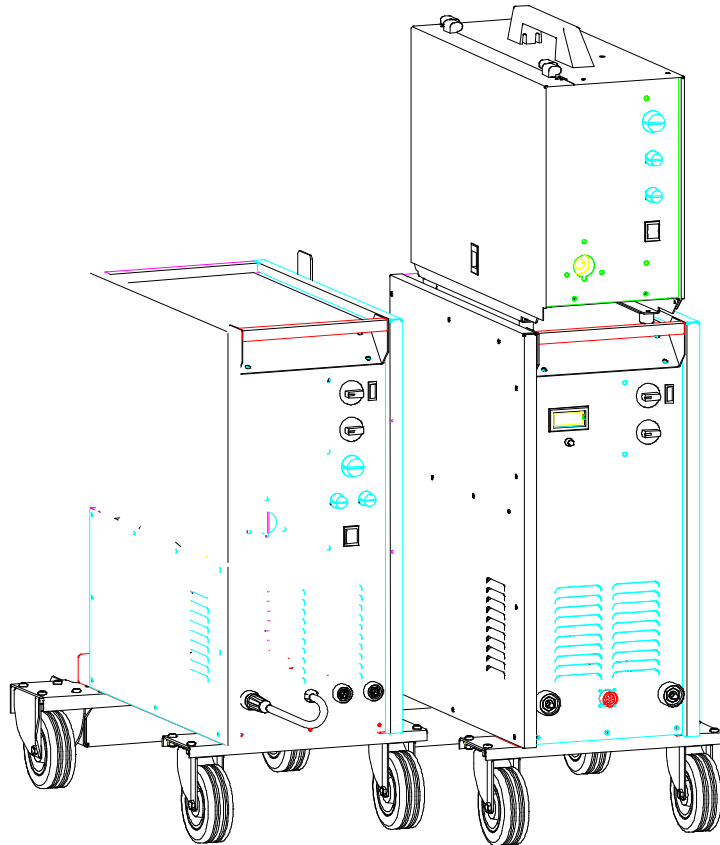




Operating Manual



TRANSMIG 210 Compact Power Source 704832

Remote Power Source 704808

TRANSMIG 250 Compact Power Source 704833

Remote Power Source 704809

2R TRANSMIG 210/250 Wirefeeder 704975

TRANSMIG 310 Compact Power Source 704836

TRANSMIG 330 Remote Power Source 705085

2R TRANSMIG 330 Wirefeeder 704841

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1. INTRODUCTION

The Transmig 210, 250, 310 and 330 are semi-automatic Gas Metal Arc Welder (GMAW-commonly MIG) with either integrated or separate wire feed unit. These products are designed to meet the broad operating needs of the metal fabrication industry where production efficiency is vital. They are designed and manufactured in Australia to Australian Standard AS1966.1-1985.

The Transmig range gives excellent performance on mild steel, stainless steel, aluminium, silicon bronze and some hard facing wires with the Argon based of shielding gases. The Transmig range also gives excellent results on mild steel using CO₂ (carbon dioxide) shielding gas.

The Transmig Plants are supplied as a complete welding package (apart from gas cylinder and electrode wire). The following instructions detail how to correctly set up your new Transmig and give guidelines on gaining the best production efficiency. Please read these instructions thoroughly before using your Transmig.

1.1 Duty Cycle

The rated duty cycle of a welding Power Source is the operating time it may be used at its rated output current without exceeding the temperature limits of the insulation of the component parts. In Australia a duty cycle period of 5 minutes is specified in Australian Standard AS 1966 Part 1-1985. To explain the 5 minute duty cycle period the following example is used. Suppose a welding Power Source is designed to operate at 30% duty cycle, 250 amperes at 26 volts. This means that it has been designed and built to provide the rated amperage (250A) at the rated voltage (26V), for 1.5 minutes out of every 5 minute period (30% of 5 minutes is 1.5 minutes). During the other 3.5 minutes of the 5 minute period the Power Source must idle and be allowed to cool. The thermal cut-out will operate if the duty cycle is exceeded.

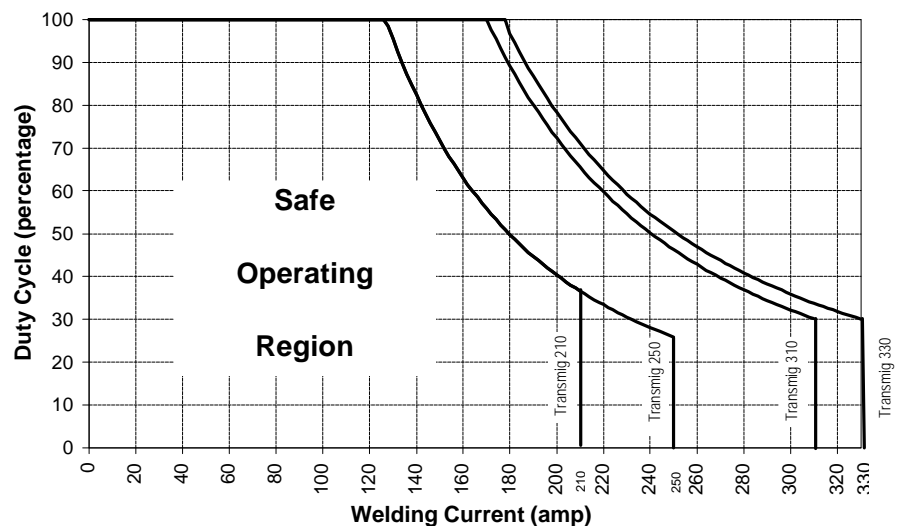


Figure 1 - Transmig duty cycle curves

CAUTION 1: *The above times are not accumulative.*

2. SPECIFICATIONS

2.1 Transmig 210 and Transmig 250 Specifications

	Transmig 210			Transmig 250		
	Compact	Remote		Compact	Remote	
Plant Assembly part number	704830	704831		704833	704834	
Plant Mass	77Kg	107Kg		78Kg	108Kg	
Plant Dimensions	860mm x 490mm x 845mm			860mm x 490mm x 845mm		
Power Source part number	704832	704808		704835	704809	
Power Source Mass	60Kg	58.5Kg		61Kg	59.5Kg	
Power Source Dimensions	640 x 310 x 732			640 x 310 x 732		
Number of Phases	Single Phase			Single Phase		
Frequency	50 / 60 Hz			50 / 60 Hz		
Open Circuit Voltage Range	18.9 to 34.2V			19 to 43V		
Output Current Range	25 to 210A			30 to 250A		
Rated Output for 15A Outlet at 240V	210A @ 25% 148A @ 50% 105A @ 100%			184A @ 25% 130A @ 50% 92A @ 100%		
⊛ Rated Output for 20A Outlet at 240V	210A @ 36% 164A @ 60% 127A @ 100%			¾		
△ Rated Output for 25A Outlet at 240V	¾			250A @ 25% 180A @ 50% 127A @ 100%		
Duty Cycle Period	5 minutes or 10 minutes			5 minutes or 10 minutes		
Number of Output Voltage Values	16			16		
Wire Size Range	0.6 - 0.9 Hard / 0.9 - 1.2 Soft			0.6 - 0.9 Hard / 0.9 - 1.2 Soft		
Operating Temperature Range	0°C to 40°C			0°C to 40°C		
Primary input voltage	200V	220V	240V	200V	220V	240V
Ñ Rated Input Current (output of 127A)	25A	23A	21A	30A	27A	25A
Rated kVA (output of 127A)	5kVA	5kVA	5kVA	6kVA	6kVA	6kVA
Maximum Input Current	42A	38A	35A	52A	47A	43A
Generator Requirements	8.5kVA	8.5kVA	8.5kVA	10kVA	10kVA	10kVA
Rated Outlet @ Max Duty Cycle	25A	23A	20A	30A	27A	25A
✦ Fuse Size @ Max Duty Cycle	50A	50A	40A	60A	60A	50A

Ñ The Rated Input Current should be used for the determination of cable size & supply requirements.

✦ Motor start fuses or motor start thermal circuit breakers are recommended for this application. Australian Standard AS3000 (Clause 2.4.3.4) permits the use of a fuse or circuit breaker rated at two times the rated input current.

