

CHASSIS 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.

FRONT SUSPENSION	FS
REAR SUSPENSION	RS
WHEEL AND TIRE SYSTEM	WT
DIFFERENTIALS	DI
TRANSFER CASE	TC
DRIVE SHAFT SYSTEM	DS
ABS	ABS
ABS (DIAGNOSTICS)	ABS(diag)
VEHICLE DYNAMICS CONTROL (VDC)	VDC
VEHICLE DYNAMICS CONTROL (VDC) (DIAGNOSTICS)	VDC(diag)
BRAKE	BR
PARKING BRAKE	PB
POWER ASSISTED SYSTEM (POWER STEERING)	PS

WHEEL AND TIRE SYSTEM

WT

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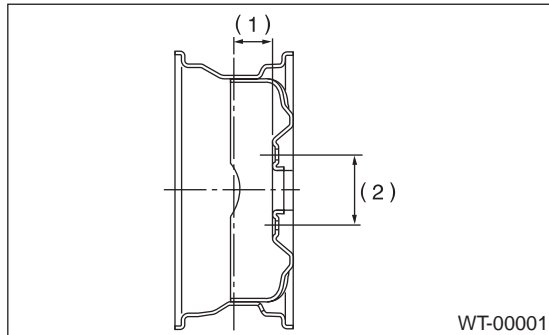
General Description

WHEEL AND TIRE SYSTEM

1. General Description

A: SPECIFICATION

1. WHEEL AND TIRE SIZE



- (1) Offset
(2) P.C.D.

Specification		Tire size	Wheel size	Offset mm (in)	P.C.D. mm (in)	Tire inflation pressure kPa (kgf/cm ² , psi)			
						Front wheel	Rear wheel		
Sedan	2.0 i, 2.5 i	205/55R16 89V	16 × 6 ¹ / ₂ JJ	55 (2.17)	100 (3.94)	220 (2.2, 32)	220 (2.2, 32)		
	2.5 i (OP)	215/45R17 87W	17 × 7JJ			230 (2.3, 33)	220 (2.2, 32)		
	2.5 i (KA model)	215/45R17 87W	17 × 7JJ			230 (2.3, 33)	220 (2.2, 32)		
	3.0 R	215/45R17 87W	17 × 7JJ			230 (2.3, 33)	220 (2.2, 32)		
	2.0 GT	215/45R17 87W	17 × 7JJ			230 (2.3, 33)	220 (2.2, 32)		
Wagon	2.0 i, 2.5 i	205/55R16 89V	16 × 6 ¹ / ₂ JJ			48 (1.89)	100 (3.94)	220 (2.2, 32)	220 (2.2, 32)
	2.5 i (OP)	215/45R17 87W	17 × 7JJ					230 (2.3, 33)	210 (2.1, 31)
	2.5 i (KA model)	215/45R17 87W	17 × 7JJ					230 (2.3, 33)	210 (2.1, 31)
	3.0 R	215/45R17 87W	17 × 7JJ					230 (2.3, 33)	210 (2.1, 31)
	2.0 GT	215/45R17 87W	17 × 7JJ					230 (2.3, 33)	210 (2.1, 31)
	OUTBACK 2.5 i	215/60R16 95V	16 × 6 ¹ / ₂ JJ	210 (2.1, 31)	200 (2.0, 29)				
	OUTBACK 3.0 R	215/55R17 94V	17 × 7JJ	210 (2.1, 31)	200 (2.0, 29)				
"T-type" Tire	2.0 GT, 3.0 R	T135/70D17 102M	17 × 4T	40 (1.57)	420 (4.2, 60)				
	2.0 i, 2.5 i	T135/80D16 101M	16 × 4T	50 (1.97)					

NOTE:

- Except for KA, KS model, "T-type" tire for temporary use is supplied as a spare tire.
- For KA, KS model, a spare tire of standard tire size is supplied.

General Description

2. SERVICE DATA

Part	Axial runout	Radial runout
Steel wheel	1.5 mm (0.059 in)	
Aluminum wheel	1.0 mm (0.039 in)	

3. ADJUSTING PARTS

Wheel balancing	Standard	Service limit
Dynamic unbalance	10 g (0.35 oz) or less	

Balance weight part number (Knock-on type weight for steel wheel)	Weight
28101TC000	5 g (0.18 oz)
28101SA060	10 g (0.35 oz)
28101SA070	15 g (0.53 oz)
28101SA080	20 g (0.71 oz)
28101SA090	25 g (0.88 oz)
723141340	30 g (1.06 oz)
723141350	35 g (1.23 oz)
723141360	40 g (1.41 oz)
723141370	45 g (1.59 oz)
723241380	50 g (1.76 oz)
723241580	55 g (1.94 oz)
723241590	60 g (2.12 oz)

