

TRANSMISSION SECTION

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

CONTROL SYSTEMS	CS
AUTOMATIC TRANSMISSION	4AT
AUTOMATIC TRANSMISSION (DIAGNOSTICS)	4AT(diag)
AUTOMATIC TRANSMISSION	5AT
AUTOMATIC TRANSMISSION (DIAGNOSTICS)	5AT(diag)
MANUAL TRANSMISSION AND DIFFERENTIAL	5MT
CLUTCH SYSTEM	CL

MANUAL TRANSMISSION AND DIFFERENTIAL

5MT

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General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

1. General Description

A: SPECIFICATION

1. MANUAL TRANSMISSION AND DIFFERENTIAL

Option code ^{★1}		EC, K4, EK		KS	EC, K4, EK		KA		
Model		2.0 L			2.5 L				
		Except for OUT-BACK	OUTBACK		Except for OUT-BACK	OUT-BACK	Except for OUT-BACK	OUT-BACK	
Type		5-forward speeds and 1-reverse (5 × 2-forward speeds and 1 × 2-reverse) ^{★2}							
Transmission gear ratio		1st	3.454		3.454				
		2nd	1.947	2.062	2.062				
		3rd	1.366	1.448	1.448				
		4th	0.972		1.088	1.088			
		5th	0.738	0.78	0.825	0.825		0.78	0.825
		Reverse	3.333						
Auxiliary transmission gear ratio ^{★2}		High	1.000						
		Low	1.447			1.196			
Front reduction gear	Final	Type of gear	Hypoid						
		Gear ratio	4.111		3.700	3.900	4.111		
Rear reduction gear	Transfer	Type of gear	Helical						
		Gear ratio	1.000						
	Final	Type of gear	Hypoid						
		Gear ratio	4.111		3.700	3.900	4.111		
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 gear oil capacity		Single-range model	3.5 ℓ (3.7 US qt, 3.1 Imp qt)						
		Dual-range model	4.0 ℓ (4.2 US qt, 3.5 Imp qt)						

★1: For option code, refer to ID section. <Ref. to ID-5, MODEL NUMBER PLATE, IDENTIFICATION, Identification.>

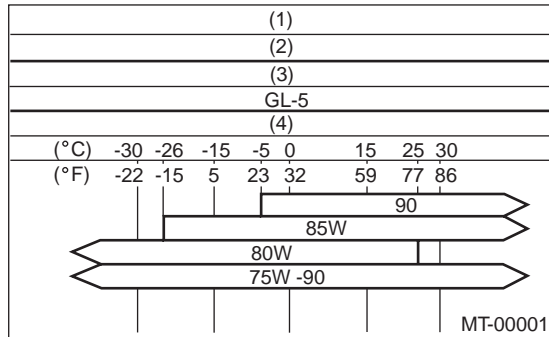
★2: Dual-range model only

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

2. TRANSMISSION GEAR OIL

Recommended oil:



- (1) Item
- (2) Transmission gear oil
- (3) API classification
- (4) SAE viscosity No. and applicable temperature

3. TRANSMISSION CASE ASSEMBLY

Drive pinion shim adjustment

Hypoid gear backlash:

0.13 — 0.18 mm (0.0051 — 0.0071 in)

Drive pinion shim			
Part Number	Thickness mm (in)	Part Number	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 Number	Marking
4.00 — 4.13 (0.1575 — 0.1626)	32294AA041	1
3.87 — 3.99 (0.1524 — 0.1571)	32294AA051	2

Input shaft holder adjustment

Dimension "D" mm (in)	Shim Number
52.50 — 53.11 (2.0669 — 2.0909)	—
52.00 — 52.49 (2.0472 — 2.0665)	1
51.26 — 51.99 (2.0181 — 2.0468)	2

4. DRIVE PINION ASSEMBLY

Preload adjustment of thrust bearing

Starting torque:

0.3 — 0.8 N·m (0.03 — 0.08 kgf·m, 0.2 — 0.6 ft·lb)

Adjusting washer No. 1	
Part Number	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 Number	Thickness mm (in)
803025059	3.850 (0.1516)
803025054	4.000 (0.1575)
803025058	4.150 (0.1634)

5. INPUT SHAFT ASSEMBLY

Snap ring (Outer-28) to ball bearing clearance:

0 — 0.12 mm (0 — 0.0047 in)

Snap ring (Outer-28)	
Part Number	Thickness mm (in)
805028050	2.48 (0.0976)
805028060	2.56 (0.1008)
805028070	2.64 (0.1039)

Snap ring (Inner-68) to ball bearing clearance:

0 — 0.12 mm (0 — 0.0047 in)

Snap ring (Inner-68)	
Part Number	Thickness mm (in)
805168020	1.84 (0.0724)
805168030	1.92 (0.0756)
805168040	2.00 (0.0787)

6. MAIN SHAFT

Snap ring (Outer-25) to synchronizer hub clearance:

0.060 — 0.100 mm (0.0024 — 0.0039 in)

Snap ring (Outer-25)			
Part Number	Thickness mm (in)	Part Number	Thickness mm (in)
805025051	2.42 (0.0953)	805025055	2.62 (0.1031)
805025052	2.47 (0.0972)	805025056	2.67 (0.1051)
805025053	2.52 (0.0992)	805025057	2.72 (0.1071)
805025054	2.57 (0.1012)	805025058	2.37 (0.0933)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

7. REVERSE IDLER GEAR

Adjustment of reverse idler gear position

Reverse idler gear to transmission case (LH) wall clearance:

6.0 — 7.5 mm (0.236 — 0.295 in)

Reverse shifter lever		
Part Number	Marking	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 the clearance using washer.

Reverse idler gear to transmission case wall clearance:

0 — 0.5 mm (0 — 0.020 in)

Washer (20.5 × 26 × t)			
Part Number	Thickness mm (in)	Part Number	Thickness 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)	—	—

8. SHIFTER FORK AND ROD

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

Rod end clearance:

A: 3rd-4th — 5th

0.5 — 1.3 mm (0.020 — 0.051 in)

B: 1st-2nd — 3rd-4th

0.4 — 1.4 mm (0.016 — 0.055 in)

1st-2nd shifter fork		
Part Number	Marking	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 Number	Marking	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 Number	Marking	Remarks
32812AA201	4	Approach to 5th gear by 0.2 mm (0.008 in).
32812AA211	5	Standard
32812AA221	6	Become distant from 5th gear by 0.2 mm (0.008 in).

9. TRANSFER CASE OR REAR CASE

Neutral position adjustment

Adjusting shim	
Part Number	Thickness mm (in)
32190AA000	0.15 (0.0059)
32190AA010	0.30 (0.0118)

Reverse accent shaft		
Part No.	Mark	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 Number	Marking	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.

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

10. EXTENSION ASSEMBLY

Thrust washer (50 × 61 × t) to taper roller bearing table outer race side preload:

0.2 — 0.3 mm (0.0008 — 0.012 in)

NOTE:

Be sure that it is within the standard preload.

Thrust washer (50 × 61 × t)	
Part Number	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 Number	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)

11. FRONT DIFFERENTIAL

Bevel gear to pinion backlash:

0.13 — 0.18 mm (0.0051 — 0.0071 in)

Washer (38.1 × 50 × t)			
Part Number	Thickness mm (in)	Part Number	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)	—	—

12. TRANSFER DRIVE GEAR

Snap ring (Outer-30) to ball bearing clearance:

0.01 — 0.15 mm (0.0004 — 0.0059 in)

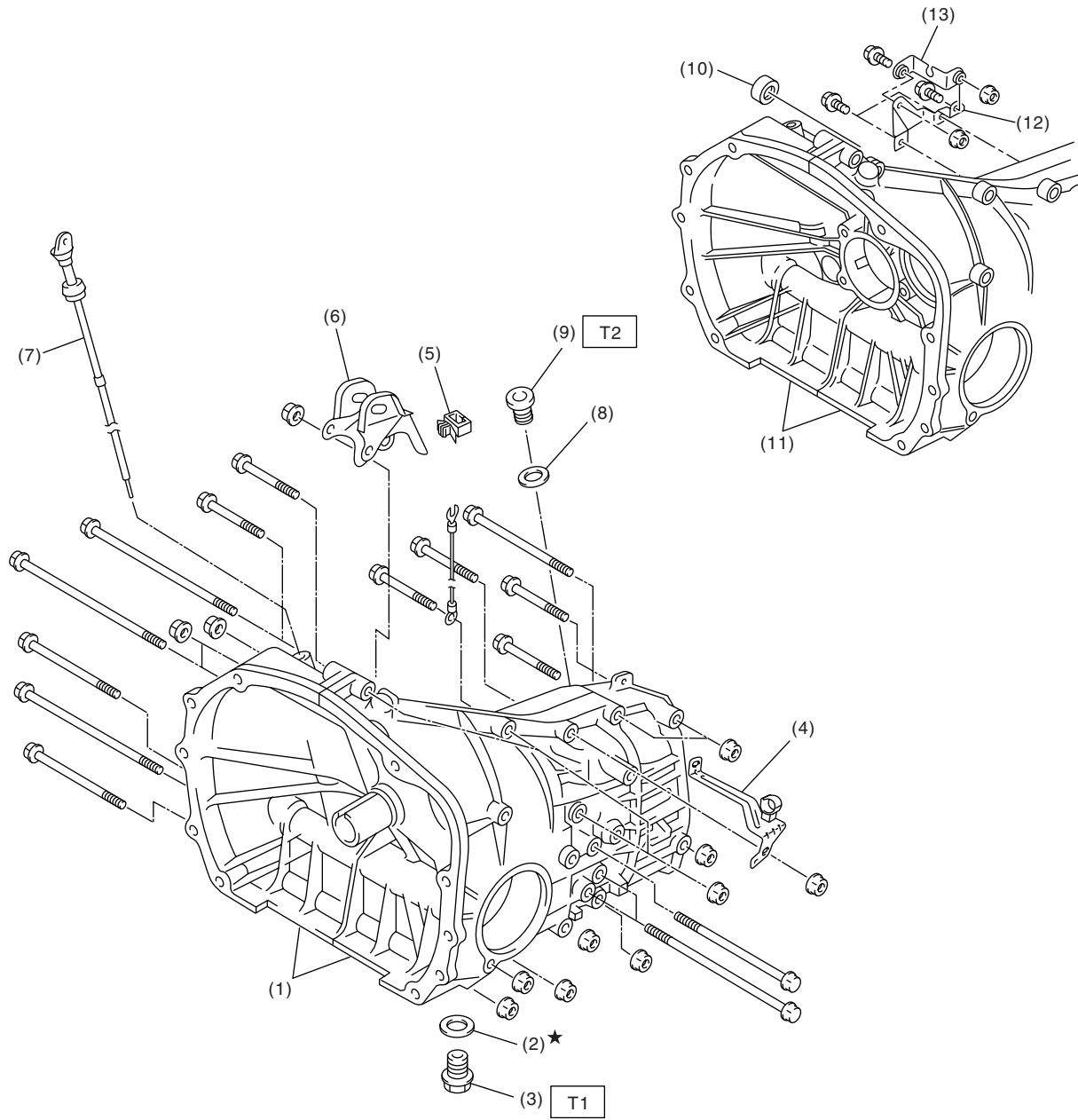
Snap ring (Outer-30)	
Part Number	Thickness mm (in)
805030041	1.53 (0.0602)
805030042	1.65 (0.0650)
805030043	1.77 (0.0697)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

B: COMPONENT

1. TRANSMISSION CASE



MT-01008

5MT-6

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

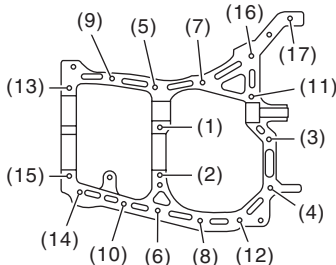
- | | | |
|---|--|--|
| (1) Transmission case ASSY (Single-range) | (8) Gasket | (13) High-low cable bracket B (Dual-range) |
| (2) Gasket | (9) Plug | |
| (3) Drain plug | (10) Oil seal (Dual-range) | |
| (4) Harness bracket | (11) Transmission case ASSY (Dual-range) | |
| (5) Clamp | (12) High-low cable bracket A (Dual-range) | |
| (6) Pitching stopper bracket | | |
| (7) Oil level gauge | | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 70 (7.1, 51)

T2: 60 (6.1, 43.7)

• Transmission case tightening torque

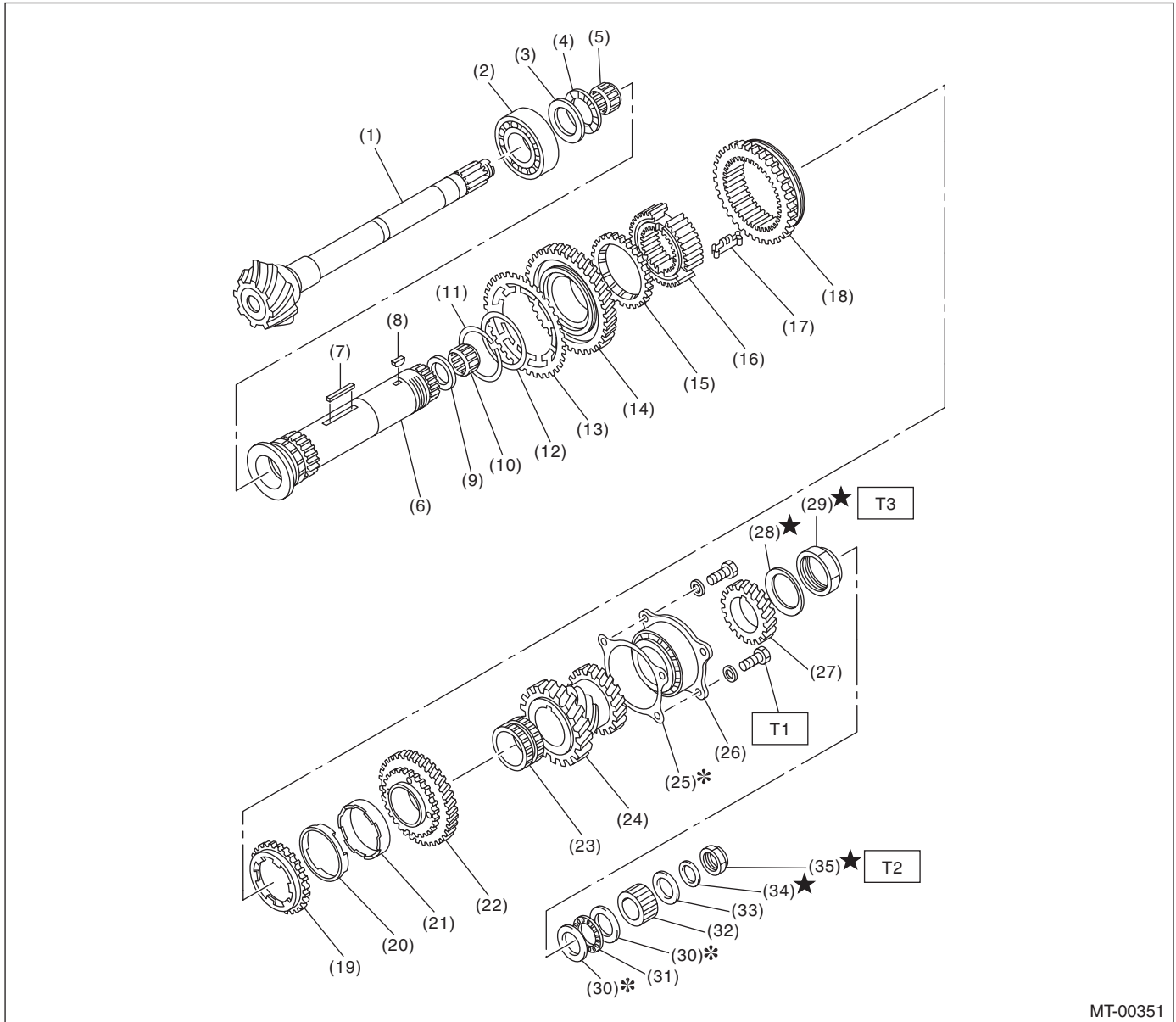
	Bolt No.	Bolt size mm	Tightening torque: N·m (kgf-m, ft-lb)
		(5) — (15)	8
	(1) — (4) (16) — (17)	10	39 (4.0, 28.9)

MT-00003

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

2. DRIVE PINION ASSEMBLY



MT-00351

- | | | |
|----------------------------------|-------------------------------|-------------------------------------|
| (1) Drive pinion shaft | (15) Baulk ring | (29) Lock nut |
| (2) Roller bearing | (16) 1st-2nd synchronizer hub | (30) Washer |
| (3) Washer | (17) Insert key | (31) Thrust bearing |
| (4) Thrust bearing | (18) Reverse driven gear | (32) Differential bevel gear sleeve |
| (5) Needle bearing | (19) Outer baulk ring | (33) Washer |
| (6) Driven shaft | (20) Synchro cone | (34) Lock washer |
| (7) Key | (21) Inner baulk ring | (35) Lock nut |
| (8) Woodruff key | (22) 2nd driven gear | |
| (9) Drive pinion collar | (23) 2nd driven gear bushing | |
| (10) Needle bearing | (24) 3rd-4th driven gear | |
| (11) Snap ring (KS and K4 model) | (25) Driven pinion shim | |
| (12) Washer (KS and K4 model) | (26) Roller bearing | |
| (13) Sub gear (KS and K4 model) | (27) 5th driven gear | |
| (14) 1st driven gear | (28) Lock washer | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 30 (3.1, 22.4)

