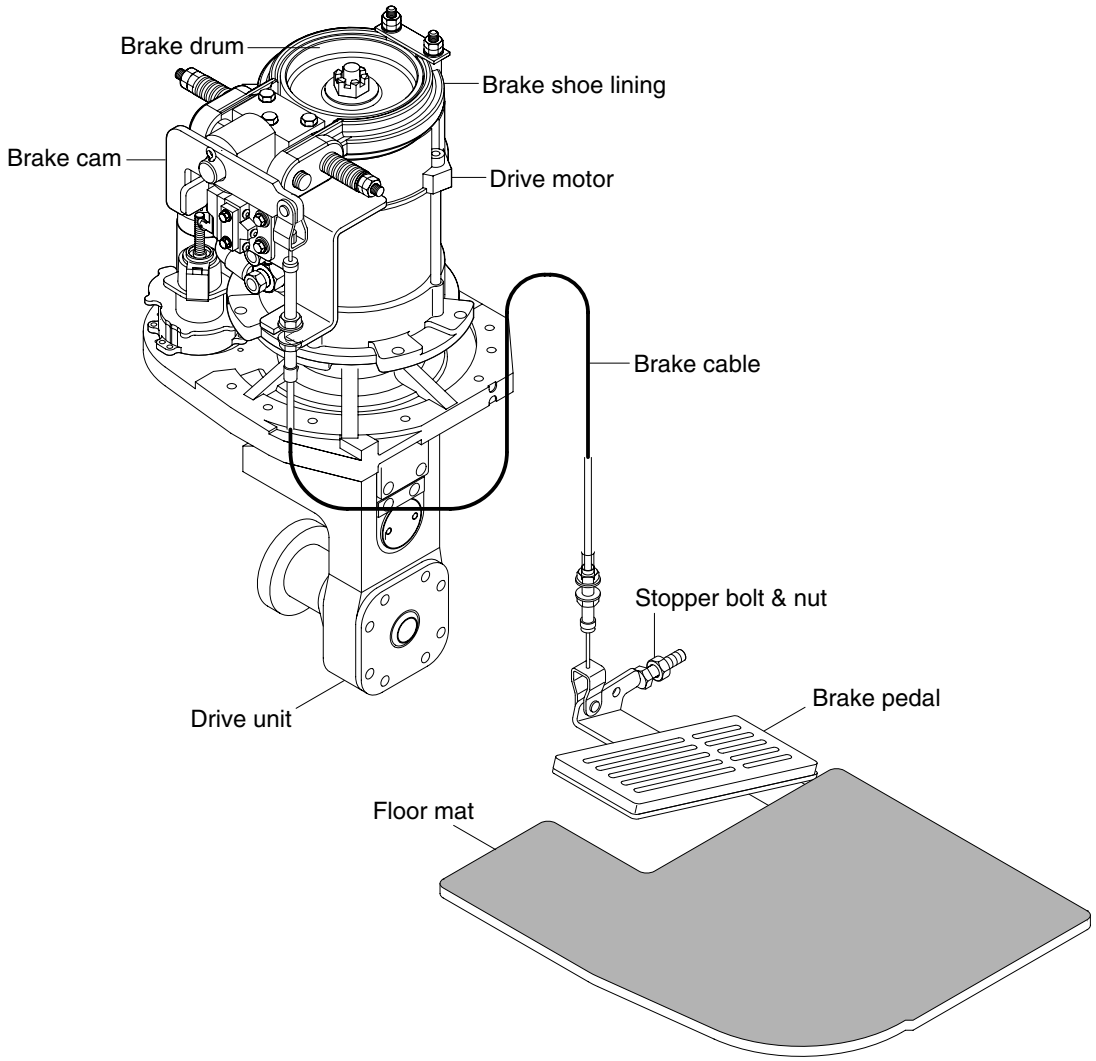
SECTION 4 BRAKE SYSTEM

GROUP 1 STRUCTURE AND FUNCTION

1. OUTLINE



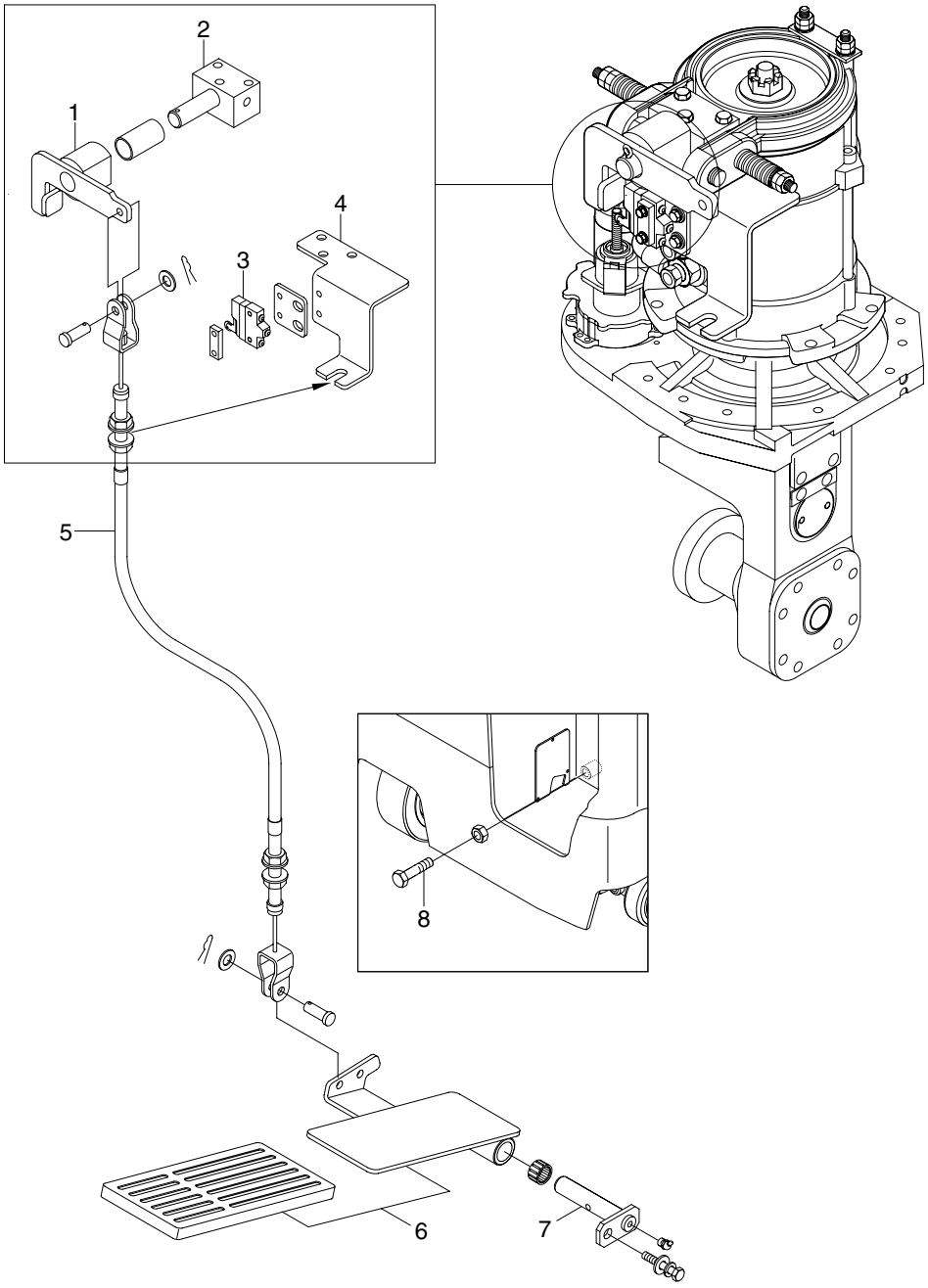
15BR9EBS01

2. SPECIFICATION

Item		15BR-9E
Type		Center brake
Brake pad	Material	Rubber mould
	W × L × T	40 × 110 × 5 mm (1.6 × 4.3 × 0.2 in)
	Area	44 cm² (6.8 in²)
