

# Transmatic 162 & 244



At the rear of this manual is a pull-out technical broadsheet and parts list. Please pass these documents to your Maintenance Department.



Fig. 1. — Transmatic 162

## GENERAL

The Transmatic 162 and Transmatic 244 are feed units designed for use in MIG/MAG welding installations to feed hard, soft or tubular (cored) wires. Details of the wire sizes handled are given in the specification (See Technical Notes).

A quick-fit central adaptor (Euro-connector) allows the full range of air and water-cooled torches to be fitted quickly and with minimum preparation. When using a water-cooled torch the water adaptor kit must be fitted. (See opposite).

Wire is fed from the feeder by one/two driven feed roll(s) and one/two pressure roll(s). The feed roll(s) is driven from d.c. motor by a worm-drive gear.

**When changing wire sizes the feed roll(s), outlet guide tube liner, inlet guide and intermediate guide may have to be changed, see Parts List.**

Each feed roll has two alternative grooves and is stamped with the wire size on the outside (facing the operator) edge.

The pressure roll tension can be adjusted to counteract wire slip and provision is made to change guide tubes to optimise conditions for various wire sizes.

Standard facilities include variable wire feed speed, wire inching, gas purge, continuous/spot weld timing and latching.

The unit is fitted with a plastic hub designed to accept a standard reel of wire. A 30Kg reel holder, wire basket or reel cover kit can be fitted (See Optional Extras, page 8).

Overrun braking adjustment facilities are provided on the hub.

### Water Adaptor Kit — (See below)

Required where a water-cooled torch is to be employed this kit contains the hoses and quick fit unions which enable the water supply and torch power/drain hoses to be coupled to the wire feed unit.

