

# Instruction Manual

Hydraulic Bolt Tensioners Model – DMS Series



Maximum Operating Pressure – 1,500 bar



This is a safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid injury or death

# **1.0 Product Information**

DURAPAC – Hydraulic Bolt Tensioners are engineered to meet Industrial Standards for Performance and Safety. The DMS Series are a multi-stage spring return tensioner, designed to fit into compact applications on grade 10.9 bolts.

- Ratchet wind down for the change bushing
- Nut turning sleeve
- Nickel coated for longevity

Special skill, knowledge and training may be required for a specific task and the product may not be suitable for all jobs. The user must ultimately make the decision regarding suitability of the product for any given task and assume the responsibility of safety for all in the work area. Contact a Durapac representative if you are unsure of your bolt tensioner's suitability for a particular application.

# **2.0 Receiving Instructions**

It is recommended prior to use that an inspection be done by qualified personnel and that any missing or damaged parts, decals, warning/safety labels or signs are replaced with Durapac authorised replacement parts only. Any bolt tensioner that appears to be damaged in any way, is worn, leaking or operates abnormally should be removed from service immediately until such time as repairs can be made. Any bolt tensioner that has been or suspected to have been subject to a shock load should be removed from service immediately until inspected by a Durapac authorised service centre. Owners and operators of this equipment should be aware that the use and subsequent repair of this equipment may require specialised training and knowledge.

# 3.0 Safety

Save these instructions. For your safety, read and understand the information contained within. The owner and operator should understand this product and safe operating procedures before attempting to use this product. Instructions and safety information should be conveyed in the operator's native language before use of this product is authorised. Make certain that the operator thoroughly understands the inherent dangers associated with the use and misuse of the product. If any doubt exists as to the safe and proper use of this product as outlined in this factory authorised manual, remove from service immediately.



#### DANGER:

- **Never** stand in-line with the bolt axis while tensioning or de-tensioning is in progress. If the bolt should fail, serious personal injury or death could result if loose or broken parts become projectiles. All personnel must be aware of this potential hazard at all times
- To avoid personal injury keep hands and feet away from work area during operation
- **Do NOT** handle pressurised hoses. Escaping oil under pressure can penetrate the skin causing serious injury. If oil is injected under the skin, see a doctor immediately



## WARNING:

- All hydraulic hoses and fittings used in the circuit must be rated at or above the maximum working pressure of the tensioner 1500 bar [21,750 psi]. Install pressure gauges in the system to monitor operating pressure. It is your window to what is happening in the system
- Always wear appropriate personal protective equipment (PPE) when operating hydraulic equipment. The operator must take precaution against injury due to failure of the tool or work piece(s)
- Do NOT hold or stand directly in line with any hydraulic connections while pressurising
- **Do NOT** attempt to disconnect hydraulic connections under pressure. Release all line pressure before disconnecting hoses
- All personnel must be clear before pressurising or depressurising the system



#### **IMPORTANT:**

- If at any stage, the safety related decals become hard to read, these must be replaced
- Minimum age of the operator must be 18 years. The operator must have read and understood all instructions, safety issues, cautions and warnings before starting to operate the equipment. The operator is responsible for this activity towards other persons
- **Do NOT** lift hydraulic equipment by the hoses or couplers. Use the carrying handle or other means of safe transport
- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Durapac authorised service centre in your area. To protect your warranty, use only high-quality hydraulic oil

# CAUTION:

- **KEEP HYDRAULIC EQUIPMENT AWAY FROM FLAMES AND HEAT.** Hydraulic fluid can ignite and burn. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance do not expose equipment to temperatures of 65°C (150°F) or higher. Protect all equipment from weld spatter
- No alteration should be made to this device

## **3.1 Bolt Tensioners**

- **Only** allow personnel to be near pressurised hydraulic tensioners when it is absolutely necessary and only when the pressure is steady. Keep an eye on the pump pressure gauge
- **Do NOT** exceed the rated capacity of the bolt tensioner or any equipment in the system. Burst hazard exists if connection pressure exceeds rated pressure
- **Do NOT** exceed the maximum extension for the equipment
- Do use a gauge or other load measuring instrument to verify load
- **Do NOT** leave the pressurised system unattended

