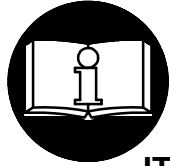


# OPERATION AND MAINTENANCE MANUAL FOR SERIES 77H HORIZONTAL AIR GRINDERS

## NOTICE

Series 77H Grinders are designed for heavy duty grinding in confined areas such as small castings or inside larger castings. 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 1/2" (13 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 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 designed for working in explosive atmospheres.
- This tool is not insulated against electric shock.

## 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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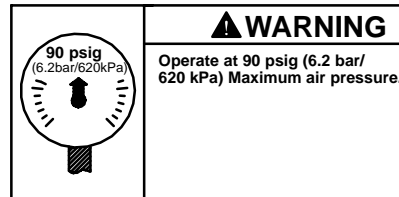
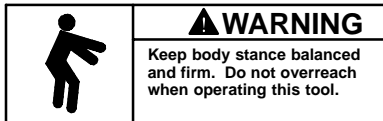
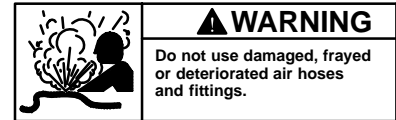
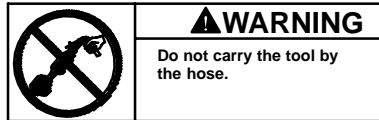
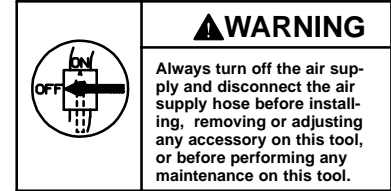
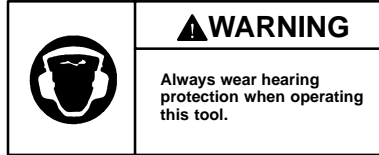
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## WARNING LABEL IDENTIFICATION

### ⚠ WARNING

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.



## GRINDER SPECIFIC WARNINGS

- Do not use this tool if the actual free speed exceeds the nameplate rpm.
- Before mounting a wheel, after all tool repairs and whenever a Grinder is issued for use, check the free speed of the Grinder with a tachometer to make certain its actual speed at 90 psig (6.2 bar/620 kPa) does not exceed the 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 Ingersoll-Rand Wheel Guard furnished with the Grinder.
- Do not use a Grinder without the recommended wheel guard. Do not use any wheel for which the operating speed listed on the blotter is lower than the actual free speed of the Grinder.
- 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 the grinding wheel properly fits the arbor. The wheel should not fit too snugly or too loosely. Plain hole wheels should have about 0.007" (0.17 mm) maximum diametral clearance. Do not use reducing bushings to adapt a wheel to any arbor unless such bushings are supplied by or 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 the wheel is defective, improperly mounted or the wrong size and speed, this is the time it will usually fail.
- When starting 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 the wheel flanges are at least 1/3 the diameter of the grinding wheel, free of nicks and burrs and sharp edges. Always use the wheel flanges furnished by the manufacturer; never use a makeshift flange or a plain washer.
- Guard opening must face away from operator. Bottom of wheel must not project beyond guard.
- Always use a wheel blotter between each wheel flange and the wheel. The blotters must be at least as large in diameter as the wheel flanges.
- Do not attempt to disassemble the Controller. The Controller is available only as a unit and is guaranteed for the life of the tool if it is not abused.
- Before installing a new Arbor Housing Assembly, always select the correct Nameplate from the Nameplate Kit and secure it to the Arbor Housing with the Nameplate Screws.

## GRINDER SPECIFIC WARNINGS

**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
77H-941	1	4 (100)	1 (25)	12,000
77H-931	1	3 (76)	1/2 (13)	12,000

## PLACING TOOL IN SERVICE

### LUBRICATION



Ingersoll-Rand No. 50

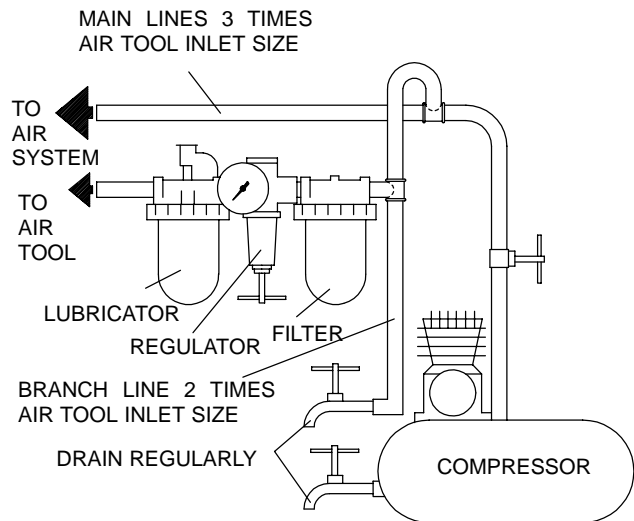
Ingersoll-Rand No. 68

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

For USA – No. C18-03-FKG0-28

**Before starting the tool**, unless the air line lubricator is used, detach the air hose and inject about 2.5 cc of Ingersoll-Rand No. 50 Oil into the air inlet. Remove the Oil Chamber Plug from the Throttle Handle and fill the chamber.

**After each eight hours of operation**, or as experience indicates, remove the Oil Chamber Plug from the Throttle Handle and fill the chamber.



(Dwg. TPD905-1)

### HOW TO ORDER A GRINDER

#### TYPE 1 WHEEL HORIZONTAL GRINDERS

Model	Free Speed rpm	Type 1 Wheel		Spindle and Guard
		inches	mm	
77H90H84	9,000	4	101.6	1/2"-13 4"
77H120H63	12,000	3	76.2	3/8"-24 3"
77H120H84	12,000	4	101.6	1/2"-13 4"

#### CONE WHEEL HORIZONTAL GRINDERS

Model	Free Speed, rpm	Spindle
77H90L10	9,000	5/8"-11
77H120L10	12,000	5/8"-11

#### FLAP WHEEL AND WIRE BRUSH MACHINES

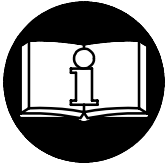
Model	Free Speed, rpm	Spindle
77H30B106	3,000	5/8"-11
77H50B106	5,000	5/8"-11

# MANUEL D'EXPLOITATION ET D'ENTRETIEN DES MEULEUSES HORIZONTALES DE LA SÉRIE 77H

## NOTE

Les meuleuses horizontales de la Série 77H sont destinées aux gros travaux de meulage dans les endroits restreints tels que sur de petites pièces coulées ou l'intérieur de grosses pièces coulées.

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 13 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 gasoil 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 flous 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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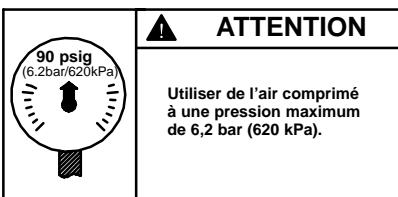
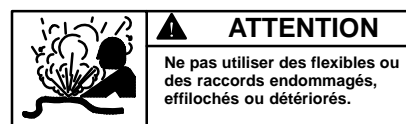
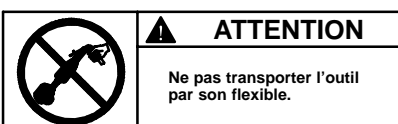
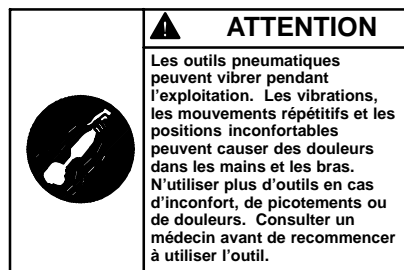
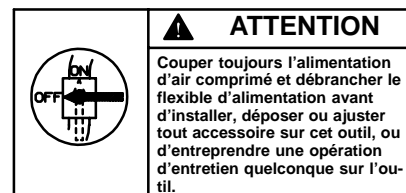
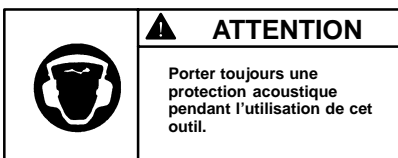
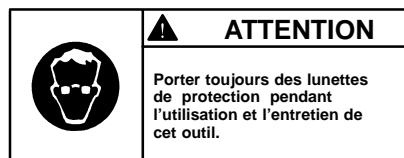
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# SIGNIFICATION DES ÉTIQUETTES D'AVERTISSEMENT

## ATTENTION

LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES.



