



PSN



PYPLOK CONNECTION SYSTEM



INDEX

Pyelok Connection System	ESSO Design Specification 3-6-6
Global Maintenance Procedure	GLO MP 407
DP40 Series Pyelok NPS	Coupling
DP04 Series Pyelok Metric	Coupling
Pyelok	Installation Tooling
Pyelok	Operating Instructions for Manual Pump
Pyelok	Operating Instructions for Air Driven Pump
Prochem Pipeline Products	Contacts



PYPLOK CONNECTION SYSTEM

ESSO Design Specification 3-6-6

ESSO	PIPE, PIPE FITTINGS AND MATERIAL SELECTION	3-6-6	
DESIGN SPECIFICATIONS		Page 11 of 44	
		Rev 10	Valid until Jan 2011
PROPRIETARY INFORMATION - For Authorized Use Only			

5.17 **PYPLOK**

Pyplok connection system may be used for connecting piping for all mediums including hydrocarbon, on CS, SS and CN piping, above and below ground. Application is limited to ASME 600 pressure, maximum, 50mm nb pipe size and between -29° and 204°C as per table below. EAPL Global Maintenance Procedure GLO MO 407 shall be followed. Pyplok connections on hydrocarbon lines shall be indicated on the relevant P & ID's.

Nom. Pipe size, inches	Pipe schedules and wall thickness				
	½"	¾"	1"	1 ½"	2"
ESSO Class					
15	sch160	sch160	sch160	sch160	sch80
15H	XXS	XXS	XXS	XXS	sch80
15P	sch80	sch80	sch80	sch80	sch80
15Q	sch160	sch160	sch160	sch160	sch80
30	sch160	sch160	sch160	sch160	sch80
30H	XXS	XXS	XXS	XXS	sch80
30P	sch160	sch160	sch160	sch160	sch80
30Q	XXS	sch160	sch160	sch160	sch80
30R	XXS	XXS	XXS	XXS	sch160
60	sch160	sch160	sch160	sch160	sch80
60H	XXS	XXS	XXS	XXS	sch160
60P	sch160	sch160	sch160	sch160	sch80
60Q	XXS	sch160	sch160	sch160	sch80
Pyplok manufacturers rating, MPa	31	25.9	24.1	18.6	13.8

Allowed for Pyplok connection
Not Allowed for Pyplok connection



Global Maintenance Procedure

GLO MP 407



Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyelok Connection System

Author: T Harris	Date: 08/10/2000
Reviewer: G Canning	Date: 06/03/2001
Approved for use: N Bennie	Date: 07/03/2001

Any deviation from this procedure must have been approved in accordance with the EWMM Section 10-11.

This procedure includes 'Tick Boxes' and a 'PIC / Supervisor Sign Off / Suggested Improvements' sheet. Use of these are optional.

Equipment Description	PYPLOK pipe connection fittings.
Equipment Number(s)	N/A-
Objective	Install PYPLOK pipe connection fittings. Task A - Pipe End Preparation Task B - Pre-installation Procedure Task C - Installation Procedure Task D - Inspection of the Swaged Joint Task E - Follow-up Action
Procedure Description	Provides a guideline for the installation of PYPLOK pipe connection fittings.
Pre-Requisites	N/A
References	PYPLOK Instruction Manual - Relevant Section Esso Work Management Manual (EWMM) - Relevant Section Esso Design Specification - DS 3-6-6

Associated Hazards and Precautions

Hazards	Precautions
Incorrect installation could cause a hydrocarbon leak to atmosphere.	Follow procedure



Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System

Permit General Work Permit

Personnel Minimum Qualification Standard

Qty

- Maintenance Technician

1

Typically this task can be completed by the above personnel, but additional personnel may be required to provide the following skills:

- Assistant

The Supervisor will select personnel to perform this work based on technical training and/or demonstrated competency.

Approved

Materials Field Change Approval required to deviate or substitute materials

Qty	Catalogue Number	Description
-----	------------------	-------------

Pyplok (SS)

1	1807996	COUPLING,PIPE,CRIMP 0.50" A316-SS PYPLOK (DP40N100-K-08V)
1	1807997	COUPLING,PIPE,CRIMP 0.75" A316-SS PYPLOK (DP40N100-K-12V)
1	1807998	COUPLING,PIPE,CRIMP 1.00" A316-SS PYPLOK (DP40N100-K-16V)
1	1807999	COUPLING,PIPE,CRIMP 1.50" A316-SS PYPLOK (DP40N100-K-24V)
1	1808000	COUPLING,PIPE,CRIMP 2.00" A316-SS PYPLOK (DP40N100-K-32V)

Pyplok (CS)

1	1808001	COUPLING,PIPE,CRIMP 0.50" A234-CS PYPLOK (DP40N100-G-08V)
1	1808002	COUPLING,PIPE,CRIMP 0.75" A234-CS PYPLOK (DP40N100-G-12V)
1	1808003	COUPLING,PIPE,CRIMP 1.00" A234-CS PYPLOK (DP40N100-G-16V)
1	1808004	COUPLING,PIPE,CRIMP 1.50" A234-CS PYPLOK (DP40N100-G-24V)
1	1808005	COUPLING,PIPE,CRIMP 2.00" A234-CS PYPLOK DP40N100-G-32V)

Pyplok (Cu-Ni)

1	1808006	COUPLING,CRIMP 44.5MM 70/30 CU-NI PYPLOK
1	1808007	COUPLING,CRIMP 57.0MM 70/30 CU-NI PYPLOK



Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System

**Tools /
Equipment
Required**

Qty	Description
1	PYPLOK Power Unit Model No. DLT40MAPW0000
1	PYPLOK Power Unit Model No. DLT55MAPW0000
1	PYPLOK Hand Pump Model No. DLT05MAPM1001
1	Face Mask or Goggles

Pre-Start Checklist

Item	Remarks	Tick
Obtain a General Work Permit.	All work must be carried out in accordance with the EWMM.	<input type="checkbox"/>

PROCEDURE STEPS:

ACTION	REMARKS	TICK
Task A - Pipe End Preparation		

1. Ensure 'Pre-Start Checklist' has been completed.





Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System

ACTION	REMARKS	TICK
2. Check pipe wall thickness. (If not using an instrument, the pipe will need to be cut first. Refer to Step 3.)	<p>Compare with wall thickness of new pipe of that pipe schedule.</p> <p>Nominal Corrosion allowances (typical - depending on pipe service):-</p> <ul style="list-style-type: none">Onshore - 1.5mm below new pipe wall thickness.Offshore - 1.9 mm below new pipe wall thickness. <p>If corrosion exceeds these allowances check with Inspection Engineering for advice.</p> <p>If the installed pipe wall thickness is found to be greater than expected:-</p> <p>Check that the pipe schedule is within the table of pipe size and schedule allowable for PYPLOK connections. (given in Design Spec. 3-6-6).</p> <p>If there are any doubts check with Inspection Engineering for assistance.</p> <p>PYPLOK connections are not to be used on XXS piping.</p>	<input type="checkbox"/>
3. Mark and cut the pipe.	<p>Ensure that cut is straight to allow the fitting to slide over the pipe. Consider using a pipe cutter.</p> <p>Make sure that the pipe ends are protected from wrench or vice marks.</p> <p>It is recommended that the cut be less than 3 degrees off square of the pipe end, but a cut of up to 5 degrees off square is acceptable.</p>	<input type="checkbox"/>



Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyelok Connection System

ACTION	REMARKS	TICK
4. De-burr the pipe.	Pipe de-burring and removal of raised nicks and burrs eliminates the potential for damage to the seals during pipe insertion. A 30 degrees chamfer on the pipe end will help with insertion.	<input type="checkbox"/>
5. Clean up the outside diameter of the pipe.	The pipe outside diameter must be cleaned for a minimum of one pipe diameter length. Surface flaws, scratches, concavities and flats, paint and galvanising should be blended with emery cloth, without reducing the diameter below the minimum. Refer to Step 8, verify pipe diameter.	<input type="checkbox"/>

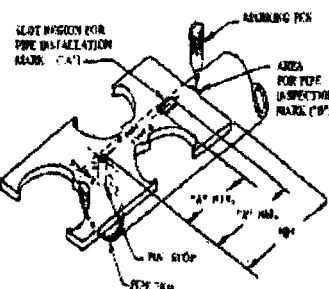
Task B - Pre-installation Procedure

6. Select correct head assembly.	Measure the diameter of the pipe. Check part number of head assembly against size of pipe. Refer to Special Instructions.	<input type="checkbox"/>
7. Select correct inspection gauge.	Check the part number of the inspection gauge against size of pipe. Refer to Special Instructions.	<input type="checkbox"/>
8. Verify pipe outside diameter and condition.	Check with inspection gauge. Outside diameter of pipe shall not exceed PMAX on inspection gauge. The PMIN on inspection gauge shall not be able to fit on pipe.	<input type="checkbox"/>
9. Check PYPLOK fitting.	Check for correct size and part no. Ensure that both seals are in place inside the fitting.	<input type="checkbox"/>



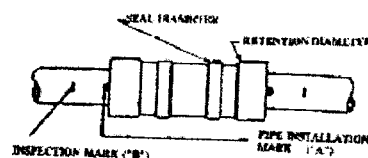
Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyelok Connection System

ACTION	REMARKS	TICK
10. Mark the pipe with inspection gauge.	Position the gauge with the pin stop of the inspection gauge over the pipe end. Mark the pipe at both "A" and "B" locations. These marks are to assist with centralising the fitting over the joint.	<input type="checkbox"/>



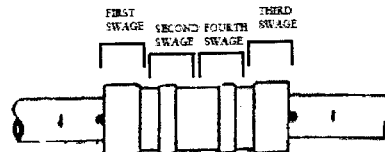
Task C - Installation Procedure

11. Slide the fitting over the pipe.	Keep rotation and twisting of the fitting to a minimum to avoid damaging the O-ring seals. A slight resistance should be encountered during insertion past the O-ring seal.	<input type="checkbox"/>
12. Position fitting correctly on pipe.	Ensure some portion of the mark "A" on the pipe is visible at both ends.	<input type="checkbox"/>





Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System



ACTION	REMARKS	TICK
13. Install head assembly on the pipe.	Remove lower half die assembly from the head assembly. Place the head assembly with upper die over the pipe adjacent to the fitting. Install the lower half die assembly onto the power unit.	<input type="checkbox"/>
14. Engage the power unit assembly into the head assembly making sure the sides of the head are flush with the ears of the power unit.	WARNING: Full engagement of the head with the power unit is critical for the safe use of the tool and the safety of the operator.	<input type="checkbox"/>
15. Slide the tool onto the fitting.	Position the dies over the raised retention diameter of the fitting.	<input type="checkbox"/>
16. Connect the hydraulic pump to the power unit.	Quick connect connections are provided for this purpose.	<input type="checkbox"/>
17. Operate the hydraulic pump to complete the FIRST SWAGE.	Refer to the diagram below:  Activate the hydraulic pump to the final swaging pressure (10,000psi). The pump pressure relief valve can be heard to operate when the final swaging pressure is reached. Also, check the pump pressure gauge to ensure that the pump has reached the final swaging pressure. If the automatic relief did not dump all of the pressure, operate the manual relief valve.	<input type="checkbox"/>
18. Reposition the head assembly over the seal diameter for the SECOND SWAGE and repeat Step No. 11.	Refer to the diagram shown in Step No. 17.	<input type="checkbox"/>



Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System

ACTION	REMARKS	TICK
19. Repeat Steps No's. 11 & 12 to complete the THIRD & FOURTH SWAGES.	Refer to the diagram shown in Step No. 17.	<input type="checkbox"/>
20. Remove the head assembly and power unit from the fitting.	Slide the complete assembly off the fitting and onto the pipe. Disconnect the hydraulic hose. Slide the head assembly from the power unit.	<input type="checkbox"/>

Task D - Inspection of the Swaged Joint

21. Visually inspect the joint.	The width of the swage must completely cover the raised retention and seal areas.  a)	<input type="checkbox"/>
22. Verify pipe insertion length.	Some portion of the pipe insertion mark "A" is beneath the fitting and also that some portion of the mark is visible.  b)	<input type="checkbox"/>

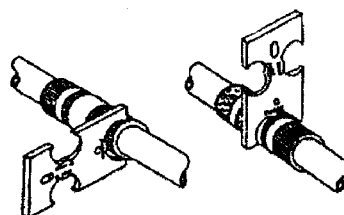


Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System

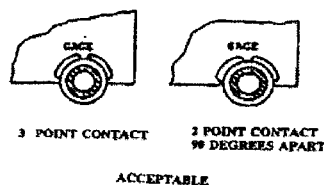
ACTION	REMARKS	TICK
--------	---------	------

23. Verify the swage diameter.

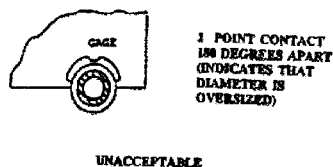
Place the inspection gauge over the swaged area as shown.

☐

For an acceptable swage, 3 point contact or 2 point contact 90 degrees apart between the swaged area and the inspection gauge must be satisfied.



An unacceptable swage is when the inspection gauge cannot be fitted all the way over the swaged area as shown.



Verify both the seal swage and the retention swages are acceptable.

 c)

24. Re-swage fitting if not acceptable.

If the gauge inspection fails to meet the inspection criteria, the fitting maybe re-swaged.

☐




Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System


ACTION	REMARKS	TICK
--------	---------	------

Task E - Follow-up Action

- | | | |
|--|--|--------------------------|
| 25. Apply a paint primer to the surface of the pipe and the fitting. | The joint should be coated as soon as practicable following the completion of the inspection to prevent corrosion.

Not applicable for CuNi connections.

 d) | <input type="checkbox"/> |
| 26. Leak test the connection with Operations. | The connection is required to pass the leak test.

 e) | <input type="checkbox"/> |
| 27. Clean up the work area and close out the General Work Permit. | | <input type="checkbox"/> |

END OF PROCEDURE STEPS



Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyelok Connection System

Special Instructions

1.	<p>Introduction</p> <p>This procedure defines the usage and limitations of the pipe connection system called PYPLOK.</p> <p>The PYPLOK pipe connection system utilises a portable, hand held installation tool to compress a fitting onto the external diameter of a pipe to form a permanent, fire safe connection.</p>
2.	<p>Approved Applications</p> <p>The PYPLOK pipe connection system is the only compression connection system for pipe that is approved by Esso Australia Ltd (EAL).</p> <p>Only PYPLOK manufactured equipment and fittings may be used. Do not use a hydraulic pump other than the PYPLOK pump supplied.</p> <p>Piping restrictions are as follows:</p> <ul style="list-style-type: none">• PYPLOK connection system may be used for connecting piping for all mediums including hydrocarbon, on Carbon Steel, Stainless Steel and Copper Nickel piping, above and below ground. Application is limited to ASME 600 pressure, maximum, 50mm nb pipe size and between -29 C and 204°C. Refer to Esso Design Specification DS 3-6-6 for further explanation.• PYPLOK connections are not to be used on XXS piping. <p><u>WARNING:</u> Chemical compatibility must be checked for the proposed application. Standard Viton seals are acceptable for hydrocarbon service.</p>
3.	<p>Hot Work Restrictions</p> <p>Restrictions on the pipe after a PYPLOK fitting has been installed are as follows:</p> <ul style="list-style-type: none">• There shall be no brazing on the line within 300 mm (1 foot) of the PYPLOK joint.• There shall be no electric welding on the line within 150 mm (6 inches) of the PYPLOK joint.



Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System

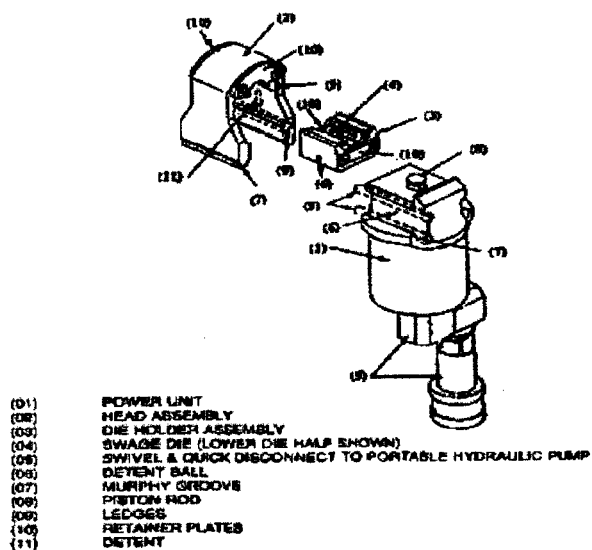
4. Components of System

The PYPLOK pipe connection system is composed of the following components

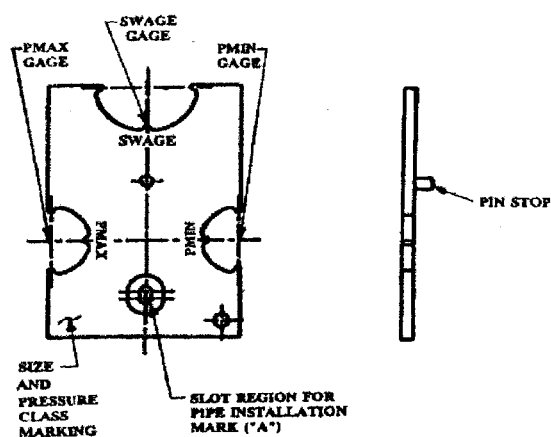
Head Assemblies

Hand Pump Model No. DLT05MAPM1001 (no diagram shown)

Power Unit Model No. DLT55MAPW000. Assembly below:



Inspection Gauges





Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System

5.	INSTALLATION TOOLS			
	PIPE DIAMETER	HEAD ASSEMBLY	INSPECTION GAUGE	No. OF SWAGES PER END
	1/2"	DLT40PYHA4008	DLTPYIG40N08	1
	3/4"	DLT40PYHA4012	DLTPYIG40N12	1
	1"	DLT40PYHA4016	DLTPYIG40N16	2
	1.5"	DLT56PYHA4024	DLTPYIG40N24	2
	2"	DLT56PYHA4032	DLTPYIG40N32	2
	44.5mm	DLT55PYHA4244	DLT55PYIG4244	2
	57.0mm	DLT55PYHA4257	DLT55PYIG4257	2
6.	TOOL INSPECTION			
	Prior to each use of the PYPLOK tools, check the following: <div><div>1) Check all components for deep scratches, gouges, dimples or other abnormalities.</div><div>2) Check swage dies for foreign material between the slots.</div><div>3) Check all contact areas between each fitting for cleanliness and damage.</div><div>4) Check pump for operation. Refer to approved materials for hydraulic fluid.</div></div> WARNING: Do not engrave or scratch any of the tooling components.			
7.	SWAGING PROBLEMS - Troubleshooting			
	PROBLEM:	POSSIBLE CAUSE:	SOLUTION:	
	Inspection gauge does not fit over the swaged fitting properly.	Pump pressure less than 10,000 psi.	Check pump output.	
		Wrong die used.	Check dies.	
Clogged or worn dies.		Clean/replace dies.		
Quick connect failed.		Replace quick connect		
	Inspection gauge worn.	Replace inspection gauge.		
Pump does not reach 10,000 psi pressure.	Air in system.	Bleed air from the pump circuit.		
	Faulty pressure gauge.	Calibrate the pressure gauge.		
Note: Refer to the manufacturer's instructions for more troubleshooting solutions.				



Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System

8.