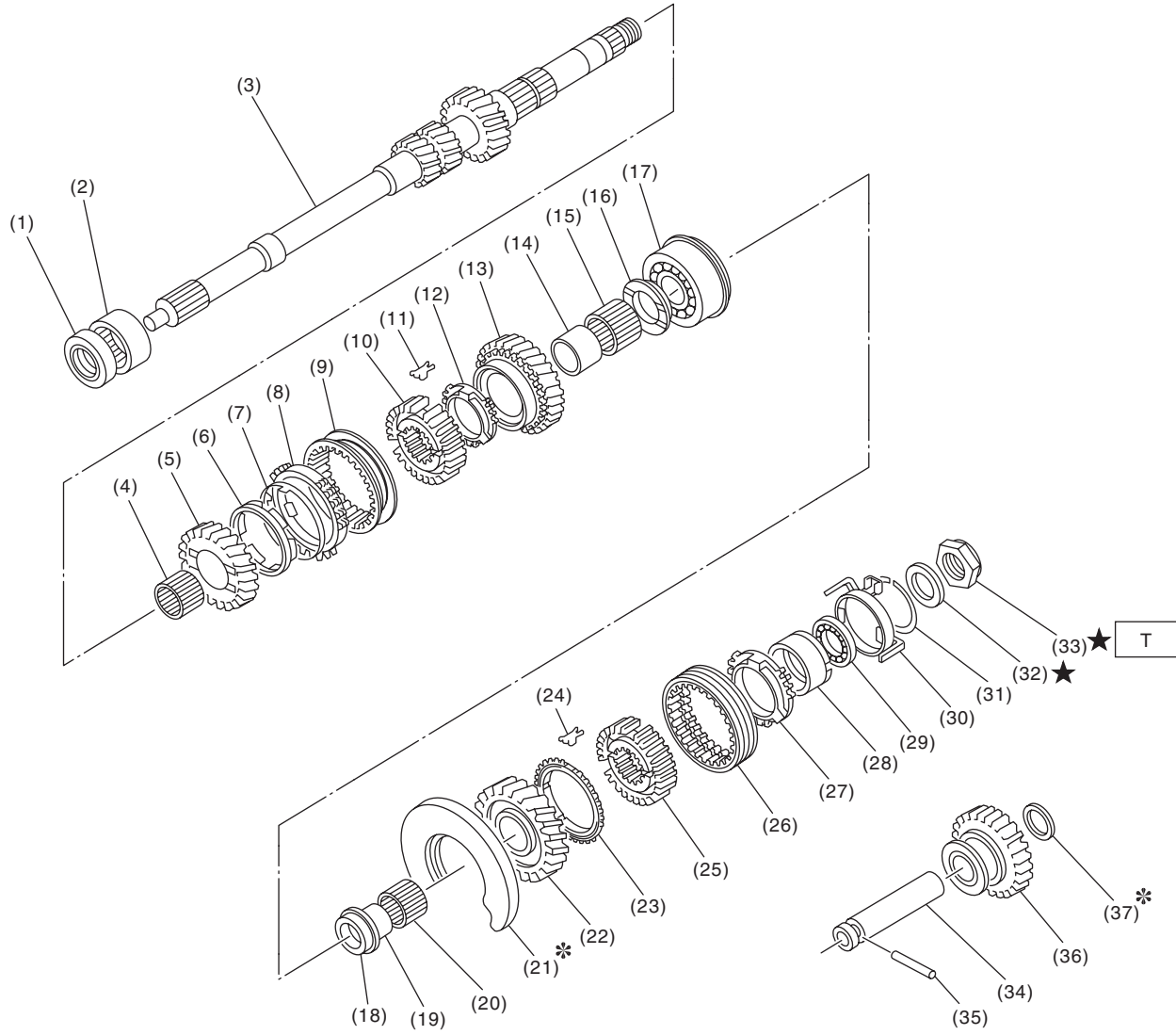
T2: 120 (12.2, 88.2)

T3: 260 (26.5, 191.7)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

3. MAIN SHAFT ASSEMBLY FOR SINGLE-RANGE



MT-01018

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

- | | | |
|----------------------------------|----------------------------------|-------------------------------|
| (1) Oil seal | (15) Needle bearing | (29) Ball bearing |
| (2) Needle bearing | (16) 4th gear thrust washer | (30) Synchro cone stopper |
| (3) Transmission main shaft | (17) Ball bearing | (31) Snap ring |
| (4) Needle bearing | (18) 5th gear thrust washer | (32) Lock washer |
| (5) 3rd drive gear | (19) 5th needle bearing race | (33) Lock nut |
| (6) Inner baulk ring | (20) Needle bearing | (34) Reverse idler gear shaft |
| (7) 3rd synchro cone | (21) Main shaft rear plate | (35) Straight pin |
| (8) Outer baulk ring | (22) 5th drive gear | (36) Reverse idler gear |
| (9) 3rd-4th coupling sleeve | (23) 5th baulk ring | (37) Washer |
| (10) 3rd-4th synchronizer hub | (24) 5th-Rev shifting insert key | |
| (11) 3rd-4th shifting insert key | (25) 5th-Rev synchronizer hub | |
| (12) 4th baulk ring | (26) 5th-Rev coupling sleeve | |
| (13) 4th drive gear | (27) Reverse baulk ring | |
| (14) 4th needle bearing race | (28) Reverse synchro cone | |

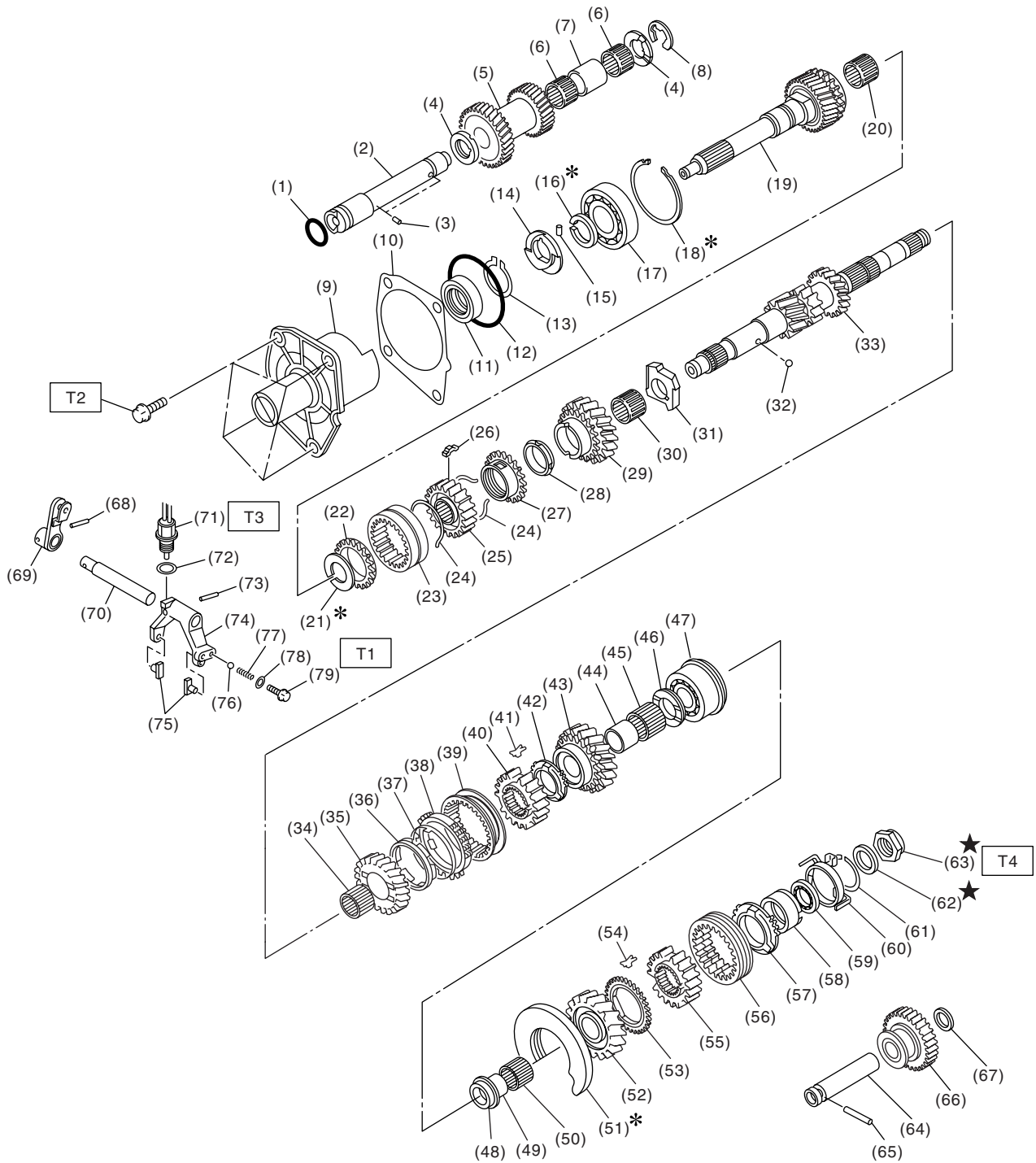
Tightening torque: N·m (kgf·m, ft·lb)

T: 120 (12.2, 88.5)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

4. MAIN SHAFT ASSEMBLY FOR DUAL-RANGE



MT-01019

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

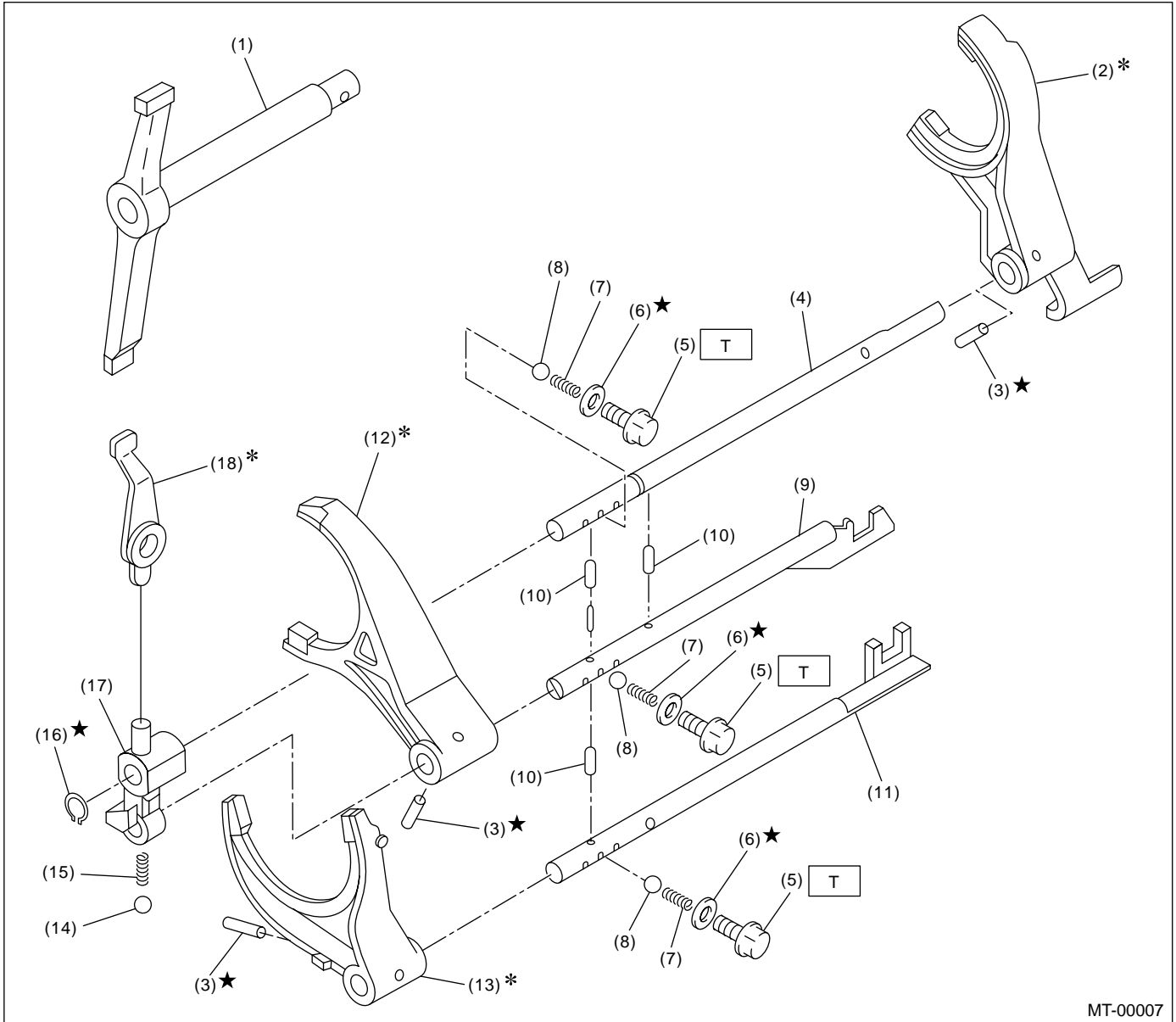
(1) O-ring	(30) Needle bearing	(59) Ball bearing
(2) High-low counter shaft	(31) Input low gear spacer	(60) Synchro cone stopper
(3) Knock pin	(32) Ball	(61) Snap ring
(4) High-low counter washer	(33) Main shaft	(62) Lock washer
(5) Counter gear	(34) Needle bearing	(63) Lock nut
(6) Needle bearing	(35) 3rd drive gear	(64) Reverse idler gear shaft
(7) Counter gear collar	(36) Inner baulk ring	(65) Straight pin
(8) Snap ring (Outer-19)	(37) Synchro cone	(66) Reverse idler gear
(9) Input shaft holder	(38) Outer baulk ring	(67) Washer
(10) Input shaft shim	(39) 3rd-4th coupling sleeve	(68) Straight pin
(11) Oil seal	(40) 3rd-4th synchronizer hub	(69) High-low shifter lever
(12) O-ring	(41) 3rd-4th shifting insert key	(70) High-low shifter shaft
(13) Snap ring (Outer-28)	(42) 4th baulk ring	(71) Low switch
(14) Oil squeeze	(43) 4th drive gear	(72) Gasket
(15) Straight pin	(44) 4th needle bearing race	(73) Straight pin
(16) Snap ring (Outer-28)	(45) Needle bearing	(74) High-low shifter fork
(17) Ball bearing	(46) 4th gear thrust washer	(75) High-low shifter piece
(18) Snap ring (Inner-68)	(47) Ball bearing	(76) Ball
(19) Input shaft	(48) 5th gear thrust washer	(77) Spring
(20) Needle bearing	(49) 5th needle bearing race	(78) Gasket
(21) Snap ring (Outer-25)	(50) Needle bearing	(79) Plug
(22) High-low baulk ring	(51) Main shaft rear plate	
(23) High-low coupling sleeve	(52) 5th drive gear	
(24) High-low synchronizer spring	(53) 5th baulk ring	
(25) High-low synchronizer hub	(54) 5th-Rev shifting insert key	
(26) Shifting insert key	(55) 5th-Rev synchronizer hub	
(27) High-low baulk ring	(56) 5th-Rev coupling sleeve	
(28) Friction damper	(57) Rev baulk ring	
(29) Input low gear	(58) Rev synchro cone	

Tightening torque: N·m (kgf·m, ft·lb)**T1: 10 (1.0, 7.4)****T2: 20 (2.0, 14.5)****T3: 25 (2.5, 18.1)****T4: 120 (12.2, 88.5)**

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

5. SHIFTER FORK AND SHIFTER ROD



- | | | |
|--------------------------|---------------------------|----------------------------|
| (1) Shifter arm | (8) Ball | (15) Spring |
| (2) 5th shifter fork | (9) 3rd-4th fork rod | (16) Snap ring (Outer) |
| (3) Straight pin | (10) Interlock plunger | (17) Reverse fork rod arm |
| (4) Reverse fork rod | (11) 1st-2nd fork rod | (18) Reverse shifter lever |
| (5) Checking ball plug | (12) 3rd-4th shifter fork | |
| (6) Gasket | (13) 1st-2nd shifter fork | |
| (7) Checking ball spring | (14) Ball | |

