

BT. TRAILER WINCH No. 2 / SEB MODEL CW3000

Introduction

This trailer winch has been designed to pull cables into, or out of ducts by means of a horizontally mounted capstan and an approved winch rope. It is capable of a designed maximum line pull of 3000 Kgs.

The winch is mounted on a single axle trailer built to full European Whole Vehicle Type Approval (ECWVTA) To Directive 2007/46/EC and relevant amendments. The installation comprises a 13 h.p., water-cooled diesel engine driving a tandem hydraulic pump assembly. Hydraulic oil then passes through a manifold containing the control valves to a hydraulic motor rigidly coupled to the capstan.

Speed control is via two rotary hand wheels on the control panel which, when turned, vary the rate of flow of oil to the hydraulic motor. Forward or reverse rotation is selected by push buttons that operate solenoids within the valve block assembly.

Reverse rotation is at a slow speed for slackening the rope in the event of it becoming trapped. Emergency stop buttons are fitted which, when pressed, will cut all hydraulic flow through the circuit, thereby stopping the winch instantaneously.

Note: Any interruption to the winches electrical functions will automatically reset the controls to neutral.

A pulley wheel is fitted below the capstan, to guide the rope in horizontal pulls. A pair of rear props give stability to the unit when winching. The lightweight telescopic reaction struts should also be used when supplied.

APPLICATION & REGULATION

- 1) This capstan winch is designed and built for hauling purposes only and ***must not be used for direct lifting application.***
- 2) Trailers built after October 2012 are European Whole Vehicle Type Approved (ECWVTA) to directive 2007/46/EC and relevant amendments and further embrace relevant conditions stated in Supply of Machinery (Safety) Directive 2006/42/EC.

OPERATOR WARNING - IMPORTANT!

Prior to any cable pulling operation, and to ensure operator safety, it is ***imperative*** that the winch be securely supported. Lower the rear props (PL809, Item 9) to the floor and secure with the lynch pins provided. Fit the reaction struts, if provided, (PL809, Item 22) to the rear of the winch and the opposing end against the lip of the pit box using the mounting feet provided. Fit a securing strap from the lashing rings (PL809, Item 18) around the vehicle tow-bar to compress the tow coupling (if using the winch attached to a vehicle).

DO NOT rely solely on the drawbar coupling to provide anchorage to any attached vehicle. This is a dangerous practice as the winch can suddenly slew, or rear up during pulling surges.

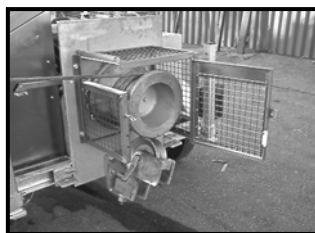
INJURY TO THE OPERATOR AND/OR DAMAGE TO THE COUPLING HITCH MECHANISM CAN RESULT IF THIS ADVICE IS IGNORED.

EAR PROTECTION. All Operator Personnel within 7 meters radius of Winch unit **MUST** wear suitable Ear Defenders whilst engine is running.

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OPERATING INSTRUCTIONS

- 1) Secure the winch by lowering the rear props (PL809, Item 9) to the floor, and fit the telescopic reaction struts if provided. Fit securing strap from winch lashing rings to vehicle as previously described (PL758).
- 2) Open Access door of the capstan guard to enable winch rope to be fed through
Note: Capstan cannot be started whilst this door is open
- 3) Feed end of rope to be pulled, around diverter pulley and up to the capstan (*fig. 1*)



(Fig. 1)

- 4) When viewed from the end of the capstan, the rope should wrap around it in a counter clockwise direction, with the first wrap being nearest the motor. The end of the rope should exit the top of the capstan toward the console side of the winch through the slot in the guard (as shown). There should be at least four wraps of rope to avoid damage to the capstan caused by rope slippage (*fig. 2*).



(Fig. 2)

- 5) Start Engine in accordance with PL 760
- 6) Ensure that both the speed adjusters (*fig.3*) are turned to their minimum position (fully clockwise)



(Fig. 3)

- 7) Pressing the 'forward' directional control button, (*fig. 4*) and then turning the right hand speed control counter-clockwise, will start the capstan rotating (counter clockwise when viewed from the end of the capstan).



(Fig. 4)

- 8) If the required speed can be obtained using this control alone, then note that the winch will continue to pull up to it's maximum load without any adjustment.
- 9) To gain more speed from the unit, press the high speed button (If lit) and then progressively turn the speed adjuster for the 1000Kg range counter clockwise until the required speed is reached. Set in this manner, the winch will pull at the fastest possible speed until the line tension reaches approx. 1000Kg. At this point, the winch will automatically disable the high speed circuit and keep pulling (at a slower rate) up to it's maximum load.
- 10) If the load drops sufficiently to allow the high speed to be used again, the button will illuminate to indicate this. Pressing the high-speed button (when lit) will result in the winch running at the maximum set speed again.
- 11) A useful feature (when installing delicate cables) is the ability to use the winch to haul the cable until it reaches 1000Kg and then stop to prevent damage. To do this, set the 3000Kg speed control to minimum, Start the capstan by pressing forward control button then high speed button. The capstan will now rotate at a speed determined only by the 1000Kg speed control. If the winch reaches a line pull equal to the pre-set load of 1000Kg, it will simply stop, and hold tension.
- 12) It is now possible to make the rope 'creep' forward by gently turning the 3000Kg speed control. Observe the load indicated by the pressure gauge and stop if it becomes excessive.
- 13) If at any time, the pulling tension needs to be released stop the winch by pressing in the stop button on the console. Alternatively, press any of the emergency stop buttons. (twist to release).
- 14) When the winch needs to be operated in a reverse direction, the blue reverse button (*fig. 5*) should be pressed and held to gently rotate the capstan. It should be noted that in reverse, the speed and line pull cannot be affected by the speed controls as the speed and line pull are controlled within the winch hydraulics. (This being factory set at the time of manufacture)



