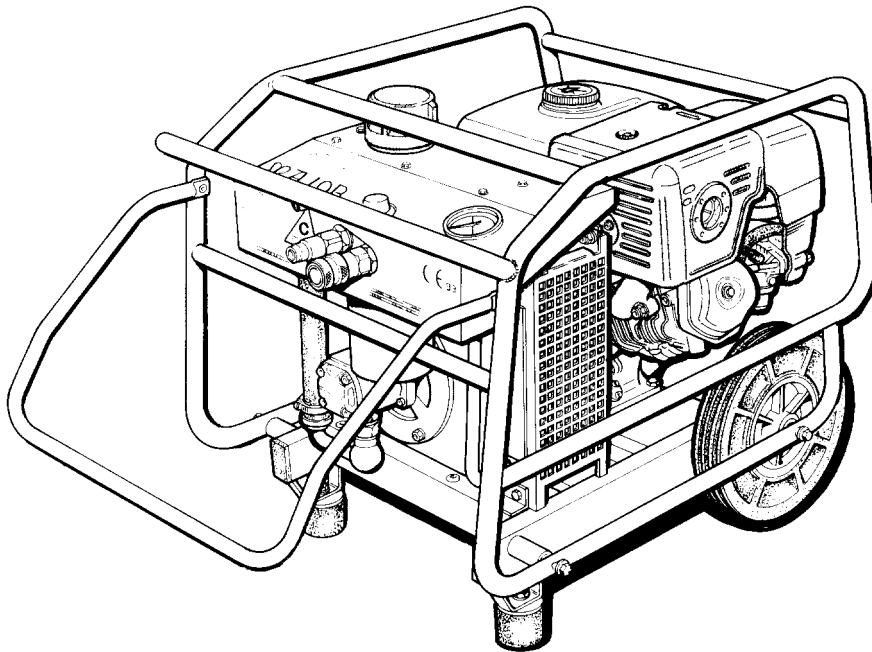




BELLE GROUP WILLERSEY.

**MAJOR 30-140 HYDRAULIC POWERPACK
OPERATING AND MAINTENANCE MANUAL**



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FOREWORD.

This manual contains general information on the operation and maintenance of the Belle Group Willersey Major Hydraulic Powerpack.

The manual is divided into the following sections :-

1. Description and Specification.
2. Operating Instructions.
3. Maintenance.
4. Parts Lists.
5. Safety.

A comprehensive Contents list follows this foreword.

Information contained in this manual is correct at the date of publication Belle Group Willersey have a policy of continuous improvement and therefore, reserve the right to make alterations without giving prior notice.

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SAFETY PRECAUTIONS.

WARNINGS AND CAUTIONS.

For the purpose of definition in this manual :-

A **WARNING** (printed in capital letters) gives information which, if ignored, could lead to

A **CAUTION** (printed in capital letters) gives information which, if ignored, could cause

FOR YOUR OWN PERSONAL SAFETY READ AND TAKE NOTE OF THE FOLLOWING:

EXHAUST GASES : Before starting the engine ensure that there is adequate ventilation to

REFUELLING : Never attempt to add fuel or oil when the engine is running. Use only the

MAINTENANCE : Do not attempt to carry out any maintenance work in the vicinity of the

Before disconnecting any part of the hydraulic system make sure that any

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SECTION 1 - DESCRIPTION AND SPECIFICATION.

1.1 INTRODUCTION.

The Belle Group Willersey. 30-140 Major Hydraulic power unit has been designed to provide a power source for a range of accessory tools including Breakers, Pumps, Drills, Disc Cutters, etc., compatible with EHTMA Category 'D' flow and Pressure.

The power units sturdy yet lightweight design makes it very portable and it will fit into most estate cars. The stainless steel frame provides convenient handling points and protects the unit. Non-drip Quick Release Couplings are provided to allow for clean and convenient connection of hoses and equipment.

The unit is mounted on a substantial steel chassis fitted with two rubber wheels and two rubber feet, making the unit very maneuverable yet stable when working.

The unit is powered by the reliable Honda GX390 Single Cylinder 4-stroke Petrol Engine. The Engine and Hydraulic oil systems are fitted with an "Oil.Alert" device to stop the machine if either oil level becomes too low.

1.2 DESCRIPTION OF OPERATION.

The Petrol Engine (1) drives the hydraulic pump (2) via a drive coupling assembly. The hydraulic pump draws oil from the tank (3) via a suction strainer and delivers it to the Valve Block (4) which incorporates a By-Pass valve to allow oil to circulate round the system when first started. Flow is directed to the Tool or Equipment via Non-Drip Quick Release Couplings after setting the By-Pass lever to the flow position.

When the accessory tool or equipment is in operation, oil flows to the accessory and is directed back through the return line at low pressure, through the Spin-on Return line filter (5) to tank, or via the cooler (6) depending on the oil temperature which is monitored by the Thermal Valve,

Max pressure is controlled by a Relief Valve fitted into the Valve Block. If the supply pressure exceeds that set by the relief valve, it operates to direct hydraulic oil back to the return line.

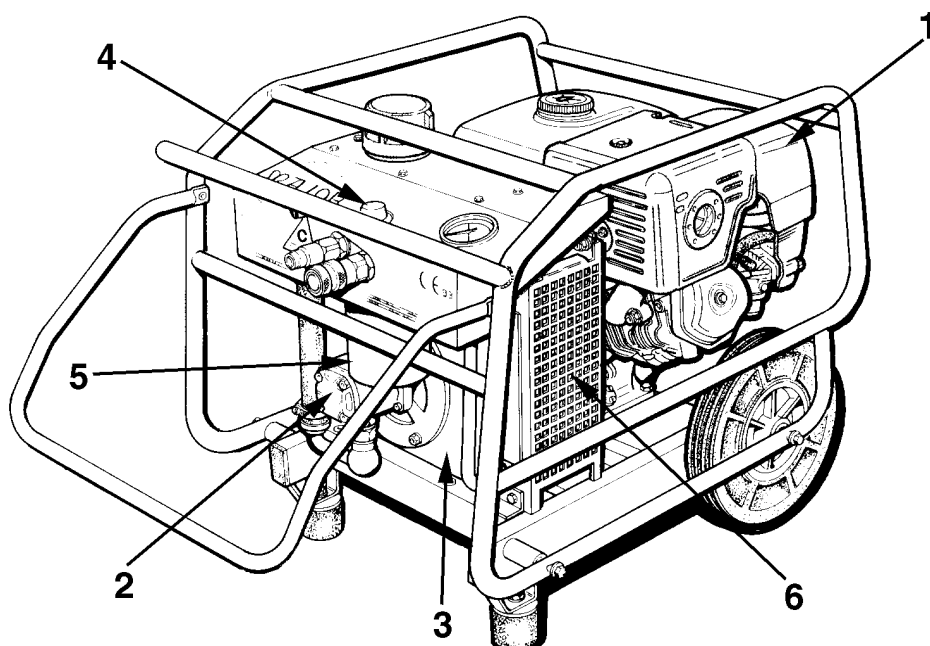
The oil pressure and hence the efficiency of the machine is influenced by temperature, and it is important that the correct working temperature is maintained. The oil temperature is controlled by a Thermal Valve, on initial start up the oil is cold and therefore its viscosity is high, The Thermal Valve directs the oil to tank. until such time as the oil temperature rises to its minimum working level. The Thermal Valve which incorporates a heat sensitive capsule will now direct the return line oil flow to tank via the cooler, thereby stabilizing the oil temperature.

Cooling air for the radiator is provided by a fan which is mounted onto the engine shaft and enclosed by a housing. The radiator is mounted at the side of the housing and is protected by a guard.

A filter condition gauge mounted on the cowl monitors the return line pressure. If the return line filter is blocked the pressure will rise, and when the indicator needle reaches the red sector under normal working conditions the filter should be replaced.

The supply line is protected from the ingress of dirt by a Suction Strainer situated in the hydraulic tank. The Tank also incorporates a Sight Level Gauge and a Float Switch. The Level Gauge provides indication of oil level,(The correct level being at the top of the sight glass) and the Float Switch monitors the oil level and stops the engine at the preset low level.

