



**Lift & Escalator Industry Association**

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29 September 2010

**To: All Members**

Dear Member

**OTIS – MACHINE BRAKE SWITCHES**

Please find Safety Bulletin issued by Otis Ltd in connection with Machine Brake Switches.

I trust this notice is self-explanatory, please be guided accordingly.

Yours sincerely

Gill Collins



EMTA Awards Limited  
Approved Assessment Centre


**ELA** Member of the  
European Lift Association



Registered in England N° 3851206.  
Registered office as above.



Certificate N° 12368

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**Description of problem**

If the brake arm/s do not lift, the drive may have sufficient power to move the lift and this problem not be detected. This can cause accelerated brake shoe wear and result in a reduction of applied friction in the brake system.

**Cause**

This fault can occur as a result of failing to detect mechanical or electrical failings in the brake system.

The use of brake proving switches on modern machines monitors the potential problems by proving that the brake has operated and lifted clear of the brake drum.

**Effected Equipment**

All units with OVF30 drives and either 18ATF or 29CT machine combinations that do not monitor the brake function by positive means (brake switches).

**Field Solution:**

The brake operation will require monitoring and cause a drive shutdown if the brake arm/s fails to lift.

**Brief Overview**


- The brake should be stripped, cleaned and adjusted in accordance with manufacturers' recommendations, depending upon whether existing components are replaced or not, either a 125% load or a no load stopping test under controlled conditions should be carried out as detailed in the following instructions
- The brake will need to be modified by fitting brake switches and striking mechanism.
- Electrically connected to the OVF30 drive to cause a drive shutdown in brake failure condition via a new BSR relay.
- The electrical drawings will require marking up to reflect the changes made.
- The function of the new switches should be verified by fault simulation.

**Material Required:**

- For the 18ATF machine a brake switch assembly - part number **TAA5300CV4**
- For the 29CT machine a brake switch assembly - part number **2700ADE7**.
- A new BSR Relay, EPC part number: **GAA613HE1**.
- A double insulated cable for the connection of the brake switches is required, 0.75mm stranded, 3 core, the length required is site specific. This should be purchased locally.
- A Wago 5 way female plug, part number: **FAA176E5**, pin 3 is for an earth connection to HL1.

All parts with Otis numbers can be obtained from **Lift Components Ltd, Leicester**.



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*Special  
Instructions:*

## Fitting Brake switches to 18 ATF or 29 CT machines

1. Display 'Lift out of service' signs at all landings.
2. Ensure that the Locked Off and Tagged Out.
3. Hand wind the unit so that the counterbalance has landed and fully compressed the buffer, ensure that when the brake is released that there is no further movement.
4. Strip down the brake unit, clean, lubricate and reassemble, ensure all brake settings are as per manufacturers recommendations for the brake type. (see below)
5. For 18 ATF machine fit brake switch pack (TAA5300CV4) and adjust in accordance with manufacturers recommendations. (see below)  
For 29 CT machine fit brake switch pack (2700ADE7) and adjust in accordance with manufacturers' recommendations. (see below)
6. Fit a new BSR relay (GAA613HE1) in the control panel and connect as per wiring diagram, (See examples of wiring diagrams below).
7. Route a new double insulated, three core 0.75mm stranded cable from the controller to the brake terminal block utilise existing trunking and conduit where possible.
8. Wire as shown in the wiring diagram below, a new female five pin WAGO plug will be required (FAA176E5); the centre pin should be wired to HL1 for an earth connection.
9. Verify all wiring modifications have been applied to the wiring diagrams.
10. The electrical drawings will require marking up to reflect the changes made.
11. Reinstate the power and reset the lift utilising ERO control, run the lift car down and check the counterweight buffer has reset.
12. Maintain control of the lift and perform the following tests;
  - Run the lift down on ERO with the brake coil disconnected; verify the drive detects the faulty operation of the brake and shuts down.
  - As the brake unit has been stripped, cleaned, lubricated and adjusted perform a verification of the brake efficiency and stopping distance.
  - Run the lift in the up direction, allow it to get to full speed, crash stop the lift and measure the stopping distance, this should not be excessive.
  - If a problem occurs during the verification of the required stopping distance or the distance cannot be achieved a 125% load test will be required.
  - If primary brake components have been replaced, e.g. linings, brake arms, coil or core pieces a 125% load test will be required in the lift.
13. Replace and secure all removed covers/guards.
14. Run the lift on full speed under controlled conditions, check the operation for any unusual noises, vibration or heat, when satisfied with the operation of the unit remove the out of order signs and return to service.
15. Complete any documentation required; enter the maintenance of the brake unit and the brake switch adaptation in the log card.

