

BRAKE SYSTEM

SECTION **BR**

MODIFICATION NOTICE:

- The vacuum pump for diesel engines has been changed.
- The anti-lock brake system has been changed.
- The service data and specifications (SDS) have been changed.
- The components of CL22VD and CL22VE front disc brake models for Europe have been introduced.

CONTENTS

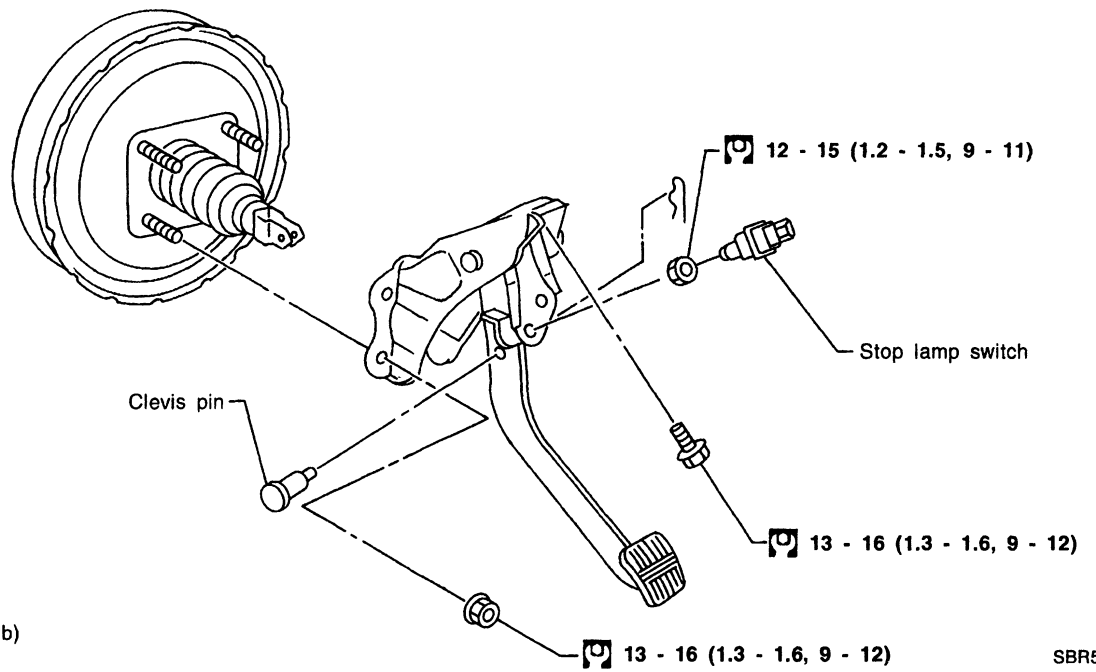
BRAKE PEDAL AND BRACKET	2	Installation	5
Removal and Installation	2	Inspection	5
VACUUM PIPING	3	FRONT DISC BRAKE	6
Removal and Installation	3	ANTI-LOCK BRAKE SYSTEM	7
VACUUM PUMP (Diesel engine model)	4	Wiring Diagram — ABS —	7
Removal and Installation	4	SERVICE DATA AND SPECIFICATIONS (SDS)	14
Removal	4	General Specifications	14

