

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

1. General Description

A: SPECIFICATION

1. MANUAL TRANSMISSION AND DIFFERENTIAL

Type		5-forward speeds and 1-reverse (all stage with synchromesh)	
Transmission gear ratio	1st		3.454
	2nd		2.062
	3rd		1.448
	4th		1.088
	5th		0.780
	Reverse		3.333
Front reduction gear	Final	Type of gear	Hypoid
		Gear ratio	3.900
Rear reduction gear	Transfer	Type of gear	Helical
		Gear ratio	1.000
	Final	Type of gear	Hypoid
		Gear ratio	3.900
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		3.5 ℓ (3.7 US qt, 3.1 Imp qt)	

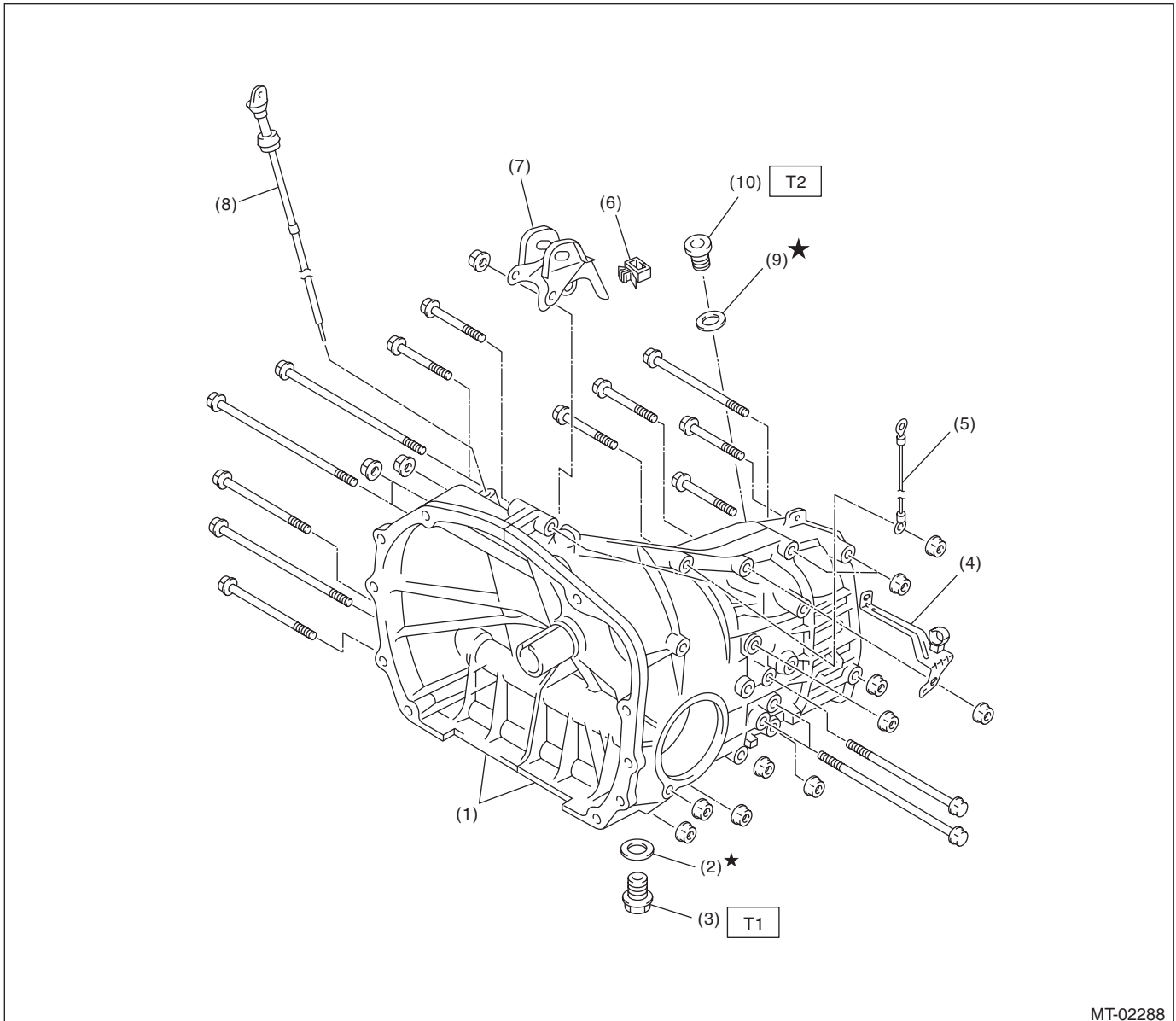
2. TRANSMISSION GEAR OIL

Recommended oil:

GL-5 (75W-90) or equivalent

B: COMPONENT

1. TRANSMISSION CASE



MT-02288

- | | |
|------------------------------------|------------------------------|
| (1) Transmission case ASSY | (6) Clamp |
| (2) Gasket | (7) Pitching stopper bracket |
| (3) Drain plug | (8) Oil level gauge |
| (4) Harness bracket | (9) Gasket |
| (5) Transmission radio ground cord | (10) Plug |

Tightening torque:N·m (kgf-m, ft-lb)

T1: 44 (4.5, 32.5) (Aluminum gasket, silver)

70 (7.1, 51.6) (Copper gasket, brown)

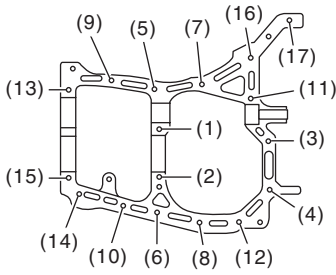
70 (7.1, 51.6) (Metal gasket, black)

