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Form P6920
Edition 10
January, 1999

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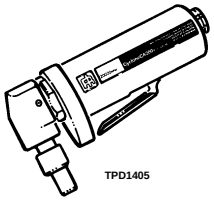
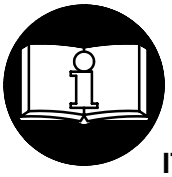



# OPERATION AND MAINTENANCE MANUAL FOR SERIES CA ANGLE GRINDERS

**NOTICE**

**Series CA Angle Grinders are designed for use in both production and maintenance applications. These applications include: deburring, material removal, cutting, sanding and finishing operations on a variety of materials.**

**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 5/16" (8 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.**



**Printed in U.S.A.**

INGERSOLL-RAND®
PROFESSIONAL TOOLS

## *WARNING LABEL IDENTIFICATION*

**⚠ WARNING**

**FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.**

**⚠WARNING**

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

**⚠WARNING**

Always wear hearing protection when operating this tool.


**⚠WARNING**

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.

**⚠WARNING**

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.

**⚠WARNING**

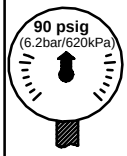
Do not carry the tool by the hose.

**⚠WARNING**

Do not use damaged, frayed or deteriorated air hoses and fittings.

**⚠WARNING**

Keep body stance balanced and firm. Do not overreach when operating this tool.




**⚠WARNING**

Operate at 90 psig (6.2 bar/620 kPa) Maximum air pressure.

## *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 CA120 Angle Grinders have a free speed of 12 000 rpm and Series CA200 Angle Grinders have a free speed of 20 000 rpm, when operated at 90 psig (6.2 bar/620 kPa) air pressure. Operation at higher air pressure will result in excessive speed.**
- **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).**

## 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 |
|---|---|---|---|---|
| AG20–106–3 | 27 | 3 (76) | 1/4 (6.4) | 26 250 |

## PLACING TOOL IN SERVICE

### LUBRICATION

**Ingersoll–Rand No. 10**
**Ingersoll–Rand No. 50**
**Ingersoll–Rand No. 63**
**Ingersoll–Rand No. 67**
**Ingersoll–Rand No. 68**
**Ingersoll–Rand No. 77**

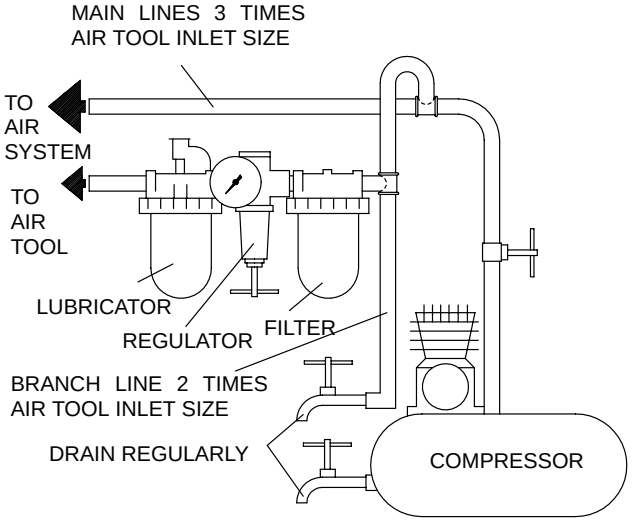
Always use an air line lubricator with these tools.
We recommend the following Filter–Lubricator–Regulator Unit:

**For USA – No. C11–03–G00**

**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.
**After each eight hours of operation,** inject approximately 1 cc of Ingersoll–Rand No. 67 or Ingersoll–Rand No. 77 Grease into the Angle Grease Fitting. Excessive lubrication will cause grease to work out around the Arbor.

**CAUTION**

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




**(Dwg. TPD905–1)**

### HOW TO ORDER CYCLONE GRINDERS

| ANGLE GRINDERS with 1/4” COLLET | |
|---|---|
| **Model** | **Speed/rpm** |
| CA200RG4 (Rear Exhaust) | 20,000 |
| CA120RG4 (Rear Exhaust) | 12,000 |
| **ANGLE GRINDERS with 3/8”–24 SPINDLE THREAD** | |
| CA200RP63 (Rear Exhaust) | 20,000 |
| CA200RH63 (Rear Exhaust) | 20,000 |
| **ANGLE SANDERS with 1/4”–20 SPINDLE THREAD** | |
| CA200RS4 (Rear Exhaust) | 20,000 |
| CA120RS4 (Rear Exhaust) | 12,000 |

## *PLACING TOOL IN SERVICE*

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

1. Piped–Away Exhaust (Standard equipment for International Models) . . . . . Part No. LG1–K284
2. Speed Control . . . . . Part No. LG1–A1015
3. Shroud Kit (for collet models only) . . . . . Part No. LA1–L980

**NOTICE**

**All the models listed above can be changed to front exhaust tools by reversing the Flow Ring and aligning 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: CA200RG4 Rear Exhaust Model becomes CA200FG4 Front Exhaust Model.**

## HOW TO ORDER CUSTOM MODELS

1. To order a tool with a Locking Lever, select the desired model and add an **"L"** to the end of the existing number.
   **Example:** CA200RG4**L**

**NOTICE**

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

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. Concentric Flanges are not available for front exhaust models.
   **Example:** CA200RG4**C**

## NEW GRINDER TO ACCESSORY COLOR MATCHING GUIDE

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

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

### (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)**

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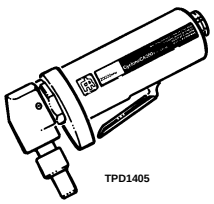


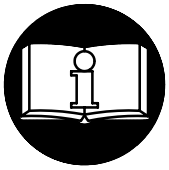

# MANUEL D'EXPLOITATION ET D'ENTRETIEN DES MEULEUSES D'ANGLE DE LA SÉRIE CA

## NOTE

**Les Meuleuses d'Angle de la Série CA sont destinés à la production et à l'entretien. Ces applications comprennent : l'ébavurage, l'enlèvement de métal, le découpage, le ponçage et les opérations de finition sur toute une gamme de matériaux.**

**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 8 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 volatiles 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 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.**



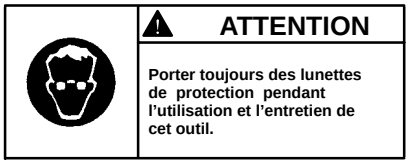
**Imprimé aux É.U.**

INGERSOLL-RAND®
PROFESSIONAL TOOLS

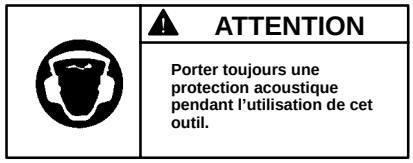
## 0*SIGNIFICATION DES ETIQUETTES D'AVERTISSEMENT*

**⚠ ATTENTION**

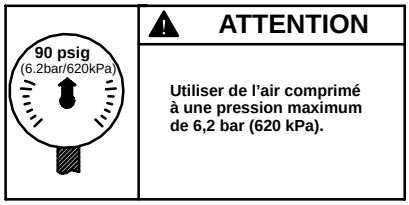
**LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES**

