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OPERATION AND MAINTENANCE MANUAL FOR MODELS 500A AND 700A TWIN BLADE IMPULSE ANGLE WRENCHES

NOTICE

Models 500A and 700A Impulse Angle 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 3/8" (10 mm) inside diameter air supply hose.
- Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.
- Do not use damaged, frayed or deteriorated air hoses and fittings.
- Be sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905-1 for a typical piping arrangement.
- Always use clean, dry air at 90 psig (6.2 bar/ 620 kPa) maximum air pressure. Dust, corrosive fumes and/or excessive moisture can ruin the motor of an air tool.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.
- Do not remove any labels. Replace any damaged label.

USING THE TOOL

- Always wear eye protection when operating or performing maintenance on this tool.
- Always wear hearing protection when operating this tool.
- Keep hands, loose clothing and long hair away from rotating end of tool.
- Anticipate and be alert for sudden changes in motion during start up and operation of any power tool.
- Keep body stance balanced and firm. Do not overreach when operating this tool. High reaction torques can occur at or below the recommended air pressure.
- Tool 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.

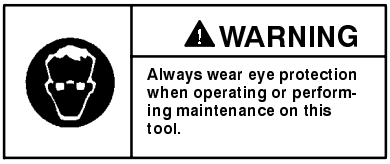
Printed in U.S.A.

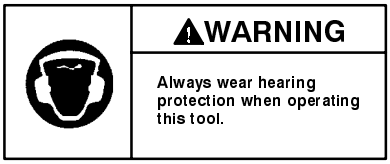
INGERSOLL-RAND®
PROFESSIONAL TOOLS

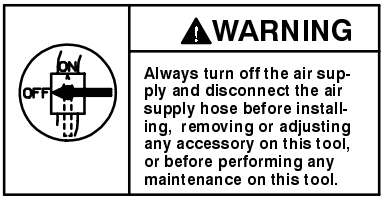
WARNING LABEL IDENTIFICATION

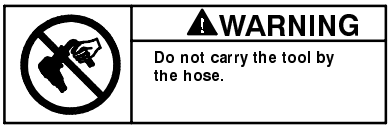
⚠ WARNING

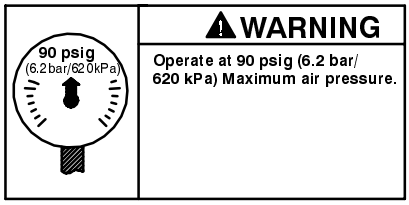
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.











ADJUSTMENTS

TORQUE ADJUSTMENT

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

1. Using a hex wrench, loosen the two cover plate mounting screws and remove the Torque Adjustment Screw Cover Plate.
2. Rotate the Spindle 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 Cover Plate and tighten the two Plate Mounting Screws.

CHANGING THE MECHANISM FLUID

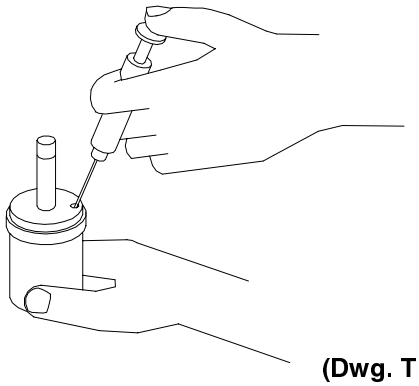
To change the Mechanism Fluid in the Impulse Mechanism, proceed as follows:

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 500A will require 9 cc of fluid, Model 700A, 12 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)

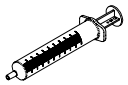
9. Submerge the fill opening in the remainder of the fluid, and using a wrench, rotate the Drive Shaft to purge any remaining air from the system.
10. Remove the mechanism from from the fluid and use the Tee Wrench to push the Piston Stop Assembly slowly downward until fluid flows from the fill opening.
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 0.2 cc of fluid from 500A models and 0.50 cc from 700A 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

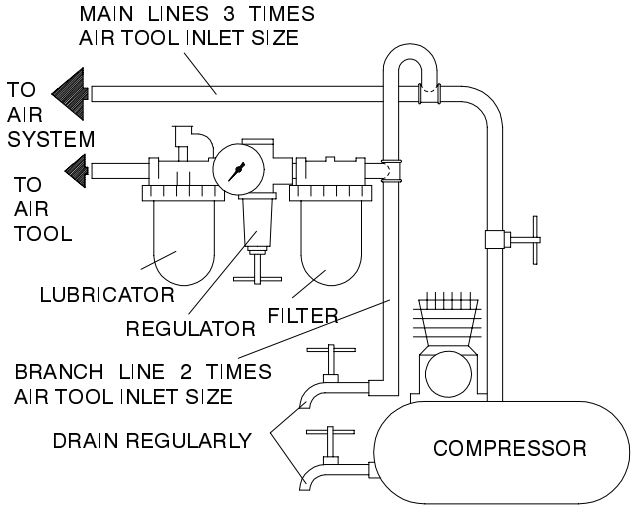


Ingersoll–Rand Fluid Part No. EQ106S–400–1

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

For USA – C22–04–G00

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 TOOL

PISTOL GRIP with 3/8" SQUARE DRIVE

Model	Free Speed	Recommended Torque Range			
		Soft Draw		Hard Slam	
		ft–lb	Nm	ft–lb	Nm
500A	7 000	12–24	16–33	22–30	30–41
700A	5 500	19–30	26–41	26–36	35–49

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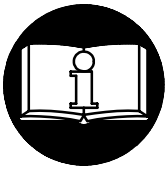
MANUEL D'EXPLOITATION ET D'ENTRETIEN DES CLÉS HYDRO–PNEUMATIQUES À DOUBLE PALETTE MODÈLES 500A ET 700A

NOTE

Les clés d'angle hydro–pneumatiques à double palette Modèles 500A et 700A 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 3/8" (10 mm) de diamètre intérieur.**
- **Couper toujours l'alimentation d'air comprimé et débrancher le flexible d'alimentation avant d'installer, déposer ou ajuster tout accessoire sur cet outil, ou d'entreprendre une opération d'entretien quelconque sur l'outil.**
- **Ne pas utiliser des flexibles ou des raccords endommagés, effilochés ou détériorés.**
- **S'assurer que tous les flexibles et les raccords sont correctement dimensionnés et bien serrés. Voir Plan TPD905–1 pour un exemple type d'agencement des tuyauteries.**
- **Utiliser toujours de l'air sec et propre à une pression maximum de 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 aux É.U.

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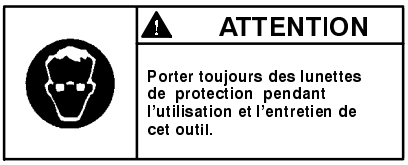
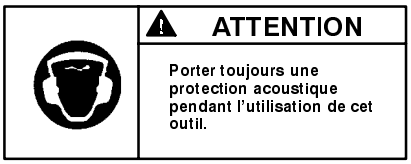
PROFESSIONAL TOOLS

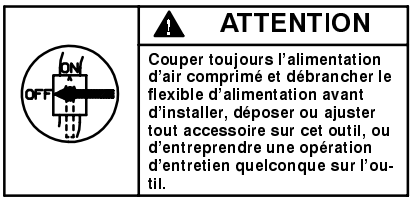
SIGNIFICATION DES ÉTIQUETTES D'AVERTISSEMENT

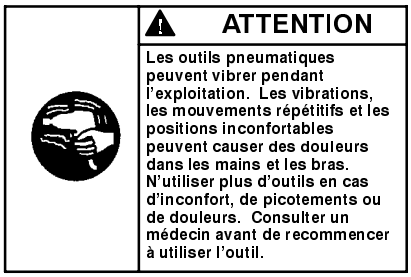
⚠ ATTENTION

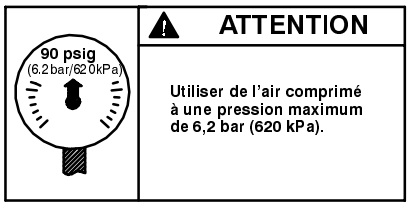
LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES.











RÉGLAGES

RÉGLAGE DU COUPLE

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

1. A l'aide d'une clé pour six pans creux, desserrer les deux vis de fixation du couvercle et déposer le couvercle de la vis de réglage de couple.
2. Tourner la broche 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 couvercle et serrer les deux vis de fixation.

