1. General Description

A: SPECIFICATION

1. TORQUE CONVERTER

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

2. OIL PUMP

Type	Inscribed gear 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

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

5. PLANETARY GEAR AND PLATE

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
Number of low clutch drive plates	5
Number of reverse clutch drive plates	2
Number of drive plates for the 2-4 brake	3
Number of drive plates for low & reverse brake	5

6. SELECTOR POSITION

P (Park)	Transmission is in neutral, output member is fixed, engine start is possible
R (Reverse)	Transmission is in reverse.
N (Neutral)	Transmission is in neutral and engine start is possible
D (Drive)	4-forward automatic gear change 1st ← → 2nd ← → 3rd ← → 4th
SPORT mode	4-forward automatic gear change 1st ← → 2nd ← → 3rd ← → 4th
Manual mode (+)	4-forward manual gear change (shift up) 1st → 2nd → 3rd → 4th
Manual mode (–)	4-forward manual gear change (shift down) 1st ← 2nd ← 3rd ← 4th
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 (throttle) opening]
Fluid	Recommended materials	SUBARU ATF
	Alternative	Idemitsu “ATF HP” **CAUTION:** **Be sure to use the recommended or equivalent ATF. Using material except recommended one or substitute would cause trouble.**
Fluid capacity ℓ (US qt, Imp qt)		9.3 — 9.6 (9.8 — 10.1, 8.2 — 8.4)
Lubrication system		Forced feed lubrication with oil pump
Oil		Automatic transmission fluid (see above)

8. COOLING AND HARNESS

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

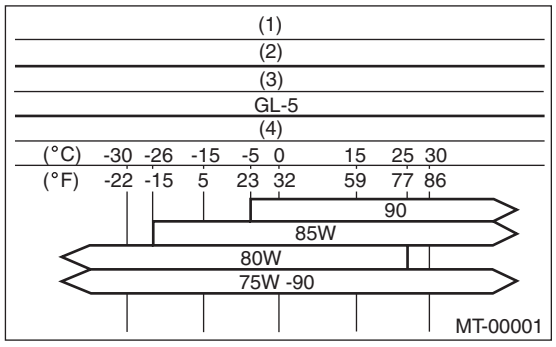
9. TRANSFER

Transfer type	Multi-plate transfer (MPT)
Number of transfer clutch drives & driven plates	5
Control method	Electronic hydraulic type
Lubricants	Same automatic transmission fluid as used in the automatic transmission
Reduction gear ratio	1.000 (53/53)

10.FINAL REDUCTION GEAR

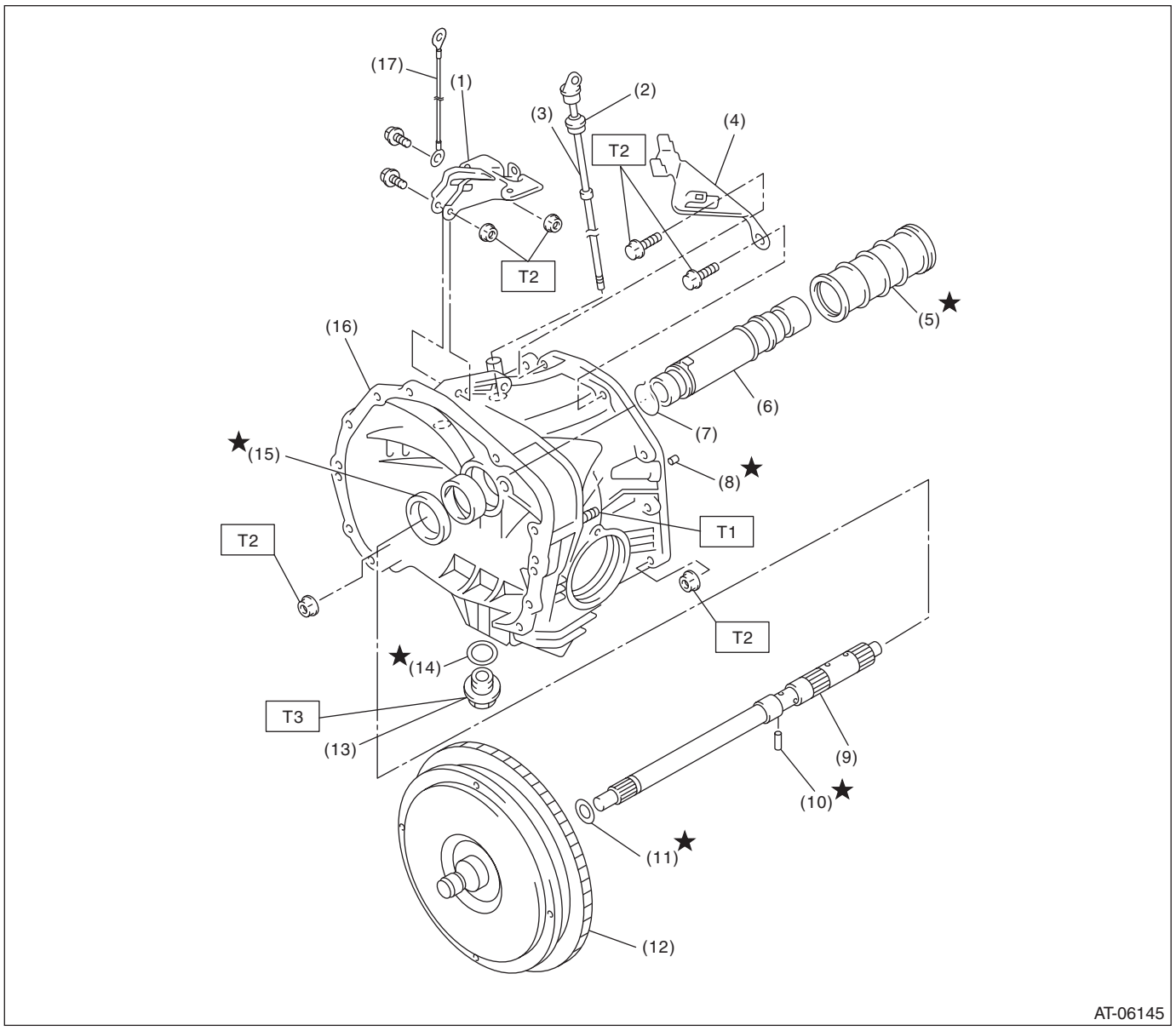
Front final reduction gear ratio	4.111 (37/9)

