

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

1. General Description

A: SPECIFICATION

1. MANUAL TRANSMISSION AND DIFFERENTIAL

Model			Turbo model	
Type			5-forward speeds and 1-reverse (all stage with synchromesh)	
Transmission gear ratio		1st	3.166	
		2nd	1.882	
		3rd	1.296	
		4th	0.972	
		5th	0.738	
		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)	

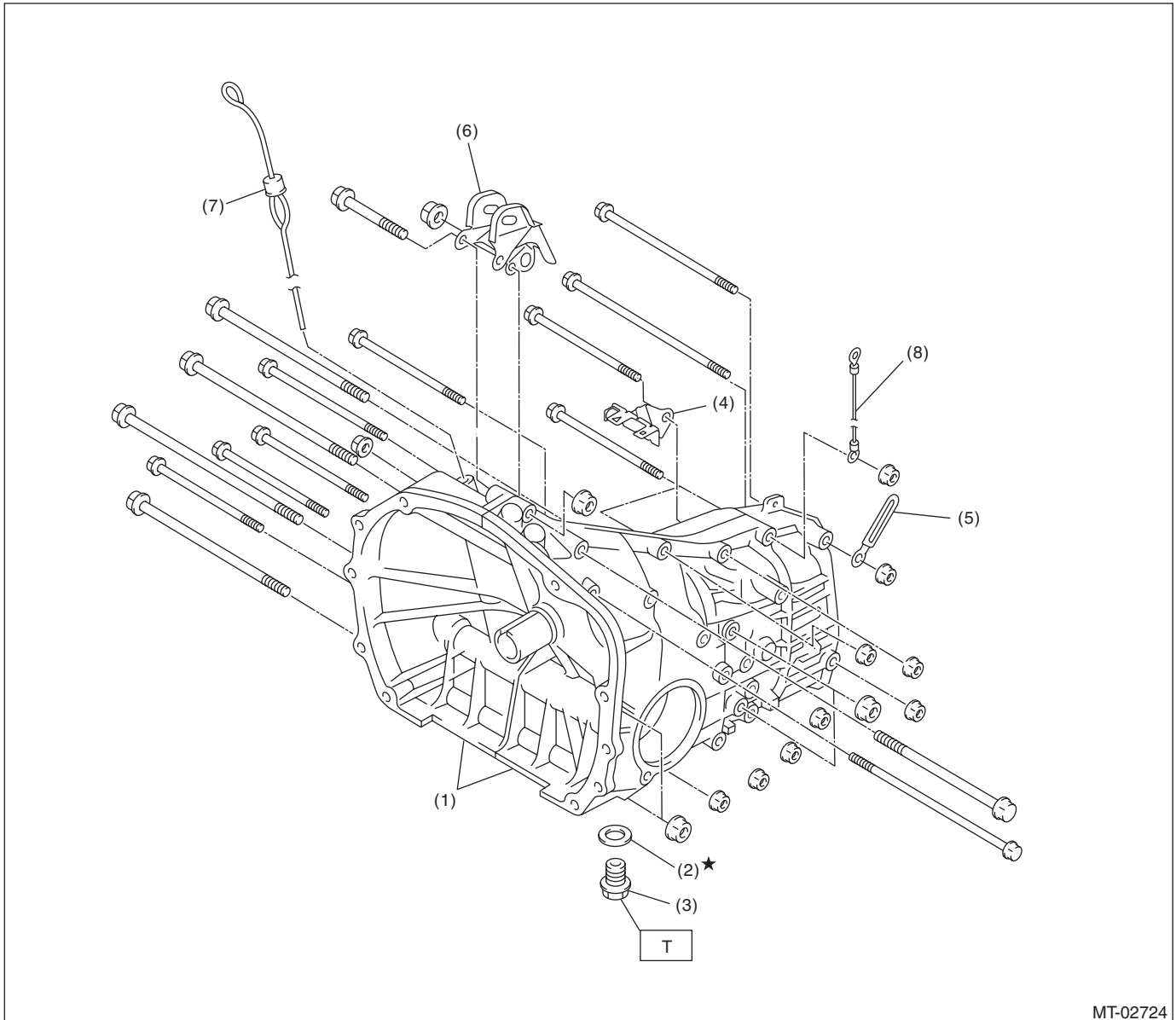
2. TRANSMISSION GEAR OIL

Recommended oil:

GL-5 (75W-90) or equivalent

B: COMPONENT

1. TRANSMISSION CASE



MT-02724

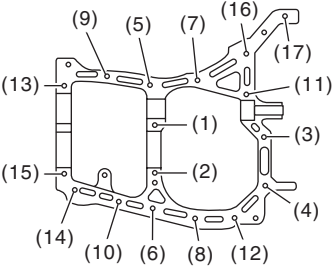
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|----------------------------|------------------------------------|
| (1) Transmission case ASSY | (5) Harness clip |
| (2) Gasket | (6) Pitching stopper bracket |
| (3) Drain plug | (7) Oil level gauge |
| (4) Harness bracket | (8) Transmission radio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

Tightening torque: N·m (kgf-m, ft-lb)
T: 44 (4.5, 32.5) (Aluminum gasket, silver)
70 (7.1, 51.6) (Copper gasket, brown)
70 (7.1, 51.6) (Metal gasket, black)

