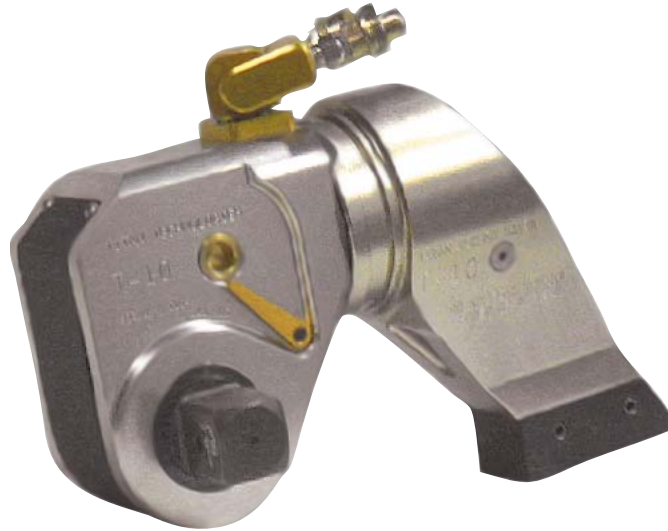




**TITAN**  
TECHNOLOGIES INTERNATIONAL, INC  
SUPERIOR BOLTING SOLUTIONS



# **Titan T-Series<sup>®</sup>**

## **Sq Drive Hydraulic Torque Wrenches**

# **Operations & Repair**

# **Manual**

CE



Subject: Welcome to Titan Technologies

Dear Valued Customer,

Thank you for your recent purchase. You have acquired the best Hydraulic Torque Wrench on the market.

Your new Titan Technologies T-Series Hydraulic Torque Wrench is engineered for superior strength and tool life. Your Titan T-Series tool will provide years of unsurpassed accuracy, performance and reliability.

We use the best high strength light alloy available. Extreme care has been taken at all steps of production and quality assurance to ensure that each part adheres to our exacting engineering and manufacturing standards Unique Patented and Patent Pending features result in a superior Hydraulic Torque Wrench that delivers superior performance and longer tool life.

All Titan Technologies Pumps and Accessories undergo a rigorous quality assurance program to ensure you the quality and reliability you deserve. The goal is to make your bolting task go as quickly and smoothly as possible.

In addition, Titan, its employees and our worldwide network of agents and representatives stand ready to assist you in any way we can to make your bolting job easier.

Titan offers an unparalleled selection of specialized bolting equipment to offer you "Superior Bolting Solutions"™. We offer direct customer service which is second to none. Your critiques, comments and suggestions are welcome. And we stand ready to act to serve you better. With that philosophy in mind if you feel your situation merits our direct attention, feel free to contact us at any time. We stand ready to serve you.

Yours truly,

Peter A. Rosa  
President &CEO

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## **Important Safety Precautions**

**Please read and understand before use.**

**If there are any questions, please contact Titan Technologies or your authorized Titan Technologies Representative.**

**Important:** Your Titan Technologies Hydraulic Torque Wrench is a State-Of-The-Art Power Tool capable of generating tremendous forces. All power tools should be treated with respect and all safety precautions should be observed to avoid accidents or injury. Please observe the following precautions and observe all safety rules at your facility. Remember, common sense is your best safety precaution.

**Read and understand all instructions, prior to use. If there are any questions, please contact Titan or an authorized Titan Representative for instructions, prior to use.** All personnel and their supervisors should be required to read and understand the operation of the Titan Technologies equipment as outlined in the manual.

**Use the proper equipment for the Job:** For environments where sparks and fire is a hazard, you must use the Titan P+ Pneumatic Power packs. **Warning: Electric Power Packs should not be used** in any atmosphere, which can be considered potentially volatile. Sparks can also be generated by friction or any metal-to-metal contact. Precautions should be taken to avoid any danger of explosion or fire, **prior** to use.