T2: 60 (6.1, 44.3)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

Transmission case tightening torque

 MT-00003	Bolt No.	Bolt size mm	Tightening torque: N·m (kgf-m, ft-lb)
	(5) — (15)	8	25 (2.5, 18.4)
	(1) — (4) (16), (17)	10	39 (4.0, 28.8)

MANUAL TRANSMISSION AND DIFFERENTIAL

This exploded view diagram illustrates the assembly of a mechanical component, likely a pump or motor. The main assembly is shown in the center, with various parts numbered 1 through 36. The assembly is divided into three main sections by dashed lines:

- Top Section:** Shows the main shaft assembly (1) and the input gear assembly (2) through (17). The input gear (17) is shown meshing with the main shaft gear (14).
- Bottom Section:** Shows the output gear assembly (18) through (21) and the main housing assembly (22) through (36). The output gear (21) is shown meshing with the main housing gear (24).
- Sub-assemblies:**
 - T1:** A sub-assembly consisting of parts (24)*, (25), and (26).
 - T2:** A sub-assembly consisting of parts (29)*, (30), (31), (32), (33), and (34).
 - T3:** A sub-assembly consisting of parts (27) and (28).

The diagram uses dashed lines to indicate the assembly sequence and the relative positions of the components. The parts are numbered as follows:

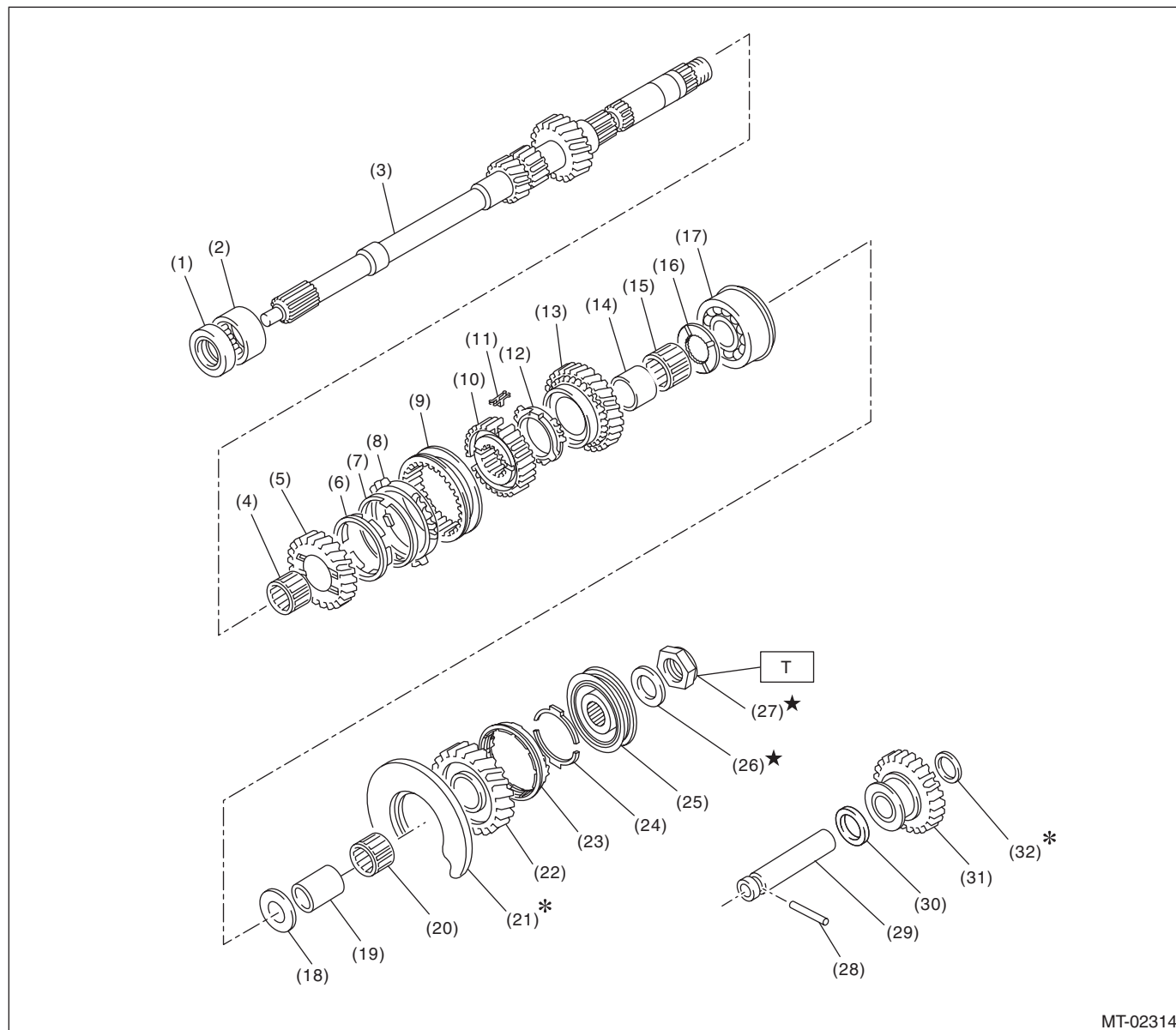
- 1: Main shaft
- 2: Input gear
- 3: Input gear housing
- 4: Input gear housing cover
- 5: Input gear housing cover screw
- 6: Main shaft housing
- 7: Main shaft housing cover
- 8: Main shaft housing cover screw
- 9: Main shaft housing cover gasket
- 10: Main shaft housing cover gasket
- 11: Main shaft housing cover gasket
- 12: Main shaft housing cover gasket
- 13: Main shaft housing cover gasket
- 14: Main shaft gear
- 15: Main shaft gear housing
- 16: Main shaft gear housing cover
- 17: Input gear
- 18: Output gear
- 19: Output gear housing
- 20: Output gear housing cover
- 21: Output gear
- 22: Main housing
- 23: Main housing cover
- 24*: Main housing gear
- 25: Main housing gear housing
- 26: Main housing gear housing cover
- 27: Main housing gear housing cover screw
- 28: Main housing gear housing cover gasket
- 29)*: Main housing gear housing cover gasket
- 30: Main housing gear housing cover gasket
- 31: Main housing gear housing cover gasket
- 32: Main housing gear housing cover gasket
- 33: Main housing gear housing cover gasket
- 34): Main housing gear housing cover gasket
- 35: Main housing gear housing cover gasket
- 36: Main housing gear housing cover gasket