11.RECOMMENDED GEAR OIL

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

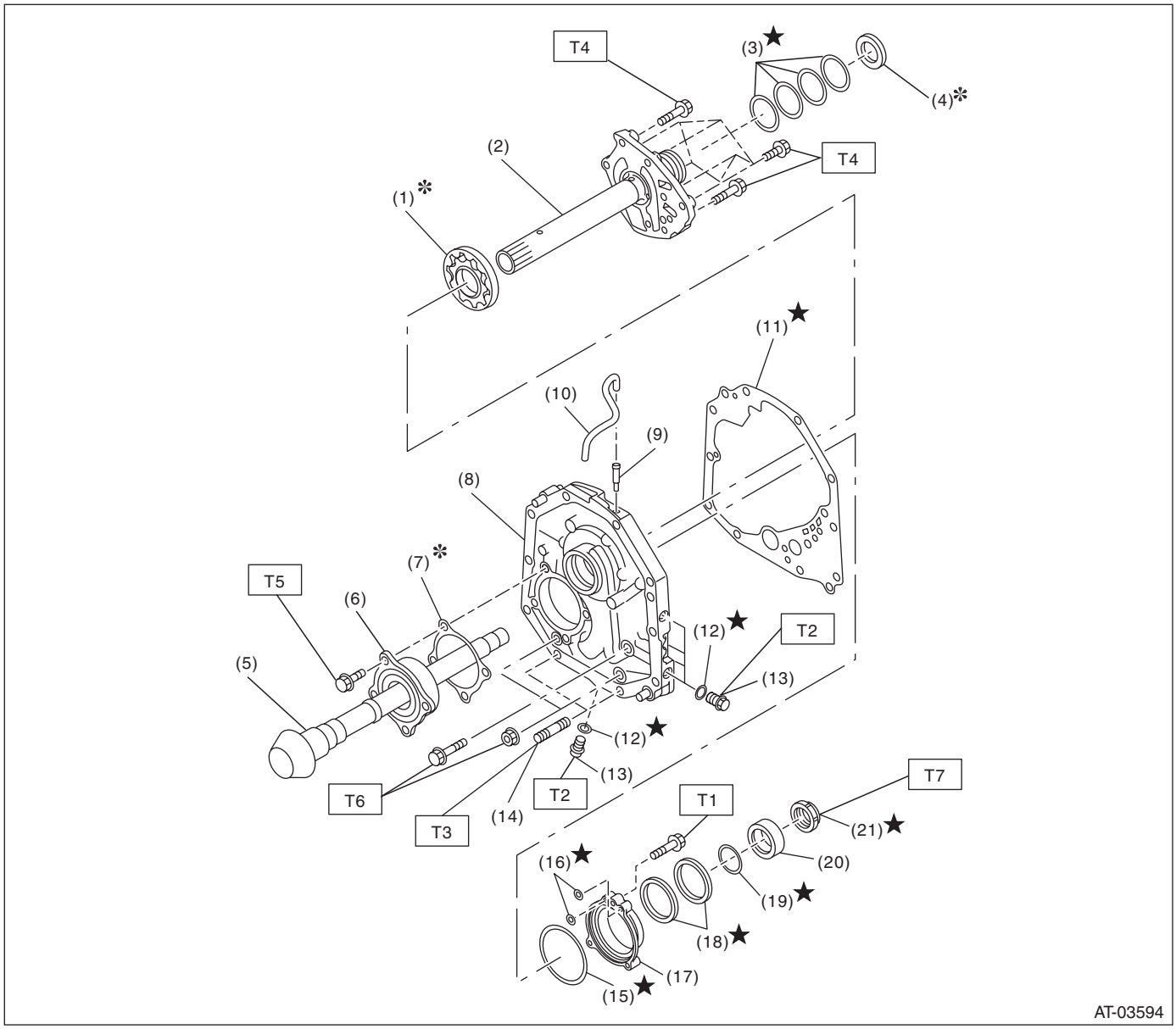
B: COMPONENT

1. TORQUE CONVERTER AND CASE



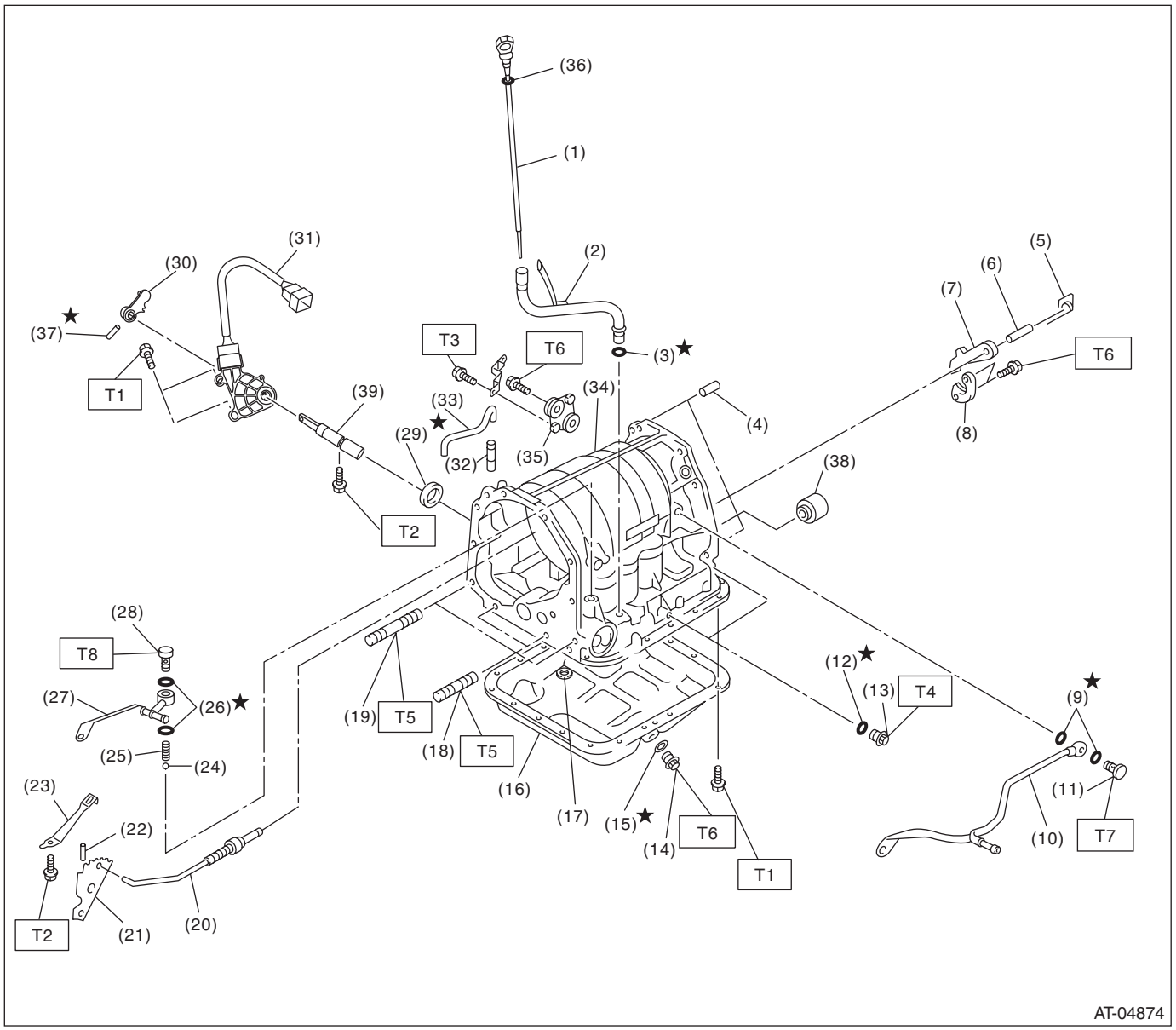
(1)	Pitching stopper bracket	(9)	Input shaft	(17)	Transmission radio ground cord
(2)	O-ring	(10)	Spring pin		
(3)	Differential oil level gauge	(11)	O-ring	***Tightening torque:N·m (kgf-m, ft-lb)***	
(4)	Stay	(12)	Torque converter clutch ASSY	***T1:***	***18 (1.8, 13.3)***
(5)	Seal pipe	(13)	Differential gear oil drain plug	***T2:***	***41 (4.2, 30.2)***
(6)	Oil pump shaft	(14)	Gasket	***T3:***	***44 (4.5, 32.5) (Aluminum gasket, silver)***
(7)	Clip	(15)	Oil seal		***70 (7.1, 51.6) (Copper gasket, brown)***
(8)	Oil drain pipe	(16)	Converter case		***70 (7.1, 51.6) (Metal gasket, black)***