### **Safety precautions and procedures:**

- To reduce the chance of accident, the operator of the tool is the person who operates the remote control.
- Stay clear during operation. If the tool must be steadied during operation, take precaution to stay clear of pinch points (reaction area).
- Make sure reaction point is safe. Keep clear, ensure reaction forces are safe and the tool is not reacting in such a way as to force the reaction arm off the tool. Keep reaction forces "in line with the nut you are turning.
- Wear proper safety attire. Use Safety Goggles, Hard Hats, proper work gloves and other applicable clothing.
- Use the correct Titan Tool for the job. A good rule of thumb is to use the largest tool that fits. This will result in longer tool life and increased safety.
- Observe all in plant safety rules
- Make sure the pump and tool are properly grounded to avoid electrical shock.

**Some “common sense” precautions:**

**Please find some simple and common sense safety precautions. These and all other plant, municipality, state and federal safety checks for power equipment must be adhered to.**

- Check all Electrical or air connections, prior to use. Any frayed or cut air lines or electrical Wiring should be replaced prior to use. Only an authorized electrician should do any electric repair work.
- Check all Hydraulic Hoses, quick connects and connections prior to use. Titan Hydraulic Torque Wrenches work under high pressure. Any kinked hoses must be replaced and are not to be used. **Caution:** Kinked Hydraulic Hoses pose an immediate safety hazard. If Safety hose burst guards are compromised. They must be replaced prior to use.
- **DO NOT** use Hydraulic Hoses, Quick Connects or other Coupling Systems, Power Cords, Air Hoses, or Remote Cords as a means of moving equipment.
- Always inspect Tools, Pumps, Impact Sockets, and Accessories for visible damage, prior to use while in use.
- Always follow proper maintenance schedules and procedures. Refer to the operations manual and always ask questions if you do not fully understand safety rules, precautions or tool operation.
- Always be alert. Use common sense. Do not use this or any other power equipment under the influence of drugs, alcohol, or other substances that may affect reaction time or your judgment.
- Check ALL sockets. Use only the proper top quality and proper size impact sockets with Titan Hydraulic Torque Wrenches. Due to the high forces generated by the Titan T-Series Hydraulic torque Wrenches, the use of Titan Technologies quality impact sockets is highly recommended.
- Inspect all sockets for damage or flaws **prior to use**. If there is any question, do not use the socket. Remember, your Titan Tool develops a tremendous amount of power. You must be aware that any socket may have hidden flaws, which may cause breakage to the socket. Stay clear during operation of the tools.

# Preparation for use

**General:** All Titan Technologies Hydraulic torque Wrenches come completely assembled and are ready for use. The Titan power packs provide the pressure and adequate flow to efficiently operate the tool.

- Titan Power Packs are configured so as to not exceed the capacity of the Titan tools. Please note that if you use the Titan Power Packs for any other purpose, please take precautions to not exceed the limits of the ancillary equipment powered by the Titan pump. You must limit the pumps pressure by presetting the pressure prior to use, to within the limits of the non-Titan equipment.

