

CHAPTER NAVIGATOR

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56CI H'H<G'7<5DH9F`
 ; 9B9F 5@B: CFA 5HCB`
 · H9FA BC@C; M
 · DF 9F 9E I G#H9G
 · B8=75HCBG
 · HCC@7<C=79G`
 · 56CI H'H<9'F9GH'C: 'H<G'7<5DH9F`
 ; 9B9F =7'G9FJ =9'DFC798I F9`
 · 89G= B'J 5F=5HCBG`
 · ; 9B9F =7: F99<I 6'G9FJ =9'DFC798I F9`
 · ; 9B9F =7: FCBH<I 6'5B8': F99K <99@<I 6'G9FJ =9'DFC798I F9`
 7<F G?B; : F99<I 6G`
 · HCC@H9FA BC@C; M`
 · D5FH'H9FA BC@C; M`
 · : I @: F99<I 6'G9FJ =9`
 5@@G9FJ =9'DFC798I F9G`

H\]g'XYa c'j Yfg]cb'cZ'6UfbYh'g'A Ubi U'8L ']g'Wtdmf][\hYX'Vm
 >c\b'6UfbYh'I gY'jg`ja]hYX'hc'hY']bX]j]Xi U'k \c'Xck b'cUXg'
 hY'a UhYf]Už'UbX'fYX]ghf]Vi h]cb']b'UbmZcfa ']g'ghf]Mmidfc\]V]hYX"
 BchY. H\]g'XYa c'Wtdm\Ug`]b_g'h Uh[c'hc`cWU]cbg']b'6UfbYh'g'
 A Ubi ``8L 'ci hg]XY'cZ'h]g'VXUdhYf''H\YgY`]b_g'UfY'bch'UM]j Y']b'
 h]g'XYa c"

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H\lg'WUdhf']g'U'ci h'Wfh]X] Y!VUf]b[` \i Vg'H'YgY` \i Vg'UfY'cZhb' W'YX' gUYX!VUf]b[` \i Vg'Vi h'Vch' `ccgY!U' ` \i Vg'UbX'Wfh]X] Y!VUf]b[` \i Vg'Wb' \Uj YgUYXVUf]b[g'H\YXYg[b'cZ'Wfh]X] Y!VUf]b[` \i Vg'j Uf]YgfhYa YbXci g'm k]h Ua cghY Yfna Ubi Z'Wf' fY'Xyg[b]b[` \i Vg']b UX]ZZfYbhk Urr5 Vci hh\Ycb`m Z'Wf' U' Wfh]X] Y!VUf]b[` \i V'a Ubi Z'Wf' fY'g' \Uj Y]b Wa a cb]g'h Uh'h YrU' i gYU'Wfh]X] YVUf]b[` h Uh]g'dfYggYX]bhc h'Y' \i Vg'Y' < UX'YrUbX'7cbfUX'UfY bLa Yg'h Uh'UfYgca Yha Ygi g'XZcf' h'Y'Wfh]X] YVUf]b["7Ufh]X] Y!VUf]b[` \i Vg']bW'XYZ'cbh' \i Vg'zfYUf' ` \i Vg'h Uh'U'WdhUh'fYU'cb' Z'Yk \YY'zUbX'Z'Y' \i Vg' ffYUf' ` \i Vg'h Uh' \Uj Y'h Y'Z'Yk \YY' a YWUb]ga `]bh] fU'X]]bhc h'Y' \i V'

H\YfY]gbc k Uh'U' V'UbXg'UbX'a cXY'g'Wb VY'Wj YfYX]b'h]g'WUdhf'zgc h'YfY]g'U[YbYf]W'Z'Y' \i V' d'fc'W'X' fY'fk]h' X]ZZfYbhghYdg'Zcf' U' X'Yg[b'j Uf]U'hc'bg' UbXU[YbYf]W'Z'cbh' \i V'#'bc'b!Z'Y' \i V'f'YUf' d'fc'W'X' fY'fk]h' X]ZZfYbhghYdg'Zcf' U' X'Yg[b'j Uf]U'hc'bg' " =b' U'X]]hc'b'z'h YfY]g'd'fc'W'X' fY'Zcf' 7' \f]g'?]b['Z'Y' \i Vg'z k \]W'UfY'd'cdi `Uf'UbX'h'cc' i b]ei Yhc' Wj Yf']b'h Y[YbYf]W' d'fc'W'X' fY'

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GENERAL INFORMATION

TERMINOLOGY

5l Y H\Yg\UzhUh[cYghfci [\ hY\i VZUci hk \JW'hY\i V'hi fbg'

5l YgdUWf. 5bm\UfXk UfYcb'h YbXcZUbU YhUhghgh YX]ghUWZfca .
 hYXfcdci hlc hYci hf VUf]b['cZ'hY\i V'Gca Yha Ygg\cfhYbXhc 'gdUWf'
 6YUf]b['a ci bh'5bmg fZUWUWfh]X] YVUf]b['Yb[U YgZ]h Yf Uh]g]bbYf .
 dYf]a Yhf'cf]hg'ci hf dYf]a Yhf" Gca Yha Ygg\cfhYbXhc 'a d bh'
 7Ufh]X] Y VUf]b[. 5 'Z `mgYZWbhUjYX VUf]b['i b]hUh Wbbch VY
 X]gUgYa VYX" 5 'VUf]b['Wfh]X] Y]bW X]g VU" VUf]b[g UbX Ub]bbYf UbX
 ci hf fUW H\YVUf]b[gUfYi g U`m\]X]b V\]bXgUg" H\YbhfYUgYa Vm
]g'g\UdYX `L YUg\cfhW]bXf'k]h `U\c Yh'fci [\ `hY Wbhf" Gca Yha Yg
 g\cfhYbXhc 'Wfh]X]Y'
 8fj Yf. GYZZYi VVXh
 8i gWd. 5 d]WWh Uh hfUg'cf dfYgYgcbhc h Yci hf YbXcZ'hY\i Vg\Y"
 hc Wj Yf hY\c Yh'fci [\ k \JW'h YVUf]b[gUfYUWgYX'
 : fY\i V VcXm H\Y g]a YbhcZ UfYf' \i V'hc `k \JW'h Y [Yfg UH W" =h
 fchUg'cb]hg'ck b VUf]b[g UbX]bW X]g U] YghUdUfhcZ'h YfUWYha YWU
 b]ga "5 `gc WYX X]j Y'
 < i Vg\Y` H\Ya Ujg'fi W] fYcZ'hY\i V'H\Y\i Vg\Y"]bW X]g'h Y\ci g
]b['Zcf h YVUf]b[gZk \JW WbhUjbgU\i V WfYUbxhc ` \i V Uub[Yg'
 =bbYf fUW H\Y W]bXf Uih Y]bbYf dYf]a Yhf'cZ U VUf]b['Wfh]X] Y'
 A ci bh'GY VUf]b['a d bh'
 Ci hf fUW H\Y W]bXf Uih Yci hf dYf]a Yhf'cZ U VUf]b['Wfh]X] Y'

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Duk . 5 "Yf'k jh UXghbWwfbY'UicbYybXUbXUfci bXX'g fZWcb'hY
ch'Yf'YbX'H\Yfci bXX'YbXUW'Ug'Ud'lj chZcf'h'YfchU'cb'cZ'h'YdUk "'H\Y
g\Ufd'YbX'Yb[U Yg'h'Yh'Yh']b'UfUWYhf]b[]b'cbYfYU'j YX'fYW'cb'cZ'fchU
h'cb'UbX'g]dgc'j Yf'h'Yh'Yh']b'h'Ych'Yf'fYU'j YX'fYW'cb'cZ'fchU'cb"

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Duk `gdf]b[. 5 'gdf]b['h'Uha cj Yg'h'YdUk `ci h'k'UfX'hc `Yb[U Yh'YfUWYhf]b["
FUWYha YWU]ga . 5 'a YWU]ga 'h'UhYb[U Yg'h'k'c'dUf'g'h'c[Yh'Yf'hc'a cj Y
U'g'cbYk \ Yb'cbYcZ'h'YdUf'g]gi bX'Y'hc'fg'cbU`cUX'Vi h]h'd'Yfa]g'h'Yh'k'c'dUf'g'
hc'fchU'Y]bXYdYbXYbh'nk \ Yb'bc'hc'fg'cbU`cUX]g'VY]b['Udd'YX'hc'h'YdUf'h'

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FUWYhd'UY . 5 'd'UY'k jh 'X'fYW'cbU' [Yf'h'Yh' 'cb'cbYZ'ZW' 'H'k'c'fUWYh'
d'U'g'fk jh [Yf'h'Yh' 'Z'W'g'U U]bgh'YUW'ch'Yf'z'Z' bW'cb'Ug'UfUWYha YWU
b]ga "K \ Yb`cUX]g'Udd'YX]b'cbYX'fYW'cb'zh'Yd'U'g'c'W'hc[Yh'Yf'UbX'h'fb'
U'g'cbY'K \ Yb`cUX]g'Udd'YX]b'h'Ych'Yf'X'fYW'cb'zh'YX'fYW'cbU'h'Yh' 'f]XY
cj Yf'YUW'ch'Yf'z'g'c'h'YdUf'g'UfYU`ck YX'hc'fchU'Y]bXYdYbXYbh'm'Gca Y'ha Yg'
W'YX'gU'fUWY'hc' gU'X'j Y"

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FUWYhf]b[. 5 'f]b['k jh 'X'fYW'cbU'h'Yh' 'cb']g']bbYf'dY'fa Yh'f"
GU . 5 'fi W'f'cf'd'U'g]W]b['cf'Ufi W'f'W'j Y'YX'a Y'U'f]b[zh'Uh'W'j Y'fg'U
[U'd'V'k Yb'h'k'c'dUf'g'hc'df'Y'Ybh'h'Y'Yb'f'm'c'Z'W'bh'a]b'U'bg"

G'ci 'X'f . 5 'U'hg fZW'h'Uh'h'YZ'ZW'cZ'UW'f]X' Y'V'U'f]b['g'U'g'U U]bgh'5
g'ci 'X'f'W'b'Y'cb'h'Y'g'U'Z'h[c]b['h'fci [\ 'h'Y'V'U'f]b['cf']b'h'Y'W']b'X'f']b'hc'
k \]W'h'Y'V'U'f]b[]g']bg'Y'h'X' 'H'Y'g'ci 'X'f'U' Y'g'h'Y'c'W']cb'cZ'h'Y'V'U'f]b["

G'bd'!f]b[. 5 'a Y'U'f]b['h'Uh'U'g']b'U[fcc'j Y'cb'h'Y'ci h'g]X'Y'cf']bg]X'Y'cZ'U
W']b'X'f'hc' 'h'U'd'h'Y'c'W']cb'cZ'U'cb'h'Yf']h'a 'cb'cf']b'h'Y'W']b'X'f' "H'Y'g'bd'
f]b[]g'U'Ya i g'h'Y'X'Y'U'W'X'hc' [Y'h]h'ci hcZ']g'a ci bh]b[[fcc'j Y'Gca Y'ha Yg'
W'YX'U'W']d'

GdUWf'g'Yj Y'5 'g'Yj Yd'UWXcj Yf'Ub'U 'Yh'Uhg'Yg'h'YX]g'ubWVhk Yb' 13 ò 5
hkc'Wfh]X[YVYf]b[g'Gca Yha Ygg'cfh'YbYXhc 'g'YjY

Gdf]b['kUg\ Yf. GYkUjnkUg\ Yf'

GhF'fUWYh'5 Uhf'buY'blà YZcf'U *fUWYhd'UH'*

K Uj nk Ug \ Yf. 5 k Ug \ Yf 'a UXYci hcZ'gdf]b[! [fUXYghY'h'U]gg\UdYXgca Y!
k \ Uh \] YUdchUc 'W]d'fM hik]h 'U\c'Yh'fci [\ 'h'YWbhfL'H'Yh]MbYgg'cZ'
Uk Uj nk Ug \ Yf ']gfYX' WXi bXYf' `cUX'H \]g'ZUhi fYybUWYg'h'Yk Uj nk Ug \ Yf ' hc'
UMUg'Uj Uf]UWY!h]MbYgg'gdUWf'

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PREREQUISITES

WHEEL REMOVAL AND INSTALLATION

6YZcfYcj Y\U `]b[`cf`UXi gh]b[`U\i VzhYk \YY`a i ghVYfYa cj YXZca `hY V`_Y`GYYh YWHEEL REMOVAL, REPLACEMENT, AND INSTALLATION WUdhf`Z` i bgj fYUci hk \YY`fYa cj U`UbX]bgU`Ujcb"

FREEWHEEL REMOVAL AND INSTALLATION

Hc`cj Y\U `cf`UXi ghUfYf`i V`k]h` Uh`fYUX`cb`ZYk \YY`z]h]gbYWggf`n`ic` fYa cj Yh`Y`ZYk \YY`"GYYh YFREEHUB MECHANISMS AND THREAD-ON FREE- WHEELS WUdhf` `Zcf`ZYk \YY`fYa cj U`" =Z`bchinYhU`i UjbnX`k]h` `WUdhf` & z]ha UmYi bWUf`k \Yh`Yf`h`Y`i V`Ug`Uh`fYUX`cb`ZYk \YY`cf`]g`UZYY`i V` H`YfY]g`Uga d`Yk`U`hc` X`h`fa]bYh`]g`9l` Ua]bYh`Yci`hf`Z`W`c`Z`h`Y[Yf`g`h`i UbX`cc`_ `Zcf`gd`]bYg`]b`h`Y`c`Yh`YU` `Y`Wa` Yg`ci`hc`Z` =Z`h`YfYfYbc`gd`]bYg`z`]h]g`bchiUZYY`i V` =Z`h`YfYfYgd`]bg`z`fchU`Y`h`Y[Yf`g`Wi` bhYV`c`W`k]gY`hc` `h`Y k \YY`" =Z`h`Ygd`]bYg`fchU`Y`k]h` `h`Y[Yf`g`z`h`Y`i V`]g`UZYY`i V` =Z`h`Ygd`]bYg` fYa Uj`g`h`UjcbUf`n`h`Y`i V`]b`bchiUZYY`i V`UbX`h`Y[Yf`g`h`i]g`UZYYk \YY`h`U`i h`fYUX`g`cb`hc` `h`Y`i V`

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INDICATIONS

H\YFYFYgy YfU`fYUgcbg`hc`cj Yf\U`h`Y`i VfgL`UbX`gy YfU`fYUgcbg`hc`
UXi gh`h`Ya`"5b`cj Yf\U`g`ci`XVYXcbYUg`dfhcZ`UfY[i`Uf`a`Uj`bh`b`UbW
VWVzh`YXi`fU`h`cb`cZ`k` \JW`k`]`W`Ub[`YX`d`Yb`X]b[`cb`h`Y`hd`Y`cZ`f]X]b[`zh`Y`
Ua`ci`bh`cZ`f]X]b[`z`Ub`X`h`Y`hd`Y`cZ`Yei`]da`Y`bh`5`X`i`g`ra`Y`bh`g`g`ci`XVYXcbY`
cb`h`Y`V`U`g`cZ`b`Y`X`

MAINTENANCE CYCLES

=Z`g`h`f`h`b[`ci`hk`]h` \i`VfgL`_`bck`b`hc`VY]b[`cc`X`W`b`X]h`cb`k`]h` [`cc`X`ei`U]h`m`
[`f`Y`U`g`z`h`Y`ng` \ci`XVYU`V`Y`hc`V`Y`f]X`X`b`h`ci`g`Ub`X`g`cZ`a`]`Y`g`k`]h`ci`hb`Y`X]b[`Ub`
cj`Yf`U`"=-Z`h`Y`Yei`]da`Y`bh`g`Y`g`]h`Y`k`Y`h`k`Y`U`h`Y`f`f]X]b[`zh`Y`b`Ub`U`d`f`c`d`f]U`h`
a`Uj`bh`b`UbW`V`W`Y`k`ci`XVY`&`S`S`S`I`'`S`S`S`a`]`Y`g`]b`a`c`g`h`V`W`Y`g`H`]g`g` \`c`f`h`V`W`Y`
a`U`h`Y`g`f`d`f]g`b[`"=h]g`W`a`a`cb`n`h`ci`[`\`h`h`U`h`W`h`f]X]Y`V`U`f]b[`\`i`V`g`U`f`Y`a`U`b`!
h`b`UbW`!`Z`Y`V`W`M`g`y`h`Y`m`f`Y`I`g`U`Y`X`I`H`Y`g`U`g`]b`h`Y`g`Y` \i`V`g`U`f`Y`Z`Z`W`M`j`Y`Z`c`f`
_`Y`d]b[`X]f`h`ci`h`Ub`X]b`W`M`U`g`Y`h`Y`cb[`Y`]h`m`c`Z`h`Y`[`f`Y`U`g`Y`V`m`a`]b]a`]n]b[`Y`l`d`c`!
g`f`Y`hc`U`f`h`U`h`X]Y`g`ci`h[`f`Y`U`g`Y`H`Y`g`U`g`U`f`Y`bc`[`i`U`f`U`b`h`Y`h`U`h`k`U`h`f`k`]`b`c`h`i`
[`Y`h]b`h`Y`V`U`f]b[`g`Ub`X`h`Y`m`X`c`b`c`h`d`f`Y`Y`b`h]b`h`f`b`U`k`Y`U`f`Z`c`a`W`b`h`U`a`]b`U`h]b[`
h`Y`[`f`Y`U`g`Y`k`]h`a`]M`c`g`W`d]W`M`U`g`j`Y`d`U`f]h`W`Y`g`cZ`a`Y`U`"=-Z`U`c`h`cZ`k`Y`h`W`b`X]`!
h`cb`f]X]b[`]g`X`cb`Y`z`h`Y`b`h`Y`a`Uj`bh`b`UbW`a`][`\`h`b`Y`X`hc`V`Y`U`g`cZ`h`b`U`g`Y`Y`f`m`
+) \$`I`%`S`S`S`a`]`Y`g`D`U`f`h`g`f`i`g`h`k`\`Y`h`Y`f`V`Y]b[`f]X`X`Y`b`c`f`b`c`h`z`g`c`U`b`c`h`Y`f`Z`U`h`f`]g`
\`c`k`cb[`h`Y`V`_`Y`a`U`h`Y`g`h`h]b[`V`Y`Z`c`f`Y`]h`k`]`V`Y`i`g`X`U`U`b`":`c`f`Y`l`a`d`Y`Z`Z`
f]X`X`Y`b`&`S`S`a`]`Y`g`]b`h`Y`f`U`b`]b`h`Y`Z`U`z`h`Y`b`d`i`h`U`k`U`m`Z`c`i`f`a`c`b`h`g`Z`c`f`h`Y`k`]b`!
h`f`z`]h`k`ci`X`d`f`c`V`U`V`m`Y`Y`U`[`cc`X]X`Y`U`hc`cj`Yf`U`h`Y` \i`VfgL`V`Y`Z`c`f`Y`d`i`h]b[`h`Y`
V`_`Y`U`k`U`m`Z`c`f`h`Y`k`]b`h`f`"

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SYMPTOMS INDICATING NEED OF OVERHAUL

