ALÉSEUSE BB7100

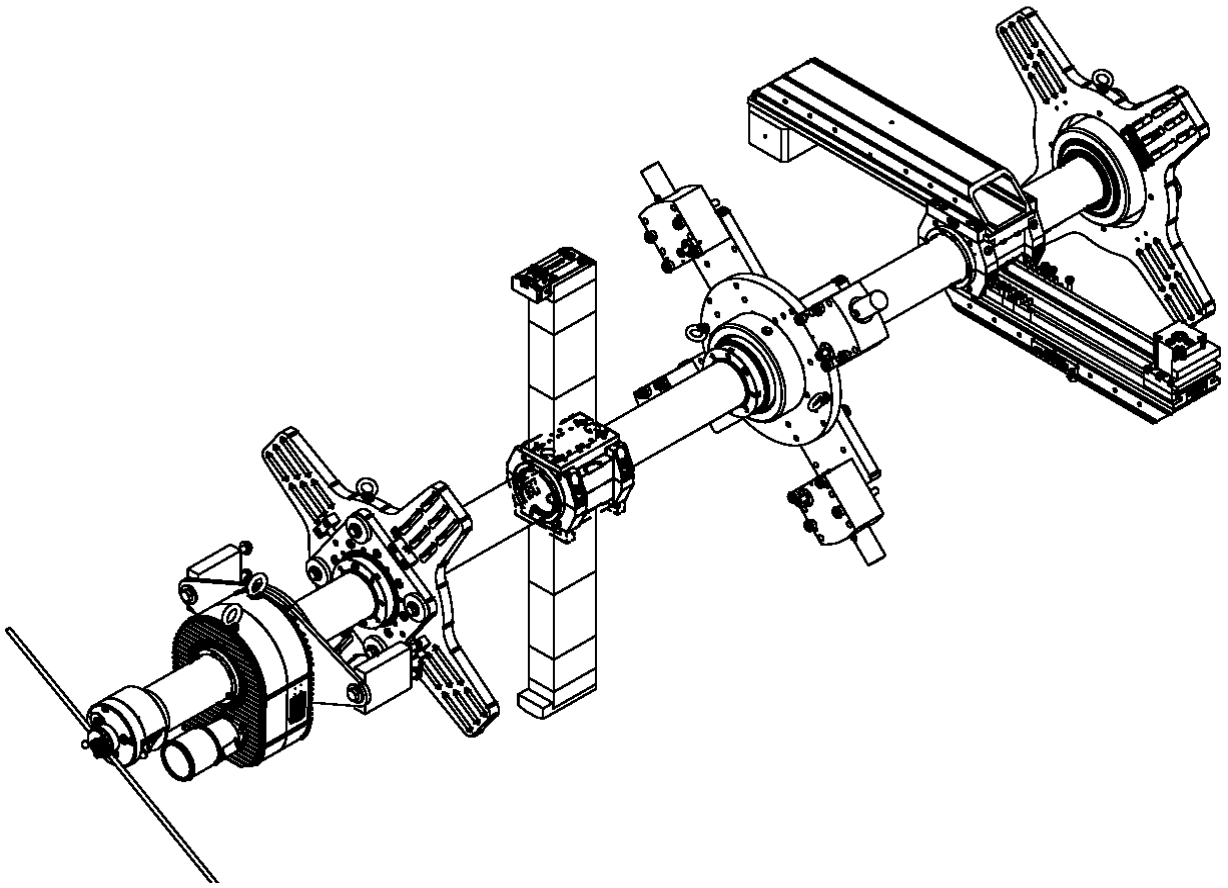
NOTICE D'UTILISATION

La présente notice est disponible au format électronique en tant que numéro de produit P/N 55769

Consignes initiales

Avril 2015

Numéro de série :



CLIMAX
Portable Machining & Welding Systems

Questions ou commentaires ?
Adresse e-mail

Chez Climax Portable Machining and Welding Systems, nous valorisons votre opinion.

Pour tout commentaire ou toute question concernant la présente notice ou d'autres documentations Climax, veuillez nous envoyer un courrier électronique à documentation@cpmt.com.
Pour tout commentaire ou toute question concernant des produits ou des services Climax, veuillez appeler Climax ou envoyer un courrier électronique à info@cpmt.com. Pour un service rapide et précis, veuillez fournir à l'agent agréé de l'usine de votre région les éléments suivants :

- Votre nom
- L'adresse d'expédition
- Votre numéro de téléphone
- Le modèle de la machine
- Le numéro de série (le cas échéant)
- La date d'acquisition.

Siège social mondial de Climax

Climax Portable Machining and Welding Systems
2712 South Second Street
Newberg, Oregon 97132 USA
Téléphone (international) : (503) 538-2185
Appel gratuit (pour l'Amérique du Nord) : 1-800-333-8311
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Courrier électronique: info@cpmt.com

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Courrier électronique: info@cpmt.de

SITES DE CLIMAX À L'ÉCHELLE MONDIALE

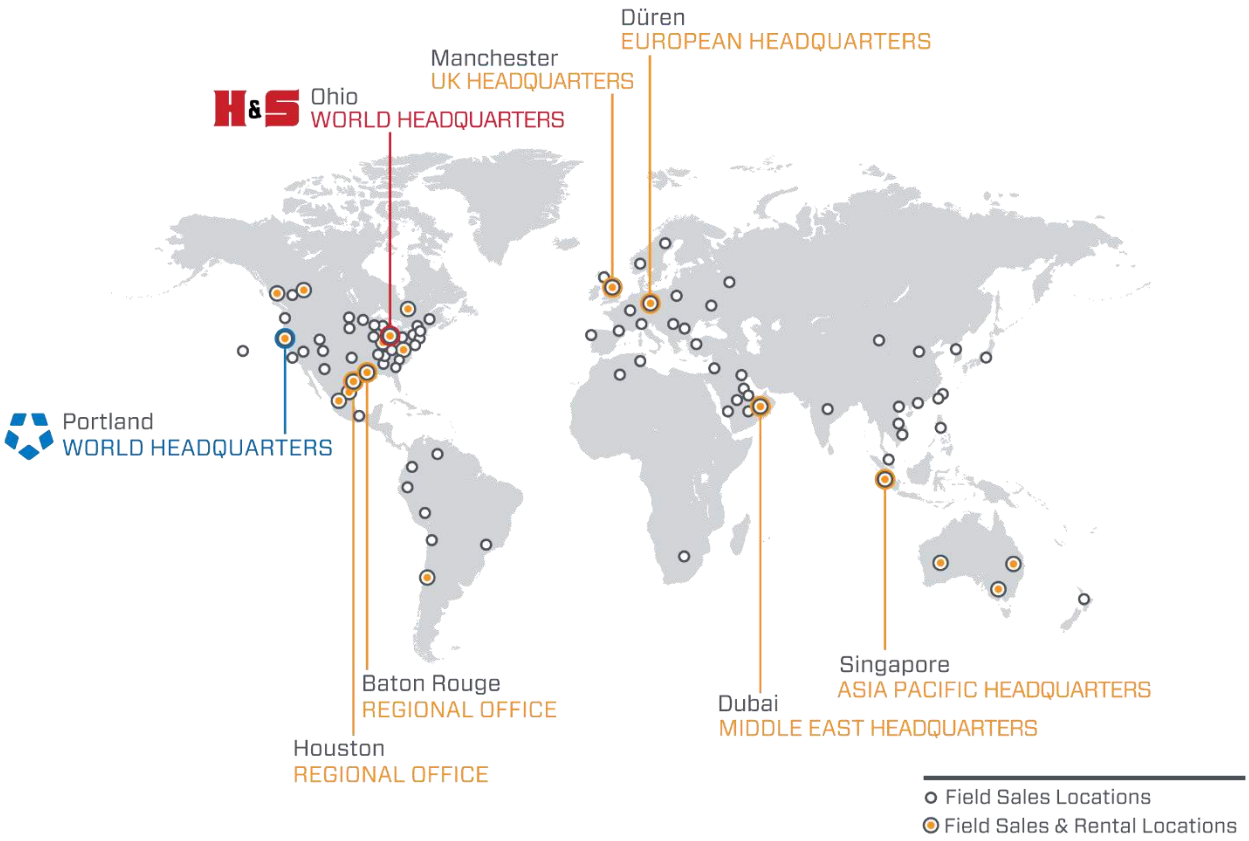


TABLE DES MATIERES

GARANTIE LIMITEE

Climax Portable Machine Tools, Inc. (ci-après dénommé « Climax ») garantit que toutes les machines neuves ne présentent aucun défaut ni du point de vue des pièces ni de la main d'œuvre. Cette garantie est accordée à l'acheteur initial pour une période d'un an à compter de la date de livraison. Si l'acheteur initial décèle un défaut dans les matériaux ou la fabrication dans les limites de la période de garantie, il devra contacter l'agent agréé de l'usine et retourner la machine dans son intégralité à l'usine, frais d'expédition prépayés. Climax procédera, à sa seule discrétion, soit à la réparation, soit au remplacement de la machine défectueuse, à titre gratuit et restituera la machine au client, frais d'expédition prépayés.

Climax garantit que toutes les pièces sont exemptes de tout défaut de matériaux et de fabrication et que tous les travaux ont été réalisés de façon appropriée. Cette garantie est accordée au client au titre de l'achat de pièces ou de main d'œuvre pour une période de 90 jours à compter de la date de livraison de la pièce ou de la machine réparée ou de 180 jours pour les machines et les composants d'occasion. Au cas où le client qui aurait acheté des pièces ou de la main d'œuvre trouverait un quelconque défaut de matériaux ou de fabrication dans les limites de la période de garantie, l'acheteur devra s'adresser à l'agent agréé de l'usine et retourner la pièce ou la machine à réparer à l'usine, frais d'expédition prépayés. Climax procèdera, à sa seule discrétion, soit à la réparation, soit au remplacement de la pièce défectueuse et/ou à la correction de tout défaut en atelier, les deux sans aucun frais et réexpédiera la pièce ou la machine réparée au client, frais d'expédition prépayés.

Ces garanties ne s'appliquent pas aux cas suivants :

- Dommage survenu après la date d'expédition et non provoqué par des défauts de matériaux ou de fabrication
- Dommage provoqué par un entretien inapproprié ou inadéquat
- Dommage provoqué par une modification ou une réparation non autorisée de la machine
- Dommage provoqué par une mauvaise utilisation de la machine
- Dommage provoqué par une utilisation de la machine au-delà de sa capacité nominale

Toutes les autres garanties, explicites ou implicites, y compris, mais sans s'y limiter, les garanties de valeur marchande et de compatibilité à une utilisation spécifique, sont déclinées et exclues.

Conditions générales de vente

Assurez-vous de prendre connaissance des conditions générales de vente qui figurent au verso de votre facture. Ces dispositions commandent et limitent vos droits vis à vis des biens achetés auprès de Climax.

À propos de la présente notice

Climax fournit le contenu de la présente notice de bonne foi au titre de consignes à l'intention de l'utilisateur. Climax ne peut pas garantir que les informations figurant dans la présente notice soient correctes pour des applications autres que celle décrite dans ladite notice. Les caractéristiques techniques du présent produit sont susceptibles d'être modifiées sans préavis.

CONSIGNES GENERALES DE SECURITE

Le principal problème de la plupart des travaux d'entretien réside dans les conditions difficiles dans lesquelles sont souvent réalisées les interventions.

Climax Portable Machining & Welding Systems se place à l'avant-garde en matière de promotion de la sécurité d'utilisation de machines-outils portatives. Assurer la sécurité nécessite un effort commun. En tant qu'opérateur sur la présente machine, vous êtes tenu à y apporter votre contribution par un examen attentif du site de travail et par l'application des procédures de fonctionnement mises en avant dans la présente notice, ainsi que des règles de votre propre société et des réglementations locales.

AVERTISSEMENT

Pour une sécurité et un rendement maximum, veuillez lire et comprendre l'intégralité de la présente notice et toute autre consigne de sécurité y afférente, avant toute utilisation du présent matériel. Tout manquement à suivre les instructions et les consignes contenues dans le présent manuel est susceptible de provoquer des blessures personnelles, le décès ou des dommages matériels.

Personnel qualifié

Avant de faire fonctionner la présente machine, vous devez recevoir une formation spécifique à l'utilisation de cette machine de la part d'un formateur qualifié. N'utilisez pas la machine si vous n'êtes pas familiarisé avec son fonctionnement correct et sécurisé.

Appliquez les consignes des étiquettes d'avertissement

Appliquez les consignes de toutes les étiquettes d'avertissement. Ne pas respecter des consignes ou ignorer les avertissements est susceptible de provoquer des blessures, voire la mort. Assurer un entretien approprié relève de votre responsabilité. Contactez Climax immédiatement en cas de besoin de remplacement de notices ou d'autocollants de sécurité.

Usage prévu

Veuillez n'utiliser cette machine que conformément aux consignes figurant dans la présente notice. N'utilisez pas cette machine pour un usage autre que celui décrit dans la présente notice.

Tenez-vous à distance des pièces mobiles

Tenez-vous à distance de la machine pendant son fonctionnement. Ne vous penchez jamais sur la machine ni n'introduisez votre main dedans pour retirer des copeaux métalliques ou effectuer des réglages lorsqu'elle est en fonctionnement.

Machine rotative

Une machine rotative peut gravement blesser un opérateur. Coupez toutes les sources d'alimentation avant d'interagir avec la machine.

Maintenez votre espace de travail propre et sec

Gardez tous les cordons et les tuyaux loin des pièces mobiles durant le fonctionnement. N'encombrez pas l'espace autour de la machine.

Protégez les vêtements amples et les cheveux longs

Une machine rotative peut provoquer des blessures graves. Ne portez pas ni vêtements amples, ni bijoux. Attachez vos cheveux en arrière s'ils sont longs ou portez un chapeau.

Environnements à risque

N'utilisez pas la machine à proximité de matières chimiques explosives, de fumées toxiques, de risques d'irradiation inappropriés ou d'autres environnements dangereux.

Projection de copeaux

Les projections de copeaux métalliques peuvent couper ou brûler. N'éliminez pas les copeaux métalliques avant le verrouillage de la machine, la mise hors tension de toutes les sources d'alimentation électrique et l'arrêt total de la machine.

PRATIQUES DE SECURITE SPECIFIQUES A LA MACHINE

Tous les aspects de la machine ont été conçus avec la sécurité comme préoccupation prioritaire. Il importe de garder à l'esprit les pratiques de sécurité suivantes lors de l'utilisation de l'aléseuse Climax BB7100.

Équipement de protection personnelle (EPP)

Lors de l'utilisation de la machine, le port d'une protection oculaire et auditive est obligatoire. Ces éléments de sécurité n'imposent pas de contraintes pour ce qui concerne le fonctionnement sécurisé de la machine.

Conditions de fonctionnement

Ne faites pas fonctionner la machine si elle n'est pas montée sur la pièce à usiner selon les instructions contenues dans la présente notice.

Outillage

La machine est fournie avec tous les outils nécessaires à sa configuration et à son fonctionnement.

Levage

Évitez de soulever des objets lourds par vous-même, vous risqueriez de vous blesser grièvement. Suivez toujours les méthodes prescrites dans votre établissement pour le levage d'objets lourds.

Liquides de coupe

N'utilisez que des lubrifiants recommandés ou des produits similaires équivalents lors de l'exécution des tâches d'entretien. Reportez-vous à la section "Entretien" pour de plus amples informations.

Zone à risques

L'utilisateur et d'autres personnes peuvent se tenir à n'importe quel endroit à proximité de la machine. L'opérateur doit s'assurer qu'aucune autre personne n'est en danger à cause de la machine.

Brides de serrage

Utilisez la référence de bride de serrage Réf. 42792 afin d'éviter le coulissement de la barre dans les paliers de support ou sa chute - Les brides se présentent en ensembles assortis et doivent être utilisées pour la fixation de la barre lorsque la machine est dans le sens vertical. Serrez ces brides au couple de serrage de 46 ft-lbs. Utilisez les brides de serrage pour éviter un serrage trop important des paliers. Les brides de serrage doivent être positionnées AU-DESSUS d'au moins 2 paliers de support lors du montage dans le sens vertical. Les brides de serrage doivent être adossées au palier lorsqu'elles sont utilisées.

Danger provenant de débris métalliques

La machine produit des débris métalliques au cours de son fonctionnement normal. Vous devez porter des lunettes et des gants de protection chaque fois que vous travaillez avec la machine.

Environnements à risque

N'utilisez pas la machine dans un environnement dangereux, tel que situé à proximité de substances chimiques explosives, de fumées toxiques ou d'endroit comportant un danger d'irradiation.

Dangers d'irradiation

Il n'y a ni systèmes ni composants sur cette machine susceptibles de produire des émissions électromagnétiques dangereuses, des rayons UV ou d'autres risques d'irradiation. Cette machine n'utilise pas de rayons laser ni ne produit de substances dangereuses telles que des gaz ou de la poussière.

Réglages et entretien

Tous les réglages, la lubrification et l'entretien doivent être effectués lorsque la machine est en position d'arrêt et qu'elle est coupée de toute source d'alimentation électrique. Les soupapes de fermeture doivent être verrouillées et étiquetées en conséquence avant d'effectuer toute intervention d'entretien.

Étiquettes d'avertissement

Des étiquettes d'avertissement sont apposées sur votre machine à la livraison. Dans le cas où une étiquette serait détériorée ou manquante, contactez Climax immédiatement pour la faire remplacer.

Entretien

Assurez-vous de l'absence de résidus et de la lubrification correcte des composants de la machine avant toute utilisation.

SYMBOLES D'AVERTISSEMENT DE SÉCURITÉ

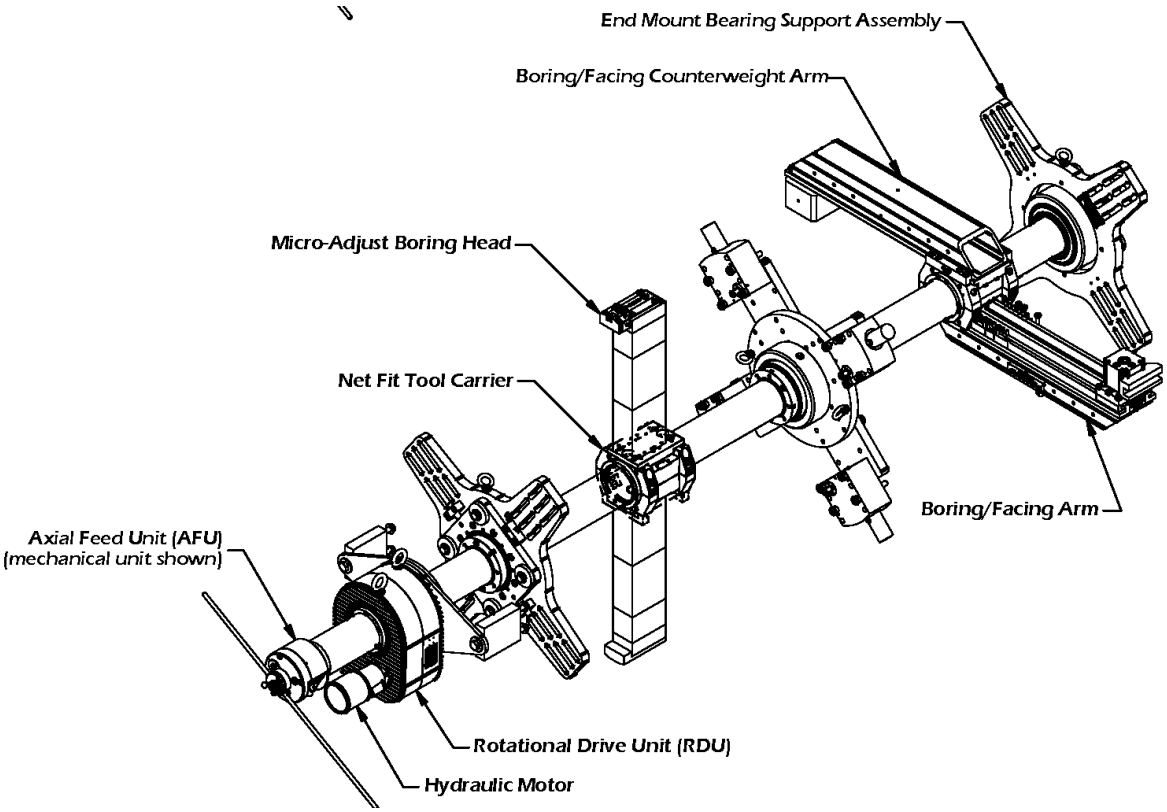
Le but des panneaux et des étiquettes relatifs à la sécurité est d'accroître le niveau de sensibilisation aux dangers éventuels.

Les symboles d'alerte liée à la sécurité indiquent un **DANGER**, un **AVERTISSEMENT** ou un besoin d'**ATTENTION**. Ces symboles peuvent être utilisés conjointement à d'autres symboles ou pictogrammes. Tout manquement au respect des avertissements liés à la sécurité peut entraîner des blessures graves. Appliquez toujours les consignes de sécurité afin de réduire le risque de dangers et de blessures graves.

	**DANGER** **Indique une situation dangereuse qui risque de provoquer la mort ou des blessures graves.**
	**AVERTISSEMENT** **Indique une situation potentiellement dangereuse qui risque de provoquer la mort ou des blessures graves.**
	**ATTENTION** **Indique une situation potentiellement dangereuse qui risque de provoquer des blessures légères ou modérées, l'endommagement de la machine ou l'interruption d'un procédé important.**
	**IMPORTANT** **Fournit des informations essentielles concernant l'accomplissement d'une tâche. Il n'existe pas ici de danger pour les personnes ou la machine.**
	**CONSEIL** **Fournit des informations importantes au sujet de la machine.**

INTRODUCTION

La présente notice décrit la manière d'utiliser votre aléseuse portative modèle BB7100. Toutes les pièces sont conformes aux normes de qualité rigoureuses établies par Climax en matière de systèmes portatifs d'usinage et de soudure. Pour une sécurité et des performances maximales, veuillez lire l'intégralité des instructions de la présente notice, avant toute utilisation de l'aléseuse portative.



INSPECTION DE LA MACHINE

Votre produit Climax a été inspecté et essayé préalablement à l'expédition et emballé pour des conditions d'expédition normales. Climax ne garantit pas l'état de votre machine au-delà de la livraison. Lorsque vous recevez votre produit CLIMAX, effectuez les contrôles de réception suivants.

1. Inspectez le(s) conteneur(s) d'expédition pour détecter d'éventuels dommages.
2. Contrôlez le contenu du conteneur d'expédition par confrontation avec la facture incluse afin de vous assurer que tous les composants ont été expédiés.
3. Inspectez tous les composants pour détecter d'éventuels dommages.

IMPORTANT

Contactez Climax immédiatement pour signaler des composants endommagés ou manquants.

Cette machine est dotée de la possibilité d'une configuration de niveau élevé comprenant de nombreuses options et accessoires. La présente notice traite de l'utilisation et du fonctionnement de toutes les options possibles. La configuration de la machine achetée par un client peut ne pas contenir toutes les options et tous les accessoires présentés dans la présente notice. Si une application spécifique de la machine nécessite des options ou accessoires supplémentaires, veuillez-vous adresser à un agent commercial agréé par Climax pour une assistance en vue d'obtenir les composants dont vous avez besoin.

MISE EN PLACE

	**AVERTISSEMENT** **Lors de la configuration ou de l'entretien de la machine, débranchez la source d'alimentation électrique et verrouillez la machine. Le non-respect de cette consigne peut conduire à un démarrage accidentel et à de graves blessures pour vous-mêmes ou votre entourage.**

Grue ou palan

Un palan, une grue ou un autre dispositif de levage est indispensable pour la mise en place de la machine. N'utiliser qu'un équipement permettant d'obtenir un fonctionnement souple avec réglage précis tel qu'un élévateur hydraulique ou un treuil à 2 étages Un dispositif de levage instable, au fonctionnement irrégulier ou qui se déplace trop rapidement ou de manière incohérente peut faire entrer en collision la machine avec la pièce à usiner et endommager l'outil.

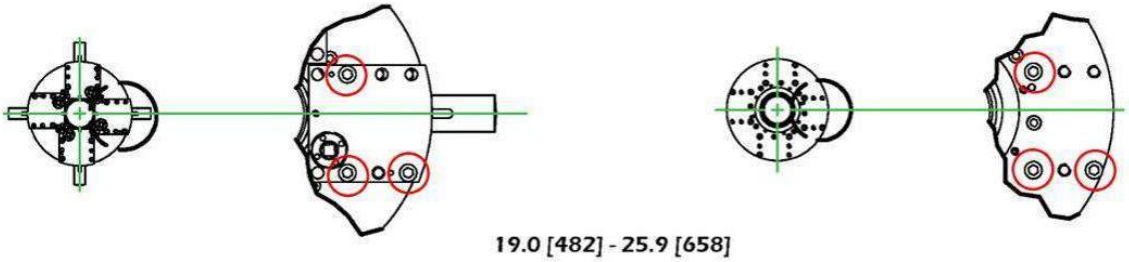
	**DANGER** **Une machine en oscillation ou devenant incontrôlable peut causer de graves blessures ou peut même se révéler mortelle. Veillez à ce que tous les opérateurs de treuil/grue soient formés sur l'utilisation correcte des machines. Veillez également à ce que les dispositifs de levage soient sécurisés et adaptés à la charge nominale.**

	**ATTENTION** **Toujours utiliser les anneaux de levage fournis sur la machine afin d'éviter son endommagement.**

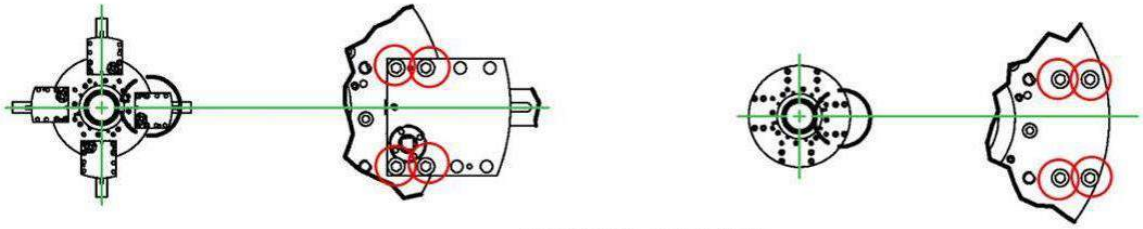
Exigences en matière d'espace

Avant de mettre en place l'aléseuse portative, déterminez l'endroit où vous allez placer chaque ensemble sur la barre d'alésage. Étant donné que l'entraînement rotatif et les ensembles de tête d'outil peuvent se situer n'importe où sur la longueur de la barre, assurez-vous de laisser suffisamment d'espace pour ceux-ci lors de la mise en place de la machine.

