



Tech Manual 1031A

Injector Control Head and Flow Tubes

Texas Oil Tools

a Division of Varco
PO Box 2327
Conroe, TX 77305
(936)756-4800 or (936)441-0006
Fax: (936)756-8102; e-mail totsales@tot.com



Prepared by: _____
Approved by: _____

TABLE OF CONTENTS

1.0 FEATURES

2.0 OPERATION

3.0 DG-40 SERIES INJECTOR CONTROL HEADS

(PACKER & FLOW TUBES)

DG43 - 5 & 10M W.P. STD

DG44 - 5 & 10M W.P. H₂S

DG46 - 15M W.P. H₂S

DG48 - 20M W.P. H₂S

4.0 DG-50 INJECTION CONTROL HEAD W/SAFETY CHECK BALL & SEAT

(PACKER & FLOW TUBES)

DG53 - 5 & 10M W.P. STD

DG54 - 5 & 10M W.P. H₂S

DG56 - 15M W.P. H₂S

DG58 - 20M W.P. H₂S

5.0 DG-70 SERIES CONTROL HEAD

(PACKER ONLY)

DG73 - 5 & 10M W.P. STD

DG74 - 5 & 10M W.P. H₂S

DG76 - 15M W.P. H₂S

DG78 - 20M W.P. H₂S

6.0 DG-80 SERIES GREASE TUBE ASSEMBLY

(NO PACKER)

DG83 - 5 & 10M W.P. STD

DG84 - 5 & 10M W.P. H₂S

DG86 - 15M W.P. H₂S

DG88 - 20M W.P. H₂S

7.0 BUSHINGS, FLOW TUBES & PACKERS

8.0 SHEAVE & BRACKET ASSEMBLY

9.0 HOSE ASSEMBLY

Injector Control Head and Flow Tubes

The DG Series Injection Control Heads are available in 5,000, 10,000, 15,000 and 20,000 psi working pressure. Available in both Standard Service and H₂S Service, with all parts in contact with well fluids in accordance with NACE MR-01-75. All tools are available as either Series DG40 or DG50 single unit or as a Series DG70 Control Head only with union nut and pin down and separate Series DG80 Grease Tube Assembly with union box up x nut and pin down.

1.0 FEATURES

The 5,000 and 10,000 psi tools are similar in design, with pin x pin connector and ½ NPT ports for injection and/or return at each connector.

The 15,000 and 20,000 psi tools are similar in design with box x box connectors. Check valves are integral to the injector coupling body and autoclave ¾ slimline ports are used for injection and return lines.

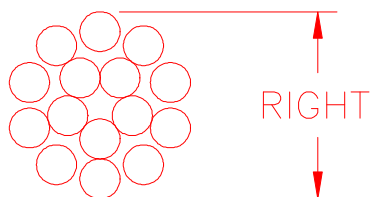
All sizes are made with a strong pack-off head capable of holding the rated pressure on the designated line size. Each packer is tested to full test pressure on a smooth surfaced test bar equal to the indicated line size.

The outer sleeve covering the flow tube is designed to contain full rated working pressure. Just in case the flow tube o-ring leaks. Each tool is tested to full test pressure without the flow tubes in place to prove the strength of the sleeves. All tools accept the standard flow tubes 14 in. long with a .750 diameter end sealing surface. Extra clearance is allowed for a maximum of one in. diameter flow tube.

The 5,000 and 10,000 psi working pressure tools have 3 flow tubes. The 15,000 has 4 and the 20,000 psi tool has 6 flow tubes.

Flow Tubes must be sized to allow passage of the largest diameter wireline, but fit close enough for effective operation with the minimum amount of grease or a heavy oil. As a general guide, Flow Tubes are sized .005 over the maximum line diameter.

Carefully check the line diameter at 500 ft. intervals to determine the maximum line size. Take care that the micrometer is positioned to measure at the crest of the wires for a true maximum diameter measurement.



2.0 OPERATION

The option of a sheave assembly mounted on the packer body is available for lighter duty operators. However, most operators, and all heavy duty jobs will be rigged with a crown sheave suspended from the mast.

Seals repair kits are packaged for each rated tool. They are packaged to replace all seals when the tool is repaired, this should minimize the chance of overlooking one of the seals as the tool is repaired.

All hose assemblies are listed separately to permit selection of the exact length required for your specific operation. Every hose assembly is assembled with all fittings in place and pressured for a minimum of 5 minutes per cycle, for two cycles to the full test pressure. Hoses are drained for shipping.

Standard hoses are made up in multiples of 50 foot lengths, with connectors to make the desired length. This reduces the loss if a piece is damaged, and gives the opportunity to make modifications and continue operation. Individual hoses can be furnished in nearly any length on special order.

Hoses and fittings are the best available and in common industry use, but may not meet specifications for H₂S service. For example: the wire reinforcement and the hose end fittings may not meet NACE specifications for H₂S service. Since the injection hose will always be filled with fresh grease, it will never be exposed to H₂S service. The return hose may be exposed to H₂S and therefore you may expect a shorter operational life in H₂S service.

