



dark matter composites ltd

'Small Air Router Kit'

Product Code - DMP0145

USER MANUAL



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User & Warranty Information

**IMPORTANT USER &
WARRANTY INFORMATION**

PLEASE READ IN FULL PRIOR TO USE

The Dark Matter Composites 'Small Air Router Kit' comprises of a modified Dynabrade Air Motor and vacuum extraction assembly designed specifically for trimming composite materials/parts and preparation of cured composite surfaces for co-bonding and secondary bonding operations.

Prior to use, please read all 'Dynabrade' and 'Dark Matter Composites' documentation provided with this 'Small Air Router Kit' and within this User Manual in full. No part of this kit can be considered 'typical' or 'independent' from the tool kit as a whole. The following documents are provided with this kit:

Dynabrade, Pneumatic Tool Safety & Operating Guidelines

Dynabrade, Industrial Pneumatic Tools Lifetime Warranty

Dynabrade, Required Tool Maintenance

Dynabrade, Operating, Maintenance and Safety Instructions

Dynabrade, Air Tools Specifications

Dark Matter Composites Ltd, Small Air Router Kit User Manual (this document)

The Dynabrade air motor supplied as part of the kit is specified uniquely to Dark Matter Composites Ltd. The Dynabrade manual PD10•12 'Air Tool Manual - Safety, Operation and Maintenance' is applicable to the air motor supplied as part of this kit as well as the instructions related directly to the 'Small Air Router Kit' in this manual.

The instructions provided within this 'User Manual' are in addition to the Dynabrade documentation included within the 'Small Air Router Kit'.

This tool kit has also been designed to be used in conjunction with a suitable portable/mobile dust extraction unit suitable for use with 'on-tool' dust extraction. Dark Matter Composites provides a range of dust extraction units that are compatible with this tool kit. Assessment of the suitability and end use of third party extraction units is the sole responsibility of the purchaser.

Use of this tool kit outside of the applications identified or the instructions provided within this user manual are not covered by the warranty.

In order to provide a full product support service, Dark Matter Composites offers training courses on how to use and get the best from the tool kit as well as a full range of recommended electric and air driven portable dust extraction units.

EC Machinery Directive: Declaration of Conformity

Directive de la CE sur les machines : Déclaration de conformité • EG Richtlijn voor Machines: Conformiteitsverklaring • EG-maskindirektiv: Försäkran om överensstämmelse • EF-maskindirektiv: Konformitetserklæring • EY-Koneistodirektiivi: Yhdennukaisuusvakuutus • Konformitätserklärung zur EG-Vorschrift für Maschinen • Δήλωση Προσαρμογής στη Κατευθυντήρια Μηχανημάτων της ΕΚ • Directiva de Maquinaria de la CE: Declaración de conformidad • Directiva da CE sobre maquinaria: Declaração de conformidade • Dyrektywa Europejskiej Wspólnoty Gospodarczej Dotycząca Maszyn: Deklaracja Zgodności z Przepisami • Dichiarazione di conformità alle direttive CE relative alle macchine

We hereby certify that the following machinery complies with all the relevant Essential Health and Safety Requirements of the EC Machinery Directives 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC as amended and the National Laws and Regulations adopting these directives.

La société Dynabrade, Inc. certifie que la machine décrite ci-dessous est conforme à toutes les exigences essentielles de sécurité et de santé pertinentes des Directives CE sur les machines N° 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC amendée ainsi qu'aux dispositions législatives et réglementaires des États membres ayant adopté lesdites Directives.

Wij verklaren bij deze dat de volgende machines voldoen aan alle van toepassing zijnde, belangrijke gezondheids- en veiligheidsvoorschriften van 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC, de EG richtlijnen voor machines, zoals gewijzigd, en aan de landelijke wetten en voorschriften die deze richtlijnen toepassen.

Vi intygar härmed att nedanstående maskin uppfyller alla gällande väsentliga hälso- och säkerhetskrav i EG-maskindirektiv 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC och tillhörande ändringar i de nationella lagar och bestämmelser där dessa direktiv antagits.

Vi attesterer herved, at den nedenfor angivne maskine overholder alle relevante og nødvendige sundheds- og sikkerhedskrav indeholdt i EF's maskindirektiv 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC med ændringer, og de nationale love og bestemmelser, i hvilket direktivet er blevet indført.

Vahvistamme täten, että seuraava koneisto täyttää kaikki asiaankuuluvat EY:n koneistodirektiivien 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC terveys- ja suojavaatimukset muutoksineen sekä kansalliset lait ja säännökset, jotka omaksuvat nämä direktiivit.

Wir bescheinigen hiermit, daß die nachfolgend angegebene Maschine allen zutreffenden Gesundheits- und Sicherheitsanforderungen der EG-Maschinenvorschriften 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC in ihrer gültigen Fassung, sowie den nationalen Gesetzen und Regelungen, in welche diese Bestimmungen aufgenommen wurde, entspricht.

Με το παρόν πιστοποιούμε ότι τα παρακάτω μηχανήματα συμμορφώνονται με όλες τις Ουσιώδεις Απαιτήσεις Υγείας και Ασφάλειας των Κατευθυντήριων Μηχανημάτων της ΕΚ 89/392/ΕΕΕ, 91/368/ΕΕΕ, 93/44/ΕΕΕ, 93/68/ΕΕΕ όπως έχουν τροποποιηθεί, και τους Εθνικούς Νόμους και Διατάξεις που αποδέχονται αυτές τις κατευθυντήριες.

Por el presente certificamos que la maquinaria señalada a continuación es conforme con todos los requisitos básicos en materia de salud y seguridad previstos en las Directivas de Maquinaria de la CE, 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC, de acuerdo con su versión vigente y con las leyes y reglamentos nacionales por los que han sido adoptadas.

Certificamos por este meio que a maquinaria que se segue cumpre todos os Requerimentos Essenciais de Segurança e Saúde relevantes das Directivas rectificadas da CE sobre Maquinaria 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC e as Leis e Regulamentos Nacionais que adoptam essas directivas.

Niniejszym poświadczam się, że poniżej wyszczególnione maszyny spełniają wszelkie wymogi Bezpieczeństwa i Higieny Pracy zgodnie z Dyrektywą EWG numer 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC (wraz z poprawkami) jak również krajowymi zarządzeniami i przepisami prawnymi zgodnymi z powyższą dyrektywą.

Si dichiara che le macchine qui di seguito descritte soddisfano i requisiti fondamentali di sicurezza e di tutela della salute specificati nelle direttive 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC e modifiche successive, nonché le legislazioni degli stati membri che adottano tali direttive.

Machinery Type: Pneumatic Power Tools • Type de machine : Outillage pneumatique • **Machinetype:** Pneumatisch gereedschap • **Maskintyp:** Tryckluftsværktøj • **Maskintype:** Tryklufsværktøj • **Koneistotyyppi:** Painelilmakäyttöiset työkalut • **Maschinentyp:** Pneumatisch angetriebenes Werkzeug • **Είδος Μηχανήματος:** Εργαλεία Πεπιεσμένου Αέρα • **Tipo de maquinaria:** Herramientas de aire comprimido. • **Tipo de maquinaria:** Ferramentas motorizadas pneumáticas • **Rodzaj maszyn:** narzędzia o napędzie pneumatycznym • **Descrizione:** macchine utensili pneumatiche.

Name of Manufacturer: • Fabricant : • **Naam van fabrikant :** • **Tillverkarens namn:** • **Fabrikantens navn:** • **Valmistajan nimi:** • **Name des Herstellers:** • **Όνομα Εργοστασίου:** • **Fabricante:** • **Nome do fabricante:** • **Producent:** • **Fabricante:** **DYNABRADE, INC.**

Address: • Adresse : • **Adres:** • **Adress:** • **Adresse:** • **Osoite:** • **Anschrift:** • **Διεύθυνση:** • **Domicilio:** • **Endereço:** • **Adres:** • **Indirizzo:** **8989 Sheridan Drive, Clarence, New York 14031-1490 U.S.A.**

A technical construction file for the machinery is retained at the above address (note: optional information for EC agents only).

Un fichier technique de construction de la machine se trouve à l'adresse ci-dessus (NOTA : Renseignements facultatifs uniquement pour les agents de la CE). • Een technisch ontwerp dossier voor de machines wordt op bovenstaand adres bewaard (opmerking: informatie naar keuze uitsluitend voor EG-lasthebbers). • Ett tekniskt arkiv för tillverkningen av denna maskin finns på ovanstående adress (OBS: ej obligatorisk information, endast avsedd för EG-företrädare). • Konstruktionsdokumenterne til maskinen arkiveres på ovennævnte adresse (bemærk: oplysning til brug for EF-repræsentanter). • Tekninen rakennetiedosto säilytetään yllä olevassa osoitteessa (huomautus: valinnanvaraista tietoa ainoastaan EY-edustajille). • Bei der genannten Adresse liegt eine Akte mit den Konstruktionszeichnungen für die Maschine vor (Hinweis: Nur zur Information für EG-Behörden). • Στη πιο πάνω διεύθυνση υπάρχει ένας φάκελος με τη τεχνική κατασκευή των μηχανών (σημείωση: προαιρετικές πληροφορίες μόνο για τους αντιπροσώπους της ΕΚ). • En el domicilio arriba indicado se conserva un expediente de diseño técnico de la maquinaria señalada (nota: información opcional exclusivamente para funcionarios de la CE). • Retem-se no endereço acima um arquivo de construção técnica para a maquinaria (nota: informação opcional apenas para uso de agentes da CE). • Dokumentacja techniczna znajduje się pod powyższym adresem (tylko dla dystrybutorów EWG). • Un fascicolo tecnico della costruzione di tali macchine è archiviato al suddetto indirizzo (nota: informazione facoltativa per il solo uso dei rappresentanti CE).

