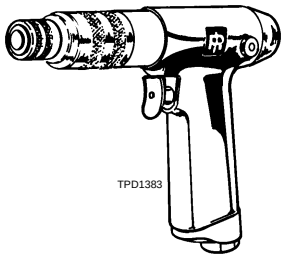

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OPERATION AND MAINTENANCE MANUAL FOR SERIES 3R SCREWDRIVERS

NOTICE

Series 3R Air Screwdrivers are designed for fastening applications in automotive and appliance assembly, the electronic and aerospace industries and for woodworking.

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 1/4" (6 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.**
- **Note the position of the reversing lever before operating the tool so as to be aware of the direction of rotation when operating the throttle.**
- **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 accessory 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.**
- **The Throttle Valve Cap is under pressure from the Throttle Valve Spring. Use care when removing the Throttle Valve Cap. *(On tools where applicable.)***
- **This tool is not insulated against electric shock.**
- **This tool is not designed for working in explosive atmospheres.**

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.

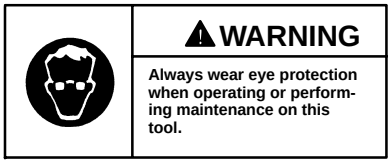
Printed in U.S.A.

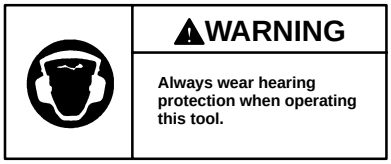
INGERSOLL-RAND®
PROFESSIONAL TOOLS

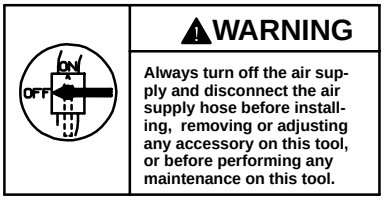
WARNING LABEL IDENTIFICATION

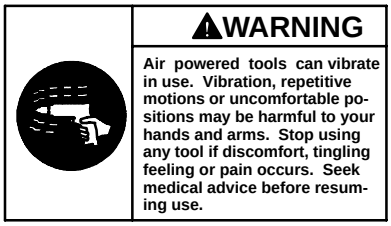
⚠ WARNING

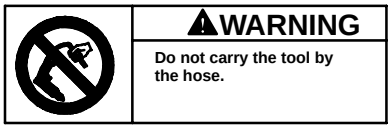
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

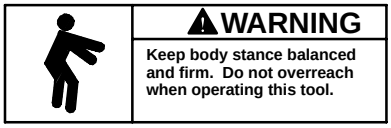


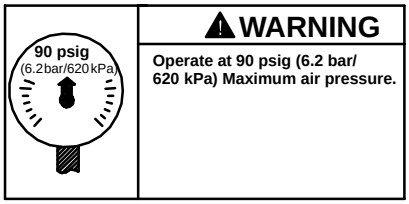












ADJUSTMENTS

CLUTCH ADJUSTMENT

⚠ WARNING

Disconnect the air supply from the Tool before proceeding.

1. Rotate the Adjusting Hole Cover on the Clutch Housing to expose the adjusting hole.
2. Insert a 1/4” hex wrench into the Bit Holder. Rotate the clutch mechanism until one of the radial holes in the Clutch Adjusting Nut is visible through the adjusting hole. Insert the No. 5C1–116 Adjusting Key or a 3/32” (2 mm) diameter hardened steel pin or rod into the hole in the Adjusting Nut to sprag the Nut against rotation.
3. Grasp the Tool firmly in one hand and rotate the Bit Holder to shift the Adjusting Nut along the Bit Holder. Rotating the Bit Holder clockwise facing the front increases the compression on the Clutch Spring and raises the torque at which the clutch will ratchet or shut the Tool off.

NOTICE

The most satisfactory adjustment is usually obtained by using the tool on the actual application and increasing or decreasing the delivered torque until the desired setting is reached. In any event, it is recommended that final adjustment be made by gradual progression.

PLACING TOOL IN SERVICE

LUBRICATION

Ingersoll–Rand No. 10

Gearing:
Ingersoll–Rand No. 28
Clutch:
Ingersoll–Rand No. 67

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

For USA – No. C08–02–FKG0–28

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

After each 50,000 cycles or each month, whichever occurs first, lubricate the clutch assembly with Ingersoll–Rand No. 28 Grease or Ingersoll–Rand No. 67 Grease as instructed below.

PLACING TOOL IN SERVICE

Lubrication of Clutch Assembly

WARNING

Disconnect the air supply from the tool before proceeding.

1. **For Cushion Clutch Models,** unscrew and remove the clutch attachment.
   a. **For L gear ratio,** inject 4 to 6 cc of Ingersoll–Rand No. 28 Grease through the center hole of the spindle to lubricate the gearing.
   b. **For M or N gear ratio,** inject 6 to 8 cc of Ingersoll–Rand No. 28 Grease through the center hole of the spindle to lubricate the gearing.
   c. Work approximately 6 to 8 cc of Ingersoll–Rand No. 67 Grease into the ball pockets, jaws, adjusting nut lock and shaft threads of the clutch mechanism.
2. **For Automatic Shutoff Clutch Models,** unscrew and remove the clutch attachment. Remove the Push Rod.
   a. **For L gear ratio,** inject 4 to 6 cc of Ingersoll–Rand No. 28 Grease through the center hole of the spindle to lubricate the gearing.
   b. **For M, N, or Q gear ratio,** inject 6 to 8 cc of Ingersoll–Rand No. 28 Grease through the center hole of the spindle to lubricate the gearing.
   c. Work approximately 6 to 8 cc of Ingersoll–Rand No. 67 Grease into the ball pockets, jaws, adjusting nut lock and shaft threads of the clutch mechanism.
   d. Insert the Push Rod into the spindle.
3. Thread the clutch attachment onto the Gear Case and hand tighten.

NOTICE

This is a left–hand thread; turn counterclockwise to tighten.

Adjustable Clutch

1. Insert a 1/4” hex wrench into the Bit Holder. While pushing against the Bit Holder, rotate the Bit Holder until the hole in the Clutch Adjusting Nut is aligned with the slot in the Clutch Housing.
2. Insert the Clutch Adjusting Key into the hole in the Clutch Adjusting Nut. While holding the Nut against rotation and facing the front end of the tool, rotate the Bit Holder counterclockwise until the Clutch Adjusting Nut contacts the rear Spring Seat Stop.
3. Grasp the tool with one hand and gripping the knurled exterior of the Clutch Housing with the other hand, unscrew and remove the Clutch Housing from the Gear Case.

NOTICE

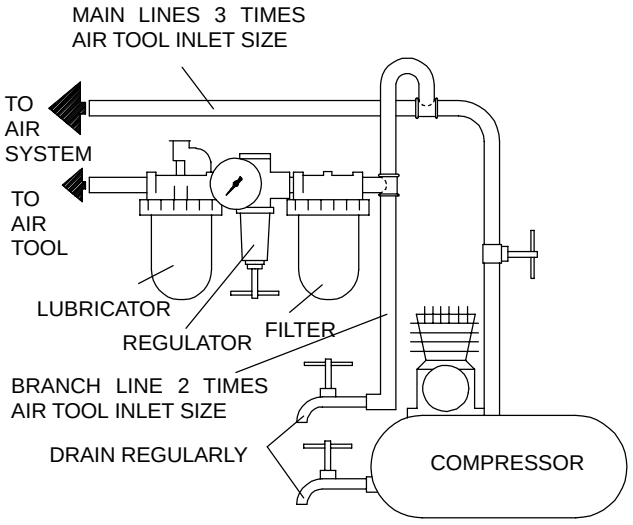
This is a left–hand thread; turn clockwise to remove.

4. Withdraw the assembled clutch from the Clutch Housing.
5. **For 3C1 Clutch**, inject a quantity of Ingersoll–Rand No. 28 Grease, under pressure, into the front hex of the Clutch Driver.

NOTICE

Make sure the grease oozes through a drilled hole in the Driver and outwardly between the Clutch Jaw, Jaw Bearing Ball, Clutch Balls, Clutch Ball Spacer and Clutch Ball Seat. Work some of the recommended grease into the Thrust Bearing.

For 3S3 Clutch, while grasping the Clutch Ball Seat and pulling the Seat downward against the Clutch Spring, work some Ingersoll–Rand No. 28 Grease around the Clutch Cam Balls, cam and Clutch Ball Seat. With the Clutch Spring tension released, work some of the recommended grease into the Thrust Bearing. Remove the Ball Retaining Ring and remove one Bit Holder Bearing Ball. Work some of the recommended grease into the hole where the Bit Holder Bearing was removed. Install the Bit Holder Bearing Ball and Ball Retaining Ring.



(Dwg. TPD905–1)

Model	Handle	Clutch/Drive	Recommended Torque Range	
	Reversible Pistol	**Direct Drive**	**psi**	**in–lbs (Nm)**
3RALD1			50 90	8 (0.9) 14 (1.6)
3RAMD1			50 90	12 (1.4) 22 (2.5)
3RAND1			50 90	19 (2.1) 34 (3.9)
	Reversible Lever Throttle	**Direct Drive**		
3RLLD1			50 90	8 (0.9) 14 (1.6)
3RLMD1			50 90	12 (1.4) 22 (2.5)
3RLND1			50 90	19 (2.1) 34 (3.9)
	Reversible Pistol	**Adjustable Cushion Clutch**	**in–lbs (Nm)**	
3RALC1			3.5 – 13 (0.39 – 1.5)	
3RALC3			3.5 – 13 (0.39 – 1.5)	
3RAMC1			2.5 – 20 (0.28 – 2.3)	
3RAMC3			2.5 – 20 (0.28 – 2.3)	
3RANC1			1.5 – 30 (0.17 – 3.4)	
3RANC3			1.5 – 30 (0.17 – 3.4)	
3RAQC1			1.5 – 45 (0.17 – 5.1)	
3RAMC9D			2.5 – 30 (0.28 – 3.4)	
3RANC9D			2.5 – 30 (0.28 – 3.4)	
	Reversible Pistol	**Push Throttle Shut–off Clutch**		
3RTLS1			3.5 – 13 (0.39 – 1.5)	
3RTMS1			2.5 – 20 (0.28 – 2.3)	
3RTNS1			1.5 – 30 (0.17 – 3.4)	
3RTNS3			1.5 – 30 (0.17 – 3.4)	
3RTPS1			1.5 – 45 (0.17 – 5.1)	
3RTQS1			1.5 – 45 (0.17 – 5.1)	
3RTLS3			3.5 – 13 (0.39 – 1.5)	
3RTMS3			2.5 – 20 (0.28 – 2.3)	
3RTMS9D			2.5 – 20 (0.28 – 2.3)	
3RTNS9D			1.5 – 30 (0.17 – 3.4)	
3RTPS9D			1.5 – 45 (0.17 – 5.1)	
3RTPS3			1.5 – 45 (0.17 – 5.1)	
3RTQS3			1.5 – 45 (0.17 – 5.1)	
	Reversible In–Line	**Push Throttle Shut–off Clutch**		
3RPMS9D			1.5 – 45 (0.17 – 5.1)	
3RPNS9D			1.5 – 30 (0.17 – 3.4)	

Model	Handle	Clutch/Drive	Recommended Torque Range
	Reversible Lever Throttle	**Adjustable Cushion Clutch**	**in–lbs (Nm)**
3RLLC1			3.5 – 13 (0.39 – 1.5)
3RLLC3			3.5 – 13 (0.39 – 1.5)
3RLMC1			2.5 – 20 (0.28 – 2.3)
3RLMC3			2.5 – 20 (0.28 – 2.3)
3RLNC1			1.5 – 30 (0.17 – 3.4)
3RLNC3			1.5 – 30 (0.17 – 3.4)
3RLMC9D			2.5 – 20 (0.28 – 2.3)
3RLNC9D			1.5 – 30 (0.17 – 3.4)
	Reversible Lever Throttle	**Shut–off Clutch**	
3RLNS1			1.5 – 30 (0.17 – 3.4)
3RLNS3			1.5 – 30 (0.17 – 3.4)
3RLQS1			1.4 – 4.5 (0.17 – 5.1)
3RLQS3			1.4 – 4.5 (0.17 – 5.1)
	Reversible In–line Push Throttle	**Adjustable Cushion Clutch**	
3RPLC1			3.5 – 13 (0.39 – 1.5)
3RPLC3			3.5 – 13 (0.39 – 1.5)
3RPMC1			2.5 – 20 (0.28 – 2.3)
3RPMC3			2.5 – 20 (0.28 – 2.3)
3RPNC1			1.5 – 30 (0.17 – 3.4)
3RPNC3			1.5 – 30 (0.17 – 3.4)
3RPMC9D			2.5 – 20 (0.28 – 2.3)
3RPNC9D			1.5 – 30 (0.17 – 3.4)
	Reversible In–line Push Throttle	**Shut–off Clutch**	
3RPLS1			3.5 – 13 (0.39 – 1.5)
3RPLS3			3.5 – 13 (0.39 – 1.5)
3RPMS1			2.5 – 20 (0.28 – 2.3)
3RPMS3			2.5 – 20 (0.28 – 2.3)
3RPNS1			1.5 – 30 (0.17 – 3.4)
3RPNS3			1.5 – 30 (0.17 – 3.4)
3RPQS1			1.5 – 45 (0.17 – 5.1)
3RPQS3			1.5 – 45 (0.17 – 5.1)

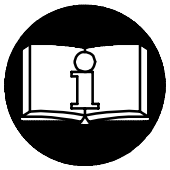
F

MANUEL D'EXPLOITATION ET D'ENTRETIEN DES TOURNEVIS DE LA SÉRIE 3R

NOTE

Les tournevis de la Série 3R sont destinés au serrage des fixations d'assemblage automobile et d'équipements ménagers, des industries électroniques et aérospatiales et pour le travail du bois.

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



⚠ ATTENTION

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

MISE EN SERVICE DE L'OUTIL

- **Toujours exploiter, inspecter et entretenir cet outil conformément au Code de sécurité des outils pneumatiques portatifs de l'American National Standards Institute (ANSI B186.1).**
- **Pour la sécurité, les performances optimales et la durabilité maximale des pièces, cet outil doit être connecté à une alimentation d'air comprimé de 6,2 bar (620 kPa) maximum à l'entrée, avec un flexible de 6 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 gasol ou le carburant d'aviation.**
- **Ne retirer aucune étiquette. Remplacer toute étiquette endommagée.**

UTILISATION DE L'OUTIL

- **Porter toujours des lunettes de protection pendant l'utilisation et l'entretien de cet outil.**
- **Porter toujours une protection acoustique pendant l'utilisation de cet outil.**
- **Tenir les mains, les vêtements flous et les cheveux longs, éloignés de l'extrémité rotative de l'outil.**
- **Noter la position du levier d'inversion avant de mettre l'outil en marche de manière à savoir dans quel sens il va tourner lorsque la commande est actionnée.**
- **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 percussion 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.**
- **Le chapeau de la soupape de commande est soumis à la pression du ressort de soupape. Prendre les soins nécessaires lors de la dépose du chapeau de soupape de commande. *(Sur les outils concernés)*.**
- **Cet outil n'est pas conçu pour fonctionner dans des atmosphères explosives.**
- **Cet outil n'est pas isolé contre les chocs électriques.**

NOTE

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

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

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

Imprimé aux É.U.

INGERSOLL-RAND®
PROFESSIONAL TOOLS

SIGNIFICATION DES ETIQUETTES D'AVERTISSEMENT

⚠ ATTENTION

LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES

⚠ ATTENTION

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

⚠ ATTENTION

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

⚠ ATTENTION

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

⚠ ATTENTION

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

⚠ ATTENTION

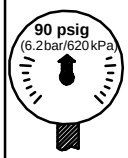
Ne pas transporter l'outil par son flexible.

⚠ ATTENTION

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

⚠ ATTENTION

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



⚠ ATTENTION

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

RÉGLAGES

REGLAGE DU LIMITEUR

⚠ ATTENTION

Débrancher l'alimentation d'air comprimé de l'outil avant d'entreprendre les opérations suivantes.

1. Tourner le capot du trou de réglage du corps de limiteur pour découvrir le trou de réglage.
2. Insérer une clé pour six pans creux de 1/4" dans le porte–embout. Tourner le mécanisme du limiteur jusqu'à ce que l'un des trous radiaux de l'écrou de réglage du limiteur soit visible à travers le trou de réglage. Insérer l'extrémité de la clé de réglage No. 5C1–116 (une goupille ou broche en acier trempé de 2 mm de diamètre peut également être utilisée) dans le trou de l'écrou de réglage pour l'empêcher de tourner.
3. Saisir fermement l'outil dans une main et tourner le porte–embout pour déplacer l'écrou le long du porte–embout. La rotation du porte–embout dans le sens des aiguilles d'une montre, vu de l'avant, augmente la compression du ressort du limiteur et par conséquent le couple de débrayage du crabot.

NOTE

La meilleure méthode de réglage est normalement obtenue en utilisant l'outil sur l'application requise en augmentant ou en diminuant le couple fourni jusqu'à ce que le réglage désiré soit obtenu. De plus, il est toujours recommandé d'obtenir le réglage final au moyen de réglages progressifs.

MISE EN SERVICE DE L'OUTIL

LUBRIFICATION

Ingersoll–Rand No. 10

Pignonnerie
Ingersoll–Rand No. 28
Limiteur
Ingersoll–Rand No. 67

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

É.U.– No. C08–02–FKG0–28

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

Tous les 50.000 cycles ou au moins tous les mois, lubrifier l'ensemble de limiteur avec de la graisse Ingersoll–Rand No. 28 ou de la graisse Ingersoll–Rand No. 67 comme indiqué ci–dessous.