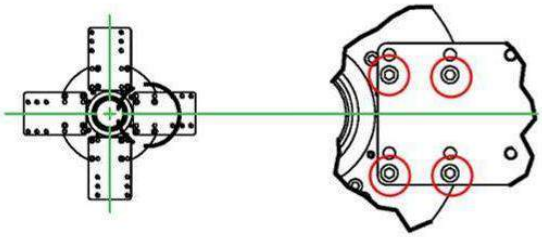
BB7100 BOLT PATTERNS



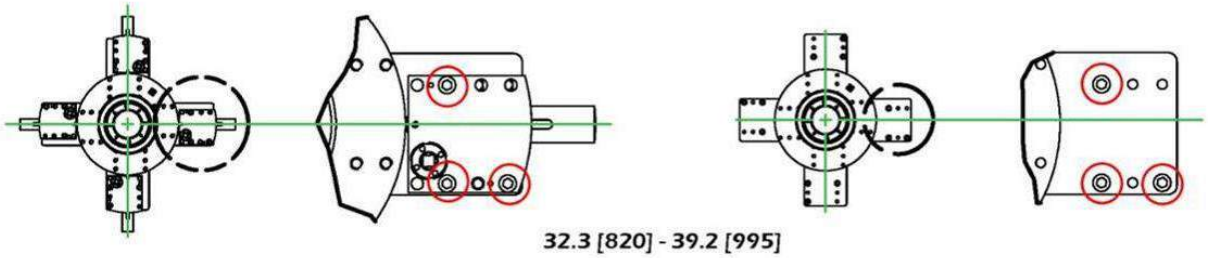
19.0 [482] - 25.9 [658]



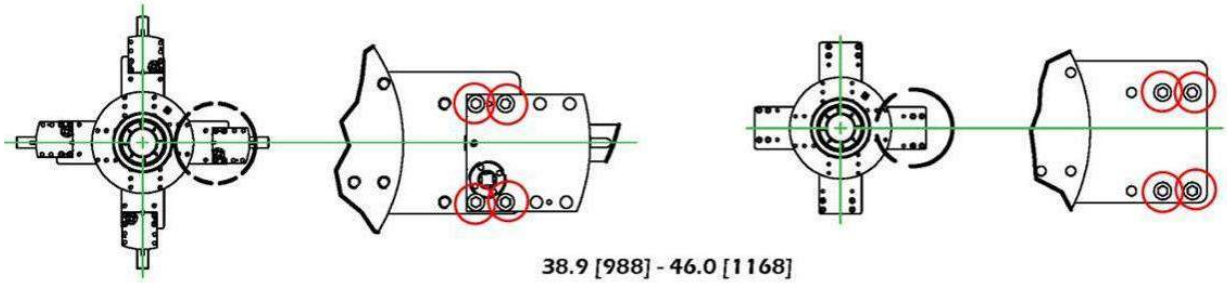
25.6 [651] - 32.5 [827]



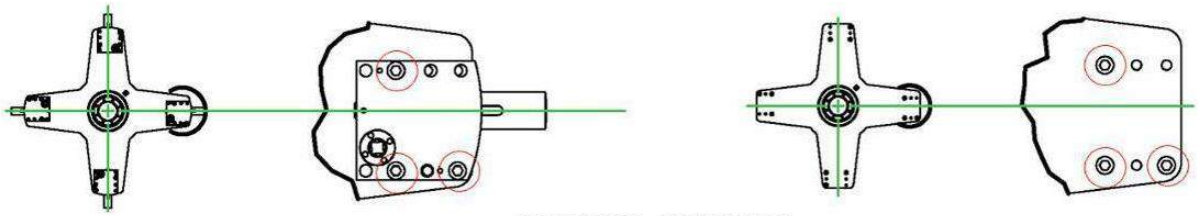
EXTENSION PLATE BOLTED POSITION



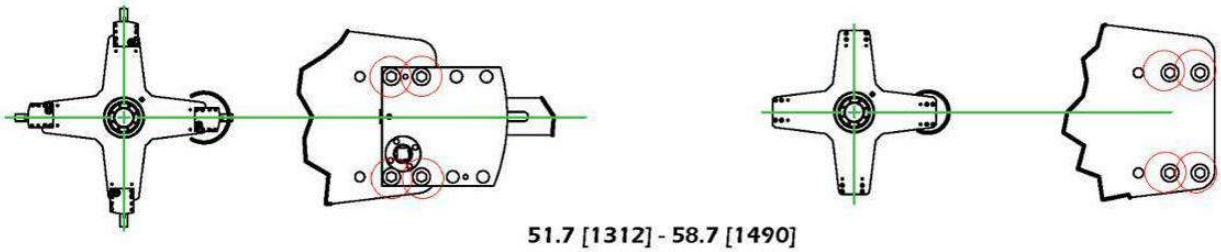
32.3 [820] - 39.2 [995]



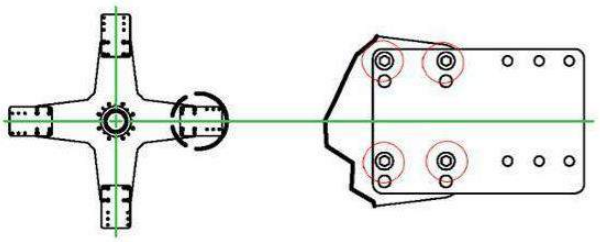
38.9 [988] - 46.0 [1168]



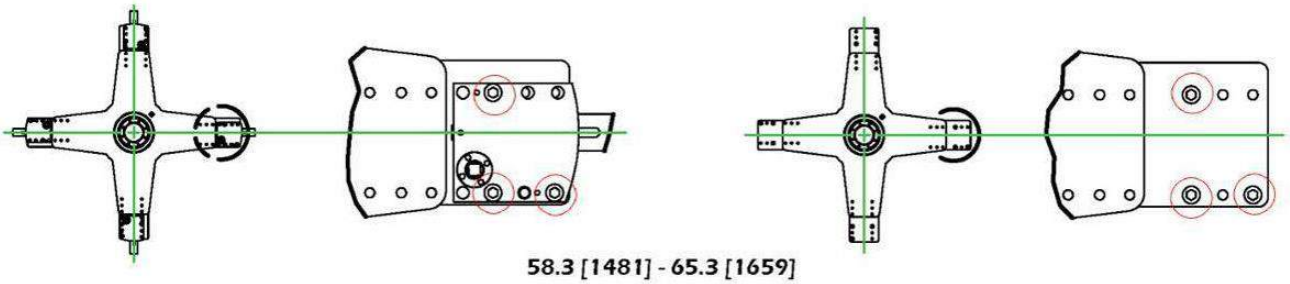
45.0 [1144] - 52.0 [1321]



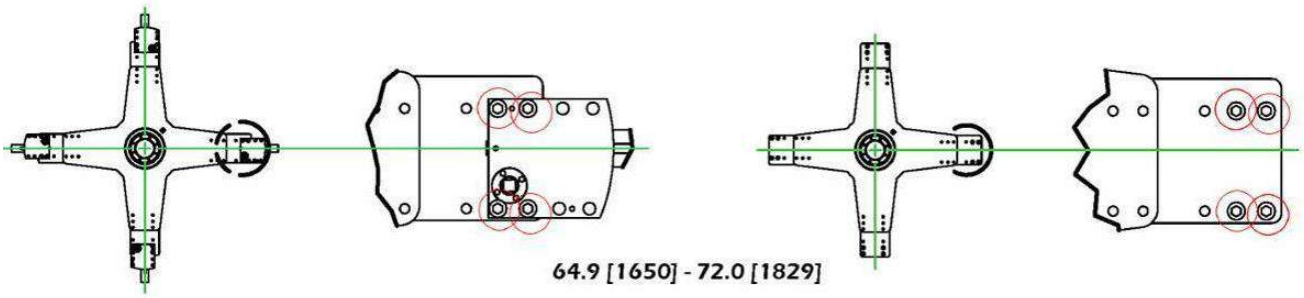
51.7 [1312] - 58.7 [1490]



EXTENSION PLATE BOLTED POSITION



58.3 [1481] - 65.3 [1659]



64.9 [1650] - 72.0 [1829]

Mise en place de la barre d'alésage et des supports de palier

Au moins deux ensembles supports de palier sont nécessaires pour assurer la stabilité de la machine. Les ensembles de palier peuvent être de styles différents.

	**ATTENTION**
	Au moins deux supports de palier sont nécessaires pour assurer la stabilité de la machine. Les ensembles de palier peuvent être de styles différents. Les supports de palier placés trop loin l'un de l'autre peuvent conduire à la flexion de la barre et réduire la précision d'alésage.

Brides de serrage

P/N 42792 - Les brides se présentent en ensembles appariés et doivent être utilisées pour la fixation de la barre lorsque la machine est dans le sens vertical.

Elles évitent le coulissement de la barre dans les paliers de support ou sa chute.

Pour éviter le serrage trop important des paliers, les brides de serrage doivent être placées au-dessus d'au moins 2 paliers de support dans le sens vertical.

	DANGER
	Pour éviter le coulissement de la barre dans les paliers de support, ou sa chute, utilisez les 2 brides de serrage fournies dans le kit d'outillage lorsque la barre d'alésage est utilisée dans le sens vertical. Serrez au couple de serrage de 46 ft.-lbs (62 Nm)!

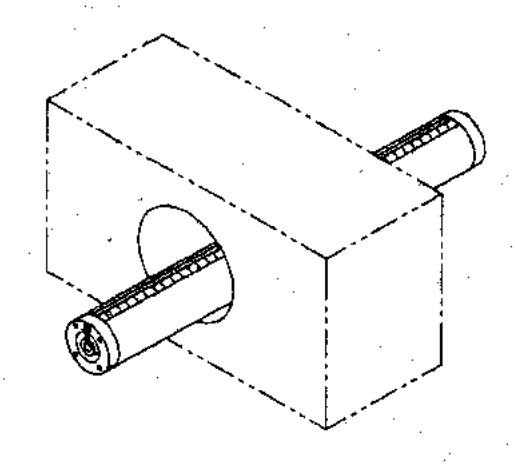
Mise en place du support de palier en extrémité

Bien que le support de palier en extrémité se fixe sur l'extérieur de la pièce à usiner, il peut se placer n'importe où sur la longueur de la barre d'alésage. Au cours de la mise en place, les paliers peuvent présenter jusqu'à 1 degré d'angle dans le sens + ou –.

4. Nettoyez l'alésage de la pièce à usiner avec un solvant pour enlever la graisse, l'huile et la saleté.
5. Vérifiez l'absence d'entailles ou de coupures sur la barre. Surfacer légèrement la barre, si nécessaire. Une barre présentant des entailles ou écorchures peut endommager les pièces accouplées de manière irrémédiable (y compris le porte-outil axial et l'unité d'entraînement rotatif).
6. Nettoyez la barre avec un solvant pour éliminer la saleté et les copeaux

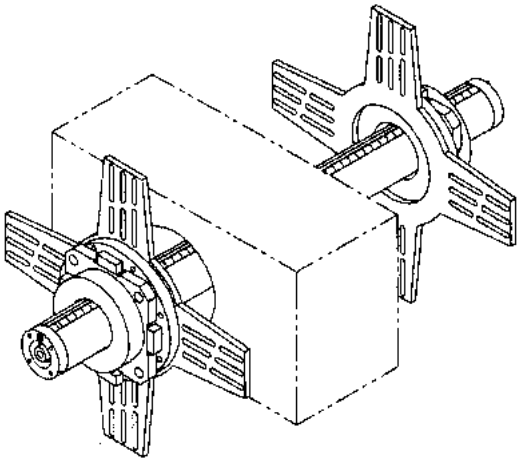
⚠	**ATTENTION** **La barre n'est pas durcie. Pour éviter tout endommagement de la barre, ne pas heurter celle-ci contre les supports de palier ou contre la pièce à usiner.**

7. • Placez la barre d'alésage dans le ou les alésages(s) à usiner.



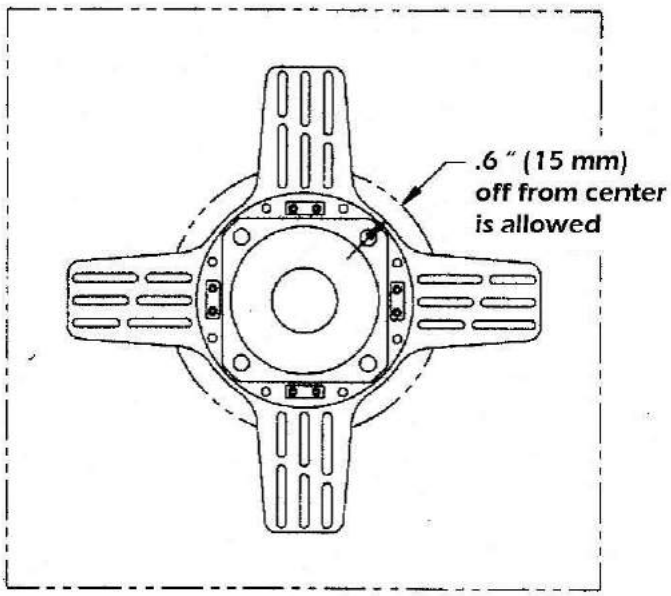
Positionnement de la barre d'alésage dans l'alésage

8. Faites coulisser les supports de palier sur chaque extrémité de la barre.



Fixation des supports de palier

9. À l'aide d'un palan, maintenez la barre et les paliers au centre de l'alésage.
10. Alignez dans la limite de 0.6" (15 mm).

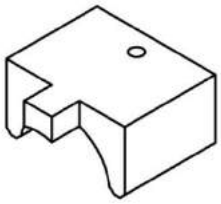


Alignement de la barre et des supports de palier avec le centre de l'alésage

	AVERTISSEMENT
	L'oscillation ou la chute de la machine peut blesser sérieusement l'opérateur. Enroulez solidement l'élingue de treuil ou les sangles autour de la barre et des paliers avant de soulever la machine.

1. Lors de l'utilisation des trous existants, veillez à les aligner avec les rainures dans le croisillon. Percez de nouveaux trous si nécessaire. Si des trous doivent être percés dans la pièce à usiner, maintenir les croisillons contre la pièce à usiner et repérer la position des rainures dans les croisillons.
2. Tirez les ensembles de palier de la barre d'alésage.
3. Retirez la barre de la pièce à usiner.
4. Si nécessaire, percez des trous de 5/8" (16 mm) sur l'extrémité de la pièce à usiner pour permettre l'alignement avec les rainures dans les croisillons.
5. Montez un palier sur l'extrémité de la pièce à usiner.
6. Faites coulisser la barre d'alésage dans le support de palier.
7. Si vous devez monter l'entraînement rotatif entre les supports, faites le maintenant.
8. Si un autre support de palier d'extrémité doit être monté, répétez les étapes précédentes.
9. Faites coulisser la barre d'alésage dans tous les ensembles de palier.

10. Verrouillez la barre en place en serrant l'écrou de cartouche du palier.
11. Introduisez l'outil clavette de palier entre la gorge dans la barre d'alésage et la gorge dans le manchon conique de palier.



OUTIL CLAVETTE DE PALIER – P/N 55572

12. Cet outil (P/N 55572) reste dans la rainure de la vis-mère pendant le serrage. La languette s'insère dans la fente du manchon conique pour éviter la rotation de celui-ci sur la barre lors du serrage du palier.
13. Serrez la clé à sangle autour de la barre d'alésage.
14. Tout en maintenant en place la clé à sangle, serrez l'écrou de palier au moyen de la clé d'écrou de palier.
15. Retirez l'outil clavette de palier (P/N 55572) de la barre d'alésage.
16. Alignez avec précision la barre d'alésage.
17. Mettre en place un comparateur pour mesurer la concentricité entre la barre d'alésage et l'alésage.
18. Réglez les vis dans les cales d'ajustement de support de palier jusqu'à ce que la barre soit centrée.

	CONSEIL
	Climax recommande d'utiliser au moins deux ensembles support pour obtenir la stabilité de la machine.

Mise en place de l'avance axiale mécanique

Montage de l'avance axiale mécanique sur la barre d'alésage

Le bloc d'avance axiale mécanique peut se monter sur n'importe quelle extrémité de la barre d'alésage. La pointe de positionnement et le trou de l'écrou hexagonal du bloc d'avance s'insèrent dans le siège de la pointe de positionnement et de l'arbre hexagonal saillant de l'embout de la barre d'alésage.

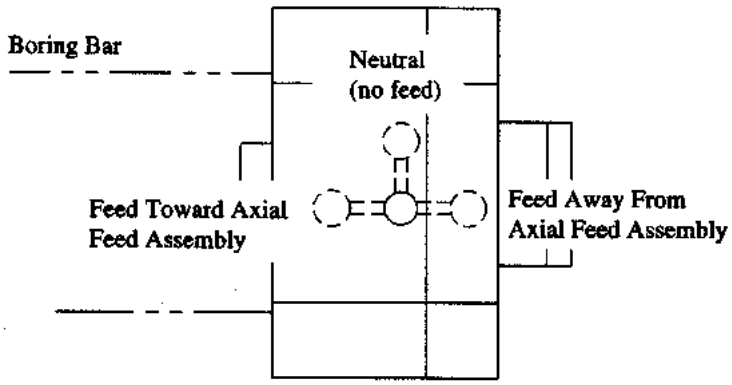
1. Mettre le bloc d'avance axiale dans la position NEUTRAL (Point mort) de telle façon que l'entraînement de la vis-mère puisse tourner dans n'importe quel sens.
2. Tout en maintenant l'avance axiale contre l'embout de la barre, tourner l'arbre de sortie du bloc d'avance jusqu'à ce que les hexagones correspondent.
3. Fixer le bloc d'avance axiale avec les deux vis fournies.
4. Fixer la tige de déclenchement à un objet fixe pour engager le mécanisme d'avance.

	AVERTISSEMENT
⚠	**Une tige de déclenchement non fixée peut causer des dommages ou des blessures. Fixer la tige de déclenchement à un objet fixe.**

Réglage du sens de l'avance axiale

La manette de commande du sens de l'avance axiale se situe sur l'embase plate de l'avance axiale.

- Pour avancer la tête d'outil VERS (TOWARD) l'avance axiale, tournez la manette en direction de la barre.
- Pour avancer la tête d'outil en position ÉLOIGNÉE (AWAY FROM) de l'avance axiale, tournez la manette en éloignement de la barre.
- L'avance est au POINT MORT (NEUTRAL) lorsque le bouton et la manette sont perpendiculaires à la barre



Sens de l'avance axiale

IMPORTANT

Si le bloc d'avance axiale est déplacé sur l'extrémité opposée de la barre, le sens de l'avance sera inversé. Vérifier le sens de l'avance avant d'utiliser la barre d'alésage.

Réglage de la vitesse d'avance axiale

La vitesse d'avance axiale est réglable et peut varier de 0.003" à 0.025" (0,07 à 0,63 mm) par tour.

Pour régler la vitesse d'avance :

1. Desserrez le bouton de vitesse d'avance.
2. Tournez la plaquette de réglage de l'avance vers la valeur de réglage désirée.
3. Resserrez le bouton de vitesse d'avance.

Mise en place de l'avance électrique

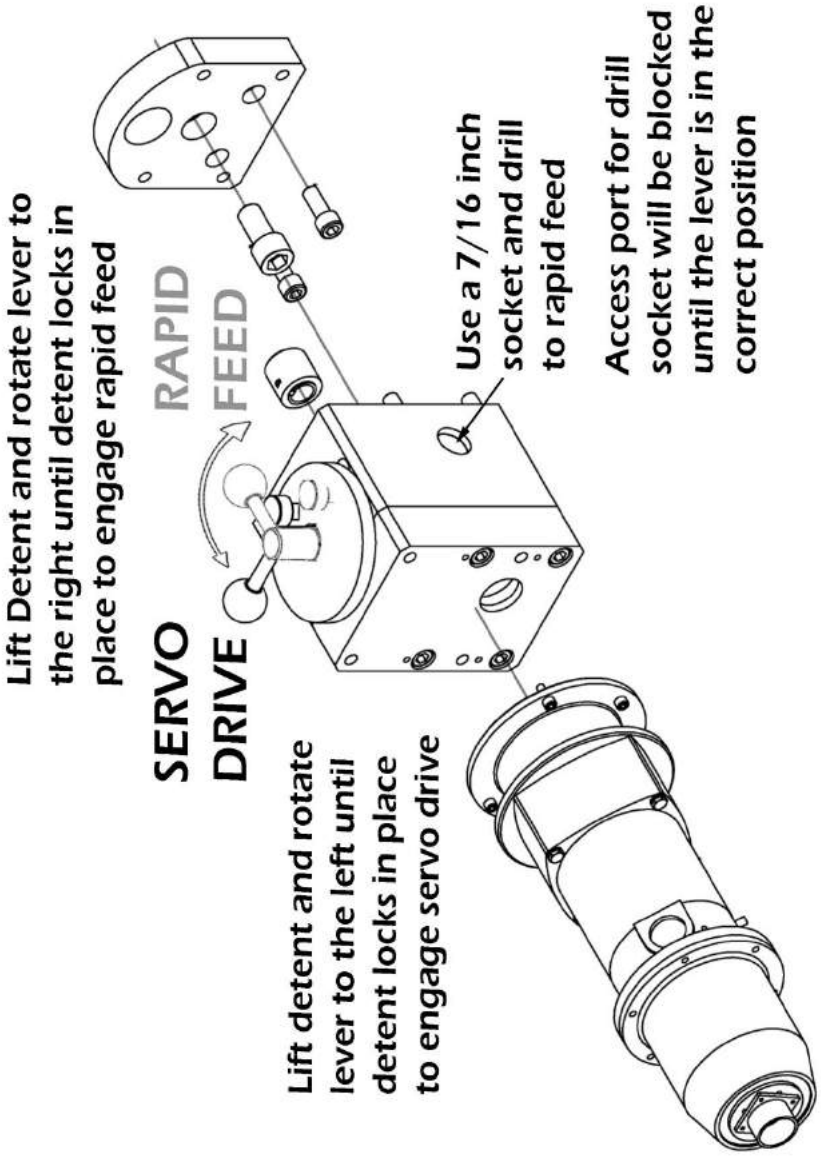
Avant de brancher l'alimentation électrique, assurez-vous que le disjoncteur principal est calibré pour supporter à la fois 125% de la pleine charge du groupe d'alimentation hydraulique (HPU) et l'entraînement de l'avance axiale. La pleine charge de l'entraînement de l'avance axiale est de 10 ampères à 460 volts. Reportez-vous aux schémas électriques de l'HPU pour déterminer les ampères à pleine charge de l'HPU et de l'entraînement de l'avance axiale

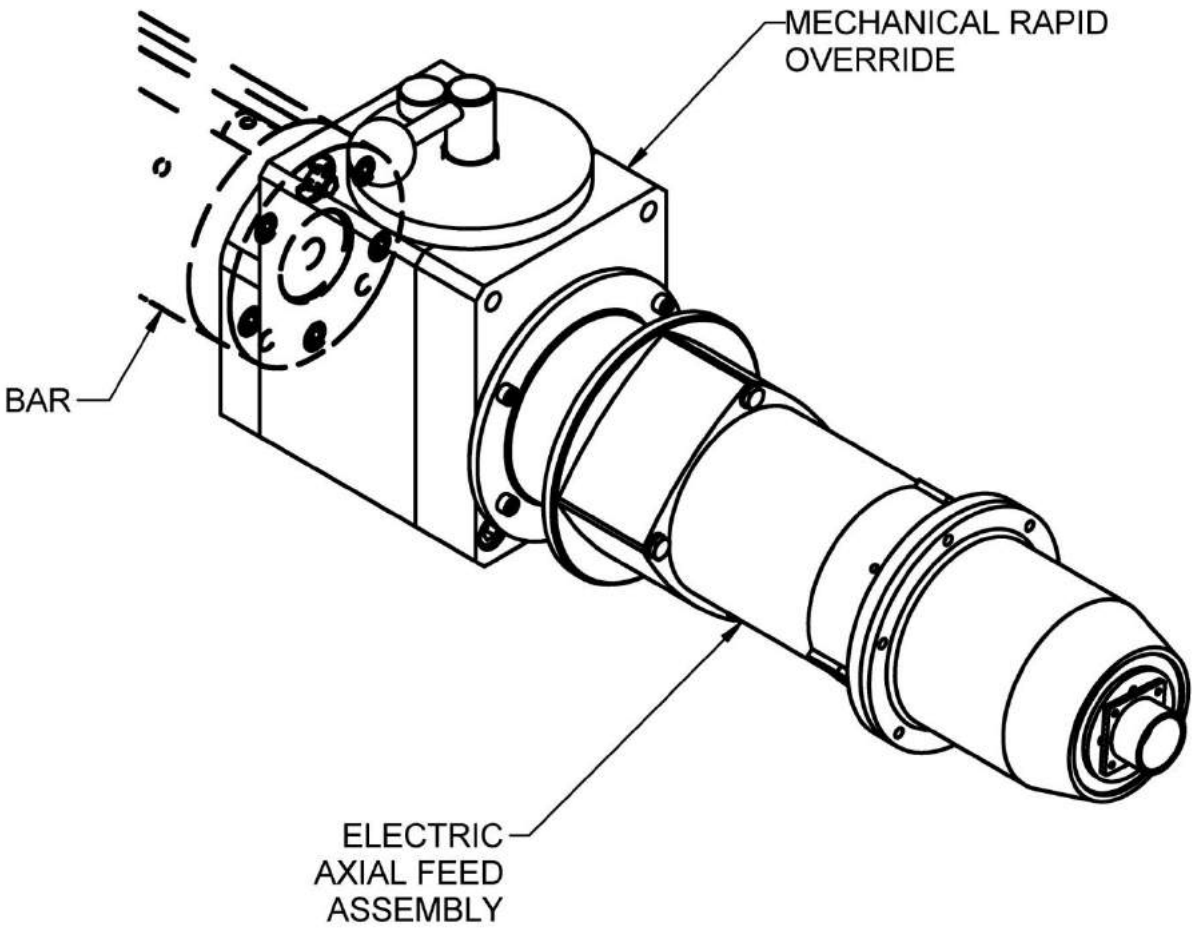
Pour installer l'avance électrique sur la barre

1. Branchez le câble d'alimentation électrique.
2. Faites coulisser l'accouplement de vis-mère sur l'arbre de sortie de la boîte de transmission.
3. Montez la plaque d'adaptation sur l'extrémité de la barre d'alésage avec deux vis à tête creuse de 3/8-16 et une de ¾-10.
4. Faites coulisser la boîte de transmission avec l'accouplement sur l'extrémité hexagonale de la vis-mère de la barre d'alésage et fixer avec quatre vis de ½-13.
5. Installez l'accouplement de l'arbre moteur et la clavette sur l'arbre du moteur de l'avance électrique.
6. Montez le moteur de l'avance électrique sur la boîte de transmission avec quatre vis de ¼ -20.
7. Fixez solidement le câble électrique au connecteur sur l'extrémité du bloc d'avance.

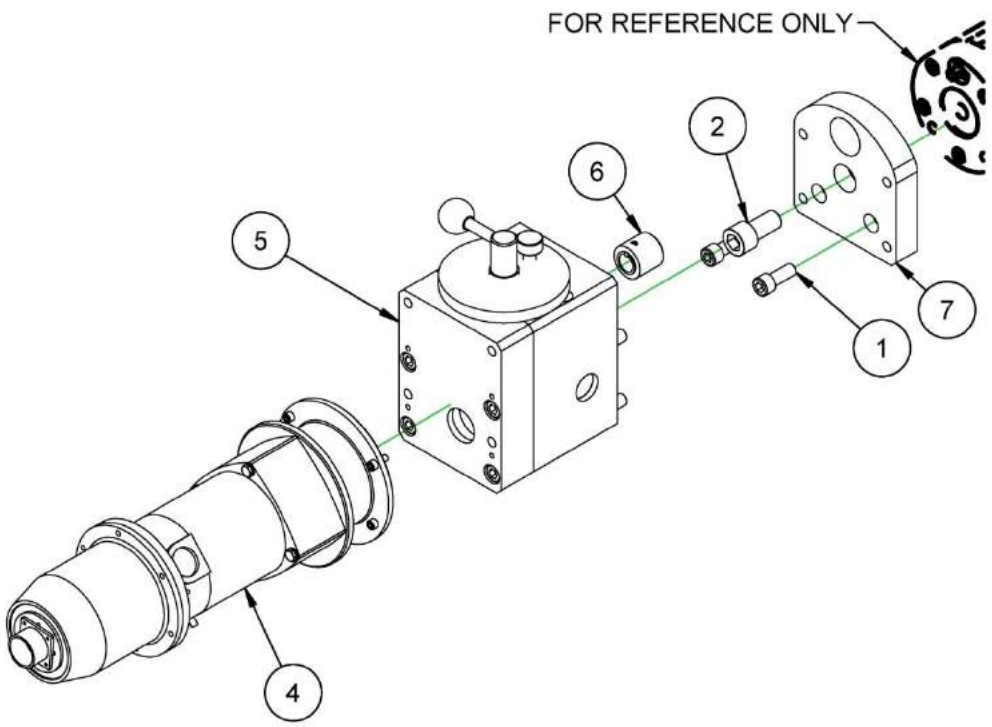
Fixation de l'avance rapide mécanique (équipement en option)

L'avance rapide mécanique en option se fixe entre l'ensemble d'avance axiale et l'extrémité de la barre d'alésage. Elle comporte un orifice latéral pour une douille porte-foret de 7/16” standard, utilisée pour l'avance rapide. La manette engage et désengage le système d'avance rapide. Lorsque le système est engagé, l'accès à l'orifice de la douille porte-foret est disponible. Lorsque la servocommande est engagée, la douille porte-foret ne s'insérera pas dans l'orifice. Les dessins et références des pièces se trouvent dans les pages suivantes.





ELECTRIC FEED
W/MECHANICAL RAPID FEED
AND PENDANT
41563



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	2	12646	SCREW 1/2-13 X 1-1/4 SHCS
2	1	22045	SCREW 3/4-10 X 1-1/2 SHCS
3	1	40720	PENDANT - NOT SHOWN
4	1	41062	FEED AXIAL ELECTRIC
5	1	41064	ASSY MECHANICAL RAPID FEED FOR ELECTRIC AXIAL FEED
6	1	41465	COUPLING, KEY 3/4 TO HEX 3/8
7	1	42581	END CAP 5 DIA BB7000

ELECTRIC FEED W/MECHANICAL RAPID FEED AND PENDANT

41563

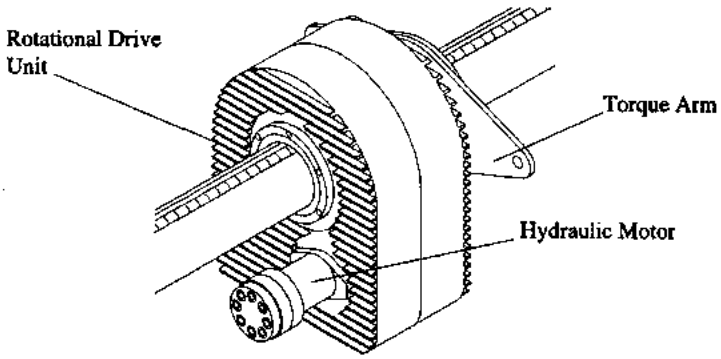
Mise en place de l'entraînement rotatif

L'entraînement rotatif peut être placé à n'importe quel endroit le long de la barre d'alésage.

	ATTENTION
	La barre d'alésage n'est pas durcie. Pour éviter tout endommagement de la barre, ne pas heurter celle-ci contre les supports de palier ou contre la pièce à usiner.

Pour mettre en place l'entraînement rotatif

1. Montez les bras de réaction sur le boîtier du bloc d'entraînement rotatif.
2. Si nécessaire, montez le moteur hydraulique sur le boîtier du bloc d'entraînement rotatif.
3. Veillez à ce que les boulons de fixation soient serrés



Montage du moteur hydraulique et des bras de réaction sur le RDU (bloc d'entraînement rotatif)

4. Desserrez les vis de blocage des bagues de verrouillage de l'entraînement de barre Extrayez les deux bagues de verrouillage en vissant les vis de poussée.
5. Faites coulisser le bloc d'entraînement rotatif sur la barre d'alésage.
6. Retirez les vis à tête creuse de l'une des bagues de verrouillage de l'entraînement de barre. Faites coulisser la bague en l'éloignant de l'entraînement rotatif le long de la barre.
7. Assurez-vous que les rainures de clavette dans la barre d'alésage et les engrenages sont alignés. Assurez-vous que la clavette s'engage avec la vis-mère. Poussez la clavette d'entraînement de barre dans la rainure de clavette.

	ATTENTION
	La clavette d'entraînement rotatif doit être engagée avant d'utiliser la barre d'alésage. Le non-respect de cette consigne peut conduire à l'endommagement de la machine.

8. Faites coulisser la bague de verrouillage de l'entraînement de barre à sa position d'origine dans l'entraînement rotatif. Serrez les vis de blocage sur les deux bagues de verrouillage.

	**ATTENTION** **Serrez uniquement les six vis de blocage à tête creuse dans les bagues de verrouillage de l'entraînement de barre et non les vis de poussée. Les vis de poussée servent à desserrer les bagues de verrouillage. Dévissez les vis de poussée avant de serrer les bagues afin d'éviter l'endommagement de ces dernières.**

9. Faites coulisser la bague de verrouillage de l'entraînement de barre à sa position d'origine dans l'entraînement rotatif.
10. Serrez les vis de serrage sur les deux bagues de verrouillage.

	**AVERTISSEMENT** **Une défaillance de l'arrimage ou le desserrage des bras de réaction peut conduire à une oscillation incontrôlable de ceux-ci et causer de graves blessures à l'opérateur ainsi que l'endommagement de la machine. Fixez les bras de réaction à un objet fixe suffisamment robuste pour résister au couple à pleine charge.**

11. Branchez les conduites hydrauliques entre le moteur et le groupe d'alimentation hydraulique.

	**ATTENTION** **Afin d'éviter d'endommager la pompe du groupe d'alimentation hydraulique, raccordez le moteur hydraulique au groupe d'alimentation avant de brancher et mettre le groupe d'alimentation sous tension.**

Installation des bras de surfaçage et d'alésage sur la barre d'alésage

Pour monter le porte-outil

1. Vérifiez l'absence d'entailles ou de coupures sur la barre. Surfacer légèrement la barre, si nécessaire.

Une barre présentant des entailles ou écorchures peut endommager les pièces accouplées de manière irrémédiable (y compris le porte-outil axial et l'unité d'entraînement rotatif).

