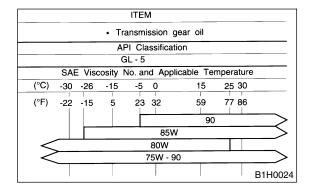
1. General Description S503001

A: SPECIFICATIONS S503001E49

1. MANUAL TRANSMISSION AND DIFFERENTIAL S503001E4901

ltem		Model				
		BRIGHTON	L	GT	OUTBACK	
Туре		5-forw	ard speeds with sy	nchromesh and 1-re	everse	
1st			3.454			
		2nd	2.062			
Transmission goor re	atio.	3rd	1.448			
Transmission gear ra	atio	4th		1.088		
		5th	0.780 0.83		0.871	
		Reverse	3.333			
Front reduction	Type of gear		Hypoid			
gear	Final	Gear ratio	3.9	3.900 4.111		11
	Transfer	Type of gear	Helical			
	Transiei	Gear ratio		1.0	000	
Rear reduction gear	Einal	Type of gear		Нур	ooid	
	Final		3.9	3.900 4.111		11
Front differential	Type and number of gear		Straight bevel gear (Bevel pinion: 2, 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 oil capacity		3.5 ℓ (3.7 US qt, 3.1 Imp qt)				

2. TRANSMISSION GEAR OIL S503001E4902 Recommended oil



3. TRANSMISSION CASE ASSEMBLY

S503001E4903

Drive pinion shim adjustment Hypoid gear backlash 0.13 — 0.18 mm (0.0051 — 0.0071 in)

	Drive pinion shim				
Part No.	Thickness mm (in)	Part No.	Thickness mm (in)		
32295AA031	0.150 (0.0059)	32295AA071	0.250 (0.0098)		
32295AA041	0.175 (0.0069)	32295AA081	0.275 (0.0108)		
32295AA051	0.200 (0.0079)	32295AA091	0.300 (0.0118)		
32295AA061	0.225 (0.0089)	32295AA101	0.500 (0.0197)		

Selection of main shaft rear plate

Main shaft rear plate				
Dimension "A" mm (in)	Part No.	Mark		
4.00 — 4.13 (0.1575 — 0.1626)	32294AA041	1		
3.87 — 3.99 (0.1524 — 0.1571)	32294AA051	2		

4. DRIVE PINION ASSEMBLY S503001E4904

Preload adjustment of thrust bearing Starting torque

 $0.3 - 0.8 \text{ N} \cdot \text{m}$ (0.03 - 0.08 kgf-m, 0.2 - 0.6 ft-lb)

Adjusting washer No. 1			
Part No.	Thickness mm (in)		
803025051	3.925 (0.1545)		
803025052	3.950 (0.1555)		
803025053	3.975 (0.1565)		
803025054	4.000 (0.1575)		
803025055	4.025 (0.1585)		
803025056	4.050 (0.1594)		
803025057	4.075 (0.1604)		

Adjusting washer No. 2			
Part No. Thickness mm (in)			
803025059	3.850 (0.1516)		
803025054	4.000 (0.1575)		
803025058	4.150 (0.1634)		

5. REVERSE IDLER GEAR S503001E4905

Adjustment of reverse idler gear position Reverse idler gear to transmission case (LH) wall clearance

Reverse shifter lever				
Part No.	Mark	Remarks		
32820AA070	7	Further from case wall		
32820AA080	8	Standard		
32820AA090	9	Closer to the case wall		

After installing a suitable reverse shifter lever, adjust reverse idler gear to transmission case wall clearance to within 0 to 0.5 mm (0 to 0.020 in) using washers.

Washer (20.5 \times 26 \times t)					
Part No.	Thickness	Part No.	Thickness		
T dit No.	mm (in)	r art ivo.	mm (in)		
803020151	0.4 (0.016)	803020154	1.9 (0.075)		
803020152	1.1 (0.043)	803020155	2.3 (0.091)		
803020153	1.5 (0.059)	_	_		

6. SHIFTER FORK AND ROD S503001E4906

Select suitable shifter forks so that both coupling sleeve and reverse driven gear are positioned in the center of their synchromesh mechanisms.