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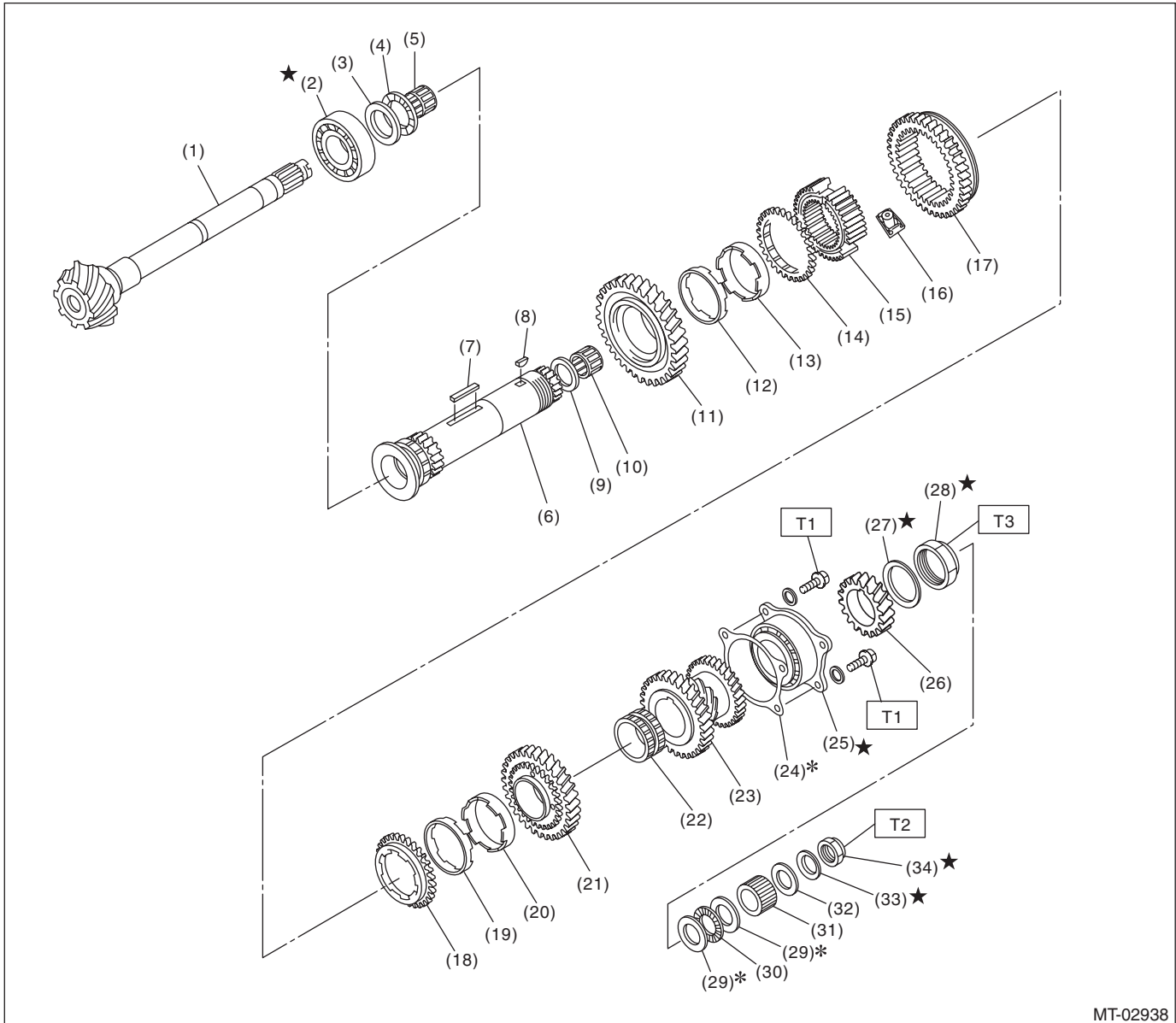
Transmission case tightening torque

 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)

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2. DRIVE PINION ASSEMBLY



MT-02938

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

Tightening torque: N·m (kgf-m, ft-lb)

T1: 30 (3.1, 22.1)

