HOSE AND HARD LINE ASSEMBLY INSTALLATION INSTRUCTIONS

GOODRIDGE


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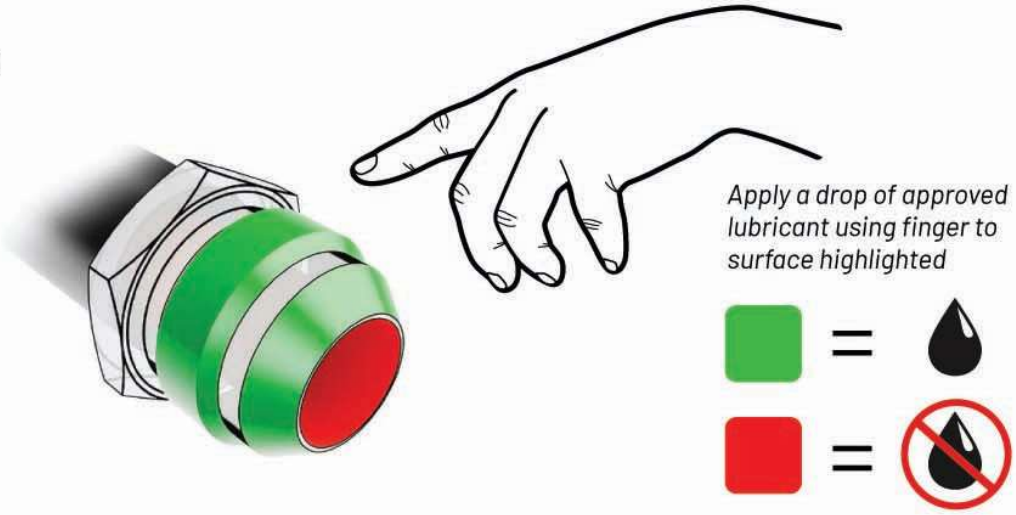
When installing hose assemblies and hard lines, there are a few precautionary notes to observe for a good fit leak free joint.

Note 1) - The initial lubrication of the coupling threads is of high importance. This entails either using an approved lubricant recommended by the manufacturer or a light oil/equivalent. Thereby it is of utmost importance that the lubricant does NOT enter the bore of the hose. ***(see fig 1)***

It is advisable to ensure that a film of lubrication is established to cover all threads (as full as possible). Lubricating the male-end reduces the risk of lubrication entering the hose.
Next, lubricating the cone sealing surface on the male-end (due to its ready accessible surfaces) helps glide the mating parts together. In case of oxygen systems. ***Please pay attention to note 2.***

Please note: *Lubricants will help reduce friction scatter (especially in brand-new joints) and will aid in the initial line up and pre-torque tightening. This is also beneficial for affecting bolt scatter and effective loading over the joint. It is sometimes advisable to use the operating system fluid as lubrication as this will reduce any cross contamination. Water glycol systems will work well if the seating faces are also lightly smeared to allow a positive slide feel when drawing the components together. Always use only the minimum amount of lubricant on the cone sealing faces.* ***(see table 2)***

Fig 1



Note 2) - Be very aware when installing hoses and Hard lines specifically for Oxygen systems; oils or general lubricants. **CANNOT** be used! Special lubricants should be used in oxygen systems to prevent explosions. ***(see fig. 2)***

