1. General Description

A: SPECIFICATION

1. TORQUE CONVERTER CLUTCH

Model	Non-turbo	Turbo
Type	Symmetric, 3 element, single stage, 2 phase torque converter	
Stall torque ratio	2.05 — 2.35	
Nominal diameter	246 mm (9.69 in)	
Stall speed (at sea level)	2,200 — 2,700 rpm	2,700 — 3,200 rpm
One-way clutch	Sprague type one-way clutch	

2. OIL PUMP

Type	Parachoid constant-displacement pump	
Driving method	Driven by engine	
Number of teeth	Inner rotor	9
	Outer rotor	10

3. TRANSMISSION CONTROL ELEMENT

Type	4-forward, 1-reverse, double-row planetary gears
Multi-plate clutch	3 sets
Multi-plate brake	2 sets
One-way clutch (sprague type)	1 sets

4. TRANSMISSION GEAR RATIO

	Gear ratio
1st	2.785
2nd	1.545
3rd	1.000
4th	0.694
Rev.	2.272

5. PLANETARY GEAR AND PLATE

Model	Non-Turbo	Turbo
Number of front sun gear teeth	33	
Number of front pinion teeth	21	
Number of front internal gear teeth	75	
Number of rear sun gear teeth	42	
Number of rear pinion teeth	17	
Number of rear internal gear teeth	75	
Number of high clutch drive plates	4	5
Number of low clutch drive plates	5	7
Number of reverse clutch drive plates	2	
Number of drive plates for the 2-4 brake	3	4
Number of drive plates for low & reverse brake	5	7

6. SELECTOR POSITION

P (Park)	Transmission is in neutral, output member is immovable, engine start is possible
R (Reverse)	Transmission is in reverse.
N (Neutral)	Transmission is in neutral and engine start is possible
D (Drive)	Automatic gear change 1st gear ← → 2nd gear ← → 3rd gear ← → 4th gear
3 (3rd)	Automatic gear change 1st gear ← → 2nd gear ← → 3rd gear ← 4th gear
2 (2nd)	2nd gear is locked. (Deceleration is possible. 2nd gear ← 3rd gear ← 4th gear)
1 (1st)	1st gear is locked. (Deceleration is possible. 1st gear ← 2nd gear ← Third gear ← 4th gear)
Control method	Wire cable type

7. HYDRAULIC CONTROL AND LUBRICATION

Type		Electronic/hydraulic control [4 forward gear changes made by electronic signals of vehicle speed and accelerator opening]
Fluid	Recommended materials	SUBARU ATF HP
	Alternative	IDEMITSU: ATF HP Castrol: Transmax J
Fluid capacity		9.3 — 9.6 ℓ (9.8 — 10.1 US qt, 8.2 — 8.4 Imp qt)
Lubrication system		Forced feed lubrication with oil pump
Oil		Automatic transmission fluid (see above)

8. COOLING AND HARNESS

Cooling system	Liquid-cooler incorporated in radiator
Inhibitor switch	12 poles
Transmission harness	20 poles

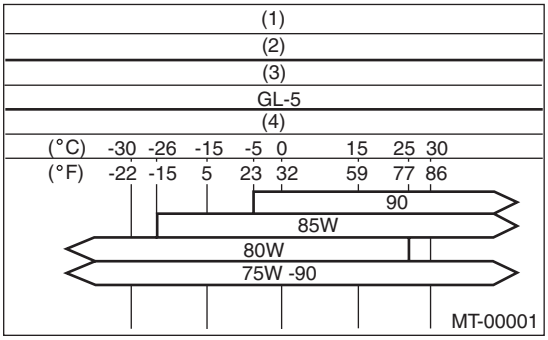
9. TRANSFER

Model	Non-turbo	Turbo	
Transfer type	Multi-plate transfer (MPT)		Variable torque distribution (VTD)
Number of transfer clutch drives & driven plates	5	6	3
Control method	Electronic, hydraulic type		
Lubricant	Same automatic transmission fluid as used in the automatic transmission		
Reduction gear ratio	1.000 (53/53)		

10.FINAL REDUCTION GEAR

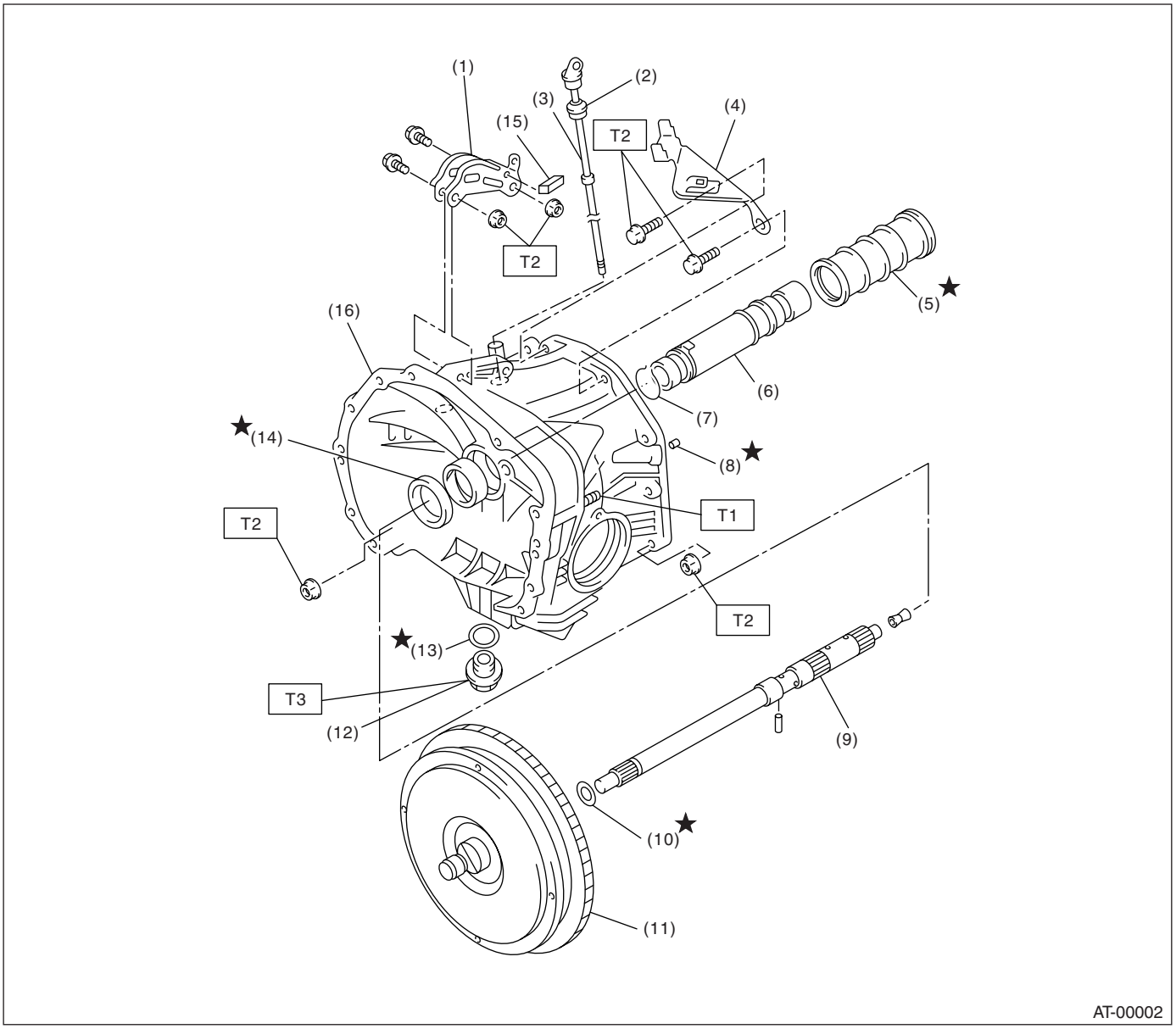
	Non-turbo	Turbo
Front final reduction gear ratio	4.444 (40/9)	4.111 (37/9)

11.RECOMMENDED GEAR OIL

Lubrication oil	 (1) Item (2) Front differential gear oil (3) API classification (4) SAE viscosity No. and applicable temperature
Front differential oil capacity	1.1 — 1.3 ℓ (1.2 — 1.4 US qt, 1.0 — 1.1 Imp qt)