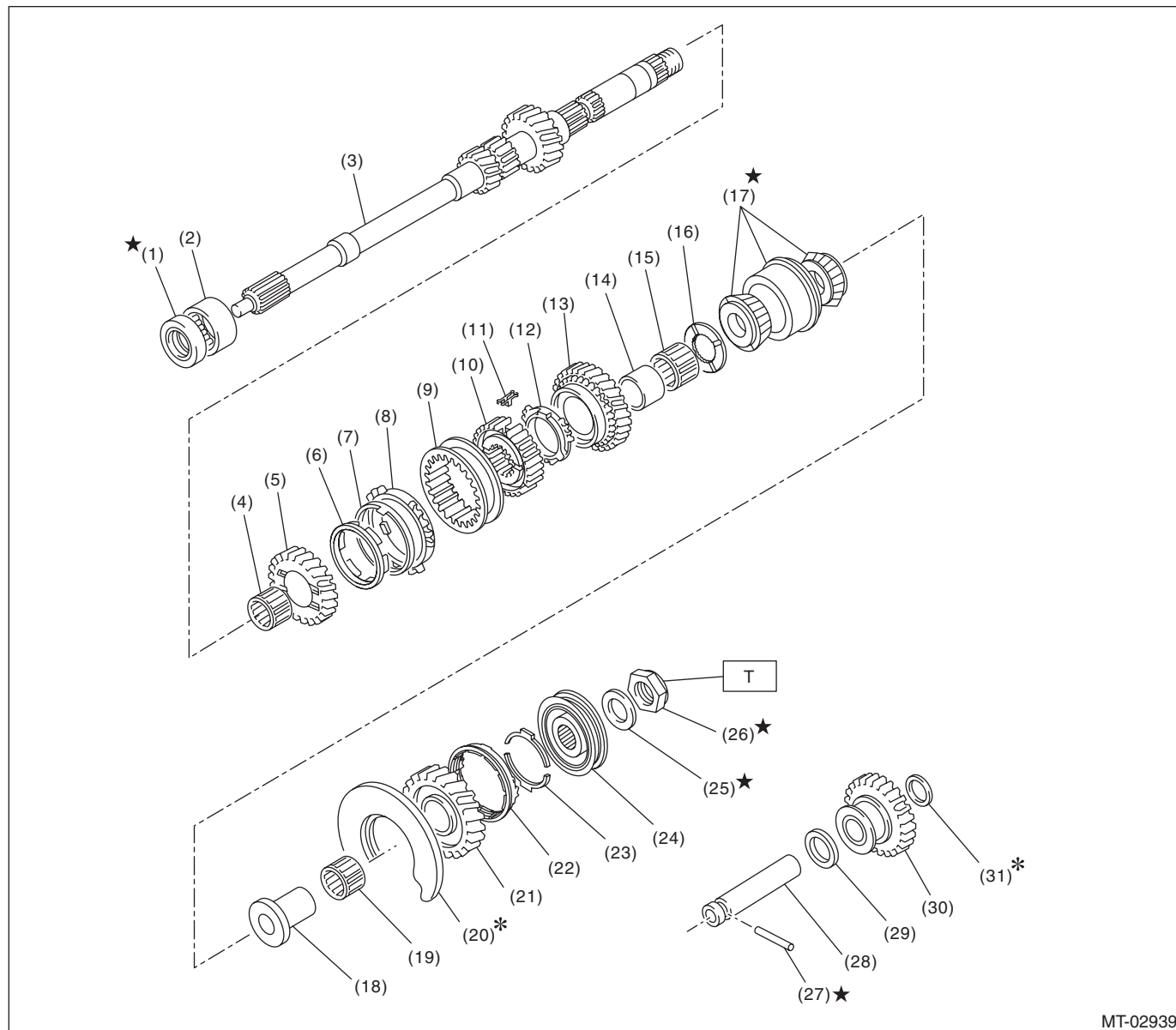
T2: 120 (12.2, 88.5)

T3: 260 (26.5, 191.8)

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3. MAIN SHAFT FOR SINGLE-RANGE



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

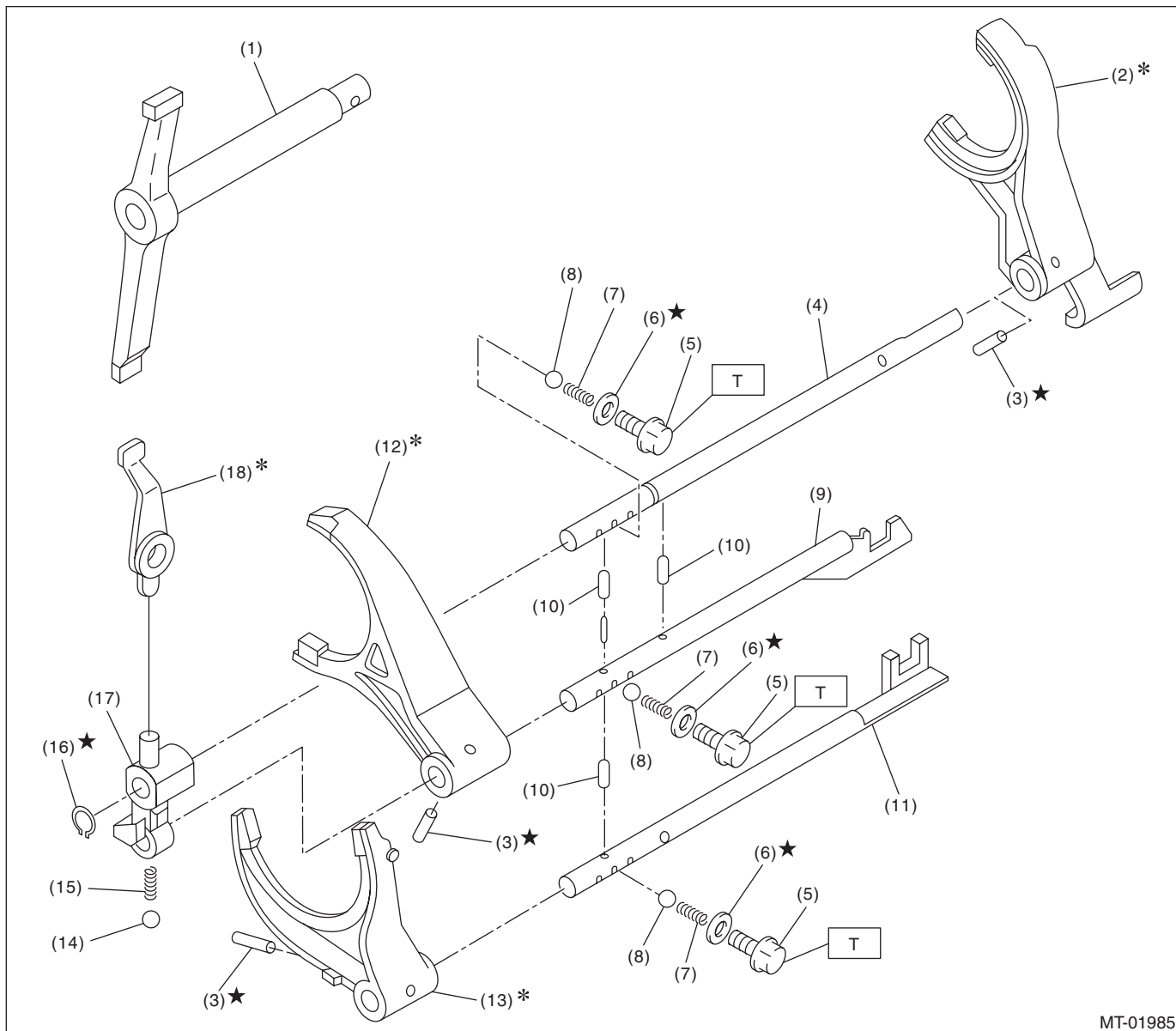
Tightening torque: N·m (kgf·m, ft·lb)

