

Preparing your power pack for use continued...

Each unit is fitted with a BLACK relief valve spring (item 12) as standard (unless specifically ordered otherwise).

Your power pack comes with additional springs for different pressure ranges. The table in Fig 5.1 specifies the spring range for each coloured spring.

| Spring Colour | Pressure range                 |
|---------------|--------------------------------|
| BLUE          | 300 - 600PSI (21 - 42 Bar)     |
| GREEN         | 600 - 1000PSI (42 - 69 Bar)    |
| RED           | 1000 - 2000PSI (69 -138 Bar)   |
| BLACK         | 2000 - 4000PSI (138 - 276 Bar) |

Fig 5.1 Colour coded spring pressure range

**It is strongly recommended that adjustment procedures outlined in this instruction are carried out by a suitably qualified hydraulic technician.**

## Maintenance

### Oil Levels:

Prior to each operation, the oil level in the reservoir should be checked and topped up if necessary.

If regular top ups of the oil are required, there may be a system problem where oil is leaking from the hydraulic circuit. Check each hose connection, all actuator seals and reservoir seal to identify the source of the leak and rectify immediately.

### Filters:

Each unit is fitted with a filtered filler breather (item 17) to help prevent the ingress of foreign particles in to the oil system. Over time the breather can become clogged and should be replaced regularly. The breather should be inspected regularly for clogging and replaced as necessary.

Your Stone power pack is also fitted with a suction strainer (item 9) which is mounted to the intake of the hydraulic pump and is located inside of the oil reservoir.

The suction filter helps prevent ingress of harmful material entering the hydraulic circuit through the pump intake which can cause damage to the power pack or other hydraulic components.

The suction filter should be replaced as part of a regular maintenance routine.

### Motor and electrical connections:

The motor is fitted with carbon brushes (item 13) that wear over time. The brushes should be checked regularly by a qualified automotive electrician and replaced when necessary.

Regularly inspect all electrical connections to ensure that they are secure and that terminals are in good condition. Poor connections can produce electrical arcing which could create a fire hazard.



**DO NOT PRESSURE WASH THE HYDRAULIC POWER PACK**

## Troubleshooting

If for any reason you are experiencing some difficulty with your SPX Stone power pack, check the following table for possible causes of the problem. If you cannot rectify any issue with these simple check procedures return the power pack to the point of purchase for inspection.

| Symptom                             | Possible cause                          | Remedy   |
|-------------------------------------|---|--|
| Motor will not run                  | Faulty electrical connections           | Check all electrical connections in accordance with instructions                   |
|                                     | Insufficient battery power              | Charge or replace battery  |
|                                     | Faulty starter solenoid                 | Replace starter solenoid   |
|                                     | Faulty motor                            | Replace motor  |
| Motor starts but load will not move | Faulty electrical connections           | Check all valves' electrical connections (if fitted with electric operated valves) |
|                                     | Faulty valve solenoid                   | Replace valve solenoid   |
|                                     | Faulty valve                            | Replace valve  |
|                                     | Insufficient oil                        | Check oil and replenish if necessary   |
|                                     | Faulty pump coupling                    | Return to service centre   |
| Load moves but stops prematurely    | Insufficient oil                        | Check oil and replenish if necessary   |
|                                     | Faulty electrical connections           | Check all valves electrical connections (if fitted with electric operated valves)  |
|                                     | Incorrect orientation of suction filter | Reposition suction filter  |
| Erratic movement of actuators       | System not bled properly                | Bleed system   |
|                                     | Faulty electrical connections           | Check all electrical connections in accordance with instructions                   |

**SPX** **STONE**<sup>TM</sup>

# Owner's instructions

PLEASE READ CAREFULLY



## 12 & 24 volt DC Hydraulic power packs 2nd Edition



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## Introduction

Congratulations on the purchase of your new SPX Stone power pack!  
Your Stone power pack is designed to give a long trouble free service life with just a few minor maintenance checks at regular intervals.

Please read the instructions carefully and always operate this equipment in a safe manner.  
For more technical problem solving, please consult a qualified hydraulic technician.