Signed:

Ned T. Librock

• **Signature :** • **Handtekening:** • **Namteckning:** • **Underskrift:** • **Allekirjoitus:** • **Gezeichnet:** • **Υπογραφή:** • **Firmado:** • **Assinado:** • **Podpisal:** • **Firma:**

Position: President, Dynabrade, Inc.

Responsabilité : Président, Dynabrade, Inc. • **Functie:** President, Dynabrade, Inc. • **Titel:** President, Dynabrade, Inc. • **Stilling:** Direktor, Dynabrade, Inc. • **Toimi:** Toimitusjohtaja, Dynabrade, Inc. • **Stellung:** President, Dynabrade, Inc. • **Θέση:** Πρόεδρος, Dynabrade, Inc. • **Cargo:** Presidente, Dynabrade, Inc. • **Cargo:** Presidente, Dynabrade, Inc. • **Stanowisko:** Prezes, Dynabrade, Inc. • **Titolo:** Presidente, Dynabrade, Inc.

Date: January 1, 2014 • Date : 1^{er} janvier 2014 • **Datum:** 1 januari 2014 • **Datum:** 1 januari 2014 • **Date:** 1. januar 2014 • **Päiväys:** 1. tammikuuta 2014

• **Datum:** 1. Januar 2014 • **Ημερομηνία:** 1η Ιανουαρίου, 2014 • **Fecha:** 1 de enero de 2014 • **Data:** 1 de Janeiro de 2014 • **Data:** 1 stycznia, 2014

• **Data:** 1 gennaio 2014



EC Machinery Directive: Declaration of Conformity

EUs Maskindirektiv: Samsvarserklæring • Директива ЕС по оборудованию: Декларация соответствия • EÜ Masinadirektiiv: vastavusdeklaratsioon • Směrnice EU o strojích: Prohlášení o shodě • ES Mechanismų direktyva: atitikties deklaracija • EK Mašīnbūves direktīva: Atbilstības deklarācija • Strojna direktiva Evropske skupnosti: izjava o skladnosti • Smernica ES o strojovjeh zariadeniach: Vyhlásenie o zhode • Gépi berendezések vonatkozó EK irányelv: Megfelelőségi nyilatkozat • Directiva CE referitoare la mașini: Declarație de conformitate • Директива за машини на ЕС: Декларация за съответствие

We hereby certify that the following machinery complies with all the relevant Essential Health and Safety Requirements of the EC Machinery Directives 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC as amended and the National Laws and Regulations adopting these directives.

Vi erklærer med dette at følgende maskiner oppfyller alle relevante helse- og sikkerhetskrav i EUs maskindirektiver 89/392/EEC, 91/368/EEC, 93/44/EEC og 93/68/EEC med respektive tillegg, og i de nasjonale lover og forskrifter som følger disse direktivene.

Настоящим подтверждаем, что следующее оборудование соответствует всем относящимся к нему Основным требованиям по охране здоровья и технике безопасности Директив ЕС по оборудованию 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC с учетом внесенных в них изменений, а также национальным законам и правилам, включающим данные директивы.

Käesolevaga kinnitame, et käesolev seade vastab kõigile EÜ Masinadirektiivides 89/392/EMÜ, 91/368/EMÜ, 93/44/EMÜ, 93/68/EEC ning nende muudatustes sätestatud asjakohastele tervisekaitse- ja ohutusnõuetele, samuti siseriiklikele seadustele ja määrustele, millega need direktiivid vastu võeti.

Tímto stvrzujeme, že následující zařízení odpovídá všem ustanovením příslušných základních požadavků na ochranu zdraví a na bezpečnost při práci směrnice EU o strojích číslo 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC ve znění národních zákonů a předpisů přijímajících tyto směrnice.

Šiuo dokumentu patvirtiname, kad toliau išvardinti mechanizmai atitinka visus būtinus EB Mechanizmų direktyvų 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC su pakeitimais ir Valstybinių įstatymų bei taisyklių, į kuriuos įeina šios direktyvos, sveikatos ir saugos reikalavimus.

Mēs ar šo apstiprinām, ka sekojošie mašīnbūves izstrādājumi atbilst visām precizēto EK Mašīnbūves direktīvu 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC saistītajām būtiskajām veselības aizsardzības un drošības tehnikas prasībām, kā arī valstu likumiem un noteikumiem, kas piemēro šīs direktīvas.

S tem potrjujemo, da naslednji stroji ustrezajo vsem primernim bistvenim zdravstvenim in varnostnim zahtevam strojnih direktiv Evropske skupnosti 89/392/EGS, 91/368/EGS, 93/44/EGS, 93/68/EGS z dopolnilni ter državnim zakonom in predpisom, ki prevzemajo te direktive.

Týmto potvrdzujeme, že nasledujúce stroje spĺňajú všetky platné Základné zdravotné a bezpečnostné požiadavky Smernice ES o strojovjeh zariadeniach 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC, v znení neskorších predpisov, a národných zákonov a predpisov, ktorými boli tieto smernice prijaté.

Ezennel tanúsítjuk, hogy a következő gépi berendezések megfelelnek az összes vonatkozó alapvető egésségvédelmi és munkabiztonsági követelménynek, amelyet a 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC módosított EK irányelvek, valamint az ezeket elfogadó nemzeti törvények és előírások tartalmaznak.

Prin prezenta certificăm faptul că mașina descrisă mai jos se conformează tuturor cerințelor esențiale aplicabile privind sănătatea și siguranța prevăzute în Directivele CE cu privire la mașini 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC și în amendamentele acestora, precum și prevederilor reglementărilor și legilor naționale privind adoptarea acestor directive.

По този начин ние удостоверяваме, че тези машини се придържат към всички приложими изисквания за опазване на здравето и безопасност към директивите машини на ЕС 89/392/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC, чрез поправка и приемане на тези директиви в Националните закони и наредби.

Machinery Type: Pneumatic Power Tools • **Maskintype:** Pneumatiske elverktøy • **Тип оборудования:** пневматические приводные инструменты • **Masina tüüp:** Pneumaatilised tööriistad • **Typ zařízení:** Pneumaticky poháněné nástroje • **Mechanismų rūšis:** pneumatiniai elektriniai įrankiai • **Mašīnbūves izstrādājuma tips:** Pneimatiskie motorinstrumenti • **Vrsta stroja:** Pnevmatiski orodni stroji • **Typ strojového zariadenia:** Pnevmatické nástroje • **Gépi berendezés típusa:** Pnevmatikus szerszámgépek • **Típus mašini:** Instrumente de prelucrare pneumatice • **Тип машини:** Пневматични инструменти

Name of Manufacturer: • **Fabrikantens navn:** • **Наименование изготовителя:** • **Tootja nimi:** • **Jméno výrobce:** • **Gamintojo pavadinimas:** • **Izgatavotāja nosaukums:** • **Naziv proizvajalca:** • **Meno výrobcu:** • **Gyártó neve:** • **Numele producătorului:** • **Име на производителя:** DYNABRADE, INC.

Address: • **Adresse:** • **Адрес:** • **Address:** • **Adresa:** • **Adresas:** • **Adrese:** • **Naslov:** • **Adresa:** • **Cim:** • **Adresa:** • **Адрес:** 8989 Sheridan Drive, Clarence, New York 14031-1490 U.S.A.

A technical construction file for the machinery is retained at the above address (note: optional information for EC agents only).

En fil med maskinens tekniske konstruksjon finnes på adressen ovenfor. (Merk: valgfri informasjon kun for representanter i EU-land). • Техническая информация о конструкции оборудования хранится по вышеуказанному адресу (примечание: необязательная информация только для агентов ЕС). • Toote tehnilist dokumentatsiooni säilitatakse ülalmainitud aadressil (märkus: vabatahtlik teave ainult EÜ esindajatele) • Souhrnné informace o technické konstrukci přístroje je uložené na výše uvedené adrese (poznámka: volitelné informace jen pro zástupce EU). • Mechanismų techninės konstrukcijos byla saugoma aukščiau nurodytu adresu (pastaba: papildoma informacija, skirta tik EB atstovams). • Mašīnbūves izstrādājumu tehnisko konstrukciju fails glabājas iepriekšminētajā adresē (piezīme: izvēles informācija tikai EK aģentiem). • Tehnična mapa teh strojev se hrani na zgornjem naslovu (opomba: neobvezna informacija samo za predstavnike Evropske skupnosti) • Technická dokumentácia strojového zariadenia je dostupná na adrese uvedenej vyššie (upozornenie: dobrovoľná informácia len pre zástupcov ES). • A gépi berendezés műszaki dokumentációjának egy példánya a fenti címen megtalálható (megjegyzés: kizárólag az EK szervek tájékoztatására) • Fișa de date tehnice privind construcția acestei mașini este păstrată la adresa de mai sus (notă: informație opțională numai pentru agenții CE.) • Файл с техническа конструктивна информация за тези машини може да намерите на горния адрес (забелжка: допълнителна информация само за агенти в ЕС).

Signed:

Ned T. Librock

• **Underskrift:** • **Подпись:** • **Allkiri:** • **Podpis:** • **Parašas:** • **Parakstīts:** • **Podpis:** • **Podpis:** • **Aláírás:** • **Semnătura:** • **Подпис:**

Position: President, Dynabrade, Inc.

