DURAPAC
ENGINEERED FOR RELIABILITY

Instruction Manual

Petrol Hydraulic Power Unit
Model – PPM2014

Maximum Operating Pressure – 700 bar

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This is a safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid injury or death

1.0 Product Information

DURAPAC – Petrol Hydraulic Power Units are engineered to meet Industrial Standards for Performance and Safety. The PPM2014 model features a powerful 4 stroke high pressure hydraulic power unit, equipped with a protection cage that makes it easier to move and lift and provides protection on construction sites. With a 10 litre aluminium reservoir it may be used with a wide range of equipment.

- Powerful Honda GXV 2.6 kW 4 stroke petrol engine
- Aluminium 10 litre oil reservoir
- Rugged tubular protection cage
- Easy to read, large 100mm diameter glycerine filled pressure gauge (optional)
- 4 way, 3 position manual directional valve with internal check valve
- Fast 4.5 Lpm first stage (70 bar) oil flow and 1.8 Lpm oil flow at 700 bar

Special skill, knowledge and training may be required for a specific task and the product may not be suitable for all jobs. The user must ultimately make the decision regarding suitability of the product for any given task and assume the responsibility of safety for all in the work area. Contact a Durapac representative if you are unsure of your power units' suitability for a particular application.

2.0 Receiving Instructions

It is recommended prior to use that an inspection be done by qualified personnel and that any missing or damaged parts, decals, warning/safety labels or signs are replaced with Durapac authorised replacement parts only. Any power unit that appears to be damaged in any way, is worn, leaking or operates abnormally should be removed from service immediately until such time as repairs can be made. Any power unit that has been or suspected to have been subject to a shock load should be removed from service immediately until inspected by a Durapac authorised service centre. Owners and operators of this equipment should be aware that the use and subsequent repair of this equipment may require specialised training and knowledge.

3.0 Safety

Save these instructions. For your safety, read and understand the information contained within. The owner and operator should understand this product and safe operating procedures before attempting to use this product. Instructions and safety information should be conveyed in the operator's native language before use of this product is authorised. Make certain that the operator thoroughly understands the inherent dangers associated with the use and misuse of the product. If any doubt exists as to the safe and proper use of this product as outlined in this factory authorised manual, remove from service immediately.

DANGER:

- To avoid personal injury keep hands and feet away from work area during operation
- **Do NOT** handle pressurised hoses. Escaping oil under pressure can penetrate the skin

causing serious injury. If oil is injected under the skin, see a doctor immediately

- Stay clear of loads supported by hydraulics. A cylinder, when used as a load lifting device, should never be used as a load holding device. After the load has been raised or lowered, it must always be supported mechanically

WARNING:

- The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Install pressure gauges in the system to monitor operating pressure. It is your window to what is happening in the system
- Always wear appropriate *personal protective equipment* (*PPE*) when operating hydraulic equipment. The operator must take precaution against injury due to failure of the tool or work piece(s)
- **Do NOT** hold or stand directly in line with any hydraulic connections while pressurising
- **Do NOT** attempt to disconnect hydraulic connections under pressure. Release all line pressure before disconnecting hoses
- All personnel must be clear before lowering load or depressurising the system
- **Do NOT** attempt to lift a load weighing more than the capacity of the cylinder

IMPORTANT:

- If at any stage, the safety related decals become hard to read, these must be replaced
- Minimum age of the operator must be 18 years. The operator must have read and understood all instructions, safety issues, cautions and warnings before starting to operate the equipment. The operator is responsible for this activity towards other persons
- **Do NOT** lift hydraulic equipment by the hoses or couplers. Use the carrying handle or other means of safe transport
- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Durapac authorised service centre in your area. To protect your warranty, use only high-quality hydraulic oil

CAUTION:

- **KEEP HYDRAULIC EQUIPMENT AWAY FROM FLAMES AND HEAT.** Hydraulic fluid can ignite and burn. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance do not expose equipment to temperatures of 65°C (150°F) or higher. Protect all equipment from weld spatter
- No alteration should be made to this device