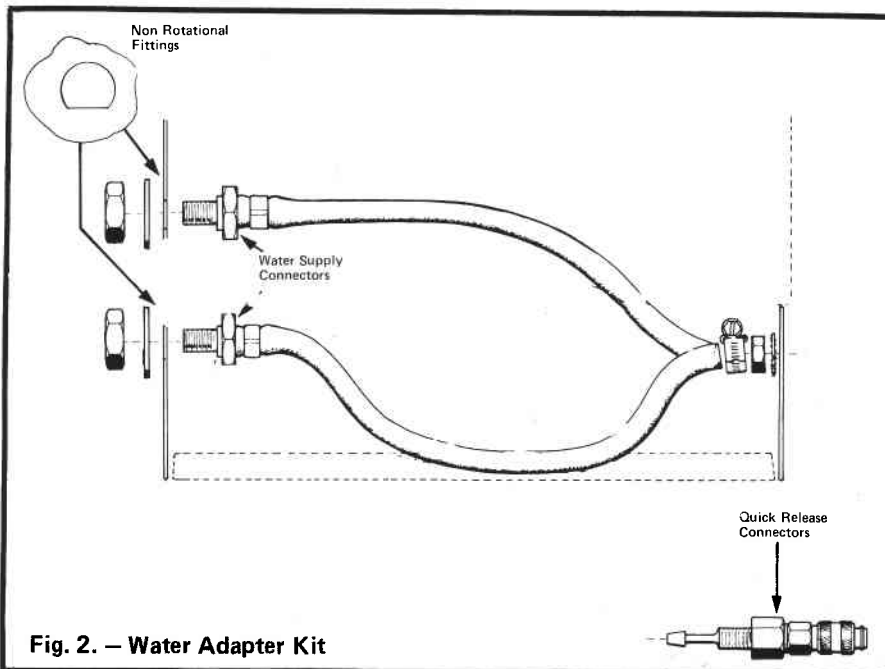


Fig. 2. — Water Adapter Kit

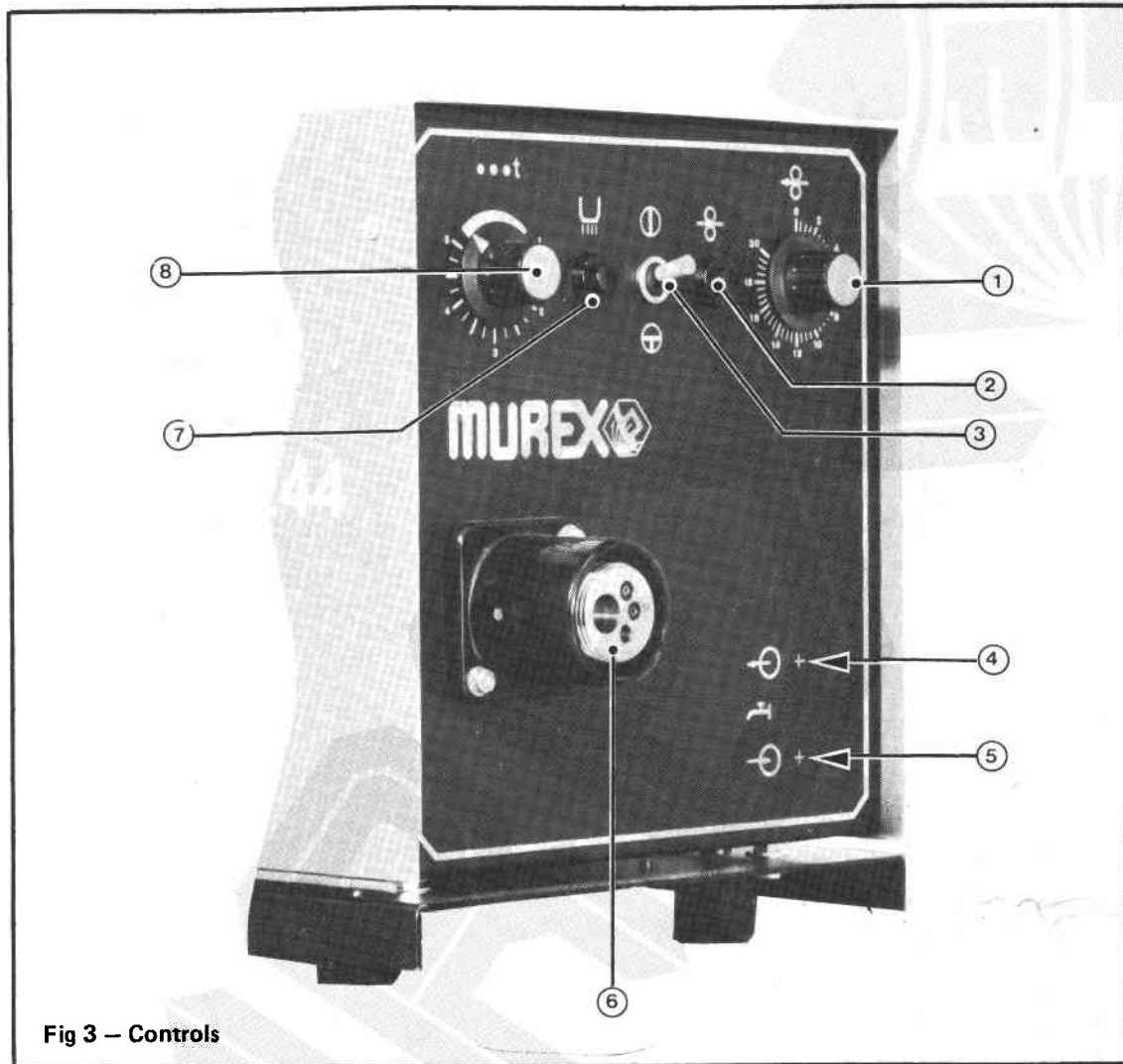


Fig 3 – Controls

## CONTROLS

- |  |  |  |
|--|--|--|
| <p>1. <b>Wire Feed Speed Control</b><br/>Provides a continuously variable wire feed speed control. The wire speed is directly proportional to welding current so that increasing the speed increases current and vice-versa.</p> | <p>4. Water out to torch.</p>  | <p>6. <b>Central Adaptor (Euroconnector)</b><br/>Allows for quick fitting of torches including gas connection wire outlet and torch switch connections.</p>  |
| <p>2. <b>Wire Inch Control</b><br/>Operates the wire feed motor but not the other welding services. It is used to 'inch' the wire through the equipment during setting up and adjustment procedures.</p>                         | <p>5. Water return from torch (drain). When a water-cooled torch is used the water connections are mounted in the holes provided. These connections are contained in the water adaptor kit. See Optional Extras.</p>   | <p>7. <b>Gas Purge Button</b><br/>When operated, opens the gas valve in the unit, allowing the gas to flow through to the welding torch. It is used when initially adjusting the gas glow and when purging the gas lines of air.</p>                                 |
| <p>3. <b>Latching Switch</b><br/>This switch provides latching facilities as follows:<br/><br/><b>Unlatched (2 way)</b><br/><b>Press-</b> Continuous welding whilst torch switch held pressed.</p>                               | <p>Release- Welding stops<br/><b>Latched (4 way)</b><br/><b>Press-</b> Gas Purge<br/><b>Release-</b> Continuous welding<br/><br/><b>Press-</b> Welding stops, gas continues giving post weld gas coverage<br/><b>Release</b> Gas stops<br/><br/><b>Water Adaptor Fitting Holes</b></p> | <p>8. <b>Spot Weld ON/OFF and Timer Control - 2 way - Operation only</b><br/>Switches the spot weld facility on and allows the operator to select a suitable weld time to provide sufficient penetration of the weld spot relative to the material being welded.</p> |

## INSTALLATION

### INITIAL SETTING UP

#### 1. Feed Rolls

**Note:** When changing wire sizes the inlet guide, intermediate guide, outlet guide tube liner and feed rolls may need changing as given below.

Before connecting the electrical and gas supplies, ensure that the equipment is set up for the type and size of wire to be used as follows:

- (a) Power Source switched off.
- (b) When changing wire sizes it may be necessary to change the feed roll, outlet guide tube liner, inlet guide and intermediate guide.

The size of feed roll is stamped on the visible surface of the roll when fitted.  
—See 'Feed Roll changing'.

#### 2. Interconnections

Lay out the torch leads keeping the leads as straight as possible.

Check that the power source is switched off.

**CAUTION:** Do not extend the interconnections beyond 20m, if in doubt call your nearest Murex distributor for advice.

#### 3. Gas

Connect the shielding gas hose between the regulator and the nipple provided on the rear panel

#### 4. Control and Power Cable

Connect the control and power cables between the fittings on the rear panel and the socket on the power source.

#### 5. Work Return Lead

Connect the work return lead to a clean area on the work piece.

### WELDING WIRE

Fit the reel of welding wire:

1. Remove the hand nut from the hub.
2. Place the reel of wire on the hub so that the wire will be drawn off from the bottom. Ensure that the pin on the hub locates in the hole in the side of the reel.
3. Release the end of the wire from the side of the reel but do not allow the coils to loosen. Cut off

the kinked portion and remove any sharp edges from the end of the wire. This must be done every time the wire is threaded through the equipment.

4. Loosen the hub reel brake nut so that the reel revolves freely. Tighten the nut just enough to prevent over-run when wire feed stops. Too much pressure will cause excessive drag.
5. Lift the pressure roll arm.
6. Thread the wire through the inlet guide over the feed roll(s) and into the outlet guide, for approximately 50mm (2in). Lower the pressure roll arm so that the welding wire is clamped into position in the groove.
7. Switch on the power source to obtain the 42V supply.
8. Push the inching button — See Fig. 2. and check that the wire is driven smoothly through the outlet guide.
9. Check that wire feed is smooth and positive. If the wire slips in the feed rolls, tighten the pressure adjuster just enough to obtain positive wire feed drive.  
**Do not overtighten.**
10. Cut off the wire to protrude 10mm from the torch connector.