The engine is fitted with an oil sensor, which operates in a similar manner to the hydraulic tank float switch to protect the engine if its lubricating oil level falls below a safe level.



1.3 SPECIFICATION.

Engine:- Engine	Honda GX390 single cylinder, air cooled. 13 Hp Petrol Refer to Engine Manual for further details.
Hydraulic Flow: -	30 litres/min. (6.7 GPM) EHTMA Class D.
Working Pressure:-	138 Bar (2000 Psi)
Dimensions:-	Height.....560 mm Width.....540 mm Length.....720 mm
Hose:-	7 metres long Siamese, 1/2" bore. min. Burst Pressure 828 Bar (12000 Psi)
Hydraulic Oil:-	For ambient Temperatures below 32 degrees Centigrade, use a ISO VG T32 or equivalent. For ambient Temperatures above 32 degrees Centigrade, use ISO VG T46 or equivalent.
Fuel:-	Petrol (Unleaded). Tank Capacity 6.5 Litres.
Guaranteed Noise Level:-	104 LWA

SECTION 2 - OPERATING INSTRUCTIONS.

2.1 - PRE-START CHECKS.

1. Ensure that the power unit is standing on a stable level ground or where necessary that it is suitably chocked for stability.

CAUTION - DO NOT OPERATE THE POWERPACK AT AN ANGLE GREATER THAN 20 CAUSING EXTENSIVE DAMAGE TO THE ENGINE.

2. Ensure that the engine exhaust is not obstructed and that there is adequate ventilation to disperse the exhaust gases.
3. Ensure that the transmission hoses are positioned to avoid damage by vehicles etc., and that they will not be under strain when connected to the accessory or tool.

CAUTION - ENSURE THAT THE INTERCONNECTING HOSE COUPLINGS ARE DAMAGE TO SEALS.

WARNING - NEVER ATTEMPT TO ADD FUEL OR OIL WHEN THE ENGINE IS RUNNING. USE ONLY THE CORRECT GRADE AND DO NOT OVERFILL.

4. Check engine fuel and oil level, top up as necessary. Refer to engine manual for details of grades.
5. Check hydraulic oil level and top up as necessary.

NOTE - WHEN TOPPING UP THE HYDRAULIC TANK, IT IS ADVISABLE TO USE A STRAINER. DO NOT OVERFILL.

2.2 - STARTING THE ENGINE.

NOTE - REFER TO THE ENGINE MANUAL FOR DETAILS. ALWAYS ENSURE THAT THE BYPASS LEVER IS IN THE BYPASS POSITION.

1. Open the fuel tap.
2. Set the start/stop switch to the on position.
3. Set the choke lever to the closed position.
4. Pull rope starter strongly but firmly in a steady action. If engine does not start, allow the
5. Gradually return the choke lever to the open position as the engine warms up.

2.3. OPERATING CHECKS.

Before commencing operations the following checks should be made: -

1. By-Pass lever is in the flow position.
2. Check that there is no excessive engine vibration.
3. Ensure that there are no hydraulic leaks from hoses or couplings.
4. Check that the filter condition indicator is not within the clogging sector once normal

Depending on the ambient temperature, optimum performance should be achieved after 5-10 minutes operation. This is the time required for the hydraulic oil to reach its correct operating temperature.

2.4 - STOPPING THE ENGINE.

NOTE - REFER TO THE ENGINE MANUAL FOR DETAILS.

1. Set the By-Pass lever to the By-Pass position.
2. Switch the start/stop switch to the off position.
3. Close the fuel tap once the engine has stopped.

SECTION 3 - MAINTENANCE.

3.1 - INTRODUCTION.

In this section information on maintenance of the power unit is presented in the form of a Routine Maintenance Schedule followed by a Fault Location Chart, and inspections and specific maintenance instructions of the power unit assemblies.

3.1.1 - MAINTENANCE PROCEDURE RECOMMENDATIONS.

Before carrying out any maintenance on the power unit note the following recommendations:-

- a) The hydraulic components used on Belle Group units are precision made; maintenance of these components should therefore be carried out by suitably qualified personnel.
- b) When servicing hydraulic components, absolute cleanliness is essential. Most hydraulic faults are caused by the ingress of dirt.
- c) Before dismantling a component, clean externally and drain all fluid. All parts should be laid out on a clean surface and their identification and dismantling sequence noted.
- d) All dismantled metal components should be cleaned using a mineral based solvent, dried and then coated with clean hydraulic oil. Seals should be washed with clean hydraulic oil. It is recommended that removed seals should be discarded and replaced with new items. Where a seal is to be refitted it must be closely inspected for wear or damage and if suspect must not be reused.
- e) Do not use pipe wrenches on hose connections, as they damage fittings and protective plating. Use adjustable or open-ended spanners. When tightening hose connections ensure that the hose does not become twisted.

3.2 - ROUTINE MAINTENANCE.

The following schedule details the attention considered necessary to ensure satisfactory operation of the power unit.

NOTE : THE ATTENTIONS AND PERIODS SUMMARISED IN THE SCHEDULE ARE INITIAL RECOMMENDATIONS AND SHOULD BE REVISED TO SUIT THE POWER UNIT WORKING CONDITIONS.

3.2.1 - ROUTINE MAINTENANCE SCHEDULE.

ITEM.	ATTENTION	RUNNING HOURS		
		10	100	300
Complete Unit	Keep all areas clean and free from dust , debris, etc. Check security of all fasteners especially on Engine Mountings.	*		
Wheels & Feet.	Examine for damage.		*	
Transmission hoses	Examine for leaks or damage. Check for correct positioning of protective sleeve.	*		
Engine.	Check oil level. Examine engine mountings. Examine Exhaust silencer for damage or deterioration. Check for excess vibration when running. Change Oil/Service.	*	*	
			*	
		Refer to manufacturers instructions		
Hydraulic Tank	Check oil level. Replace Filter. Change Hydraulic Oil	*		*
Oil Cooler.	Externally clean using compressed air DO NOT USE WIRE BRUSH.		*	
Return line Filter.	Replace or when indicator shows clogged.			*
Hydraulic pipes/ Connections	Examine for oil leaks	*		

3.3 FAULT DIAGNOSIS.

SYMPTON	POSSIBLE FAULT	ACTION
Engine stops or will not start	Fuel tap switched off. Fuel shortage. Fuel line blocked. Air cleaner blocked. Engine oil level low. (Oil Alert Switch) Hydraulic oil level low. (Float Switch). Engine malfunction. Engine ignition switch or connecting wires damaged. Hydraulic tank float switch or connecting wires damaged. Hydraulic pump seized.	switch on fuel tap. Refuel. Clean filter. Clean. or renew element. Refer to Engine Manual. Top up to correct level. Top up to correct level . Refer to engine manual. Check for earth leak, Renew worn or damaged parts. Renew worn or damaged parts. Renew pump.
Hydraulic oil pressure low.	By-Pass lever in by-pass position. Relief valve set low or worn. Pump worn or damaged. Engine power low.	Set to flow. Check relief setting. and adjust if necessary. Replace if necessary. Check system oil flow (re Para 3.4) Renew pump if necessary. Refer to engine manual.
Hydraulic oil temperature too high.	Radiator fins blocked. Cooling fan lose or damaged. Hydraulic pump worn or damaged. Relief valve set low or worn. Thermal valve malfunction. Hydraulic oil contaminated.	Clean using air blast. Tighten or renew as necessary. Renew pump. Check setting & replace as necessary Renew valve. Drain oil tank & transmission hoses and replenish with correct oil grade .Renew filters.
Excessive vibration.	Engine misfiring or hunting. Engine mountings loose.	Refer to engine manual. Tighten or replace damaged parts.
Engine speed remains at idle when tools are operating.	P.O.D. Cylinder seized in retracted position. P.O.D. Cable Adjustment incorrect. Throttle lever set at incorrect setting	Check cylinder & replace as necessary. Re-adjust as necessary. Reset engine speed & lock throttle lever using thumb screw.
Engine speed remains at full when off load/By-pass.	P.O.D. Cylinder seized in extended position. P.O.D. Cable adjustment incorrect.	Check cylinder and replace as necessary. Re-adjust as necessary.

