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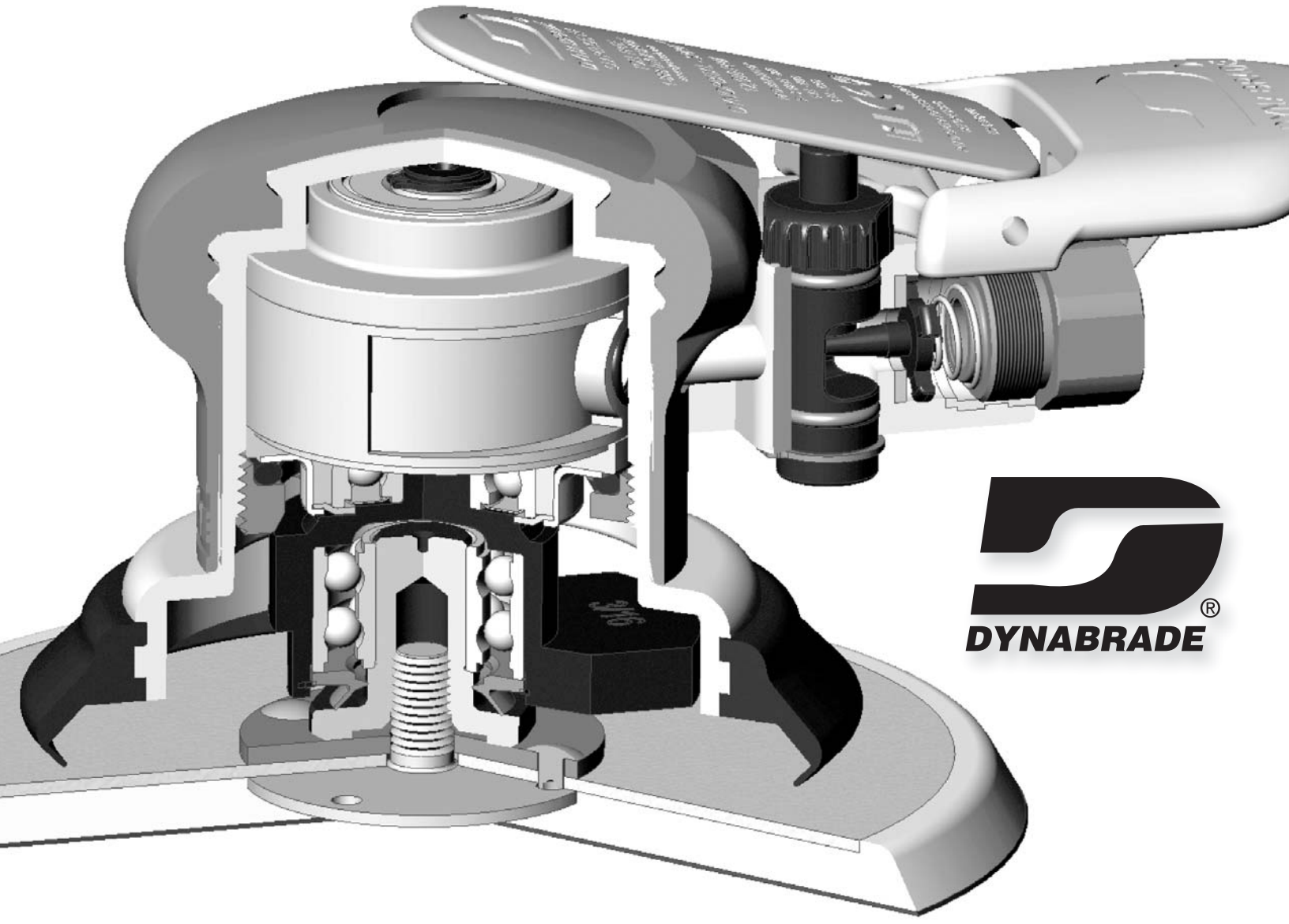
INDUSTRIAL AIR TOOL MAINTENANCE GUIDE



DYNABRADE®

DYNABRADE®

INDUSTRIAL AIR TOOL MAINTENANCE GUIDE

TABLE OF CONTENTS

CAREFULLY READ ALL INSTRUCTIONS BEFORE OPERATING, MAINTAINING OR SERVICING ANY POWER TOOL

CONTACT YOUR DYNABRADE REPRESENTATIVE FOR PRICING OF PRODUCTS SHOWN IN THIS GUIDE

SAFETY STATEMENT

All Dynabrade® products are built with the highest level of quality and performance in mind. Understanding the proper use and safe procedures involved with using power tools is our primary concern. Accidental injury or death can be prevented and/or reduced by reading and understanding the following:

- ***Safety Code for Portable Air Tools* – (B186.1)**
  American National Standards Institute (ANSI)
- ***Safety Requirements for Use, Care and Protection of Abrasive Wheels* – (B7.1)**
  American National Standards Institute (ANSI)
- ***Hand Held Non-Electric Power Tools* – (EN 792)**
  European Committee for Standards (EN)
- ***General Industry Safety & Health Regulations* – (CFR 29 Part 1910)**
  Occupational Safety and Health Administration (OSHA)
- **Applicable State and Local Regulations – (Regulations may vary)**

USERS ARE RESPONSIBLE FOR FOLLOWING ALL ESTABLISHED SAFETY CODES AND REGULATIONS.

Carefully read, understand and follow tool manuals before operating or servicing Dynabrade® Power Tools. Always operate, inspect and maintain tools in accordance with all safety codes and regulations for the protection of operating personnel as well as adjacent areas. All products offered by Dynabrade® are not to be modified, converted or otherwise altered from the original design without the expressed written consent from Dynabrade, Inc. Use only genuine Dynabrade® replacement parts and accessories made especially for the tool in use. The use of any other manufacturer's replacement parts and/or accessories could create a hazard.

