

**PANDROL**



# Diesel Power Unit

MODEL 02900A

OPERATION AND MAINTENANCE  
MANUAL



**ENG\_OMM\_DIESEL\_POWER\_UNIT\_P01**

22th November 2021

Partners in excellence

**Thank you for choosing Diesel Power Unit!**  
**You are now the owner of a quality product from Pandrol.**

# 1. Preface

This manual aims to help you get to know your new Diesel Power Unit, to use it in the best way and to maintain it properly for a long lifetime. It also presents important safety regulations and warnings.

The manual is intended for people who handle and operate the machine. It is originally written in English and translated into the local language by Pandrol.

Pandrol reserves the right to change specifications, equipment, instructions and maintenance guidelines without prior notice.

The manual contains instructions about the following topics:

1. Installation
2. Operation
3. Safety features and warnings
4. Maintenance and troubleshooting

(1) refers to a component in a figure/illustration.

## IMPORTANT

This manual contains ordered actions, e.g.

1. Do this
2. ...and then this...
3. ...and finally this

These actions **must** be done in the numerical order presented.

# 2. Revision

Revision	Date	Comments
P01	2021-11-22	New Manual

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## 3. Safety Information



### 3.1. General

- 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 hoses.
- 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.
- 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 the tool use or operation once it leaves the plant. Pandrol has no control over operator or maintainer selection. The customer must assume responsibility for the tool suitability for a particular function.
- During use of the tool, good judgement must be used to work safely and efficiently without endangering themselves or bystanders.
- Understanding of the operation and maintenance manual is essential for anyone using or maintaining the tool.
- Warnings and safety precautions described in this document shall only be considered as a minimum. National conditions, standards and regulations override conditions, standards and regulations described in this document.
- Work with the machine is only to be carried out by qualified personnel, well-informed and educated in general railway workmanship and specifically in the conditions, standards and regulations on specific rail track.
- The machine may only be used for its specified purpose.
- Any adjustments or service on the machine is only allowed to be done by qualified personnel that have read and understood this manual and have had training and information from Pandrol.

### 3.2. Safety actions

- Read and understand all safety regulations and warnings before installation, operating or performing maintenance on this machine.
- 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.
- Use standards and regulations, accident prevention regulations and regulations concerning special ambient conditions (e.g. areas potentially endangered by explosive materials, heavy pollution or corrosive influences).
- 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 your self or someone else.

- Do not operate the tool at excessive fluid temperatures operator discomfort and potential burns can result at high oil temperatures.
- 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.

### 3.3. Personal/Safety equipment

- 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.
- When working near electrical conductors, always assume that the conductors are energized and that hoses and clothing can conduct harmful electricity. Use hoses labeled and certified as nonconductive.
- 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.
- The use of an compressed air, which must be less than 8 BAR (116 PSI), to blow parts clean or to blow them dry after being cleaned with a solvent will cause particles of dirt and/or droplets of the cleaning solvent to be airborne. These conditions may cause skin and/or eye irritation. When using an air jet do not direct it toward another person. Improper use of air jet could result in bodily injury.

### 3.4. Safety precautions

- Always wear protective equipment such as gloves, safety glasses, ear protection and safety shoes.
- Do not wear clothing which may become entangled in the tool.
- 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, do not carry the tool by hydraulic hoses, and repair leaks immediately.
- Do not operate the power unit until you have been properly trained or under the supervision of a qualified instructor.
- Never store engine oil or hydraulic oil near oxygen tanks or lines.
- Never add engine oil or hydraulic oil when a spill might come in contact with your oxygen lines, torch or fittings.
- Clean up spills immediately.
- Never perform grinding or sawing operations that direct sparks into the close proximity of the power unit or flammable materials.
- Never operate the power unit with any part of the exhaust system or the heat deflector removed.
- Periodically, inspect the fuel tank, fuel line and fittings for cracks or leaks and repair or replace as required.

- Avoid over filling the fuel tank; wipe up any spills immediately and properly dispose of the cleaning rags.
- Always turn power unit "OFF" and disconnect hoses before performing any maintenance.

### 3.5. Qualified personnel

The machine is only to be used by trained personnel, thoroughly familiar with and trained in general railway workmanship. The equipment should be operated according to the conditions and standard regulations applying to the track they are working on.

The equipment must be serviced, maintained, or in any way modified only by trained personnel, who are familiar with the Operation & Maintenance Manual and have received training and information from Pandrol.