3.4 . - SYSTEM PRESSURE AND FLOW CHECKS.

1. Connect a suitable hydraulic test unit to the powerpack. The unit should comprise a high pressure flowmeter 0-50 l/min, a pressure gauge 0-200 Bar (0-3000 Psi), a temperature gauge, and a load valve. Suggested unit available from UCC (UC 4120).
2. Connect the test unit to the power pack with the load valve and the By-Pass lever in the by-pass position and start the power pack. Allow the engine to warm up, set the by-pass lever to the flow position. Close the load valve completely and check that the relief valve setting is correct (140 Bar). The hydraulic oil will tend to get quite hot during this operation and therefore the checking should be carried out as quickly as possible and the load valve opened before excessive temperatures are reached.
3. Carefully close the load valve to raise the pressure to 100 Bar (1500 Psi). Check that the flow rate is between 27 and 30 l/min. Adjust the engine speed to give the correct flow. **DO NOT EXCEED 3600 RPM " on load " speed.** If correct flow cannot be obtained within max engine speed then the pump must be suspect; replace as necessary.

3.5. - REMOVAL AND REFITTING PROCEDURES.

3.5.1. - FRAME/CHASSIS - Refer to Fig 3.1.

- a) Remove the four Durluk Screws (Item 9) securing the frame to the chassis (Item 5) and retain screws. The frame (Item 1) will now lift clear and the wheels are free to slide off their axles if required.
- b) The rubber feet (Item 7) can be removed by undoing the Nut and Washer and withdrawing the foot from its location.
- c) Removal of the Handle (Item 4) should only be carried out when the existing handle must be replaced due to damage etc. The handle is riveted to the frame using a strong rivet (Item 2) which is installed at the factory using a special tool. Replacement of these rivets cannot easily be made without the special tool, and we recommend that this operation is carried out by the Belle Group Willersey Service Department.
- d) The two Universal Mounting Plates (Item 12) can be removed by undoing the Set Screws (Item 10) and Spring Washers (Item 11). Set Screws (Items 13 & 14) holding the engine in place would be removed with the engine assy.

NOTE - Reassembly of the Frame/Chassis components is the reverse of the above; it is strongly recommended that new Spring Washers (Items 11 and 7) are fitted to ensure locking.

3.5.2. - COWL - Refer to Fig 3.2.

- a) Remove the frame as described in 3.5.1. above.
- b) Drain the hydraulic oil by removing the Drain Plug (Item 4) and Seal (Item 3).
- c) Disconnect the Capillary Tube (Item 16) from the gauge end of the hose and plug to prevent leakage.
- d) Remove the Cap Screw (Item 7) and Washer (Item 8) securing the Cowl to the Valve Block.
- e) Remove the 8 off Set Screws (Item 11) and Washers (Item 12) which secure the cowl to the Tank.
- f) Lift away the Cowl from the hydraulic tank in an upward and forward motion to clear the Q.R.C.Couplings (Fig 3.3. Items 17 & 18) taking care not to damage the gasket (Item 13).
- g) Access is now available to the inside of the tank, allowing removal of the Suction Strainer (Item 2), Float Switch (Item 6), and Sight Level Gauge (Item 5) for servicing.

NOTE - It is recommended that a new Gasket (Item 13), drain plug seal (Item 3) and Gauge seal (Item 15) be fitted upon reassembly.

NOTE - The Tank (Item 1) should not normally require removal from the Chassis unless substantial damage has occurred. If it is necessary to replace the Tank assy it should be note that the Rivets (Item 17) used to secure the Tank are factory installed using a special tool and it is recommended that this work be carried out by Belle Group Willersey Service Department.

3.5.3. - VALVE BLOCK - Refer to Fig 3.3.

- a) Remove the Cowl as described in 3.5.2. above.
- b) Disconnect the cooler feed and return pipes by undoing the swivel nuts at the cooler connections (Item 7 & 8 Fig 3.4) and the Cap Screw and washer (Items 11 & 12 Fig 3.4). Gently remove the pipes from their locations in the Valve Block.

NOTE - Support the hexagon fitting of the cooler using the correct size spanner to avoid twisting damage to the cooler.

- c) Disconnect the H.P. Feed pipe (Item 19) by undoing the pipe end nuts and gently remove the pipe.
- d) From within the hydraulic tank remove the four Set Screws (Item 25) and Washers (Item 26) remembering to support the valve block weight. Remove the Clamping Plate (Item 27) and break away the valve block from the tank wall and remove the Gasket (Item 30), taking care not to leave the Blanking Plug (Item 28).

NOTE - Should further disassembly of the Valve Block be required the following points should be noted: -

- 1) Always refit a new Filter Can (Item 24) remembering to smear the new seal with clean hydraulic fluid. It is normally sufficient to tighten to a good hand tightness, however the Can should be checked for tightness once the powerpack has been re-assembled and run to warm up the hydraulic oil.

If hand tightness proves to be insufficient to seal the Filter Can, a strap wrench may be used provided that the Can is not distorted.

- 2) The Relief Valve (Item 11) is a cartridge unit, and should only be removed to examine the seals fitted to the nose. If problems arise regarding pressure control, it is advisable to fit a new Relief Valve.
- 3) Should any hydraulic fittings and bonded seals be removed it is advisable to refit using new seals after examining the fitting to ensure that there is no damage.
- 4) The By-Pass spool (Item 1B) can be extracted by removing the lever/knob (Items 5 & 6) after slackening the grub screw (Item 3) and then removing the Boss (Item 4) from the top of the spool. The Circlip (Item 22) can then be removed from the other end. The spool should then be removed by gently pushing from the Circlip end until the 'O' Ring is revealed, and after removal of this ring the spool should be pushed right through the opposite way thus avoiding seal damage.

Refitting the spool is the reverse of the above by fitting the bottom 'O' Ring and pushing the spool through the block to reveal the second 'O' Ring groove. The second seal can then be fitted and the spool pushed back to its correct position and secured by the Circlip and boss.

NOTE- To refit the valve block, carry out the reverse of the above instructions taking care to fit a new gasket (Item 29) and before bolting the valve block to the tank ensure that the blanking plug (Items 28) is correctly fitted into the housing in the block and also ensure that the spigot locates into its location hole in the clamping plate.

3.5.4. - COOLER - Refer to Fig 3.4.

- a) Remove the frame as described in 3.5.1. above.
- b) Remove the cowl as described in 3.5.2. above.
- c) Remove the two pipe connections at the cooler using two spanners (ie:- supporting the cooler connection fitting against twisting and bending).

NOTE - It may prove advisable to remove the pipes completely before attempting to extract the cooler from its housing. Remember that the cooler and pipes will be full of hydraulic oil.

- d) Unscrew the 6 off screws (Item 5) and 2 off Screws (Item 13) holding the cooler (Item 1) and Guard (Item 2) to the fan housing, and retain the Nuts (Item 3) and Washers (Item 4).
- e) Gently pull the Cooler from its housing complete with Guard and separate.

NOTE - Refitting the cooler assy is the reverse of the above, however it should be noted that the cooler is manufactured from soft materials and should therefore be treated carefully to avoid damage.

It is strongly recommended that new Shakeproof Washers (Item 14) are fitted on reassembly and that the 2 off Set Screws (Item 13) are loctited into position using Nutlock or similar strength product.

3.5.5.- PUMP - Refer to Fig 3.5

- a) Drain hydraulic tank as described in 3.5.2.
- b) Disconnect H.P. Feed pipe as described in 3.5.3.
- c) Disconnect the suction hose (Item 21) at both swivel connections at the Tank (Item 22) and the Pump (Item 13).
- d) Remove and retain the 4 off Cap Screws (Item 14) securing the pump (Item 11) to the Pump Conversion Plate (Item 26)
- e) Withdraw the Pump away from the Pump Conversion Plate taking care to retain the nylon insert between the coupling halves.
- f) Where a pump replacement is required it is necessary to remove the drive coupling half from the pump shaft by folding back the locking tab on the Tab Washer and removing the Nut. The coupling half will usually require a puller for removal as it is prone to locking on its taper. The port connectors (Items 9 & 12) must also be removed.

