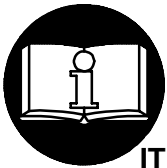


## OPERATION AND MAINTENANCE MANUAL FOR SERIES HD, HX AND HXD GRINDERS

### NOTICE

Series HD, HX and HXD Grinders are designed for close-quarter work in the metal fabricating industry, shipyards, pipe fabrication, die manufacturing and limited space applications. They are particularly good where conduits, pipes, ducts, etc. pass through bulkheads or frames. These small Grinders are very efficient for grinding weld bead and leaving a fine finish.

Ingersoll-Rand is not responsible for customer modification of tools for applications on which Ingersoll-Rand was not consulted.



### ⚠ WARNING

**IMPORTANT SAFETY INFORMATION ENCLOSED.  
READ THIS MANUAL BEFORE OPERATING TOOL.**

**IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PLACE THE INFORMATION  
IN THIS MANUAL INTO THE HANDS OF THE OPERATOR.  
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.**

#### PLACING TOOL IN SERVICE

- Always operate, inspect and maintain this tool in accordance with American National Standards Institute Safety Code for Portable Air Tools (ANSI B186.1).
- For safety, top performance, and maximum durability of parts, operate this tool at 90 psig (6.2 bar/620 kPa) maximum air pressure at the inlet with 3/8" (10 mm) inside diameter air supply hose.
- Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.
- Do not use damaged, frayed or deteriorated air hoses and fittings.
- Be sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905-1 for a typical piping arrangement.
- Always use clean, dry air at 90 psig (6.2 bar/620 kPa) maximum air pressure. Dust, corrosive fumes and/or excessive moisture can ruin the motor of an air tool.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.
- Do not remove any labels. Replace any damaged label.

#### USING THE TOOL

- Always wear eye protection when operating or performing maintenance on this tool.
- Always wear hearing protection when operating this tool.
- Keep hands, loose clothing and long hair away from rotating end of tool.
- Anticipate and be alert for sudden changes in motion during start up and operation of any power tool.
- Keep body stance balanced and firm. Do not overreach when operating this tool. High reaction torques can occur at or below the recommended air pressure.
- Tool accessories may continue to rotate briefly after throttle is released.
- Air powered tools can vibrate in use. Vibration, repetitive motions or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.
- Use accessories recommended by Ingersoll-Rand.
- This tool is not insulated against electric shock.
- This tool is not designed for working in explosive atmospheres.

### NOTICE

The use of other than genuine Ingersoll-Rand replacement parts may result in safety hazards, decreased tool performance, and increased maintenance, and may invalidate all warranties.

Repairs should be made only by authorized trained personnel. Consult your nearest Ingersoll-Rand Authorized Servicenter.

Refer All Communications to the Nearest  
Ingersoll-Rand Office or Distributor.

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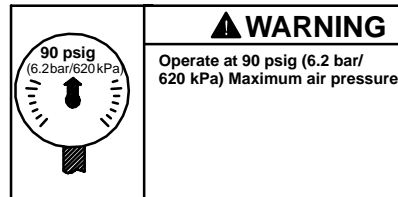
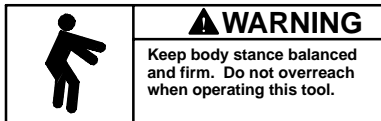
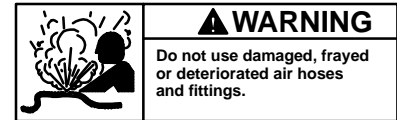
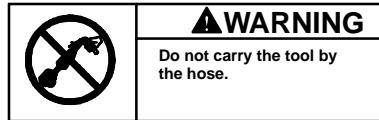
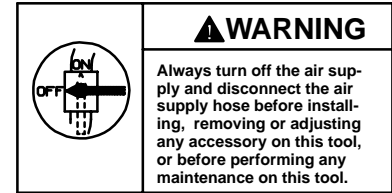
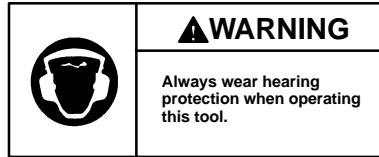
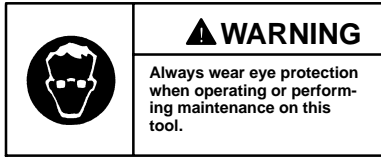
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**PROFESSIONAL TOOLS**

## WARNING LABEL IDENTIFICATION

### ⚠ WARNING

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.



## GRINDER SPECIFIC WARNINGS

### ⚠ WARNING

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

- Do not use this tool if actual free speed exceeds the nameplate rpm.
- Before mounting a wheel, after any tool repair or whenever a Grinder is issued for use, check free speed of Grinder with a tachometer to make certain its actual speed at 90 psig (6.2 bar/620 kPa) does not exceed rpm stamped or printed on the nameplate. Grinders in use on the job must be similarly checked at least once each shift.
- Always use the recommended Ingersoll-Rand Wheel Guard furnished with the Grinder.
- Do not use any grinding wheel, bur or other accessory having a maximum operating speed less than the free speed of the Grinder in which it is being used. Always conform to maximum rpm on grinding wheel blotters.
- Inspect all grinding wheels for chips or cracks prior to mounting. Do not use a wheel that is chipped or cracked or otherwise damaged. Do not use a wheel that has been soaked in water or any other liquid.
- Make certain grinding wheel properly fits the arbor. Do not use reducing bushings to adapt a wheel to any arbor unless such bushings are supplied by and recommended by the wheel manufacturer.
- After mounting a new wheel, hold the Grinder under a steel workbench or inside a casting and run it for at least 60 seconds. Make certain no one is within the operating plane of the grinding wheel. If a wheel is defective, improperly mounted or the wrong size and speed, this is the time it will usually fail.
- When starting with a cold wheel, apply it to the work slowly until the wheel gradually warms up. Make smooth contact with the work and avoid any bumping action or excessive pressure.
- Always replace a damaged, bent or severely worn wheel guard. Do not use a wheel guard that has been subjected to a wheel failure.
- Make certain wheel flanges are at least 1/3 the diameter of grinding wheel, free of nicks, burrs and sharp edges. Always use wheel flanges furnished by the manufacturer; never use a makeshift flange or a plain washer. Tighten Flange Nut securely.
- Guard opening must face away from operator. Bottom of wheel must not project beyond guard.
- Series HD120 and HX120 Grinders have a free speed of 12,000 rpm; Series HD150 and HX150 Grinders have a free speed of 15,000 rpm and Series HD180, HX180 and HXD180 Grinders have a free speed of 18,000 rpm, when operated at 90 psig (6.2 bar/620 kPa) air pressure. Operation at higher air pressure will result in excessive speed.

(continued)

## GRINDER SPECIFIC WARNINGS

- Always match collet size with accessory shank size.
- Always insert tool shank no less than 10 mm in the collet. Tighten Collet Nut securely to prevent accessory from working out during operation of the Grinder. Check tightness of Collet Nut before

operating the Grinder. Pay particular attention to the fact that allowed speed of a mounted point is lowered when the length of the shaft is increased between end of collet and mounted point (overhang).

**WARNING:** Incorrect combinations of grinding wheel, wheel guard and tool speed could result in injury. Correct combinations are specified below:

Guard Part Number	Wheel Type	Wheel Diameter in. (mm)	Maximum Wheel Thickness in. (mm)	Maximum Speed rpm
LE2-931	1	3 (76)	1/2 (12.7)	20,500
LE2-941	1	4 (100)	1/4 (6.4)	19,200

## PLACING TOOL IN SERVICE

### LUBRICATION



Ingersoll-Rand No. 10      Ingersoll-Rand No. 68  
Ingersoll-Rand No. 50

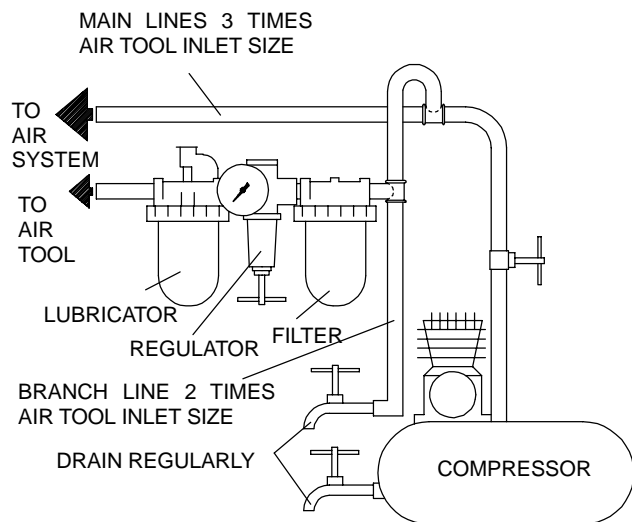
Always use an air line lubricator with these tools.  
We recommend the following Filter-Lubricator-Regulator Unit:

For USA – No. C28-04-FKG0-28

After each two hours of operation, if an air line lubricator is not used, inject 1/2 to 1 cc of Ingersoll-Rand No. 10 Oil into the Air Inlet.

### CAUTION

Do not mark any nonmetallic surface of this tool with customer identification codes. Such action could affect tool performance.



(Dwg. TPD905-1)

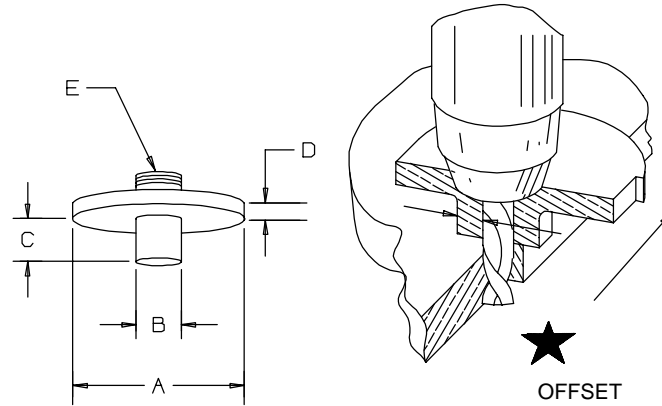
### MOUNTING THE ROUTER ATTACHMENT

To mount a TD-RK4 or TD-RK6 Router Attachment to a HD180 Grinder having a collet, proceed as follows:

1. Use the Collet Body Wrench to hold the Collet Body from turning and using the Collet Nut Wrench, unscrew and remove the Collet Nut Assembly from the Grinder. Remove the Collet.
2. Grasp the tool in copper-covered or leather-covered vise jaws with the spindle upward and using a 1-1/2" wrench, unscrew and remove the Clamp Nut. This is a **left-hand thread**, rotate the Nut **clockwise** to remove it.
3. Remove the Clamp Spacer and install the Router Attachment Clamp Spacer.
4. Thread the Clamp Nut onto the Housing and tighten the Nut between 20 and 25 ft-lb (27 and 34 Nm) torque. This is a **left-hand thread**, rotate the Nut **counterclockwise** to tighten it.
5. Insert the Collet into the Collet Body and loosely thread the Collet Nut onto the Collet Body. Insert a router bit into the Collet and tighten the Collet Nut.
6. Install the Nosepiece Adapter over the bit and collet assembly and thread it onto the Clamp Spacer. Tighten the Adapter between 2 and 3 ft-lb (2.7 and 4.0 Nm) torque. This is a **left-hand thread**, rotate the Adapter **counterclockwise** to tighten it.
7. Install the Adapter Lock Screw in the Adapter and tighten it between 12 and 18 in-lb (1.3 and 2.0 Nm) torque.
8. Thread the Lock Nut onto the Nosepiece Adapter.
9. Thread the Nosepiece Assembly onto the Adapter and then back the Lock Nut against the Assembly. Tighten the Lock Nut between 14 and 19 ft-lb (19.0 and 25.8 Nm) torque.
10. If a Trimmer Guide is used, thread the Guide into the Nosepiece Assembly and tighten the Guide between 3 and 4 ft-lb (4.1 and 5.4 Nm) torque.

# PLACING TOOL IN SERVICE

## TRIMMER GUIDE



**Trimmer Guide Dimensions**

(Dwg. TPD1208)

PART NUMBER FOR ORDERING	A	B	C	D	E
R120-128-2 (for 1/4" shank)	1-1/2	3/8	3/8	1/8	1/2-20NF
R120-128-7 (for 1/4" shank)	2-1/2	1/2	1/2	3/16	1/2-20NF
LG2-129-1 (for 3/8" shank)	2-1/2	1/2	5/8	1/8	5/8-18UNF

★ Note: Offset = 1/2 ("B" dimension minus trimmer bit diameter.)

