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Form P7078
Edition 5
June, 2000

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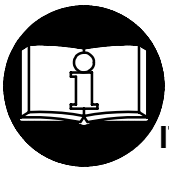
OPERATION AND MAINTENANCE MANUAL FOR MODELS 2400P AND 3000P TWIN BLADE IMPULSE WRENCHES

NOTICE

Models 2400P and 3000P Impulse Wrenches are designed for assembly operations which require high speed rundown of fasteners with consistent torque delivery and reduced torque reaction.
Ingersoll–Rand is not responsible for customer modification of tools for applications on which Ingersoll–Rand was not consulted.



⚠ WARNING

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

PLACING TOOL IN SERVICE

- **Always operate, inspect and maintain this tool in accordance with American National Standards Institute Safety Code for Portable Air Tools (ANSI B186.1).**
- **For safety, top performance, and maximum durability of parts, operate this tool at 90 psig (6.2 bar/620 kPa) maximum air pressure at the inlet with 1/2" (13 mm) inside diameter air supply hose.**
- **Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.**
- **Do not use damaged, frayed or deteriorated air hoses and fittings.**
- **Be sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905–1 for a typical piping arrangement.**
- **Always use clean, dry air at 90 psig (6.2 bar/620 kPa) maximum air pressure. Dust, corrosive fumes and/or excessive moisture can ruin the motor of an air tool.**
- **Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.**
- **Do not remove any labels. Replace any damaged label.**

USING THE TOOL

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

NOTICE

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

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

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

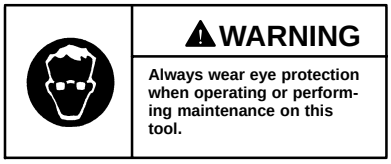
Printed in Japan

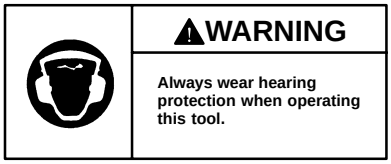
Ingersoll-Rand®

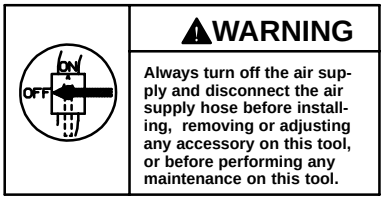
WARNING LABEL IDENTIFICATION

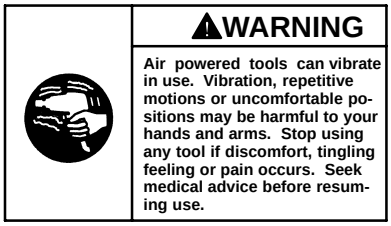
⚠ WARNING

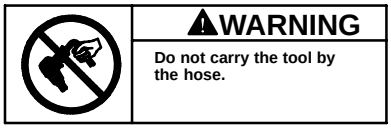
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

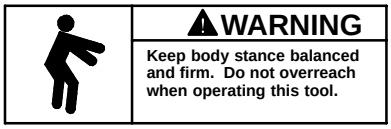


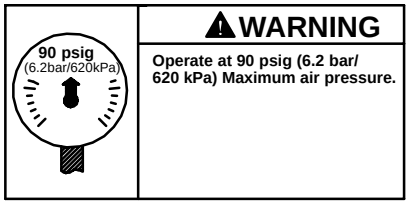












ADJUSTMENTS

TORQUE ADJUSTMENT

To adjust the torque on these Twin Blade Impulse Wrenches, proceed as follows:

1. Remove the Adjustment Hole Plug.
2. Rotate the Drive Shaft until the Torque Adjustment Screw is visible in the opening.
3. Using a 1.5 mm hex wrench, rotate the Adjustment Screw clockwise to increase the torque output and counterclockwise to decrease the torque output. Do not rotate the Oil Plug.

NOTICE

Make all final adjustments at the job.

4. Replace the Adjustment Hole Plug.

CHANGING THE MECHANISM FLUID

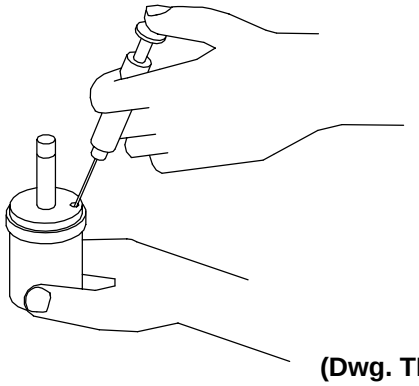
To change the Mechanism Fluid in the Impulse Mechanism, proceed as follows:

1. Remove the Rubber Housing Boot.
2. Using a hex wrench, remove the four Hammer Case Cap Screws and Lock Washers. Lift the Hammer Case off the Motor Housing over the Drive Shaft. Remove the Hammer Case Gasket.
3. Lift the assembled mechanism off the Rotor.
4. Using a 2 mm hex wrench, rotate the Torque Adjustment Screw clockwise until the Screw stops. Rotate the Screw counterclockwise until it stops or makes six complete revolutions.
5. Using a 2.5 mm hex wrench, unscrew and remove the Oil Plug. Remove the Oil Plug Seal and Oil Plug Seal Support.
6. With the oil plug opening downward over a container, rotate the Drive Shaft to purge the fluid from the mechanism.
7. Thread the Tee Wrench included with the Tool Kit (Part No. 1900P–99) into the Piston Stop Assembly that is 180 degrees from the Torque Adjustment Screw and pull the Stop Assembly toward the output end of the mechanism until it stops.
8. Using the syringe and fluid from the Fluid Replacement Kit (Part No. EQ106S–K400), fill the mechanism with the fluid furnished in the Kit until the fluid overflows the fill hole. Model 2400P will require 30 cc of fluid, Model 3000P, 43 cc.
   See Dwg. TPD1265.

NOTICE

DO NOT SUBSTITUTE ANY OTHER FLUID. Failure to use the impulse mechanism fluid provided could damage the tool, increase maintenance and decrease performance. Use only clean fluid in these tools.

ADJUSTMENTS



(Dwg. TPD1265)

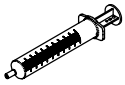
9. Submerge the fill opening in the remainder of the fluid, and using a wrench, rotate the Drive Shaft to purge any remaining air from the system.
10. Remove the mechanism from from the fluid and use the Tee Wrench to push the Piston Stop Assembly slowly downward until fluid flows from the fill opening.
11. Thread the Oil Plug with the Oil Plug Seal and Seal Support into the mechanism until it is snug.
12. Using a 2 mm hex wrench, turn the Torque Adjustment Screw clockwise until it stops. This is the maximum torque position.
13. Wipe the outside of the mechanism dry and clean and remove the Oil Chamber Plug. Using the syringe, withdraw 0.5 cc of fluid from 2400P models and 1.0 cc from 3000P models.
14. Install the Oil Chamber Plug and tighten it between 20 and 25 in–lb (2.3 and 2.8 Nm) torque.
15. Position a new Hammer Case Gasket on the Motor Housing and install the assembled mechanism on the rotor shaft.
16. Place the Hammer Case Cover over the Drive Shaft against the Housing and Gasket. Install the four Hammer Case Cap Screws and Lock Washers. Tighten each Screw between 45 and 50 in–lb (5.1 and 5.6 Nm) torque.
17. Install the Rubber Housing Boot on the tool.

PLACING TOOL IN SERVICE

LUBRICATION

Ingersoll–Rand No. 50

Ingersoll–Rand No. 67

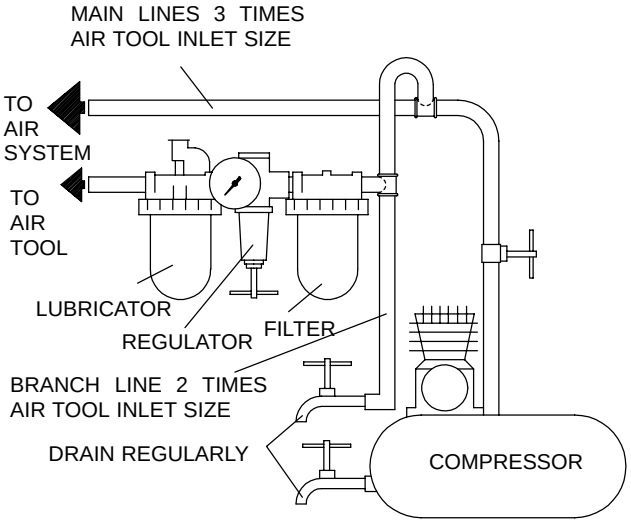


Ingersoll–Rand Fluid Part No. EQ106S–400–1

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

USA – No. C18–03–FKG0–28

After each 20 000 cycles, or as experience indicates, drain and refill the Impulse Unit Drive Assembly as instructed in this manual using the Fluid Replacement Kit (Part No. EQ106S–K400). Lubricate the hex drive and the output shaft before assembly.



(Dwg. TPD905–1)

HOW TO ORDER AN IMPULSE WRENCH

Model	Free Speed	Recommended Torque Range			
		Soft Draw		Hard Slam	
		ft–lb	Nm	ft–lb	Nm
PISTOL GRIP with 1/2" SQUARE DRIVE					
2400P	4,300	35–80	47–108	107–170	145–230
PISTOL GRIP with 3/4" SQUARE DRIVE					
3000P	4,500	60–110	82–150	124–210	169–286

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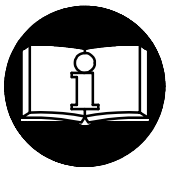
MANUEL D'EXPLOITATION ET D'ENTRETIEN DES CLÉS HYDRO–PNEUMATIQUES À DOUBLE PALETTE MODÈLES 2400P ET 3000P

NOTE

Les clés hydro–pneumatiques à double palette Modèles 2400P et 3000P sont destinées aux opérations d'assemblage nécessitant une grande vitesse de serrage avec une régularité du couple et un serrage virtuellement sans réaction sur l'opérateur.