3.1 Hydraulic Power Units

- **Do** use a gauge or other load measuring instrument to verify load
- **Do NOT** exceed the rated capacity of the power unit or any equipment in the system. Burst hazard exists if connection pressure exceeds rated pressure

- **Do NOT** operate the system with bent or damaged couplers or damaged threads
- **Do NOT** subject the power unit and its components to shock loads
- Use only Durapac approved accessories and components
- **Do NOT** connect to an application which can return more oil to the reservoir than the power unit reservoir can hold
- **Do NOT** connect power unit to a hydraulic system that is powered by another pump

3.2 Hydraulic Hoses & Fluid Transmission Lines

- Avoid short runs of straight-line tubing. Straight line runs do not provide for expansion and contraction due to pressure and/or temperature changes
- Reduce stress in tube lines. Long tubing runs should be supported by brackets or clips. Before operating the power unit, tighten all hose connections with proper tools. Do not over tighten. Connections should be tightened securely and leak-free. Over tightening can cause premature thread failure or high-pressure fittings to burst
- Should a hydraulic hose ever rupture, burst or need to be disconnected, immediately shut off the power unit and release all pressure. Never attempt to grasp a leaking pressurised hose with your hands. The force of escaping hydraulic fluid can inflict injury
- **Do NOT** subject the hose to potential hazard such as fire, sharp objects, extreme heat or cold or heavy impact
- **Do NOT** allow the hose to kink, twist, curl, crush, cut or bend so tightly that the fluid flow within the hose is blocked or reduced. Periodically inspect the hose for wear
- Hose material and coupler seals must be compatible with the hydraulic fluid used. Hoses also must not come in contact with corrosive materials such as battery acid, creosote-impregnated objects and wet paint. Never paint a coupler or hose

FAILURE TO HEED THESE WARNINGS MAY RESULT IN PERSONAL INJURY AS WELL AS PROPERTY DAMAGE.

4.0 Installation

WARNING:

- **Do NOT** overfill the tank beyond its permitted maximum capacity. Any sudden backflow from the circuit downstream from the pump might cause the tank to burst
- **Never** connect a control unit to an application with an oil volume greater than the capacity of the tank. Sudden backflow from the circuit downstream from the pump might cause the tank to burst

IMPORTANT:

- This power unit is for use with a double-acting cylinder ONLY! Ensure that both A and B ports are properly connected to a double acting application
- Always secure threaded port connections with high grade, non-hardening pipe thread sealant. Teflon tape can be used if only one layer of tape is used and it is applied carefully, two threads back, to prevent the tape from being introduced into hydraulic system, which could cause jamming of precision-fit parts

4.1 Familiarise yourself with the specifications and illustrations in this owner's manual. Know your power unit, its limitations and how it operates before attempting to use. Refer to specification chart below or if in doubt, contact a Durapac representative.

Model Number	Motor Type/Brand	Hydraulic Pressure (bar)	Hydraulic Reservoir Capacity (L)	Motor Fuel	Motor Power (kW/RPM)	Dimensions Outside Frame (mm) LxWxH	Weight incl. oil & frame (kg)
PPM2014	4-Stroke / Honda	700	10.0	Petrol	2.6 / 3,000	470x372x630	47

4.2 Place the control unit in a horizontal position where it is stable and all feet are in contact with the surface that it is standing on. Where possible, fix the control unit to the surface that it is standing on.

4.3 Ensure that there is adequate oil in the reservoir to perform the required function. Ideally the gauge should not read less than 1/3. If this is the case see section 6.1 Adding Hydraulic Fluid.

4.4 Hydraulic connections – check all system fittings and connections to be sure they are tight and leak free.

4.5 Completely fill the fuel tank with petrol. The bleeding of the fuel system is automatic.

4.6 Remove air from the system – Air can accumulate in the hydraulic system during the initial setup or after prolonged use, causing the cylinder to respond slowly or in an unstable manner. Should removal of air from power unit be required, please follow the steps in 6.2 – Bleeding Air from the System in the Maintenance Section.

