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MANUAL TRANSMISSION AND DIFFERENTIAL 6-SPEED (6MT)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

1. General Description

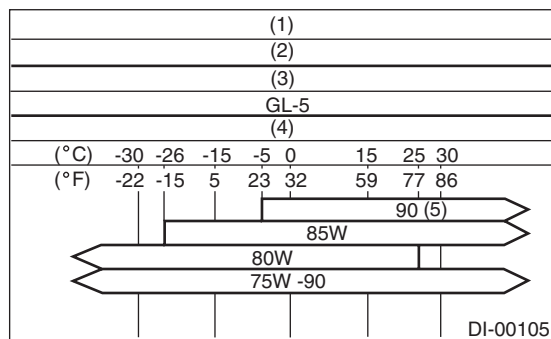
A: SPECIFICATION

1. MANUAL TRANSMISSION AND DIFFERENTIAL

Type		6-forward speeds and 1-reverse	
Transmission gear ratio		1st	3.636
		2nd	2.375
		3rd	1.761
		4th	1.346
		5th	0.971
		6th	0.756
		Reverse	3.545
Front reduction gear	Final	Type of gear	Hypoid
		Gear ratio	3.900
Rear reduction gear	Transfer	Type of gear	Helical
		Gear ratio	1.100
	Final	Type of gear	Hypoid
		Gear ratio	3.545
Front differential	Type and number of gear		Planetary gear (Pinion gear: 8, Gear: 2)
	Type of LSD		Helical
Center differential	Type and number of gear		Planetary gear (Internal gear: 1, Pinion gear: 6, Sun gear: 1 and Electromagnetic floating variable control multiple clutch)
Transmission gear oil			GL-5
Transmission gear oil capacity			4.1 ℓ (4.3 US qt, 3.6 Imp qt)

2. TRANSMISSION GEAR OIL

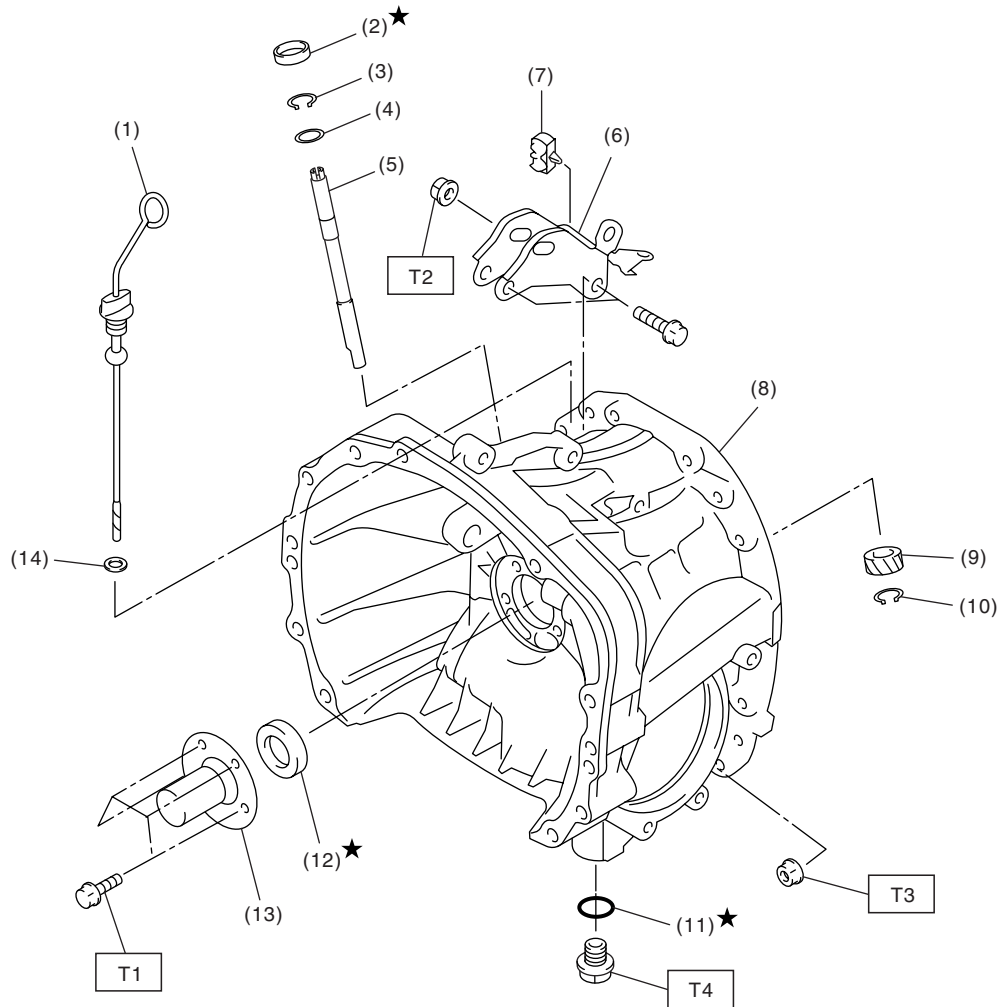
Recommended oil:



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

B: COMPONENT

1. CLUTCH HOUSING



MT-01449

- | | |
|-----------------------------------|-----------------------------------|
| (1) Oil level gauge | (8) Clutch housing |
| (2) Oil seal | (9) Speedometer driven gear |
| (3) Snap ring | (10) Snap ring |
| (4) Washer | (11) Gasket |
| (5) Speedometer driven gear shaft | (12) Oil seal |
| (6) Pitching stopper bracket | (13) Clutch release bearing guide |
| (7) Clip | (14) O-ring |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 6.4 (0.65, 4.7)

T2: 41 (4.2, 30.2)

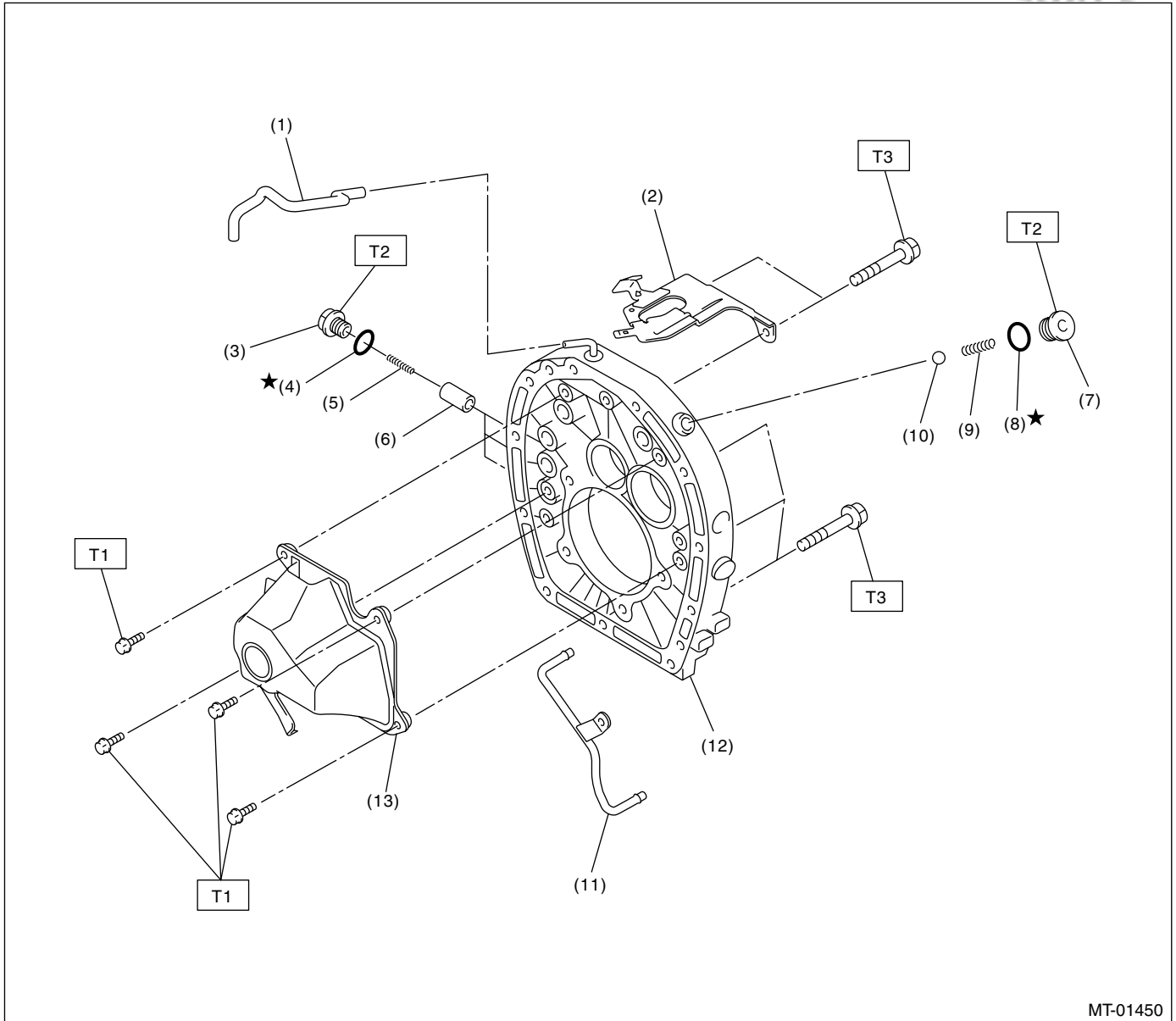
T3: 50 (5.1, 36.9)

T4: 70 (7.1, 51.6)

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2. ADAPTER PLATE



- (1) Air breather hose
- (2) Transmission harness stay
- (3) Plug
- (4) Gasket
- (5) Spring
- (6) Plunger

- (7) Plug
- (8) Gasket
- (9) Spring
- (10) Ball
- (11) Lubrication pipe
- (12) Adapter plate

- (13) Oil chamber

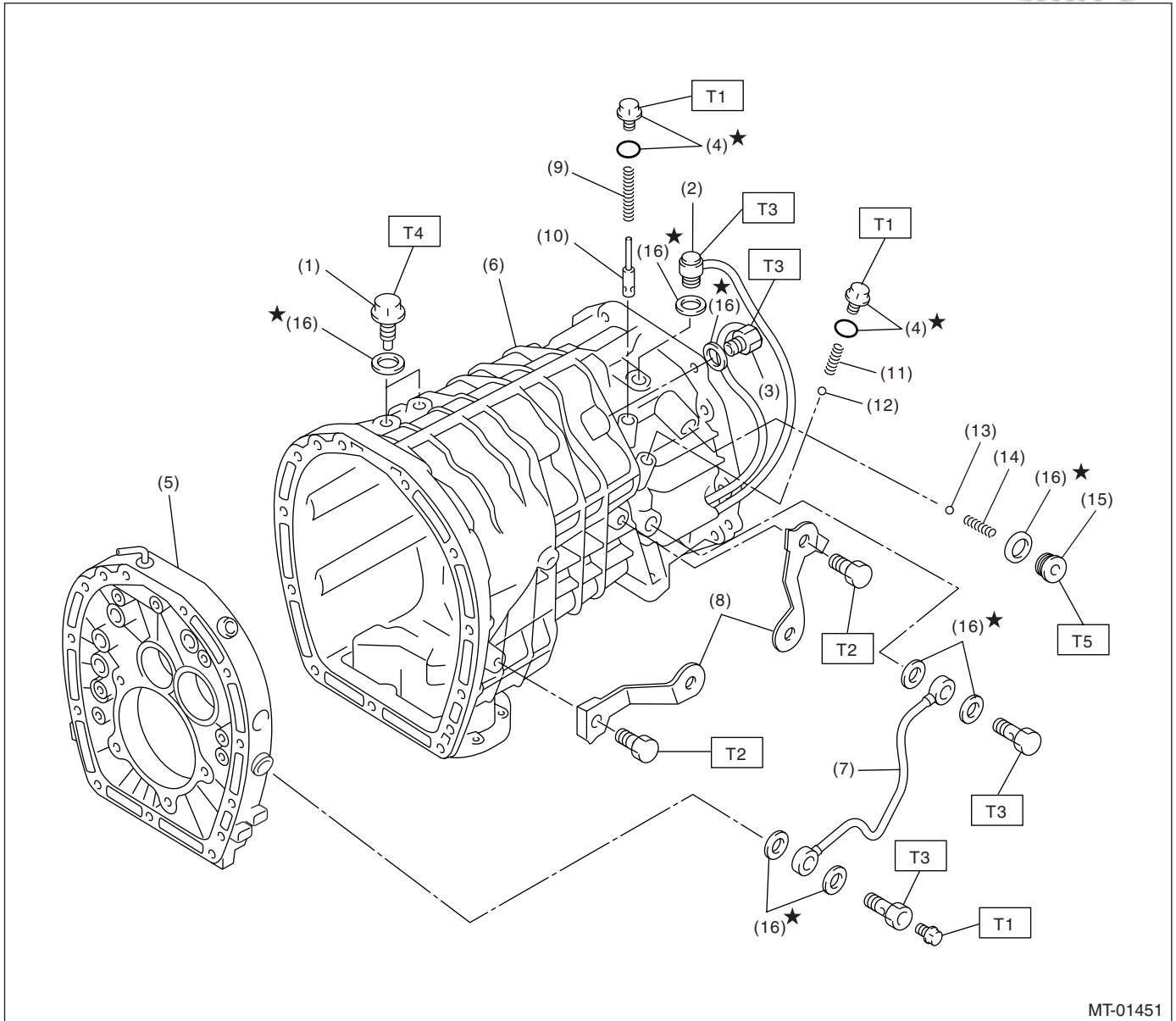
Tightening torque: N·m (kgf-m, ft-lb)

T1: 6.4 (0.65, 4.7)

T2: 37 (3.8, 27.3)

T3: 50 (5.1, 36.9)

3. TRANSMISSION CASE



- | | |
|-----------------------------|----------------------------|
| (1) Pilot bolt | (9) Return spring |
| (2) Neutral position switch | (10) Pressure relief valve |
| (3) Back-up light switch | (11) Return spring |
| (4) O-ring | (12) Ball |
| (5) Adapter plate | (13) Ball |
| (6) Transmission case | (14) Spring |
| (7) Oil pipe | (15) Plug |
| (8) Harness bracket | (16) Gasket |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 13 (1.3, 9.6)

T2: 16 (1.6, 11.8)

T3: 32 (3.3, 23.6)

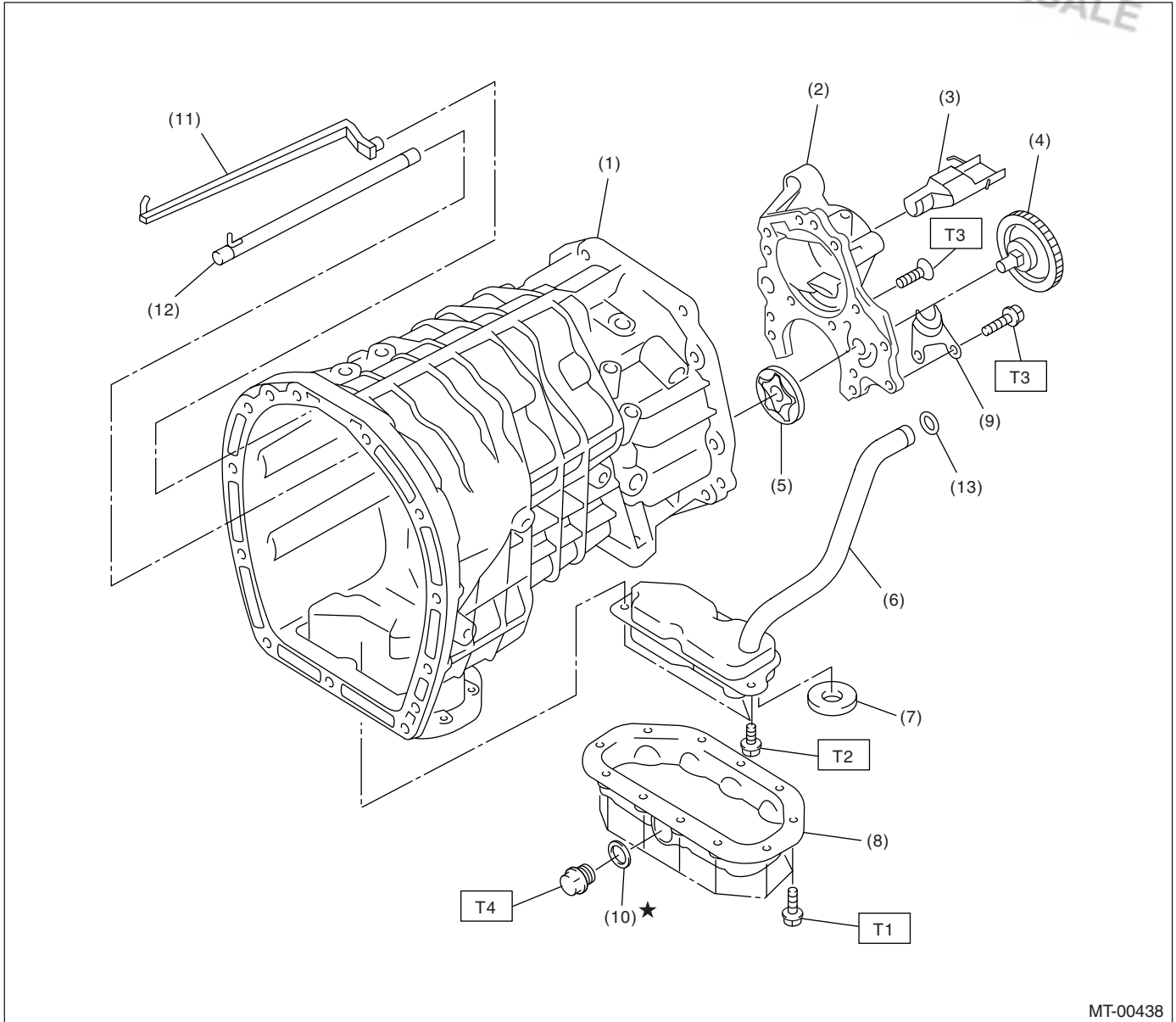
T4: 34 (3.5, 25.1)

T5: 41 (4.2, 30.2)

General Description

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4. OIL PAN AND OIL PUMP



MT-00438

- | | |
|-------------------------------|----------------|
| (1) Transmission case | (8) Oil pan |
| (2) Oil pump cover | (9) Plate |
| (3) Oil guide | (10) Gasket |
| (4) Oil pump driven gear ASSY | (11) Oil guide |
| (5) Oil pump rotor ASSY | (12) Oil pipe |
| (6) Strainer ASSY | (13) O-ring |
| (7) Magnet | |

Tightening torque: N·m (kgf-m, ft-lb)

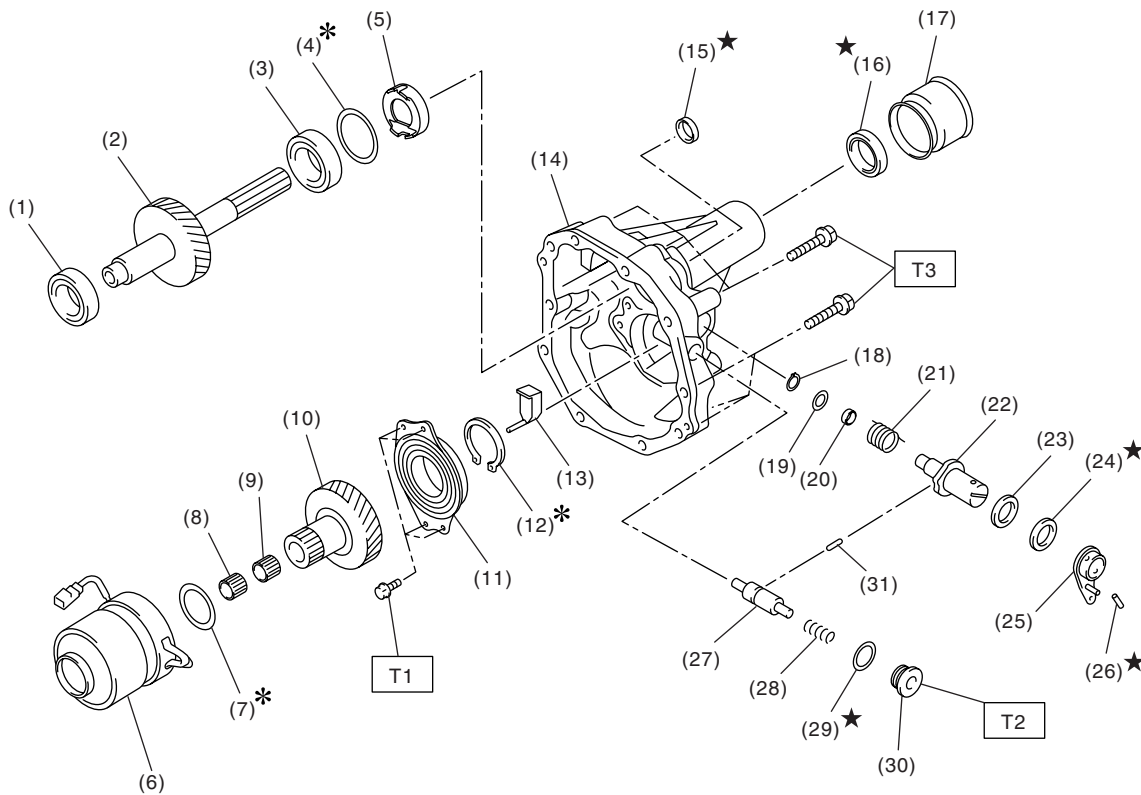
T1: 6.4 (0.65, 4.7)

T2: 10 (1.0, 7.4)

T3: 25 (2.5, 18.1)

T4: 44 (4.5, 32.5)

5. EXTENSION CASE AND CENTER DIFFERENTIAL



MT-01417

- | | | |
|---------------------------------|--------------------------|--------------------------------|
| (1) Taper roller bearing | (13) Extension guide | (25) Reverse check lever COMPL |
| (2) Transfer driven gear | (14) Extension case | (26) Straight pin |
| (3) Taper roller bearing | (15) Oil seal | (27) Reverse check plug |
| (4) Shim | (16) Oil seal | (28) Spring |
| (5) Oil plate | (17) Dust cover | (29) Gasket |
| (6) Center differential | (18) Snap ring | (30) Plug |
| (7) Shim | (19) Washer | (31) Plunger |
| (8) Needle bearing | (20) Bushing | |
| (9) Needle bearing | (21) Spring | |
| (10) Transfer drive gear | (22) Reverse check shaft | |
| (11) Ball bearing (with flange) | (23) Ball bearing | |
| (12) Snap ring | (24) Oil seal | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 25 (2.5, 18.1)

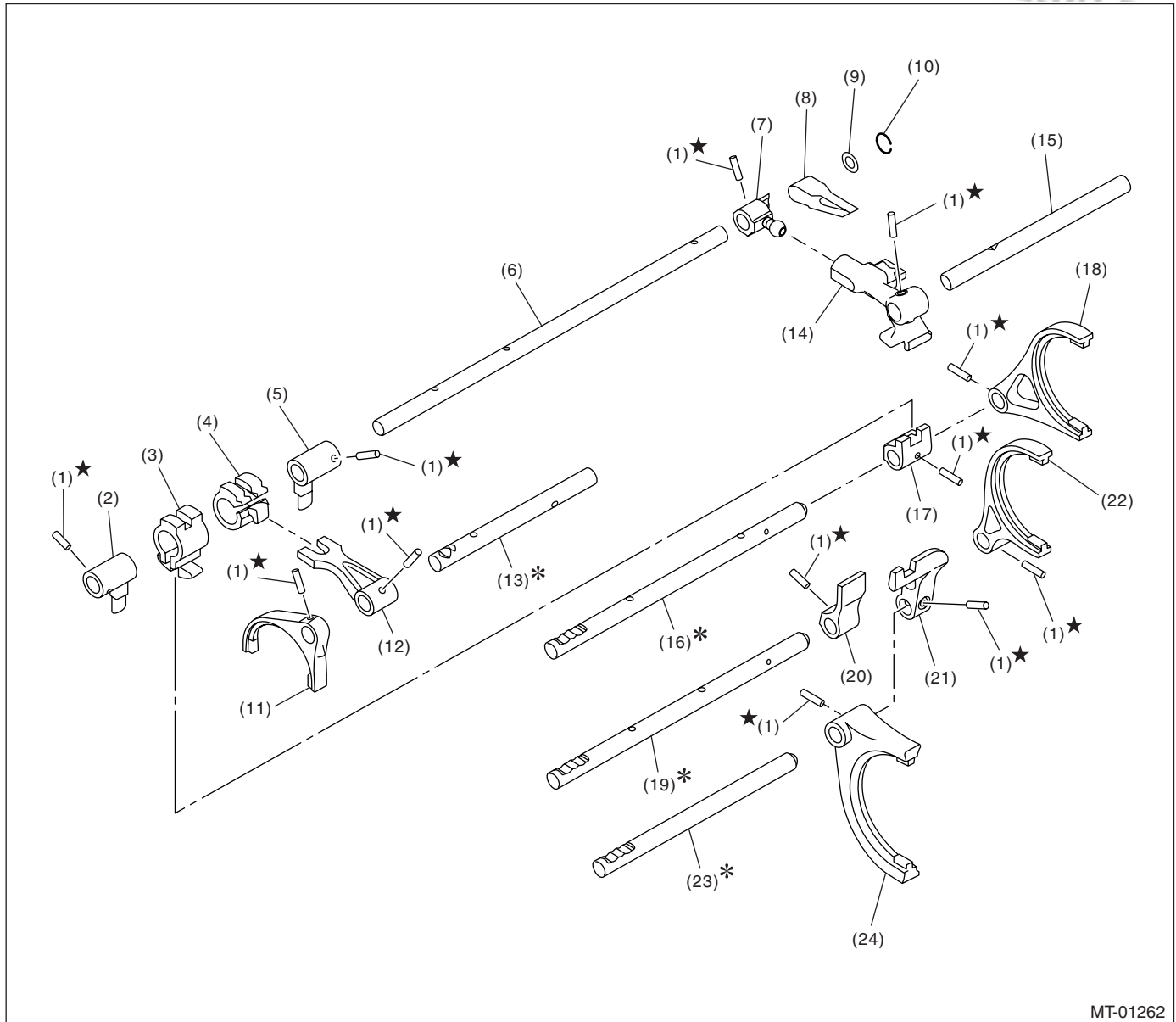
T2: 41 (4.2, 30.2)

T3: 48 (4.9, 35.4)

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6. SHIFTER FORK AND FORK ROD



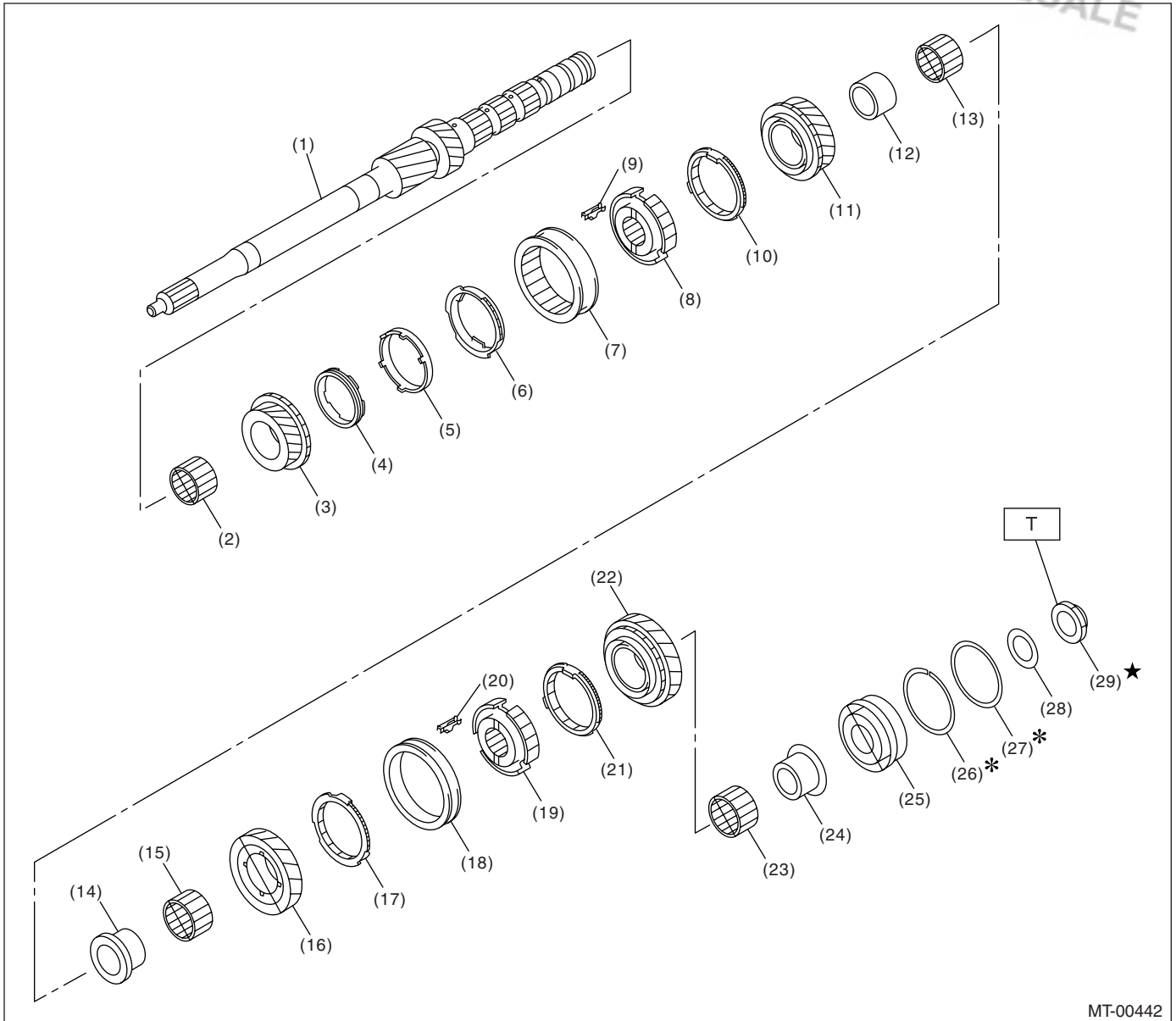
MT-01262

- | | | |
|-----------------------------|--------------------------|--------------------------|
| (1) Spring pin | (9) Washer | (17) 5th-6th shifter arm |
| (2) Interlock arm | (10) Snap ring | (18) 5th-6th fork COMPL |
| (3) Interlock block | (11) Reverse fork COMPL | (19) 3rd-4th fork rod |
| (4) Reverse interlock block | (12) Reverse shifter arm | (20) 3rd-4th shifter arm |
| (5) Interlock arm | (13) Reverse fork rod | (21) 1st-2nd shifter arm |
| (6) Striking rod | (14) Selector arm | (22) 3rd-4th fork COMPL |
| (7) Selector arm No. 2 | (15) Shifter arm shaft | (23) 1st-2nd fork rod |
| (8) Neutral set spring | (16) 5th-6th fork rod | (24) 1st-2nd fork COMPL |

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7. MAIN SHAFT ASSEMBLY



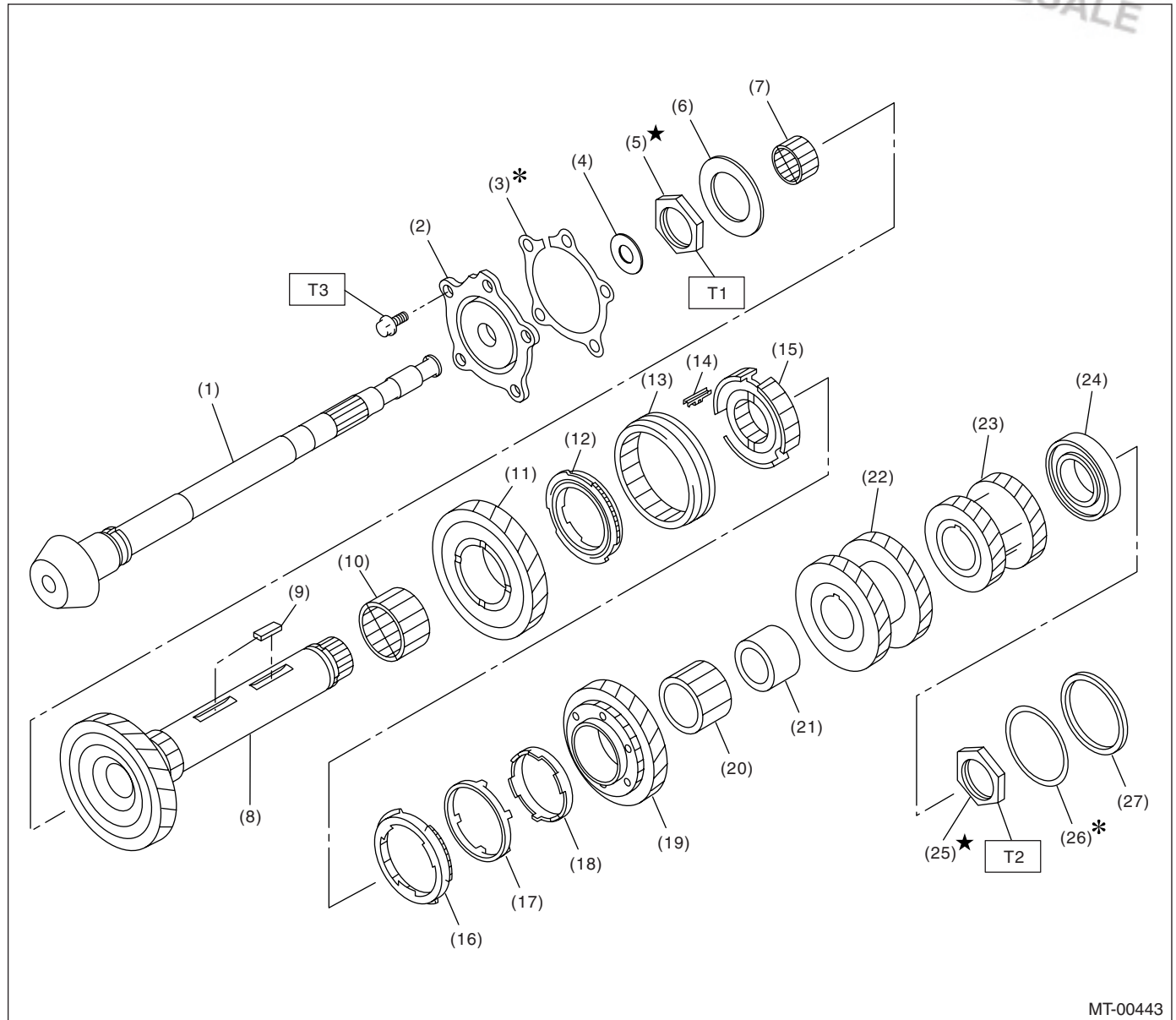
- | | | |
|-------------------------|--------------------------|---------------------------|
| (1) Main shaft | (12) 4th bushing | (23) Needle bearing |
| (2) Needle bearing | (13) Needle bearing | (24) 6th bushing |
| (3) 3rd drive gear | (14) 5th bushing | (25) Taper roller bearing |
| (4) Inner baulk ring | (15) Needle bearing | (26) Snap ring |
| (5) Synchro cone | (16) 5th drive gear | (27) Washer |
| (6) Outer baulk ring | (17) 5th baulk ring | (28) Washer |
| (7) 3rd-4th sleeve | (18) 5th-6th sleeve | (29) Lock nut |
| (8) 3rd-4th hub | (19) 5th-6th hub | |
| (9) Shifting insert key | (20) Shifting insert key | |
| (10) 4th baulk ring | (21) 6th baulk ring | |
| (11) 4th gear | (22) 6th drive gear | |

Tightening torque: N-m (kgf-m, ft-lb)
T: 392 (40.0, 289)

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8. DRIVE PINION AND DRIVEN SHAFT ASSEMBLY



MT-00443

- | | |
|----------------------------|--------------------------|
| (1) Drive pinion shaft | (13) 1st-2nd sleeve |
| (2) Taper roller bearing | (14) Shifting insert key |
| (3) Shim | (15) 1st-2nd hub |
| (4) Washer | (16) Outer baulk ring |
| (5) Lock nut | (17) Synchro cone |
| (6) Thrust bearing | (18) Inner baulk ring |
| (7) Needle bearing | (19) 2nd driven gear |
| (8) Driven shaft | (20) Needle bearing |
| (9) Key | (21) 2nd bushing |
| (10) Needle bearing | (22) 3rd-4th driven gear |
| (11) 1st driven gear | (23) 5th-6th driven gear |
| (12) 1st synchro ring ASSY | (24) Ball bearing |

- | |
|---------------|
| (25) Lock nut |
| (26) Shim |
| (27) Collar |

Tightening torque: N·m (kgf-m, ft-lb)

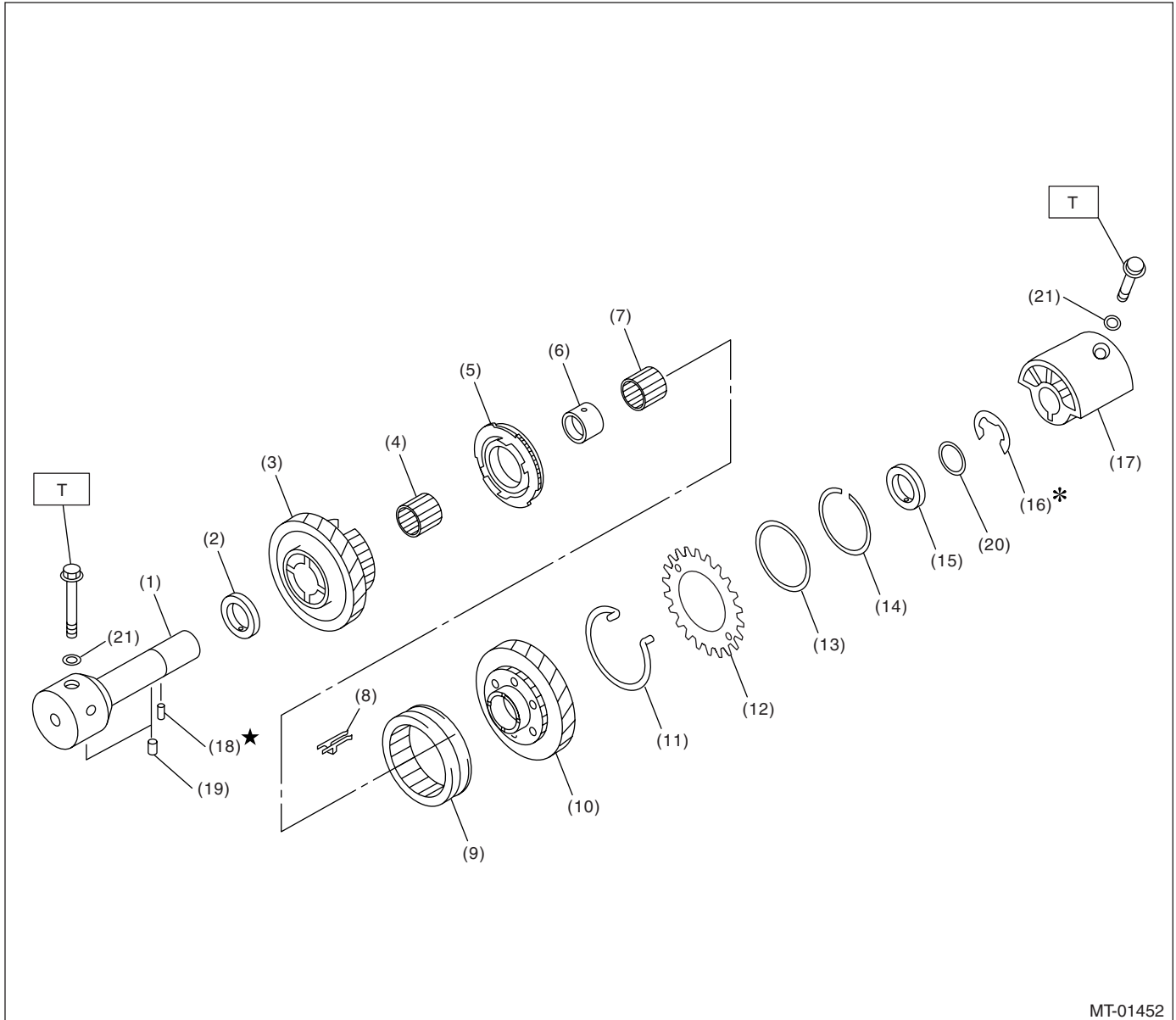
T1: 285 (29.1, 210)
* 265 (27.0, 195)

T2: 570 (58.1, 420)
* 530 (54.0, 391)

T3: 54 (5.5, 39.8)

* Tightening torque when using ST.

9. REVERSE IDLER GEAR ASSEMBLY



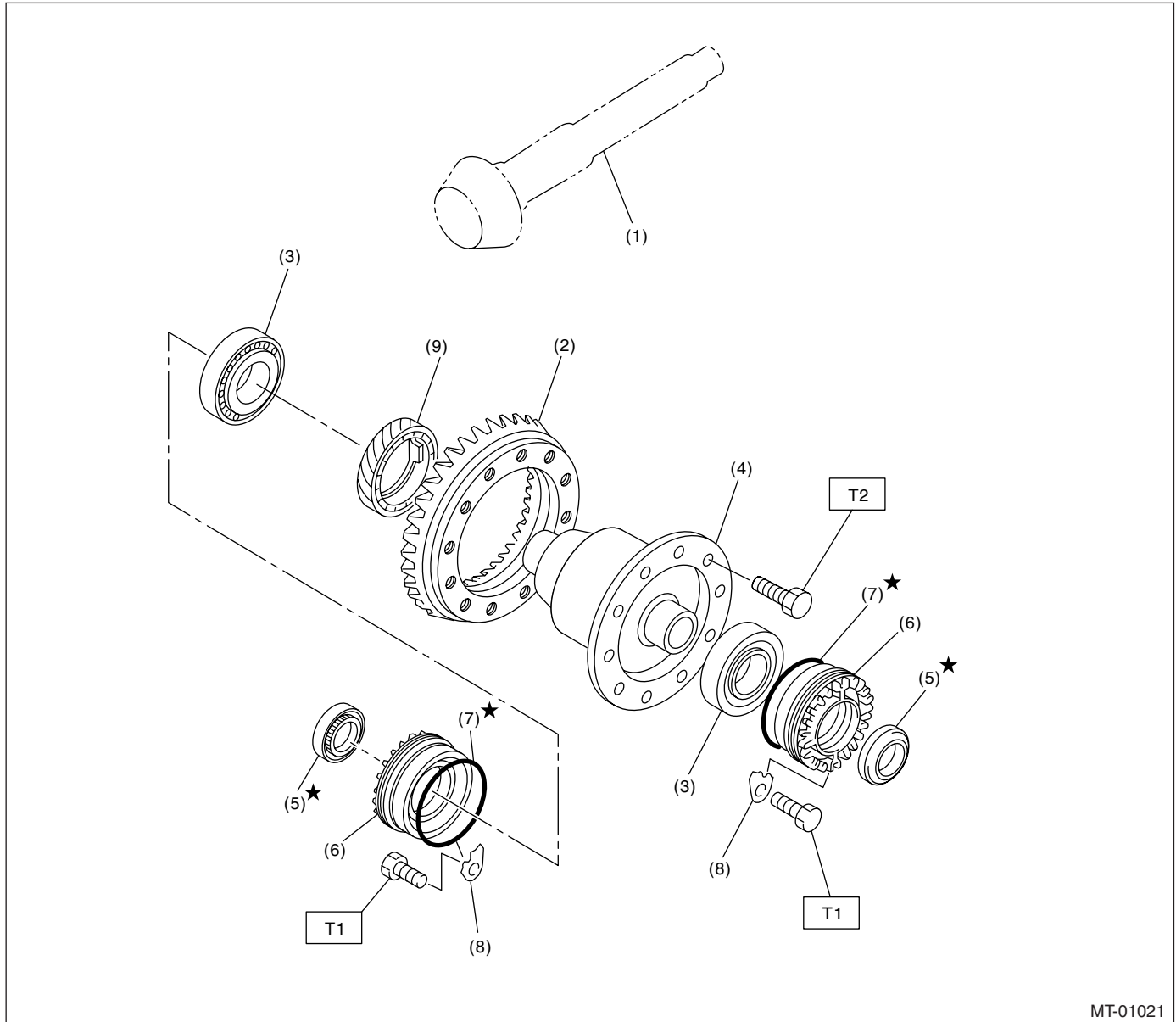
- | | | |
|--------------------------------|-----------------------------|---------------------------|
| (1) Base | (9) Reverse coupling sleeve | (17) Reverse idler holder |
| (2) Washer | (10) Reverse idler gear | (18) Spring pin |
| (3) Reverse idler gear No. 2 | (11) Spring | (19) Knock pin |
| (4) Needle bearing | (12) Sub gear | (20) Washer |
| (5) Reverse idler synchro set | (13) Friction plate | (21) Gasket |
| (6) Reverse idler gear bushing | (14) Snap ring | |
| (7) Needle bearing | (15) Washer | |
| (8) Shifting insert key | (16) Snap ring | |

Tightening torque: N·m (kgf·m, ft·lb)
T: 25 (2.5, 18.1)

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10.FRONT DIFFERENTIAL



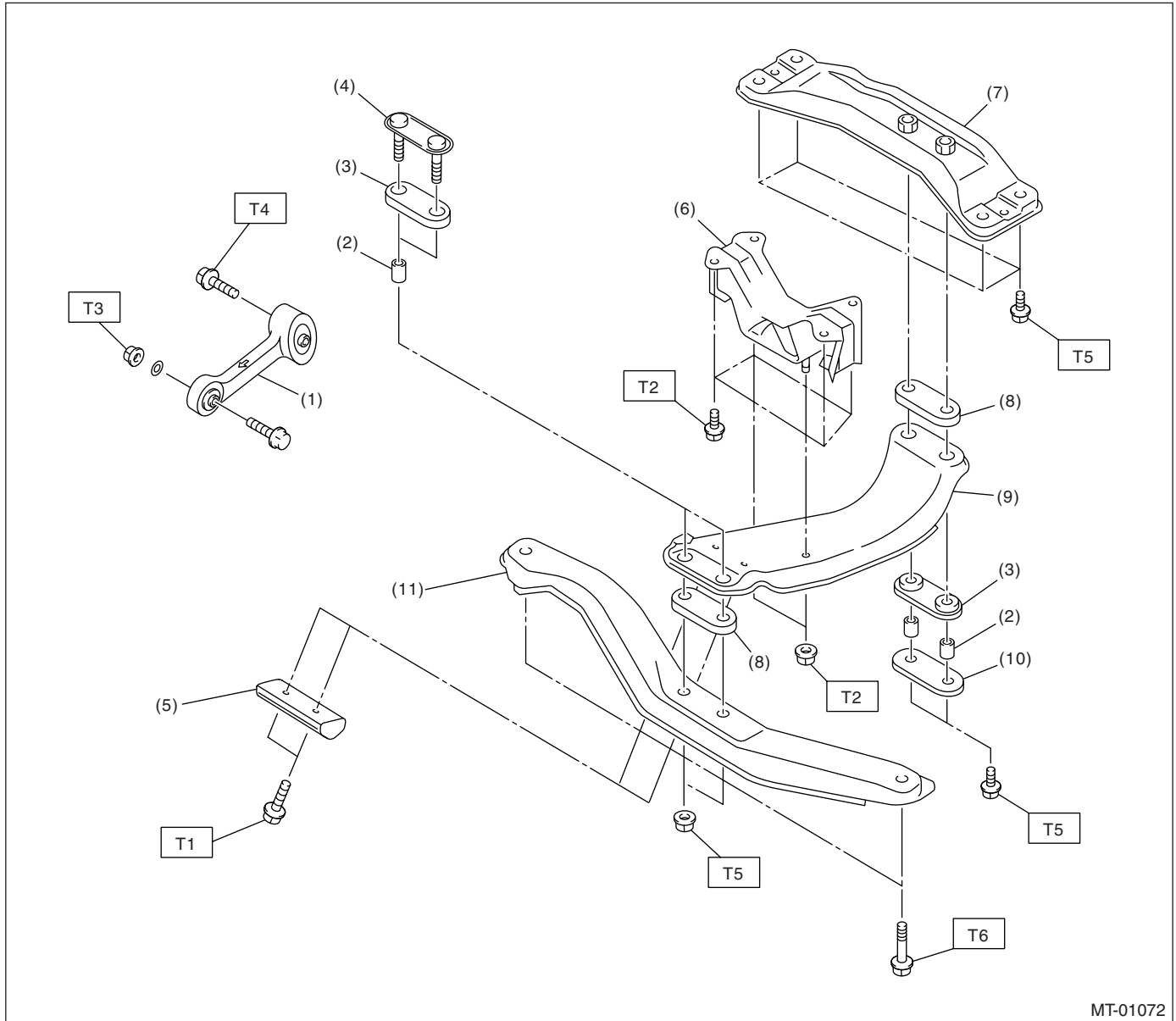
- | | |
|------------------------|--------------------------------|
| (1) Drive pinion shaft | (6) Differential side retainer |
| (2) Hypoid driven gear | (7) O-ring |
| (3) Roller bearing | (8) Retainer lock plate |
| (4) Differential ASSY | (9) Speedometer drive gear |
| (5) Oil seal | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 25 (2.5, 18.1)

T2: 69 (7.0, 50.9)

11.TRANSMISSION MOUNTING



MT-01072

- | | |
|-------------------------|------------------------|
| (1) Pitching stopper | (7) Rear crossmember |
| (2) Spacer | (8) Cushion D |
| (3) Cushion C | (9) Center crossmember |
| (4) Front plate | (10) Rear plate |
| (5) Dynamic damper | (11) Front crossmember |
| (6) Rear cushion rubber | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7.5 (0.76, 5.5)

T2: 35 (3.6, 25.8)

T3: 50 (5.1, 36.9)

T4: 58 (5.9, 42.8)

T5: 70 (7.1, 51.6)

T6: 140 (14.3, 103)

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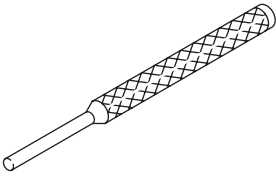
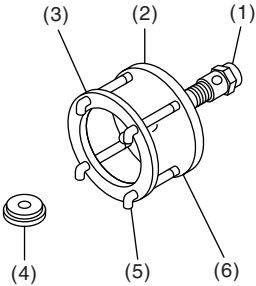
C: CAUTION

- Wear work clothing, including a cap, protective goggles and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation, and 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.
- When disassembling the case and other light alloy parts, use a plastic hammer to force it apart. Do not pry it apart with a screwdriver or other tool.
- Be careful not to burn yourself, because each part on the vehicle is hot after running.
- Use SUBARU genuine gear oil, grease etc. or the equivalent. Do not mix gear oil, grease etc. with that of another grade or from other 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 revolution surfaces before installation.
- Replace deformed or otherwise damaged snap rings with new ones.
- Before installing O-rings or oil seals, apply sufficient amount of gear oil to avoid damage and deformation.
- Be careful not to incorrectly install or fail to install O-rings, snap rings and other such parts.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate or shop cloth between the part and the vise.
- Avoid damaging the mating surface of the case.
- Before applying sealant, completely remove the old seal.

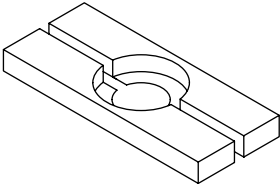
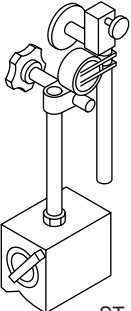
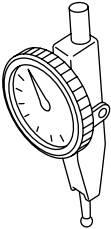
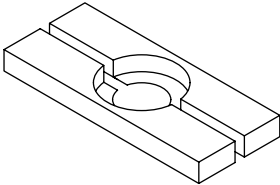
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-398791700</p>	398791700	REMOVER	Used for removing and installing spring pin (6 mm).
 <p>ST-399527700</p>	399527700	PULLER SET	Used for removing and installing roller bearing (Differential). (1) BOLT (2) PULLER (3) HOLDER (4) ADAPTER (5) BOLT (6) NUT

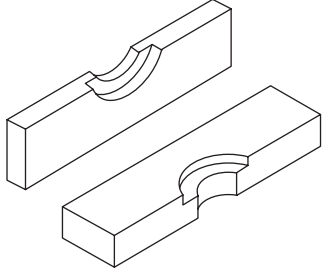
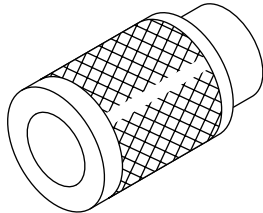
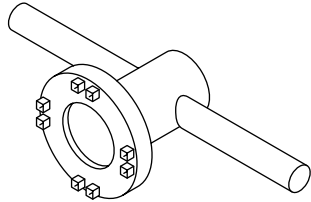
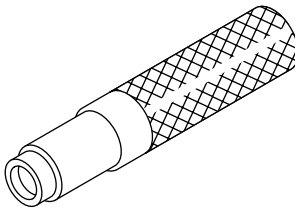
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498515700</p>	498515700	REMOVER	Used for removing roller bearing of drive pinion shaft.
 <p>ST-498247001</p>	498247001	MAGNET BASE	<ul style="list-style-type: none"> Used for measuring backlash between side gear and pinion, and hypoid gear. Used with DIAL GAUGE (498247100).
 <p>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 with MAGNET BASE (498247001).
 <p>ST-498077000</p>	498077000	REMOVER	Used for removing differential taper roller bearing.