CHANGEMENT DU FLUIDE DU MÉCANISME

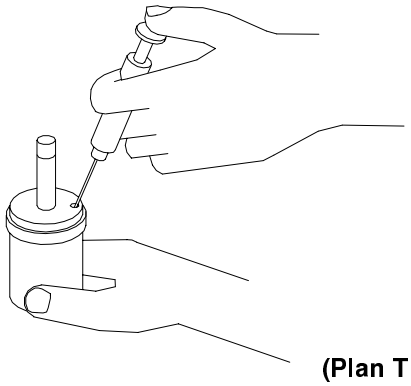
Le fluide du mécanisme d'impulsion est changé de la façon suivante :

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 500A nécessite 9 cm^3 de fluide et le Modèle 700A nécessite 12 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)

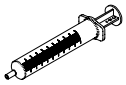
9. Submerger l'ouverture de remplissage dans le reste du fluide et, à l'aide d'une clé, tourner l'arbre d'entraînement pour purger tout l'air du système.
10. Retirer le mécanisme du fluide et, à l'aide de la clé en T, pousser l'ensemble de butée de piston lentement vers le bas jusqu'à ce que le fluide 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 0,2 cm^3 de fluide sur le modèle 500A et 0,50 cm^3 sur le modèle 700A.
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

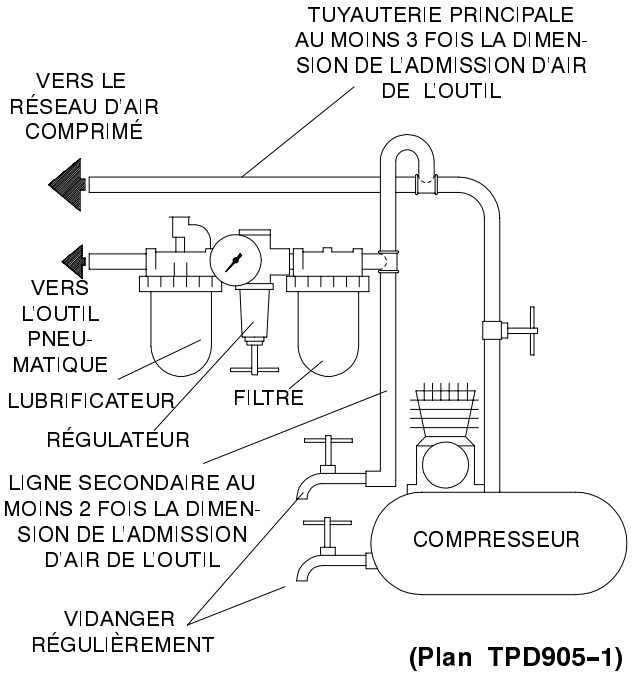


Fluide Ingersoll–Rand
Référence EQ106S–400–1

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

For USA – No. C22–04–G00

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)

SPÉCIFICATIONS

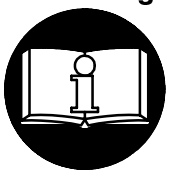
Modèle	Type de poignée	Entraînement carré	Vitesse à vide	Gamme de couples recommandée	
		pouces		Serrage élastique Nm	Serrage franc Nm
500A	pistolet	3/8"	7 000	12–24 (16–33)	22–30 (30–41)
700A	pistolet	3/8"	5 500	19–30 (26–41)	26–36 (35–49)

E

MANUAL DE FUNCIONAMIENTO Y MANTENIMIENTO PARA LLAVES ANGULARES DE IMPULSO DE DOS HOJAS MODELOS 500A Y 700A

NOTA

Las llaves angulares de impulso modelos 500A y 700A 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).**
- **Utilice, inspeccione y mantenga esta herramienta siempre de acuerdo con todas las normativas locales y nacionales que se apliquen a las herramientas neumáticas de utilización manual o que se sujeten con la mano.**
- **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 3/8" (10 mm).**
- **Corte siempre el suministro de aire y desconecte la manguera de suministro de aire antes de instalar, desmontar o ajustar cualquier accesorio de esta herramienta, o antes de realizar cualquier operación de mantenimiento de la misma.**
- **No utilice mangueras de aire y 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

- **Lleve siempre protección ocular cuando utilice esta herramienta o realice operaciones de mantenimiento en la misma.**
- **Lleve 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.

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ETIQUETAS DE AVISO

⚠ AVISO

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

⚠ ADVERTENCIA

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

⚠ ADVERTENCIA

Las herramientas neumáticas pueden vibrar durante el uso. La vibración, los movimientos repetitivos o las posiciones incómodas podrían dañarle los brazos y las manos. En caso de incomodidad, sensación de hormigueo o dolor, dejar de usar la herramienta. Consultar al médico antes de volver a utilizarla.

⚠ ADVERTENCIA

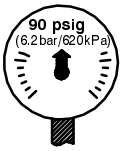
Mantener una postura del cuerpo equilibrada y firme. No estirar demasiado los brazos al manejar la herramienta.

⚠ ADVERTENCIA

Usar siempre protección para los oídos al manejar esta herramienta.

⚠ ADVERTENCIA

No coger la herramienta por la manguera para levantarla.



⚠ ADVERTENCIA

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

⚠ ADVERTENCIA

Cortar siempre el suministro de aire y desconectar la manguera de suministro de aire antes de instalar, retirar o ajustar cualquier accesorio de esta herramienta, o antes de realizar cualquier operación de mantenimiento de la misma.

⚠ ADVERTENCIA

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

AJUSTES

AJUSTE DE PAR

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

1. Empleando una llave exagonal, aflojar los dos tornillos que sujetan la tapa del tornillo de ajuste del par y quitarla.
2. Gire el eje hasta que el Tornillo de Ajuste de Embrague esté visible a través del 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. Poner la tapa y apretar sus dos tornillos.

CAMBIO DEL LÍQUIDO DEL MECANISMO

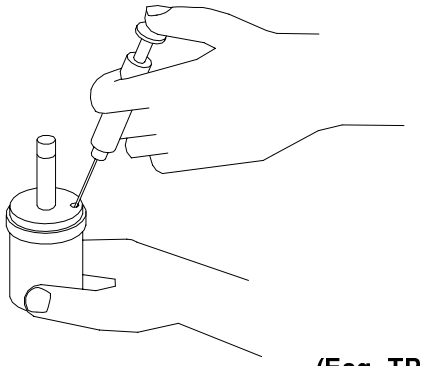
Para cambiar el líquido del mecanismo de impulso, proceda como sigue:

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 500A requerirá 9 cc de líquido, y el modelo 700A, 12 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 0,2 cc de líquido de los modelos 500A, y 0,50 cc de los modelos 700A.
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.

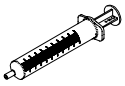
PARA PONER LA HERRAMIENTA EN SERVICIO

LUBRICACIÓN

Ingersoll–Rand Nº 50

Ingersoll–Rand Nº 67

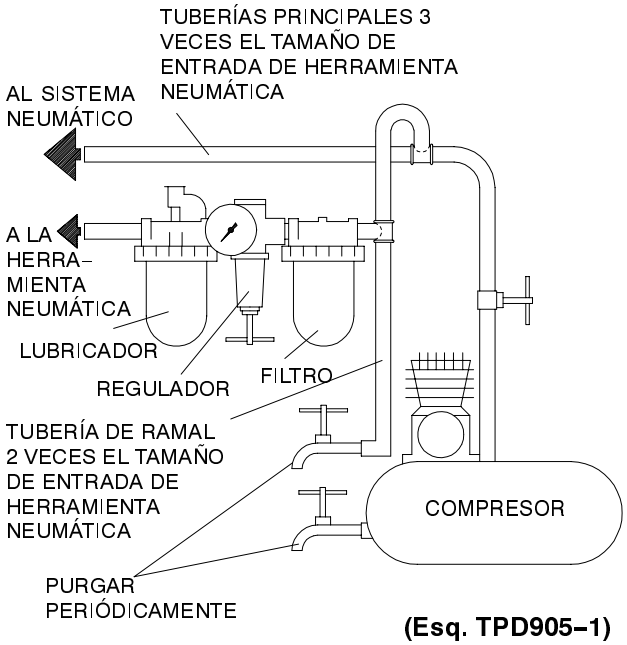
Líquido Ingersoll–Rand Nº EQ106S–400–1



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

For USA – No. C22–02–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)

ESPECIFICACIONES

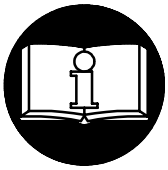
Modelo	Tipo de empuña-dura	Accionamiento	Velocidad en vacío	Gama de par recomendada	
		pulg.		Junta elástica ft–lbs (Nm)	Junta rígida ft–lbs (Nm)
500A	pistola	3/8	7 000	12–24 (16–33)	22–30 (30–41)
700A	pistola	3/8	5 500	19–30 (26–41)	26–36 (35–49)

P

MANUAL DE FUNCIONAMENTO E MANUTENÇÃO PARA CHAVES DE IMPULSO EM ÂNGULO DE LÂMINA DUPLA MODELOS 500A E 700A

AVISO

As Chaves de Impulso em Ângulo Modelos 500A e 700A são concebidas para operações de montagem que requerem o aparafusamento de fixadores a alta velocidade com valor de binário constante e reacção de binário reduzida.
A Ingersoll–Rand não pode ser responsabilizada pela modificação de ferramentas para aplicações para as quais não tenha sido consultada.



⚠ ADVERTÊNCIA

IMPORTANTES INFORMAÇÕES DE SEGURANÇA EM ANEXO.
LEIA ESTE MANUAL ANTES DE OPERAR A FERRAMENTA.
É RESPONSABILIDADE DA ENTIDADE PATRONAL PÔR AS INFORMAÇÕES CONTIDAS NESTE MANUAL À DISPOSIÇÃO DOS UTILIZADORES.
A NÃO OBEDIÊNCIA ÀS ADVERTÊNCIAS SEGUINTES PODERÁ RESULTAR EM LESÕES PESSOAIS.