SAFETY LEGEND

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

Ear protection to be worn when exposure to sound exceeds the limits of applicable federal, state or local statutes, ordinances and/or regulations.

⚠ WARNING

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

⚠ WARNING

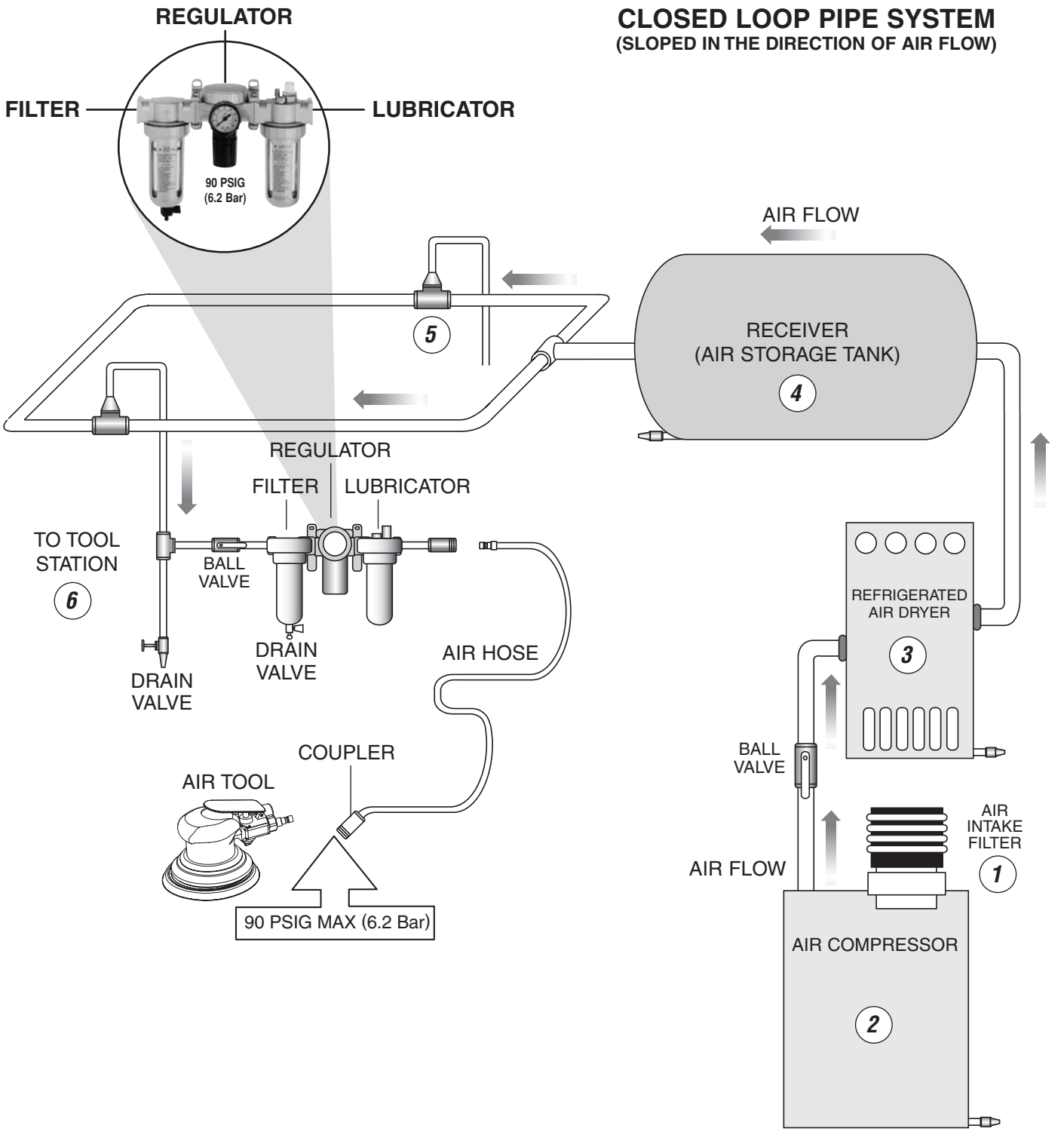
Air line hazard, pressurized supply lines and flexible hoses can cause serious injury. Do not use damaged, frayed or deteriorated air hoses and fittings.

COMPRESSED AIR SUPPLY SYSTEM

LUBRICATOR SETTING
1 **DROP/MIN.**
20 **SCFM** (566 **LPM**)

Dynabrade recommends one drop of air lube per minute for each 20 SCFM (566 LPM)

Example: If the tool specifications state 40 SCFM (1,133 LPM), set the drip rate of your lubricator at 2 drops per min.



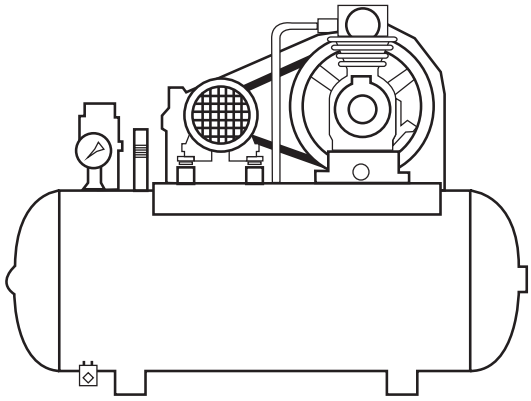
COMPRESSED AIR SUPPLY SYSTEM (CONT.)