T: 120 (12.2, 88.5)

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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 | |

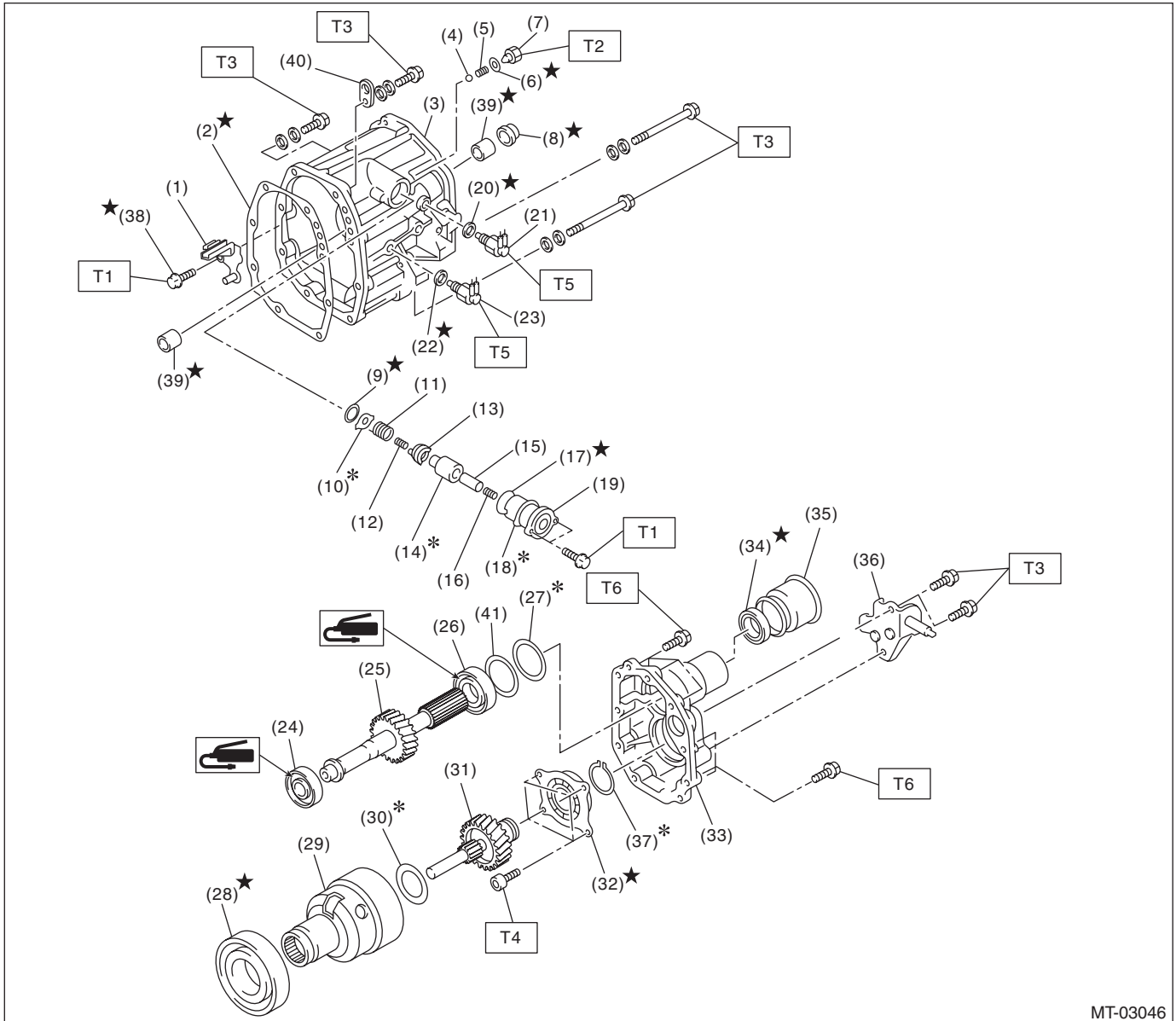
Tightening torque: N·m (kgf-m, ft-lb)

T: 20 (2.0, 14.8)

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5. TRANSFER CASE AND EXTENSION



