

NOVELLUS

**CONCEPT  
ONE-200  
SYSTEM  
MANUAL**

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**Illustrated  
Parts Guide**

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### 1.1 USING THIS GUIDE

The *Illustrated Parts Guide* is organized by system modules, subsystems, assemblies, and parts. Section 2.0 serves as a visual table of contents. Section 3.0 provides details of the Process Module and section 4.0 provides details of the system support modules.

The **System Index** (Fig. 1.1) visually identifies each major system module or option. Each module is referenced to a corresponding Subsystem Index. The System Index is found in section 2.1

The **Subsystem Index** (Fig. 1.2) identifies the major subsystems of each module. Each subsystem is referenced to its corresponding Assembly Index. See sections 2.1 – 2.5.

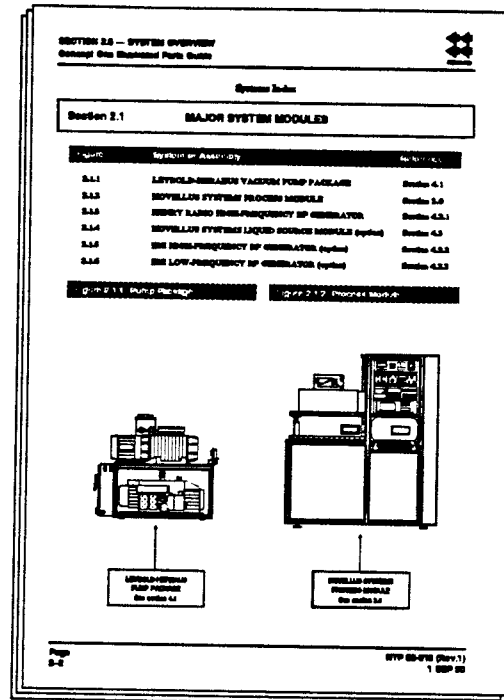


Figure 1.1 System Index

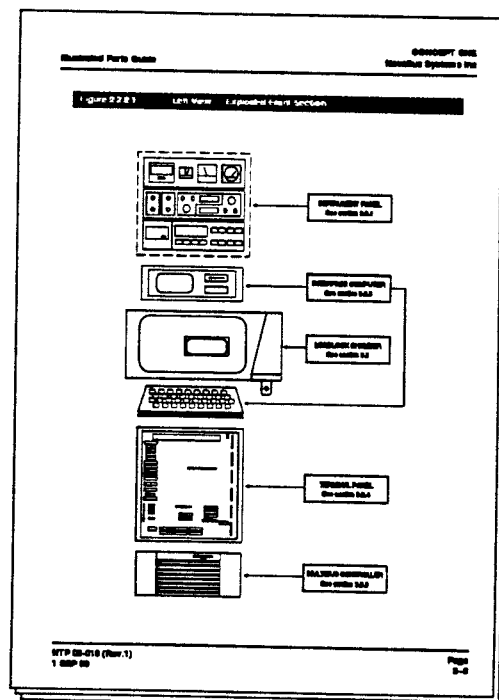
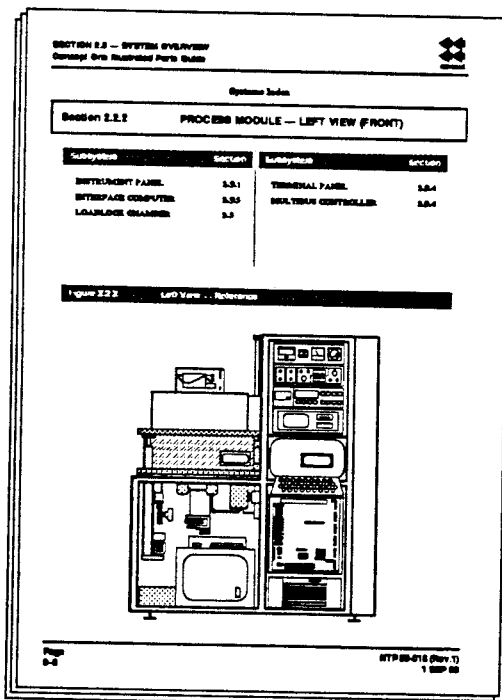


Figure 1.2 Subsystem Index

The Assembly Index (Fig. 1.3) provides two views of the selected subsystem. The first view is shaded to show the location of each subsystem with respect to the system module. The second view is exploded to reveal the individual assemblies which constitute the subsystem. Each assembly is referenced to a corresponding Parts Schedule (see Fig. 1.3). The Assembly Indices are found in sections 3.1 – 4.3.

