PANDROL

Compact Shear B-M-VIR

USER MANUAL

Revision 06
20 September 2023
11334018

Partners in excellence

Revision History

Version	Date	Author	Comments
01	01/09/2021	CHA	Original emission
02	14/12/2021	CHA	Minor corrections
03	05/01/2022	CHA	Warranty added
04	08/03/2022	CHA	Add reference
05	10/08/22	CHA	Spare part list updated
06	20/09/2023	CK	Add support for the drill, control level oil, Modification of the pressure

Contents

1. Explanation of symbols

WARNING! The machine can be dangerous.

Careless and incorrect use results in injury to the operator

Read carefully the instructions of the operating manual before using the machine.

WARNING! Be careful to the mobile pieces of the shearing machine so as to avoid any risk of squashing.

2. General safety instructions

- 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.
- Verify that the main electricity supply is the same as the one necessary for the machine perfect running.
- 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.
- 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.
- The shearing machine is specially designed to cut the metal excess after an aluminothermic weld, don't divert of its primary function.
- The operator must respect the regulations, procedures and particular orders of the Railway operating Network.
- Never use the shearing machine when you are tired or under influence of medicines, alcohol or substances which can alter your sight, dexterity, or appreciation capacity.
- To avoid personal injury or equipment damage, all tool repair, maintenance or service must only be performed by authorized and properly trained personnel.
- Hydraulic pipes and couplings must be correctly inspected before every use. Any defective component must be rejected.
- 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.
- Shearing machine weight is rather high, so three persons are necessary to handle and place it on track under no circumstances the original design and configuration of the shearing machine should be modify.
- Do not operate the tool at excessive fluid temperatures operator discomfort and potential burns can result at high oil temperatures.
- 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.
-

3. Description

The Pandrol Shearing machine is a light and extremely powerful tool, which is powered by a battery whose purpose is to cut the excess metal induced by the aluminothermic welding process.

Its operation is intuitive and efficient thanks to its motorization by a drill, without percussion, with an 18V battery.

Additionally, chuck attachment is simple and allows a quick connection of the drill to the hydraulic system to provide the 12 ton of force required to shear aluminothermic welds.

WARNING

The Shearing machine is only compatible with the Milwaukee drill provided (without percussion)

3.1 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. 204°C /400°F. A leak directed into the weld area (1038°C/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 my 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.

4. Operating instructions

4.1 Storage

The shearing does not require special storage conditions.

However, be sure to:

- Protect the frame from knocks.
- Do not tilt the shearing machine, which could cause hydraulic oil to leak through the oil tank cap.

Oil specifications :

Amoco Rykon MV	Citgo A/W all temp
Sunvis 706	Mobil D.T.E 13
Chevron EP-MV	Texaco ‘Rando’ HDAZ
HVLP	ISO VG 32

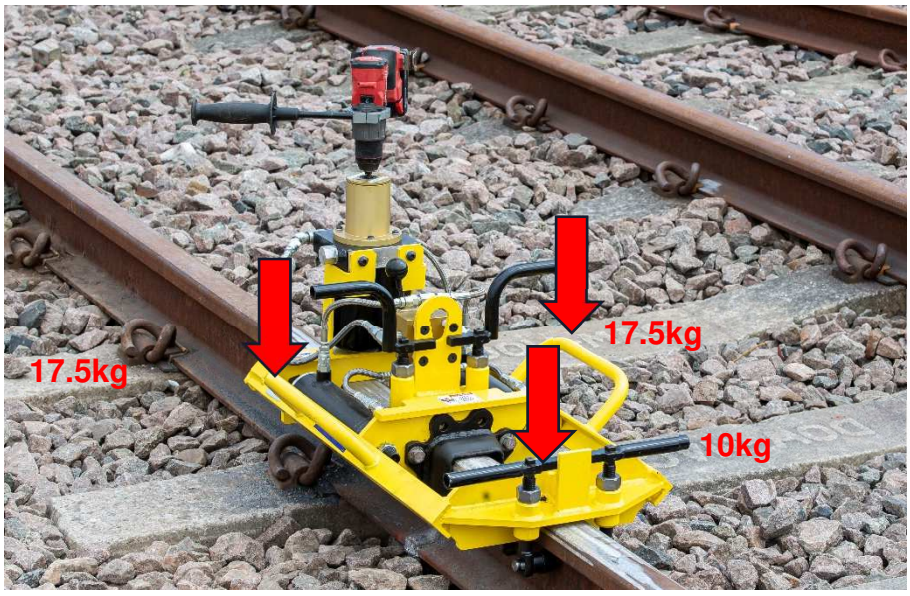
4.2 Handling

The machine ready-to-go weighs 45.3 kg

It requires 3 operators for its handling, one on each side of the machine and one at the end.