Brake drum diameter	New	120 mm (4.7 in)
	Repair	117 mm (4.6 in)
Brake pedal play		10~15 mm (0.4~0.6 in)
Brake distance	Unloaded	Less than 5.0 m (197 in)
	Loaded	Less than 2.0 m (79 in)

3. BRAKE PEDAL AND PIPING

1) STRUCTURE



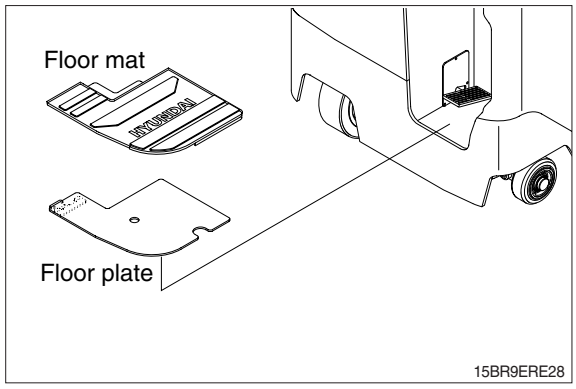
15BR9EBS02

1	Brake cam	5	Brake cable
2	Brake cam lever	6	Brake pedal
3	Brake switch	7	Pin
4	Bracket	8	Stopper bolt

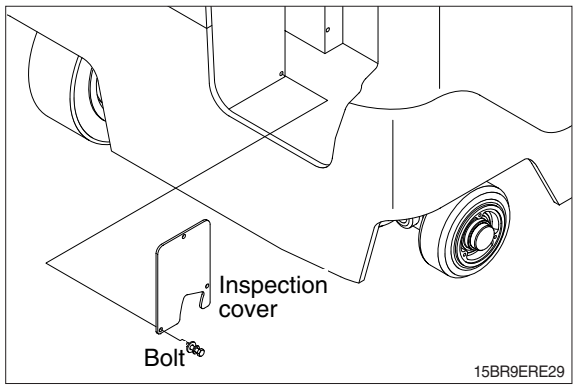
2) DISASSEMBLY AND ASSEMBLY

(1) Disassembly

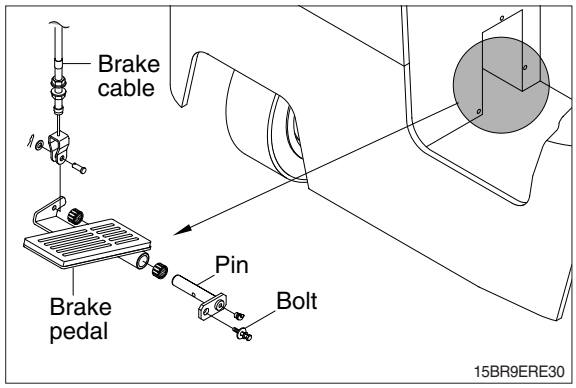
① Remove floor mat and floor plate.



② Remove inspection cover



③ Remove bolt, pin, spring and brake cable to remove brake pedal assembly.