MISE EN SERVICE DE L'OUTIL

Lubrification de l'ensemble de limiteur

⚠ ATTENTION

Débrancher l'alimentation d'air comprimé de l'outil avant d'entreprendre les opérations suivantes.

1. **Pour les modèles avec limiteur à amortisseur**, dévisser et déposer l'ensemble de limiteur.
   a. **Pour le rapport de pignonnerie L**, injecter 4 à 6 cm^3 de graisse Ingersoll–Rand No. 28 dans le trou central de la broche pour lubrifier le roulement.
   b. **Pour le rapport M ou N**, injecter 6 à 8 cm^3 de graisse Ingersoll–Rand No. 28 dans le trou central de la broche pour lubrifier le roulement.
   c. Appliquer environ 6 à 8 cm^3 de graisse Ingersoll–Rand No. 67 dans les pochettes des billes, les crabots, le verrou d'écrou de réglage et les filets de l'arbre du mécanisme de limiteur.
2. **Pour les modèles avec limiteur à arrêt**, dévisser et déposer l'ensemble de limiteur. Déposer le poussoir.
   a. **Pour le rapport de pignonnerie L**, injecter 4 à 6 cm^3 de graisse Ingersoll–Rand No. 28 dans le trou central de la broche pour lubrifier le roulement.
   b. **Pour le rapport M, N ou Q**, injecter 6 à 8 cm^3 de graisse Ingersoll–Rand No. 28 dans le trou central de la broche pour lubrifier le roulement.
   c. Appliquer environ 6 à 8 cm^3 de graisse Ingersoll–Rand No. 67 dans les pochettes des billes, les crabots, le verrou d'écrou de réglage et les filets de l'arbre du mécanisme de limiteur.
   d. Remonter le poussoir dans la broche.
3. Visser l'ensemble de limiteur sur le boîtier d'engrenages et le serrer à la main.

NOTE

Le limiteur est fileté à gauche; le tourner dans le sens inverse des aiguilles d'une montre pour le serrer.

Limiteur Réglable

1. Insérer une clé pour six pans creux de 1/4" dans le porte–embout.Tout en poussant contre le porte–embout, tourner ce dernier jusqu'à ce que le trou de l'écrou de réglage du limiteur soit aligné sur la rainure du corps de limiteur.
2. Insérer le clé de réglage du limiteur dans le trou de l'écrou de réglage du limiteur. Tout en empêchant l'écrou de tourner et en faisant face à l'avant de l'outil, tourner le porte–embout dans le sens inverse des aiguilles d'une montre jusqu'à ce que l'écrou de réglage entre en contact avec la butée du siège de ressort arrière.
3. Tenir l'outil avec une main et saisir l'extérieur moleté du corps de limiteur avec l'autre main. Dévisser et déposer le corps de limiteur du boîtier d'engrenages.

NOTE

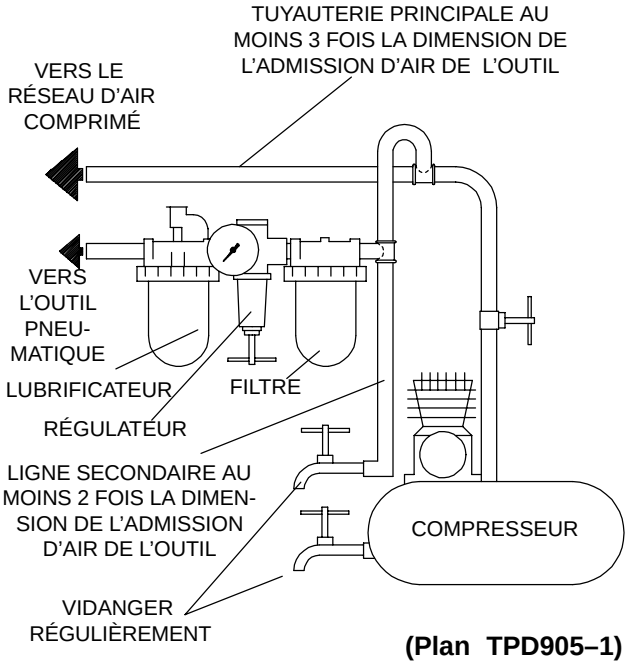
Le limiteur est fileté à gauche; le tourner dans le sens des aiguilles d'une montre pour le déposer.

4. Retirer le limiteur assemblé du corps de limiteur.
5. **Pour le limiteur 3C1**, injecter sous pression une quantité de graisse Ingersoll–Rand No. 28 dans l'avant hexagonal de l'entraîneur du limiteur.

NOTE

S'assurer que la graisse s'échappe par le trou percé dans l'entraîneur et vers l'extérieur entre le crabot, les billes du limiteur, l'entretoise des billes et le siège des billes du limiteur. Appliquer de la graisse recommandée dans le roulement de butée.

Pour le limiteur 3S3, saisir le siège des billes du limiteur et le pousser vers le bas contre le ressort du limiteur et appliquer de la graisse Ingersoll–Rand No. 28 autour des billes de la came du limiteur, de la came et du siège des billes du limiteur. La tension du ressort du limiteur étant relâchée, appliquer de la graisse recommandée dans le roulement de butée. Déposer la bague de retenue des billes, enlever une bille de roulement du porte–embout. Appliquer de la graisse recommandée dans le trou créé par la bille déposée. Remonter la bille de roulement du porte–embout et la bague de retenue des billes.



(Plan TPD905–1)

Modèle	Poigneé	Limiteur/Entraîneur	Gamme de couples recommandée	
	Pistolet réversible	**Entraîneur direct**	**psi**	**in–lbs (Nm)**
3RALD1			50 90	8 (0,9) 14 (1,6)
3RAMD1			50 90	12 (1,4) 22 (2,5)
3RAND1			50 90	19 (2,1) 34 (3,9)
	Commande à levier réversible	**Entraîneur direct**		
3RLLD1			50 90	8 (0,9) 14 (1,6)
3RLMD1			50 90	12 (1,4) 22 (2,5)
3RLND1			50 90	19 (2,1) 34 (3,9)
	Pistolet réversible	**limiteur à amortisseur réglable**	**in–lbs (Nm)**	
3RALC1			3,5 – 13 (0,39 – 1,5)	
3RALC3			3,5 – 13 (0,39 – 1,5)	
3RAMC1			2,5 – 20 (0,28 – 2,3)	
3RAMC3			2,5 – 20 (0,28 – 2,3)	
3RANC1			1,5 – 30 (0,17 – 3,4)	
3RANC3			1,5 – 30 (0,17 – 3,4)	
3RAQC1			1,5 – 45 (0,17 – 5,1)	
3RAMC9D			2,5 – 30 (0,28 – 3,4)	
3RANC9D			2,5 – 30 (0,28 – 3,4)	
	Pistolet réversible	**commande à poussoir et limiteur à arrêt**		
3RTLS1			3,5 – 13 (0,39 – 1,5)	
3RTMS1			2,5 – 20 (0,28 – 2,3)	
3RTNS1			1,5 – 30 (0,17 – 3,4)	
3RTNS3			1,5 – 30 (0,17 – 3,4)	
3RTPS1			1,5 – 45 (0,17 – 5,1)	
3RTQS1			1,5 – 45 (0,17 – 5,1)	
3RTLS3			3,5 – 13 (0,39 – 1,5)	
3RTMS3			2,5 – 20 (0,28 – 2,3)	
3RTMS9D			2,5 – 20 (0,28 – 2,3)	
3RTNS9D			1,5 – 30 (0,17 – 3,4)	
3RTPS9D			1,5 – 45 (0,17 – 5,1)	
3RTPS3			1,5 – 45 (0,17 – 5,1)	
3RTQS3			1,5 – 45 (0,17 – 5,1)	
	Réversible en ligne	**commande à poussoir et limiteur à arrêt**		
3RPMS9D			1,5 – 45 (0,17 – 5,1)	
3RPNS9D			1,5 – 30 (0,17 – 3,4)	

Modèle	Poignée	Limiteur/Entraîneur	Gamme de couples recommandée
	commande à levier réversible	**limiteur à amortisseur réglable**	**in–lbs (Nm)**
3RLLC1			3,5 – 13 (0,39 – 1,5)
3RLLC3			3,5 – 13 (0,39 – 1,5)
3RLMC1			2,5 – 20 (0,28 – 2,3)
3RLMC3			2,5 – 20 (0,28 – 2,3)
3RLNC1			1,5 – 30 (0,17 – 3,4)
3RLNC3			1,5 – 30 (0,17 – 3,4)
3RLMC9D			2,5 – 20 (0,28 – 2,3)
3RLNC9D			1,5 – 30 (0,17 – 3,4)
	commande à levier réversible	**limiteur à arrêt**	
3RLNS1			1,5 – 30 (0,17 – 3,4)
3RLNS3			1,5 – 30 (0,17 – 3,4)
3RLQS1			1,4 – 4.5 (0,17 – 5,1)
3RLQS3			1,4 – 4.5 (0,17 – 5,1)
	commande à poussoir réversible et en ligne	**limiteur à amortisseur réglable**	
3RPLC1			3,5 – 13 (0,39 – 1,5)
3RPLC3			3,5 – 13 (0,39 – 1,5)
3RPMC1			2,5 – 20 (0,28 – 2,3)
3RPMC3			2,5 – 20 (0,28 – 2,3)
3RPNC1			1,5 – 30 (0,17 – 3,4)
3RPNC3			1,5 – 30 (0,17 – 3,4)
3RPMC9D			2,5 – 20 (0,28 – 2,3)
3RPNC9D			1,5 – 30 (0,17 – 3,4)
	commande à poussoir réversible et en ligne	**limiteur à arrêt**	
3RPLS1			3,5 – 13 (0,39 – 1,5)
3RPLS3			3,5 – 13 (0,39 – 1,5)
3RPMS1			2,5 – 20 (0,28 – 2,3)
3RPMS3			2,5 – 20 (0,28 – 2,3)
3RPNS1			1,5 – 30 (0,17 – 3,4)
3RPNS3			1,5 – 30 (0,17 – 3,4)
3RPQS1			1,5 – 45 (0,17 – 5,1)
3RPQS3			1,5 – 45 (0,17 – 5,1)

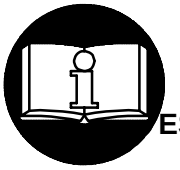
E

MANUAL DE USO Y MANTENIMIENTO PARA ATORNILLADORES MODELO 3R

NOTA

Los Atornilladores Neumáticos Modelo 3R están diseñados para aplicaciones de montaje en la industria de electrodomésticos automóviles, las industrias electrónica y aeroespacial y del mueble.
Ingersoll–Rand no aceptará responsabilidad alguna por la modificación de las herramientas efectuada por el cliente para las aplicaciones que no hayan sido consultadas con Ingersoll–Rand.

⚠ AVISO



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

PARA PONER LA HERRAMIENTA EN SERVICIO

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

USO DE HERRAMIENTA

- **Use siempre protección ocular cuando 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.**
- **Note la posición de la palanca de inversión antes de funcionar la herramienta para estar consciente de su dirección giratoria cuando funcione el estrangulador.**
- **Anticipe y esté alerta a los cambios repentinos en el movimiento durante la puesta en marcha y el manejo de toda herramienta motorizada.**
- **Mantenga una postura de cuerpo equilibrada y firme. No estire demasiado los brazos al manejar la herramienta. Pueden ocurrir reacciones de alto par a, o menos de, la recomendada presión de aire.**
- **El accesorio de herramienta podría seguir girando brevemente después de haber soltado la palanca de estrangulación.**
- **Las herramientas neumáticas pueden vibrar durante el uso. La vibración, repetición o posiciones incomodas pueden dañarle los brazos y manos. En caso de incomodidad, sensación de hormigueo o dolor, deje de usar la herramienta. Consulte a un médico antes de volver a usarla otra vez.**
- **Utilice únicamente los accesorios Ingersoll–Rand recomendados.**
- **La Tapa de Válvula de Estrangulación está presionada por el Muelle de Válvula de Estrangulación. Tenga cuidado al sacar la Tapa de Válvula de Estrangulación. (En las herramientas que la aplican).**
- **Esta herramienta no ha sido diseñada para trabajar en ambientes explosivos.**
- **Esta herramienta no está aislada contra descargas eléctricas.**

NOTA

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

Las reparaciones sólo serán realizadas por personal cualificado y autorizado. Consulte con el centro de servicio Ingersoll–Rand autorizado más próximo.

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

Impreso en EE. UU.

INGERSOLL-RAND®
PROFESSIONAL TOOLS

ETIQUETAS DE AVISO

⚠ AVISO

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

⚠ ADVERTENCIA

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

⚠ ADVERTENCIA

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

⚠ ADVERTENCIA

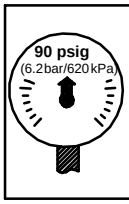
Mantener una postura del cuerpo equilibrada y firme. No estirar demasiado los brazos al manejar la herramienta.

⚠ ADVERTENCIA

Use siempre protección para los oídos cuando utilice esta herramienta.

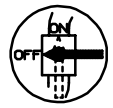
⚠ ADVERTENCIA

No coger la herramienta por la manguera para levantarla.



⚠ ADVERTENCIA

Manejar la herramienta a una presión de aire máxima de 90 psig (6,2 barias/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 EMBRAGUE

⚠ AVISO

Desconecte el suministro de aire comprimido de la herramienta antes de proceder.

1. Mueva la Tapa de Orificio de Ajuste en la Caja de Embrague para ver el orificio de ajuste.
2. Inserte una llave hexagonal de 1/4” en el Portapuntas. Mueva el mecanismo de embrague hasta que uno de los orificios radiales en la Tuerca de Ajuste de Embrague pueda verse a través del orificio de ajuste. Inserte la Llave de Ajuste Nº 5C1–116, un perno o varilla de acero templado de 2 mm (3/32”) de diámetro en el orificio de Tuerca de Ajuste para engalgar la Tuerca contra movimiento.
3. Sujete la herramienta firmemente en una mano y mueva el Portapuntas para mover la Tuerca de Ajuste a lo largo del Portapuntas. Moviendo el Portapuntas a la derecha cuando esté de frente incrementa la compresión de Muelle de Embrague e incrementa el par en el que actuará el Embrague, o parará la Herramienta.

NOTA

Normalmente se obtendrá el mejor ajuste usando la herramienta en trabajo actual e incrementando o disminuyendo el par hasta lograr el ajuste deseado. En cualquier caso, se recomienda hacer el ajuste final por progresión gradual.

PARA PONER LA HERRAMIENTA EN SERVICIO

LUBRICACION

Ingersoll–Rand Nº 10

Engranajes:
Ingersoll–Rand Nº 28
Embrague:
Ingersoll–Rand Nº 67

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

EE.UU. – Nº C08–02–FKG0–28

Después de cada 40.000 ciclos o mensualmente , lo que sea primero, lubrique el tren de engranajes con Grasa Ingersoll–Rand Nº 28.

Después de cada 50.000 ciclos o mensualmente, lo que sea primero, lubrique el conjunto de embrague con Grasa Ingersoll–Rand Nº 28 o Grasa Ingersoll–Rand Nº 67 como se indica abajo.

PARA PONER LA HERRAMIENTA EN SERVICIO

Lubricación de Conjunto de Embrague

⚠ AVISO

Desconecte el suministro de aire comprimido de la herramienta antes de proceder.

1. **Para Modelos de Embrague de Colchón,** desenrosque y saque el acoplamiento de embrague.
   a. **Para engranaje de radio L,** inyecte de 4 a 6 cc de Grasa Ingersoll–Rand Nº 28 por el orificio central de eje para lubricar el engranaje.
   b. **Para engranaje de radio M o N,** inyecte de 6 a 8 cc de Grasa Ingersoll–Rand Nº 28 por el orificio central de eje para lubricar el engranaje.
   c. Ponga aproximadamente de 6 a 8 cc de Grasa Ingersoll–Rand Nº 67 en los bolsillos de bolas, mordazas, cierre de tuerca de ajuste y roscas de eje del mecanismo de embrague.
2. **Para Embragues de Parada Automática,** desenrosque y saque el acoplamiento de embrague. Saque el Empujador.
   a. **Para engranaje de radio L,** inyecte de 4 a 6 cc de Grasa Ingersoll–Rand Nº 28 por el orificio central de eje para lubricar el engranaje.
   b. **Para engranaje de radio M, N o Q ,**inyecte de 6 a 8 cc de Grasa Ingersoll–Rand Nº 28 por el orificio central de Eje para lubricar el engranaje.
   c. Ponga aproximadamente de 6 a 8 cc de Grasa Ingersoll–Rand Nº 67 en los bolsillos de bolas, mordazas, cierre de tuerca de ajuste y roscas de eje del mecanismo de embrague.
   d. Inserte el Empujador en el eje.
3. Enrosque el Acoplamiento de embrague en la Carcasa de Engranajes, y apriete a mano.

NOTA

Esta es una rosca de izquierda. Mueva a la izquierda para enroscar.