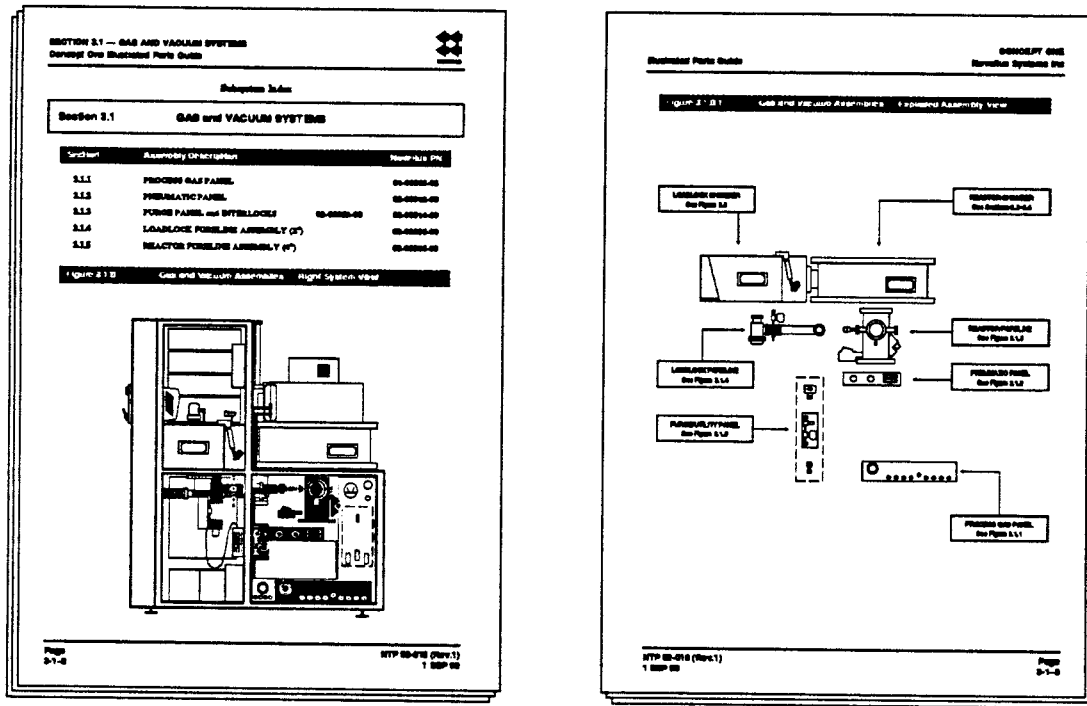


Figure 1.3 Assembly Index

The Parts Schedule (Fig. 1.4, facing page) provides a listing of parts for the selected assembly. The Parts Schedule is keyed to a parts illustration which always appears on the same page or the page facing the Parts Schedule. Parts Schedules comprise sections 3.1.x – 4.3.x

Additional figures (numbered 3.1.x.x – 4.3.x.x) are used to show subassembly details, component options, or alternate views which cannot be shown clearly in the main assembly figure. If the detail figure appears on the same or facing page as the parent assembly, it is keyed to the same Parts Schedule as the parent. If the detail figure appears on a page apart from the parent assembly, it will be keyed to a separate Parts Schedule which is numbered the same as the figure.

Figures at all levels are cross-referenced to related figures at the same or different levels. The callout flags shown on the following page are used in the figures to identify parts, to cross-reference assemblies, and to provide other pertinent information.

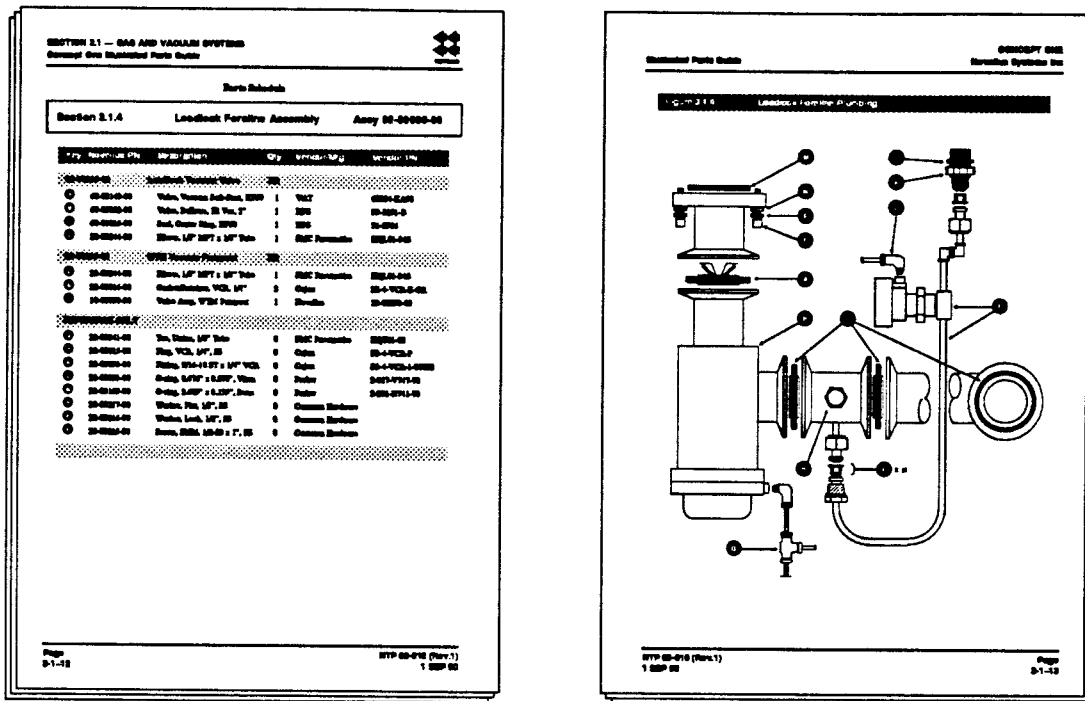
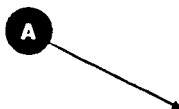
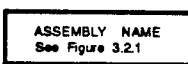


Figure 1.4 Parts Schedule



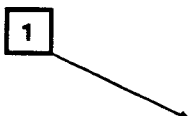
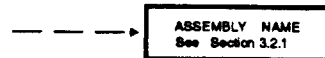
The *bubble* symbol (left) is used to identify the individual parts and components of an assembly. The part number and related information may be obtained by matching the key letter to the *Parts Schedule* which appears on the same or facing page.

The *banner* symbol (below) is used for cross-reference to additional figures or other sections of the manual which are related to the current figure.



A *solid arrow* indicates a component or a lesser assembly which is part of the current illustrated assembly. A more detailed figure of the indicated part may be found in the referenced section.

