

OPERATING MANUAL

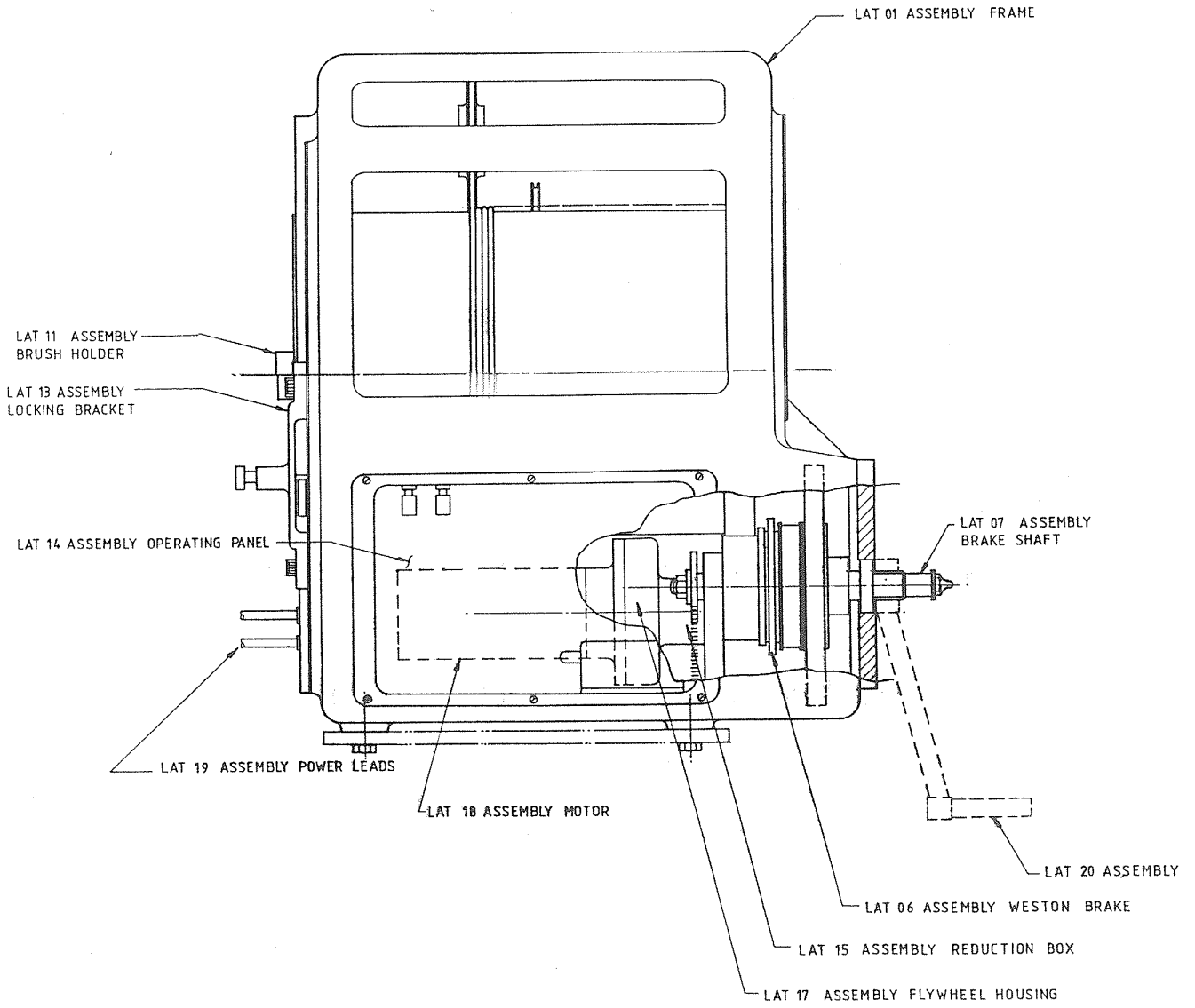
LATROBE WINCH

MODEL WS-900

WS900-01

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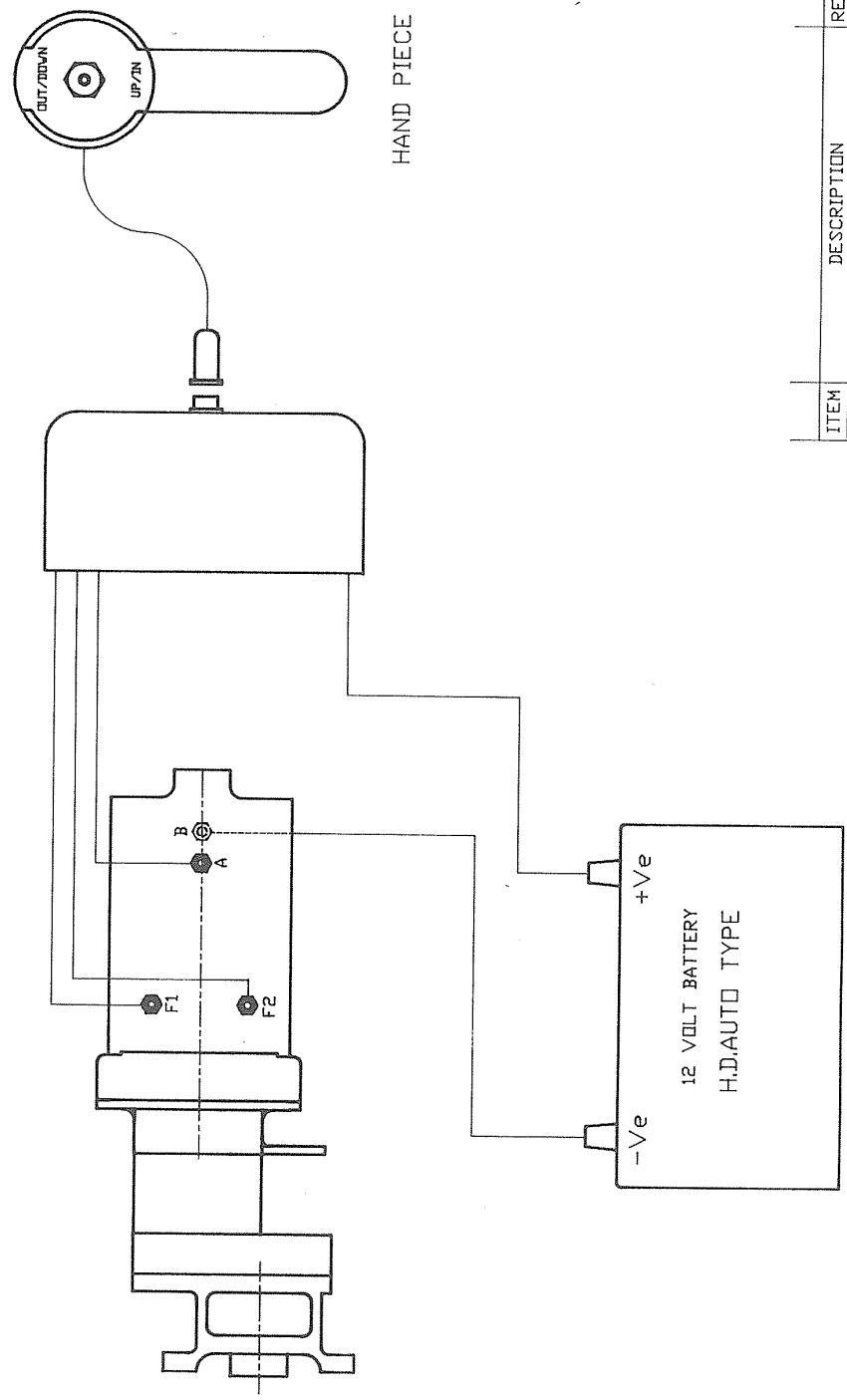
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REV	DESCRIPTION	DATE

