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Edition 3
March, 1996

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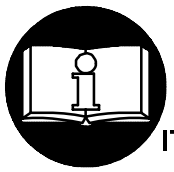
OPERATION AND MAINTENANCE MANUAL FOR SERIES HDS AND TDS SANDERS AND POLISHERS

NOTICE

Series HDS and TDS Sanders and Polishers are designed for smoothing, trimming or removing metal in close–quarter areas in foundries, shipyards, steel mills and in construction applications.

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



⚠ WARNING

IMPORTANT SAFETY INFORMATION ENCLOSED.
READ THIS MANUAL BEFORE OPERATING TOOL.
IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PLACE THE INFORMATION IN THIS MANUAL INTO THE HANDS OF THE OPERATOR.
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

PLACING TOOL IN SERVICE

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

USING THE TOOL

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

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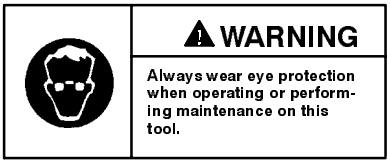
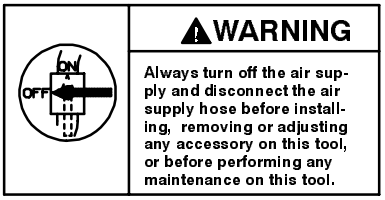
PROFESSIONAL TOOLS

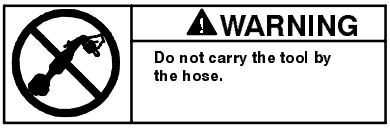
WARNING LABEL IDENTIFICATION

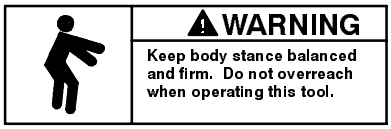
⚠ WARNING

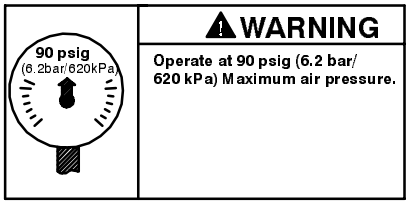
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

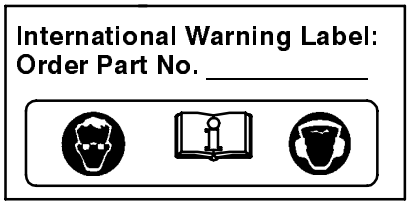












SANDER/POLISHER SPECIFIC WARNINGS

- **These Sanders and Polishers will operate at the free speed specified on the nameplate if the air supply line furnishes 90 psig (6.2 bar/620 kPa) air pressure at the tool. Operation at higher air pressure will result in excessive speed.**
- **Use only a sanding pad, buffing wheel or polishing bonnet with these tools. Do not use any grinding wheel, bur or metal removing accessory other than a sanding pad with these tools. Never use an accessory having a maximum operating speed less than the free speed of the Sander or Polisher in which it is being used.**

PLACING TOOL IN SERVICE

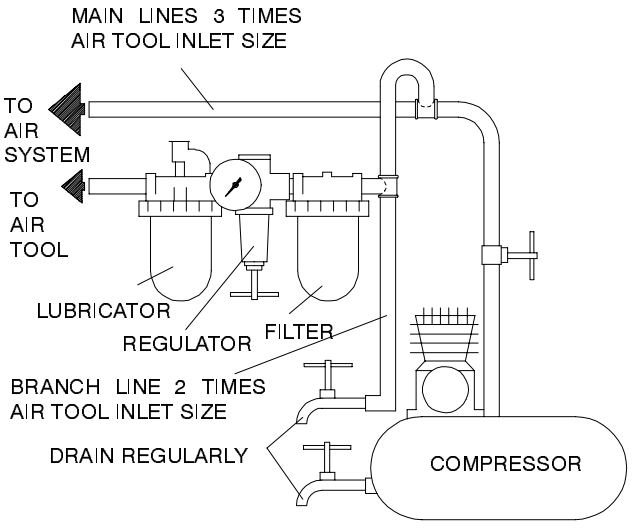
LUBRICATION

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

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

For USA – No. C11–03–G00
For International – No. C16–C3–A29

Before starting the tool, unless the air line lubricator is used, detach the air hose and inject about 2.5 cc of oil into the air inlet.
After each eight hours of operation, replenish the oil supply. Inject approximately 1.5 cc of Ingersoll–Rand No. 68 Grease into the Grease Fitting.
After each forty–eight hours or operation, inject about 5 cc of grease into each Grease Fitting.
For HDS60, HDS90, TDS90 or TDS120, inject approximately 1.5 cc of Ingersoll–Rand No. 67 Grease into the Grease Fittings. See lube and torque specification drawings.



(Dwg. TPD905–1)

HOW TO ORDER CYCLONE SANDERS AND POLISHERS

TOOLS WITH 1/4" COLLET	
Model	**Free Speed, rpm**
TDS120RG4	12 000
TDS90RG4	9 000
TDS45RG4	4 500
TDS30RG4	3 000
TDS15RG4	1 500
HDS90RG4	9 000
HDS60RG4	6 500
HDS45RG4	4 500
HDS30RG4	3 000
HDS10RG4	1 000

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: HDS60RG4 Rear Exhaust Model becomes HDS60FG4 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:** HDS60RG4**L.**

   NOTICE

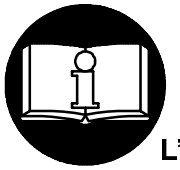
   Any time a tool is ordered with a Low-Profile Concentric Flange, it will come equipped with a Locking Lever from the factory.
2. To order a tool with a Low-Profile Concentric Flange, select the desired model and add a **"C"** to the end of the existing number. **Example:** HDS60RG4**C**.

F

MANUEL D'EXPLOITATION ET D'ENTRETIEN PONCEUSES ET POLISSEUSES D'ANGLE DES SERIES HDS ET TDS

NOTE

Les ponceuses et polisseuses d'angle des series HDS et TDS sont destinées au ponçage, à l'ébavurage ou à l'enlèvement du métal dans les fonderies, les chantiers navals, les aciéries et la construction.
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 SECURITÉ SONT JOINTES.
LIRE CE MANUEL AVANT D'UTILISER L'OUTIL.
L'EMPLOYEUR EST TENU À COMMUNIQUER LES INFORMATIONS DE CE MANUEL AUX EMPLOYÉS UTILISANT CET OUTIL.
LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES

MISE EN SERVICE DE L'OUTIL

- **Toujours exploiter, inspecter et entretenir cet outil conformément au Code de sécurité des outils pneumatiques portatifs de l'American National Standards Institute (ANSI B186.1).**
- **Pour la sécurité, les performances optimales et la durabilité maximale des pièces, cet outil doit être connecté à une alimentation d'air comprimé de 6,2 bar (620 kPa) maximum à l'entrée, avec un flexible de 10 mm de diamètre intérieur.**
- **Couper toujours l'alimentation d'air comprimé et débrancher le flexible d'alimentation avant d'installer, déposer ou ajuster tout accessoire sur cet outil, ou d'entreprendre une opération d'entretien quelconque sur l'outil.**
- **Ne pas utiliser des flexibles ou des raccords endommagés, effilochés ou détériorés.**
- **S'assurer que tous les flexibles et les raccords sont correctement dimensionnés et bien serrés. Voir Plan TPD905–1 pour un exemple type d'agencement des tuyauteries.**
- **Utiliser toujours de l'air sec et propre à une pression maximum de 90 bar (620 kPa). 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 passe 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 del'outil et augmenter l'entretien, et peut annuler toutes les garanties.