Rod end clearance

1st-2nd shifter fork				
Part No. Mark		Remarks		
32804AA060	1	Approach to 1st gear by 0.2 mm (0.008 in)		
32804AA070	No mark	Standard		
32804AA080	3	Approach to 2nd gear by 0.2 mm (0.008 in)		

3rd-4th shifter fork				
Part No. Mark Remarks				
32810AA061	1	Approach to 4th gear by 0.2 mm (0.008 in)		
32810AA071	No mark	Standard		
32810AA101	3	Approach to 3rd gear by 0.2 mm (0.008 in)		

5th shifter fork				
Part No. Mark		Remarks		
32812AA201	7	Approach to 5th gear by 0.2 mm (0.008 in)		
32812AA211	No mark	Standard		
32812AA221	9	Become distant from 5th gear by 0.2 mm (0.008 in)		

7. TRANSFER CASE S503001F4907

Neutral position adjustment

Adjustment shim			
Part No. Thickness mm (in)			
32190AA000	0.15 (0.0059)		
32190AA010	0.30 (0.0118)		

Reverse accent shaft			
Part No.	Remarks		
32188AA090	3	Neutral position is closer to 1st.	
32188AA100	0	Standard	
32188AA110	1	Neutral position is closer to reverse gear.	

Reverse check plate adjustment

Reverse check plate			
Part No.	Mark	Angle θ	Remarks
32189AA000	0	28°	Arm stops closer to 5th gear.
32189AA010	1	31°	Arm stops closer to 5th gear.
33189AA020	2	34°	Arm stops in the center.
32189AA030	3	37°	Arm stops closer to reverse gear.
32189AA040	4	40°	Arm stops closer to reverse gear.

8. EXTENSION ASSEMBLY \$503001E4908

Thrust washer ($50 \times 61 \times t$) to taper roller bearing table outer race side clearance

0.2 — 0.3 mm T (0.0008 — 0.012 in T)

NOTE:

T: Tight

Thrust washer (50 \times 61 \times 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)	

Thrust washer to center differential side clearance 0.15 — 0.35 mm (0.0059 — 0.0138 in)

Thrust washer		
Part No.	Thickness mm (in)	
803036050	0.9 (0.035)	
803036054	1.0 (0.039)	
803036051	1.1 (0.043)	
803036055	1.2 (0.047)	
803036052	1.3 (0.051)	
803036056	1.4 (0.055)	
803036053	1.5 (0.059)	
803036057	1.6 (0.063)	
803036058	1.7 (0.067)	

9. FRONT DIFFERENTIAL S503001E4909

Bevel gear to pinion backlash 0.13 — 0.18 mm (0.0051 — 0.0071 in)

- 1				
ı		Washer (38	$3.1 \times 50 \times t$)	
	Part No.	Thickness mm (in)	Part No.	Thickness mm (in)
	803038021	0.925 — 0.950 (0.0364 — 0.0374)	803038023	1.025 — 1.050 (0.0404 — 0.0413)
	803038022	0.975 — 1.000 (0.0384 — 0.0394)	_	_

Pinion shaft to axle drive shaft clearance 0 — 0.2 mm (0 — 0.008 in)

Snap ring (Outer-28)				
Part No.	Thickness mm (in)	Part No.	Thickness mm (in)	
805028011	1.05 (0.0413)	805028012	1.20 (0.0472)	

10. TRANSFER DRIVE GEAR \$503001E4913

Snap ring (Outer-30) to ball bearing clearance 0.01 — 0.15 mm (0.004 — 0.0050 in)