## HOW TO ORDER CYCLONE GRINDERS

### GRINDERS with 1/4" COLLET

Model	Speed/rpm
HD180RG4 (Rear Exhaust)	18,000
HD150RG4 (Rear Exhaust)	15,000
HD120RG4 (Rear Exhaust)	12,000

### 5" EXTENDED GRINDERS with 1/4" COLLET

HX180RG4 (Rear Exhaust)	18,000
HX150RG4 (Rear Exhaust)	15,000
HX120RG4 (Rear Exhaust)	12,000

### 5" EXTENDED GRINDERS with 3" WHEEL GUARD

HX180RH63 (Rear Exhaust)	18,000
--------------------------	--------

### 5" EXTENDED GRINDERS with 4" WHEEL GUARD

HX180FH64 (Front Exhaust)	18,000
HX180RH64 (Rear Exhaust)	18,000
HX150FH64 (Front Exhaust)	15,000
HX150FH64 (Front Exhaust)	15,000
HX120RH64 (Rear Exhaust)	12,000

### 2" EXTENDED GRINDERS with 3" WHEEL GUARD

HXD180RH63 (Rear Exhaust)	18,000
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## PLACING TOOL IN SERVICE

The following equipment is available at an extra price and must be ordered separately:

- |  |                     |
|--|---------------------|
| 1. Bearing Inserting Tool (for HX or HXD models) ..... | Part No. LE2-950    |
| 2. Cone Wheel Adapter (for HX models) .....            | Part No. LE2-104-L6 |
| 3. Router Attachment Assembly                          |                     |
| for models using 1/4" diameter bits .....              | Part No. TD-RK4     |
| for models using 3/8" diameter bits .....              | Part No. TD-RK6     |
| 4. Trimmer Guide (for Router Attachments)              |                     |
| for 1/4" shank .....                                   | Part No. R120-128-2 |
| for 1/4" shank .....                                   | Part No. R120-128-7 |
| for 3/8" shank .....                                   | Part No. LG2-129-1  |

### NOTICE

All the models listed on Page 5 can be changed to front exhaust tools by reversing the Flow Ring and aligning the the indicator marks with the letter "F" on the Housing. To order a front exhaust tool from the factory, substitute the letter "F" for the letter "R" in the above models. Example: HD180RG4 Rear Exhaust Model becomes HD180FG4 Front Exhaust Model.

### HOW TO ORDER CUSTOM MODELS

- |   |  |
|---|--|
| <p>1. To order a tool with a Locking Lever, select the desired model and add an "L" to the end of the existing number.<br/> <b>Example: HD180RG4L</b></p> | <p>2. To order a tool with a Low-Profile Concentric Flange, select the desired model and add a "C" to the end of the existing number.<br/> <b>Example: HD180RG4C</b></p> |
|---|--|

### NOTICE

Anytime a tool is ordered with a Low-Profile Concentric Flange, it will come equipped with a Locking Lever from the factory.

### NEW GRINDER TO ACCESSORY COLOR MATCHING GUIDE

Ingersoll-Rand has pioneered a new color code system designed to:

- |   |   |
|---|---|
| <p>1. Simplify the identification of rated tool speed via a unique corresponding color match.</p> <p>2. Easily communicate the appropriate backing pads and</p> | <p>accessories for each tool through a matching color code system on the backing pads and/or other corresponding Grinder accessories.</p> <p>3. The chart below demonstrates the color code system between the Grinder and the accessory.</p> |
|---|---|

**(READ FROM LEFT TO RIGHT)**

SPEED COLOR ON NAMEPLATE	RATED TOOL SPEED	SAFE RANGE ACCESSORY (MAXIMUM OPERATING SPEED)							
		35,000	30,000	25,000	20,000	18,000	15,000	12,000	9,000
RED	35,000	RED							
ORANGE	30,000		ORANGE						
YELLOW	25,000			YELLOW					
GREEN	20,000				GREEN				
BLUE	18,000					BLUE			
GREY	15,000						GREY		
TAN	12,000							TAN	
VIOLET	9,000								VIOLET

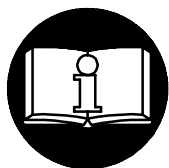
**(Dwg. TPD1146-1)**

# MANUEL D'EXPLOITATION ET D'ENTRETIEN DES MEULEUSES DES SÉRIES HD, HX ET HXD

## NOTE

Les meuleuses des Séries HD, HX et HXD sont destinées aux travaux dans des espaces restreints dans l'industrie des fabrications métalliques, des chantiers navals, des fabrications de tuyauteries, de matrices et de moules et pour toutes les applications où l'espace est limité. En particulier, elles sont idéales dans les endroits où les tubes, tuyauteries, gaines, etc. passent à travers des cloisons ou des châssis. Ces petites meuleuses sont très efficaces pour le meulage des cordons de soudure lorsqu'une bonne finition est requise.

Ingersoll-Rand ne peut être tenu responsable de la modification des outils par le client pour les adapter à des applications qui n'ont pas été approuvées par Ingersoll-Rand.



## ATTENTION

**D'IMPORTANTES INFORMATIONS DE SÉCURITÉ SONT JOINTES.  
LIRE CE MANUEL AVANT D'UTILISER L'OUTIL.  
L'EMPLOYEUR EST TENU DE COMMUNIQUER LES INFORMATIONS  
DE CE MANUEL AUX EMPLOYÉS UTILISANT CET OUTIL.**

**LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES.**

### MISE EN SERVICE DE L'OUTIL

- Toujours exploiter, inspecter et entretenir cet outil conformément au Code de sécurité des outils pneumatiques portatifs de l'American National Standards Institute (ANSI B186.1).
- Pour la sécurité, les performances optimales et la durabilité maximale des pièces, cet outil doit être connecté à une alimentation d'air comprimé de 6,2 bar (620 kPa) maximum à l'entrée, avec un flexible de 10 mm de diamètre intérieur.
- Couper toujours l'alimentation d'air comprimé et débrancher le flexible d'alimentation avant d'installer, déposer ou ajuster tout accessoire sur cet outil, ou d'entreprendre une opération d'entretien quelconque sur l'outil.
- Ne pas utiliser des flexibles ou des raccords endommagés, effilochés ou détériorés.
- S'assurer que tous les flexibles et les raccords sont correctement dimensionnés et bien serrés. Voir Plan TPD905-1 pour un exemple type d'agencement des tuyauteries.
- Utiliser toujours de l'air sec et propre à une pression maximum de 6,2 bar. La poussière, les fumées corrosives et/ou une humidité excessive peuvent endommager le moteur d'un outil pneumatique.
- Ne jamais lubrifier les outils avec des liquides inflammables ou volatils tels que le kérosène, le gasol ou le carburant d'aviation.
- Ne retirer aucune étiquette. Remplacer toute étiquette endommagée.

### UTILISATION DE L'OUTIL

- Porter toujours des lunettes de protection pendant l'utilisation et l'entretien de cet outil.
- Porter toujours une protection acoustique pendant l'utilisation de cet outil.
- Tenir les mains, les vêtements fous et les cheveux longs, éloignés de l'extrémité rotative de l'outil.
- Prévoir, et ne pas oublier, que tout outil motorisé est susceptible d'à-coups brusques lors de sa mise en marche et pendant son utilisation.
- Garder une position équilibrée et ferme. Ne pas se pencher trop en avant pendant l'utilisation de cet outil. Des couples de réaction élevés peuvent se produire à, ou en dessous, de la pression d'air recommandée.
- La rotation des accessoires de l'outil peut continuer pendant un certain temps après le relâchement de la gâchette.
- Les outils pneumatiques peuvent vibrer pendant l'exploitation. Les vibrations, les mouvements répétitifs et les positions inconfortables peuvent causer des douleurs dans les mains et les bras. N'utiliser plus d'outils en cas d'inconfort, de picotements ou de douleurs. Consulter un médecin avant de recommencer à utiliser l'outil.
- Utiliser les accessoires recommandés par Ingersoll-Rand.
- Cet outil n'est pas conçu pour fonctionner dans des atmosphères explosives.
- Cet outil n'est pas isolé contre les chocs électriques.

## NOTE

L'utilisation de rechanges autres que les pièces d'origine Ingersoll-Rand peut causer des risques d'insécurité, réduire les performances de l'outil et augmenter l'entretien, et peut annuler toutes les garanties.

Les réparations ne doivent être effectuées que par des réparateurs qualifiés autorisés. Consultez votre Centre de Service Ingersoll-Rand le plus proche.

Adressez toutes vos communications au Bureau Ingersoll-Rand ou distributeur le plus proche.

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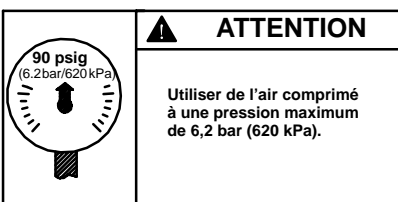
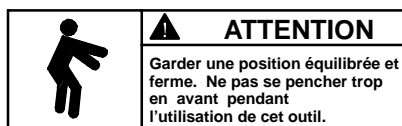
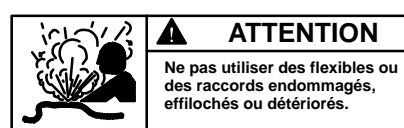
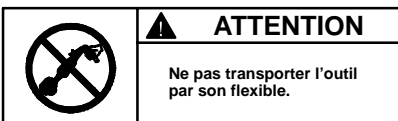
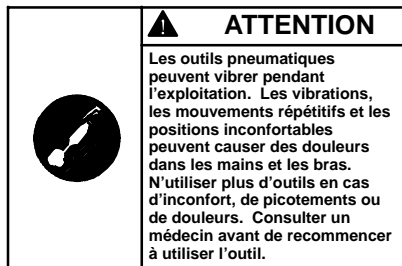
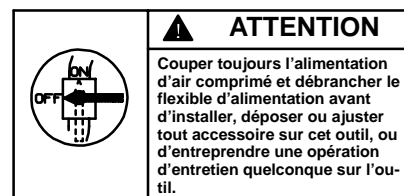
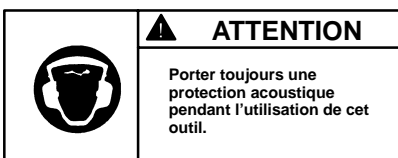
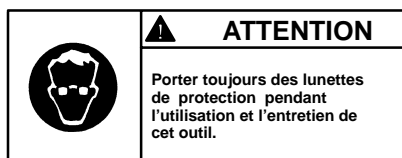
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**PROFESSIONAL TOOLS**

## SIGNIFICATION DES ÉTIQUETTES D'AVERTISSEMENT

### ATTENTION

#### LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES



## AVERTISSEMENTS SPÉCIFIQUES AUX MEULEUSES

### ATTENTION

#### LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES

- Ne pas utiliser cet outil si la vitesse à vide réelle dépasse celle indiquée sur la plaque signalétique.
- Avant de monter une meule, après toute réparation de l'outil ou avant de fournir une meuleuse pour utilisation, vérifier la vitesse à vide de la meuleuse avec un tachymètre pour s'assurer que la vitesse réelle à 6,2 bar (620 kPa) ne dépasse pas celle poinçonnée ou imprimée sur la plaque signalétique. Les meuleuses sorties sur chantier doivent être vérifiées de la même façon au moins une fois par poste.
- Utiliser toujours le protège-meule Ingersoll-Rand fourni avec la meuleuse.
- Ne jamais utiliser une meule, une fraise ou tout autre accessoire ayant une vitesse de service inférieure à la vitesse à vide de la meuleuse sur laquelle il est monté. Respecter toujours la vitesse maximum inscrite sur les disques en papier de la meule.
- Inspecter toutes les meules avant de les monter pour vérifier qu'elles ne présentent pas d'éclats ou de fissures. Ne jamais utiliser une meule écaillée, fissurée ou ayant un endommagement quelconque. Ne jamais utiliser une meule qui a été trempée dans l'eau ou tout autre liquide.
- S'assurer que la meule se monte correctement sur l'arbre. Ne pas utiliser de bagues réductrices, à moins que ces bagues soient recommandées et fournies par le fabricant de la meule.
- Après avoir monté une nouvelle meule, tenir la meuleuse sous un établi en acier ou dans une pièce coulée et la faire tourner pendant au moins 60 secondes. S'assurer que personne ne se tient dans le plan de rotation de la meule. Toute meule défectueuse, mal montée ou de dimension et vitesse incorrectes se cassera généralement à ce moment là.
- Pour commencer le travail avec une meule froide, l'appliquer lentement contre la pièce jusqu'à ce que la meule s'échauffe progressivement. Mettre la meule en contact avec la pièce en douceur en évitant tout choc ou pression excessive.
- Remplacer toujours un protège-meule endommagé, tordu ou très usé. Ne pas utiliser un protège-meule qui a été soumis à la rupture d'une meule.
- S'assurer que les flasques de meule couvrent au moins 1/3 du diamètre de la meule, et qu'ils sont exempts d'entailles, de bavures et d'arêtes vives. Utiliser toujours les flasques fournis par le fabricant ; ne jamais utiliser de flasque de provenance douteuse ou de rondelle plate. Serrer fermement l'écrou du flasque.
- L'ouverture du protège-meule doit être orientée côté opposé à l'opérateur. Le bas de la meule ne doit pas dépasser le protège-meule.
- Les meuleuses des séries HD120 et HX120 ont une vitesse à vide de 12.000 tr/mn; Les meuleuses des Séries HD150 et HX150 ont une vitesse à vide de 15.000 tr/mn, et les meuleuses des Séries HD180, HX180 ET HXD180 ont une vitesse à vide de 18.000 tr/mn, lorsqu'exploitées avec une pression d'air de 6,2 bar (620 kPa). L'exploitation à une pression supérieure produira une vitesse excessive.