Stilling: Styreformann, Dynabrade, Inc. • **Должность:** президент компании, Dynabrade, Inc. • **Ametikoht:** Dynabrade, Inc. president • **Funkce:** Prezident, Dynabrade, Inc. • **Pareigos:** „Dynabrade, Inc.“ prezidentas • **Amats:** Firms Dynabrade, Inc. prezidents • **Položaj:** Predsednik, Dynabrade Inc. • **Funkcia:** prezident, Dynabrade, Inc. • **Beosztás:** Elnök, Dynabrade, Inc. • **Funcția:** Președinte, Dynabrade, Inc. • **Позиция:** Президент, Dynabrade, Inc.

Date: January 1, 2014 • **Dato:** 1. januar 2014 • **Дата:** 1 января 2014 г. • **Kuupäev:** 1. jaanuar, 2014 • **Dne:** 1. ledna 2014 • **Data:** 2014 m. sausio 1 d. • **Datums:** 2014. gada 1. janvāris • **Datum:** 1. januar 2014 • **Dátum:** 1. januára 2014 • **Dátum:** 2014. január 1 • **Data:** 1 ianuarie 2014 • **Дата:** 1 Января 2014



25,000 RPM Pencil Grinder

Air Tool Manual – Safety, Operation and Maintenance

SAVE THIS DOCUMENT, EDUCATE ALL PERSONNEL

Models:

5286X



FIND THE MOST CURRENT OFFERING OF SUPPORT DOCUMENTS AND ACCESSORIES @ 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 Safety Institute (ANSI) Safety Code for Portable Air Tools – B186.1. For additional safety information, refer to Safety Requirements for the Use, Care and Protection of Abrasive Wheels – ANSI B7.1, Code of Federal Regulation – CFR 29 Part 1910, European Committee for Standards (EN) Hand Held Non-Electric Power Tools – Safety Requirements and applicable State and Local Regulations.

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.	

⚠ WARNING

Some dust created by sanding, sawing, 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 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: Pencil Grinder Tools are ideal for engraving, light deburring, deflashing, surface preparation, cleaning and finishing using the proper abrasive stones, abrasive mounted wheels, points, molded abrasives, and carbide burrs.

Do not use tool for anything other than its intended applications.

This power tool is not intended for use in potentially explosive atmospheres and is not insulated against contact with electrical power.

Training: Proper care, maintenance, and storage of your tool will maximize performance.

- Employer's Responsibility – Provide Pencil Grinder operators with safety instructions and training for safe use of tools and accessories.

Accessory Selection:

- Abrasive/accessory RPM (speed) rating MUST be approved for AT LEAST the tool RPM rating.

(continued on next page)

SAFETY INSTRUCTIONS (Cont.)

- Before mounting an accessory, visually inspect for defects. Do not use defective accessories.
- Always match collet insert with accessory shaft size. i.e. 1/8" shaft = 1/8" collet insert
- Follow tool specifications before choosing size and type of accessory (see pg. 7 for ANSI Group W plain wheels).
- Only use recommended fittings and air line sizes. Air supply hoses and air hose assemblies must have a minimum working pressure rating of 170 PSIG (10 Bars, g) or working pressure limited to 113 PSIG for all 25,000 RPM Pencil Grinders.
- If a grinding bit is broken, a careful investigation should be made by the user to determine and correct the cause.

OPERATING INSTRUCTIONS

Warning: Always wear personal protection equipment. Operator of tool is responsible for following: accepted eye, face, respiratory, hearing, hand and body protection. Adjacent personnel must be protected from potential injury.

Caution: Hand, wrist and arm injury may result from repetitive work, motion and overexposure to vibration.

Operation: Be sure that any loose clothing, hair and all jewelry is properly restrained. Keep hand and clothing away from working end of the air tool.

- BEFORE MOUNTING AN ACCESSORY, after all tool repairs and whenever a pencil grinder is issued for use, check tool RPM (speed) with tachometer with air pressure set at 90 PSIG while the tool is running. If tool is operating at a higher speed than the RPM marked on the tool housing, or operating improperly, the tool must be serviced and corrected before use.

Caution: Tool RPM must never exceed abrasive/accessory RPM rating. Check accessory manufacturer for details on maximum operating speed or special mounting instructions.

- With power source disconnected from air tool check the collet to assure it is in good condition. If so mount the recommended accessory.
- Make sure tool is off and then connect power source.

Do not expose air tool to inlet pressure above 90 PSIG or (6.2 Bars).

Caution: After installing the accessory, before testing or use and/or after assembling tool, the pencil grinder must be started at a reduced speed to check for good balance. Make sure no one is in the unguarded plane of the accessory. Gradually increase tool speed. DO NOT USE if tool vibration is excessive. Correct cause, and retest to insure safe operation. Run tool for 1 minute of operating speed in a protected area.

- Make sure that work area is uncluttered, and visitors are at a safe range from the tools and debris.
- Use a vise or clamping device to hold work piece firmly in place.
- Do not apply excessive force on tool or apply "rough" treatment to it.
- Always work with a firm footing, posture and proper lighting.
- Ensure that sparks and debris resulting from work do not create a hazard.
- Debris from working certain materials may have the tendency to create a spark/ignition hazard, understand the properties and associated risk of the materials being worked.
- Tools exhaust may contain lubricants, bearing grease, and other materials. Direct exhaust away from operator.
- Do not use cut off wheels or router bits in this tool.
- Note the tool rundown time. Control the tool as if it were under power.
- Use long shank burrs (1.9" or longer) with caution. They are subject to bending, whipping, and breaking when run at high speeds.
- The rated RPM of a mounted point is lowered if the overhang (end of collet to abrasive) exceeds .5 inches (12.7mm). Refer to the included tables. Reference ANSI B 7.1 for a more complete listing and additional information.
- Always use/replace collet cover after accessory changes. To avoid risk of injury due to rotating collet always operate tool with collet cover in place.
- Use hearing protection when working with materials that produce high process noise levels. Permanent hearing loss can result from high sound levels.
- 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.
- Do Not set the tool down until the on/off valve is OFF and the tool has stopped turning.
- If power source is interrupted ensure tool is in OFF position before setting tool down.

Report to your supervisor any condition of the tool, accessories, or operation you consider unsafe.

MAINTENANCE INSTRUCTIONS

Important: A Preventative Maintenance Program is recommended for this tool. The program should include inspection of air supply lines, air line pressure and repair of tools. Refer to ANSI B186.1 for additional maintenance information.

- Use only genuine Dynabrade replacement parts to insure quality. To order replacement parts, specify **Model#**, **Serial#** and **RPM** of your air tool.
- All Dynabrade Air Tools must be used with a Filter-Regulator-Lubricator to maintain all warranties.

Routine Preventative Maintenance:

- 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: **11411** Air Filter-Regulator-Lubricator (FRL) – Provides accurate air pressure regulation and two stage filtration of water contaminants. Operates Up to 55 SCFM/1,558 LPM @ 100 PSIG with 1/2" NPT female ports.
- Dynabrade recommends Dynabrade Air Lube (P/N **95842** 1pt. (473ml).
- **DO NOT** clean or lubricate tools with chemicals that have a low flash point (example: WD-40®).
- Air tool markings must be kept legible at all times. User is responsible for maintaining specification information i.e.: Model #, S/N, and RPM.
- Blow air supply hose out prior to initial use.
- Visually inspect air hoses and fittings for frays, visible damage and signs of deterioration. Replace damaged or worn components.
- Check free speed of pencil grinder using a tachometer on a regular basis.
- Refer to Dynabrade's Warning/Safety Operating Instructions Tag (Reorder No. **95903**) for safety information.

Handling and Storage:

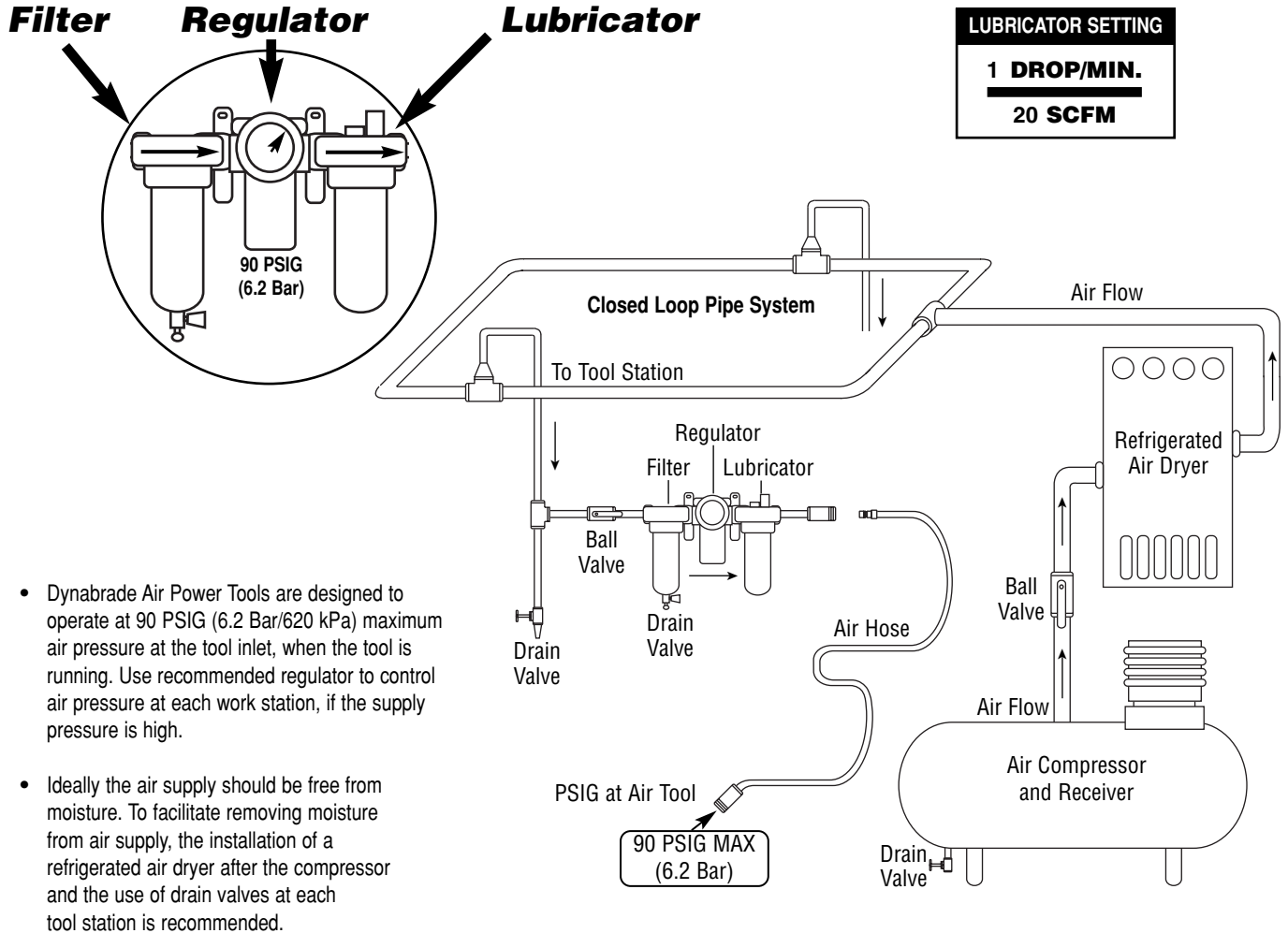
- Use of tool rests, hangers and/or balancers is recommended.
- Protect tool inlet from debris.
- **DO NOT** carry tool by air hose.

MAINTENANCE INSTRUCTIONS - CONTINUED

Handling and Storage:

- Protect abrasive accessories from exposure to water, solvents, high humidity, freezing temperature and extreme temperature changes.
- Store accessories in protective racks or compartments to prevent damage.

Air System



Notice

All Dynabrade motors use the highest quality parts and metals available and are machined to exacting tolerances. The failure of quality pneumatic motors can most often be traced to an unclean air supply. Air pressure easily forces dirt or water contained in the air supply into motor bearings causing early failure. Dirt and water often score the inner workings of the tool resulting in limited efficiency and power. Our warranty obligation is contingent upon proper use of our tools and cannot apply to equipment which has been subjected to misuse such as unclean air, wet air or a lack of maintenance during the use of this tool.

Lifetime Warranty

All Dynabrade portable pneumatic power tools are rigorously inspected and performance tested in our factory before shipping to our customers. If a Dynabrade tool develops a performance problem and an inherent defect is found during normal use and service, Dynabrade will warrant this tool against defects in workmanship and materials for the lifetime of the tool. Upon examination and review at our factory, Dynabrade shall confirm that the tool qualifies for warranty status, and will repair or replace the tool at no charge to the customer. Normally wearable parts and products are NOT covered under this warranty. Uncovered items include bearings, contact wheels, rotor blades, regulators, valve stems, levers, shrouds, guards, O-rings, seals, gaskets and other wearable parts. Dynabrade's warranty policy is contingent upon proper use of our tools in accordance with factory recommendations, instructions and safety practices. It shall not apply to equipment that has been subjected to misuse, negligence, accident or tampering in any way so as to affect its normal performance. To activate lifetime warranty, customer must register each tool at www.dynabrade.com. Dynabrade will not honor lifetime warranty on unregistered tools. A one-year warranty will be honored on all unregistered portable pneumatic power tools. Lifetime warranty applies only to portable pneumatic tools manufactured by Dynabrade, Inc. in the USA. Lifetime warranty applies only to the original tool owner; warranty is non-transferable.

Models:

52861, 52862
52863, 52864

Pencil Grinder Complete Assembly

KEY

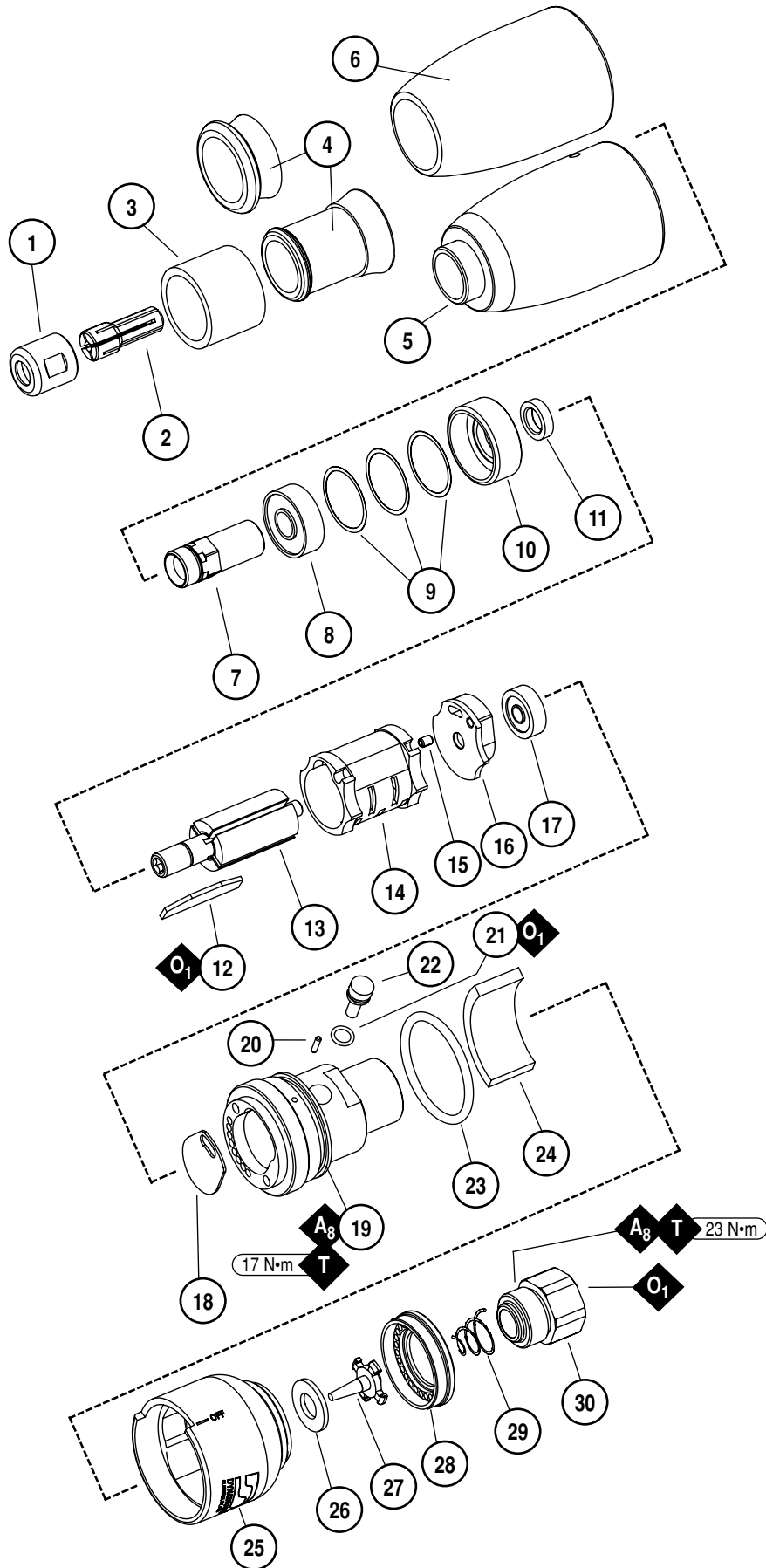
A Adhesive: **A₃** = Loctite #242
A₇ = Loctite #222
A₈ = Loctite #567

T Torque: **N·m x 8.85 = In. - lbs.**

Always follow adhesive manufacturers cleaning and priming recommendations.

Index Key

No.	Part #	Description
1	01484	Collet Cap
2	Collet Insert	
	01495	1/8 in.
	01496	3mm
	01485	1/4 in.
	01497	6mm
3	52881	Tactile Grip
4	52879	Collet Cover
	52898	Thread Guard (Optional)
5	52885	Housing
6	52897	Grip
7	01435	Collet Body
8	02649	Bearing
9	54529	Shim Pack (3/Pkg.)
10	02038	Front Bearing Plate
11	01479	Spacer
12	01480	Vane (4/Pkg.)
13	01475	Rotor
14	01476	Cylinder
15	50767	Pin
16	52871	Rear Bearing Plate
17	02696	Bearing
18	52872	Air Inlet Gasket
19	52875	Manifold
20	97416	Pin
21	98459	O-Ring
22	52876	Plunger
23	96016	O-Ring
24	52882	Felt Muffler
25	Cover	
	52883	Model - 52861
	52884	Model - 52862
	52888	Model - 52863
	52889	Model - 52864
26	01464	Seal
27	58365	Tip Valve
28	52880	Retainer Cover
29	01468	Spring
30	01494	Inlet Bushing



Special Repair Tools

Part #	Description
97787	Adjustable Spanner Wrench



96076 12mm Wrench
95262 14mm Wrench

Disassembly/Assembly Instructions – 25,000 RPM Pencil Grinder

Important: Manufacture warranty is void if tool is disassembled before warranty expires by anyone other than a Dynabrade authorized repair technician.
Notice: All of the special tooling referred to in these instructions can be ordered from your Dynabrade Distributor. Please refer to this parts page for correct part identification. Before servicing this air tool always shut off the air supply valve and dissipate the remaining air pressure before disconnecting the tool from the air supply.