MOTOR GEARBOX ASSEMBLY DWG.NO.-LAT27

MOTOR CONTROLLER ASSEMBLY DWG.NO.-LAT-28



HAND PIECE

NORMALLY SUPPLIED BY CUSTOMER

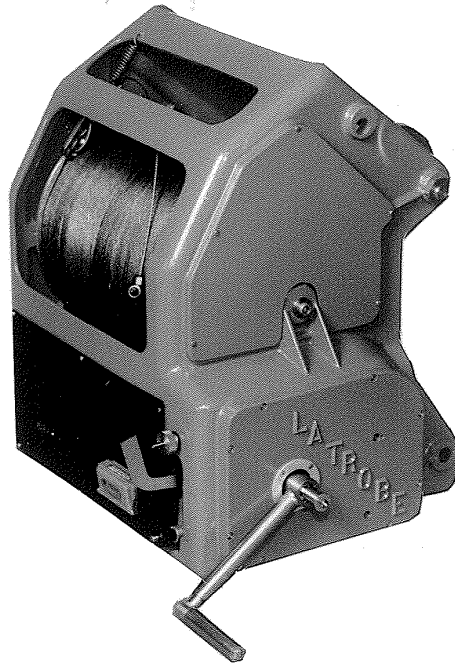
ITEM	DESCRIPTION	REQD	MATERIAL	REMARKS
	HYDROLOGICAL SERVICES		SCALE 1/4	REMOVE ALL BURRS & SHARP EDGES
	LATROBE WINCH		DRAWN S.S. DATE 1/4/93	REV DRAWING NUMBER LAT26
	BANKS 200 POWER UNIT ASSEMBLY		CHECKED	

CAUTION

LATROBE BANKS POWER UNIT

- [1] Remove tape from breather cap on gearbox prior to operation.
- [2] Top up power unit gearbox with approximately 50 mls of Transmission Oil 90 Grade or heavier. Fill to the top through breather cap. Check monthly if in constant use.
- [3] Lubricate drum gear with grease APIW with small paint brush. Smear grease on all teeth monthly.
- [4] Lubricate bronze drive gear with Molybond grease. Smear all teeth using paint brush monthly.
- [5] Grease main shaft every two months. Make sure Weston brake is closed by rotating handle in raise mode before applying grease.
- [6] Clean layer winding lead screw with metho or similar then apply graphite powder to top of lead screw.

LATROBE SINGLE DRUM WINCH

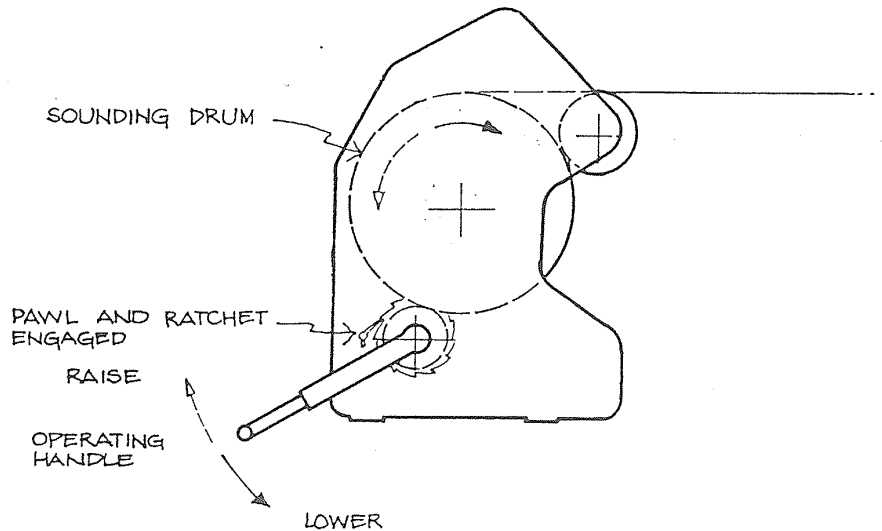


INTRODUCTION

The winch exhibits state-of-the-art design features, representing years of both in-house and field development.

It comprises a rugged cast aluminium body and cable drum, with stainless steel shaft components and corrosion resistant fasteners throughout.

WINCH MODE

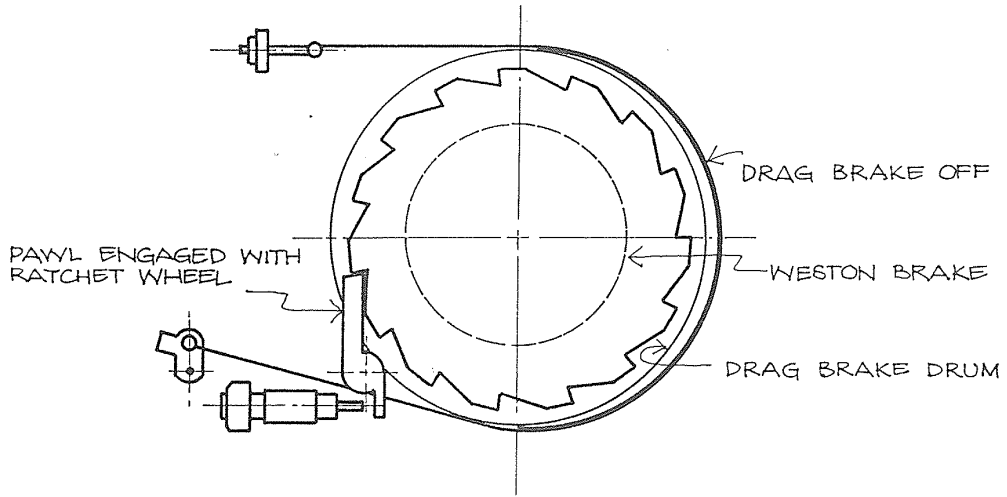


Latrobe Winch shown in "winch mode", that is, the traverse drum is out of mesh with the sounding drum and is prevented from rotating by drum stop. In this mode, the sounding weight can be raised and lowered whilst the traversing block remains stationary.