3.0 DG40 SERIES INJECTOR CONTROL HEADS

Reference Drawing DG43-T003, DG46-T001

ITEM	QTY	DESCRIPTION	STD 5M & 10M DG43 (a)	H ₂ S 5M & 10M DG44 (b)	H ₂ S 15M DG46 (c)
Reference the following Drawings:			DG43-T003		DG46-T002
1	1	Piston	8010-2325	8010-2325	8207-0521
2	1	Wiper Ring	7962-2006	7962-2006	7962-2750
3	1	Retainer Ring, External	7824-3507	7824-3507	7824-4255
4	1	Cylinder Head	8010-2321	8010-2321	8207-0522
5	1	O-Ring	7813-3329	7813-3329	7813-3335
6	1	O-Ring	7813-3341	7813-3341	7813-3344
7	1	O-Ring (Piston)	7813-3341	7813-3341	7813-3355
8	1	Retainer Ring, Internal	7826-2137	7826-2137	7826-2137
9	1	Spring	7827-1715	7827-1715	7827-1715
10	1	Cylinder	8010-2322	8010-2322	8207-0523
11	1	Upper Bushing	8102-27XX	8102-27XX	8107-04XX
12	1	Packer	8101-39XX	8101-39XX	8101-39XX
13	1	Packer Body	8107-1042	8107-1042	8207-1848
14	1	Line Guide	8102-39XX	8102-39XX	8102-39XX
15a&b	6	O-Ring(Flow Tube)	7813-3210	7813-4210	-
15c	8	O-Ring)Flow Tube)			7813-4210
16a&b	8	O-Ring(Sleeve)	7813-3318	7813-4318	-
16c	6	Seal (Sleeve)			7821-2509
17a&b	3	Sleeve	8107-1032	8107-1032	-
17c	4	Sleeve	-	-	8206-3232
18a&b	3	Flow Tube	SEE FLOW TUBE CHART ON FOLLOWING PAGE		
18c	4	Flow Tube, DG46	SEE FLOW TUBE CHART ON FOLLOWING PAGE		
19	2	Connector/Coupling, Flow Tube	8107-1022	8107-1022	8206-2531
20a	-	Plug, 1/2 NPT	7934-1004	7934-1004	-
21	2	Bottom Sub	8107-9XXX	8107-9XXX	8107-8XXX
22	1	Union Nut	AS ORDERED		
23	1	Union Seal	AS ORDERED		
24	1	Union Back-up Ring	AS ORDERED		
25	1	Injection Coupling	-	-	8207-0921
26	1	Non-Extrusion Ring	-	-	8207-02XX
27	1	Nipple Hex 1/4 M X 1/4 M NPT	7934-1122	7934-1122	7934-1122
28	1	Elbow 1/4 F X 1/4 M NPT 90°	7934-2122	7934-2122	7934-2122
29	1	Quick Connect, Male	7934-0920	7934-0920	7934-0920

ITEM	QTY	DESCRIPTION	STD 5M & 10M DG43 (a)	H ₂ S 5M & 10M DG44 (b)	H ₂ S 15M DG46 (c)
Reference the following Drawings:			DG43-T003		DG46-T002
30	1	Guide, Check Valve	-	-	8206-3923
31	1	Spring, Check Valve	-	-	7827-1607
32	1	Seat, Check Valve	-	-	8206-3922
33	1	Bonnet, Check Valve	-	-	8206-3921
34	1	Carbide Ball, Check Valve	-	-	8102-2211

SEAL KITS

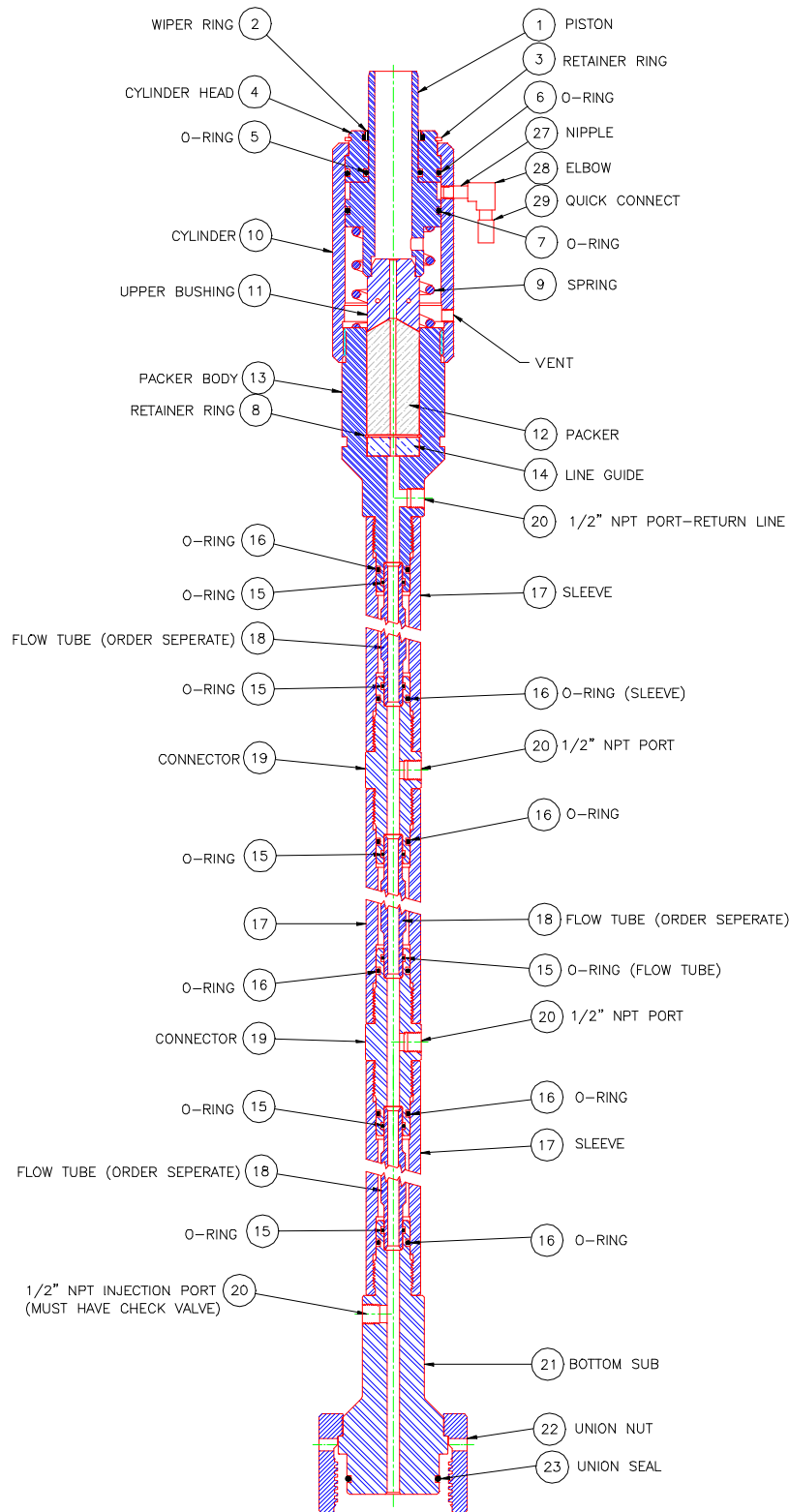
ITEM	QTY	DESCRIPTION	STD 5M & 10M DG43	H ₂ S 5M & 10M DG44	H ₂ S 15M DG46
Seal Kit Assembly Number			8109-1015	8109-1014	8109-1116
2	1	Wiper Ring	7962-2006	7962-2006	7962-2750
3	1	Retainer Ring, External	7824-3507	7824-3507	7824-4255
5	1	O-Ring	7813-3329	7813-3329	7813-3335
6	1	O-Ring	7813-3341	7813-3341	7813-3344
7	1	O-Ring(Piston)	7813-3341	7813-3341	7813-3355
8	1	Retainer Ring (Internal)	7826-2137	7826-2137	7826-2137
15a&b	6	O-Ring	7813-3210	7813-4210	-
15c	8	O-Ring	-	-	7813-4210
16a&b	6	O-Ring	7813-3318	7813-4318	-
16c	8	Seal	-	-	7821-2509