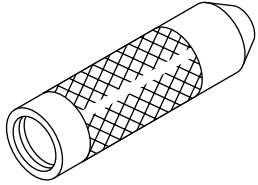
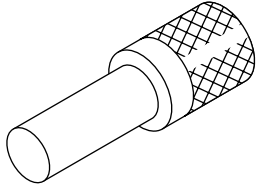
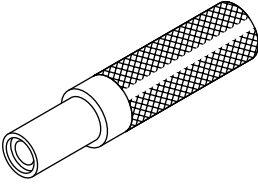
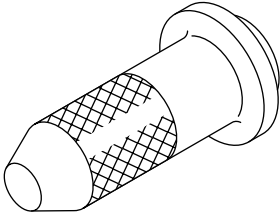
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-899858600</p>	899858600	REMOVER	Used for removing roller bearing.
 <p>ST-499757002</p>	499757002	INSTALLER	Used for installing bearing cone of transfer driven gear (extension core side).
 <p>ST-499787000</p>	499787000	WRENCH ASSY	Used for removing and installing differential side retainer RH.
 <p>ST-499827000</p>	499827000	PRESS	Used for installing speedometer oil seal when installing speedometer cable to transmission.

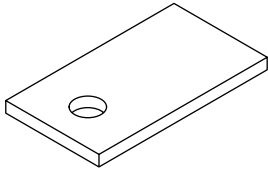
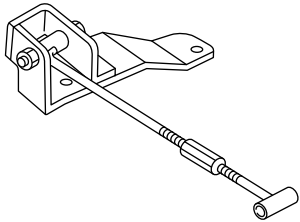
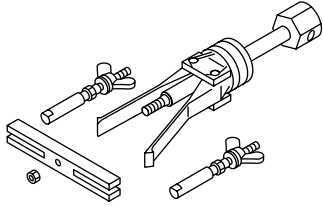
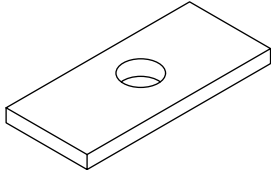
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499877000	499877000	RACE 4-5 INSTALLER	Used for disassembling driven shaft and transfer driven gear.
 ST-899864100	899864100	REMOVER	Used for removing parts on transmission main shaft and drive pinion.
 ST-899824100	899824100	PRESS	Used for installing speedometer shaft oil seal.
 ST-498057300	498057300	INSTALLER	Used for installing extension oil seal.

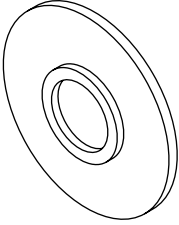
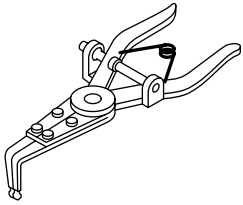
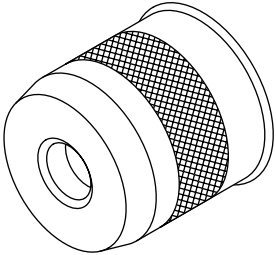
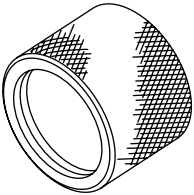
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498255400</p>	498255400	PLATE	Used for measuring backlash.
 <p>ST41099AC000</p>	41099AC000	ENGINE SUPPORT	Used for supporting engine.
 <p>ST-398527700</p>	398527700	PULLER ASSY	Used for removing extension case oil seal and clutch housing oil seal.
 <p>ST-499575500</p>	499575500	GAUGE	Used for measuring total end play, extension end play and drive pinion height.

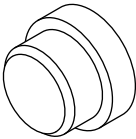
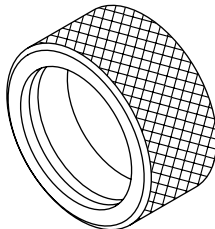
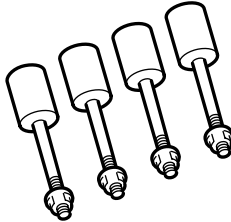

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398177700	398177700	INSTALLER	Used for assembling main shaft.
 ST-399893600	399893600	PLIERS	<ul style="list-style-type: none"> Used for removing and installing neutral set spring. Used with CLAW (18756AA000).
 ST-499247400	499247400	INSTALLER	Used for installing transfer drive gear ball bearing.
 ST18675AA000	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing differential side retainer oil seal.

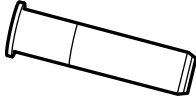
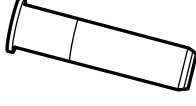
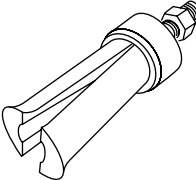
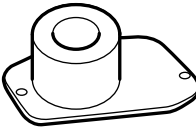
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-398497701</p>	398497701	SEAT	Used for installing transfer drive gear ball bearing.
 <p>ST-398437700</p>	398437700	INSTALLER	Used for installing front differential side bearing.
 <p>ST18632AA000</p>	18632AA000	STAND ASSY	Used for disassembling and assembling transmission.
 <p>ST18671AA000</p>	18671AA000	OIL SEAL GUIDE	<ul style="list-style-type: none"> • Used for installing oil seal to reverse check. • Used with INSTALLER (18657AA010).

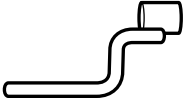
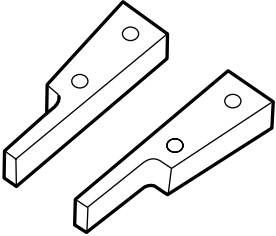
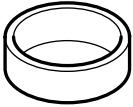

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18657AA010</p>	18657AA010	INSTALLER	<ul style="list-style-type: none"> Used for installing oil seal to reverse check. Used with OIL SEAL GUIDE (18671AA000).
 <p>ST18657AA000</p>	18657AA000	INSTALLER	Used for installing oil seal to shift rod.
 <p>ST18758AA000</p>	18758AA000	PULLER	Used for removing extension taper roller bearing outer race.
 <p>ST18831AA000</p>	18831AA000	GAUGE	Used for measuring extension taper roller bearing.

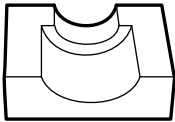
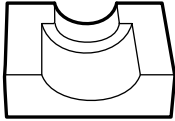
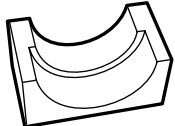
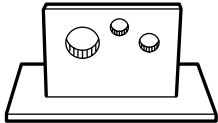
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18631AA000</p>	18631AA000	HANDLE	Used for measuring front differential backlash.
 <p>ST18756AA000</p>	18756AA000	CLAW	<ul style="list-style-type: none"> Used for installing and removing neutral set spring. Used with PLIERS (399893600).
 <p>ST18754AA000</p>	18754AA000	REMOVER	Used for removing each parts of driven gear.
 <p>ST18757AA000</p>	18757AA000	STRAIGHT PIN REMOVER	Used for installing reverse idler gear.


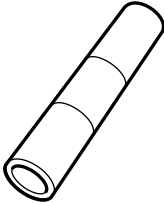
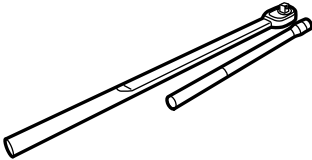

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18665AA000</p>	18665AA000	HOLDER	<ul style="list-style-type: none"> Used for installing and removing main shaft lock nut. Used with BASE (18664AA000).
 <p>ST18666AA000</p>	18666AA000	HOLDER	<ul style="list-style-type: none"> Used for installing and removing driven shaft lock nut. Used with BASE (18664AA000).
 <p>ST18667AA000</p>	18667AA000	HOLDER	<ul style="list-style-type: none"> Used for installing and removing drive pinion shaft lock nut. Used with BASE (18664AA000).
 <p>ST18664AA000</p>	18664AA000	BASE	<ul style="list-style-type: none"> Used for installing and removing main shaft lock nut. Used for installing and removing drive pinion shaft lock nut. Used for installing and removing driven shaft lock nut.



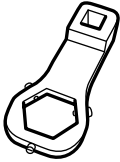
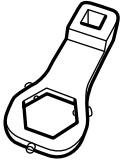
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18722AA010	18722AA010	REMOVER	Used for disassembling main shaft.
 ST18651AA000	18651AA000	INSTALLER	Used for assembling main shaft.
 ST18852AA000	18852AA000	TORQUE WRENCH	<ul style="list-style-type: none"> • Used for tightening main shaft lock nut. • Used for tightening drive pinion shaft lock nut. • Used for tightening driven shaft lock nut.
 ST18668AA000	18668AA000	PUNCH	Used for caulking main shaft lock nut.

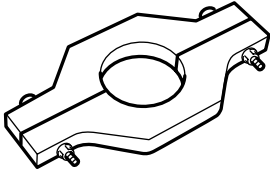
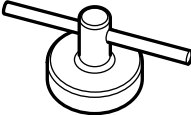
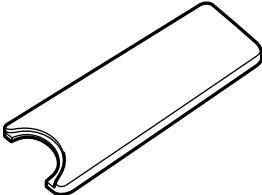
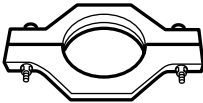
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18669AA000</p>	18669AA000	PUNCH	Used for caulking driven shaft lock nut.
 <p>ST18670AA000</p>	18670AA000	PUNCH	Used for caulking drive pinion shaft lock nut.
 <p>ST18620AA000</p>	18620AA000	ADAPTER WRENCH	Used for installing and removing driven gear shaft lock nut.
 <p>ST18621AA000</p>	18621AA000	ADAPTER WRENCH	Used for installing and removing drive pinion shaft lock nut.

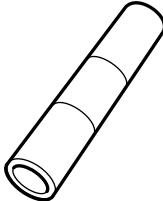
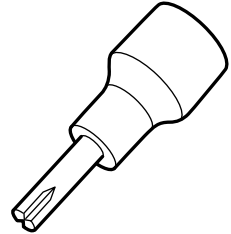
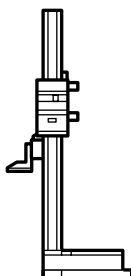
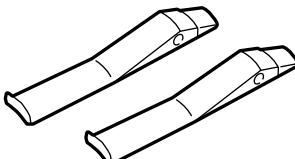
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18723AA000</p>	18723AA000	REMOVER	Used for disassembling the driven shaft.
 <p>ST18630AA000</p>	18630AA000	WRENCH ASSY	Used for removing and installing differential side retainer (left side).
 <p>ST18672AA000</p>	18672AA000	GUIDE CLIP	Used for installing reverse idler gear snap ring.
 <p>ST18720AA000</p>	18720AA000	REMOVER	Used for disassembling main shaft.

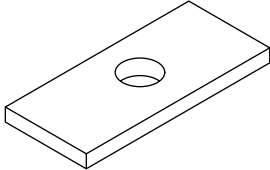
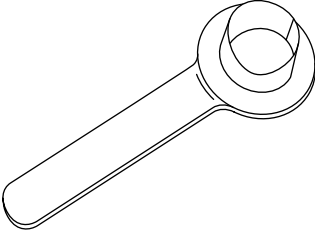
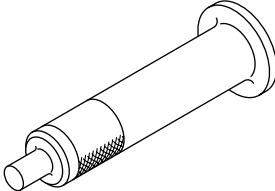
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18654AA000</p>	18654AA000	INSTALLER	Used for assembling driven shaft.
 <p>ST18663AA000</p>	18663AA000	SOCKET	Used for installing and removing oil pump cover.
 <p>ST18853AA000</p>	18853AA000	HEIGHT GAUGE	Used for selecting shift rod.
 <p>ST18760AA000</p>	18760AA000	CLAW	<ul style="list-style-type: none"> • Used for removing front side retainer bearing outer race. • Used with PULLER ASSY (398527700).

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398643600	398643600	GAUGE	Used for measuring drive pinion height.
 ST28399SA010	28399SA010	OIL SEAL PROTECTOR	Used for protecting oil seal when installing front drive shaft.
 ST18657AA020	18657AA020	OIL SEAL INSTALLER	Used for installing oil seal.

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and ampere.
Bar	Used for extracting drive shaft.

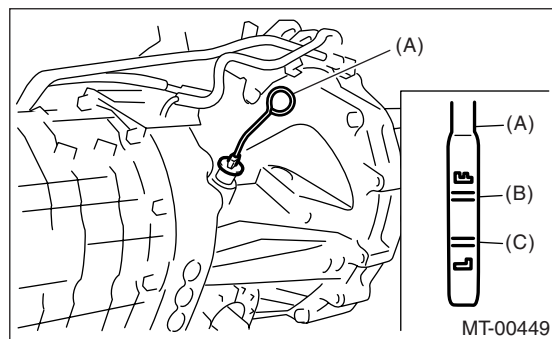
Transmission Gear Oil

MANUAL TRANSMISSION AND DIFFERENTIAL

2. Transmission Gear Oil

A: INSPECTION

- 1) Park the vehicle on a level surface.
- 2) Turn the ignition switch to OFF, and wait until the engine cools.
- 3) Remove the oil level gauge and wipe it clean.
- 4) Reinsert the level gauge all the way. Be sure that the level gauge is correctly inserted and in the proper direction.
- 5) Pull out the oil level gauge again and record the oil level. If it is below the lower level, add oil through the oil level gauge hole to bring the level up to the upper level.



- (A) Oil level gauge
(B) Upper level
(C) Lower level

B: REPLACEMENT

- 1) Pull out the oil level gauge.
- 2) Lift-up the vehicle.
- 3) Remove the transmission under cover.
- 4) Drain the transmission gear oil completely.

CAUTION:

Directly after the vehicle has been running or the engine has been long idle running, the transmission gear oil is hot. Be careful not to burn yourself.

NOTE:

- Tighten the transmission gear oil drain plug after draining transmission gear oil.
- Use a new gasket.

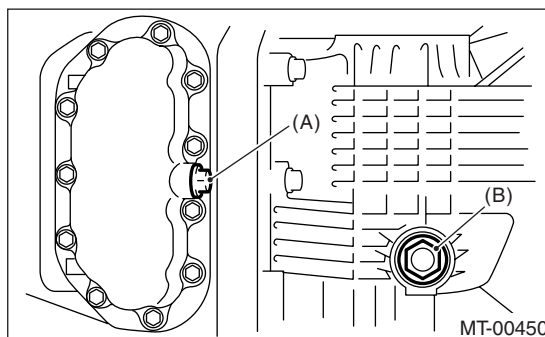
Tightening torque:

Oil pan side

44 N·m (4.5 kgf-m, 32.5 ft-lb)

Clutch housing side

70 N·m (7.1 kgf-m, 51.6 ft-lb)



- (A) Drain plug (Oil pan side)
(B) Drain plug (Clutch housing side)

- 5) Lower the vehicle.
- 6) Pour gear oil into the gauge hole.

Recommended gear oil:

Use GL-5 or equivalent.

Gear oil capacity:

4.1 ℓ (4.3 US qt, 3.6 Imp qt)

- 7) Check the level of the transmission gear oil.

NOTE:

- When inserting the level gauge into transmission gear, align the protrusion on the side of the top part of the level gauge with the notch in the gauge hole.
- The gear oil level should be within the specified range marked on the level gauge.

3. Oil Seal

A: INSPECTION

Inspect for oil leakage from the oil seal. Replace the oil seal if the lips is deformed, hardened, damaged, worn or defective if any.

B: REPLACEMENT

- 1) Clean the transmission exterior.
- 2) Drain the gear oil completely.

NOTE:

- Tighten the drain plug after draining gear oil.
- Use a new gasket.

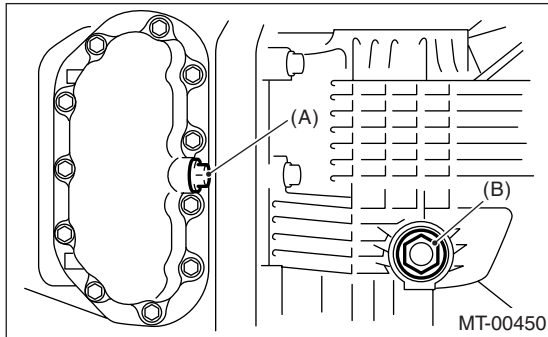
Tightening torque:

Oil pan side

44 N·m (4.5 kgf-m, 32.5 ft-lb)

Clutch housing side

70 N·m (7.1 kgf-m, 51.6 ft-lb)

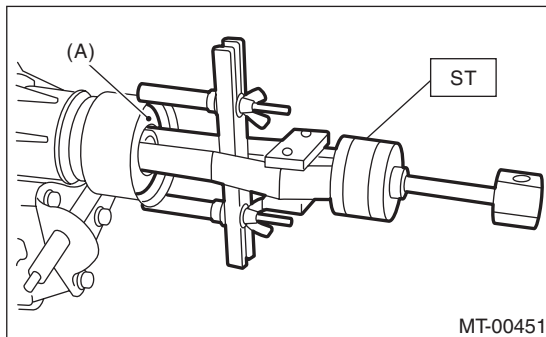


(A) Drain plug (Oil pan side)

(B) Drain plug (Clutch housing side)

- 3) Remove the rear exhaust pipe and muffler.
- 4) Remove the propeller shaft. <Ref. to DS-16, REMOVAL, Propeller Shaft.>
- 5) Using the ST, remove the oil seal.

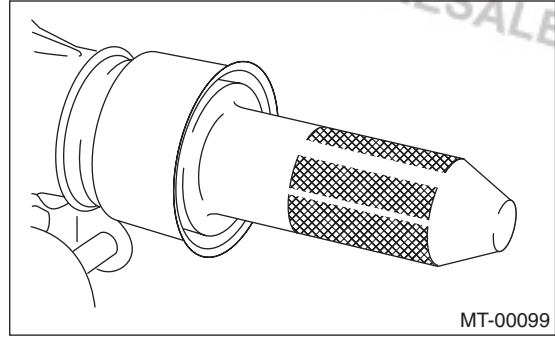
ST 398527700 PULLER ASSY



(A) Oil seal

- 6) Using the ST, install the oil seal.

ST 498057300 INSTALLER



- 7) Install the propeller shaft. <Ref. to DS-17, INSTALLATION, Propeller Shaft.>

- 8) Install the rear exhaust pipe and muffler.

- 9) Pour gear oil and check the oil level. <Ref. to 6MT-29, REPLACEMENT, Transmission Gear Oil.>

4. Differential Side Retainer Oil Seal

A: INSPECTION

Inspect for oil leakage from the differential side retainer oil seal. If there is oil leakage, perform the following procedure.

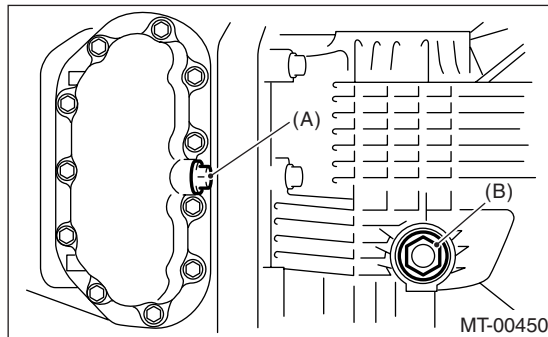
- Replace the oil seal.
- Check the front drive shaft.

B: REPLACEMENT

- 1) Lift-up the vehicle.
- 2) Remove the front and center exhaust pipes. <Ref. to EX(H4DOTC)-8, REMOVAL, Front Exhaust Pipe.>
- 3) Drain the gear oil from drain plug.

CAUTION:

- Directly after the vehicle has been running or the engine has been long idle running, the differential gear oil is hot. Be careful not to burn yourself.
- Be careful not to spill the differential gear oil on exhaust pipe to prevent it from emitting smoke or fire. When the differential gear oil is spilled on exhaust pipe, wipe it away completely.



- (A) Drain plug (Oil pan side)
(B) Drain plug (Clutch housing side)

- 4) Tighten the drain plug.

NOTE:

Use a new gasket.

Tightening torque:

Oil pan side

44 N·m (4.5 kgf-m, 32.5 ft-lb)

Clutch housing side

70 N·m (7.1 kgf-m, 51.6 ft-lb)

- 5) Separate the front drive shaft from transmission. <Ref. to DS-33, REMOVAL, Front Drive Shaft.>
- 6) Remove the differential side retainer oil seal using driver wrapped with vinyl tape or etc.
- 7) Using the ST, install the differential side retainer by slightly tapping with hammer.

ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER

- 8) Apply gear oil to the oil seal lips.

- 9) Set ST to side retainer.

ST 28399SA010 OIL SEAL PROTECTOR

- 10) Install the front drive shaft into transmission.

NOTE:

Replace the circlip of drive shaft with a new one.

- 11) Install the front drive shaft into transmission, remove the ST and insert the drive shaft securely.

ST 28399SA010 OIL SEAL PROTECTOR

- 12) Install the front and center exhaust pipes. <Ref. to EX(H4DOTC)-8, INSTALLATION, Front Exhaust Pipe.>

- 13) Lower the vehicle.

- 14) Pour gear oil through the oil level gauge hole.

Recommended gear oil:

<Ref. to 6MT-2, TRANSMISSION GEAR OIL, SPECIFICATION, General Description.>

Gear oil capacity:

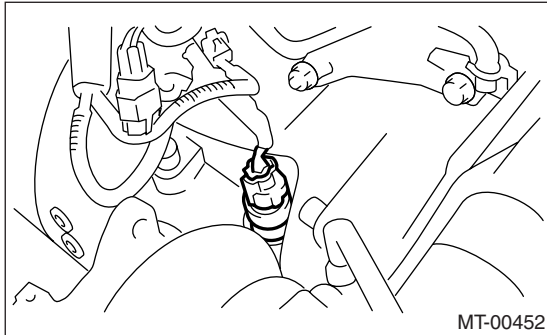
4.1 ℓ (4.3 US qt, 3.6 Imp qt)

- 15) Check the level of the gear oil. <Ref. to 6MT-29, INSPECTION, Transmission Gear Oil.>

5. Vehicle Speed Sensor

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the intercooler. <Ref. to IN(H4DOTC)-11, REMOVAL, Intercooler.>
- 3) Disconnect the vehicle speed sensor connector.



- 4) Remove the vehicle speed sensor.

B: INSTALLATION

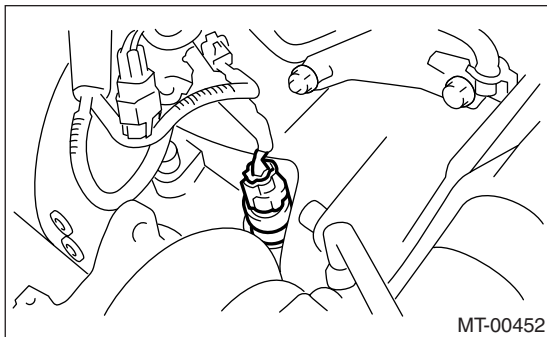
- 1) Align the tip end of vehicle speed sensor key with key groove on the end of speedometer driven gear shaft, and then install it.

Tightening torque:

5.9 N·m (0.6 kgf-m, 4.4 ft-lb)

NOTE:

- Ensure the sensor mounting hole is clean and free of foreign matter.
- Discard the vehicle speed sensor after removal, and replace it with a new one.



- 2) Connect the connector to vehicle speed sensor.
- 3) Install the intercooler. <Ref. to IN(H4DOTC)-11, INSTALLATION, Intercooler.>

C: INSPECTION

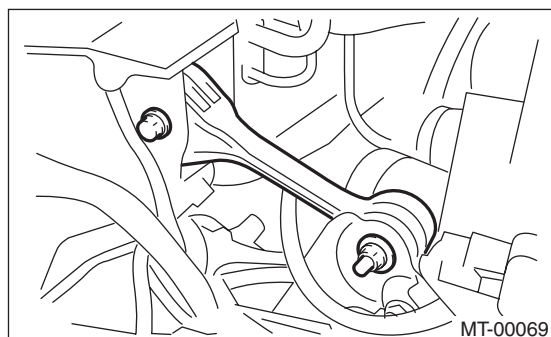
Inspect that the speedometer is normally operated, because vehicle speed sensor cannot be inspected as a single part. If it is not normally operated, inspect the combination meter system. <Ref. to IDI-3, INSPECTION, Combination Meter System.>

6. Transmission Mounting System

A: REMOVAL

1. PITCHING STOPPER

- 1) Disconnect the ground cable from battery.
- 2) Remove the intercooler. <Ref. to IN(H4DOTC)-11, REMOVAL, Intercooler.>
- 3) Remove the pitching stopper.



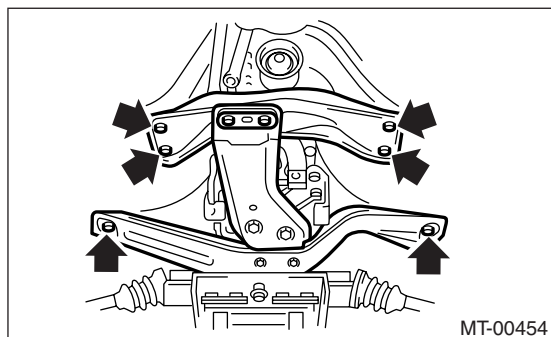
2. CROSSMEMBER AND CUSHION RUBBER

- 1) Disconnect the ground cable from battery.
- 2) Lift-up the vehicle.
- 3) Remove the center exhaust pipe. <Ref. to EX(H4DOTC)-10, REMOVAL, Center Exhaust Pipe.>
- 4) Remove the rear exhaust pipe and muffler.
- 5) Set the transmission jack under the transmission body.

CAUTION:

Always support the transmission case with a transmission jack.

- 6) Remove the rear crossmember.



- 7) Remove the rear cushion rubber.

B: INSTALLATION

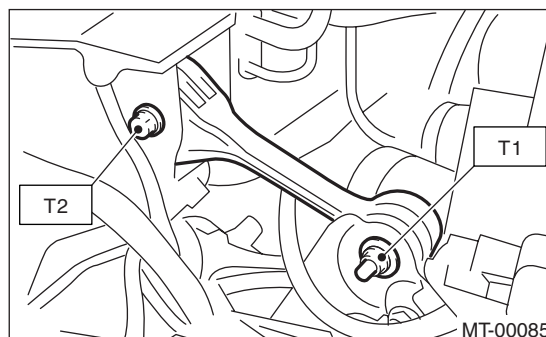
1. PITCHING STOPPER

- 1) Install the pitching stopper.

Tightening torque:

T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)

T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)



- 2) Install the intercooler. <Ref. to IN(H4DOTC)-11, INSTALLATION, Intercooler.>
- 3) Connect the battery ground cable to battery.

2. CROSSMEMBER AND CUSHION RUBBER

- 1) Install the rear cushion rubber.

Tightening torque:

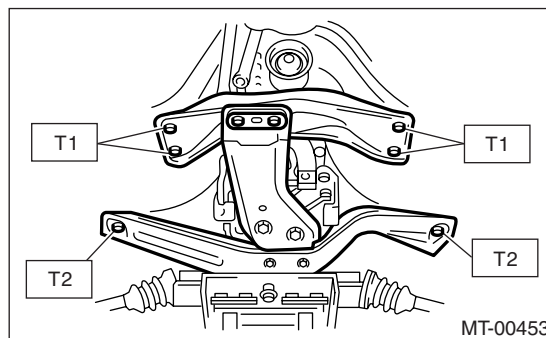
35 N·m (3.6 kgf-m, 25.8 ft-lb)

- 2) Install the crossmember.

Tightening torque:

T1: 70 N·m (7.1 kgf-m, 51.6 ft-lb)

T2: 140 N·m (14.3 kgf-m, 103 ft-lb)



- 3) Remove the transmission jack.
- 4) Install the center exhaust pipe. <Ref. to EX(H4DOTC)-11, INSTALLATION, Center Exhaust Pipe.>
- 5) Install the rear exhaust pipe and muffler. <Ref. to EX(H4DOTC)-15, INSTALLATION, Rear Exhaust Pipe.> <Ref. to EX(H4DOTC)-16, INSTALLATION, Muffler.>

Transmission Mounting System

MANUAL TRANSMISSION AND DIFFERENTIAL

C: INSPECTION

Repair or replace parts if the results of the inspection below are not satisfactory.

1. PITCHING STOPPER

Make sure that the pitching stopper is not bent or damaged. Make sure that the rubber is not stiff, cracked, or otherwise damaged.

2. CROSSMEMBER AND CUSHION RUBBER

Make sure that the crossmember is not bent or damaged. Make sure that the cushion rubber is not stiff, cracked, or otherwise damaged.

7. Manual Transmission Assembly

A: REMOVAL

1) Set the vehicle on a lift, and then open the front hood and support it with hood stay.

NOTE:

Set the hood stay to its specified hole.

2) Remove the front wheel.

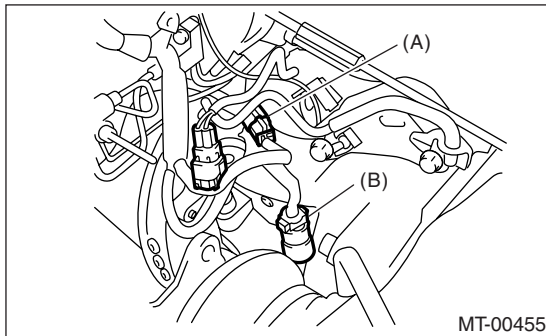
3) Disconnect the ground cable from battery.

4) Remove the intercooler assembly. <Ref. to IN(H4DOTC)-11, REMOVAL, Intercooler.>

5) Lift-up the vehicle, and then remove the under cover.

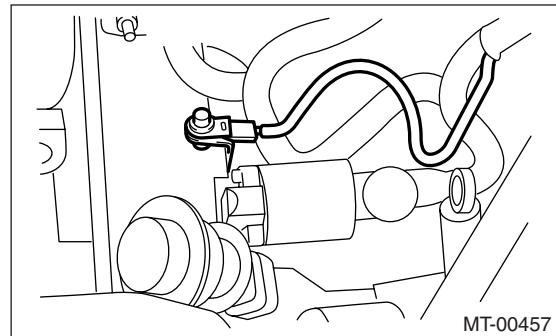
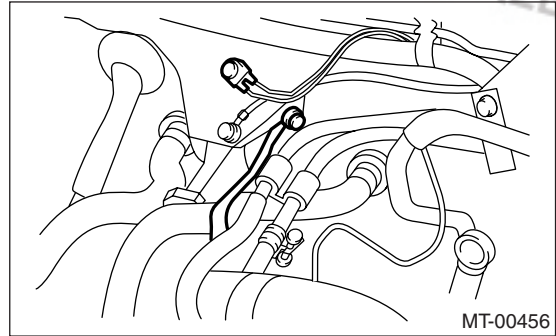
6) Remove the steering universal joint. <Ref. to PS-21, REMOVAL, Universal Joint.>

7) Lower the vehicle and disconnect the connector located on upper side of transmission.



- (A) Transmission connector
- (B) Vehicle speed sensor connector

8) Disconnect the ground cable at upper side of transmission case and body.

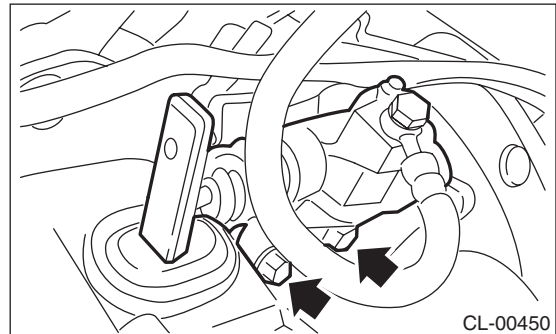


9) Remove the starter assembly. <Ref. to SC(H4SO)-8, REMOVAL, Starter.>

10) Remove the operating cylinder.

NOTE:

Hang the removed operating cylinder with a wire, etc.



11) Remove the clutch release shaft.

(1) Remove the plug with hexagon wrench.

(2) Install a 6 mm bolt to the release shaft, then pull out the release shaft.

(3) Lift up the release fork, and then remove it from the release bearing claw. Pull it to the engine side and set it free.

12) Remove the throttle body. <Ref. to FU(STI)-12, REMOVAL, Throttle Body.>

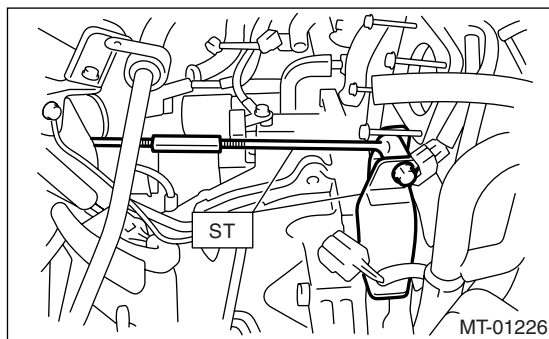
13) Remove the pitching stopper, and then remove the pitching stopper bracket.

Manual Transmission Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

14) Set the ST.

ST 41099AC000 ENGINE SUPPORT

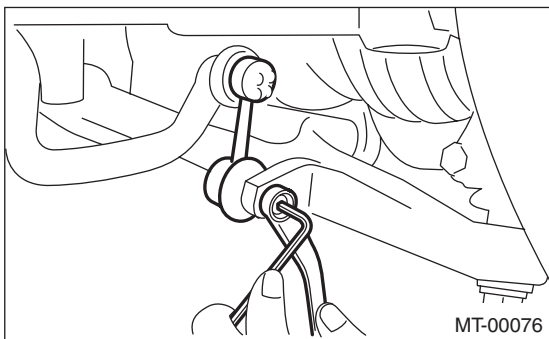


15) Remove the center and rear exhaust pipe and muffler. <Ref. to EX(H4DOTC)-10, REMOVAL, Center Exhaust Pipe.>, <Ref. to EX(H4DOTC)-15, REMOVAL, Rear Exhaust Pipe.>, <Ref. to EX(H4DOTC)-16, REMOVAL, Muffler.>

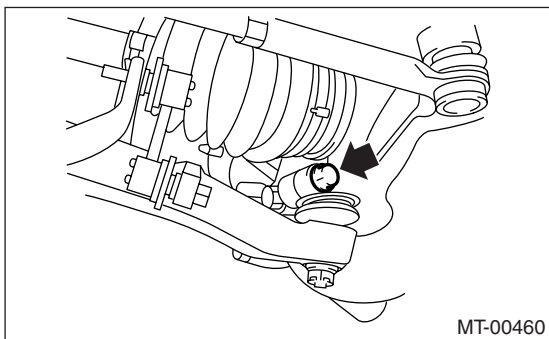
16) Drain the transmission gear oil. <Ref. to 6MT-29, Transmission Gear Oil.>

17) Remove the propeller shaft. <Ref. to DS-16, REMOVAL, Propeller Shaft.>

18) Remove the front stabilizer bolt.



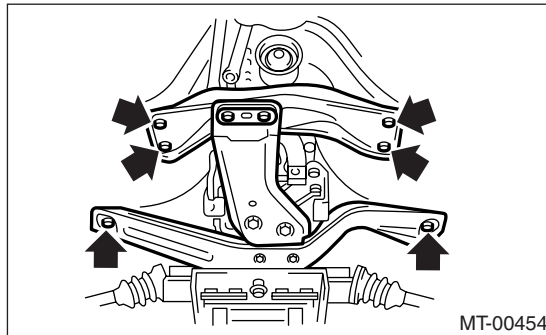
19) Remove the ball joint of transverse link from housing.



20) Remove the front drive shaft. <Ref. to DS-33, REMOVAL, Front Drive Shaft.>

21) Remove the front drive shaft, then take the front drive shaft.

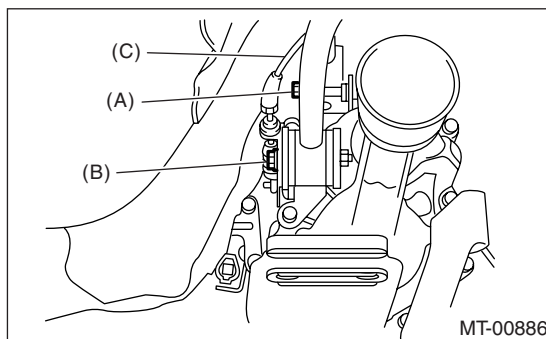
22) Set the transmission jack under the transmission, then remove the front crossmember and rear crossmember.



23) Move the transmission to right side, then remove the joint COMPL, stay bolt and reverse check cable.

NOTE:

If the transmission is not moved, the joint COMPL and stay bolt will contact body and damage may occur.



(A) Joint COMPL bolt

(B) Stay bolt

(C) Reverse check cable

24) Remove the fixing bolt of engine and transmission, then remove the transmission from vehicle.

NOTE:

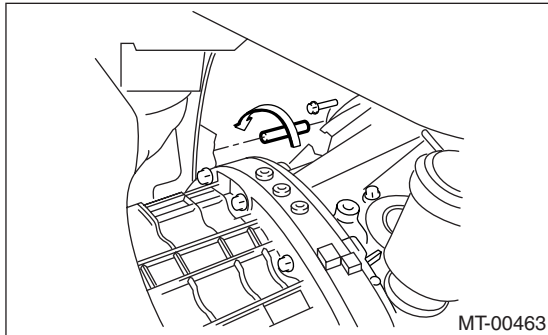
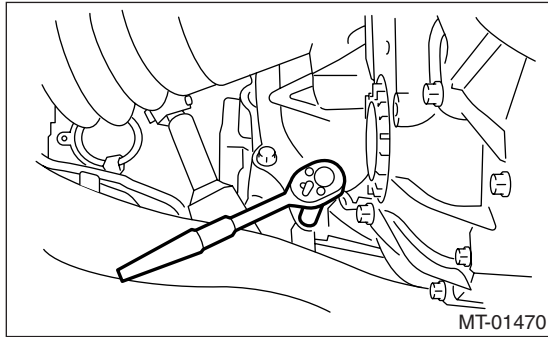
- Rotate the turn buckle of ST (ENGINE SUPPORT ASSY) and lower the rear side of engine to facilitate removal.

- Take care not to contact the transmission with body when pulling backward to remove.

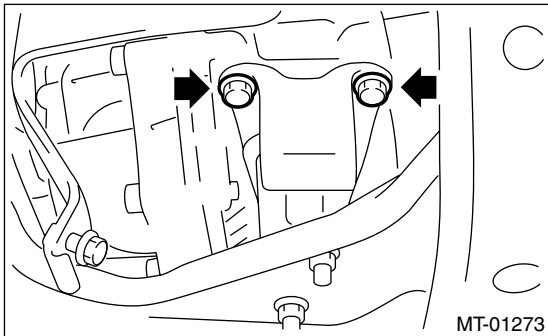
Manual Transmission Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

- Remove the clutch pipe and breather pipe carefully which may interfere each other.



25) Remove the crossmember from transmission.

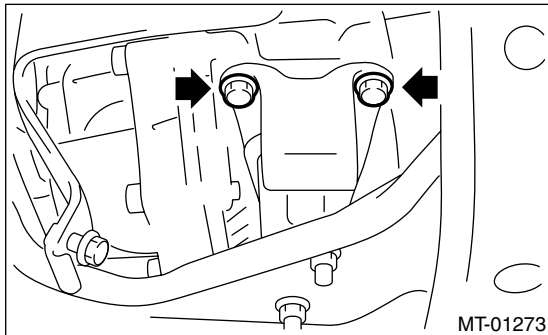


B: INSTALLATION

- 1) Set the release fork, release bearing and release shaft to transmission. <Ref. to CL-18, INSTALLATION, Release Bearing and Lever.>
- 2) Install the crossmember to transmission.

Tightening torque:

35 N·m (3.6 kgf-m, 25.8 ft-lb)



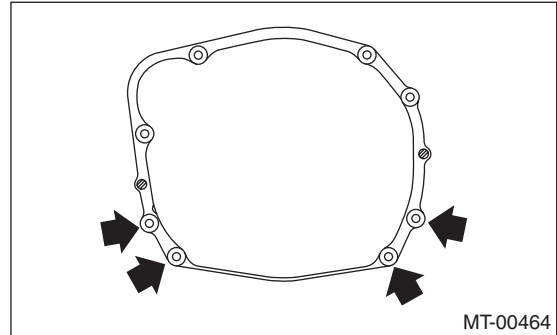
3) Install the transmission.

NOTE:

- Make sure the main shaft spline part is inserted completely.
- Make sure the rear side of engine is lowered.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

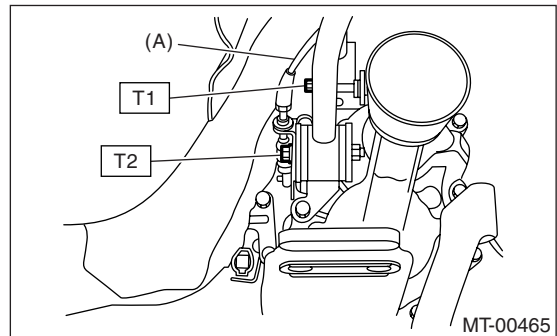


4) Move the transmission to the right side, then install the joint COMPL bolt, stay bolt and reverse check cable.

Tightening torque:

T1: 11.8 N·m (1.2 kgf-m, 8.7 ft-lb)

T2: 32 N·m (3.3 kgf-m, 23.6 ft-lb)



(A) Reverse check cable

5) Install the front crossmember and rear crossmember.

NOTE:

Rotate the turn buckle of ST (ENGINE SUPPORT ASSY) and lift up the rear side of engine to facilitate installation.

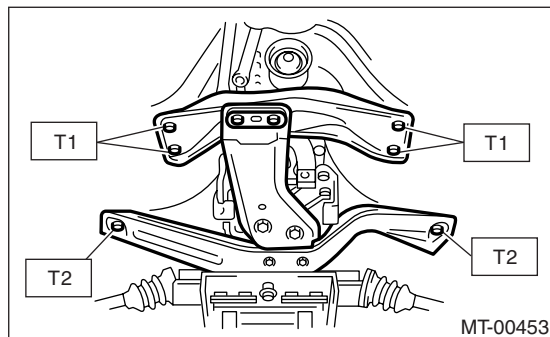
Manual Transmission Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

Tightening torque:

T1: 70 N·m (7.1 kgf-m, 51.6 ft-lb)

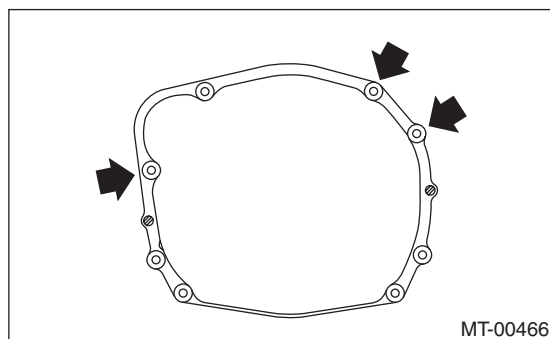
T2: 140 N·m (14.3 kgf-m, 103 ft-lb)



6) Lower the vehicle and install the fixing bolt.

Tightening torque:

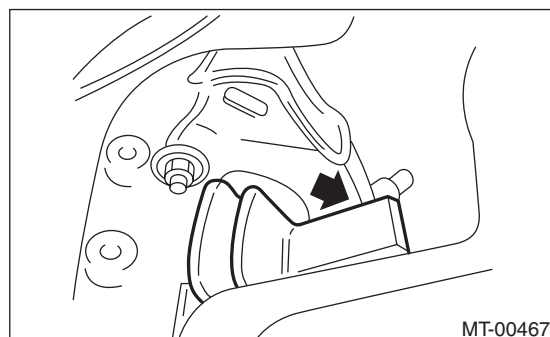
50 N·m (5.1 kgf-m, 36.9 ft-lb)



7) Make sure the release bearing is installed completely.

NOTE:

- Push the release fork to operating cylinder side until you hear a “click” sound. Pull the release fork to engine side. Setting is completed if the release fork does not contact the case.
- Make sure the boot cover is firmly set.



8) Install the pitching stopper bracket.

Tightening torque:

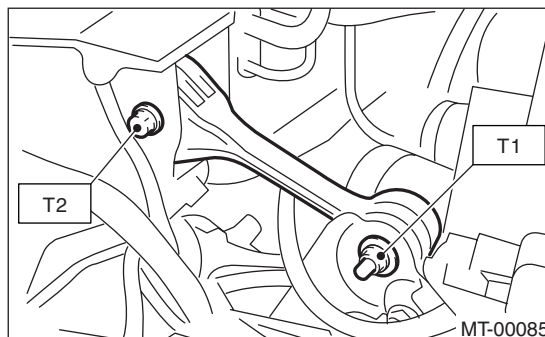
41 N·m (4.2 kgf-m, 30.2 ft-lb)

9) Install the pitching stopper.

Tightening torque:

T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)

T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)



10) Install the throttle body. <Ref. to FU(STI)-12, INSTALLATION, Throttle Body.>

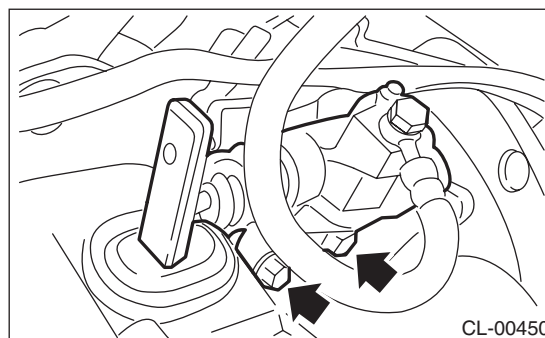
11) Install the operating cylinder.

Tightening torque:

41 N·m (4.2 kgf-m, 30.2 ft-lb)

NOTE:

Check that the clutch hose is routed properly.

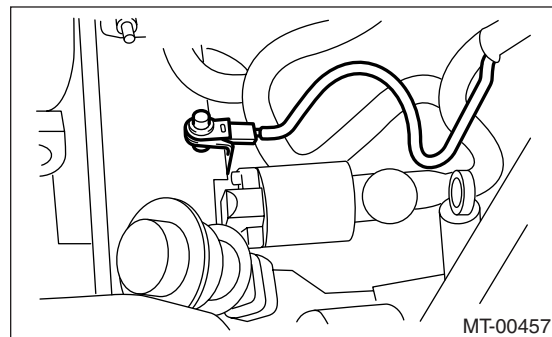
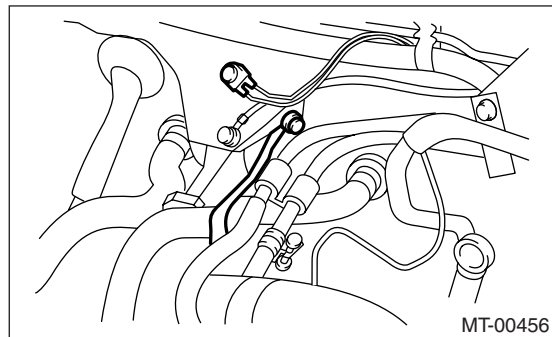


12) Install the starter assembly.

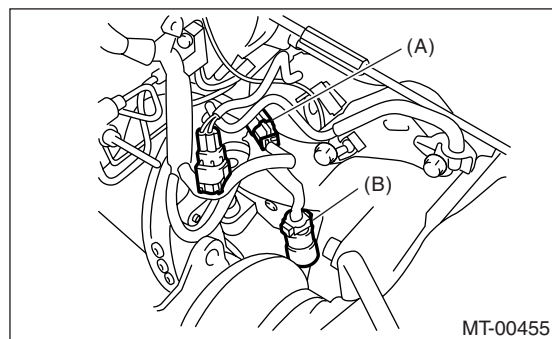
Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

13) Install the transmission and body ground cable.



14) Connect the connector located on the upper side of transmission.



- (A) Transmission connector
(B) Vehicle speed sensor connector

15) Replace the front differential side retainer oil seal.

- (1) Remove the oil seal by using flat tip screwdriver and etc.
- (2) Fit a new oil seal using ST.

ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER

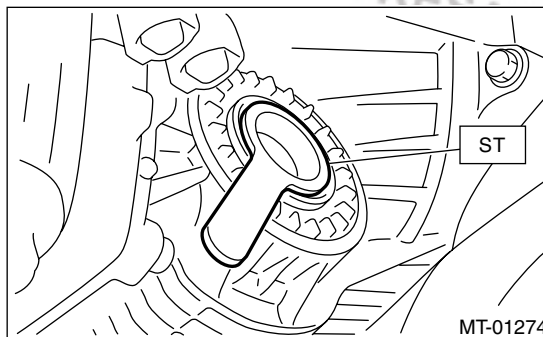
NOTE:

- Apply oil to the oil seal lips.
- Always replace the differential side oil seal after extracting front drive shaft from the transmission.

16) Apply grease to the oil seal lips.

17) Set the ST to the differential side retainer.

ST 28399SA010 OIL SEAL PROTECTOR



18) Install the front drive shaft into transmission.

NOTE:

Replace the circlip of drive shaft with a new one.

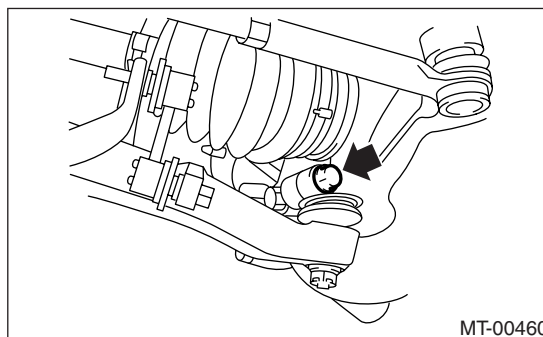
19) Install the front drive shaft into transmission, remove the ST and insert the drive shaft securely.

ST 28399SA010 OIL SEAL PROTECTOR

20) Install the ball joint of transverse link to housing.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)



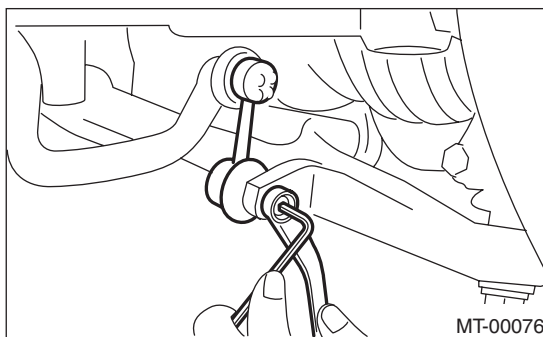
21) Install the stabilizer nut.

Tightening torque:

45 N·m (4.6 kgf-m, 33.2 ft-lb)

NOTE:

Use a new self-locking nut.



22) Install the propeller shaft. <Ref. to DS-17, INSTALLATION, Propeller Shaft.>

23) Install the center exhaust pipe. <Ref. to EX(H4DOTC)-11, INSTALLATION, Center Exhaust Pipe.>

Manual Transmission Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

- 24) Install the rear exhaust pipe and muffler. <Ref. to EX(H4DOTC)-15, INSTALLATION, Rear Exhaust Pipe.>, <Ref. to EX(H4DOTC)-16, INSTALLATION, Muffler.>
- 25) Install the universal joint. <Ref. to PS-21, INSTALLATION, Universal Joint.>
- 26) Install the under cover.
- 27) Install the intercooler assembly. <Ref. to IN(H4DOTC)-11, INSTALLATION, Intercooler.>
- 28) Connect the battery ground cable to battery.

8. Preparation for Overhaul

A: PROCEDURE

- 1) Clean oil, grease, dirt and dust from transmission.
- 2) Remove the drain plug to drain oil. After draining, retighten it as before.

NOTE:

Replace the gasket with a new one.

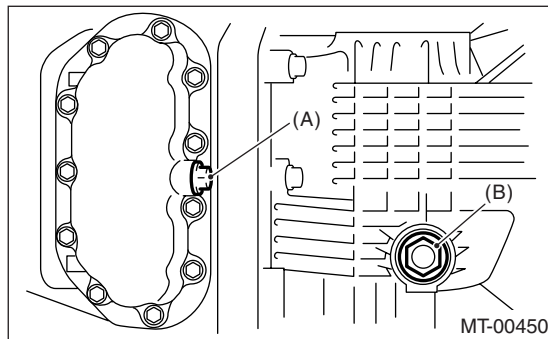
Tightening torque:

Oil pan side

44 N·m (4.5 kgf-m, 32.5 ft-lb)

Clutch housing side

70 N·m (7.1 kgf-m, 51.6 ft-lb)

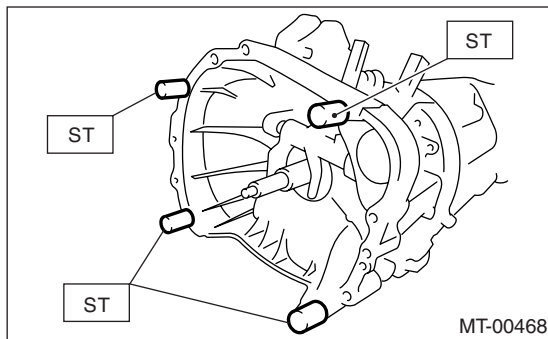


(A) Drain plug (Oil pan side)

(B) Drain plug (Clutch housing side)

- 3) Attach the transmission to ST.

ST 18632AA000 STAND ASSY

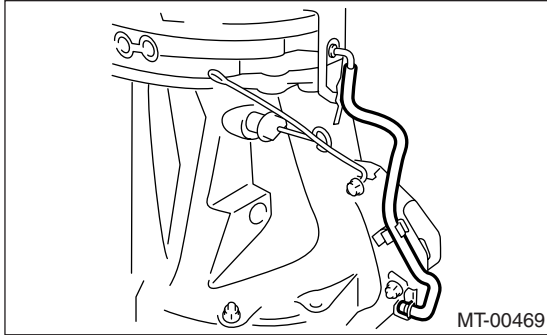


- 4) Rotating parts should be coated with oil prior to assembly.
- 5) All disassembled parts, if to be reused, should be reinstalled in the original positions and directions.
- 6) Gaskets, lock washers and lock nut must be replaced with new ones.
- 7) Liquid gasket should be used where specified to prevent leakage.

9. Air Breather Hose

A: REMOVAL

Disconnect the air breather hose.

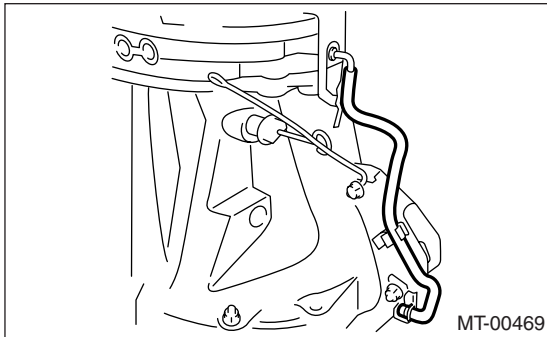


B: INSTALLATION

Install the air breather hose.

NOTE:

Install so that the hose is not folded over, excessively bent or twisted.