## AVERTISSEMENTS SPÉCIFIQUES AUX MEULEUSES

- 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 meuleuse sans son protège-meule recommandé. Ne jamais utiliser de meule dont la vitesse de fonctionnement imprimée sur l'étiquette est inférieure à la vitesse à vide de meuleuse.
- 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. Le montage de la meule ne doit être ni serré ni libre. Les meules à trou lisse doivent présenter un jeu diamétral maximum de 0,17 mm. 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.
- 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.
- Monter toujours un disque en buvard entre les flasques et la meule. Les disques doivent avoir un diamètre au moins égal à celui des flasques.
- Ne jamais essayer de démonter le contrôleur. Ce dernier est fourni seulement comme un ensemble et est garanti pendant toute la durée de vie de l'outil s'il est utilisé correctement.
- Avant de monter un nouveau corps d'arbre, sélectionner la plaque signalétique correcte dans le kit de plaques et la fixer sur le corps d'arbre à l'aide des vis de plaque signalétique.

## AVERTISSEMENTS SPÉCIFIQUES AUX MEULEUSES

**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 pouces (mm)	Épaisseur maximale de roue pouces (mm)	Vitesse maximale (t/min)
77H-941	1	4 (100)	1 (25)	12.000
77H-931	1	3 (76)	1/2 (13)	12.000

### MISE EN SERVICE DE L'OUTIL

#### LUBRIFICATION



**Ingersoll-Rand No. 50**



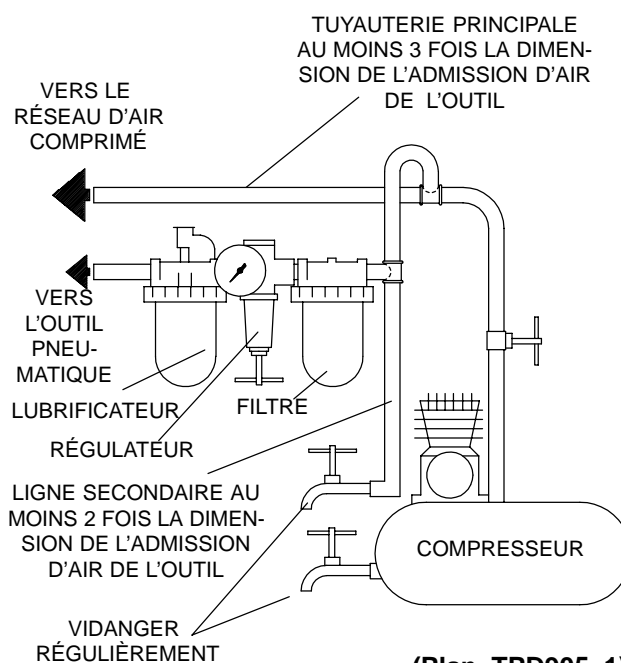
**Ingersoll-Rand No. 68**

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

**É.U. C18-C3-FKG0-28**

**Avant de mettre l'outil en marche**, si un lubrificateur de ligne n'est pas utilisé, débrancher le flexible d'alimentation et verser environ 2,5 cm<sup>3</sup> d'huile Ingersoll-Rand No. 50 dans le raccord d'admission de l'outil. Déposer le bouchon de la chambre d'huile de la poignée de commande et remplir la chambre d'huile.

**Toutes les huit heures de fonctionnement**, ou en fonction de l'expérience, déposer le bouchon de la chambre d'huile et remplir cette dernière avec de l'huile.



(Plan TPD905-1)

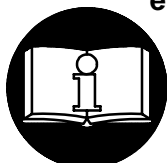
### SPÉCIFICATIONS

Modèle	Type de Meule	Vitesse à vide	Meule Type 1	Broche et (Protège Meule)
		tr/mn	pouces (mm)	
77H90H84	Type 1	9.000	4 (101,6)	1/2" - 13 (4")
77H120H63	Type 1	12.000	3 (76,2)	3/8" - 24 (3")
77H120H84	Type 1	12.000	4 (101,6)	1/2" - 13 (4")
77H90L10	Cône	9.000	---	5/8" - 11
77H120L10	Cône	12.000	---	5/8" - 11
77H30B106	Brosse Métallique	3.000	---	5/8" - 11
77H50B106	Brosse Métallique	5.000	---	5/8" - 11

# MANUAL DE USO Y MANTENIMIENTO PARA AMOLADORAS NEUMÁTICAS HORIZONTALES DE LA SERIE 77H

## NOTA

Las amoladoras neumáticas horizontales de la serie 77H están diseñadas para trabajos de amolado de servicio pesado en espacios reducidos, tales como pequeñas piezas de fundición o el interior de piezas de fundición de mayor tamaño. 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 UTILIZAR 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 mayor seguridad, rendimiento óptimo y larga vida útil de las piezas, utilice esta herramienta a una presión de aire máxima de 90 psig (6,2 bar/620 kPa) con una manguera de suministro de aire con diámetro interno de 13 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 racores dañados, desgastados o deteriorados.
- Asegúrese de que todos los racores y mangueras sean del tamaño correcto y estén bien apretados. El Esq. TPD905-1 muestra una disposición característica de las tuberías.
- Use siempre aire limpio y seco a una presión máxima de 90 psig (6,2 bar/620 kPa). El polvo, los gases corrosivos y el exceso de humedad pueden 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.

### UTILIZACIÓN 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 atento a los cambios repentinos en el movimiento durante la puesta en marcha y utilización de toda herramienta motorizada.
- Mantenga una postura del cuerpo equilibrada y firme. No estire demasiado los brazos al manejar la herramienta. Pueden darse elevados pares de reacción a la presión de aire recomendada, e incluso a presiones inferiores.
- Los accesorios de la herramienta podrían seguir girando brevemente después de haberse soltado la palanca de mando.
- Las herramientas neumáticas pueden vibrar durante el uso. La vibración, los movimientos repetitivos o las posiciones incómodas pueden dañarle los brazos y manos. En caso de incomodidad, sensación de hormigueo o dolor, deje de usar la herramienta. Consulte con el médico antes de volver a utilizarla.
- 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 puede 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 se deben encomendar a personal debidamente cualificado y autorizado. Consulte con el centro de servicio autorizado Ingersoll-Rand más próximo.

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

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## ETIQUETAS DE AVISO


### ⚠ AVISO


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


	<p><b>⚠ ADVERTENCIA</b></p> <p>Use siempre protección ocular cuando utilice esta herramienta o realice operaciones de mantenimiento en la misma.</p>
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	<p><b>⚠ ADVERTENCIA</b></p> <p>Use siempre protección para los oídos cuando utilice esta herramienta.</p>
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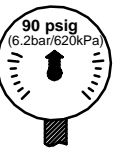
	<p><b>⚠ ADVERTENCIA</b></p> <p>Cortar siempre el suministro de aire y desconectar la manguera de suministro de aire antes de instalar, retirar o ajustar cualquier accesorio de esta herramienta, o antes de realizar cualquier operación de mantenimiento de la misma.</p>
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	<p><b>⚠ ADVERTENCIA</b></p> <p>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.</p>
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	<p><b>⚠ ADVERTENCIA</b></p> <p>No coger la herramienta por la manguera para levantarla.</p>
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	<p><b>⚠ ADVERTENCIA</b></p> <p>No utilizar mangueras de aire y accesorios dañados, desgastados ni deteriorados.</p>
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	<p><b>⚠ ADVERTENCIA</b></p> <p>Mantener una postura del cuerpo equilibrada y firme. No estirar demasiado los brazos al manejar la herramienta.</p>
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	<p><b>⚠ ADVERTENCIA</b></p> <p>Manejar la herramienta a una presión de aire máxima de 90 psig (6,2 bar/620 kPa).</p>
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## AVISOS ESPECÍFICOS SOBRE LA AMOLADORA