COLOCAÇÃO DA FERRAMENTA EM SERVIÇO

- 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, desempenho superior e durabilidade máxima das peças, opere esta ferramenta a uma pressão máxima de 90 psig. (6,2 bar/620 kPa) na admissão com uma mangueira de alimentação de ar com diâmetro interno de 3/8 pol. (10 mm).
- Desligue sempre a alimentação de ar e a mangueira de alimentação de ar antes de instalar, retirar ou ajustar qualquer acessório desta ferramenta, ou antes de fazer manutenção na mesma.
- Não utilize mangueiras de ar e acessórios danificados, puídos ou deteriorados.
- Certifique–se de que todas as mangueiras e acessórios são da dimensão correcta e que estão seguros firmemente. Consulte o Des. TPD905–1 para uma disposição de tubos típica.
- Utilize sempre ar limpo e seco a uma pressão máxima de 90 psig (6,2 bar/620 kPa). Poeira, fumos corrosivos e/ou humidade excessiva podem destruir o motor de uma ferramenta pneumática.
- Não lubrifique a ferramenta com líquidos inflamáveis ou voláteis como querosene, gasóleo ou combustível para jactos.
- Não retire nenhum rótulo. Substitua os rótulos danificados.

UTILIZAÇÃO DA FERRAMENTA

- Use sempre protecção para os olhos ao operar ou fazer manutenção nesta ferramenta.
- Use sempre protecção auricular ao operar esta ferramenta.
- Mantenha as mãos, roupas soltas e cabelos longos afastados da extremidade rotativa da ferramenta.
- Esteja preparado e alerta para mudanças súbitas no movimento durante o arranque e o funcionamento de qualquer ferramenta mecânica.
- Mantenha o corpo numa posição equilibrada e firme. Não estique o corpo ao operar esta ferramenta. Podem ocorrer binários de reacção elevados à ou abaixo da pressão do ar recomendada.
- O veio da ferramenta pode continuar a rodar por um curto período de tempo depois de soltar o regulador.
- As ferramentas pneumáticas podem vibrar durante a utilização. Vibração, movimentos repetitivos ou posições desconfortáveis podem ser nocivos às suas mãos e braços. Pare de utilizar qualquer ferramenta se sentir desconforto, sensação de formigueiro ou dor. Procure assistência médica antes de reiniciar a utilização.
- Use os acessórios recomendados pela Ingersoll–Rand.
- Use apenas caixas e acessórios de percussão. Não use caixas e acessórios manuais (cromo).
- Esta ferramenta não é concebida para funcionar em atmosferas explosivas.
- Esta ferramenta não é isolada contra choque eléctrico.

AVISO

A utilização de qualquer peça sobresselente que não seja Ingersoll–Rand genuína pode resultar em riscos à segurança, em desempenho reduzido da ferramenta e mais necessidade de manutenção, e pode invalidar todas as garantias.
As reparações só devem ser feitas por pessoal autorizado e com formação adequada. Consulte o Representante Autorizado Ingersoll–Rand mais próximo.

Envie toda a correspondência ao Escritório ou Distribuidor Ingersoll–Rand mais próximo.

Impresso nos E.U.A.

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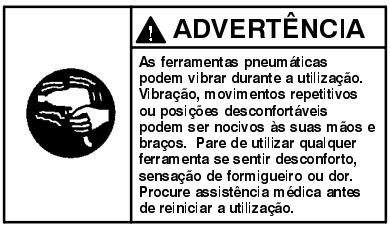
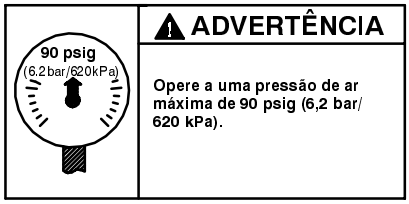
IDENTIFICAÇÃO DAS ETIQUETAS DE ADVERTÊNCIA

⚠ ADVERTÊNCIA

A NÃO OBEDIÊNCIA ÀS ADVERTÊNCIAS SEGUINTES PODERÁ RESULTAR EM LESÕES PESSOAIS.





AJUSTES

REGULAÇÃO DE BINÁRIO

Para ajustar a potência de binário destas Chaves de Impulso de Lâmina Dupla, proceda como segue:

1. Utilizando uma chave sextavada, desaperte os dois Parafusos de Montagem da Placa de Cobertura e desmonte a Placa de Cobertura do Parafuso de Ajuste de Binário.
2. Rode o Veio até o Parafuso de Ajuste de Binário estar visível na abertura.
3. Com uma chave sextavada de 1,5 mm, rode o Parafuso de Ajuste para a direita para aumentar o valor de binário ou para a esquerda para diminuir o valor de binário. Não rode o Bujão de Óleo.

AVISO

Realize todos os ajustes finais no local de trabalho.

4. Recoloque a Placa de Cobertura e aperte os dois Parafusos de Montagem da Placa.

COMO MUDAR O FLUIDO PARA MECANISMO:

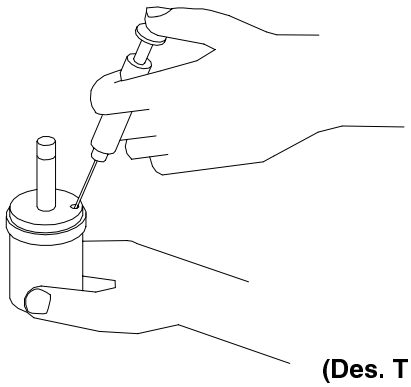
Para mudar o Fluido para Mecanismo do Mecanismo de Impulso, proceda como segue:

1. Remova a Luva da Carcaça de Borracha.
2. Com uma chave sextavada, retire os quatro Parafusos Allen da Caixa do Martelo e as Contraporcas. Retire da Carcaça do Motor a Caixa do Martelo sobre o Veio de Accionamento. Retire a Junta da Caixa do Martelo.
3. Retire do Rotor o mecanismo montado.
4. Utilizando uma chave sextavada de 2 mm, rode o parafuso de ajuste de binário para a direita até o parafuso parar. Rode o parafuso para a esquerda até ele parar ou após seis rotações completas.
5. Com uma chave sextavada de 2,5 mm, desaparafuse e retire o Bujão do Óleo. Retire o Vedante do Bujão do Óleo e o Suporte do Vedante do Bujão do Óleo.
6. Com a abertura do bujão do óleo voltada para baixo sobre um recipiente, rode o Veio de Accionamento para remover o fluido do mecanismo.
7. Aparafuse a Chave em "T" incluída com o Kit de Ferramentas (Peça Nº 1900P–99) no Conjunto do Batente do Pistão, que está a 180 graus do Parafuso de Ajuste de Binário, e puxe o Conjunto do Batente na direcção da extremidade de saída do mecanismo até ele parar.
8. Usando a seringa e o fluido do Kit de Substituição de Fluido (Peça Nº EQ106S–K400), encha o mecanismo com o fluido fornecido no Kit até este transbordar o orifício de enchimento. O Modelo 500A precisará de 9 cc de fluido, o Modelo 700A precisará de 12 cc. Consulte o Des. TPD1265.

AVISO

NÃO SUBSTITUA POR NENHUM OUTRO FLUIDO. Se o fluido para mecanismo de impulso fornecido não for usado, a ferramenta poderá ser danificada, poderá aumentar a necessidade de manutenção e diminuir o desempenho. Use apenas fluido limpo nestas ferramentas.

AJUSTES



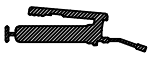
(Des. TPD1265)

9. Submerja a abertura de enchimento no fluido restante e, com uma chave, rode o Eixo de Accionamento para purgar qualquer ar restante no sistema.
10. Retire o mecanismo do fluido e utilize a Chave em "T" para empurrar o Conjunto do Batente do Pistão lentamente para baixo até sair fluido na abertura de enchimento.
11. Aparafuse o Bujão do Óleo com o Vedante do Bujão do Óleo e o Suporte do Vedante no mecanismo até ficar seguro.
12. Utilizando uma chave sextavada de 2 mm, rode o parafuso de ajuste de binário para a direita até o parafuso parar. Esta é a posição de binário máximo.
13. Seque o lado de fora do mecanismo, limpe e retire o Bujão da Câmara de Óleo. Com a seringa, retire 0,2 cc de fluido dos modelos 500A-EU e 0,50 cc dos modelos 700A-EU.
14. Instale o Bujão da Câmara de Óleo e aperte-o com um valor de binário entre 2,3 e 2,8 Nm.
15. Posicione uma nova Junta da Caixa do Martelo sobre a Carcaça do Motor e instale o mecanismo montado sobre o veio do rotor.
16. Coloque a Tampa da Caixa do Martelo sobre o Veio de Accionamento contra a Carcaça e a Junta. Instale os quatro Parafusos Allen da Caixa do Martelo e as Contraporcas. Aperte cada parafuso com um valor de binário entre 5,1 e 5,6 Nm.
17. Instale a Luva da Carcaça de Borracha na ferramenta.