### Power pack Layout

Depending on the type of power pack you may have, there are a number of differences that may be obvious between your power pack and the unit shown below. All power packs have some common features and a quick review of your pack should help you better understand what each component is.

The electric motor is coupled to the pump via the endhead. The endhead provides oil flow direction through galleries inside the endhead. The endhead also houses the various valve options that are available for SPX Stone power packs.

There are three basic types of power packs that SPX Stone offer.

1. Single acting
2. Double acting
3. Remote valve

Fig 1.1 shows a basic **single acting** power pack which has a solenoid lower valve (item 3) to lower the load under gravity.

Fig 1.2 shows the manual lowering valve that fits in place of the solenoid operated version (item 3).

The **double acting** version (not shown) has a special adaptor plate that mounts the double acting valve to the endhead. It does not have a solenoid lowering valve (item 3)

The **remote valve** version looks similar to the unit in Fig 1.1 however it does not have a solenoid lowering valve (item 3). The remote valve unit also utilises the return port (see Fig 2.1).

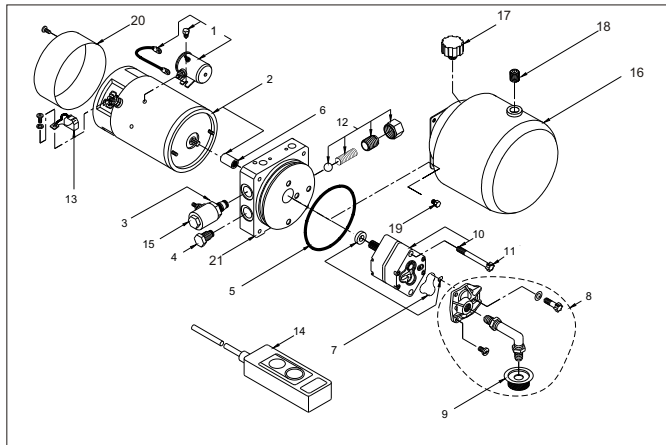


Fig 1.1 Power pack exploded view

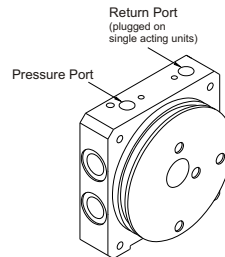


Fig 2.1 Service ports

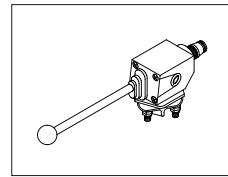


Fig 1.2 Manual Lowering valve

| Item | Description                      | QTY | Item | Description                         | QTY |
|------|----------------------------------|-----|------|-------------------------------------|-----|
| 1    | Solenoid starter assembly        | 1   | 14   | Electric pendant control (Optional) | 1   |
| 2    | DC Motor                         | 1   | 15   | Solenoid coil                       | 1   |
| 3    | Solenoid lowering valve          | 1   | 16   | Oil reservoir                       | 1   |
| 4    | Check cartridge                  | 1   | 17   | Filler breather                     | 1   |
| 5    | Reservoir O-ring                 | 1   | 18   | Alternate breather plug             | 1   |
| 6    | Coupling                         | 1   | 19   | Tank fastening screw                | 4   |
| 7    | Pump O-ring kit                  | 1   | 20   | Motor cover                         | 1   |
| 8    | Inlet plumbing kit               | 1   | 21   | Endhead                             | 1   |
| 9    | Suction strainer                 | 1   |      |                                     |     |
| 10   | Pump assembly                    | 1   |      |                                     |     |
| 11   | Pump mounting bolt               | 2   |      |                                     |     |
| 12   | Adjustable relief valve assembly | 1   |      |                                     |     |
| 13   | Motor brush                      | 2   |      |                                     |     |

## Operation and Maintenance

### Connecting your power pack to the power supply.

Your SPX Stone power pack is usually fitted with a **solenoid starter assembly** (item 1) that is mounted to the DC motor. It has two large terminal posts and depending on the type of unit that you have, it may have either one or two small connection terminals.