K \Uhgna dka gkci `X`YUXhc`h`YZYY]b[`h`Uih`Y`i`VfLg`ci`XVYcj Yf!
\U`YX3C bY]g`h`Uik`Yb`h`fb]b[`h`YU`Y]h`XcYg`bchh`fb`ga`cch`m`G]bW
h`YfY`UfY`bc`UXi`ga`Ybh`cb`a`cgh`Wfh[X]`Y`VYUf]b[`i`Vgž`h`Y`h[`\h`Ygg`lg
i`b`_`Ymhc`VYWM`g`X`Vm`Udccc`UXi`ga`Ybh`H`Y`UW`cZ`ga`cch`b`Ygg`Wi`X`
VYWM`g`X`Vm`X`m[`f`Y`U`g`Z`W`b`h`L`a`]b`U`H`X`[`f`Y`U`g`Z`c`f`k`c`f`b`d`U`f`h`"5`b`c`h`Y`f`g`na`d!
h`ca`]g`h`Uik`Yb`f`Ya`cj`]b[`h`Y`k`\`Y`U`b`X`f`ch`U]b[`h`Y`U`Y`ž`h`Y`Y`b`X`c`Z`h`Y`
U`Y`cg`W`U`h`g`ž`]b`X`]W]b[`U`V`Y`bh`U`Y`fk`\]W`g`ci`X`U`k`U`h`g`V`Y`f`Y`d`U`W`X`"M`h`
U`b`ch`Y`f`g`na`d`h`ca`]g`U`gei`YU]b[`c`f`W`W]b[`g`ci`b`X`W`a`]b[`Z`ca`h`Y`i`V`h`U`i`
]b`X`]W`h`g`U`V`Y`U`f]b[`]g`c`cg`Y`]b`]h`g`a`ci`bh":`]b`U`m`ž`h`Y`i`V`a`U`m`\U`Y`U`V`f`c`_`Y`b`
U`Y`ž`k`\]W`a`U`h`b`ch`V`Y`c`V`]ci`g`i`bh`h`Y`ei`]W`!`f`Y`U`g`Y`g`Y`k`Y`f`]g`f`Ya`cj`Y`X`U`b`X`
h`Y`b`h`Y`U`Y`Z`U`g`ci`h]b`h`k`c`d]W`g`"

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HfWb]W mWfh]X] YVUf]b] gWbbchVYIUXi ghXI H\lg]gVVM gYzi b`LY
 UbUXi ghVY!WbY\i VhUh\UgUMdZ]b] `ci hck UfXh YbXcZ]h YU YUbX
 UWbYZ]b]]b hck UfXh Ya]XXYcZ]h YU YZUMfh]X] YVUf]b] \UgUb]bbYf
 fUWZ]b] `ci hZca h YU]gcZ]h YU YUbXUb ci hf fUWZ]b]]b hck UfXh Y
 U]gcZ]h YU Y`C b`Ub UXi ghVY!WbY\i VZh YVUf]b]]gUXi ghXVna cj]b]`
 h YWbYcb`h YU Ygc`h Uh]hVWVa YgWcgf`hc`cf`Z fh Yf`Zca`h`YVd`-b`U
 Wfh]X] Y!VUf]b] `i Vza cj]b]`h Y]bbYf`fUWVcgf`cf`Z fh Yf`Zca`h`Yci hf`
 fUWwi`Xcb`mVYUWa d]g\YXVmM dUbX]b]`cf`g`f]b]_]b]`h YfUWZk` \]W]g
]a d`cg]VYg]bW]h]g`UfXbYXghY`C b`h`Ych`Yf`UbX]h]gdcgg]VYhc`a]gUXi gh
 UMfh]X] YVUf]b]`cb`Uh`fUXYXU`Y`-Z]h`Y`UfXk`UfYcb`h`YU`Y`i`gici`hg]XY
 cZ]h`Y]bbYf`fUW]g`h`fUYXcbhc`h`YU`Y`hc`Zfz]hk]`Xg]UW]h`Y]bbYf`fUW
 Zca`h`Y`WffW]cf]Yb]h]cb`k]h`h`Y`ci`hf`fUWZ]g]b]`h`YVU`VUf]b]`g`hc`
 V]bX`V]k`Yb`h`Ya`fgyU`i`fy`%`%`H\lg`\UdYbg`VVM`gY`h`YVU`gf]XY]b`
 g`U`ck`h`fci`[\g]b`YUW`fUW`K` \Yb`h`Y`fci`[\g`Xc`bch`]bYi`d`k]h`YUW`ch`Yfz`
 h`Y`ZZ]M]j`Yk]X]h`cZ]h`YVUbbY`h`Ym]M]h]c]`Yh`Yf`VWVa`YgbUffck`Yf`h`Ub`
 h`YVU`VUf]b]`g`

H`Y`gna`d]ca`W]U]Xk` \Yb`h`Y`UfXk`UfY]g]hc`h]` \h]U`U]bgh]h`Y]bbYf`fUW
]g]h`U]cZ]U]h]` \h]VUf]b]`-b`h`YVW]g]h`U]h`YU`Y]gei`]W]fYU]g]Y]fi`g`U`n]z]h`Y
 gna`d]ca`a`Um]`c`Uk`U]k` \Yb`h`Yk` \Y]`]gfYa`cj`YXZca`h`YV]`YVVM`gY`cZ`
 h`Yb]U]h`fYcZ`ei`]W]fYU]g]YU`Yg]hc`Y]d`UbXk` \Yb`h`Y`cUXcZ]h`Yei`]W]fYU]g]Y
 g`Yk`Yf`]gfYU]g]Y`H`YfYzcfYU`i`V`h`Uh]g]Ud]UfYb]h]m]UbYk` \Yb`W]W]YX`ci`hi
 cZ]h`YV]`YWi`XVY`cj`Yf]h]` \h]b`h`YV]`Yfk` \Yb`h`YfY]g]bc`k`U]hc`W]W]`]h`

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TOOL CHOICES

GENERAL-USE TOOLS

H\YfYUfYgY YfU'hc`g`i gYXZcf'gYfj]M[b[`Wfh]X[Y!VUf]b[`i Vg'hUhUfYi gYX
 cb'ch'Yf'dUfh'g'cZ'h'YV[_Y'H\YgY]bWXY
 < Y! _Ymk fYbWYg'f] U]ci ggnYgi d'hc *a a L
 7cbYk fYbWYg'f] U]ci ggnYgi d'hc %a a L
 D'Ug]W`a U`Yh
 =b'YfbU'g'Ud!f]b[`d`Yf'g'f] U]ci ggnYg'UbX'Ub[`Yg'cZ'h'dg`
 GcZi'Uk g'Zcf'h'Yj]gY
 5l `Yj]gY'f'c'f'ch'Yf'f'U'X'i g'Uk `W`a dg`L]b`Uk]X'Y'j U]Y'h'c'Z'g'n'Yg'

CUSTOM SUPPORTS AND DRIVERS

Gy YfU'hc`g`a UhMYbYXXh UhWbbchVYdi fWUgYXZgc h'Yna i ghVYa UXY
 Vrh'Ya YWUb]WH\YgY'hc`g`UfYi g U`mg]a d'Yhc`a U_YUbX]bYl dYbgj YZVi hi
 h'YmfYei]fYgca YfYgci fWZ `bYgg'H\YgYWg'ca `hc`g'ZU`]bhc`hc`c`WM]cf]Yg`
 g`ddcf]g'UbXX]j Yg`
7i gca`g`ddcf]g` H\Y`i VUbXX]j Yf`a i ghVYg`ddcf]h'X'U'hj U]ci g'h]a Yg`
 Xi f]b[`VUf]b[`fYa`cj U`UbX]bg'U`U'hcb"5b`Ugg'f]a YbhcZ`Yb[h'g'UbXX]Ua`!
 Y'h'f'g'cZ'DJ 7`d]dYUbX'DJ 7`d`i a V]b[`U`h]b[g'Z'ca `h'Y`\U'X'k U'f'Y'g'c'f'Y'g'f'j Y
 h'g'di fdcgY'k Y""5bch'Yf'k U'h'c`g`ddcf]h'Y'X'f]j Yf`]g`V'mdi h]b[`U'W'g'Y'h'Y
 W[`cb`]r'h'Yb`]bg'f]h]b[`h'Y'X'f]j Yf`]bhc`h'Yj]gY'k]h`h'Y'W'g'Y'h'Y'W[`f'Y'g'h]b[`
 cb'hc`cZ'h'Yj]gY'

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7i gca Xfj Yfg H\YfYUfYcWgcbgk \Yb Wfh[X YVUf]b[g'byX'hc VY
dfYggX]bžVi hh YfY]g'bchiUWa dU]VY]bgU U]cb'hc " =b'h]g'WgYZUXfj Yf'
]gi g'X'hc]a dU]h YVUf]b['Zcf']bgU U]cb"H\Y]XU'Xfj Yf' WbhU]g'h YZWW
cZ'h Yci hf'fUW'cZ'h YVUf]b[ž\Ug'U'c'Y]b'h YWbhf'h U]g' Uf[Yf'h U'b
h Y]bbYf'fUW'U'X]g'UZk' h'bh'g'cZ'Ua]`]a Yhf'ga U'Yf']b'X]Ua Yhf'h U'b'h Y
VUf]b["Gca Yha Yg'Ugc'W]h'hc`]g'g' hif]] \h'fU]h'ci [\h'Yn'fYcZ]h'hc'g'cfh
hc'WUf'h YU'Y'G'W]cbg'cZ'hi V]b[f]W]W]Z]Ua YU'X'Zcf_'hi Vgž'g'U]h'cd'gž
\Ub'X'YUf'g'W]cbg'U'cf'd]dYf]D] 7ž'W'ddYfžcf'gh'Y]Z]ca' h'Y\U'f'X'k'U'f'Y'g'cf'Y'U'f'
dch]h]U'Xfj Yfg' H\YfYa U]h]Y' Yb'V'Y'c'W]g'cbg'k \YfYU'V]W]W]hc`a U'X'Zcf'
U'Wa d'Y'h'm'X]Z]f'Y'bh'idi f'cd'g'Y]g'h'Yf]] \h'C'8'ž="8'ž'U'b'X'Y'b[h'hc'V'Y'U'i'g'Z'`
Xfj Yf'

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BEARING-REMOVAL TOOLS

H\YfYUfYg'Y YfU'hc'g'f'W]bh'm'X]g'W]h]bi Y'X'cf'W'ff'Y'bh'm]U]U'V'Y'h'U]h'U'f'Y'
]b'h'Y'W]h]cf'm'cZ'Îi b]j Yfg'U' W'fh[X Y'V'U'f]b['f'Ya'cj Yfg'8'i Y'hc'h'Y'j'U'f]Y'm'
cZ'\i V'X'Y]g]b'gž'bc'hc`W'b'V'Y'h'fi`m'i b]j Yfg'Už'Vi h'k]h'U[cc'X'U'g'cf'ha Y'bh'icZ'
hc'g'U'b'X'U']h'Y]b[Y'bi]h'ž]j]f'h'U'm]U'b'm'i V'W'b'V'Y'g'f]j]W'X'H\YfYUfY'h'f'Y'Y'
W'c]W'g'cZ'f'Ya'cj U'hc'g'h'Y'6]W]W]f'Y'g'U'f'W'G'U'Y'X'6'U'f]b[F'Ya'cj Yf?']h'
f] G'6'F'!?']ž'g'd']h']d'Y' h'f'U'W'f'gž'U'b'X'h'Y'7'U'J'U'b' & ": cf'h'Y'Wa d'Y' U'f'Y'U'cZ'
V'U'f]b['f'Ya'cj Už'h'Y'k'Y'!Y'ei]dd'Y'X'a Y'W'U'b]W'k'ci 'X'k'U'b'h'Y'U'W'cZ'h'Y'g'Y'hc'g'
Cb'Ya'cf'Y'hc`h'U'g'`ci 'X'bh'V'Y'cj Y'cc_'Y'X]g'h'Y'U'Y']h'g'Y'Z'K \Y'b'h'Y'U'Y'
]g'h'Y'g'`ci 'X'Y'f'X'h'm]Y']h'U'k'U'ng'U'ng'U'g'U'V'U'f]b['f'Ya'cj Y'f'k'\]Y'h'Y'U'Y']g'V'Y]b['
f'Ya'cj Y'X'C'b'W'h'Y'U'Y'U'b'X'V'U'f]b[U'f'Y'g'd'U'f'U'X'ž'h'Y'U'Y'W'b'V'Y]b'g'U'Y'X'V'U'W'
]b'hc'h'Y'\i V'U'b'X'i g'X'U'g'U'X'f]j Y'f'hc'f'Ya'cj Y'h'Y'g'Y'W'b'X'V'U'f]b['U'g'k'Y'"

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H\Y6]mWYFyGUW'G6F!?']g'hYa cghii b]j YfgU'hcc "'=hik cf_g'cb'hY
df]bVd'YcZ'Ub'Yl dUbX]b['W]bXYf'hUh[f]dgh'Y]bg]XYVcfYcZ'h'YVUf]b['Vm
a'Yubg'cZ'Z]W]cb"H\]g'Xyg[b'Y]a]bUhg'h'YbYXZcf'UWgg'hc'h'YVUW'ZUW
cZ'h'YVUf]b[žk \]W]g'bchUk Uhg'UWgg]VY'H\]g'hcc` _]h]bW'Xyg'Uj'YgnYg'
cZ'fYa'cj'Yfg`%\$a a ž%&a a ž%#&ž% a a žUbX%+a a "'H\Y']a]h]cb'cZ'h'Y
hcc`]g'hUhVUf]b[]g'hUh\]j YU'Uf[Y="8"#C"8"X]ZZfYbWZUfY\]j]mgYWFYX
k]h' @cW]Y'cf'UfY'Wffc'XX]b'd'UW'a Um\]j Ya'cf'YZ]W]cb'\c'X]b['h'Ya']b'
d'UW'Zh'Yb'h'Yhcc`'Wb[]b'YfU'Y'V]k'Yb']g'YZ'UbX'h'YVUf]b["'=Z'h]g']g'h'Y
W]g'Zh'Yhcc`'k]''_Yd'g]dd]b['ci h'VYZcfY'h'YVUf]b[']g'a'cj'YX''

DfcdYf'WfY'UbXi'g'Y'cZ'h'Y'G6F!?']g']a dcfhUb'h'H\Y'Yl dUbX]b['W]bXYf'g'
UfY'Yg'm'Xyg'fcm'X]Z'h'Ym'fY'Yl dUbX'X'k \]b'bch'Wb]b'YX'Vm'U'VUf]b['h'Ym'
UfY'Xyg[b'Y'hc'U'ž'g'c' b'Y'f'h[\]h'b'h'Y'Vc'h'g'i b'Ygg'h'Y'Yl dUbX]b['W]bXYf']g'
]bg]XY'U'VUf]b['h'Uh]h]g']b]h'b'X'X'hc'U'h'

BICYCLE RESEARCH SBR-K PROCEDURE

- %'' GY'YVh'Yl dUbg]cb'W]bXYf'h'Uh'a U'hW'Yg'VYUf]b['=#8"
- &'' ; fYUgY']bg]XY'W'cb'Y'cZ'Yl dUbg]cb'W]bXYf'ž'h'Yb']bghU''i bXYf'Vc'h'cb'
hUdYfYX'YbX'cZ'Xf]j Yfž'Vi h'Xc' bch'h[\]h'b'Vc'h'
- ' '' 7'YUb'ci hg]XY'cZ'Yl dUbXYf'UbX']bg]XY'cZ'VYUf]b['k]h'U'W'c'\c''cf'
ch\Yf'fYg]Xi'Y!ZfY'gc'j'Yb'h'
- ('' =bgYfh'g\UZh'YbX'cZ'hcc`]bhc'ci h'Yf'ZUW'cZ'VYUf]b[ž'h'Yb'di ''cb'
g\UZh'YbX'i bh] 'Yl dUbg]cb'f]b['W'ca dfYggYg'UbX']bgYfhg']bhc'VYUf!
]b["'5X↑ gh'hcc`dcg]h]cb'gc'ZUh'ZUW'cZ'Yl dUbg]cb'f]b[']g'Zi'g\ 'k]h'
ci h'Yf'ZUW'cZ'VYUf]b["

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) "" <c`X`Vc`h`j]b`g\UZH`YbX`cZ`hcc`ghU]cbUfmik]h\`YI`_Ymk` \]Y`h][\hYb!
]b[`Vc`h`Uh`YI` dUbXYf`YbX`Ug`h][\h`Ug`dcgg]V`Y`fg\cfh`cZ`fci` bX]b[\YI`
 _Ymicf`\YI`gcW`Yhg`]b`Vc`hg`
 * "" D`UW`\i`V`cf`ZFY\i`V`VcXmicb`gi`ddcfh`h`Yb`hUd`cb`g\UZh`k]h\`d`Ug!
 h]Wa`U`Yh`hc`Xf]j`Y`ci`h`VYUf]b["
 + "" @ccgYb`Vc`h`j]b`YI` dUbXYf`YbX`cZ`hcc`z`h`Yb`di` ``cf`hUd`VYUf]b[`cZZ`
 YI` dUbXYf`YbX`"

SPLIT-LIP EXTRACTOR DESIGN

H`Y`gd`]h`]d`YI`h`UWcf`XYg[b`]g`UW]bXYf`h`Uh]ggd`]h]b` \UZ`fYb[h`k`]gY`
 C`b`Y`YbX`cZ`h`Y`W]bXYf` \Ug`]dg`h`Uh`W`W`V`Y`]bX`h`Y`VYUf]b["K` \Yb`h`Y`gd`]h`
 W]bXYf`]g`W`a`d`f`Y`gg`X`f`W`g`X`Z`h`Y`]dg`d`U`g`h`fci` [\`h`Y`VYUf]b["K` \Yb`h`Y`
 gd`]h`]g`g`d`f`Y`U`c`d`Yb`UbX`g` ddcf`h`X`V`h`h`Y`]bg`Y`h`cb`cZ`U`W`]g`Y`z`h`Y`]dg`W`b`
 bc` `cb[Y`d`U`g`h`fci` [\`h`Y`VYUf]b["I` g`Y`U` #, `` `W`h`W`]g`Y`Z`cf`%&I`%`a`a` `="8`"
 VYUf]b[g`z`U`b`X`i` g`Y`U`%#&` `W`h`W`]g`Y`Z`cf`%I`%`a`a` `="8`"VYUf]b[g`K` \Yb`]a`d`U`W`
]g`U`dd`]Y`X`h`c`h`Y`W`]g`Y`z`h`Y`VYUf]b[`]g`X`f`j`Yb`ci`h`H`Y`U`X`]U`b`h`U`Y`cZ`h`Y`g`Y`
 gd`]h`]d`h`cc`g`]g`h`Uh`h`Y`mb`Y`Y`f`g`]d`ci`h`H`Y`X`]g`U`X`]U`b`h`U`Y`cZ`h`]g`X`Y`g[b`]g`
 h`Uh`]Z`h`Y`f`Y`]g`b`ch`U`X`Y`e`i`U`h`Y`W`U`f`U`b`W`c`b`h`Y`V`U`W`]g`X`Y`cZ`h`Y`VYUf]b[`Z`cf`h`Y`
 `]dg`z`h`Y`h`cc`k`]`b`ch`U`h`

SPLIT-LIP EXTRACTOR PROCEDURE

% "" 7`ca`d`f`Y`gg`h`cc`!`W]bXYf`\Uj`Yg`z`h`Yb`]bghU`h`cc`f]d!`YbX`Z]fgh`k`]bhc`
 ci`hYf`Z`U`W`cZ`VYUf]b[`VY]b[`fYa`cj`YX`
 & "" `bghU`h`V`X`]g`Y`]bhc`h`cc`gd`]h`f`Z`f`ca` `c`d`d`c`g]h`Y`g]X`Y`k`U`b`X`k`YX[`Y`V`X`]g`Y`
 Z]fa`m]bhc`h`cc`"
 ' "" D`UW`\i`V`cf`ZFY\i`V`VcXmicb`gi`ddcfh`k]h\`VYUf]b[`VY]b[`fYa`cj`YX`
 cb`V`ch`ca` "
 ("" I`g`Y`V`U`d`Y`Yb`\U`a`a`Y`f`h`c`h`U`d`cb`V`X`]g`Y`i`bh`VYUf]b[`]g`f`Ya`cj`YX`z`h`Yb`
 g`Y`d`U`f`U`h`Y`V`X`]g`Y`Z`f`ca` `h`cc`"

