Dynorbital-Spirit®

12,000 RPM, Random Orbital Sander

Automotive
APD14.01
August, 2014
Supersedes APD09.02

For Serial No. 14H1000H and Higher

Safety, Operation and Maintenance – Save This Document and Educate All Personnel

Models

3/8" Orbit	
21000	21011
21001	21014
21004	21015
21005	21016
21006	21019
21009	21060
21010	21063

3/16" Orbit	
21020	21031
21021	21034
21024	21035
21025	21036
21026	21039
21029	21061
21030	21064

3/32" Orbit	
21040	21051
21041	21054
21044	21055
21045	21056
21046	21059
21049	21062
21050	21065

DYNABRADE LIFETIME WARRANTY MADE IN USA

SANDER/POLISHER

Find The Most Current Offering of Support Documents and Accessories at www.Dynabrade.com

⚠ WARNING

Read and understand this tool manual before operating your air tool. Follow all safety rules for the protection of operating personnel as well as adjacent areas. Always operate, inspect and maintain this tool in accordance with the American National Standards Institute (ANSI). Safety Requirements for the Use, Care and Protection of Abrasive Wheels – ANSI B7.1, Compressed Air and Gas Institute (CAGI) Safety Code for Portable Air Tools – B186.1, Code of Federal Regulation – CFR 29 Part 1910, International Organization for Standardization (ISO) Hand Held Non-Electric Power Tools – Safety Requirements and applicable State and Local Regulations.

Read and understand tool manual before work starts to reduce risk of injury to operator, visitors, and tool.

Eye protection must be worn at all times, eye protection to conform to ANSI Z87.1.

Ear protection to be worn when exposure to sound, exceeds the limits of applicable Federal, State or local statues, ordinances and/or regulations.

Practice safety requirements. Work alert, have proper attire, and do not operate tools under the influence of alcohol or drugs.

Respiratory protection to be used when exposed to contaminants that exceed the applicable threshold limit values required by law.

Air line hazard, pressurized supply lines and flexible hoses can cause serious injury. Do not use damaged, frayed or deteriorated air hoses and fittings.

Some dust created by sanding, grinding, drilling, and other construction activities contain chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints
- Crystalline silica from bricks and cement and other masonry products
- Arsenic and chromium from chemically treated lumber

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

SAFETY INSTRUCTIONS

Carefully Read and Understand the General and Sander/Polishing sections found in Tool Safety and Operating Guidelines (PN00001676) Before Handling or Using Tool.

Carefully Read all instructions before operating or servicing any Dynabrade® Abrasive Power Tool. Products offered by Dynabrade are not to be modified, converted or otherwise altered from the original design.

Tool Intent: Dynorbital-Spirit® Random Orbital Sanders are used for sanding and finishing a variety of materials including wood, metal, plastic, fiberglass, solid surfaces, composites, rubber, glass and stone.

DO NOT USE Tool for Anything Other Than Its Intended Applications.

Training: Proper care, maintenance, and storage of your air tool will maximize tools performance and reduce chance for accident.

Employer's Responsibility: Provide operators with safety instructions and training for safe use of tools and accessories.

Report to Your Supervisor any Condition of the Tool, Accessories or Operation you Consider Unsafe.

MAINTENANCE INSTRUCTIONS

Important: To keep tool safe, a Preventative Maintenance Program is recommended. The program should include inspection of the tool and all related accessories and consumables, including air lines, pressure regulators, filters, oilers, etc. (refer to CAGI B186.1 for additional maintenance information). If accessory or tool breakage occurs, investigate failure to determine the cause and correct before issuing tool for work. Use the following schedule as a starting point in developing a Preventative Maintenance Program. If tool does not operate properly (RPM, vibration, start/stop) after these scheduled checks or at any time, the tool must be repaired and corrected before returning tool to use.

