



04579272

Form P7608-EU

Edition 1

March, 2003



OPERATION AND MAINTENANCE MANUAL FOR 1 SERIES - DRILLS AND ANGLE DRILLS

NOTICE

1 Series Drills and Angle Drills are designed for drilling operations in the aerospace, assembly, appliance, electronic, machining and furniture industries.

⚠ WARNING



**IMPORTANT SAFETY INFORMATION ENCLOSED - SAVE THESE INSTRUCTIONS
READ AND UNDERSTAND THIS MANUAL BEFORE OPERATING THIS PRODUCT
IT IS YOUR RESPONSIBILITY TO MAKE THIS SAFETY INFORMATION
AVAILABLE TO OTHERS THAT WILL OPERATE THIS PRODUCT
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY**

PLACING TOOL IN SERVICE

- Always install, operate, inspect and maintain this product in accordance with all applicable standards and regulations (local, state, country, federal, etc.).
- Always use clean, dry air at 90 psig (6.2 bar/620 kPa) maximum air pressure at the inlet. Higher pressure may result in hazardous situations including excessive speed, rupture, or incorrect output torque or force.
- Be sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905-2 for a typical piping arrangement.
- Ensure an accessible emergency shut off valve has been installed in the air supply line, and make others aware of its location.
- Do not use damaged, frayed or deteriorated air hoses and fittings.
- Keep clear of whipping air hoses. Shut off the compressed air before approaching a whipping hose.
- Always turn off the air supply, bleed the air pressure and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool or any accessory.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel. Use only recommended lubricants.
- Use only proper cleaning solvents to clean parts. Use only cleaning solvents which meet current safety and health standards. Use cleaning solvents in a well ventilated area.
- Keep work area clean, uncluttered, ventilated and illuminated.
- 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.
- Always use Personal Protective Equipment appropriate to the tool used and material worked. This may include dust mask or other breathing apparatus, safety glasses, ear plugs, gloves, apron, safety shoes, hard hat and other equipment.
- When wearing gloves always be sure that the gloves will not prevent the throttle mechanism from being released.
- Prevent exposure and breathing of harmful dust and particles created by power tool use.
Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:
 - lead from lead based paints,
 - crystalline silica from bricks and cement and other masonry products, and
 - arsenic and chromium from chemically treated lumber.Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

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

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Using the Tool (Continued)

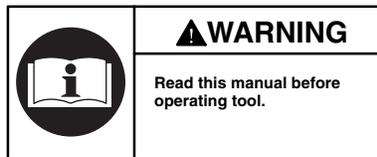
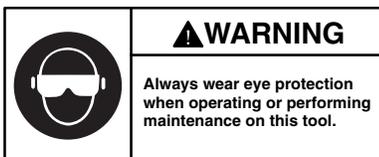
- Keep others a safe distance from your work area, or ensure they use appropriate Personal Protective Equipment.
- This tool is not designed for working in explosive environments, including those caused by fumes and dust, or near flammable materials.
- This tool is not insulated against electric shock.
- Be aware of buried, hidden or other hazards in your work environment. Do not contact or damage cords, conduits, pipes or hoses that may contain electrical wires, explosive gases or harmful liquids.
- Keep hands, loose clothing, long hair and jewelry away from working end of tool.
- Power 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.
- Keep body stance balanced and firm. Do not overreach when operating this tool. Anticipate and be alert for sudden changes in motion, reaction torques, or forces during start up and operation.
- Tool and/or accessories may briefly continue their motion after throttle is released.
- To avoid accidental starting - ensure tool is in "off" position before applying air pressure, avoid throttle when carrying, and release throttle with loss of air.
- Ensure work pieces are secure. Use clamps or vises to hold work piece whenever possible.
- Do not carry or drag the tool by the hose.
- Do not use power tools when tired, or under the influence of medication, drugs, or alcohol.
- Never use a damaged or malfunctioning tool or accessory.
- Do not modify the tool, safety devices, or accessories.
- Do not use this tool for purposes other than those recommended.
- Use accessories recommended by Ingersoll-Rand.
- When a suspension device is used, ensure that it is securely fastened.
- Be aware of the risk of crushing between the tool or reaction bar and a fixed object or workpiece, caused by torque reaction.
- Anticipate the torque reaction developed when the drill bit snags or binds, which occurs when breaking through the material being drilled or when heavily loaded. If snags or binds, release the trigger and remove the drill bit from the workpiece by rotating it in the reverse direction.
- When support handle, or other means, is provided with a high torque tool it should be used to minimize the hazard due to the reaction torque.
- Do not use any drill bits or other accessory having a maximum operating speed less than the free speed of the drill in which it is being used.
- Securely tighten drill bits or other accessories in the chuck before operating the drill. When using a chuck key, remove it before starting the drill.
- For reversible models, note the position of the reversing mechanism before operating the tool so as to be aware of the direction of rotation when operating the throttle.

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 Servicer.

WARNING SYMBOL IDENTIFICATION



LUBRICATION



Ingersoll-Rand No. 10



Ingersoll-Rand No. 28 Gearing
Ingersoll-Rand No. 67 Clutch

Always use an air line lubricator with this tool.
We recommend the following Filter-Regulator-Lubricator (FRL) Unit:

Inside USA use *FRL Unit # C08-02-FKG0-28*

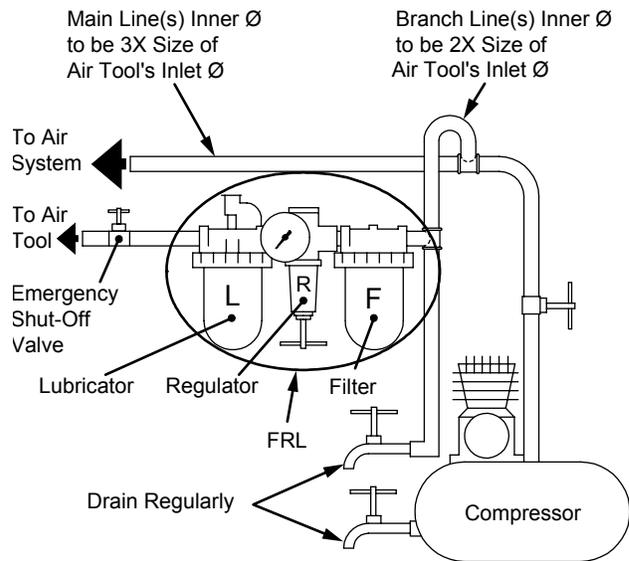
Outside USA use *FRL Unit # C08-02-FKG0*

After each 40,000 cycles or each month, whichever occurs first, lubricate the gear train with Ingersoll-Rand No. 28 Grease.

After each 40,000 cycles or each month, whichever occurs first, inject 2 to 4 cc of Ingersoll-Rand No. 67 Grease into the Grease Fitting on the Angle Attachment.

INSTALLATION

Air Supply and Connections: Always use clean, dry air. Dust, corrosive fumes and/or excessive moisture can damage the motor of an air tool. An air line filter can greatly increase the life of an air tool. The filter removes dust and moisture. Be sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905-2 for a typical piping arrangement.



(Dwg. TPD905-2)

SPECIFICATIONS

Model	Type of Handle	Chuck Capacity		Free Speed rpm	■ Sound Level dB (A)		◆ Vibrations Level m/s ²
		in.	mm		Pressure	Power	
1AL1	Pistol	1/4	6	2,800	74.1	---	0.3
1P06ST4	Pistol	1/4	6	600	74.9	---	0.2
1P09ST4	Pistol	1/4	6	900	77.2	---	0.3
1P38ST4	Pistol	1/4	6	3,800	79.2	---	0.2
1S30MF4	Straight	1/4	6	3,000	73.3	---	0.5
1LL1A1	Rt. Angle	1/4-28 female	---	2,700	73	---	0.5
1LJ1A1	Rt. Angle	1/4-28 female	---	3,700	74.2	---	0.5

- Tested in accordance with PNEUROP PN8NTC1.2 at free speed.
- ◆ Tested in accordance to ISO8662-1 at 80% rated free speed.

NOTICE

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.

When the life of the tool has expired, it is recommended that the tool be disassembled, degreased and parts be separated by material so that they can be recycled.

DECLARATION OF CONFORMITY

(F) CERTIFICAT DE CONFORMITÉ (D) KONFORMITÄT SERKLÄRUNG (I) DICHIARAZIONE DI CONFORMITÀ
 (E) DECLARACIÓN DE CONFORMIDAD (NL) SCHRIFTELIJKE VERKLARING VAN CONFORMITEIT
 (DK) FABRIKATIONSERKLÆRING (S) FÖRSÄKRAN OM ÖVERENSSTÄMMELSE
 (N) KONFORMITETSERKLÆRING (FIN) VAKUUTUS NORMIEN TÄYTTÄMISESTÄ (P) DECLARAÇÃO DE
 CONFORMIDADE (GR) ΔΗΛΩΣΗ ΑΝΑΓΝΩΡΙΣΗΣ

Supplier's Name: Ingersoll-Rand	Address: Swan Lane, Hindley Green, Wigan WN2 4EZ
(F) nom du fournisseur (DK) naam leverancier (D) Name des Herstellers (S) leverantörens namn (I) nome del fornitore (N) leverandørens navn (E) nombre del proveedor (FIN) Toimittajan nimi (NL) naam leverancier (P) nome do fornecedor (GR) όνομα προμηθευτή	(F) adresse (DK) adresse (D) Adresse (S) adress (I) indirizzo (N) adresse (E) domicilio (FIN) osoite (NL) adres (P) endereço (GR) διεύθυνση

Declare under our sole responsibility that the product: 1 Series Drills and Angle Drills

(F) Déclarons sous notre seule responsabilité que le produit: Perceuses droite et à tête d'angle 1 Série
 (D) Erklären hiermit, gemäß unserer alleinigen Verantwortung, daß die Geräte: Bohrmaschinen und Winkelbohrer der 1 Baureihe
 (I) Dichiaro sotto la nostra unica responsabilità che il prodotto: Trapani e trapani ad angolo 1 serie
 (E) Declaramos que, bajo nuestra responsabilidad exclusiva, el producto: Taladros rectos y angulares de la 1 serie
 (NL) Verklaan, onder onze uitsluitende aansprakelijkheid, dat het product: 1 TYPE Boormachines en haakse boormachines
 (DK) Erklærer som eneansvarlig, at nedenstående produkt: Boremaskiner og vinkelboremaskiner af 1 serie
 (S) Intyggar härmed, i enlighet med vårt fullständiga ansvar, att produkten: Bormaskiner och vinkelbormaskiner, 1 serie
 (N) Erklærer som eneansvarlig at produktet: 1 Serie bormaskiner og vinkelbormaskiner
 (FIN) Vakuutamme ja kannamme yksin täyden vastuun siitä, että tuote: 1 Series porakoneet ja kulmaporakoneet
 (P) Declaramos sob a nossa exclusiva responsabilidade que o produto: Berbequins 1 Série e Berbequins em Ângulo
 (GR) δηλώνουμε με αποκλειστική μας ευθύνη ότι αυτό το προϊόν: Τρυπάνια 1 σειράς έαι άωνιωτά τρυπάνια

Models:
1 Series

(F) Modelle (D) Modell (I) Modello (E) Modelo (NL) Model
 (DK) Model (S) Modell (N) Modell (FIN) Mallia (P) Modelo (GR) MONTEEA

To which this declaration relates, is in compliance with provisions of Directives: 98/37/EC

(F) objet de ce certificat, est conforme aux prescriptions des Directives: (D) auf die sich diese Erklärung bezieht, den Richtlinien: (I) a cui si riferisce la presente dichiarazione è conforme alle normative delle direttive:
 (E) a los que se refiere la presente declaración, cumplen con todo lo establecido en las directivas: (NL) waarop deze verklaring betrekking heeft overeenkomt met de bepalingen van directieven: (DK) som denne erklæring vedrører, overholder bestemmelserne i følgende direktiver: (S) som detta intyg avser, uppfyller kraven i Direktiven:
 (N) som denne erklæringen gjelder for, oppfyller bestemmelsene i EU-direktivene: (FIN) johon tämä vakuutus viittaa, täyttää direktiiveissä: (P) ao qual se refere a presente declaração, está de acordo com as prescrições das Directivas:
 (GR) τα οποία αφορά αυτή η δήλωση, είναι σύμφωνα με τις προβλέψεις των Εντολών:

By using the following Principle Standards: EN792-3, ISO8662, PNEUROP, PN8NTC1.2

(F) en observant les normes de principe suivantes: (D) unter Anlehnung an die folgenden Grundnormen entsprechen:
 (I) secondo i seguenti standard: (E) conforme a los siguientes estándares: (NL) overeenkomstig de volgende hoofdstandaards: (DK) ved at være i overensstemmelse med følgende hovedstandard(er): (S) Genom att använda följande principstandard: (N) ved å bruke følgende prinsipielle standarder: (FIN) esitetty vaatimukset seuraavia perusnormeja käytettäessä: (P) observando as seguintes Normas Principais: (GR) Χρησιμοποιώντας τις ακόλουθες Αρχές Κανονισμών:

Serial Number Range: (2003 →) WI03a XXXXX →

Date: March, 2003

(F) No. Serie: (DK) Serienr:
 (D) Serien-Nr.-Bereich: (S) Seriennummer, mellan:
 (I) Numeri di Serie: (N) Serienr:
 (E) Gama de No. de Serie: (FIN) Sarjanumero:
 (NL) Seriennummers: (P) Gama de Nos de Série:
 (GR) Κλίμακα Αύξοντος Αριθμού:

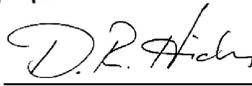
(F) Date: Mars, 2003
 (D) Datum: März, 2003
 (I) Data: Marzo, 2003
 (E) Fecha: Marzo, 2003
 (NL) Datum: Maart, 2003
 (DK) Dato: Marts, 2003
 (S) Datum: Mars, 2003
 (N) Dato: Mars, 2003
 (FIN) Päiväys: Maaliskuu, 2003
 (P) Data: Março, 2003
 (GR) Ημερομηνία: Μάρτιος, 2003

Approved By:

(F) Approuvé par: (DK) Godkendt af:
 (D) Genehmigt von: (S) Godkänt av:
 (I) Approvato da: (N) Godkjent av:
 (E) Aprobado por: (FIN) Hyväksytty:
 (NL) Goedgekeurd door: (P) Aprovado por:
 (GR) Εγκρίθηκε από:



D. Vose



D. R. Hicks



04579272

Form P7608-EU

Révision 1

Mars, 2003

F

MANUEL D'EXPLOITATION ET D'ENTRETIEN POUR LES PERCEUSES DROITE & A TETE D'ANGLE DE LA 1 SÉRIE

NOTE

Les perceuses droites et à tête d'angle de la 1 Série sont destinées aux opérations de perçage dans les industries de l'aérospatiale, de l'assemblage, de la fabrication mécanique, du meuble, de l'électronique et des appareils ménagers.

