

**PANDROL**



# Lightweight Battery- Operated Weld Shear

MANUAL



**05100-ECO**  
22 June 2020

**Partners in excellence**



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# Summary

The Pandrol Weld Shear is lightweight and highly efficient battery driven tool. Operation is simple and effective with the battery operated non-impacting drill. Simple chuck attachment permits for quick connection of the drill and operation of the shears hydraulic system to deliver shearing force required for effective field weld installations.

We exclusively utilize the Milwaukee drill on our weld shear.

Figure 1: Milwaukee Model 2803-22



Figure 2:

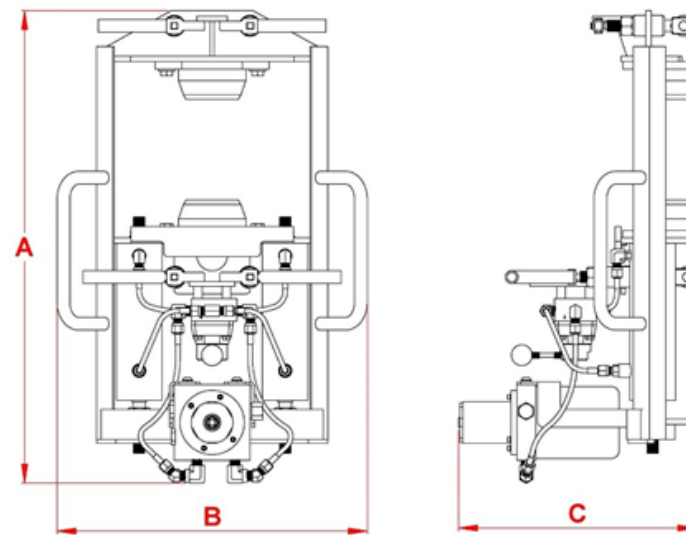


Table 1: Model Specifications

FLOW	PRESSURE	DIMENSIONS	WEIGHT w/o drill
5 GPM (19 LPM)	2000 PSI (140 BAR)	A- 31.25" (79.4 cm)	98 lbs (45.3 kg)
		B- 20.45" (51.9 cm)	
		C- 15.70" (39.9 cm)	



# 1. General Safety Precautions

Tool operators and maintenance personnel must always comply with the safety precautions given in this manual, and with all stickers and tags attached to the tool and hose. All safety precautions are given for your safety. Read to understand and follow all safety, maintenance and operation instructions before you use or maintain the tool. Review the manual daily before using the tool. In addition, follow all safety guidelines given you by your supervisor. Do not use the tool if you have any questions about the operation, safety or maintenance of this tool. Failure to follow these instructions can result in personal injury or equipment damage.

Pandrol has no control over tool use or operation once it leaves the pandrol plant. Pandrol has no control over operator or maintainer selection. The customer must assume responsibility for the tool's suitability for a particular function, for anyone using the tool or maintaining the tool regarding their fitness to use the tool or repair the tool, understanding of the operation and safety and maintenance manual, intelligence to use good judgment necessary to work safely and efficiently without endangering themselves or bystanders in the work area.

- Do not operate the tool until you have been thoroughly and properly trained or under the supervision of an instructor.
- Check power source daily to determine if correct flow and pressure are available. Never exceed flows or pressures for the tool being used. Personal injury or damage to the tool can result.
- Operators must clear the work area of non-essential personnel. Flying debris can cause serious injury.
- The operator must be familiar with all prohibited work areas such as unsafe grades, poor footing areas and overhead hazards.
- Maintain balance and proper footing at all times. Never overreach to the extent that a broken part or sudden movement of the tool can cause you to lose your balance and fall, or cause injury to yourself or someone else.
- When working near electrical conductors, always assume that the conductors are energized, and that hoses and clothing can conduct harmful electricity. Use hoses labelled and certified as non-conductive.
- Do not operate the tool at excessive fluid temperatures operator discomfort and potential burns can result at high oil temperatures.
- Never wear loose clothing that can get entangled in the working parts of the tools or be careless with hands, feet or other body parts around the working parts of the tools. Hydraulic tools exert high torque and force and can cause serious injury or death if improperly used.
- To avoid personal injury or equipment damage, all tool repair, maintenance or service must only be performed by authorized and properly trained personnel.
- Always wear safety equipment such as oil injection resistant work gloves, safety glasses, safety boots, ear protection and other safety apparel dictated by your supervisor applicable for the job you are doing and the tool you are using.
- Do not clean inspect or repair the tool while connected to the power source. Accidental engagement of the tool can cause serious personal injury.
- Oil injection hazard exists with this tool. Oil injection is a condition where hydraulic oil is injected under the skin from pressure in the line. Always wear gloves and repair any leaks immediately. Never carry a tool by the hoses.