INSTALLATION

- To ensure long life and dependable service, use a Closed Loop Air System and Filter-Regulator-Lubricator (FRL) as diagramed below.
- Each tool should have its own dedicated hose connected to an air supply FRL. Quick disconnects should be installed at the FRL in an effort to reduce contamination into the tool. Securely affix all fittings and hose assemblies.
- It is strongly recommended that all Dynabrade rotary vane air tools be used with a Filter-Regulator-Lubricator to minimize the possibility of misuse due to unclean air, wet air or insufficient lubrication. Dynabrade recommends the following: **10681** Air Line Filter-Regulator-Lubricator — Provides accurate air pressure regulation, two-stage filtration of water contaminants and micro-mist lubrication of pneumatic components.
- Dynabrade recommends 1 drop of air lube per minute for each 20 SCFM (example: if the tool specification states 40 SCFM, set the drip rate on the filter-lubricator to 2 drops per minute). **95842** Dynabrade Air Lube is recommended.

MAINTENANCE SCHEDULE

Maintenance schedules depend on the type and style of tool. Refer to page 3 to reference symbols associated with specific maintenance items/areas. Match maintenance schedules accordingly. See page 4 for any additional maintenance information.

Note: *Turbine style air motors do not require oil.*

Daily (every 8 hours):

- Inspect tool and accessories for damage or broken parts. Replace items as necessary to ensure proper operation and safety.

◆O Lubricate motor as recommended. Use **95842** Dynabrade Air Lube (10W/NR). Apply 1 drop/minute of air lube per 20 SCFM.

- Check air line pressure with a gage. (MAX. 90 PSIG or 6.2 Bar operating pressure at the air inlet of the tool.)

◆W Lubricate wick system and right angle gears through gear case fitting. Apply 3 plunges of **95848** Gear Oil. Use **95541** Lubricant Gun (Prime lubricant gun before use).

- Check tool for proper operation: If operating improperly or demonstrates unusual vibration, the tool must be serviced and problem corrected before further use.

Every 20 Hours/Once a Week (which ever comes first):

- Measure RPM (speed) by setting air pressure to 90 PSIG (6.2 Bar) at tool inlet, without accessory mounted, while the tool is running. Using tachometer, check spindle speed of the tool. Unless otherwise stated the no-load speed may not exceed the rated speed. If tool speed exceeds maximum rated RPM, service as required and correct before use.
- If tool is running too fast: look for worn, damaged or missing governor, air control rings and silencer(s). Service as required.
- If tool is running too slow: look for malfunctioning governor, clogged inlet screen, silencer(s) or air stream. Service as required.

Note: *Special care must be taken when servicing governors. Refer to specific tool manual for governor instructions and/or speed control devices. Governor assemblies made from molded plastic components are non-serviceable and must be replaced.*

Every 50 Hours:

◆G Lubricate planetary gears through gear case fitting with 3 plunges of **95542** Grease. Use **95541** Lubricant Gun. (Prime lubricant gun before use).

REPAIR

- Use only genuine Dynabrade replacement parts to ensure quality. To order replacement parts, specify Model#, Serial# and RPM of your air tool.
- Mineral spirits are recommended when cleaning the tool and parts. Do not clean tool or parts with any solvents or oils containing acids, esters, ketones, chlorinated hydrocarbons or nitro carbons.
- A Motor Tune-Up Kit is available which includes high wear and medium wear motor parts.
- Air tool markings must be kept legible at all times, if not, reorder housing and replace. User is responsible for maintaining specification information.

◆O After maintenance is performed on tool, add a few drops of **95842** Dynabrade Air Lube to the tool inlet and start the tool a few times to lubricate air motor. Verify RPM (per 20 hr maintenance schedule), vibration and operation.

HANDLING & STORAGE

- Use of tool rests, hangers and/or balancers is recommended.
- Protect tool inlet from debris (see Notice below).
- **Do Not** carry tool by air hose or near the tool throttle lever.
- Store accessories in protective racks or compartments to prevent damage.
- Follow the handling instructions outlined in the operating instructions when carrying the tool and when changing accessories.
- Protect accessories from exposure to water, solvents, high humidity, freezing temperature and extreme temperature changes.