## AVERTISSEMENTS SPÉCIFIQUES AUX MEULEUSES

- Toujours choisir une pince adaptée à la dimension de la queue de l'accessoire.
- La queue de l'outil doit toujours être insérée dans la pince sur au moins 10 mm. Serrer fermement l'écrou de pince pour éviter tout desserrage de l'accessoire pendant l'emploi de la meuleuse. Vérifier le serrage de

l'écrou de pince avant de mettre la meuleuse en marche. Ne jamais oublier que la vitesse admissible d'une meule sur tige doit être réduite lorsque la longueur de la tige entre le bout de la pince et la meule (porte-à-faux) est augmentée.

**ATTENTION:** Une mauvaise combinaison de roue d'affûtage, de protection de roue et de vitesse de l'outil peut provoquer un accident corporel. Les combinaisons correctes sont spécifiées ci-dessous:

Référence de la protection	Type de roue	Diamètre de roue mm (po.)	Epaisseur maximale de roue mm (po.)	Vitesse maximale (t/min)
LE2-931	1	3 (76)	1/2 (12.7)	20.500
LE2-941	1	4 (100)	1/4 (6.4)	19.200

## MISE EN SERVICE DE L'OUTIL

### LUBRIFICATION



Ingersoll-Rand No. 10  
Ingersoll-Rand No. 50

Ingersoll-Rand No. 68

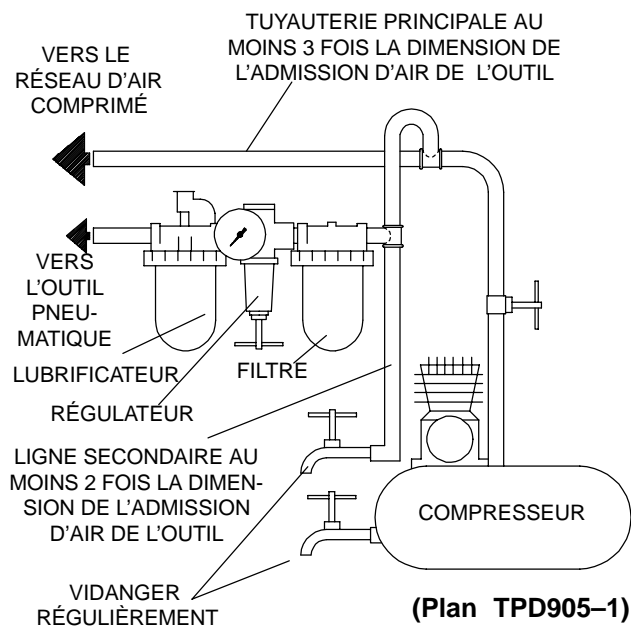
Utiliser toujours un lubrificateur avec ces outils. Nous recommandons l'emploi du filtre-régulateur-lubrificateur suivant :

É.U. – No. C28-04-FKG0-28

Toutes les deux heures de fonctionnement, si un lubrificateur de ligne n'est pas utilisé, injecter 1/2 à 1 cm<sup>3</sup> d'huile Ingersoll-Rand No. 10 dans le raccord d'admission.

### AVERTISSEMENT

Ne pas marquer les codes d'identification client sur les surfaces non métalliques de cet outil. De telles actions pourraient affecter les performances de l'outil.



### MONTAGE DE L'ACCESSOIRE

#### DE DEFONÇAGE

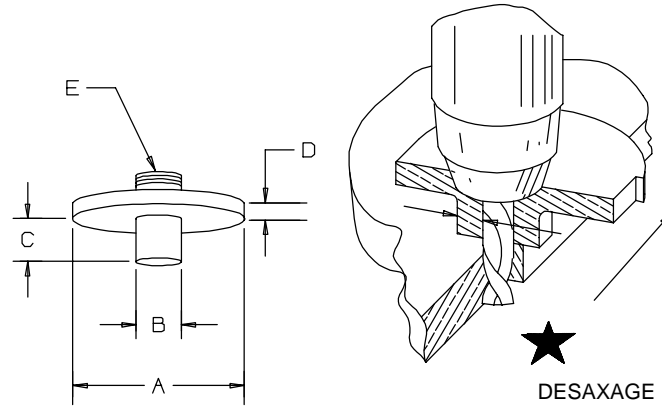
Le montage d'un accessoire de défonceur TD-RK4 ou TD-RK6 sur une meuleuse HD180 équipée d'une pince est effectué de la façon suivante:

1. Retenir le corps de pince à l'aide de la clé de corps de pince et, à l'aide de la clé d'écrou de pince, dévisser et retirer l'écrou de pince de la meuleuse. Extraire la pince.
2. Serrer l'outil dans un étau équipé de mordaches en cuir ou en cuivre avec l'arbre dirigé vers le haut. A l'aide d'une clé de 1-1/2", dévisser et retirer l'écrou d'accouplement. **Ce filetage a un pas à gauche**, tourner l'écrou dans **le sens des aiguilles d'une montre** pour le dévisser.
3. Extraire l'entretoise d'accouplement et monter l'entretoise d'accouplement de l'accessoire de défonceur.
4. Visser l'écrou d'accouplement sur le carter et serrer l'écrou à un couple de 27 à 34 Nm. **Cet écrou est fileté à gauche** et doit être tourné dans **le sens inverse des aiguilles d'une montre** pour le serrer.
5. Insérer la pince dans le corps de pince et visser l'écrou de pince sans le serrer sur le corps de pince. Monter une fraise dans la pince et serrer l'écrou de pince.
6. Monter l'adaptateur de nez sur l'ensemble fraise et pince et le visser sur l'entretoise à un couple de 2,7 à 4,0 Nm. **L'adaptateur est fileté à gauche** et doit être tourné dans **le sens inverse des aiguilles d'une montre** pour le serrer.
7. Monter la vis de blocage de l'adaptateur et le serrer à un couple de 1,3 à 2,0 Nm.
8. Visser l'écrou de blocage sur l'adaptateur de nez.
9. Visser le nez sur l'adaptateur et ramener l'écrou de blocage en arrière contre l'ensemble. Serrer l'écrou de blocage à un couple de 19,0 à 25,8 Nm.
10. Lorsqu'un guide de fraisage est utilisé, le visser dans le nez et serrer le guide à un couple de 4,1 à 5,4 Nm.



# MISE EN SERVICE DE L'OUTIL

## GUIDE DE FRAISAGE



Dimensions du guide de fraisage

(Plan TPD1208)

NUMÉRO DE RÉFÉRENCE DE PIÈCE POUR COMMANDE	A	B	C	D	E
R120-128-2 (pour tige de 1/4")	1-1/2	3/8	3/8	1/8	1/2-20NF
R120-128-7 (pour tige de 1/4")	2-1/2	1/2	1/2	3/16	1/2-20NF
LG2-129-1 (pour tige de 3/8")	2-1/2	1/2	5/8	1/8	5/8-18UNF

★ NB : Désaxage = 1/2 (Dimension 'B' moins diamètre de la fraise)

## SPÉCIFICATIONS

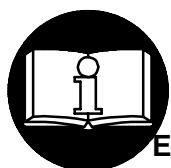
Modèle	Vitesse d'exploitation maximum	Pince
HD180RG4 HD180RG4	18.000	1/4"
HD150RG4	15.000	1/4"
HD120RG4	12.000	1/4"
HX180RG4 HX180RG4	18.000	1/4"
HX150RG4 HX150RG4	15.000	1/4"
HX120RG4 HX120RG4	12.000	1/4"
Modèle	Vitesse d'exploitation maximum	Protège-Meule
HX180RH63 HX180RH63	18.000	3"
HX120RH64	12.000	4"
HXD180RH63	18.000	3"

## MANUAL DE USO Y MANTENIMIENTO PARA AMOLADORAS MODELOS HD, HX Y HXD

### NOTA

Las Amoladoras Serie HD, HX y HXD están diseñadas para trabajo de cercanía en la industria de fabricación de metales, astilleros, fabricación de tuberías y aplicaciones en espacios reducidos. Estas amoladoras resultan especialmente eficaces para aquellas situaciones en las que los conductos, tuberías, etc. atraviesan tabiques o bastidores. Estas pequeñas Amoladoras son muy eficaces para amolar cordones de soldadura y obtener un acabado fino.

Ingersoll-Rand no aceptará responsabilidad alguna por la modificación de las herramientas efectuada por el cliente para las aplicaciones que no hayan sido consultadas con Ingersoll-Rand.



### ⚠ AVISO

**SE ADJUNTA INFORMACIÓN IMPORTANTE DE SEGURIDAD.  
LEA ESTE MANUAL ANTES DE USAR LA HERRAMIENTA.**

**ES RESPONSABILIDAD DE LA EMPRESA ASEGURARSE DE QUE EL OPERARIO  
ESTÉ AL TANTO DE LA INFORMACIÓN QUE CONTIENE ESTE MANUAL.**

**EL HACER CASO OMISO DE LOS AVISOS SIGUIENTES PODRÍA OCASIONAR LESIONES.**

#### PARA PONER LA HERRAMIENTA EN SERVICIO

- Utilice, examine y mantenga siempre esta herramienta conforme al código de seguridad para herramientas neumáticas portátiles de la American National Standards Institute (ANSI B186.1).
- Para seguridad, máximo rendimiento y vida de servicio de las piezas, use esta herramienta a una presión de aire máxima de 90 psig (6,2 bar/620 kPa) en la manguera de suministro de aire con diámetro interno de 10 mm.
- Corte siempre el suministro de aire y desconecte la manguera de suministro de aire antes de instalar, desmontar o ajustar cualquier accesorio de esta herramienta, o antes de realizar cualquier operación de mantenimiento de la misma.
- No utilice mangueras de aire y accesorios dañados, desgastados ni deteriorados.
- Asegúrese de que todas las mangueras y accesorios sean del tamaño correcto y estén bien apretados. Vea Esq. TPD905-1 para un típico arreglo de tuberías.
- Use siempre aire limpio y seco a una presión máxima de 90 psig. El polvo, los gases corrosivos y/o el exceso de humedad podrían estropear el motor de una herramienta neumática.
- No lubrique las herramientas con líquidos inflamables o volátiles tales como queroseno, gasoil o combustible para motores a reacción.
- No saque ninguna etiqueta. Sustituya toda etiqueta dañada.

#### USO DE LA HERRAMIENTA

- Use siempre protección ocular cuando utilice esta herramienta o realice operaciones de mantenimiento en la misma.
- Use siempre protección para los oídos cuando utilice esta herramienta.
- Mantenga las manos, la ropa suelta y el cabello largo alejados del extremo giratorio de la herramienta.
- Anticipe y esté alerta sobre los cambios repentinos en el movimiento durante la puesta en marcha y el manejo de toda herramienta motorizada.
- Mantenga una postura de cuerpo equilibrada y firme. No estire demasiado los brazos al manejar la herramienta. Pueden ocurrir reacciones de alto par a, o a menos de, la recomendada presión de aire.
- Los accesorios de la herramienta podrían seguir girando brevemente después de haber soltado la palanca de estrangulación.
- Las herramientas neumáticas pueden vibrar durante el uso. La vibración, repetición o posiciones incómodas pueden dañarle los brazos y manos. En caso de incomodidad, sensación de hormigueo o dolor, deje de usar la herramienta. Consulte a un médico antes de volver a usarla otra vez.
- Utilice únicamente los accesorios Ingersoll-Rand recomendados.
- Esta herramienta no ha sido diseñada para trabajar en ambientes explosivos.
- Esta herramienta no está aislada contra descargas eléctricas.

### NOTA

El uso de piezas de recambio que no sean las auténticas piezas Ingersoll-Rand podría poner en peligro la seguridad, reducir el rendimiento de la herramienta y aumentar los cuidados de mantenimiento necesarios, así como invalidar toda garantía.

Las reparaciones sólo serán realizadas por personal cualificado y autorizado. Consulte con el centro de servicio Ingersoll-Rand autorizado más próximo.

Toda comunicación se deberá dirigir a la oficina o al distribuidor Ingersoll-Rand más próximo.

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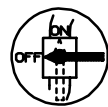





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## ETIQUETAS DE AVISO

### ⚠ AVISO

EL HACER CASO OMISO DE LOS AVISOS SIGUIENTES PODRÍA OCASIONAR LESIONES.

	<b>⚠ ADVERTENCIA</b> Use siempre protección ocular cuando utilice esta herramienta o realice operaciones de mantenimiento en la misma.		<b>⚠ ADVERTENCIA</b> Use siempre protección para los oídos cuando utilice esta herramienta.		<b>⚠ ADVERTENCIA</b> Cortar siempre el suministro de aire y desconectar la manguera de suministro de aire antes de instalar, retirar o ajustar cualquier accesorio de esta herramienta, o antes de realizar cualquier operación de mantenimiento de la misma.
	<b>⚠ ADVERTENCIA</b> Las herramientas neumáticas pueden vibrar durante el uso. La vibración, los movimientos repetitivos o las posiciones incómodas podrían dañarle los brazos y las manos. En caso de incomodidad, sensación de hormigueo o dolor, dejar de usar la herramienta. Consultar al médico antes de volver a utilizarla.		<b>⚠ ADVERTENCIA</b> No coger la herramienta por la manguera para levantarla.		<b>⚠ ADVERTENCIA</b> No utilizar mangueras de aire y accesorios dañados, desgastados ni deteriorados.
	<b>⚠ ADVERTENCIA</b> Mantener una postura del cuerpo equilibrada y firme. No estirar demasiado los brazos al manejar la herramienta.		<b>⚠ ADVERTENCIA</b> Manejar la herramienta a una presión de aire máxima de 90 psig (6,2 bar/620 kPa).		

