TRAILER ABS



MGX
MGX 2
MGX 2E
MGX 100

OPERATOR'S GUIDE

Haldex
Brake Systems

000 700 022/01.99./Redditch

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MGX ABS OPERATOR'S GUIDE

Your trailer has been fitted the Haldex MGX anti-lock braking system.
This system has been specifically designed to be effective, reliable and easy to service.
The purpose of this booklet is to describe the components involved and give you sufficient information to make your use of the system easy.

When overhaul of the components is required, we advise you to refer to the full **SERVICE MANUAL** which describes replacement procedures fully.

BRAKING WITH ABS
In an emergency apply full force on the brake pedal. The ABS will be activated immediately you fully apply the brakes and will assist you to retain steering control of your vehicle according to the road surface conditions. DO NOT apply and release the brakes by pumping the brake. This is known as 'Cadence braking' and can have a detrimental effect on vehicle braking.

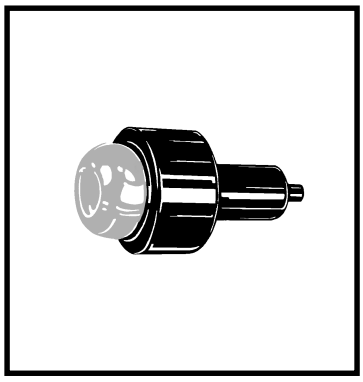
SYSTEM DESCRIPTION

The MGX anti-lock brake system incorporates two sensor / exciter assemblies and one modulating valve with combined relay / emergency function (**M**emory **C**ontrolled **E**mergency **R**elay **V**alve).

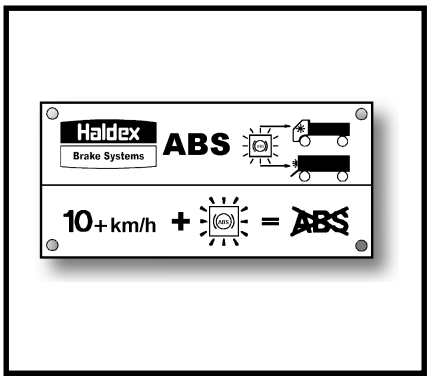
The position of the various components is shown in Fig 1. This layout shows a tri-axle. The system is equally compatible with single / tandem axles. In the case of full trailers, two complete MGX systems will be fitted, one to control the front (steering) axle, and one for the rear axle(s).

FUNCTION
The ABS system constantly monitors (on permenant powering) the speed of rotation of the wheels via sesning equipment.The exciter urns with the wheel and its teeth break the magnetic field of the sensor 60 (or 100 times in the case of MGX 100) times per revolution. While under braking the first sensed wheel to decelerate too quickly (the onset of a skid) causes the ABS to decrease air pressure to the brakes extremely rapidly from all controlled axles. The ABS will continue to operate to prevent skidding until the trailer slows to about 6 mph at which speed the ABS ceases to operate.

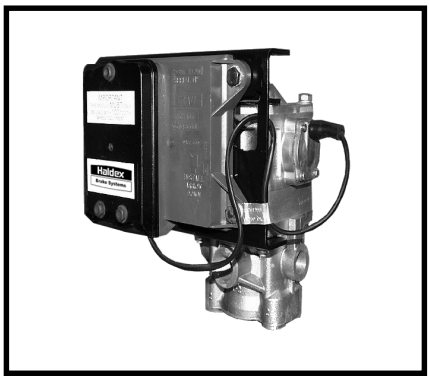
GENERAL COMPONENTS GUIDE



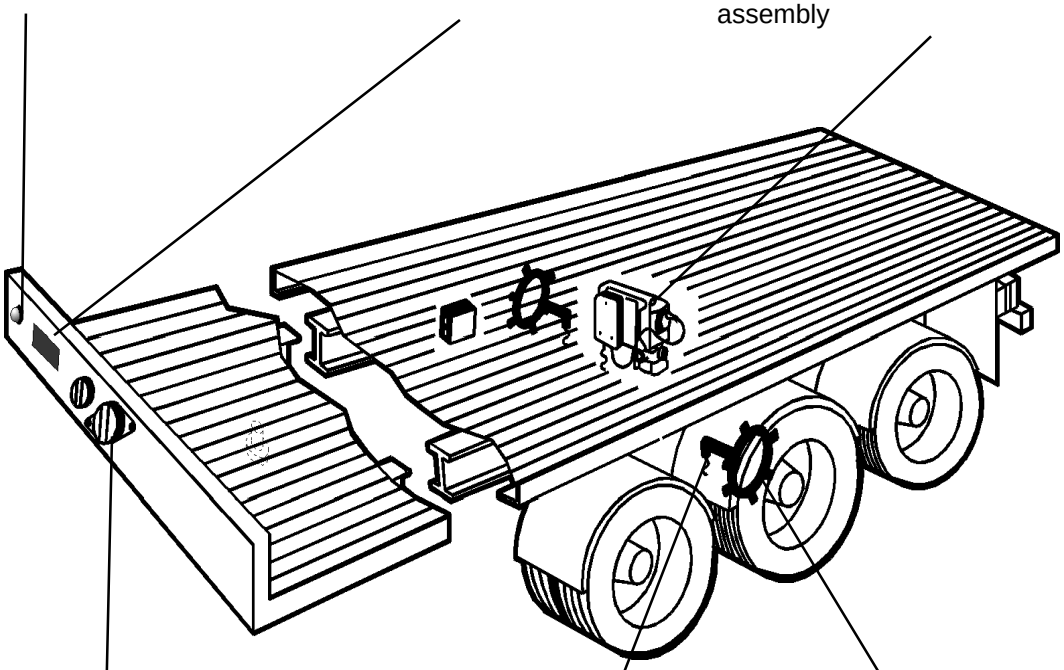
The Warning lamp



The Drivers information plate

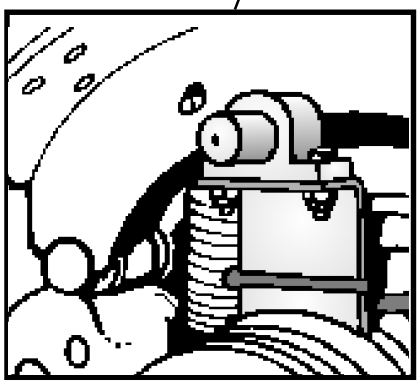


Control module and MCER Valve assembly

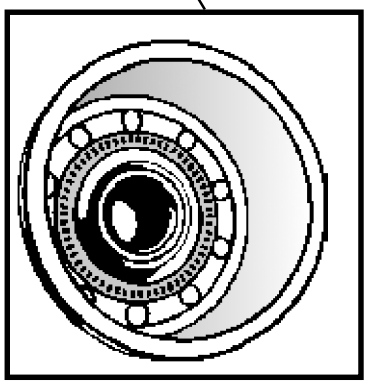




ISO 7638 Connector assembly



The Sensor



The Exciter

Fig 1

SYSTEM LAYOUT

The system fitted to your trailer is a **2 S**ensor and **1 M**odulator (Valve) system (**2S/1M**) descibed on page 1.