(Fig. 5)

SAFETY NOTE: The emergency stop buttons, mounted at the rear of the canopy, will immediately stop the winch from rotating in either direction if pressed. They must be twisted to release, to allow the winch to run again, *after investigation/rectification of the fault.*

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STARTING PROCEDURE

- 1) Check engine fuel level and top up as required.
- 2) Check engine oil level and top up as required.
- 3) Check coolant level and top up as required.
- 4) Check hydraulic oil level and top up as required.
- 5) Turn on ignition, but do not start engine.
- 6) Observe yellow heater plug warning light on engine control panel.
- 7) When heater plug light extinguishes, turn ignition key to start engine.
- 8) When engine starts, all lights on the panel should extinguish, and the green "OK" light should come on.
- 9) Allow the engine to warm up for 2-3 minutes before using the winch.

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PERMISSIBLE ADJUSTMENTS

All of the functions of the winch are factory set, and should not normally require adjustment.

The only functions that may be altered if it is required at any time (after repair for example), are the forward line pull for the capstan. In reverse, the capstan speed and load are factory set and cannot be altered.

A maintenance manual is available, explaining the correct procedure for setting up the hydraulic system. Only suitably qualified persons should be allowed to make adjustments to the winch.

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MAINTENANCE

HYDRAULIC SYSTEM

The satisfactory performance depends primarily upon conscientious attention to, and replacement of the oil. Intervals between oil changes vary with operating conditions, but should always be changed (along with the relevant filters) if it is found to have deteriorated, or become contaminated. As a guide, the gauge on the filter indicates oil/filter condition.

A periodic check of the hydraulic connections should be made in order to minimise the risk of foreign particles entering the circuit and damaging the components.

After a prolonged shut-down, bleed the motor in accordance with the appropriate data sheet since a layer of air can form during operation. Extended periods of shutdown should ideally be avoided

HYDRAULIC OIL – Shell Tellus VG 32² or equivalent

EXTERNAL FILTER – 25 microns

INTERNAL FILTERS – 125 microns

ENGINE – See appropriate data sheet for maintenance schedule

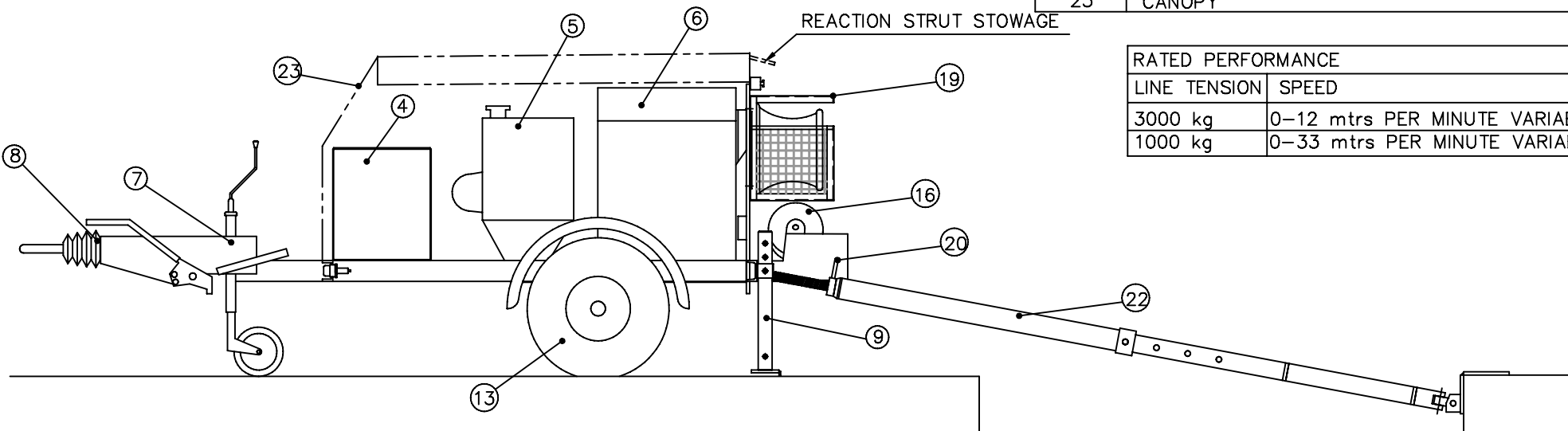
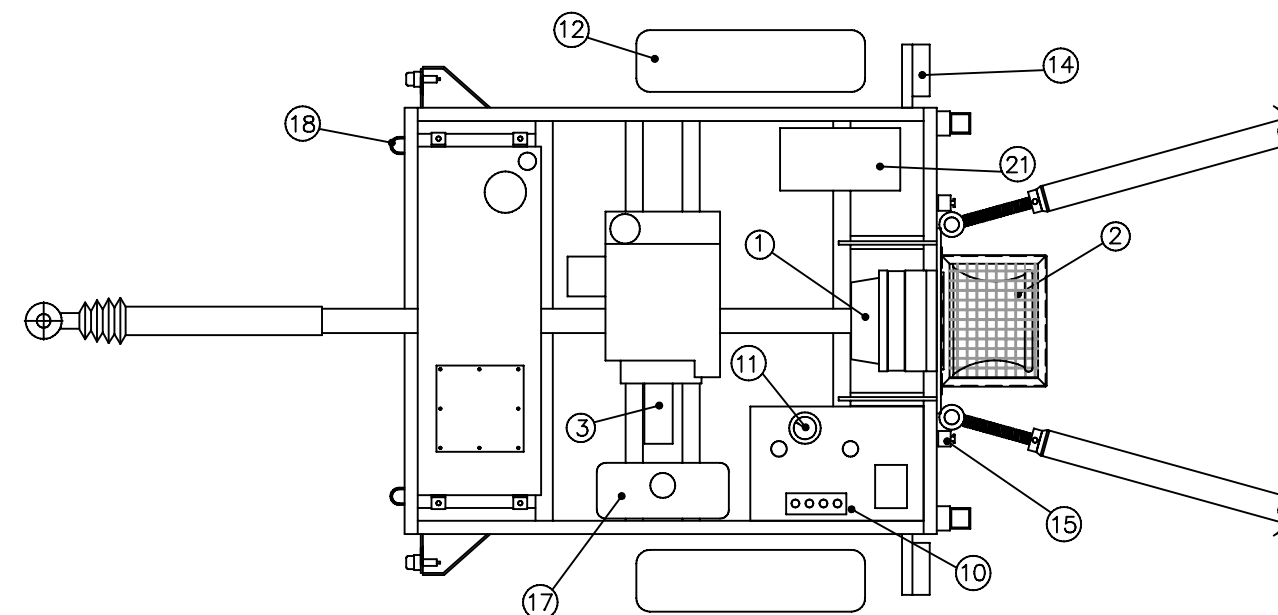
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OPERATING FAULT DIAGNOSIS