It will be observed that if the winch handle is released, the weight will be held in position - this is due to the automatic (Weston) brake. To lower, it is necessary to wind the weight down. This again is due to the influence of the Weston brake.

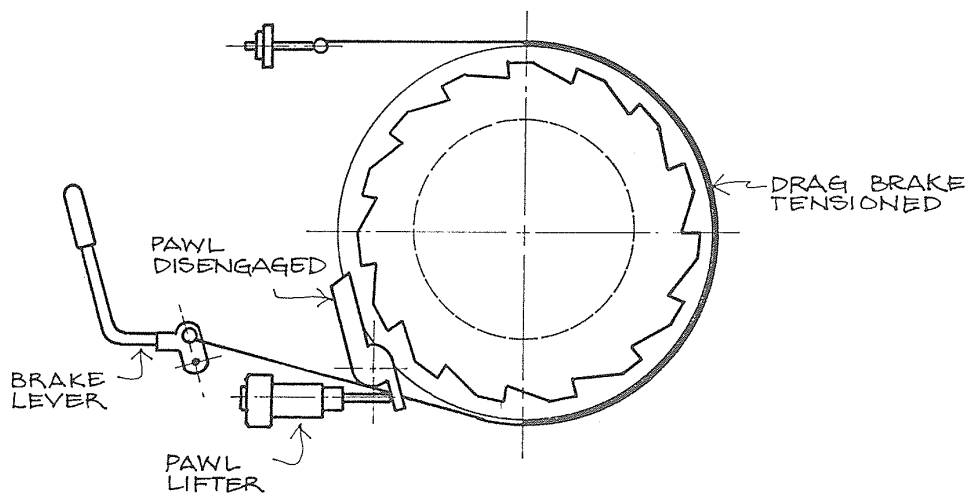
For the brake to operate in this manner, the pawl must engage with the ratchet wheel on the operating shaft. With the pawl engaged, a loud click will be heard as the handle is rotated in a clockwise direction.

WESTON BRAKE MODE



- WESTON BRAKE MODE
- PAWL ENGAGED
 - WESTON BRAKE IN CONTROL

FREE FALL MODE



- FREE FALL MODE
- PAWL DISENGAGED
 - WESTON BRAKE HAS NO EFFECT

FREE FALL MODE

A supplementary drag brake is provided to permit a controlled "FREE FALL" of the gauging weight. To achieve "FREE FALL", it is first necessary to disengage the Weston brake. The Weston brake is essentially a screw clutch, which incorporates a plate ratchet wheel between the pressure plates. In the raise direction, the whole assembly locks up, providing a positive drive and the ratchet wheel is cut to allow it to pass the pawl without engagement. When the raising operation stops, the brake assembly unwinds sufficiently for the pawl to engage in the ratchet wheel. With the central plate ratchet wheel stationary, the brake locks up under the influence of the load. To lower, the handle must be rotated in the appropriate direction which releases pressure from one side of the screw clutch, allowing the load side to rotate in sympathy.

To disengage the Weston brake, it is only necessary to move the pawl clear of the ratchet wheel, so that it will not engage and hold the load.

The MK II Latrobe unit is fitted with a spring loaded pawl lifter. To bring into operation, rotate knob, hold handle of drag brake and rotate operating handle in raise direction until pawl springs clear of ratchet. Apply drag brake and disengage operating handle from spline.

Operate brake handle to give the desired rate of fall.

NOTE: FOR SAFETY REASONS, RE-ENGAGE PAWL AS SOON AS FREE FALL LOWERING IS COMPLETE.

COUNTERS

The winch is fitted with one counter. The SOUNDING counter is situated on the control panel and registers in centimetres.

POWER OPERATION

The MK II Latrobe is designed for operation with gauging weights up to 90Kgs. The Banks Power Unit consists of a 12V DC Motor, reduction box plus circuitry for reversing the motor.

All operations are controlled by a remote controller.

NOTE : See Page WS900-03 for items of CAUTION prior to use.

MAINTENANCE

For the most part, the Latrobe Winch is maintenance free. However periodic maintenance is required as set out below.

See CAUTION notes Page WS900-03.

Lubrication

1. Grease the Weston brake every six months through the grease nipple located on the outside of the main shaft. Ampol APLW or similar water resistant grease is recommended. Following this, engage pawl and wind operating handle half a turn in both directions approximately five (5) times to ensure that grease is spread on the brake screw.
2. Wipe the layer winding screws every six (6) months with a clean rag and solvent, preferably Trichloroethylene. Inspect for damaged threads and repair as necessary. No lubrication is normally required but a light spray of Hawker Pacific WD40 or equivalent can be used.
3. The drum gear teeth should be lightly lubricated every six (6) months with Ampol APLW grease or equivalent.
4. The sounding drum slipring should be wiped every three (3) months with a clean, dry rag and solvent such as Trichloroethylene, then lightly sprayed with a non-insulating lubricant such as WD40.

Weston Brake

The Weston brake is a proven and reliable component of the winch drive and will provide many hours of service life. However, in the event of a breakdown, the following procedure should be followed.

Removal

1. Remove all sources of external loading from the drums.
2. Engage pawl and wind operating handle quarter turn anticlockwise. This will loosen the brake screw.

(Steps 3, 4, 7 & 9 only apply to winches fitted with Banks Power Units).

3. Take disengaging handle from side of winch after removing set screw and bolt.
4. Remove front half of winch L.H. side cover (five (5) screws) far enough to reach inside and unscrew power leads from motor.
5. Remove control panel from rear of winch (six (6) screws).
6. Remove grease nipple, washer and operating handle from brake shaft.
7. Remove two (2) set screws from transmission cover and withdraw motor.
8. Remove transmission cover (eight (8) setscrews) leaving brake shaft and bearing in position on winch.
9. Remove white nylon gear and clamp ring (four (4) screws).
10. Remove "nyloc" nut, washer, sprocket and drive chain from end of brake shaft.
11. Remove drag brake and pawl assemblies.
12. Slide brake shaft out of winch.
13. Remove Weston brake assembly.