## AVISOS ESPECÍFICOS PARA AMOLADORA

### ⚠ AVISO

EL HACER CASO OMISO DE LOS AVISOS SIGUIENTES PODRÍA OCASIONAR LESIONES.

- No use esta herramienta si la velocidad libre real excede la indicada en la placa de identificación.
- Antes de montar una muela, y después de todas las reparaciones de herramienta y siempre que se proporcione una Amoladora para su uso, compruebe la velocidad libre de dicha Amoladora con un tacómetro para asegurarse que su velocidad real a 90 psig (620 bar/6,2 kPa) no exceda las rpm estampadas o impresas en la placa de identificación. Las Amoladoras usadas en trabajos deberán ser examinadas similarmente como mínimo una vez en cada jornada de trabajo.
- Use siempre el Cubremuela Ingersoll–Rand recomendado y suministrado con la Amoladora.
- No use nunca una muela, taladro rotatorio dental o cualquier otro accesorio que tenga una velocidad máxima de funcionamiento menor que la velocidad libre de la Amoladora en la que se esté usando. Cumpla siempre las rpm máximas indicadas en los distanciadores de la muela.
- Inspeccione todas las muelas antes de su montaje para ver si tienen grietas o roturas. No use una muela que esté rota o agrietada o dañada de cualquier otra forma. No use una muela que haya estado a remojo en agua o en cualquier otro líquido.
- Asegúrese de que la muela esté bien puesta en la espiga. No use anillos reductores para adaptar una muela a la espiga a menos que estos hayan sido suministrados y recomendados por el fabricante de muelas.
- Después de haber montado una muela nueva, sujete la Amoladora bajo un banco de acero o en un molde y hágala funcionar durante 60 segundos como mínimo. Asegúrese que no haya nadie en el entorno de operación de muela. Si la muela es defectuosa, está mal montada o es del tamaño y velocidad incorrectas, normalmente fallará en este momento.
- Cuando ponga en marcha una muela en frío, aplíquela lentamente al trabajo hasta que se caliente gradualmente. Contacte la zona de trabajo suavemente, y evite golpes o exceso de presión.
- Cambie siempre un cubremuela dañado, torcido o muy desgastado. No use un cubremuela que haya experimentado un fallo de muela.
- Asegúrese que las bridas de muela sean de un diámetro mínimo de 1/3 de la muela y que estén libres de marcas, abrasiones y ordes afilados. Use siempre las bridas de muela suministradas por el fabricante; no use nunca una brida casera o arandela normal. Apriete la Tuerca de Brida de manera segura.
- La apertura del cubremuela deberá estar orientada hacia afuera del operario. La parte inferior de la muela no deberá proyectarse fuera del cubremuela.
- Las Amoladoras Modelos HD120 y HX120 tienen una velocidad libre de 12.000 rpm; las Amoladoras Modelos HD150 y HX150 tienen una velocidad libre de 15.000 rpm y los Modelos HD180, HX180 y HXD180 tienen una velocidad libre de 18.000 rpm, cuando se operan a una presión de aire de 90 psig (6,2 bar/620 kPa). Si se utiliza la herramienta a una presión de aire comprimido mayor, se causará exceso de velocidad. (continuación)

## AVISOS ESPECÍFICOS PARA AMOLADORA

- Empareje siempre el tamaño de pinza con el tamaño de vástago de accesorio.
- Inserte siempre el vástago de herramienta en la pinza un mínimo de 10 mm. Apriete la Tuerca de Pinza de manera segura para evitar que se salga el accesorio durante el funcionamiento de la Amoladora.

Compruebe el apriete de Tuerca de Pinza antes de usar la Amoladora. Preste especial atención al hecho de que la velocidad permitida de un punto de montaje disminuye cuando se incrementa la longitud de eje entre extremo de pinza y punto de montaje (saliente).

**AVISO:** Combinaciones incorrectas de rueda de rectificación, protector de rueda y velocidad de herramienta puedan resultar en lesionamientos. Las combinaciones correctas se especifican a continuación:

Número de Pieza del Protector	Tipo de Rueda	Diámetro de Rueda mm (in.)	Grosor Máximo de Rueda mm (in.)	Velocidad Máxima (rpm)
LE2-931	1	3 (76)	1/2 (12,7)	20.500
LE2-941	1	4 (100)	1/4 (6,4)	19.200

## PARA PONER LA HERRAMIENTA EN SERVICIO

### LUBRICACIÓN



Ingersoll-Rand N° 10  
Ingersoll-Rand N° 50



Ingersoll-Rand N° 68

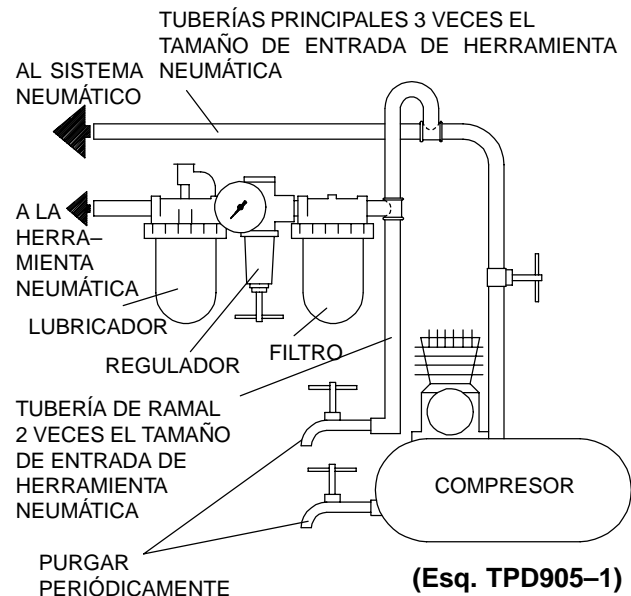
Utilice siempre un lubricador de aire comprimido con estas herramientas. Recomendamos la siguiente unidad de Filtro-Lubricador-Regulador:

EE.UU. – N°. C28-04-FKG0-28

Después de cada dos horas de uso, si no se usa un lubricante de línea de aire comprimido, inyecte 1/2 – 1 cc de Aceite Ingersoll-Rand N° 10 en la Admisión de Aire.

### PRECAUCIÓN

No marque ninguna superficie no metálica de esta herramienta con los códigos de identificación de cliente. Tal acción podría afectar al rendimiento de la herramienta.



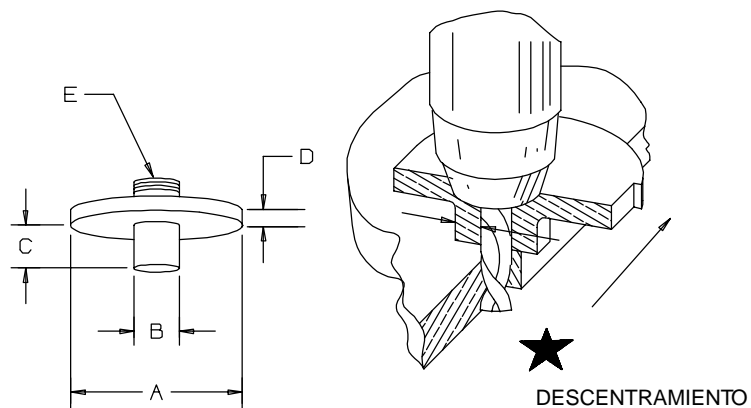
### MONTAJE DEL ACCESORIO DE FRESADO

Para montar un accesorio de fresado TD-RK4 o TD-RK6 a una Amoladora HD180 con pinza, proceda de la manera siguiente:

1. Utilice la llave de cuerpo de pinza para evitar que gire el cuerpo de pinza y, utilizando una llave de tuerca de pinza, desenrosque y quite el conjunto de tuerca de pinza de la amoladora. Saque la pinza.
2. Sujete la herramienta en un tornillo de banco con mordazas cubiertas de cobre o cuero con el husillo hacia arriba y, utilizando una llave de 1-1/2 pulg., desatornille la tuerca de abrazadera. Puesto que se trata de **una rosca hacia la izquierda**, gire la tuerca **en el sentido de las agujas del reloj** para quitarla.
3. Saque el espaciador de abrazadera e instale el espaciador de abrazadera del accesorio de fresado.
4. Enrosque la tuerca de abrazadera en la carcasa y apriete dicha tuerca entre 20 y 25 ft-lb (27 y 34 Nm) de par. Puesto que se trata de **una rosca hacia la izquierda**, gire la tuerca **en sentido contrario al de las agujas del reloj** para apretarla.
5. Inserte la pinza en el cuerpo de pinza y enrosque la tuerca de pinza en el cuerpo de pinza sin apretarla. Inserte una broca de fresado en la pinza y apriete la tuerca de pinza.
6. Inserte el adaptador de la pieza de extremo sobre el conjunto de pinza y broca de fresado, y enrósquelo en el espaciador de abrazadera. Apriete el adaptador entre 2 y 3 ft-lb (2,7 a 4,0 Nm) de par. Puesto que se trata de **una rosca hacia la izquierda**, gire el adaptador **en sentido contrario al de las agujas del reloj** para apretarlo.
7. Instale el tornillo de bloqueo en el adaptador, y apriételo entre 12 y 18 pulg.-lb (1,3 2,0 Nm) de par.
8. Enrosque la tuerca de bloqueo en el adaptador de la pieza de extremo.
9. Enrosque el conjunto de pieza de extremo en el adaptador y gire la tuerca de bloqueo en sentido contrario, contra el conjunto. Apriete la tuerca de bloqueo entre 14 y 19 ft-lb (19,0 a 25,8 Nm) de par.
10. Si se utiliza una guía de recorte, enrosque la guía en la pieza de extremo y apriete dicha guía entre 3 y 4 ft-lb (4,1 y 5,4 Nm) de par.

# PARA PONER LA HERRAMIENTA EN SERVICIO

## GUÍA DE RECORTE



Dimensiones de la guía de recorte

(Esq. TPD1208)

NÚMERO DE PIEZA PARA PEDIDO	A	B	C	D	E
R120-128-2 (para mango de 1/4 pulg.)	1-1/2	3/8	3/8	1/8	1/2-20NF
R120-128-7 (para mango de 1/4 pulg.)	2-1/2	1/2	1/2	3/16	1/2-20NF
LG2-129-1 (para mango de 3/8 pulg.)	2-1/2	1/2	5/8	1/8	5/8-18UNF

★ Nota: Descentramiento = 1/2 (dimensión "B" menos diámetro de broca de recorte.)

## ESPECIFICACIONES

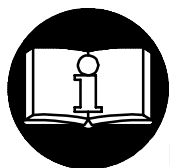
Modelo	Velocidad Libre, rpm	Pinza
HD180RG4 HD180RG4	18.000	1/4"
HD150RG4	15.000	1/4"
HD120RG4	12.000	1/4"
HX180RG4 HX180RG4	18.000	1/4"
HX150RG4 HX150RG4	15.000	1/4"
HX120RG4 HX120RG4	12.000	1/4"
Modelo	Velocidad Libre, rpm	Cubremuela
HX180RH63 HX180RH63	18.000	3"
HX120RH64	12.000	4"
HXD180RH63	18.000	3"

# MANUAL DE FUNCIONAMENTO E MANUTENÇÃO PARA ESMERILADORAS SÉRIES HD, HX E HXD

## AVISO

As Esmeriladoras Séries HD, HX e HXD são concebidas para pequenos trabalhos em indústria de fabricação de metais, estaleiros, fabricação de tubos e aplicações espaciais limitadas. Elas são particularmente úteis onde condutas, tubos, canais, etc, passam através de quadros principais ou estruturas. Estas pequenas Esmeriladoras são muito eficientes no esmerilamento de cordão de solda deixando um acabamento fino.

A Ingersoll-Rand não é responsável por modificações, feitas pelo cliente em ferramentas, nas quais a Ingersoll-Rand não tenha sido consultada.