Valve Disassembly:

1. Remove the collet cover with grip from the **52885** Housing by turning it counterclockwise.
2. Use the **96076** Wrench (12mm) to hold the **01435** Collet Body stationary while using the **95262** Wrench (14mm) to remove the **01484** Collet Cap by turning it counterclockwise.
3. Place the **52296** Repair Collar around the thickest portion of the **52885** Housing.
4. Fasten the tool with the repair collar into a vise so that the collet body is pointing down.
5. Use two wrenches, one to hold the **01494** Inlet Bushing stationary, and one to remove the **96229** Male Fitting from the inlet bushing. Turn the fitting counterclockwise.
6. Use a wrench to remove the **01494** Inlet Bushing by turning it counterclockwise.
7. Remove the **52880** Cover Retainer, cover, and **52882** Felt Muffler.
8. Remove the **01468** Spring, **58365** Tip Valve, **01464** Seal, and **52876** Valve Stem.

Valve Disassembly Complete.

Access Air Motor:

1. Remove the **96016** O-Ring.
2. Use a HOT AIR GUN to apply heat to the **52875** Twist Valve Manifold.
3. Use an adjustable wrench to remove the twist valve manifold from the **52885** Housing by turning it counterclockwise.
4. Remove the **52872** Air Inlet Gasket from the twist valve manifold.
5. Push the air motor assembly out of the **52885** Housing.

Air Motor Disassembly:

1. Fasten the **96346** 2" Bearing Separator around the portion of the **01476** Cylinder that is closest to the **52871** Rear Bearing Plate. Place the bearing separator on the table of the **96232** #2 Arbor Press so that the collet body is pointing down. Use a 3/16" or 5mm diameter flat end drive punch as a press tool and push the rotor out of the **02696** Bearing. Use the **96210** Bearing Removal Tool and the arbor press to remove the **02696** Bearing from the rear bearing plate.
2. Fasten the vane slot portion of the rotor in a vise with aluminum or bronze jaws so that the collet body is pointing up.
3. Use an adjustable wrench to remove the collet body by turning it counterclockwise.
4. Remove the front bearing/plate/shims and the **01479** Spacer.

Air Motor Disassembly Complete.

Air Motor Assembly:

1. Install the **01479** Spacer onto the rotor.
2. Select .003" (.08mm) thickness shims from the **54529** Shim Pack and install these into the **02038** Front Bearing Plate.
3. Install the **02649** Bearing into the front bearing plate.
4. Position the rotor in a vise with aluminum or bronze jaws so that the rotor spindle is pointing up. Install the front bearing/plate/shims onto the rotor.
5. Install the **01435** Collet Body onto the rotor. (Torque to 17N·m/150 in. lbs.)
6. Remove the assembly from the vise.
7. Use a .001" (0.3mm) thick feeler gauge to check the clearance between the front bearing plate and the face of the rotor. The clearance should be .001"-.0015" (0.3-0.4mm). **Note:** If the clearance needs adjustment repeat steps 2-6, adding or removing shims as required.
8. Lubricate the **01480** Vanes (4) with the **95842** Dynabrade Air Lube 10W/NR (or equivalent) and install these into the rotor.
9. Install the **01476** Cylinder over the rotor so that the air inlet opening of the cylinder will line up with the air inlet opening in the **52871** Rear Bearing Plate.
10. Use the raised outer diameter of the **96216** Bearing Press Tool and the **94232** #2 Arbor Press to install the **02696** Bearing into the **52871** Rear Bearing Plate.
11. Use the raised inner diameter of the **96216** Bearing Press Tool and the arbor press to install the rear bearing/plate onto the rotor.
Note: Carefully press the bearing/plate down until it just touches the cylinder. This will establish a snug fit between the bearing plates and the cylinder.
12. Install the **52872** Air Inlet Gasket into the twist valve manifold carefully so that the air inlet is completely open.
13. After threaded surfaces have been properly cleaned and primed, apply a small amount of the Loctite® #567 to the external threads of the **52875** Twist Valve Manifold.
14. Position the air motor so that the **52871** Rear Bearing Plate fits into the **52875** Twist Valve Manifold.
15. Carefully slide the motor assembly into the **52885** Housing and thread the twist valve manifold into the housing. (Torque to 17N·m/150 in. lbs.)
16. Install the **96016** O-Ring onto the **52875** Twist Valve Manifold.

Air Motor Assembly Complete.

Valve Assembly:

1. Position the tool with the **52296** Repair Collar in a vise so that the opening for the **52876** Valve Stem is facing up.
2. Install the **52876** Valve Stem along with the **98459** O-Ring into the **52875** Twist Valve Manifold.
3. Install the **52882** Felt Muffler into the deep curved recess in the cover and carefully slide the cover onto the twist valve manifold.
4. Position the tool with the **52296** Repair Collar in a vise so that the air inlet opening is facing up.

(continued on next page)

Disassembly/Assembly Instructions – (Continued)

5. Install the **52880** Cover Retainer onto the cover.
6. Install the **01464** Seal into the air inlet opening so that it lays flat.
7. Use a small flat blade screwdriver to push the valve stem over so that the tip valve will fit into the air inlet opening properly.
8. Use needle nose pliers to grasp the back of the **58365** Tip Valve and insert it into the air inlet opening.
9. Use needle nose pliers to install the **01468** Spring into the air inlet opening so that the small end of the spring fits against the Tip valve.
10. After threaded surfaces have been properly cleaned and primed, apply a small amount of the Loctite® #567 onto the external threads of the **01494** Inlet Bushing and install the inlet bushing into twist valve manifold. (Torque to 23N-m/200 in. lbs.)
11. Using two wrenches, one to hold the **01494** Inlet Bushing stationary, and one to install the **96229** Male Fitting into the inlet bushing by turning it clockwise.
12. Remove the tool from the vise.
13. Install the collet insert and cap onto collet body.
14. Install the collet cover and grip assembly onto the **52885** Housing by turning it clockwise.

Valve Assembly Complete. Assembly Complete. Allow adhesive to cure (follow adhesive manufacturers recommendations) before operating tool.

Important: Tool should now be tested for proper operation at 90 PSIG. If tool does not operate properly or operates at a higher RPM than marked on the tool, the tool should be serviced to correct the cause before use. Before operating, place 2-3 drops of Dynabrade Air Lube (P/N **95842**) directly into air inlet with cover turn to the on position. Operate tool for 30 seconds to determine if tool is operating properly and to allow lubricating oils to properly permeate motor.

Preventative Maintenance Schedule

For All 25,000 RPM Pencil Grinders

This service chart is published as a guide to expectant life of component parts. The replacement levels are based on average tool usage over one year. Dynabrade Inc. considers one year usage to be 1,000 hours.

LEGEND	
X	Type of wear, no other comments apply.
L	Easily lost. Care during assembly/disassembly.
D	Easily damaged during assembly/disassembly.
R	Replace each time tool is disassembled.

Parts Common to all Models:

Index #	Part Number	Description	Number Required	High Wear	Medium Wear	Low Wear	Non-Wear
				100%	70%	30%	10%
1	01484	Collet Cap	1			X	
2	See Note	Collet Insert	1			X	
3	52881	Tactile Grip	1	X			
4	52879	Collet Cover	1		L		
5	52885	Housing	1			X	
6	52897	Housing	1			X	
7	01435	Collet Body	1			X	
8	02649	Bearing	1		T		
9	54529	Shim Pack (3/Pkg.)	1	T			
10	02038	Front Bearing Plate	1			X	
11	01479	Spacer	1			X	
12	01480	Vane (4/Pkg.)	1	T			
13	01475	Rotor	1				X
14	01476	Cylinder	1			X	
15	50767	Pin	1			X	
16	52871	Rear Bearing Plate	1			X	
17	02696	Bearing	1		T		
18	52872	Air Inlet Gasket	1	T			
19	52875	Manifold	1				X
20	97416	Pin	1			D	
21	98459	O-Ring	1		T		
22	52876	Plunger	1		T		
23	96016	O-Ring	1			T	
24	52882	Felt Muffler	1	T			
25	See Note	Cover	1			X	
26	01464	Seal	1			T	
27	58365	Tip Valve	1			T	
28	52880	Retainer Cover	1			X	
29	01468	Spring	1		T		
30	01494	Inlet Bushing	1				X

Note: Please refer to page 4 of tool manual for specific part number or number required.

Pencil Grinder Reference Tables

Note: Reprinted with permission of United Abrasives Manufacturers Association From (ANSI B7.1). For more information on other type mounted wheels refer to (ANSI B7.1) Safety requirements for use, care and protection of Abrasive wheels.