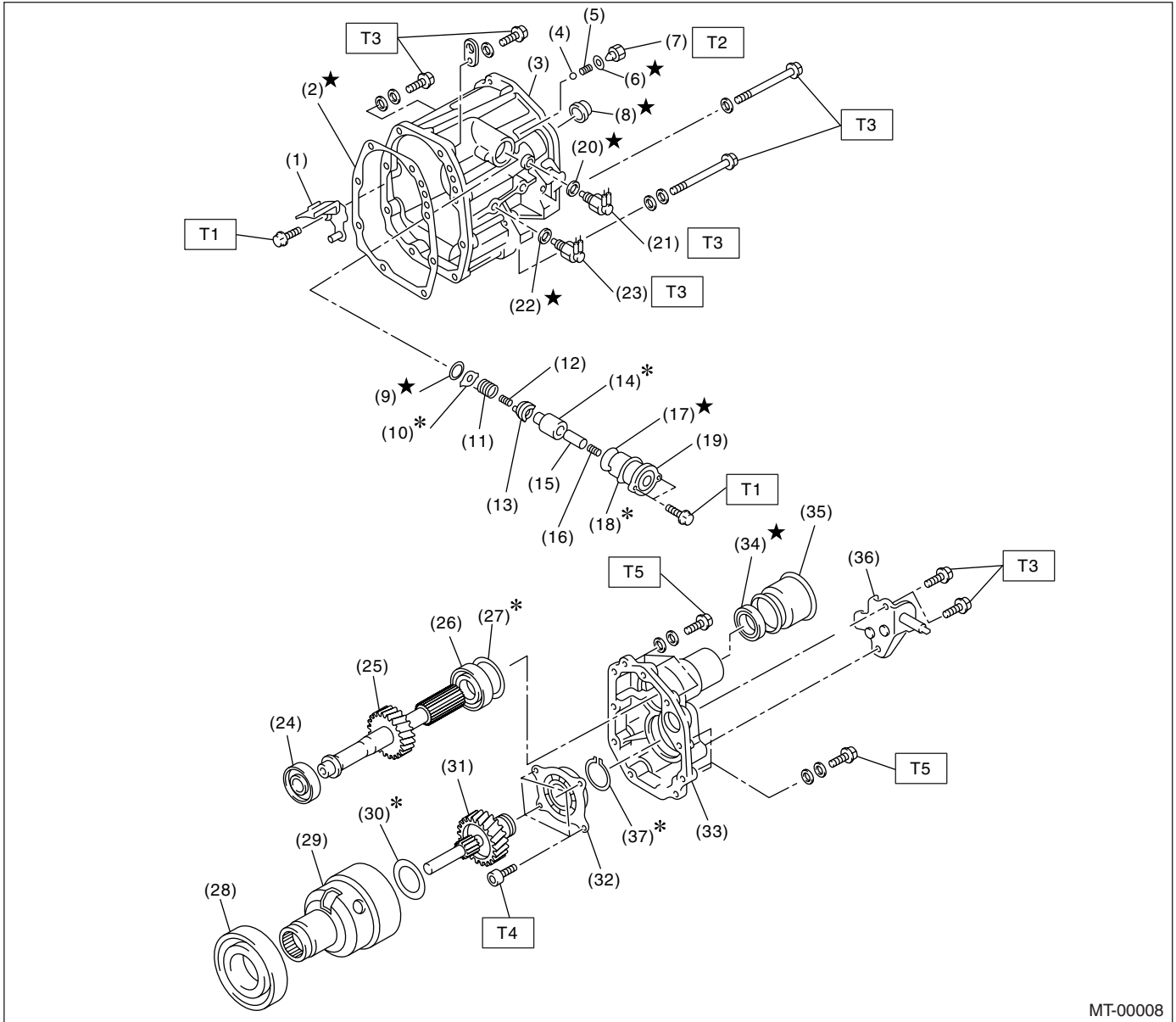
Tightening torque: N·m (kgf·m, ft·lb)

T: 19.5 (2.0, 14.4)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

6. TRANSFER CASE AND EXTENSION



MT-00008

- | | | |
|----------------------------|------------------------------|--------------------------|
| (1) Oil guide | (16) Return spring | (31) Transfer drive gear |
| (2) Gasket | (17) O-ring | (32) Ball bearing |
| (3) Transfer case | (18) Adjusting select shim | (33) Extension case |
| (4) Ball | (19) Reverse check sleeve | (34) Oil seal |
| (5) Reverse accent spring | (20) Gasket | (35) Dust cover |
| (6) Gasket | (21) Neutral position switch | (36) Shift bracket |
| (7) Plug | (22) Gasket | (37) Snap ring |
| (8) Oil seal | (23) Back-up light switch | |
| (9) Snap ring (Inner) | (24) Roller bearing | |
| (10) Reverse check plate | (25) Transfer driven gear | |
| (11) Reverse check spring | (26) Roller bearing | |
| (12) Reverse return spring | (27) Adjusting washer | |
| (13) Reverse check cam | (28) Ball bearing | |
| (14) Reverse accent shaft | (29) Center differential | |
| (15) Return spring cap | (30) Adjusting washer | |

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)

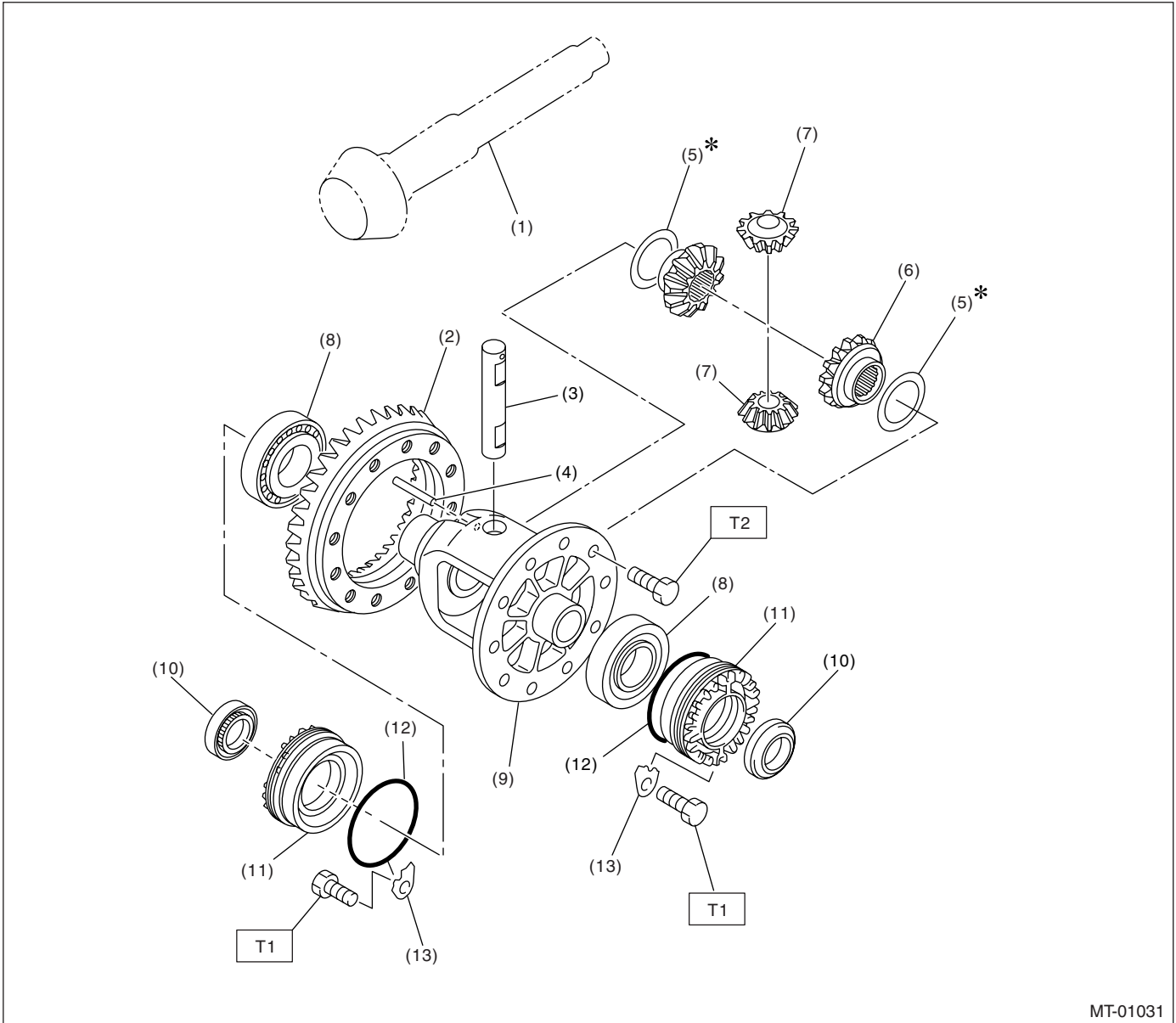
T4: 26 (2.7, 20)

T5: 40 (4.1, 29.7)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

7. FRONT DIFFERENTIAL



MT-01031

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

Tightening torque: N·m (kgf·m, ft·lb)

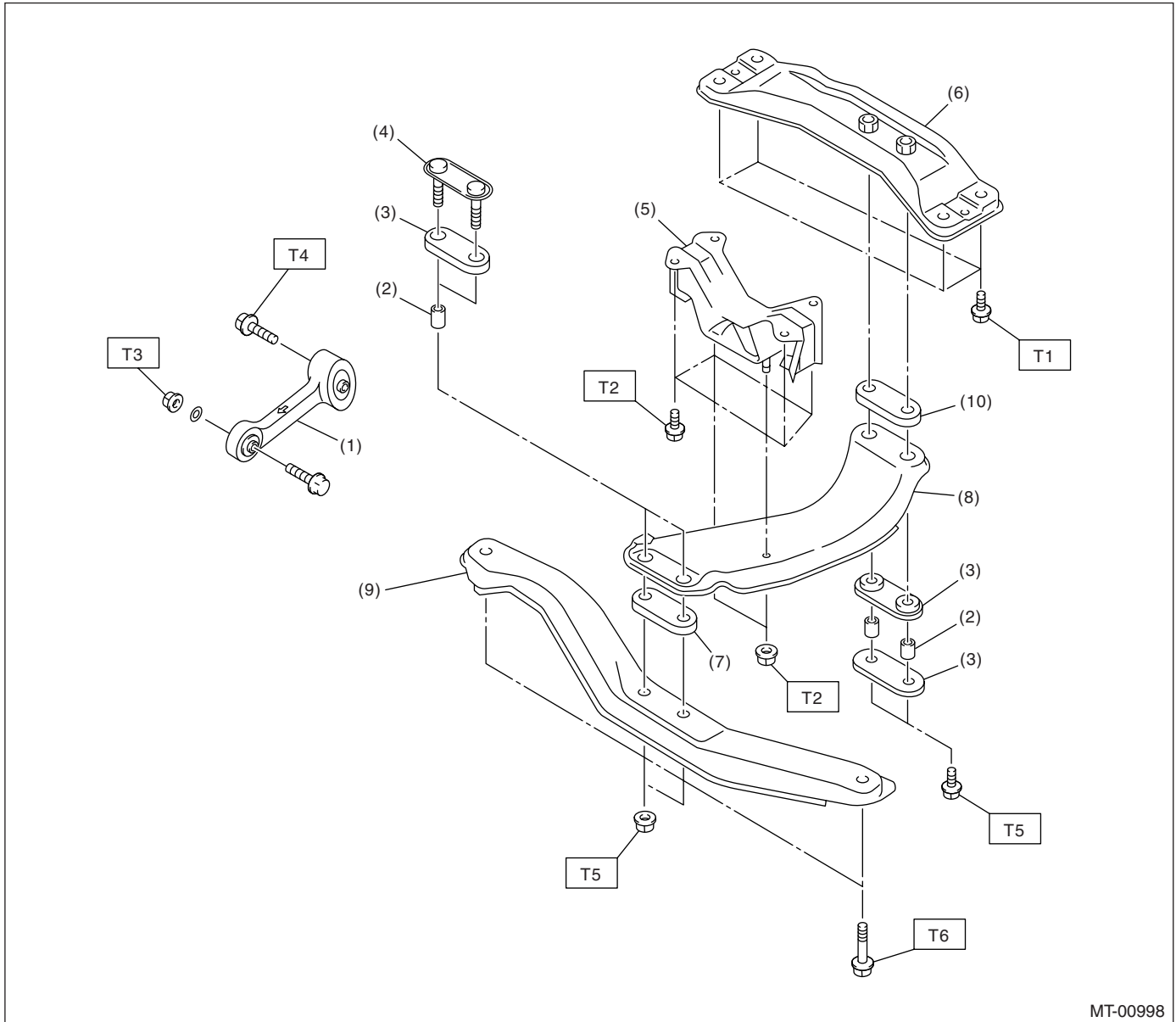
T1: 25 (2.5, 18.1)

T2: 62 (6.3, 45.6)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

8. TRANSMISSION MOUNTING



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

Tightening torque: N·m (kgf·m, ft·lb)

T1: 70 (7.1, 51)

T2: 35 (3.6, 26)

T3: 50 (5.1, 37)

T4: 58 (5.9, 43)

T5: 70 (7.1, 51)

T6: 140 (14.3, 103)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

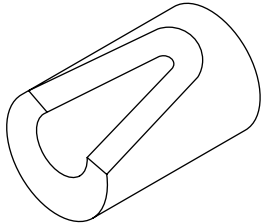
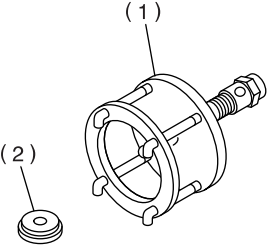
C: CAUTION

- 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.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- When disassembling the case and other light alloy parts, use a plastic hammer to force it apart. Do not pry it apart with a screwdriver or other tool.
- Be careful not to burn yourself, because each part on the vehicle is hot after running.
- Use SUBARU genuine gear oil, grease etc. or equivalent. Do not mix gear oil, grease etc. with that of another grade or from other manufacturers.

- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Apply gear oil onto sliding or revolution surfaces before installation.
- Replace deformed or 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 vice, place cushioning material such as wood blocks, aluminum plate or cloth between the part and the vice.
- Avoid damaging the mating surface of the case.
- Before applying sealant, completely remove the old seal.

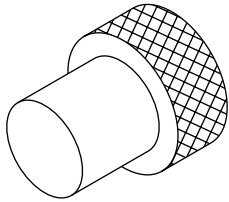
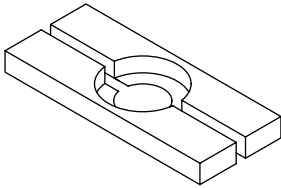
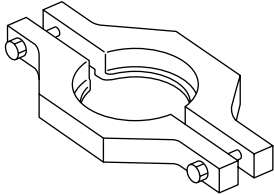
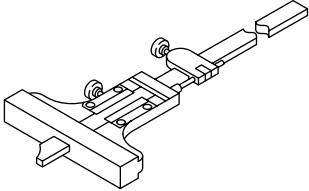
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-399411700</p>	399411700	ACCENT BALL INSTALLER	Used for installing reverse shifter rail arm.
 <p>ST-899524100</p>	899524100	PULLER SET	Used for removing and installing roller bearing (Differential). (1) Puller (2) Cap

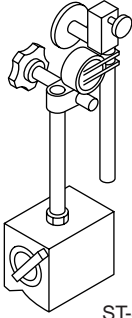
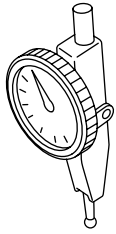
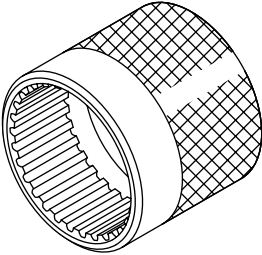
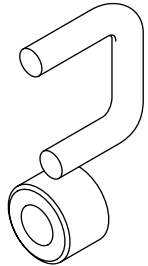
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-399780104</p>	399780104	WEIGHT	Used for measuring preload on roller bearing.
 <p style="text-align: center;">ST-498077000</p>	498077000	REMOVER	Used for removing roller bearing of drive pinion shaft.
 <p style="text-align: center;">ST-498077300</p>	498077300	CENTER DIFFERENTIAL BEARING REMOVER	Used for removing the center differential cover ball bearing.
 <p style="text-align: center;">ST-498147000</p>	498147000	DEPTH GAUGE	Used for adjusting main shaft axial end play.

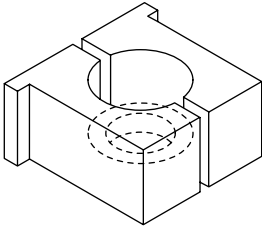
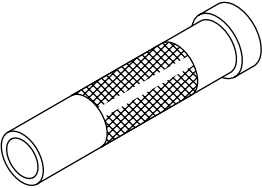
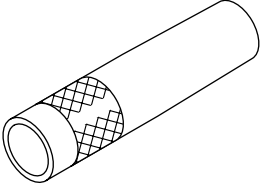
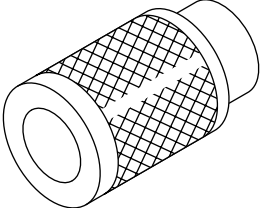
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-498247001</p>	498247001	MAGNET BASE	<ul style="list-style-type: none"> • Used for measuring backlash between side gear and pinion, and hypoid gear. • Used with DIAL GAUGE (498247100).
 <p style="text-align: center;">ST-498247100</p>	498247100	DIAL GAUGE	<ul style="list-style-type: none"> • Used for measuring backlash between side gear and pinion, and hypoid gear. • Used with MAGNET BASE (498247001).
 <p style="text-align: center;">ST-498427100</p>	498427100	STOPPER	Used for securing drive pinion shaft assembly and driven gear assembly when removing lock nut of drive pinion shaft assembly.
 <p style="text-align: center;">ST-498787100</p>	498787100	MAIN SHAFT STOPPER	Used for removing and installing lock nut of transmission main shaft.

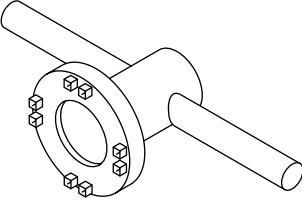
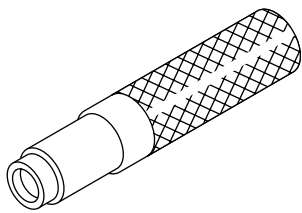
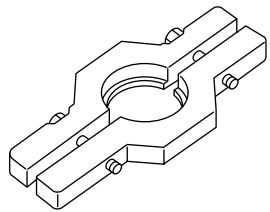
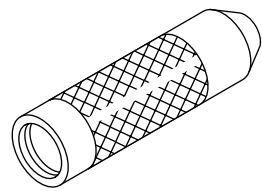
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-498937000</p>	498937000	TRANSMISSION HOLDER	Used for removing and installing transmission main shaft lock nut.
 <p style="text-align: center;">ST-499277100</p>	499277100	BUSHING 1-2 INSTALLER	<ul style="list-style-type: none"> • Used for installing 1st driven gear thrust plate and 1st-2nd driven gear bushing. • Used for installing roller bearing outer races to differential case.
 <p style="text-align: center;">ST-499277200</p>	499277200	INSTALLER	Used for press-fitting 2nd driven gear, roller bearings, and 5th driven gear onto driven shaft.
 <p style="text-align: center;">ST-499757002</p>	499757002	INSTALLER	<ul style="list-style-type: none"> • Used for installing snap ring (OUT 25), and ball bearing (25 × 26 × 17). • Used for installing bearing cone of transfer driven gear (extension core side).