A *dashed arrow* indicates a separate component or assembly which adjoins or relates to the currently illustrated assembly.



The *flag* symbol (left) is used to provide special information concerning individual parts or groups of parts. This information may be obtained by matching the flag number to the NOTES section of the *Parts Schedule*.



## 1.2 ORDERING PARTS

Many of the parts or assemblies shown in the *Illustrated Parts Guide* are listed for reference purposes only, and they are *not* available for purchase from Novellus Systems. The Parts Schedule for each assembly lists parts under one of three subheading: Kits, Individual Parts, and Reference Only.

### 1.2.1 Parts Kits

A Part Kit is a group of related parts which is available for purchase as a unit. The parts which belong to the kit may *not* be purchased separately, unless they are listed elsewhere as individual parts. A kit may contain assembled parts, or unassembled parts, depending upon the nature of the parts. A kit may also contain other kits.

A typical Parts Kit listing is shown in Figure 1.5. The kit part number and description is shown in the shaded bar. The parts which belong to the kit are listed as items A through D. The quantity shown for each item is the number supplied with one kit.

A number of general maintenance kits are available in addition to the kits illustrated in this manual. Appendix D provides a supplementary listing of Preventive Maintenance Kits and

Key	Novellus PN	Description	Qty	Vendor/Mfg	Vendor PN
	<b>05-50067-00</b>	<b>Gas Distrib Spider Assy</b>	<b>Kit</b>		
<b>A</b>	22-00179-00	Elbow, Union, 3/8" O-seal	8	Key Hi Vac Prod	10853-1
<b>B</b>	10-00072-00	Tube, 3/8" x 1/4" x 6-1/8", PFA	8	Fluorocarbon	7006045
<b>C</b>	22-00239-00	O-ring, 5.984" x 0.139", Viton	2	Parker	2-258-V747-70
<b>D</b>	22-00345-00	O-ring, 0.362" x 0.103", Buna	8	Parker	2-110-N741-70

Figure 1.5 Kit Listing

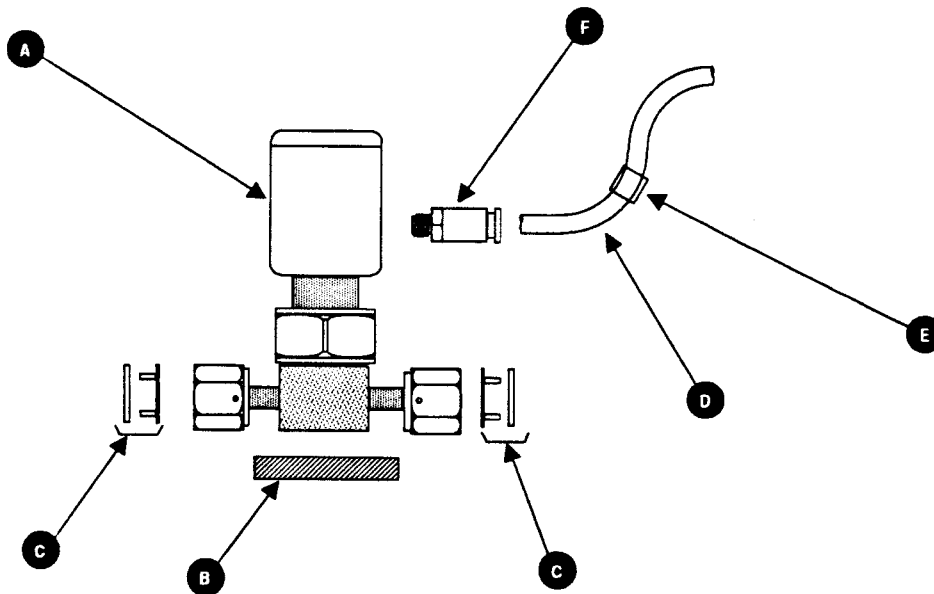
Common Parts Kits.

Parts Schedule

**Section 3.1.1.1      Pneumatic Valve Kit-A**

Key	Novellus PN	Description	Qty	Vendor/Mfg	Vendor PN
	05-50093-00	<b>Pneumatic Valve</b>	<b>Kit</b>		
<b>A</b>	22-00612-00	Valve, Pneumatic, NC	1	Nupro	SS-BNV51-DJ-C
<b>C</b>	22-00016-00	Gasket/Retainer, VCR, 1/4"	2	Cajon	NI-4-VCR-Z-GR
<b>F</b>	22-00323-00	Fitting, One-Touch, 1/8"	1	SMC	KQH 01-32
<b>REFERENCE ONLY</b>					
<b>B</b>	15-00581-00	Plate, Valve Mounting	0	Novellus	15-00581-00
<b>D</b>	10-00040-00	Tubing, 1/8" OD, PVC	0	ADI	1311
<b>E</b>	31-00173-00	Wire Marker	0	Weidmueller	3113.5