⊛ To achieve this rating, the 15 Amp plug and primary supply lead (as supplied) must be replaced with a 20 Amp plug & lead. This must be carried out by a qualified electrical tradesperson.

- ▲ To achieve this rating, the 15 Amp plug and primary supply lead (as supplied) must be replaced with a 25 Amp plug & lead. This must be carried out by a qualified electrical tradesperson.

2.2 Transmig 310 and Transmig 330 Specifications

	Transmig 310			Transmig 330		
Plant Assembly part number	704836			704839		
Plant Mass	87Kg			117Kg		
Plant Dimensions	860mm x 490mm x 845mm			860mm x 490mm x 845mm		
Power Source part number	704838			705085		
Power Source Mass	71Kg			70Kg		
Power Source Dimensions	640 x 310 x 732			640 x 310 x 732		
Number of Phases	Three Phase			Three Phase		
Frequency	50 / 60 Hz			50 / 60 Hz		
Open Circuit Voltage Range	17.5 to 41.2V			17.5 to 41.2V		
Output Current Range	25 to 310A			25 to 330A		
Rated Output Duty Cycle	310A @ 30% 220A @ 60% 170A @ 100%			330A @ 30% 228A @ 60% 177A @ 100%		
Duty Cycle Period	5 minutes or 10 minutes			5 minutes or 10 minutes		
Number of Output Voltage Values	24			24		
Wire Size Range	0.6 - 1.2 Hard / 0.9 - 1.2 Soft			0.6 - 1.2 Hard / 0.9 - 1.2 Soft		
Operating Temperature Range	0°C to 40°C			0°C to 40°C		
Primary input voltage	220V	380V	415V	220V	380V	415V
Ñ Rated Input Current for output current at 100% duty cycle.	21A	12A	11A	21A	12A	11A
Rated kVA for output current at 100% duty cycle.	8kVA	8kVA	8kVA	8kVA	8kVA	8kVA
Maximum Input Current	36A	21A	19A	38A	22A	20A
Generator Requirements	13.7kVA	13.7kVA	13.7kVA	14.4kVA	14.4kVA	14.4kVA
Rated Outlet @ Max Duty Cycle	25A	15A	15A	25A	15A	15A
✦ Fuse Size @ Max Duty Cycle	50A	30A	20A	50A	30A	20A

- Ñ The Rated Input Current should be used for the determination of cable size & supply requirements.
- ✦ Motor start fuses or motor start thermal circuit breakers are recommended for this application. Australian Standard AS3000 (Clause 2.4.3.4) permits the use of a fuse or circuit breaker rated at two times the rated input current.

2.3 MIG Torch Specifications

Torch Part Number	717578
Torch Type	TWECO 250A (Eliminator Consumables)
Torch Cable Length	3.6 metre

2.4 Wirefeeder Specifications

Wirefeeder	704975 (Transmig 210 & 250 Remote)	704841 (Transmig 330)
Mass	21Kg	23Kg
Dimensions	600 x 245 x 475	
Motor Supply Voltage	36V AC	
Motor Supply VA	180VA	
Control Supply Voltage	24V AC	
Control Supply VA	30VA	
Minimum Wire Speed	One metre per minute	
Maximum Wire Speed	17 metres per minute	
Wire Diameter:	Mild Steel	0.6, 0.8, 0.9
	Stainless Steel	0.8, 0.9
	Aluminium	0.9, 1.0, 1.2
	Flux Cored	0.8, 0.9, 1.2
Operating Temperature Range	0°C to 40°C	
Wire Spool Size	15Kg Maximum	
Spot Time Range	0 to 2.5 Seconds	
Stitch 'ON' Time	0 to 2.5 Seconds	
Stitch 'OFF' Time	0 to 2.5 Seconds	
Burnback Time Range	0 to 0.15 Seconds	

2.5 Plant Contents

	Transmig 210		Transmig 250		Transmig 310	Transmig 330
	Compact	Remote	Compact	Remote	Compact	Remote
Wheeling Kit	✓	✓	✓	✓	✓	✓
Roll on Cylinder Carrier	✓	✓	✓	✓	✓	✓
Power Source	✓	✓	✓	✓	✓	✓
Operating Instructions	✓	✓	✓	✓	✓	✓
3 Metre Work Lead	✓	¾	✓	¾	✓	¾
8 Metre Work Lead	¾	✓	¾	✓	¾	✓
2R Wirefeeder (8 metre)	¾	✓	¾	✓	¾	✓
Regulator / Flowmeter	✓	✓	✓	✓	✓	✓
TWECO MIG torch 250A	✓	✓	✓	✓	✓	✓
Feed Roller 0.6/0.8 Hard	✓	✓	✓	✓	✓	✓
Feed Roller 0.9/1.2 Hard	✓	✓	✓	✓	✓	✓

2.6 Optional Accessories

Part Number	Description	Transmig 210		Transmig 250		Transmig 310	Transmig 330
		Compact	Remote	Compact	Remote	Compact	Remote
705103	Digital Meter Kit	✓	✓	✓	✓	✓	Standard
704914	Wirefeeder Swivel Base	¾	✓	¾	✓	¾	✓
704913	Wirefeeder Trolley	¾	✓	¾	✓	¾	✓
704917	110Volt Aux Supply Kit	✓	✓	✓	✓	✓	✓
ELC2123035	250A Eliminator torch (3.6M) (fits Transmig adaptor)	✓	✓	✓	✓	✓	✓
ELC4123545	450A Eliminator torch (3.6M) (fits Transmig adaptor)	✓	✓	✓	✓	✓	✓
704343	Torch trigger lead to suit Eliminator torch	✓	✓	✓	✓	✓	✓
704099	Work lead (3m)	✓	✓	✓	✓	¾	¾
705163	Work lead (3m)	¾	¾	¾	¾	✓	✓
704829	Work lead (8m)	✓	✓	✓	✓	¾	¾
704828	Work lead (8m)	¾	¾	¾	¾	✓	✓
704912	8 M Interconnection Extension	¾	✓	¾	✓	¾	¾
704465	8 M Interconnection Extension	¾	¾	¾	¾	¾	✓
717162	TWECO No.2 torch (3.6M) (adaptor 704915 required)	✓	✓	✓	✓	✓	✓
717201	TWECO No.4 torch (3.6M) (adaptor 704915 required)	✓	✓	✓	✓	✓	✓
704915	TWECO No.2 & 4 Adaptor	✓	✓	✓	✓	✓	✓
7977036	Feed roll, 0.6/0.8 Hard Wire	✓	✓	✓	✓	✓	✓
7977660	Feed roll, 0.9/1.2 Hard Wire	✓	✓	✓	✓	✓	✓
7977037	Feed roll, 1.0/1.2 Hard Wire	✓	✓	✓	✓	✓	✓
7977731	Feed roll, 0.8/0.9 Soft Wire	✓	✓	✓	✓	✓	✓
7977264	Feed roll, 1.0/1.2 Soft Wire	✓	✓	✓	✓	✓	✓
7977732	Feed roll, 0.8/0.9 Flux cored	✓	✓	✓	✓	✓	✓
704277	Feed roll, 1.0/1.2 Flux cored	✓	✓	✓	✓	✓	✓
ELC94L	Eliminator Torch trigger lock	✓	✓	✓	✓	✓	✓
705000	MIG pliers (size No 1)	✓	✓	✓	✓	✓	✓
705001	MIG pliers (size No 2)	✓	✓	✓	✓	✓	✓
646265	Weld measurement gauge	✓	✓	✓	✓	✓	✓
705277	Auxiliary transformer kit 240/36/24V	✓	✓	¾	¾	¾	¾
705278	Auxiliary transformer kit 240- 220-200/36/24V	¾	¾	✓	✓	¾	¾
705126	Auxiliary transformer kit 415- 380-220/36/24V	¾	¾	¾	¾	✓	✓

3. INSTALLATION RECOMMENDATIONS

3.1 Environment

The Transmigs are NOT designed for use in environments with increased hazard of electric shock as defined in AS3195-1990.

- a) Examples of environments with increased hazard of electric shock are -
 - i) In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts;
 - ii) In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator, or
 - iii) In wet or damp hot locations where humidity or perspiration considerably reduces the skin resistance of the human body and the insulation properties of accessories.
- b) Environments with increased hazard of electric shock do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard, have been insulated.