Les réparations ne doivent être effectueés 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

SIGNIFICATION DES ETIQUETTES D'AVERTISSEMENT

⚠ ATTENTION

LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES

⚠ ATTENTION

Porter toujours des lunettes de protection pendant l'utilisation et l'entretien de cet outil.

⚠ ATTENTION

Porter toujours une protection acoustique pendant l'utilisation de cet outil.

⚠ ATTENTION

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.

⚠ ATTENTION

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.

⚠ ATTENTION

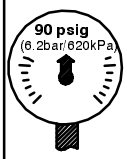
Ne pas transporter l'outil par son flexible.

⚠ ATTENTION

Ne pas utiliser des flexibles ou des raccords endommageés, effilochés ou détériorés.

⚠ ATTENTION

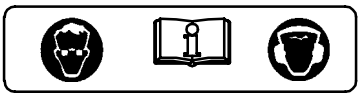
Garder une position équilibrée et ferme. Ne pas se pencher trop en avant pendant l'utilisation de cet outil.



⚠ ATTENTION

Utiliser de l'air comprimé à une pression maximum de 6,2 bar (620 kPa).

Etiquette d'avertissement internationale:
Commander Pièce No._____



AVERTISSEMENTS PARTICULIERS AUX PONCEUSES/POLISSEUSES

- **Ces ponceuses et polisseuses fonctionneront à la vitesse à vide spécifiée sur la plaque signalétique lorsque le circuit d'alimentation fournit de l'air à une pression de 6,2 bar (620 kPa) à l'outil. L'exploitation à une pression supérieure produira une vitesse excessive.**
- **Utiliser seulement un plateau de ponçage, un disque de polissage ou une peau de mouton de polissage avec ces outils. Ne jamais utiliser de meule ou d'accessoire d'ébavurage ou d'enlèvement de métal autre que le plateau de ponçage sur ces outils. Ne jamais utiliser un accessoire ayant une vitesse de fonctionnement maximum inférieure à la vitesse à vide de la ponceuse ou de la polisseuse sur laquelle il est utiliseé.**

MISE EN SERVICE DE L'OUTIL

LUBRIFICATION

Voir plans de spécification de lubrification et de couple.

Ingersoll–Rand N°. 50
Ingersoll–Rand N°. 50 **Ingersoll–Rand N°. 68**
Ingersoll–Rand N°. 63

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

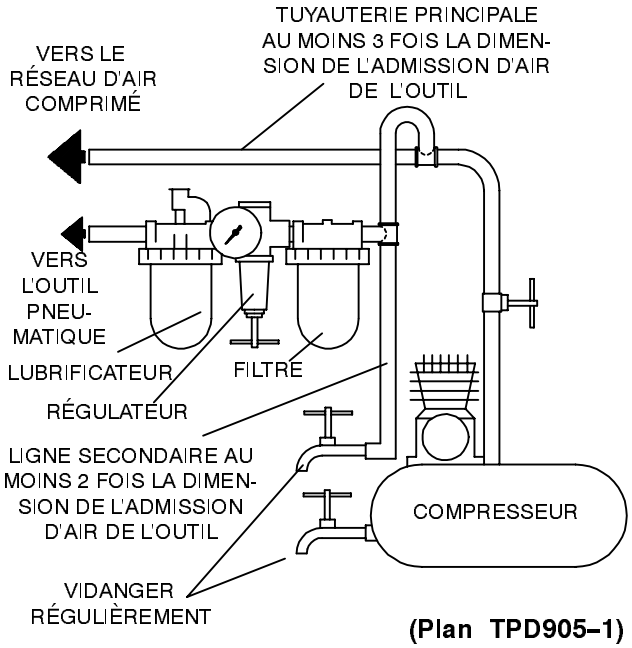
USA.- N° C11–03–G00
International – N°. C16–C3–A29

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^3 d'huile dans le raccord d'admission de l'outil.

Toutes les huit heures de fonctionnement, remplir la réserve d'huile. Injecter environ 1,5 cm3 de graisse Ingersoll–Rand No. 68 dans le raccord de graissage.

Toutes les quarante-huit heures de fonctionnement, injecter environ 5 cm^3 de graisse dans chaque raccord de graissage.

Sur les modèles HDS60, HDS90, TDS90 ou TDS120, injecter environ 1,5 cm3 de graisse Ingersoll–Rand No. 67 dans les raccords de graissage.



(Plan TPD905–1)

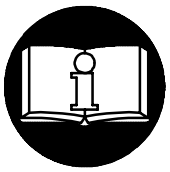
E

MANUAL DE FUNCIONAMIENTO Y MANTENIMIENTO LIJADORAS Y PULIDORAS MODELOS HDS Y TDS

NOTA

Las Lijadoras y Pulidoras Modelos HDS y TDS están diseñadas para pulido, recorte o eliminación de metal en fundiciones, astilleros, fábricas de acero y en la industria de construcción.

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 10 mm.**
- **Corte siempre el suministro de aire y desconecte la manguera de suministro de aire antes de instalar, desmontar o ajustar cualquier accesorio de esta herramienta, o antes de realizar cualquier operación de mantenimiento de la misma.**
- **No utilice mangueras de aire y accesorios dañados, desgastados ni deteriorados.**
- **Asegúrese de que todas las mangueras y los accesorios sean del tamaño correcto y estén bien apretados. Vea Esq. TPD905–1 para un típico arreglo de tuberías.**
- **Use siempre aire limpio y seco a una máxima presión de 90 psig (6,2 bar/620kPa). 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.

INGERSOLL-RAND®
PROFESSIONAL TOOLS

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

Usar siempre protección para los oidos al manejar esta herriamenta.

⚠ 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

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

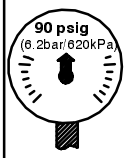
No coger la herramienta por la manguera para levantarla.

⚠ ADVERTENCIA

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

⚠ ADVERTENCIA

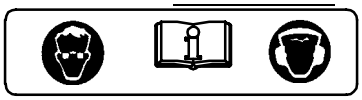
Mantener una postura del cuerpo equilibrada y firme. No estirar demasiado los brazos al manejar la herramienta.