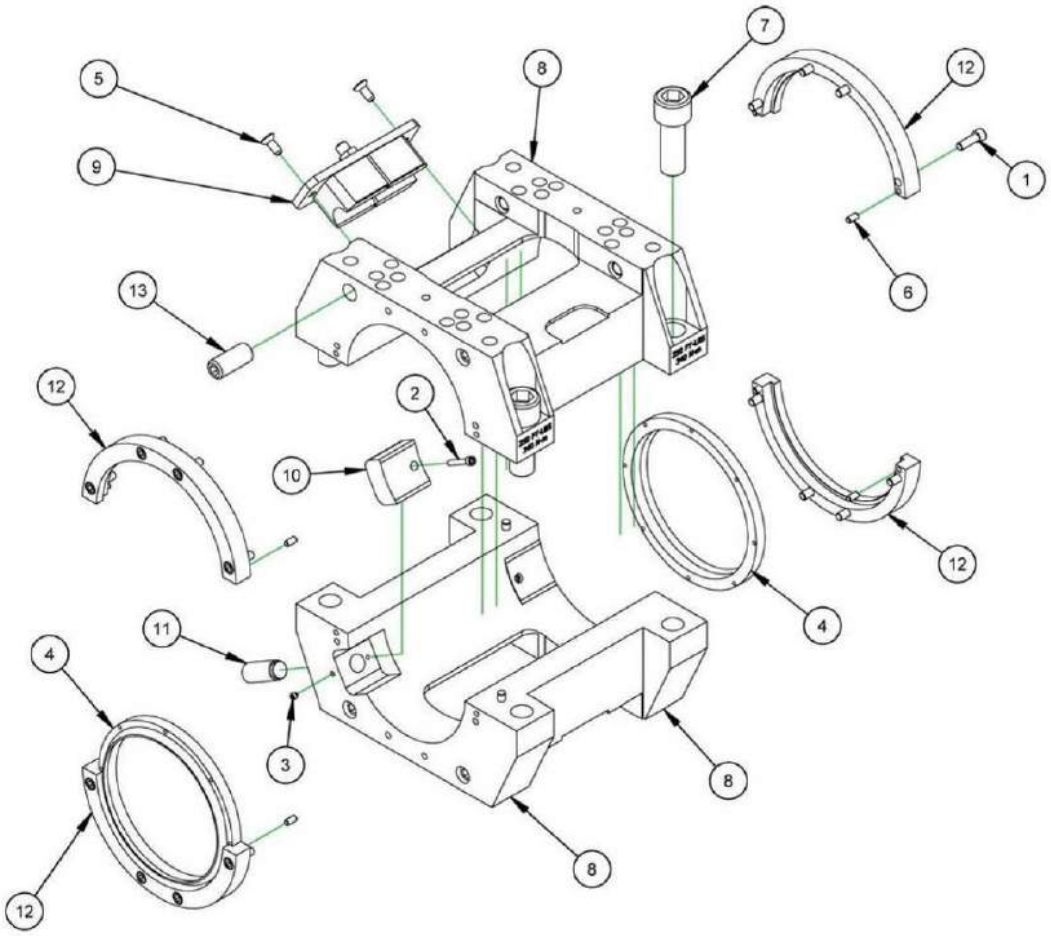
2. Nettoyez la barre et le porte-outil avec un solvant pour éliminer la saleté et les copeaux
3. Re-huilez la barre, reportez-vous à la section "Entretien" pour de plus amples informations.
4. Monter les deux moitiés du porte-outil sur la barre.
5. Fixer le porte-outil avec les quatre vis 3/4-10 x 2 SHCS (P/N 28757).
6. Introduire la clavette d'entraînement amovible (P/N 53523) dans le port-outil sur la vis-mère. Serrer les vis de fixation (P/N 22496) à 96 in/lbs (10.85 N-m).

IMPORTANT

La barre peut tourner dans les deux sens. Veillez à ce que la rotation soit correcte pour les cartouches en carbure.

CONSEIL

Un meilleur résultat est obtenu sur les alésages de précision lorsqu'on effectue plusieurs coupes d'ébauche suivies d'une ou deux coupe(s) de finition.

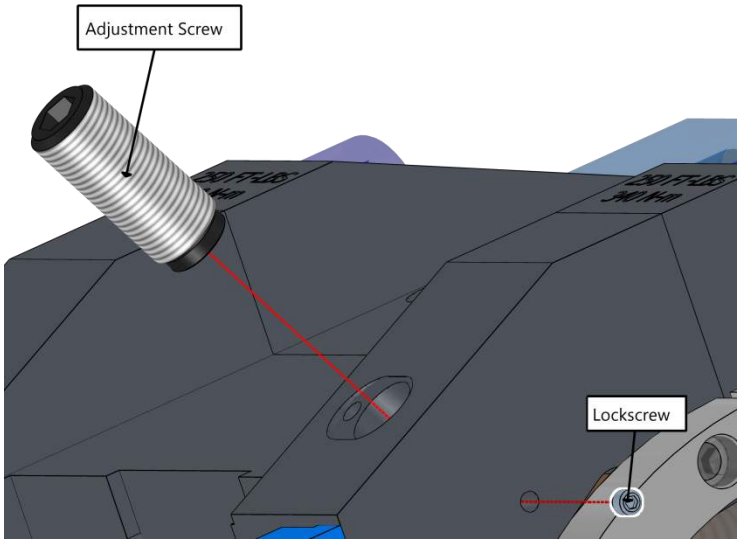


PARTS LIST		
ITEM	PART No.	DESCRIPTION
1	12647	SCREW 1/4-28 X .75 SHCS
2	12880	SCREW 8-32 X 1 SHCS
3	12897	SCREW 10-32 X 3/16 SSSNT
4	15826	WIPER ROD 5 MOLYHANE
5	22496	SCREW 1/4-20 X 5/8 FHSCS
6	25578	PIN DOWEL 3/16 DIA X 3/8
7	28757	SCREW 3/4-16 X 2 SHCS
8	53850	TOOL CARRIER BB7100
9	54134	ADJUSTABLE NUT AXIAL LEAD SCREW 1-5 ACME
10	54179	SHOE ADJUSTABLE TOOL CARRIER BB7100
11	55307	SCREW 5/8-18 X 1.55 SSSFP MODIFIED
12	55446	SEAL HOUSING TOOL CARRIER BB7000
13	55564	SCREW ASSY 5/8-18 X 1-1/2 SSSFP WITH NYLON BALL TIP

TOOL CARRIER ASSY BB7100 53922

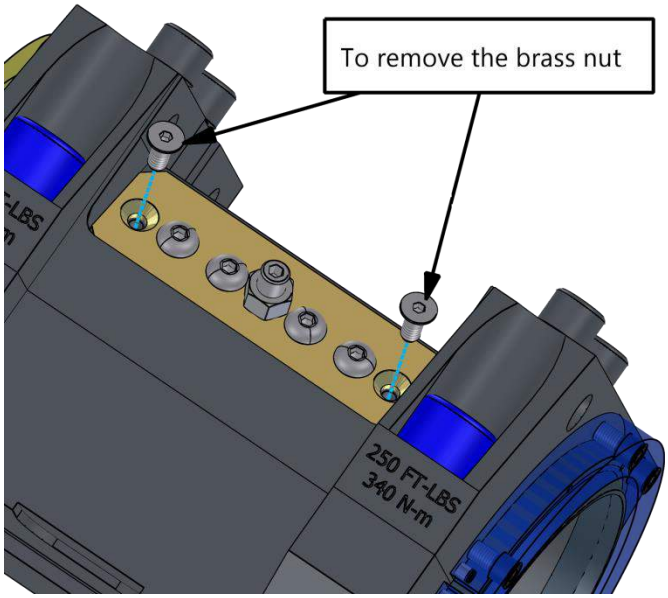
Pour verrouiller le porte-outil sur la barre en vue d'autres opérations

1. Desserrez la vis de blocage sur le côté du porte-outil
2. Serrez ou desserrez la vis de réglage
3. Serrez la vis de blocage pour maintenir la vis de réglage en position



Pour retirer l'écrou en laiton

1. Ne pas retirer toutes les vis
2. Retirez les vis sur chaque extrémité de l'écrou en laiton
3. (S'il existe un jeu trop important dans l'écrou en laiton, la vis de réglage centrale peut être serrée)



Montage du bras de guidage sur le porte-outil

1. Au moyen d'un dispositif de levage tel qu'une grue, placez le bras sur le porte-outil en affleurement avec la surface de celui-ci comme représenté.

	**IMPORTANT** **Utilisez toujours les anneaux de levage pour soulever les bras. Les anneaux de levage tournants assurent la flexibilité et la sécurité pendant les opérations de mise en place.**

2. Fixez le bras avec une barre de serrage (P/N 53074) avec des vis 1/2-20 x 1-3/4 (P/N 18225) – 4 par barre de serrage et serrez au couple de 100 ft-lb. (135 N-m)

	**DANGER** **Le non-respect du couple de serrage correct des quatre vis ½-20 x 1-1/4 SHCS (réf. 18225) à 100 ft-lb (135 N-m) peut conduire à un glissement imprévu du bras de l'outil et entraîner des blessures graves ou fatales.**

Réglage de la perpendicularité du porte-outil

Le porte-outil est doté de quatre vis de réglage permettant d'ajuster perpendiculairement le bras de guidage si nécessaire.

Ensemble module d'avance

Montez et fixez le module d'avance avec la plaque d'adaptation (P/N 46879), comme indiqué ci-dessous.

Mise en place du module d'avance et du bras de déclenchement

Montage du bras à contrepoids sur le porte-outil

1. Faites tourner le porte-outil sur la barre pour permettre au bras à contrepoids d'être monté sur la surface réceptrice du porte-outil.
2. Fixez l'anneau de levage sur le bras à contrepoids et montez le bras

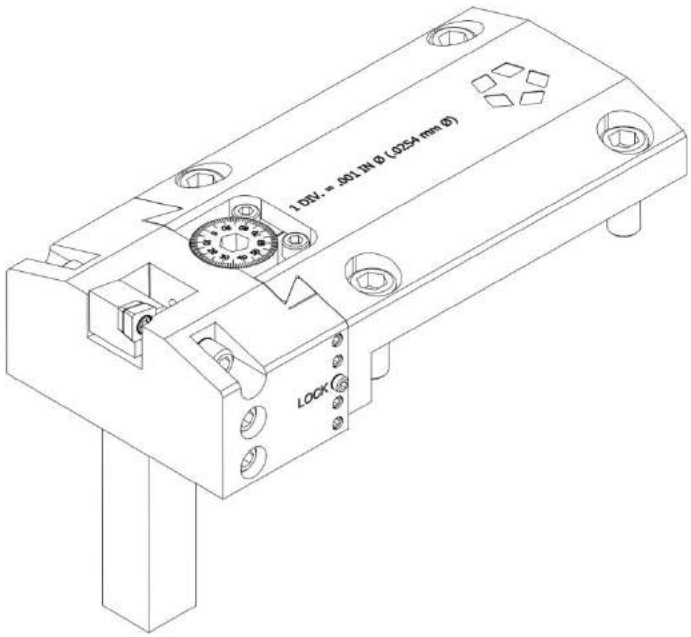
	IMPORTANT
	Utilisez toujours les anneaux de levage pour soulever les bras. Les anneaux de levage tournants procurent la flexibilité et la sécurité pendant les opérations de mise en place.

3. À l'aide d'un dispositif de levage tel qu'une grue, soulevez l'ensemble contrepoids pour l'installer sur le bras. Fixez l'ensemble contrepoids sur le bras au moyen des vis 7/8-14 x 1-1/2 (P/N 53049).

Veuillez noter que vous pouvez positionner le contrepoids lui-même à un emplacement quelconque sur le bras en vue d'équilibrer l'ensemble.

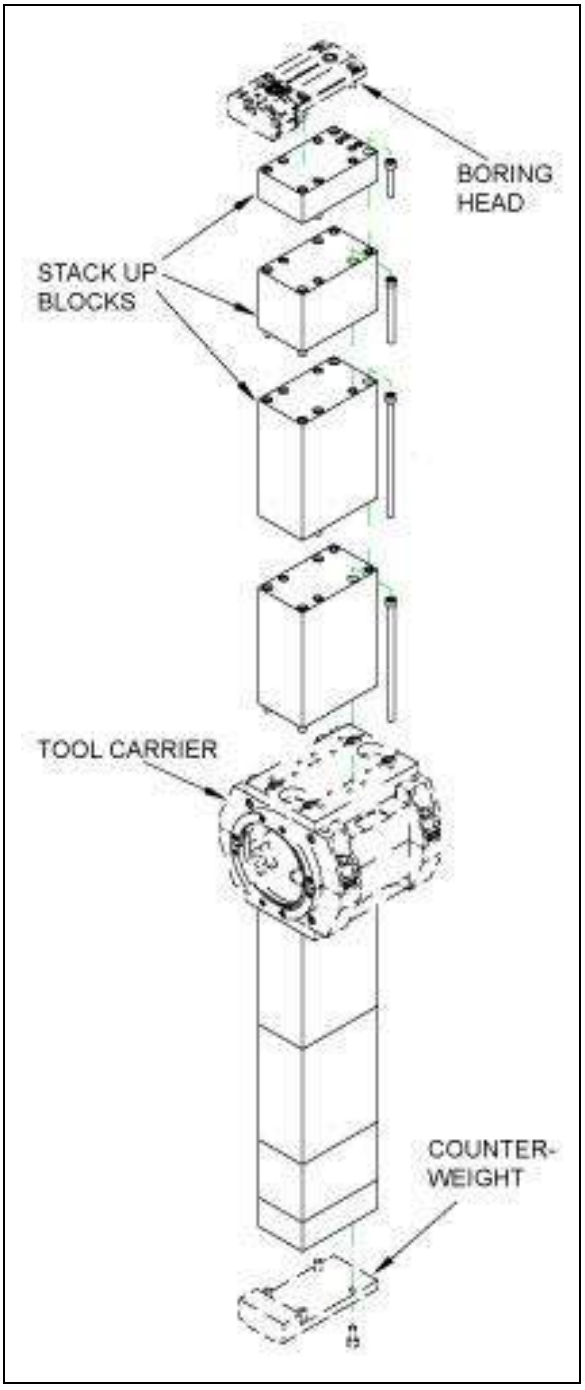
Tête d'alésage micrométrique

La tête d'alésage micrométrique permet d'effectuer rapidement le micro-réglage d'un outil à section carrée disponible dans le commerce pour l'alésage. La plage de micro-réglage est de 0,5 pouce et la possibilité de faire coulisser l'outil sans avoir à changer la configuration permet d'obtenir un déplacement total de l'outil de plus de 2 pouces (par configuration).



Pour régler l'outil au diamètre désiré, il suffit d'agir sur la vis à cadran jusqu'à l'obtention de ce diamètre, puis de bloquer la vis centrale de réglage de la queue d'aronde avec la clé hexagonale à poignée en T fournie. Chaque division sur la vis à cadran correspond à un changement de diamètre de 0,001 pouce. Les vis de réglage de la queue d'aronde sont réglées à la charge correcte par Climax et ne nécessitent aucune reprise de réglage. Un produit de freinage Vibratite-VC3 est présent sur ces vis de réglages afin d'éviter une perte de tension pendant les vibrations. Ce composé est également utilisé sur la vis de blocage et il peut s'avérer nécessaire de l'appliquer à nouveau de temps à autre le cas échéant.

La tête d'alésage micro-réglable de l'aléseuse BB7100 est fournie avec un porte-outil à section carrée de 3/4 de pouce. Une cale boulonnée est fournie sur le porte-outil de ¾ de pouce de manière à ce qu'il soit rapidement convertible en porte-outil de ½ pouce.



Pour configurer la coupe avant et la coupe arrière, déplacez simplement les têtes d'alésage contre les vis de montage dans le sens opposé.

Une petite vis de blocage stoppe le chariot de l'outil pour qu'il ne sorte pas de son support et la tête d'alésage ne doit jamais être utilisée sans celui-ci.

L'entretien approprié de cette installation implique le nettoyage et la lubrification des surfaces de la queue d'aronde et des filets et rainures de la vis à cadran, et si la vis de blocage à tendance à se desserrer au bout de quelque temps, appliquer le produit de freinage Vibrative VC-3 fourni.

Configuration de la tête d'alésage.

1. Sélectionnez les pièces nécessaires à l'aide du tableau "Gamme de cales empilables pour outil de tête d'alésage".
2. En utilisant le dessin comme guide, assembler les cales empilables sur le porte-outil de manière symétrique sur les deux côtés du support d'outil, des plus petites aux plus grandes.
3. Monter la tête d'alésage et le contrepoids sur les cales empilables.

TABLEAU DE LA GAMME DES CALES EMPILABLES POUR OUTIL DE TÊTE D'ALÉSAGE MICROMÉTRIQUE BB7100 DIAMÈTRES de 10.25" à 58.25"			
PLAGE DE DIAMÈTRE D'ALÉSAGE EN POUCES (mm)	**NOMBRE DE CALES EMPILABLES REQUISES**		
	cale de 2"	**cale de 4"**	**cale de 8"**
10.25"-14.25" (260,35-362)	0	0	0
14.25"-18.25" (362-463,5)	1	0	0
18.25"-22.25" (463,5-565,2)	0	1	0
22.25"-26.25" (565,2-666,7)	1	1	0
26.25"-30.25" (666,7-768,3)	0	0	1
30.25"-34.25" (768,3-870)	1	0	1
34.25"-38.25" (870-971,5)	0	1	1
38.25"-42.25" (971,5-1073,1)	1	1	1
42.25"-46.25" (1073,1-1174,7)	0	0	2
46.25"-50.25" (1174,7-1276,3)	1	0	2
50.25"-54.25" (1276,3-1378)	0	1	2
54.25"-58.25" (1378-1479,5)	1	1	2

TABLEAU DE LA GAMME DES CALES EMPILABLES POUR OUTIL DE TÊTE D'ALÉSAGE PLEINE BB7100 DIAMÈTRES de 12.9" à 61.4"				
PLAGE DE DIAMÈTRE D'ALÉSAGE EN POUCES (mm)	**NOMBRE DE CALES EMPILABLES REQUISES**			
	cale de 0.75"	**cale de 2"**	**cale de 4"**	**cale de 8"**
12.9-15.9 (327,66-403,86)	0	0	0	0
14.4-17.4 (365,76-441,96)	1	0	0	0

16.9-19.9 (429,26-505,46)	0	1	0	0
18.4-21.4 (467,36-543,56)	1	1	0	0

TABLEAU DE LA GAMME DES CALES EMPILABLES POUR OUTIL DE TÊTE D'ALÉSAGE PLEINE BB7100 **DIAMÈTRES de 12.9" à 61.4"**				
PLAGE DE DIAMÈTRE D'ALÉSAGE EN POUCES (mm)	**NOMBRE DE CALES EMPILABLES REQUISES**			
	CALE de 0.75"	**cale de 2"**	**cale de 4"**	**cale de 8"**
20.9-23.9 (530,86-607,06)	0	0	1	0
22.4-25.4 (568,96-645,16)	1	0	1	0
24.9-27.9 (632,46-708,66)	0	1	1	0
26.4-29.4 (670,56-746,76)	1	1	1	0
28.9-31.9 (734,06-810,26)	0	0	0	1
30.4-33.4 (772,16-848,36)	1	0	0	1
32.9-35.9 (835,66-911,86)	0	1	0	1
34.4-37.4 (873,76-949,96)	1	1	0	1
36.9-39.9 (937,26-1013,46)	0	0	1	1
38.4-41.4 (975,36-1051,56)	1	0	1	1
40.9-43.9 (1038,86-1115,06)	0	1	1	1
42.4-45.4 (1076,96-1153,16)	1	1	1	1
44.9-47.9 (1140,46-1216,66)	0	0	0	2
46.4-49.4 (1178,56-1254,76)	1	0	0	2
48.9-51.9 (1242,06-1318,26)	0	1	0	2
50.4-53.4 (1280,16-1356,36)	1	1	0	2
52.9-55.9 (1343,66-1419,86)	0	0	1	2
54.4-57.4 (1381,76-1457,96)	1	0	1	2

56.9-59.9 (1445,26-1521,46)	0	1	1	2
58.4-61.4 (1483,36-1559,56)	1	1	1	2

Pour installer la tête d'alésage micrométrique

1. Montez le porte-outil sur la barre.
2. Montez les cales empilables fournies sur le porte-outil afin d'atteindre la plage de diamètres d'alésage désirée.
3. Montez la tête d'alésage et le contrepoids sur les cales empilables du haut.
4. Montez l'outil à section carrée et le régler en fonction du diamètre d'alésage désiré.
5. Avant de procéder à l'installation mettez hors tension et verrouillez l'alimentation électrique sur le groupe d'alimentation.
6. Assurez-vous de la propreté de tous les raccords des tuyaux hydrauliques flexibles.
7. Brancher les conduites hydrauliques entre le groupe d'alimentation et le moteur hydraulique comme indiqué dans le manuel d'instructions du groupe d'alimentation.
8. Branchez le groupe d'alimentation à une prise mise à la terre.

	**ATTENTION** **L'utilisation prolongée de ce groupe d'alimentation hydraulique sans raccorder le moteur hydraulique causera une surchauffe du système et pourrait endommager la pompe.**

	**AVERTISSEMENT** **Afin d'éviter des préjudices pouvant être causés par les projections de copeaux ou le niveau sonore important, il est recommandé de porter un équipement de protection individuelle pendant l'utilisation de la machine.**

Faites tourner par à-coups le moteur du groupe d'alimentation pour vous assurer que le moteur de pompe tourne dans le même sens que la flèche située sur l'accouplement moteur/pompe. Si le moteur tourne dans le mauvais sens et que vous utilisez un groupe d'alimentation Climax :

- Débranchez et verrouillez l'alimentation du groupe d'alimentation électrique.
- Ouvrez le boîtier électrique.
- identifiez les fils L1, L2, et L3 sur le bornier.
- Intervertir deux fils quelconques.
- Refermez le boîtier.

FONCTIONNEMENT

Contrôles préalables au démarrage

AVERTISSEMENT

Lors de la configuration ou de l'entretien de la machine, débranchez la source d'alimentation électrique et verrouillez la machine. Le non-respect de cette consigne peut conduire à un démarrage accidentel de la machine et à de graves blessures pour vous-mêmes ou votre entourage.

Brides de serrage

P/N 42792 - Les brides se présentent en ensembles appariés et doivent être utilisées pour la fixation de la barre lorsque la machine est dans le sens vertical.

Elles évitent le coulissement de la barre dans les paliers de support ou sa chute.

Pour éviter le serrage trop important des paliers, les brides de serrage doivent être placées au-dessus d'au moins 2 paliers de support dans le sens vertical.

DANGER

Pour éviter le coulissement de la barre dans les paliers de support, ou sa chute, utilisez les 2 brides de serrage fournies dans le kit d'outillage lorsque la barre d'alésage est utilisée dans le sens vertical. Serrez au couple de serrage de 46 ft.-lbs (62 Nm)!

Avant d'utiliser la machine :

1. Arrimez les bras de réaction du bloc d'entraînement rotatif et la tige à butée du bloc d'avance axiale.
2. Assurez-vous que le plein d'huile du bloc d'entraînement rotatif est correct.
3. Assurez-vous que tous les éléments de coupe sont tranchants et en bon état.
4. Sécurisez toutes les parties de la machine, y compris le porte-outil axial, la tête d'outil et l'outil de coupe. Assurez-vous que toutes les pièces mobiles se déplacent librement.
5. Mettez hors tension le groupe d'alimentation hydraulique
6. Assurez-vous que le câblage du groupe d'alimentation hydraulique est compatible avec la source électrique. Branchez le groupe d'alimentation hydraulique à une prise mise à la terre.
7. Contrôlez le niveau du réservoir du groupe d'alimentation hydraulique. Remplissez le réservoir au-dessus de la barre rouge avec de l'huile hydraulique anti-usure Mobil DTE-24 ou équivalente. Assurez-vous que le groupe d'alimentation est de niveau.

8. Nettoyez les tuyaux hydrauliques flexibles et les raccords avant leur branchement.
9. Assurez-vous que le moteur de la pompe du groupe d'alimentation hydraulique tourne dans le sens indiqué par la flèche située sur l'accouplement moteur/pompe.

Démarrage de la machine

La machine Climax BB71000 est prévue pour une utilisation à différentes vitesses de rotation et d'avance. La vitesse de rotation est contrôlée en faisant varier le débit du groupe d'alimentation hydraulique (HPU). La vitesse d'avance du bloc mécanique est contrôlée manuellement par le bloc d'avance.

1. Mettez hors tension le groupe d'alimentation hydraulique.

Pour l'alésage :

Réglez le sens de l'avance sur l'avance axiale.

Réglez la vitesse d'avance sur l'avance axiale.

Pour le surfaçage :

Réglez le sens de l'avance sur la position NEUTRAL (POINT MORT).

Verrouillez le porte-outil sur la barre au moyen des patins réglables.

Réglez le mécanisme de déclenchement automatique sur le tête de surfaçage.

1. Mettez sous tension le groupe d'alimentation hydraulique.
2. Réglez la rotation de la barre à la vitesse désirée.
3. Appliquer le liquide de coupe pendant l'exécution de la coupe.

Arrêt de la machine

L'avance axiale est entraînée par la rotation de la barre d'alésage. L'arrêt de la barre stoppe également l'avance.

	IMPORTANT
	**En cas d'urgence, mettez hors tension le groupe d'alimentation hydraulique.**

Pour arrêter la machine

1. Arrêtez le groupe d'alimentation hydraulique.
2. Mettez hors tension et verrouillez le groupe d'alimentation.
3. Après l'immobilisation complète de la machine, utilisez une brosse pour enlever les copeaux.

ATTENTION

Pour éviter tout dommage corporel par la projection de copeaux, ne pas utiliser d'air comprimé pour les éliminer.

Usinage répétitif

Pour configurer la machine en vue de l'usinage répétitif

1. Inverser le sens de l'avance axiale (tête d'outil).
2. Faire revenir manuellement ou automatiquement l'avance de la tête d'outil au début de la coupe.
3. Affûter l'outil de coupe ou remplacer les plaquettes carbure si nécessaire.
4. À l'aide d'un comparateur, réajuster la profondeur tranchante de l'outil de coupe. La profondeur tranchante maximale recommandée est de 1/8" (3 mm).
5. Faites fonctionner la barre d'alésage conformément aux instructions contenues dans la rubrique «Démarrage de la machine».

ATTENTION

La barre n'est pas durcie. Pour éviter tout endommagement de la barre, ne pas heurter celle-ci contre les supports de palier ou contre la pièce à usiner.

DEMONTAGE

Pour démonter la machine

1. Mettez hors tension et verrouillez le groupe d'alimentation hydraulique.
2. Débranchez les tuyaux hydrauliques flexibles du moteur.
3. Retirez l'outil de coupe ou la cartouche en carbure de la tête d'outil.
4. Retirez la tête de l'outil et le porte-outil.
5. Retirez l'avance axiale de la barre.
6. Soutenez solidement la barre d'alésage, les supports de palier et l'entraînement rotatif avec des palans.
7. Si l'entraînement rotatif est placé entre les ensembles support de palier, commencez par déposer un support de la façon suivante :
   - Desserrez la cartouche de palier.
   - Desserrez le support sur la pièce à usiner.
   - Retirez le support de la barre.
8. Sécurisez l'entraînement rotatif avec un palan.
9. Desserrez les six vis de blocage dans l'entraînement rotatif.
10. Extrayez les bagues de verrouillage de l'entraînement de barre en vissant les quatre vis de poussée.
11. Retirez une bague de verrouillage. Retirez la clavette d'entraînement.
12. Faites glisser doucement le bloc d'entraînement rotatif en dehors de la barre.
13. Desserrez les cartouches de palier.
14. Déposez la barre d'alésage.
15. Retirez la/les support(s) de palier de la pièce à usiner.

Autre solution de démontage

Pour retirer les supports avant de déposer la barre

1. Mettez hors tension et verrouillez le groupe d'alimentation hydraulique.
2. Débranchez les tuyaux hydrauliques flexibles du moteur hydraulique.
3. Retirez l'outil de coupe ou la cartouche en carbure de la tête d'outil.
4. Retirez la tête de l'outil et le porte-outil.
5. Soutenez solidement la barre d'alésage, les supports de palier et l'entraînement rotatif avec des palans.
6. Retirez l'avance axiale de la barre.
7. Si l'entraînement rotatif est placé entre les ensembles support de palier, déposez d'abord un support :
   - Desserrez la cartouche de palier.
   - Desserrez le support sur la pièce à usiner.
   - Retirez le support de la pièce d'usinage.
8. Sécurisez l'entraînement rotatif avec un palan.
9. Desserrez les six vis de blocage dans l'entraînement rotatif.
10. Extrayez les bagues de verrouillage de l'entraînement de barre en vissant les quatre vis de poussée.
11. Retirez une bague de verrouillage.
12. Retirez la clavette d'entraînement.
13. Faites glisser doucement le bloc d'entraînement rotatif en dehors de la barre.
14. Desserrez les cartouches de palier.
15. Placez un berceau de bois propre au bas de l'alésage.
16. Retirez la/les support(s) de palier de la pièce à usiner.
17. Faites glisser la barre en dehors de l'alésage en utilisant le berceau.

ENTRETIEN

Lubrifiants recommandés

Lubrifiant	Marque	À utiliser sur
Graisse pour engrenages	UNOBA EP #0	Cartouches de palier
Huile pour entraînement rotatif	Mobil SHC 634 Synthetic	Engrenages de boîte de transmission
Huile légère	LPS 2	Surfaces non peintes
Huile de coupe	UNOCAL KOOLKUT	Outils de coupe, pièce d'usinage
Huile hydraulique	Huile hydraulique anti-usure Mobil DTE-24	Groupe d'alimentation hydraulique et moteur

ATTENTION

Utilisez uniquement les produits lubrifiants préconisés afin d'éviter tout dommage.