**Figure 3.1.1.1      Pneumatic Valve Kit**



Parts Schedule

**Section 3.1.1.2      Pneumatic Valve Kit-B**

Key	Novellus PN	Description	Qty	Vendor/Mfg	Vendor PN
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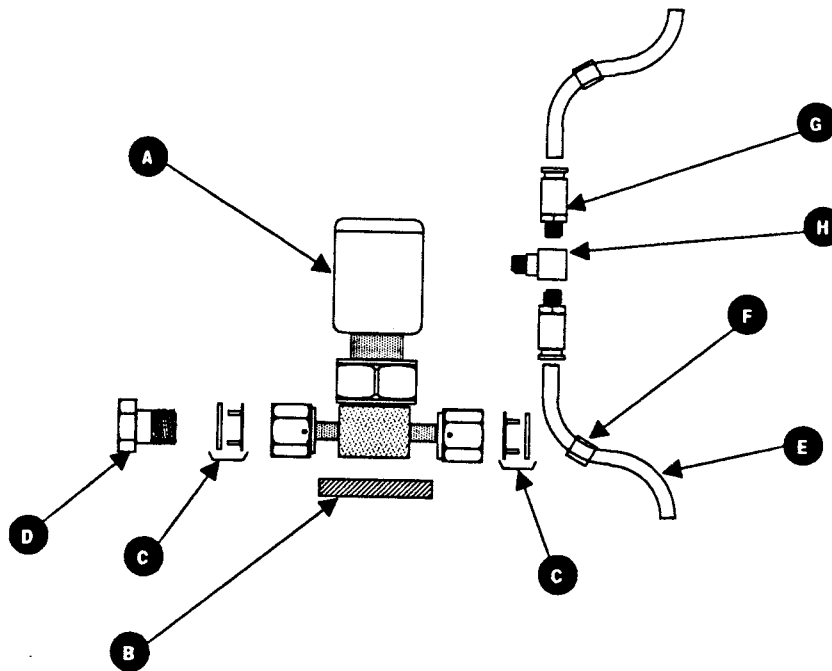
**05-50092-00      Pneumatic Valve      Kit**

<b>A</b>	22-00612-00	Valve, Pneumatic, NC	1	Nupro	SS-BNV51-DJ-C
<b>C</b>	22-00016-00	Gasket/Retainer, VCR, 1/4"	2	Cajon	NI-4-VCR-Z-GR
<b>F</b>	22-00359-00	Tee, Branch, 10-32 ST	1	ADI	1108
<b>G</b>	22-00323-00	Fitting, One-Touch, 1/8"	2	SMC	KQH 01-32

**REFERENCE ONLY**

<b>B</b>	15-00581-00	Plate, Valve Mounting	1	Novellus	15-00581-00
<b>D</b>	10-00040-00	Tubing, 1/8" OD, PVC	0	ADI	1311
<b>E</b>	31-00173-00	Wire Marker	0	Weidmueller	3113.5

