TECALEMIT GARAGE EQUIPMENT CO LTD

A Member of the Tecalemit Group of Companies

INSTALLATION & OPERATION

CAR BRAKE TESTERS

Cat. No's. DE 7184, DE 7185, DE 7186, DE 7187

Accepted by The Department of Transport (DTp) for statutory vehicle testing.

SAFETY PRECAUTIONS (U.K. Health and Safety at Work Act 1974)

Never direct High Pressure Air, Grease or Oil Delivery Nozzles at any part of the body. Always switch off and remove the fuse from electrical supplies, uncouple pressure supplies, and exhaust all air pressure reservoirs before commencing any maintenance work. Make sure that any guards or covers removed for maintenance work are replaced before operating the equipment.

SPECIFICATION

Maximum axle load	1800 kg (4000 lb)
Motor (2)	1.9 kW (2·6 H.P.)
Standard voltages	
DE 7184, DE 7186	3 phase, 415 volt, 50 Hz (4 wire supply is necessary) 20 amp minimum load capacity
DE 7185, DE 7187	1 phase, 240 volts, 50 Hz, 30 amp minimum load capacity.
Roller diameter	220 mm (8 5/8 in)
Min. width between rollers	835 mm (2 ft. 9 in)
Max. width over rollers	2200 mm (7 ft 2½ in)
Equivalent road speed	2 k.p.h. (1¼ m.p.h.)
Brake force gauges (2)	200 mm (8 in) dial reading 0 - 700 kg. in 10 kg increments

GENERAL PRINCIPLES

1. The Brake Tester incorporates two pairs of rollers mounted in a steel frame which is recessed into the floor. Each pair of rollers accommodates one wheel of the vehicle under test. The two pairs are in axial alignment to accept both wheels of the same axle, and are identified as Left Hand (L.H.) and Right Hand (R.H.) rollers in relation to the 'drive on' direction.

2. A separate electric motor drives each pair of rollers via two belts and a gearbox. The gearbox output shaft is coupled to one roller at the opposite end of which is a chain drive to the secondary roller of the pair. Both rollers transmit positive drive to one road wheel of the vehicle under test.

3. The gearbox input and output shafts are arranged co-axially, resulting in a torque reaction on the gearbox casing proportioned to the load applied at the rollers by the brake of the vehicle under test. Deflection of the base plate on which the gearbox is mounted is sensed by a hydraulic load cell, and transmitted to a gauge on the console unit.

4. The gauges on the console unit are calibrated directly as kgf, braking force, enabling the braking force of each wheel of the vehicle under test to be read off quickly and accurately. The total force of the braking system is obtained by adding together the individual wheel forces.

CALCULATING BRAKING EFFICIENCY

5. Braking efficiency is expressed as a percentage of G where G is the gravitational force acting on the mass of the vehicle. The formula for this is:—

$$\frac{\text{Total braking force of all vehicle's wheels in kg}}{\text{Vehicle weight in kg}} \times 100 = \%\ \text{Braking Efficiency}$$

From this it is evident that if one vehicle weighs twice as much as a second vehicle, the total braking force of the heavier vehicle must be twice that of the lighter one to obtain the same percentage braking efficiency.

With vehicles of the same weight, the braking efficiency is proportional to the braking force. For example:

Vehicle 'A'

Braking force 600 kg.

Weight 1000 kg

$$\text{Braking efficiency} = \frac{600}{1000} \times 100 = 60\%$$

Vehicle 'B'

Braking force 300 kg

Weight 1000 kg

$$\text{Braking efficiency} = \frac{300}{1000} \times 100 = 30\%$$

6. The stopping distance from a given speed is proportional to the braking efficiency.

From the example above:

Vehicle 'A' Braking efficiency = 60%

Stopping distance from 50 kpm = 15 m
or from 30 mph = 49 ft

Vehicle 'B' Braking efficiency = 30%

Stopping distance from 50 kpm = 30 m
or from 30 mph = 98 ft

These distances do not include the "thinking" distance necessary before application of the brakes. A simple calculator is supplied with each machine to provide a direct reading of % braking efficiency when the vehicle weight and total braking force are known.

7. With modern braking systems, the maximum braking efficiency obtainable is limited by the adhesion of tyres on the road surface. The maximum coefficient of adhesion is obtained just prior to the skid point and with good tyres on a good road surface an efficiency of 85% may be registered at this point.

OPTIONAL EXTRAS

Pressometer Cat. No. OA 50026

8. The Pressometer is a separate pedal pressure indicator which is available as an optional extra.

The unit consists of a hydraulic transmitter with bracket for attaching to the vehicle's brake pedal connected by flexible tube to a guage with a dead beat pointer.

The gauge is designed to hook onto the driver's window, and is calibrated up to 80 kg.

9. The use of a pressometer will ensure that the same brake pressure is applied to each wheel, thereby providing a datum for the comparison of individual brake performance.

10. Wheel Chocks. Cat. No. 68052

Wheel chocks are available as optional extras for added safety when testing both wheels simultaneously, or for testing vehicles with the hand brake operating on the front wheels.

11. Priming Kit OA 9851

This kit contains a small screw down gun and a bleed bottle for priming or topping up the hydraulic systems.

12. Calibration Kit, OA 50100

The kit comprises a balance arm and weight which allows periodic calibration checks to be carried out.

DESCRIPTION

DE 7184 3 phase Automatic Stop Machine

DE 7185 1 phase Automatic Stop Machine

13. Each of these machines consists of a floor mounted console incorporating the gauges of the machine, and a roller bed assembly which is recessed in the floor of the test bay.