NOTE - Refitting the pump is the reverse of the above, however it is recommended that new Bonded Seals (Item 10) are fitted, taking care to ensure that the port adaptors are not damaged.

3.5.6. - FAN - Refer to Fig 3.5.

- a) Remove the pump as described in 3.5.5.
- b) Remove the Valve Block as described in 3.5.3.
- c) Remove 3 off Nuts (Item 16) and Washers (Item 17) and withdraw the Pump Plate (Item 18) to reveal the Fan and Drive Coupling half.
- d) Slacken the Grub Screw (Item 7) securing the Drive Coupling Half (Item 8) and slide off the shaft.
- e) Slacken off the 2 off Grub Screws securing the Fan (Item 6) to the Shaft Extension, and slide off the Fan. Retain the Shaft Key.

3.5.7. - ENGINE - Refer to Fig 3.5.

- a) Remove the Fan as described in 3.5.6..
- b) Remove the 4 off bolts (Item 23) securing the engine to the Tank, remember to support the weight of the Engine Spacer (Item 1).
- c) Remove the 4 off Set Screws (Item 14 Fig 3.1) to release the Engine from the Chassis.
- d) The Engine can now be lifted clear of the Tank/Chassis.

NOTE- If an engine replacement is necessary the Shaft Extension fitted to the Engine shaft must be taken off by removing the Retaining Bolt (Item 4). The Shaft Extension can then be slid off the engine shaft once the Grub Screws (Item 2) have been unscrewed.

3.5.8. - POWER ON DEMAND SYSTEM - Refer to Fig 3.6.

NOTE - The P.O.D. Cylinder and cable assy are designed as a cartridge which can be disassembled completely without disturbing any other part of the Power Pack.

- a) Slacken the P.O.D. Retaining Nut (Item 8) and unscrew fully.
- b) Pull down the Nut/Cable to extract the Spring (Item 5) and Piston (Item 3) for examination.

NOTE - To connect a new Cable the piston can be withdrawn sufficiently to reveal the Grub Screw (Item 4) which clamps the cable to the piston allowing access without extracting the 'U' Ring (Item 2) from the body.

- c) The P.O.D. Body (Item 7) can be unscrewed from the Valve Block for examination if desired.
- d) The Cable can only be removed from the Tank by removal of the Clamps (Item 12). These clamps are plastic and cannot be removed without damage. Replace the clamps upon reassembly.

NOTE - Reassembly is the reverse of the above procedure. However, care should be taken when fitting the Piston Seal (Item 2) into the bore of the body (Item 7). Standard cable length allows for the cable to be pushed fully home into the piston before clamping by the grub screw (Item 4).

When unit is fully reassembled adjuster (item 10) can be adjusted as follows:-

Adjustment

- a) Start engine with cable slack and check flow and pressure as per section 3.4.
- b) Off load the machine by operating the By-pass lever.
- c) Adjust the cable tightness by using the adjuster (item 10) until the engine speed drops to 1800-2200 rpm.
- d) lock off adjuster and check that engine reaches high speed when system pressure is raised
- e) Repeat if settings are not as specified.

SECTION 4 - PARTS IDENTIFICATION LISTS.

4.1 SPARES HOLDING INFORMATION.

To reduce down time of the Hydraulic Power Unit it is recommended that the following parts are available for immediate replacement.

ITEM	PART NO.	QTY
Pressure Gauge	00005/2	1 off
Gauge Seal	00006	10 off
Tank Lid Gasket	00858	1 off
Oil Cooler	01414	1 off
Valve Block Gasket	00803	1 off
QRC Probe	00545	2 off
QRC Carrier	00546	2 off
Drive Coupling	01453	1 off
Float Switch	00790	1 off
Filter Can	00178	1 off
Cable Assy	01014	1 off
POD Assy	00921	1 off
Cable Clamp	01031	2 off

4.2 - SPARES ORDERING.

When ordering Spare Parts, customers are requested to provide the following information: -

Machine Serial No.

Part No.

Description of Part.

Quantity required.

This information should be forwarded to the following address for action:-

Spares Department.

Belle Group Willersey

Willersey Industrial estate

Willersey Nr Broadway.

Worcestershire. WR12 7RR

Telephone No. 0386 858482.

Fax No. 0386 858378.

email. spares@panther-ltd.com

4.2.1 - WARRANTY.

Belle Group Willersey.. Power Packs, Breakers, and Tools are guaranteed for a period of 12 Months from delivery to the end user, with a **limited 3-Month warranty applying to Hoses, Couplings and Seals**. The guarantee covers defects in workmanship or materials under normal use and service. Panther agree to repair or replace (at their discretion) without charge to the purchaser any part or parts proven to be defective within the warranty period.

This Warranty will not apply:-

- a) To a Belle Group Willersey Product which has been subject to misuse, negligence, accident, or which has been repaired or modified without the Manufacturers approval.
- b) Where parts other than those of the manufacturers make or selection have been fitted.
- c) If the defect is due to fair wear and tear, neglect, or misuse.
- d) To components which have not been made by the manufacturer and for which individual guarantees already exist. In these cases the original makers guarantee will apply.