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## 18ATF Machine

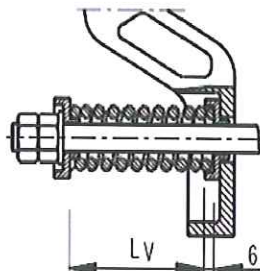
### 3.8 BRAKE ADJUSTMENT

#### 3.8.1 SPRING ADJUSTMENT (Fig. 3)

The brake is a TRA200 type supplied with a 125VDC coil, with options of 48V or 60V. The brake has two arms, each with a none asbestos brake lining bonded to a steel plate, assembled to the arm with bolts. Each arm is pivoted with compression springs mounted on a common rod.

Brake spring are adjusted by the Factory, according to the table



MOTOR TYPE	MOTOR ASSEMBLY	$L_V$ (mm)	$M_F$ EST. (Kp.m)
2 SPEED	TAA20000B51/61/71	73	16
	B52/62/72	71	22
	B53/63	68	30
	B56/66	75	11.5
	B80/90/100	73	16
	B81/91/101	70	26
	TAA20000C51/61	74	13.5
	C52/62	72	20
	C53/63	70	27
VF	TAB20000E16/17/18/19 TAB20000G3/5/6/7	68	32
	TAB20000E30/31/32/35/36/37 E38/39/40/45/47/48	77	



The brake spring should be adjusted at jobsite in function of the parameters to be obtained (confort, stopping accuracy, code requirements, etc....)

Spring adjustment procedure:

- 1.- With an empty car, buffer the counterweight.
- 2.- Switch off the mains isolator.
- 3.- Note the length of each spring.

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### Machine Brake Switches

- 4.- Release nuts (1), (2), (B), (B1)
- 5.- Carry the external nut (B) (sheave side) at the end of bar (3) and fastening the bar (3) tight against the nut (A).
- 6.- Fastening blocked nuts (A) and (B) release/tight the nut (A1) to decrease/increase spring force until obtain the desired.
- 7.- Being careful that previous length is not modified, fasten the nut (A1) and tight against it the nut (B1).
- 8.- Tight two nuts (1), (2) at the same time, against the central lug, taking care that bar (3) does not move axially.