Assembly of these components back into the winch is a reversal of steps 1 - 13.

Inspection

1. Remove the nylon pinion (four (4) screws) and unwind the brake drum from the brake screw. Separate the ratchet wheel and the two (2) brake pads.

2. With the brake disassembled, clean all metal components thoroughly in a solvent, such as Trichloroethylene.
Note: Brake pads should only be wiped with a clean, dry rag.
3. Inspect the surfaces of the ratchet wheel and brake pads for scores. Repair if necessary by placing each of the components onto a sheet of fine grade emery cloth and work in a circular motion.
Note: The Weston brake will not operate smoothly if either the ratchet wheel or pads are not perfectly flat.

Check that brake pad thickness is not less than 1.5mm.
Replace if necessary.
4. Check the brake screw surfaces for wear or corrosion and repair with a fine file or emery paper if necessary.
Note: Lack of use of the Weston brake could cause seizure of the brake screw. To avoid this, follow lubrication recommendation (Step 1)
5. Coat the brake screw and bore of ratchet wheel with grease before assembly. (Ampol APlW or equivalent)
6. Smooth any wear marks on the nylon gear and pinion teeth with a medium grade file.

Electrical System

The winch is designed for operation with conventional current meters using single core insulated meter suspension cable.

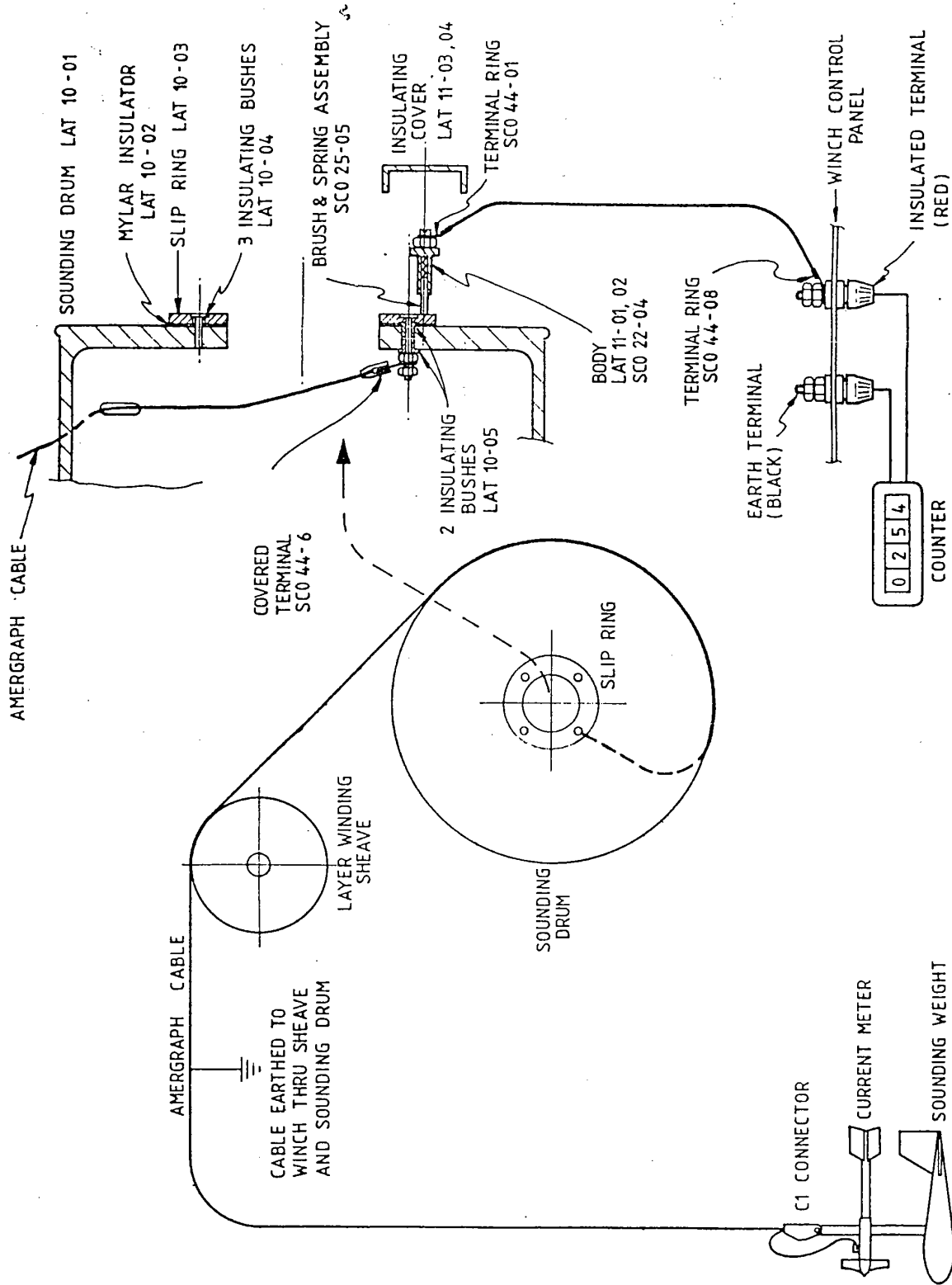
A "quick connect" terminal is located at the left hand end of the sounding drum, (accessible after removing cover plate) providing an electrical connection between the slipring and suspension cable conductor, thus allowing the cable to be fitted without removing the drum.

FAULT FINDING

The following is included to assist field staff to remedy electrical problems that can occur when taking current meter observations.

Using the counter to indicate a complete circuit, proceed as follows.

1. Bridge out red and black terminals situated on control panel. If the counter does not operate, repair or replace counter.
2. Connect the red terminal to frame. No indication shows that black terminal is not properly connected to frame. Check for corrosion under terminal, or loose mounting.
3. Bridge slipring to frame. Operation suggests the connection through brush to the red terminal is sound - proceed to step 4.
Failure to operate suggests either a break in red lead from brush to red terminal or broken/sticking brush. To inspect brush, remove and ensure that it moves freely in holder. If brush is broken, reclaim unbroken portion and extend the spring, thus providing a temporary connection until a replacement can be fitted.
4. Bridge out current meter terminals.
Operation indicates a failure in the meter contacts - repair. No operation indicates a failure in the circuit between the slipring and the meter, i.e. the circuit fault is in the suspension cable. Check quick connect terminal at winch. Check cable adjacent to meter. Check for damaged or bent cable. Repair or replace suspension cable.