The unit with only one small terminal is for use on vehicles that are negative to ground.  
The two terminal model is for use on insulated earth vehicles.

Fig 3.1 & 3.2 show the two options that are available.

A positive switchable power source must be connected to terminal 1 and a negative power source must be connected to terminal 2.

#### Solenoid starter assembly

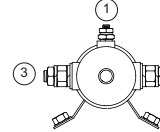


Fig 3.1 Single terminal (for negative earth)

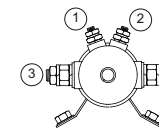


Fig 3.2 Dual terminal (for insulated earth)

The main positive battery lead must be connected to terminal 3. See Fig 3.3

It is important to ensure that the correct size battery leads are used for your particular installation to avoid voltage drop. Make sure that the battery has sufficient charge to run the DC motor.

**Low voltage could cause damage to the DC motor. DC motors should not be run for extended periods.**  
(Consult technical data for duty cycles-Available from your dealer)

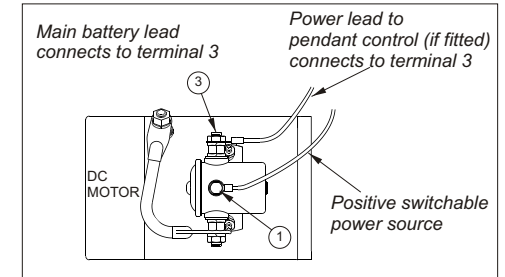


Fig 3.3 Connecting single terminal motors

The negative supply to your power pack can be connected in a number of ways:

#### 1. Single terminal motors

The chassis of the vehicle to which the power pack is to be mounted may be negative (-) ground. Therefore the process of mounting the power pack to the vehicle chassis will provide a negative (-) supply to the motor. Alternatively, a battery lead from the negative (-) terminal of the battery can be connected directly to the body of the power pack.

The most suitable point of connection for the negative (-) battery lead is at the mounting bolts that fix the power pack to the vehicle (for single terminal motors).

#### 2. Dual terminal motors

Where the power pack is fitted with a dual terminal motor, independent battery leads **must** be connected to the connection terminals of the DC motor. See Fig 4.1 for correct connection of battery terminals.

Check the vehicle specifications for your vehicle to determine the most suitable connection method.

**Please consult with a qualified automotive electrician for correct connection of DC electrical devices.**

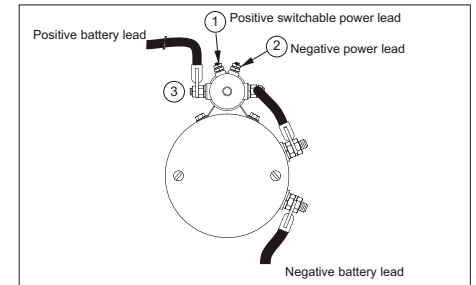


Fig 4.1 Connecting dual terminal motors

### Preparing your power pack for Operation.

After you have correctly connected the power pack to a suitable power supply, the unit must next be filled with a suitable grade of hydraulic oil. (SHELL Tellus 32 or equivalent)

As part of the installation process, the hydraulic system to which your power pack is installed, must be bled of all air.

To correctly bleed your hydraulic system it is necessary to "crack" the supply line to the hydraulic actuator and briefly operate the power pack until all air is expelled from the supply line and a clear stream of oil flows out.

Oil should be bled in to a suitable receptacle to prevent environmental hazards.

Once a continuous stream of fluid is present without

evidence of air, the supply line should be tightened and the power pack switched off.

All hydraulic service procedures should be carried out in a safe manner. Ensure all loads are sufficiently supported by a mechanical means to prevent personal injury or death.

Once all of the hydraulic actuators have been bled of air they should be fully retracted and the level of oil in the reservoir should be checked and topped up if necessary.

Your power pack has a relief valve that has not been set to any specific setting (unless specifically ordered otherwise). It is important to ensure that the relief valve is adjusted in accordance with your system requirements. (see over leaf)