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, 5.2)***
(5)	Drive pinion shaft	(15)	O-ring	***T2:***	***13 (1.3, 9.6)***
(6)	Roller bearing	(16)	O-ring	***T3:***	***18 (1.8, 13.3)***
(7)	Drive pinion shim	(17)	Oil seal retainer	***T4:***	***25 (2.5, 18.4)***
(8)	Oil pump housing	(18)	Oil seal	***T5:***	***40 (4.1, 29.5)***
(9)	Nipple	(19)	O-ring	***T6:***	***42 (4.3, 31.0)***
(10)	Air breather hose	(20)	Drive pinion collar	***T7:***	***116 (11.8, 85.6)***

3. TRANSMISSION CASE AND CONTROL DEVICE

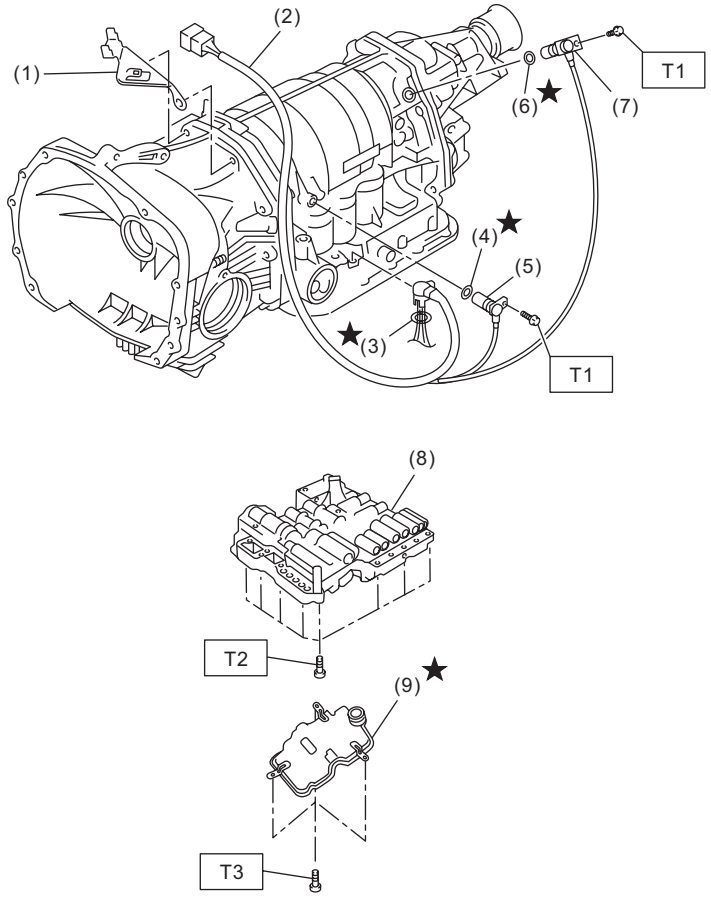


(1) ATF level gauge
(2) Oil charge pipe
(3) O-ring
(4) Straight pin
(5) Return spring
(6) Shaft
(7) Parking pawl
(8) Parking support
(9) Gasket
(10) ATF inlet pipe
(11) Union screw
(12) O-ring
(13) Test plug
(14) Drain plug (ATF)
(15) Gasket
(16) Oil pan
(17) Magnet
(18) Stud bolt (short)
(19) Stud bolt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

Tightening torque:N·m (kgf-m, ft-lb)

T1:	***5 (0.5, 3.7)***
T2:	***6 (0.6, 4.4)***
T3:	***12 (1.2, 8.9)***
T4:	***13 (1.3, 9.6)***
T5:	***18 (1.8, 13.3)***
T6:	***25 (2.5, 18.4)***
T7:	***40 (4.1, 29.5)***
T8:	***45 (4.6, 33.2)***