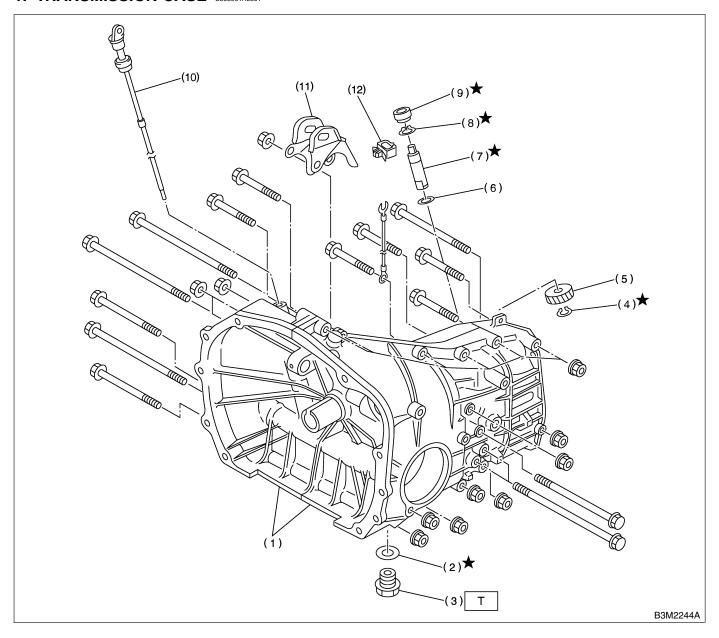
Snap ring (Outer-30)		
Part No. Thickness mm (in)		
805030041	1.53 (0.0602)	
805030042	1.65 (0.0650)	
805030043	1.77 (0.0697)	

Manual Transmission and Differential

MEMO:

B: COMPONENT S503001A05

1. TRANSMISSION CASE S503001A0501



Manual Transmission and Differential

(1) Transmission case ASSY

(2) Gasket

(3) Drain plug

(4) Snap ring (Outer)

(5) Speedometer driven gear

(6) Washer

(7) Speedometer shaft

(8) Snap ring (Outer)

(9) Oil seal

(10) Oil level gauge

(11) Pitching stopper bracket

(12) Clamp

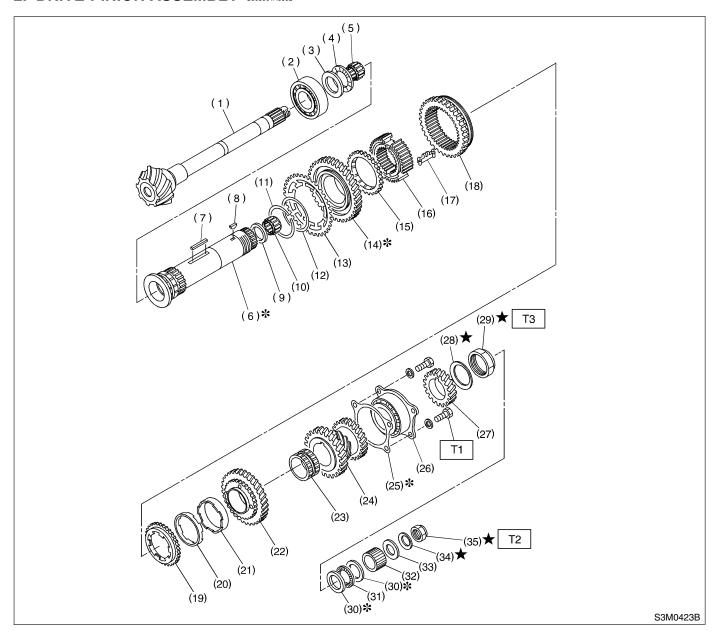
Tightening torque: N·m (kgf-m, ft-lb)

T: 44 (4.5, 32.5)

• Transmission case tightening torque:

(9) (5) (7) (16) (17) (13) (13) (11)	Bolt No.	Bolt size	Tightening torque: N⋅m (kgf-m, ft-lb)
(15) - (2)	<5> to <15>	8 mm	25 (2.5, 18.1)
(14) (10) (6) (8) (12) B3M2243A	<1> to <4> <16>, <17>	10 mm	39 (4.0, 28.9)