- No use esta herramienta si la velocidad en vacío real excede la indicada en la placa de identificación.
- Antes de montar una muela, después de cualquier reparación de la herramienta o al poner en servicio una amoladora, compruebe con un tacómetro la velocidad en vacío de la amoladora para asegurarse de que su velocidad real a 90 psig (6.2 bar/620 kPa) no exceda la velocidad estampada o impresa en la placa de identificación. Las amoladoras que están en uso también se deberán revisar al menos una vez en cada turno de trabajo.
- Use siempre el cubremuela Ingersoll–Rand suministrado con la amoladora.
- No use una amoladora sin el cubremuela recomendado. No use ninguna muela cuya velocidad de funcionamiento, tal y como aparece en la arandela de sujeción de la muela, sea menor que la velocidad en vacío real de la amoladora.
- Inspeccione todas las muelas antes de su montaje por si presentaran muescas o grietas. No use una muela que presente muescas o grietas o cualquier otro daño. No utilice una muela que haya estado a remojo en agua o en cualquier otro líquido.
- Asegúrese de que la muela esté bien puesta en el husillo. La muela no debe estar ni muy floja ni muy apretada. Las muelas de orificio normal deberán tener una holgura diamétrica máxima de aproximadamente 0,007 pulg. (0,17 mm). No use casquillos reductores para adaptar una muela al husillo a menos que éstos hayan sido suministrados o recomendados por el fabricante de muelas.
- Después de montar una muela nueva, sujete la amoladora bajo un banco de acero o dentro de un molde de fundición y hágala funcionar durante 60 segundos como mínimo. Asegúrese de que no haya nadie en el entorno de operación de la 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 fría, aplíquela lentamente al trabajo hasta que se caliente gradualmente. Aplique la muela a la pieza 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 de que las bridas de la muela tengan un diámetro mínimo de 1/3 del diámetro de la muela y que estén libres de marcas, rebabas y bordes afilados. Use siempre las bridas de muela suministradas por el fabricante; no use nunca una brida casera o arandela normal.
- La apertura del cubremuela deberá estar orientada hacia el lado opuesto del operario. La parte inferior de la muela no deberá sobresalir del cubremuela.
- Use siempre un anillo de sujeción entre cada brida de muela y la muela. Los anillos de sujeción deberán tener un diámetro como mínimo igual al de las bridas de muela.
- No trate de desmontar el regulador. Éste está disponible únicamente como conjunto y está garantizado para toda la vida útil de la herramienta, siempre que se utilice como es debido.
- Antes de instalar un conjunto de la carcasa del eje nuevo, seleccione siempre la placa de identificación adecuada del kit de placas de identificación, y fíjela en la carcasa del eje con los tornillos para placa de identificación.



## AVISOS ESPECÍFICOS SOBRE LA AMOLADORA

**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 in. (mm)	Grosor Máximo de Rueda in. (mm)	Velocidad Máxima (rpm)
77H-941	1	4 (100)	1 (25)	12.000
77H-931	1	3 (76)	1/2 (13)	12.000

## PARA PONER LA HERRAMIENTA EN SERVICIO

### LUBRICACIÓN



Ingersoll-Rand N° 50

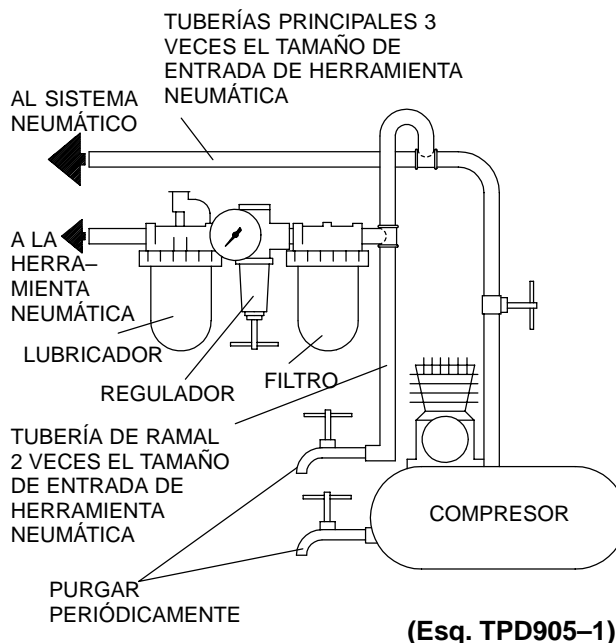
Ingersoll-Rand N° 68

Utilice siempre un lubricador de aire comprimido con estas herramientas. Recomendamos utilizar el siguiente conjunto de filtro-lubricador-regulador:

**EE. UU. C18-03-FKG0-28**

**Antes de poner la herramienta en marcha**, a menos que se haya puesto un lubricador de línea de aire comprimido, desconecte la manguera de aire e inyecte unos 2,5 cc de aceite Ingersoll-Rand N° 50 en la admisión de aire. Saque el tapón de la cámara de aceite de la palanca de mando y llene dicha cámara.

**Después de cada ocho horas de funcionamiento** (o como indique la experiencia), saque el tapón de la cámara de aceite del estrangulador y llene dicha cámara.



(Esq. TPD905-1)

## ESPECIFICACIONES

Modelo	Tipo de muela	Velocidad en vacío	Tamaño de muela, tipo 1	Husillo y (tamaño del cubremuela)
		rpm	pulg. (mm)	
77H90H84	Tipo 1	9.000	4 (101,6)	1/2" - 13 (4")
77H120H63	Tipo 1	12.000	3 (76,2)	3/8" - 24 (3")
77H120H84	Tipo 1	12.000	4 (101,6)	1/2" - 13 (4")
77H90L10	Cono	9.000	---	5/8" - 11
77H120L10	Cono	12.000	---	5/8" - 11
77H30B106	Cepillo de alambre	3.000	---	5/8" - 11
77H50B106	Cepillo de alambre	5.000	---	5/8" - 11

# MANUAL DE FUNCIONAMENTO E MANUTENÇÃO PARA ESMERILADORAS PNEUMÁTICAS HORIZONTAIS SÉRIES 77H

## AVISO

As Esmeriladoras Séries 77H são concebidas para esmerilamento pesado em área confinadas tais como moldes pequenos ou dentro de moldes maiores.

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, inspeccione 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 13 mm (1/2").
- 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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# IDENTIFICAÇÃO DO RÓTULO DE ADVERTÊNCIA

## ▲ ADVERTÊNCIA


O NÃO CUMPRIMENTO DAS SEGUINTE ADVERTÊNCIAS PODE RESULTAR EM FERIMENTOS.


	<b>▲ ADVERTÊNCIA</b> Use sempre óculos de protecção quando estiver operando ou executando algum serviço de manutenção nesta ferramenta.
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	<b>▲ ADVERTÊNCIA</b> Use sempre protecção contra o ruído ao operar esta ferramenta.
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	<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.
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	<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.
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	<b>▲ ADVERTÊNCIA</b> Não carregue a ferramenta segurando na mangueira.
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	<b>▲ ADVERTÊNCIA</b> Não use mangueiras de ar ou adaptadores danificados, gastos ou deteriorados.
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	<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.
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	<b>▲ ADVERTÊNCIA</b> Opere com pressão do ar Máxima de 90 psig (6,2-6,9 bar).
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## ADVERTÊNCIAS ESPECÍFICAS SOBRE A ESMERILADORA

- 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 quer 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. Esmeriladoras em uso no serviço devem ser similarmente verificadas pelo menos uma vez a cada turno.
- Use sempre o Protector de Disco da Ingersoll-Rand fornecido com a Esmeriladora.
- Não use uma Esmeriladora sem o protector de disco recomendado. Não use qualquer disco de esmerilamento, broca ou outro acessório que possua um velocidade máxima de operação menor do que a velocidade livre da Esmeriladora que esteja sendo usado. Respeite sempre a máxima rpm nos acessórios do 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 em água ou qualquer outro líquido.
- Verifique se o disco de esmerilamento se encaixa na árvore de montagem. Os orifícios dos discos sozinhos devem ter um espaço diametral máximo de 0,17 mm (0,007") . 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 disco novo, prenda a Esmeriladora sob uma bancada de aço ou dentro de um molde e coloque-o em funcionamento por 60 segundos. Verifique se não há ninguém próximo ao disco de esmerilamento. Se o disco estiver com algum defeito, inadequadamente montado, for do tamanho errado ou tiver velocidade incorrecta, este é o momento que ele irá normalmente falhar.
- Quando iniciar um trabalho com um disco frio, aplique-o ao serviço lentamente até que ele gradualmente aqueça. Faça um contacto suave com o serviço e evite executar qualquer ação de batimento ou pressão excessiva.
- Sempre reponha um protector de disco danificado, torto ou severamente gasto. Não use um protector de disco que tenha sido sujeito a uma falha de disco.
- Certifique-se de que as flanges do disco sejam pelo menos 1/3 do diâmetro do disco de esmerilamento, livre de cortes, arestas e extremidades afiadas. Sempre use flanges de disco fornecidas pelo fabricante. Nunca use uma flange improvisada ou uma anilha plana. Aperte a Porca da Flange.

