Specifications

Item		Specification	
Master cylinder	Type	Tandem	
	Cylinder I.D.	23.81mm (0.94in)	
	Piston stroke	43±1mm (1.69±0.039in)	
	Fluid level switch	Provided	
Brake booster	Type	7" + 8" Tandem	
	Boosting ratio	9 : 1	
Front Disc brake	Caliper Type	General Disc Brake	Brembo Disc Brake
	Type	Ventilated disc	Ventilated disc
	Disc O.D	320mm(12.60in)	340mm(13.39in)
	Disc thickness	28mm(1.10in)	28mm(1.10in)
	Caliper piston	Single	4piston
	Cylinder I.D	Φ60mm(2.36in)	Φ(42mm+42mm(1.65in+1.65in))X2
Rear Disc brake	Caliper Type	General Disc Brake	Brembo Disc Brake
	Type	Solid disc	Ventilated disc
	Disc O.D	314mm(12.36in)	330mm(12.99in)
	Disc thickness	13mm(0.51in)	20mm(0.79in)
	Caliper piston	Single	4piston
	Cylinder I.D	Φ42.9mm(1.69in)	Φ(32mm+28mm(1.26in+1.10in))X2
Parking brake	Type	DIH (Drum in hat)	
	Drum I.D.	Ø 190mm (7.48in)	

NOTE

O.D. : Outer Diameter
I.D : Inner Diameter

Specification(ABS)

Part	Item	Standard value	Remark
HECU	System	4 Channel 4 Sensor (Solenoid)	
	Type	Motor, valve relay intergrated type	
	Operating Voltage	10 ~ 16 V	
	Operating Temperature	-40 ~ 120 °C (-40 ~ 248°F)	
	Motor power	210 W	
Warning lamp	Min. operating Voltage	12V	
	Max. Current consumption	Max. 200mA	
	Supply voltage	DC 4.5 ~ 20V	
	Output current low	5.9 ~ 8.4mA	

Active Wheel speed sensor (ABS)	Output current high	11.8~ 16.8mA	
	Output range	1 ~ 2500 Hz	
	Tone wheel	Front : 46 teeth Rear : 47 teeth	
	Air gap	0.5 ~ 1.5 mm	

Specification (ESC)

Part	Item	Standard value	Remark
HECU	System	4 Channel 4 Sensor (Solenoid)	Total control (ABS, EBD, TCS, ESC)
	Type	Motor, valve relay intergrated type	
	Operating Voltage	10 ~ 16V	
	Operating Temperature	-40 ~ 120°C(-40 ~ 248°F)	
	Motor power	270W	
Warning lamp	Min. Operating Voltage	12V	
	Max. Current consumption	Max. 200mA	
Active Wheel speed sensor	Supply voltage	DC 4.5 ~ 20V	
	Output current low	5.9 ~ 8.4mA	
	Output current high	11.8~ 16.8mA	
	Output range	1 ~ 2500Hz	
	Tone wheel	Front : 46 teeth Rear : 47 teeth	
	Air gap	0.5 ~ 1.5mm	
Steering Wheel Angle Sensor	Operating Voltage	8 ~ 16V	
	Current consumption	Max. 100mA	
	Output measurement range	-780 ~ +799.9°	
	Operating Angular velocity	1500°/sec	
Yaw rate& Lateral G sensor (CAN TYPE)	Operating Voltage	8 V ~ 17V	
	Current Consumption	Max. 140mA	
	Yaw rate sensor measurement range	-75 ~ 75°/sec	
	Lateral G sensor measurement range	-1.5 ~ 1.5gN	

Service Standard

Items	Standard vale
Brake pedal stroke	AT : 132.1mm (5.20in) MT : 132.9mm (5.23in)
Stop lamp clearance	1.0 ~ 1.5mm (0.04 ~ 0.06in)
Brake pedal free play	3 ~ 8 mm (0.12 ~ 0.13in)
Parking brake lever stroke when lever assembly is pulled with 196N (20Kg, 44lb force)	5 Notch

Front brake disc	disc thickness	General	28mm(1.10in)
		Brembo	28mm(1.10in)
	pad thickness	General	11mm(0.43in)
		Brembo	8.5mm(0.33in)
Rear brake disc	disc thickness	General	13mm(0.51in)
		Brembo	20mm(0.79in)
	pad thickness	General	9mm(0.35in)
		Brembo	9.1mm(0.36in)