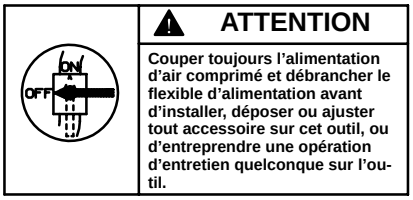


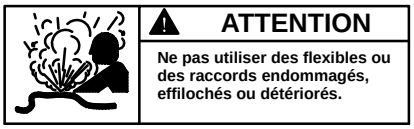







## *AVERTISSEMENTS SPÉCIFIQUES AUX MEULEUSES*

**⚠ 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 d'Angle Modèles CA120–EU ont une vitesse à vide de 12 000 tr/mn et les Meuleuses d'Angle CA200–EU ont une vitesse à vide de 20 000 tr/mn quand elles sont exploitées à une pression d'air de 6,2 bar (620kPa). L'exploitation à une pression supérieure produira une vitesse excessive.**

## *AVERTISSEMENTS SPECIFIQUES 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.) | Epaisseru maximale de roue mm (po.) | Vitesse maximale (t/min) |
|---|---|---|---|---|
| AG20–106–3 | 27 | 3 (76) | 1/4 (6.4) | 26 250 |

## *MISE EN SERVICE DE L'OUTIL*

### LUBRIFICATION

**Ingersoll–Rand No. 10** **Ingersoll–Rand No. 67**
**Ingersoll–Rand No. 50** **Ingersoll–Rand No. 68**
**Ingersoll–Rand No. 63** **Ingersoll–Rand No. 77**

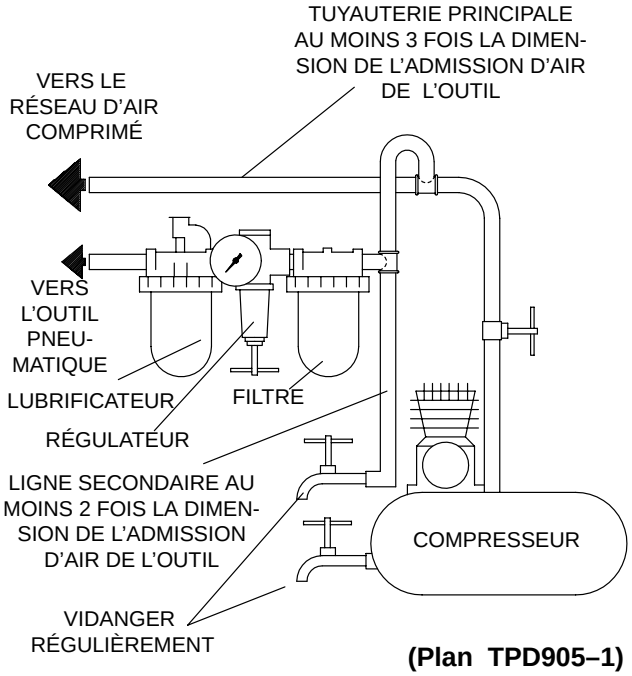
Utiliser toujours un lubrificateur avec ces outils. Nous recommandons l'emploi du filtre–régulateur–lubrificateur suivant :

**USA – No. C11–033–G00**

**Toutes les deux heures de fonctionnement**, si un lubrificateur de ligne n'est pas utilisé, injecter 1/2 à 1 $cm^3$ d'huile Ingersoll–Rand No. 10 dans le raccord d'admission. **Toutes les huit heures de fonctionnement**, injecter environ 1 $cm^3$ de graisse Ingersoll–Rand No. 67 ou No. 77 dans le raccord de graissage du renvoi d'angle. Tout graissage excessif causera l'extrusion de la graisse autour de l'arbre.

**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.**




**(Plan TPD905–1)**

# *MISE EN SERVICE DE L'OUTIL*

## NOUVEAU GUIDE DE CORRESPONDANCE MEULEUSE/ACCESSOIRE À CODE COULEUR

Ingersoll–Rand a lancé un nouveau système de code couleur destiné à:

1. Simplifier l'identification des vitesses nominales des outils grâce à un code couleur de correspondance unique.
2. Faire correspondre facilement les plateaux–supports et les accessoires à chaque outil grâce à l'introduction d'un code couleur d'identification sur les plateaux et/ou les accessoires des meuleuses.
3. Le tableau ci–dessous illustre le système d'identification couleur pour les meuleuses et les accessoires.

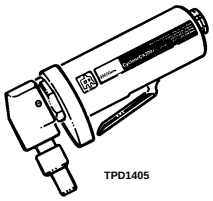
### (A LIRE DE GAUCHE A DROITE)

| COULEUR DE VITESSE SUR PLAQUE SIGNALETIQUE | VITESSE NOMINALE DE L'OUTIL | GAMME SURE DES ACCESSOIRES (VITESSE MAXIMALE DE FONCTIONNMENT) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 35 000 | 30 000 | 25 000 | 20 000 | 18 000 | 15 000 | 12 000 | 9 000 |
| ROUGE | 35,000 | ROUGE | | | | | | | |
| ORANGE | 30,000 | | ORANGE | | | | | | |
| JAUNE | 25,000 | | | JAUNE | | | | | |
| VERT | 20,000 | | | | VERT | | | | |
| BLEU | 18,000 | | | | | BLEU | | | |
| GRIS | 15,000 | | | | | | GRIS | | |
| OCRE | 12,000 | | | | | | | OCRE | |
| VIOLET | 9,000 | | | | | | | | VIOLET |

**(Plan TPD1146–1)**

## SPÉCIFICATIONS

| Modèle | Vitesse d'exploitation maximum | Pince |
|---|---|---|
| CA200RG4 | 20.000 | 1/4" |
| CA120RG4 | 12.000 | 1/4" |
| **Modèle** | **Vitesse d'exploitation maximum** | **Filetage de broche** |
| CA200RP63 | 20.000 | 3/8"–24 |
| CA200RH63 | 20.000 | 3/8"–24 |
| CA200RS4 | 20.000 | 1/4"–20 |
| CA120RS4 | 12.000 | 1/4"–20 |




E

# MANUAL DE FUNCIONAMIENTO Y MANTENIMIENTO PARA AMOLADORAS ANGULARES MODELO CA

**NOTA**

**Las Amoladoras Angulares Modelo CA están diseñadas para usar en aplicaciones de fabricación y mantenimiento. Estas aplicaciones incluyen: desbaste, rectificación de metales, corte, lijado y operaciones de acabado de una variedad de materiales.**

**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 INFORMACION IMPORTANTE DE SEGURIDAD.**
**LEA ESTE MANUAL ANTES DE USAR LA HERRAMIENTA.**
**ES RESPONSABILIDAD DE LA EMPRESA ASEGURARSE DE QUE EL OPERARIO ESTE AL TANTO DE LA INFORMACION QUE CONTIENE ESTE MANUAL.**
**EL HACER CASO OMISO DE LOS AVISOS SIGUIENTES PODRIA 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 durabilidad de piezas, use esta herramienta a una máxima presión de aire de 90 psig (6,2 bar/620kPa) en la admisión de manguera de suministro de aire de diámetro interno de 8 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 que todas las mangueras y accesorios sean del tamaño correcto y estén seguros. Vea Esq. TPD905–1 para un típico arreglo de tuberías.**
- **Use siempre aire limpio y seco a una máxima presión 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 HERRAMIENTA