B: COMPONENT

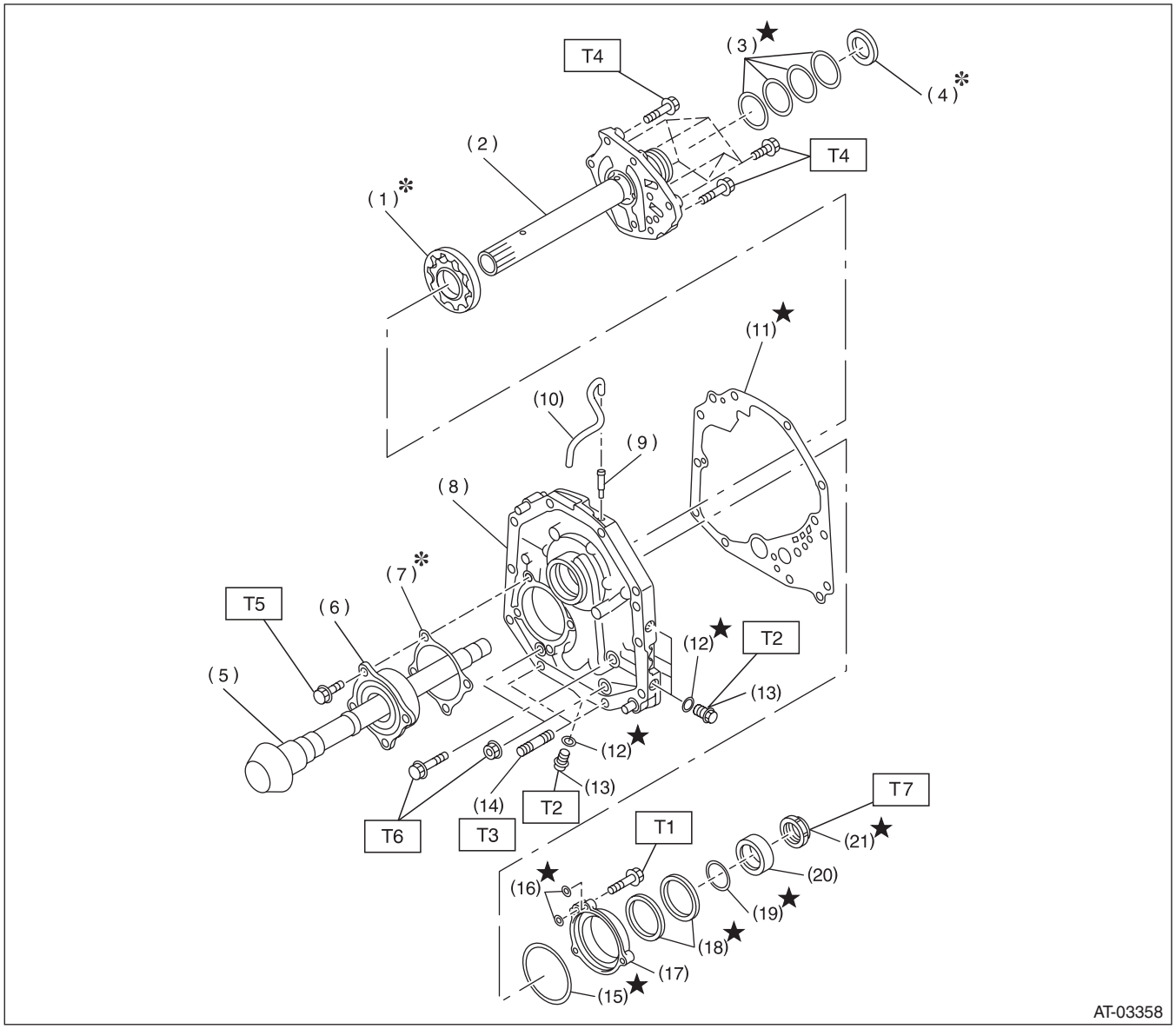
1. TORQUE CONVERTER CLUTCH AND CASE



(1) Pitching stopper bracket
(2) O-ring
(3) Differential oil level gauge
(4) Stay
(5) Seal pipe
(6) Oil pump shaft
(7) Clip
(8) Rubber seal
(9) Input shaft
(10) O-ring
(11) Torque converter clutch ASSY
(12) Differential gear oil drain plug
(13) Gasket
(14) Oil seal
(15) Clip (Turbo model)
(16) Converter case

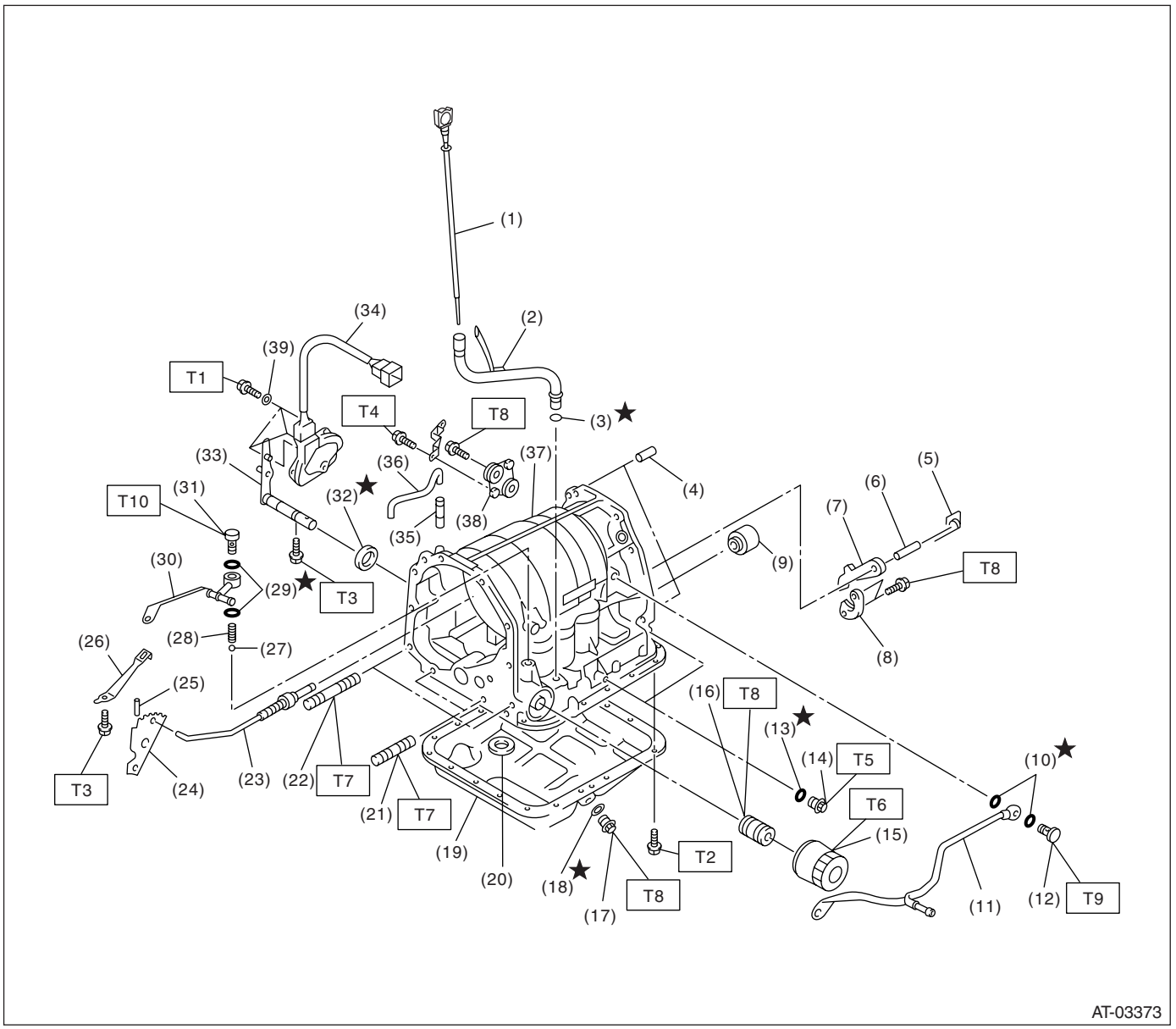
Tightening torque: N·m (kgf-m, ft-lb)
T1: 18 (1.8, 13.0)
T2: 41 (4.2, 30.4)
T3: 70 (7.2, 51.7) (Copper gasket)
44 (4.5, 32.5) (Aluminum gasket)

2. OIL PUMP



(1)	Oil pump rotor	(11)	Gasket	(21)	Lock nut
(2)	Oil pump cover	(12)	O-ring		
(3)	Seal ring	(13)	Test plug	***Tightening torque: N·m (kgf-m, ft-lb)***	
(4)	Thrust needle bearing	(14)	Stud bolt	***T1:***	***7 (0.7, 5.1)***
(5)	Drive pinion shaft	(15)	O-ring	***T2:***	***13 (1.3, 9.4)***
(6)	Roller bearing	(16)	O-ring	***T3:***	***18 (1.8, 13.0)***
(7)	Drive pinion shim	(17)	Oil seal retainer	***T4:***	***25 (2.5, 18.1)***
(8)	Oil pump housing	(18)	Oil seal	***T5:***	***40 (4.1, 29.5)***
(9)	Nipple	(19)	O-ring	***T6:***	***42 (4.3, 31)***
(10)	Air breather hose	(20)	Drive pinion collar	***T7:***	***116 (11.8, 85)***