The layout of the chassis components are shown in Fig 2. The Module and Valve are mounted together on a single bracket for ease of installation and maintenance.

The powering of the system can be via any one of the following cables:

ISO 7638 - Dedicated ABS power cable

ISO 3731 (24S) - Supplementary power cable.

ISO 1185 (24N) - Stop Light powering.

A green warning lamp will also have been fitted to the headboard of the trailer, in a position visible to the driver through the driving mirror. This lamp will have been connected to the ABS via a junction box into which the ISO 1185 (24N) cable would also be connected.

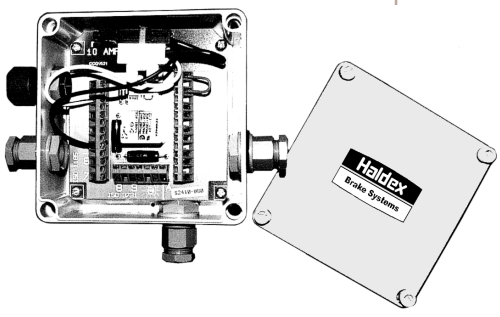
When an ISO 7638 is fitted, or powering is through the ISO 3731 (24S), it will normally control a red warning lamp in the driver's console.

Either warning lamp has two functions:

- To indicate system integrity via the correct lamp sequence (page 9) every time the ABS module is electrically powered up.

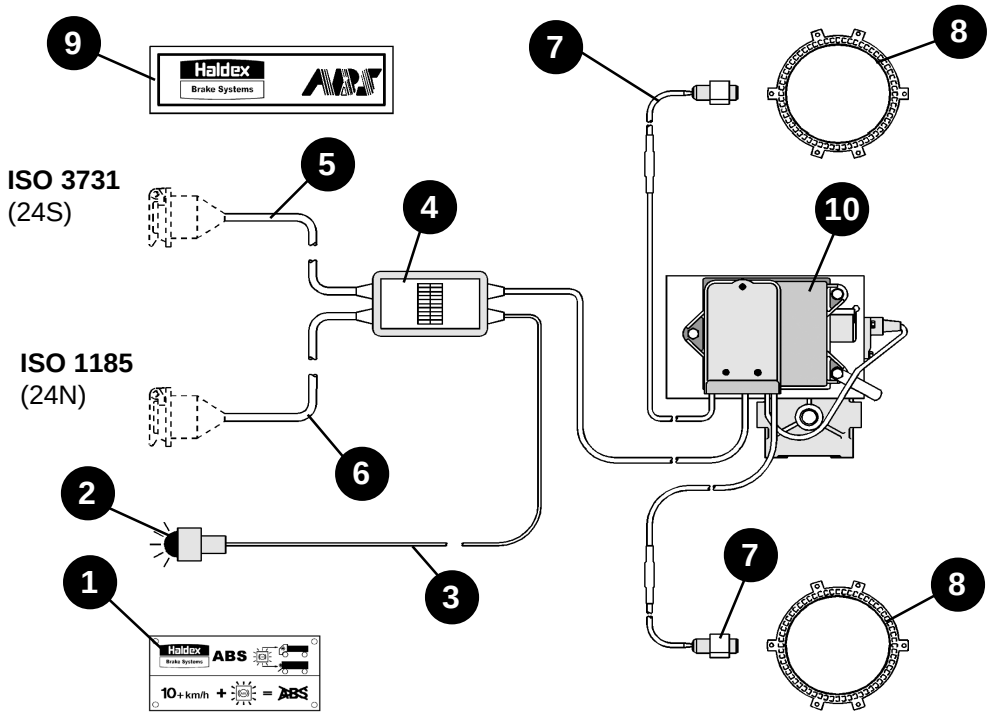
- To indicate by permanent illumination, when the vehicle is moving, if a fault has been detected.