5.0 Operation

WARNING:

- **Do NOT** install the control unit in an inclined position. This may cause oil to leak or the oil feed unit to malfunction
- Noise levels for a petrol –driven motor are around 90 dB, so suitable protection (earmuffs) should be worn during use
- **Do NOT** operate the power unit in closed or badly ventilated rooms

IMPORTANT:

- **Never** set the relief valve to a higher pressure than the maximum rated pressure of the power unit. Higher settings may result in equipment damage and/or personal injury
- **Do NOT** remove the relief valve
- The power unit has a high pressure safety valve set to 700 bar. The operator should ensure the tool he is operating is adequately rated
- Always monitor pressure, load or position using suitable equipment. Pressure may be monitored by means of an optional manifold and gauge. Do not load a hydraulic application (cylinder, spreader etc) to more than 80% of its rated capacity. Load may be monitored by means of a load cell and digital indicator. Correct application position can only be determined by the operator of the equipment
- **Do NOT** operate a power unit that is disconnected from the application. If operated in this condition, the hose and connections will become pressurised. This increases the chance of a burst hazard. Damage may also occur to the power unit and its components
- When the hydraulic circuit has been set up, it is advisable to run the system a few times with no load, to check that it is working off-load
- The operator should stand in a position from where he/she has a clear view of and access to the controls and instruments on the control unit, as well as the movements of the applications employed in any operation
- If a coupling does not screw down easily by hand, do not attempt to force it with mechanical means. Excessive force may damage the thread. Check that couplings are clean and free of foreign matter

5.1 Before Using the Power Unit

5.1.1 Check all system fittings and connections to be sure they are tight and leak free.

5.1.2 Check hydraulic oil level in reservoir. See section 6.1 Adding Hydraulic Fluid, if required.

5.1.3 Check the engine oil level. Refill if required.

5.1.4 Check fuel level. Refill if required.

5.1.5 Auxiliary equipment should be placed in neutral.

5.2 Before Starting the Engine

5.2.1 Set speed control lever to the STOP position.

5.2.2 Move the speed control lever to ½ START or all the way to the START position, as desired or necessary.

Note - Starting at a lower speed will help prevent exhaust smoke.

5.2.3 Ensure the directional control valve is positioned in the centre free flow position.

5.3 Starting the Engine

5.3.1 Start the motor.

5.3.2 Activate any directional valves fitted.

5.3.3 Set the directional valves to discharge or stop the motor to interrupt the oil supply.

5.4 Relief Valve Adjustment

All power units contain a factory set relief valve to prevent over-pressurisation of the system. A deck mounted adjustable pressure relief valve is optional and can be set to lower working pressures.

6.0 Maintenance

IMPORTANT:

- Check oil level regularly
- Use only good quality hydraulic fluid. **Do NOT** use brake fluid, transmission fluid, turbine oil, motor oil, alcohol, glycerine etc. Use of anything other than good quality hydraulic oil will void warranty and damage the power unit, hose, and application. We recommend Durapac Hydraulic Oil or equivalent
- Equipment must only be serviced by a qualified hydraulic technician. For repair service, contact your local Durapac authorised service centre
- Tighten connections as needed. Use non-hardening pipe thread compound when servicing connections

Carry out a regular service check once a year or after every 30 hours of operation. For the regular service check, complete the same checks as below for the preventative maintenance, but in addition, the control unit should be dismantled and cleaned, to make sure its internal parts are all in good condition. This work needs to be performed by a qualified technician. For repair service, contact the Durapac authorised service centre in your area.

Dirt, sand, etc. will quickly ruin any hydraulic system. Ensure that couplings are clean and free of foreign matter. After each use, clean couplings and attach dust caps.

Maintenance is required when wear or leakage is noticed. Periodically inspect all components to detect any problem that may require service and maintenance.

6.1 Adding Hydraulic Fluid

⚠ WARNING: Always add oil with cylinders fully retracted (or extended, if pull cylinders) or the system will contain more oil than the reservoir can hold.

6.1.1 Depressurise and disconnect hydraulic hose from application/cylinder.

6.1.2 With the power unit in its upright, horizontal position, remove the air vent plug located on the top plate of the reservoir.