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H\Y7UJUb` &]gUgb[`Yhcc`k]h`]ddYXdfcb[gh UhigdfYUXUdUfhUghY
hcc` \UbXY]g]h[\h\B\X`H\Y`]dg`UfYgca Yk \Uh\]bbYf`h\Ub`h\Ygd`]h`]d`hdY
cZ]hcc`žgc`h\Y7UJUb` & `a UhUhgca YVMf]b[ghUh\Ygd`]h`]d`hcc`k`]`bch`
G]bW]]h]gbch]ghYgd]W]UW`_Yh\Ych\Yf`fYa`cj`Yfg`]h]ga`cfYi`bj`YfgU` < ck`Yj`Yfž
h\YUh]]gbch]df]W]gYUbX`h\Yhcc`]ga`i`W`a`cfYUk`_k`UfX`h`i`gY`

CALVAN #28 PROCEDURE

```
%"" @ccgYb`hcc` \UbX`Y`gc`dfcb[ g`V`b`h`U`W`h`Y`U`W` `ch`Yf`  
&"" ðbgYfh`dfcb[ g` ]bhc`ci`hYf`ZUW`cZ`VYUf]b[ `VY]b[ `fYa`cj`YXž`i`bh` ]` ]dg`cZ`  
dfcb[ g`UfY`VY\ ]bX`VYUf]b[ "  
' "" <c`X`dfcb[ !YbX`cZ`hcc`ghUh]cbUfmik` \]Y`hi`fb]b[ `hcc` \UbX`Y`WcW`!  
k` ]gY`Ug`h] [ \h`mi`Ug`dcgg]V`Y`  
( "" Gi`ddcfh`k` \YY`cf`ZfYY`i`V`VcXm]b`U]f`k` ]h`cbY` \UbX`k` \]Y`i`g]b[ `g`  
g` ]XY` \Ua`a`Yf`cb`hcc`hc`Udd`m`Xck`bk`UfX` ]a`dUW`h`i`bh` ]VYUf]b[ ` ]g`  
YI`hfUW`h`Y`X`"  
) "" @ccgYb`hcc` \UbX`Y`hc`fYa`cj`Y`7`U`J`Ub`hcc`Zfca`VYUf]b[ "
```

BEARING-INSTALLATION TOOLS

H\YfYUfYgY`YfU`hcc`g`f`W`b`h`m`j`U`W`Y`cf`W`f`Y`b`h`m`j`U`W`Y`h`U`h`f`Y`]b`h`Y`
W`h`]cfm`cZ`i`bj`YfgU`]W`h`]X`]Y`VYUf]b[]bg`U`Yfg`
H\YfYUfYh`c`j`Uf]Y`h`Y`g`c`Z`i`bj`YfgU`VYUf]b[]bg`U`Yfg`H\YgYUfYh`Y6]W`h`Y`
F`Y`g`U`f`W`G`Y`U`X`6`Y`U`f]b[ðbg`U`U`h`cb`?]h]f` G6`=?`E`UbX`h`Y`K` \]h` ðb`X`]g`f`]g`
6`Y`U`f]b[`D`f`Y`g`g`f` **6YUf]b[!DF** `E`6`ch`k`cf`_`cb`h`Y`df]b]W`d`Y`h`U`h`j`U`f]ci`g`X`U`a`!
Y`h`f`g`c`Z`g`d`U`W`f`g`a`U`h`U`U`b`g`h`h`Y`Z`U`W`c`Z`h`Y`V`Y`U`f]b[žk`]h`U`h`f`Y`U`X`X`g`U`h`h`U`h`
]bg`Y`f`h`g`h`f`ci` [\`h`Y`V`Y`U`f]b[g`UbX`g`d`U`W`f`g`h`c`X`f`U`k`h`Y`k` \c`Y`U`g`g`Y`a`V`m`h`c` [Y`h`Y`f`
k` \Y`b`h`] [\h`b`Y`X`H\Y`X`]Z`Z`f`Y`b`W`V`h`k`Y`b`h`Y`hcc`g`]g`d`f`]a`U`f`]m`]b`h`Y`bi`a`V`f`
UbX`W`b`U`]i`f`U`h`cb`c`Z`g`d`U`W`f`g`

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H\YK \]hY=bXi gf]Yg|cc` \Ug|gdUMfghUia UW'hYVMf]b| C"8"gcZ&(a a ž & a a žUbX' \$a a žUbXgca YcZ'hYgYgdUMf|g\Uj Y`|dg'hUhUh]b%) a a `UbX %a a a `c Yg'H\Yg\Uz]hgYZÚhgUMVf]b| k]h U%&a a `="8"

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é Model Navigator

H\Y6]MWFYgYfW' hcc` \Ug|gdUMfghUia UW'hY C"8"gcZ &(a a ž &*a a ž& a a ž' \$a a ž' &a a žUbX') a a `VUf]b| g'5XX]hcbU'gdUMfga UW' VUf]b| `="8"gcZ%&a a ž%) a a žUbX%a a a "H\Yg\Uz]hgYZÚhgUMVf]b| k]h U%\$a a `="8"

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8 Ygd]h'h YgYXZZfYbWg]b'gdUMf|gUbXg\Uz]X]Ua Yhf|g'Vch` hcc`gk]` Úi a cgidcdi `Uf` \i VXYg| bg'H\Y="8" gdUMf|gcb'h Y6]MWFYgYfW' hcc` h'bx hc' [Yh`cgh]b'h Y\i V i b Ygg'h Y YbhfY]bgUUhcb`dfcWgg]gXcbYk]h` h'Y hcc`dfYgYm`cf]ncbU"H\YK \]hY=bXi gf]Yg|cc` \UgUb YX] Y]b YUgYcZi gY VVM gY]hg="8" gdUMf|gWbbchg]d'ci hcZ'cdg|hcb"

USING BEARING INSTALLERS

H\YfYUfYgY YU'cVYm] Yg|c` Yd]b'a]bXk \]YgYh]b| i dUMVf]b|]bgU`Yf k]h` h'YdUfhg'h UhUfYVY]b| UggYa VYX":]fgž]Z'h Yhcc`g\Uz]cf'Ud]`cha UWYg' h'Y="8" cZ'h YVUf]b| žh]g]bg]fYg[ccXU]] ba Ybh"GMWbXž]Z'h YVUf]b| `]g VY]b| `]bgU`YX]b|c` UfYWggYXa ci blžh YC"8" cZ'h Yd]`chcf`dfYgg] fYkUg! Yfgcb'h Yhcc`a i ghibchY VVX'h YX]Ua Yhf`cZ'h YVUf]b| `cf`YgY'h Yd]`chcf` dfYgg] fYkUg\Yfg'k]` `Ua "":]bUmñh YVUf]b| `]ga cgidfchMMX]Z'h Yd]`chcf` dfYgg] fYkUg\Yfg'WbUW'h Yci hf`fUWcb`m`Z'h Yhcc`ga i `hubYci gmUdd]Yg' dfYgg] fYh` h'Yci hf`UbX]bbYf`fUWgž]h]gUa cghUg[ccX"=h]g'bchdfYZffYXVi hi]h]g'UWd]hVYZcf`h Yhcc`hc`Udd`mdfYgg] fY`gihc`h'Y]bbYf`fUWg'7cbWfbg U'ci h`cUXcb'h Y]bbYf`fUWfYdf]a Uf]mU]gg] Yk \Yb]a dUM]g'h Ya Yh`cXcZ']bgYf]hcb"H\Yg\Uz]hgYZÚhgUMVf]b| k]h U%\$a a `="8"

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: fca ` \YfYcbžh]g`WUdhf`]g`Xj]XYX]bhc`lk c`g`YMcgbg`H\Y Úfg h]g`YMc bž
GENERIC SERVICE PROCEDUREž]g`g]hVYZcf`gfj]Mb[`a UbmcZ`h`YX]ZZfYbh
VfUbXgcZ`Wfh]X] Y!VUf]b[`i Vg": c`ck]b[`h]g`g`YMc b]g`Ug`YMc b`Zcf`CHRIS
KING HUBS""

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BEARING HUBS

DESIGN VARIATIONS

H\YfYUfYU`ja]hYX`bi a VVf`cZ`k Uhg`h UhVhf]X] Y!VUf]b[`i Vg`Vb`VY Xyg[bYX` J Uf]U]cbg`UfY gYb`]b`h`Y`k`UmU`Y`gdUM`g`UHUW`hc`U`Ygž`ck` VUf]b[g`UfYfYU]bYX]b`h`Y`i`V`g`Y`cf`Z`Y`i`V`VcX`n`ck`U`Y`g`Y`b[U`Y`h`Y` VUf]b[gž`ck`h`Y`VUf]b[g`UfY`U`Y`X]b`c`W`h`cb`f`lc`h`Y`U`Y`ž`X`j`Y`ž`cf`i`V` g`Y`ž`UbX`h`Y`Xyg[b`c`Z`h`Y`f`U`W`Y`h`a`Y`W`U`b`]`g`a`":`U`a`]`U`f`n`Y`m`i`f`g`Y`Z`k`]`h`h`Y` Z`c`ck`]b[`h`f`a`]`b`c`c[`m`h`c`d`f`Y`d`U`f`Y`Z`c`f`i`g`b[`h`Y`[`Y`b`Y`f`W`d`f`c`W`X`i`f`Y`

AXLE SPACERS

5l`Y`gdUM`g`UHUW`hc`h`Y`U`Y`]b`Z`c`i`f`X`Z`Z`f`Y`b`h`k`U`hg`H`Y`m`Y`h`Y`f`d`f`Y`g`g`c`b`ž` h`f`Y`U`X`c`b`ž`U`f`Y`g`W`f`Y`X`V`m`g`Y`h`g`W`k`gž`cf`U`f`Y`U`Y`X`d`Y`f`a`U`b`Y`b`h`i`h`c`h`Y`U`Y`

DfYgg!cb`gdUMf. H`Y`g`Y`g`h`u`]b`d`U`W`V`n`a`Y`U`b`g`c`Z`Z`]`W`c`b`"H`Y`Z`]`W`c`b`a`U`h` V`Y`W`U`X`V`m`U`a`]`X`d`f`Y`g`g`U`h`c`f`V`n`U`b`C`!`f`]b[`V`h`k`Y`b`h`Y`gdUM`U`b`X`h`Y`U`Y`

H`f`Y`U`X`c`b`gdUMf. H`Y`g`Y`b[U`Y`h`Y`U`Y`V`n`a`Y`U`b`g`c`Z`U`h`f`Y`U`X`"H`Y`gdUM` a`U`h`U`j`Y`k`f`Y`b`W`U`U`g`c`b`]`g`c`i`h`g`X`ž`cf`]`h`a`U`h`U`j`Y`U`Y`!`g`c`W`h`c`b`c`b`Y`Z`U`W` G`c`a`Y`U`j`Y`d`]b`c`Y`g`Z`c`f`U`d`]b`g`d`U`b`b`Y`"K` \`Y`b`c`b`Y`c`Z`h`Y`g`Y`gdUM`g`]`g`d`f`Y`g`b`ž` h`Y`f`Y`]`g`i`g`U`m`U`k`f`Y`b`W`U`h`]b[`c`b`h`Y`gdUM`c`b`h`Y`c`d`d`c`g`h`Y`b`X`c`Z`h`Y`U`Y`ž`U`g` k`Y`ž`cf`]b`h`Y`U`Y`ž`]`h`Y`Z`G`c`a`Y`h`a`Y`g`h`Y`f`Y`]`g`b`c`h`U`k`f`Y`b`W`U`h`]b[`]b`h`Y`c`d`d`c`g`h`Y` Y`b`X`ž`g`h`Y`U`Y`a`i`g`h`V`Y`W`a`d`Y`X`]b`U`b`U`Y`j`]`g`Y`h`c`i`b`h`f`Y`U`X`h`Y`gdUM`"

G`h`g`W`k`gdUMf. H`Y`g`Y`U`f`Y`f`Y`U`]b`Y`X`h`c`h`Y`U`Y`V`n`a`Y`U`b`g`c`Z`U`g`Y`h`g`W`k`h`U`h`i` h`f`Y`U`X`g`h`f`c`i`[`h`Y`g`X`Y`c`Z`h`Y`gdUM`h`U`h`V`]b`X`g`U`U`b`g`h`h`Y`U`Y`K` \`Y`b`c`b`Y`c`Z` h`Y`g`Y`gdUM`g`]`g`d`f`Y`g`b`ž`h`Y`f`Y`]`g`i`g`U`m`U`g`a`U`Y`!`g`c`W`h`g`W`k`f`c`f`g`W`k`g`L`]b` h`Y`g`X`Y`c`Z`h`Y`gdUM`"G`c`a`Y`h`a`Y`g`h`Y`f`Y`]`g`U`W`U`f`W`j`Y`f`]b[`h`Y`gdUM`U`b`X`U` h`U`h`W`b`V`Y`g`Y`b`]`g`U`b`U`W`g`g`c`Y`]b`h`Y`W`U`f`f`Z`c`f`]`X`b`h`U`W`h`c`b`d`i`f`d`c`g`Y`"

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: **II YXgdUMF.** H\YgYa cgcZhb fYZci bXcb h\Yf[\ hYbXcZ h\YU `Y`H\Ym 13 ò 18
Xc bch\Uj Yl hfbU`k fYbW`Uhg`cf`g`h`g`M`k`g`H`Y`m`k`]`b`c`h`d`i`]`c`Z`Z`V`m`\`U`b`X`
cf`f`Y`g`d`c`b`X`h`c`]`Y`Y`f`U`Y`H`Y`m`a`U`m`\`U`j`Y`U`\`Y`!`_`Y`m`U`h`b`|`|`b`h`Y`f`c`i`h`f`Z`W`Z`V`i`h`
|`h`a`U`h`c`b`m`Y`U`k`U`h`c`]`Y`d`h`Y`U`Y`Z`f`c`a`h`i`f`b`|`b`|`k`\`]`Y`U`h`f`Y`U`c`b`g`d`U`M`c`b`
h`Y`c`h`Y`f`Y`b`X`c`Z`h`Y`U`Y`|`g`V`Y`|`b`|`f`Y`a`c`j`Y`X`c`f`|`b`g`U`Y`X`

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BEARING RETENTION TO SHELL AND DRIVER

H\YfYUfYh`f`Y`Y`k`U`h`g`h`U`h`h`Y`V`U`f`|`b`|`g`a`U`m`Y`f`Y`h`|`b`Y`X`h`c`h`Y`h`i`V`g`Y`U`b`X`
h`Y`X`f`j`Y`f`f`Z`Y`Y`i`V`V`c`X`h`i`

DfYgg!ÚhifYh`b`h`c`b. H\YgY`U`f`Y`d`f`Y`g`g`U`h`i`f`|`b`h`f`Z`f`Y`b`W`U`h`L`h`c`h`Y`Y`l`h`f`b`U`
a`c`i`b`h`|`b`|`g`f`Z`W`":`c`f`W`|`g`U`k`U`h`g`f`Y`e`i`|`f`Y`X`Z`c`f`f`Y`a`c`j`U`b`X`|`b`g`U`U`h`c`b`"H`Y`
g`Y`M`f`|`h`m`c`Z`h`Y`|`b`h`f`Z`f`Y`b`W`U`h`|`g`g`c`a`Y`h`a`Y`g`U`|`a`Y`b`h`X`k`|`h`@`V`h`Y`V`h`k`Y`b`
h`Y`a`U`h`|`b`|`g`f`Z`W`g`

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GbUd!f|b|`f`Y`h`b`h`c`b. H`|`g`g`g`h`Y`a`f`Y`|`Y`g`c`b`U`g`b`U`d`!`f`|`b`|`|`b`U`|`f`c`c`j`Y`f`g`h`d`U`h`i`
h`Y`V`U`f`|`b`|`Z`W`h`c`h`f`U`d`h`Y`V`U`f`|`b`|`|`b`h`Y`a`c`i`b`h`i`c`Z`h`b`|`g`U`b`U`|`a`Y`b`h`U`h`c`b`
h`c`U`d`f`Y`g`g`U`h`i`f`Y`h`b`h`c`b`g`g`h`Y`a`U`b`X`b`c`h`h`Y`g`c`Y`a`Y`h`c`X`c`Z`f`Y`h`b`h`c`b`"

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G`a`c`i`X`f`f`Y`h`b`h`c`b. H`|`g`g`g`h`Y`a`g`f`Y`|`Y`g`c`b`g`a`c`i`X`f`g`U`Y`X`h`c`h`Y`Y`l`h`f`b`U`
U`b`X`|`b`h`f`b`U`a`c`i`b`h`g`h`c`h`f`U`d`h`Y`V`U`f`|`b`|`|`b`d`U`W`H`Y`V`U`f`|`b`|`|`g`U`g`|`d`U`h`|`b`h`c`h`Y`
Y`l`h`f`b`U`a`c`i`b`h`H`Y`f`Y`a`U`m`Y`|`f`Y`U`g`Y`c`f`U`h`!`g`Y`h`Y`c`b`h`Y`a`c`i`b`h`|`b`|`g`f`Z`W`g`

BEARING RETENTION TO AXLE

H\YfYUfYh`f`Y`Y`k`U`h`g`h`U`h`h`Y`V`U`f`|`b`|`g`a`U`m`Y`f`Y`h`|`b`Y`X`h`c`h`Y`U`Y`
DfYgg!ÚhifYh`b`h`c`b. H\YgY`U`f`Y`d`f`Y`g`g`U`h`i`f`|`b`h`f`Z`f`Y`b`W`U`h`L`h`c`h`Y`U`Y`":`c`f`W`|`g`
U`k`U`h`g`f`Y`e`i`|`f`Y`X`Z`c`f`f`Y`a`c`j`U`b`X`|`b`g`U`U`h`c`b`"H`Y`g`Y`M`f`|`h`m`c`Z`h`Y`|`b`h`f`Z`f`Y`b`W`
U`h`|`g`g`c`a`Y`h`a`Y`g`U`|`a`Y`b`h`X`k`|`h`@`V`h`Y`V`h`k`Y`b`h`Y`a`U`h`|`b`|`g`f`Z`W`g`H`Y`U`Y`
a`U`h`\`U`j`Y`g`a`c`i`X`f`g`c`f`b`c`h`i`

13 ò CARTRIDGE-
BEARING HUBS

G]d'Uh H\g'gghYa fY]Yg'cb'U YgdUMg'U' YXhc h'YU Yci hk UfX'Zca h'YVUf]b[f]LUBXgdUM'g'Yj Ygcf'g'ci X'f'g]b'h'Y'i Vg\Y'']bk UfX'Zca h'YVUf]b["H\YU Yg'ci X'g]d']b'cf'ci hcZ'h'YVUf]b[g'k \Yb'h'YU YgdUM'g' UfYfYa cj YX'H\YU YbYj Yf \Ug'g'ci X'f'g'

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G'ci X'f' fY]h]cb. H\g'gghYa g'fY]Yg'cb'g'ci X'f'g'Vi]h]bhc h'YU Yf]cW'X]bk UfX'cZ'h'YVUf]b[g]hc h'fUd'h'YU Y]b'd'UW'H\YVUf]b[]g'Ug]d' U'icf'UdfYgg'U'hc h'YU Y'

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AXLE TYPES

5l Yg'ZU'']bhc h'kc V'g]VW]M]cf]Yg'g'ai X'f'X'cf'ga adh"

G'ci X'f'YXU Y'H\YU Y\Ug'U' YXg'W]cbg]bk UfX'Zca h'YVUf]b[g'h'U'i UfYU'f[Y'X]Ua Y]f'h'U'b'h'YU Y'k \YfY]hdUg]Yg'h'fci [\ h'YVUf]b[g' =a dUM]g'i g' U'm'f'Yei]f'X'Zcf'fYa cj U'UbX'cbY'cZ'h'YVUf]b[g'a i giWa Yci hik]h' h'YU Y'