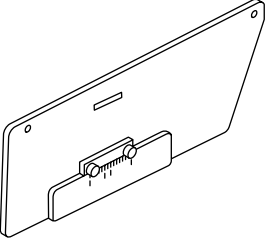
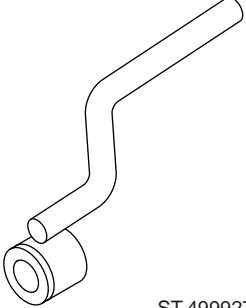
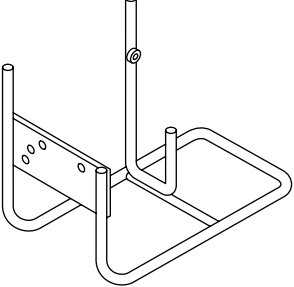
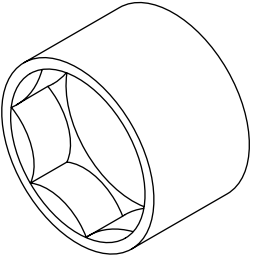
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-499787000</p>	499787000	WRENCH ASSY	Used for removing and installing differential side retainer.
 <p style="text-align: center;">ST-499827000</p>	499827000	PRESS	Used for installing speedometer oil seal when installing speedometer cable to transmission.
 <p style="text-align: center;">ST-499857000</p>	499857000	5TH DRIVEN GEAR REMOVER	Used for removing 5th driven gear.
 <p style="text-align: center;">ST-499877000</p>	499877000	RACE 4-5 INSTALLER	<ul style="list-style-type: none"> • Used for installing 4th needle bearing race and ball bearing onto transmission main shaft. • Used with REMOVER (899714110).

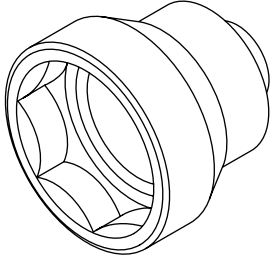
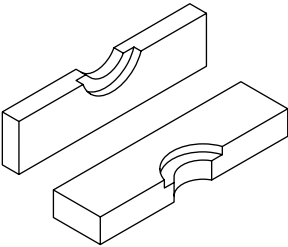
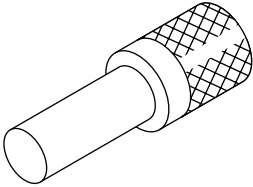
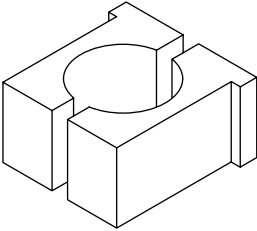
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-499917500</p>	499917500	DRIVE PINION GAUGE ASSY	Used for adjusting drive pinion shim.
 <p style="text-align: center;">ST-499927100</p>	499927100	HANDLE	Used for fitting transmission main shaft.
 <p style="text-align: center;">ST-499937100</p>	499937100	TRANSMISSION STAND SET	Stand used for transmission disassembly and assembly.
 <p style="text-align: center;">ST-499987003</p>	499987003	SOCKET WRENCH (35)	Used for removing and installing driven pinion lock nut and main shaft lock nut.

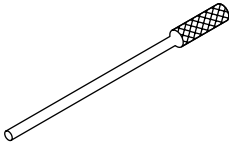
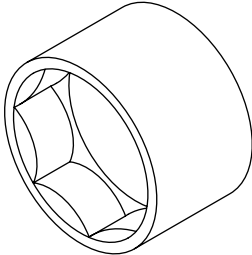
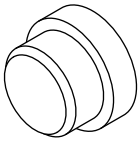
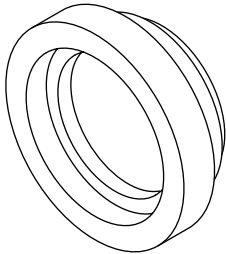
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-499987300</p>	499987300	SOCKET WRENCH (50)	Used for removing and installing driven gear assembly lock nut.
 <p style="text-align: center;">ST-899714110</p>	899714110	REMOVER	Used for installing transmission main shaft drive pinion and rear drive shaft.
 <p style="text-align: center;">ST-899864100</p>	899864100	REMOVER	Used for removing parts on transmission main shaft and drive pinion.
 <p style="text-align: center;">ST-899884100</p>	899884100	HOLDER	Used for tightening lock nut on sleeve.

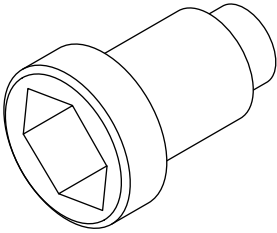
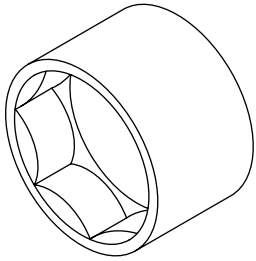
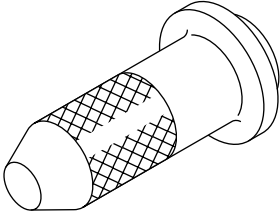
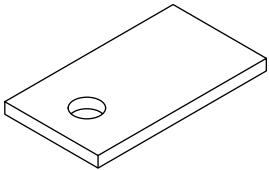
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-899904100</p>	899904100	REMOVER	Used for removing and installing straight pin.
 <p style="text-align: center;">ST-899988608</p>	899988608	SOCKET WRENCH (27)	Used for removing and installing drive pinion lock nut.
 <p style="text-align: center;">ST-398497701</p>	398497701	ADAPTER	<ul style="list-style-type: none"> • Used for installing roller bearing onto differential case. • Used with INSTALLER (499277100).
 <p style="text-align: center;">ST-499587000</p>	499587000	INSTALLER	Used for installing driven gears to driven shaft.

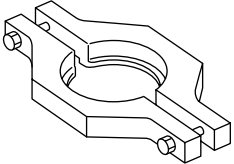
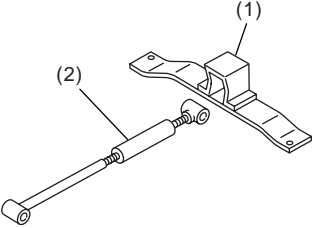
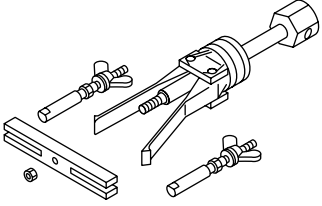
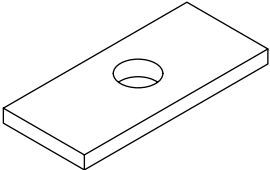
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-499987100</p>	499987100	SOCKET WRENCH (35)	Used for removing and installing drive pinion lock nut.
 <p style="text-align: center;">ST-899984103</p>	899984103	SOCKET WRENCH (35)	Used for removing and installing drive pinion lock nut.
 <p style="text-align: center;">ST-498057300</p>	498057300	INSTALLER	Used for installing extension oil seal.
 <p style="text-align: center;">ST-498255400</p>	498255400	PLATE	Used for measuring backlash.

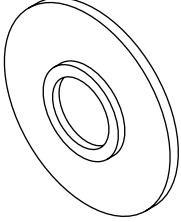
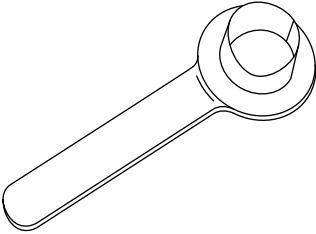
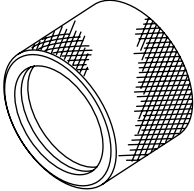
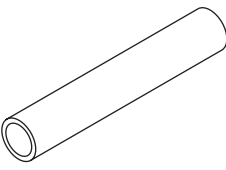
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-498077400</p>	<p style="text-align: center;">498077400</p>	<p>SYNCHRONIZER CONE REMOVER</p>	<ul style="list-style-type: none"> • Used for removing synchronizer cone of main shaft. • Used for removing 5th driven gear of drive pinion shaft.
 <p style="text-align: center;">ST41099AA000</p>	<p style="text-align: center;">41099AA000</p>	<p>ENGINE SUPPORT BRACKET</p>	<p>Used for supporting engine. (1) ENGINE SUPPORT BRACKET (41099AA010) (2) ENGINE SUPPORT (41099AA020)</p>
 <p style="text-align: center;">ST-398527700</p>	<p style="text-align: center;">398527700</p>	<p>PULLER ASSY</p>	<p>Used for removing extension case roller bearing.</p>
 <p style="text-align: center;">ST-398643600</p>	<p style="text-align: center;">398643600</p>	<p>GAUGE</p>	<p>Used for measuring total end play, extension end play and drive pinion height.</p>

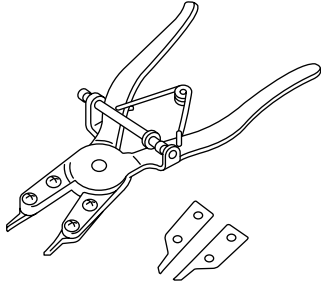
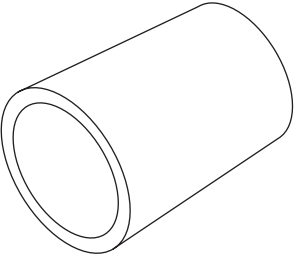
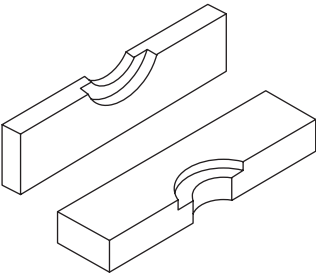
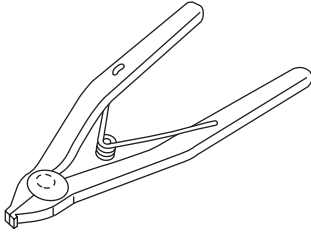
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p data-bbox="337 548 469 569">ST-398177700</p>	398177700	INSTALLER	<ul data-bbox="976 201 1495 310" style="list-style-type: none"> • Used for installing bearing cone of transfer driven gear (transfer case side). • Used for installing ball bearing of transfer drive gear.
 <p data-bbox="326 936 469 957">ST28399SA010</p>	28399SA010	FRONT DRIVE SHAFT OIL SEAL PROTECTOR	Used for protecting oil seal from damage when inserting front drive shaft.
 <p data-bbox="326 1325 469 1346">ST18675AA000</p>	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing differential side retainer oil seal.
 <p data-bbox="337 1713 469 1734">ST-398507703</p>	398507703	DUMMY COLLAR	<ul data-bbox="976 1367 1471 1419" style="list-style-type: none"> • Used for installing input shaft holder oil seal. • For dual-range model.

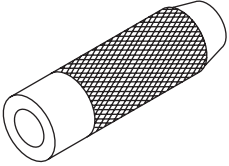
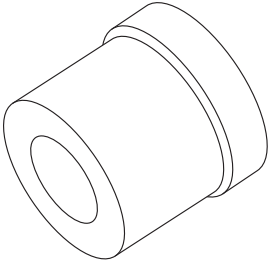
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-398663600</p>	398663600	PLIERS	<ul style="list-style-type: none"> • Used for removing and installing input shaft snap ring. • For dual-range model.
 <p style="text-align: center;">ST-499757001</p>	499757001	SNAP RING GUIDE	<ul style="list-style-type: none"> • Used for installing snap ring (OUT 25). • For dual-range model.
 <p style="text-align: center;">ST-899858600</p>	899858600	RETAINER	<ul style="list-style-type: none"> • Used for removing ball bearing. • For dual-range model.
 <p style="text-align: center;">ST-899474100</p>	899474100	EXPANDER	<ul style="list-style-type: none"> • Used for removing and installing snap ring. • For dual-range model.

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-899580100</p>	899580100	INSTALLER	<ul style="list-style-type: none"> • Used for pressing ball bearings into input shaft. • For dual-range model.
 <p style="text-align: center;">ST-399513600</p>	399513600	INSTALLER	<ul style="list-style-type: none"> • Used for pressing ball bearings into input shaft. • For dual-range model.

2. GENERAL TOOL

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

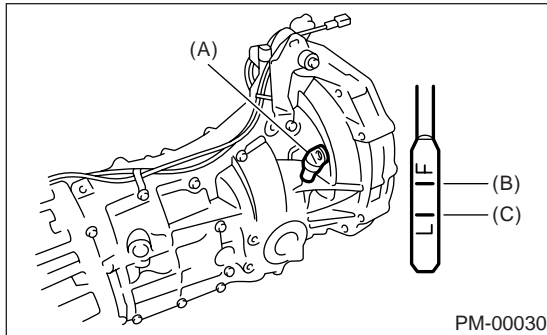
Transmission Gear Oil

MANUAL TRANSMISSION AND DIFFERENTIAL

2. Transmission Gear Oil

A: INSPECTION

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



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

B: REPLACEMENT

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

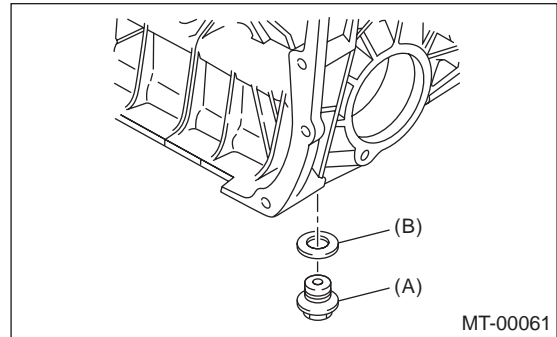
CAUTION:

Immediately after the engine running, the transmission gear oil is very hot. Be careful not to burn yourself.

NOTE:

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

Tightening torque:
70 N·m (7.1 kgf-m, 51 ft-lb)



- (A) Drain plug
- (B) Gasket

- 4) Lower the vehicle.
- 5) Pour gear oil through the gauge hole.

Recommended gear oil:

GL-5 (75W-90) or equivalent

Gear oil capacity:

Single-range model

3.5 ℓ (3.7 US qt, 3.1 Imp qt)

Dual-range model

4.0 ℓ (4.2 US qt, 3.5 Imp qt)

- 6) Check the level of transmission gear oil.

CAUTION:

The level should be within the specified range marked on the gauge.

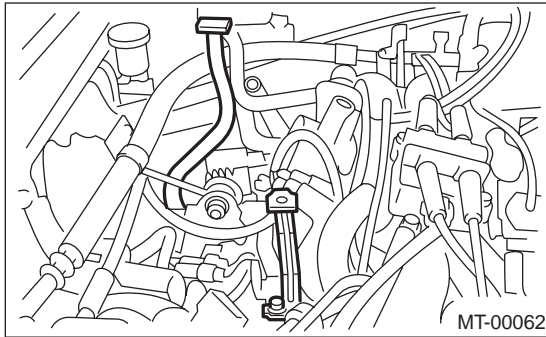
Manual Transmission Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

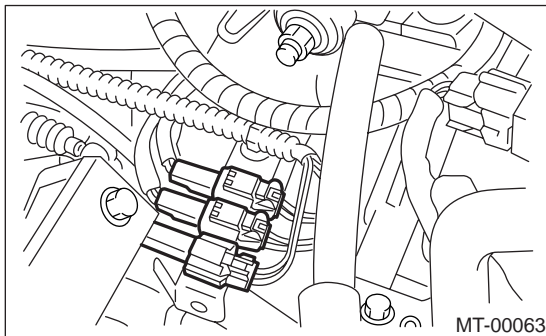
3. Manual Transmission Assembly

A: REMOVAL

- 1) Open the front hood fully, and support with stay.
- 2) Disconnect the ground cable from battery.
- 3) Drain transmission gear oil completely.
- 4) Remove the air intake chamber and air cleaner case. <Ref. to IN(H4SO 2.0)-8, REMOVAL, Air Intake Chamber.> <Ref. to IN(H4SO 2.0)-6, REMOVAL, Air Cleaner Case.>
- 5) Remove the air intake chamber stay.

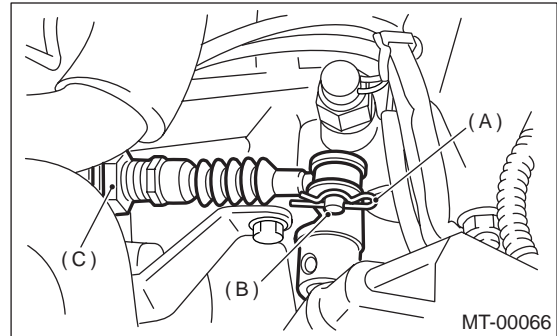


- 6) Disconnect the following connectors:
 - (1) Neutral position switch connector
 - (2) Back-up light switch connector
 - (3) High-low switch connector (Dual-range model)



- 7) Remove the snap pin and clevis pin from drive select cable. (Dual-range model)

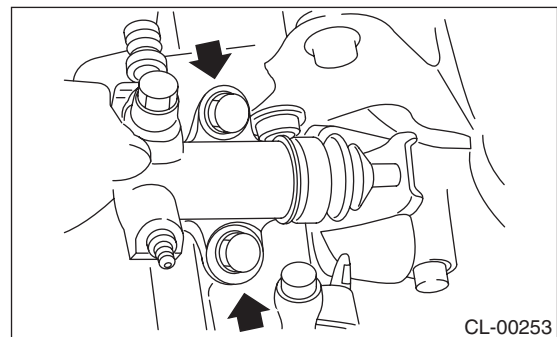
- 8) Remove the drive select cable on transmission side. (Dual-range model)



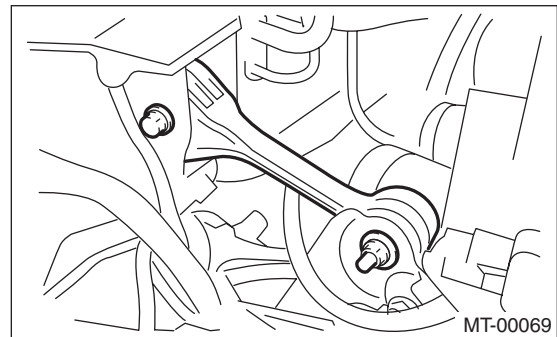
- (A) Snap pin
- (B) Clevis pin
- (C) Drive select cable

- 9) Remove the starter. <Ref. to SC(H4SO 2.0)-6, REMOVAL, Starter.>

- 10) Remove the operating cylinder from transmission.