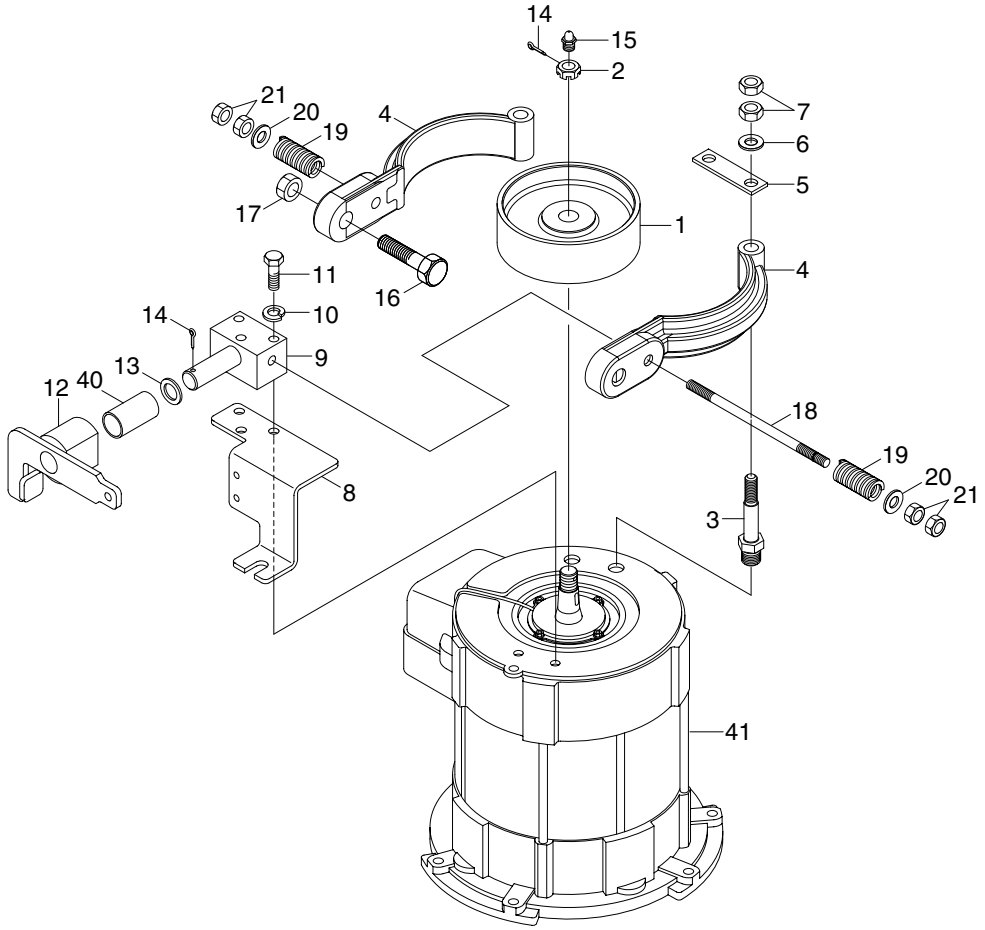


(2) Assembly

Perform disassembly in reverse order.

4. BRAKE SYSTEM

1) STRUCTURE



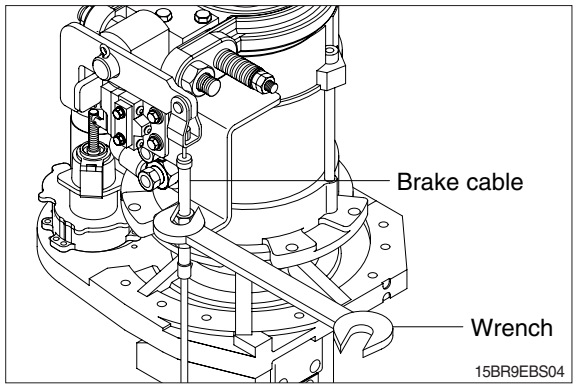
15BR9EBS03

1	Brake drum	9	B/cam bracket	17	Hex nut
2	Low castle nut	10	Spring washer	18	Brake rod
3	Brake shoe pin	11	Hex bolt	19	Spring
4	Lining brake shoe	12	Brake cam	20	Plain washer
5	Lock plate	13	Plain washer	21	Hex nut
6	Plain washer	14	Split pin	40	Du-bushing
7	Hex nut	15	Grease nipple	41	Traction motor
8	Cable bracket	16	Cam bolt		