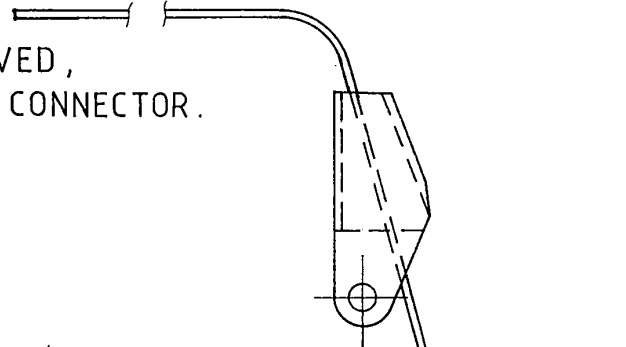


LATROBE WINCH DDT-900
CIRCUIT SCHEMATIC

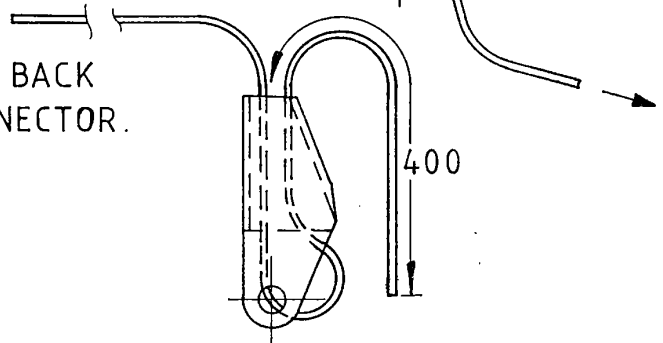
HYDROLOGICAL SERVICES P/L.

FITTING C1 CONNECTOR TO AMERGRAPH CABLE

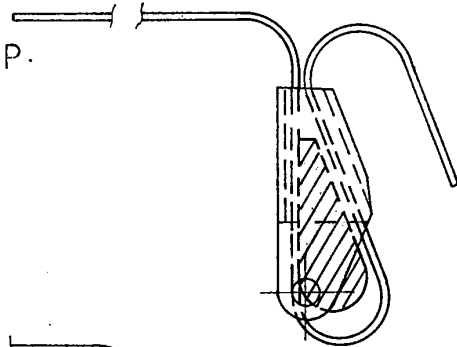
1. WITH R-CLIP AND PIN REMOVED, SLIDE END OF CABLE THRU CONNECTOR.



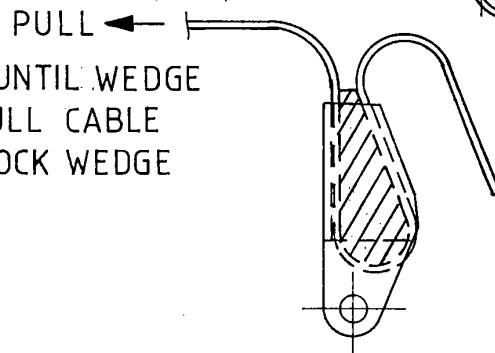
2. LOOP CABLE AND SLIDE BACK ABOUT 400mm THRU CONNECTOR.



3. FIT WEDGE INSIDE CABLE LOOP.

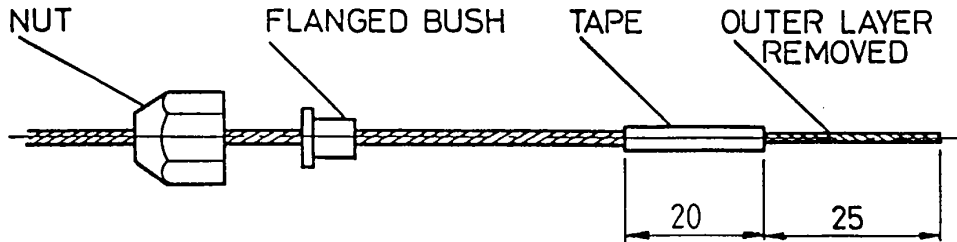


4. PULL CABLE BACK UNTIL WEDGE IS HELD AND THEN PULL CABLE AGAIN TIGHTLY TO LOCK WEDGE IN POSITION.

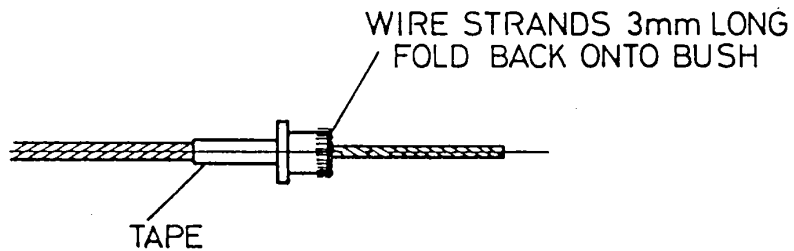


FITTING ANGLE PLUG TO AMERGRAPH CABLE

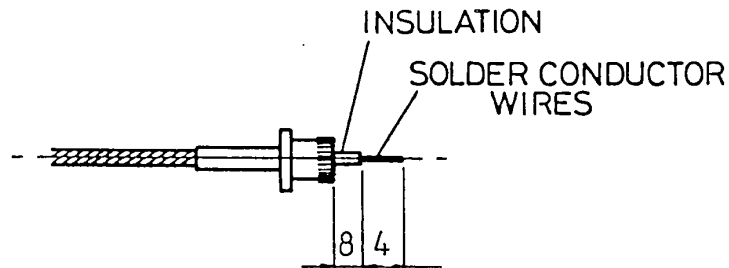
1. Slide nut and flanged bush onto Amergraph cable.
2. Wrap insulating tape around cable 25mm from end, or fit heatshrink, 20mm long.
3. Unwind outer layer of cable and cut off at tape.



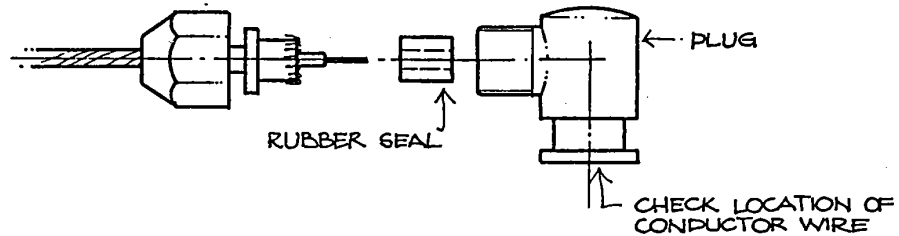
4. Unwind inner cable layer back to tape, one strand at a time and cut off 3mm in front of the insulation tape.
5. Slide flanged bush forward and bend the short inner layer strands onto the bush.