3. TRANSMISSION CASE AND CONTROL DEVICE

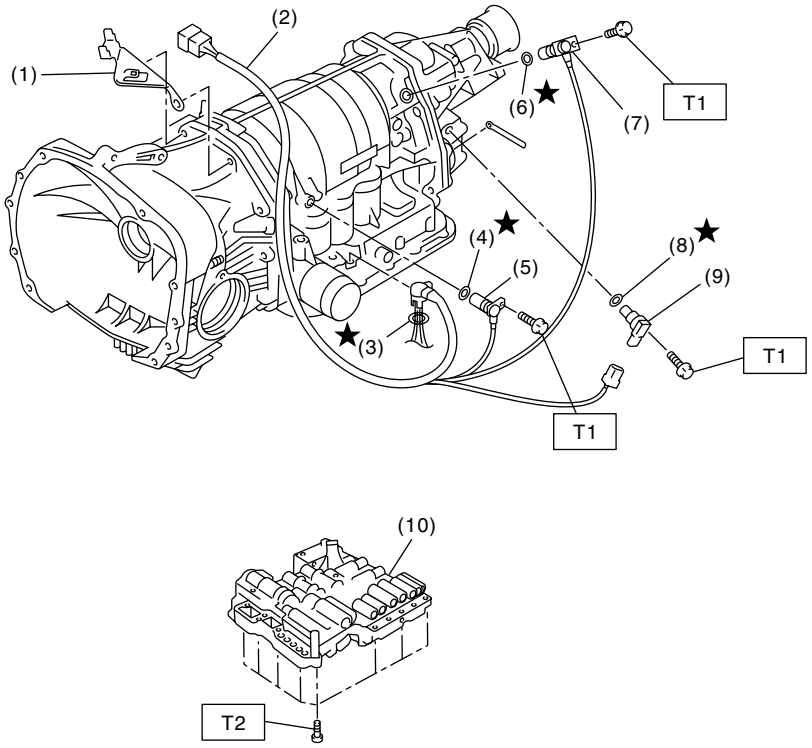


AT-03373

(1) ATF level gauge
(2) Oil charger pipe
(3) O-ring
(4) Straight pin
(5) Return spring
(6) Shaft
(7) Parking pawl
(8) Parking support
(9) Transfer clutch seal
(10) Gasket
(11) Inlet pipe
(12) Union screw
(13) O-ring
(14) Test plug
(15) Oil filter
(16) Oil filter stud bolt
(17) Drain plug (ATF)
(18) Gasket
(19) Oil pan
(20) Magnet
(21) Stud bolt (short)
(22) Stud bolt (long)
(23) Parking rod
(24) Manual plate
(25) Spring pin
(26) Detention spring
(27) Ball
(28) Spring
(29) Gasket
(30) Outlet pipe
(31) Union screw
(32) Oil seal
(33) Range select lever
(34) Inhibitor switch ASSY
(35) Nipple
(36) Air breather hose
(37) Transmission case
(38) Plate ASSY
(39) Washer

Tightening torque: N·m (kgf-m, ft-lb)	
T1:	***3.4 (0.35, 2.6)***
T2:	***5 (0.5, 3.6)***
T3:	***6 (0.6, 4.4)***
T4:	***12 (1.2, 8.7)***
T5:	***13 (1.3, 10)***
T6:	***14 (1.4, 10)***
T7:	***18 (1.8, 13)***
T8:	***25 (2.5, 18.1)***
T9:	***40 (4.1, 29.5)***
T10:	***45 (4.6, 33.2)***

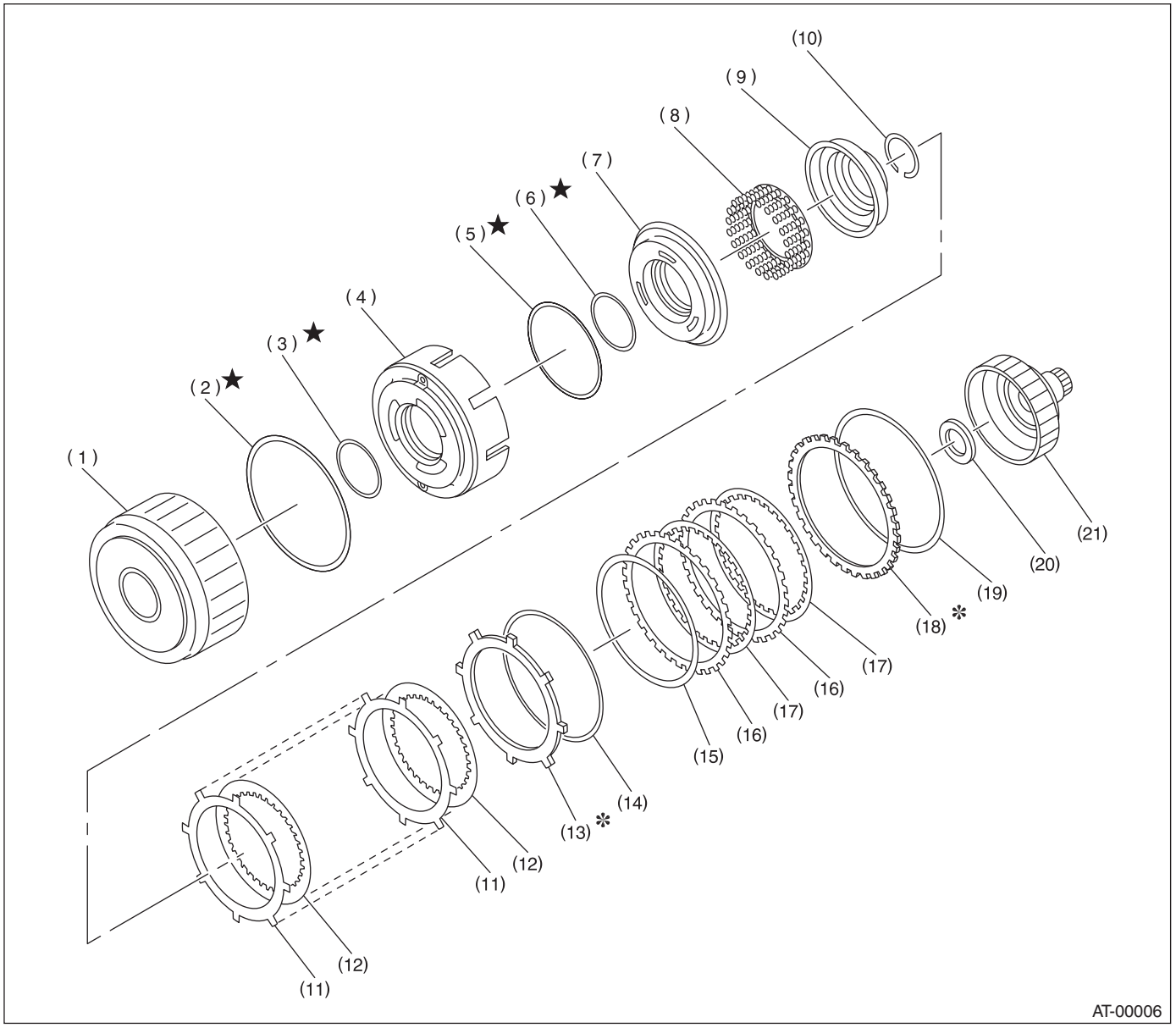
4. CONTROL VALVE AND HARNESS ROUTING



(1) Stay
(2) Transmission harness ASSY
(3) O-ring
(4) O-ring
(5) Torque converter turbine speed sensor
(6) O-ring
(7) Front vehicle speed sensor
(8) O-ring
(9) Rear vehicle speed sensor
(10) Control valve body

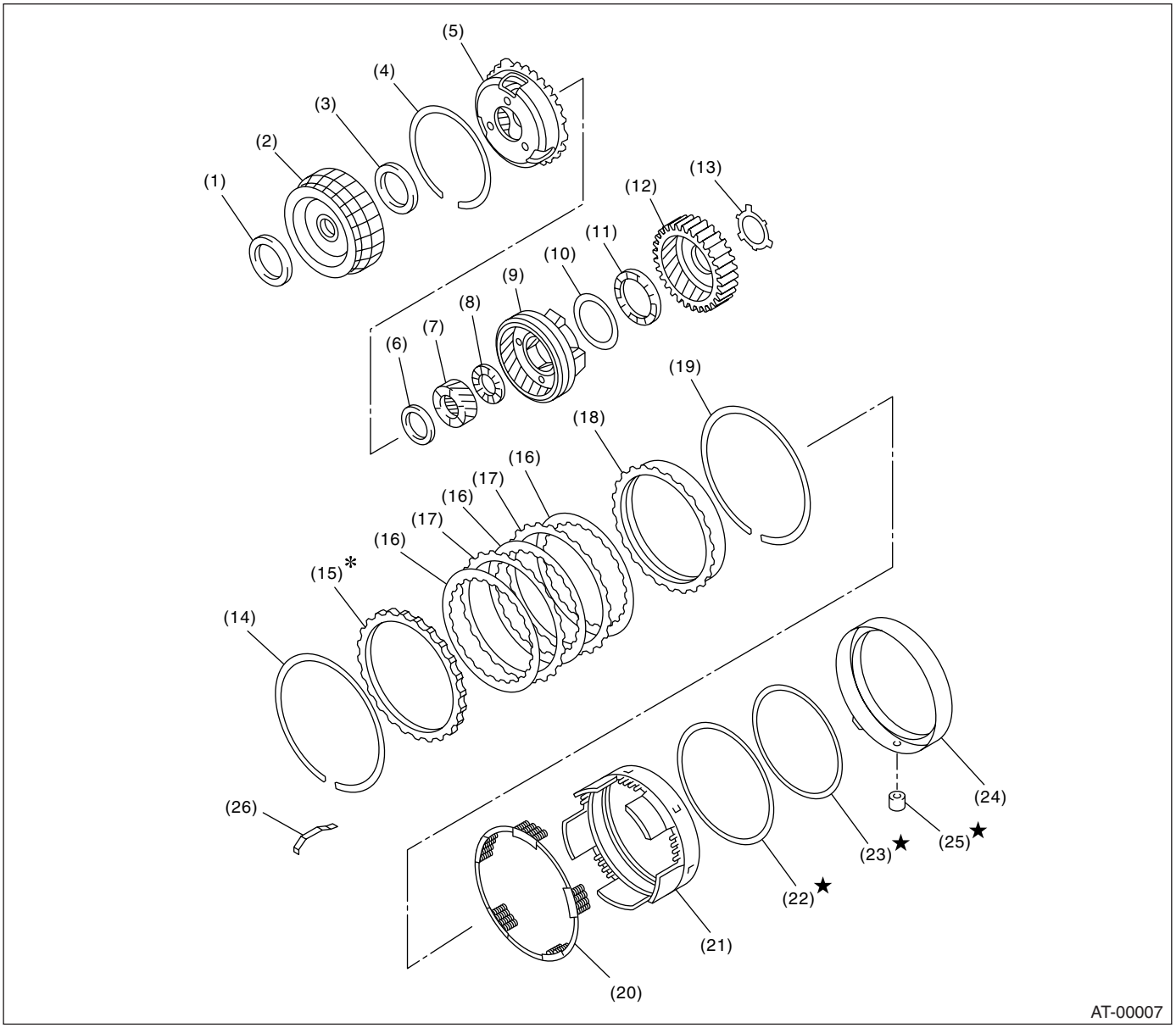
Tightening torque: N·m (kgf-m, ft-lb)
T1: 7 (0.7, 5.1)
T2: 8 (0.8, 5.8)

