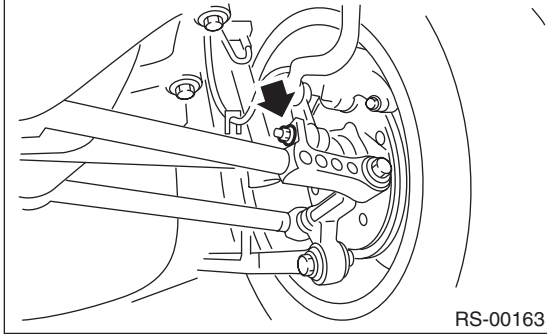


(A) Parking brake cable guide
(B) ABS wheel speed sensor cable clamp

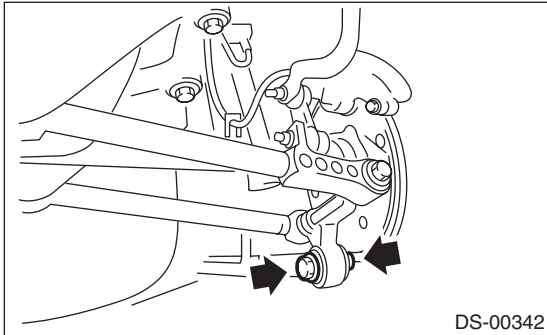
Rear Differential

DIFFERENTIALS

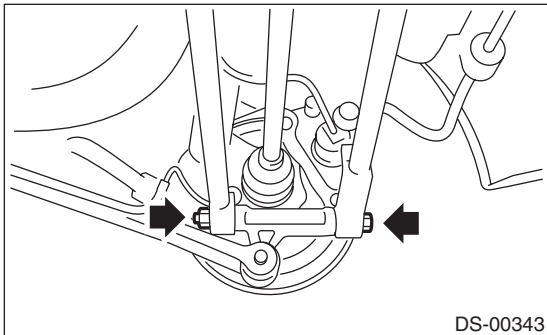
(4) Remove the rear stabilizer link.



(5) Remove the bolts which secure the trailing link to the housing.



(6) Remove the bolts which secure the front and rear lateral links to the rear housing.

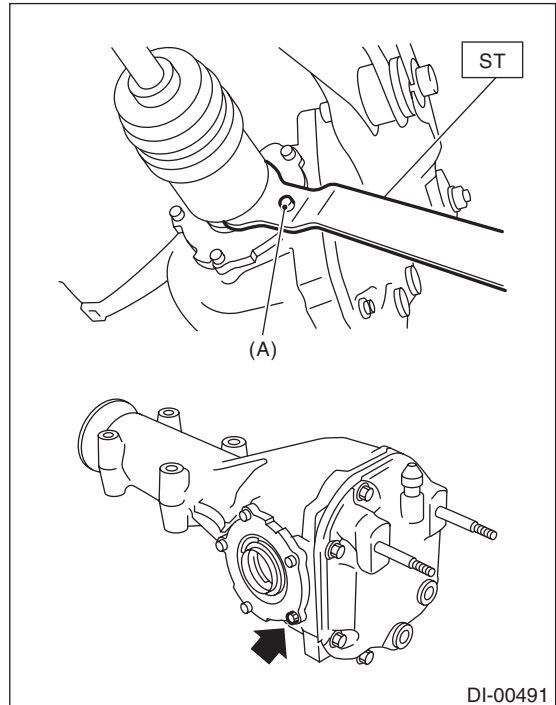


(7) Remove the DOJ from the rear differential by using ST.

NOTE:

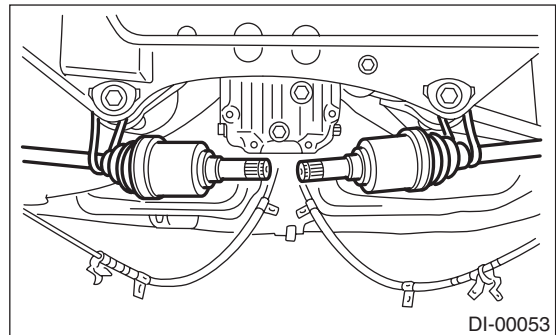
When removing the DOJ from the rear differential, fit the ST to the bolts as shown in the figure so as not to damage the side bearing retainer.

ST 208099PA100 DRIVE SHAFT REMOVER

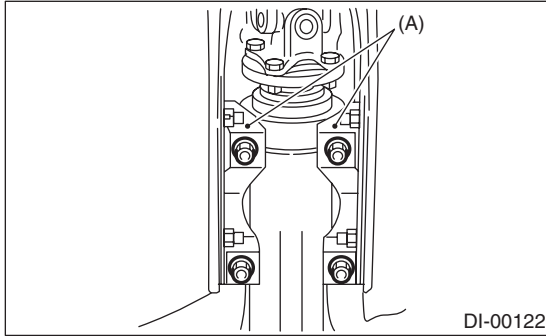


(A) Bolt

14) Suspend the rear drive shaft to the rear cross-member using wire.

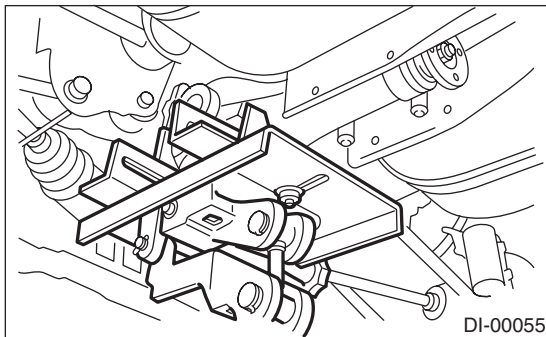


15) Remove the differential mount lower bracket.

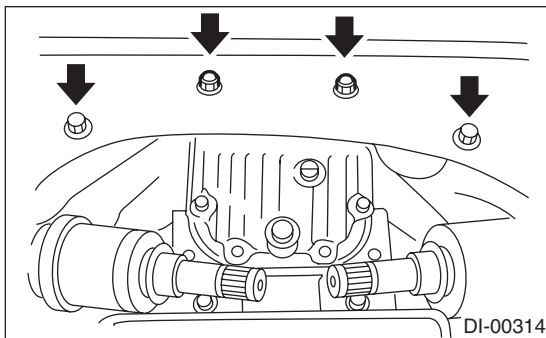


(A) Differential mount lower bracket

16) Support the rear differential with the transmission jack.



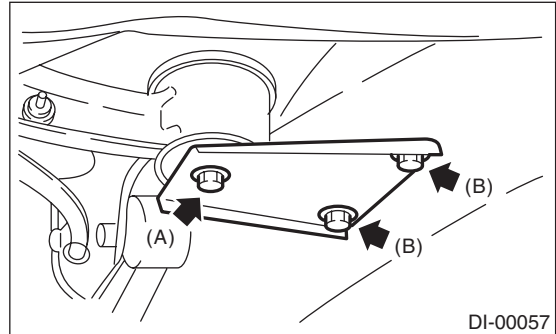
17) Remove the self-locking nuts and bolts.



18) Remove the bolts which secure the front differential member to the body. Loosen the bolt A first, then remove the bolt B.

NOTE:

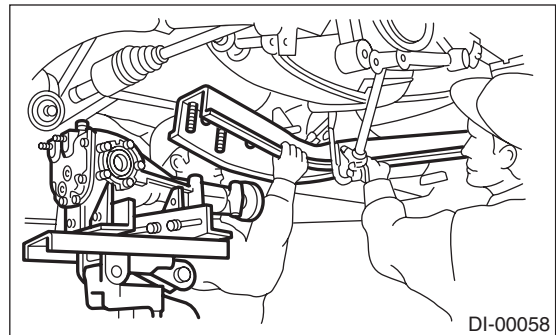
Instruct your co-worker to hold the front differential member so that it will not fall.



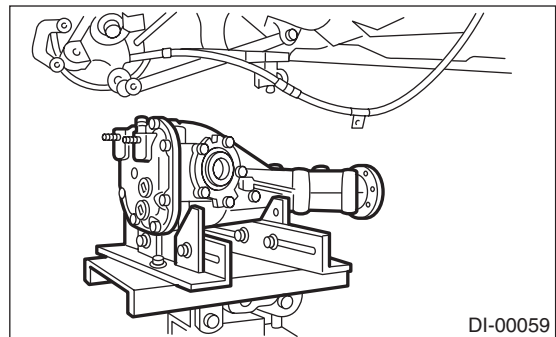
(A) Bolt A
(B) Bolt B

19) Remove the bolt A.

20) While slowly lowering the transmission jack, move the rear differential forward, and remove the differential front member and rear differential from vehicle.



21) Remove the rear differential from vehicle.



B: INSTALLATION

1) Install the air breather cap by tapping with a plastic hammer.

NOTE:

Install a new air breather cap.

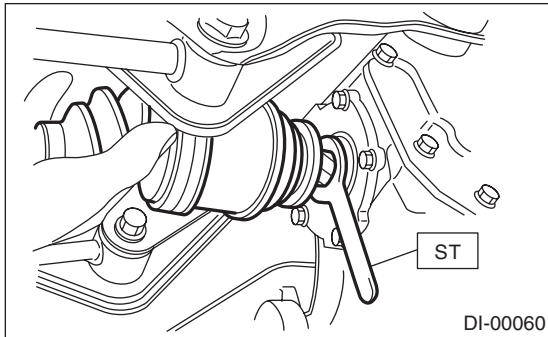
2) Position the differential front member with the vehicle body by passing the member under the parking brake cable and securing it to rear differential.

NOTE:

When installing the differential front member of rear differential, be careful not to mix up the order of installation with that for the upper and lower stoppers.

3) Install the DOJ of the drive shaft into the rear differential. <Ref. to DI-53, REPLACEMENT, Rear Differential Side Oil Seal.>

ST 28099PA090 OIL SEAL PROTECTOR



4) Installing procedure hereafter is in the reverse order of removal.

5) After installing, fill the differential carrier with gear oil up to the bottom of the filler plug hole. <Ref. to DI-20, Differential Gear Oil.>

C: DISASSEMBLY

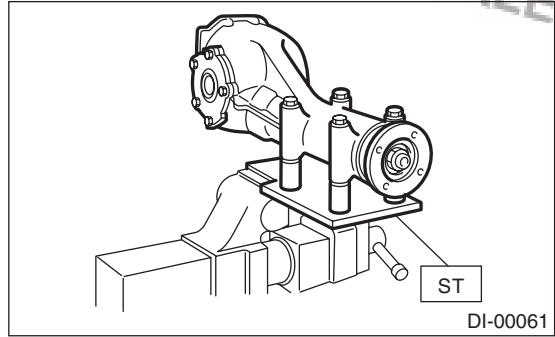
1. EXCEPT FOR STI MODEL

To detect the real cause of trouble, inspect the following items before disassembling.

- Tooth contact and backlash of hypoid driven gear and drive pinion.
- Driven gear rear face runout limit
- Total preload of drive pinion

1) Set the ST on vise and install the differential assembly to ST.

ST 398217700 ATTACHMENT

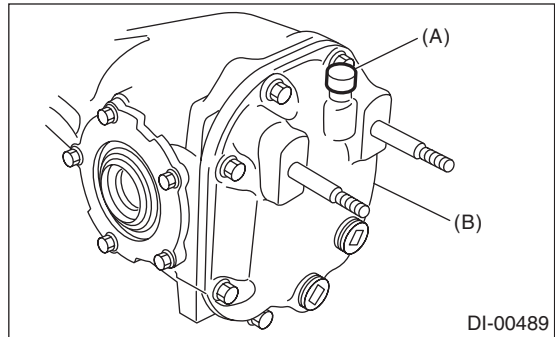


2) Drain the gear oil by removing the plug.

3) Remove the air breather cap.

NOTE:

- Do not attempt to replace the air breather cap unless necessary.
- Whenever the air breather cap is removed, replace it with a new part.

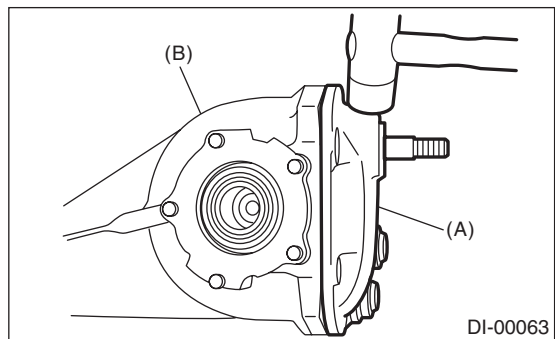


- (A) Air breather cap
- (B) Rear cover

4) Remove the bolts, and then remove the rear cover.

NOTE:

Remove it by tapping with a plastic hammer.



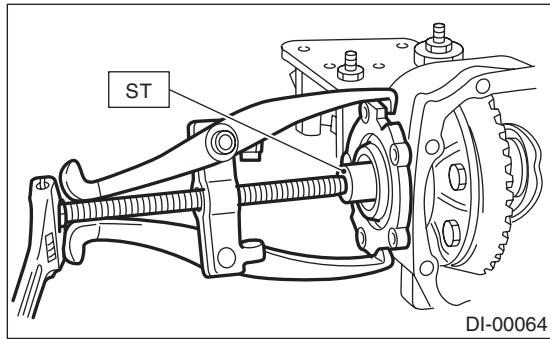
- (A) Rear cover
- (B) Differential carrier

5) Keep the side bearing retainers separate to make it possible to identify RH and LH sides. Remove the side bearing retainer attaching bolts, set the ST to differential case, and extract the side bearing retainers RH and LH with a puller.

NOTE:

Each shim, which is installed to adjusted the side bearing preload, should be kept together with its mating retainer.

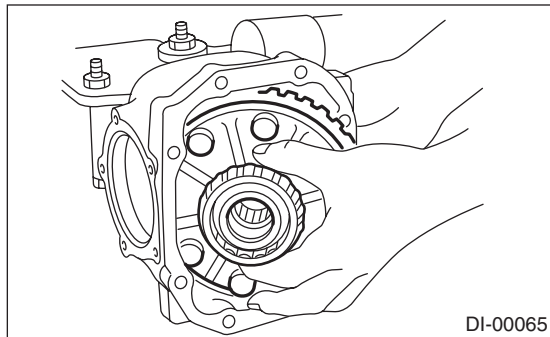
ST 398457700 ATTACHMENT



6) Pull out the differential case assembly from differential carrier.

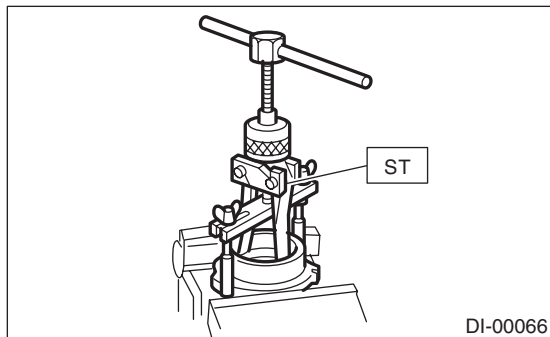
NOTE:

Be careful so that the teeth do not hit against the case.



7) When replacing the side bearing, remove the bearing cup from the side bearing retainer using ST.

ST 398527700 PULLER ASSY

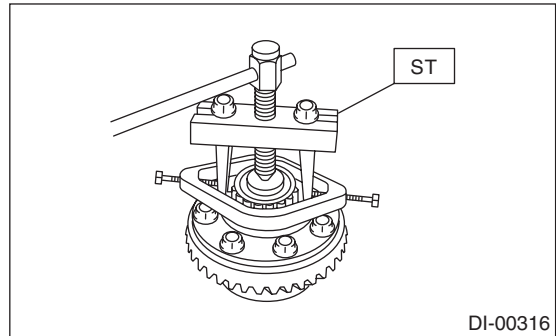


8) Remove the bearing cone with ST.

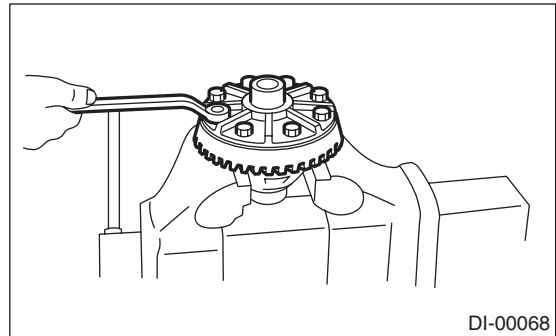
NOTE:

- Do not attempt to disassemble the parts unless necessary.
- Set the puller so that its claws catch the edge of the bearing cone.
- Never mix up the RH and LH bearing races and cones.

ST 18759AA000 PULLER ASSY



9) Remove the hypoid driven gear by loosening hypoid driven gear bolts.

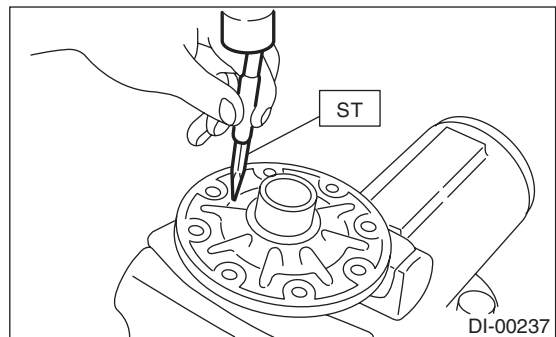


10) Drive out the pinion shaft lock pin from hypoid driven gear side. (Model without LSD)

NOTE:

The lock pin is staked at the pin hole end on the differential carrier. Do not drive it out forcibly before removing the stake.