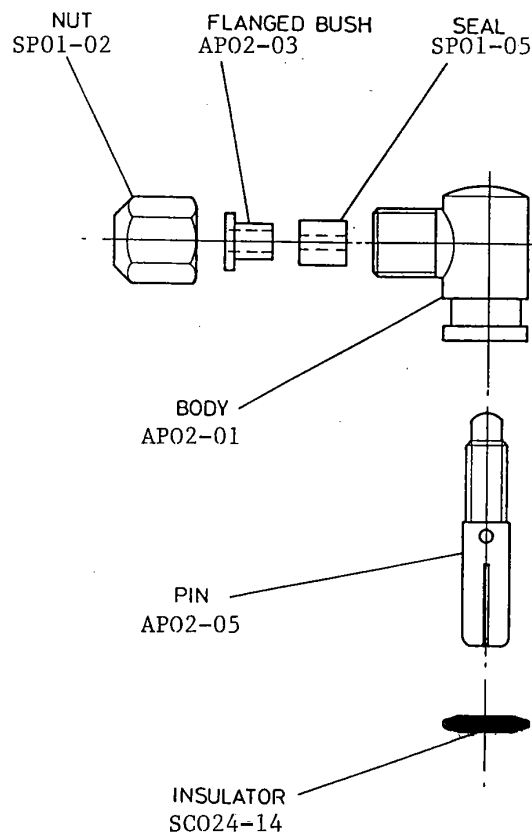
6. Strip conductor insulation back to 8mm in front of flanged bush.
7. Coat copper conductor wire with resin-cored solder. BE CAREFUL not to heat wire insulation. Cut wire back to 4mm long.



8. Slide rubber seal onto conductor and then push cable into plug. Look into the other end of the plug and check that conductor wire is in the centre of the plug hole.



9. Screw nut onto plug and tighten with a spanner.
10. Screw pin into plug and tighten, using a 1/16" allen key as a lever.
11. Slide rubber insulator onto pin.
12. Check circuit.

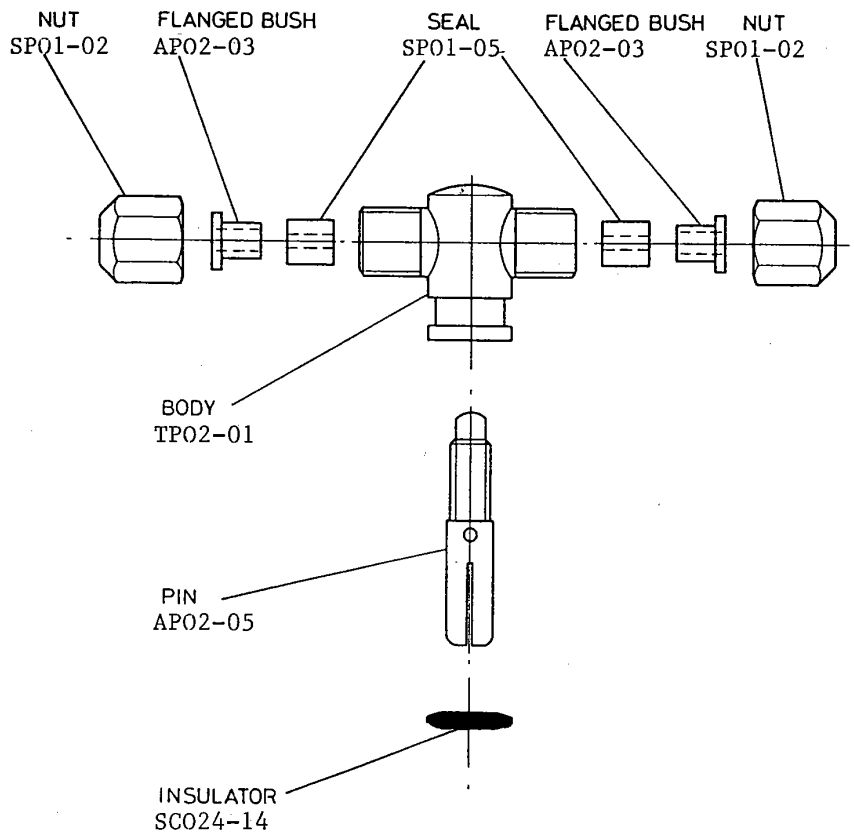


ANGLE PLUG ASSEMBLY AP 02
HYDROLOGICAL SERVICES P/L

FITTING TEE PLUG TO AMERGRAPH CABLE

REFER INSTRUCTIONS FOR FITTING ANGLE PLUG TO AMERGRAPH CABLE

1. Proceed steps 1 - 9 on both sides of plug.
2. Screw pin into plug and tighten, using 1/16" hexagon wrench as a lever.
3. Slide rubber insulator onto pin.
4. Check circuit.



TEE PLUG ASSEMBLY TP 02
HYDROLOGICAL SERVICES P/L

FITTING AMERGRAPH CABLE TO SOUNDING DRUM

1. Slide swage onto cable 550mm from end and clamp with swaging tool. (Refer Diagram A)
2. Slide 50mm long plastic tube insulation along wire to swage.
3. Unwind outer layer of cable 100mm and cut off.
4. Slide plastic tube insulation forward over cut ends of outer layer.
5. Unwind inner layer from around insulated core 70mm from end of cable.
6. Twist wires of inner layer together, cut off 30mm and then cover wires with 50mm long plastic tube insulation.
7. Strip conductor insulation back 5mm.
8. Coat copper conductor wires with resin-cored solder. Be careful not to melt insulation.
9. Slide 65mm long plastic tube insulation onto conductor. (Refer
Diagram B)
10. Slide on terminal insulator.
11. Slide coated conductor end into spade terminal and solder in place.
12. Crimp terminal around plastic tube insulation.
13. Slide insulator forward over terminal.
14. Tape ends of cable back together.