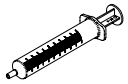
COLOCAÇÃO DA FERRAMENTA EM SERVIÇO

LUBRIFICAÇÃO

Ingersoll-Rand Nº 50



Ingersoll-Rand Nº 67

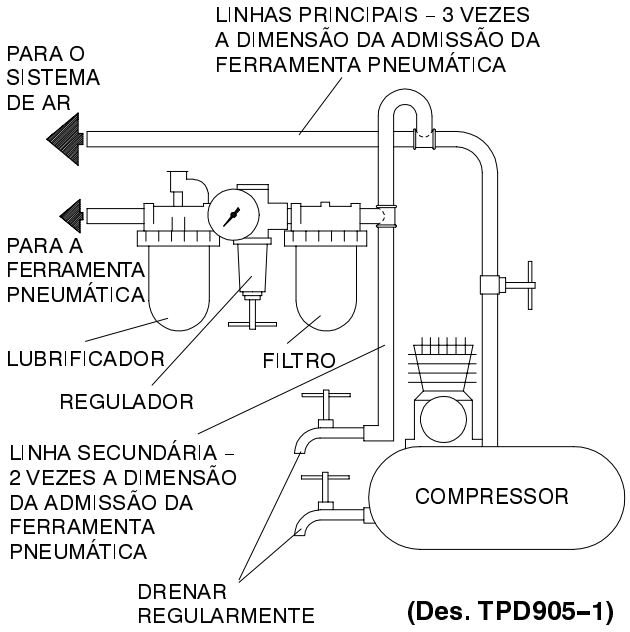


Fluido Ingersoll-Rand Peça Nº. EQ106S-400-1

Utilize sempre um lubrificador de linha de ar com estas ferramentas. Recomendamos a seguinte Unidade Filtro-Lubrificador-Regulador:

For USA - No. C22-04-G00

Após cada 20 000 ciclos, ou conforme a experiência indicar, drene e volte a encher o Conjunto de Accionamento da Unidade de Impulso como está instruído no manual utilizando o Kit para Substituição do Fluido (Peça Nº. EQ106S-K400). Lubrifique o accionamento sextavado e o veio de saída antes da montagem.

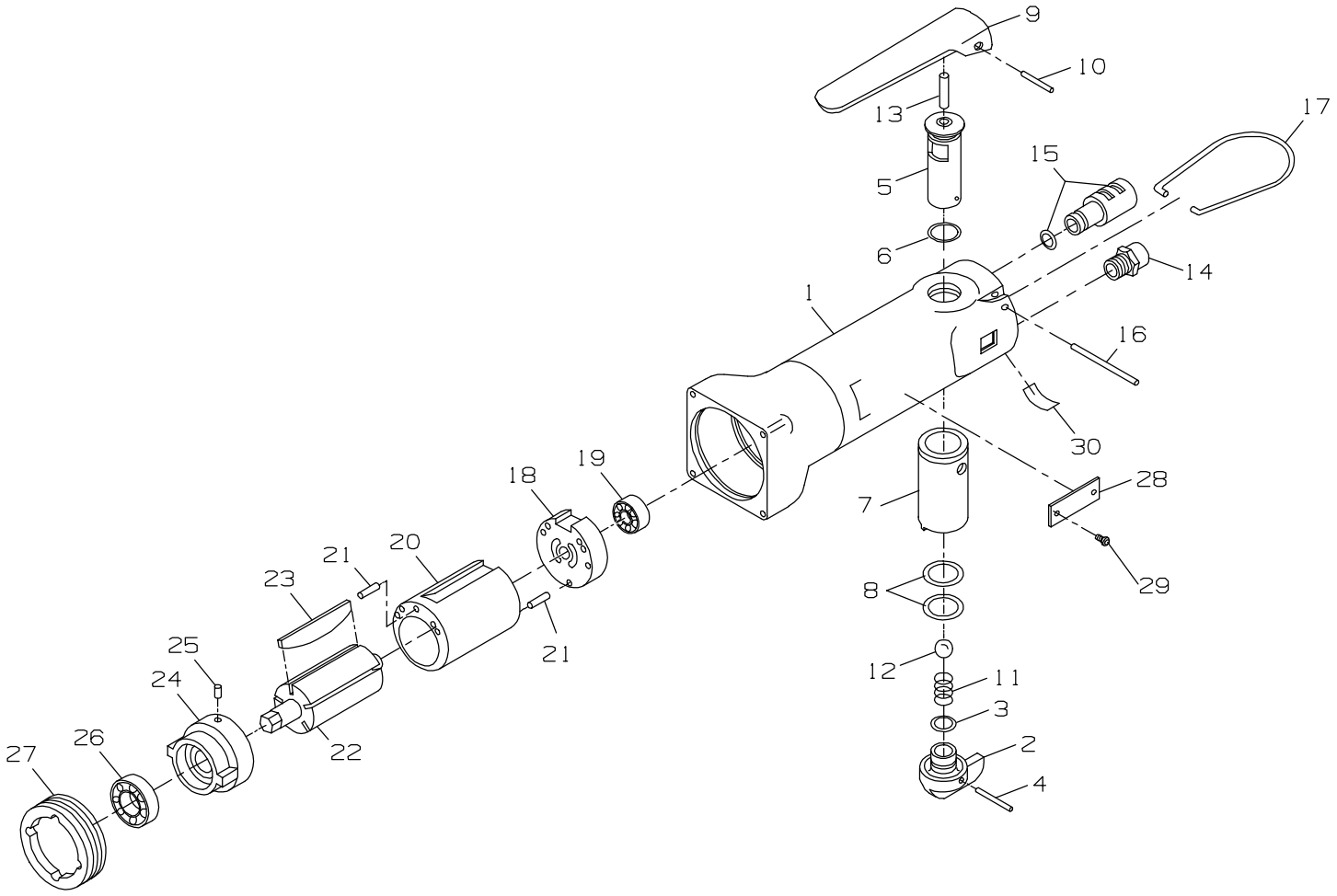


(Des. TPD905-1)

ESPECIFICAÇÕES

Modelo	Tipo de Punho	Encabadouro/Comando	Velocidade Livre	Intervalo de Torque Recomendado	
		pol.		Apertos Ligeiros Nm (pés-lb)	Batimento Duro Nm (pés-lb
500A	pistola	3/8	7 000	12-24 (16-33)	22-30 (30-41)
700A	pistola	3/8	5 500	19-30 (26-41)	26-36 (35-49)

MODELS 500A AND 700A POWER UNIT FOR TWIN BLADE ANGLE IMPULSE TOOLS



(Dwg. TPB959)