14. The roller bed assembly consists of two sub-assemblies with welded steel frames, the two being bolted together in the floor recess. Positive grip steel plate covers fit over the whole assembly, leaving only the crest of the rollers exposed. Each frame houses two 220 mm (8 5/8 in) diameter grit covered rollers, the bearings of which are of the "lubricated for life" type. Each pair of rollers is interconnected by a 20 mm (¾ in) pitch single chain drive. One roller of each pair is coupled to an individual co-axial shaft reduction gearbox driven by a 1.9 kW totally enclosed electric motor via a duplex vee belt drive. The rollers are driven at a speed equivalent to 2 kph (1¼ mph).

The gearbox electric motor and a hydraulic load cell are mounted on a base plate which is free to rotate about the gearbox shaft, the whole power unit assembly being counterbalanced by a tension spring. Any force applied to the rollers results in a proportional deflection of the power unit and its base plate.

The hydraulic load cell senses this deflection and transmits the resultant pressure to gauges in the instrument console via 6 mm o/d (¼ in o.d.) nylon tubing.

15. A 35 mm (1 3/8 in) diameter wheel slip sensing roller, located between the gritted rollers, is driven by the vehicle's road wheel.

When the brake force is sufficient to cause slip between the gritted rollers and the tyre, the slowing of the sensing roller rotation changes a signal produced by a proximity switch located adjacent to the wheel slip roller. This switches off the power to the motor and energises an electric solenoid valve to hold the indicated brake force.

16. The console houses two 200 mm (8 in) dial gauges calibrated to give direct readings of brake force in kgf. units. The switch panel is fitted with an illuminated mains ON/OFF switch and a calibration switch which allows the rollers to be rotated continuously without a vehicle in position for purposes of calibration and maintenance.

Internally the console is fitted with two direct on line starters, an electronic control circuit board, and two solenoid valves in the hydraulic pipe lines. A bleed nipple is attached to each gauge to facilitate bleeding of the hydraulic lines. A terminal block is provided near the base of the console to accept the external wiring and a second terminal block is sited near the control circuit board, for the sensing circuit wires.

17. A small hand held remote control unit houses one start and one stop switch for the control of both motors. The design of the start switch is such that it has to be pressed to the right to start the R.H. motor and to the left to start the L.H. motor. This arrangement also ensures independent starting of single phase motors. The stop switch, when depressed, will stop both motors simultaneously and also provide pointer lock on the brake force gauges.

DE 7186 3 ph.
DE 7187 1 ph. Non Automatic Stop Machines

18. These two machines are basically the same as the Automatic stop models except for the following:

(1) The roller bed is NOT fitted with the wheel slip sensing rollers which give the previous models their auto stop facility.

(2) The console houses two 200 mm (8 in) dial gauges incorporating 'dead beat' pointers and calibrated to give direct readings of brake force in kgf units. Two push button start/stop controls and an illuminated mains ON/OFF switch are mounted in a switch panel. In the single phase model only, a changeover switch which allows only one motor to be started at a time, is included in the panel.

Internally the console is fitted with two direct on line starters. A bleed nipple is attached to each gauge to facilitate bleeding of the hydraulic lines from load cells to gauges. A terminal block is provided near the base of the console to accept the external wiring.

OPERATING INSTRUCTIONS

DE 7184 & DE 7185 Automatic Stop Machines

19. No vehicle should be accepted with an axle weight in excess of 1800 kg (4000 lb). Overloading will result in serious mechanical and even structural damage to the machine.

Vehicle tyres should be in reasonable condition, CORRECTLY INFLATED, free from stones and mud and as dry as possible.

The vehicle should be driven on in the correct approach direction until the wheels rest squarely in the pairs of rollers free of the side or centre cover plates.

20. Select the mains switch ON - (illuminated), and the calibration switch OFF. Start both sets of rollers by means of the start control on the Remote Control. Unit. Allow the vehicle to steer itself into a "Squared-up" position. Apply the Handbrake.

21. Stop the rollers; restart the L.H. set and apply pressure gradually to the brake pedal until wheel slip occurs. The rollers will stop automatically when this point is reached. Record the maximum brake force obtained. Start the R.H. rollers and repeat this operation. Testing wheels individually obviates the need to chock wheels, and gives a more reliable reading of maximum brake force.

22. Start both sets of rollers and apply pressure, gradually to the brake pedal until near maximum brake force is reached. (This figure is known from the wheel slip test carried out in para. 24). Release the pressure gradually and observe the decreasing brake force reading. If wheel slip is introduced inadvertently start this test again. It is necessary to note the values of brake balance on both wheels of the steered axle for both increasing and decreasing brake forces.

23. Drive the vehicle forward (see para. 25) and repeat the tests, as in para. 21, for the rear wheels using the service foot brake.

24. Repeat this test using the hand brake. Total the braking forces of all four wheels when using the service brake, determine the vehicle weight from the chart provided, and use the calculator to determine brake efficiency. Repeat this for the hand brake values, and complete the Report Form.

25. Rollers may be stationary when driving front wheels off, but MUST BE rotating when driving the rear wheels off (for front wheel driven vehicles the reverse applies). It will be found easier to reverse the driving wheels out of the rollers than to drive forward.

It is recommended that the console mains ON/OFF switch is switched off at the conclusion of each test UNLESS the machine is going to be used again immediately.

DE 7186 & DE 7187 Non Automatic Stop Machines

26. No vehicle should be accepted with an axle weight in excess of 1800 kg (4000 lb). Overloading will result in serious mechanical and even structural damage to the machine.

Vehicle tyres should be in reasonable condition, CORRECTLY INFLATED, free from stones and mud and as dry as possible.

The vehicle should be driven on in the correct approach direction until the wheels rest squarely in the pairs of rollers free of the side or centre cover plates.