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Ga cch U Y'H\YU Y]g'h'Yg]Ua YX]Ua Y]f']bk UfX'Zca h'YVUf]b[g'Ug]h'i]g'k \YfY]hdUg]Yg'h'fci [\ h'YVUf]b[g' =ia Un'Y'dcgg]V'Yhc fYa cj Y'h'YU Y'k]h'ci h'Zcf'W'Vi h]a dUM'a Un'Y'f'Yei]f'X'H\YVUf]b[g'k]''g'Um]b'd'UW'k \Yb' h'YU Y]g'fYa cj YX'

RATCHET MECHANISMS

H\YfYUfY'h'kc W'a a cb'fU'W]h'a YWU]ga g' duk`fU'W]g'UbX'fU'W]h'd'U'g'

Duk`fU'W]g' Duk`g'UfYU'h'U'W]X'hc h'Yci hg]X'Y'cZ'h'Y'X'f]j Yf'f'Z'Y'i V'V'c'X'h'i UbX'Yb[U'YU'fU'W]h'f]b['U' YX'hc h'Y]bg]X'Y'cZ'h'Y'i V'g'Y'' =bX]j]X] U' Y'Z' gdf]b[g'cf'W]'`gdf]b[g'a U'ndi g'ci h'cb'YU'W'dUk`ž'cf'Ug]b['Y'W]W'U'f'gdf]b[' a Un'Yb'W'c'g'YU' h'Y'dUk`g'ž'W]g]b[h'Ya'hc'd]j ch'ci h'k UfX'hc Yb[U'Y'h'Y'fU'W]h'i f]b["H\Y'fU'W]h'f]b[]g'h'd]W'm'Ud'Yfa Ub'Yb'h'd'U'f'hcZ'h'Y'i V'

FUWYhdUhg Hkc dUhg Yb[U YUbXX]gYb[U YUW'ch Yf Vna YubgcZ
XfYMcU' [Yf!hYh' cb'h Yf' Wa a cb'ZUWg' C bY dUH Yb[U Yg'h YXf] Yf'
fZY\i VVcXnh Vna YubgcZYh Yf]bhfbU'cf Yl hfbU'gd]bYg' H\Ych Yf dUH
Yb[U Yg'h Y\i Vg\Y' Vna YubgcZUb Yl hfbU'gd]bY'5 gdlfU W] gdf]b[dfYggYg
U UbgicbYcZ'h Yd Uhg'hc _ Yd'h Yd Uhg]b WbhUM

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BEARING HUBS

GENERIC FREEHUB SERVICE PROCEDURE

13 ò 21

H\YZc`ck]b[`dfcWXi fY]gg]hVYZcf`a UbmMUbXgUbXa cXYgcZZFY\i Vg`
k]h`Wfh]X] YVUf]b[g`H\g]bW`Xg`7Ua dU]bc`cz< ~ []žF]b[`fžK \]hY`bXi g`
hf]YgžUbXbi a Yfci g`ch`Yf`7Ufh]X] YVUf]b[`Zfcbh`i VgUbXWfh]X] YVUf]b[`.
fYf`i Vg`hUihUWVdh`fYU]cb`ZYk \YYgUfY]b`h`Y**bl hgVM]cb**"

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éé Chapter Navigator
é Model Navigator

PREPARATION

%"" FYa cj Y`k \YY`Zfca `V]mWY"
&"" FYa cj Y`E F`Zfca `i V"
' "" FYa cj Y`W]ggYhY`fVt[gk"
("" **8]gVWfU_Yg`cb`m** FYa cj Y`X]gWfhc`dfYj Ybh`Vt`bhUa]bUh]cbž`UWV]XYbhU`
VYbX]b[ž`cf`]b↑ fmhc`\UbXg`Zfca `g\Ufd`X]gWYX[Ygk"
) "" `bgdYVh`Ul `Y`gdUWVfg`WcgY`mZcf`k fYbW`ZUhgž`]bhYfbU`\YI `Z]h]b[gž`
UbX`gYh`gWYk g"
* "" `bgdYVh`\c`Yg`]b`YbXg`cZ`Ul `Y`Zcf`]bhYfbU`\YI `Z]h]b[g"

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AXLE-SPACER REMOVAL

**BCH9: `5I `Y`gdUWVfg`a UmVY`X]ZZYfYbh`cb`YUMV`g]XYž`UbX`X]ZZYfYbh`k Ug\!
Yfg`a UmVY`dfYgYbh`cb`YUMV`g]XY""K \Yb`fYa cj]b[`gdUWVfgž`_YYd`hfUWV`
cZ`k \]M`g]XY`h`YmVWa Y`cZZ`cZ`UbX`k \Yh`Yf`k Ug\ Yfg`k YfY`dfYgYbh`
i bXYf`gdUWVfg`"
+ "" **DfYgg!cb`gdUWVfg`cb`m** Di "" cb`gdUWVfg]k`hc`fYa cj Y`Zfca `Ul `Y"" **BCH9: `
Cb`m]Z`WfhU]b`h`Uh`gdUWVfg`UFY`dfYgg`cbž`i`gY`h`]bž`ZUhgWYk`Xfj`Yf`
hc`dfmi`d`ghi`W`gdUWVfg`°
, "" **DfYgg!cb`gdUWVfg`cb`m** `bgdYVh`Ul `Y`YbXg`Zcf`C!f]b[gž`h`Yb`fYa cj Y`
Ubm`C!f]b[g"****

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FREEHUB ILLUSTRATIONS

<~ []
F]b[`f
K \]hY`bXi g]Yg

13 ò CARTRIDGE-
BEARING HUBS

- "" H fYUX!cb'gdUMVfg'cb`m 5 hUWX`k fYbVX`hc`gdUMVfg'cb`Vch`YbXg'cZ`
Ul`Y`fbf'gdUMVf'cb'cbY`YbX`UbX`Ul`Y`cb'ch`Yf`YbXŁ`h`Yb`i bh`fYUX`
gdUMVffgŁ`

%" GYHgVWYk`gdUMVfg'cb`m 1 gY`YI`_Ymhc`ccgYb`gYhgVWYk`fgŁ`cbY`
Zi`hi`fbž`h`Yb`UhYa`dh`hc`di`cZZ`gdUMVffgŁ`Z`gh`gh`W`ž`ccgYb`gYh`
gVWYk`fgŁ`Ubch`Yf`hi`fb`UbX`hfmU[U]b" BCH9. Gca`Y`i`Vg`Uj`Y`a`i`!
hjd`Y`gYhgVWYk`g`k`j`h`UMVgg`h`fci`[`U`g]b[`Y`c`Y`FchUy`U`Y`hc`
VWYV`Zcf`LXX]h]cbU`gYhgVWYk`g`

%%" 7 UfYZi`mibchY`Ubmik`Ug`Yfg`fbf`Ub`UXX]h]cbU`gdUMVfŁ`cWUhyX`
VYhk`YYb`Ul`Y`gdUMVfg`UbX`VYUf]b[`gž`h`Yb`Vi`bX`Y`k`Ug`Yfg`UbX`#cf`
gdUMVfg`k`j`h`VčffYgdcbX]b[`Ul`Y`gdUMVfg`

%&" Ž`Ul`Y`gdUMVfg`WJa`Y`cZZ`Vch`g]XYg`UbX`UfY`bch]XYbh]Wž`di`h`U`gYVW`
cbX`Vi`bX`Y`h]Y`h`fci`[`h`Y`f][`h]g]XY`gYh`hc`a`Uf`_`h`

AXLE AND FREEHUB-BODY REMOVAL

% " žbgdYWh`f][`h`YbX`cZ`Ul`Y`Zcf`Z]l`YX`gdUMVf`cf`g`ci`XYf`h`Uh`k`ci`X`
cVghfi`Wh`žfY`i`V`VcXm`žfca`g`X]b[`cZZ`YbX`cZ`Ul`Y`

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%(" *Bc'cVghfi Wjcb'cVgYfj YX'jb'ghYd'* % . 'K UhW]b['WfYZi ``mZcf``ccgY`
dUk `gž'gdf]b[gž'fUhWYh'd`UhYgž'gdUWf'g'YYj Ygž'UbX'k Ug\Yfg'VY\]bX`
ZfYY\i V'VcXmž'di ``ZfYY\i V'VcXmci hcZ'\i V'g\Y``GydUfUHY`dUk `g`
UbX'gdf]b[gž'fUhWYh'd`UhYfgž'UbX'gdf]b[ž'UbX'gdUWf'g'YYj Yg'cf`
k Ug\Yfg'Zfca `ZfYY\i V'VcXmiUbX#cf`\i V'g\Y``
FYWłfX`ei Ubh]hmUbX`cWWh]cb'cZ'Ubmik Ug\Yfg'cf'gdUWf'g'YYj Yg'\YfY.
. K Ug\Yffgž'cWWh]cb
. GdUWf'ffgž'cWWh]cb
: *cf'fUHWYHd'UHY'a YWUbjga g'cb'm'* FYWłfX`cWWh]cb'UbX'cf]YbhUj]cb`
cZ'gd]fU`gdf]b[`YfY`fWYVW`U`h\UhUdd`nł`
. UX`UWf'bh'hc`\i V'g\Y``OQ
. UX`UWf'bh'hc`ZfYY\i V'VcXmiOQ
. ga U`!YbX'hck UfX'd`UHY`OQ
. `Uf[Y!YbX'hck UfX'd`UHY`OQ
%) " *CVghfi Wjcb'lg'cVgYfj YX'jb'ghYd'* % . 'G_]d`ZfYY\i V!VcXmifYa cj U`i bh]`
UZhYf`Ul`Y`fYa cj U`]g`Wła d`YhYX"
%* " I g]b[`Z]b[Yf'dfYggi fYž'hfmid g\]b[`Ul`Y`ci h'f][\h'YbX'cZ'\i Vž'h\Yb'hfmi
di g\]b[`Ul`Y`ci h'Yžh'YbX'cZ'\i V" `Z'Ul`Y`fYgdc bXg'hc`Z]b[Yf'dfYggi fYž`
Wła d`YhY`Ul`Y`fYa cj Už'h\Yb'bchY`k \]W`g]XY`Ul`Y`Wła Y`ci hcZ`UbX`
k \]W`YbX'cZ`Ul`Y`f]Z'bch'gma a Yhf]Wł'k Ug'cb'f][\h'g]XY`cZ'\i V"
. 5I`Y`Wła Y`ci hcZ`F][\h'OQ``@Yžh'OQ
. 8]gh]b[i]g\]b[`ZYUhi fY`
%+ " žbgdYWł ZUWf'g'cZ'VYUf]b[g`Zcf'gbUd!f]b[gž'h\Yb'fYa cj Y'gbUd!f]b[g'k]h`
gbUd!f]b[`d`]Yfg``7UfYZi ``mibchY`cWWh]cbg'gbUd!f]b[g'k YfY`Zci bX.

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K \]hY`žXi gh]Yg

% " *Z'U'Y'k]`bch'fYgdcbX'hc Z]b[Yf'dfYggi fY. D'UMY` \i V'cb'gi ddcfh`
 fIYZh'g]XY'Xck bž'i b`Ygg'Z]l YX'gdUMYf']g'cb'f][\hž [Ybh'mhUd'cb'YbX'
 cZ'Ul'Y'k]h' d`Ugh]Wa U`Yhž'h\Yb'bchY'k \]M\`g]XY'Ul'Y'WJa Y'ci hcZ'
 UbX'k \]M\`YbX'cZ'Ul'Y'f]Z'bchigna a Yhf]WŁ'k Ug'cb'f][\h'g]XY'cZ'\i V"
 5l'Y'WJa Y'ci hicZ'F][\h'OO'`@YZh'OO
 8]gh]b[i]g\]b[`ZYUhi fY.*

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%- " *Z'ZY\i V'VcXm]g gh]`UHUMYX'hc` \i V. K UH\]b[`WUfYZi`mZcf`ccgY`
 dUk`gž'gdf]b[gž'fUH\Yh'd`UhYgž'gdUMYf'g'YYj Ygž'UbX'k Ug\Yfg'VY\]bX'
 ZFY\i V'VcXmž'di`ZFY\i V'VcXmici hicZ'\i V'g\Y`"GYdUfUHY`dUk`g`
 UbX'gdf]b[gž'fUH\Yh'd`UHYfgŁ'UbX'gdf]b[ž'UbX'gdUMYf'g'YYj Yg'cf`
 k Ug\Yfg'Zfca`ZFY\i V'VcXmUbX#cf`\i V'g\Y`"`
 F YVŁ'fX'ei Ubh]mUbX'`cWU]cb'cZ'Ubmik Ug\Yfg'cf'gdUMYf'g'YYj Yg`\YfY.
 K Ug\YffgŁ'`cWU]cb
 GdUMYffgŁ'`cWU]cb
 : cf'fUH\YH'd`UH'`a YWU]ga g'cb`m'F YVŁ'fX'`cWU]cb'UbX'cf]YbhU]cb`
 cZ'gd]fU'gdf]b[\YfY'fV\YV`U`h\Uh'Udd`nŁ.*

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. UX'UMYbh'hc` \i V'g\Y`"OO
 UX'UMYbh'hc`ZFY\i V'VcXmOO
 ga U`!YbX'hc k UfX'd`UH'OO
 `Uf[Y!YbX'hc k UfX'd`UH'OO
 &\$" @cc_`Zcf'gYU`h\Uha UmVY`cWU]YX']b'f][\h'YbX'cZ'\i V'g\Y`"cf'cb`
]bg]XY'YbX'cZ'ZFY\i V'VcXmž'h\Yb']bgdYVW'gYU'UbX'fYa cj Y']Z'XUa !
 U[YX" 7\YV`gYU`cWU]cb'UbX'cf]YbhU]cb`\YfY.
 Ł' \i V'g\Y`"OO' Cb'ZFY\i V'VcXmOO
 : `UHYf'ZUMY'ci h'OO' : `UHYf'ZUMY']b'OO

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 K \]hY' ŁXi gh]Yg

&% " Z VYUf]b[Wba Y ci hk]h U Y fcf VYUf]b[ZY` ci hk \ Yb UI Y k Ug fYa cj YXŁ D`UW VYUf]b[#Ul Y UggYa V`m]b j]gY`gc VYUf]b[]g fYgh]b[cb`hd`cZj]gYž Ul Y`]g`ccgY fbchWUa dYXŁ`]b j]gY`UbX`g\cfhYbX`cZ Ul Y`]g`dc]bh]b[i d` I gY`d`Ugh]Wba U`Yh`hc`hJd` Ul Y` ci h`cZ`VYUf]b[" 6YUf]b[]bZcfa Uh]cb. ... G]XY. F][\h'OO`@Yzh'OO

C"8".=8".7cXY.

K Ug\Yf`bchYg.

&& " G`d!Z]hVYUf]b[g`cb`m Di ``cb`VYUf]b[]b`Y]h`Yf`g]XY`cZ`\i V`k]h`Z]b[[Yfg`hc`WX`YW`Zcf`g`d!Z]hVYUf]b[ž`h`Yb`fYa`cj`Y`VYUf]b[`k`]h`Z]b[Yfg`Z`dcg]V`Y`fk`Uh`W]b[`Zcf`Z`Uh`cf`k`Uj`mik`Ug\Yfg`VY\]bX`VYUf]b[gŁ`A`U`Y`bchUh]cbg`fVYUf]b[`UbX`k`Ug\Yf`c`W]h]cbgž`VYUf]b[`X]a`Ybg]cbgž`UbX` * I I I `WŁXY`bi`a`VYfg`cb`gYU`gŁ`

6YUf]b[]bZcfa Uh]cb. ... G]XY. F][\h'OO`@Yzh'OO C"8".=8".7cXY.

K Ug\Yf`bchYg.

&' " ðbgdYW`Zcf`dfYgYbW`cZ`gdUW`f`g`YYj`Y`f]Z`Ub`mŁ`c`W]h`YX`VY`hk`YYb`VYUf]b[g`F`Ya`cj`Y`g`YYj`Y`bck`]Z`Y]h`Yf`VYUf]b[`Ug`VYYb`fYa`cj`YX`

&(" G`d!Z]hVYUf]b[g`cb`m Di ``cb`fYa`U]b]b[`VYUf]b[]b`\i V`k]h`Z]b[Yfg`hc`WX`YW`Zcf`g`d!Z]hVYUf]b[ž`h`Yb`fYa`cj`Y`VYUf]b[`k`]h`Z]b[Yfg`Z`dcg! g]V`Y`fk`Uh`W]b[`Zcf`Z`Uh`cf`k`Uj`mik`Ug\Yfg`VY\]bX`VYUf]b[gŁ`A`U`Y`bchUh]cbg`fVYUf]b[`UbX`k`Ug\Yf`c`W]h]cbgž`VYUf]b[`X]a`Ybg]cbgž`UbX` * I I I `WŁXY`bi`a`VYfg`cb`gYU`gŁ`

6YUf]b[]bZcfa Uh]cb. ... G]XY. F][\h'OO`@Yzh'OO C"8".=8".7cXY.

K Ug\Yf`bchYg.

BCH9. GYY VYUf]b[!fYa cj Yf`gY`cb`Zcf`VYUf]b[!fYa cj Yf`hcc`g`UbX`hcc` hYWb]ei Yg`

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13 ò CARTRIDGE-BEARING HUBS

&) " *DfYgg! Zh'VYUf]b[g'cb`m* 9b[U[Y`VYUf]b[`YI hfUMWcf`h`fci [\ `ci hg]XY`
ZUMV`cZ`VYUf]b[`fY]h`Yf`g]XY`cZ`\i VŁ`-Z`hcc`fYei]fYg`ja dUMWk]h`a U!
`Yhř`d`UMW` \i V`cb`gi ddcfh`

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&* " *DfYgg! Zh'VYUf]b[g'cb`m* FYa cj Y`VYUf]b[`Zfca ` \i V`UbX`cc_`Zcf`ZUhi
cf`k Uj mik Ug\Yfg`cWWhYX`VY\]bX`VYUf]b[ž`h`Yb`a U_Y`bchUh]cbg`
fVYUf]b[`UbX`k Ug\Yf`cWWh]cbgž`VYUf]b[`X]a Ybg]cbgž`UbX`* | | | `VŁXY`
bi a VYfg`cb`gYU`gŁ`
6YUf]b[`]bZcfa Uh]cb. ... G]XY. F][\h'OO`@YZh'OO
C"8".=8".7cXY.
K Ug\Yf`bchYg.

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&+ " *DfYgg! Zh'VYUf]b[g'cb`m* 9b[U[Y`VYUf]b[`YI hfUMWcf`hc`fYa U]b]b[`VYUf!
]b[`f]Z`Ubnt`]b` \i V"-Z`hcc`fYei]fYg`ja dUMWk]h`a U`Yhř`d`UMW` \i V`cb`
gi ddcfh`

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& " *DfYgg! Zh'VYUf]b[g'cb`m* FYa cj Y`VYUf]b[`Zfca ` \i V`UbX`cc_`Zcf`ZUhi
cf`k Uj mik Ug\Yfg`cWWhYX`VY\]bX`VYUf]b[ž`h`Yb`a U_Y`bchUh]cbg`
fVYUf]b[`UbX`k Ug\Yf`cWWh]cbgž`VYUf]b[`X]a Ybg]cbgž`UbX`* | | | `VŁXY`
bi a VYfg`cb`gYU`gŁ`
6YUf]b[`]bZcfa Uh]cb. ... G]XY. F][\h'OO`@YZh'OO
C"8".=8".7cXY.
K Ug\Yf`bchYg.