⚠ ATTENTION

D'IMPORTANTES INFORMATIONS DE SECURITÉ SONT JOINTES -
CONSERVEZ SOIGNEUSEMENT CES INSTRUCTIONS.

LISEZ ET ASSIMILEZ CE MANUEL AVANT D'UTILISER CE PRODUIT.

IL VOUS INCOMBE DE TRANSMETTRE CES INFORMATIONS
DE SECURITE A TOUTES LES PERSONNES QUI UTILISERONT CE PRODUIT.

LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES.



MISE EN SERVICE DE L'OUTIL

- Installez, exploitez, inspectez et entretenez toujours ce produit conformément à toutes les normes et réglementations (locales, départementales, nationales, fédérales, etc.) en vigueur.
- Utilisez toujours de l'air sec et propre à une pression maximum de 90 psig (6,2 bar, 620kPa). Toute pression supérieure peut créer des situations dangereuses y compris une vitesse excessive, une rupture ou un couple ou effort de sortie incorrect.
- S'assurer que tous les flexibles et les raccords sont correctement dimensionnés et bien serrés. Voir Plan TPD905-2 pour un exemple type d'agencement des tuyauteries.
- Vérifiez qu'un robinet d'arrêt d'urgence accessible a bien été installé dans le circuit d'alimentation d'air et notifier son emplacement à tout le personnel.
- Ne pas utiliser des flexibles ou des raccords endommagés, effilochés ou détériorés.
- En cas de rupture ou d'éclatement du flexible d'air ne pas s'approcher. Couper le réseau d'air comprimé avant d'approcher du flexible d'air.
- Coupez toujours l'alimentation d'air comprimé, purgez la pression d'air et débranchez 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 lubrifiez jamais les outils avec des liquides inflammables ou volatils tels que le kérosène, le gasoil ou le carburant d'aviation. Utilisez seulement les lubrifiants recommandés.
- N'utilisez que des solvants de nettoyage appropriés pour nettoyer les pièces. Utilisez seulement les solvants répondant aux réglementations de santé et de sécurité en vigueur. Utilisez les solvants de nettoyage dans une zone adaptée.
- Maintenez le lieu de travail propre, sans obstruction, aéré et bien éclairé.
- Ne retirer aucune étiquette. Remplacer toute étiquette endommagée.

USING THE TOOL

- 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.
- Portez toujours les équipements de protection personnelle adaptés à l'outil utilisé et au matériau travaillé. Ces équipements peuvent être des masques anti-poussière ou autre appareil respiratoire, des lunettes de sécurité, des bouchons d'oreille, des gants, un tablier, des chaussures de sécurité, un casque et d'autres équipements.
- Si vous portez des gants, vérifiez toujours que les gants ne vous empêcheront pas de relâcher le mécanisme de commande.
- Évitez toute exposition et respiration des poussières et particules nocives créées par l'emploi de l'outil pneumatique:

Certaines poussières produites par les opérations de ponçage, sciage, meulage, perçage et autres activités de construction contiennent des produits chimiques qui sont reconnus comme pouvant causer le cancer, des infirmités de naissance ou d'autres risques à effets nocifs. Parmi ces produits chimiques on trouve:

- le plomb des peintures à base de plomb,
- les cristaux de silice contenus dans les briques, le ciment et d'autres produits de maçonnerie, et
- l'arsenic et le chrome des bois traités chimiquement.

Le risque présenté par l'exposition à ces poussières est fonction de la fréquence et du type de travail effectué. Pour réduire l'exposition à ces produits chimiques : travaillez dans une zone bien aérée, et utilisez les équipements de sécurité approuvés, tels que les masques à poussière qui sont spécialement conçus pour filtrer et arrêter les particules microscopiques.

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

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Imprimé aux India



Utilisation de l'Outil (Continued)

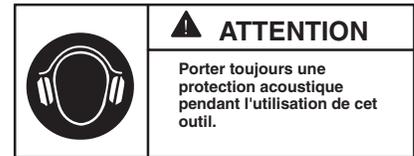
- Tenez les gens à une distance sûre de la zone de travail ou vérifiez qu'ils utilisent des équipements de protection personnelle appropriés.
- Cet outil n'est pas conçu pour fonctionner dans des atmosphères explosives, y compris celles créées par les vapeurs ou les poussières ou près de matériaux inflammables.
- Cet outil n'est pas isolé contre les chocs électriques.
- Soyez conscient des risques, cachés ou autres dans votre environnement de travail. N'entrez jamais en contact avec les câbles, les conduites, les tuyaux ou les flexibles qui pourraient contenir des câbles électriques, des gaz explosifs ou des liquides dangereux.
- Gardez les mains, vêtements amples, cheveux longs et bijoux éloignés de l'extrémité rotative de l'outil.
- Les outils électriques peuvent vibrer pendant l'usage. Les vibrations, les mouvements répétitifs et les positions inconfortables peuvent causer des douleurs dans les mains et les bras. Cessez d'utiliser les outils en cas d'inconfort, de picotements ou de douleurs. Consultez un médecin avant de recommencer à utiliser l'outil.
- Garder une position équilibrée et ferme. Ne pas se pencher trop en avant pendant l'utilisation de cet outil. Anticiper et prendre garde aux changements soudains de mouvement, couples de réaction ou forces lors du démarrage et de l'exploitation.
- L'outil et/ou les accessoires peuvent continuer à tourner brièvement après le relâchement de la gâchette.
- Pour éviter toute mise en marche accidentelle - vérifiez que l'outil est à la position "arrêt" avant d'appliquer l'air comprimé, évitez de toucher la commande de mise en marche lorsque vous transportez l'outil et relâcher la commande lorsque la pression d'air chute.
- Vérifiez que les pièces à travailler sont fermement fixées. Utilisez des brides ou un étau pour retenir les pièces lorsque possible.
- Ne transportez pas l'outil par son flexible d'air comprimé.
- N'utilisez pas d'outils lorsque vous êtes fatigué ou sous l'influence de médicaments, de drogues ou d'alcool.
- N'utilisez jamais un outil ou accessoire endommagé ou de fonctionnement douteux.
- Ne modifiez jamais l'outil, les dispositifs de sécurité ou les accessoires.
- N'utilisez pas cet outil à des fins autres que celles recommandées.
- Utiliser les accessoires recommandés par Ingersoll-Rand.
- Lorsqu'un dispositif de suspension est employé, vérifiez qu'il est fermement attaché.
- Soyez conscient du risque d'écrasement entre l'outil ou la barre de réaction et un objet fixe ou la pièce, causé par la réaction de couple.
- Anticipez la réaction de couple causée par le coincement du foret qui peut se produire lorsqu'il débouche de la pièce ou lorsqu'il est soumis à une charge excessive. En cas de coincement, relâchez la gâchette et retirez le foret de la pièce en le faisant tourner dans le sens inverse.
- Lorsqu'une poignée secondaire, ou tout autre moyen, est prévue sur un outil à couple élevé, utilisez-la pour réduire au minimum les risques dus au couple de réaction.
- N'utilisez jamais un foret ou tout autre accessoire ayant une vitesse de service inférieure à la vitesse à vide de la perceuse sur laquelle il est monté.
- Serrez fermement les forets ou autres accessoires dans le mandrin avant d'employer la perceuse. Lorsqu'une clé de mandrin est utilisée, retirez-la avant de mettre la perceuse en marche.
- Pour les modèles réversibles, notez la position du levier d'inversion avant de mettre l'outil en marche de manière à savoir dans quel sens il va tourner lorsque la commande est actionnée.

NOTE

L'utilisation de recharges 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.

SIGNIFICATION DES SYMBOLES D'AVERTISSEMENT



LUBRIFICATION



Ingersoll-Rand No. 10



Ingersoll-Rand No. 28 Gearing
Ingersoll-Rand No. 67 Clutch

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

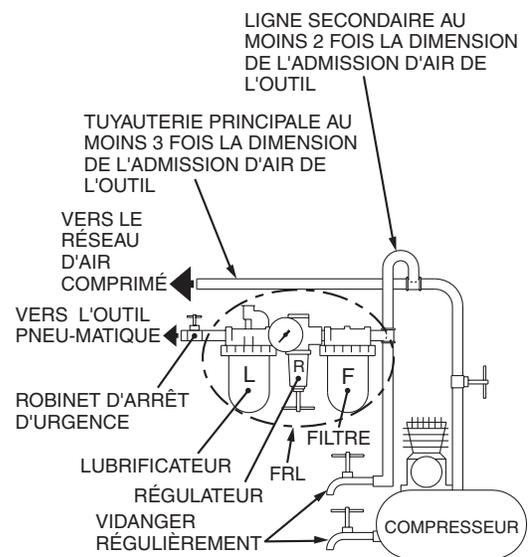
Aux Etats-Unis, utiliser FRL #C08-02-FKG0-28
En dehors des Etats-Unis, utiliser FRL #C08-02-FKG0

Tous les 40.000 cycles ou au moins tous les mois, lubrifier le train d'engrenages avec de la graisse Ingersoll-Rand No. 28.

Tous les 40.000 cycles ou au moins tous les mois, selon le cas, injecter 2 à 4 cm³ de graisse Ingersoll-Rand No. 67 dans le raccord de graissage du renvoi d'angle.

INSTALLATION

Toujours utiliser de l'air sec et propre. La poussière, les fumées corrosives et/ou l'humidité excessive peuvent endommager le moteur d'un outil pneumatique. Un filtre à air permet de prolonger considérablement sa durée de vie. Le filtre élimine la rouille, le tartre, l'humidité et les autres débris qui peuvent s'accumuler dans les tuyaux d'air. S'assurer que tous les flexibles et les raccords sont correctement dimensionnés et bien serrés. Voir Plan TPD905-2 pour un exemple type d'agencement des tuyauteries.



(Plan TPD905-2)

SPÉCIFICATIONS

Modèle	Poignée à levier	Capacité du mandrin		Vitesse à vide tr/mn	■ Niveau sonore dB (A)		◆ Niveau de vibration m/s ²
		pouces	mm		Pression	Puissance	
1AL1	pistolet	1/4	6	2.800	74,1	---	0,3
1P06ST4	pistolet	1/4	6	600	74,9	---	0,2
1P09ST4	pistolet	1/4	6	900	77,2	---	0,3
1P38ST4	pistolet	1/4	6	3.800	79,2	---	0,2
1S30MF4	Straight	1/4	6	3.000	73,3	---	0,5
1LL1A1	Rt. Angle	1/4-28 female	---	2.700	73	---	0,5
1LJ1A1	Rt. Angle	1/4-28 female	---	3.700	74,2	---	0,5

- Testé selon PNEUROP PN8NTC1.2 à la vitesse à vide.
- ◆ Testé selon ISO8662-1 à 80% de la vitesse à vide nominale.

NOTE

CONSERVEZ SOIGNEUSEMENT CES INSTRUCTIONS. NE PAS LES DÉTRUIRE.

A la fin de sa durée de vie, il est recommandé de démonter l'outil, de dégraisser les pièces et de les séparer en fonction des matériaux de manière à ce que ces derniers puissent être recyclés.



04579272

Form-Nr. P7608-EU

Ausgabe 1

März, 2003



BETRIEBS- UND WARTUNGS-HANDBUCH FÜR BOHRMASCHINEN UND WINKELBOHRER DER 1 BAUREIHE

HINWEIS

Bohrmaschinen und Winkelbohrer der 1 Baureihe werden eingesetzt für Bohranwendungen in der Luft- und Raumfahrt-, sowie der Möbel-Industrie, bei der Montage, der Herstellung von Geräten, in der Elektronik und bei der spanenden Verarbeitung.

⚠ ACHTUNG

NACHFOLGEND WICHTIGE SICHERHEITSHINWEISE - DIESE ANWEISUNGEN SIND SORGFÄLTIG AUFZUBEWAHREN.



DIESE ANLEITUNG VOR INBETRIEBNAHME DES PRODUKTS UNBEDINGT GRÜNDLICH DURCHLESEN.

ES FÄLLT IN IHREN VERANTWORTUNGSBEREICH, DIESE SICHERHEITSMITTEILUNGEN ANDEREN BENUTZERN DES PRODUKTS ZUGÄNGLICH ZU MACHEN. DIE NICHTEINHALTUNG DIESER WARNHINWEISE KANN ZU VERLETZUNGEN FÜHREN.