END OF USE/DISPOSAL

When tool has reached its end of useful service, disassemble tool into its primary components (i.e. steel, aluminum and plastic) and recycle or discard per local, state and/or federal regulations as to not harm the environment.

NOTICE

All Dynabrade air motors use the highest quality parts available and are manufactured to exacting tolerances. Air motor failures are often traced to lack of lubrication or unclean air supply. Compressed air can force dirt and other contaminants into motor bearings causing early failure. Contaminants can score cylinder wall and vanes resulting in reduced efficiency and power. Our warranty obligation is contingent upon proper use of our tools. Air motors which have been subjected to misuse, contaminated air or lack of lubrication will void warranty.

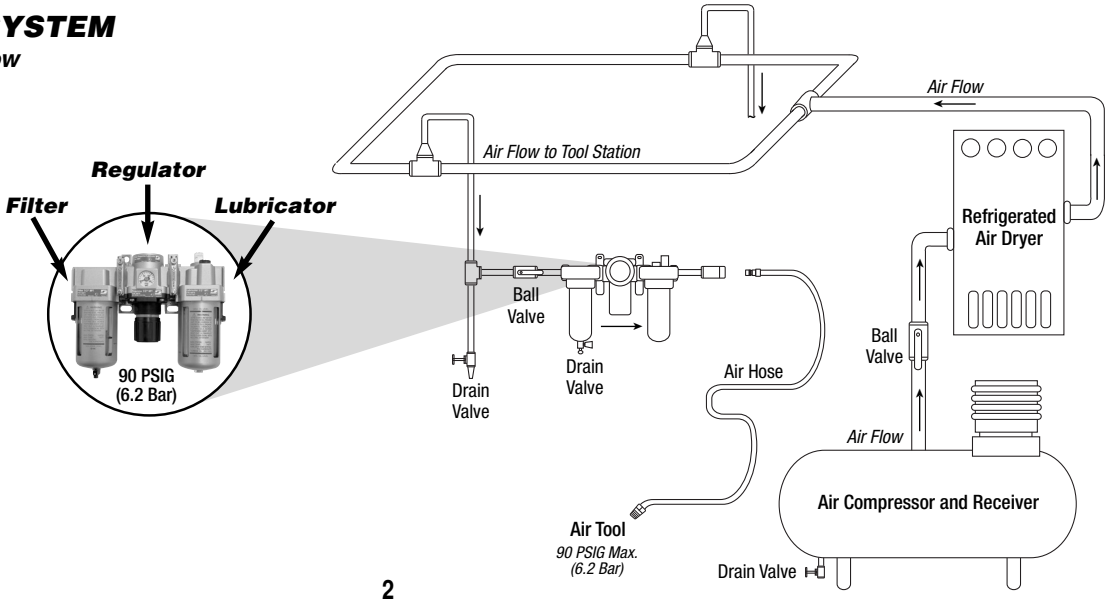
CLOSED LOOP AIR SYSTEM

Sloped in Direction of Air Flow

- Dynabrade Air Power Tools are designed to operate at 90 PSIG (6.2 Bar) maximum air pressure at the tool inlet, when the tool is running. Use recommended regulator to control air pressure.
- Ideally the air supply should be free from moisture. To facilitate removing moisture from air supply, the installation of a refrigerated air dryer after the compressor and the use of drain valves at each tool station is recommended.

Lubricator Setting

1 Drop/Minute per 20 SCFM



Dynorbital-Spirit®
Complete Assembly

Models
21000, 21001, 21004, 21005, 21006, 21009, 21010, 21011, 21014, 21015, 21016, 21019, 21020, 21021, 21024, 21025, 21026, 21029, 21030, 21031, 21034, 21035, 21036, 21039, 21040, 21041, 21044, 21045, 21046, 21049, 21050, 21051, 21054, 21055, 21056, 21059, 21060, 21061, 21062, 21063, 21064, 21065

Note: To order replacement parts specify the **Model #** and **Serial #** of your machine.