2. DRIVE PINION ASSEMBLY S503001A0502



- (1) Drive pinion shaft
- (2) Roller bearing
- (3) Washer
- (4) Thrust bearing
- (5) Needle bearing
- (6) Driven shaft
- (7) Key
- (8) Woodruff key
- (9) Drive pinion collar
- (10) Needle bearing
- (11) Snap ring (Outer)
- (12) Washer
- (13) Sub gear
- (14) 1st driven gear

- (15) Baulk ring
- (16) 1st-2nd synchronizer hub
- (17) Insert key
- (18) Reverse driven gear
- (19) Outer baulk ring
- (20) Synchro cone
- (21) Inner baulk ring
- (22) 2nd driven gear
- (23) 2nd driven gear bushing
- (24) 3rd-4th driven gear
- (25) Driven pinion shim
- (26) Roller bearing
- (27) 5th driven gear
- (28) Lock washer

- (29) Lock nut
- (30) Washer
- (31) Thrust bearing
- (32) Differential bevel gear sleeve
- (33) Washer
- (34) Lock washer
- (35) Lock nut

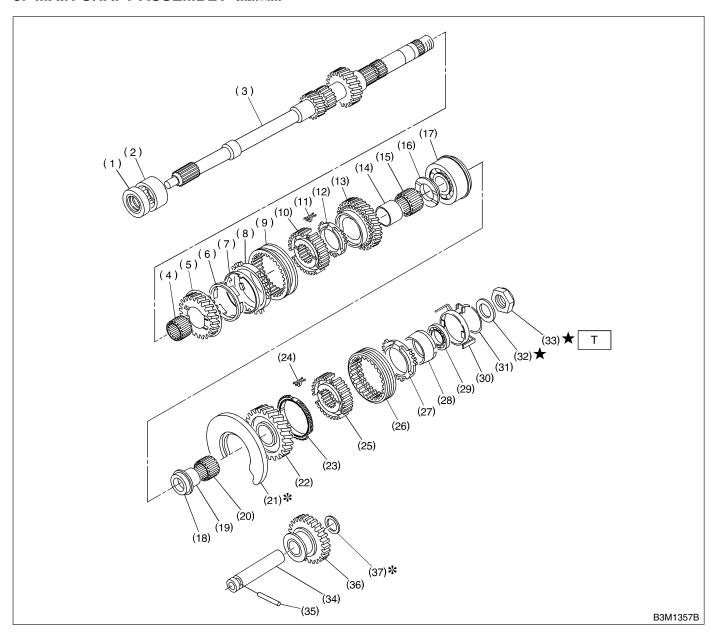
Tightening torque: N·m (kgf-m, ft-lb)

T1: 29 (3.0, 21.7)

T2: 118 (12.0, 86.8)

T3: 265 (27, 195)

3. MAIN SHAFT ASSEMBLY S502001A0503



- (1) Oil seal
- (2) Needle bearing
- (3) Transmission main shaft
- (4) Needle bearing
- (5) 3rd drive gear
- (6) Inner baulk ring
- (7) Synchro cone (3rd)
- (8) Outer baulk ring
- (9) Coupling sleeve (3rd-4th)
- (10) Synchronizer hub (3rd-4th)
- (11) Shifting insert key (3rd-4th)
- (12) 4th baulk ring
- (13) 4th drive gear
- (14) 4th needle bearing race