BR

BRAKE PEDAL AND BRACKET

Removal and Installation

SEC. 465



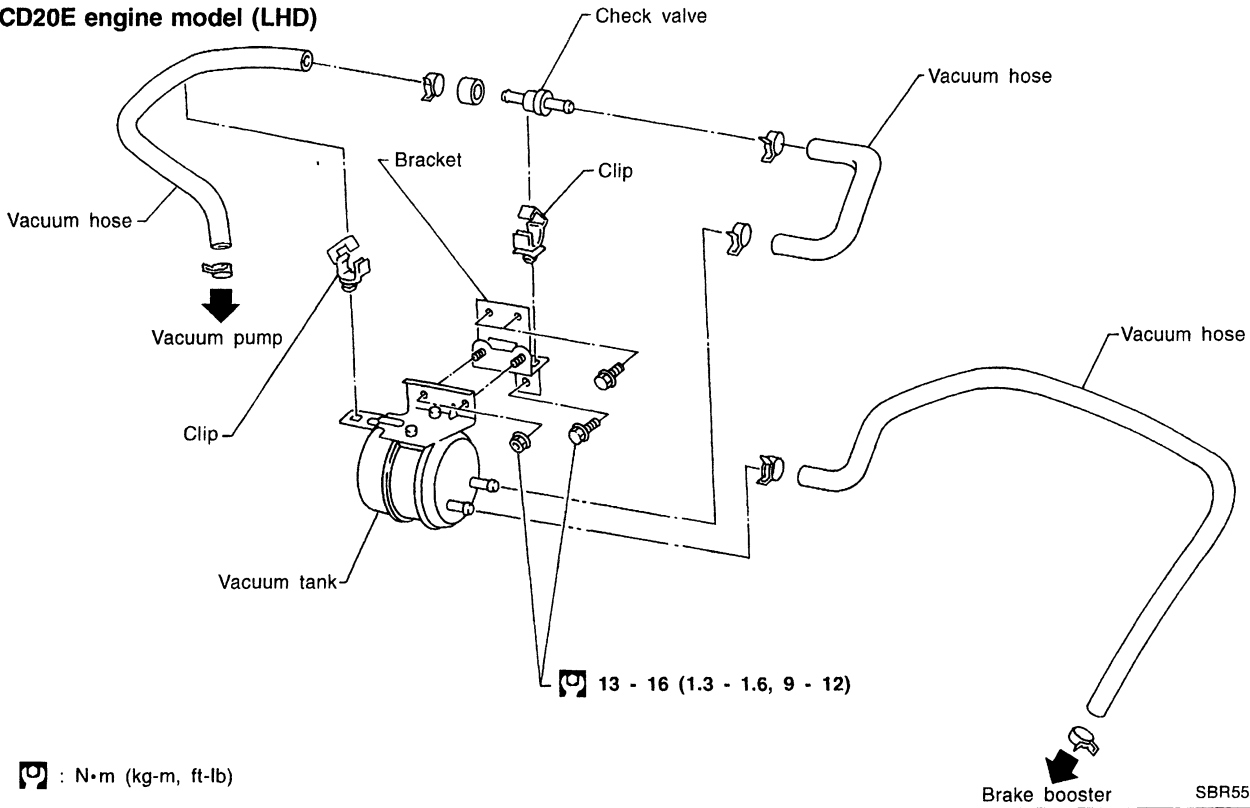
SBR552D

VACUUM PIPING

Removal and Installation

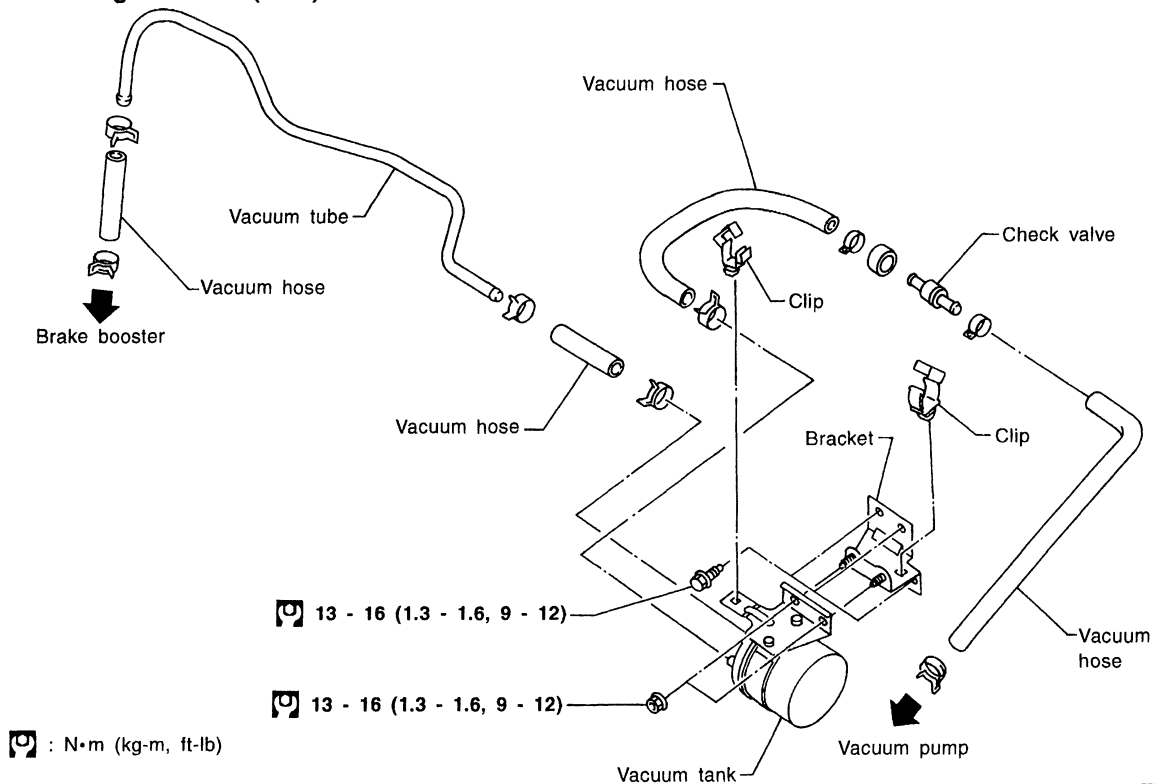
SEC. 470

CD20E engine model (LHD)



SEC. 470

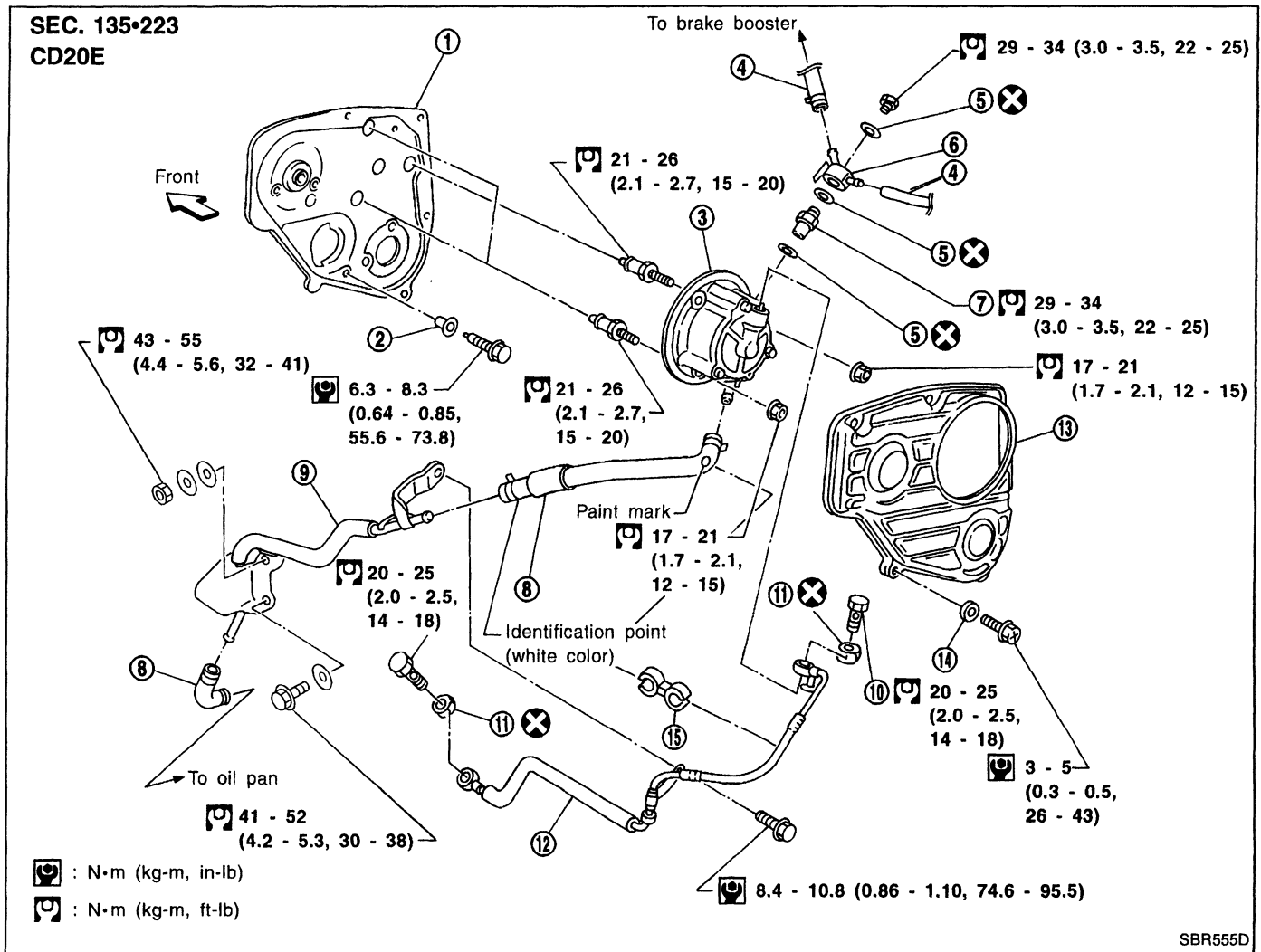
CD20E engine model (RHD)



BR

VACUUM PUMP (Diesel engine model)

Removal and Installation



- ① Rear back cover
- ② Collar
- ③ Vacuum pump
- ④ Vacuum hose
- ⑤ Copper washer

- ⑥ Connector
- ⑦ Check valve
- ⑧ Oil return hose
- ⑨ Oil return tube
- ⑩ Eye bolt

- ⑪ Gasket
- ⑫ Oil feed tube
- ⑬ Belt cover
- ⑭ Grommet
- ⑮ Clip

Removal

1. Remove upper air cleaner case, air duct (located between air cleaner case and intake manifold collector) and rear resonator.
2. Remove vacuum hose, oil feed hose and oil return hose from vacuum pump.
3. Remove connector.
 - Mark vacuum pump body and connector to align during reassembly.
4. Remove water pipe securing bolts located under the fuel injection pump timing belt cover. Then remove water pipe.
5. Remove belt cover.
 - For subsequent part removal procedures required to remove vacuum pump, refer to EM section ("Injection Pump Timing Belt").