Embrague Ajustable

1. Inserte una llave hexagonal de 1/4” en el Portapuntas. Mientras empuja contra Portapuntas, mueva el Portapuntas hasta que el orificio en la Tuerca de Ajuste de Embrague esté alineado con la ranura en la Carcasa de Embrague.
2. Inserte la Llave de Ajuste de Embrague en el orificio de la Tuerca de Ajuste de Embrague. Mientras sujeta la Tuerca contra movimiento y mirando al extremo delantero de la herramienta, mueva el Portapuntas a la izquierda hasta que la Tuerca de Ajuste de Embrague contacte el Tope de Asiento de Muelle trasero.
3. Sujete la herramienta en una mano y con el extremo protuberante de la Carcasa de Embrague en la otra mano, desenrosque y saque la Carcasa de Embrague de la Carcasa de Engranajes.

NOTA

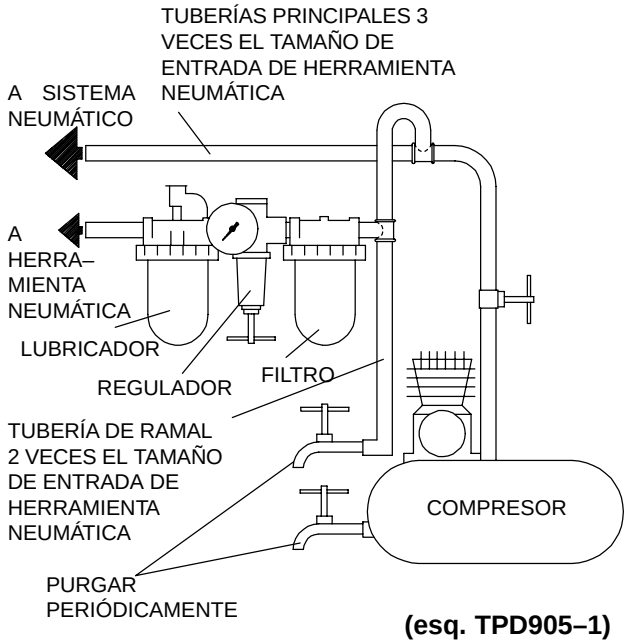
Esta es una rosca de izquierda. Mueva a la derecha para sacarla.

4. Saque el embrague montado fuera de la Carcasa de Engranajes.
5. **Para Embrague 3C1,** inyecte Grasa Ingersoll–Rand Nº 28, presionada, en el hexágono delantero de Accionamiento de Embrague.

NOTA

Asegúrese que la grasa pase por el agujero taladrado en el Accionamiento y entre Mordaza de Embrague, Bola de Rodamiento de Mordaza, Bolas de Embrague, Distanciador de Bolas de Embrague y Asiento de Bolas de Embrague. Ponga alguna de la grasa recomendada en el Rodamiento Axial.

Para Embrague 3S3, mientras sujeta el Asiento de Bolas de Embrague empuje el Asiento contra el Muelle de Embrague, y ponga alguna Grasa Ingersoll–Rand Nº 28 alrededor de las Bolas de Leva de Embrague, leva y Asiento de Bolas de Embrague. Después de sacar la tensión de Muelle de Embrague, ponga la grasa recomendada en el Rodamiento Axial. Saque el Anillo Retenedor de Bola y la Bola de Rodamiento de Portapuntas. Ponga alguna de la grasa recomendada en el orificio de Rodamiento de Portapuntas. Instale la Bola de Rodamiento de Portapuntas y Anillo Retenedor de Bola.



(esq. TPD905–1)

Modelo	Empuñadura	Embrague/ Accionamiento	Gama de par recomendada	
	pistola reversible	**accionamiento directo**	**psi**	**in–lbs (Nm)**
3RALD1			50 90	8 (0,9) 14 (1,6)
3RAMD1			50 90	12 (1,4) 22 (2,5)
3RAND1			50 90	19 (2,1) 34 (3,9)
	mando por palanca reversible	**accionamiento directo**		
3RLLD1			50 90	8 (0,9) 14 (1,6)
3RLMD1			50 90	12 (1,4) 22 (2,5)
3RLND1			50 90	19 (2,1) 34 (3,9)
	pistola reversible	**embrague ajustable**	**in–lbs (Nm)**	
3RALC1			3,5 – 13 (0,39 – 1,5)	
3RALC3			3,5 – 13 (0,39 – 1,5)	
3RAMC1			2,5 – 20 (0,28 – 2,3)	
3RAMC3			2,5 – 20 (0,28 – 2,3)	
3RANC1			1,5 – 30 (0,17 – 3,4)	
3RANC3			1,5 – 30 (0,17 – 3,4)	
3RAQC1			1,5 – 45 (0,17 – 5,1)	
3RAMC9D			2,5 – 30 (0,28 – 3,4)	
3RANC9D			2,5 – 30 (0,28 – 3,4)	
	pistola reversible	**accionamiento por empuje y embrague de parada**		
3RTLS1			3,5 – 13 (0,39 – 1,5)	
3RTMS1			2,5 – 20 (0,28 – 2,3)	
3RTNS1			1,5 – 30 (0,17 – 3,4)	
3RTNS3			1,5 – 30 (0,17 – 3,4)	
3RTPS1			1,5 – 45 (0,17 – 5,1)	
3RTQS1			1,5 – 45 (0,17 – 5,1)	
3RTLS3			3,5 – 13 (0,39 – 1,5)	
3RTMS3			2,5 – 20 (0,28 – 2,3)	
3RTMS9D			2,5 – 20 (0,28 – 2,3)	
3RTNS9D			1,5 – 30 (0,17 – 3,4)	
3RTPS9D			1,5 – 45 (0,17 – 5,1)	
3RTPS3			1,5 – 45 (0,17 – 5,1)	
3RTQS3			1,5 – 45 (0,17 – 5,1)	
	reversible recta	**accionamiento por empuje y embrague de parada**		
3RPMS9D			1,5 – 45 (0,17 – 5,1)	
3RPNS9D			1,5 – 30 (0,17 – 3,4)	

Modelo	Empuñadura	Embrague/ Accionamiento	Gama de par recomendada
	mando por palanca reversible	**embrague ajustable**	**in–lbs (Nm)**
3RLLC1			3,5 – 13 (0,39 – 1,5)
3RLLC3			3,5 – 13 (0,39 – 1,5)
3RLMC1			2,5 – 20 (0,28 – 2,3)
3RLMC3			2,5 – 20 (0,28 – 2,3)
3RLNC1			1,5 – 30 (0,17 – 3,4)
3RLNC3			1,5 – 30 (0,17 – 3,4)
3RLMC9D			2,5 – 20 (0,28 – 2,3)
3RLNC9D			1,5 – 30 (0,17 – 3,4)
	mando por palanca reversible	**embrague de parada**	
3RLNS1			1,5 – 30 (0,17 – 3,4)
3RLNS3			1,5 – 30 (0,17 – 3,4)
3RLQS1			1,4 – 4.5 (0,17 – 5,1)
3RLQS3			1,4 – 4.5 (0,17 – 5,1)
	accionamiento por empuje, recta, reversible	**embrague ajustable**	
3RPLC1			3,5 – 13 (0,39 – 1,5)
3RPLC3			3,5 – 13 (0,39 – 1,5)
3RPMC1			2,5 – 20 (0,28 – 2,3)
3RPMC3			2,5 – 20 (0,28 – 2,3)
3RPNC1			1,5 – 30 (0,17 – 3,4)
3RPNC3			1,5 – 30 (0,17 – 3,4)
3RPMC9D			2,5 – 20 (0,28 – 2,3)
3RPNC9D			1,5 – 30 (0,17 – 3,4)
	accionamiento por empuje, recta, reversible	**embrague de parada**	
3RPLS1			3,5 – 13 (0,39 – 1,5)
3RPLS3			3,5 – 13 (0,39 – 1,5)
3RPMS1			2,5 – 20 (0,28 – 2,3)
3RPMS3			2,5 – 20 (0,28 – 2,3)
3RPNS1			1,5 – 30 (0,17 – 3,4)
3RPNS3			1,5 – 30 (0,17 – 3,4)
3RPQS1			1,5 – 45 (0,17 – 5,1)
3RPQS3			1,5 – 45 (0,17 – 5,1)

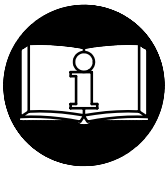
P

MANUAL DE FUNCIONAMENTO E MANUTENÇÃO PARA A APARAFUSADORAS SÉRIE 3R

AVISO

As Aparafusadoras Pneumáticas Série 3R são concebidas para aplicações de aperto em linhas de montagem, indústrias eletrónicas, aeroespaciais e de mobiliário.

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 6 mm (1/4").**
- **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.**
- **Observe qual é a posição da alavanca que reverte o sentido de rotação antes de operar esta ferramenta de modo a estar atento ao sentido de rotação quando operar o regulador de pressão.**
- **Antecipe e esteja alerta a mudanças repentinas no movimento quando ligar e operar qualquer ferramenta motorizada.**
- **Mantenha a posição do corpo equilibrada e firme. Não exagere quando operar esta ferramenta. Torques de reacção elevados podem ocorrer na ou abaixo da pressão de ar recomendada.**
- **Os acessórios da ferramenta podem continuar a girar brevemente após a pressão ter sido aliviada.**
- **Ferramentas accionadas pneumáticamente podem vibrar em uso. Vibração, movimentos repetitivos ou posições desconfortáveis podem ser prejudiciais às mãos e aos braços. Pare de usar a ferramenta caso ocorra algum desconforto, sensação de formigueiro ou dor. Procure assistência médica antes de retornar ao trabalho.**
- **Use acessórios recomendados pela Ingersoll–Rand.**
- **O Tampo daVálvula Reguladora está montado sob pressão da Mola da Válvula. Tenha cuidado ao removê–lo. (*Em ferramentas onde aplicável.)***
- **Esta Ferramenta não foi concebida para trabalhos em atmosferas explosivas.**
- **Esta Ferramenta não está isolada contra choques eléctricos.**

AVISO

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

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

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

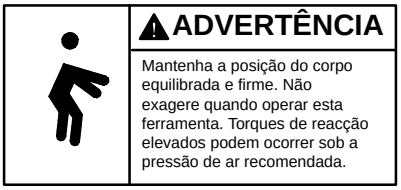
Impresso nos E.U.A.

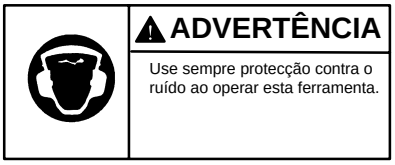
INGERSOLL-RAND®
PROFESSIONAL TOOLS

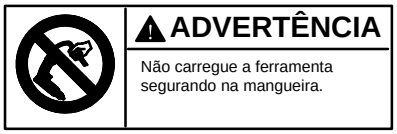
IDENTIFICAÇÃO DO RÓTULO DE ADVERTÊNCIA

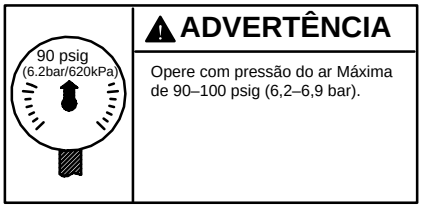
⚠ ADVERTÊNCIA

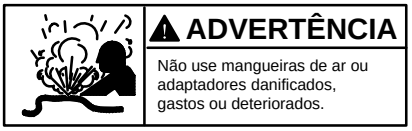
O NÃO CUMPRIMENTO DAS SEGUINTES ADVERTÊNCIAS PODE RESULTAR EM FERIMENTO.











AJUSTES

AJUSTE DA EMBRAIAGEM

⚠ ADVERTÊNCIA

Desconecte a alimentação de ar da Ferramenta antes de prosseguir.

1. Gire a Capa de Ajuste do Furo (102) no Corpo da Embraiagem.
2. Insira um chave de 1/4” hexagonal no Suporte da Ponteira (125 ou 128). Gire o mecanismo da embraiagem até que um dos furos radiais na Porca de Ajuste da Embraiagem (116) esteja visível através do furo de ajuste. Insira a Chave de Ajuste No. 5C1–116 ou uma cavilha de aço endurecido de 2mm (3/32”) de diâmetro ou cilindro no furo na Porca de Ajuste para impedir que a Porca rode.
3. Agarre a Ferramenta com firmeza com uma mão e rode o Suporte da Ponteira para mover a Porca de Ajuste ao longo do Suporte da Ponteira. Ao Girar o Suporte da Ponteira no sentido horário voltado para a frente da ferramenta, a compressão na Mola da Embraiagem aumentará e elevará o torque fazendo com que a embraiagem se mantenha a funcionar na mesma engrenagem ou desligue a Ferramenta.

AVISO

O ajuste mais satisfatório é usualmente obtido ao utilizar a ferramenta na aplicação real e aumentando ou diminuindo o torque exercido até que o ajuste desejado seja atingido. Em qualquer caso, é recomendado que o ajuste final seja feito em progressivamente.

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

LUBRIFICAÇÃO

Ingersoll–Rand No. 10

Engrenagem:
Ingersoll–Rand No. 28
Embraiagem:
Ingersoll–Rand No. 67

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

Para E.U.A. – No. C08–02–FKG0–28

Depois de cada 40.000 ciclos ou de mês a mês, **o que ocorrer primeiro,** lubrifique o trem de engrenagem com Massa Lubrificante Ingersoll–Rand No. 28.

Depois de cada 50.000 ciclos ou de mês a mês, **o que ocorrer primeiro,** lubrifique o conjunto da embraiagem com Massa Lubrificante Ingersoll–Rand No. 28 ou com Massa Lubrificante Ingersoll–Rand No. 67 como se indica na página seguinte.

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

Lubrificação do Conjunto da Embraiagem

⚠ ADVERTÊNCIA

Desligue a alimentação de ar da Ferramenta antes de prosseguir.

1. **Para Modelos de Embraiagem De Mola,** desparafuse e remova o acoplamento da embraiagem.
   a. **Para uma engrenagem L,** injecte 4 a 6 cc de Massa Lubrificante Ingersoll–Rand No. 28 através do furo do fuso central para lubrificar a engrenagem.
   b. **Para uma engrenagem M ou N,** injecte 6 a 8 cc de Massa Lubrificante Ingersoll–Rand No. 28 através do centro do furo do fuso para lubrificar a engrenagem.
   c. Injecte aproximadamente 6 a 8 cc de Massa Lubrificante Ingersoll–Rand No. 67 no bolsos das esferas, garras e travão da porca de ajuste e roscas do eixo do mecanismo da embraiagem.
2. **Para Modelos de Embraiagem de Corte Automático,** desaparafuse e remova o acoplamento da embraiagem. Remova o Cilindro de Encaixe.
   a. **Para uma engrenagem L,** injecte 4 a 6 cc de Massa Lubrificante Ingersoll–Rand No. 28 através do furo do fuso central para lubrificar a engrenagem.
   b. **Para uma engrenagem M, N ou Q,** injecte 6 a 8 cc de Massa Lubrificante Ingersoll–Rand No. 28 através do centro do furo do fuso para lubrificar a engrenagem.
   c. Injecte aproximadamente 6 a 8 cc de Massa Lubrificante Ingersoll–Rand No. 67 no bolsos das esferas, garras e travão da porca de ajuste e roscas do eixo do mecanismo da embraiagem.
   d. Insira o Cilindro de Encaixe no fuso.
3. Faça rosca no acoplamento da embraiagem na Caixa de Engrenagens e aperte manualmente.

AVISO

Esta é uma rosca à esquerda, por isso gire no sentido contrário ao dos ponteiros do relógio para apertá–la.

Embraiagem Ajustável

1. Insira uma chave de 1/4” hexagonal no Suporte da Ponteira (125 ou 128). Enquanto estiver a fazer pressão no Suporte da Ponteira rode o mecanismo da embraiagem até que o furo na Porca de Ajuste da Embraiagem (116) esteja alinhado com o furo no Corpo da Embraiagem.
2. Insira a Chave de Ajuste no furo na Porca de Ajuste para impedir que a Porca rode. Enquanto segura a porca contra a rotação e de frente para a extremidade frontal da ferramenta, rode o Suporte da Ponteira no sentido contrário ao dos ponteiros do relógio até que a Porca de Ajuste da Embraiagem encoste na Paragem do Assento da Mola.
3. Agarre a Ferramenta com firmeza com uma mão e enquanto estiver agarrando o exterior enrugado do Corpo da Embraiagem com a outra mão, desaparafuse e remova o Corpo da Embraiagem da Caixa de Engrenagens.

AVISO

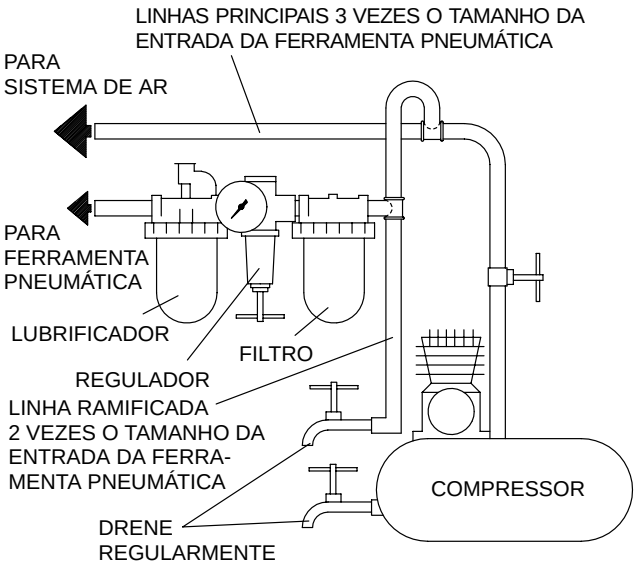
Esta é uma rosca à esquerda, por isso gire no sentido horário para desapertá–la.