- **Use siempre protección ocular cuando maneje, o realice operaciones de mantenimiento a, esta herramienta.**
- **Use siempre protección para los oídos cuando maneje esta herramienta.**
- **Mantenga las manos, la ropa suelta y el cabello largo alejados del extremo giratorio de la herramienta.**
- **Anticipe y esté alerta a 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 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 incomodas 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.**



**Impreso en EE. UU.**

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# *ETIQUETAS DE AVISO*

**⚠ AVISO**

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

**⚠ ADVERTENCIA**

**Usar siempre protección ocular al manejar o realizar operaciones de mantenimiento en esta herramienta.**

**⚠ ADVERTENCIA**

**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.**

**⚠ ADVERTENCIA**

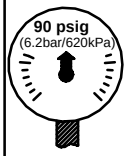
**Mantener una postura del cuerpo equilibrada y firme. No estirar demasiado los brazos al manejar la herramienta.**

**⚠ ADVERTENCIA**

**Usar siempre protección para los oìdos al manejar esta herriamenta.**

**⚠ ADVERTENCIA**

**No coger la herramienta por la manguera para levantarla.**




**⚠ ADVERTENCIA**

**Manejar la herramienta a una presión de aire máxima de 90 psig (6,2 bar/620 kPa).**


**⚠ ADVERTENCIA**

**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.**

**⚠ ADVERTENCIA**

**No utilizar mangueras de aire y accesorios dañados, desgastados ni deteriorados.**

# *AVISOS ESPECIFICOS DE AMOLADORA*

**⚠ AVISO**

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

- **No use esta herramienta si la actual velocidad libre 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 ofrezca una Amoladora para uso, compruebe la velocidad libre de la Amoladora con un tacómetro para asegurarse que su velocidad actual a 90 psig (6,2 bar/620 kPa) no exceda las rpm estampadas o impresas en la placa de identificación. Las Amoladoras usadas en trabajos deberán ser similarmente examinadas como mínimo en cada jornada de trabajo.**
- **Use siempre el Cubremuela recomendado por Ingersoll–Rand y suministrado con la Amoladora.**
- **No use nunca una muela o cualquier otro accesorio que tenga una máxima velocidad de funcionamiento menor a la velocidad libre de la Amoladora en la que se va a usar. Cumpla siempre las máximas rpm indicadas en 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 de cualquier otra forma dañada. No use una muela que haya estado a remojo en agua o en cualquier otro líquido.**
- **Asegúrese 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 nueva muela, sujete la Amoladora debajo de un banco de acero o en un molde y funciónela por como mínimo 60 segundos. 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 incorrecta, normalmente fallará en este tiempo.**
- **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 acción de saltos 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 muela y estén libres de marcas, abrasiones y bordes 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 con seguridad.**
- **La apertura del cubremuela deberá estar orientada hacia afuera del operario. La parte inferior de la muela no deberá salir del guarda.**
- **Las Amnoladoras Angulares Modelo CA120 tienen una velocidad libre de 12.000 rpm y las Amoladoras Angulares Modelo CA200 tienen una velocidad libre de 20.000 rpm a 90 psig (6,2 bar/620 kPa). Mayores presiones de aire comprimido causarán exceso de velocidad.**

**(continuación)**

## *AVISOS ESPECIFICOS DE AMOLADORA*

- **Empareje siempre el tamaño de pinza con el tamaño de vástago de accesorio.**
- **Inserte siempre el vástago de herramienta a un mínimo de 10mm en la pinza. Apriete la Tuerca de Pinza con seguridad 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. De atención particular al hecho de que la permitida velocidad 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) |
|---|---|---|---|---|
| AG20–106–3 | 27 | 3 (76) | 1/4 (6.4) | 26 250 |

## *PARA PONER LA HERRAMIENTA EN SERVICIO*

### LUBRICACION

**Ingersoll–Rand Nº 10** **Ingersoll–Rand Nº 67**
**Ingersoll–Rand Nº 50** **Ingersoll–Rand Nº 68**
**Ingersoll–Rand Nº 63** **Ingersoll–Rand Nº 77**

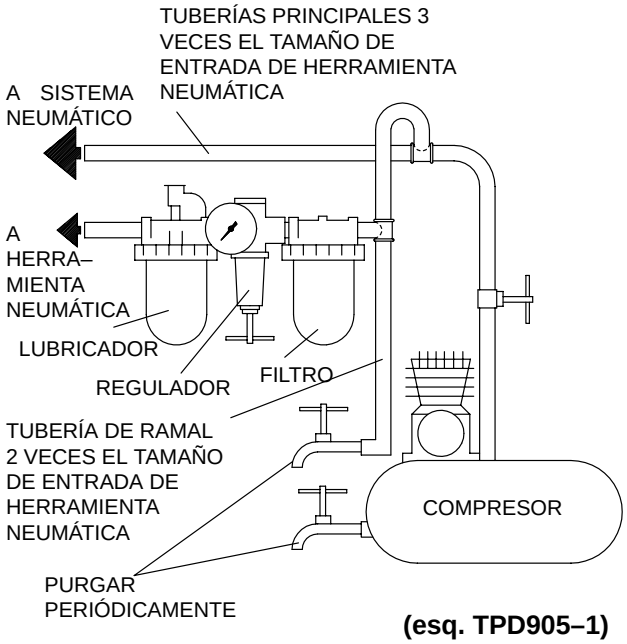
Utilice siempre un lubricador de aire comprimido con estas llaves de impacto. Recomendamos la siguiente unidad de Filtro–Lubricador–Regulador:

**USA – Nº. C11–03–G00**

**Después de cada dos horas de uso,** a menos que se use un lubricante de línea de aire comprimido, inyecte 0,5 – 1,0 cc de Aceite Ingersoll–Rand Nº 10 en la Admisón de Aire.
**Después de cada ocho horas de uso,** inyecte así como 1 cc de Grasa Ingersoll–Rand Nº 67 o Grasa Ingersoll–Rand No 77 en el Engrasador. El exceso de lubricación causará que caiga grasa en la espiga.