4.3 - PARTS IDENTIFICATION LISTS

Fig. 3.1 FRAME/CHASSIS ASSY

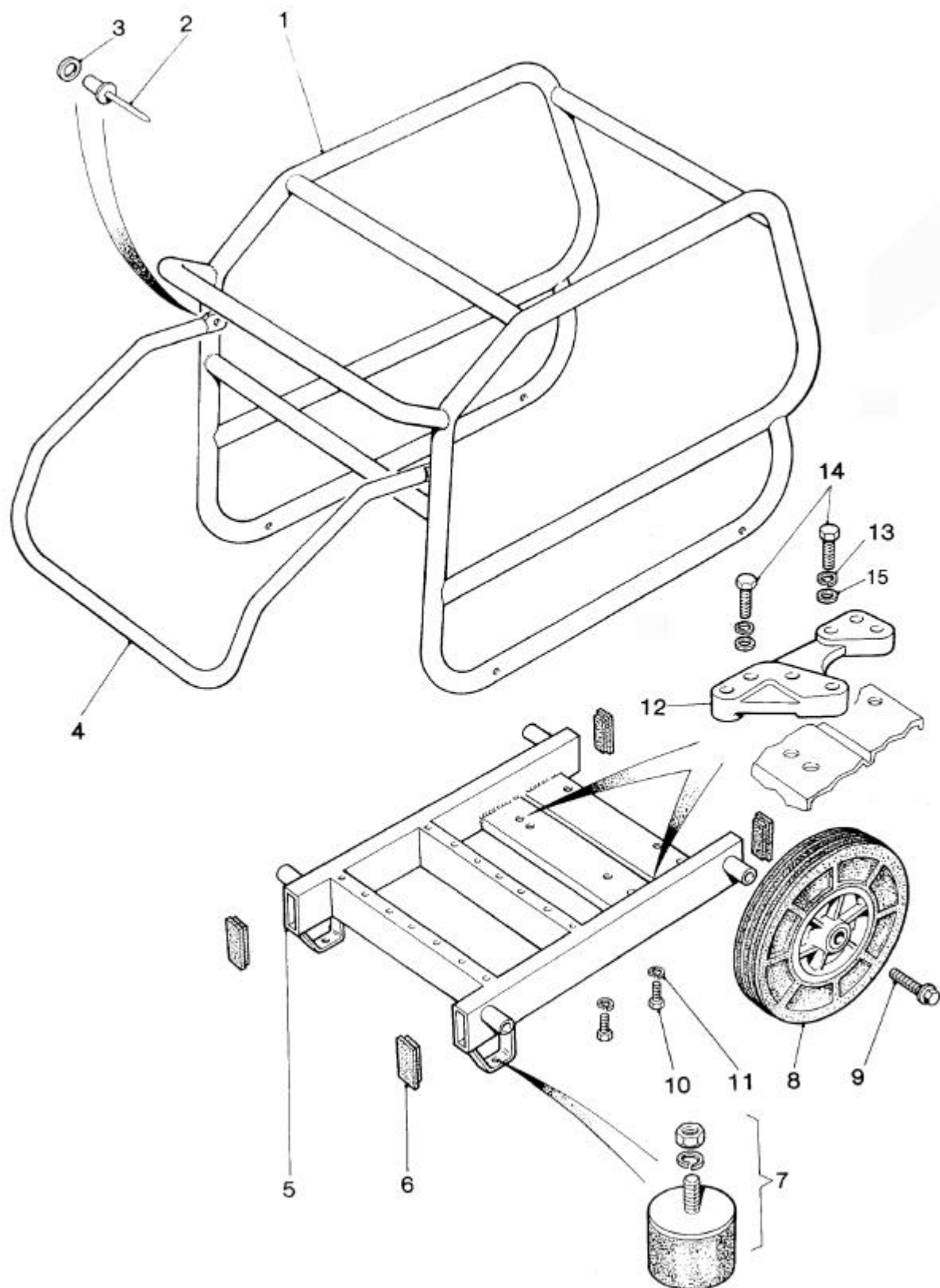


Fig. 3.1. FRAME/CHASSIS ASSY PARTS LIST.

ITEM No	DESCRIPTION	PART No	QTY
1	Frame	01493	1
2	Rivet	01150	2
3	Washer	10-400-0800	2
4	Handle	01476	1
5	Chassis	01436	1
6	Chassis Plug	00013	4
7	Bonded Foot	01525	2
8	Wheel	01524	2
9	Durlock Bolt	01419	4
10	Set Screw	10-340-1016	4
11	Spring Washer	10-410-1000	4
12	Universal Mounting Plate	01651	2
13	Shakeproof Washer	10-405-1000	4
14	Set Screw	10-340-1035	4
15	Plain Washer	10-400-1000	4

Fig 3.2 Tank Assy.

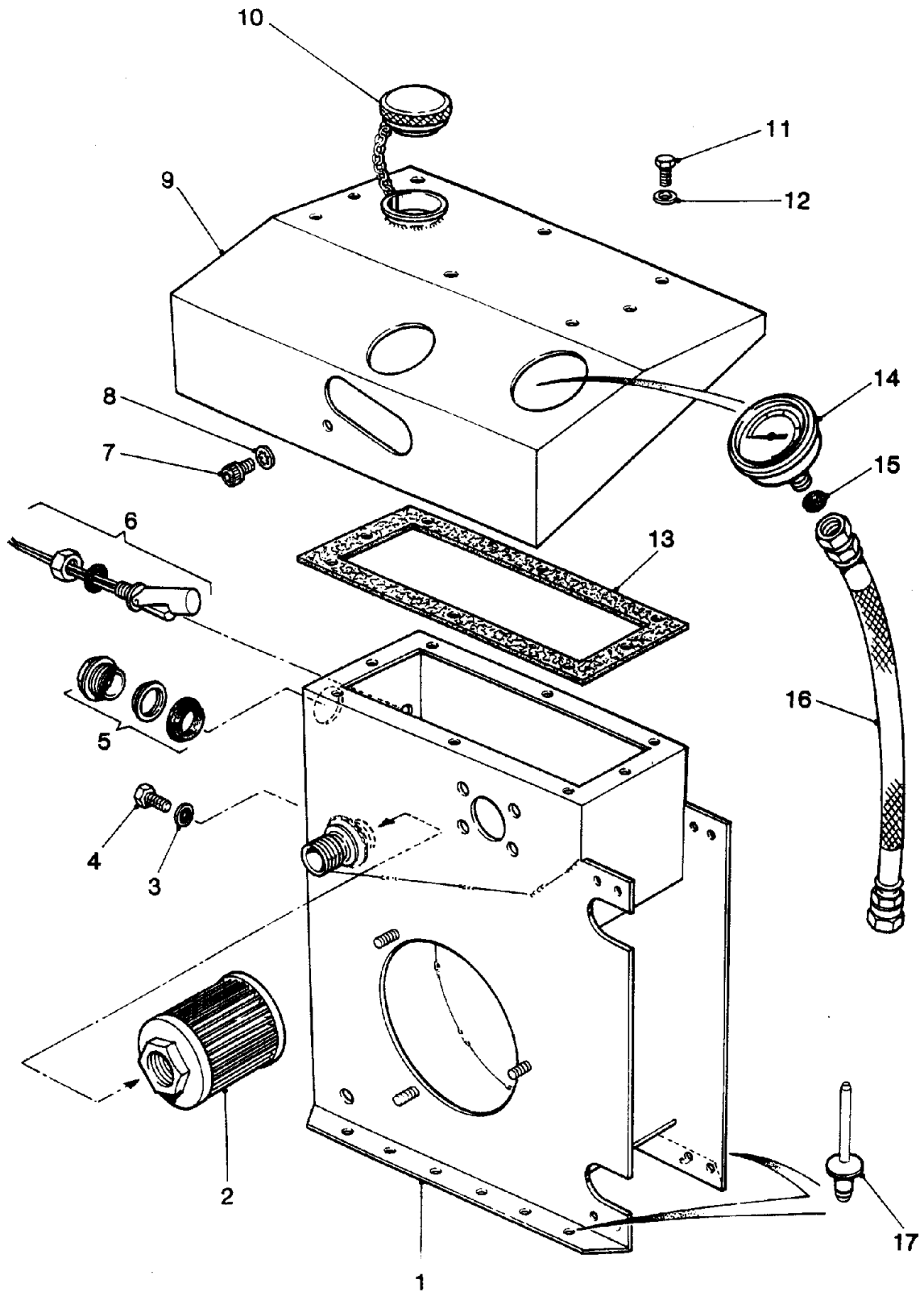


Fig 3.2 Tank Assy Parts List.

ITEM No	DESCRIPTION	PART No	QTY
1	Tank	01654	1
2	Suction Strainer	00065	1
3	Bonded Seal	10-100-0510	1
4	Blanking Plug Bolt	10-340-1016	1
5	Sight Glass	01466	1
6	Float Switch	00790	1
7	Cap Screw	10-330-0810	1
8	Shakeproof Washer	10-405-0800	1
9	Cowl	01655	1
10	Filler Cap	00129	1
11	Set Screw	10-340-0616	8
12	Plain Washer	10-400-0600	8
13	Gasket	00858	1
14	Pressure Gauge	00005/2	1
15	Pressure Gauge Seal	00006	1
16	Capillary Hose	00007	1
17	Rivet	01160	12

Fig. 3.3. Valve Block Assy.