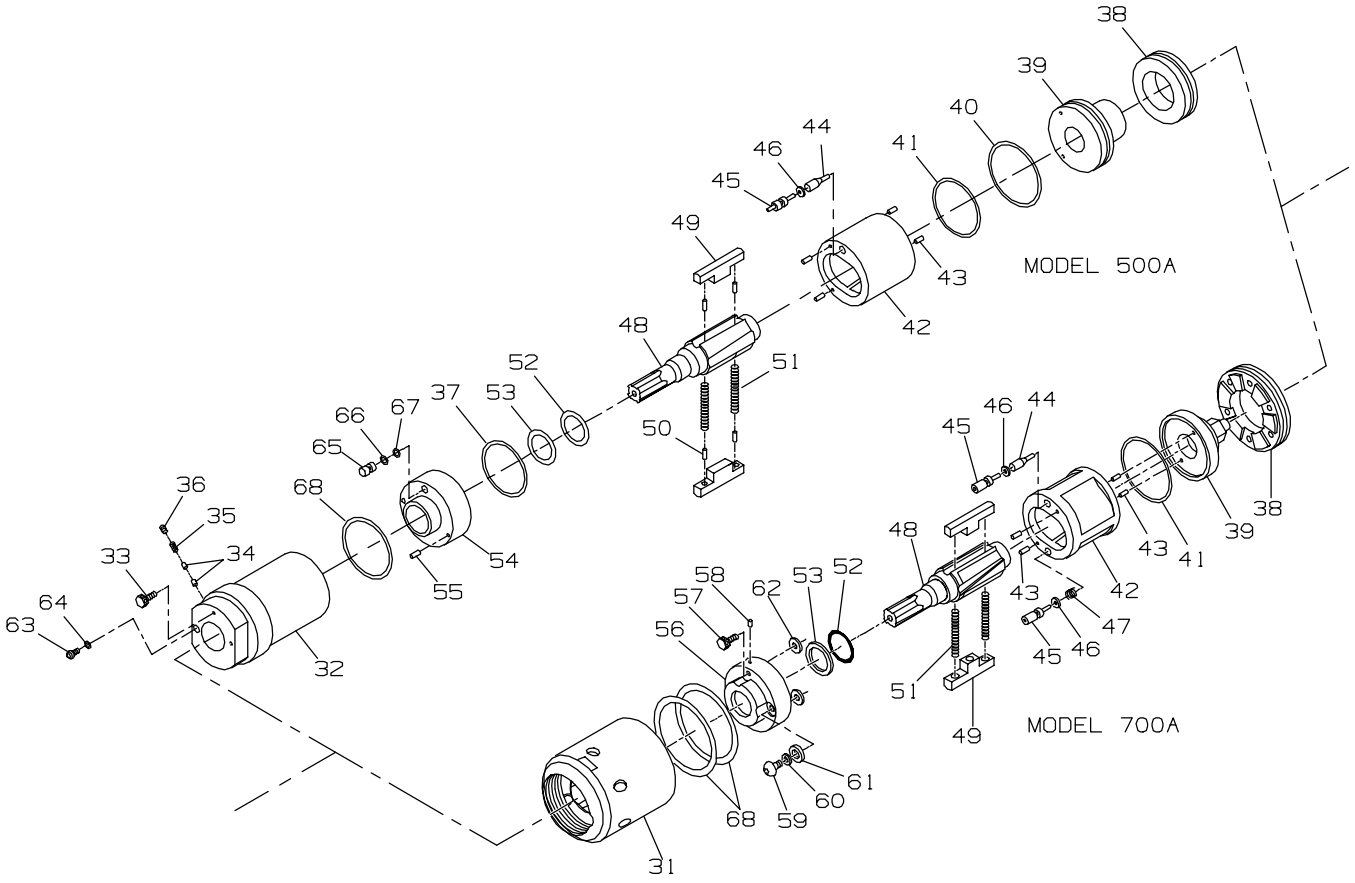
PART NUMBER FOR ORDERING

			500A	700A
		Motor Housing Assembly	500A-A40	700A-A40
	1	Motor Housing	500A-40	700A-40
	2	Reverse Valve Knob Assembly	EQ106S-A658	EQ106S-A658
	3	Reverse Valve Knob Seal	EQ106S-119	EQ106S-119
	4	Knob Retaining Pin	EQ106S-152	EQ106S-152
	5	Reverse Valve Assembly	180PQ-A329	180PQ-A329
	6	Reverse Valve Seal	180PQ-67	180PQ-67
	7	Reverse Valve Bushing	700A-330	700A-330
	8	Reverse Valve Bushing Seal (2)	EQ106P-283	EQ106P-283
	9	Throttle Lever	EQ106S-273	EQ106S-273
	10	Throttle Lever Pin	EQ106S-120	EQ106S-120
	11	Throttle Valve Spring	EQ106S-51	EQ106S-51
	12	Throttle Ball	180PQ-929	180PQ-929
	13	Throttle Plunger	180SQ-298	180SQ-298
	14	Inlet Bushing	EQ106S-565	EQ106S-565
	15	Exhaust Deflector Assembly	180PQ-A23	180PQ-A23
	16	Deflector Retaining Pin	EQ106P-152	EQ106P-152
	17	Suspension Bail	EQ106S-365	EQ106S-365
		Motor Assembly	500A-A53	700A-A53
	18	Rear End Plate Assembly	380SQ-A12	380SQ-A12
♦	19	Rear Rotor Bearing	500A-22	500A-22
	20	Cylinder Assembly	500A-A3	700A-A3
	21	Cylinder Alignment Pin (2)	500A-299	EQ112P-99
	22	Rotor	500A-53	EQ108S-53
♦	23	Vane Packet (set of 6 Vanes)	500A-42-6	EQ108S-42-6
	24	Front End Plate Assembly	500A-A11	700A-A11
	25	End Plate Alignment Pin	380SQ-298	380SQ-298
♦	26	Front Rotor Bearing	500P-22	EQ106S-22
	27	Front End Plate Spacer	700A-41	700A-41
	28	Nameplate		
		for 500A and 700A	500A-301	700A-301
		for 500A-EU and 700A-EU	500A-EU-301	700A-EU-301
	29	Nameplate Drive Screw (2)	EQ106S-322	EQ106S-322
	30	Oil Daily Label	500P-69	500P-69
	*	Motor Tune-up Kit (includes illustrated items 19, 23 and 26)	500A-K500	700A-K500

* Not illustrated.

♦ Indicates Motor Tune-up Kit part.

MODELS 500A AND 700A IMPULSE MECHANISMS FOR TWIN BLADE ANGLE IMPULSE WRENCHES



(Dwg. TPB960)

PART NUMBER FOR ORDERING

			500A	700A
		Impulse Unit Drive Assembly	500A–A200	700A–A200
	31	Liner Case	---	700A–240
		Liner Case Assembly	500A–A240	---
	32	Liner Case	500A–240	---
	33	Torque Adjustment Screw	700A–230	---
♦	34	Adjustment Screw Plug Lock (2)	180PQ–283	---
	35	Plug Lock Spring	180PQ–219	---
	36	Plug Lock Screw	500A–230	---
♦	37	Liner O–ring	EQ208S–237	---
	38	Housing Cap	380PQ–207	EQ106S–207
	39	Rear Liner Cover	---	EQ208S–212
	39	Rear Liner Cover Assembly	380PQ–A212	---
♦	40	Liner Cover O–ring	380PQ–236	---
♦	41	Liner Cover O–ring	EQ106S–236	EQ208S–237
	42	Liner Assembly	500A–A203	700P–A203
	43	Liner Pin (4)	180PQ–298	EQ208S–298
	44	Relief Valve	500A–222	EQ210S–222
		Spring Guide Assembly (1 for 500A; 2 for 700A)	500A–A255	700A–A255
	45	Spring Guide	500A–255	700A–255
♦	46	Spring Guide Seal	180PQ–272	EQ106P–288
	47	Guide Assist Spring	---	EQ212P–219
	48	Drive Shaft	500A–626X	700A–626X
	49	Blade (2)	---	700PS3–220
		Blade Assembly (2)	500A–A220	---
	49	Blade	500A–220	---
	50	Blade Assembly Pin (2 per Assembly)	500A–120	---
	51	Blade Spring (2)	380PQ–568	EQ208S–219
♦	52	Drive Shaft Seal	180PQ–271	EQ208S–271
♦	53	Seal Back–up Ring	380PQ–272	EQ106S–272
	54	Front Liner Cover Assembly	380PQ–A211	---
	55	Liner Cover Pin	180PQ–232	---

♦ Indicates Mechanism Tune–up Kit part.