**PRECAUCION**

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




**(esq. TPD905–1)**

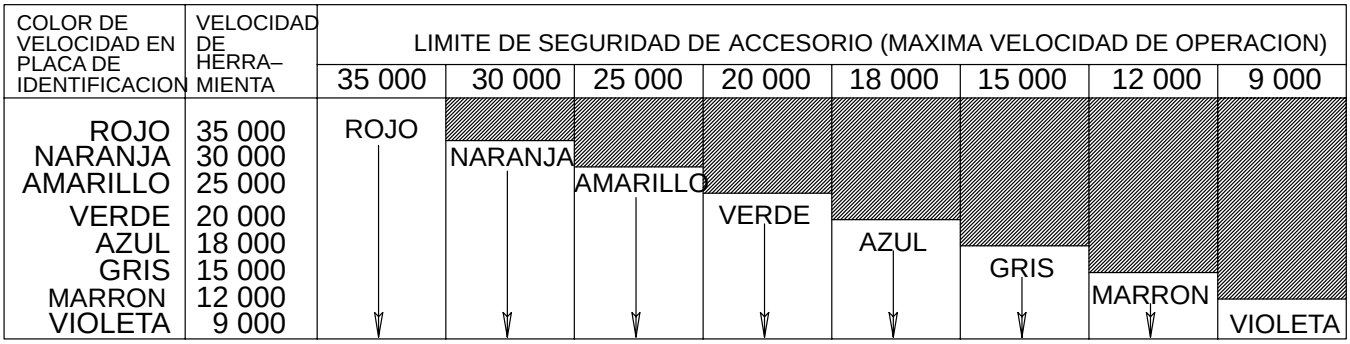
# *PARA PONER LA HERRAMIENTA EN SERVICIO*

## SISTEMA DE CODIGO DE COLORES

Ingersoll–Rand ha introducido un nuevo sistema de codificación de colores diseñado para:

1. Simplificar la identificación de la velocidad regulada de herramienta por codificación de colores correspondientes.
2. Comunica fácilmente los accesorios apropiados y platos de cada herramienta con un sistema de codificación de colores en los platos y en otros accesorios de Amoladora correspondientes.
3. La tabla muestra el sistema de codificación de colores de Amoladora y accesorio.

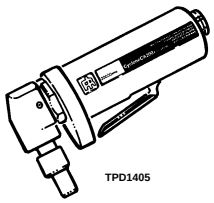
### (LEA DE IZQUIERDA A DERECHA)




**(esq. TPD1146–1)**

## ESPECIFICACIONES

| Modelo | Velocidad Libre, rpm | Pinza |
|---|---|---|
| CA200RG4 | 20.000 | 1/4” |
| CA120RG4 | 12.000 | 1/4” |
| **Modelo** | **Velocidad Libre, rpm** | **Rosca de eje** |
| CA200RP63 | 20.000 | 3/8”–24 |
| CA200RH63 | 20.000 | 3/8”–24 |
| CA200RS4 | 20.000 | 1/4”–20 |
| CA120RS4 | 12.000 | 1/4”–20 |




P

# MANUAL DE FUNCIONAMENTO E MANUTENÇÃO PARA ESMERILADORAS ANGULARES SÉRIES CA

**AVISO**

**As Esmeriladoras Angulares Séries CA são concebidas para uso em aplicações de produção e manutenção. Estas aplicações incluem: operações de alisamento, de remoção de material, de corte, de lixamento e de acabamento em uma variedade de materiais.**

**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 SEGUINTES 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 8 mm (5/16").**
- **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.**



**Impresso nos E.U.A.**

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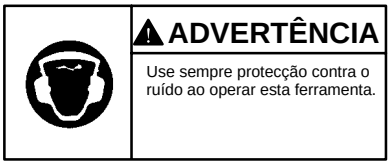
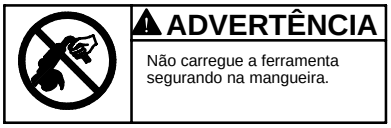
## *IDENTIFICAÇÃO DO RÓTULO DE ADVERTÊNCIA*

**⚠ ADVERTÊNCIA**

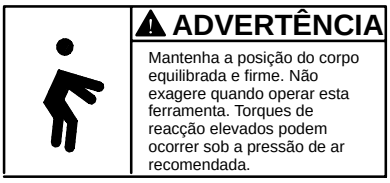
**O NÃO CUMPRIMENTO DAS SEGUINTES ADVERTÊNCIAS PODE RESULTAR EM FERIMENTO.**

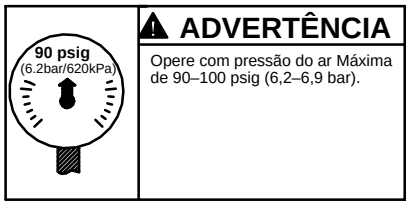










# ADVERTÊNCIAS ESPECÍFICAS SOBRE A ESMERILADORA

**⚠ 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 redutores 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 extender para fora do protector.**
- **As Esmeriladoras Angulares Séries CA120 possuem uma velocidade livre de 12 000 rpm e as Séries 200, 20 000 rpm, quando operadas com uma pressão de ar de 6,2 bar/620 kPa (90 psig). Operações com pressões mais elevadas resultará em velocidades excessivas.**

*(continua)*

# ADVERTÊNCIAS ESPECÍFICAS SOBRE A ESMERILADORA

- **Use sempre uma pinça cuja dimensão seja igual ao encabadouro acessório.**
- **Insira sempre o encabadouro 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 estaõ especificadas abaixo:**

| Número de Peça do Protector | Tipo do Disco | Diâmetro do Disco | Espressura Máxima do Disco | Velocidade Máxima |
|---|---|---|---|---|
| | | mm (pol.) | mm (pol.) | rpm |
| AG20–106–3 | 27 | 76 (3) | 6,4 (1/4) | 26 250 |

# *COLOCANDO A FERRAMENTA EM FUNCIONAMENTO*

## LUBRIFICAÇÃO

**Ingersoll–Rand No. 10** **Ingersoll–Rand No. 67**
**Ingersoll–Rand No. 50** **Ingersoll–Rand No. 68**
**Ingersoll–Rand No. 63** **Ingersoll–Rand No. 77**

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

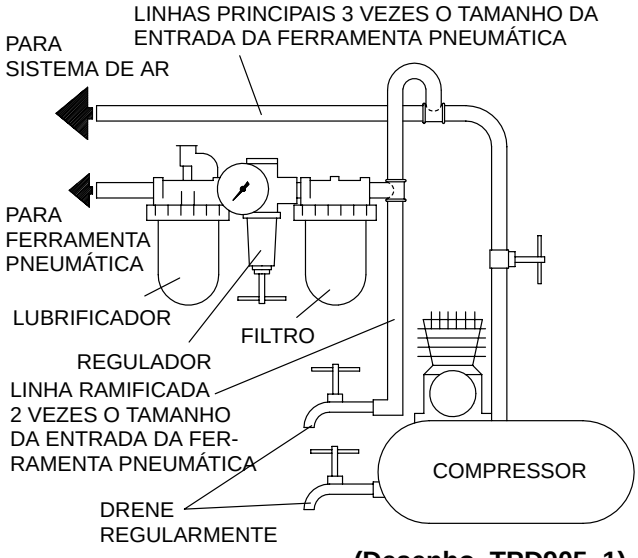
**Para USA – No. C11–033–G00**

**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.

**Depois de oito horas de operação,** injecte cerca de 1cc de Massa Lubrificadora Ingersoll–Rand No. 67 ou Ingersoll–Rand No. 77 no Adaptador de Ângulo. Lubrificação Excessiva poderá causar derramamento de massa lubrificadora em torno da Árvore.