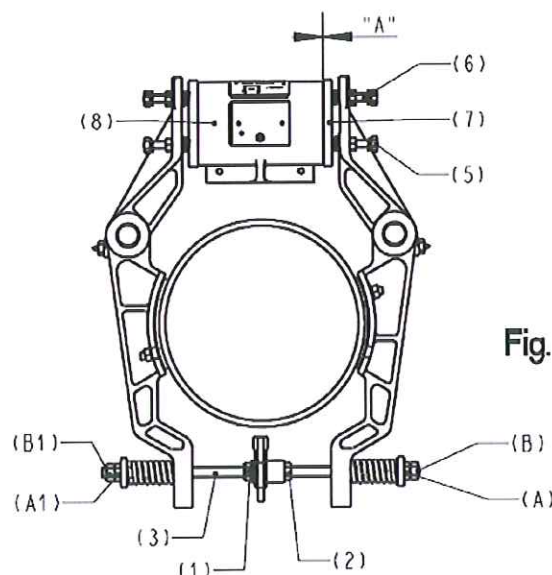


Fig. 3

#### 3.8.2 AIR GAP ADJUSTMENT

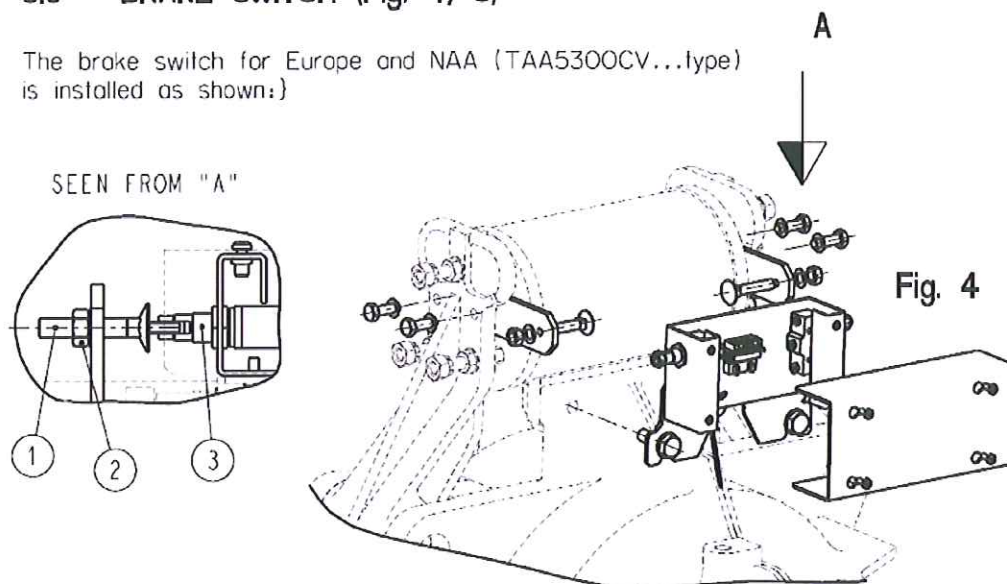
- 1.- Release nuts (5)
- 2.- Turn screws (6) to the right until disk (7) be in perfect contact with brake magnet (8)
- 3.- Turn screws (6) to the left until their head is in contact with disk (7) once all the screws are in this position, turn each screw to the left 1/2 turn, tight safely nut (5) taking care of not turning the screw.

With "A"=0.7±0.9mm the brake pulley have to be free when the brake magnet is operated, otherwise increase "A"

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### 3.9 BRAKE SWITCH (Fig. 4, 5)

The brake switch for Europe and NAA (TAA5300CV...type) is installed as shown:}



The brake switch should be adjusted as follow:

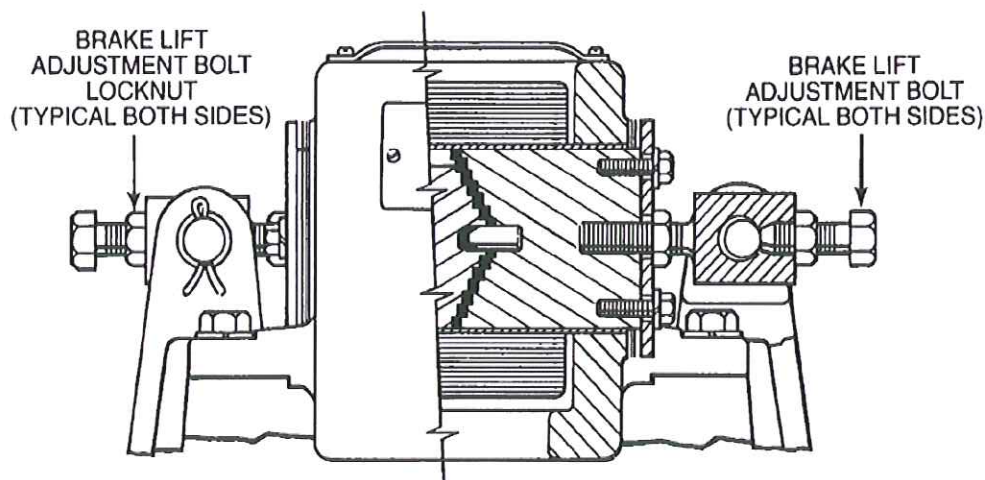
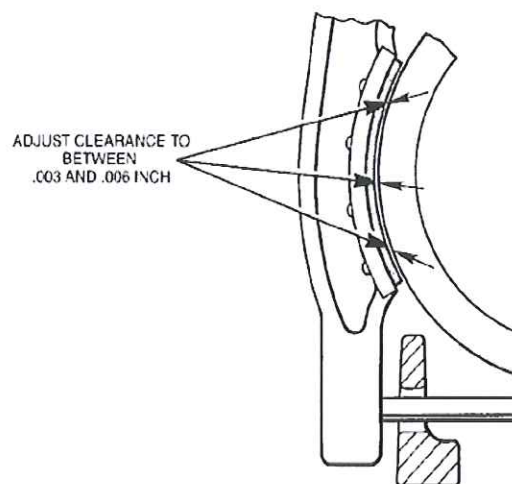
#### 18ATF MACHINE BRAKE SWITCH ADJUSTMENT INSTRUCTIONS (TAA5300CV)

