



Advanced Braking Pty Ltd

Technical Bulletin – TBN-037

Product: LCV9 – SIBS on Fuso Canter FG649

Subject:

Upgrade of 12V relay with SIBS system on Fuso Canter FG649.

Important information to prevent vehicle runaway

Change Revision

Issue Revision	Issue Date	Comments
00	Wed 23 Apr. 08	Initial Release



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Product: LCV9 – SIBS on Fuso Canter FG649

Subject:

- 1. Upgrade of 12V relay on Fuso Canter FG649.**
- 2. Important information to prevent vehicle runaway**

Summary:

A vehicle runaway was caused by a failed relay on a Fuso Canter fitted with SIBS brakes. This Technical Bulletin covers the upgrade of the relay to prevent further failures, adjustment of the relief valve setting and procedures to operator procedures to prevent a reoccurrence.

Description:

On a mine site, the relay supplied with the SIBS hydraulic system (EMMA system) has failed closed. This means that the pump motor has run continuously until the circuit breaker has tripped. When the operator has attempted to release the brake, the pump has not run.

The operator left the cabin of the vehicle, and reset the circuit breaker. As the relay is fused closed, the pump motor is connected directly to battery and started to run. Even though the EMMA brake is in the ON position, and the solenoid valve that allows pressure to build in the park brake system is open to tank, the hydraulic motor has developed sufficient back pressure to release the brake and the vehicle has rolled away.

Investigation:

The Hauguan relay supplied with the SIBS system was found to be of a borderline spec. The relay supplied is a standard automotive type and rated to 60Amp continuous and 80Amp inrush.

The Parker hydraulic pump has an internal pressure relief valve set to 2,000psi. The electric motor supplied with the pump draws 60Amps (continuous) at 2,000psi and may intermittently draw more than this under certain conditions.

With the pump running back pressure can be generated at the brake. This is despite the path to tank being open. The back pressure in the EMMA system is controlled by the setting of the pressure relief valve. On the vehicle in question this was set very high – in excess of 800psi. This high back pressure in the brake system caused the brakes to release.

Recommendations:

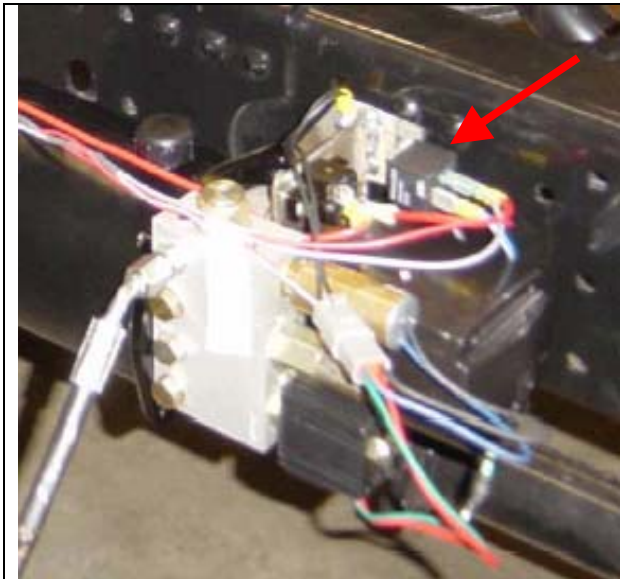
To all ABT customers with SIBS on Fuso Canter FG649 (12 volt electrical system):

1. Install the revised 12V relay.
 - The revised relay is rated for continuous operation at 100Amps with 400 Amps inrush.
2. Set the relief valve in the EMMA manifold to 350psi.
 - This will ensure that the back pressure build up in the system will not be sufficient to release the brakes.
3. Ensure that only qualified personnel re-set the system circuit breaker and that the vehicle is chocked to prevent a run-away.
 - Tripping of the circuit breaker is not a normal occurrence, and is a sign that there is an issue with the electrical system. When the circuit breaker trips, the fault needs to be diagnosed by a qualified technician and appropriate measures must be taken to prevent a vehicle run-away.