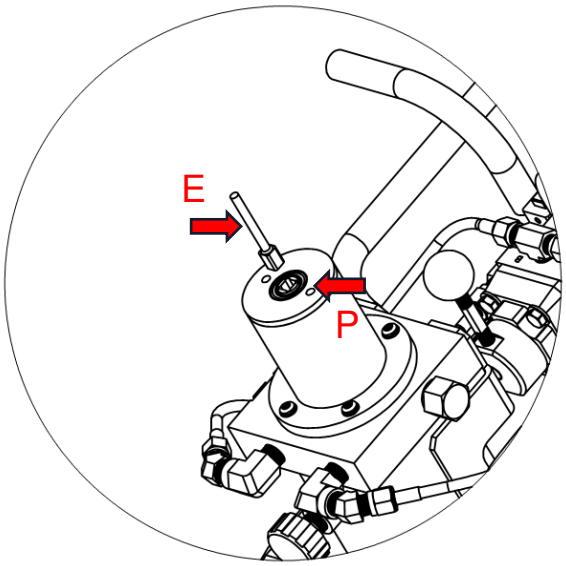
⚠ The shearing machine should never be moved with the drill mounted on the machine.

Figure 1: handling



4.3 Drill connection

Figure 2: Drill connection



- Insert the 3/8 "bit (Item E) in the chuck of the Drill.
- Then fit everything into the square footprint of the pump (mark P).

WARNING

The drill must be equipped with the handle to be used. Refer to the drill manual for assembly

Figure 3: Handle for the drill

Put directly the handle in the support.

4.4 Mounting of the blades

- Remove the 4 screws (mark V) intended to hold the blades on the crossbars.
- Place the blades on the pins (Ref G)
- Using two 22mm wrenches, reassemble the screws and tighten them.

Figure 4: mounting screws

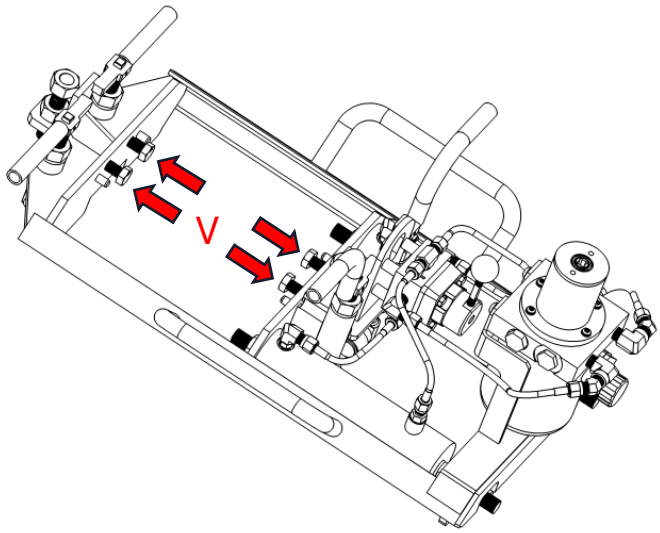
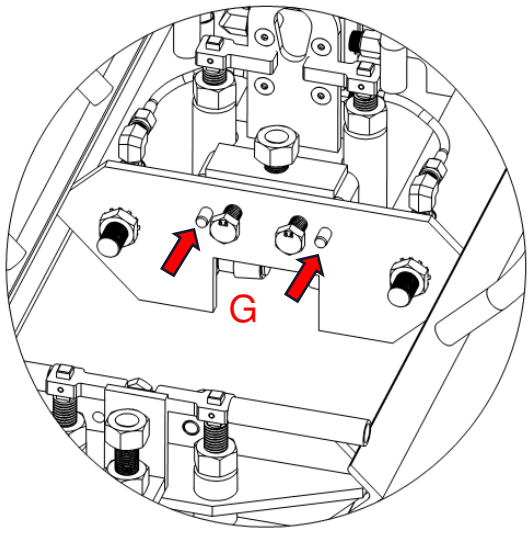


Figure 5: mounting pins



Nota : for the choice of the blades, refer to the table on page 17.

4.5 Setting before operating

4.5.1 Setting of the drill

WARNING

The settings of the screwdriver must be observed. These must not be changed under any circumstances. Changing these settings may cause a malfunction.

WARNING

In drilling mode, the drill may cause the wrist to twist if it is used without the grab handle. Be sure to follow the handle assembly instructions. The drill must be handled with two hands.

WARNING

The direction of operation of the shearing is changed using the hydraulic distributor. Under no circumstances should the direction of rotation (counterclockwise) of the drill be changed while the machine is in operation.

Figure 6: Setting of the drill

4.5.2 Setting of the blades

Height adjustment

The front and central cross piece are each fitted with a reference C screw.

These screws should be adjusted to create sufficient clearance between the cutting edge of the blade and the rail.