FAULT	CAUSE	REMEDY
Rope slipping on capstan.	1) Not enough turns of rope on capstan.	1) Rewind in accordance with instructions.
Loss of power or failure to achieve desired pre-set pull load and/or speed.	1) Incorrect relief valve setting. 2) Hydraulic filters blocked. 3) Engine not running correctly. 4) Air in hydraulic circuit	1) Consult factory or engineer for guidance. 2) Replace filters and oil. 3) Refer to manual and investigate. 4) Run winch without load for 10mins. to purge system.
Engine will not turn over.	1) Flat battery. 2) Loose battery terminals. 3) Damaged or broken wiring.	1) Recharge or replace. 2) Fasten correctly 3) Repair/replace loom
Red warning light on engine panel when running	1) Possible engine fault	1) Stop engine and investigate before running engine again
Engine running but winch will not operate when control buttons are pressed	1) Speed controls set to minimum 2) Emergency stop button pushed in. 3) Electrical fault	1) Turn in direction indicated to increase speed 2) Twist to release. 3) Investigate properly before running winch again

TRAILER CHASSIS NUMBER MUST ALWAYS BE QUOTED WHEN ORDERING SPARES

PARTS LIST



RATED PERFORMANCE	
LINE TENSION	SPEED
3000 kg	0-12 mtrs PER MINUTE VARIABLE
1000 kg	0-33 mtrs PER MINUTE VARIABLE

BT. TRAILER WINCH No. 2 / SEB MODEL CW3000

MAINTENANCE MANUAL

Introduction

Before commencing repairs to the hydraulic system, ensure that both ball valves adjacent to the tank are turned to the “off” position. It is also advisable to loosen the return line to the tank top filter to prevent oil siphoning out of the tank.

If the canopy is to be removed prior to repairs, make sure that the door stays on the console door and the toolbox/engine cover are removed and that the multi-plug to the emergency stop buttons, mounted on the rear of the canopy, is disconnected. The canopy is secured to the trailer with 6 bolt fixings.

NOTE: The winch capstan will not operate if the canopy multi-plug is disconnected.

WARNING !

- 1) If the Winch has been running, allow time for the engine to cool before working around the exhaust area. The exhaust gets **very** hot when the Winch is running and injury could result from touching it.
- 2) Do not attempt to remove the engine, or main drive motor from the Winch without mechanical aids.
- 3) Diesel fuel is flammable. Never refill the fuel tank with the engine running or near a naked flame.

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Technical Data

Weight of Winch (C/W Reaction struts)	-	870kg
Tyre Pressure	-	36psi
Wheel Nut Torque	-	52lb/ft
Capstan Securing Bolts Torque	-	50lb/ft

Capacities

Hydraulic Oil Tank	-	120ltrs
Engine Oil With Filter	-	1.6ltrs
Without Filter	-	1.5ltrs
Coolant capacity	-	fill to 5mm above radiator tubes
Diesel Tank	-	14.5ltr

Hydraulic System

Maximum permissible pressure	-	220 bar (continuous)
Maximum flow rate	-	64.5ltr/min

Recommended Lubricants

Engine	-	SAE15W-40 CE or CF
Hydraulic Oil	-	VG32 ² or equivalent
Lubricating Grease	-	OVOLINE 75 General Purpose (or equivalent)

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MAINTENANCE SCHEDULE

WARNING !