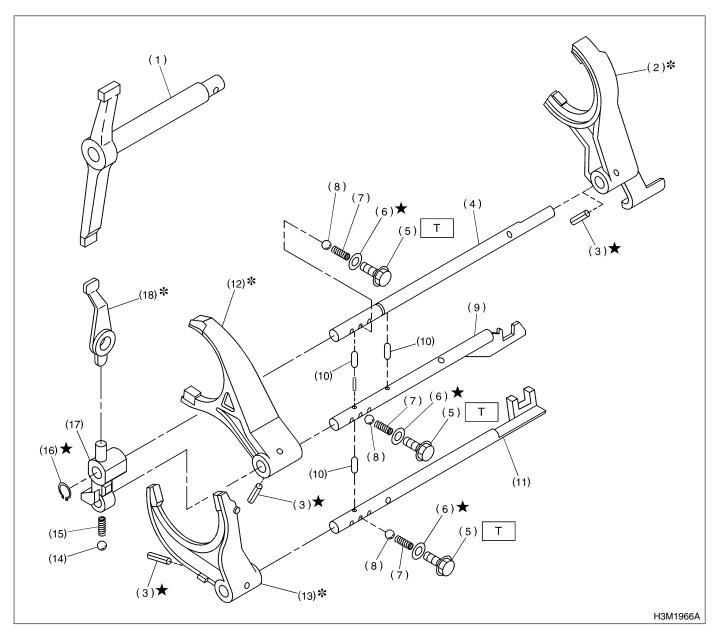
- (15) Needle bearing
- (16) 4th gear thrust washer
- (17) Ball bearing
- (18) 5th gear thrust washer
- (19) 5th needle bearing race
- (20) Needle bearing
- (21) Main shaft rear plate
- (22) 5th drive gear
- (23) 5th baulk ring
- (24) Shifting insert key (5th-Rev)
- (25) Synchronizer hub (5th-Rev)
- (26) Coupling sleeve (5th-Rev)
- (27) Rev baulk ring
- (28) Synchro cone (Rev)

- (29) Ball bearing
- (30) Synchro cone stopper
- (31) Snap ring
- (32) Lock washer
- (33) Lock nut
- (34) Reverse idler gear shaft
- (35) Straight pin
- (36) Reverse idler gear
- (37) Washer

Tightening torque: N·m (kgf-m, ft-lb)
T: 118 (12.0, 86.8)

4. SHIFTER FORK AND SHIFTER ROD

S503001A0504



- (1) Shifter arm
- (2) 5th shifter fork
- (3) Straight pin
- (4) Reverse fork rod
- (5) Checking ball plug
- (6) Gasket
- (7) Checking ball spring
- (8) Ball

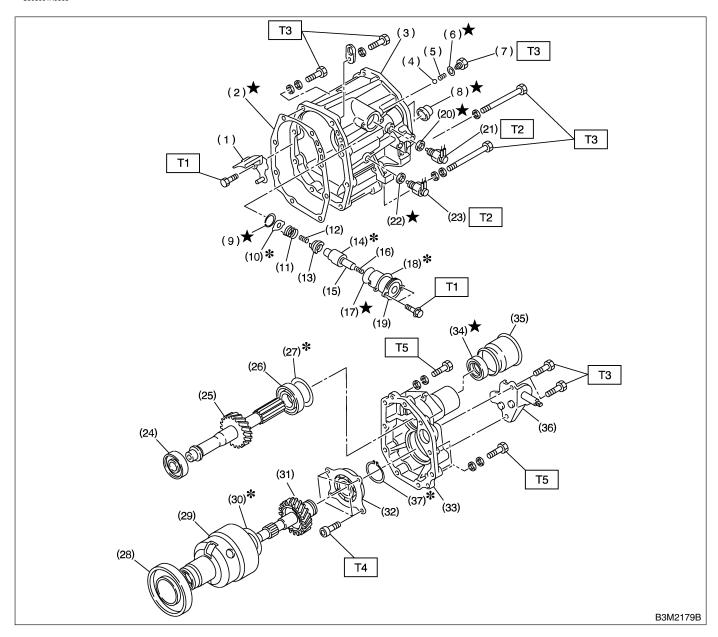
- (9) 3rd-4th fork rod
- (10) Interlock plunger
- (11) 1st-2nd fork rod
- (12) 3rd-4th shifter fork
- (13) 1st-2nd shifter fork
- (14) Ball
- (15) Spring
- (16) Snap ring (Outer)

- (17) Reverse fork rod arm
- (18) Reverse shifter lever

Tightening torque: N⋅m (kgf-m, ft-lb) T: 19.6 (2.0, 14.5)

5. TRANSFER CASE AND EXTENSION

S503001A0505



- (1) Oil guide
- (2) Gasket
- (3) Transfer case
- (4) Ball
- (5) Reverse accent spring
- (6) Gasket
- (7) Plug
- (8) Oil seal
- (9) Snap ring (Inner)
- (10) Reverse check plate
- (11) Reverse check spring
- (12) Reverse return spring
- (13) Reverse check cam
- (14) Reverse accent shaft
- (15) Return spring cap