TABLE 27
GROUP W—(PLAIN WHEELS)
MAXIMUM OPERATING SPEEDS (RPM) FOR 1/8" MANDRELS

Shape No.	Wheel Diam. Inches	Wheel Thickness Inches	1/8" Overhang & Thd. Mils.	Overhang — Dimension O*			
				1"	1 1/4"	2"	2 1/2"
W 143	1/8	1/8	105,000	64,500	46,650	32,400	21,370
W 144	1/8	1/4	105,000	64,500	46,650	32,400	21,370
W 145	1/8	3/8	105,000	64,500	46,650	32,400	21,370
W 146	1/8	1/2	105,000	64,500	46,650	32,400	21,370
W 151	1/4	1/8	105,000	64,500	46,650	32,400	21,370
W 152	1/4	1/4	105,000	64,500	46,650	32,400	21,370
W 153	1/4	3/8	80,850	52,500	37,500	26,250	17,620
W 154	1/4	1/2	70,500	45,600	31,500	21,970	15,220
W 157	1/2	1/8	123,000	65,625	47,770	33,150	21,750
W 158	1/2	1/4	105,000	64,500	46,650	32,400	21,370
W 159	1/2	3/8	92,400	57,370	39,370	27,900	18,900
W 160	1/2	1/2	81,370	51,000	34,120	24,000	16,870
W 161	1/4	1/8	77,250	45,970	30,900	22,500	16,120
W 162	1/4	3/8	68,400	42,370	28,870	20,850	15,000
W 163	1/4	1/2	60,000	38,020	26,250	18,750	13,870
W 164	1/4	3/4	45,900	30,000	21,750	15,900	11,850
W 165	3/8	1/8	107,400	62,470	41,250	29,250	20,250
W 166	3/8	1/4	96,970	57,000	35,620	25,120	18,000
W 167	3/8	3/8	75,000	45,750	31,120	22,500	15,750
W 168	3/8	1/2	68,400	41,770	28,650	21,000	15,000
W 169	3/8	3/4	61,650	37,720	27,000	19,870	14,250
W 170	3/8	1	52,500	33,000	23,020	16,650	12,600
W 171	3/8	3/4	37,120	25,500	18,750	14,620	10,020
W 172	3/4	1/8	99,370	59,250	41,020	29,250	20,250
W 173	3/4	1/4	87,600	53,250	35,250	24,750	17,250
W 174	3/4	3/8	69,000	41,250	27,750	20,400	15,000
W 175	3/4	1/2	54,000	33,000	24,150	18,000	13,500
W 176	3/4	3/4	45,370	28,500	21,000	15,900	12,150
W 177	3/4	1	33,750	23,250	17,620	13,650	10,350
W 178	3/4	1	25,250	18,750	14,250	10,870	8,250
W 181	1/2	1/8	76,390	55,500	36,750	25,500	17,850
W 182	1/2	1/4	73,500	43,650	29,100	20,770	15,450
W 183	1/2	3/8	51,750	31,870	22,500	17,250	12,900
W 184	1/2	1/2	41,020	26,400	19,500	15,000	11,400
W 185	1/2	3/4	34,500	22,500	16,870	13,120	9,900
W 186	1/2	1	26,250	17,400	12,750	9,750	8,020
W 187	1/2	1	20,620	13,870	10,120	7,870	6,370
W 190	3/8	1/8	61,120	48,000	31,500	22,650	16,870
W 191	3/8	1/4	58,870	34,500	25,120	18,900	14,250
W 192	3/8	3/8	43,120	27,370	19,870	15,220	11,620
W 193	3/8	1/2	32,250	23,020	16,500	12,520	9,750
W 194	3/8	3/4	29,400	19,120	13,500	10,500	8,250
W 195	3/8	1	22,120	14,250	10,120	7,650	6,150
W 196	3/8	1	17,620	11,620	8,100	6,150	5,100
W 199	3/4	1/8	50,930	44,770	30,000	21,750	15,750
W 200	3/4	1/4	50,930	33,520	23,850	17,850	13,350
W 201	3/4	3/8	38,250	24,370	17,400	13,270	9,970
W 202	3/4	1/2	30,600	19,500	13,500	10,120	7,800
W 203	3/4	3/4	25,500	15,900	10,870	8,250	6,600
W 204	3/4	1	18,900	12,000	8,400	6,220	5,250
W 210	7/8	1/8	43,650	35,250	25,720	18,900	14,320
W 211	7/8	1/4	43,650	27,900	20,400	15,820	12,220
W 212	7/8	3/8	33,750	20,400	14,400	11,020	9,000
W 213	7/8	1/2	27,000	16,870	11,250	8,250	6,600
W 215	1	1/8	38,200	24,900	18,000	13,870	10,500
W 216	1	1/4	30,620	18,600	12,750	9,620	7,500

*See Figure 47

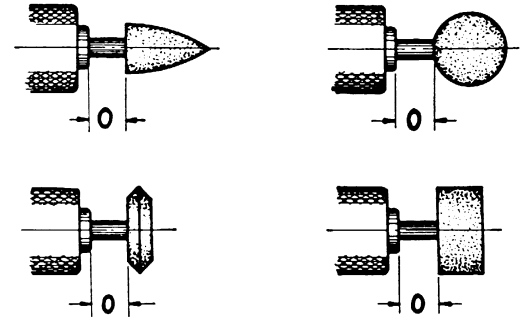


FIGURE NO. 47
Dimension "O" indicates overhang of mandrel.

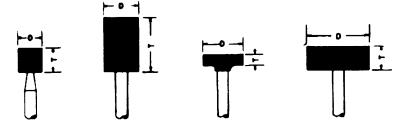


ILLUSTRATION No. 80

MOUNTED WHEELS
STANDARD SHAPES
GROUP "W"

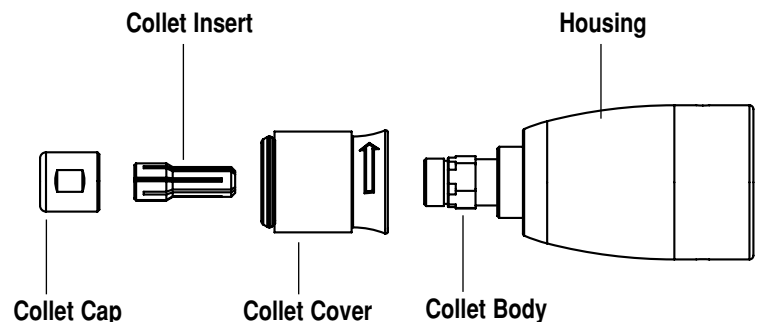
Collet Insert/Accessory Mounting Instructions

Changing A Collet Insert/Accessory:

1. Disconnect tool from power source.
2. Remove the collet cover with grip from the **52885** Housing by turning it counterclockwise.
3. Use the **96076** Wrench (12mm) to hold the **01435** Collet Body stationary while using the **95262** Wrench (14mm) to loosen the **01484** Collet Cap by turning it counterclockwise.
4. Insert desired bit into collet insert a minimum of one inch or at least half the overall length of the accessory and tighten **01484** Collet Cap using **95262** Wrench (14mm) while holding **01435** Collet Body stationary using **96076** Wrench (12mm).

Note: See table 27 above for overhang limits for plain wheels (Group W).

5. Attach collet cover with grip onto **52885** Housing by turning it clockwise.



Optional Accessories

FIND THE MOST CURRENT OFFERING OF SUPPORT DOCUMENTS AND ACCESSORIES @ WWW.DYNABRADE.COM



10681 Filter-Regulator-Lubricator

- Minimize the possibility of misuse due to unclean air, wet air or insufficient lubrication.
- Provides accurate air pressure regulation and two stage filtration of water contaminants.



Model 93351

- 1/8" Carbide Burr Kit, Includes 12 burrs for grinding, deburring, and finishing metal.



94994 Over Hose Assembly

- Over Hose Assembly directs exhaust away from operator.



97787 Spanner Wrench

- Assembly/Disassembly tool, used to properly hold housing.



52898 Optional Thread Guard

- Gives a tactile warning near the working end of the tool.



52877 Tool Hanger

- Allows for tool to be suspended by a tool hanger for ease of use.



52296 Repair Collar

- Specially designed collar for use in vise to prevent damage to valve body housing during disassembly/assembly.



Dynabrade Air Lube

- For pneumatic equipment.
- Absorbs up to 10% of its weight in water.
- Prevents rust and formation of sludge.

95821: 4 oz. (118 ml)

95842: 1 pt. (473 ml)

95843: 1 gal. (3.8 L)

Machine Specifications

Model Number	Motor RPM	Sound Level	Maximum Air Flow SCFM (LPM)	Air Pressure PSIG (Bars)	Collet Size	Weight Pound (kg)	Length Inch (mm)	Height Inch (mm)
52861	25,000	79 dB(A)	16 (445)	90 (6.2)	1/8"	1.1 (.48)	5-5/8 (144)	1-1/2 (39)
52862	25,000	79 dB(A)	16 (445)	90 (6.2)	3mm	1.1 (.48)	5-5/8 (144)	1-1/2 (39)
52863	25,000	79 dB(A)	16 (445)	90 (6.2)	1/4"	1.1 (.48)	5-5/8 (144)	1-1/2 (39)
52864	25,000	79 dB(A)	16 (445)	90 (6.2)	6mm	1.1 (.48)	5-5/8 (144)	1-1/2 (39)

Additional Specifications: Air Inlet Thread 1/4" NPT • Hose Size 1/4" (6mm)

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

Reference Contact Information

- 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
- Government Printing Office – GPO**
Superintendent of Documents
Attn. New Orders
P.O. Box 371954
Pittsburgh, PA 15250-7954
Tel: 1 (202) 512-1803
- Power Tool Institute, Inc.**
P.O. Box 818
Yachata, Oregon 97498-0818
Tel: 1 (503) 547-3185
Fax: 1 (503) 547-3539
- European Committee for Standardization**
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1. Diamond Routing Bits

The tool kit is supplied with a pair of diamond routing bits, either parallel or fluted. The use of diamond grit provides the most effective material for removing composite materials with air tools. The diamond grit also has low wear rates. The diamond routing bits are supplied in 2 grits to accommodate a wide range of commonly used composite materials. The table below provides details of the diamond routing bits supplied in the kit which are also available as spare parts.