VACUUM PUMP (Diesel engine model)

Removal (Cont'd)

- Before removing oil feed tube and return tube, remove front exhaust tube assembly.

Installation

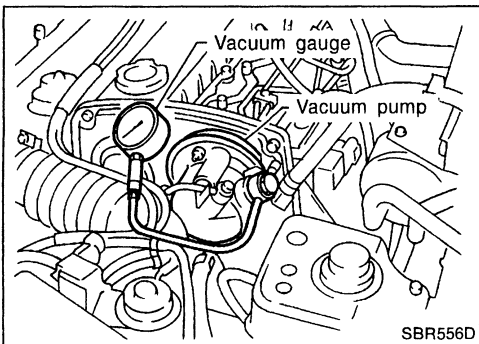
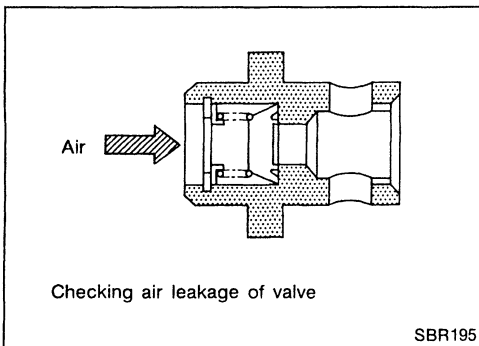
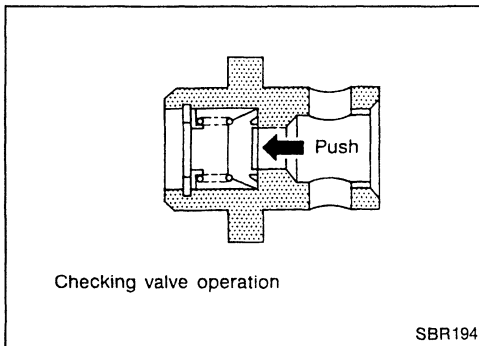
- To install parts, reverse the removal procedures.
- Align alignment mark on connector with that on vacuum pump body, then install connector to vacuum pump. Note direction of connector during installation.

Inspection

CHECK VALVE

1. Check valve operation. Check that valve operates smoothly when slightly pushed. Replace if necessary.
2. Check for air leakage with 98 to 490 kPa (1.0 to 4.9 bar, 1 to 5 kg/cm², 14 to 71 psi) of air pressure. Replace if necessary.

BR



VACUUM

1. Remove vacuum hose and connect a vacuum gauge to it.
2. Check vacuum pressure produced by vacuum pump at idle.

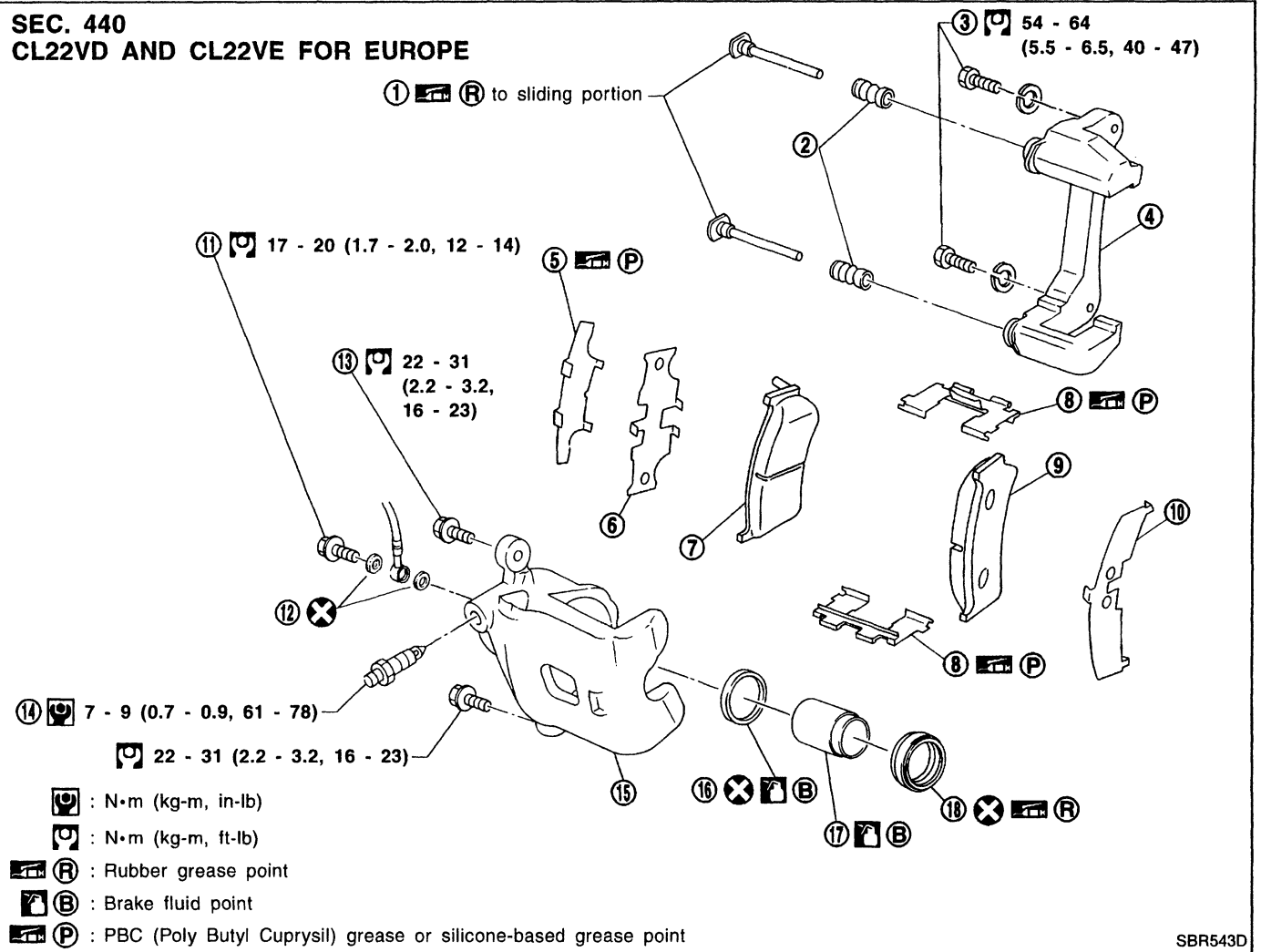
Specification:

More than -93.3 kPa (-933 mbar, -700 mmHg, -27.56 inHg)/800 rpm

If vacuum pressure is outside specification, check for air drawn into vacuum line. Repair if necessary. Check vacuum pressure again. If it is still outside specification, replace vacuum pump with a new one.