In order to avoid personal injury and/or material damage, everyone involved with assembling, starting-up or overhaul must possess relevant knowledge of the equipment, its use, maintenance requirements and procedures.

## 4. Summary

The Pandrol Diesel Power Unit can be optionally equipped with catalytic converter, mobility kit and mounted hose reel. Engine protection devices are installed to protect the engine from low oil and high temperature.



Fig 1.

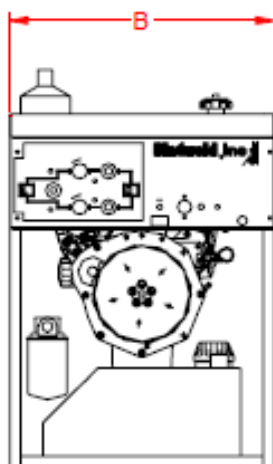


Fig 2.

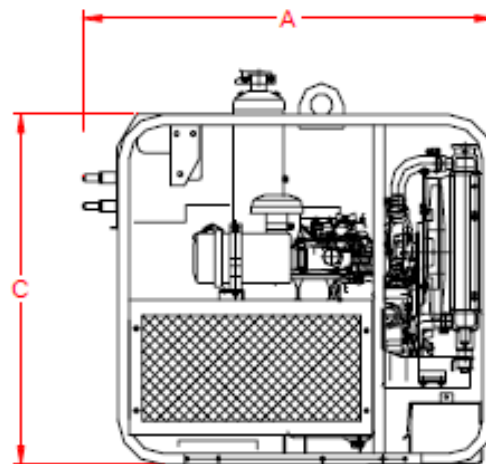


Fig 3.

Engine	Flow	Pressure	Dimensions	Weight
18 hp Kubota Fuel: Diesel Start: Electric	5 GPM (19 LPM) or 10 GPM (38 LPM)	2000 PSI (140 BAR)	a - 38" (96.5 cm) b - 24" (60.9 cm) c - 36" (91.4 cm)	450 lbs (204 kg)

### Accessories:

02326 - Hose reel equipped with 50' transmission hose and mounting bracket.

2900C - Diesel power unit equipped with catalytic converter.

06100 - Tamper cart w/(2) hose reels.

## 5. Operation

**Before starting the power unit, check all fluid levels, and add fuel, motor oil, and or hydraulic oil as required.**

- To start the power unit, check to make sure that both control valves are in the "OFF" position.
- Place ignition switch to the on position. Press start button until engine starts and release.



### **NOTE!**

- **This unit is equipped with an automatic safety shutdown device. In case of low oil pressure or high engine temperature, the engine will shut down automatically. During the starting process, the automatic shutdown will bypass for 15 seconds. If the unit does not start within 15 seconds, turn the ignition switch to "OFF" and then back to "ON" to reset timer.**

- Connect the power transmission hose to either the 5 or 10 GPM ports, depending on the flow required for the tool you will be using.
- Connect the tool(s) to the power transmission hose(s) before turning the flow control valves on the power unit.
- In cold weather start the power unit and allow the oil to circulate before using the tools. In extremely cold weather, refer to cold weather operation section of this manual!
- To provide hydraulic cooling, the unit is equipped with a cooling fan that operates when the ignition switch is in the "ON" position.
- To shut down the power unit or to, turn the control valves to the "OFF" position and place ignition switch to off



### **NOTE!**

- **When operating a 10 GPM tool you cannot have any other tool connected to the 5 GPM ports, even if the tool is not being used.**



## 5 GPM tools:

To operate a 5 GPM tool, connect both tools to the ports marked 5 GPM and turn "ON" the valve corresponding to each tool port.

## 10 GPM tools:

To operate a 10 GPM tool, connect it to the port marked 10 GPM and turn on both control valves.

### 5.1. Changing tools

- Always turn the control knobs to the "OFF" position before disconnecting hoses.
- Once the tool has been changed, turn the valve(s) to the "ON" position depending on flow requirements of the tool to be used.

### 5.2. Cold weather operation

The power unit and tools will perform well in extreme cold weather if the warm-up procedures are followed. These procedures should be used anytime the temperature is below 40 degrees fahrenheit (4.4c). In extremely cold climates, changing to an aircraft quality hydraulic oil (mil. Spec. H-5606) will reduce the warm up time required. When warm weather returns, be sure to change back to a higher viscosity hydraulic oil.



