

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

1. General Description

A: SPECIFICATION

1. MANUAL TRANSMISSION AND FRONT DIFFERENTIAL

Type	6-forward speeds and 1-reverse		
Transmission gear ratio	1st		3.636
	2nd		2.235
	3rd		1.521
	4th		1.137
	5th		0.891
	6th		0.707
	Rev.		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	Straight bevel gear (Bevel pinion: 4, bevel gear: 2)	
Center differential	Type and number of gear	Straight bevel gear (Bevel pinion: 2, bevel gear: 2 and viscous coupling)	
Transmission gear oil		GL-5	
Transmission gear oil capacity		4.1 ℥ (4.3 US qt, 3.6 Imp qt)	

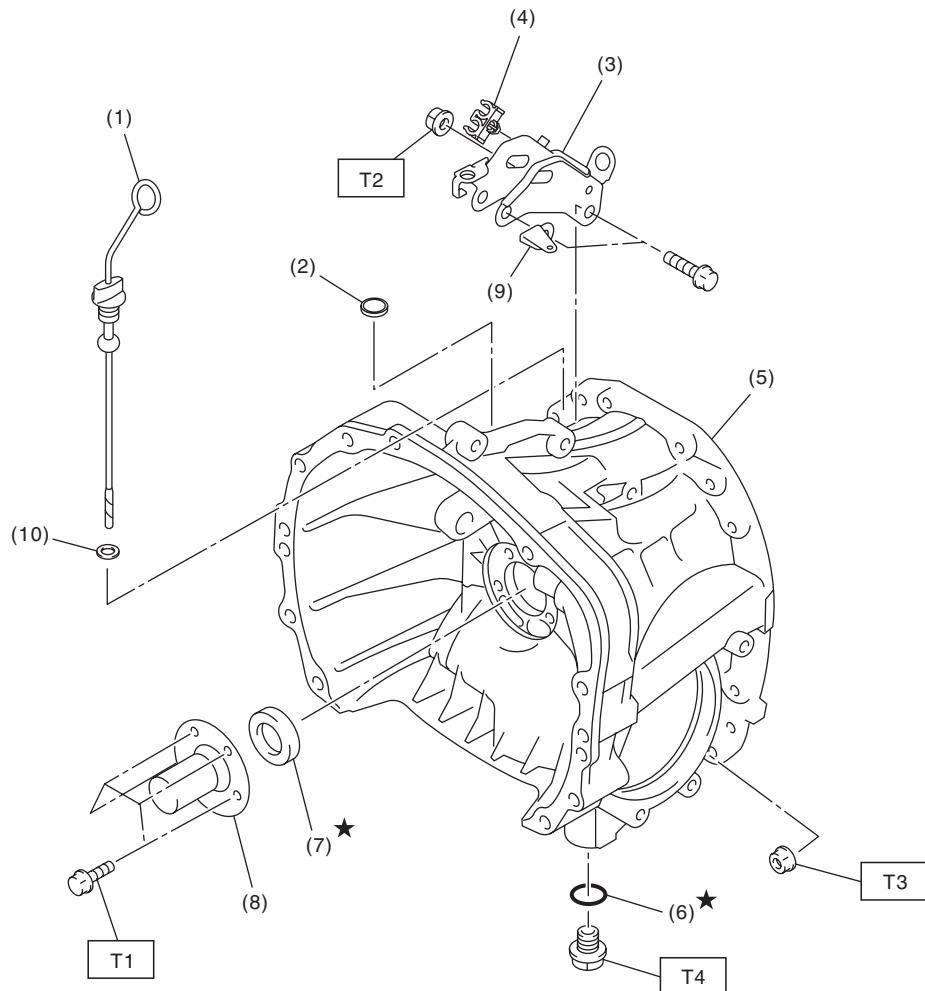
2. TRANSMISSION GEAR OIL

Recommended oil:

GL-5 (75W-90) or equivalent

B: COMPONENT

1. CLUTCH HOUSING



MT-01476

- (1) Oil level gauge
- (2) Plug
- (3) Pitching stopper bracket
- (4) Clip
- (5) Clutch housing

- (6) Gasket
- (7) Oil seal
- (8) Clutch release bearing guide
- (9) Return spring bracket
- (10) O-ring

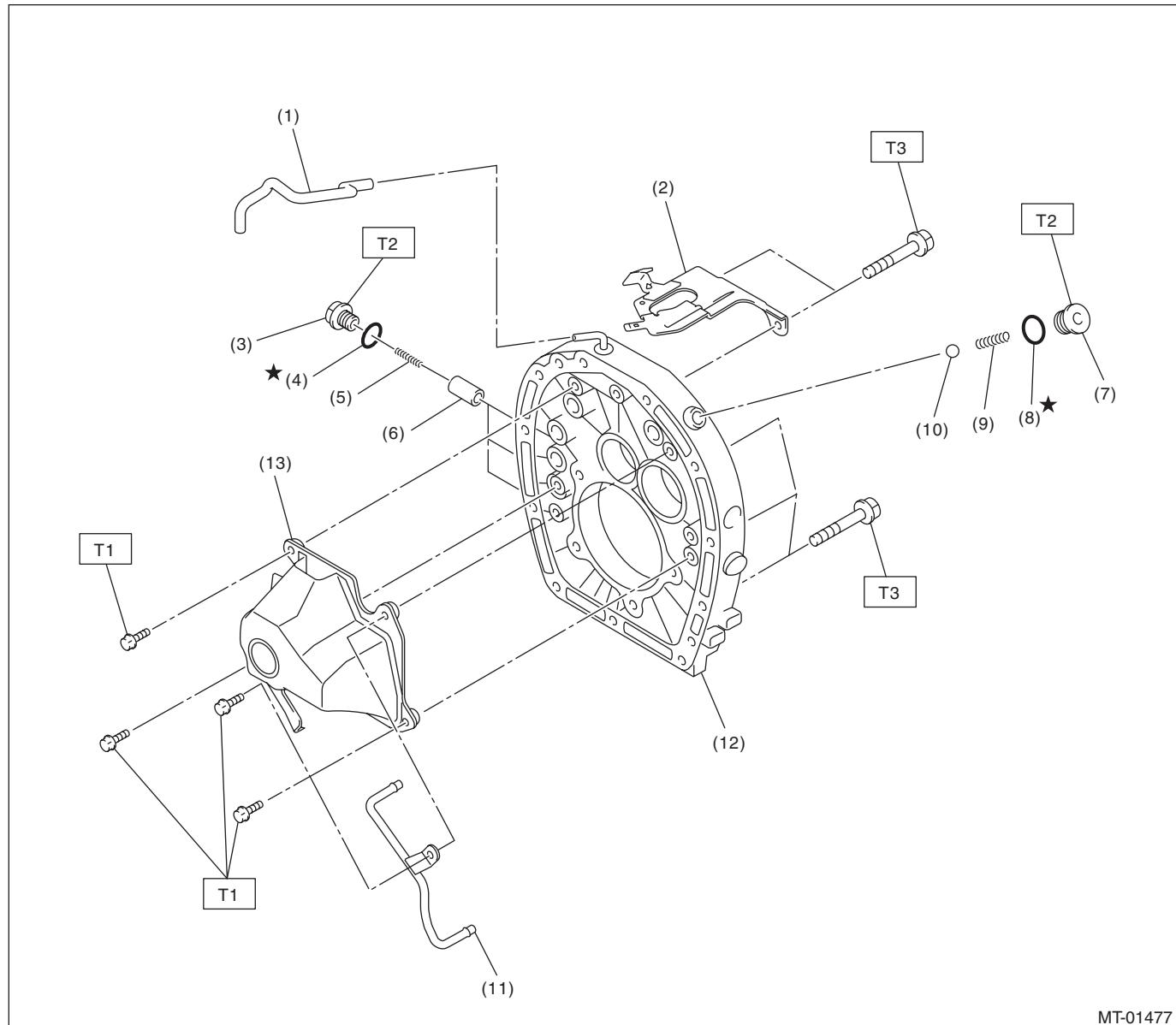
Tightening torque: N·m (kgf·m, ft-lb)

- 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



MT-01477

(1) Breather hose	(7) Checking ball plug	(13) Oil chamber
(2) Transmission harness stay	(8) Gasket	
(3) Plug	(9) Checking ball spring	
(4) Gasket	(10) Ball	
(5) Spring	(11) Lubrication pipe	
(6) Plunger	(12) Adapter plate	