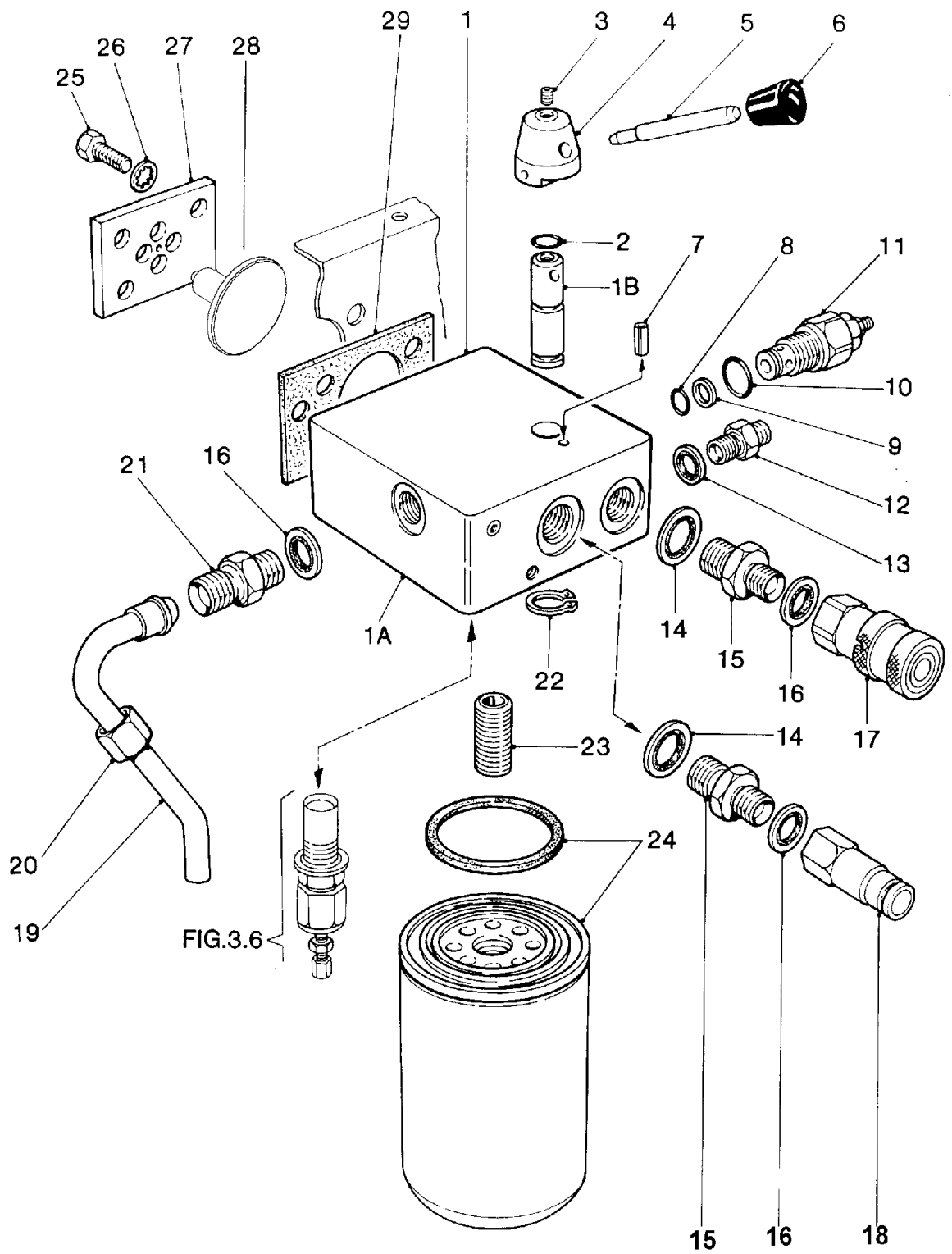


Fig. 3.3. Valve Block Assy. Parts List

ITEM No	DESCRIPTION	PART No	QTY
1a	Valve Block (only supplied matched with	01392	1
1b	Spool (only supplied matched with v/v block)	01392/1	1
2	'O' Ring	10-202-6347	1
3	Grub Screw	10-360-0510	1
4	Boss	00920/2	1
5	Lever	00920/3	1
6	Knob	00045	1
7	Dowel Pin	10-500-0515	1
8	'O' Ring	01082/1	1
9	Back-up Washer	01082/2	1
10	'O' Ring	01082/3	1
11	Relief Valve	01082	1
12	Male/Male Adaptor	10-600-0404	1
13	Bonded Seal	10-100-0511	1
14	Bonded Seal	10-100-0513	2
15	Adaptor	10-600-0806	2
16	Bonded Seal	10-100-0512	3
17	Q.R.C. Carrier	00546	1
18	Q.R.C. Probe	00545	1
19	H.P. Feed Pipe	01878	1
20	Nut	00060-CS	1
21	Adaptor	10-600-0806	1
22	Circlip	10-615-1200	1
23	Filter Spigot	00047	1
24	Filter Can	00178	1
25	Set Screw	10-340-1020	4
26	Shakeproof Washer	10-405-1000	4
27	Clamping Plate	00729	1
28	Blanking Plug	02159	1
29	Gasket	00803	1

Fig.3.4. Cooler Assy.

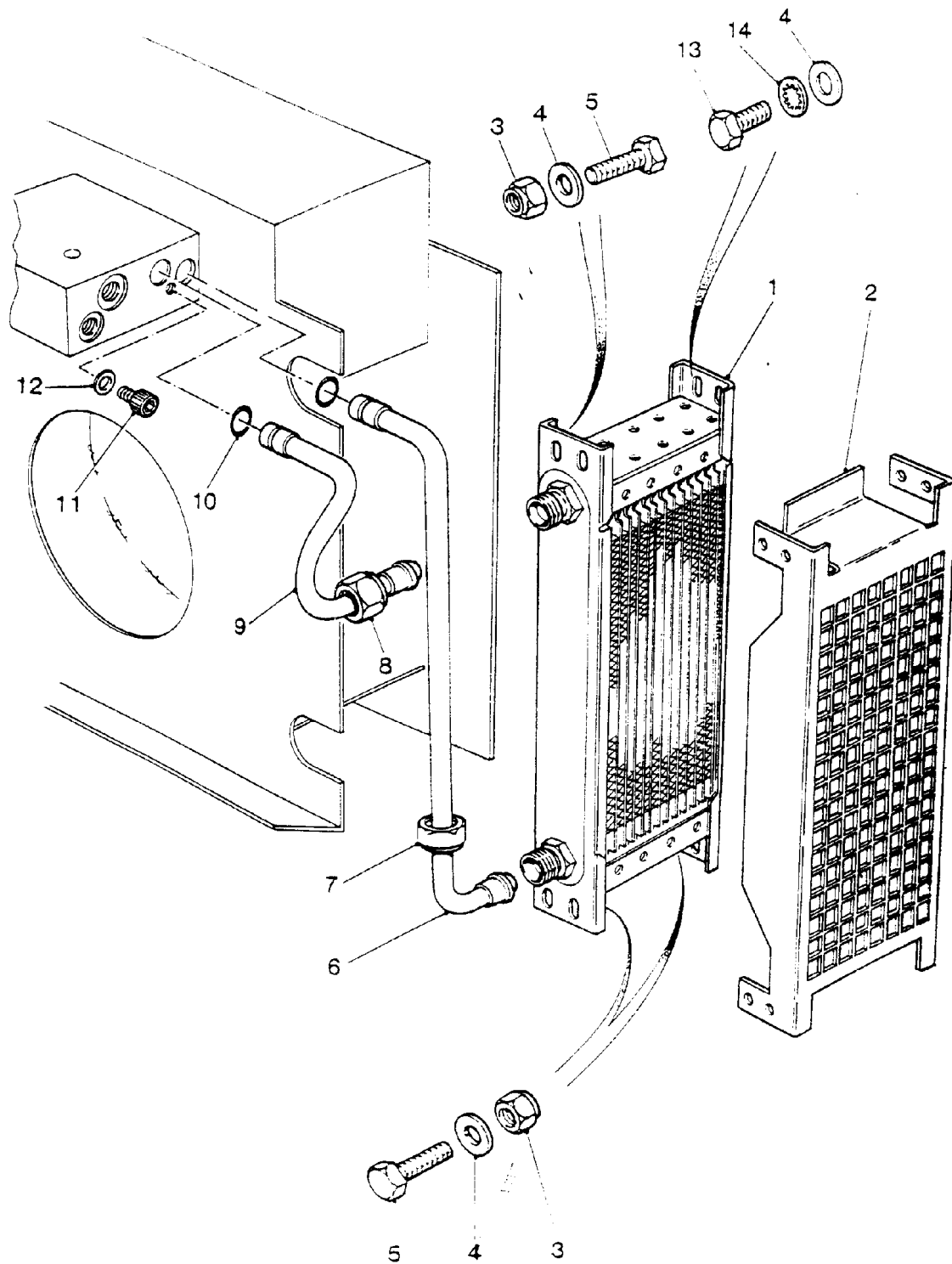


Fig.3.4. Cooler Assy. Parts List.