27. Ensure the mains switch is ON - (illuminated).

Start both sets of rollers by operating the push buttons on the console.
NOTE: On DE 7187 (single phase) the changeover switch, below the mains on/off switch, must also be selected as only one set of rollers can be started at a time. Allow the vehicle to steer itself into a "squared-up" position. Apply the Hand Brake.

28. Stop the R.H. rollers and apply pressure gradually to the brake pedal until wheel slip occurs. Note the maximum reading recorded by the dead beat pointer. Maximum braking force is obtained immediately prior to the wheels locking. Stop the L.H. rollers and start the R.H. rollers and repeat this operation.

Testing wheels individually obviates the need to chock wheels, and gives a more reliable reading of maximum brake force.

29. With both sets of rollers rotating gradually apply pressure to the brake pedal until near maximum brake force is reached (indicated by dead pointers). Release pressure gradually and observe brake force readings.

It is required to observe values of brake balance on both wheels of the steered axle for both increasing and decreasing brake forces.

30. Drive the vehicle forward (see para. 21) and repeat the tests as in paragraph 28, for the rear wheels using the service (foot) brake.

31. Repeat this test using the hand brake.
Total the braking forces of all four wheels when using the service brake, determine the vehicle weights from the chart provided, and use the calculator to determine brake efficiency. Repeat this for the Hand Brake values and complete the report form.

32. Rollers may be stationary when driving front wheels off but MUST be rotating when driving the rear wheels off (for front wheel driven vehicles the reverse applies). It will be found easier to reverse the driving wheels out of the rollers than to drive forward.

INTERPRETING GAUGE INDICATIONS

33. When the tester is started up, low reading may be observed on the brake force gauges, due to drag of bearings etc. Readings are normally slightly higher on the driver's side. If the readings are unduly high, brake drag is indicated.

GAUGE READING	COMPLAINT
Slow, regular fluctuation	Oval brake drums or distorted discs
Regular jump at each road wheel revolution	Localised corrosion or wear of drum or disc
Rapid oscillation	Glazed, oily or wet linings
Delayed fall on pedal release	Sticking brake shoes or pads
Slow build up and low readings	Grease on shoes or pads
Sudden fall	Hydraulic leakage

An efficiency of 80% is very good

An efficiency of 60% is average

Defects can thus be analysed, corrected and the brake system retested in an efficient manner, so performing other duties than that of merely testing the braking system for the purpose of issuing a M.O.T. certificate of roadworthiness.

34. Certain vehicles are not suitable for testing on roller type testers. Examples are those with permanently coupled four wheel drive, mechanical servo braking systems, limited slip differentials and some belt driven vehicles. This list is not complete and operators should take every care to ensure that vehicles submitted for test are suitable for roller testing.

INSTALLATION INSTRUCTIONS

35. The position of pit and console should be discussed with a Tecalemit representative, attention being paid to the vehicle approach direction and console position. The console must be sited so that the operator can see the console face when testing the front and rear wheels. Excessive manoeuvring of the vehicle to position it on the rollers is undesirable and should be avoided.

CUSTOMER'S RESPONSIBILITY

36. The following work should be completed before Tecalemit supervisory staff are requested.

(1) Preparation of the pit and the conduit between roller-bed and console in accordance with Drawing No. DE 7184-7 Sheet 2.

Occasionally, it may be found that both discrepancies occur together, but a logical process of correction will quickly produce the optimum readings.

SETTING THE AUTOMATIC ROLLER STOP CONTROL

44. Operation of the auto roller stop is controlled by the two potentiometers located at the top left and right corners of the printed circuit board in the console. They may be adjusted, when necessary, as follows:–

(1) Position a car on the roller bed.

(2) Turn both potentiometers fully clockwise.

(3) With mains switch ON, press and hold in the motor control switch on the remote control unit.

(4) Turn one potentiometer at a time anti-clockwise until the contactors "hold-in" when the start switch is released. This gives an approximate setting, a more sensitive setting may be required to:-

(a) Ensure that the contactors "hold-in" continuously.

(b) Ensure that the maximum brake force indicated by the gauge needle is held by the solenoid valve.

MAINTENANCE

45. Four monthly

(1) Inspect all moving parts for wear or damage.

(2) Tighten all grub screws, nuts and screws.

(3) Adjust belts if required.

(4) Adjust (if required) and lubricate the chain drive using a heavy gear oil.

(5) Inspect hydraulic system for leaks.

(6) Check calibration and adjust if necessary.

N.B. The Department of Transport requires that Brake Testers used for the purpose of 'M.O.T.' tests on vehicles should be calibrated every FOUR months, and a certificate issued to this effect.

DIAPHRAGMS (see Fig.4)

46. In time, depending upon the work load of the tester, hydraulic leakage may occur from a load cell (or the Pressometer unit). Each unit incorporates a diaphragm, deterioration of which will result in a hydraulic leak. Failure of the diaphragm is indicated by inability to obtain or maintain a gauge reading. The following precautions must be observed when renewing a diaphragm:–

(1) The diaphragm must be fitted with the fabric surface on the low pressure side of the unit.

(2) Press the diaphragm over the piston and fit the clamp plates.

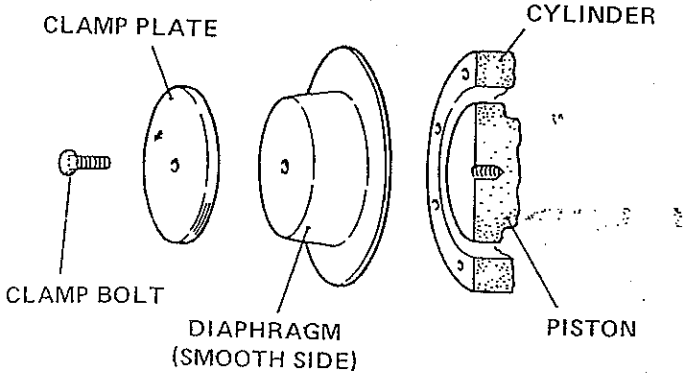


Fig.4 Assembly of Load Cell or Pressometer Diaphragm

PRESSOMETER

47. A failure to obtain or maintain a gauge reading indicates hydraulic leakage. Should this be due to deterioration of the pedal unit diaphragm, follow the procedure given in Para. 46.