3.2 Location

Be sure to locate the Power Source according to the following guidelines:

- a) In areas, free from moisture and dust.
- b) Ambient temperature 0°C to 40°C.
- c) In areas, free from oil, steam and corrosive gases.
- d) In areas, not subjected to abnormal vibration or shock.
- e) In areas, not exposed to direct sunlight or rain.
- f) Place at a distance of 30cm or more from walls or similar that could restrict natural air flow for cooling.
- g) The minimum ground clearance for these products is 140mm.

3.3 Ventilation

Since the inhalation of welding fumes can be harmful, ensure that the welding area is effectively ventilated.

3.4 Mains Supply Voltage Requirements

The Mains supply voltage should be within $\pm 10\%$ of the rated Mains supply voltage. Too low a voltage may cause poor welding performance or the wirefeeder malfunction. Too high a supply voltage will cause components to overheat and possibly fail.

The Transmig is supplied with an input lead to which an appropriate plug should be fitted.

Install a power outlet for each Power Source and fit fuses as per Transmig 210 and Transmig 250 Specifications or Transmig 310 and Transmig 330 Specifications.

WARNING 1: *CIGWELD advises that your Transmig be electrically connected by a qualified electrical tradesperson.*

Refer to Table 1 for the ratings of the Mains supply leads that are supplied with the various Transmig Power Sources.

Transmig 210, 250, 310, 330

Transmig	Mains Supply Lead Size	Lead Current Rating	Lead Length	Machine Voltage Setting	Duty Cycle
210	1.5mm ²	16 Amps	3 metre	240 Volt	210A @ 25%
250	1.5mm ²	16 Amps	3 metre	240 Volt	184A @ 25%
310	1mm ²	12 Amps	3.7 metre	415/440 Volt	310A @ 30%
330	1mm ²	12 Amps	3.7 metre	415/440 Volt	330A @ 30%

Table 1 - Factory fitted Mains supply leads fitted to the Transmig Power Sources

CAUTION 2: *The Transmig Mains supply leads should be replaced with leads as specified in Table 2 when the Transmigs Mains supply voltage is changed or when it is plugged into a higher rated Mains outlet.*

3.5 Alternative Mains Supply Voltage Requirements

The Power Sources are suitable for the following Mains supply voltages:

	Mains Supply Voltage Setting	Mains Supply Lead Size	Mains Outlet Size	Fuse Size	Machines Duty Cycle
Export Model Only Export Model Only Transmig 210	200 Volt	4mm ²	25 Amp	✦ 50 Amp	210A @ 36%
	220 Volt	4mm ²	25 Amp	✦ 50 Amp	
	240 Volt	2.5mm ²	20 Amp	✦ 40 Amp	
Transmig 250 See Figure 2	200 Volt	6mm ²	30 Amp	✦ 60 Amp	250A @ 25%
	220 Volt	6mm ²	30 Amp	✦ 60 Amp	
	240 Volt	4mm ²	25 Amp	✦ 50 Amp	
Transmig 310 See Figure 3	220 Volt	2.5mm ²	20 Amp	✦ 40 Amp	310A @ 30%
	380 Volt	1.5mm ²	15 Amp	✦ 20 Amp	
	415/440 Volt	1mm ²	15 Amp	✦ 20 Amp	
Transmig 330 See Figure 3	220 Volt	2.5mm ²	20 Amp	✦ 40 Amp	330A @ 30%
	380 Volt	1.5mm ²	15 Amp	✦ 20 Amp	
	415/440 Volt	1mm ²	15 Amp	✦ 20 Amp	

Table 2 - Mains supply lead sizes for alternative Mains supply voltages

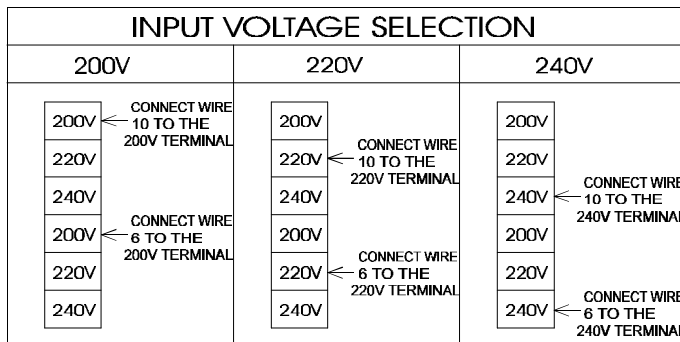


Figure 2 - Voltage settings for Transmig 210/250

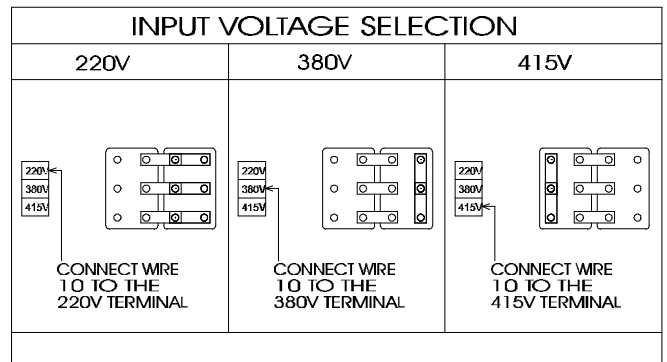


Figure 3 - Voltage settings for Transmig 310/330

4. SET UP FOR COMPACT TRANSMIGS

Refer to Figure 4 for the plant setup of a compact Transmig.

- a) Remove all packaging materials.
- b) Fit the fixed and swivel wheels to the Power Source.

WARNING 2: *To obtain adequate air flow and cooling for the Power Source components, the four wheels must be fitted. Alternatively, the Power Source may be raised 140mm from the floor using supports that do not restrict airflow.*

- c) Connect the work lead to the negative welding terminal (-) [positive welding terminal (+) for flux cored wire].
- d) Connect the *TORCH* lead to the positive welding terminal (+) [negative welding terminal (-) for flux cored wire].
- e) Position a gas cylinder on the rear tray and lock securely to the Power Source cylinder bracket with the chain provided. If this arrangement is not used then ensure that the gas cylinder is secured to a building pillar, wall bracket or otherwise securely fixed in an upright position.
- f) Fit the gas Regulator/Flowmeter to the gas cylinder.
- g) Connect the gas hose from the rear of the Power Source to the Flowmeter outlet.
- h) Two dual groove feed rollers are supplied as standard with the plant. These can accommodate 0.6, 0.8, 0.9 and 1.2 diameter hard wires. Select the roller required with the chosen wire size marking facing outwards.
- i) Fit the electrode wire spool to the wire reel hub located behind the wire compartment door. Ensure that the drive dog-pin engages the mating hole in the wire spool. Push the 'R' clip into place to retain the wire spool securely. The wire should feed from the bottom of the spool.
- j) Fit the TWECO MIG torch to the wire feed unit by releasing the torch locking screw in the brass torch adaptor and pushing in the torch fitting until the plastic torch casing meets the brass adaptor. Tighten the torch locking screw securely. Also ensure that the adjacent black knurled screw in the wire feeder casting is securely tightened. Remove the contact tip from the torch.
- k) Connect the two black torch trigger leads to the torch trigger terminals.
- l) Lift up the wire feeder pressure lever and pass the electrode wire through the inlet guide, between the rollers, through the outlet guide and into the torch.
- m) Lower the pressure lever and with the torch lead reasonably straight, feed the wire through the torch. Fit the appropriate contact tip.

CAUTION 3: *The electrode wire will be at welding voltage potential whilst it is being fed through the system.*



Figure 4 - Compact Transmig Setup

5. SET UP FOR REMOTE TRANSMIG WITH WIREFEEDER

Refer to Figure 5 for the plant setup of a remote Transmig with wirefeeder.

5.1 Power Source Connections

- a) Remove all packaging materials.
- b) Fit the fixed and swivel wheels to the Power Source. Refer to WARNING 2.
- c) Connect the work lead to the negative welding terminal (-) [positive welding terminal (+) for flux cored wire].
- d) Position a gas cylinder on the rear tray and lock securely to the Power Source cylinder bracket with the chain provided. If this arrangement is not used then ensure that the gas cylinder is secured to a building pillar, wall bracket or otherwise securely fixed in an upright position.
- e) Fit the gas regulator and Flowmeter to the gas cylinder.