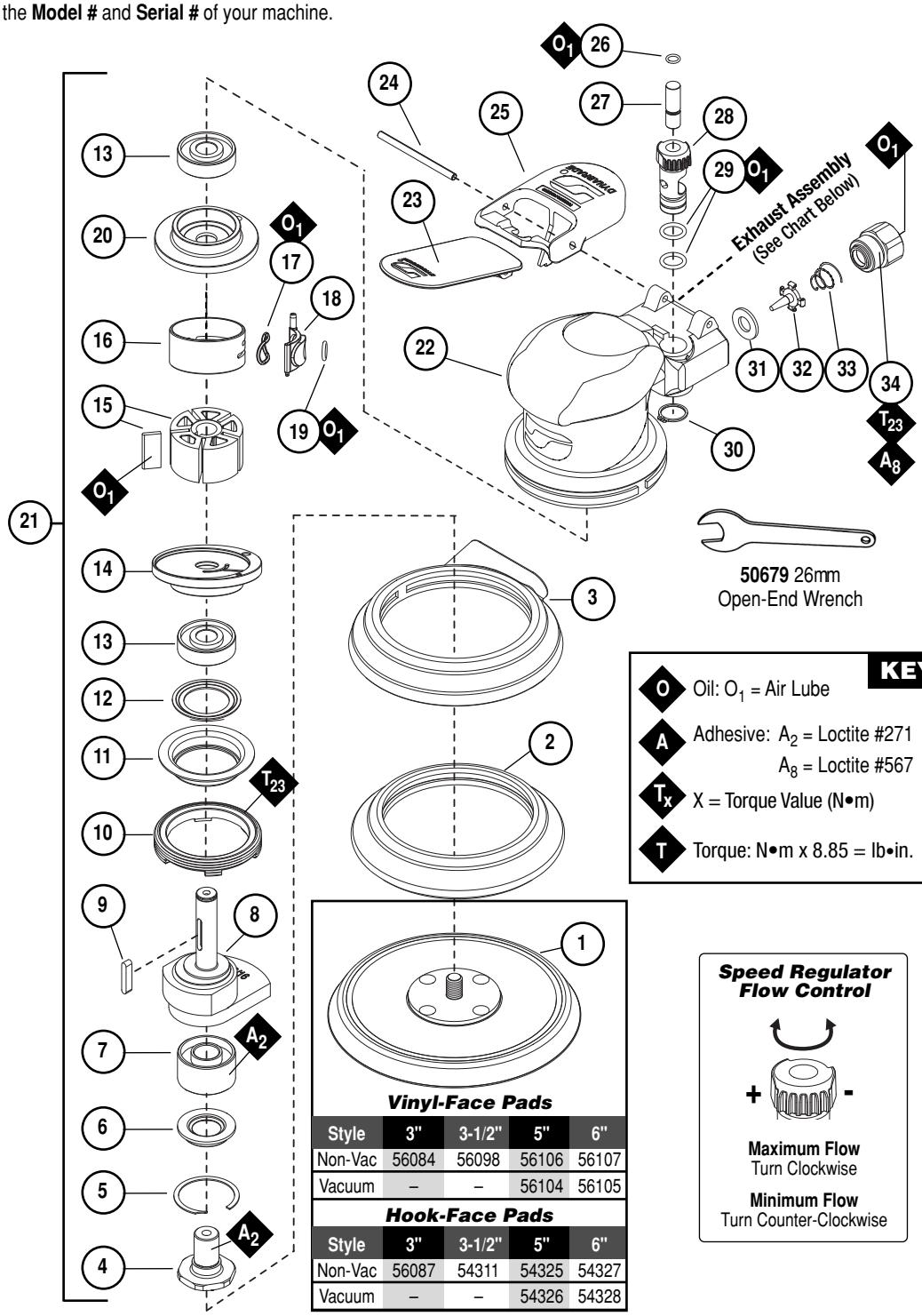
Index Key

No.	Part #	Description
1		**Back-Up Pads** - See Below
2		**Non-Vacuum Shroud**
	54458	3" & 3-1/2" Diameter
	56051	5" & 6" Diameter
3		**Vacuum Shroud**
	57084	3" & 3-1/2" Diameter
	69362	5" Diameter
	69363	6" Diameter
4	**57069**	Balancer Shaft
5	**95630**	Snap Ring
6	**59084**	V-Seal
7	**56052**	Bearing
8		**Motor Shaft Balancer**

Orbit	3"	3-1/2"	5"	6"
3/8"	59122	59070	59071	59072
3/16"	59120	59060	59061	59062
3/32"	59121	59065	59066	59067

9	**56047**	Key
10	**59058**	Lock Ring
11	**59057**	"Top Hat" Seal
12	**59083**	Felt
13	**58368**	Bearing (2)
14	**59137**	Front Bearing Plate
15	**57113**	Rotor/Blade Set
16	**59134**	Cylinder
17	**95529**	O-Ring
18	**59133**	Cylinder Sleeve Adapter
19	**01024**	O-Ring
20	**59138**	Rear Bearing Plate
21		**Drop-In Motor Assembly** (See Chart - Page 4)
22		**Housing** (See Chart - Page 4)
23		**Throttle Lever**
	69356	3/8" Dia. Orbit
	69360	3/16" Dia. Orbit
	69357	3/32" Dia. Orbit
24	**94590**	Pin
25	**57041**	Comfort Platform
26	**98459**	O-Ring
27	**58363**	Valve Stem
28	**59075**	Speed Regulator