Tightening torque:N·m (kgf·m, ft·lb)

T1: 6.4 (0.65, 4.7)

T2: 37 (3.8, 27.3)

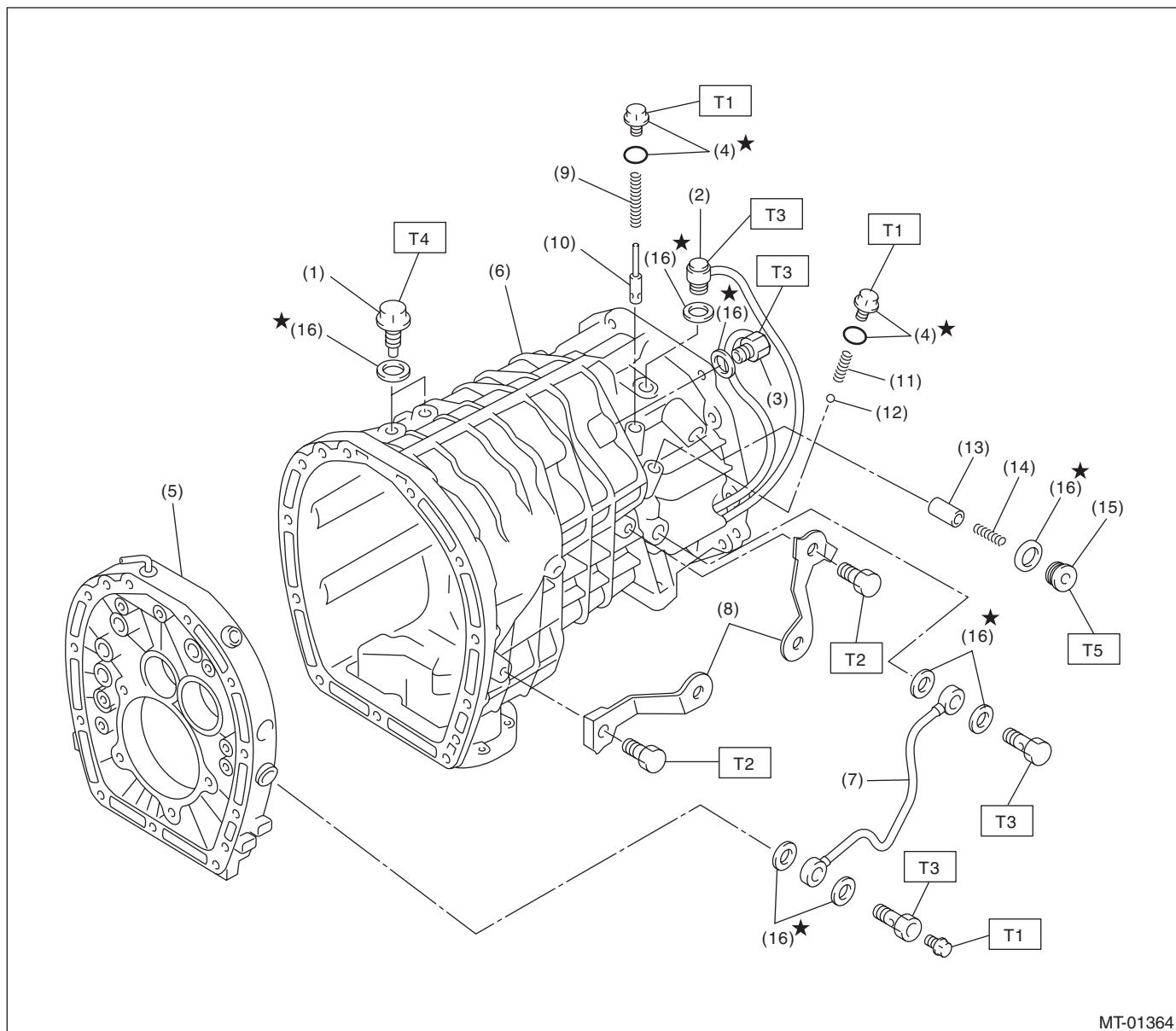
T3: 50 (5.1, 36.9)

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3. TRANSMISSION CASE

- Transmission serial No. 144576 or earlier



(1) Pilot bolt	(9) Relief valve spring
(2) Neutral switch	(10) Relief valve
(3) Back-up light switch	(11) Valve spring
(4) Bolt assembly seal	(12) Ball
(5) Adapter plate	(13) Plunger
(6) Transmission case	(14) Spring
(7) Oil pipe	(15) Plug
(8) Harness bracket	(16) Gasket

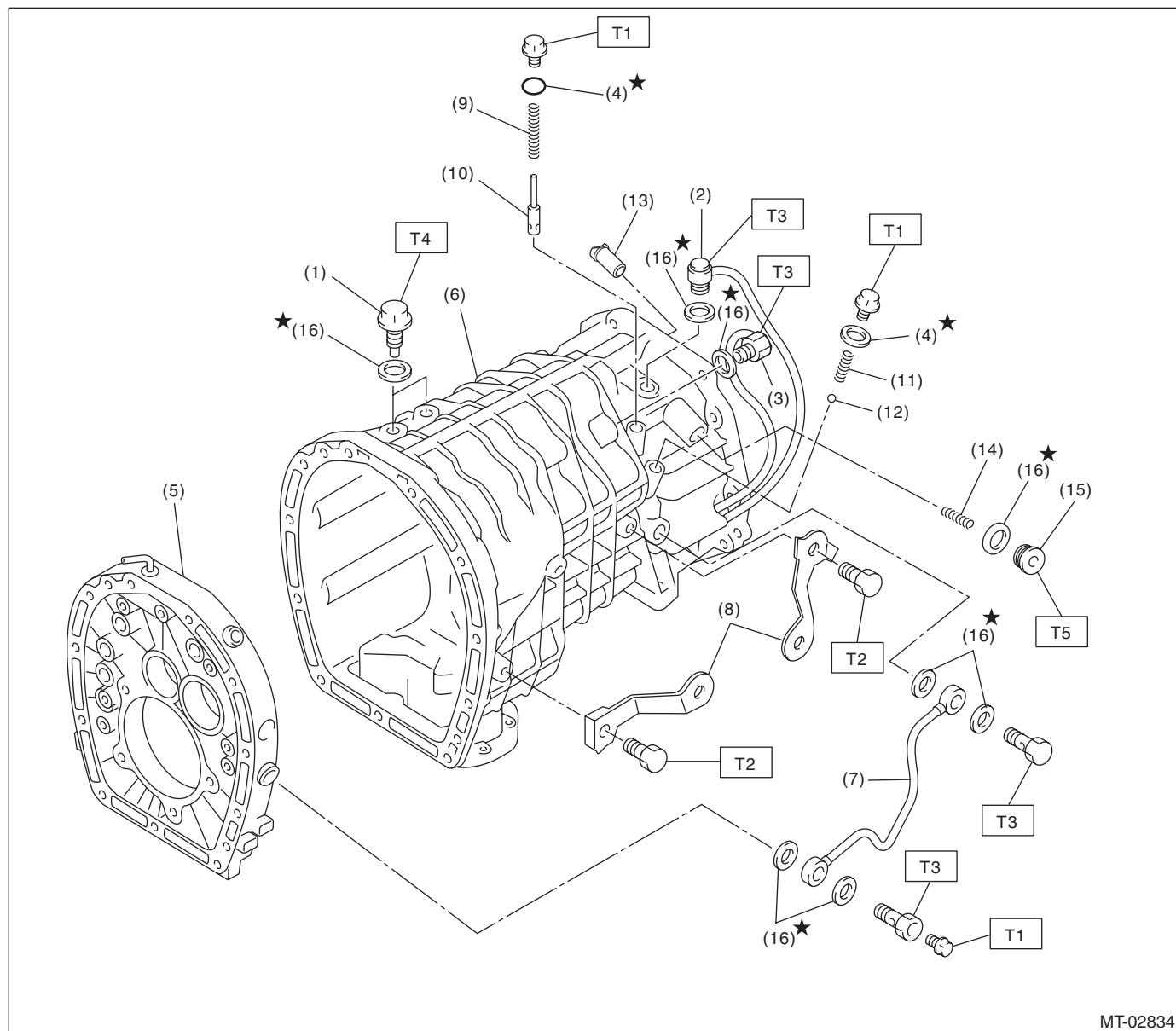
Tightening torque:N·m (kgf·m, ft·lb)