HYDRAULIC BLEEDING

48. Should any defect occur affecting the hydraulic system of the pedal pressure measuring device, an oil filling and air bleeding procedure will be necessary after repair.

49. Remove the ¼ in. B.S.P. brass plug in the block under the gauge and slacken the cap screw in the side of the base of the foot pedal unit.

50. Remove the ¼ in. B.S.P. plug and fit the priming gun. Hold the Pressometer above the level of the gauge so that the flexible pipe between them has a continuous rise and the 4 mm hole is at the highest point. Prime the system until air free oil emerges from the hole. Push the knob of the Pressometer down until itslower rim aligns with the groove on the body. Holding it in this position tighten the screw, lower the pedal unit, remove the oil gun and nipple and quickly insert the ¼ in. B.S.P. plug.

51. Should the gauge remain sluggish or is erratic when the pedal is pre-loaded by a known dead weight, further bleeding is necessary.

CAUTION: Do not operate any part of the hydraulic system until the system is primed with oil. 'Dry' operation will damage the diaphragm.

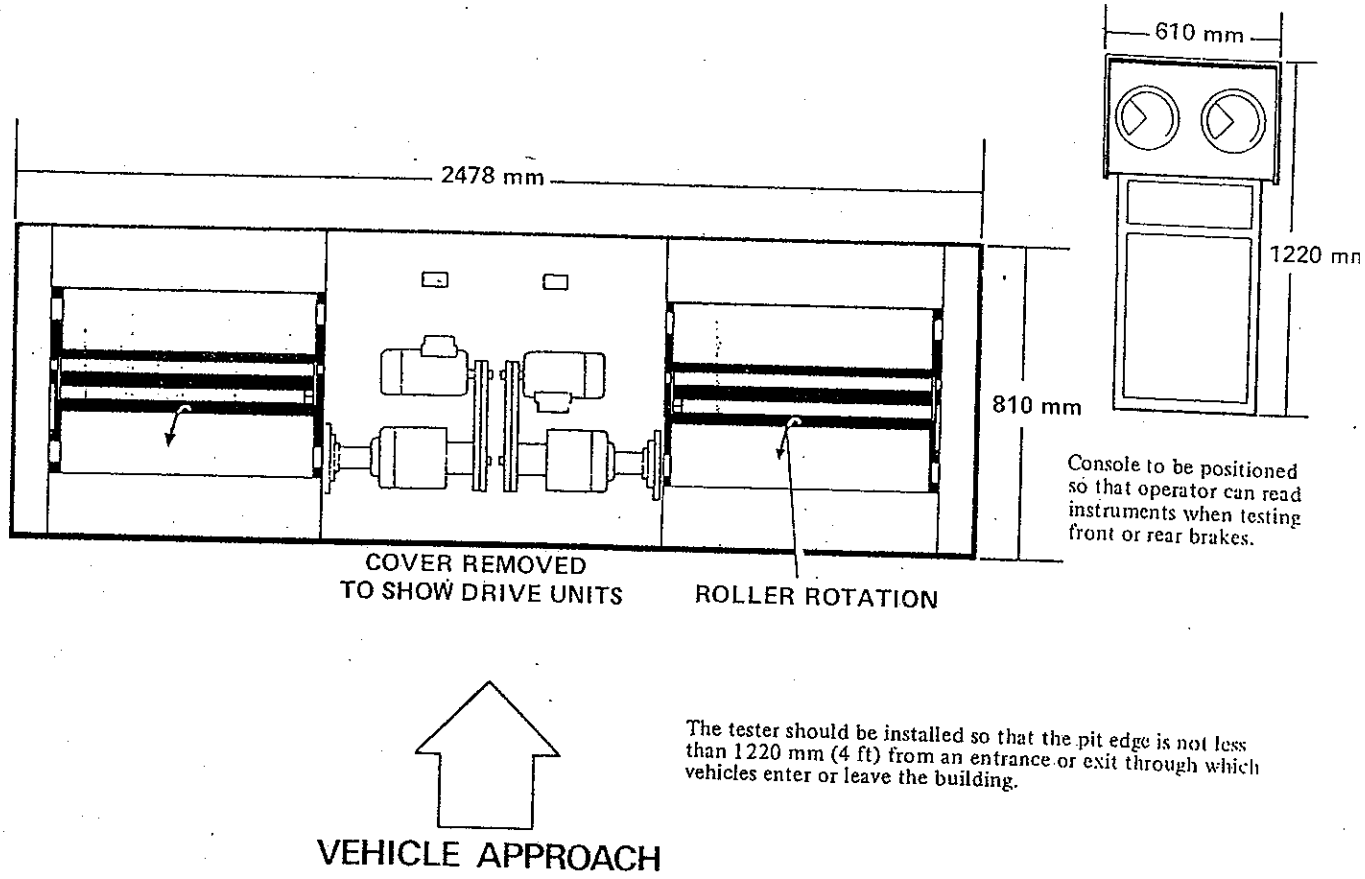


Fig. 1 Dimensions – Car Brake Tester

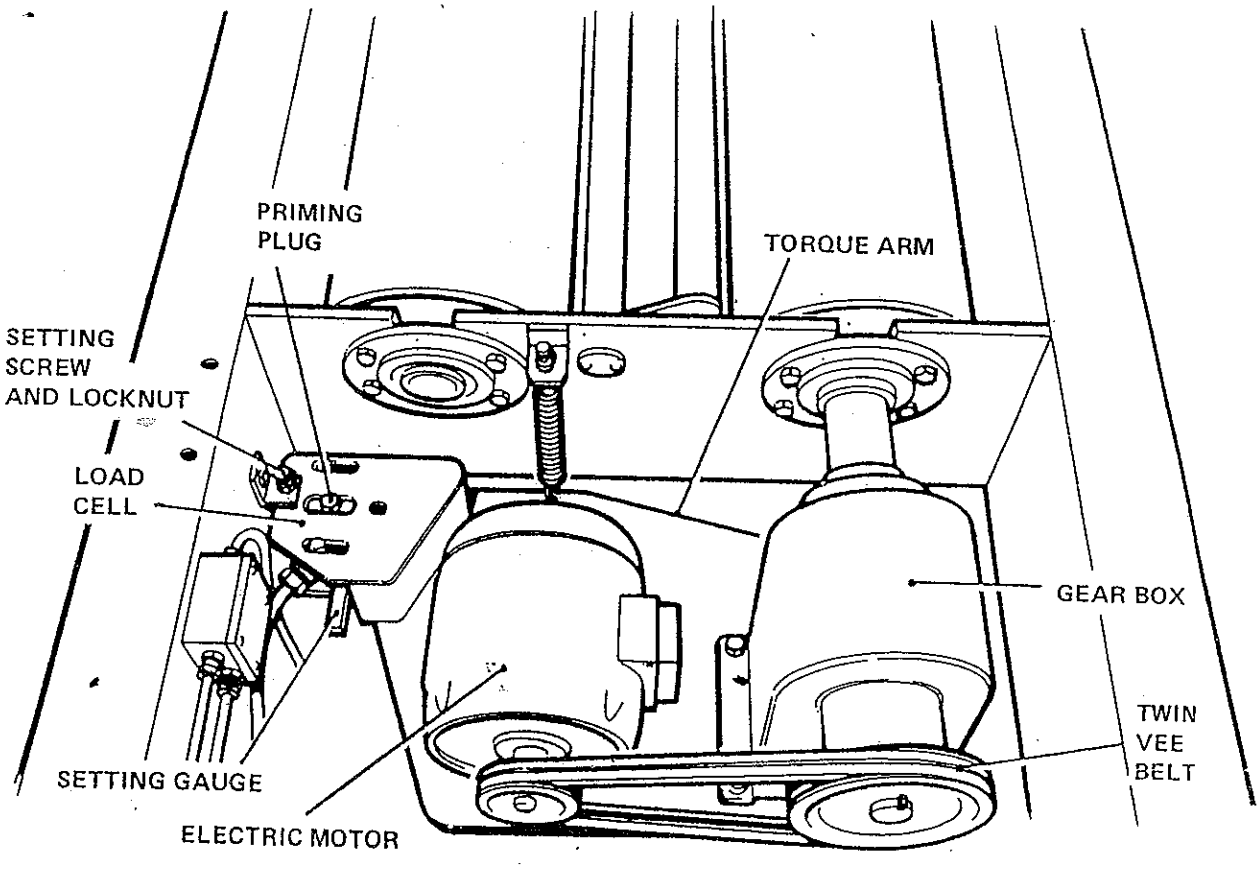


Fig.2 Load Cell and Torque Arm Assembly

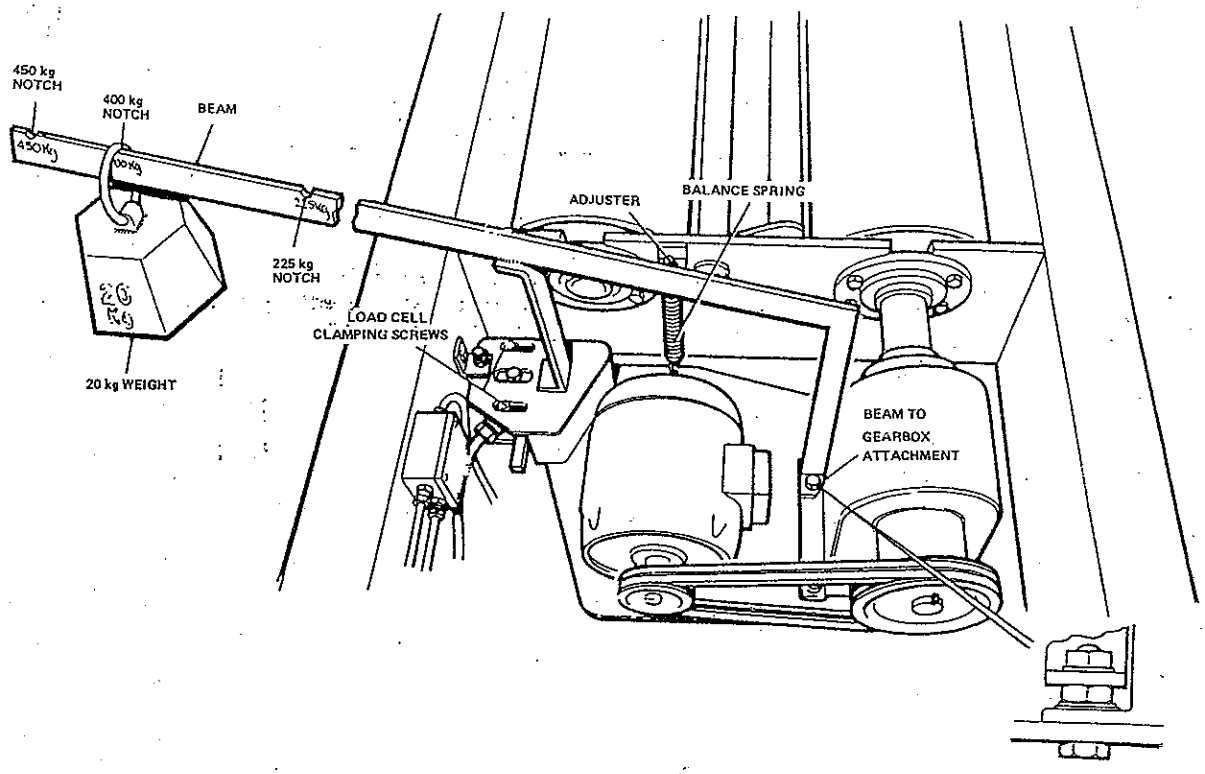


Fig.3 Position of Calibrating Arm

To ensure complete bleeding of the bourden tube within the gauge, each instrument should be unclamped and turned through 90°, anti-clockwise when viewed from the front. This should be repeated three or four times. Return the gauge to the normal position and tighten the bleed screw. It is preferable during this operation to have some help so that pressure can be maintained on the oil gun whilst the bleed screws are tightened. Remove the priming gun and quickly replace the original plug and sealing washer. Strict cleanliness must be observed throughout this operation and the oil gun should be filled carefully to ensure that air bubbles are not entrained

(7) Set in motion the rollers adjacent to the load cell being worked on. Check that the direction of rotation of the rollers is in accordance with the arrow. See Fig.1. Slacken the locknut on the setting screw above the load cell until the power unit is felt to be "floating". The amount of "float" varies with the temperature of the hydraulic oil but approximately 1 mm of free movement will be found to be satisfactory.