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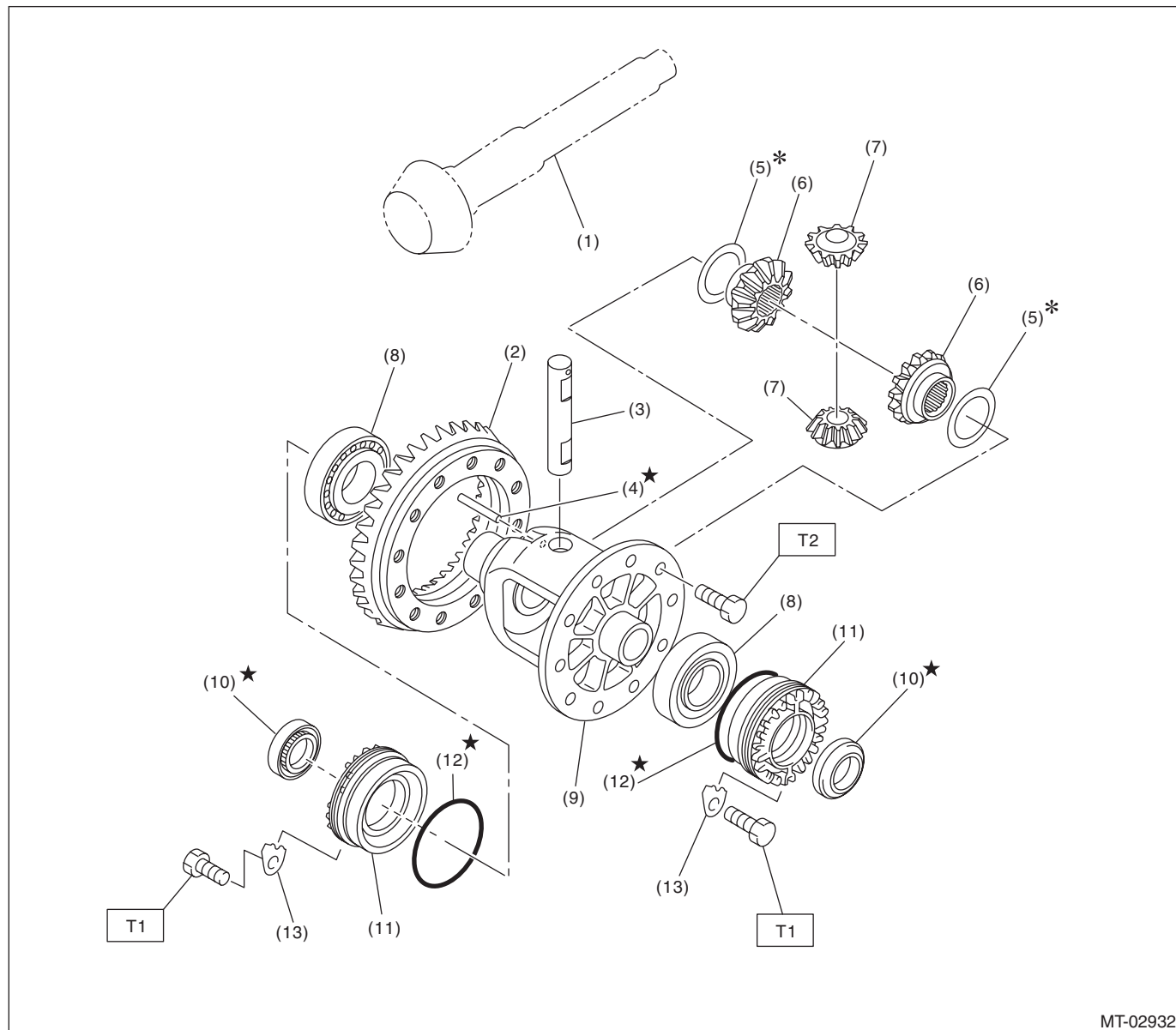
(1) Oil guide	(18) Adjusting select shim	(35) Dust cover
(2) Gasket	(19) Reverse check sleeve	(36) Shift bracket
(3) Transfer case	(20) Gasket	(37) Snap ring
(4) Ball	(21) Neutral position switch	(38) Precoat bolt
(5) Reverse accent spring	(22) Gasket	(39) Roller bearing
(6) Gasket	(23) Back-up light switch	(40) Transmission hanger
(7) Plug	(24) Roller bearing	(41) Dish plate
(8) Oil seal	(25) Transfer driven gear	
(9) Snap ring (inner)	(26) Roller bearing	
(10) Reverse check plate	(27) Adjusting washer	
(11) Reverse check spring	(28) Ball bearing	
(12) Reverse return spring	(29) Center differential	
(13) Reverse check cam	(30) Adjusting washer	
(14) Reverse accent shaft	(31) Transfer drive gear	
(15) Return spring cap	(32) Ball bearing	
(16) Return spring	(33) Extension case	
(17) O-ring	(34) Oil seal	

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)**

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6. FRONT DIFFERENTIAL



- (1) Drive pinion shaft
- (2) Hypoid driven gear
- (3) Pinion shaft
- (4) Straight pin
- (5) Adjusting 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)