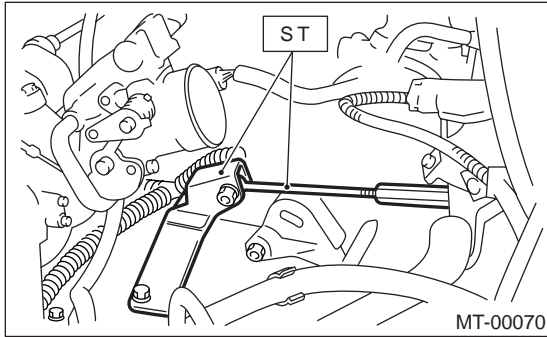
- 11) Remove the pitching stopper.



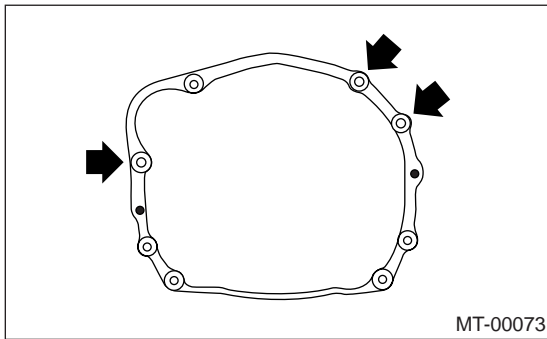
Manual Transmission Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

- 12) Set the ST.
ST 41099AA000 ENGINE SUPPORT ASSY



- 13) Remove the bolts which hold upper side of transmission to engine.

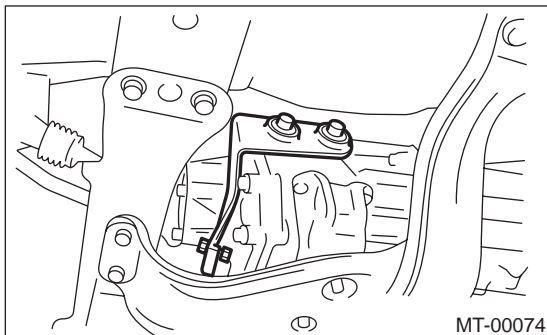


- 14) Lift-up the vehicle.
15) Remove the front and center exhaust pipes.
<Ref. to EX(H4SO 2.0)-7, REMOVAL, Front Exhaust Pipe.>
16) Remove the rear exhaust pipe and muffler.
<Ref. to EX(H4SO 2.0)-11, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(H4SO 2.0)-13, REMOVAL, Muffler.>

CAUTION:

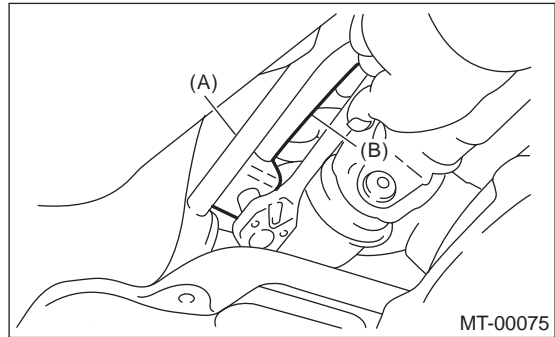
When removing the exhaust pipes, be careful each exhaust pipe does not drop out.

- 17) Remove the heat shield cover. (if equipped)
18) Remove the hanger bracket from the right side of transmission.



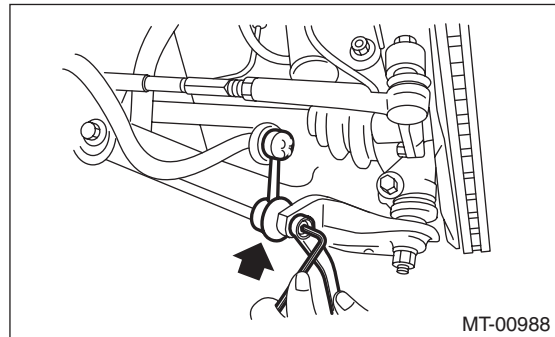
- 19) Remove the propeller shaft. <Ref. to DS-10, REMOVAL, Propeller Shaft.>
20) Remove the gear shift rod and the stay from transmission.

- (1) Disconnect the stay from transmission.
(2) Remove the rod from transmission.

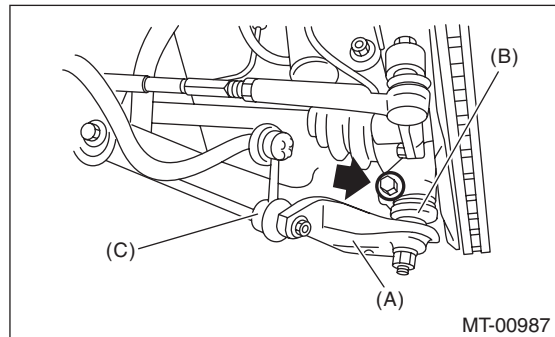


- (A) Stay
(B) Rod

- 21) Remove the stabilizer link from front arm.



- 22) Remove the bolt securing ball joint of front arm to housing.

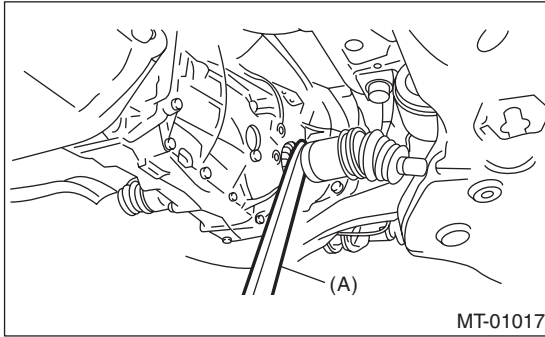


- (A) Front arm
(B) Ball joint
(C) Stabilizer link

Manual Transmission Assembly

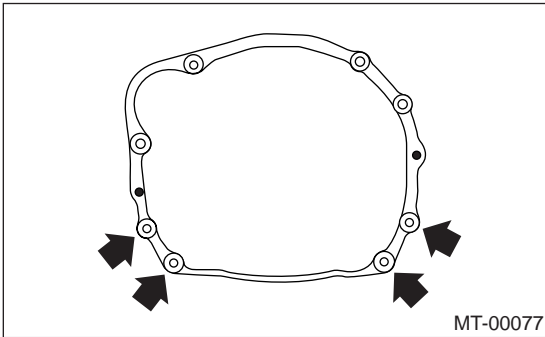
MANUAL TRANSMISSION AND DIFFERENTIAL

23) Using the lever, remove the left and right front drive shaft from transmission.



(A) Lever

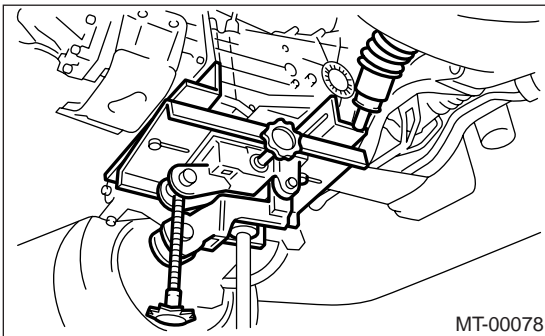
24) Remove the nuts which hold lower side of transmission to engine.



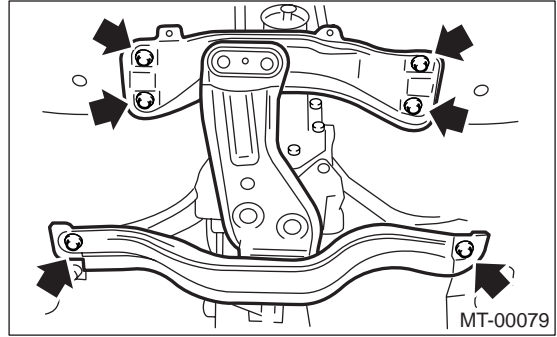
25) Place the transmission jack under transmission.

CAUTION:

Always support transmission case with a transmission jack.



26) Remove the transmission rear crossmember from vehicle.



27) Remove the transmission.

NOTE:

Move the transmission jack toward rear until main shaft is withdrawn from clutch disc.

28) Separate the transmission assembly from rear cushion rubber.

B: INSTALLATION

1) Install the rear cushion rubber to transmission assembly.

Tightening torque:

35 N·m (3.57 kgf·m, 25.8 ft·lb)

2) Install the transmission onto engine.

(1) Gradually raise the transmission with transmission jack.

(2) Engage them at splines.

NOTE:

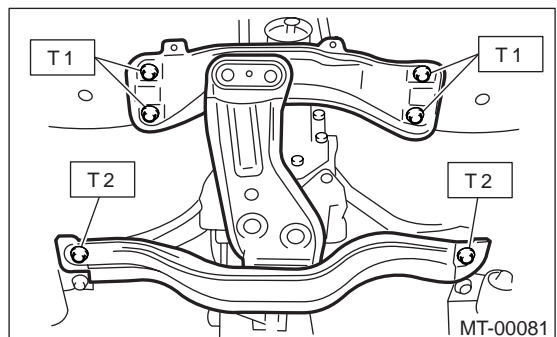
Be careful not to strike the main shaft against clutch housing cover.

3) Install the transmission rear crossmember.

Tightening torque:

T1: 70 N·m (7.1 kgf·m, 51 ft·lb)

T2: 140 N·m (14.3 kgf·m, 103 ft·lb)



4) Take out the transmission jack.

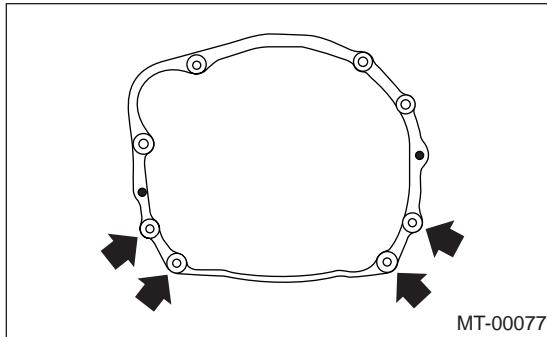
Manual Transmission Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

5) Tighten the nuts which hold lower side of transmission to engine.

Tightening torque:

50 N·m (5.1 kgf·m, 36.9 ft·lb)



6) Connect the transmission to engine.

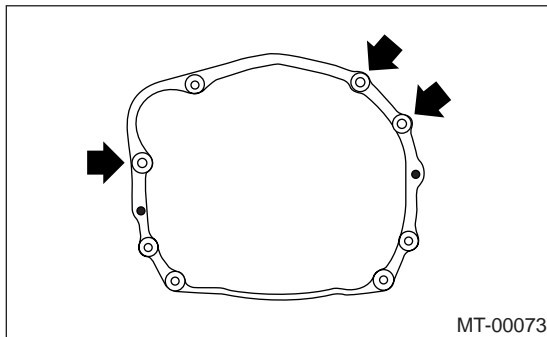
(1) Install the starter.

<Ref. to SC(H4SO 2.0)-6, INSTALLATION, Starter.>

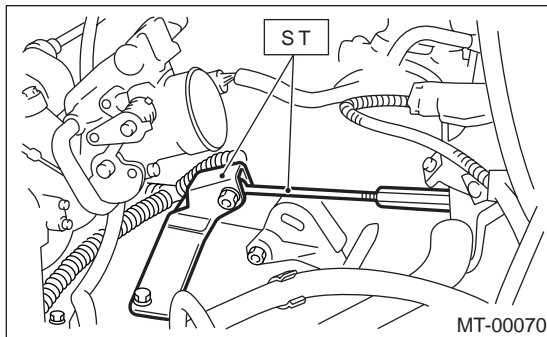
(2) Tighten the bolts that hold upper side of transmission to engine.

Tightening torque:

50 N·m (5.1 kgf·m, 36.9 ft·lb)



7) Remove the ST.

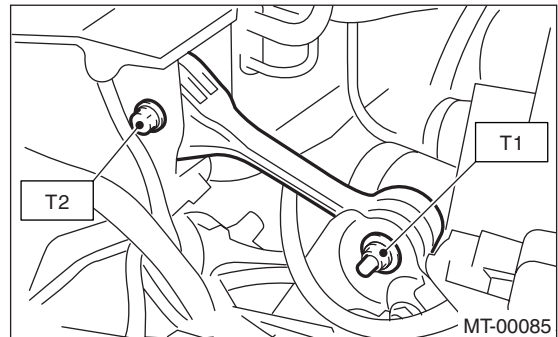


8) Install the pitching stopper.

Tightening torque:

T1: 50 N·m (5.1 kgf·m, 37 ft·lb)

T2: 58 N·m (5.9 kgf·m, 43 ft·lb)



9) Lift-up the vehicle.

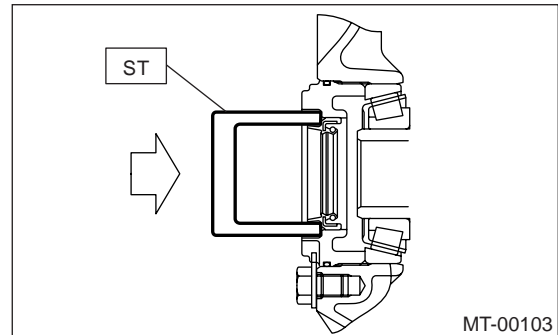
10) Install the front drive shaft into transmission.

11) Replace the differential side retainer oil seal.
<Ref. to 5MT-40, REPLACEMENT, Differential Side Retainer Oil Seal.>

ST 186755AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER

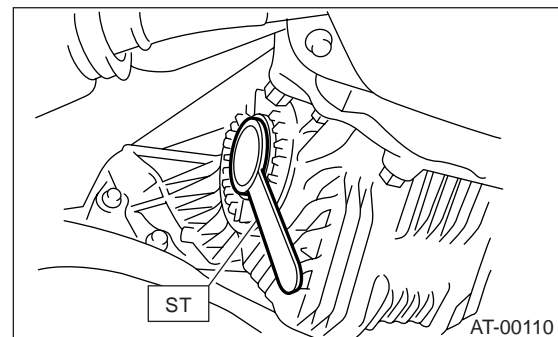
NOTE:

Be sure to replace the differential side retainer oil seal after the procedure of removing the front drive shaft.



12) Install the front drive shaft into transmission.

ST 28399SA010 FRONT DRIVE SHAFT OIL SEAL PROTECTOR



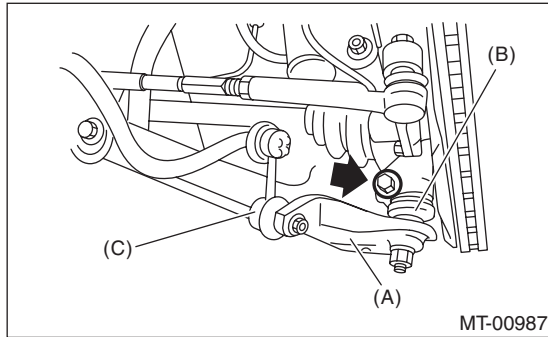
Manual Transmission Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

13) Install the ball joint of lower arm.

Tightening torque:

49 N·m (5.0 kgf·m, 36 ft·lb)

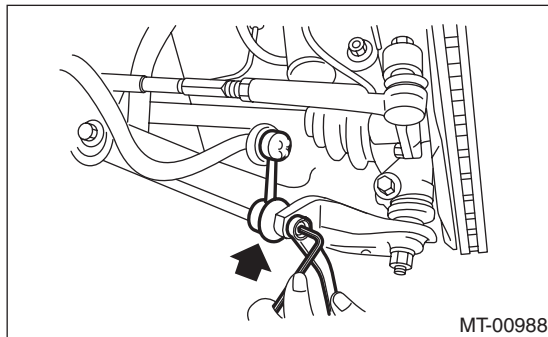


- (A) Front arm
- (B) Ball joint
- (C) Stabilizer link

14) Install the stabilizer link into front arm.

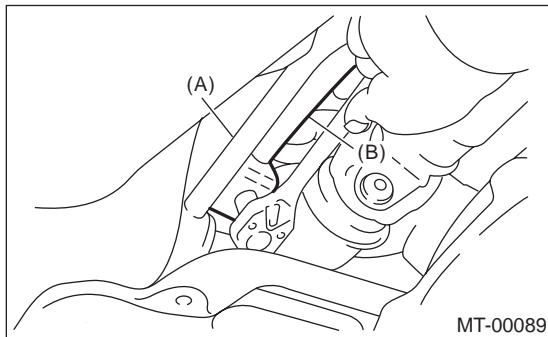
Tightening torque:

45 N·m (4.6 kgf·m, 33.2 ft·lb)



15) Install the gear shift rod and the stay.

(1) Install the gear shift rod into transmission.



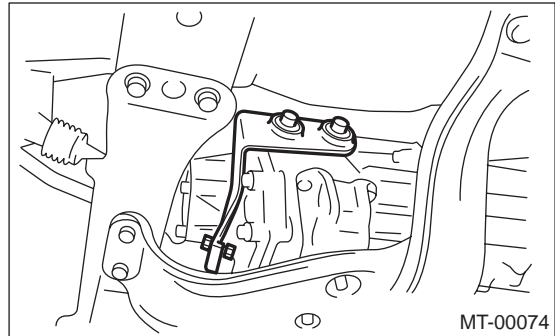
- (A) Stay
- (B) Rod

(2) Install the stay onto transmission.