COMPRESSED AIR SYSTEMS SHOULD INCLUDE THE FOLLOWING:

1. **AIR INTAKE FILTERING**
   Incoming air must be filtered to remove dust and other contaminats carried in the air.
2. **AIR COMPRESSION**
   The filtered air is compressed (typically 80 psig [5.5 bar] - 110 psig [7.6 bar]) using: screw, centrifugal, or reciprocating compressors.
3. **AIR COOLING/DRYING**
   Compressing air raises its temperature dramatically, so cooling is required. The pressurized air also carries a significant amount of water vapor through the compression process. Cooling the air is an important step in removing the water vapor. The water vapor condenses as the air is cooled, making it easy to drain away.
4. **AIR STORAGE**
   A tank called a receiver is placed downstream from the air cooler/dryer. The air receiver provides surge capacity. This reduces demand fluctuations in the compressed air system.
5. **AIR DISTRIBUTION**
   A system of distribution pipes and regulators carry the compressed air from the compressor to work areas. This system includes various isolation valves, fluid traps and additional air storage vessels.
6. **POINT OF USE**
   At the work area, a feeder pipe with a final isolation valve, filter, regulator and lubricator carries the compressed air to a hose that supplies the air-power tool.

   Filter-Regulator-Lubricator:
   Proper air tool maintenance requires delivering the required pressure and volume of clean, lubricated, compressed air to the air motor. An air filter-regulator-lubricator can help to protect portable air tools. The filter can help to prevent water and particulate contaminates from entering the air motor. The regulator accurately controls air pressure to the tool. To further protect moving parts of the air motor the lubricator can be set to provide an adequate amount of oil.

SELECTING A COMPRESSOR



A) COMPRESSOR TYPE – Base on your PSIG (Bar) needs

0 to **80 PSIG** (5.5 Bar) – You may only need a single stage compressor

80 to **250 PSIG** (17.2 Bar) – You will need a two-stage compressor

Two-stage compressors are recommended when tool usage is continuous.

Note: Dynabrade air tools require air pressure of 90 PSIG (6.2 Bar)

B) AIR CONSUMPTION – Determine the total demand SCFM (LPM). List the requirements for all equipment, tools and other air consumption variables (both continuous and intermittent air usage demands).

continued on next page

SELECTING A COMPRESSOR (CONT.)

C) COMPRESSOR HORSEPOWER (hp) – Use the determined total demand SCFM (LPM) and add approximately 20% for system variables. Add _____% for (your) future growth.
If the above total equals less than 100 SCFM (2,832 LPM) divide this total by 4 to find the compressor hp.
If the total is over 100 SCFM (2,832 LPM) divide by 5 to find the compressor hp.

Example: System requirements = 165 SCFM (4,673 LPM) @ 100 PSIG (6.9 Bar)
165 ÷ 5 = 33 hp
Resulting in a suggested compressor size:
30 Hp to **40 hp** compressor

D) TANK SIZE – As a general rule, the more receiver the better the system. Use a larger tank for installations where large flows of short duration are needed.

Example: For a **5 hp** compressor use a **60 Gal. (227 L), 80 Gal. (303 L)** or **120 Gal. (454 L)** storage tank.

E) CONTROLS

Stop-Start – The motor stops when the compressor unloads and starts again when the pressure in the receiver drops. Use a stop-start pressure switch control for a small system. (Compressors up to 15 hp.)

Continuous Run – Equipped with constant pressure control, loading and unloading as the supply of compressed air in the receiver drops or reaches a maximum.

DEFINING ACFM vs. SCFM

The term CFM is often confusing and difficult to define for one condition, and one definition does not satisfy all conditions we encounter in our customer applications throughout the world. Often these terms are very vague, and in turn, misunderstood.

The primary reason for all the difficulties described above is because air is a compressible fluid. Due to the atmospheric variations in air pressure, temperature and density - the fluid properties are constantly changing. The conditions are dependent on the location, time of the year, altitude, etc. Thus, it is important to understand that the conditions in Los Angels (an altitude of 0 Feet, atmospheric is 14.69 psia.) vary significantly from the conditions in Denver (an altitude of 5280 feet, atmospheric pressure is 12.12 psia.).

The term standard cubic feet per minute (SCFM) is typically used as a standard reference condition for flow rate performance for atmospheric pressure at sea level as opposed to actual cubic feet per minute (ACFM) typically used to rate performance of compressor systems for actual pressure and temperature.

CONCLUSION
The difficult task is sizing a compressor properly, specifying the compressor's required capacity. The proper understanding of the terms, SCFM, ACFM is important and will help in selecting a compressor. SCFM should be used to compare differences in compressor capacities, and ACFM for actual non-standard site conditions and proper load applications. Also the reference pressure, temperature and discharge pressure must be specified in addition to the required capacity.

NOTE: Dynabrade Inc. adheres to measuring maximum air flow in standard cubic feet per minute (SCFM) (ISO Standard: 68˚ F, 0% relative humidity, 14.5 psia. Air pressure at sea level). This is an average maximum rating recorded at free speed on non-governed tools or at maximum horsepower on governed tools.

(Squire-Cogwell/Aeros Instruments “ACFM vs. SCFM vs. ICFM”)

MAINTAINING ADEQUATE AIR FLOW

PREVENT AND ELIMINATE AIR SUPPLY RESTRICTIONS

Common causes of restriction:

- The air supply hose is too long.
- The inside diameter (i.d.) of the hose is too small.
- The air connections or fittings have an inside diameter that is too small.
- There are too many air connections or fittings being used.
- If an inline filter is being used, the unit may be too small or the filter element may be plugged.
- If an inline regulator is being used, the unit may be to small, not adjusted properly or defective.
- The air supply hose, air fitting, air tool inlet or air tool exhaust may be plugged.
- If the air tool has a speed regulator it may be closed.

AIR SUPPLY HOSE

- Use the air supply hose with the correct inside diameter as is recommended by the air tool manufacturer.
- Use the shortest air supply hose possible for the task being performed.
- Longer air supply hoses require larger inside diameters.
- Coiled air supply hoses appear much shorter than they actually are. When using a coiled hose, make sure that the inside diameter is large enough to compensate for the length (see chart below).