29	**01025**	O-Ring (2)
30	**95697**	Retaining Ring
31	**01464**	Seal
32	**58365**	Tip Valve
33	**01468**	Spring
34	**01494**	Inlet Bushing
35	**69364**	Shroud Adapter
36	**57083**	Vacuum Adapter
37	**96197**	Dowel Pin
38	**57066**	Muffler Body
39	**95526**	O-Ring
40	**59088**	Vac Nozzle
41	**57067**	Vac Tube
42	**57093**	Vacuum Adapter
43	**56027**	Muffler Insert(AR)
44	**69359**	Muffler Cap

AR – As Required



KEY

- O: Oil: O_1 = Air Lube
- A: Adhesive: A_2 = Loctite #271, A_8 = Loctite #567
- T_x: X = Torque Value (N•m)
- T: Torque: N•m x 8.85 = lb•in.

Vinyl-Face Pads

Style	3"	3-1/2"	5"	6"
Non-Vac	56084	56098	56106	56107
Vacuum	–	–	56104	56105

Hook-Face Pads

Style	3"	3-1/2"	5"	6"
Non-Vac	56087	54311	54325	54327
Vacuum	–	–	54326	54328

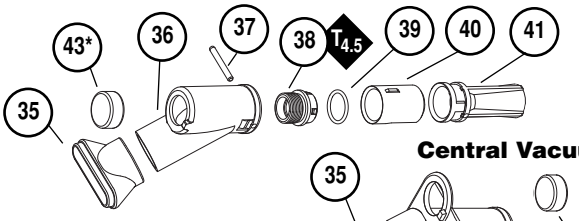
Speed Regulator Flow Control

Maximum Flow
Turn Clockwise

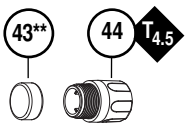
Minimum Flow
Turn Counter-Clockwise

Exhaust Assemblies

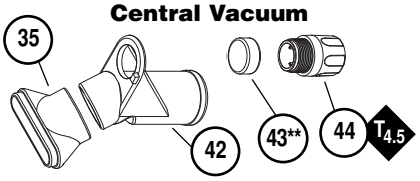
Self Generated Vacuum



Non-Vacuum



Central Vacuum



*Requires two (2) Muffler Inserts.
** Requires five (5) Muffler Inserts.