PYPLOK NUMBER MAKE-UP								
DP	40	N	10	0	G	08	V	
							Seal Material Code.	
							V - Viton per MIL-R-83248	
							Pipe Size (NPS)	
							IMP - 1/2"=08, 3/4"=12, 1"=16, 1-1/2"=24, 2"=32	
							MET - 44.5mm=44, 57.0mm=57	
							Fitting Material Code	
							G - Carbon Steel.	
K - Stainless Steel.								
B - 70/30 CuNi								
0=Non-reducer, 1=Reducer								
Fitting Configuration								
NPS (pipe)								
Pyelok Series 40 = Imperial, 04 = Metric								


Deutsch Pyelok Industrial Series								
FITTING CHARACTERISTICS								
Fitting Material			Carbon Steel A106 Gr B Forgings A105 Gr B Stainless Steel 316/316L 70/30 CuNi per MIL-C-15726					
Operating Pressure (ASME B31.1)			4,500 psig - 1/2" 3,750 psig - 3/4" 3,500 psig - 1" 2,700 psig - 1-1/2" 2,000 psig - 2"			600 psig (all metric sizes)		
Operating Temperature			-20.2°F to 399.2°F (-29°C to 204°C)			400°F (max for metric)		
Pipe Schedules			10, 40, 80 and 160					
Standard Seal Material			Viton per MIL-R-83248. (other materials available upon request)					



Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System

Quality Checks

Quality checks need to be recorded in Wizard Technical Report

No	STEP	QUALITY CHECK	 Measured Value
a)	D20	Does the swage cover both of the raised retention and seals areas?	Yes / No
b)	D21	Is some portion of Mark "A" visible at either end of the fitting?	Yes / No
c)	D22	Are both the seal swage and the retention swages acceptable as per the gauge?	Yes / No
d)	E24	Was a field coating applied to the connection?	Yes / No
e)	E25	Did the connection pass the leak test?	Yes / No Leak test press. ____ kPa



Global Maintenance Procedure	GLO MP 407
Piping & Valves	Pyplok Connection System

If there are any suggested improvements, hand the procedure to the PIC / Supervisor for signing. Mail or fax (x6517) a copy of the back page to the Procedures Administrator at Longford.

Procedure users Name (print): _____

Site/Platform: _____

Maintenance Work Order No: _____

Signed: _____ Date: _____

PIC / Supervisor

Suggested improvements

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



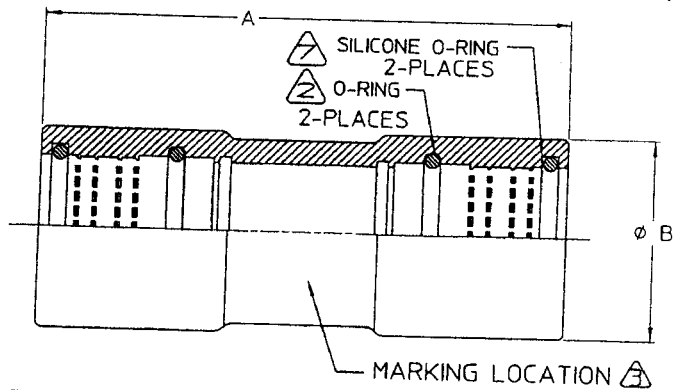
PYPLOK FITTINGS

DP 40 SERIES

NPS COUPLING

DP40 Series

NPS COUPLING IMPERIAL



PART NUMBER	LINE SIZE	A ±.015	B DIA
DP40N100 04	1/4" N.P.S.	2.300	.835
DP40N100 06	3/8" N.P.S.	2.700	1.020
DP40N100 08	1/2" N.P.S.	3.270	1.200
DP40N100 12	3/4" N.P.S.	3.600	1.490
DP40N100 16	1" N.P.S.	3.832	1.795
DP40N100 20	1-1/4" N.P.S.	4.700	2.200
DP40N100 24	1-1/2" N.P.S.	5.200	2.440
DP40N100 32	2" N.P.S.	6.300	2.980
DP40N100 40	2 1/2" N.P.S.	7.500	3.450
DP40N100 48	3" N.P.S.	8.700	4.140

1 FITTING MATERIAL CODE: 45

MAT'L MAT'L SPEC
 G: CARBON STEEL ASTM A 234 WPB
 GL: CARBON STEEL (LOW TEMP) ASTM A 333 GR 6
 K: SS 316/316L, ASTM A 403 WP316/316L
 B: 70/30 CuNi MIL-C-15726
 C: COPPER ASTM B 124
 D: ALUMINUM ASTM B 247

2 O-RING MATERIAL CODE: (NO ADHESIVE REQUIRED DURING INSTALLATION)

A: AFLAS (TFE PROPYLENE)
 V: FLUOROCARBON (BLACK) PER MIL-R-83248
 E: ETHYLENE PROPYLENE (BLACK WITH 1 WHITE DOT AND 2 YELLOW DOTS) PER NAS 1611
 M: SILICONE (ORANGE) PER MS9068
 T: FLUOROCARBON-VITON "GLT" (BLACK) PER VGLT-XXX
 G: NEOPRENE PER AMS-3209

3 PERMANENTLY MARKED AT LOCATION SHOWN: (CARBON STEEL-WHITE, STAINLESS STEEL-BLACK)

"DCO", "PYPLOK"
 PART NUMBER
 JOB NUMBER, RMLC NO.
 LINE SIZE
 MAT'L SPEC

- 4 ASTM A-105, ASTM A-106 B AND ASTM A-333 GR 6 MEETS THE REQUIREMENTS
- 5 ASTM A-182 F316/316L AND ASTM A-479 TYPE 316/316L MEETS THE REQUIREMENTS OF ASTM A-403 WP316/316L.

THIS DRAWING IS COMPUTER (CAD) GENERATED. ALL CHANGES MUST BE INCLUDED IN DATA BASE.		DRILL: HOLES PER ANSI B92.1, MACHINED SURFACES 125 ✓		CUSTOMER	
THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF DEUTSCH METAL COMPONENTS AND SHALL NOT BE COPIED, REPRODUCED OR DISCLOSED WITHOUT EXPRESS AUTHORIZATION BY DEUTSCH METAL COMPONENTS.		DECIMALS .XX ±.010" FRACTIONS 1/64" ANGLES 0° 30' XXX ±.005"		TITLE COUPLING- PYPLOK® DP40 SERIES, N.P.S. PSCH NO. 14798 SIZE DWG. NO. B DP40N100 SCALE NONE WEIGHT — — — SHEET 1 OF 2	
DATE 12-2-93 01-21-00 1-21-00					

E.O. 135089 AML DATE: 7-19-94
 E.O. 136362 AML DATE: 98-03-25
 E.O. 136596 AML DATE: 99-05-03
 E.O. 139230 AML DATE: 99-08-05
 E.O. 140476 AML DATE: 00-01-18



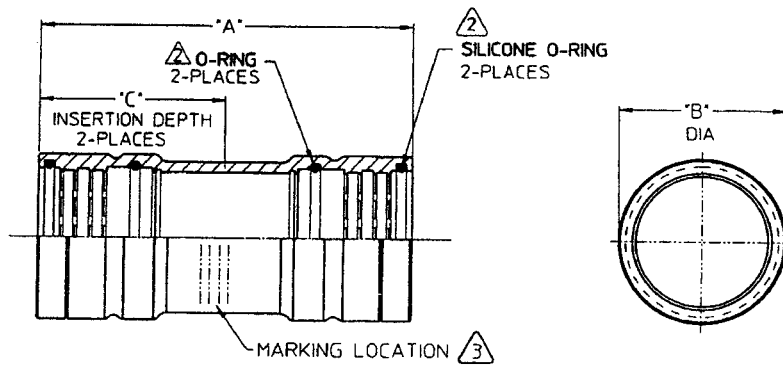
PYPLOK FITTINGS

DP 04 SERIES

METRIC COUPLING

DP04 Series

Coupling Metric



PART NUMBER	LINE SIZE (OD)	A	B DIA.	C ± 2.5	MAX. WT. IN LBS ¹	
					G. K.	B
DP04M100 ¹ 06 ²	6	37.0	9.10	17.9	.015	.025
DP04M100 ¹ 08 ²	8	40.0	13.30	19.4	.044	.065
DP04M100 ¹ 10 ²	10	43.0	14.50	20.9	.044	.065
DP04M100 ¹ 12 ²	12	46.0	17.10	22.4	.064	.094
DP04M100 ¹ 16 ²	16	52.0	22.40	25.4	.125	.185
DP04M100 ¹ 20 ²	20	58.0	26.80	28.4	.181	.262
DP04M100 ¹ 25 ²	25	65.0	32.10	31.9	.300	.400
DP04M100 ¹ 30 ²	30	73.0	37.40	35.9	.500	.520
DP04M100 ¹ 38 ²	38	85.0	48.87	41.9	.820	1.180
DP04M100 ¹ 44 ²	44.5	115.0	54.90	56.9	1.200	1.750
DP04M100 ¹ 48 ²	48	100.0	56.60	49.4	1.300	1.891
DP04M100 ¹ 57 ²	57	125.0	66.90	61.9	1.540	2.230
DP04M100 ¹ 76 ²	76.1	158.8	88.52	78.8	3.271	4.750
DP04M100 ¹ 88 ²	88.9	192.6	104.06	96.3	4.890	6.370

¹ FITTING MATERIAL CODE: ⁴ ⁵

DIMENSIONS IN mm

*G: CARBON STEEL

MAT'L SPEC

ASTM A 234 WPB

*K: SS 316/316L

ASTM A 403 WP316/316L

*B: 70/30 CuNi

MIL-C-15726

² O-RING MATERIAL CODE: (NO ADHESIVE REQUIRED DURING INSTALLATION)

*V: FLUOROCARBON (BLACK OR BROWN)
PER MIL-R-83248

*E: ETHYLENE PROPYLENE (BLACK WITH 1 WHITE DOT AND 2 YELLOW DOTS)
PER NAS 1611

*M: SILICONE (ORANGE)
PER MS9068

³ PERMANENTLY MARKED AT LOCATION SHOWN:

"DCO": PYPLOK®
PART NUMBER
JOB NUMBER, RMLC NO
LINE SIZE
MAT'L SPEC

⁴ ASTM A-105 AND ASTM A-106 B MEETS THE REQUIREMENTS OF ASTM A-234 WPB

⁵ ASTM A-182 F316/316L AND ASTM A-479 TYPE 316/316L MEETS THE REQUIREMENTS OF ASTM A-403 WP316/316L

DO NOT SCALE DRAWING

-UNLESS OTHERWISE SPECIFIED-
"DRILL" HOLES PER ANSI B31.1, MACHINED SURFACES 125/
PARTS TO BE FREE OF BURRS AND SHARP EDGES
DIMENSIONING & TOLERANCING PER ANSI Y14.5 - 1973

DECIMALS FRACT. ANGLES
XX⁺01 .XXX⁺005 1/64 30°30'

DWN: *M. S. S. S.* APPD: *S. S. S.*
CRD: *3/24/99* E.O. NO. 138276

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF THE DEUTSCH COMPANY AND SHALL NOT BE COPIED, REPRODUCED OR DISCLOSED WITHOUT EXPRESS AUTHORIZATION BY THE DEUTSCH COMPANY.