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K \]hY`bXi ghf]Yg

BEARING REMOVAL FROM FREEHUB BODY

*BCH9: Gca Y`a Ubi ZUMi fYfg`Xc`bchigi ddcfh`fYd`UM]b[`VYUf]b[g`]b`
ZFY\i V`VcXmiUbX`gY`-VŁa d`YhY`ZFY\i V`VcX]Yg`cb`m`7Ua dU[bc`c`UbX`
< ~ []UfY`bchU`Y`]b`h`]g`fY[UfX`*

&- " ðbgdYWh ZFY\i V`VcXmiZcf`gbUd!f]b[g`]bghU`YX`]b`Zfcbh`cZ`UbmVYUf!
]b[gž`h`Yb`fYa cj Y`gbUd!f]b[g`

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CLEANING AND INSPECTION

' * " 7 \ YW_ U` VYUf]b[g' Zcf' ZfYY' d` Umž' h][\ hbYggž' cf' fci [\ bYgg" ÷ VŁbg]X|
 Yf]b[' fYi g]b[' UbmVYUf]b[g' fX]gVŁi fU[YXŁž' i gY' gYU' d]W_ hc' fYa cj Y'
 gYU'g" **BCH9. ' ?YYd' VYUf]b[g' Zcf' bck °**

' + " 7` YUb' U` dUfhg' k]h\ gc' j Ybh' UbX' Xfmh\ cfc i [\ m' fWYUbYX' VWfhf]X[Y'
 VYUf]b[g' a i gh' VY' Xf]YX' k]h\ VŁa dfYggYX' U]fŁ'

' , " ðgdYWh' U` h' fYUXg' Zcf' XUa U[Y"

' - " ðgdYWh' U` VYUf]b[' a ci bhg' Zcf' VŁffcg]cb' UbX' Zcf' dc`]g\]b[' f]bX]WWhYg'
 VYUf]b[g' \ Uj Y' VYYb' a cj]b[']bUddfcdf]UHy' m]b' a ci bh' @W]h' k]` VY'
 bYXYX' Zcf' fY]bghU` Uh]cbŁ'

(\$ " ÷' fYi g]b[' UbmVYUf]b[gž' dUW_ k]h\ [fYUgY' UbX' dfYgg' gYU' g' VUW_]b"

(% " I gY' dUfhg' Vi bX' Yg' UbX' bchYg']b' fYa cj U' ghYdg' hc' cf[Ub]nY' U` dUfhg']b'
 VŁffYWh' gYei YbW' g' Zcf' YZi' UbX' f][\ hg]XYg' cZ' \ i V' UbX']bbYf' UbX' ci hYf'
 YbXg' cZ' ZfYY\ i V' VcXm'

(& " ÷' fYd' UW]b[' VYUf]b[gž' gi Vgh]hi hY' bYk ' VYUf]b[g']b' dUfhg' Umci h' Zcf' c` X'
 VYUf]b[g"

BEARING INSTALLATION INTO FREEHUB BODY

**BCH9. ' GYY' VYUf]b[!]bghU' Yf' gYWh]cb' Zcf' [i]XY]bYg' UbX' hVW]b]ei Yg' Zcf'
 i gY' cZ' hcc' g' hc' dfYgg']b' VYUf]b[g'**

(' " 5 ggYa V' Y' ZfYY\ i V' VcXmž' VYUf]b[gž' g' YYj Yg' f]Z' UbmŁ' UbX' k Ug\ Yfg'
 f]Z' UbmŁ']b' VŁffYWh' gYei YbW' f]bchYX']b' ghYdg' ' ' İ ') Ł' cb' g\ UZi' cZ'
]bghU' Yfž' k]h\ Uddfcdf]UHy' d] chg#k Ug\ Yfg']b' d' UW" H\ Ybž' [Ybhimi
 h][\ hYb' hcc' i bh] U` dUfhg' UfY' Ži ` migYUHyX" FYa cj Y' ZfYY\ i V' VcXmi
 Zfca]bghU' Yf"

((" **GbUd! f]b[' fYhYbh]cb' cb' m' ÷Ybh]ZmiZUhyf' ZUW' cZ' gbUd' f]b[ž' h' Yb'
]bghU']bhc' ZfYY\ i V' VcXmik]h\ ZUhyf' ZUW' ci h' BCH9. ' DfYgg' cb' gbUd!
 f]b[' hc' VŁbZfa]h]g' Ži ` migYUHyX"**

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BEARING INSTALLATION INTO HUB SHELL

*BCH9. GYY VYUf]b[!]bghU`Yf`gVW]cb`Zcf`[i]XY]bYg`UbX`hVW]b]ei Yg`Zcf`
i gY`cZ`hcc`g`hc`dfYgg`]b`VYUf]b[g`*

- () " *G`d!Z]h`VYUf]b[g`cb`m` ; fYUgY`U`a ci bhgž`h`Yb`]bghU`Y`Z]h`g]XY`VYUf`
]b[g`UbX`k` Ug`Yfg`f]Z`Ubnř`gdUW]f`g`YYj`Y`f]Z`Ubnř`UbX`f][\h`g]XY`
VYUf]b[`UbX`k` Ug`Yfg`f]Z`Ubnř`]bhc` \i`V`g`Y`"*
- (* " *Ga cch!U`Y`i`Vg`cb`m` ÷bghU`Y`Z]h`g]XY`VYUf]b[g`UbX`k` Ug`Yfg`f]Z`
Ubnř`\i`V`g`Y`ž`UbX`f][\h`g]XY`VYUf]b[g`UbX`k` Ug`Yfg`f]Z`Ubnř`cbhc`
VYUf]b[`]bghU`Yfž`h`Yb` [Ybh`mih][\h`yb`]bghU`Yf`i`bh`]U`dUfhg`UfY`Zi`m`
gYU`hYX`" FYa`cj`Y`i`V`Zfca`]bghU`Yf`*
- (+ " *G`ci`XYFY!U`Y`i`Vg`cb`m` ÷bghU`f][\h`g]XY`VYUf]b[g`UbX`k` Ug`!
Yfg`f]Z`Ubnř`UbX`\i`V`g`Y`cbhc`VYUf]b[`]bghU`Yfž`h`Yb` [Ybh`mih][\h`yb`
]bghU`Yf`i`bh`]U`dUfhg`UfY`Zi`m`gYU`hYX`" FYa`cj`Y`i`V`Zfca`]bghU`Yf`*
- (, " *GbUd!f]b[`fYh`Ybh]cb`cb`m` ÷XYbh]ZmZU`hYf`ZUW`cZ`gbUd`f]b[fgł`h`Yb`
]bghU`]bhc` \i`V`g`Y`U[U]bgh`ci`hYf`ZUW`cZ`VYUf]b[fgł`k`]h`ZU`hYf`
ZUW`fgł`ci`h` BCH9. DfYgg`cb`gbUd!f]b[`hc`V`bZ]fa`]h`]g`Zi`m`gYU`hYX`"*

RATCHET-MECHANISM ASSEMBLY

- (- " *Duk`gng`hYa`cb`m`@ Vf]W]hY`dUk`g`UbX`gdf]b[g`k`]h`c`]f`c`]W]b`VY`
\YUj`nž`Vi`h`[fYUgY`i`gi`U`m]bhYfZYfYg`k`]h`dUk`UW]cbł`h`Yb`]bghU`
dUk`g`UbX`gdf]b[fgł`hc`ZfYY\i`V`VcXm`*
-) \$ " *FUW]Yh`d`U`h`gng`hYa`cb`m`@ Vf]W]hY`gd]fU`gdf]b[`UbX`d`UW`]b`cW]!
h]cb`UbX`cf]YbhU]cb`bchYX`]b`ghYd`%`cf`%`"*
-) % " *FUW]Yh`d`U`h`gng`hYa`cb`m`@ Vf]W]hY`U`gi`fZUW`g`cb`fUW]Yh`d`U`h`g`
k`]h`][\h`[fYUgY`cf`\YUj`mic]" 5ggYa`V`Y`fUW]Yh`a`YV]Ub]ga`fd`U`h`gž`
gdUW]fgž`gdf]b[gł`]b`cfXYf`bchYX`]b`ghYd`%`cf`%`ž`hc`VUW`ZUW`cZ`
ZfYY\i`V`VcXm`*

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BEARING HUBS

-) & " **ghYd`&\$Ł**"
-) ' " **Ga cch`U`Y`cb`m**; fYUgY`Ul`Y`UbX`XYhYfa]bY`f][\h#YZh`cf]YbhUh]cb`cZ`Ul`Y`fbchYX`]b` **ghYd`%+Ł**"
-) (" **Ga cch`U`Y`cb`m`**ghYU`Ul`Y`]bhc`ZFYY\i V`VcXmifUg`bchYX`]b`ghYd`%&`cf`%`hc`Ul`Y"
-)) " **Ga cch`U`Y`cb`m`**ghYU`ZFYY\i V`VcXmihc`li V`g\Y`"" : cf`dUk` `gng! hYa`g`cb`nž`i`gY`[YbhY`]bk`UfX`dfYggi`fY`UbX`Vč`i`bhYfWcW_k`]gY`fchU! h]cb`hc`gYUh`dUk` `g`fU`gc`hfmidc_]b[`dUk` `g`]b`]bX]j`]Xi`U`mŁ`"5`hYfbU! h]j`Y`mž`Vč`a`dfYgg`dUk` `g`Vmik`fUdd]b[`k`]h`][\hk`Y][\h`fi`VYf`VUbX`" GYUh`ZFYY\i V`VcXmž`h`Yb`WfYZi` `mifYa`cj`Y`fi`VYf`VUbX`"
-) * " **G\ci`XYfYX`U`Y`cb`m`**D`UWY`li V`cb`gi`ddcfh]fg]XY`k`]h`VYUf]b[`UfYUXm]bghU`YX`ZUM]b[`Xck`bŁ`H`Ybž`]bghU`Ul`Y`fk`UHW`f][\h#YZh`cf]YbhUh]cb`Ug`bchYX`]b` **ghYd`%`**Ł`UbX`hUd`Ul`Y`k`]h`d`Ugh]Wa`U`Yhi`bh]`g\ci`XYf`ghcdg`Ul`Y`]bghU`Uh]cb"
-) + " **G\ci`XYfYX`U`Y`cb`m`**D`UWY`fYa`U]b]b[`li V`VYUf]b[`cj`Yf`YbX`cZ`Ul`Yž`h`Yb`i`gY`Xf]j`Yf`hc`gYUh`Ul`Y`]bhc`li V`g\Y`""`ghYU`fYa`U]b]b[`gbUd! f]b[`f]Z`UbntŁ"
-) , " **G\ci`XYfYX`U`Y`cb`m**; fYUgY`Ul`Yž`h`Yb`]bghU`ZFYY\i V`VcXmihc`Ul`Y`" : cf`dUk` `gng`hYa`g`cb`nž`i`gY`[YbhY`]bk`UfX`dfYggi`fY`UbX`Vč`i`bhYf! WcW_k`]gY`fchU]cb`hc`gYUh`dUk` `g`fU`gc`hfmidc_]b[`dUk` `g`]b`]bX]j`]Xi`! U`mŁ`"5`hYfbUh]j`Y`mž`Vč`a`dfYgg`dUk` `g`Vmik`fUdd]b[`k`]h`][\hk`Y][\h`fi`VYf`VUbX`" GYUh`ZFYY\i V`VcXmž`h`Yb`WfYZi` `mifYa`cj`Y`fi`VYf`VUbX`"

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13 ò CARTRIDGE-BEARING HUBS

AXLE-SPACER INSTALLATION

-) - " **H\ fYUX!cb UI Y'gdUWfg'cb`m** HfYUh'Ul `Y'h\ fYUXg'k]h`c]ž'h\Yb'h\ fYUX'cb'Ul `Y'gdUWffgŁ" I gY'k fYbW\Yg'cb'Vch\ 'gdUWfgž'cf'cb'gdUWf'cb'cbY'g]XY'UbX'cb'Ul `Y'cb'ch\Yf'g]XYž'hc'gYW fY'gdUWfg" Cb`m]b'UVgYbW\`cZ'a Ubi ZUW\i fYfŃg'fYVŁa a YbXUh]cbgž'hcfei Y'hc`* \$]b!`Vg"
- * \$" **GYHgWYk UI Y'gdUWfg'cb`m**; fYUgY'dfchfi X]b[`Ul `Yž'g]XY'Ul `Y'gdUWffgŁ'cbhc'Ul `Yž'h\Yb'[Ybh`migYW\ fY'gYh'gWYk fgŁ"
- * %" **DfYgg!cb UI Y'gdUWfg'cb`m** ÷bghU``C!f]b[g'f]Z'Ubnt'hc'Ul `Y'cf']bg]XY'cZ'gdUWfž'[fYUgY'dfchfi X]b[`Ul `Y'YbXgž'h\Yb'dfYgg'cb'Ul `Y'gdUWffgŁ"

COMPLETION

- * &" ; fYUgY'ZfYY\i V!VcXmigd`]bYgž'h\Yb']bghU``W\ggYthY"
- * ' " ÷bghU``E F'a YW\Ub]ga "
- * (" ÷bghU``k \YY`"

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GENERIC FRONT HUB AND FREEWHEEL HUB SERVICE PROCEDURE

H\|g' dfcWXi fYk cf_g k]h`a cghWfh]X| Y!VUf]b[`Zfcbh\i Vg'UbX'k]h`
Wfh]X| Y!VUf]b[`fYf\i Vg'h Uhi h`]nYUh fYUX'cb`ZFYk \YY"K \JWYj Yf`hndY
cZ\i V]gV]b[`gYfj]WXzh YfY]gUk Ung'h Ydch]bh]U`Zcf`X]ZZfYbWgV]k Yb`
hY`ZhUbXf]] \hg]XZg'c VgYfj U]cbgUfY'† ghUgV]h]W` \YfYUg'h YmLfYk \Yb`
gYfj]]b[`UZFY\i V`

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PREPARATION

- %"" FYa cj Y'k \YY`Zfca `V]W]WY"
- &"" FYa cj Y'EF`Zfca ` \i V"
- ' "" *FYUF\i Vg'cb`m* FYa cj Y'h fYUX!cb`ZFYk \YY"
- ("" *8]gVWfU`Yg'cb`m* FYa cj Y`X]gWf]hc`dfYj Ybh`W`bhUa]bUh]cbž`UW]XYbhU`
VYbX]b[ž'cf`]b† fmihc` \UbXg'Zfca `g\Ufd`X]gWYX[YgŁ"
-) "" ðgdYWh`Ul`Y`gdUW]fg`WcgY`mZcf`k fYbW`ZUhgž`]bhYfbU` \YI`Z]h]b[gž`
UbX`gYhigWYk`g"
- * "" ðgdYWh` \c`Yg`]b`YbXg`cZ`Ul`Y`Zcf`]bhYfbU` \YI`Z]h]b[g"

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AXLE-SPACER REMOVAL

- BCH9. `5I`Y`gdUW]fg`a UmVY`X]ZZYfYbh'cb`YUM`g]XYž`UbX`X]ZZYfYbh'k Ug\!
Yfg`a UmVY`dfYgYbh'cb`YUM`g]XY"K \Yb`fYa cj]b[`gdUW]fgž`_YYd`fUW]
cZ`k \]W`g]XY`h`YmV]a Y`cZZ`cZ`UbX`k \Yh`Yf`k Ug\ Yfg`k YfY`dfYgYbh'
i`bXYf`gdUW]fg"*
- + "" *DfYgg!cb`gdUW]fg`cb`m* Di "" cb`gdUW]ffgŁ`hc`fYa cj Y`Zfca `Ul`Y"" *BCH9. `*
*Cb`m]Z`Wf]U]b`h`Uh`gdUW]fg`UfY`dfYgg`cbž`i`gY`h`]bž`ZUhgWYk`Xf]j`Yf`
hc`dfmi`d`gh`V]`gdUW]fg`*
- , "" *DfYgg!cb`gdUW]fg`cb`m* ðgdYWh`Ul`Y`YbXg`Zcf`C!f]b[gž`h`Yb`fYa`cj`Y`
UbmC!f]b[g"

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- "" H\FYUX!cb'gdUMVfg'cb`m 5hUMX`k fYbVX`hc'gdUMVfg'cb`Vch`
YbXg`cZ`UI`Y`fcb'gdUMVf'cb'cbY`YbX`UbX`UI`Y`cb'ch`Yf`YbXŁ`h`Yb`
i bh\FYUX`gdUMVffgb`

%" GYHgVYk`gdUMVfg'cb`m 1 gY`YI`_Ymhc`ccgYb`gYhgVYk`fg`cbY`
Z`h`fbž`h`Yb`UrhYa`dh`hc`di`cZZ`gdUMVffgb`Z`gh`gh`W`ž`ccgYb`gYh`
gVYk`fg`Ubch`Yf`h`fb`UbX`hfmU[U]b" BCH9. Gca`Y`i`Vg`Uj`Y`a`i`!
h`d`Y`gYhgVYk`g`k`h`UMVgg`h`fci`[`U`g]b`Y`c`Y`FchU`U`Y`hc`
VYVW`Zcf`LXX]h`cbU`gYhgVYk`g`

%%" 7 UfYZ`mibchY`Ubmik`Ug`Yfg`cWWhYX`VYhk`YYb`UI`Y`gdUMVfg`UbX`VYUf`
]b[gž`h`Yb`Vi`bX`Y`k`Ug`Yfg`k`h`V`ffYgdc`bX]b[`gdUMVfg`

%&" Z`UI`Y`gdUMVfg`WJa`Y`cZZ`Vch`g]XYg`UbX`UfY`bch]XYbh]W]ž`di`h`U`gYVW`
cbX`Vi`bX`Y`h]Y`h`fci`[`h`Y`f][`h]g]XY`gYh`hc`a`Uf`_`h`

AXLE REMOVAL

% " I`g]b[`Z]b[`Yf`dfYggi`fYž`h`fmdi`g]b[`UI`Y`ci`h`f][`h`YbX`cZ`i`Vž`h`Yb`h`fmi`
di`g]b[`UI`Y`ci`h`Yž`h`YbX`cZ`i`V" Z`UI`Y`fYgdc`bXg`hc`Z]b[`Yf`dfYggi`fYž`
V`a`d`Yh`U`Y`fYa`cj`Už`h`Yb`bch`k`]W]g]XY`U`Y`WJa`Y`ci`hcZ`UbX`
k`]W]YbX`cZ`UI`Y`f]Z`bch`gma`a`Yhf]W]Ł`k`Ug`cb`f][`h]g]XY`cZ`i`V"
5 I`Y`WJa`Y`ci`hcZ`F][`h`OQ`@Yž`OQ`
8]gh]b[i]g]b[`ZYUhi`fY.

%(" ðgdYVh`ZUMV`g`cZ`VYUf]b[`g`Zcf`gbUd!f]b[`gž`h`Yb`fYa`cj`Y`gbUd!f]b[`g`k`h`
gbUd!f]b[`d`Yfg" 7 UfYZ`mibchY`cWWh]cbg`gbUd!f]b[`g`k`YfY`Zci`bX"

%) " Z`UI`Y`k`j`bch`fYgdc`bX`hc`Z]b[`Yf`dfYggi`fY. D`UMV`i`V`cb`gi`ddcfh`
fk`h`Z]YX!gdUMVf`YbX`cZ`UI`Yž`Z`Ubnž`ZUM]b[`Xck`b`"; Ybh`mhUd`cb`
YbX`cZ`UI`Y`k`h`d`Ugh]Wa`U`Yhž`h`Yb`bch`k`]W]g]XY`U`Y`WJa`Y`
ci`hcZ`UbX`k`]W]YbX`cZ`UI`Y`f]Z`bch`gma`a`Yhf]W]Ł`k`Ug`cb`f][`h]g]XY`
cZ`i`V"
5 I`Y`WJa`Y`ci`hcZ`F][`h`OQ`@Yž`OQ`
8]gh]b[i]g]b[`ZYUhi`fY.