4. Retire a embraiagem montada do Corpo da Embraiagem.
5. **Para uma Embraiagem 3C1,** injecte uma quantidade de Massa Lubrificante Ingersoll–Rand No. 28, sob pressão no hexagonal frontal do Comando da Embraiagem.

AVISO

Certifique–se de que a massa lubrificante escorra através de um furo perfurado no Comando e para fora da Garra da Embraiagem, Esferas de Engrenagem da Garra, Esferas da Embraiagem, Espaçador das Esferas da Embraiagem e acento das Esferas da Embraiagem. Insira um pouco de massa lubrificante recomendada na Engrenagem de Impulso.

Para uma Embraiagem 3S3, insira Massa Lubrificante Ingersoll–Rand No. 28 em volta das Esferas do Came (Excêntrico) da Embraiagem, came e Assento das esferas da Embraiagem enquanto estiver agarrando o Assento das Esferas da Embraiagem e puxando–o para baixo contra a Mola da Embraiagem. Com a Mola da Embraiagem distendida, coloque um pouco de massa lubrificante recomendada na Engrenagem do Impulso. Remova o Anel Retentor das Esferas e remova as Esferas do Rolamento do Suporte da Ponteira. Coloque um pouco de massa lubrificante recomendada no furo de onde o Rolamento do Suporte da Ponteira foi retirado. Instale a Esfera do Rolamento do Suporte da Ponteira e Anel Retentor da Esfera.



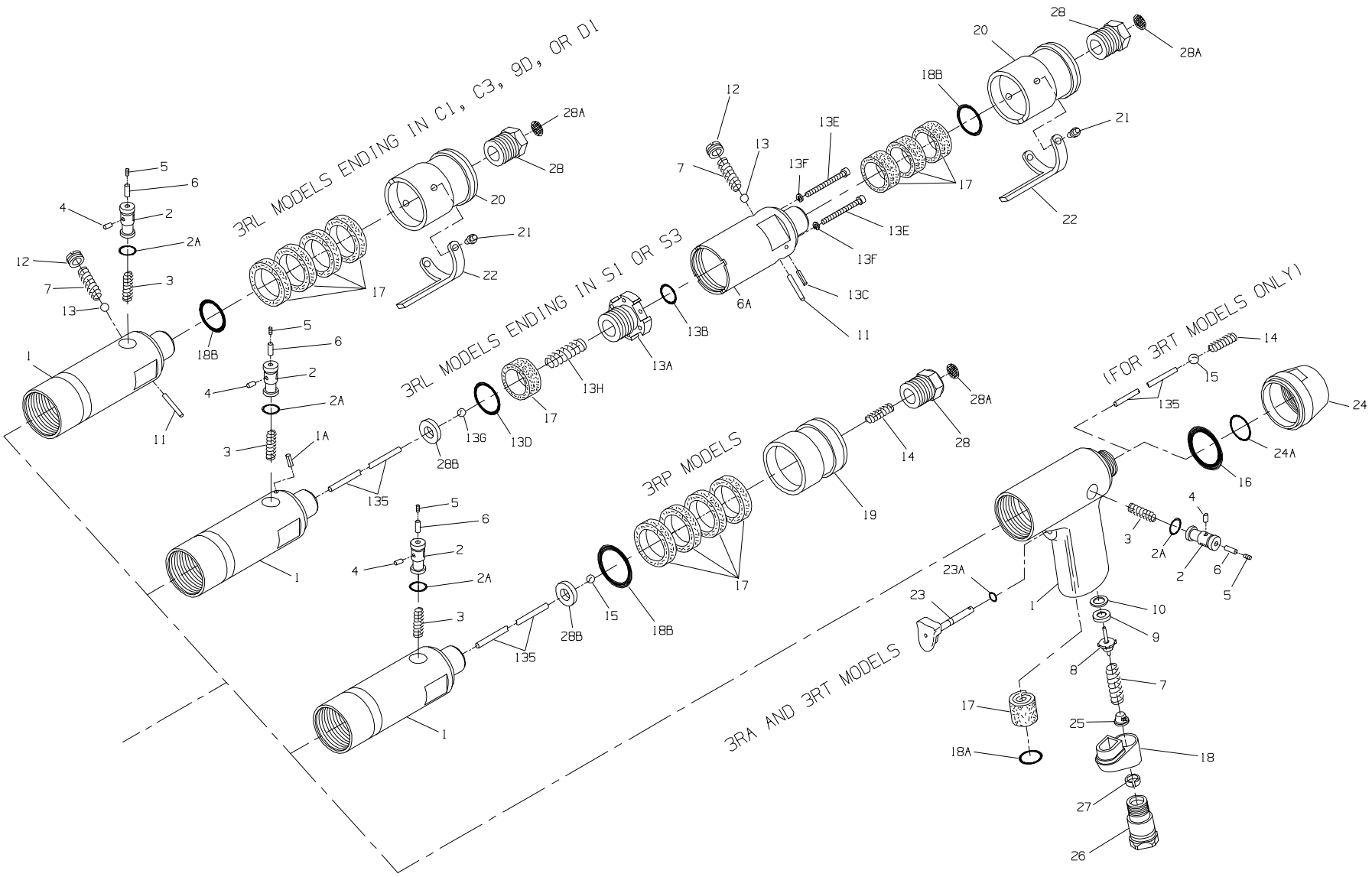
(Desenho TPD905–1)

ESPECIFICAÇÕES

Modelo	Punho	Embraiagem/Comando	Intervalo de Torque Recomendado	
	Pistola reversível	**Comando directo**	**psi**	**in–lbs (Nm)**
3RALD1			50 90	8 (0,9) 14 (1,6)
3RAMD1			50 90	12 (1,4) 22 (2,5)
3RAND1			50 90	19 (2,1) 34 (3,9)
	Alavanca reguladora de pressão reversível	**Comando directo**		
3RLLD1			50 90	8 (0,9) 14 (1,6)
3RLMD1			50 90	12 (1,4) 22 (2,5)
3RLND1			50 90	19 (2,1) 34 (3,9)
	Pistola reversível	**Embraiagem de mola ajustável**	**in–lbs (Nm)**	
3RALC1			3,5 – 13 (0,39 – 1,5)	
3RALC3			3,5 – 13 (0,39 – 1,5)	
3RAMC1			2,5 – 20 (0,28 – 2,3)	
3RAMC3			2,5 – 20 (0,28 – 2,3)	
3RANC1			1,5 – 30 (0,17 – 3,4)	
3RANC3			1,5 – 30 (0,17 – 3,4)	
3RAQC1			1,5 – 45 (0,17 – 5,1)	
3RAMC9D			2,5 – 30 (0,28 – 3,4)	
3RANC9D			2,5 – 30 (0,28 – 3,4)	
	Pistola reversível	**Embraiagem desliga e embraiagem de corte automático**		
3RTLS1			3,5 – 13 (0,39 – 1,5)	
3RTMS1			2,5 – 20 (0,28 – 2,3)	
3RTNS1			1,5 – 30 (0,17 – 3,4)	
3RTNS3			1,5 – 30 (0,17 – 3,4)	
3RTPS1			1,5 – 45 (0,17 – 5,1)	
3RTQS1			1,5 – 45 (0,17 – 5,1)	
3RTLS3			3,5 – 13 (0,39 – 1,5)	
3RTMS3			2,5 – 20 (0,28 – 2,3)	
3RTMS9D			2,5 – 20 (0,28 – 2,3)	
3RTNS9D			1,5 – 30 (0,17 – 3,4)	
3RTPS9D			1,5 – 45 (0,17 – 5,1)	
3RTPS3			1,5 – 45 (0,17 – 5,1)	
3RTQS3			1,5 – 45 (0,17 – 5,1)	
	Em linha reversível	**Embraiagem desliga e embraiagem de corte automático**		
3RPMS9D			1,5 – 45 (0,17 – 5,1)	
3RPNS9D			1,5 – 30 (0,17 – 3,4)	

Modelo	Punho	Embraiagem/Comando	Intervalo de Torque Recomendado
	Pistola reversível	**Comando directo**	**in–lbs (Nm)**
3RLLC1			3.5 – 13 (0.39 – 1.5)
3RLLC3			3.5 – 13 (0.39 – 1.5)
3RLMC1			2.5 – 20 (0.28 – 2.3)
3RLMC3			2.5 – 20 (0.28 – 2.3)
3RLNC1			1.5 – 30 (0.17 – 3.4)
3RLNC3			1.5 – 30 (0.17 – 3.4)
3RLMC9D			2.5 – 20 (0.28 – 2.3)
3RLNC9D			1.5 – 30 (0.17 – 3.4)
	Alavanca reguladora de pressão reversível	**Comando directo**	
3RLNS1			1.5 – 30 (0.17 – 3.4)
3RLNS3			1.5 – 30 (0.17 – 3.4)
3RLQS1			1.4 – 4.5 (0.17 – 5.1)
3RLQS3			1.4 – 4.5 (0.17 – 5.1)
	Botão regulador de pressão e em linha reversíveis	**Embraiagem de mola ajustável**	
3RPLC1			3.5 – 13 (0.39 – 1.5)
3RPLC3			3.5 – 13 (0.39 – 1.5)
3RPMC1			2.5 – 20 (0.28 – 2.3)
3RPMC3			2.5 – 20 (0.28 – 2.3)
3RPNC1			1.5 – 30 (0.17 – 3.4)
3RPNC3			1.5 – 30 (0.17 – 3.4)
3RPMC9D			2.5 – 20 (0.28 – 2.3)
3RPNC9D			1.5 – 30 (0.17 – 3.4)
	Botão regulador de pressão e em linha reversíveis	**Embraiagem de corte**	
3RPLS1			3.5 – 13 (0.39 – 1.5)
3RPLS3			3.5 – 13 (0.39 – 1.5)
3RPMS1			2.5 – 20 (0.28 – 2.3)
3RPMS3			2.5 – 20 (0.28 – 2.3)
3RPNS1			1.5 – 30 (0.17 – 3.4)
3RPNS3			1.5 – 30 (0.17 – 3.4)
3RPQS1			1.5 – 45 (0.17 – 5.1)
3RPQS3			1.5 – 45 (0.17 – 5.1)

SERIES 3R SCREWDRIVER MOTOR HOUSING ASSEMBLIES



(Dwg. TPA901–7)

PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

	Motor Housing Assembly		1A	Valve Housing Alignment Pin	
	for 3RA models ending in –EU	3RA–EU–A40		(for 3RL Models ending in S1 or S3) .	3RL–15
	for all other 3RA models	3RA–A40	2	Reverse Valve	3RL–329
	for 3RL models ending in		• 2A	Reverse Valve Seal	WFS182–307
	C1–EU, C3–EU, 9D–EU or		• 3	Reverse Valve Spring	SPA102R–515
	D1–EU	3RL–EU–A40	• 4	Valve Lock Pin	SPA102R–667
	for 3RL models ending in		• 5	Retainer Setscrew	SPA102R–669
	C1, C3, 9D or D1	3RL–A40	• 6	Lock Pin Retainer	3RL–668
	for 3RL models ending in		6A	Throttle Valve Housing	
	S1–EU or S3–EU	3RLS–EU–A40		(for 3RL Models ending in S1 or S3)	3RL–503
	for 3RL models ending in		♦ • 7	Throttle Valve Spring	
	S1 or S3	3RLS–A40		for 3RA and 3RT Models	3RA–51
	for 3RP models ending in –EU	3RP–EU–A40		for 3RL Models	3RL–51
	for all other 3RP models	3RP–A40	♦ 8	Throttle Valve (for 3RA	
	for 3RT models ending in –EU	3RT–EU–A40		and 3RT Models)	7RAK–302
	for all other 3RT models	3RT–A40	♦ • 9	Valve Seat (for 3RA and 3RT Models) . . .	7RAK–303
1	Motor Housing		10	Valve Seat Support (for 3RA	
	for 3RA and 3RT models			and 3RT Models)	7RAK–304
	ending in –EU	3RA–EU–B40	11	Throttle Valve Plunger (for 3RL Models) .	3RL–302
	for all other 3RA and 3RT models . . .	3RA–B40	12	Throttle Valve Cap (for 3RL Models)	3RL–266
	for 3RL models ending in		• 13	Throttle Valve Ball (for 3RL Models) . . .	4U–722
	C1–EU, C3–EU, 9D–EU or D1–EU . .	3RL–EU–B40	13A	Throttle Valve Housing	
	for 3RL models ending in			Adapter (for 3RL Models	
	C1, C3, 9D or D1	3RL–B40		ending in 3S1 or 3S3)	3RL–502
	for 3RL models ending in		• 13B	Throttle Valve Housing	
	S1–EU or S3–EU	3RLS–EU–B40		Adapter Seal (for 3RL Models	
	for 3RL models ending in S1 or S3 . . .	3RLS–B40		ending in 3S1 or 3S3)	PS3–67
	for 3RP models ending in –EU	3RP–EU–B40			
	for all other 3RP models	3RP–B40			

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

♦ Indicates Tune–up Kit part.

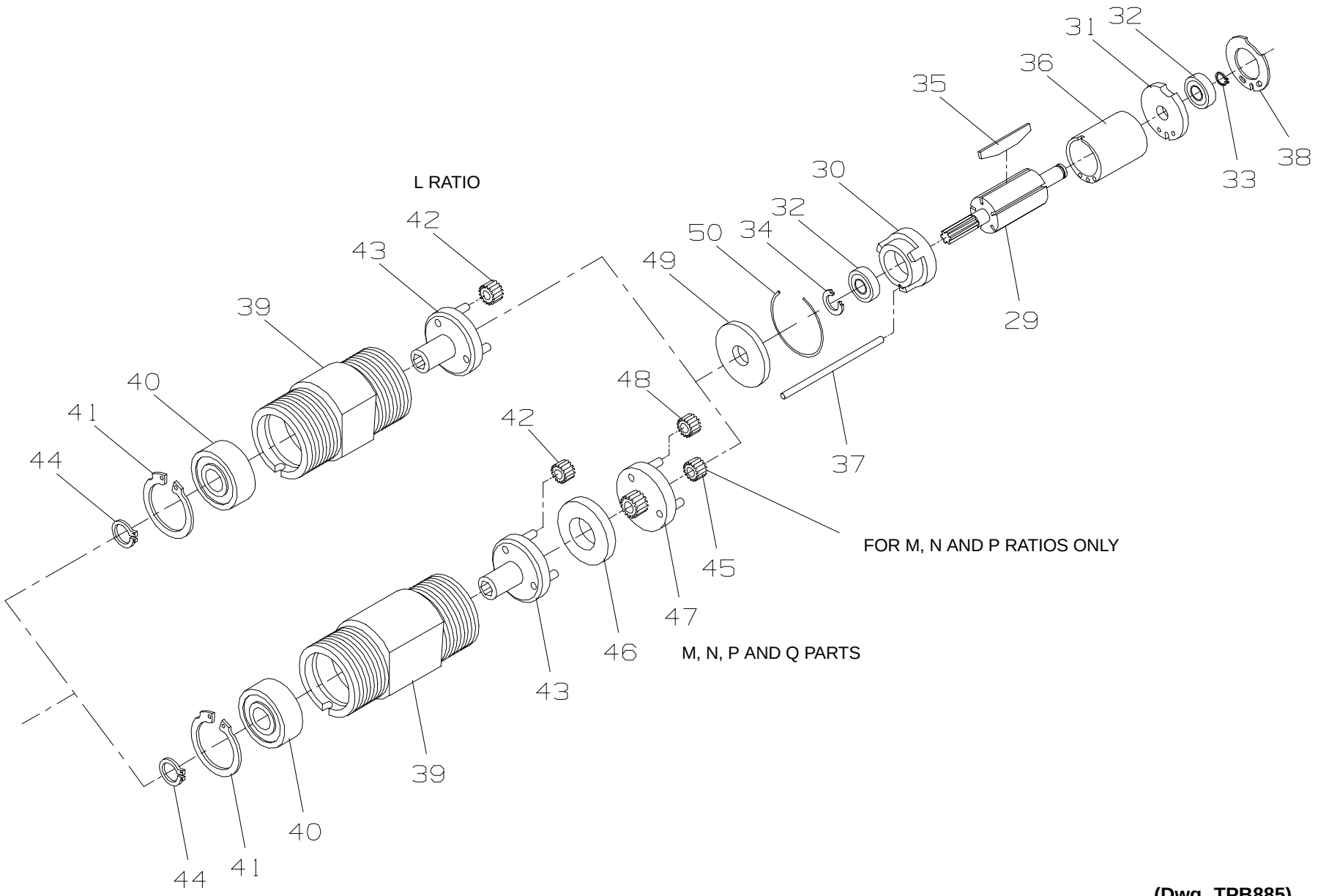
		PART NUMBER FOR ORDERING
13C	Exhaust Deflector Alignment Pin (for 3RL Models ending in 3S1 or 3S3)	3RL–15
13D	Throttle Valve Housing Seal (for 3RL Models ending in 3S1 or 3S3)	3RL–210
13E	Throttle Valve Housing Cap Screw (4) (for 3RL Models ending in 3S1 or 3S3)	3RL–510
13F	Throttle Valve Housing Cap Screw Lock Washer (4) (for 3RL Models ending in 3S1 or 3S3)	3RL–511
13G	Throttle Ball (for 3RL Models ending in 3S1 or 3S3)	8U–722
13H	Throttle Ball Spring (for 3RL Models ending in 3S1 or 3S3)	3RP–51
♦ 14	Throttle Ball Spring	
	for 3RP Models	3RP–51
	for 3RT Models	3RT–51
• 15	Throttle Ball (for 3RP and 3RT Models)	8U–722
♦• 16	Housing Seal (for 3RA and 3RT Models)	3RL–210
♦• 17	Muffler Element	
	for 3RA and 3RT Models	3RA–310
	for 3RL and 3RP Models (4)	3RL–311
18	Muffler Assembly (for 3RA and 3RT Models)	3RA–A123
♦• 18A	Muffler O–ring	85H–167
♦• 18B	Exhaust Deflector Seal (for 3RL and 3RP Models)	3RL–210
19	Exhaust Deflector (for 3RP Models)	3RP–23
	Exhaust Deflector Assembly (for 3RL Models)	3RL–A23
20	Exhaust Deflector	3RL–23
21	Throttle Lever Pin (2)	3RL–120
22	Throttle Lever	3RL–273
• 23	Trigger Assembly (for 3RA and 3RT Models)	3RA–A93
♦• 23A	Trigger Pin Seal	8SL–259
24	Back Cap Assembly (for 3RA and 3RT Models)	3RA–A202
♦• 24A	Back Cap O–ring	AF120–290
♦ 25	Inlet Screen (for 3RA and 3RT Models)	R0A2–61
26	Inlet Bushing (for 3RA and 3RT Models)	3RA–465
27	Inlet Bushing Spacer (for 3RA and 3RT Models)	3RA–65
28	Inlet Bushing Assembly (for 3RL and 3RP Models)	3RL–A465
♦ 28A	Inlet Screen	3RL–61
*	Warning Label	
	for all models ending in –EU	EU–99
	for all other models	WARNING–7–99
28B	Seat (for 3RL Models ending in S1 or S3 and all 3RA and 3RT Models)	3RP–303

* Not Illustrated.