"a" Denotes DG43

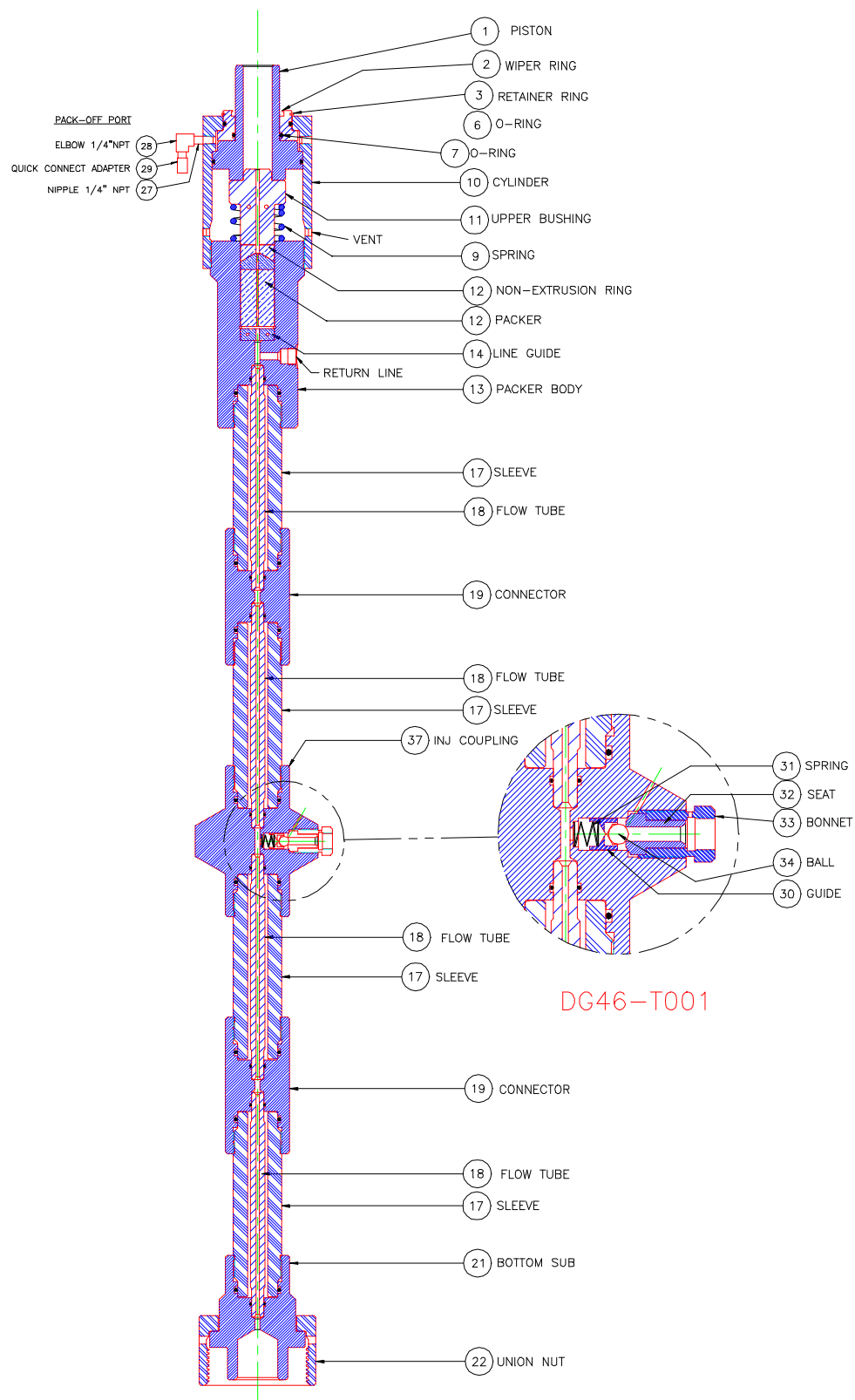
"b" Denotes DG44

"c" Denotes DG46

NOTE: Where applicable, replace X's in part numbers with numbers from section 7.0 to correspond to wireline size requirements or union configurations.



DG43-T003



4.0 DG50 INJECTOR CONTROL HEAD W/ SAFETY CHECK BALL& SEAT

Reference Drawing DG53-T001

ITEM	QTY	DESCRIPTION	STD 5M & 10M DG53	H ₂ S 5M & 10M DG54	H ₂ S 15M DG56
1	1	Piston	8010-2325	8010-2325	8207-0521
2	1	Wiper Ring	7962-2006	7962-2006	7962-2750
3	1	Retainer Ring, External	7824-3507	7824-3507	7824-4255
4	1	Cylinder Head	8010-2321	8010-2321	8207-0522
5	1	O-Ring	7813-3329	7813-3329	7813-3335
6	1	O-Ring	7813-3341	7813-3341	7813-3344
7	1	O-Ring (Piston)	7813-3341	7813-3341	7813-3355
8	1	Retainer Ring, Internal	7826-2137	7826-2137	7826-2137
9	1	Spring	7827-1715	7827-1715	7827-1715
10	1	Cylinder	8010-2322	8010-2322	8207-0523
11	1	Upper Bushing	8102-27XX	8102-27XX	8107-04XX
12	1	Packer	8101-39XX	8101-39XX	8101-39XX
13	1	Packer Body	8107-1042	8107-1042	8207-1848
14	1	Line Guide	8102-39XX	8102-39XX	8102-39XX
15a&b	6	O-Ring(Flow Tube)	7813-3210	7813-4210	-
15c	8	O-Ring)Flow Tube)			7813-4210
16a&b	8	O-Ring(Sleeve)	7813-3318	7813-4318	-
16c	6	Seal (Sleeve)			7821-2509
17a&b	3	Sleeve	8107-1032	8107-1032	-
17c	4	Sleeve	-	-	8206-3232
18a&b	3	Flow Tube	SEE FLOW TUBE CHART ON FOLLOWING PAGE		
18c	4	Flow Tube, DG46	SEE FLOW TUBE CHART ON FOLLOWING PAGE		
19a	3	Connector/Coupling, Flow Tube	8107-1022	-	-
19b&c	2	Connector/Coupling, Flow Tube	-	8107-1022	8206-2531
20a	-	Plug, ½ NPT	7934-1004	7934-1004	-
21	2	Bottom Sub Specific Union	8307-4XXX	8307-4XXX	8107-8XXX
22	1	Union Nut	AS ORDERED		
23	1	Union Seal	AS ORDERED		
24	1	Union Back-up Ring	AS ORDERED		
25	1	Injection Coupling	-	-	8207-0921
26	1	Non-Extrusion Ring	-	-	8207-02XX
27	1	Nipple Hex ¼ M X ¼ M NPT	7934-1122	7934-1122	7934-1122
28	1	Elbow ¼ F X ¼ M NPT 90°	7934-2122	7934-2122	7934-2122
29	1	Quick Connect, Male	7934-0920	7934-0920	7934-0920