- Do not use damaged equipment. Immediately replace any damaged hoses, fittings, or other components showing wire braid, nicks, cuts, damage or abrasions. Failure to do so may result in equipment damage and / or personal injury or death.
- Clean up any oil or fluid spills immediately.
- Follow all directions for use, maintenance, storage and transportation of the drill according to the manufacturer.

Have supervisor add additional precautions relating to the specific work area and local safety regulations below.

## 2. Safety Precautions

- Always wear safety equipment such as gloves, safety glasses, ear protection, safety shoes, and other required safety equipment.
- Do not wear clothing which may become entangled in the tool.
- Keep hands clear of work area at all time.
- Always keep work area free of tools or any other objects which may impair sound footing.

### CAUTION

Oil injection hazard exists with this tool. Oil injection is a condition where the hydraulic oil is forced under the skin through pressure in the line. Always wear gloves and repair leaks immediately.

- Because of the high field weld temperatures, it is extremely important to check for worn hoses, nicks, cuts, and/or leaks before each shear operation. Hydraulic oil has a flash point of approx. 400 degree f. A leak directed into the weld area (1900° f) will cause a fire and possible serious injury or death.
- Do not clean or inspect the tool while it is connected to the power source. Accidental engagement of the tool can cause serious injury.
- Always check work area for any trash which may ignite from sparks, weld splatter or slag.
- Always check the work area for smouldering ties or trash before leaving site.
- Never strike hold downs with any object to loosen shear from the rail.
- Follow all drill manufactures instructions on proper use, maintenance, transportation and storage.

# 3. Operation

Table 2: <Insert Table Title here>

MODEL NO	FLOW	PRESSURE	MAX BACK PRESSURE
05100- eco	5 gpm (19 lpm)	2000 psi (140 bar)	250 psi (17 bar)

Place the shear on the rail prior to setting up the weld to adjust the hold down rollers. After hold down rollers are adjusted, remove shear from rail to prepare weld. Do not carry the shear with the cordless drill attached.

- Use only the Milwaukee drill provided with this tool. Failure to use this drill can cause the tool not to operate properly. Never transport the shear while the drill is installed, it could become dislodged and potential damage to the drill could result.
- Be sure drill is completely charged and is operating counterclockwise (in reverse) before continuing.
- When the weld is ready to be cut, position two people, one on each side of the shear. They should carefully place the shear over the weld and lock it into place with the hold down rollers.
- Attach the drill to the weld shear for activating the tool, ensure it is in reverse (counterclockwise rotation) only after the weld shear is installed on the rail.
- Move the handle to side that is labelled shear to make the cut.
- Press trigger on drill. Do not release while shearing the weld.
- The flow will stop when the cylinder travel is complete. Release drill trigger at this time.
- After shear is complete, move the handle the opposite direction (labelled retract) to retract the shear blades.
- Press drill trigger again. Drill will continue to operate counterclockwise (in reverse).
- Ensure the shear is fully retracted.
- Remove drill from the weld shear.
- To remove shear from the rail, loosen hold downs, position two people, one on each side of the shear, and carefully remove from the rail.
- Follow all drill manufactures instructions on proper use, maintenance, transportation and storage.

## 4. Maintenance

- As the blades wear and/or when replacing blades, the clearance gap between blade tips may require adjusting, this can be done by removing the cylinder rod jam nuts at the rear of the shear. Loosen the cylinder rod adjusting nuts and with the cylinder rods completely extended, set the gap at 1/32” by moving the cylinder rod adjusting nuts. Retighten cylinder rod adjusting nuts, cycle the shear to check gap dimension. Reinstall and tighten cylinder rod jam nuts.
- Inspect hoses daily. Replace cut, burned, or otherwise damaged hoses.
- Keep quick disconnect couplers clean and lubricated.
- Use hydraulic fluids that comply with HTMA specification 5.7, the hydraulic fluid should have a viscosity between 100 and 400 ssu (20-82 centistokes) at the maximum and minimum expected operating temperatures. Petroleum based hydraulic fluids with anti-wear properties and a viscosity index of over 140 work for a wide range of operating conditions.

**Table 3: The following oils meet HTMA specification 5.7**

Amoco Rykon MV	Citgo A/W all temp
Sunvis 706	Mobil D.T.E 13
Chevron EP-MV	Texaco 'Rando' HDAZ

Other fluids that meet or exceed this specification can be used. \*See cold weather operation hydraulic oil note.