5.2 Wirefeeder Connections

- a) Connect the welding power cable to the positive welding terminal (+) [negative welding terminal (-) for flux cored wire].
- b) Connect the control cable to the front of the Power Source of the Transmig 210 remote or Transmig 250 remote or Transmig 330.
- c) Connect the gas hose from the rear of the wire feeder unit to the Flowmeter outlet.
- d) Two dual groove feed rollers are supplied as standard with the plant. These can accommodate 0.6, 0.8, 0.9, 1.0 and 1.2 diameter hard wires. Select the roller required with the chosen wire size marking facing outwards.
- e) Fit the electrode wire spool to the wire reel hub located behind the wire compartment door. Ensure that the drive dog-pin engages the mating hole in the wire spool. Push the 'R' clip into place to retain the wire spool securely. The wire should feed from the bottom of the spool.
- f) Fit the torch to the wire feed unit by releasing the torch locking screw in the brass torch adaptor and pushing in the torch fitting until the plastic torch casing meets the brass adaptor. Tighten the torch locking screw securely. Also ensure that the adjacent black knurled screw in the wire feeder casting is securely tightened. Remove the contact tip from the torch.
- g) Connect the torch trigger lead to the torch trigger terminals.
- h) Lift up the wire feeder pressure lever and pass the electrode wire through the inlet guide, between the rollers, through the outlet guide and into the torch.
- i) Lower the pressure lever and with the torch lead reasonably straight, feed the wire through the torch. Fit the appropriate contact tip. Refer to CAUTION 3.

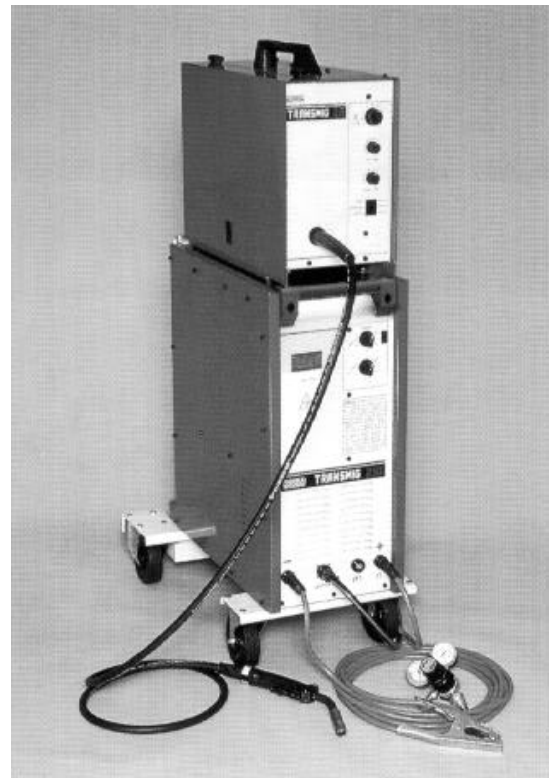


Figure 5 - Remote Transmig Setup

6. Power Source / 2R Wirefeeder Controls, Indicators and Features

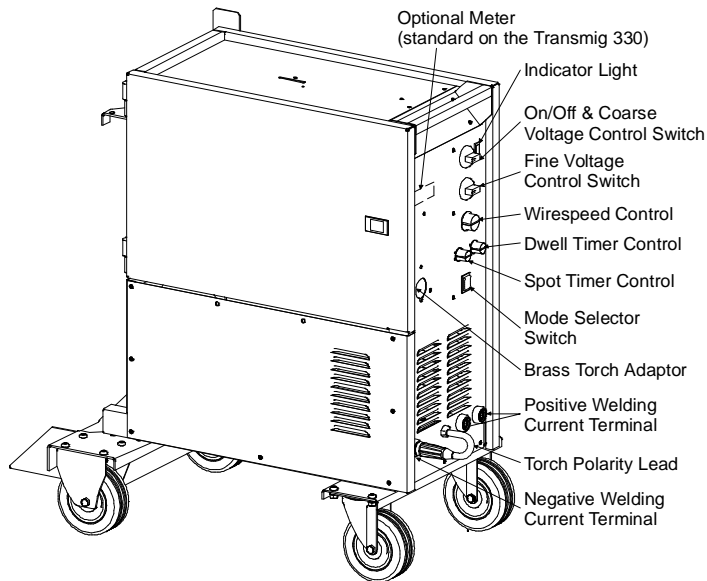


Figure 6 - Compact Transmig controls

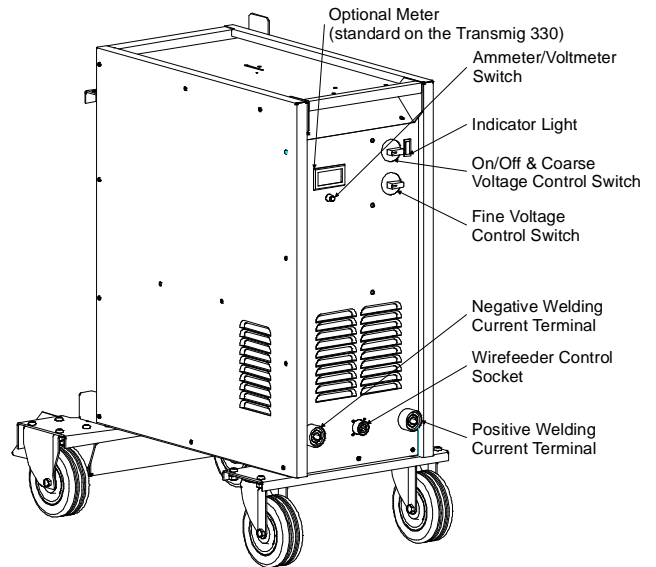


Figure 7 - Remote Transmig controls

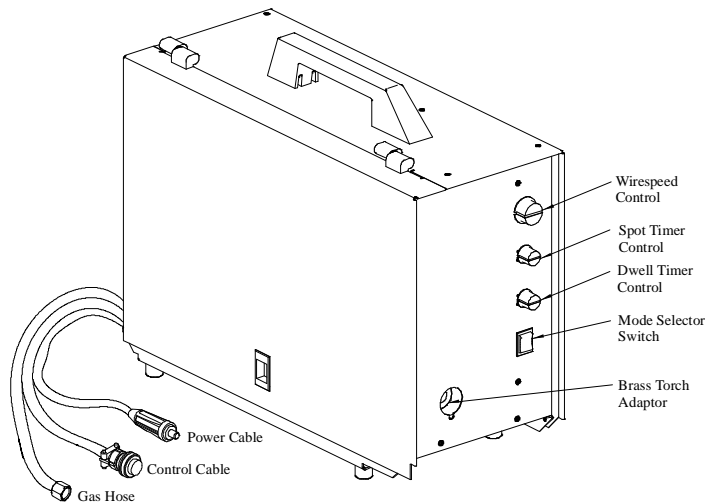


Figure 8 - Wirefeeder controls

6.1 Indicator Light

The indicator light is provided to indicate when the Transmig is connected to the Mains supply voltage.

WARNING 3: *When the light is lit, the machine is connected to the Mains supply voltage and the internal electrical components are at Mains voltage potential.*

6.2 Standby/Coarse Voltage Control Switch and Fine Voltage Control Switch

The Coarse Voltage Control switch turns off the fan and auxiliary power in the *STANDBY* position. It sets the voltage level to the welding terminals in the remaining positions, increasing the voltage as it is rotated in the clockwise direction. The Fine Voltage Control switch increases the voltage (in smaller increments than the Coarse switch) as it is rotated in the clockwise direction.

WARNING 4: *The Coarse & Fine Voltage Control switches MUST NOT BE SWITCHED during the welding process.*

6.3 Digital Ammeter and Voltmeter (Standard for Transmig 330 Only)

Where fitted an average reading ammeter and voltmeter is provided to allow accurate monitoring (5% tolerance) of welding current and voltage. Refer to section 9.1 on page 25 for the Improved Current Accuracy Calibration Procedure for the Digital Meter.

The Digital Meter will display both welding current and voltage. To toggle between the current and voltage readings depress the push button switch mounted below the meters display. See Figure 9 for an example of current and voltage displays.