#### **NOTE!**

- **In cold weather situations it may be necessary to turn the glow plug. Preheat switch to the up position for 10 sec. before starting.**

- Start the power unit and let it run until it is running smoothly.
- Connect the power transmission hoses to the power unit and couple the power transmission hose tool ends together forming a "LOOP".
- Turn a tool control valve "ON" to circulate oil through the hose.
- When the oil reaches 50 degrees fahrenheit (10 C) you may begin to operate the tools.



#### **NOTE!**

- **Refer to operating procedures of this manual before starting**

## 6. Trouble shooting guide

- Before any troubleshooting, check all fluid levels, and add fuel, motor oil and/or hydraulic oil as required.
- Repair any leaks or obvious damage to power unit.
- Maintenance to be performed by qualified maintenance personnel only read operation manual to understand operational characteristics before making any adjustments.

Problem	Remedy
Power unit runs, but engine quits when under load.	<ul style="list-style-type: none"> <li>Check system relief pressure - valve (part #00139) should be set at 2000 - 2100 PSI</li> <li>Check flow- should be no greater than 10 GPM on 10 GPM port.</li> <li>If flow and pressure are ok, but engine still quits under load: <ul style="list-style-type: none"> <li>- Drain fuel and check for water or contamination.</li> <li>- Tune engine</li> </ul> </li> </ul>
Power unit flow greater or less than 10 GPM	<ul style="list-style-type: none"> <li>Check the 10 GPM port for proper flow rate.</li> <li>Check flow rate under load. With flow and pressure test gauge (part #03600) attached to power unit, slowly “dial in” 1500 PSI. Power unit should still deliver 9.5 – 10 GPM on the 10 GPM port with both control valves on and engine throttle advanced to “full” setting.</li> </ul>
Bottom 5 GPM port drops flow under load, and won’t deliver 2000 PSI relief pressure. Other ports ok	<ul style="list-style-type: none"> <li>Adjust flow control valve (part #0141-01). See flow control setting from calibration procedures.</li> <li><b>Service precaution:</b> Do not take system relief valve and flow control valves out and install them in the wrong holes. If you do, damage to the pump will result.</li> </ul>
Hydraulic oil overheats	<ul style="list-style-type: none"> <li>Check temperature with thermal measurement device. If over 140 Degrees F. (60 Degrees celsius), Check the following: <ul style="list-style-type: none"> <li>-Hydraulic oil to full mark in tank</li> <li>-Adequate clearance for air circulation around power unit.</li> </ul> </li> <li>Power unit should be moved so unrestricted air movement is available In front, rear and sides of unit. Remember, the cooler draws air from Around the power unit. If the cooler can only draw hot exhaust, captured Air next to bulkhead, or superheated air in truck body hot hydraulic Oil will be the result.</li> <li>Check tool flow rate. Operate 5 GPM tools only on 5 GPM. Excess Flow at 10 GPM can cause overspeeding of the tool or heat buildup Depending on the tool design.</li> <li>Make certain that only the control knobs needed for the tool being Used are turned on. Having both knobs turned on and only using one 5 GPM tool will allow fluid to be forced over the relief causing over Heating.</li> <li>Check system for excessive back pressure. Back pressure should Not exceed 250 PSI - see back pressure section.</li> </ul>

## 7. Review of hydraulic principles

### Tool circuit

#### 7.1. Hydraulic formulas

$$\text{GPM} = \frac{\text{CID} \times \text{RPM}}{231}$$

$$\text{HP} = \frac{\text{GPM} \times \text{PSI}}{1714 (.85)}$$

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

$$\frac{10 \text{ GPM} \times 1500 \text{ PSI}}{1456.9} = \frac{15000}{1456.9} = 10.3 \text{ HP}$$

(subtract back pressure for tool HP)

Estimated HP delivered by pump or used by tool

	PSI					
GPM	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

#### 7.2. 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.

## 8. Maintenance

### 8.1. General

**Maintenance and overhaul is to be carried out by qualified personnel only**  
**Warranty is based on parts and spares delivered by Pandrol.**

**Check tools DAILY for proper operation, leaks, or damage.**

**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.

### The following oils meet HTMA Specification 5.7

AMOCO RYKON MV  
 SUNVIS 706  
 CHEVRON EP-MV

CITGO A/W ALL TEMP  
 MOBIL D.T.E. 13  
 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.