(continua)

## ADVERTÊNCIAS ESPECÍFICAS DA ESMERILADORA

- A abertura do protector deve estar não deve apontar ao operador. O fundo do disco não deve se estender para fora do protector.
- Use sempre um acessório de disco de roda entre cada flange e o disco. Os acessórios devem ser pelo menos do mesmo tamanho em diâmetro que as flanges dos discos.
- Não tente desmontar o Controlador. O Controlador está disponível apenas como uma unidade e é garantido pela vida útil da ferramenta se não houver abuso na sua utilização.
- Antes de instalar um novo Conjunto do Corpo da Árvore de Montagem, seleccione sempre a Placa de Identificação do Kit de Placa de Identificação e prenda-o ao Corpo da Árvore de Montagem com Parafusos da Placa de Identificação.

**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
77H-941	1	100 (4)	25 (1)	12.000
77H-931	1	76 (3)	13 (1/2)	12.000

## COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

### LUBRIFICAÇÃO



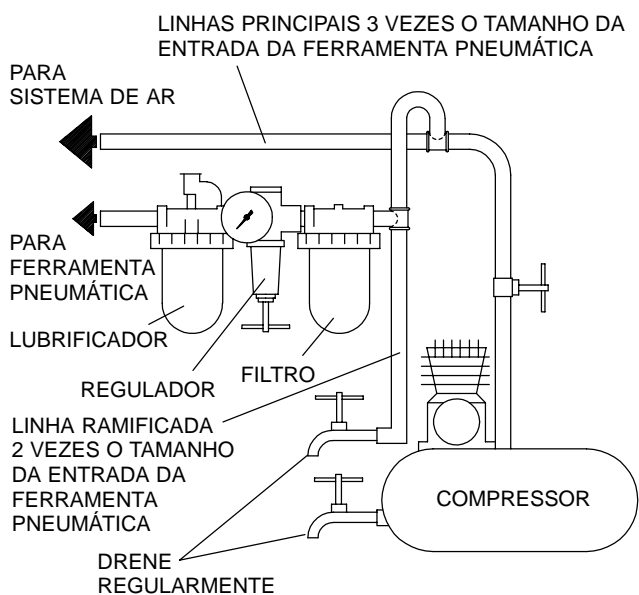
**Ingersoll-Rand No. 50    Ingersoll-Rand No. 68**

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

**Para E.U.A. – No. C18-03-FKG0-28**

**Antes de ligar a ferramenta,** a menos que um lubrificador de linha esteja sendo usado, desconecte a mangueira de ar em injecte aproximadamente 2,5 cc de Óleo Ingersoll-Rand No. 50 na entrada de ar. Remova o Bujão do Câmara de Óleo do Punho Regulador de Pressão e encha a câmara.

**Depois de cada oito horas de operação,** ou como a experiência indicar, remova o Bujão da Câmara de Óleo do Punho de Regulador de Pressão e encha a câmara.

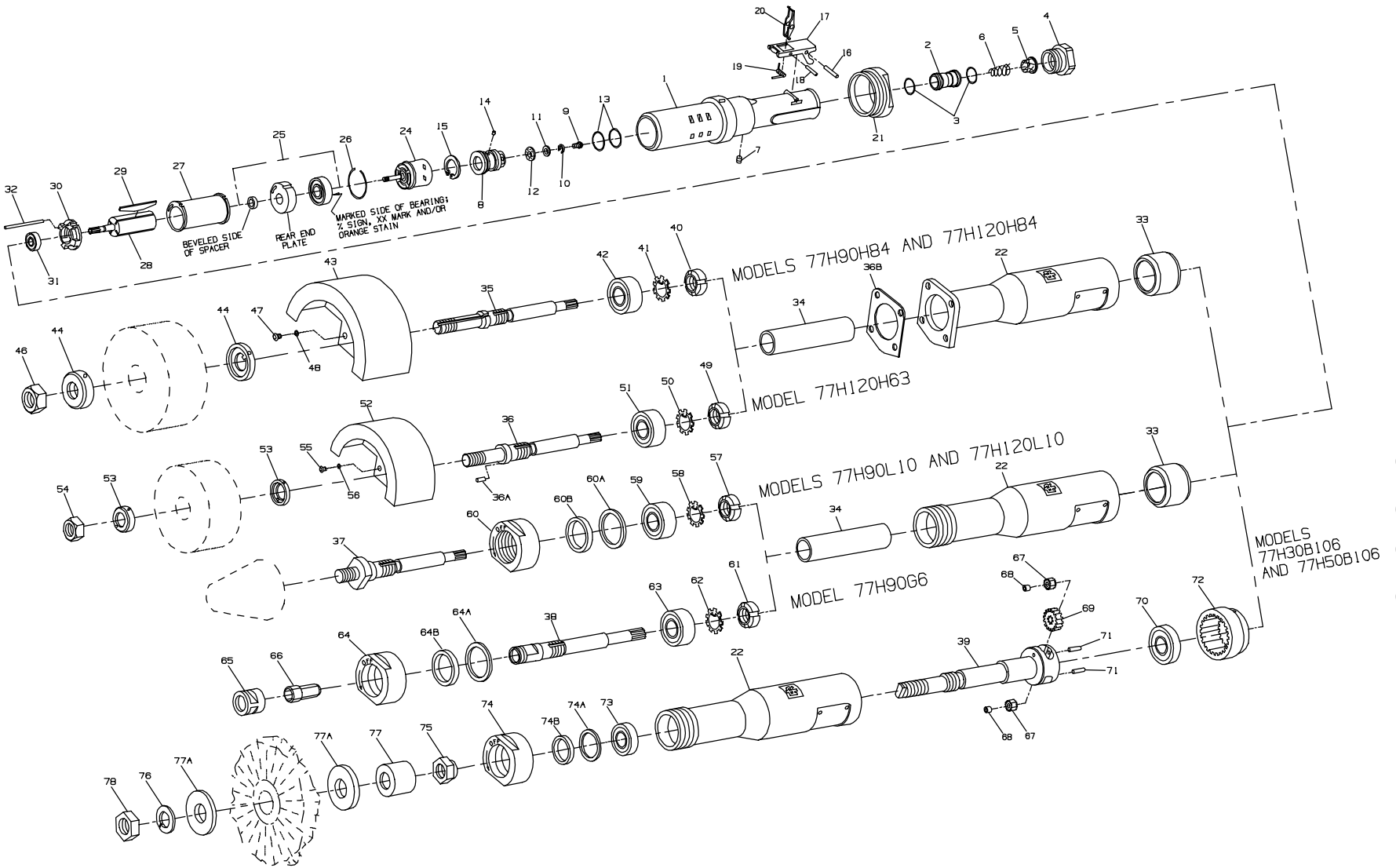


(Desenho TPD905-1)

## COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

### ESPECIFICAÇÕES

Modelo	Tipo de Roda	Velocidade Livre	Tamanho da Roda Tipo 1	Fuso e (Tamanho do Protector)
		rpm	mm (pol.)	
77H90H84	Tipo 1	9.000	101,6 (4)	1/2" – 13 (4")
77H120H63	Tipo 1	12000	76,2 (3)	3/8" – 24 (3")
77H120H84	Tipo 1	12.000	101,6 (4)	1/2" – 13 (4")
77H90L10	Cone	9.000	---	5/8" – 11
77H120L10	Cone	12.000	---	5/8" – 11
77H30B106	Escova de Arame	3.000	---	5/8" – 11
77H50B106	Escova de Arame	5.000	---	5/8" – 11