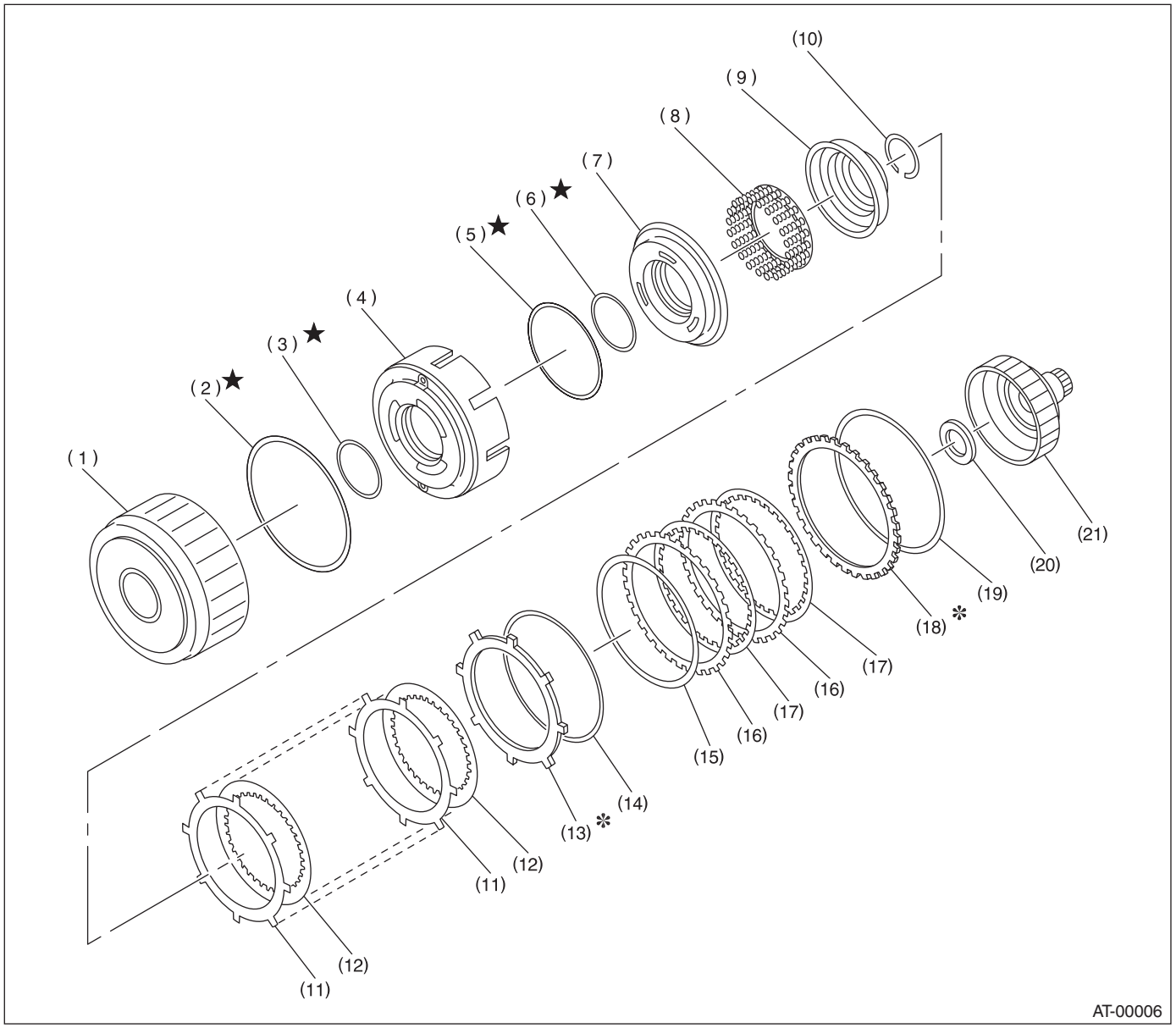
4. CONTROL VALVE AND HARNESS ROUTING



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

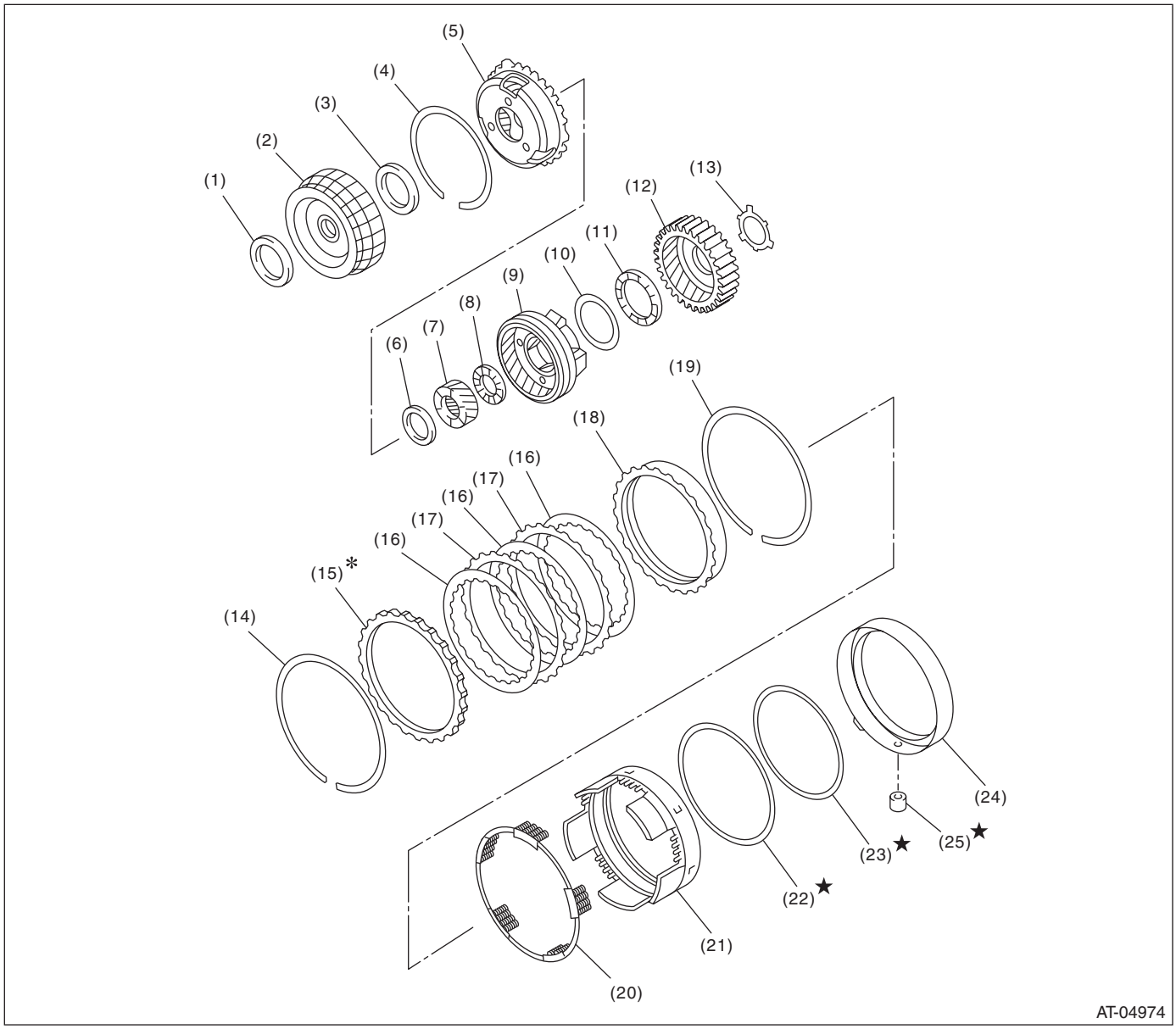
Tightening torque:N·m (kgf-m, ft-lb)
T1: 7 (0.7, 5.2)
T2: 8 (0.8, 5.9)
T3: 10 (1.0, 7.4)

5. HIGH CLUTCH AND REVERSE CLUTCH



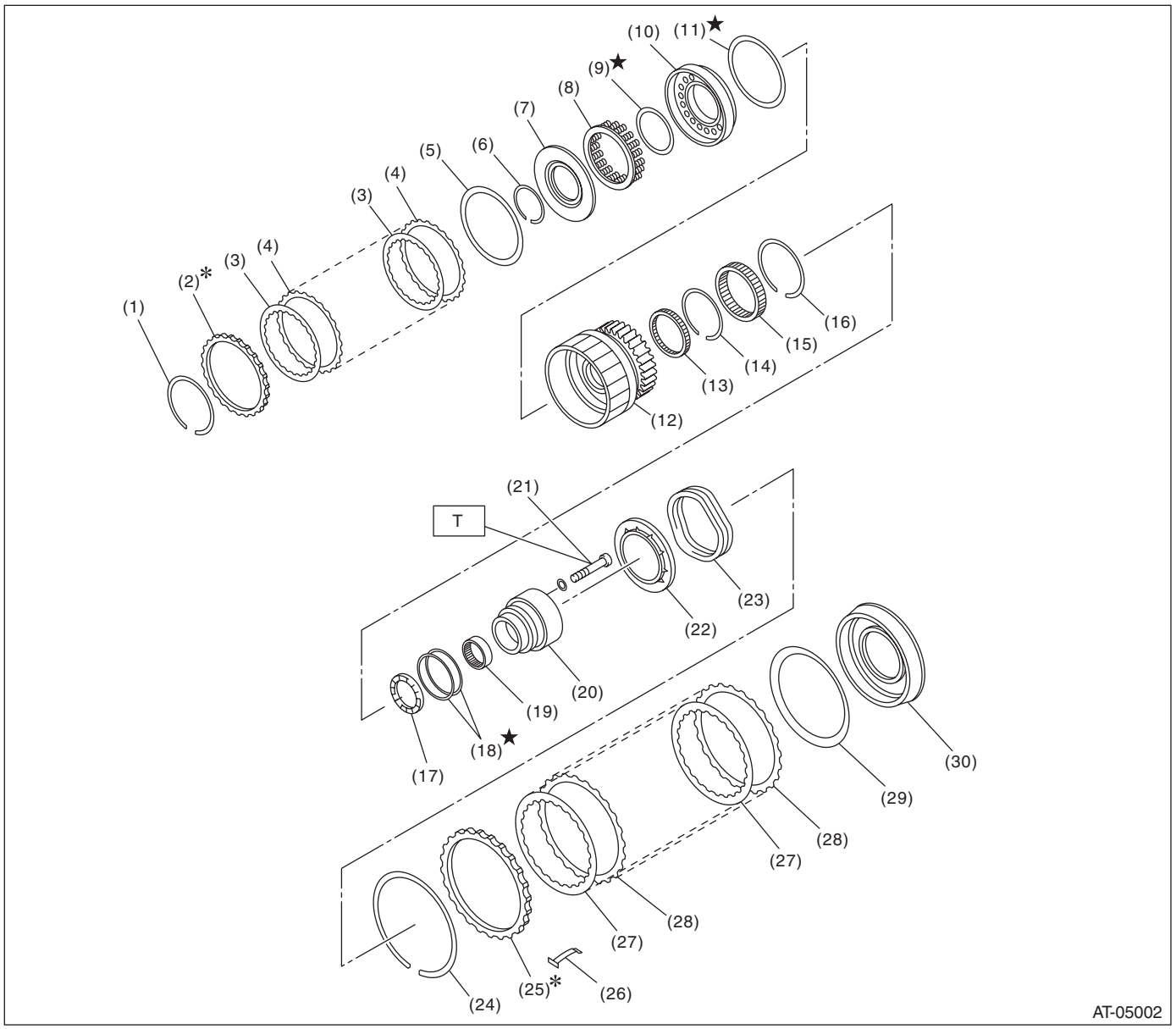
(1) High clutch drum
(2) Lip seal
(3) D-ring
(4) Reverse clutch piston
(5) D-ring
(6) D-ring
(7) High clutch piston
(8) Spring retainer
(9) Clutch cover
(10) Snap ring
(11) Driven plate (high clutch)
(12) Drive plate (high clutch)
(13) Retaining plate (high clutch)
(14) Snap ring
(15) Dish plate
(16) Driven plate (reverse clutch)
(17) Drive plate (reverse clutch)
(18) Retaining plate (reverse clutch)
(19) Snap ring
(20) Thrust needle bearing
(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) Spring retainer
(21) 2-4 brake piston
(22) D-ring
(23) D-ring
(24) 2-4 brake piston retainer
(25) 2-4 brake seal