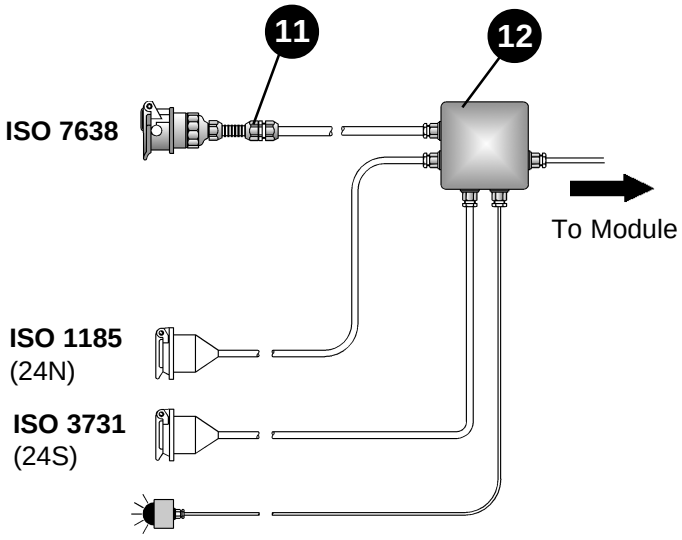




ABS CHASSIS COMPONENTS



ALTERNATIVE

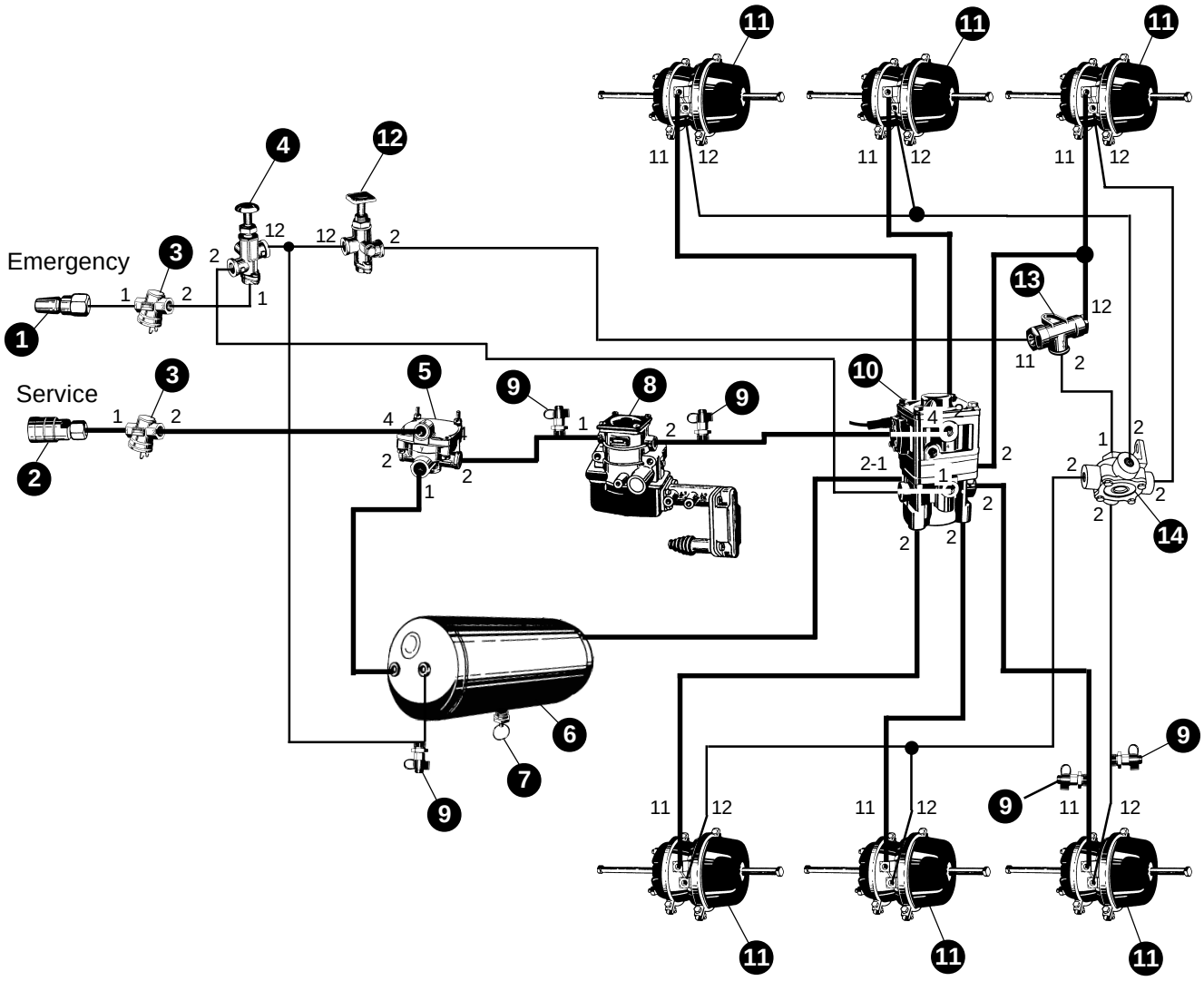


ITEM	DESCRIPTION
1	ABS Information Label
2	Green Warning lamp Bulb (24v-5w Double pole)
3	2 core cable
4	Junction box
5	ISO 3731 (24S) Cable assembly
6	ISO 1185 (24N) Cable assembly
7	Sensor assembly
8	Exciter
9	ABS Identification Label
10	Module/Bracket/Valve assembly
11	ISO 7638 Socket Assembly
12	Haldex Junction box (PCB)

Fig 2

PIPING DIAGRAM

- 2 Line Air Brake system, 3 Axle Semi-Trailer, Spring Brakes, Air Suspension



ITEM	DESCRIPTION
1	Emergency Coupling
2	Service Coupling
3	Pipe Filter
4	Trailer Release valve
5	Relay Valve
6	Air Reservoir (40L/Axle - Spring Brake Chamber)
7	Drain valve
8	Load Sensing valve - pneumatic
9	Test point
10	MCER Valve. (ABS)
11	Spring Brake Chamber
12	Park Valve
13	Double Check Valve
14	Quick Release Valve