Balance weight part number (Knock-on type weight for aluminum wheel)	Weight
28101SA000	5 g (0.18 oz)
28101SA010	10 g (0.35 oz)
28101SA020	15 g (0.53 oz)
28101SA030	20 g (0.71 oz)
28101SA040	25 g (0.88 oz)
23141GA512	30 g (1.06 oz)
23141GA522	35 g (1.23 oz)
23141GA532	40 g (1.41 oz)
23141GA542	45 g (1.59 oz)
23141GA552	50 g (1.76 oz)
—	55 g (1.94 oz)
23141GA572	60 g (2.12 oz)

Balance weight part number (Adhesive type weight for aluminum wheel)	Weight
28101AG000	5 g (0.18 oz)
28101AG010	7.5 g (0.26 oz)
28101AG020	10 g (0.35 oz)
28101AG030	12.5 g (0.44 oz)
28101AG040	15 g (0.53 oz)
28101AG050	17.5 g (0.62 oz)
28101AG060	20 g (0.71 oz)
28101AG070	22.5 g (0.79 oz)
28101AG080	25 g (0.88 oz)
28101AG090	27.5 g (0.97 oz)
28101AG100	30 g (1.06 oz)
28101AG110	32.5 g (1.15 oz)
28101AG120	35 g (1.23 oz)
28101AG130	37.5 g (1.32 oz)
28101AG140	40 g (1.41 oz)
28101AG150	42.5 g (1.50 oz)
28101AG160	45 g (1.59 oz)
28101AG170	47.5 g (1.68 oz)
28101AG180	50 g (1.76 oz)
28101AG190	52.5 g (1.85 oz)
28101AG200	55 g (1.94 oz)
28101AG210	57.5 g (2.03 oz)
28101AG220	60 g (2.12 oz)
28101AG230	62.5 g (2.20 oz)
28101AG240	65 g (2.29 oz)
28101AG250	67.5 g (2.38 oz)
28101AG260	70 g (2.47 oz)
28101AG270	72.5 g (2.56 oz)
28101AG280	75 g (2.65 oz)
28101AG290	77.5 g (2.73 oz)
28101AG300	80 g (2.82 oz)
28101AG310	82.5 g (2.91 oz)
28101AG320	85 g (3.00 oz)
28101AG330	87.5 g (3.09 oz)
28101AG340	90 g (3.17 oz)
28101AG350	92.5 g (3.26 oz)
28101AG360	95 g (3.35 oz)
28101AG370	97.5 g (3.44 oz)
28101AG380	100 g (3.53 oz)

B: PREPARATION TOOL

1. GENERAL TOOL

TOOL NAME	REMARKS
Air pressure gauge	Used for measuring tire inflation pressure.
Dial gauge with magnet stand	Used for measuring wheel runout.
Wheel balancer	Used for adjusting wheel balance.

2. Tire

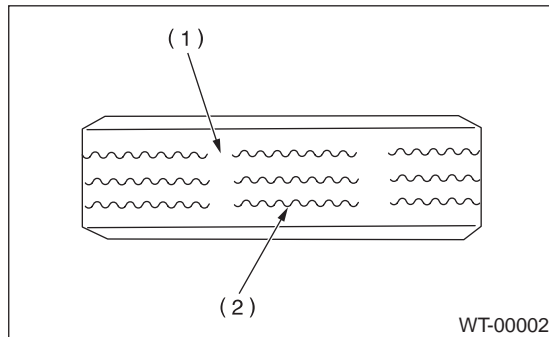
A: INSPECTION

- 1) Take stones, glass, nails etc. out of the tread groove.
- 2) Replace the tire if as follows.

CAUTION:

When replacing a tire, make sure to use only the same size, construction and load range as originally installed.

- (1) When large crack on side wall, damage or crack on tread is found.
- (2) When the "tread wear indicator" appears as a solid band across the tread.

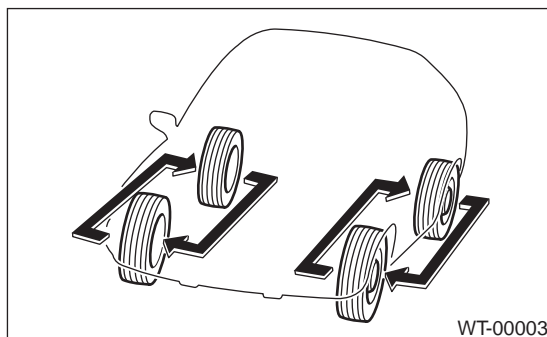


- (1) Tread wear indicator
- (2) Tire tread

- 3) When a crack on tire valve is found, replace the tire valve.