⚠ ADVERTENCIA

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

Etiqueta de Aviso Internacional:
Pida Pieza No. _____

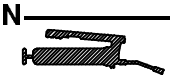


AVISOS ESPECIFICOS DE LIJADORA/PULIDORA

- **Estas Lijadoras y Pulidoras funcionarán a la velocidad constante especificada en la placa de identificación si la línea de suministro de aire a la herramienta tiene una presión de 90 psig (6,2bar/ 6,2 kPa). El funcionamiento a mayores presiones resultará en exceso de velocidad.**
- **Use sólo lija, placa de pulir o boina de pulir con estas herramientas. No use muela, ni accesorio escariador o fresador, que no sea para lijar con estas heramientas. No use nunca un accesorio que tenga una máxima velocidad de funcionamiento menor a la velocidad de la Lijadora o Pulidora en la que se va a usar.**
- **Use sólo lija, rueda de pulir o bonete de pulir con estas herramientas. No use muela, ni accesorio escariador o fresador, que no sea para lijar con estas herramientas. No use nunca un accesorio que tenga una máxima velocidad de funcionamiento menor a la velocidad de la Lijadora o Pulidora en la que se va a usar.**

PARA PONER LA HERRAMIENTA EN SERVICIO

LUBRICACION



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

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

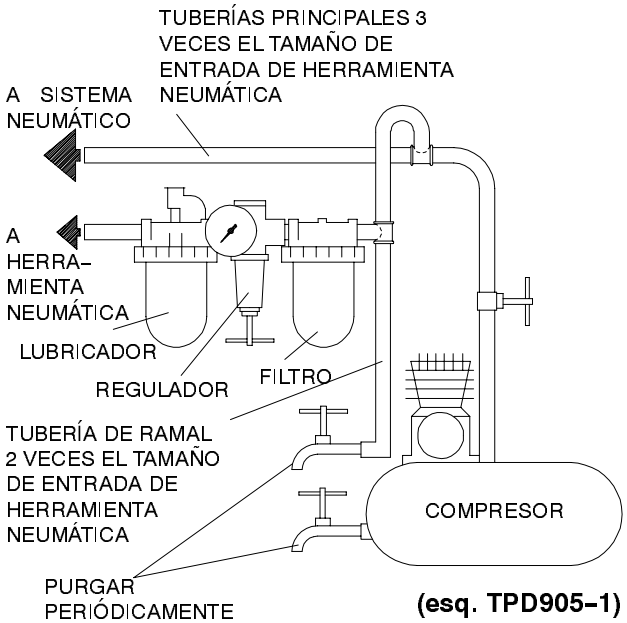
USA – Nº. C11–03–G00
Internacional – Nº. C16–C3–A29

Antes de pone la herramienta en marcha, a menos que se haya puesto lubricante de línea de aire comprimido, desconecte la manguera de aire e inyecte 2,5cc de aceite en la admisión de aire.

Después de cada ocho horas de uso, reponga el suministro de aceite. Inyectar aproximadamente 1,5 cc de grasa Ingersoll–Rand Nº 68 por la boquilla de engrase.

Después de cada cuarenta y ocho horas de uso, inyecte así como 5 cc de grasa en cada engrasador.

En los modelos HDS60, HDS90, TDS90 o TDS120, inyectar aproximadamente 1,5 cc de grasa Ingersoll–Rand Nº 67 por las boquillas de engrase. Ver los dibujos de lubricación y pares.



(esq. TPD905–1)

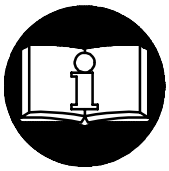
P

MANUAL DE FUNCIONAMENTO E MANUTENÇÃO
LIXADORAS E POLIDORAS SÉRIES HDS E TDS

AVISO

As Lixadoras e Polidoras Séries HDS e TDS são concebidas para alisamento, corte de sebes ou remoção de metais em fundições, estaleiros, siderúrgias e em aplicações de construções metálicas.

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 10 mm (3/8").
- Desligue sempre a alimentação de ar e desconecte a mangueira de alimentação de ar antes de instalar, remover ou ajustar qualquer acessório nesta ferramenta, ou antes de executar qualquer serviço de manutenção nesta ferramenta.
- Não use mangueiras de ar ou adaptadores danificados, gastos ou deteriorados.
- Certifique–se de que todas as mangueiras e adaptadores sejam do tamanho correcto e estejam apertados com firmeza. Veja o Desenho TPD905–1 para um arranjo típico de tubagem.
- Use sempre ar seco e limpo com pressão máxima de 6,2 bar/620 kPa (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.

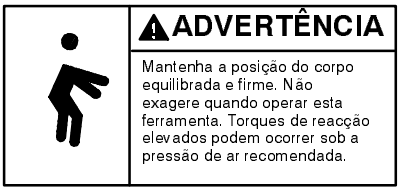
Impresso nos E.U.A.

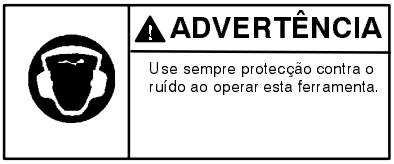
INGERSOLL-RAND®
PROFESSIONAL TOOLS

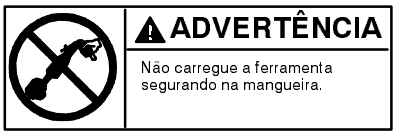
IDENTIFICAÇÃO DO RÓTULO DE ADVERTÊNCIA

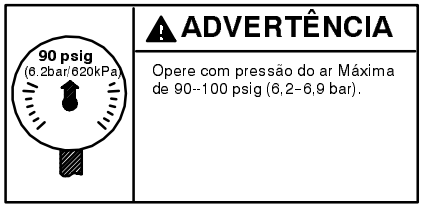
⚠ ADVERTÊNCIA

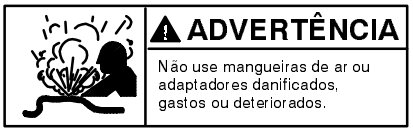
O NÃO CUMPRIMENTO DAS SEGUINTES ADVERTÊNCIAS PODE RESULTAR EM FERIMENTO.

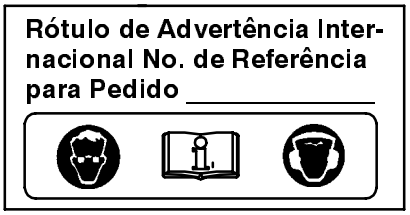












ADVERTÊNCIAS ESPECÍFICAS SOBRE A ESMERILADORA

- **Não tente desmontar o Controlador. O Controlador é disponível apenas como uma unidade e é garantido pela vida útil da ferramenta se não for cometido abuso na sua utilização.**
- **Estas Lixadoras irão operar com velocidade livre especificada na placa de identificação se a linha de alimentação de ar fornecer 6,2 bar/620 kPa (90 psig) de pressão de ar na ferramenta. O funcionamento a pressões de ar mais elevadas irá resultar em velocidade excessiva.**
- **Use somente almofada de lixa, discos de lixa ou boína de polimento com estas ferramentas. Não use nenhum disco de esmerilamento, ou acessório de fresagem com estas ferramentas. Nunca use um acessório com velocidade máxima de operaçã que a velocidade livre da esmeriladora ou polidora, na qual o disco está sendo usado.**

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

LUBRIFICAÇÃO

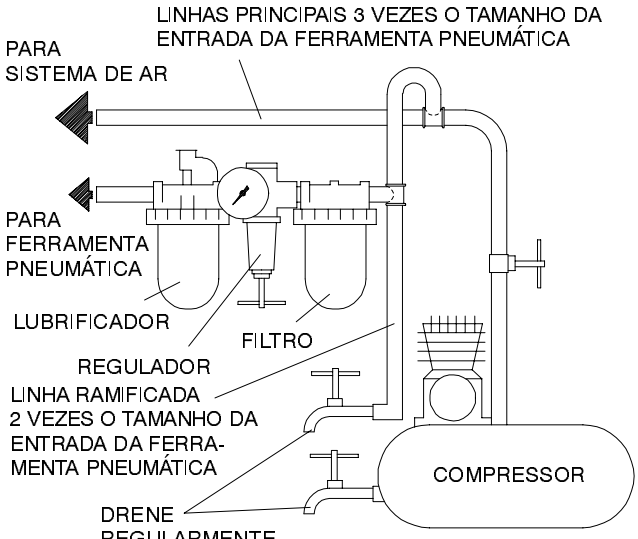
Ingersoll–Rand No. 10 **Ingersoll–Rand No. 68**
Ingersoll–Rand No. 50
Ingersoll–Rand No. 63