- **Do NOT** operate the system with bent or damaged couplers or damaged threads
- Use only Durapac approved accessories and components
- **Do NOT** overload equipment. Overloading can cause equipment failure and possible personal injury

#### 3.2 Hydraulic Hoses & Fluid Transmission Lines

- Avoid short runs of straight-line tubing. Straight line runs do not provide for expansion and contraction due to pressure and/or temperature changes
- Reduce stress in tube lines. Long tubing runs should be supported by brackets or clips. Before operating the pump, connections should be tightened securely and leak-free. Over tightening can cause premature thread failure or high-pressure fittings to burst
- Should a hydraulic hose ever rupture, burst or need to be disconnected, immediately shut off the pump and release all pressure. Never attempt to grasp a leaking pressurised hose with your hands. The force of escaping hydraulic fluid can inflict injury
- **Do NOT** subject the hose to potential hazard such as fire, sharp objects, extreme heat or cold or heavy impact
- **Do NOT** allow the hose to kink, twist, curl, crush, cut or bend so tightly that the fluid flow within the hose is blocked or reduced. Periodically inspect the hose for wear
- **Ensure** that the bend radius is not less than the manufacturer's specified minimum bend radius for the type of hose being used
- Hose material and coupler seals must be compatible with the hydraulic fluid used. Hoses also must not come in contact with corrosive materials such as battery acid, creosote-impregnated objects and wet paint. Never paint a coupler or hose

FAILURE TO HEED THESE WARNINGS MAY RESULT IN PERSONAL INJURY AS WELL AS PROPERTY DAMAGE.

## 4.0 Installation

- 4.1 Ensure that all personnel involved in this procedure are trained and understand bolt tightening procedures and the tensioning equipment being used. Ensure that all personnel read and understand the safety information contained within this document.
- 4.2 Familiarise yourself with the specifications and illustrations in this owner's manual.Know your bolt tensioner, its limitations and how it operates before attempting to use.Refer to the specification chart below or if in doubt, contact a Durapac representative.

Madel Ne	Pre-loa	d Force	Thr	read	A/F v	width	Diam	eter A	Heig	jht B
mouel No.	(kN)	(lbs)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
DMS-M20	200	44,962	M20	3/4	30	1 1/4	47	1.9	169	6.7
DMS-M24	290	65,195	M24	7/8	36	1 7/16	60	2.4	200	7.9
DMS-M27	380	85,427	M27	1	41	1 5/8	65	2.6	210	8.3
DMS-M30	460	103,412	M30	1 1/8	46	1 13/16	72	2.8	204	8.0
DMS-M33	570	128,141	M33	1 1/4	50	2 13/16	79	3.1	216	8.5
DMS-M36	670	150,622	M36	1 3/8	55	2 3/16	83	3.3	250	9.8
DMS-M39	800	179,847	M39	1 1/2	60	2 3/8	91	3.6	265	10.4
DMS-M42	920	206,824	M42	1 5/8	65	2 9/16	98	3.9	272	10.7
DMS-M45	1,080	242,794	M45	1 3/4	70	2 3/4	106	4.2	273	10.7
DMS-M48	1,220	274,267	M48	1 7/8	75	2 15/16	112	4.4	290	11.4
DMS-M52	1,450	325,973	M52	2	80	3 1/8	123	4.8	336	13.2
DMS-M56	1,680	377,679	M56	2 1/4	85	3 1/2	131	5.2	356	14.0
DMS-M64	2,210	496,828	M64	2 1/2	95	3 7/8	150	5.9	357	14.1
DMS-M72	2,880	647,450	M72	3	105	4 5/8	168	6.6	406	16.0



Figure 1 – Bolt Tensioner Diameters

- 4.3 Check all system fittings and connections to be sure they are tight and leak free.
- 4.4 Check oil level in reservoir before operating pump.