30 Pack
Muffler Inserts
Part No. 56054

LIFETIME WARRANTY

To validate Dynabrade Lifetime Warranty, you must register each tool at: www.dynabrade.com. Registration of each tool at website is required. Dynabrade will not honor Lifetime Warranty on unregistered tools. Please view the entire Lifetime Warranty Policy at dynabrade.com.

MACHINE SPECIFICATIONS

Model Number	Vacuum Style	Tool Dia. Inch (mm)	Dia. Orbit Inch (mm)	Sound Level	Weight Pound (kg)	Length Inch (mm)
21005	Non-Vac	3-1/2 (89)	3/8 (10)	78 dB(A)	1.4 (.6)	6 (152)
21010	Non-Vac	5 (127)	3/8 (10)	73 dB(A)	1.5 (.7)	6-1/2 (165)
21015/21060	Non-Vac	6 (152)	3/8 (10)	74 dB(A)	1.6 (.7)	7 (178)
21025	Non-Vac	3-1/2 (89)	3/16 (5)	72 dB(A)	1.4 (.6)	6 (152)
21030	Non-Vac	5 (127)	3/16 (5)	72 dB(A)	1.4 (.6)	6-1/2 (165)
21035/21061	Non-Vac	6 (152)	3/16 (5)	73 dB(A)	1.5 (.7)	7 (178)
21045	Non-Vac	3-1/2 (89)	3/32 (2)	70 dB(A)	1.4 (.6)	6 (152)
21050	Non-Vac	5 (127)	3/32 (2)	74 dB(A)	1.4 (.6)	6-1/2 (165)
21055/21062	Non-Vac	6 (152)	3/32 (2)	70 dB(A)	1.5 (.6)	7 (178)
21000	Non-Vac	3 (76)	3/8 (10)	70 dB(A)	1.4 (.6)	6 (152)
21020	Non-Vac	3 (76)	3/16 (5)	72 dB(A)	1.4 (.6)	6-1/2 (165)
21040	Non-Vac	3 (76)	3/32 (2)	70 dB(A)	1.3 (.6)	7 (178)
21006	Self-Gen	3-1/2 (89)	3/8 (10)	77 dB(A)	1.5 (.7)	8-1/2 (216)
21011	Self-Gen	5 (127)	3/8 (10)	76 dB(A)	1.6 (.7)	8-1/2 (216)
21016	Self-Gen	6 (152)	3/8 (10)	76 dB(A)	1.7 (.7)	9 (229)
21026	Self-Gen	3-1/2 (89)	3/16 (5)	78 dB(A)	1.4 (.6)	8-1/2 (216)
21031	Self-Gen	5 (127)	3/16 (5)	76 dB(A)	1.5 (.7)	8-1/2 (216)
21036	Self-Gen	6 (152)	3/16 (5)	77 dB(A)	1.6 (.7)	9 (229)
21046	Self-Gen	3-1/2 (89)	3/32 (2)	76 dB(A)	1.4 (.6)	8-1/2 (216)
21051	Self-Gen	5 (127)	3/32 (2)	75 dB(A)	1.5 (.6)	8-1/2 (216)
21056	Self-Gen	6 (152)	3/32 (2)	77 dB(A)	1.5 (.7)	9 (229)
21001	Self-Gen	3 (76)	3/8 (10)	76 dB(A)	1.5 (.7)	8-1/2 (216)
21021	Self-Gen	3 (76)	3/16 (5)	76 dB(A)	1.4 (.6)	8-1/2 (216)
21041	Self-Gen	3 (76)	3/32 (2)	77 dB(A)	1.4 (.6)	9 (229)
21009	Central	3-1/2 (89)	3/8 (10)	77 dB(A)	1.5 (.7)	7 (178)
21014	Central	5 (127)	3/8 (10)	77 dB(A)	1.5 (.7)	7-1/4 (184)
21019/21063	Central	6 (152)	3/8 (10)	79 dB(A)	1.6 (.7)	7-3/4 (197)
21029	Central	3-1/2 (89)	3/16 (5)	76 dB(A)	1.4 (.6)	7 (178)
21034	Central	5 (127)	3/16 (5)	75 dB(A)	1.5 (.6)	7-1/4 (184)
21039/21064	Central	6 (152)	3/16 (5)	77 dB(A)	1.6 (.7)	7-3/4 (197)
21049	Central	3-1/2 (89)	3/32 (2)	76 dB(A)	1.4 (.6)	7 (178)
21054	Central	5 (127)	3/32 (2)	76 dB(A)	1.4 (.6)	7-1/4 (184)
21059/21065	Central	6 (152)	3/32 (2)	74 dB(A)	1.5 (.7)	7-3/4 (197)
21004	Central	3 (76)	3/8 (10)	75 dB(A)	1.5 (.6)	7 (178)
21024	Central	3 (76)	3/16 (5)	77 dB(A)	1.4 (.6)	7-1/4 (184)
21044	Central	3 (76)	3/32 (2)	76 dB(A)	1.4 (.6)	7-3/4 (197)