1. TIRE ROTATION

Rotate tires periodically (5,000 km/3,100 miles) as shown in the figure, in order to prevent them from uneven wear and to prolong their life.



3. Steel Wheel

A: REMOVAL

- 1) Apply the parking brake, and position the select lever to "P" or "LOW".
- 2) Set the shop jacks or a lift to specified point, and support the vehicle with its wheels slightly contacting the floor.
- 3) Loosen the wheel nuts.
- 4) Raise the vehicle until its wheels take off the ground using a jack or a lift.
- 5) Remove the wheel nuts and wheels.

NOTE:

- When removing the wheels, prevent hub bolts from damage.
- Place the wheels with their outer sides facing upward to prevent wheels from damage.

B: INSTALLATION

- 1) Remove dirt from the mating surface of wheel and brake rotor.
- 2) Attach the wheel to the hub by aligning the wheel bolt hole with the hub bolt.
- 3) Temporarily attach the wheel nuts to the hub bolts. (In the case of aluminum wheel, use SUBARU genuine wheel nut for aluminum wheel.)
- 4) Manually tighten the nuts making sure the wheel hub hole is aligned correctly to the guide portion of hub.
- 5) Tighten the wheel nuts in a diagonal selection to the specified torque. Use a wheel nut wrench.

Wheel nut tightening torque:

90 N·m (9.1 kgf·m, 65.7 ft·lb)

CAUTION:

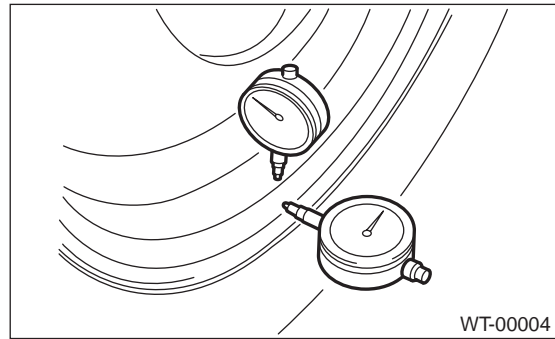
- Tighten the wheel nuts in two or three steps by gradually increasing the torque and working diagonally, until they reach the specified torque.
- Do not depress the wrench with foot. Always use both hands when tightening.
- Make sure the bolt, nut and the nut seating surface of the wheel are free from oil.

- 6) If a wheel is removed for replacement or for repair of a puncture, retighten the wheel nuts to the specified torque after running 1,000 km (600 miles).

C: INSPECTION

- 1) Deformation or damage on the rim may cause air leakage. Check the rim flange for deformation, crack or damage, and repair or replace as necessary.
- 2) Jack-up the vehicle until wheels clear the floor.

- 3) Slowly rotate the wheel to check rim "runout" using a dial gauge.

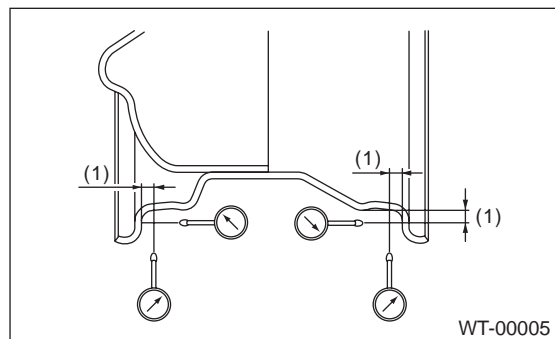


WT-00004

Rim runout:

Axial runout limit	Radial runout limit
1.5 mm (0.059 in)	

- 4) If the rim runout exceeds specifications, remove the tire from wheel and check runout while attaching the dial gauge to positions shown in the figure.



WT-00005

(1) Approx. 7 mm (0.28 in)

- 5) If the measured runout still exceeds specifications, replace the wheel.