Figure 7: Position of vertical adjustment screws

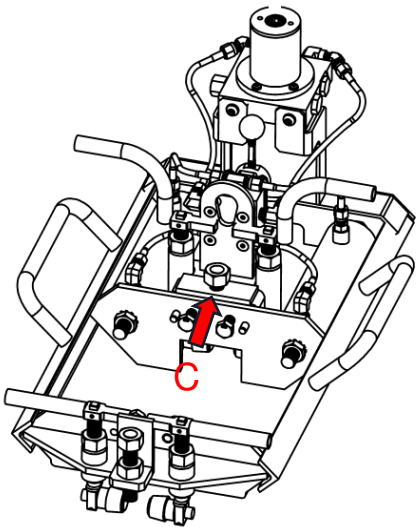
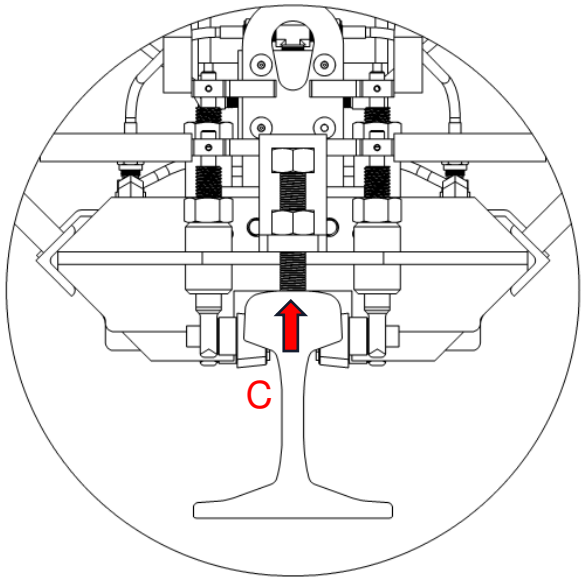


Figure 8: Vertical adjustment



Operating mode ;

- Unlock the locknuts and loosen the 2 screws item C
- Place the adjusting shim of the desired height on the rail.
- Place the shearing machine on the adjusting shim.
- Tighten the screws marked C until they come into contact with the rail.
- Lock the locknuts

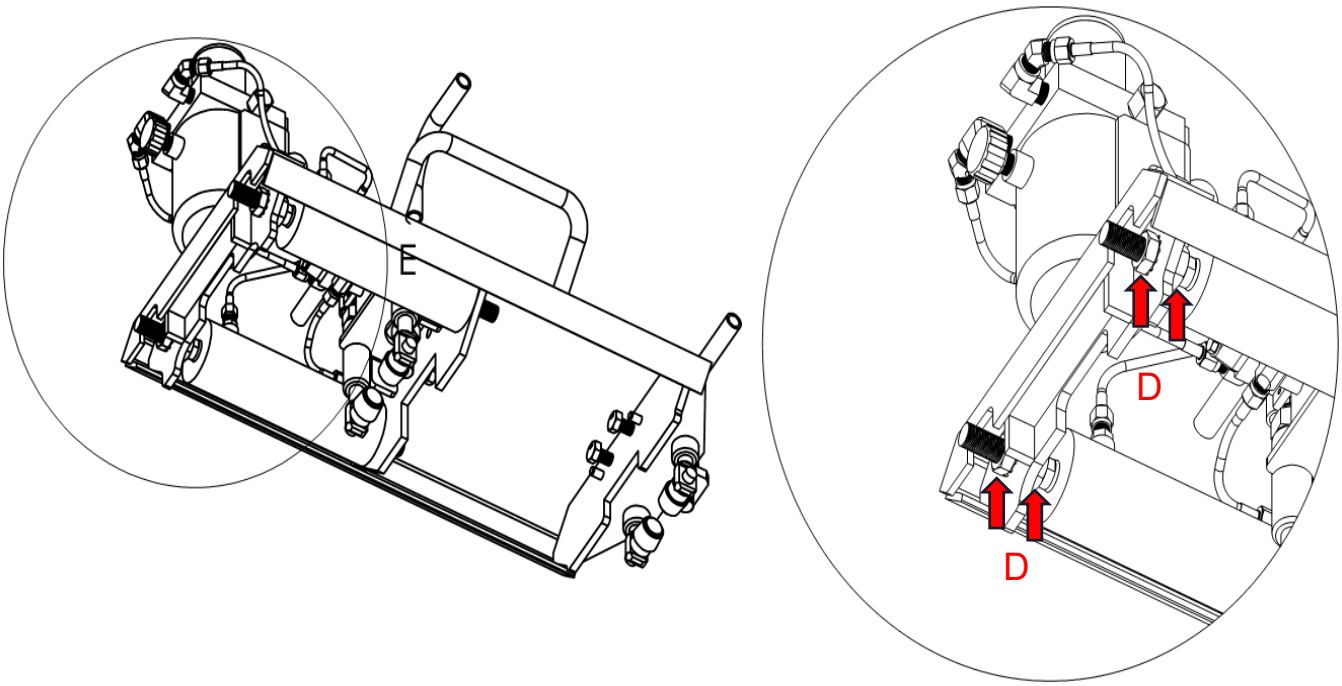
To optimize the cut, this adjustment must be carried out systematically after resharpening or replacing the knives.

NOTA : For welding gap > 25 mm, create a gap of approximately 4 mm between the blades and the rail.

Setting of the stroke of the cylinders

To prevent damage to the edges of the blades, it is essential to leave a clearance of 1 mm by adjusting the 2 screws marked D serving as adjustment on the cylinders.