Fig 4

WIRING DIAGRAM

- ISO 3731 (24S) and ISO 1185 (24N) Power Supply

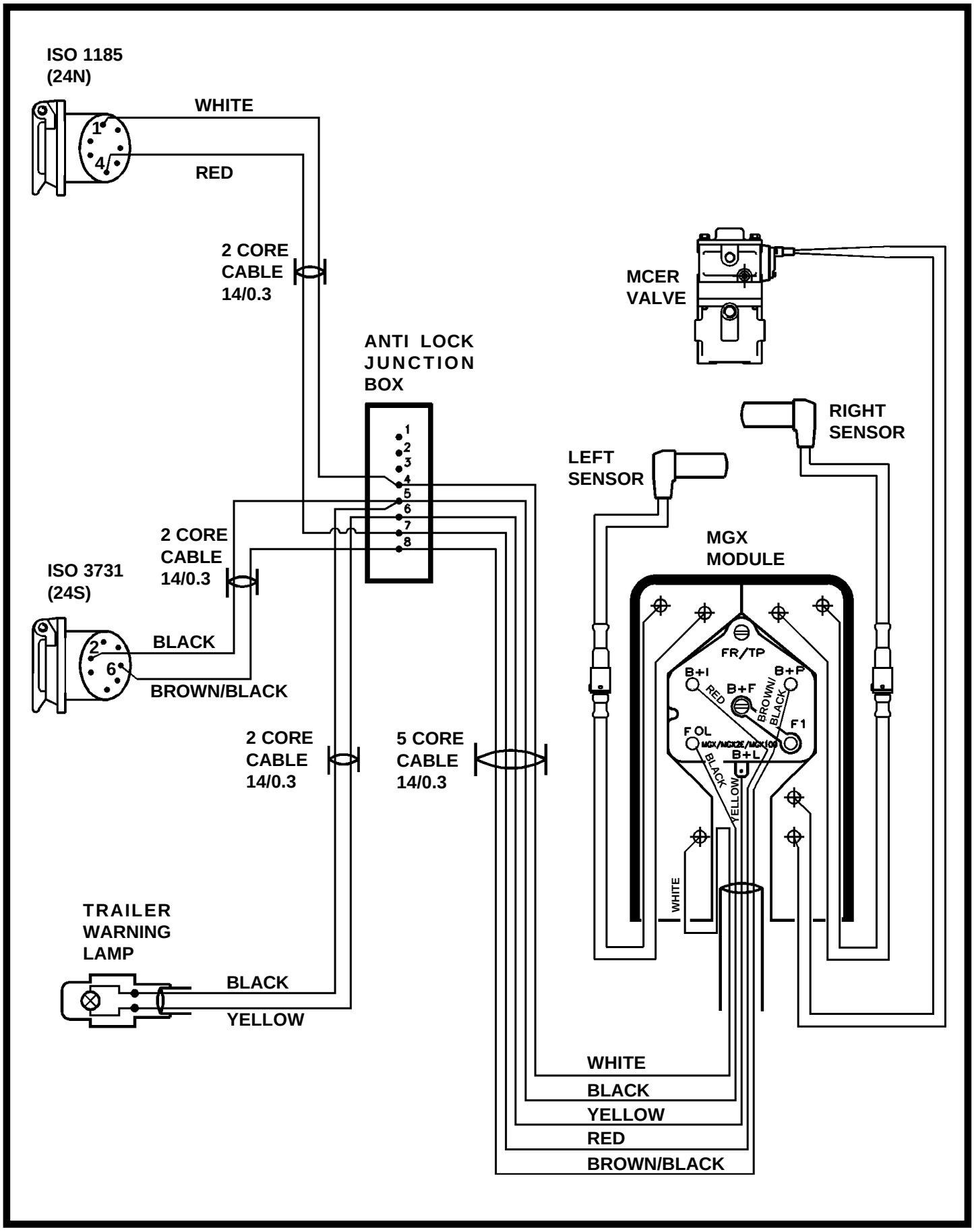


Fig 5

WIRING DIAGRAM

- ISO 7638 (Fused), ISO 3731 (24S) and ISO 1185 (24N) Power Supply

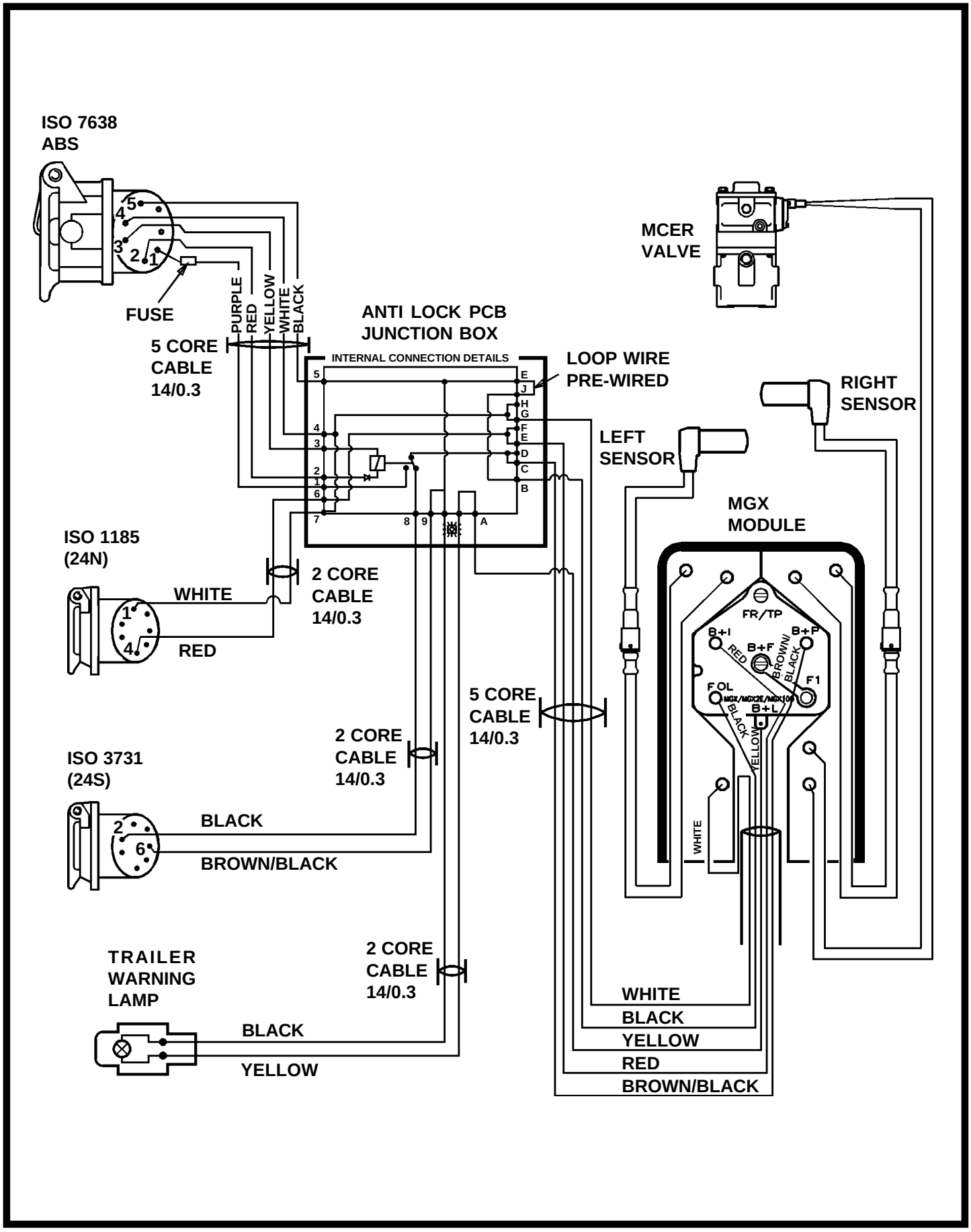
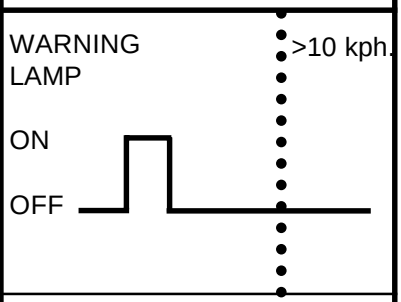
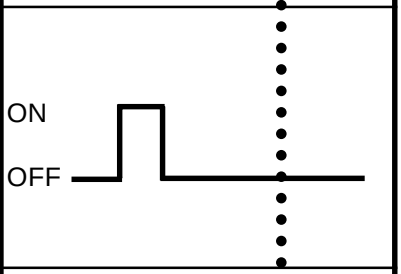
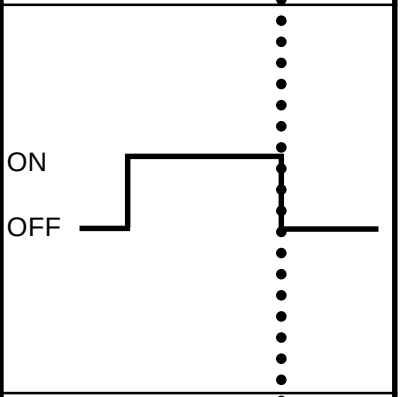
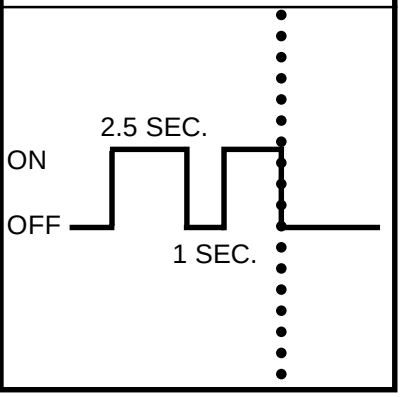