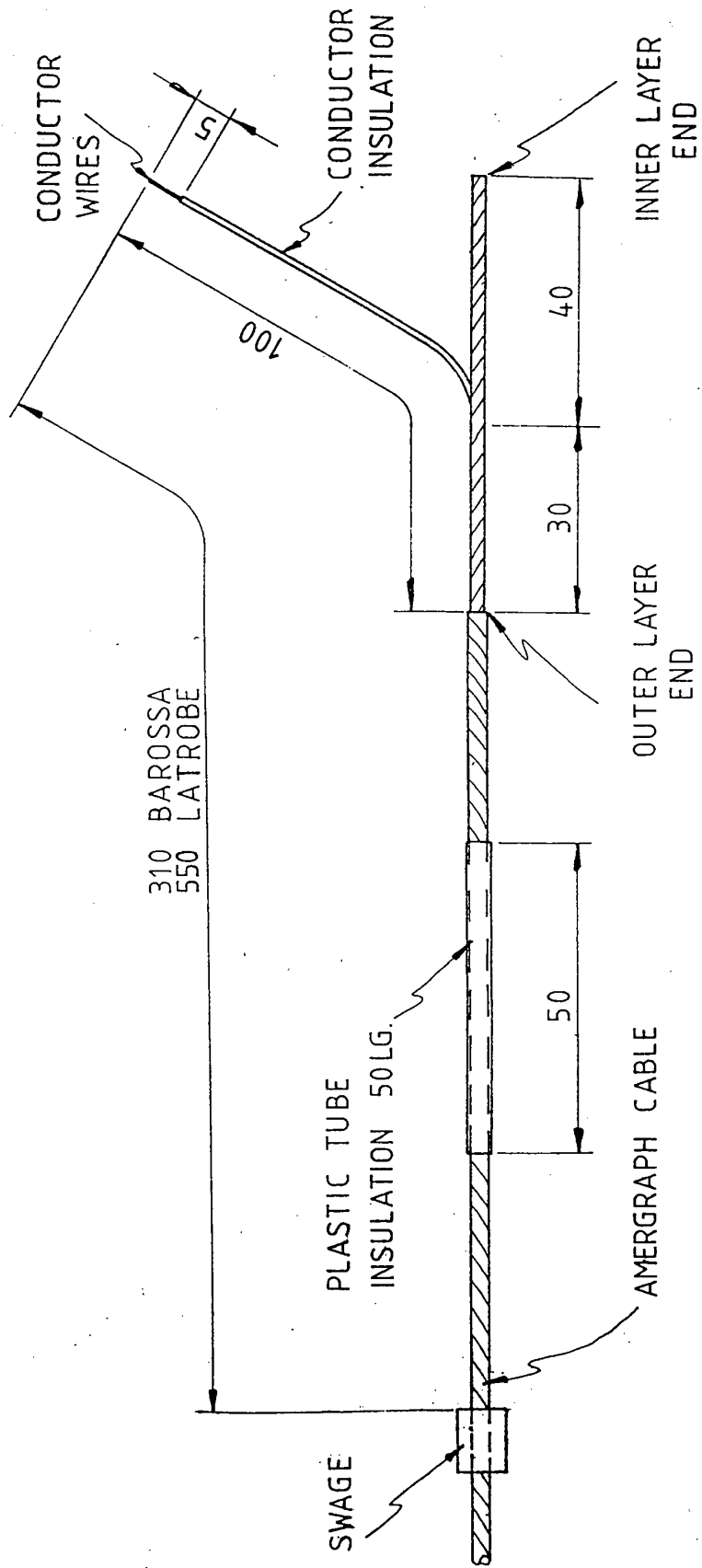
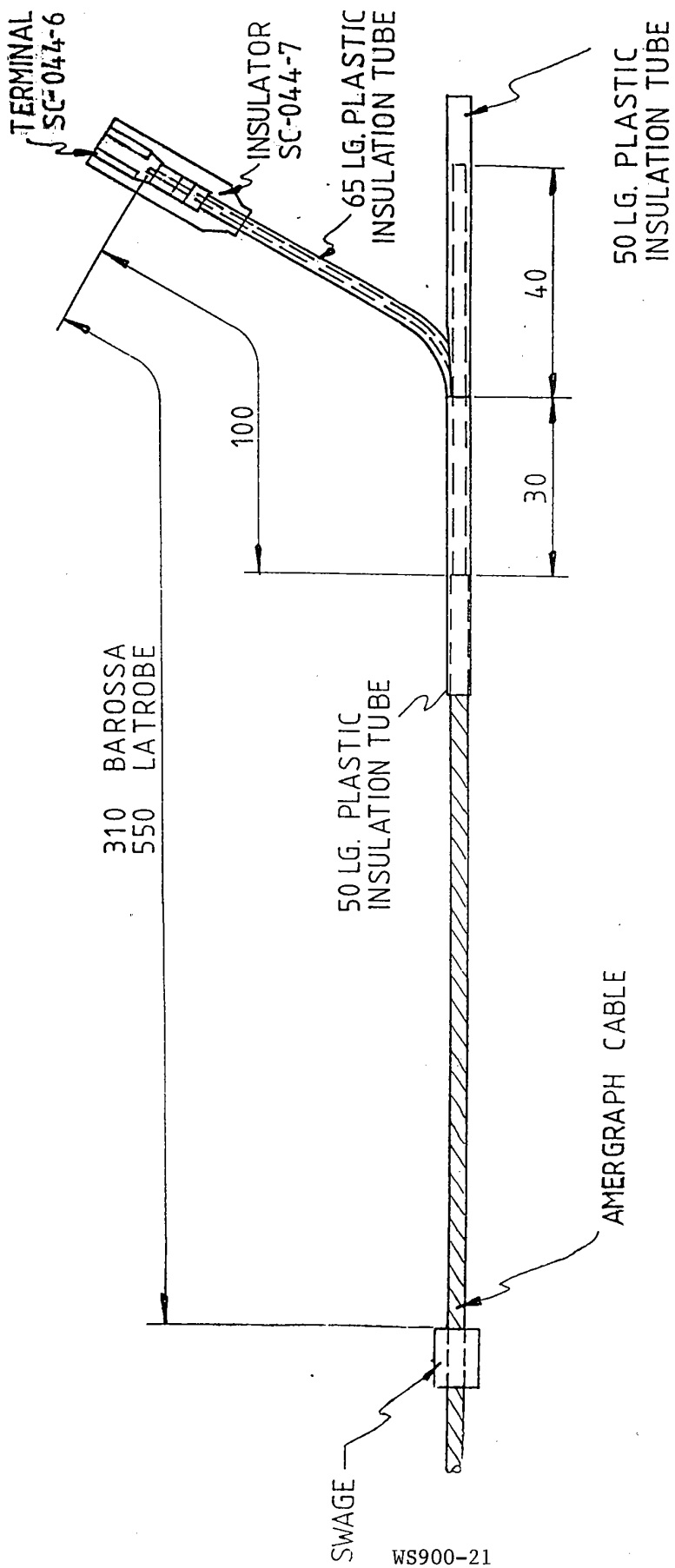