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



⚠ ATTENTION

**D'IMPORTANTES INFORMATIONS DE SÉCURITÉ SONT JOINTES.
LIRE CE MANUEL AVANT D'UTILISER L'OUTIL.
L'EMPLOYEUR EST TENU DE COMMUNIQUER LES INFORMATIONS DE CE MANUEL AUX EMPLOYÉS UTILISANT CET OUTIL.
LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES.**

MISE EN SERVICE DE L'OUTIL

- **Toujours exploiter, inspecter et entretenir cet outil conformément au Code de sécurité des outils pneumatiques portatifs de l'American National Standards Institute (ANSI B186.1).**
- **Pour la sécurité, les performances optimales et la durabilité maximale des pièces, cet outil doit être connecté à une alimentation d'air comprimé de 6,2 bar (620 kPa) maximum à l'entrée, avec un flexible de 13 mm de diamètre intérieur.**
- **Couper toujours l'alimentation d'air comprimé et débrancher le flexible d'alimentation avant d'installer, déposer ou ajuster tout accessoire sur cet outil, ou d'entreprendre une opération d'entretien quelconque sur l'outil.**
- **Ne pas utiliser des flexibles ou des raccords endommagés, effilochés ou détériorés.**
- **S'assurer que tous les flexibles et les raccords sont correctement dimensionnés et bien serrés. Voir Plan TPD905–1 pour un exemple type d'agencement des tuyauteries.**
- **Utiliser toujours de l'air sec et propre à une pression maximum de 6,2 bar (620 kPa). La poussière, les fumées corrosives et/ou une humidité excessive peuvent endommager le moteur d'un outil pneumatique.**
- **Ne jamais lubrifier les outils avec des liquides inflammables ou volatiles tels que le kérosène, le gasoil ou le carburant d'aviation.**
- **Ne retirer aucune étiquette. Remplacer toute étiquette endommagée.**

UTILISATION DE L'OUTIL

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

NOTE

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

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

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

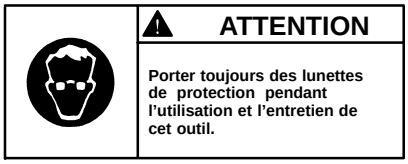
Imprimé au Japon

Ingersoll-Rand®

SIGNIFICATION DES ÉTIQUETTES D'AVERTISSEMENT

⚠ ATTENTION

LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES.



⚠ ATTENTION

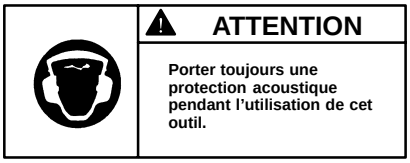
Porter toujours des lunettes de protection pendant l'utilisation et l'entretien de cet outil.

⚠ ATTENTION

Les outils pneumatiques peuvent vibrer pendant l'exploitation. Les vibrations, les mouvements répétitifs et les positions inconfortables peuvent causer des douleurs dans les mains et les bras. N'utiliser plus d'outils en cas d'inconfort, de picotements ou de douleurs. Consulter un médecin avant de recommencer à utiliser l'outil.

⚠ ATTENTION

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

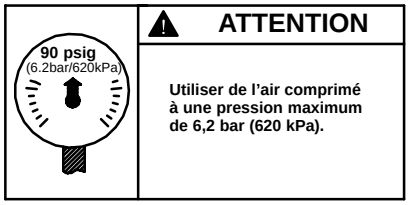


⚠ ATTENTION

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

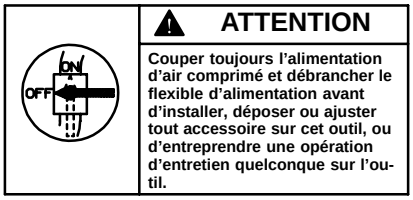
⚠ ATTENTION

Ne pas transporter l'outil par son flexible.



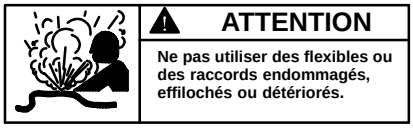
⚠ ATTENTION

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



⚠ ATTENTION

Couper toujours l'alimentation d'air comprimé et débrancher le flexible d'alimentation avant d'installer, déposer ou ajuster tout accessoire sur cet outil, ou d'entreprendre une opération d'entretien quelconque sur l'outil.



⚠ ATTENTION

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

RÉGLAGES

RÉGLAGE DU COUPLE

Pour ajuster le couple sur ces clés à impulsions à double palette, procéder comme suit :

1. Déposer le bouchon du trou de réglage.
2. Tourner l'arbre d'entraînement jusqu'à ce que la vis de réglage de couple soit visible dans l'ouverture.
3. A l'aide d'une clé pour six pans creux de 1,5 mm, tourner la vis dans le sens des aiguilles d'une montre pour augmenter le couple de serrage, ou dans le sens inverse des aiguilles d'une montre pour réduire le couple. Ne pas tourner le bouchon d'huile.

NOTE

Effectuer tous les réglages finaux sur l'écrou à serrer.

4. Remonter le bouchon dans le trou de réglage.

CHANGEMENT DU FLUIDE DU MÉCANISME

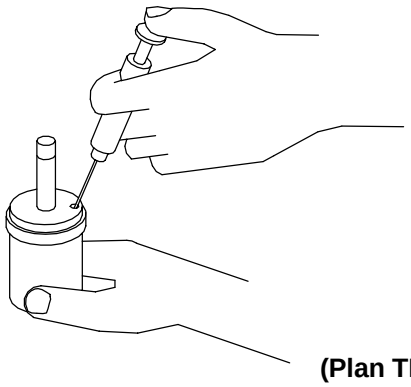
Le fluide du mécanisme d'impulsion est changé de la façon suivante :

1. Déposer la gaine en caoutchouc du corps.
2. A l'aide d'une clé pour six pans creux, déposer les quatre vis du carter de marteau et les rondelles frein. Retirer le carter de marteau du corps du moteur sur l'arbre d'entraînement. Déposer le joint du carter de marteau.
3. Retirer le mécanisme assemblé du rotor.
4. A l'aide d'une clé pour six pans creux de 2 mm, tourner la vis de réglage de couple dans le sens des aiguilles d'une montre jusqu'à ce qu'elle vienne en butée. Tourner la vis dans le sens inverse des aiguilles d'une montre jusqu'à ce qu'elle vienne en butée, ou après six tours complets.
5. A l'aide d'une clé pour six pans creux de 2,5 mm, dévisser et déposer le bouchon d'huile. Déposer le joint du bouchon d'huile et la bague d'appui du joint.
6. Tout en tenant le trou du bouchon d'huile vers le bas au–dessus d'un récipient, tourner l'arbre d'entraînement pour purger le fluide contenu dans le mécanisme.
7. Visser la clé en T fournie dans le nécessaire d'outillage (Réf. No. 1900P–99) dans la butée de piston qui se trouve à 180° par rapport à la vis de réglage de couple et tirer l'ensemble de butée vers la sortie et le mécanisme jusqu'à ce qu'il s'arrête.
8. A l'aide de la seringue et du fluide fourni dans le nécessaire de fluide de remplacement (Réf. No. EQ106S–K400), remplir le mécanisme avec le fluide fourni jusqu'à ce qu'il déborde du trou de remplissage. Le Modèle 2400P nécessite 30 cm^3 de fluide et le Modèle 3000P nécessite 43 cm^3. Voir Plan TPD1265.

NOTE

NE PAS UTILISER D'AUTRE FLUIDE. La non utilisation du fluide fourni pourrait causer l'endommagement de l'outil, augmenter l'entretien et réduire les performances. N'utiliser que du fluide propre dans ces outils.

RÉGLAGES



(Plan TPD1265)

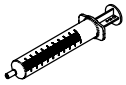
9. Submerger l'ouverture de remplissage dans le reste du fluide et, à l'aide d'une clé, tourner l'arbre d'entraînement pour purger tout l'air du système.
10. Retirer le mécanisme du fluide et, à l'aide de la clé en T, pousser l'ensemble de butée de piston lentement vers le bas jusqu'à ce que le fluide déborde de l'ouverture de remplissage.
11. Visser le bouchon, équipé du joint et de son support, dans le mécanisme et le serrer fermement.
12. A l'aide d'une clé pour six pans creux de 2 mm, tourner la vis de réglage de couple dans le sens des aiguilles d'une montre jusqu'à ce qu'elle vienne en butée. C'est la position de couple maximum.
13. Essuyer l'extérieur du mécanisme pour le sécher et déposer le bouchon de la chambre d'huile. A l'aide de la seringue, retirer 0,5 cm^3 de fluide sur le modèle 2400P et 1 cm^3 sur le modèle 3000P.
14. Remonter le bouchon de la chambre d'huile et le serrer à un couple de 2,3 à 2,8 Nm.
15. Placer une nouvelle garniture de carter de marteau sur le corps de moteur et installer le mécanisme assemblé sur l'arbre du rotor.
16. Placer le couvercle de carter de marteau sur l'arbre d'entraînement et contre le corps et son joint. Monter les quatre vis à six pans creux du carter de marteau et les rondelles frein. Serrer chaque vis à un couple de 5,1 à 5,6 Nm.
17. Monter la gaine en caoutchouc sur l'outil.