## ⚠️ ADVERTÊNCIA

**INFORMAÇÃO DE SEGURANÇA IMPORTANTE EM ANEXO  
LEIA ESTE MANUAL ANTES DE OPERAR A FERRAMENTA.  
É DA RESPONSABILIDADE DO EMPREGADOR COLOCAR A INFORMAÇÃO  
DESTE MANUAL NAS MÃOS DO OPERADOR.**

**O NÃO CUMPRIMENTO DAS SEGUINTE ADVERTÊNCIAS PODE RESULTAR EM FERIMENTOS.**

### COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

- Sempre opere, inspecione e mantenha esta ferramenta de acordo com o Código de Segurança do Instituto Americano de Padrões Nacionais para Ferramentas Pneumáticas Portáteis (ANSI B186.1).
- Para segurança, máximo desempenho e máxima durabilidade das peças, opere esta ferramenta com uma pressão de ar máxima de 6,2 bar/620 kPa (90 psig) na entrada da mangueira de alimentação de ar com diâmetro interno de 10 mm (3/8").
- Desligue sempre a alimentação de ar e desconecte a mangueira de alimentação de ar antes de instalar, remover ou ajustar qualquer acessório nesta ferramenta, ou antes de executar qualquer serviço de manutenção nesta ferramenta.
- Não use mangueiras de ar ou adaptadores danificados, gastos ou deteriorados.
- Certifique-se de que todas as mangueiras e adaptadores sejam do tamanho correcto e estejam apertados com firmeza. Veja o Desenho TPD905-1 para um arranjo típico de tubagem.
- Use sempre ar seco e limpo com pressão máxima de 90 psig. Pó, fumos corrosivos e/ou humidade excessiva podem arruinar o motor de uma ferramenta pneumática.
- Não lubrifique as ferramentas com líquidos inflamáveis ou voláteis tais como querosene, diesel ou combustível de jactos.

- Não remova nenhum rótulo. Reponha qualquer rótulo danificado.

### USANDO A FERRAMENTA

- Use sempre óculos de protecção quando estiver operando ou executando serviço de manutenção nesta ferramenta.
- Use sempre protecção contra ruído ao operar esta ferramenta.
- Mantenha as mãos, partes do vestuário soltas e cabelos compridos afastados da extremidade em rotação.
- Antecipe e esteja alerta a mudanças repentinas no movimento quando ligar e operar qualquer ferramenta motorizada.
- Mantenha a posição do corpo equilibrada e firme. Não exagere quando operar esta ferramenta. Torques de reacção elevados podem ocorrer na ou abaixo da pressão de ar recomendada.
- Os acessórios da ferramenta podem continuar a girar brevemente após a pressão ter sido aliviada.
- Ferramentas accionadas pneumáticamente podem vibrar em uso. Vibração, movimentos repetitivos ou posições desconfortáveis podem ser prejudiciais às mãos e aos braços. Pare de usar a ferramenta caso ocorra algum desconforto, sensação de formigueiro ou dor. Procure assistência médica antes de retornar ao trabalho.
- Use acessórios recomendados pela Ingersoll-Rand.
- Esta Ferramenta não foi concebida para trabalhos em atmosferas explosivas.
- Esta Ferramenta não está isolada contra choques eléctricos.

## AVISO

O uso de peças de substituição que não sejam genuinamente da Ingersoll-Rand podem resultar em riscos de segurança, diminuição do desempenho da ferramenta, aumento da necessidade de manutenção e pode invalidar todas as garantias.

As reparações devem ser feitas somente por pessoal treinado autorizado. Consulte o Centro de Serviços da Ingersoll-Rand mais próximo.

Envie Todos os Comunicados Para o Distribuidor ou Escritório da Ingersoll-Rand Mais Próximo.

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**INGERSOLL-RAND®**  
**PROFESSIONAL TOOLS**

# IDENTIFICAÇÃO DO RÓTULO DE ADVERTÊNCIA

## ⚠ ADVERTÊNCIA

O NÃO CUMPRIMENTO DAS SEGUINTES ADVERTÊNCIAS PODE RESULTAR EM FERIMENTO.

 <b>⚠ ADVERTÊNCIA</b> Use sempre óculos de protecção quando estiver operando ou executando algum serviço de manutenção nesta ferramenta.	 <b>⚠ ADVERTÊNCIA</b> Use sempre protecção contra o ruído ao operar esta ferramenta.	 <b>⚠ ADVERTÊNCIA</b> Desligue sempre a alimentação de ar e desconecte a mangueira de alimentação de ar antes de instalar, remover ou ajustar qualquer acessório nesta ferramenta, ou antes de executar algum serviço de manutenção nesta ferramenta.
 <b>⚠ ADVERTÊNCIA</b> Ferramentas accionadas pneumáticamente podem vibrar em uso. Vibração, movimentos repetitivos ou posições desconfortáveis podem ser prejudiciais às mãos e aos braços. Pare de usar a ferramenta caso ocorra algum desconforto, sensação de formigamento ou dor. Procure assistência médica antes de retornar ao trabalho.	 <b>⚠ ADVERTÊNCIA</b> Não carregue a ferramenta segurando na mangueira.	 <b>⚠ ADVERTÊNCIA</b> Não use mangueiras de ar ou adaptadores danificados, gastos ou deteriorados.
 <b>⚠ ADVERTÊNCIA</b> Mantenha a posição do corpo equilibrada e firme. Não exagere quando operar esta ferramenta. Torques de reacção elevados podem ocorrer sob a pressão de ar recomendada.	 <b>⚠ ADVERTÊNCIA</b> Opere com pressão do ar Máxima de 90–100 psig (6,2–6,9 bar).	

## ADVERTÊNCIAS ESPECÍFICAS SOBRE A ESMERILADORA

### ⚠ ADVERTÊNCIA

O NÃO CUMPRIMENTO DAS SEGUINTES ADVERTÊNCIAS PODE RESULTAR EM FERIMENTO.

- Não use esta ferramenta se a velocidade livre total exceder a rpm indicada na placa de identificação.
- Antes de montar o disco, depois de qualquer reparação de ferramenta ou quando se pretende que uma Esmeriladora seja colocada em funcionamento, verifique a velocidade livre da Esmeriladora com um tacometro para se certificar de que a sua velocidade real a 6,2 bar/620kPa (90 psig) não exceda a rpm selada ou impressa na placa de identificação. As Esmeriladoras em funcionamento devem ser similarmente verificadas pelo menos uma vez em cada turno.
- Use sempre o Protector do Disco da Ingersoll–Rand fornecido com a Esmeriladora.
- Não use qualquer disco de esmerilamento, broca ou outro acessório que possua uma velocidade máxima de operação menor do que a velocidade livre da Esmeriladora que esteja a ser usada. Respeite sempre a máxima rpm nos adaptadores de disco de esmerilamento.
- Verifique todas os discos de esmerilamento para ver se há lascas ou rachaduras antes da montagem. Não use um disco que esteja lascado ou rachado ou de alguma maneira danificado. Não use um disco que tenha sido encharcado com água ou qualquer outro líquido.
- Verifique se o disco de esmerilamento se encaixa na árvore de montagem. Não use rolamentos reductores para adaptar um disco na árvore de montagem a não ser que tais rolamentos tenham sido fornecidos ou recomendados pelo fabricante do disco.
- Depois de montar um novo disco, segure a Esmeriladora sob uma bancada de aço ou dentro de uma moldagem e coloque-a em funcionamento por 60 segundos. Verifique se não há ninguém dentro do plano de operação. Se o disco estiver com algum defeito, inadequadamente montado ou se for do tamanho errado ou tiver velocidade incorrecta, este é o momento em que ele normalmente falhará.
- Quando iniciar um trabalho com um disco frio, ponha-o a trabalhar lentamente até que o disco aqueça gradualmente. Faça um contacto suave com o local a ser trabalhado e evite de executar qualquer ação de batimento ou pressão excessiva.
- Reponha um protector do disco sempre que estiver danificado, torto ou severamente gasto. Não use um protector do disco que tenha sido sujeito a uma falha do disco.
- Certifique-se de que as flanges da roda sejam pelo menos 1/3 do diâmetro do disco de esmerilamento, livre de cortes, arestas e extremidades afiadas. Use sempre flanges do disco fornecidas pelo fabricante. Nunca use uma flange provisória ou uma anilha plana. Aperte bem a Porca da Flange.
- A abertura do protector deve estar afastada do operador. O fundo do disco não deve se estender para fora do protector.
- As Esmeriladoras Séries HD120 possuem uma velocidade livre de 12.000 rpm; As Esmeriladoras Séries HD150 e HX150 possuem 15.000 rpm e as Séries HD180, HX180, e HXD180 de Esmeriladoras possuem uma velocidade livre de 18.000 rpm quando operadas sob uma pressão de ar de 6,2 bar/620 kPa (90 psig). Operações sob condições de pressões mais elevadas resultarão em velocidades excessivas.

(continua)

## ADVERTÊNCIAS ESPECÍFICAS SOBRE A ESMERILADORA

- Use sempre uma pinça cuja dimensão seja igual ao encabadoiro acessório.
- Insira sempre o encabadoiro da ferramenta com comprimento que não seja inferior a 10mm no colete. Aperte a Porca do Pinça seguramente para evitar que o acessório se desajuste durante a operação da

esmeriladora. Verifique o aperto da Porca do Pinça antes de operar a esmeriladora. Preste particular atenção ao facto de que a velocidade permitida de um ponto montado é diminuída quando o comprimento do eixo é aumentado entre a extremidade da pinça e o ponto montado (pendurado).

**ADVERTÊNCIA:** Combinações incorrectas de disco de esmerilamento, protector do disco e velocidade da ferramenta pode resultar em ferimento.

As combinações correctas estão especificadas abaixo:

Número de Peça do Protector	Tipo do Disco	Diâmetro do Disco mm (pol.)	Espessura Máxima do Disco mm (pol.)	Velocidade Máxima rpm
LE2-931	1	76 (3)	12,7 (1/2)	20.500
LE2-941	1	100 (4)	6,4 (1/4)	19.200

## COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

### LUBRIFICAÇÃO



Ingersoll-Rand No. 10      Ingersoll-Rand No. 68  
Ingersoll-Rand No. 50

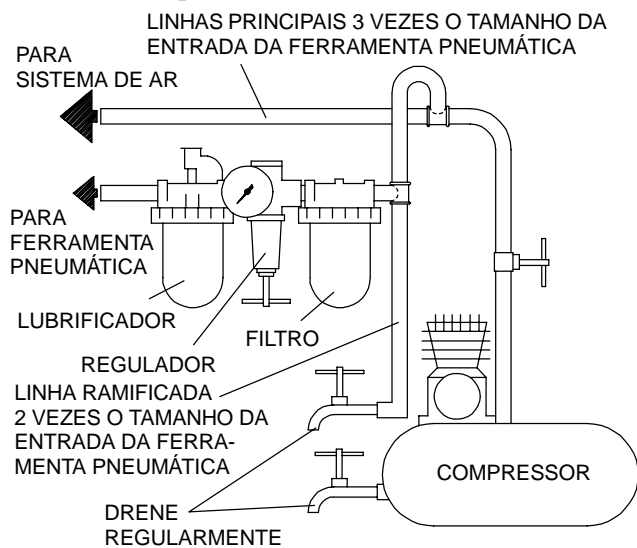
Use sempre um lubrificador de ar de linha com estas ferramentas. Nós recomendamos a seguinte Unidade Filtro-Lubrificador-Regulador:

Para E.U.A. – No. C28-04-FKG0-28

Depois de cada duas horas de operação, se estiver usando um lubrificador de ar de linha, injecte 1/2 a 1 cc de Óleo Ingersoll-Rand No. 10 na Entrada de Ar.

### CUIDADO

Não marque as superfícies não metálicas desta ferramenta com códigos de identificação do cliente. Tais acções podem afectar o desempenho da ferramenta.



### MONTAGEM DO ACESSÓRIO DE CORTE

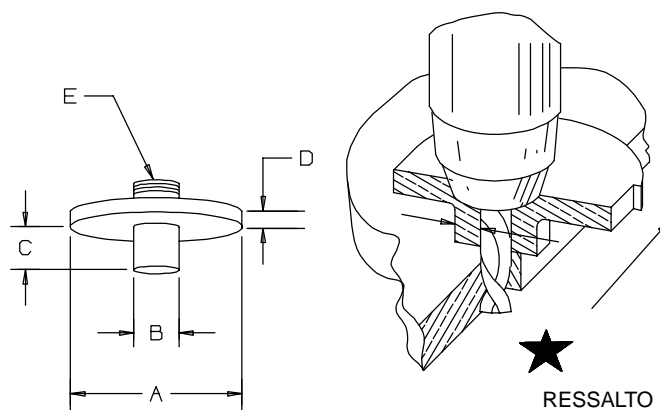
Para montar um acessório de corte TD-RK4 ou TD-RK6 numa Esmeriladora HD180 que tenha uma pinça, proceda da seguinte maneira:

1. Use uma Chave Manual de Bocas para segurar a Máquina evitando assim que esta gire. Desaparafuse a porca da pinça da Esmeriladora. Remova a Pinça.
2. Segure a ferramenta num torno de bancada protegendo-a com mordentes de cobre ou couro, com o eixo para cima. Com uma chave de 1-1/2", desaparafuse e remova a Porca da Pinça. Esta é **uma rosca à esquerda**. Gire a porca **no sentido horário** para removê-la.
3. Instale o Acessório de Corte.
4. Aperte a Porca da Pinça no Veio da Máquina com um torque entre 27 e 34 Nm (20 e 25 pés-lb). Esta é uma **rosca à direita**, gire a Porca **no sentido contrário ao dos ponteiros do relógio** para a apertar.
5. Coloque a Pinça no Veio da Máquina e aperte livremente a Porca. Introduza um Acessório de Corte na Pinça e aperte a respectiva Porca.
6. Instale o Acessório Adaptador Final sobre a mó e aperte o acessório entre 2,7 e 4,0 Nm (2 e 3 pés-lb). Esta é uma **rosca à esquerda**. Gire a Porca **no sentido dos ponteiros do relógio** para apertá-la.
7. Instale a Porca e aperte-a com um torque de 1,3 a 2,0 Nm (12 e 18 pol-lb).
8. Aperte a Porca e o Acessório Adaptador Final.
9. Aperte a Porca Trava com um torque entre 19,0 e 15,8 Nm (14 e 19 pés-lbs).
10. Se se usar uma guia final de aperto, esta deverá ser colocada depois do acessório adaptador com um aperto entre 4,1 e 5,4 Nm (3 e 4 pés-lb).



# COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

## GUIA FINAL DE APERTO



Dimensões da Guia Final de Aperto

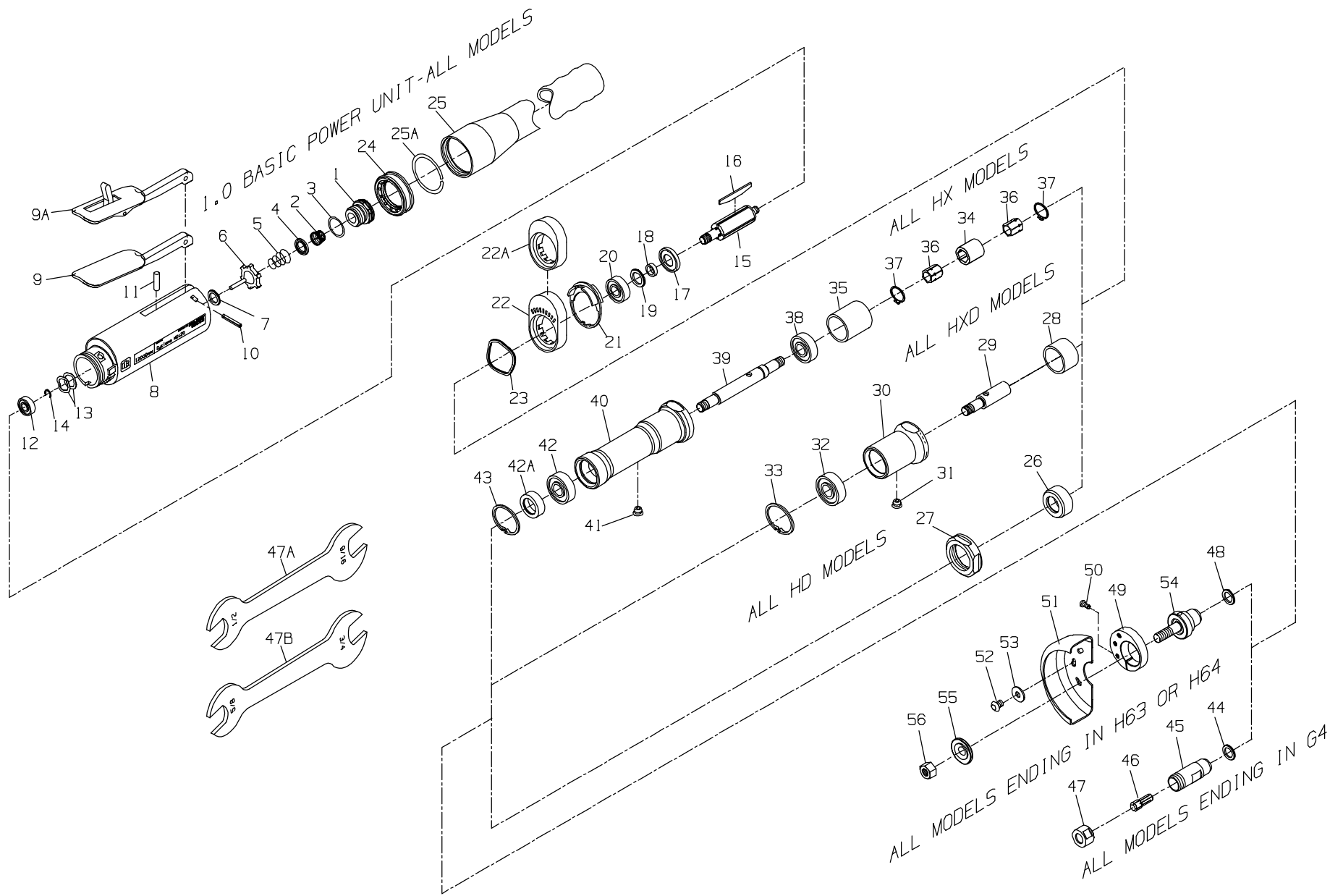
(Desenho TPD1208)

NÚMERO DE REFERÊNCIA PARA PEDIDO	A	B	C	D	E
R120-128-2 (para haste de 1/4")	1-1/2	3/8	3/8	1/8	1/2-20NF
R120-128-7 (para haste de 1/4")	2-1/2	1/2	1/2	3/16	1/2-20NF
LG2-129-1 (para haste de 3/8")	2-1/2	1/2	5/8	1/8	5/8-18UNF

★ Nota: Ressalto = 1/2 (Dimensão "B" menos o diâmetro do acessório da guia final de aperto).

## ESPECIFICAÇÕES

Modelo	Velocidade Livre rpm	Pinça
HD180RG4 HD180RG4	18.000	1/4"
HD150RG4	15.000	1/4"
HD120RG4	12.000	1/4"
HX180RG4 HX180RG4	18.000	1/4"
HX150RG4 HX150RG4	15.000	1/4"
HX120RG4 HX120RG4	12.000	1/4"
Modelo	Velocidade Livre rpm	Resguardo do Disco
HX180RH63 HX180RH63	18.000	3"
HX120RH64	12.000	4"
HXD180RH63	18.000	3"



MAINTENANCE SECTION

(Dwg. TPA1296-2)



PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

Common parts for ALL HD, HX and HXD Grinders					
1	Inlet Assembly	LG2-A465	17	Front End Plate	LG2-11
2	Inlet Screen	R1602-61	18	Front End Plate Spacer	LG2-65
• 3	Inlet Seal	R18LF-21	• 19	Front Seal Cup Assembly	61H-A32
4	Throttle Valve Spring Seat	LG3-592	20	Front Rotor Bearing	LG2-24
5	Throttle Valve Spring	7L-51	21	Flow Ring	
6	Throttle Valve	LG3-302		for HD120 and HX120	
• 7	Throttle Valve Seat	LG3-303		(12 000 rpm) (grey)	LG2-103-0
8	Motor Housing	LG3-40		for HD150 and HX150	
9	Throttle Lever	LG2-273		(15 000 rpm) (brown)	LG2-103-1
9A	Locking Throttle Lever Assembly (for all models ending in L or C)	LG2-A400		for HD180, HX180 and HXD180 (18 000 rpm) (blue)	LG3-103-3
*	Lever Lock	LG1-402	22	High Profile Flange	LG2-23
*	Lock Spring	LG1-405	# 22A	Concentric Flange	LG3R-23
*	Lock Pin	5UT-757	23	Flange Clamp	LG2-29
10	Throttle Lever Pin	61H-120	+ 24	Exhaust Hose Adapter Kit	LG2-K284
11	Throttle Valve Plunger	LG2-191	+ 25	Exhaust Hose Adapter	LG2-184
12	Rear Rotor Bearing	R120-127	+ 25A	Exhaust Hose	3RL-284
• 13	Rear Rotor Bearing Spacer (2)	400-25-191	* 25A	Exhaust Hose Retainer	6WT-203
• 14	Rear Rotor Bearing Retainer	LG1-118		Warning Label	
15	Rotor	LG3-53-4		for models ending in H63-EU	EU-63-99
• 16	Vane Packet (set of 4 Vanes)	DG31-42-4		for models ending in H64-EU	EU-64-99
				for all other models ending in -EU	EU-99
				for all other models	LG2-99

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MAINTENANCE SECTION

\* Not illustrated.

• To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (•) for every four tools in service.

+ Standard equipment with models ending in **M**, **MC** or **ML** and **ALL** Front Exhaust models; optional equipment on all other models.



# Always install a Locking Throttle Lever Assembly (9A) on a tool with a Low Profile Concentric Flange (22A). Do not equip a tool with a standard non-locking Lever (9) and low profile concentric Flange. This can allow the tool to continue to run if dropped or set down.