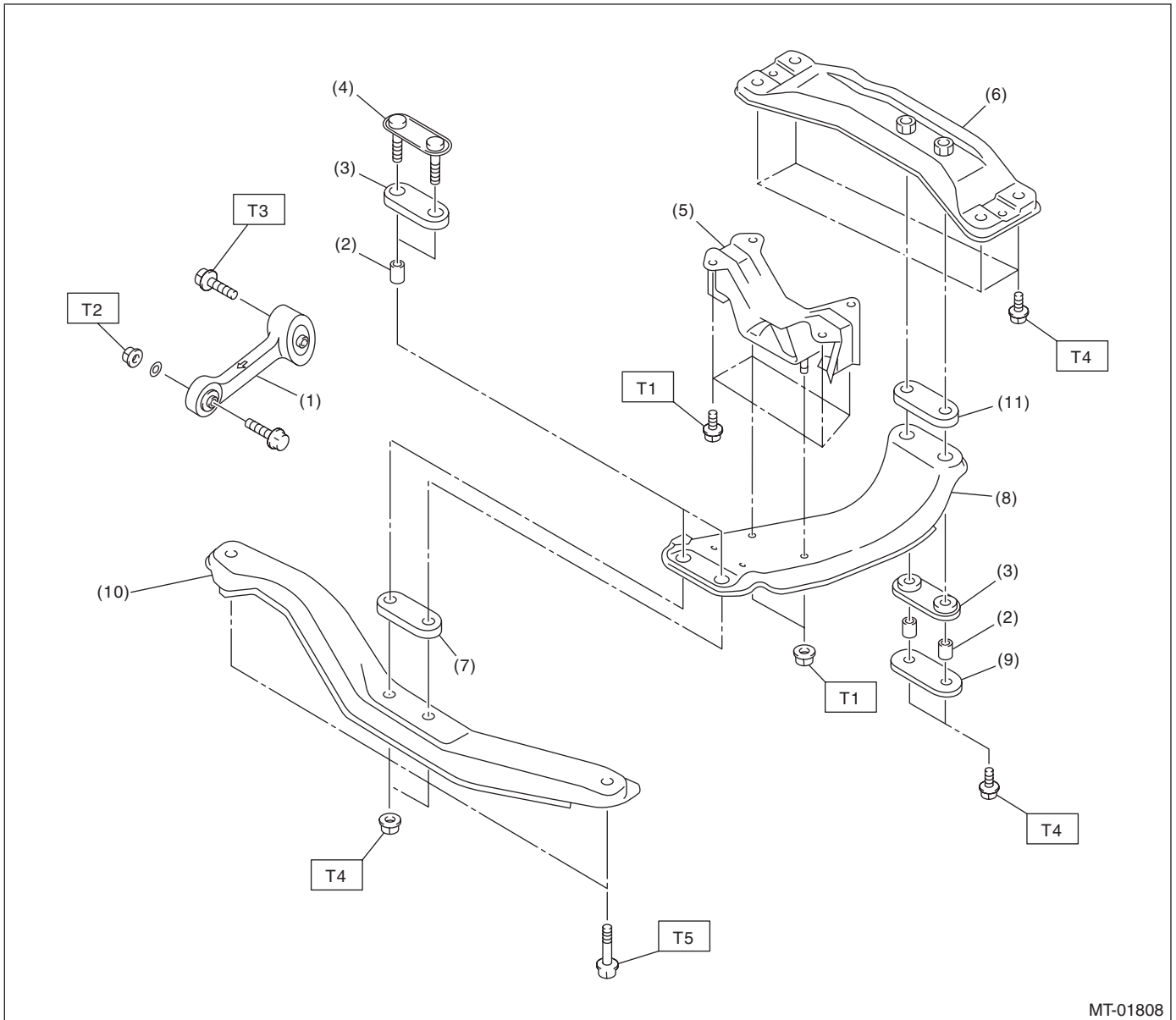
T1: 25 (2.5, 18.4)

T2: 62 (6.3, 45.7)

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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)

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C: CAUTION

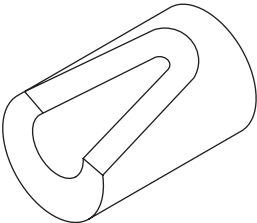
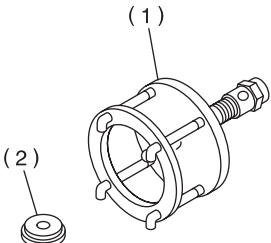
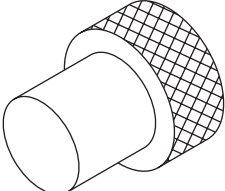
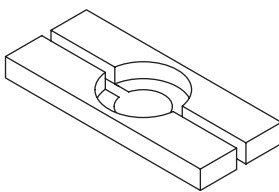
- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, 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.

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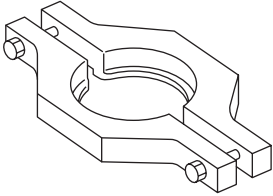
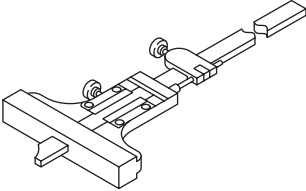
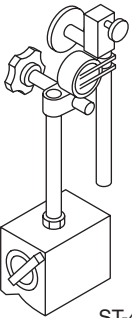
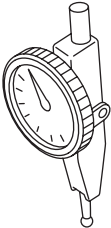
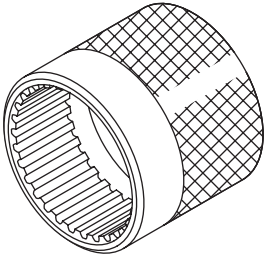
D: PREPARATION TOOL

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 front differential roller bearing. 1. PULLER 2. ADAPTER
 <p>ST-399780104</p>	399780104	WEIGHT	Used for measuring preload on the front differential 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 roller bearing of the transfer driven gear.

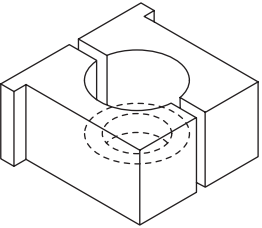
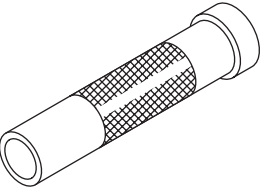
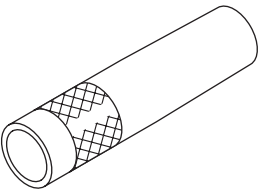
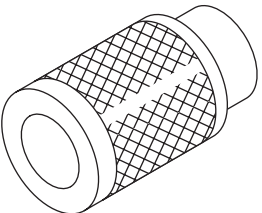
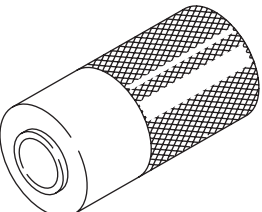
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498077300	498077300	CENTER DIFFERENTIAL BEARING REMOVER	Used for removing the center differential cover ball bearing.
 ST-498147001	498147001	DEPTH GAUGE	Used for adjusting the extension end play and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