TITLE COUPLING- PYPLOK®
DP METRIC SERIES (O.D.)
4.1 MPa/41 bar/600 PSI

DEUTSCH
METAL COMPONENTS
14800 S. FIGUEROA, GARDENA, CA 90248

CUSTOMER

DP04M100

FSCM NO. 14798 1 SHEET OF 1

NO. 013679 BY: A.A. DATE: 3/21/97
E.O. 138276 BY: AHL DATE: 99-03-10
E.O. 13798 BY: AHL DATE: 99-01-29



PYPLOK

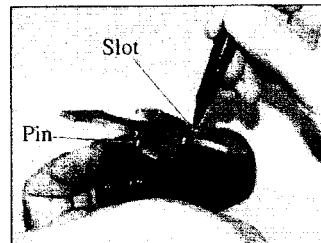
Installation Tooling

Marking and Inspection Gage

Marking and inspection gages are combined into one gage.

Marking Gage

The gage has a pin and a slot for marking along the centerline. Position the pin with the end of the pipe and make a mark inside the slot for locating the fitting on the pipe.



Inspection Gage

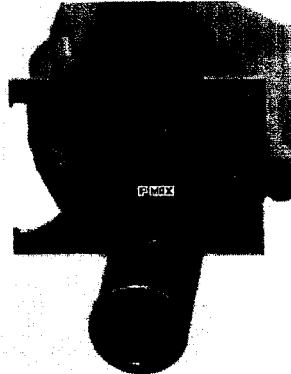
Inspection gages have two cutouts one on each of the long sides of the gauge.

Use these cutouts to verify the pipe minimum and maximum OD.

The gage has a cutout on the middle of the short side of the gauge.

This cutout has three points for verifying the after swage dimension of the joint.

The gages are marked with the part number, pressure class, and size of pipe.



Pipe Preparation

Pipe End Preparation

Pipe end preparation is important to assure good contact area between the pipe and the seal within the fitting. The preparation involves the following steps:

- Pipe Cutting
- Pipe Deburring
- Outside Diameter Clean-up

Pipe Cutting

Using a straight edge, make sure that the pipe end is straight to allow the fitting to slide over, the pipe upon insertion. Protect the pipe from wrench and vise grip damage, and cut the pipe to proper length. Deutsch highly recommended that the cut is less than 3° off square of the pipe end, but a cut up to 5° off square is acceptable.

Pipe Deburring

Pipe deburring and removal of raised nicks and burrs eliminates the potential for damage to the fitting seals during pipe insertion. A 30° chamfer will help in the pipe insertion.

Outside Diameter Clean Up

Clean the outside surface of the pipe for a minimum of one pipe diameter length. Blend surface flaws, scratches, concavities and flats, paint and galvanizing with emery cloth, without reducing the diameter below the minimum.



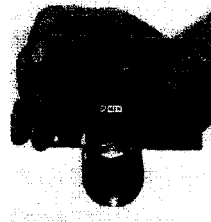
Installation Tooling

Pre-Installation Procedures

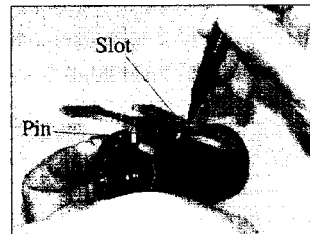
- Select the proper Pyplok tooling, i.e.; power unit and head assembly.
- Prepare pipe ends.
- Verify the pipe OD and ensure it is free of any damage.
- Ensure fitting seals are in-place.
- Select appropriate Marking/Inspection gage. All gages are marked with applicable size and pressure class information.
- Using **PMAX** gage, check the outside diameter of the pipe. Verify the pipe size by placing the fitting over the pipe and examine the fit.



- Using the **PMIN** gage verify the PMIN dimension by placing it over the outside diameter of the pipe. The PMIN gage must NOT fit over the pipe. This check helps to ensure proper Marking/Inspection gage usage.



- Place the gage on the pipe with the stop pin pressed against the pipe end.
- Apply an insertion mark through the marking window.



CAUTION: Hydraulic pressure for the DLT tools must not exceed 10,250 PSI. Minimum of 80 PSI shop air is required for operation of either the Haskel or Power Team Pneumatic pumps.

Installation Procedure



- Insert the pipe into the fitting keeping the rotation and twisting to a minimum. You will encounter slight resistance when inserting the tube past the seal ring.
- Position the end of the fitting over the pipe installation mark so that some portion of the mark is visible. This is important to ensure proper insertion depth and to complete an acceptable swage.



- Install the lower die block assembly onto the upper piston of the power unit



- Place the yoke (head with the upper dies in-place) over the pipe adjacent to the fitting end.
- Engage the power unit assembly into the yoke. Ensure the ball detents in the lower die block engage the grooves in the yoke.

CAUTION: Full engagement of the head with the power unit is critical for the safety of the operator and the tool.



- Connect the hydraulic power supply
- Activate the hydraulic power supply to the proper pressure and then release it after reaching the desired pressure.
- Disengage the yoke from the power unit-the swaging is now complete

NOTE: Typically, there are two raised bands near each end of a Pyplok® fitting called seal diameter and retention diameter seal bands. In some cases, you must swage fittings more than once on each end of the fitting to compress the seal diameter and retention diameter bands. Whether it takes one, two, or three swages depends on the type and size of the fitting and the condition of the swage dies.

Inspection of the Swaged Joint

Visual Inspection

- Verify the width of the swage completely covers the raised retention and seal areas

Pipe Insertion Verification



- Inspect the pipe insertion mark
- Verify that the fitting covers a portion of the pipe installation mark and a portion is clearly visible
- In the event that the installation mark is not clearly visible, use the inspection mark to verify proper insertion.
- Position the marking tool against the fitting end, placing the side with the pin stop away from the pipe, and orient the inspection mark to verify that some portion of the inspection mark is visible in the gage window or between the dot and the fitting end.

Swage Diameter Verification

- Place the inspection gage over the swaged
- At two positions, approximately 90° apart verify both the seal and retention swages
- An acceptable swage is a minimum of 2 point contact 90° apart between the swaged area and the inspection gage must be satisfied
- An unacceptable swage is when there is 2 point contact 180° apart
- If the swage fails to meet the inspection criteria, the fitting can be re-swaged





PYPLOK

Operating Instructions for Manual Pump

SOP604-005

**OPERATING INSTRUCTIONS FOR
DLT05MAPM1000 MANUAL PUMP**

AUGUST 1997

REV.C

ISSUED
FEB 21 2008
DOCUMENT CONTROL

REVISION SUMMARY

DOCUMENT NUMBER: SOP604-005

<u>DATE</u>	<u>ECO NO.</u>	<u>REV.</u>	<u>DESCRIPTION OF CHANGE</u>
NOV. 1992		A	PUMP MODEL HHT REVISED
MAR.1997	135236	B	PUMP MODEL P19-DEUTSCH
AUG.1997	135283	C	REVISED PAGES 3 AND 8

TABLE OF CONTENTS

	PAGE
1 Introduction	2
2 Scope	2
3 Specifications	3
4 operating instructions	3
5 parts identification	3
6 Safety precautions	5
7 Set up	5
8 Calibration of pressure gauge	6
9 Warranty	6
10 Troubleshooting	7
11 Preventive maintenance	8
12 Fluid level, draining and flushing	9
13 Spare parts	10

SOP604-005

OPERATING INSTRUCTIONS FOR DLT05MAPM1000 MANUAL PUMP

INTRODUCTION

The portable manually operated hydraulic pump described in this manual is an integral part of swaging process required to operate the swage tooling to which it is connected. Your choice of Deutsch products reflects your continuing desire to provide hydraulic systems that will meet your needs of durability, serviceability and innovation today and tomorrow.

All of us at Deutsch Metal Components (DMC) dedicated to providing products of high quality that will enhance your system needs. To that end, we do invite you to offer any comments that you feel would be beneficial. All comments will be promptly reviewed and answered.

SCOPE

This manual provides operating instructions for the DLT05MAPM1000 manually operated hydraulic pump which is used to swage Pyplok, Permaswage, Powerlok, Deutschlite, Deutschlok and other Deutsch swage products manufactured at Deutsch Metal Components.

If you should require any assistance beyond what is provided in this manual, please contact your Deutsch representative or the factory.

CAUTION

THE EQUIPMENT USED IN THIS SYSTEM IS SUBJECTED TO EXTREMELY HIGH PRESSURE DURING SWAGING. IMPROPER USE MAY RESULT IN TOOL FAILURE OR PERSONAL INJURY. THE EQUIPMENT DESCRIBED IN THIS MANUAL SHOULD BE USED ONLY BY QUALIFIED PERSONNEL IN POSSESSION OF A DEUTSCH LEVEL 'A' TRAINING CARD.

SOP604-005

PRODUCT SPECIFICATIONS AS PER THE REVISION B OF THE DOCUMENT.

The pump model has been changed from HHT TO P19-2 from March of 1997. The new specifications are as below.

Outer dimensions: 4" wide X 5.5" high X 13.5" long.

Weight: 6.6 lbs.

Handle Effort: 90 lbs.

Usable oil: 20 Cu. in.

Oil type used: MIL-H-5606

Outlet port size: 1/8 in. NPT.