Fig 6

WARNING LAMP AND SYSTEM CHECK PROCEDURE

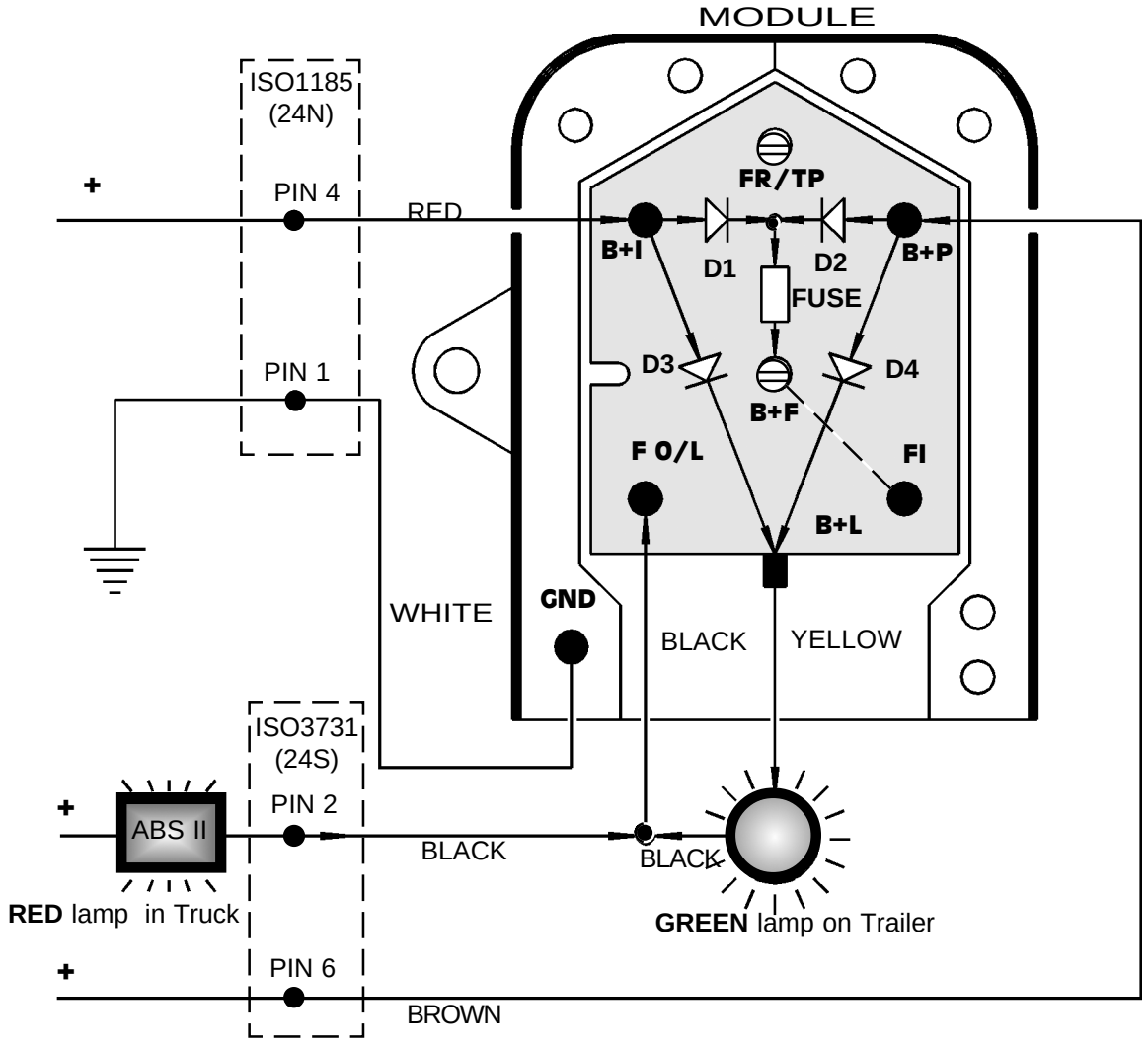
As mentioned on page 3, there will be a green warning lamp mounted on the headboard of the trailer. Their may also be a warning lamp on the driver's console of the towing vehicle.

On power up of the system, the warning lamp(s) must illuminate in the following sequence in order to show a fault-free system: (on some installations it will be necessary to depress the brake pedal in order to power up the ABS).

SYSTEM	WHEN ABS POWERED BY		VISUAL
	IGNITION	STOP LAMPS	
MGX with Mk 1 Fuse Board Blue case Module No. 75061172	Cab lamp ON for 1 second then OFF. NOTE: Trailer lamp inhibited. Any further lamp display = SYSTEM FAULT.	Trailer lamp ON for 1 second then OFF. Any further lamp display = SYSTEM FAULT.	
MGX 2 or MGX with Mk 2 Fuse Board Black case Module No. 75061356	Cab and Trailer lamp ON for 1 second then OFF. Any further lamp display = SYSTEM FAULT.	Trailer lamp ON for 1 second then OFF. Any further lamp display = SYSTEM FAULT.	
MGX 2E Grey case Module No. 75061413	Cab and Trailer lamp ON until vehicle exceeds 10 kph then OFF. Any further lamp display = SYSTEM FAULT.	Trailer lamp ON for 1 second then OFF (if speed is above 10 kph) OR lamp ON until speed exceeds 10 kph then OFF. Any further lamp display = SYSTEM FAULT.	
MGX 100 Green case Module No. 364 080 001	Cab and Trailer lamp ON for 2.5 second then OFF 1 second then ON until vehicle exceeds 10 kph. Any further lamp display = SYSTEM FAULT.	Trailer lamp ON for 2.5 second then OFF 1 second then ON until vehicle exceeds 10 kph. then OFF. Any further lamp display = SYSTEM FAULT.	