- Tightening torque: N·m (kgf·m, ft·lb)**
T1: 30 (3.1, 22.1)
T2: 120 (12.2, 88.5)
T3: 260 (26.5, 191.8)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

3. MAIN SHAFT FOR SINGLE-RANGE



MT-02314

(1) Oil seal	(13) 4th drive gear	(25) 5th hub & sleeve No. 2
(2) Needle bearing	(14) 4th needle bearing race	(26) Lock washer
(3) Transmission main shaft	(15) Needle bearing	(27) Lock nut
(4) Needle bearing	(16) 4th gear thrust washer	(28) Straight pin
(5) 3rd drive gear	(17) Ball bearing	(29) Reverse idler gear shaft
(6) Inner baulk ring	(18) 5th gear thrust washer	(30) Washer
(7) 3rd synchro cone	(19) 5th needle bearing race	(31) Reverse idler gear
(8) Outer baulk ring	(20) Needle bearing	(32) Washer
(9) 3rd-4th coupling sleeve	(21) Main shaft rear plate	
(10) 3rd-4th synchronizer hub	(22) 5th drive gear	
(11) 3rd-4th shifting insert key	(23) 5th baulk ring	
(12) 4th baulk ring	(24) Baulk lever	

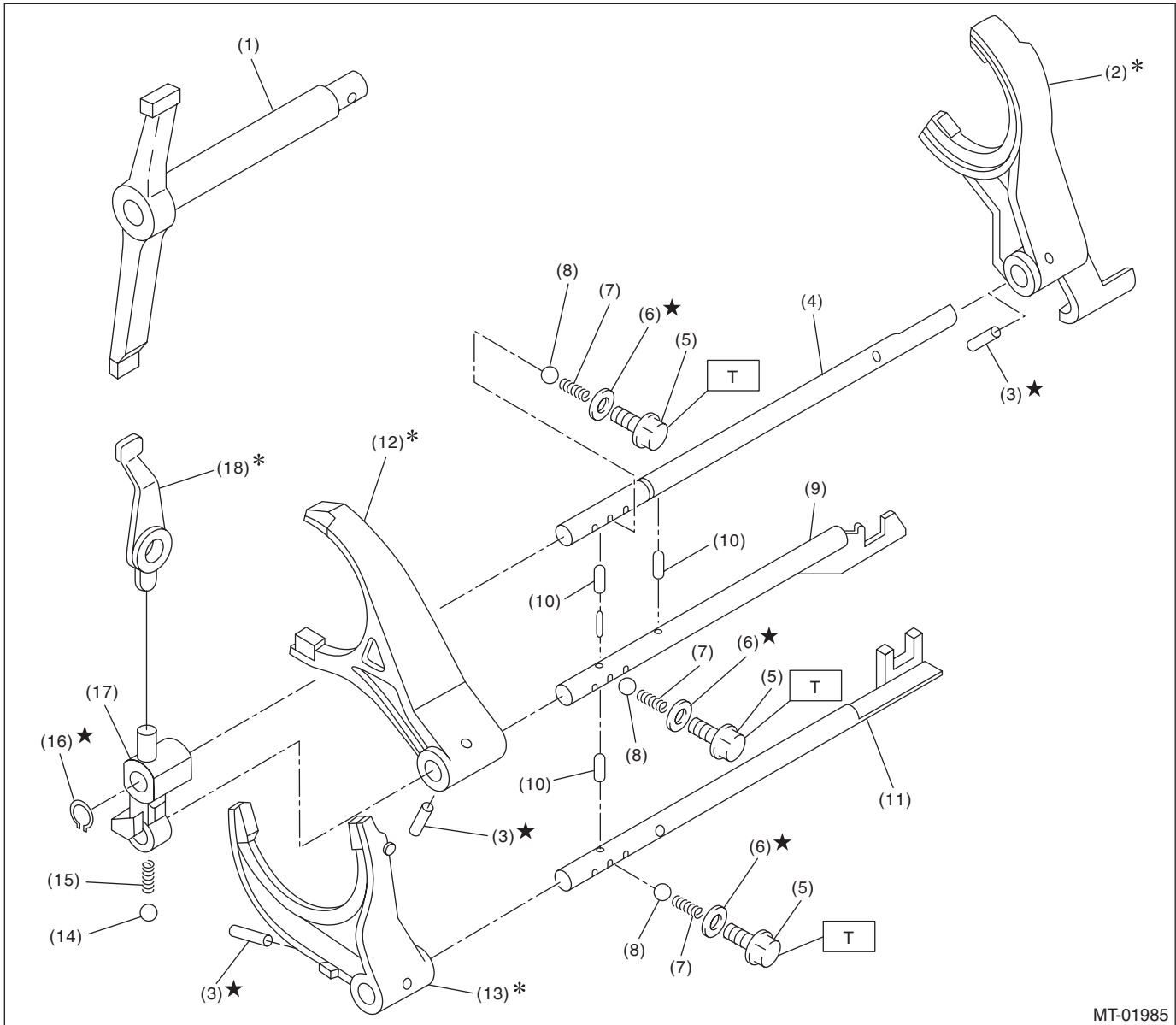
Tightening torque: N·m (kgf-m, ft-lb)