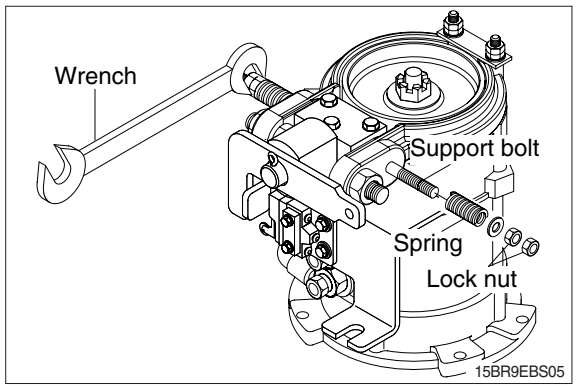
2) DISASSEMBLY AND ASSEMBLY

(1) Disassembly

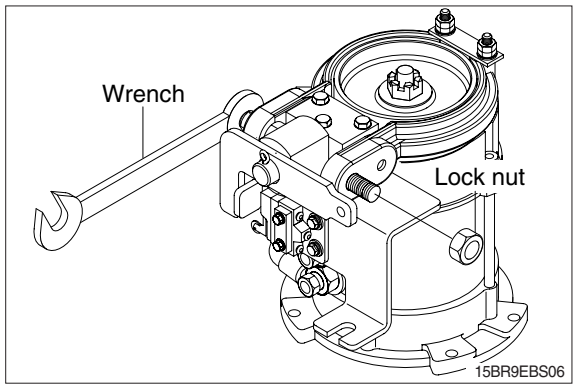
① Remove the brake cable from bracket.



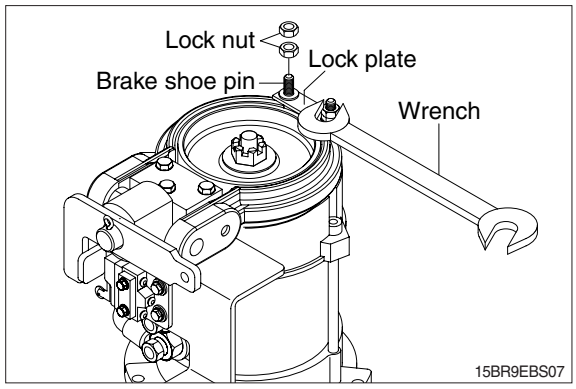
② Remove spring and support bolts after removing lock nut of brake spring.



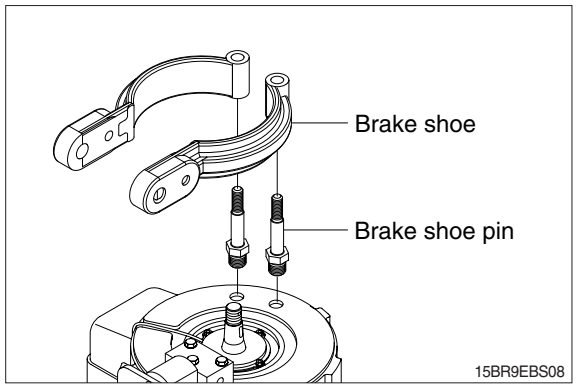
③ Remove lock nut for adjusting bolt.



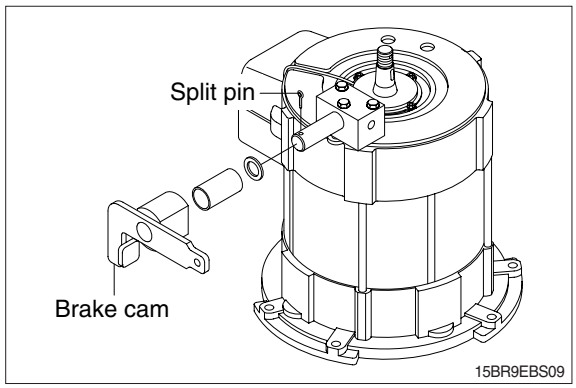
④ Remove lock nut of brake shoe pin and take lock plate of shaft.