## 5.0 Operation

#### **IMPORTANT:**

- Ensure that the bolt material can take the initial load to be applied. DMS-Series tensioners are powerful tools that are capable of yielding or breaking studs/bolts if bolt material properties are not sufficient to support the load being applied
- Ensure that all calculations (bolt load, hydraulic pressure, etc.) have been made prior to starting the tensioning process and that they have been reviewed and approved by a qualified engineer
- Check that the hydraulic hoses are fully connected. There should be no loose ends and every male nipple should be connected to a corresponding female connector
- Check that each female connector is securely locked in position on the corresponding nipple by physically pulling the connection
- Check that the threaded portion of the tensioning tool is screwed on the stud and that the thread engagement is sufficient. Note: The thread projection of the stud above the top of the nut should be sufficient to allow the tensioning tool to engage the stud a minimum of one stud diameter



Figure 2 – Safety Precautions

- Do NOT exceed the maximum working pressure for each stud size or tensioner. Maximum working pressure for standard tensioners is 21,750 psi (1,500 bar / kg/cm<sup>2</sup>)
- **Do NOT** exceed the maximum extension for the equipment
- When pressurizing the system, observe the gauge, and be ready to stop, at the required pressure
- **Do NOT** leave the pressurized system unattended. If you must leave the area release the pressure and ensure that the return to tank valve on the pump unit is fully open
- **Do NOT** pressurize the Control Console or Hand / Air Pump unless the outlet is either connected to the tensioning system or is safely blanked with a blanking plug
- **ONLY** an unused female coupler or a blanking plug is to be used at the end of end of the tensioner circuit. A female coupler can remain disconnected (open ended) while under pressure. However, as a precaution, it is strongly recommended that a blanking plug be installed in the coupler before beginning pressurisation
- **Do NOT** pressurize the back of a disconnected male coupler. Male couplers cannot withstand high pressures when disconnected. Only the female coupler on the **last** tensioner in the circuit can remain uncoupled. All other couplers must be connected
- **Ensure** no personnel are in-line with the bolt axis when system is under pressure, failure to do so could result in death or personal injury

# 5.1 Force / Pressure Table

		DM	S-M20	DM	S-M24	DM	IS-M27	DN	/IS-M30	DN	/IS-M33	DN	/IS-M36	DMS-M39		
bar	psi	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf	
50	725	7	1,495	10	2,169	13	2,843	15	3,450	19	4,270	22	5,023	27	5,990	
100	1,450	13	2,989	19	4,338	25	5,686	31	6,900	38	8,541	45	10,046	53	11,979	
150	2,175	20	4,484	29	6,507	38	8,529	46	10,350	57	12,811	67	15,069	80	17,969	
200	2,900	27	5 <i>,</i> 978	39	8,675	51	11,372	61	13,800	76	17,081	89	20,093	107	23,958	
250	3,625	33	7,473	48	10,844	63	14,215	77	17,250	95	21,351	112	25,116	133	29,948	
300	4,350	40	8,968	58	13,013	76	17,059	92	20,699	114	25,622	134	30,139	160	35,938	
350	5 <i>,</i> 075	47	10,462	68	15,182	89	19,902	107	24,149	133	29,892	156	35,162	187	41,927	
400	5,800	53	11,957	77	17,351	101	22,745	123	27,599	152	34,162	179	40,185	213	47,917	
450	6,525	60	13,451	87	19,520	114	25 <i>,</i> 588	138	31,049	171	38,432	201	45,208	240	53,906	
500	7,250	67	14,946	97	21,688	127	28,431	154	34,499	190	42,703	224	50,232	267	59,896	
550	7,975	73	16,440	106	23,857	139	31,274	169	37,949	209	46,973	246	55,255	293	65 <i>,</i> 885	
600	8,700	80	17,935	116	26,026	152	34,117	184	41,399	228	51,243	268	60,278	320	71,875	
650	9,425	86	19,430	125	28,195	164	36,960	200	44,849	247	55,513	291	65,301	346	77,865	
700	10,150	93	20,924	135	30,364	177	39 <i>,</i> 803	215	48,299	266	59,784	313	70,324	373	83,854	
750	10,875	100	22,419	145	32,533	190	42,646	230	51,749	285	64,054	335	75,347	400	89,844	
800	11,600	106	23,913	154	34,701	202	45,489	246	55,199	304	68,324	358	80,371	426	95 <i>,</i> 833	
850	12,325	113	25,408	164	36,870	215	48,332	261	58,649	323	72,594	380	85,394	453	101,823	
900	13,050	120	26,903	174	39 <i>,</i> 039	228	51,176	276	62,098	342	76,865	402	90,417	480	107,813	
950	13,775	126	28,397	183	41,208	240	54,019	292	65,548	361	81,135	425	95,440	506	113,802	
1,000	14,500	133	29,892	193	43,377	253	56,862	307	68,998	380	85,405	447	100,463	533	119,792	
1,050	15,225	140	31,386	203	45,546	266	59,705	322	72,448	399	89,675	469	105,486	560	125,781	
1,100	15,950	146	32,881	212	47,714	278	62,548	338	75,898	418	93,946	492	110,510	586	131,771	
1,150	16,675	153	34,376	222	49 <i>,</i> 883	291	65,391	353	79,348	437	98,216	514	115,533	613	137,761	
1,200	17,400	160	35 <i>,</i> 870	232	52,052	304	68,234	368	82,798	456	102,486	536	120,556	640	143,750	
1,250	18,125	166	37,365	241	54,221	316	71,077	384	86,248	475	106,756	559	125,579	666	149,740	
1,300	18,850	173	38,859	251	56,390	329	73,920	399	89,698	494	111,027	581	130,602	693	155,729	
1,350	19,575	180	40,354	261	58,559	342	76,763	414	93,148	513	115,297	603	135,625	720	161,719	
1,400	20,300	186	41,848	270	60,727	354	79,606	430	96,598	532	119,567	626	140,649	746	167,708	
1,450	21,025	193	43,343	280	62,896	367	82,450	445	100,047	551	123,837	648	145,672	773	173,698	
1,500	21,750	200	44,838	290	65 <i>,</i> 065	380	85,293	461	103,497	570	128,108	671	150,695	800	179,688	