Upon receipt of the winch, wheel nut torque should be checked and then checked regularly (see PL811 for detail).

A	=	Daily
B	=	Weekly
C	=	Every 6 months
D	=	Every 12 months

• Check operation of all lights	A
• Check all fluid levels	A
• Visually inspect Winch (where possible) for leaks/damage	A
• Check correct operation of capstan guard interlock and Emergency stop buttons	A
• Check everything in 'A'	B
• Check tyre pressure	B
• Check operation of all canopy locks/door stays	B
• Check everything in 'B'	C
• Change fuel filter	C
• Check and adjust (if necessary) trailer brakes	C
• Lubricate all canopy hinges/locks	C
• Check everything in 'C'	D
• Change engine oil/filter * Note 1	D
• Change Hydraulic filters	D
• Check correct operation of all electric's.	D
• Check and adjust alternator drive belt	D
• Check anti-freeze specific gravity/concentration and change if required * Note 2	D
• Strip and inspect brakes for wear	D
• Lubricate tow coupling and rear guide pulley grease points	D
• Check condition and security of exhaust system	D
• Check condition of air cleaner	D

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Notes

- 1.** The engine oil filter should be changed, initially, approximately 1 month after delivery. Thereafter, the service schedule should be followed as normal.
- 2.** It is ***imperative*** that coolant anti-freeze mixture be checked ***every year*** prior to the on-set of frosty weather regardless of the recommended service interval.
- 3.** For all other engine service requirements, please refer to the enclosed engine manufacturer's manual.
- 4.** The following items have no routinely serviceable items: - Hydraulic Motor, Pump, Control Valve and other circuit valves.

WINCH SET-UP PROCEDURE

If the Winch does not seem to be performing as intended or after major repair to the engine or hydraulic system, the following procedure should be followed to set up the system for optimum performance.

Run the engine until correct operating temperature is reached approx 10 minutes (be sure that hydraulic tank is full, and both isolator valves adjacent to the tank are turned on otherwise severe damage will occur to the pumps).

Set engine r.p.m. to approximately 2930rpm offload (i.e. capstan not rotating)

Run capstan for at least 10 minutes at full speed to purge the system of air (if hydraulic system has been drained completely, it may be necessary to remove the hexagon head bleed screw at the rear of the motor to remove all the air)

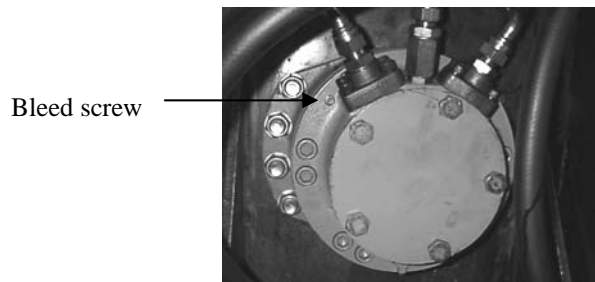


FIG 1

Securely anchor the Winch using the tow eye and rear props/reaction struts provided.

Wrap a 5.8 tonne minimum break test rope fitted with an inline dynamometer around the guide pulley and capstan, and anchor the other end to a substantial structure or object in order to set the relief valves.

WARNING! *It is important that the Winch, rope anchors and rope are strong enough to withstand the forces generated by the Winch. Serious injury could result from any anchor point failing under load.*

WINCH SETUP CONTINUED

Release the lock-nuts on both relief valves in readiness (Fig 2)

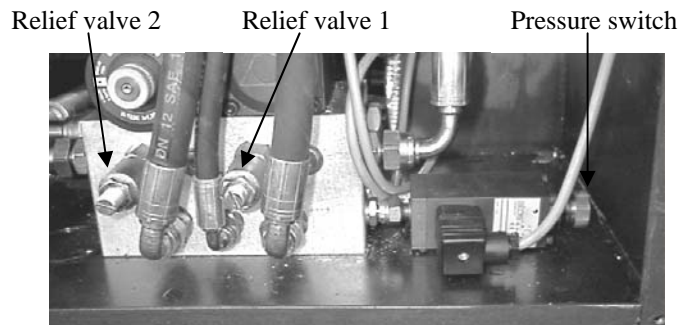


FIG 2

Start engine and press “forward” button (only) and turn 3000Kg speed control to maximum. Observe pressure gauge on console and adjust relief valve 1 (PL803 item 3) Fig 2 until gauge reads approx. 3000 Kgs. (2850 Kgs if BT Spec.) Tighten the lock-nut and stop the winch.

Turn the knurled adjuster on the pressure switch (PL803, item7) Fig 2, located inside the console to the right of the manifold (viewed from operator side), until the indicator on the switch body points to approximately 100 bar (in order to set relief valve 2).

Turn the 3000 Kgs speed control to ***Minimum***, and 1000 Kgs speed control to ***Maximum***

Start the Winch and select “forward” then “high speed”. Adjust the relief valve until pressure gauge on console shows approximately 1050 Kgs. Tighten the lock-nut and stop the Winch.