**Figure 3.1.1.2      Pneumatic Valve Kit**





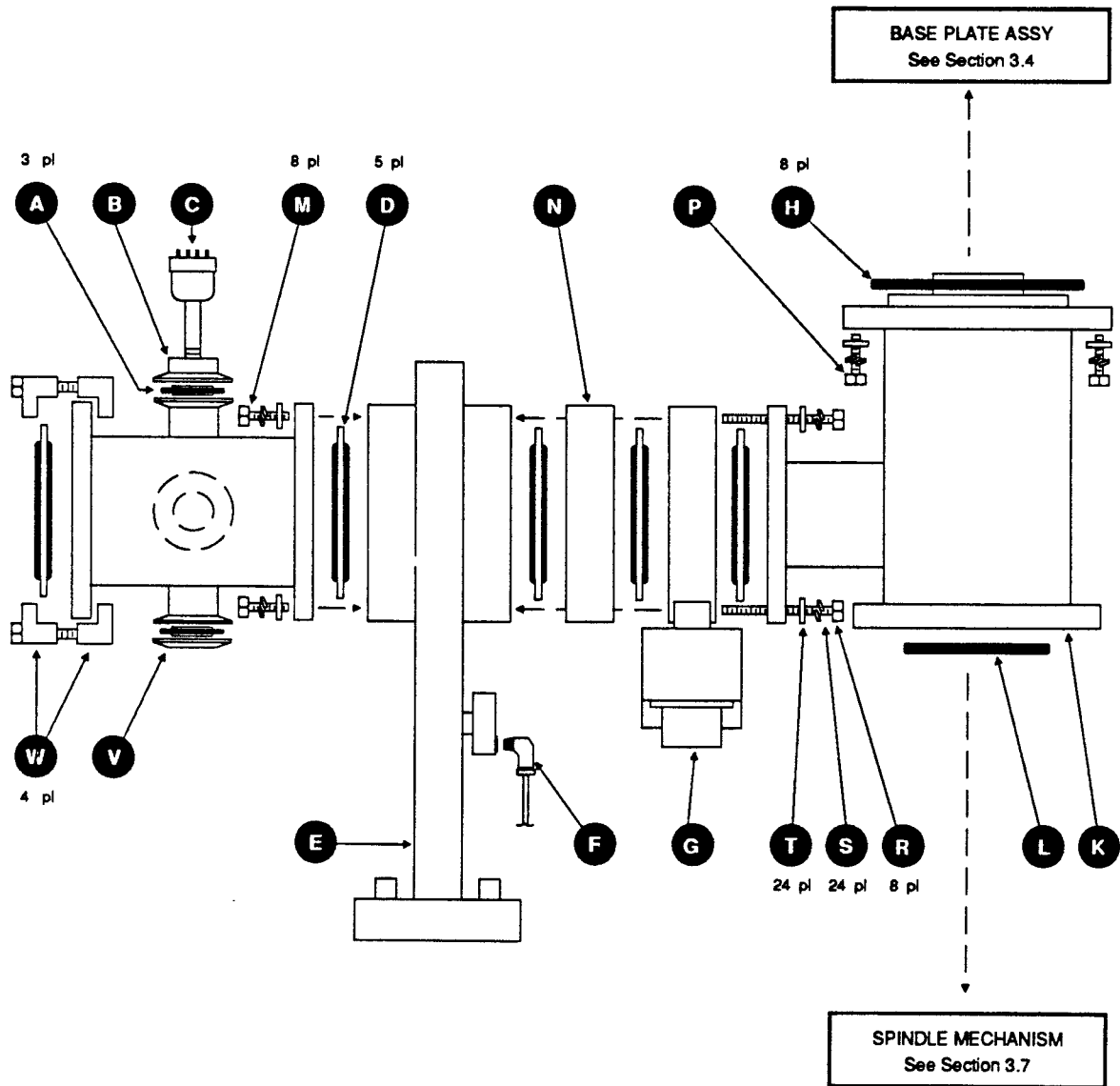


Parts Schedule

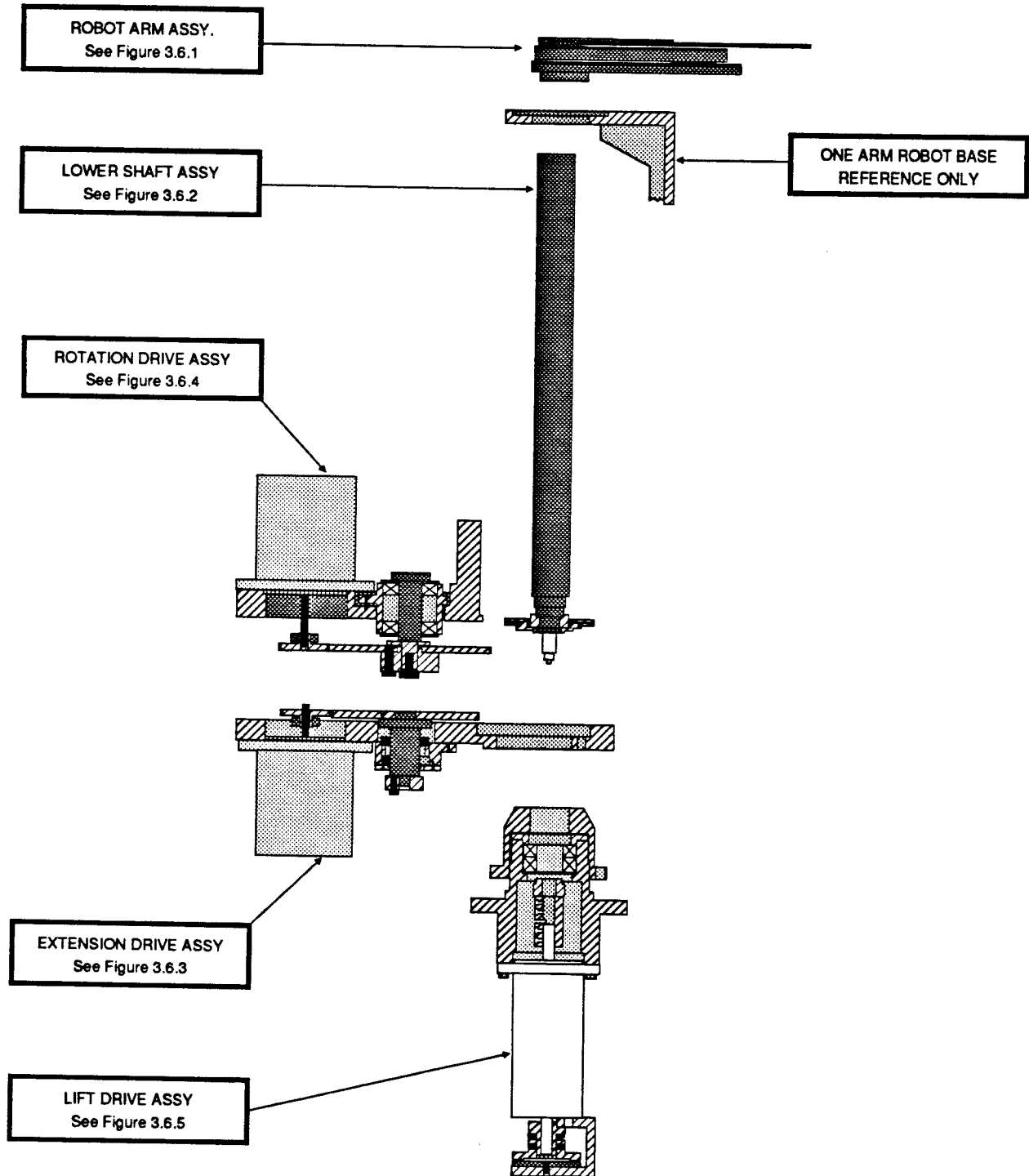
**Section 3.1.5                      Reactor Foreline Assembly                      Assy 02-00006-00**