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%* " ZVYUf]b[Wba Y'ci hk]h U Y'fcf VYUf]b[ZY`ci hk \Yb UI Y'k Ug' fYa cj YXŁ D`UWV VYUf]b[#Ul Y`UggYa V`m]b`j]gY`gc VYUf]b[`]g`fYgh]b[` cb`hd`cZ`j]gYž`Ul `Y`]g`ccgY`fbch`WUa dYXŁ`]b`j]gY`UbX`g`cfh`YbX`cZ` Ul `Y`]g`dc]bh]b[`i`d``I` gY`d`Ugh]Wba U`Yh`hc`hUd`Ul `Y`ci`h`cZ`VYUf]b[" 6YUf]b[`]bZcfa Uh]cb. ... G]XY. F][\h'OO`@Yzh'OO

C"8".=8".7cXY.

K Ug\Yf`bchYg.

%+ " G`d!Z]hVYUf]b[g`cb`m Di ``cb`VYUf]b[`]b`Y]h`Yf`g]XY`cZ`\i`V`k`]h`Z]b[[Yfg`hc`VX`YW`Zcf`g`d!Z]hVYUf]b[ž`h`Yb`fYa`cj`Y`VYUf]b[`k`]h`Z]b[Yfg`]Z`dcg]V`Y`fk`UhW]b[`Zcf`ZUh`cf`k`Uj`mik`Ug`Yfg`VY`]bX`VYUf]b[gŁ`A`U`Y`bchUh]cbg`fVYUf]b[`UbX`k`Ug`Yf`c`WUh]cbgž`VYUf]b[`X]a`Ybg]cbgž`UbX` *| | | WŁXY`bi`a`VYfg`cb`gYU`gŁ` 6YUf]b[`]bZcfa Uh]cb. ... G]XY. F][\h'OO`@Yzh'OO

C"8".=8".7cXY.

K Ug\Yf`bchYg.

% " ðbgdYW`Zcf`dfYgYbW`cZ`gdUWV`g`YYj`Y`f]Z`Ubmt`c`WUhYX`VYhk`YYb`VYUf]b[g`FYa`cj`Y`g`YYj`Y`bck`]Z`Y]h`Yf`VYUf]b[`Ug`VYYb`fYa`cj`YX`

%- " G`d!Z]hVYUf]b[g`cb`m Di ``cb`fYa`U]b]b[`VYUf]b[`]b`\i`V`k`]h`Z]b[Yfg`hc`VX`YW`Zcf`g`d!Z]hVYUf]b[ž`h`Yb`fYa`cj`Y`VYUf]b[`k`]h`Z]b[Yfg`]Z`dcg!`g]V`Y`fk`UhW]b[`Zcf`ZUh`cf`k`Uj`mik`Ug`Yfg`VY`]bX`VYUf]b[gŁ`A`U`Y`bchUh]cbg`fVYUf]b[`UbX`k`Ug`Yf`c`WUh]cbgž`VYUf]b[`X]a`Ybg]cbgž`UbX` *| | | WŁXY`bi`a`VYfg`cb`gYU`gŁ` 6YUf]b[`]bZcfa Uh]cb. ... G]XY. F][\h'OO`@Yzh'OO

C"8".=8".7cXY.

K Ug\Yf`bchYg.

BCH9. GYY VYUf]b[!fYa`cj`Yf`gYV]cb`Zcf`VYUf]b[!fYa`cj`Yf`hcc`g`UbX`hcc` hYVb]ei`Yg`

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&\$" *DfYgg! Zh'VYUf]b[g'cb`m* 9b[U[Y'VYUf]b['YI hfUMWcf'h\ fci [\ 'ci hg]XY' ZUMV'cZ'VYUf]b['fY]h\Yf'g]XY'cZ'\i VŁ'`Z'hcc`fYei]fYg'ja dUMW'k]h\`a U! 'Yhř'd`UMW` \i V'cb'gi ddcfh'

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&% " *DfYgg! Zh'VYUf]b[g'cb`m* FYa cj Y'VYUf]b['Zfca ` \i V'UbX`cc_`Zcf`ZUhi cf`k Uj mik Ug\Yfg`cWWhYX`VY\]bX`VYUf]b[ž`h\Yb`a U_Y`bchUh]cbg` fVYUf]b['UbX`k Ug\Yf`cWWh]cbgž`VYUf]b['X]a Ybg]cbgž`UbX`* | | | `VŁXY` bi a VYfg'cb'gYU'gŁ' 6YUf]b[']bZcfa Uh]cb. ' ' G]XY. 'F][\h'OO' ' '@YZh'OO' C"8". =8". 7cXY. ' K Ug\Yf`bchYg. '

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&&" *DfYgg! Zh'VYUf]b[g'cb`m* 9b[U[Y'VYUf]b['YI hfUMWcf`hc`fYa U]b]b['VYUf!]b['f]Z'Ubnt.]b` \i V" `Z'hcc`fYei]fYg'ja dUMW'k]h\`a U`Yhř'd`UMW` \i V'cb' gi ddcfh'

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&' " *DfYgg! Zh'VYUf]b[g'cb`m* FYa cj Y'VYUf]b['Zfca ` \i V'UbX`cc_`Zcf`ZUhi cf`k Uj mik Ug\Yfg`cWWhYX`VY\]bX`VYUf]b[ž`h\Yb`a U_Y`bchUh]cbg` fVYUf]b['UbX`k Ug\Yf`cWWh]cbgž`VYUf]b['X]a Ybg]cbgž`UbX`* | | | `VŁXY` bi a VYfg'cb'gYU'gŁ' 6YUf]b[']bZcfa Uh]cb. ' ' G]XY. 'F][\h'OO' ' '@YZh'OO' C"8". =8". 7cXY. ' K Ug\Yf`bchYg. '

HUB ILLUSTRATIONS
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CLEANING AND INSPECTION

&(" 7 \YW\ U` VYUf]b[g'Zcf`ZfYY`d`Umž`h][\hbYgg'cf`fci [\bYgg" `Z`VŁbg]XYf!]b['fYi g]b['UbmVYUf]b[g'fX]gVŁi fU[YXŁž`i gY`gYU`d]W\`hc`fYa cj Y`gYU'g" &) " 7`YUb`U`dUfhg`k]h\`gc`j Ybh`UbX`Xfmh\`cfc [\`mfWYUbyX`WWhf]X[Y` VYUf]b[g'a i gh'VY`Xf]YX`k]h\`VŁa dfYggYX`U]fŁ" &* " ðbgdYWh`U`h`fYUXg`Zcf`XUa U[Y"

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&+ " ðgdYVhU`VYUf]b[`a ci bhg`Zcf`Wèffcg]cb`UbX`Zcf`dc`]g\]b[`f]bX]WUhg`
VYUf]b[g`Uj`Y`VYYb`a`cj`]b[`]bUddfcdf]UHY`m]b`a`ci`bh`@W]hY`k`]`VY`
bYYXYX`Zcf`fY]bghU`Uh]cbL`
&," `Z`fYi`g]b[`UbmVYUf]b[gž`dUW`k`]h`[`fYUgY`UbX`dfYgg`gYU`g`VUW`]b`
&- " I`gY`dUfhg`Vi`bX`Yg`UbX`bchYg`]b`fYa`cj`U`ghYdg`hc`cf[`Ub]nY`U`dUfhg`]b`
WèffYVh`gYei`YbW`g`Zcf`YZh`UbX`f][`h]g]XYg`cZ`i`V`UbX`]bbYf`UbX`ci`hYf`
YbXg`cZ`ZFY`i`V`VcXm`
'`\$`Z`fYd`UW]b[`VYUf]b[gž`gi`Vgh]hi`hY`bYk`VYUf]b[g`]b`dUfhg`Umci`h`Zcf`c`X`
VYUf]b[g`

BEARING INSTALLATION INTO HUB SHELL

*BCH9: GYY`VYUf]b[!]`bghU`Yf`gYVh]cb`Zcf`[i`]XY]bYg`UbX`hVW]b]ei`Yg`Zcf`
i`gY`cZ`hc`g`hc`dfYgg`]b`VYUf]b[g`*

'`%`G`d!`Zh`VYUf]b[g`cb`m;`fYUgY`U`a`ci`bhgž`h`Yb`]bghU`YZh]g]XY`VYUf]`
]b[g`UbX`k`Ug`Yfg`f]Z`Ubmž`gdUW`f`g`YYj`Y`f]Z`Ubmž`UbX`f][`h]g]XY`
VYUf]b[`UbX`k`Ug`Yfg`f]Z`Ubmž`]bhc`i`V`g`Y`

'`&`Ga`cch!`U`Y`i`Vg`cb`m`ðbghU`YZh]g]XY`VYUf]b[g`UbX`k`Ug`Yfg`f]Z`
Ubmž`i`V`g`Y`ž`UbX`f][`h]g]XY`VYUf]b[g`UbX`k`Ug`Yfg`f]Z`Ubmž`cbhc`
VYUf]b[`]bghU`Yfž`h`Yb`[`Ybh`m]h][`hYb`]bghU`Yf`i`bh]`U`dUfhg`UfY`Zi`mi`
gYUHYX`F`Ya`cj`Y`i`V`Zfca`]bghU`Yf`

*BCH9: Bc`VYUf]b[`]bghU`Yfg`UfY`Vèa`dUh]VY`k`]h`&\$`a`a`h`fi`!`U`Yg`i`gYX`
cb`gca`Y`A`H6g`Hnd]W`nž`U`h`Y`dUfhg`a`i`gh`VY`ghUW]YX`i`d`cb`h`Y`
VYbW`hcd`]b`gYei`YbWž`h`Yb`]a`dUW]fd]Ugh]Wèa`U`Yh`a`i`gh`VY`Udd`]YX`
fX]fYVh]micf`h`fci`[`U`W`g`h`ca`Xf]j`Yfè`i`bh]`U`dUfhg`UfY`gYUHYX`*

'`'`G`ci`XYFYX!`U`Y`i`Vg`cb`m`ðbghU`f][`h]g]XY`VYUf]b[g`UbX`k`Ug`!
Yfg`f]Z`Ubmž`UbX`i`V`g`Y`cbhc`VYUf]b[`]bghU`Yfž`h`Yb`[`Ybh`m]h][`hYb`
]bghU`Yf`i`bh]`U`dUfhg`UfY`Zi`migYUHYX`F`Ya`cj`Y`i`V`Zfca`]bghU`Yf`

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' (" *GbUd!f]b['fYhYbh]cb`cb`m`* ðYbh]ZmZUhhYf`ZUWY`cZ`gbUd`f]b[fgł`h`Yb`
]bghU`]bhc` \i V`g`Y`U[U]bghici`hYf`ZUWY`cZ`VYUf]b[fgł`k`]h`ZUhhYf`
ZUWYfgł`ci`h" *BCH9: DfYgg`cb`gbUd!f]b[`hc`VčbZ]fa`]h`]g`Z`"mgYUHX"*

AXLE INSTALLATION

') " *Ga cch!U`Y`Vi Vg`cb`m`;* fYUgY`Ul`Y`UbX`]bghU`]bhc` \i V`fk`UHWX`
f][` \h#YZhicf]YbhUh]cb`cZ`Ul`Y`ž`Ug`bchYX`]b`ghYd`%`Ł`
' * " *G\ci`XYfYX!U`Y`Vi Vg`cb`m`* D`UWY` \i V`cb`gi`ddcfh]fg]XY`k`]h`VYUf]b[`
U`fYUXm]bghU`YX`ZUM]b[`Xck`bł`h`Yb`]bghU`Ul`Y`fk`UHWX`f][` \h#YZhicf]!
YbhUh]cbž`Ug`bchYX`]b`ghYd`%`Ł`UbX`hUd`Ul`Y`k`]h`d`Ugh]Wa`U`Yhi`bh`]
g\ci`XYf`ghcdg`Ul`Y`]bghU`Uh]cb`"
' + " *G\ci`XYfYX!U`Y`Vi Vg`cb`m`* D`UWY`fYa`U]b]b[` \i V`VYUf]b[`cj`Yf`YbX`
cZ`Ul`Y`ž`h`Yb`i`gY`Xf]j`Yf`hc`gYUhUl`Y`]bhc` \i V`g`Y`" ðbghU`fYa`U]b]b[`
gbUd!f]b[`f]Z`Ubnł`"

AXLE-SPACER INSTALLATION

' , " *H`fYUX!cb`U`Y`gdUWYfg`cb`m`* HfYUhiUl`Y`h`fYUXg`k`]h`c]ž`h`Yb`h`fYUX`
cb`Ul`Y`gdUWYffgł`I`gY`k`fYbWX`Yg`cb`Vch`gdUWYfgž`cf`cb`gdUWYf`
cb`cbY`g]XY`UbX`cb`Ul`Y`cb`ch`Yf`g]XYž`hc`gYW`fY`gdUWYfg`"Cb`m]b`
UVgYbWY`cZ`a`Ubi`ZUWYi`fYf]g`fYVč`a`a`YbXUh]cbgž`hc`fei`Y`hc`*`\$]b!`Vg`"
' - " *GYHgWYk`U`Y`gdUWYfg`cb`m`;* fYUgY`dfchfi`X]b[`Ul`Y`ž`g]XY`Ul`Y`
gdUWYffgł`cbhc`Ul`Y`ž`h`Yb`[`Ybh`migYW`fY`gYh`gWYk`fgł`"
(\$ " *DfYgg!cb`U`Y`gdUWYfg`cb`m`* ðbghU`C!f]b[`g`f]Z`Ubnł`hc`Ul`Y`cf`]bg]XY`
cZ`gdUWYfž`[`fYUgY`dfchfi`X]b[`Ul`Y`YbXgž`h`Yb`dfYgg`cb`Ul`Y`gdUWYffgł`"

COMPLETION

(% " *FYUf`Vi V`cb`m`;* fYUgY`ZfYYk` \YY`h`fYUXgž`h`Yb`]bghU`ZfYYk` \YY`"
(& " ðbghU`E`F`a`YWX`Ub]ga` "
(' " ðbghU`k` \YY`"

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BEARING HUBS

CHRIS KING FREEHUBS

H\jggWcbUdd\YggWUW`mhc`hY7\flg?]b[`A H6žfcUžUbX8]gWc!
HW`fYf` \i Vg` 5`h`ci [\ `bchgdWUW`mZcf`hY6AL` \i VžcbWmi` `fY
Za]]f`k]h`hY` \i VgWj`fYX` \fYžhY6AL` \i Vg`ci` `XbchVYUWU`Yb[Y
hc`gYfj]W

H`fYfYhk`c` `Y` YgcZ`gYfj]Wdceg]VY`H`YVUg]WgYfj]W]bW`Xg`WUub]b[`.
cf`fYd`UWa` YbhcZ`Xf]j` Ya` YWUub]ga` g`UbX[`fYUg]b[`cZ`VYf]b[`g`H`YZ` ``gYfj]W
UXXg`hc`h`]g`VYf]b[`fYd`UWa` YbhUbXXf]j` Ya` YWUub]ga` `dUfhg`fYd`UWa` Ybh`H`Y
VUg]WgYfj]W`fYei]fYg`cbY`]bYl` dYbgj` YgdWU`hcc`ž`hY`<`i`V`7`cbY`5`X`i`g`]b[`.
Hcc` ` `++` \$%`H`YZ` ``gYfj]W`fYei]fYg`UWa` d`Y`7` \flg?]b[<`i`V`G`Yfj]W?]h
fbi`a`V`f`i`b`j`U`W`Y`E`"5`XX]h`cbU`m`U`&`i`%#(` `g`W`cb`c`Z`&`i`%#(` ` `="8"DJ`7`d`d`Y
UbX`cfX]b`f`mg` \cd`hcc`g`f`Y`b`Y`X`X`'

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TOOL TERMINOLOGY

H\YZ`ck]b[`hcc`g`fYU`dUfhcZ`h`Y7`f]g?]b[< i V`Gfj]W?]h`
 7c[`gd`]bYk`fYbW. 5 `Uf[Y`X]Ua Ymf`f]b[`k]h`gd`]bYg`cb`h`Y]bbYf`dYf]a !
 Ymf`=h]g`UYYXÎ W[`gd`]bYk`fYbW`i
 7cbYk`Ug`Yf. 5 `ghY`k`Ug`Yf`k]h`UWb]W`ZWW`cb`cbYg`XY`
 8fj`Yg`Y`Vi`g`]b[. 5 `cb[`W]bXf`k]h`U`Uf[Yf`X]Ua Ymf`UicbY`YbX`=h]g`
 `UYYXÎ`Xf]j`Yg`Y`Vi`g`]b[`i`
 9l`hbg]cb`g`Uz`5`h`fYUXX`g`Uz`h`k]h`h`c`h`fYUXX]Ua Ymf`g`YbX]b[`]b`U`
 `_bi`f`YX`g`Uz`h`UicbY`YbX`
 < i V`WbYUX`i`g]b[`hcc`. 5 `a`YX]i`a`!`Yb[`h`W]bXf`k]h`Z`ci`f`g`hY`d]bg`
]b`Uf`Y`Wg]b`cb`Y`YbX`=h]g`UYYXÎ`i`V`WbYUX`i`g]b[`hcc`i`
 ?`bi`f`YX`f]b[. 5 `f]b[`k]h`g`Yj`YfU`g`hYdg`cZ`j`Uf]ci`g`X]Ua Ymf`g`cb`YUW`
 ZWW`UbX`k]h`U`_bi`f`YX`h`h`i`f`Y`U`h`h`Y`ci`h`fa`cg`id`Yf]a Ymf`=h]g`UYYX`
 Î`_bi`f`YX`f]b[`i`
 Gd`]bYX`f]j`Yf. 5 `g`cfh`W]bXf`k]h`U`gei`UfY`c`Y]b`cb`Y`ZWW`UbX`Ugd`]bYX`
 WbU`i`f`U]cb`]b`h`Y`cddcg]h`ZWW`=h]g`UYYXÎ`gd`]bYX`f]j`Yf`i`
 Gd`]hf]b[`g`H`c`f]b[`g`f]Uf[`Y`UbX`ga`U`L`gd`]h]b[`U`Z`UbX`YX`hc[`Y`h`Yf`Vm`
 a`Y`bg`c`Z`Ub`C`!`f]b[`]b`h`Y[`fccj`Y]b`h`Y`ci`h`f`d`Yf]a Ymf`c`Z`h`Yf]b[`H`Y`m`f`Y`
 `UYYXÎ`[`gd`]hf]b[`i`U`bXÎ`ga`gd`]hf]b[`i`
 H`U`b`XY. 5 `Uf[`Y`g`h`Y`dd`YX`W]bXf`k]h`U`h`f`Y`U`XX`g`Uz`h`UicbY`YbX`U`b`X`U`
 `U`b`XY]bg`Y`h`X`h`f`ci`[`U`V`U`U`h`h`Y`ch`Yf`YbX`=h]g`UYYXÎ`H`U`b`XY`i`

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PART TERMINOLOGY

5X1 ghb['WbY. 5 f]b['k]h 'Zci f` \c `Yg]b]hg`ZUWk \]W fYgYa VYgUXi gi
Wd`hUh]gi gXhc UXi gh`h YVUf]b[`dfYcUX`

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5l `YbX. 5 Wd`h Uh`hfYUgcbhc `h Y`ZhYbXcZ`h YU `Y
7Udhi fYd`UH. 5 `gla d`Ya YU`k Ug`Yf`h Uh_ Ydg`h YbYXY!VUf]b[`WU Y
Zca `a cj]b[`ci hcZ`h YbYXY!VUf]b[`fUW`

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7Udhi fYg`Yj Y. 5 `a YU`W]bXf`k]h `cbY`UhiZUW`h Uh_ Ydg`h YbYXY
VUf]b[`WU YZca `a cj]b[`h Ych`Yf`k Urci hcZ`h YbYXY!VUf]b[`fUW`