INBETRIEBNAHME DES WERKZEUGES

- Dieses Produkt stets in Übereinstimmung mit örtlich und landesweit geltenden Normen und gesetzlichen Bestimmungen installieren, betreiben, prüfen und instandhalten.
- Stets reine, trockene Druckluft mit 6,2 bar (620 kPa/90 psig) Höchstdruck am Einlaß verwenden. Bei höheren Drücken können Gefahrensituationen auftreten - u.a. überhöhte Werkzeugdrehzahl, Riß von Druckluftverbindungen, falsches Abgabedrehmoment, falsche Abgabeleistung.
- Darauf achten, daß alle Schläuche und Anschlüsse die passende Größe haben und korrekt befestigt sind. In Zeichnung TPD905-2 ist eine typische Rohrleitungsanordnung abgebildet.
- Sicherstellen, daß in der Druckluft-Versorgungsleitung ein zugänglich angeordnetes Notaus-Absperrventil vorgesehen ist, und dessen Lage anderen mitteilen.
- Keine beschädigten, durchgescheuerten oder abgenutzten Luftschläuche und Anschlüsse verwenden.
- Von gelösten, schlagenden Druckluftschläuchen fernhalten. Vor Annäherung an einen schlagenden Druckluftschlauch Druckluftversorgung abschalten.
- Vor Montage, Demontage oder Verstellung von Aufsatzteilen bzw. Wartungsarbeiten an Werkzeug oder Aufsatzteilen stets die Druckluftversorgung allseitig abschalten, Werkzeug entlüften und Druckluftschlauch abtrennen.
- Werkzeuge nicht mit brennbaren oder flüchtigen Flüssigkeiten wie Kerosin und Diesel schmieren. Nur empfohlene Schmierstoffe verwenden.
- Nur geeignete Reinigungslösungen benutzen, die den einschlägigen Sicherheits-, und Gesundheitsnormen entsprechen. Reinigungslösungen nur in gut belüfteten Bereichen verwenden.
- Arbeitsbereich sauber und aufgeräumt halten und für ausreichende Belüftung und gute Beleuchtung sorgen.
- Keine Aufkleber entfernen. Beschädigte Aufkleber austauschen.

WERKZEUGEINSATZ

- Beim Betreiben oder Warten dieses Werkzeuges stets Augenschutz tragen.
- Beim Betreiben dieses Werkzeuges stets Gehörschutz tragen.
- Stets persönliche Schutzausrüstung tragen, die auf das verwendete Werkzeug und den bearbeiteten Werkstoff abgestimmt ist. Hierzu können Staubschutzmasken oder andere Atemschutzgeräte gehören, Schutzbrillen, Gehörschutz, Handschuhe, Schürzen, Sicherheitsschuhe, Schutzhelme und andere Schutzausrüstungen.
- Werden Handschuhe getragen, so ist darauf zu achten, dass die Handschuhe das Loslassen des Drosselmechanismus nicht behindern.
- Vermeiden Sie, sich den Schadstoffen auszusetzen und die Schadstoffe einzusatmen, die bei Verwendung von Elektro- und Druckluftwerkzeugen freigesetzt werden:
Bei der Nutzung von Maschinen zum Schleifen, Sägen, Trennschleifen, Bohren und weiteren Tätigkeiten auf dem Bausektor entstehen Stäube, die ihrerseits Chemikalien enthalten, die bekanntermaßen Krebs,

Schädigungen der Nachkommen oder andere Schädigungen des menschlichen Reproduktionssystems verursachen. Zu Beispielen für diese Chemikalien zählen:

- Blei, freigesetzt aus bleihaltigen Anstrichstoffen,
- Kristallines Silikat, abgegeben von Ziegeln und Zement sowie weiteren Baustoffen und
- Arsen und Chrom, freigesetzt aus chemisch behandelten Hölzern.

Die durch solche Aussetzungen bedingten Risiken für die Gesundheit unterscheiden sich je nach der Häufigkeit, mit der solche Tätigkeiten durchgeführt werden. Um die Aussetzung zu diesen chemischen Stoffen herabzusetzen, sind folgende Maßnahmen zu ergreifen: Alle Arbeiten sind in gut belüfteten Bereichen durchzuführen und bei allen Arbeiten sind zugelassene persönliche Schutzausrüstungen zu tragen. Hierzu gehören beispielsweise Atemschutzmasken, die spezifisch auf das Herausfiltern mikroskopisch kleiner Partikel ausgelegt sind.

Wenden Sie sich bei Rückfragen an Ihre nächste Ingersoll-Rand-Niederlassung oder den autorisierten Fachhandel.

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Druck: India



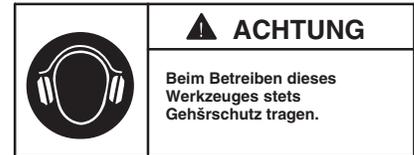
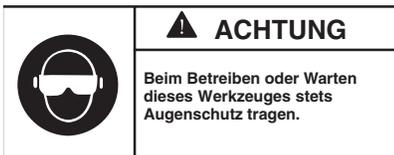
- Dritte in sicherer Entfernung vom eigenen Arbeitsbereich halten oder sicherstellen, daß sie angemessene persönliche Schutzausrüstung tragen.
- Dieses Werkzeug nicht in explosionsgefährdeten Umgebungen einsetzen, einschließlich solcher Bedingungen, die in Anwesenheit von Rauch, Stäuben oder möglicherweise brennbaren Materialien geschaffen werden.
- Dieses Werkzeug ist nicht gegen elektrischen Schlag isoliert.
- Auf nicht direkt erkennbare Gefährdungen am eigenen Arbeitsplatz achten. Nicht mit Leitungen, Führungen, Rohren oder Schläuchen, die elektrische Kabel, flammbare Gase oder schädliche Flüssigkeiten führen können, in Kontakt kommen oder diese beschädigen.
- Hände, lose Bekleidungsstücke, lange Haare und Schmuckstücke vom beweglichen Ende des Werkzeuges fernhalten.
- Elektro- und Druckluftwerkzeuge können während des Betriebs vibrieren. Vibrationen, häufige gleichförmige Bewegungen oder unbequeme Positionen können schädlich für Hände und Arme sein. Bei Unbehagen, Kribbeln oder Schmerzen Werkzeuge nicht weiterbenutzen. Vor dem erneuten Arbeiten mit dem Werkzeug ärztlichen Rat einholen.
- Auf sichere Körperhaltung achten. Während der Benutzung des Werkzeuges nicht zu weit nach vorne lehnen. Bei Anlauf und Betrieb auf Rückschlag achten und auf plötzliche Änderungen der Reaktionsdrehmomente und Gegenkräfte vorbereitet sein.
- Nach Freigabe des Drückers können Werkzeug und/oder Zubehörteile noch kurzzeitig weiterlaufen.
- Zur Vermeidung unbeabsichtigten Anlaufens sicherstellen, daß das Werkzeug ausgeschaltet ist, ehe die Druckluftversorgung hergestellt wird. Werkzeug nicht am Drücker tragen und bei Verlust der Druckluftversorgung den Drücker freigeben.
- Auf sicheren Sitz des Werkstücks achten. Wenn möglich, Werkstück mit Zwingen festklemmen oder in einen Schraubstock einspannen.
- Das Werkzeug nicht am Schlauch tragen oder ziehen.
- Werkzeug nicht in übermüdetem Zustand oder unter dem Einfluß von Arzneimitteln, Drogen oder Alkohol einsetzen.
- Niemals ein beschädigtes oder nicht korrekt funktionierendes Werkzeug oder Zubehörteil verwenden.
- Keine Modifikationen an Werkzeug, Sicherheitseinrichtungen oder Zubehörteilen vornehmen.
- Dieses Werkzeug lediglich für die empfohlenen Verwendungszwecke nutzen.
- Stets von Ingersoll-Rand empfohlenes Zubehör verwenden.
- Wird eine Aufhängevorrichtung genutzt, ist sicherzustellen, dass diese sicher befestigt wurde.
- Aufgrund des Reaktionsmoments ist stets auf das Quetschrisiko zwischen Werkzeug oder Reaktionsstab und einem feststehenden Objekt oder dem Werkstück zu achten.
- Auf das Reaktionsmoment durch einen festhängenden oder klemmenden Bohrer vorbereitet sein, Dies stellt sich bei hoher Belastung oder Durchbohren des Werkstücks ein. Bei Festhängen oder Klemmen den Drücker loslassen und den Bohrer durch Drehung in Gegenrichtung aus dem Werkstück entfernen.
- Wenn ein mit hohem Drehmoment arbeitendes Werkzeug mit einem Hilfsgriff o.ä. ausgerüstet ist, sollte dieser genutzt werden, um die vom Reaktionsmoment ausgehende Gefahr auf ein Mindestmaß zu verringern.
- Niemals Bohrer oder sonstiges Zubehör verwenden, deren Betriebsgeschwindigkeit geringer als die Leerlaufdrehzahl der eingesetzten Bohrmaschine ist.
- Vor Benutzung der Bohrmaschine Bohrer oder anderes Zubehör sicher im Bohrfutter befestigen. Genutzten Bohrfutterschlüssel vor Starten der Maschine abnehmen.
- Bei umsteuerbaren Modellen vor der Inbetriebnahme auf die Stellung der Umsteuereinrichtung achten, damit bei Betätigung des Drückers die Drehrichtung schon bekannt ist.

HINWEIS

Die Verwendung von nicht Original-Ingersoll-Rand-Ersatzteilen kann Sicherheitsrisiken, verringerte Standzeit und erhöhten Wartungsbedarf nach sich ziehen und alle Garantieleistungen ungültig machen.

Reparaturen sollen nur von geschultem Personal durchgeführt werden. Wenden Sie sich an Ihre nächste Ingersoll-Rand-Niederlassung oder den autorisierten Fachhandel.

IDENTIFIKATION VON WARNSYMBOLEN



Modell	Griffart	Spannfutterkapazität		Freie Drehzahl	■ Schallpegel dB (A)		◆ Schwingungsintensität
		Zoll	Nm	U/min	Druck	Leistung	m/s ²
1AL1	Pistolengriff	1/4	6	2.800	74,1	---	0,3
1P06ST4	Pistolengriff	1/4	6	600	74,9	---	0,2
1P09ST4	Pistolengriff	1/4	6	900	77,2	---	0,3
1P38ST4	Pistolengriff	1/4	6	3.800	79,2	---	0,2
1S30MF4	Straight	1/4	6	3.000	73,3	---	0,5
1LL1A1	Rt. Angle	1/4-28 female	---	2.700	73	---	0,5
1LJ1A1	Rt. Angle	1/4-28 female	---	3.700	74,2	---	0,5

- Gemäß PNEUROP PN8NTC1.2 bei freier Drehzahl getestet.
- ◆ Gemäß ISO8662-1 bei 80% der freien Nandrehzahl getestet.

HINWEIS

DIESE ANWEISUNGEN SIND SORGFÄLTIG AUFZUBEWAHREN. NICHT ZERSTÖREN.

Zur Entsorgung ist das Werkzeug vollständig zu demontieren, zu entfetten und nach Materialarten getrennt der Wiederverwertung zuzuführen.



04579272

Modulo P7608-EU

Edizione 1

Marzo, 2003



MANUALE OPERATIVO E DI MANUTENZIONE PER I TRAPANI E TRAPANI AD ANGOLO DELLA 1 SERIE

AVVISO

I trapani e i trapani ad angolo 1 serie sono stati progettati per operazioni di foratura nell'industrie aerospaziale, di montaggio, degli elettrodomestici, di elettronica, di meccanica e dei mobili.

⚠ AVVERTENZA



**IMPORTANTE INFORMAZIONE DI SICUREZZA ACCLUSA -
CONSERVARE QUESTE ISTRUZIONI.**

**LEGGERE ATTENTAMENTE IL PRESENTE MANUALE
PRIMA DI USARE QUESTO PRODOTTO.**

**QUESTE INFORMAZIONI SULLA SICUREZZA DEVONO ESSERE MESSE A COMPLETA
DISPONIBILITÀ DI COLORO CHE UTILizzeranno QUESTO PRODOTTO.**

LA MANCATA OSSERVANZA DELLE SEGUENTI AVVERTENZE PUÒ CAUSARE LESIONI FISICHE.

MESSA IN SERVIZIO DELL'ATTREZZO

- L'installazione, il funzionamento, l'ispezione e la manutenzione di questo prodotto devono essere condotti in conformità di tutte le normative e standard pertinenti (locali, nazionali, regionali, ecc.).
- Usare sempre aria pulita e asciutta con pressione massima in ingresso di 6,2 bar/620 kPa (90 psi). Se la pressione supera questo valore si possono creare situazioni di pericolo, tra cui velocità eccessiva, forza o coppia di uscita non corrette e rotture.
- Assicurarsi che tutti i tubi ed i raccordi siano delle corrette dimensioni e saldamente serrati. Consultare il disegno TPD905-2 per una tipica disposizione dei tubi.
- Accertarsi che la valvola d'arresto di emergenza accessibile sia stata installata nel tubo di alimentazione dell'aria e rendere disponibile questa informazione.
- Non adoperare tubi e raccordi danneggiati, consunti o deteriorati.
- Porre attenzione ai tubi flessibili che agiscono come fruste. Chiudere l'aria compressa prima di avvicinarsi ad un tubo flessibile in movimento.
- Disinserire sempre l'alimentazione aria, scaricare la pressione dell'aria e staccare il relativo tubo dall'attrezzo, prima di installare, togliere o regolare qualsiasi accessorio, oppure prima di eseguire qualsiasi operazione di manutenzione dell'attrezzo o di qualsiasi accessorio.
- Non lubrificare gli attrezzi con liquidi infiammabili o volatili come kerosene, gasolio o combustibile per aviogetti. Usare solo i lubrificanti raccomandati.
- Usare soltanto solventi detergenti di tipo adatto per pulire le parti. Usare soltanto solventi detergenti che siano conformi alle norme vigenti in materia di sicurezza e prevenzione infortuni. Usare i solventi detergenti in un'area ben ventilata.
- Tenere l'area di lavoro pulita, sgombra, ventilata ed illuminata.
- Non togliere nessuna etichetta. Sostituire eventuali etichette danneggiate.