- 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)

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- Transmission serial No. 144577 or later



MT-02834

(1) Pilot bolt	(9) Relief valve spring
(2) Neutral switch	(10) Relief valve
(3) Back-up light switch	(11) Valve spring
(4) Bolt assembly seal	(12) Ball
(5) Adapter plate	(13) Selector plunger
(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)

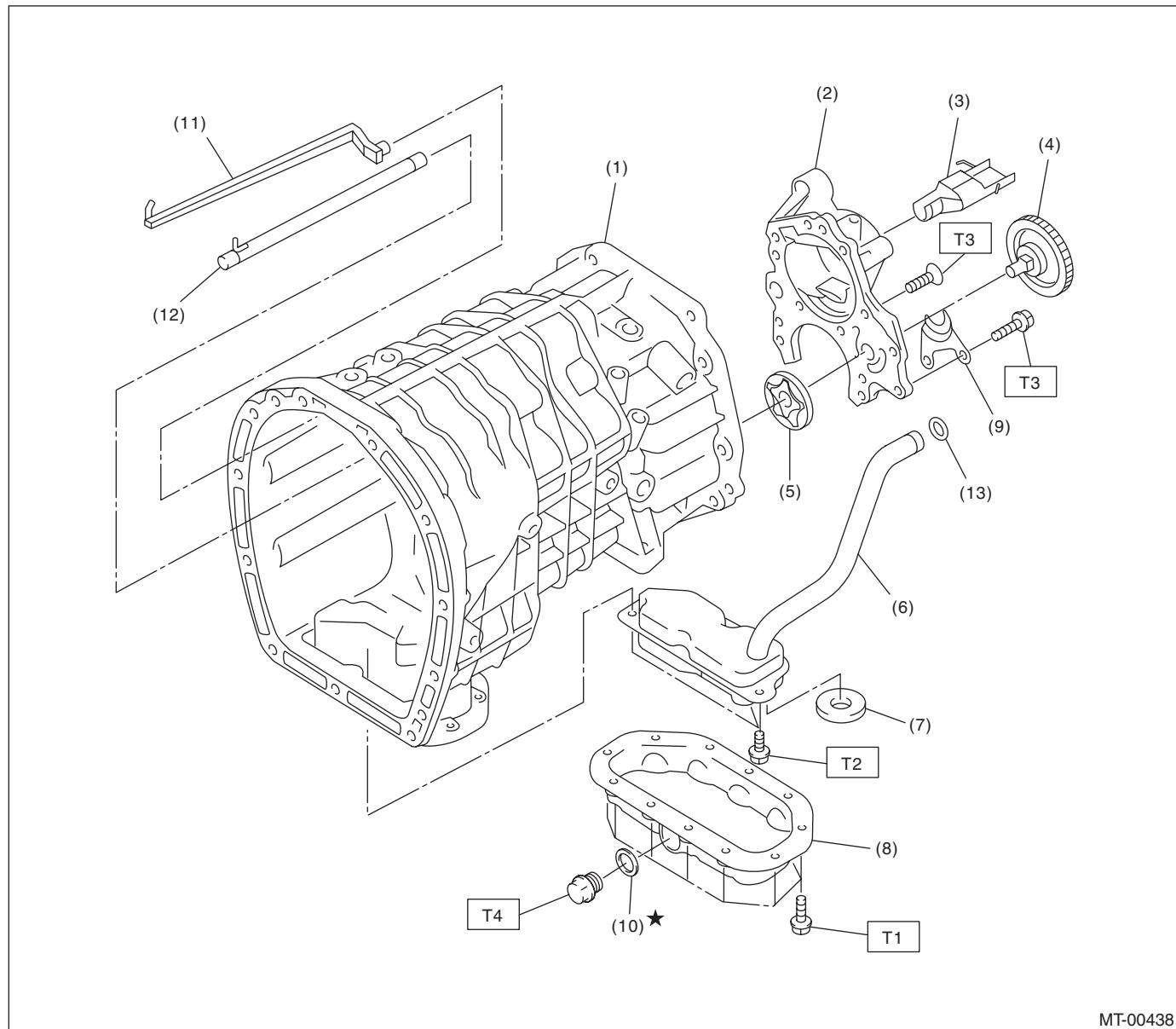
T4: 34 (3.5, 25.1)

T5: 41 (4.2, 30.2)

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4. OIL PAN & OIL PUMP



(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)

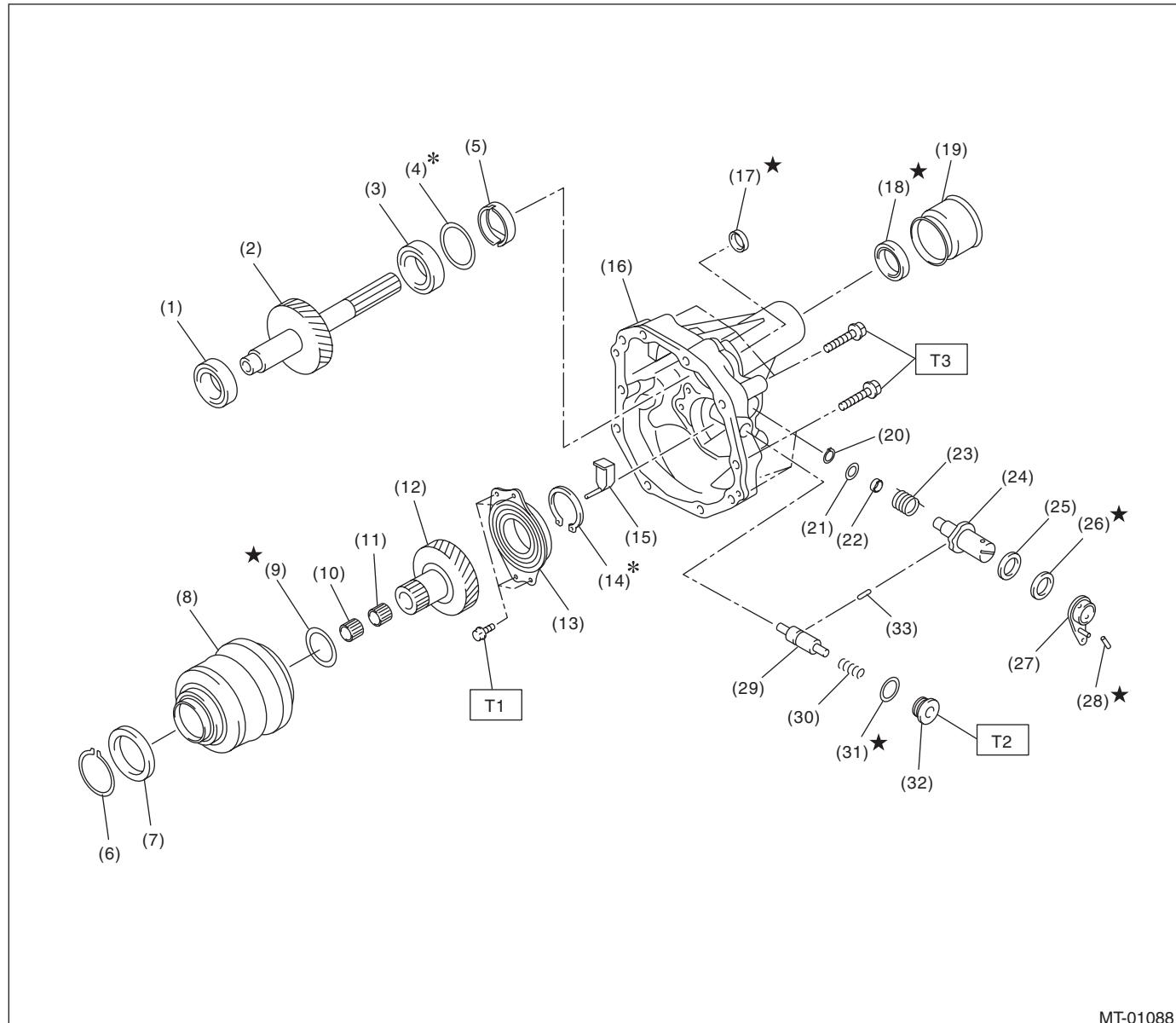
T3: 25 (2.5, 18.4)