Remove the setting gauge and tighten the locknut on the setting screw without upsetting the adjustment. Stop the rollers.

CALIBRATION

42. A kit as illustrated in Fig. 3, can be obtained by the customer under Cat. No. OA 50100 and is used as follows:

Fit the calibration arm to the roller set, See Fig. 3, ensuring that the locating pin fits into the hole in the load cell mounting plate. Select the console calibration switch ON and start the rollers. The Calibration arm alone should give an initial reading on the gauge of 70 kgf. Place the 20 kg weight onto the arm in the notches provided: in each case the resultant gauge force should be that stamped on the arm adjacent to each notch.

Repeat these checks on the opposite roller set.

Sluggish gauge operation and/or erratic readings probably indicate air in the gauge system. Bleed the system in accordance with Para. 41 (6).

The machine has been works calibrated, and normally there should be no need to make adjustment to the load cell position or to the tension of the power unit balancing spring. This would only be necessary in the event of a consistent discrepancy in readings when carrying out the calibration precedure.

43. The discrepancy may be either:

(1) An almost constant error throughout the gauge readings.

This may occur if the power unit balance spring setting has been disturbed. Adjust the balance by increasing or decreasing the tension in the spring by means of the 5 mm Nyloc nut. Increase tension if gauge readings are too high. Decrease tension if gauge readings are low. See Fig. 3.

(2) An error which increases as the load increases. This indicates that the load cell position has been moved. Slack

Slacken the two clamping screws passing through slots in the base plate, and move slightly away from the gearbox to decrease (or towards the gearbox to increase) the gauge readings. Tighten clamp screws before re-testing. See Fig.3.

(2) Electrical work for supply from a suitably fused isolator to the console in accordance with the following wiring diagrams:-

DE 7184	31881-297	Sheet ref.	TSM 4744
DE 7185	31881-298	" "	TSM 4745
DE 7186	31881-299	" "	TSM 4746
DE 7187	31881-300	" "	TSM 4747

The supply of a suitable isolator and wiring is included in this requirement.

(3) The supply of a crane 600 Kg (12 cwt) capacity, and labour for lifting the brake tester into the pit.