4. Aluminum Wheel

A: REMOVAL

Refer to “Steel Wheel” for removal procedure of aluminum wheels. <Ref. to WT-5, REMOVAL, Steel Wheel.>

B: INSTALLATION

Refer to “Steel Wheel” for installation procedure of aluminum wheels. <Ref. to WT-5, INSTALLATION, Steel Wheel.>

C: INSPECTION

Refer to “Steel Wheel” for inspection procedure of aluminum wheels. <Ref. to WT-5, INSPECTION, Steel Wheel.>

Rim runout:

Axial runout limit	Radial runout limit
1.0 mm (0.039 in)	

D: CAUTION

Aluminum wheels are easily scratched. To maintain their appearance and safety, do the followings:

- 1) Do not damage the aluminum wheels during removal, installation, wheel balancing, etc. After removing the aluminum wheels, place them on a rubber mat, etc.
- 2) While driving the vehicle, be careful not to ride over sharp obstacles or allow aluminum wheels to contact the shoulder of the road.
- 3) When installing a tire chain, be sure to install it properly not to have slack, otherwise it may hit the wheel while driving.
- 4) When washing the aluminum wheel, use neutral synthetic detergent and water. Avoid using the cleanser including abrasive, hard brushes or an automatic car washer.

5. Wheel Balancing

A: ADJUSTMENT

NOTE:

Change the setting of wheel balancer to adhesive type weight as adhesive type weight is adopted for outside balance weight of 17-inch wheel.

1) Remove the balance weights.

CAUTION:

- Be careful not to damage the wheel.
- Completely remove the two-sided tape of the adhesive type weight from the wheel.

2) Using the wheel balancer, measure the wheel balance.

3) Select a weight close to the value measured by wheel balancer.

CAUTION:

Use SUBARU genuine balance weight.

Balance weight part number (Knock-on type weight for steel wheel)	Weight
28101TC000	5 g (0.18 oz)
28101SA060	10 g (0.35 oz)
28101SA070	15 g (0.53 oz)
28101SA080	20 g (0.71 oz)
28101SA090	25 g (0.88 oz)
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723141350	35 g (1.23 oz)
723141360	40 g (1.41 oz)
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28101AG280	75 g (2.65 oz)
28101AG290	77.5 g (2.73 oz)
28101AG300	80 g (2.82 oz)
28101AG310	82.5 g (2.91 oz)
28101AG320	85 g (3.00 oz)
28101AG330	87.5 g (3.09 oz)
28101AG340	90 g (3.17 oz)
28101AG350	92.5 g (3.26 oz)
28101AG360	95 g (3.35 oz)
28101AG370	97.5 g (3.44 oz)
28101AG380	100 g (3.53 oz)

4) Install the selected weight to the point designated by wheel balancer.

CAUTION:

- Remove grease from adhesive type weight applying surface of wheel.
- Press the adhesive type weight by 25 N (2.5 kgf, 5.6 lb) or more per 5 g (0.18 oz) for 2 seconds at least to attain close contact.
- Make all amounts of the applied adhesive type weight to be 100 g (3.53 oz) or less.

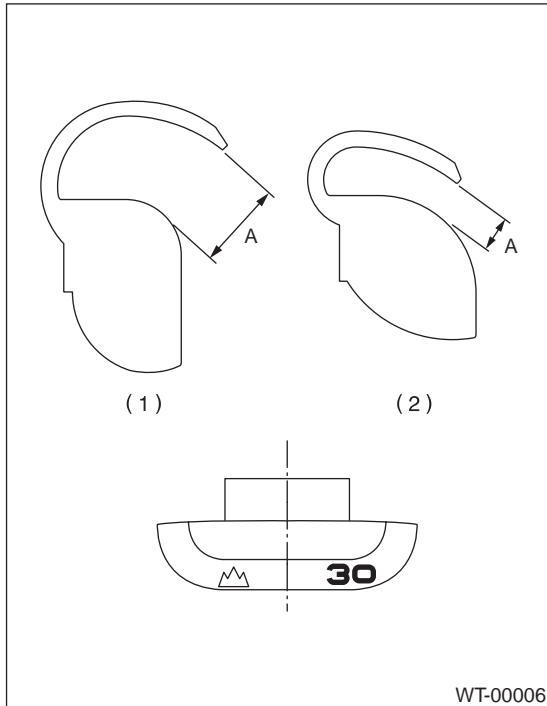
Wheel Balancing

WHEEL AND TIRE SYSTEM

5) Using the wheel balancer, measure the wheel balance again. Check that wheel balance is correctly adjusted.

NOTE:

- 55 g (1.94 oz) knock-on type weight used with aluminum wheel is not available.
- Balance weights of knock-on type weight for aluminum wheel are available for use with any of 15- to 17-inch aluminum wheels.