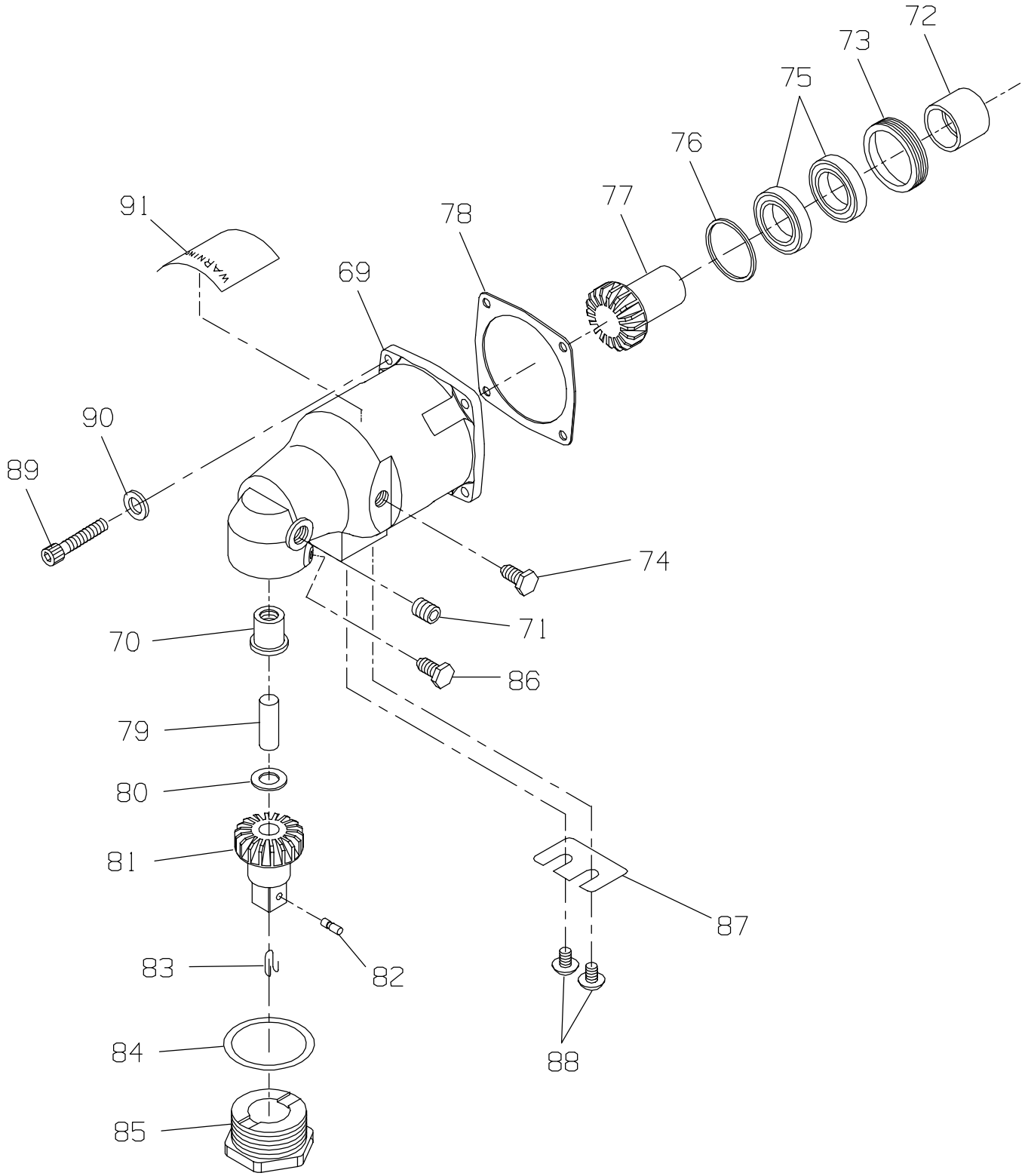
PART NUMBER FOR ORDERING

			500A	700A
		Front Liner Cover Assembly	---	700A-A211
	56	Front Cover Plate Assembly	---	700A-B211
	57	Torque Adjustment Screw	---	700A-230
	58	Adjustment Screw Lock	---	500PQ-288
	59	Oil Plug	---	EQ106S-277
♦	60	Oil Plug Seal	---	EQ106S-228
♦	61	Oil Plug Seal Support	---	EQ106S-229
♦	62	Front Liner Cover Guide Seal (2)	---	EQ208S-238
	63	Oil Plug	180PQ-277	---
♦	64	Oil Plug Seal	EQ110P-288	---
	65	Oil Stop Cap Assembly	180PQ-A38	---
	66	Stop Cap O-ring	EQ106P-288	---
	67	Back-up Ring	380SQ-272	---
♦	68	Front Liner Seal (1 for 500A; 2 for 700A)	380PQ-288	EQ208S-236
	*	Impulse Mechanism Tune-up Kit (includes illustrated items 34 [2], 37, 40, 41, 46, 52, 53, 64 and 68)	500P-K600	---
	*	Impulse Mechanism Tune-up Kit (includes illustrated items 41, 46, 52, 53, 60, 61, 62 [2] and 68 [2])	---	700A-K600
	*	Fluid Replacement Kit (includes Fluid Syringe, Fill Tube and 4 oz. [31 mL] of Replacement Fluid)	EQ106S-K400	EQ106S-K400
	*	Replacement Fluid (4 oz.)	EQ106S-400-1	EQ106S-400-1
	*	Tool Kit (includes all the specialized tooling required to repair these tools and consists of two Spanner Plugs, a Tee Wrench with a special tip, an O-ring Installer Fixture and a pressing fixture that has a Disassembly Arbor and Pressing Sleeve)	180PQ-99	700A-99

* Not illustrated.

♦ Indicates Mechanism Tune-up Kit part.

MODELS 500A AND 700A ANGLE HOUSING FOR TWIN BLADE ANGLE IMPULSE WRENCHES



(Dwg. TPB961)

		PART NUMBER FOR ORDERING ↓ 500A	↓ 700A
	Angle Housing Assembly	500A-A727	700A-A727
69	Angle Housing	500A-727	700A-727
70	Spindle Shaft Bushing	700A-641	700A-641
71	Grease Plug	180PQ-95	180PQ-95
72	Angle Housing Spacer	500A-900	700A-900
73	Pinion Bearing Cap	700A-902	700A-902
74	Bearing Cap Retainer Screw	700A-277	700A-277
75	Pinion Bearing (2)	EQ106S-22	EQ106S-22
76	Pinion Bearing Shim (1.004" ID x 1.082" OD) (25.5 mm ID x 27.5 mm OD)		
	0.004" (0.1 mm) thickness	700A-740	700A-740
	0.008" (0.2 mm) thickness	700A-741	700A-741
	0.012" (0.3 mm) thickness	700A-742	700A-742
77	Bevel Pinion	700A-901	700A-901
78	Housing Gasket	500A-746	700A-746
79	Spindle Shaft	500A-298	500A-298
80	Spindle Upper Shim (21/64" ID x 35/64" OD) (8.2 mm ID x 14.0 mm OD)		
	0.012" (0.3 mm) thickness	500A-933	500A-933
	0.024" (0.6 mm) thickness	700A-933	700A-933
	Spindle Assembly	700A-A626	700A-A626
81	Spindle	700A-626	700A-626
82	Socket Retaining Pin	5020-716	5020-716
83	Retaining Pin Spring	401-718	401-718
84	Spindle Lower Shim (1.110" ID x 1.260" OD) (28.2 mm ID x 32.0 mm OD)		
	0.004" (0.1 mm) thickness	700A-743	700A-743
	0.008" (0.2 mm) thickness	700A-744	700A-744
	0.012" (0.3 mm) thickness	700A-745	700A-745
85	Spindle Cap	700A-728	700A-728
86	Spindle Cap Retaining Screw	700A-277	700A-277
87	Torque Adjustment Screw Cover Plate	700A-888	700A-888
88	Cover Plate Mounting Screw (2)	500A-322	500A-322
89	Angle Housing Mounting Screw (4)	500A-638	500PQ-638
90	Mounting Screw Lock Washer (4)	500P-58	500P-58
91	Warning Label		
	for 500A and 700A	WARNING-2-99	WARNING-2-99
	for 500A-EU and 700A-EU	EU-99	EU-99

—CHANGING THE MECHANISM FLUID —

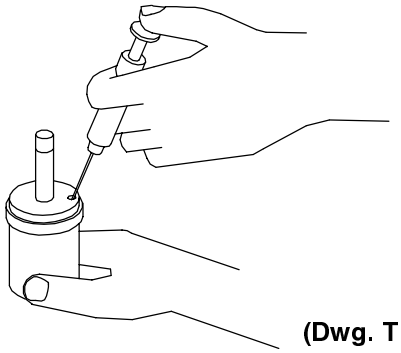
To change the Mechanism Fluid in the Impulse Mechanism, proceed as follows:

1. Grasp the tool in copper-covered or leather-covered vise jaws with the Angle Housing (69) upward.
2. Using a hex wrench, remove the four Angle Housing Mounting Screws (89) and Lock Washers (90). Lift the assembled Angle Housing off the Motor Housing (1). Remove the Housing Gasket (78).
3. Lift the assembled mechanism off the Rotor (22).
4. Using a wrench, rotate the Torque Adjustment Screw (33 or 57) 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 (59 or 63). Remove the Oil Plug Seal (60 or 64) and Oil Plug Seal Support (61).
6. With the oil plug opening downward over a container, rotate the Drive Shaft (48) to purge the fluid from the mechanism.
7. **For Model 500A,** thread the Tee Wrench included with the Tool Kit (Part No. 180PQ-99) through the oil plug hole into the Spring Guide (45) and pull the Guide toward the output end of the mechanism until it stops.
   For Model 700A, thread the Tee Wrench included with the Tool Kit (Part No. 700A-99) through the oil plug hole into the Spring Guide (45) that is 180 degrees from the Torque Adjustment Screw (57) and pull the Spring Guide toward the output end of the mechanism until it stops.

NOTICE

Use the fluid specified in the next step when filling the mechanism. 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.

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 500A will require 9 cc of fluid and Model 700A, 12 cc. (Refer to Dwg. TPD1265)



(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 the fluid and use the Tee Wrench to push the Spring Guide 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 1.5 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 0.2 cc of fluid from 500A models and 0.50 cc of fluid from 700A models.
14. Install the Oil Chamber Plug and tighten it between 20 and 25 in-lb (2.3 and 2.8 Nm) torque.
15. Install the assembled mechanism on the rotor shaft.
16. Place a new Housing Gasket on the Angle Housing and install the assembled Angle Housing over the Drive Shaft against the Housing. Install the four Angle Housing Mounting Screws and Lock Washers. Tighten each Screw between 45 an 50 in-lb (5.1 and 5.6 Nm) torque.

DISASSEMBLY

General Instructions

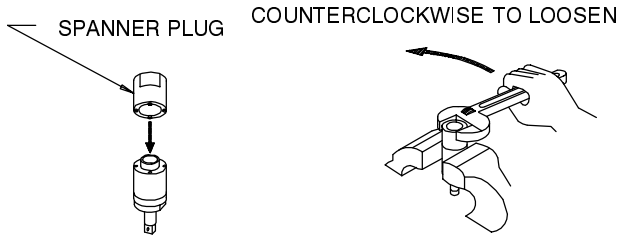
1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. When grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members 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 Angle Head

1. Grasp the tool in copper–covered or leather–covered vise jaws with the Angle Housing (69) upward.
2. Using a hex wrench, remove the four Angle Housing Mounting Screws (89) and Lock Washers (90). Lift the assembled Angle Housing off the Motor Housing (1). Remove the Housing Gasket (78) and Angle Housing Spacer (72).
3. Unscrew and remove the Bearing Cap Retainer Screw (74).
4. Using a spanner wrench, unscrew and remove the Pinion Bearing Cap (73).
5. Pull the two Pinion Bearings (75), any Pinion Bearing Shims (76) and the Bevel Pinion (77) out of the Angle Housing.
6. Unscrew and remove the Spindle Cap Retaining Screw (86).
7. Unscrew and remove the Spindle Cap (85) and pull the Spindle (81), Spindle Shaft (79) and any Spindle Shims (80 or 84) that are in the assembly.