Motor Power .25 hp (186 W)
Motor Speed 12,000 RPM
Tool Height 3-1/2" (89 mm)
Pad Thread 5/16"-24 Female
Air Inlet Thread 1/4" NPT
Hose I.D. 1/4" (6 mm)
Air Flow Rate 16 SCFM (450 LPM)
Air Pressure 90 PSIG (6.2 Bar)

Sound Level is the pressure measurement according to the method outlined in ISO regulation ISO-15744

REPLACEMENT HOUSINGS

Model #	Housing #	Model #	Housing #
21000	21105	**21035**	21126
21003	21106	**21038**	21127
21004	21107	**21039**	21128
21005	21108	**21040**	21129
21008	21109	**21043**	21130
21009	21110	**21044**	21131
21010	21111	**21045**	21132
21013	21112	**21048**	21133
21014	21113	**21049**	21134
21015	21114	**21050**	21135
21018	21115	**21053**	21136
21019	21116	**21054**	21137
21020	21117	**21055**	21138
21023	21118	**21058**	21139
21024	21119	**21059**	21140
21025	21120	**21060**	21141
21028	21121	**21061**	21142
21029	21122	**21062**	21143
21030	21123	**21063**	21144
21033	21124	**21064**	21145
21034	21125	**21065**	21146

OPTIONAL ACCESSORIES

Drop-In Motor Assemblies

Orbit	3"	3-1/2"	5"	6"
3/8"	59512	59485	59497	59500
3/16"	59513	59486	59498	59501
3/32"	59514	59487	59499	59502

Note 59058 Lock Ring is only included with 3/8" Orbit Drop-In Motor Assemblies.

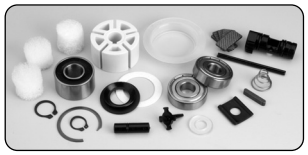
Non-Vacuum to Vacuum Conversion Kits

Non-Vac Tool	Converts To	Kit Number
3-1/2" (89 mm)	Self-Generated Vac-Ready	57118
3-1/2" (89 mm)	Central Vac-Ready	57119
5" (127 mm)	Self-Generated Vac-Ready	57120
5" (127 mm)	Central Vac-Ready	57121
6" (152 mm)	Self-Generated Vac-Ready	57122
6" (152 mm)	Central Vac-Ready	57123

Tune-Up Kit

- Contains high & medium wear parts.

Part No. 96510



REFERENCE CONTACT INFORMATION

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Compressed Air & Gas Institute
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Tel: 1 (216) 241-7333 • Fax. (216) 241-0105

European Committee for Standardization
Rue de Stassart 36 • B - 1050 Brussels, Belgium

International Organization of Standards
Case postale 56 • CH-1211 Geneva 20
Tel: + 41 22 749 01 11 • Fax: + 41 22 749 09 47

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