Barre d'alésage et vis-mère

Nettoyez fréquemment la vis-mère et la barre d'alésage pendant l'utilisation. Éloignez les copeaux du filetage de la vis-mère. Lubrifiez à intervalles réguliers la vis-mère avec de l'huile légère afin d'assurer un déplacement en douceur de l'entraînement rotatif. Avant l'entreposage, huilez légèrement la barre afin de prévenir la formation de rouille. NE PAS GRAISSER LA VIS-MÈRE

Avance axiale

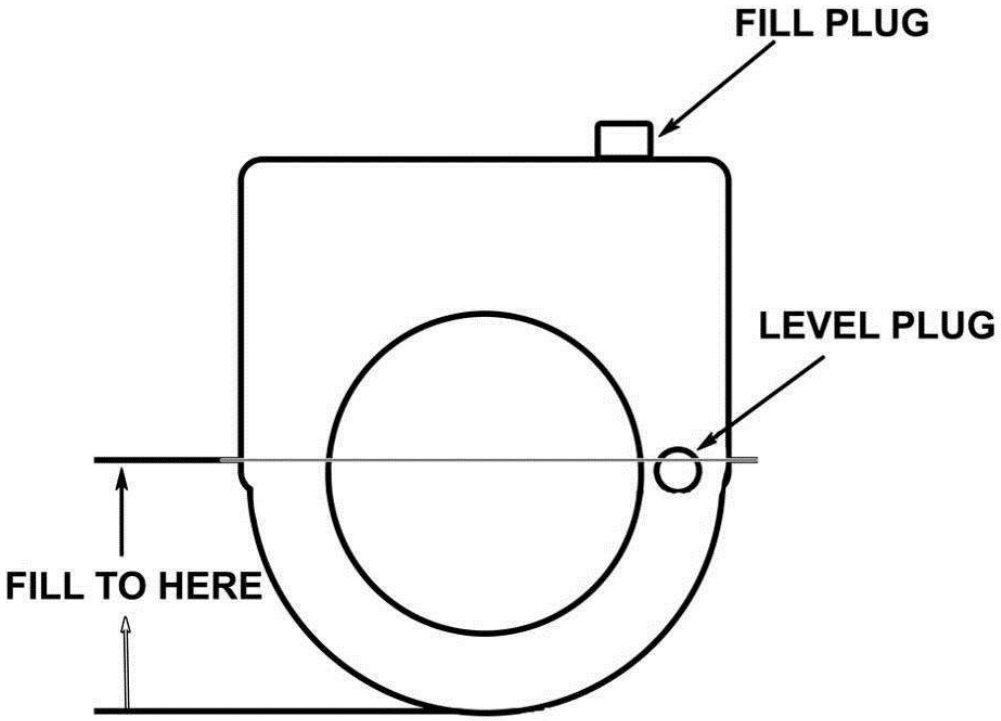
En conditions normales d'utilisation, l'avance axiale ne nécessite pas d'entretien.

Entraînement rotatif

En conditions normales, changez l'huile de la boîte de transmission de l'entraînement rotatif toutes les 500 heures. Lubrifiez la boîte de transmission de l'entraînement principal toutes les 500 heures avec une huile pour engrenages Aero-Lube SAE 90 ou équivalente.

Pour remplir la boîte de transmission :

1. À l'aide de l'anneau de levage, placez la boîte de transmission en position verticale. Fixez la boîte de transmission de manière à ce qu'elle ne puisse pas bouger.
2. Retirez le bouchon de remplissage et le bouchon de niveau.



Remplissage d'huile de la boîte de transmission

3. Remplissez la boîte de transmission (par le trou de remplissage) jusqu'à ce que l'huile sorte du trou de niveau.
4. Remettez en place le bouchon de niveau.
5. Ajoutez un quart (0,94 L) d'huile supplémentaire.
6. Remettez en place le bouchon de remplissage.

Support de palier

Ensembles support de palier montés en extrémité

Graissez périodiquement la cartouche de palier en pompant la graisse par le raccord de graissage dans le boîtier.

Avant l'entreposage, huilez légèrement l'ensemble afin d'éviter la rouille.

Ensembles support de palier montés en diamètre intérieur (DI)

Si les mors adhèrent à l'intérieur des blocs, extrayez les mors et graissez les engrenages à vis sans fin à l'intérieur des blocs.

Graissez périodiquement la cartouche de palier

Tête d'alésage

Huilez légèrement toutes les pièces afin de prévenir la formation de rouille.

Tête de surfaçage mécanique

Avant et fréquemment pendant le fonctionnement, lubrifiez le support de tête d'outil avec de l'huile pour glissières par le raccord de graissage. Brossez les copeaux sur la vis-mère afin d'éviter l'endommagement des filets. Huilez légèrement la vis-mère à intervalles réguliers pour assurer un déplacement en douceur du porte-outil. Lors du changement des porte-outils, appliquez de l'huile pour glissières sur les glissières de queue d'aronde.

Porte-outil axial

Huilez légèrement toutes les pièces afin de prévenir la formation de rouille.

STOCKAGE

Un bon stockage de la machine d'alésage portative Modèle BB7100 évitera sa détérioration ou son endommagement indu. Avant de stocker la machine, nettoyez-la avec un solvant afin d' éliminer l'excès de graisse, les copeaux métalliques et l'humidité. Pulvérisez sur la machine une couche de protection contre l'humidité (LPS1 ou LPS2 pour le stockage à court-terme, LPS3 pour le stockage à long terme) afin de prévenir la formation de rouille. Stockez la machine dans les boîtes fournies. Placez des sachets déshydratants ou un pare-vapeur autour de la machine pour absorber l'humidité.

PIECES DE RECHANGE

Le tableau suivant répertorie les pièces les plus fréquemment remplacées en raison de l'usure, de la perte ou de tout dommage. Pour éviter les temps d'arrêt indésirables vous pourrez opter de stocker les éléments énumérés ci-dessous.

Problème	Vérification
Le bloc d'avance axiale ne fait pas avancer la barre d'alésage.	Assurez-vous que le sens de l'avance est réglé dans la position désirée.
	Nettoyez la vis mère
	Vérifiez que la vitesse d'avance n'est pas trop basse.
	Assurez-vous que le bloc d'avance axiale est solidement fixé sur l'extrémité de la barre.
Broutement	Réaffûtez l'outil de coupe ou remplacez les plaquettes carbure si nécessaire.
	Réglez la vitesse d'avance.
	Augmentez ou réduisez la vitesse du moteur hydraulique.
	Changez la profondeur de coupe.

NO DE PIÈCE	DESCRIPTION	QUANTITÉ	À UTILISER SUR
15549	Écrou de réglage du palier de vis-mère	2	Barre d'alésage
15173	Rondelle de butée	4	
12446	Palier de butée	2	
15172	Roulement à aiguilles	2	
15555	Clavette d'entraînement de barre	1	
15754	Tige de déclenchement	1	Avance axiale mécanique
15608	Joint	2	Entraînement rotatif
15768	Joint	2	
18432	Ressort d'extension	3	Tête de surfaçage
10532	Palier d'embrayage à rouleaux	1	
18399	Boîtier d'embrayage axial	1	
15214	Écrou de vis-mère axiale	1	Porte-outil axial
15826	Racleur de tige	2	
21114	Élément de filtre hydraulique	2	Groupe d'alimentation hydraulique
19259	Clavette de blocage palier	1	Kit d'outils
16496	Clé ajustable	1	
15367	Clé à sangle	1	

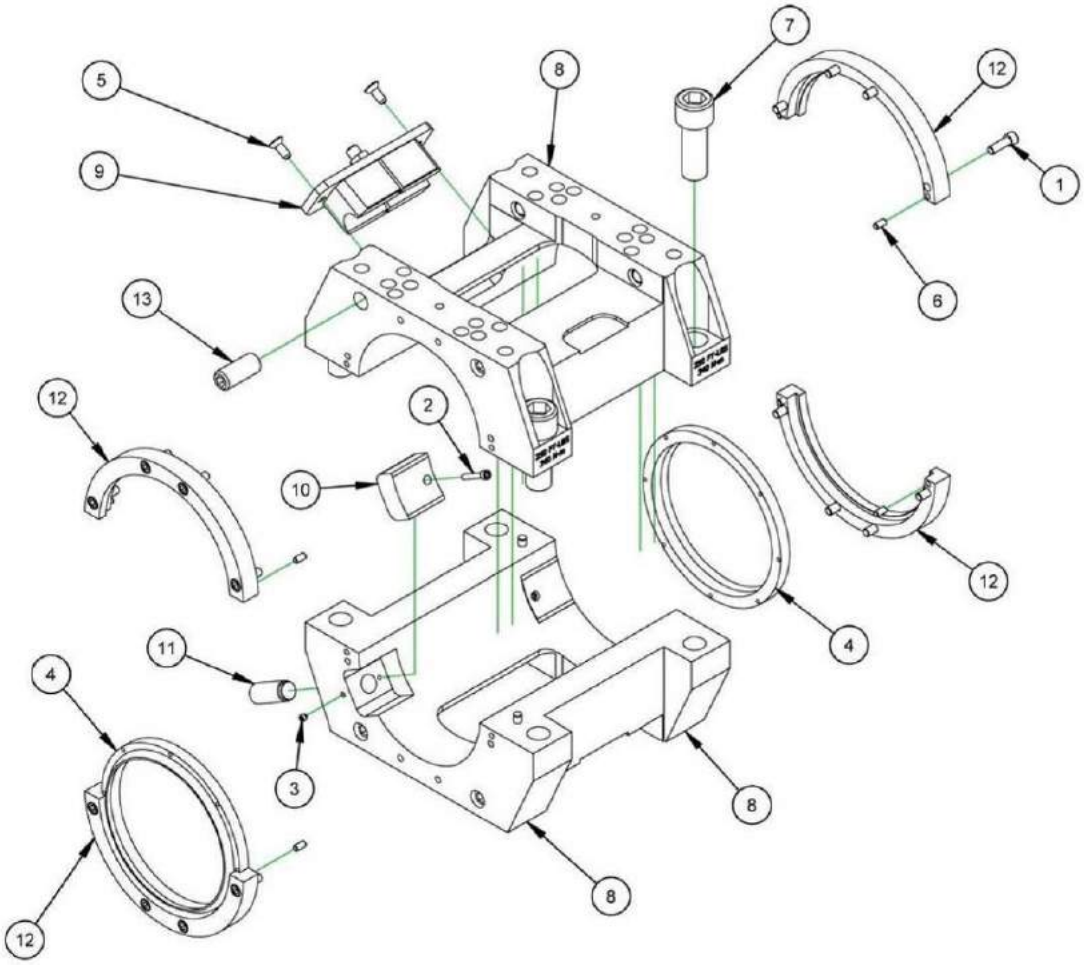
KIT D'OUTILS

KIT D'OUTILS BB7100 P/N 54263

NO DE PIÈCE	DESCRIPTION	QUANTITÉ	UOM
10855	RALLONGE CLÉ, EMBOUT 3/8 X 6	1	Pièce
11856	RONDELLE 5/8 FLTW	4	Pièce
12339	RONDELLE 3/4 FLTW	2	Pièce
12800	CLÉ EMBOUT 15/16	1	Pièce
12835	CLÉ EMBOUT 1-1/8 COMBINAISON LONGUE (KB)	1	Pièce
14735	RALLONGE CLÉ, EMBOUT 1/2 X 10	1	Pièce
14818	CLÉ À CLIQUET, EMBOUT 1/2	1	Pièce
15367	CLÉ À SANGLE 1-3/4 LARGE X 48 LONG	1	Pièce
16792	CLÉ EMBOUT 3/8 COMBINAISON	1	Pièce
17378	VIS 5/8-11 X 2-1/4 HHCS	4	Pièce
19261	DOUILLE 3/8 6 PT X EMBOUT 3/8	1	Pièce
19700	TOIT PLAT DE CONTENEUR D'EXPÉDITION 20 X 8.75 X 10.5	1	Pièce
20869	JEU DE CLÉ HEX 5/64 À 3/4 15 PIÈCES	1	Pièce
21406	VIS 3/4-10 X 2 HHCS	2	Pièce
24751	CLÉ À CLIQUET, EMBOUT 3/8	1	Pièce
29661	CLÉ À POIGNÉE RABATTABLE,, EMBOUT 1/2, POIGNÉE 17 IN (KB)	1	Pièce
33999	JEU DE CLÉS HEX 0050 - 3/8ROTULE EMBOUT BONDHUS (KB)	1	Pièce
42792	BRIDE DE SERRAGE 5 DI X 6-1/4 DE X 7/8 2 PIÈCES	2	Pièce
54411	SÉCURITÉ RDU 6IN	1	Pièce
54412	SÉCURITÉ RDU 6.5IN	1	Pièce
55045	JEU DE DOUILLES HEX 10 PIÈCES 1/2 X 3/8 EMBOUT	1	Pièce
55572	SUPPORT D'OUTIL BB7100	1	Pièce
55769	MANUEL D'INSTRUCTIONS BB7100 BARRE D'ALÉSAGE DIAM. 5	1	Pièce
56636	CLÉ PLATE POUR PALIER DODGE IMPERIAL DIAM. 5 OFFSET 0.6 IN	1	Pièce

PIÈCES ET VUES ÉCLATÉES

Les diagrammes suivants et les listes de pièces sont donnés à titre indicatif seulement. La garantie limitée de la machine est nulle si la machine a été modifiée par quiconque n'ayant pas été autorisé par écrit pour effectuer des opérations d'entretien sur la machine par Climax Portable Machining & Welding Systems.



PARTS LIST		
ITEM	PART No.	DESCRIPTION
1	12647	SCREW 1/4-28 X .75 SHCS
2	12880	SCREW 8-32 X 1 SHCS
3	12897	SCREW 10-32 X 3/16 SSSNT
4	15826	WIPER ROD 5 MOLYHANE
5	22496	SCREW 1/4-20 X 5/8 FHSCS
6	25578	PIN DOWEL 3/16 DIA X 3/8
7	28757	SCREW 3/4-16 X 2 SHCS
8	53850	TOOL CARRIER BB7100
9	54134	ADJUSTABLE NUT AXIAL LEAD SCREW 1-5 ACME
10	54179	SHOE ADJUSTABLE TOOL CARRIER BB7100
11	55307	SCREW 5/8-18 X 1.55 SSSFP MODIFIED
12	55446	SEAL HOUSING TOOL CARRIER BB7000
13	55564	SCREW ASSY 5/8-18 X 1-1/2 SSSFP WITH NYLON BALL TIP

TOOL CARRIER ASSY BB7100 53922

PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
2	16	11118	SCREW 1/4-20 X 1 SHCS
3	2	12579	FTG PLUG 1/2 NPTM SOCKET
4	1	14684	PLATE SERIAL NUMBER
5	1	15093	KEY 3/8 SQ X 1.50 RADIUS BOTH ENDS
6	4	15602	BRG NEEDLE 1-5/8 ID X 2 OD X 5/8
7	4	15605	BRG THRUST 1.750 ID X 2.500 OD X .0781
8	8	15607	WASHER THRUST 1.750 ID X 2.500 OD X .123
9	2	15608	SEAL 6.000 ID x 7.500 OD x .500 CRWA1 DBL LIP
10	2	15621	BRG CONE 6.2500 ID X .9375 WIDE
11	2	15622	BRG CUP 8.0938 OD X .7188 WIDE
12	2	15624	LOCK RING
13	1	15672	DRIVE SHAFT ROTATIONAL DRIVE
14	1	15673	JACK SHAFT ROTATIONAL DRIVE
15	1	15679	JACK GEAR ROTATIONAL DRIVE
16	1	15680	GEAR BULL ROTATIONAL DRIVE
17	10	15743	SCREW 3/8-16 X 4 SHCS
18	2	15784	SHIM SET
19	2	16174	EYE LIFTING 5/8 MODIFIED
20	1	19294	ARM TORQUE ASSY
21	1	34735	LABEL WARNING 3-1/2 X 4
22	1	45463	HOUSING RDU BB7000 5 DIA BAR

DRIVE ROTATIONAL ASSY 10.59:1 5 BAR 15606

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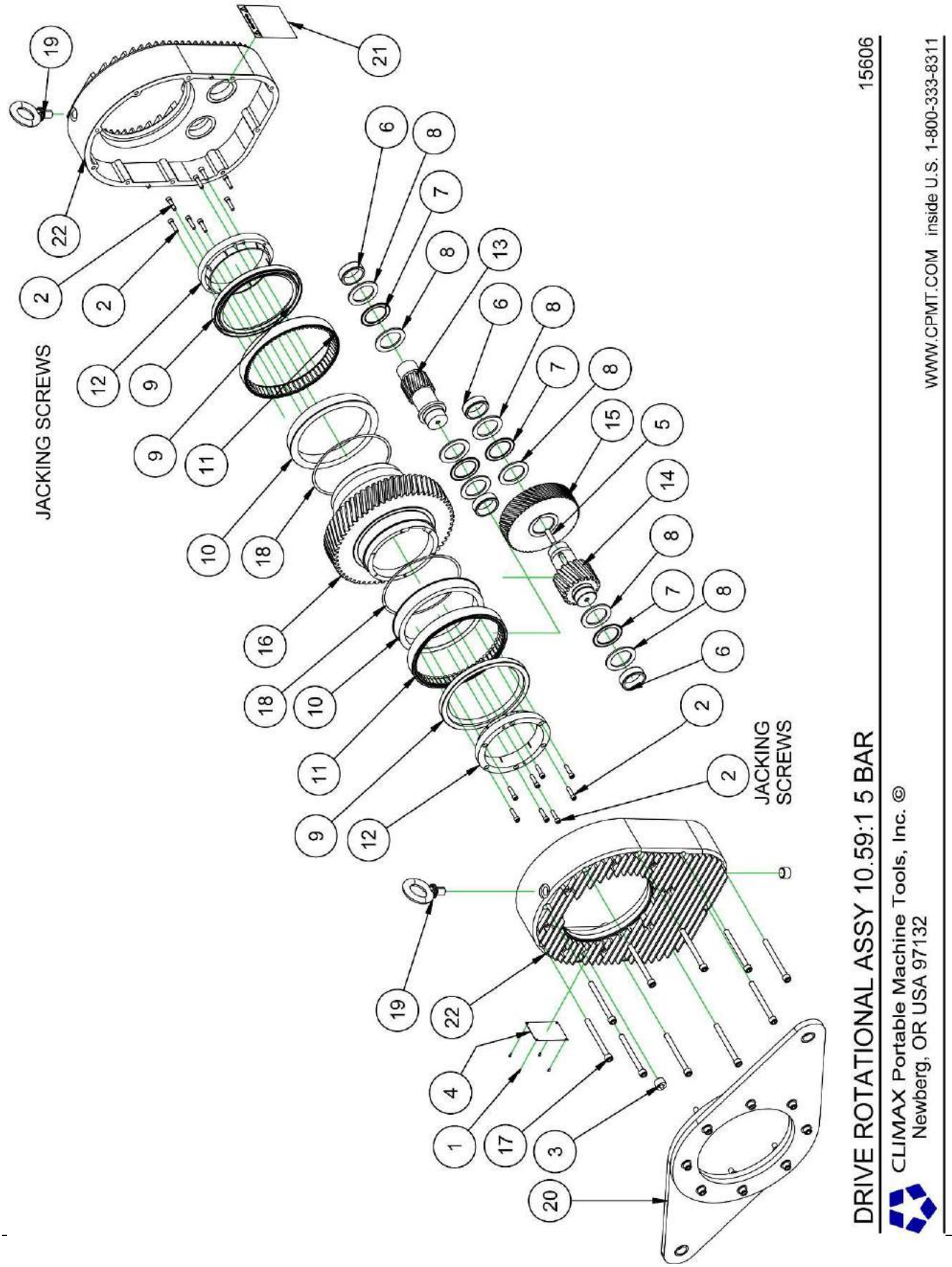
JACKING SCREWS
JACKING SCREWS
DRIVE ROTATIONAL ASSY 10.59:1 5 BAR
15606
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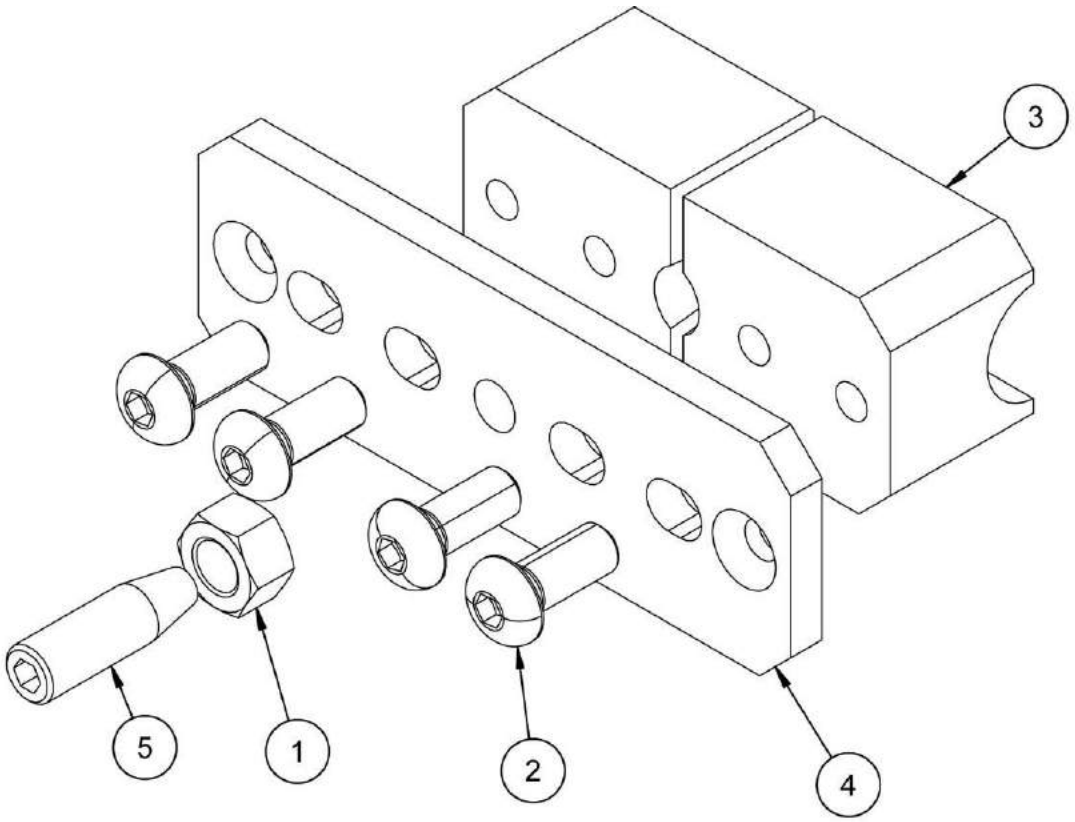

PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	1	10536	NUT 3/8-24 STDN
2	4	14771	SCREW 5/16-18 X 3/4 BHSCS
3	2	54135	NUT AXIAL LEAD SCREW 1-5 ACME BB7100 MATCHED SET
4	1	54136	ADJUSTABLE HALFNUT BACK PLATE BB7100
5	1	54137	SCREW MODIFIED 3/8-24 SSS 10 DEG TAPER

ADJUSTABLE NUT AXIAL LEAD SCREW 1-5 ACME 54134

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PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	1	42371	ASSY FEED SELECTOR
2	1	42374	BOX GEAR AXIAL FEED MECH 5 DIA STRAIGHT MNT
3	2	15746	STUD 1/4-20 X 1.75
4	2	15745	BALL 3/4 DIA BLACK PLASTIC X 1/4-20
5	1	42376	COVER AXIAL FEED
6	2	15728	BRG NEEDLE 5/8 ID X 13/16 OD X .500 CLOSED
7	2	15713	ROCKER FEED
8	2	12385	BRG ROLLER CLUTCH 3/4 X 1.0 X 1.0
9	2	15750	BRG CAM FOLLOWER .750 OD X .500 WIDE W/STUD
10	1	15718	SHAFT FEED
11	2	13492	BRG ROLLER CLUTCH 3/8 X 5/8 X .875
12	1	15710	CAM STATIONARY
13	5	15729	RING SNAP 63/64 OD (25mm0
14	1	15711	CAM ADJUSTABLE
15	4	10670	SCREW 1/4-20 X 3/8 SHCS
16	1	15716	HOLDER TORQUE ARM
17	1	15717	PLATE FEED ADJUSTING
18	3	15726	BRG BALL .9843 ID X 1.8504 OD X .4724 W/SEALS
19	2	10595	WASHER 3/8 LOCW
20	2	10536	NUT 3/8-24 STDN
21	4	11739	WASHER THRUST .750 ID X 1.250 OD X .0312
22	3	10612	RING SNAP 3/4 OD
23	2	10058	WASHER THRUST .375 ID X .812 OD X .030
24	1	15730	RING O 3/32 X 1/2 ID X 11/16 OD
25	2	11019	RING SNAP 5/8 OD
26	1	12578	SCREW 5/16-18 X 2-3/4 SHCS
27	3	10819	PIN ROLL 1/8 DIA X 5/8
28	1	15724	KEY 1/4 SQ X 1.37 SQ BOTH ENDS
29	1	10850	PIN ROLL 3/16 DIA X 3/4

MECHANICAL AXIAL FEED ASSEMBLY

42407

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PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
30	1	15725	KEY 1/8 SQ X .62 SQ
31	1	15747	KNOB 1-3/4 DIA 1/4-20 X 1 LG STUD
32	1	15754	ROD TRIP
33	1	15744	SCREW 5/16-18 X 3/8 SSSFP
34	1	15720	DIAL MANUAL FEED
35	1	15731	RING O 1/16 X 1 ID X 1-1/8 OD
36	1	15732	DETENT BALL 3/8-16 X 5/8 STANDARD PRESSURE
37	2	15749	SPRING COMP .48 OD X .042 WIRE X 1.62 LONG
38	1	42375	BLOCK FEED SELECTOR
39	4	11211	SCREW 3/8-16 X 1-3/4 SHCS
40	2	10436	WASHER THRUST .500 ID X .937 OD X .060
41	4	20166	PIN DOWEL 1/4 DIA X 1/2
42	1	12629	WASHER THRUST .25 ID X .687 OD X .030
43	2	42385	SCREW 1/2-13 X 4-3/4 SHCS
44	2	11218	NUT 1/2-13 JAMN
45	2	11823	WASHER THRUST .625 ID X 1.125 OD X .030
46	1	42406	GEAR DRIVE
47	1	15708	SHAFT AXIAL FEED OUTWARD
48	1	15707ipt	SHAFT AXIAL FEED INWARD

MECHANICAL AXIAL FEED ASSEMBLY

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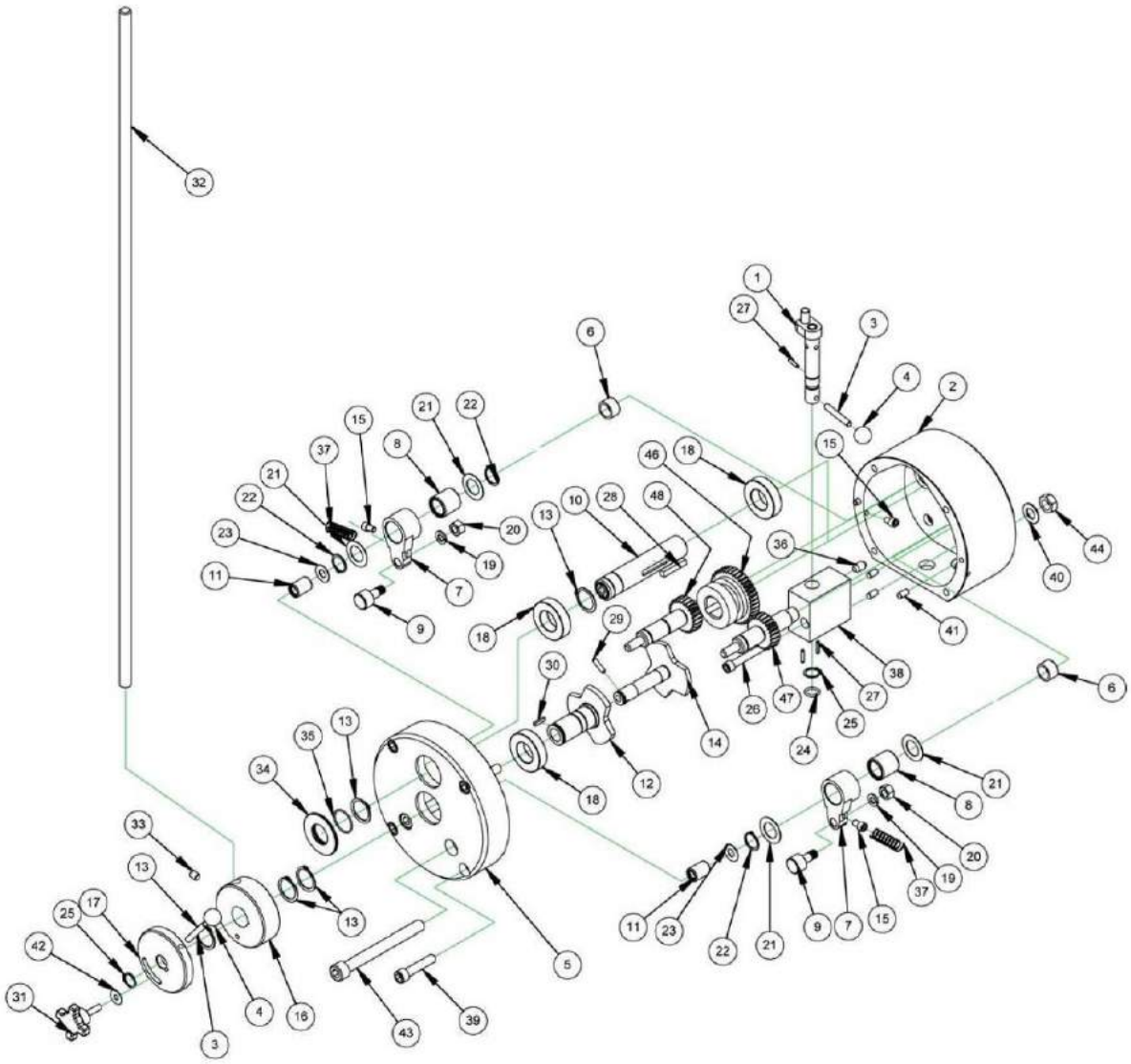