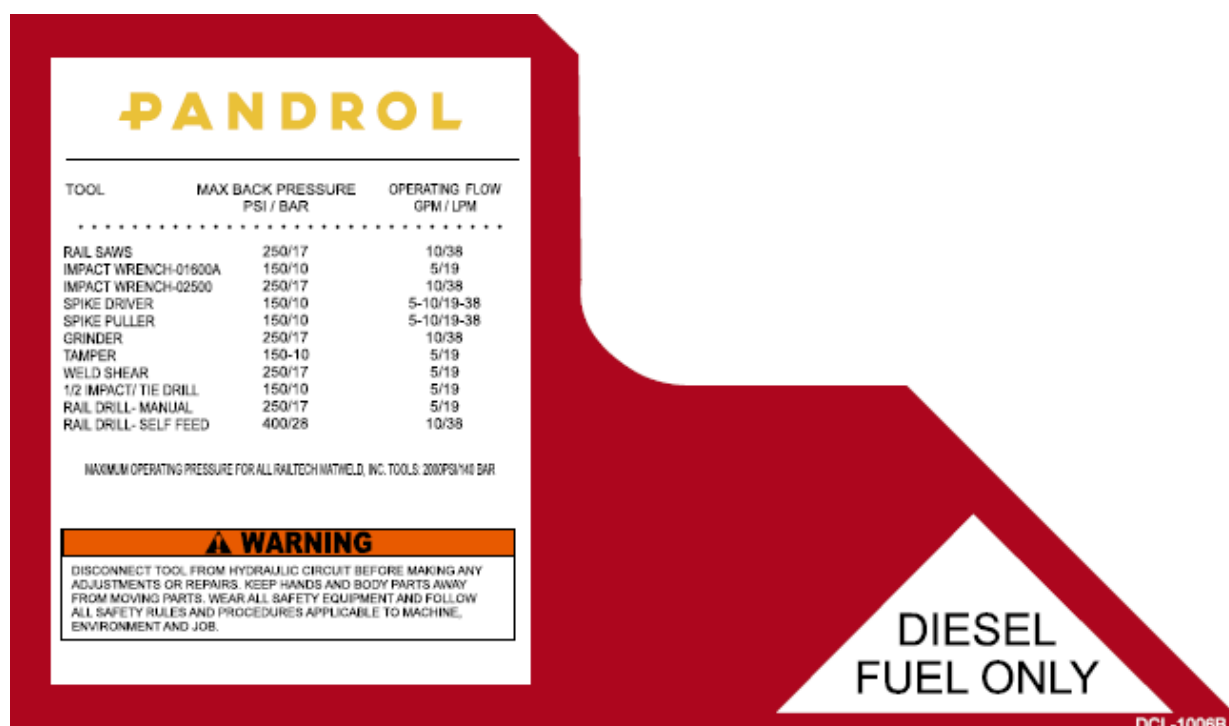
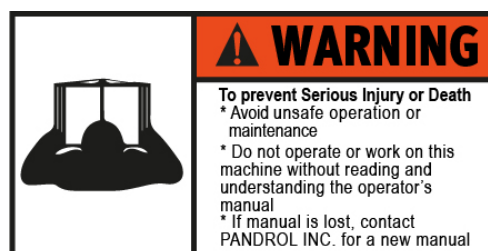


#### **WARNING!**

- All adjustments work, overhaul and service must take place with the machine turned off. Failure to do so could lead to fatal injury.**
- It is of great importance that qualified personnel accomplish all service and overhaul**

## 8.2. Warning labels and information symbols

Below are examples of warning labels and information symbols on the machine. If any of these labels become damaged or lost, they are to be replaced with new original warning labels that are available from Pandrol.



# PANDROL

**MODEL 02900A**  
**HYDRAULIC POWER UNIT**  
**2000 P.S.I. OPERATING PRESSURE**

## STARTING INSTRUCTIONS

- Hydraulic control valves in "off" position.
- Move ignition switch to "on" position.
- Move glowplug preheat switch up and hold for 10 seconds for glowplug preheat\*
- Push start button to start engine.