(4) The customer is also responsible for ascertaining from his Local Petroleum Officer the requirements for protection of electrical equipment in his area. If necessary, Tecalemit Garage Equipment Co. Ltd. can supply, at extra cost, a fan which will permit the pit to be purged with fresh air.

(5) If the machine is to be used for 'M.O.T.' testing a calibration certificate must be obtained from the installation engineer. This certificate will be issued at the time of commissioning. The customer must also request re-calibration and a new certificate to be issued at 4 monthly intervals in order to comply with testing regulations (see para. 45 (6).

(6) A pedestal for floor mounting and wall brackets for wall mounting the Gauge Cabinet are available as optional extras. This allows the electrical cabinet to be remotely situated.

TECALEMIT'S RESPONSIBILITY

37. Supply of supervisory staff to check the pit dimensions prior to installing the tester, supervise installation of the tester, secure the console in the agreed position, make all hydraulic connections and bleed the hydraulic system, check calibration and give the operator instructions and demonstrations.

SITE PREPARATION

38. Prepare the pit and conduit in accordance with the correct installation drawing (see Para. 36).

The pit ledge must be level. If the floor is sloping the ledge must be constructed to the highest point, and then screeded off with good quality sand and cement.

On no account must the dimensions of the pit differ from those shown on the appropriate drawings (see Para. 36 (1).

Note the different width of the ledge around the pit and the relationship of the ledge to the drive on direction. It is recommended that a suitable drain is incorporated in the floor of the pit.

ELECTRICAL REQUIREMENTS

39. A 415 Volt 50 Hz (cycles) 3 phase and neutral supply of 20 amps minimum load capacity is required for DE 7184 and DE 7186. A 240 volt 50 Hz (cycles) single phase supply of 30 amps minimum load capacity is required for DE 7185 and DE 7187.

SITE VISIT

40. A joint visit to the site is made by the Tecalemit Representative and the Area Service Supervisor to check that the pit is correct, and that arrangements have been made for the electrical work as detailed in Para. 36(2). A check is also made to ensure that all items supplied by Tecalemit have arrived.