ITEM No	DESCRIPTION	PART No	QTY
1	Cooler	01441	1
2	Cooler Guard	01448	1
3	Nut	10-301-0600	6
4	Washer	10-400-0600	8
5	Set Screw	10-340-0616	6
6	Cooler Return Pipe	01478	1
7	Nut	00060	1
8	Nut	00060	1
9	Cooler Feed Pipe	01479	1
10	'O' Ring	10-202-5157	2
11	Cap Screw	10-330-0810	1
12	Plain Washer	10-400-0800	1
13	Set Screw	10-340-0612	2

Fig 3.5 Pump Assy.

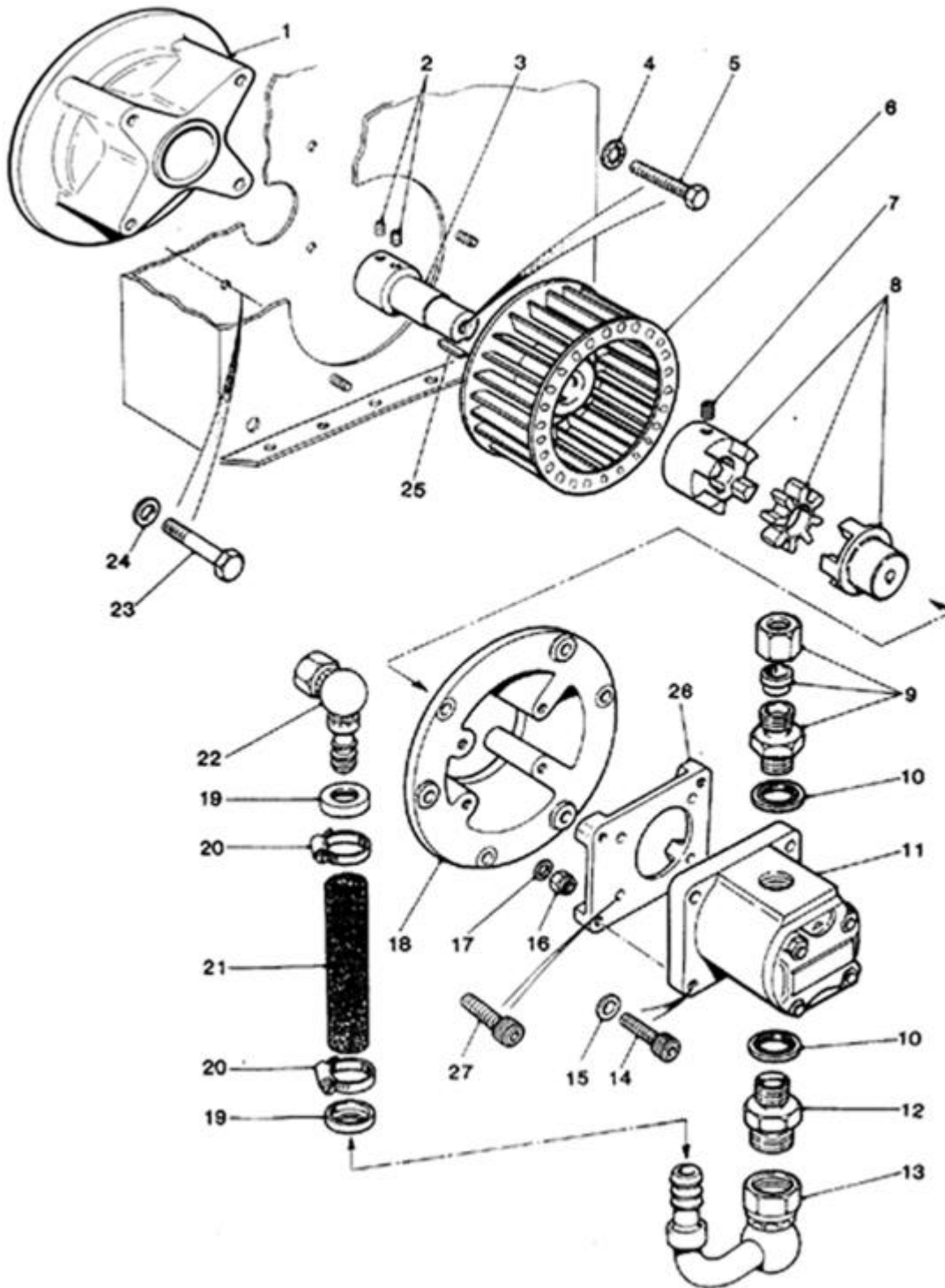


Fig 3.5 Pump Assy. Parts List.

ITEM No	DESCRIPTION	PART No	QTY
1	Engine Spacer	01963	1
2	Grub Screw	10-360-0610	2
3	Extension Shaft	01660	1
4	Shakeproof Washer	10-405-1000	1
5	Bolt	10-321-0652	1
6	Fan	01391	1
7	Grub Screw	10-360-0810	1
8	Drive Coupling	01653	1
9	Stud Coupling	01034	1
10	Bonded Seal	10-100-0513	2
11	Pump	02151	1
12	Adaptor	10-600-1208	1
13	Suction Hose Adaptor	00051	1
14	Cap Screw	10-330-0835	4
15	Shakeproof Washer	10-405-0800	4
16	Nut	10-301-0800	3
17	Washer	10-400-0800	3
18	Pump Plate	00490	1
19	Back-Up Ring	00052	2
20	Jubilee Clip	10-501-2540	2
21	Suction Hose	01659	1
22	Compact Elbow	01140	1
23	Bolt	10-321-0537	4
24	Shakeproof Washer	10-405-0800	4
25	Key	01470	1
26	Pump Conversion Plate	01650	1
27	Cap Screw	10-330-0620	4

Fig 3.6 P.O.D. Assy.