5. HIGH CLUTCH AND REVERSE CLUTCH



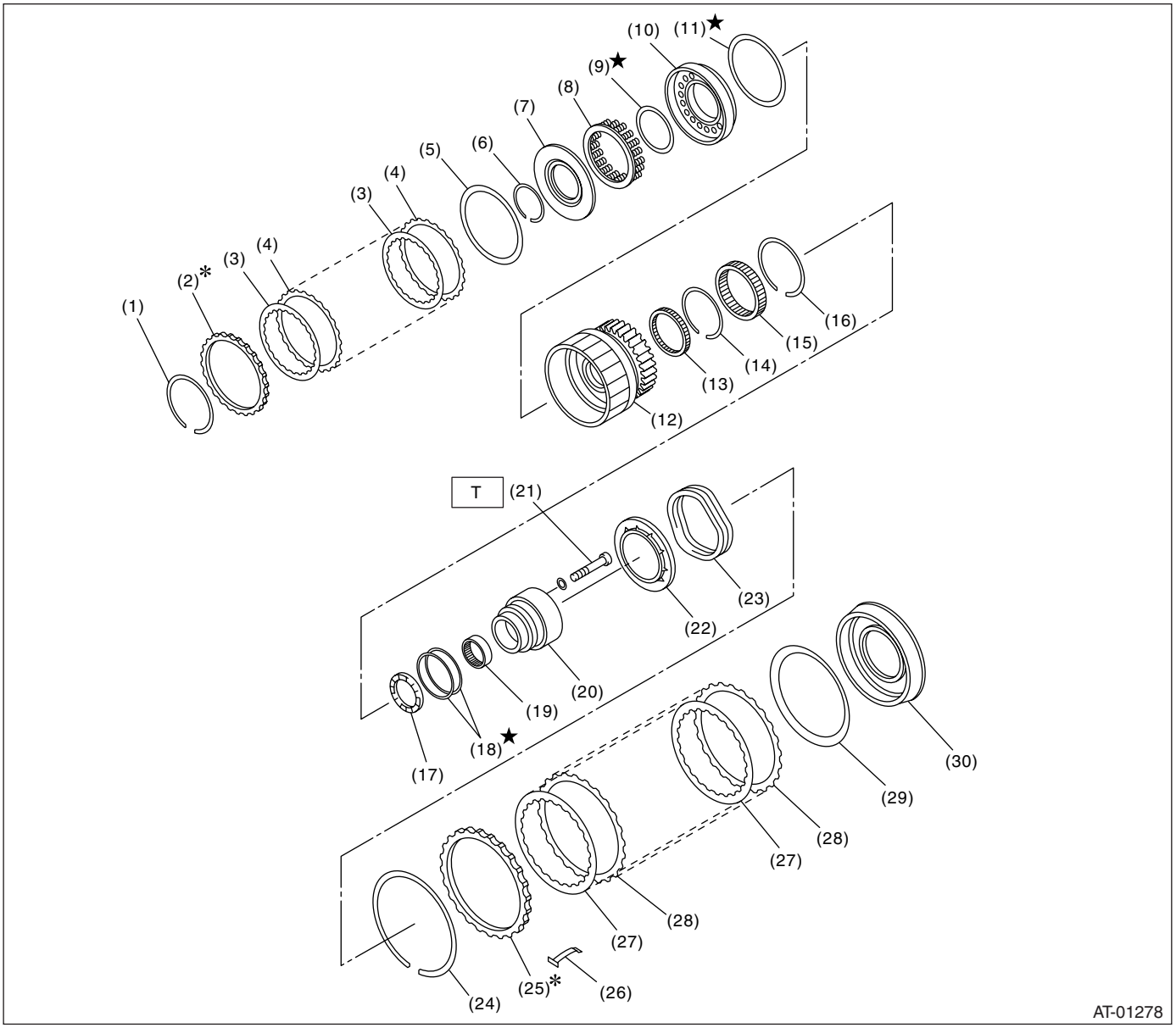
(1)	High clutch drum	(8)	Spring retainer	(15)	Dish plate
(2)	Lip seal	(9)	Clutch cover	(16)	Driven plate
(3)	D-ring	(10)	Snap ring	(17)	Drive plate
(4)	Reverse clutch piston	(11)	Driven plate	(18)	Retaining plate
(5)	D-ring	(12)	Drive plate	(19)	Snap ring
(6)	D-ring	(13)	Retaining plate	(20)	Thrust needle bearing
(7)	High clutch piston	(14)	Snap ring	(21)	High clutch hub

6. PLANETARY GEAR AND 2-4 BRAKE



(1) Thrust needle bearing
(2) Front sun gear
(3) Thrust needle bearing
(4) Snap ring
(5) Front planetary carrier
(6) Thrust needle bearing
(7) Rear sun gear
(8) Thrust needle bearing
(9) Rear planetary carrier
(10) Washer
(11) Thrust needle bearing
(12) Rear internal gear
(13) Washer
(14) Snap ring
(15) Retaining plate
(16) Drive plate
(17) Driven plate
(18) Pressure rear plate
(19) Snap ring
(20) 2-4 spring retainer
(21) 2-4 brake piston
(22) D-ring
(23) D-ring
(24) 2-4 brake piston retainer
(25) 2-4 brake seal
(26) Leaf spring

7. LOW CLUTCH AND LOW & REVERSE BREAK

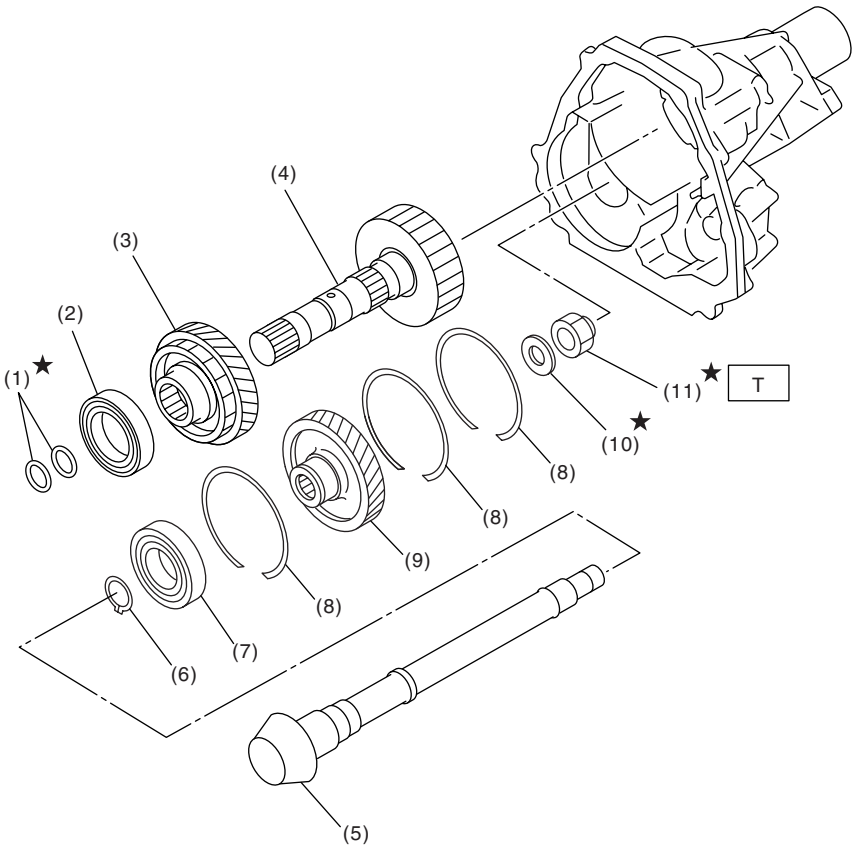


(1) Snap ring
(2) Retaining plate
(3) Drive plate
(4) Driven plate
(5) Dish plate
(6) Snap ring
(7) Cover
(8) Spring retainer
(9) D-ring
(10) Low clutch piston
(11) D-ring
(12) Low clutch drum
(13) Needle bearing
(14) Snap ring
(15) One-way clutch
(16) Snap ring
(17) Thrust needle bearing
(18) Seal ring
(19) Needle bearing
(20) One-way clutch inner race
(21) Socket bolt
(22) Spring retainer
(23) Return spring
(24) Snap ring
(25) Retaining plate
(26) Leaf spring
(27) Drive plate
(28) Driven plate
(29) Dish plate
(30) Low & reverse brake piston