MISE EN SERVICE DE L'OUTIL

LUBRIFICATION

Ingersoll–Rand No.50

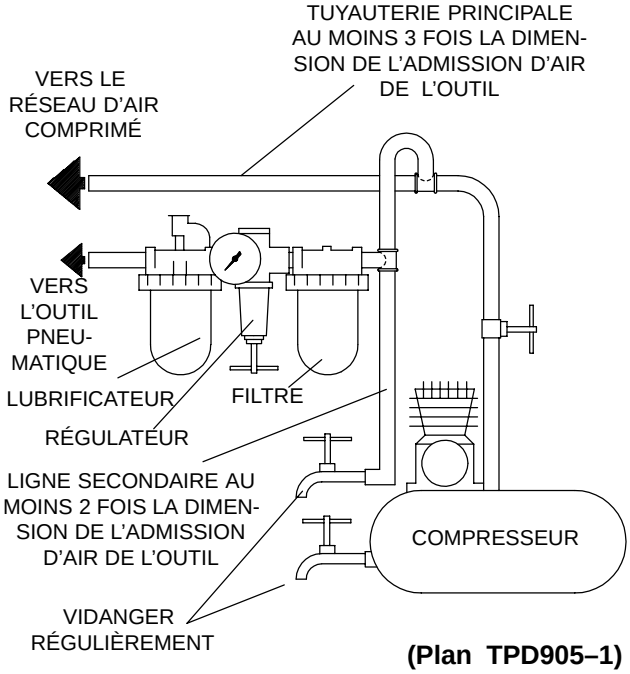
Ingersoll–Rand No. 67
Fluide Ingersoll–Rand
Référence EQ106S–400–1



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

É. U. – C18–03–FKG0–28

Tous les 20 000 cycles, ou en fonction de l'expérience, vider et remplir l'ensemble de mécanisme d'impulsion conformément aux instructions du manuel en utilisant le nécessaire de fluide de remplacement (Réf. No. EQ106S–K400). Lubrifier l'entraîneur hexagonal et l'arbre de sortie avant l'assemblage.



(Plan TPD905–1)

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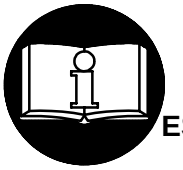
MANUAL DE FUNCIONAMIENTO Y MANTENIMIENTO PARA LLAVES DE IMPULSO DE DOBLE PALETA MODELOS 2400P Y 3000P

NOTA

Las llaves de impulso modelos 2400P y 3000P está diseñadas para operaciones de ensamblaje que requieran alta velocidad de atornillado con un par consistente y reducida reacción de par. Ingersoll–Rand no aceptará responsabilidad alguna por la modificación de las herramientas efectuada por el cliente para las aplicaciones que no hayan sido consultadas con Ingersoll–Rand.

⚠ AVISO



SE ADJUNTA INFORMACIÓN IMPORTANTE DE SEGURIDAD.
LEA ESTE MANUAL ANTES DE UTILIZAR LA HERRAMIENTA.
ES RESPONSABILIDAD DE LA EMPRESA ASEGURARSE DE QUE EL OPERARIO ESTÉ AL TANTO DE LA INFORMACIÓN QUE CONTIENE ESTE MANUAL.
EL HACER CASO OMISO DE LOS AVISOS SIGUIENTES PODRÍA OCASIONAR LESIONES.

PARA PONER LA HERRAMIENTA EN SERVICIO

- **Utilice, examine y mantenga siempre esta herramienta conforme al código de seguridad para herramientas neumáticas portátiles de la American National Standards Institute (ANSI B186.1).**
- **Para mayor seguridad, rendimiento óptimo y larga vida útil de las piezas, utilice esta herramienta a una presión de aire máxima de 90 psig (6,2 bar/620 kPa) con una manguera de suministro de aire con diámetro interno de 13 mm.**
- **Corte siempre el suministro de aire y desconecte la manguera de suministro de aire antes de instalar, desmontar o ajustar cualquier accesorio de esta herramienta, o antes de realizar cualquier operación de mantenimiento de la misma.**
- **No utilice mangueras de aire y racores dañados, desgastados o deteriorados.**
- **Asegúrese de que todos los racores y mangueras sean del tamaño correcto y estén bien apretados. El Esq. TPD905–1 muestra una disposición característica de las tuberías.**
- **Use siempre aire limpio y seco a una presión máxima de 90 psig (6,2 bar/620 kPa). El polvo, los gases corrosivos y el exceso de humedad pueden estropear el motor de una herramienta neumática.**
- **No lubrique las herramientas con líquidos inflamables o volátiles tales como queroseno, gasoil o combustible para motores a reacción.**
- **No saque ninguna etiqueta. Sustituya toda etiqueta dañada.**

UTILIZACIÓN DE LA HERRAMIENTA

- **Use siempre protección ocular cuando utilice esta herramienta o realice operaciones de mantenimiento en la misma.**
- **Use siempre protección para los oídos cuando utilice esta herramienta.**
- **Mantenga las manos, la ropa suelta y el cabello largo alejados del extremo giratorio de la herramienta.**
- **Anticipe y esté atento a los cambios repentinos en el movimiento durante la puesta en marcha y utilización de toda herramienta motorizada.**
- **Mantenga una postura del cuerpo equilibrada y firme. No estire demasiado los brazos al manejar la herramienta. Pueden darse elevados pares de reacción a la presión de aire recomendada, e incluso a presiones inferiores.**
- **El eje de la herramienta puede seguir girando brevemente después de haberse soltado el mando.**
- **Las herramientas neumáticas pueden vibrar durante el uso. La vibración, los movimientos repetitivos o las posiciones incómodas pueden dañarle los brazos y manos. En caso de incomodidad, sensación de hormigueo o dolor, deje de usar la herramienta. Consulte con el médico antes de volver a utilizarla.**
- **Utilice únicamente los accesorios Ingersoll–Rand recomendados.**
- **Utilice únicamente bocas y accesorios para llaves de impacto. No utilice bocas o accesorios manuales (cromados).**
- **Esta herramienta no ha sido diseñada para trabajar en ambientes explosivos.**
- **Esta herramienta no está aislada contra descargas eléctricas.**

NOTA

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

Las reparaciones sólo se deben encomendar a personal debidamente cualificado y autorizado. Consulte con el centro de servicio autorizado Ingersoll–Rand más próximo.

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

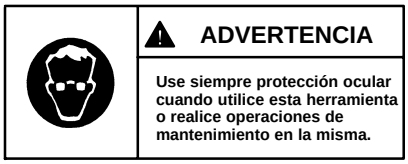
Impreso en Japón

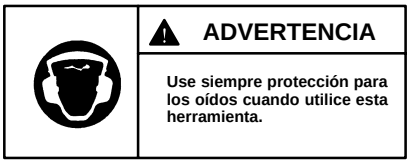
Ingersoll-Rand®

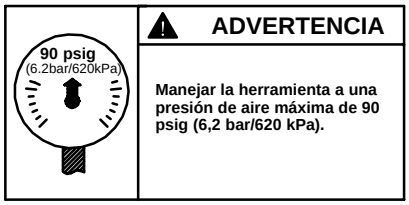
ETIQUETAS DE AVISO

⚠ AVISO

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







AJUSTES

AJUSTE DE PAR

Para ajustar el par de estas llaves de impulso de doble paleta, proceda como sigue:

1. Saque el tapón del orificio de ajuste.
2. Gire el eje de accionamiento hasta que el tornillo de ajuste de par sea visible a través de dicho orificio.
3. Con una llave hexagonal de 1,5 mm, gire el tornillo de ajuste de par hacia la derecha para incrementar el par y hacia la izquierda para disminuirlo. No gire el tapón del aceite.

NOTA

Haga todos los ajustes finales trabajando.

4. Vuelva a poner en su sitio el tapón del orificio de ajuste.

CAMBIO DEL LÍQUIDO DEL MECANISMO

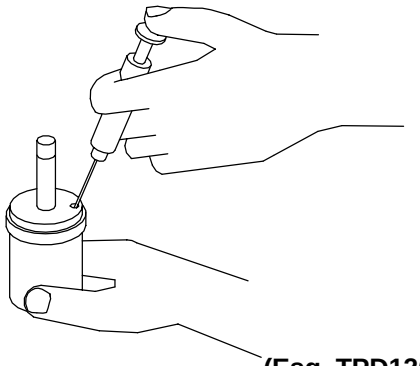
Para cambiar el líquido del mecanismo de impulso, proceda como sigue:

1. Saque la funda de la carcasa de caucho.
2. Utilizando una llave hexagonal, saque los cuatro tornillos de la caja de mazas y las arandelas de seguridad. Levante la caja de mazas y sáquela de la carcasa del motor por encima del eje de accionamiento. Saque la junta obturadora de la caja de mazas.
3. Levante el mecanismo ensamblado y sáquelo del rotor.
4. Con una llave hexagonal de 2 mm, gire el tornillo de ajuste de par hacia la derecha hasta que se pare. Gire el tornillo hacia la izquierda hasta que se pare o dé seis vueltas completas.
5. Con una llave hexagonal de 2,5 mm, desenrosque y saque el tapón del aceite. Saque el retén del tapón del aceite y el soporte de dicho retén.
6. Con el orificio del tapón del aceite apuntando hacia abajo sobre un contenedor, gire el eje de accionamiento para purgar el líquido del mecanismo.
7. Enrosque la llave en “T” que se incluye en la caja de herramientas (Ref. Nº 1900P–99)) en el conjunto del tope del pistón que se encuentra a 180 grados del tornillo de ajuste de par, y tire de dicho conjunto hacia el extremo de salida del mecanismo hasta que se pare.
8. Con la jeringuilla y el líquido del juego de cambio de líquido (Ref. Nº EQ106S–K400), llene el mecanismo con el líquido suministrado en dicho equipo hasta que el líquido se salga del orificio de llenado. El modelo 2400P requerirá 30 cc de líquido, y el modelo 3000P, 43 cc. Vea Esq. TPD1265.