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

Para USA – No. C11–03–G00
Para Internacional – No. C16–C3–A29

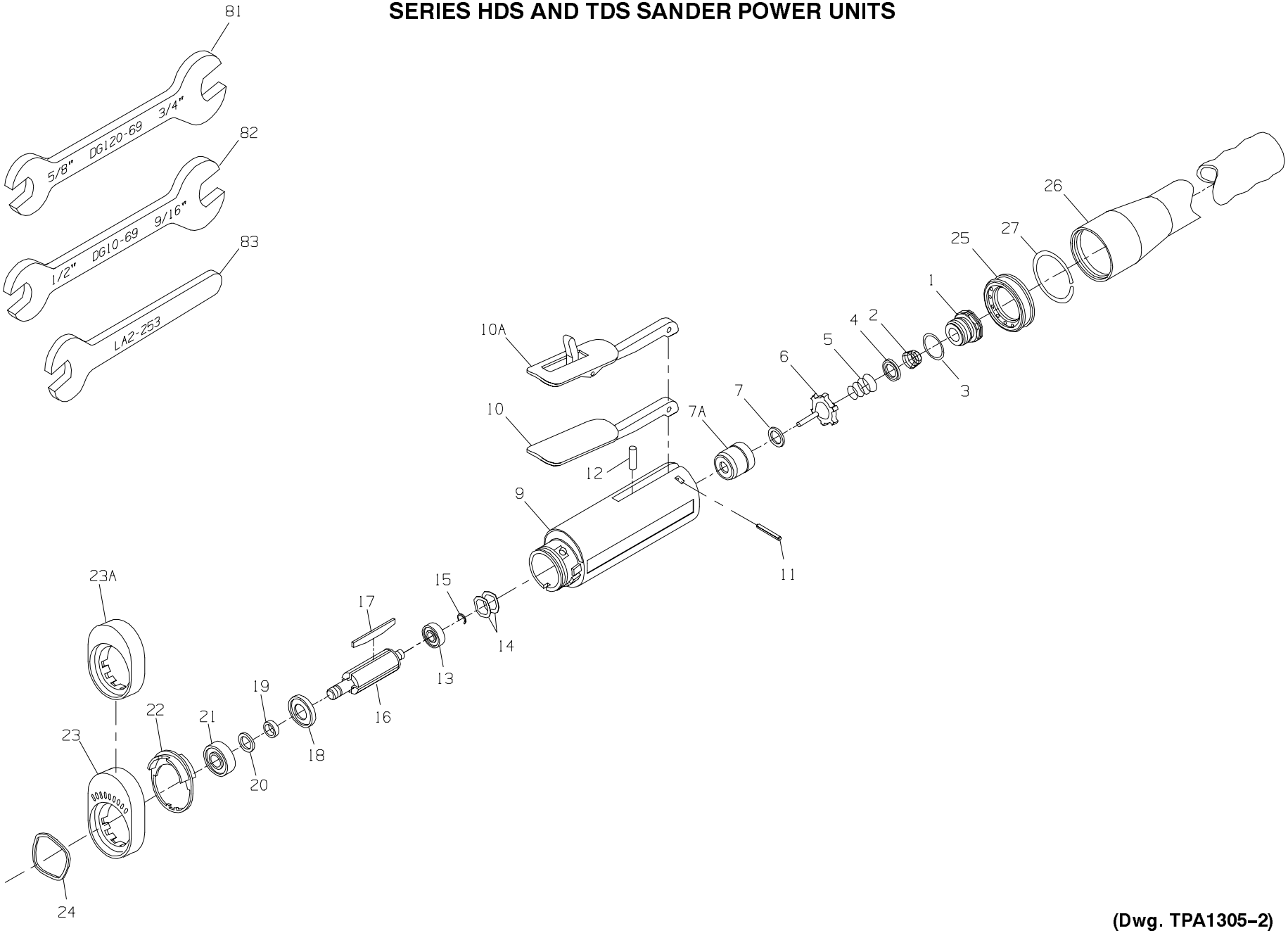
Antes de ligar a Ferramenta, ao menos que um lubrificador de ar de linha seja usado, desligue a mangueira de ar e injecte aproximadamente 2,5 cc de óleo na entrada de ar.
Depois de oito horas de operação, substitua o suprimento de óleo. Injecte aproximadamente 1,5 cc de Massa Ingersoll–Rand Nº 68 no Copo de Lubrificação.
Depois de quarenta e oito horas de operação, injecte cerca de 5cc de Massa Lubrificante Ingersoll–Rand no Adaptador.

Para HDS60, HDS90, TDS90 ou TDS120, injecte aproximadamente 1,5 cc de massa Ingersoll–Rand Nº 67 nos Copos de Lubrificação. Consulte os desenhos de especificação de lubrificação e binário.



(Desenho TPD905–1)

SERIES HDS AND TDS SANDER POWER UNITS



(Dwg. TPA1305–2)

		PART NUMBER FOR ORDERING				PART NUMBER FOR ORDERING
	1	Inlet Assembly	LG2-A465		22	Flow Ring
	2	Inlet Screen	R1602-61			for all HDS models (blue) — LG3-103-3
•	3	Inlet Seal	R18LF-21			for TDS30, TDS45 and TDS90 models (brown) — LG2-103-1
	4	Throttle Valve Spring Seat	LG3-592			for TDS15 models (khaki) — LG2-103-2
	5	Throttle Valve Spring	7L-51			for TDS120 models (red) — LG2-103-3
	6	Throttle Valve			23	High Profile Flange — LG2-23
		for HDS models	LG3-302	#	23A	Concentric Flange — LG3R-23
		for TDS models	LG2-302		24	Flange Clamp — LG2-29
•	7	Throttle Valve Seat		+	25	Exhaust Hose Adapter — LG2-184
		for HDS models	LG3-303	+	26	Exhaust Hose — 3RL-284
		for TDS models	LG2-303	+	27	Exhaust Hose Retainer — 6WT-203
	7A	Valve Cartridge Case (for TDS models only)	LG2-300A		*	Warning Label — LG2-99
	9	Motor Housing				for EU models — EU-99
		for HDS models	LG3-40		*	Namepalte
		for TDS models	LG2-40			for HDS10 — LGS301-301
	10	Throttle Lever	LG2-273			for HDS10-EU — LGS301-EU-301
	10A	Locking Throttle Lever Assembly (for all models ending in L or C)	LG2-A400			for HDS30 — LGS303-301
	*	Lever Lock	LG1-402			for HDS30-EU — LGS303-EU-301
	*	Lock Spring	LG1-405			for HDS45 — LGS345-301
	*	Lock Pin	5UT-757			for HDS45-EU — LGS345-EU-301
	11	Throttle Lever Pin	61H-120			for HDS60 — LGS306-301
	12	Throttle Valve Plunger	LG2-191			for HDS60-EU — LGS306-EU-301
	13	Rear Rotor Bearing	R120-127			for HDS90 — LGS309-301
•	14	Rear Rotor Bearing Spacer (2)	400-25-191			for HDS90-EU — LGS309-EU-301
•	15	Rear Rotor Bearing Retainer	LG1-118			for TDS15 — LGS215-301
	16	Rotor				for TDS15-EU — LGS215-EU-301
		for HDS models	LG3-53-4			for TDS30 — LGS203-301
		for TDS models	LG2-53-4			for TDS30-EU — LGS203-EU-301
•	17	Vane Packet (set of 4 Vanes)				for TDS45 — LGS245-301
		for HDS models	DG31-42-4			for TDS45-EU — LGS245-EU-301
		for TDS models	DG21-42-4			for TDS90 — LGS209-301
	18	Front End Plate	LG2-11			for TDS90-EU — LGS209-EU-301
	19	Front End Plate Spacer	LG2-65			for TDS120 — LGS212-301
•	20	Front Seal Cup Assembly	61H-A32			for TDS120-EU — LGS212-EU-301
	21	Front Rotor Bearing	LG2-24			

* Not illustrated.