16) Install the propeller shaft. <Ref. to DS-11, INSTALLATION, Propeller Shaft.>

17) Install the heat shield cover. (if equipped)

18) Install the hanger bracket on the right side of transmission.

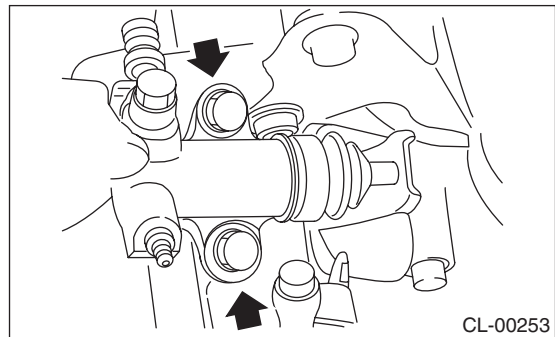


19) Install the front, center and rear exhaust pipe, and muffler. <Ref. to EX(H4SO 2.0)-8, INSTALLATION, Front Exhaust Pipe.> <Ref. to EX(H4SO 2.0)-11, INSTALLATION, Rear Exhaust Pipe.> <Ref. to EX(H4SO 2.0)-13, INSTALLATION, Muffler.>

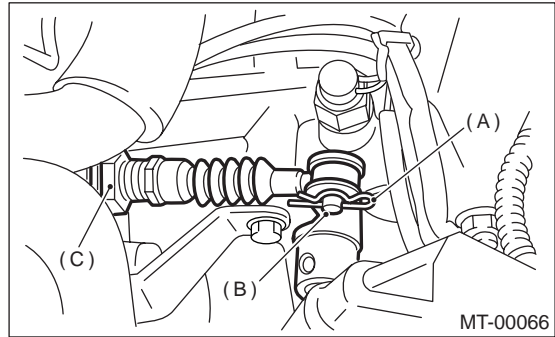
20) Install the operating cylinder.

Tightening torque:

37 N·m (3.8 kgf·m, 27.5 ft·lb)



21) Install the drive select cable on transmission side. (Dual-range model)



- (A) Snap pin
- (B) Clevis pin
- (C) Drive select cable

22) Connect the following connectors:

(1) Transmission ground cable

Tightening torque:

13 N·m (1.3 kgf·m, 9.4 ft·lb)

Manual Transmission Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

- (2) Neutral position switch connector
 - (3) Back-up light switch connector
 - (4) High-low switch connector (Dual-range model)
- 23) Fill transmission gear oil through the transmission level gauge hole.
- 24) Install the air intake chamber stay.

Tightening torque:

16 N·m (1.6 kgf-m, 11.6 ft-lb)

- 25) Install the air intake chamber and air cleaner case. <Ref. to IN(H4SO 2.0)-7, INSTALLATION, Air Cleaner Case.> <Ref. to IN(H4SO 2.0)-8, INSTALLATION, Air Intake Chamber.>
- 26) Connect the battery ground cable to battery.
- 27) Take off the vehicle from lift arms.

Transmission Mounting System

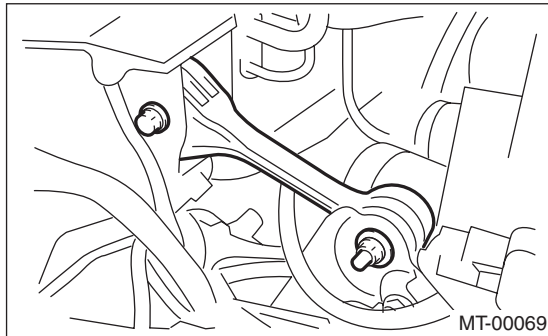
MANUAL TRANSMISSION AND DIFFERENTIAL

4. Transmission Mounting System

A: REMOVAL

1. PITCHING STOPPER

- 1) Disconnect the ground cable from battery.
- 2) Remove the air intake chamber. <Ref. to IN(H4SO 2.0)-8, REMOVAL, Air Intake Chamber.>
- 3) Remove the air cleaner case. <Ref. to IN(H4SO 2.0)-6, REMOVAL, Air Cleaner Case.>
- 4) Remove the pitching stopper.



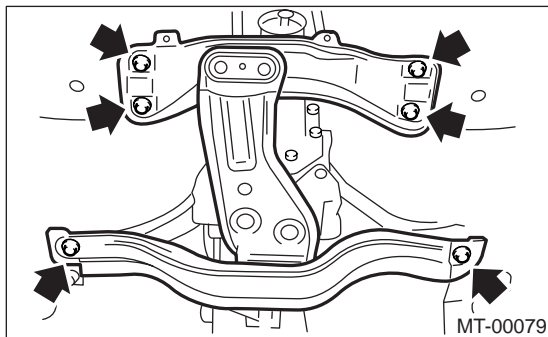
2. CROSSMEMBER AND CUSHION RUBBER

- 1) Disconnect the ground cable from battery.
- 2) Jack-up the vehicle and support it with rigid racks.
- 3) Remove the front, center and rear exhaust pipe, and muffler. <Ref. to EX(H4SO 2.0)-7, REMOVAL, Front Exhaust Pipe.> <Ref. to EX(H4SO 2.0)-11, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(H4SO 2.0)-13, REMOVAL, Muffler.>
- 4) Remove the heat shield cover. (If equipped)
- 5) Set the transmission jack under transmission body.

CAUTION:

Always support the transmission case with a transmission jack.

- 6) Remove the rear crossmember.



- 7) Remove the rear cushion rubber.

B: INSTALLATION

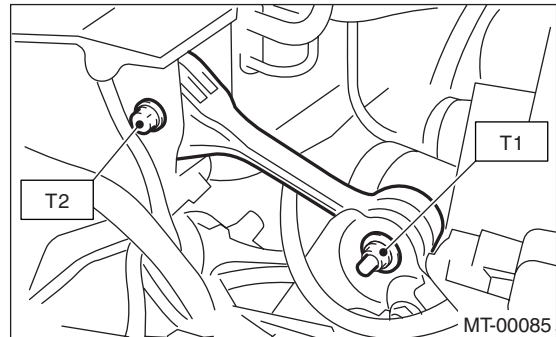
1. PITCHING STOPPER

- 1) Install the pitching stopper.

Tightening torque:

T1: 50 N·m (5.1 kgf-m, 37 ft-lb)

T2: 58 N·m (5.9 kgf-m, 43 ft-lb)



- 2) Install the air intake chamber and cleaner case. <Ref. to IN(H4SO 2.0)-7, INSTALLATION, Air Cleaner Case.> <Ref. to IN(H4SO 2.0)-8, INSTALLATION, Air Intake Chamber.>

- 3) Connect the battery ground cable to battery.

2. CROSSMEMBER AND CUSHION RUBBER

- 1) Install the rear cushion rubber.

Tightening torque:

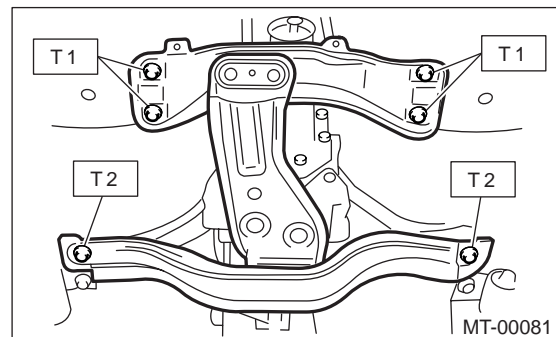
35 N·m (3.6 kgf-m, 26 ft-lb)

- 2) Install the rear crossmember.

Tightening torque:

T1: 70 N·m (7.1 kgf-m, 51 ft-lb)

T2: 140 N·m (14.3 kgf-m, 103 ft-lb)



- 3) Remove the transmission jack.
- 4) Install the heat shield cover. (If equipped)
- 5) Install the front, center and rear exhaust pipe, and muffler. <Ref. to EX(H4SO 2.0)-8, INSTALLATION, Front Exhaust Pipe.> <Ref. to EX(H4SO 2.0)-11, INSTALLATION, Rear Exhaust Pipe.> <Ref. to EX(H4SO 2.0)-13, INSTALLATION, Muffler.>
- 6) Lower the vehicle.
- 7) Connect the battery ground cable to battery.

Transmission Mounting System

MANUAL TRANSMISSION AND DIFFERENTIAL

C: INSPECTION

Perform the following inspection procedures and repair or replace defective parts.

1. PITCHING STOPPER

Check pitching stopper for bends or damage. Check that the rubber is not stiff, cracked, or otherwise damaged.

2. CROSSMEMBER AND CUSHION RUBBER

Check crossmember for bends or damage. Check that the cushion rubber is not stiff, cracked, or otherwise damaged.

5. Oil Seal

A: INSPECTION

Check leakage of gear oil from the oil seal part. If there is oil leakage, replace with a new oil seal.

B: REPLACEMENT

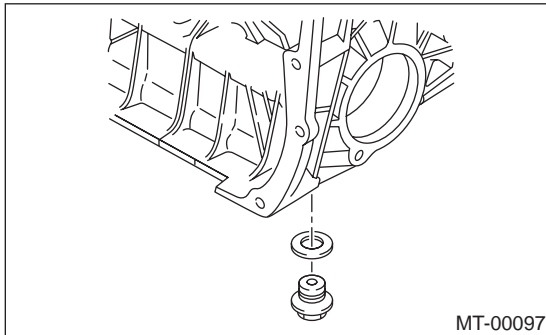
- 1) Clean the transmission exterior.
- 2) Drain gear oil completely.

NOTE:

Tighten the drain plug after draining gear oil.

Tightening torque:

70 N·m (7.1 kgf·m, 51 ft·lb)



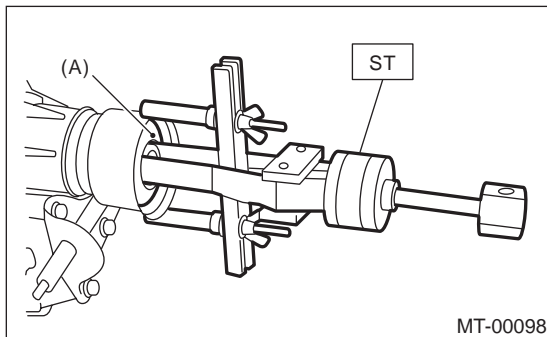
- 3) Remove the rear exhaust pipe and muffler. <Ref. to EX(H4SO 2.0)-11, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(H4SO 2.0)-13, REMOVAL, Muffler.>

- 4) Remove the heat shield cover. (If equipped)

- 5) Remove the propeller shaft. <Ref. to DS-10, REMOVAL, Propeller Shaft.>

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

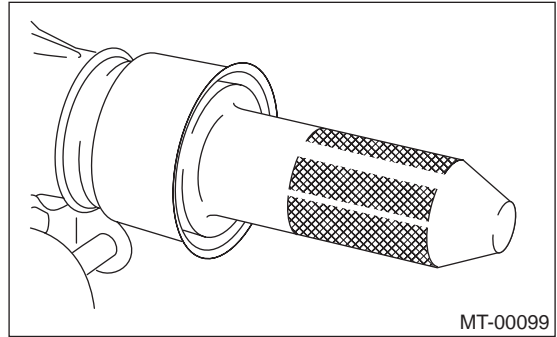
ST 398527700 PULLER ASSY



(A) Oil seal

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

ST 498057300 INSTALLER



- 8) Install the propeller shaft. <Ref. to DS-11, INSTALLATION, Propeller Shaft.>

- 9) Install the heat shield cover. (If equipped)

- 10) Install the rear exhaust pipe and muffler.

<Ref. to EX(H4SO 2.0)-11, INSTALLATION, Rear Exhaust Pipe.> <Ref. to EX(H4SO 2.0)-13, INSTALLATION, Muffler.>

- 11) Pour gear oil and check the oil level. <Ref. to 5MT-30, REPLACEMENT, Transmission Gear Oil.>

Differential Side Retainer Oil Seal

MANUAL TRANSMISSION AND DIFFERENTIAL

6. Differential Side Retainer Oil Seal

A: INSPECTION

Check leakage of gear oil from the differential side retainer oil seal part. If there is oil leakage, replace with a new oil seal.

B: REPLACEMENT

- 1) Lift-up the vehicle.
- 2) Drain gear oil from differential oil drain plug.

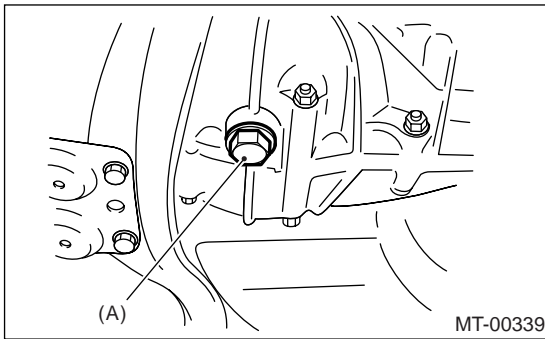


(A) Differential oil drain plug

- 3) Replace with a new gasket and tighten the differential oil drain plug.

Tightening torque:

70 N·m (7.1 kgf·m, 51 ft·lb)



(A) Differential oil drain plug

- 4) Remove the front and center exhaust pipe. <Ref. to EX(H4SO 2.0)-7, REMOVAL, Front Exhaust Pipe.>
- 5) Separate the front drive shaft from transmission. <Ref. to DS-22, REMOVAL, Front Drive Shaft.>
- 6) Remove the differential side retainer oil seal.

NOTE:

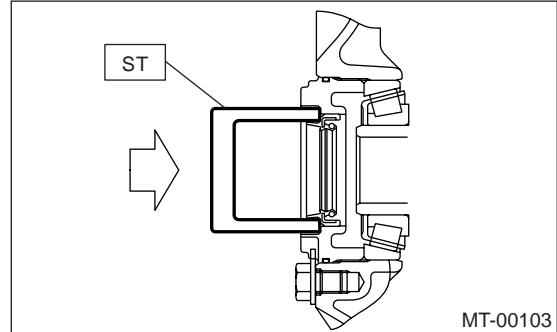
- Be sure to replace the differential side retainer oil seal after the procedure of removing the front drive shaft from transmission.
- When prying to remove the part using flat tip screwdriver, be careful not to scratch the differential side retainer. ST 398527700 puller assembly may be used for this operation procedure.

- 7) Using the ST, install the differential side retainer by slightly tapping with a plastic hammer.

ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER

NOTE:

Apply oil to the oil seal lips.



- 8) Install the front drive shaft. <Ref. to DS-22, INSTALLATION, Front Drive Shaft.>

ST 28399SA010 FRONT DRIVE SHAFT OIL SEAL PROTECTOR

- 9) Install the front and center exhaust pipe. <Ref. to EX(H4SO 2.0)-8, INSTALLATION, Front Exhaust Pipe.>

- 10) Lower the vehicle.

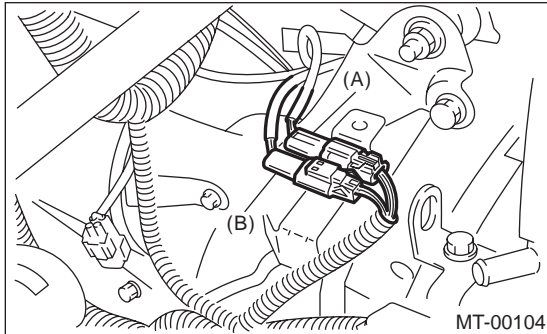
- 11) Pour gear oil through the gauge hole. <Ref. to 5MT-30, REPLACEMENT, Transmission Gear Oil.>

7. Switches and Harness

A: REMOVAL

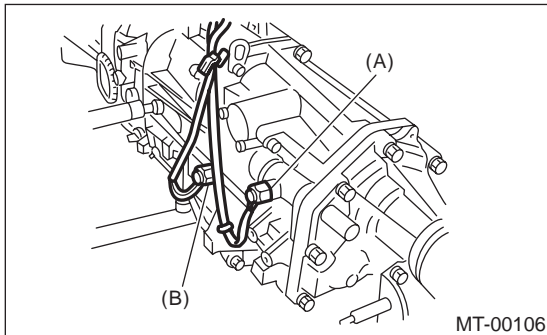
1. BACK-UP LIGHT SWITCH AND NEUTRAL POSITION SWITCH

- 1) Disconnect the ground cable from battery.
- 2) Remove the air intake chamber and cleaner case. <Ref. to IN(H4SO 2.0)-6, REMOVAL, Air Cleaner Case.> <Ref. to IN(H4SO 2.0)-8, REMOVAL, Air Intake Chamber.>
- 3) Disconnect the connectors of back-up light switch and neutral position switch.



- (A) Neutral position switch connector (Brown)
- (B) Back-up light switch connector (Gray)

- 4) Lift-up the vehicle.
- 5) Remove the back-up light switch and neutral position switch with harness.

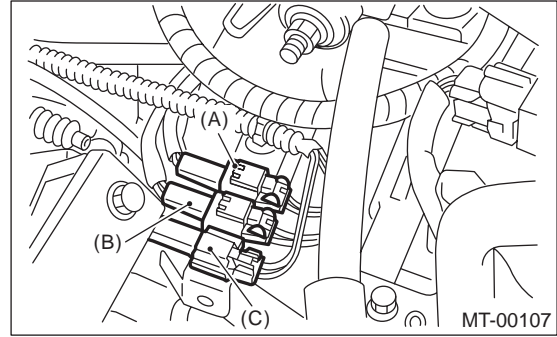


- (A) Neutral position switch (Brown)
- (B) Back-up light switch (Gray)

2. HIGH-LOW SWITCH (DUAL-RANGE MODEL)

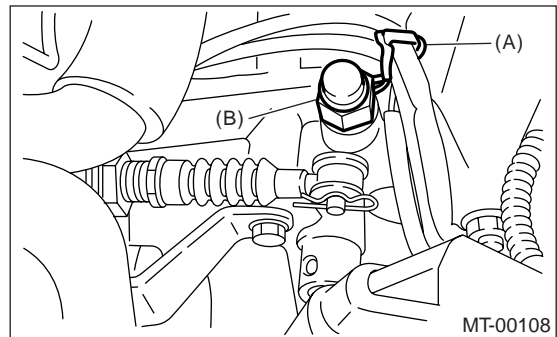
- 1) Disconnect the ground cable from battery.
- 2) Remove the air intake chamber and cleaner case. <Ref. to IN(H4SO 2.0)-6, REMOVAL, Air Cleaner Case.> <Ref. to IN(H4SO 2.0)-8, REMOVAL, Air Intake Chamber.>

- 3) Disconnect the connector of high-low switch.