C: INSPECTION

Make sure the hose is not cracked or clogged.

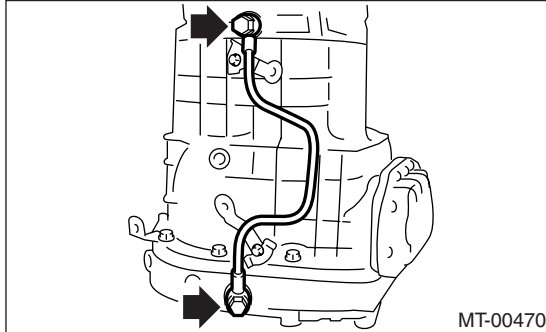
10.Oil Pipe

A: REMOVAL

Remove the oil pipe.

NOTE:

Use a new gasket.



B: INSTALLATION

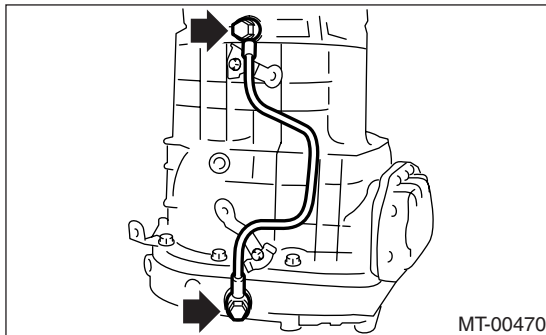
Install in the reverse order of removal.

NOTE:

Use a new gasket.

Tightening torque:

32 N·m (3.3 kgf-m, 23.6 ft-lb)



C: INSPECTION

- 1) Make sure there is no damage on pipe. If there is damage, replace the pipe.
- 2) Check the joint parts of pipe for oil leakage. If there is oil leakage, replace the gasket.

Back-up Light Switch

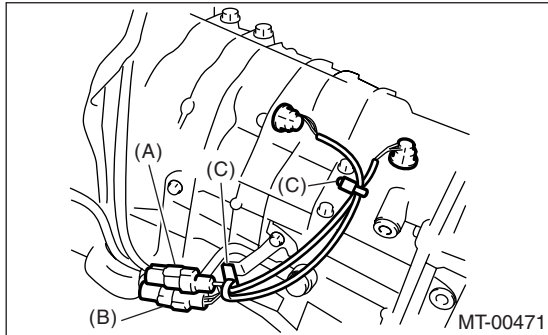
MANUAL TRANSMISSION AND DIFFERENTIAL

11. Back-up Light Switch

A: REMOVAL

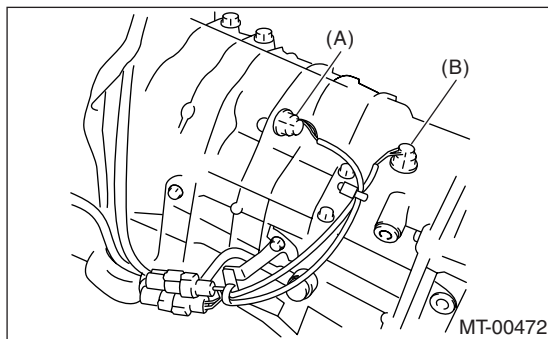
1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>

2) Disconnect the back-up light switch connector.



- (A) Back-up light switch connector (White)
- (B) Neutral position switch connector (Black)
- (C) Clip

3) Remove the back-up light switch.



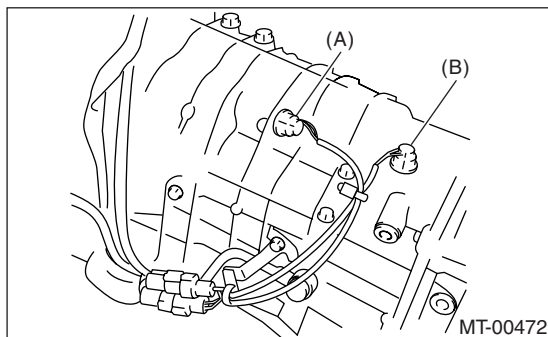
- (A) Back-up light switch
- (B) Neutral position switch

B: INSTALLATION

1) Install the back-up light switch.

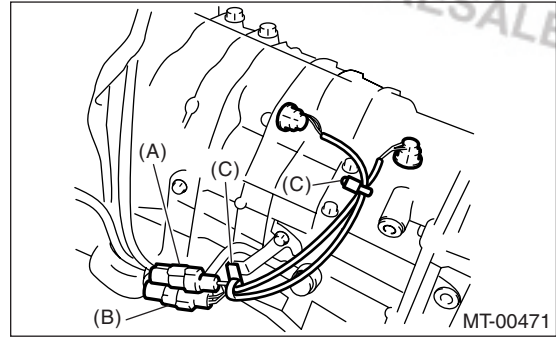
Tightening torque:

32 N·m (3.3 kgf-m, 23.6 ft-lb)



- (A) Back-up light switch
- (B) Neutral position switch

2) Connect the back-up light switch connector.



- (A) Back-up light switch connector (White)
- (B) Neutral position switch connector (Black)
- (C) Clip

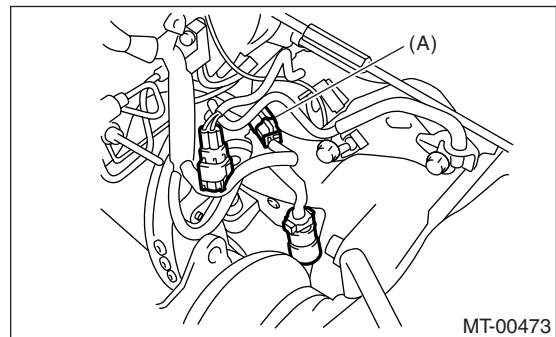
3) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

1) Disconnect the ground cable from battery.

2) Remove the intercooler. <Ref. to IN(H4DOTC)-11, REMOVAL, Intercooler.>

3) Disconnect the transmission harness and chassis harness.



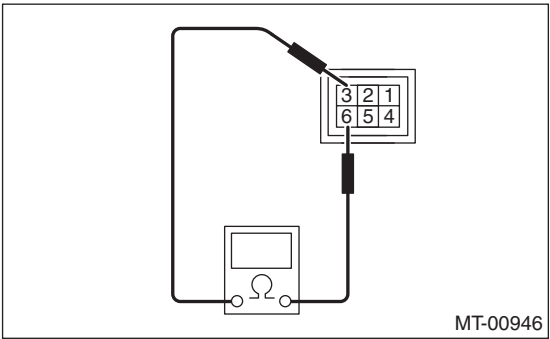
- (A) Transmission connector

4) Measure the resistance between back-up light switch terminals. If it is not within specifications, replace the back-up light switch.

Back-up Light Switch

MANUAL TRANSMISSION AND DIFFERENTIAL

Gear shift position	Terminal No.	Specified resistance
Back-up position	3 and 6	Less than 1 Ω
Other positions		More than 1 M Ω



Neutral Position Switch

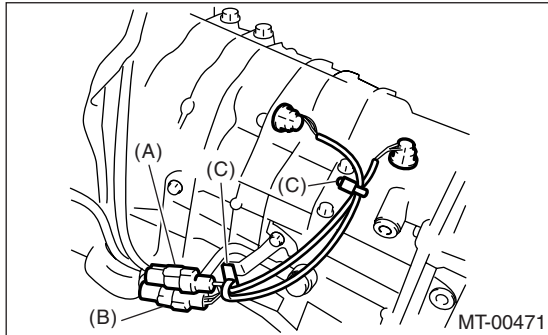
MANUAL TRANSMISSION AND DIFFERENTIAL

12. Neutral Position Switch

A: REMOVAL

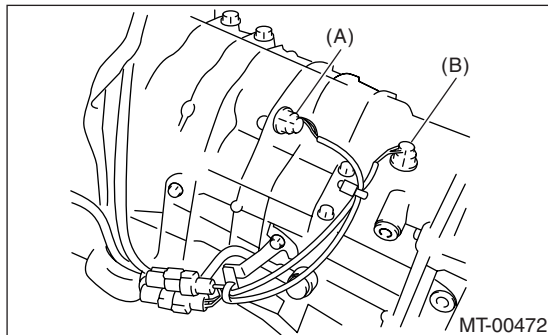
1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>

2) Disconnect the neutral position switch connector and clip.



- (A) Back-up light switch connector (White)
- (B) Neutral position switch connector (Black)
- (C) Clip

3) Remove the neutral position switch.



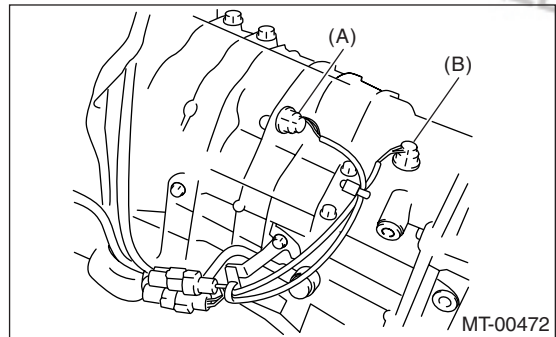
- (A) Back-up light switch
- (B) Neutral position switch

B: INSTALLATION

1) Install the neutral position switch.

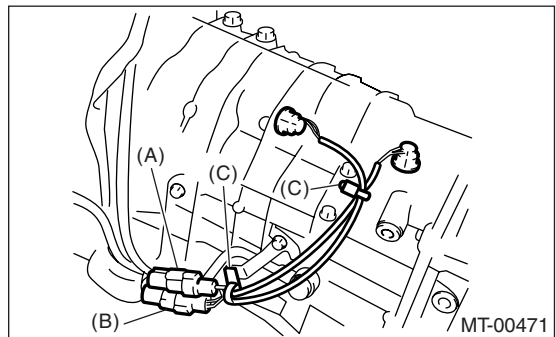
Tightening torque:

32 N·m (3.3 kgf-m, 23.6 ft-lb)



- (A) Back-up light switch
- (B) Neutral position switch

2) Connect the neutral position switch connector and clip.



- (A) Back-up light switch connector (White)
- (B) Neutral position switch connector (Black)
- (C) Clip

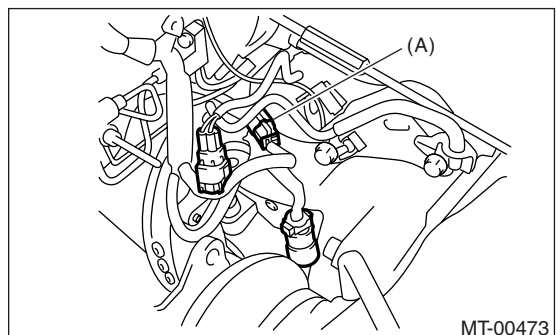
3) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

1) Disconnect the ground cable from battery.

2) Remove the intercooler. <Ref. to IN(H4DOTC)-11, REMOVAL, Intercooler.>

3) Disconnect the transmission harness and chassis harness.



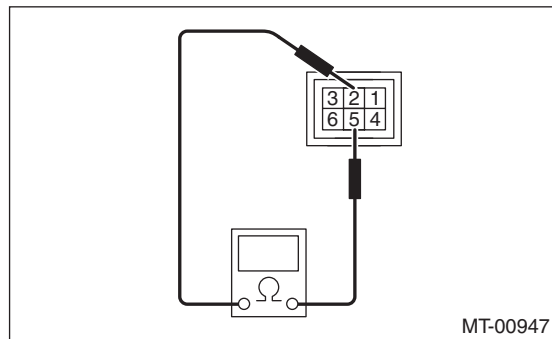
- (A) Transmission connector

Neutral Position Switch

MANUAL TRANSMISSION AND DIFFERENTIAL

4) Measure the resistance between neutral position switch terminals. If it is not within specifications, replace the neutral position switch.

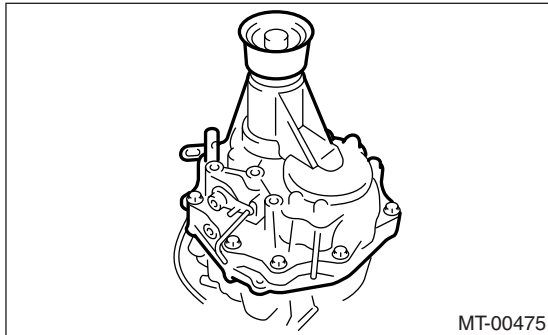
Gear shift position	Terminal No.	Specified resistance
Neutral position	2 and 5	Less than 1 Ω
Other positions		More than 1 M Ω



13.Extension Case

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the extension case.



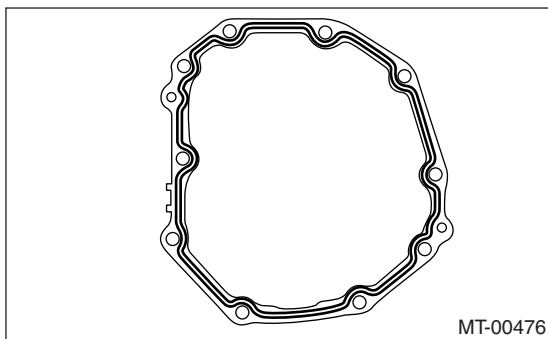
- 4) Completely remove the remaining liquid gasket from the extension case and transmission case.

B: INSTALLATION

- 1) Select the transfer driven gear thrust washer, and then install it to extension case. <Ref. to 6MT-50, ADJUSTMENT, Extension Case.>
- 2) Apply oil lightly to the outer periphery of bearing cone, and then install it to extension case.
- 3) Select the thrust washer of transfer drive gear, and then install it to center differential.
- 4) Apply liquid gasket to the transmission case.

Liquid gasket:

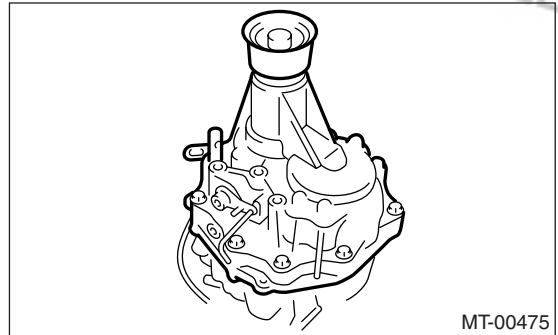
THREE BOND 1215 (Part No. 004403007)



- 5) Install the extension case.

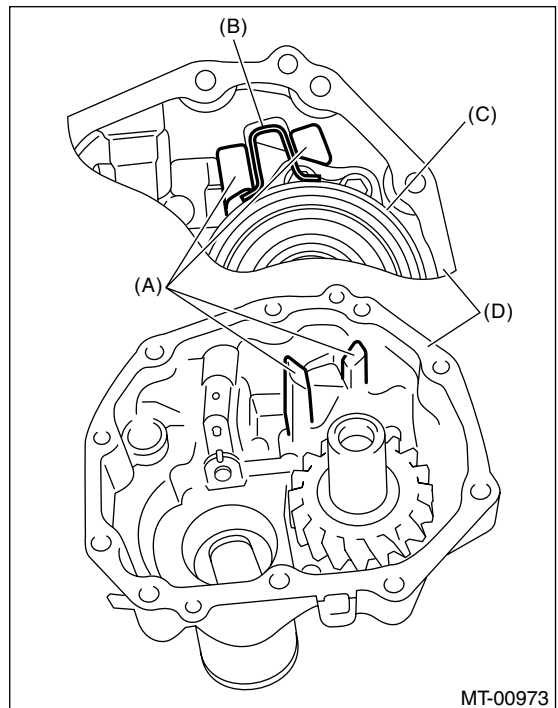
Tightening torque:

48 N·m (4.9 kgf-m, 35.4 ft-lb)



NOTE:

Insert the stopper portion of center differential between extension guides.



- (A) Extension guides
- (B) Stopper
- (C) Center differential
- (D) Extension case

- 6) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

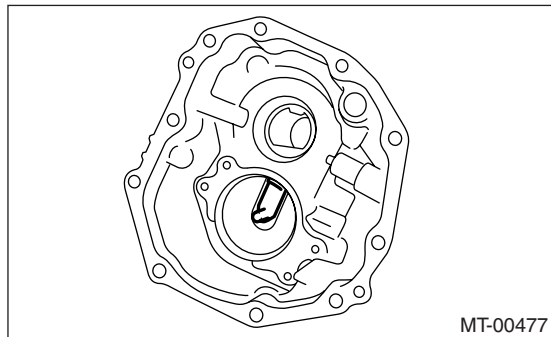
C: DISASSEMBLY

- 1) Remove the transfer drive gear. <Ref. to 6MT-57, REMOVAL, Transfer Drive Gear.>

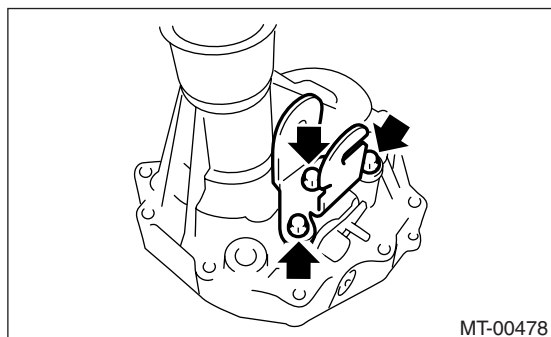
Extension Case

MANUAL TRANSMISSION AND DIFFERENTIAL

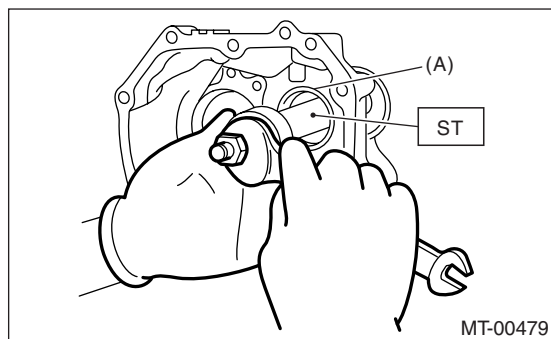
2) Remove the extension guide.



3) Remove the shift bracket.

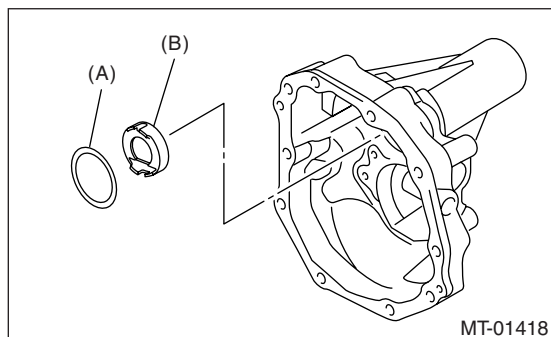


4) Using the ST, remove the bearing cone.
ST 18758AA000 PULLER



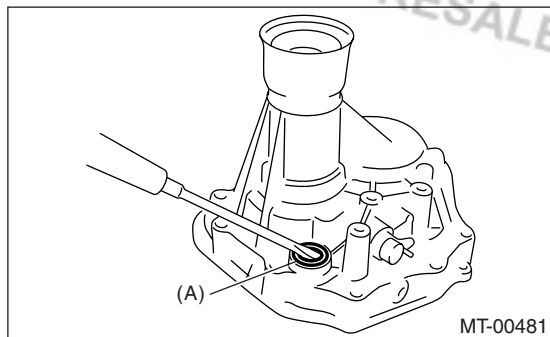
(A) Bearing cone

5) Remove the thrust washer and oil plate.



(A) Thrust washer
(B) Oil plate

6) Remove the shifter arm oil seal.



(A) Oil seal

7) Remove the reverse checking system. <Ref. to 6MT-54, REMOVAL, Reverse Check System.>

8) Remove the extension oil seal. <Ref. to 6MT-30, REPLACEMENT, Oil Seal.>

D: ASSEMBLY

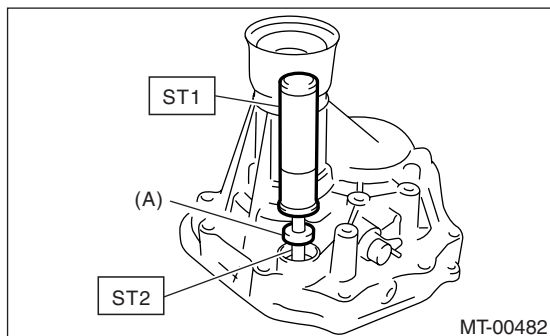
1) Install the reverse checking system. <Ref. to 6MT-55, INSTALLATION, Reverse Check System.>

2) Install the extension case oil seal. <Ref. to 6MT-30, REPLACEMENT, Oil Seal.>

3) Using the ST, install the shifter arm oil seal.

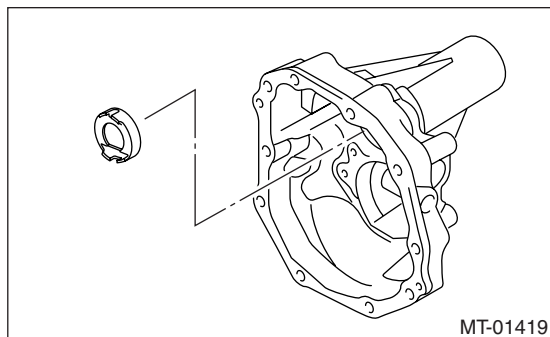
ST1 18657AA000 INSTALLER

ST2 18671AA000 OIL SEAL GUIDE



(A) Oil seal

4) Install the oil plate.



5) Select the bearing thrust washer, and then install it to extension case. <Ref. to 6MT-50, ADJUSTMENT, Extension Case.>

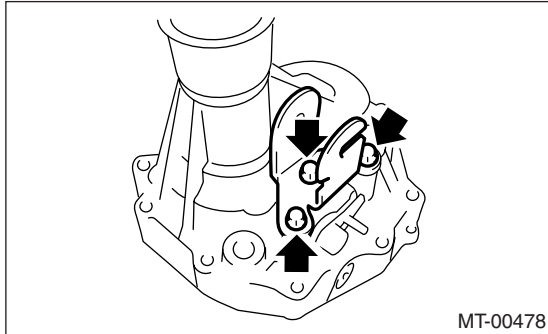
Extension Case

MANUAL TRANSMISSION AND DIFFERENTIAL

- 6) Apply oil lightly to the outer periphery of bearing cone, and then install it to extension case.
- 7) Install the shift bracket.

Tightening torque:

25 N·m (2.5 kgf-m, 18.1 ft-lb)



- 8) Install the extension guide, and then install the transfer driven gear. <Ref. to 6MT-57, INSTALLATION, Transfer Drive Gear.>

E: INSPECTION

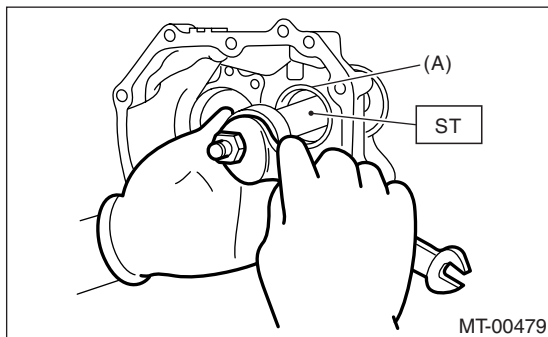
- 1) Make sure there is no damage or crack on extension case. If there is damage or crack, replace the extension case.
- 2) Check each oil seal and joint part of extension case and transmission case for oil leakage. If there is oil leakage, replace the oil seal and liquid gasket.

F: ADJUSTMENT

1. TRANSFER DRIVEN GEAR BEARING THRUST WASHER ADJUSTMENT

- 1) Using the ST, remove the bearing cone from extension case.

ST 18758AA000 PULLER

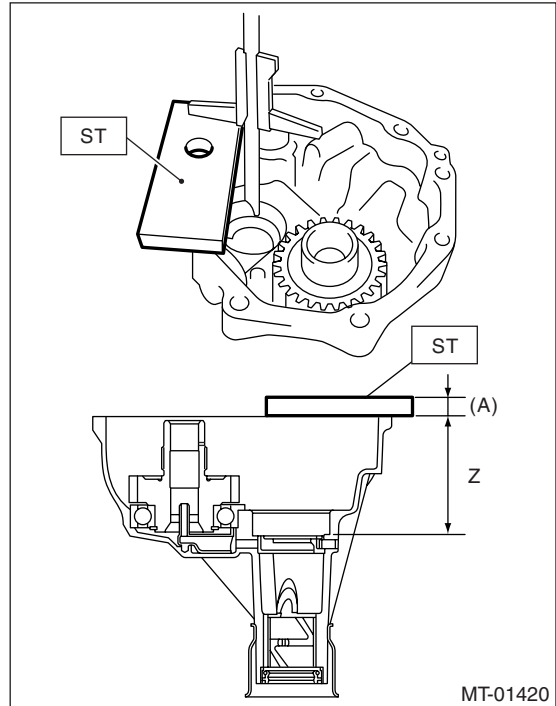


(A) Bearing cone

- 2) Remove the thrust washer.
 - 3) Measure the depth "Z" between end of extension case and contact point of bearing cone.
- ST 499575500 GAUGE

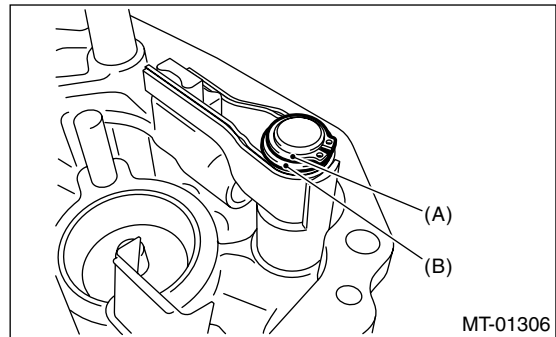
NOTE:

To measure the depth "Z", subtract the thickness of ST [15 mm (0.59 in)] from the measured value.



(A) 15 mm (0.59 in)

- 4) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 5) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 6) Remove the snap ring and flat washer from selector arm part.



(A) Snap ring

(B) Flat washer

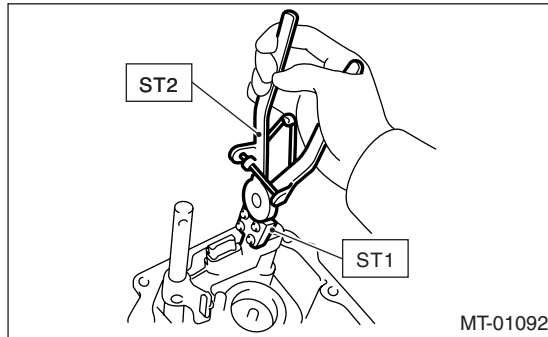
- 7) Using the ST, remove the neutral set spring and support.

ST1 18756AA000 CLAW

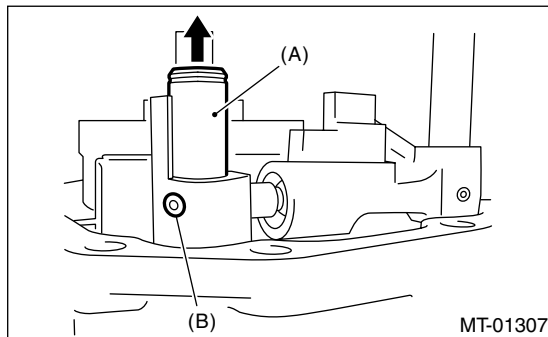
Extension Case

MANUAL TRANSMISSION AND DIFFERENTIAL

ST2 399893600 PLIERS



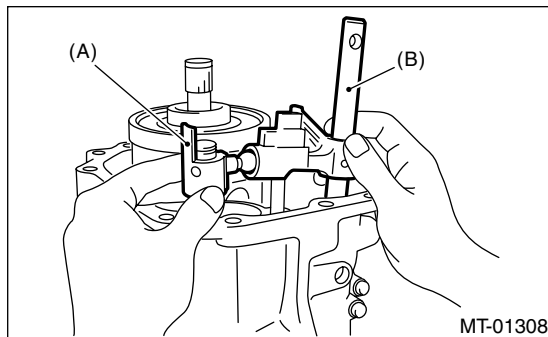
8) Lift-up the striking rod and remove the spring pin.



(A) Striking rod

(B) Spring pin

9) Remove the selector arm No. 2 and shifter arm.



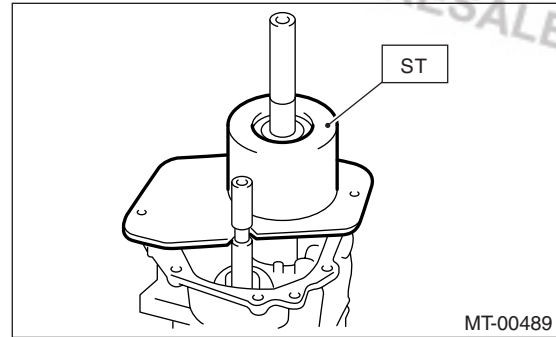
(A) Selector arm No. 2

(B) Shifter arm

10) Install the bearing cone to transfer driven gear.

11) Set the ST.

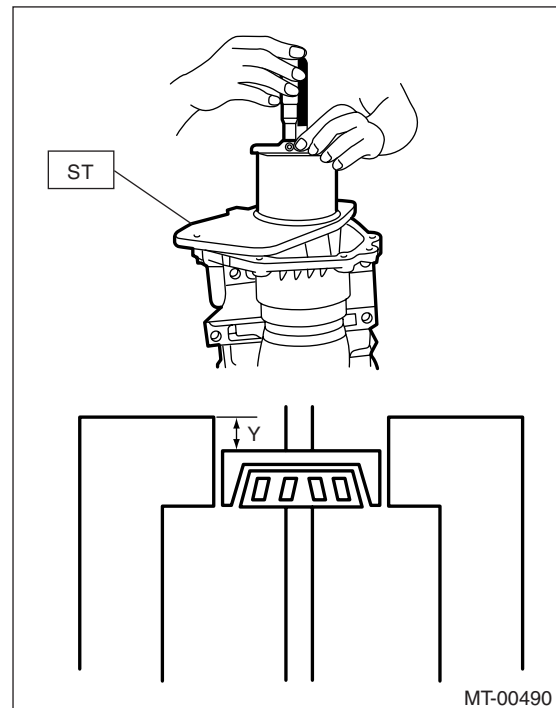
ST 18831AA000 GAUGE



12) Rotate the transfer driven gear approx. ten times to get the bearing accustomed.

13) Measure the depth "Y" between end of ST and bearing cone.

ST 18831AA000 GAUGE



14) Calculate the value t of transfer driven gear bearing thrust washer using the following equation.

$t = Z - (100 - Y) - \{0.02 \text{ to } 0.11 \text{ mm (0.0008 to 0.0043 in)}\}$

t mm (in)	Thickness of transfer driven gear bearing thrust washer.
Y mm (in)	Depth from end of ST to bearing cone.
Z mm (in)	Depth from end of extension case to contact point of bearing cone.
0.02 — 0.11 mm (0.0008 — 0.0043 in)	Standard clearance between thrust washer and taper roller bearing.
100 mm (3.94 in)	Height of ST.

15) Select the nearest thrust washer from the following table, according to the calculated value t.

Extension Case

MANUAL TRANSMISSION AND DIFFERENTIAL

Standard clearance between thrust washer and taper roller bearing:

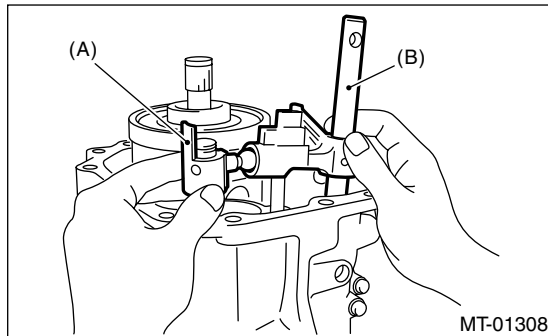
0.02 — 0.11 mm (0.0008 — 0.0043 in)

NOTE:

Make clearance within standard.

Thrust washer (50 × 61 × t)	
Part No.	Thickness mm (in)
803050060	0.50 (0.0197)
803050061	0.55 (0.0217)
803050062	0.60 (0.0236)
803050063	0.65 (0.0256)
803050064	0.70 (0.0276)
803050065	0.75 (0.0295)
803050066	0.80 (0.0315)
803050067	0.85 (0.0335)
803050068	0.90 (0.0354)
803050069	0.95 (0.0374)
803050070	1.00 (0.0394)
803050071	1.05 (0.0413)
803050072	1.10 (0.0433)
803050073	1.15 (0.0453)
803050074	1.20 (0.0472)
803050075	1.25 (0.0492)
803050076	1.30 (0.0512)
803050077	1.35 (0.0531)
803050078	1.40 (0.0551)
803050079	1.45 (0.0571)

16) Install the selector arm No. 2 and shifter arm.



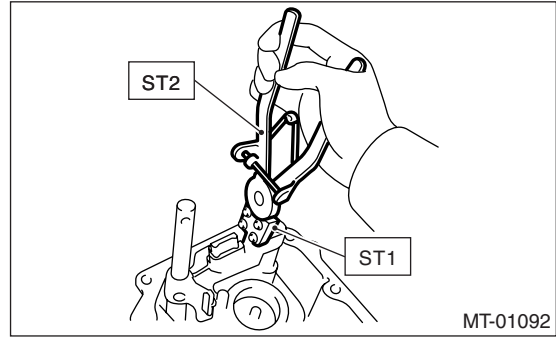
- (A) Selector arm No. 2
(B) Shifter arm

17) Install a new spring pin.

18) Using the ST, install the neutral set spring and support.

ST1 18756AA000 CLAW

ST2 399893600 PLIERS



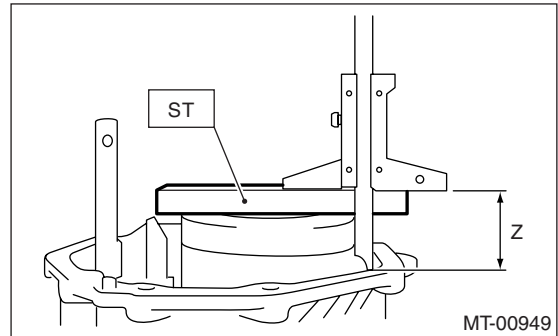
19) Install the snap ring and flat washer.

20) Install the center differential.

2. SELECTING THE TRANSFER DRIVE GEAR THRUST WASHER

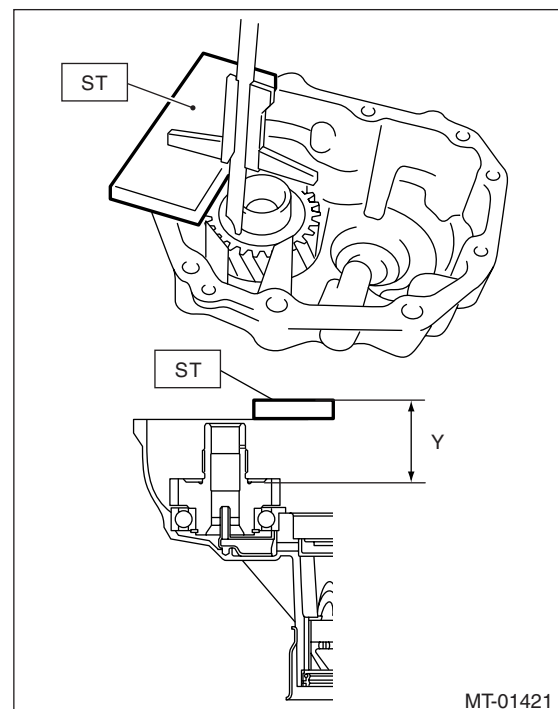
1) Measure the height "Z" between end of transmission case and end of ST.

ST 499575500 GAUGE



2) Measure the depth "Y" between end of ST and transfer drive gear.

ST 499575500 GAUGE



Extension Case

MANUAL TRANSMISSION AND DIFFERENTIAL

3) Calculate the value t of transfer drive gear thrust washer using the following equation.

$$t = \{Y - 15 \text{ mm (1.18 in)}\} - \{Z - 15 \text{ mm (1.18 in)}\} - 0.75 \text{ to } 0.95 \text{ mm (0.030 to 0.037 in)}$$

t mm (in)	Thickness of transfer drive gear thrust washer
Y mm (in)	Depth from end of ST to transfer drive gear
Z mm (in)	Height from end of transmission case to the end of ST
0.75 — 0.95 mm (0.030 — 0.037 in)	Standard clearance between thrust washer and transfer drive gear.
15 mm (1.18 in)	Thickness of ST

4) Select the nearest thrust washer from the following table, according to the calculated value t .

Standard clearance between thrust washer and transfer drive gear:

0.75 — 0.95 mm (0.030 — 0.037 in)

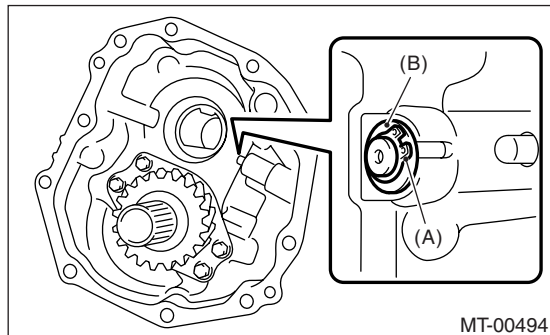
Thrust washer (36.3 × 52 × t)	
Part No.	Thickness mm (in)
803036070	0.80 (0.0315)
803036071	0.95 (0.0374)
803036072	1.10 (0.0433)
803036073	1.25 (0.0492)
803036074	1.40 (0.0551)
803036075	0.65 (0.0256)

5) Install the selected thrust washer.

14.Reverse Check System

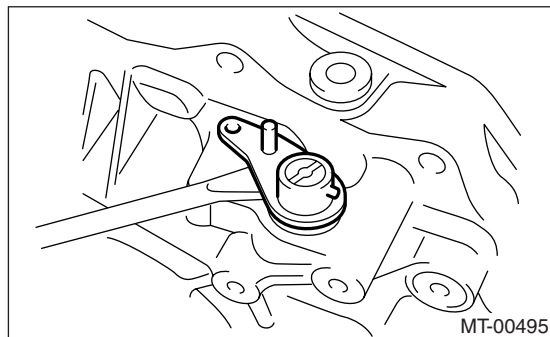
A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 4) Remove the snap ring and washer from reverse check shaft.



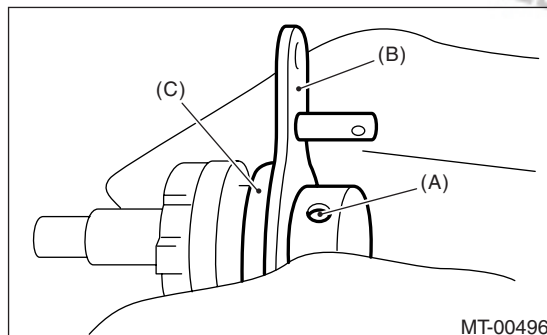
- (A) Snap ring
- (B) Washer

- 5) Remove the reverse check shaft and spring from extension case.



- 6) Remove the spring pin, and then remove the reverse check lever and oil seal from reverse check shaft.

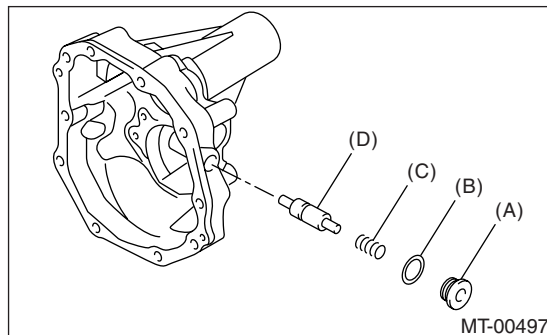
NOTE:
Do not reuse the oil seal.



- (A) Spring pin
- (B) Reverse check lever
- (C) Oil seal

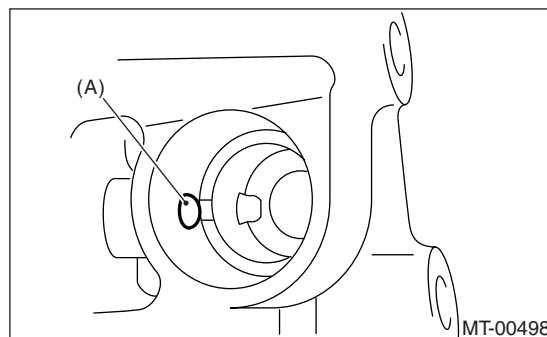
- 7) Remove the plug from extension case, then remove the gasket, spring and plunger.

NOTE:
Do not reuse the gasket.



- (A) Plug
- (B) Gasket
- (C) Spring
- (D) Plunger

- 8) Remove the reverse lock plunger.



- (A) Reverse lock plunger

Reverse Check System

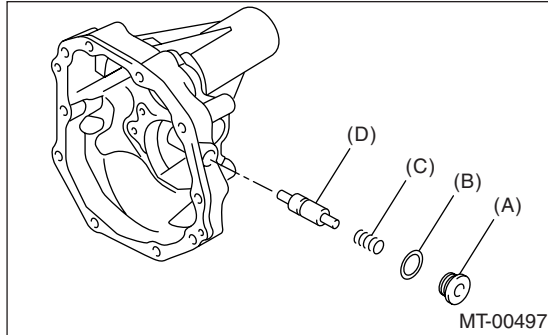
MANUAL TRANSMISSION AND DIFFERENTIAL

B: INSTALLATION

- 1) Insert the reverse lock plunger.
- 2) Install in the order of reverse check plug, spring, gasket and plug.

Tightening torque:

41 N·m (4.2 kgf-m, 30.2 ft-lb)

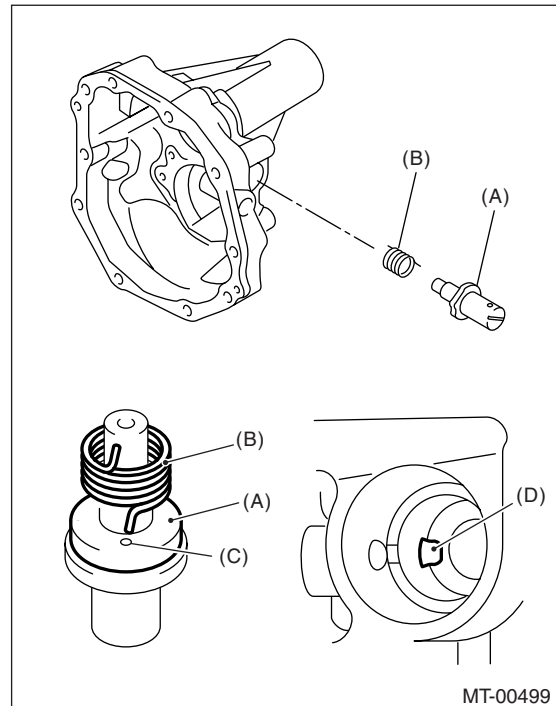


- (A) Plug
- (B) Gasket
- (C) Spring
- (D) Reverse check plug

- 3) Install the spring and reverse check shaft to extension case.

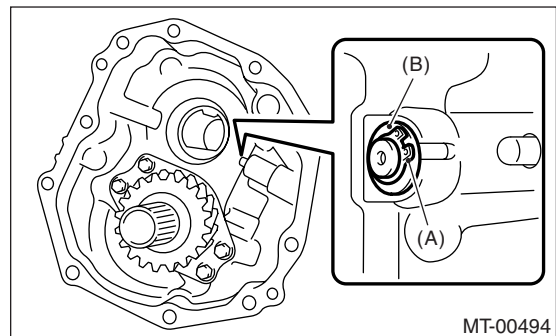
NOTE:

Be sure the spring end aligns with the hole of reverse check shaft and cutout portion of extension case.



- (A) Reverse check shaft
- (B) Spring
- (C) Hole
- (D) Cutout portion

- 4) Install the washer and snap ring.



- (A) Snap ring
- (B) Washer

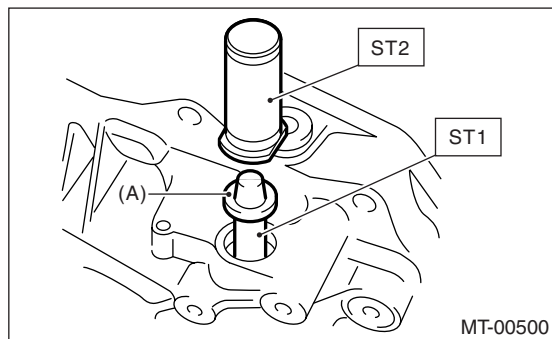
- 5) Set the ST1 to reverse check shaft. Install a new oil seal, then press with ST2.

ST1 18671AA000 OIL SEAL GUIDE

Reverse Check System

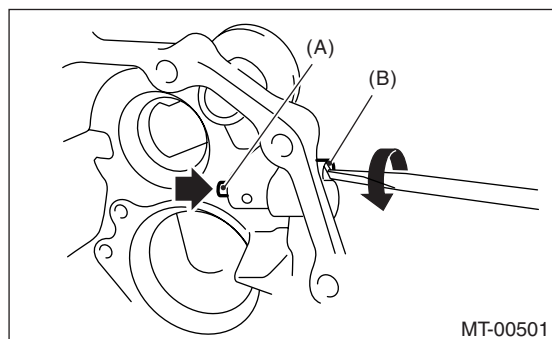
MANUAL TRANSMISSION AND DIFFERENTIAL

ST2 18657AA010 INSTALLER



(A) Oil seal

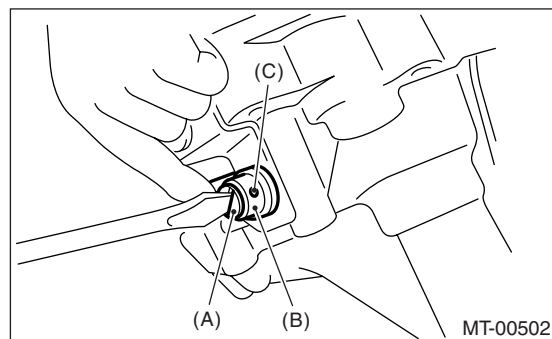
6) Insert the reverse check lever, then rotate the reverse check shaft until the plunger can be pushed in first.



(A) Plunger

(B) Reverse check shaft

7) Align the hole of reverse check lever and reverse check shaft, then install the spring pin.



(A) Reverse check shaft

(B) Reverse check lever

(C) Hole

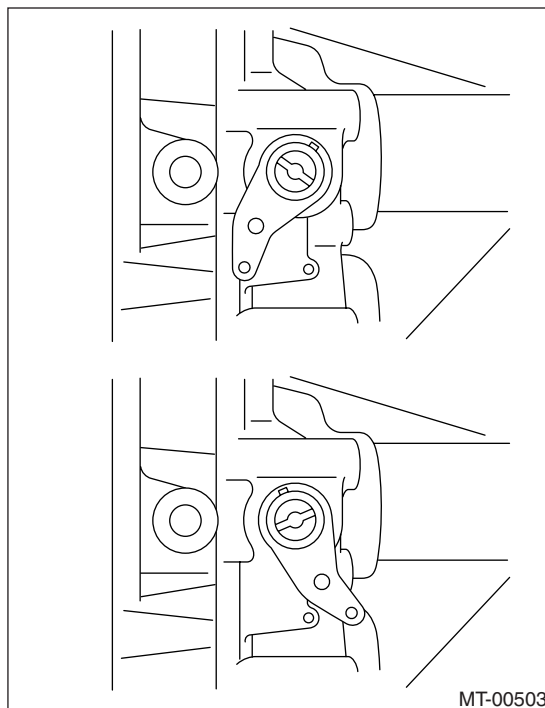
8) Make sure the reverse check operates correctly. <Ref. to 6MT-56, INSPECTION, Reverse Check System.>

9) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>

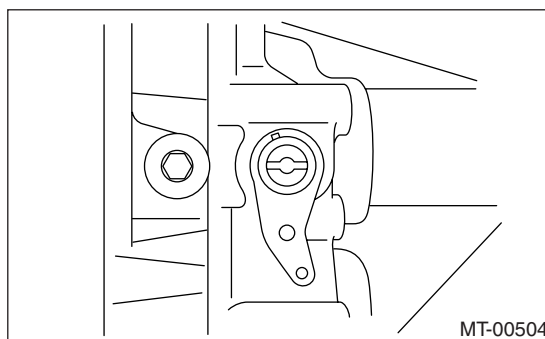
10) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

- 1) Make sure there is no damage on each parts.
- 2) Make sure the reverse check lever operates smoothly.
- 3) Make sure there is no oil leakage on oil seal part of reverse check shaft. If there is oil leakage, replace the oil seal.
- 4) Inspect the reverse check operation.
 - (1) The plunger can be pushed or the gear can be shifted to reverse, when reverse check lever is in the following position.



- (2) The plunger cannot be pushed or the gear cannot be shifted to reverse, when reverse check lever is in the following position.

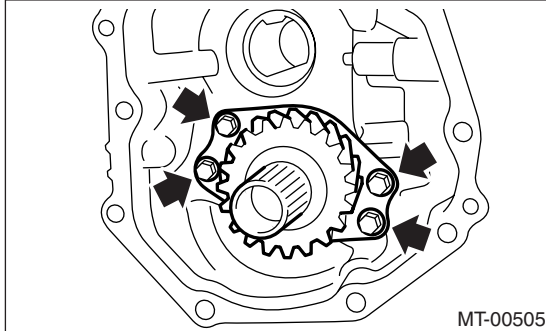


- 5) If not as specified, reassemble the reverse check system.

15. Transfer Drive Gear

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 4) Remove the transfer drive gear.

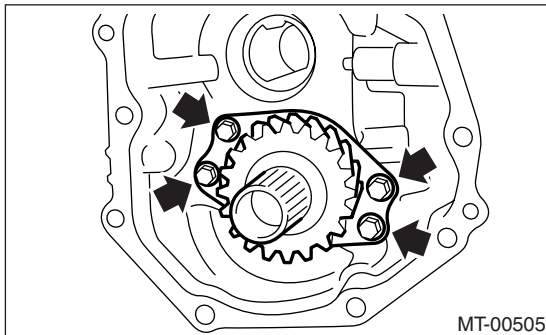


B: INSTALLATION

- 1) Install the transfer drive gear.

Tightening torque:

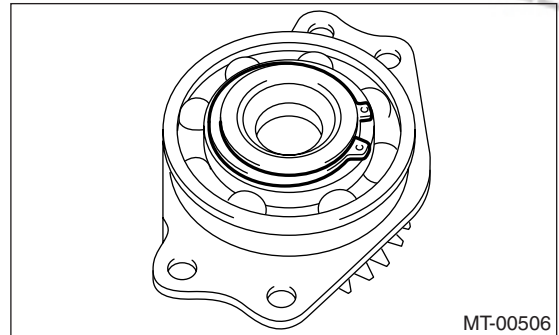
25 N·m (2.5 kgf-m, 18.1 ft-lb)



- 2) If the ball bearing, transfer drive gear or snap ring is replaced, select the transfer drive gear thrust washer. <Ref. to 6MT-49, ASSEMBLY, Extension Case.>
- 3) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 4) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

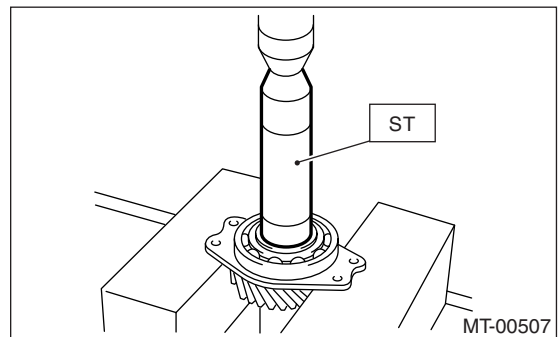
- 1) Remove the snap ring.



- 2) Using the ST, remove the ball bearing.
ST 499877000 RACE 4-5 INSTALLER

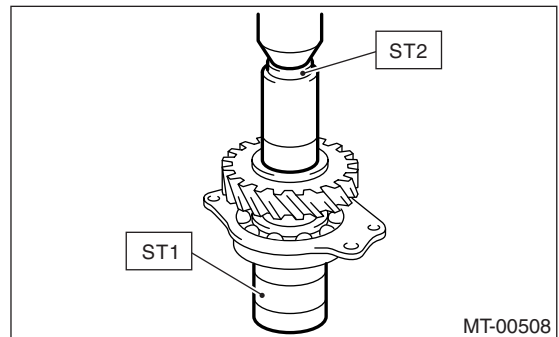
NOTE:

Do not reuse the ball bearing.

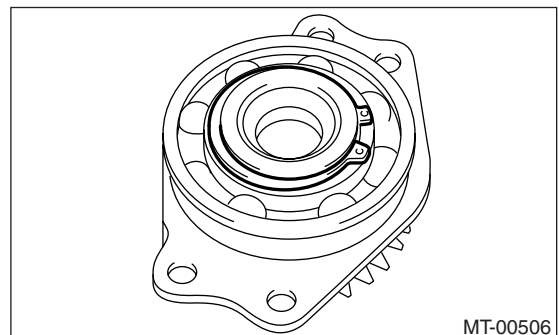


D: ASSEMBLY

- 1) Using the ST, install the ball bearing.
ST1 499247400 INSTALLER
ST2 398497701 SEAT



- 2) Install the snap ring.



Transfer Drive Gear

MANUAL TRANSMISSION AND DIFFERENTIAL

3) Inspect the clearance between snap ring and ball bearing. <Ref. to 6MT-58, INSPECTION, Transfer Drive Gear.>

E: INSPECTION

1) Bearings

Replace the bearings in the following cases.

- Broken or rusty bearings
- Worn or damaged
- Bearings that fail to turn smoothly or make abnormal noise.

2) Drive gear

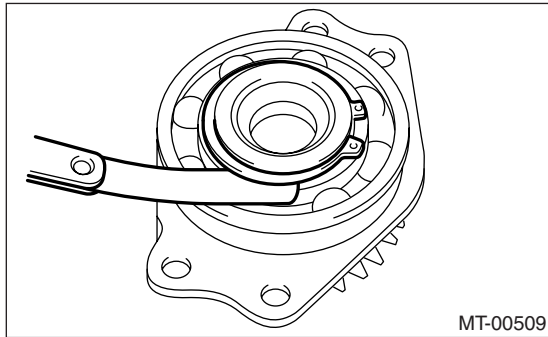
Replace the drive gear in the following cases.