\*Only in cold weather operations

DCL-1005B

## HYDRAULIC CONTROLS OPERATION

- This power unit offers two individual 5 GPM supplies or one combined 10 GPM supply.
- Turn control knobs to "off" position before attaching hoses, changing tools, or detaching hoses.
- To operate a 10 GPM tool - connect hose to 10 GPM supply and turn both valve control knobs to "on".
- To operate a 5 GPM tool - connect hose to a 5 GPM supply and turn adjacent valve control knob "on". Two 5 GPM tools may be operated at the same time.
- NOTE: If you are using one service hose, or one tool at a time, it is not necessary to switch the hose between the 10 GPM port and a 5 GPM port. Hook the service hose to the 10 GPM port and a 5 or 10 GPM tool. Turn on the top valve only for 5 GPM flow. Turn on both valves for a 10 GPM flow.

## CAUTION

- Refer to maintenance manual for cold weather operation.
- Never operate the power unit with any part of the exhaust system or heat deflector removed!
- Operate in a ventilated area only!
- Keep clear of open flames or sparks!

DCL-1005

## ATTENTION!

THIS POWER UNIT IS EQUIPPED WITH AN AUTOMATIC SHUTDOWN SYSTEM IN THE EVENT OF OVERHEATING OR LOW OIL PRESSURE CONDITION. DO NOT ATTEMPT TO RESTART THE ENGINE UNTIL THE PROBLEM IS CORRECTED.

DCL-1023

FILL LEVEL

HYDRAULIC OIL

DCL-1004

## 9. Limited warranty

Pandrol, INC 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.

### 9.1. 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

### 9.2. 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 not withstanding 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.





## 10. Customer information

Name \_\_\_\_\_

Company \_\_\_\_\_

Serial # of your Pandrol tool \_\_\_\_\_

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

### **Pandrol hydraulic tool list**

All Pandrol Hydraulic Tools operate at 5 GPM (19 LPM) or 10 GPM (38 LPM) @ 2000 PSI (140 BAR)

#### **Power units:**

00100K – Gasoline powered (1) 10 GPM or (2) 5 GPM circuits

02900A – Diesel (1) 10 GPM or (2) 5 GPM circuits (optional catalytic exhaust)

05500 – Twin power dual circuit (1) 10 GPM or (2) 5 GPM circuits & 5000 watt generator

02050RM – Modular power unit (1) 9 GPM

03700A – Electric power (1) 10 GPM or (2) 5 GPM circuits

#### **Grinders:**

09200A – Precision frog grinder

06000 – Profile grinder

06950 & 06950A – Multi-purpose grinder

05900 – Frog/profile grinder (trigger version available)

00700 – Rail surfacing guide

04600 – Straight stone grinder cw rotation (trigger version available)

04700 – Straight stone grinder ccw rotation (trigger version available)

07500 – Chamfer tool

04800 – 6" Cup stone grinder (trigger version available)

00600 – 8" Cup stone grinder

05400 – Angle grinder

09300 - Head wash grinder

**Track tools:**

03900A – Reversing rail saw  
05100A & 05100B – Power weld shear  
03500 – Self feed rail drill  
04500D – 1/2" Hydraulic drill impact wrench  
08200 – Tamper  
02800A – 60 Ton bridge spreader  
01200 – Spring anchor applicator  
01100A – Spike puller (Single, 2 stage & trigger versions available)  
00800A – 16" Rail saw  
05000 – Hand pump weld shear  
02500 – 10 GPM 1" Impact wrench  
08300 – Spike driver  
01600A – 5 GPM 1" Impact wrench  
01100RM – Light-weight spike puller