- 1.- Release nut (2)
- 2.- Turn the actuating screw (1) till the switch (3) contact is activated (a click sound)
- 3.- Turn the actuating screw (1) in the opposite direction just till the switch contact is deactivated (another click sounds)
- 4.- Turn the actuating screw (1) on additional half turn in the same direction indicated in point 3 (the switch contact remains deactivated)
- 5.- Tighten nut (2) holding the screw (1) in the same position.

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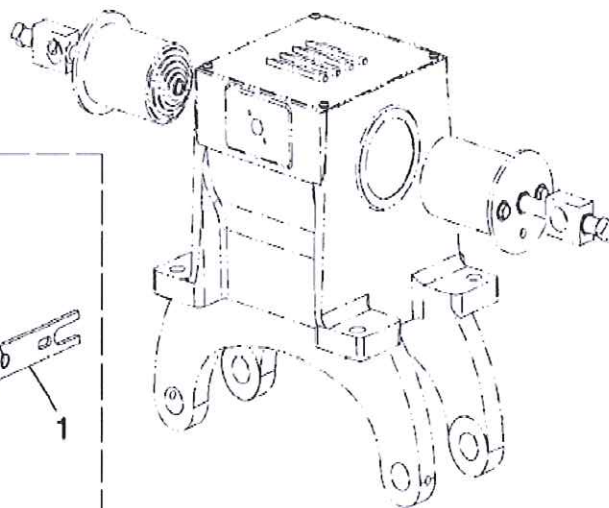
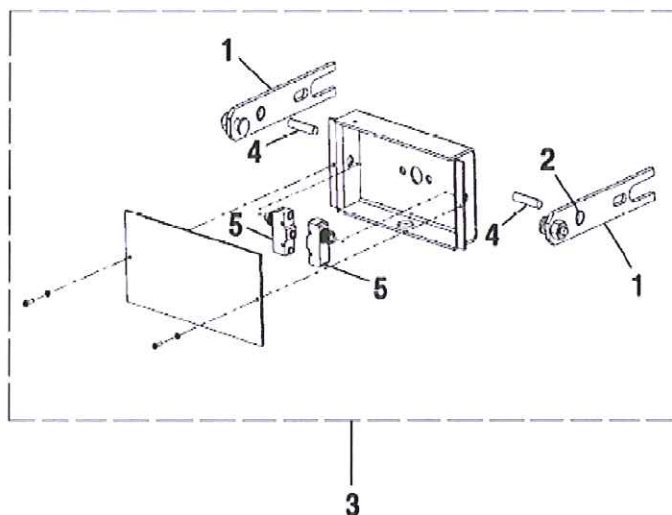
## 29CT Machine

1. Run car and verify brake shoes clear brake pulley when brake is fully picked.
2. Adjust brake pick by turning the adjusting bolt on the brake cores to obtain .003" - .006" of clearance between brake shoe and drum.
3. Listen to brake as car is running on inspection. Turn adjusting bolt out until you hear a slight ticking noise of brake shoe touching drum.
4. Turn adjusting bolt in till noise stops.
5. Turn adjusting bolt in another 1/4 turn, This should provide sufficient clearance of brake to drum.