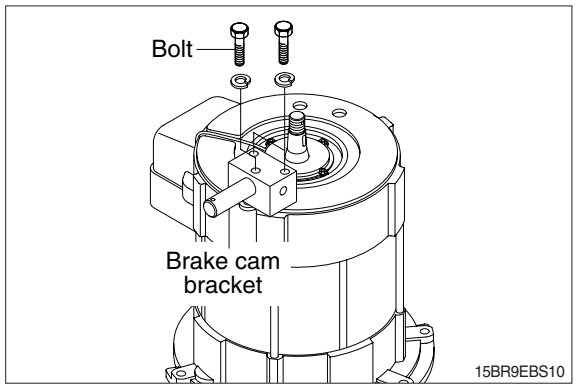
⑤ Take off brake shoe lifting up straightly.



⑥ Remove the split pin from the bracket of cam and remove the cam.

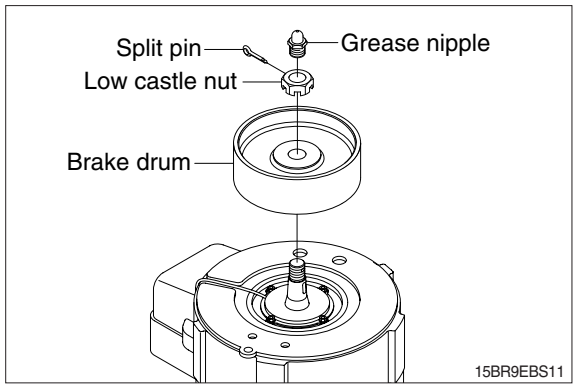


⑦ Remove 3 bolts attached on bracket and take off brake cam bracket.



⑧ Remove the split pin from brake drum mounting bolt and remove the nut.

⑨ Remove brake drum from motor shaft.

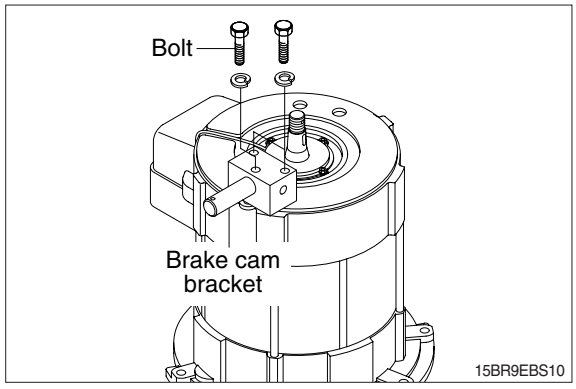


(2) Assembly

Assembly is in the reverse order to disassembly but be careful of following points.

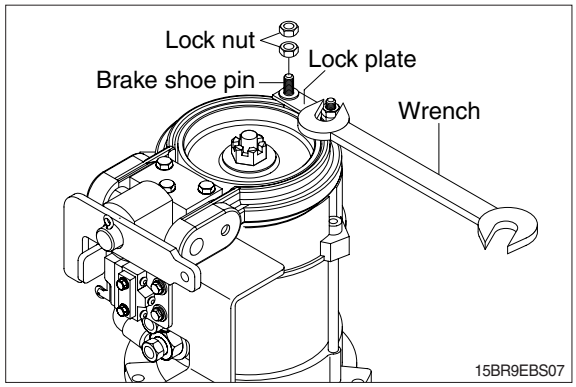
① Brake cam bracket mounting bolts.
- Tightening torque : 1.6~1.9 kgf · m (12~14 lbf · ft)