**CUIDADO**

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




**(Desenho TPD905–1)**

# *COLOCANDO A FERRAMENTA EM FUNCIONAMENTO*

## NOVO GUIA DE COMBINAÇÃO DE CORES ENTRE A ESMERILADORA E O ACESSÓRIO

A Ingersoll–Rand é pioneira no desenho de um novo sistema de código de cores para:

1. Simplificar a identificação da velocidade aferida de uma ferramenta através de uma única combinação de cores correspondentes.
2. Comunicam facilmente os painéis traseiros e acessórios apropriados para cada ferramenta através de um sistema de códigos de combinação de cores nos paineis traseiros e/ou acessórios correspondentes à Esmeriladora.
3. A tabela abaixo demonstra o sistema de códigos de cores correspondentes à Esmeriladora e ao Acessório.

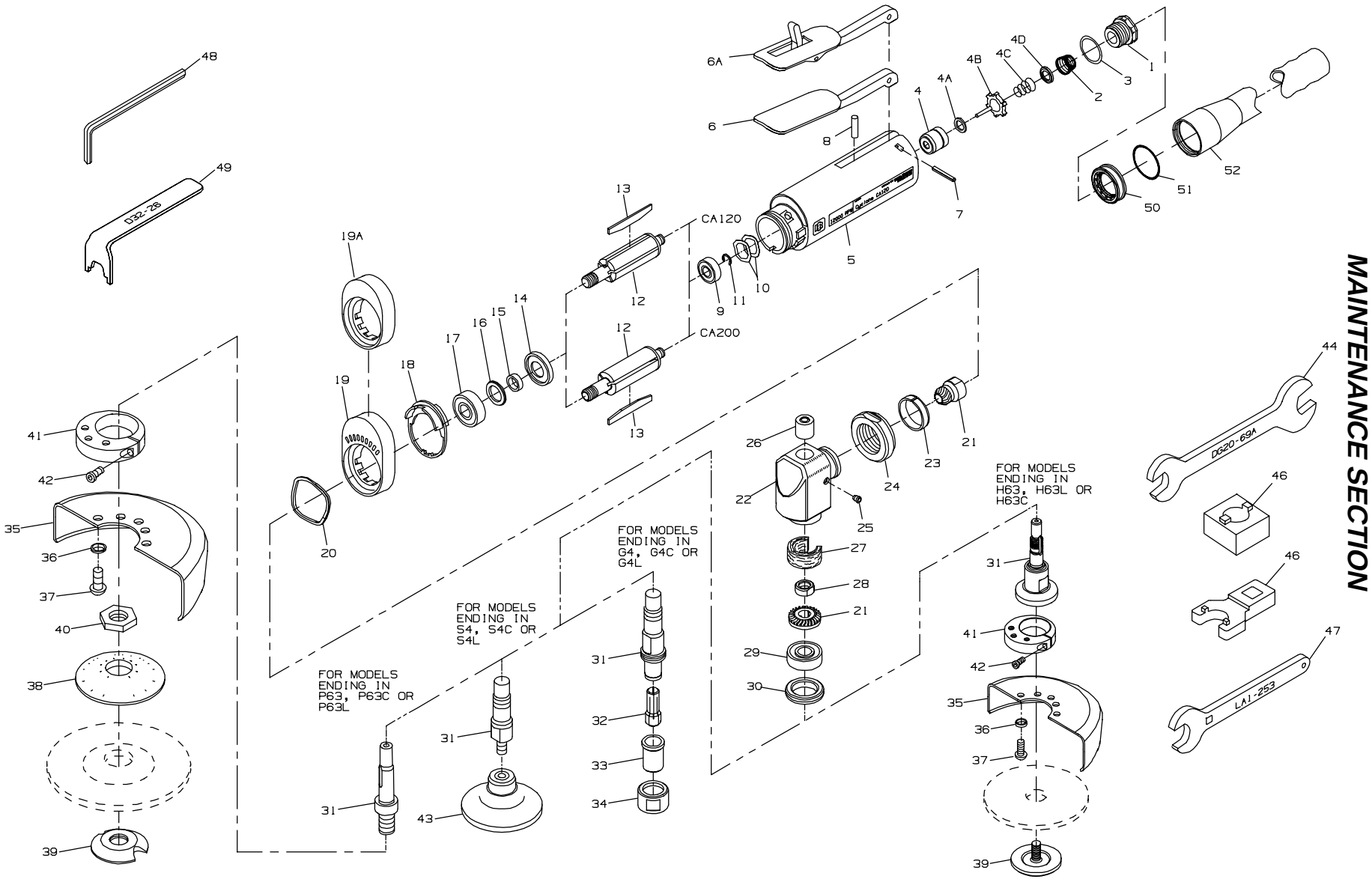
### (LEIA DA ESQUERDA PARA A DIREITA)

| COR DA VELOCIDADE NA PLACA DE IDENTIFICAÇÃO | VELOCIDADE AFERIDA DA FERRAMENTA | ACESSÓRIO DE INTERVALO SEGURO (MÁXIMA VELOCIDADE DE OPERAÇÃO) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 35 000 | 30 000 | 25 000 | 20 000 | 18 000 | 15 000 | 12 000 | 9 000 |
| VERMELHA | 35 000 | VERMELHA | | | | | | | |
| LARANJA | 30 000 | | LARANJA | | | | | | |
| AMARELA | 25 000 | | | AMARELA | | | | | |
| VERDE | 20 000 | | | | VERDE | | | | |
| AZUL | 18 000 | | | | | AZUL | | | |
| CINZA | 15 000 | | | | | | CINZA | | |
| MARRON CLARO | 12 000 | | | | | | | MARRON CLARO | |
| VIOLETA | 9 000 | | | | | | | | VIOLETA |

**(Desenho TPD1146–1)**

## ESPECIFICAÇÕES

| Modelo | Velocidade Livre | Colete |
|---|---|---|
| | rpm | |
| CA200RG4 | 20.000 | 1/4” |
| CA120RG4 | 12.000 | 1/4” |
| **Modelo** | **Velocidade Livre** | **Rosca do Eixo** |
| | rpm | |
| CA200RP63 | 20.000 | 3/8”–24 |
| CA200RH63 | 20.000 | 3/8”–24 |
| CA200RS4 | 20.000 | 1/4”–20 |
| CA120RS4 | 12.000 | 1/4”–20 |




(Dwg. TPA1268–6)

PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

| | | Common parts for ALL CA Grinders | |
|---|---|---|---|
| | 1 | Inlet Assembly | LG1–A465A |
| | 2 | Inlet Screen | R1602–61 |
| • | 3 | Inlet Seal | 85H–167 |
| | | Throttle Valve Cartridge Kit | LG1–K300 |
| | 4 | Throttle Valve Cartridge Case | LG1–300A |
| | 4A | Throttle Valve Seat | LG1–303 |
| | 4B | Throttle Valve | AG210–302 |
| | 4C | Throttle Valve Spring | 7L–51 |
| | 4D | Throttle Valve Spring Seat | LG1–592 |
| | 5 | Motor Housing | LG1–40 |
| | 6 | Throttle Lever | LG1–273 |
| | 6A | Locking Throttle Lever Assembly (for models ending in L, C, ML or MC) | LG1–A400 |
| | * | Lever Lock | LG1–402 |
| | * | Lock Spring | LG1–405 |
| | * | Lock Pin | 5UT–757 |
| | 7 | Throttle Lever Pin | 61H–120 |
| | 8 | Throttle Valve Plunger | LG1–191 |
| | 9 | Rear Rotor Bearing | DG230–22 |
| • | 10 | Rear Rotor Bearing Spacer (2) | DG20–278 |
| • | 11 | Rear Rotor Bearing Retainer | LG1–118 |
| | 12 | Rotor | |
| | | for CA120 (5 vane slots) | LG1–53–5 |
| | | for CA200 (3 vane slots) | LG1–53–3 |
| • | 13 | Vane Packet (set of 5 Vanes) | LG1–42–5 |
| | 14 | Front End Plate | LG1–11 |
| | 15 | Front End Plate Spacer | DG10–65–5 |
| • | 16 | Front Seal Cup | LG1–32 |
| | 17 | Front Rotor Bearing | LG1–24 |
| | 18 | Flow Ring | |
| | | for CA120 (12 000 rpm) (brown) | LG1–103–1 |
| | | for CA200 (20 000 rpm) (red) | LG1–103–3 |
| | 19 | High Profile Flange | LG1–23 |
| # | 19A | Low Profile Concentric Flange (for all models ending in C) | LG1R–23 |
| | 20 | Flange Clamp | LG1–29 |
| | 21 | Bevel Pinion and Bevel Gear (sold only as a matched set) | |
| | | for CA120 | LA1–A552–2.0S |
| | | for CA200 | LA1–A552–1.5A |

* 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.

**⚠ WARNING**

**# Always install a Locking Throttle Lever Assembly (6A) on a tool with a Low Profile Concentric Flange (19A). Do not equip a tool with a standard non–locking Throttle Lever (6) and Low Profile Concentric Flange. This can allow the tool to continue to run if dropped or set down.**

| | | PART NUMBER FOR ORDERING |
|---|---|---|
| | 22 | Angle Housing Assembly . . . . . LA1–A550S |
| | 23 | Clamp Spacer . . . . . LA1–46 |
| | 24 | Clamp Nut . . . . . LG1–27 |
| | 25 | Grease Fitting . . . . . D0F9–879 |
| | 26 | Upper Arbor Bearing . . . . . AG210–693 |
| ⊕ | 27 | Wick |
| | | for CA120 . . . . . LA1–560 |
| | | for CA200 . . . . . LA1–561 |
| | 28 | Bevel Gear Nut . . . . . AG210–578A |
| | 29 | Lower Arbor Bearing . . . . . AG210–24 |
| | 30 | Arbor Bearing Cap . . . . . AG210–531 |
| | 31 | Arbor |
| | | for all models ending in G4, G4C or G4L . . . . . AG210–4–G4 |
| | | for all models ending in S4, S4C or S4L . . . . . AG210–4–W2 |
| | | for all models ending in P63, P63C or P63L . . . . . LA1–6 |
| | | H63, H63C or H63L . . . . . LA1–103–1 |
| | * | Warning Label |
| | | for models ending in P63–EU . . . . . EU–63–99 |
| | | for all other models ending in –EU . . . EU–99 |
| | | for all other models . . . . . LG1–99 |
| | * | Nameplate |
| | | for CA120 models ending in –EU . . . . LA112–EU–301 |
| | | for all other CA120 models . . . . . LA112–301 |
| | | for CA200 models ending in –EU . . . . LA120–EU–301 |
| | | for all other CA200 models . . . . . LA120–301 |
| | | **Additional parts for all collet models** |
| | 32 | Collet |
| | | for models ending in –EU . . . . . DG110–700–6mm |
| | | for all other models . . . . . DG110–700–G4 |
| | 33 | Nosepiece . . . . . AG210–698A |
| | 34 | Collet Nut . . . . . AG210–699A |
| | | **Additional parts for all models ending in P63 or H63** |
| | 35 | Wheel Guard . . . . . AG20–106–3 |
| | 36 | Guard Lock Washer (3) . . . . . R2–320 |
| | 37 | Guard Mounting Screws (3) . . . . . LA1–667 |
| | 38 | Wheel Flange (for P63) . . . . . R0A2D61–337 |
| | 39 | Flange Nut |
| | | for P63 . . . . . AG21–337A–3 |
| | | for H63 . . . . . LA1–388 |
| | 40 | Flange Spacer (for P63) . . . . . LA2–111 |
| | 41 | Guard Adapter Assembly . . . . . LA1–A710 |
| | 42 | Guard Pinch Bolt . . . . . 804–634 |
| | | **Additional parts for all models ending in S4** |
| | 43 | Sanding Pad (standard on models ending in S4M, S4MC or S4ML; optional on models ending in S4, S4C or S4L) |
| | | for CA120 (3” diameter) . . . . . 3–PAD |
| | | for CA200 (2” diameter) . . . . . 2–PAD |
| | | **Accessories for CA models** |
| | 44 | Collet Body Wrench/Collet Nut Wrench (7/16” x 11/16”) (included with all models ending in G4, G4C or G4L) . . . . . DG20–69A |

* Not illustrated.

⊕ The LA1–A550S Angle Housing Assembly is furnished with two Wicks. Use Wick (LA1–561) with the notch on CA200 models.

| | | | PART NUMBER FOR ORDERING | | | PART NUMBER FOR ORDERING |
|---|---|---|---|---|---|---|
| | 46 | Arbor Bearing Cap Wrench | | * | Bur Kit | LG1–K1 |
| | | for models ending in S4, S4C | | * | 2” Abrasive Pad Kit | LG1–K2 |
| | | or S4L | AG210–29 | * | 3” Abrasive Pad Kit (for CA120 | |
| | | for models ending in H63 | LA1–29 | | models only) | LG1–K3 |
| | 47 | Clamp Nut Wrench (included with | | * | Shroud Kit (for collet models only) | LA1–K980 |
| | | all models) | LA2–253 | * | No. 10 Oil (4 oz. bottle) | 10Z4 |
| | 48 | Arbor Wrench (3/16” hex) (included with all | | * | No. 63 Oil (4 oz. bottle) | 63Z4 |
| | | model sending in P63, P63C or P63L) | AG220–340 | * | No. 67 Grease (1 lb. can) | 67–1LB |
| | 49 | Wheel Nut Wrench (included with | | * | No. 77 Grease (1 lb. can) | 77–1LB |
| | | all models ending in P63, P63C or P63L) | D32–26 | * | Shroud Kit (for non–collet models) | LA1–K975 |
| | * | Variable Speed Control Assembly | | | | |
| | | (with piped away exhaust) | LG1–A1015 | | | |
| | ∅ | Piped Away Exhaust Kit | LG1–K284 | | | |
| + | 50 | Exhaust Hose Adapter | LG1–284 | | | |
| + | 51 | Exhaust Hose Retainer | LG1–67 | | | |
| + | 52 | Exhaust Hose | 3RL–284 | | | |

* Not illustrated.