FRONT DISC BRAKE

SEC. 440 CL22VD AND CL22VE FOR EUROPE



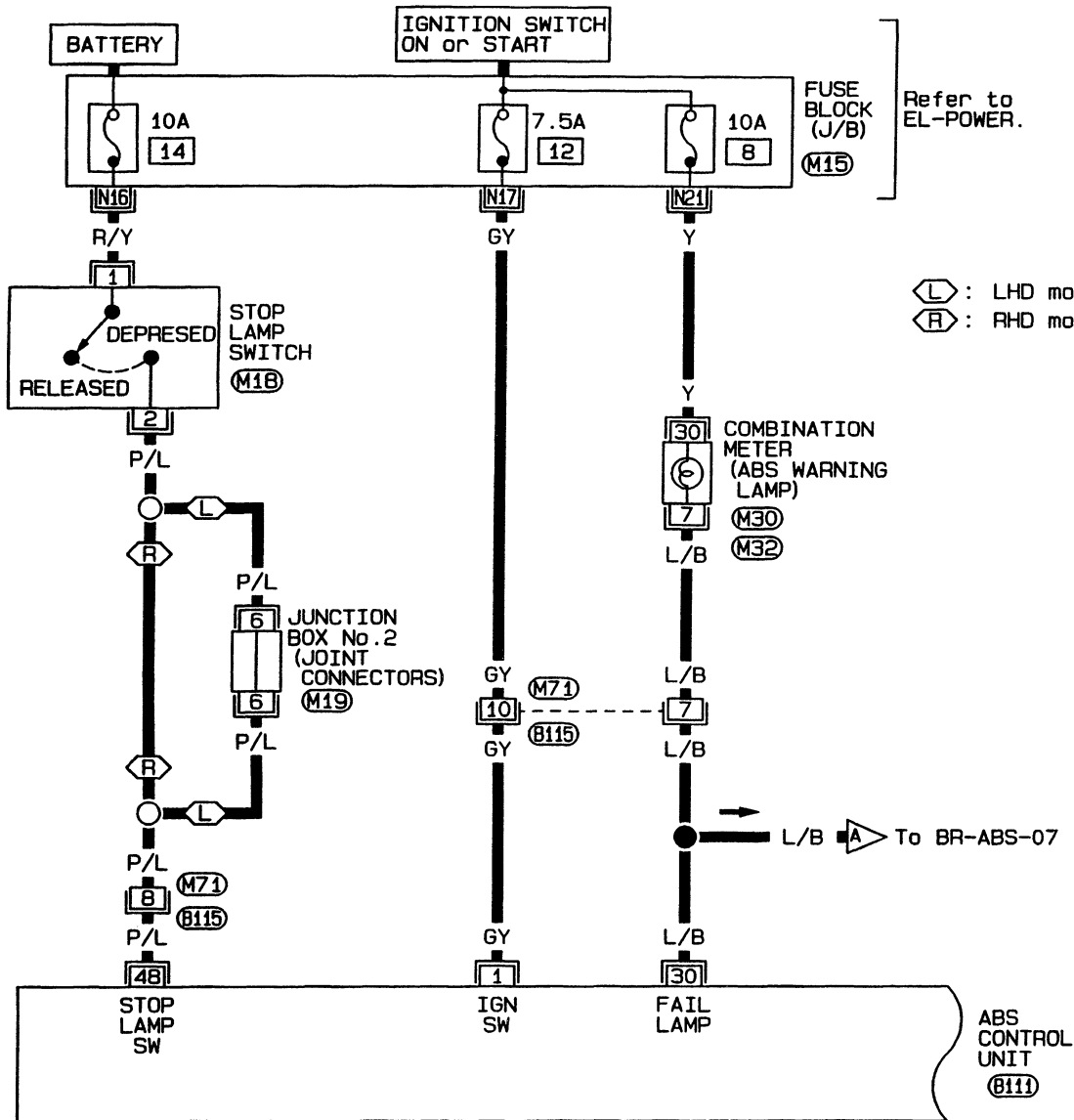
SBR543D

- | | | |
|-----------------------------|-------------------|-----------------|
| ① Main pin | ⑦ Inner pad | ⑬ Main pin bolt |
| ② Pin boot | ⑧ Pad retainer | ⑭ Bleed valve |
| ③ Torque member fixing bolt | ⑨ Outer pad | ⑮ Cylinder body |
| ④ Torque member | ⑩ Outer shim | ⑯ Piston seal |
| ⑤ Shim cover | ⑪ Connecting bolt | ⑰ Piston |
| ⑥ Inner shim | ⑫ Copper washer | ⑱ Piston boot |