### TORCH

1. Check that the torch leads are laid out straight and connect the torch to the torch adaptor.
2. Remove the nozzle and contact tip from the torch. Using the inching button, feed the wire through the torch. Thread a contact tip over the wire and screw it into the torch. Tighten the contact tip with the key provided.
3. Fit the appropriate nozzle.
4. Press the torch switch and check that wire flows smoothly from the torch.

### REPLACEMENTS AND ADJUSTMENT

1. **Outlet Guide Tube Liner Removal**
  - (a) Release the pressure roll(s).
  - (b) If the guide tube liner will move freely, push it out of the torch adaptor using a pencil or soft wooden dowel rod, then withdraw it from the torch adaptor using a pair of long nose pliers.

If the guide tube liner does not move freely, it may be necessary to drive it out using a hard wooden dowel or old guide tube.

**Note:** Do not use a screwdriver or metal tool to push out the tube. Use of such a tool may score the end of the guide tube and impair wire feeding.

#### 2. Feed Roll Changing

Remove the feedroll retaining screw(s). It will be necessary to give the screwdriver a sharp twist to avoid turning the motor.

Lift the pressure arm and pull off the feedroll(s). When replacing the feedroll(s), note the wire size which is stamped on the face of the roll(s).

The required size must face outwards when the roll is refitted.

Fit the feedroll(s) and lower the pressure arm. Refit the retaining screw(s) giving it a sharp twist with the screwdriver to tighten.

#### 3. Inlet Guide Replacement

Slacken retaining screw and pull inlet guide out from rear.

#### 4. Intermediate Guide Replacement

Release pressure arm. Slacken intermediate guide retaining screw. Remove rear feed roll. Slide out intermediate guide from the rear.

#### 5. Overrun Adjustment

Tighten or unscrew the hub bolt/nut in the centre of the wire reel hub until sufficient hub friction is achieved to prevent overrun.

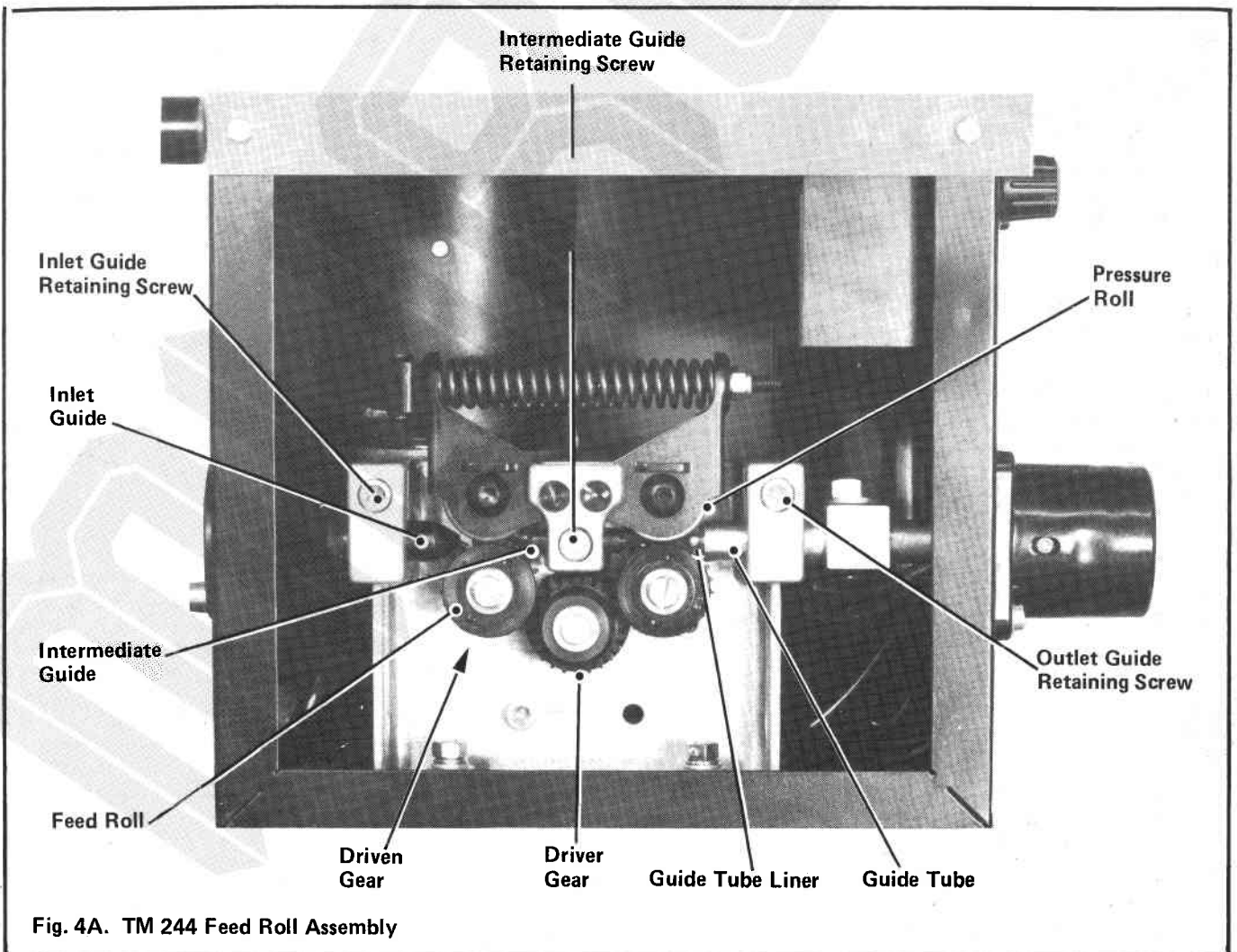
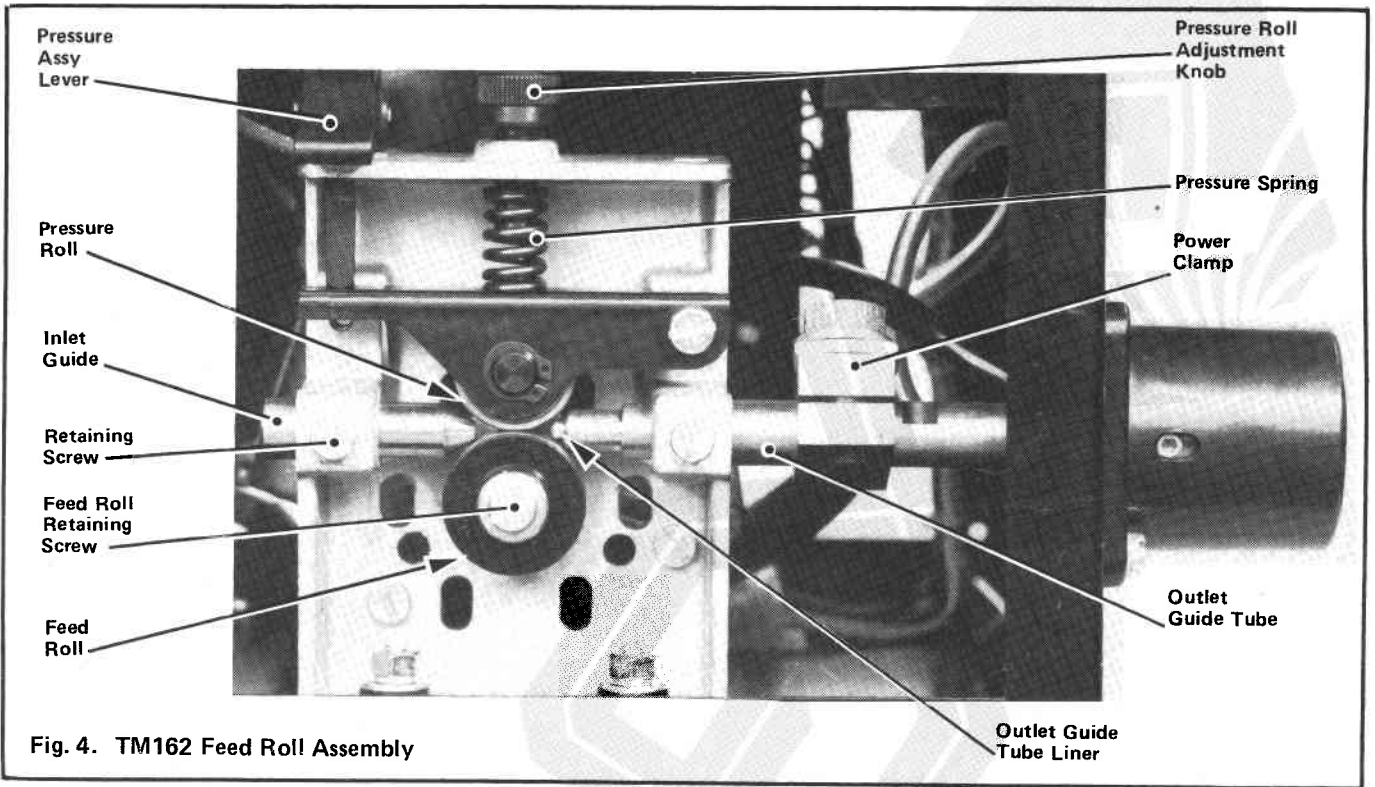
**Note:** Do not over tighten or the wire will slip in the feed rolls.