**MAINTENANCE SECTION**



PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

1	Throttle Handle Assembly .....	77H-A160		for 77H90L10, 77H120L10,	
2	Throttle Valve Assembly .....	88V60-A302		77H90G6, 77H30B106 and	
3	Seal (2) .....	C321-606		77H150B106 .....	77E-A40-G4
4	Inlet Bushing .....	77H-38		for 77H90L10-EU, 77H120L10-EU,	
5	Inlet Bushing Screen .....	834-61		77H30B106-EU and	
6	Throttle Valve Spring .....	77H-262		77H150B106-EU .....	77E-EU-A40-G4
7	Oil Chamber Plug .....	R2-227	*	Grease Fitting .....	D0F9-879
8	Throttle Valve Seat Support Assembly .....	77H-A303	*	Nameplate Kit .....	77H-EU-K301
9	Valve Seat Screw .....	PS3-83	*	Nameplate Screw (4) (for all models	
10	Valve Seat Lock Washer .....	H54U-352		ending in -EU) .....	BN403-302
11	Valve Seat Washer .....	99V60-155	*	Warning Label (for all models ending	
12	Valve Seat .....	R4-159A		in -EU) .....	EU-99
13	Valve Support Seal (2) .....	SPP101-743	*	Nameplate Kit (for all other models) .....	77H-K301
14	Oiler Feeder Plug .....	77H-75		Nameplate Screw (4) .....	BN403-302
15	Throttle Valve Seat Support Retainer .....	77H-518		Warning Label	
16	Throttle Lever Pin .....	MR-100		for 77H30B106 and 77H50B106 ....	WARNING-5-99
17	Throttle Lever Assembly .....	77H-A400		for all other models not ending	
18	Lever Lock Pin .....	R100B-120		in -EU .....	WARNING-4-99
19	Lever Lock Spring .....	DG120-405			
20	Lever Lock .....	DG120-402			
21	Coupling Nut .....	77H-282			
∇ 22	Arbor Housing Assembly				
	for 77H90H84, 77H120H84 and				
	77H120H63 .....	77E-A40-H8			
	for 77H90H84-EU, 77H120H84-EU,				
	and 77H120H63-EU .....	77E-EU-A40-H8			

\* Not illustrated.

∇ **For all models**, whenever a new Arbor Housing is installed, select the correct Nameplate from the Nameplate Kit and attach it to the Housing with the Nameplate Screws.

**PART NUMBER FOR ORDERING**

**PART NUMBER FOR ORDERING**

<p>+ 24</p>	<p>Controller Assembly (consists of Controller and Rear End Plate Assembly) for 77H90G6, 77H90H84, 77H90L10 and 77H30B106 for 77H120H84, 77H120H63 and 77H120110 . . . . .</p>	<p>77H90-A524ARH 77H120-A524ARH 77H150-A524ARH</p>	<p>35</p>	<p><b>THE FOLLOWING PARTS ARE USED IN MODELS 77H90H84, 77H90H84-EU, 77H120H84 AND 77H120H84-EU TYPE 1 RADIAL WHEEL GRINDERS</b></p>	<p>77E-4A-H8</p>
<p>25</p>	<p>Rear End Plate Assembly (consists of rear end plate, rotor bearing and required spacers) . . . . .</p>	<p>77H-A12</p>	<p>36B 40 41 42 43</p>	<p>Arbor (13 teeth) . . . . . Dust Seal . . . . . Bearing Locknut . . . . . Bearing Lock Washer . . . . . Wheel End Bearing . . . . . Wheel Guard (4" x 1") . . . . .</p>	<p>77H-930 77H-824-H6 77H-66-H6 77H-33-H6 77H-941</p>
<p>26</p>	<p>Rear End Plate Gasket . . . . .</p>	<p>77H-739</p>	<p>44</p>	<p>Wheel Flange (2) . . . . .</p>	<p>77H-16-H8</p>
<p>27</p>	<p>Cylinder . . . . .</p>	<p>77H-3</p>	<p>46</p>	<p>Wheel Nut . . . . .</p>	<p>215-182</p>
<p>+ 28</p>	<p>Rotor for 77H30B106 and 77H50B106 (9 teeth) . . . . . for all others (13 teeth) . . . . .</p>	<p>77H30-53RH 77H-53ARH</p>	<p>47</p>	<p>Wheel Guard Screw M6 x 1-6g 14 mm long (2) . . . . . 10-32 x 1/2" long (2) . . . . .</p>	<p>77H-638 FEA100-26</p>
<p>29</p>	<p>Vane Packet (set of 4 Vanes) . . . . .</p>	<p>77H-42-4</p>	<p>48</p>	<p>Wheel Guard Lock Washer (2) (for use with No. 77H-638) . . . . .</p>	<p>88H60-67</p>
<p>30</p>	<p>Front End Plate . . . . .</p>	<p>77H-11</p>	<p><b>THE FOLLOWING PARTS ARE USED IN MODELS 77H120H63 AND 77H120H63-EU TYPE 1 RADIAL WHEEL GRINDERS</b></p>		
<p>31</p>	<p>Front Rotor Bearing . . . . .</p>	<p>77H-24</p>	<p>36</p>	<p>Arbor (13 teeth) . . . . .</p>	<p>77E-A4A-H6</p>
<p>32</p>	<p>Cylinder Dowel . . . . .</p>	<p>77H-98</p>	<p>36A</p>	<p>Wheel Flange Pin . . . . .</p>	<p>77H-84</p>
<p>33</p>	<p>Motor Spacer . . . . .</p>	<p>77E-208-H8</p>	<p>36B</p>	<p>Dust Seal . . . . .</p>	<p>77H-930</p>
<p>34</p>	<p>Arbor Coupling . . . . .</p>	<p>77E-304A</p>	<p>49</p>	<p>Bearing Locknut . . . . .</p>	<p>77H-824-H6</p>
<p>*</p>	<p>Controller Wrench . . . . .</p>	<p>77H-950</p>	<p>50</p>	<p>Bearing Lock Washer . . . . .</p>	<p>77H-66-H6</p>
<p>*</p>	<p>Valve Seat Support Retaining Pliers . . . . .</p>	<p>77H-154</p>	<p>51</p>	<p>Wheel End Bearing . . . . .</p>	<p>77H-33-H6</p>
<p>*</p>	<p>Coupling Nut Wrench . . . . .</p>	<p>77H-281</p>	<p>52</p>	<p>Wheel Guard (3" x 1/2") . . . . .</p>	<p>77H-931</p>
<p>*</p>	<p>Vibra-Tite®** (0.6 cc) (2) . . . . .</p>	<p>5R-VT06</p>	<p>53</p>	<p>Wheel Flange (2) . . . . .</p>	<p>77H-16-H6</p>
<p>*</p>	<p>Adhesive Kit . . . . .</p>	<p>77H-KVLT</p>			
<p>*</p>	<p>Tune-up Kit (includes illustrated parts 3 [2], 5, 6, 12, 13 [2], 26 and 29) . . . . .</p>	<p>77H/77A-TK3</p>			

**MAINTENANCE SECTION**

\* Not illustrated.  
 + Early models of these Grinders had Rotors and Controller Assemblies with left-hand threads. If you have a model with a left-hand thread, contact Ingersoll-Rand when ordering replacement parts.  
 \*\* Registered trademark of ND Industries.



PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

54	Wheel Nut .....	23-697	65	Collet Nut .....	DG120-699A
55	Wheel Guard Screw M6 x 1-6g 14 mm long (2) .....	77H-638	*	Collet Nut and Arbor Wrench (2) (3/4") .....	DG120-69
	10-32 x 1/2" long (2) .....	FEA100-26	66	Collet for 1/4" or 6 mm diameter shank accessory .....	G160HD-700-1/4
56	Wheel Guard Screw Lock Washer (2) (for use with 77H-638) .....	88H60-67		for 3/8" diameter shank accessory .	DG120-700-G6
	<b>THE FOLLOWING PARTS ARE USED IN MODELS 77H90L10, 77H90L10-EU, 77H120L10 AND 77H120L10-EU CONE WHEEL GRINDERS</b>			<b>THE FOLLOWING PARTS ARE USED IN MODELS 77H30B106, 77H30B106-EU, 77H50B106 AND 77H50B106-EU WIRE BRUSH MACHINES</b>	
37	Cone Wheel Arbor (13 teeth) 3/8"-24 thread .....	77H-4A-L6	39	Wire Brush Arbor .....	77E-4-B10
	1/2"-13 thread .....	77H-4A-L8	67	Planet Gear Assembly (2) .....	77H-A10
	5/8"-11 thread .....	77E-4A-L10	68	Planet Gear Bearing (one for each Gear) .	G700-654
57	Bearing Locknut .....	77H-824-H6	69	Rotor Pinion (9 teeth) .....	77H-17
58	Bearing Lock Washer .....	77H-66-H6	70	Gear Frame Bearing .....	WFS182-97
59	Wheel End Bearing .....	77H-33-H6	71	Planet Gear Shaft (2) .....	G700-191
60	Wheel Bearing Cap .....	77H-19A	72	Internal Gear .....	77H-406
60A	Cap Spring .....	77H-20	73	Wheel End Bearing .....	77E-33-B10
60B	Dust Washer .....	66H-35	74	Wheel Bearing Cap .....	77H-19A
*	Cone Wheel Arbor Wrench (1") .....	7RAQT4-254	74A	Cap Spring .....	77H-20
	<b>THE FOLLOWING PARTS ARE USED IN MODEL 77H90G6 COLLET TYPE GRINDER</b>		74B	Dust Washer .....	66H-35
38	Collet Arbor (13 teeth) .....	77E-4A-G4	75	Wheel End Bearing Nut .....	77E-91A
61	Bearing Locknut .....	77H-824-H6	76	Wire Brush Lock Washer .....	A-67
62	Bearing Lock Washer .....	77H-66-H6	77	Wire Brush Spacer (Long) .....	77H50-775
63	Wheel End Bearing .....	77H-33-H6	77A	Wire Brush Spacer (Short) (2) .....	R3F-286
64	Wheel Bearing Cap .....	77H-19A	78	Wire Brush Nut .....	HU-776
64A	Cap Spring .....	77H-20	*	Wheel Bearing Nut Wrench (1") .....	7RAQT4-254
64B	Dust Washer .....	66H-35	*	Wire Brush Nut Wrench (15/16") .....	7S60-24818