MECHANICAL AXIAL FEED ASSEMBLY

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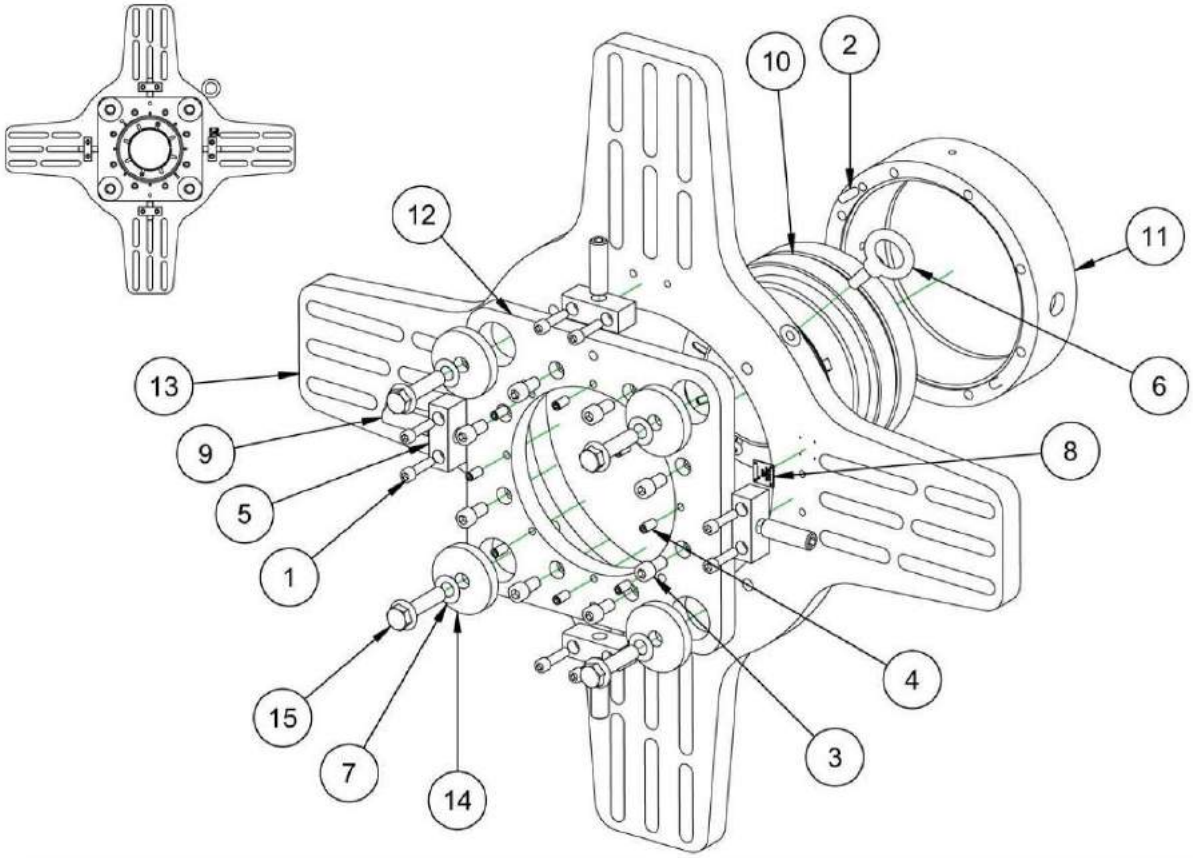

PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	8	10474	SCREW 3/8-16 X 1-1/2 SHCS
2	2	11027	PIN DOWEL 3/8 DIA X 1
3	8	15307	SCREW 1/2-13 X 1 SHCS
4	8	15322	SCREW 3/8-24 X 3/4 SSSFP
5	4	20956	BLOCK ADJUSTING
6	1	25211	EYE LIFTING 1/2-13
7	4	27172	WASHER SPRING BELLEVILLE 5/8 X 1-1/4 X .040
8	1	29152	PLATE MASS TAG
9	4	42212	SCREW MOD SSSCP 3/4-10 UNC X 2.5
10	1	47110	IMPERIAL BRG INSERT 070911 FOR 5" BAR
11	1	53683	BEARING HOUSING 5" BAR
12	1	53687	COVER BRG 5" HOUSING EXTERNAL
13	1	53708	SPIDER END BRG SUPPORT 5" BAR DIA
14	4	54239	WASHER 5/8 FLTW .7 ID 3.0 OD .5 THICK
15	4	54796	SCREW 5/8-11 X 2-1/2 HHCS FLANGED BLK OX

SPIDER ASSY END BRG SUPPORT 34.5" BB7100 53711

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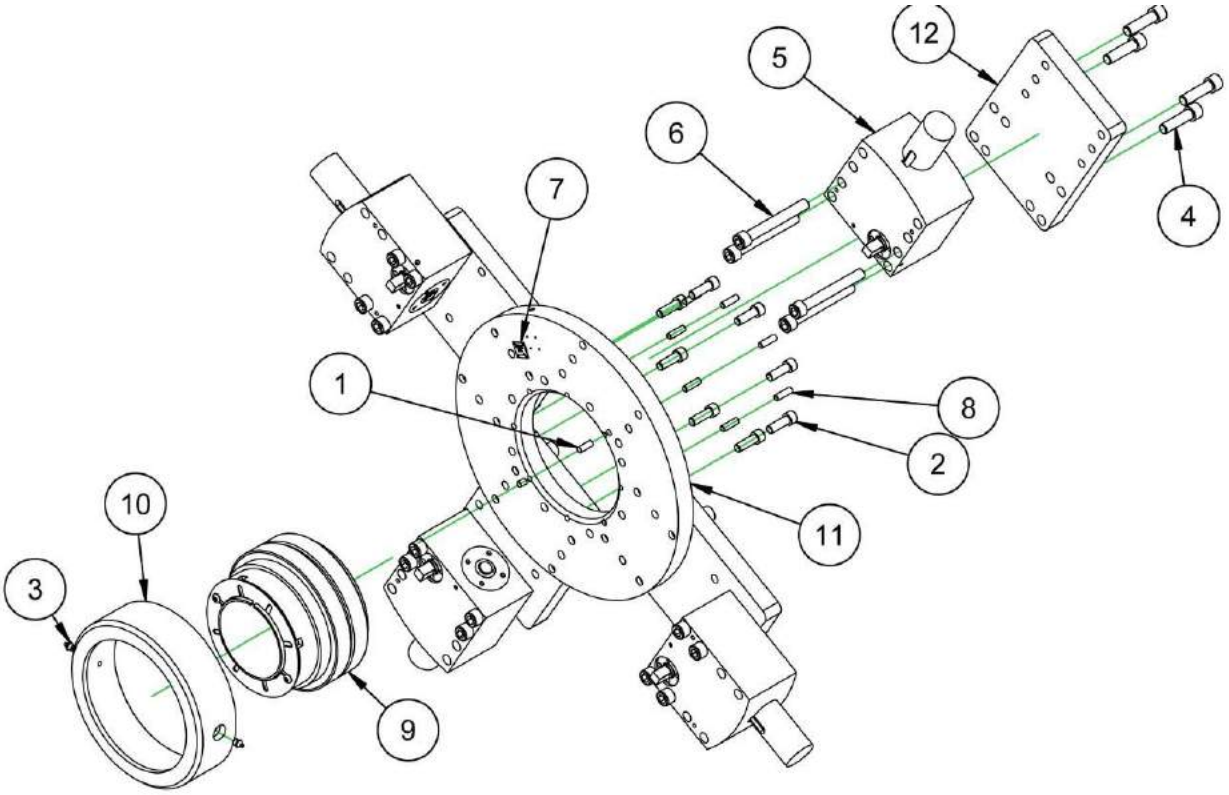

PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	2	11027	PIN DOWEL 3/8 DIA X 1
2	8	11691	SCREW 1/2-13 X 1-1/2 SHCS
3	2	11898	FTG GREASE 1/8 NPTM
4	16	12214	SCREW 5/8-11 X 2-1/4 SHCS (32X FOR 54305 AND 54310)
5	8	17438	BLOCK CENTERING ASSY (FOR 54302 AND 54310)
		54306	BLOCK CENTERING ASSY JACK BOLT (FOR 54305 AND 54311)
6	16	17805	SCREW 5/8-11 X 5 SHCS (FOR 54302 AND 54310)
7	1	29152	PLATE MASS TAG
8	8	32284	SCREW 3/8-24 X 1.25 SSSFP
9	1	47110	IMPERIAL BRG INSERT 070911 FOR 5" BAR
10	1	53683	BEARING HOUSING 5" BAR
11	1	54303	SPIDER ID 19 TO 45 DIA BB7100
12	4	54304	SPIDER EXTENSION PLATE
13	1	54309	(NOT SHOWN) SPIDER ID 45 TO 71 DIA (FOR 54310 AND 54311)

JACK BOLT 19-71 ID 54310
FACE ADJUST 19-71 ID 54311
JACK BOLT 19-45 ID 54305
(SHOWN) FACE ADJUST 19-45 ID 54302

MOUNT ID BRG ASSY

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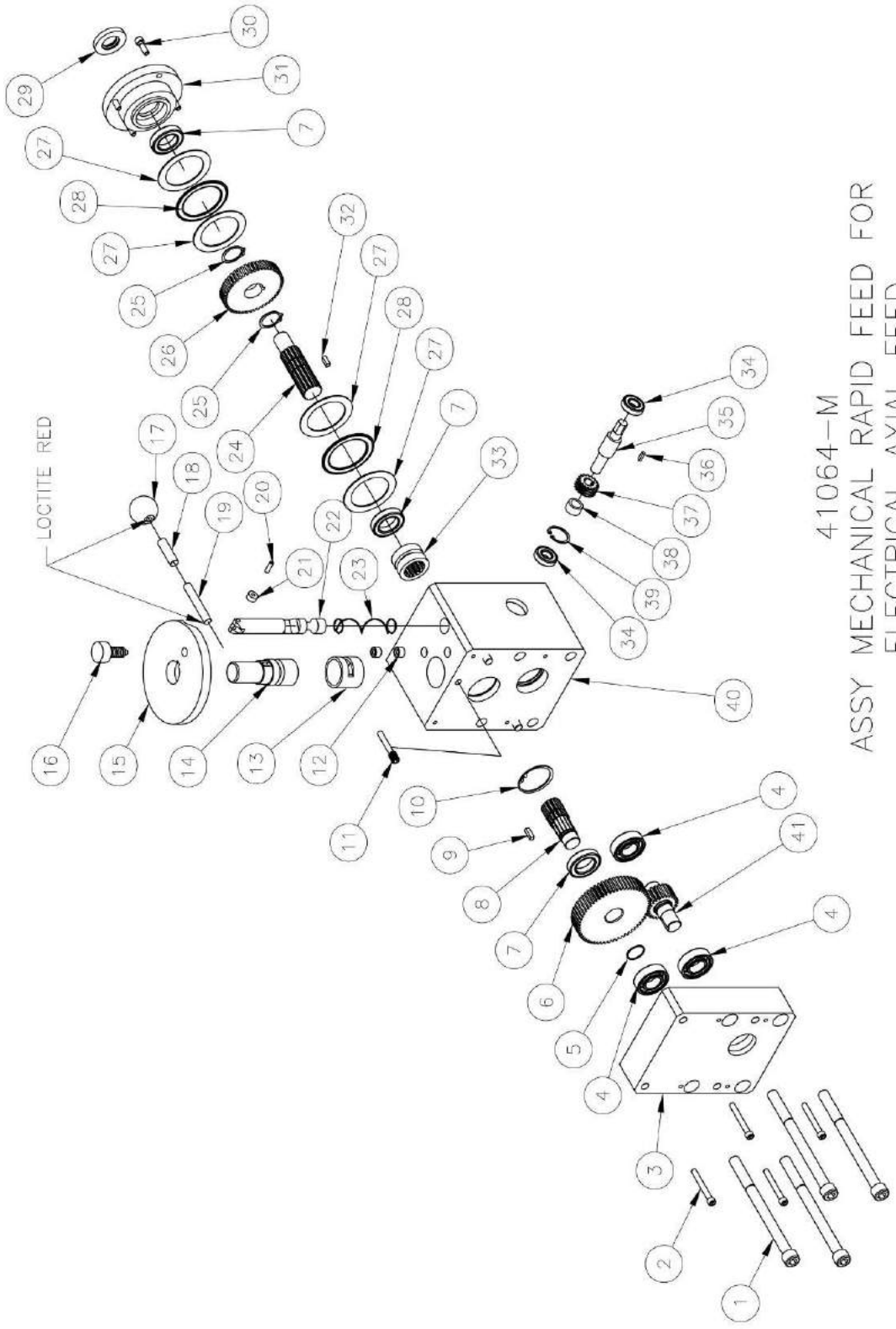
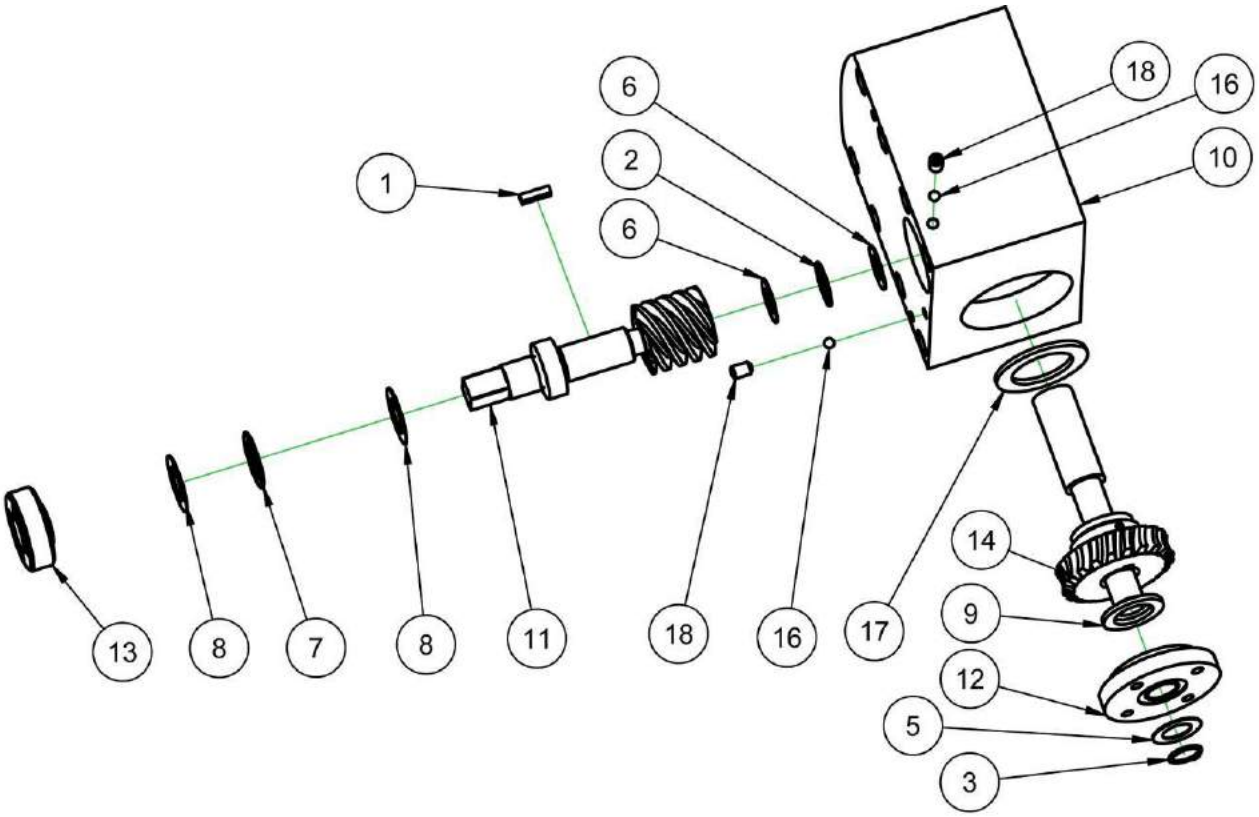
ITEM NO	QTY	PART NO	DESCRIPTION
1	4	11695	SCREW 1/2-13 X 6-1/2 SHCS
2	4	12444	SCREW 1/4-20 X 2 SHCS
3	1	41065	COVER GEARBOX HOUSING MECH RAPID
4	3	10807	BRG BALL .7874 ID X 1.6535 OD X .4724 W/SEALS
5	1	39074	RING SNAP 7/8 OD SPIRAL MED DUTY
6	1	39017	GEAR SPUR 16DP 60T 20PA .745 X .875LG STEEL
7	3	21295	BRG BALL .9843 ID X 1.6535 OD X .3543 W/SEALS
8	1	40397	DRIVE SHAFT
9	1	18146	KEY 3/16 SQ X .62 SQ BOTH ENDS
10	1	17857	RING SNAP ID 1.653 (42MM) BORE
11	1	40398	LOCK SCREW
13	1	40384	BUSHING SHIFT LEVER MODIFIED
14	1	40394	ROD SHIFT
15	1	40395	SHIFT PLATE
16	1	40402	PLUNGER SPRING 1/12-13 X .88 KNURLED KNOB BRASS
17	1	33526	KNOB BALL 1 3/8 DIA 3/8-16 THD
18	1	35508	FERRULE HANDLE
19	1	35507	STUD HANDLE
20	1	16953	PIN DOWEL 3/16 DIA X 5/8
21	1	42642	BUSHING DRILL 3/16 ID X 1/2 OD X 1/4
22	1	42631	ROD PUSH STOP RAPID FEED LOCKOUT
23	1	40472	SPRING COMP .734 OD .050 WIRE X 1.31 LONG
24	1	42593	SHAFT SPLINE OUTPUT 3/4 OD KEYED
25	2	15729	RING SNAP 63/64 OD (25MM)
26	1	40371	GEAR HELICAL STEEL MODIFIED
27	4	30021	WASHER THRUST 2.000 ID X 2.750 OD X .060
28	2	16177	BRG THRUST 2.000 ID X 2.750 OD X .0781
29	1	42602	SEAL .750 ID X 1.625 OD X .25 WIDE CRW1
30	4	10160	SCREW 1/4-20 X 3/4 SHCS
31	1	42598	CAP SEAL AND GEAR COVER
32	1	12361	KEY 3/16 SQ X .50 SQ BOTH ENDS
33	1	40383	SPLINE COUPLING
34	2	14034	BRG BALL .5000 ID X 1.1250 OD X .3125
35	1	40380	PINION SHAFT
36	1	14788	KEY 1/8 SQ X .50 SQ BOTH ENDS
37	1	12881	GEAR HELICAL 16DP 16T 14.5PA 45HA RH .5 STL H
38	1	40382	SPACER
39	1	14980	RING SNAP 1-1/8 ID
40	1	41066	BOX GEAR MAIN HOUSING MECH RAPID
41	1	39029	GEAR SPUR SHAFT INPUT
	2	42647	BUSHING DRILL 17/64 ID X 1/2 OD X 3/8
	1	10854	KEY 1/4 SQ X .37 SQ BOTH ENDS





PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	1	10217	KEY 3/16 SQ X .75
2	1	10538	BRG THRUST .625 ID X 1.125 OD X .0781
3	1	10612	RING SNAP 3/4 OD
4	1	10858	WORM 8 DP QUARD RH 1.75 14.5 PA STEEL HARDENED
5	1	11739	WASHER THRUST .750 ID X 1.250 OD X .0312
6	2	11823	WASHER THRUST .625 ID X 1.125 OD X .030
7	1	13174	BRG THRUST .875 ID X 1.437 OD X .0781
8	2	14274	WASHER THRUST .875 ID X 1.437 OD X .030
9	1	17007	WASHER THRUST 1.000 ID X 1.562 OD X .123
10	1	17439	BLOCK CENTERING
11	1	17447	SHAFT CRANK
12	1	17507	NUT WORM GEAR ASSY
13	1	17508	NUT WORM ASSY
14	1	17520	SCREW ASSY JAW FEED ASSY
15	4	17700	(NOT SHOWN) SCREW 5/8-18 X 5-1/2 SHCS
16	2	19225	BALL NYLON 1/4 DIA
17	1	21053	WASHER THRUST
18	2	31016	SCREW 5/16-18UNC X 1/2 SSSCPPL

BLOCK CENTERING ASSY 17438

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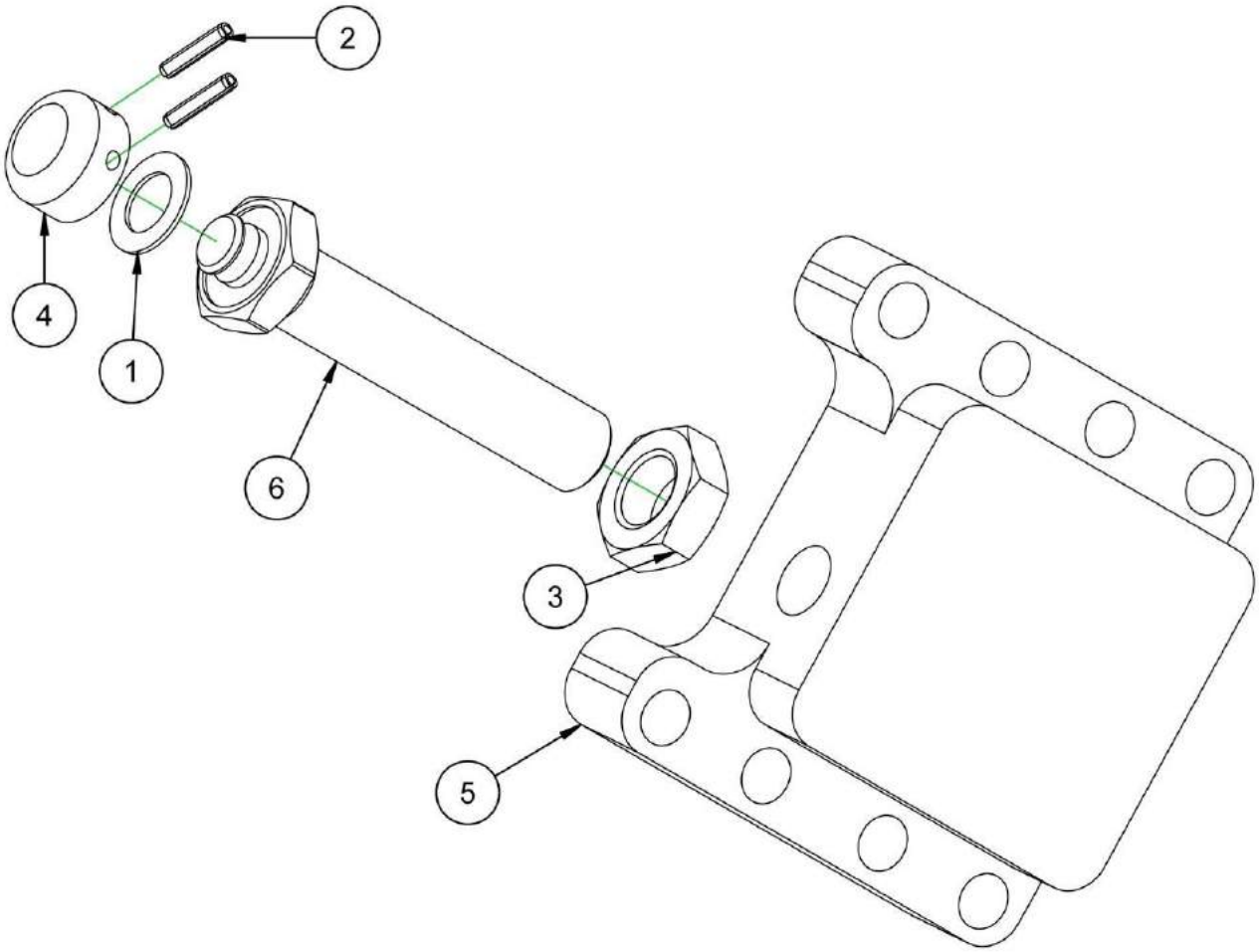

PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	1	10136	WASHER THRUST .750 ID X 1.25 X .060
2	2	12959	PIN ROLL Ø3/16 X 1
3	1	15128	NUT 1-8 JAMN
4	1	50528	CAP JAW SCREW FF6100
5	1	54307	BLOCK CENTERING JACK BOLT BB7100 & BB8100
6	1	54308	JACK BOLT ID MOUNT BB7100 & BB8100

BLOCK CENTERING ASSY JACK BOLT BB7100 & BB8100 54306

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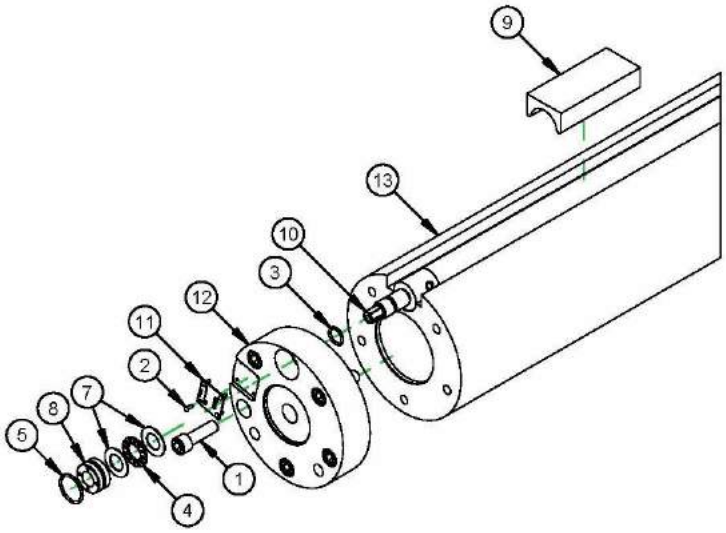

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	10	10453	SCREW 3/8-16 X 1 1/4 SHCS
2	8	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
3	2	10840	RING O 1/16 X 1/2 ID X 5/8 OD (VMI)
4	2	12446	BRG THRUST .562 ID X 1.000 OD X .0781
5	2	12447	RING O 1/16 X 7/8 ID X 1 OD
6	1	15172	BRG NEEDLE 9/16 ID X 3/4 OD X .500 OPEN
7	4	15173	WASHER THRUST .562 ID X 1.000 OD X .030
8	2	15549	NUT LEADSCREW BRG ADJ 1 DIA
9	1	15555	KEY BAR DRIVE
10	1	23689	LEADSCREW ASSY 5 & 6 DIA X 8 FT BORING BAR
		23691	LEADSCREW ASSY 5 & 6 DIA X 10 FT BORING BAR
		23692	LEADSCREW ASSY 5 & 6 DIA X 12 FT BORING BAR
		23693	LEADSCREW ASSY 5 & 6 DIA X 14 FT BORING BAR
		23694	LEADSCREW ASSY 5 & 6 DIA X 16 FT BORING BAR
		23695	LEADSCREW ASSY 5 & 6 DIA X 18 FT BORING BAR
		23696	LEADSCREW ASSY 5 & 6 DIA X 20 FT BORING BAR
11	2	29152	PLATE MASS CE
12	2	42389	END CAP 5 DIA BB7000
13	1	45123	BAR BORING 5 DIA X 96 PILOT MOUNT
		44918	BAR BORING 5 DIA X 120 PILOT MOUNT
		45436	BAR BORING 5 DIA X 144 PILOT MOUNT
		45437	BAR BORING 5 DIA X 168 PILOT MOUNT
		45439	BAR BORING 5 DIA X 192 PILOT MOUNT
		45440	BAR BORING 5 DIA X 216 PILOT MOUNT
		44816	BAR BORING 5 DIA X 240 PILOT MOUNT

45211 BAR BORING ASSY 5 DIA X 96 PILOT MOUNT	45038 BAR BORING ASSY 5 DIA X 192 PILOT MOUNT
45039 BAR BORING ASSY 5 DIA X 120 PILOT MOUNT	45287 BAR BORING ASSY 5 DIA X 216 PILOT MOUNT
45036 BAR BORING ASSY 5 DIA X 144 PILOT MOUNT	44814 BAR BORING ASSY 5 DIA X 240 PILOT MOUNT
45037 BAR BORING ASSY 5 DIA X 168 PILOT MOUNT	

BAR BORING ASSY 5 DIA PILOT MOUNT 45036

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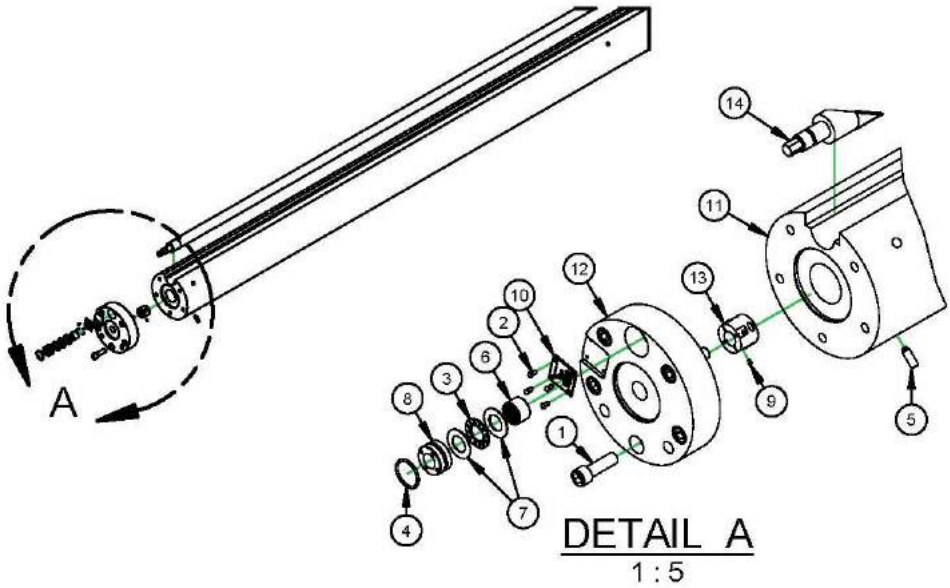

PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	10	10453	SCREW 3/8-16 X 1 1/4 SHCS
2	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
3	2	12446	BRG THRUST .562 ID X 1.000 OD X .0781
4	2	12447	RING O 1/16 X 7/8 ID X 1 OD
5	12	12734	SCREW 1/4-28 X 3/4 SSSHD
6	2	15172	BRG NEEDLE 9/16 ID X 3/4 OD X .500 OPEN
7	4	15173	WASHER THRUST .562 ID X 1.000 OD X .030
8	2	15549	NUT LEADSCREW BRG ADJ 1 DIA
9	12	21457	SCREW 1-64 X 1/8 BHSCS
10	1	29152	PLATE MASS TAG
11	1	VARIES	BAR BORING 5" DIA X ?" W/ BORE FOR OPTICS
12	2	42389	END CAP 5 DIA BB7000
13	3	42390	TARGET ALIGNMENT 1.0 OD
14	1	VARIES	LEADSCREW ASSY 5 DIA X ?" BORING BAR

AVAILABLE BORING BAR ASSEMBLIES W/OPTICS							
PART No.	DESCRIPTION	BAR P/N	LEADSCREW	PART No.	DESCRIPTION	BAR P/N	LEADSCREW
54579	5 DIA X 96 (2.5 m)	54726	23689	54582	5 DIA X 192 (4.9 m)	54728	23694
42317	5 DIA X 120 (3 m)	42080	23691	54583	5 DIA X 216 (5.5 m)	54729	23695
54580	5 DIA X 144 (3.7 m)	54370	23692	54584	5 DIA X 240 (6 m)	54371	23696
49123	5 DIA X 157.5 (4 m)	49117	49121	42318	5 DIA X 275 (7 m)	42082	42437
54581	5 DIA X 168 (4.3 m)	54727	23693	49124	5 DIA X 315 (8 m)	49118	49122