#### 6. Feed Roll Pressure

Correct feed roll pressure will provide smooth, uninterrupted feeding of the wire. Inspection of the wire should reveal only slight marks from the feed rolls and no deformation of the wire. Use of the correct pressure is especially important when feeding aluminium wires. The pressure should be just enough to provide positive wire drive without slipping.

#### 7. Burn Off Adjustment

If burn off requires adjustment, it must be set using a control mounted on the printed circuit board. See Fig. 7.



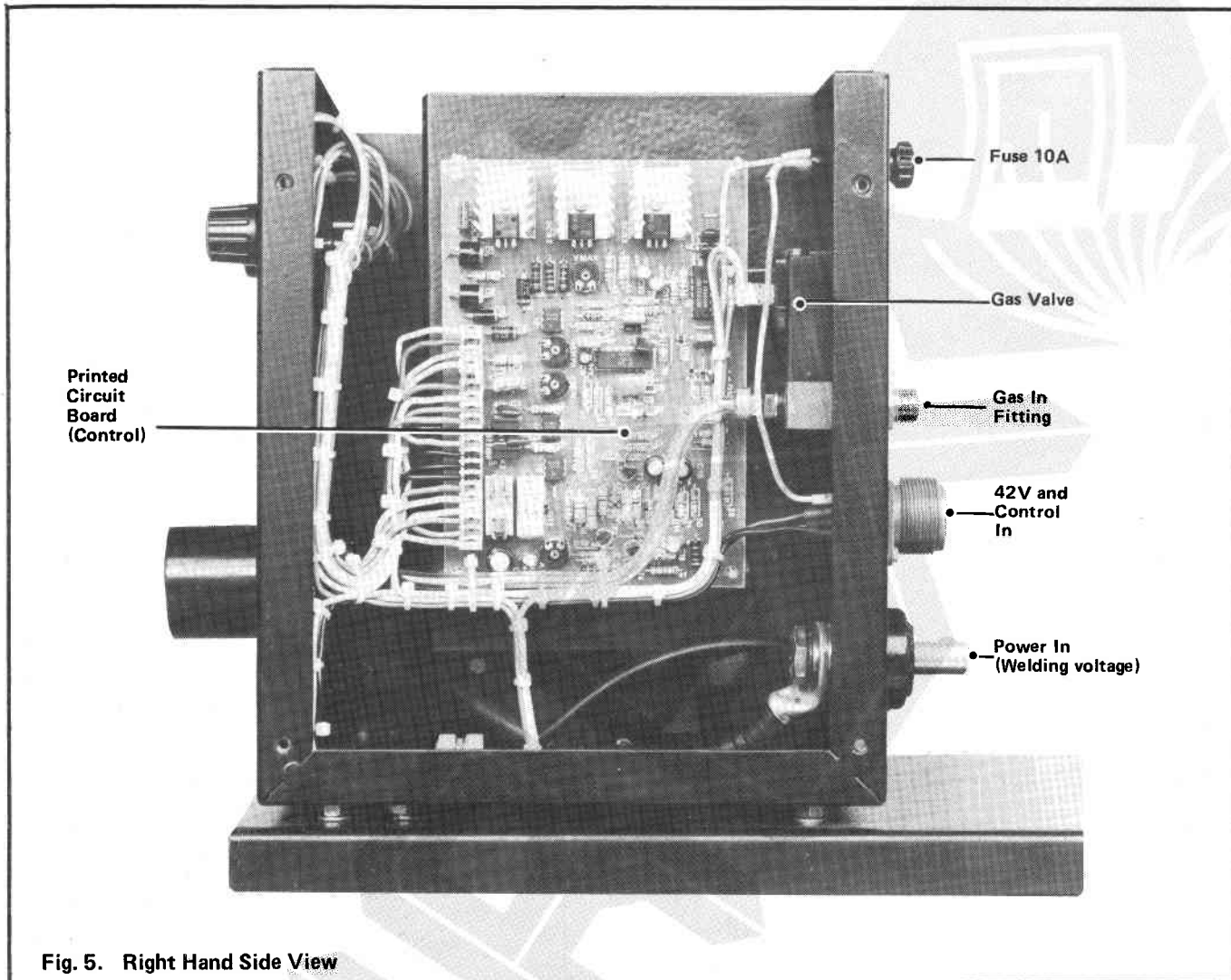


Fig. 5. Right Hand Side View

Maximum Motor Speed Setting

Soft Start Control

Minimum Motor Speed Setting

Burn - off Control

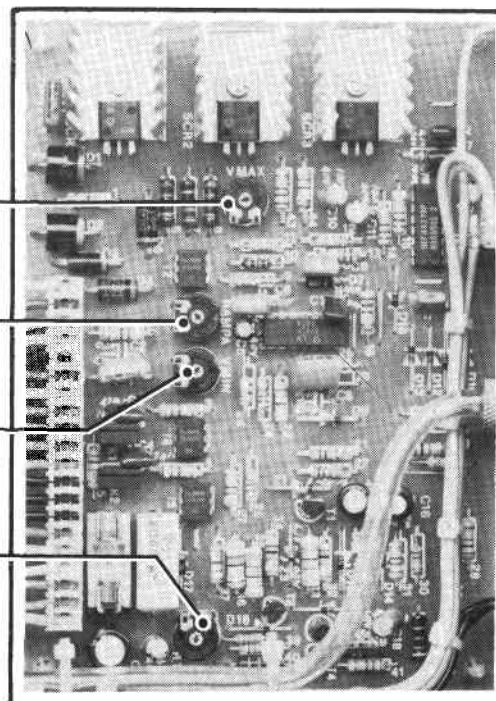
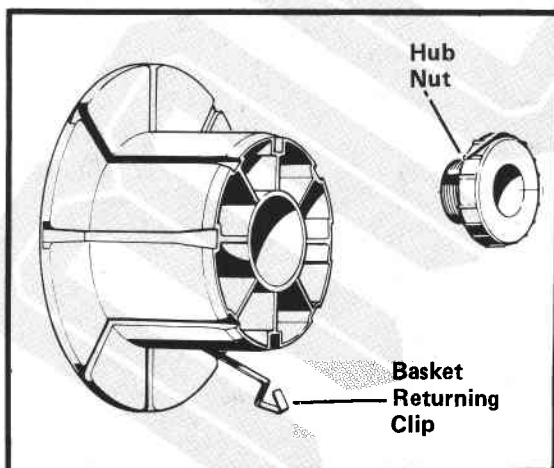


Fig. 6. Printed Circuit Board Controls

FAULT	POSSIBLE CAUSE AND REMEDY
1. Weld deposit 'Stringy' and incomplete	1a. Torch moved over workpiece too quickly 1b. Gas mixture incorrect.
2. Weld deposit too thick	2a. Torch moved over workpiece too slowly 2b. Welding voltage too low
3. Arc unstable, excessive spatter and weld	3a. Torch held too far from the workpiece 3b. Rust, grease or paint on workpiece 3c. Insufficient shielding gas, check gas contents gauge, regulator setting and operation of gas valve
4. Wire repeatedly burns back	4a. Torch held too close to the workpiece 4b. Intermittent break in the welding circuit caused by: (1) Contact tip loose - Tighten (2) Contact tip damaged - Replace (3) Welding wire or liner corroded - replace wire or liner
5. Burning holes in the workpiece	4c. Wire feed slipping caused by: (1) Restriction in Liner (such as kinks) or contact tip - check and replace if necessary. (2) Worn feed rolls - replace (3) Outlet guide or pressure roll adjustment incorrect
6. Lack of penetration	5a. Torch moved too slowly or erratically 5b. Welding volts too high 5c. Wire feed speed too high
	6a. Torch moved too fast 6b. Welding volts too low 6c. Wire feed speed too low

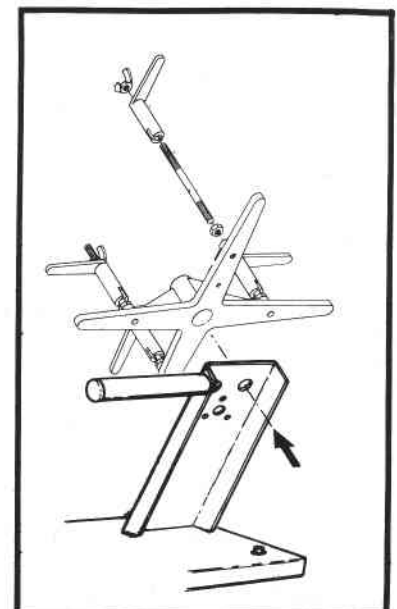
### OPTIONAL EXTRAS

(See also Parts List)



#### Wire Basket Adaptor

This adaptor pushes on to the existing wire feed hub and is held in position by the hub nut.