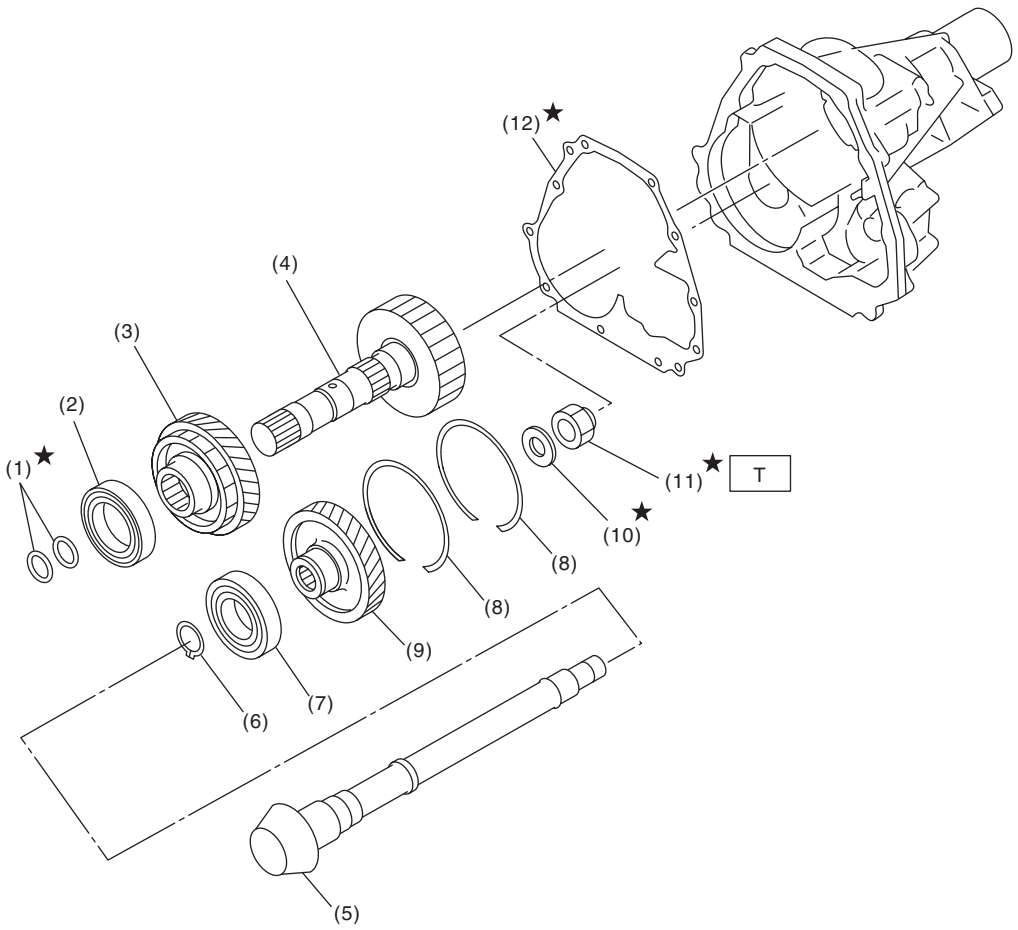
7. LOW CLUTCH AND LOW & REVERSE BRAKE



(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, 18.4)