AIR SUPPLY HOSE RECOMMENDED CHART

Air Motor SCFM (Standard Cubic Feet per Minute)	Hose & Fitting I.D. Required	Recommended Length Air Supply Hose
22 SCFM (623 LPM)	1/4" (6 mm)	1' - 8' (0.3048 m – 2.44 m)
28 SCFM (793 LPM)	3/8" (10 mm)	1' - 25' (0.3048 m – 8.7 m)
35 SCFM (991 LPM)	3/8" (10 mm)	1' - 20' (0.3048 m – 6.10 m)
45 SCFM (1,274 LPM)	3/8" (10 mm)	1' - 10' (0.3048 m – 3.042 m)
73 SCFM (2,067 LPM)	1/2" (15 mm)	1' - 20' (0.3048 m – 6.10 m)

CHOOSE THE CORRECT INSIDE DIAMETER (I.D.) AND LENGTH OF AIR SUPPLY HOSE

NOTE: To increase the length of air supply hose it will be necessary to increase the inside diameter of the hose.

AIR SUPPLY HOSES

FLEXIBLE AIR SUPPLY HOSES

3/8" I.D. with two male 1/4" NPT fittings. PART NUMBER **11292** - 8 feet (2.44 m) long

1/2" I.D. with one male and one female 1/2" NPT fitting. PART NUMBER **95870** - 5 feet (1.53 m) long

For a complete offering of air line assemblies, reference the Dynabrade Industrial Power Tools, Accessories and Abrasives Catalog (D07.01) or check online: www.dynabrade.com

AIR PLUGS AND COUPLERS

PLUGS

COMPARE AIRFLOW SCFM (LPM)

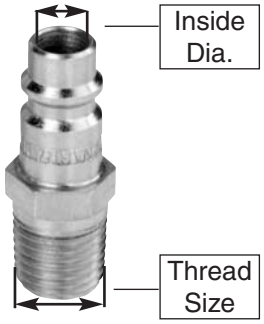
Common Plug	Dynabrade Plug
	
30 SCFM (850 LPM) **.2010 in. (5.11 mm) I.D.**	**74 SCFM (2,096 LPM)** **.3070 in. (7.80 mm) I.D.**

NOTE: All information is based on the size of the **INSIDE DIAMETER @ 90 PSIG (6.2 Bar) in conjunction with the mating coupler.**

HOW TO MEASURE A TYPICAL PLUG

NPT
(National Pipe Thread)
is the thread size.

(i.e. 1/4" NPT)



- Dynbrade plugs provide maximum air flow
- Plugs are available in the following sizes: 1/4", 3/8"and 1/2" NPT.

IMPORTANT: It is not always advisable to use an air plug and coupler to connect an air tool to the air supply hose. Contaminates can enter the air tool through plug and coupler connections. This often happens when an operator changes to a different tool. The hose and coupler may fall to the floor, or disconnected air tools are left lying exposed in the work area. The exposed ends of the plug and coupler will collect abrasive, grinding, sanding and polishing particles. When the air tool is once again connected to the air supply, these particles are blown into the air motor. When this happens it causes considerable wear to the internal parts of the air motor.

Using a direct thread connection between the air power tool and the air supply hose can reduce the likelihood of contamination entering an air motor at the point where the air connection is made.

COUPLERS

- Dynbrade couplers provide maximum air flow
- Couplers are available in the following sizes: 1/4", 3/8" and 1/2" NPT.
- Couplers are sold separately as well as in matched assemblies with plugs.
- Dynbrade couplers come in different styles to satisfy every request.

COUPLER STYLES

Safety Couplers	Composite-Style Couplers	Steel and Brass Couplers
		

For a complete offering of plugs and couplers, reference the Dynabrade Industrial Power Tools, Accessories and Abrasives Catalog (D07.01) or check online: www.dynabrade.com

PREVENTATIVE MAINTENANCE

PROVIDE A GOOD AIR SUPPLY:

1. **REDUCE OR ELIMINATE CONDENSATION (WATER VAPOR) FROM THE AIR SUPPLY**
    - Water traps and drains
    - After-coolers
    - Refrigerated air dryer
2. **PREVENT DEBRIS FROM ENTERING THE AIR MOTOR**
    - Filter the air.
    - Keep the air inlet connections, plugs and couplers clean, free of dust and debris.
    - Keep exhaust mufflers and elements in place. Muffler elements provide a barrier that will prevent dust from being pulled into the air motor.
    - Do not use compressed air to blow-off the tool, this could force debris into bearings.
3. **LUBRICATE THE AIR MOTOR**
    - Use an automatic lubricator to supply the correct weight and amount of air motor oil.
    - Supply the air motor oil manually, directly into the air inlet. Apply 2-3 drops throughout the day.

      i.e., start-up
      mid-morning
      lunch
      mid-afternoon
      end of the day

ELIMINATE ANY BLOCKAGE OF AIRFLOW, IN OR OUT:

1. **KEEP THE TOOL'S AIR INLET CLEAR OF ANY DEBRIS**
2. **CLEAN OR REPLACE EXHAUST MUFFLER ELEMENTS AS NEEDED**

LUBRICATE GEARS, SLEEVES, BEARINGS AND SLIDERS

1. **USE THE MANUFACTURER'S SPECIFIED LUBRICANT**
    - Apply the suggested amount at the recommended interval.
      Note: This is usually found in technical support literature, i.e., tool manuals, parts pages, etc.

USE THE TOOL, ACCESSORY OR RELATED PRODUCT AS SPECIFIED BY DYNABRADE, INC.

1. **ADHERE TO THE SPECIFIED MAXIMUM OPERATING AIR PRESSURE**
2. **ADHERE TO THE SPECIFIED MAXIMUM OPERATING RPM FOR ALL TOOLS AND ACCESSORIES**

   i.e., grinding wheels
   mounted points
   cut-off wheels
   sanding discs
   burrs
   back-up pads, etc.