T4: 44 (4.5, 32.5)

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5. EXTENSION CASE AND CENTER DIFFERENTIAL



MT-01088

(1)	Taper roller bearing	(14)	Snap ring	(27)	Reverse check lever COMPL
(2)	Transfer driven gear	(15)	Oil guide	(28)	Straight pin
(3)	Taper roller bearing	(16)	Extension case	(29)	Reverse check plug
(4)	Shim	(17)	Oil seal	(30)	Spring
(5)	Oil plate	(18)	Oil seal	(31)	Gasket
(6)	Snap ring	(19)	Dust cover	(32)	Plug
(7)	Oil pump drive gear	(20)	Snap ring	(33)	Plunger
(8)	Center differential	(21)	Washer		
(9)	Shim	(22)	Bushing		
(10)	Needle bearing	(23)	Spring		
(11)	Needle bearing	(24)	Reverse check shaft		
(12)	Transfer drive gear	(25)	Ball bearing		
(13)	Ball bearing (with flange)	(26)	Oil seal		

Tightening torque:N·m (kgf·m, ft·lb)

T1: 25 (2.5, 18.4)

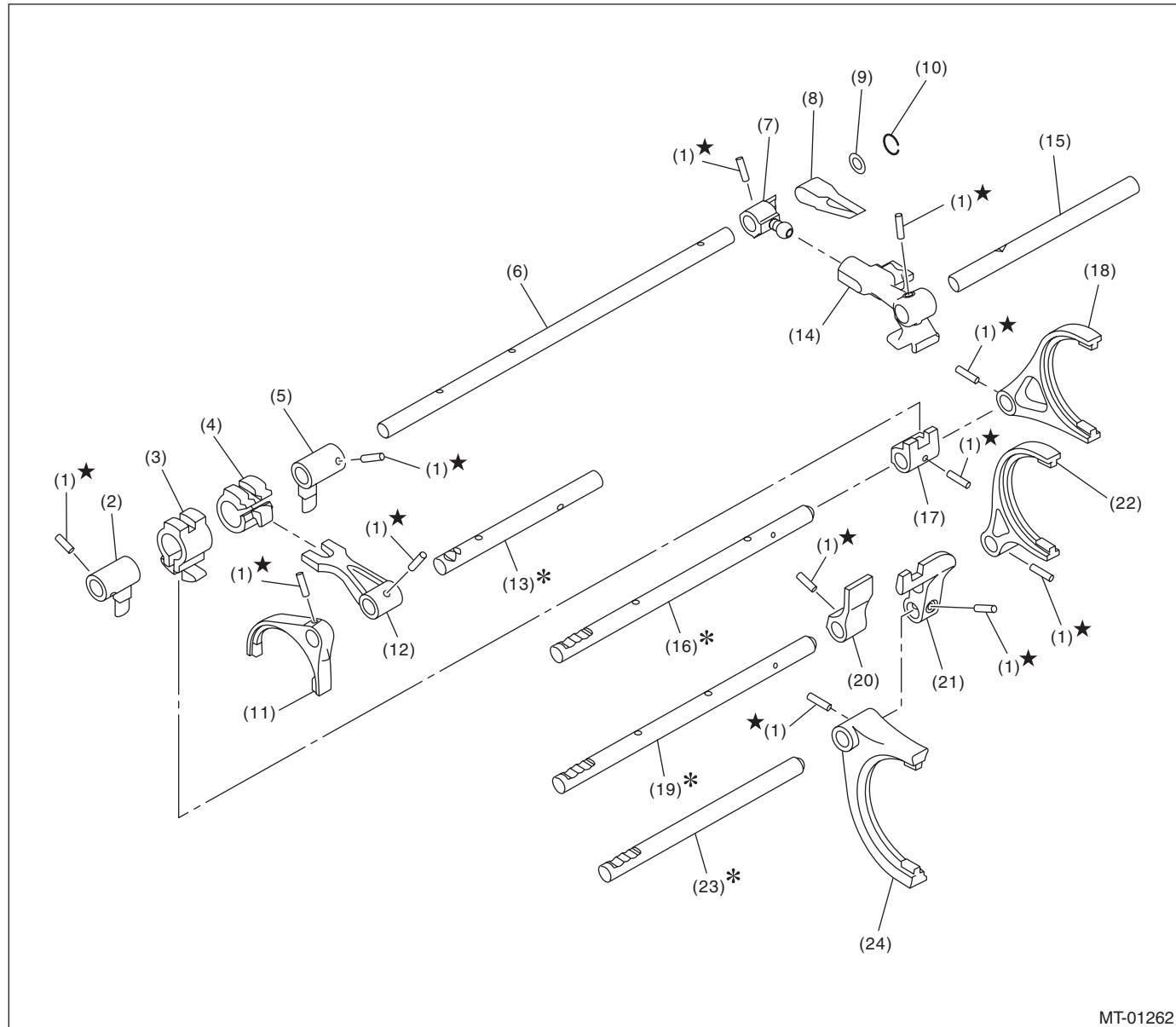
T2: 41 (4.2, 30.2)

T3: 48 (4.9, 35.4)

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6. SHIFTER FORK AND FORK ROD