Mounting holes: 5/16 in. dia. (4)

OPERATING INSTRUCTIONS

When shipped from DMC, the pump is ready to operate. The pump is calibrated for 10,000 \pm 250 psi operation. An internal relief valve is set to dump the pressure at 10,000 psi. The manual relief valve is closed to operate the pump and opened to relieve the pressure. Air can get into the system as a result of repeated connections and disconnections of tools during operation. Air bleeding procedure specified in the manual must be used as needed. Use the oil filling procedure given in the manual.

The manual also contains procedures for preventive maintenance and servicing the pump. Parts list is also provided to help servicing the pump. A repair kit is recommended for performing repairs and is specified in the parts list. The kit part no. is DLT05MAPM1020. A troubleshooting table is provided for reference on page 7.

The term "CYLINDER" used in the manual refers to the swage tool.

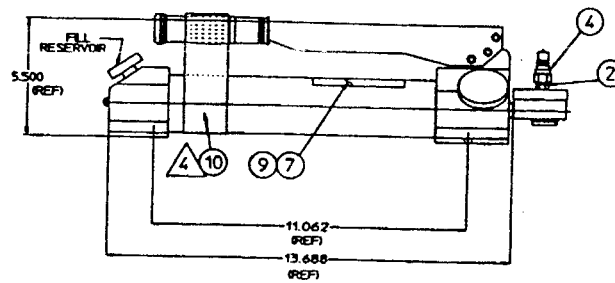
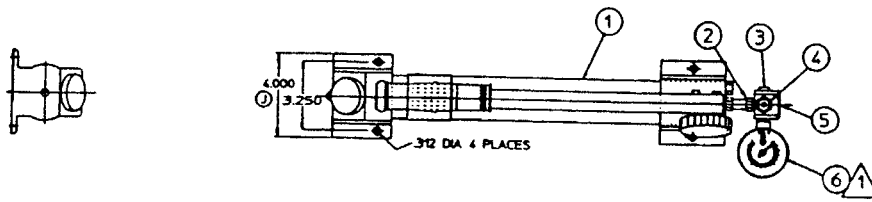
SEE FIGURE 1 FOR PARTS IDENTIFICATION

To operate the pump, follow these instructions:

1. Connect the hydraulic hose to the pump unit.
2. Connect the other end of the hose to the swage tool.
3. Close the manual relief valve near the pressure gauge and actuate the pump manually pumping the lever. The pump is equipped with an automatic internal high pressure relief valve which will dump the pressure, once 10,000 psi; is achieved. If it is necessary to drop the pressure prior to 10,000 psi; open the manual relief valve.

The pressure gauge will indicate the pressure of 10,000 psi; at the green marking on the dial.

SOP604-005



ITEM	QTY	PART NUMBER	DESCRIPTION
10	1	DLT05MAST1008	STRAP, VELCRO
9	1	DLT00MABL0006	LABEL
8			
7	1	DLT05MABL1001	LABEL-ID
6	1	DLT01MAPH1012	GAUGE, HYD. PRES. 0 TO 15,000 PSI
5	1	DLT02MAPP1014	TEE FITTING
4	1	DLT10MA00M000	1/8" O.D. MALE 10,000 PSI
3	2	MS27769-2	PLUG 1/8 NPT
2	2	AN911-1J	NIPPLE 1/8 NPT
1	1	DLT05MAPH1003	PUMP, 10,000 PSI MANUAL
ITEM	QTY	PART NUMBER	DESCRIPTION

Figure 1 Hydraulic Pump (P19-2) Parts Identification

Operating Instructions

SAFETY PRECAUTIONS



WARNING: To help prevent personal injury,

- Before operating the pump, all hose connections must be tightened with the proper tools. Do not overtighten. Connections need only be tightened securely and leak-free. Overtightening may cause premature thread failure or high pressure fittings to split at pressures lower than their rated capacities.
- Should a hydraulic hose ever rupture, burst, or need to be disconnected, immediately shut off the pump and shift the control valve twice to release all pressure. Never attempt to grasp a leaking hose under pressure with your hands. The force of escaping hydraulic fluid could cause serious injury.
- Do not subject the hose to any potential hazard such as fire, extreme heat or cold, sharp surfaces, heavy impact. Do not allow the hose to kink, twist, curl, or bend so tightly that the fluid flow within the hose is blocked or reduced. Periodically inspect the hose for wear because any of these conditions can damage the hose and result in personal injury.
- Do not use the hose to move attached equipment. Stress may damage the hose and cause personal injury.
- 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 creosote-impregnated objects and some paints. Consult the manufacturer before painting a hose. Never paint the couplers. Hose deterioration due to corrosive materials may result in personal injury.
- All components in the hydraulic system must match the maximum pressure rating of the pump.

Pump

- Do not exceed the PSI rating noted on the pump nameplate or tamper with internal high pressure relief valve. Creating pressure beyond rated capacities may result in personal injury.
- Before adding hydraulic fluid, retract the system to prevent overfilling the pump reservoir. An overfill may cause personal injury due to excess reservoir pressure created when cylinders are retracted.
- The load must be under operator control at all times.

Cylinder

- Do not exceed rated capacities of the cylinders. Excess pressure may result in personal injury.
- Do not set poorly-balanced or off-center loads on a cylinder. The load may tip and cause personal injury.
- Stay clear of lifted loads and keep others away.
- Extensions are not recommended for lifting applications.

SET-UP

Hydraulic Connections

IMPORTANT: Seal all hydraulic connections with a high grade, nonhardening thread sealant such as Power Team HTS6. Teflon tape may also be used to seal hydraulic connections if only one layer of tape is used. Apply the tape carefully, two threads back, to prevent it from being pinched by the coupler and broken off inside the pipe end. Any loose pieces of tape could travel through the system and obstruct the flow of fluid or cause jamming of precision-fit parts.

1. Clean all areas around the fluid ports of the pump and cylinder. Clean all hose ends, couplers, and union ends. Remove thread protectors from the hydraulic fluid outlets, and connect the hose assembly. Couple hose to cylinder.

CALIBRATION OF PRESSURE GAUGE

The following methods are recommended for the calibration of gauge.

1. Deadweight test method
2. Primary pressure gauge (traceable to NIST) attached to quick disconnect.

It is recommended that the gauge be calibrated atleast once a year or more frequently , depending on the use, in accordance with MIL-STD-45662.

WARRANTY

This pump is guaranteed against defects in workmanship and materials for a period of 90 days from the date of delivery. This warranty does not cover altered pump units, damage resulting from lack of proper care, use of hydraulic fluids not recommended herein, foreign materials in the fluid, or packing and seals.

This warranty is void if the pump unit is disassembled and re assembled incorrectly, or re assembled with parts not obtained from Deutsch Metal Components without prior approval in writing.

Deutsch Metal Components does not recommend the use of this pump in conjunction with tooling or fittings NOT manufactured by Deutsch.

Deutsch Metal Components also does not guarantee the validity of a completed fitting joint made using fittings manufactured by Deutsch, and Visa-versa. In any event, the warranty will be declared null and void when such conditions are found to exist.

TROUBLE-SHOOTING



WARNING: To help prevent personal injury, always release pump pressure and disconnect hoses(s) from pump before making repairs.

Refer to the appropriate pump parts list during trouble-shooting. Repairs must be performed in a dirt-free environment by qualified personnel familiar with this equipment.

PROBLEM	CAUSE	SOLUTION
Pump losing pressure	<ol style="list-style-type: none"> 1. System components leaking 2. Directional control valve leaks or not adjusted properly 3. Fluid leaking past outlet check seat(s) 	<ol style="list-style-type: none"> 1. Repair or replace as necessary 2.* Reseat, repair, or replace directional control assembly and correctly adjust 3.* Check for dirt. Reseat pump body and/or replace poppet(s) or ball(s)
Handle rises after each stroke	<ol style="list-style-type: none"> 1. Fluid leaking past outlet check seat(s) 	<ol style="list-style-type: none"> 1.* Check for dirt. Reseat pump body and/or replace poppet(s) or ball(s)
Pump not delivering fluid	<ol style="list-style-type: none"> 1. Low fluid level in reservoir 2. Intake filter is dirty 3. Seats worn and not seating properly 	<ol style="list-style-type: none"> 1. Check fluid level per instructions 2. Remove reservoir and clean 3.* Repair seats or replace pump body
Pump does not reach full pressure	<ol style="list-style-type: none"> 1. Low fluid level in reservoir 2. System components leaking 3. Directional control valve leaks or not adjusted properly 4. Improperly adjusted relief valve 5. Fluid leaking past inlet or outlet checks or high pressure piston seal damaged 	<ol style="list-style-type: none"> 1. Check fluid level per instructions 2. Repair or replace as necessary 3.* Reseat, repair, or replace directional control assembly and correctly adjust 4.* Readjust 5.* Reseat or repair inlet or outlet checks or replace high pressure piston seal
Pump handle can be pushed down (slowly) without raising the load	<ol style="list-style-type: none"> 1. Inlet checks are not seating 2. Damaged piston assembly or piston seals leaking 	<ol style="list-style-type: none"> 1.* Check for dirt and/or reseat valve seats 2.* Replace piston assembly and/or piston seals
Pump handle operates with a spongy action	<ol style="list-style-type: none"> 1. Air trapped in system 2. Too much fluid in reservoir 	<ol style="list-style-type: none"> 1. Position cylinder lower than pump. Extend and return cylinder several times. Follow bleeding instructions. 2. Check fluid level per instructions
Pump handle effort drops significantly after some pressure has been obtained	<ol style="list-style-type: none"> 1. This is normal operation on most two-stage hand pumps 	

PREVENTIVE MAINTENANCE

IMPORTANT: Any repair or servicing that requires dismantling the pump must be performed in a dirt -free environment by a qualified technician.

LUBRICATION

Apply lubricant regularly to all pivot and rubbing points. Use a good grade No. 10 motor oil or grease.

BLEEDING AIR FROM THE PUMP / SYSTEM.