MAINTENANCE ACCESSORIES

AIR TOOL LUBRICANTS AND DYNASWIVEL®

Dynabrade Air Lube (10W/NR)

- Formulated for pneumatic equipment.
- Absorbs up to 10% of its weight in water.
- Prevents rust and formation of gum/sludge for longer tool operation with greater power and less downtime.

95821
4 oz. (118 ml)

95843
1 gal. (3.8 l)

95842
1 pt. (473 ml)

95848 Gear Oil
2.5 oz. (74 ml) tube

- Formulated for geared tools utilizing a wick-type lubrication system.
- Failure to lubricate will cause premature gear failure.

Grease

- Multi-purpose grease for all types of bearings, cams and gears.
- High film strength; excellent resistance to water, steam, etc.
- Workable range: 0°F (-17˚C) to 300°F (148˚C).

95542
10 oz. (283.5 g) tube

95541 Push-Type Lubricant Gun

- One-hand operation
- Can be used with Grease or Gear Oil

Note: Have a dedicated gun for each type of lubricant.

DYNASWIVEL®

- The Dynaswivel® is a “universal-joint” that connects portable air tools to an air line.
- It improves tool maneuverability, minimizes operator fatigue and extends hose life.
- Patented; works great on air tools.
- SWIVELS 360° AT TWO LOCATIONS which allows air hose to drop straight to the floor, no matter how the tool is held.

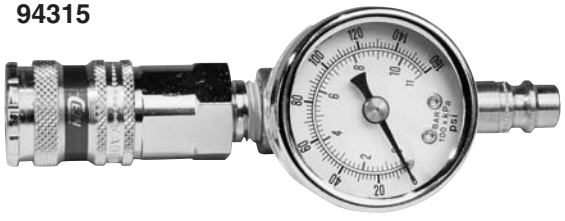
94300

- Air flow: up to 33 SCFM (935 LPM) MAXIMUM.
- Non-marring, lightweight, composite construction.

AIRLINE TEST GAUGE

- Use to test air pressure at selected areas of an air supply system. Test at the tool, to see specific pressure.
- Comes complete with brass "T" connector, quick disconnect coupler and a round pressure gauge.

94315



FILTER-REGULATOR-LUBRICATOR

- Provides accurate air pressure regulation, two stage filtration of water/contaminants and lubrication of pneumatic components.

11405 – Small FRL

- 40 SCFM @ 100 PSIG, 3/8" NPT female ports. (1,133 LPM) (6.9 Bar)

11411 – Large FRL

- 55 SCFM @ 100 PSIG, 1/2" NPT female ports. (1,558 LPM) (6.9 Bar)

SPECIFICATIONS FOR ALL MODELS

Line Size	Max. Air Flow Pressure	Max. Air Temperature
3/8" (10 mm)	140 PSIG / 9.7 Bar	140° F / 60° C
1/2" (15 mm)	140 PSIG / 9.7 Bar	140° F / 60° C

Filter Only
11400
- **Small Filter**
  40 SCFM (1,133 LPM) @ 100 PSIG (6.9 Bar)
  3/8" female inlet thread

11406
- **Large Filter**
  55 SCFM (1,558 LPM) @ 100 PSIG (6.9 Bar)
  1/2" female inlet thread

Regulator Only
11401
- **Small Regulator**
  40 SCFM (1,133 LPM) @ 100 PSIG (6.9 Bar)
  3/8" female inlet thread

11407
- **Large Regulator**
  55 SCFM (1,558 LPM) @ 100 PSIG (6.9 Bar)
  1/2" female inlet thread

Lubricator Only
11403
- **Small Lubricator**
  40 SCFM (1,133 LPM) @ 100 PSIG (6.9 Bar)
  3/8" female inlet thread

11409
- **Large Lubricator**
  55 SCFM (1,558 LPM) @ 100 PSIG (6.9 Bar)
  1/2" female inlet thread

Filter-Regulator
11402
- **Small Filter-Regulator**
  40 SCFM (1,133 LPM) @ 100 PSIG (6.9 Bar)
  3/8" female inlet thread

11408
- **Large Filter-Regulator**
  55 SCFM (1,558 LPM) @ 100 PSIG (6.9 Bar)
  1/2" female inlet thread

Regulator-Lubricator
11404
- **Small Lubricator-Regulator**
  40 SCFM (1,133 LPM) @ 100 PSIG (6.9 Bar)
  3/8" female inlet thread

11410
- **Large Lubricator-Regulator**
  55 SCFM (1,558 LPM) @ 100 PSIG (6.9 Bar)
  1/2" female inlet thread

DROP-IN MOTORS/TUNE-UP KITS

Tune-Up Kit

Drop-In Motor

Drop-In Motors are complete short block motors. Tune-Up Kits include assorted parts to help maintain motor and replace high wear motor parts.

For a complete offering, reference the Dynabrade Industrial Power Tools, Accessories and Abrasives Catalog (D07.01) or check online: www.dynabrade.com

GUIDELINES FOR INSTALLING A DROP-IN MOTOR ASSEMBLY

Installing a Drop-in Motor assembly is relatively simple to perform. However, there are some necessary steps to follow to be successful.

1) Review and understand the specific power tool "Disassembly and Assembly Instructions" before attempting the installation of a drop-in-motor.
Note: Even though a technician is not disassembling every component, it is important to perform the correct technique when removing and installing the air motor assembly.

2) Before attempting the drop-in-motor procedure, have the necessary repair tooling to remove and install the air motor.
Note: View the last page of the parts page for a list of available repair tooling.

3) Remove the old muffler elements.

4) Clean the inside of the motor housing, air inlet and exhaust passages, before installing the new Drop-In-Motor assembly.

5) Install new muffler elements.