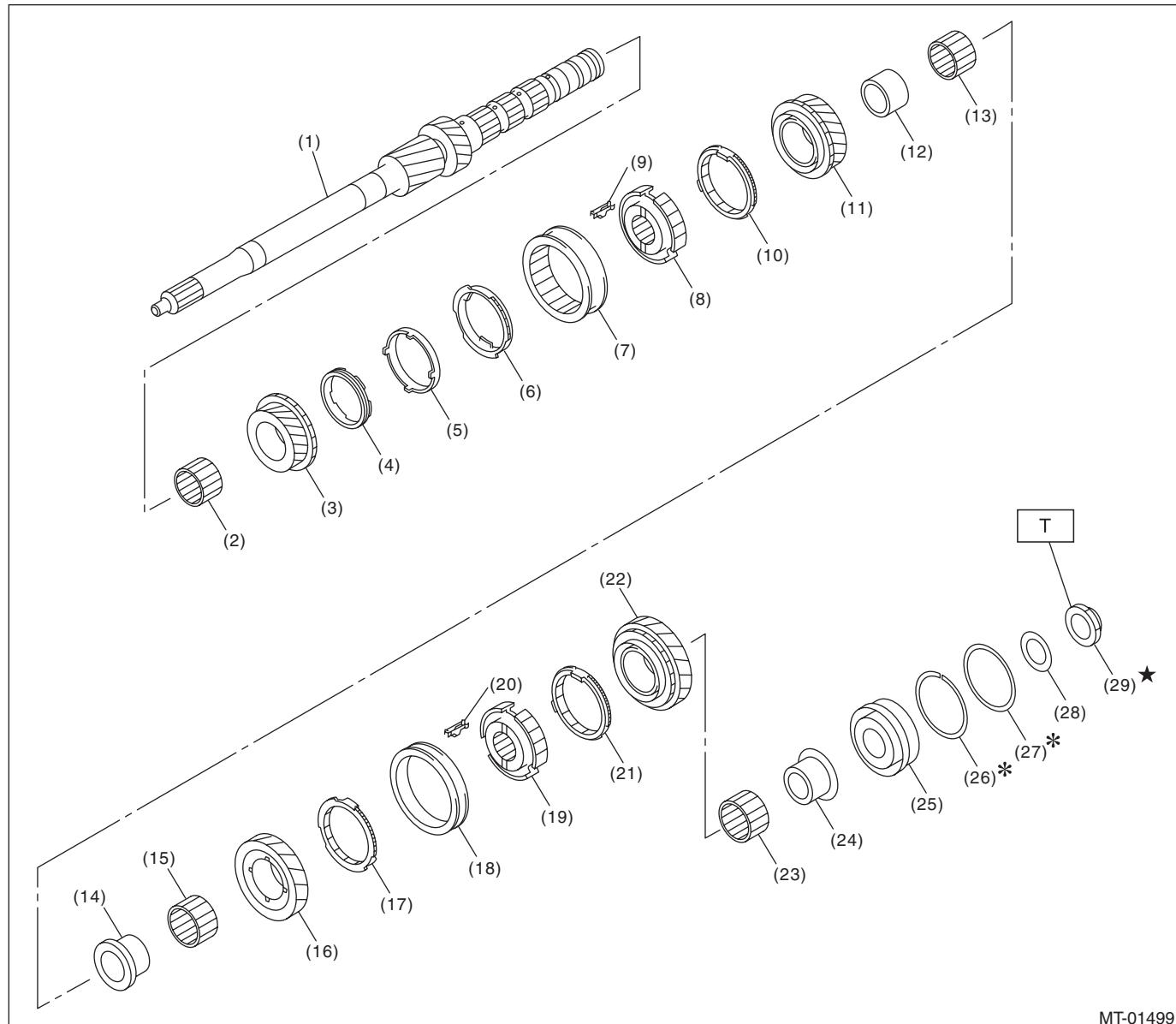
MT-01262

(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



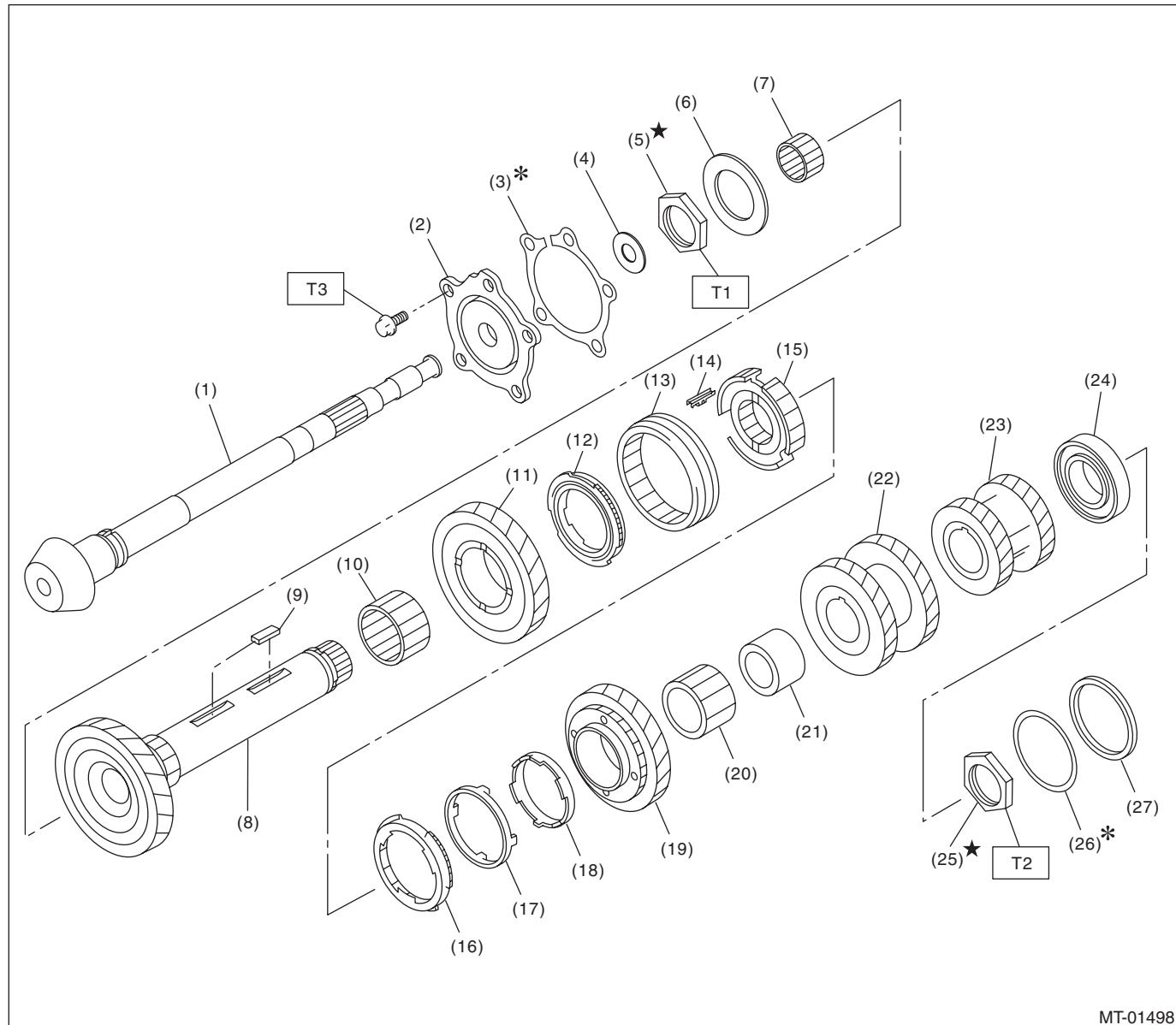
(1) Main shaft	(12) 4th bushing	(23) Needle bearing
(2) Needle bearing	(13) Needle bearing	(24) 6th bushing
(3) 3rd drive gear	(14) 5th bushing	(25) Taper roller bearing
(4) Inner baulk ring	(15) Needle bearing	(26) Snap ring
(5) Synchro cone	(16) 5th drive gear	(27) Washer
(6) Outer baulk ring	(17) 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, 289.1)

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8. DRIVE PINION AND DRIVE SHAFT ASSEMBLY



MT-01498

(1) Drive pinion shaft	(13) 1st-2nd sleeve	(25) Lock nut
(2) Taper roller bearing	(14) Shifting insert key	(26) Shim
(3) Shim	(15) 1st-2nd hub	(27) Collar
(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	

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)

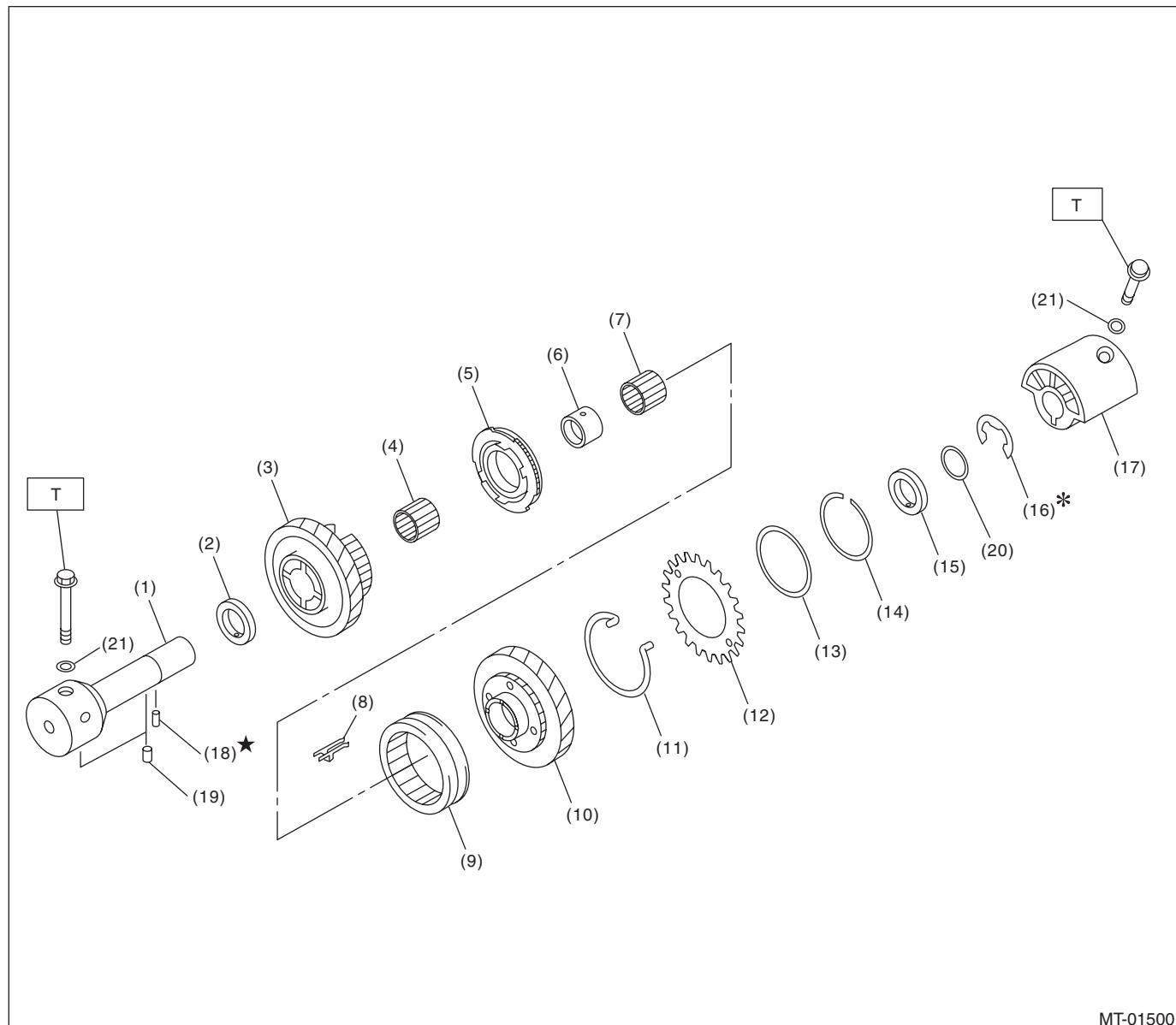
T3: 54 (5.5, 40)