		DMS-M42		DM	S-M45	DM	S-M48	DM	S-M52	DM	S-M56	DM	S-M64	DMS-M72		
bar	psi	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf	
50	725	31	6,889	36	8,091	41	9,136	48	10,867	56	12,586	74	16,553	96	21,576	
100	1,450	61	13,777	72	16,182	81	18,272	97	21,733	112	25,172	147	33,106	192	43,152	
150	2,175	92	20,666	108	24,273	122	27,408	145	32,600	168	37,758	221	49,659	288	64,728	
200	2,900	123	27,554	144	32,364	163	36,544	193	43,467	224	50,344	295	66,211	384	86,304	
250	3,625	153	34,443	180	40,455	203	45,680	242	54,333	280	62,930	368	82,764	480	107,880	
300	4,350	184	41,332	216	48,546	244	54,817	290	65,200	336	75,516	442	99,317	576	129,456	
350	5,075	215	48,220	252	56,637	285	63,953	338	76,067	392	88,102	516	115,870	672	151,032	
400	5,800	245	55,109	288	64,728	325	73,089	387	86,933	448	100,688	589	132,423	768	172,608	
450	6,525	276	61,997	324	72,819	366	82,225	435	97,800	504	113,274	663	148,976	864	194,184	
500	7,250	307	68,886	360	80,910	407	91,361	484	108,667	560	125,860	737	165,528	960	215,760	
550	7,975	337	75,774	396	89,001	447	100,497	532	119,533	616	138,446	810	182,081	1,056	237,336	
600	8,700	368	82,663	432	97,092	488	109,633	580	130,400	672	151,032	884	198,634	1,152	258,912	
650	9,425	398	89 <i>,</i> 552	468	105,183	528	118,769	629	141,267	728	163,618	957	215,187	1,248	280,488	
700	10,150	429	96,440	504	113,274	569	127,905	677	152,133	784	176,204	1,031	231,740	1,344	302,064	
750	10,875	460	103,329	540	121,365	610	137,041	725	163,000	840	188,790	1,105	248,293	1,440	323,640	
800	11,600	490	110,217	576	129,456	650	146,177	774	173,867	896	201,376	1,178	264,845	1,536	345,216	
850	12,325	521	117,106	612	137,547	691	155,313	822	184,733	952	213,962	1,252	281,398	1,632	366,792	
900	13,050	552	123,995	648	145,638	732	164,450	870	195,600	1,008	226,548	1,326	297,951	1,728	388,368	
950	13,775	582	130,883	684	153,729	772	173,586	919	206,467	1,064	239,134	1,399	314,504	1,824	409,944	
1,000	14,500	613	137,772	720	161,820	813	182,722	967	217,333	1,120	251,720	1,473	331,057	1,920	431,520	
1,050	15,225	644	144,660	756	169,911	854	191,858	1,015	228,200	1,176	264,306	1,547	347,610	2,016	453,096	
1,100	15,950	674	151,549	792	178,002	894	200,994	1,064	239,067	1,232	276,892	1,620	364,162	2,112	474,672	
1,150	16,675	705	158,438	828	186,093	935	210,130	1,112	249,933	1,288	289,478	1,694	380,715	2,208	496,248	
1,200	17,400	736	165,326	864	194,184	976	219,266	1,160	260,800	1,344	302,064	1,768	397,268	2,304	517,824	
1,250	18,125	766	172,215	900	202,275	1,016	228,402	1,209	271,667	1,400	314,650	1,841	413,821	2,400	539,400	
1,300	18,850	797	179,103	936	210,366	1,057	237,538	1,257	282,533	1,456	327,236	1,915	430,374	2,496	560,976	