∅ When ordering a Piped–Away Exhaust Kit, make certain the wrench hex on the Inlet Assembly of your tool is threaded. If it is **NOT** threaded, order a new Inlet Assembly (Part No. LG1–A465A).

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

# *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 (13) with a light film of oil before inserting them into the vane slots.
2. 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.
5. Do not press any needle bearing from a part unless you have a new needle bearing on hand for installation. Needle bearings are always damaged during the removal process.

### Disassembly of the Angle Head

1. Grasp the tool in copper–covered or leather–covered vise jaws with the end of the Arbor (31) upward.
2. **For models with Collets**, using the Collet Body Wrench (44) on the arbor flats and the Collet Nut Wrench (45) on the Collet Nut (34), unscrew the Collet Nut and remove the Nosepiece (33) and Collet (32).

   **For models with Sanding Pads**, using the Collet Body Wrench (44) on the arbor flats to prevent the Arbor from turning, unscrew the Sanding Pad (43) from the Arbor.

   **For models with Wheel Guards**, insert the Arbor Wrench (48) into the end of the Arbor to keep it from turning and using the Wheel Nut Wrench (49), unscrew and remove the Flange Nut (39). Remove the Wheel Flange (38), wheel and Flange Spacer (40) from the Arbor. Using a 9/64" hex wrench, loosen the Guard Pinch Bolt (42) and remove the Guard Adapter Assembly (41) along with the assembled Wheel Guard (35).
3. Using the Arbor Bearing Cap Wrench (46), unscrew and remove the Arbor Bearing Cap (30). This is a **left–hand thread.** Rotate the Cap Wrench **counterclockwise** to remove the Cap.

**NOTICE**

**In the following step, do not allow the Angle Head to rotate when separating it from the Motor. Components may fall from the Angle Head.**

4. Using the Clamp Nut Wrench (47), loosen the Clamp Nut (24) and pull the Angle Housing Assembly (22) away from the Motor Housing (5). This is a **left–hand thread.** Rotate the Nut Wrench **clockwise** to loosen the Nut.
5. Grasp the Arbor and pull the assembled Arbor out of the Angle Head. If the Wick (27) needs replacement, pull it out of the Angle Housing. The Wick is staked into position and will be destroyed by removal. Make certain a replacement Wick is available before removing the old Wick.
6. If the Upper Arbor Bearing (26) needs replacement, support the Angle Head on the table of an arbor press, bearing end down, and press the Bearing out of the Angle Head.
7. Grasp the Arbor in copper–covered or leather–covered vise jaws with the collet end downward. Using an adjustable wrench, unscrew and remove the Bevel Gear Nut (28) and lift the Bevel Gear off the Arbor.
8. If the Lower Arbor Bearing (29) must be replaced, use a piece of tubing to support the Bearing on the table of an arbor press and press the Arbor from the Bearing.

### Disassembly of the Motor

1. Pull the Flange (19) and Flow Ring (18) off the front of the Motor Housing (5).
2. Grasp the Bevel Pinion (21) and pull the assembled motor out of the Motor Housing. Remove the two Rear Rotor Bearing Spacers (10) from the bottom of the Housing.
3. Remove the Vanes (13) from the Rotor (12).
4. Grasp the Rotor in copper–covered or leather–covered vise jaws with the Bevel Pinion upward. Using a 1/2" wrench, unscrew and remove the Bevel Pinion.

5. If the Front Rotor Bearing (17) must be replaced, support the Front End Plate (14) between two blocks on the table of an arbor press. Place the blocks as close to the body of the Rotor as possible and press the Rotor from the Bearing and End Plate. Remove the Front End Plate Spacer (15) and Front Seal Cup (16) from the hub of the Rotor.
6. If the Rear Rotor Bearing (9) must be replaced, use snap ring pliers to remove the Rear Rotor Bearing Retainer (11).
7. Using a bearing puller, pull the Rear Rotor Bearing off the hub of the Rotor.

### Disassembly of the Inlet and Throttle

1. Using a 3/4" wrench or six point 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 (4D), Throttle Valve Spring (4C) and Throttle Valve (4B) from the Motor Housing (5).
4. If the Throttle Valve Seat (4A) must be replaced, insert a hooked tool through the central opening of the Seat and, catching the underside of the Seat, pull it from the Housing.
5. If the Throttle Valve Cartridge Case (4) must be replaced, insert two hooked tools through the central opening of the Case approximately 180 degrees apart and, catching the underside of the Case, pull it from the Housing.
6. Press the Throttle Lever Pin (7) from the Housing and remove the Throttle Lever (6). Remove the Throttle Valve Plunger (8).

## 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 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** solution 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.
7. Unless otherwise noted, always press on the stamped end of a needle bearing when installing a needle bearing into a recess.

### Assembly of the Throttle and Inlet

1. Insert the Throttle Valve Plunger (8) into the Motor Housing (5).
2. Position the Throttle Lever (6) on the Motor Housing and using an arbor press, press the Throttle Lever Pin (7) into the Housing and Lever. The Lever will retain the Plunger in the Housing.
3. If the Throttle Valve Cartridge Case (4) was removed, lubricate the outside and the throttle stem end of the Case with o–ring lubricant. Using a wooden dowel, push the Case, open end trailing, into the Motor Housing.
4. If the Throttle Valve Seat (4A) was removed, use a 5/8" wooden dowel with a flat end to push the Seat into the Motor Housing.
5. Push the small end of the Throttle Valve Spring (4C) onto the end of the Throttle Valve (4B) 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 (4D) onto the large end of the Throttle Valve Spring.
6. 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.
7. Push the Inlet Screen (2), closed end leading, into the bushing of the Inlet Assembly (1). After moistening the 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.
8. Thread the Inlet Assembly into the Housing and tighten it between 20 and 25 ft–lb (27.1 and 33.9 Nm) torque.

### Assembly of the Motor

1. If the Rear Rotor Bearing (9) was removed, stand the Rotor (12) upright on the table of an arbor press with the threaded end downward. Place the threaded rotor hub into a hole drilled into a flat, smooth block so that the Rotor rests against the large rotor body. Press the Rear Rotor Bearing, with the shielded side of the Bearing against the rear end plate, onto the hub of the Rotor.
2. Install the Rear Rotor Bearing Retainer (11) in the groove on the hub of the Rotor.
3. Place the Front End Plate Spacer (15) onto the threaded hub of the Rotor and install the Front End Plate (14) around the Spacer, counterbored end trailing. Press the Front Seal Cup (16), recess end trailing, onto the Spacer until the trailing end is flush with the Spacer.