Key Novellus PN	Description	Qty	Vendor/Mfg	Vendor PN
<b>05-50071-00                      Foreline TC Gauge                      KIt</b>				
<b>A</b> 60-00019-00	Seal, Center Ring, KF25	1	HPS	31-2603
<b>B</b> 22-00203-00	Flange Ftg, KF25 x 1/8" FPT	1	HPS	31-2003
<b>C</b> 60-00005-00	Gauge Tube, Vacuum, TC	1	Hastings	HA 7216
<b>05-50022-00                      Reactor Vacuum Valve                      KIt</b>				
<b>D</b> 60-00026-00	Seal, Center Ring, NW100	2	HPS	76-0510
<b>E</b> 60-00003-00	Valve, Gate, Hi Vac, 4"	1	VAT	14040-PE34
<b>F</b> 22-00245-00	Elbow, 1/8" MPT x 1/4" Tube	1	SMC Pneumatics	KQL07-345
<b>05-50021-00                      Vacuum Throttle Valve                      KIt</b>				
<b>D</b> 60-00026-00	Seal, Center Ring, NW100	3	HPS	76-0510
<b>G</b> 60-00001-00	Valve, Throttle, Vacuum Control	1	Vacuum General	MDV-038-100B
<b>05-50020-00                      Reactor Vacuum Vestibule                      KIt</b>				
<b>D</b> 60-00026-00	Seal, Center Ring, NW100	3	HPS	76-0510
<b>H</b> 22-00174-00	O-ring, 6.234" x 0.139", Viton	1	Parker	2-259-V747-75
<b>K</b> 16-00088-00	Vestibule Box, RC Foreline	1	Novellus	16-00088-00
<b>L</b> 22-00256-00	O-ring, 3.484" x 0.139", Viton	1	Parker	2-238-V747-75
<b>REFERENCE ONLY</b>				
<b>M</b> 20-00209-00	Screw, SkHd, M8 x 30, Blk Ox	0	Common Hardware	
<b>N</b> 15-00416-00	Flange, Spacing Ring, 4"	0	Novellus	15-00416-00
<b>P</b> 21-00060-01	Screw, SkHd, 5/16-18 x 1-1/4", SS	0	Common Hardware	
<b>R</b> 20-00210-00	Screw, SkHd, M8 x 90, Blk Ox	0	Common Hardware	
<b>S</b> 21-00354-00	Washer, Lock, 5/16", SS	0	Common Hardware	
<b>T</b> 20-00208-00	Washer, Flat, 5/16 x 5/8", SS	0	Common Hardware	
<b>V</b> 60-00020-00	Flange, Blankoff, KF25	0	HPS	31-1603
<b>W</b> 60-00028-00	Clamp, Double-Claw, NW80/100	0	HPS	76-1106

**Figure 3.1.5 Reactor Foreline Plumbing**



**Figure 3.6.0.1 ONE ARM ROBOT ASSEMBLY — Exploded Assembly View**





Parts Schedule

Section 3.6.1	Robot Arm Assembly	Assy 02-00269-00
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Key	Novellus PN	Description	QTY	Vendor/Mfg	Vendor PN
	<b>02-0026 9-00</b>	<b>Robot Arm</b>	<b>Kit</b>		
<b>A</b>	15-00503-00	Bracket, Wafer Paddle	1	Novellus	15-00503-00
<b>D</b>	15-00546-00	Cover, Forearm Bearing	1	Novellus	15-00546-00
<b>E</b>	20-00258-00	Spring, Wave, 0.790" x 0.650"	1	Seastrom	5806-149-2
<b>F</b>	15-00527-00	Pulley, Forearm Drive	1	Novellus	15-00527-00
<b>G</b>	22-00303-00	Bearing, Forearm Shaft	1	King Bearing	S-1017-MC
<b>H</b>	15-00549-00	Shaft, Forearm	1	Novellus	15-00549-00
<b>J</b>	15-00492-00	Forearm, One Arm Robot	1	Novellus	15-00492-00
<b>K</b>	15-00538-00	Cover, Upper Arm	1	Novellus	15-00538-00
<b>L</b>	15-00488-00	Arm, One Arm Robot	1	Novellus	14-00488-00
<b>M</b>	15-00547-00	Shaft, Elbow	1	Novellus	15-00547-00
<b>N</b>	15-00525-00	Pully, Upper Arm Drive	1	Novellus	15-00525-00
<b>P</b>	15-00523-00	Pulley, Forearm Drive	1	Novellus	15-00523-00
<b>R</b>	21-00248-00	Screw, Flat Phillips, 4-40 x 7/8"	1	Common Hardware	
<b>S</b>	21-00040-00	Screw, SocHd Cap, 4-40 x 1/4"	3	Common Hardware	
<b>T</b>	21-00243-00	Screw, Flat Phillips, 4-40 x 1/4"	27	Common Hardware	
<b>U</b>	21-00200-00	Screw, Flat Phillips, 6-32 x 1/4"	4	Common Hardware	
<b>V</b>	15-00526-00	Pulley, Arm Drive	1	Novellus	15-00526-00
<b>W</b>	19-00109-00	Cable, Forearm Drive	1	Novellus	19-00109-00
<b>X</b>	19-00108-00	Cable, Arm Drive	1	Novellus	19-00108-00
<b>Y</b>	22-00304-00	Bearing, 1.50" O.D.	1	King Bearing	S1724MC
<b>Z</b>	15-00522-00	Coupling, Extension Shaft	1	Novellus	15-00522-00
<b>A1</b>	15-00543-00	Cover, Pulley	1	Novellus	15-00543
<b>B1</b>	21-00398-00	Screw, Flat Phillips, 10-32 x 3/8"	3	Common Hardware	
<b>C1</b>	21-00047-00	Screw, SocHd Cap, 6-32 x 3/8"	3	Common Hardware	
<b>D1</b>	15-00539-00	Cover, Forearm Seal	1	Novellus	15-00539-00
<b>E1</b>	15-00521-00	Clamp, Pulley	2	Novellus	15-00521-00