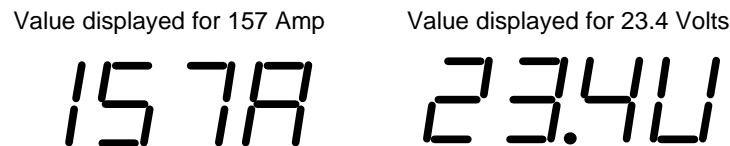


Figure 9 - Examples of the digital read outs

6.4 Torch Polarity Lead (Compact Models Only)

This lead selects the welding voltage polarity of the electrode wire. Plug it into the positive welding terminal (+) when using steel, stainless steel or aluminium electrode wire. Plug the Torch Polarity Lead into the negative welding terminal (-) when using gasless electrode wire. If in doubt, consult the manufacturer of the electrode wire for the correct polarity.

6.5 Positive and Negative Welding Terminals

Welding current flows from the Power Source via heavy duty bayonet type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

WARNING 5: *Loose welding terminal connections can cause overheating and result in the male plug being fused in the bayonet terminal.*

6.6 Wirefeeder Control Socket (Remote Wirefeeder Models Only)

This socket accepts the male plug on the control cable from the Wirefeeder. The male plug should be fully inserted into the control socket then locked into position by turning the retaining ring on the male plug in a clockwise direction.

6.7 Thermal Overload

The critical component for thermal protection is the rectifier stack, which is fitted with a thermal overload cutout device. If the overload operates then the machine should be left to cool for approximately 15 minutes before resuming welding. There will be no danger of transformer damage if the Power Source is operated within its duty cycle, refer to section 1.1 for an explain of duty cycle and section 2 for the Power Source specifications.

6.8 Choice of Inductance Setting (Transmig 210 & 250 Only)

The Transmig 210 & 250 have two inductance taps. These inductance terminals are the positive welding terminals. Inductance selection can effect the spatter level and penetration characteristics of the weld. The correct choice depends upon the shielding gas, transfer mode and the material type.

High Inductance Symbol



Used for:

1. CO₂ shielded welding.
2. Dip transfer with $\text{Æ}1.2\text{mm}$ wires (CO₂ or mixed gas).
3. Gives a hotter weld in DIP transfer.

Low Inductance Symbol



Used for:

1. Spray transfer
2. Aluminium and Flux Cored wires.
3. Gives a cooler weld in DIP transfer.

CAUTION 4: *If in doubt, use the high inductance setting.*

6.9 Wirespeed Control (Compact Models & 2R Wirefeeder Only)

The Wirespeed Control knob controls the welding current via the electrode wire feed rate. ie the speed of the wire feed motor.

6.10 Spot Timer (Compact Models & 2R Wirefeeder Only)

With the *MODE SELECTOR* switch is switched to the *SPOT* position, the *SPOT TIME* knob controls the duration of a single spot weld.

With the *MODE SELECTOR* switch is switched to the *STITCH* position, the *SPOT TIME* knob controls the welding or 'ON' time whilst stitch welding.

6.11 Dwell Timer (Compact Models & 2R Wirefeeder Only)

The *DWELL TIME* knob controls the interval or 'OFF' time whilst stitch welding.

6.12 Mode Selector Switch (Compact Models & 2R Wirefeeder Only)

The Mode Selector switch selects the method of welding mode.

- a) *SPOT* This mode of welding is used to weld two plates together at a desired location by melting the top & bottom plates together to form a nugget between them. The spot time period is set by the *SPOT TIME* control knob. Refer to CAUTION 5.

CAUTION 5: *A spot nozzle (P/N EL22I62FAS) should be used on the MIG torch to obtain consistent spot welds.*

- b) *CONTINUOUS* This mode of welding is used to weld two or more components together with a continuous weld.
- c) *STITCH* This mode of welding is used to weld two or more components together with a stitch weld. The *SPOT TIME* knob controls the welding or 'ON' time whilst the *DWELL TIME* knob controls the interval or 'OFF' time for stitch welding.

6.13 Burnback Control (Compact Models & 2R Wirefeeder Only)

The amount of electrode wire that is burnt back out of the weld pool, when the torch trigger switch is released, can be adjusted by the potentiometer shaft that is located inside the wire spool cavity compartment above the wire feed motor.

6.14 Wirefeeder Driver Roller Pressure Adjustment (Compact Models & 2R Wirefeeder Only)

The moveable roller applies pressure to the grooved roller via screw adjustable spring pressure. The adjustable spring screw should be adjusted to a minimum pressure that will provide satisfactory wire feed without slippage. If slipping occurs, and inspection of the wire contact tip reveals no wear, distortion or burn-back jam, the correct feed roll groove size is used, the feed roll groove is not worn, the conduit liner should be checked for kinks and clogging by metal flakes and swarf. If this is not the cause of slipping, the feedroll pressure can be increased by rotating the adjustable spring screw clockwise. Excessive pressure may cause rapid wear of the feed roller, motor shaft and motor bearings. Refer to CAUTION 7.

6.15 Wire Reel Brake (Compact Models & 2R Wirefeeder Only)

The wire reel hub incorporates a friction brake which is adjusted during manufacture for optimum braking. If it is considered necessary, adjustment can be made by turning the large nut inside the open end of the wire reel hub. Clockwise rotation will tighten the brake. Correct adjustment will result in the reel circumference continuing no further than 20mm after release of the Torch trigger switch. The electrode wire should be slack without becoming dislodged from the reel.

CAUTION 6: *Excessive tension on the brake will cause rapid wear of mechanical wire feed parts, overheating of electrical componentry and possibly an increased incidence of wire Burnback into the contact tip.*

7. TWECO MIG TORCH (P/N 717578 where supplied)

7.1 Introduction

The TWECO 250A gun fitted to the Transmig offers robust construction, unparalleled reliability and easy replacement of consumable parts. The TWECO 250A has an operating capacity in excess of the capacity of the Transmigs and can be expected to give trouble free service.

TWECO MIG Torches may be fitted to many different types of MIG welding plants so that your whole shop can be converted to TWECO. Not only will this give greater reliability (and hence greater productivity), but it will reduce stockholdings of consumable parts. See your CIGWELD distributor for details.

CAUTION 7: *Genuine TWECO contact tips and lines should be used. Many non-genuine liners use inferior materials which can cause wire feed problems.*

7.2 Torch Consumable Parts

NOTE 1: * denotes parts that are supplied as standard with MIG torch 717578.

a) Gas Diffusers

Part No.	Part No.
* EL52 (slide on nozzles)	EL52CT (screw on nozzles)

Table 3 - MIG torch gas diffusers

b) Contact Tips

STANDARD

Wire Size (mm)	Part No.
0.6	not available
0.8	EL1630
0.9	* EL1635
1.0	EL1640
1.2	EL1645
1.2 Alum	EL16A364

TAPERED

Wire Size (mm)	Part No.
0.6	EL16T23
0.8	EL16T30
0.9	EL16T35
1.0	EL16T40
1.2	EL16T45
1.2 Alum	EL16AT364

Table 4 - MIG torch contact tips

c) Nozzles

Bore Size (mm)	Part No.
9.5	EL22A37
9.5	EL22A37F
12.7	EL22A50
12.7	EL22A50F
12.7	EL22I50P
15.9	EL22A62
15.9	EL22A62F
15.9	* EL22I62P
19.1	EL22A75
19.1	EL22A75F
15.9	EL22I62FAS (Spot Nozzle)

Bore Size (mm)	Part No.
9.5	EL22CT37
9.5	EL22CT37F
12.7	EL22CT50
12.7	EL22CT50F
12.7	EL22CT50P
15.9	EL22CT62
15.9	EL22CT62F
15.9	EL22CT62P
19.1	EL22CT75
19.1	EL22CT75F

CT = Coarse Thread P=Protruding Tip
F = Flush Tip

Table 5 - MIG torch nozzles

d) Conduit liners

HARD ELECTRODE WIRE

Wire Size	Part No.
0.6	OTW42/23
0.8	OTW42/3035
0.9	* OTW42/3035
1.0	OTW42/4045 or OTW44/3545
1.2	OTW42/4045 or OTW44/3545

SOFT ELECTRODE WIRE

Wire Size (mm)	Part No.
0.6 Alum	not available
0.8 Alum	not available
0.9 Alum	OTW42N/3545
1.0 Alum	or
1.2 Alum	OTW44N/3545

Table 6 - MIG torch conduit liners

7.3 MIG Torch Components

Refer to Figure 10 for a pictorial representation of the components listed in Table 7.