ST 899904100 STRAIGHT PIN REMOVER



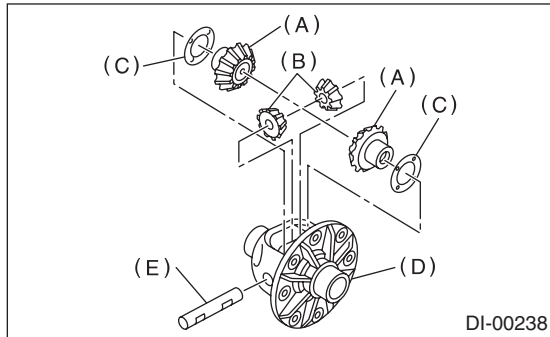
Rear Differential

DIFFERENTIALS

11) Draw out the pinion mate shaft and remove pinion mate gears, side gears and thrust washers. (Model without LSD)

NOTE:

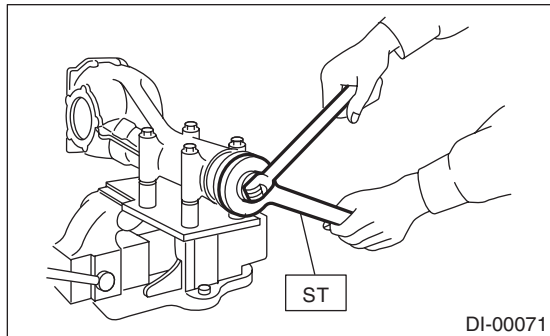
The gears should be marked or kept separated right and left, and front and rear as well as thrust washers.



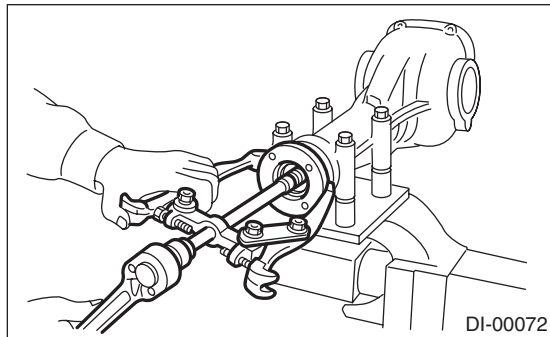
- (A) Side gear
- (B) Pinion mate gear
- (C) Thrust washer
- (D) Differential case
- (E) Pinion mate shaft

12) Remove the self-locking nut while holding the companion flange with ST.

ST 498427200 FLANGE WRENCH



13) Extract the companion flange with a puller.

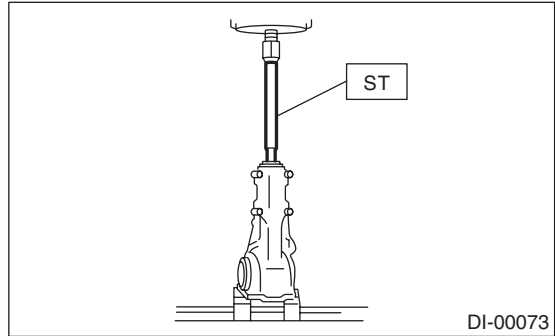


14) Press the end of drive pinion shaft and extract it together with rear bearing cone, pinion height adjusting spacer and washer.

NOTE:

Hold the drive pinion so as not to drop it.

ST 398467700 DRIFT

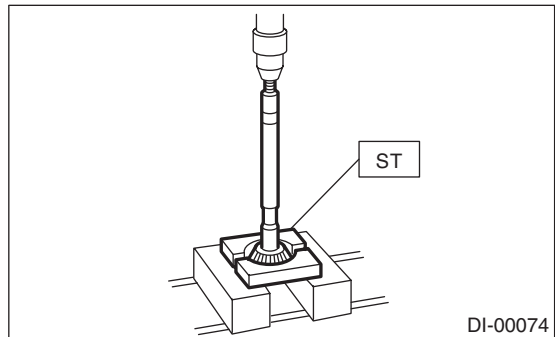


15) Remove the rear bearing cone from drive pinion by supporting the cone with ST.

NOTE:

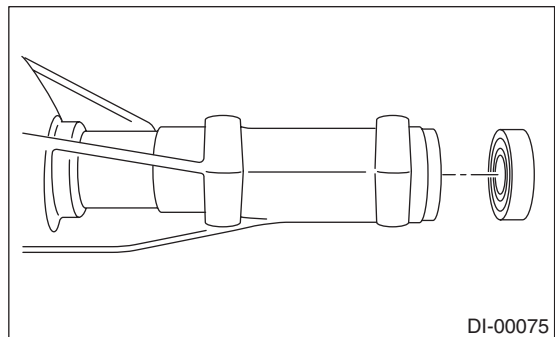
Place the replacer so that its center-recessed side faces the pinion gear.

ST 398517700 REPLACER

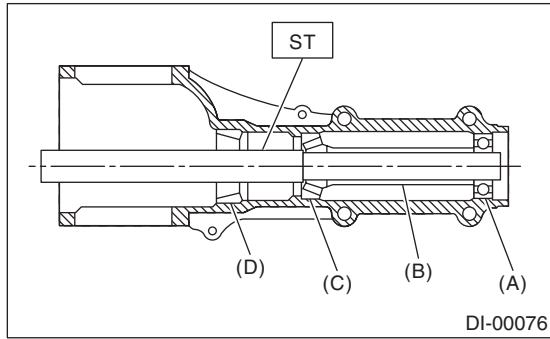


16) Remove the front oil seal from differential carrier using ST.

ST 398527700 PULLER ASSY

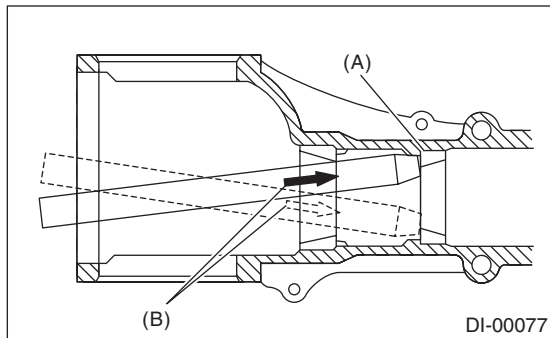


17) Remove the pilot bearing together with the front bearing cone and spacer using the ST.
 ST 398467700 DRIFT



- (A) Pilot bearing
- (B) Spacer
- (C) Front bearing
- (D) Rear bearing cup

18) When replacing the bearings, hit out the front bearing cup and rear bearing cup in this order out of case using a brass bar.



- (A) 2 cutout portions along diagonal lines
- (B) Tap alternately with brass bar.

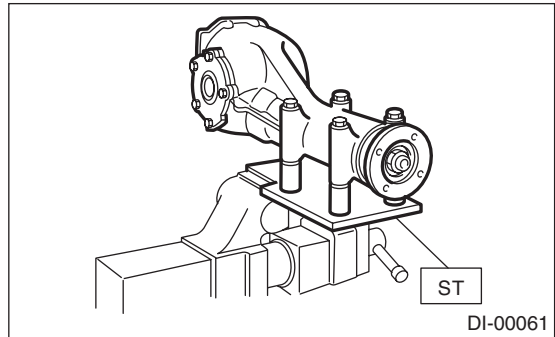
2. STI MODEL

To detect the real cause of trouble, inspect the following items before disassembling.

- Tooth contact and backlash of hypoid driven gear and drive pinion.
- Driven gear rear face runout limit
- Total preload of drive pinion

1) Set the ST on vise and install the differential assembly to ST.

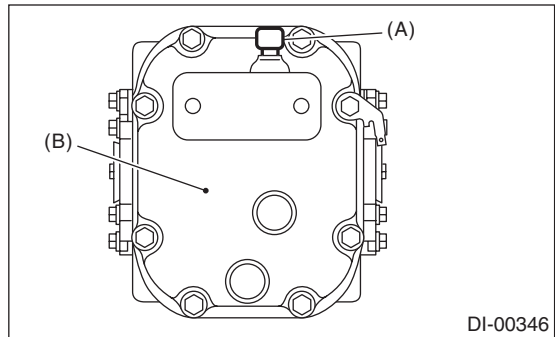
ST 398217700 ATTACHMENT



- 2) Drain the gear oil by removing the plug.
- 3) Remove the air breather cap.

NOTE:

- Do not attempt to replace the air breather cap unless necessary.
- Whenever the air breather cap is removed, replace it with a new part.



- (A) Air breather cap
- (B) Rear cover

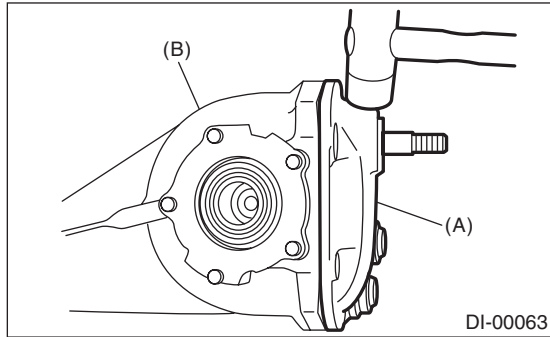
Rear Differential

DIFFERENTIALS

4) Remove the bolts, and then remove the rear cover.

NOTE:

Remove it by tapping with a plastic hammer.



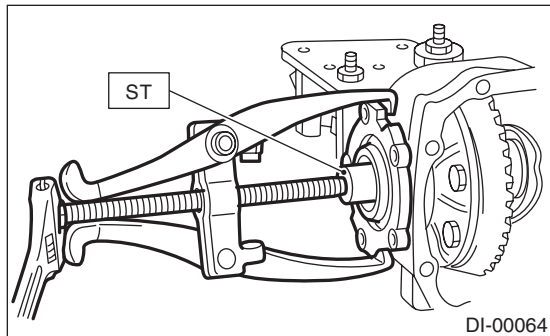
- (A) Rear cover
- (B) Differential carrier

5) Keep the side bearing retainers separate to make it possible to identify RH and LH sides. Remove the side bearing retainer attaching bolts, set the ST to differential case, and extract the side bearing retainers RH and LH with a puller.

NOTE:

Each shim, which is installed to adjusted the side bearing preload, should be kept together with its mating retainer.

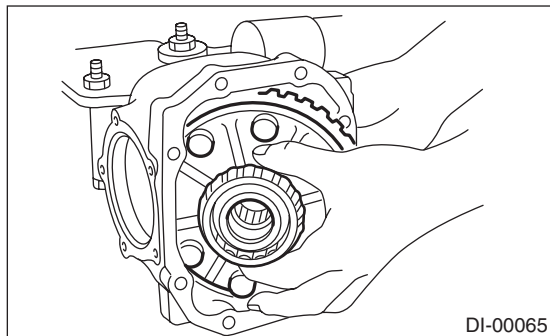
ST 398457700 ATTACHMENT



6) Pull out the differential case assembly from differential carrier.

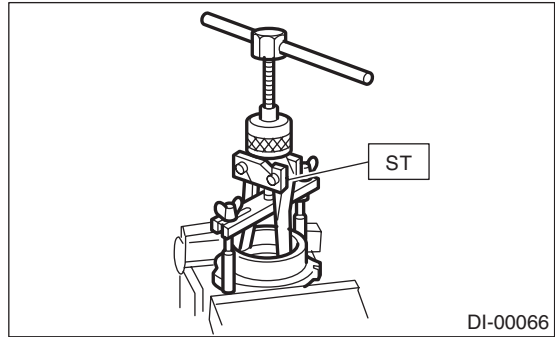
NOTE:

Be careful so that the teeth do not hit against the case.



7) When replacing the side bearing, remove the bearing cup from the side bearing retainer using ST.

ST 398527700 PULLER ASSY

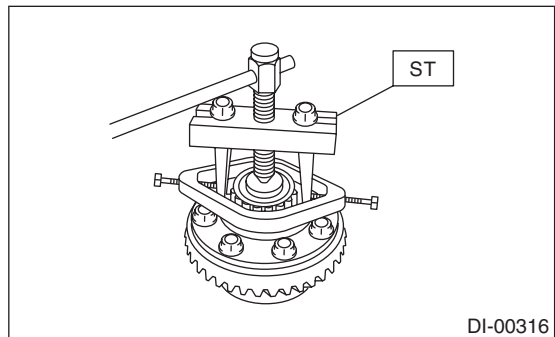


8) Remove the bearing cone with ST.

NOTE:

- Do not attempt to disassemble the parts unless necessary.
- Set the puller so that its claws catch the edge of the bearing cone.
- Never mix up the RH and LH bearing races and cones.

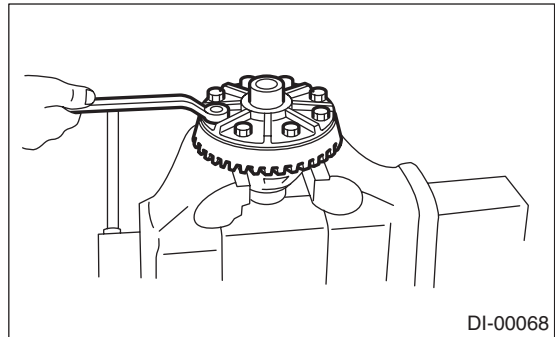
ST 18759AA000 PULLER ASSY



9) Remove the hypoid driven gear by loosening hypoid driven gear bolts.

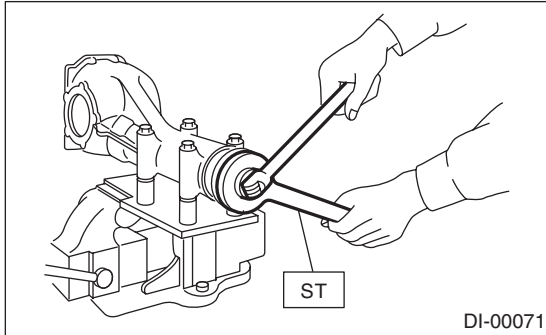
NOTE:

Do not disassemble the differential case.



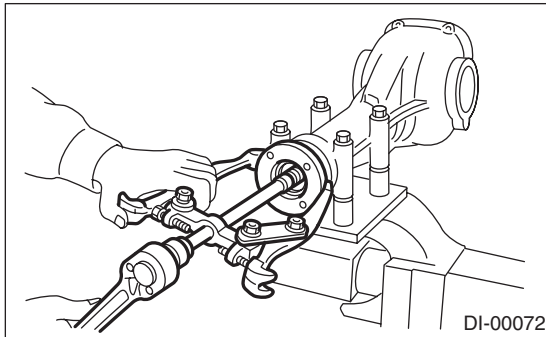
10) Remove the self-locking nut while holding the companion flange with ST.

ST 18633AA000 WRENCH COMPL



DI-00071

11) Extract the companion flange with a puller.



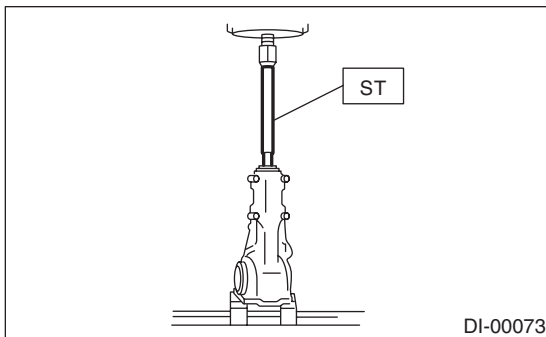
DI-00072

12) Press the end of drive pinion shaft and extract it together with rear bearing cone, pinion height adjusting spacer and washer.

NOTE:

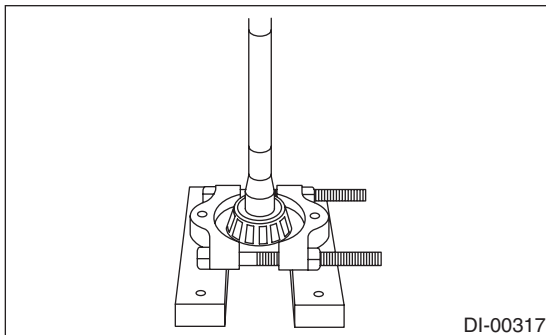
Hold the drive pinion so as not to drop it.

ST 398467700 DRIFT



DI-00073

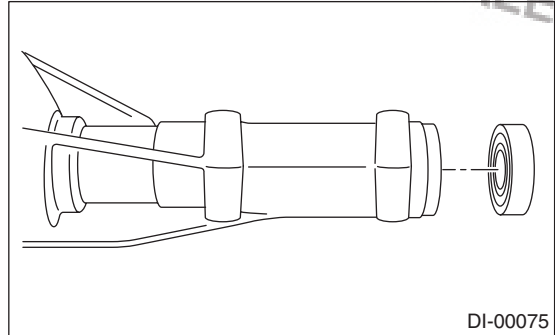
13) Removes the rear bearing cone from the drive pinion.



DI-00317

14) Remove the front oil seal from differential carrier using ST.

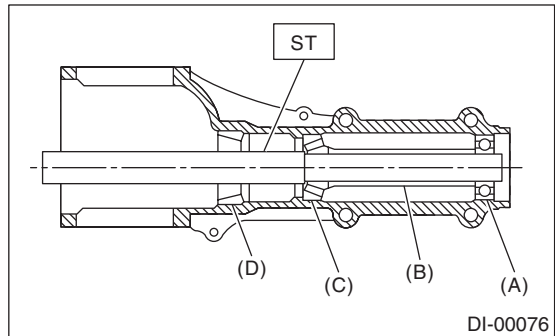
ST 398527700 PULLER ASSY



DI-00075

15) Remove the pilot bearing together with the front bearing cone and spacer using the ST.

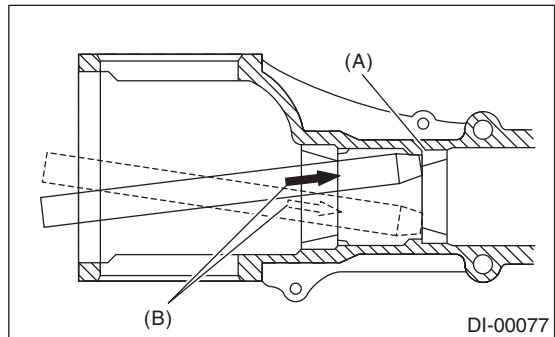
ST 398467700 DRIFT



DI-00076

- (A) Pilot bearing
- (B) Spacer
- (C) Front bearing
- (D) Rear bearing cup

16) When replacing the bearings, hit out the front bearing cup and rear bearing cup in this order out of case using a brass bar.