Adjust pressure switch until indicator points to approximately 85 bar.

If at any time during relief valve adjustment, the engine stalls, turn the relief valve being set anti-clockwise until engine will run easily under load, then progressively turn clockwise until desired pressure setting is achieved.

Back off tension on the test rope by selecting reverse, then run Winch at full speed forward (High speed selected) with both speed controls at Maximum. Observe dynamometer reading at the point at which the engine comes ‘on load’ and then, ‘off load’ – This being the changeover point from high speed to low speed – The dynamometer should be in the region of 1000Kgs when high speed disengages. Dynamometer should then climb to approx. 3000Kg (2850Kg if BT Spec) before relief valve ‘cracks’. The engine should continue to run with the Winch holding this load.

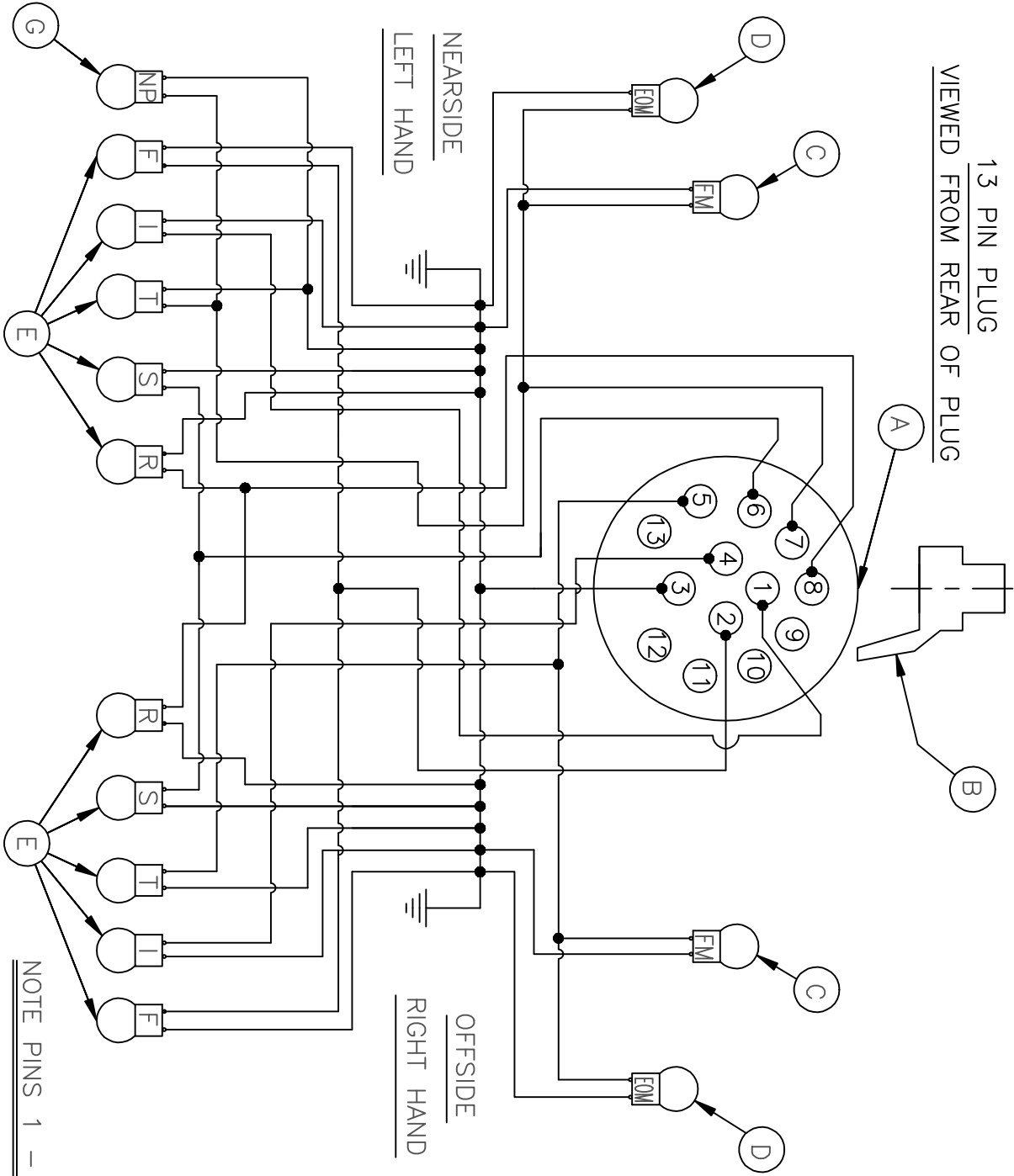
Back off tension on test rope. If all results are satisfactory, then Winch is set up for operation.

Consult manufacturer if Winch cannot be set.