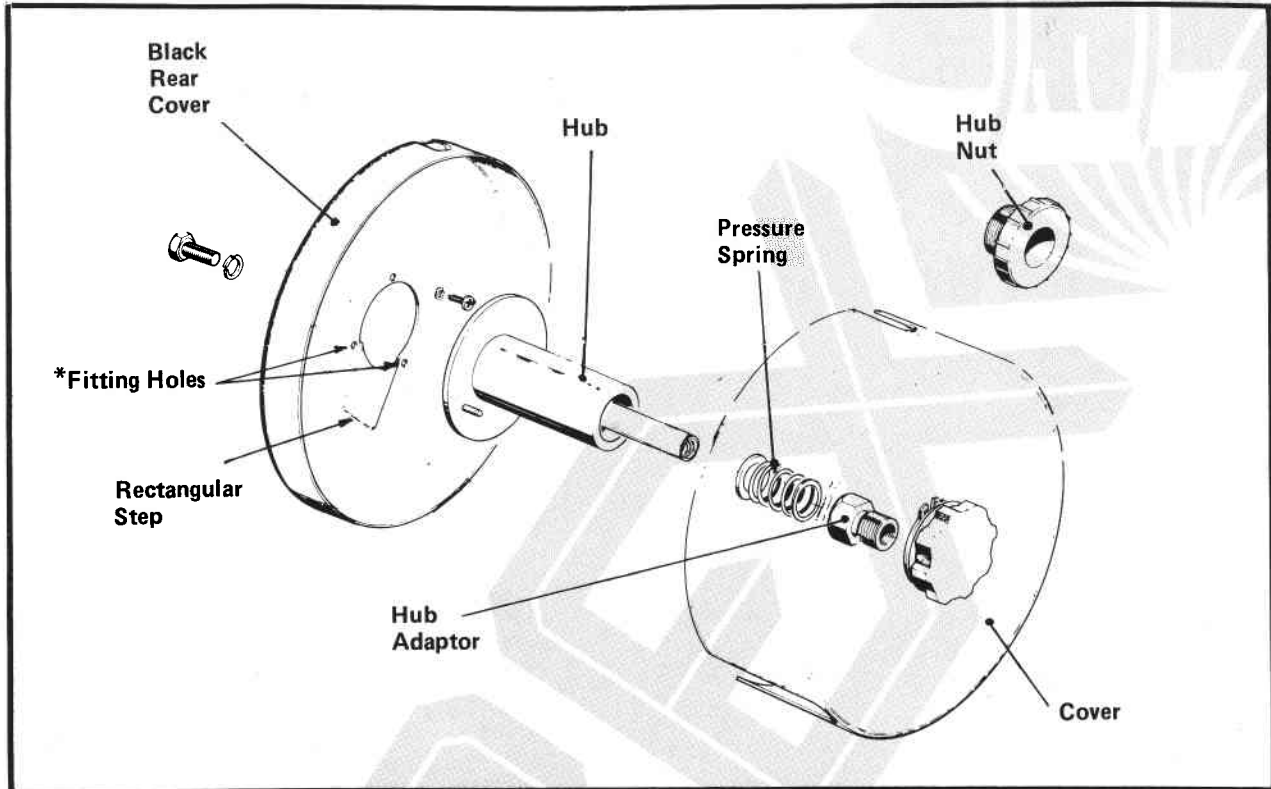
#### 30Kg Spool Holder

This holder is fitted on to the wire feed hub.

To accommodate the increased diameter of the spool holder, the hub spindle must be moved to the rear, top fitting hole as shown.

## OPTIONAL EXTRAS

(See also Parts List)



### Reel Cover Kit Fitting

1. Remove Hub Nut and Tension Screw.
2. Slide off Hub and Pressure Spring.
3. Mount Black rear cover of reel cover kit to reel stand, using hardware provided.  
**Note:** *Rectangular 'step' points towards inlet hole on rear panel of feeder.*  
*Attach using the 2 screw holes on either side of 'step' only.\**
4. Replace Hub and Spring and screw in Hub Adaptor.
5. Fit wire spool and cover.

# Transmatic 162 & 244 Technical Notes

## SPECIFICATION

	Transmatic 162	Transmatic 244
Drive System	2 Wheel	4 Wheel
Motor	90W	150W
Wire Feed Speed Range	1-18m/min	1-18m/min
Supply Voltage	42Vac	42V ac
Wire Size: Hard	0.8-1.6mm	0.8-2.4mm
Soft	1.0-1.6mm	1.0-2.4mm
Cored	1.2-1.6mm	1.2-2.4mm
Dimensions:		
Height	300mm	300mm
Weight	245mm	245mm
Length	530mm	530mm
Weight (Nett)	13.4Kg	15.5Kg

Due to variations which can occur in manufactured products, claimed performance, voltages, ratings, all capacities, measurements, dimensions and weights quoted are approximate only. Achievable capacities and ratings in use and operation will depend upon correct installation, use, application, maintenance and service.

## CIRCUIT DESCRIPTION

**EXTERNAL CONNECTIONS TO PCB**

42V a.c. from the power source is applied to pins 1 & 2 of input socket SK1 pins A & F.

The torch switch TS connects +24Vd.c. from pin 14 on the PCB edge connector to pins 15 and 17 via the latch/unlatch switch.

The gas purge button closes the circuit to provide 42V to the gas valve GV via pins A and F.

The power source contactor is switched by pin C and the gas valve via pin A.

**WIRE FEED SPEED CONTROL****Motor Control**

The 42V a.c. supply is connected across bridge circuit D1/SCR2, D2/SCR1 to power the motor.

The motor draws power from the supply, the quantity governed by the firing angle of thyristors SCR2 and SCR1.

The circuit uses both armature voltage and current feedback control to maintain the preset speed.