Figure 9: Setting of the stoke of the cylinders

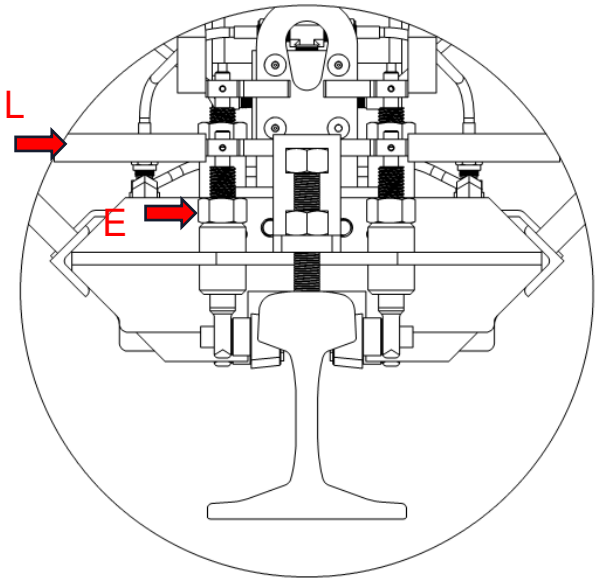


- Loosen the adjusting nuts (item D) of the cylinder rod and with the cylinder rods fully extended.
- Adjust the desired gap by moving the adjusting nuts on the cylinder rod.
- Tighten the cylinder rod adjusting nuts, run the shearing machine to check the gap size.
- Reinstall and tighten the cylinder rod jam nuts.

Setting of the hold down rollers

The hold down roller takes up cutting forces and provides cutting quality and safety.

Figure 10: Setting of the hold down rollers



Operating mode :

With the shearing machine placed on the rail, with the blades adjusted, rotate the lever (mark L) of the hold down roller by 90 ° so that the roller is engaged under the head of the rail, then:

- Using the knurled nut (item E) raise the hook up to contact under the head
- Loosen the nut 1/8 turn to create a slight play

Proceed in the same way for the 3 other hold down rollers.

Nota : For welding gap > 25 mm, create a gap of approximately 4 mm between the blades and the rail.

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5. Operating

Before use, check that all the settings described in the previous paragraph have been made and carry out a no-load test.

5.1 Shearing

Place the deburrer on the rail before placing the weld to adjust the hold down rollers. Once the hold-down rollers are adjusted, remove the machine from the rail to prepare for the weld. Do not transport the deburrer with the drill mounted.

WARNING

Use only the Milwaukee drill supplied with the machine. Failure to use this drill may result in machine malfunction. Never carry the deburrer while the drill is installed, it could come off and potential damage to the drill could result.

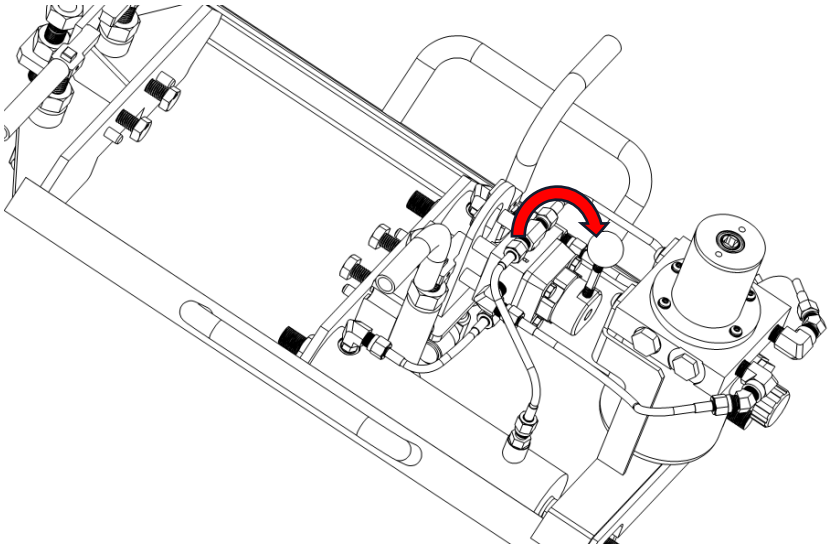
WARNING

Make sure the drill is fully charged and running counterclockwise before continuing.

Make sure that all screwdriver settings have been observed.

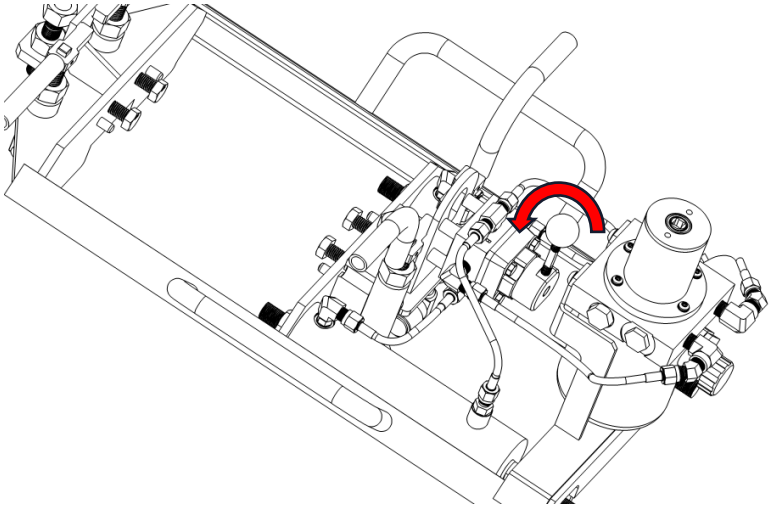
- When the weld is ready to be cut, position two people, one on each side of the shear. They should carefully place the shear over the weld and lock it into place with the hold down rollers
- Attach the drill to the weld shear for activating the tool, ensure it is in reverse (counterclockwise rotation) only after the weld shear is installed on the rail.
- Move the handle to side that is labelled “shear” to make the cut.