8fj Yf]b[. 5 f]b[`h Uh`Ug`hYh`cb`cbYZUWUbX`Y]W`gd`]bYg`cb`h Y]bbYf`
dY]a Yhf`

8fj Yg`XYcZ`i Vg`Y`. H`Yg`XYcZ`h Y`i Vg`Y`k]h `h Y`Uf[Yf!X]Ua Yhf`
`c`Y`

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8fj Ygdf]b[. 5 `Uf[YX]Ua Yhf`gdf]b[`h Uha cj Yg`h YXf]j Yf]b["
8fj Yb`f]b[. 5 f]b[`h Uh`Ug`hYh`cb`cbYZUWUbX`gd`]bYg`cb`h Y`ci hf`
dY]a Yhf`

8fj Yg`Y`. 5 `Wa d`Yl `mg`UdYX`W]bXf`hc`k \]W`h YW[g`UHUW`K \ Yb`
]bg`U`YX`]hfYgYa VYg`UZFY`i V`VcX`ncb`UW`bj Yb]cbU`ZY`i V`

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7\fg?]b[`ZY`i V

B YXYVUf]b[. 5 VUf]b[`h Uh]g`UW]bXf`]bg`YU`cZ`UWU`"
B YXY!VUf]b[`WU Y. 5 `d`Ug]WU`Y`cZ`W]bXf]W`g`UdY`h Uh`c`Xg`h Y`
bYXYVUf]b[g`

B YXY!VUf]b[`fUW. 5 g`h Y`VUf]b[`g`fZUW]b`h Yg`UdY`cZ`Uga d`YW`f
]bXf`cb`k \]W`h YbYXYVUf]b[g`fc`"

B cb!Xf]j Yg`XYcZ`i Vg`Y`. H`Yg`XYcZ`h Y`i Vg`Y`k]h `h Y`ga U`Yf!
X]Ua Yhf`c`Y`

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D'UghWgU fga U`UbX`Uf[YL 5 h]b'kUg\Yf!`LYgU'a UXYcZ'dUghW\Uhi 13 ò 41
fYgYa VYgUg\ja `kUg\Yf"

F]b[8f]j Y`H\Y7\flg?]b[`bUa YZcf`hYZYk\Y]b[`X]g[b`hUhi]gi gYX
]b`hYgY`i Vg]bg]hUXcZUWbj Yb]cbU`dUk `UbXfUWYhf]b[`X]g[b"

GU`f]b[. 5 f]b[`hUhi]g`hfYXXcb`hYci hg]XZgd`]bYXcb`hY]bg]XYUbX
\UgUVi Yfi WYf`gU`]bg]U`YX]b`cbYZW

Gdf]b[fYU]bY. 5 U`Uha YU`f]b[`hUhi]gUg][\`hUdYf`c`cbYZWUbxUWYUf`
g]d!Xck b`]b`X]Ua Yhf`cb`hYch\Yf`ZUWk\]W`g ddcflg`hYXf]j Ygdf]b["

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FULL HUB SERVICE

AXLE AND BEARING-SEAL REMOVAL

% " ' ' FYa cj Y'Vt[g"
 &" ' ' ðbgYfhU') a a ' \YI ' _Ym]b'YUW'YbX'cZ'Ul 'Yž'h'Yb'i bh\fyUX''YZh]g]XY'
 Ul 'Y!YbX#UX↑ gh]b[!Vtby'UggYa V'm'
 ' ' ' ' Di ' ' Xf]j Yg\Y''UbX'Ul 'Y'ci h'Xf]j Y'g]XY'cZ'\i V'k]h'Z]fa 'Vt' bhYfWcW!
 k]gY'hk]gh]b['a ch]cb"

BCH9: 'G_d'hc'ghYd' +]Z'fYd'UM]b['VYUf]b[g'

(' ' ' ' ðbgYfh]h]d'cZ'fUncf' _b]ZY']b'X]U[cbU'gd']h'cZ'a YhU'gbUd!f]b[']b'ZUWY'
 cZ'Xf]j Y!g]XY'\i V!g\Y''VYUf]b['hc'']Z'h'cbY'YbX'cZ'f]b[ž'h'Yb'di ' ' 'gbUd'
 f]b['ci h'cZ'VYUf]b[" 'FYdYU'h'cb'bcblXf]j Y'g]XY"
) ' ' ' ' I gY'gYU'd]W_ 'hc'']Z'h'gcZ'ž'fi VYyf'gYU'ci h'cZ'ZUW'cZ'YUW'VYUf]b["
 7\flg'?]b['fYWa a YbX'gi gY'cZ'U'][\h'gdfUm'i Vf]W]bh]b]gh]UX'cZ'gc'j Ybh'
 k\Yb'W]Ub]b['dUfhg'UbX'VYUf]b[g'hc'Uj'c]X'Ub'ndcgg]V']h'cZ'X]a U]b['d'Ugh]W'
 UbX'fi WYf'dUfhg'k]h'gc'j Ybh'
 * ' ' ' ' : 'i g\ 'YI dcgYX'VYUf]b[g'k]h' '][\h'gdfUm'i Vf]W]bh'UbX'Xfmik]h'Vt'a !
 dfYggYX'U]f" 'I gY''][\h'i Vf]W]bh'cb'Vfi g\ 'hc'WUfYZi 'm'WYU'ub'\Y'WU'
 gd']bYg'cb'Xf]j Yg\Y''UbX']bg]XY'Xf]j Y'YbX'cZ'\i V'g\Y''"
 ð'h'Yb'YI hgYdž'fYa cj]b['h'YC'!f]b['a U_Yg]h'YUg]f'hc'di ' 'h'YU'Y'ci hž'V' h'
]h]g'bchib'WYg]U'm' =Z'mi 'fYa cj Y]ž'h'U_Y'W'fY'bc'h'c' 'cgY]h'UbX'hc'fYa Ya VYf'
 hc'fYd'UW]h'
 + ' ' ' ' FYa cj Y'ga U''C'!f]b['Zfca 'bcblXf]j Y'YbX'cZ'Ul 'Yž'h'Yb'di g\ 'Ul 'Y'ci h'
 'Uf[Y'YbX'cZ'Xf]j Yg\Y''"

BCH9: 'G_d'hc'ghYd')]Z'bc'h'fYd'UM]b['VYUf]b[g'

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=b h YbYl hg h d h Ygd]h f] b[ž Yl h b g] c b' g \ U z U b X W b Y k U g \ Y f U f Y U g g Y a V Y X
 h c' h Y H \ U b X Y' = Z' h Y Y l h b g] c b' g \ U z] g' h f Y U X X] b' h c c' a i W ž h Y g d'] h f] b['
] g' Y l d U b X X U b X' k]' b c h d U g g' h f c i [\ ' h Y V Y U f] b[" H \ Y g a U' g d'] h f] b['] g' b c h
 g n a Y f] W ž g c' V g Y f Y k \] W' Z W c Z' h Y f] b['] g' U' U f[Y f' X] U a Y h f'
 , "' ' D' U W Y' g a U' g d'] h f] b[' f I U f[Y! X] U a Y h Y f! Z U W Y' Z] f g h' c b' g a U' ' Y b X' c Z'
 Y l h Y b g] c b' g \ U z h' d' U W Y' V e b Y' k U g \ Y f' f V e b Y! g] X Y' Z] f g h' U[U] b g h' g d'] h'
 f] b[ž' h Y b' h' f Y U X' Y l h Y b g] c b' g \ U z h' Z' ' m] b h c' Y b X' c Z' H! \ U b X' Y' k] h' c i h'
 Y l d U b X] b[' g d'] h f] b["

- "' ' = b g Y f h i H! \ U b X' Y' h' f c i [\ ' X f] j Y' g] X Y' c Z' \ i V"

H \ Y _ b i f' Y X f] b['] g' U W a d' Y l' m g \ U d Y X h c c' k] h' g y Y f U' g h Y d g c f' g' a c i' X y f g'
 c Z j U f] c i g X] U a Y h f' g c b' Y U W' c Z'] g' Z W g' H \ Y d i f d c g Y c Z' h Y W b U' i f U] c b'] g'
 h c'] b g] f Y ž] Z d f c d Y f' m c f] Y b h X ž h U h' h Y _ b i f' Y X f] b[' U W g g a Y k \ U h' _ Y U d] c h
 h c' U] [b' h Y V Y U f] b[' U b X' h Y H \ U b X Y' 5 b c h Y f' Z' b W] c b' c Z' h Y _ b i f' Y X f] b[ž'
 U W] y Y X V m h' f Y U X] b['] h i c b' h' Y f Y W a a Y b X X U a c i b l ž] g' h c' g Y h' h Y X Y d h' c Z'
 h' Y g d'] h f] b[' g c' h' U h k \ Y b' h' Y g d'] h f] b['] g' Y l d U b X X ž] h] g] b' h' Y W f f Y W d c g] h' c b'
 f Y U h j Y h c' h' Y V Y U f] b[" = Z' h Y k f c b[' Y b X c Z' h Y _ b i f' Y X f] b['] g' h' f Y U X X c b' U f g ž'
 h' Y b' h' Y b i a V f' c Z' h' f b g' k]' b c h k c f_ ' h c' W f f Y W m d c g] h' c b' h' Y g d'] h f] b["
 % \$ " H \ f Y U X' _ b i f' Y X' f] b[ž' V] [! Y b X' Z] f g h' ž' Z' ' m i c b h c' Y l h Y b g] c b' g \ U z h' h' Y b'
 V U W' c Z Z' Y l U W m i g Y j Y b' Z' ' ' h i f b g"

5' g' f Y g] [b'] b' h' Y b Y l h g h d' h' U h' h' Y _ b i f' Y X f] b[' \ U g' V Y b' h' f Y U X X c b' h' Y
 k f c b[' U a c i b h] g' h' U h' h' Y H \ U b X Y [Y g' h] [\ h] b' U Z U W] c b' c Z' U h' f b' k \ Y b'
 h] [\ h b] b['] h i c' Y l d U b X' h' Y g d'] h f] b[" = Z' h'] g' \ U d Y b g ž' c c g Y b' h' Y H \ U b X Y U b X'
 i b h' f Y U X' h' Y _ b i f' Y X f] b[' U c i h c b Y h' f b ž h' Y b' l f m] U U b"

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13 ò CARTRIDGE-
 BEARING HUBS

%%" Di ``hcc`UggYa V`mici h`Xf]j Y`g]XY`cZ`i V`i bh]`_bi f`YX`f]b[`gYUhg`
U[U]bogh`i V``H\Ybž`c`X`YI hYbg]cb`g\UZh`ghUj]cbUfmUbX`hi fb`H!\UbX`Y`
WcW_k]gY`i bh]`gd`]h]f]b[`]g`Zi ``mYI dUbXYX"

%&" Hi fb`_bi f`YX`f]b[`Zi ``mWcW_k]gY"

% " HUd`cb`H!\UbX`Y`hcc`k]h`d`Ugh]Wa U`Yh`hc`Xf]j Y`VYUf]b[`ci h`bcb!
Xf]j Y`g]XY`cZ`i V"

%(" I bh`fYUX`_bi f`YX`f]b[ž`h`Yb`fYa cj Y`f]b`cfXYf`bcb!Xf]j Y!g]XY`VYUf]b[`UbX`ga U`d`Ugh]WgYU"

%) " I bh`fYUX`YI hYbg]cb`g\UZh`UbX`fYa cj Y`hcc`g`Zfca `i V"

DRIVE-SIDE BEARING REMOVAL

%* " D`UW`Uf[Y`gd`]h]f]b[`cb`ga U``YbX`cZ`YI hYbg]cb`g\UZh`d`UW`Wc`bY`
k Ug\Yf`fWc`bY!g]XY`Z]fgh`U[U]bogh`gd`]h]f]b[ž`h`Yb`h`fYUX`YI hYbg]cb`
g\UZh`Zi ``m]bhc`YbX`cZ`H!\UbX`Y`k]h`ci h`YI dUbX]b[`gd`]h]f]b["

%+ " ðgYfh`H!\UbX`Y`]bhc`bcb!Xf]j Y`g]XY`cZ`i V"

% " H\`fYUX`_bi f`YX`f]b[`fV][!YbX`Z]fgh`c`bhc`YI hYbg]cb`g\UZh`YI UW`im`h`fY`
Zi ``hi fbg"

%- " Di ``hcc`UggYa V`mici h`bcb!Xf]j Y`g]XY`cZ`i V`i bh]`_bi f`YX`f]b[`gYUhg`
U[U]bogh`i Vž`h`Yb`c`X`YI hYbg]cb`g\UZh`ghUj]cbUfmUbX`hi fb`H!\UbX`Y`
WcW_k]gY`i bh]`gd`]h]f]b[`]g`Zi ``mYI dUbXYX"

&\$" Hi fb`_bi f`YX`f]b[`Zi ``mWcW_k]gY"

–bh`YbYI h`k`c`g`h`d`g`U`h`Y`V`Y`f]b[`]g`d`f`Y`g`X`ci`h`h`Y`f`Y`f`Y`U`bi`a`V`f`c`Z`ch`Y`f`
d`U`f`h`h`U`h`k`]`W`a`Y`ci`h`U`h`h`Y`g`U`a`Y`h`a`Y`H`Y`g`Y`hi`d`c`Z`h`Y`hcc``]g`X`Y`g]`b`Y`X`
h`c`]b`g`f`Y`h`U`h`U`h`Y`d`U`f`h`g`W`a`Y`ci`h`h`c`]`Y`h`Y`ž`h`U`d`Y`X`cb`h`Y`hcc``]b`h`Y`cf`X`f`
h`Y`m`f`Y`]b`g`U`Y`X`]b`h`Y`i`V`g`Y`""6`m`Z`c`k`]b[`h`Y`X`]f`Y`W`cb`g`W`c`g`Y`ž`h`]g`d`c`g`
g`V`Y`h`c`h`Y`b`h`U`Y`h`Y`g`Y`bi`a`Y`f`ci`g`d`U`f`h`g`c`Z`h`Y`hcc``]b`c`f`X`f`ž`g`U`g`h`c`V`W`a`Y`
Z`a`]`]`f`k`]h`h`Y`g`Y`ei`Y`b`W`U`b`X`cf`]Y`b`h`U`h`cb`g`c`Z`h`Y`d`U`f`h`g`"

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7\`f]g`?]b[`hcc`g
7\`f]g`?]b[`Z`Y`Y`i`V

&% " K]h`Xf]j Y`g]XY`cZ`i V`gi ddcfhYX`cb`DJ 7`d]dYž`hUd`cb`H!\UbX`Y`hcc`
k]h`d`Ugh]Wa U`Yh`hc`Xf]j Y`VYUf]b[`ci h`Xf]j Y`g]XY`cZ`i V`
&&" I bh`fYUX`_bi f`YX`f]b[ž`h`Yb`fYa cj Y`f]b`cfXYfL`Xf]j Y!g]XY`VYUf]b[ž`
`Uf[Y`d`Ugh]WgYU`ž`Xf]j Yb`f]b[`fYI h`fbU`migd`]bYXlž`Xf]j Y`f]b[`f]bhYf!
bU`migd`]bYXlž`Xf]j Y`gdf]b[ž`UbX`gdf]b[`fYhU]bYf`
&' " I bh`fYUX`YI h`bg]cb`g`UZh`UbX`fYa cj Y`hcc`g`Zfca `i V`

DRIVESHELL DISASSEMBLY

=b`h`YbYI hgh`Ydž`h`YXf]j Yg`Y`]g]bgYf`hX]b`h`YVW[`gd`]bY`k`fYbW`UbX`Vch`
UfY[fUg]dYX]b`h`Yj]gY`H`YfY]g`bc`b`YX`Zcf`\][`ZcfW`k`Yb`W`g]b[`h`Yj]gYž
UbX`h`Y`hcc`g`UbX`d`f`h`g`W`i`X`Y`U`g]m`V`Y`X`L`a`U`Y`X`V`m`I`W`g`g`Z`c`f`W`7`c`b`g]X`f`h`Y`
g]X`Y`c`Z`h`Y`hcc`k`]h`k`f]h]b[`hc`V`Y`h`Y`Z`c`b`h`Z`U`W`UbX`h`Y`V`Ub`_`g]X`Y`h`V`Y`h`Y`
V`U`W`Z`U`W`

&(" `bgYf`h`Xf]j Yg`Y`]bhc`V`U`W`_`Z`U`W`c`Z`W`L[`gd`]bY`k`fYbW`ž`h`Yb`[Ybh`m`
gYW`fY`Z`U`h`g`c`Z`k`fYbW`_`]b`j`]gY`"

&) " D`U`W`_`gd`]bY`Xf]j Yf`cb`" # `Xf]j Y`k`fYbW`ž`h`Yb`i`gY`gd`]bY`Xf]j Yf`hc`
i`bh`fYUX`gYU`f]b[`Zfca`Xf]j Yg`Y`"

&* " F`Ya`cj`Y`W`d`h`i`fY`d`U`h`Y`ž`h`Yb`b`Y`Y`X`Y`!`V`Y`U`f]b[`W`U[Y`Zfca`Xf]j Yg`Y`
k`]h`m`ci`f`Z]b[Yfg`f]b`Y`Y`X`Y`!`V`Y`U`f]b[`f`U`W`_`UbX`W`d`h`i`fY`g`Y`Y`j`Y`f`Ya`U]b`]b`
Xf]j Yg`Y`L`"

H`Y`d`f`Y`j`ci`g`g`h`d`g`U`g`h`U`h`Y`b`Y`X`Y`!`V`U`f]b[`f`U`W`_`UbX`W`d`h`i`fY`g`Y`Y`j`Y`f`Ya`U]b`
]b`h`Y`Xf]j Yg`Y`" =b`g`ca`Y`W`g`Y`ž`]b`h`Y`b`YI`hgh`Y`d`h`Y`m`a`U`h`V`Y`c`cg`Y`UbX`d`f`c`b`Y`
h`c`Z`U`]b[`ci`h`k`]h`ci`h`Y`b`W`i`f`U`Y`a`Y`b`h`=Z`h`]g`]g`h`Y`W`g`Y`ž`]h`]g`U`b`Y`h`c`Y`h`h`Y`a`
W`a`Y`ci`h`U`h`]g`h`a`Y`

&+ " F`Ya`cj`Y`W`L[`gd`]bY`k`fYbW`_`Zfca`_`j`]gYž`fYa`cj`Y`Xf]j Yg`Y`Zfca`_`W`L[`
gd`]bY`k`fYbW`ž`h`Yb`fY]bgYf`h`Xf]j Yg`Y`]bhc`Zfcb`h`Z`U`W`_`c`Z`W`L[`gd`]bY`
k`fYbW`"

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7\]f]g?]b[`ZfY`i`V

&, " D`UWY`ga U`gd`hif]b[`fIUf[Y!X]Ua YhYf!YbX`Z]fgh`cb`ga U`YbX`cZ`
 YI hYbg]cb`g\UZh`d`UWY`V`bY`k Ug\Yf`fV`bY!g]XY`Z]fgh`U[U]bgh`gd`h`
 f]b[ž`h`Yb`h`fYUX`YI hYbg]cb`g\UZh`Zi`m]bhc`YbX`cZ`H!\UbX`Y`k]h`ci`h`
 YI dUbX]b[`gd`hif]b["
 &- " ðbgYfhiH!\UbX`Y`h`fci [\ `ga U`YbX`cZ`Xf]j Yg\Y`"
 ' \$" H`fYUX`_bi`fYX`f]b[`fga U`YbX`Z]fgh`cbhc`YI hYbg]cb`g\UZh`YI UW`mi`
 &l`%#&`hi`fbgž`h`Yb`di`h`cc`h`fci [\ `Xf]j Yg\Y`i`bh`Uf[Y`g\ci`XYf`cb`
 ZUWY`cZ`_bi`fYX`f]b[`gYUhg`]bg]XY`YbX`cZ`Xf]j Yg\Y`"
 ' %" <c`X]b[`YI hYbg]cb`g\UZh`ghU]cbUfmž`hi`fb`H!\UbX`Y`W`cW`k]gY`i`bh`
 gd`hif]b[`]g`Zi`m`YI dUbXYXž`h`Yb`hi`fb`_bi`fYX`f]b[`Zi`m`W`cW`k]gY`
 ' &" ;`fUgd`ZUhg`cZ`V`[`gd`]bY`k`fYbW`X`]b`j]gYž`h`Yb`h`Ud`cb`H!\UbX`Y`k]h`
 d`Ugh]Wa U`Yh`hc`Xf]j Y`VYUf]b[`dUfhg`ci`h`V`ch`ca`cZ`Xf]j Yg\Y`"
 ' ' " FYa`cj`Y`V`[`gd`]bY`k`fYbW`X`Z`fca`j]gYž`i`bh`fYUX`_bi`fYX`f]b[`Z`fca`
 YI hYbg]cb`g\UZh`h`Yb`fYa`cj`Y`f]b`c`fXYf`b`YYX`Y!VYUf]b[`fUWYž`W`dhi`fY`
 g`YYj`Yž`VYUf]b[ž`UbX`ga`U`d`Ugh]W`gYU`"
 ' (" I`bh`fYUX`YI hYbg]cb`g\UZh`UbX`fYa`cj`Y`U`h`cc`g`Z`fca`Xf]j Yg\Y`"