- (16) Return spring
- (17) O-ring
- (18) Adjusting select shim
- (19) Reverse check sleeve
- (20) Gasket
- (21) Neutral switch
- (22) Gasket
- (23) Back-up light switch
- (24) Roller bearing
- (25) Transfer driven gear
- (26) Roller bearing
- (27) Adjusting washer
- (28) Ball bearing
- (29) Center differential
- (30) Adjusting washer

- (31) Transfer drive gear
- (32) Ball bearing
- (33) Extension
- (34) Oil seal
- (35) Dust cover
- (36) Shift bracket
- (37) Snap ring

Tightening torque: N⋅m (kgf-m, ft-lb)

T1: 6.4 (0.65, 4.7)

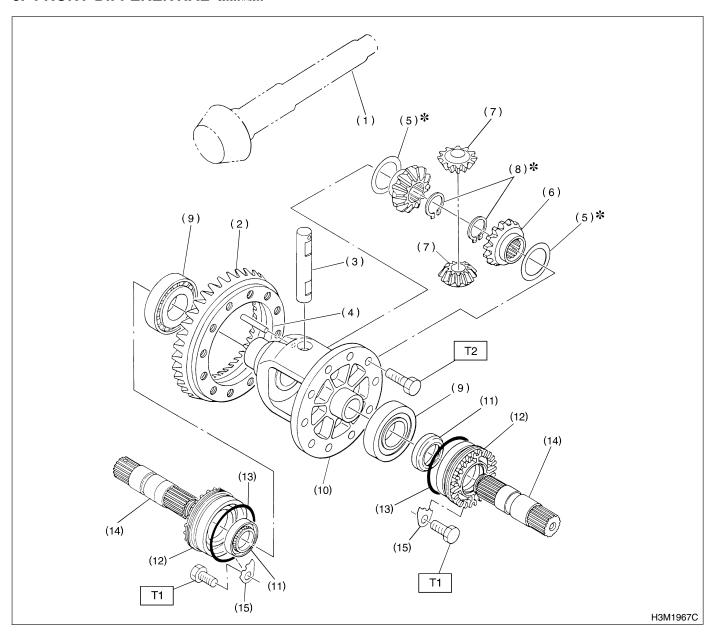
T2: 8.8 (0.9, 6.5)

T3: 10 (1.0, 7.2)

T4: 25 (2.5, 18.1)

T5: 40 (4.1, 29.7)

6. FRONT DIFFERENTIAL S503001A0506



- (1) Drive pinion shaft
- (2) Hypoid driven gear
- (3) Pinion shaft
- (4) Straight pin
- (5) Washer
- (6) Differential bevel gear
- (7) Differential bevel pinion

- (8) Snap ring (Outer)
- (9) Roller bearing
- (10) Differential case
- (11) Oil seal
- (12) Differential side retainer
- (13) O-ring
- (14) Axle drive shaft