DIAGRAM A. AMERGRAPH CABLE - SOUNDING DRUM END

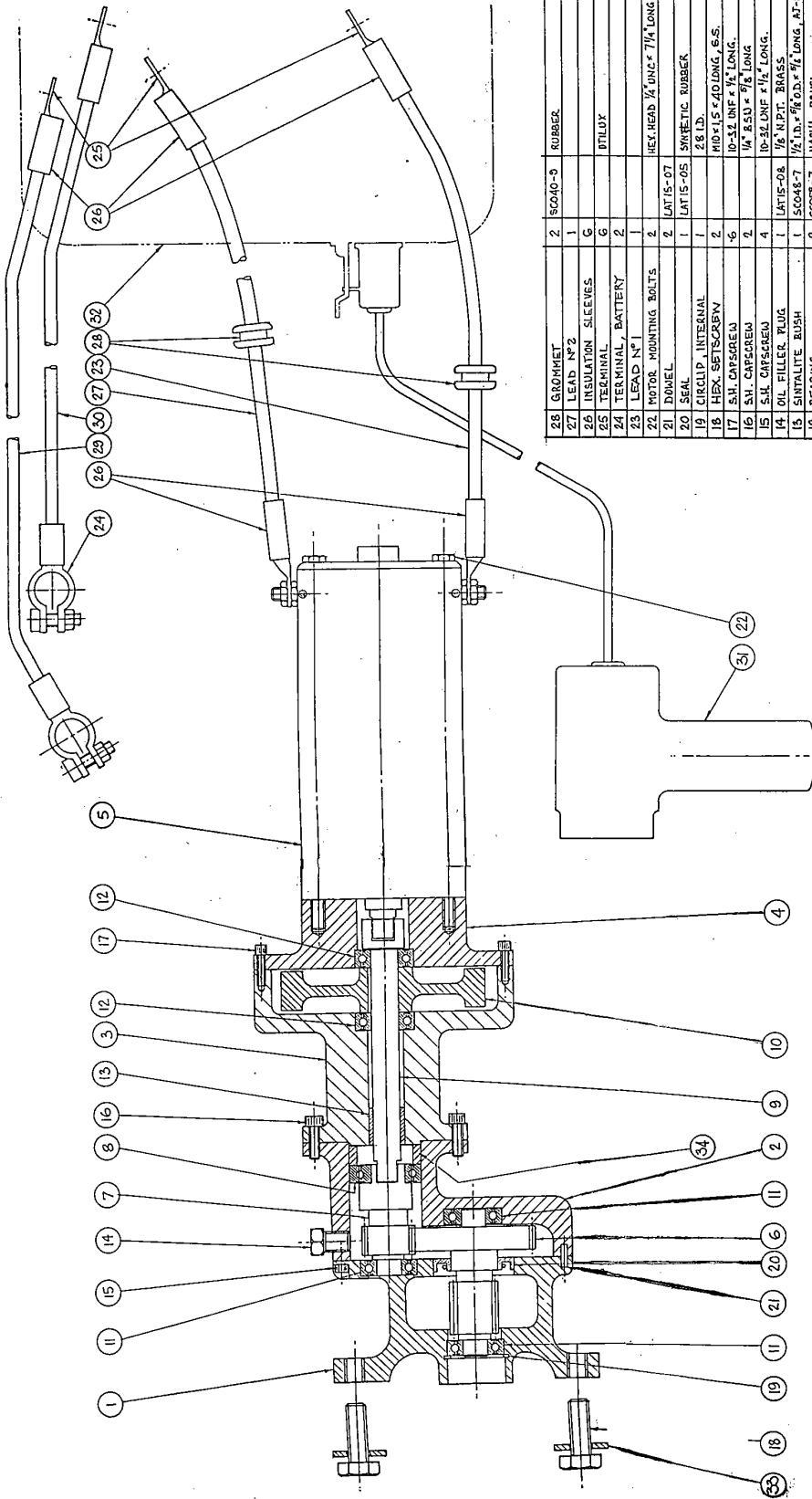
HYDROLOGICAL SERVICES P/L.



WS900-21

DIAGRAM B AMERGRAPH CABLE - SOUNDING DRUM END

HYDROLOGICAL SERVICES P/L.



ITEM	DESCRIPTION	QTY	PART NO.	MATERIAL
28	GROMMET	2	SC040-9	RUBBER
27	LEAD N°2	1		
26	INSULATION SLEEVES	6		
25	TERMINAL	6		DTULUY
24	TERMINAL, BATTERY	2		
23	LEAD N°1	1		HEX HEAD 7/8 UNC x 7/4 LONG.
22	MOTOR MOUNTING BOLTS	2	LAT15-07	SWRNETIC RUBBER
21	DOVIEL	1	LAT15-05	
20	SEAL	1		2.8 ID.
19	CIRCLIP, INTERNAL	2		MID-1.5 x 1.0 LONG. S.S.
18	HEX SETSCREW	5		10-14 UNF x 1/2 LONG.
17	S.H. CHSCREW	2		1/4" x 3/8" LONG.
16	S.H. CHSCREW	4		10-32 UNF x 1/2 LONG.
15	OIL FILLER PLUG	1	LAT15-08	1/8" NPT. BRASS
14	SINTALITE RUSH	2	SC048-7	1/2" ID. x 7/8" O.D. x 7/8" LONG. AF-II.
13	BEARING	2	SC058-7	NACHI R0808L
12	BEARING	3	SC058-8	NACHI R001Z
11	FLYWHEEL	1	LAT17-03	
10	SHAFT	1	LAT17-04	S. STEEL
9	BEARINGS	1	SC058-9	N.S.K. R02Z (60x110x24)
8	PINION	1	LAT15-03	S. STEEL
7	GEAR	1	LAT15-04	S. STEEL
6	MOTOR ASSEMBLY	1	LAT18	
5	EXTENSION FLANGE	1	LAT17-01	
4	FLYWHEEL HOUSING	1	LAT17-02	
3	INPUT CASTING	1	LAT15-01	
2	OUTPUT CASTING	1	LAT15-02	
1	DESCRIPTION	REQD	PART NO.	MATERIAL

ITEM	DESCRIPTION	QTY	PART NO.	MATERIAL
32	WASHER	1	LAT 15-02	DELTA
31	CONTROLLER UNIT	2	LAT	DELTA
30	REMOVB CONTROL ASSY	1		WARN MDPEL 3000
29	BATTERY LEAD, NEGATIVE	1		
28	BATTERY LEAD, POSITIVE	1		
27	CONNECTION	1		

ITEM	DESCRIPTION	QTY	PART NO.	MATERIAL
HYDROLOGICAL SERVICES PTY. LTD.				
LATROBE WINCH				
POWER UNIT ASSY (BANKS)				
SCALE	1:1			
DATE				
BY				
CHECKED				
APPROVED				