Description & Application	Part No. & Image	
This kit is supplied with diamond routing bits in two styles to address effective cutting and dust removal from different materials	<p>Parallel Router Bits</p> <p>For general purpose routing of solid laminates. In some cases, small localised debris between 1-4mm maybe projected locally, which falls but does not become airborne.</p>	<p>Fluted Router Bits</p> <p>For fine laminates and sandwich panels to ensure effective dust capture. The flutes prevent debris being projected from the front of the cutter.</p>
<p>36/44 Diamond Grit</p> <p>Suitable for cutting and grinding back abrasive filled composites or heavy woven roving.</p>	<p>DMP0145-SP01</p> 	<p>DMP0145-SP03</p> 
<p>44/60 Diamond Surface Planer</p> <p>Suitable for general purpose cutting and grinding over a range of composite materials.</p>	<p>DMP0145-SP02</p> 	<p>DMP0145-SP04</p> 
<p>Material</p>	<p>Solid Laminates</p>	<p>Sandwich Panels (up to 15mm)</p>
<p>Wet Lay-Up Glass / Polyester or Vinyl Ester</p>	<p>up to 6mm</p>	<p>6mm total skin thickness</p>
<p>Infused Glass / Vinyl Ester or Epoxy</p>	<p>up to 5mm</p>	<p>5mm total skin thickness</p>
<p>Pre-preg Glass / Phenolic or Epoxy</p>	<p>up to 4mm</p>	<p>4mm total skin thickness</p>
<p>Infused Carbon / Phenolic or Epoxy</p>	<p>Up to 4mm</p>	<p>4mm total skin thickness</p>
<p>Pre-preg Carbon / Phenolic or Epoxy</p>	<p>up to 3mm</p>	<p>3mm total skin thickness</p>

Special Notes

- The geometry also allows for effective dust capture when used with a suitable on-tool dust extraction unit. Use of this tool kit without a suitable on-tool dust extraction unit is not recommended.

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- Prior to use, check the diamond surface planer to be used for any signs of corrosion or damage. Do not use the diamond surface planer if corrosion or damage is present.
- After use, remove the diamond surface planer from the tool. To clean the diamond surface planer run under clean water and use a soft brush to remove any dust/debris from the diamond surface planer. Ensure the diamond surface planer is completely dry prior to being stored.

- Where the surface planer is incorrectly used, excessive heat can lead to the surface planer becoming clogged with burnt resin making the surface planer ineffective at material removal. To remove the burnt resin, soak the surface planer in a suitable resin removing solvent or detergent overnight. Brush the degraded resin from the surface planer using a fine wire brush and continue to clean as above.



- It is difficult to assess the level of wear or the life of diamond coated tools when used with composite materials. There will be a notable reduction in cutting performance when the diamond router bit requires replacement.
- When ordering spare or replacement parts, the part number is laser engraved on the stem of each diamond router bit.
- Where removal of aramid materials is required, please contact Dark Matter Composites directly for advice.



2. Fitting & Removal of Diamond Routing Bits

SAFETY NOTICE - Always disconnect the air supply to the air router prior to fitting or adjusting any part of the air router/jig assembly.

Fitting

1. Hold the vacuum shroud/pipe assembly and loosen the locknut with the 30mm spanner provided. Unscrew the vacuum shroud from the collar adaptor.
2. Hold the air motor and loosen the collar adaptor using the 30mm spanner. Unscrew the collar adaptor from the air motor.
3. Check the 6mm collet is fitted within the collet assembly. Note that the size of the collet is laser engraved on the collet body.



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4. Fully insert the required diamond router bit into the collet assembly. Tighten the collet assembly with the 12mm and 14mm spanners provided.



5. Screw the collar adaptor onto the air motor. *Note - Ensure the threads of the collar adaptor and air motor are clean and free from dust. If the threads are contaminated on assembly, the collar adaptor may loosen during use.*



6. Tighten the collar adaptor with the 30mm spanner provided.

7. To refit the vacuum shroud/pipe assembly onto the collar adaptor, hold the airline swivel joint so that it does not interfere with the vacuum tube and to support the end of the air motor.



8. Rotate the body of the air motor to engage the threads of the collar adaptor and vacuum base. Ensure a minimum of two full threads are engaged (2 revolutions). Hold the vacuum shroud/pipe assembly and tighten the lock nut with the 30mm spanner.

Removal

1. Hold the vacuum shroud/pipe assembly and loosen the locknut with the 30mm spanner provided. Unscrew the vacuum shroud from the collar adaptor.



2. Hold the air motor and loosen the collar adaptor using the 30mm spanner. Unscrew the collar adaptor from the air motor.



3. Loosen the collet assembly with the 12mm and 14mm spanners provided and remove the diamond router bit from the collet assembly.



4. Screw the collar adaptor onto the air motor and tighten with the 30mm spanner provided.



5. To refit the vacuum shroud/pipe onto the collar adaptor, hold the airline swivel joint so that it does not interfere with the vacuum tube and to support the end of the air motor.
6. Rotate the body of the air motor to engage the threads of the collar adaptor and vacuum base. Ensure a minimum of two full threads are engaged (2 revolutions). Hold the vacuum shroud/pipe assembly and tighten the lock nut with the 30mm spanner.



3. Zero Adjustment of Routing Bits

SAFETY NOTICE - Always disconnect the air supply to the air router prior to fitting or adjusting any part of the air router/jig assembly.

Where accurate depth control/adjustment is required, the zero must be reset on the router assembly whenever the cutting head is changed, as follows:

1. Fit the required routing bit as detailed in section 2.
2. Hold the vacuum shroud/pipe and loosen the locknut with the 30mm spanner provided.
3. Stand the router assembly face down on a flat surface and press the vacuum base firmly against the flat surface.



4. Rotate the router body clockwise until the routing bit makes contact with the flat surface. A slight resistance in the rotation of the router body should be felt at this point.



5. Without moving the router assembly, hold the vacuum shroud/pipe assembly and tighten the locknut with the 30mm spanner provided.



6. Lift the router assembly and check the router bit is level with the base using a straight edge.



7. If required, loosen the locknut, make any fine adjustments necessary and tighten the locknut.

8. Using a fine permanent marker, mark a horizontal line on the scale pointer in line with the lower edge of the collar.



9. Using a fine permanent marker, mark a vertical line on the collar adaptor in line with the scaled edge of the pointer.



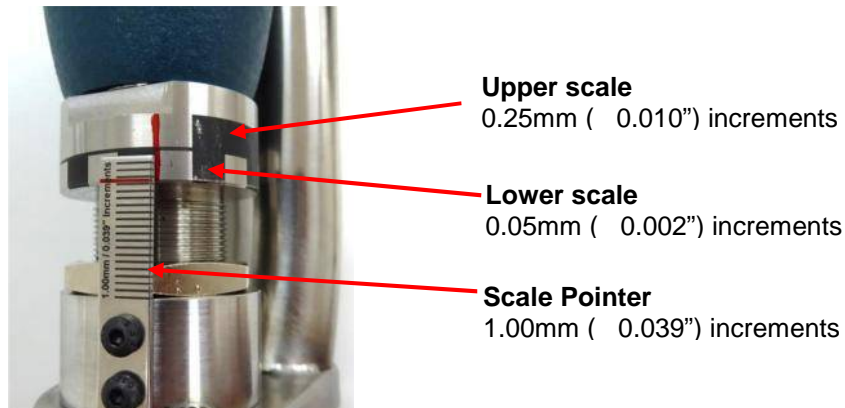
10. These two marks represent the positions on the scales that relate to the routing bit at the face of the base and not protruding i.e. the zero depth position of the routing bit.
11. When required, the marks applied to the scales can be removed with a suitable solvent cleaner. We recommend the use of the 3M VHB Surface Cleaner Sachets for this purpose.

4. Depth Adjustment of Routing Bits

SAFETY NOTICE - Always disconnect the air supply to the air router prior to fitting or adjusting any part of the air router/jig assembly.

Special Notes

- The collar adaptor is engraved with two laser engraved scales:
 - The upper scale is in large increments of 0.25mm (0.010")
 - The lower scale is in small increments of 0.05mm (0.002")
- Depth adjustment is achieved using a 1mm metric thread pitch (0.039") on the router collar adaptor. Note that 0.001" of depth is lost per full thread due to conversion from metric to imperial. If required, make allowance for this when depth cutting in imperial.



Depth Adjustment

1. Stand the router assembly face down on a flat surface.
2. Hold the vacuum shroud/pipe assembly and loosen the locknut with the 30mm spanner provided.
3. Rotate the collar adaptor/router assembly:
 - ***Clockwise to increase the surface planer depth***
 - ***Anti-clockwise to reduce the surface planer depth***
 - Use the laser engraved scales and zero marks for reference.
4. Hold the vacuum shroud/pipe assembly and tighten the lock nut with the 30mm spanner.



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5. Using the Router Vacuum Guide Base

The router assembly can be used to route surfaces either free hand or to follow guide jigs (not included with this kit). The base of the vacuum shroud/pipe assembly is also configured as a vacuum guide base. This can be used to rest up against surfaces and edges of jigs allowing unusual shapes to be trimmed accurately, as well as surfaces that require uniform abrading for bonding surface preparation.