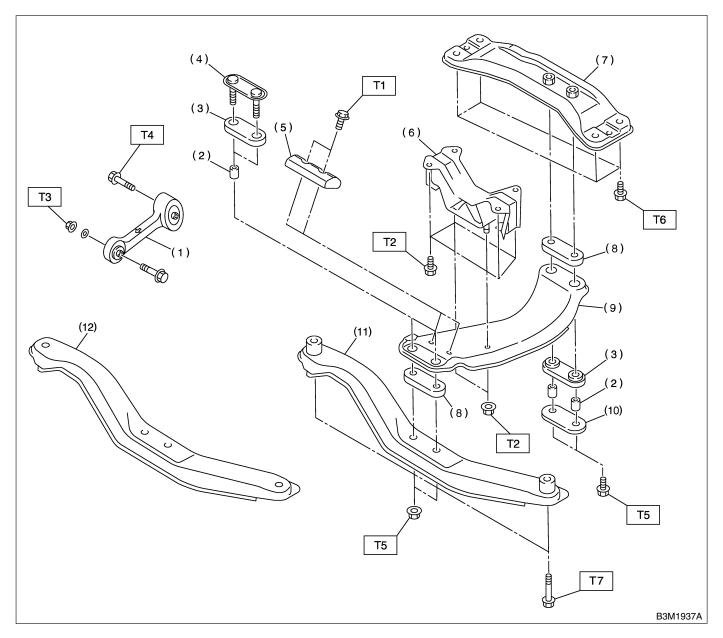
(15) Retainer lock plate

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

T1: 25 (2.5, 18.1)

T2: 62 (6.3, 45.6)

7. TRANSMISSION MOUNTING S503001A0507



- (1) Pitching stopper
- (2) Spacer
- (3) Cushion C
- (4) Front plate
- (5) Damper (Outback model only)
- (6) Rear cushion rubber
- (7) Rear crossmember
- (8) Cushion D

- (9) Center crossmember
- (10) Rear plate
- (11) Front crossmember (OUTBACK model)
- (12) Front crossmember (Except OUTBACK model)

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7.5 (0.76, 5.5)

T2: 35 (3.6, 26)

T3: 50 (5.1, 37)

T4: 58 (5.9, 43)

T5: 70 (7.1, 51)

T6: 75 (7.6, 55)

T7: 140 (14.3, 103)

C: CAUTION S503001A03

- Wear working 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 or 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 your hands, 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 safety stands 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 S503001A17

1. SPECIAL TOOLS S503001A1701

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
ILLOSTIATION	398791700	REMOVER II	
	390791700	HEMOVER II	Used for removing and installing spring pin (6 mm).
			,
B3M1938			
	399411700	ACCENT BALL	Used for installing reverse shifter rail arm.
		INSTALLER	
B3M1939			

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
(3) (2) (1) (3) (6) (4) (5) B3M1940A	399527700	PULLER SET	Used for removing and installing roller bearing (Differential). (1) BOLT (899521412) (2) PULLER (399527702) (3) HOLDER (399527703) (4) ADAPTER (398497701) (5) BOLT (899520107) (6) NUT (021008000)
B3M1941	399780104	WEIGHT	Used for measuring preload on roller bearing.
B3M1942	498077000	5TH DRIVEN GEAR REMOVER	Used for removing roller bearing of drive pinion shaft.
B3M1943	498077300	CENTER DIFFER- ENTIAL BEARING REMOVER	Used for removing the center differential cover ball bearing.

		T	T
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
B3M1944	498147000	DEPTH GAUGE	Used for adjusting main shaft axial end play.
B3M1945	498247001	MAGNET BASE	 Used for measuring backlash between side gear and pinion, and hypoid gear. Used with DIAL GAUGE (498247100).
B3M1946	498247100	DIAL GAUGE	 Used for measuring backlash between side gear and pinion, and hypoid gear. Used with MAGNET BASE (498247001).
B3M1947	498427100	STOPPER	Used for securing the drive pinion shaft assembly and driven gear assembly when removing the drive pinion shaft assembly lock nut.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
-	498787100	MAIN SHAFT STOP-	Used for removing and installing transmission
		PER	main shaft lock nut.
B3M1948			
	498937000	TRANSMISSION HOLDER	Used for removing and installing transmission main shaft lock nut.
·			
B3M1949			
	499277100	BUSHING 1-2 INSTALLER	Used for installing 1st driven gear thrust plate and 1st-2nd driven gear bushing.
			Used for installing roller bearing outer races to differential case.
B3M1950	400077000	INICTALLED	Head for many fixing the Condition was 11
	499277200	INSTALLER	Used for press-fitting the 2nd driven gear, roller bearings, and 5th driven gear onto the driven
			shaft.
B3M1951			