COME USARE L'ATTREZZO

- Indossare sempre degli occhiali protettivi quando si adopera questo attrezzo o se ne esegue la manutenzione.
- Indossare sempre delle cuffie protettive quando si adopera questo attrezzo.
- Indossare sempre attrezzatura protettiva adeguata allo strumento e ai materiali in uso. Tra questi una mascherina parapolvere o oggetti simili, occhiali di sicurezza, paraorecchi, guanti, grembiule, scarpe di sicurezza, elmetto e altri indumenti di protezione.
- Quando si indossano dei guanti, assicurarsi che questi non impediscano di disinserire il dispositivo di regolazione.
- Prevenire l'esposizione e la respirazione di polvere e particelle pericolose dovute all'uso di strumenti elettrici:
La polvere causata da smerigliatura, segatura, macinatura, trapanatura e altre attività relative alla costruzione contiene sostanze chimiche note come cause di cancro, di menomazioni alla nascita o di altri danni legati alla riproduzione. Tali sostanze chimiche sono, ad esempio:
 - vernici a base di piombo,
 - silice cristallina derivante da mattoni e cemento e altri prodotti per muratura,
 - arsenico e cromo derivanti da legname trattato chimicamente.I rischi causati dalle esposizioni variano in base alla frequenza con cui viene eseguito questo tipo di lavori. Per ridurre l'esposizione a tali sostanze chimiche: lavorare in una zona ben ventilata, con attrezzature di sicurezza approvate come le maschere per protezione dalla polvere progettate specificamente per eliminare con il filtro le particelle microscopiche.

Indirizzare tutte le comunicazioni al più vicino
concessionario od ufficio Ingersoll-Rand.

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Stampato in India



- Tenere le persone ad una distanza di sicurezza dall'area di lavoro ed accertarsi che esse utilizzino l'attrezzatura protettiva adeguata.
- Questo attrezzo non è stato progettato per essere impiegato in ambienti a rischio di esplosione per fumi e polveri e nelle vicinanze di materiali infiammabili.
- Questo utensile non è isolato contro le scosse elettriche.
- Informarsi sui pericoli nascosti nel proprio ambiente di lavoro. Non toccare o danneggiare cavi, condotti, tubi o flessibili che possano contenere cavi elettrici, gas esplosivi o liquidi pericolosi.
- Tenere le mani, vestiti larghi, capelli lunghi e gioielleria fuori dalla portata del lato in funzione dell'utensile.
- Gli attrezzi elettrici sono soggetti a vibrazioni durante l'uso. Le vibrazioni, i movimenti ripetitivi o le posizioni scomode possono risultare dannosi per mani e braccia. Interrompere l'uso dell'attrezzo se si avvertono sintomi di disagio fisico, formicolio o dolore. Interpellare un medico prima di riprendere il lavoro.
- Mantenere con il corpo una posizione salda e ben bilanciata. Nonsbilanciarsi durante l'uso di questo utensile. Fare attenzione e cercare di anticipare improvvise variazioni di movimento, coppie di reazione, o forze inaspettate durante l'avviamento e l'uso di qualsiasi utensile.
- Lo strumento e/o gli accessori potrebbero continuare a ruotare per un breve tempo dopo il disinserimento della valvola a farfalla.
- Per evitare avvii accidentali - accertarsi che lo strumento sia in posizione "off" prima di applicare la pressione dell'aria, evitare di toccare la valvola a farfalla durante lo spostamento, rilasciare la valvola a farfalla in caso di perdite d'aria.
- Accertarsi che i pezzi di lavorazione siano sicuri. Consigliamo di usare dei morsetti o una morsa per bloccare, il pezzo in lavorazione.
- Non trasportare o trascinare l'attrezzo tenendolo per il tubo.
- Evitare l'uso degli attrezzi elettrici quando si è stanchi, sotto l'effetto di medicinali, droghe o alcol.
- Non usare mai attrezzi o accessori danneggiati o malfunzionanti.
- Non modificare in alcun modo lo strumento, i dispositivi di sicurezza o gli accessori.
- Non usare questo strumento per scopi diversi da quelli consigliati.
- Usare accessori raccomandati dalla Ingersoll-Rand.
- Quando viene utilizzato un attrezzo a sospensione, accertarsi che sia bloccato saldamente.
- Essere sempre a conoscenza del rischio di schiacciamento tra l'attrezzo o la barra di reazione ed un oggetto fisso o il pezzo di lavorazione, causato dalla controspinta della coppia.
- Prevedere lo sviluppo della reazione di coppia quando la punta del trapano inceppa o grippa. Ciò può verificarsi quando si forano materiali particolarmente duri, o quando si applica un carico eccessivo. Se la punta si inceppa o si grippa, rilasciare il grilletto e rimuovere la punta del trapano dal pezzo in lavorazione ruotandolo in senso inverso.
- Quando insieme ad un attrezzo ad alta coppia viene fornita un'impugnatura di supporto, o altro, tale supporto va utilizzato per minimizzare i pericoli dovuti alla coppia di reazione.
- Non adoperare alcuna punta per trapani, o altro accessorio, avente una velocità operativa massima inferiore alla velocità libera del trapano su cui viene montata.
- Prima di utilizzare il trapano serrare saldamente le punte del trapano o altri accessori nel mandrino. Quando si utilizza la chiave per mandrino, rimuoverla prima di avviare il trapano.
- Nei modelli reversibili, prendere nota della posizione del meccanismo di inversione prima di azionare l'attrezzo in modo da conoscere la direzione di rotazione quando si aziona la valvola di azionamento.

AVVISO

L'uso di ricambi non originali Ingersoll-Rand potrebbe causare condizioni di pericolosità, compromettere le prestazioni dell'attrezzo ed aumentare la necessità di manutenzione, inoltre potrebbe invalidare tutte le garanzie.

Le riparazioni devono essere effettuate soltanto da personale autorizzato e qualificato. Rivolgersi al più vicino centro di assistenza tecnica Ingersoll-Rand.

IDENTIFICAZIONE DEI SIMBOLI DI AVVERTENZA





Ingersoll-Rand Nr. 10



Ingersoll-Rand Nr. 28 Ingranaggi
Ingersoll-Rand Nr. 67 Frizione

Con questi attrezzi usare sempre un lubrificatore di linea.
Si raccomanda l'uso del seguente gruppo filtro-regolatore-lubrificatore (FRL):

All'interno degli Stati Uniti utilizzare FRL N. C08-02-FKG0-28

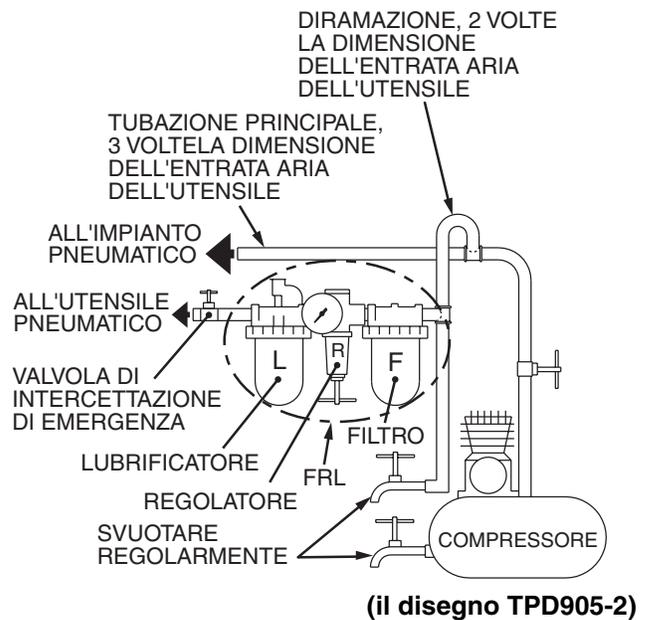
Fuori degli Stati Uniti utilizzare FRL N. C08-02-FKG0

Dopo ogni 40.000 cicli o ogni mese, secondo quale condizione si verifichi prima, lubrificare il treno degli ingranaggi con grasso Ingersoll-Rand Nr. 28.

Dopo ogni 40.000 cicli o ogni mese, secondo quale circostanza si verifichi prima, iniettare nell'ingrassatore posto sulla testa ad angolo da 2 a 4 cc di grasso Ingersoll-Rand Nr. 67.

INSTALLAZIONE

Utilizzare sempre aria asciutta e pulita. La polvere, i fumi corrosivi e/o l'eccessiva umidità possono danneggiare il motore degli utensili pneumatici. Il filtro per tubi dell'aria può notevolmente prolungare la durata di un utensile pneumatico. Il filtro rimuove la ruggine, le scorie, l'umidità ed altri detriti dai tubi dell'aria. Assicurarsi che tutti i tubi ed i raccordi siano delle corrette dimensioni e saldamente serrati. Consultare il disegno TPD905-2 per una tipica disposizione dei tubi.



Modello	Tipo d'impugnatura	Capacità del mandrino		Velocità libera giri/min	■ Livello di rumorosità dB (A)		◆ Livello di vibrazione m/s ²
		poll.	mm		Pressione	Potenza	
1AL1	a squadra	1/4	6	2.800	74,1	---	0,3
1P06ST4	a squadra	1/4	6	600	74,9	---	0,2
1P09ST4	a squadra	1/4	6	900	77,2	---	0,3
1P38ST4	a squadra	1/4	6	3.800	79,2	---	0,2
1S30MF4	Straight	1/4	6	3.000	73,3	---	0,5
1LL1A1	Rt. Angle	1/4-28 female	---	2.700	73	---	0,5
1LJ1A1	Rt. Angle	1/4-28 female	---	3.700	74,2	---	0,5

- Collaudato in conformità con PNEUROP PN8NTC1.2 a velocità libera.
- ◆ Collaudato in conformità con ISO8662-1 all' 80% della velocità libera.

AVVISO

CONSERVARE QUESTE ISTRUZIONI. NON DISTRUGGERLE.

Quando l'attrezzo diventato inutilizzabile, si raccomanda di smontarlo, sgrassarlo e separare i componenti secondo i materiali in modo da poterli riciclare.



04579272

Impreso P7608-EU

Edición 1

Marzo, 2003



MANUAL DE USO Y MANTENIMIENTO PARA TALADROS RECTOS Y ANGULARES DE LA 1 SERIE

NOTA

Los taladros rectos y angulares de la 1 serie están diseñados para las operaciones de taladrado en la industria aeroespacial, de montaje, de electrodomésticos, electrónica, de mecanizado y del mueble.

AVISO

SE ADJUNTA INFORMACIÓN IMPORTANTE DE SEGURIDAD -
GUARDE ESTAS INSTRUCCIONES.



LEA ESTE MANUAL Y ASEGÚRESE DE COMPRENDERLO BIEN ANTES
DE UTILIZAR ESTE APARATO.

ES SU RESPONSABILIDAD PONER ESTA INFORMACIÓN DE SEGURIDAD
A DISPOSICIÓN DE QUIENES VAYAN A UTILIZAR EL APARATO.

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

— PARA PONER LA HERRAMIENTA EN SERVICIO —

- Instale, utilice, inspeccione y mantenga siempre este aparato de acuerdo con todas las normas locales y nacionales que sean de aplicación.
- Use siempre aire limpio y seco a una presión máxima de 90 psig (6,2 bar/620 kPa) en la admisión. Una presión superior puede redundar en situaciones peligrosas, entre ellas una velocidad excesiva, rotura, o un par o una fuerza de salida incorrectos.
- Asegúrese de que todas las mangueras y accesorios sean del tamaño correcto y estén bien apretados. Vea Esq. TPD905-2 para un típico arreglo de tuberías.
- Cerciórese de que se haya instalado una válvula de corte de emergencia en la línea de suministro de aire y notifique a los demás de su ubicación.
- No utilizar mangueras de aire y accesorios dañados, desgastados ni deteriorados.
- Manténgase apartado de toda manguera de aire que esté dando latigazos. Apague el compresor de aire antes de acercarse a una manguera de aire que esté dando latigazos.
- Corte siempre el suministro de aire, descargue la presión 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 o de un accesorio.
- No lubrique las herramientas con líquidos inflamables o volátiles tales como queroseno, gasoil o combustible para motores a reacción. Use únicamente los lubricantes recomendados.
- Use solamente los disolventes apropiados para la limpieza de las piezas. Use solamente los disolventes de limpieza que cumplan las normas vigentes de salud y seguridad. Los disolventes de limpieza se deben usar en una zona bien ventilada.
- Mantenga la zona de trabajo limpia, despejada, ventilada e iluminada.
- No saque ninguna etiqueta. Sustituya toda etiqueta dañada.