- If their tooth surface and shaft are excessively broken or damaged.

3) Measure the clearance between snap ring and inner race of ball bearing with a thickness gauge.

Standard clearance between snap ring and inner race:

0 — 0.15 mm (0 — 0.0059 in)



4) If the measurement is not within specifications, select suitable snap ring.

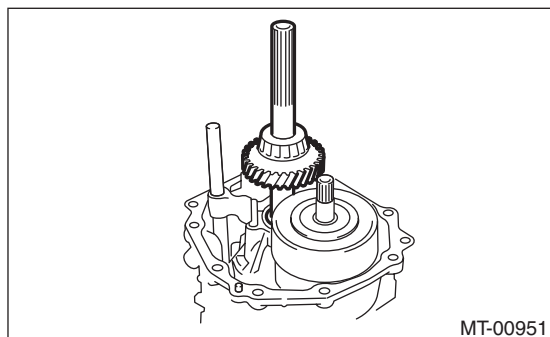
Thrust washer	
Part No.	Thickness mm (in)
805045050	1.76 (0.069)
805045060	1.88 (0.074)
805045070	2.00 (0.079)

After replacement of the snap ring, inspect the clearance again.

16. Transfer Driven Gear

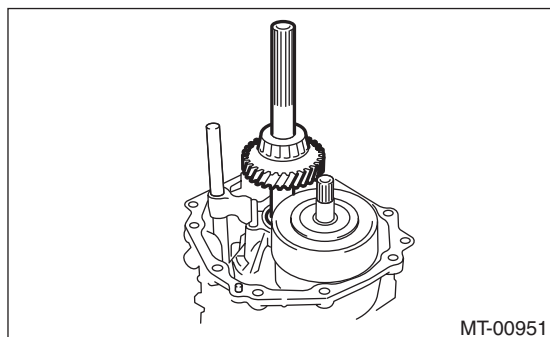
A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 4) Remove the transfer driven gear.



B: INSTALLATION

- 1) Install the transfer driven gear.

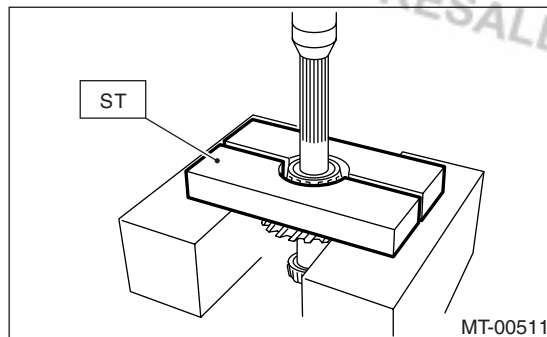


- 2) If the bearing or transfer driven gear is replaced, select the transfer driven thrust washer. <Ref. to 6MT-50, ADJUSTMENT, Extension Case.>
- 3) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 4) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

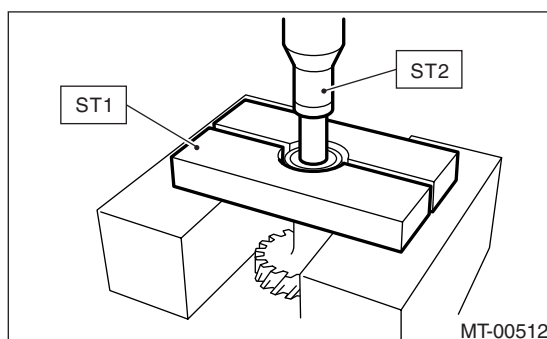
- 1) Using the ST, remove the roller bearing of extension case side.

ST 498515700 REMOVER



- 2) Using the ST, remove the roller bearing of transmission case side.

ST1 899858600 REMOVER
ST2 899864100 REMOVER



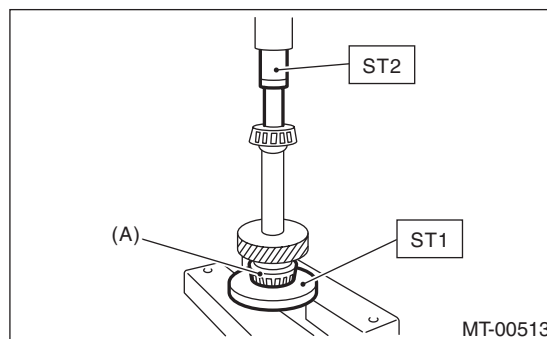
D: ASSEMBLY

- 1) Using the ST, install the roller bearing of extension case side.

ST1 398177700 INSTALLER
ST2 899864100 REMOVER

CAUTION:

Do not apply pressure in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).



(A) Roller bearing

- 2) Using the ST, install the roller bearing of transmission case side.

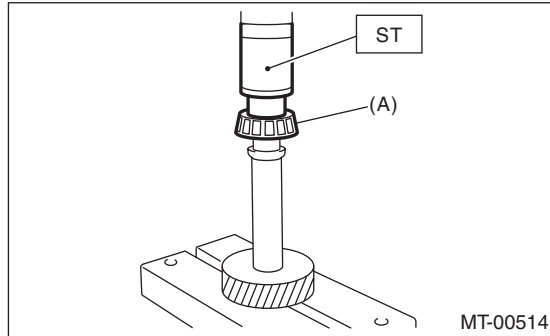
ST 499757002 INSTALLER

Transfer Driven Gear

MANUAL TRANSMISSION AND DIFFERENTIAL

CAUTION:

Do not apply pressure in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).



(A) Roller bearing

E: INSPECTION

1) Bearings

Replace the bearing in following cases.

- Broken or rusty bearings
- Worn or damaged
- Bearings that fail to turn smoothly or make noise when turned after gear oil lubrication.

2) Driven gear

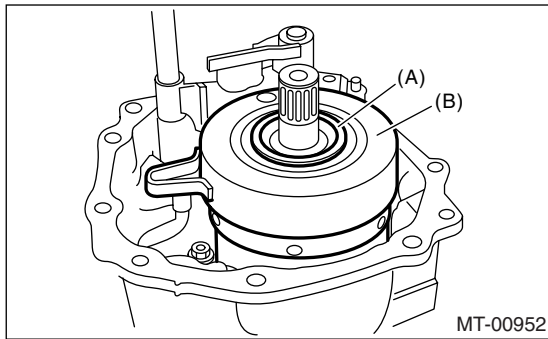
Replace the driven gear in following case.

If their tooth surfaces and shaft are excessively broken or damaged.

17.Center Differential

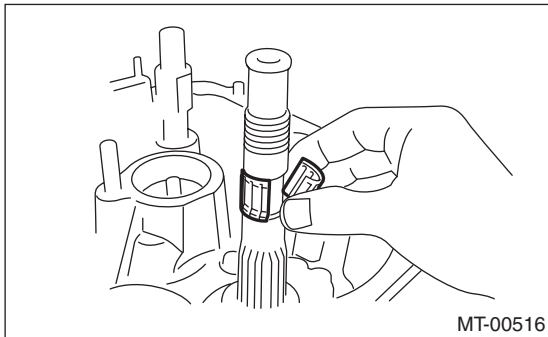
A: REMOVAL

- 1) Remove the manual transmission case assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 4) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 5) Disconnect the center differential connector.
- 6) Remove the thrust washer and center differential.



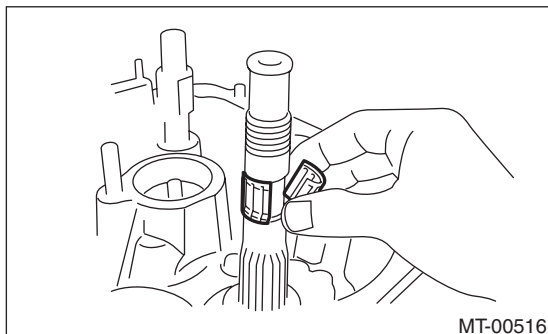
- (A) Thrust washer
(B) Center differential

- 7) Remove the needle bearing.

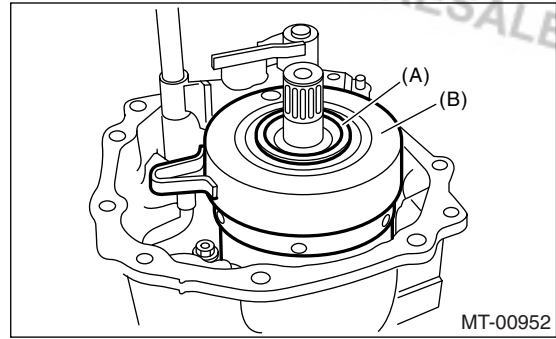


B: INSTALLATION

- 1) Install the needle bearing.



- 2) Install the thrust washer and center differential.



- (A) Thrust washer
(B) Center differential

- 3) If replacing the center differential, select the transfer drive gear and thrust washer and install. <Ref. to 6MT-50, ADJUSTMENT, Extension Case.>
- 4) Connect the center differential connector, and secure it to oil guide.
- 5) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 6) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 7) Install the manual transmission case assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

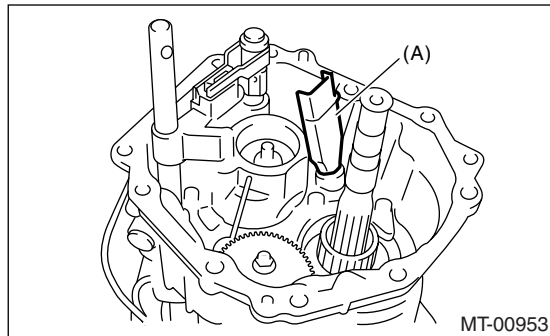
C: INSPECTION

Make sure there is no damage on the center differential, ball bearing and oil pump drive gear. Replace the center differential assembly if damaged.

18.Oil Pump

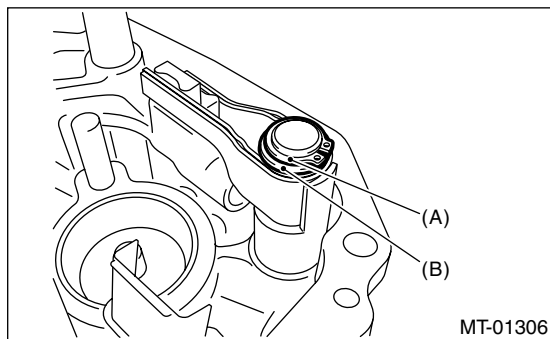
A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 4) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 5) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 6) Remove the oil guide.



(A) Oil guide

- 7) Remove the snap ring and flat washer.

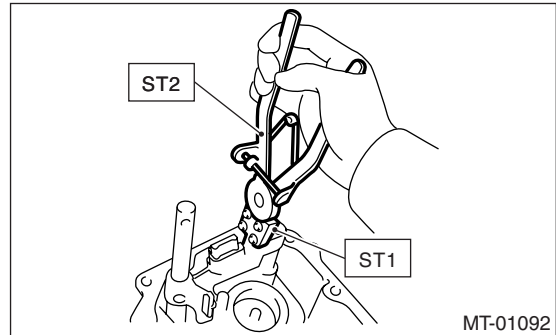


(A) Snap ring
(B) Flat washer

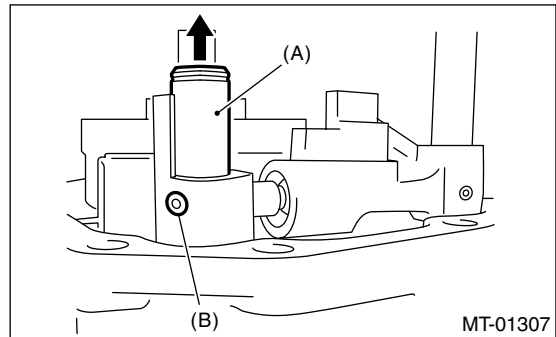
- 8) Using the ST, remove the neutral set spring and support.

ST1 18756AA000 CLAW

ST2 399893600 PLIERS

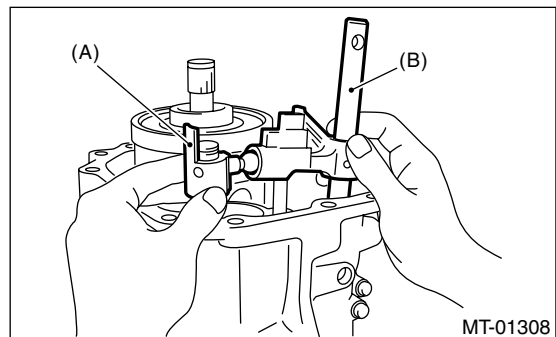


- 9) Raise the striking rod up, and then remove the spring pin.



(A) Striking rod
(B) Spring pin

- 10) Remove the selector arm No. 2 and shifter arm.



(A) Selector arm No. 2
(B) Shifter arm

- 11) Remove the oil pump shaft assembly and plate.

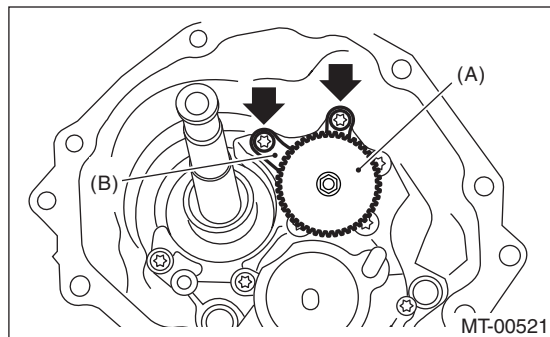
NOTE:

Remove the bolts using ST, because tool may break if general tool is used.

Oil Pump

MANUAL TRANSMISSION AND DIFFERENTIAL

ST 18663AA000 SOCKET



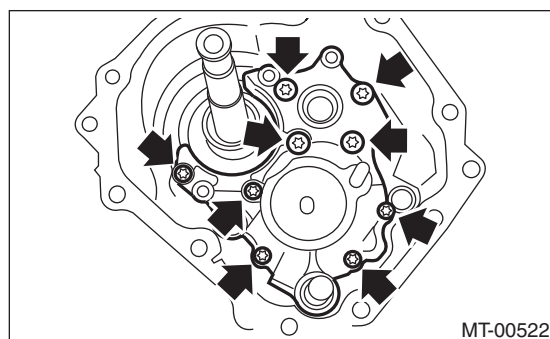
- (A) Oil pump shaft ASSY
- (B) Plate

12) Remove the oil pump cover assembly.

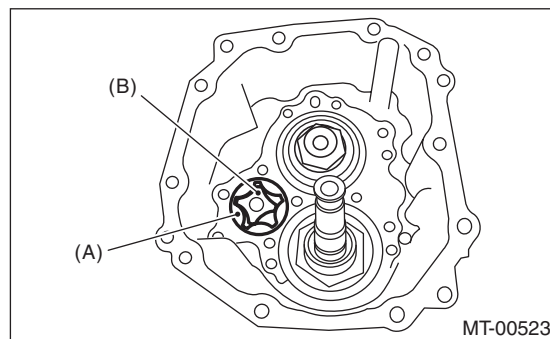
NOTE:

Remove the bolts using ST, because tool may break if general tool is used.

ST 18663AA000 SOCKET



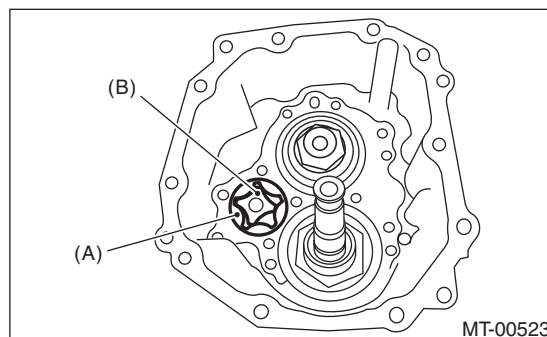
- 13) Remove the thrust washer on main shaft part.
- 14) Remove the oil pump rotor.



- (A) Outer rotor
- (B) Inner rotor

B: INSTALLATION

1) Apply oil to the outer periphery of outer rotor, then install to transmission case.



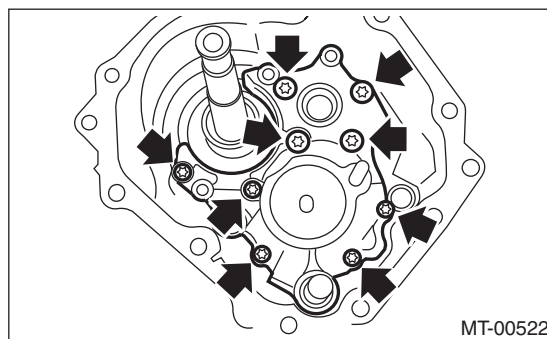
- (A) Outer rotor
- (B) Inner rotor

- 2) Install the thrust washer to main shaft part.
- 3) Install the oil pump cover assembly.

Tightening torque:

25 N·m (2.5 kgf-m, 18.1 ft-lb)

ST 18663AA000 SOCKET

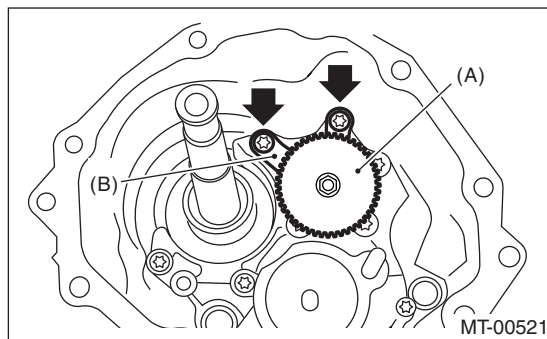


4) Install the oil pump shaft assembly and plate.

Tightening torque:

25 N·m (2.5 kgf-m, 18.1 ft-lb)

ST 18663AA000 SOCKET

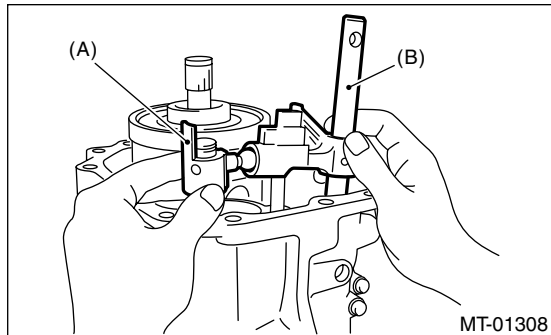


- (A) Oil pump shaft ASSY
- (B) Plate

Oil Pump

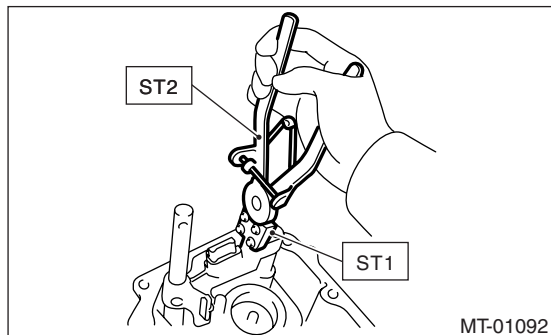
MANUAL TRANSMISSION AND DIFFERENTIAL

- 5) If replacing the oil pump cover assembly, select the transfer driven gear and thrust washer, then install them to the extension case. <Ref. to 6MT-50, ADJUSTMENT, Extension Case.>
- 6) Install the selector arm No. 2 and shifter arm.

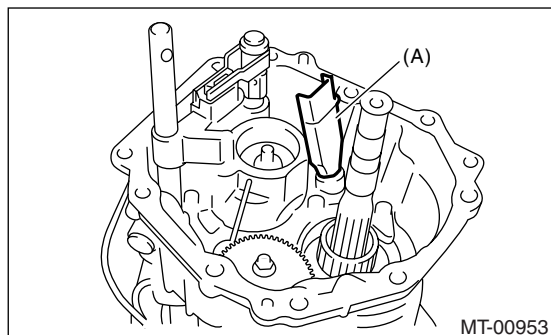


- (A) Selector arm No. 2
(B) Shift arm

- 7) Install a new spring pin.
- 8) Using the ST, install the neutral set spring and support.
ST1 18756AA000 CLAW
ST2 399893600 PLIERS



- 9) Install the snap ring and flat washer.
- 10) Install the oil guide.



- (A) Oil guide

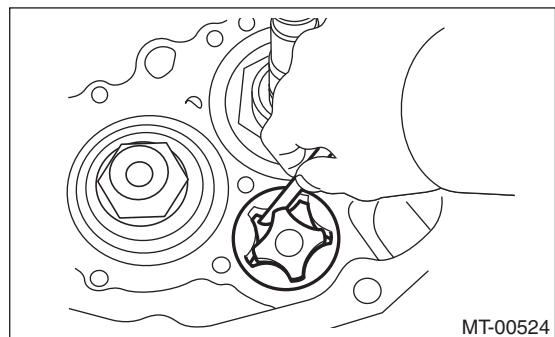
- 11) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 12) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>

- 13) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 14) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

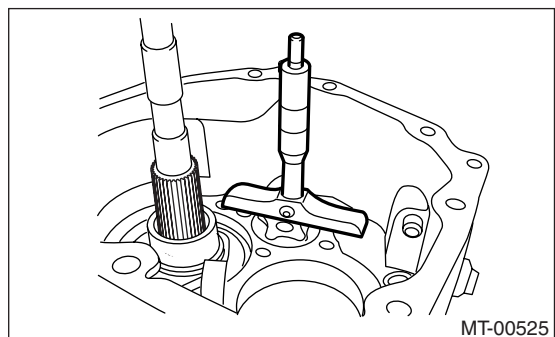
- 1) Make sure there is no damage on the inner rotor and outer rotor. Replace the inner rotor and outer rotor as assembly if damaged.
- 2) Clearance at tip
Install the inner rotor and outer rotor to transmission case. Align tip of the inner rotor and outer rotor, then measure the clearance. Replace the inner rotor and outer rotor as a set if clearance exceeds specification.

Specification of clearance at tip:
Less than 0.15 mm (0.0059 in)



- 3) Side clearance
Measure to the transmission case and rotor. Replace the inner rotor and outer rotor as a set if clearance exceeds specification.

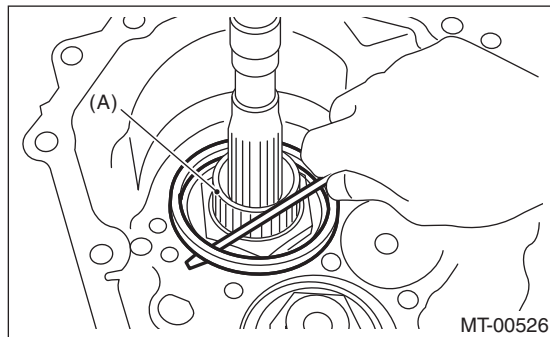
Specification of side clearance:
0.03 — 0.10 mm (0.0012 — 0.0039 in)



19. Transmission Case

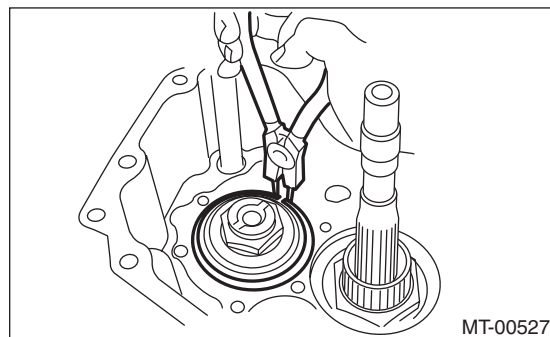
A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.> <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the shim and spacer of driven gear assembly.

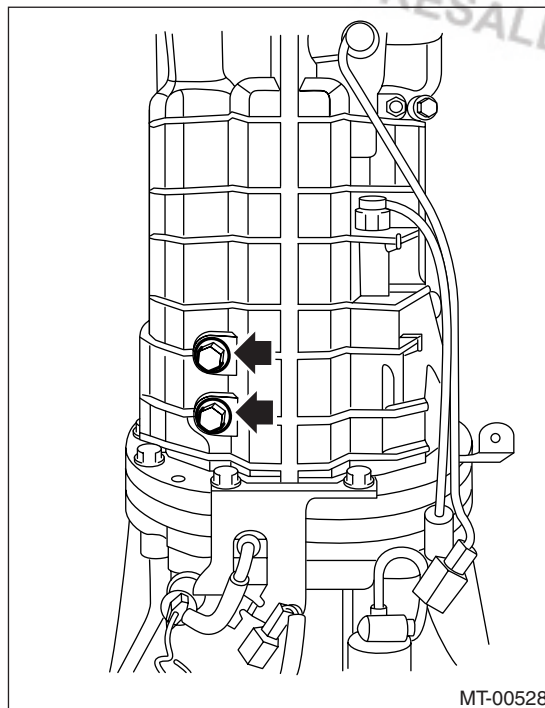


(A) Driven gear ASSY

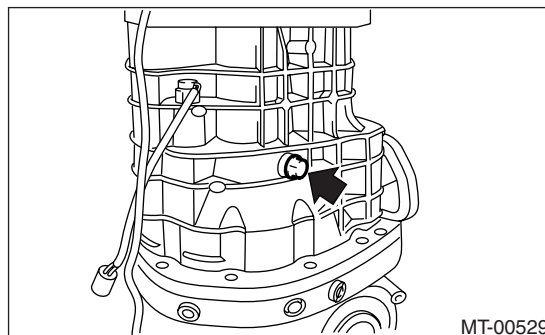
- 9) Remove the snap ring.



- 10) Remove the pilot bolt.



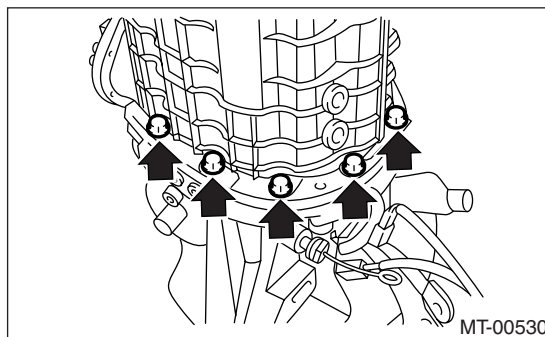
- 11) Remove the holder reverse bolt.



- 12) Remove the transmission case.

NOTE:

If the oil guide catches on shift fork, the transmission case may be difficult to be removed. Move the oil guide right and left to remove. Do not pull the transmission case by force.



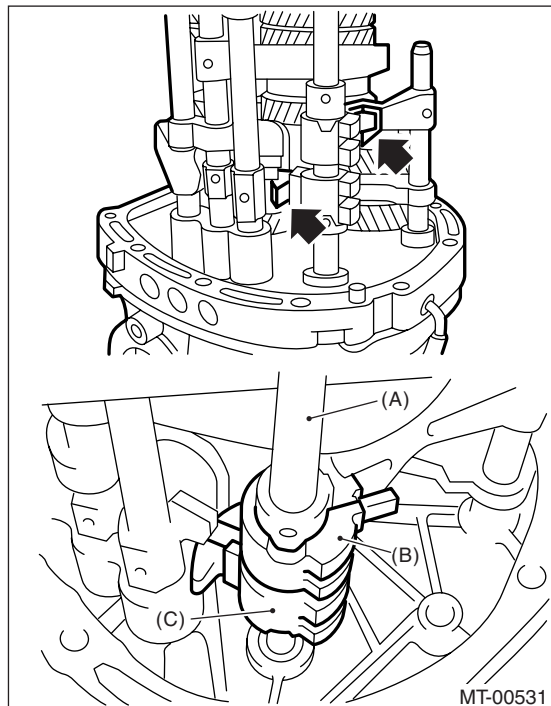
- 13) Completely remove the remaining liquid gasket on transmission case and adapter plate.

Transmission Case

MANUAL TRANSMISSION AND DIFFERENTIAL

B: INSTALLATION

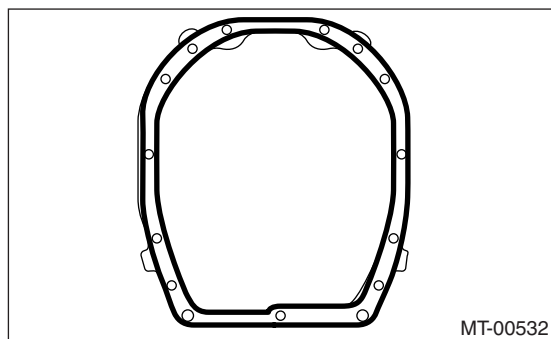
1) Make sure that each shifter fork and interlock block is shifted to neutral position. If not, shift to neutral position.



- (A) Striking rod
- (B) Reverse interlock block
- (C) Interlock block

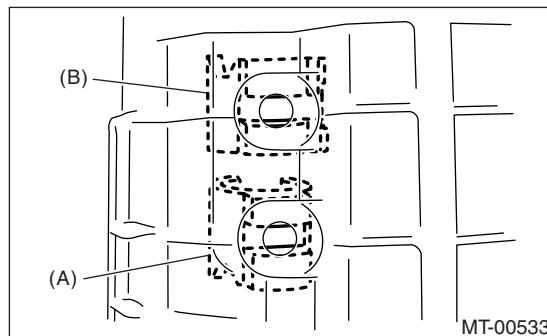
2) Apply liquid gasket to the adapter plate.

Liquid gasket:
THREE BOND 1215 (Part No. 004403007)



3) Install the transmission case.

4) Make sure the interlock block and reverse interlock block are aligned in neutral position by inspecting through the pilot bolt installation hole. If not aligned, remove the transmission case, then shift each shifter fork and interlock block to neutral position.



- (A) Interlock block
- (B) Reverse interlock block

5) Using a new gasket, install the pilot bolts temporarily.

6) Tighten the transmission case with bolts and nuts.

Tightening torque:
50 N·m (5.1 kgf-m, 36.9 ft-lb)

7) Tighten the pilot bolts.

Tightening torque:
34 N·m (3.5 kgf-m, 25.1 ft-lb)

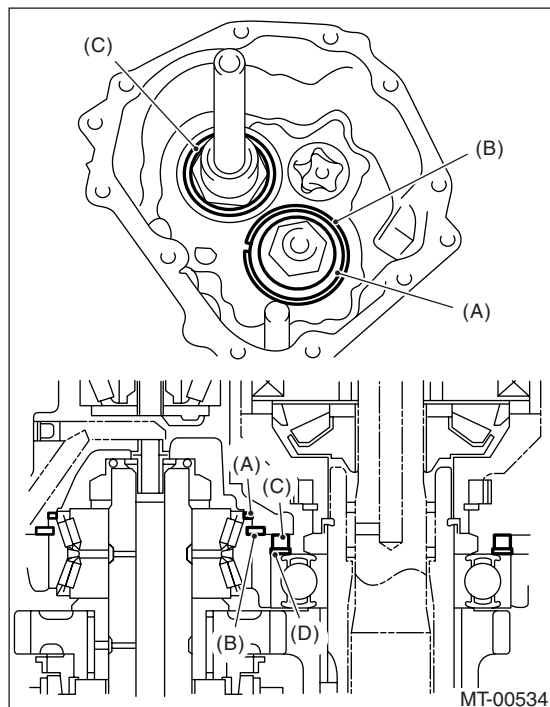
8) Tighten the holder reverse bolt.

Tightening torque:
25 N·m (2.5 kgf-m, 18.1 ft-lb)

Transmission Case

MANUAL TRANSMISSION AND DIFFERENTIAL

9) Install the snap ring, washer and collar of driven gear assembly.



- (A) Washer
- (B) Snap ring
- (C) Collar
- (D) Washer

10) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>

11) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>

12) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>

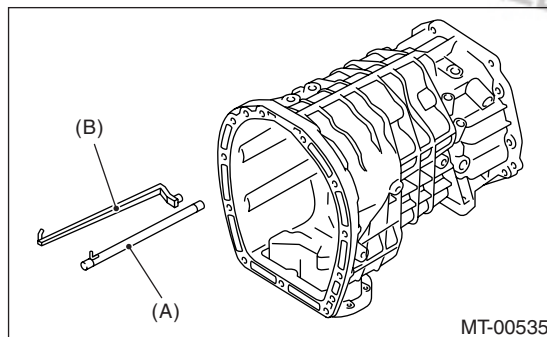
13) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>

14) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.> <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>

15) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

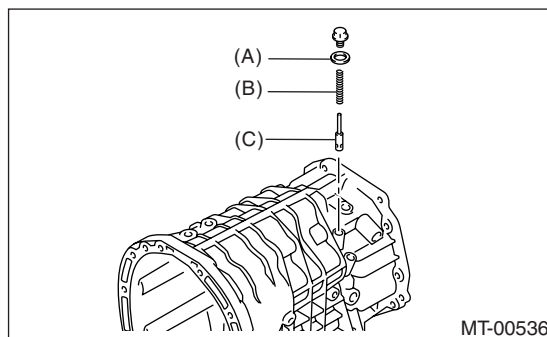
C: DISASSEMBLY

1) Remove the oil pipe and oil guide.



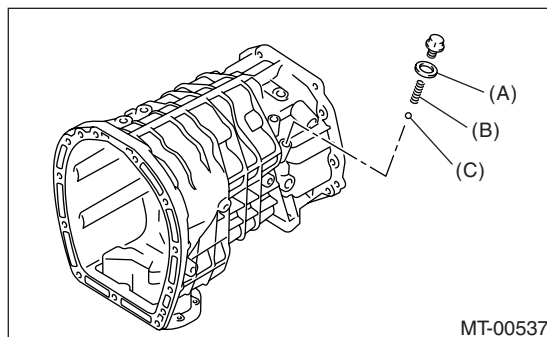
- (A) Oil pipe
- (B) Oil guide

2) Remove the bolt, and then remove the O-ring, relief spring and relief valve.



- (A) O-ring
- (B) Relief valve spring
- (C) Relief valve

3) Remove the bolt, and then remove the O-ring, valve spring and ball.

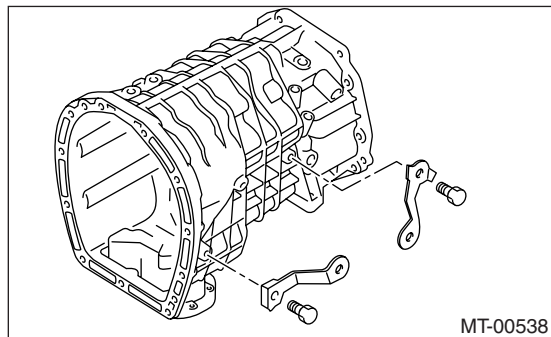


- (A) O-ring
- (B) Valve spring
- (C) Ball

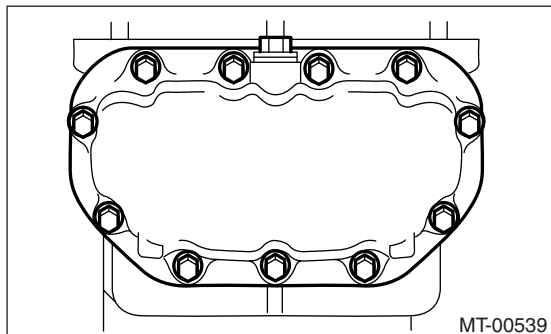
Transmission Case

MANUAL TRANSMISSION AND DIFFERENTIAL

4) Remove the harness bracket.

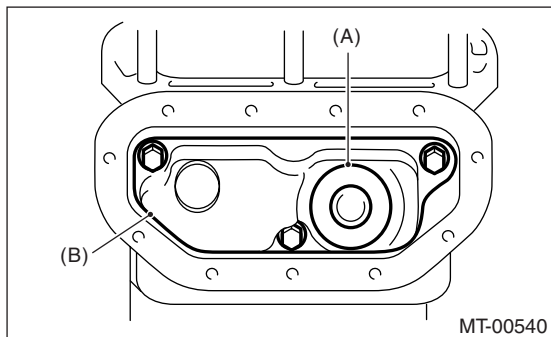


5) Remove the oil pan.



6) Completely remove the remaining liquid gasket on transmission case and oil pan.

7) Remove the oil pan magnet, and then remove the oil strainer.

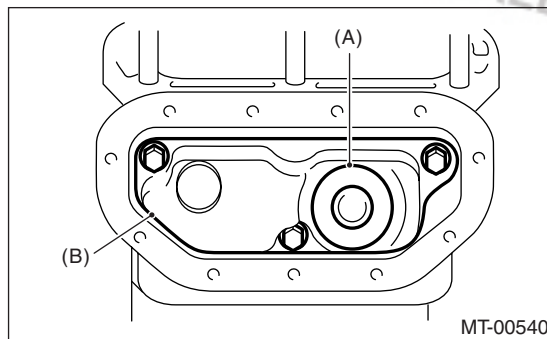


- (A) Oil pan magnet
- (B) Oil strainer

D: ASSEMBLY

1) Install the oil strainer and magnet.

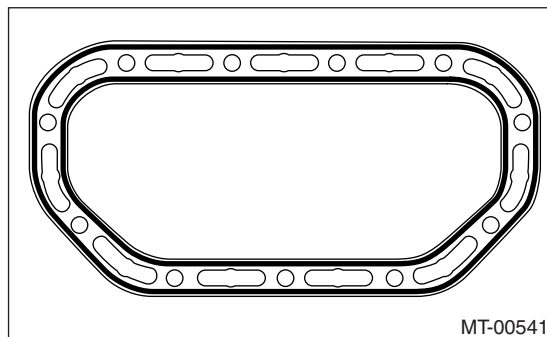
Tightening torque:
10 N·m (1.0 kgf-m, 7.4 ft-lb)



- (A) Oil pan magnet
- (B) Oil strainer

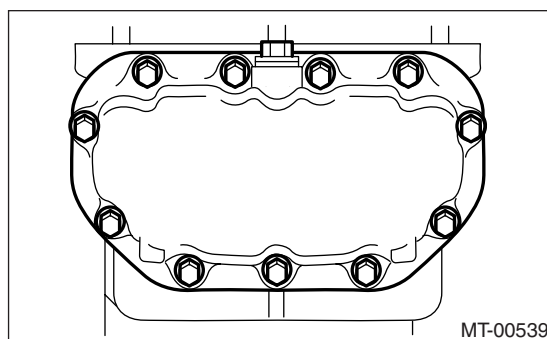
2) Apply liquid gasket to the oil pan.

Liquid gasket:
THREE BOND 1215 (Part No. 004403007)



3) Install the oil pan.

Tightening torque:
6.4 N·m (0.65 kgf-m, 4.7 ft-lb)



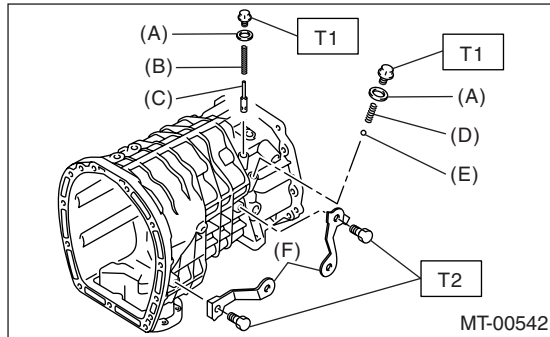
4) Install the relief valve, relief valve spring and new O-ring.

5) Install the ball, valve spring and new O-ring.

Tightening torque:

T1: 13 N·m (1.3 kgf-m, 9.6 ft-lb)

T2: 16 N·m (1.6 kgf-m, 11.8 ft-lb)



- (A) O-ring
- (B) Relief valve spring
- (C) Relief valve
- (D) Valve spring
- (E) Ball
- (F) Harness bracket

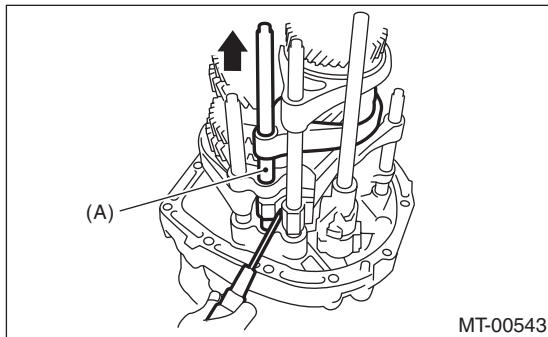
E: INSPECTION

- 1) Completely remove with shop cloth if sludge is adhered to the oil pan magnet.
- 2) Make sure there is no clog on the oil strainer. If clogged, remove clog or replace the oil strainer.
- 3) Make sure there is no damage on each parts. Replace damaged parts with new parts.

20. Main Shaft Assembly

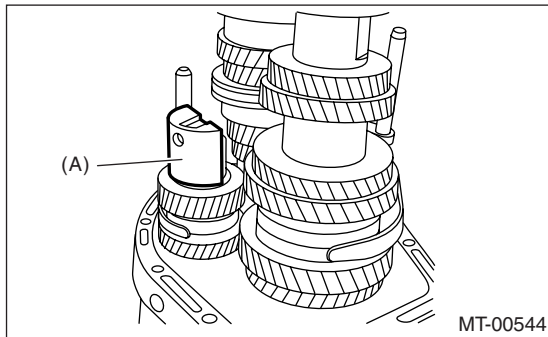
A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.> <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-65, REMOVAL, Transmission Case.>
- 9) Remove the striking rod.
- 10) Using a screwdriver, shift to 4th gear position.



(A) 3rd-4th shift rod

- 11) Remove the reverse idler holder.

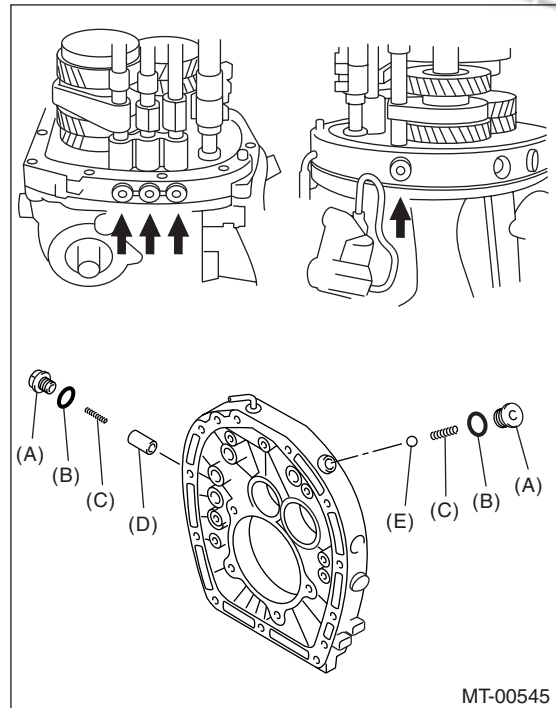


(A) Reverse idler holder

- 12) Remove all checking plug, gasket, checking spring, plunger and checking ball from adapter plate.

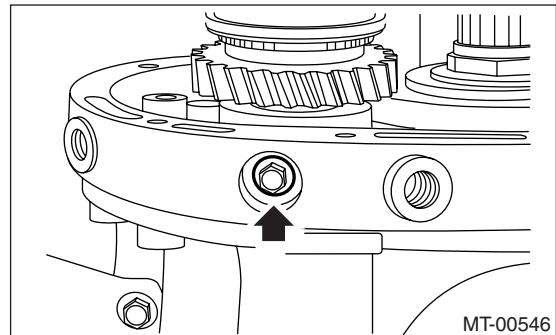
NOTE:

Do not reuse the gasket.



- (A) Checking plug
- (B) Gasket
- (C) Checking spring
- (D) Plunger
- (E) Checking ball

- 13) Remove the bolt and gasket installing reverse idler shaft.



- 14) Press the main shaft assembly, driven gear assembly, reverse idler gear and each shifter fork, then remove from the adapter plate at once.

NOTE:

Two people should do the work.

B: INSTALLATION

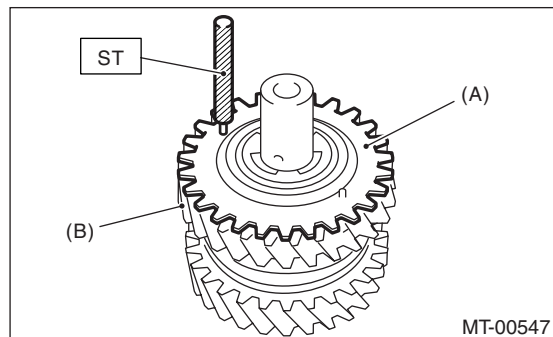
- 1) Adjust the 3rd-4th, and 5th-6th shifter fork rod. <Ref. to 6MT-115, ADJUSTMENT, Shifter Fork and Rod.>

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

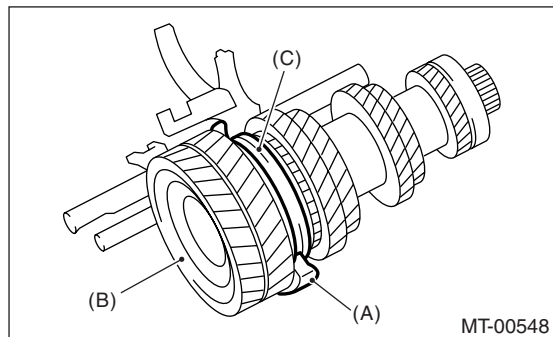
2) Turn the sub gear counterclockwise for approx. three teeth. Align the sub gear and reverse idler gear hole, then insert the ST.

ST 18757AA000 STRAIGHT PIN REMOVER



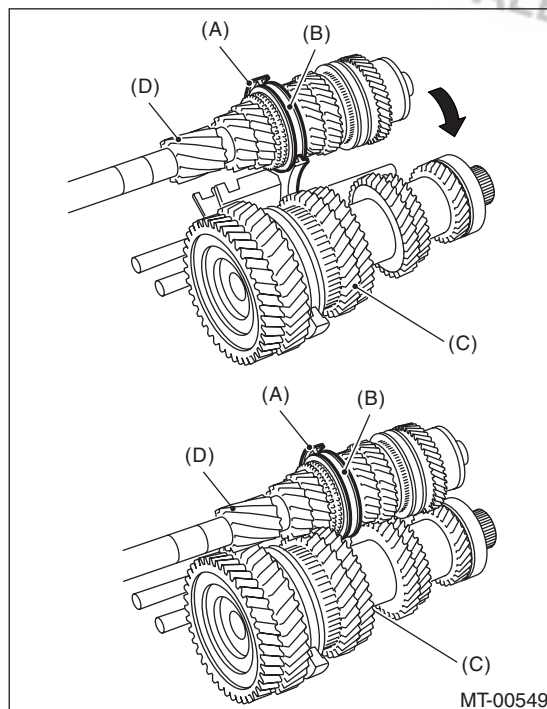
- (A) Sub gear
- (B) Reverse idler gear

3) Install the driven gear assembly to 1st-2nd shifter fork assembly.



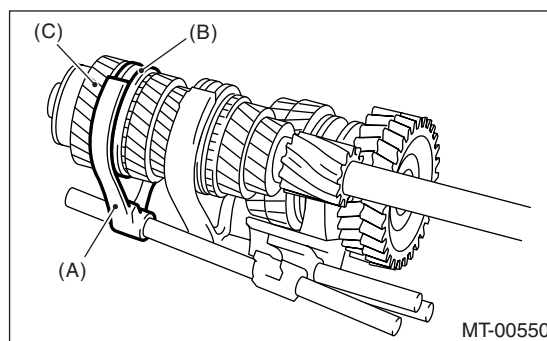
- (A) 1st-2nd shifter fork
- (B) Driven gear ASSY
- (C) 1st-2nd sleeve

4) Install the main shaft assembly to 3rd-4th shifter fork, and then assemble to driven gear assembly.



- (A) 3rd-4th shifter fork
- (B) 3rd-4th sleeve
- (C) Driven gear ASSY
- (D) Main shaft ASSY

5) Install the 5th-6th shifter fork assembly to main shaft assembly.



- (A) 5th-6th shifter fork
- (B) 5th-6th sleeve
- (C) Main shaft ASSY

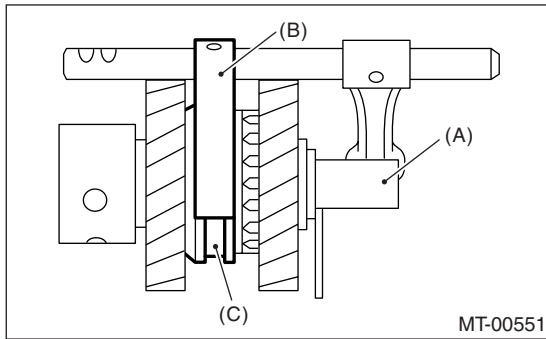
Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

6) Install the reverse shifter fork assembly to reverse idler gear assembly.

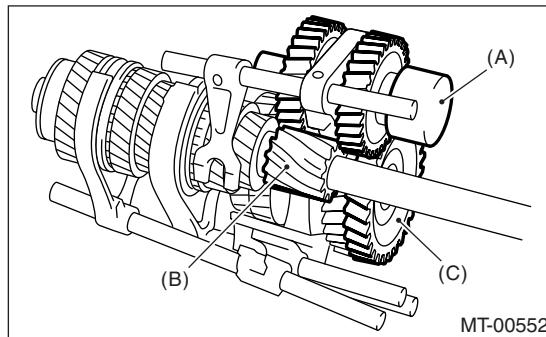
Tightening torque:

37 N·m (3.8 kgf-m, 27.3 ft-lb)



- (A) Reverse idler gear ASSY
- (B) Reverse shifter fork
- (C) Reverse sleeve

7) Install the reverse idler gear assembly.



- (A) Reverse idler gear ASSY
- (B) 1st drive gear
- (C) Reverse gear

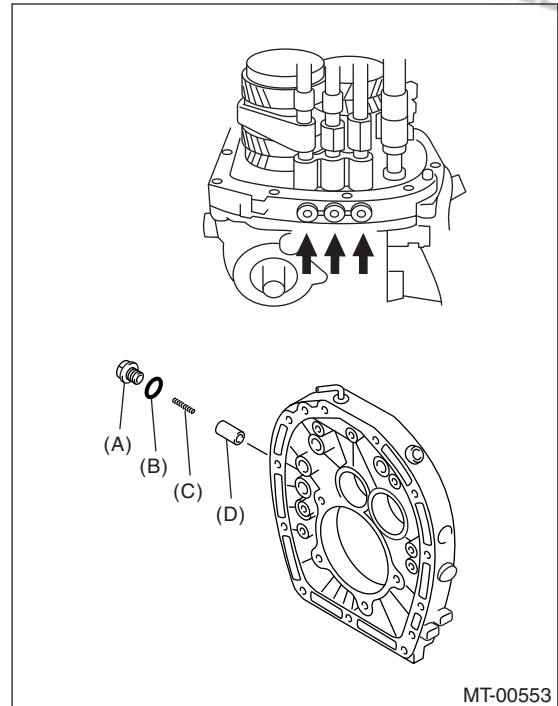
8) Install the thrust bearing of driven gear assembly.

9) Press each shifter fork, main shaft assembly, driven gear assembly and reverse idler gear assembly, then install them to the adapter plate at once.

NOTE:

Two people should do the work.

10) Install the plunger, checking spring, new gasket and checking plug.



- (A) Checking plug
- (B) Gasket
- (C) Checking spring
- (D) Plunger

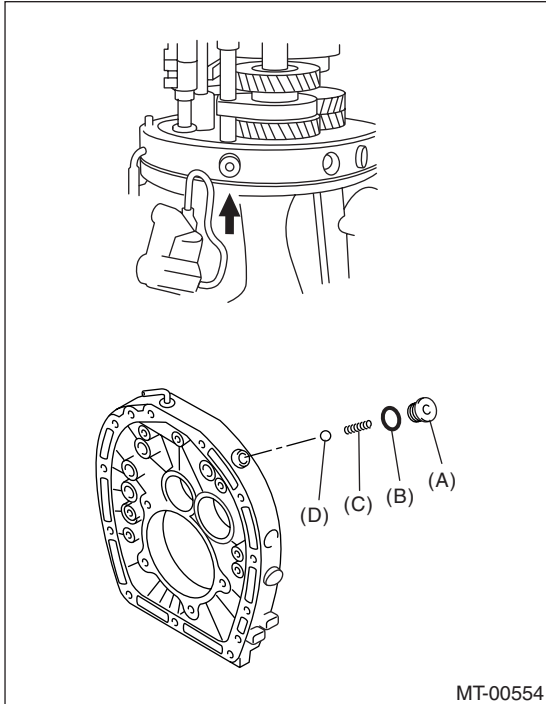
11) Install the checking ball, checking spring, new gasket and checking plug.

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

Tightening torque:

37 N·m (3.8 kgf-m, 27.3 ft-lb)

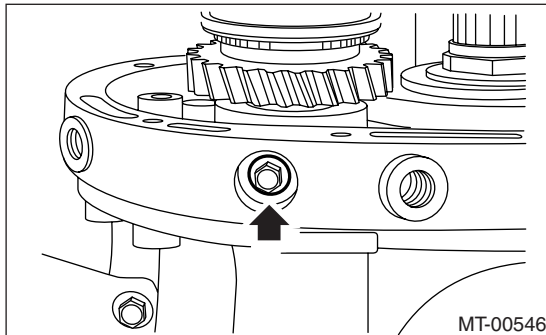


- (A) Checking plug
- (B) Gasket
- (C) Checking spring
- (D) Checking ball

12) Install the bolt and a new gasket.

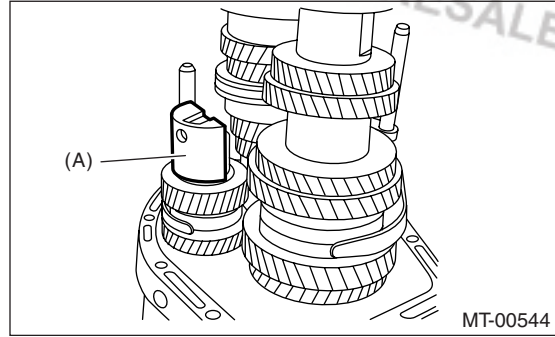
Tightening torque:

25 N·m (2.5 kgf-m, 18.1 ft-lb)



13) Using a screwdriver, shift to 4th gear position.

14) Install the reverse idler holder



(A) Reverse idler holder

15) Install the striking rod.

16) Install the transmission case. <Ref. to 6MT-66, INSTALLATION, Transmission Case.>

17) Install the selected main shaft snap ring and washer.

18) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>

19) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>

20) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>

21) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>

22) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.> <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>

23) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

NOTE:

Each sleeve and hub engage at a specified point. Mark an engagement point on the sleeve and hub before disassembly.