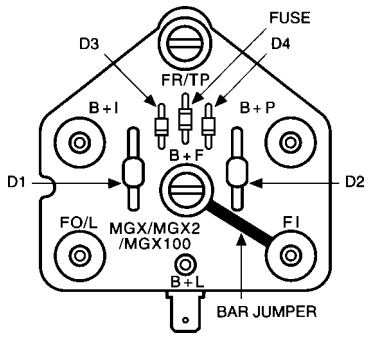
LAMP CIRCUIT

Mk II Polar Fuse Board - 24S /24N Power Supplies



Terminal Reference Guide

B+P	Battery positive permanent supply ISO3731 (24S)
B+I	Battery positive intermittent (Stoplamp) ISO1185 (24N)
B+F	Battery positive fused
F O/L	Failure output / Lamp
B+L	Battery positive lamp supply
FI	Failure input
FR/TP	Fault reset - MGX2 / Test pulse - MGX
GND	Ground terminal



Mk II Polar Fuse Board

Fig 7

MULTIMETER READINGS

CHECKING POSITION	MEASURE BETWEEN	CORRECT VALUE	REMARKS
Sensor output **MGX2 / 2E**	A & B C & D	0.9V AC Min. (+0.5V)	Sensor disconnected from ECU. **Measure cable end.** Wheel rotated at 1 rev / 2 sec.
Sensor resistance **MGX2 / 2E**	A & B C & D	>4.0 <6.0 kOhm	Sensor disconnected from ECU. **Measure cable end.**
Sensor output **MGX100**	A & B C & D	0.2V AC Min. (+0.15V)	Sensor disconnected from ECU.**Measure cable end.** Wheel rotated at 1 rev / 2 sec.
Sensor resistance **MGX 100**	A & B C & D	>1.0 <2.4 kOhm	Sensor disconnected from ECU. **Measure cable end.**
MCER Valve Solenoid resistance	V+ V-	>6.0 <16 Ohm	MCER Valve cable disconnected from Module. **Measure cable end.**
Supply from ISO 3731 (24S)or ISO 1185(24N)	B- B+F	24V	Ignition switched on or Foot brake applied, ignition switched on.
Supply from ISO 1185 (24N)	B- B+I	24V	Foot brake applied,ignition switched on
Supply from ISO 3731 (24S)or ISO 1185(24N)	B- B+L	24V	Ignition switched on or Foot brake applied, ignition switched on.
Supply from ISO 3731 (24S)or ISO 1185(24N)	B- FI	24V	Ignition swithched on or Foot brake applied,ignition switched on - Warning lamp ON.
Supply from ISO 3731 (24S)or ISO 1185(24N)	B- F O/L	1 - 6V	Ignition switched on or Foot brake applied, ignition switched on - Warning lamp ON.
Supply from ISO 3731 (24S)or ISO 1185(24N)	B- FI	24V	Ignition switched on or Foot brake applied, ignition switched on - Warning lamp OFF.
Supply from ISO 3731 (24S)or ISO 1185(24N)	B- F O/L	24V	Ignition switched on or Foot brake applied, ignition switched on - Warning lamp OFF.
Supply from ISO 3731 (24S)or ISO 1185(24N)	B- V+	0 - 0.1V	Ignition switched on or Foot brake applied, ignition switched on.
Supply from ISO 3731 (24S)or ISO 1185(24N)	B- V-	0 - 0.02V	Ignition switched on or Foot brake applied, ignition switched on.
Supply from ISO 3731 (24S)	B- B+P	24V	Ignition switched on.