DI-00077

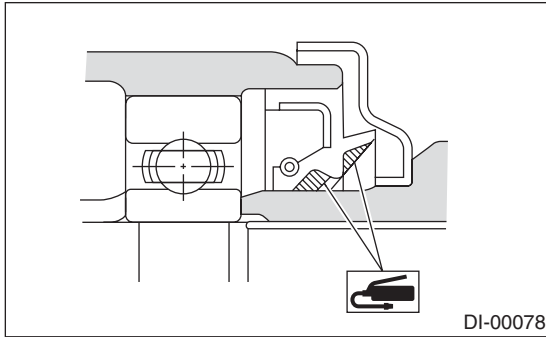
- (A) 2 cutout portions along diagonal lines
- (B) Tap alternately with brass bar.

D: ASSEMBLY

1. EXCEPT FOR STI MODEL

NOTE:

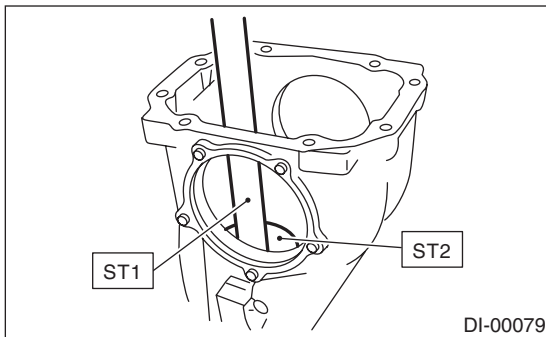
- Assemble in the reverse order of disassembly.
- Check and adjust each part during assembly.
- Keep the shims and washers in order, so that they are not improperly installed.
- Thoroughly clean the surfaces on which the shims, washers and bearings are to be installed.
- Apply gear oil when installing the bearings and thrust washers.
- Be careful not to mix up the RH and LH bearing races.
- Use a new O-ring and gasket.
- Replace the oil seal with a new part at every disassembly. Apply grease to the lips when installing the oil seal.
- Be careful not to install the oil seal in the wrong direction.



1) Adjusting preload for front and rear bearings
Adjust the bearing preload between front and rear bearings with spacer and washer. Pinion height adjusting washer is not affected by this adjustment. The adjustment must not be carried out with oil seal inserted.

(1) Install the rear bearing race into the differential carrier using ST1 and ST2.

- ST1 398477701 HANDLE
- ST2 398477703 DRIFT 2



(2) Install the front bearing race to the differential carrier using ST1 and ST2.

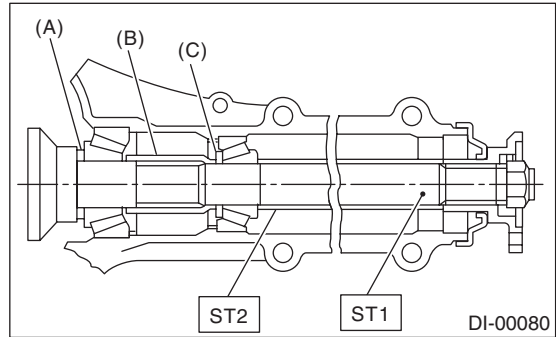
- ST1 398477701 HANDLE
- ST2 398477702 DRIFT

(3) Insert the ST1 into carrier with the pinion height adjusting washer and rear bearing cone fitted onto it.

NOTE:

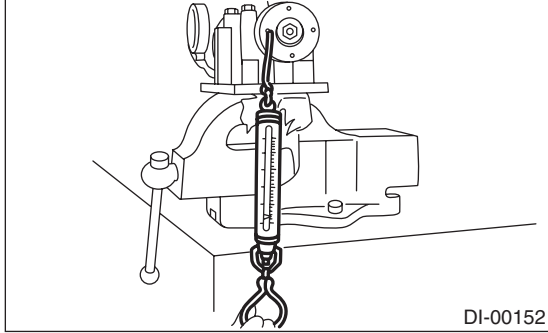
- If tooth contact (drive pinion, hypoid driven gear) is normal in the inspection before disassembling, verify that the washer is not deformed, and then re-use the used washer.
 - Use new rear bearing cone.
- (4) Install the preload adjusting spacer and washer, front bearing cone, ST2, companion flange, washer and drive pinion nut.

- ST1 398507702 DUMMY SHAFT
- ST2 398507703 DUMMY COLLAR



- (A) Pinion height adjusting washer
- (B) Preload adjusting spacer
- (C) Preload adjusting washer

(5) Turn ST1 by hand to seat the bearing, and measure the initial load and initial torque with a spring scale or a torque wrench while tightening the self-locking nut. Select the preload adjusting washer and spacer so that the specified preload is obtained when nut is tightened to the specified torque.



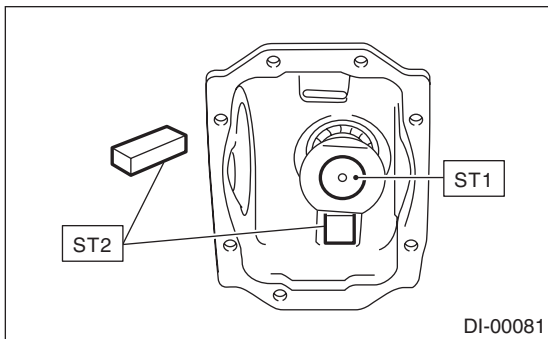
NOTE:

- Use a new self-locking nut.
- Be careful not to give excessive preload.
- When tightening the self-locking nut, lock ST1 with ST2 as shown in the figure.
- Measure the preload in tangent direction to the flange.

ST1 398507702 DUMMY SHAFT
 ST2 398507704 BLOCK

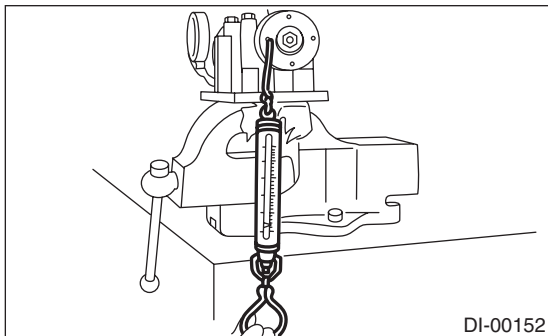
Tightening torque:

181.5 N·m (18.5 kgf·m, 134 ft·lb)



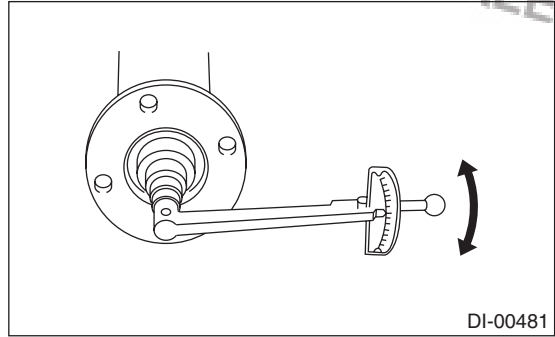
Initial load:

17.7 — 38.8 N (1.8 — 4.0 kgf, 4.0 — 8.7 lbf)



Starting torque:

**0.67 — 1.47 N·m (0.07 — 0.15 kgf·m,
 0.49 — 1.08 ft·lb)**



	Part No.	Thickness mm (in)
Preload adjusting washer	383705200	2.59 (0.1020)
	383715200	2.57 (0.1012)
	383725200	2.55 (0.1004)
	383735200	2.53 (0.0996)
	383745200	2.51 (0.0988)
	383755200	2.49 (0.0980)
	383765200	2.47 (0.0972)
	383775200	2.45 (0.0965)
	383785200	2.43 (0.0957)
	383795200	2.41 (0.0949)
	383805200	2.39 (0.0941)
	383815200	2.37 (0.0933)
	383825200	2.35 (0.0925)
383835200	2.33 (0.0917)	
383845200	2.31 (0.0909)	
	Part No.	Length mm (in)
Preload adjusting spacer	383695201	56.2 (2.213)
	383695202	56.4 (2.220)
	383695203	56.6 (2.228)
	383695204	56.8 (2.236)
	383695205	57.0 (2.244)
	383695206	57.2 (2.252)

Rear Differential

DIFFERENTIALS

2) Adjusting drive pinion height:

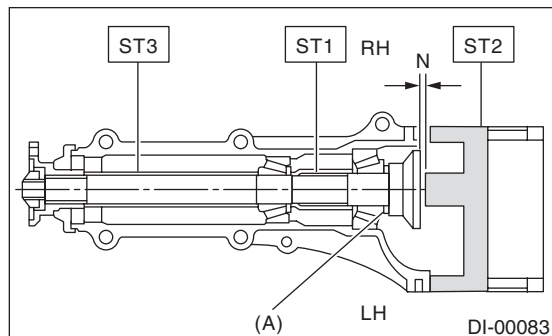
Adjust the drive pinion height with washer installed between the rear bearing cone and the back of pinion gear.

(1) Attach the ST2.

NOTE:

At this time, install a pinion height adjusting washer, temporarily selected, or the same as that used before. Measure and record the thickness.

- ST1 398507702 DUMMY SHAFT
- ST2 398507701 DIFFERENTIAL CARRIER GAUGE
- ST3 398507703 DUMMY COLLAR



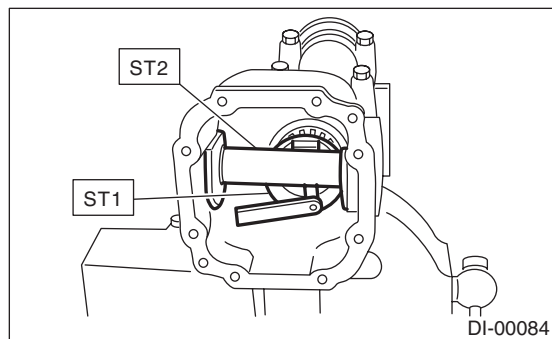
(A) Pinion height adjusting washer

(2) Measure the clearance N between the end of ST2 and the end surface of ST1 by using a thickness gauge.

NOTE:

Make sure there is no clearance between the case and ST2.

- ST1 398507702 DUMMY SHAFT
- ST2 398507701 DIFFERENTIAL CARRIER GAUGE



(3) Obtain the thickness of pinion height adjusting washer to be inserted from the following formula, and replace the temporarily installed washer with this one.

$$T = To + N - (H \times 0.01) - 0.20 \text{ mm (0.0079 in)}$$

NOTE:

Use copies of this page.

T	Thickness of pinion height adjusting washer	mm (in)	
To	Thickness of washer temporarily inserted	mm (in)	
N	Clearance of thickness gauge	mm (in)	
H	Figure marked on drive pinion head		
Memo:			

(Example of calculation)

$$To = 2.20 + 1.20 = 3.40 \text{ mm}$$

$$N = 0.23 \text{ mm}$$

$$H = + 1$$

$$T = 3.40 + 0.23 - 0.01 - 0.20 = 3.42$$

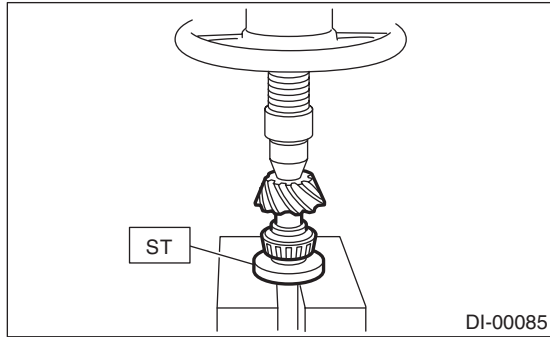
Result: Thickness = 3.42 mm

Therefore use washer 383605200.

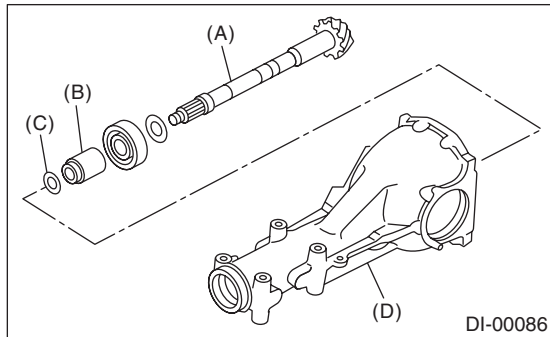
Pinion height adjusting washer	
Part No.	Thickness mm (in)
383495200	3.09 (0.1217)
383505200	3.12 (0.1228)
383515200	3.15 (0.1240)
383525200	3.18 (0.1252)
383535200	3.21 (0.1264)
383545200	3.24 (0.1276)
383555200	3.27 (0.1287)
383565200	3.30 (0.1299)
383575200	3.33 (0.1311)
383585200	3.36 (0.1323)
383595200	3.39 (0.1335)
383605200	3.42 (0.1346)
383615200	3.45 (0.1358)
383625200	3.48 (0.1370)
383635200	3.51 (0.1382)
383645200	3.54 (0.1394)
383655200	3.57 (0.1406)
383665200	3.60 (0.1417)
383675200	3.63 (0.1429)
383685200	3.66 (0.1441)

3) Install the selected pinion height adjusting washer on drive pinion, and press the rear bearing cone into position with ST.

ST 398177700 INSTALLER



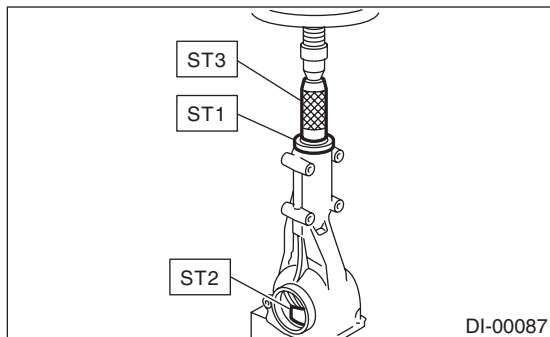
4) Insert the drive pinion into the differential carrier, and install the preselected bearing preload adjusting spacer and washer.



- (A) Drive pinion
- (B) Bearing preload adjusting spacer
- (C) Bearing preload adjusting washer
- (D) Differential carrier

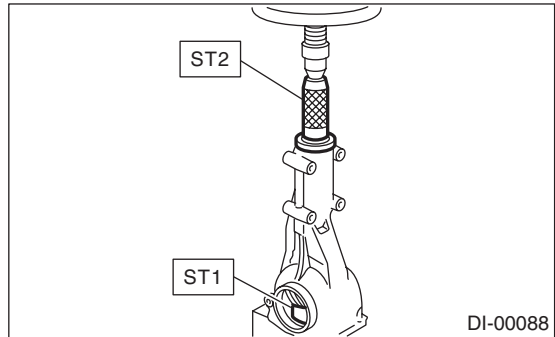
5) Press-fit the front bearing cone into case with ST1, ST2 and ST3.

ST1 398507703 DUMMY COLLAR
 ST2 399780104 WEIGHT
 ST3 899580100 INSTALLER



6) Insert the spacer, then press-fit the pilot bearing with ST1 and ST2.

ST1 399780104 WEIGHT
 ST2 899580100 INSTALLER

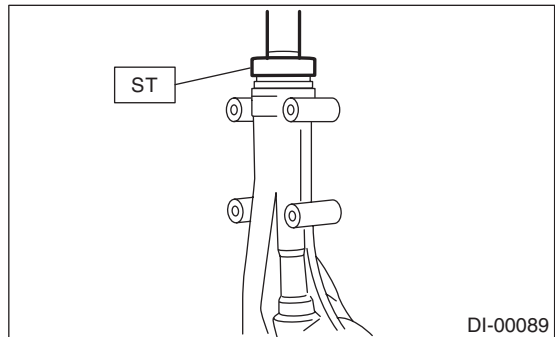


7) Fit a new oil seal with ST.

NOTE:

- Press-fit until the oil seal end comes 1 mm (0.04 in) inward from end of carrier.
- Apply grease to the oil seal lips.

ST 498447120 INSTALLER

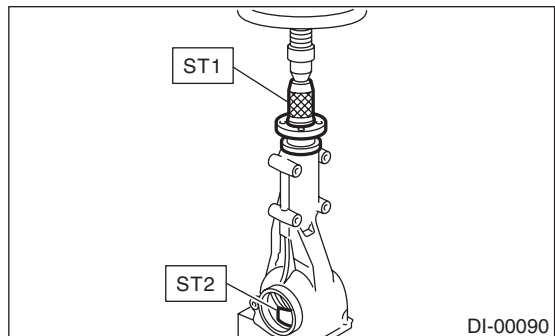


8) Press-fit the companion flange with ST1 and ST2.

NOTE:

Be careful not to damage the bearing.

ST1 899874100 INSTALLER
 ST2 399780104 WEIGHT



9) Apply loctite on the drive pinion shaft thread and new self-locking nut seat.

Loctite:

THREE BOND 1324 (Part No. 004403042) or equivalent

Rear Differential

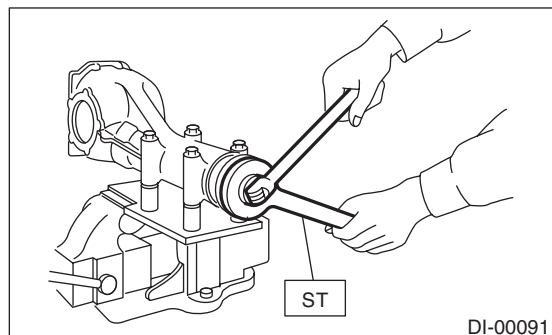
DIFFERENTIALS

10) Attach a new self-locking nut and tighten it with the ST.