The supply of a crane, 600 kg (12 cwt) capacity for lifting the main assemblies into the pit, the final assembly and electrical connections is co-ordinated between the Sales Engineer, Service Supervisor and customer.

INSTALLATION PROCEDURE

CAUTION: The following instructions detail the adjustment of mechanical and electrical equipment. Only competent electricians and/or trained service engineers should be employed to carry out such work. Certain adjustments to the electrical controls necessitate the power supply being switched on during the adjustment period. Extreme care must be taken during these operations.

41. (1) The roller bed assembly is supplied in two halves. Each half is lowered into the pit with covers removed taking care that it is positioned in the correct relationship to the drive on direction, see Fig.1. Shim as necessary to ensure alignment of the rollers, bolt the two halves firmly together.

To secure the complete roller unit in the pit, tighten the four main clamping screws in the sides of the frame.

(2) The instrument console should now be sited and bolted to the floor using approved anchor bolts, 3/8 in UNC.

(3) Complete the wiring i.e. isolator switch to console; console to motors and proximity switches to console, in accordance with the appropriate wiring diagram (see Para. 36 (2).

Seal the cable entry using the compound supplied.

NOTE: Take care to connect the wires from the proximity switch in the correct polarity at the terminal block. When wiring is complete and dealing with each half machine in turn, run the nylon tubing between the load cell and the console making use of the sleeve nuts and cones on the load cell and solenoid valves. On Models DE 7186 and /7 this connection is made directly to the double ended union on the console.

WARNING: IT IS ESSENTIAL THAT UTMOST CLEANLINESS BE EXERCISED WHEN CUTTING AND FITTING THE HYDRAULIC PIPING AND MAKING THE CONNECTIONS. ALL PIPEWORK SHOULD BE BLOWN THROUGH TO REMOVE ALL CUTTING SWARF AND DIRT. CONNECTIONS MUST BE SPOTLESSLY CLEAN AS ANY FOREIGN MATTER ENTERING THE HYDRAULIC SYSTEM CAN RESULT IN LOAD CELL FAILURE.

(4) Slide the setting gauge under the load cell tappet (This will be in position when the unit leaves the factory) and tighten the setting screw and locknut until there is no vertical movement of the power unit base plate. Failure to do this can result in damage to the load cell during the bleeding operation, or an inadequate allowance for thermal expansion of the hydraulic oil.

(5) With all pipe connections throughout the hydraulic system correctly made and tightened up, prime and bleed the system as follows:

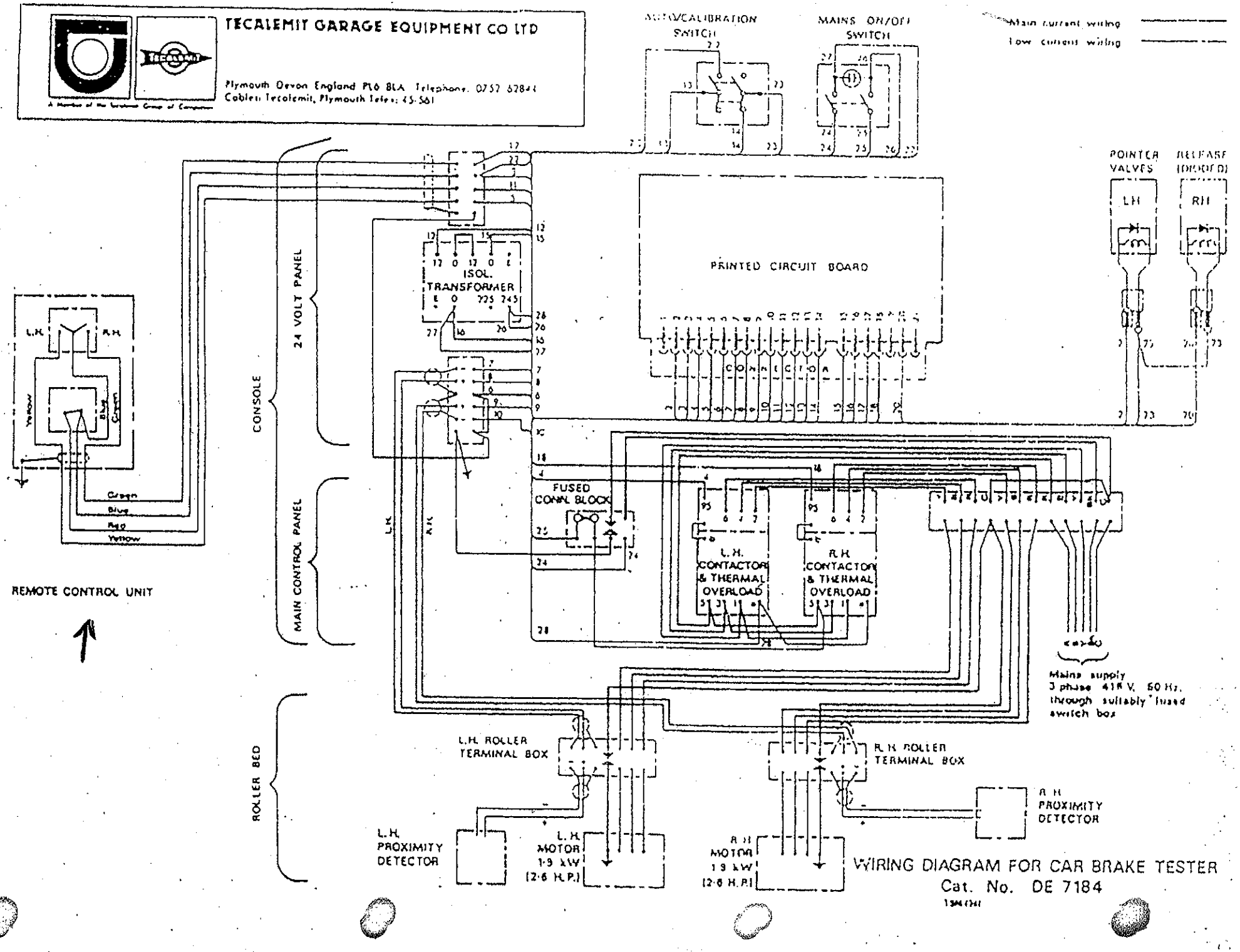
(6) Clean and remove the plug and seal washer from the top of the load cell, fit the priming gun* and slacken the bleed nipple on the back of the brake force gauge. Place the clear plastic tubing over the bleed nipple for collection of excess fluid.