5" DIAMETER BORING BARS W/OPTICS 42318

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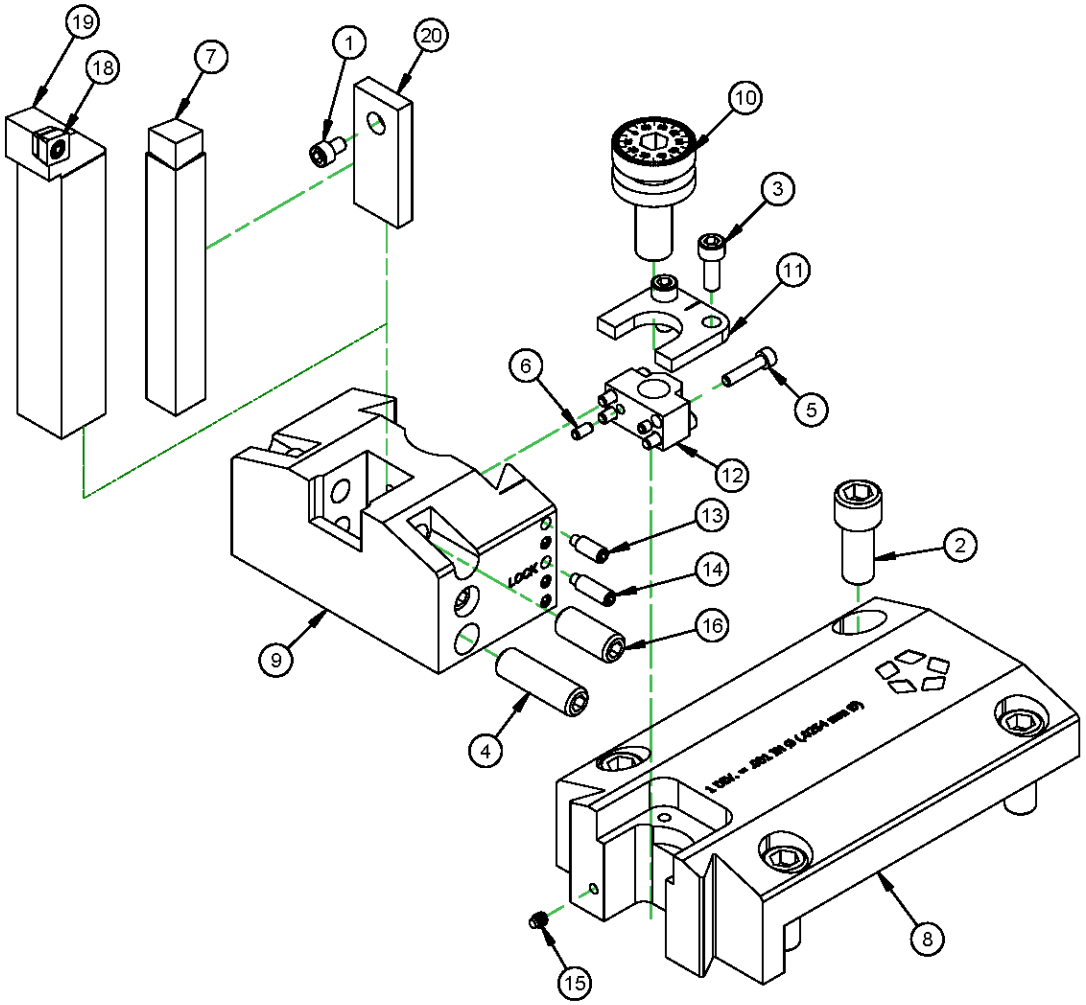
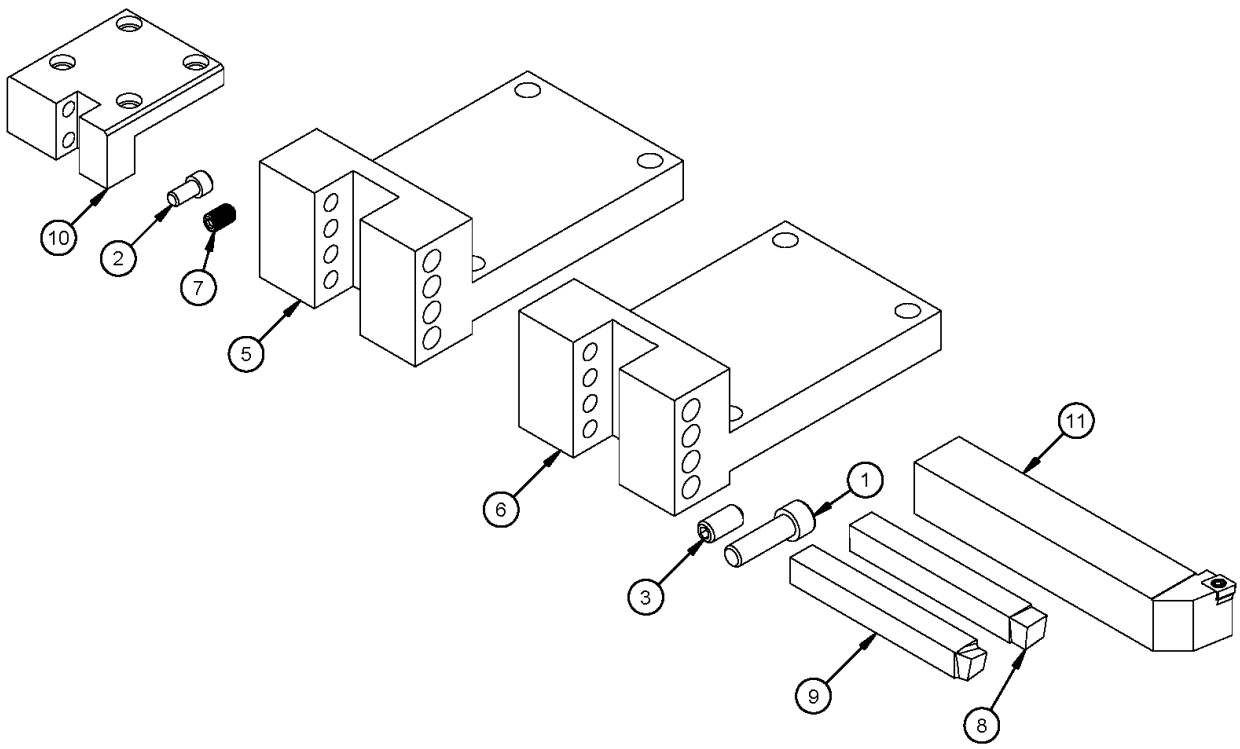


79325 - CHART BORING HEAD MICRO ADJUST LARGE BB

AVAILABLE CONFIGURATIONS	
P/N:	DESCRIPTION
79468	BORING HEAD MICRO ADJUST 1/2 INCH TOOLING LARGE BB
79020	BORING HEAD MICRO ADJUST 3/4 INCH TOOLING (1/2 INCH READY) LARGE BB
79021	BORING HEAD MICRO ADJUST 1 INCH TOOLING LARGE BB

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	10226	SCREW 8-32 X 1/4 SHCS (WITH 79556)
2	4	11756	SCREW 3/8-16 X 7/8
3	2	12743	SCREW 10-24 X 1/2 SHCS
4	4	13484	SCREW 3/8-16 X 1-1/2 SSSFP (79468)
		79424	SCREW 3/8-16 X 1-1/4 SSSFP (79020, 79021)
5	4	15210	SCREW 6-32 X 5/8 SHCS
6	2	15414	PIN DOWEL 1/8 DIA X 1/4
7	1	31859	BIT TOOL HSS 1/2 X 4.0 LH FINISHING SINGLE TC (79468)
		31868	BIT TOOL HSS 1/2 X 4.0 LH ROUGHING SINGLE (79468)
NS	1	39694	WRENCH TORX FT-15 (79020, 79021)
8	1	78776	BORING HEAD CARRIAGE HOLDER
9	1	78777	CARRIAGE BORING HEAD TOOL 3/4 INCH TOOLING
		79022	CARRIAGE BORING HEAD TOOL 1 INCH TOOLING
		79500	CARRIAGE BORING HEAD TOOL 1/2 INCH TOOLING
10	1	79807	BORING HEAD MICRO ADJUST DIAL SCREW MOD
11	1	78809	DIAL SCREW PLATE
12	1	79019	NUT DIAL SCREW 7/16-20 UNF
13	4	79418	SCREW 10-32 X 1/2 SSSFDP
14	1	79419	SCREW 10-32 X 5/8 SSSFDP
15	1	79420	SCREW 8-32 X 3/16 SSSFDP
16	2	79422	SCREW 3/8-16 X 7/8 SSSFP
17	10	79484	INSERT CARBIDE 80 DEG 3/8 IC 1/64 NOSE RADIUS CCGT-3251 KC5010 (79020, 79021)
18	1	79485	HOLDER INSERT CARBIDE 3/4 SQ SHANK SCREW ON LEFT HAND (79020)
	1	79486	HOLDER INSERT CARBIDE 3/4 SQ SHANK SCREW ON RIGHT HAND (79020)
	1	79479	HOLDER INSERT CARBIDE 1 SQ SHANK SCREW ON LEFT HAND (79021)
	1	79480	HOLDER INSERT CARBIDE 1 SQ SHANK SCREW ON RIGHT HAND (79021)
20	1	79556	SHIM FOR 1/2 TOOLING IN 3/4 CARRIAGE
NS	1	80816	VIBRA-TITE VC3 THREADLOCKER
NS	1	81073	DRIVE HEX KEY 3/32 T HANDLE SHORT LENGTH

79325 - CHART BORING HEAD MICRO ADJUST LARGE BB



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	8	10453	SCREW 3/8-16 X 1 1/4 SHCS
2	4	10800	SCREW 1/4-20 X 1/2 SHCS
3	16	11734	SCREW 3/8-16 X 3/4 SSSCP
5	1	23090	HOLDER TOOL 1 IN. SQUARE LEAD
6	1	23091	HOLDER TOOL 1 IN. SQUARE FOLLOW
7	2	25150	SCREW 5/16-24 X 1/2 SSSFP
8	1	31859	BIT TOOL HSS 1/2 X 4.0 LH FINISHING SINGLE
9	1	31868	BIT TOOL HSS 1/2 X 4.0 LH ROUGHING SINGLE
10	1	54328	1/2" TOOL HOLDER FOR BB6100 & BB7100 BORING SET
11	2	79479	HOLDER INSERT CARBIDE 1 SQ SHANK SCREW ON LEFT HAND
		79480	HOLDER INSERT CARBIDE 1 SQ SHANK SCREW ON RIGHT HAND
NS	10	79484	INSERT CARBIDE 80 DEG 3/8 IC 1/32 NOSE RADIUS CCGT-3252

BORING HEAD SOLID TOOLING LEADING AND TRAILING
FOR LARGE BB 81246

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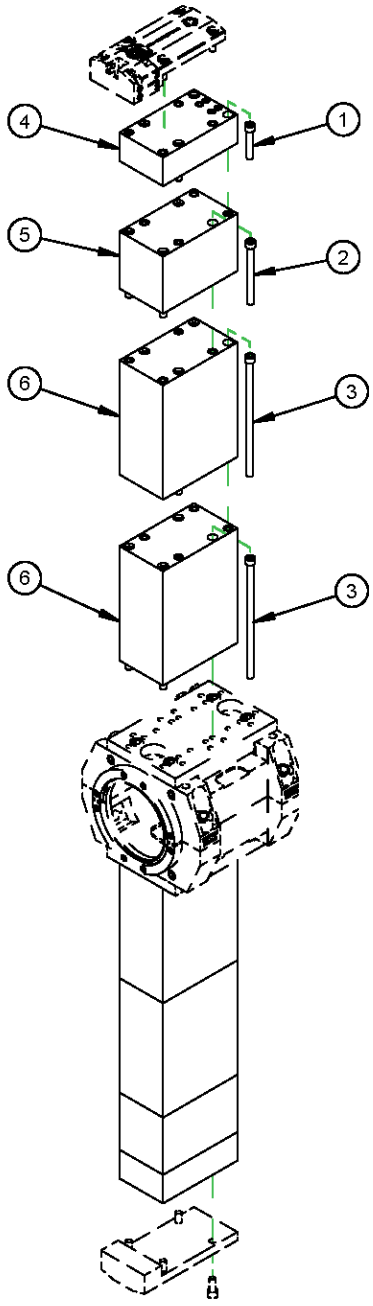
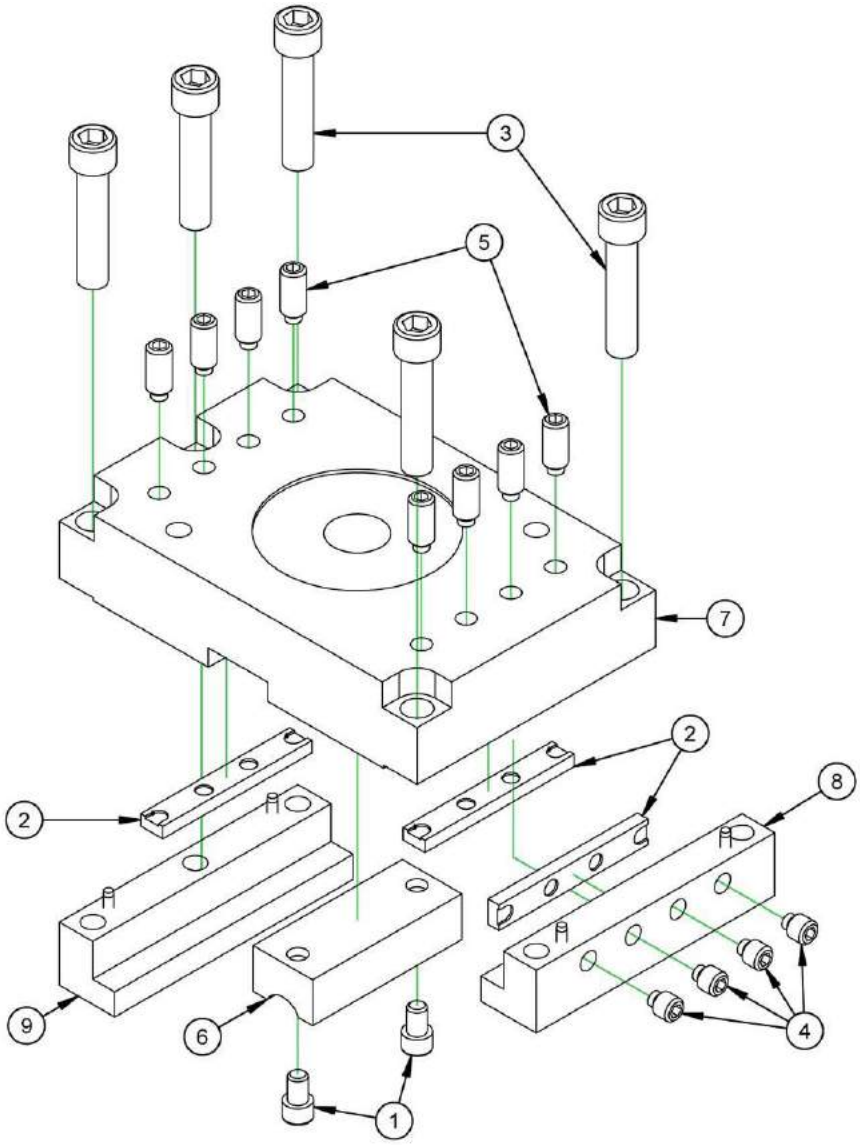


81252 - BORING DIAMETER RANGE 10.25-58.25 STACK UP BLOCKS BB7100

AVAILABLE CONFIGURATIONS	
P/N:	DESCRIPTION
81251	BORING DIAMETER RANGE 10.25-26.25 STACK UP BLOCKS BB7100
81252	BORING DIAMETER RANGE 10.25-58.25 STACK UP BLOCKS BB7100

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	10557	SCREW 3/8-16 X 2 SHCS
2	8	15743	SCREW 3/8-16 X 4 SHCS
3	16	20884	SCREW 3/8-16 X 8 SHCS
4	2	22760	SPACER 2.0 IN FOR BORING SET BB6100 & BB7100
5	2	79011	SPACER 4.0 IN FOR BORING SET BB6100 & BB7100
6	4	79012	SPACER 8.0 IN FOR BORING SET BB6100 & BB7100

81252 - BORING DIAMETER RANGE 10.25-58.25 STACK UP BLOCKS BB7100



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	2	10670	SCREW 1/4-20 X 3/8 SHCS
2	3	49639	GIB TOOL CARRIER
3	5	53065	SCREW 3/8-16 X 1.72 SHCS MODIFIED
4	4	53878	SCREW 5/16-24 X 3/8 SSSDPPL
5	8	53880	SCREW 5/16-24 X 1 SSSDPPL
6	1	54178	NUT HALF FACING HEAD BB7100
7	1	54192	FACING ARM CARRIER MOUNTING DECK BB7100
8	1	54195	KEEPER SLIDE ARM CARRIAGE GIB SIDE
9	1	57054	KEEPER SLIDE ARM CARRIAGE NON-GIB SIDE

FACING CARRIER ASSY SLIDE ARM 54193

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PARTS LIST		
ITEM	PART No.	DESCRIPTION
1	10532	BRG ROLLER CLUTCH 1 ID X 1-5/16 OD X 1.063
2	10534	RING SNAP 1 OD
3	10538	BRG THRUST .625 ID X 1.125 OD X .0781
4	11020	HANDLE CRANK STRAIGHT 10MM SQUARE
5	11053	SCREW 3/8-16 X 2-3/4 SHCS
6	11211	SCREW 3/8-16 X 1-3/4 SHCS
7	11259	SCREW 8-32 X 3/8 FHSCS
8	11823	WASHER THRUST .625 ID X 1.125 OD X .030
9	14788	KEY 1/8 SQ X .50 SQ BOTH ENDS
10	15613	SCREW 3/8-16 X 6 SHCS
11	18399	HOUSING CLUTCH AXIAL
12	18432	SPRING EXTENSION .24 OD X .026 WIRE X 1.250 FREE LGTH
13	19099	GIB CARRIER TOOL BB8000 FACING HEAD
14	19105	SPACER
15	19110	SHAFT DRIVE
16	19112	COLLAR FEED CLUTCH
17	19122	GEAR HELICAL
18	19130	RING SNAP 5/8 OD LOW PROFILE
19	19223	COUNTERWEIGHT FACING ASSY
20	19232	SCREW 10-24 X 3/8 SHCS
21	22685	CARRIER TOOL
22	22686	PLATE END DRIVE SHAFT
23	22688	BASE PLATE FACING HEAD
24	22689	PLATE END LEADSCREW
25	28953	PIN DOWEL MODIFIED
26	22687	SLIDE FACING HEAD 4 INCH TRAVEL
	41097	SLIDE FACING HEAD 6 INCH TRAVEL
	43364	SLIDE FACING HEAD 8 INCH TRAVEL
27	19104	LEADSCREW ASSY FACING HEAD 4 INCH STROKE
	41098	LEADSCREW ASSY FACING HEAD 6 INCH STROKE
	43366	LEADSCREW ASSY FACING HEAD 8 INCH STROKE

HEAD FACING ASSY MECH FEED 4 INCH	22680
HEAD FACING ASSY MECH FEED 6 INCH	49753
HEAD FACING ASSY MECH FEED 8 INCH	49754

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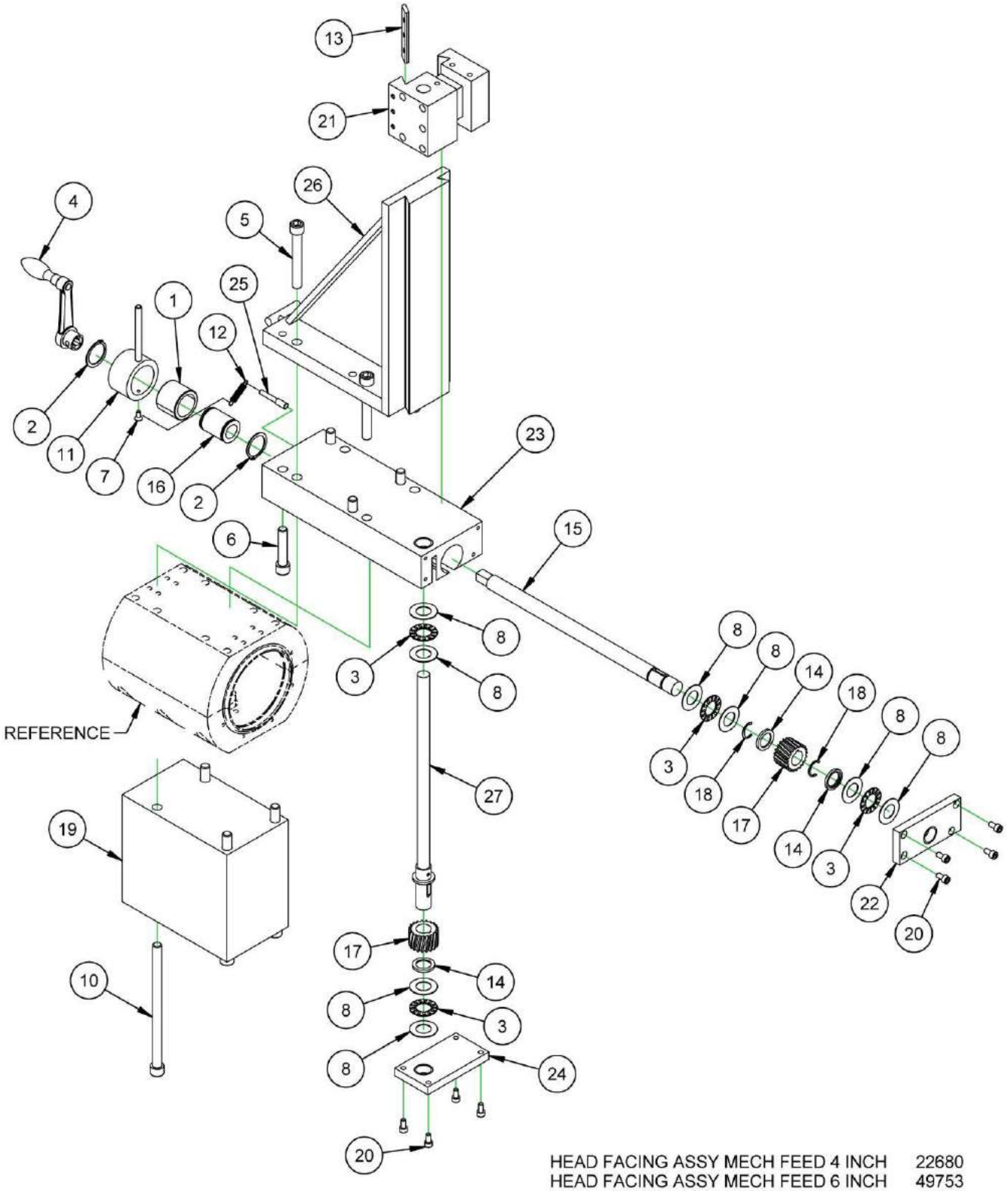

HEAD FACING ASSY MECH FEED 4 INCH	22680
HEAD FACING ASSY MECH FEED 6 INCH	49753
HEAD FACING ASSY MECH FEED 8 INCH	49754

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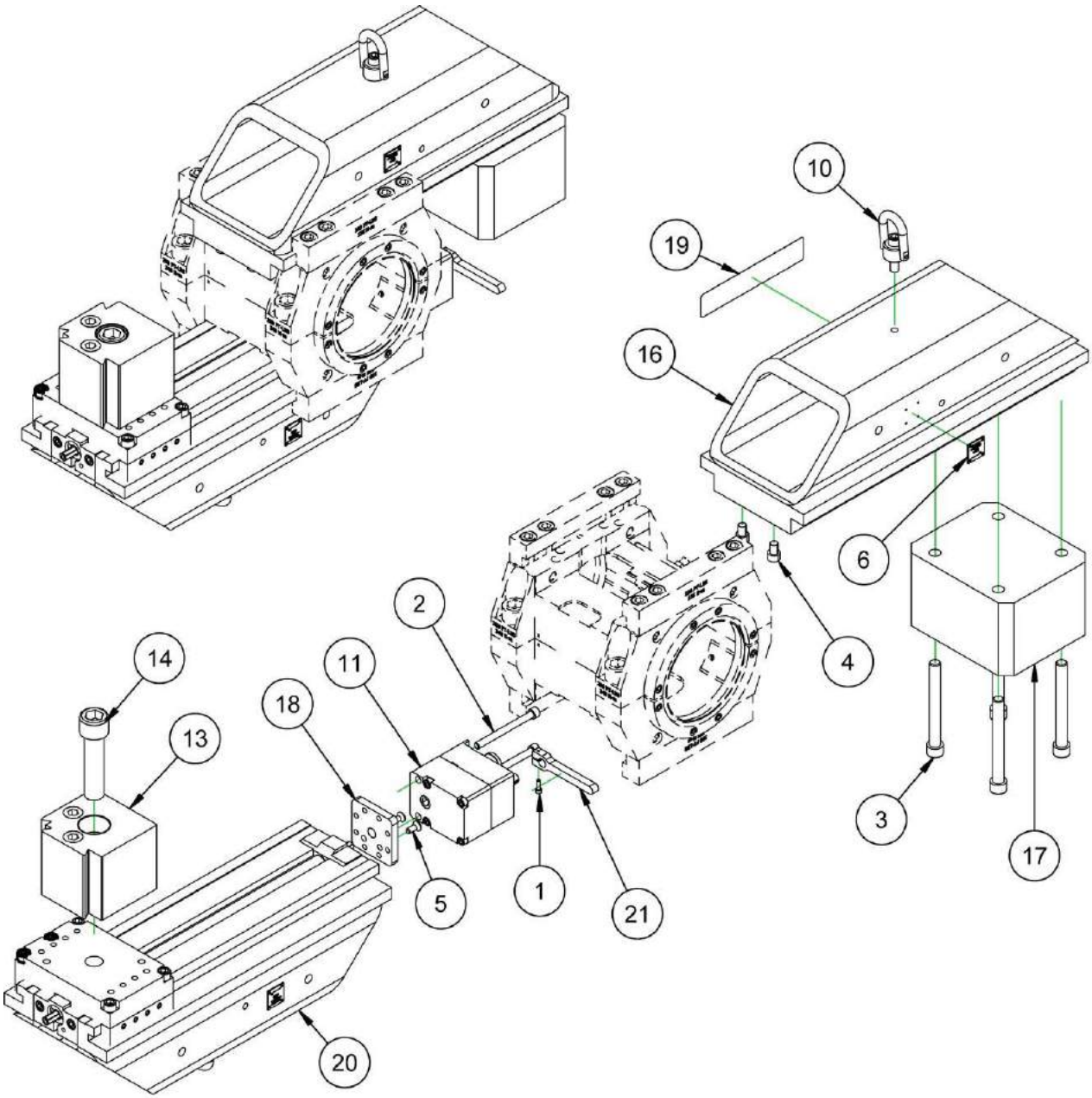
PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	1	11845	SCREW 8-32 X 1/2 SHCS
2	2	11873	SCREW 5/16-18 X 3-1/2 SHCS
3	4	13406	SCREW 1/2-13 X 4-1/2 SHCS
4	2	16403	SCREW 3/8-16 X 1/2 SHCS
5	2	22496	SCREW 1/4-20 X 5/8 FHSCS
6	1	29152	PLATE MASS TAG
7	1	40787	(NOT SHOWN) HOLDER INSERT 80 DEG NEG R/H
8	1	40788	(NOT SHOWN) HOLDER INSERT 80 DEG NEG L/H
9	1	41407	(NOT SHOWN) INSERT CARBIDE 80 DEG 1/2 IC 1/64 NOSE RADIUS KC5010
10	1	41471	RING HOIST SWIVEL 3/8-16 X .56 1000 LBS
11	1	45691	ASSY FEEDBOX REVERSE CLUTCH INPUT
12	1	49621	(NOT SHOWN) QUICK CHANGE TOOL HOLDER RH 1
13	1	54910	TOOL POST ROTATING 34IN TOOLING 4IN SQUARE BB6100
		53451	QUICK CHANGE TOOL POST MODIFIED
14	1	54924	SCREW 7/8 -14 X 2 SHCS
		53455	SCREW 7/8 -14 X 3-1/2 SHCS
15	1	53638	(NOT SHOWN) QUICK CHANGE TOOL HOLDER RH 1
16	1	53893	COUNTERWEIGHT ARM 18 INCH BB6100 & BB7100
		54255	COUNTERWEIGHT ARM 23 INCH BB6100 & BB7100
		54256	COUNTERWEIGHT ARM 34 INCH BB6100 & BB7100
17	1	54997	COUNTERWEIGHT BB6100
		53905	COUNTERWEIGHT
18	1	54867	PLATE ADAPTER FEEDBOX
19	1	54939	LABEL COUNTERWEIGHT ARM 18"
		54940	LABEL COUNTERWEIGHT ARM 23"
		54942	LABEL COUNTERWEIGHT ARM 34"
20	1	54955	ASSEMBLY 18IN SLIDE ARM
		54956	ASSEMBLY 23IN SLIDE ARM
		54958	ASSEMBLY 34IN SLIDE ARM
21	1	55094	TRIP ARM STEEL 3 INCH



AVAILABLE ASSEMBLIES	PART No.
BORING/FACING SLIDE ARM SET 18" BB6100	54385
BORING/FACING SLIDE ARM SET 23" BB6100	54386
BORING/FACING SLIDE ARM SET 18" BB7100 (SHOWN)	54258
BORING/FACING SLIDE ARM SET 23" BB7100	54259
BORING/FACING SLIDE ARM SET 34" BB7100	54260

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PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	4	10436	WASHER THRUST .500 ID X .937 OD X .060
2	2	10437	BRG THRUST .500 ID X .937 OD X .0781
3	4	11741	SCREW 5/16-18 X 1-1/2 SHCS
4	2	12897	SCREW 10-32 X 3/16 SSSNT
5	2	15906	RING O 1/8 X 3/4 X 1 OD
6	4	20166	PIN DOWEL 1/4 DIA X 1/2
7	1	29152	PLATE MASS TAG
8	1	41471	RING HOIST SWIVEL 3/8-16 X .56 1000 LBS
9	2	46733	END CAP SLIDE ARM 3.5 IN BAR
10	1	54193	FACING CARRIER ASSY SLIDE ARM
11	2	54197	NUT BEARING PRELOAD 1/2-20 .94 OD
12	1	54229	SLIDE ARM 18 INCH
		54230	SLIDE ARM 23 INCH
		54433	SLIDE ARM 26 INCH
		54231	SLIDE ARM 34 INCH
		54900	SLIDE ARM 53 INCH
13	1	54232	LEADSCREW SLIDE ARM 18 INCH
		54233	LEADSCREW SLIDE ARM 23 INCH
		54634	LEADSCREW SLIDE ARM 26 INCH
		54234	LEADSCREW SLIDE ARM 34 INCH
		54864	LEADSCREW SLIDE ARM 53 INCH
14	1	54931	LABEL TOOL ARM ASSY 18"
		54932	LABEL TOOL ARM ASSY 23"
		54934	LABEL TOOL ARM ASSY 26"
		54933	LABEL TOOL ARM ASSY 34"
		54936	LABEL TOOL ARM ASSY 53"