ST 498427200 FLANGE WRENCH

Tightening torque:

181.5 N·m (18.5 kgf·m, 134 ft·lb)

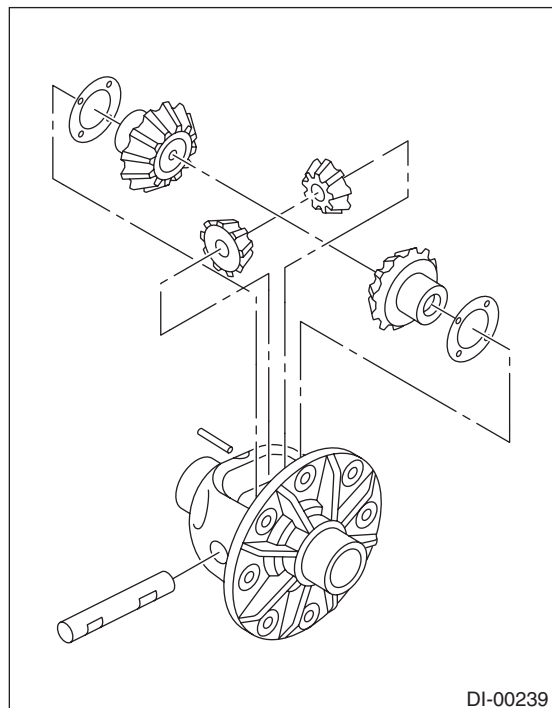


11) Assembling differential case

Install the side gears and pinion mate gears, with their thrust washers and pinion mate shaft, into the differential case. (Model without LSD)

NOTE:

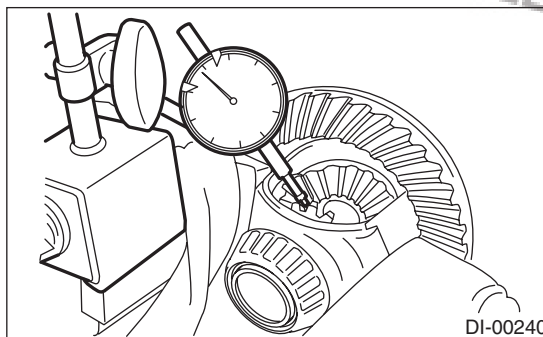
- Apply gear oil on both sides of the washer and on the side gear shaft before installing.
- Insert the pinion mate shaft into the differential case by aligning the lock pin holes.



(1) Measure the side gear backlash.

Side gear backlash:

0.10 — 0.20 mm (0.004 — 0.008 in)



(2) Adjust the backlash as specified by selecting side gear thrust washer.

Side gear thrust washer	
Part No.	Thickness mm (in)
383445201	0.75 — 0.80 (0.0295 — 0.0315)
383445202	0.80 — 0.85 (0.0315 — 0.0335)
383445203	0.85 — 0.90 (0.0335 — 0.0354)

(3) Check the condition of rotation after applying oil to the gear tooth surfaces and thrust surfaces.

(4) After inserting the pinion shaft lock pin into differential case, stake the both sides of the hole to prevent pin from falling off.

12) Install the driven gear to the differential case.

NOTE:

- Before installing bolts, apply Loctite to bolt threads.
- Make sure there is no clearance between the differential case and driven gear.

Loctite:

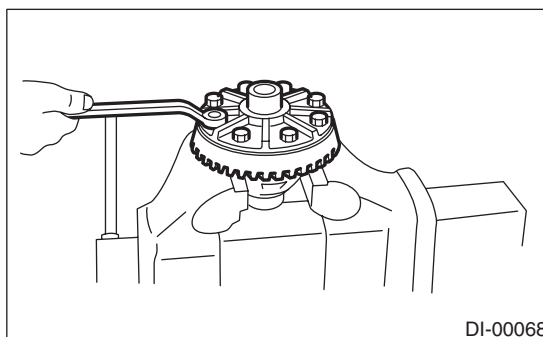
THREE BOND 1324 (Part No. 004403042) or equivalent

NOTE:

Tighten diagonally while tapping the bolt heads.

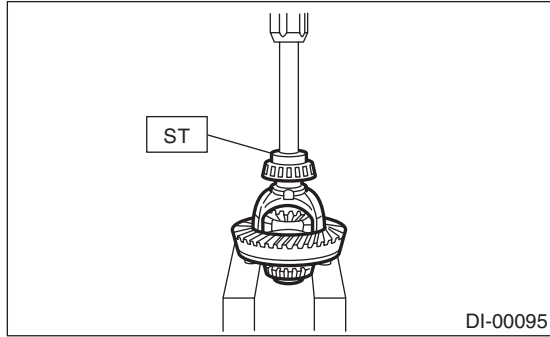
Tightening torque:

103 N·m (10.5 kgf·m, 76 ft·lb)



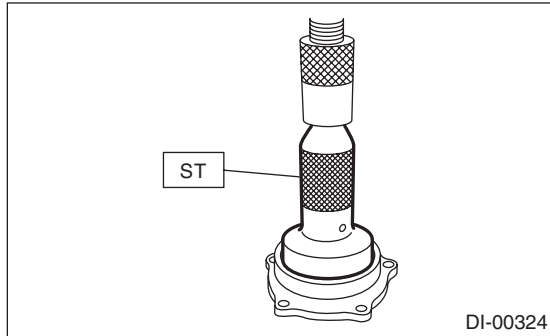
13) Press the side bearing into differential case using ST.

ST 398487700 DRIFT



14) Press the side bearing outer race into side bearing retainer using ST.

ST 398417700 DRIFT



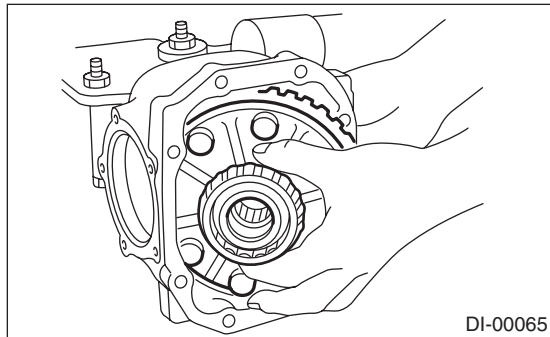
15) Adjusting the side bearing retainer shims

(1) The driven gear backlash and side bearing preload can be adjusted by the side bearing retainer shim thickness.

(2) Install the differential case assembly into differential carrier in the reverse order of disassembly.

NOTE:

Be careful so that the teeth do not hit against the case.



(3) Install the side bearing retainer shims to retainers RH and LH from which they were installed.

NOTE:

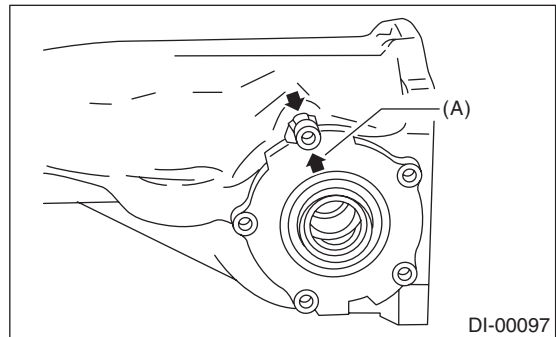
Replace broken or corroded side bearing retainer shims with a new part of the same thickness.

Side bearing retainer shim	
Part No.	Thickness mm (in)
383475201	0.20 (0.0079)
383475202	0.25 (0.0098)
383475203	0.30 (0.0118)
383475204	0.40 (0.0157)
383475205	0.50 (0.0197)

(4) Align the arrow mark on differential carrier with the mark on side bearing retainer during installation.

NOTE:

Be careful that side bearing outer race is not damaged by the bearing roller.

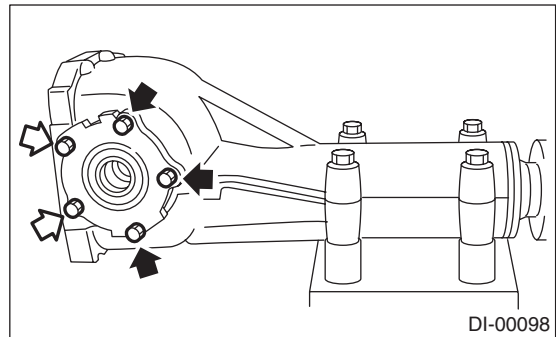


(A) Arrow mark

(5) Tighten the side bearing retainer bolts.

Tightening torque:

10.5 N·m (1.1 kgf-m, 7.7 ft-lb)

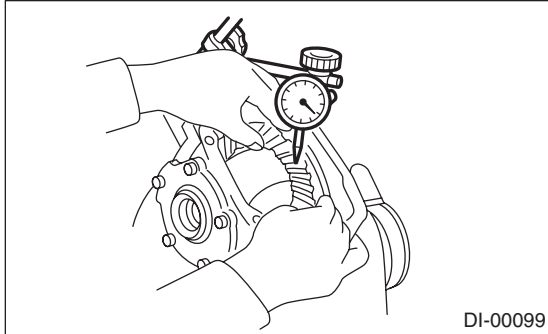


DIFFERENTIALS

(6) Measure the driven gear to drive pinion backlash. Set the magnet base on differential carrier. Align the contact point of dial gauge with the tooth surface of hypoid driven gear, and move the hypoid driven gear while securing the drive pinion. Read the value indicated on dial gauge.

Backlash:

0.10 — 0.20 mm (0.004 — 0.008 in)



NOTE:

If the backlash exceeds 0.20 mm (0.008 in), reduce the thickness of shim on the back side of the hypoid driven gear and increase the thickness of shims on the teeth side of the hypoid driven gear. If the backlash is less than 0.10 mm (0.004 in), increase the thickness of shim on the back side of the hypoid driven gear and reduce the thickness of shims on the teeth side of the hypoid driven gear.

(7) At the same time, measure the total preload of the drive pinion. Compared with the resistance when differential case is not installed, if the total preload is not within specification, adjust the thickness of side bearing retainer shims, increasing/reducing both shims by an even amount at a time.

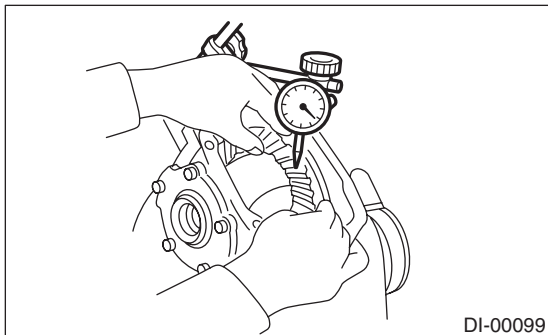
Total preload:

20.7 — 54.4 N (2.1 — 5.5 kgf, 4.7 — 12.2 lbf)

16) Recheck the driven gear to pinion backlash.

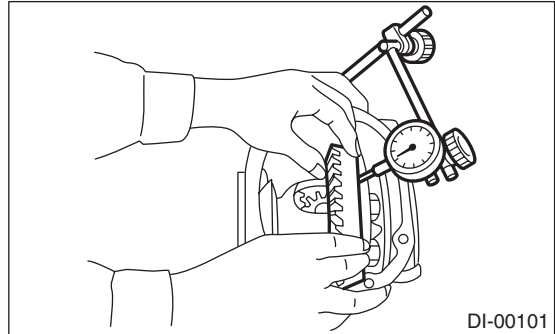
Backlash:

0.10 — 0.20 mm (0.004 — 0.008 in)



17) Check the driven gear runout on its back surface, and make sure that the pinion and driven gear rotate smoothly.

Driven gear rear face runout limit:
0.05 mm (0.0020 in) or less



18) Checking and adjusting the tooth contact of driven gear

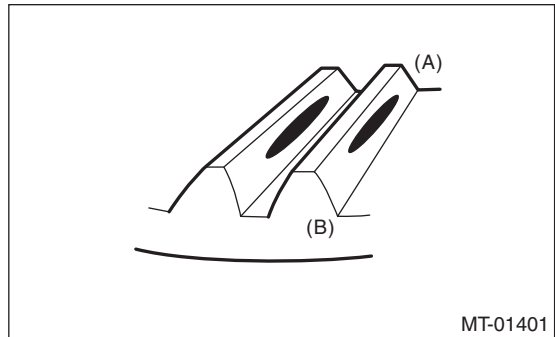
- (1) Apply an even coat of red lead on both sides of three or four teeth on the driven gear. Check the contact pattern after rotating the driven gear several revolutions back and forth until a definite contact pattern appears on the driven gear.
- (2) If the contact pattern is not correct, readjust it according to the directions indicated in the "Contact Pattern".

NOTE:

Be sure to wipe off the red lead completely after the adjustment is completed.

- Correct tooth contact

Check item: Tooth contact pattern is slightly shifted toward toe side under no-load rotation. (When driving, it moves towards the heel side.)

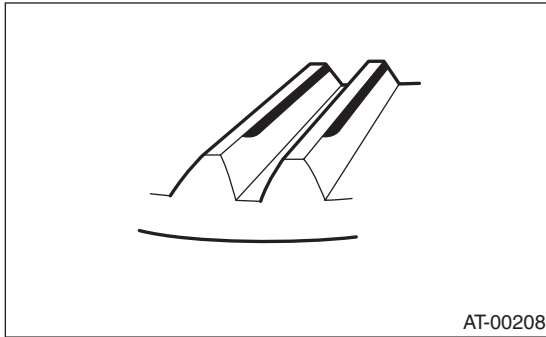


- (A) Toe side
- (B) Heel side

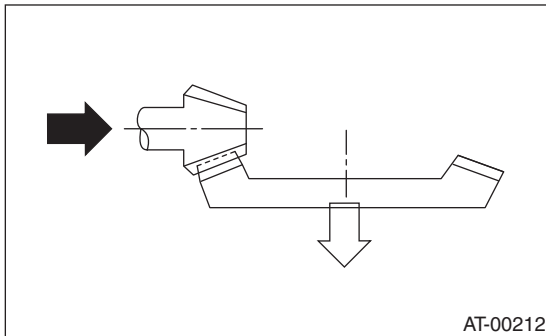
- Face contact

Check item: Backlash is too large.

Contact pattern



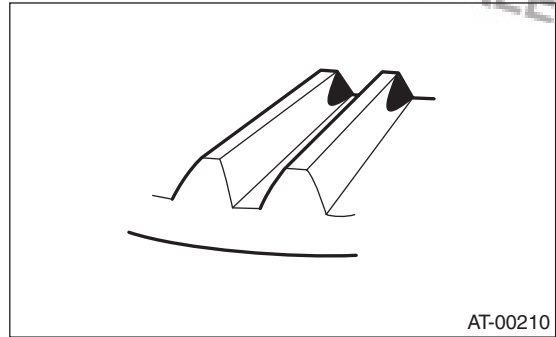
Corrective action: Increase the thickness of pinion height adjusting washer according to the procedure for bringing the drive pinion close to the driven gear.



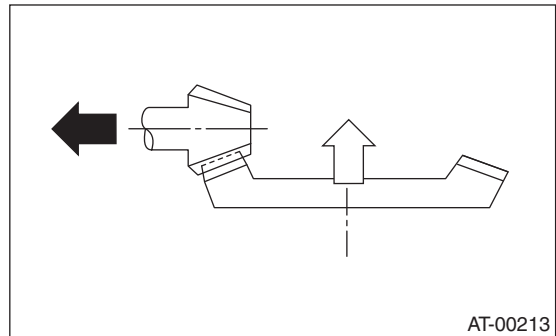
- Toe contact (inside contact)

Check item: Teeth contact area is too small.

Contact pattern



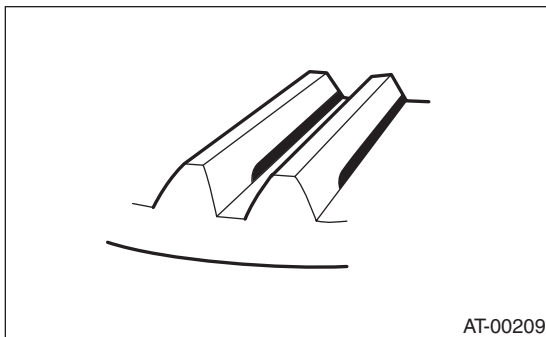
Corrective action: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing drive pinion away from hypoid driven gear.



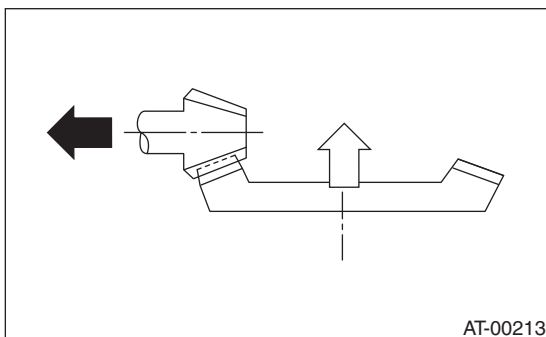
- Flank contact

Check item: Backlash is too small.

Contact pattern



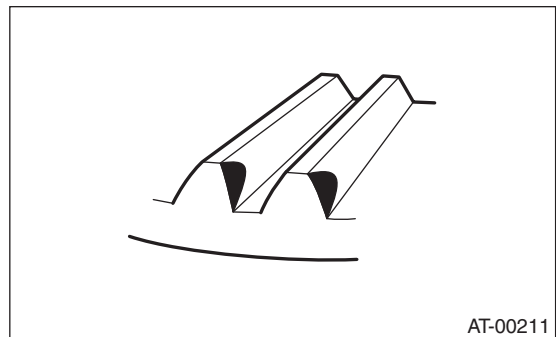
Corrective action: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing drive pinion away from hypoid driven gear.