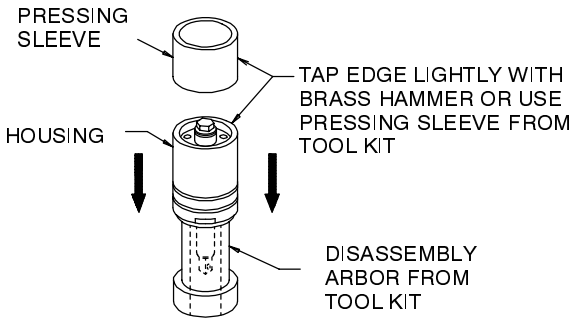
Disassembly of the Impulse Mechanism

1. Lift the assembled mechanism off the Rotor (22).
2. Using a wrench, rotate the Torque Adjustment Screw (33 or 57) clockwise until the Screw stops. Rotate the Screw counterclockwise until it stops or makes six complete revolutions.
3. Using a 2.5 mm hex wrench, unscrew and remove the Oil Plug (59 or 63). Remove the Oil Plug Seal (60 or 64) and Oil Plug Seal Support (61).
4. With the oil plug opening downward over a container, rotate the Drive Shaft (48) to purge the fluid from the mechanism.
5. Grasp the flats of the Housing (31 or 32) in vise jaws with the output end of the Drive Shaft downward.
6. Insert the pins of the Spanner Plug from the No. 180PQ–99 or No. 700A–99 Tool Kit into two holes in the Housing Cap (38). Using a wrench on the plug, unscrew and remove the Housing Cap from the Housing. (Refer to Dwg. TPD1267).



(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 TPB960.

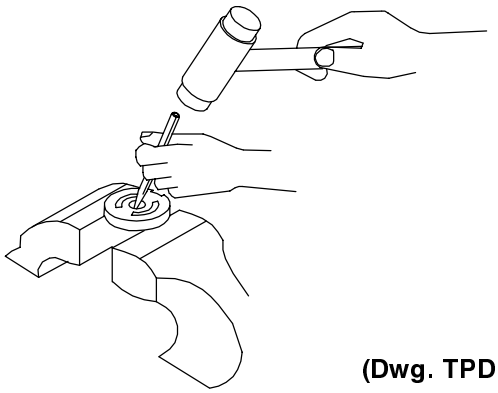
Disassembly of the Motor

1. Grasp the Motor Housing (1) in vise jaws with the shaft of the Rotor (22) upward.
2. Insert the pins of the end plate spacer spanner into the holes in the Front End Plate Spacer (27). Using a wrench, unscrew and remove the Spacer. This is a **left–hand thread**; rotate the wrench **clockwise** to remove the Spacer.
3. Pull the assembled motor from the Motor Housing.
4. Remove the Front End Plate (24), Front Rotor Bearing (26), Cylinder Assembly (20) and Vanes (23) from the Rotor.
5. On the table of an arbor press, support the Rear End Plate (18) with blocks as close to the Rotor as possible and press the Rotor out of the Rear End Plate and Rear Rotor Bearing (19).

NOTICE

When performing the following step, do not enlarge or damage the shaft hole in the End Plate.

6. 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. TPD1299).



(Dwg. TPD1299)

7. Press the Reverse Lever Pin (4) out of the Reverse Lever (2) and remove the Reverse Lever, Reverse Lever Seal (3), Throttle Valve Spring (11) and the Throttle Ball (12).
8. Spread the end of the Suspension Bail (17), where the ends enter the Motor Housing, and remove the Bail.
9. Using a pin punch, tap the Throttle Lever Pin (10) and the Deflector Retaining Pin (16) out of the Handle. Remove the Throttle Lever (9), Throttle Plunger (13) and the Exhaust Deflector Assembly (15).
10. Push the Reverse Valve Assembly (5) out the throttle lever end of the Housing and remove the two Reverse Valve Bushing Seals (8) if they need to be replaced.
11. Unscrew and remove the Inlet Bushing (14).
12. If the Reverse Valve Bushing (7) must be replaced, press it from the Motor Housing.

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

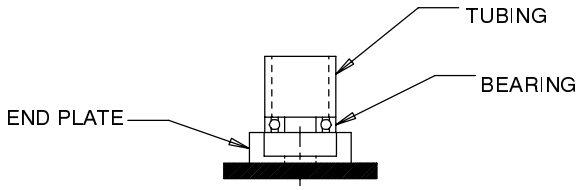
1. If the Reverse Valve Bushing (7) was removed from the Motor Housing (1), press it into the Housing, lug end trailing, from the side of the Housing opposite the lever position. Make certain the ports align with the bushing holes.
2. Thread the Inlet Bushing (14) into the threaded hole at the rear of the handle of the Motor Housing and tighten it between 30 and 35 ft-lb (40 and 47 Nm) torque.
3. Position the Exhaust Deflector Assembly (15) in the hole at the rear of the motor housing handle and install the Deflector Retaining Pin (16) to secure it in position.

NOTICE

It may be necessary to slide the Assembly in or out in order to align the groove in the Assembly with the pin hole.

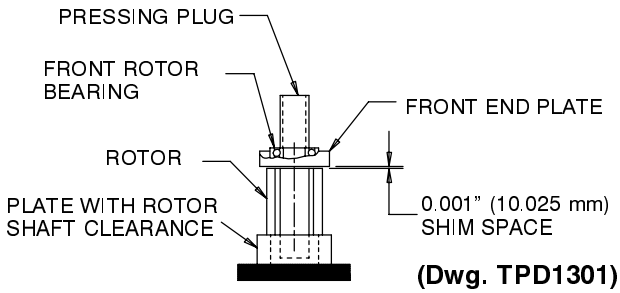
4. Install two new Reverse Valve Bushing Seals (8) in the grooves inside the Reverse Valve Bushing, if they were removed.
5. Install the Reverse Valve Seal (6) in the groove next to the large hub of the Reverse Valve (5).
6. Install the Reverse Valve Assembly, seal end trailing, into the lever side of the Motor Housing. Make certain the square depression on the shaft of the Valve faces forward toward the output end of the tool.
7. Install the Reverse Lever Seal (3) in the groove on the small hub of the Reverse Lever (2).
8. Insert the Throttle Ball (12) followed by the Throttle Valve Spring (11) into the Reverse Valve Assembly.
9. Position the Reverse Lever Assembly on the Reverse Valve Assembly with the indicator lever rearward. Make certain the crossholes in the Lever align with the pin holes in the Valve. Press the Knob Retaining Pin (4) into the Lever and Valve.
10. Insert the Throttle Plunger (13) into the Reverse Valve Assembly.
11. Position the Throttle Lever (9) on the Motor Housing and secure it by pressing the Throttle Lever Pin (10) into the Housing and Lever.

12. Using an arbor press and a piece of tubing that contacts the outer ring of the bearings, press the Front Rotor Bearing (26) into the Front End Plate (24) and the Rear Rotor Bearing (19) into the Rear End Plate (18). (Refer to Dwg. TPD1300).



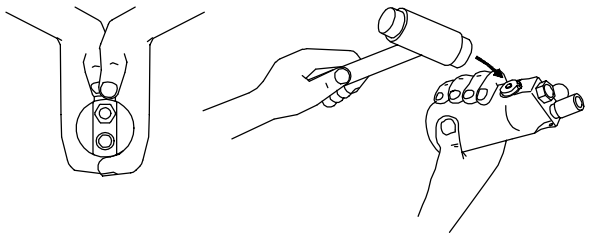
(Dwg. TPD1300)

13. Stand the Rotor (22) 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.
14. 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. TPD1301).



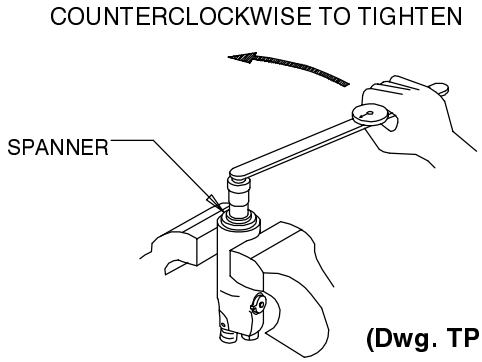
(Dwg. TPD1301)

15. Coat each Vane (23) 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.
16. Install the Cylinder (20) over the Vanes and Rotor. Make certain the contour at the end of the Cylinder matches the contour of the End Plate. Make certain the Cylinder Alignment Pin (21) enters the hole in the face of the End Plate.
17. Place the Rear End Plate and Bearing against the face of the Cylinder, Bearing end trailing. Make certain the Cylinder Alignment Pin enters the hole in the End Plate.
18. Insert the assembly, Rear End Plate leading, into the Motor Housing making sure the End Plate Alignment Pin (25) enters the notch in the Housing. It may be necessary to tap the assembly into position with a brass or plastic hammer. (Refer to Dwg. TPD1303).



(Dwg. TPD1303)

19. Grasp the Motor Housing in vise jaws with the rotor shaft upward. Thread the Front End Plate Spacer (27) into the Housing and using the end plate spacer spanner, tighten the Spacer to 12 ft–lb (16 Nm) torque. This is a **left–hand thread**; rotate the wrench **counterclockwise** to tighten. (Refer to Dwg. TPD1304).