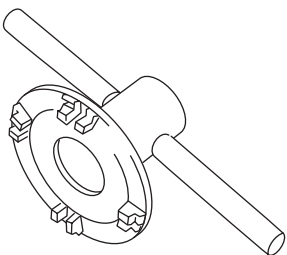
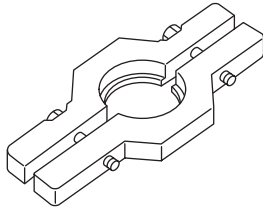
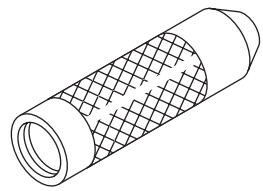
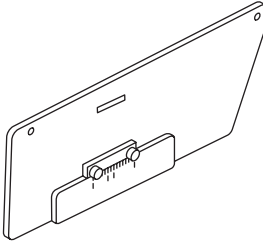
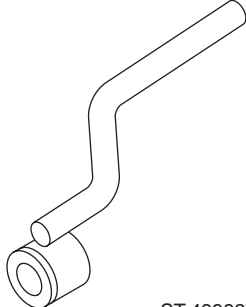
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498937000</p>	498937000	TRANSMISSION HOLDER	Used for removing and installing the main shaft lock nut.
 <p>ST-499277100</p>	499277100	BUSHING 1-2 INSTALLER	<ul style="list-style-type: none"> • Used for installing the front differential roller bearing inner race. • Used for installing drive pinion shaft washer.
 <p>ST-499277200</p>	499277200	INSTALLER	<ul style="list-style-type: none"> • Used for installing the 2nd driven gear bushing, 3rd-4th driven gear, roller bearing and 5th driven gear. • Used for installing drive pinion shaft washer.
 <p>ST-499757002</p>	499757002	INSTALLER	<ul style="list-style-type: none"> • Used for attaching the snap ring (outer 25). • Used for removing the roller bearing and driven gear of the drive pinion shaft.
 <p>ST-927640000</p>	927640000	INSTALLER	Used for installing the roller bearing (transfer case side) of transfer driven gear.

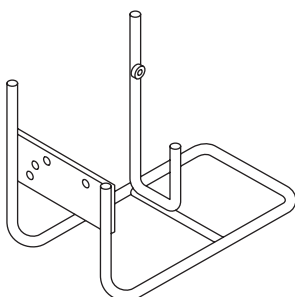
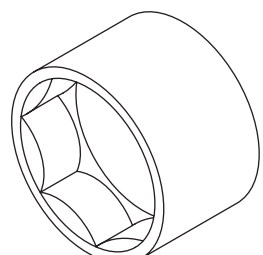
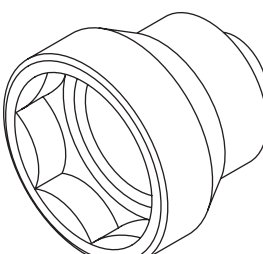
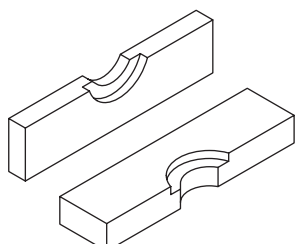
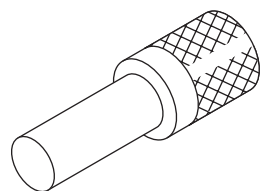
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18630AA010	18630AA010	WRENCH COMPL RETAINER	<ul style="list-style-type: none"> Used for removing and installing the differential side retainer. Used for backlash measurement of the front differential hypoid gear and preload adjustment of the roller bearing. WRENCH ASSY (499787000) can also be used.
 ST-499857000	499857000	5TH DRIVEN GEAR REMOVER	Used for removing the 5th driven gear.
 ST-499877000	499877000	RACE 4-5 INSTALLER	<ul style="list-style-type: none"> Used for installing the 4th drive gear needle bearing race, main shaft ball bearing and 5th drive gear thrust washer. Used together with REMOVER (899714110).
 ST-499917500	499917500	DRIVE PINION GAUGE ASSY	Used for adjusting the drive pinion shaft shim.
 ST-499927100	499927100	HANDLE	Used for backlash measurement of the front differential hypoid gear and preload adjustment of the roller bearing.

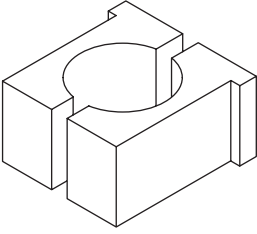
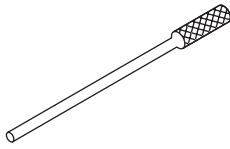
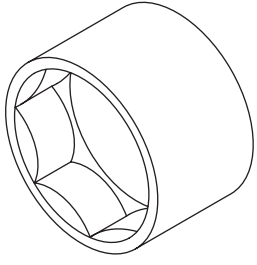
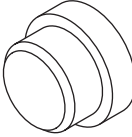
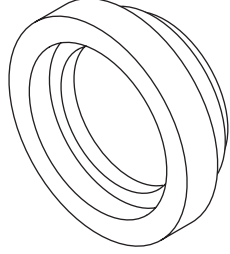
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 <p>ST-499937100</p>	499937100	TRANSMISSION STAND	Used for disassembling and assembling the transmission.
 <p>ST-499987003</p>	499987003	SOCKET WRENCH (35)	Used for removing and installing the driven pinion lock nut and main shaft lock nut.
 <p>ST-499987300</p>	499987300	SOCKET WRENCH (50)	Used for removing and installing the driven gear assembly lock nut.
 <p>ST-899714110</p>	899714110	REMOVER	Used for installing the transmission main shaft, drive pinion shaft and rear drive shaft.
 <p>ST-899864100</p>	899864100	REMOVER	<ul style="list-style-type: none"> • Used for removing transmission main shaft parts. • Used for installing the roller bearing of the transfer case. • Used for installing the roller bearing of transfer driven gear (extension case side). • Used for installing the roller bearing of transfer driven gear (transfer case side).