- (1) Knock-on type weight for aluminum wheel
(2) Knock-on type weight for steel wheel

Service limit: A

Knock-on type weight for steel wheel:

5 — 25 g (0.18 — 0.88 oz) 2.0 mm (0.08 in)

30 g (1.06 oz) or more 1.8 mm (0.07 in)

Knock-on type weight for aluminum wheel:

5 — 25 g (0.18 — 0.88 oz) 5.0 mm (0.20 in)

30 g (1.06 oz) or more 4.5 mm (0.177 in)

6. “T-type” Tire

A: NOTE

“T-type” tire for temporary use is prepared as a spare tire. (Except for KA, KS model)

CAUTION:

- Do not use a tire chain with the “T-type” tire. Because of the smaller tire size, a tire chain will not fit properly and will result in damage to the vehicle and the tire.
- Do not drive at a speed greater than 100 km/h (62 MPH).
- Drive as slowly as possible and avoid passing over bumps.

B: REPLACEMENT

Refer to “Steel Wheel” for installation procedure of “T-type” tire. <Ref. to WT-5, REMOVAL, Steel Wheel.>

CAUTION:

Replace with a conventional tire as soon as possible since the “T-type” tire is only for temporary use.

C: INSPECTION

1) Check the tire air pressure.

Specifications:

420 kPa (4.2 kg/cm², 60 psi)

- 2) Take the stones, glass, nails, etc. out of the tread groove.
- 3) Check the tires for deformation, cracks, partial wear or wear.

CAUTION:

Replace the tire with a new one if defective.

General Diagnostic Table

WHEEL AND TIRE SYSTEM

7. General Diagnostic Table

A: INSPECTION

Symptom	Possible cause	Corrective action
Wheel wobble.	Improperly inflated tire.	Adjust the tire pressure.
	Uneven wear	Check the tire referring to Abnormal tire wear in this table, carry out the procedure and replace the tire.
	Front wheel alignment	Check the front wheel alignments. <Ref. to FS-8, INSPECTION, Wheel Alignment.>
	Rear wheel alignment	Check the rear wheel alignments. <Ref. to RS-8, INSPECTION, Wheel Alignment.>
	Front strut	Check the front strut. <Ref. to FS-24, INSPECTION, Front Strut.>
	Rear shock absorber	Check the rear shock absorber. <Ref. to RS-16, INSPECTION, Rear Shock Absorber.>
	Front axle	Check the front axle. <Ref. to DS-15, INSPECTION, Front Axle.>
	Front hub unit bearing	Check the front hub unit bearing. <Ref. to DS-18, INSPECTION, Front Hub Unit Bearing.>
	Rear hub unit bearing	Check the rear hub unit bearing. <Ref. to DS-21, INSPECTION, Rear Hub Unit Bearing.>
Vehicle is abnormally out of balance.	Improperly inflated tire.	Adjust the tire pressure.
	Uneven wear	Check the tire referring to Abnormal tire wear in this table, carry out the procedure and replace the tire.
	Front stabilizer	Check the front stabilizer. <Ref. to FS-16, INSPECTION, Front Stabilizer.>
	Front wheel alignment	Check the front wheel alignments. <Ref. to FS-8, INSPECTION, Wheel Alignment.>
	Rear wheel alignment	Check the rear wheel alignments. <Ref. to RS-8, INSPECTION, Wheel Alignment.>
Abnormal wheel vibration	Improperly inflated tire.	Adjust the tire pressure.
	Uneven wear	Check the tire referring to Abnormal tire wear in this table, carry out the procedure and replace the tire.
	Improper wheel balancing	Check the wheel balance. <Ref. to WT-7, ADJUSTMENT, Wheel Balancing.>
	Front axle	Check the front axle. <Ref. to DS-15, INSPECTION, Front Axle.>
	Front hub unit bearing	Check the front hub unit bearing. <Ref. to DS-18, INSPECTION, Front Hub Unit Bearing.>
	Rear hub unit bearing	Check the rear hub unit bearing. <Ref. to DS-21, INSPECTION, Rear Hub Unit Bearing.>

General Diagnostic Table

WHEEL AND TIRE SYSTEM

Symptom	Possible cause	Corrective action
Abnormal tire wear	Improperly inflated tire.	Adjust the tire pressure.
	Improper wheel balancing	Check the wheel balance. <Ref. to WT-7, ADJUSTMENT, Wheel Balancing.>
	Front wheel alignment	Check the front wheel alignments. <Ref. to FS-8, INSPECTION, Wheel Alignment.>
	Rear wheel alignment	Check the rear wheel alignments. <Ref. to RS-8, INSPECTION, Wheel Alignment.>

General Diagnostic Table

WHEEL AND TIRE SYSTEM