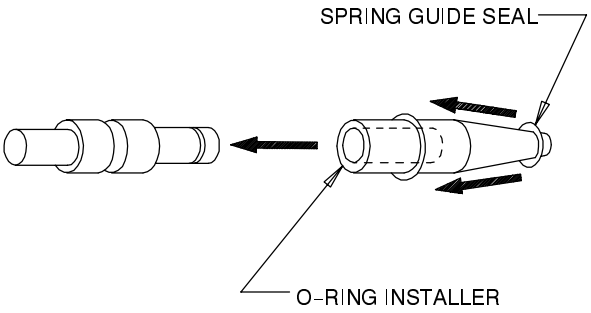
(Dwg. TPD1304)

20. After installing the Front End Plate Spacer, grasp the shaft of the Rotor and rotate it by hand. If the Rotor does not turn easily, disassemble the motor unit and determine where the assembly is binding. The motor must rotate freely before proceeding further with the assembly.

Assembly of the Impulse Mechanism

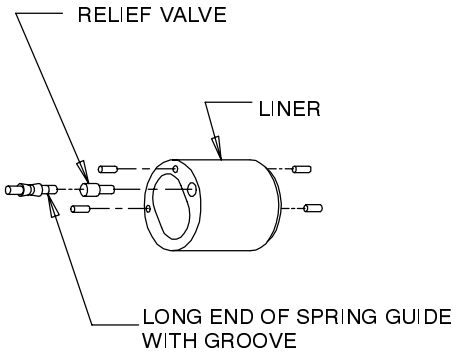
1. Insert the long shaft of the Spring Guide (41) intothe central opening of the O–ring Installer furnished with the Tool Kit (Part No. 180PQ–99 or Part No. 700A–99). Place the Spring Guide Seal (46) on the tapered end of the Installer and roll the Seal up the taper and into the groove on the large body of the Spring Guide.

For Model 700A, repeat the procedure with the second Spring Guide and Seal.
(Refer to Dwg. TPD1305)



(Dwg. TPD1305)

2. **For Model 500A,** insert the Relief Valve (44), large end trailing, into the Liner (42). Insert the assembled Spring Guide, long hub with annular groove leading, into the Liner against the Relief Valve.
(Refer to Dwg. TPD1306).



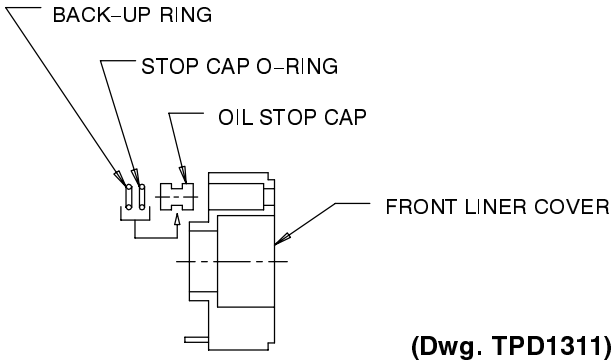
(Dwg. TPD1306)

For Model 700A, when looking inside the central opening of the Liner (42), 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 Relief Valve (44). Install the Relief Valve, large end trailing, into that opening. Insert the Guide Assist Spring (47) into the hole in the end face of the opposite wall.

3. **For Model 700A,** insert a Spring Guide Assembly, large end trailing, into the opening against the Relief Valve. Mark this opening with a felt marker to indicate that it contains the Relief Valve. Install the remaining Spring Guide Assembly, large end trailing, into the hole with the Spring.
4. **For Model 500A**, install the Liner Cover O-ring (40) in the groove around the Rear Liner Cover (39).

For Model 700A, install the Rear Liner Cover Seal (41) in the annular groove on the face of the Rear Liner Cover (39).

5. **For Model 700A**, install the two Front Liner Cover Guide Seals (62) in the openings on the face of the Front Liner Cover (56).
6. **For Model 500A**, if the Oil Stop Cap Assembly (65) was removed from from the Front Liner Cover (54), install the Stop Cap O-ring (66) and Back-up Ring (67) in the groove of the Cap and insert the Assembly into the Cover.
(Refer to Dwg. TPD1311).



(Dwg. TPD1311)

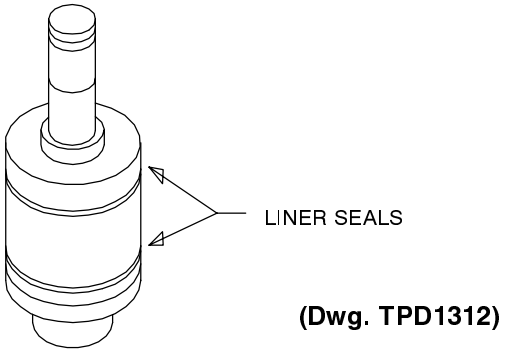
7. Insert the short round hub of the Drive Shaft (61) into the central opening of the Rear Liner Cover.
8. **For Model 500A**, insert a Blade (49) into one slot in the Drive Shaft with the Blade Assembly Pin (50) inward toward the Shaft. Install the Blade Springs (51) through the Drive Shaft and encircle the Pins in the Blade. Place the remaining Blade on the Springs making certain the Springs encircle the Pins in that Blade.
For Model 700A, insert a Blade (49) 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.

NOTICE

This following 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.

9. 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 this position by installing the Liner Assembly, guide spring end trailing, over the Drive Shaft and against the Rear Liner Cover. Make certain the Liner Pins (43) in the Liner enter the holes in the Cover.

10. Insert the hub 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.
11. Install the Seal Back-Up Ring (53) followed by the Drive Shaft O-ring (52) in the central opening in the face of the Front Liner Cover.
12. Install the Front Liner Cover Assembly over the Drive Shaft and against the Liner.
    For Model 500A, make certain the Oil Stop Cap Assembly aligns with the Spring Guide assembly.
    For Model 700A, make certain the Torque Adjustment Screw (57) aligns with the proper spring guide opening that was marked during assembly.
13. **For Model 500A**, install the Liner Cover O-ring (41) in the groove that was formed where the Rear Liner Cover contacts the Liner and install the Liner O-ring (37) in the groove formed where the Front Liner Cover contacts the Liner. Lubricate the Seals with O-ring lubricant. (Refer to Dwg. TPD1312).



(Dwg. TPD1312)

14. **For Model 500A,** apply some grease to the Liner Cover Seal (68) and install it in the grooves inside the Liner Housing (32) near the end with the external wrench flats.
    For Model 700A, apply some grease to the two Liner Cover Seals (68) and install them in the grooves inside the Liner Housing (31) near the end with the external wrench flats.
15. **For Model 500A**, orient the Liner Housing so the Liner Cover Pin (55) will enter the hole in the Housing and install the Housing over the Liner.
    For Model 700A, 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 (59) 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 with the output spindle downward. Remove the Rear Liner Cover and fill the recess in the Cover with grease. Reinstall the Cover and push it downward below the threads at the rear of the Housing.
17. Using the Spanner Plug furnished with the Tool Kit and a torque wrench, install the Housing Cap, (castellated end leading for Model 700A). Tighten the Cap between 101 and 116 ft-lb (137 and 157 Nm) torque.
18. Make certain the Drive Shaft rotates freely and then fill the mechanism with fluid as instructed in the section, **CHANGING THE MECHANISM FLUID.**

Assembly of the Angle Head

1. If the Spindle Shaft Bushing was removed, press a new Bushing into the Angle Housing (69), large end trailing, until it seats.
2. Lubricate and install the two Pinion Bearings (75) on the shaft of the Bevel Pinion (77) and insert the assembly, gear end leading, into the motor end of the Angle Housing.
3. Install the Pinion Bearing Cap (73) and tighten it snug.
4. Insert the Spindle Shaft (79) into the gear end of the Spindle (81).
5. Chalk the gear teeth of the Spindle and carefully insert the assembly into the Angle Housing. Make certain the Shaft enters the Bushing. Install the Spindle Cap (85) and lightly tighten it.
6. Using a wrench on the square drive, rotate the Spindle to sufficiently mark the chalked gear teeth. Carefully remove the Spindle Cap and examine the gear teeth.
7. If the gearing runs smoothly and gear tooth engagement is good, reinstall the Cap and tighten it and the Pinion Bearing Cap securely.
   If the gearing does not run smoothly or gear tooth engagement is poor, proceed as follows:
   a. Determine which way the Spindle or Pinion must move to improve engagement.
   b. Insert the correct thickness Pinion Bearing Shim (76), Spindle Upper Shim (80) or Spindle Lower Shim (84) separately or in combination to achieve the desired engagement.
   c. Chalk the gear teeth and test the tooth engagement again.
   d. When satisfied that the proper bevel gear engagement has been achieved, tighten the Spindle Cap and Pinion Bearing Cap securely.
8. Remove the Grease Plug (71) and fill the cavity with gear grease.
9. Install the Bearing Cap Retaining Screw (74) and Spindle Cap Retaining Screw (86) and tighten them securely.
10. Install the assembled Impulse Unit Drive Assembly on the rotor shaft in the Motor Housing (1).
11. Install the Angle Housing Spacer (72), small opening leading, onto the Drive Shaft (48) against the impulse mechanism.
12. Place a new Housing Gasket (78) on the Angle Housing and install the assembled Angle Housing over the Drive Shaft against the Housing. Install the four Angle Housing Mounting Screws (89) and Lock Washers (90). Tighten each Screw between 45 an 50 in-lb (5.1 and 5.6 Nm) torque.

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