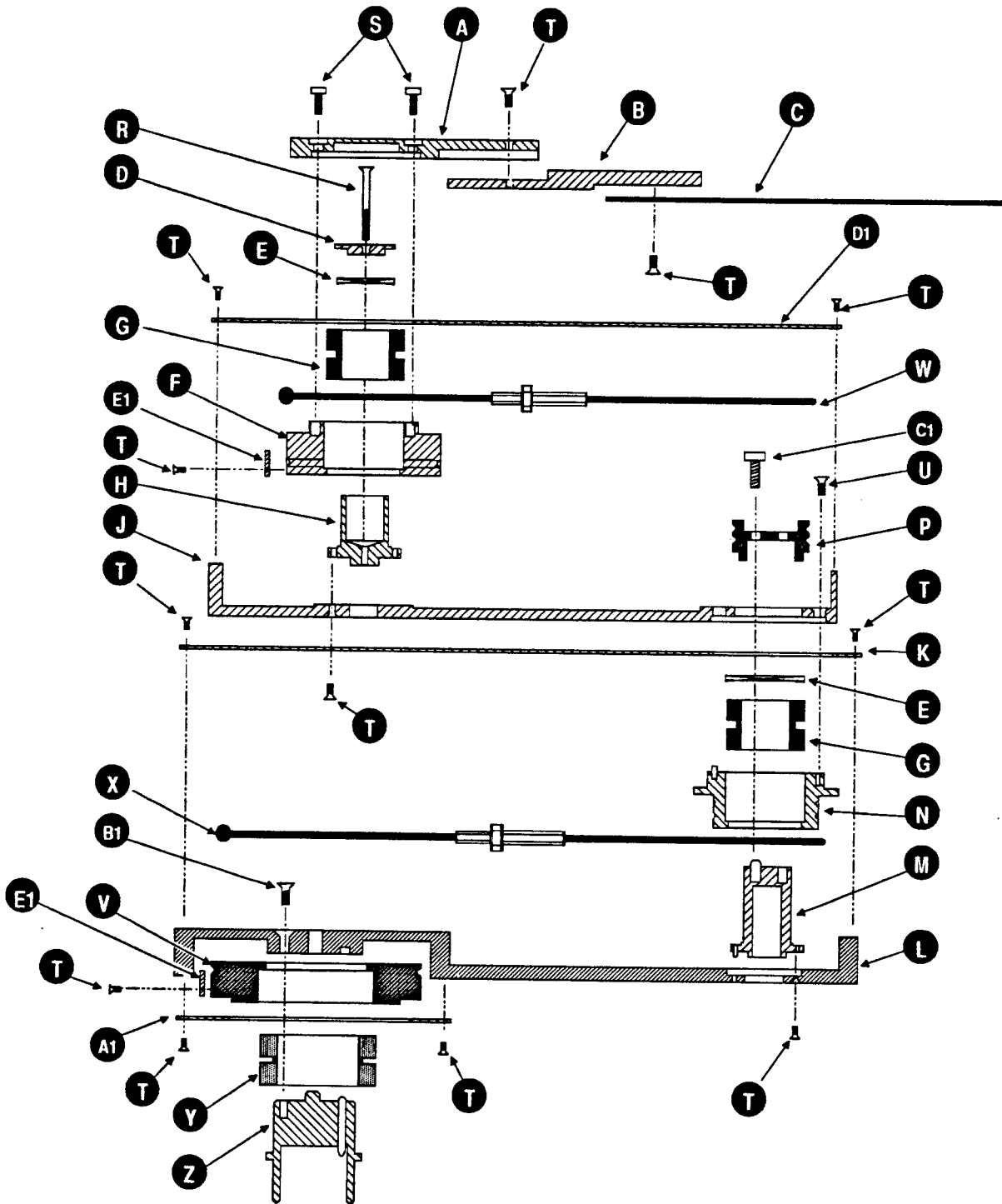
**REFERENCE ONLY**

<b>B</b>	15-00486-00	Bracket, Paddle, 125mm (Note 1)	0	Novellus	15-00486-00
<b>B</b>	15-00485-00	Bracket, Paddle, 150mm(Note 1)	0	Novellus	15-00485-00
<b>B</b>	15-00486-00	Bracket, Paddle, 200mm(Note 1)	0	Novellus	15-00711-00
<b>C</b>	15-00495-00	Paddle, Wafer, 125mm(Note 1)	0	Novellus	15-00495-00
<b>C</b>	15-00496-00	Paddle, Wafer, 150mm(Note 1)	0	Novellus	15-00496-00
<b>C</b>	15-00669-00	Paddle, Wafer, 200mm(Note 1)	0	Novellus	15-00669-00

**NOTES**

- 1** Paddle Brackets and Wafer Paddles are ordered as options for specified wafer sizes.