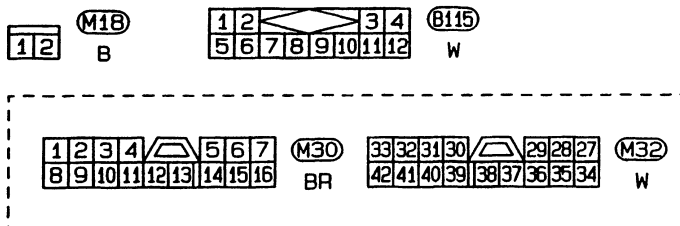
ANTI-LOCK BRAKE SYSTEM

Wiring Diagram — ABS —

BR-ABS-01



BR



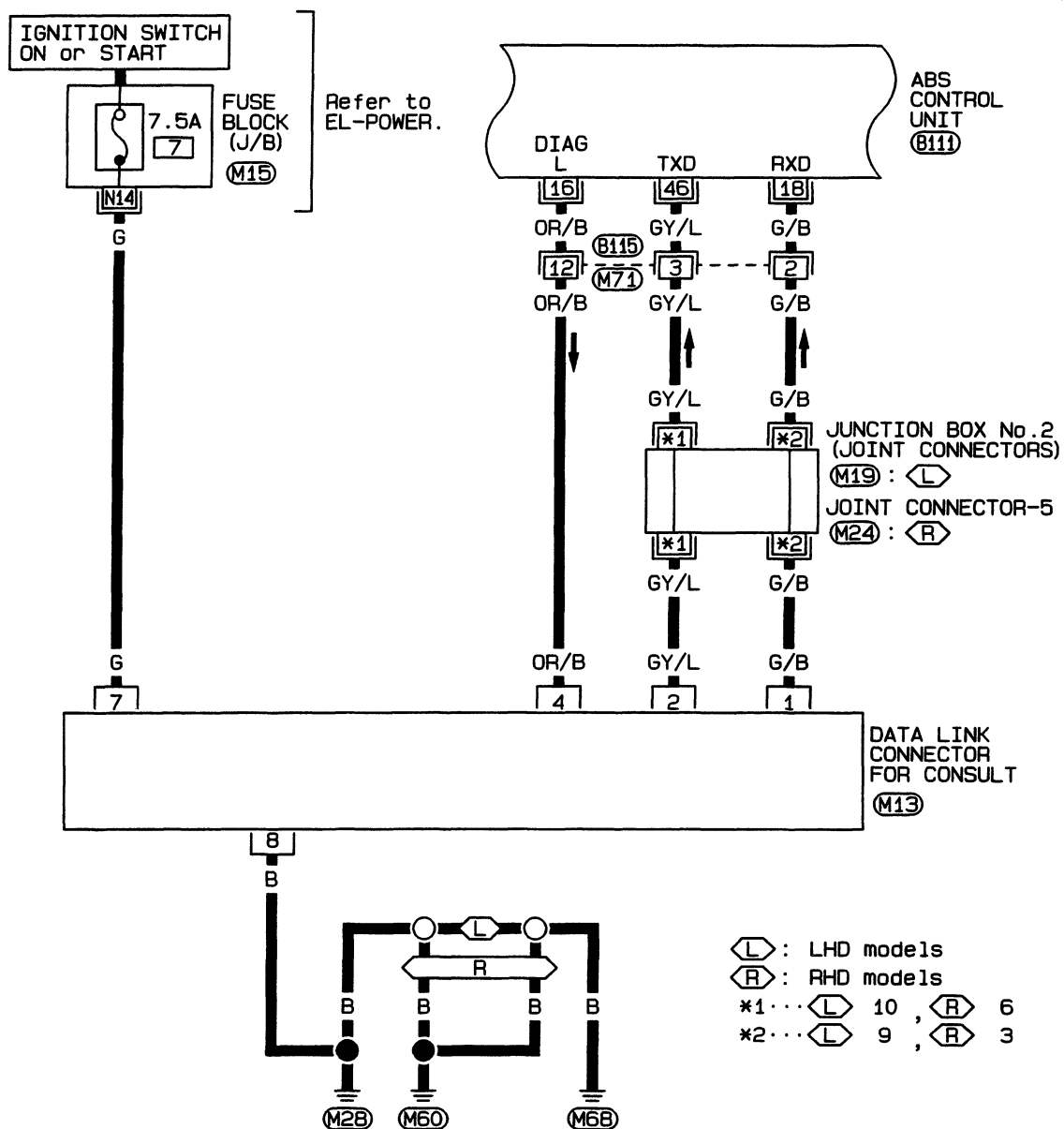
Refer to last page
(Foldout page).

(M15)
(M19)
(811)

ANTI-LOCK BRAKE SYSTEM

Wiring Diagram — ABS — (Cont'd)

BR-ABS-02



1	2	3	4	5	6	7	(M13)
8	9	10	11	12	13	14	GY

1	2	3	4	(B115)
5	6	7	8	W

1	1	1	2	2	2	3	3	3	(M24)
4	4	4	5	5	5	6	6	6	OR

Refer to last page
(Foldout page).

(M15)

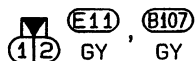
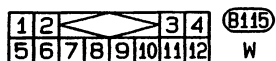
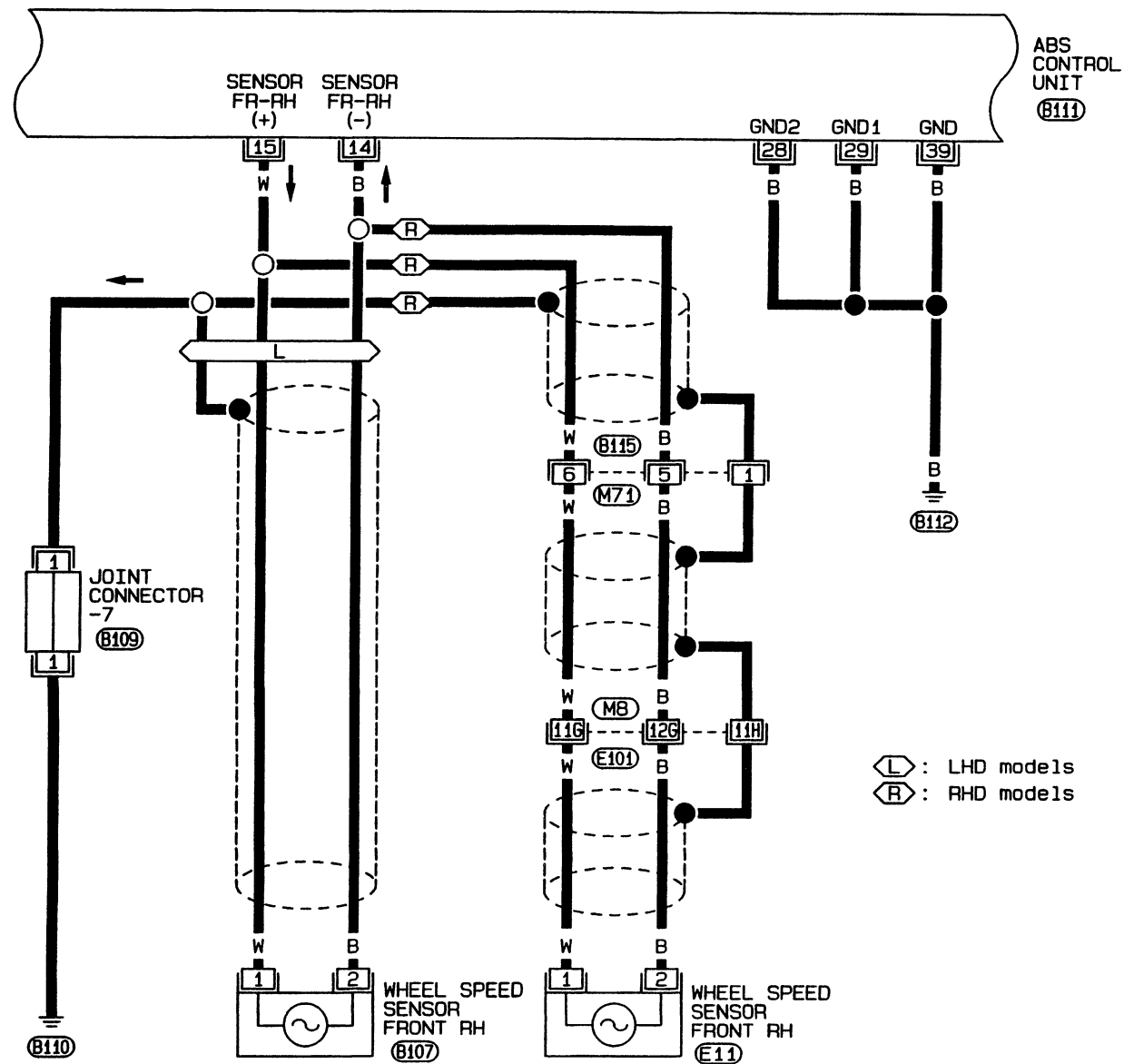
(M19)