Air can accumulate in the hydraulic system during the initial set-up or after prolonged use, causing the swage tool to respond slowly or in an unstable manner. To remove the air,

1. Position the swage tool at a lower level than the pump.
2. Cycle the tool several times without putting a load on the system. Air will be released into the pump reservoir. Follow the fluid level instructions on page 9 to release the air from the reservoir and top off the fluid supply.

CAUTION: Swage tool must have the head assembly engaged with the power unit when cycling for step 2 above.

Hydraulic Fluid Level

WARNING: Cylinder(s) must be fully retracted before checking the fluid level. Release all system pressure before breaking any hydraulic connection in the system. Check the hydraulic fluid level in the reservoir periodically. Use a funnel with a filter to add hydraulic fluid if needed.

For models with Reservoir Type B: Remove the filler cap. The fluid level should come to the bottom edge of the filler hole when the pump is level and resting horizontally on its base and the cylinders are retracted (see Figure 2).

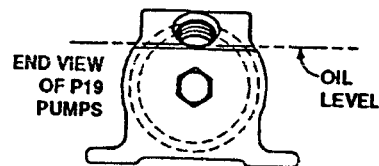


Figure 2

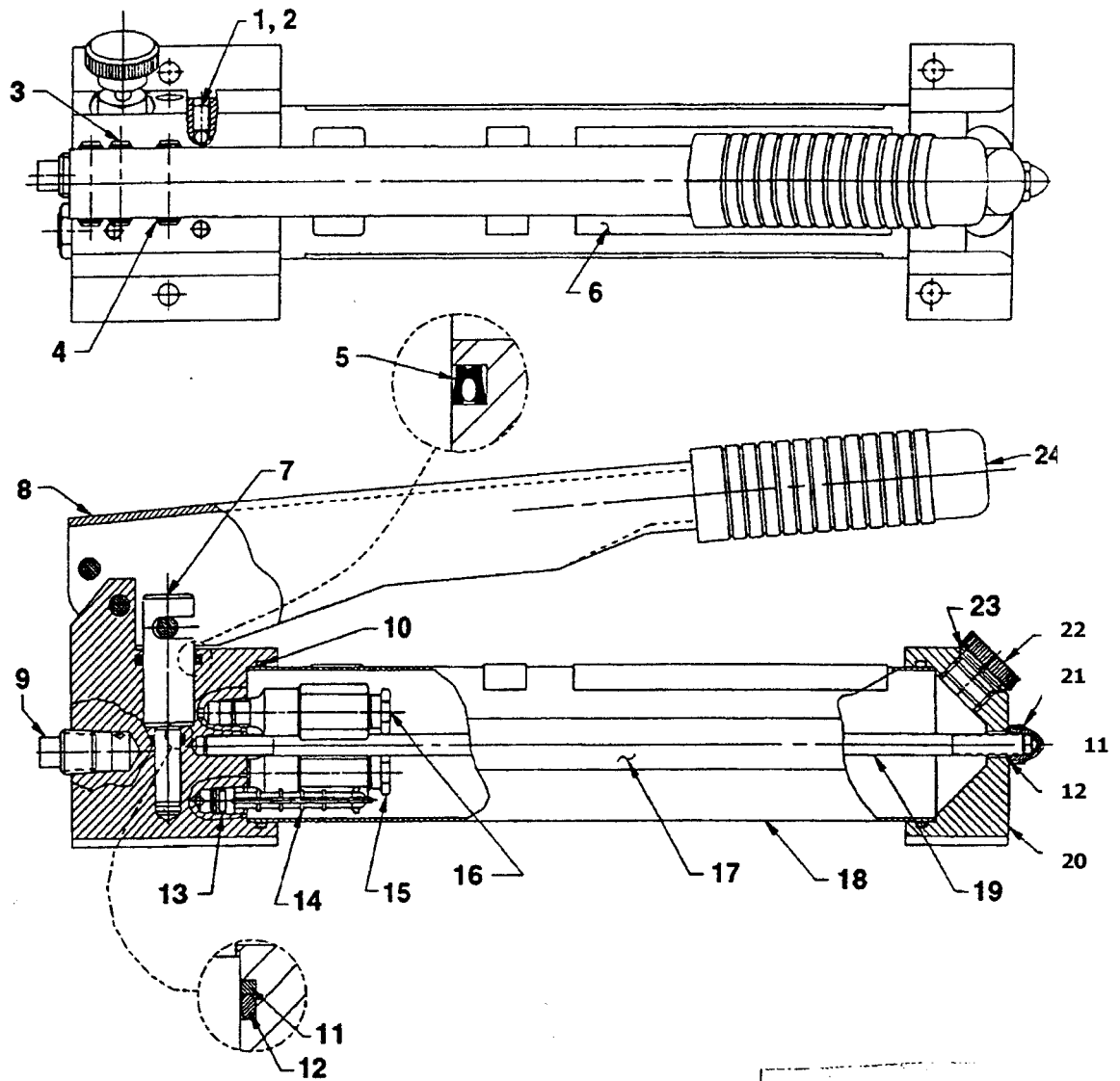
Draining And Flushing The Reservoir

Drain, clean and replenish the reservoir with high-grade, approved Power Team hydraulic fluid yearly or more often if necessary. The frequency of fluid change will depend upon the general working conditions, severity of use and overall cleanliness and care given the pump.

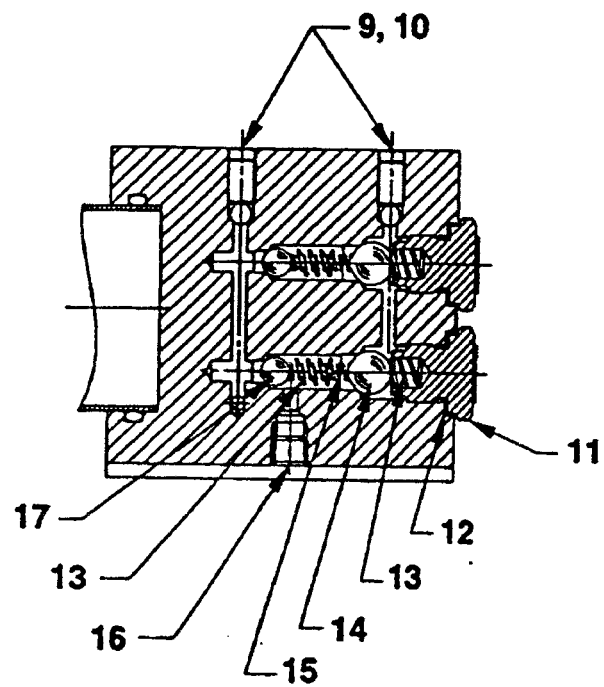
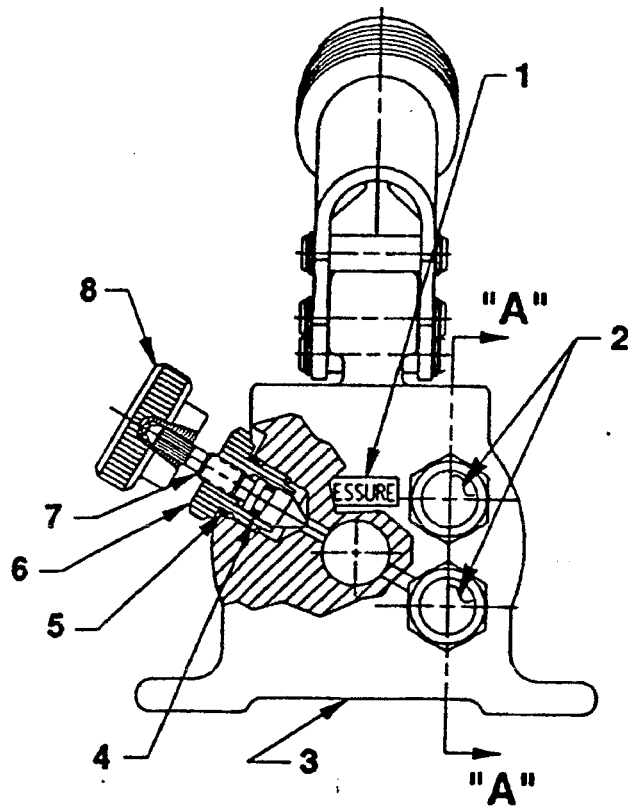
IMPORTANT: Clean the exterior of the pump first. After draining and flushing the reservoir, drain and clean the other hydraulic system components (hoses, cylinders, etc.) before connecting them to the pump again. This will help prevent contaminated fluid from entering the pump.

1. Remove the filler cap. Drain the hydraulic fluid through filler hole.
2. Remove the nut from the tie rod. Separate the reservoir from the pump body. Clean the reservoir and filter.
IMPORTANT: Removing the filter from the pump assembly could result in its breakage. Attempt to clean it as well as possible with it installed.
3. Reassemble and fill the reservoir with Power Team hydraulic fluid. Replace the filler cap.

**TWO-SPEED
HYDRAULIC HAND PUMP**
Max. Capacity: 10,000 PSI



END VIEW AND SECTION A-A



SECTION A-A

Item No.	Part No.	No. Req'd	Description
1	215301	1	Pressure Decal
2	*215907	2	Decal
3	64863	1	Pump Body
4	*10265	1	O-ring (5/16 X 3/16 X 1/16)
5	*10300	1	O-ring (5/8 X 15/32 X 5/64)
6	34871	1	Guide
7	29783	1	Stem
8	29827	1	Knob
9	12223	2	Ball (3/16 Dia.)
10	10519	2	Set Screw (1/4-20 UNC X 3/8 Lg.; Torque to 75/80 in. lbs.)
11	305975	2	Valve Screw (Torque to 480/500 in. lbs.)
12	*14874	2	Soft Copper Washer (.700 X 1/2 X 1/32)
13	*10444	4	Compression Spring (3/16 I.D. X 13/32 Lg.)
14	*10378	2	Steel Ball (3/8 Dia.)
15	*211797	2	Compression Spring (5/32 O.D. X 5/8 Lg.)
16	15130	2	Plug (1/16 NPTF)
17	*10375	2	Steel Ball (1/4 Dia.)