At this stage, note that when SCR3 conducts via R8, the motor is shunted by SCR3 and effectively 'braked'. Dynamic braking current, sensed by R8, via comparator IC3a connects D9 & D8 to ground, resulting in both reference voltage and firing signals to SCR2 and SCR1 being inhibited.

**Wire Feed Speed Reference Level**

12V d.c. is applied to series resistor chain R18, RV1, VR3. Note that the lower end of the resistor chain is connected not directly to PCB ground, but via motor current measuring resistor RM. Hence the reference voltage at the input to IC3b is not only dependant on the setting of RV1, but also on the average value of armature current - increased current creating a more positive reference.

When D9 (brake) releases the reference at the input to IC3b, the reference voltage ramps up (C12 charges via R41, VR1, RV1, R18) giving a controlled ramp acceleration to the speed reference.

Armature feedback voltage (via VR2, R19) is compared with the reference level at IC3b input. IC3b output provides the threshold input level to IC3c (firing angle comparator).

**Pulse Generator - For Waveforms see back page**

The full wave rectified signal is applied to the base of T4 - Waveform A. The action of T4/C2/R13 then produces a sawtooth voltage - Waveform B. This is then applied to the inverting input of IC3c.

IC3c compares the falling sawtooth with the level on its non-inverting input. The resultant rectangular waveform (C) which has positive going transition coincident with the intersection of the ramp and the level on its non-inverting input is used to gate SCR2 and SCR1 via I2 (photocoupled triac).

Thyristors SCR2 & SCR1 are fired 'early' or 'late' in time, dependant on the reference level set on RV1 plus the armature voltage and armature current feedback.

**Inching**

Pressing the inching button (across pins 20 and 3) grounds the base circuit of T1 causing it to release the dynamic brake.

**2 WAY AND 4 WAY LATCHING**

Under non-operating conditions T3 is off, IC3d output is RT at 0 volt and T1 is conducting.

With T1 conducting, SCR3 is turned on and the braking/inhibiting circuit is activated (motor, reference voltage and pulsing output shunted).

I1, output (pin 15) (Q1) set low via the latched position of the switch.

**2 Way (unlatched) Operation**

1. Torch switch (TS) pressed.
  - (a) 24 volts applied to Pin 17 of PCB turning on T3, grounding the inhibit signal and tone.
  - (b) This releases the brake and reference circuits, wire feed now commences.
  - (c) IC3d now switches positive energising phototriacs I4 I5.
  - (d) Power triacs TR1 & TR2 turn on energising the gas valve and welding contactor.

**WELDING COMMENCES**

2. Torch Switch Released.
  - (a) Removal of 24V from pin 17 of PCB causes T3 to turn off.
  - (b) T1 turns on applying the motor brake.
  - (c) After the burn-back time set by C7 in parallel with the burn-back timer potentiometer, VR4 IC3d switches deactivating the phototriacs I4 & I5 and hence turning off the gas supply and welding contactor via Triacs TK1 & TK2.

**4 Way (Latched) Operation**

1. Torch Switch Pressed:
  - (a) 24V applied to pin 15 of PCB causing I1, (Q) output to go high. T2 is also turned on inhibiting T3 from turning on.
  - (b) I4 is energised directly, turning on the gas supply.
2. Torch Switch Released:
  - (a) Removal of 24V from pin 15 turns off T2 and hence T3 turns on supplied from I1 (Q1).
  - (b) Operation is now as explained in '2 Way (unlatched) Operation Section 1 b,c, & d.

**WELDING COMMENCES**

3. Torch Switch Pressed:
  - (a) Application of 24V to pin 15 sets I1, (Q1) to zero.
  - (b) T3 turns off applying the dynamic brake via T1 and turning off the contactor after the burn-back time.
  - (c) T4 is held on, supplied directly from pin 15, hence the gas supply is maintained.
4. Torch Switch Released:
 

+24V removed from pin 15 hence I4 and the gas supply turns off.