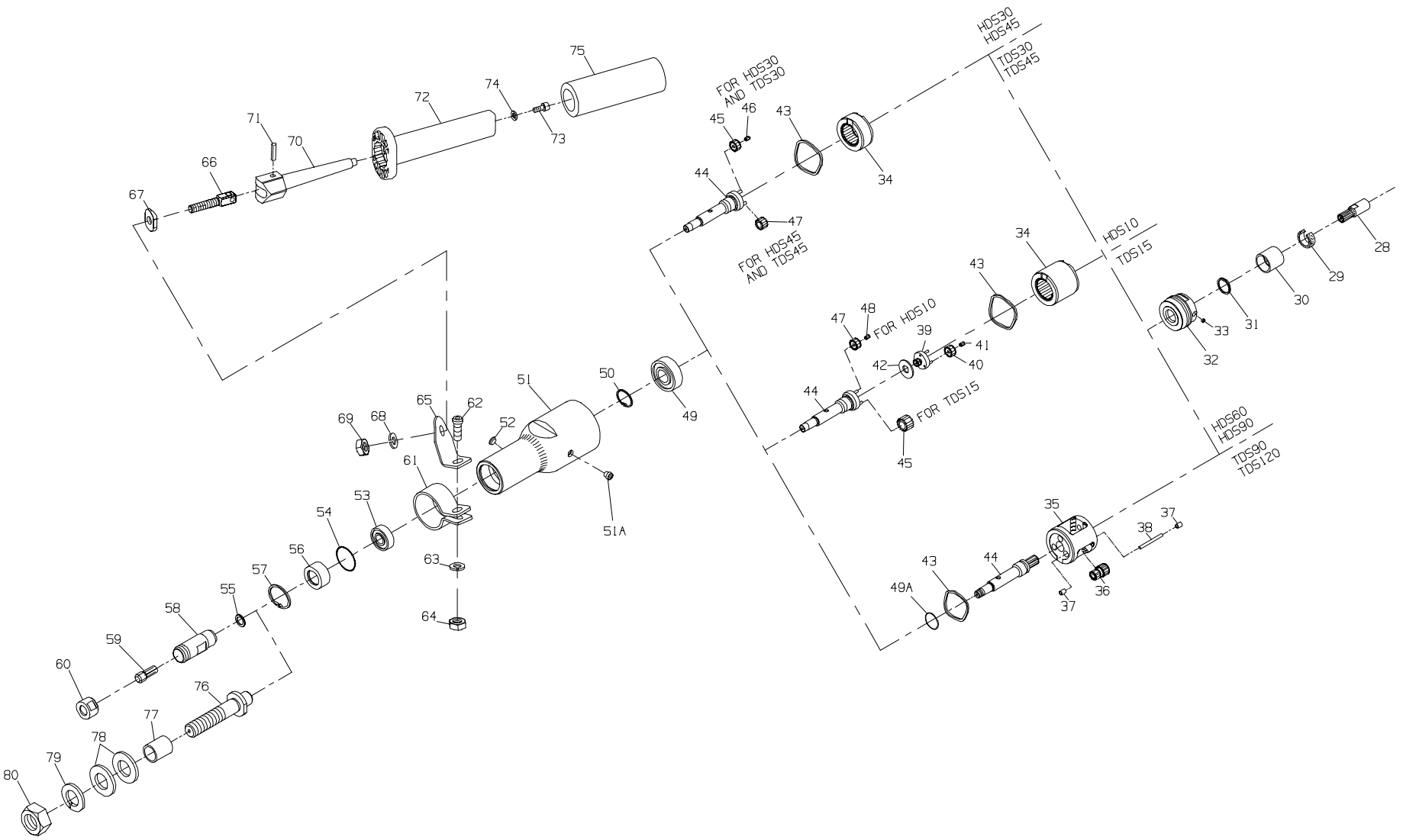
• To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (•) for every four tools in service.

⚠ WARNING

 # Always install a Locking Throttle Lever Assembly (10A) on a tool with a Concentric Flange (23A). Installing a Concentric Flange on a tool without a Locking Throttle Lever will allow the tool to continue running if the tool is dropped or set down on the standard non-locking Throttle Lever (10).

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

SERIES HDS AND TDS SANDER GEAR UNITS



(Dwg. TPDA1334–2)

		PART NUMBER FOR ORDERING
28	Rotor Pinion	
	for HDS10	LES2–17–16.1
	for HDS30 and TDS30	LS2–17–6.3
	for HDS45 and TDS45	LS2–17–3.8
	for HDS60	HDS–17–2.8
	for HDS90, TDS90 and TDS120	HDS–17–1.9
	for TDS15	LES2–17–12.9
29	Wick	LAS2–560
30	Clamp Sleeve	LAS2–176
31	Wick Retaining Ring	182A53–685
32	Gear Case Adapter Assembly	LAS2–A337
33	Grease Fitting	D0F9–879
34	Ring Gear	
	for HDS10 and TDS15	LES2–406
	for HDS30 and TDS30	LAS2–406
	for HDS45 and TDS45	LS2–406–3.8
35	Gear Frame	
	for HDS60	LES2–8–2.8
	for HDS90, TDS90 and TDS120	LES2–8–1.9
36	Spur Gear (3)	
	for HDS60	HDS–10–2.8
	for HDS90, TDS90 and TDS120	HDS–10–1.9
37	Spur Gear Bearing (2 for each Spur Gear)	W22–654
38	Spur Gear Pin (1 for each Spur Gear)	LES2–191
39	Gear Head	
	for HDS10	LES2–216–16.1
	for TDS15	LES2–216–12.9

		PART NUMBER FOR ORDERING
40	Gear Head Planet Gear (3)	
	for HDS10	4RLM–10A
	for TDS15	6WTM–10
41	Gear Head Planet Gear Bearing (3)	6WTM–500
42	Gear Head Spacer	6LM–80
43	Ring Gear Clamp	LG2–29
44	Spindle	
	for HDS10	LES2–4–16.1
	for HDS30 and TDS30	LS2–4–6.3
	for HDS45 and TDS45	LS2–4–3.8
	for HDS60	HDS–4–2.8
	for HDS90, TDS90 and TDS120	HDS–4–1.9
	for TDS15	LES2–4–12.9
45	Spindle Planet Gear Assembly (3)	
	for HDS30 and TDS30	7AK–A10
	for TDS15	6WTN–A10
46	Spindle Planet Gear Bearing (for 7AK–A10) (1 for each Gear)	7AK–500
47	Spindle Planet Gear (3)	
	for HDS10	4RLN–10A
	for HDS45 and TDS45	5RAN–9
48	Spindle Planet Gear Bearing (for HDS10 only) (1 for each Gear)	6WTM–500
49	Rear Spindle Bearing	105352
49A	Rear Spindle Bearing Seal (for HDS60, HDS90, TDS90 and TDS120)	AF120–290
50	Rear Spindle Bearing Retainer	G57–729

• 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.