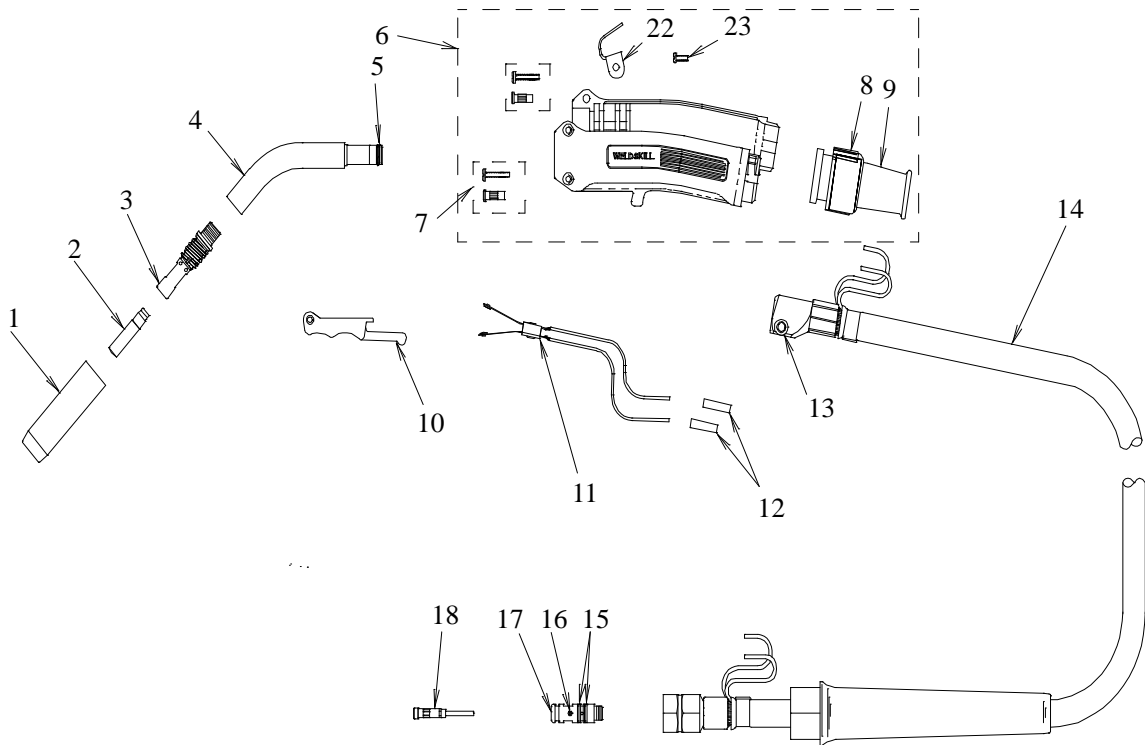


Figure 10 - Exploded view of MIG torch

Item	Part No.	Description	Qty
1	3/4	Nozzle (refer to Table 5)	1
2	3/4	Contact tip (refer to Table 4)	1
3	3/4	Gas diffuser (refer to Table 3)	1
4	WM6345	Conductor tube	1
5	OTW45B	O-Ring, Gun Handle	1
6	OTW90721H	Handle kit (includes items 7, 22 & 23)	1
7		Insert & screw (refer to item 6)	2
8	n/a	Handle cap	1
9	n/a	Support	1
10	ELC94	Trigger Lever	1
11	ELC94B	Trigger blades	1
12	3/4	Butt Splice (insulated crimp link 1.5mm ²)	2
13	ELC1042	Cap screw	1
14	OTW9072110	Cable assembly	1
15	OTW224	O-Ring, Connector Plug	2
16	OTW44C	Set screw 8/32 UNC	1
17	OTW350174	Connector plug	1
18	3/4	Conduit liner (refer to Table 6)	1
22	3/4	Gun hanger (refer to item 6)	1
23	3/4	Hanger screw (refer to item 6)	1
24	ELC94L	Locking Trigger (not shown) (option)	—

Table 7 - MIG Torch components

7.4 Installing A New Conduit Liner

- a) Be sure the MIG Torch cable is arranged in a straight line, free from twists, when installing or removing a conduit liner. Remove the old conduit liner by first removing the MIG Torch nozzle, contact tip and gas diffuser. Then loosen set screws (8/32 UNC) in the conductor tube and connector plug and pull the old conduit liner out of the cable assembly from the connector plug end.
- b) To install a new conduit liner, first inspect the o-ring gas seal on the conduit liner for cuts or damage. Start from the connector plug end of the assembly and begin pushing the conduit liner through the connector plug, cable assembly and into the gun. If the conduit liner should lodge along the way, gently whip or work the cable assembly to aid forward movement.
- c) When the conduit liner stop meets the end of the connector plug and the new raw end extends through the end to the conductor tube, the Allen screw in the connector plug must be securely tightened onto the conduit liner to prevent its backward movement.

IMPORTANT 1: *When the conduit liner is fully inserted into the cable assembly and the conduit liner stop is firmly against the Connector Plug, the "raw end" of the conduit liner will protrude out of the open end of the gun conductor tube. Trim the conduit liner as shown in Figure 11. The trimmed end which seats in the Gas Diffuser must be filed and reamed smooth on the inside and outside radii so the electrode wire will not be obstructed.*

- d) Replace Gas Diffuser, Contact Tip, and Nozzle.
- e) Tighten the Allen screw in the conductor tube.

WARNING 6: *Do not over tighten the conductor tube screw as this action will result in the distortion of the conduit liner and will lead to wire feedability problems.*

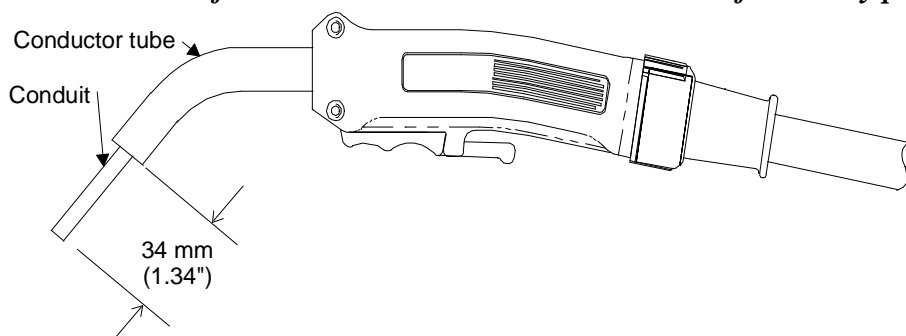


Figure 11 - Conduit liner trim length

7.5 MIG Torch Maintenance

Remove dust and metallic particles from the torch conduit liner by forcing clean, dry compressed air into the conduit liner once a week. This will minimise wire feeding problems.

8. BASIC WELDING TECHNIQUE

8.1 Setting of the Power Source & Wirefeeder

The setting of the Transmig requires some practice by the operator, the welding plant having two control settings that have to balance. These are the Wirespeed control and the welding Voltage Control switches. The welding current is determined by the Wirespeed control, the current will increase with increased Wirespeed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the current level, but lengthens the arc. By decreasing the voltage, a shorter arc is obtained with a little change in current level.

When changing to a different electrode wire diameter, different control settings are required. A thinner electrode wire needs more Wirespeed to achieve the same current level.

A satisfactory weld cannot be obtained if the Wirespeed and Voltage control switch settings are not adjusted to suit the electrode wire diameter and the dimensions of the work piece.

If the Wirespeed is too high for the welding voltage, “stubbying” will occur as the wire dips into the molten pool and does not melt. Welding in these conditions normally produces a poor weld due to lack of fusion. If, however, the welding voltage is too high, large drops will form on the end of the wire, causing spatter. The correct setting of voltage and Wirespeed can be seen in the shape of the weld deposit and heard by a smooth regular arc sound.

8.2 Position of MIG Torch

The angle of MIG torch to the weld has an effect on the width of the weld run. Refer to Figure 12.