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

♦ Indicates Tune–up Kit part.

MOTOR AND GEARING



(Dwg. TPB885)

		PART NUMBER FOR ORDERING
29	Rotor	
	for 3RP and 3RT Models	
	and 3RL Models ending in S1 or S3	3RP–53
	for 3RA Models and 3RL	
	Models ending in C1, C3, 9D or D1	3RL–53
30	Front End Plate	3RL–11
31	Rear End Plate	
	for 3RP, 3RT, 3RA and 3RL Models	3RL–12
	for 3RP and 3RTP Models	3RPP–12
♦ • 32	Rotor Bearing (2)	DG10–22
♦ 33	Rear Rotor Bearing Retainer	8SL–305
♦ 34	Front Rotor Bearing Retainer	3RL–13
♦ 35	Vane Packet (set of 5 Vanes)	3RL–42–5
36	Cylinder	3RL–3
37	Cylinder Dowel	3RL–98
♦ • 38	Rear End Plate Gasket	3RL–739
39	Gear Case Assembly	
	for L ratio	3RLL–A37
	for M, N, P and Q ratios	3RLM–A37
40	Spindle Bearing	R00A–510
41	Spindle Bearing Retainer	3RL–28
42	Sprindle Planet Gear (3)	
	for L ratio (19 teeth)	3RLL–10
	for M ratio (14 teeth)	3RLM–10
	for N, P and Q ratios (17 teeth)	3RLN–10
43	Spindle	
	for L ratio	3RLL–108
	for M ratio	3RLM–108
	for N, P or Q ratios	3RLN–108

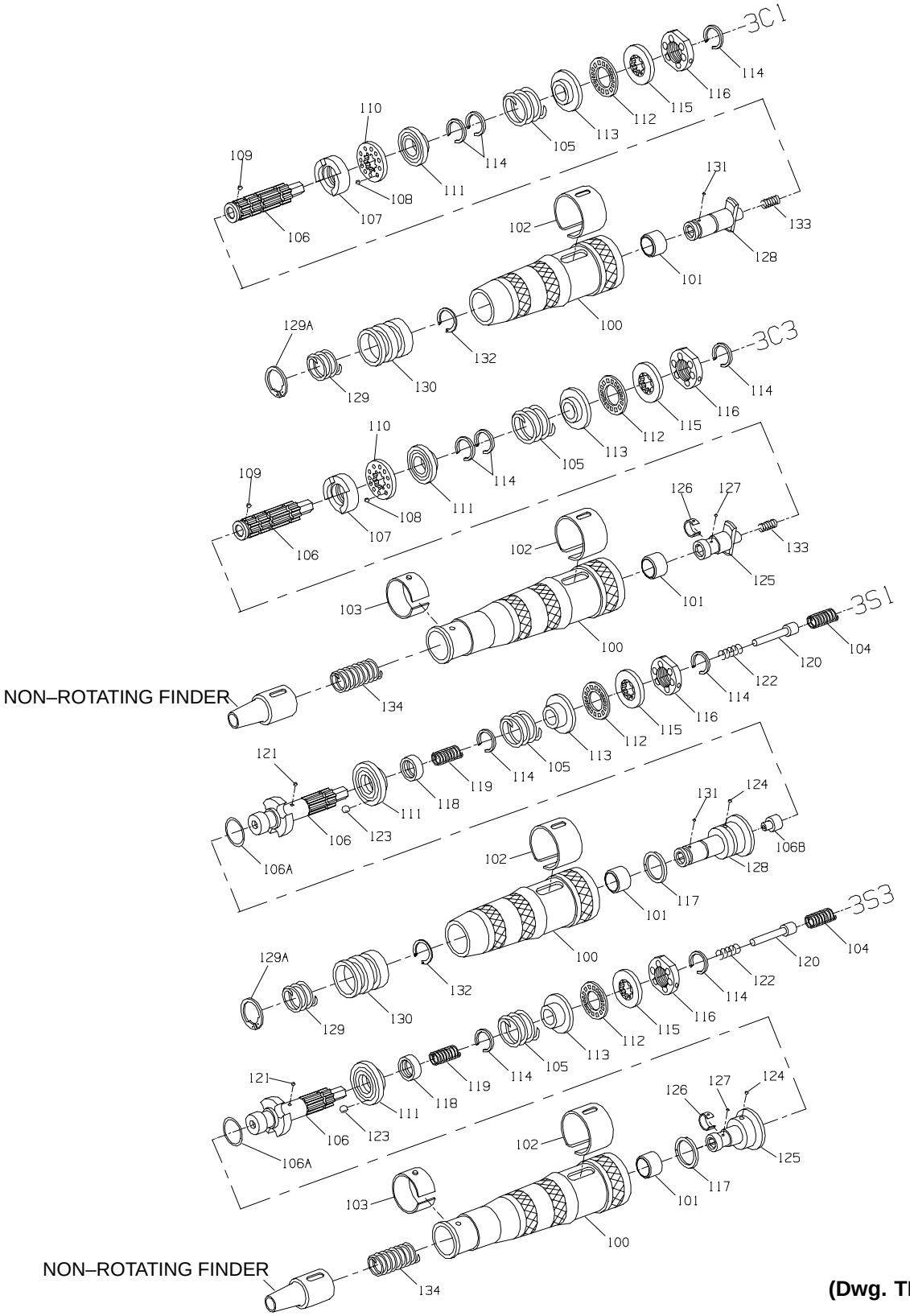
		PART NUMBER FOR ORDERING
44	Spindle Retaining Ring	3RL–6
45	Rotor Pinion (for M, N or P ratios)	3RLM–17
46	Gear Head Spacer (for M, N, P and Q ratios)	3RL–80
47	Gear Head	
	for M ratio	3RLM–216
	for N and P ratios	3RLN–216
	for Q ratio	3RLQ–216
48	Gear Head Planet Gear (3)	
	for M, N and P ratios (14 teeth)	3RLM–10
	for Q ratio (19 teeth)	3RLL–10
49	Motor Clamp Washer	3RL–207
50	Clamp Washer Retaining Ring	3RL–208
*	Suspension Bail (for Models 3RL and 3RP)	7L–365
*	Hanger (for Models 3RA and 3RT)	3RA–365
*	Hand Grip (for Models 3RL and 3RP)	3RP–747
*	Exhaust Hose (for Models 3RL and 3RP)	3RL–284
*	Tune–up Kit for 3RA and 3RT Models (includes illustrated parts 7, 8, 9, 14, 16, 17, 18A, 23A, 24A, 25, 32, 33, 34, 35 and 38)	3RA–TK2
*	Tune–up Kit for 3RL and 3RP Models (includes illustrated parts 7, 14, 17, 18B, 28A, 32, 33, 34, 35, and 38)	3RL–TK2
*	Insert Bit Holder Guide (for use in 3C3, 3S3 and P3C3 Clutch Attachments)	102A60–630
*	Inlet Bushing (1/4” NPT) (for 3RL and 3RP Models only)	3RL–565

* Not illustrated.

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

♦ Indicates Tune–up Kit part.

ADJUSTABLE CUSHION CLUTC AND ADJUSTABLE SHUTOFF CLUTCH



(Dwg. TPA905–3)

PART NUMBER FOR ORDERING

		For 3RA or 3RL Models Ending in C1 or C3		For 3RL, 3RP or 3RT Models Ending in S1 or S3	
	Adjustable Clutch Attachment (with light clutch spring)	3C1	3C3	3S1	3S3
100	Clutch Housing Assembly	3C1–A580A	3S3–A580	3C1–A580A	3S3–A580
101	Clutch Housing Bushing	3C1–781	3S3–781	3C1–781	3S3–781
102	Adjusting Hole Cover	3S3–415	3S3–415	3S3–415	3S3–415
103	Finder Retaining Spring		102A60–628		102A60–628
• 104	Clutch Return Spring			3S3–405	3S3–405
	Clutch Driver Assembly (with light clutch spring)	3C1–A581	3C1–A581	3S1–A581	3S3–A581
• 105	Clutch Spring				
	Light (Black)	3S3–L583	3S3–L583	3S3–L583	3S3–L583
	Medium (Yellow)	3S3–M583	3S3–M583	3S3–M583	3S3–M583
	Heavy (Green)	3S3–H583	3S3–H583	3S3–H583	3S3–H583
106	Clutch Driver	3C1–581	3C3–581	3S3–581	3S3–581
• 106A	Clutch Driver Seal			R0BRIC–283	R0BRIC–283
106B	Clutch Driver Spacer			3S1–211	
107	Clutch Jaw	3C1–589	3C1–589		
• 108	Clutch Ball (11) (1/8” diameter)	AV1–255	AV1–255		
• 109	Jaw Bearing Ball (10) (1/8” diameter)	AV1–255	AV1–255		
110	Clutch Ball Spacer	3C1–401	3C1–401		
• 111	Clutch Ball Seat	3C1–627	3C1–627	3S3–627	3S3–627
• 112	Thrust Bearing	161A32–105	161A32–105	161A32–105	161A32–105
113	Clutch Spring Seat	3C1–623	3C1–623	3C1–623	3C1–623
114	Spring Seat Stop (3 for 3C1 or 3C3; 2 for 3S1 or 3S3 Clutch)	3S3–701	3S3–701	3S3–701	3S3–701
115	Adjusting Nut Lock	3S3–588	3S3–588	3S3–588	3S3–588
116	Adjusting Nut	3S3–582	3S3–582	3S3–582	3S3–582
117	Ball Retaining Ring			3S3–625	3S3–625
118	Shutoff Collar			3S3–402	3S3–402
• 119	Collar Return Spring			3S3–407	3S3–407

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

PART NUMBER FOR ORDERING

		For 3RA or 3RL Models Ending in C1 or C3		For 3RL, 3RP or 3RT Models Ending in S1 or S3	
120	Shutoff Plunger			3S3–408	3S3–408
• 121	Shutoff Plunger Ball (4) (3/32" diameter)			R000B–263	R000B–263
122	Plunger Return Spring			3S3–420	3S3–420
• 123	Clutch Cam Ball (3) (1/4" diameter)			4U–722	4U–722
• 124	Bit Holder Bearing Ball (10) (1/8" diameter)			AV1–255	AV1–255
125	Bit Holder Assembly		3C3–A586		3S3–A586 ■
126	Bit Retaining Spring		3S3–241		3S3–241
127	Bit Retaining Ball		R000B–263		R000B–263
128	Bit Holder	3C1–586		3S1–586 #	
129	Retaining Sleeve Spring	5C1–931–4		5C1–931–4	
129A	Sleeve Spring Retainer (Blue)	5C1–853		5C1–853	
130	Bit Retaining Sleeve	5C1–930–4		5C1–930–4	
131	Bit Retaining Ball 9/64" diameter)	RX1–629		RX1–629	
132	Bit Retaining Sleeve Stop	5C1–729		5C1–729	
133	Disengaging Spring	3S3–420	3S3–420		
134	Finder Spring		102A60–242		102A60–242
135	Push Rod			3RP–435	3RP–435
*	Clutch Adjusting Key	5C1–416	5C1–416	5C1–416	5C1–416

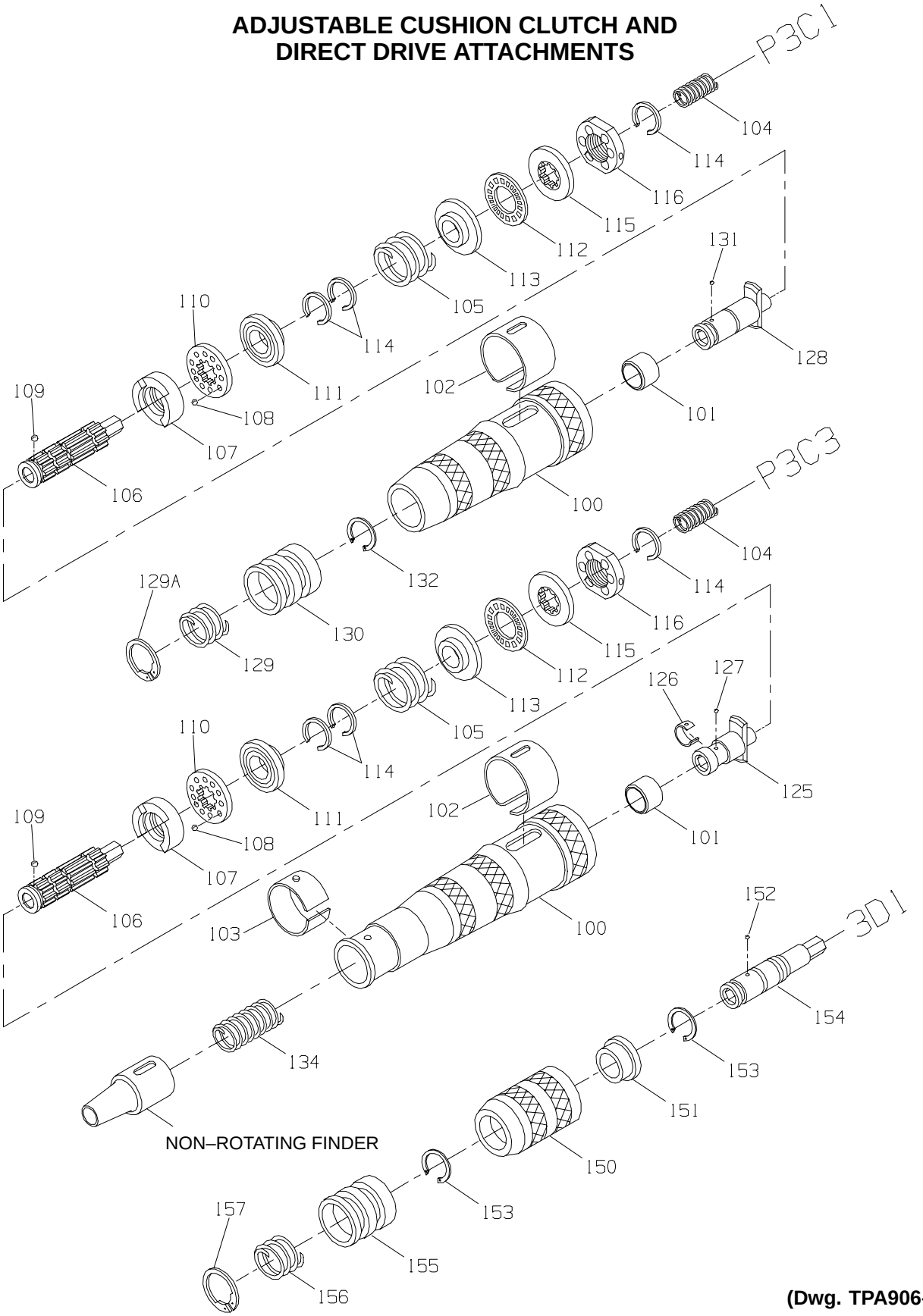
* Not Illustrated.

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

■ Bit Holder Assembly No. 3S3–586 is included with Clutch Driver Assembly No. 3S3–A581.

\# Bit Holder No. 3S1–586 is included with Clutch Driver Assembly No. 3S1–A581.