Have tool inspected, at least annually, by Pandrol or a Pandrol qualified service representative to determine if tool is in need of safety changes or worn part replacement.

- Contact pandrol on a periodic basis, at least annually, for service bulletins, safety notices, or other important information pertaining to this tool.
- Follow all drill manufactures instructions on proper use, maintenance, transportation and storage.



# 5. General Notes

Figure 3:

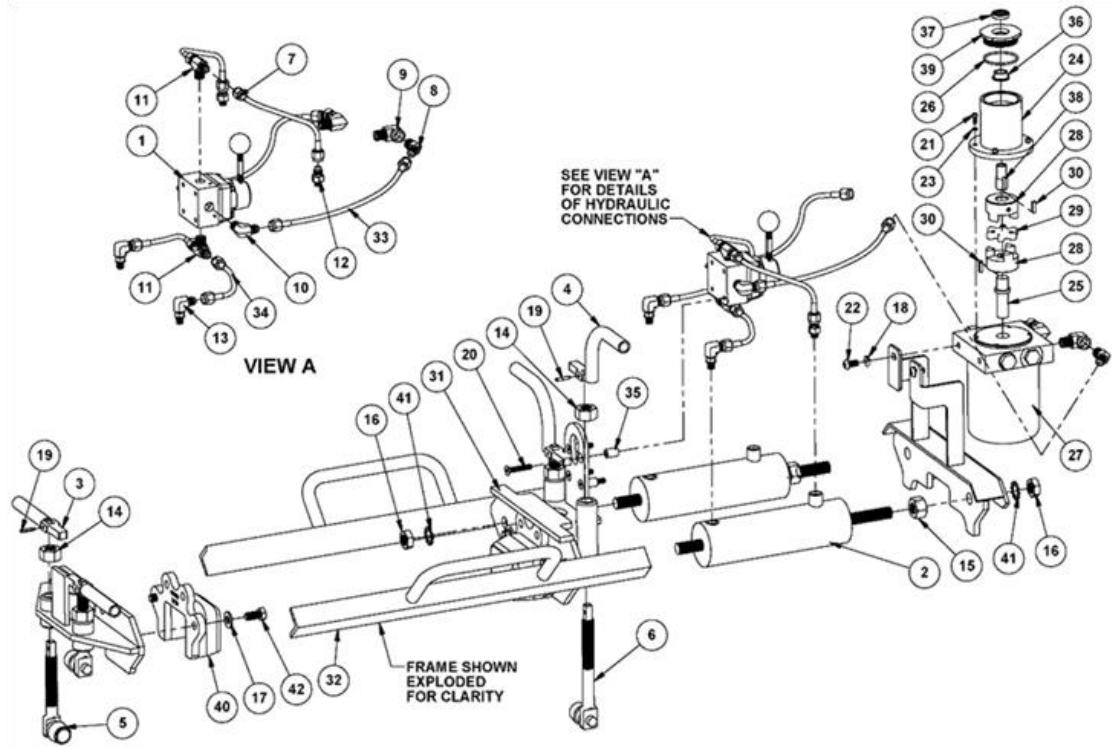
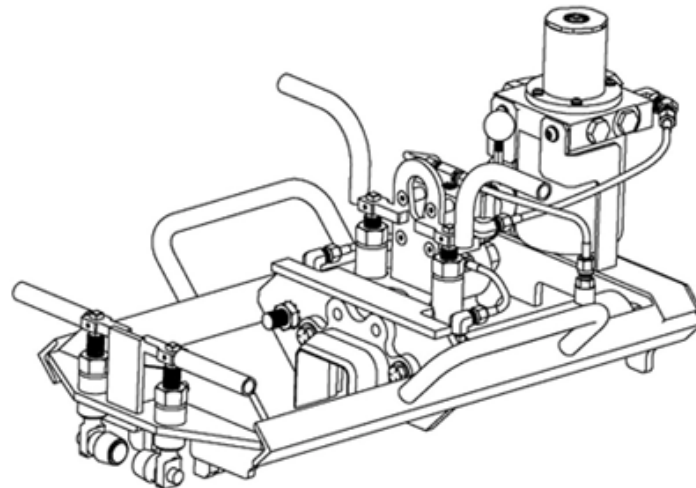


Figure 4:

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	00905	DETENT VALVE KIT	1
2	00908A	HYDRAULIC CYLINDER	2
3	05104	FRONT HOLD DOWN HANDLE	2
4	05107	CENTER HOLD DOWN HANDLE	2
5	05117	FRONT ROLLER ASSEMBLY	2
6	05118	CENTER ROLLER ASSEMBLY	2
7	05154	HOSE	2
8	355-06-06	3/8 NPT x -06 JIC 45 ELBOW	2
9	409-06-06	3/8 NPT STREET 90 ELBOW	2
10	2501-06-06	3/8 JIC x 3/8 NPT 90 ELBOW	2
11	2601-06-06-06	3/8 JIC x 3/8 JIC x 3/8 NPT TEE	2
12	6400-06-04	-06 JIC x -04 O-RING	2
13	6801-06-04	-06 JIC X -04 O-RING 90 ELBOW	2
14	A1437	3/4-10 PLAIN HEAVY HEX NUT	4
15	A1439	3/4-16 PLAIN HEAVY HEX NUT	2
16	A1465	3/4-16 HEX JAM NUT	4
17	A2194	1/2 SAE FLAT WASHER	4
18	A3811	3/8 LOCK WASHER	2
19	A6079	DIA. 3/16 x 1 SPRING PIN	4
20	A6310	5/16-18 x 1 3/4 FLAT HEAD SCREW	4
21	A6349	1/4-20 X 5/8 BHCS	4
22	A6359	3/8 X 3/4 BHCS	2
23	A3809	1/4 LOCK WASHER	4
24	EP 06 18 02	SPIDER COUPLING HOUSING	1
25	EP 06 18 05	FEMALE SPLINE ADAPTER	1
26	EP 06 18 11	3-928 O-RING	1
27	EP 06 18 19	PUMP/RESERVOIR	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
28	EP 06 18 20	SPIDER COUPLING HUB	2
29	EP 06 18 21	SPIDER COUPLING FLEXIBLE HUB	1
30	EP 06 18 22	3/16" SQ. X 3/4" STEEL KEY	2
31	EP 06 18 26	CENTER PLATE	1
32	EP 06 18 27	FRAME	1
33	EP 06 18 28	HOSE	2
34	EP 06 18 29	HOSE	2
35	EP 06 18 30	VALVE SPACER	4
36	EP 06 18 32	OILITE BRONZE BUSHING	1
37	EP 06 18 33	SHAFT SEAL	1
38	EP 06 18 35	FEMALE SPLINE ADAPTER	1
39	EP 06 18 36	CAP	1
40	EP 10 19 04	132/136 LONG SHEAR BLADE	2
41	EP 10 19 05	TOOTH LOCKWASHER	4
42	EP 10 19 07	1/2-13 X 1 HEX HEAD BOLT	4





# 6. Review of Hydraulic Principles

## Tool Circuit

### Hydraulic Formulas

$$\text{GPM} = \frac{\text{CID X RPM}}{231} \qquad \text{HP} = \frac{\text{GPM X PSI}}{1714} \times (.85)$$

Example: HP required to deliver 10 GPM at 1500 PSI.

$$\frac{10 \text{ GPM X } 1500 \text{ PSI}}{1456.9}$$

$$= \frac{15000}{1456.9} = 10.3 \text{ HP}$$

(subtract back pressure for tool HP)

Table 4: Estimated HP delivered by pump or used by tool

	GPM			PSI		
	500	1000	1500	2000	2500	3000
3	1.03	2.06	3.09	4.12	5.15	6.18
5	1.72	3.43	5.15	6.86	8.58	10.30
10	3.43	6.86	10.30	13.70	17.20	20.60
15	5.15	10.30	15.40	20.60	25.70	30.90

## Back Pressure

Back pressure measured at the tool return port must not exceed the manufacturers back pressure rating. Most manufacturers list the maximum back pressure for their hydraulic tools at 250 psi. Back pressure measured on the return side of the tool is the force required to get the oil back to the tank. In almost all cases the lower the back pressure the better the tool performance. First, the back pressure is subtracted from the maximum tool pressure to arrive at a maximum tool operating pressure. For example, tools with 2000 psi operating pressure are installed on a system with 250 psi back pressure. This leaves 1750 psi as a maximum tool pressure. Imagine a system with 500 psi back pressure. 2000 minus 500 psi back pressure leaves only 1500 psi for the tool. Second, tools are designed for pressure to build on the pressure side of the tool. If too much pressure builds on the return side, not only is performance effected, but seals may blow. This is why it is very important to direct the flow into the tool correctly. Reversing the hoses to test may result in blown seals, damage to the tool, and personal injury.