— USO DE LA HERRAMIENTA —

- Use siempre protección ocular cuando maneje, o realice operaciones de mantenimiento en esta herramienta.
- Use siempre protección para los oídos cuando maneje esta herramienta.
- Utilice siempre el equipo de protección individual que corresponda a la herramienta en uso y al material con el que se trabaja. Ello puede incluir una mascarilla contra el polvo u otro aparato de respiración, gafas de seguridad, tapones de oído, guantes, delantal, zapatos de seguridad, casco y otros artículos.
- Cuando use guantes, asegúrese siempre de que estos no eviten que se suelte el mecanismo de mando.
- Evite respirar el polvo y partículas nocivos que se producen al utilizar la herramienta, así como exponerse a ellos:

Ciertos tipos de polvo que se producen al lijar, serruchar, rectificar o taladrar y durante otras actividades de la construcción contienen sustancias químicas que son conocidos como causantes de cáncer, defectos de nacimiento y otros daños reproductivos. Algunos ejemplos de estas sustancias químicas:

- el plomo de las pinturas con base de plomo,
- la sílice cristalina de ladrillos y hormigón y otros productos asociados con la albañilería, y
- el arsénico y el cromo que produce la madera sometida a tratamientos químicos.

El riesgo a la persona que presenta una exposición de este tipo varía en función de la frecuencia con que se realiza esta clase de trabajo. Para reducir la exposición a estas sustancias químicas: trabaje en una zona bien ventilada y utilice equipo de protección homologado, por ejemplo una mascarilla especialmente diseñada para filtrar partículas microscópicas.

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

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Impreso en India



- Mantenga a los demás a una distancia segura de la zona de trabajo, o asegúrese de que utilicen el correspondiente equipo de protección individual.
- Esta herramienta no está diseñada para su utilización en ambientes explosivos, incluidos los que son provocados por la presencia de vapores y polvo, o cerca de materiales inflamables.
- Esta herramienta no está aislada contra descargas eléctricas.
- Tenga en cuenta los peligros enterrados, ocultos o de otro tipo en el entorno de trabajo. Tenga cuidado de no hacer contacto con, ni dañar, cables, conductos, tuberías ni mangueras que puedan contener hilos eléctricos, gases explosivos o líquidos nocivos.
- Mantenga las manos, la ropa suelta, el cabello largo y las alhajas apartados del extremo de trabajo de la herramienta.
- Las herramientas eléctricas pueden vibrar durante el uso. La vibración, los movimientos repetitivos o las posiciones incómodas pueden dañarle los brazos y manos. En caso de incomodidad, sensación de hormigueo o dolor, deje de usar la herramienta. Consulte con el médico antes de volver a utilizarla.
- Mantenga una postura del cuerpo equilibrada y firme. No estire demasiado los brazos al manejar la herramienta. Anticipe y esté atento a los cambios repentinos en el movimiento, pares de reacción u otras fuerzas durante la puesta en marcha y utilización.
- El movimiento de la herramienta y/o los accesorios puede prolongarse brevemente después de soltarse el mando.
- Para evitar el arranque imprevisto de la herramienta, verifique que esté en la posición de desconexión "off" antes de aplicarle aire a presión, evite tocar el mando al transportarla y suelte el mando mientras se descarga el aire.
- Asegúrese de que las piezas a trabajar estén bien sujetas. Siempre que sea posible, utilice mordazas o un tornillo de banco para sostener la pieza.
- No lleve ni arrastre la herramienta sujetándola por la manguera.
- No utilice herramientas eléctricas cuando esté cansado o bajo la influencia de medicamentos, drogas o alcohol.
- No utilice nunca una herramienta o un accesorio dañado o que no funcione correctamente.
- No modifique la herramienta, los dispositivos de seguridad ni los accesorios.
- No utilice esta herramienta para otros fines que no sean los recomendados.
- Utilice únicamente los accesorios Ingersoll-Rand recomendados.
- Cuando se utilice un dispositivo de suspensión, verifique que esté bien asegurado.
- Tenga en cuenta que, debido a la reacción de par, existe un riesgo de aplastamiento entre la herramienta o la barra de reacción y un objeto fijo o una pieza labrada.
- Anticipe la reacción de par que se desarrolla cuando la broca se engancha o agarrota, lo cual ocurre al irrumpir a través del material que se taladra o cuando la carga es muy pesada. Si la broca se engancha o agarrota, suelte el gatillo y retire la broca de la pieza girándola en el sentido contrario.
- Cuando se proporciona una empuñadura auxiliar u otro medio con una herramienta de par elevado, conviene utilizarla para reducir el peligro que representa el par de reacción.
- No utilice nunca una broca u otro accesorio cuya velocidad máxima de funcionamiento sea inferior a la velocidad en vacío del taladro en el que se va a utilizar.
- Apriete bien las brocas u otros accesorios en el portabrocas antes de accionar el taladro. Cuando utilice una llave para portabrocas, retírela antes de poner en marcha el taladro.
- Para motores reversibles, tome nota de la posición del mecanismo inversor antes de poner en marcha la herramienta para tener en cuenta el sentido de rotación al accionar el mando.

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.

IDENTIFICAÇÃO DO SÍMBOLO DE AVISO

	<p>⚠ ADVERTENCIA</p> <p>Use siempre protección ocular cuando utilice esta herramienta o realice operaciones de mantenimiento en la misma.</p>
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	<p>⚠ ADVERTENCIA</p> <p>Lea este manual antes de usar la herramienta.</p>
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	<p>⚠ ADVERTENCIA</p> <p>Use siempre protección para los oídos cuando utilice esta herramienta.</p>
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LUBRICACIÓN



Ingersoll-Rand No. 10



Ingersoll-Rand No. 28 Engranajes
Ingersoll-Rand No. 67 Embrague

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

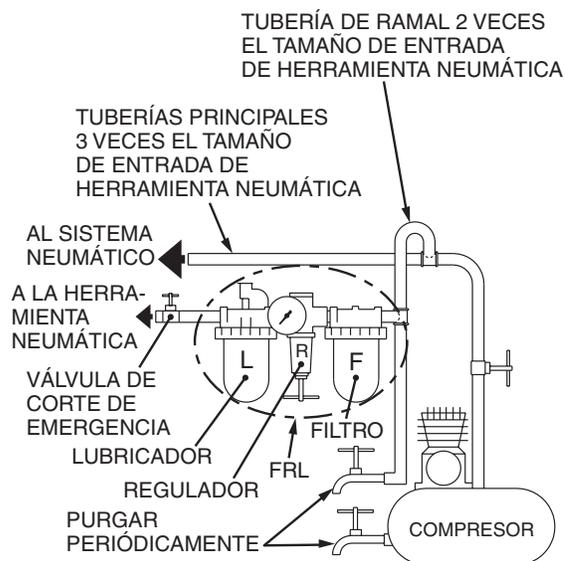
En EE.UU. utilizar FRL n° C08-02-FKG0-28
Fuera de EE.UU. utilizar FRL n° C08-02-FKG0

Después de cada 40.000 ciclos o mensualmente, lo que sea primero, lubrique el tren en engranajes con Grasa Ingersoll-Rand N° 28.

Después de cada 40.000 ciclos o cada mes de uso, lo que sea primero, inyecte 2-4 cc de grasa Ingersoll-Rand N° 67 en el engrasador de la cabeza angular.

MONTAJE

Use siempre aire seco y limpio. El polvo, los humos corrosivos y/o la humedad excesiva pueden dañar el motor de una herramienta neumática. Un filtro de aire puede aumentar muchísimo la duración de una herramienta neumática. El filtro elimina el óxido, la cascarilla de óxido, la humedad y otros residuos de las líneas de aire. Asegúrese de que todas las mangueras y accesorios sean del tamaño correcto y estén bien apretados. Vea Esq. TPD905-2 para un típico arreglo de tuberías.



(Esq. TPD905-2)

ESPECIFICACIONES

Modelo	Tipo de empuñadura	Capacidad del portabrocas		Velocidad en vacío	■ Nivel de ruido dB (A)		◆ Nivel de vibraciones
		pulg.	mm	rpm	Presión	Potencia	m/s ²
1AL1	pistola	1/4	6	2.800	74,1	---	0,3
1P06ST4	pistola	1/4	6	600	74,9	---	0,2
1P09ST4	pistola	1/4	6	900	77,2	---	0,3
1P38ST4	pistola	1/4	6	3.800	79,2	---	0,2
1S30MF4	Straight	1/4	6	3.000	73,3	---	0,5
1LL1A1	Rt. Angle	1/4-28 female	---	2.700	73	---	0,5
1LJ1A1	Rt. Angle	1/4-28 female	---	3.700	74,2	---	0,5

- Comprobado conforme a la norma PNEUROP PN8NTC1.2 a la velocidad en vacío.
- ◆ Comprobado conforme a la norma ISO8662-1 a 80% de la velocidad en vacío nominal.

NOTA

GUARDE ESTAS INSTRUCCIONES. NO DESTRUYA.

Una vez vencida la vida útil de herramienta, se recomienda desarmar la herramienta, desengrasarla y separar las piezas de acuerdo con el material del que están fabricadas para reciclarlas.



04579272

Form P7608-EU

Versie 1

Maart, 2003



HANDLEIDING VOOR BEDIENING EN ONDERHOUD VAN 1 TYPE BOORMACHINES EN HAAKSE BOORMACHINES

LET WEL

De 1 type Boormachines en Haakse Boormachines zijn ontworpen voor boorwerkzaamheden in de luchtvaartindustrie, assemblagebedrijven, fabrikanten van apparaten en voor elektronische en machinale bewerkingen en meubelindustrieën.

⚠ WAARSCHUWING

**BELANGRIJKE VEILIGHEIDSINFORMATIE IS INGESLOTEN -
DEZE INSTRUCTIES GOED BEWAREN.**



**ZORG ERVOOR DAT U DEZE HANDLEIDING DOORGELEZEN EN
BEGREPEN HEBT ALVORENS HET PRODUCT TE GEBRUIKEN.**

**U BENT ER ZELF VOOR VERANTWOORDELIJK OM DEZE INFORMATIE TER
BESCHIKKING TE STELLEN VAN ANDERE PERSONEN DIE GEBRUIK MAKEN VAN DIT PRODUCT.
EEN NALATEN DE HIERNAVOLGENDE WAARSCHUWINGEN OP TE
VOLGEN KAN LICHAMELIJK LETSEL TOT GEVOLG HEBBEN.**

INGEBRUIKNEMING VAN HET GEREEDSCHAP

- Dit product moet altijd geïnstalleerd, geïnspecteerd en onderhouden worden in overeenstemming met alle geldende normen en richtlijnen (plaatselijk, landelijk, internationaal, enz.).
- Gebruik altijd schone, droge lucht op 90 psig (6,2 bar/620 kPa), maximum luchtdruk bij de inlaat. Een hogere druk kan tot gevaarlijke situaties leiden, inclusief een te hoge snelheid, stukspringen of incorrect geleverde koppel of kracht.
- Zorg ervoor dat alle slangen en fittingen de juiste afmetingen hebben en goed zijn vastgemaakt. Zie tekening TPD905-2 voor een typisch leidingnet.
- Er moet een bereikbaar noodafsluitventiel in de leiding van de luchttoevoer zijn aangebracht en andere personen moeten worden ingelicht over de locatie hiervan.
- Geen beschadigde, gerafelde of versleten luchtslangen of fittingen gebruiken.
- Blijf uit de buurt van zwiepende luchtslangen. Schakel de perslucht uit alvorens een zwiepende luchtslang te benaderen.
- Sluit altijd de luchttoevoer af, ontlast de druk en ontkoppel de luchttoevoerslang voordat u enig hulpstuk van dit gereedschap verwijdert of afstelt, of voordat u enig onderhoud aan dit gereedschap uitvoert.
- Gereedschappen mogen niet gesmeerd worden met ontvlambare of vluchtige vloeistoffen zoals petroleum, diesel of vliegtuigbrandstof. Gebruik uitsluitend aanbevolen smeermiddelen.
- Voor het schoonmaken van de onderdelen alleen oplosmiddelen gebruiken. Gebruik uitsluitend oplosmiddelen die aan de huidige veiligheids- en gezondheidsstandaards voldoen. De oplosmiddelen moeten te allen tijde in goed geventileerde ruimten worden gebruikt.
- De werkomgeving schoon, ordelijk, goed geventileerd en verlicht houden.
- Geen typeplaatjes verwijderen. Beschadigde typeplaatjes moeten worden vervangen.

GEBRUIK VAN HET GEREEDSCHAP

- U moet te allen tijde oogbeschermers dragen wanneer u dit gereedschap bedient of er onderhoudswerkzaamheden aan uitvoert.
- Altijd oorbeschermers dragen wanneer dit gereedschap wordt bediend.
- Gebruik altijd persoonlijke beschermingsmiddelen die geschikt zijn voor het gebruikte gereedschap. Dat kan onder andere zijn: stofmasker of ander ademhalingsapparaat, veiligheidsbril, oordoppen, handschoenen, schort, veiligheidsschoenen, helm en ander materieel.
- Wanneer handschoenen worden gedragen dient u altijd te controleren of de handschoenen niet verhinderen dat het bedieningsmechanisme wordt losgelaten.
- Voorkom blootstelling aan en inademen van schadelijke stoffen een deeltjes die vrijkomen bij gebruik van elektrisch gereedschap:

De stof die veroorzaakt wordt door schuren, zagen, afslijpen en boren met elektrisch gereedschap, alsmede andere constructiewerkzaamheden, bevat chemicaliën die bekend staan als kankerverwekkend en die geboortefwijkingen of andere voor de voortplanting nadelige gevolgen kunnen hebben. Enkele van deze chemicaliën zijn:

- lood uit loodhoudende verf;
- kristallijnsilica in baksteen, cement en andere metselwerkproducten;
- arsenicum en chroom in met chemicaliën behandeld timmerhout.