ADJUSTABLE CUSHION CLUTCH AND DIRECT DRIVE ATTACHMENTS



(Dwg. TPA906–1)

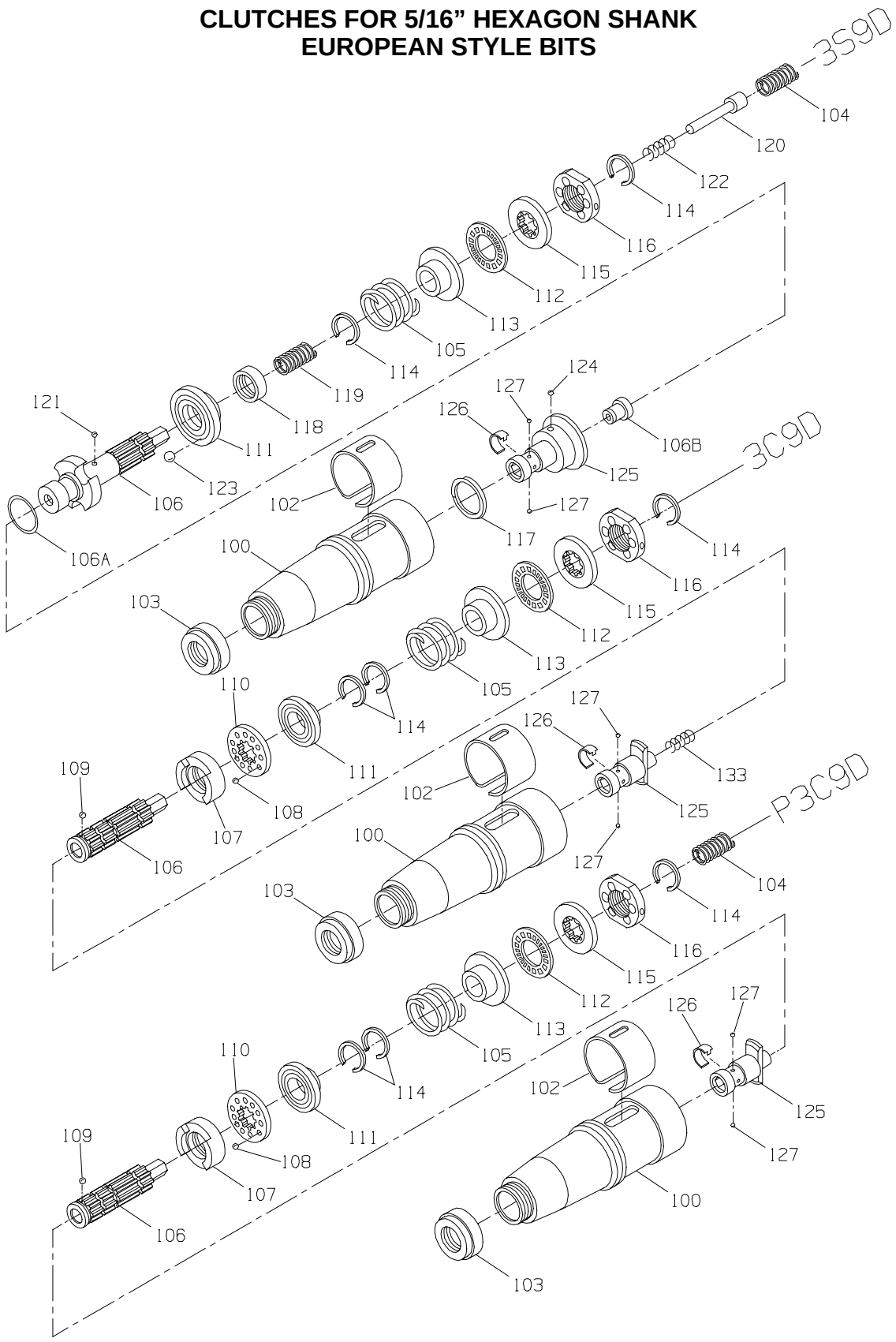
PART NUMBER FOR ORDERING

		For 3RP Models Ending in C1 or C3		For Models Ending in D1
	Adjustable Clutch Attachment (with light clutch spring)	P3C1	P3C3	
100	Clutch Housing Assembly	3C1–A580A	3S3–A580A	
101	Clutch Housing Bushing	3C1–781	3S3–781	
102	Adjusting Hole Cover	3S3–415	3S3–415	
103	Finder Retaining Spring		102A60–628	
• 104	Clutch Return Spring	3S3–405	3S3–405	
	Clutch Driver Assembly (with light clutch spring)	3C1–A581	3C1–A581	
• 105	Clutch Spring			
	Light (Black)	3S3–L583	3S3–L583	
	Medium (Yellow)	3S3–M583	3S3–M583	
	Heavy (Green)	3S3–H583	3S3–H583	
106	Clutch Driver	3C1–581	3C1–581	
107	Clutch Jaw	3C1–589	3C1–589	
• 108	Clutch Ball (11) (1/8” diameter)	AV1–255	AV1–255	
• 109	Jaw Bearing Ball (10) (1/8” diameter)	AV1–255	AV1–255	
110	Clutch Ball Spacer	3C1–401	3C1–401	
• 111	Clutch Ball Seat	3C1–627	3C1–627	
• 112	Thrust Bearing	161A32–105	161A32–105	
113	Clutch Spring Seat	3C1–623	3C1–623	
114	Spring Seat Stop (3)	3S3–701	3S3–701	
115	Adjusting Nut Lock	3S3–588	3S3–588	
116	Adjusting Nut	3S3–582	3S3–582	
125	Bit Holder Assembly		3C3–A586	
126	Bit Retaining Spring		3S3–241	
127	Bit Retaining Ball		R000B–263	
128	Bit Holder	3C1–586		
129	Retaining Sleeve Spring	5C1–931–4		
129A	Sleeve Spring Retainer (Blue)	5C1–853		
130	Bit Retaining Sleeve	5C1–930–4		
131	Bit Retaining Ball (9/64” diameter)	RX1–629		
132	Bit Retaining Sleeve Stop	5C1–729		
134	Finder Spring		102A60–242	
135	Push Rod	3RP–435	3RP–435	
*	Clutch Adjusting Key	5C1–416	5C1–416	
	Direct Drive Attachment			3D1
150	Screwdriver Housing Assembly			3D1–A580
151	Housing Bushing			3D1–781
152	Bit Retaining Ball			RX1–629
153	Bit Holder Retaining Ring (2)			5C1–729
154	Bit Holder			3D1–786
155	Bit Retaining Sleeve			5C1–930–4
156	Retaining Sleeve Spring			5C1–931–4
157	Sleeve Spring Retainer (Blue)			5C1–853

* Not Illustrated.

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

CLUTCHES FOR 5/16” HEXAGON SHANK EUROPEAN STYLE BITS



(Dwg. TPA925–1)

PART NUMBER FOR ORDERING

		For 3RA or 3RL Models Ending in C9D	For 3RP or 3RT Models Ending in S9D	For 3RP Models Ending in C9D
	Adjustable Clutch Attachment (with Light Clutch Spring)	3C9D	3S9D	P3C9D
100	Clutch Housing Assembly	3C9D–A580	3C9D–A580	3C9D–A580
102	Adjusting Hole Cover	3S3–415	3S3–415	3S3–415
103	Clutch Housing Cap	3C9D–19	3C9D–19	3C9D–19
• 104	Clutch Return Spring		3S3–405	3S3–405
	Clutch Driver Assembly (with light clutch spring)	3C1–A581	3S9D–A581	3C1–A581
• 105	Clutch Spring			
	Light (Black)	3S3–L583	3S3–L583	3S3–L583
	Medium (Yellow)	3S3–M583	3S3–M583	3S3–M583
	Heavy (Green)	3S3–H583	3S3–H583	3S3–H583
106	Clutch Driver	3C1–581	3S3–581	3C1–581
106A	Clutch Driver Seal		R0BR1C–283	
106B	Clutch Driver Spacer		3S9D–211	
107	Clutch Jaw	3C1–589		3C1–589
• 108	Clutch Ball (11) (1/8” diameter)	AV1–255		AV1–255
• 109	Jaw Bearing Ball (10) (1/8” diameter)	AV1–255		AV1–255
110	Clutch Ball Spacer	3C1–401		3C1–401
• 111	Clutch Ball Seat	3C1–627	3S3–627	3C1–627
• 112	Thrust Bearing	161A32–105	161A32–105	161A32–105
113	Clutch Spring Seat	3C1–623	3C1–623	3C1–623
114	Spring Seat Stop (3 for 3C9D and P3C9D; 2 for 3S9D)	3S3–701	3S3–701	3S3–701
115	Adjusting Nut Lock	3S3–588	3S3–588	3S3–588
116	Adjusting Nut	3S3–582	3S3–582	3S3–582
117	Ball Retaining Spring		3S3–625	
118	Shutoff Collar		3S3–402	
• 119	Collar Return Spring		3S3–407	
120	Shutoff Plunger		3S3–408	
• 121	Shutoff Plunger Ball (4) (3/32” diameter)		R000B–263	
122	Plunger Return Spring		3S3–420	
• 123	Clutch Cam Ball (3) (1/4” diameter)		4U–722	
• 124	Bit Holder Bearing Ball (10) (1/8” diameter)		AV1–255	
125	Bit Holder Assembly	3C9D–A586	3S9D–A586 ■	3C9D–A586
126	Bit Retaining Spring	3C9D–241	3C9D–241	3C9D–241
127	Bit Retaining Ball	AV1–255	AV1–255	AV1–255
• 133	Disengaging Spring	3S3–420		
135	Push Rod		3RP–435	3RP–435
*	Clutch Adjusting Key	5C1–416	5C1–416	5C1–416

* Not Illustrated.

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

■ Bit Holder Assembly No. 3S9D–A586 is included with Clutch Driver Assembly No. 3S9D–A581.

CLUTCH SPRING SELECTION CHART

Model	TORQUE RANGE (Soft Draw)		
	Light Clutch Spring (Black)	**Medium Clutch Spring (Yellow)**	**Heavy Clutch Spring (Green)**
3RALC1	3.5 to 13 in–lb (.39 to 1.5 Nm)		
3RALC3	3.5 to 13 in–lb (.39 to 1.5 Nm)		
3RAMC1	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RAMC3	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RANC1	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RANC3	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RAQC1			5.0 to 45 in–lb (.56 to 5.1 Nm)
3RLLC1	3.5 to 13 in–lb (.39 to 1.5 Nm)		
3RLLC3	3.5 to 13 in–lb (.39 to 1.5 Nm)		
3RLMC1	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RLMC3	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RLNC1	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RLNC3	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RLNS1	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RLQS1			5.0 to 45 in–lb (.56 to 5.1 Nm)
3RLNS3	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RLQS3			5.0 to 45 in–lb (.56 to 5.1 Nm)
3RPLC1	3.5 to 13 in–lb (.39 to 1.5 Nm)		
3RPLC3	3.5 to 13 in–lb (.39 to 1.5 Nm)		
3RPMC1	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RPMC3	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RPNC1	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RPNC3	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RPLS1	3.5 to 13 in–lb (.39 to 1.5 Nm)		
3RPMS1	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RPNS1	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RPPS1	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	
3RPQS1			5.0 to 45 in–lb (.56 to 5.1 Nm)
3RTLS1	3.5 to 13 in–lb (.39 to 1.5 Nm)		
3RTMS1	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RTNS1	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RTPS1	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	
3RTQS1			5.0 to 45 in–lb (.56 to 5.1 Nm)
3RPLS3	3.5 to 13 in–lb (.39 to 1.5 Nm)		
3RPMS3	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RPNS3	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RPPS3	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	
3RPQS3			5.0 to 45 in–lb (.56 to 5.1 Nm)

CLUTCH SPRING SELECTION CHART *(Continued)*

Model	TORQUE RANGE (Soft Draw)		
	Light Clutch Spring (Black)	**Medium Clutch Spring (Yellow)**	**Heavy Clutch Spring (Green)**
3RTLS3	3.5 to 13 in–lb (.39 to 1.5 Nm)		
3RTMS3	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RTNS3	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RTPS3	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	
3RTQS3			5.0 to 45 in–lb (.56 to 5.1 Nm)
3RAMC9D	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RANC9D	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RLMC9D	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RLNC9D	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RPMC9D	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RPNC9D	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RPMS9D	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RPNS9D	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RPPS9D	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	
3RTMS9D	2.5 to 16 in–lb (.28 to 1.8 Nm)	3.0 to 20 in–lb (.34 to 2.3 Nm)	
3RTNS9D	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	5.0 to 30 in–lb (.56 to 3.4 Nm)
3RTPS9D	1.5 to 16 in–lb (.17 to 1.8 Nm)	2.5 to 23 in–lb (.28 to 2.6 Nm)	

⚠ WARNING

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

Always turn off air supply and disconnect air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.

LUBRICATION

Each time a Series 3R Screwdriver is disassembled for maintenance and repair or replacement of parts, lubricate the tool as follows:

1. Gearing

   For L ratio, coat gears with 2 to 4 cc of Ingersoll–Rand No. 28 Grease.

   For M, N, P or Q ratios, coat gears with 4 to 6 cc of Ingersoll–Rand No. 28 Grease.
2. Use Ingersoll–Rand No. 10 Oil for lubricating the motor. Inject approximately l to 2 cc of oil into the air inlet before attaching the air hose.

DISASSEMBLY

General Instructions

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

Disassembly of the Tool

1. Each Series 3R Air Screwdriver is comprised of three modules or units – a motor housing and motor unit, a gear unit and an adjustable clutch unit. Each module or unit can be removed, disassembled for repairs and reassembled independently of the other units.
2. Unscrew and remove the Clutch Housing Assembly (100) from the Gear Case Assembly (39).

NOTICE

This is a left–hand thread and should only be hand–tight. Turn clockwise to remove.

3. Unscrew the Gear Case Assembly from the Motor Housing, and lift off the entire gear unit.

NOTICE

This is a right–hand thread; turn counterclockwise to remove.

Disassembly of the Adjustable Cushion Clutch and Adjustable Shutoff Clutch

1. Withdraw the Clutch Driver Assembly and Bit Holder (125 or 128) from the Clutch Housing.
2. **For Models 3RP and 3RT ending in C1, C3, S1, S3, C9D or S9D,** grasp the Clutch Return Spring (104) near the Spring Seat Stop (114) to avoid elongating the Spring and pull the Spring from the Clutch Driver (106).

   For Models 3RL ending in S1 or S3, grasp the Clutch Return Spring (104) near the Spring Seat Stop (114) to avoid elongating the Spring and pull the Spring from the Clutch Driver (106).

   For Models 3RA and 3RL ending in C1, C3 or C9D, use a hooked tool to reach into the end of the Clutch Driver and pull the Disengaging Spring (133) from the Driver.

   For Models 3RL, 3RP and 3RT ending in S1, S3 or S9D, remove the Shutoff Plunger (120). Using a hooked tool to reach into the end of the Clutch Driver, hook the Plunger Return Spring (122) and pull it from the Driver.
3. Using a thin blade screwdriver, pry the Spring Seat Stop (114) adjacent to the Adjusting Nut (116) off the Clutch Driver.
4. Carefully clamp the external hex end of the Clutch Driver in copper–covered vise jaws. Using a wrench on the flats of the Adjusting Nut, unscrew the Nut.

NOTICE

This is a right–hand thread.

5. Remove the Clutch Driver from the vise, and remove the Adjusting Nut, Adjusting Nut Lock (115), Thrust Bearing (112), Clutch Spring Seat (113) and Clutch Spring (105) from the Clutch Driver.
6. **For Models 3RA, 3RL and 3RP ending in C1, C3 or C9D,** use a thin blade screwdriver to pry off the remaining two Spring Seat Stops (114) from the Clutch Driver.

NOTICE

Place a container under the assembly before removing the retainer nearest the Clutch Ball Seat (111). Removal of this retainer allows the eleven Clutch Balls (108) and ten Jaw Bearing Balls (109) to fall from the Assembly.

Slide the Clutch Ball Seat, Clutch Ball Spacer (110) and Clutch Jaw (107) off the Clutch Driver.

For Models 3RL, 3RP and 3RT ending in S1, S3 or S9D, use a thin blade screwdriver to pry off the remaining Spring Seat Stop (114) from the driver.

NOTICE

Place a container under the assembly before removing the Spring Seat Stop. Removal of this retainer allows the four Shutoff Plunger Balls (121) and three Clutch Cam Balls (123) to fall from the assembly.

Slide the Collar Return Spring (119), Shutoff Collar (118) and Clutch Ball Seat (111) off the Clutch Driver. Using a thin blade screwdriver, carefully pry off the Ball Retaining Spring (117). Dump the ten Bit Holder Bearing Balls (124) into a container. Remove the Bit Holder Assembly (125) from the Clutch Driver. Remove the Clutch Driver Seal (106A) from the groove at the front end of the Clutch Driver. Remove the Clutch Driver Spacer (106B) from Models **3RP and 3RT ending in S9D.**

7. If the Clutch Housing Bushing (101 or 151) is worn, proceed as follows:

   For Models 3RA, 3RL, 3RP and 3RT ending in 9D

   a. Unscrew and remove the Clutch Housing Cap (103) from the Clutch Housing (100).
   b. Stand the Clutch Housing on a workbench with the bit end upward.
   c. Using a hammer and a blunt rod smaller in diameter than the bushing opening, drive the rearmost Bushing out of the Housing by tapping random locations on the face of the Bushing.
   d. Using a press and supporting the front face of the Housing, press the forward Bushing out the bit end of the Housing.

   For all other Models, press the single Clutch Housing Bushing from the Clutch Housing (100).

Disassembly of the Direct Drive Attachment

1. Unscrew and remove the Screwdriver Housing Assembly (150).

NOTICE

This is a left–hand thread and should only be hand tight. Turn clockwise to remove.