Figure 11: Changing the direction of operation



- 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.

Figure 12: Changing the direction of operation



- Press drill trigger again. Drill will continue to operate counter clockwise (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.

6. Working area

The user's working area is represented by a blue perimeter.

Figure 13: Working area

The shearing machine should always be positioned so that the user can easily manipulate the distributor inside the track.

7. 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”/1mm 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.

Tableau 1: Maintenance periodicity

		PERIODICITY		
OBJECT	**OPERATION**	**Before use**	**After use**	**Presence of signs of wear or improper operation**
Complete machine	Inspection of the machine	X		
Hydraulic hoses	Inspection	X		
	Replacement			X
Quick couplings	Lubrification	X		
Complete machine	Clean the machine using a clean cloth or air to remove dirt		X	
Locking mechanism	Replacement			X

Use hydraulic fluids that comply with HTMA specification 4.1, 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.

Check regularly the level of oil in the motor pump.

Amoco Rykon MV	Citgo A/W all temp
Sunvis 706	Mobil D.T.E 13
Chevron EP-MV	Texaco ‘Rando’ HDAZ
HVLP	ISO VG 32

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.

8. Signalisation

Our deburring machines benefit from traceability included on this company nameplate.

Figure 14: Company nameplate

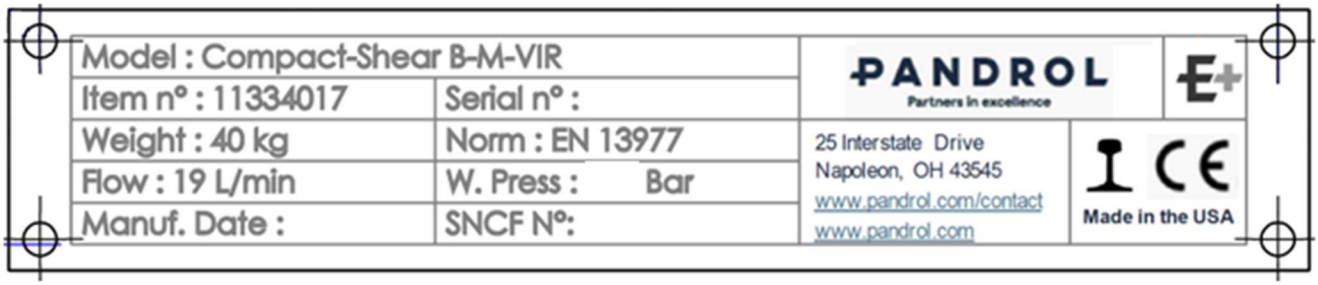


Figure 15: sticker EN 13977

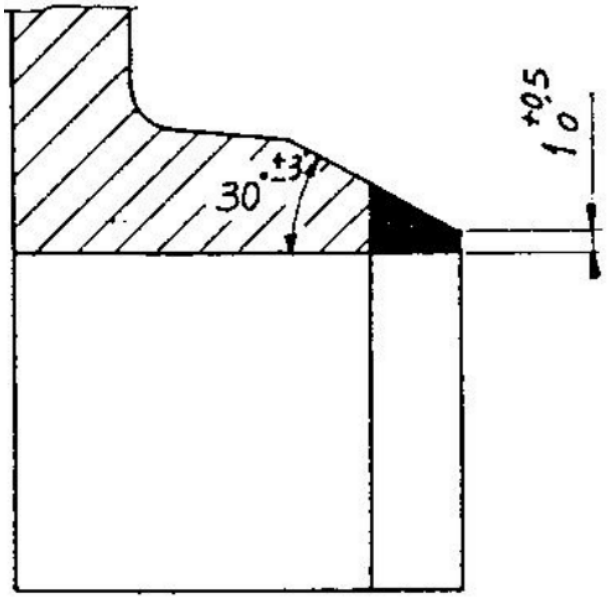
9. Blades

9.1 Sharpening

The geometry of the cutting edge over the entire profile of the blade is very important to obtain the optimum quality of shearing.