Prime the system until air free oil emerges from the bleed screw. Do not over pressurise the system by excessive operation of the gun – at no time should the gauge needle be deflected above the maximum marked range.

* A Priming Kit. Part No. OA 9851 is available as an optional extra.

TECALEMIT GARAGE EQUIPMENT CO LTD

Plymouth Devon England PL6 8LA Telephone: 0752 62844
Cables: Tecalemit, Plymouth Telex: 45-561



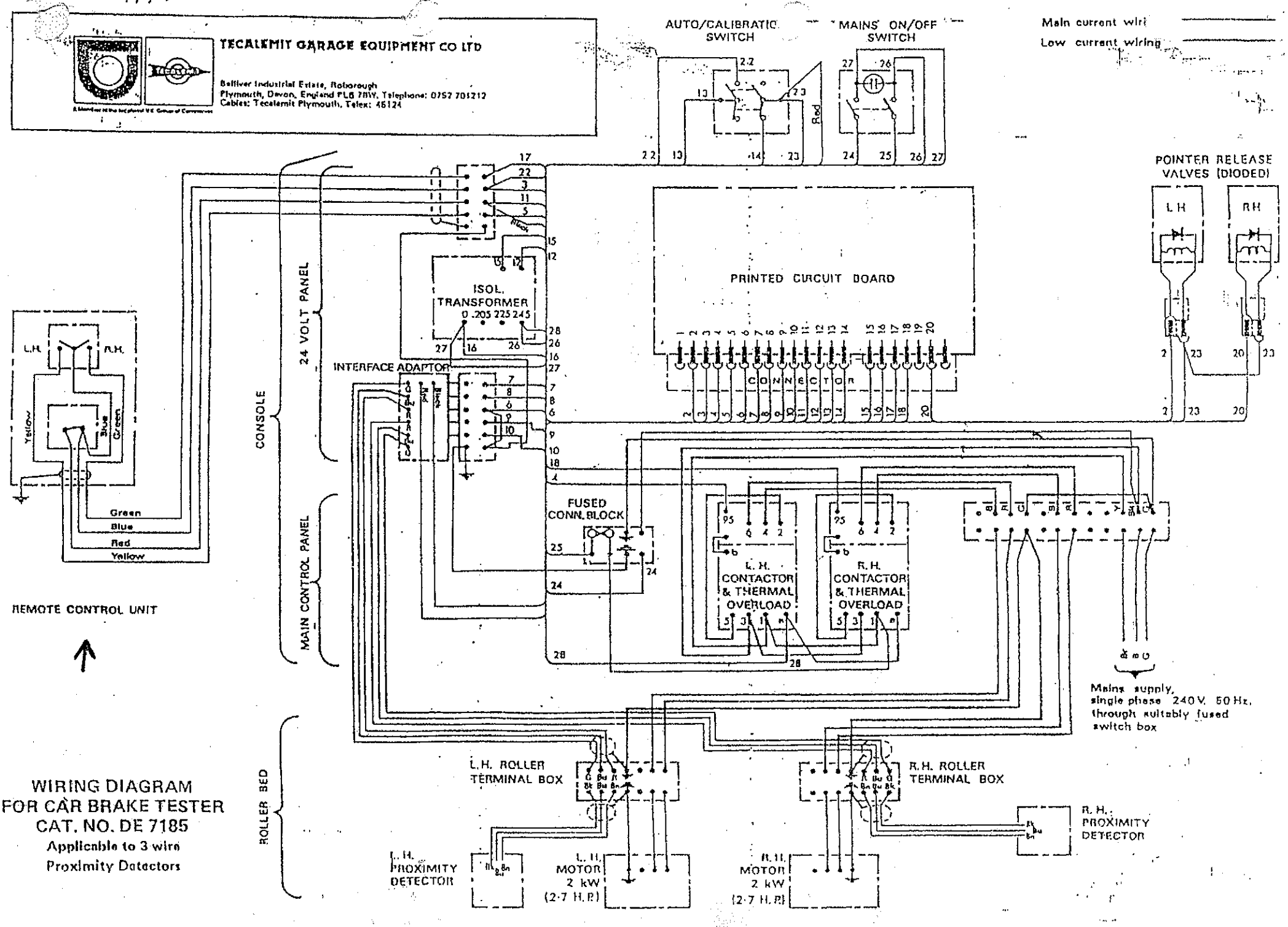
WIRING DIAGRAM FOR CAR BRAKE TESTER

Cat. No. DE 7184

TSM 4745

TECALEMIT GARAGE EQUIPMENT CO LTD

Bellfiver Industrial Estate, Roborough
Plymouth, Devon, England PL6 7BW. Telephone: 0752 705212
Cables: Tecalemit Plymouth, Telex: 45124



WIRING DIAGRAM FOR CAR BRAKE TESTER CAT. NO. DE 7185

Applicable to 3 wire Proximity Detectors