Part numbers marked with an asterisk (*) are contained in Repair Kit No. DLT05MAPM1020



PYPLOK

Operating Instructions for Air Driven Pump

DEUTSCH METAL COMPONENTS
DLT02MAPP1000 AIR DRIVEN PUMP

OPERATING INSTRUCTIONS

SOP6-00-10
REV. B

MARCH 1999

ISSUED
APR 11 8 2005
DOCUMENT CONTROL

TABLE OF CONTENTS

REVISION CHANGE SUMMARY	1
1 SCOPE.....	2
2 DESCRIPTION OF THE PUMP UNIT	2
2.1 <u>Environmental Requirements</u>	2
3 POWER REQUIRED TO OPERATE THE PUMP UNIT	2
4 OPERATING INSTRUCTIONS.....	3
4.1 <u>Start-up and Operation</u>	3
4.2 <u>Pressure Adjustment</u>	3
4.3 <u>Storing the Pump Unit</u>	4
5 REFILLING THE PUMP UNIT WITH HYDRAULIC FLUID.....	4
5.1 <u>Types of Hydraulic Fluid Which May Be Used</u>	4
5.2 <u>How to Add Fluid to the Pump Unit</u>	5
6 AIR BLEED PROCEDURE	5
7 MAINTENANCE.....	5
8 TROUBLESHOOTING.....	6
9 WARRANTY	6
EXHIBIT 1, Illustrated Parts Breakdown	7

REVISION CHANGE SUMMARY

DOCUMENT NUMBER: SOP6-00-10

DATE	ECO NO.	REV.	DESCRIPTION OF CHANGE
05/05/89	125077	N/C	RELEASED FOR USE.
07/12/90	127002	A	ADDED "(NSN 4320-01-322-5407)" TO THE TITLE.
03/25/99	138397	B	REFORMATTED. NEW ILLUSTRATIONS AND PARTS LIST ADDED AS EXHIBIT 1. ADDED PARA. 4.2, PRESSURE ADJUSTMENT.

SOP6-00-10
OPERATING INSTRUCTIONS
DLT02MAPP1000 AIR DRIVEN PUMP
(NSN 4320-01-322-5407)

1. SCOPE

This manual gives operating instructions for the DLT02MAPP1000 air driven pump unit. It also gives instructions for customer troubleshooting of the pump unit.

If you need any assistance beyond what is provided by this manual, please contact your DMC representative. This entire manual should be read before using the pump unit. Most problems with new equipment result from incorrect use of the equipment.

2. DESCRIPTION OF THE PUMP UNIT

(See Exhibit 1)

SIZE: 16" X 7.4" X 6.5"

WEIGHT: 18.7 lb.

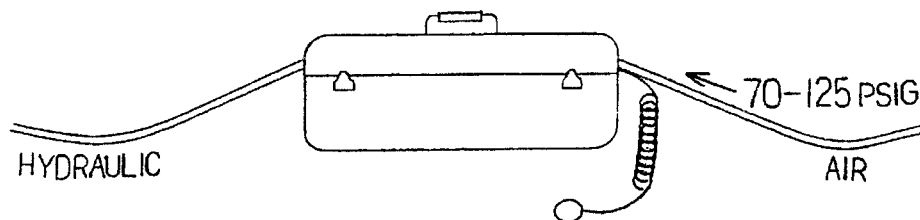
PERFORMANCE: Develops 10,000 psig hydraulic pressure.

2.1. Environmental Requirements

- a. The pump operates reliably between -65°F and +150°F.
- b. For longer seal life, do not operate the pump unit at temperatures over +130°F.
- c. The pump unit can be operated in any position. If the pump unit is used in a vertical position, make sure the pump end is up and the reservoir end is down.

3. POWER REQUIRED TO OPERATE THE PUMP UNIT

The pump unit requires an input of compressed air or nitrogen at 70-125 psig to operate. Regardless of whether air or nitrogen is used, it should be filtered before being input into the pump unit. The air or nitrogen input should also be unlubricated.



4. OPERATING INSTRUCTIONS

CAUTION:

**IF THE HYDRAULIC SYSTEM BEGINS TO LEAK, IMMEDIATELY STOP THE OPERATION OF THE PUMP.
NEVER MOVE THE PUMP BY PULLING ON THE HYDRAULIC HOSE.**

4.1. Start-up and Operation

To operate the pump unit, follow these instructions:

1. Connect a compressed air or nitrogen supply hose to the air input on the pump unit.
2. Connect the end of the hydraulic hose to the fluid output on the pump unit.
3. Connect the other end of the hydraulic hose to the swage tooling.

CAUTION:

BE SURE THAT THE HYDRAULIC HOSE IS NOT KINKED OR SHARPLY TWISTED AT ANY POINT.

4. To start the pump, press or squeeze the air control switch closed. This can be done either with your hand or your foot.

The pump unit will now begin to build hydraulic pressure. At 10,000 psig, the pump will stop cycling. The pressure level will hold as long as the control switch is kept closed.

CAUTION:

BE SURE THE AIR CONTROL SWITCH HOSE (GRAY) IS NOT KINKED OR SHARPLY TWISTED AT ANY POINT.

5. To release the hydraulic pressure, allow the air control switch to spring open.

4.2. Pressure Adjustment

4.2.1. For pumps without the external adjustment feature:

1. Remove tube assembly No. 23 by disconnecting it at both ends.
2. Disconnect the nut on item No. 8 from the tube assembly No. 25.
3. Remove the elbow No. 8 from the air pilot switch.
4. Rotate the air pilot switch counterclockwise to remove it.
5. Take the spring assembly out and either tighten or loosen the nut holding the spring to increase or decrease the pressure.
6. Assemble the parts in reverse order.

4.2.2. For pumps with the externally adjustable air pilot switches:

1. Remove the screw holding the nameplate and slide the nameplate.
2. Loosen the lock nut (outer ring), by using a pin in each of the circular nuts.
3. Tighten the inner ring to compress the spring - for increasing the pressure.
4. Loosen the inner ring to expand the spring - for decreasing the pressure.
5. The above adjustment can be done while the pump is working.
6. After the adjustment is done, tighten the lock nut (the outer ring) by holding the inner ring in place, using the pins.
7. Assemble the nameplate.

4.3. Storing the Pump Unit

When storing the pump unit components, do the following:

- a. Replace the supplied plastic caps over all the quick disconnects.

CAUTION:

not covering the quick disconnects will allow dirt into the hydraulic system. this will almost surely result in the premature failure of the system.

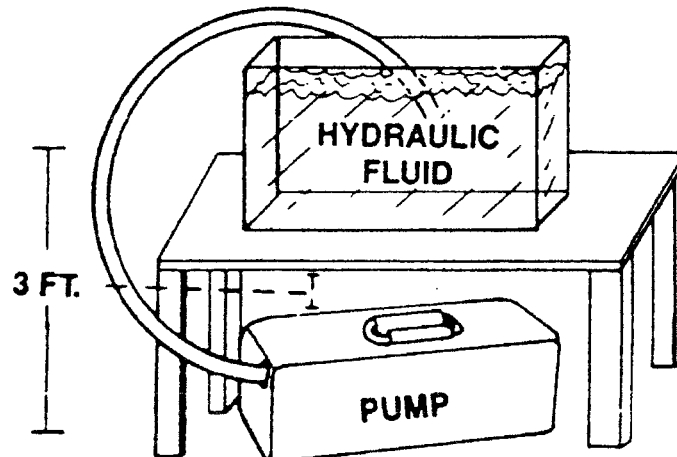
- b. Be sure the hydraulic hose is not kinked.
- c. Be sure the air control switch hose is not kinked.
- d. Keep the pump unit clean.
- e. The reservoir must be full of hydraulic fluid.

5. REFILLING THE PUMP UNIT WITH HYDRAULIC FLUID

5.1. Types of Hydraulic Fluid Which May Be Used

1. Petroleum base. (MIL-H-5606)
2. Silicon base compatible with Neoprene.

Light viscosity fluids are suggested. Heavier viscosities (up to 300 ssu @ 100°F) are also suitable.



5.2. How to Add Fluid to the Pump Unit

This is a gravity-fill process. If possible, position the fluid supply tank at least three feet higher than the pump unit.

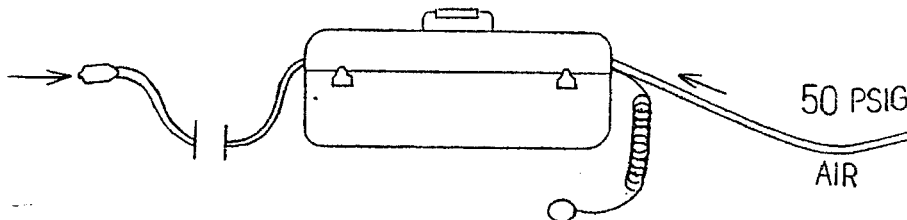
1. Connect the hydraulic hose to the pump unit/
2. Submerge the other (open) end of the hydraulic hose into the fluid supply tank.
3. Apply compressed air/nitrogen to the pump unit.
4. Press, or squeeze, the control switch.
5. After the air bubbles stop coming out of the hydraulic hose, release the control switch
6. Wait about two or three minutes. It will take this long for sufficient fluid to flow from the supply tank to the pump unit reservoir.
7. Repeat steps 3 - 7 until air bubbles are no longer expelled into the fluid supply tank. Performing steps 3 - 7 two or three times is usually enough.

NOTE: This procedure works more efficiently if the pump unit is stood on end, with the pump end up and the reservoir end down. (The pump unit can be hung on the wall.)

6. **AIR BLEED PROCEDURE**

To bleed air from the hydraulic system:

1. Connect the hydraulic hose to the pump unit.
2. Apply about 50 psig compressed air/nitrogen to the pump unit.
3. Press on the center piece of the quick disconnect at the loose end of the hydraulic hose. (This is necessary to allow fluid to flow out of the hose.)