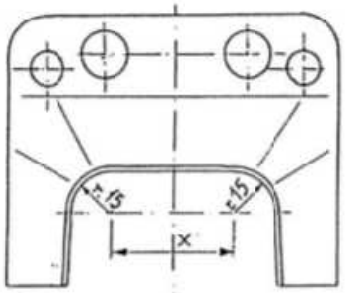
Blades must be systematically monitored and resharpened (approximately every 50 cuts)

Figure 16: Sharpening of the blades



TYPES DE COUTEAUX A UTILISER SELON LES PROFILS DE RAILS

Type 32 Rallongés **Standard 11335018** **H.T. 11335032**	Type 36 Rallongés **Standard 11335019** **H.T. 11335033**	Type 40 Rallongés **Standard 11335024** **H.T. 11335034**		Type 45 Rallongés **standard 11335022** **H.T. 11335028**		Type 48 Rallongés **Standard 11335023** **H.T. 11335035**
20 Kg Std.	34 Kg PLMA	31 Kg Australie		41 Kg R41		41,2 Kg Type 16
25 Kg	65 Lb ASCE	70 Lb U.P	48 Kg LP	SJ 41	CFF4	45 Kg AL 16A
50 Lb NSFB	70 Lb ASCE Thailande	36 Kg Anglais	100 Lb HF	42,1 Kg R14	CFF4 TJD	50 Kg EB
Ouganda	36 Kg UST	37,2 Kg Anglais	50 Kg N	ou R42	S54	105 Lb NYC
50 Lb OBS	36 Kg UST Suisse	75 Lb ASCE	50 Kg Nelle Zélande	SJ 43	UIC 54 - U78	CFF6
Ouganda	36 Kg CFF5	80 Lb ASCE	50 Kg U 50	R 43	UIC 54 A (A65)	R 65
26 Kg Std.	UNI 36	Mozambique	UNI 50	91 Lb RR	UIC 54 HM	UIC 60
26 Kg renforcé	37,8 Kg AL 11A	80 Lb BSA	100 Lb PS	45 Kg ED	110 Lb CF & I	UIC 60 HH
29 Kg	75 Lb RBS Ouganda	80 Lb BSA	100 Lb RB	45 Kg Danemark	110 Lb RE	60 Kg EB
BS 60 AFB Anglais	39 Kg ARAB	Sierra Léone	52 Kg Metro	90 RBS	112 LB RE	UIC 61
30 Kg Std.	39 Kg PMA	80 Lb OBS Ouganda	U 60	90 Lb ASCE	113 A	122 BC & O
30 Kg Nord	40 Kg Nord	80 Lb RBS	U 60 CA	Mozambique	113 Lb HF	122 Lb
30 Kg Suisse	40 Kg type Am.	41 Kg Australie	60 Kg N	90 Lb BSA	115 Lb RE	63 Kg EB
31,6 Kg	85 CF & I	85 Lb ASCE	U 59	47 Kg Australie	119 Lb CF & I	127 Lb
33,4 Kg Prussien	85 ARAA	85 Lb PS		S 49	60 Kg Australie HH	127 Lb NYC
36 Kg Portugal	45 Kg Nord	45 Kg MSA		50 Kg Chine	60 Kg Australie	130 Lb PS
36 Kg S13	45 Kg Est	90.20 ARAA Brésil		50 Kg Australie	119 Lb	131 Lb RE
36 Kg S40 Std.	45,5 EV45	90.30 ARAB		SJ 50	62 Kg S52	130 Lb RE
24 a	46 Kg S12	90 Lb GN		UIC 50	130 Lb HF	66 Kg Australie
	U 33 Ame épaisse	90 Lb RA		100 Lb AREA		132 LB HH
	U 33 ou S33	90 Lb RB		100 Lb ASCE		132 Lb RE
	U 55	90 Lb SF		100 Lb ARAB		133 Lb RE
	10 a	90 Lb CF & I		100 Lb RA		68 Kg Australie
		91 Lb Nelle. Zélande		100 Lb RE		136 Lb CF & I
		CFF1		100 Lb CF & I		136 Lb HH
		CFF1 TJD		53 Kg Australie		136 Lb RE
		UNI 46		ou 107 Lb Australie		140 Lb RE
		47 Kg Australie		CFF3 (UIC 54E)		A 74
						UIC 71
						155 Lb PS
						155 Lb Penna