**Other products:**

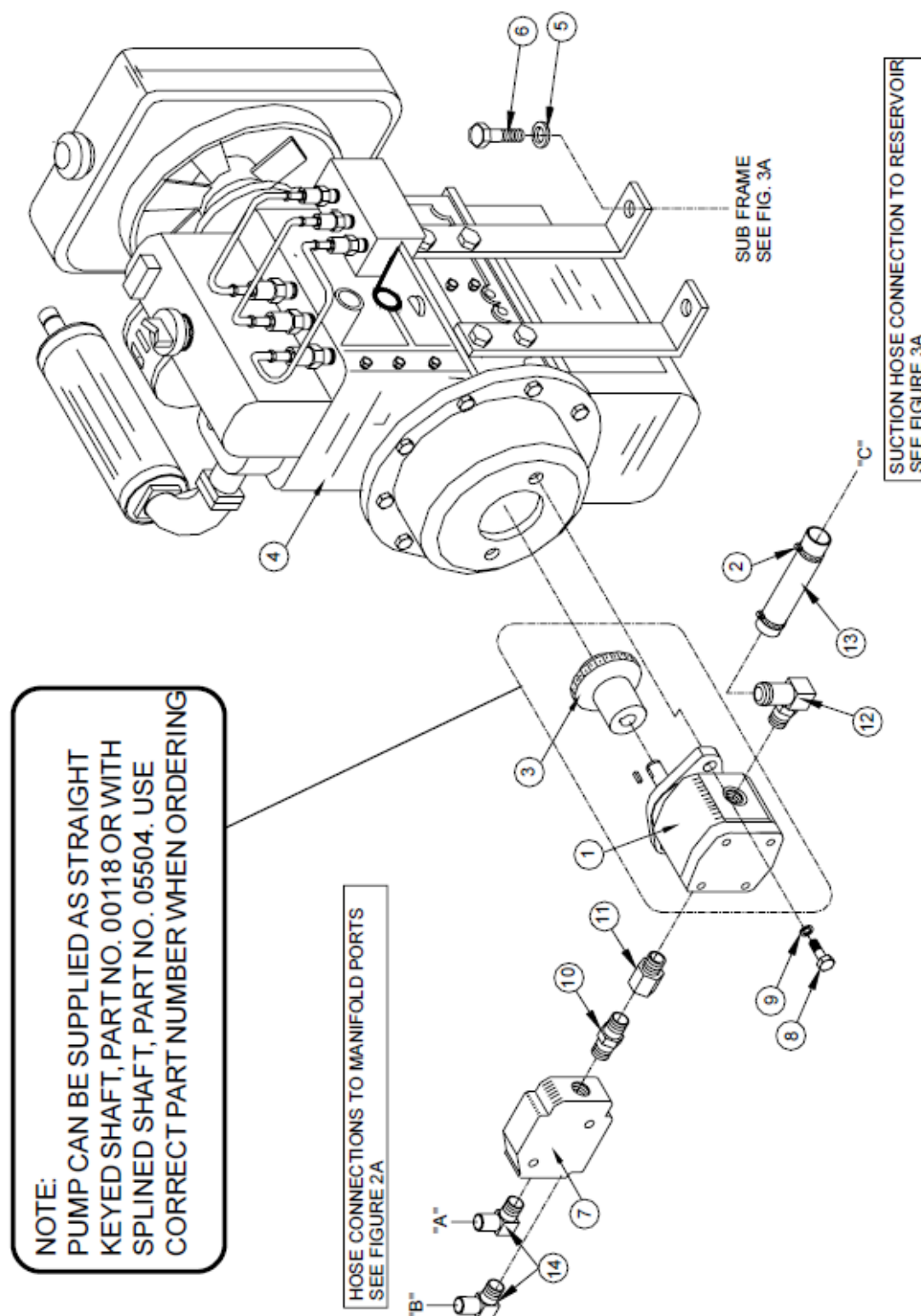
Hydraulic manifolds  
Hydraulic test gauges  
Hose reels  
Hydraulic hoses