ITEM	QTY	DESCRIPTION	STD 5M & 10M DG53	H ₂ S 5M & 10M DG54	H ₂ S 15M DG56
30	1	Guide, Check Valve	-	-	8206-3923
31	1	Spring, Check Valve	-	-	7827-1607
32	1	Seat, Check Valve	-	-	8206-3922
33	1	Bonnet, Check Valve	-	-	8206-3921
34	1	Carbide Ball, Check Valve	-	-	8102-2211
35	1	O-Ring, (Seat)	7813-3016	7813-4016	7813-4016
36	1	Seat, Ball Check	8102-2212	8102-2212	8102-2212
37	1	Carbide Ball 5/8"	8102-2211	8102-2211	8102-2211
38	1	Ball and Seat Retainer	8405-0225	8405-0225	8405-0225

SEALS KITS

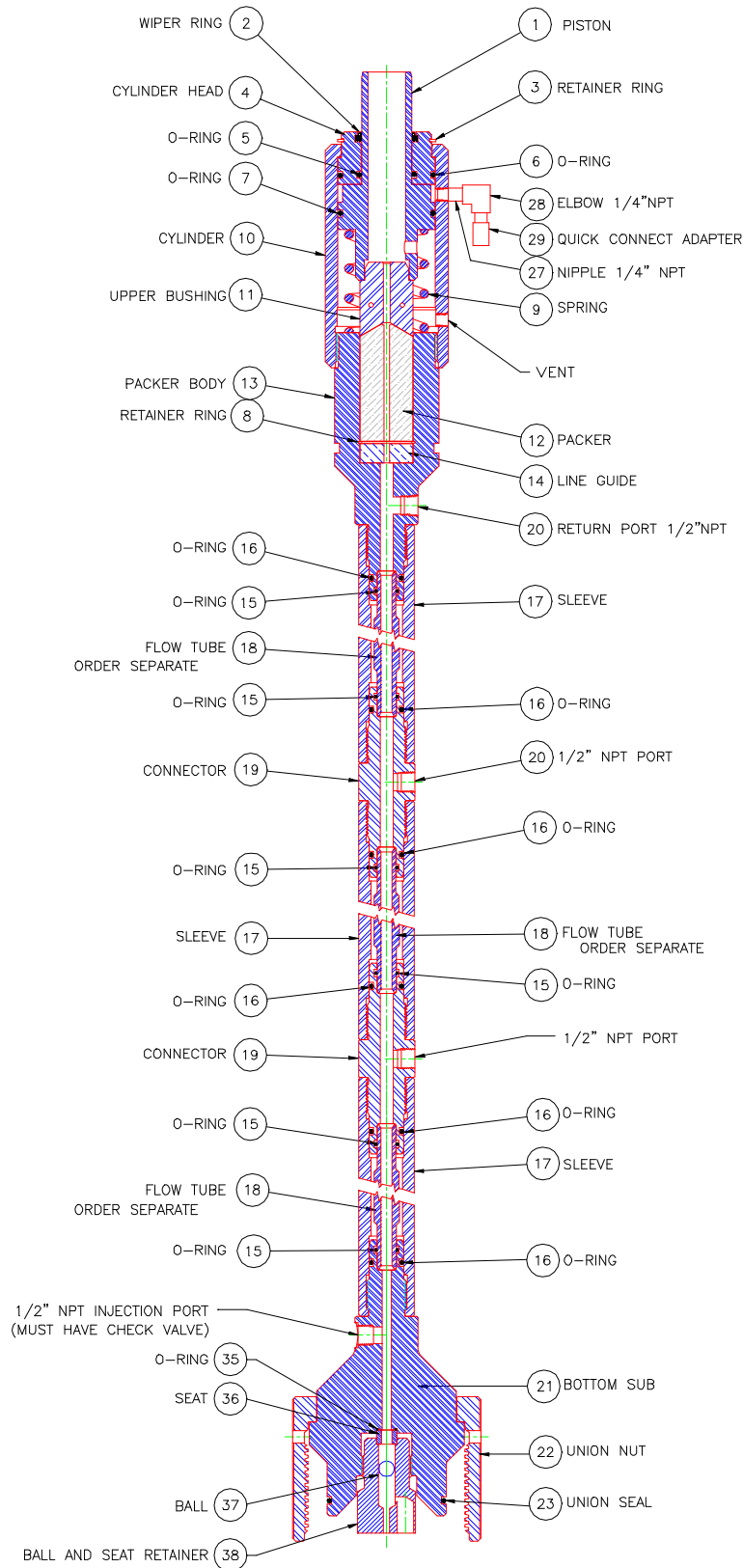
ITEM	QTY	DESCRIPTION	STD 5M & 10M DG53	H ₂ S 5M & 10M DG54	H ₂ S 15M DG56
Seal Kit Assembly Numbers			DG51-SK01	DG54-SK01	DG56-SK01
2	1	Wiper Ring	7962-2006	7962-2006	7962-2750
3	1	Retainer Ring, External	7824-3507	7824-3507	7824-4255
5	1	O-Ring	7813-3329	7813-3329	7813-3335
6	1	O-Ring	7813-3341	7813-3341	7813-3344
7	1	O-Ring (Piston)	7813-3341	7813-3341	7813-3355
8	1	Retainer Ring, Internal	7826-2137	7826-2137	7826-2137
15a&b	6	O-Ring (Flow Tube)	7813-3210	7813-4210	-
15c	8	O-Ring (Flow Tube)	-	-	7813-4210
16a&b	6	O-Ring (Sleeve)	7813-3318	7813-4318	-
16c	8	Seal (Sleeve)	-	-	7821-2509
35	1	O-Ring (Seat)	7813-3016	7813-4016	7813-4016
36	1	Carbide Ball	8102-2211	8102-2211	8102-2211
37	1	Seat, Ball Check	8102-2212	8102-2212	8102-2212

"a" Denotes DG53

"b" Denotes DG54

"c" Denotes DG56

NOTE: Where applicable, replace X's in part numbers with numbers from section 7.0 to correspond to wireline size requirements or union configurations.