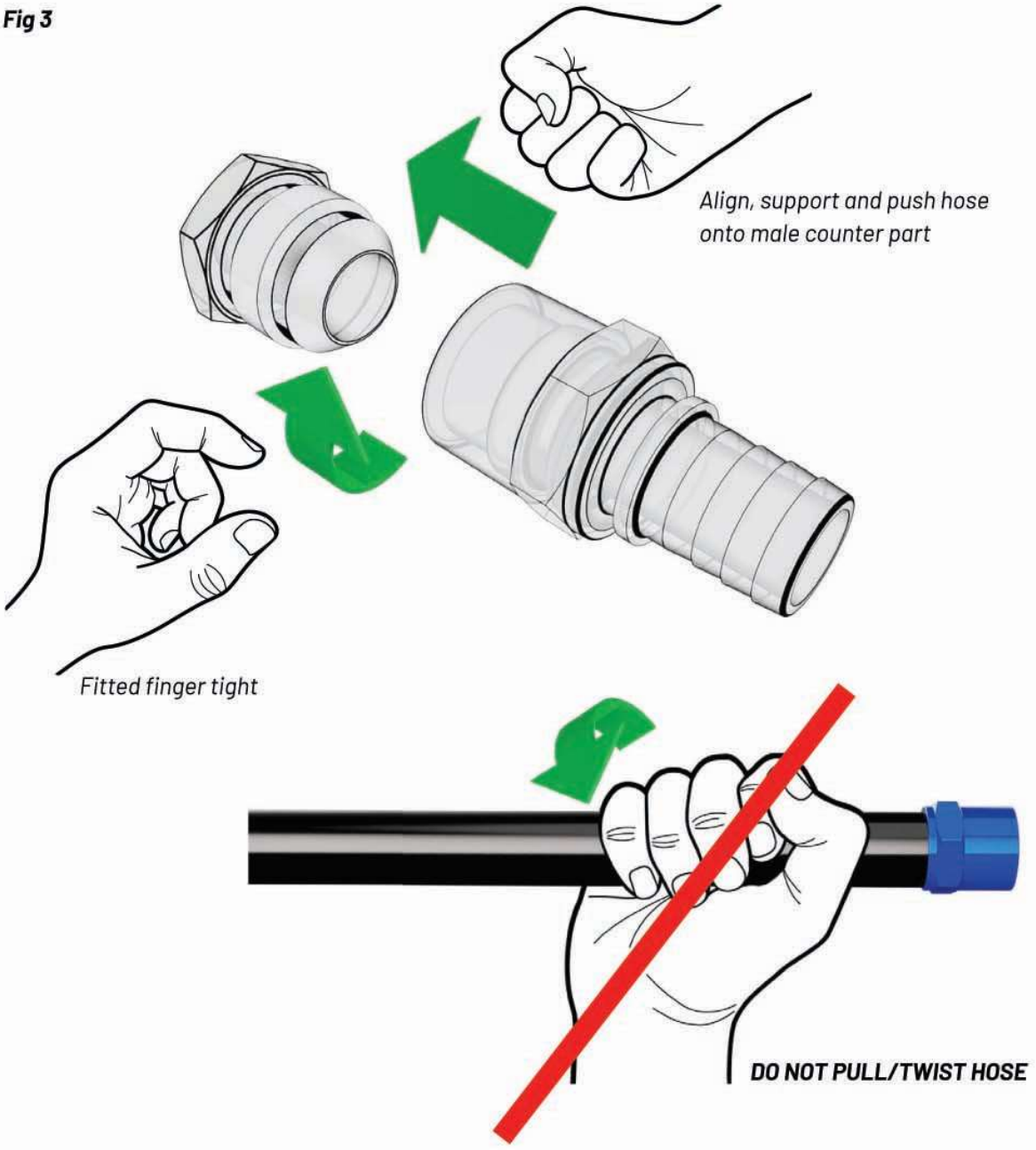
Fig 2

Note 3) - Union nuts should be fitted finger tight and then whilst holding the hose in place, ***"feel" the closing fit***, thereby ensuring you can feel the two faces contacting concentrically and squarely to prevent misalignment before fully tightening.

This is the "critical" stage which ensures the two faces provide the maximum contact area for sealing. Remember you must push the hose onto the male connector and the hose should be supported at all times.