(B11)

ANTI-LOCK BRAKE SYSTEM

Wiring Diagram — ABS — (Cont'd)

BR-ABS-03



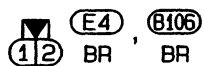
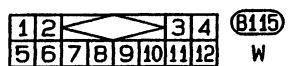
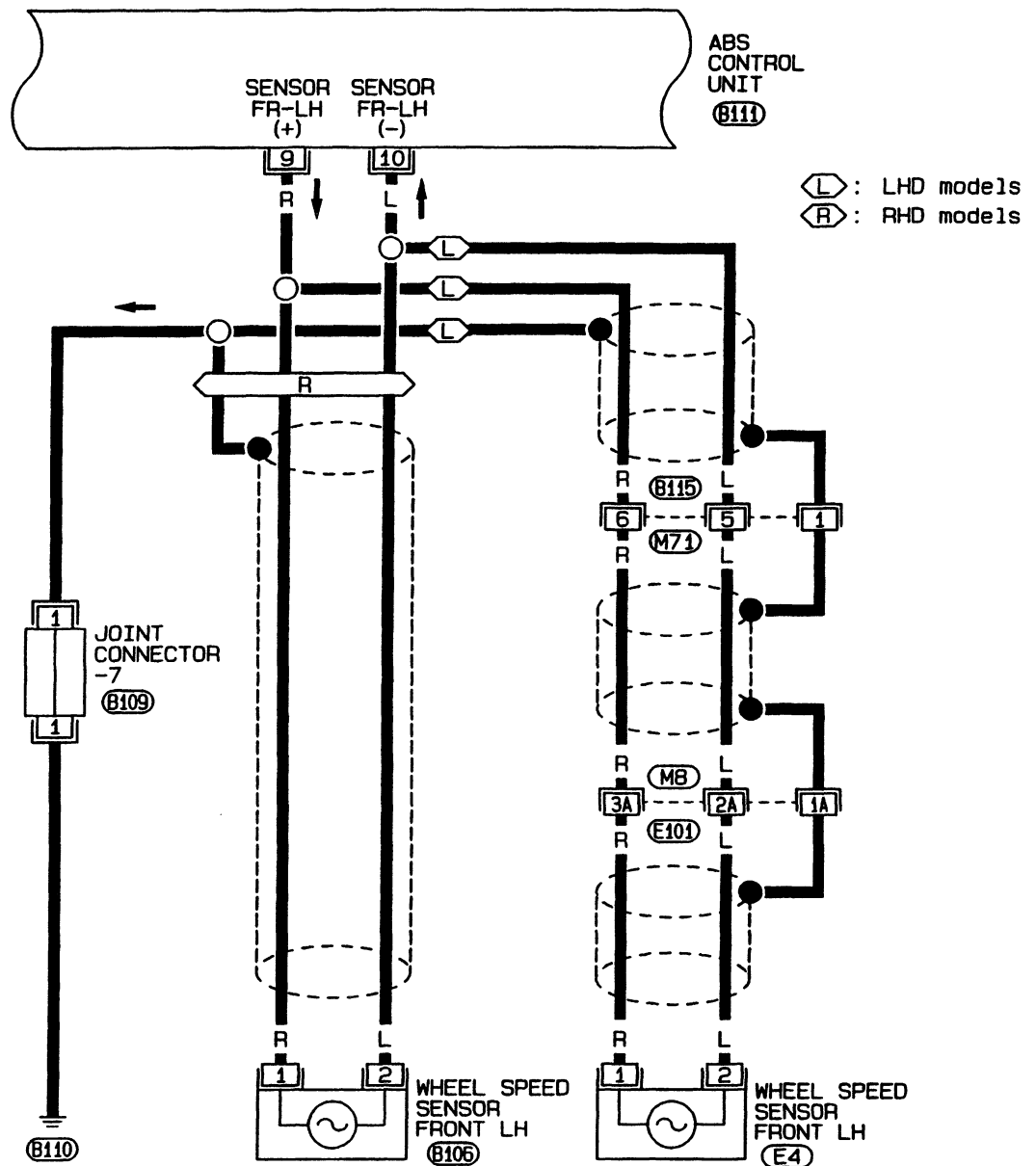
Refer to last page (Foldout page).

(M8), (E101)
(B111)

ANTI-LOCK BRAKE SYSTEM

Wiring Diagram — ABS — (Cont'd)