## 7. Limited Warranty

Pandrol, Napoleon, OH, warrants to the original purchase of this product that the product will be free from defects in material and workmanship for the period of one

(1) year after the delivery of such product to the customer. Other equipment and parts used, but not manufactured by pandrol are covered directly by the warranty of the manufacturer of those products. Proof of purchase must be documented including reference to a serial number located on each tool. The purchaser's only remedies under this limited warranty shall be limited at Pandrol's sole option to the following: repair, replacement or refund of the purchase price of the defective products. Each of these remedies requires timely notification of the defect in the product and substantiation that the product has been properly stored, maintained and used. Pandrol's obligations hereunder extend only to the purchaser of the product and not to any third party.

As a condition precedent to Pandrol's obligation hereunder, the defective product must not have been altered or modified without the express written approval of pandrol. The product must not have been subjected to deliberate damage, shipping damage, neglect, tampering by unauthorized personnel or damage by improper use, storage or maintenance. Serial numbers must not have been altered, defaced or removed. Such action voids limited warranty.

### Exclusions to Limited Warranty

This limited warranty is exclusive and is in lieu of any other warranty, written or oral, expressed or implied, including, without limitation, any implied warranty or merchantability or fitness for a particular purpose.

Limited warranty does not cover normal wear and tear items such as filters, hoses, couplers, bits, sockets, augers, and batteries.

### Limitation of Liability

Except as provided above, pandrol shall in no event be liable or responsible for any injury, loss or damage, direct, incidental or consequential, arising out of the use or misuse or inability to use the product, however caused and on any theory of liability including, without limitations, breach of contract, tort, (including negligence or street liability) and notwithstanding any failure of any remedy herein of its essential purpose, even if pandrol was aware of this possibility of such damage. Pandrol's limited warranty as set forth above shall not be enlarged, diminished or affected by, and no obligation or liability shall arise or go out of the rendering of technical advice or service by pandrol or its agents. The foregoing may not be changed except by written agreement signed by an authorized officer of pandrol, the remedies set forth herein are exclusive.



## 8. Customer Information

Name:

Company:

Serial # of your Pandrol tool:

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Upon receiving your Pandrol tool, make sure to list serial number above so that a good record is kept for order information

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### Pandrol Hydraulic Tool List

All Pandrol Hydraulic Tools operate at 5GPM or 10 GPM @ 2000 PSI

#### **POWER UNITS:**

02900A – DIESEL POWER UNIT

00100K – DUAL CIRCUIT POWER UNIT

02050RM- MODULAR POWER UNIT

05500 – TWIN POWER DUAL CIRCUIT UNIT 1-10 GPM OR 2-5 GPM & 5000-WATT GENERATOR

03700A – ELECTRIC POWER UNIT

#### **GRINDERS:**

04600 & 04650– STRAIGHT STONE CW & TRIGGER VERSION

04700 & 04750 – STRAIGHT STONE CCW & TRIGGER VERSION

00600 & 00600C - 8" CUPSTONE GRINDER

04800 & 04850 – CUPSTONE & TRIGGER VERSION

00700 – RAIL SURFACING GUIDE

09200A - PRECISION FROG GRINDER

05900 – FROG/PROFILE GRINDER – ON/OFF FLOW CONTROL

05950 – FROG/PROFILE GRINDER – SAFETY TRIGGER

06000 – PROFILE GRINDER

05400 – ANGLE GRINDER

05600 – BULL NOSE GRINDER





06950 & 06950A - MULTI-PURPOSE GRINDER

**TRACK TOOLS:**

01600A – 5 GPM 1” IMPACT WRENCH

02500 - 10 GPM 1” IMPACT WRENCH

04500D – ½” IMPACT DRILL

00800A – 16” RAIL SAW

03900A – REVERSING RAIL SAW

01100RM – SPIKE PULLER

08200– TIE TAMPER

08300– SPIKE DRIVER

03500 – SELF FEED RAIL DRILL

03100C - RAIL PULLER

02800 - BRIDGE SPREADER

05000- HAND PUMP WELD SHEAR

05100A - POWER WELD SHEAR

05100-ECO BATTERY OPERATED WELD SHEAR

03800B- HYDRAULIC AIR PROPANE PRE-HEATER

06600 - POWER UNIT TRANSPORT CART

07500 - CHAMFER TOOL

**OTHER PRODUCTS:**

HYDRAULIC MANIFOLDS

HYDRAULIC TEST GAUGES

HOSE REELS

HYDRAULIC HOSES ACCESSORIES

# PANDROL

Find out more at

[pandrol.com](https://pandrol.com)

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