\* Not illustrated.

## MAINTENANCE SECTION



**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.**

### DISASSEMBLY

#### General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. Whenever grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part 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.

#### Disassembly of the Arbor

1. **For Models 77H120H63, 77H120H63-EU, 77H90H84, 77H90H84-EU, 77H120H84 and 77H120H84-EU**, grasp the Arbor Housing (22) in a vise, guard up.
2. Use an applicable spanner wrench inserted into the pin hole of the flange to hold the arbor. Using an open-end wrench, remove the Wheel Nut (46 or 54).
3. Remove the Wheel Flanges (44 or 53) and Wheel Flange Pin (36A).
4. Unscrew and remove the Wheel Guard Screws (47 or 55). Remove the Wheel Guard Lock Washers (48 or 56), Wheel Guard (43 or 52), and Dust Seal (36B).
5. Lift the Arbor (35 or 36) and the Arbor Coupling (34) from the Arbor Housing. Pull the Arbor Coupling off the Arbor.
6. Grasp the Arbor (35 or 36) in a vise, spline end up.
7. Using pliers, straighten the tangs of the Bearing Lock Washer (41 or 50). Unscrew the Bearing Locknut (49 or 57) and remove the Bearing Lock Washer.
8. If the Arbor Bearing (42 or 51) needs to be replaced, press it from the Arbor Shaft.
9. **For Models 77H90L10, 77H90L10-EU, 77H120L10 and 77H120L10-EU**, grasp the Arbor Housing (22) in a vise, cone wheel up.

10. Using a No. 7RAQT-254 Cone Wheel Arbor Wrench to hold the arbor, unscrew the cone wheel and remove it from the arbor.
11. Using a wrench on the flats, remove the Wheel Bearing Cap (60) in the direction of the arrow on the face of the Cap. Lift the Wheel Bearing Cap, Arbor Assembly (37) and Arbor Coupling (34) from the Arbor Housing. Pull the Arbor Coupling off the Arbor.
12. Grasp the flats on the Arbor (37) in a vise, spline end up.
13. Using pliers, straighten the tangs of the Bearing Lock Washer (58). Unscrew the Bearing Locknut (57) and remove the Bearing Lock Washer.
14. Press the Arbor Bearing (59) from the Arbor Shaft.
15. Remove the Wheel Bearing Cap, Cap Spring (60A) and Dust Washer (60B).
16. **For Model 77H90G6**, grasp the Arbor Housing (22) in a vise, collet end up.
17. Use a No. DG120-69 Collet Arbor Wrench to hold the Arbor. Using a No. DG120-69 Collet Nut Wrench, remove the Collet Nut (65).
18. Remove the Collet (66) from the end of the arbor.
19. Using a wrench on the flats, remove the Wheel Bearing Cap (64) in the direction of the arrow on the face of the Cap. Remove the Dust Washer (64B) and Cap Spring (64A).
20. Lift the Arbor (38) and the Arbor Coupling (34) from the Arbor Housing. Pull the Arbor Coupling from the Arbor.
21. Grasp the Arbor (38) in a vise, spline end up.
22. Using pliers, straighten the tangs of the Bearing Lock Washer (62). Unscrew the Bearing Locknut (61) and remove the Bearing Lock Washer.
23. If the Arbor Bearing (63) needs to be replaced, press it from the Arbor Shaft.
24. **For Models 77H30B106, 77H30B106-EU, 77H50B106 and 77H50B106-EU**, grasp the Arbor Housing (22) in a vise, wire brush up.
25. Use the 7RAQT-254 Wrench on the flats of the Wheel End Bearing Nut to hold the arbor. Using the 7S60-24818 Wrench, remove the Wire Brush Nut (78).
26. Remove the Wire Brush Lock Washer (76), Wire Brush Short Spacer (77A), Wire Brush, Wire Brush Short Spacer (77A) and Wire Brush Long Spacer (77).
27. Use a wrench on the flats at the end of the arbor to hold the arbor. Using the 7RAQT4-254 Wrench, remove the Wheel End Bearing Nut (75).
28. Using a wrench on the flats, remove the Wheel Bearing Cap (74) in the direction of the arrow on the face of the Cap. Remove the Dust Washer (74B) and Cap Spring (74A).
29. Remove the Wheel End Bearing (73).

## MAINTENANCE SECTION

### Disassembly of the Throttle Lever and Inlet

1. Grasp the flats of the Throttle Handle (1) in a vise, Air inlet up.
2. Remove the Inlet Bushing (4), Inlet Bushing Screen (5) and the Throttle Valve Spring (6). The Bushing has an interference thread and is tightly fit.
3. Drive out the Throttle Lever Pin (16) to release the Throttle Lever Assembly.
4. Remove the Throttle Handle from the vise.
5. Using a soft hammer, tap the arbor end of the housing to release the Throttle Valve Assembly (2), or using lock ring pliers, pull the Assembly from the Throttle Handle. Remove the two Seals (3).

### Disassembly of the Motor and Throttle

1. Grasp the Arbor Housing (22) horizontally in a vise.
2. Using No. 77H-281 Coupling Nut Wrench, remove the Coupling Nut (21).
3. Grasp the Throttle Handle (1) and pull the handle from the Arbor Housing.
4. Grasp the splined end of the Rotor (28) and pull the motor from the Throttle Handle.
5. Remove the Cylinder Dowel (32).
6. Grasp the splined end of the Rotor in leather-covered or copper-covered vise jaws.
7. Remove the Front End Plate (30) and Front Rotor Bearing (31) from the Rotor.
8. If the Front Rotor Bearing needs to be replaced, press it from the Front End Plate.
9. Lift off the Cylinder (27).
10. Remove the Vanes (29).

#### NOTICE

**Loctite®\* No. 277 was applied to the threads of the Rotor during assembly to prevent the Controller Assembly (24) from loosening during operation. Before attempting to unscrew the assembly from the Rotor, apply moderate heat from a propane torch to the middle of the rotor body to soften the Loctite. Do not overheat the Rotor. Heat it only long enough to allow the Controller Assembly to be unscrewed without using excessive force.**

#### CAUTION

**Use only the special Controller Wrench for removing the Controller Assembly. Do not attempt to disassemble the Controller. It is available only as a unit and is guaranteed for the life of the Grinder if it is not abused.**

11. Using the No. 77H-950 Controller Wrench, unscrew and remove the Controller Assembly (24).

\* Registered trademark of Loctite Corporation.