**Accessories**

Drill bits  
Shear Blades  
Saw Blades  
Grinding Stones  
Sockets

# 11. Assembly

## 11.1. Engine parts diagram

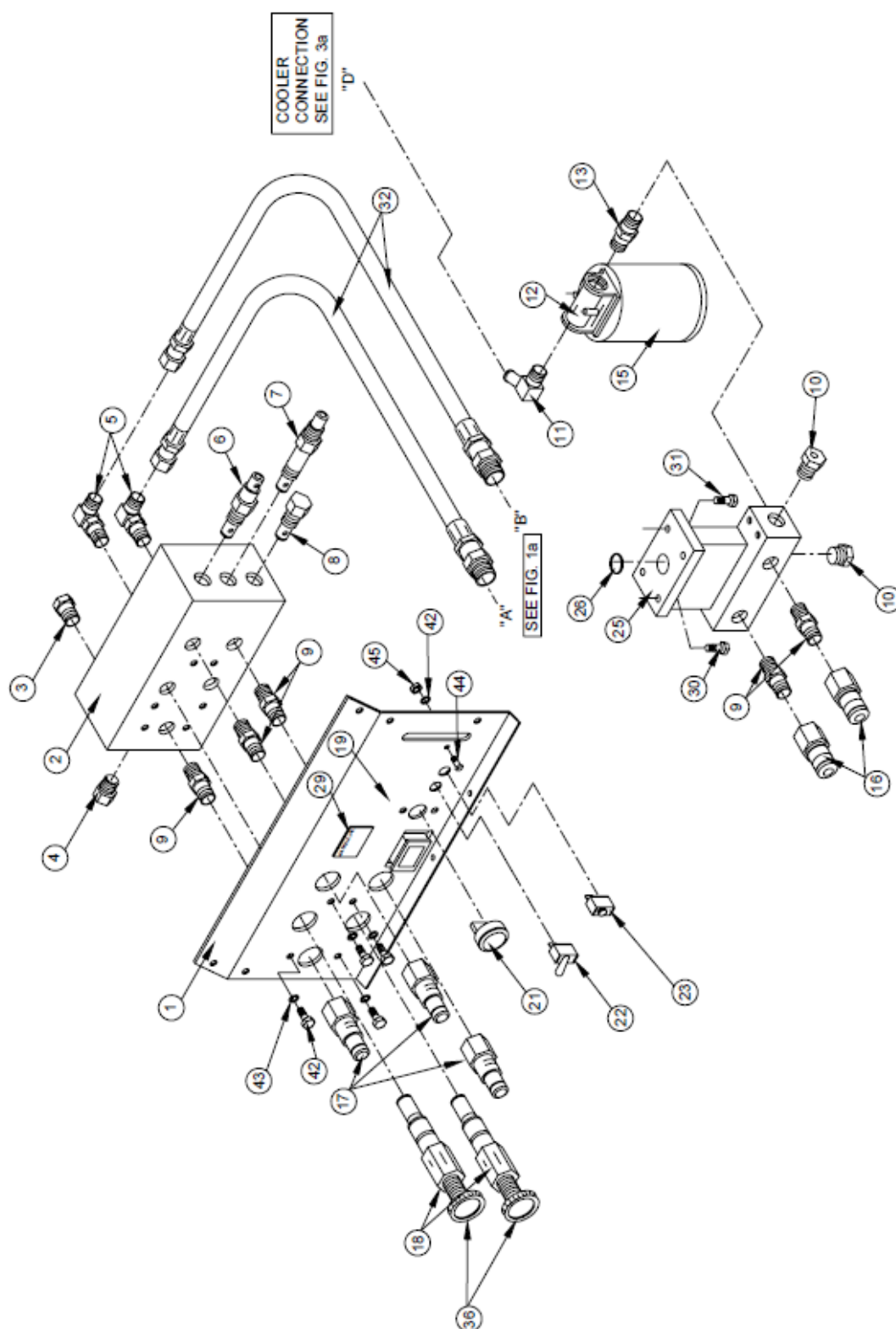


## 11.2. Engine parts list

ITEM NO.	PART NO.	DESCRIPTION	QUANTITY
1	SEE NOTE	10 GPM PUMP	1
2	00147	HOSE CLAMP	1
3	02950	PUMP COUPLING	1
4	02902	KUBOTA DIESEL ENGINE	1
5	A2194	1/2SAE FLAT WASHER	4
6	A1083	1/2X1-1/2 GR 5 ZP	4
7	00119	FLOW DIVIDER	1
8	A1043	3/8 X 1-1/4" GR. 5 ZP.	2
9	A2192	3/8 SAE FLAT WASHER	2
10	69-08-08	1/2 HEX NIPPLE	1
11	269-12-08	#12 MALE X 1/2 NPT FEMALE	1
12	4601-16-12	#16 SAE X 1 HOSE BARB 90	1
13	02954	SUCTION HOSE	1
14	5502-08-08	1/2 STREET EL	2

**NOTE:**  
PUMP CAN BE SUPPLIED AS STRAIGHT  
KEYED SHAFT, PART NO. 00118 OR WITH  
SPLINED SHAFT, PART NO. 05504. USE  
CORRECT PART NUMBER WHEN ORDERING