Note: Alternative Supply to ISO 3731 (24S) can be ISO 7638

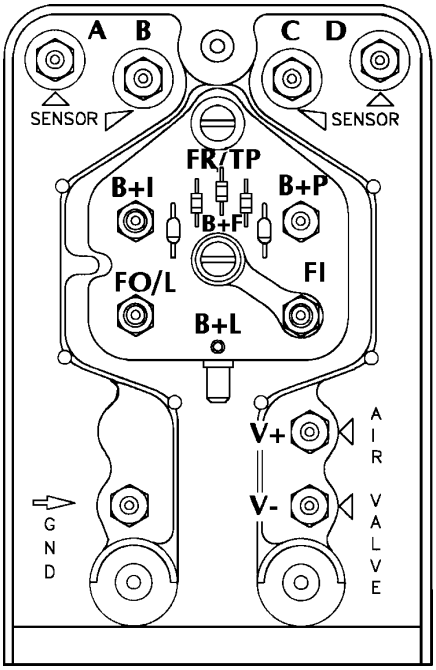


Fig 8

FAULT FINDING AND RECTIFICATION CHART

LAMP FAULT INDICATION	FAULT	RECTIFICATION
No lamp flash at power up. **MGX / MGX 2 / MGX 2E / MGX 100**	1 - Blown bulb. 2 - No power to module (B+I / B+P). 3 - Yellow or black lamp wire open circuit (F/OL / B+L) 4 - Yellow wire short circuit (D3 Diode blown). 5 - White wire open circuit. 6 - Module faulty.	1 - Check/replace bulb. 2 - Check for 224 Volts to B+I / B+P terminals. 3 - Check yellow and black lamp wire for open circuit (F/OL / B+L). 4 - Check D3 Diode (if burnt or blown rectify short circuit on yellow wire and replace polar fuse board). 5 - Check white wire for open circuit and rectify. 6 - Replace Module.
Lamp comes ON and stays ON when stationary. **MGX / MGX 2 / MGX 100**	1 - Module latched (exept MGX) 2 - Black wire short circuit to B- or Ground. 3 - Broken or missing bar jumper. 4 - Fuse blown. 5 - Module faulty.	1 - De-Latch module (Apply B+, Short between FR / TP and B+F, remove B+, wait, then re-apply B+). 2 - Apply B+, disconnect black wire at module. 3 - Check bar jumper security (Inspect for cracks). 4 - Repalce polar fuse board. 5 - Replace Module.
Lamp comes ON at speed 0 -20 kph. **MGX / MGX 2 / MGX 2E / MGX 100**	1 - Sensor fault.	1 - Adjust/replace faulty sensor.
Lamp comes ON at speed 80+ kph. **MGX / MGX 2 / MGX 2E / MGX 100**	1 - Damaged exciter. 2 - Excessive exciter run out. 3 - Loose sensor. 4 - Loose exciter.	1 - Check exciter and sensors for security condition and run out.
Lamp stays ON above 10 kph. **MGX 2E / MGX 100**	1 - Sensor fault. 2 - Module latched (MGX 2E only)	1 - Adjust/replace faulty sensor. 2 - De-Latch module.
Module will not De-Latch. **MGX 2 / MGX 2E / MGX 100**	1 - Solenoid open or short circuit. 2 - Supply wiring fault. 3 - Supply voltage <18 Volts or >32 Volts.	1 - Check solenoid for open or short circuit. Check solenoid for operation 2 - Check junction boxes for corrosion/water ingress. 3 - Rectify supply voltage (battery condition, alternator and electrical circuit for volts leak to ground).
Delayed lamp (lamp flashes ON/OFF then comes back on after approximately 3 seconds). **MGX only**	1 - Solenoid open or short circuit. 2 - Module faulty.	1 - Check solenoid for open or short circuit. Check solenoid for operation 2 - Replace module.

RECOMMENDED MAINTENANCE SCHEDULE

TIME OR MILAGE (whichever occurs first)	**COMPONENT**	**OPERATION**
When hubs are removed	Exciter	Check for damage
	Sensor	Check for wear clean and re-adjust.
Every 3 months or 25,000 miles (40,000 km)	Complete System	Perform system check out and air leakage check.
Annually or every or 100,000 miles (160,000 km)	Complete System	Perform system check out and air leakage check. Check wiring and piping security and integrity.
	Sensor	Check for wear clean and re-adjust.
Every two years 200,000 miles (320,000 km)	MCER Valve	Repalce or service as necessary.

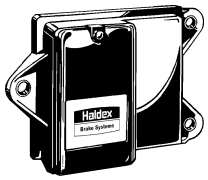
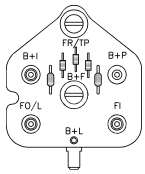
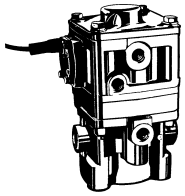
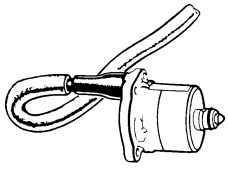
SERVICING PARTS

The list of available service parts is indicated on page 13 to 18. These can be obtained from Haldex service centres or distributors.

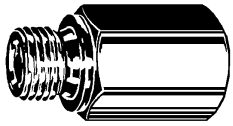
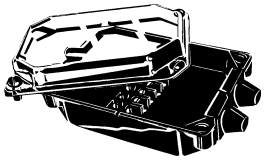
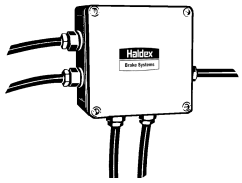
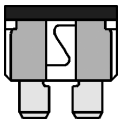
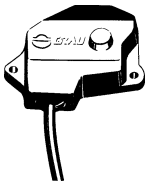
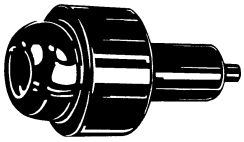
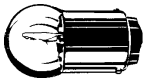
A European Service Guide is avaliable free of charge on application.

The diffrent components are shown in view form in order to allow easy recognition.

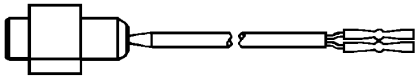
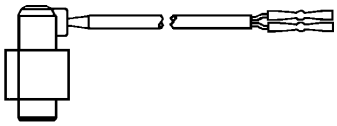
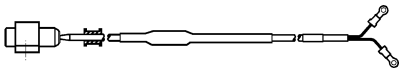
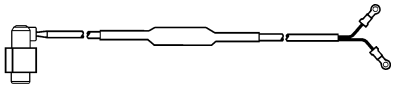
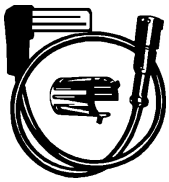
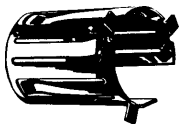
SERVICE PARTS

DESCRIPTION	PART NUMBER	VIEW
MGX 2 Module (Black) - 75061356 **MGX 2E** Module (Grey) - 75061413 **MGX 100** Module (Green) - 364 080 001	**950 364 101** **950 364 102** **950 364 103**	
MGX / MGX 2 / MGX 2E / MGX 100 Polar fuse board	**950 364 108**	
Module Lid	**75610347**	
MGX Bar Jumper	**75611835**	
MGX 2 / MGX 2E / MGX 100 Bar Jumper	**75612653**	
MCER Valve - 75611959 MCER Valve - Conduit	**950 364 104** **75612002**	
Solenoid 24v (PVC) Solenoid 24v (Conduit)	**950 364 106** **950 364 009**	

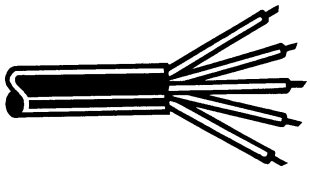
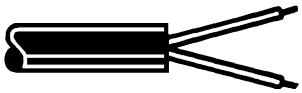
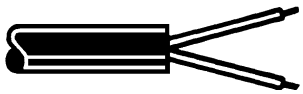
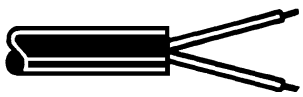
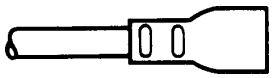
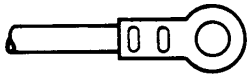
SERVICE PARTS

DESCRIPTION	PART NUMBER	VIEW
Flow Valve Flow Valve Kit (inc. 'O' ring, b/washer)	**950 364 110** **393 027 001**	
For 24S and 24N power supply Junction Box	**75611675**	
For ISO 7638, 24S and 24N power supply PCB Junction Box (w/o fuse) PCB Junction Box (fused) PCB Junction Box (fused)	 **003 7682 09 -** Semi Trailer **003 7861 09 -** Semi Trailer **003 7683 09 -** Full Trailer	
Fuse - 10 amp	**042 5332 09**	
Warning Lamp Controller	**950 364 111**	
Warning Lamp - Green	**950 364 710**	
Bulb (24v - 5w) Double pole	**950 364 711**	