DG53-T001

5.0 DG70 CONTROL HEAD (PACKER ONLY)

Reference Drawing DG70-T001

ITEM	QTY	DESCRIPTION	STD 5M & 10M DG73	H ₂ S 5M & 10M DG74	H ₂ S 15M DG76	H ₂ S 20M DG78
1	1	Piston	8010-2325	8010-2325	8207-0521	8207-0521
2	1	Wiper Ring	7962-2006	7962-2006	7962-2750	7962-2750
3	1	Retainer Ring, External	7824-3507	7824-3507	7824-4257	7824-4255
4	1	Cylinder Head	8010-2321	8010-2321	8207-0522	8207-0522
5	1	O-Ring	7813-3329	7813-3329	7813-3335	7813-3335
6	1	O-Ring	7813-3341	7813-3341	7813-3344	7813-3344
7	1	O-Ring (Piston)	7813-3341	7813-3341	7813-3355	7813-3355
8	1	Retainer Ring, Internal	7826-2137	7826-2137	7826-2137	7826-2137
9	1	Spring	7827-1715	7827-1715	7827-1715	7827-1849
10	1	Cylinder	8010-2322	8010-2322	8207-0523	8207-0523
11	1	Upper Bushing	8102-27XX	8102-27XX	8107-04XX	8107-04XX
12	1	Packer	8101-39XX	8101-39XX	8101-39XX	8101-39XX
13	1	Packer Body (Specify Union)	8107-7XXX	8107-7XXX	8107-7XXX	8107-7XXX
14	1	Line Guide	8102-39XX	8102-39XX	8207-03XX	8207-03XX
22	1	Union Nut	AS ORDERED			
23	1	Seal, Union	AS ORDERED			
24	1	Back-Up Ring, Union	AS ORDERED			
26	1	Non-Extrusion Ring	-	-	-	8207-02XX
27	1	Nipple Hex 1/4 M X 1/4 M NPT	7934-1122	7934-1122	7934-1122	7934-1122
28	1	Elbow 1/4 F X 1/4 M NPT 90°	7934-2122	7934-2122	7934-2122	7934-2122
29	1	Quick Connect, Male	7934-0920	7934-0920	7934-0920	7934-0920

SEALS KIT

ITEM	QTY	DESCRIPTION	STD 5M & 10M DG73	H ₂ S 5M & 10M DG74	H ₂ S 15M DG76	H ₂ S 20M DG78
2	1	Wiper Ring	7962-2006	7962-2006	7962-2750	7962-2750
3	1	Retainer Ring, External	7824-3507	7824-3507	7824-4257	7824-4255
5	1	O-Ring	7813-3329	7813-3329	7813-3335	7813-3335
6	1	O-Ring	7813-3341	7813-3341	7813-3344	7813-3344
7	1	O-Ring (Piston)	7813-3341	7813-3341	7813-3355	7813-3355
8	1	Retainer Ring, Internal	7826-2137	7826-2137	7826-2137	7826-2137