1) Secure the ST on workbench.

ST 18664AA000 BASE

2) Lift the caulking of lock nut.

3) Set the main shaft assembly on ST, then remove the lock nut and washer.

ST1 18665AA000 HOLDER

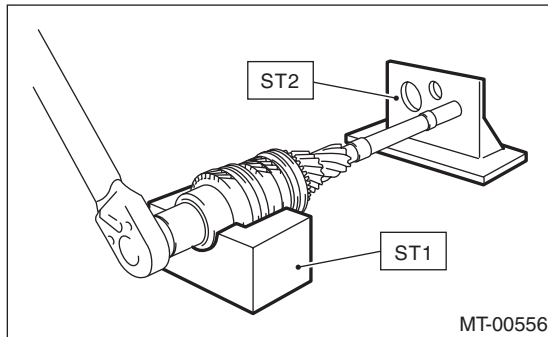
ST2 18664AA000 BASE

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

Use a 38 mm socket wrench.

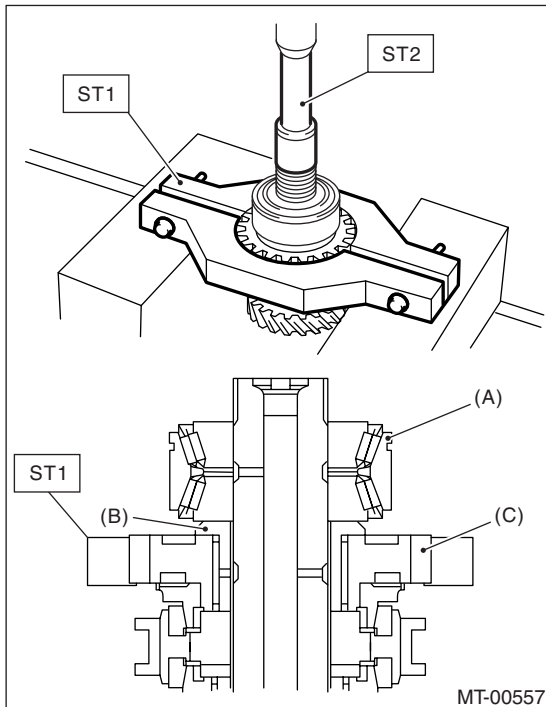


4) Remove the main shaft assembly from ST.

5) Set the ST1 on 6th drive gear, then remove the taper roller bearing, bushing and 6th drive gear using press.

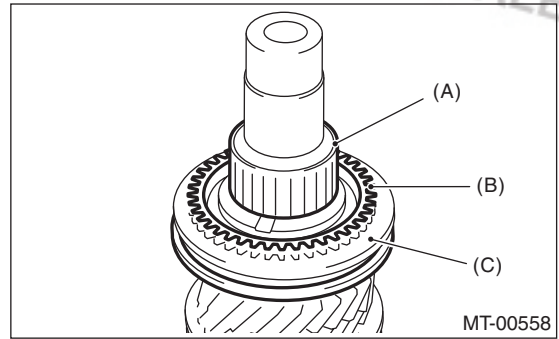
ST1 18722AA010 REMOVER

ST2 899864100 REMOVER



- (A) Taper roller bearing
- (B) Bushing
- (C) 6th drive gear

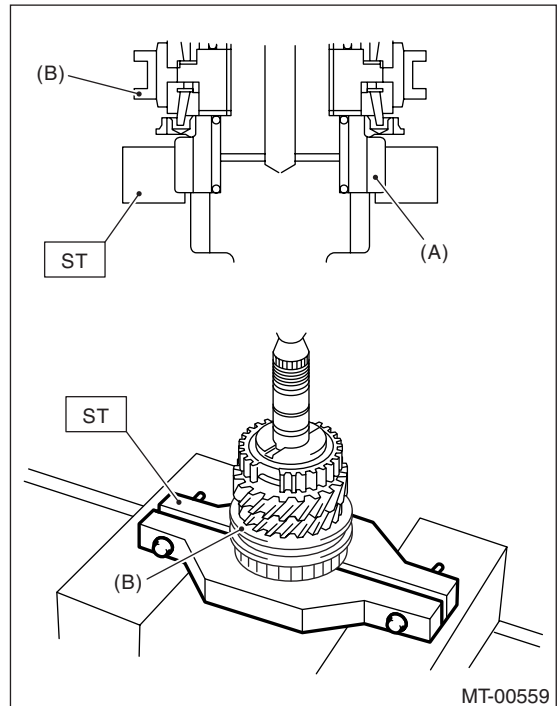
6) Remove the 5th-6th sleeve, 6th needle bearing and 6th baulk ring.



- (A) Needle bearing
- (B) 6th baulk ring
- (C) 5th-6th sleeve

7) Set the ST on 3rd drive gear, then remove each part using press.

ST 18720AA000 REMOVER



- (A) 3rd drive gear
- (B) 3rd-4th sleeve

D: ASSEMBLY

NOTE:

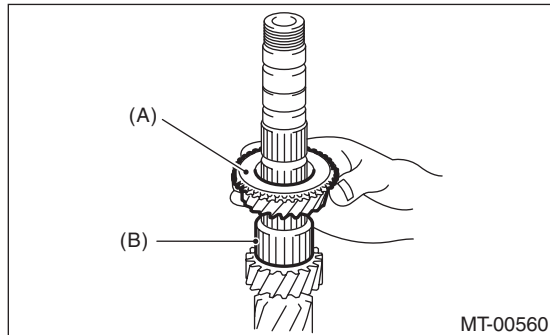
Replace the following parts as a set.

- Sleeve and hub
- Outer baulk ring, 3rd synchro cone and inner baulk ring
- Taper roller bearing

Main Shaft Assembly

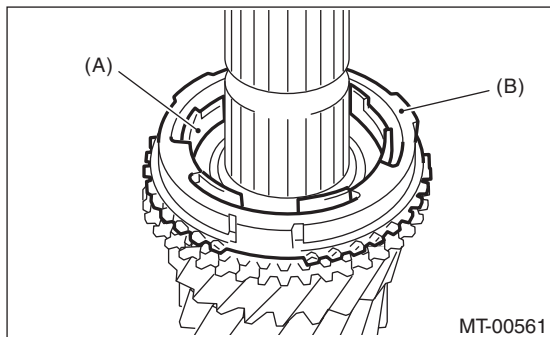
MANUAL TRANSMISSION AND DIFFERENTIAL

- 1) Sufficiently apply gear oil to the main shaft, 3rd needle bearing and inner periphery of 3rd drive gear.
- 2) Install the 3rd needle bearing and 3rd drive gear to main shaft.



- (A) 3rd needle bearing
- (B) 3rd drive gear

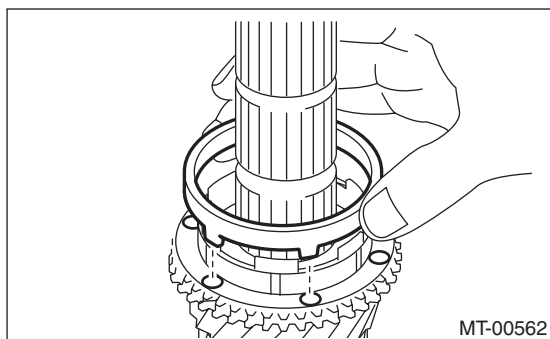
- 3) Install the inner baulk ring, 3rd synchro cone and outer baulk ring.



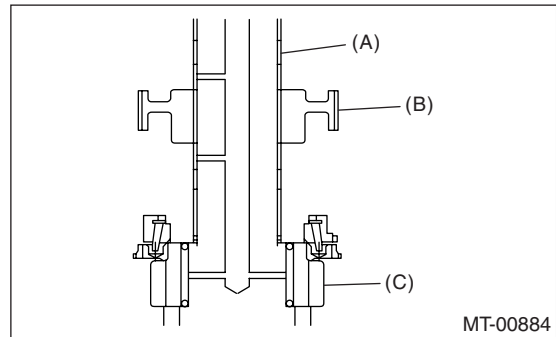
- (A) Inner baulk ring
- (B) Outer baulk ring

NOTE:

Install the 3rd synchro cone, by aligning protrusion portions of the 3rd synchro cone with 3rd drive gear hole portion.

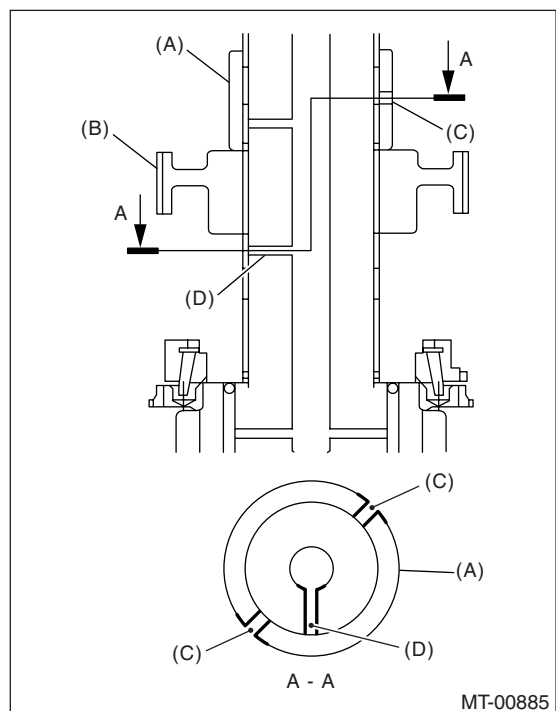


- 4) Install the 3rd-4th hub and 4th bushing.
 - (1) Set them to the main shaft, taking care of 3rd-4th hub installing direction.



- (A) Main shaft
- (B) 3rd-4th hub
- (C) 3rd drive gear

- (2) Set them to the main shaft, taking care not to overlap the main shaft oil hole and 4th bushing oil hole.



- (A) 4th bushing
- (B) 3rd-4th hub
- (C) 4th bushing oil hole
- (D) Main shaft oil hole

- (3) Using the ST, press in the 3rd-4th hub and 4th bushing at once.

ST1 18651AA000 INSTALLER
ST2 398177700 INSTALLER

Main Shaft Assembly

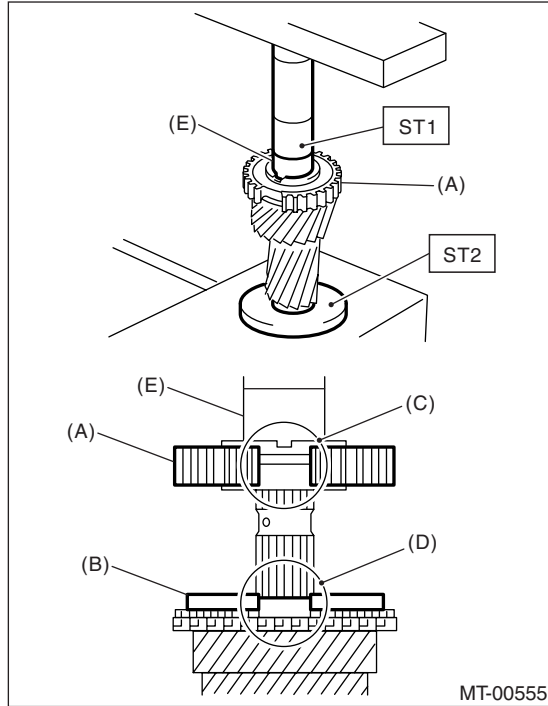
MANUAL TRANSMISSION AND DIFFERENTIAL

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:

When pressing in 3rd-4th hub and 4th bushing, align the protrusion portion of outer baulk ring and cutout portion of 3rd-4th bushing by moving the outer baulk ring.



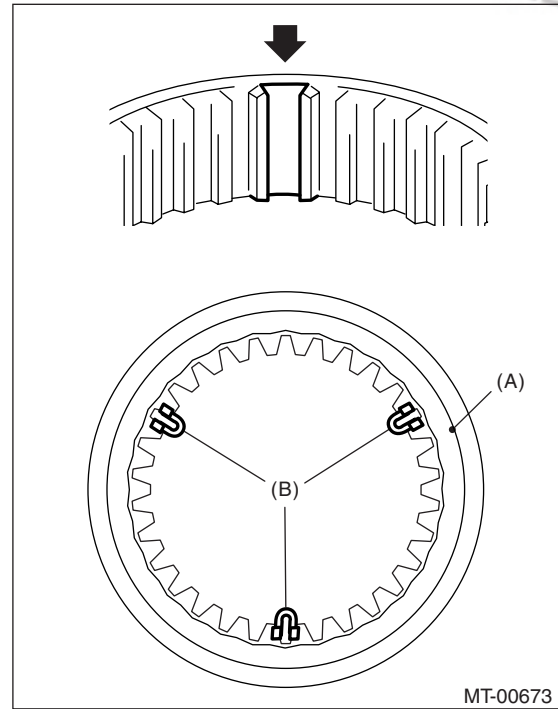
- (A) 3rd-4th hub
- (B) Outer baulk ring
- (C) Cutout portion of 3rd-4th hub
- (D) Protrusion portion of outer baulk ring
- (E) 4th bushing

5) Make sure the 3rd drive gear is smoothly turned by hand. If not, reassemble.

6) Install the 3rd-4th shifting insert key in proper place of 3rd-4th sleeve.

NOTE:

Angle of each shifting insert key is 120° apart.

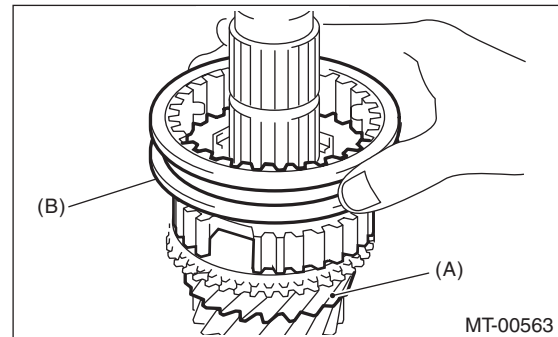


- (A) 3rd-4th sleeve
- (B) 3rd-4th shifting insert key

7) Install the 3rd-4th sleeve to 3rd-4th hub.

NOTE:

- 3rd-4th sleeve has a groove for identification.
- Install the 3rd-4th sleeve with groove facing to 3rd drive gear side.

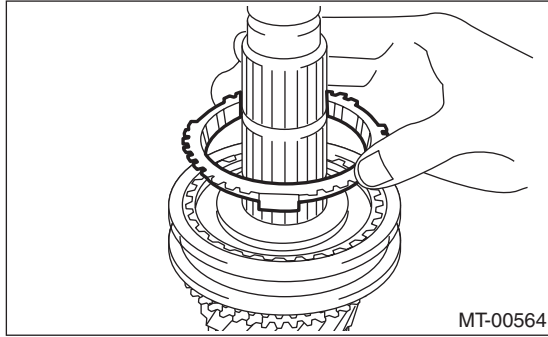


- (A) 3rd drive gear
- (B) Groove (single line) for identification of 3rd-4th sleeve

Main Shaft Assembly

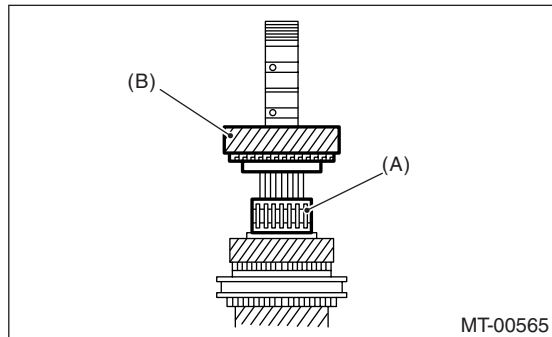
MANUAL TRANSMISSION AND DIFFERENTIAL

8) Install the 4th baulk ring.



9) Sufficiently apply gear oil to the main shaft, 4th needle bearing and inner periphery of 4th drive gear.

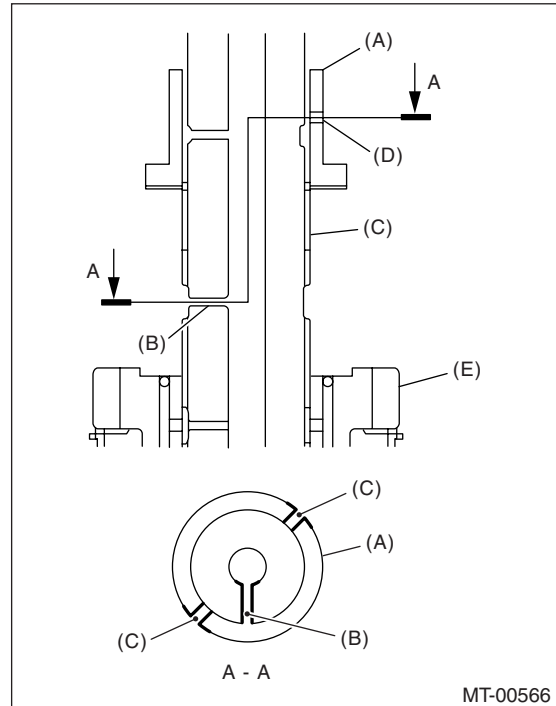
10) Install the 4th needle bearing and 4th drive gear.



- (A) 4th needle bearing
- (B) 4th drive gear

11) Install the 5th bushing.

(1) Set it to the main shaft, taking care not to overlap the main shaft oil hole and 5th bushing oil hole.



- (A) 5th bushing
- (B) Main shaft oil hole
- (C) Main shaft
- (D) 5th bushing oil hole
- (E) 4th drive gear

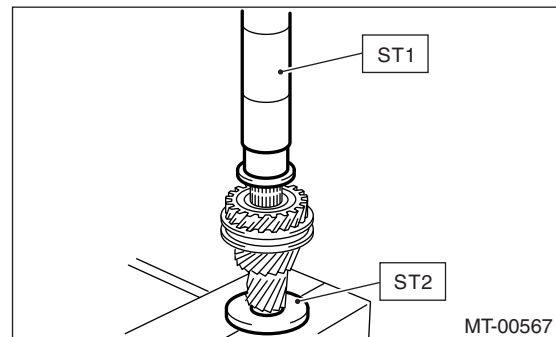
(2) Using the ST, press in the 5th bushing.

ST1 18651AA000 INSTALLER

ST2 398177700 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).



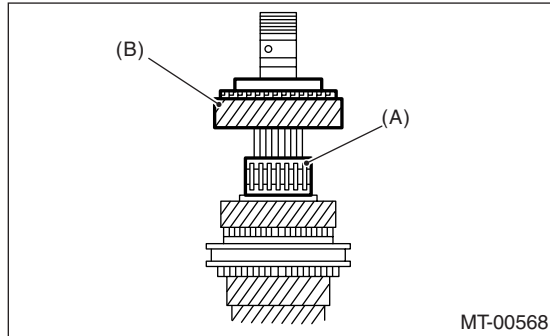
12) Make sure the 4th drive gear is smoothly turned by hand. If not, reassemble.

13) Sufficiently apply gear oil to the main shaft, 5th needle bearing and inner periphery of 5th drive gear.

Main Shaft Assembly

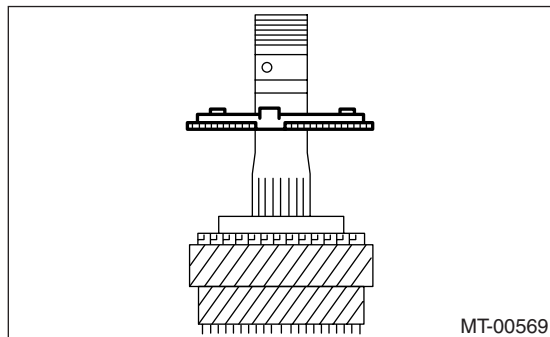
MANUAL TRANSMISSION AND DIFFERENTIAL

14) Install the 5th needle bearing and 5th drive gear.



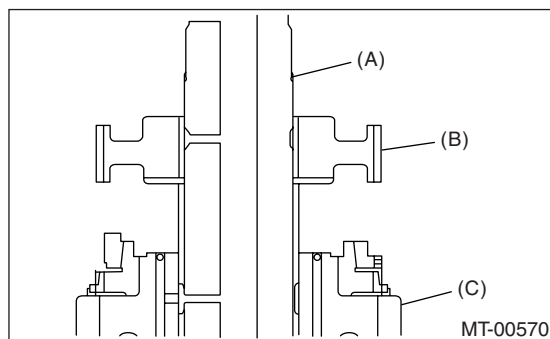
- (A) 5th needle bearing
- (B) 5th drive gear

15) Install the 5th baulk ring.



16) Install the 5th-6th hub.

- (1) Set it to the main shaft, taking care of 5th-6th hub installing direction.



- (A) Main shaft
- (B) 5th-6th hub
- (C) 5th drive gear

- (2) Using the ST, press in the 5th-6th hub.

ST1 18651AA000 INSTALLER

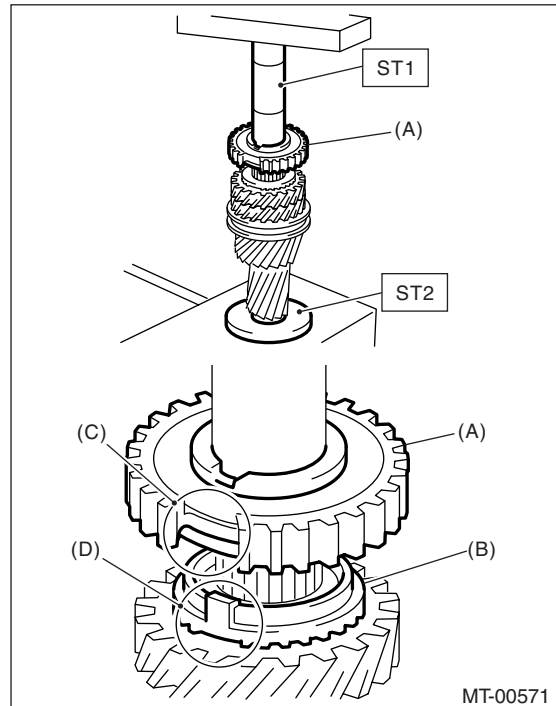
ST2 398177700 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:

When pressing in 5th-6th hub, align the protrusion portion of outer baulk ring and cutout portion of 5th-6th bushing by moving the outer baulk ring.



- (A) 5th-6th hub
- (B) Outer baulk ring
- (C) Cutout portion of 5th-6th hub
- (D) Protrusion portion of outer baulk ring

17) Make sure the 5th drive gear is smoothly turned by hand. If not, reassemble.

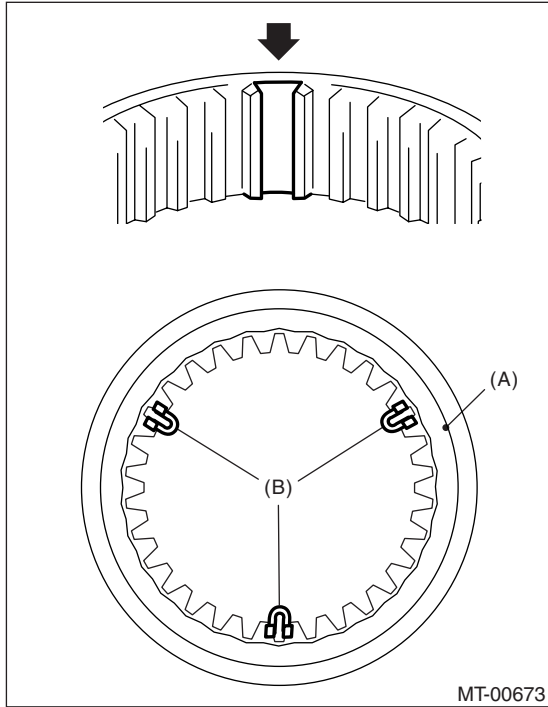
18) Install the 5th-6th shifting insert key in proper place of 5th-6th sleeve.

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

Angle of each shifting insert key is 120° apart.

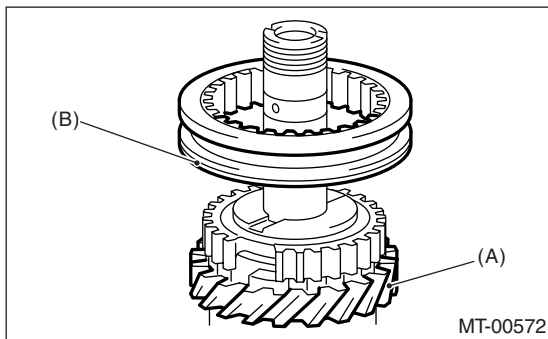


- (A) 5th-6th sleeve
(B) Shifting insert key

19) Install the 5th-6th sleeve to 5th-6th hub.

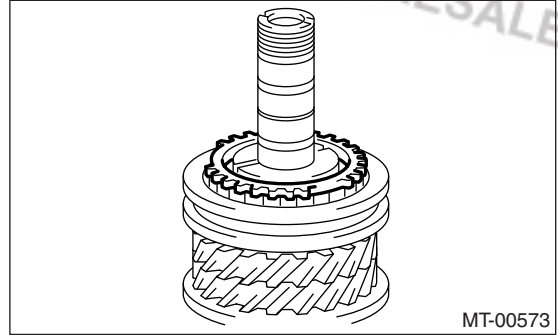
NOTE:

- 5th-6th sleeve has two grooves for identification.
- Install the 5th-6th sleeve with the groove facing to 5th drive gear side.



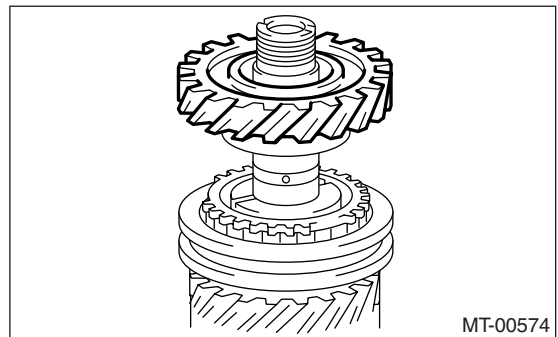
- (A) 5th drive gear
(B) Groove (2 lines) for identification of 5th-6th sleeve

20) Install the 6th baulk ring.

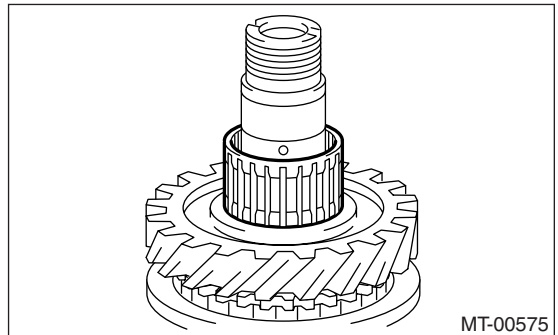


21) Sufficiently apply gear oil to the main shaft, 6th needle bearing and inner periphery of 6th drive gear.

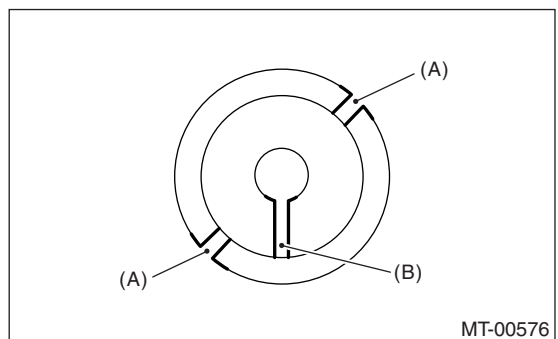
22) Install the 6th drive gear.



23) Install the 6th needle bearing.



24) Set the 6th bushing to main shaft, taking care not to overlap the 6th bushing oil hole and main shaft oil hole.



- (A) 6th bushing oil hole
(B) Main shaft oil hole

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

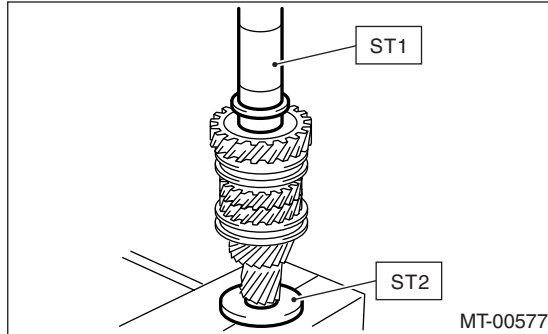
25) Using the ST, install the 6th bushing.

ST1 18651AA000 INSTALLER

ST2 398177700 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).



26) Make sure the 6th drive gear is smoothly turned by hand. If not, reassemble.

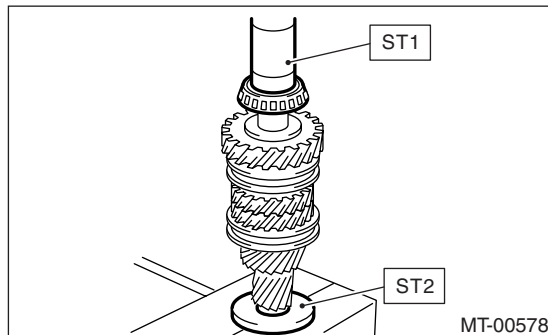
27) Using the ST, install the inner bearing inner race.

ST1 18651AA000 INSTALLER

ST2 398177700 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).



28) Using the ST, install the retainer and outer bearing inner race.

ST1 18651AA000 INSTALLER

ST2 398177700 INSTALLER

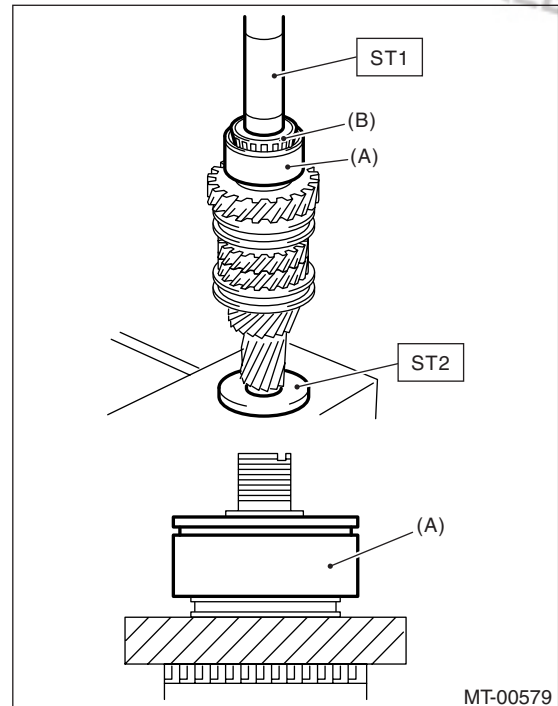
CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:

- Make sure to install the retainer in proper direction.

- Press in until there is no backlash in retainer and where bearing is smoothly turned by hand.



(A) Retainer

(B) Outer bearing inner race

29) Make sure the taper roller bearing is smoothly turned by hand. If not, replace the taper roller bearing as a set and reassemble.

30) Install the lock washer and new lock nut.

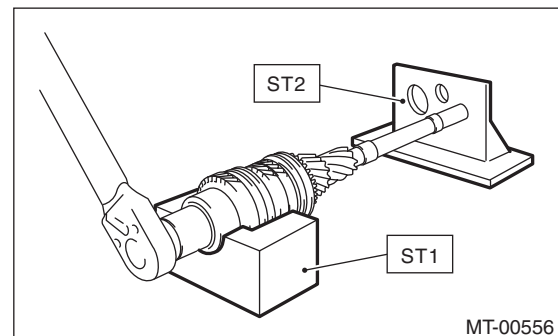
31) Set the main shaft assembly to ST, then tighten the lock nut.

ST1 18665AA000 HOLDER

ST2 18664AA000 BASE

Tightening torque:

392 N·m (40.0 kgf-m, 289 ft-lb)



32) Using the ST, caulk four portions on the lock nut to obtain dimension A 27 ± 0.3 mm (1.06 ± 0.01 in).

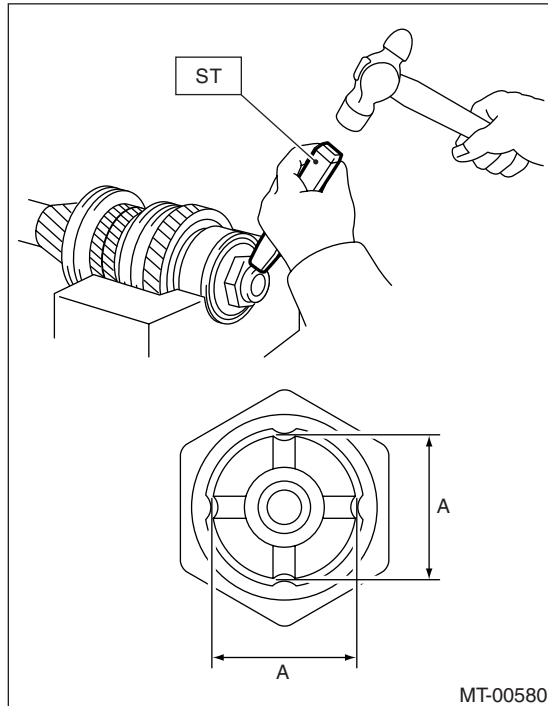
ST 18668AA000 PUNCH

Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

Do not crack the caulking part of lock nut.



E: INSPECTION

Disassembled parts should be washed clean first and then inspected carefully.

1) Bearing

Replace the bearings in the following cases.

- Worn, rusted and damaged bearing
- Bearings that fail to turn smoothly or make abnormal noise when turned
- Bearings having other defects

2) Bushing (each gear)

Replace the bushings in the following case.

- When the sliding surface is damaged or abnormally worn.

3) Gears

Replace the gears in the following cases.

- Gear teeth surfaces are broken or excessively worn.
- Parts that contact the baulk ring is damaged.
- The inner surface of gear is damaged.

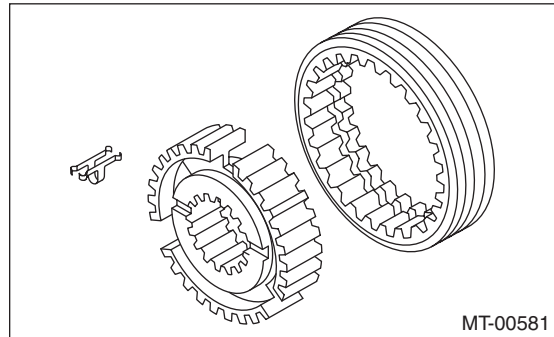
4) Baulk ring, synchro cone

Replace the baulk ring and synchro cone in the following case.

- Worn, rusted and damaged baulk ring

5) Shifting insert key

Replace the shifting insert key if deformed, excessively worn or defective in any way.



F: ADJUSTMENT

1. SELECTION OF MAIN SHAFT SNAP RING AND WASHER

NOTE:

Perform the following procedures when:

- Replacing the 1st to 6th driven gear.
- Replacing the 1st and 2nd synchro ring assembly.
- Replacing the ball bearing.
- Replacing the adapter plate.
- Replacing the driven shaft.

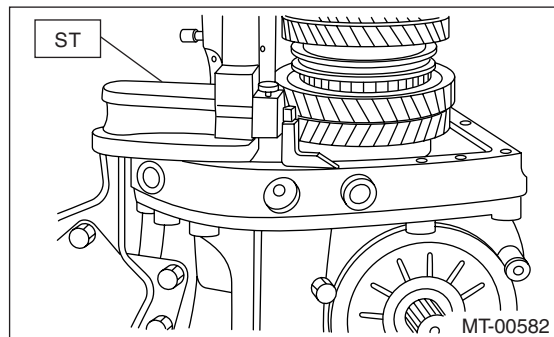
1) Insert the drive pinion assembly in adapter plate.

NOTE:

Make sure the thrust bearing outer race is not removed and drive pinion is not lift-up.

2) Set the height gauge to adapter plate. Lower the indicator of height gauge to mating surface of adapter plate and case, then set to zero point.

ST 18853AA000 HEIGHT GAUGE



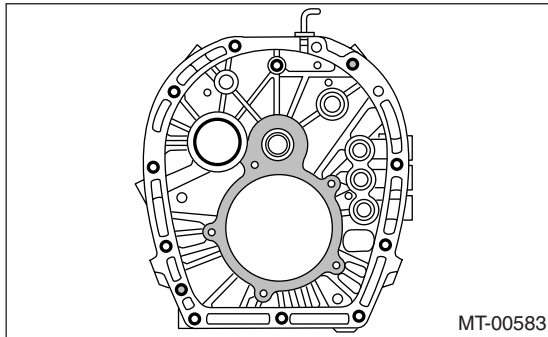
NOTE:

- Remove the remaining gasket on edge surface with scraper, since the adapter plate is base point of measurement.

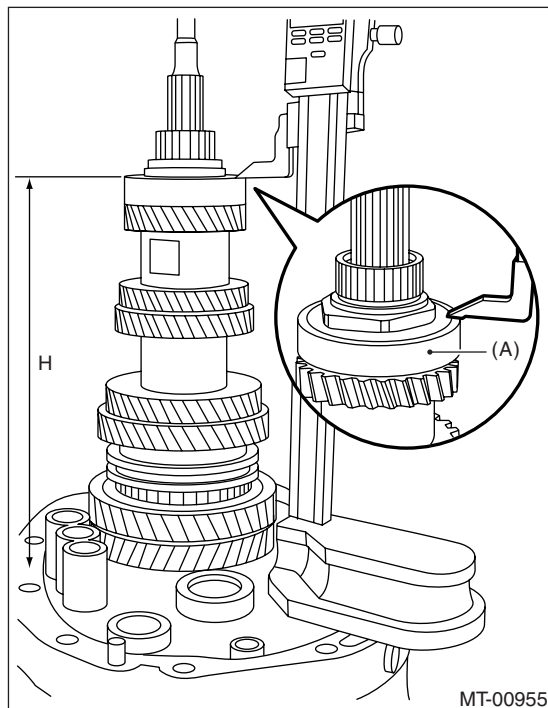
Main Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

- Do not place the height gauge on shaded area in the figure during measurement.



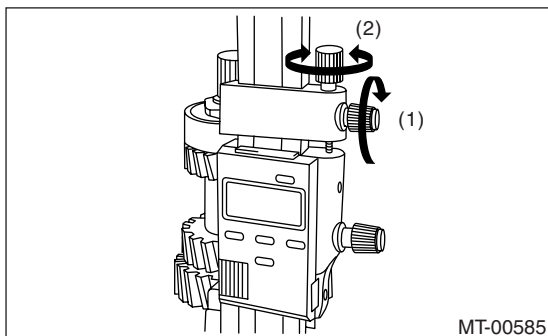
- Measure the height to edge surface of ball bearing (height H).



(A) Ball bearing

NOTE:

Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of bearing.



Measure the five points of ball bearing by turning every approx. 120°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.

- According to measurement value, select the snap ring and washer from the following table.

Snap ring

H: mm (in)	Part No.	Thickness: mm (in)
270.83 — 271.40 (10.66 — 10.69)	805072010	1.65 (0.065)
271.41 — 271.98 (10.69 — 10.71)	805072011	1.95 (0.077)
271.99 — 272.56 (10.71 — 10.73)	805072012	2.25 (0.089)

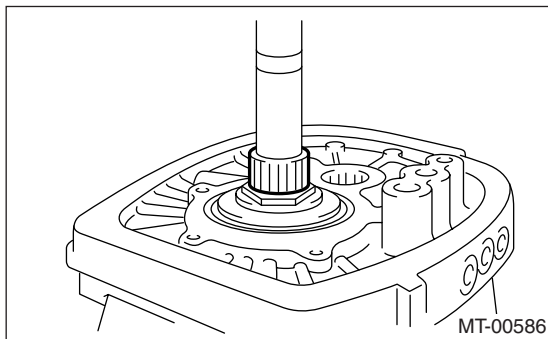
Washer

H: mm (in)	Part No.	Thickness: mm (in)
270.83 — 271.40 (10.66 — 10.69)	803067012	1.6 (0.063)
271.41 — 271.98 (10.69 — 10.71)	803067011	1.3 (0.051)
271.99 — 272.56 (10.71 — 10.73)	803067010	1.0 (0.039)

21. Driven Gear Assembly

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.> <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-65, REMOVAL, Transmission Case.>
- 9) Remove the driven gear assembly. <Ref. to 6MT-70, REMOVAL, Main Shaft Assembly.>
- 10) Remove the needle bearing.



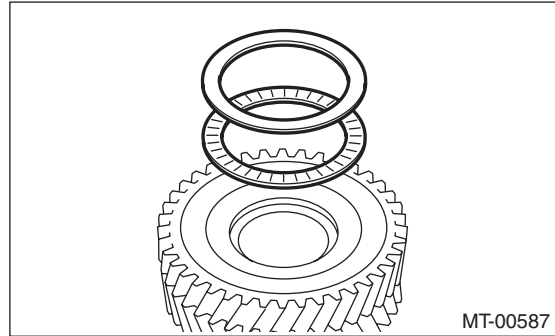
- 11) Remove the thrust needle bearing.

B: INSTALLATION

- 1) Adjust the main shaft snap ring. <Ref. to 6MT-81, ADJUSTMENT, Main Shaft Assembly.>
- 2) Adjust the 1st-2nd shifter rod. <Ref. to 6MT-115, ADJUSTMENT, Shifter Fork and Rod.>
- 3) Install the thrust needle bearing.

NOTE:

Make sure to install the thrust needle bearing in proper direction.



- 4) Install the 1st needle bearing.
- 5) Install the driven gear assembly. <Ref. to 6MT-70, INSTALLATION, Main Shaft Assembly.>
- 6) Install the transmission case. <Ref. to 6MT-66, INSTALLATION, Transmission Case.>
- 7) Adjust backlash at axial direction of driven gear assembly. <Ref. to 6MT-90, ADJUSTMENT, Driven Gear Assembly.>
- 8) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>
- 9) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 10) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 11) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 12) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.> <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>
- 13) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

NOTE:

Each sleeve and hub engage at a specified point. Mark an engagement point on the sleeve and hub before disassembly.

- 1) Secure the ST on workbench.
ST 18664AA000 BASE
- 2) Lift the caulking of lock nut.

Driven Gear Assembly

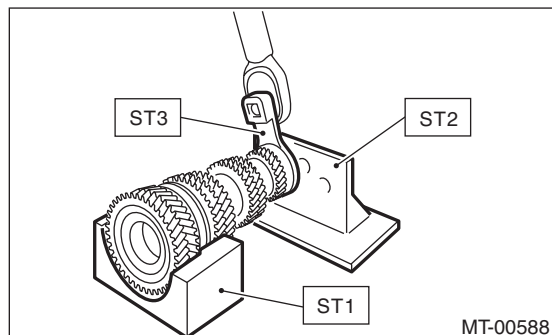
MANUAL TRANSMISSION AND DIFFERENTIAL

3) Install the ST3 to lock nut, set the driven gear assembly on ST, then remove the lock nut.

ST1 18666AA000 HOLDER

ST2 18664AA000 BASE

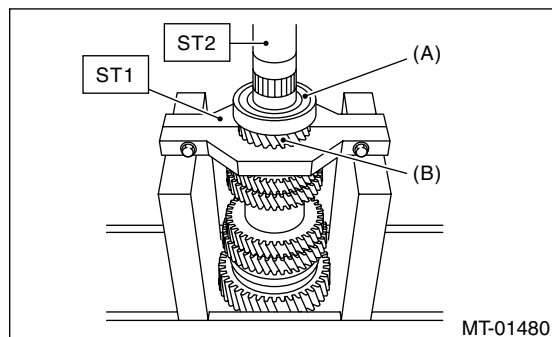
ST3 18620AA000 ADAPTER WRENCH



4) Install the ST1 to 6th gear, then remove the ball bearing and 5th-6th driven gear.

ST1 18723AA000 REMOVER

ST2 499877000 RACE 4-5 INSTALLER



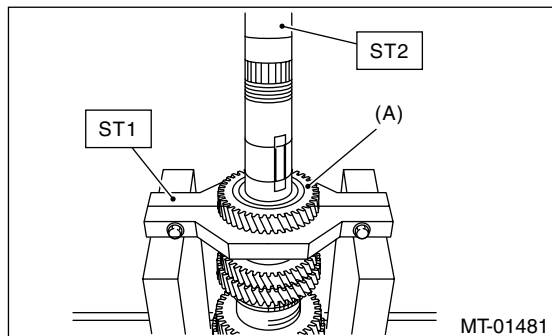
(A) Ball bearing

(B) 5th-6th driven gear

5) Install the ST1 to 4th gear, then remove the 3rd-4th driven gear.

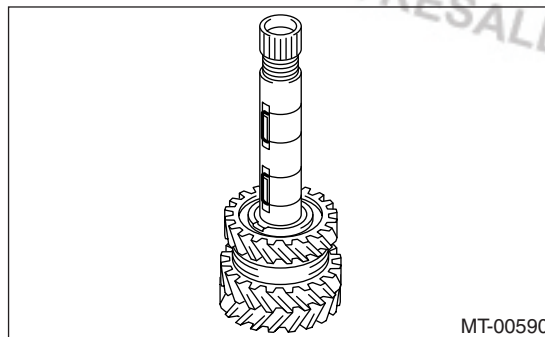
ST1 18723AA000 REMOVER

ST2 499877000 RACE 4-5 INSTALLER

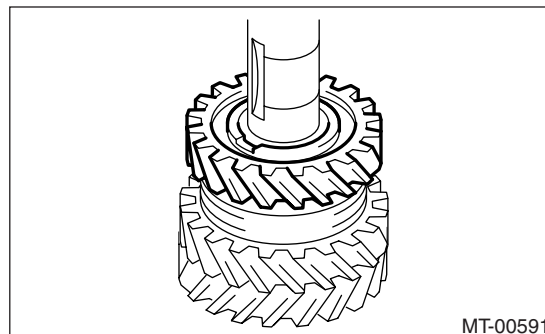


(A) 3rd-4th driven gear

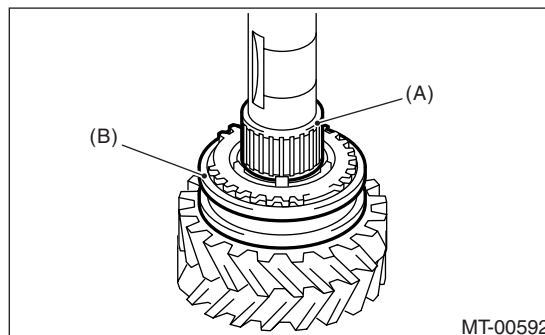
6) Remove the driven gear key.



7) Remove the 2nd gear.



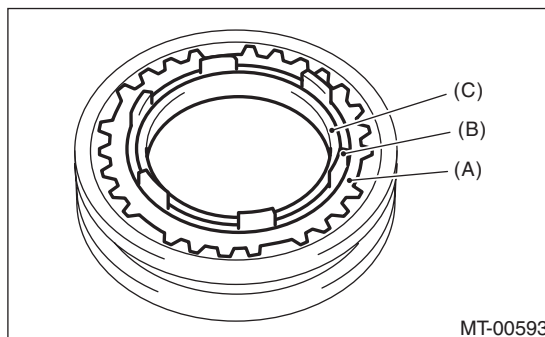
8) Remove the needle bearing and 1st-2nd sleeve.



(A) Needle bearing

(B) 1st-2nd sleeve

9) Remove the outer baulk ring, 2nd synchro cone and inner baulk ring.



(A) Outer baulk ring

(B) 2nd synchro cone

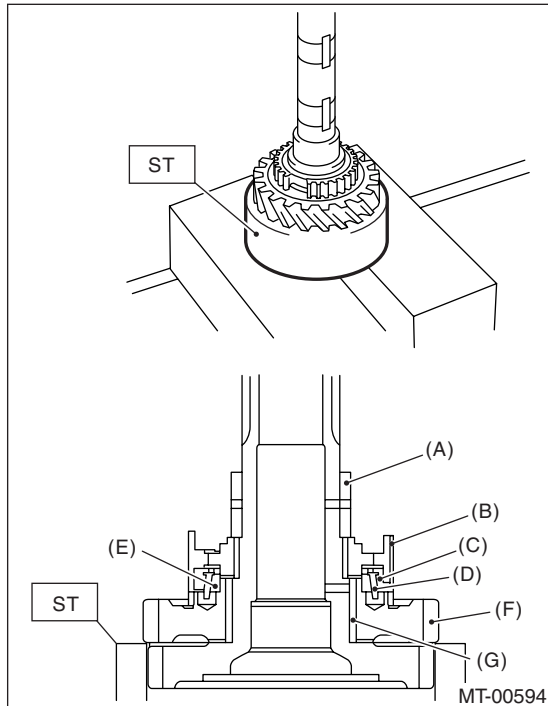
(C) Inner baulk ring

Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

10) Using the ST, remove each part.

ST 18754AA000 REMOVER



- (A) 2nd bushing
- (B) 1st-2nd hub
- (C) Outer baulk ring
- (D) 1st synchro cone
- (E) Inner baulk ring
- (F) 1st driven gear
- (G) 1st needle bearing

D: ASSEMBLY

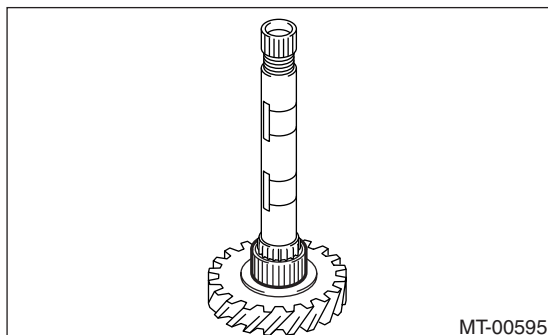
NOTE:

Replace the following parts as a set.

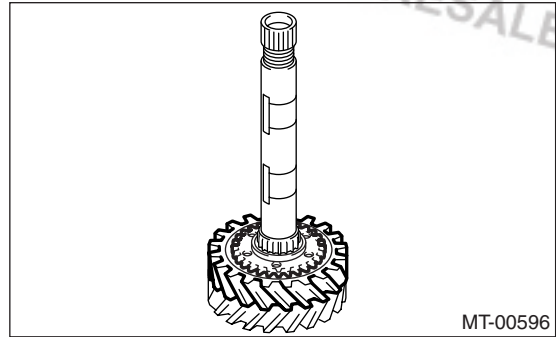
- Sleeve and hub
- Outer baulk ring, 1st synchro cone, inner baulk ring
- Outer baulk ring, 2nd synchro cone, inner baulk ring

1) Sufficiently apply gear oil to the drive shaft, 1st needle bearing and inner periphery of 1st driven gear.

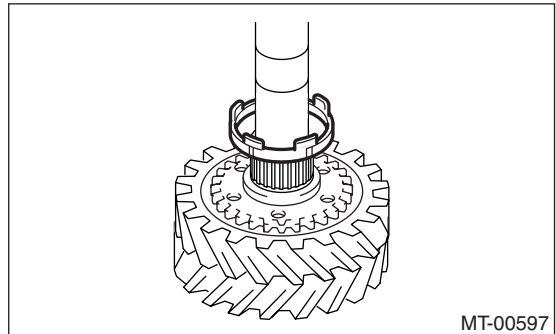
2) Install the 1st needle bearing.



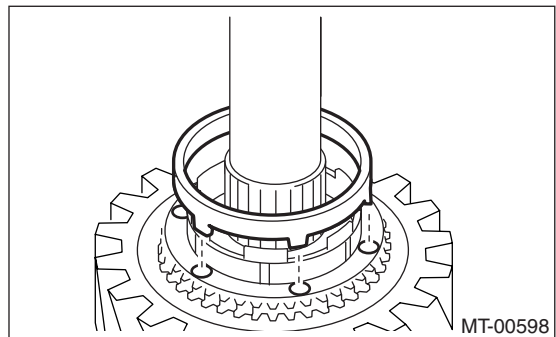
3) Install the 1st driven gear to driven shaft.



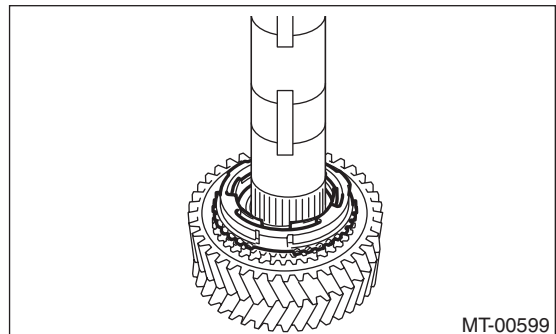
4) Install the inner baulk ring.



5) Align protrusion portions of the 1st synchro cone to the holes of 1st drive gear to install.



6) Install the outer baulk ring.



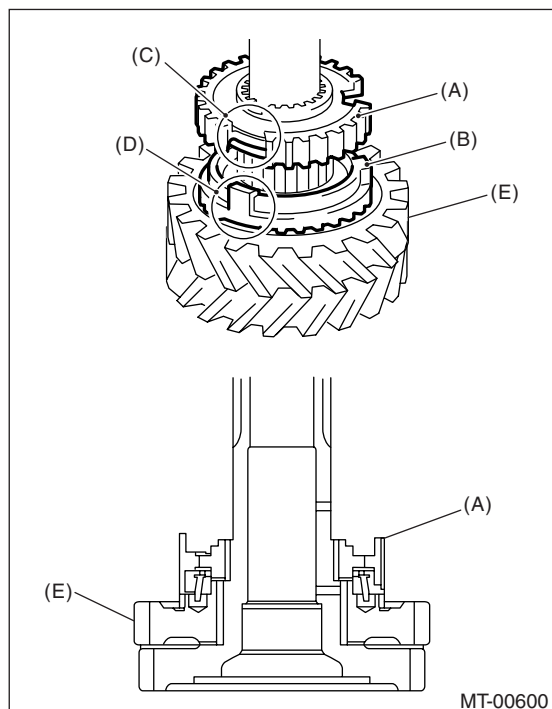
7) Install the 1st-2nd hub.

Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

- Align the protrusion portion of outer baulk ring and cutout portion of 1st-2nd hub, then install.
- Make sure to install the 1st-2nd hub in proper direction.