Special Notes

The vacuum guide base rests against the part surface, using it as a reference surface in terms of depth. As material is removed, part of the router base may become suspended above the part surface. Do NOT hold the air motor, hold the router assembly at the vacuum shroud. Press down on the vacuum shroud where the base makes contact with the part surface, the surface planer will remain in the correct position. Undue load on the router body



while part of the router base is suspended above the part surface will tip the router body and cut irregularities in the surface. The air router must be used as a router and not as a sanding or grinding tool.

Guide Jig Design

- The outer edge of the standard vacuum guide base can be used to rest against the edge of a guide jig.
- Guide jigs and their sequence of use need to be designed to use the part surface as a reference surface.
- The offset between the edge of the vacuum guide base and the cutter is:

$$\text{Offset (mm)} = \frac{26\text{mm} - \text{Cutter Diameter (mm)}}{2}$$

- The routing bits provided with this kit are Ø6mm and the guide base offset is 10mm / 3/8".
- If required, please contact Dark Matter Composites for advice on jig design.



SAFETY NOTICE - Always disconnect the air supply to the air router prior to fitting or adjusting any part of the air router/jig assembly.

Using the Vacuum Guide Base

1. Select the routing bit to suit the material being removed as detailed in section 1.
2. Fit the required routing bit as detailed in section 2.
3. Zero the routing bit as detailed in section 3.
4. Set the depth of the routing bit (as detailed in section 4) to the depth associated with material removal operation.
5. Check and adjust the position of the part and ensure it is suitably supported and clamped as necessary.
6. Check the air motor speed regulator is in the 'OFF' position.
7. Connect the compressed air supply hose and vacuum extraction unit hose to the air router connections.
8. ***Ensure that the weight of the air and vacuum hoses are fully supported above the tool using a suitable hanger/support boom. Any side load or restriction applied to the air router during operation may result in the router tipping and surface planer digging into the surface of the part.***
9. Lift the router assembly just clear of the part surface so that it does not make contact with the part and turn the air motor speed regulator slowly towards the 'ON' position. Check the correct operation of the air motor and gradually increase the speed to check correct operation over the full speed range and then cease operation of the air motor.
10. If there is any problem with the setup of the air router or any unusual imbalance or vibration present, cease operation of the air router immediately. Disconnect the compressed air supply and fully check the setup and configuration of the equipment. If required, remove the equipment from service and conduct repair/maintenance activities on the equipment as required.
11. If the air router operates correctly, continue with the material removal activity.
12. ***Ensure that the vacuum extraction connected to the air router is running prior to starting the air router.***
13. Lift the air router just clear of the part surface so that it does not make contact with the part and move the air motor speed regulator to towards the 'ON' position to the desired speed.
14. Where the vacuum guide base is used for free hand material removal, press the router base against the part surface to cut down into the part surface.
15. Where the vacuum guide base is used to follow a guide jig, rest the edge of the vacuum guide base against the guide jig and then press the router base against the part surface to cut down into the part surface.
16. Take care to ensure that the router base is pressed against the part surface where it is supported by the part surface, not where it is unsupported.
17. Do NOT hold the air motor, hold the router assembly at the vacuum shroud.
18. Move the vacuum guide base in a slow and controlled manner, allowing the side of the cutting head to remove material in a controlled manner. Do NOT operate the air router in a swinging motion, back and forth motion, or too fast as the routing bit will rise up the material and not cut to the required depth.

6. Cleaning & Maintenance

The diamond routing bits remove composite material in dust form. When used with a suitable portable/mobile dust extraction unit for use with 'on-tool' dust extraction, dust generation outside the shroud assembly is negligible when used correctly. However, components within the shroud assembly become dust contaminated during each use.

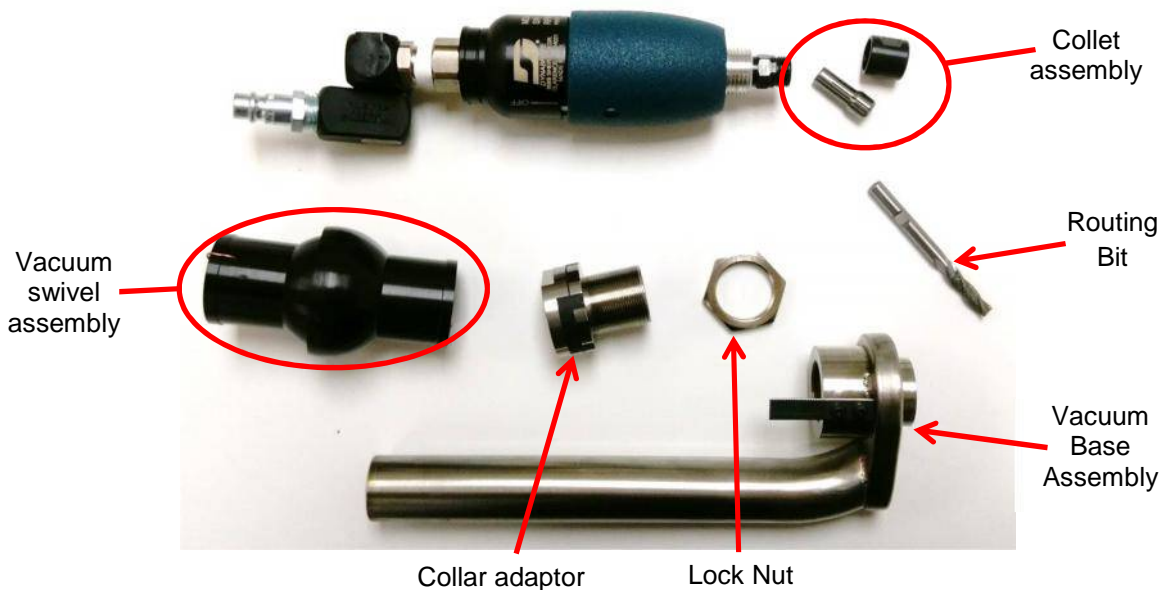
In addition to the Dynabrade Maintenance Instructions included in this manual, the following cleaning and maintenance activities should be followed.

Routing Bits

- Remove and clean the routing bits as detailed in section 1.

Router Assembly

- The following parts of the router assembly become contaminated with dust during each use.



- **To clean the collet assembly and air motor:**
 - Disassemble these parts as stated in the Dynabrade Maintenance Instructions.
 - Mineral spirits are recommended for cleaning these parts.
 - Where required use a soft brush to loosen dust from the parts.
 - Dry with lint free tissue.
 - Reassemble as stated in the Dynabrade Maintenance Instructions.
 - Do NOT clean with any solvents or oils containing acids, esters, ketones, chlorinated hydrocarbons or nitro carbons.
 - Do NOT clean with chemicals that have a low flash point (for example: acetone, WD40).

- **To clean the vacuum base assembly, collar adaptor and lock nut:**
 - Rinse under clean running water to remove any dust/debris from the internal and external surfaces of the parts.
 - Where required use a soft brush to loosen dust from the parts.
 - Ensure the parts are completely dry prior to being stored.
- **To clean the vacuum swivel:**
 - Rinse under clean running water to remove any dust/debris from the internal and external surfaces of the swivel.
 - Where required use a soft brush to loosen dust from the part.
 - Ensure the part is completely dry prior to being reassembled.
 - Do NOT use solvents or detergents as these may damage the part.

7. Compatible Portable Extraction

This air tool kit has been specifically designed to be used with a compatible portable extraction unit. The combination of a lightweight Dynabrade air motor with a bespoke vacuum shroud and bespoke cutters requires very specific extraction.

Advice for Dust Free Operations

- This advice applies specifically to the use of this air tool kit.
- We recommend the use of extraction that auto-starts with the air motor operation.
- We recommend the use of extraction with a 'low airflow alarm'.
- Operational conditions:
 - For Ø6mm routing bits, part numbers DMP0145-SP01 to SP04, set the air tool speed to 12,000-15,000rpm (approx. half speed)
 - For Ø7mm and Ø13mm surface planers, part numbers DMP0111-SP01 to SP06, set the air tool speed to the full 25,000rpm
 - Extractor requirements = 5m³/hr at 5,000Pa
- For our portable dust extraction unit DMP0120, use:
 - Hose size setting '16'
 - Variable airflow at the minimum
 - The second cleaning hose and brush must also be connected and open to allow the airflow to be reduced accordingly.
- For our portable dust extraction unit DMP0123:
 - Set the combined air pressure to for the extractor and air tool to 6 Bar / 80psig
 - The second cleaning hose and brush must also be connected and open to allow the airflow to be reduced accordingly.

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During extensive trials, no airborne dust was present with the materials listed below. In some cases, small localised debris between 1-4mm maybe projected locally, which falls but does not become airborne. The presence of debris varies dependant upon the quality of the laminate and the feed rate used. We have much more information available, please contact us to discuss your requirements.

Material	Solid Laminates	Sandwich Panels (up to 15mm)
Wet Lay-Up Glass / Polyester or Vinyl Ester	up to 6mm	6mm total skin thickness
Infused Glass / Vinyl Ester or Epoxy	up to 5mm	5mm total skin thickness
Pre-preg Glass / Phenolic or Epoxy	up to 4mm	4mm total skin thickness
Infused Carbon / Phenolic or Epoxy	Up to 4mm	4mm total skin thickness
Pre-preg Carbon / Phenolic or Epoxy	up to 3mm	3mm total skin thickness



DMP0120



DMP0123