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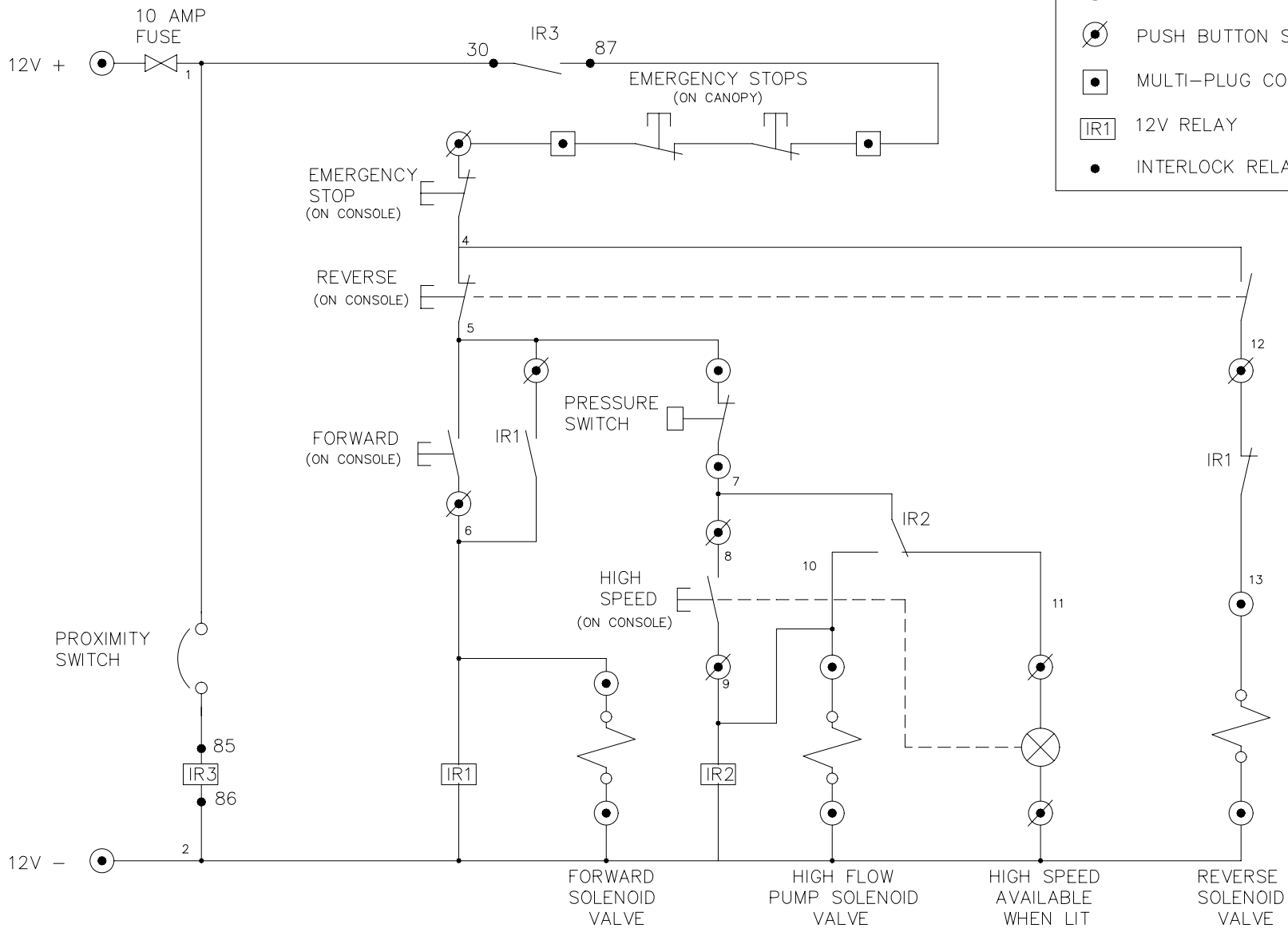
PART'S LIST

ITEM	DESCRIPTION
A	13 PIN PLUG
B	OPTIONAL 13 PIN-7 PIN CONVERTER
C	FRONT MARKER <small>WHERE FITTED</small>
D	END OUTLINE MARKER <small>WHERE FITTED</small>
E	REAR LIGHT CLUSTER
G	NUMBER PLATE LIGHT