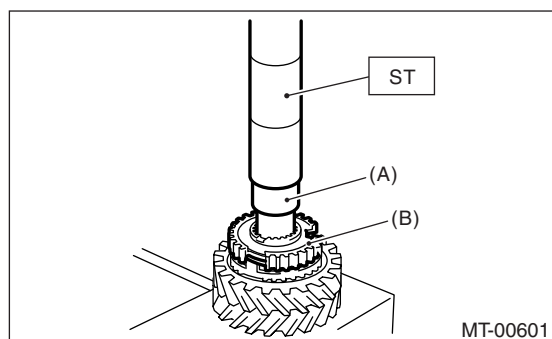
- (A) 1st-2nd hub
- (B) Outer baulk ring
- (C) Cutout portion of 1st-2nd hub
- (D) Protrusion portion of outer baulk ring
- (E) 1st driven gear

8) Using the ST, install the 2nd hub.

ST 18654AA000 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).



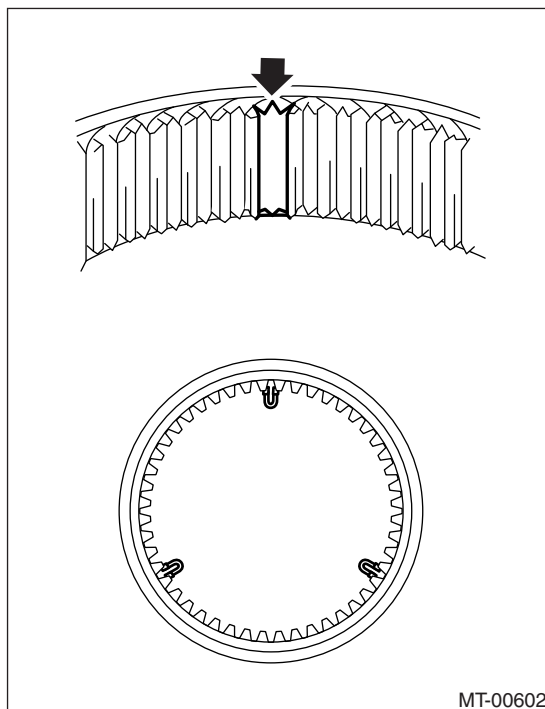
- (A) 2nd bushing
- (B) 1st-2nd hub

9) Make sure the 1st drive gear is smoothly turned by hand. If not, reassemble.

10) Install the shifting insert key in proper place of 1st-2nd sleeve.

NOTE:

Angle of each shifting insert key is 120° apart.



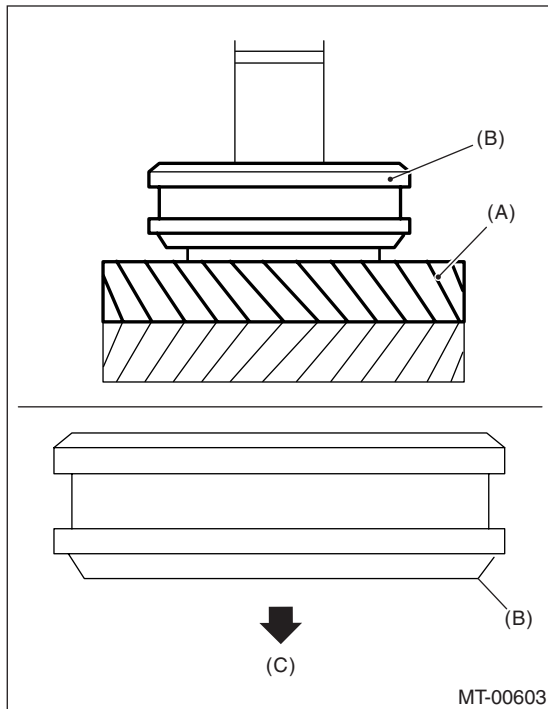
11) Install the 1st-2nd sleeve to 1st-2nd hub.

Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

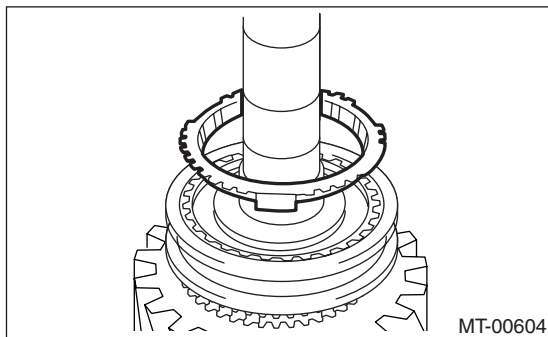
NOTE:

Make sure to install the 1st-2nd sleeve in proper direction.

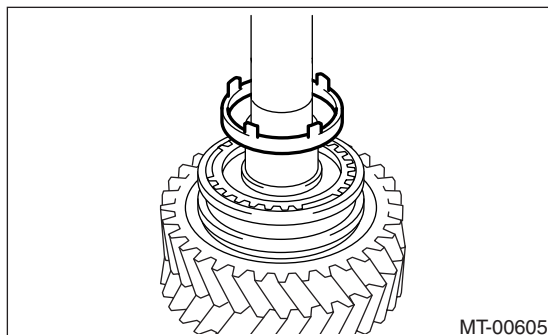


- (A) 1st driven gear
- (B) 1st-2nd sleeve
- (C) 1st driven gear side

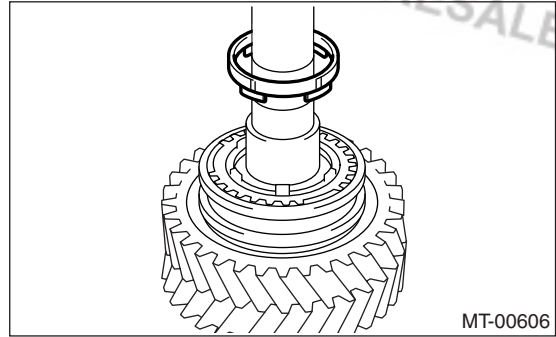
12) Install the outer baulk ring.



13) Install the 2nd synchro cone.



14) Install the inner baulk ring.

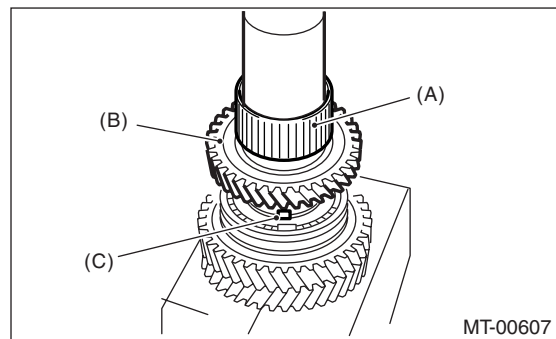


15) Sufficiently apply gear oil to the bushing, 2nd needle bearing and inner periphery of 2nd drive gear.

16) Install the 2nd needle bearing and 2nd driven gear.

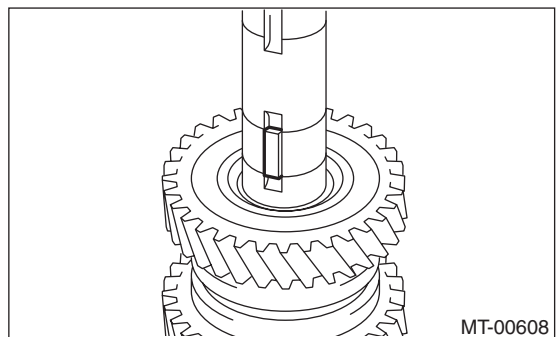
NOTE:

Align the protrusion portion of 2nd synchro cone with 2nd driven gear hole, then install them.



- (A) 2nd needle bearing
- (B) 2nd driven gear
- (C) Protrusion portion of 2nd synchro cone

17) Install the key.



18) Using the ST, install the 3rd-4th driven gear.
ST 18654AA000 INSTALLER

CAUTION:

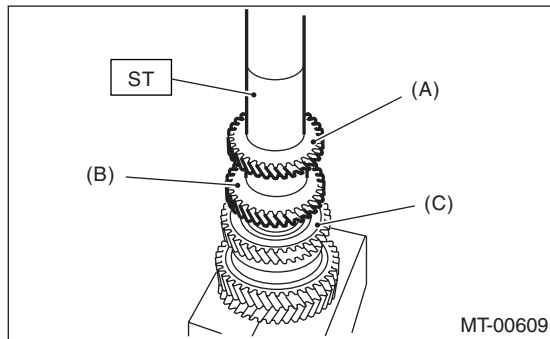
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

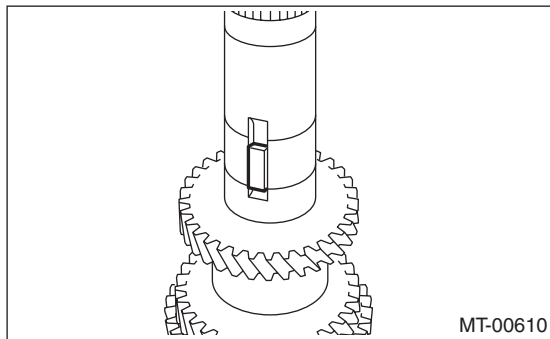
- Make sure to install the 3rd-4th driven gear in proper direction.
- Align the groove of 3rd-4th driven gear with key.



- (A) 4th gear
(B) 3rd gear
(C) 2nd gear

19) Make sure the 2nd driven gear is smoothly turned by hand. If not, reassemble.

20) Install the key.



21) Using the ST, install the 5th-6th driven gear.
ST 18654AA000 INSTALLER

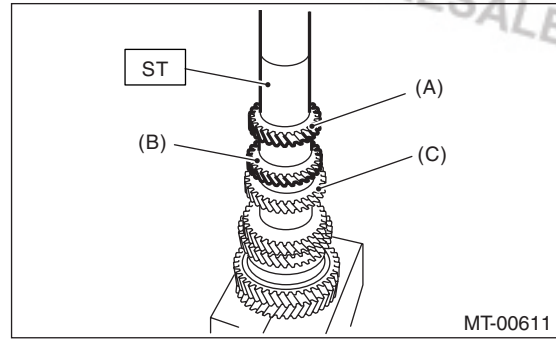
CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:

- Make sure to install the 5th-6th driven gear in proper direction.

- Align the groove of 5th-6th driven gear with key.



- (A) 6th gear
(B) 5th gear
(C) 4th gear

22) Using the ST, install the ball bearing.

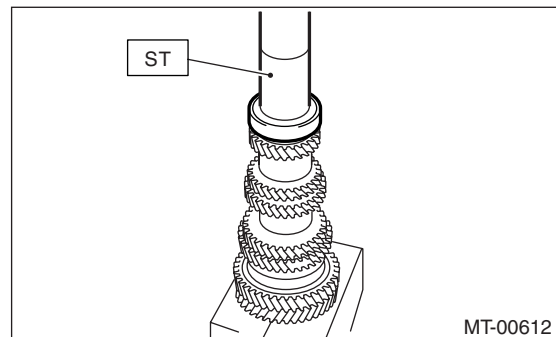
ST 18654AA000 INSTALLER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:

Make sure to install the ball bearing in proper direction.



23) Make sure the ball bearing is smoothly turned by hand. If not, reassemble.

24) Install a new lock nut.

25) Install the ST3 to lock nut, then install the ST to driven gear assembly and tighten lock nut.

ST1 18666AA000 HOLDER

ST2 18664AA000 BASE

ST3 18620AA000 ADAPTER WRENCH

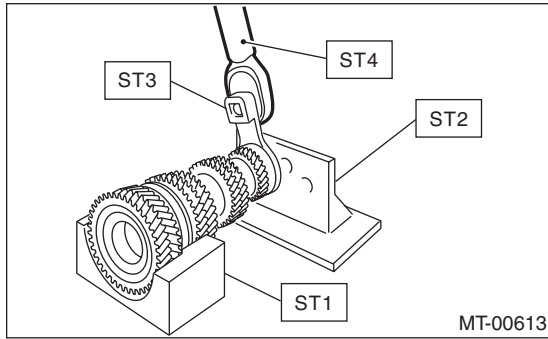
ST4 18852AA000 TORQUE WRENCH

Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

Tightening torque:

530 N·m (54.0 kgf-m, 391 ft-lb)

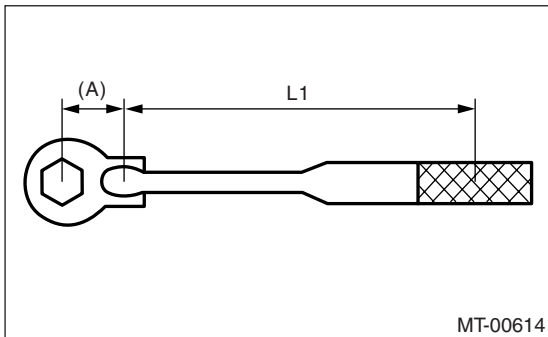


NOTE:

If torque wrench except ST4 is used, calculate the following equation, then tighten the lock nut.

$$T = L1 / (0.1 + L1) \times 570$$

T	N·m (kgf-m, ft-lb)	Setting value of torque wrench
L1	m (in)	Torque wrench length
0.1 m (3.94 in)		ST length
570 N·m (58.1 kgf-m, 420 ft-lb)		Tightening torque of lock nut



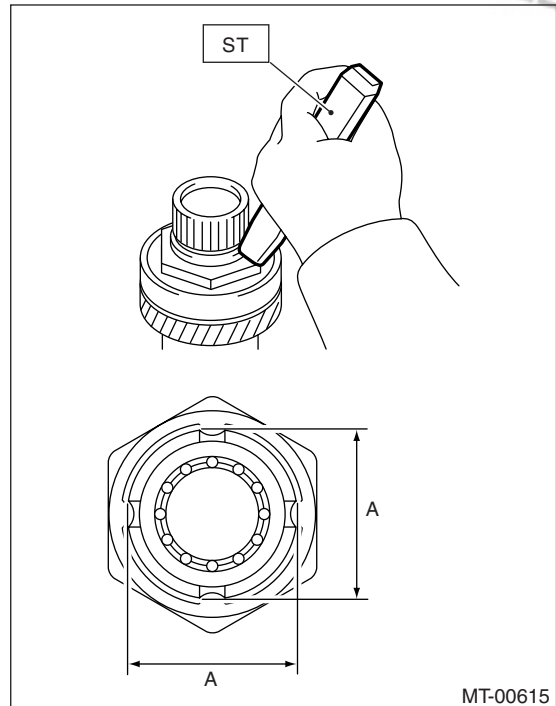
(A) 0.1 m (3.94 in)

26) Using the ST, caulk four portions on the lock nut to obtain dimension A 44 ± 0.5 mm (1.73 ± 0.02 in).

ST 18669AA000 PUNCH

NOTE:

Do not crack the caulking part of lock nut.



E: INSPECTION

Disassembled parts should be washed clean first and then inspected carefully.

1) Bearing

Replace the bearings in the following cases.

- Worn, rusted and damaged bearing
- Bearings that fail to turn smoothly or make abnormal noise when turned
- Bearings having other defects

2) Bushing (each gear)

Replace the bushings in the following case.

- When the sliding surface is damaged or abnormally worn.

3) Gears

Replace the gears in the following cases.

- Gear teeth surfaces are broken or excessively worn.
- Parts that contact the baulk ring is damaged.
- The inner surface of gear is damaged.

4) Baulk ring, synchro cone

Replace the baulk ring and synchro cone in the following case:

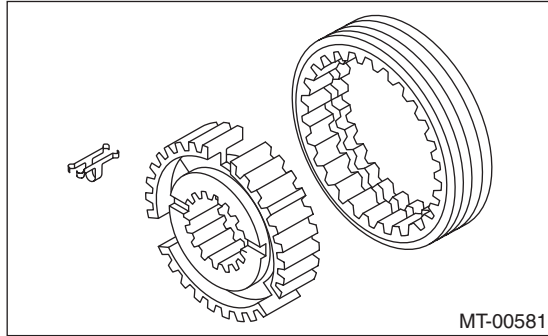
- Worn, rusted and damaged baulk ring

5) Shifting insert key

Driven Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

Replace the shifting insert key if deformed, excessively worn or defective in any way.



3) Select 0 to 3 washers from the following table to adjust backlash closest to specification.

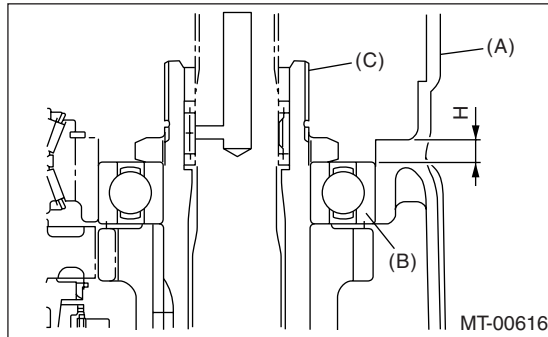
Backlash specification at axial direction of driven gear assembly:

0.1 — 0.3 mm (0.0039 — 0.0118 in)

Washer	
Part No.	Thickness t mm (in)
803072030	0.15 (0.0059)
803072031	0.30 (0.0118)
803072032	0.45 (0.0177)
803072033	0.60 (0.0236)

F: ADJUSTMENT

1) Measure length “H”, which is from transmission case and oil pump cover mating surface to ball bearing edge.



- (A) Transmission case
- (B) Ball bearing
- (C) Driven gear ASSY

2) Using the following equation, calculate the washer thickness of driven gear assembly.

$$T = H - \{5.8 \pm 0.05 \text{ mm (0.23} \pm 0.002 \text{ in)}\} - \{0.1 \text{ to } 0.3 \text{ mm (0.0039 to 0.0118 in)}\}$$

t	Thickness of washer
H	Length from transmission case and oil pump cover mating surface to ball bearing edge
5.8±0.05 mm (0.23±0.002 in)	Thickness of collar
0.1 to 0.3 mm (0.0039 to 0.0118 in)	Backlash specification at axial direction of driven gear assembly

22.Reverse Idler Gear Assembly

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.> <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-65, REMOVAL, Transmission Case.>
- 9) Remove the reverse idler gear assembly. <Ref. to 6MT-70, REMOVAL, Main Shaft Assembly.>

B: INSTALLATION

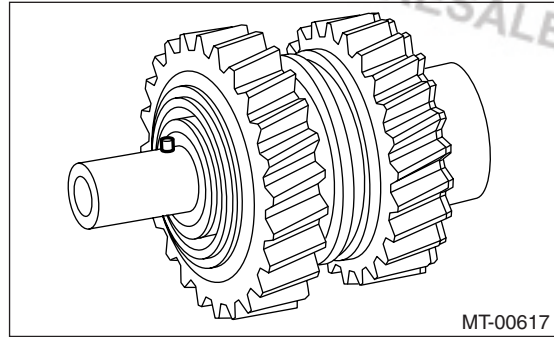
- 1) Select the reverse fork rod. <Ref. to 6MT-115, ADJUSTMENT, Shifter Fork and Rod.>
- 2) Install the reverse idler gear assembly. <Ref. to 6MT-70, INSTALLATION, Main Shaft Assembly.>
- 3) Install the transmission case. <Ref. to 6MT-66, INSTALLATION, Transmission Case.>
- 4) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>
- 5) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 6) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 7) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 8) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.> <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>
- 9) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

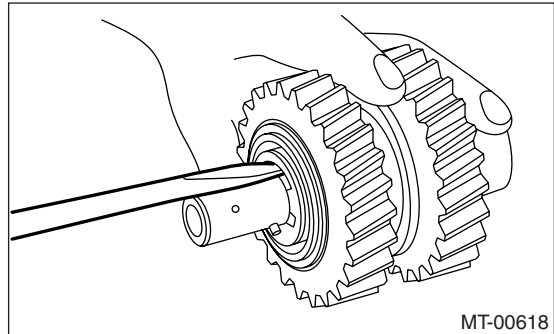
NOTE:

Sleeve and reverse gear engage at a specified point. Mark an engagement point on the sleeve and hub before disassembly.

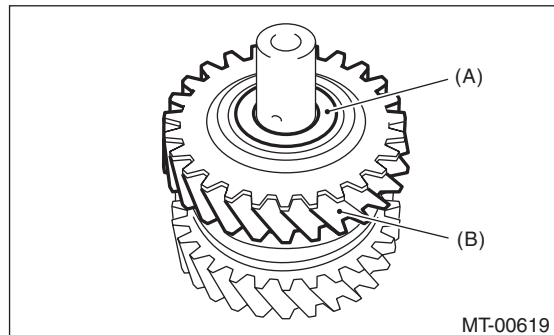
- 1) Remove the spring pin.



- 2) Remove the snap ring.

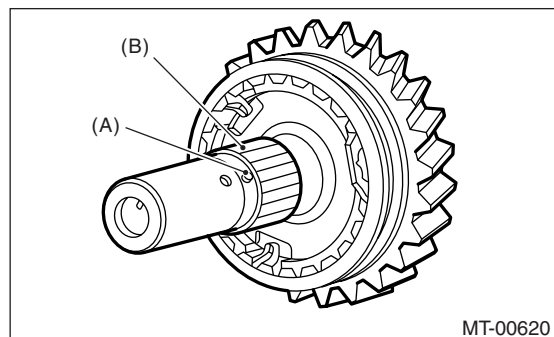


- 3) Remove the washer and reverse idler gear.



- (A) Washer
(B) Reverse idler gear

- 4) Remove the knock pin and reverse idler gear needle bearing.



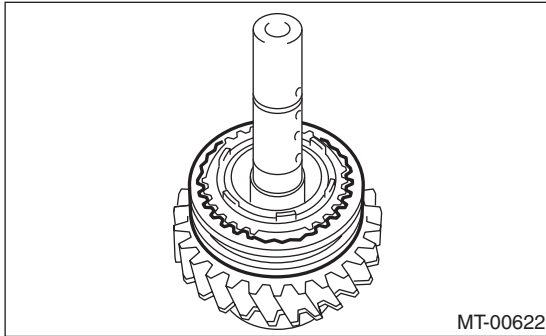
- (A) Knock pin
(B) Reverse idler gear needle bearing

Reverse Idler Gear Assembly

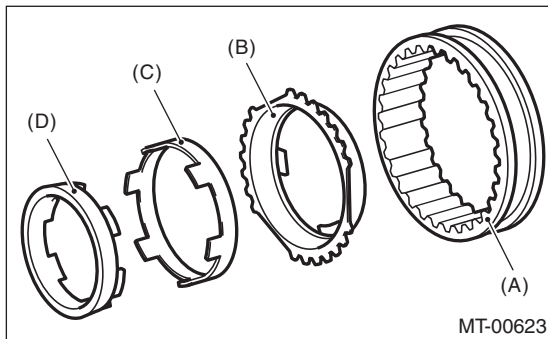
MANUAL TRANSMISSION AND DIFFERENTIAL

5) Remove the collar.

6) Remove the reverse sleeve.

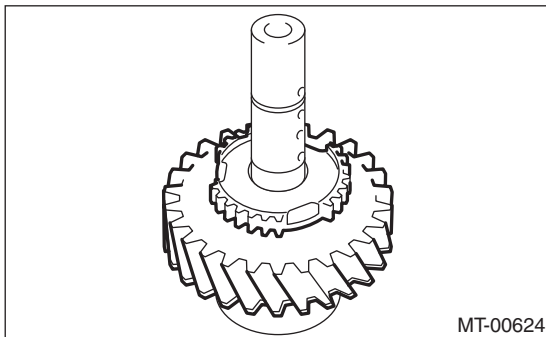


7) Remove the outer baulk ring, reverse synchro cone and inner baulk ring from reverse sleeve.

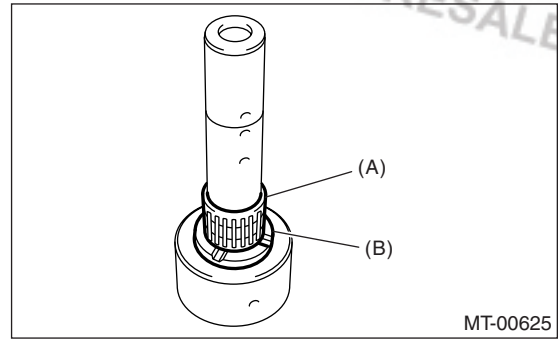


- (A) Reverse sleeve
- (B) Outer baulk ring
- (C) Reverse synchro cone
- (D) Inner baulk ring

8) Remove the reverse idler gear No. 2.

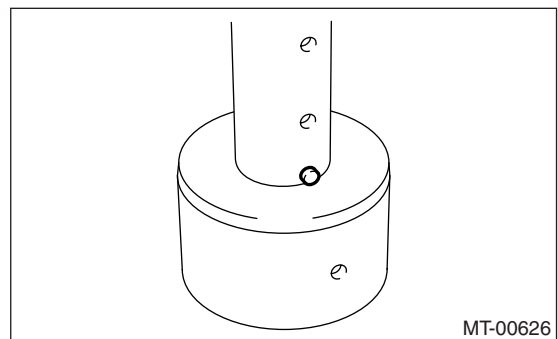


9) Remove the washer and needle bearing.

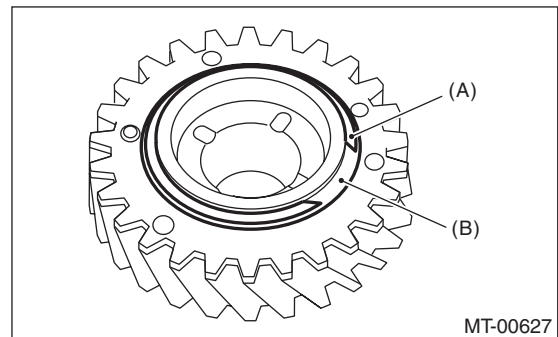


- (A) Needle bearing
- (B) Washer

10) Remove the knock pin.



11) Remove the snap ring and friction plate from reverse gear.

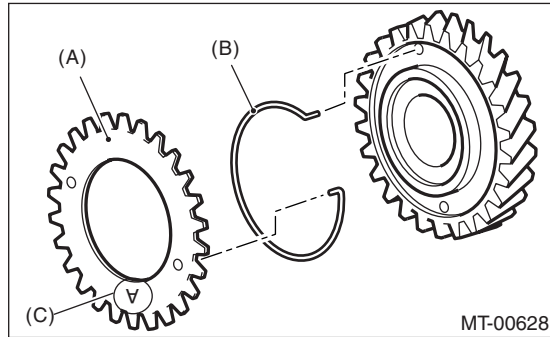


- (A) Snap ring
- (B) Friction plate

Reverse Idler Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

12) Remove the sub gear and spring.



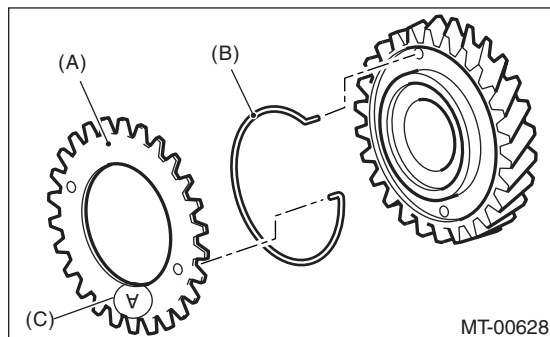
- (A) Sub gear
- (B) Spring
- (C) Punch mark (mark A)

D: ASSEMBLY

1) Install the sub gear and spring.

NOTE:

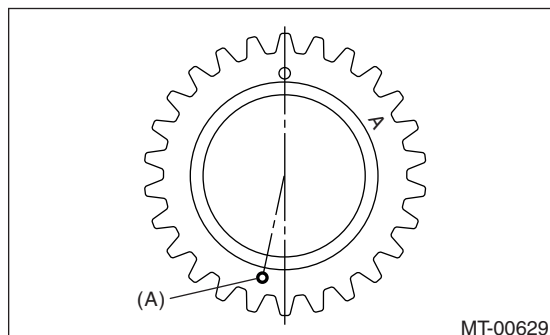
- Install the spring with white marking on hook part facing to sub gear side.
- Install the sub gear with punch mark (mark A) facing outside.



- (A) Sub gear
- (B) Spring
- (C) Punch mark (mark A)

NOTE:

- Install the spring and sub gear, taking care to install the sub gear installation hole in proper direction.

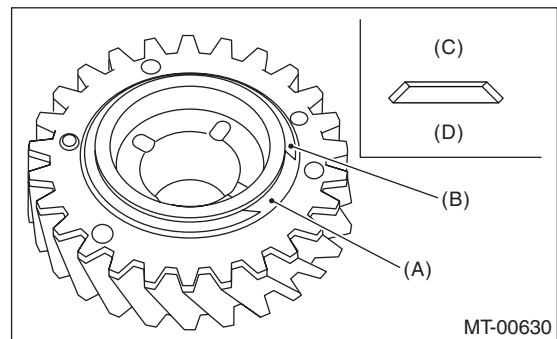


- (A) Installation hole

2) Install the friction plate and snap ring.

NOTE:

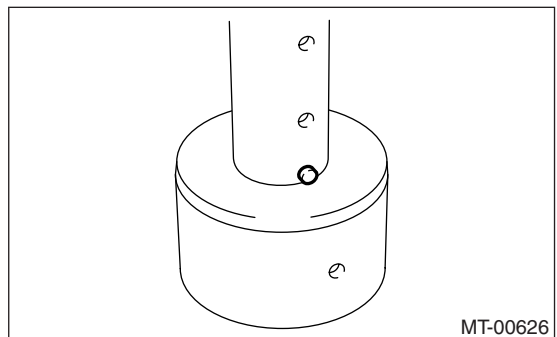
Make sure to install the friction plate in proper direction.



- (A) Friction plate
- (B) Snap ring
- (C) Snap ring side
- (D) Sub gear side

3) Sufficiently apply gear oil to the shaft, needle bearing and inner periphery of reverse drive gear.

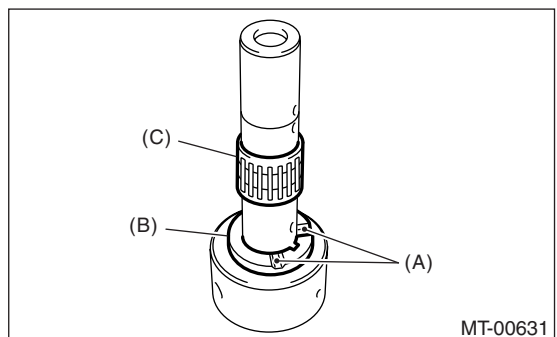
4) Install the knock pin.



5) Install the washer and needle bearing.

NOTE:

Install the washer with groove facing to reverse idler gear.

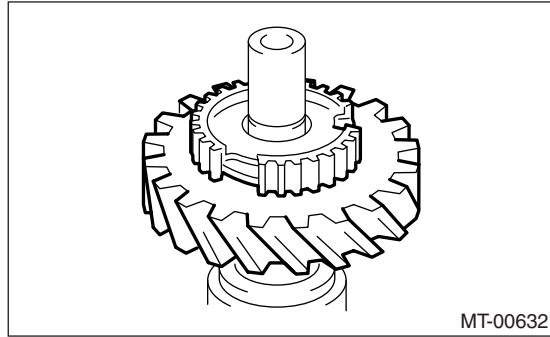


- (A) Groove
- (B) Washer
- (C) Needle bearing

Reverse Idler Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

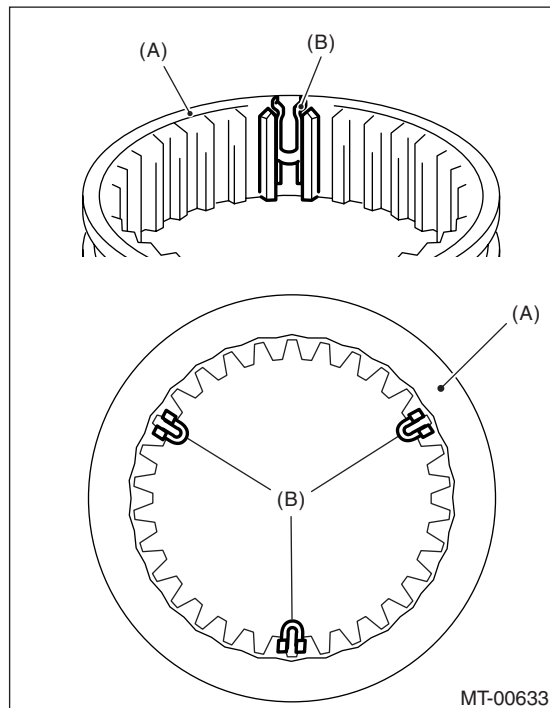
6) Install the reverse idler gear No. 2.



7) Install the shifting insert key in proper place of reverse sleeve.

NOTE:

Angle of each shifting insert key is 120° apart.

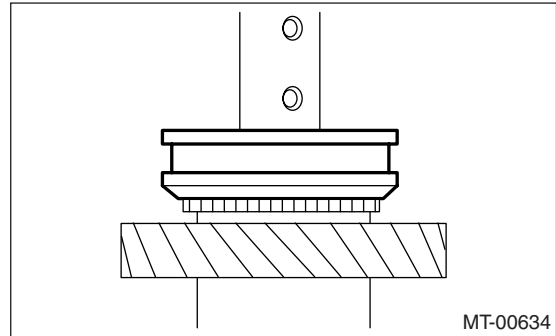


- (A) Reverse sleeve
- (B) Shifting insert key

8) Install the reverse sleeve to reverse idler gear No. 2.

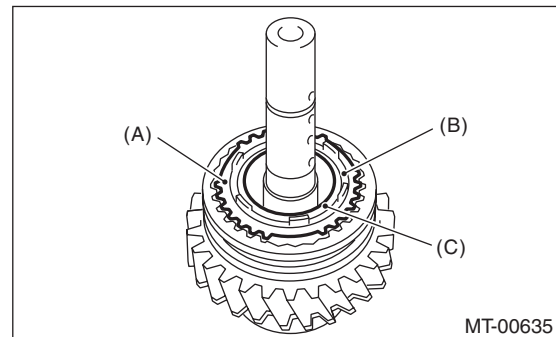
NOTE:

Make sure to install the reverse sleeve in proper direction.



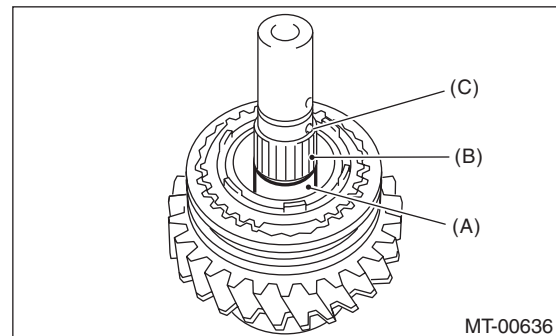
9) Sufficiently apply gear oil to the collar, needle bearing and inner periphery of reverse drive gear.

10) Install the outer baulk ring, reverse synchro cone and inner baulk ring.



- (A) Outer baulk ring
- (B) Reverse synchro cone
- (C) Inner baulk ring

11) Install the collar and needle bearing, then install the knock pin.

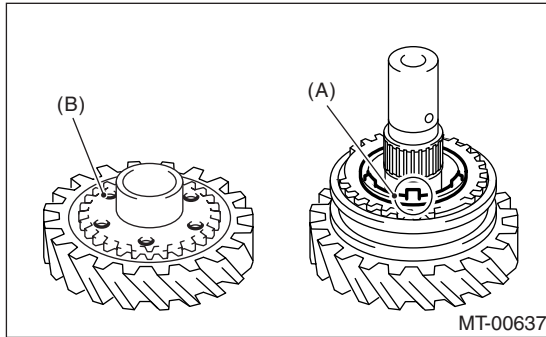


- (A) Collar
- (B) Needle bearing
- (C) Knock pin

Reverse Idler Gear Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

12) Align the protrusion portion of reverse synchro cone with reverse idler gear hole, then install the reverse idler gear.

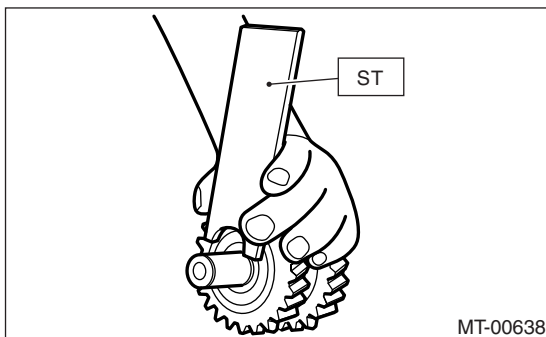


- (A) Protrusion portion of reverse synchro cone
(B) Reverse idler gear hole

13) Install the washer with groove facing to reverse idler gear.

14) Using the ST, install the snap ring.

ST 18672AA000 GUIDE CLIP



15) Inspect and adjust the clearance between snap ring and washer. <Ref. to 6MT-95, INSPECTION, Reverse Idler Gear Assembly.>

16) Install a new spring pin.

E: INSPECTION

Disassembled parts should be washed clean first and then inspected carefully.

1) Bearings

Replace the bearings in the following cases.

- Worn, rusted and damaged bearing
- Bearings that fail to turn smoothly or make abnormal noise when turned
- Bearings having other defects

2) Bushing (each gear)

Replace the bushings in the following case:

- When the sliding surface is damaged or abnormally worn.

3) Gears

Replace the gears in the following cases:

- The gear teeth surfaces are broken or excessively worn.
- The parts that contact the baulk ring is damaged.
- The inner surface of gear is damaged.

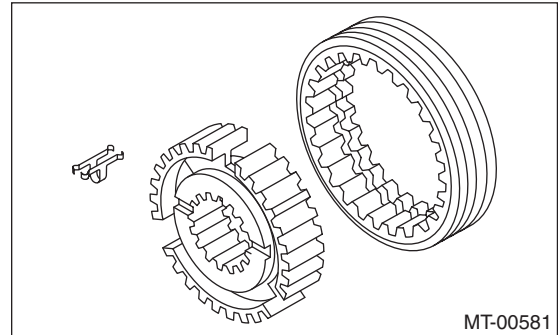
4) Baulk ring, synchro cone

Replace the baulk ring and synchro cone in the following case:

Worn, rusted and damaged baulk ring

5) Shifting insert key

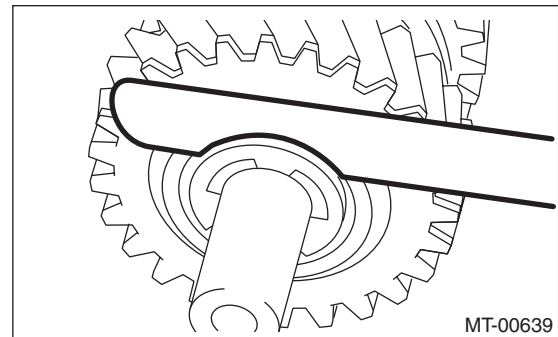
Replace the shifting insert key if deformed, excessively worn or defective in any way.



6) Inspect the clearance between snap ring and washer.

Specification of clearance:

0.1 — 0.3 mm (0.0039 — 0.0118 in)



Select and replace the snap ring from the following table if clearance is out of specification.

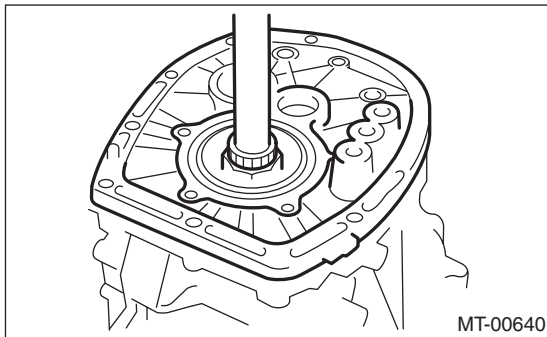
Snap ring	
Parts No.	Thickness mm (in)
031319000	1.50 (0.059)
805019030	1.60 (0.062)
805019010	1.72 (0.068)

Inspect the clearance again after replacing snap ring.

23. Drive Pinion Shaft Assembly

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.> <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-65, REMOVAL, Transmission Case.>
- 9) Remove each gear assembly. <Ref. to 6MT-70, REMOVAL, Main Shaft Assembly.>
- 10) Remove the drive pinion shaft assembly.

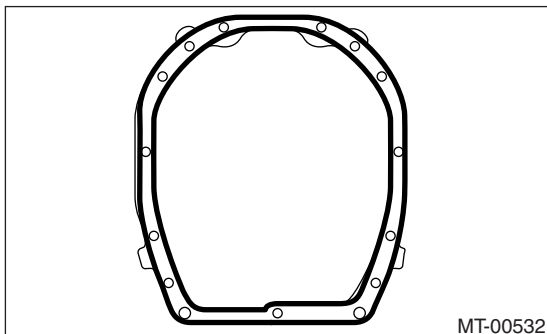


B: INSTALLATION

- 1) Completely remove the remaining gasket on drive plate and clutch housing.
- 2) Apply liquid gasket to the clutch housing.

Liquid gasket:

THREE BOND 1215 (Part No. 004403007)



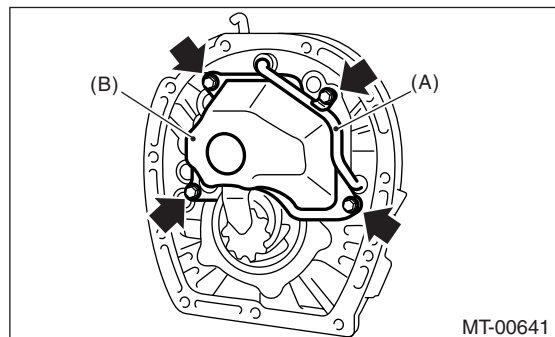
- 3) Install each gear assembly. <Ref. to 6MT-70, INSTALLATION, Main Shaft Assembly.>
- 4) Install the transmission case. <Ref. to 6MT-66, INSTALLATION, Transmission Case.>
- 5) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>
- 6) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 7) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 8) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 9) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.> <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>
- 10) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

NOTE:

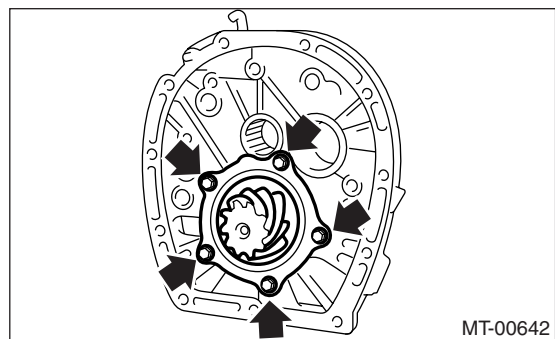
Replace the drive pinion shaft as a set with hypoid driven gear.

- 1) Remove the pipe and oil chamber.



- (A) Pipe
(B) Oil chamber

- 2) Remove the drive pinion shaft and shim from adapter plate.



- 3) Secure the ST on workbench.
ST 18664AA000 BASE
- 4) Lift the caulking of lock nut.

Drive Pinion Shaft Assembly

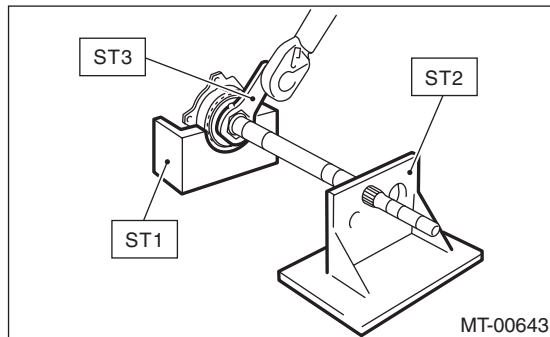
MANUAL TRANSMISSION AND DIFFERENTIAL

5) Install the ST3 to lock nut, then set drive pinion shaft to ST. Remove the lock nut and washer.

ST1 18667AA000 HOLDER

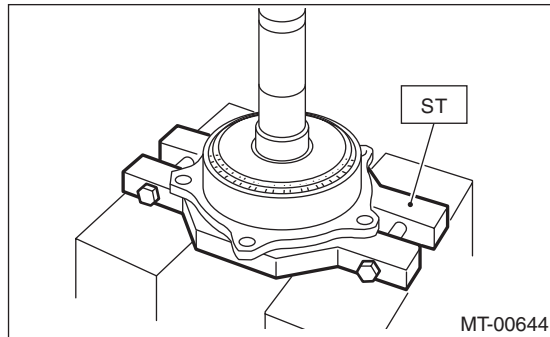
ST2 18664AA000 BASE

ST3 18621AA000 ADAPTER WRENCH



6) Using the ST, remove the taper roller bearing assembly.

ST 18723AA000 REMOVER



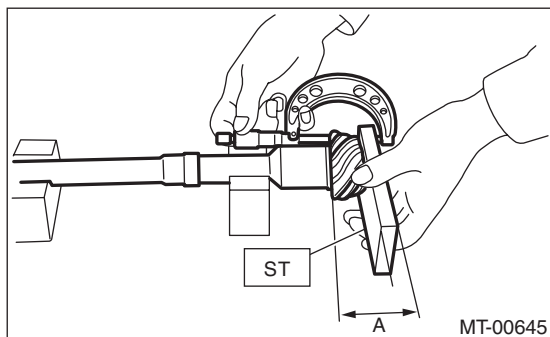
D: ASSEMBLY

1) Using the ST, measure dimension "A" of drive pinion.

NOTE:

Note dimension "A" for selection of drive pinion shim.

ST 398643600 GAUGE

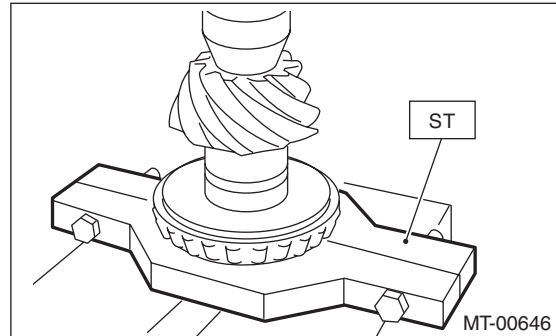


2) Install the inner bearing inner race to drive pinion shaft using ST and press.

ST 18723AA000 REMOVER

CAUTION:

Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

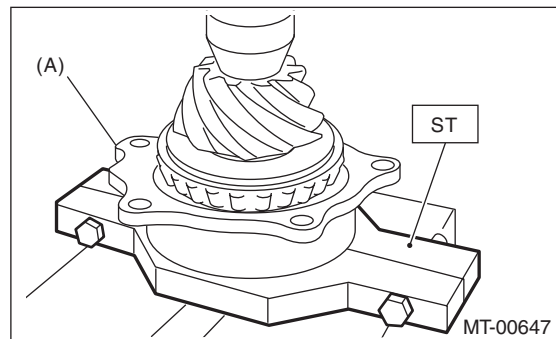


3) Install the retainer and outer bearing inner race to drive pinion shaft using ST and press.

ST 18723AA000 REMOVER

NOTE:

Press to the point where bearing is turned smoothly without slack.



(A) Retainer

4) Install the washer and a new lock nut.

5) Set the ST to drive pinion, then tighten the lock nut.

ST1 18667AA000 HOLDER

ST2 18664AA000 BASE

ST3 18621AA000 ADAPTER WRENCH

ST4 18852AA000 TORQUE WRENCH

NOTE:

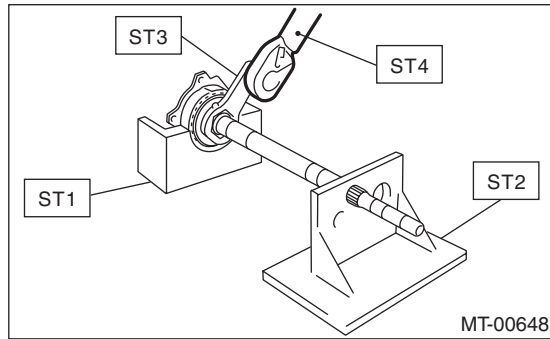
Tighten with the ST and torque wrench straight-lined.

Drive Pinion Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

Tightening torque:

265 N·m (27.0 kgf-m, 195 ft-lb)

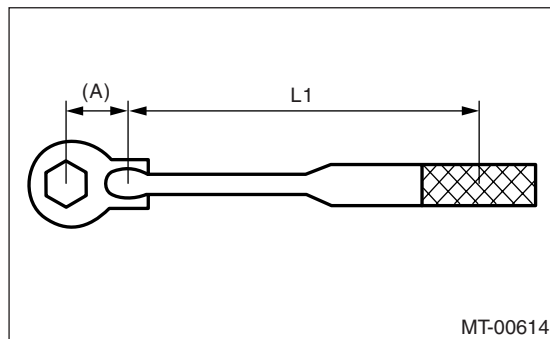


NOTE:

- If torque wrench except ST4 is used, calculate the following equation, then tighten the lock nut.
- Tighten with the ST and torque wrench straight-lined.

$$T = L1 / (0.1 + L1) \times 285$$

T	N·m (kgf-m, ft-lb)	Setting value of torque wrench
L1	m (in)	Torque wrench length
0.1 m (3.94 in)		ST length
285 N·m (29.0 kgf-m, 210 ft-lb)		Tightening torque of lock nut



(A) 0.1 m (3.94 in)

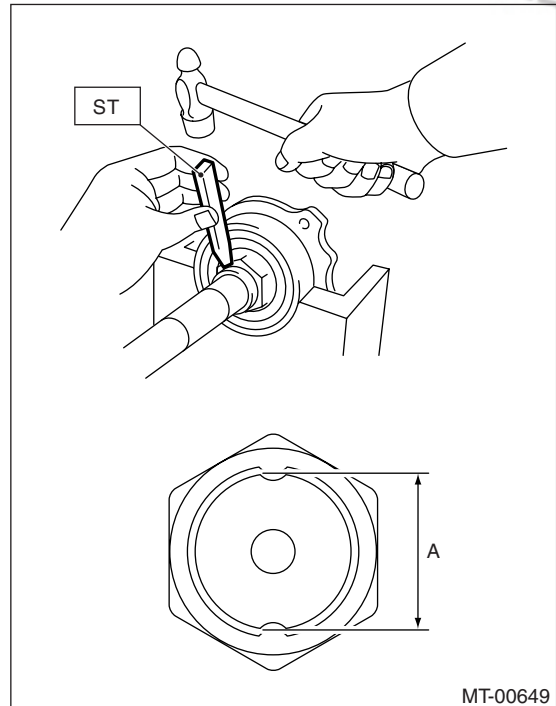
6) Measure the starting torque. <Ref. to 6MT-99, INSPECTION, Drive Pinion Shaft Assembly.>

7) Using the ST, caulk two portions on the lock nut to obtain dimension "A" 37 ± 0.5 mm (1.46 ± 0.02 in).

ST 18670AA000 PUNCH

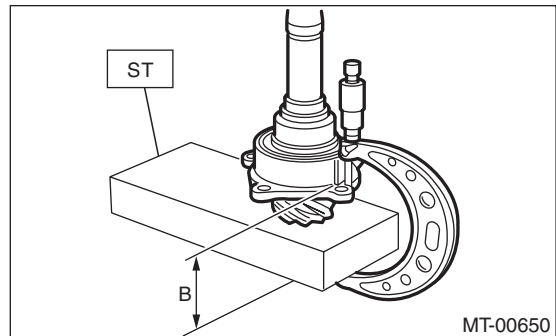
NOTE:

Do not crack the caulking part of lock nut.



8) Using the ST, measure dimension "B" of the drive pinion.

ST 398643600 GAUGE



9) Calculate the following formula, then select one or two pieces of drive pinion shim from the table below.

$$6.5 \pm 0.0625 \text{ mm} - (B - A) [0.26 \pm 0.0025 \text{ in} - (B - A)]$$

NOTE:

A: Measured value from step 1).

B: Measured value from step 8).

Drive pinion shim	
Part No.	Thickness mm (in)
32295AA270	0.15 (0.0059)
32295AA280	0.175 (0.0069)
32295AA290	0.20 (0.0079)
32295AA300	0.225 (0.0089)
32295AA310	0.25 (0.0098)
32295AA320	0.275 (0.0108)

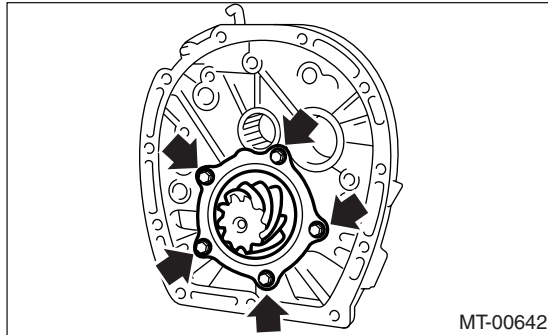
Drive Pinion Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

10) Apply gear oil to the side face of taper roller bearing, then install the drive pinion shaft and selected shim to adapter plate.

Tightening torque:

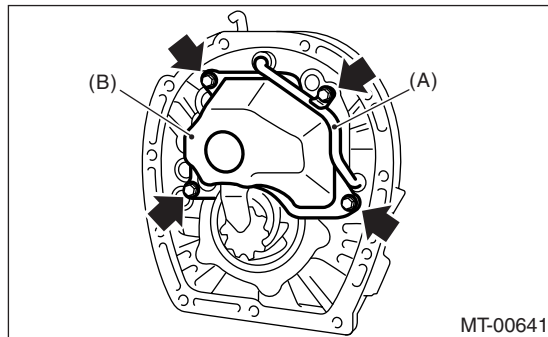
54 N·m (5.5 kgf-m, 39.8 ft-lb)



11) Install the oil chamber and pipe.

Tightening torque:

6.4 N·m (0.65 kgf-m, 4.7 ft-lb)



(A) Pipe

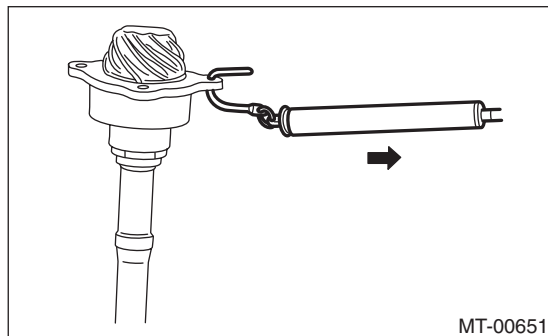
(B) Oil chamber

E: INSPECTION

1) Using the spring balancer, measure the starting torque. If the starting torque is out of specification, replace the taper roller bearing.

Starting torque:

0 — 0.95 N (0 — 0.097 kgf, 0 — 0.21 lbf)



2) Gears

Replace the gears in the following case.

- Gear teeth surfaces are broken or excessively worn.

3) Bearings

Replace the bearings in the following cases.