NOTA

NO SUSTITUYA CON NINGÚN OTRO LÍQUIDO. Si no se usa el líquido de mecanismo impulsor suministrado, se podría dañar la herramienta, incrementar su mantenimiento y disminuir su rendimiento. Use solamente líquido limpio con estas herramientas.

AJUSTES



(Esq. TPD1265)

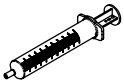
9. Sumerja el orificio de llenado en el resto del líquido y, utilizando una llave, gire el eje de accionamiento para purgar el aire que pudiera quedar en el sistema.
10. Saque el mecanismo del líquido y utilice la llave en "T" para empujar lentamente el conjunto de tope del pistón hacia abajo hasta que el líquido se salga del orificio de llenado.
11. Enrosque el tapón del aceite con el retén del tapón de aceite y el soporte del retén en el mecanismo hasta que quede bien ajustado.
12. Con una llave hexagonal de 2 mm, gire el tornillo de ajuste de par hacia la derecha hasta que se pare. Ésta es la posición de máximo par.
13. Limpie la parte de fuera del mecanismo y séquelo, y saque el tapón de la cámara de aceite. Utilizando la jeringuilla, saque 0,5 cc de líquido de los modelos 2400P, y 1,0 cc de los modelos 3000P.
14. Instale el tapón de la cámara de aceite y apriételo entre 20 y 25 pulg.–lb (2,3 a 2,8 Nm) de par.
15. Coloque una junta obturadora de la caja de mazas nueva en la carcasa del motor e instale el mecanismo ensamblado en el eje rotor.
16. Coloque la cubierta de la caja de mazas sobre el eje de accionamiento y contra la carcasa y la junta obturadora. Instale los cuatro tornillos de la caja de mazas y las arandelas de seguridad. Apriete cada tornillo entre 45 y 50 pulg–lb (5,1 y 5,6 Nm) de par.
17. Instale la funda de la carcasa de caucho en la herramienta.

PARA PONER LA HERRAMIENTA EN SERVICIO

LUBRICACIÓN

Ingersoll–Rand Nº 50

Ingersoll–Rand Nº 67

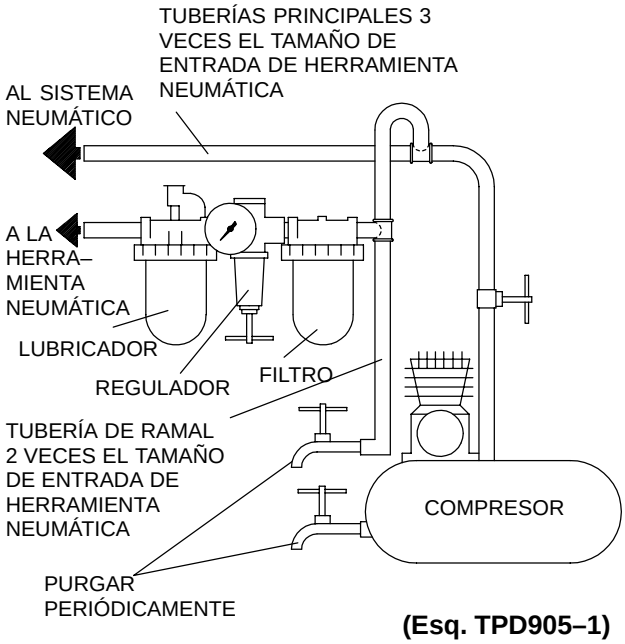


Líquido Ingersoll–Rand Nº EQ106S–400–1

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

EE.UU. – C11–03–G00

Después de cada 20 000 ciclos, o según indique la experiencia, drene y vuelva a llenar el conjunto de accionamiento del mecanismo impulsor tal y como se indica en este manual, utilizando el juego de cambio de líquido (Ref. Nº EQ106S–K400). Lubrique el eje de salida y el de accionamiento hexagonal antes del montaje.



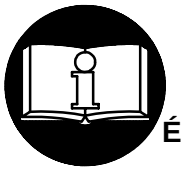
(Esq. TPD905–1)

MANUAL DE FUNCIONAMENTO E MANUTENÇÃO PARA FERRAMENTAS PNEUMÁTICAS DE IMPULSÃO DE LÂMINAS DUPLAS MODELOS 2400P E 3000P

P

AVISO

As Ferramentas Pneumáticas de Impulsão Modelos 2400P e 3000P são concebidas para operações de montagem que exijam velocidade de aperto elevada com torque exercido consistente e reacção de torque reduzida.
A Ingersoll–Rand não é responsável por modificações feitas pelo cliente em ferramentas nas quais a Ingersoll–Rand não tenha sido consultada.



⚠ ADVERTÊNCIA

INFORMAÇÃO DE SEGURANÇA IMPORTANTE EM ANEXO.
LEIA ESTE MANUAL ANTES DE OPERAR A FERRAMENTA.
É DA RESPONSABILIDADE DO EMPREGADOR COLOCAR A INFORMAÇÃO DESTE MANUAL NAS MÃOS DO OPERADOR.
O NÃO CUMPRIMENTO DAS SEGUINTES ADVERTÊNCIAS PODE RESULTAR EM FERIMENTOS.

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

- **Sempre opere, inspeccione e mantenha esta ferramenta de acordo com o Código de Segurança do Instituto Americano de Padrões Nacionais para Ferramentas Pneumáticas Portáteis (ANSI B186.1).**
- **Para segurança, máximo desempenho e máxima durabilidade das peças, opere esta ferramenta com uma pressão de ar máxima de 6,2 bar/620 kPa (90 psig) na entrada da mangueira de alimentação de ar com diâmetro interno de 13 mm (1/2").**
- **Desligue sempre a alimentação de ar e desconecte a mangueira de alimentação de ar antes de instalar, remover ou ajustar qualquer acessório nesta ferramenta, ou antes de executar qualquer serviço de manutenção nesta ferramenta.**
- **Não use mangueiras de ar ou adaptadores danificados, gastos ou deteriorados.**
- **Certifique–se de que todas as mangueiras e adaptadores sejam do tamanho correcto e estejam apertados com firmeza. Veja o Desenho TPD905–1 para um arranjo típico de tubagem.**
- **Use sempre ar seco e limpo com pressão máxima de 6,2 bar/620 kPa (90 psig). Pó, fumos corrosivos e/ou humidade excessiva podem arruinar o motor de uma ferramenta pneumática.**
- **Não lubrifique as ferramentas com líquidos inflamáveis ou voláteis tais como querosene, diesel ou combustível de jactos.**
- **Não remova nenhum rótulo. Reponha qualquer rótulo danificado.**

USANDO A FERRAMENTA

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

AVISO

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

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

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

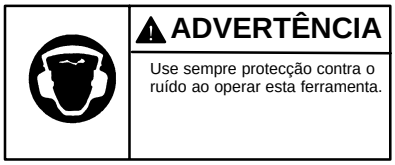
Fabricado no Japão

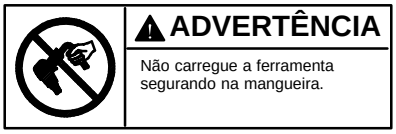
Ingersoll-Rand®

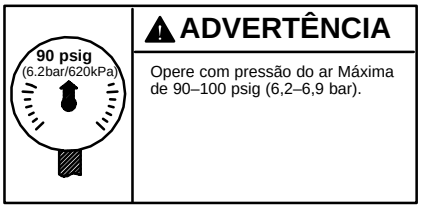
IDENTIFICAÇÃO DO RÓTULO DE ADVERTÊNCIA

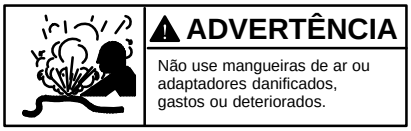
⚠ ADVERTÊNCIA

O NÃO CUMPRIMENTO DAS SEGUINTES ADVERTÊNCIAS PODE RESULTAR EM FERIMENTOS.









AJUSTES

AJUSTE DE TORQUE

Para ajustar o torque nestas Ferramentas Pneumáticas de Impulso de Lâminas Duplas, proceda da seguinte maneira:

1. Remova o Bujão do Furo de Ajuste.
2. Gire o Eixo de Comando até o Parafuso de Ajuste de Torque estar visível na abertura.
3. Usando uma chave Allen de 1,5 mm, gire o Parafuso de Ajuste no sentido horário para aumentar o torque de saída e no sentido anti–horário para diminuir o torque de saída. Não gire o Bujão de Óleo.

AVISO

Faça todos os ajustes finais no serviço.