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

8. REDUCTION GEAR

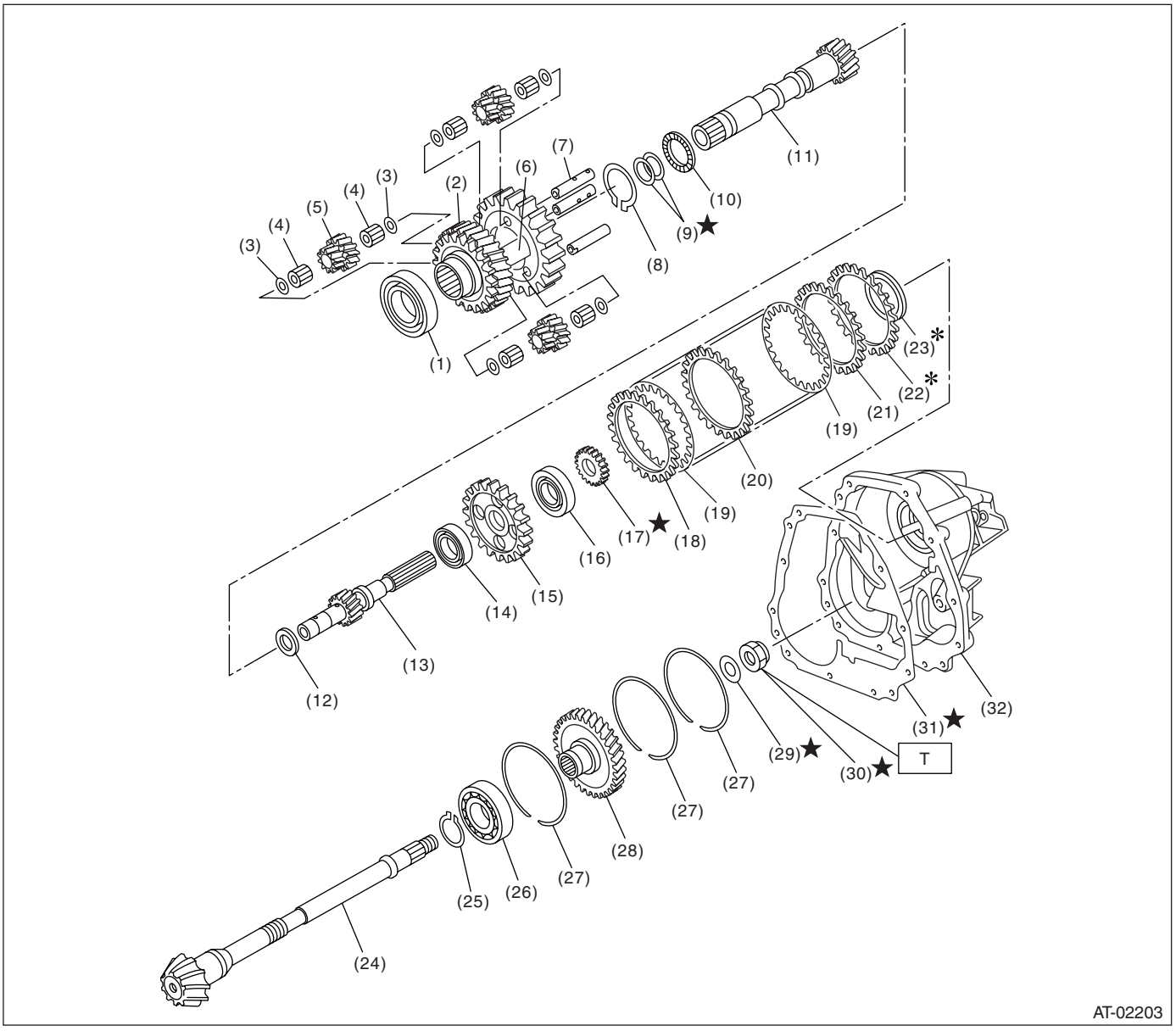
MPT MODEL



(1) Seal ring
(2) Ball bearing
(3) Reduction drive gear
(4) Reduction drive shaft
(5) Drive pinion shaft
(6) Snap ring
(7) Ball bearing
(8) Snap ring
(9) Reduction driven gear
(10) Washer
(11) Lock nut

Tightening torque: N·m (kgf-m, ft-lb)
T: 100 (10.2, 73.8)

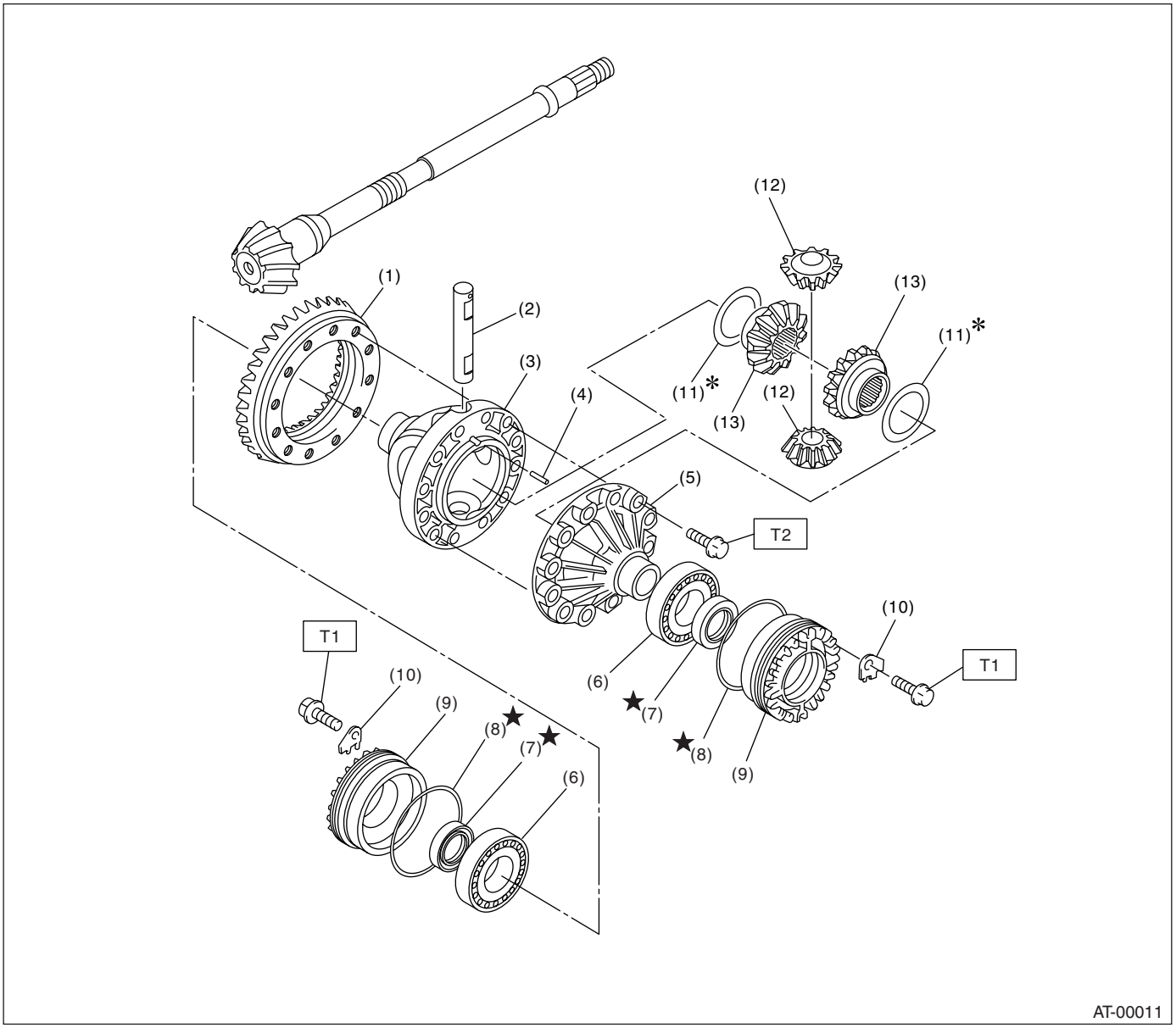
VTD MODEL



(1) Ball bearing
(2) Reduction drive gear
(3) Washer
(4) Needle bearing
(5) Pinion gear
(6) Carrier
(7) Planetary pinion shaft
(8) Snap ring
(9) Seal ring
(10) Thrust needle bearing
(11) Intermediate shaft
(12) Thrust washer
(13) Rear drive shaft
(14) Ball bearing
(15) Multi-plate clutch (LSD) hub
(16) Ball bearing
(17) Revolution gear
(18) Driven plate (Thick)
(19) Drive plate
(20) Driven plate (Thin)
(21) Driven plate (Thick)
(22) Pressure plate
(23) Rear drive shaft shim
(24) Drive pinion shaft
(25) Snap ring
(26) Ball bearing
(27) Snap ring
(28) Reduction driven gear
(29) Lock washer
(30) Lock nut
(31) Gasket
(32) Extension case