T: 120 (12.2, 88.5)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

4. SHIFTER FORK AND SHIFTER ROD



MT-01985

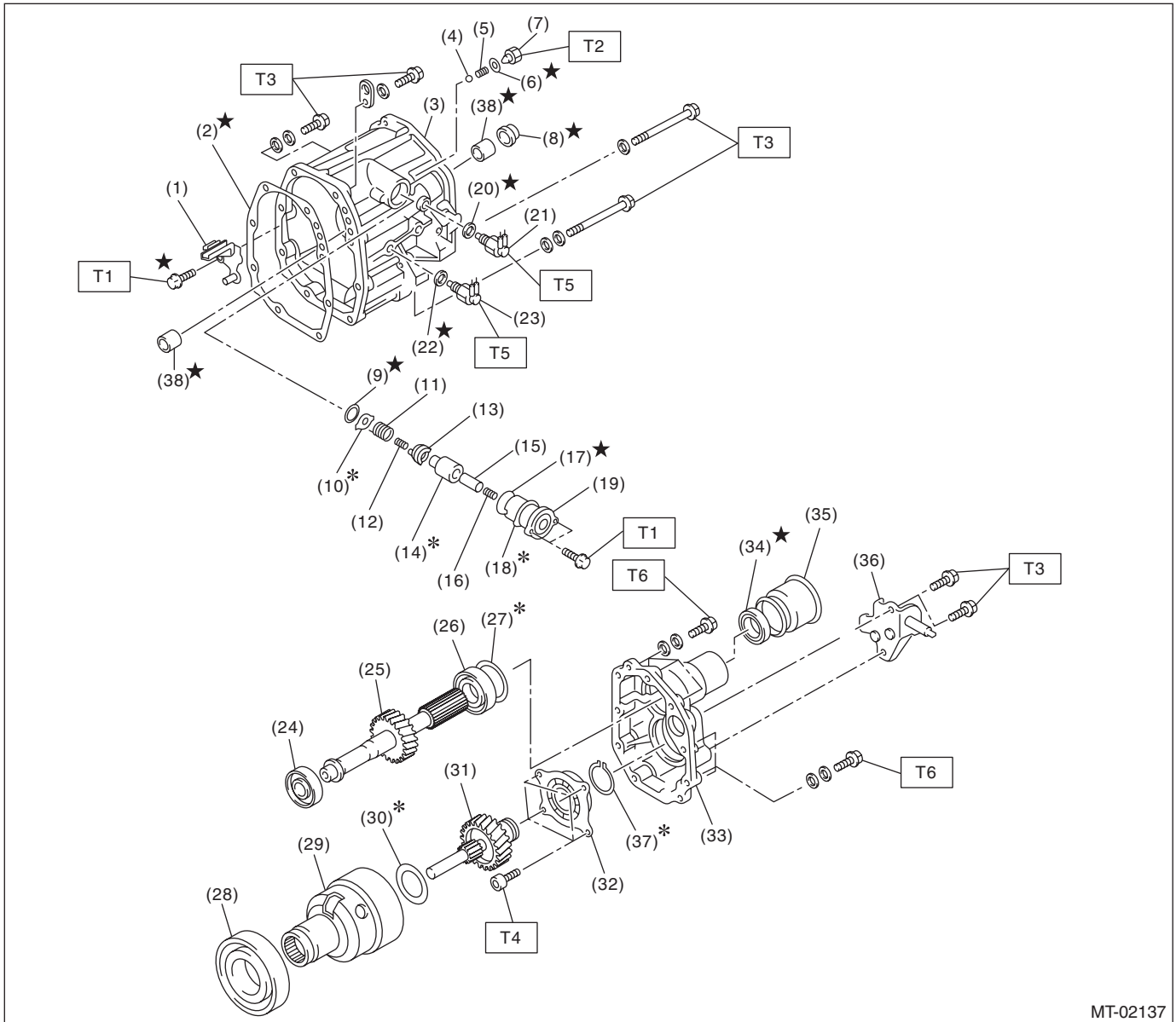
- | | | |
|--------------------------|---------------------------|----------------------------|
| (1) Shifter arm | (8) Ball | (15) Spring |
| (2) 5th shifter fork | (9) 3rd-4th fork rod | (16) Snap ring (Outer) |
| (3) Straight pin | (10) Interlock plunger | (17) Reverse fork rod arm |
| (4) Reverse 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: 20 (2.0, 14.8)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