※ Apply loctite #277

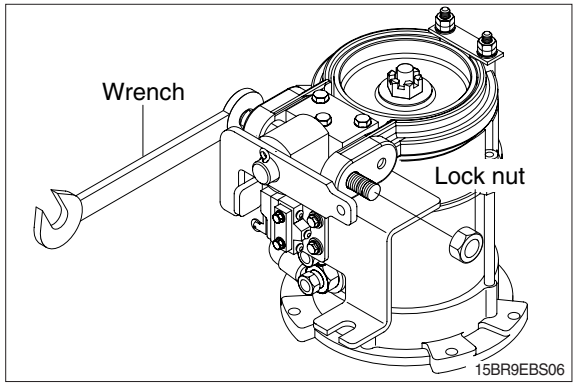


② Brake shoe support pin mounting.
- Tightening torque : 14.6~16 kgf · m (106~116 lbf · ft)

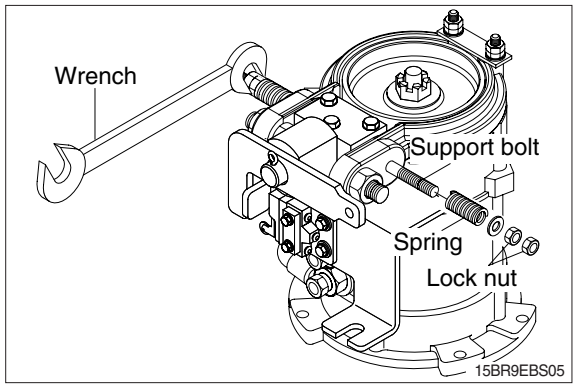
※ Apply loctite #277



③ Adjusting bolt lock nuts.
- Tightening torque : 11.4~12.6 kgf · m (82~91 lbf · ft)



④ Support bolts lock nuts.
- Tightening torque : 2.3~2.8 kgf · m (16.6~20.3 lbf · ft)



5. INSPECTION

1) Lining inspection

(1) Contact normally?
(2) Any injuries?
(3) Any one sided contact?
(4) Service limit : 1.5 ㎜ (0.059")

※ Lining should be replaced together with brake shoe.

2) Brake drum inspection

(1) Any damage or wear?
If so, plane the disc for revising.
(2) Drum die should not exceed ; under 3 ㎜ (0.012")

3) Spring inspection

(1) Are the springs weakened or damaged?

GROUP 2 OPERATIONAL CHECKS AND TROUBLESHOOTING

1. OPERATIONAL CHECKS

1) BRAKE PEDAL OPERATION

(1) Once the pedal released, the machine must remain stopped.
(2) Check the free play of pedal is 10~15 mm (0.4~0.6 in).
(3) Check the pedal height is 58~63 mm (2.3~2.5 in).

2) BRAKE SYSTEM OPERATION

(1) Check the operation of brake cam.
(2) Measure lining at point with most wear, and check that lining thickness is at least 2.0 mm (0.08 in).
(3) Measure inside diameter of drum and check that it is within the specification limit. (see 4-1 table)

3) BRAKE FORCE

(1) Select a dry, flat, paved surface and drive truck at maximum speed when signal is given, stop truck immediately and measure distance from point where signal was given to point where truck stopped. (Unloaded)
  · Stopping distance : Within 5 m (16' 5")
(2) Check that there is no pulling of steering wheel, pulling by brakes to one side or abnormal noise when making emergency stops.

2. TROUBLESHOOTING

Problem	Cause	Remedy
Brake drags	· Brake spring out of adjustment. · Brake spring broken. · Brake drum worn or rusted. · Brake switch defective. · Brake pedal play excessive. · Brake lining insufficient contact. · Motor shaft key broken. · Motor shaft damage.	· Check and adjust. · Replace. · Check, and replace if defective. · Check, and replace if defective. · Adjust brake pedal play. · Adjust and replace if defective. · Replace. · Replace.
Poor braking effect	· Brake spring out of adjustment. · Brake spring broken or deteriorated. · Brake pedal play excessive. · Faulty return due to rusting of parts. · Brake shoes worn.	· Check and adjust. · Replace. · Adjust brake pedal play. · Disassemble and clean or replace. · Replace.
Brake squeaks	· Brake shoe glazed or dirty, brake shoe worn, brake dust accumulation. · Brake drum warped or scored. · Defective adhesion between brake shoe and lining.	· Replace brake shoe, clean brake drum circumference. · Repair or replace. · Replace.
Brake shoe not releasing	· Heavy tightening of stopper. · Wheel cylinder damaged. · Master cylinder damaged.	· Adjust. · Check for oil leakage, volume, air mixing, and repair if defective. Replace wheel cylinder if defective. · Check connection between master cylinder and pedal, and replace master cylinder if defective.