Tightening torque: N·m (kgf-m, ft-lb)
T: 100 (10.2, 73.8)

9. DIFFERENTIAL GEAR

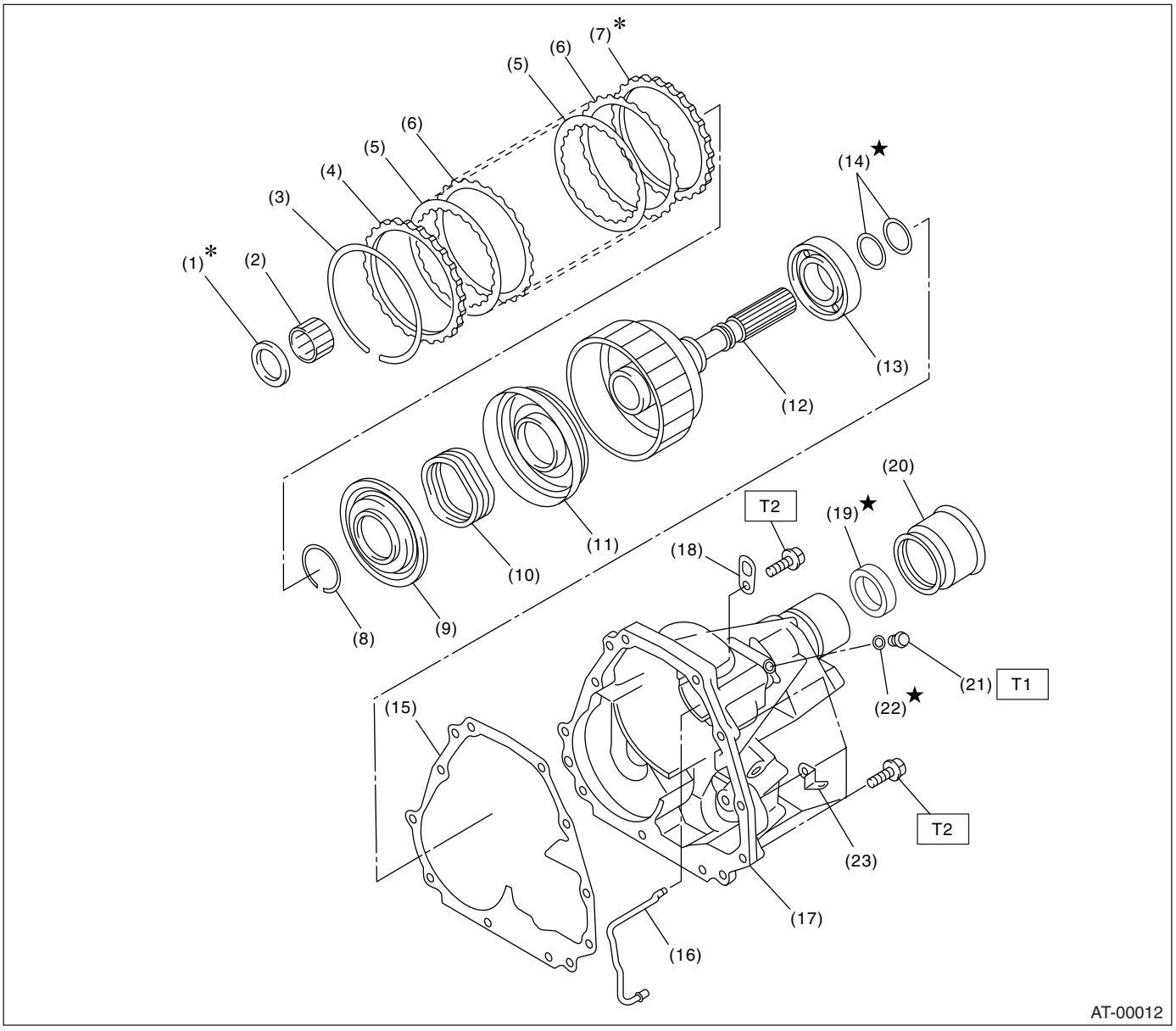


(1) Hypoid driven gear
(2) Pinion shaft
(3) Differential case (RH)
(4) Straight pin
(5) Differential case (LH)
(6) Taper roller bearing
(7) Oil seal
(8) O-ring
(9) Differential side retainer
(10) Lock plate
(11) Washer
(12) Differential bevel pinion
(13) Differential bevel gear

Tightening torque: N·m (kgf-m, ft-lb)
T1: 25 (2.5, 18.1)
T2: 62 (6.3, 45.6)

10.TRANSFER AND EXTENSION CASE

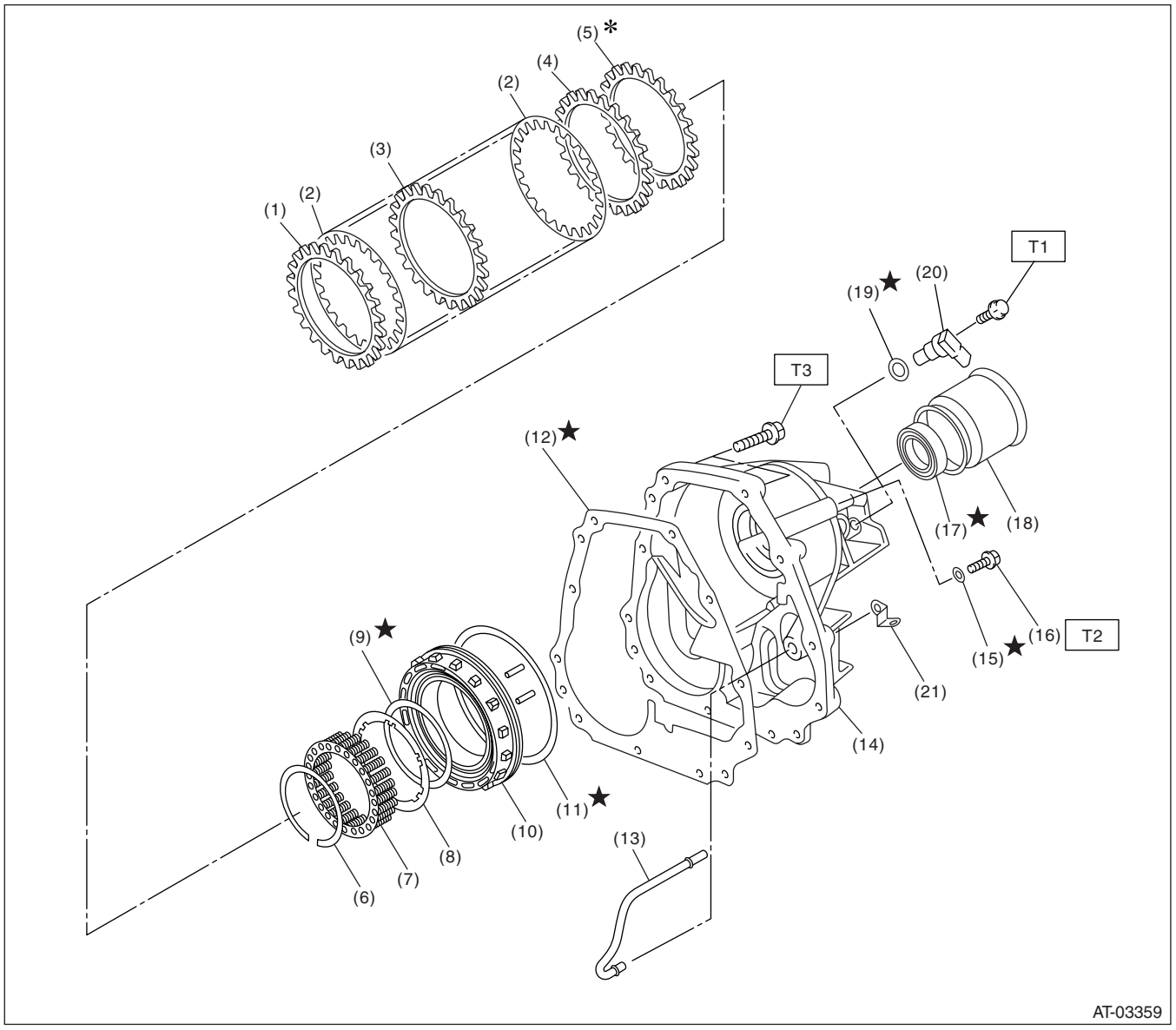
MPT MODEL



(1)	Thrust needle bearing	(10)	Return spring	(19)	Oil seal
(2)	Needle bearing	(11)	Transfer clutch piston	(20)	Dust cover
(3)	Snap ring	(12)	Rear drive shaft	(21)	Test plug
(4)	Pressure plate	(13)	Ball bearing	(22)	O-ring
(5)	Drive plate	(14)	Seal ring	(23)	Clip (Turbo model)
(6)	Driven plate	(15)	Gasket		
(7)	Retaining plate	(16)	Transfer clutch pipe		
(8)	Snap ring	(17)	Extension case		
(9)	Transfer clutch piston Seal	(18)	Transmission hanger		

Tightening torque: N·m (kgf-m, ft-lb)
T1: 13 (1.3, 9.4)
T2: 25 (2.5, 18.1)