4. Reponha o Bujão do Furo de Ajuste.

MUDANDO O FLUIDO DO MECANISMO

Para mudar o Fluído do Mecanismo no Mecanismo de Impulso, proceda da seguinte maneira:

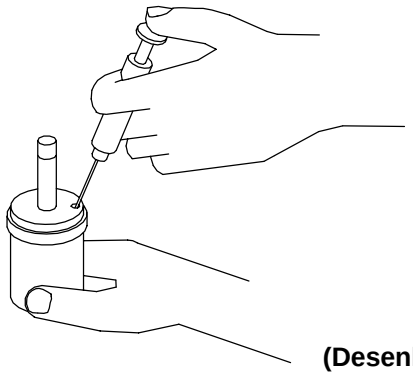
1. Remova o Calço do Corpo de Borracha.
2. Usando uma chave Allen, remova os três Parafusos dos Tampos da Caixa do Martelo e Anilhas de Trava. Erga a Caixa do Martelo para fora do Corpo do Motor sobre o Eixo de Comando. Remova a Junta da Culatra da Caixa do Martelo.
3. Erga o mecanismo montado do motor.
4. Usando uma chave Allen de 2 mm gire o Parafuso de Ajuste de Torque no sentido horário até que o Parafuso pare. Gire o Parafuso no sentido contrário ao dos ponteiros do relógio até que ele pare ou complete 6 revoluções.
5. Usando uma chave Allen de 2,5 mm, desparafuse e remova o Bujão de Óleo. Remova o Lacre do Bujão do Óleo e o Suporte do Lacre do Bujão de Óleo.
6. Com a abertura do bujão de óleo para baixo sobre um recipiente, gire o Eixo de Comando para expelir o fluido do mecanismo.
7. Rosqueie a Chave em “T” incluída no Kit de Ferramenta (Número 1900A–99) no Conjunto de Paragem do Pistão que está a 180 graus do Parafuso de Ajuste de Torque e puxe o Conjunto de Paragem em direção à saída do mecanismo até que ele pare.
8. Usando a seringa e fluído do Kit de Reposição de Fluído (Número de Pedido EQ106S–K400), encha o mecanismo com o fluído fornecido no Kit até que o fluído transborde do orifício de enchimento. O Modelo 2400P necessitará 30 cc de fluído, o Modelo 3000P, 43 cc. Veja o Desenho TPD1265.

AVISO

NÃO SUBSTITUA POR QUALQUER OUTRO FLUÍDO.

Caso o fluido fornecido não for usado danos podem ocorrer à ferramenta, aumento da manutenção e diminuição do desempenho. Use somente fluido limpo nestas ferramentas.

AJUSTES



(Desenho TPD1265)

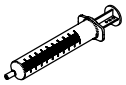
9. A abertura de enchimento deve ser submersa no restante do fluido, e usando uma chave, gire o Eixo do Comando para expelir qualquer ar remanescente do sistema.
10. Remova o mecanismo do fluido e use uma Chave em ”T” para empurrar o Conjunto de Paragem do Pistão lentamente para baixo até que o fluido flua da abertura de enchimento.
11. Rosqueie o Bujão de Óleo com o Lacre do Bujão de Óleo no mecanismo até que ele esteja apertado.
12. Usando uma chave Allen de 2 mm, gire o Parafuso de Ajuste de Torque no sentido horário até o Parafuso parar. Esta é a posição de aperto máximo.
13. Limpe a parte externa do mecanismo a seco e limpe e remova o Bujão da Câmara de Óleo. Usando uma seringa, retire 0,50 cc de fluido do modelo 2400P e 1,0 cc do modelo 3000P.
14. Instale o Bujão da Câmara de Óleo e aperte–o com 2,3 a 2,8 Nm (20 a 25 pol–lb).
15. Posicione a Junta da Culatra da Caixa do Martelo nova no Corpo do Motor e instale o mecanismo montado no eixo do rotor.
16. Coloque a Capa da Caixa do Martelo sobre o Eixo de Comando contra o Corpo e o Junta da Culatra. Instale os três Parafusos do Tampo da Caixa do Martelo e Anilhas de Trava. Aperte cada Parafuso com um torque de 5,1 e 5,6 Nm (45 e 50 pol–lb).
17. Instale o Calço do Corpo de Borracha na ferramenta.

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

LUBRIFICAÇÃO

Ingersoll–Rand No. 50

Ingersoll–Rand No. 67

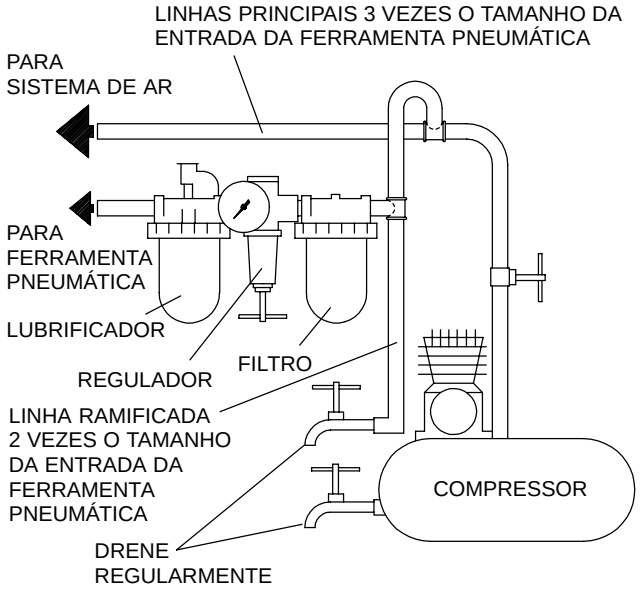


Fluído Ingersoll–Rand Número de Pedido No. EQ106S–400–1

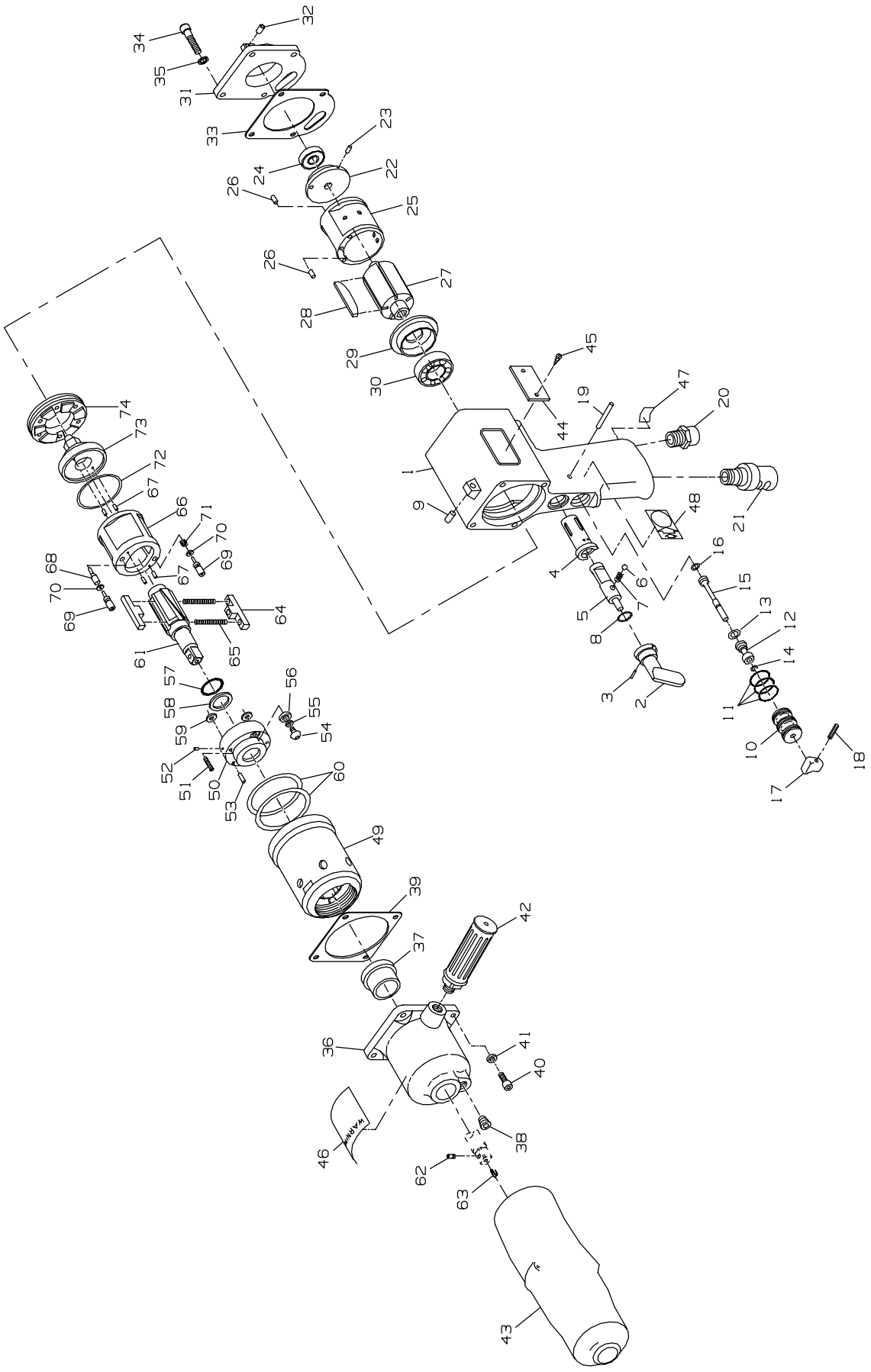
Use sempre um lubrificador de ar de linha com estas ferramentas. Nós recomendamos a seguinte Unidade Filtro–Lubrificador–Regulador**:**

Para os E.U.A. – No. C18–03–FKG0–28

Depois de cada 20 000 ciclos, ou como a experiência indicar, drene e encha o Conjunto do Comando da Unidade de Impulso como instruído neste manual usando o Kit de Reposição de Fluído (Número de Pedido EQ106S–K400). Lubrifique o comando hexagonal e o eixo de saída antes de montar.