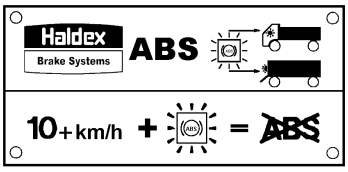
SERVICE PARTS

DESCRIPTION	PART NUMBER	VIEW
45 / 60 Tooth Sensor - Straight inc. Inline crimp and heat shrink sleeve	**393 045 001**	
45 / 60 Tooth Sensor - Angled inc. Inline crimp and heat shrink sleeve	**393 046 001**	
45 / 60 Tooth Sensor assy - Straight Cable length = 2.4m inc. grommet	**950 364 501**	
45 / 60 Tooth Sensor assy - Angled Cable length = 2.6m	**950 364 502**	
80 / 100 Tooth Sensor - Straight Cable = 0.5m, w/o Retaining clip Cable = 2.0m, w/o Retaining clip	**950 364 506** **364 208 011**	
80 / 100 Tooth Sensor - Angled Cable = 0.5m + Retaining clip Cable = 1.0m, w/o Retaining clip	**950 364 503 -** Standard **364 094 031**	
Retaining Clip (for 80 / 100 Tooth Sensors)	**059 5123 09**	

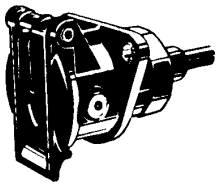
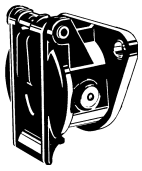
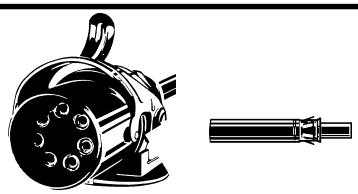
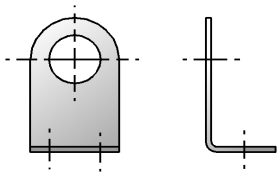
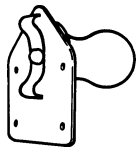
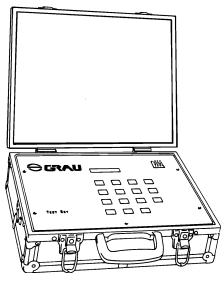
SERVICE PARTS

DESCRIPTION	PART NUMBER	VIEW
80 / 100 Tooth Sensor Extension Cable (PUR) 2m 3m	**059 5098 09** **059 5104 09**	
5 Core Cable Black/Red/White/Yellow/ Brown+Black 2m 100m	**75612944** **059 5076 09**	
2 Core Cable - For ISO 1185 (24N) White/Red 12.5m 100m	**75612127** **059 5078 09**	
2 Core Cable - For ISO 3731 (24S) Black/Brown+Black 12.5m 100m	**75612128** **059 5076 09**	
2 Core Cable - For warning lamp Black/Yellow 12.5m 100m	**75612126** **059 5077 09**	
Connector - Module, Warning lamp	**75611708**	
Connector - Module, Sensor	**75612019**	

SERVICE PARTS

DESCRIPTION	PART NUMBER	VIEW
In-line Crimp	**75610251**	
Heat Shrink Sleeve	**75610245**	
Spiral sleeve 1m 100m	**75613235** **069 5000 09**	
Exciter 45 T. - ROR 15" 45 T. - YORK 15" 60 T. - ROR, YORK, 22.5" 60 T. - BPW 8-9 Tonne 60 T. - BPW 10-12 Tonne	 **75611821** **75611901** **75611817** **016 7119 09** **75611384**	
Exciter 80 T. - ROR 15" 100 T. - ROR 22.5" - TM 100 T. - ROR 22.5" - TE	 **018 5004 09** **018 5003 09** **018 5005 09**	
Label - ABS	**950 364 702**	
Flex Coil - Suzie ISO 7638	**950 364 720**	

SERVICE PARTS

DESCRIPTION	PART NUMBER	VIEW
ISO 7638 Socket / Cable Assembly 12m - (fused) 12m - (w/o fuse)	**950 364 404** **364 221 111**	
ISO 7638 Socket and pin kit (w/o fuse)	**950 364 402**	
Replacement fuse kit for fused ISO 7638	**950 364 401**	
ISO 7638 Plug and socket kit	**950 364 403**	
Earth cable kit (Front and Rear Full-Trailers Installations only)	**393 052 001**	
Warning Lamp Bracket	**75611973**	
Reset Tool	**75061374**	
MGX Test Set (inc. loom) Test set loom (only)	**903 030 001** **905 030 001**	

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Haldex Group

The Haldex Group is a global supplier of proprietary products for trucks, cars and industrial vehicles, with special emphasis on performance and safety. TheGroup is organized in Divisions which focus on their respective product niche:

Haldex Brake Systems supplies ABS and brake components for heavy vehicle air brakes.

Haldex Barnes Hydraulics supplies gear pumpsand hydraulic systems for power steering and lifting functions on industrial vehicles and trucks.

Haldex Garphyttan Wire supplies specially steel-alloyed wire products mainly for applications in combustion engines.

Haldex Traction Systems supplies 4WD systems for cars and trucks.

Sales companies are established in Europe, North and SouthAmerica and Asia. Production takes place in 9 factories in USA, 9 factories in Europe and 1 joint venture in India.

The Haldex Group is listed on the Stockholm Stock Exchange.

Haldex
Brake Systems

Innovative Vehicle Technology

Company Vision

We use our demonstrated competence to provide innovative components, systems and service for trucks, trailers and buses, that lower life cycle costs and improve vehicle safety. Haldex wants to become the first choice business partner of commercial vehicle manufactures world wide in the areas of braking and suspension control systems with special emphasis on heavy commercial vehicles.

Total Support

A uniquely wide range of services is available from Haldex. These include expert consultancy for braking and suspension development, brake calculations, type approvals and application engineering.
The aim is accurate specification for manufactures and low cost of owner ship for the operator.
Full aftermarket support includes a Worldwide parts distribution and service network, on-line technical advice, field visits and installation/ maintenance training held on-site or at Haldex facilities.

Research and Development

Continual, heavy investment in Research and Development is carried out in response to ever increasing commercial, legislative, environmental, performance and technological demands.

Quality and Production Standards

The very latest production technology ensures the very highest quality standards. All production sites are ISO 9001 approved.