8.3 Distance from the MIG Torch Nozzle to the Work Piece

The electrode wire stick out from the MIG Torch nozzle should be between 2.0mm to 5.0mm. This distance may vary depending on the type of joint that is being welded.

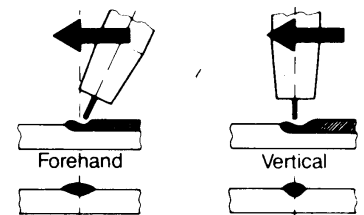


Figure 12 - MIG Torch angle

8.4 Travel Speed

Speed at which a weld travels influences the width of the weld and penetration of the welding run.

8.5 Stitch Welding Operation

Stitch welding is normally used to bridge excessive gaps between panels or when welding very thin material to prevent heat build up and distortion. Set the controls as follows for stitch welding:

- a) Coarse & Fine Voltage Control Switches and Wirespeed Control
Set these controls to obtain the desired welding conditions for the wire and material being welded.
- b) Mode Selector Switch
Set the *MODE SELECTOR* switch to *STITCH*.
- c) Spot Time
Adjust the *SPOT TIME* control knob for the desired weld or 'ON' time whilst stitch welding.
- d) Dwell Time
Adjust the *DWELL TIME* control knob for the desired interval or 'OFF' time whilst stitch welding.

8.6 Spot Welding Operation

Fit a spot welding nozzle to the MIG Torch for consistent spot welding operations. The Transmigs will operate effectively using 0.8mm electrode wire when spot welding. Penetration depth is limited when using 0.6mm electrode wire for spot welding. Set the controls as follows for spot welding:

- a) Coarse & Fine Voltage Control Switches and Wirespeed Control
Select higher Voltage Control switch positions and set the Wirespeed Control between 9 to 15 m/min for maximum penetration.
- b) Mode Selector Switch
Set the *MODE SELECTOR* switch to *SPOT*.
- c) Spot Time
Adjust the *SPOT TIME* control knob for the desired weld or 'ON' time for spot welding.
- d) Dwell Time
The *DWELL TIME* control knob has no affect in this mode of operation.

9. ROUTINE MAINTENANCE & INSPECTION

The only routine maintenance required for the Transmig is a thorough cleaning and inspection. For operating environments with high levels of air born metallic dust particles clean out the Power Source/Wirefeeder once a week. For operating environments with low levels of air born metallic dust particles clean out the Power Source/Wirefeeder once every six months.

WARNING 7: *Disconnect the Transmig from the Mains supply voltage before disassembling.*

Special maintenance is not necessary for the control unit parts in the Power Source / Wirefeeder. If these parts are damaged for any reason, replacement is recommended.

CAUTION 8: *Do not blow air into the Power Source / Wirefeeder during cleaning. Blowing air into the Power Source / Wirefeeder can cause metal particles to interfere with sensitive electronic components and cause damage to the Power Source / Wirefeeder.*

To clean the Power Source / Wirefeeder, disconnect the Power Source from the Mains supply voltage, remove the covers and use a vacuum cleaner to remove any accumulated dust. The Power Source / Wirefeeder should also be wiped clean. If necessary, solvents that are recommended for cleaning electrical apparatus may be used.

Troubleshooting and repairing the Transmig should be carried out only by those who are familiar with electrical equipment.

WARNING 8: *Do not attempt to diagnose or repair unless you have had training in electronic measurement and troubleshooting techniques.*

9.1 Improved Current Accuracy Calibration Procedure for the Digital Meter

CAUTION 9: *This calibration procedure should be carried out by a qualified electrical tradesperson.*

The following procedure will give a current measurement accuracy of better than the factory standard of approximately 5%.

a) **Equipment Required:**

	Transmig 210	Transmig 250	Transmig 310	Transmig 330
DC Ammeter (certified up to $\pm 1\%$ accuracy)	250A	300A	400A	400A
LOAD RESISTANCE of 0.1W	5kW	8kW	12kW	12kW
Output Connecting Leads	✓	✓	✓	✓

b) **Procedure:**

- i) With the Transmig switched off, connect the LOAD RESISTANCE and DC AMMETER to the output terminals.
- ii) Open the wirefeeder compartment door or remove the lefthand side cover (when viewing the Transmig from the front) from the Power Source.
- iii) Select maximum voltage switch positions

Coarse 4	Fine 4	(MIG 210/250)
Coarse 4	Fine 6	(MIG 310/330)
- iv) Switch the Mains supply voltage to the Transmig ON.
- v) Ensure the DIGITAL METER is selected to read current.
- vi) Short circuit the TORCH TRIGGER terminals to energise output welding terminals.

CAUTION 10: *Do not allow the Transmig to remain ON under load for more than ONE minute!*

- vii) Determine the output current as given by the DC AMMETER.
- viii) Adjust SHUNT CAL. potentiometer on DIGITAL METER to read identically with DC AMMETER.
- ix) Open circuit the TORCH TRIGGER terminals to deactivate output welding terminals.
- x) Select minimum voltage switch positions

Coarse 1	Fine 1
----------	--------
- xi) Short circuit the TORCH TRIGGER terminals to energise output welding terminals. Refer to CAUTION 10.
- xii) Determine output current as given by the DC AMMETER.
- xiii) Confirm the minimum DIGITAL METER reading is within $\pm 2\%$ of DC AMMETER.
- xiv) If the above is not met, offset the SHUNT CAL. potentiometer such that both the minimum and maximum values are within $\pm 2\%$.
- xv) The improved accuracy for DIGITAL METER is now complete.
- xvi) Where fitted, position the meter cover over the hexagonal brass spacers taking care not to trap loom wiring.
- xvii) Fit the M3 flat washers and M3x10 screws through the meter cover and into the hexagonal brass spacers.

xviii) Close wire-feeder compartment or replace side panel.

10. BASIC TROUBLESHOOTING

The basic level of troubleshooting is that which can be performed without special equipment or knowledge, and without removing the covers from the Power Source / Wirefeeder.

If major components are faulty, then the Power Source / Wirefeeder should be returned to an Accredited CIGWELD Service Agent for repair.

10.1 Solving Problems Beyond the Welding Terminals

The general approach to fix Gas Metal Arc Welding (GMAW) problems is to start at the wire spool then work through to the MIG torch. There are two main areas where problems occur with GMAW:

a) Porosity

When there is a gas problem the result is usually porosity within the weld metal. Porosity always stems from some contaminant within the molten weld pool which is in the process of escaping during solidification of the molten metal.

Contaminants range from no gas around the welding arc to dirt on the work piece surface. Porosity can be reduced by checking the following points.

1. Gas cylinder contents and flow meter. - Ensure that the gas cylinder is not empty and the flow meter is correctly adjusted to 15 litres per minute.
2. Gas leaks. - Check for gas leaks between the regulator/cylinder connection and in the gas hose to the Power Source.
3. Internal gas hose in the Power Source. - Ensure the hose from the solenoid valve to the torch adaptor has not fractured and that it is connected to the torch adaptor.
4. Welding in a windy environment. - Shield the weld area from the wind or increase the gas flow.
5. Welding dirty, oily, painted, oxidised or greasy plate. - Clean contaminates off the work piece.
6. Distance between the MIG torch nozzle and the work piece. - Keep the distance between the MIG torch nozzle and the work piece to a minimum. Refer to section 8.3 on page 23.
7. Maintain the MIG torch in good working order. - Ensure that the gas holes are not blocked and gas is exiting out of the torch nozzle. Refer to CAUTION 11.

Do not restrict gas flow by allowing spatter to build up inside the torch nozzle.

Check that the MIG torch O-rings are not damaged.

CAUTION 11: *Disengage the drive roll when testing for gas flow by ear.*

b) Inconsistent wire feed

Wire feeding problems can be reduced by checking the following points.