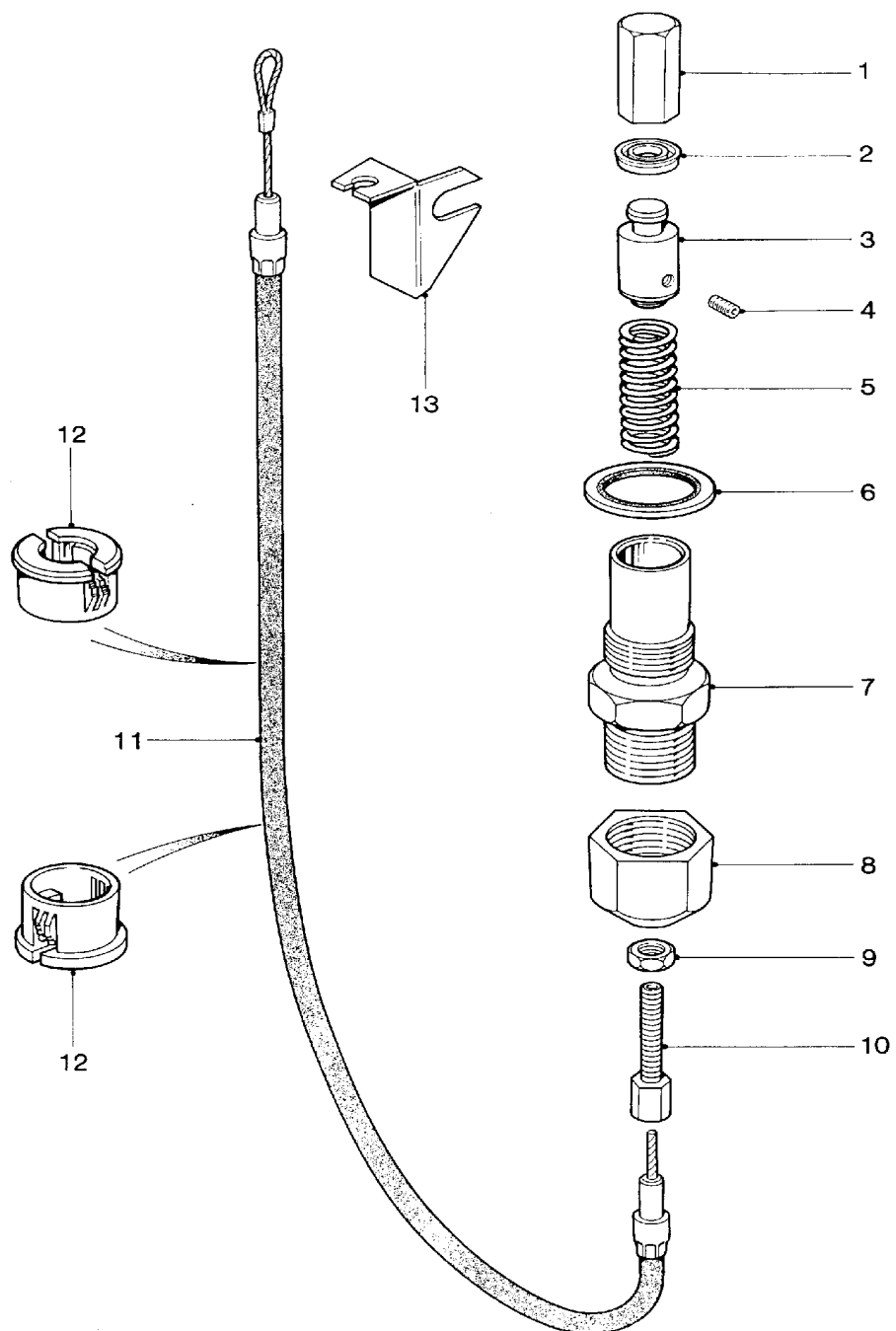


Fig 3.6 P.O.D. Assy. Parts List.

ITEM No	DESCRIPTION	PART No	QTY
1	Spacer	00921/3	1
2	U Ring	00922	1
3	Piston	00921/2	1
4	Grub Screw	10-360-0404	1
5	Spring	0067863	1
6	Bonded Seal	10-100-0513	1
7	Body	00921/1	1
8	End Cap	00921/4	1
9	Nut	10-300-0600	1
10	Adjuster	00921/5	1
11	Cable Assy.	01014	1
12	Cable Clamp	01031	2
13	Cable Support Bracket	01015	1

Fig 3.7 Hose Assy.

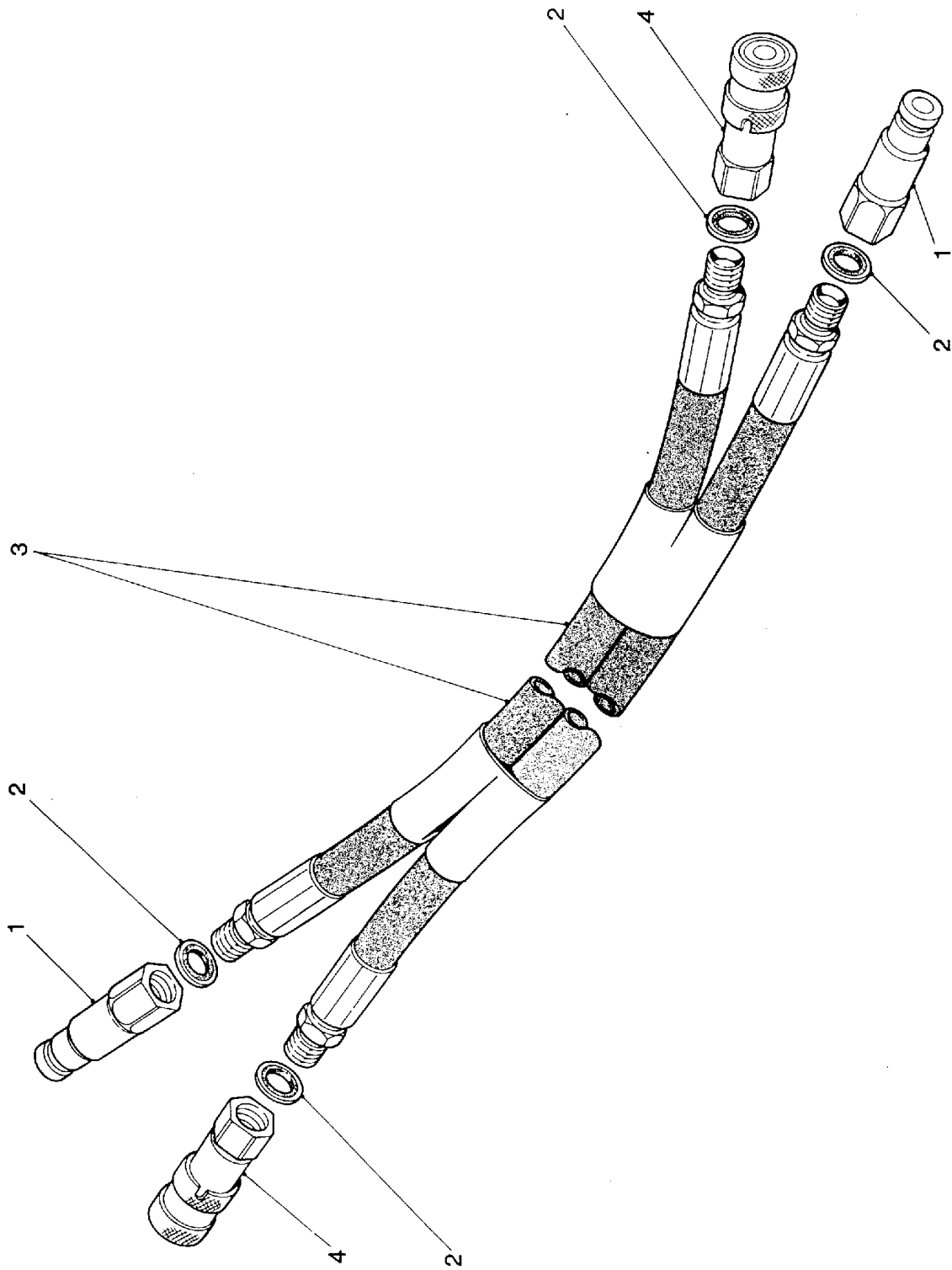


Fig 3.7 Hose Assy. Parts List.

ITEM No	DESCRIPTION	PART No	QTY
1	Q.R.C. Probe	00545	2
2	Bonded Seal	10-100-0512	4
3	Hose Assy.	00560	1
4	Q.R.C. Carrier	00546	2

SECTION 5. - CODES OF PRACTISE HYDRAULIC POWER SYSTEMS

Before starting Refer to Manufactures operating instructions.

Compatibility Hydraulic power systems are designed to operate at a specific Flow and Pressure. Equipment produced by EHTMA members carries a triangular colour coded range identification label. Check that both the tool and power unit have the same identification label before operation. It is imperative that power systems and tools having different colour codings are not interconnected as this practise is both inefficient and Dangerous.

For reference the EHTMA colour is as follows:

Classification	Colour Code	Nominal Flow l/min.	Flow Range l/min.	Nominal Pressure Bar.	Relief Valve Pressure Bar.
A	Yellow	6	5.5-6.5	135	180
B	Blue	15	13.5-16.5	129	172
C	Green	20	18.0-22.0	103	138
D	Brown	30	27.0-33.0	103	138
E	Red	40	36.0-44.0	103	138
F	Black	50	45.0-55.0	103	138
G	Orange	60	55.0-66.0	103	138
Z	Grey	10	9.0-11.0	135	180

If in doubt consult the equipment manufacturer

Characteristics Operators not familiar with use of hydraulic power packs should note the following points:

1. Hydraulic power units use oil to transmit power, hence it is essential to only use hydraulic oil of the type and grade recommended by the manufacturer. Also ensure that the correct oil level is maintained.
DO NOT OVER FILL.
2. Use only clean oil and filing equipment.
3. Power units require a free flow of air for cooling purposes and should therefore be sited in a well-ventilated area free from hazardous fumes.

Safety Points

1. Safety clothing etc, appropriate to the tool being used should always be worn.
2. Ensure their couplings are clean and correctly engaged before operation.
3. Check that guards to moving parts and hot areas are secure and undamaged.
4. Check hoses for deep cuts or exposed braiding; replace any damaged hose.

This code of practise applies to hydraulic power systems generally. Please ensure that you have read and understand the manufacturer's instruction before operating.

Aug 2002