NOTE PINS 1 – 8 ONLY USED ON TRAILER LIGHTS

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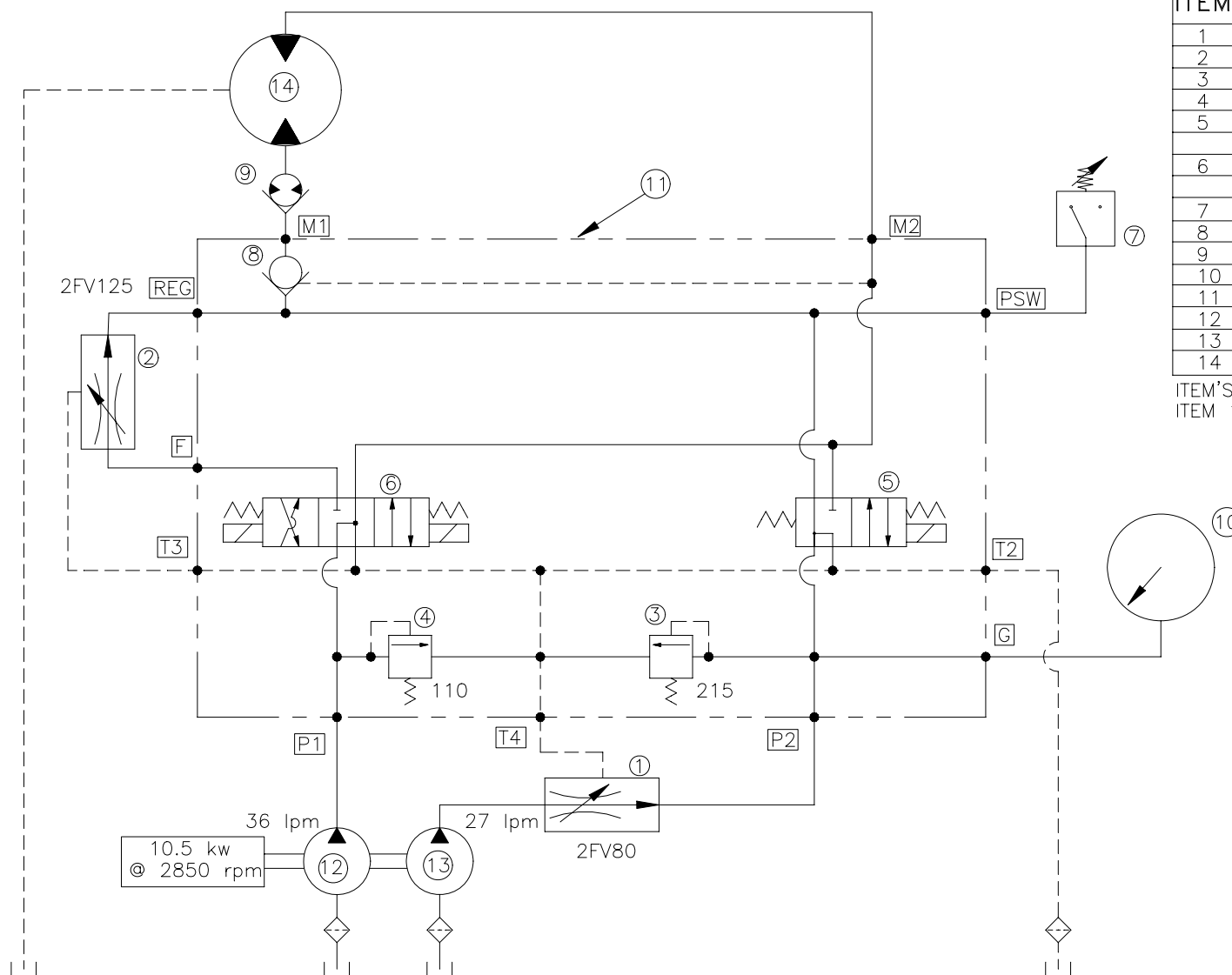
- SOLENOID & PRESSURE SWITCH TERMINALS
- PUSH BUTTON STATION TERMINALS
- MULTI-PLUG CONNECTOR
- 12V RELAY
- INTERLOCK RELAY TERMINALS

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PART'S LIST

ITEM	DESCRIPTION
1	PRIORITY FLOW CONTROL - 0-30 LTR/MIN
2	PRIORITY FLOW CONTROL - 0-45 LTR/MIN
3	RELIEF VALVE (1)
4	RELIEF VALVE (2)
5	2 POSITION 12 VDC SOLENOID OPERATED
	DIRECTIONAL CONTROL VALVE
6	3 POSITION 12 VDC SOLENOID OPERATED
	DIRECTIONAL CONTROL VALVE
7	0 - 160 BAR PRESSURE SWITCH
8	PILOT OPERATED CHECK VALVE
9	POPPET VALVE (DRILLED 1.7mm)
10	PRESSURE GAUGE
11	CETOP 5 MANIFOLD
12	14cc / REV GEAR PUMP
13	8.5cc / REV GEAR PUMP
14	POCLAIN MOTOR

ITEM'S 12 and 13 ARE A TANDEM ASSEMBLY
ITEM 12 IS NEAREST TO THE ENGINE BELL HOUSING



BRAKE SYSTEMS SET UP

To Adjust The Brake System

- 1 Jack one wheel off the ground and stabilise on an axle stand
- 2 With a 17mm spanner, turn the adjuster (on the brake back plate) clockwise whilst at the same time spinning the wheel in a forward rotation until the wheel locks up. Once locked, back off the adjuster until the brakes are just off binding (whilst spinning in a forward rotation).
- 3 Repeat for the other side
- 4 With one wheel still off the ground, remove the free play from the brake rod/cables. Referring to PL731, tighten the adjusting nut on the brake rod (item 5) whilst at the same time spinning the wheel in a forward rotation until the wheel locks up. Once locked, back off the nut until the wheel rotates but with slight resistance.
- 5 The brake system is now set.