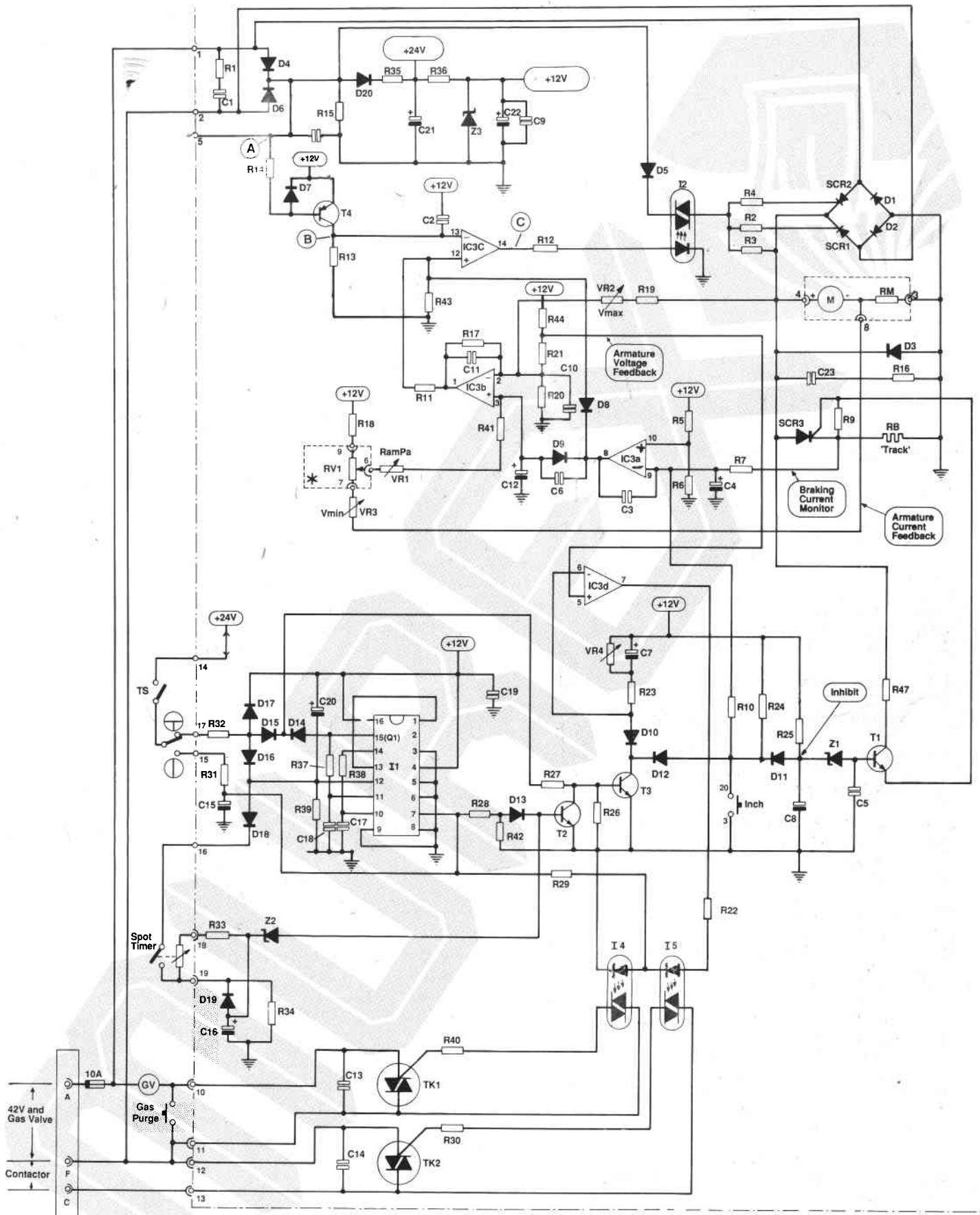
**Spot Timer Operation**

**Note:** only usable in 2 stroke (unlatched) mode.

1. Torch Switch Pressed:
  - (a) 24V applied to pin 17 of PCB turning on T3.
  - (b) T3 in turn energises the gas solenoid and contactor and removes the motor brake/inhibit circuit (as previously described).

**WELDING COMMENCES**

- (c) Capacitor C16 commences charging via Timer Control.
- (d) When threshold voltage reached T2 turns on inhibiting T3 and hence welding ceases.
2. Torch Switch Released:
  - (a) Capacitor C16 discharged via R42 and D14.



## MAINTENANCE

Switch off the power source before commencing.

### Before Fitting a New Spool of Wire

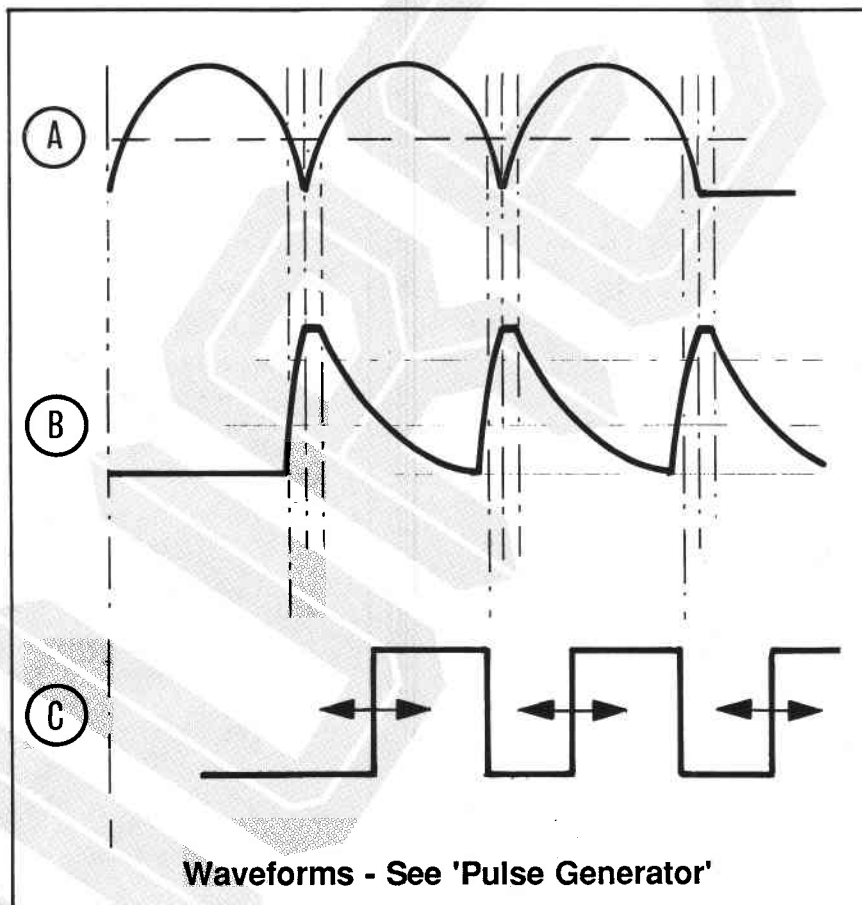
1. Blow through the torch liner with dry compressed air of shielding gas.
2. Remove any dirt or deposits of metal from the feed and pressure rolls.

### Monthly

1. Remove the cover (retain the fixing screws).
2. Using a soft brush, remove any dust or dirt from the interior of the unit. If compressed air is used to clean the unit the pressure must not exceed  $2\text{kg/cm}^2$  ( $30\text{ lb/in}^2$ ), and the air must be dry.

**SUITABLE EYE AND MOUTH PROTECTION SHOULD BE WORN.**

3. Check that the internal welding cable is in good electrical contact with the welding cable connector, and the terminal block on the central adaptor.



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# Transmatic 162 & 244 Parts List

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**Transmatic 162 Pt.No. 1411550**  
**Transmatic 244 Pt. No. 1411551**

When ordering spare parts, please quote both the Part Number and the Description. Customers should also give the type and serial number of the unit for which the parts are required.