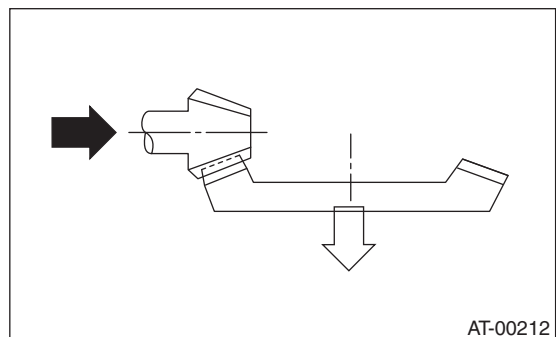
- Heel contact (outside end contact)

Check item: Teeth contact area is too small.

Contact pattern

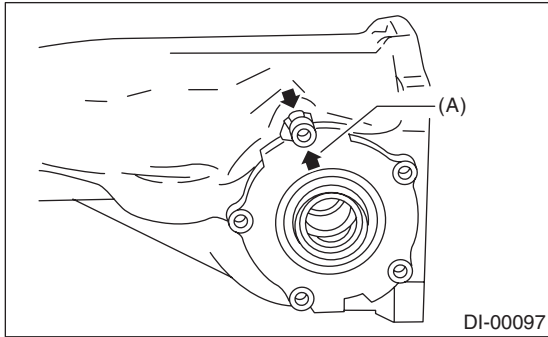


Corrective action: Increase thickness of pinion height adjusting washer according to the procedures for moving the drive pinion closer to the driven gear.



DIFFERENTIALS

- 19) If proper tooth contact is not obtained, once again adjust the drive pinion height by changing the RH and LH side bearing retainer shims and the hypoid gear backlash.
- 20) Remove the RH and LH side bearing retainer.
- 21) Install new O-rings to side bearing retainers of both sides.
- 22) Install oil seal to side bearing retainers of both sides. <Ref. to DI-53, REPLACEMENT, Rear Differential Side Oil Seal.>
- 23) Align the arrow mark on differential carrier with the mark on side bearing retainer during installation.



(A) Arrow mark

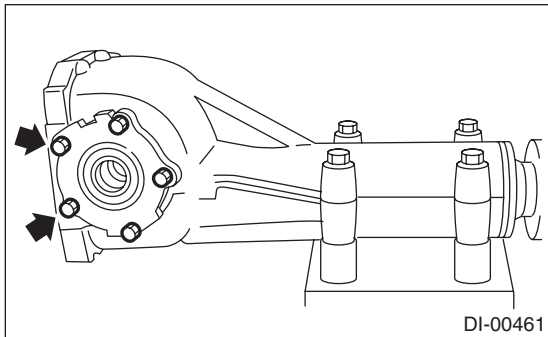
- 24) Apply liquid gasket to the bolt with arrow marks, and install the side bearing retainer.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

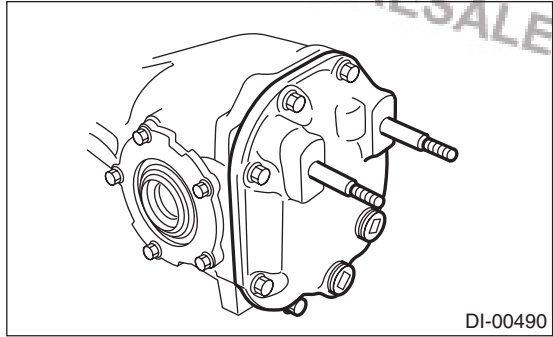
10.5 N·m (1.1 kgf-m, 7.7 ft-lb)



- 25) Install the new gasket and rear cover, and tighten the bolts to the specified torque.

Tightening torque:

29.5 N·m (3.0 kgf-m, 21.8 ft-lb)



- 26) Install the air breather cap.
- 27) Install the drain plug and filler plug.

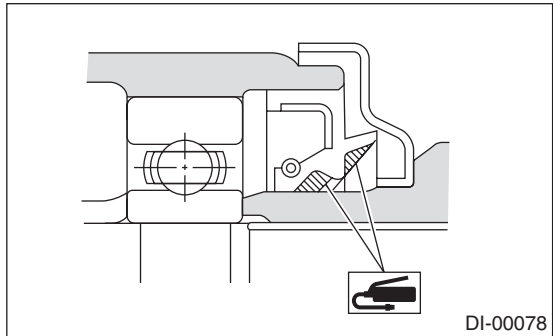
Tightening torque:

49 N·m (5.0 kgf-m, 36.2 fi-lb)

2. STI MODEL

- 1) Cautions for assembly:

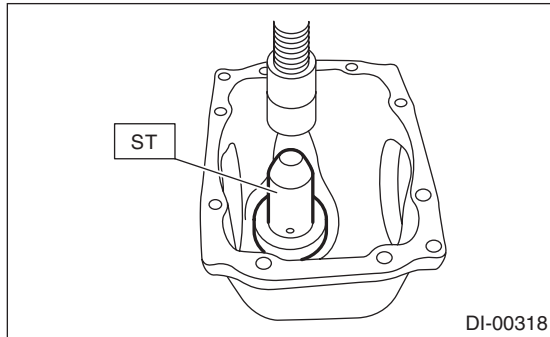
- Assemble in the reverse order of disassembly.
- Check and adjust each part during assembly.
- Keep the shims and washers in order, so that they are not improperly installed.
- Thoroughly clean the surfaces on which the shims, washers and bearings are to be installed.
- Apply gear oil when installing the bearings and thrust washers.
- Be careful not to mix up the RH and LH bearing races.
- Replace the oil seal with a new part at every disassembly. Apply chassis grease between the lips when installing the oil seal.



- Adjust the bearing preload between front and rear bearings with spacer and washer. Pinion height adjusting washer is not affected by this adjustment. The adjustment must not be carried out with oil seal inserted.

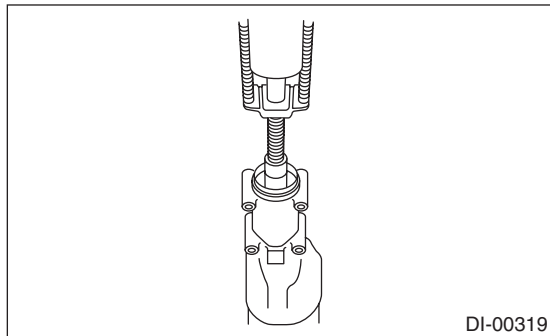
2) Using the ST, press the rear bearing race into the differential carrier.

ST 398417700 DRIFT



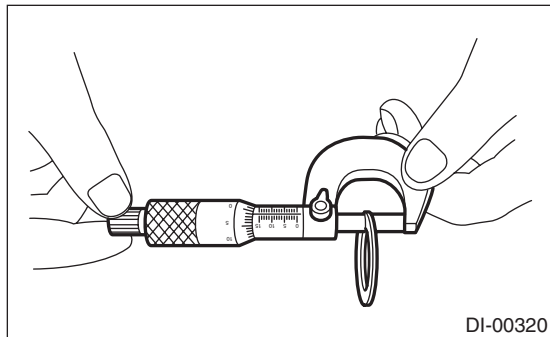
3) Using the ST, press the front bearing race into the differential carrier.

ST 398477702 DRIFT

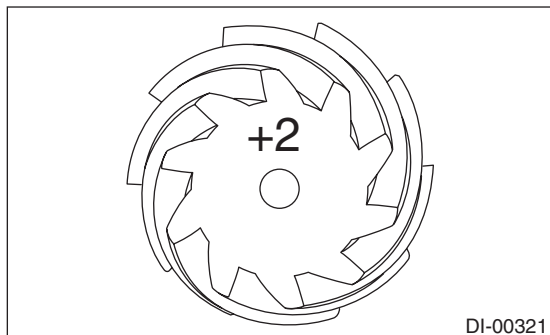


4) Selection of pinion height adjusting washer

(1) Measure the thickness of the inserted pinion height adjusting washer.



(2) Read the markings on the installed drive pinion gear and the new part.



(3) Obtain the thickness of pinion height adjusting washer to be inserted from the following formula, and replace the installed washer with this one.

$$T = T1 + (T2 \times 0.01 - T3 \times 0.01)$$

T mm	Thickness of the selected pinion height adjusting washer
T1 mm	Thickness of the inserted pinion height adjusting washer
T2 mm	Number marked on the installed drive pinion gear
T3 mm	Number marked on the new drive pinion gear

(Example of calculation)

$$T1 = 3.30, T2 = +2, T3 = -1$$

$$T = 3.30 + \{(2 \times 0.01) - (-1 \times 0.01)\} = 3.33$$

Result: Thickness = 3.33 mm

The washer to be used is 38336AA310.

Pinion height adjusting washer	
Part No.	Thickness mm (in)
38336AA230	3.09 (0.1217)
38336AA240	3.12 (0.1228)
38336AA250	3.15 (0.1240)
38336AA260	3.18 (0.1252)
38336AA270	3.21 (0.1264)
38336AA280	3.24 (0.1276)
38336AA290	3.27 (0.1287)
38336AA300	3.30 (0.1299)
38336AA310	3.33 (0.1311)
38336AA320	3.36 (0.1323)
38336AA330	3.39 (0.1335)
38336AA340	3.42 (0.1346)
38336AA350	3.45 (0.1358)
38336AA360	3.48 (0.1370)
38336AA370	3.51 (0.1382)
38336AA380	3.54 (0.1394)
38336AA390	3.57 (0.1406)
38336AA400	3.60 (0.1417)
38336AA410	3.63 (0.1429)
38336AA420	3.66 (0.1441)

NOTE:

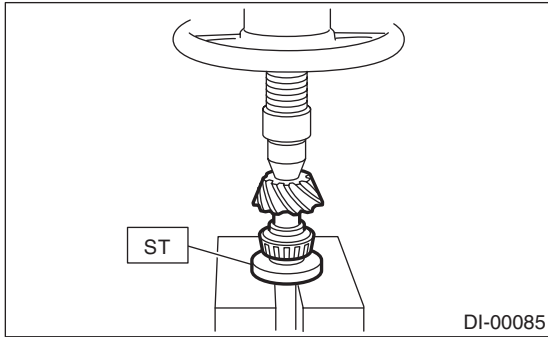
No marking means 0 (zero).

Rear Differential

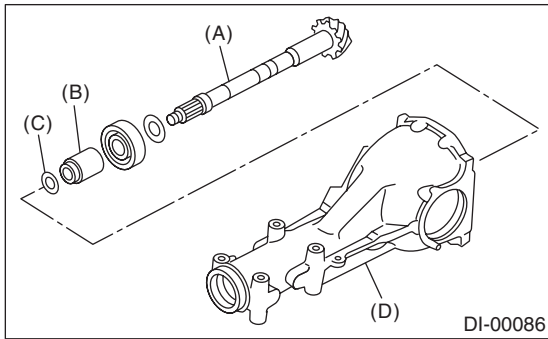
DIFFERENTIALS

5) Install the selected pinion height adjusting washer on drive pinion, and press the rear bearing cone into position with ST.

ST 18674AA000 INSTALLER



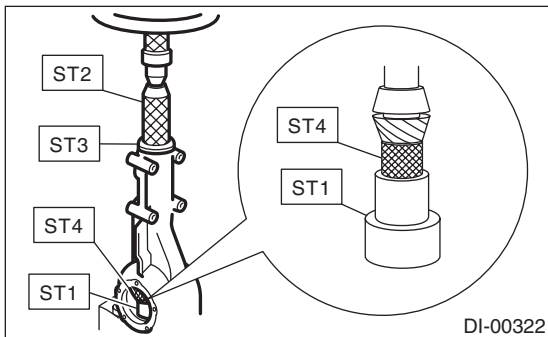
6) Insert the drive pinion into the differential carrier, and install the originally installed bearing preload adjusting spacer and washer.



- (A) Drive pinion
- (B) Bearing preload adjusting spacer
- (C) Bearing preload adjusting washer
- (D) Differential carrier

7) Insert the spacer, then press-fit the pilot bearing using ST.

ST1 399780104 WEIGHT
 ST2 899580100 INSTALLER
 ST3 398507703 DUMMY COLLAR
 ST4 498937110 HOLDER

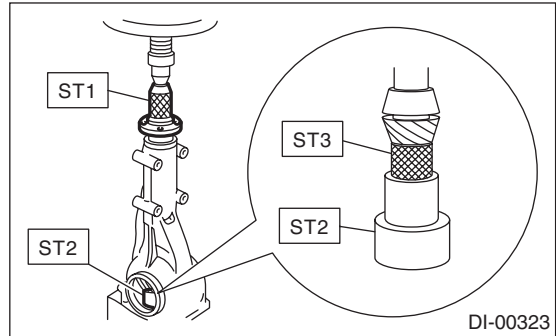


8) Press-fit the companion flange with ST1, ST2 and ST3.

NOTE:

Be careful not to damage the bearing.

ST1 899874100 INSTALLER
 ST2 399780104 WEIGHT
 ST3 498937110 HOLDER



9) Apply loctite on the drive pinion shaft thread and new self-locking nut seat.

Loctite:

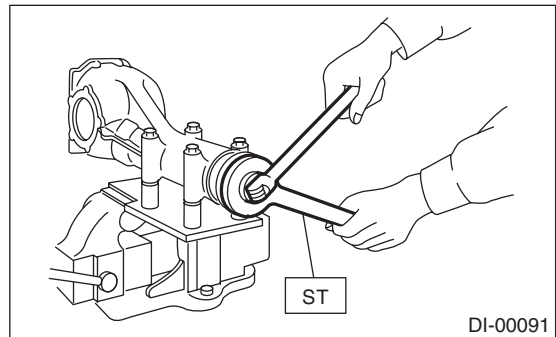
THREE BOND 1324 (Part No. 004403042) or equivalent

10) Attach the self-locking nut. Tighten it using the ST.

ST 18633AA000 WRENCH COMPL

Tightening torque:

181.5 N·m (18.5 kgf-m, 134 ft-lb)

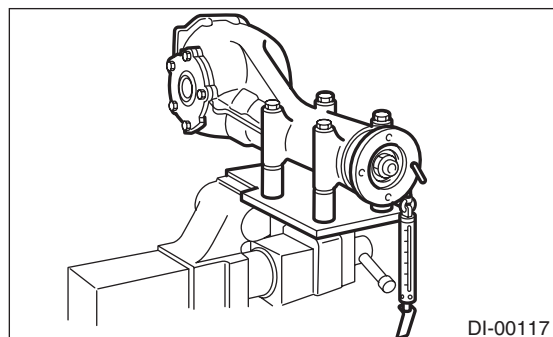


11) Turn the drive pinion shaft 10 times or more until it fits in each taper roller bearing.

12) Turn the drive pinion shaft 10 times or more until it fits in each taper roller bearing, and measure the preload.

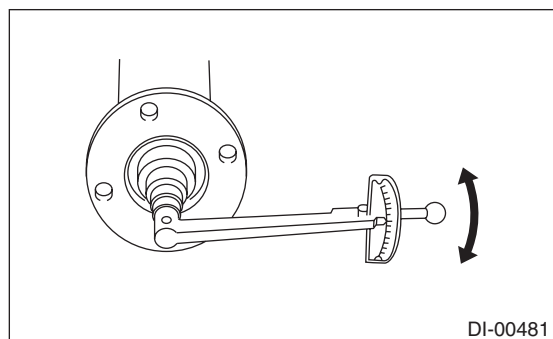
Initial load:

24.1 — 38.6 N (2.5 — 3.9 kgf, 5.4 — 8.7 lb)



Initial torque:

0.98 — 1.57 N·m (0.10 — 0.16 kgf·m, 0.72 — 1.16 ft·lb)

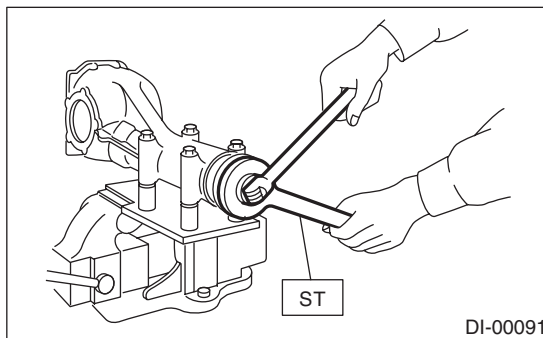


13) If the bearing preload is out of the specified range, select a preload adjusting washer and spacer from the list below so that the preload is within the specification.

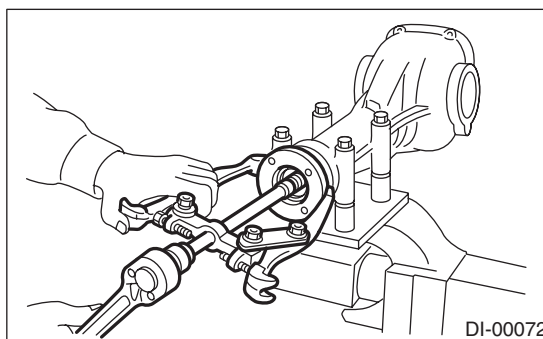
Preload adjusting washer	Part No.	Thickness mm (in)
	383705200	2.59 (0.1020)
	383715200	2.57 (0.1012)
	383725200	2.55 (0.1004)
	383735200	2.53 (0.0996)
	383745200	2.51 (0.0988)
	383755200	2.49 (0.0980)
	383765200	2.47 (0.0972)
	383775200	2.45 (0.0965)
	383785200	2.43 (0.0957)
	383795200	2.41 (0.0949)
	383805200	2.39 (0.0941)
	383815200	2.37 (0.0933)
383825200	2.35 (0.0925)	
383835200	2.33 (0.0917)	
383845200	2.31 (0.0909)	
Preload adjusting spacer	Part No.	Length mm (in)
	31454AA130	52.2 (2.055)
	31454AA140	52.4 (2.063)
	31454AA150	52.6 (2.071)
	31454AA160	52.8 (2.079)
	31454AA170	53.0 (2.087)
31454AA180	53.2 (2.094)	

14) Remove the self-locking nut while holding the companion flange with ST.