## Instruction Manual

		DMS-M42		DMS-M45		DMS-M48		DM	S-M52	DM	S-M56	DM	S-M64	DMS-M72		
bar	psi	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf	kN	lbf	
1,350	19,575	828	185,992	972	218,457	1,098	246,674	1,305	293,400	1,512	339,822	1,989	446,927	2,592	582,552	
1,400	20,300	858	192,880	1,008	226,548	1,138	255,810	1,354	304,267	1,568	352,408	2,062	463,479	2,688	604,128	
1,450	21,025	889	199,769	1,044	234,639	1,179	264,947	1,402	315,133	1,624	364,994	2,136	480,032	2,784	625,704	
1,500	21,750	920	206,658	1,080	242,730	1,220	274,083	1,451	326,000	1,680	377,580	2,210	496,585	2,880	647,280	



Figure 3 – Bolt Tensioner Assembly

#### 5.2 Pre-operation

- 5.2.1 Determine the correct pump pressure as per 5.1 Force / Pressure Table.
- 5.2.2 Connect the hydraulic hoses as shown in Figure 4.



Figure 4 – Typical Hydraulic Hose Arrangement



Figure 5 & 6 – Safety Precautions

## **5.3 Tensioning Procedure**

5.3.1 Before commencing the bolt tensioning operation, read and comply with all of the SAFEY PRECAUTIONS. This includes understanding the minimum protrusion 1.5 x Bolt Diameter.



Figure 7 – Minimum Bolt Protrusion

5.3.2 Position the Tensioner over the bolt to be tightened.

5.3.3 Engage the plunger with the bolt. A 1/2" Square Socket is provided in the top of the puller bar so that the Tensioner orientation can be maintained whilst the plunger engages the bolt.



Figure 8 – Tightening the Bolt

5.3.4 Continue rotating the plunger, increasing its engagement with the bolt until the bridge is flush with the washer. To ensure the tool is fully flush, it may be necessary to rotate the gearbox slightly whilst lowering to fully engage the gear driven socket with the nut.





5.3.5 Once the Tensioner is in situ, it should still be possible to rotate the bridge to a suitable angle to access the bolt if required.



Figure 11 & 12 – Rotate for Access (if needed)

5.3.6 Connect SUITABLE high pressure hydraulic hose. Make sure the quick connect coupling is fully engaged.



Figure 13 – Engage Quick Coupling

5.3.7 Apply the correct hydraulic pressure. The tool will begin to stroke and the operator should observe the top of the plunger ascending through the top of the tool.



Figure 14 – Tightening the Bolt

If the stroke indicators show the tensioner has reached maximum stroke before the correct hydraulic pressure has been achieved, follow these steps:

A. **Tighten the Bolt** - Use a 1/2" Drive. Insert the Drive into the Drive Socket on the top of the Gearbox. Rotate the Socket until the nut is tight.



Figure 15 – Tighten the Bolt

B. **Release the Pressure** - Slowly release the hydraulic pressure. If available, connect a low-pressure oil return hose. This will allow the tool to retract more quickly.



Figure 16 – Release the Pressure

C. Retract the Tensioner - The spring retract system will now fully retract the tensioning tool.

bar

D. **Reengage the Tool** - The tensioner will have retracted upwards since the bolt will have elongated. The tool will need reengaging onto the flange.