PART NUMBER FOR ORDERING

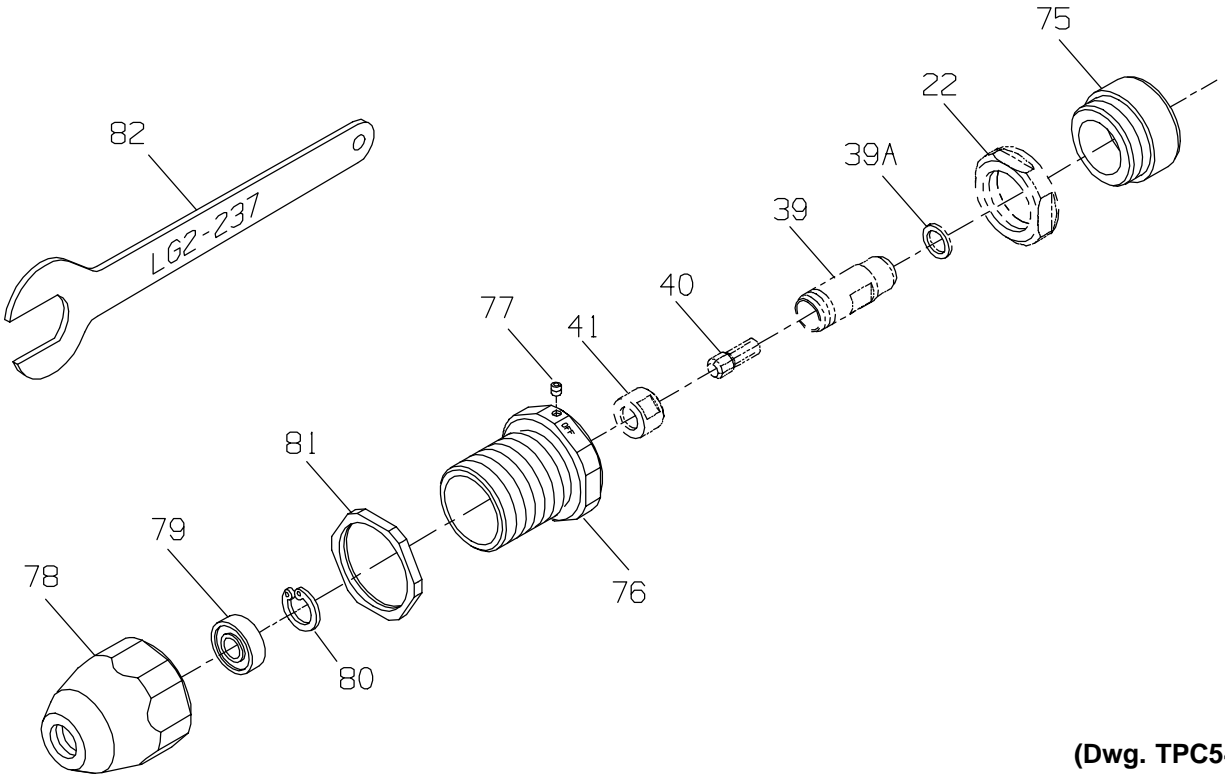
PART NUMBER FOR ORDERING

* Nameplate		43 Arbor Bearing Retaining Ring . . . . .	W22-118
for HD120 models ending in -EU . .	LG312-EU-301	<b>Parts common to all models ending in G4</b>	
for all other HD120 models . . . . .	LG312-301	44 Front Seal Cup Assembly . . . . .	61H-A32
for HD150 models ending in -EU . .	LG315-EU-301	45 Collet Body . . . . .	LG2-290
for all other HD150 models . . . . .	LG315-301	46 Collet	
for HD180 models ending in -EU . .	LG318-EU-301	for models ending in -EU . . . . .	G160HD-700-6mm
for all other HD180 models . . . . .	LG318-301	for all other models . . . . .	G160HD-700-1/4
for HX120 models ending in -EU . .	LE312-EU-301	47 Collet Nut Assembly . . . . .	DG120-699A
for all other HX120 models . . . . .	LE312-301	47A Collet Body Wrench . . . . .	DG10-69
for HX150 models ending in -EU . .	LE315-EU-301	47B Collet Nut Wrench . . . . .	DG120-69
for all other HX150 models . . . . .	LE315-301	<b>Parts common to all models ending ending in H63 or H64</b>	
for HX180 models ending in -EU . .	LE318-EU-301	48 Front Seal Cup Assembly . . . . .	61H-A32
for all other HX180 models . . . . .	LE318-301	49 Guard Adapter Assembly . . . . .	LE2-A710
for HXD180 models ending in -EU	LE318-EU-301	50 Guard Adapter Screw . . . . .	231-638
for all other HXD180 models . . . .	LED318-301	51 Wheel Guard	
<b>Additional parts for all HD models</b>		for 3" diameter x 1/2 wide	
26 Clamp Spacer . . . . .	LG2-46	maximum Type 1 wheels . . . . .	LE2-931
27 Clamp Nut . . . . .	LG2-27	for 4" diameter x 1/4 wide	
<b>Additional parts for all extended HXD models</b>		maximum Type 1 wheels . . . . .	LE2-941
28 Clamp Sleeve . . . . .	LE2-176	52 Wheel Guard Mounting Screw (3) . . . . .	LE2-667
29 Arbor . . . . .	LE2-4	53 Mounting Screw Washer (3) . . . . .	L01-67
30 Arbor Housing . . . . .	LE2-20	54 Straight Wheel Adapter	
31 Arbor Housing Plug . . . . .	EG220-92	for 3" diameter x 1/2 wide	
32 Front Arbor Bearing . . . . .	WFS182-22	maximum Type 1 wheels . . . . .	LE2-4-H63
33 Arbor Bearing Retaining Ring . . . . .	W22-118	for 4" diameter x 1/4 wide	
<b>Additional parts for all HX models</b>		maximum Type 1 wheels . . . . .	LE3-4-H64
34 Arbor Coupling . . . . .	LE2-304	55 Wheel Flange	
35 Clamp Sleeve . . . . .	LE2-276	for 3" diameter x 1/2 wide	
36 Arbor Bearing Nut (2) . . . . .	LE2-85	maximum Type 1 wheels . . . . .	DEG31-16
37 Coupling Retaining Ring (2) . . . . .	RX3-729	for 4" diameter x 1/4 wide	
38 Rear Arbor Bearing . . . . .	LE2-22	maximum Type 1 wheels . . . . .	LE3-16
39 Arbor . . . . .	LE2-4-5	56 Flange Nut . . . . .	23-697
40 Arbor Housing . . . . .	LE2-20-5	<b>Accessories</b>	
41 Arbor Housing Plug . . . . .	EG220-92	* Bearing Inserting Tool (for HX and HXD	
42 Front Arbor Bearing . . . . .	WFS182-22	models) (2 pieces) . . . . .	LE2-950
42A Arbor Bearing Shield (for models ending in G4) . . . . .	LE2-200		

\* Not illustrated.

# MAINTENANCE SECTION

## ROUTER ATTACHMENT FOR MODEL HD180 WITH COLLETS



(Dwg. TPC542)

**PART NUMBER FOR ORDERING**

	Router Attachment Assembly	
	for models using 1/4" diameter bits .....	TD-RK4
	for models using 3/8" diameter bits .....	TD-RK6
75	Clamp Spacer .....	LG2-19
76	Nosepiece Adapter .....	LG2-124
77	Adapter Lock Screw .....	0E9-561
78	Nosepiece Assembly	
	for models using 1/4" collet .....	LG2-A125-1
	for models using 3/8" collet .....	LG2-A125-3
79	Nosepiece Bearing	
	for LG2-A125-1 .....	TD200-127
	for LG2-A125-3 .....	G160-22
80	Bearing Retaining Ring	
	for LG2-A125-1 .....	RXA21-343
	for LG2-A125-3 .....	3RL-28
81	Lock Nut .....	R120-126
82	Lock Nut Wrench .....	LG2-237

## MAINTENANCE SECTION

### WARNING

Always wear eye protection when operating or performing maintenance on this tool.

Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.

### LUBRICATION

Whenever one of these Grinders is disassembled for overhaul or replacement of parts, lubricate as follows:

1. Always wipe the Vanes (16) with a light film of oil before inserting them into the vane slots.
2. Lubricate the Front Seal Cup Assembly (19, 44 or 48) with Ingersoll-Rand No. 50 Oil.
3. Inject 0.5 to 1.0 cc of Ingersoll-Rand No. 10 Oil into the Air Inlet Assembly (1) after assembly.

### DISASSEMBLY

#### General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. When grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part or tool and help prevent distortion. This is particularly true of threaded members and housings.
3. Do not remove any part which is a press fit in or on a subassembly unless the removal of that part is necessary for repairs or replacement.
4. Do not disassemble the tool unless you have a complete set of new gaskets and O-rings for replacement.

#### Steps common to ALL models ending in G4

1. Using the Collet Body Wrench (47A) to hold the Collet Body (45) from turning and the Collet Nut Wrench (47B) on the Collet Nut Assembly (47), unscrew and remove the Collet Nut Assembly.
2. Remove the Collet (46).

#### Steps common to ALL models ending in H63 or H64

1. Use an adjustable spanner wrench in one of the holes in the Wheel Adapter (54) and a 9/16" wrench to loosen and remove the Flange Nut (56). Remove the Wheel Flange (55) and grinding wheel.
2. Using a 5/32" hex wrench, loosen the Guard Adapter Screw (50) and pull the Guard Adapter Assembly (49) and assembled Wheel Guard (51) from the Arbor Housing (30 or 40).

#### Steps common to ALL HD models

1. Grasp the tool in copper-covered or leather-covered vise jaws with the spindle upward and using a 1-1/2" wrench, unscrew and remove the Clamp Nut (27). This is a **left-hand thread** and must be rotated **clockwise**.
2. Remove the Clamp Spacer (26) and Flange Clamp (23).
3. Pull the Flange (22) and Flow Ring (21) off the front of the Motor Housing (8).
4. Grasp the Collet Body (45) and pull the assembled motor out of the Motor Housing. Remove the Motor Housing from the vise and remove the two Rear Rotor Bearing Spacers (13) from the bottom of the Housing.
5. Remove the Vanes (16) from the Rotor (15).
6. Grasp the Rotor in copper-covered or leather-covered vise jaws with the Collet Body upward. Using the Collet Body Wrench, unscrew and remove the Collet Body. Remove the Front Seal Cup Assembly (44) from the Collet Body.

#### Steps common to ALL HXD models

1. Use a screwdriver to remove the Arbor Housing Plug (31) and rotate the Arbor (29) until the crosshole in the Arbor is aligned with the opening in the Arbor Housing (30).
2. Insert a 5/32" (4 mm) diameter hardened steel rod approximately 6" (150 mm) long through the arbor crosshole to sprag the Arbor. Using a spanner wrench on the Wheel Adapter (54), unscrew and remove the Adapter. Remove the Front Seal Cup Assembly (48) from the Adapter.
3. Grasp the tool in copper-covered or leather-covered vise jaws with the spindle upward and using a 1-1/2" wrench, unscrew and remove the Arbor Housing. This is a **left-hand thread** and must be rotated **clockwise**.
4. Remove the Clamp Sleeve (28), Flange Clamp (23), Flange (22) and Flow Ring (21) from the front of the Motor Housing (8).
5. Using snap ring pliers, remove the Arbor Bearing Retaining Ring (33).
6. Stand the Arbor Housing (30), threaded end upward, on the table of an arbor press and using a rod or piece of tubing that contacts the outer ring of the bearing, press the Front Arbor Bearing (32) from the Arbor Housing.
7. Grasp the Arbor and pull the assembled motor out of the Motor Housing. Remove the Motor Housing from the vise and remove the two Rear Rotor Bearing Spacers (13) from the bottom of the Housing.

## MAINTENANCE SECTION

8. Remove the Vanes (16) from the Rotor (15).
9. Grasp the Rotor in copper-covered or leather-covered vise jaws with the Arbor upward. Using a 5/32" diameter rod through the crosshole, unscrew and remove the Arbor.

### Steps common to ALL HX models

1. Use a screwdriver to remove the Arbor Housing Plug (41) and rotate the Arbor (39) until the crosshole in the Arbor is aligned with the opening in the Arbor Housing (40).
2. Insert a 5/32" (4 mm) diameter hardened steel rod approximately 6" (150 mm) long through the arbor crosshole to sprag the Arbor.

#### For models ending in H63 or H64

Using a spanner wrench on the Wheel Adapter (54), unscrew and remove the Adapter. Remove the Front Seal Cup Assembly (48) from the Adapter.

#### For models ending in G4

Using the Collet Body Wrench (47A) on the Collet Body (45), unscrew and remove the Collet Body. Remove the Front Seal Cup Assembly (44) from the Collet Body.

3. Grasp the tool in copper-covered or leather-covered vise jaws with the spindle upward and using a 1-1/2" wrench, unscrew and remove the Arbor Housing. This is a **left-hand thread** and must be rotated **clockwise**.
4. Remove the Clamp Sleeve (35), Arbor Coupling (34) and the Flange Clamp (23).
5. Grasping the Arbor Bearing Nut (36), pull the Arbor out of the Arbor Housing.
6. Using snap ring pliers, remove the Arbor Bearing Retaining Ring (43) from the Arbor Housing.
7. **For models ending in G4**, remove the Arbor Bearing Shield (42A).
8. Stand the Arbor Housing, threaded end upward, on the table of an arbor press and using a rod or piece of tubing that contacts the outer ring of the bearing, press the Front Arbor Bearing (42) from the Arbor Housing.
9. Insert a 5/32" (4 mm) diameter hardened steel rod approximately 6" (150 mm) long through the crosshole in the Arbor and using a 1/2" wrench on the Arbor Bearing Nut, unscrew and remove the Nut.
10. Using an arbor press, press the Rear Arbor Bearing (38) off the Arbor.
11. Pull the Flange (22) and Flow Ring (21) off the front of the Motor Housing (5).
12. Grasp the Arbor Bearing Nut on the rotor shaft and pull the assembled motor out of the Motor Housing (8). Remove the Motor Housing from the vise and remove the two Rear Rotor Bearing Spacers (13) from the bottom of the Housing.

13. Remove the Vanes (16) from the Rotor (15).
14. Grasp the Rotor in copper-covered or leather-covered vise jaws with the Arbor Bearing Nut upward. Using a 1/2" wrench, unscrew and remove the Arbor Bearing Nut.

### Steps common to ALL models

1. If the Front Rotor Bearing (20) must be replaced, support the Front End Plate (17) between two blocks on the table of an arbor press. Place the blocks as close to the body of the Rotor (15) as possible and press the Rotor from the Bearing and End Plate. Remove the Front End Plate Spacer (18) and Front Seal Cup Assembly (19) from the hub of the Rotor.
2. If the Rear Rotor Bearing (12) must be replaced, use snap ring pliers to remove the Rear Rotor Bearing Retainer (14).
3. Using a bearing puller, pull the Rear Rotor Bearing off the hub of the Rotor.

### Disassembly of the Inlet and Throttle

1. Using a 6 point 15/16" socket, unscrew and remove the Inlet Assembly (1).
2. Remove the Inlet Seal (3) and Inlet Screen (2) from the Inlet.
3. Remove the Throttle Valve Spring Seat (4), Throttle Valve Spring (5) and Throttle Valve (6) from the rear of the Motor Housing (8).
4. If the Throttle Valve Seat (7) must be replaced, insert a hooked tool through the central opening of the Seat and pull it out of the Housing by hooking the underside of the Seat.
5. Press the Throttle Lever Pin (10) from the Housing and remove the Throttle Lever (9). Remove the Throttle Valve Plunger (11).

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## ASSEMBLY

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### General Instructions

1. Always press on the **inner** ring of a ball-type bearing when installing the bearing on a shaft.
2. Always press on the **outer** ring of a ball-type bearing when pressing the bearing into a bearing recess.
3. Whenever grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws. Take extra care not to damage threads or distort housings.
4. Except for bearings, always clean every part and wipe every part with a thin film of oil before installation.
5. Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly in clean solvent and dry with a clean cloth. Sealed or shielded bearings should not be cleaned. Work grease into every open bearing before installation.
6. Apply a film of o-ring lubricant to every o-ring before installation.

## MAINTENANCE SECTION

### Assembly of the Inlet and Throttle

1. Insert the Throttle Valve Plunger (11) into the Motor Housing (8).
2. Position the Throttle Lever (9) on the Motor Housing and using an arbor press, press the Throttle Lever Pin (10) into the Housing and Lever. The Lever will retain the Plunger in the Housing.
3. If the Throttle Valve Seat (7) was removed, use a 5/8" wooden dowel with a flat end to push the Seat into the Motor Housing.
4. Push the small end of the Throttle Valve Spring (5) onto the end of the Throttle Valve (6) with the short stem until the Spring snaps into position around the hub and remains there. Install the dish end of the Throttle Valve Spring Seat (4) onto the large end of the Throttle Valve Spring.
5. Holding the Housing with the Lever downward, make sure the Plunger is out of the way and insert the assembled Throttle Valve, long stem end leading, into the housing recess.
6. Push the Inlet Screen (2), closed end leading, into the Inlet Assembly (1). After moistening a new Inlet Seal (3) with O-ring lubricant and being careful not to nick the Seal on the threads of the Inlet, install the Seal on the Inlet.
7. Thread the Inlet Assembly into the Housing and tighten it between 20 to 25 ft-lb (27 to 34 Nm) torque.