6.1.3 Take out the filling plug.

6.1.4 Use a small funnel to fill the oil to within 20mm of the opening.

6.1.5 Bleed air from system if necessary.

6.1.6 Wipe up any spilled fluid and reinstall the air vent plug/reservoir cap.

6.2 Bleeding Air from the System

6.2.1 Repeat Steps 6.1.1 to 6.1.4 (above) if required.

6.2.2 Invert cylinder and place at a lower level than the power unit reservoir.

6.2.3 Extend and retract the cylinder several times without putting a load on the system. Air will be released into the power unit reservoir.

6.3 Changing Hydraulic Fluid

⚠ For best results, change fluid once a year or every 300 hours of use.

6.3.1 Repeat Steps 6.1.1 to 6.1.3 (above).

6.3.2 Tilt power unit to drain out old oil into a sealable container.

6.3.3 Repeat Steps 6.1.4 to 6.1.6 (above).

6.3.4 Dispose of fluid in accordance with local regulations.

6.4 Preventative Maintenance

⚠ These checks need to be completed **before** the pump is hydraulically connected to the circuit

6.4.1 Examine the overall condition and cleanliness of the equipment.

6.4.2 Ensure the freedom of movement of controls off-load.

6.4.3 Check for oil leaks.

6.4.4 Confirm operating efficiency of the relief valve and/or distributor.

6.4.5 Ensure the maximum operating pressure has be set with reference to the pressure gauge.

6.4.6 Check for damaged or badly fitted accessories.

6.5 Storage

6.5.1 When not in use, depressurise and disconnect the power unit from the application.

6.5.2 Wipe clean, thoroughly and store in clean, dry environment. Avoid temperature extremes.

6.5.3 For transportation or long storage, replace the air vent plug with the shipping plug.

7.0 Troubleshooting

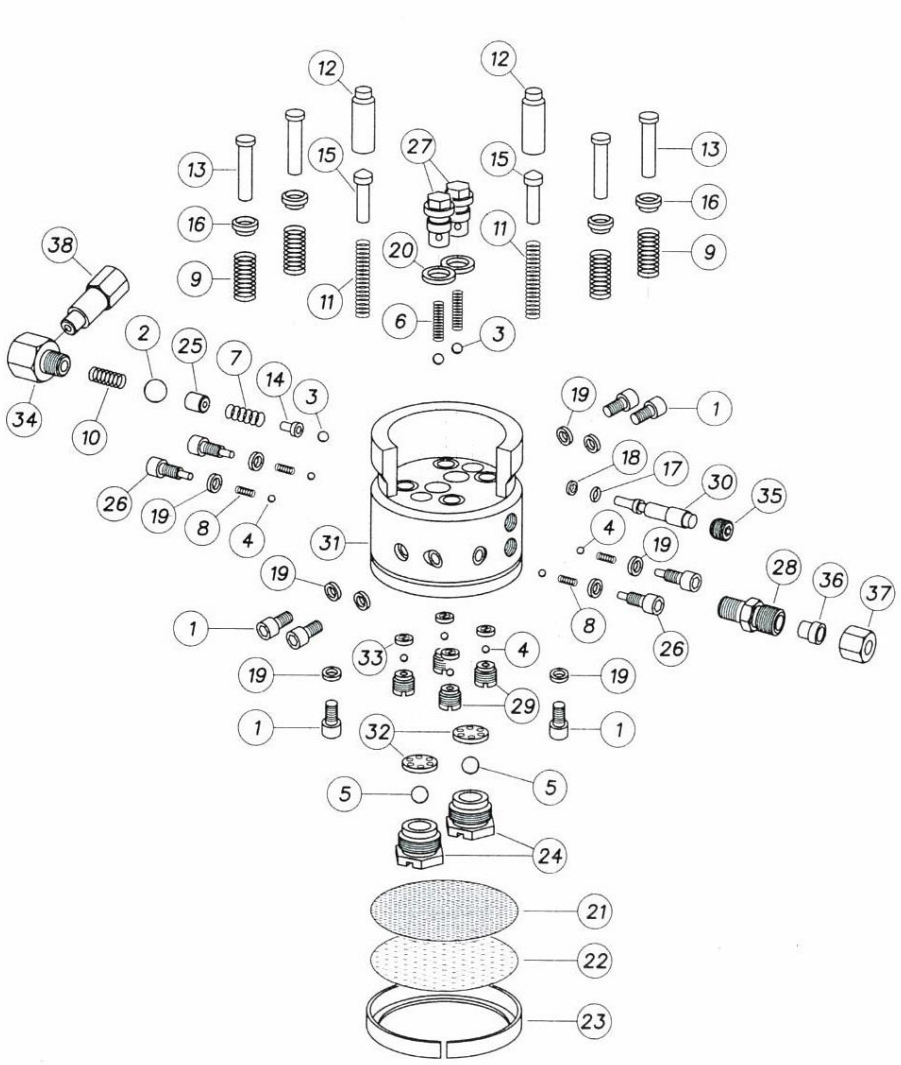
Problem	Cause	Solution
Noisy operation	Air trapped in system	• Check all points where air may leak into the system • Refer to 6.2 – Bleeding Air from the System
	Power unit reservoir too full	• Drain fluid to correct level
	Low fluid level in power unit reservoir	• Refer to 6.1 – Adding Hydraulic Fluid • Fill and bleed the system
Power unit oil is over-heating	Oil viscosity is too high	• Refer to 6.3 – Changing Hydraulic Fluid • Refill with a good quality hydraulic oil
	High pressure leakage on upper pressure plate	• Tighten plug
	Low fluid level in power unit reservoir	• Refer to 6.1 – Adding Hydraulic Fluid • Fill and bleed the system
Power unit runs but will not pump oil	Power unit is not primed	• Run power unit a few minutes tipping from side to side
	Relief valve open / directional valve in discharge position	• Reset the relief valve / directional valve to appropriate position
	Badly connected couplings	• Remove/replace and tighten couplings
	Shortage of oil in tank	• Refer to 6.1 – Adding Hydraulic Fluid • Fill and bleed the system
	Accumulation of dirt in the hydraulic circuit	• **Secure load by other means** • Clean and flush lines
	Damaged o-ring	• Send to a Durapac authorised service centre for repair
	Defective control valve	• Send to a Durapac authorised service centre for repair