		PART NUMBER FOR ORDERING			PART NUMBER FOR ORDERING
51	Extension Housing		67	Anchor Bolt Clamp	LG2–58
	for HDS30, HDS45, TDS30		68	Anchor Bolt Lockwasher	T11–58
	and TDS45	LS2–20	69	Anchor Bolt Nut	D02–428
	for HDS10, HDS60, HDS90,		70	Handle Arbor	LG2–48Y
	TDS15, TDS90 and TDS120	LS2X–20	71	Anchor Roll Pin	R00A2–120
51A	Grease Fitting	D0FN–879	72	Handle	LG2–48X
52	Extension Housing Plug	EG220–92	73	Handle Lock Screw	AG31–667
53	Front Spindle Bearing	WFS182–22	74	Lack Screw Washer	MF–37
• 54	Front Spindle Bearing Seal	ET1604–213	75	Handle Grip	LG2–48W
• 55	Seal Cup Assembly	61H–A32	76	Wire Brush Adapter Assembly	LS2–A4–B10
56	Spindle Bearing Shield	LE2–200	77	Spacer (long)	77H50–775
57	Shield Retainer	W22–118	78	Spacer (short) (2)	R3F–286
58	Collet Body	LG2–290	79	Lockwasher	A–67
59	Collet	G160HD–700–1/4	80	Lock Nut	HU–776
60	Collet Nut	DG120–699A	81	Collet Nut Wrench (double–end 5/8” x 3/4”)	DG120–69
61	Handle Clamp	LS2–48	82	Collet Body Wrench (double–end	
62	Handle Clamp Mounting Screw	206041–01		1/2” x 9/16”)	DG10–69
63	Mounting Screw Lockwasher	T11–58	83	Gear Case Adapter Wrench	
64	Mounting Screw Nut	D02–428		(single–end 1–1/2”)	LA2–253
65	Handle Bracket	LS2–364			
66	Position Anchor Bolt	LG2–373			

• 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 use protective eyewear when performing maintenance on a tool or operating a 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. Failure to do so could result in injury.

LUBRICATION

Each time model HDS and TDS Sanders and Polishers are disassembled for maintenance, repair or replacement of parts, lubricate the tools:

1. Always wipe the Vanes (17) 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.
3. Moisten all O–rings with O–ring lubricant.

DISASSEMBLY

General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. 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.
3. 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.
4. 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.
5. Do not disassemble the tool unless you have a complete set of new gaskets and O–rings for replacement.

Disassembly of Extension Assembly

1. Using the Collet Body Wrench (82) on the flats of the Collet Body (58) and the Collet Nut Wrench (81) on the Collet Nut (60), unscrew the Collet Nut and remove the Collet (59).
2. Loosen the Mounting Screw Nut (64) and slide the assembled handle off the collet end of the Extension Housing (51).
3. Using snap ring pliers, remove the Shield Retainer (57) and slide the Spindle Bearing Shield (56) out of the Extension Housing.
4. Using a thin blade screwdriver, pry the Extension Housing Plug (52) out of the Extension Housing. Insert a 5/32" steel rod into the opening and through the hole in the Spindle (44) to prevent it from rotating and using the Collet Body Wrench, unscrew and remove the Collet Body.
5. Remove the Seal Cup Assembly (55) from the Collet body.
6. Grasp the tool in copper–covered vise jaws with the Spindle upward and using the Gear Case Adapter Wrench (83) on the flats of the Gear Case Adapter (32) and a 1–1/2" wrench on the flats of the Extension Housing, unscrew and remove the Housing. This is a **left–hand thread** and must be rotated **clockwise** to remove the Housing.

NOTICE

Some of the gears will be free to fall from the spindle gear shafts when the Housing is separated from the Adapter. Make certain they do not fall on a hard surface which could damage them.

7. **For HDS30, HDS45, TDS30 or TDS45,** remove the Spindle Planet Gears (45 or 47), Planet Gear Bearings (46), the Ring Gear (34) and the Ring Gear Clamp (43) from the motor end of the Extension Housing.
   For HDS10 or TDS15, remove the Gear Head (39), Gear Head Planet Gears (40), Bearings (41), Gear Head Spacer (42), Spindle Planet Gears (45 or 47), Bearings (48), Ring Gear (34) and the Ring Gear Clamp (43) from the motor end of the Extension Housing.
   For HDS60, HDS90, TDS90 or TDS120, pull the assembled Gear Frame (25) off the spline of the Spindle (44).
8. **For HDS60, HDS90, TDS90 or TDS120,** if the Spur Gears (36), Spur Gear Bearings (37) or Spur Gear Pins (38) do not need to be replaced, set the assembled Gear Frame aside. If any of the components must be replaced, proceed as follows:

NOTICE

The Spur Gear Bearings will be damaged during removal. Make certain a new set of bearings is available before attempting to disassemble the Gear Frame.

   a. Stand the assembled Gear Frame on the table of an arbor press and using a pressing plug having a diameter equal to the size of the Spur Gear Pin, press the Bearing from the Gear Frame.
   b. Push the Pin from the Spur Gear and lift the Spur Gear out of the Gear Frame.
   c. Repeat step (a) and (b) for the remaining two Spur Gears.
   d. Turn the Gear Frame end for end and press the remaining Bearings from the Gear Frame.
9. Grasp the gear end of the assembled Spindle and pull it out of the Extension Housing.
10. If the Front Bearing Spindle Seal (54) is nicked or damaged and must be replaced, remove it from the internal groove near the output end of the Extension Housing.

11. If the Front Spindle Bearing (53) must be replaced, use a bearing puller to pull the Bearing off the front end of the Spindle.
12. If the Rear Spindle Bearing (49) must be replaced, use snap ring pliers to remove the Rear Spindle Bearing Retainer (50) and using a bearing puller, pull the Bearing from the Spindle.
13. **For HDS60, HDS90, TDS90 or TDS120,** if the Rear Spindle Bearing Seal (49A) is nicked or damaged and must be replaced, remove it from the groove in the spindle shaft where the Rear Spindle Bearing was located.
14. Using the Gear Case Adapter Wrench, unscrew and remove the Gear Case Adapter. This is a **left-hand thread**; rotate the Adapter **clockwise** to remove it.
15. Remove the Clamp Sleeve (30) and if the Wick (29) must be replaced, pull it from the motor end of the Spacer.

Disassembly of the Motor

1. Pull the Flange (23) and Flow Ring (22) off the front of the Motor Housing (9).
2. Grasp the Rotor Pinion (28) and pull the assembled motor out of the Motor Housing. Remove the two Rear Rotor Bearing Spacers (14) from the bottom of the Housing.
3. Remove the Vanes (17) from the Rotor (16).
4. Grasp the Rotor in copper-covered vise jaws with the Rotor Pinion upward. Using a 1/2" wrench, unscrew and remove the Pinion.
5. If the Front Rotor Bearing (21) must be replaced, support the Front End Plate (18) 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 (19) and Front Seal Cup Assembly (20) from the hub of the Rotor.
6. If the Rear Rotor Bearing (13) must be replaced, use snap ring pliers to remove the Rear Rotor Bearing Retainer (15).
7. Using a bearing puller, pull the Rear Rotor Bearing off the hub of the Rotor.