**NOTICE**

**Before performing the next step, be aware that the Front Rotor Bearing is a double 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 (17) 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. Thread the Bevel Pinion (21) onto the Rotor and using a torque wrench, tighten the Bevel Pinion between 9 and 10 ft–lb (12.2 and 13.6 Nm) torque.
7. Inject approximately 0.7 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 (10) into the bottom of the motor housing bore.
8. Wipe each Vane (13) with a light film of oil and insert a Vane into each vane slot in the Rotor.
9. Grasp the Bevel Pinion and insert the assembled Rotor into the Motor Housing (5).
10. Assemble the Flow Ring (18) with the Flange (19) 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.
11. Install the assembled Flange, Flow Ring leading, onto the front of the Motor Housing.

### Assembly of the Angle Head

1. If the Upper Arbor Bearing (26) was removed and a new Bearing must be installed, proceed as follows:
    a. Support the machined face of the Angle Head (22) on the table of an arbor press with the upper arbor bearing bore upward.

**NOTICE**

**When installing the Bearing in the next step, always press on the stamped or closed end of the Bearing.**

    b. Press a new Upper Arbor Bearing into the bore, flush with the top of the Angle Housing.
2. If the Lower Arbor Bearing (29) is being installed, it is necessary to note the identification marks on the Bearing. One side of the Bearing has black stains or hash marks across the inner and outer races. Using a sleeve that contacts the inner ring of the Lower Arbor Bearing, press the Bearing, black stain or hash mark side leading, onto the Arbor (31).

**NOTICE**

**The Bevel Gear and Bevel Pinion in the next step are specially matched sets. Some sets are color coded for manufacturing purposes only. Only the Gear and Pinion set furnished as a replacement part or the same Gear and Pinion removed from one tool, is a matched set. A Bevel Gear from one tool used with a Bevel Pinion from another tool with the same color code IS NOT A MATCHED SET. Replace these parts only as a matched set. Failure to do so will result in unsatisfactory tool performance and damage to the Bevel Gear and Bevel Pinion.**

3. Slide the Bevel Gear, geared face trailing, onto the small threaded end of the Arbor, aligning the integral keys of the Gear with the slotted keyways in the Arbor.
4. Thoroughly clean the small threads on the Arbor above the Bevel Gear and the threads in the Bevel Gear Nut (28).
5. Apply a thin coat of Permalock HM118* (M. I. Hernon Grade 427) to the threads of the Bevel Gear Nut and the Nut threads on the Arbor. Thread the Bevel Gear Nut onto the Arbor to retain the Bevel Gear and tighten the Nut to 10 to 12 ft–lb (13.5 to 16.2 Nm) torque. Grease the Bevel Gear with 1.5 cc of Ingersoll–Rand No. 67 Grease.
6. Form the Wick (27) into a horseshoe shape and fully inset it into the U–shaped cavity in the Angle Head. If installing one of the Wicks having a notch on one side, make certain the notch enters the Housing first. Saturate the Wick with approximately 1.5 cc of Ingersoll–Rand No. 63 Oil. **Do not substitute any other oil.**

* Product of Nation Starch and Chemical Corporation.

7. Inject 2 cc of Ingersoll–Rand No. 67 or Ingersoll–Rand No. 77 Grease into the Upper Arbor Bearing and Wick cavity in the Angle Head. **Do not substitute any other grease.**
8. Carefully grasp the assembled motor in copper–covered or leather–covered vise jaws with the Throttle Lever downward.
9. Install the motor Clamp Nut (24), threaded end trailing, onto the motor end of the Angle Head. Spread the Clamp Spacer (23) and install it, beveled end trailing, onto the motor end of the Angle Head against the Clamp Nut.
10. Position the output end of the Angle Head upward and opposite with the Throttle Lever and thread the Clamp Nut onto the Motor Housing. Using the Motor Clamp Nut Wrench (47), tighten the Nut to 20 to 25 ft–lb (27 to 34 Nm) torque. This is a **left–hand thread**, turn **counterclockwise** to tighten.
11. Insert the assembled Arbor into the Angle Head, bevel gear end first, making sure the teeth on the Bevel Gear and Pinion mesh. Rotate the Arbor manually to determine they are rotating smoothly.
12. Thoroughly clean the internal threads of the Angle Head and the threads on the Arbor Bearing Cap (30).
13. Carefully apply a uniform coat of Vibra–Tite VC3 No. 205** to both sets of threads and allow the compound to cure for 10 to 20 minutes.
14. Using the Arbor Bearing Cap Wrench (46), install the Arbor Bearing Cap and tighten to 12 to 15 ft–lb (16 to 20 Nm) torque. The Bearing Cap has a **left–hand thread:** turn **counterclockwise** to install.
15. **For models with Collets,** install the Collet (32) into the end of the Arbor. Slip the Nosepiece (33) over the end of the Arbor. Using the Collet Body Wrench (44) to hold the Arbor, install the Collet Nut (34) over the Nosepiece.

    **For models with Sanding Pads,** using the Collet Body Wrench (44) on the flats of the Arbor to prevent the Arbor from turning, screw the Sanding Pad (43) onto the Arbor.

    **For models with Wheel Guards,** orient the assembled Wheel Guard (35) and the Guard Adapter Assembly (41) on the Angle Housing and using a 9/64" hex wrench, tighten the Guard Pinch Bolt (42). Install the Flange Spacer (40), a wheel, Wheel Flange (38) and the Flange Nut (39) onto the Arbor. Insert the Arbor Wrench (48) into the end of the Arbor to keep it from turning and use the Wheel Nut Wrench (49) to tighten the Flange Nut.

** Product of N.D. Industries.

## 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 a clean, suitable, cleaning solution. Back Flush the Muffler Elements with a clean, suitable, cleaning solution until all contaminants and obstructions are removed. If elements cannot be cleaned, replace them. |
| | Plugged Inlet Screen | Clean the Inlet Screen in a clean, suitable, cleaning solution or replace the Screen. |
| | Worn or broken Vanes | Install a **complete** set of new Vanes. |
| | Loose Clamp Nut | Tighten the Nut between 20 and 25 ft–lb (27 and 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 dragging against the shield of the Front Rotor Bearing | Reposition the Front Seal Cup. |
| Excessive runout | Bent Arbor | Replace the Arbor. |
| | Loose Collet Nut | Tighten the Collet Nut until snug. |
| | Worn or damaged Collet, Collet Nut or Nosepiece | Replace the damaged component and retest. |
| | Worn or damaged Upper Arbor Bearing or Lower Arbor Bearing | Replace the worn or damaged 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. |
| 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. |

## TROUBLESHOOTING GUIDE *(Continued)*

| Trouble | Probable Cause | Solution |
|---|---|---|
| Front Rotor Bearing runs hot | Incorrect installation of the Front Seal Cup | Reposition the Front Seal Cup 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 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 and Rear Rotor Bearing Spacers and replace any damaged parts. If the rear end plate is damaged, replace the Rotor. |
| | Worn or broken Upper Arbor Bearing or Lower Arbor Bearing | Replace the worn or broken Bearing. |
| | Worn or broken Bevel Gear or Bevel Pinion | Examine the Bevel Gear and Bevel Pinion. If either is worn or damaged, replace both the Gear and the Pinion because they are a matched set and must not be used separately. |

**NOTICE**

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