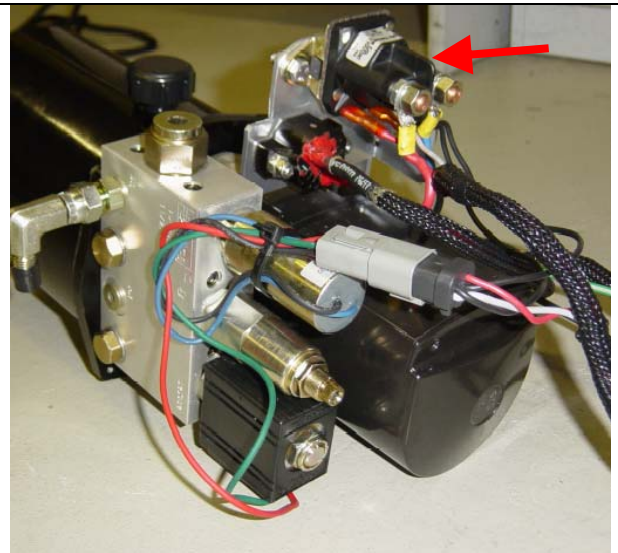
The revised relay and brackets required for fitment will be supplied FOC by ABT.

Actions:

1. Fitment of revised relay

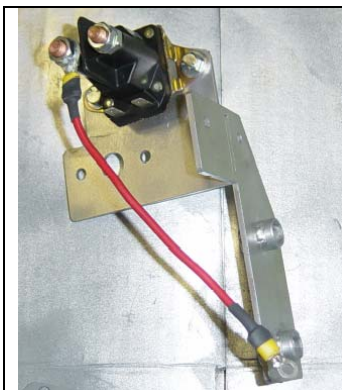


EMMA unit mounted on chassis rail showing existing automotive type relay



EMMA unit showing revised relay

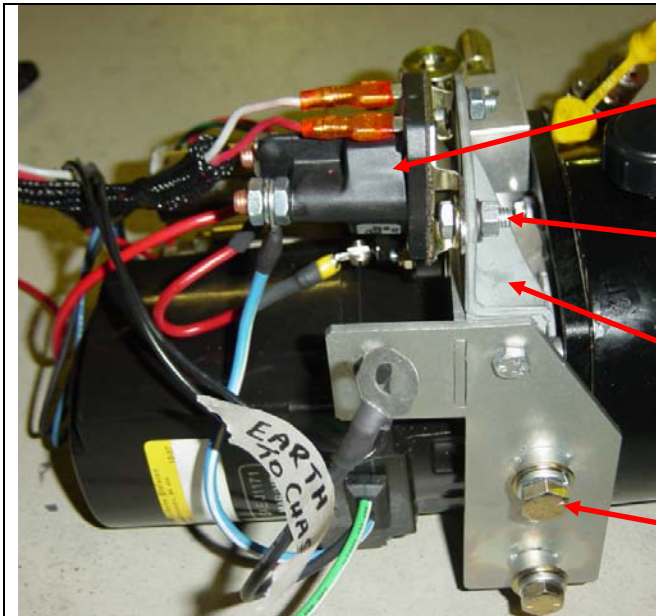
The revised relay is supplied bolted to a bracket as shown below. Connect the relay to the harness as shown below. A wiring diagram is attached to the end of the TBN.



Relay shown fixed to a new bracket. Fitment requires removal of pump and circuit breaker from existing bracket and mounting to supplied bracket.



Relay shown fixed to a bolt-on bracket. Supplied bracket can be bolted to existing bracket via

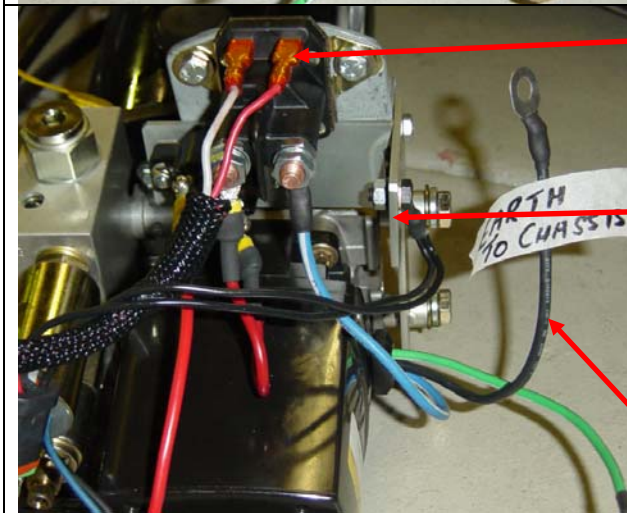


Revised relay for continuous operation
12V 100Amp continuous, 400Amp inrush. SPST NO.
IP rating: 65
ABT P/N: 02-7053

2 x M6 bolts and related fasteners

Additional mounting bracket for larger relay. Mounts to existing bracket via 2 x M5 bolts – one shared with circuit breaker and one shared with manifold earth wires

3/8 UNC mounting bolts. Mounts pump / bracket assembly to the vehicle chassis



Grey & red wires from harness. Use existing quick disconnect spade eye terminals supplied (spade terminals shown on image).