#### NOTICE

**The Rear End Plate, Spacer and Bearing are a matched set. Do not mix the components with those of another set. The Rear Rotor Bearing is always damaged during the removal process, and a complete new Rear End Plate Assembly must be installed.**

12. If the Rear End Plate Assembly (25) consisting of the Rear End Plate, Spacer and Bearing needs to be replaced, press it from the Controller.
13. Remove the Rear End Plate Gasket (26).
14. Using No. 77H-154 Valve Seat Support Retainer Pliers, remove the Throttle Valve Seat Support Retainer (15).
15. Grasp the Throttle Handle (1) horizontally in a vise. Using a brass rod 8" (204 mm) long inserted into the air inlet end of the handle, lightly tap the brass rod with a soft hammer to release the Throttle Valve Seat Support Assembly (8).
16. Remove the Valve Seat Screw (9), Valve Seat Lock Washer (10), Valve Seat Washer (11), Valve Seat (12) and Valve Support Seals (13).
17. Check the Oiler Feeder Plug (14). Replace if necessary.
18. Place the Arbor Housing (22), arbor end up on a workbench. Lightly tap the end of the Arbor Housing with a soft hammer to release the Motor Spacer (33).
19. **For Wire Brush Machines**, lightly tap the protruding end of the arbor with a soft hammer to release the Wire Brush Arbor (39).
20. Remove the Internal Gear (72).
21. Remove the Gear Frame Bearing (70). This is a light press fit.
22. Check the Planet Gears (67) and the Planet Gear Bearings (68) for wear. If they need to be replaced, proceed as follows:
  - a. Using a pin punch and soft hammer, remove the Planet Gear Shaft (71).
  - b. Remove the Planet Gear Assembly (67).
  - c. Remove the Planet Gear Bearing (68) from inside the Planet Gear.
  - d. Remove the Rotor Pinion (69).
  - e. Remove the second Planet Gear as in steps (a) through (c).

#### NOTICE

**Always replace both Planet Gears and the Rotor Pinion even if only one Gear shows wear. Carefully check the Internal Gear and replace if necessary.**

## MAINTENANCE SECTION

### ASSEMBLY

#### 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 in a bearing recess.
3. Whenever grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
4. Always clean every part, and wipe every part with a thin film of oil before installation.
5. Apply a film of O-ring lubricant to all O-rings before final assembly.

#### Assembly of the Motor and Throttle

1. Assemble the Throttle Valve Seat Support Parts. Tighten the Valve Seat Screw (9) to 12 in-lb (1.4 Nm) torque. Apply O-ring Lubricant to the new Valve Support Seals (13) before installing them on the Throttle Valve Seat Support.
2. Insert the Assembly in the large diameter of the handle, Valve Seat Screw end first.
3. Using No. 77H-154 Valve Seat Support Retainer Pliers, install the Throttle Valve Seat Support Retainer (15).
4. Press the Front Rotor Bearing (31) and the Front End Plate (30) onto the rotor shaft.
5. Grasp the Rotor (28) in a vise, splined end down.
6. Place the Cylinder (27) over the Rotor, aligning the dowel hole in the Cylinder with the dowel hole in the Front End Plate.
7. Apply a film of light oil to each new Vane (29) and insert a Vane, straight edge out, into each vane slot in the Rotor. If new Vanes are required, replace the entire set.
8. Check the large inside diameter of the Rear End Plate Assembly (25) for wear. If the large inside diameter of the Rear End Plate is worn to 1.516" (38.5 mm) or larger, install a new Rear End Plate Assembly.

#### NOTICE

**If the Controller Assembly must be replaced, it is furnished with a new Rear End Plate Assembly. Use only the End Plate Assembly furnished with the Controller Assembly. If the Controller is good but the Rear End Plate Assembly needs replacement, only install a new Rear End Plate Assembly. Do not use or interchange old parts with new Rear End Plate Assembly components. The End Plate, Spacer and Bearing are a matched set. Do not mix components with those of another set.**

**The Rear Rotor Bearing is always damaged during removal and a new Rear End Plate Assembly must be installed.**

9. Press the Rear End Plate Assembly onto the shaft of the Controller Body making certain that the marked end of the Rear Rotor Bearing faces toward the Controller or rear of the Grinder. Also make certain that the bevelled side of the Spacer faces the Cylinder or front of the Grinder.
10. Clean the threads on the Controller Assembly (24) and apply two or three drops of Loctite No. 277.

#### NOTICE

**Thread the Controller onto the Rotor. Before tightening the Controller, be certain that the dowel holes in the Cylinder and End Plate are aligned. Tighten the Controller to 7.5 to 8.0 ft-lb (10.1 to 10.8 Nm) torque. Do not exceed 8 ft-lb (10.8 Nm) torque as the Controller could be damaged. Allow Loctite to cure for six hours before putting Grinder back in service.**

#### WARNING

**Always check the free speed of the Grinder after it has been reassembled and before it is put back into service. Never use a Grinder with a free speed which exceeds the maximum speed listed on the Nameplate.**

11. Remove the Rotor from the vise.
12. Insert the Cylinder Dowel (32) so it is flush with the face of the Front End Plate and protrudes from the back of the Rear End Plate Assembly.
13. Install a new Rear End Plate Gasket (26) into the Throttle Handle (1).
14. Install the assembled motor into the Throttle Handle (1), making sure the Cylinder Dowel (32) aligns with the pin hole inside the Throttle Handle.
15. Install the Motor Spacer (33) into the large end of the Arbor Housing. (22).
16. **For Wire Brush Machines**, install the Planet Gear Bearings (68) into the Planet Gears (67).
  - a. Install one assembled Planet Gear (67) into one of the slots in the gear head. Make sure the shaft hole aligns in both the Planet Gear and the gear head.
  - b. Press the Planet Gear Shaft (71) into the hole opposite the tapered shaft hole in the gear head until it is flush with the face of the gear head.
  - c. Install the Rotor Pinion (69) making sure the teeth of the Planet Gear and Pinion mesh. Install the other assembled Planet Gear into the other slot of the gear head. Make sure the teeth of the Planet Gear and Pinion mesh and the shaft hole aligns in both the Planet Gear and the gear head.

## MAINTENANCE SECTION

- d. Press the other Planet Gear Shaft (71) into the hole opposite the tapered shaft hole in the gear head until it is flush with the face of the gear head.
- e. Press the Gear Frame Bearing (70) onto the gear head end of the Arbor (39).
- f. Install the Internal Gear (72) over the gear head end of the Arbor (39), making sure the splines of the Internal Gear mesh with the planet gear teeth.
- g. Lubricate the Gearing liberally with Ingersoll-Rand Lubricant No. 68 and install the assembled Arbor into the Arbor Housing (22).

### NOTICE

**In the following step, make sure the Lever (17) on the Throttle Handle (1) aligns with the I-R logo on the exterior of the Arbor Housing (22).**

17. Slide the assembled Throttle Handle (1) into the Arbor Housing (22).

### CAUTION

**For Wire Brush Machines, make sure the spline on the Rotor (28) properly engages the spline in the Rotor Pinion (69).**

18. Grasp the Arbor Housing in a vise, air inlet up.
19. Clean the Coupling Nut (21) threads and carefully apply a uniform coat of Vibra-Tite®\*\* VC3 No. 205 to at least the first three threads. Allow the Vibra-Tite to cure for ten to twenty minutes before assembly.

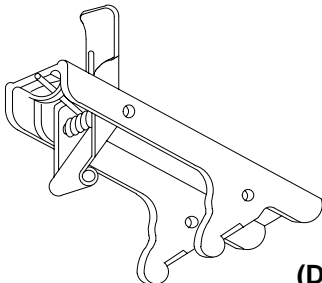
### NOTICE

**In the following step, do not exceed 52 ft-lb (70.5 Nm) torque. The motor may be damaged if this torque is exceeded.**

20. Using No. 77H-281 Coupling Nut Wrench, install the Coupling Nut and tighten it to 50 to 52 ft-lb (68 to 70.5 Nm) torque.

### Assembly of the Throttle Lever and Inlet

1. Assemble the Throttle Lever Assembly (17) as illustrated in Dwg. TPD662.



(Dwg. TPD662)

2. Align the holes in the Throttle Lever Assembly (17) with the slots in the Throttle Handle. Using a soft hammer, tap the Throttle Lever Pin (16) through the Throttle Lever Assembly. File off any sharp edges. Operate the mechanism to assure operation.
3. Grasp the flats of the Throttle Handle Assembly (1) in a vise, air inlet up.
4. Insert the new Throttle Valve Spring (6), small end first.