- Worn, rusted and damaged bearing
- Bearings that fail to turn smoothly or make abnormal noise when turned

4) Adapter plate

Replace the adapter plate in the following cases.

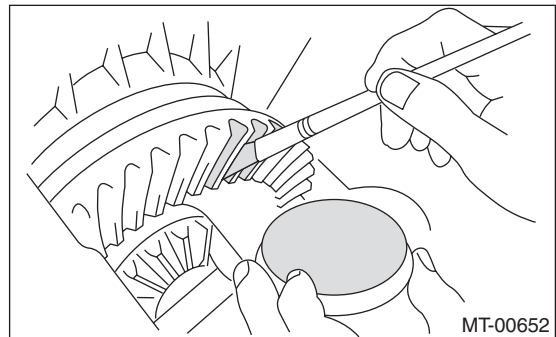
- Worn, rusted and damaged bearing
- Damaged adapter plate

5) Make sure the pipe and pipe chamber is not damaged or clogged. Repair or replace if damaged or clogged.

F: ADJUSTMENT

1) Inspect and adjust the backlash between hypoid driven gear and drive pinion. <Ref. to 6MT-106, HYPOID GEAR BACKLASH, ADJUSTMENT, Front Differential Assembly.>

2) Apply a uniform thin coat of red lead on both teeth surfaces of three or four teeth of the hypoid driven gear.



3) Install the drive pinion shaft assembly to clutch housing, then tighten it with at least four bolts.

NOTE:

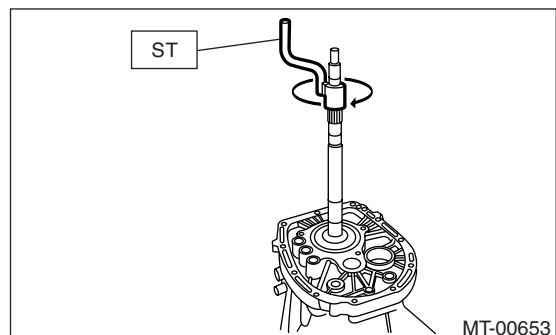
Install it with the remaining liquid gasket to prevent the mating surface of clutch housing and adapter plate from damaging.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

4) Using the ST, rotate several times.

ST 18631AA000 HANDLE



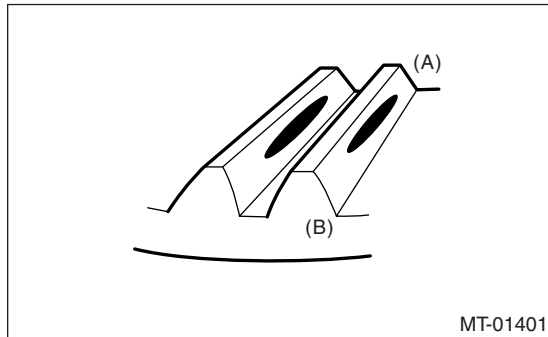
Drive Pinion Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

5) Remove the drive pinion shaft assembly, and then check tooth contact. If it is inaccurate, adjust the backlash or thickness of shim.

- Tooth contact

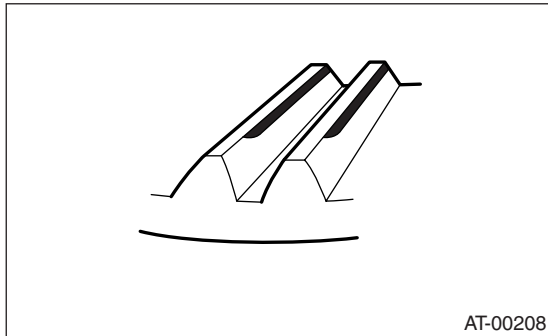
Checking item: Tooth contact pattern is slightly shifted toward to toe side under no-load rotation. [When loaded, contact pattern moves toward heel.]



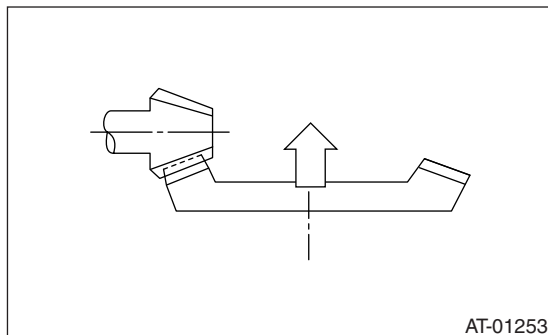
- (A) Toe side
- (B) Heel side

- Face contact

Checking item: Backlash is too large.
Contact pattern



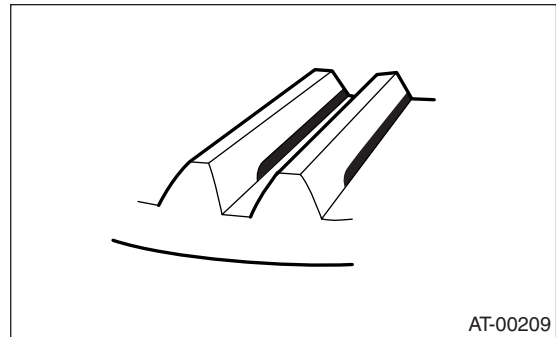
Corrective action: Verify the backlash again, and then adjust it.



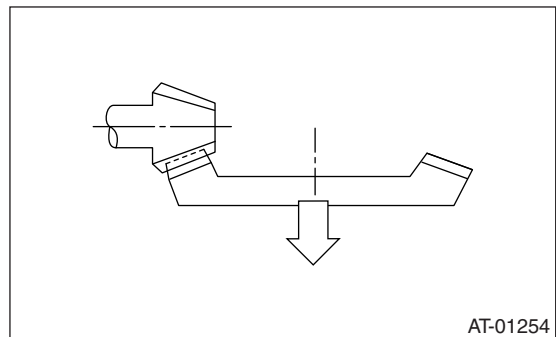
- Flank contact

Checking item: Backlash is too small.

Contact pattern



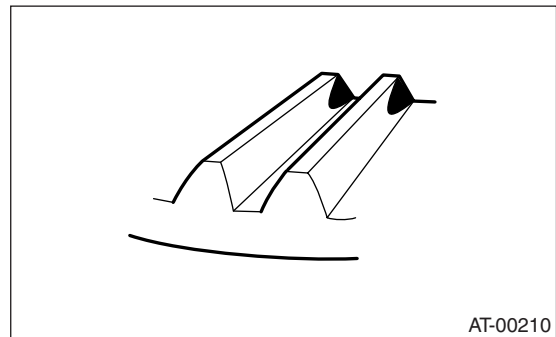
Corrective action: Verify the backlash again, and then adjust it.



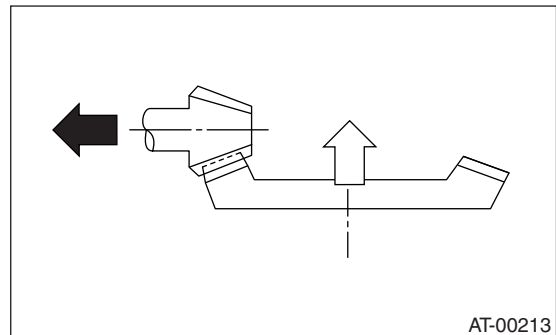
- Toe contact (Inside end contact)

Checking item: Contact areas is small.

Contact pattern



Corrective action: Reduce thickness of drive pinion shim in order to move drive pinion away from crown gear.



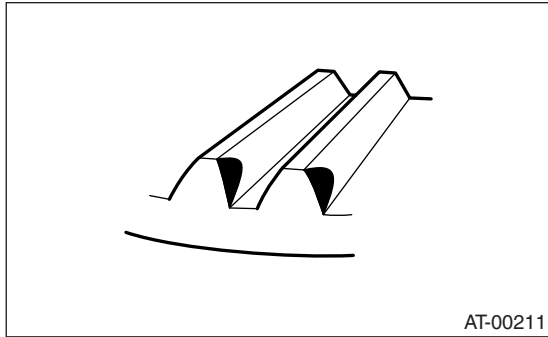
Drive Pinion Shaft Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

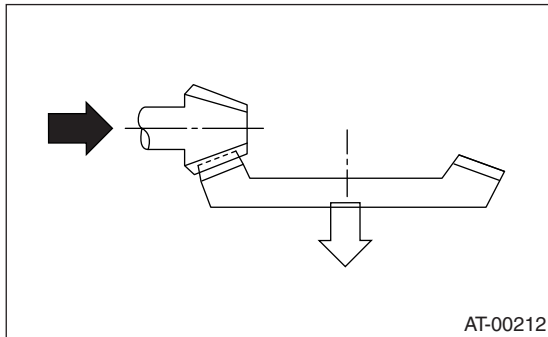
- Heel contact (Outside end contact)

Checking item: Contact areas is small.

Contact pattern



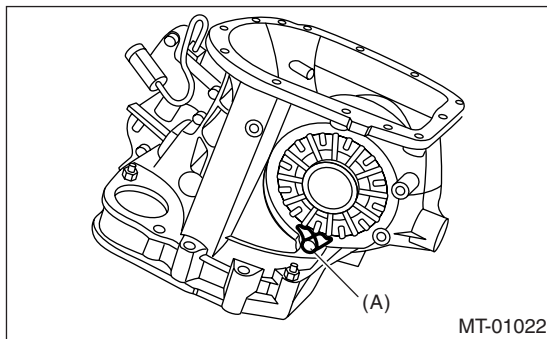
Corrective action: Increase thickness of drive pinion shim in order to bring drive pinion close to crown gear.



24. Front Differential Assembly

A: REMOVAL

- 1) Remove the manual transmission assembly. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.> <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-65, REMOVAL, Transmission Case.>
- 9) Remove each gear assembly. <Ref. to 6MT-70, REMOVAL, Main Shaft Assembly.>
- 10) Remove the drive pinion shaft assembly. <Ref. to 6MT-96, REMOVAL, Drive Pinion Shaft Assembly.>
- 11) Remove the retainer lock plates on both side.



(A) Retainer lock plate

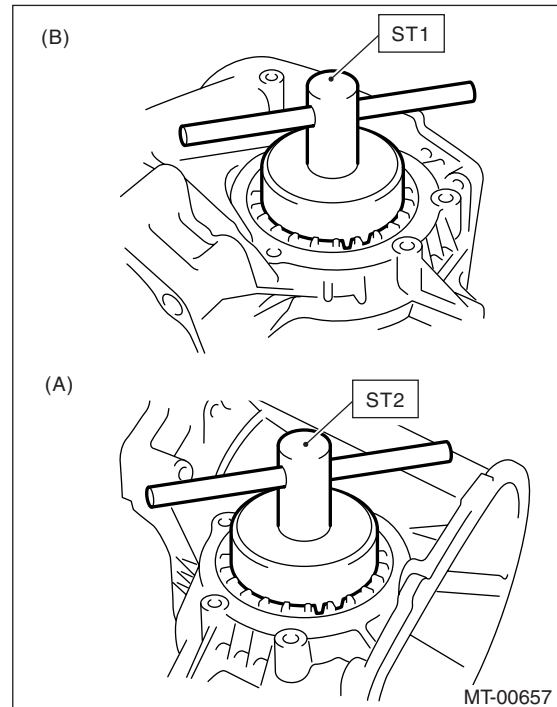
- 12) Using the ST, remove the differential side retainer on both side.

ST1 499787000 WRENCH ASSY (RIGHT SIDE)

ST2 18630AA000 WRENCH ASSY (LEFT SIDE)

NOTE:

Be careful not to damage the part of clutch case where the retainer is to be installed.



(A) Left side

(B) Right side

- 13) Remove the front differential.

B: INSTALLATION

- 1) Install the differential assembly into clutch housing.
- 2) Apply oil to the threaded portion part of differential side retainer.
- 3) Remove the O-ring from differential side retainer of both sides.
- 4) Using the ST, install the differential side retainer to both sides.

ST1 499787000 WRENCH ASSY (RIGHT SIDE)

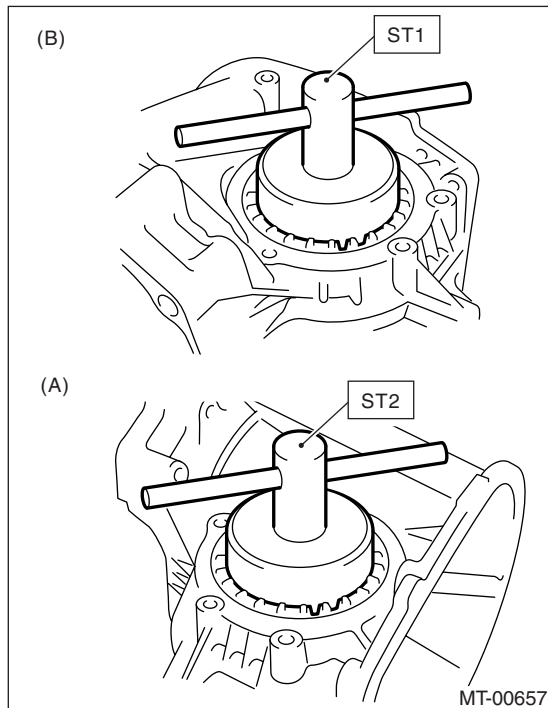
ST2 18630AA000 WRENCH ASSY (LEFT SIDE)

Front Differential Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

Be careful not to damage the oil seal.

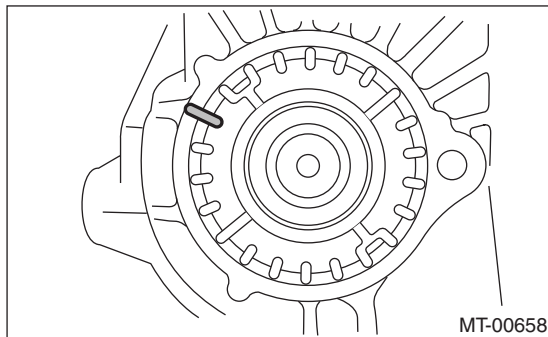


- (A) Left side
- (B) Right side

5) Check and adjust the hypoid gear backlash. <Ref. to 6MT-106, HYPOID GEAR BACKLASH, INSPECTION, Front Differential Assembly.>

6) Check and adjust the tooth contact. <Ref. to 6MT-99, ADJUSTMENT, Drive Pinion Shaft Assembly.>

7) Mark an engagement point on the right and left side retainer and clutch housing.



8) Remove the differential side retainer from both sides.

NOTE:

Note the rotating number of time till removal, when removing the differential side retainer.

9) Install a new O-ring to differential side retainer of both sides.

10) Install the differential side retainer to both sides.

NOTE:

Install the differential side retainer by screwing in the same rotating number of time till removal, and then align the mark.

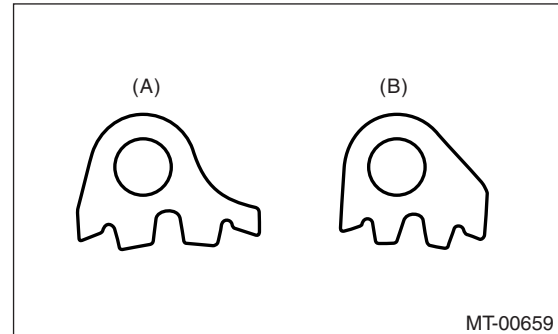
11) Install the retainer lock plate.

Tightening torque:

25 N·m (2.5 kgf-m, 18.1 ft-lb)

NOTE:

Be careful not to confuse right and left retainer lock plates.



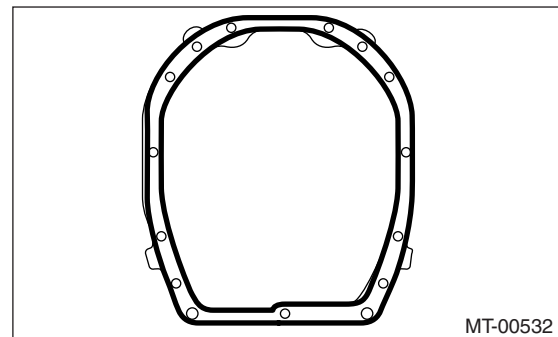
- (A) Left
- (B) Right

12) Completely remove the remaining gasket from the clutch housing and adapter plate.

13) Apply liquid gasket to the clutch housing.

Liquid gasket:

THREE BOND 1215 (Part No. 004403007)



14) Install the drive pinion shaft assembly. <Ref. to 6MT-96, INSTALLATION, Drive Pinion Shaft Assembly.>

15) Install each gear assembly at once. <Ref. to 6MT-70, INSTALLATION, Main Shaft Assembly.>

16) Install the transmission case. <Ref. to 6MT-66, INSTALLATION, Transmission Case.>

17) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>

18) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>

19) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>

Front Differential Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

20) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>

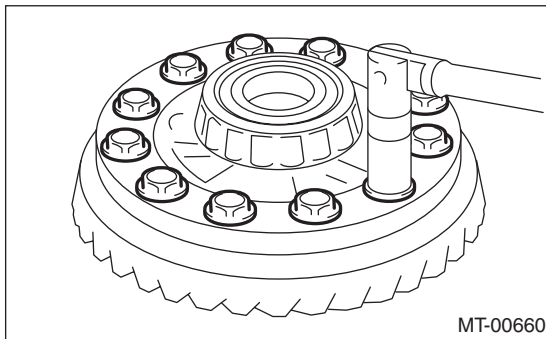
21) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.> <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>

22) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

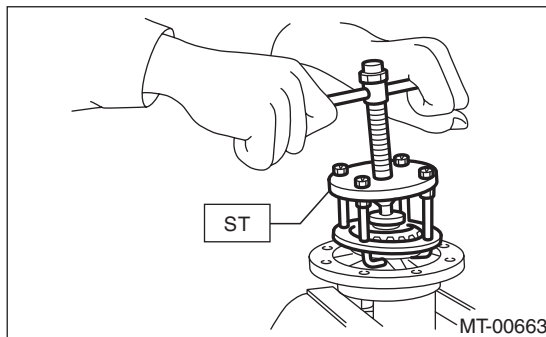
1. DIFFERENTIAL CASE

1) Secure the differential assembly on a vise, and then remove the hypoid driven gear.



2) Using the ST, remove the hypoid driven gear side bearing.

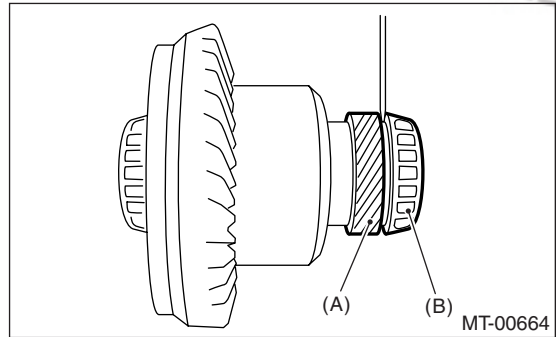
ST 399527700 PULLER SET



3) Using a screw driver, make clearance of 2 — 3 mm (0.079 — 0.118 in) between the speedometer drive gear and roller bearing.

NOTE:

Be careful not to damage the differential case.

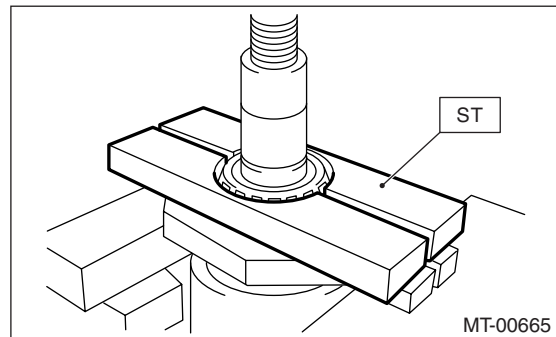


(A) Speedometer drive gear

(B) Roller bearing

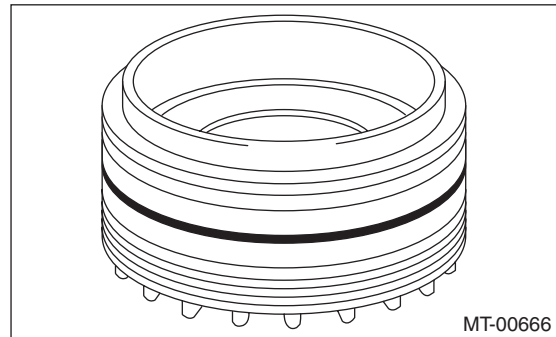
4) Using the ST, remove the roller bearing.

ST 498077000 REMOVER



2. DIFFERENTIAL SIDE RETAINER

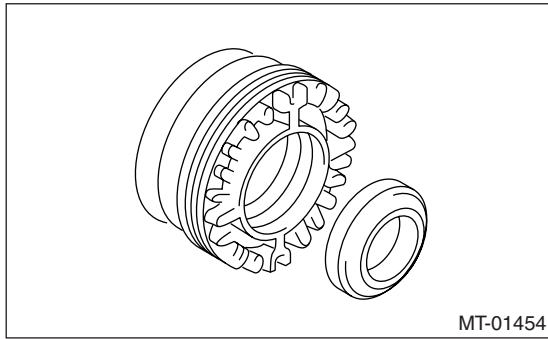
1) Remove the O-ring from differential side retainer.



Front Differential Assembly

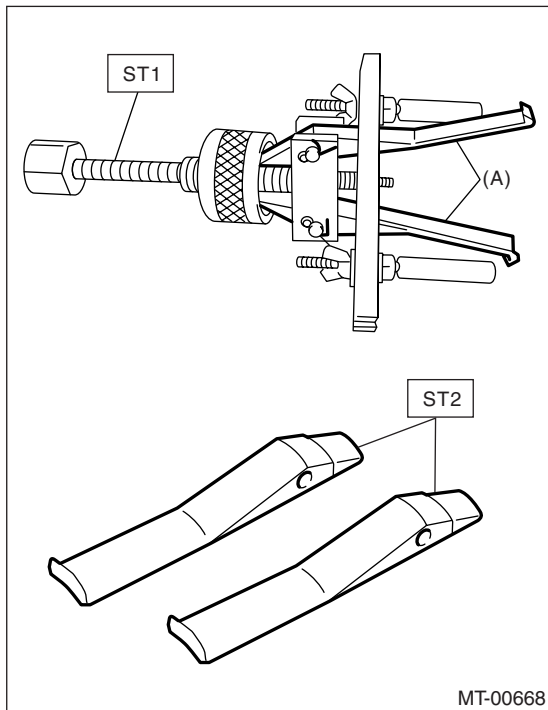
MANUAL TRANSMISSION AND DIFFERENTIAL

2) Remove the oil seal from differential side retainer.



3) Remove the claw of ST1, and then install the claw of ST2.

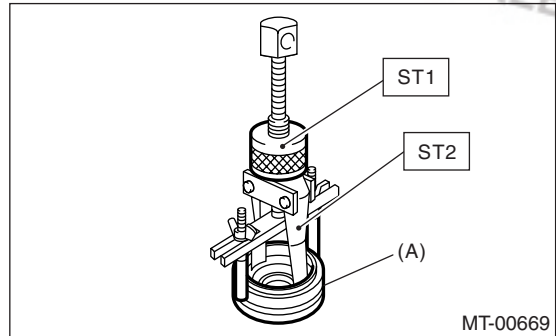
ST1 398527700 PULLER ASSY
ST2 18760AA000 CLAW



(A) Claw

4) Remove the bearing outer race from differential side retainer.

ST1 398527700 PULLER ASSY
ST2 18760AA000 CLAW



(A) Differential side retainer

D: ASSEMBLY

1. DIFFERENTIAL CASE

1) Using the ST, install a new speedometer drive gear and right and left side bearing inner race to differential case.

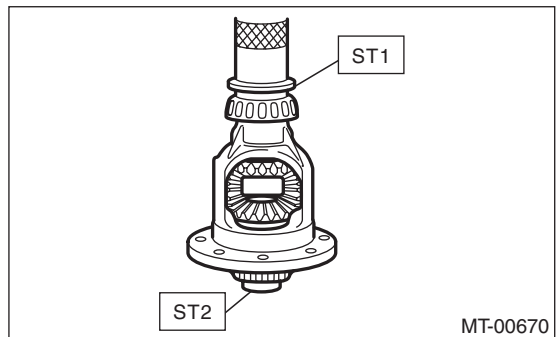
ST1 398437700 INSTALLER
ST2 398497701 SEAT

CAUTION:

Do not apply pressure in excess of 20 kN (2.0 ton, 2.2 US ton, 2.0 Imp ton).

NOTE:

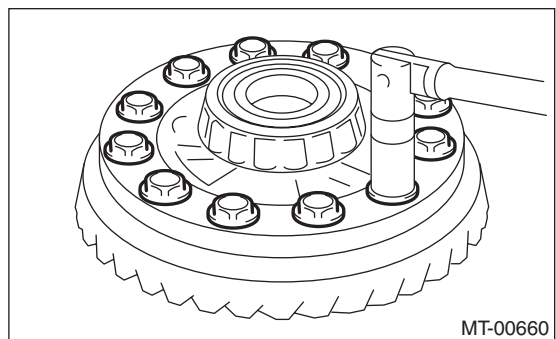
Always replace the inner race and outer race as a set.



2) Install the hypoid driven gear to differential case.

Tightening torque:

69 N·m (7.0 kgf-m, 50.9 ft-lb)



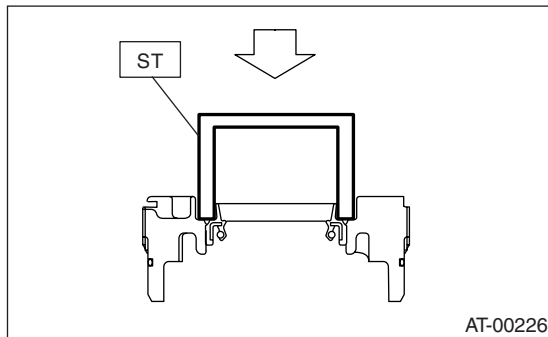
Front Differential Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

2. DIFFERENTIAL SIDE RETAINER

1) Using the ST, install the oil seal.

ST 18675AA000 DIFFERENTIAL SIDE OIL
SEAL INSTALLER



2) Install the bearing outer race to differential side retainer on both sides.

3) Install the O-ring to differential side retainer on both sides.

NOTE:

Be careful not to damage the O-ring.

E: INSPECTION

Repair or replace the front differential in following cases.

- Each gear is damaged, seized, or excessively worn.
- Sliding surface of the differential case is damaged, seized or excessively worn.
- Bearings and bearings part are damaged, rusted or worn.
- Bearings fail to turn smoothly or make abnormal noise when turned.

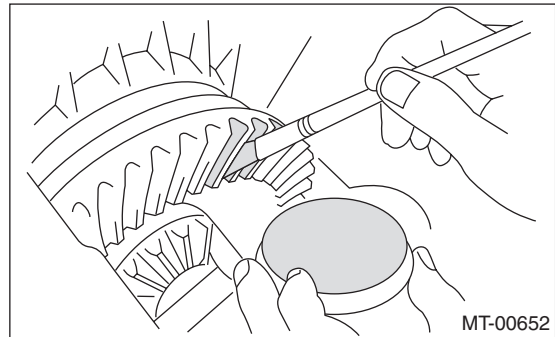
1. HYPOID GEAR BACKLASH

Check the hypoid gear backlash. If it is not within specifications, adjust it. <Ref. to 6MT-106, HYPOID GEAR BACKLASH, ADJUSTMENT, Front Differential Assembly.>

2. TOOTH CONTACT OF HYPOID GEAR

1) Be sure the hypoid gear backlash is within specifications. If it is not within specifications, adjust it. <Ref. to 6MT-106, HYPOID GEAR BACKLASH, ADJUSTMENT, Front Differential Assembly.>

2) Apply a uniform thin coat of red lead on both tooth surfaces of three or four teeth of the hypoid driven gear.



3) Install the drive pinion shaft assembly, and then secure it with five bolts.

NOTE:

Use the old gasket and washer to prevent the mating surface of housing from damaging.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

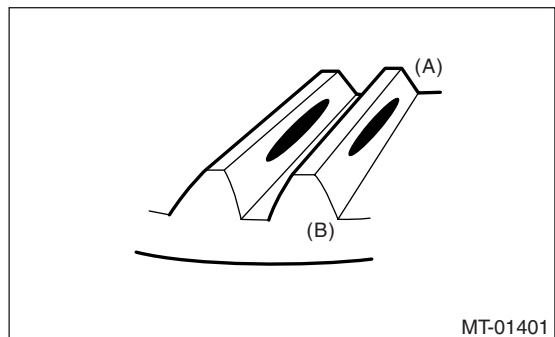
4) Rotate the drive pinion shaft to right and left for several times.

5) Remove the drive pinion shaft assembly, and then check tooth contact. If tooth contact is inaccurate, adjust it. <Ref. to 6MT-99, ADJUSTMENT, Drive Pinion Shaft Assembly.>

- Correct tooth contact.

NOTE:

Under no load, tooth contacts 50 — 60% from center to toe side (tooth contact shifts to heel side when driving).



(A) Toe side

(B) Heel side

F: ADJUSTMENT

1. HYPOID GEAR BACKLASH

1) Install the right and left side differential side retainer.

ST1 499787000 WRENCH ASSY (RIGHT
SIDE)

ST2 18630AA000 WRENCH ASSY (LEFT SIDE)

Front Differential Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

Screw in the right side differential side retainer a bit further than left side.

2) Install the drive pinion shaft assembly, and then secure it with five bolts.

NOTE:

Use the old gasket and washer to prevent the mating surface of housing from damaging.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

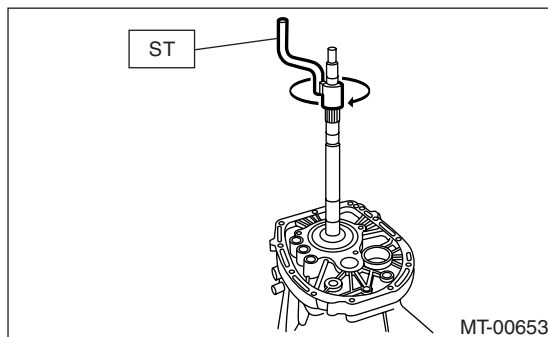
3) Using the ST, screw in the left side differential side retainer until the drive pinion and hypoid driven gear contacts lightly. Then loosen the right side differential side retainer.

ST1 499787000 WRENCH ASSY (RIGHT SIDE)

ST2 18630AA000 WRENCH ASSY (LEFT SIDE)

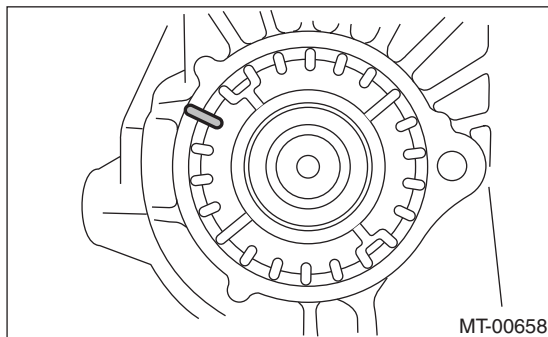
4) Using the ST, rotate the drive pinion shaft several times.

ST 18631AA000 HANDLE



5) Repeat step 3) and 4) until the left side differential side retainer can not be rotated. For the right side differential side retainer, screw it in until the inner race and outer race contacts lightly. This condition is "0" backlash.

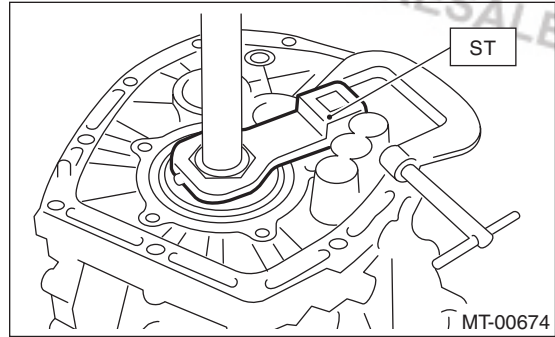
6) Mark an engagement point on the right and left side retainer and clutch housing.



7) Return the left side differential side retainer for three teeth, and screw in the right side differential side retainer for three teeth.

8) Using the ST, secure the drive pinion shaft.

ST 18621AA000 ADAPTER WRENCH



9) Install the axle shafts to both sides of front differential.

Parts No. 38415AA000 AXLE SHAFT

10) Move the axle shaft, and measure the hypoid gear backlash.

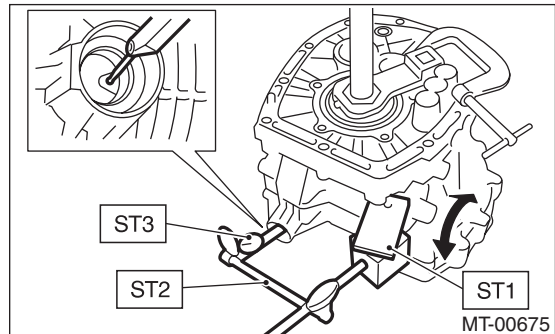
ST1 498255400 PLATE

ST2 498247001 MAGNET BASE

ST3 498247100 DIAL GAUGE

Hypoid gear backlash:

0.13 — 0.18 mm (0.0051 — 0.0071 in)



11) If the backlash is out of specification, adjust it by turning the right and left side differential side retainers.

12) Screw in the right side differential side retainer for further 1.75 teeth.

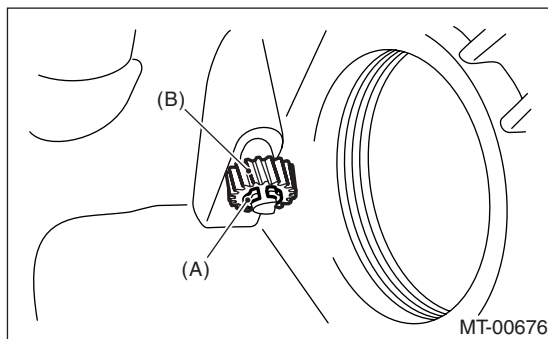
2. TOOTH CONTACT OF HYPOID GEAR

Refer to the section of drive pinion shaft for checking of tooth contact. <Ref. to 6MT-106, TOOTH CONTACT OF HYPOID GEAR, INSPECTION, Front Differential Assembly.>

25.Speedometer Gear

A: REMOVAL

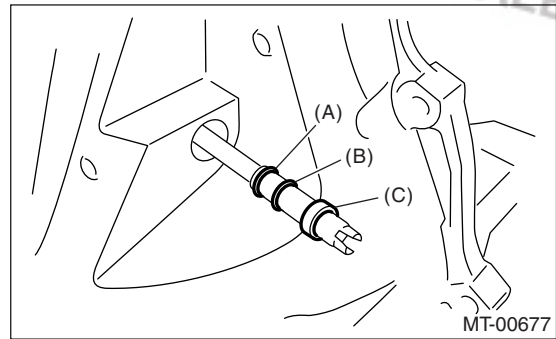
- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.> <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-65, REMOVAL, Transmission Case.>
- 9) Remove each gear assembly. <Ref. to 6MT-70, REMOVAL, Main Shaft Assembly.>
- 10) Remove the drive pinion shaft assembly. <Ref. to 6MT-96, REMOVAL, Drive Pinion Shaft Assembly.>
- 11) Remove the front differential assembly. <Ref. to 6MT-102, REMOVAL, Front Differential Assembly.>
- 12) Remove the vehicle speed sensor. <Ref. to 6MT-32, REMOVAL, Vehicle Speed Sensor.>
- 13) Remove the snap ring, and then remove the speedometer driven gear.



- (A) Snap ring
(B) Speedometer driven gear

- 14) Remove the speedometer driven gear shaft from clutch housing.

- 15) Remove the oil seal, speedometer driven gear shaft and washer.



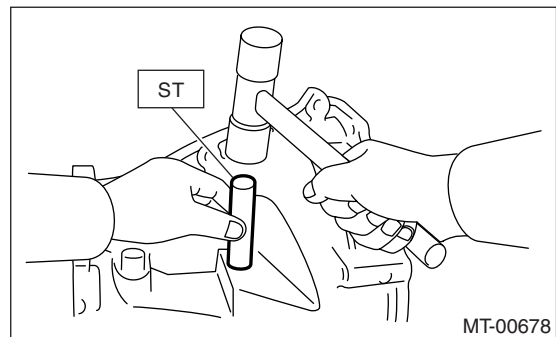
- (A) Washer
(B) Snap ring
(C) Oil seal

- 16) Remove the snap ring from speedometer driven gear shaft.

B: INSTALLATION

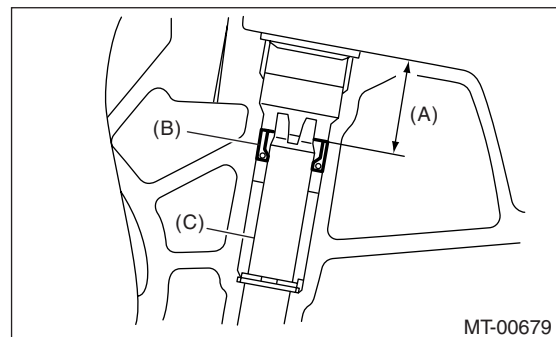
- 1) Install the oil seal, washer and snap ring to speedometer driven gear shaft.
- 2) Insert the speedometer driven gear shaft. Using the ST, press the oil seal.

ST 899824100 or 499827000 PRESS



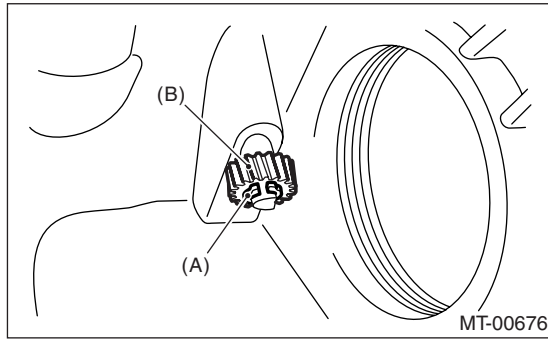
NOTE:

- Replace the oil seal with a new one.
- Insert the oil seal approx. 24 mm (0.94 in) from the edge of clutch case.



- (A) Approx. 24 mm (0.94 in)
(B) Oil seal
(C) Speedometer driven gear shaft

3) Install the speedometer driven gear and snap ring.



- (A) Snap ring
- (B) Speedometer driven gear

4) Install the vehicle speed sensor. <Ref. to 6MT-32, INSTALLATION, Vehicle Speed Sensor.>

5) Install the front differential assembly. <Ref. to 6MT-102, INSTALLATION, Front Differential Assembly.>

6) Install the drive pinion shaft assembly. <Ref. to 6MT-96, INSTALLATION, Drive Pinion Shaft Assembly.>

7) Install each gear assembly at once. <Ref. to 6MT-70, INSTALLATION, Main Shaft Assembly.>

8) Install the transmission case. <Ref. to 6MT-66, INSTALLATION, Transmission Case.>

9) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>

10) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>

11) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>

12) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>

13) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.> <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>

14) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

26.Shifter Fork and Rod

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.> <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-65, REMOVAL, Transmission Case.>
- 9) Remove each gear assembly. <Ref. to 6MT-70, REMOVAL, Main Shaft Assembly.>

B: INSTALLATION

- 1) Install each gear assembly at once. <Ref. to 6MT-70, INSTALLATION, Main Shaft Assembly.>
- 2) Install the transmission case. <Ref. to 6MT-66, INSTALLATION, Transmission Case.>
- 3) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>
- 4) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 5) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 6) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 7) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.> <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>
- 8) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

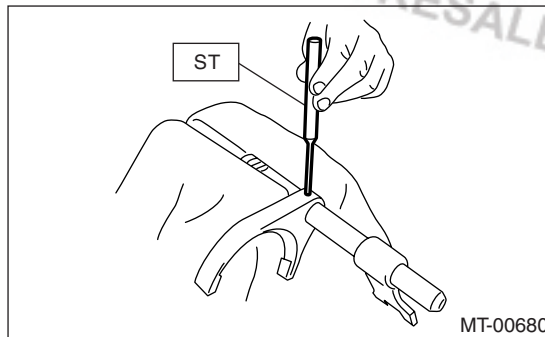
NOTE:

Discard the removed spring pin and replace it with a new one.

1. REVERSE SHIFTER FORK

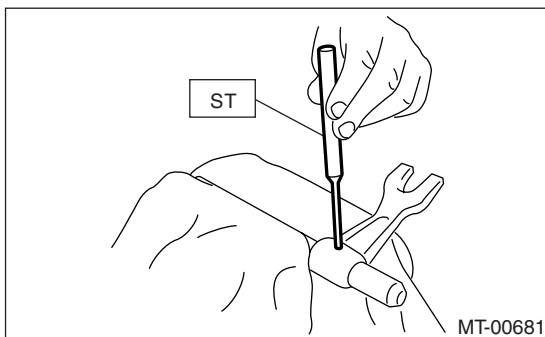
- 1) Using the ST, remove the reverse fork.

ST 398791700 REMOVER



- 2) Using the ST, remove the reverse shifter arm.

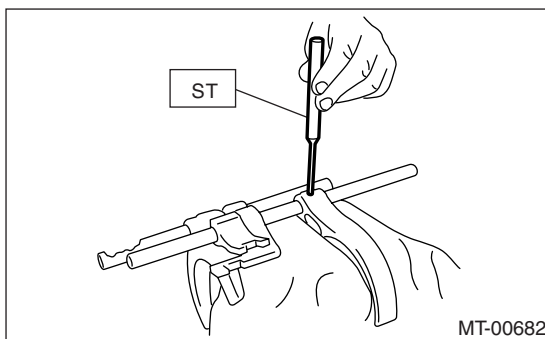
ST 398791700 REMOVER



2. 1st-2nd, 3rd-4th SHIFTER FORK

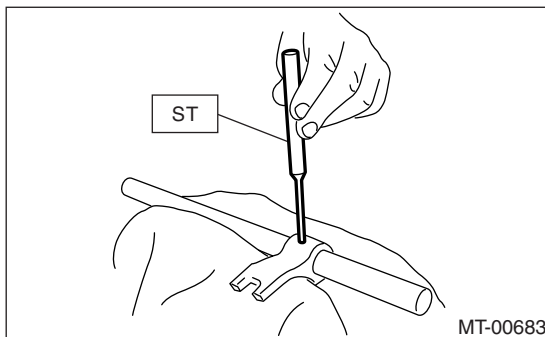
- 1) Using the ST, remove the 3rd-4th shifter fork.

ST 398791700 REMOVER



- 2) Using the ST, remove the 3rd-4th shifter arm.

ST 398791700 REMOVER

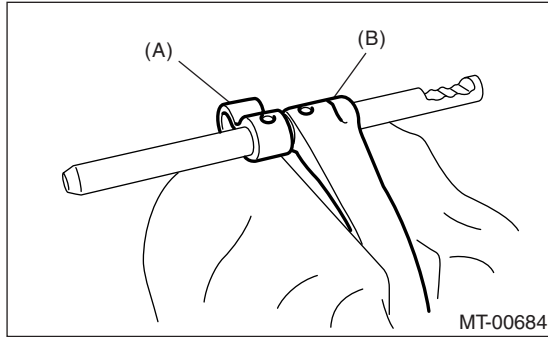


- 3) Using the ST, remove the 1st-2nd shifter arm and 1st-2nd shifter fork.

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

ST 398791700 REMOVER



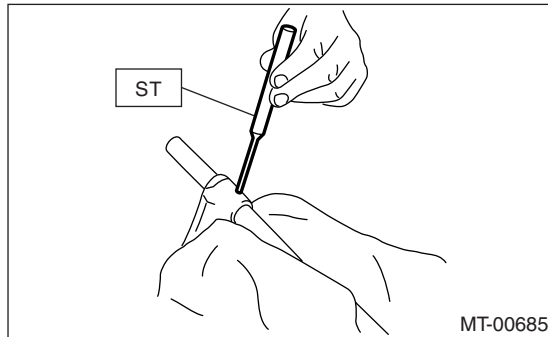
(A) 1st-2nd shifter arm

(B) 1st-2nd shifter fork

3. 5th-6th SHIFTER FORK

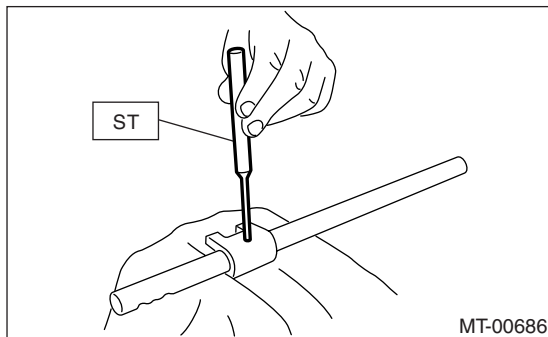
1) Using the ST, remove the 5th-6th shifter fork.

ST 398791700 REMOVER



2) Using the ST, remove the 5th-6th shifter arm.

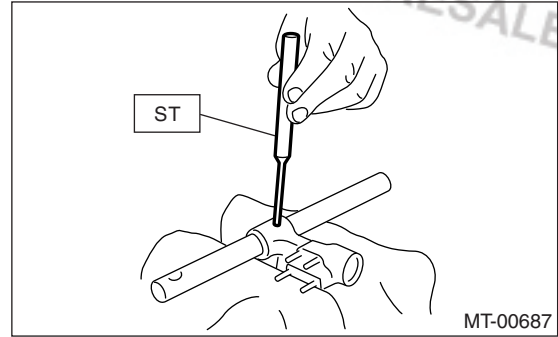
ST 398791700 REMOVER



4. SHIFT ARM SHAFT

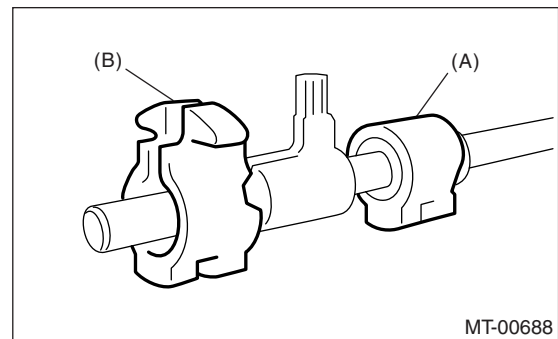
Using the ST, remove the selector arm.

ST 398791700 REMOVER



5. STRIKING ROD

1) Remove the reverse interlock block and interlock block from striking rod.

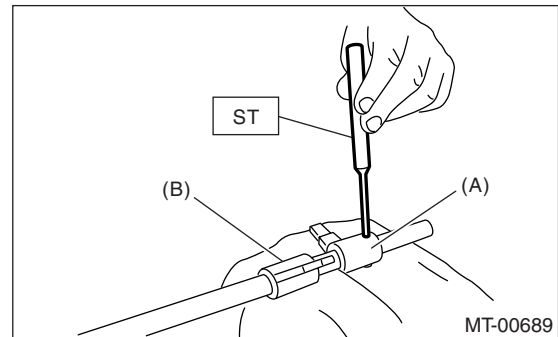


(A) Reverse interlock block

(B) Interlock block

2) Using the ST, remove the reverse interlock arm.

ST 398791700 REMOVER



(A) Reverse interlock arm

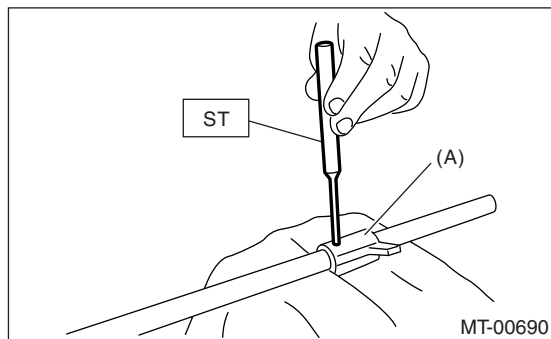
(B) Interlock arm

3) Using the ST, remove the interlock arm.

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

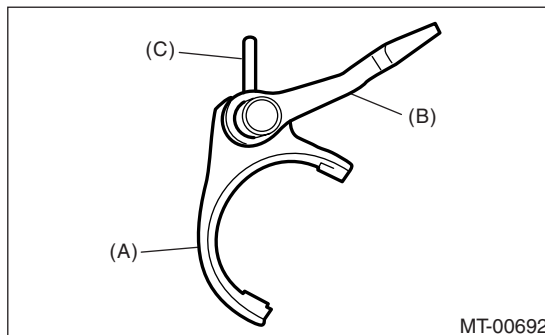
ST 398791700 REMOVER



(A) Interlock arm

NOTE:

Make sure to install the reverse arm and rod in proper direction.



- (A) Reverse arm
- (B) Reverse fork rod
- (C) Spring pin

D: ASSEMBLY

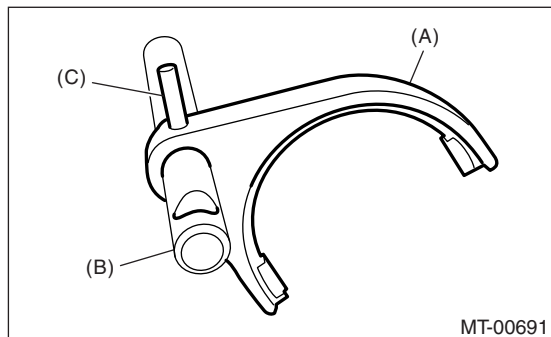
1. REVERSE SHIFTER FORK

1) Using the ST, install the reverse fork.

ST 398791700 REMOVER

NOTE:

Make sure to install the reverse fork and rod in proper direction.



- (A) Reverse fork
- (B) Reverse fork rod
- (C) Spring pin

2) Using the ST, install the reverse arm.

ST 398791700 REMOVER

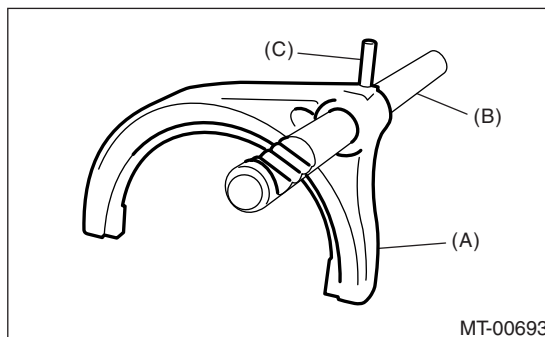
2. 1st-2nd, 3rd-4th SHIFTER FORK

1) Using the ST, install the 1st-2nd shifter fork.

ST 398791700 REMOVER

NOTE:

Make sure to install the 1st-2nd shifter fork and rod in proper direction.



- (A) 1st-2nd shifter fork
- (B) 1st-2nd fork rod
- (C) Spring pin

2) Using the ST, install the 1st-2nd shifter arm.

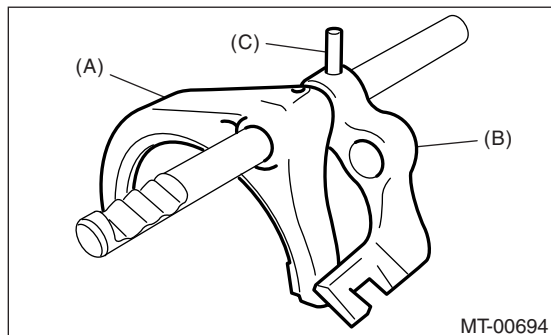
ST 398791700 REMOVER

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

Make sure to install the 1st-2nd shifter arm and fork in proper direction.



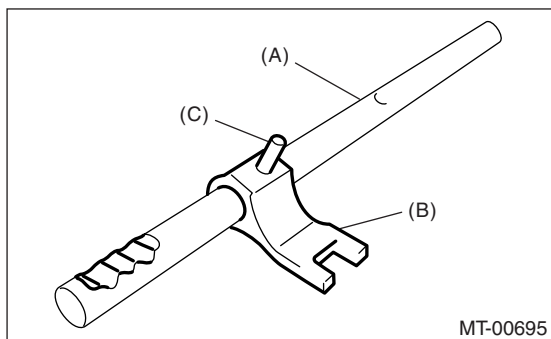
- (A) 1st-2nd shifter fork
- (B) 1st-2nd fork arm
- (C) Spring pin

3) Using the ST, install the 3rd-4th shifter arm.

ST 398791700 REMOVER

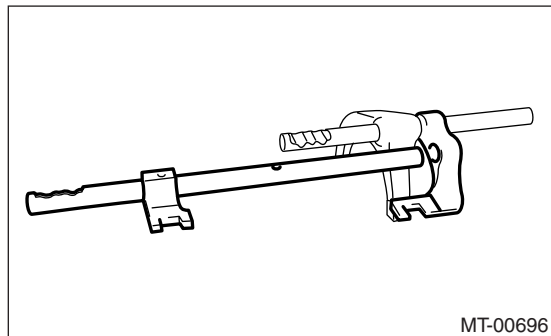
NOTE:

Make sure to install the 3rd-4th shifter arm and rod in proper direction.



- (A) 3rd-4th fork rod
- (B) 3rd-4th shifter arm
- (C) Spring pin

4) Install the 3rd-4th fork rod into 1st-2nd shifter arm.

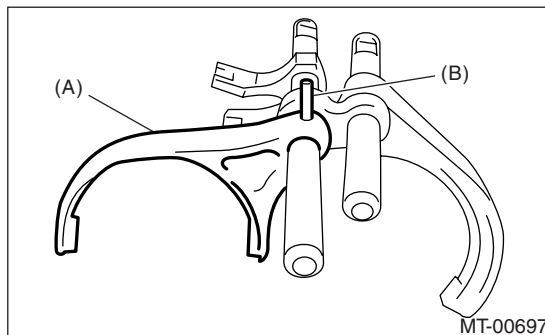


5) Using the ST, install the 3rd-4th shifter fork.

ST 398791700 REMOVER

NOTE:

Make sure to install the 3rd-4th shifter fork in proper direction.



- (A) 3rd-4th shifter fork
- (B) Spring pin

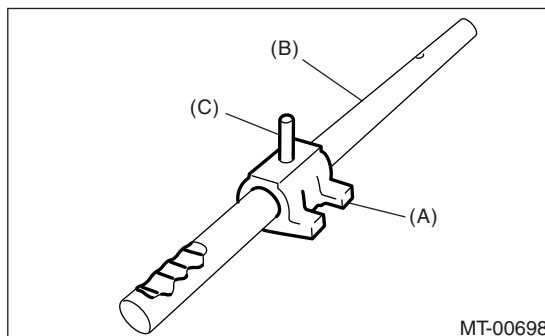
3. 5th-6th SHIFTER FORK

1) Using ST, install the 5th-6th shifter arm.