Attach 2 x 8mm eye terminals to the red wire and blue/white wire.

Red wire (AV 5.0mm²) from circuit breaker (40Amp). Longer wire may be required

Blue/white wire from the motor

Attach black earth wire from the motor to a suitable position on the chassis

IMPORTANT: Coat all exposed terminals in PLASTI-DIP (Liquid electrical tape or similar) to prevent corrosion (not shown).



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2. Setting of EMMA relief valve

Refer to TBN-019 for details of the valve adjustment, however as higher relief pressures can lead to the brakes being released it is important to use a pressure gauge to check the pressure or for any future relief valve adjustments.

The pressure gauge should be capable of reading 2000psi and will need adaptors to suit 7/16" JIC hydraulic fittings; the ideal spot to measure the line pressure is at the EMMA™ manifold outlet connection (7/16" JIC).

The EMMA™ return filter can affect the line pressure if it is partially blocked; the filter replacement is recommended every 1000hrs.

Procedure:

1. Chock the wheels to ensure the vehicle cannot roll.
2. Apply the EMMA™ brake using the brake control unit (push red button)
3. Locate the EMMA™ unit.
4. Clean thoroughly around the relief valve and other hydraulic components
5. Remove the nut (3/4" spanner) holding the solenoid coil to the solenoid valve. Remove the solenoid coil (keeping the wiring connected).
6. Ensure suitable PPE is worn in the event of high pressure fluid leaking.
7. Place a clean rag under the manifold outlet connection, undo the hydraulic hose, and contain any fluid. Fit the pressure gauge inline with the hose / manifold. Ensure all fittings a tight.
8. Release the EMMA™ brake at the same time record the pressure shown on the relief valve.

IMPORTANT: DO NOT LET THE EMMA™ PUMP RUN FOR MORE THAN 10 SECONDS DURING THIS OPERATION.

9. If the pressure is set to below the maximum setting for the vehicle (for Canter this is 350 psi) type then no further action is needed. Go to item 13. If the pressure is higher than 350 psi follow instructions below.
10. Using an 11/16" spanner, loosen the locknut at the top of the relief valve.
11. Using a 3/16" Allen key, turn the adjusting screw:
 - CLOCKWISE to INCREASE Relief Valve Pressure Setting – This will INCREASE the delay in EMMA™ brake application.



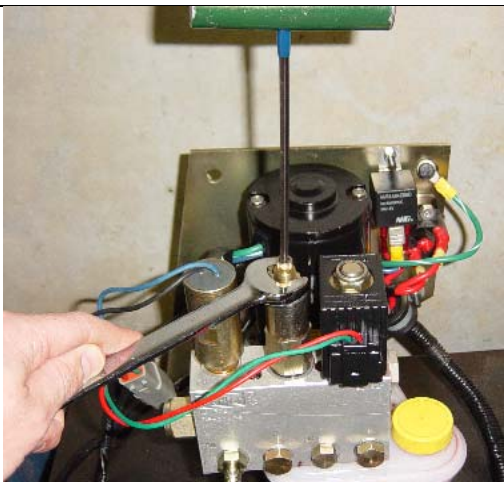
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- ANTI-CLOCKWISE to REDUCE Relief Valve Pressure Setting – This will DECREASE the delay in EMMA™ brake application.
- Adjust the screw to obtain 350 psi.

12. Tighten the locknut. Recheck pressure setting using gauge.

13. Refit the solenoid coil, ensure the EMMA™ brake is applied and there is no line pressure before removing the test gauge, operate the EMMA™ brake and check for any leaks.

14. Test drive the vehicle.



Adjustment of relief valve using 11/16” spanner and 3/16” Allen key.

3. Only qualified personnel to investigate faults with hydraulic or electrical system supplied with SIBS brakes

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