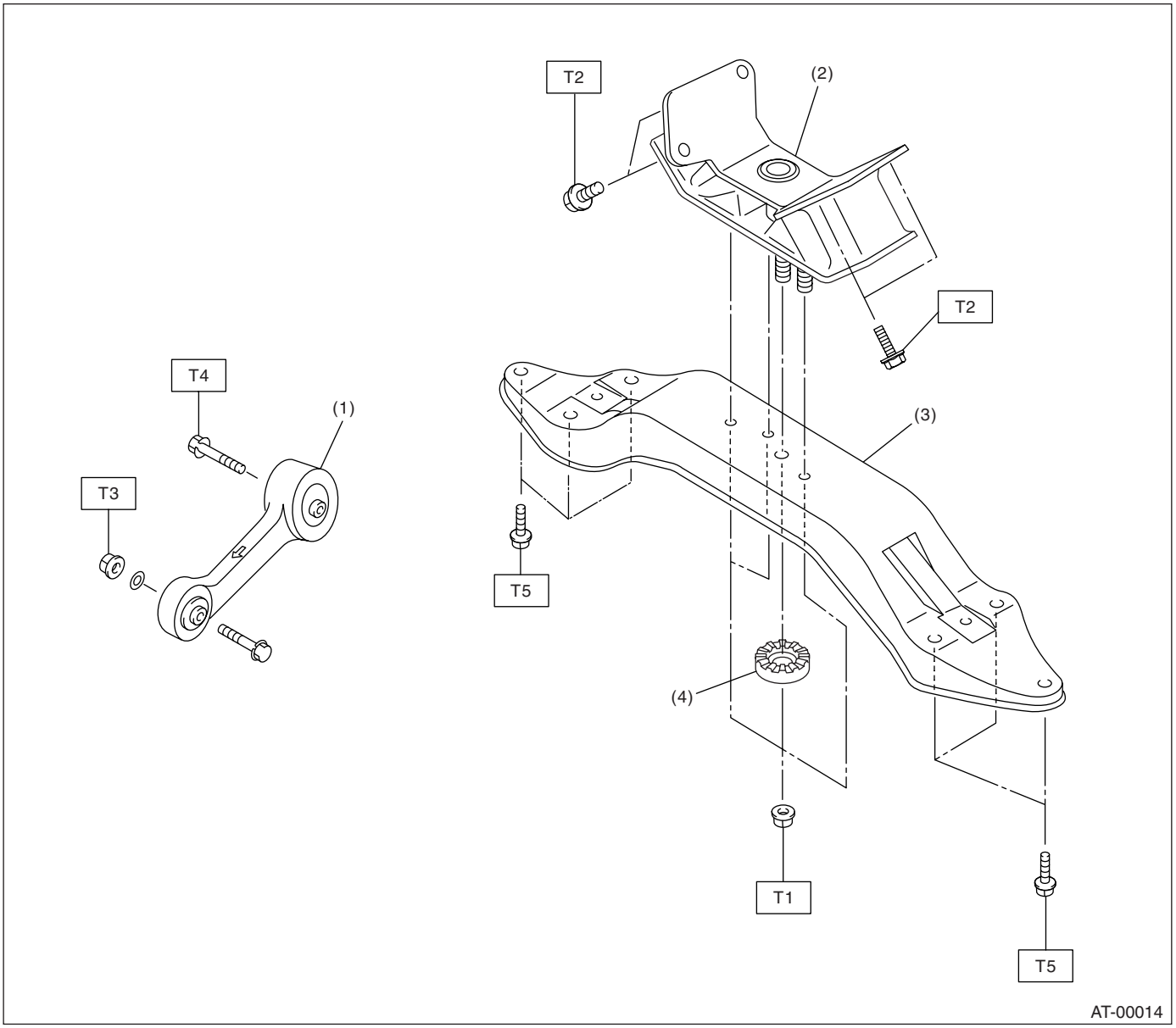
VTD MODEL



(1) Driven plate (Thick)
(2) Drive plate
(3) Driven plate (Thin)
(4) Driven plate (Thick)
(5) Retaining plate
(6) Snap ring
(7) Spring retainer
(8) Plate
(9) O-ring
(10) Multi-plate clutch (LSD) piston ASSY
(11) O-ring
(12) Gasket
(13) Multi-plate clutch (LSD) pipe
(14) Extension case
(15) O-ring
(16) Test plug
(17) Oil seal
(18) Dust cover
(19) O-ring
(20) Rear vehicle speed sensor
(21) Clip (Turbo model)

Tightening torque: N·m (kgf-m, ft-lb)
T1: 7 (0.7, 5.1)
T2: 13 (1.3, 9.4)
T3: 25 (2.5, 18.1)

11.TRANSMISSION MOUNTING



(1) Pitching stopper
(2) Rear cushion rubber
(3) Transmission rear crossmember
(4) Stopper

Tightening torque: N·m (kgf-m, ft-lb)
T1: 35 (3.6, 26)
T2: 39 (4.0, 29)
T3: 50 (5.1, 37)
T4: 58 (5.9, 43)
T5: 70 (7.1, 51)

C: CAUTION

• Wear work clothing, including a cap, protective goggles and protective shoes during operation.
• Remove contamination including dirt and corrosion before removal, installation or disassembly.
• Keep the disassembled parts in order and protect them from dust and dirt.
• Do not place the oil pan with its inner side facing up until it is installed, to prevent intrusion of foreign matter into the valve body.
• 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 separate the case. Do not pry apart with screwdrivers or other tools.
• Be careful not to burn yourself, because each part on the vehicle is hot after running.
• Use SUBARU genuine gear oil, grease etc. or equivalent. Do not mix fluid, 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 or ATF 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 ATF fluid 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 a cushioning material such as wood blocks, aluminum plates, or shop cloth between the part and the vise.
• Avoid damaging the mating surface of the case.
• Before applying sealant, completely remove the old sealant.
• When disassembling the AT, be sure to use nylon gloves and paper towels. Do not use cloth gloves or waste cloth.

D: PREPARATION TOOL

1. SPECIAL TOOL

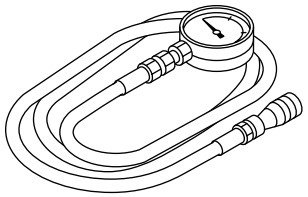
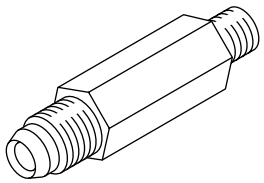
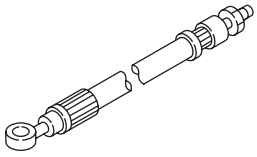
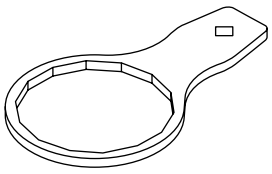
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498575400	498575400	OIL PRESSURE GAUGE ASSY	Used for measuring oil pressure.
 ST-498897200	498897200	OIL PRESSURE GAUGE ADAPTER	Used at the oil pump housing when measuring reverse clutch pressure and line pressure.
 ST-498897700	498897700	OIL PRESSURE ADAPTER SET	Used for measuring the transfer clutch pressure.
 ST-498545400	498545400	OIL FILTER WRENCH	Used for removing and installing the ATF filter.

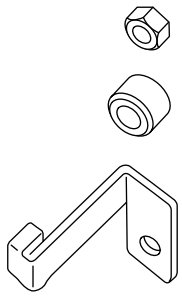
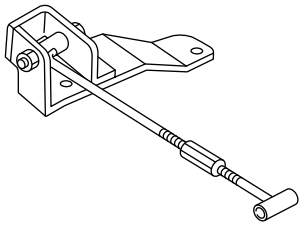
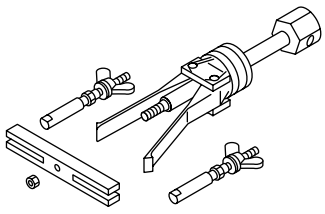
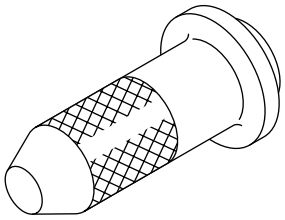
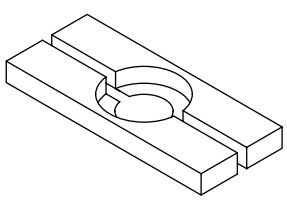
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498277200	498277200	STOPPER SET	Used for removing and installing the automatic transmission assembly.
 ST41099AC000	41099AC000	ENGINE SUPPORT ASSY	Used for supporting the engine.
 ST-398527700	398527700	PULLER ASSY	• Used for removing the extension case roller bearing. • Used for removing the extension oil seal. • Used for removing the front differential side retainer bearing outer race. • Used for removing the front differential side retainer oil seal.
 ST-498057300	498057300	INSTALLER	Used for installing the extension oil seal.
 ST-498077000	498077000	REMOVER	Used for removing the differential taper roller bearing.