6) Correctly align the air motor assembly with the inside of the motor housing before attempting to install it.

7) Adhere to all torque specifications for tightening the air motor assembly into the motor housing.

8) Once the new Drop-in-Motor is installed into the air motor housing, apply three drops of 10Wt. non-detergent air motor oil into the air inlet opening and test run the air power tool. Check the RPM of the air tool with a tachometer to verify the correct rated operating RPM and air motor performance.

Drop-in Air Motor Installation Complete.

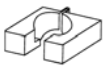
TUNE-UP KIT SUGGESTION

Reference a parts page / tool manual and follow the detailed assembly disassembly instructions for the motor assembly and replace parts with new parts from the Tune-Up Kit. If you no longer have a parts page / tool manual, search the Dynbrade website by model number and find the product support page. Find the parts page / tool manual that corresponds to your model and reference the parts list provided in the Tune-Up Kit and the parts page / tool manual.

REPAIR TOOL REFERENCE

SPECIAL REPAIR TOOLS

Repair Collars: Designed to protect the tool during servicing



Item#	Part Number	Description/Where Used
❑ 1.	**52296**	.4hp Motor/Valve Housing
❑ 2.	**57092**	Palm & Two-Hand, Dynorbital®/Gear-Driven/Dynalocke™
❑ 3.	**51989**	1hp Motor/Valve Housing, 1.3Hp Valve Housing

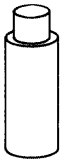
Lock Ring Tools: For the removal and installation of air motors

Item#	Part Number	Description/Where Used
❑ 4.	**50971**	.4hp, .5hp, .7hp & 1hp Motors as Specified
❑ 5.	**56058**	Palm & Two-Hand, Dynorbital®/Dynalocke™
❑ 6.	**56599**	(Formerly 96337) 5", 6" & 8" Two-Hand Gear-Driven/Use with Composite Housing
❑ 7.	**97782**	1hp Right Angle, Mini-Angle Head
❑ 8.	**96165**	Mini-Angle Head
❑ 9.	**96479**	Retainer Wrench/Pencil Grinder (Use for all Models)

Gear/Plate Disassembly & Assembly Wrenches

Item#	Part Number	Description/Where Used
❑ 10.	**96181**	Pinion Wrench for 8" (203 mm) Two-Hand Gear-Driven Sander
❑ 11.	**96182**	Front Plate Tool for 8" (203 mm) Two-Hand Gear-Driven Sander
❑ 12.	**53698**	Carrier Tool 1hp (2-Flats)
❑ 13.	**53699**	Carrier Tool 1hp (3-Flats)

Bearing Removal Tools: Use to Remove Bearings



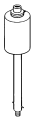
Item#	Part Number	Description/Where Used
❑ 14.	**96210**	02650, 02696 Bearings
❑ 15.	**96211**	01015, 02648 Bearings
❑ 16.	**96212**	11016 Bearing
❑ 17.	**96213**	02649 Bearing
❑ 18.	**96214**	01007 Bearing

Bearing Press Tools: Use to Install Bearings

Item#	Part Number	Description/Where Used
❑ 19.	**96216**	02650 Bearing
❑ 20.	**96239**	02651, 56052, 11831, 54520 Bearings
❑ 21.	**96240**	02649, 12153 Bearings
❑ 22.	**96241**	01015, 12152 Bearings
❑ 23.	**96242**	02696, 12151, 12058, 12078 Bearings
❑ 24.	**96243**	11016, 02648, 02057 Bearings
❑ 25.	**96244**	01007, 01206 Bearings
❑ 26.	**96418**	51651, 51686 Pencil Grinder Bearings
❑ 27.	**96419**	51544, 51685 Pencil Grinder Bearings, 51078 Bearing
❑ 28.	**57091**	5", 6", 8" All Dynorbital® and Two-Hand Gear-Driven Sanders

REPAIR TOOL REFERENCE (CONT.)

Bearing and Gear Pullers: Use to Remove Bearings and Gears



Item#	Part Number	Description/Where Used
❑ 29.	**56056**	Bearing Puller/56052 Bearing
❑ 30.	**57099**	Bearing Puller/56052 Bearing; Use if the Bearing Remains in the Motor Shaft Balancer

Collars and Fixtures: Use for Holding Motor and Gear Assemblies During Disassembly or Assembly

Item#	Part Number	Description/Where Used
❑ 31.	**96245**	Machined Size .992 I.D./Dynadie Ⅲ
❑ 32.	**96246**	Machined Size 1.028 I.D./.4hp
❑ 33.	**96247**	Mini-Angle Head
❑ 34.	**96248**	Machined Size 1.390 I.D./Ring Gear .7hp Dynastraight
❑ 35.	**96249**	Machined Size 1.50 I.D./1.3 hp Motor
❑ 36.	**96249**	Machined Size 1.980 I.D./Dynorbital® Supreme Sander
❑ 37.	**96250**	Machined Size 2.290 I.D./2hp Right-Angle Tools
❑ 38.	**96209**	Motor Clamp; 1hp
❑ 39.	**96231**	Tool Plate/Use with the 96232 Arbor Press

Assorted Special Pencil Grinder Repair Tools:

Item#	Part Number	Description/Where Used
❑ 40.	**51694**	Shaft Lock Pin
❑ 41.	**94999**	Air Bushing Removal Tool
❑ 42.	**96408**	Motor Top Plate Wrench
❑ 43.	**96483**	Bullet (Used for Installing the Grip onto a Pencil Grinder)
❑ 44.	**96486**	Collet Insert, Removal Tool

Arbor Press: Use for Disassembly/Assembly

Item#	Part Number	Description/Where Used
❑ 45.	**96232**	Arbor Press (#2)
❑ 46.	**96230**	Press Ram (General no-mar Ram)