2. Using a pair of snap ring pliers, reach into the Screwdriver Housing and remove the Bit Holder Retaining Ring (153) at the Gear Case end of the Bit Holder (154). Slide the Bit Holder out of the Screwdriver Housing.
3. If the Housing Bushing (151) requires replacement, press the Bushing from the Housing toward the Gear Case end of the Housing.
4. Using a pair of snap ring pliers, remove the Bit Holder Retaining Ring near the Bit Retaining Sleeve (155).
5. Remove the Bit Retaining Sleeve from the Bit Holder.
6. Using a pointed rod, spiral the Retaining Sleeve Spring (156) from the bit end of the Bit Holder.
7. Remove the Bit Retaining Ball (152) from the Bit Holder.

Disassembly of the Gearing

1. Using a thin blade screwdriver, work the Clamp Washer Retaining Ring (50) from the groove in the Gear Case Assembly (39) and withdraw the Motor Clamp Washer (49).
2. **For Models 3RLM and 3RLN,** tap the motor end of the Gear Case Assembly against the top of the workbench to remove the Gear Head (47), Gear Head Planet Gears (48), Rotor Pinion (45) and Gear Head Spacer (46).
3. Using a pair of snap ring pliers, remove the Spindle Retaining Ring (44) from the groove in the front of the Spindle (43).
4. Lightly tap or press the Spindle and Spindle Planet Gears (42) from the Gear Case Assembly.
5. Using a pair of snap ring pliers, remove the Spindle Bearing Retainer (41) from the groove in the front of the Gear Case.
6. Using a sleeve that contacts the outer ring of the bearing, press the Spindle Bearing (40) from the front of the Gear Case.

Disassembly of the Motor

1. Grasp the splined end of the Rotor (29) and pull the motor from the Motor Housing (1).
2. Withdraw the Rear End Plate Gasket (38) from the bottom of the housing bore.
3. While grasping the Cylinder (36) in one hand, lightly tap on the splined end of the Rotor to drive the Rotor from the bore of the Front Rotor Bearing (32), thus freeing the Front End Plate (30) and Bearing.
4. Using snap ring pliers remove the Front Rotor Bearing Retainer (34) and remove the Front Rotor Bearing from the Front End Plate.

5. Slide the Cylinder off the Rotor, and withdraw the Vanes (35) from the vane slots.
6. Remove the Rear Rotor Bearing Retainer (33) from the groove in the hub of the Rotor.
7. Support the Rear End Plate (31) as close to the rotor body as possible on the table of an arbor press, and press the Rotor from the Rear Rotor Bearing.

Disassembly of the Reverse Valve and Throttle Mechanism

1. Using a l/16" Allen Wrench, remove the Retainer Set Screw (5) from the Reverse Valve (2).
2. With the Reverse Valve facing downward, lightly tap the Motor Housing on the workbench until the Lock Pin Retainer (6) falls out of the Reverse Valve.
3. Hold the Motor Housing horizontally with the Reverse Valve on your left as you face the rear of the tool. With slight inward pressure on the Reverse Valve tap the Motor Housing on a workbench until the Valve Lock Pin (4) drops into the opening vacated by the Lock Pin Retainer.
4. Remove the Reverse Valve along with the Reverse Valve Seal (2A). Reverse Valve Spring (3) and Valve Lock Pin from the Motor Housing.
5. **For 3RA and 3RT Models,** lightly grasp the handle of the Motor Housing (1) in copper–covered vise jaws so that the Inlet Bushing (26) is upward. Unscrew the Inlet Bushing and remove the Inlet Bushing Spacer (27), Muffler Assembly (18), Muffler Element (17), Inlet Screen (25), Throttle Valve Spring (7), Throttle Valve (8) and Trigger Assembly (23). Remove the Trigger Pin Seal (23A) from the Trigger Assembly. If the Valve Seat (9) needs to be replaced, use a stiff wire hook and insert it through the Valve Seat and Valve Seat Support (10) to grasp the underside of the Valve Seat Support. Withdraw the Valve Seat and Valve Seat Support from the handle.

   For 3RT Models, use an adjustable wrench on the flats of the Back Cap Assembly (24) to unscrew and remove the Back Cap Assembly from the Motor Housing.

⚠ CAUTION

Place a container under the Assembly to catch the Throttle Ball Spring (14) and Throttle Ball (15) when removing the Back Cap Assembly.

Remove the Push Rod (135) from the Motor Housing. If removal of the Throttle Ball Seat (16) is necessary, use a stiff wire hook inserted through the Seat and withdraw it from the Motor Housing.

For 3RL Models ending in C1, C3, 9D or D1, remove the Throttle Valve Cap (12), Throttle Valve Spring (7), Throttle Valve Ball (13) and Throttle Valve Plunger (11) from the Motor Housing.

⚠ WARNING

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

Using an adjustable wrench, unscrew the Inlet Bushing Assembly (28). Remove the Exhaust Deflector (20) from the Motor Housing. Insert the eraser end of a wooden pencil into the small end of the Inlet Bushing Assembly and push the Inlet Screen (28A) out through the large end of the Inlet Bushing. Work the four Muffler Elements (17) out of the Exhaust Deflector and remove the Exhaust Deflector Seal (18B).

The Throttle Lever is attached to the Exhaust Deflector with two Throttle Lever Pins (25) which are two–piece rivets. Lightly grasp the Exhaust Deflector in copper–covered vise jaws taking care not to distort the Deflector. Using a pin punch and hammer carefully drive the pin in the center of the rivet inward until it clears the rivet. Repeat this procedure to remove the other pin. Working inside the Exhaust Deflector and using needle nose pliers, squeeze the ends of rivets and push the rivets through the opposite side of the Exhaust Deflector. Remove the Throttle Lever (22).

For 3RL Models ending in S1 or S3, remove the Push Rod (135). Remove the Throttle Valve Cap (12) Throttle Valve Spring (7), Throttle Valve Ball (13) and Throttle Valve Plunger (11) from the Throttle Valve Housing (6A).

⚠ WARNING

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

Using an adjustable wrench, unscrew the Inlet Bushing Assembly (28). Remove the Exhaust Deflector (20) from the Throttle Valve Housing. Insert the eraser end of a wooden pencil into the small end of the Inlet Bushing Assembly and push the Inlet Screen (28A) out through the large end of the Inlet Bushing. Work the four Muffler Elements (17) out of the Exhaust Deflector and remove the Exhaust Deflector Seal (18B).

The Throttle Lever is attached to the Exhaust Deflector with two Throttle Lever Pins (25) which are two–piece rivets. Lightly grasp the Exhaust Deflector in copper–covered vise jaws taking care not to distort the Deflector. Using a pin punch and hammer, carefully drive the pin in the center of the rivet inward until it clears the rivet. Repeat this procedure to remove the other pin. Working inside the Exhaust Deflector and using needle nose pliers, squeeze the ends of rivets and push the rivets through the opposite side of the Exhaust Deflector. Remove the Throttle Lever (22). Using a 5/64" hex wrench, loosen and remove the Throttle Valve Housing Cap Screws (13E) and Lock Washers (13F). Remove the Throttle Valve Housing and the Throttle Valve Housing Seal (13D) from the Motor Housing (1). Remove the Throttle Valve Housing Adapter Seal (13B) from the Throttle Valve Housing Adapter (13A). Unscrew and remove the Throttle Valve Housing Adapter, Throttle Ball Spring (13H), Throttle Ball (13G) and the Muffler Element (17).

For 3RP Models, use an adjustable wrench to unscrew and remove the Inlet Bushing Assembly (28).

⚠ CAUTION

Place a container under the Exhaust Deflector (19) to catch the Throttle Ball Spring (14) and Throttle Ball (15) when removing the Inlet Bushing Assembly (28).

Remove the Push Rod (135). If removal of the Throttle Ball Seat (16) is necessary, use a stiff wire hook inserted through the Throttle Ball Seat and withdraw it from the Motor Housing. Insert the eraser end of a wooden pencil into the small end of the Inlet Bushing Assembly and push the Inlet Screen (28A) out through the large end of the Inlet Bushing. Work the four Muffler Elements (17) out of the Exhaust Deflector.

ASSEMBLY

General Instructions

1. Always press on the **inner** ring of a ball–type bearing when installing the bearing on a shaft.
2. Always press on the **outer** ring of a ball–type bearing when pressing the bearing into a bearing recess.
3. Whenever grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws. Take extra care with threaded parts and housings.
4. Always clean every part and wipe every part with a thin film of oil before installation.
5. Apply a film of O–ring lubricant to all O–rings before final assembly.
6. Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly in a suitable cleaning solution and dry with a clean cloth. **Sealed or shielded bearings should never be cleaned.** Work grease thoroughly into every open bearing before installation.

Assembly of the Reverse Valve and Throttle Mechanism

1. Coat the Reverse Valve Seal (2A) with o–ring lubricant and install it in the groove between the head and lock pin hole on the body of the Reverse Valve (2).
2. Insert the Reverse Valve Spring (3) into the plain end of the Reverse Valve.
3. Insert the Valve Lock Pin (4) into the small hole in the side of the Reverse Valve.
4. Start the Reverse Valve into the bushing, aligning the Valve Lock Pin with the timing notch on the bushing.
5. Holding the tool with the lock pin hole in the Reverse Valve facing downward, push the Reverse Valve into the bushing against the compression of the Reverse Valve Spring.
6. Using a small diameter rod inserted into the end of the Reverse Valve and while maintaining valve pressure on the Spring, use the rod to force the Valve Lock Pin into the slot in the wall of the bushing.
7. After the Valve Lock Pin has engaged the slot in the bushing, slowly release the Reverse Valve and it will stay in position.
8. Insert the Lock Pin Retainer (6) in the tapped end of the Reverse Valve and install the Retainer Set Screw (5).

For 3RA and 3RT Models

a. Lightly grasp the handle of the Motor Housing (1) in copper–covered vise jaws so that the inlet end of the Housing is upward.
b. Install the Throttle Valve Seat Support (10) by pushing it into place with a 1/2" (13 mm) diameter dowel.
c. Follow this with the Throttle Valve Seat (9).
d. Apply O–ring lubricant to the Trigger Pin Seal (23A) and install it in the groove on the trigger stem. Insert the Trigger Assembly (23) into the trigger bushing.

e. Installation of the Throttle Valve (8) is sometimes a bit tricky due to the smallness of the Valve and the depth of the bore in which it is located. The difficult part is in holding the Valve while inserting the long end of the valve stem through the hole in the trigger stem. Although the Valve can be held with a push–button mechanical drafting pencil or a wooden dowel, one of the easiest ways to hold it is by using a common wooden pencil with rubber eraser. Insert the short end of the valve stem into the rubber eraser full depth, then back it out far enough so that the Valve is just nicely supported. Insert the Valve into the bore of the handle so that the long end of the stem enters the hole in the trigger stem. Pull outward on the Trigger to hold the Valve while removing the pencil.

f. Place the Inlet Screen (25), closed end first, inside the large end coil of the Throttle Valve Spring (7).

g. Insert the Throttle Valve Spring and Screen, small coil first, into the handle so that the Spring encircles the end of the Throttle Valve.

h. Work the Muffler Element (17) into the exhaust cavity in the handle of the Motor Housing until the trailing end of the Muffler Element is approximately 1/4” (6 mm) into the Housing.

i. Lubricate the Muffler O–ring (18A) with o–ring lubricant and place it over the exhaust port of the Muffler.

j. Place the Muffler Assembly (18) on the face of the handle so that the exhaust port extends into the handle.

k. Slide the Inlet Bushing Spacer (27) over the threaded end of the Inlet Bushing (26), and install the Inlet Bushing in the handle. Tighten it to a minimum of 26 ft–lb (35 N m) of torque.

NOTICE

The Inlet Bushing must securely clamp the Exhaust Deflector.

For 3RT Models only

a. Lubricate the Back Cap O–ring (24A) with O–ring lubricant and place it into the recess of the back cap.

b. If the Throttle Ball Seat (16) was removed, install a new Seat using a 5/16” (8 mm) diameter dowel to push it into place.

c. Insert the Push Rod (135) through the Throttle Ball Seat and into the Motor Housing (1) followed by the Throttle Ball (15) and Throttle Ball Spring (14). If a new Push Rod is being installed, proceed as follows:

9. Assemble the complete Clutch Assembly, Gear Case Assembly and the Motor Housing Assembly without the Back Cap Assembly (24), Throttle Ball (15) and Throttle Ball Spring (14).

10. While pushing the Clutch Assembly against the Spindle (43), insert the new Push Rod through the Throttle Ball Seat (16) in the rear of the Motor Housing until it contacts the Shutoff Plunger (120).

NOTICE

Exert a slight pressure on the Push Rod to make certain the Shutoff Plunger contacts the Shutoff Plunger Balls (121).

11. The length of the Push Rod must be trimmed so that 0.04’’ to 0.09” (1.0 mm to 2.3 mm) protrudes above the Throttle Ball Seat. There are numerous ways to determine how much material must be trimmed from the Push Rod and experience will dictate the best method to use. Following is one method requiring only a narrow –depth scale. If the Push Rod extends beyond the Housing, measure the distance from the end of the Push Rod to the face of the Throttle Ball Seat. Subtract 5/64” (2 mm) from that distance and cut the remaining difference from the end of the Push Rod. If the Push Rod does not extend beyond the Housing, measure the distance from the end of the Housing to the face of the Throttle Ball Seat. Record that distance. Measure the distance from the end of the Push Rod to the end of the Housing and add 5/64” (2 mm) to that distance. Subtract the added distance from the first measurement and trim the remaining difference from the end of the Push Rod.

12. Insert the Push Rod through the Throttle Ball Seat and into the Motor Housing followed by the Throttle Ball and Throttle Ball Spring. Install the Spring with the small end against the Throttle Ball.

13. Retain these parts with the Back Cap Assembly (24) and tighten the Cap between 7 and 10 ft–lb (9 and 13 Nm) torque.

⚠ CAUTION

Do not over tighten the Cap but do not allow a gap to exist between the Back Cap and Motor Housing.

For 3RL Models ending in C1, C3, 9D or D1

a. Position the Throttle Lever (22) on the Exhaust Deflector with the Lever covering the timing notch at the front end of the Deflector.

b. Insert the two Throttle Lever Pins (21) through the Lever and into the Exhaust Deflector. Using copper–covered vise jaws as a press, press the pins in the center of the Throttle Lever Pins flush with the head of the rivets.

⚠ CAUTION

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

c. Work four new Muffler Elements (17) into the Exhaust Deflector (20).

d. Center the Inlet Screen (28A) over the air line end of the Inlet Bushing Assembly (28) and, using the eraser end of a wooden pencil, push the Screen into the Bushing until it bottoms on the internal shoulder.

e. Slide the Exhaust Deflector Seal (18B) onto the rear of the Motor Housing (1). Place the Exhaust Deflector on the rear of the Motor Housing, aligning the Notch in the Deflector with the timing pin in the Housing. Tighten the Inlet Bushing Assembly to a minimum of 15 ft–lb (20 Nm) torque.

NOTICE

The Inlet Bushing must securely clamp the Exhaust Deflector.

f. With the Throttle Lever downward, insert the Throttle Valve Plunger (11), Throttle Valve Ball (13) and Throttle Valve Spring (7) into the Motor Housing.

g. Position the Throttle Valve Cap (12) on the Throttle Valve Spring. Screw the Valve Cap into the Housing until the Cap is within approximately two threads of being flush with the Housing. Apply a light, uniform coat of a thread locking compound to the remaining two threads. Tighten the Valve Cap securely and place the Housing on a workbench with the Valve Cap facing downward. Allow the Loctite to cure approximately five minutes.

For 3RL Models ending in S1 or S3

a. Place the Throttle Valve Housing Seal (13D) on the smaller shoulder of the Motor Housing (1). To hold the Seal in position, lightly coat both the Seal and the shoulder with Ingersoll–Rand No. 28 Grease. Install the Throttle Ball (13G) and the Throttle Ball Spring (13H).

b. Place one new Muffler Element (17) on the threaded side of the Throttle Valve Housing Adapter (13A) and thread the Adapter into the Motor Housing until the adapter flange contacts the Housing. Center the notch or depression on the Adapter with the housing alignment pin by backing out the Adapter 1/4 turn maximum, if necessary.

c. Place the Throttle Valve Housing Adapter Seal (13B) on the Adapter.

d. Place the Throttle Valve Housing over the Adapter and onto the rear of the Motor Housing, making sure that the notch in the Throttle Valve Housing is aligned with the alignment pin on the Motor Housing.

e. Secure the Throttle Valve Housing with the two Throttle Valve Housing Cap Screws (13E) and Lock Washers (13F). Tighten the Screws between 8 and 10 in–lb (0.90 and 1.13 Nm) torque. If the Cap Screws cannot be started into the Adapter, then the Adapter is not in proper alignment with the Housing. Refer to Step “b”.

f. Work three new Muffler Elements into the Exhaust Deflector (20) to a point beyond the two throttle lever pin holes.

g. Position the Throttle Lever (22) on the Exhaust Deflector with the Lever covering the timing notch at the front of the Deflector. Insert the Two Throttle Lever Pins (21) through the Lever and into the Exhaust Deflector. Using pliers, press the pins in the center of the Throttle Lever Pins flush with the head of the rivet.

⚠ CAUTION

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

h. Center a new Inlet Screen (28A) over the air line end of the Inlet Bushing Assembly (28) and, using the eraser end of a wooden pencil, push the Screen into the Bushing until it bottoms on the internal shoulder.

i. Slide the Exhaust Deflector Seal (18B) onto the rear of the Throttle Valve Housing. Place the Exhaust Deflector on the rear of the Throttle Valve Housing, aligning the notch in the Deflector with the alignment pin in the Housing. Tighten the Inlet Bushing Assembly to a minimum of 15 ft–lb (20 Nm) torque.