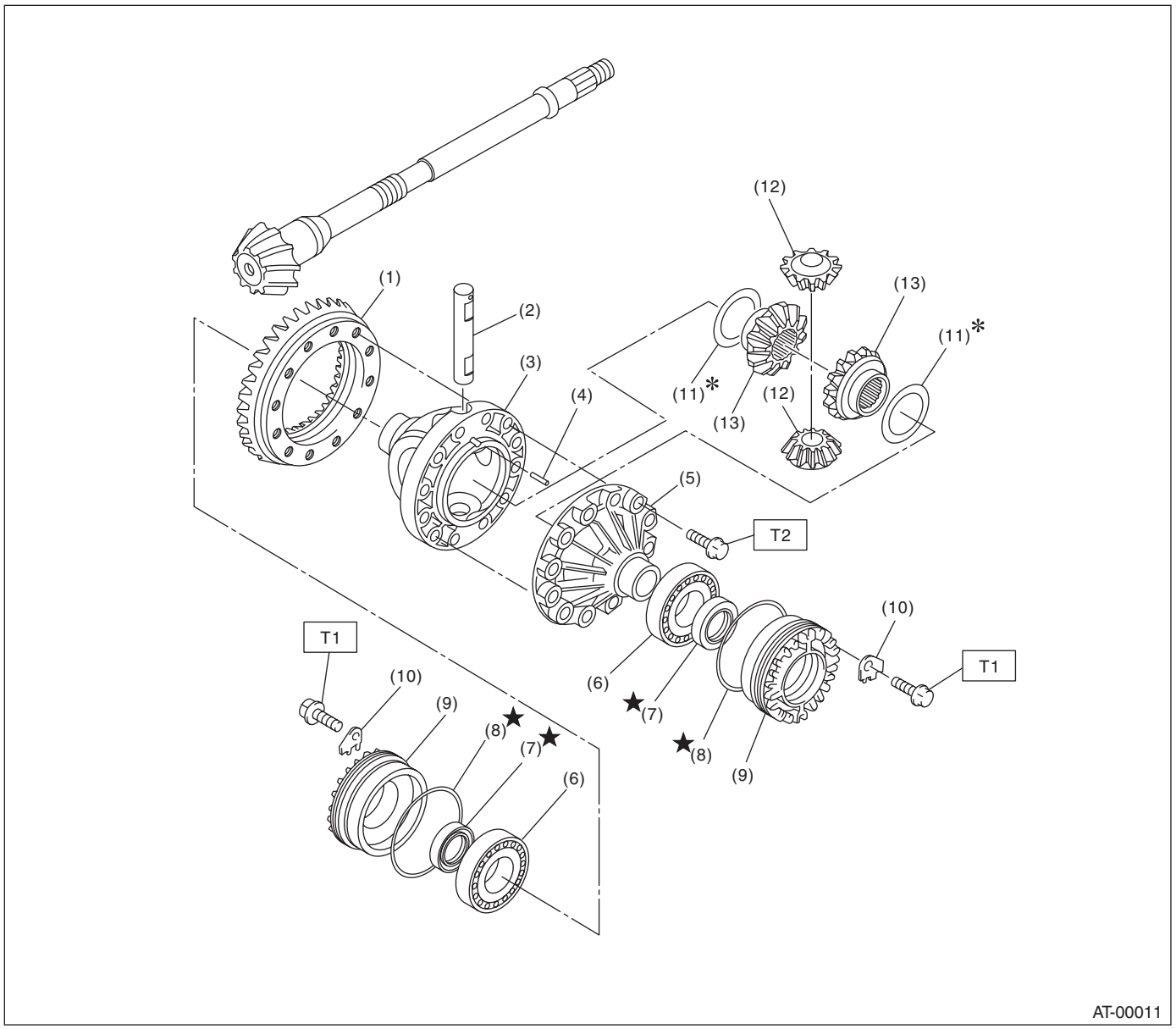
8. REDUCTION GEAR



(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
(12) Gasket

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

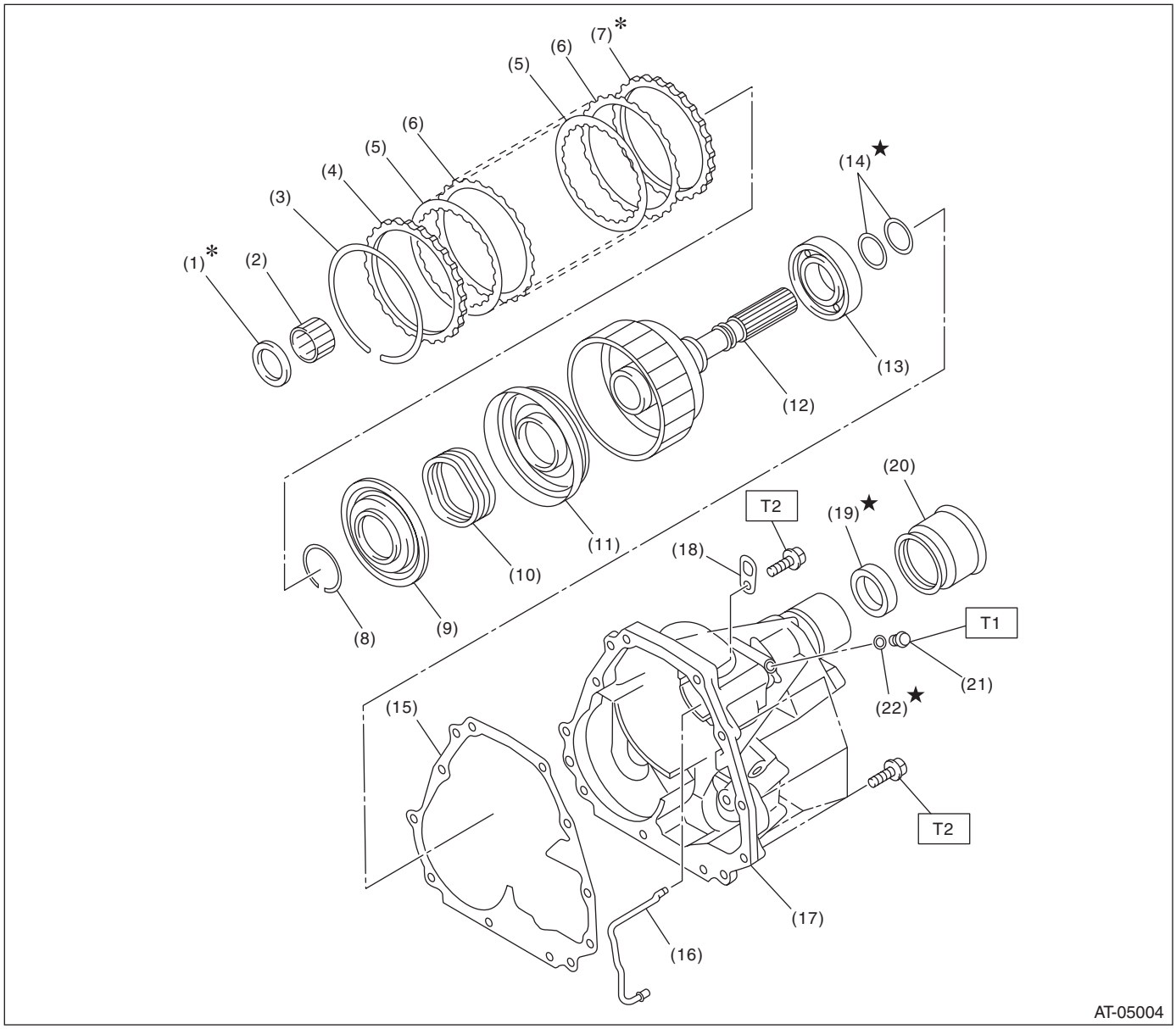
9. DIFFERENTIAL GEAR



(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, 18.4)
T2: 62 (6.3, 45.7)