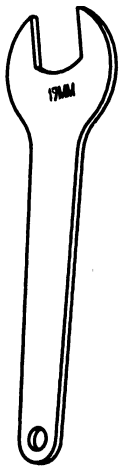
Special Repair Tool Kits:

Item#	Part Number	Description/Where Used
❑ 47.	**11270**	Dynafile® with Screw-In Motor/Use to replace Contact and Idler Wheel Components.
❑ 48.	**11288**	Dynafile® with Cam-Lock Motor/Use to replace Contact and Idler Wheel Components.
❑ 49.	**57098**	Dynorbital® Supreme and Dynorbital-Spirit® Sander Repair Kit Use with Composite Housing Models.
❑ 50.	**57260**	5", 6" Two-Hand Dynorbital® and Dynalocke™/Use with Composite Housing Models.
❑ 51.	**57325**	8" Two-Hand Dynorbital®/Use with Composite and Aluminum Housing Models.
❑ 52.	**57525**	Mini-Dynorbital®/Use with Composite Housing Models: 57500, 57501, 57502 & 57503)
❑ 53.	**96283**	5", 6", 8" Two-Hand Gear-Driven/Use with Composite Hosing Models.
❑ 54.	**96405**	Finesse-It, Two-Step Tools/Models: 57240(45), 57125, 57126, 57500, 57502 & Dynorbital® Supreme/Dynorbital-Spirit®
❑ 55.	**56077**	Lightweight Palm Style Dynorbital®/Use with Aluminum Housing Models.
❑ 56.	**56577**	Mini-Lightweight Palm-Style Dynorbital®/Use with Aluminum Housing Models.

REPAIR TOOL REFERENCE (CONT.)

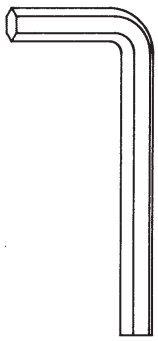
GENERAL REPAIR TOOLS

Wrenches: Open-End



Item#	Part Number	Description/Where Used
❑ 57.	**96314**	4 mm/Dynadie Ⅲ
❑ 58.	**95731**	8 mm/Pencil Grinder
❑ 59.	**96076**	12 mm
❑ 60.	**95262**	14 mm
❑ 61.	**95263**	17 mm
❑ 62.	**95281**	19 mm
❑ 63.	**95823**	21 mm
❑ 64.	**95304**	24 mm
❑ 65.	**50679**	26 mm
❑ 66.	**50679**	26 mm Offset Wrench/3" HiVac Dynorbital-Spirit®
❑ 67.	**96079**	32 mm
❑ 68.	**95987**	5/16"
❑ 69.	**96031**	7/16"
❑ 70.	**96032**	11/16"
❑ 71.	**95176**	3/4"
❑ 72.	**11278**	1-1/2"/ Dynafile® with Screw-In Motor

Hex Key Wrenches:



Item#	Part Number	Description/Where Used
❑ 73.	**95251**	1.5 mm
❑ 74.	**96401**	2 mm
❑ 75.	**95252**	2.5 mm
❑ 76.	**95266**	3 mm
❑ 77.	**95331**	4 mm
❑ 78.	**96034**	12 mm
❑ 79.	**96215**	15 mm
❑ 80.	**95050**	5/64"
❑ 81.	**95052**	3/32"
❑ 82.	**95048**	1/8"
❑ 83.	**95049**	3/16"
❑ 84.	**95134**	9/64"
❑ 85.	**95303**	1/4"
❑ 86.	**95521**	5/16"
❑ 87.	**95051**	3/8"

Pin Style Spanner Wrenches:

Item#	Part Number	Description/Where Used	Cntr/Cntr	Pin Dia.
❑ 88.	**96347**	Adjustable-Face	10 to 100 mm	2.9 mm
❑ 89.	**96148**	Fixed-Face/Model: 50370	24 mm	3 mm
❑ 90.	**94925**	Fixed-Face Models: 50302, 50306, 52620, 52625	32 mm	4 mm
❑ 91.	**96348**	Adjustable-Face	10 to 100 mm	5.8 mm
❑ 92.	**96507**	Fixed-Face/Model: 52515	1-1/16"	1/8"
❑ 93.	**95267**	Fixed-Face/Model: 50343	5/8"	1/8"
❑ 94.	**95270**	Fixed-Face/Model: 52700	1"	1/8" Sq.
❑ 95.	**96318**	Adjustable-Face/Model: 50273	5/8" to 2"	5/32"
❑ 96.	**96038**	Fixed-Face	1-9/32"	1/4"

REPAIR TOOL REFERENCE (CONT.)

Generic Hand Tools:

Item#	Part Number	Description/Where Used
❑ 97.	**96341**	English Folding Hex Key Set (5/64" to 1/4")
❑ 98.	**96342**	Metric Folding Hex Key Set (1.5mm to 8mm)
❑ 99.	**96343**	Internal/External retaining Ring Pliers
❑ 100.	**96344**	3/32" Dia. Pilot Punch (Use to remove roll pins.)
❑ 101.	**96345**	15/16" Bearing Separator
❑ 102.	**96346**	2" Bearing Separator
❑ 103.	**96349**	Small Torque Wrench (30 - 150 in.-lbs.)
❑ 104.	**96350**	Large Torque Wrench (100 - 1000 in.-lbs.)
❑ 105.	**96351**	Bench Vise (4" Jaw)
❑ 106.	**96352**	4" (102mm) Soft Jaw Caps (Bronze)
❑ 107.	**96353**	(8 piece) Drive Pin Punch Set; 1/16" (1.5mm) to 5/16" (7.9mm)
❑ 108.	**96354**	Feeler Gages (.0015 to .025)
❑ 109.	**96355**	Small Phillips Screwdriver
❑ 110.	**96356**	Large Phillips Screwdriver
❑ 111.	**96357**	Groove Pliers (Channel Lock Style)
❑ 112.	**96358**	Standard Pliers (slip-joint style)
❑ 113.	**96359**	Needle Nose Pliers
❑ 114.	**96360**	10" Adjustable Wrench (Crescent Style)
❑ 115.	**96361**	3/8" (10mm) Drive, Ratchet (includes metric and english socket set)
❑ 116.	**96362**	3/8" (10mm) Drive, Breaker Bar; 10" (254mm) long flex handle
❑ 117.	**96363**	Small Slotted Screwdriver
❑ 118.	**96364**	Large Slotted Screwdriver
❑ 119.	**96365**	3/8" (10mm) to 1/4" (6mm) Drive, Socket Adapter
❑ 120.	**96366**	12 oz. Soft Hammer
❑ 121.	**96367**	8 oz. Ball Peen Hammer
❑ 122.	**96368**	Electronic Tachometer
❑ 123.	**96373**	11/16" Deep Socket
❑ 124.	**94315**	Air Pressure Test Gauge/Used to test air pressure of air supply system
❑ 125.	**80025**	Load Cell/Used to measure the performance of finishing tools under load
❑ 126.	**80030**	Test Tool Kit/Includes: 80025, 94315, 95842 and 96368