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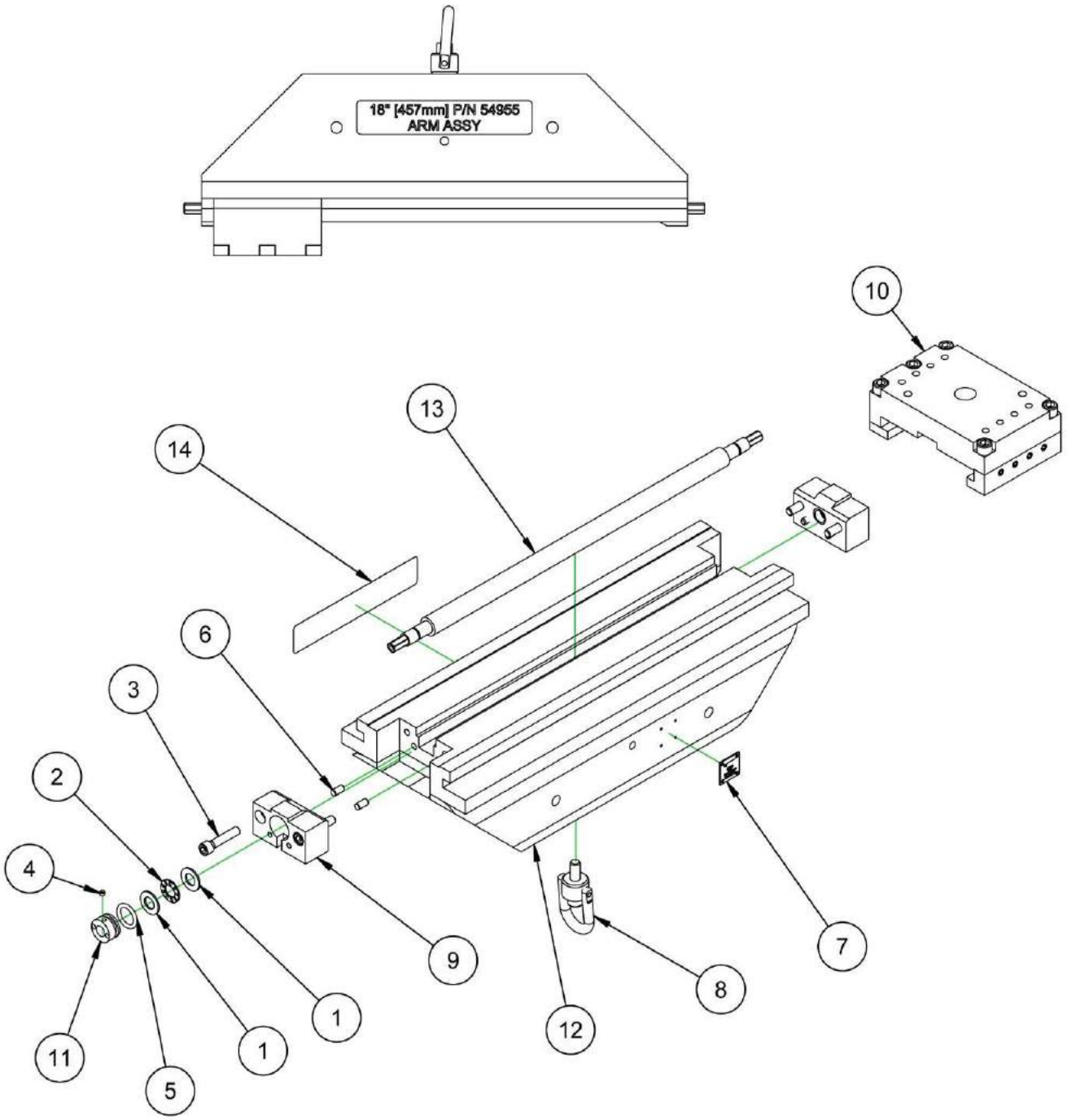

AVAILABLE ASSEMBLIES	PART No.
ASSEMBLY 18IN SLIDE ARM	54955
ASSEMBLY 23IN SLIDE ARM	54956
ASSEMBLY 26IN SLIDE ARM	54957
ASSEMBLY 34IN SLIDE ARM	54958
ASSEMBLY 53IN SLIDE ARM	54959

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PARTS LIST		
ITEM	PART No.	DESCRIPTION
1	10560	SCREW 10-32 X 3/8 FHSCS
2	11760	BUSHING OILITE .5 ID X .625 OD X .5
3	12444	SCREW 1/4-20 X 2 SHCS
4	14284	PIN DOWEL 3/16 X 1
5	15079	WASHER THRUST 1.000 ID X 1.562 OD X .030
6	15414	PIN DOWEL 1/8 DIA X 1/4
7	15416	SCREW 5/16-18 X 4 SHCS
8	19561	SPRING COMP .148 X .023 X .50
9	19562	BALL STEEL 5/32 DIA
10	22480	PIN DOWEL 1/8 DIA X 1/2
11	25957	BRG ROLLER CLUTCH 1 X 1.312 X .625
12	29385	KEY 3/32 SQ X 11/32 SQ BOTH ENDS
13	44717	CLUTCH ARM FEED
14	44721	DRIVE BUSHING
15	44788	LEVER ARM MODIFIED ADDED KEYWAY
16	44970	SPRING EXT .187 OD X .023 WIRE X 1.00 LONG
17	45571	HOUSING FEEDBOX REVERSE CLUTCH INPUT CAM SIDE
18	45573	SHAFT CLUTCH REVERSE CLUTCH INPUT FEED ASSY
19	45753	HOUSING FEEDBOX REVERSE CLUTCH INPUT MTG SIDE
20	45780	CAM ASSY FEEDBOX REVERSE CLUTCH INPUT
21	45801	KNOB RELEASE FEEDBOX REVERSE CLUTCH INPUT
22	45870	DRIVE SHAFT FEEDBOX REVERSE CLUTCH INPUT

ASSY FEEDBOX REVERSE CLUTCH INPUT 45691

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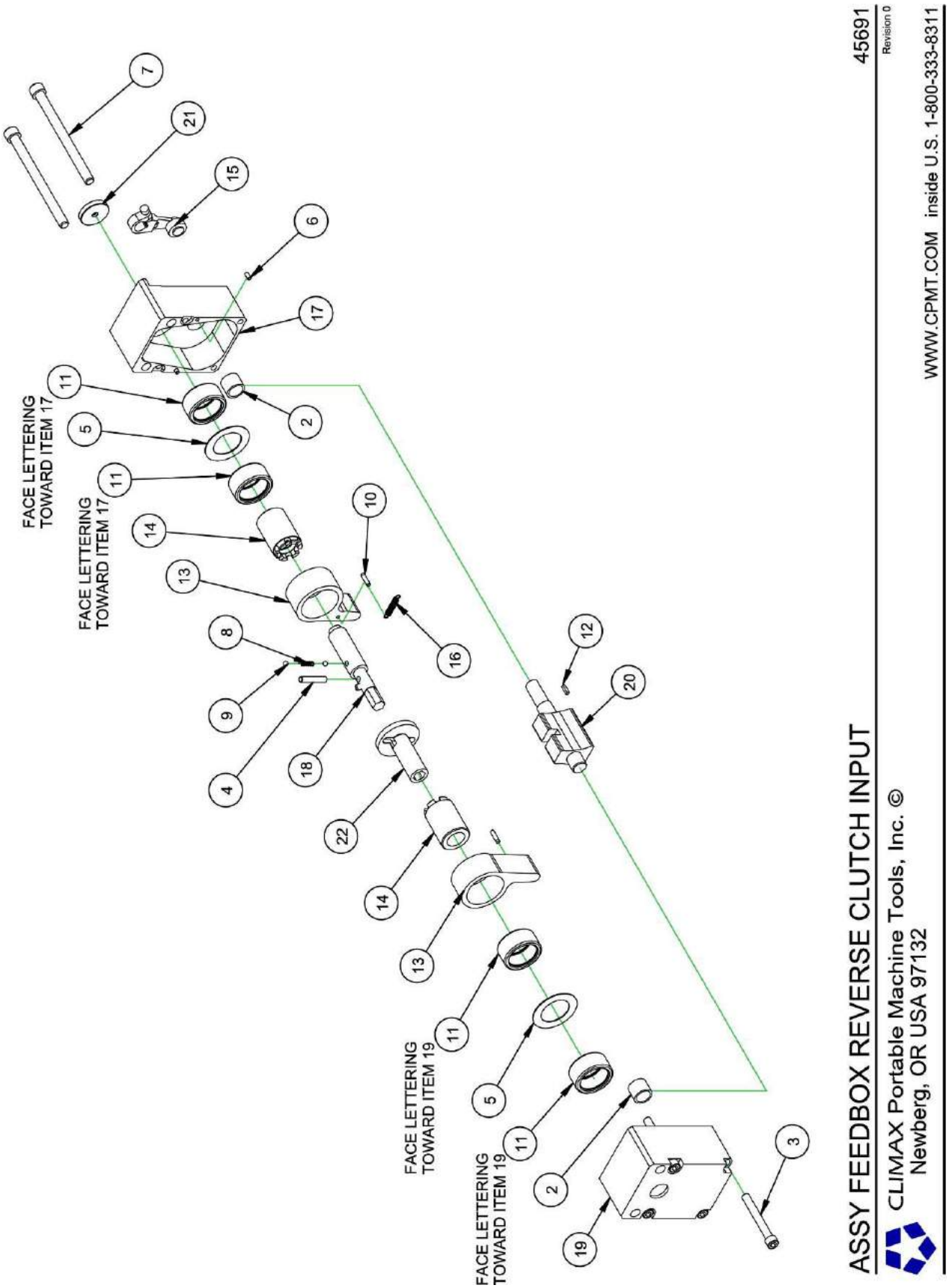
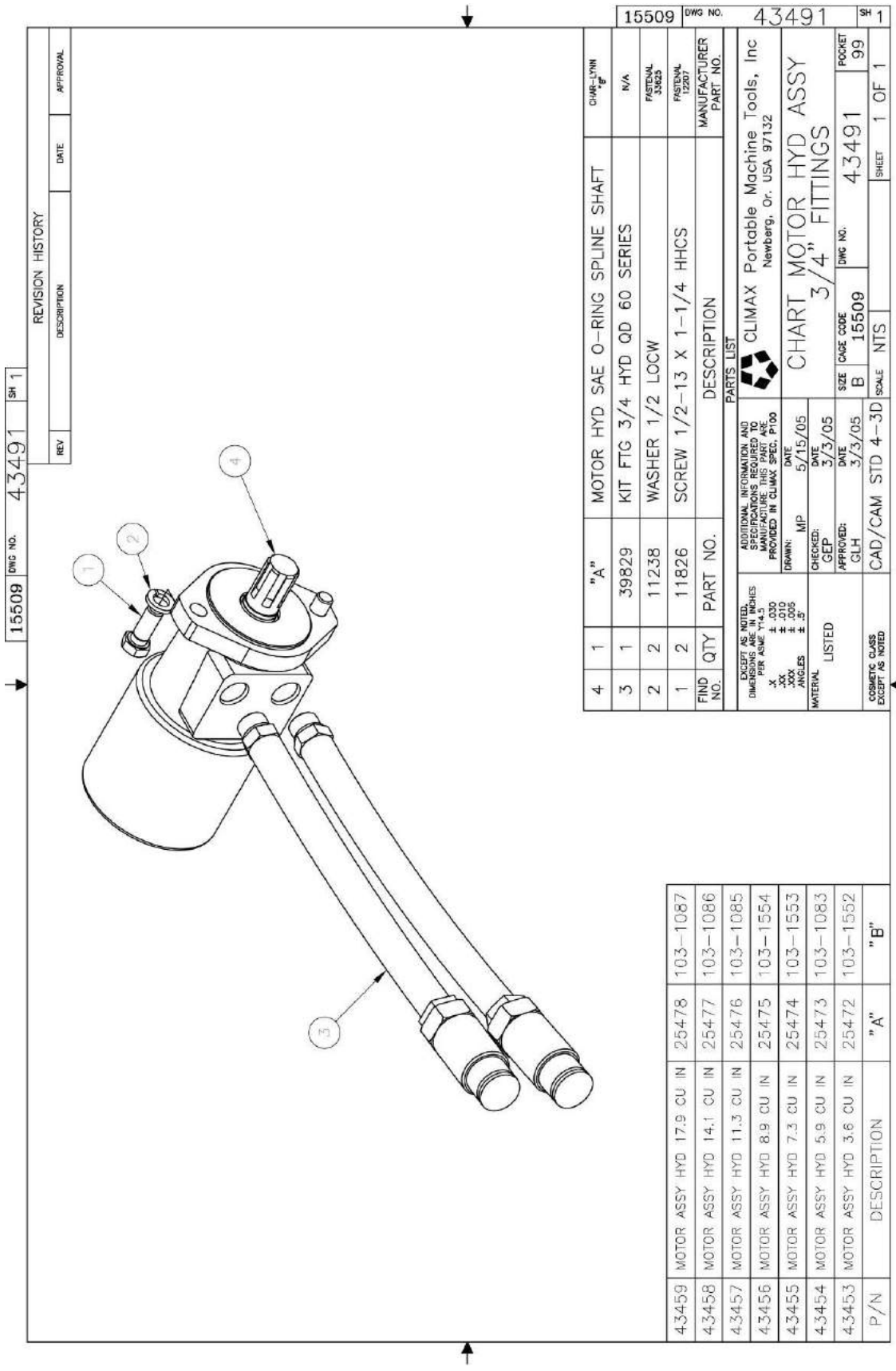


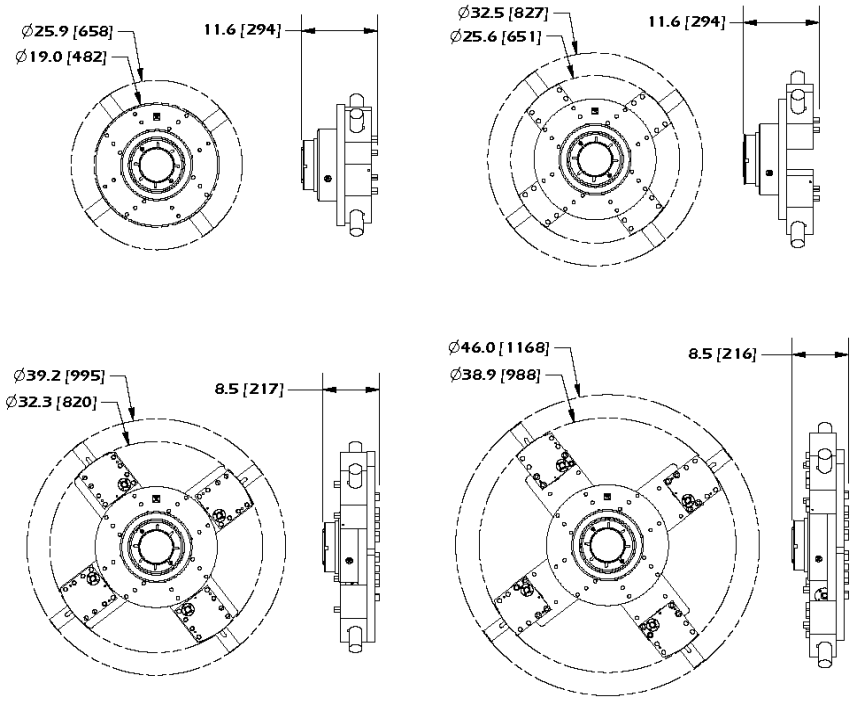


CARACTÉRISTIQUES TECHNIQUES

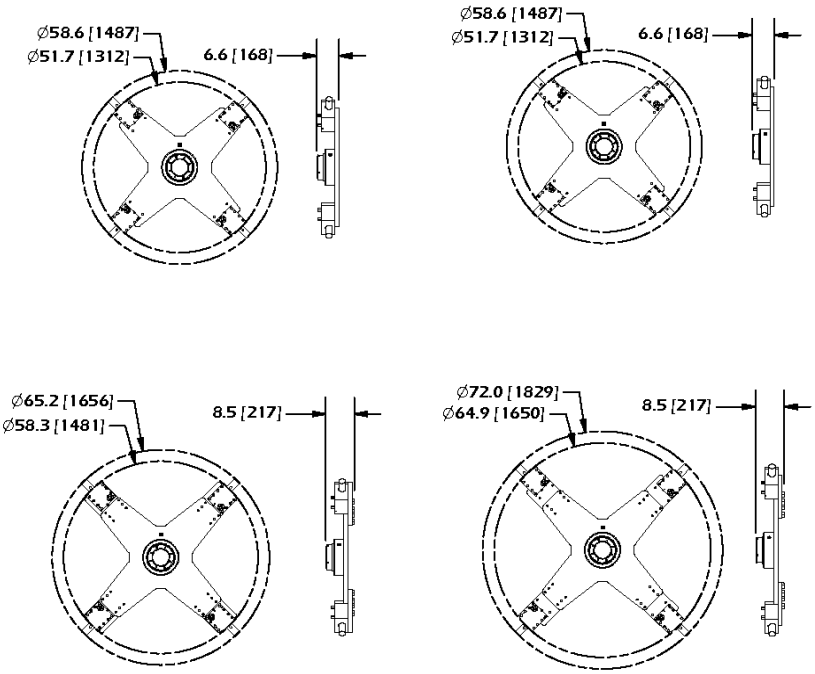
	US	Metric
Boring and Facing Ranges:		
Boring diameter range, standard stack block assembly:	10.25 - 58.25 inches	260.4 - 1479.6 mm
Boring diameter range, boring/facing arm assembly:		
with 18 inch (457.2 mm) boring/facing arm	22.1 - 30.5 inches	561.3 - 774.7 mm
with 23 inch (584.2 mm) boring/facing arm	25.1 - 40.5 inches	637.5 - 1028.7 mm
with 34 inch (863.6 mm) boring/facing arm	35.9 - 62.5 inches	911.9 - 1587.5 mm
Facing diameter range, mechanical facing head assembly:	12.0 - 57.5 inches	304.8 - 1460.5 mm
Facing diameter range, boring/facing arm assembly:		
with 18 inch (457.2 mm) boring/facing arm	17.8 - 30.5 inches	452.1 - 774.7 mm
with 23 inch (584.2 mm) boring/facing arm	17.8 - 40.5 inches	452.1 - 1028.7 mm
with 34 inch (863.6 mm) boring/facing arm	17.8 - 62.5 inches	452.1 - 1587.5 mm
Facing diameter range, boring/facing arm assembly (tool post reversed):		
("tool post reversed" refers to rotating the tool post so that the tool is on the bar side of the tool post.)		
with 18 inch (457.2 mm) boring/facing arm	9.6 - 17.4 inches	243.8 - 442.0 mm
with 23 inch (584.2 mm) boring/facing arm	9.6 - 27.4 inches	243.8 - 696.0 mm
with 34 inch (863.6 mm) boring/facing arm	9.6 - 49.4 inches	243.8 - 1254.8 mm
Performance Data		
Rotational Drive Unit (RDU) Gear Ratio:	10.59:1 gear reduction	
Hydraulic motor size affects torque and speed		
Theoretical values calculated using a 25 Hp hydraulic power unit producing 2000 psi (13790 kPa) continuous, [normal operation is 1200 psi (8270 kPa)] and pumping 15 gpm (68 l/min).		
Hydraulic motor size range:	3.6 - 17.9 in^3	59.9 - 293.3 cm^3
Boring Bar Torque:	750 - 2900 ft•lb	1020 - 3930 N•m
Max boring rpm:	90 - 18 rpm	90 - 18 rpm
For example, with 11.3 in^3 (185.3 cm^3) hydraulic motor (43457):		
Boring Bar Torque:	2280 ft•lb	3090 N•m
Max boring rpm:	29 rpm	29 rpm
Feed rate of mechanical Axial Feed Unit (AFU):	0.003 - 0.025 in./rev.	0.076 - 0.635 mm/rev.
Feed rate of electric Axial Feed Unit (AFU):		
In "slow" speed	0 - 0.3 in./min.	0 - 7.6 mm/min.
In "fast" speed	2.0 - 100 in./min.	50 - 2500 mm/min.
Measures:		
Operating weight (estimated)	2012.3 lbs.	912.8 kg
Typical machine consisting of Rotational Drive Unit (RDU), Axial Feed Unit (AFU), boring head set, tool carrier, 2 bearing mounts, 12 foot (365.8 cm) bar, tool kit, and hydraulic motor.		
Shipping weight (estimated), for machine (metal crate)	2203 lbs.	999.3 kg
Shipping weight (estimated), for machine (wood crate)	2117.3 lbs.	960.4 kg
(machine with RDU, AFU, boring head set, tool carrier, tool kit, and hydraulic motor.)		
Shipping weight (estimated), set of 2 Bearings	780 lbs.	353.8 kg
Shipping weight (estimated), Boring Bar	5.9 lbs./inch	1.05 kg/cm
Shipping weight (estimated), 15 Hp Hydraulic Power Unit	750 lbs	340.2 kg
Shipping weight (estimated), 25 Hp Hydraulic Power Unit	875 lbs	396.9 kg
Shipping dimensions:		
Machine, in wood crate, W, D, H	24 x 37 x 20.6 inches	610 x 940 x 524 mm
Machine, in steel crate, W, D, H	43.3 x 29.5 x 22.5 inches	1099 x 749 x 571.5 mm
Bearing (each bearing shipped separately) W, D, H	36.5 x 36.5 x 17 inches	927 x 927 x 432 mm
12 foot (365.8 cm) bar W, D, H	15 x 14 x 158 inches	381 x 356 x 4013 mm
15 or 25 Hp Hydraulic Power Unit W, D, H	24 x 43 x 47 inches	610 x 1092 x 1194 mm

DIMENSIONS OPÉRATIONNELLES

Dimensions in Inch (mm)

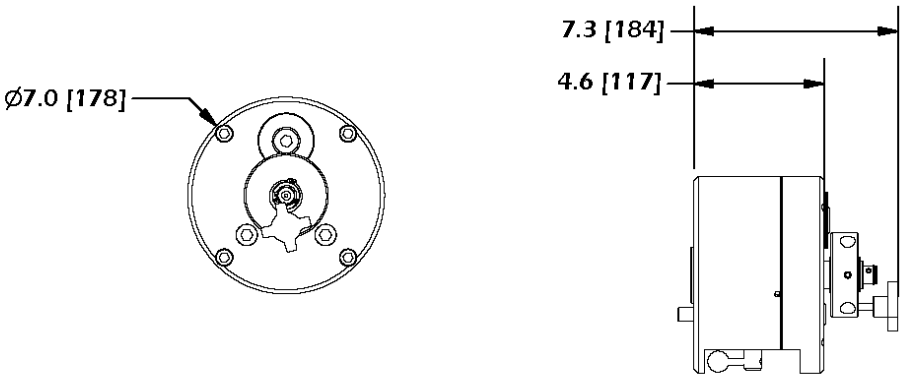


20 - 46 inch (508.0 - 1168.4 mm) ID Mount
(Face Adjust shown. Jack screw adjust ranges are the same)

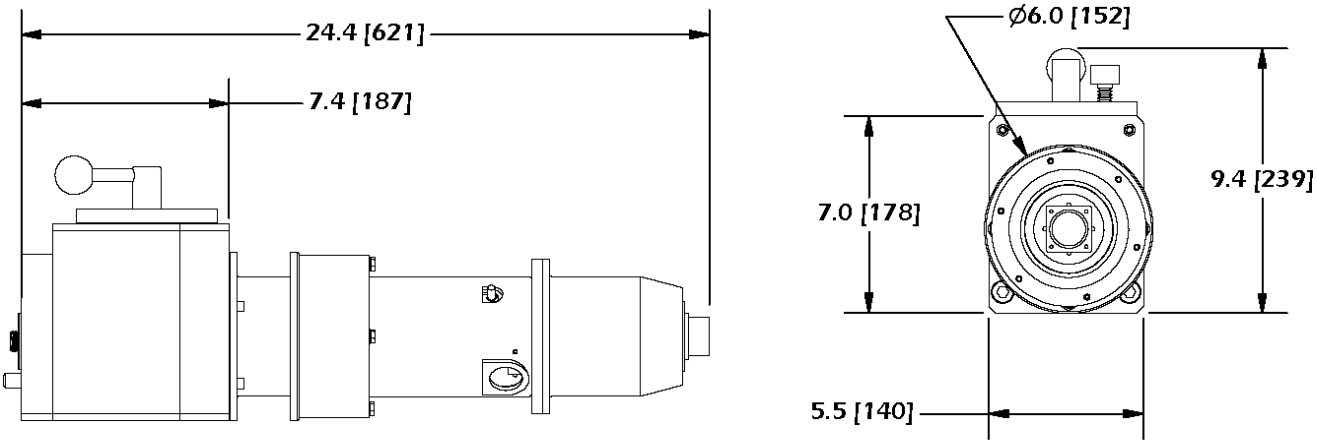


46 - 72 inch (1168.4 - 1828.8 mm) ID Mount
(Face Adjust shown. Jack screw adjust ranges are the same)

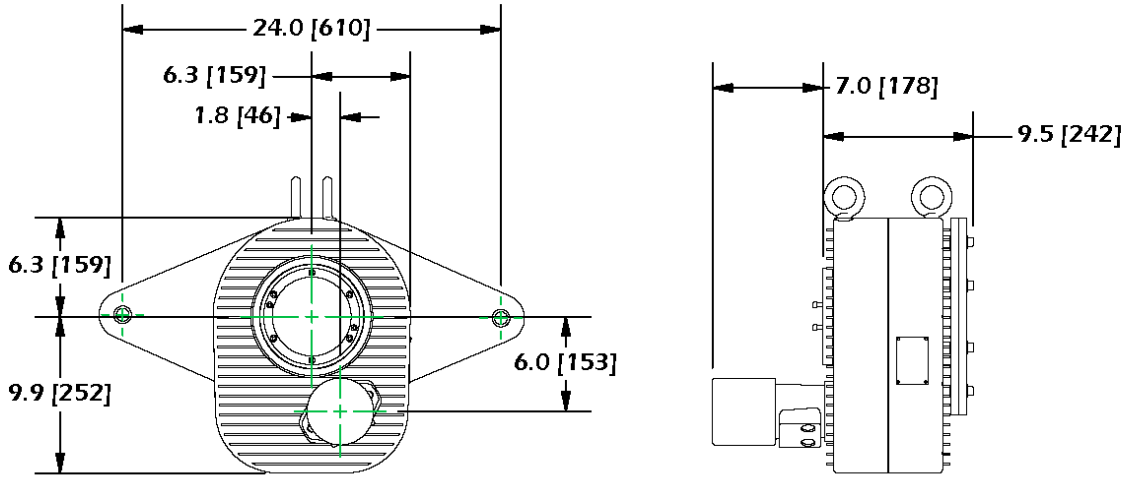
Dimensions in Inch (mm)



Mechanical Axial Feed Assembly

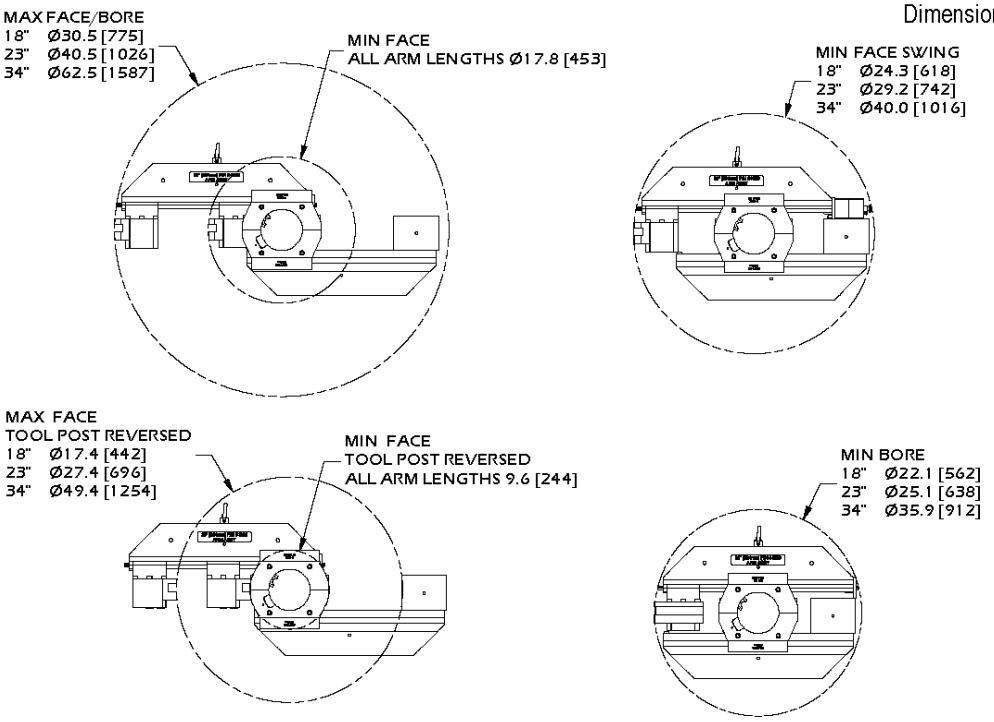


Electrical Axial Feed Assembly

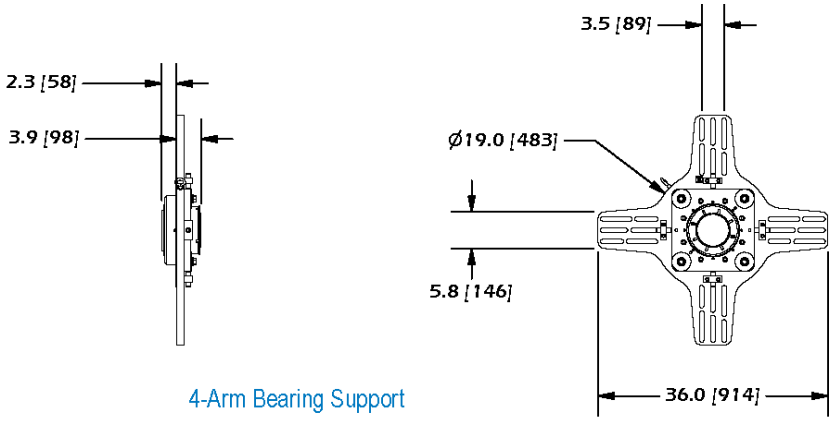


Rotational Drive Unit

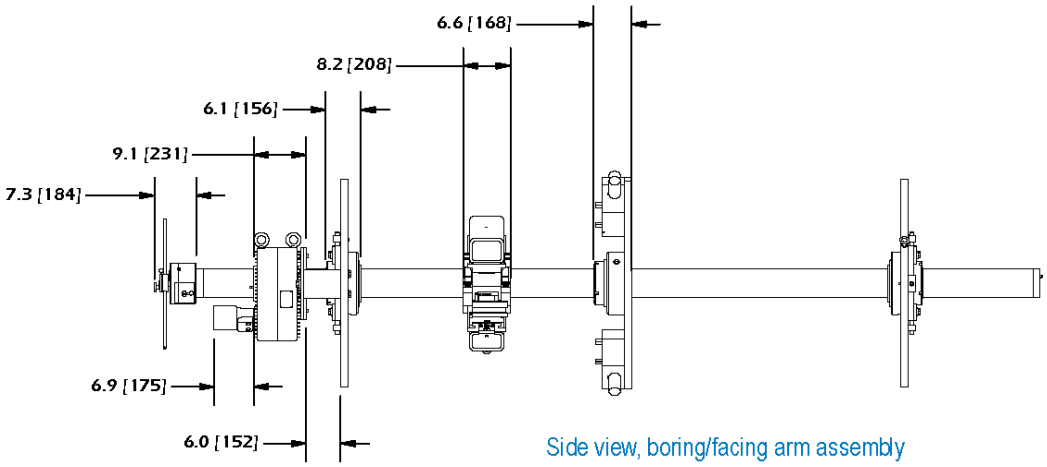
Dimensions in Inch (mm)



Boring/facing arm configurations



4-Arm Bearing Support



Side view, boring/facing arm assembly

FDSM

Unoba® EP Grease (All Grades)

Material Safety Data Sheet

1. Product and Company Identification

Product Name:	Unoba® EP Grease (All Grades)
MSDS Number:	722490
Synonyms:	76 Unoba® EP Grease 00 76 Unoba® EP Grease 0 76 Unoba® EP Grease 1 76 Unoba® EP Grease 2 76 Unoba® EP Grease 3
Intended Use:	Lubricating Grease
Manufacturer/Supplier:	ConocoPhillips Lubricants 600 N. Dairy Ashford, 2W900 Houston, Texas 77079-1175
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
Customer Service:	U.S.: 888-766-7676 or International: +1-83-2486-3363
Technical Information:	800-435-7761
MSDS Information:	Internet: http://w3.conocophillips.com/NetMSDS/

2. Hazards Identification

Emergency Overview

CAUTION!