NEVER pull/twist a hose assembly into place using the coupling nuts, because there will be no ***"feel" for the fit situation***, and this could easily lead to misalignment and leakage ***(see fig. 3)***

Fig 3



Note 4) - New coupling nuts need to be torqued to the correct specification. A difference in installation practice occurs between regular hoses and hard-lines. Below a schematic has been established showing the necessary steps. Furthermore, a torque sheet is supplied showing the appropriate torque values for the different dash sizes, lubrication types and different materials ***(see table 1)***
WARNING: *Please use the correct tightening torques suitable to the application that is presented.*

Torquing instructions Hose

Step 1: *After aligning the mating surfaces* ***(see note 3)*** *utilizing the appropriate torque wrench, tighten nut (blue) to 50% of the specified torque value given in* ***table 1.***

Step 2: *Slacken the nut (blue)*

Step 3: *Re-align and re-tighten the nut (blue) to 100% of the specified torque value given in* ***table 1.***



Torquing instructions Hard line

Step 1: *After aligning the mating surfaces* ***(see note 3)*** *utilizing the appropriate torque wrench, tighten nut (blue) to 100% of the specified torque value given in* ***table 1.***

Step 2: *Slacken the nut (blue)*

Step 3: *Re-align and re-tighten the nut (blue) to 100% of the specified torque value given in* ***table 1.***



WARNING: Please ensure that the alignment procedure ***(see note 3)*** is repeated whenever (re) tightening of the fitting is being executed.

Note 5) - In general terms leaks can occur due to the following:

- Sealing face contamination
- Sealing face damage
- Sealing face misalignment
- Torque relaxation ***(see note 6)***

Re-tightening can be tried once with minor increments to stop leakage, however in the case that leakage persists, the joint ***WILL have to be opened to investigate the cause!***

WARNING: When loosening any joint, please ensure the system is discharged first.

Note 6) - Another point to consider, in some critical joints, is a factor called torque relaxation. This is where the torque rapidly reduces after the initial tightening. In such critical applications one should revisit the coupling and re-tighten to the same specified torque ***(see table 1)***. This should happen within 5-10 and up to 15 minutes after the initial tightening.

Torque settings

Table 1

Thread	Dash size	FFWR	Torque (Nm)	Material	Notes, alloy tq
3/8 x 24 UNF	3	-	14 dry steel	7 – 9 Aluminium	4.8 Nm SAE 30 oil
7/16 x 20 UNF	4	2	18 dry steel	9 – 12 Aluminium	7 Nm SAE 30 oil
1/2 x 20 UNF	5	2	23 dry steel	12 – 15 Aluminium	8 Nm SAE 30 oil
9/16 x 18 UNF	6	1-1/2	30 dry steel	15 – 20 Aluminium	11 Nm SAE 30 oil
3/4 x 16 UNF	8	1-1/2	57 dry steel	29 – 37 Aluminium	19 Nm SAE 30 oil
7/8 x 14 UNF	10	1-1/2	81 dry steel	40 – 50 Aluminium	27 Nm SAE 30 oil
1.1/6 x 12 UNF	12	1-1/4	114 dry steel	57 – 71 Aluminium	36 Nm SAE 30 oil
1.5/16 x 12 UNF	16	1	160 dry steel	89 – 104 Aluminium	58 Nm SAE 30 oil
1.5/16 x 12 UNF	20	1	220 dry steel	110 – 143 Aluminium	77 Nm SAE 30 oil
BSPP (Parallel)					
1/8 x 28	3		12		
¼ x 19	4		20		
3/8 x 19	6		35		
½ x 14	8		60		
5/8 x 14	10		70		
¾ x 14	12		115		
NPT (Tapered)		TFFT			
1/8 x 27	3	2-3	10		
¼ x 18	4	2-3	20		
3/8 x 18	6	2-3	35		
½ x 14	8	2-3	60		
¾ x 14	12	2-3	115		

FFWR: the recommended number of flats on the fitting's nut that should pass a certain point after resistance is felt