Power unit does not reach rated capacity	Low fluid level in reservoir	• **Secure load by other means** • Depressurise power unit and hose, remove application, then fill and bleed the system
	Safety valve on wrong setting	• Reset the safety valve to an appropriate setting
	Pressure regulator valve set at a value that is too low	• Reset the regulator valve to an appropriate setting
	Worn or damaged seals	• Replace worn seals • Look for excessive contamination or wear • Replace contaminated fluid
	Leaking system components	• Repair or replace as necessary
Poor performance	Fluid level in power unit is low	• **Secure load by other means** • Depressurise power unit and hose, remove application, then fill and bleed the system

Problem	Cause	Solution
Application does not extend, move or respond to pressurised fluid	Overload condition	• Remedy overload condition
	Loose couplers	• Tighten couplers
	Faulty couplers	• Replace couplers
	Malfunctioning power unit	• Contact a Durapac authorised service centre for repair
Application does not fully extend (cylinder or spreader)	Reservoir overfilled	• **Secure load by other means** • Depressurise power unit and hose, remove application, then drain fluid to proper level
	Low fluid level in power unit reservoir	• **Secure load by other means** • Depressurise power unit and hose, remove application, then fill and bleed the system
	Load above capacity of system	• Use correct equipment
Application responds slower than normal	Loose connection or coupler	• Tighten couplers
	Restricted hydraulic line or fitting	• Clean and replace if damaged
	Power unit not operating correctly	• Check the power unit's operating instructions • Repair or replace as necessary
	Low fluid level in power unit reservoir	• **Secure load by other means** • Depressurise power unit and hose, remove application, then fill and bleed the system
Application responds to pressurised fluid, but system does not maintain pressure	Leaky connection	• Clean, reseal with thread sealant, and tighten connection
	Worn or damaged relief valve / directional valve	• Contact a Durapac authorised service centre for repair
	Worn or damaged check valve	• Contact a Durapac authorised service centre for repair
	Air in the circuit	• Check all points where air may leak into the system • Refer to 6.2 – Bleeding Air from the System
	Leaking cylinder seals	• Replace worn seals • Look for excessive contamination or wear • Replace contaminated fluid
	Accumulation of dirt in the hydraulic circuit	• **Secure load by other means** • Clean and flush lines
	Overload condition	• Remedy overload condition
Application does not return fluid to power unit (i.e. cylinder will not retract)	Closed release valve	• **Secure load by other means** • Open release valve
	Too much oil in the reservoir	• **Secure load by other means** • Depressurise power unit and hose, remove application, then drain fluid to proper level
	Relief valve not fully open	• Fully open the relief valve
	Accumulation of dirt in the hydraulic circuit	• **Secure load by other means** • Clean and flush lines