### 11.3. Control & manifold parts diagram



## 11.4. Control & manifold parts list

ITEM NO.	PART NO.	DESCRIPTION	QUANTITY
1	00155	LOWER CONSOLE	1
2	00136	MANIFOLD BLOCK	1
3	231P-10	#10 O-RING PLUG	1
4	231P-16	#16 O-RING PLUG	1
5	515-08-10	½ T X 10 STR. THD 90	2
6	00141-01	FLOW CONTROL VALVE	1
7	00139	RELIEF VALVE	1
8	00140	CHECK VALVE	1
9	69-08-08	½ NPT HEX NIPPLE	5
10	231P-08	#8 O-RING PLUG	2
11	4503-12-12	¾ MP X ¾ H 45	1
12	00150	FILTER BODY ASSEMBLY	1
13	69-12-08	REDUCER	1
15	00149	HYDRAULIC OIL FILTER	1
16	00145	QUICK DISCONNECT COUPLER	2
17	00146	QUICK DISCONNECT NIPPLE	3
18	00137	CONTROL VALVE	1
19	02903	HOUR METER	1
20	02935	IGNITION SWITCH	1
21	692303	START SWITCH	1
22	00193	FAN SWITCH	1
23	02951	INDICATION LIGHT	1
25	00175	RETURN MANIFOLD BLOCK	1
26	00183	RETURN MANIFOLD O-RING	1
27	A1005	1/4-20 X 1-3/4 HEX HEAD BOLT	6
28	A2190	1/4 SAE FLAT WASHER	12
29	SERIAL TAG	SERIAL NUMBER TAG	1
30	A5434	¼-20 X ¾ SHCS	2
31	A5448	5/16-18 X 1 SHCS	2
32	00816	HOSE PIGTAIL	2
36	00138A	REPLACEMENT KNOB	2
38	A2190	1/4 USS FLAT WASHER	1
39	A1001	¼-20 X ¾ GR. 5 ZP	2
40	00184	RETURN MANIFOLD SUPPORT BRACKET	1
42	A1021	5/16 X ¾ GR. 5 ZP	4
43	A2191	5/16 SAE FLAT WASHER	4





## 11.6. Frame parts list

ITEM NO.	PART NO.	DESCRIPTION	QUANTITY
1	02910A	FRAME	1
2	02911A	ENGINE SUB FRAME	1
3	00153	UPPER CONSOLE	1
4	00128A	FUEL TANK	1
5	A1000	1/4-20 X 1/2	6
6	A2046	1/4-20 NYLOCK NUT	18
7	A2190	1/4 FLAT WASHER	28
8	00154	FUEL TANK STRAP	1
9	00130	FUEL LINE	1
10	01031	HOSE CLAMP	2
11	00129	FUEL VALVE	1
12	00180	FUEL TANK INSUL.	1
13	A1005	1/4-20 X 1-3/4	8
14	00127	FUEL CAP	1
15	02926	OIL COOLER GUARD	1
16	00125A	OIL COOLER	1
17	A2192	3/8 FLAT WASHER	8
18	A2050	3/8 NYLOCK NUT	4
19	4501-12-16	1" MP X 3/4 HOSE	1
20	02943	HOSE-COOLER TO TANK	1
21	A1046	3/8-16 X 2	4
22	02942	HOSE-COOLER TO FILTER	1
23	00152	HOSE CLAMP	4
24	01008	RESERVOIR	1
25	04503-12-12	3/4 MP X 3/4 HOSE 45	1
26	4404-16-12	#12 SAE X 1 HOSE	1
27	00131	FILTER-BREATHER	1
28	231P-16	PLUG	1
29	A1002	1/4-20 X 1	4
31	A1025	5/16-18 X 1-3/4	6
32	02339	COOLER GUARD	1
33	A1022B	5/16-18 X 1 BRASS	2
34	00122	BATTERY	1
35	A2191B	5/16 FLAT WASHER BRASS	2
36	A2048B	5/16 - 18 NYLOCK NUT BRASS	2
37	00121-02-01	BATTERY POST COVER	1
38	A1022	5/16-18 X 1	1
39	00172	BATTERY RETAINER CLIP	1
40	A2048	5/16 NYLOCK NUT	7
41	A2191	5/16-18 FLAT WASHER	14
42	A1454	3/8-16 JAM NUT	4
43	00121	BATTERY POSITIVE CABLE	1
44	00120	BATTERY NEGATIVE CABLE	1
45	00181	FAN	1





## 12. Disclaimer

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

## 13. Contact

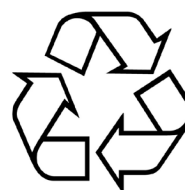
Address	Phone	Internet and E-mail
		www.Pandrol.com

## 14. Recycling and Environment

Sustainable environment is a great part of Pandrol.

All components of the product 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](https://pandrol.com)

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