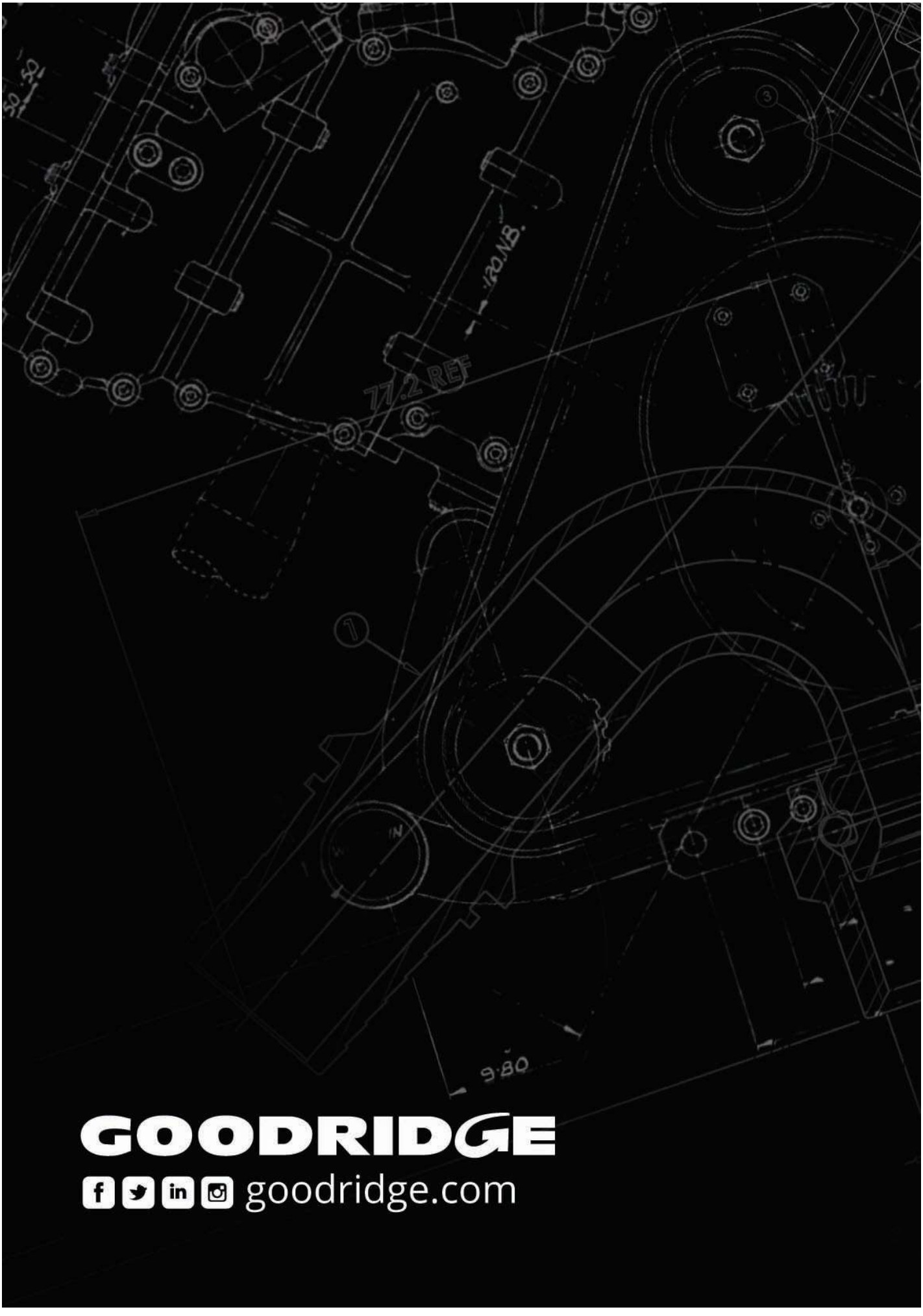
Adjustments for different types of lubrication

Table 2

Lubrication	Torque reduction (%)
Graphite	50 - 55
White grease (lithium)	35 - 45
SAE 30 oil	35 - 45
SAE 40 oil	30 - 40
No Lube	0

Please note: *All torque figures are for guidance only, the above figures are based upon basic reduction factors and not specifically directed to any specific aluminium alloys, there are many factors too numerous to mention here that affect the clamp loading on hydraulic joints.*

Stainless steels should be carefully considered when it comes to proper torque loading and special advice needs to be sourced regarding the type and application, for high pressure applications (20000 psi) the torque can be 5% higher than dry steel, but generally stainless is more malleable and requires strict control regarding the grade used.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