BEARING AND RINGDRIVE LUBRICATION

7\flg?]b[`a`U`Y`gd`WU`[`fYUgY`Z`f`i`gY]b`h`Y`7\flg?]b[`i`Vg`5`h`ci [\`
 XYj]U]cb`Z`fca`h`Y`f`W`a`a`Yb`XX[`fYUgY`a`U`mb`ch`VYUg`W]h`W`]bg]XY`h`Y`VU`
 VYUf]b[gž`h`Y`k`fcb[`i`V]W`b`h`W`b`a`U`Y`h`Y`F]b[8`f]j`Y`b`cb!Z`b`W]cbU`" H`Y`
 f`W`a`a`Yb`XX[`fYUgY]g`j`Y`m][\`h`U`b`X`]b`]g`U`g`Y`b`W`Z`7\flg?]b[`f`W`a`a`Yb`X`g`
 U\][\!ei`U]m]`\$K`c]ž`b`y`Y`U`b`ch`Y`f[`fYUgY`K` \`Yb[`fYUg]b[`h`Y`VYUf]b[gž]h]g`
 W]h]W`h`c`i`gY`Ua`c`XY`U`Y`Ua`ci`bh`H`c`a`i`W[`fYUgY`k]`a`U`Y`h]a`d`c`g]VY`h`c`
 gY`h`h`Y`fi`WY`f`gY`U`b`X`g`b`U`d`f]b["

BCH9: G`_d`h`c`ghYd`" - `Z`fYd`U`m]b[`VYUf]b[g`"

') " D`UWY`ga U`VYUX`cZ`7\flg?]b[`[`fYUgY`cbY!\U`Z`h`c`h`k`c!h`]fXg`cZ`h`Y`
 k`Um`U`f`ci`b`X`]bg]XY`cZ`\i`V!g\Y`VYUf]b[g`"

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7\flg?]b[`h`cc`g
 7\flg?]b[`Z`fY`i`V

' * " D'UW'fi VVYf'gYU'g'cj Yf' [fYUgY'UbX'WfYzI ``migYUh'VYhk YYb']bbYf'UbX'ci hYf'fUW'g"
 '+' 9b[U[Y'cbY'YbX'cZ'gd`]'h'f]b[']'b[[fccj Y'VYhk YYb']bbYf'UbX'ci hYf'fUW'gž'h\Yb'k cf_ U``h\Y'k UmUfci bXž'gYUh]b['gd`]'h'f]b[']'bhc'VYUf]b["' F YdYUhZcf'ch\Yf'VYUf]b["
 ', " I gY'Z]b[Yf'hc'gYdUfUHy'Xf]j Y'f]b[g'UbX'di h'VYUX'cZ'7\`f]g'?]b['[fYUgY']b[[Ud'VYhk YYb'Xf]j Y'f]b[g''F Y'YUgY'f]b[ž'h\Yb'ga YUf'YI W'gg' [fYUgY'cj Yf'\Y']W'gd`]'bYg"

*BCH9: G_d'hc ghYd) *]Z'bc'h'fYd'UW]b['VYUf]b[g'*

NON-DRIVE-SIDE BEARING INSTALLATION

5 ``h'fY'cZ'h'Y'VUf]b['Wf]X] Yg'UfY'bcbl'gna a Yf]W''I dcb'YI Ua]b]b['h'Y'c'Y]b'YUW'cZ'h'Y'h'fY'VUf]b['Wf]X] Ygž'h'Wb'VYgYb'h'U'icb'Y'Yb'X'cZ'h'Y'c'Y]g'h'U'fY'X]b]g'X'K \Yb'YUW'VUf]b['g]b]g'U'Y'X'Z'VY'g'fY'hc'bc'h'k'\]W'k'Um'h'g'Î]b]h'f'U'm'h'U'fY'X'Yb'X'Ī'g'aci'X'Z'W': U]i'fY'hc'cf]Yb'h'h'Y'VUf]b[g'W'ff'Y'W'k]``a U_Y]h]a d'cg]VY'hc'Wa'd'Y'h'Y'i V'U'g'Ya Vm'Ub'X'U'g'c'a U_Y'g']h'Y'lf'Ya Ym'X'Z'W'h'ic'f'Ya'cj'Y'h'Y'VUf]b['k]h'ci'h'X'U'a U]b['h'Y'd'U'h]W'g'U' h'U'g]h'g'V\]b'X'Y'U'W'VUf]b[" =b'U' h'f'Y'W'g'ž'h'Y'W'ff'Y'W'VUf]b['cf]Y'b'U']cb']g'g' W'h'U'h'Y'h'U'fY'X'Yb'X'cZ'h'Y'c'Y'Yb'X'gi'd'Z'W]b['ci'h'Z'ca' h'Y'W'W'h'f'cZ'h'Y'i V'

' - " <c'X]b['H!\UbX'Y'h'fYUXYX!YbX'i dž'd'UW'ga U``VYUf]b['f]bhYfbU'm' h'U'd'Y'fY'X'Yb'X'Z]f'g'h'c'bc'h' H!\UbX'Yž'h'Yb'd'UW'ga U``d'Ugh]W'g'YU'cb'h'cd'cZ'VYUf]b["

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6m7\fg?]b[ñfYwa a YbXU]cbžUgYa]b[mfYXi bXUhidfcWgg]gi gYX
k\Yb'gU]b[YUWVUf]b["H\YWa dUbnñdcg]hcb]g'hUih]gdfcWgg]bg fYg'
dfcdYf'VUf]b['U][ba Ybh'H\g]g'k \mh'YbYl hghYd]bW'Xyg]h[\h]b['h'Y
H\UbXY'hk]W'
(%" H][\hYb'H!\UbX'Y'i bh]'VYUf]b['gYUhg'Zi ``m'@ccgYb'H!\UbX'Y'ž'fchUHY'
_bi f'YX'f]b['% \$š 'Y]h'Yf'k Umž'h\Yb'gYWW'fY'H!\UbX'Y'U[U]b"FYa'cj'Y'
hcc`g"

DRIVE-SIDE BEARING AND RINGDRIVE INSTALLATION
(&" 7\YW\h'Uh'C!f]b['g]'b'd'UW']bg]XY']bbYf'dYf]a YhYf'cZ'gdf]b['
fYhU]bYfž'h\Yb']bghU'`gdf]b['fYhU]bYf']b'Xf]j Y'g]XY'cZ'\i V'gc'h\Uh'
ghYddYX'ZUW'ZUW'g'ci h'Xf]j Y'g]XY'cZ'\i V"
(' " ðbgYfh'Xf]j Y'gdf]b[']b'Xf]j Y'g]XY'cZ'\i V"
((" I'gY'7\fg?']b['[fYUgY'hc'i Vf]WU]h'hcch\YX'ZUW'UbX'\Y']W'gd`]bY'cZ'
Xf]j Y'f]b['f]bhYfbU'mgd`]bYXlž'h\Yb']bgYfh'f]b['gc'hYYh\ZUW'ci h'Xf]j Y'
g]XY'cZ'\i V"

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7\fg?]b['hcc`g
7\fg?]b['ZY\i V

() " ðgYfhXf]j Yb`f]b[`fYI hYfbU`mgd`]bYXÉ`hcch\!ZUW`Z]fgh`]bhc` \i V`gc`
gd`]bYg`Yb[U[Y` \i V`g\Y`gd`]bYg`
(* " D`UW`Uf[Y`d`Ugh]WgYU`cj Yf`Xf]j Yb`f]b[ž`h\Yb`]bgYfh`Uf[Y`VYUf]b[`gc`
]bhYfbU`miHudYfYX`YbX`ZUW`g`ci`h`cZ`\i V`
(+ " ðgYfhH!\UbX`Y`h`fci [\ `bcblXf]j Y`g]XY`cZ`\i Vž`h\Yb`h`fYUX`_bi`fYX`
f]b[`fIUf[Y!YbX`Z]fghÉ`cbhc`H!\UbX`Y`UbX`U[U]bghZUW`cZ`VYUf]b["
(, " H[\hYb`H!\UbX`Y`i`bh]`VYUf]b[`gYUhg`Zi` ``m`@ccgYb`H!\UbX`Yž`fchUH`
_bi`fYX`f]b[`% \$š`Y]h`Yf`k`Umž`h\Yb`gYW`fY`H!\UbX`Y`U[U]b`" F`Ya`cj`Y`
hcc`g`"

DRIVESHELL ASSEMBLY

(- " <c`X]b[`H!\UbX`Y`h`fYUXYX!YbX`i`dž`d`UW`cbhc`h`fYUXYX`YbX`f]b`
cfXYfÉ`Xf]j Yg\Y`Vi`g\]b[`fga`U`!YbX`Z]fghž`ga`U`VYUf]b[`f]bhYfbU`mi
HudYfYX!YbX`Z]fghž`ga`U`d`Ugh]WgYU`ž`UbX`Xf]j Yg\Y`fIUf[Y!YbX`Z]fghÉ`
) \$" H`fYUX`cb`_bi`fYX`f]b[`fIUf[Y!YbX`Z]fghÉ`i`bh]`]h`gYUhg`cj`Yf`YbX`cZ`
Xf]j Yg\Y`"
) %" H[\hYb`H!\UbX`Y`i`bh]`VYUf]b[`gYUhg`Zi` ``m`@ccgYb`H!\UbX`Yž`fchUH`
_bi`fYX`f]b[`% \$š`Y]h`Yf`k`Umž`h\Yb`gYW`fY`H!\UbX`Y`U[U]b`" F`Ya`cj`Y`
hcc`g`"
=Z`h`Yb`YX`Y!VUf]b[`fUW`X`bchZU`ci`hk` \]YX]gUgYa`V]b[`h`YX`f]j`Yg\Y`
UgYa`V`m`h`YZ`ck]b[`ghd`k]`VYb`YX`Y]b`Z` ``h`]bgU`h`YW`dhi`fYg`Yj`Y`
UbX`b`YX`Y!VUf]b[`fUW`=Z`h`Ym`X`X`ZU`ci`h`X`i`f]b[`X]gUgYa`V`m`h`Y`h`c`d`Uf`g`
g`ci`X`g`a`d`ng`d]bhc`d`UW`X`i`f]b[`h`Yb`Y`h`ghdž`UbX`]hk`]`VY`i`bb`YW`g`f`n`ic`
i`gY`h`Y`g`Y`U`f]b[`Ug`Ub]`bgU`U]cb`df`Yg`Zcf`h`Yg`Y`d`Uf`g`
) &" D`UW`W`dhi`fY`g`YYj`Y`fZ`Uh`ZUW`ZUW]b[`ci`h`UbX`b`YX`Y!VYUf]b[`fUW`
]bhc`Uf[Y`YbX`cZ`Xf]j Yg\Y` ``=Z`b`YW`g`g`Uf`nž`i`gY`gd`]bY`Xf]j Yf`UbX`gYU`
f]b[`hc`gYU`h`b`YX`Y!VYUf]b[`fUW`Zi` ``nž`h\Yb`fYa`cj`Y`gYU`f]b["

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7\flg?]b[`ZYY\i`V

) ' " ðgYfhXf]j Yg\Y``]bhc`VUW`ZUW`cZ`Wé[`gd`]bY`k fYbWéž`h\Yb`[Ybh`m
 gYW fY`Wé[`gd`]bY`k fYbWé`]b`j]gY"
) (" ; fYUgY`bYYX`Y!VYUf]b[`WU[Y`k]h`7`f]g?]b[`[fYUgYž`h\Yb`]bgYfh`bYYX`Y!
 VYUf]b[`WU[Y`UbX`WUdh fY`d`UHY`]bhc`Xf]j Yg\Y``"
)) " H\ fYUX`gYU`f]b[`]bhc`Xf]j Yg\Y``ž`h\Yb`gYW fY`hc`%\$\$]b!`Vg" FYa`cj`Y`
 Xf]j Yg\Y``Zfca`hcc`g"

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AXLE ASSEMBLY AND ADJUSTMENT

) * " ðgYfhUl`Y`]bhc`Uf[Y`YbX`cZ`Xf]j Yg\Y``i bh]`]higYUhg`k]h`U`Í dcdž`
 h\Yb`di`higa`U``C!f]b[`VUW`cbhc`h\ fYUXYX`YbX`cZ`Ul`Y"
) + " ðgYfhUl`Y#Xf]j Yg\Y``UggYa`V`m]bhc`Xf]j Y`g]XY`cZ`\i`V`k]h`U`WcW`
 k]gY`fchUh]cb`UbX`U`ZcfWZ`di`g\ž`i`bh]`]higYUhg`k]h`U`Í dcd`i
) , " Di`h) a`a` \YI`_Ym]b`j]gYž`Y]h\Yf`YbX`dc]bh]b[`i`dž`h\Yb`d`UW`f][`h`
 YbX`cZ`Ul`Y`cbhc`\YI`_Ym`
) - " H\ fYUX`UX↑gh]b[`Wé`bY`Z`micbhc`Ul`Y`YbXž`h\Yb`h\ fYUX`UggYa`V`m`
 cbhc`Yž`YbX`cZ`Ul`Y`fKc`bch`gYW`fYÉ"

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@_YU`ch`Yf`\i`Vg`h`Uhi`h]`nY`ei]W`fYUgY`fYh]cbž`h`YU`Y`cZ`U7`f]g`
 ?]b[`i`V`Wa`dfYggYg`k`Yb`h`Yk`Y`Y`]g`]bg`U`YX`]b`h`Y`Xfcdci`hg`UbX`h`Y`
 ei]W`fYUgY`]g`dfcdY`mg`Y`W`YX`I`b`_Y`W`bj`Yb]cbU`i`Vgž`]h]g`bchidcgg]VY`
 hc`ga`i`U`h`]g`Wa`dfYgg]Y`c`UX`Uih`Y`g`a`Y`h`a`Y`U`g`a`U`]b[`h`Y`UX`i`ga`Y`blž`
 gc`]h]g`b`W`g`U`f`m`c`i`g`Y`U`h]U`UbX`Y`f`c`f`d`f`c`W`g`c`Z`UX`i`ga`Y`blž`g`U`f`h]b[`k`]h`
 Ub`UX`i`ga`Y`bh`h`U`h]g`W`U`f`m`c`c`cg`Yž`h`Yb`a`U`]b[`Ub`Y`UX`i`ga`Y`bl`g`i`bh`h`Y`
 `ccg`Y`b`Y`g`↑`g`h`g`U`d`U`f`g`cb`W`h`Y`k`Y`Y`]g`W`f`W`m]bg`U`YX`]b`h`Y`V`_`Y`
 * \$" <c`X]b[`Ul`Y`YbX`gh]cbUf`mž`fchU`Y`UX↑gh]b[`Wé`bY`WcW`k`]gY`i`bh]`
 Wé`bh`U`h]g`ZY`hž`h\Yb`fchU`Y`Wé`i`bh`f`WcW`k`]gY`%#(`h`i`fb`"GHUV]`nY`
 UX↑gh]b[`Wé`bY`k`Y`Y`[Ybh`m`g`YW`f]b[`Ul`Y`YbX`"

ILLUSTRATIONS
 7`f]g?]b[`hcc`g
 7`f]g?]b[`Z`Y`i`V

* %" D`UW`k \YY`]b`ZfUa Y`UbX`W`ffYW`m`gYW`fY`ei]W`fY`YUgY`h`Yb`W`YW`
 Zcf`_bcW`_Vm`Yf`_]b[`UhYfU`micb`f]a ""fZ`bc`_bcW`_]g`ZY`h`h`Y`Z]fgh`
 h]a Y`h`]g`ghYd`]g`UhYa dhYX`ž`fYXc`ghYd`* \$`k]h`U`g`][\h`m`ccgYf`ghUfh`
]b[`UX↑`gha`Ybh`Ł`
 * &" ž`_bcW`_]g`ZY`h`ž`fYa`cj`Y`k` \YY`UbX`di`h`f][\h`YbX`cZ`U`I`Y`VUW`_cb` \YI`
 _Ym]b`j`]gY`"
 * ' " K` \]Y`ghUV`]n]b[`UX↑`gh]b[`W`bY`ž`_ccgYb`U`I`Y`YbX`ž`h`Yb`h`i`fb`UX↑`gh]b[`
 W`bY`U`ZYk`_XY[`fYYg`W`cW`_k`]gY`UbX`gYW`fY`U`I`Y`YbX`"F`YdYU`h`W`X`YW`_]b`
 ghYd`*`%`UbX`ghcd`]Z`_bcW`_]g`Y`]a`]bUhYX`"

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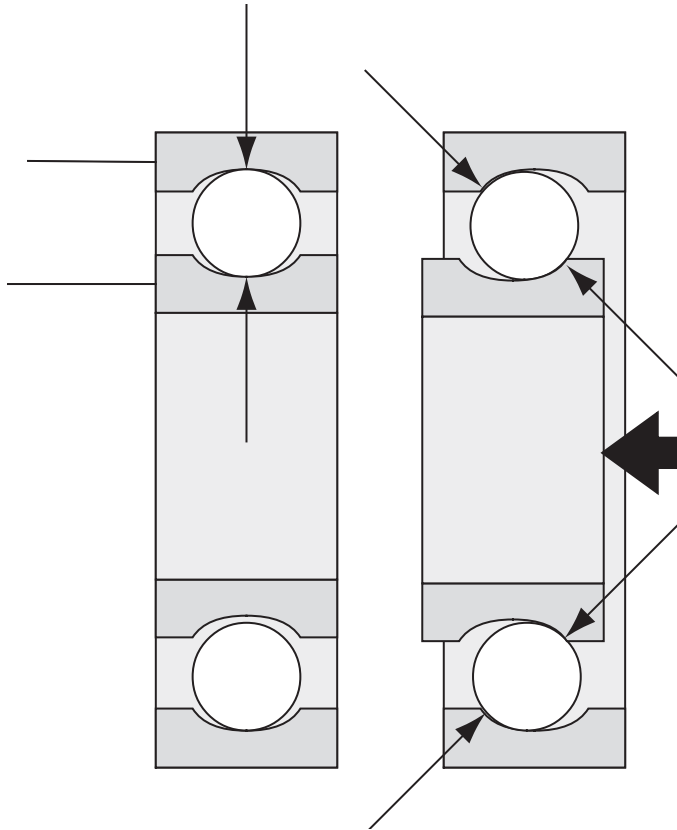
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% "% 'H\Y'g]XY`cUX'cb'h\Y']bbYf'fUWY'cZ'h\Y'f][\h'VYUf]b['WUfhf]X[Y'WUli gYg'WcbhUW'i hc'cVWV f' VYhk YYb'h\Y'fUWYg'UbX'h\Y'VU`VYUf]b[g'Uh]bUddfcd f]UhY'dc]bhg'fWcbhUW'i dc]bhg']bX]WUhyX'Vmi Uffck gL'