* Tightening torque when using the ST

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9. REVERSE IDLER GEAR ASSEMBLY



MT-01500

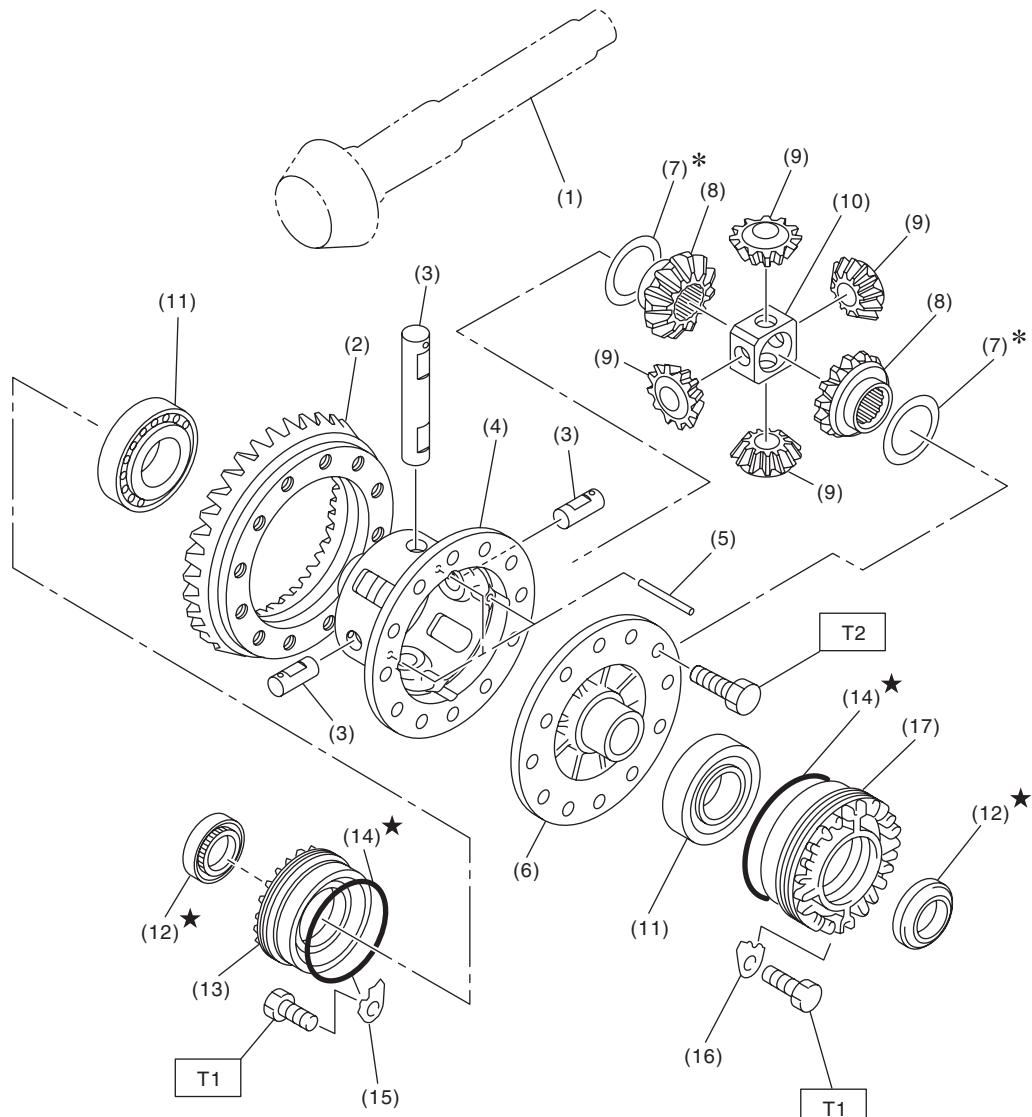
(1) Base COMPL	(9) Reverse coupling sleeve	(17) Reverse idler holder
(2) Counter high and low washer	(10) Reverse idler gear	(18) Spring pin
(3) Reverse idler gear No. 2	(11) Spring	(19) Knock pin
(4) Needle bearing	(12) Sub gear	(20) Washer
(5) Reverse idler synchro set	(13) Friction plate	(21) Gasket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

Tightening torque:N·m (kgf·m, ft·lb)
T: 25 (2.5, 18.4)

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10. FRONT DIFFERENTIAL



MT-01529

(1)	Drive pinion shaft	(8)	Differential bevel gear	(15)	Retainer lock plate RH
(2)	Hypoid driven gear	(9)	Differential bevel pinion	(16)	Retainer lock plate LH
(3)	Pinion shaft	(10)	Pinion shaft joint	(17)	Differential side retainer LH
(4)	Differential case RH	(11)	Roller bearing		
(5)	Straight pin	(12)	Oil seal		
(6)	Differential case LH	(13)	Differential side retainer RH		
(7)	Washer	(14)	O-ring		

Tightening torque:N·m (kgf·m, ft-lb)

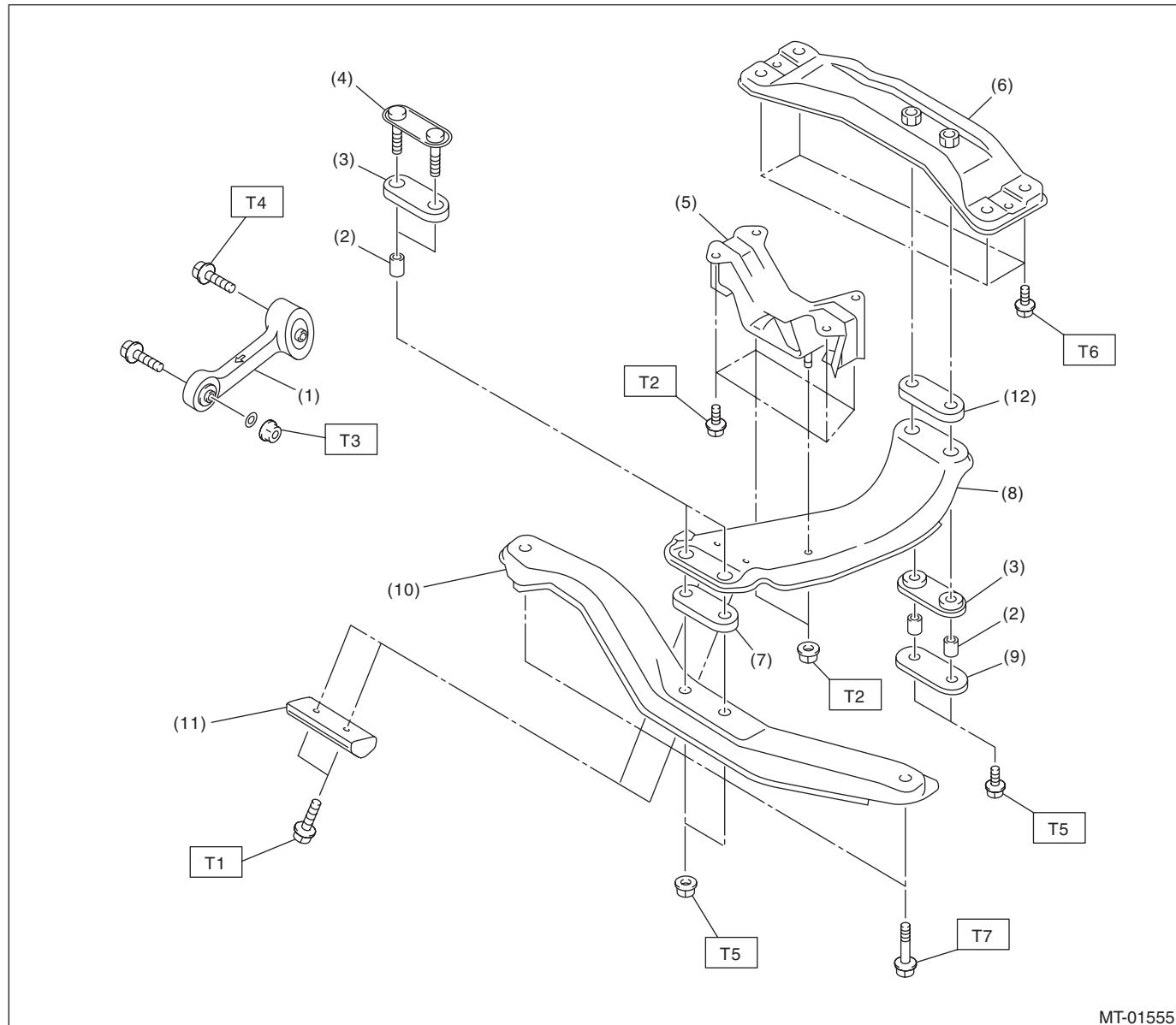
T1: 25 (2.5, 18.4)