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6. In order to adjust the brake switches properly, run the car on Inspection and adjust the set bolts so that the BSR relay drops with the brakes up at their fully picked positions. Tighten lock nuts and verify operation.
7. Tighten the locking nuts on the brake adjusting bolts. Run the car and verify that the brake shoes do not drag the drum.

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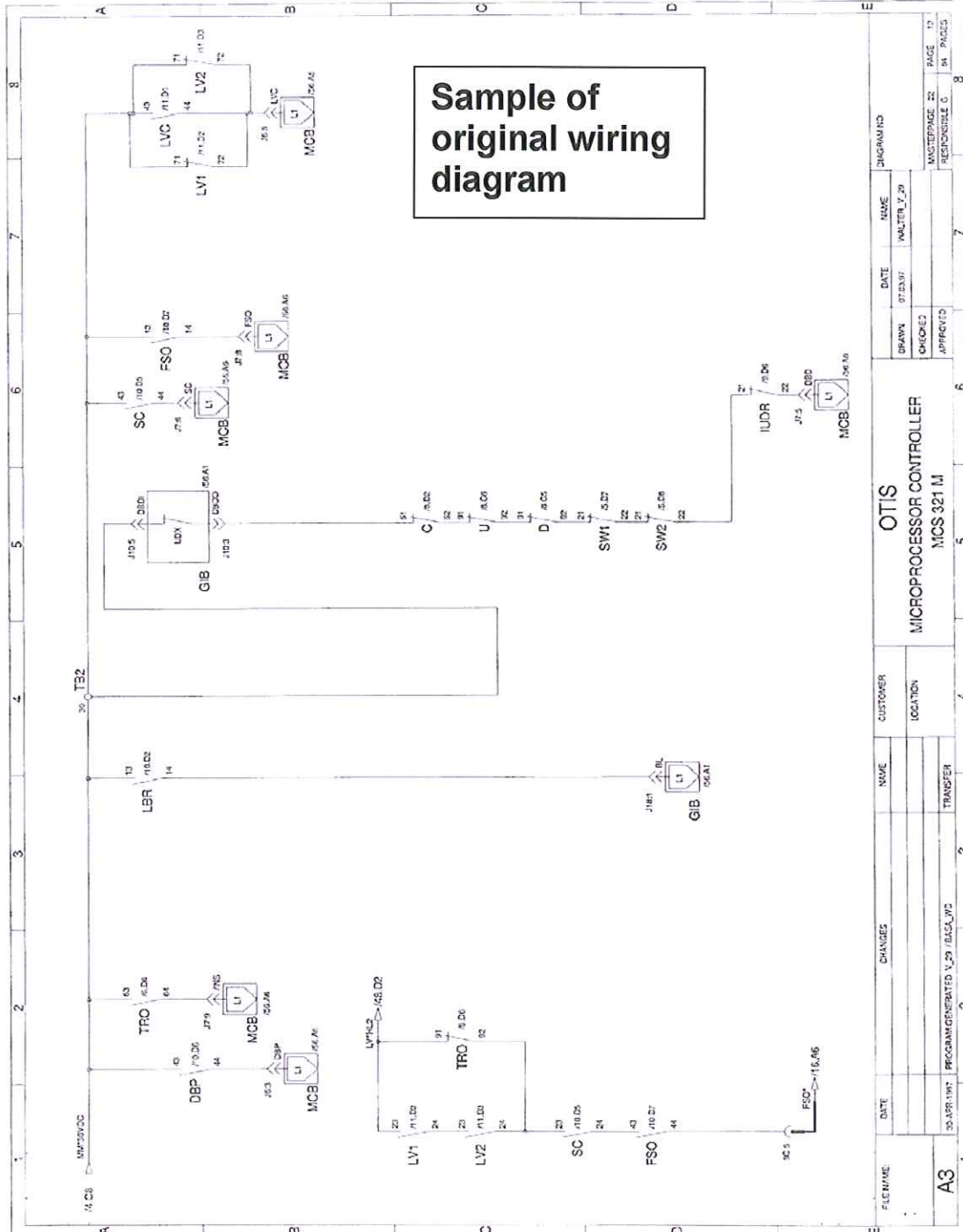