(Desenho TPD905–1)



(Dwg. TPA1342)

PART NUMBER FOR ORDERING

		2400P	3000P
	Motor Housing Assembly	2400P–A40	3000P–A40
1	Motor Housing	2400P–40	3000P–40
2	Reverse Lever	3000P–328	3000P–328
3	Reverse Lever Retaining Pin	3000P–152	3000P–152
4	Reverse Valve Bushing	2400P–330	2400P–330
5	Reverse Valve	2400P–329	2400P–329
6	Reverse Valve Detent Ball	500P–333	500P–333
7	Reverse Valve Detent Spring	1900P–51	1900P–51
8	Reverse Valve Retainer	1410P–303	1410P–303
9	Suspension Hole Liner	1100P–232	1100P–232
10	Throttle Bushing Assembly	EQ112P–A503	EQ112P–A503
11	Throttle Bushing Seal (3)	EQ106P–283	EQ106P–283
12	Throttle Valve Assembly	EQ112P–A304	EQ112P–A304
13	Throttle Valve Seal	EQ112P–159	EQ112P–159
14	Valve Retaining Ring	EQ106P–303	EQ106P–303
15	Throttle Rod Assembly	EQ112P–A302	EQ112P–A302
16	Throttle Rod Seal	EQ106P–288	EQ106P–288
17	Trigger	EQ106P–93	EQ106P–93
18	Trigger Pin	EQ106P–265	EQ106P–265
19	Throttle Retaining Pin	180PQ–120	180PQ–120
20	Inlet Bushing	EQ106S–565	EQ106S–565
21	Exhaust Deflector	2400P–A23	2400P–A23
	Motor Assembly	2400P–A53	3000P–A53
	Rear End Plate Assembly	2400P–A12	3000P–A12
22	Rear End Plate Assembly	2400P–B12	EQ230P–A12
23	End Plate Alignment Pin	2400P–152	EQ230P–99
24	Rear Rotor Bearing	R38P–606	EQ230P–24
25	Cylinder Assembly	2400P–A3	3000P–A3
26	Cylinder Alignment Pin (2)	1900P–152	3000P–152
27	Rotor	2400P–53	EQ230P–53
28	Vane Packet (set of 6 Vanes)	2400P–42–6	EQ230P–42–6
29	Front End Plate Assembly	2400P–A11	3000P–A11
30	Front Rotor Bearing	2400P–22	2400P–22

		PART NUMBER FOR ORDERING	
		2400P	**3000P**
31	Motor Case Cover Assembly	2400P–A202	3000P–A202
32	Suspension Hole Liner	1100P–232	1100P–232
33	Motor Case Cover Gasket	2400P–739	3000P–739
34	Motor Case Cover Screw (4)	2400P–277	3000P–638
35	Cover Screw Lock Washer (4)	EQ112P–58	EQ112P–58
	Hammer Case Assembly	2400P–A727	3000P–A727
36	Hammer Case	2400P–727	3000P–727
37	Hammer Case Bushing	EQ110P–641	3000P–641
38	Adjustment Hole Plug	500P–95	500P–95
39	Hammer Case Gasket	2400P–740	3000P–740
40	Hammer Case Cap Screw (4)	2400P–277	3000P–638
41	Cap Screw Lock Washer (4)	EQ112P–58	EQ112P–58
42	Dead Handle	—	EQ230P–A48
43	Rubber Housing Boot	2400P–2	3000P–2
44	Nameplate		
	for models ending in –EU	———	3000P–EU–301
	for all other models	2400P–301	3000P–301
*	Forward Rotation Label (for models ending in –EU)	———	7802R–EU–F99
*	Reverse Rotation Label (for models ending in –EU)	———	7802R–EU–R99
45	Nameplate Screw (2 for 2400P; 4 for 3000P)	EQ106S–322	EQ106S–322
46	Warning Label		
	for models ending in –EU	———	EU–99
	for all other models	WARNING–2–99	WARNING–2–99
47	Oil Daily Label	500P–69	500P–69
48	Two Speed Trigger Label	180PQ–68	180PQ–68
*	Motor Tune–up Kit (includes illustrated items 24, 28, 30 and 33)	2400P–K500	3000P–K500

* Not illustrated.

PART NUMBER FOR ORDERING

		2400P	3000P
	Impulse Unit Drive Assembly	2400P–A200	3000P–A200
49	Liner Housing	1900P–240	EQ230P–240
	Front Cover Assembly	1900P–A211	3000P–A211
50	Front Liner Cover Assembly	1900P–B211	3000P–B211
51	Torque Adjustment Screw	1900P–230	1900P–230
52	Adjustment Screw Lock	2400P–288	2400P–288
53	Alignment Pin	1900P–120	EQ230P–232
54	Oil Plug	EQ230P–277	EQ230P–277
55	Oil Plug Seal	EQ208S–238	EQ208S–238
56	Oil Plug Seal Support	EQ230P–229	EQ230P–229
57	Drive Shaft O–ring	EQ110P–271	EQ230P–271
58	Seal Back–up Ring	EQ110P–272	EQ230P–272
59	Front Liner Cover Piston Seal (2)	2400P–237	3000P–236
60	Liner Housing Seal (2)	1900P–238	3000P–238
	Drive Shaft Assembly	1900P–A626	—
61	Drive Shaft	1900P–626	3000P–626
62	Socket Retaining Pin	804–716	—
63	Retaining Pin Spring	5HUD–718	—
64	Drive Shaft Blade (2)	1900P–220	EQ230P–220
65	Blade Spring (2)	1900P–219	EQ230P–219
66	Liner Assembly	1900P–A203	3000P–A203
67	Liner Alignment Pin (4)	1900P–298	EQ230P–298
68	Torque Valve Piston	1900P–222	EQ230P–222
	Piston Stop Assembly (2)	1900P–A255	EQ230P–A255
69	Piston Stop	1900P–255	EQ230P–255
70	Piston Stop Seal (2)	EQ104S–50	EQ230P–288
71	Piston Stop Assist Spring	1900P–219	1900P–219
72	Rear Liner Cover Seal	2400P–238	3000P–237
73	Rear Liner Cover	2400P–212	EQ230P–212
74	Housing Cap	EQ112P–207	EQ230P–207
*	Fluid Replacement Kit	EQ106S–K400	EQ106S–K400
*	Replacement Fluid (4 oz.)	EQ106S–400–1	EQ106S–400–1
*	Mechanism Tune–up Kit (includes illustrated items 55, 56, 57, 58, 59 [2], 60 [2], 70 [2] and 72)	1900P–K600	—
*	Mechanism Tune–up Kit (includes illustrated items 39, 55, 56, 57, 58, 59 [2], 60 [2], 65 [2], 70 [2], 71 and 72)	—	3000P–K600A
*	Tool Kit (includes all the specialized tooling required to repair these tools and consists of a Spanner Plug, Threaded Tee Wrench, O–ring Installer and a pressing fixture that has a Disassembly Arbor and Pressing Sleeve)	1900P–99	1900P–99

* Not illustrated.

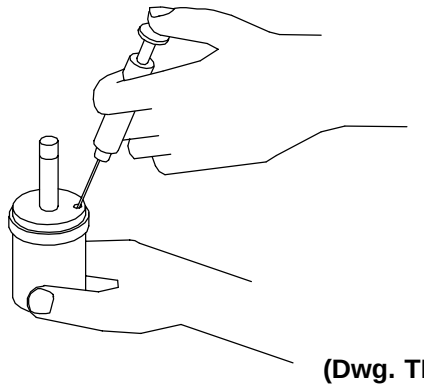
– CHANGING THE MECHANISM FLUID —

To change the Mechanism Fluid in the Impulse Mechanism, proceed as follows:

1. Remove the Rubber Housing Boot (43).
2. Using a hex wrench, remove the four Hammer Case Cap Screws (40) and Lock Washers (41). Lift the Hammer Case (36) off the Motor Housing (1) over the Drive Shaft. Remove the Hammer Case Gasket (39).
3. Lift the assembled mechanism off the Rotor (27).
4. Using a 2 mm hex wrench, rotate the Torque Adjustment Screw (51) clockwise until the Screw stops. Rotate the Screw counterclockwise until it stops or makes six complete revolutions.
5. Using a 2.5 mm hex wrench, unscrew and remove the Oil Plug (54). Remove the Oil Plug Seal (55) and Oil Plug Seal Support (56).
6. With the oil plug opening downward over a container, rotate the Drive Shaft to purge the fluid from the mechanism.
7. Thread the Tee Wrench included with the Tool Kit (Part No. 1900P–99) into the Piston Stop Assembly (69) that is 180 degrees from the Torque Adjustment Screw and pull the Stop Assembly toward the output end of the mechanism until it stops.
8. Using the syringe and fluid from the Fluid Replacement Kit (Part No. EQ106S–K400), fill the mechanism with the fluid furnished in the Kit until the fluid overflows the fill hole. Model 2400P will require 30 cc of fluid, Model 3000P, 43 cc. (Refer to Dwg. TPD1265)

NOTICE

DO NOT SUBSTITUTE ANY OTHER FLUID. Failure to use the impulse mechanism fluid provided could damage the tool, increase maintenance and decrease performance. Use only clean fluid in these tools.