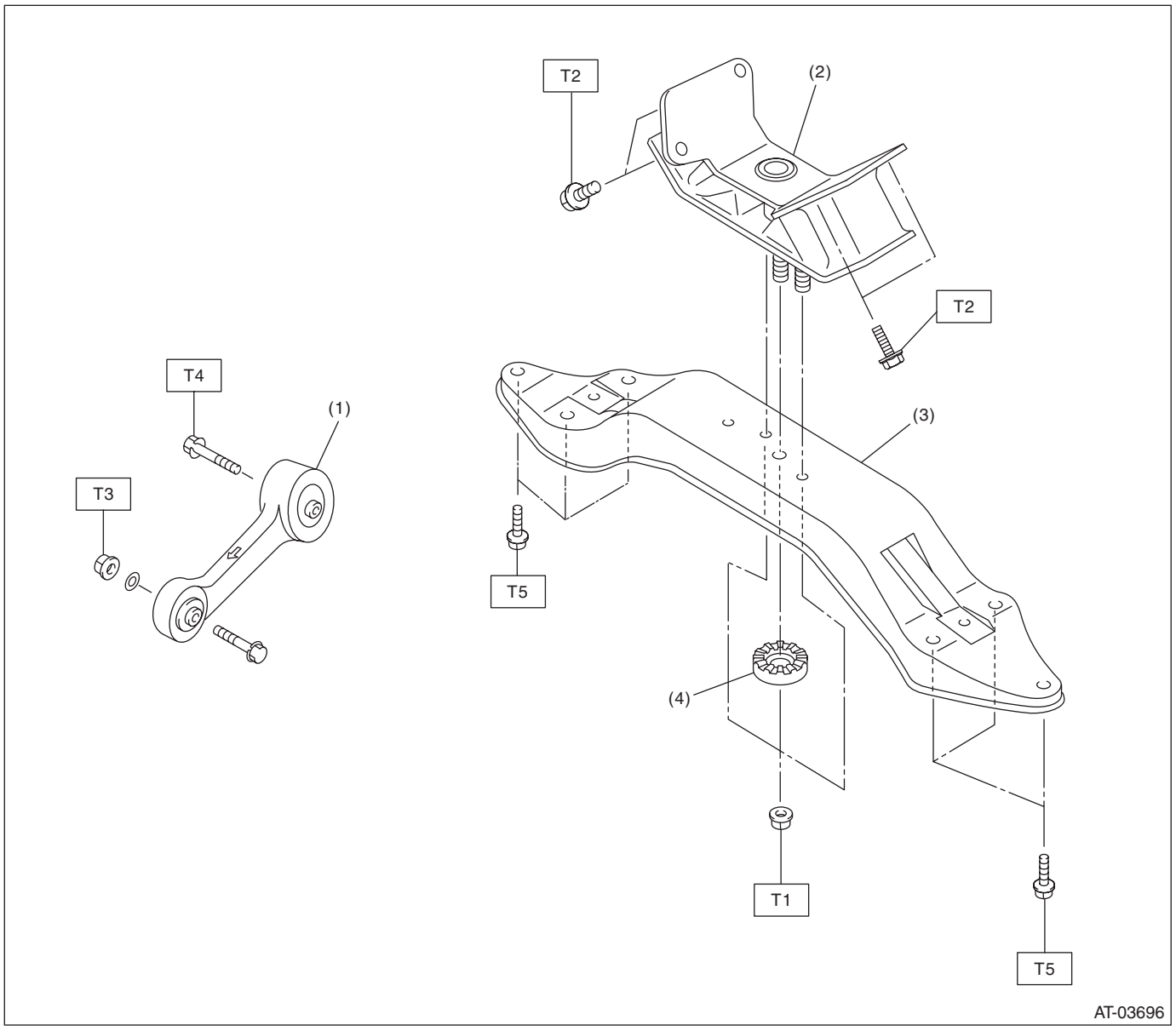
10.TRANSFER AND EXTENSION CASE



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

Tightening torque:N·m (kgf-m, ft-lb)
T1: 13 (1.3, 9.6)
T2: 25 (2.5, 18.4)

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, 25.8)
T2: 40 (4.1, 29.5)
T3: 50 (5.1, 36.9)
T4: 58 (5.9, 42.8)
T5: 70 (7.1, 51.6)

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.
• 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 force it apart. 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, SUBARU genuine ATF, and specified grease or equivalent. Do not mix gear oil, grease, etc. of different grades or manufacturers.
• Be sure to tighten bolts and nuts to the specified torque.
• Place lifts, shop jacks or rigid racks at specified locations.
• Apply gear oil or ATF onto sliding or revolution surfaces before installation in view of components usage.
• 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 cushioning material such as wood blocks, aluminum plate, 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.
• When disassembling or assembling 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

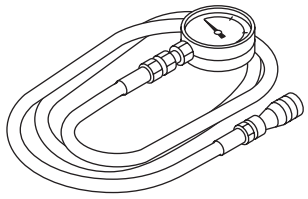
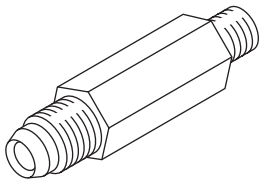
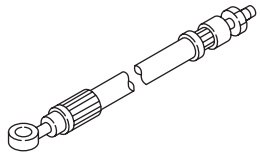
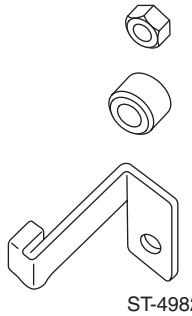
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498575400	498575400	OIL PRESSURE GAUGE ASSY	Used for measuring oil pressure.
 ST-498897200	498897200	OIL PRESSURE GAUGE ADAPTER	Used at the oil pump housing when measuring reverse clutch pressure and line pressure.
 ST-498897700	498897700	OIL PRESSURE ADAPTER SET	Used for measuring transfer clutch pressure.
 ST-498277200	498277200	STOPPER SET	Used for removing and installing automatic transmission assembly to engine.

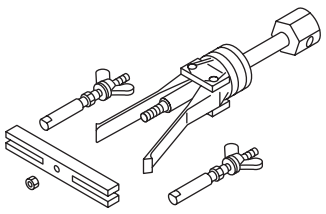
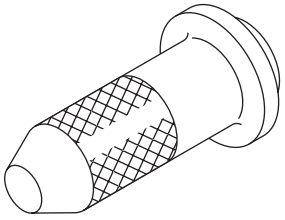
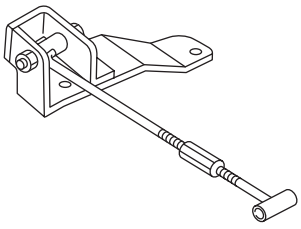
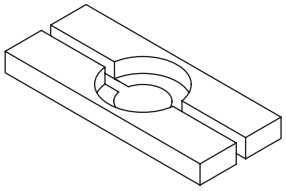
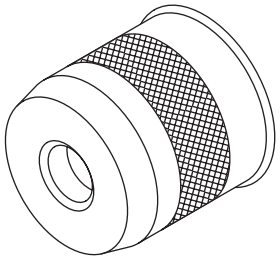
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398527700	398527700	PULLER ASSY	• Used for removing the extension case roller bearing. • Used for removing the extension oil seal. • Used for removing the front differential side retainer bearing outer race. • Used for removing the front differential side retainer oil seal.
 ST-498057300	498057300	INSTALLER	Used for installing the extension oil seal.
 ST41099AC000	41099AC000	ENGINE SUPPORT ASSY	Used for supporting the engine.
 ST-498077000	498077000	REMOVER	Used for removing the differential taper roller bearing.
 ST-499247400	499247400	INSTALLER	• Used for installing the transfer outer snap ring. • Used together with GUIDE (499257300).

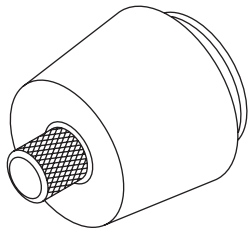
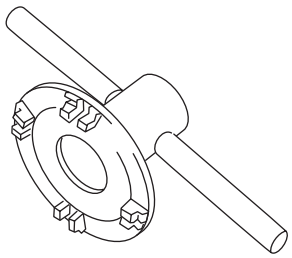
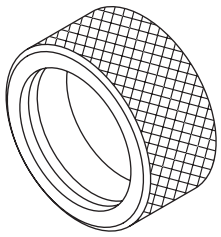
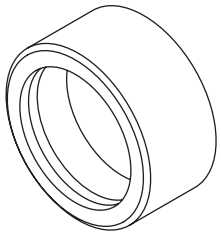
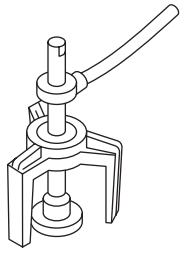
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499257300	499257300	SNAP RING OUTER GUIDE	• Used for installing the transfer outer snap ring. • Used together with INSTALLER (499247400).
 ST18630AA010	18630AA010	WRENCH COMPL RETAINER	• Used for removing and installing the differential side retainer. • WRENCH ASSY (499787000) can also be used.
 ST-398437700	398437700	DRIFT	Used for installing the converter case oil seal.
 ST-398487700	398487700	INSTALLER	Used for installing the front differential taper roller bearing.
 ST-398673600	398673600	COMPRESSOR	Used for removing and installing the clutch spring.