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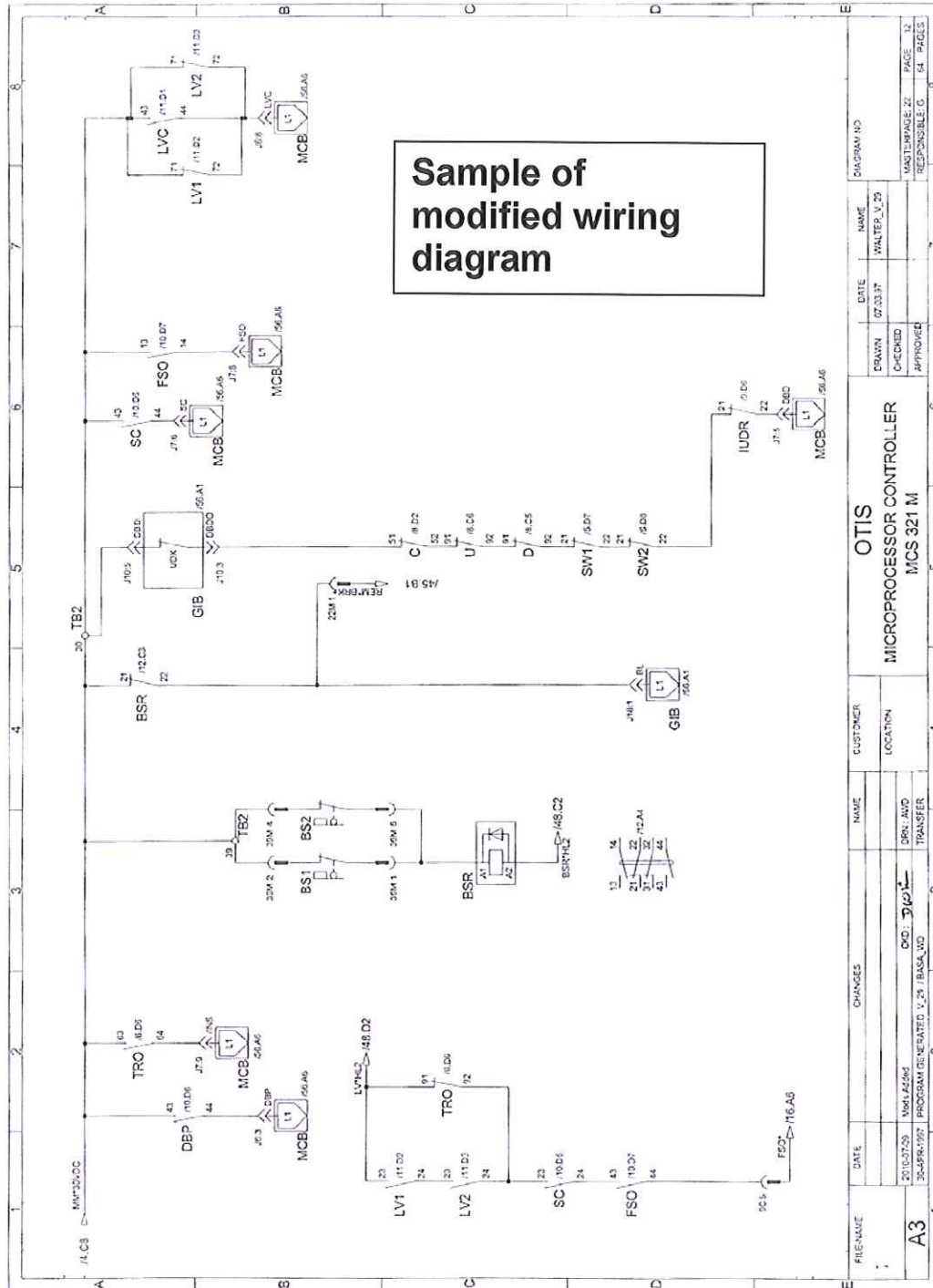
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