III LIOTO ATION	TOOL NUMBER	DECODIDATION	DEMARKO
ILLUSTRATION	TOOL NUMBER 499757002	DESCRIPTION SNAP RING PRESS	REMARKS Used for installing snap ring (OUT 25), and ball
	499/3/002	SIVAF NING FRESS	bearing (25 x 26 x 17).
B3M1952	400707000	WDENIOU AGOV	
B3M1953	499787000	WRENCH ASSY	Used for removing and installing differential side retainer.
26M 1000	499827000	PRESS	Used for installing speedometer oil seal when
B3M1954			installing speedometer cable to transmission.
	499857000	5TH DRIVEN GEAR REMOVER	Used for removing 5th driven gear.
B3M1955			

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
B3M1956	499877000	RACE 4-5 INSTALLER	 Used for installing 4th needle bearing race and ball bearing onto transmission main shaft. Used with REMOVER (899714110).
B3M1957	499917500	DRIVE PINION GAUGE ASSY	Used for adjusting drive pinion shim.
B3M1958	499927100	HANDLE	Used for fitting transmission main shaft.
B3M1959	499937100	TRANSMISSION STAND SET	Stand used for transmission disassembly and assembly.

		I	
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
B3M1960	499987003	SOCKET WRENCH (35)	Used for removing and installing driven pinion lock nut and main shaft lock nut.
20111900	499987300	SOCKET WRENCH	Used for removing and installing driven gear
B3M1961	100007,000	(50)	assembly lock nut.
B3M1961	899714110	REMOVER	Lload for fiving transmission main shaft, drive
	033714110	HEINIOVEN	Used for fixing transmission main shaft, drive pinion, rear drive shaft.
B3M1962			
	899864100	REMOVER	Used for removing parts on transmission main shaft and drive pinion.
B3M1963			

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	899884100	HOLDER	Used for tightening lock nut on sleeve.
B3M1964			
	899904100	REMOVER	Used for removing and installing straight pin.
B3M1965			
	899988608	SOCKET WRENCH	Used for removing and installing drive pinion
B3M1966		(27)	lock nut.
B3M1967	398497701	ADAPTER	 Used for installing roller bearing onto differential case. Used with INSTALLER (499277100).

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	499587000	INSTALLER	Used for installing driven gears to driven shaft.
B3M1968	899824100	PRESS	Used for installing speedometer shaft oil seal.
B3M1969	099024100	FRESS	Osed for installing speedometer shart on sear.
Domitoco	499987100	SOCKET WRENCH	Used for removing and installing drive pinion
		(35)	lock nut.
B3M1970	899984103	SOCKET WRENCH	Used for removing and installing drive pinion
B3M1971	033304103	(35)	lock nut.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
illos i i i i i i i i i i i i i i i i i i i	498057300	INSTALLER	Used for installing extension oil seal.
			g
B3M1972			
B3M1973	498255400	PLATE	Used for measuring backlash.
	498077400	REMOVER	Used for removing synchronizer cone of main
B3M1974			shaft. Used for removing 5th driven gear of drive pinion shaft.
ВЗМ1974	41099AA010	ENGINE SUPPORT	Used for supporting engine.
B3M1975	+1033AA010	BRACKET	Osed for supporting engine.

II L LIOTDATION	TOOL NUMBER	DECODIDEION	DEMARKO
ILLUSTRATION	TOOL NUMBER	DESCRIPTION ENGINE SUPPORT	REMARKS
The second secon	41099AA020	ENGINE SUPPORT	Used for supporting engine.
B3M1976	000507700	DILLED ACCOV	Handford and the second and the seco
B3M1977	398527700	PULLER ASSY	 Used for removing and installing extension case roller bearing. Used for removing front differential side retainer bearing cup.
B3M1977	00004000	041105	
	398643600	GAUGE	Used for measuring total end play, extension end play and drive pinion height.
B3M1978	38177700	INSTALLER	Used for installing bearing cone of transfer
B3M1905	33, 33		driven gear (transfer case side).

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
ILLUSTRATION	499757002	INSTALLER	Used for installing bearing cone of transfer driven gear (extension case side).
B3M1952			
	499797000	INSTALLER	Used for installing differential side retainer oil seal.
B3M2197			

2. GENERAL PURPOSE TOOLS S503001A1702

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and ampere.