Use a 1/2" Square Drive Socket, reengage the plunger onto the stud until the tool is flush with the flange. After the tensioner is flush, continue to turn the plunger ONE HALF TURN FURTHER to fully reset the tool.



Figure 17 & 18 – Reengage the Tool

E. Reconnect the Hose.



Figure 19 – Reconnect the Hose

F. Return to Step 5.3.6 to Apply the correct pressure.

If necessary, repeat this sequence until the bolt tensioning tool reaches the correct oil pressure without reaching the maximum piston stroke.

5.3.8 Apply the correct hydraulic pressure again. Wind the nut once this is achieved. **Do NOT** exceed the maximum stroke. This is indicated by stroke indicators around the top of the plunger.

**Do NOT** exceed pressure of 1,500 bar.



Figure 20 – Tightening the Bolt

5.3.9 Slowly release the hydraulic pressure. If a low-pressure oil return hose is available, attach it to accelerate retraction. Otherwise, allow the tool to retract through the hydraulic hose.

Remove hose once the stroke has returned to zero.



Figure 21 – Release the Pressure

5.3.10 Remove the tensioner using the 1/2" Square Drive in the top of the plunger.



Figure 22 – Remove the Tensioner

## **5.4 De-tensioning Procedure**

5.4.1 Before commencing the bolt de- tensioning operation, read and comply with all of the SAFEY PRECAUTIONS. This includes understanding the minimum protrusion 1.5 x Bolt Diameter.



Figure 23 – Minimum Bolt Protrusion

5.4.2 Position the Tensioner over the bolt to be tightened. Orient the tensioner so that manifold is accessible, and the bridge window allows tommy bar access to the nut. Engage the plunger with the bolt. A 1/2" Square Socket is provided in the top of the puller bar so that the Tensioner orientation can be maintained whilst the plunger engages the bolt.



Figure 24 – Loosening the Bolt

5.4.3 Continue rotating the plunger, increasing its engagement with the bolt until the bridge is flush with the washer. To ensure the tool is fully flush, it may be necessary to rotate the gearbox slightly whilst lowering to fully engage the gear driven socket with the nut.



Figure 25 & 26 – Correct Tool Engagement

5.4.4 Rotate the plunger Anti-Clockwise by half a turn. This is to prevent the tensioner from locking onto the stud.



Figure 27 – Loosening the Bolt

5.4.5 Once the Tensioner is in situ, it should still be possible to rotate the bridge to a suitable angle to access the bolt if required.





5.4.6 Connect SUITABLE high pressure hydraulic hose. Make sure the quick connect coupling is fully engaged.



Figure 30 – Engage Quick Coupling

5.4.7 Apply the correct hydraulic pressure. The tool will begin to stroke and the operator should observe the top of the puller ascending through the top of the tool.



Figure 31 – Loosening the Bolt

5.4.8 Use a 1/2" Drive. Insert the Drive into Drive Socket on the top of the Gearbox. Rotate the Socket until the nut is loose.





5.4.9 Slowly release the hydraulic pressure. If available, connect a low-pressure oil return hose. This will allow the tool to retract more quickly.



Figure 33 – Release the Pressure

- 5.4.10 The spring retract system will now fully retract the tensioning tool.
- 5.4.11 Remove the tensioner using the 1/2" Square Drive in the top of the plunger.



Figure 34 – Remove the Tensioner

## 6.0 Maintenance



#### **IMPORTANT:**

- Check oil level regularly
- Use only good quality hydraulic fluid. **Do NOT** use brake fluid, transmission fluid, turbine oil, motor oil, alcohol, glycerine etc. Use of anything other than good quality hydraulic oil will void warranty and damage the pump, hose, and application. We recommend Durapac Hydraulic Oil or equivalent
- Equipment must only be serviced by a qualified hydraulic technician. For repair service, contact your local Durapac authorised service centre
- Damage to hydraulic hoses may not be detected during visual inspections. For this reason, Durapac recommends that hydraulic hoses be replaced on a regular basis
- Tighten connections as needed. Use non-hardening pipe thread compound when servicing connections

The tensioner is of a rugged construction and utilises reliable seals. The only maintenance that may occasionally be required is the repair of a hydraulic fitting or the replacement of a seal and the quick connect fittings.