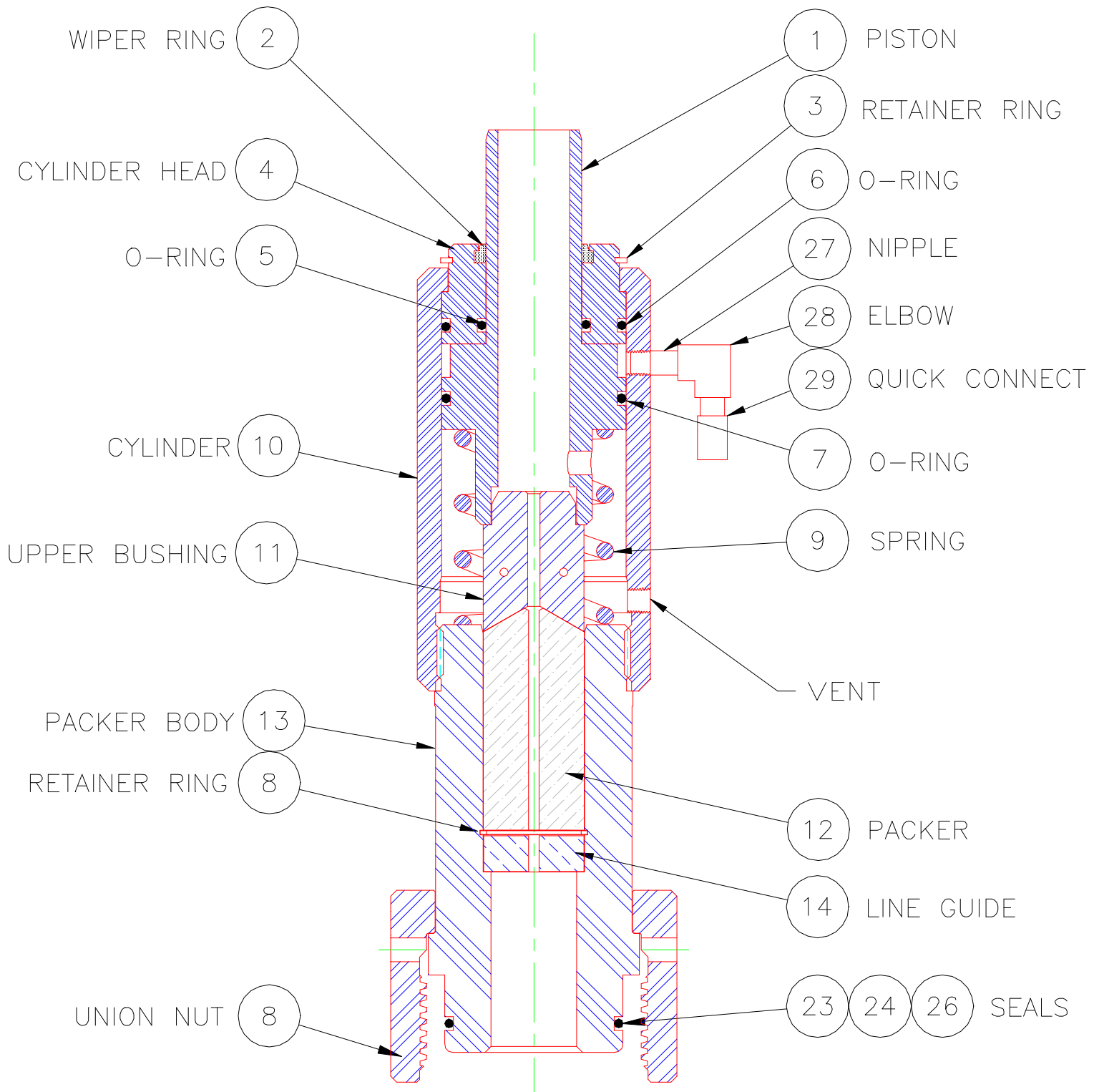
"a" Denotes DG73

"c" Denotes DG76

"b" Denotes DG74

"d" Denotes DG78

NOTE: Where applicable, replace X's in part numbers with numbers from section 7.0 to correspond to wireline size requirements or union configurations.



DG70-T001

6.0 DG80 GREASE TUBE ASSEMBLY (NO PACKER)

Reference Drawing DG80-T001

ITEM	QTY	DESCRIPTION	STD 5M & 10M DG83	H ₂ S 5M & 10M DG84	H ₂ S 15M DG86
15a	6	O-Ring, Flow Tube	7813-3210	-	-
15b&c	8	O-Ring, Flow Tube	-	7813-4210	7813-4210
16a&b	6	O-Ring	7813-3318	7813-4318	-
16c	8	Seal	-	-	7821-2509
17a&b	3	Sleeve	8107-1032	8107-1032	-
17c	4	Sleeve	-	-	8206-3232
19	2	Connector	8107-1022	8107-1022	8206-2531
20a&b	1	Plug	7934-1004	7934-1004	-
20c	1	Plug	-	-	7934-7533
21	2	Bottom Sub, Specify Union	8107-9XXX	8107-9XXX	8107-8XXX
22	1	Union Nut	AS ORDERED		
25	1	Injector Coupling	-	-	8207-0921
30	1	Guide, Check Valve	-	-	8206-3923
31	1	Spring, Check Valve	-	-	7827-1607
32	1	Seat, Check Valve	-	-	8206-3922
33	1	Bonnet, Check Valve	-	-	8206-3921
34	1	Ball, Check Valve	-	-	8102-2211
40	1	Top Sub, Specify Union	8107-4XXX	8107-4XXX	8107-6XXX

SEALS KIT

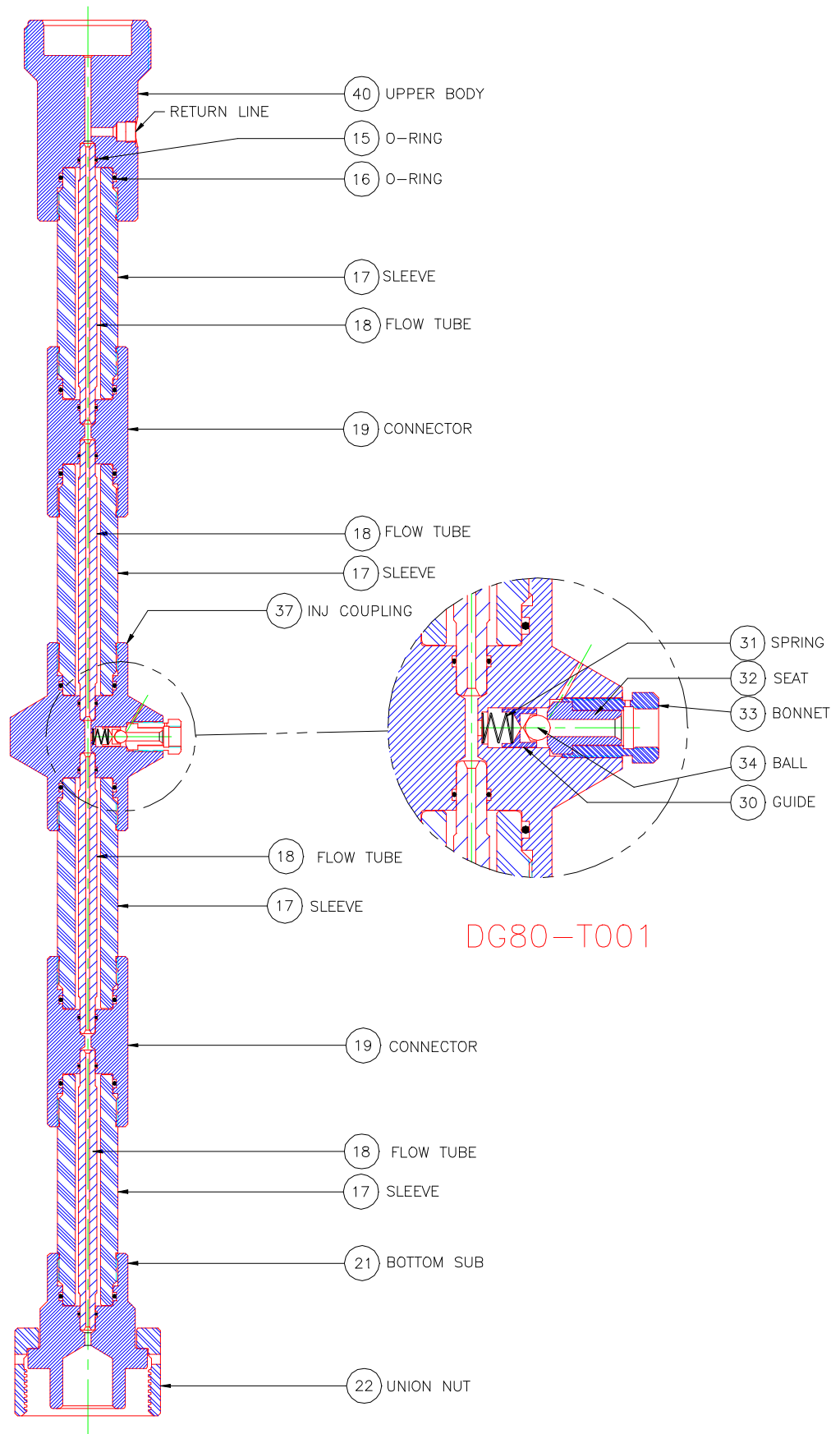
ITEM	QTY	DESCRIPTION	STD 5M & 10M DG83	H ₂ S 5M & 10M DG84	H ₂ S 15M DG86
Seals Kit Assembly Number			8109-1217	8109-1218	8109-1219
15a	6	O-Ring, Flow Tube	7813-3210		-
15b&c	8	O-Ring, Flow Tube	-	7813-4210	7813-4210
16a&b	6	O-Ring	7813-3318	7813-4318	-
16c	8	Seal			7821-2509
32	1	Seat, Check Valve	-	-	8206-3922
34	1	Ball, Check Valve		-	8102-2211

"a" Denotes DG83

"b" Denotes DG84

"c" Denotes DG86

NOTE: Where applicable, replace X's in part numbers with numbers from section 7.0 to correspond to wireline size requirements or union configurations.