BR-ABS-04

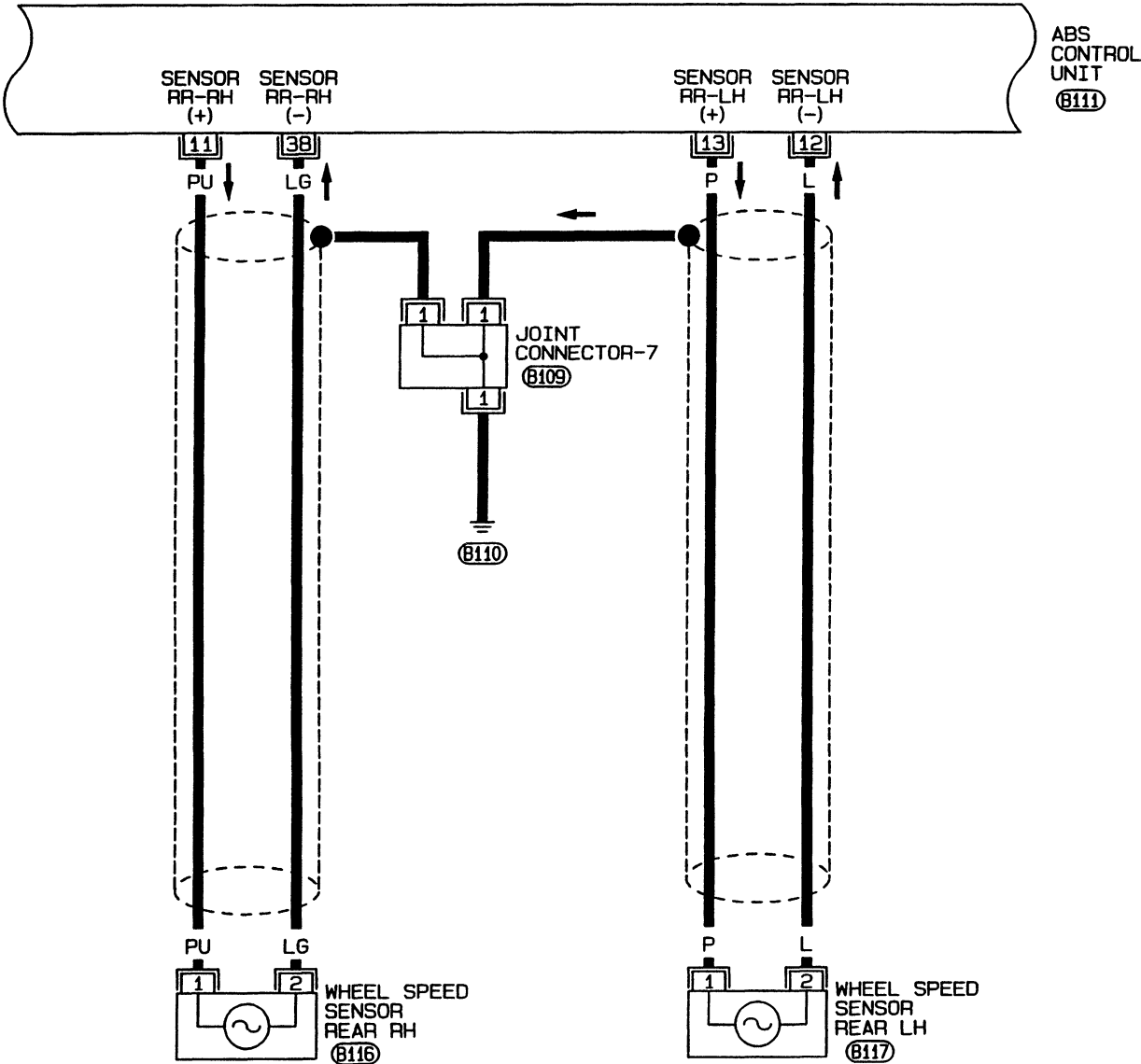


Refer to last page (Foldout page).

(MB), (E101)
(B111)

ANTI-LOCK BRAKE SYSTEM
Wiring Diagram — ABS — (Cont'd)

BR-ABS-05



12 8116 8117
GY BR

111111 8109
GY

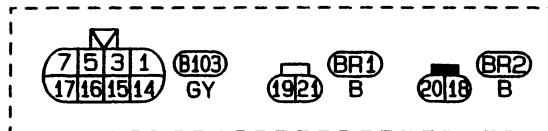
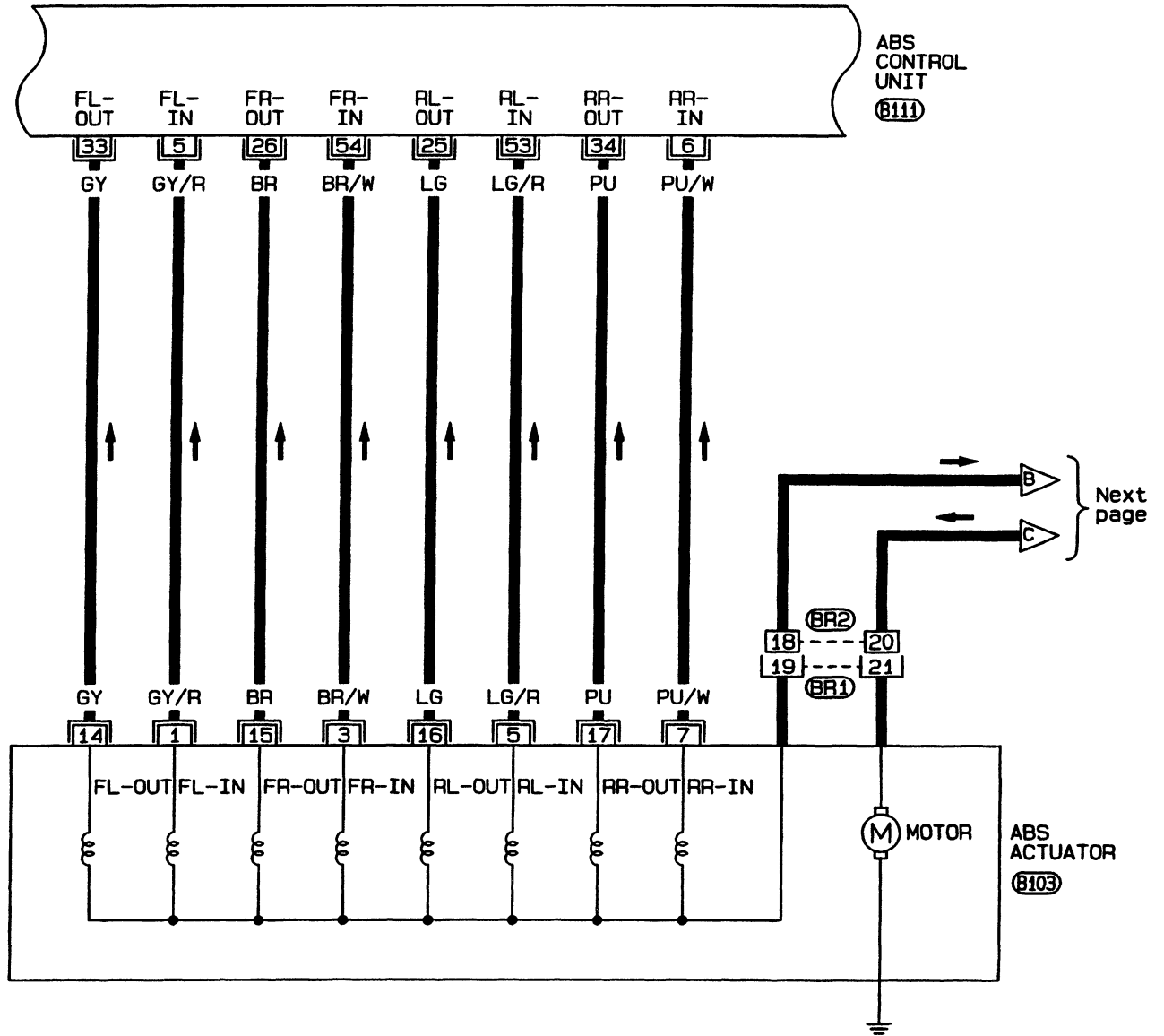
Refer to last page
(Foldout page).