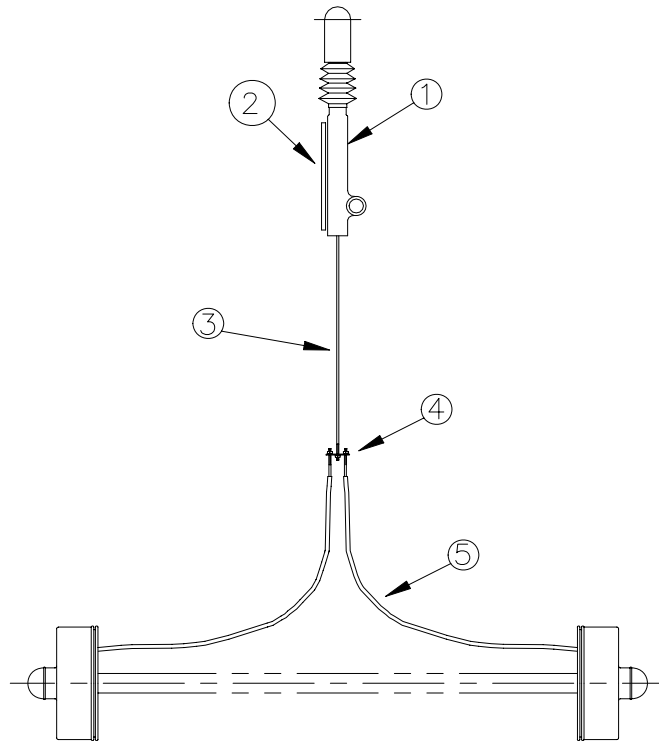
To Test The System

- 1 Firmly apply and then release the park brake 6 times ensuring both brakes lock and release each time. If the brakes do not lock, recheck the adjustment and or check brake linings for wear. If the brakes do not release, loosen the rod adjusting nut slightly and recheck.
- 2 Re-apply the park brake and check the reverse mode by pushing the trailer backwards, first to the right and then to the left, each time the brakes should release, then automatically re-apply and lock. If this does not happen, re-adjust the system.
- 3 The system is now tested and the trailer is ready for use.

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PART'S LIST

ITEM	DESCRIPTION
1	TOW UNIT
2	HAND BRAKE
3	BRAKE ROD
4	BALANCE BEAM
5	BRAKE CABLE

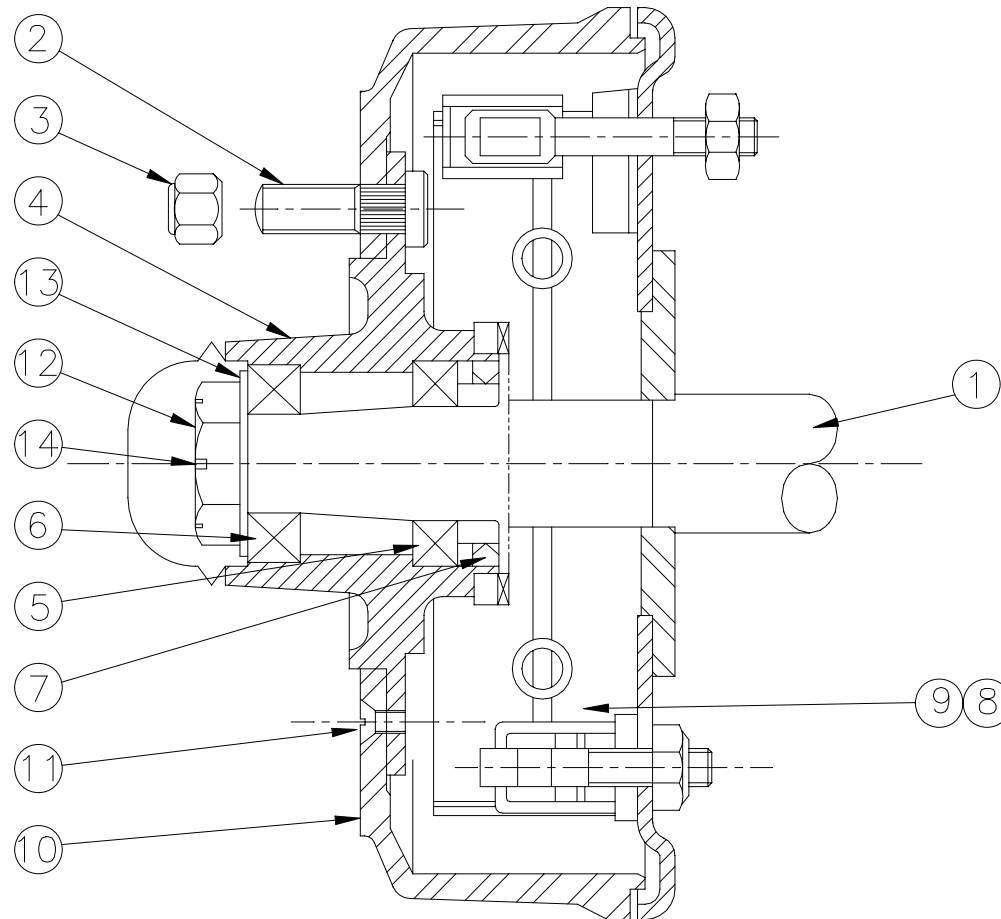


MECHANICAL BRAKE SYSTEM

SHEET N°:- PL 731

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PART'S LIST



ITEM	DESCRIPTION
1	STUB AXLE
2	WHEEL STUD
3	WHEEL NUT
4	HUB
5	INNER BEARING
6	OUTER BEARING
7	OIL SEAL
8	L.H. BRAKE ASSEMBLY
9	R.H. BRAKE ASSEMBLY
10	BRAKE DRUM
11	BRAKE DRUM RETAINER
12	AXLE NUT
13	AXLE WASHER
14	SPLIT PIN

HUB & BRAKE ARRANGEMENT

SHEET N^o:- PL 175