(Dwg. TPD1265)

9. Submerge the fill opening in the remainder of the fluid, and using a wrench, rotate the Drive Shaft to purge any remaining air from the system.
10. Remove the mechanism from from the fluid and use the Tee Wrench to push the Piston Stop Assembly slowly downward until fluid flows from the fill opening.
11. Thread the Oil Plug with the Oil Plug Seal and Seal Support into the mechanism until it is snug.
12. Using a 2 mm hex wrench, turn the Torque Adjustment Screw clockwise until it stops. This is the maximum torque position.
13. Wipe the outside of the mechanism dry and clean and remove the Oil Chamber Plug. Using the syringe, withdraw 0.5 cc of fluid from 2400P models and 1.0 cc from 3000P models.
14. Install the Oil Chamber Plug and tighten it between 20 and 25 in–lb (2.3 and 2.8 Nm) torque.
15. Position a new Hammer Case Gasket on the Motor Housing and install the assembled mechanism on the rotor shaft.
16. Place the Hammer Case Cover over the Drive Shaft against the Housing and Gasket. Install the four Hammer Case Cap Screws and Lock Washers. Tighten each Screw between 45 an 50 in–lb (5.1 and 5.6 Nm) torque.
17. Install the Rubber Housing Boot on the tool.

DISASSEMBLY

General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. When grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part 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 an assembly unless the removal of that part is necessary for repairs or replacement.

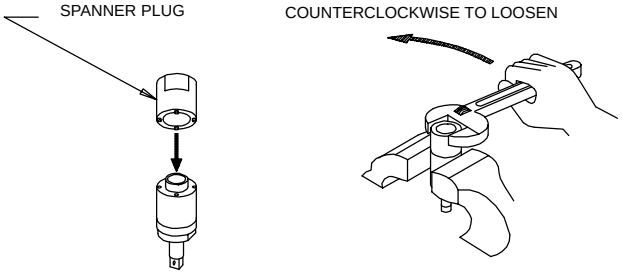
Disassembly of the Impulse Mechanism

1. Use a hooked wire to pull the Retaining Pin Spring (63) out of the end of the Drive Shaft (61) and remove the Socket Retaining Pin (62).
2. Remove the Rubber Housing Boot (43).
3. Using a hex wrench, remove the four Hammer Case Cap Screws (40) and Lock Washers (41). Lift the Hammer Case (36) off the Motor Housing (1) over the Drive Shaft. Remove the Hammer Case Gasket (39).
4. Lift the assembled mechanism off the Rotor (27).
5. Grasp the flats of the Housing (49) in vise jaws with the output end of the Drive Shaft downward.

6. Insert the pins of the Spanner Plug from the No. 1900P–99 Tool Kit into two holes in the Housing Cap (74). Using a wrench on the plug, unscrew and remove the Housing Cap from the Housing. (Refer to Dwg. TPD1267.)

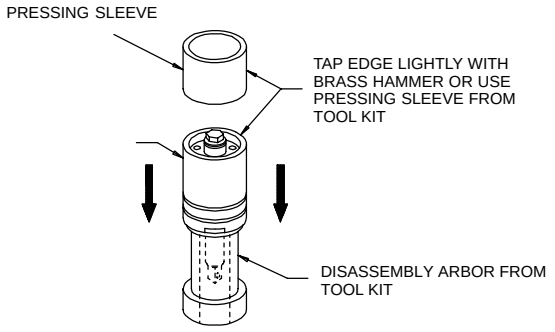
NOTICE

It may be necessary to cut the thread sealant around the Housing Cap with a sharp knife before attempting to remove the Cap.



(Dwg. TPD1267)

7. Stand the Disassembly Arbor from the Tool Kit, large end downward, on a workbench or the table of an arbor press. Insert the output end of the Drive Shaft into the central opening and either tap the Housing downward off the components or use the Pressing Sleeve in the Kit to press the Housing downward off the components. (Refer to Dwg. TPD1268.)



(Dwg. TPD1268)

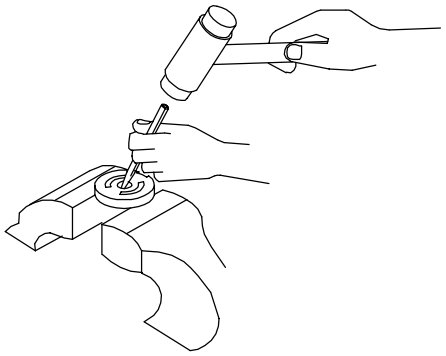
8. Disassemble the components of the mechanism in the sequence shown in Drawing TPA1342 on Page 4.

Disassembly of the Motor

1. Grasp the Motor Housing (1) in vise jaws with the Motor Case Cover Assembly (31) upward.
2. Using a hex wrench, remove the four Motor Case Cover Screws (34) and Lock Washers (35).
3. Remove the Cover and Motor Case Cover Gasket (33) from the Motor Housing.
4. Remove the Housing from the vise jaws and insert a rod into the central opening in the output end of the rotor shaft.
5. While holding the motor end of the Housing above a piece of cardboard on the workbench, lightly tap the rod to remove the Rear End Plate Assembly (22), Rotor (27) and Vanes (28).
6. On the table of an arbor press, support the Rear End Plate with blocks as close to the Rotor as possible and press the Rotor out of the Rear End Plate and Rear Rotor Bearing (24).
7. To remove the Rear Rotor Bearing from the Rear End Plate, use a small drift or pin punch through the central opening of the Rear End Plate to tap the Bearing out of the End Plate. (Refer to Dwg. TPD1271.)

NOTICE

Do not enlarge or damage the shaft hole in the End Plate.



(Dwg. TPD1271)

8. Using a longer drift punch through the Cylinder (25), tap the Front Rotor Bearing (30) out of the Front End Plate Assembly (29) in the same manner.

NOTICE

Do not enlarge or damage the shaft hole in the End Plate.

9. The Cylinder and Front End Plate are a shrink fit in the Motor Housing and parts that can be damaged during the heating process must be removed before heating the Housing.
10. Press the Reverse Lever Pin (3) out of the Reverse Lever (2) and pull the lever off the shaft of the Reverse Valve (5).
11. Using snap ring pliers, remove the Reverse Valve Retainer (8).
12. Grasp the shaft of the Reverse Valve with pliers, and pull the Reverse Valve, Reverse Valve Detent Ball (6) and Detent Spring (7) out of the Reverse Valve Bushing (4). Be careful not to lose the Ball and Spring.
13. Using a pin punch, tap the Throttle Retaining Pin (19) out of the Handle.

14. Grasp the Trigger (17) and pull the assembled throttle out of the Motor Housing.
15. Using a pin punch and without damaging the Trigger, remove the Trigger Pin (18).
16. Slide the Throttle Bushing Assembly (10) off the shaft of the Throttle Rod Assembly (15).
17. Using a thin blade screwdriver, remove the Valve Retaining Ring (14) and slide the Throttle Valve Assembly (12) off the shaft of the Throttle Valve Rod.
18. Using an adjustable wrench, unscrew and remove the Inlet Bushing (20) and Exhaust Deflector Assembly (21).
19. Insert a threaded rod through the Cylinder and Front End Plate and install a nut and washer on the end plate end of the rod. Position the Rear End Plate on the threaded rod against the Cylinder and clamp the End Plates and Cylinder snug with another nut and washer. Do not tighten the assembly excessively.
20. Using a heat induction coil or an oven, heat the assembly and Housing until it is warm enough to pull the assembly out the rear of the Motor Housing. Do not apply enough heat to distort the Housing.

CAUTION

Take all precautions necessary to prevent being burned by handling warm or hot parts.

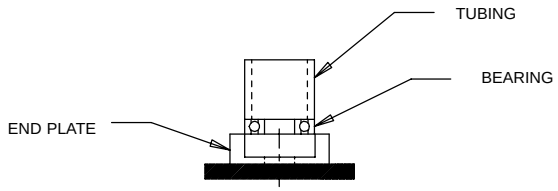
ASSEMBLY

General Instructions

1. When grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
2. Always press on the **inner** ring of a ball–type bearing when installing the bearing on a shaft.
3. Always press on the **outer** ring of a ball–type bearing when pressing the bearing into a bearing recess.
4. Except for bearings and mechanism parts, always clean every part and wipe every part with a thin film of oil before installation.
5. Wipe a thin film of mechanism fluid on all internal mechanism components before installing them in the mechanism.
6. Apply a film of O–ring lubricant to every O–ring before installation.

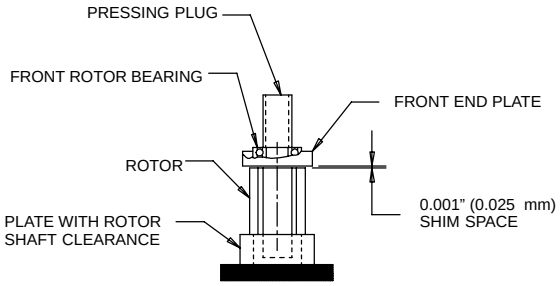
Assembly of the Motor

1. Using an arbor press and a piece of tubing that contacts the outer ring of the bearings, press the Front Rotor Bearing (30) into the Front End Plate (29) and the Rear Rotor Bearing (24) into the Rear End Plate (22). (Refer to Dwg. TPD1274.)