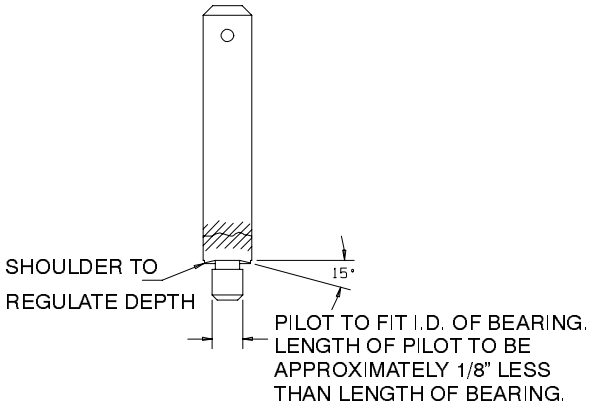
Disassembly of the Inlet and Throttle

1. Using a 15/16" 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 (4), Throttle Valve Spring (5) and Throttle Valve (6) from the Motor Housing (9).
4. If the Throttle Valve Seat (7) 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. **For TDS Models,** if the Throttle Valve Case (7A) must be replaced, insert two hooked tools through the central opening of the Case approximately 180 degrees apart and pull it from the Housing.
6. Press the Throttle Lever Pin (11) from the Housing and remove the Throttle Lever (10). Remove the Throttle Valve Plunger (12).

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. Always clean every part and wipe every part with a thin film of oil before installation.
5. Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly in **clean** solvent and dry with a clean cloth. Sealed or shielded bearings should not be cleaned. Work grease into every open bearing before installation.
6. Apply a film of O-ring lubricant to every O-ring before installation.
7. Unless otherwise noted, always press on the stamped end of a needle bearing when installing a needle bearing into a recess. Use a bearing inserting tool similar to the one shown below.



(Dwg. TPD786)

NEEDLE BEARING INSERTING TOOL

Assembly of the Throttle and Inlet

1. Insert the Throttle Valve Plunger (12) into the Motor Housing (9).

2. Position the Throttle Lever (10) on the Motor Housing and using an arbor press, press the Throttle Lever Pin (11) into the Housing and Lever. The Lever will retain the Plunger in the Housing.
3. **For TDS Models,** if the Throttle Valve Case (7A) 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 (7) 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 (5) onto the end of the Throttle Valve (6) with the short stem until the Spring snaps into position around the hub and remains there. Install the dish end of the Throttle Valve Spring Seat (4) onto the large end of the Throttle Valve Spring.
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 to 25 ft-lb (27.1 to 33.9 Nm) torque.

Assembly of the Motor

1. If the Rear Rotor Bearing (13) was removed, stand the Rotor (16) 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 onto the hub of the Rotor.
2. Install the Rear Rotor Bearing Retainer (15) in the groove on the hub of the Rotor.
3. Install the Front End Plate (18), counterbored end trailing, onto the threaded hub of the Rotor. Using finger pressure, press the Front Seal Cup Assembly (20), felt end trailing, onto the end of the Front End Plate Spacer(19) that is opposite the the large internal bevel. Continue pressing until the felt end is flush with the end of the Spacer. Saturate the felt with Ingersoll-Rand No. 50 Oil. Place the assembled Spacer, Seal Assembly trailing, onto the threaded hub of the Rotor. Make sure the Seal Assembly enters the recess in the Front End Plate.
4. Stand the small hub of the Rotor on the table of an arbor press with the threaded end upward and press the Front Rotor Bearing (21) onto the hub of the Rotor.

NOTICE

The Front Rotor Bearing is a flush ground bearing and must be installed in a specific manner. The end of the Bearing with a black stain or hash marks must be away from the Spacer.

5. Grasp the assembled Rotor in copper-covered vise jaws with the threaded rotor hub upward.
6. Thread the Rotor Pinion (28) onto the Rotor and using a torque wrench, tighten the Pinion between 14 and 19 ft-lb (19.0 and 25.8 Nm) torque.
7. Inject approximately 1/2 cc of Ingersoll-Rand No. 68 Grease into the small recess at the bottom of the motor housing bore. Drop the two Rear Rotor Bearing Spacers (14) into the bottom of the motor housing bore.
8. Wipe each Vane (17) with a light film of oil and insert a Vane into each vane slot in the Rotor.
9. Grasp the Rotor Pinion and insert the assembled Rotor into the Motor Housing (9).
10. Assemble the Flow Ring (22) with the Flange (23) 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. Carefully install the assembled Flange, Flow Ring leading, onto the front of the Motor Housing. Make certain the Ring properly engages the Housing.

Assembly of the Extension Housing

1. Form the Wick (29) into a circle and insert it into one end of the Clamp Sleeve (30) and push it against the Wick Retaining Ring (31). Saturate the Wick with approximately 1.5 cc of Ingersoll-Rand No. 63 Oil. **Do not substitute any other oil.**
2. Install the Clamp Sleeve over the Rotor Pinion (28), Wick end first, against the Front Rotor Bearing (21).
3. **For HDS60, HDS90, TDS90 or TDS120,** apply a thin coat of O-ring lubricant to the Rear Spindle Bearing Seal (49A) and install it in the annular groove on the Spindle (44).
4. **For HDS10, HDS30, HDS45, TDS15, TDS30 or TDS45,** using a block with clearance for the gear pins, stand the Spindle (44) on the table of an arbor press with the collet end upward. With the seal end of the Rear Spindle Bearing (49) trailing, press the Bearing onto the large hub of the Spindle.
   For HDS60, HDS90, TDS90 or TDS120, slide the Rear Spindle Bearing (49) onto the shaft of the Spindle until it covers the Seal. Use care not to damage the Seal when sliding the Bearing over it.

5. Using snap ring pliers, install the Rear Spindle Bearing Retainer (50).
6. Using a block with clearance for the gear pins or shaft spline, stand the Spindle on the table of an arbor press with the collet end upward. With the seal end trailing, press the Front Spindle Bearing (53) onto the shaft of the Spindle until it stops against the shoulder.
7. Install the Ring Gear Clamp (43) at the bottom of the large opening in the gearing end of the Extension Housing.
8. Moisten the Front Bearing Spindle Seal (54) with O–ring lubricant and install it in the second internal groove inward from the collet end of the Extension Housing.
9. Insert the assembled Spindle, small end leading, into the large end of the Extension Housing until the Rear Spindle Bearing seats in the housing recess.

CAUTION

Make certain the Front Spindle Bearing Seal is not forced out of the groove or damaged during installation of the Spindle.

10. **For HDS60, HDS90, TDS90 or TDS120,** if the Gear Frame (35) was disassembled, proceed as follows:
    a. Stand the Gear Frame on the table of an arbor press with the notched face upward.
    b. Using a needle bearing inserting tool, press a Spur Gear Bearing (37), marked end trailing, into each of the three holes in the Gear Frame until the trailing end of the Bearing is flush with the counterbored face. Turn the Gear Frame end for end.
    c. Position a Spur Gear (36) in the Gear Frame with the small end of the Gear toward the notched face with the Bearings pressed into position.
    d. Insert a Spur Gear Pin (38) through the hole in the Gear Frame and in the Spur Gear and Spur Gear Bearing.
    e. Press a Spur Gear Bearing into the gear frame hole around the Pin until the marked end of the Bearing is flush with the counterbored face on the Gear Frame.
    f. Repeat steps (c), (d) and (e) with the remaining Spur Gears.
11. **For HDS10, HDS30, HDS45, TDS15, TDS30 or TDS45,** slide the Ring Gear (34) into the large end of the Extension Housing. Coat the teeth of the Ring Gear and the three Spindle Planet Gears (45 or 47) with approximately 2 cc of Ingersoll–Rand No. 68 Grease and install the Gears with their Bearings (46 or 48) on the spindle gear shafts. The planet gear teeth must mesh with the ring gear teeth.