De risicofactor op grond van deze blootstellingen varieert, afhankelijk van de regelmaat waarmee u deze werkzaamheden verricht. De blootstelling aan deze chemicaliën kan als volgt worden gereduceerd: werk in een goed geventileerde ruimte en met goedgekeurde beschermingsmiddelen, zoals stofmaskers die specifiek ontworpen zijn voor het uifilteren van microscopische deeltjes.

Richt al uw communicatie tot het dichtstbijzijnde
Ingersoll-Rand Kantoor of Wederverkoper.

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Gedrukt in India



- Houd andere personen op veilige afstand van uw werkplek of zorg ervoor dat zij persoonlijke beschermingsmiddelen gebruiken.
- Dit gereedschap is niet ontworpen voor gebruik in een explosieve omgeving, inclusief waar dit veroorzaakt is door dampen en stof, noch voor gebruik in de buurt van brandbare materialen.
- Dit gereedschap is niet geïsoleerd tegen elektrische schokken.
- Houd rekening met ingegraven, verborgen voorwerpen of andere gevaren in uw werkomgeving. Buizen, leidingen of slangen die elektrische bedrading, explosieve gassen of gevaarlijke vloeistoffen kunnen bevatten mogen niet aangeraakt of beschadigd worden.
- De handen, losse kleding, lang haar en sierraden uit de buurt van het bewegende einde van het gereedschap houden.
- Elektrisch gereedschap kan trillen tijdens het gebruik. Trilling, herhaaldelijke bewegingen of oncomfortabele posities kunnen schadelijk zijn voor uw handen en armen. Stop met het gebruik van gereedschap wanneer u ongemak of een tintelend gevoel of pijn ervaart. Vraag medisch advies alvorens het werk te hervatten.
- Zorg voor gebalanceerde en stevige lichaamshouding. Niet te ver uitreiken tijdens gebruik van dit gereedschap. Anticipeer en let op veranderingen in beweging, reactiekoppels of krachten tijdens starten en gebruik.
- Het gereedschap en/of de bijbehorende hulpstukken kunnen korte tijd blijven doordraaien nadat de regelhendel wordt losgelaten.
- Om ongewild starten te voorkomen moet het gereedschap in de stand "uit" zijn gezet, voordat de luchtdruk wordt ingeschakeld. Bij het dragen de regelhendel niet aanraken en de regelhendel met luchtverlies loslaten.
- De werkstukken moeten goed vastgezet zijn. Maak zoveel mogelijk gebruik van klemmen of bankschroeven om het werkstuk vast te zetten.
- Het werktuig niet aan de slang dragen of slepen.
- Gebruik geen elektrisch gereedschap bij vermoeidheid of onder de invloed van medicijnen, drugs of alcohol.
- Gebruik nooit een beschadigd of defect gereedschap of accessoire.
- Het gereedschap, de veiligheidsinrichtingen of bijbehorende hulpstukken mogen niet gemodificeerd worden.
- Dit gereedschap uitsluitend gebruiken voor de aanbevolen doeleinden.
- Uitsluitend de door Ingersoll-Rand aanbevolen bijbehorende hulpstukken gebruiken.
- Wanneer een draaginrichting wordt gebruikt moet gezorgd worden dat deze stevig is bevestigd.
- Wees te allen tijde attent op het gevaar van kneuzing tussen de machine of de reactiestang en een vast voorwerp of werkstuk als gevolg van een reactiekoppel.
- Anticipeer de reactiekoppel die optreedt wanneer de boor vast komt te zitten of vastloopt, wat kan gebeuren wanneer het te boren materiaal wordt doorbroken of in het geval van zware belasting. In het geval van vastzitten of vastlopen, de drukschakelaar ontspannen en de boor uit het werkstuk verwijderen door hem in omgekeerde richting te draaien.
- Wanneer een steunhandgreep of ander middel is aangebracht op een machine met grote draaikracht, moet deze gebruikt worden om het risico in verband met een reactiekoppel te verminderen.
- U mag nooit een boor of enig ander hulpstuk gebruiken dat een maximum bedrijfssnelheid heeft die minder is dan het onbelaste toerental van de boormachine waarin hij wordt gebruikt.
- De boor of enig ander hulpstuk goed vastzetten in de boorkop alvorens de boormachine te gebruiken. Wanneer een boorkopsleutel gebruikt wordt moet deze worden verwijderd voordat de boormachine wordt gestart.
- Bij omkeerbare typen dient u voordat het gereedschap in gebruik wordt genomen eerst op de stand van de omkeerhendel te letten, zodat u de draairichting kent wanneer de regelaar wordt gebruikt.

LET WEL

Het gebruiken van andere dan originele Ingersoll-Rand onderdelen kan gevaar opleveren voor de veiligheid, en een vermindering met zich brengen van het prestatievermogen van het gereedschap en een toeneming van het onderhoud ervan; het kan een vervallen van alle garantie-bepalingen tot gevolg hebben.

Reparaties mogen uitsluitend worden uitgevoerd door hiertoe gemachtigd en geschoold personeel. Raadpleeg uw dichtstbijzijnde erkende Ingersoll-Rand Servicenter.

WARNING SYMBOL IDENTIFICATION





Ingersoll-Rand Nr. 10



Ingersoll-Rand Nr. 28 Drijfwerk
Ingersoll-Rand Nr. 67 Koppeling

Men moet steeds een in-lijn aangesloten drukluchtsmeerinrichting gebruiken. Wij bevelen u de volgende Filter-Regeleenheid-Smeerinrichting aan (FRS):

Gebruik binnen VS FRS #C08-02-FKG0-28

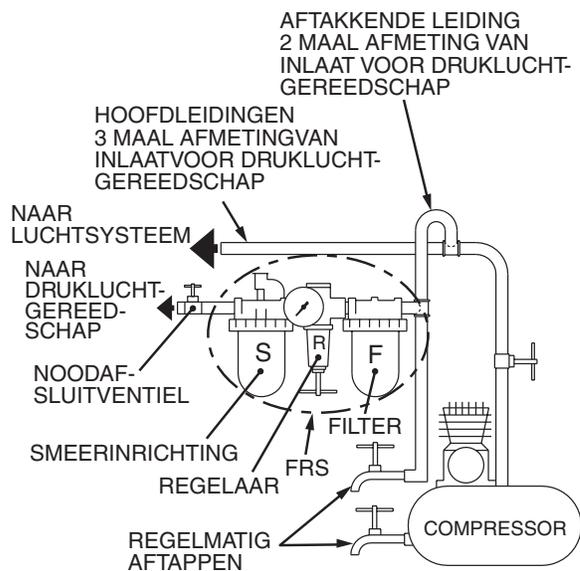
Gebruik buiten VS FRS #C08-02-FKG0

Na elke 40.000 cycli of elke maand, onverschillig wat het eerst komt, het Drijfwerk met Ingersoll-Rand Nr. 28 Vet smeren.

Na elke 40.000 cycli of elke maand, onverschillig wat het eerst komt, 2 tot 4 cc Ingersoll-Rand Nr. 67 Vet spuiten in de Smeernippel voor de Haakse Kop.

MONTAGE

Maak altijd gebruik van schone, droge lucht. Stof, corroderende rook en/of teveel vocht kunnen de motor van pneumatisch gereedschap beschadigen. Een luchtleidingsfilter kan de levensduur van pneumatisch gereedschap aanzienlijk verlengen. Het filter verwijdert roest, schilfers, vocht en ander vuil uit de luchtleidingen. Zorg ervoor dat alle slangen en fittingen de juiste afmetingen hebben en goed zijn vastge maakt. Zie tekening TPD905-2 voor een typisch leidingnet.



(Tekening TPD905-2)

SPECIFICATIES

Model	Type	Capaciteit Houder		Onbelast toerental rpm	■ Geluidsniveau dB (A)		◆ Trillingsniveau m/s ²
		in.	mm		Druk	Vermogen	
1AL1	pistool	1/4	6	2.800	74,1	---	0,3
1P06ST4	pistool	1/4	6	600	74,9	---	0,2
1P09ST4	pistool	1/4	6	900	77,2	---	0,3
1P38ST4	pistool	1/4	6	3.800	79,2	---	0,2
1S30MF4	Straight	1/4	6	3.000	73,3	---	0,5
1LL1A1	Rt. Angle	1/4-28 female	---	2.700	73	---	0,5
1LJ1A1	Rt. Angle	1/4-28 female	---	3.700	74,2	---	0,5

- Getest overeenkomstig PNEUROP PN8NTC1.2 bij onbelast toerental.
- ◆ Getest overeenkomstig ISO8662-1 bij 80% onbelast toerental.

LET WEL

DEZE INSTRUCTIES GOED BEWAREN. NIET Vernietigen.

Wanneer de levensduur van het gereedschap verstreken is, wordt u aangeraden het gereedschap te demonteren en ontvetten, en de delen gescheiden naar materialen op te bergen zodat zij gerecycled kunnen worden.

▲ 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

Each time a 1 Series Drill or Angle Drill is disassembled for maintenance and repair or replacement of parts, lubricate the tool as follows:

1. **Gearing**
For 2100 rpm or more, coat gears with 2 to 4 cc of Ingersoll-Rand No. 28 Grease.
For models below 2100 rpm, coat gears with 4 to 6 cc of Ingersoll-Rand No. 28 Grease.
2. **Angle Head**
 Inject 2 to 4 cc of Ingersoll-Rand No. 67 Grease into the Grease Fitting (101).
3. Use Ingersoll-Rand No. 10 Oil for lubricating the motor. Inject approximately 1 to 2 cc of oil into the air inlet before attaching the air hose.

DISASSEMBLY

General Instructions

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

Disassembly of the Tool

1. Each 1 Series Drill is comprised of three modules or units. In-line and Pistol Drills have a motor housing and motor unit, a gear unit and a drill chuck spindle unit. Angle Drills have a motor housing and motor unit, a gear unit and an angle attachment unit. The tool can be disassembled for repairs to each individual unit without disturbing the other units.
2. **For Pistol and In-Line models:** to remove Drill Chuck (51), lightly grasp the tool in a copper-covered vise using the flats on the Gear Case (38). Insert the Chuck Key into one of the holes in the Chuck and tap lightly with a hammer. Remove the Drill Chuck Spacer (50).
3. **For Models 1LJ1A1 and 1LL1A1**, to remove the Angle Attachment, use two wrenches to unscrew the Coupling Nut (111) from the Gear Case and lift off the entire angle attachment.

4. Using two wrenches, unscrew and remove the Gear Case from the Motor Housing (1).

Disassembly of the Angle Attachment

1. Carefully grasp the Angle Head in copper-covered vise jaws so that the Spindle is facing upward.
2. Using a wrench, remove the Spindle Bearing Cap (110).

NOTICE

This is a left-hand thread.

- Do not remove the Spindle (102) from the Angle Head until the Bevel Pinion (102) is pulled outward against the Bevel Pinion Thrust Bearing (106). Failure to do so could damage the Spindle Upper Bearing (103), making it impossible to remove the Bearing from the Spindle. Also, the Bevel Pinion could be damaged. If tightness or binding occurs, check to make sure the Bevel Pinion has been pulled outward.
3. Pull the Spindle from the Angle Head.
 4. Inspect the lower Spindle Bearing (109) for looseness or roughness. If either of these conditions exist, press the Bearing from the Spindle.
 5. If the Spindle Upper Bearing (103) appears rough or loose, press it off the Spindle.
 6. Remove the Thrust Bearing Retainer (107), Rear Thrust Bearing Seat (108) and Bevel Pinion Thrust Bearing (106) from the Bevel Pinion (102) shaft.
 7. Grasp the spline of the Bevel Pinion shaft in leather-covered or copper-covered vise jaws. While pulling on the Angle Head, tap the rear face of the Angle Housing with a soft hammer to pull the Bevel Pinion and Bevel Bearing (105) from the Angle Housing.

NOTICE

Do not remove the Bevel Pinion shaft and Bevel Pinion Bearing unless you have a new Bearing on hand.

After the Angle Head is disassembled, check all parts for damage or wear.

8. If the gear teeth on either the Spindle or Bevel Pinion are worn or chipped, replace both parts.

NOTICE

These gear sets are furnished in a matched set and must be replaced as a matched set.

Disassembly of Gearing

1. Using a thin blade screwdriver, work the Motor Clamp Washer Retaining Ring (37) from the groove in the Gear Case and withdraw the Motor Clamp Washer (36).
2. **For Models 1P44, 1P21, 1P13, 1P09, 1P06 and 1LJ1A1**, tap the motor end of the Gear Case against the top of the workbench to remove the Gear Head (42), Gear Head Spacer (41), Drive Plate (43) or Gear Head Planet Gears (44).
For 1P76, 1P21 and 1P13, remove the Rotor Pinion (45).

3. For Models 1LJ1A1 and 1LL1A1, using pair of snap ring pliers, remove the Spindle Retaining Ring (49A) from the groove in the front of the Spindle.
4. To remove the Spindle (39) and Spindle Planet Gears (40), firmly hold the Gear Case and tap the end of the Spindle on front of the Gear Case with a soft-faced hammer, driving the Spindle from the Gear Case.
5. Use snap ring pliers to remove the Spindle Bearing Retainer (49) from the groove in the front of the Gear Case.
6. Using a sleeve that contacts the outer ring of the bearing, press the Rear Spindle Bearing (46) from the front of the Gear Case.

Disassembly of the Motor

1. Grasp the splined end of the Rotor (33) and pull the motor from the Motor Housing (1).
2. Withdraw the Rear End Plate Gasket (29) from the bottom of the housing bore.
3. While grasping the Cylinder (32) in one hand, lightly tap on the splined end of the Rotor to drive the Rotor from the bore of the Front End Plate (30) and Bearing.
4. Using snap ring pliers, remove the Front Rotor Bearing Retainer (31) and pull the Front Rotor Bearing from the Front End Plate.
5. Slide the Cylinder off the Rotor, and withdraw the Vanes (34) from the vane slots.
6. Remove the Rear Rotor Bearing Retainer (26) from the groove in the hub of the Rotor.
7. Support the Rear End Plate (28) as close to the rotor body as possible, and press the Rotor from the Rear Rotor Bearing.