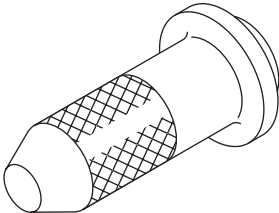
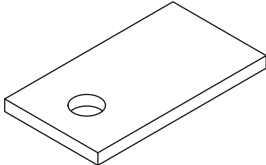
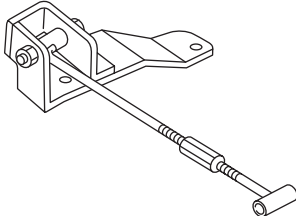
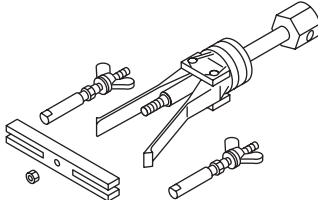
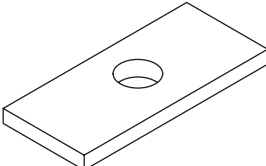
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 <p>ST-899884100</p>	899884100	HOLDER	<ul style="list-style-type: none"> Used for removing and installing the drive pinion shaft lock nut. Used for removing and installing the driven shaft lock nut. Used for measuring the starting torque of the drive pinion shaft.
 <p>ST-899904100</p>	899904100	STRAIGHT PIN REMOVER	Used for removing and installing the straight pin.
 <p>ST-899988608</p>	899988608	SOCKET WRENCH (27)	<ul style="list-style-type: none"> Used for removing and installing the drive pinion shaft lock nut. Used for measuring the starting torque of the drive pinion shaft.
 <p>ST-398497701</p>	398497701	ADAPTER	Used for installing the front differential roller bearing.
 <p>ST-499587000</p>	499587000	INSTALLER	Used for installing the driven shaft parts.

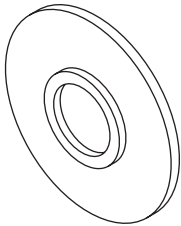
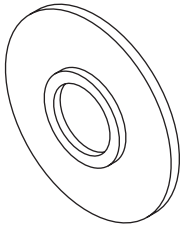
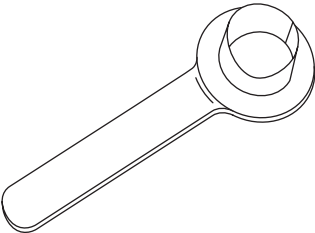
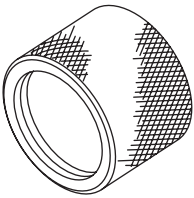
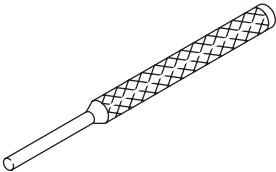
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498057300</p>	498057300	INSTALLER	Used for installing the extension oil seal.
 <p>ST-498255400</p>	498255400	PLATE	Used for adjusting the extension end play.
 <p>ST41099AC000</p>	41099AC000	ENGINE SUPPORT ASSY	Used for supporting engine.
 <p>ST-398527700</p>	398527700	PULLER ASSY	<ul style="list-style-type: none"> • Used for removing the extension oil seal. • Used for removing the bearing outer race and oil seal of front differential side retainer.
 <p>ST-398643600</p>	398643600	GAUGE	Used for adjusting the extension end play.

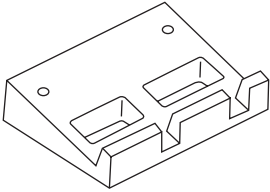
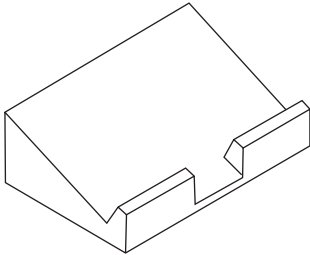
General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-398177700</p>	398177700	INSTALLER	Used for installing the ball bearing of the transfer drive gear.
 <p>ST-498175500</p>	498175500	INSTALLER	Used for installing the roller bearing of transfer driven gear (extension case side).
 <p>ST28399SA010</p>	28399SA010	OIL SEAL PROTECTOR	Used for protecting the oil seal from damage when inserting the front drive shaft.
 <p>ST18675AA000</p>	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing the differential side retainer oil seal.
 <p>ST-398791700</p>	398791700	STRAIGHT PIN REMOVER 2	Used for installing and removing the straight pin.

General Description

MANUAL TRANSMISSION AND DIFFERENTIAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498267200</p>	498267200	CYLINDER HEAD TABLE	Used for removing and installing the roller bearing of the transfer case.
 <p>ST-498267300</p>	498267300	CYLINDER HEAD TABLE	Used for removing and installing the roller bearing of the transfer case.

2. GENERAL TOOL

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