5. TRANSFER CASE AND EXTENSION



MT-02137

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

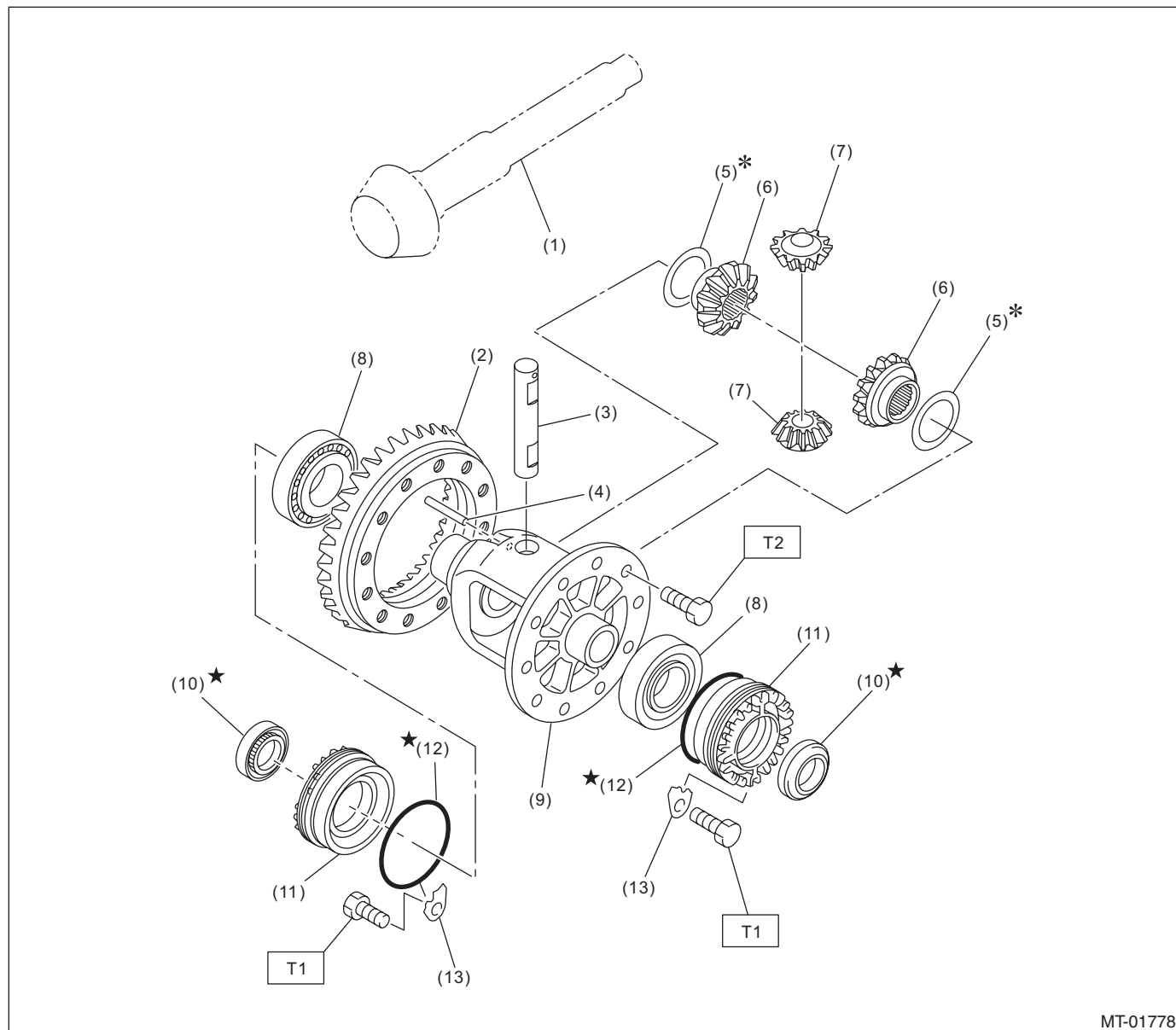
(1) Oil guide	(17) O-ring	(32) Ball bearing
(2) Gasket	(18) Adjusting select shim	(33) Extension case
(3) Transfer case	(19) Reverse check sleeve	(34) Oil seal
(4) Ball	(20) Gasket	(35) Dust cover
(5) Reverse accent spring	(21) Neutral position switch	(36) Shift bracket
(6) Gasket	(22) Gasket	(37) Snap ring
(7) Plug	(23) Back-up light switch	(38) Roller bearing
(8) Oil seal	(24) Roller bearing	
(9) Snap ring (inner)	(25) Transfer driven gear	
(10) Reverse check plate	(26) Roller bearing	
(11) Reverse check spring	(27) Adjusting washer	
(12) Reverse return spring	(28) Ball bearing	
(13) Reverse check cam	(29) Center differential	
(14) Reverse accent shaft	(30) Adjusting washer	
(15) Return spring cap	(31) Transfer drive gear	
(16) Return spring		

Tightening torque:N·m (kgf-m, ft-lb)**T1: 6.4 (0.7, 4.7)****T2: 9.75 (1.0, 7.2)****T3: 24.5 (2.5, 18.1)****T4: 26 (2.7, 19.2)****T5: 32.3 (3.3, 23.8)****T6: 40 (4.1, 29.5)**

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

6. FRONT DIFFERENTIAL



- (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) Roller bearing
- (9) Differential case
- (10) Oil seal
- (11) Differential side retainer
- (12) O-ring

- (13) Retainer lock plate

Tightening torque: N·m (kgf-m, ft-lb)