# 7.0 Troubleshooting

Problem	Cause	Solution
Pump loses pressure	Leaking system components	Repair or replace as
		necessary
Pump not delivering fluid	Low fluid level in reservoir	Check fluid level
	Worn seats	Repair seats
		<ul> <li>Replace pump body</li> </ul>
Pump does not reach rated	Low fluid level in reservoir	Check fluid level
capacity	Leaking system components	<ul> <li>Repair or replace as necessary</li> </ul>
	Fluid leaking past inlet or outlet checks	<ul> <li>Repair inlet or outlet checks</li> <li>Replace high pressure</li> </ul>
		piston seal
Tensioner will not extend	Loose couplers	Tighten couplers
	Low fluid level in pump reservoir	Fill and bleed the system
	Leaking tensioner seals	<ul> <li>Replace worn seals</li> <li>Look for excessive contamination or wear</li> </ul>
Tensioner extends only partially	Low fluid level in pump reservoir	Fill and bleed the system
	Load above capacity of system	Use correct equipment
Tensioner extends slower than	Loose couplers	Tighten couplers
normal	Restricted hydraulic line or fitting	<ul> <li>Clean and replace if damaged</li> </ul>
	Pump not operating correctly	<ul> <li>Check pump's operating instructions</li> <li>Repair or replace as</li> </ul>
		necessary
	Low fluid level in pump reservoir	Fill and bleed the system
Tensioner does not hold pressure	Leaky connection	<ul> <li>Clean, reseal with thread sealant, and tighten connection</li> </ul>
	Leaking tensioner seals	<ul> <li>Replace worn seals</li> <li>Look for excessive contamination or wear Replace contaminated fluid</li> </ul>
	Pump or valve not operating correctly	Repair or replace as necessary
Tensioner will not retract	Closed pump release valve	Open pump release valve
	Loose couplers	Tighten couplers
	Blocked hydraulic lines	Clean and flush lines
	Pump reservoir too full	• Drain fluid to correct level

# Appendix A – Specifications for Bolt Tensioning



#### Advantages of Lubrication

- 1. Reduces the friction during tightening.
- 2. Increases bolt service life.
- 3. Decreases bolt failure during installation.
- 4. Higher friction results in less conversion of torque to preload.

Metric																				
Bolt	М	6	8	10	12	14	16	18	20	22	24	27	30	33	36	39	42	45	48	52
Hexagon	mm	10	13	17	19	22	24	27	30	32	36	41	46	50	55	60	65	70	75	80
Thickness	mm	5	6.5	8	10	11	13	15	16	18	19	22	24	26	29	31	34	36	38	42
Bolt	Μ	56	60	64	68	72	76	80	85	90	95	100	105	110	115	120	125	130	140	150
Hexagon	mm	85	90	95	100	105	110	115	120	130	135	145	150	155	165	170	180	185	200	210
Thickness	mm	45	48	51	54	58	61	64		72		84								

Imperial																
Bolt	Inch	3/8	1/2	5/8	3/4	7/8	1	1 1/8	11/4	1 3/8	1 1/2	15/8	13/4	1 7/8	2	2 1/4
Hexagon	mm	17	22	27	32	36	41	46	50	55	60	65	70	75	80	90
Thickness	mm	9.5	12.5	15.8	19	22	25	28	32	35	38	41	44	47	50	57
Hexagon	in	11/16	7/8	1-1/16	1 1/4	1 7/16	15/8	1 13/16	2	2 3/16	2 3/8	2 9/16	2 3/4	2 15/16	3 1/8	3 1/2
Thickness	in	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	13/8	1 1/2	15/8	13/4	17/8	2	2 1/4
-																
Bolt	Inch	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	6
Hexagon	mm	100	108	118	127	137	146	156	165	175	184	194	203	213	222	232
Thickness	mm	63	70	76												
Hexagon	in	3 7/8	4 1/4	4 5/8	5	5 3/8	5 3/4	6 1/8	6 1/2	6 7/8	7 1/4	7 5/8	8	8 3/8	8 3/4	9 1/8
Thickness	in	2 1/4	2 1/2	3												