- (A) Neutral switch (Brown)
- (B) Back-up light switch (Gray)
- (C) High-low switch (Black)

- 4) Remove the high-low switch cable from clamp.
- 5) Remove the high-low switch.



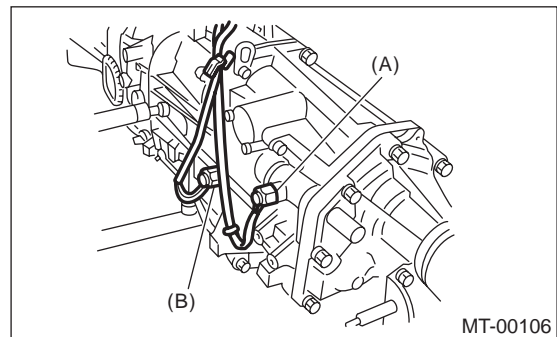
- (A) Clamp
- (B) High-low switch

B: INSTALLATION

1. BACK-UP LIGHT SWITCH AND NEUTRAL POSITION SWITCH

- 1) Install the back-up light switch and neutral position switch with harness.

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



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

Switches and Harness

MANUAL TRANSMISSION AND DIFFERENTIAL

- 2) Connect the connectors of back-up light switch and neutral position switch.
- 3) Install the air intake chamber and cleaner case. <Ref. to IN(H4SO 2.0)-7, INSTALLATION, Air Cleaner Case.> <Ref. to IN(H4SO 2.0)-8, INSTALLATION, Air Intake Chamber.>
- 4) Connect the battery ground cable to battery.

2. HIGH-LOW SWITCH (DUAL-RANGE MODEL)

- 1) Install the high-low switch.

Tightening torque:

25 N·m (2.5 kgf·m, 18.4 ft·lb)

- 2) Install the high-low switch cable to clamp.
- 3) Connect the connector of high-low switch.
- 4) Install the air intake chamber and cleaner case. <Ref. to IN(H4SO 2.0)-7, INSTALLATION, Air Cleaner Case.> <Ref. to IN(H4SO 2.0)-8, INSTALLATION, Air Intake Chamber.>
- 5) Connect the battery ground cable to battery.

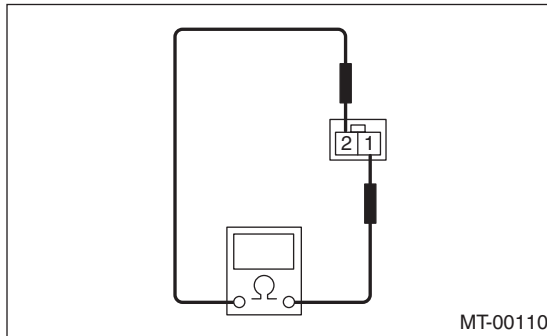
C: INSPECTION

1. BACK-UP LIGHT SWITCH

Inspect the back-up light switch. <Ref. to LI-7, INSPECTION, Back-up Light System.>

2. NEUTRAL POSITION SWITCH

- 1) Turn the ignition switch to OFF.
- 2) Disconnect the connector of neutral position switch.
- 3) Measure the resistance between neutral position switch terminals.



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

- 4) Replace the faulty parts.

8. Preparation for Overhaul

A: PROCEDURE

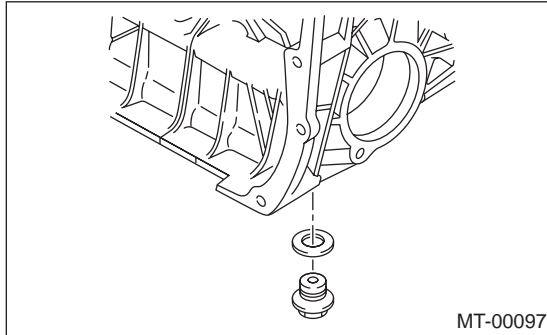
- 1) Clean oil, grease, dirt and dust from transmission.
- 2) Remove the drain plug to drain oil. Tighten the engine oil drain plug after draining.

NOTE:

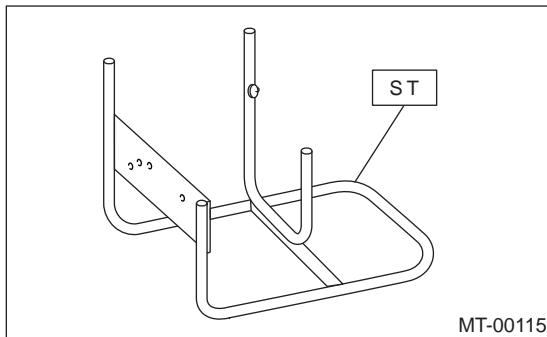
Use a new gasket.

Tightening torque:

70 N·m (7.1 kgf·m, 51 ft·lb)



- 3) Attach the transmission to ST.
ST 499937100 TRANSMISSION STAND



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

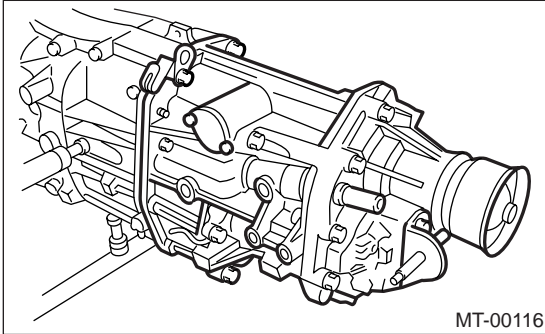
Transfer Case and Extension Case Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

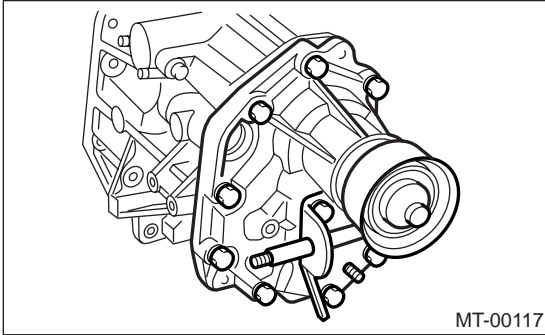
9. Transfer Case and Extension Case Assembly

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 5MT-31, REMOVAL, Manual Transmission Assembly.>
- 2) Remove the back-up light switch and neutral position switch. <Ref. to 5MT-41, REMOVAL, Switches and Harness.>
- 3) Remove the transfer case with extension case assembly.

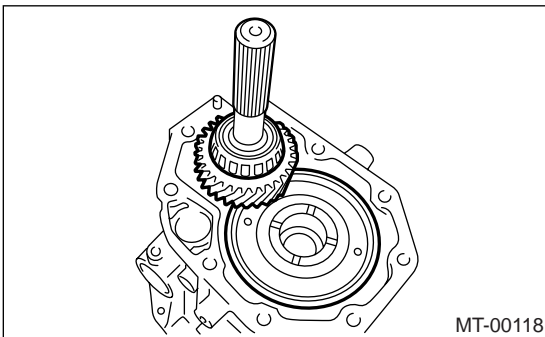


- 4) Remove the shifter arm.
- 5) Remove the extension case assembly.

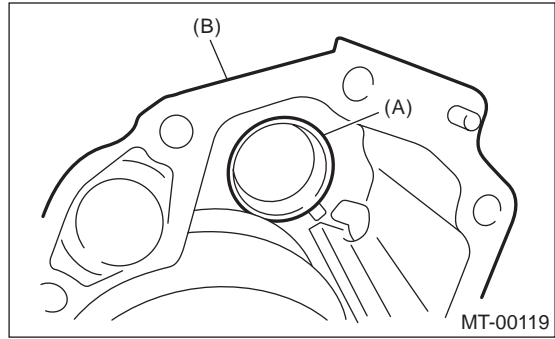


B: INSTALLATION

- 1) Install the center differential and transfer driven gear into transfer case.

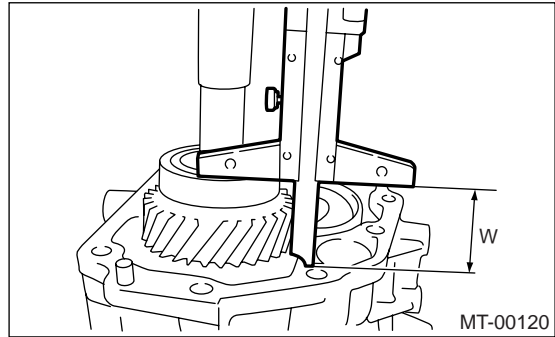


- 2) Remove the bearing outer race from extension case.



- (A) Bearing outer race
(B) Extension case

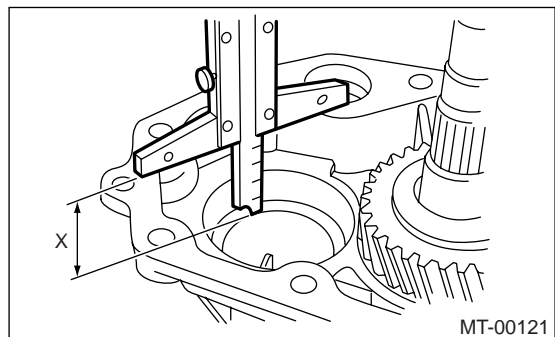
- 3) While pressing the bearing outer race horizontally, turn the driven shaft ten rotations.
- 4) Measure the height "W" between transfer case and taper roller bearing on the transfer driven gear.



- 5) Measure the depth "X" on bearing insertion part of extension case.

NOTE:

Measure with bearing outer race and thrust washer removed.



- 6) Calculate the tight "t" using following equation.
 $t = X - W + 0.2 \text{ to } 0.3 \text{ mm (0.008 to 0.012 in)}$
- 7) Select the washer of nearest value in the following table:

Standard preload between thrust washer and taper roller bearing:

0.2 — 0.3 mm (0.008 — 0.012 in)

Transfer Case and Extension Case Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

NOTE:

Be sure that the preload is within standard value.

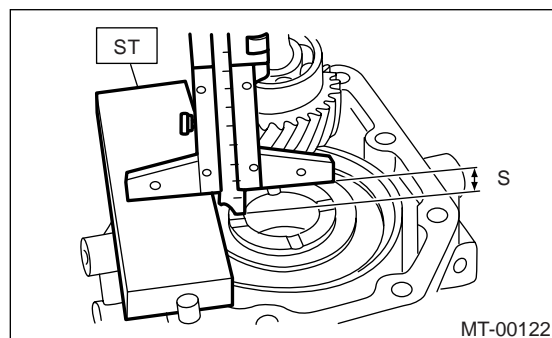
Thrust washer (50 × 61 × t)	
Part Number	Thickness mm (in)
803050060	0.50 (0.0197)
803050061	0.55 (0.0217)
803050062	0.60 (0.0236)
803050063	0.65 (0.0256)
803050064	0.70 (0.0276)
803050065	0.75 (0.0295)
803050066	0.80 (0.0315)
803050067	0.85 (0.0335)
803050068	0.90 (0.0354)
803050069	0.95 (0.0374)
803050070	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)

8) Fit the thrust washers on transfer drive shaft.

9) Install the bearing outer race into extension case.

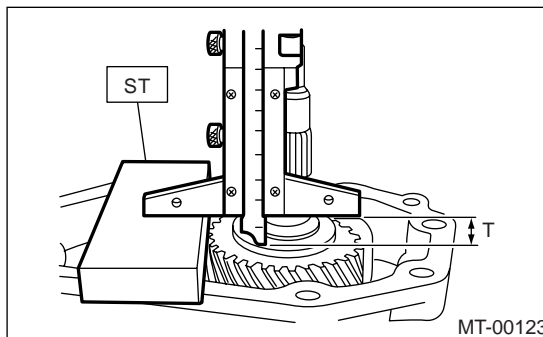
10) Measure the depth “S” between transfer case and center differential.

ST 398643600 GAUGE



11) Measure the height “T” between extension case and transfer drive gear.

ST 398643600 GAUGE



12) Calculate the thrust washer “U” using following equation.

$$U = \{15 \text{ mm (1.18 in)} - T\} - \{S - 15 \text{ mm (1.18 in)}\} - 0.15 \text{ to } 0.35 \text{ mm (0.0059 to 0.0138 in)}$$

U mm (in)	Thickness of transfer drive gear thrust washer
T mm (in)	Height from end of ST to transfer drive gear
S mm (in)	Depth from end of transmission case to the end of ST
0.15 — 0.35 mm (0.0059 — 0.0138 in)	Standard clearance between thrust washer and transfer drive gear.
15 mm (1.18 in)	Thickness of ST

13) Select a suitable washer in the following table:

Standard clearance:

0.15 — 0.35 mm (0.0059 — 0.0138 in)

Thrust washer	
Part Number	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)

14) Fit the thrust washer on center differential.

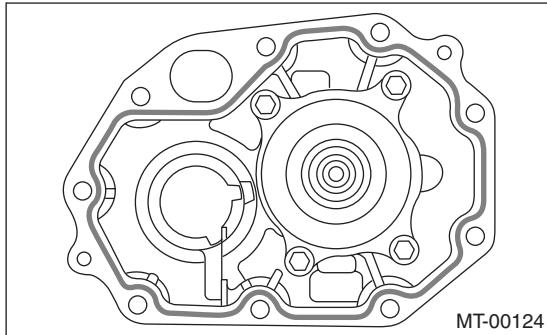
Transfer Case and Extension Case Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

15) Apply proper amount of liquid gasket to the transfer case mating surface.

Liquid gasket

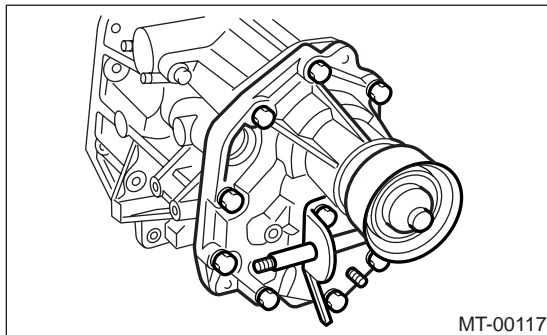
THREE BOND 1215 (Part No. 004403007) or equivalent



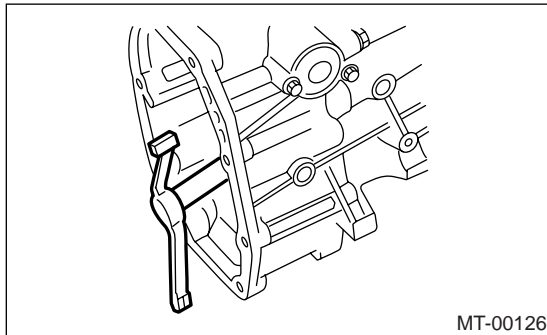
16) Install the extension assembly into transfer case.

Tightening torque:

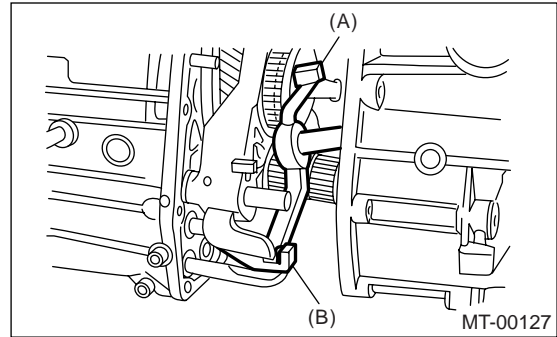
40 N·m (4.1 kgf·m, 29.7 ft·lb)



17) Install the shifter arm to transfer case.



18) Hang the shifter arm on 3rd-4th fork rod.



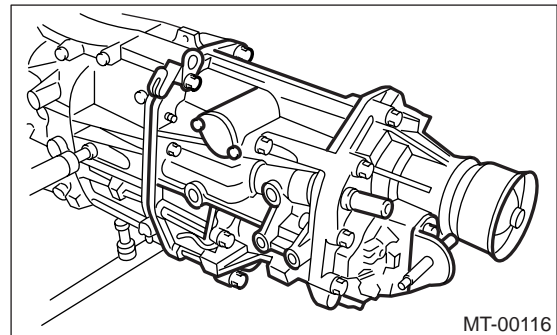
(A) Shifter arm

(B) 3rd-4th fork rod

19) Install the transfer case with extension case assembly to transmission case.

Tightening torque:

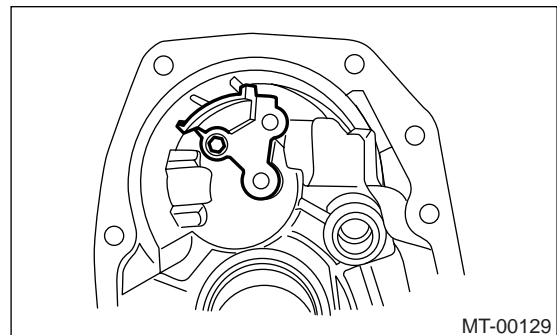
25 N·m (2.5 kgf·m, 18.4 ft·lb)



C: DISASSEMBLY

1. TRANSFER CASE

- 1) Remove the reverse check assembly. <Ref. to 5MT-53, REMOVAL, Reverse Check Sleeve.>
- 2) Remove the oil guide.