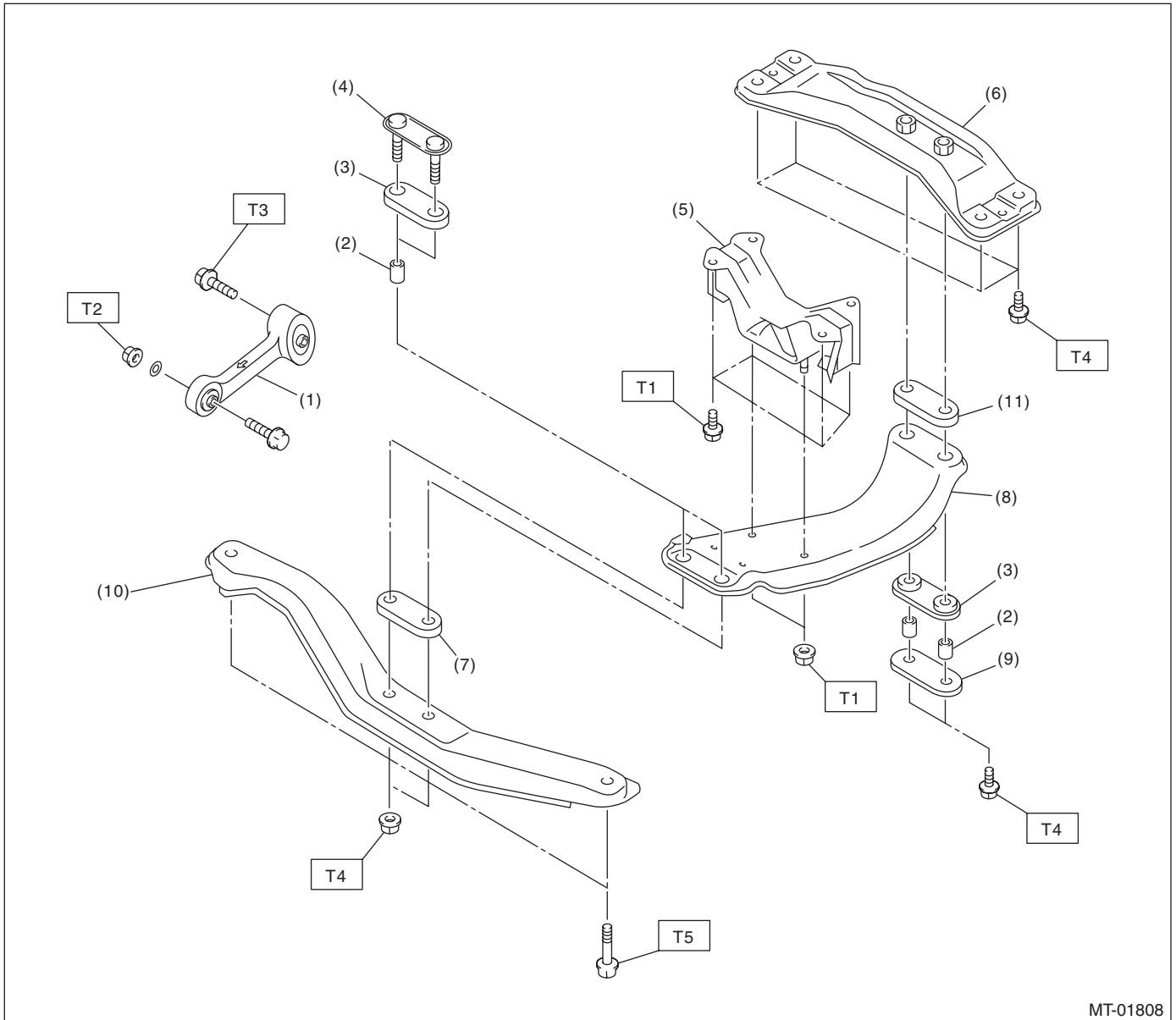
T1: 25 (2.5, 18.4)

T2: 62 (6.3, 45.7)

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

7. TRANSMISSION MOUNTING



MT-01808

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

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

T1: 35 (3.6, 25.8)

T2: 50 (5.1, 36.9)

T3: 58 (5.9, 42.8)

T4: 70 (7.1, 51.6)

T5: 140 (14.3, 103.3)

C: CAUTION

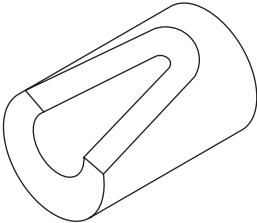
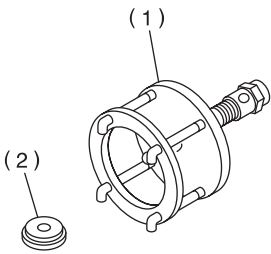
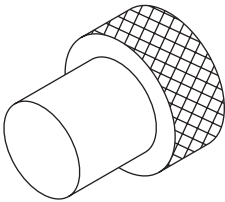
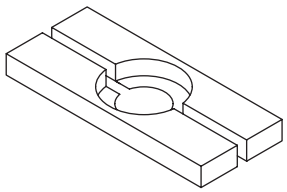
- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal,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

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

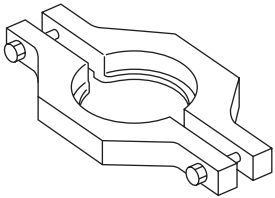
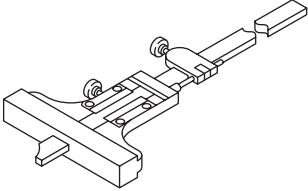
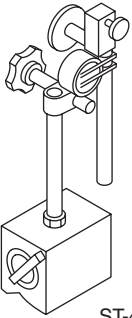
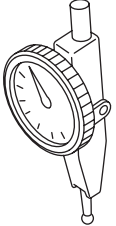
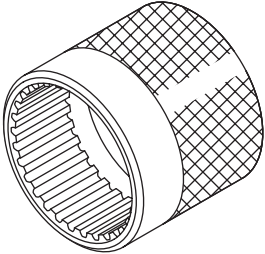
D: PREPARATION TOOL

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 the roller bearing (differential). (1) Puller (2) Cap
 <p>ST-399780104</p>	399780104	WEIGHT	Used for measuring preload on the roller bearing.
 <p>ST-498077000</p>	498077000	REMOVER	<ul style="list-style-type: none"> Used for removing the roller bearing of the drive pinion shaft. Used for removing the ball bearing of the input shaft. Used for removing the roller bearing of the transfer driven gear.