Cote x : 32-36-40-45-48

RAILTECH INTERNATIONAL

COUTEAUX DE TRANCHEUSE

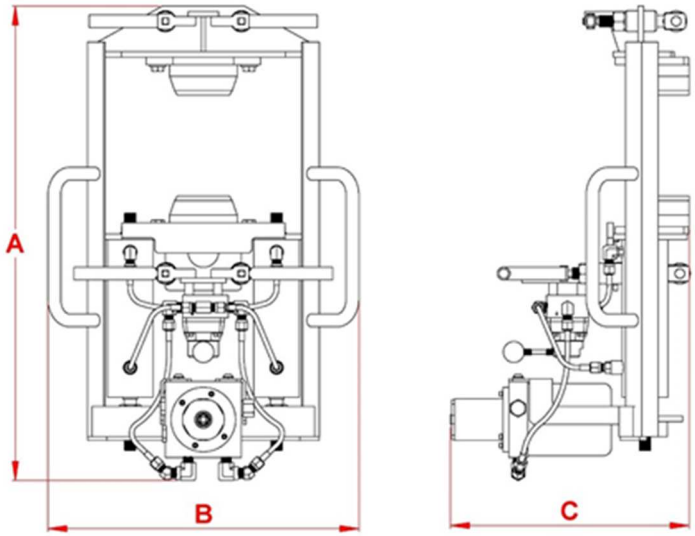
01/04/2004

Figure 17: Types of blades to use according to the rail profiles

10. Technical characteristics

Figure 18: Illustration

Figure 19: Technical characteristics



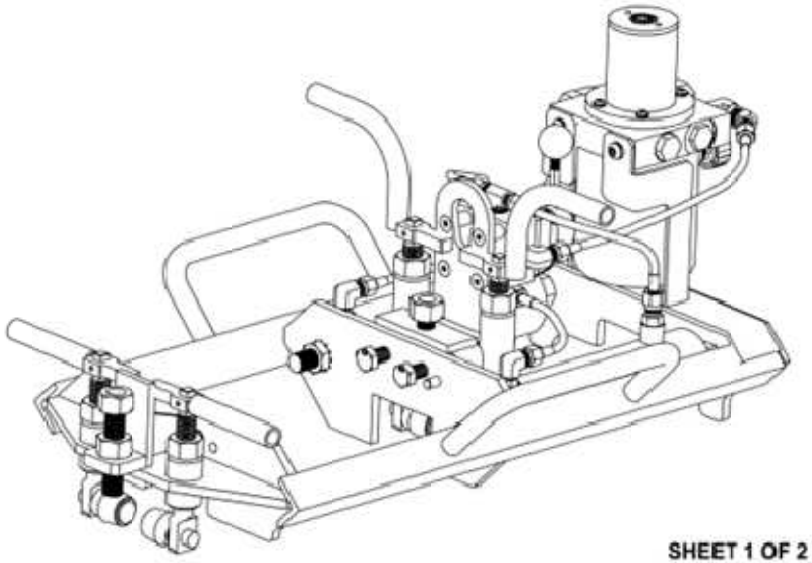
Flow	Pressure	Dimensions	Weight w/o drill
5 GPM (19 LPM)	190 BAR	A- 30.5” (775 mm)	98 lbs (45.3 kg)
		B- 27.75” (705 mm)	
		C- 27.75” (705 mm)	

11. Spare part list

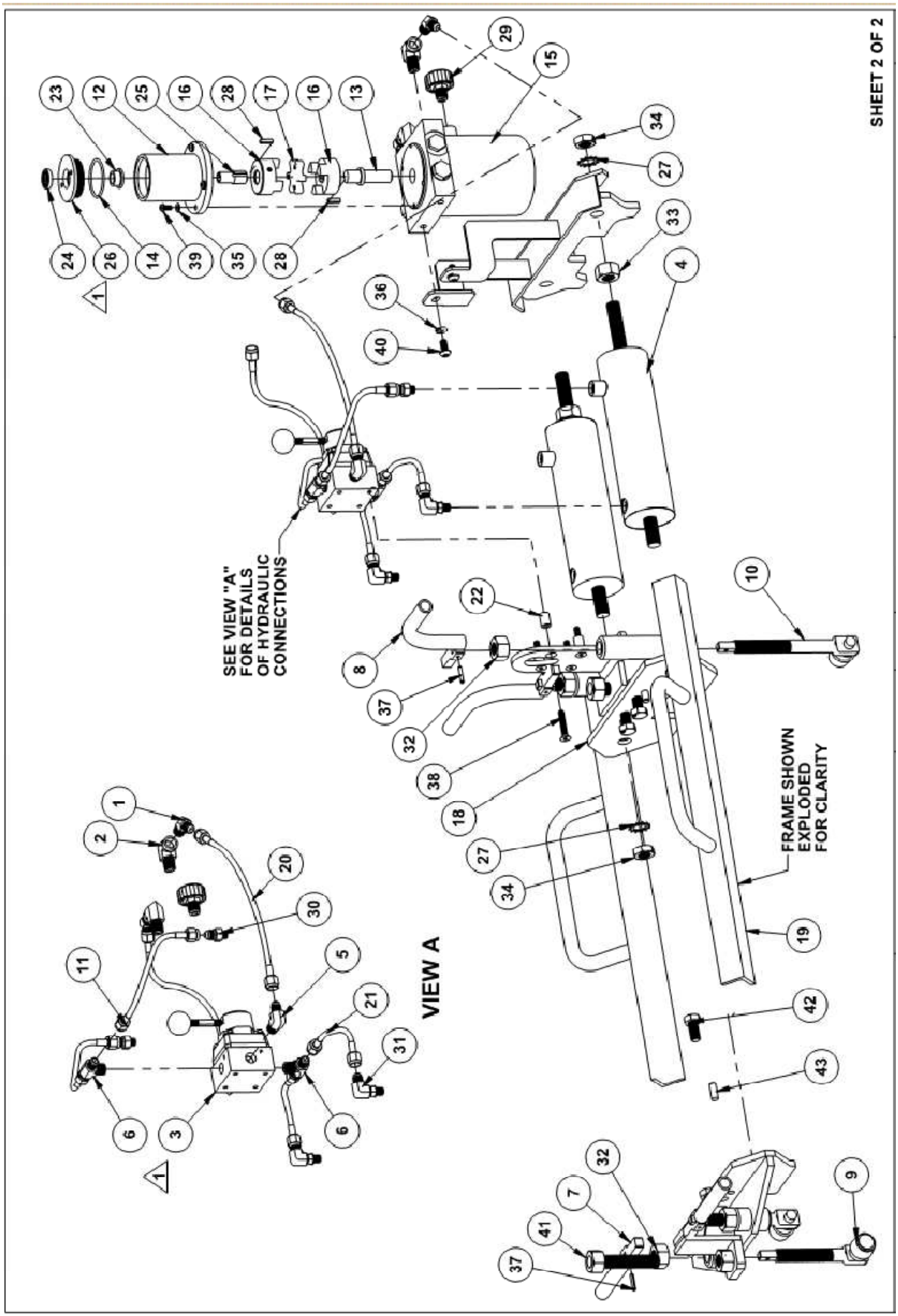
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	47703009	3/8 NPT x -06 JIC 45 ELBOW	2
2	47703010	3/8 NPT STREET 90 ELBOW	2
3	47702060	DETENT VALVE KIT	1
4	47702061	HYDRAULIC CYLINDER	2
5	47703007	3/8 JIC x 3/8 NPT 90 ELBOW	2
6	47703008	3/8 JIC x 3/8 JIC x 3/8 NPT TEE	2
7	48601578	FRONT HOLD DOWN HANDLE	2
8	48601579	CENTER HOLD DOWN HANDLE	2
9	48601580	FRONT ROLLER ASSEMBLY	2
10	48601581	CENTER ROLLER ASSEMBLY	2
11	47601013	HOSE	2
12	48607001	SPIDER COUPLING HOUSING	1
13	48607002	PUMP SPLINE ADAPTER	1
14	48607003	3-928 O-RING	1
15	47103017	KP25 PUMP/RESERVOIR	1
16	44302005	SPIDER COUPLING HUB	2
17	44302006	SPIDER COUPLING FLEXIBLE HUB	1
18	48601582	CENTER PLATE	1
19	48601583	FRAME	1
20	47601014	HOSE	2
21	47601015	HOSE	2
22	41108011	VALVE SPACER	4
23	45301004	OILITE BRONZE BUSHING	1
24	48607004	SHAFT SEAL	1
25	48607005	DRILL COUPLER ADAPTER	1
26	48607006	CAP	1
27	41120006	TOOTH LOCKWASHER	4