    For HDS60, HDS90, TDS90 or TDS120, coat the gear train with approximately 2 cc of Ingersoll–Rand No. 68 Grease and slide the assembled Gear Frame, notched face leading, into the Housing against the Rear Spindle Bearing. The Gear Frame must engage the spline of the Spindle and force the Bearing to the bottom of the bearing recess.
12. **For HDS10 or TDS15,** insert the Gear Head Spacer (42) into the Extension Housing against the Spindle Planet Gears. Insert the Gear Head (39), spline shaft leading, into the Housing. Make certain the spline passes through the Spacer and engages the teeth of the Gears. Grease the Gear Head Planet Gears (40) and Bearings (41) and install them on the shafts of the Gear Head. Make certain the Teeth of the Gears and the Ring Gear mesh.
13. Install the Flange Clamp (24) on the small hub of the Gear Case Adapter (32) and thread the Adapter, clamp end leading, into the Motor Housing (9). This is a **left–hand thread**; rotate the Adapter **counterclockwise** to tighten it. Tighten the Adapter between 20 and 25 ft–lb (27.1 and 33.9 Nm) torque.
14. Holding the assembled Extension Housing horizontally in one hand and the assembled Motor Housing in the other hand, insert the teeth of the Rotor Pinion with the teeth of the three Planet Gears and thread the housings together. This is a **left–hand thread**; thread the housings **counterclockwise** to tighten them. Tighten the joint between 20 and 25 ft–lb (27.1 and 33.9 Nm) torque.
15. Using finger pressure, press the Seal Cup Assembly (55), felt end trailing, onto the rotor end of the Collet Body (58). Press the Cup Assembly to the shoulder of the Collet Body. Saturate the felt with Ingersoll–Rand No. 50 Oil.
16. Insert a 5/32" pin through the opening in the Extension Housing and the crosshole in the Spindle to keep the Spindle from rotating. Thread the Collet Body and Seal Cup Assembly onto the Spindle and tighten it between 14 and 19 ft–lb (19 and 26 Nm) torque. Install the Extension Housing Plug (52).
17. Slide the Spindle Bearing Shield (56), large opening first, over the Collet Body and into the the Extension Housing. Using snap ring pliers, install the Shield Retainer (57) in the internal groove in the Extension Housing.
18. Slide the Handle Clamp (61) with the assembled handle onto the Extension Housing and position the handle in the most comfortable position. Tighten the Mounting Screw Nut (64) between 10 and 12 ft–lb (13.5 and 16.3 Nm) torque.
19. Insert the Collet (59) into the Collet Body and thread the Collet Nut (60) onto the Collet Body.
20. Use the Collet Body Wrench (82) on the flats of the Collet Body and the Collet Nut Wrench (81) on the Collet Nut to tighten the Collet Nut.

TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Low power or low free speed	Insufficient air pressure	Check air line pressure at the Inlet of the Tool. It must be 90 psig (6.2 bar/620 kPa).
	Clogged muffler elements	Disassemble the Tool and agitate bare Motor Housing and Flange in clean kerosene. Back flush muffler elements by blowing into the exhaust ports with an air gun until all contaminants and obstructions are removed. If elements cannot be cleaned, replace the Motor Housing and/or the Flange.
	Plugged Inlet Screen (2)	Clean the Inlet Screen with a stream of air or replace the Screen.
	Worn or broken Vanes (17)	Install a **complete** set of new Vanes.
	Loose Extension Housing (51) or Gear Case Adapter (32)	Tighten the Housing or Adapter to 20 to 25 ft–lb (27 to 34 Nm) torque.
	Worn or broken Motor Housing (9)	Replace the Motor Housing.
	Internal air leakage in the Motor Housing indicated by high air consumption/low speed.	Replace the Motor Housing.
	Grit buildup under the Throttle Lever (10) restricting full Throttle Valve Plunger (12) movement.	Remove the Throttle Lever and clean the groove in the Motor Housing.
	Bent stem on Throttle Valve (6)	Replace the Throttle Valve.
	Front Seal Cup Assembly (20) dragging against the shield of the Front Rotor Bearing (21)	Reposition the Front Seal Cup Assembly.
Rough operation/vibration	Improper lubrication or dirt buildup	Inject 3 cc of clean kerosene into the Inlet, operate the Tool for 30 seconds and **immediately** inject 3 cc of the recommended oil into the Inlet and run the Sander long enough to coat the internal parts with the oil.
	Worn or broken Rear Rotor Bearing (13) or Front Rotor Bearing	Replace the worn or broken Bearings. Examine the Front End Plate (18), Front End Plate Spacer (19), Front Seal Cup Assembly (20) and Rear Rotor Bearing Spacers (14) and replace any damaged parts. If the attached rotor plate is damaged, replace the Rotor (16).
	Worn or broken Rear Spindle Bearing (49) or Front Spindle Bearing (53)	Replace the Bearings.
	Dirt contaminated Front Spindle Bearing	Replace the Bearing.
	Worn, bent or broken Spindle (44)	Replace the Spindle if, when mounted between centers, the runout on the spindle body exceeds 0.002" T.I.R. or 0.0005" T.I.R. on the bearing mounting diameters.

TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Excessive runout	Loose Collet Nut (60)	Tighten the Collet Nut until snug.
	Worn or damaged Collet (59), Collet Nut or Collet Body (58)	Replace the damaged component and retest.
	Bent, worn or broken Spindle	Replace the Spindle if, when mounted between centers, the runout on the spindle body exceeds 0.002" T.I.R. or 0.0005" T.I.R. on the bearing mounting diameters.
	Worn or damaged Front Spindle Bearing	Replace the Front Spindle Bearing.
Scoring	Worn Front End Plate Spacer (19) or Front End Plate (18)	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 (6) or Throttle Valve Seat (7)	Inject 3 cc of clean kerosene into the Inlet, operate the Tool for 30 seconds and **immediately** inject 3 cc of the recommended oil into the Inlet and run the Tool long enough to coat the internal parts with the oil.
	Worn Throttle Valve or Throttle Valve Seat	Replace the Throttle Valve and/or Throttle Valve Seat.
Exhausts at wrong direction	Incorrect orientation of the Flow Ring (22)	Reverse the face of the Flow Ring against the Motor Housing.
Front Rotor Bearing runs hot	Incorrect installation of the Front Seal Cup Assembly	Reposition the Front Seal Cup Assembly flush with the face of the Front End Plate Spacer.
	Front End Plate Spacer rubbing the bore of the Front End Plate	Replace the Front End Plate and Front End Plate Spacer combination.
	Incorrect Front Rotor Bearing 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 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 (24)	Replace the Flange Clamp.
	Damaged Flow Ring	Replace the Flow Ring.

NOTICE

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.

NOTES