### Assembly of the Motor

#### Steps common to ALL models

1. If the Rear Rotor Bearing (12) was removed, stand the Rotor (15) upright on the table of an arbor press with the threaded end downward. Make sure the threaded end passes through a hole drilled in a block so that the Rotor rests against the large rotor body. Press the Rear Rotor Bearing onto the hub of the Rotor.
2. Install the Rear Rotor Bearing Retainer (14) in the groove on the hub of the Rotor.
3. Install the Front End Plate (17), counterbored end trailing, onto the threaded hub of the Rotor. Using finger pressure, press the Front Seal Cup Assembly (19), felt end trailing, onto the end of the Front End Plate Spacer (18) that is opposite the the large internal bevel. Continue pressing until the felt end is flush with the end of the Spacer. Saturate the felt with Ingersoll-Rand No. 50 Oil. Place the assembled Spacer, Seal Assembly trailing, onto the threaded hub of the Rotor. Make sure the Seal Assembly enters the recess in the Front End Plate.

### NOTICE

**Before performing the next step, be aware that the Front Rotor Bearing is a flush ground bearing and must be installed in a specific manner. The end of the Bearing with a black stain or hash marks must be away from the Spacer.**

4. Stand the Rotor on the table of an arbor press with the threaded end upward and press the Front Rotor Bearing (20) onto the hub of the Rotor.
5. Grasp the assembled Rotor in copper-covered or leather-covered vise jaws with the threaded rotor hub upward.
6. Using finger pressure, press the Front Seal Cup Assembly (44 or 48), felt end trailing, onto the rotor end of the Collet Body (45) or Wheel Adapter (54). Press the Cup Assembly to the shoulder on the Collet Body or Wheel Adapter. Saturate the felt with Ingersoll-Rand No. 50 Oil.
7. If the Front Arbor Bearing (32) must be replaced on a **Model HXD**, proceed as follows before assembling the motor:
  - a. Place the Clamp Sleeve (28) on the table of an arbor press and install the large end of the Arbor Housing (30) on the Clamp Sleeve.
  - b. Slide the Front Arbor Bearing onto the threaded hub of the Arbor (29) and insert the Arbor, bearing end trailing, into the Housing. Make certain the end of the Arbor rests on the arbor press table and the Bearing is aligned with the bore in the Housing.
  - c. Install the small piece of the LE2-950 Bearing Inserting Tool over the Arbor and press the Bearing into the Housing until it stops against the shoulder of the Arbor.
  - d. Remove the Arbor from the Housing and Bearing but keep the parts together so that the same parts are installed together. Do not mix and match Arbors with Bearings and Housings or Clamp Sleeves.
8. Thread the Collet Body and Seal Assembly (for HD models), Arbor (29) (for HXD models) or the Arbor Bearing Nut (36), Retainer end leading, (for HX models) onto the Rotor and using a torque wrench, tighten the Collet Body, Arbor or Arbor Bearing Nut between 14 and 19 ft-lb (19 and 26 Nm) torque.
9. Inject approximately 1/2 cc of Ingersoll-Rand No. 68 Grease into the small recess at the bottom of the motor housing bore. Drop the two Rear Rotor Bearing Spacers (13) into the bottom of the motor housing bore.
10. Wipe each Vane (16) with a light film of oil and insert a Vane into each vane slot in the Rotor.



## MAINTENANCE SECTION

11. Grasp the Collet Body, Arbor or Arbor Bearing Nut and insert the assembled Rotor into the Motor Housing (8).
12. Assemble the Flow Ring (21) with the Flange (22) before installing the Flange on the Housing. Mate the Flow Ring to the end of the Flange without perforations. The positioning of the Flow Ring is dictated by the desired exhaust. To set the tool exhaust, proceed as follows:
  - a. **For front exhaust tools**, align the notched projection on the edge of the Flow Ring with the letter “F” on the Housing.
  - b. **For rear exhaust tools**, align the notched projection on the edge of the Flow Ring with the letter “R” on the Housing. Do not make the 12,000 rpm models function as rear exhaust tools.
13. Install the assembled Flange, Flow Ring leading, onto the front of the Motor Housing.
14. Grasp the Motor Housing in copper-covered or leather-covered vise jaws with the Collet Body, Arbor or Arbor Bearing Nut upward. Do not distort the Housing.
15. Position the Flange Clamp (23) against the Flange.
  - b. Stand the larger piece of the No. LE2–950 Bearing Inserting Tool on the table of an arbor press and insert the Arbor, Rear Arbor Bearing end leading, into the central opening of the piece until the Bearing stops against the top of the Inserting Tool.
  - c. Install the Arbor Housing, threaded end first, over the Arbor until it stops against the Bearing and pilots on the Bearing Inserting Tool.
  - d. Position the Front Arbor Bearing on the Arbor and using the smaller piece of the No. LE2–950 Bearing Inserting Tool as a pressing tool and pilot, press the Bearing onto the Arbor until it stops against the arbor shoulder.
  - e. **For models ending in G4**, install the Arbor Bearing Shield (42A) in the Housing against the Bearing.
  - f. Using snap ring pliers, install the Arbor Bearing retaining Ring (43) in the Arbor Housing.

### Steps common to ALL HX models

1. Lubricate the Arbor Coupling (34) with approximately 1 cc of Ingersoll–Rand No. 68 Grease and position the Coupling over the Arbor Bearing Nut (36). Position the Clamp Sleeve (35) over the Arbor Coupling against the Front Rotor Bearing (20).
2. If the Rear Arbor Bearing (38) was removed, proceed as follows:
  - a. Stand the larger piece of the LE2–950 Bearing Inserting Tool on the table of an arbor press.
  - b. Place the Rear Arbor Bearing on the surface of the Inserting Tool and align the central opening of the Bearing with the central opening of the Inserting Tool.
  - c. The large body of the Arbor (39) has an annular groove between the crosshole and one threaded end. Press that end of the Arbor into the Bearing until the shoulder of the Arbor stops against the Bearing.
3. If the Front Arbor Bearing (42) was removed from the Arbor Housing (40), proceed as follows:
  - a. If the Rear Arbor Bearing was not removed from the Arbor, insert a 5/32” (4 mm) hardened steel rod approximately 6” (150 mm) long through the crosshole and using a 1/2” wrench, unscrew and remove the Arbor Bearing Nut (36) from the Arbor. **Do not remove the Bearing.**

### Steps common to ALL HXD models

1. Position the Clamp Sleeve (28) over the Arbor against the Front Rotor Bearing (20).
2. Thread the Arbor Housing (30) onto the Motor Housing and tighten the joint between 20 and 25 ft–lb (27 and 34 Nm) torque. This is a **left–hand thread**. Turn **counterclockwise** to tighten.
3. Using snap ring pliers, install the Arbor Bearing Retaining Ring (33) in the Arbor Housing.

### Steps common to ALL HD models

1. Position the Clamp Spacer (26) over the Arbor against the Front Rotor Bearing (20).
2. Thread the Clamp Nut (27) onto the Housing and tighten the Nut between 20 and 25 ft–lb (27 and 34 Nm) torque. This is a **left–hand thread**. Turn **counterclockwise** to tighten.

## **MAINTENANCE SECTION**

### **Steps common to ALL models ending in H63 or H64**

1. Insert a 5/32" (4 mm) diameter hardened steel rod approximately 6" (150 mm) long through the opening in the Arbor Housing and Arbor to keep the Arbor from turning. Using an adjustable spanner wrench, tighten the Wheel Adapter (54) between 14 and 19 ft-lb (19 and 26 Nm) torque.
2. Remove the rod and install the Arbor Housing Plug (31 or 41).
3. If the Wheel Guard (51) was removed from the Guard Adapter (49), attach the Guard to the Adapter with the three Wheel Guard Mounting Screws (52) and Mounting Screw Lock Washers (53). Tighten each Screw between 5-1/2 and 6 ft-lb (7.4 and 8.1 Nm) torque.
4. Install the assembled Guard Adapter (49) on the front end of the Arbor Housing, flush with the end of the Housing. Install the Guard Adapter Screw (50) into the Adapter and tighten the Screw between 7-1/2 and 8 ft-lb (7.4 and 10.8 Nm) torque.
5. Install in order the wheel, Wheel Flange (55) and Flange Nut (56).
6. Use an adjustable spanner wrench inserted into one of the holes in the Wheel Adapter to hold the Adapter from turning. Using a 9/16" wrench on the Flange Nut, tighten the Nut securely.

### **Steps common to ALL models ending in G4**

1. Insert the Collet (46) into the Collet Body (45).
2. Thread the Collet Nut Assembly (47) onto the Collet Body and use the Collet Body Wrench (47A) and the Collet Nut Wrench (47B) to tighten the Nut to the Collet Body.

## MAINTENANCE SECTION

### TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Low power or low free speed	Insufficient air pressure	Check air line pressure at the Inlet of the Tool. It must be 90 psig (6.2 bar/620 kPa).
	Clogged muffler elements	Disassemble the Tool and agitate bare Motor Housing and Flange in clean, suitable, cleaning solution. If elements cannot be cleaned, replace the Motor Housing and/or the Flange.
	Plugged Inlet Screen	Clean the Inlet Screen in clean, suitable, cleaning solution or replace the Screen.
	Worn or broken Vanes	Install a <b>complete</b> set of new Vanes.
	Loose Clamp Nut or Arbor Housing	Tighten the Nut or Housing to 20 to 25 ft-lb (27 to 34 Nm) torque.
	Worn or broken Motor Housing	Replace the Motor Housing.
	Internal air leakage in the Motor Housing indicated by high air consumption/low speed or air leaking out the front and rear exhaust simultaneously.	Replace the Motor Housing.
	Grit buildup under the Throttle Lever restricting full Throttle Valve Plunger movement.	Remove the Throttle Lever and clean the groove in the Motor Housing.
	Bent stem on Throttle Valve	Replace the Throttle Valve.
	Front Seal Cup Assembly dragging against the shield of the Front Rotor Bearing	Reposition the Front Seal Cup Assembly.
Excessive runout	Bent rotor hub	Replace the Rotor.
	Loose Collet Nut	Tighten the Collet Nut until snug.
	Worn or damaged Collet or Collet Nut	Replace the damaged component and retest.
	Worn or damaged Front Rotor Bearing	Replace the Front Rotor Bearing.
	Bent, worn or broken Extension Arbor on HX or HXD models	Replace the Extension Arbor if, when mounted between centers, the runout on the arbor body exceeds 0.002" T.I.R. or 0.0005" T.I.R. on the bearing mounting diameters.
	Worn or damaged Front Arbor Bearing on HX or HXD models	Replace the Front Arbor Bearing.
Scoring of End Plate	Worn Front End Plate Spacer or Front End Plate	Install a new Front End Plate Spacer and Front End Plate.
	Worn Front Rotor Bearing	Install a new Front Rotor Bearing.

## MAINTENANCE SECTION

### TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Leaky Throttle Valve	Dirt accumulation on Throttle Valve or Throttle Valve Seat	Disassemble, inspect and clean parts.
	Worn Throttle Valve or Throttle Valve Seat	Replace the Throttle Valve and/or Throttle Valve Seat.
	Excessive dirt build-up beneath the Throttle Lever	Clean out the slot area.
	Bent Throttle Valve Plunger	Replace the Plunger.
Exhausts at wrong direction	Incorrect orientation of the Flow Ring	Reverse the face of the Flow Ring against the Motor Housing.
Front Rotor Bearing runs hot	Incorrect installation of the Front Seal Cup Assembly	Reposition the Front Seal Cup Assembly flush with the face of the Front End Plate Spacer.
	Front End Plate Spacer rubbing the bore of the Front End Plate	Replace the Front End Plate and Front End Plate Spacer combination.
	Incorrect Front Rotor Bearing installation orientation	If a black stain or black hashmarks are not visible on the face of the Bearing when it is assembled with the End Plate and Rotor, the Bearing is installed backwards. If possible, remove the Bearing and install it correctly or replace the Bearing.
Slow tool idle	Bent or leaky Throttle Valve	Replace the Throttle Valve.
Air leakage around Flow Ring	Damaged, mutilated or missing Flange Clamp	Replace the Flange Clamp.
	Damaged Flow Ring	Replace the Flow Ring.
Rough operation/vibration	Improper lubrication or dirt buildup	Disassemble the Tool and clean in a clean, suitable, cleaning solution. Assemble the Tool and inject 3 cc of the recommended oil into the Inlet and run the Grinder long enough to coat the internal parts with the oil.
	Worn or broken Rear Rotor Bearing or Front Rotor Bearing	Replace the worn or broken Bearings. Examine the Front End Plate, Front End Plate Spacer Front Seal Cup Assembly and Rear Rotor Bearing Spacers and replace any damaged parts. If the rear end plate is damaged, replace the Rotor.
	Worn or broken Rear Arbor Bearing in HX models or Front Arbor Bearing in HX or HXD models	Replace the worn or broken Bearing.
	Dirt contaminated Front Arbor Bearing in HX or HXD models	Replace the Bearing.
	Bent, worn or broken Extension Arbor on HX or HXD models	Replace the Extension Arbor if, when mounted between centers, the runout on the arbor body exceeds 0.002" T.I.R. or 0.0005" T.I.R. on the bearing mounting diameters.

### NOTICE

**SAVE THESE INSTRUCTIONS. DO NOT DESTROY.**