T2: 69 (7.0, 50.9)

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11. TRANSMISSION MOUNTING



(1) Pitching stopper	(7) Upper cushion rubber
(2) Spacer	(8) Center crossmember
(3) Lower cushion rubber	(9) Rear plate
(4) Front plate	(10) Front crossmember
(5) Transmission cushion rubber	(11) Dynamic damper
(6) Rear crossmember	(12) Rear cushion rubber

Tightening torque: N·m (kgf·m, ft·lb)

T1: 7.5 (0.8, 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: 75 (7.5, 55.3)

T7: 140 (14.3, 103)

C: CAUTION

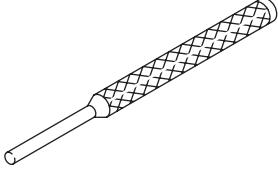
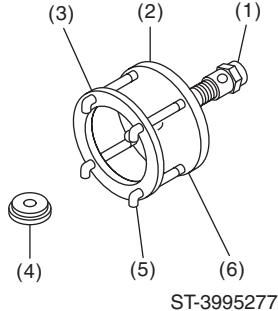
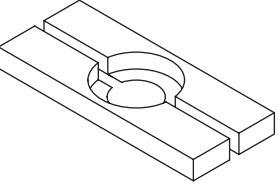
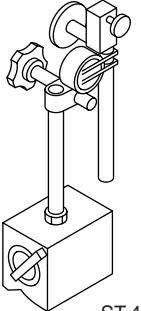
- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- When disassembling the case and other light alloy parts, disassemble by using a plastic hammer. Do not pry apart with screwdrivers or other tools.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine gear oil, grease or the equivalent. Do not mix gear oil, grease, etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Apply gear oil onto sliding or revolving surfaces before installation.
- Replace deformed or damaged snap rings with new parts.
- 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 parts.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plates, or cloth between the part and the vise.
- Avoid damaging the mating surface of the case.
- Before applying liquid gasket, completely remove the old liquid gasket.

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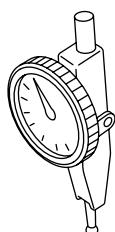
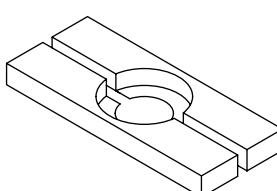
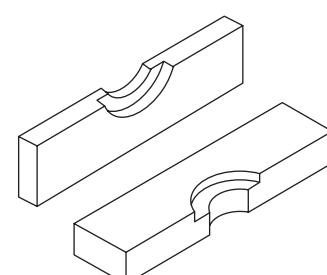
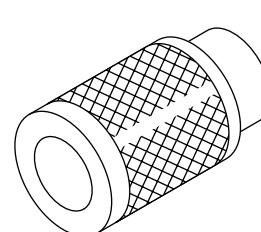
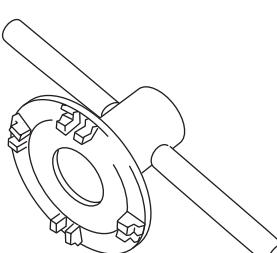
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398791700	398791700	REMOVER	Used for removing and installing the spring pin (6 mm).
 ST-399527700	399527700	PULLER SET	Used for removing and installing the roller bearing (Differential). 1. BOLT (899521412) 2. PULLER (399527702) 3. HOLDER (399527703) 4. ADAPTER (398497701) 5. BOLT (899520107) 6. NUT (021008000)
 ST-498515700	498515700	REMOVER	Used for removing the roller bearing of the drive pinion shaft.
 ST-498247001	498247001	MAGNET BASE	<ul style="list-style-type: none">Used for measuring backlash between the side gear, pinion, and hypoid gear.Used together with the DIAL GAUGE (498247100).

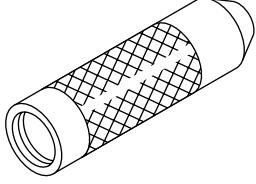
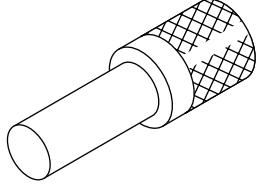
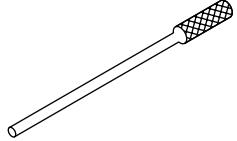
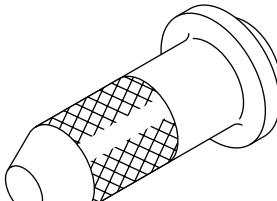
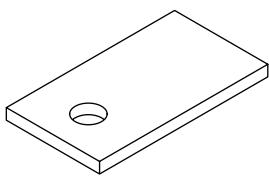
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498247100	498247100	DIAL GAUGE	<ul style="list-style-type: none"> Used for measuring backlash between the side gear, pinion, and hypoid gear. Used together with the MAGNET BASE (498247001).
 ST-498077000	498077000	REMOVER	Used for removing the differential taper roller bearing.
 ST-899858600	899858600	REMOVER	Used for removing the roller bearing.
 ST-499757002	499757002	INSTALLER	Used for installing the bearing cone of the transfer driven gear (extension core side).
 ST18630AA010	18630AA010	WRENCH COMPL RETAINER	<ul style="list-style-type: none"> Used for removing and installing the differential side retainer RH. WRENCH ASSEMBLY (499787000) can also be used.

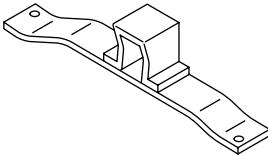
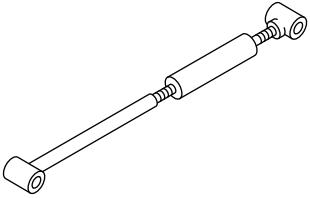
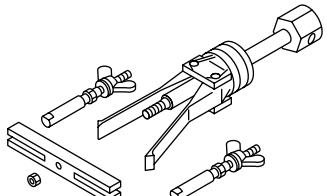
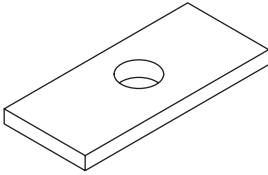
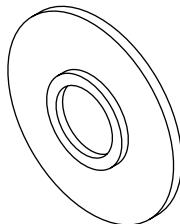
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	499877000	RACE 4-5 INSTALLER	Used for disassembling the driven shaft and transfer driven gear.
	899864100	REMOVER	Used for removing the transmission main shaft and drive pinion parts.
	899904100	REMOVER	Used for removing and installing the straight pin.
	498057300	INSTALLER	Used for installing the extension oil seal.
	498255400	PLATE	Used for measuring backlash.