ST 18633AA000 WRENCH COMPL



15) Extract the companion flange with a puller.



Rear Differential

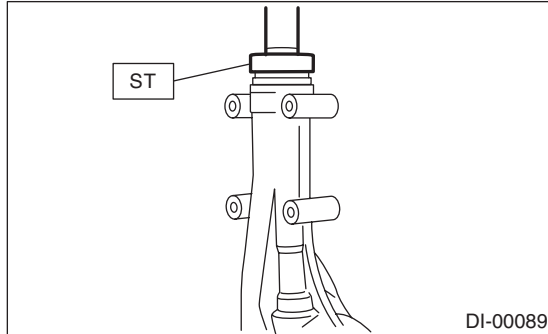
DIFFERENTIALS

16) Install a new oil seal using ST.

NOTE:

- Press-fit until the oil seal end comes 1 mm (0.04 in) inward from end of carrier.
- Apply grease between the oil seal lips.

ST 498447120 INSTALLER



17) Press-fit the companion flange with ST1, ST2 and ST3.

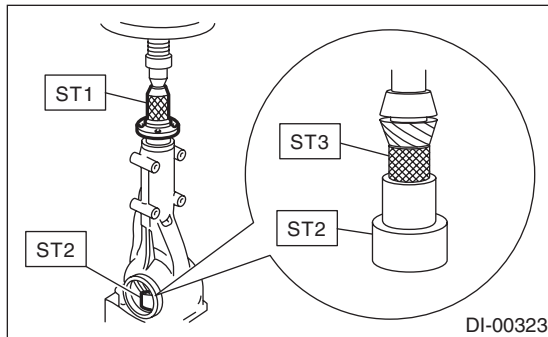
ST1 899874100 INSTALLER

ST2 399780104 WEIGHT

ST3 498937110 HOLDER

NOTE:

Be careful not to damage the bearing.



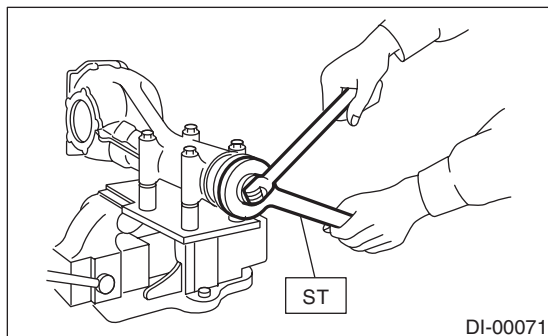
18) Apply loctite on the drive pinion shaft thread and new self-locking nut seat.

Loctite:

THREE BOND 1324 (Part No. 004403042) or equivalent

19) Attach the self-locking nut. Tighten it using the ST.

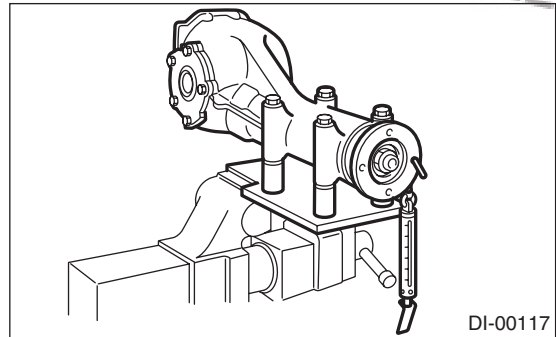
ST 18633AA000 WRENCH COMPL



20) Check the initial torque and initial load.

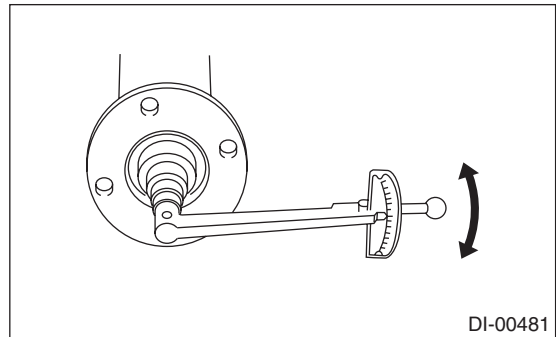
Initial load:

24.1 — 38.6 N (2.5 — 3.9 kgf, 5.4 — 8.7 lb)



Initial torque:

0.98 — 1.57 N·m (0.10 — 0.16 kgf·m, 0.72 — 1.16 ft·lb)



21) Install the driven gear to the differential case.

NOTE:

- Before installing bolts, apply Loctite to bolt threads.
- Make sure there is no clearance between the differential case and driven gear.

Loctite:

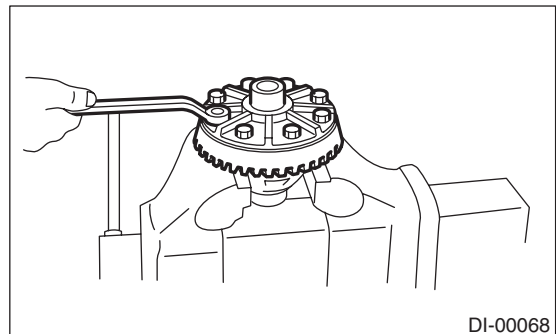
THREE BOND 1324 (Part No. 004403042) or equivalent

NOTE:

Tighten diagonally while gently tapping the bolt heads.

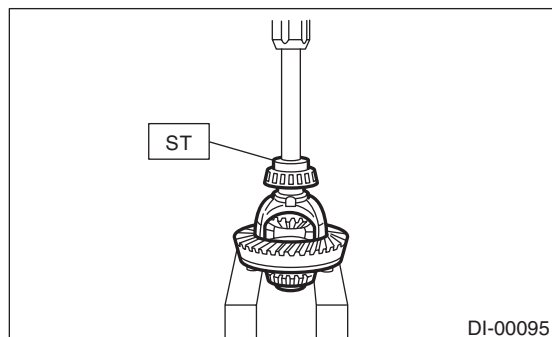
Tightening torque:

103 N·m (10.5 kgf·m, 76 ft·lb)



22) Press the side bearing into differential case using ST.

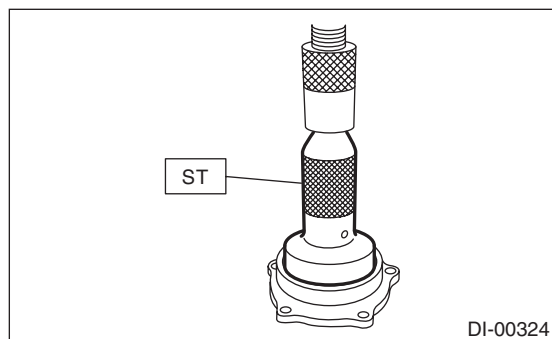
ST 398487700 DRIFT



23) Assemble the side bearing retainer.

(1) Using the ST and a press, press in the side bearing outer race.

ST 398417700 DRIFT



(2) Install the oil seal. <Ref. to DI-53, REPLACEMENT, Rear Differential Side Oil Seal.>

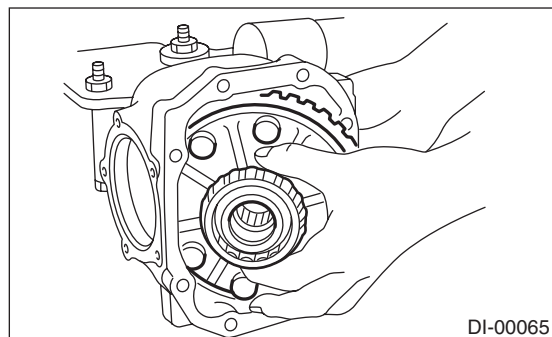
24) Adjusting the side bearing retainer shims

(1) The driven gear backlash and side bearing preload can be adjusted by the side bearing retainer shim thickness.

(2) Install the differential case assembly into differential carrier in the reverse order of disassembly.

NOTE:

Be careful so that the teeth do not hit against the case.



(3) Install the side bearing retainer shims to RH and LH retainers from the position where they were removed.

NOTE:

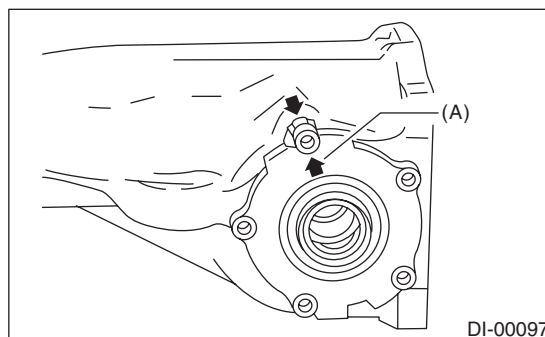
Replace broken or corroded side bearing retainer shims with a new part of the same thickness.

Side bearing retainer shim	
Part No.	Thickness mm (in)
383475201	0.20 (0.0079)
383475202	0.25 (0.0098)
383475203	0.30 (0.0118)
383475204	0.40 (0.0157)
383475205	0.50 (0.0197)

(4) Align the arrow mark on differential carrier with the mark on side bearing retainer during installation.

NOTE:

Be careful that side bearing outer race is not damaged by the bearing roller.

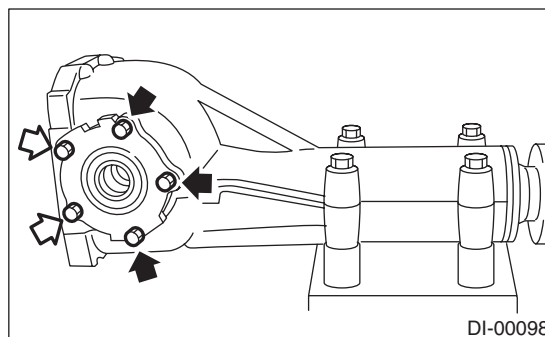


(A) Arrow mark

(5) Tighten the side bearing retainer bolts.

Tightening torque:

10.5 N·m (1.1 kgf-m, 7.7 ft-lb)

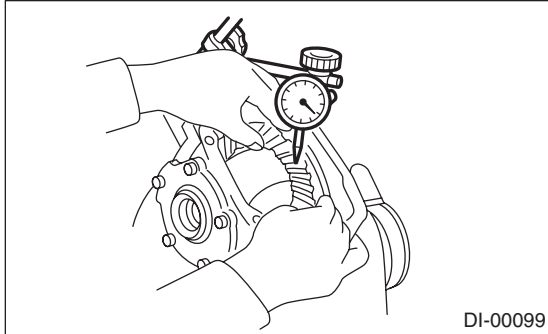


DIFFERENTIALS

(6) Measure the driven gear to drive pinion backlash. Set the magnet base on the differential carrier. Align the contact point of dial gauge with the tooth surface of hypoid driven gear, and move the hypoid driven gear while securing the drive pinion. Read the value indicated on dial gauge.

Backlash:

0.10 — 0.20 mm (0.004 — 0.008 in)



NOTE:

If the backlash exceeds 0.20 mm (0.008 in), reduce the thickness of shim on the back side of the hypoid driven gear and increase the thickness of shims on the teeth side of the hypoid driven gear. If the backlash is less than 0.10 mm (0.004 in), increase the thickness of shim on the back side of the hypoid driven gear and reduce the thickness of shims on the teeth side of the hypoid driven gear.

(7) At the same time, measure the total preload of the drive pinion. Compared with the time when differential case is not installed, if the total preload is not within specification, adjust the thickness of side bearing retainer shims, increasing/reducing both shims by an even amount at a time.

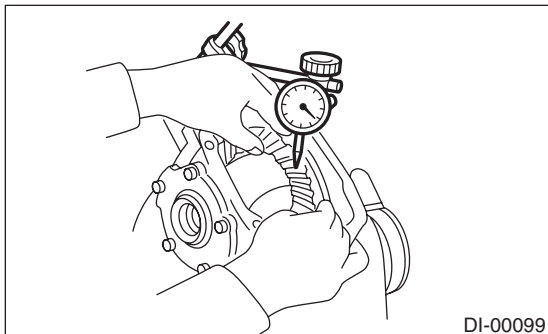
Total preload:

27 — 54 N (2.8 — 5.5 kgf, 6.1 — 12.2 lbf)

25) Measure the driven gear to drive pinion backlash again.

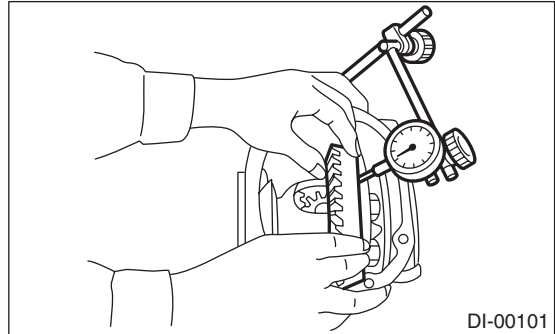
Backlash:

0.10 — 0.20 mm (0.004 — 0.008 in)



26) Check the hypoid driven gear runout on its back surface, and make sure that the pinion and hypoid driven gear rotates smoothly.

**Driven gear rear face runout limit:
0.05 mm (0.0020 in) or less**



27) Checking and adjusting the tooth contact of hypoid driven gear

(1) Apply an even coat of red lead on both sides of three or four teeth on the driven gear. Check the contact pattern after rotating the hypoid driven gear several revolutions back and forth until a definite contact pattern appears on the hypoid driven gear.

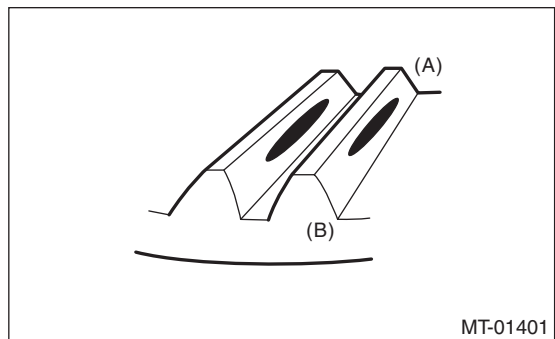
(2) If the contact pattern is not correct, readjust it according to the directions indicated in the "Contact Pattern".

NOTE:

Be sure to wipe off the red lead completely after the adjustment is completed.

- Correct tooth contact

Check item: Tooth contact pattern is slightly shifted toward toe side under no-load rotation. (When driving, it moves towards the heel side.)

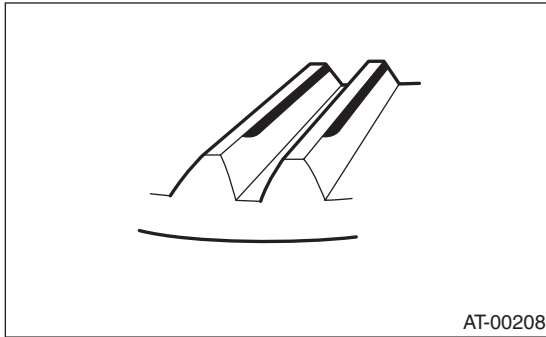


- (A) Toe side
- (B) Heel side

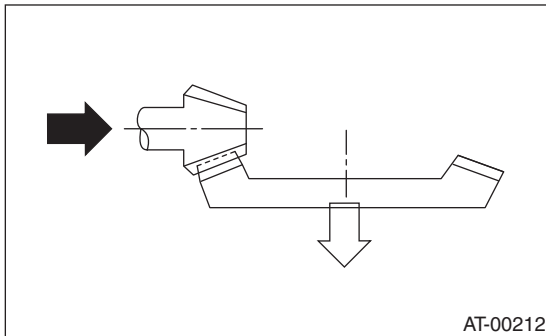
- Face contact

Check item: Backlash is too large.

Contact pattern



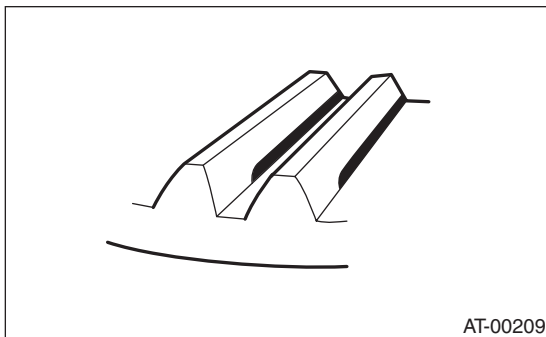
Corrective action: Increase the thickness of pinion height adjusting washer according to the procedure for bringing the drive pinion close to the driven gear.



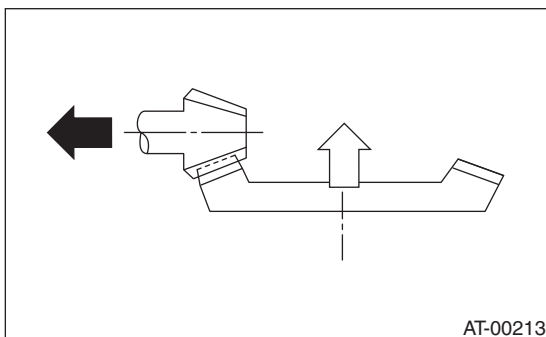
- Flank contact

Check item: Backlash is too small.

Contact pattern



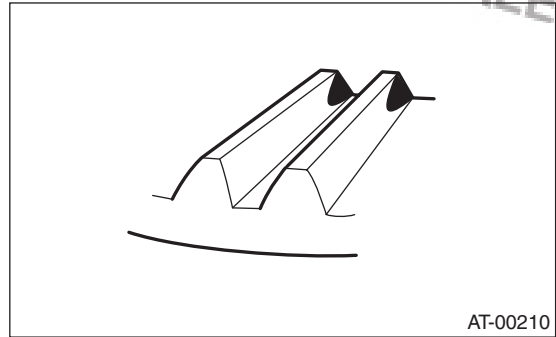
Corrective action: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing drive pinion away from hypoid driven gear.