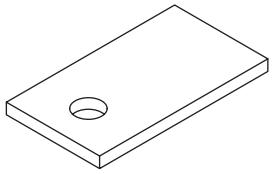
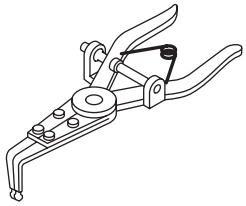
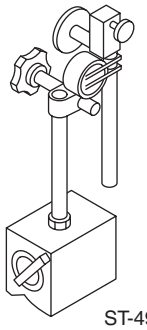
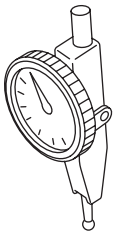
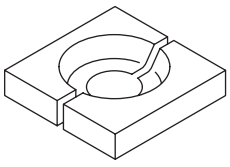
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498255400	498255400	PLATE	Used for measuring the backlash of hypoid gear.
 ST-399893600	399893600	PLIER	Used for removing and installing the clutch spring.
 ST-498247001	498247001	MAGNET BASE	• Used for measuring the gear backlash. • Used together with DIAL GAUGE (498247100).
 ST-498247100	498247100	DIAL GAUGE	• Used for measuring the gear backlash. • Used together with MAGNET BASE (498247001).
 ST-498517000	498517000	REPLACER	Used for removing the front roller bearing.

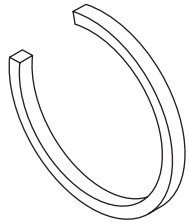
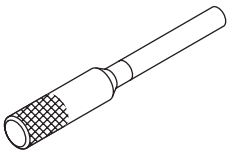
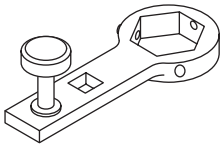
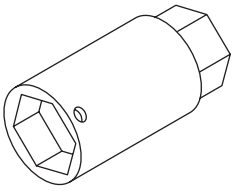
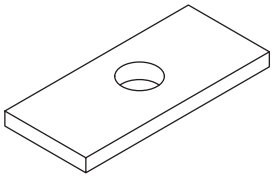
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398623600	398623600	SEAT	Used for removing the spring of the transfer clutch piston.
 ST-499267300	499267300	STOPPER PIN	Used for installing the inhibitor switch.
 ST-499787700	499787700	WRENCH	Used for removing and installing the drive pinion lock nut.
 ST-499787500	499787500	ADAPTER	Used for removing and installing the drive pinion lock nut.
 ST-398643600	398643600	GAUGE	Used for measuring total end play, extension end play and drive pinion height.

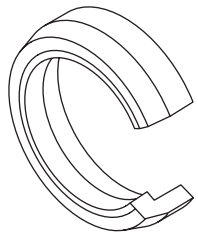
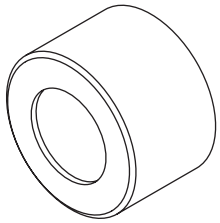
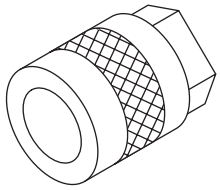
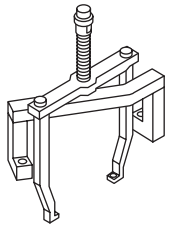
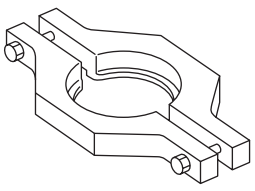
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498627100	498627100	SEAT	Used for holding the low clutch piston retainer spring when installing snap ring.
 ST-499577000	499577000	GAUGE	Used for measuring the mating surface of the transmission to the end face of the reduction gear.
 ST-499737000	499737000	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.

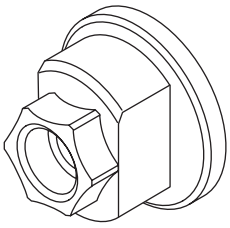
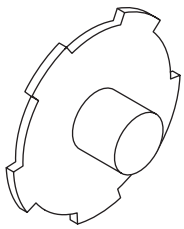
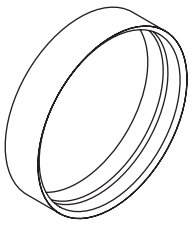
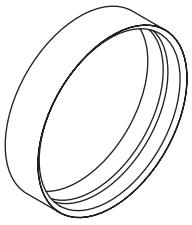
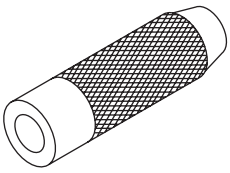
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498937110	498937110	HOLDER	Used for removing and installing the drive pinion lock nut.
 ST-498677100	498677100	COMPRESSOR	Used for installing the 2-4 brake snap ring.
 ST-498437000	498437000	HIGH CLUTCH PISTON GUIDE	Used for installing the high clutch 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.

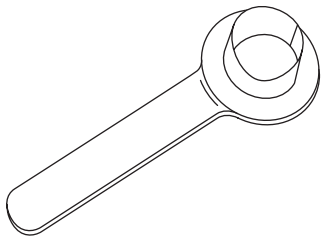
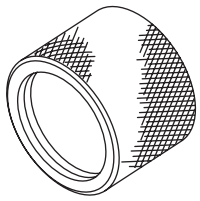
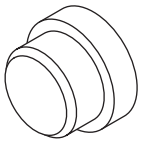
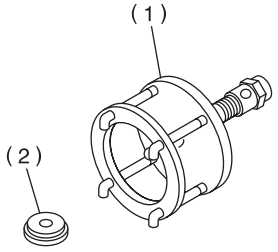
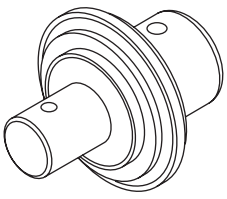
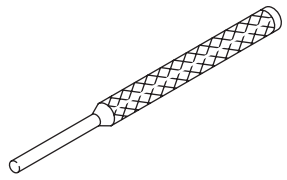
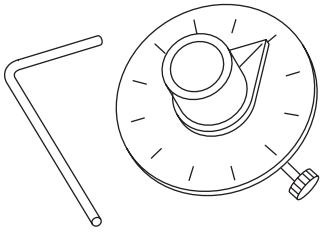
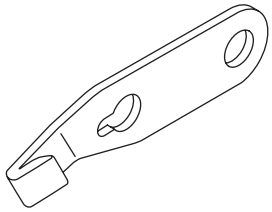
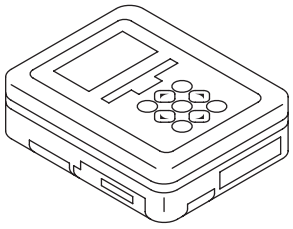
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST28399SA010	28399SA010	OIL SEAL PROTECTOR	Used for installing the axle shaft.
 ST18675AA000	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing the differential side retainer oil seal.
 ST-398497701	398497701	INSTALLER	Used for installing the needle bearing.
 ST-899524100	899524100	PULLER SET	Use only the bolt. • Used together with PULLER SET (499737100). • Used together with PULLER (499737000). 1. PULLER 2. CAP
 ST-499247300	499247300	INSTALLER	Used for installing the oil pump housing retainer oil seal.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398791600	398791600	REMOVER	Used for removing the shifter arm spring pin.
 ST18854AA000	18854AA000	ANGLE GAUGE	Used for installing the drive plate.
 ST-498497100	498497100	CRANKSHAFT STOPPER	Used for stopping the drive plate rotation when removing and installing the drive plate.
 ST1B022XU0	1B022XU0	SUBARU SELECT MONITOR III KIT	Used for troubleshooting 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 scale	Used for measuring the starting torque of the drive pinion.
Circuit tester	Used for measuring resistance and voltage.
TORX® T70	Used for removing and installing differential gear oil drain plug.
Push/pull gauge	Used for measuring the piston stroke of each clutch.