8111

ANTI-LOCK BRAKE SYSTEM

Wiring Diagram — ABS — (Cont'd)

BR-ABS-06



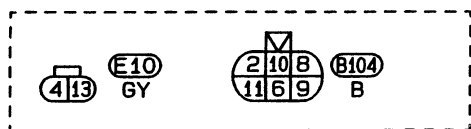
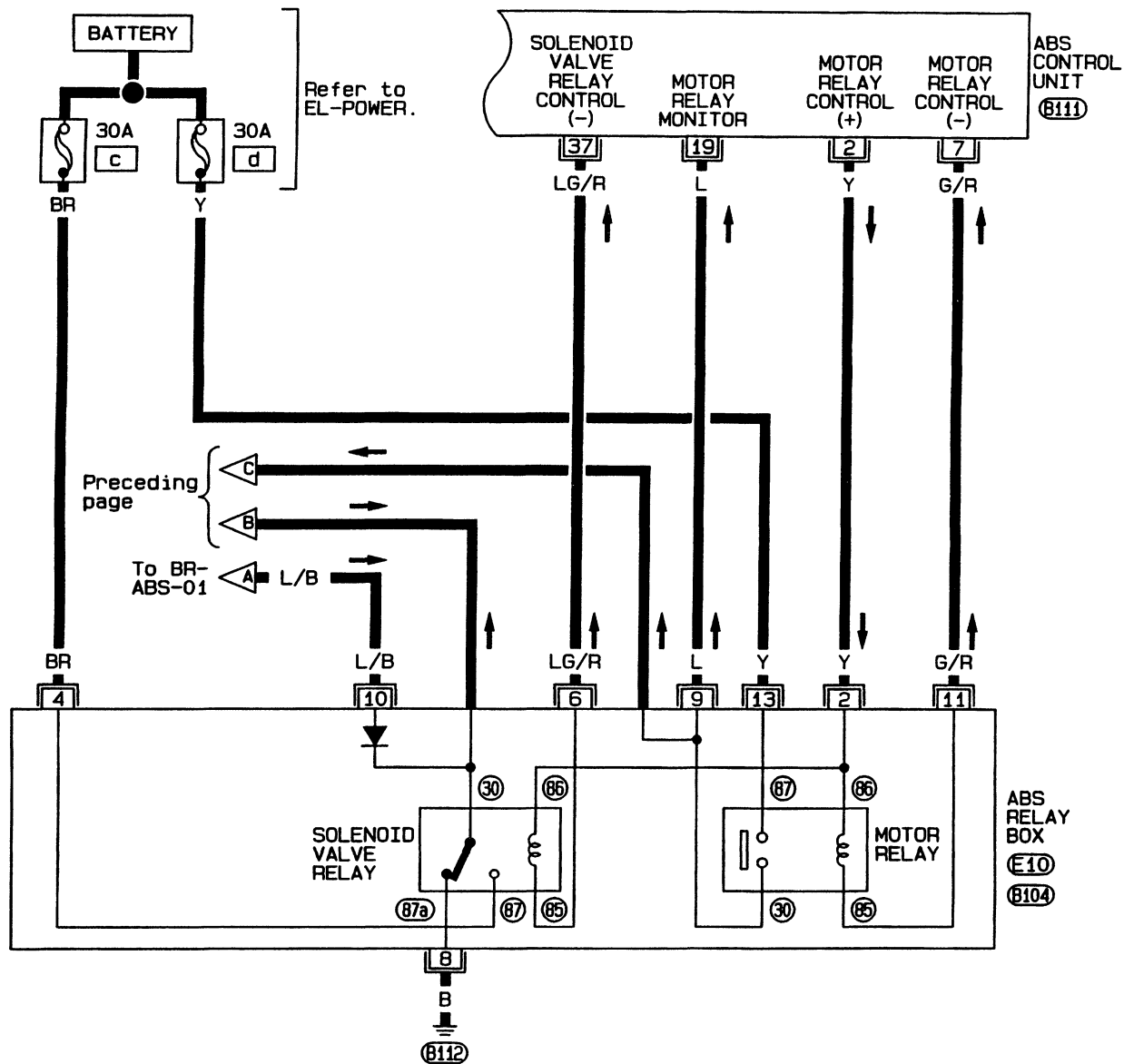
Refer to last page (Foldout page).

8111

ANTI-LOCK BRAKE SYSTEM

Wiring Diagram — ABS — (Cont'd)

BR-ABS-07



Refer to last page (Foldout page).

(8111)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

BRAKE UNIT (Europe)

Applied model	Without ABS				With ABS			
	GA14DE	GA16DE	CD20E		GA14DE	GA16DE	CD20E	SR20DE
			RHD	LHD				
	Standard				Option			Standard
Front brake								
Brake model	CL22VD	CL22VE			CL22VD	CL22VE		AD22VF
Cylinder bore diameter mm (in)	54.0 (2.126)							
Pad length x width x thickness mm (in)	106 x 39.5 x 11.0 (4.17 x 1.555 x 0.433)							106.8 x 43.8 x 10.0 (4.20 x 1.724 x 0.394)
Rotor outer diameter x thick- ness mm (in)	232 x 18 (9.13 x 0.71)		247 x 18 (9.72 x 0.71)		232 x 18 (9.13 x 0.71)		247 x 18 (9.72 x 0.71)	257 x 26 (10.12 x 1.02)
Rear brake								
Brake model	LT18C				CL7HB			CL9HC
Cylinder bore diameter mm (in)	15.87 (5/8)				30.23 (1-1/4)			33.96 (1-3/8)
Lining or pad length x width x thickness mm (in)	172.8 x 30 x 4 (6.80 x 1.18 x 0.16)				94 x 29 x 10 (3.70 x 1.14 x 0.39)			89.1 x 39.5 x 10.0 (3.508 x 1.555 x 0.394)
Drum inner diameter or rotor outer diameter x thick- ness mm (in)	180 (7.09)				234 x 7 (9.21 x 0.28)			258 x 9.0 (10.16 x 0.354)
Master cylinder								
Cylinder bore diameter mm (in)	22.22 (7/8)							23.81 (15/16)
Control valve								
Valve model	Dual proportioning valve built into master cylinder			Dual proportioning valve separated from master cylinder				
Split point [kPa (bar, kg/cm ² , psi)] x reducing ratio	3,923 (39.2, 40, 569) x 0.4							1,961 (19.6, 20, 284) x 0.2
Brake booster								
Booster model	M195T							
Diaphragm diameter mm (in)	Primary: 205 (8.07) Secondary: 180 (7.09)							
Recommended brake fluid	DOT 3 or DOT 4 Never mix different type fluids (DOT3 and DOT4).							