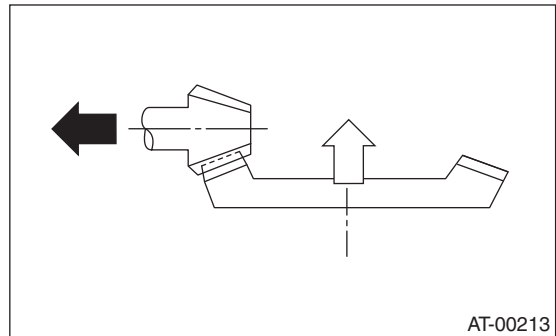
- Toe contact (inside contact)

Check item: Teeth contact area is too small.

Contact pattern



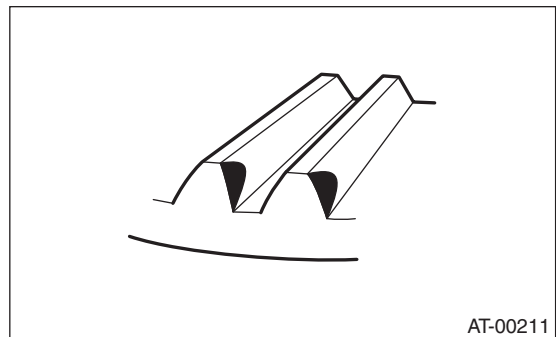
Corrective action: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing drive pinion away from hypoid driven gear.



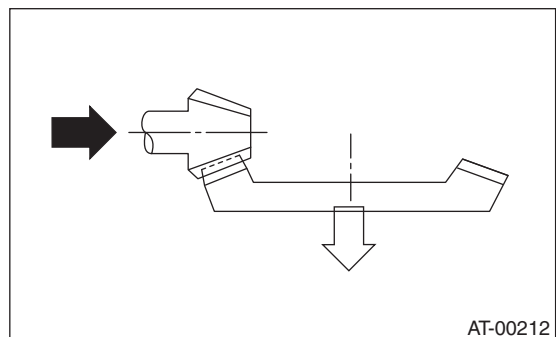
- Heel contact (outside end contact)

Check item: Teeth contact area is too small.

Contact pattern



Corrective action: Increase thickness of pinion height adjusting washer according to the procedures for moving the drive pinion closer to the driven gear.



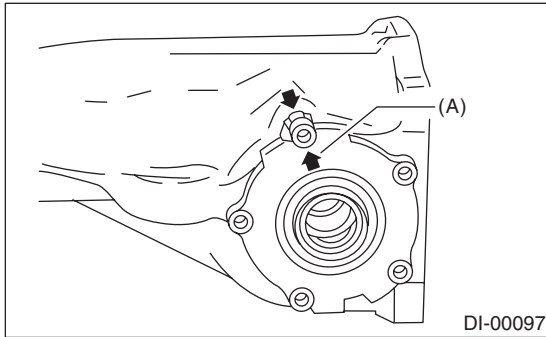
DIFFERENTIALS

28) If proper tooth contact is not obtained, once again adjust the drive pinion height by changing the RH and LH side bearing retainer shims and the hypoid gear backlash.

29) Remove the RH and LH side bearing retainer.

30) Install new O-rings to side bearing retainers of both sides.

31) Align the arrow mark on differential carrier with the mark on side bearing retainer during installation.



(A) Arrow mark

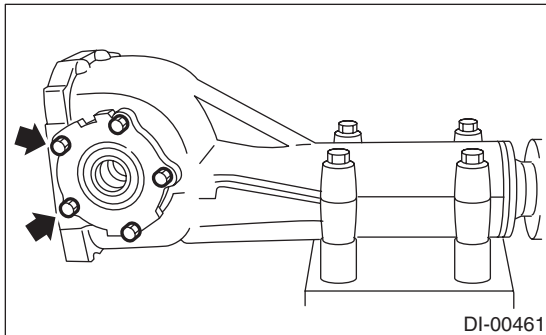
32) Apply liquid gasket to the bolt with arrow marks, and install the side bearing retainer.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

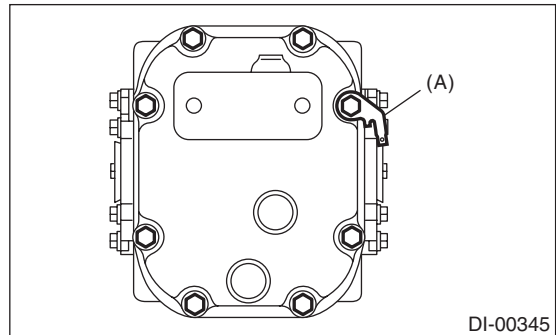
10.5 N·m (1.1 kgf-m, 7.7 ft-lb)



33) Install the new gasket, rear cover and stay ground, and tighten the bolts to the specified torque.

Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb)



(A) Stay ground

34) Install a new air breather cap.

35) Install the filler plug and the rear differential oil temperature switch.

Tightening torque:

49 N·m (5.0 kgf-m, 36.2 ft-lb)

E: INSPECTION

Wash all the disassembled parts clean, and examine them for wear, damage and other defects. Repair or replace the defective parts as necessary.

1) Hypoid driven gear and drive pinion

- If there is evidently an abnormal tooth contact, find out the cause and adjust until the teeth contact correctly. Replace the gear if there is an excessive worn or an incapable adjustment.

- If crack, cutout or seizure is found, replace the parts as a set. Slight damage of some teeth can be corrected by oil stone or the like.

2) Side gear and pinion mate gear

- Replace if cracks, scoring or other defects are evident on the tooth surface.

- Replace if thrust washer contact surface is worn or seized. Slight damages of the surface can be corrected by oil stones or equivalent.

3) Bearing

Replace if seizure, peeling, wear, rust, dragging during rotation, abnormal noise or other defect is evident.

4) Thrust washer of the side gear and pinion mate gear:

Replace if seized, flawed, abnormally worn or having other defects.

5) Oil seal

Replace if deformed or damaged, and at every disassembling.

6) Differential carrier

Replace if the bearing bores are worn or damaged.

7) Differential case

Replace if its sliding surfaces are worn or cracked.

8) Companion flange

Replace if the oil seal lip contact surface shows cracking.

9) Rear differential oil temperature switch

If the following inspection detects a defect, replace the rear differential temperature switch.

(1) Inspect continuity between compartment temperature sensor terminal and vehicle body.

(2) Immerse the sensor in oil and raise the oil temperature. Check that continuity disappears at an oil temperature of 144°C — 156°C (291°F — 313°F) and that continuity recovers when the oil temperature lowers to 135°C (275°F).

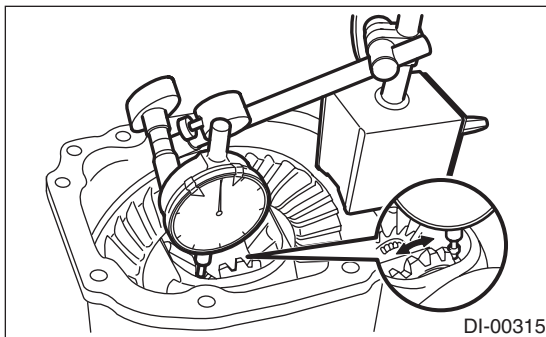
1. SIDE GEAR BACKLASH

Using a dial gauge, check the backlash of side gear.

Side gear backlash:

0.1 — 0.2 mm (0.004 — 0.008 in)

If the side gear backlash is not within the specification, select the side gear thrust washer and adjust the side gear backlash as specified.



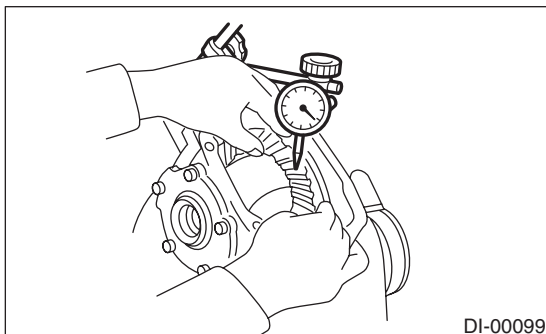
2. HYPOID DRIVEN GEAR BACKLASH

Using a dial gauge, check the backlash of hypoid driven gear.

Hypoid driven gear backlash:

0.1 — 0.2 mm (0.004 — 0.008 in)

If the hypoid driven gear backlash is not within the specification, adjust the side bearing preload or repair if necessary.



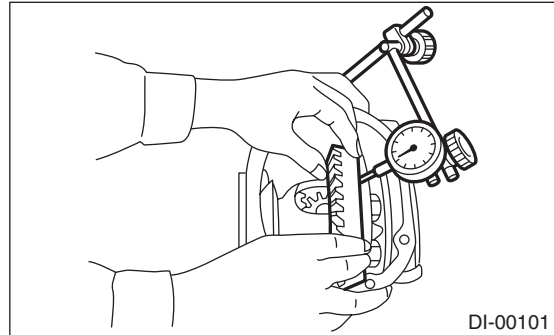
3. DRIVEN GEAR REAR FACE RUNOUT LIMIT

Using a dial gauge, check the hypoid driven gear back surface runout.

Driven gear rear face runout limit:

0.05 mm (0.0020 in) or less

If the hypoid driven gear runout exceeds 0.05 mm (0.0020 in), replace the hypoid driven gear.



4. TOOTH CONTACT BETWEEN HYPOID DRIVEN GEAR AND DRIVE PINION

Inspect the tooth contact between the hypoid driven gear and drive pinion. <Ref. to DI-32, ASSEMBLY, Rear Differential.>

5. TOTAL PRELOAD

Using a spring scale, check the total preload.

Total preload:

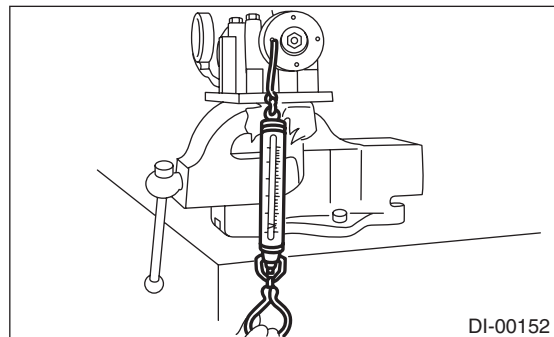
Except for STI model:

20.7 — 54.4 N (2.1 — 5.5 kgf, 4.7 — 12.2 lbf)

STI model:

27 — 54 N (2.8 — 5.5 kgf, 6.1 — 12.2 lbf)

If the total preload is not within the specification, adjust the side bearing retainer shims.

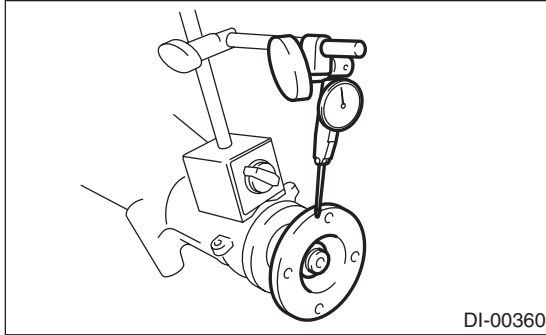


6. COMPANION FLANGE

- 1) If rust or dirt is attached to the companion flange, remove them.
- 2) Set a dial gauge at a companion flange surface (mating surface of propeller shaft and companion flange), and then measure the companion flange runout.

Limit of runout:

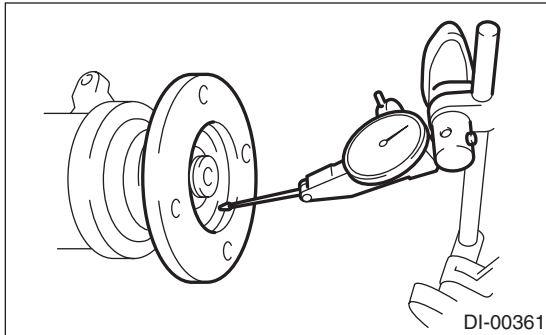
0.08 mm (0.003 in)



- 3) Set the gauge inside of the companion flange, and measure the runout.

Limit of runout:

0.08 mm (0.003 in)



- 4) If either runout exceeds the limit, move the phase of companion flange and drive pinion 90° each, and find the point where the runout is within the limit.
- 5) If the runout exceeds the limit even after changing the phase, replace the companion flange and recheck the runout.
- 6) If the runout exceeds the limit after replacing the companion flange, the drive pinion may be assembled incorrectly or bearing is faulty.

F: ADJUSTMENT

1. SIDE GEAR BACKLASH

Adjust the side gear backlash.

<Ref. to DI-32, ASSEMBLY, Rear Differential.>

2. HYPOID DRIVEN GEAR BACKLASH

Adjust the hypoid driven gear backlash.

<Ref. to DI-32, ASSEMBLY, Rear Differential.>

3. TOOTH CONTACT BETWEEN HYPOID DRIVEN GEAR AND DRIVE PINION

Adjust the tooth contact between hypoid driven gear and drive pinion gear.

<Ref. to DI-32, ASSEMBLY, Rear Differential.>

4. TOTAL PRELOAD

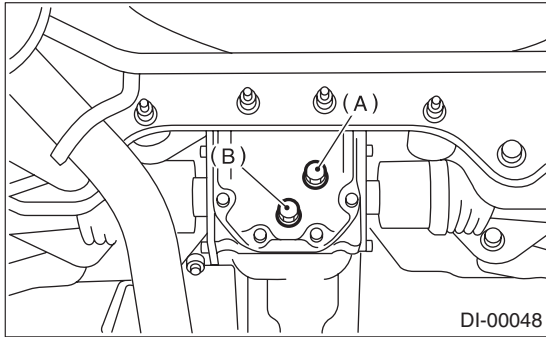
Adjust the side bearing shim.

<Ref. to DI-32, ASSEMBLY, Rear Differential.>

5. Rear Differential Front Oil Seal

A: REPLACEMENT

- 1) Set the vehicle on a lift.
- 2) Disconnect the ground cable from battery.
- 3) Shift the select lever or gear shift lever to neutral.
- 4) Release the parking brake.
- 5) Remove the oil drain plug, and drain gear oil.



- (A) Filler plug
- (B) Drain plug

- 6) Install the oil drain plug.

NOTE:

Apply liquid gasket to the drain plug.

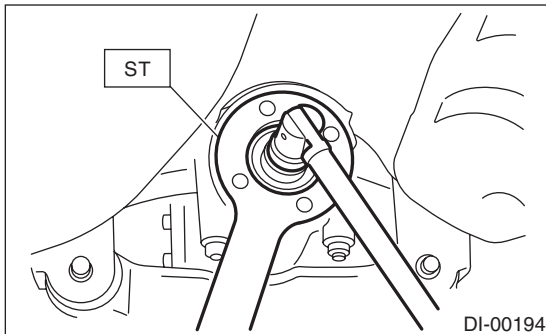
Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

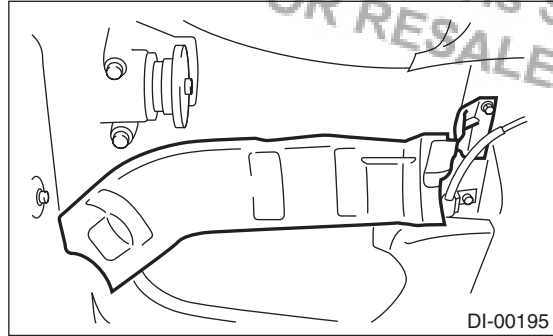
Tightening torque:

49 N·m (5.0 kgf·m, 36.2 ft·lb)

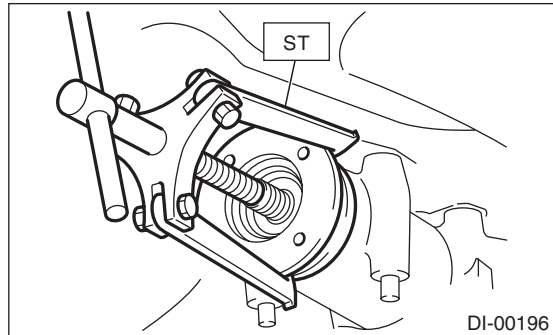
- 7) Lift up the vehicle.
 - 8) Remove the rear exhaust pipe and muffler.
 - 9) Remove the propeller shaft from the vehicle body. <Ref. to DS-15, REMOVAL, Propeller Shaft.>
 - 10) Remove the self-locking nut while holding the companion flange with ST.
- Except for STI model
 ST 498427200 FLANGE WRENCH
 STI model
 ST 18633AA000 WRENCH COMPL



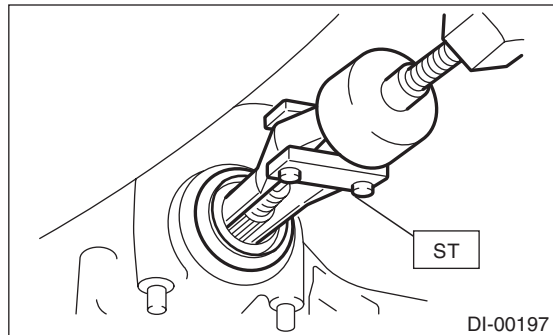
- 11) Remove the center heat shield cover.



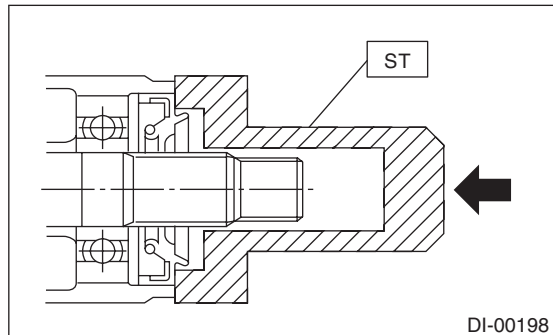
- 12) Extract the companion flange using ST.
- ST 399703600 PULLER ASSY



- 13) Remove the oil seal using ST.
- ST 398527700 PULLER ASSY



- 14) Install a new oil seal using ST.
- ST 498447120 INSTALLER



- 15) Install the companion flange.

NOTE:

Use a plastic hammer to install companion flange.