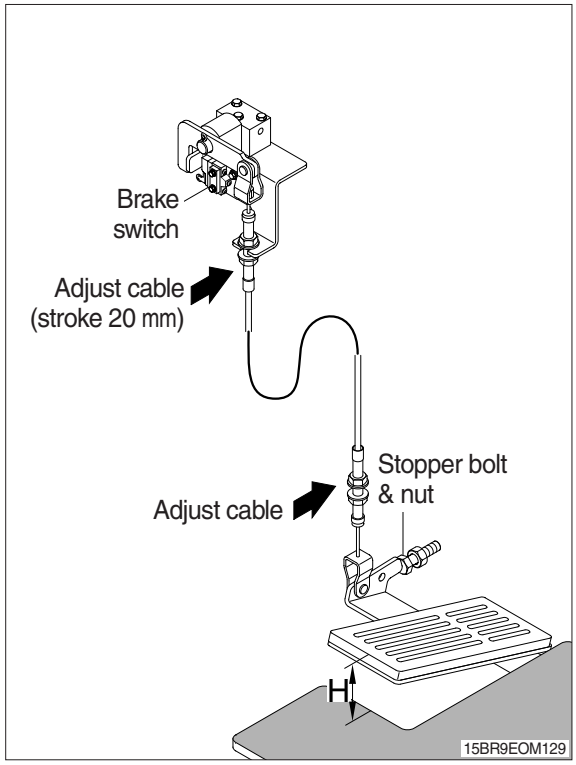
GROUP 3 TEST AND ADJUSTMENT

1. CHECK AND ADJUSTMENT OF THE SERVICE BRAKE SYSTEM

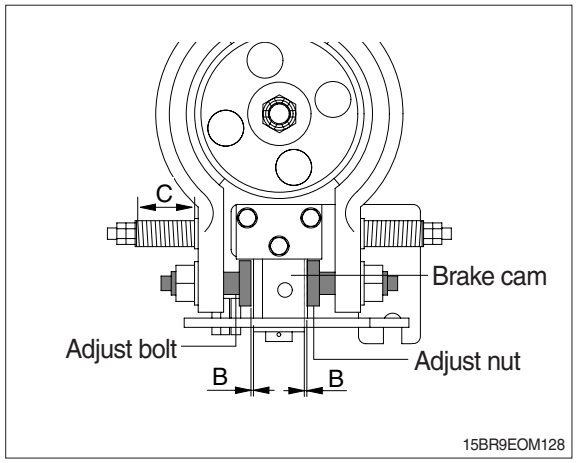
1) Check the pedal height (H) and adjust the stopper bolt & nut : 75 $^{+5}_{0}$ mm

2) After adjusting the pedal height set vertically the brake cam and set the brake cable.
Tighten nut for brake cable.

3) Check the brake switch to be operating condition while the pedal is depressed.



4) Check the gap (B) between brake cam and adjusting bolt.
· B : 0.5~1.0 mm
If the gap is too long and short adjust the adjusting bolt.
· Adjust nut tightening torque
11.0~13.0 kgf · m (79.6~94.0 lbf · ft)



5) Check the brake lining wear or any damage.
If brake lining is contacted any one side or lining thickness is 1.5 mm, brake lining and shoe assy should be replaced together.

6) Check the height (C) of brake spring and adjust the spring.

Model	Height (mm)
15BR-9E	40 $^{+5}_{0}$

· Spring nut tightening torque
2.0~3.0 kgf · m (14.4~21.6 lbf · ft)