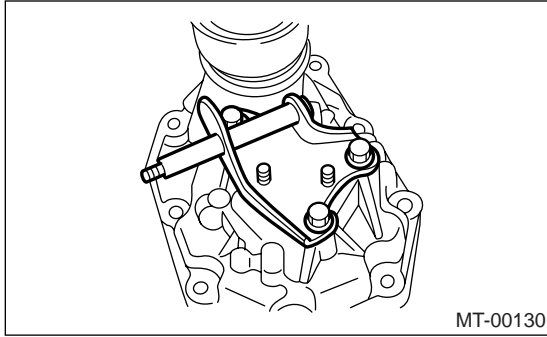
2. EXTENSION CASE

- 1) Remove the transfer drive gear assembly. <Ref. to 5MT-48, REMOVAL, Transfer Drive Gear.>

Transfer Case and Extension Case Assembly

MANUAL TRANSMISSION AND DIFFERENTIAL

2) Remove the shift bracket.



2) Install the reverse check sleeve assembly to transfer case. <Ref. to 5MT-53, INSTALLATION, Reverse Check Sleeve.>

3) Remove the oil seal from extension case. <Ref. to 5MT-39, Oil Seal.>

D: ASSEMBLY

1. EXTENSION CASE

1) Using the ST, install the oil seal to extension case. <Ref. to 5MT-39, Oil Seal.>

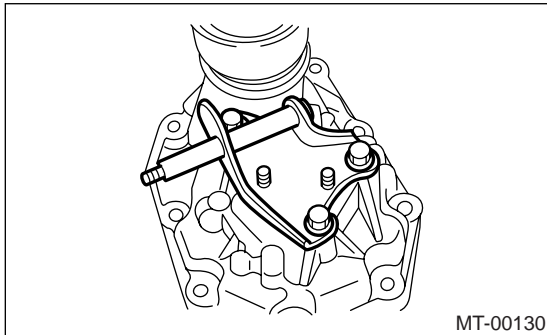
NOTE:

Use a new oil seal.

2) Install the shift bracket to extension case.

Tightening torque:

25 N·m (2.5 kgf·m, 18.4 ft·lb)



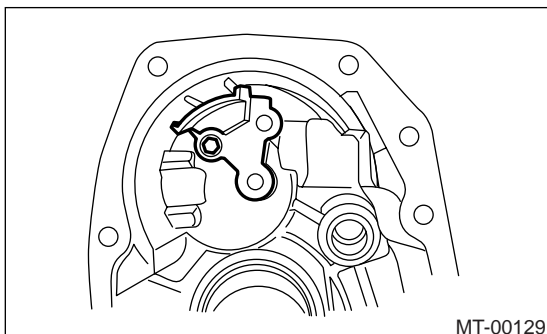
3) Install the transfer drive gear to extension case. <Ref. to 5MT-48, INSTALLATION, Transfer Drive Gear.>

2. TRANSFER CASE

1) Install the oil guide to transfer case.

Tightening torque:

6.4 N·m (0.65 kgf·m, 4.7 ft·lb)



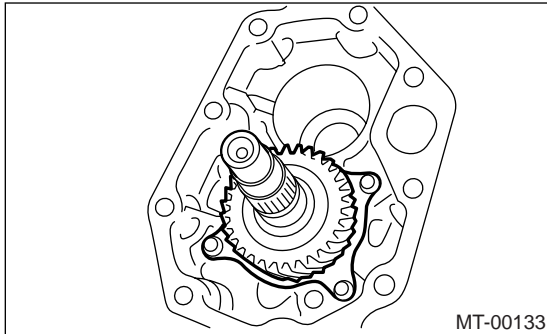
Transfer Drive Gear

MANUAL TRANSMISSION AND DIFFERENTIAL

10. Transfer Drive Gear

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 5MT-31, REMOVAL, Manual Transmission Assembly.>
- 2) Remove the back-up light switch and neutral position switch. <Ref. to 5MT-41, REMOVAL, Switches and Harness.>
- 3) Remove the transfer case with extension case assembly. <Ref. to 5MT-44, REMOVAL, Transfer Case and Extension Case Assembly.>
- 4) Remove the extension case assembly.
- 5) Remove the transfer driven gear.
- 6) Remove the transfer drive gear.

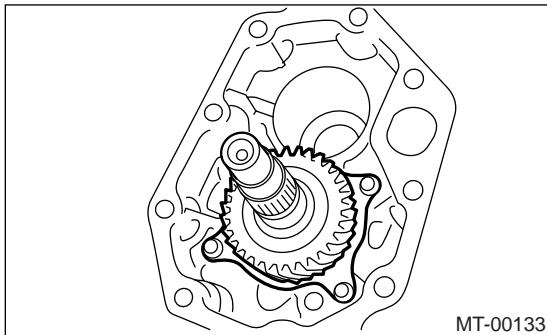


B: INSTALLATION

- 1) Install the transfer drive gear.

Tightening torque:

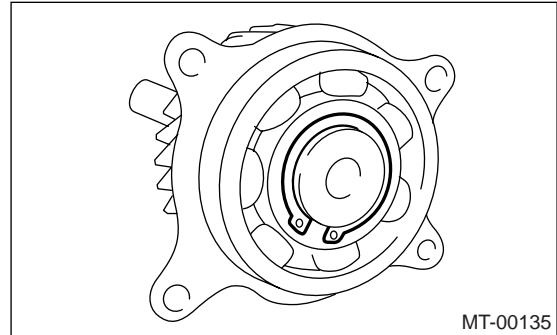
26 N·m (2.7 kgf·m, 20 ft·lb)



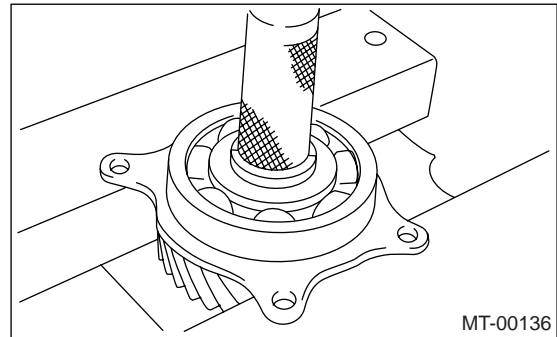
- 2) Install the transfer driven gear.
- 3) Install the extension case assembly.
- 4) Install the transfer case and extension case assembly. <Ref. to 5MT-44, INSTALLATION, Transfer Case and Extension Case Assembly.>
- 5) Install the back-up light switch and neutral position switch. <Ref. to 5MT-41, INSTALLATION, Switches and Harness.>
- 6) Install the manual transmission assembly into vehicle. <Ref. to 5MT-33, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

- 1) Remove the snap ring.



- 2) Remove the ball bearing.



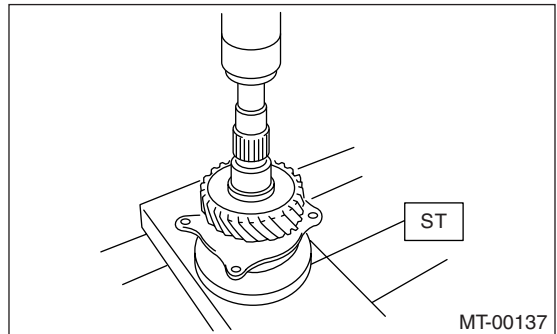
D: ASSEMBLY

- 1) Set the ST applying to the inner race of bearing to install the drive shaft.

ST 398177700 INSTALLER

NOTE:

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



- 2) Install the snap ring on transfer drive shaft.
- 3) Inspect the clearance between snap ring and ball bearing. <Ref. to 5MT-48, INSPECTION, Transfer Drive Gear.>

E: INSPECTION

- 1) Bearings

Replace the bearing in following cases:

- In case of broken or rusty bearings
- In case of worn or damaged bearings
- When the bearings fail to turn smoothly or emit noise in rotation after gear oil lubrication.

Transfer Drive Gear

MANUAL TRANSMISSION AND DIFFERENTIAL

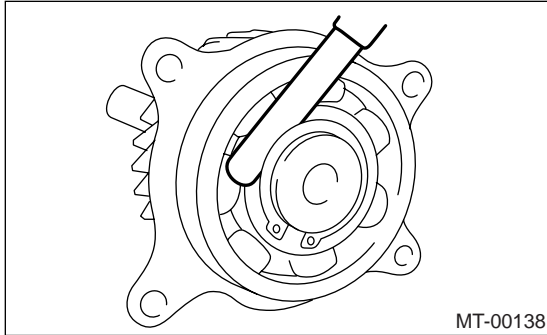
2) Drive gear

Replace the drive gear when their tooth surface and shaft are excessively broken or damaged.

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

Clearance:

0.01 — 0.15 mm (0.0004 — 0.0059 in)



If the measurement is not within specification, select a suitable snap ring and replace it.

Snap ring (Outer-30)	
Part Number	Thickness mm (in)
805030041	1.53 (0.0602)
805030042	1.65 (0.0650)
805030043	1.77 (0.0697)

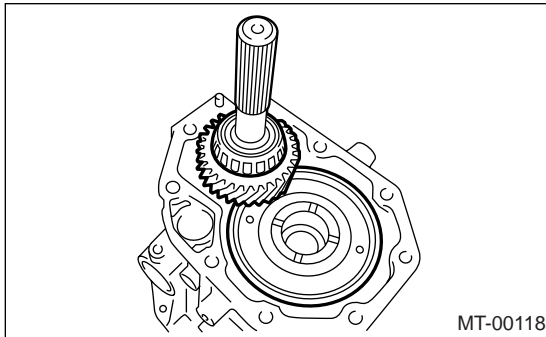
Transfer Driven Gear

MANUAL TRANSMISSION AND DIFFERENTIAL

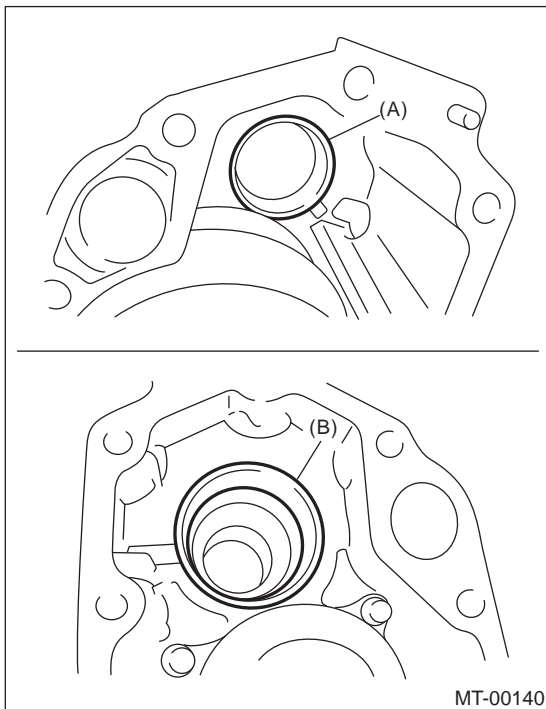
11. Transfer Driven Gear

A: REMOVAL

- 1) Remove the manual transmission assembly from vehicle. <Ref. to 5MT-31, REMOVAL, Manual Transmission Assembly.>
- 2) Remove the back-up light switch and neutral position switch. <Ref. to 5MT-41, REMOVAL, Switches and Harness.>
- 3) Remove the transfer case with extension case assembly. <Ref. to 5MT-44, REMOVAL, Transfer Case and Extension Case Assembly.>
- 4) Remove the extension case assembly.
- 5) Remove the transfer driven gear.



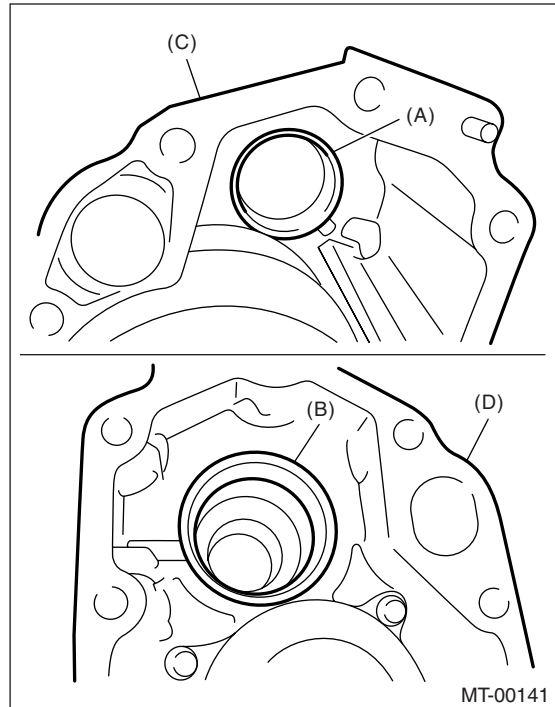
- 6) Remove the bearing outer races from the extension case and transfer case.



- (A) Bearing outer race (Transfer case side)
- (B) Bearing outer race (Extension case side)

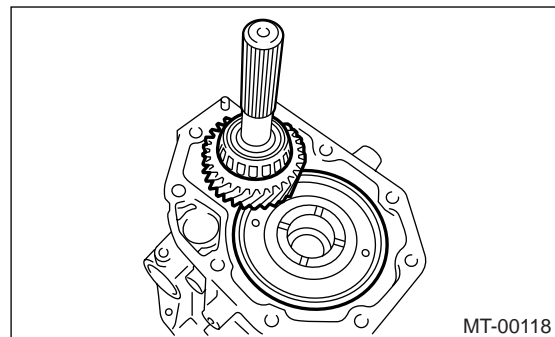
B: INSTALLATION

- 1) Install the bearing outer races to the extension case and transfer case.



- (A) Bearing outer race
- (B) Bearing outer race
- (C) Transfer case
- (D) Extension case

- 2) Install the transfer driven gear.



- 3) Install the transfer case and extension case assembly. <Ref. to 5MT-44, INSTALLATION, Transfer Case and Extension Case Assembly.>
- 4) Install the back-up light switch and neutral position switch. <Ref. to 5MT-41, INSTALLATION, Switches and Harness.>
- 5) Install the manual transmission assembly into vehicle. <Ref. to 5MT-33, INSTALLATION, Manual Transmission Assembly.>

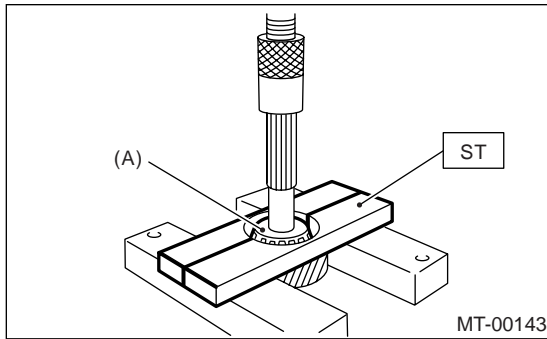
Transfer Driven Gear

MANUAL TRANSMISSION AND DIFFERENTIAL

C: DISASSEMBLY

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

ST 498077000 REMOVER

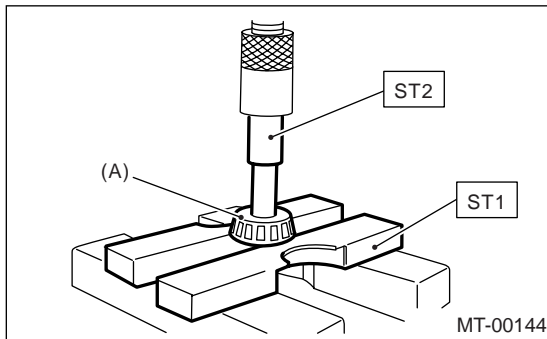


(A) Roller bearing

2) Using the ST1 and ST2, remove the roller bearing (transfer case side).

ST1 498077000 REMOVER

ST2 899864100 REMOVER



(A) Roller bearing

D: ASSEMBLY

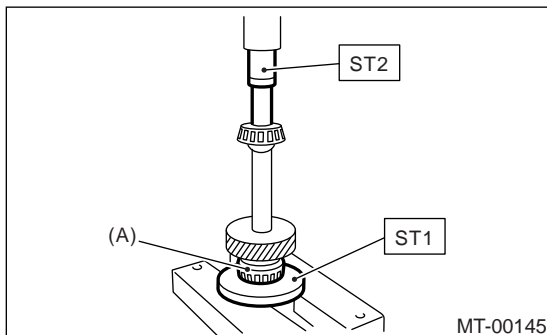
1) Using the ST, install the roller bearing (extension case side).

ST1 398177700 INSTALLER

ST2 899864100 REMOVER

NOTE:

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



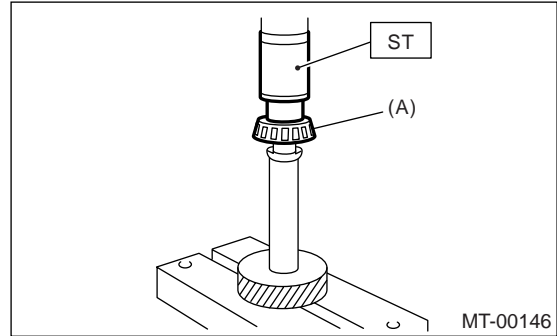
(A) Roller bearing

2) Using the ST, install the roller bearing (transfer case side).

ST 499757002 INSTALLER

NOTE:

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



(A) Roller bearing

E: INSPECTION

1) Bearings

Replace the bearing in following cases:

- In case of broken or rusty bearings
- In case of worn or damaged bearings
- When the bearings fail to turn smoothly or emit noise in rotation after gear oil lubrication.

2) Driven gear

Replace the drive gear when their tooth surface and shaft are excessively broken or damaged.