Eye Irritant

NFPA

Appearance: Green
Physical Form: Semi-Solid
Odor: Petroleum

Potential Health Effects

Eye: Eye irritant. Contact may cause stinging, watering, redness, and swelling.

Skin: Contact may cause mild skin irritation including redness and a burning sensation. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available on acute toxicity.

Ingestion (Swallowing): No harmful effects expected from ingestion.

Signs and Symptoms: Effects of overexposure may include irritation of the digestive tract, nausea and diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Pre-Existing Medical Conditions: Conditions which may be aggravated by exposure include skin disorders and eye disorders.

See Section 11 for additional Toxicity Information.

3. Composition / Information on Ingredients

Component	CASRN	Concentration*
Lubricant Base Oil (Petroleum)	VARIOUS	<90
Additives	PROPRIETARY	>12
Zinc dialkyl dithiophosphate	68649-42-3	<2

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. Remove contact lenses if present and easy to do. For direct contact, hold eyelids apart and flush the affected eye(s) with clean water for at least 15 minutes. If irritation persists, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Notes to Physician: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

5. Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 1 **Flammability:** 1 **Instability:** 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

6. Accidental Release Measures

Personal Precautions: This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal.

7. Handling and Storage

Precautions for safe handling: Wear eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Conditions for safe storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

8. Exposure Controls / Personal Protection

Component	US-ACGIH	OSHA	Other
Lubricant Base Oil (Petroleum)	TWA: 5mg/m^3 STEL: 10 mg/m^3 as Oil Mist, if generated	TWA: 5 mg/m^3 as Oil Mist, if generated	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials: Nitrile.

Respiratory Protection: Respiratory protection is not normally required under intended conditions of use. Emergencies or conditions that could result in significant airborne exposures may require the use of NIOSH approved respiratory protection. An industrial hygienist or other appropriate health and safety professional should be consulted for specific guidance under these situations.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

9. Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Green
Physical Form:	Semi-Solid
Odor:	Petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	<0.1mm Hg
Vapor Density (air=1):	> 5
Boiling Point/Range:	No data
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Bulk Density:	7.5 lbs/gal
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	450°F / 232°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
LEL (vol % in air):	No data
UEL (vol % in air):	No data
Autoignition Temperature:	No data

10. Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

11. Toxicological Information

Chronic Data:

Lubricant Base Oil (Petroleum)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including severe hydrocracking/hydroprocessing to reduce aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and are not considered carcinogens by NTP, IARC, or OSHA.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil (Petroleum)	>5 g/kg	>2 g/kg	No data
Zinc dialkyl dithiophosphate	>2000 mg/kg (rat)	>2000 mg/kg (rat)	No data

12. Ecological Information

Ecotoxicity: Experimental studies show that acute aquatic toxicity values are in the range 1-100 mg/l. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions. Should be regarded as capable of causing long term adverse effects in the aquatic environment.

Mobility: Volatilization to air is not expected to be a significant fate process due to the low vapor pressure of this material. Components may behave differently in the aquatic environment with soaps dispersing and dissolving to some extent in water while the hydrocarbons will float on the surface due to their low water solubility. The hydrocarbon portion would be expected to show low mobility in soil and water. The major environmental fate would be expected to be biodegradion.

Persistence and degradability: The base oil constituents of greases are expected to be inherently, but no readily biodegradable. Some of the thickening agents may be readily biodegradable.

Bioaccumulation Potential: Log Kow values measured for the hydrocarbon components of this material range from 4 to over 6, and therefore regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

13. Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

This material under most intended uses would become "Used Oil" due to contamination by physical or chemical impurities. Whenever possible, Recycle Used Oil in accordance with applicable federal and state or local regulations. Container contents should be completely used and containers should be emptied prior to discard.

14. Transportation Information

U.S. Department of Transportation (DOT)
Shipping Description: *Not regulated*
Note: *If shipped by land in a packaging having a capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply. (Contains oil)*

International Maritime Dangerous Goods (IMDG)
Shipping Description: *Not regulated*
Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.*

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)
UN/ID #: *Not regulated*

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

15. Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health:	Yes
Chronic Health:	No
Fire Hazard:	No
Pressure Hazard:	No
Reactive Hazard:	No

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration*	de minimis
Zinc compound(s)	<2	1.0%

EPA (CERCLA) Reportable Quantity (in pounds):
This material does not contain any chemicals with CERCLA Reportable Quantities. This material contains the following chemicals subject to the reporting requirements of 40 CFR 302.4:

California Proposition 65:
Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Silica-Crystalline (Quartz)	Cancer
Naphthalene	Cancer

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class
D2B

National Chemical Inventories:
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.
All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

16. Other Information

Date of Issue:	23-Oct-2008
Status:	Final
Previous Issue Date:	06-Apr-2005
Revised Sections or Basis for Revision:	Emergency Overview (Section 2) Health Hazard (Section 2) Composition (Section 3) Regulatory information (Section 15)
MSDS Number:	722490

Guide to Abbreviations:
ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:
The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL SHC 634**
Product Description: Synthetic Base Stocks and Additives
Product Code: 201560500570, 602912-00, 970321
Intended Use: Circulating/gear oil

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
MSDS Requests	713-613-3661
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0
HMIS Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use

mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Oxides of carbon, Aldehydes, Incomplete combustion products, Sulfur oxides

FLAMMABILITY PROPERTIES

Flash Point [Method]: >210C (410F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL, 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions.
Control measures to consider:
No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator

selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly affect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Color: Orange
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.869
Flash Point [Method]: >210C (410F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: >316C (600F)
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: <0.013 kPa (0.1 mm Hg) at 20 C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): N/D
Solubility in Water: Negligible

Viscosity: 460 cSt (460 mm2/sec) at 40 C
Oxidizing Properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -30°C (-22°F)

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

Contains:
Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitizing in test animals and humans.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.
Material -- Not expected to demonstrate chronic toxicity to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT) : Not Regulated for Land Transport

LAND (TDG) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: IECSC, DSL, EINECS, KECI, TSCA

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
PHENOL, 4,4-METHYLENEBIS(2,6-BIS(1,1-DIMETHYLETHYL)-	118-82-1	5,9

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 13: Empty Container Warning was modified.
Section 08: Hand Protection was modified.
Section 06: Notification Procedures was modified.
Section 16: Standard phrases for California Proposition 65 was added.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only
MHC: 0,0,0,0,0,0 PPEC: A

DGN: 2007946XUS (547900)

MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012 **Supersedes:** May 14, 2009

Section 1 • Product and Company Identification

Product Name: LPS® 2 (Bulk)

Part Number(s): 00222, 02128, 00205, 00255, C00222, C02128, C00205, C00255

Chemical Name: Petroleum Distillates

Product Use: An industrial lubricant designed to displace moisture from equipment, provide heavy-duty lubrication and rust prevention.

Manufacturer Information: LPS Laboratories, 4647 Hugh Howell Road, Tucker, GA, USA 30084
TEL: USA & Canada: 1 800 241-8334
Outside USA and Canada: +1 770 243-8800
FAX: USA & Canada: 1 800 543-1563
Outside USA and Canada: +1 770 243-8899

Emergency Telephone Number: Chemtrec: USA & Canada: 1 800 424-9300
Outside USA and Canada: +1 703 527-3887

Website: http://www.lpslabs.com

Section 2 • Hazards Identification

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Emergency Overview:

Aerosol: Not applicable

Bulk: DANGER: Combustible. Keep away from heat and flame. Harmful or fatal if swallowed.

Primary route(s) of entry: Skin and eye contact. Inhalation.

Potential Acute Health Effects:

Eyes: Irritating to eyes.

Skin: Repeated exposure may cause skin dryness or cracking.

Inhalation: Excessive inhalation of vapors can cause irritation of the respiratory tract, nausea, dizziness or headache.

Ingestion: Product has a low order of acute oral toxicity, but ingestion of large quantities may cause nausea, vomiting, and gastrointestinal irritation. May cause injury if aspirated into lungs.

Potential Chronic Health Effects:

Carcinogenic Effects: **NTP:** No **IARC:** No **OSHA:** No **ACGIH:** No

Mutagenic Effects: None

Teratogenic Effects: None

Target Organs: None

MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012 **Supersedes:** May 14, 2009

Medical conditions aggravated by exposure:
Persons with pre-existing central nervous system (CNS) disease, neurological conditions, skin disorders, chronic respiratory diseases, or impaired liver or kidney function should avoid exposure.

Signs and Symptoms
Stinging in eyes. Repeated or prolonged skin contact can cause redness, irritation, and scaling of the skin (dermatitis). Breathing of high vapor concentrations may cause headaches, stupor, irritation of throat and eyes, and kidney effects.

Section 3 • Composition / Information on Ingredients

Component	CASRN	Weight Percent
Distillates (Petroleum), Hydrotreated Light	64742-47-8	70 - 80%
Mineral Seal (Petroleum) Oil	64742-47-8 / 64742-52-5	20 - 30%

Section 4 • First Aid Measures

Eyes: Check for and remove contact lenses. If irritation or redness develops, flush eyes with cool, clean, low pressure water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye and eyelid tissue. DO NOT use eye ointment. Seek medical attention immediately.

Skin: Remove contaminated shoes and clothing. Clean affected area thoroughly with mild soap and water. DO NOT use ointments. Seek medical attention if irritation persists.

Inhalation: Immediately move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). If breathing is difficult, seek medical attention immediately.

Ingestion: DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down. DO NOT leave victim unattended. Seek medical attention immediately.

Notes to Physician: This material is an aspiration hazard. Potential danger from aspiration must be weighed against possible oral toxicity (See Section 2 - Ingestion) when deciding whether to induce vomiting. Inhalation of high concentrations of this material, as could occur in enclosed spaces or during deliberate abuse, may be associated with cardiac arrhythmias.

MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012 **Supersedes:** May 14, 2009

Section 5 • Fire Fighting Measures

Products of Combustion: Carbon monoxide and carbon dioxide.

General Fire Hazards: High heat will cause product to boil, evolving vapor that could cause explosive rupture of closed containers.

Firefighting media: SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use CO2, water spray, fog or foam. Cool containing vessels with water jet in order to prevent pressure build-up, auto-ignition or explosions.

Sensitivity to Impact: None **Sensitivity to Static Discharge:** None

Protection Clothing (Fire): Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Evacuate area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles.

Special Remarks on Explosion Hazards:
High heat will cause product to boil, evolving vapor that could cause explosive rupture of closed containers.

Section 6 • Accidental Release Measures

Containment Procedures:
Small Spill and Leak: Absorb with an inert material and dispose of properly.
Large Spill and Leak: Secure the area and control access. Dike far ahead of a liquid spill to ensure complete collection. Pick up free liquid for disposal using absorbent pads, sand, or other inert non-combustible absorbent materials. Place into appropriate waste containers for later disposal.

Clean-Up Procedures: Contain and recover spilled material when possible.

Evacuation Procedures: Ventilate area of leak or spill. Keep unnecessary and unprotected people away.

Special Procedures: Remove all sources of ignition. Ventilate area. Wear personal protective equipment during cleanup.

Section 7 • Handling and Storage

Handling: DO NOT spray into or around ignition sources. DO NOT allow material to come in contact with eyes or skin. Wear appropriate protective equipment during handling. Keep container closed. Avoid breathing vapors or mists. Use only with adequate ventilation. Wash thoroughly after handling.

Storage: Keep container in a cool, well-ventilated area. Avoid all sources of ignition (spark or flame). Store between 40°F and 120°F (4.4°C and 49°C).

Precautions to be taken in handling and storage:
Store all materials in a dry, well-ventilated area. Avoid breathing vapors.

MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012 **Supersedes:** May 14, 2009

Section 8 • Exposure Controls / Personal Protection

Exposure Guidelines:

Component	CASRN	OSHA	ACGIH	NIOSH	Supplier
Distillates (Petroleum), Hydrotreated Light	64742-47-8	5 mg/m3 (oil mist) PEL	5 mg/m3 (oil mist) TLV 10 mg/m3 (oil mist) STEL	5 mg/m3 (oil mist) TWA 10 mg/m3 (oil mist) STEL	100 ppm TWA 525 mg/m3 TWA
Mineral Seal (Petroleum) Oil	64742-47-8 / 64742-52-5	5 mg/m3 PEL	5 mg/m3 (oil mist) 10 mg/m3 (oil mist)	5 mg/m3 (oil mist) TWA 10 mg/m3 (oil mist) STEL	None reported

Engineering Controls: Provide general and/or local exhaust ventilation to keep exposures below the exposure guidelines listed above.

Personal protective equipment

Eye protection: Safety glasses with side shields conforming to appropriate regulations. Eye wash fountain and emergency shower facilities are recommended.

Hand protection: Normally no hand protection is required; however, if product will be sprayed for an extended period, "overspray" onto skin may occur. If so, wear chemical resistant gloves conforming to appropriate regulations. Please observe the instructions regarding permeability and breakthrough time that are provided by the supplier of the gloves.

Respiratory protection: Typical use of this product under normal conditions does not require the use of respiratory protection. If airborne concentrations are above the applicable exposure limits (listed above), use NIOSH approved respiratory protection (i.e. organic vapor cartridge).

General Hygiene Considerations: Wash thoroughly after handling. Have eye-wash facilities immediately available.

MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012 **Supersedes:** May 14, 2009

Section 9 • Physical and Chemical Properties

Appearance:	Liquid	**Color:**	Brown
Odor:	Petroleum / Cherry	**Evaporation Rate:**	< 0.1 (BuAc = 1)
Solubility Description:	< 3% in water	**Flash Point:**	79°C (175°F) - dispensed liquid
Boiling Point:	195°C (383°F)	**Flash Point Method:**	Tag-Closed Cup
Specific Gravity (H2O=1):	0.82 - 0.86 @ 20°C	**Decomposition Temperature:**	Not established
Vapor Density (air = 1):	4.7	**Auto ignition temperature:**	> 228°C (442ºF)
Vapor Pressure:	< 0.05 mm Hg @ 20ºC	**Flammable limits (estimated):**	LOWER: 0.6% UPPER: 7.0%
Rule 1171 PPc:	Not applicable	**Partition Coefficient (octanol/water):**	< 1
V.O.C. Content:	Aerosol: Not applicable Bulk: 0% per State & Federal Consumer Product Regulations	**Odor Threshold:**	Not established
Melting Point:	< -50ºC (-58ºF)	**Viscosity:**	< 7 cSt @ 25ºC
pH:	Not applicable	**Volatiles:**	92 - 95%
Heat of combustion:	Aerosol: Not applicable Bulk: > 30 kJ/g		

Section 10 • Stability and Reactivity

Chemical Stability:	Product is stable under recommended storage conditions.
Conditions to Avoid:	Keep away from heat and ignition sources.
Incompatibility:	Reactive or incompatible with oxidizing agents.
Hazardous Decomposition:	Combustion will generate smoke, possibly thick and choking, resulting in zero visibility and combustion products include carbon monoxide and carbon dioxide.
Hazardous Polymerization:	Will not occur.

MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012 **Supersedes:** May 14, 2009

Section 11 • Toxicological Information

Acute and Chronic Toxicity

A: General Product Information
An acute toxicity study of this product has not been conducted. Information given in this section relates only to individual constituents contained in this preparation.

B: Component Analysis

Component	CASRN	LC-50	LD-50
Distillates (Petroleum), Hydrotreated Light	64742-47-8	> 6.8 mg/L*	> 5 g/kg*
Mineral Seal (Petroleum) Oil	64742-47-8 / 64742-52-5	Not established	Not established

* Supplier Data

Section 12 • Ecological Information

Mobility: Semi-volatile. Readily absorbed into soil. **Persistence / Degradability:** Only slightly biodegradable

Bioaccumulative potential: No bioaccumulation potential **Other adverse effects:** See below

Ecological studies have not been conducted for this product. The following information is available for component(s) of this product.

Ecotoxicity

Effects on Organisms	Component	CASRN	Test	Species	Results
Acute Toxicity on Fishes	Distillates (Petroleum), Hydrotreated Light	64742-47-8	96-hr LC50	Oncorhynchus Mykiss	3,200 µg/L*
Acute Toxicity on Daphnia	No data available				
Bacterial Inhibition					
Growth inhibition of algae					
Bioaccumulation in fish					

* Supplier Data

For the 64742-47-8 component, no toxicity has been observed in water due to extremely low water solubility. However, hydrocarbon and petroleum distillates are potentially toxic to freshwater and saltwater ecosystems. If material is spilled on soil, some potential toxic effects could occur before biodegradation could remove material.

If spilled, the 64742-46-7 constituent may kill grasses and small plants by interfering with transpiration. Spilled material may coat gill structures of fish resulting in suffocation if spilled in shallow, running water. This product may be toxic to amphibians by preventing dermal respiration. This product may also cause gastrointestinal distress to birds and mammals through ingestion. Biodegradation of this product is possible within 90 to 120 days in aerobic environments at temperatures above 21°C.

MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012 **Supersedes:** May 14, 2009

Section 13 • Disposal Considerations

Waste Status: In its purchased form, this material does not meet the definition of a RCRA hazardous waste (40 CFR 261).

Disposal: Waste must be disposed of in accordance with any and all applicable environmental control rules and/or regulations.

Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information inaccurate, incomplete, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive than federal laws and regulations.

Section 14 • Transport Information

Non-aerosol versions of this product are not regulated by any mode of transportation.

The preceding information is subject to change and must be verified prior to shipment. It is the responsibility of anyone offering hazardous materials for shipment to ensure compliance with all applicable regulations.

Section 15 • Regulatory Information

U.S. Federal Regulations

RCRA Hazardous Waste No.: None

Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA):
None

Toxic Substances Control Act (TSCA):
All components of this product are TSCA inventory listed and/or are exempt.

Superfund Amendments and Reauthorization Act (SARA) Title III SARA Section 311/312 (40 CFR 370) Hazard Categories:
Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

This product contains the following toxic chemical(s) subject to reporting requirements of SARA Section 313 (40 CFR 372):
No individual section 313 component is present at or above 1%.

Section 112 Hazardous Air Pollutants (HAPs): None

State Regulations

California: This product does not contain chemical(s) known to the State of California to cause cancer, birth defects or other

California and OTC States: This product conforms to consumer product regulations.

New Jersey Right to Know:
Aerosol: Not applicable
Bulk: Distillates (Petroleum), Hydrotreated Light 64742-47-8 ● Mineral Seal (Petroleum) Oil 64742-46-7 / 64742-52-5 ● Proprietary NJ TS RN 800959-5152P ● Proprietary NJ TS RN 800959-5153P ● Alkyd Acid Phosphate 68307-94-8

MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012 **Supersedes:** May 14, 2009

International Regulations

Canadian Environmental Protection Act (CEPA):
All of the components of this product are included on the Canadian Domestic Substances list (DSL).

Canadian Workplace Hazardous Materials Information System WHMIS:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification:
Bulk: Class B3, Class D2B

Other Regulations:

Montreal Protocol listed ingredients:	None
Stockholm Convention listed ingredients:	None
Rotterdam Convention listed engredients:	None
RoHS Compliant:	Yes

Section 16 • Other Information

		HMIS 1996		HMIS III	
MSDS#:	10222	Health:	1	Health:	[/] 1
MSDS Preparation Responsible Name: Elena Badiuzzi Compliance Manager Telephone: +1 770 243-8800		Flammability:	2	Flammability Aerosol:	NA
				Flammability Bulk:	2
		Reactivity:	0	Physical Hazard Aerosol:	NA
				Physical Hazard Bulk:	0

NFPA
Flammability
Health 2 1 0 Reactivity
Special

Notice to Reader:
To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Elena Badiuzzi, Compliance Manager
LPS Laboratories, a division of Illinois Tool Works

Koolkut® Spectrum

Material Safety Data Sheet

1. Product and Company Identification

Product Name:	Koolkut® Spectrum
MSDS Number:	778731
Intended Use:	Metalworking Fluid
Manufacturer/Supplier:	ConocoPhillips Lubricants 600 N. Dairy Ashford Houston, Texas 77079-1175
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
Customer Service:	888-766-7676
Technical Information:	800-255-9556
MSDS Information:	Internet: http://w3.conocophillips.com/NetMSDS/

2. Hazards Identification

Emergency Overview

May be harmful to breastfed babies

NFPA

Appearance: Amber
Physical Form: Liquid
Odor: Petroleum

Potential Health Effects
Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Contact may cause mild skin irritation including redness and a burning sensation. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). No information available on skin absorption.

Inhalation (Breathing): No information available on acute toxicity.

Ingestion (Swallowing): Low to moderate degree of toxicity by ingestion.

Signs and Symptoms: Effects of overexposure may include irritation of the digestive tract, nausea and diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Pre-Existing Medical Conditions: Conditions which may be aggravated by exposure include skin disorders.

See Section 11 for additional Toxicity Information.

3. Composition / Information on Ingredients

Component	CASRN	Concentration*
Lubricant Base Oil (Petroleum)	VARIOUS	>90
Chlorinated Paraffins (C14-C17)	61788-76-9	<5
Additives	PROPRIETARY	<5

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek medical attention.

Ingestion (Swallowing): If swallowed, seek emergency medical attention. If victim is drowsy or unconscious and vomiting, place on the left side with the head down and do not give anything by mouth. If victim is conscious and alert and ingestion occurred within the last hour, vomiting should be induced for ingestions of large amounts (more than 5 ounces in an adult) preferably under direction from a physician or poison center. Do not leave victim unattended and observe closely for adequacy of breathing.

Notes to Physician: Acute aspirations of large amounts of oil-laden material may produce a serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities.

5. Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 0 **Flammability:** 1 **Instability:** 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

OSHA Flammability Category: None

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

6. Accidental Release Measures

Personal Precautions: This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal.

7. Handling and Storage

Precautions for safe handling: Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Conditions for safe storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

8. Exposure Controls / Personal Protection

Component	US-ACGIH	OSHA	Other
Lubricant Base Oil (Petroleum)	TWA: 5mg/m^3 STEL: 10 mg/m^3 as Oil Mist, if generated	TWA: 5 mg/m^3 as Oil Mist, if generated	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials: Nitrile.

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with R or P95 filters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

9. Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Amber
Physical Form:	Liquid
Odor:	Petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	<1 mm Hg
Vapor Density (air=1):	>1
Boiling Point/Range:	No data
Melting/Freezing Point:	<-4°F / <-20°C
Solubility in Water:	Insoluble
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.89 @ 60ºF (15.6ºC)
Bulk Density:	7.4 lbs/gal
Viscosity:	5.4 cSt @ 100°C; 32 cSt @ 40°C
Evaporation Rate (nBuAc=1):	No data
Flash Point:	>399°F / >204°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
LEL (vol % in air):	No data
UEL (vol % in air):	No data
Autoignition Temperature:	No data

10. Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

11. Toxicological Information

Chronic Data:

A mortality study sponsored by General Motors and the United Auto Workers suggested a link between cutting oils or machining fluids and various forms of cancer (e.g., esophageal, laryngeal,and rectal) The study evaluated workplace exposures from 1940-1984. Since the composition of these materials has changed substantially since 1940, and because the most notable effects were seen among those with work histories dating back to that time, the relevance of these findings to present-day exposures is uncertain. Cutting oils or machining fluids have not been identified as carcinogens by NTP, IARC, or OSHA.

Lubricant Base Oil (Petroleum)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including severe hydrocracking/hydroprocessing to reduce aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and are not considered carcinogens by NTP, IARC, or OSHA.

Chlorinated Paraffins (C14-C17)

Carcinogenicity: Certain Chlorinated paraffins mixtures have caused an increase in tumors when given in very high oral doses to mice and rats. This particular chlorinated paraffin has not been identified as a carcinogen by NTP, IARC or OSHA.

Target Organs: Administration of intermediate length chlorinated paraffins has demonstrated limited evidence of liver toxicity in experimental animals. Effects seen include increased liver:body weight ratios and hepatocellular hypertrophy.

Reproductive: Animal studies in both rats (up to 5000 mg/kg, orally) and rabbits (up to 100 mg/kg), orally did not demonstrate effects on the developing fetus. However, the rat studies found increased mortality in pups exposed to chlorinated paraffins via lactation.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil (Petroleum)	>5 g/kg	>2 g/kg	No data
Chlorinated Paraffins (C14-C17)	>4 g/kg (rat)	>10 ml/kg (rabbit)	No Data

12. Ecological Information

Ecotoxicity: Experimental studies show that acute aquatic toxicity values are greater than 1000 mg/l. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions.

Mobility: Volatilization to air is not expected to be a significant fate process due to the low vapor pressure of this material. In water, base oils will float and spread over the surface at a rate dependent upon viscosity. There will be significant removal of hydrocarbons from the water by sediment adsorption. In soil and sediment, hydrocarbon components will show low mobility with adsorption to sediments being the predominant physical process. The main fate process is expected to be slow biodegradation of base oil components in soil and sediment.

Persistence and degradability: The hydrocarbons in this material are not readily biodegradable, but since they can be degraded by microorganisms, they are regarded as inherently biodegradable.

Bioaccumulation Potential: Log Kow values measured for the hydrocarbon components of this material range from 4 to over 6, and therefore regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

13. Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

This material under most intended uses would become "Used Oil" due to contamination by physical or chemical impurities. Whenever possible, Recycle Used Oil in accordance with applicable federal and state or local regulations. Container contents should be completely used and containers should be emptied prior to discard.

14. Transportation Information

U.S. Department of Transportation (DOT)
Shipping Description: *Not regulated*
Note: *If shipped by land in a packaging having a capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply. (Contains oil)*

International Maritime Dangerous Goods (IMDG)
Shipping Description: *Not regulated*
Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.*

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)
UN/ID #: *Not regulated*
Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24.*

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

15. Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)
Acute Health: No

Chronic Health:	No
Fire Hazard:	No
Pressure Hazard:	No
Reactive Hazard:	No

CERCLA/SARA - Section 313 and 40 CFR 372:
This material does not contain any chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372.

EPA (CERCLA) Reportable Quantity (in pounds):
This material does not contain any chemicals with CERCLA Reportable Quantities.

California Proposition 65:
This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class
None

National Chemical Inventories:
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.
All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

16. Other Information

Date of Issue:	15-Oct-2008
Status:	Final
Previous Issue Date:	20-Jun-2007
Revised Sections or Basis for Revision:	Emergency Overview (Section 2) Toxicological (Section 11)
MSDS Number:	778731

Guide to Abbreviations:
ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:
The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL DTE 24**
Product Description: Base Oil and Additives
Product Code: 201560102010, 602623-00, 970972
Intended Use: Hydraulic fluid

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use

adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Pressurized mists may form a flammable mixture.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulfur oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >200°C (392°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The

National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders. For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to hydrocarbons are recommended. Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers. Keep away from incompatible materials.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following are recommended: 5 mg/m³ - ACGIH TLV (inhalable fraction), 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:
No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:
No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:
No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Color: Brown
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15.6 °C): 0.871
Flash Point [Method]: >200°C (392°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (600°F)
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 °C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 32 cSt (32 mm2/sec) at 40 °C | 5.3 cSt (5.3 mm2/sec) at 100°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -18°C (0°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

OTHER ECOLOGICAL INFORMATION

VOC: 0 G/L [ASTM E1868-10]

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT): Not Regulated for Land Transport

LAND (TDG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

Complies with the following national/regional chemical inventory requirements:: AICS, DSL, ENCS, IECSC, KECI, PICCS, TSCA

EPCRA SECTION 302: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
ZINC ALKYL DITHIOPHOSPHATE	68649-42-3	15

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 09: Boiling Point C(F) was modified.
Section 08: Comply with applicable regulations phrase was modified.
Section 09: Vapor Pressure was modified.
Hazard Identification: Health Hazards was modified.
Section 11: Dermal Lethality Test Data was modified.
Section 11: Dermal Lethality Test Comment was modified.
Section 11: Oral Lethality Test Data was modified.
Section 11: Inhalation Lethality Test Data was modified.
Section 11: Dermal Irritation Test Data was modified.
Section 11: Eye Irritation Test Data was modified.

Section 11: Oral Lethality Test Comment was modified.
Section 11: Inhalation Lethality Test Comment was modified.
Section 11: Dermal Irritation Test Comment was modified.
Section 11: Eye Irritation Test Comment was modified.
Section 11: Inhalation Irritation Test Data was modified.
Section 09: Relative Density - Header was modified.
Section 09: Flash Point C(F) was modified.
Section 09: Viscosity was modified.
Section 09: Viscosity was modified.
Section 14: LAND (TDG) - Header was modified.
Section 15: List Citations Table was modified.
Section 15: National Chemical Inventory Listing was modified.
Section 15: Community RTK - Header was modified.
Section 12: Other Ecological Information - Header was added.
Section 12: California VOC was added.
Section 12: California VOC was added.

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