Problem	Cause	Solution
	Loose couplers	• **Secure load by other means** • Tighten couplers
	Restrictions in the pipeline	• **Secure load by other means** • Clean and flush lines
	Weak or broken retraction springs	• **Secure load by other means** • Contact a Durapac authorised service centre for repair
	Internally damaged cylinder	• **Secure load by other means** • Contact a Durapac authorised service centre for repair

8.0 Parts Breakdown and List

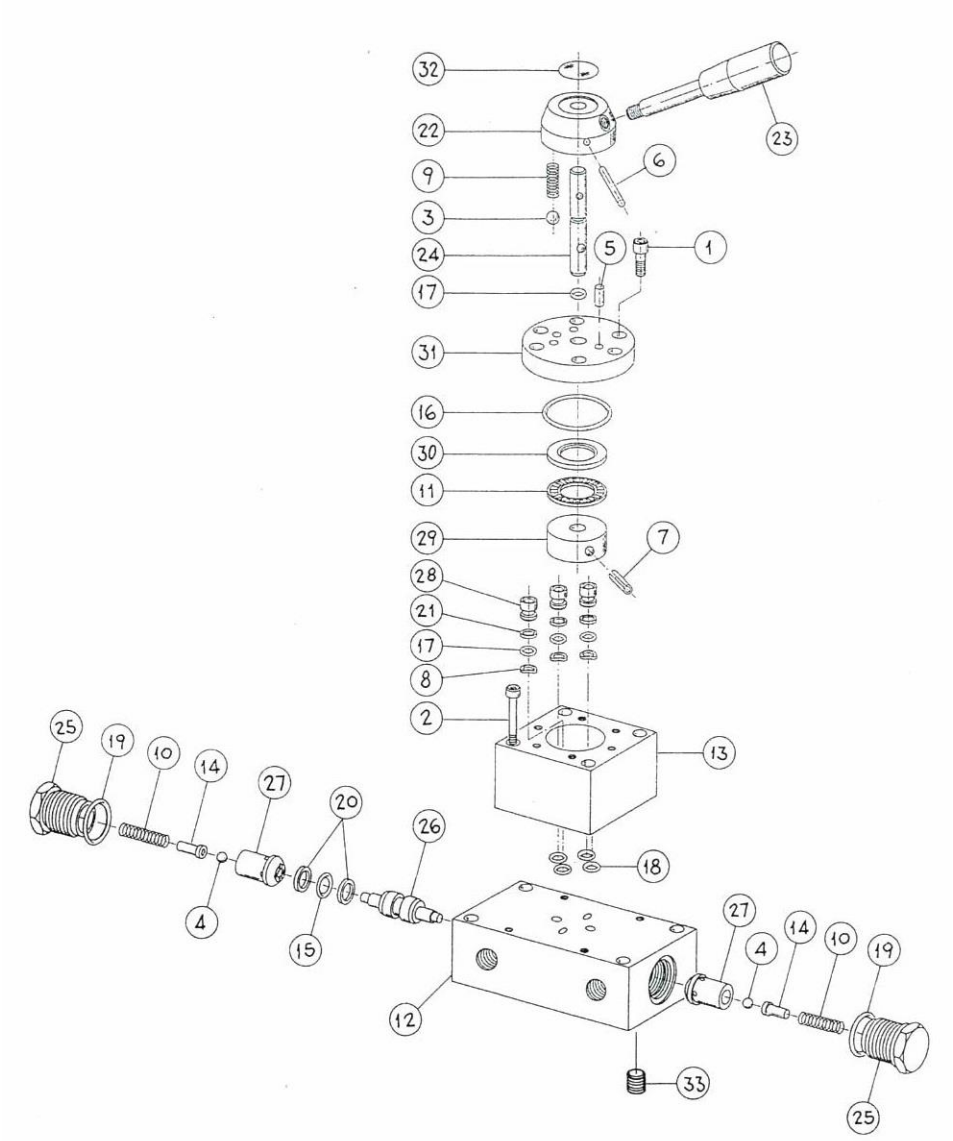
8.1 Piston Pump



Item	Description	Part No.	Qty
1	M5x8 screw	ZCG1000	6
2	1/2" ball	ZCG1001	1
3	1/4" ball	ZCG1002	3
4	1/8" ball	ZCG1003	8
5	3/8" ball	ZCG1004	2
6	Spring	ZCG1005	2
7	Spring	ZCG1006	1
8	Spring	ZCG1007	4
9	Spring	ZCG1008	4
10	Spring	ZCG1009	1
11	Spring	ZCG1010	2
12	D.11 piston	ZCG1011	2
13	D.6 piston	ZCG1012	4
14	Ball guide pin	ZCG1013	1
15	D.11 piston spring guide	ZCG1014	2
16	D.6 piston spring guide washer	ZCG1015	4
17	O-ring	ZCG1016	1
18	Bk-ring	ZCG1017	1
19	Copper ring	ZCG1018	10

Item	Description	Part No.	Qty
20	Copper ring	ZCG1019	2
21	Suction filter	ZCG1020	1
22	Suction filter support	ZCG1021	1
23	Suction filter retaining ring	ZCG1022	1
24	D.11 piston suction valve	ZCG1023	2
25	Drilled screw	ZCG1024	1
26	H.P. output valve screw	ZCG1025	4
27	L.P. output valve plug	ZCG1026	2
28	Output fitting	ZCG1027	1
29	D.6 piston suction plug	ZCG1028	4
30	Discharge valve spool	ZCG1029	1
31	Pump body	ZCG1030	1
32	L.P. suction washer	ZCG1031	2
33	H.P. suction washer	ZCG1032	4
34	Relief valve fitting	ZCG1033	1
35	1/8" NPT plug	ZCG1034	1
36	Cutting ring	ZCG1035	1
37	Locking nut	ZCG1036	1
38	Relief valve	ZCG1037	1