Disassembly of the Motor Housing

For Pistol Grip (Models 1A and 1P)

1. Lightly grasp the pistol grip handle in copper-covered vise jaws so that the Air Inlet Busing (19) is upward.
2. Unscrew the Air Inlet Bushing and remove the Inlet Bushing Spacer (21), Muffler Assembly (22), Muffler O-Ring (23), Air Strainer Screen (20), Throttle Valve Spring (11) and Throttle Valve (10).
3. Withdraw the Trigger (7) and Trigger Pin Seal (8).
4. Using a stiff wire hook, pull the Throttle Valve Seat (9) from the handle.
5. Using a pair of needle-nose pliers, pull the Muffler Element (24) from the handle.

Disassembly of the Motor Housing For In-Line and Angle Drills



The Throttle Valve Cap is under pressure from the Throttle Valve Spring and care must be exercised when removing the Throttle Valve Cap.

1. Remove the Throttle Valve Cap (13), Throttle Valve Spring (11), Throttle Valve Ball (14) and Throttle Valve Plunger (12) from the Motor Housing (1).
2. Using an adjustable wrench, remove the Inlet Busing Assembly (17).

3. If the Inlet Screen (18) requires replacement, use the eraser end of a wooden pencil to push the Inlet Screen from the Inlet Bushing Assembly.
4. Remove the Exhaust Deflector Assembly (2) from the Motor Housing.
5. Remove the Exhaust Deflector Seal (6) from the Housing.
6. The Throttle Lever (3) is attached to the Exhaust Deflector Assembly with two Throttle Lever Pins (4) which are two-piece rivets. Lightly grasping the Deflector in copper-covered vise jaws, drive the pin in the center of the rivet inward with a pin punch until it is free of the rivet. Repeat the procedure on the other rivet. Squeeze the ends of the rivets, together and pry them from the Deflector with a screwdriver or pull them with pliers.
7. Work the Muffler Elements out of the Exhaust Deflector.

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 with threaded parts and housings.
4. Always clean every part and wipe every part with a thin film of oil before installation.
5. Apply a film of O-ring lubricant to all O-rings before final assembly.
6. Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly in a suitable cleaning solution and dry with a clean cloth.
Sealed or shielded bearings should never be cleaned. Work grease thoroughly into every open bearing before installation.

Assembly of the Motor Housing

For Pistol Grip (Models 1A and 1P)

1. Grasp the handle in a vise so that the handle is vertical and the entrance to the handle bore is upward.
2. Note that the Throttle Seat Valve (9) is symmetrical and can be installed in the handle either side first in order to get full use of each side. Push the Throttle Valve Seat into the tapped bore or the handle with a 1/2" (13 mm) diameter dowel. Push it in until it seats.
3. Install the Trigger Pin Seal (8) onto the trigger pin and insert Trigger (7) in the Housing.
4. Installation of the Throttle Valve is sometimes a bit difficult due to the smallness of the Valve and the depth of the bore in which it is located. The difficult part is in holding the Valve while inserting the long end of the valve stem through the hole in the trigger pin. Although the Valve can be held with a push-button mechanical pencil or a wooden dowel, one of the easiest ways to hold it is by using a common wooden pencil with rubber eraser. Insert the short end of the valve stem into the rubber eraser full depth, then backing it out far enough so that the Valve is just nicely supported. Insert the Valve into the bore of the handle so that the long end of the stem enters the hole in the trigger to hold the Valve while removing the pencil.

5. Place the Air Strainer Screen (20), closed end first, inside the large end coil of the Throttle Valve Spring (11).
6. Insert the Throttle Valve Spring and Screen, small coil first, into the handle so that the Spring encircles the end of the Throttle Valve.
7. If the Muffler Element (24) was removed from the handle, wash it in a clean, suitable, cleaning solution and then fold it and pinch it dry. While keeping it folded, insert it into the exhaust cavity in the handle.
8. Place the Muffler O-Ring (23) over the perforated baffle of the Muffler (22).
9. Place the Muffler on the face of the handle so that the perforated baffle extends into the handle.
10. Slide the inlet Bushing Spacer (21) over the threaded end of the Inlet Bushing (19), and install the Inlet Bushing in the handle. Tighten it to 26 ft-lb (35 Nm) of torque.

**Assembly of the Motor Housing
For In-Line and Angle Drills**

1. Work new Muffler Elements (25) into the Exhaust Deflector (2) or (5) to a point beyond the two throttle lever pin holes.
2. Position the Throttle Lever (3) on the Exhaust Deflector with the Lever covering the timing notch at the front end of the Deflector. Insert the two Throttle Lever Pins (4) through the Lever and into the Exhaust Deflector. Using pliers, press the pins in the center of the Throttle Lever Pins flush with the head.

NOTICE

Do not apply a force strong enough to distort the Exhaust Deflector.

3. Center a new Inlet Screen (18) over the air line end of the Inlet Bushing Assembly (17) and, using the eraser end of a wooden pencil, push the Screen into the Bushing until it bottoms on the internal shoulder.
4. Place the Exhaust Deflector Seal (6) on the smaller shoulder of the Motor Housing. To hold the Seal in position, lightly coat the Seal and shoulder with Ingersoll-Rand No. 28 Grease. Place the Exhaust Deflector on the rear of the Housing, aligning the notch in the Deflector with the alignment pin in the Housing. Secure the Deflector to the Housing with the Inlet Bushing Assembly. Use a torque wrench and tighten the Inlet Bushing Assembly to 15 to 18 ft-lb (20 to 24 Nm) torque.
5. Before installing throttle components, make sure that the Motor Housing is positioned correctly. The Throttle Lever should be facing downward. Shift leftward the Throttle Valve Plunger (12), Throttle Valve Ball (14) and Throttle Valve Spring (11) into the Motor Housing. Position the Throttle Valve Cap (13) on the Throttle Valve Spring. Screw the Valve Cap into the Motor Housing until the cap is within approximately two threads of being flush with the Housing. Apply a light, uniform coat of thread locking compound to the remaining two threads. Tighten the Valve Cap securely and place the Housing on a workbench with the Valve Cap facing downward. Allow the thread locking compound to cure approximately five minutes.

Assembly of the Motor

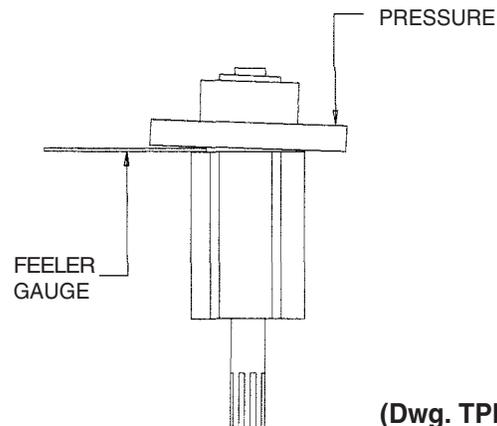
1. Place the Rear End Plate (28) on the short, unsplined shaft of the Rotor (33) with the counterbore away from the body of the Rotor.
2. Using a sleeve that contacts the inner ring of the Rear Rotor Bearing (27), press the Bearing onto the shaft until the Rear End Plate just contacts the rotor body.
3. The clearance between the Rear End Plate and Rotor is critical. While pressing down with your finger on the outer edge of the End Plate on the Bearing side, insert a .002" (.05 mm) feeler gauge between the face of the Rotor and End Plate directly opposite the point where pressure is applied.

NOTICE

This measurement must be made at the outside diameter of the rotor body.

Supporting the End Plate, lightly tap the shaft with a plastic hammer to increase the space. Press the Bearing farther onto the shaft if the space is too wide. When the proper clearance is obtained, install the Rear Rotor Bearing Retainer (26) on the shaft.

**MEASUREMENT OF REAR
END PLATE CLEARANCE**



4. Place the Rotor, with the splined end up, in a block which has clearance for the Rotor Bearing and supports the Rear End Plate.
5. Wipe each Vane (34) with a light film of Ingersoll-Rand No. 10 oil and place a Vane in each slot in the Rotor.
6. Note that the Cylinder (32) has a notch in one end. Place the Cylinder, notched end up, down over the Rotor and against the Rear End Plate, aligning the dowel hole in the Cylinder with the U-shaped notch in the rim of the Rear End Plate.
7. Install the Front Rotor Bearing (27) in the Front End Plate (30) and retain it with the Front Rotor Bearing Retainer (31).
8. Using a sleeve that contacts the inner ring of the bearing, press the assembled Front End Plate, flat side first, on the splined end of the Rotor until the End Plate just contacts the Cylinder.

9. Install the Rear End Plate Gasket (29) in the Motor Housing, aligning the small notch in the Gasket with the dowel pin hole in the Housing.
10. Insert a thin, rigid wire into the dowel pin hole at the bottom of the motor recess in the Motor Housing. Grasping the assembled motor by the spline on the Rotor and with the dowel pin holes of the Front End Plate and Cylinder aligned with the U-shaped notch in the Rear End Plate, install the assembled motor in the Motor Housing. Maintain alignment between the motor and Motor Housing by passing the aligned dowel holes in the assembled motor over the wire positioned in the Motor Housing. Withdraw the wire and install the Cylinder Dowel (35), making certain the Cylinder Dowel is flush with or below the Front End Plate.

Assembly of the Gearing

For Models 1AL1, 1P06, 1P09, 1P13, 1P21, 1P38, 1P44, 1P76, 1S30, 1S39 and 1S60

1. Set the Gear Case (38) on the table of an arbor press with the threaded end down.
2. Using a sleeve that will contact the outer ring of the bearing, press the Rear Spindle Bearing (46), open side first, into the bearing recess until it seats.
3. Work some grease into the teeth of the Spindle Planet Gears (40) and onto the planet gear shafts on the Spindle (39).
4. Slide the Spindle into the Gear Case so that the spindle shaft passes through the bore of the Rear Spindle Bearing.
5. For Angle Drills, install the Spindle Retaining Ring (49A) into groove on the Spindle shaft.
6. For Pistol and In-line Drills, install the Spindle Bearing Spacer (47) and Front Spindle Bearing (48), shielded side out, on the shaft of the Spindle.
7. Install the Spindle Bearing Retainer (19) in the groove in the Gear Case.
8. Slide the Spindle Planet Gears onto the planet gear shafts, making certain the teeth on the Gears mesh with the teeth of the Gear Case.
9. **For Models 1P13, 1P21 and 1P76**, work some grease into the teeth of the Rotor Pinion (45). Place the Rotor Pinion in the Spindle so that it meshes with the Spindle Planet Gear.
10. **For Models 1P06, 1P09, 1P13, 1P21, 1P44 and 1S39**, coat the Gear Head Spacer (41) with grease and place it in the Gear Case against the Spindle Planet Gears.
11. **For Models 1P06, 1P09, 1P13, 1P21, 1P44 and 1S39**, work some grease onto the planet gear shafts on the Gear Head (42). **For Model 1P06**, work some grease into the teeth of the Gear Head Planet Gears (44).
12. **For Models 1P06, 1P09, 1P13, 1P21, 1P44 and 1S39**, slide the Gear Head into the Gear Case so that the teeth on the gear head shaft mesh with the Spindle Planet Gears.
13. **For Models 1P06, 1P09, 1P13 and 1P21**, slide the Gear Head Planet Gears onto the planet gear shafts, making certain the teeth on the Planet Gears mesh with the teeth in the Gear Case.
14. **For Models 1P44 and 1S39**, slide the Drive Plate (43) on the planet gear shafts of the Gear Head.
15. **For Models 1P09, 1P13 and 1P21**, work some grease into the teeth of the Rotor Pinion (45) and place the Rotor Pinion in the Gear Head so that it meshes with the Gear Head Planet Gears.
16. Place the Motor Clamp Washer (36) into the Gear Case and install the Clamp Washer Retaining Ring (37).

For Models 1LL1A1 and 1LJ1A1

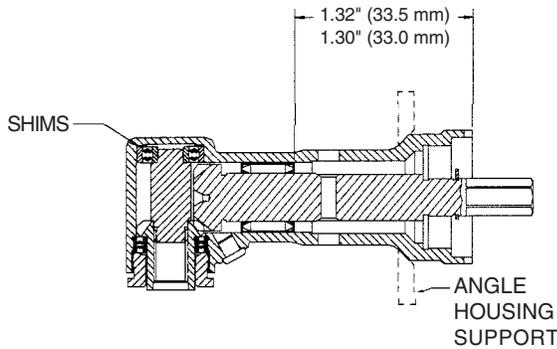
1. Hold the Gear Case (38) with the notched end upward.
2. Slide the Spindle Bearing (48), open side first, into the Gear Case until it seats against the bearing recess.
3. Install the Spindle Bearing Retainer in the groove in the Gear Case.
4. Work some grease into the teeth of the Spindle Planet Gears (40) and into the planet gear shafts of the Spindle (39).
5. Slide the Spindle Bearing Spacer (47) over the shaft of the Spindle.
6. Slide the Spindle into the Gear Case so that the spindle shaft passes through the bore of the bearing.
7. Slide the Spindle Planet Gears onto the planet gear shafts, making certain the teeth on the Gears mesh with the teeth of the Gear Case.
8. **For Model 1LJ1A1**, put some grease on the planet gear shafts and slide the Gear Head (42) into the Gear Case so that the teeth on the gear head shaft mesh with the Spindle Planet Gears.
9. **For Model 1LJ1A1**, slide the Drive Plate (43) onto the planet gear shafts of the Gear Head.