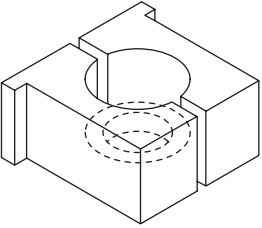
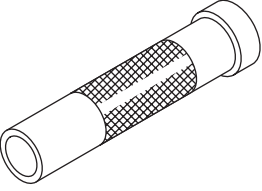
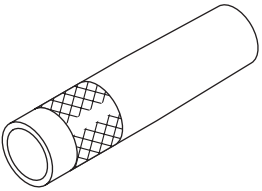
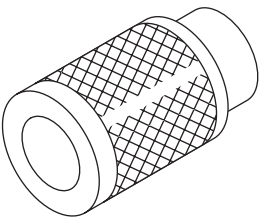
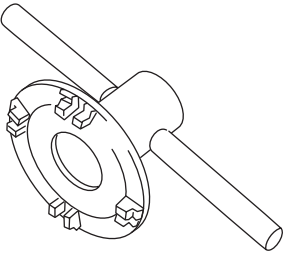
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498077300	498077300	CENTER DIFFERENTIAL BEARING REMOVER	Used for removing the center differential cover ball bearing.
 ST-498147001	498147001	DEPTH GAUGE	Used for adjusting the main shaft play.
 ST-498247001	498247001	MAGNET BASE	<ul style="list-style-type: none"> • Used for measuring backlash between the side gear and pinion, and the hypoid gear. • Used together with DIAL GAUGE (498247100).
 ST-498247100	498247100	DIAL GAUGE	<ul style="list-style-type: none"> • Used for measuring backlash between the side gear and pinion, and the hypoid gear. • Used together with MAGNET BASE (498247001).
 ST-498427100	498427100	STOPPER	Used for securing the drive pinion shaft assembly and the driven gear assembly when removing the drive pinion shaft assembly lock nut.

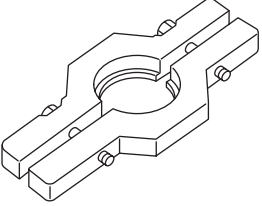
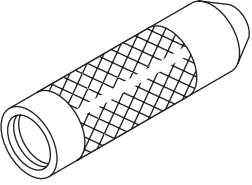
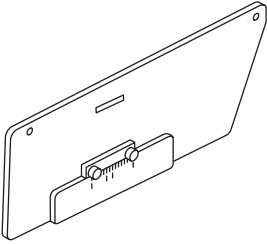
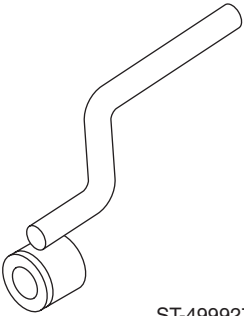
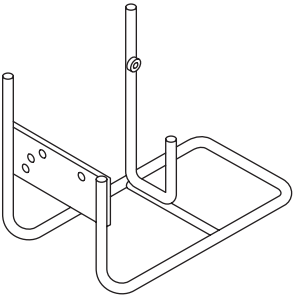
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498937000	498937000	TRANSMISSION HOLDER	Used for removing and installing the lock nut of the transmission main shaft.
 ST-499277100	499277100	BUSHING 1-2 INSTALLER	<ul style="list-style-type: none"> • Used for installing the 1st driven gear thrust plate and the 1st-2nd driven gear bushing. • Used for installing the roller bearing outer race to the differential case.
 ST-499277200	499277200	INSTALLER	Used for press-fitting the 2nd driven gear, roller bearings and the 5th driven gear onto the driven shaft.
 ST-499757002	499757002	INSTALLER	<ul style="list-style-type: none"> • Used for installing the snap ring (OUT 25), and ball bearing (25 × 26 × 17). • Used for installing the bearing cone of the transfer driven gear (extension core side).
 ST18630AA010	18630AA010	WRENCH COMPL RETAINER	<ul style="list-style-type: none"> • Used for removing and installing the differential side retainer. • WRENCH ASSY (499787000) can also be used.

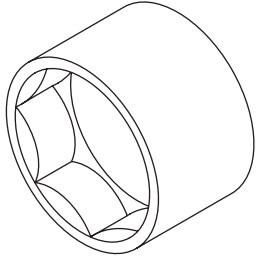
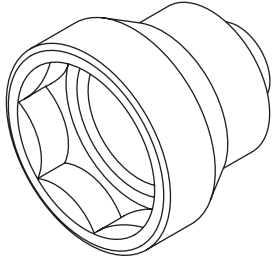
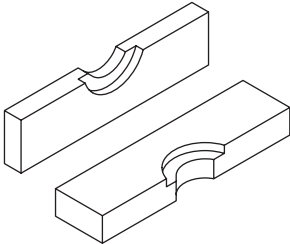
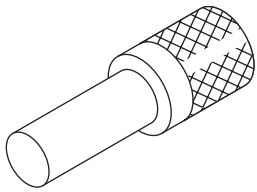
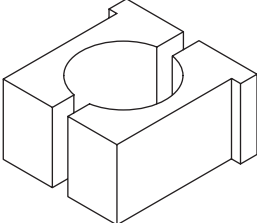
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-499857000</p>	499857000	5TH DRIVEN GEAR REMOVER	Used for removing the 5th driven gear.
 <p>ST-499877000</p>	499877000	RACE 4-5 INSTALLER	<ul style="list-style-type: none"> Used for installing the 4th needle bearing race and ball bearing onto the transmission main shaft. Used together with REMOVER (899714110).
 <p>ST-499917500</p>	499917500	DRIVE PINION GAUGE ASSY	Used for adjusting the drive pinion shim.
 <p>ST-499927100</p>	499927100	HANDLE	Used for fitting the transmission main shaft.
 <p>ST-499937100</p>	499937100	TRANSMISSION STAND SET	Used for disassembling and assembling the transmission.