Parts Pages, Forms, Adhesive:

Item#	Part Number	Description/Where Used
❑ 127.	**96369**	Liquid Thread Locker (50 ml bottle)
❑ 128.	**96370**	Parts Page Manual
❑ 129.	**96371**	Repair Estimate Forms (qty. 100)

FULL SERVICE REPAIR STATION

Full Service Repair Station:

Part Number 91000 includes most of the Special and General Repair Tools listed on pages 12 - 15.

Contact Dynabrade Customer Service:

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Call (US): 1-888-396-2272
Fax: (716) 631-2073

MAINTENANCE / REPAIR TRAINING PROGRAMS

SERVICE

Dynabrade Customer Service is committed to giving outstanding service. The customer service staff will assist with answering questions, supplying tool manuals and providing other necessary product support. If it becomes necessary to have your Dynabrade tool or accessory repaired, our fully trained factory experts can meet all your service needs.

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Dynabrade Product Training Programs cover safe operation, maintenance and repair of Dynabrade tools and accessories. To request training, visit our website: **www.dynabrade.com**

INSTRUCTIONAL VIDEOS AND CDS

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Fax: (716) 631-2073

GLOSSARY

CUBIC FEET per MINUTE (CFM)

- CFM is measured in more than one way to apply to specific situations.

CFM variations:

ACTUAL CUBIC FEET per MINUTE (ACFM)

- ACFM, when applied to compressor capacity, is the amount of air delivered, measured at prevailing ambient inlet conditions.

INLET CUBIC FEET per MINUTE (ICFM)

- ICFM is the same as ACFM for displacement type compressors but may be higher for multi-stage centrifugal compressors, where clearance type seals may allow leakage between stages, so that the inlet CFM may be greater than the delivered CFM.

STANDARD CUBIC FEET per MINUTE (SCFM)

- SCFM is measured at "Standard" conditions. Standard conditions refer here to the ISO Standard which generates its measurements at these following conditions: 68˚ F, 0% relative humidity, and 14.5 psia.
- SCFM is the standard measure used for flow meters.

CAPACITY, ACTUAL

- The quantity of gas actually compressed and delivered to the discharge of a compressor running at full-rated speed and rated pressure conditions. Actual capacity is expressed in cubic feet per minute (CFM) at the conditions prevailing at the inlet to the first stage.

DISPLACEMENT

- Displacement of a compressor is the piston volume swept out per unit time; it is usually expressed in cubic feet per minute.

FREE AIR

- Air at atmospheric conditions at any specific location. Because the altitude, barometer, and temperature may vary at different localities and at different times, it follows that this term does not mean air under identical or standard conditions.

PISTON DISPLACEMENT

- Net volume actually displaced by the compressor piston at rated machine speed is generally expressed in cubic feet per minute (usually CFM). For multi-stage compressors, the piston displacement of the first stage only is commonly stated as that of the entire machine.

RECEIVERS

- Tanks used for storage of air discharged from compressors. They also serve to damp discharge line pulsation.

The RULE of "7"

- Some air tool manufacturers use CFM to rate their tools. This must be converted to SCFM for the purpose of properly choosing the horsepower of a compressor.
- Use **7** as an estimated (not exact) conversion factor when converting SCFM to CFM and vice versa.
- CFM to SCFM: **CFM x 7 = SCFM**
- SCFM to CFM: **SCFM / 7 = CFM**

NOTES

MEASUREMENT CONVERSION

U.S. Unit of Measure	Conversion Formula	International Unit of Measure
Inch	x 25.4	Millimeter (mm)
Pound	x .454	Kilogram (kg)
PSIG	÷ 14.5	Bar
SFPM	x .3048	SMPM
SCFM	x 28.32	LPM
hp	x 745.7	W

REFERENCE CONTACT INFORMATION

1. **American National Standards Institute – ANSI**
   25 West 43rd Street
   Forth Floor
   New York, NY 10036
   Tel: 1 (212) 642-4900
   Fax: 1 (212) 398-0023

2. **Government Printing Office – GPO**
   Superintendent of Documents
   Attn. New Orders
   P.O. Box 371954
   Pittsburgh, PA 15250-7954
   Tel: 1 (202) 512-1803

3. **European Committee for Standardization**
   Rue de Stassart 36
   B - 1050 Brussels, Belgium

4. **Thomas Associates**
   Compressed Air & Gas Institute
   1300 Sumner Ave.
   Cleveland, Ohio 44115
   Email: www.cagi.org

5. **Sullair Corporation**
   3700 E. Michigan Blvd.
   Michigan City, Indiana 46360
   Email: www.sullair.com

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