For all Models

1. Place the Motor Clamp Washer (36) in the Gear Case against the internal gear. Install the Clamp Washer Retaining Ring (37).

Assembly of the Angle Attachment

1. Work a light coat of grease into the gear teeth of the Bevel Pinion (102) and insert it, gear end first, into the long bore of the Angle Housing (100).
2. Work 0.5 to 1 cc of grease into the Bevel Pinion Bearing (105) and insert it, unstamped end first, into the bore of the Angle Housing, after the Bevel Pinion.
3. Support the Angle Housing on an angled support as shown. Refer to Dwg. TPB585. Use a bearing inserting tool and press the Bevel Pinion Bearing so the face is a maximum of 1.32" (33.50 mm) but not less than 1.30" (33.00 mm) below the end face of the Angle Head. Refer to Dwg. TPB585.
4. Lubricate the Bevel Pinion Thrust Bearing (106) with 0.5 to 1 cc of grease. Install the Bearing on the rear of the bevel pinion shaft with red-stained end of Bearing toward the rear of the Angle Head. Refer to Dwg. TPB585. Secure Bearing on shaft with Thrust Bearing Retainer (107).



AXIAL-PLAY
SHIM TO .001" MIN. -.003"
MAX.

(Dwg. TPB585)

5. Apply a small drop of Loctite No. 601 to the small outside diameter of the spindle upper bearing shaft on the Spindle (102).
6. Apply 2 to 3 cc of grease to the Spindle Upper Bearing (103) and a light coat of grease to the gear teeth on the Spindle. Press the Spindle Upper Bearing onto the Spindle and allow the Loctite to dry a minimum of ten minutes.

NOTICE

Do not get any Loctite in the bearing; damage to the Bearing could result. Do not get any on the inside diameter of the Bearing; grease will prevent the Loctite from working.

7. Insert the Spindle into the Angle Head until the Spindle Upper Bearing seats into the recess of the Angle Head.

NOTICE

Make sure that the Bevel Pinion is pulled outward toward the Bevel Pinion Bearing before inserting the Spindle into the Angle Head.

8. Slip the Lower Spindle Bearing over the end of the Spindle and into the angle head recess.
9. Install the Spindle Bearing Cap (110) finger tight.
10. Spindle must turn freely.
11. While holding the Bevel Pinion out of engagement with the Spindle, measure the amount of end play in the Spindle. Subtract .002" (.051 mm) from the reading to determine the required shim thickness.
12. Unscrew and remove the Spindle Bearing Cap. While pulling the Bevel Pinion outward toward the Bevel Pinion Bearing, remove the Spindle from the Angle Head.
13. Insert the required number of shims, as determined in step (11) into the upper bearing recess of the Angle Head.

NOTICE

Shim Packet contains three .002" (.05 mm) shims and two .005" (.13 mm) shims.

14. Reassemble and test the Angle Head as indicated in steps (6) through (12).
15. Once proper shimming has been achieved, remove the Angle Housing Cap, clean the threads on the Angle Head and the Angle Housing Cap, and apply a film of Vibra-Tite®** VC3 to the threads.
16. Install the Angle Housing Cap and tighten to 35 in-lb (3.9 Nm) torque.
17. Install the Rear Thrust Bearing Seat (108) on the bevel pinion shaft with the flat face against the Thrust Bearing.
18. Slide the Coupling Nut Retainer (112) and the Coupling Nut (111), threaded end trailing, over the notched end of the Angle Housing.
19. Compress the Coupling Nut Retainer, and work it into the internal groove in the unthreaded end of the Coupling Nut.

Assembly of the Tool

1. Apply some grease to the spline of the rotor shaft and screw the Gear Case and components into the Motor Housing. Tighten to 15 to 18 ft-lb (20 to 25 Nm) torque.

NOTICE

This is a left-hand thread.

2. **For Models 1LL1A1 and 1LJ1A1**, align the pin in the Rear Thrust Bearing Seat with the notch in the Gear Case (38) and screw the Coupling Nut onto the Gear Case. Tighten to 18.4 to 22.1 ft-lb (25 to 30 Nm) of torque.

NOTICE

This is a left-hand thread.

3. For all other models, slide the Drill Chuck Spacer (50) over the threaded end of the Drill Chuck Spindle and install the Drill Chuck (51).

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TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Loss of Power	Low air pressure	Check air supply. For top performance, the air pressure must be 90 psig (6.2 bar/620 kPa) at the inlet.
	Plugged Air Strainer Screen Inlet Screen	Clean the Air Strainer or screen in a clean, suitable cleaning solution. If the Screen cannot be cleaned, replace it.
	Clogged Muffler or Exhaust Silencer	Clean the Muffler Element in a clean, suitable cleaning solution. If it cannot be cleaned, replace it.
	Worn or broken Vanes	Replace the complete set of Vanes.
	Damaged Rear End Plate Gasket	Install a new Rear End Plate Gasket.
	Worn or broken Cylinder	Replace the Cylinder if it is cracked or if the bore appears wavy or scored.
	Improper lubrication or dirt build-up	Clean the Motor Unit parts and lubricate as instructed.
Leaky Throttle Valve	Worn Throttle Valve and/or Throttle Valve Seat	Install a new Throttle Valve and/or a Throttle Valve Seat.
	Dirt accumulation on Throttle Valve and/or Throttle Valve Seat	Pour about 3 cc of a clean, suitable cleaning solution in the air inlet and operate the tool for about 30 seconds. Immediately pour 3 cc of the recommended oil in the air inlet and operate the tool for 30 seconds to lubricate all the cleaned parts.
Gear Case gets hot	Excessive grease	Clean and inspect the Gear Case and gearing parts and lubricate as instructed.
	Worn or damaged parts	Clean and inspect the Gear Case and gearing. Replace worn or broken components.
Angle Head gets hot	Excessive grease	Clean and inspect the Angle Head and gearing parts. Lubricate as instructed.
	Inadequate grease	Inject 0.5 to 1.5 cc of the recommended grease into the Grease Fitting.
	Worn or damaged parts	Clean and inspect the Angle Head and gearing. If the Bevel Gear and/or Bevel Pinion is worn or broken, replace both parts as they are a matched set.

PART NUMBER FOR ORDERING →

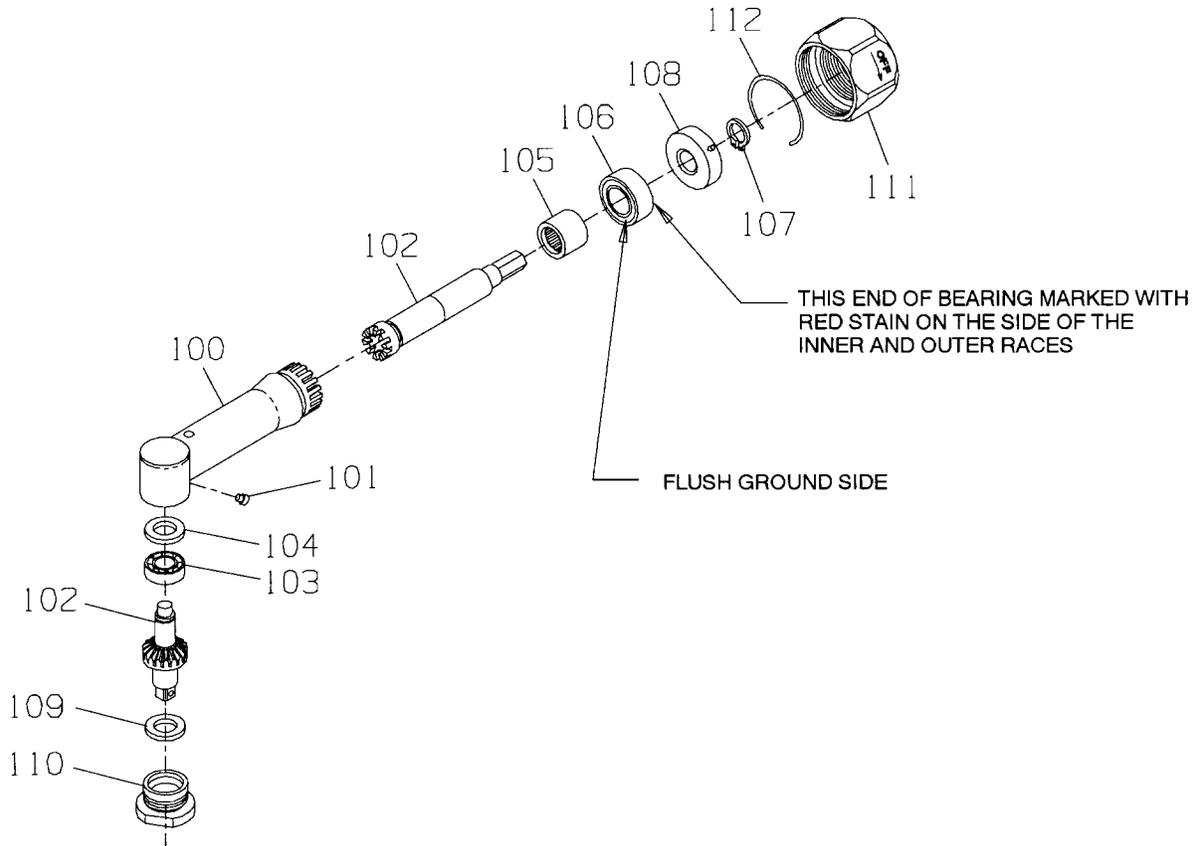
→ **PART NUMBER FOR ORDERING**

39	Spindle For Models 1P76ST4, 1P44ST4 and 1S60MF4 For Models 1AL1, 1P38ST4 and 1S30MF4 For Models 1P09ST4 and 1P21ST4 For Models 1P44ST4, 1P13ST4, 1P06ST4 and 1S39MF4 For Model 1LL1A1 For Model 1LJ1A1 Spindle Planet Gear (3) For Models 1AL1, 1LL1A1, 1P38ST4 and 1S30MF4 For Models 1P76ST4, 1P09ST4, 1P21ST4 and 1P60MF4 For Models 1P44ST4, 1LJ1A1, 1P13ST4, 1P06ST4 and 1S39MF4 Gear Head Spacer (for Models 1P44ST4, 1P21ST4, 1P13ST4, 1P09ST4, 1P06ST4 and 1S39MF4 Gear Head For Model 1P21ST4 For Models 1P44ST4, 1LJ1A1, 1P13ST4 and 1S39MF4 For Model 1P06ST4 For Model 1P09ST4 Drive Plate (for Models 1P44ST4, 1LJ1A1 and 1P39MF4)	3AH-8 3AL-8 3AM-8 3AN-8 3RLL-108 3RLN-108 3RLL-10 3RLM-10 3RLN-10 3RL-80 3RLM-216 3RLN-216 M002-216-044 M002-216-028 M002-171	44 45 46 47 48 49 49A 50 51 51A 52 53	Gear Head Planet Gear (3) For Models 1P21ST4 and 1P13ST4 ... For Models 1P09ST4 and 1P06ST4 ... Rotor Pinion (for Models 1P21ST4, 1P13ST4 and 1P76ST4) Rear Spindle Bearing (for all Models except 1LL1A1 and 1LJ1A1) Spindle Bearing Spacer (for all Models except 1LL1A1 and 1LJ1A1) For Models 1LJ1A1 and 1LL1A1 Front Spindle Bearing Spindle Bearing Retainer For all Models except 1LL1A1 and 1LJ1A1 For Models 1LJ1A1 and 1LL1A1 Spindle Retaining Ring (for Models 1LJ1A1 and 1LL1A1) Drill Chuck Spacer Drill Chuck Chuck Key Horizontal Hanger Tune-up Kit (includes illustrated parts 8, 9, 10, 11, 20, 23, 24, 26, 27[2], 29, 31 and 34) ... Tune-up Kit (includes illustrated parts 8, 9, 10, 11, 20, 23, 26, 27, 29, 31 and 34)	3RLM-10 3RLL-10 3RLM-17 R00H-97 3A-111A 3RL-80 R00A-510 3RANT2-28 3RL-28 3RL-6 5A-90 R0H-99 R1H-J253 3RA-365 3A-TK2 3A-TK2HP
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* Not illustrated.

◆ Indicates Tune-up Kit part.

• 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.



(Dwg. TPC525)

PART NUMBER FOR ORDERING



		3RL1A1	3RL1A4
	Angle Attachment	3RL1A1	3RL1A4
100	Angle Housing	3RL1A-550	3RL1A-550
101	Grease Fitting	D0F9-879	D0F9-879
102	Matched Bevel Gear Set (Bevel Pinion and Spindle not sold separately)	3RL1A-A591	3RL1A4-A591
103	Spindle Upper Bearing	7L1A-603	7L1A-603
104	Upper Bearing Shim Packet	7L1A-P448	7L1A-P448
105	Bevel Pinion Bearing	7AH-24	7AH-24
106	Bevel Pinion Thrust Bearing	3RL1A-514	3RL1A-514
107	Thrust Bearing Retainer	3RL2-705	3RL2-705
108	Rear Thrust Bearing Seat Assembly (Includes Rear Bearing Seat and Lock Pin)	3RL1A-682	3RL1A-682
109	Lower Spindle Bearing	7L1A-593	7L1A-593
110	Spindle Bearing Cap	7L1A-A531	7L1A-531
111	Coupling Nut	3RL2-27	3RL2-27
112	Coupling Nut Retainer	3RL2-29	3RL2-29

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