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
28	41402001	3/16" SQ. X 3/4" STEEL KEY	2
29	48612018	RESERVOIR BREATHER CAP	1
30	47703011	-06 JIC x -04 O-RING	2
31	47703012	-06 JIC X -04 O-RING 90 ELBOW	2
32	40919001	3/4-10 PLAIN HEAVY HEX NUT	4
33	40919002	3/4-16 PLAIN HEAVY HEX NUT	2
34	40919003	3/4-16 HEX JAM NUT	4
35	41112005	1/4 LOCK WASHER	4
36	41109001	3/8 LOCK WASHER	2
37	41303005	DIA. 3/16 x 1 SPRING PIN	4
38	41008071	5/16-18 x 1 3/4 FLAT HEAD SCREW	4
39	41006064	1/4-20 X 5/8 BHCS	4
40	41009001	3/8 X 3/4 BHCS	2
41		BLADE ADJUSTMENT SCREW	2
42		M14 x 30mm Hex Head Cap Screw	4
43		Dowel Pin	4

THE FOLLOWING COMPONENTS NOT SHOWN
- MILWAUKEE #48-32-5031 1/4" HEX X 3/8" SQ.SOCKET ADAPTER
- MILWAUKEE #2803-20 M18 FUEL 1/2" DRILL DRIVER (TOOL ONLY)



SHEET 1 OF 2



12. Warranty and Service

12.1 Warranty

All products from Pandrol are supplied with a 12-month Warranty.

The Warranty is not valid if the indicated defect or fault in the product does not exist or if the fault is the result of a handling error, tampering or non-permitted modification, or if the machine has been exposed to fire, lightning or excess voltage.

12.2 Service

Aftersales support and technical service are available from Pandrol, during and after the Warranty period. Please contact Pandrol.

12.3 Disclaimer

Pandrol exempts itself from liability in the event of usage that deviates from that recommended in this manual.

12.4 Contact

Table 1: Contact

Address	Phone	Internet and E-mail
Pandrol Z.I Rue du Bas Pré, 59590 Raismes, FRANCE	+33 (0) 6 45 67 97 19	www.pandrol.com contact.sav@pandrol.com

13. Recycling and Environment

Sustainable environment is a great part of Pandrol.

All components of the Power unit can either be:

• Recycled

• Taken care of

• Be re-used

We recommend you to follow your local region regulations of environmental and recycling policies

PANDROL

Find out more at

pandrol.com

Partners in excellence