7.0 BUSHINGS, FLOWTUBES & PACKERS**PACKERS & BUSHINGS
5M & 10M - ALL MODELS**

Item	11	12	14
Line Size	Upper Bushing	Packer	Line Guide
.092	8102-2722	8101-3922	8102-3922
$\frac{1}{8}$	8102-2723	8101-3923	8102-3923
$\frac{3}{16}$	8102-2724	8101-3924	8102-3924
$\frac{7}{32}$	8102-2725	8101-3925	8102-3925
$\frac{1}{4}$	8102-2726	8101-3926	8102-3926
$\frac{5}{16}$	8102-2728	8101-3928	8102-3928
$\frac{3}{8}$	8102-2729	8101-3929	8102-3929
$\frac{7}{16}$	8102-2730	8101-3930	8102-3930
$\frac{15}{32}$	8102-2731	8101-3931	8102-3931

**FOR ALL WORKING PRESSURES
5,000, 10,000, 15,000, & 20,000 psi**

Line Size	Flow tube I.D.	Part No.
.092	.096	8010-8096
	.098	8010-8098
$\frac{1}{8}$	.125	8010-8125
	.128	8010-8128
	.130	8010-8130
	.133	8010-8133
	.136	8010-8136
$\frac{3}{16}$	.173	8010-8173
	.177	8010-8177
	.180	8010-8180
	.185	8010-8185
	.188	8010-8188
	.191	8010-8191
	.194	8010-8194
	.196	8010-8196
$\frac{7}{32}$	.199	8010-8199
	.201	8010-8201
	.204	8010-8204
	.209	8010-8209
	.213	8010-8213
	.218	8010-8218
	.221	8010-8221
	.224	8010-8224
	.228	8010-8228
	.234	8010-8234
	.238	8010-8238
	.242	8010-8242
$\frac{9}{32}$	.251	8010-8251
	.261	8010-8261
	.290	8010-8290
	.297	8010-8297
	.302	8010-8302
	.312	8010-8312
	.316	8010-8316
	.318	8010-8318

Line Size	Flow tube I.D.	Part No.
	.323	8010-8323
	.328	8010-8328
	.332	8010-8332
$\frac{3}{8}$	.360	8010-8360
	.368	8010-8368
	.375	8010-8375
	.377	8010-8377
$\frac{7}{16}$	.386	8010-8386

8.0 SHEAVE & BRACKET ASSEMBLY

DG43, DG44, DG46 & DJ21

Assembly No.			14"	10"
ITEM	QTY	DESCRIPTION	STD 5M & 10M DJ21	H ₂ S 5M & 10M DJ21
71	1	Retainer Ring, External	7824-4257	7824-4257
72	2	Hex Nut, 1.50-8 UN	7937-0824	7937-0824
73	2	Socket Crew	7942-0402	7942-0402
74	2	Woodruff Key	7970-0806	7970-0806
75	Top Block			
	1	.108 Line	8176-2314	8176-2314
	1	$\frac{3}{16}$ Line	8176-2414	8176-5410
	1	$\frac{7}{32}$ Line	8176-2514	8176-2510
76	1	Offset Bracket, Upper	8412-0424	8412-0424
77	1	Upper Staff	8412-0425	8412-0425
78	1	Lower Staff	8412-0426	8412-0426
79	1	Split Ring	8412-0423	8412-0423
	1	Split Ring	8412-0423	8412-0423
	1	Offset Bracket, Lower	8412-0422	8701-0423

9.0 HOSE ASSEMBLY

INJECTION HOSE ASSEMBLY 5,000 psi Working Pressure

Assembly No.			8014-3050	8014-3100	8014-3150	8014-3200	8014-3250
Length, ft.			50	100	150	200	250
Item	Description	Part No.	Qty.				
51	Hose, ½ dia. ½ NPT, 50 ft.	7831-4450	1	2	3	4	5
52	Union, ½" Yale	7934-3444	2	3	4	5	6
53	Check Valve	7934-3744	1	1	1	1	1
54	Elbow, 90° Street	7934-4244	1	1	1	1	1
55	Nipple ½ NPT x 3 lg.	7934-4034	2	2	2	2	2

RETURN HOSE ASSEMBLY 5,000 psi Working Pressure

Assembly No.			8014-2050	8014-2100	8014-2150	8014-2200	8014-2250
Length, ft.			50	100	150	200	250
Item	Description	Part No.	Qty.				
51	Hose, ½ dia. ½ NPT, 50 ft.	7831-4450	1	2	3	4	5
52	Union, ½" Yale	7934-3444	1	2	3	4	5
53	Elbow, 90° Street	7934-4244	1	1	1	1	1
54	Nipple ½ NPT x 3 lg.	7934-4034	2	2	2	2	2
55	Reducer Bushing	7934-1446	1	1	1	1	1
56	Needle Valve	7934-3966	1	1	1	1	1

HOSE ADD-ON ASSEMBLY

Assembly No.			8014-9025	8014-9049
Item	Description	Qty	25 FT. Hose Part No.	50 Ft. Hose Part No.
51	Hose ½" Dia.	1	7831-4425	7831-4450
52	Union, ½" Yale	1	7934-3444	7934-3444

INJECTION HOSE ASSEMBLY
10,000 psi Working Pressure

Assembly No.			8016-5050	8016-5100	8016-5150	8016-5200	80-16-5250
Length, ft.			50	100	150	200	250
Item	Description	Part No.	Qty.				
51	Hose, ½ dia. ½ NPT, 50 ft.	7831-4450	1	2	3	4	5
52	Union, ½" Yale	7934-3444	2	3	4	5	6
53	Check Valve	7934-3844	1	1	1	1	1
54	Elbow, 60° ½" NPT, 10MN	8207-2323	1	1	1	1	1
55	Nipple ½ NPT x 3 lg. 10MN	8207-2322	3	3	3	3	3
58	Yale O-Ring	7813-3212					