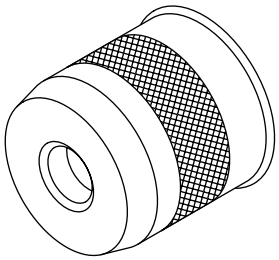
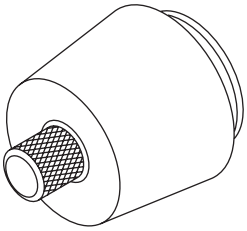
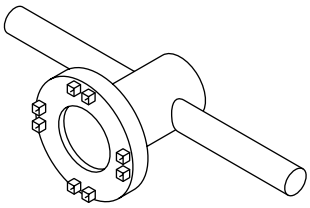
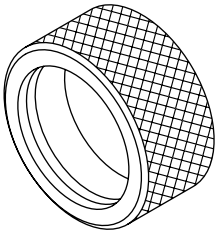
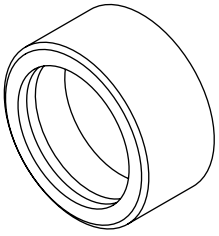
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499247400	499247400	INSTALLER	• Used for installing the transfer outer snap ring. • Used with GUIDE (499257300).
 ST-499257300	499257300	SNAP RING OUTER GUIDE	• Used for installing the transfer outer snap ring. • Used with the INSTALLER (499247400).
 ST-499787000	499787000	WRENCH ASSY	Used for removing and installing the differential side retainer.
 ST-398437700	398437700	DRIFT	Used for installing the torque converter case oil seal.
 ST-398487700	398487700	INSTALLER	Used for installing the front differential taper roller bearing.

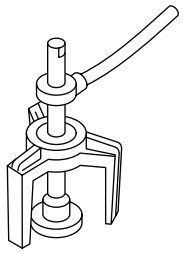
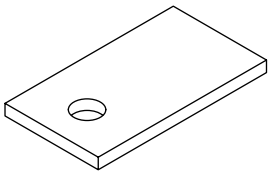
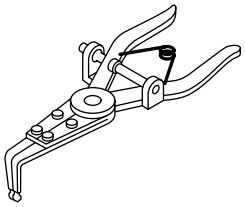
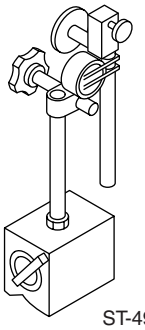
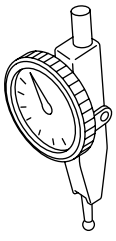
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398673600	398673600	COMPRESSOR	Used for removing and installing the clutch spring.
 ST-498255400	498255400	PLATE	Used for measuring the backlash of hypoid gear.
 ST-399893600	399893600	PLIERS	Used for removing and installing the clutch spring.
 ST-498247001	498247001	MAGNET BASE	• Used for measuring the gear backlash. • Used with the DIAL GAUGE (498247100).
 ST-498247100	498247100	DIAL GAUGE	• Used for measuring the gear backlash. • Used with the MAGNET BASE (498247001).

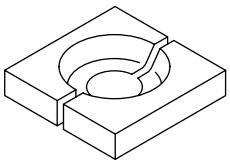
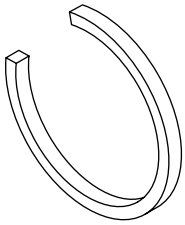
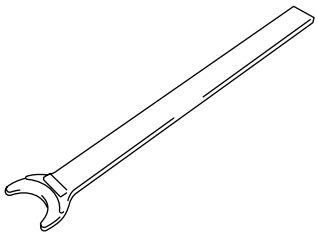
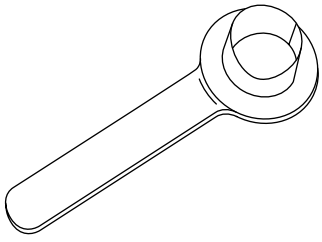
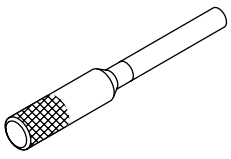
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498517000	498517000	REPLACER	Used for removing the front roller bearing.
 ST-398623600	398623600	SEAT	Used for removing the spring of the transfer clutch piston.
 ST28399SA000	28399SA000	DRIVE SHAFT REMOVER	Used for removing the axle shaft.
 ST28399SA010	28399SA010	OIL SEAL PROTECTOR	Used for installing the axle shaft.
 ST-499267300	499267300	STOPPER PIN	Used for installing the inhibitor switch.

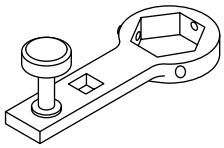
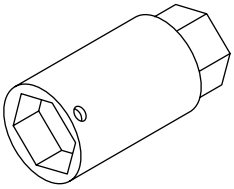
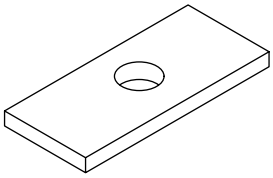
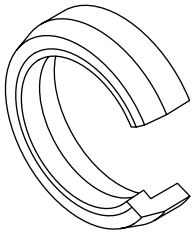
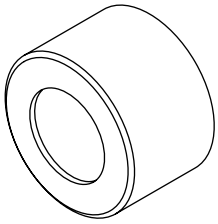
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499787700	499787700	WRENCH	Used for removing and installing the drive pinion lock nut.
 ST-499787500	499787500	ADAPTER	Used for removing and installing the drive pinion lock nut.
 ST-398643600	398643600	GAUGE	Used for measuring the total end play, extension end play and drive pinion height.
 ST-498627100	498627100	SEAT	Used for holding the low clutch piston retainer spring when installing snap ring.
 ST-499577000	499577000	GAUGE	Used for measuring the mating surface of the transmission to the end face of the reduction gear.

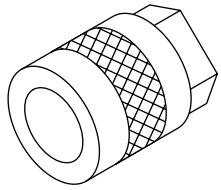
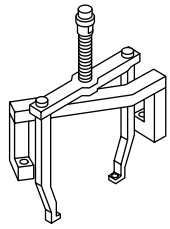
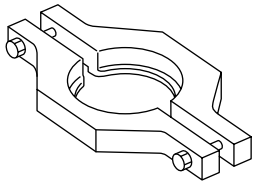
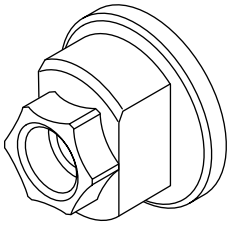
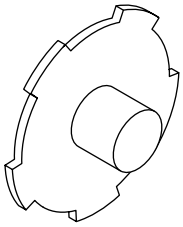
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499737000	499737000	PULLER	Used for removing the reduction driven gear assembly.
 ST-499737100	499737100	PULLER SET	Used for removing the reduction drive gear assembly.
 ST-498077600	498077600	REMOVER	Used for removing the ball bearing.
 ST-498937110	498937110	HOLDER	Used for removing and installing the drive pinion lock nut.
 ST-498677100	498677100	COMPRESSOR	Used for installing the 2-4 brake snap ring.

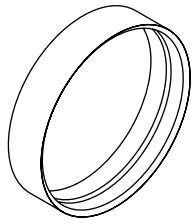
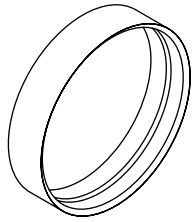
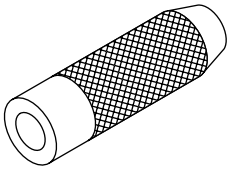
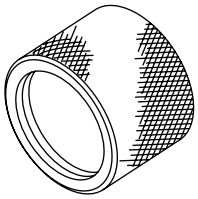
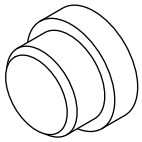
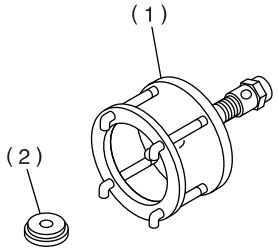
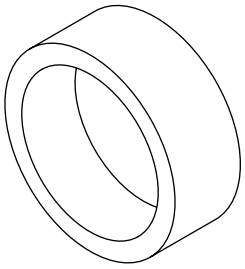
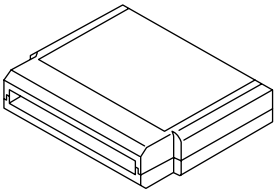
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498437000	498437000	HIGH CLUTCH PISTON GUIDE	Used for installing the high clutch piston.
 ST-498437100	498437100	LOW CLUTCH PISTON GUIDE	Used for installing the low clutch piston.
 ST-899580100	899580100	INSTALLER	Used for press-fitting the ball bearing of the transfer clutch.
 ST18675AA000	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing the differential side retainer oil seal.
 ST-398497701	398497701	SEAT	Used for installing the needle bearing.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-899524100	899524100	PULLER SET	Used for bolt only. • Used with 499737100 PULLEY SET. • Used with 499737000 PULLER. (1) Puller (2) Cap
 ST-398744300	398744300	PISTON GUIDE	• Used for measuring the contact surface of the transmission mating surface to the multi-plate clutch end face. • For VTD model.
 ST18482AA010	18482AA010	CARTRIDGE	Troubleshooting for the electrical system.
 ST22771AA030	22771AA030	SUBARU SELECT MONITOR KIT	Troubleshooting for the electrical system.

2. GENERAL TOOL

TOOL NAME	REMARKS
Depth gauge	Used for measuring the transmission end play.
Thickness gauge	Used for measuring clearance of the clutch, brake and oil pump.
Micrometer	Used for measuring thickness of the drive pinion.
Spring balance	Used for measuring the starting torque of the drive pinion.
Circuit tester	Used for measuring resistance and voltage.
TORX® T70	Used for installing and removing the differential gear oil drain plug.
Push/pull gauge	Used for measuring each piston stroke.