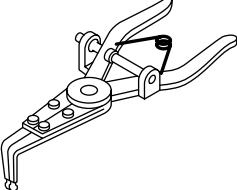
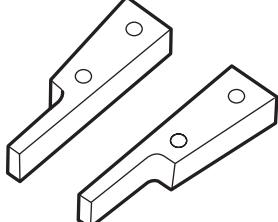
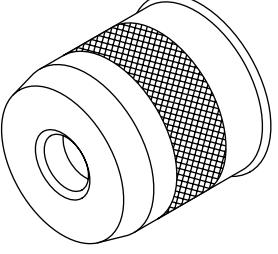
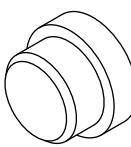
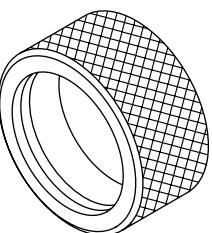
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST41099AA010	41099AA010	ENGINE SUPPORT BRACKET	Used for supporting engine.
 ST41099AA020	41099AA020	ENGINE SUPPORT	Used for supporting engine.
 ST-398527700	398527700	PULLER ASSY	Used for removing the extension case oil seal and clutch housing oil seal.
 ST-499575500	499575500	GAUGE	Used for measuring the total end play, extension end play and drive pinion height.
 ST-398177700	398177700	INSTALLER	Used for assembling the main shaft.

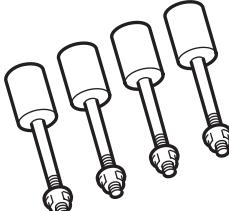
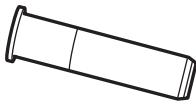
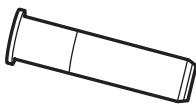
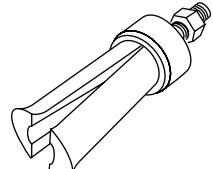
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-399893600	399893600	PLIER	<ul style="list-style-type: none"> Used for removing and installing the neutral set spring. Used together with the CLAW (18756AA000).
 ST18756AA000	18756AA000	CLAW	<ul style="list-style-type: none"> Used for removing and installing the neutral set spring. Used together with the PLIER (399893600).
 ST-499247400	499247400	INSTALLER	Used for installing the ball bearing of the transfer drive gear.
 ST-398497701	398497701	SEATS	Used for installing the ball bearing of the transfer drive gear.
 ST-398437700	398437700	INSTALLER	Used for installing the front differential side bearing.

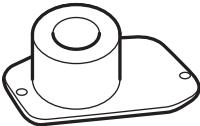
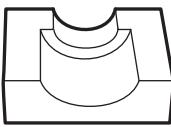
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	18632AA000	STAND ASSY	Used for disassembling and assembling the transmission.
	18671AA000	OIL SEAL GUIDE	<ul style="list-style-type: none"> Used for installing the oil seal to the reverse check. Used together with the INSTALLER (18657AA010).
	18657AA010	INSTALLER	<ul style="list-style-type: none"> Used for installing the oil seal to the reverse check. Used together with the OILSEAL GUIDE (18671AA000).
	18657AA000	INSTALLER	Used for installing the oil seal to the shift rod.
	18758AA000	PULLER	Used for removing the extension taper roller bearing outer race.

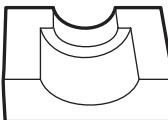
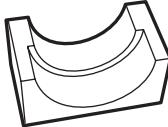
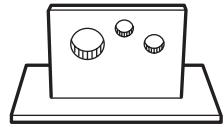
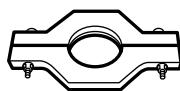
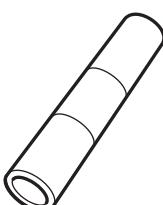
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	18831AA000	GAUGE	Used for measuring the extension taper roller bearing.
ST18831AA000			
	18631AA000	HANDLE	Used for measuring the front differential back-lash.
ST18631AA000			
	18754AA000	REMOVER	Used to remove parts of the driven gear.
ST18754AA000			
	18757AA000	STRAIGHT PIN REMOVER	Used for installing the reverse idler gear.
ST18757AA000			
	18665AA000	HOLDER	<ul style="list-style-type: none"> • Used for removing and installing the main shaft lock nut. • Used together with the BASE (18664AA000).
ST18665AA000			

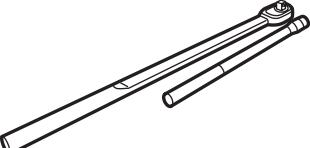
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	18666AA000	HOLDER	<ul style="list-style-type: none"> Used for removing and installing the driven shaft lock nut. Used together with the BASE (18664AA000).
	18667AA000	HOLDER	<ul style="list-style-type: none"> Used for removing and installing the drive pinion shaft lock nut. Used together with the BASE (18664AA000).
	18664AA000	BASE	<ul style="list-style-type: none"> Used for removing and installing the main shaft lock nut. Used for removing and installing the drive pinion shaft lock nut. Used for removing and installing the driven shaft lock nut.
	18722AA010	REMOVER	Used for disassembling the main shaft.
	18651AA000	INSTALLER	Used for assembling the main shaft.

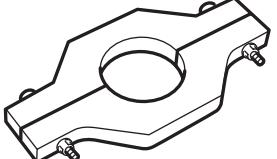
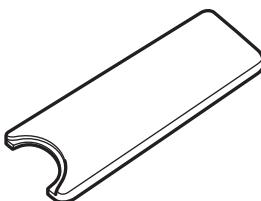
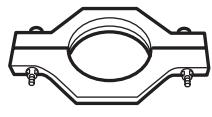
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	18852AA000 ST18852AA000	TORQUE WRENCH	<ul style="list-style-type: none"> Used to tighten the main shaft lock nut. Used to tighten the drive pinion shaft lock nut. Used to tighten the driven shaft lock nut.
	18668AA000 ST18668AA000	PUNCH	Used to crimp the main shaft lock nut.
	18669AA000 ST18669AA000	PUNCH	Used to crimp the driven shaft lock nut.
	18670AA000 ST18670AA000	PUNCH	Used to crimp the drive pinion shaft lock nut.
	18620AA000 ST18620AA000	ADAPTER WRENCH	Used for removing and installing the driven gear shaft lock nut.

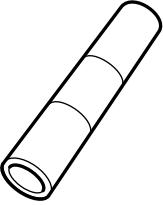
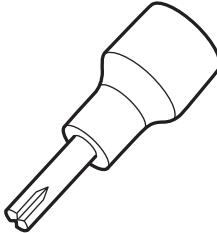
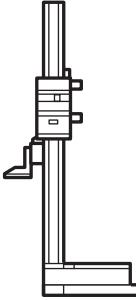
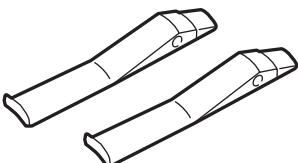
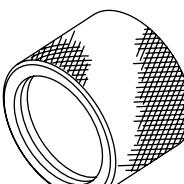
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	18621AA000	ADAPTER WRENCH	Used for removing and installing the drive pinion shaft lock nut.
	18723AA000	REMOVER	Used for disassembling the driven shaft.
	18630AA000	WRENCH ASSY	Used for removing and installing the differential side retainer LH.
	18672AA000	GUIDE CLIP	Used for installing the reverse idler snap ring.
	18720AA000	REMOVER	Used for disassembling the main shaft.

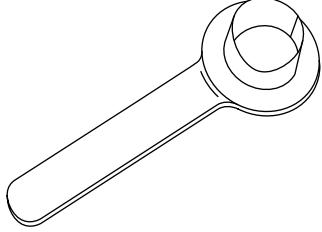
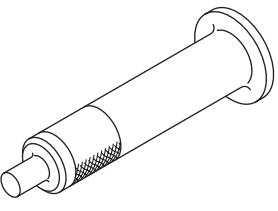
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18654AA000	18654AA000	INSTALLER	Used for assembling the driven shaft.
 ST18663AA000	18663AA000	SOCKET	Used for removing and installing the oil pump cover.
 ST18853AA000	18853AA000	HEIGHT GAUGE	Used for selecting the shift rod.
 ST18760AA000	18760AA000	CLAW	<ul style="list-style-type: none"> Used for removing the front side retainer bearing outer race. Used together with the PULLER ASSY (398527700).
 ST18675AA000	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing the differential side retainer oil seal.

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST28399SA010	28399SA010	OIL SEAL PROTECTOR	Used for protecting oil seal when installing front drive shaft.
 ST18657AA020	18657AA020	OIL SEAL INSTALLER	Used for installing the oil seal.

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Depth gauge	Used for measuring the transmission end play.