1. Wire spool brake is too tight
 - Feed roller driven by motor in the cabinet will slip.
2. Wire spool brake is too loose
 - Wire spool can unwind and tangle.
3. Worn or incorrect feed roller size
 - Use 'U' groove drive feed roller matched to the aluminium wire size you are welding.
Use 'V' groove drive feed roller matched to the steel wire size you are welding.
Use 'knurled V' groove drive feed roller matched to the flux cored wire size you are welding.
4. Mis-alignment of inlet/outlet guides
 - Wire will rub against the mis-aligned guides and reduces wire feedability.
5. Liner blocked with swarf
 - Increased amounts of swarf is produced by the electrode wire passing through the feed roller when excessive pressure is applied to the pressure roller adjuster.
Swarf can also be produced by the wire passing through an incorrect feed roller groove shape or size.
Swarf is fed into the conduit liner where it accumulates thus reducing wire feedability.
6. Incorrect or worn contact tip
 - The contact tip transfers the weld current to the electrode wire. If the hole in the contact tip is too large then arcing may occur inside the contact tip resulting in the wire jamming in the contact tip.
When using soft wire such as aluminium it may become jammed in the contact tip due to expansion of the wire when heated. A contact tip designed for soft wires should be used.
7. Poor work lead contact to work piece
 - If the work lead has a poor electrical contact to the work piece then the connection point will heat up and result in a reduction of power at the arc.
8. Bent liner
 - This will cause friction between the wire and the liner thus reducing wire feedability

10.2 Welding Problems

FAULT	CAUSE	REMEDY
1 Undercut	A Welding arc voltage too high. B Incorrect torch angle C Excessive heat input	A Reduce voltage by reducing the Voltage Control switches positions or turn the Wirespeed control knob clockwise. B Adjust angle C Increase the torch travel speed or reduce welding current by reducing the Voltage Control switches positions and turn the Wirespeed control knob anti-clockwise.
2 Lack of penetration	A Welding current too low B Joint preparation too narrow or gap too tight C Shielding gas incorrect	A Increase welding current by increasing turn the Wirespeed control knob clockwise and increasing Voltage Control switch positions. B Increase joint angle or gap C Change to a gas which gives higher penetration
3 Lack of fusion	Arc voltage to low	Increase Arc voltage by increasing the Voltage Control switches position.
4 Excessive spatter	A Arc voltage too high B Arc voltage too low	A Lower voltage by reducing the Voltage Control switches positions or turn the Wirespeed control knob clockwise. B Raise voltage by increasing the Voltage Control switches or turn the Wirespeed control knob anti-clockwise.
5 Irregular weld shape	A Incorrect voltage and current settings. Convex, Arc voltage too low Concave, voltage too high. B Wire is wandering C Incorrect shielding gas D Insufficient or excessive heat input	A Adjust voltage and current by adjusting the Voltage Control switches positions and the Wirespeed control knob. B Replace contact tip C Check gas selection D Adjust the Wirespeed control knob or the Voltage Control switches.
6 Arc does not have a crisp sound that short arc exhibits when the wirefeed speed and voltage are adjusted correctly.	The MIG torch has been connected to the wrong voltage polarity on the front panel.	Connect the MIG torch to the positive welding terminal (+) for solid wires and gas shielded flux cored wires.

Welding Problems (continued)

FAULT	CAUSE	REMEDY
7 Weld cracking	A Weld beads too small B Weld penetration narrow and deep C Excessive weld stresses D Excessive voltage E Cooling rate too fast	A Decrease torch travel speed B Reduce current and voltage and increase the MIG Torch travel speed or select a lower penetration shielding gas. C Increase weld metal strength or revise design D Decrease voltage by reducing the Voltage Control switches. E Slow the cooling rate by preheating part to be welded or cool slowly.
8 Cold weld puddle	A Faulty rectifier unit B Loss of a phase in the Mains supply voltage. C Loose welding cable connection. D Low Mains supply voltage	A Have an Accredited CIGWELD Service Agent test then replace the faulty component. B Check mains power C Check all welding cable connections. D Contact supply authority

10.3 Power Source Problems

FAULT	CAUSE	REMEDY
1 Indicator light is ON but welding arc can not be established.	Coarse Voltage Control switch is in the <i>STANDBY</i> position.	Switch the Coarse Voltage Control switch to a welding setting.
2 Mains supply voltage is ON. Indicator light is not lit and welding arc can not be established.	A Primary fuse is blown. B Broken connection in primary circuit.	A Replace primary fuse. B Have an Accredited CIGWELD Service Agent check primary circuit.
3 Mains indicator light is not lit but welding arc can be established.	Burnt out Indicator light.	Have an Accredited CIGWELD Service Agent replace Indicator light.
4 Mains supply voltage is ON and Indicator light is lit but when the torch trigger switch is depressed nothing happens.	Torch trigger switch leads are disconnected.	Reconnect.
5 Mains supply voltage is ON, no wire feed but gas flows from the MIG Torch when the torch trigger switch is depressed.	A Electrode wire stuck in conduit liner or contact tip (burn-back jam). B Faulty control PCB	A Check for clogged / kinked MIG Torch conduit liner or worn contract tip. Replace faulty components. B Have an Accredited CIGWELD Service Agent investigate the fault.

Power Source Problems (continued)

FAULT	CAUSE	REMEDY
6 Wire feeds when the torch trigger switch is depressed but arc can not be established.	Poor or no work lead contact.	Clean work clamp area and ensure good electrical contact.
7 Mains supply voltage is ON and contactor in the Power Source operates but wire does not feed when the torch trigger switch is depressed.	TWECO Torch has been damaged internally, trigger wires are making contact with welding power cable.	Have an Accredited CIGWELD Service Agent repair torch & replace PCB.
8 Jerky wire feed	A Worn or dirty contact tip B Worn feed roll. C Excessive back tension from wire reel hub. D Worn, kinked or dirty conduit liner	A Replace B Replace C Reduce brake tension on spool hub D Clean or replace conduit liner
9 No gas flow	A Gas hose is cut. B Gas passage contains impurities. C Gas regulator turned off.	A Replace or repair. B Disconnect gas hose from the rear of Power Source or wire-feeder then raise gas pressure and blow out impurities. C Turn on.
10 Gas flow continues after the torch trigger switch has been released.	Gas valve has jammed open due to impurities in the gas or the gas line.	Have an Accredited CIGWELD Service Agent repair or replace gas valve.

10.4 Key Spare Parts

Description	Transmig 210	Transmig 250	Transmig 310	Transmig 330
Main Transformer	705164	705165	704983	705166
Auxiliary Transformer	705275	705278	705126	705126
Rectifier	7977657	7977657	7977658	7977658
Capacitor 22000µF 63V	7977178	7977178	¾	¾
Control PCB (704882)	705150	705150	705150	705150
Contactora	7977752	7977752	7977752	7977752
Wirespeed Knob	7977709	7977709	7977709	7977709
Spot & Dwell Knob	7977708	7977708	7977708	7977708
Wirespeed Potentiometer	704807	704807	704807	704807
Spot & Dwell Potentiometer	704806	704806	704806	704806
Coarse Voltage Switch	7977677	7977678	7977667	7977667
Fine Voltage Switch	7977665	7977666	7977668	7977668
Solenoid Valve	KK281	KK281	KK281	KK281
Wire Reel Lock Pin	OTWAK1P	OTWAK1P	OTWAK1P	OTWAK1P
Wire Reel Hub	702337	702337	702337	702337
Indicator Light	7977680	7977680	7977681	7977681
Welding Current Terminals	7977159	7977159	704460	704460
Work Lead Plug	705152	705152	704461	704461
Wire Drive Assembly	7977659	7977659	7977659	7977659
Wire Drive Motor	7977693	7977693	7977693	7977693
Two roll wire drive system	7977684	7977684	7977684	7977684
Fan Motor	7976341	7976341	7977679	7977679
Fan Impellor	7977288	7977288	7977288	7977288
Swivel Wheel	7977566	7977566	7977566	7977566
Fixed Wheel	7977567	7977567	7977567	7977567
7 Pin Control Plug	7977162	7977162	7977162	7977162
7 Pin Plug Cable Clamp	703255	703255	703255	703255
7 Pin Control Socket	7977163	7977163	7977163	7977163
Roll on cylinder carrier	704961	704961	704961	704961
Cylinder bracket	704692	704692	704692	704692
Cylinder chain	703625	703625	703625	703625
Front wheel bracket	704960	704960	704960	704960
Wirefeeder to suit Remote Power Source only	704975	704975	¾	704841
Regulator/Flowmeter	301526	301526	301526	301526
MIG Torch 250A	717578	717578	717578	717578