**Figure 3.6.1 Robot Arm Assembly**



## Cross-Reference Listing by Part Number

Nvls PN	Part Description	Kit Qty	Vendor	Mfg PN	Reference	Availability
02-00025-00	Panel, DC Power Supply	0	Novellus	02-00025-00	3.8.6	Ref Only
02-00051-01	Panel, AC Distrib, Lower	0	Novellus	02-00051-01	3.8.6	Ref Only
02-00051-02	Panel, AC Distrib, Upper	0	Novellus	02-00051-02	3.8.6	Ref Only
02-00055-00	Switch, Foot-activated, w/ Cable	1	Novellus	02-00055-00	3.9.2	Item 02-00055-00
02-00079-00	Elec Assy, High-Freq Choke	1	Novellus	02-00079-00	4.2.2	Item 02-00079-00
[02-00080-00]	Elec Box, Htr RF Isolation	1	Novellus	02-00080-[00]	3.4.5	Kit 02-00080-00
02-00085-00	Inductor, RF Isolation Ckt	1	Novellus	02-00085-00	3.4.5	Ref Only
02-00090-00	PCB, RF Isolation	1	Novellus	02-00090-00	3.4.5	Ref Only
02-00095-00	Panel, AC Line Filter	0	Novellus	02-00095-00	3.8.6	Ref Only
02-00097-00	CONTROL THERMOCOUPLE	Kit			3.4.1	Kit 02-50097-00
02-00105-00	Capacitor, Air Gap, RF Distrib	1	Novellus	02-00105-00	3.2.5	Kit 05-50030-00
02-00106-00	Match Net, Dual-Freq Upgrade	1	Novellus	02-00106-00	3.2.4	Kit 05-50066-00
02-00110-00	Cabinet, Pump Assy (Ver.2)	0	Novellus	27-00087-00	4.3.2	Ref Only
[02-00110-00]	Gauge, Pressure, 30 psig	0	US Gauge	54-68ES-30	4.3.2	Ref Only
[02-00110-00]	Transducer, Pressure, 500 psi	0	Novellus		4.3.2	Ref Only
02-00150-00	PCB, Multibus Power Board	1	Novellus	02-00150-00	3.9.3	Item 02-00150-00
02-00164-00	Fork, Ceramic	0	Novellus	02-00164-00	3.7.1	Ref Only
02-00194-00	LIQUID END CYLINDER REBUILD	Kit			4.3.2	Kit 02-00194-00
02-00194-00	LIQUID END CYLINDER REBUILD	Kit			4.3.3	Kit 02-00194-00
02-00199-00	Inductor, RF Distribution Plate	1	Novellus	02-00199-00	3.2.5	Kit 05-50031-00
02-00205-00	Feedthrough, Thermocouple	1	Novellus	02-00205-00	3.4.2	Item 02-00205-00
02-00206-00	Hdwe, TC Filter Assy w/Enclosure	0	Novellus	02-00206-00	3.4.2	Ref Only
02-00215-00	SPINDLE INDEXER ASSEMBLY	Kit			3.7.3	Kit 02-00215-00
02-00216-00	PCB, TC Filter	1	Novellus	02-00216-00	3.4.2	Item 02-00216-00
02-0026 9-00	ROBOT ARM	Kit			3.6.1	Kit 05-50038-00
03-00002-00	Tee Assy, Manometer	1	Novellus	03-00002-00	3.4.3	Kit 05-50050-00
03-00046-01	Cable, HF (CA57), 12 ft	1	Novellus	03-00046-01	4.2.3	Item 03-00046-01
03-00046-02	Cable, HF (CA57), 36 ft	1	Novellus	03-00046-02	4.2.3	Item 03-00046-02
03-00046-03	Cable, HF (CA57), 60 ft	1	Novellus	03-00046-03	4.2.3	Item 03-00046-03
03-00046-04	Cable, HF (CA57), 84 ft	1	Novellus	03-00046-04	4.2.3	Item 03-00046-04



Cross-Reference Listing by Part Number

Nvls PN	Part Description	Kit Qty	Vendor	Mfg PN	Reference	Availability
03-00046-05	Cable, HF (CA57), 108 ft	1	Novellus	03-00046-05	4.2.3	Item 03-00046-05
03-00046-06	Cable, HF (CA57), 132 ft	1	Novellus	03-00046-06	4.2.3	Item 03-00046-06
03-00057-00	LOADLOCK SENSOR HARNESS	Kit			3.5.5	Kit 03-50057-00
03-00064-00	Strap, RF Plate to Gas Head, Cu	1	Novellus	03-00064-00	3.2.5	Kit 05-50032-00
03-00074-00	CASSETTE DOOR SENSOR HARNESS	Kit			3.5.2	Kit 03-50074-00
03-00076-00	Cable, HF Choke (CA101)	1	Novellus	03-00076-00	4.2.2	Item 03-00076-00
03-00078-01	Cable, LF (CA102), 12 ft	1	Novellus	03-00075-01	4.2.3	Item 03-00078-01
03-00078-02	Cable, LF (CA102), 36 ft	1	Novellus	03-00075-02	4.2.3	Item 03-00078-02
03-00078-03	Cable, LF (CA102), 60 ft	1	Novellus	03-00075-03	4.2.3	Item 03-00078-03
03-00078-04	Cable, LF (CA102), 84 ft	1	Novellus	03-00075-04	4.2.3	Item 03-00078-04
05-00005-00	Hardware, Heater Install	1	Novellus	05-00005-00	3.3.2	Item 05-00005-00
05-00007-00	REACTOR CHAMBER PM	Kit			3.3.1	Kit 05-50007-00
05-00015-00	QUARTERLY PM	Kit			4.1.2.2	Kit 05-00015-00
05-00022-00	LIQUID SOURCE PUMP PM	Kit			4.3.3	Kit 05-00022-00
05-00100-00	CASSETTE NEST HARDWARE, 8"	Kit			3.5.2	Kit 05-00100-00
05-00100-00	LFC Module PM	Kit				
05-50002-00	GAS LINE FILTER	Kit			3.2.1	Kit 05-50002-00
05-50010-00	3-way Solenoid Valve	Kit				
05-50010-00	3-WAY SOLENOID VALVE	Kit			3.1.2	Kit 05-50010-00
05-50010-00	3-WAY SOLENOID VALVE	Kit			4.3.3.2	Kit 05-50010-00
05-50011-00	4-WAY SOLENOID VALVE	Kit			3.1.2	Kit 05-50011-00
05-50012-00	PURGE LINE FILTER	Kit			3.1.3	Kit 05-50012-00
05-50013-00	PNEUMATIC VALVE	Kit			3.1.3	Kit 05-50013-00
05-50013-00	PNEUMATIC VALVE	Kit			3.2.1	Kit 05-50013-00
05-50014-00	WATER FLOW SWITCH	Kit			3.1.3	Kit 05-50014-00
05-50015-00	AIR PRESSURE SWITCH	Kit			3.1.3	Kit 05-50015-00
05-50017-00	METERING VALVE	Kit			3.1.3	Kit 05-50017-00
05-50018-00	LOADLOCK VACUUM VALVE	Kit			3.1.4	Kit 05-50018-00
05-50020-00	REACTOR VACUUM VESTIBULE	Kit			3.1.5	Kit 05-50020-00
05-50021-00	VACUUM THROTTLE VALVE	Kit			3.1.5	Kit 05-50021-00