ST 398791700 REMOVER

NOTE:

Make sure to install the 5th-6th shifter arm and rod in proper direction.



- (A) 5th-6th shifter arm
- (B) 5th-6th fork rod
- (C) Spring pin

2) Using the ST, install the 5th-6th shifter fork.

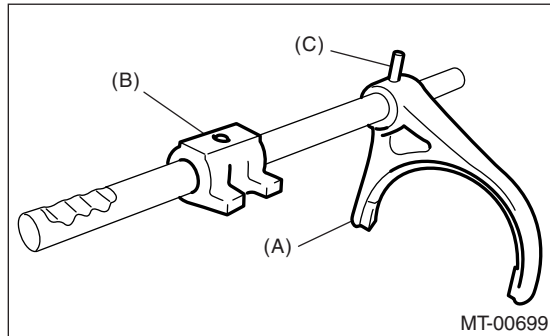
ST 398791700 REMOVER

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

Make sure to install the 5th-6th shifter fork and arm in proper direction.



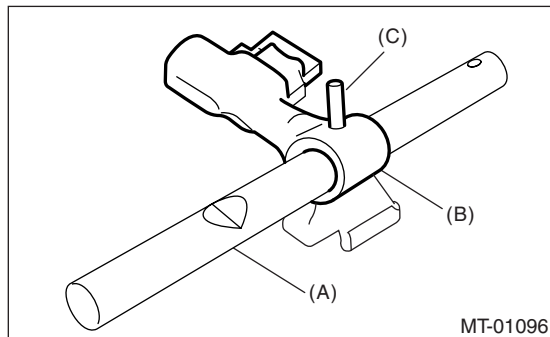
- (A) 5th-6th shifter fork
- (B) 5th-6th shifter arm
- (C) Spring pin

4. SHIFT ARM SHAFT

Using the ST, install the selector arm.
ST 398791700 REMOVER

NOTE:

Make sure to install the selector arm and rod in proper direction.



- (A) Selector rod
- (B) Selector arm
- (C) Spring pin

5. STRIKING ROD

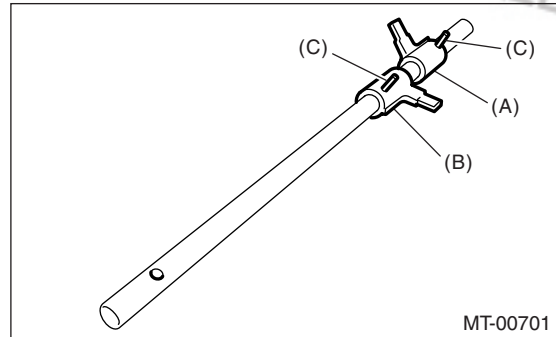
1) Using the ST, install the reverse interlock arm and interlock arm.

ST 398791700 REMOVER

NOTE:

- Make sure to install the reverse interlock arm and rod in proper direction.

- Make sure to install the interlock arm and rod in proper direction.

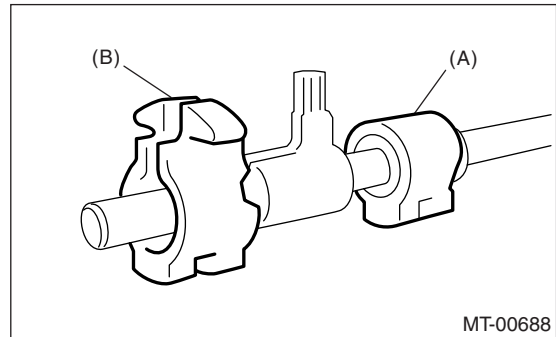


- (A) Reverse interlock arm
- (B) Interlock arm
- (C) Spring pin

2) Install the reverse interlock block and interlock block to striking rod.

NOTE:

Make sure to install the reverse interlock block and interlock block in proper direction.



- (A) Reverse interlock block
- (B) Interlock block

E: INSPECTION

- 1) Check the shift shaft and shift rod for damage. Replace if damaged.
- 2) Repair or replace the gearshift mechanism if excessively worn, bent, or defective in any way.

F: ADJUSTMENT

1. SELECTION OF 1st-2nd FORK ROD

NOTE:

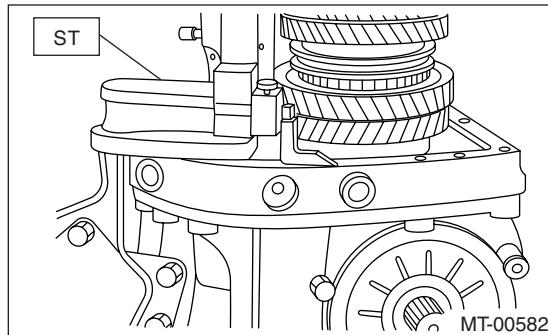
- Perform the following procedures when.
Replacing the 1st, 2nd driven gear.
 - Replacing the 1st, 2nd synchro ring assembly.
 - Replacing the adapter plate.
 - Replacing the driven shaft.
 - Replacing the 1st-2nd hub, sleeve assembly.
- 1) Insert the drive pinion assembly in adapter plate.

NOTE:

Make sure the thrust bearing outer race is not removed and drive pinion is not lift-up.

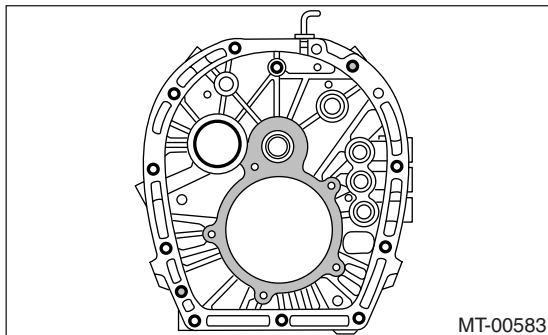
2) Set the height gauge to adapter plate. Lower the indicator of height gauge to mating surface of adapter plate and case, then set to zero point.

ST 18853AA000 HEIGHT GAUGE



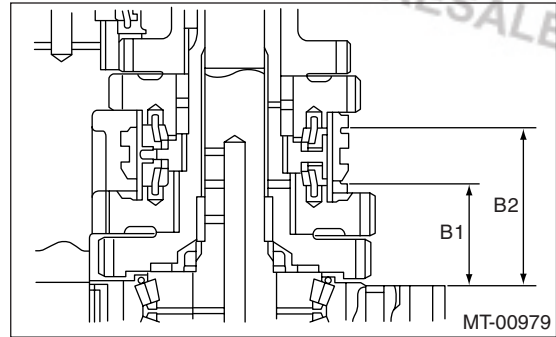
NOTE:

- Remove the remaining gasket on edge surface with scraper, since the adapter plate is base point of measurement.
- Do not place the height gauge on shaded area in the figure during measurement.

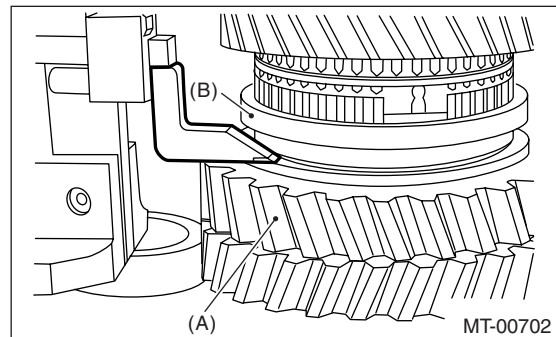


3) Select the main shaft snap ring. <Ref. to 6MT-81, ADJUSTMENT, Main Shaft Assembly.>

4) Measure "B1" and "B2" as shown in the figure.



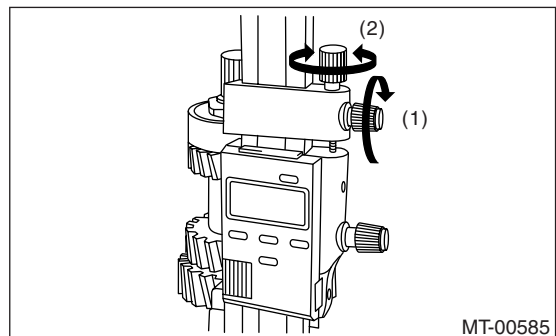
(1) Shift the 1st-2nd sleeve to 1st driven gear side, then press down to the stopper and measure "B1".



- (A) 1st driven gear
- (B) 1st-2nd sleeve

NOTE:

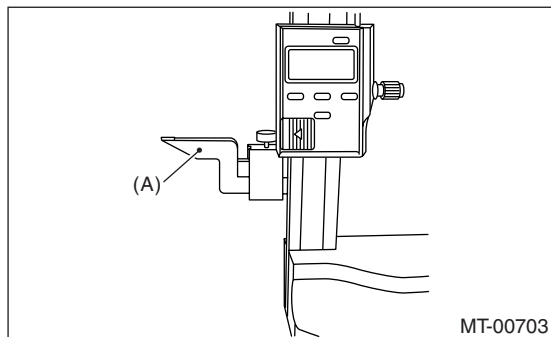
- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of sleeve 1st side.
- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.



Shifter Fork and Rod

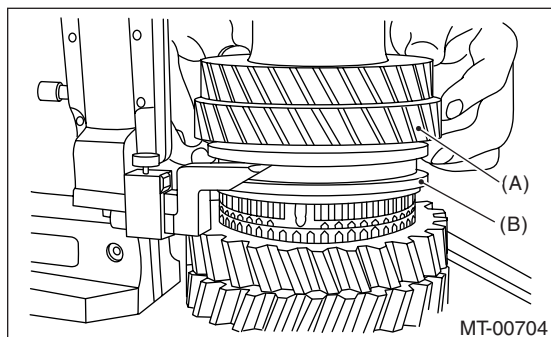
MANUAL TRANSMISSION AND DIFFERENTIAL

(2) Set the height gauge indicator upside down.



(A) Indicator

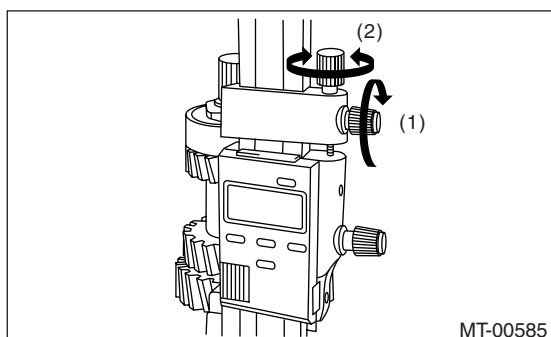
(3) Shift the 1st-2nd sleeve to 2nd driven gear side, then press up to the stopper and measure "B2".



(A) 2nd driven gear
(B) 1st-2nd sleeve

NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of sleeve 2nd side.
- Perform the measuring procedure with two people, and measure the sleeve lifted up straight.
- Measure five points of the sleeve turning every approx. 72° apart. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.



(4) According to both measurements, calculate the 1st-2nd sleeve neutral position. Select the

fork rod which applies to the calculated value from following equation.

$$\text{Equation: } T = (B1 + B2) / 2$$

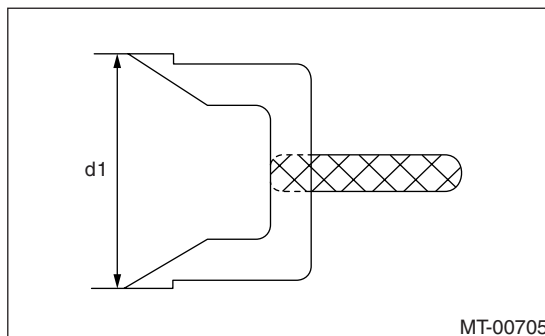
T: 1st-2nd sleeve center position

B1: Height from adapter plate edge to sleeve edge when shifted to 1st gear.

B2: Height from adapter plate edge to sleeve edge when shifted to 2nd gear. [measurement value + 55 mm (2.17 in)]

NOTE:

The indicator is installed upside down compared to the setting procedure of zero point. Add "d1" [fixing value: 55 mm (2.17 in)] from the following figure to "B2", to obtain measurement value of "B2".



T	mm (in)	Lot No. (Mark)
62.93 — 63.23 (2.4776 — 2.4894)		32801AA111 (1)
63.23 — 63.53 (2.4894 — 2.5012)		32801AA131 (None)
63.53 — 63.83 (2.5012 — 2.5130)		32801AA141 (2)

2. SELECTION OF 3rd-4th FORK ROD

NOTE:

Perform the following procedures when.

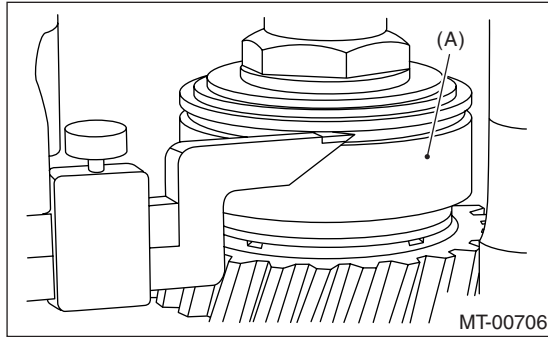
- Replacing the main shaft.
- Replacing the 3rd, 3rd to 6th drive gear and bushing.
- Replacing the 3rd, 3rd to 6th synchro assembly.
- Replacing the 3rd-4th hub, sleeve assembly.

- 1) Insert the main shaft assembly in adapter plate.
- 2) Set the height gauge to adapter plate. Lower the indicator of height gauge to upper surface of snap ring groove, on the upper side of main rear bearing, then set to zero point.

Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

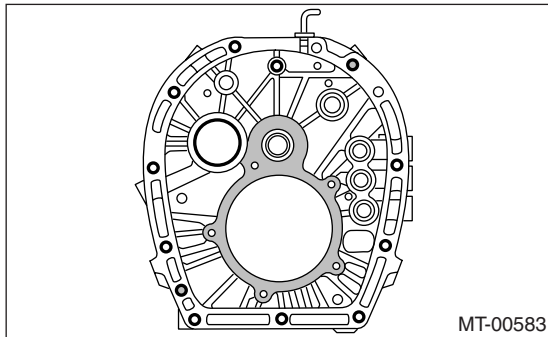
ST 18853AA000 HEIGHT GAUGE



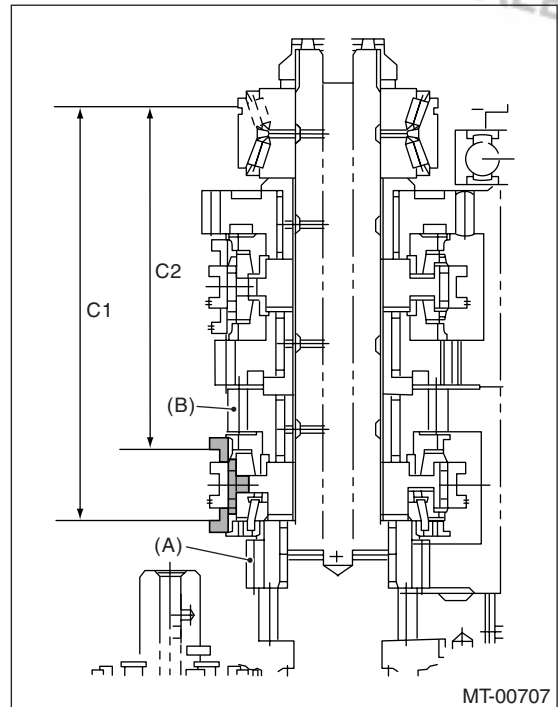
(A) Roller bearing

NOTE:

- Remove the remaining gasket on edge surface with scraper, since the height gauge is set on adapter plate during measurement.
- Do not put the height gauge on shaded area in the figure during the measurement.



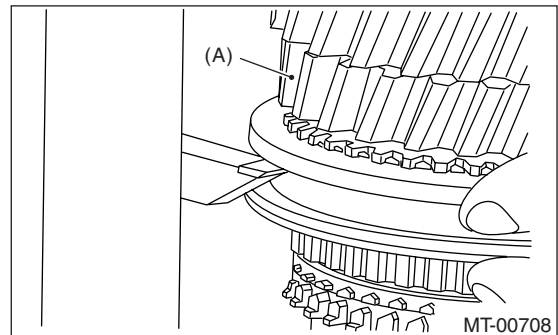
3) Using the height gauge, measure “C1” and “C2” shown in the figure.



(A) 3rd drive gear

(B) 4th drive gear

(1) Shift the 3rd-4th sleeve to 4th gear side, then press up to the stopper and measure “C2”.



(A) 4th drive gear

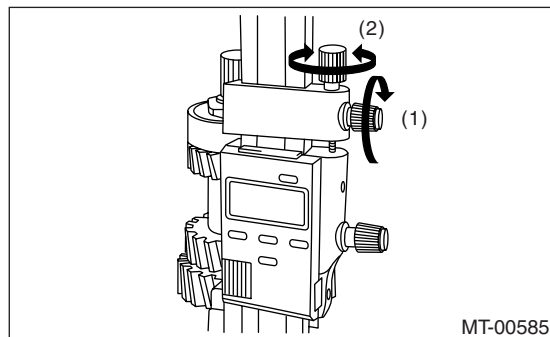
NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure.
- Turn dial (2) to set the indicator to edge surface of sleeve 4th side.
- Perform the measuring procedure with two people, and measure the sleeve lifted up straight.

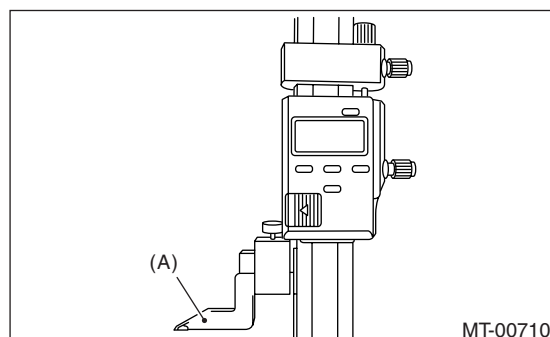
Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.

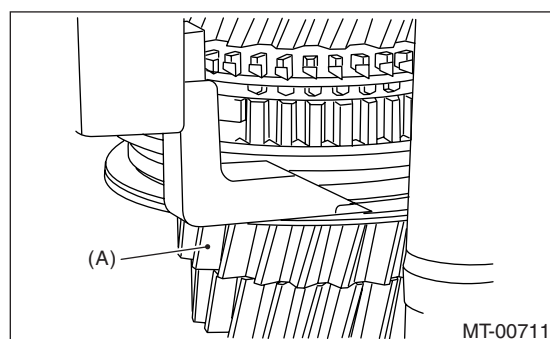


(2) Set the height gauge indicator upside down.



(A) Indicator

(3) Shift the 3rd-4th sleeve to 3rd drive gear side, then press down to the stopper and measure "C1".

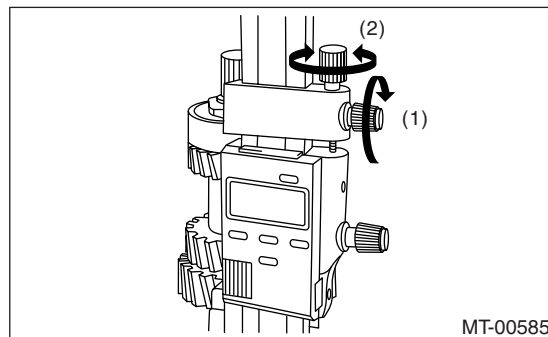


(A) 3rd drive gear

NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of sleeve 3rd side.

- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.



4) According to both measurements, calculate the 3rd-4th sleeve neutral position. Select the fork rod which applies to the calculated value from following equation.

Equation: $T = (C1 + C2) / 2$

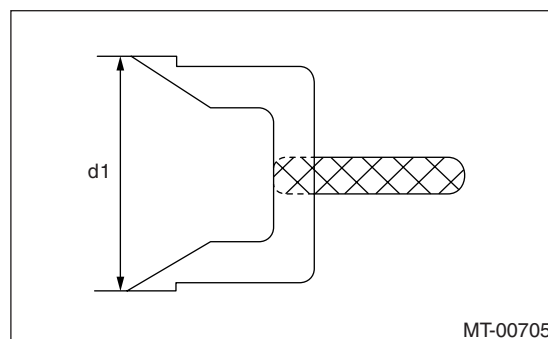
T: 3rd-4th sleeve center position

C1: Length from main shaft rear bearing snap ring groove to sleeve edge when shifted to 3rd gear. [measurement value +55 mm (2.17 in)]

C2: Length from main shaft rear bearing snap ring groove to sleeve edge when shifted to 4th gear.

NOTE:

The indicator is installed upside down compared to the setting procedure of zero point. Add "d1" [fixing value: 55 mm (2.17 in)] from the following figure to "C1", to obtain measurement value of "C1".



Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

T mm (in)	Lot No. (Mark)		
	M.SFT Snap ring 805072010 [t = 1.65 mm (0.065 in)]	M.SFT Snap ring 805072011 [t = 1.95 mm (0.077 in)]	M.SFT Snap ring 805072012 [t = 2.25 mm (0.089 in)]
137.22 — 137.52 (5.4024 — 5.4142)	32809AA171 (None)	32809AA181 (2)	32809AA191 (4)
137.52 — 137.82 (5.4142 — 5.4260)	32809AA161 (1)	32809AA171 (None)	32809AA181 (2)
137.82 — 138.12 (5.4260 — 5.4379)	32809AA141 (3)	32809AA161 (1)	32809AA171 (None)
T = Thickness			

3. SELECTION OF 5th-6th FORK ROD

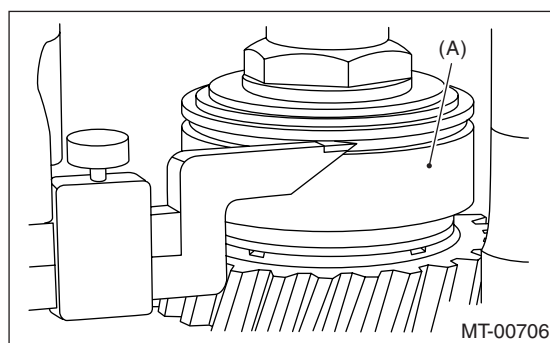
NOTE:

Perform the following procedures when.

- Replacing the main shaft.
- Replacing the 3rd to 6th drive gear and bushing.
- Replacing the 3rd to 6th synchro ring assembly.
- Replacing the 3rd-4th hub, sleeve assembly.
- Replacing the 5th-6th hub, sleeve assembly.

- 1) Insert the main shaft assembly in adapter plate.
- 2) Set the height gauge to adapter plate. Lower the indicator of height gauge to upper surface of snap ring groove, or the upper side of main rear bearing. Then set to zero point.

ST 18853AA000 HEIGHT GAUGE

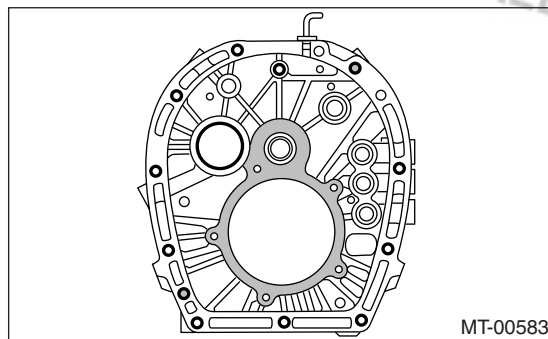


(A) Ball bearing

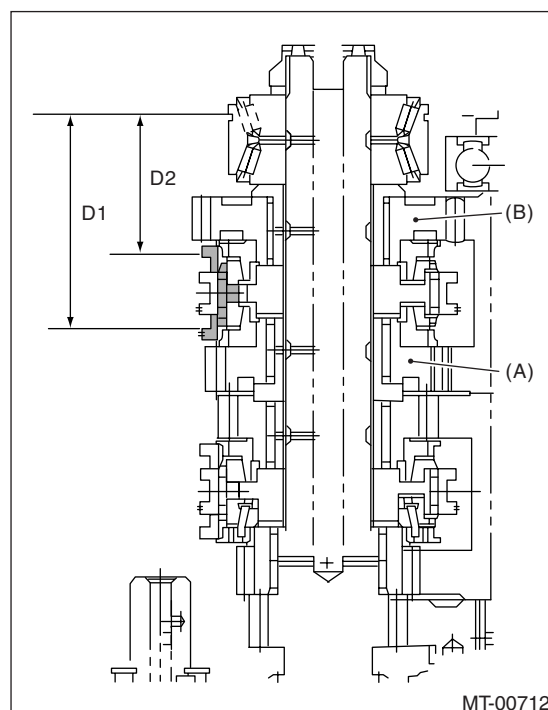
NOTE:

- Remove the remaining gasket on edge surface with scraper, since the height gauge is set on adapter plate during measurement.

- Do not place the height gauge on shaded area in the figure during the measurement.



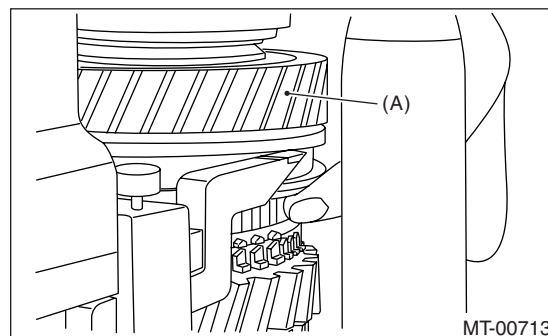
- 3) Using the height gauge, measure "D1" and "D2" shown in the figure.



(A) 5th main gear

(B) 6th main gear

- (1) Shift the 5th-6th sleeve to 6th main gear side, then press up to the stopper and measure "D2".



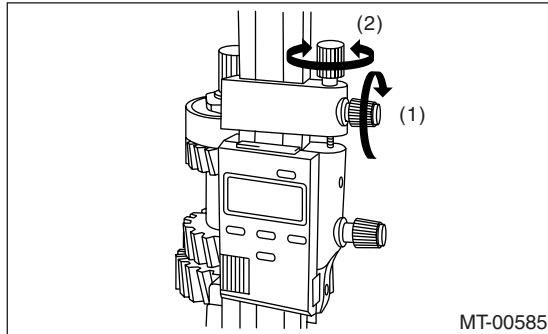
(A) 6th main gear

Shifter Fork and Rod

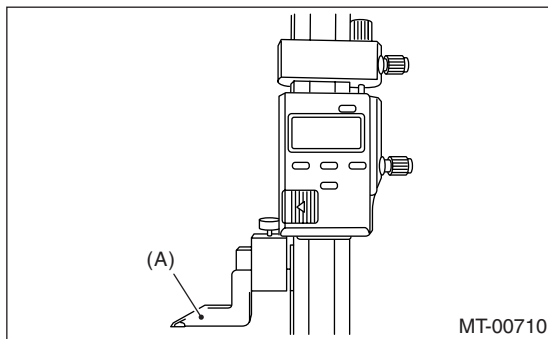
MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of sleeve 6th side.
- Perform the measuring procedure with two people, and measure the sleeve lifted up straight.
- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.

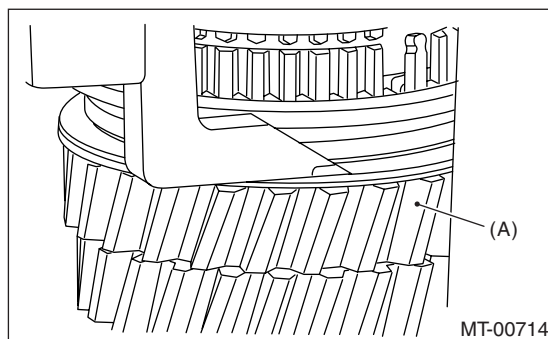


(2) Set the height gauge indicator upside down.



(A) Indicator

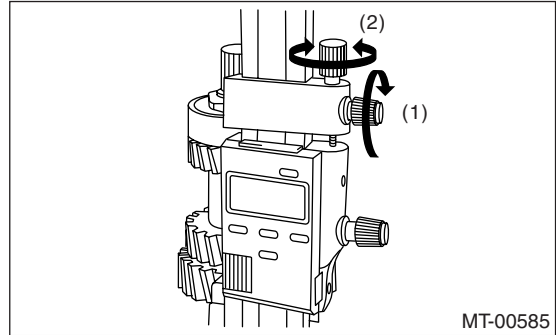
(3) Shift the 5th-6th sleeve to 5th main gear side, then press down to the stopper and measure "D1".



(A) 5th main gear

NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of sleeve 5th side.
- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.



4) According to both measurements, calculate the 5th-6th sleeve neutral position. Select the fork rod, which applies to the calculated value from following equation.

Equation: $T = (D1 + D2) / 2$

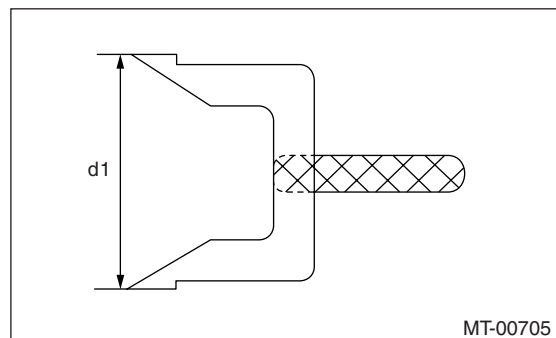
T: 5th-6th sleeve center position

D1: Length from the shaft rear bearing snap ring groove to sleeve groove edge when shifted to 5th gear. [measurement value + 55 mm (2.17 in)]

D2: Length from main shaft rear bearing snap ring groove to sleeve groove edge when shifted to 6th gear.

NOTE:

The indicator is installed upside down compared to the setting procedure of zero point. Add "d1" [fixing value: 55 mm (2.17 in)] from the following figure to "D1", to obtain measurement value of "D1".



Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

T mm (in)	Lot No. (Mark)		
	M.SFT Snap ring 805072010 [t = 1.65 mm (0.065 in)]	M.SFT Snap ring 805072011 [t = 1.95 mm (0.077 in)]	M.SFT Snap ring 805072012 [t = 2.25 mm (0.089 in)]
64.12 — 64.42 (2.5244 — 2.5362)	32945AA021 (None)	32945AA031 (2)	32945AA041 (4)
64.42 — 64.72 (2.5362 — 2.5480)	32945AA011 (1)	32945AA021 (None)	32945AA031 (2)
64.72 — 65.02 (2.5480 — 2.5598)	32945AA001 (3)	32945AA011 (1)	32945AA021 (None)
T = Thickness			

4. SELECTION OF REVERSE FORK ROD

NOTE:

Perform the following procedures when.

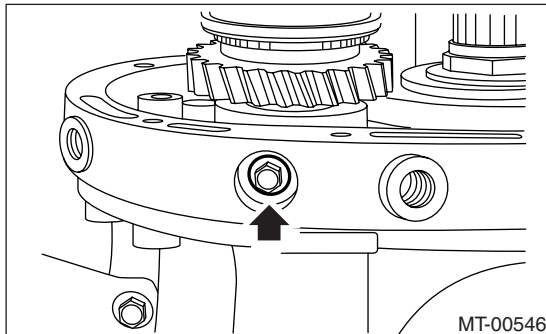
- Replacing the reverse idler gear.
- Replacing the reverse idler gear No. 2.
- Replacing the adapter plate.
- Replacing the base.

1) Insert the reverse idler gear assembly in adapter plate.

2) Tighten the base COMPL fixing bolt.

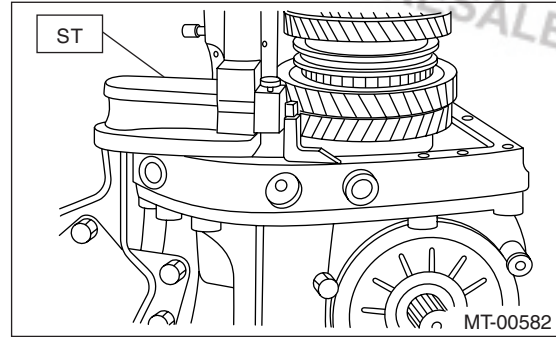
Tightening torque:

25 N·m (2.5 kgf·m, 18.1 ft·lb)



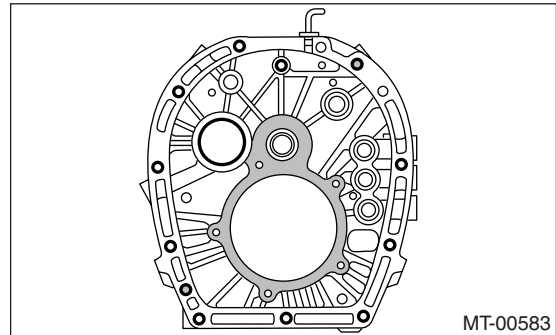
3) Set the height gauge to adapter plate. Lower the indicator of height gauge to mating surface of adapter plate and case, then set to zero point.

ST 18853AA000 HEIGHT GAUGE



NOTE:

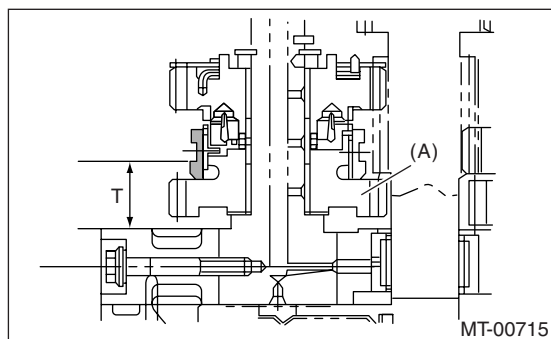
- Remove the remaining gasket on edge surface with scraper, since the adapter plate is base point of measurement.
- Do not place the height gauge on shaded area in the figure during measurement.



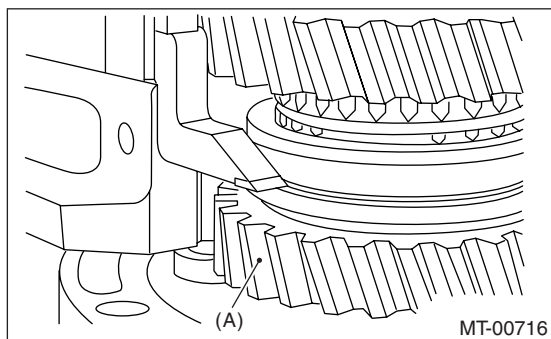
Shifter Fork and Rod

MANUAL TRANSMISSION AND DIFFERENTIAL

4) Press the reverse sleeve to reverse side idler gear No. 2, then measure "T".



(A) Reverse idler gear No. 2

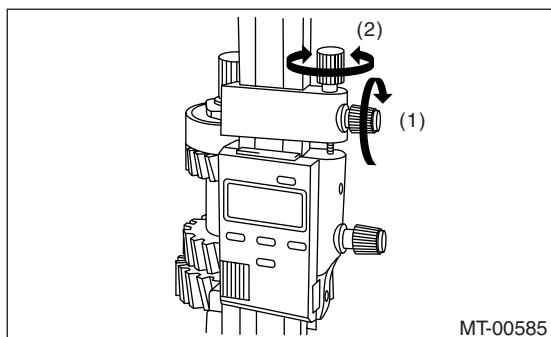


(A) Reverse idler gear No. 2

T + 4.8 mm (0.189 in)	Lot No. (Mark)
33.50 — 33.80 (1.3189 — 1.3307)	32816AA110 (1)
33.80 — 34.10 (1.3307 — 1.3425)	32816AA130 (None)
34.10 — 34.40 (1.3425 — 1.3543)	32816AA140 (2)
T = Thickness	

NOTE:

- Set the indicator of height gauge near measuring object, then lock the dial (1) as shown in the figure. Turn dial (2) to set the indicator to edge surface of reverse sleeve side.
- Measure five points of the sleeve turning every approx. 72°. Round off each two upper and lower measurement value. Use the remaining center value as measurement value.



5) According to measurement, calculate the reverse sleeve neutral position. Select the fork rod which applies to the calculated value from following equation.

Equation: $T + 4.8 \text{ mm (0.189 in)}$

27.Clutch Housing

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 6MT-35, REMOVAL, Manual Transmission Assembly.>
- 2) Prepare the transmission for overhaul. <Ref. to 6MT-41, Preparation for Overhaul.>
- 3) Remove the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, REMOVAL, Oil Pipe.> <Ref. to 6MT-46, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-44, REMOVAL, Back-up Light Switch.>
- 4) Remove the extension case. <Ref. to 6MT-48, REMOVAL, Extension Case.>
- 5) Remove the transfer driven gear. <Ref. to 6MT-59, REMOVAL, Transfer Driven Gear.>
- 6) Remove the center differential. <Ref. to 6MT-61, REMOVAL, Center Differential.>
- 7) Remove the oil pump. <Ref. to 6MT-62, REMOVAL, Oil Pump.>
- 8) Remove the transmission case. <Ref. to 6MT-65, REMOVAL, Transmission Case.>
- 9) Remove each gear assembly. <Ref. to 6MT-70, REMOVAL, Main Shaft Assembly.>
- 10) Remove the drive pinion shaft assembly. <Ref. to 6MT-96, REMOVAL, Drive Pinion Shaft Assembly.>
- 11) Remove the front differential assembly. <Ref. to 6MT-102, REMOVAL, Front Differential Assembly.>
- 12) Remove the vehicle speed sensor. <Ref. to 6MT-32, REMOVAL, Vehicle Speed Sensor.>
- 13) Remove the speedometer gear. <Ref. to 6MT-108, REMOVAL, Speedometer Gear.>

B: INSTALLATION

- 1) Install the pitching stopper bracket.

Tightening torque:

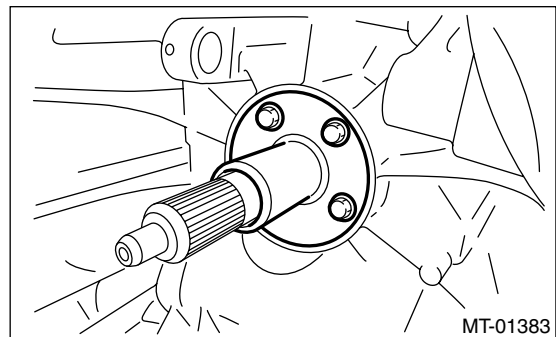
41 N·m (4.2 kgf·m, 30.2 ft-lb)

- 2) Install the speedometer gear. <Ref. to 6MT-108, INSTALLATION, Speedometer Gear.>
- 3) Install the vehicle speed sensor. <Ref. to 6MT-32, INSTALLATION, Vehicle Speed Sensor.>
- 4) Install the front differential assembly. <Ref. to 6MT-102, INSTALLATION, Front Differential Assembly.>
- 5) Install the drive pinion shaft assembly. <Ref. to 6MT-96, INSTALLATION, Drive Pinion Shaft Assembly.>
- 6) Install each gear assembly at once. <Ref. to 6MT-70, INSTALLATION, Main Shaft Assembly.>
- 7) Install the transmission case. <Ref. to 6MT-66, INSTALLATION, Transmission Case.>
- 8) Install the oil pump. <Ref. to 6MT-63, INSTALLATION, Oil Pump.>

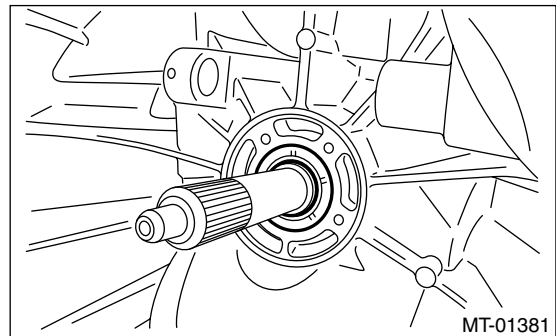
- 9) Install the center differential. <Ref. to 6MT-61, INSTALLATION, Center Differential.>
- 10) Install the transfer driven gear. <Ref. to 6MT-59, INSTALLATION, Transfer Driven Gear.>
- 11) Install the extension case. <Ref. to 6MT-48, INSTALLATION, Extension Case.>
- 12) Install the oil pipe, neutral position switch, back-up light switch and harness. <Ref. to 6MT-43, INSTALLATION, Oil Pipe.> <Ref. to 6MT-46, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-44, INSTALLATION, Back-up Light Switch.>
- 13) Install the manual transmission assembly to vehicle. <Ref. to 6MT-37, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

- 1) Remove the clutch release bearing guide.



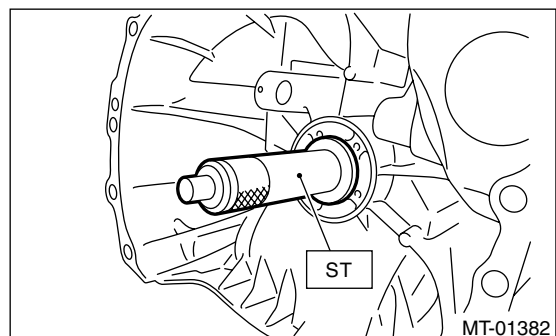
- 2) Remove the oil seal.



D: ASSEMBLY

- 1) Install the oil seal into clutch housing without damaging.

ST 18657AA020 OIL SEAL INSTALLER



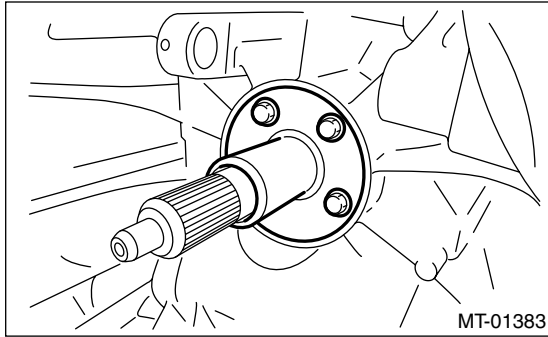
- 2) Install the clutch release bearing guide.

Clutch Housing

MANUAL TRANSMISSION AND DIFFERENTIAL

Tightening torque:

6.4 N·m (0.65 kgf-m, 4.7 ft-lb)



E: INSPECTION

- 1) Make sure there is no damage or crack on the clutch housing. Replace the clutch housing with a new one if there is excessive damage.
- 2) Check the clutch housing for gear oil leakage. If there is oil leakage, repair or replace the leakage part.

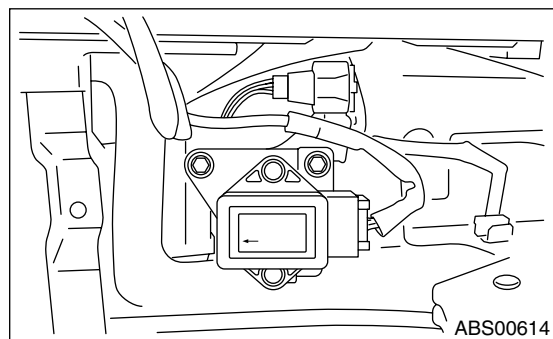
28. Yaw Rate and Lateral G Sensor

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the console cover. <Ref. to EI-46, Console Box.>
- 3) Disconnect the connector from yaw rate & lateral G sensor.
- 4) Remove the yaw rate & lateral G sensor from body.

CAUTION:

Do not drop or bump the yaw rate & lateral G sensor.



B: INSTALLATION

Install in the reverse order of removal.

CAUTION:

Do not drop or bump the yaw rate & lateral G sensor.

Tightening torque:

18 N·m (1.8 kgf-m, 13 ft-lb)

29. Driver's Control Center Differential Control Module

A: REMOVAL

- 1) Remove the ground cable from battery.
- 2) Remove the glove box. <Ref. to EI-43, REMOVAL, Glove Box.>
- 3) Disconnect the connector after removing the bolt from the inside of glove box, and then remove the control module.

B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb)

30. Steering Angle Sensor

A: REPLACEMENT

CAUTION:

- Do not perform the removal except when the replacement.
- When replacing three times or more, replace the combination switch as assembly to protect screw part.

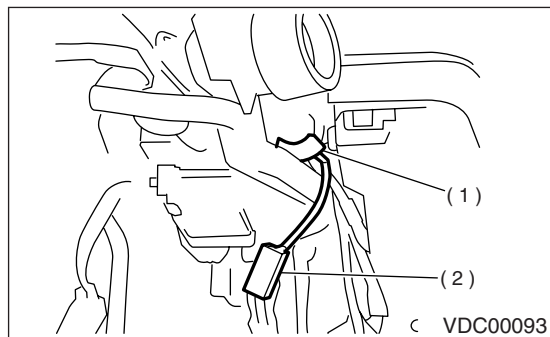
- 1) Set the steering wheel in a straight-ahead position.
- 2) Disconnect the ground cable from battery.
- 3) Remove the airbag module.
<Ref. to AB-14, REMOVAL, Driver's Airbag Module.>

WARNING:

Always refer to "Airbag System" when performing the airbag module repair service.

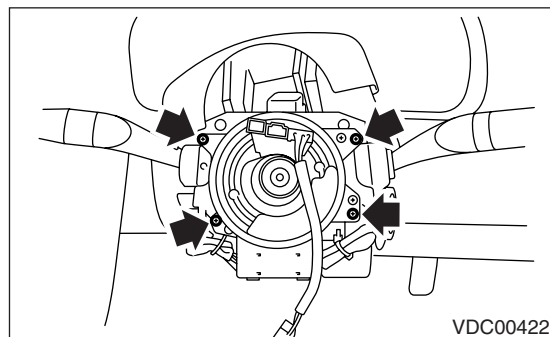
<Ref. to AB-3, CAUTION, General Description.>

- 4) Remove the steering wheel.
<Ref. to PS-20, REMOVAL, Steering Wheel.>
- 5) Remove the screws and detach the steering column lower cover.
- 6) Remove the two screws securing the steering column upper cover.
- 7) Unlock the harness band and disconnect the connector of steering angle sensor.

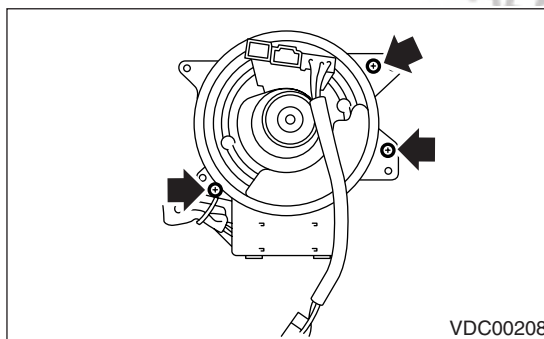


- (1) Harness band
- (2) Connector

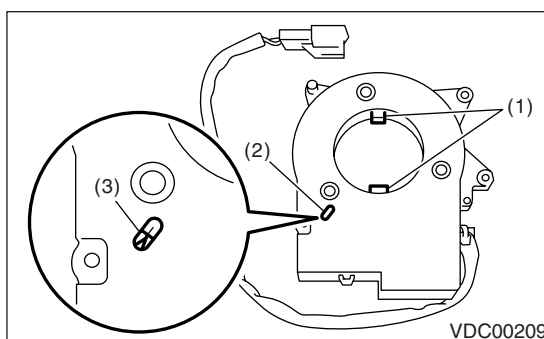
- 8) Remove the screws which secure the roll connector to the steering column.



- 9) Remove the steering angle sensor from the roll connector.



- 10) Turn the protrusion portion of new steering angle sensor to match the alignment mark of inspection hole.

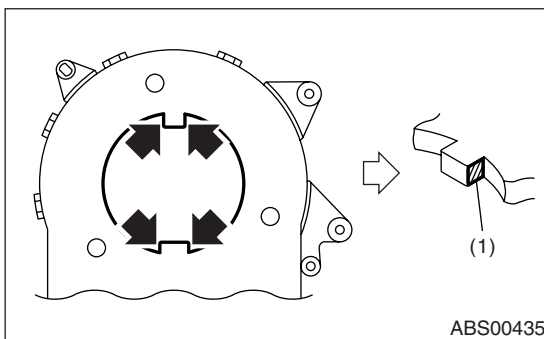


- (1) Protrusion portion
- (2) Inspection hole
- (3) Alignment mark

CAUTION:

Be careful not to allow foreign particles to enter from inspection hole.

- 11) Align the center of roll connector.
<Ref. to AB-20, INSTALLATION, Roll Connector.>
- 12) Apply thin coat of grease which is enclosed with new part to the protruding parts (four) of steering angle sensor.



- (1) Apply grease.

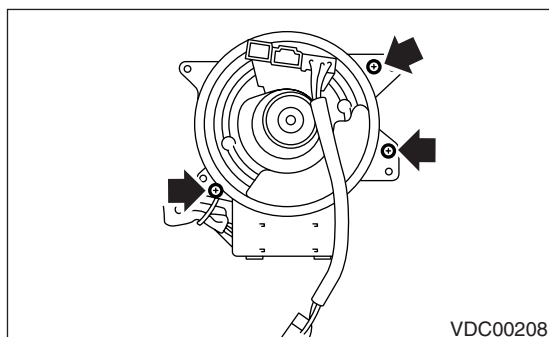
Steering Angle Sensor

MANUAL TRANSMISSION AND DIFFERENTIAL

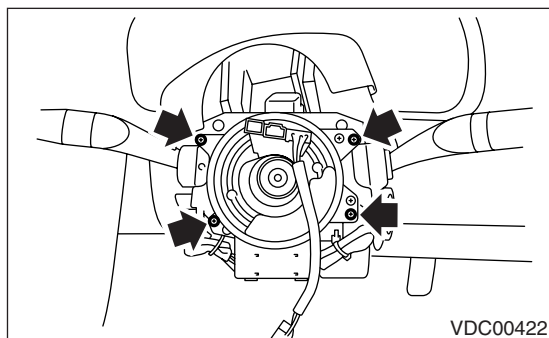
13) Align the position of protrusion portion and install the roll connector to the steering angle sensor.

Tightening torque:

0.5 N·m (0.05 kgf-m, 0.36 ft-lb)



14) Install the roll connector to combination switch.



15) Install the steering wheel.

<Ref. to PS-20, INSTALLATION, Steering Wheel.>

Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb)

16) Install the airbag module to steering wheel.
<Ref. to AB-14, INSTALLATION, Driver's Airbag Module.>

WARNING:

Always refer to "Airbag System" before performing the service operation.

<Ref. to AB-3, CAUTION, General Description.>

17) Connect the battery ground cable to battery.

31. General Diagnostic Table

A: INSPECTION

1. MANUAL TRANSMISSION

Symptom	Possible cause	Remedy
1. Gears are difficult to intermesh. NOTE: The cause for difficulty in shifting gears can be classified into two kinds: one is malfunction of the gear shift system and the other is malfunction of the transmission. However, if the operation is heavy and engagement of the gears is difficult, defective clutch disengagement may also be responsible. Check whether the clutch is correctly functioning, before checking the gear shift system and transmission.	(a) Worn, damaged or burred chamfer of internal spline of sleeve and reverse driven gear	Replace.
	(b) Worn, damaged or burred chamfer of spline of gears	Replace.
	(c) Worn or scratched bushings	Replace.
	(d) Incorrect contact between synchronizer ring and gear cone or wear	Correct or replace.
2. Gear slips out. • Gear slips out when coasting on rough road. • Gear slips out during acceleration.	(a) Defective pitching stopper adjustment	Adjust.
	(b) Loose engine mounting bolts	Tighten or replace.
	(c) Worn fork shifter, broken shifter fork rail spring	Replace.
	(d) Worn or damaged ball bearing	Replace.
	(e) Excessive clearance between splines of synchronizer hub and synchronizer sleeve	Replace.
	(f) Worn tooth step of synchronizer hub (responsible for slip-out of 3rd gear)	Replace.
	(g) Worn 1st driven gear, needle bearing and race	Replace.
	(h) Worn 2nd driven gear, needle bearing and race	Replace.
	(i) Worn 3rd drive gear and bushing	Replace.
	(j) Worn 4th drive gear and bushing	Replace.
	(k) Worn 5th drive gear and bushing	Replace.
	(l) Worn 6th drive gear and bushing	Replace.
3. Unusual noise comes from transmission. NOTE: If an unusual noise is heard when the vehicle is parked with its engine idling and if the noise ceases when the clutch is disengaged, it may be considered that the noise comes from the transmission.	(a) Insufficient or improper lubrication	Lubricate or replace with specified oil.
	(b) Worn or damaged gears and bearings NOTE: If the trouble is only wear of the tooth surfaces, merely a high roaring noise will occur at high speeds, but if any part is broken, rhythmical knocking sound will be heard even at low speeds.	Replace.

General Diagnostic Table

MANUAL TRANSMISSION AND DIFFERENTIAL

2. DIFFERENTIAL

Symptom	Possible cause	Remedy
1. Broken differential (case, gear, bearing, etc.) NOTE: Abnormal noise will develop and finally it will become impossible to continue to run due to broken pieces obstructing the gear revolution.	(a) Insufficient or improper oil	Replace.
	(b) Use of vehicle under severe conditions such as excessive load and improper use of clutch	Replace.
	(c) Improper adjustment of taper roller bearing	Adjust.
	(d) Improper adjustment of drive pinion and hypoid driven gear	Adjust.
	(e) Loose hypoid driven gear clamping bolts	Tighten.
2. Differential and hypoid gear noises Troubles of the differential and hypoid gear always appear as noise problems. Therefore noise is the first indication of the trouble. However noises from the engine, muffler, tire, exhaust gas, bearing, body, etc. are easily mistaken for the differential noise. Pay special attention to the hypoid gear noise because it is easily confused with other gear noises. There are the following four kinds of noises. <ul style="list-style-type: none"> • Gear noise when driving: If noise increases as the vehicle speed increases it may be due to insufficient gear oil, incorrect gear engagement, damaged gears, etc. • Gear noise when coasting: Damaged gears due to maladjusted bearings and incorrect shim adjustment • Bearing noise when driving or when coasting: Cracked, broken or damaged bearings • Noise which mainly occurs when turning: Unusual noise from the differential side gear, differential pinion, differential pinion shaft, etc. 	(a) Insufficient oil	Lubricate.
	(b) Improper adjustment of hypoid driven gear and drive pinion	Check tooth contact.
	(c) Worn teeth of hypoid driven gear and drive pinion	Replace as a set. Readjust bearing preload.
	(d) Loose roller bearing	Readjust hypoid driven gear to drive pinion backlash and check tooth contact.
	(e) Distorted hypoid driven gear or differential case	Replace.
	(f) Broken or damaged LSD.	Replace.