Rear Differential Front Oil Seal

DIFFERENTIALS

16) Apply loctite on the drive pinion shaft thread and new self-locking nut seat.

Loctite:

THREE BOND 1324 (Part No. 004403042) or equivalent

17) Tighten the self-locking nut within the specified torque range so that the companion flange preload becomes the same value as that before replacing the oil seal.

Except for STI model

ST 498427200 FLANGE WRENCH

STI model

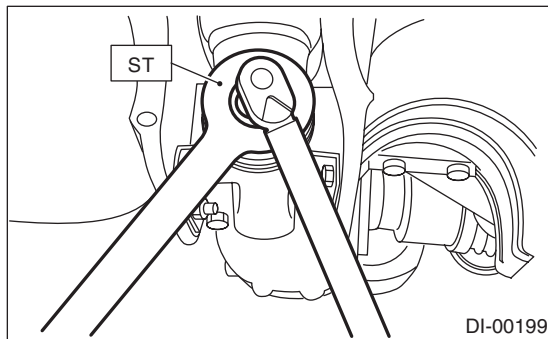
ST 18633AA000 WRENCH COMPL

NOTE:

Use a new self-locking nut.

Tightening torque:

181.5 N·m (18.5 kgf-m, 134 ft-lb)



18) Hereafter, reassemble in the reverse order of disassembly.

19) After installing, fill the differential carrier with gear oil up to the bottom of the filler plug hole. <Ref. to DI-20, Differential Gear Oil.>

6. Rear Differential Side Oil Seal

A: INSPECTION

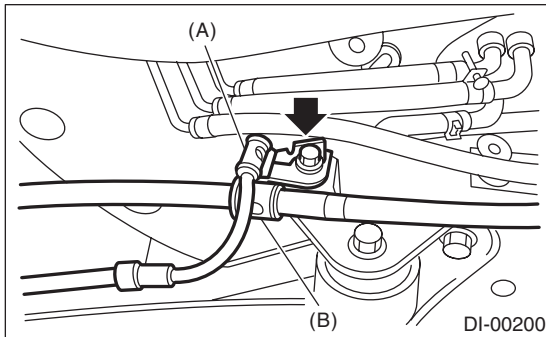
Make sure that there is no oil leakage from the side oil seal.

If there is oil leakage, replace the oil seal.

B: REPLACEMENT

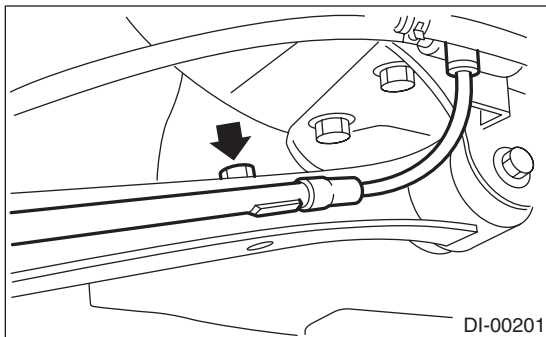
- 1) Shift the select lever or gear shift lever to neutral.
- 2) Release the parking brake.
- 3) Loosen the wheel nuts on both sides.
- 4) Lift up the vehicle.
- 5) Remove the wheels.
- 6) Remove the rear exhaust pipe and muffler.
 - Non-turbo model <Ref. to EX(H4SO)-8, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(H4SO)-9, REMOVAL, Muffler.>
 - Turbo model and STI model <Ref. to EX(H4DOTC)-15, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(H4DOTC)-17, REMOVAL, Muffler.>
- 7) Remove the DOJ of rear drive shaft from rear differential.

- (1) Remove the ABS wheel speed sensor cable clamp and the parking brake cable clamp from bracket.

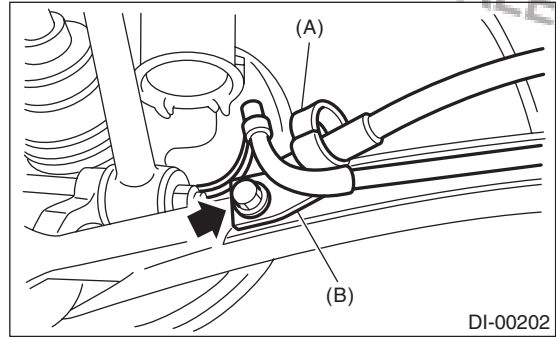


- (A) ABS wheel speed sensor cable clamp
- (B) Parking brake cable clamp

- (2) Remove the ABS wheel speed sensor cable clamp from the trailing link.

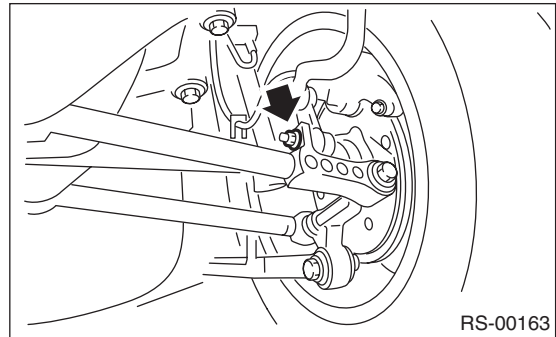


- (3) Remove the ABS wheel speed sensor cable clamp and the parking brake cable guide from the trailing link.

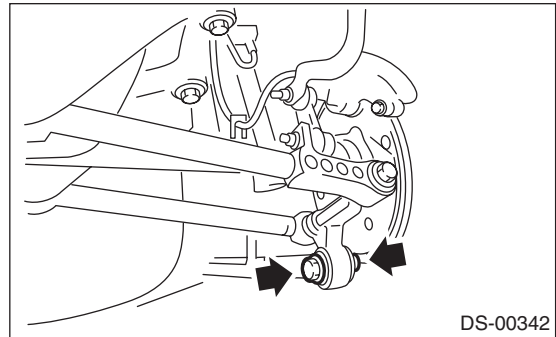


- (A) Parking brake cable guide
- (B) ABS wheel speed sensor cable clamp

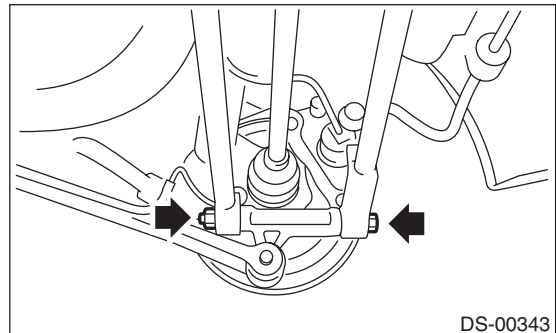
- (4) Remove the rear stabilizer link.



- (5) Remove the bolts which secure the trailing link to the housing.



- (6) Remove the bolts which secure the front and rear lateral links to the rear housing.



Rear Differential Side Oil Seal

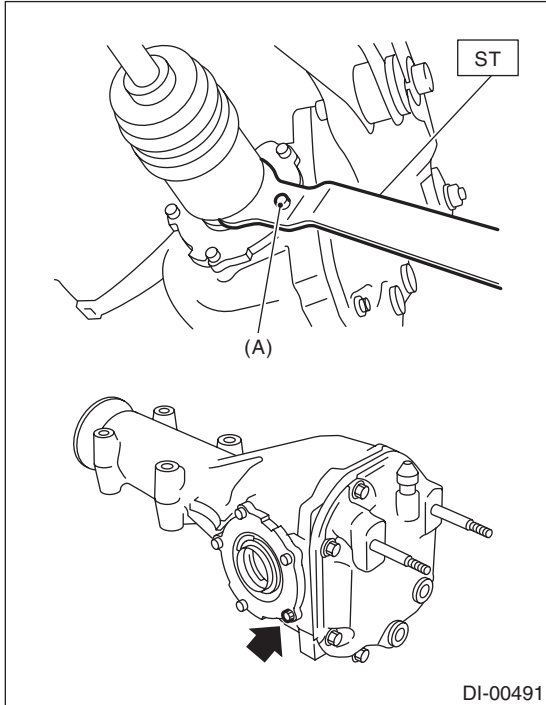
DIFFERENTIALS

(7) Remove the DOJ from the rear differential by using ST.

NOTE:

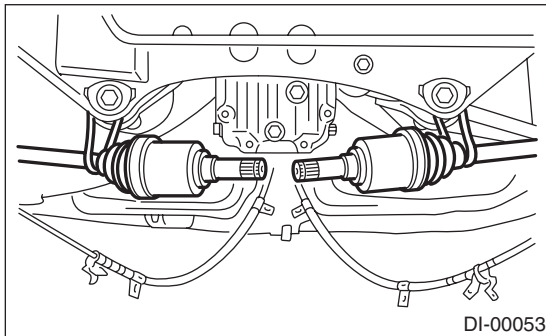
When removing the DOJ from the rear differential, fit the ST to the bolts as shown in the figure so as not to damage the side bearing retainer.

ST 208099PA100 DRIVE SHAFT REMOVER



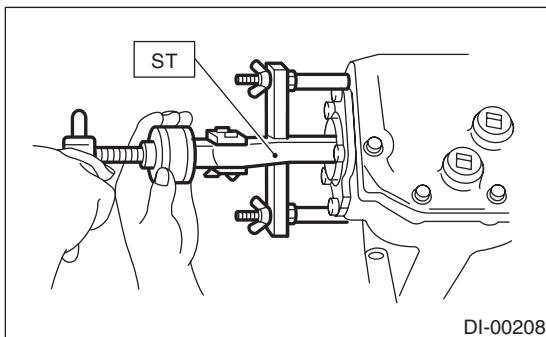
(A) Bolt

8) Suspend the rear drive shaft to the rear cross-member using wire.



9) Remove the oil seal using ST.

ST 398527700 PULLER ASSY

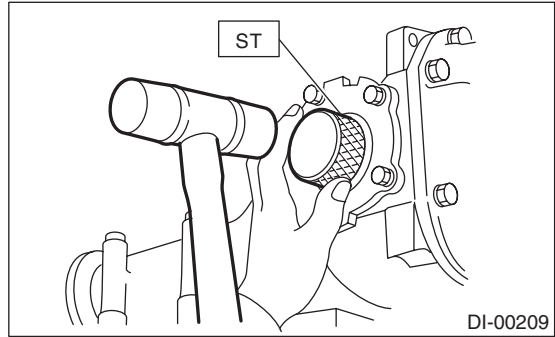


10) Install a new side oil seal using the ST.

NOTE:

Apply chassis grease to the oil seal lips.

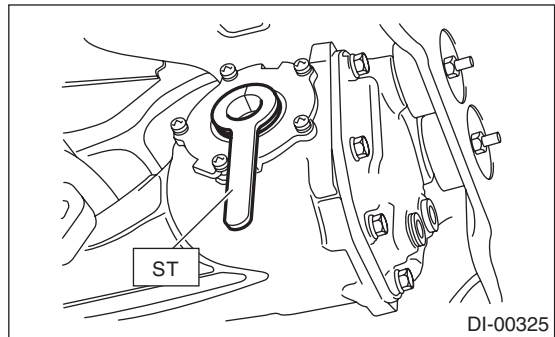
ST 398437700 DRIFT



11) Insert the DOJ into rear differential.

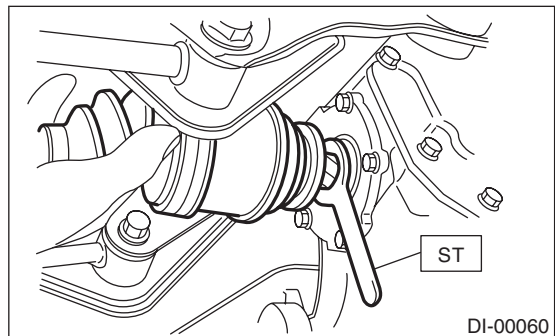
(1) Attach the ST to rear differential.

ST 28099PA090 OIL SEAL PROTECTOR



(2) Install the spline shaft until the spline portion is inside the side oil seal using ST.

ST 28099PA090 OIL SEAL PROTECTOR



(3) Remove the ST.

ST 28099PA090 OIL SEAL PROTECTOR

12) Hereafter, reassemble in the reverse order of disassembly.

7. Rear Differential Member

A: REMOVAL

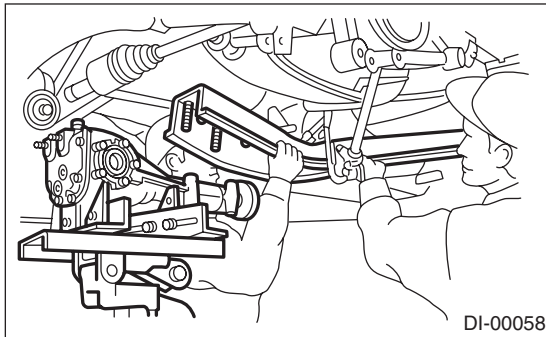
When removing the differential front member, use the removal procedure for rear differential. <Ref. to DI-23, REMOVAL, Rear Differential.>

B: INSTALLATION

1) Position the differential front member with the vehicle body by passing the member under the parking brake cable and securing it to rear differential.

NOTE:

When installing the differential front member, be careful of the order for installation of the stoppers.

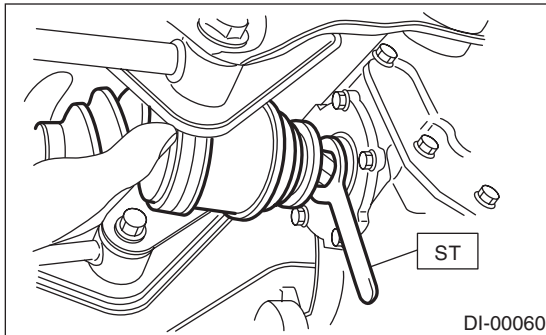


2) Insert the DOJ of the rear drive shaft into the rear differential. <Ref. to DI-53, REPLACEMENT, Rear Differential Side Oil Seal.>

NOTE:

Before inserting, replace the differential side oil seal with a new part.

ST 28099PA090 OIL SEAL PROTECTOR



3) Hereafter, install in the reverse order of removal.

C: INSPECTION

1) Check the rear differential member for damage, bend and corrosion.

If damage, bend or corrosion is excessive, replace the rear differential member.

2) Check the bushings of the rear differential member for cracking, hardening and damage.

If cracking, hardening or damage is excessive, replace rear differential member.

8. General Diagnostic Table

A: INSPECTION

Symptom or trouble	Possible cause	Remedy
1. Oil leakage	(1) Worn, scratched, or incorrectly seated front or side oil seal. Scored, battered or excessively worn sliding surface of companion flange.	Repair or replace.
	(2) Clogged or damaged air breather cap.	Clean, repair or replace.
	(3) Loose bolts on differential spindle or side bearing retainer, or incorrectly fitted O-ring.	Tighten the bolts to specified torque. Replace the O-ring.
	(4) Loose rear cover attaching bolts or damaged gasket.	Tighten the bolts to specified torque. Replace gasket and apply liquid gasket.
	(5) Loose oil filler or drain plug.	Retighten and apply liquid gasket.
	(6) Wear, damage or incorrect fitting of spindle, side bearing retainer or oil seal.	Repair or replace.
2. Seizure NOTE: Seized or damaged parts should be replaced, and also other parts should be thoroughly checked for any defect and should be repaired or replaced as required.	(1) Insufficient backlash for hypoid gear.	Readjust or replace.
	(2) Excessive preload for side, rear or front bearing.	Readjust or replace.
	(3) Insufficient or improper oil used.	Replace seized part and fill with specified oil to specified level.
3. Damage NOTE: Damaged parts should be replaced, and also other parts should be thoroughly checked for any defect and should be repaired or replaced as required.	(1) Improper backlash for hypoid gear.	Replace.
	(2) Insufficient or excessive preload for side, rear or front bearing.	Readjust or replace.
	(3) Excessive backlash for differential gear.	Replace gear or thrust washer.
	(4) Loose bolts and nuts such as hypoid driven gear bolt.	Retighten.
	(5) Damage due to overloading.	Replace.
4. Noises when starting or shifting gears NOTE: Noises may be caused by differential assembly, universal joint, wheel bearing, etc. Find out what is actually making noise before disassembling.	(1) Excessive backlash for hypoid gear.	Readjust.
	(2) Excessive backlash for differential gear.	Replace gear or thrust washer.
	(3) Insufficient preload for front or rear bearing.	Readjust.
	(4) Loose drive pinion nut.	Tighten to the specified torque.
	(5) Loose bolts and nuts such as side bearing retainer attaching bolt.	Tighten to the specified torque.
5. Noises when cornering	(1) Damaged differential gear.	Replace.
	(2) Excessive wear or damage of thrust washer.	Replace.
	(3) Broken pinion mate shaft.	Replace.
	(4) Seized or damaged side bearing.	Replace.

Symptom or trouble	Possible cause	Remedy
<p>6. Gear Noise</p> <p>NOTE: Since noises from engine, muffler, transmission, propeller shaft, wheel bearings, tires, and body are sometimes mistaken for noises from differential assembly, be careful in checking them. Inspection methods to locate noises include coasting, accelerating, cruising, and lift-up of all four wheels. Perform these inspections according to the condition of trouble. When listening to noises, shift the gear into four wheel drive and fourth speed position, trying to pick up only differential noise.</p>	(1) Improper tooth contact of hypoid gear.	Readjust or replace hypoid gear set.
	(2) Improper backlash of the hypoid gear.	Readjust.
	(3) Scored or chipped teeth of hypoid gear.	Replace hypoid gear set.
	(4) Seized hypoid gear.	Replace hypoid gear set.
	(5) Improper preload for front or rear bearings.	Readjust.
	(6) Seized, cut-away or chipped front or rear bearing.	Replace.
	(7) Seized, cut-away or chipped side bearing.	Replace.
	(8) Vibrating differential gear.	Replace.

General Diagnostic Table

DIFFERENTIALS

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