RETURN HOSE ASSEMBLY
10,000 psi Working Pressure

Assembly No.			8016-6050	8016-6100	8016-6150	8016-6200	80-16-6250
Length, ft.			50	100	150	200	250
Item	Description	Part No.	Qty.				
51	Hose, ½ dia. ½ NPT, 50 ft.	7831-4450	1	2	3	4	5
52	Union, ½" Yale	7934-3444	1	2	3	4	5
54	Elbow, 60° ½ NPT 10MN	8207-2323	1	1	1	1	1
55	Nipple ½ NPT x 3 lg. 10MN	8207-2322	2	2	2	2	2
57	Reducer Bushing ½ x ¾	7934-1446	1	1	1	1	1
56	Needle Valve, ¾"	7934-3666	1	1	1	1	1

HOSE ADD-ON ASSEMBLY

Assembly No.			8016-6025	8016-6049
Item	Description	Qty	25 FT. Hose Part No.	50 Ft. Hose Part No.
51	Hose ½" Dia.	1	7831-4425	7831-4450
52	Union, ½" Yale	1	7934-3444	7934-3444

INJECTION HOSE ASSEMBLY
15,000 psi Working Pressure
 $\frac{3}{4}$ " Slimline Connections

Assembly No.			8015-7050	8015-7100	8015-7150	8015-7200	8015-7250
Length, ft.			50	100	150	200	250
Item	Description	Part No.	Qty.				
51	Hose, $\frac{1}{2}$ dia. $\frac{1}{2}$ NPT, 50 ft.	7835-4050	1	2	3	4	5
52	Connector 4113-4113	7934-7515	0	1	2	3	4
54	Elbow, 90° AE $\frac{3}{4}$ " SL	7934-7522	1	1	1	1	1
55	Nipple $\frac{1}{2}$ NPT x 3 lg. 10MN	7934-7504	1	1	1	1	1
59	Quick Connect, Female w/check	7934-5240	2	2	2	2	2
60	Quick Connect, Male wo/check	7934-5375	2	2	2	2	2

RETURN HOSE ASSEMBLY
15,000 psi Working Pressure

Assembly No.			8015-4050	8015-4100	8015-4150	8015-4200	8015-4250
Length, ft.			50	100	150	200	250
Item	Description	Part No.	Qty.				
51	Hose, $\frac{1}{2}$ dia. $\frac{1}{2}$ NPT, 50 ft.	7835-4050	1	2	3	4	5
52	Connector 4113-4113	7934-7515	0	1	2	3	4
54	Elbow, 90° AE $\frac{3}{4}$ " SL	7934-7522	1	1	1	1	1
55	Nipple $\frac{1}{2}$ NPT x 3 lg. 10MN	7934-7504	1	1	1	1	1
59	Quick Connect, Female w/check	7934-5240	1	1	1	1	1
60	Quick Connect, Male wo/check	7934-5375	1	1	1	1	1
61	Adapter, AE $\frac{3}{4}$ SL to 4113	7934-7542	1	1	1	1	1
62	Valve, AE $\frac{3}{4}$ SL	7934-7581	1	1	1	1	1
63	Adapter, $\frac{1}{2}$ NPT F x AE $\frac{3}{4}$ SL	7934-7519	1	1	1	1	1

HOSE ADD-ON ASSEMBLY
15,000 psi Working Pressure

Assembly No.			8015-4024	8015-4049
Item	Description	Qty	25 FT. Hose Part No.	50 Ft. Hose Part No.
51	Hose $\frac{1}{2}$ " Dia.	1	7935-4025	7835-4050
52	Connector	1	7934-7515	7935-7515

INJECTION HOSE ASSEMBLY
20,000 psi Working Pressure

Assembly No.			8018-9050	8018-9100	8018-9150	8018-9200	8018-9250
Length, ft.			50	100	150	200	250
Item	Description	Part No.	Qty.				
51	Hose, .3 dia. ½ NPT, 50 ft.	7836-3050	2	4	6	8	10
52	Connector 6108-6108		0	2	4	6	8
54	Elbow, 90° AE ⅜ HP		1	1	1	1	1
55	Nipple AE ⅜ HP		3	3	3	3	3
59	Quick Connect, Female w/check		2	2	2	2	2
60	Quick Connect, Male wo/check		2	2	2	2	2
61	Adapter, AE ⅜ HP to 6108		4	4	4	4	4

RETURN HOSE ASSEMBLY
20,000 psi Working Pressure

Assembly No.			8018-8050	8018-8100	8018-8150	8018-8200	8018-8250
Length, ft.			50	100	150	200	250
Item	Description	Part No.	Qty.				
51	Hose, .3 dia. ½ NPT, 50 ft.	7836-3050	1	2	3	4	5
52	Connector 6108-6108		0	1	2	3	4
54	Elbow, 90° AE ⅜ HP		1	1	1	1	1
55	Nipple AE AE ⅜ HP		1	1	1	1	1
59	Quick Connect, Female w/check		1	1	1	1	1
60	Quick Connect, Male wo/check		1	1	1	1	1
61	Adapter, AE ⅜ HP to 6108		1	1	1	1	1
62	Valve, AE AE ⅜ HP		1	1	1	1	1
63	Adapter, ⅜ HP		1	1	1	1	1

NOTE: 20,000 psi hose is only .3 dia; parallel hoses are required for injection to reduce line loss

HOSE ADD-ON ASSEMBLY
20,000 psi Working Pressure

Assembly No.			8018-8024	8018-8049
Item	Description	Qty	25 FT. Hose Part No.	50 Ft. Hose Part. No.
51	Hose .3" Dia.	1	7936-8025	7836-8050
52	Connector	1		

DRAIN HOSE
200 psi Working Pressure

Assembly No.			8013-4050	8013-4100	8013-4150	8013-4200	8013-4250
Length, ft.			50	100	150	200	250
Item	Description	Part No.	Qty.				
51	Hose, ½ dia. ½ NPT, 50 ft.	7833-4450	1	2	3	4	5
52	Coupling, ½ NPT	7934-1944	0	1	2	3	4
54	Elbow, 90° ½ NPT	7934-2244	1	1	1	1	1
55	Reducer Nipple ¼ x ½ NPT	7934-1224	1	1	1	1	1
59	Quick Connect, Female	7934-5404	1	1	1	1	1
60	Quick Connect, Male	7934-5504	1	1	1	1	1