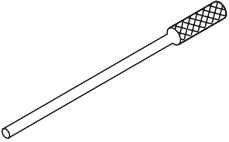
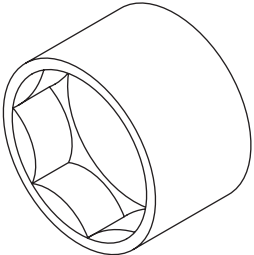
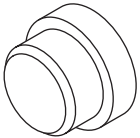
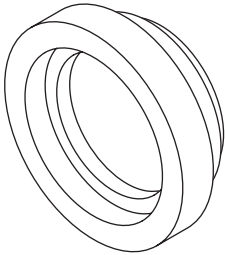
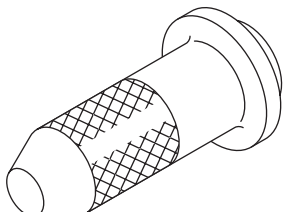
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-499987003</p>	499987003	SOCKET WRENCH (35)	Used for removing and installing the driven pinion lock nut and main shaft lock nut.
 <p>ST-499987300</p>	499987300	SOCKET WRENCH (50)	Used for removing and installing the driven gear assembly lock nut.
 <p>ST-899714110</p>	899714110	REMOVER	Used for fixing the transmission main shaft, drive pinion and rear drive shaft.
 <p>ST-899864100</p>	899864100	REMOVER	Used for removing transmission main shaft and drive pinion parts.
 <p>ST-899884100</p>	899884100	HOLDER	Used for tightening the lock nut on the sleeve.

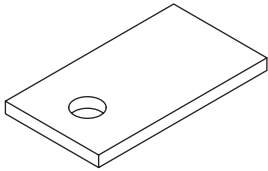
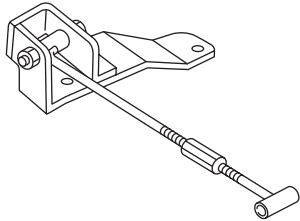
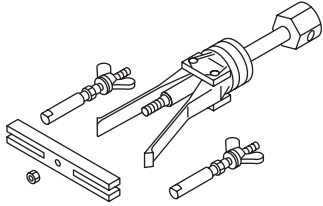
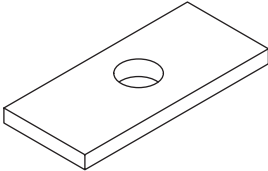
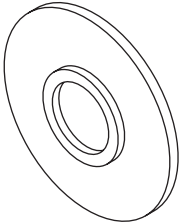
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-899904100	899904100	STRAIGHT PIN REMOVER	Used for removing and installing the straight pin.
 ST-899988608	899988608	SOCKET WRENCH (27)	Used for removing and installing the drive pinion lock nut.
 ST-398497701	398497701	ADAPTER	<ul style="list-style-type: none"> • Used for installing roller bearing onto the differential case. • Used together with INSTALLER (499277100).
 ST-499587000	499587000	INSTALLER	Used for installing the driven gears to the driven shaft.
 ST-498057300	498057300	INSTALLER	Used for installing the extension oil seal.

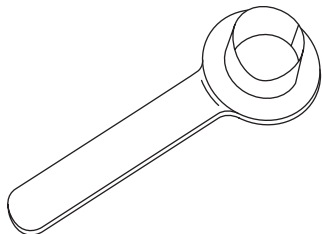
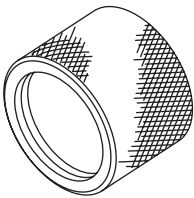
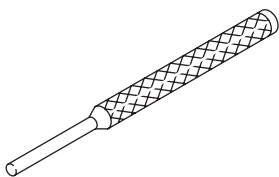
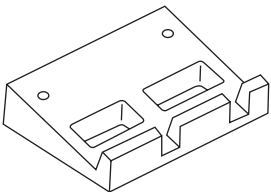
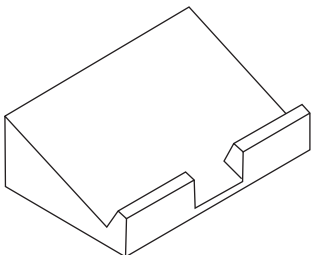
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498255400</p>	498255400	PLATE	Used for measuring backlash.
 <p>ST41099AC000</p>	41099AC000	ENGINE SUPPORT ASSY	Used for supporting the engine.
 <p>ST-398527700</p>	398527700	PULLER ASSY	Used for removing the extension case roller bearing.
 <p>ST-398643600</p>	398643600	GAUGE	Used for measuring total end play, extension end play and drive pinion height.
 <p>ST-398177700</p>	398177700	INSTALLER	<ul style="list-style-type: none"> • Used for installing the bearing cone of transfer driven gear (transfer case side). • Used for installing the ball bearing of the transfer drive gear.

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST28399SA010	28399SA010	OIL SEAL PROTECTOR	Used for protecting the oil seal from damage when inserting the front drive shaft.
 ST18675AA000	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing the differential side retainer oil seal.
 ST-398791700	398791700	STRAIGHT PIN REMOVER 2	Used for installing and removing the straight pin.
 ST-498267200	498267200	CYLINDER HEAD TABLE	Used for installing and removing the roller bearing of the transfer case.
 ST-498267300	498267300	CYLINDER HEAD TABLE	Used for installing and removing the roller bearing of the transfer case.

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
TORX® bit T70	Used for installing and removing the differential gear oil drain plug.