### NOTICE

**The Inlet Bushing in the next step has an interference thread. Apply a light film of oil to the threads before assembly.**

5. Clean the face of the Inlet Bushing (4) and the Inlet Bushing Screen (5) in a suitable cleaning solution before assembling into the tool. Insert the parts in the end of the Throttle Handle. Using a wrench, tighten the Inlet Bushing (4) to  $40 \pm 5$  ft-lb ( $54 \pm 7$  Nm) torque.
6. Fill the Oil Chamber with the recommended oil and install the Oil Chamber Plug (7). Tighten to 4 ft-lb (5.4 Nm) torque.

### Assembly of the Arbor

1. **For Models 77H120H63, 77H120H63-EU, 77H90H84, 77H90H84-EU, 77H120H84 and 77H120H84-EU**, press the Wheel End Bearing (42 or 51) onto the Arbor (35 or 36).
2. Grasp the Arbor (35 or 36) in a vise, spline end up.
3. Install the Bearing Lock Washer (41 or 50) and Bearing Locknut (40 or 49) onto the Arbor. Tighten the Locknut snugly. Bend the tangs of the Bearing Lock Washer into the grooves of the Bearing Locknut.
4. Remove the Arbor from the vise.
5. Grasp the Arbor Housing (22) in a vise, guard end up. Install the Dust Seal (36B) on the Arbor Housing.
6. Lubricate with 3 to 4 cc of Ingersoll-Rand No. 68 Grease and install the Arbor Coupling (34) into the Arbor Housing (22) and onto the spline of the rotor shaft. Slide the spline of the Arbor (35 or 36) into the Arbor Coupling (34).

\*\* Registered trademark of ND Industries.

## MAINTENANCE SECTION

7. Place the Wheel Guard (43 or 52) onto the Arbor Housing, keeping the Dust Seal (36B) in place and making sure the holes are aligned. Install the Guard Lock Washers (48 or 56) and Wheel Guard Screws (47 or 55). Tighten the two upper screws to 9.0 to 9.5 in-lb (10.25 to 10.75 Nm) torque. Tighten the two lower Screws to 4.2 to 4.3 in-lb (4.75 to 5.50 Nm) torque.
8. **For Models 77H90H84, 77H90H84-EU, 77H120H84 and 77H120H84-EU**, install a Wheel Flange (44), Wheel and the other Wheel Flange (44) onto the Arbor (35) so that the keys are opposite each other.  
**For Models 77H120H63, 77H120H63-EU, 77H150H63 and 77H150H63-EU**, install a Wheel Flange (53) so the pin in the Arbor (36) enters the hole in the side of the flange. Install the Wheel and the other Wheel Flange (53).
9. Using an applicable spanner wrench inserted into the pin hole of the inboard flange to hold the arbor, install the Wheel Nut (46 or 54) with an open-end wrench. Only tighten sufficiently to drive the wheel and prevent slippage. Remove the Arbor Housing from the vise.
10. **For Models 77H90L10, 77H90L10-EU, 77H120L10 and 77H120L10-EU**, install the Wheel Bearing Cap (60), Dust Washer (60B) and Cap Spring (60A) on the Arbor (37). Press the Wheel End Bearing (59) on the end of the Arbor.
11. Grasp the Arbor (37) in a vise, spline end up.
12. Install the Bearing Lock Washer (58) and Bearing Locknut (57) onto the Arbor (37). Tighten the Locknut snugly. Bend the tangs of the Bearing Lock Washer into the grooves of the Bearing Locknut.
13. Remove the Arbor from the vise.
14. Grasp the Arbor Housing (22) in a vise, threaded end up.
15. Lubricate with 3 to 4 cc of Ingersoll-Rand No. 68 Grease and install the Arbor Coupling (34) into the Arbor Housing and onto the spline of the rotor shaft.
16. Slide the spline of the Arbor (37) into the Arbor Coupling. Tighten the Wheel Bearing Cap to 25 to 30 ft-lb (34 to 41 Nm) torque.
17. Using a No. 74RAQT4-254 Cone Wheel Arbor Wrench to hold the Arbor (37), install the cone wheel turning clockwise until hand-tight. Remove the Arbor Housing from the vise.
18. **For Model 77H90G6**, press the Wheel End Bearing (63) onto the Arbor (38).
19. Grasp the Arbor (38) in a vise, spline end up.
20. Install the Bearing Lock Washer (62) and Bearing Locknut (61) onto the Arbor (38). Tighten the Locknut snugly. Bend the tangs of the Bearing Lock Washer into the grooves of the Bearing Locknut.
21. Remove the Arbor from the vise.
22. Grasp the Arbor Housing (22) in a vise, threaded end up.
23. Lubricate with 3 to 4 cc of Ingersoll-Rand No. 68 Grease and install the Arbor Coupling (34) into the Arbor Housing and onto the spline of the rotor shaft. Slide the spline of the Arbor (38) into the Arbor Coupling (34).
24. Install the Wheel Bearing Cap (64), Cap Spring (64A) and Dust Washer (64B). Tighten the Cap to 25 to 30 ft-lb (34 to 41 Nm) torque.
25. Install the Collet (66) into the end of the Arbor.
26. Use a No. DG120-69 Collet Arbor Wrench to hold the Arbor. Use a No. DG120-69 Collet Nut Wrench to tighten the Collet Nut (65). Remove the Arbor Housing from the vise.
27. **For Models 77H30B106, 77H30B106-EU, 77H50B106 and 77H50B106-EU**, press the Wheel End Bearing (73) into the Arbor Housing (22) and onto the Arbor (39).
28. Grasp the Arbor Housing (22) in a vise, threaded end up.
29. Install the Wheel Bearing Cap (74), Cap Spring (74A) and Dust Washer (74B). Tighten the Cap to 25 to 30 ft-lb (34 to 41 Nm) torque.
30. Install the Wheel End Bearing Nut and tighten snugly.
31. Install the Wire Brush Long Spacer (77), Wire Brush Short Spacer (77A), Wire Brush, Wire Brush Short Spacer (77A), Wire Brush Lock Washer (76) and Wire Brush Nut (78). Use a wrench on the flats of the Wheel End Bearing Nut (75) to hold the Arbor. Using an open-end wrench, tighten the Wire Brush Nut (78) securely. Remove the Arbor Housing from the vise.

## MAINTENANCE SECTION

### TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Low power or low free speed	Low air pressure at the Inlet	Check the air pressure at the Inlet. The pressure must not exceed 90 psig (6.2 bar/620 kPa).
	Plugged Inlet Bushing Screen	Clean the Screen in a clean, suitable, cleaning solution. If it cannot be cleaned, replace it.  <b>⚠ WARNING</b> <b>Never operate a Grinder without an Inlet Screen. Ingestion of dirt into the Grinder can, in some cases, cause an unsafe condition.</b>
	Worn or broken Vanes	Replace a <b>complete</b> set of new Vanes.
	Worn or broken Cylinder	Replace the Cylinder if it appears cracked or if the bore is wavy or scored.
	Improper lubrication or dirt build-up in the motor	Lubricate the Grinder as instructed in <b>LUBRICATION</b> . If lubrication does not result in satisfactory operation, disassemble the motor, clean and inspect all parts.
High free speed	Worn Rear End Plate Assembly and/or Controller Seal in Controller Assembly.	Replace the Rear End Plate Assembly and/or Controller Assembly
Grinder will not run	Coupling Nut too tight	Loosen Coupling Nut and re-tighten to 50 to 52 ft-lb (68 to 70.5 Nm) torque.  <b>⚠ WARNING</b> <b>Do not exceed 52 ft-lb (70.5 Nm) torque</b>
Rough operation	Worn or broken Rear Rotor Bearing or Front Rotor Bearing	Examine each bearing. Replace if worn or damaged.
	Bent Arbor	Mount the Arbor on centers. Check bearing diameter runout with an indicator. Replace the Arbor if runout exceeds 0.002" (0.051 mm) Total Indicator Reading.
Scoring	Improper assembly	Make certain that <b>all</b> motor parts are properly aligned prior to clamping the Motor Assembly.
Air leaks	Worn Valve Seat or Valve Seat Washer	Replace worn parts.
	Worn Throttle Valve Seals	Replace both Seals.
	Oil Chamber Plug and Oiler Plug Washer not tight	Tighten the Plug. If the problem persists, replace the Plug.
Excessive runout (exceeds TIR at a point one inch from the end of the Collet)	Check for worn or damaged Collet. Examine the Front Rotor Bearing for wear, damage or excessive play.	Replace the Collet and Collet Nut. Replace the Front Rotor Bearing.

### NOTICE

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