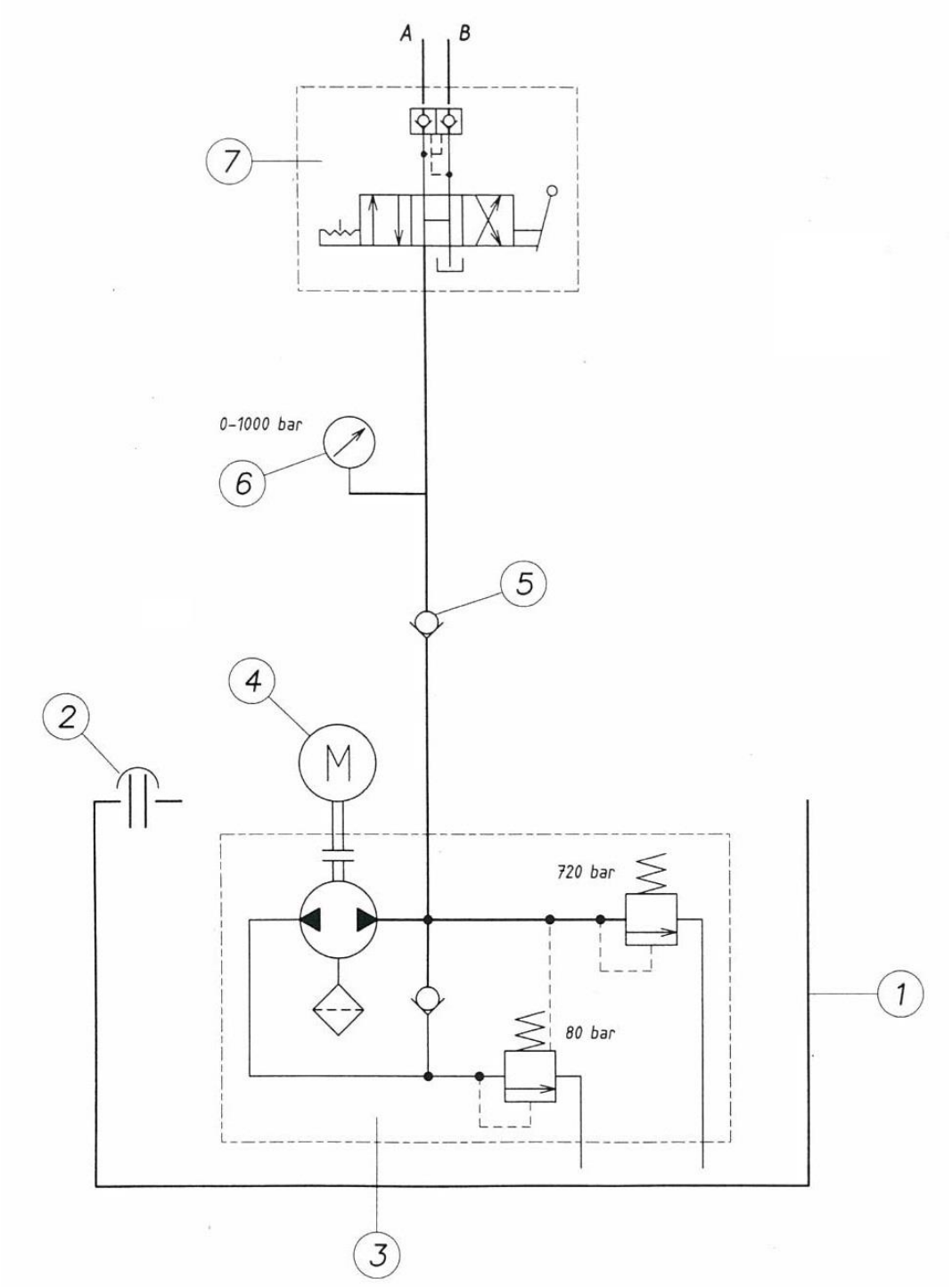
8.2 Manual Valve



Item	Description	Part No.	Qty
1	M5x12 bolt	ZCG1038	6
2	M6x45 bolt	ZCG1039	4
3	3/16" ball	ZCG1040	1
4	9/32" ball	ZCG1041	2
5	5x10 pin	ZCG1042	1
6	4x45 pin	ZCG1043	1
7	6x20 pin	ZCG1044	1
8	Washer	ZCG1045	3
9	Spring	ZCG1046	1
10	Spring	ZCG1010	2
11	Bearing	ZCG1047	1
12	Body	ZCG1048	1
13	Subplate	ZCG1049	1
14	Spring guide	ZCG1050	2
15	O-ring	ZCG1051	1
16	O-ring	ZCG1052	1

Item	Description	Part No.	Qty
17	O-ring	ZCG1053	4
18	O-ring	ZCG1054	4
19	O-ring	ZCG1055	2
20	Back-up ring	ZCG1056	2
21	Back-up ring	ZCG1057	3
22	Lower base	ZCG1058	1
23	Lever	ZCG1059	1
24	Valve stem	ZCG1060	1
25	Plug	ZCG1061	2
26	Spool	ZCG1062	1
27	Valve	ZCG1063	2
28	Shear valve	ZCG1064	3
29	Distributor	ZCG1065	1
30	Washer	ZCG1066	1
31	Valve disc	ZCG1067	1
32	Cap	ZCG1068	1
33	1/8" NPT plug	ZCG1034	1

9.0 Hydraulic Circuit



Item	Description	Part No.	Qty
1	10 L Reservoir	ZCG1069	1
2	Oil filler cap	ZCG1070	1
3	Piston pump	ZCG1071	1
4	Honda petrol motor	ZCG1072	1
5	Check valve	ZCG1073	1
6	0-700 bar gauge	ZCG1074	1
7	4W/3P manual valve	ZCG1075	1