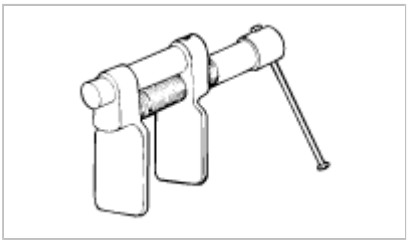
Tightening Torques

Items		N.m	kgf.m	lb-ft
Master cylinder to brake booster		12.7 ~ 16.7	1.3 ~ 1.7	9.4 ~ 12.3
Brake booster mounting nuts		12.7 ~ 15.7	1.3 ~ 1.6	9.4 ~ 11.6
Air bleeding screw	General	6.9 ~ 12.7	0.7 ~ 1.3	5.1 ~ 9.4
	Brembo	16.7 ~ 19.6	1.7 ~ 2.0	12.3 ~ 14.5
Brake tube flare nuts		12.7 ~ 16.7	1.3 ~ 1.7	9.4 ~ 12.3
Front caliper guide rod bolts		21.6 ~ 31.4	2.2 ~ 3.2	15.9 ~ 23.1
Rear caliper guide rod bolts		21.6 ~ 31.4	2.2 ~ 3.2	15.9 ~ 23.1
Front caliper assembly to knuckle	General	78.5 ~ 98.1	8.0 ~ 10.0	57.9 ~ 72.3
	Brembo	88.3 ~ 103.0	9.0 ~ 10.5	65.1 ~ 75.9
Rear caliper assembly to knuckle		78.5 ~ 98.1	8.0 ~ 10.0	57.9 ~ 72.3
Brake hose to caliper		24.5 ~ 29.4	2.5 ~ 3.0	18.1 ~ 21.7
Brake pedal member bracket bolts		12.7 ~ 15.7	1.3 ~ 1.6	9.4 ~ 11.6
Brake pedal shaft nut		8.8 ~ 13.7	0.9 ~ 1.4	6.5 ~ 10.1
Stop lamp switch lock nut		7.8 ~ 9.8	0.8 ~ 1.0	5.8 ~ 7.2
Wheel speed sensor mounting bolt		6.9 ~ 10.8	0.7 ~ 1.1	5.1 ~ 8.0
HECU bracket mounting bolt		16.7 ~ 25.5	1.7 ~ 2.6	12.3 ~ 18.8
Yaw rate&G sensor mounting bolts		7.8 ~ 10.8	0.8 ~ 1.1	5.8 ~ 8.0

Lubricants

Items	Recommended	Quantity
Brake fluid	DOT 3 or DOT 4	As required
Brake pedal bushing and bolt	Chassis grease	As required
Parking brake shoe and backing plate contacting surface	Heat resistance grease	As required
Front caliper guide rod and boot	AI-11P	1.2 ~ 1.7g
Rear caliper guide rod and boot	AI-11P	0.8 ~ 1.3g

Special Service Tools

Tool (Number and Name)	Illustration	Use
09581-11000 Piston expander		Spreading the front disc brake piston

Troubleshooting

Problem Symptoms Table

Use the table below to help you find the cause of theproblem. The numbers indicate the priority of the likecause of the problem. Check each part in order.
If necessary, replace these parts.

Symptom	Suspect Area	Reference
Lower pedal or spongy pedal	1. Brake system (Fluid leaks) 2. Brake system (Air in) 3. Piston seals (Worn or damaged) 4. Rear brake shoe clearance(Out of adjustment) 5. Master cylinder (Inoperative)	repair air·bleed replace adjust replace
Brake drag	1. Brake pedal free play (Minimum) 2. Parking brake lever travel (Out of adjustment) 3. Parking brake wire (Sticking) 4. Rear brake shoe clearance(Out of adjustment) 5. Pad or lining (Cracked or distorted) 6. Piston (Stuck) 7. Piston (Frozen) 8. Anchor or Return spring (Inoperative) 9. Booster system (Vacuum leaks) 10. Master cylinder (Inoperative)	adjust adjust repair adjust replace replace replace replace repair replace
Brake pull	1. Piston (Sticking) 2. Pad or lining (Oily) 3. Piston (Frozen) 4. Disc (Scored) 5. Pad or lining (Cracked or distorted)	replace replace replace replace replace
Hard pedal but brake inefficient	1. Brake system (Fluid leaks) 2. Brake system (Air in) 3. Pad or lining (Worn) 4. Pad or lining (Cracked or distorted) 5. Rear brake shoe clearance(Out of adjustment) 6. Pad or lining (Oily) 7. Pad or lining (Glazed) 8. Disc (Scored) 9. Booster system (Vacuum leaks)	repair air·bleed replace replace adjust adjust replace replace repair
Noise from brake	1. Pad or lining (Cracked or distorted) 2. Installation bolt (Loosen) 3. Disc (Scored) 4. Sliding pin (Worn) 5. Pad or lining (Dirty) 6. Pad or lining (Glazed) 7. Anchor or Return spring (Faulty) 8. Brake pad shim (Damage) 9. Shoe hold-down spring (Damage)	replace adjust replace replace clean replace replace replace replace
Brake fades	1. master cylinder	replace
Brake vibration, pulsation	1. brake booster 2. pedal free play 3. master cylinder 4. caliper	replace adjust replace replace

	5. master cylinder cap seal 6. damaged brake lines	replace replace
Brake Chatter	Brake chatter is usually caused by loose or worn components, or glazed or burnt linings. Rotors with hard spots can also contribute to brake chatter. Additional causes of chatter are out-of-tolerance rotors, brake lining not securely attached to the shoes, loose wheel bearings and contaminated brake lining.	