(Dwg. TPD1274)

2. Stand the Rotor (27) on the table of an arbor press. It should be upright on a flat metal plate having a clearance hole for the shaft. The shaft with the hex must be upward.
3. Place a 0.001” (0.025 mm) shim on the upward surface of the large portion of the rotor body. Using a piece of tubing that contacts the inner ring of the bearing, press the Front Rotor Bearing and Front End Plate, End Plate leading, onto the shaft of the Rotor until the End Plate contacts the shim. Remove the shim. (Refer to Dwg. TPD1275.)



(Dwg. TPD1275)

4. Coat each Vane (28) with a thin film of oil and insert a Vane into each of the rotor vane slots with the straight edge of the Vane outward.
5. Install the Cylinder Assembly (25) over the Vanes and Rotor making certain the Cylinder Alignment Pin (26) enters the hole in the face of the Front End Plate.
6. Stand the assembly on an arbor press table so that the rotor shaft on the front end plate end contacts the table. Press the Rear End Plate Assembly, bearing end trailing, onto the rotor shaft against the Cylinder. Make certain the Cylinder Alignment Pin (26) enters the hole in the face of the Rear End Plate.
7. Stand the assembly on a table with the Front End Plate Assembly upward.

8. Using an induction coil or oven, heat the Motor Housing until the motor opening is large enough to be placed over the Cylinder. At that time, install the Housing over the Cylinder and Front End Plate making sure the radial End Plate Alignment Pin (23) in the Rear End Plate enters the notch in the Motor Housing.

CAUTION

Take all precautions necessary to prevent being burned by handling warm or hot parts.

9. Allow the assembly to cool and install the Motor Case Cover Gasket (33) and Motor Case Cover (31).
10. Secure the Cover to the Housing by installing the four Motor Case Cover Screws (34) and Lock Washers (35). Tighten each Screw between 45 and 50 in–lb (5.1 and 5.6 Nm) torque.
11. Install the Exhaust Deflector (21) in the bottom of the handle of the Motor Housing (1) and tighten it between 20 and 25 ft–lb (27 and 34 Nm) torque.
12. Thread the Inlet Bushing (20) into the bottom of the handle of the Motor Housing and tighten it between 30 and 35 ft–lb (40 and 47 Nm) torque.
13. Install the Throttle Rod Seal (16) in the groove on the large hub of the Throttle Rod (15).
14. Install the Throttle Valve Seal (13) in the groove on the large hub of the Throttle Valve (12).
15. Slide the Throttle Valve, Valve Seal end first, onto the Throttle Valve Rod.
16. Secure the Throttle Valve Assembly by installing the Valve Retaining Ring (14) in the small groove on the Throttle Valve Rod.
17. Install the three Throttle Bushing Seals (11) in the grooves on the Throttle Bushing (10).
18. Slide the Throttle Bushing Assembly onto the shaft of the Throttle Valve Rod and position the Trigger (17) on the same shaft. Install the Trigger Pin (18).
19. Insert the assembled Trigger into the Housing. Make certain the widest end of the Trigger is nearest the motor bore and the narrowest portion of the Throttle Valve aligns with hole for the Throttle Retaining Pin (19). Install the Pin making certain it captures the Throttle Valve and secures the assembled Trigger.
20. Align the detent hole in the Reverse Valve (5) with the hole inside the Reverse Valve Bushing (4) and slide the Valve into the Bushing until almost reaching the detent hole. Insert the Reverse Valve Detent Spring (7) and Reverse Valve Detent Ball (6) into the hole and while compressing the Spring with the Ball, slide the Valve completely into the Bushing.
21. Using snap ring pliers, install the Reverse Valve Retainer (8).
22. Slide the Reverse Lever (2) onto the Reverse Valve, making certain the cast lug enters the notch on the face of the Reverse Valve Bushing. Secure the Lever to the Valve by inserting the Reverse Lever Retaining Pin (3).

Assembly of the Impulse Mechanism

1. Insert the long shaft of the Piston Stop (69) into the central opening of the O–ring Installer furnished with the Tool Kit (Part No. 1900P–99). Place the Piston Stop Seal (70) on the tapered end of the Installer and roll the Seal up the taper and into the groove on the large body of the Piston Stop. Repeat the procedure with the other Piston Stop and Seal.
2. When looking inside the central opening of the Liner Assembly (66), the internal wall has three holes on one side which do not extend through the wall. The opening on the end face of that wall is for the Torque Valve Piston (68). Install the Torque Valve Piston, large end trailing, into that opening.
3. Insert the Piston Stop Assist Spring (71) into the hole in the end face of the opposite wall.
4. Thread the Threaded Tee Wrench furnished with the Tool Kit into one of the Piston Stop Assemblies and using the Wrench to hold the Assembly, insert the Assembly into the opening against Piston. Mark this opening with a felt marker to indicate that it contains the Torque Valve Piston.
5. Unscrew the Wrench and in the same manner, install the other Piston Stop Assembly in the hole with the Spring.
6. Install the Rear Liner Cover Seal (72) in the annular groove on the face of the Rear Liner Cover (73).
7. Install the two Front Liner Cover Piston Seals (59) in the openings on the face of the Front Liner Cover (50).
8. Install the Seal Back–Up Ring (58) followed by the Drive Shaft O–ring (57) in the central opening in the face of the Front Liner Cover.
9. Insert the short round hub of the Drive Shaft (61) into the central opening of the Rear Liner Cover.
10. Insert a Blade (64) into one slot in the Drive Shaft. Install the Blade Springs (65) through the Drive Shaft and into the holes in the Blade. Place the remaining Blade on the Springs making certain the Springs enter the holes in that Blade.
11. Using finger pressure, compress the Springs with the Blades until the outer edges of the Blades are flush with the drive shaft surface. Capture the Blades in thisposition by installing the Liner Assembly, piston stop end trailing, over the Drive Shaft and against the Rear Liner Cover.

NOTICE

This installation can be accomplished more easily by aligning the compressed Blades with the webs at the narrowest portion of the opening. Keeping the Blades on the web allows them to slide the length of the Liner without interference.

12. Insert the hex end of the Rear Liner Cover into the Disassembly Arbor from the Tool Kit and stand it on a workbench with the Drive Shaft upward.
13. Install the Front Liner Cover Assembly over the Drive Shaft and against the Liner. Make certain the Torque Adjustment Screw (51) aligns with the proper piston stop opening that was marked during assembly.
14. Install the two Liner Cover Seals (60) in the grooves inside the Liner Housing (49) near the end with the external wrench flats.
15. Place the Liner Housing, Seal end trailing, over the assembled Liner. Make certain the notch in the trailing end face of the Housing aligns with the Oil Plug (54) in the Front Liner Cover. Use the Pressing Sleeve from the Tool Kit to press the Housing over the Seals and into position. Do not Damage the Seals during installation.
16. Grasp the flats of the Liner Housing in vise jaws and using the Spanner Plug furnished with the Tool Kit and a torque wrench, install the Housing Cap, castellated end leading. This is a left–hand thread; rotate the wrench counterclockwise to tighten the Cap. Tighten the Cap on model 2400P between 173 and 188 ft–lb (235 and 254 Nm) torque and on model 3000P between 186 and 200 ft–lb (252 and 272 Nm) torque.
17. Make certain the Drive Shaft rotates freely and then fill the mechanism with fluid and reassemble the tool as instructed in the section, **CHANGING THE MECHANISM FLUID**.
18. After assembling the tool, check the torque output with a torque tester or pulse counter.
    If the output is not acceptable, adjust the torque output as instructed in the section **TORQUE ADJUSTMENT.**
    If the output is acceptable, proceed as follows:
    a. Using a hex wrench, remove the four Hammer Case Cap Screws (40) and Lock Washers (41). Lift the Hammer Case (36) off the Motor Housing (1) over the Drive Shaft. Remove the Hammer Case Gasket (39).
    b. Lift the assembled mechanism off the Rotor (27).
    c. Grasp the flats of the Housing (49) in vise jaws with the output end of the Drive Shaft downward.
    d. Insert the pins of the Spanner Plug from the No. 1900P–99 Tool Kit into two holes in the Housing Cap (74). Using a wrench on the plug, unscrew and remove the Housing Cap from the Housing. This is a left–hand thread, rotate the plug counterclockwise to loosen the Cap.
    e. Apply thread sealant to the threads of the Cap and using the Spanner Plug furnished with the Tool Kit and a torque wrench, install the Housing Cap, castellated end leading. This is a left–hand thread; rotate the wrench counterclockwise to tighten the Cap. Tighten the Cap on model 2400P between 173 and 188 ft–lb (235 and 254 Nm) torque and on model 3000P between 186 and 200 ft–lb (252 and 272 Nm) torque.
    f. Position a new Hammer Case Gasket (39) on the Motor Housing and install the assembled mechanism on the rotor shaft.
    g. Place the Hammer Case Cover over the Drive Shaft against the Housing and Gasket. Install the four Hammer Case Cap Screws and Lock Washers. Tighten each Screw between 45 an 50 in–lb (5.1 and 5.6 Nm) torque.
    h. Install the Rubber Housing Boot on the tool.

NOTES

NOTES