NOTICE

The Inlet Bushing must securely clamp the Exhaust Deflector.

j. With the Throttle Lever downward, insert the Throttle Valve Plunger (11), Throttle Valve Ball (13) and Throttle Valve Spring (7) into the Throttle Valve Housing.

k. Position the Throttle Valve Cap (12) on the Throttle Valve Spring. Screw the Valve Cap into the Housing until the Cap is within approximately two threads of being flush with the Housing. Apply a light, uniform coat of thread locking compound to the remaining two threads. Tighten the Valve Cap securely and place the Housing on a workbench with the Valve Cap facing downward. Allow the Loctite to cure approximately five minutes.

For 3RP Models only

a. Work four new Muffler Elements (17) as far as possible into the Exhaust Deflector (20).

b. Center the Inlet Screen (28A) over the air line end of the Inlet Bushing Assembly (28) and, using the eraser end of a wooden pencil, push the Screen into the Bushing until it bottoms on the Internal shoulder.

c. If the Throttle Ball Seat (16) was removed, install a new Seat using a 5/16” (8 mm) diameter dowel to push it into place.

d. Slide the Exhaust Deflector Seal (18B) onto the rear of the Motor Housing (1). Place the Exhaust Deflector (20) on the rear of the Motor Housing.

e. Insert the Push Rod (135) through the Throttle Ball Seat and into the Motor Housing followed by the Throttle Ball (15) and Throttle Ball Spring (14). Install the Spring with the small end against the Throttle Ball.

NOTICE

If a new Push Rod is being installed, refer to the section above for 3RT Models for the proper installation procedure. For 3RP Models, the Inlet Bushing Assembly replaces the Back Cap Assembly of the 3RT Models.

f. Secure the throttle parts and the Exhaust Deflector with the Inlet Bushing Assembly. Tighten the Bushing to a minimum of 15 ft–lb (20 Nm) of torque.

NOTICE

The Inlet Bushing must securely clamp the Exhaust Deflector.

Assembly of the Motor

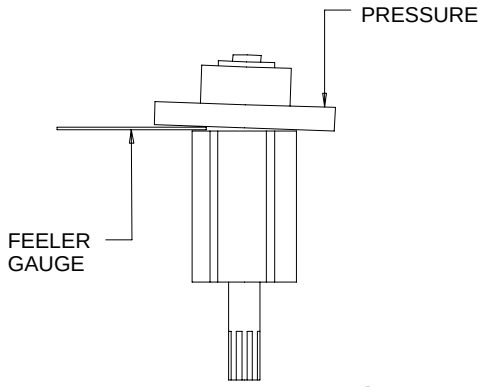
1. Place the Rear End Plate (31) on the short, unsplined shaft of the Rotor (29) with the counterbore away from the body of the Rotor.
2. Using a sleeve that contacts the inner ring of the Rotor Bearing (32), press the Bearing onto the shaft until the Rear End Plate just contacts the rotor body.
3. The clearance between the Rear End Plate and Rotor is critical. **While pressing down** with your finger the outer edge of the End Plate on the Bearing side, insert a .002” (.05 mm) feeler gauge between the face of the Rotor and End Plate directly opposite the point where pressure is applied.

NOTICE

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

Supporting the End Plate, lightly tap the shaft with a plastic hammer to increase the space. Press the Bearing farther onto the shaft if the space is too wide. When the proper clearance is obtained, install the Rear Rotor Bearing Retainer (33) on the shaft.

MEASUREMENT OF REAR END CLEARANCE



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4. Place the Rotor, with the splined end up, in a block which has clearance for the Rotor Bearing and supports the End Plate.

5. Wipe each Vane (35) with a light film of Ingersoll–Rand No. 10 Oil and place a Vane in each slot in the Rotor.
6. Note that the Cylinder (36) has a notch in one end. Place the Cylinder, notched end up, over the Rotor and against the Rear End Plate, aligning the dowel hole in the Cylinder with the U–shaped notch in the rim of the End Plate. The notch in the end of the Cylinder should be against the Front End Plate.
7. Install the Front Rotor Bearing in the Front End Plate (30) and retain it with the Front Rotor Bearing Retainer (34).
8. Using a sleeve that contacts the inner ring of the bearing, press the assembled Front End Plate, flat side first, onto the splined end of the Rotor until the End Plate just contacts the Cylinder.
9. Install the Rear End Plate Gasket (38) in the Motor Housing, aligning the small notch in the Gasket with the dowel pin hole in the Housing.
10. Insert a thin, rigid wire into the dowel pin hole at the bottom of the motor recess in the Motor Housing. Grasping the assembled motor by the spline on the Rotor and with the dowel pin holes of the Front End Plate and Cylinder aligned with the U–shaped notch in the Rear End Plate, install the assembled motor in the Motor Housing. Maintain alignment between the motor and Motor Housing by passing the aligned dowel holes in the assembled motor over the wire positioned in the Motor Housing. Withdraw the wire and install the Cylinder Dowel (37), making certain the Cylinder Dowel is flush with or below the Front End Plate.
11. **For 3RL Models ending in S1 or S3,** insert the Pushrod (135) through the center of the Rotor. If a new Pushrod is being installed in these models. proceed as follows:
    a. Assemble the complete Clutch Assembly, Gear Case Assembly and the Motor Housing Assembly without the assembled Throttle Valve Housing (6A). Exhaust Deflector Assembly, Throttle Valve Housing Adapter (13A), Throttle Ball Spring (13H), Muffler Element (17) and Throttle Ball (13G).
    b. Insert the new Push Rod through the central opening where the Throttle Ball seats at the rear of the Motor Housing until it contacts the Shutoff Plunger (120).

    NOTICE

    Exert a slight pressure on the Push Rod to make certain the Shutoff Plunger contacts the Shutoff Plunger Balls (121).

    c. The length of the Push Rod must be trimmed so that 0.04 to 0.09” (1.0 mm to 2.3 mm) protrudes above the seating surface for the Throttle Ball. There are numerous ways to determine how much material must be trimmed from the Push Rod and experience will dictate the best method to use. Following is one method requiring only a narrow–depth scale. If the Push Rod extends beyond the Housing, measure the distance from the end of the Push Rod to the face of the surface where the Throttle Ball seats. Subtract 5/64” (2 mm) from that distance and cut the remaining difference from the end of the Push Rod. If the Push Rod does not extend beyond the Housing, measure the distance from the end of the Housing to the surface where the Throttle Ball seats. Record that distance. Measure the distance from the end of the Push Rod to the end of the Housing and add 5/64” (2mm) to that distance. Subtract the added distance from the first measurement and trim the remaining difference from the end of the Push Rod.

Assembly of the Gearing

1. Set the Gear Case (39) on the table of an arbor press with the notched end upward.
2. Using a sleeve that will contact the outer ring of the bearing, press the Spindle Bearing (40), open side first, into the bearing recess until it seats.
3. Install the Spindle Bearing Retainer (41) in the groove adjacent to the Bearing.
4. Work some Ingersoll–Rand No. 28 Grease into the teeth of the Spindle Planet Gears (42) and onto the planet gear shafts on the Spindle (43).
5. Slide the Spindle into the Gear Case so that the spindle shaft passes through the bore of the Spindle Bearing.
6. Install the Spindle Retaining Ring (44) in the groove on the spindle shaft.
7. Slide the Spindle Planet Gears onto the planet gear shafts, making certain the teeth of the Gears mesh with the teeth of the Gear Case.
8. **For M or N Gear Ratio,** coat the Gear Head Spacer (46) with grease and place it in the Gear Case against the Spindle Planet Gears. Work some grease into the teeth of the Gear Head Planet Gears (48) and onto the planet gear shafts on the Gear Head (47). Slide the Gear Head into the Gear case so that the teeth on the gear head shaft mesh with the Spindle Planet Gears. Slide the Gear Head Planet Gears onto the planet gear shafts making certain the teeth of the Gears mesh with the teeth of the Gear Case. Work some grease into the teeth of the Rotor Pinion (45) and place the Rotor Pinion in the Gear Head so that it meshes with the Gear Head Planet Gears.

9. Place the Motor Clamp Washer (49) in the Gear Case against the internal gear. Install the Clamp Washer Retaining Ring (50). Thread the Gear Case with its assembled gearing into the Motor Housing, and tighten it between 15 and 18 ft–lb (20 and 25 Nm) torque.

NOTICE

This is a right–hand thread; turn clockwise to tighten.

Assembly of the Adjustable Cushion Clutch and Adjustable Shutoff Clutch

1. If the Clutch Housing Bushing was removed, proceed as follows:

   For Models 3RA and 3RL ending in D1, standing the Clutch Housing Assembly (150) on an arbor press table with the internal thread upward, press the Clutch Housing Bushing into the Clutch Housing until the shoulder of the Bushing seats.

   For Models 3RA, 3RL, 3RP and 3RT ending in C1, C3, S1 or S3, stand the Clutch Housing Assembly (100) on an arbor press table with the internal thread upward. Using a step arbor that pilots the inside of the Bushing with the large bore of the Clutch Housing. press the Clutch Housing Bushing (101) into the Clutch Housing to a depth between 2.564" and 2.569" (65.12 and 65.25 mm) below the top face. The bore of the Bushing must be parallel with the large bore of the Housing within .0012" (0.03 mm).

   For Models 3RA, 3RL, 3RP and 3RT ending in S9D or C9D

   a. With the Clutch Housing Cap (103) removed, stand the Clutch Housing Assembly (100) on an arbor press table with the internal thread upward. Press one of the clutch housing bushings into the Clutch Housing until the shoulder of the bushing seats.
   b. Invert the Housing and press the remaining bushing into the front end of the Housing until the shoulder of the bushing seats.
   c. Thread the Clutch Housing Cap (103) onto the Housing.

   For Models 3RA, 3RL and 3RP ending in C1, C3 or C9D

   a. Apply a coat of the recommended grease to the ten Jaw Bearing Balls (109), eleven Clutch Balls (108), the internal hex of the Clutch Driver (106) and the Thrust Bearing (112).
   b. Holding the Clutch Driver (106) in one hand with the external hex end down, slide the Clutch Jaw onto the external hex end of the Driver. Move the Jaw along the Driver to a point near the front shoulder of the Driver where the ten Jaw Bearing Balls can be installed in the Jaw.
   c. Install the Balls and pull the Jaw toward the shoulder of the Driver to capture the Balls.
   d. While maintaining pressure against the Clutch Jaw, invert the Clutch Driver and install the Clutch Ball Spacer (110) on the Driver.
   e. Place the eleven Clutch Balls in the openings of the Clutch Ball Spacer and install the Clutch Ball Seat (111) with the recess on the face of the Seat toward the Clutch Balls.
   f. Lock all the components in place by installing two of the Spring Seat Stops (114) in the grooves on the Driver nearest the Clutch Jaw.

   For Models 3RL, 3RP and 3RT ending in S1, S3 or S9D

   a. Apply some of the recommended grease to the groove at the front end of the Clutch Driver (106) and install the Clutch Driver Seal (106A) in the groove.
   b. Install the Clutch Driver Spacer (106B) into the Bit Holder Assembly (125) or Bit Holder (106).
   c. Put some of the recommended grease into the opening in the front end of the Clutch Driver (106) and slide the Bit Holder Assembly or Bit Holder onto the flanged end of the Clutch Driver.
   d. Apply a coat of the recommended grease to each of the ten Bit Holder Bearing Balls (124) and insert the Balls into the bit holder bearing hole.
   e. Install the Ball Retaining Ring (117) into the groove of the Bit Holder Assembly or Bit Holder to retain the Bit Holder Bearing Balls.
   f. Apply a coat of the recommended grease to the cam surface, clutch ball pockets, and shaft of the Clutch Driver.
   g. Holding the Bit Holder, Clutch Driver upward, insert each of the three Clutch Cam Balls (123) into the three sections of the Bit Holder Assembly.
   h. Install the Clutch Ball Seat (111) over the end of the driver with the large circular groove toward the Clutch Cam Balls.
   i. Insert the four Shutoff Plunger Balls (121) into the hole on the side of the Clutch Driver.
   j. Install the Shutoff Collar (118), relieved end first, over the end of the Clutch Driver until it contacts the face of the Clutch Spring Seat (113).

k. Slide the Collar Return Spring (119), large end first, over the Clutch Driver until it contacts the Shutoff Collar and retain all components with the Spring Seat Stop (114).

l. Apply a light coat of the recommended grease to the Shutoff Plunger (120) and insert the Plunger Return Spring (122) and Shutoff Plunger into the hex of the Clutch Driver.

2. Position the Clutch Spring (105) on the hub of the Clutch Ball Seat and install the Clutch Spring Seat (113) on the Clutch Driver with the hub inside the Clutch Spring.
3. Lubricate and install the Thrust Bearing (112) and the Adjusting Nut Lock (115), with the flat side of the Lock toward the Bearing, on the Clutch Driver. Lubricate the side of the Adjusting Nut Lock that is not flat.
4. Thread the Adjusting Nut (116) onto the Clutch Driver, with the smooth face away from the Nut Lock, until the Nut passes the remaining Spring Seat Stop groove in the Clutch Driver.
5. Install the Spring Seat Stop (114) into the groove adjacent to the Adjusting Nut.

   For Models 3RA and 3RL ending in C1, C3 or C9D, insert the Disengaging Spring (133) into the front end of the Clutch Driver. Inject a small quantity of the recommended grease into the opening in the bit end of the Clutch Driver and slide the pilot end of the Bit Holder Assembly (128) into the Clutch Driver.

   For Models 3RL, 3RP and 3RT ending in C1, C3, S1, S3, C9D or S9D, insert the Clutch Return (104), small end first, over the hex end of the Clutch Driver until it stops against the Spring Seat Stop (114).

   For Models 3RP ending in C1, C3 or C9D, inject a small quantity of the recommended grease into the opening in the bit end of the Clutch Driver and slide the pilot end of the Bit Holder Assembly (128) or (125) into the Clutch Driver.

6. Apply a light coat of the recommended grease to the hex end of the Clutch Driver and to the bearing surface of the Bit Holder.
7. Slide the assembled Clutch into the Clutch Housing (100).
8. Screw the Clutch Housing Assembly onto the Gear Case securely.

NOTICE

The clutch should only be hand tight. It has a left–hand thread. Turn counterclockwise to tighten.

Assembly of the Direct Drive Attachment

1. If the Housing Bushing (151) was removed, press the new Bushing into the Screwdriver Housing (150) until the shoulder of the Bushing is against the face inside the Housing.
2. Install one of the Bit Holder Retaining Rings (153) in the groove at the Gear Case end of the Bit Holder (154).
3. Apply a light coat of the recommended grease to the surface of the Bit Holder that fits into the Bushing and slide the Bit Holder into the Bushing until the Bit Holder Retaining Ring stops against the shoulder of the Bushing.
4. Install the remaining Bit Holder Retaining Ring in the groove nearest the bit end of the Bit Holder.
5. Apply some of the recommended grease to the Bit Retaining Ball (152) and install the Ball in the hole in the Bit Holder.
6. Slide the Bit Retaining Sleeve (155) onto the Bit Holder until it stops against the Bit Holder Retaining Ring at the bit end of the Bit Holder.
7. Install the Retaining Sleeve Spring (156), large end first, onto the Bit Holder and into the Bit Retaining Sleeve. Continue pushing until the small end of the Spring is captured by the groove at the bit end of the Bit Holder.
8. Thread the Screwdriver Housing Attachment onto the Gear Case Assembly until it is hand tight.

NOTICE

This is a left–hand thread. Turn counterclockwise to tighten.

TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Loss of Power	Low air pressure	Check air supply. For top performance, the air pressure must be 90 psig (6.2 bar/620 kPa) at the inlet.
	Plugged Air Strainer Screen or Inlet Screen	Clean the Air Strainer or screen in a clean, suitable, cleaning solution. If the Screen cannot be cleaned, replace it.
	Clogged Muffler or Exhaust Silencer	Clean the Muffler Element in a clean, suitable, cleaning solution. If it cannot be cleaned, replace it.
	Worn or broken Vanes	Replace the **complete** set of Vanes.
	Damaged Rear End Plate Gasket	Install a new Rear End Plate Gasket.
	Worn or broken Cylinder	Replace the Cylinder if it is cracked or if the bore appears wavy or scored.
	Improper lubrication or dirt build–up	Clean the Motor Unit parts and lubricate as instructed.
Leaky Throttle Valve	Worn Throttle Valve and/or Throttle Valve Seat	Install a new Throttle Valve and/or a Throttle Valve Seat.
	Dirt accumulation on Throttle Valve and/or Throttle Valve Seat	Pour about 3 cc of a clean, suitable, cleaning solution in the air inlet and operate the tool Valve for about 30 seconds. **Immediately** pour 3 cc the recommended oil in the air inlet and operate the tool for 30 seconds to lubricate all the cleaned parts.
Inconsistent disengagement of Adjustable Clutch	Improper lubrication	Remove Adjustable Clutch mechanism mechanism and examine parts. Lubricate as instructed,
	Wrong Clutch Spring (using Heavy Clutch Spring on light torque application)	Change to Medium or Light Clutch Spring.
Motor stalls before Adjustable Clutch ratches	Improper Clutch adjustment or improper tool ratio for application	Check Clutch Adjustment and review tool performance vs. requirements.
	Low air pressure at the inlet	Check the air supply. For top performance, the air pressure must be 90 psig (6.2 psig/620 kPa) at the inlet.
	Insufficient grease	Lubricate the Clutch as instructed.

NOTICE

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.