7. **MAINTENANCE**

See also SOP604-019, "Maintenance and Repair Instructions, DLT02MAPP1000 Air Driven Pump".

- Add clean, filtered fluid to the pump unit.
- Keep all quick disconnects covered with the supplied caps.
- Replace kinked or defective hoses.
- Check for leaks before operating the pump unit.

8. TROUBLESHOOTING

This guide describes some problems, their causes and solutions.

PROBLEM	POSSIBLE CAUSE	SOLUTION
The pump will not cycle.	Air /gas pressure being input into the pump unit is too low.	Check input (See 3.0)
	The control switch hose is kinked, clogged or leaking.	Unkink or replace the hose.
The pump cycles, but pressure doesn't reach 10,000 psig.	Too much air is trapped in the pump unit's hydraulic system.	Bleed air. (See 6.0)
	Not enough fluid in the pump unit.	Add fluid (See 5.0)
	Internal valve malfunction.	Return the unit for repair.
The pump develops pressure, but the hydraulic tool won't work.	The hydraulic hose is kinked, clogged or leaking.	Unkink or replace the hose.
	Quick disconnect failure.	Replace the quick disconnect.
The pump doesn't release when the control switch is released.	The control switch hose is kinked, clogged or leaking.	Unkink or replace the hose.
	Quick disconnect failure.	Replace the quick disconnect.
	Internal valve malfunction.	Return the unit for repair.
The pump develops more than 10,000 psig.	Air pilot switch malfunction, or incorrect adjustment.	Return the pump for repair or adjustment.

If the pump develops and problem not solved by the troubleshooting guide, contact your DMC representative.

9. WARRANTY

This pump unit is guaranteed against defects in workmanship and materials for a period of 90 days from the date of delivery. This warranty does not cover altered pump units, damage from lack of proper care, use of other than recommended hydraulic fluids, or using input pressures above 125 psig.

This warranty is void if the pump unit is disassembled and reassembled incorrectly, or reassembled with parts not obtained from or approved in writing by Deutsch Metal Components.

EXHIBIT 1

ILLUSTRATED PARTS BREAKDOWN

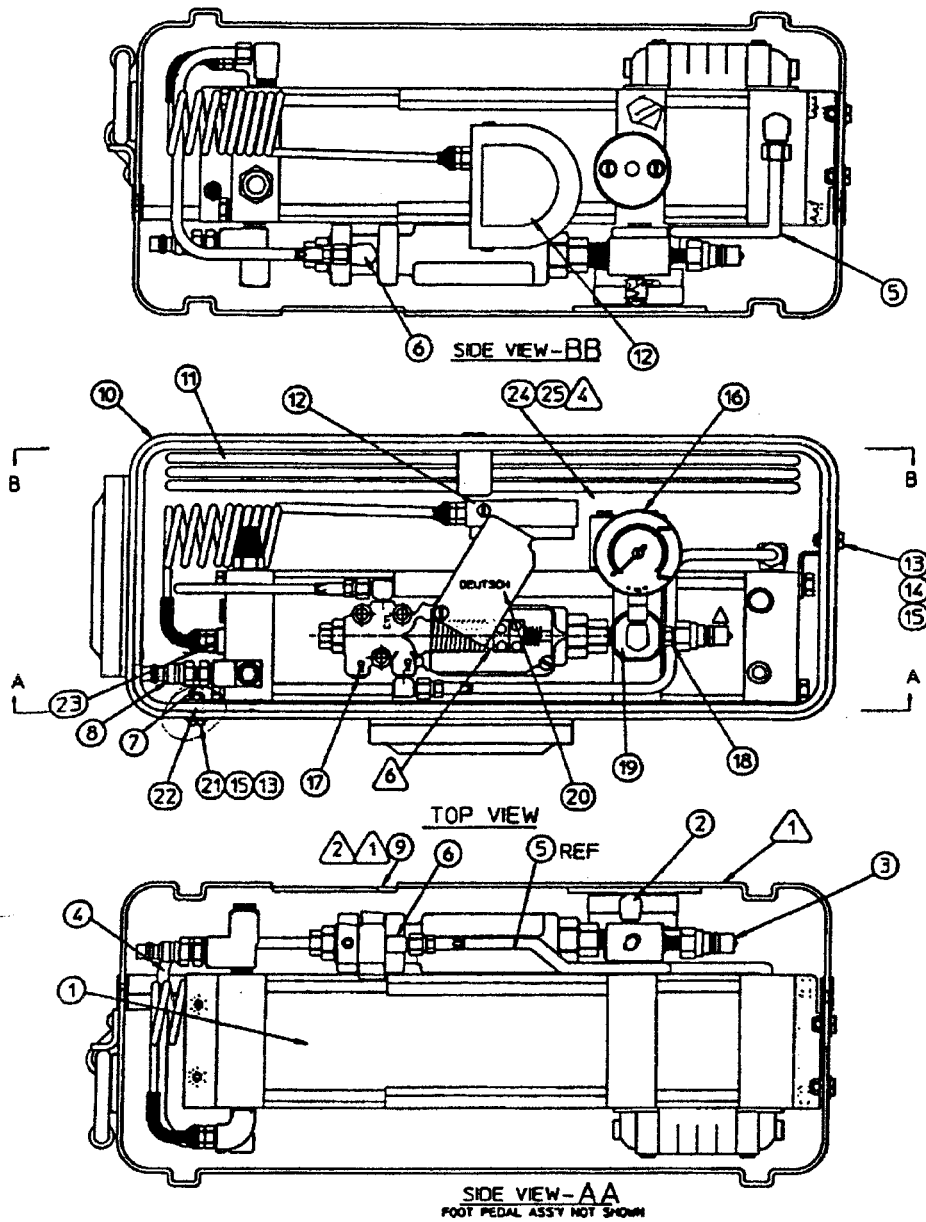
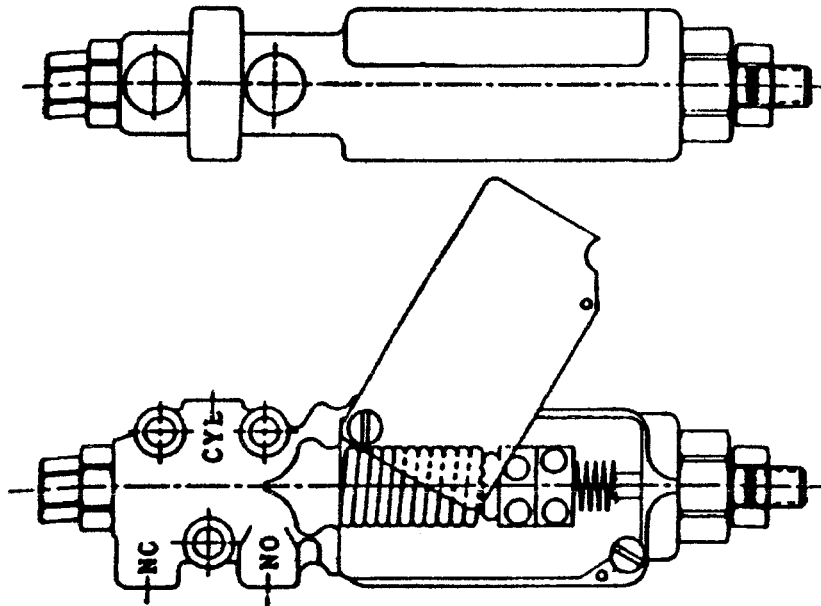


EXHIBIT 1 (cont.)



ITEM		PART NUMBER	DESCRIPTION
26	1	DLT02MABL1000	IDENTIFICATION LABEL
25	1	SOP6-00-10	INSTRUCTION MANUAL
24	1	DHC-11	OPERATION MANUAL
23	1	AN914-10	ELBOW INTERNAL AND EXTERNAL PIPE THD. 90°
22	1	DLT02MAPP1035	SPACER
21	2	MS35225-68	SCREW, MACHINE, PAN HEAD, SLOTTED
20	1	DLT02MAPP1018	IDENTIFICATION LABEL
19	1	DLT02MAPP1014	TEE FITTING
18	1	AN911-1J	NIPPLE PIPE THREAD
17	2	MS27769-2	PLUG
16	1	DLT01MAPM1012	GAGE HYDRAULIC PRES. 0 TO 15,000 PSI
15	10	MS15795-742	WASHER
14	2	MS35225-64	SCREW, MACHINE, PAN HEAD, SLOTTED
13	4	DLT02MAPP1017	NUT, SELF-LOCKING, HEXAGON
12	1	DLT02MAPP1007	FOOT PEDAL AIR SWITCH ASS'Y
11	1	DLT01MAPM1010	HOSE AND COUPLING HALVES ASS'Y
10	1	DLT02MAPP1002	PUMP CASE
9	1	D10004-71	IDENTIFICATION LABEL
8	1	D12025-102	1/8" O.D. MALE
7	1	AN912-10	BUSHING REDUCER
6	2	090-20002	90° ELBOW ASSEMBLY
5	1	DLT02MAPP1033	TUBING ASSEMBLY
4	1	DLT02MAPP1032	TUBING ASSEMBLY
3	1	DLT10MAODM000	1/8" O.D. MALE 10,000 PSI
2	1	AN914K1K	ELBOW 90°-1/8 NPT
1	1	DLT02MAPP1030	PUMP AIR PILOT SW. ASSEM



PROCHEM PIPELINE PRODUCTS

Contacts

Contact	Phone	Fax	Mobile	Email	Address
Rex Johnson	03 9799 2244	03 9799 2255	0419 812 214	rjohnson@prochem.com.au	15 Ventura Place, DANDENONG SOUTH VIC
Peter Winter	03 9799 2244	03 9799 2255	0419 812 222	pwinter@prochem.com.au	15 Ventura Place, DANDENONG SOUTH VIC
Tim Valentine	03 9799 2244	03 9799 2255	N/A	tvalentine@prochem.com.au	15 Ventura Place, DANDENONG SOUTH VIC
Robert Krings	03 9799 2244	03 9799 2255	N/A	rkrings@prochem.com.au	15 Ventura Place, DANDENONG SOUTH VIC