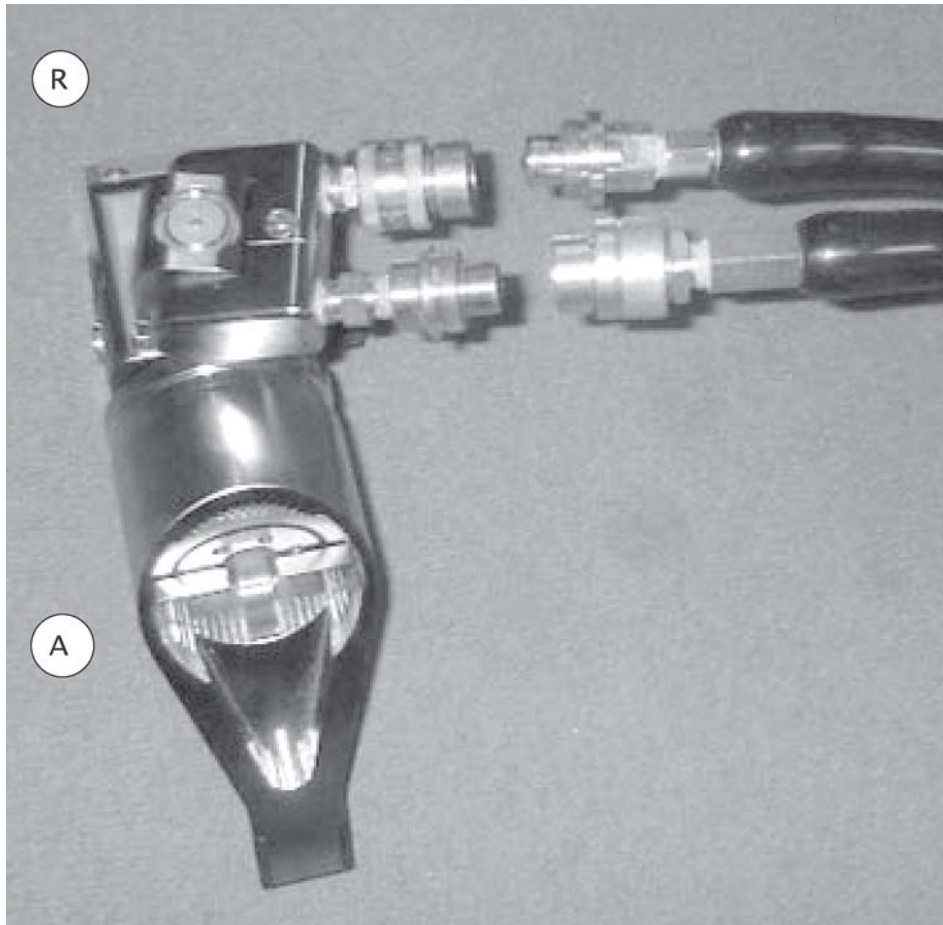
**Basic System Assembly:** The Titan T-Series Hydraulic Torque Wrenches are connected to the Power Pack via a 10, 000-psi twin-Line Hydraulic Hose Assembly. The hoses have a 4: 1 Safety Factor. Caution: Use only Titan Technologies hoses and connections to assure quality and safety of hoses and connections.



**Extremely Important:** The sequencing of your connects is imperative and **must not** be switched. The connections are provided from the factory in the following configuration and must not be changed.

1. High pressure (Advance) at the pump and tool is supplied with a Male Nipple Quick Connect.
2. Low Pressure (Return side) at the tool and pump are supplied with a Female Quick Connect.
3. Twin-Line Hoses are Male Connect to Male Connect and Female Connect to Female Connect.
4. Your system will not work properly unless set up this way.
  - When changing Quick Connects, you **MUST** replace a male connection with a male connection and a female connection with a female connection.

## HOSE COUPLING



### **Changing the tool from loosen to tightening and visa versa:**

Stand the tool with the drive facing you and the swivel on the top. To tighten, the drive must be on the right side. To loosen, The drive must protrude from the left side. The Reaction Arm is always in plane with the drive.

To change the drive: Depress the drive retainer Button and pull the drive from the tool. Insert the drive in the other side of the tool and reengage retainer. Test positive retention of retainer by pulling the drive. If the drive does not remove from the spline, it is properly retained by the drive retainer.

## Directions for setting your required torque.

1. Connect the tools, pump and hoses.
2. Find the proper power supply.



3. **MAKE SURE YOU HAVE THE PROPER PRESSURE/TORQUE CONVERSION CHART FOR THE TOOL YOU ARE USING!**
4. Cycle the tools (free standing) to assure all quick connects are properly seated and that the power supply is adequate.
5. Loosen the Lock Nut on the High Pressure Regulator assembly.
6. Consult the Pressure /Torque Conversion chart for the proper pressure for the torque you desire. See example on the next page.

**NOTE: This chart is for example ONLY. Use the proper Torque Chart for your model Titan Technologies Tool.**

**SAMPLE ONLY Pressure/Torque Conversion Chart**  
**Titan Technologies International, Inc.**  
**Model T-1 (3/4" Sq Drive Hydraulic Torque Wrench)**

Psi Torque	(Ft. Lbs)
1500	215
1600	228
1800	255
2000	281
2200	308
2400	335
2600	362
2800	390
3000	416
3200	442
3400	467
3600	492
3800	525
4000	548
4200	575
4400	602
4600	631
4800	658
5000	674
5200	701
5400	728
5600	755
5800	781
6000	801
6200	828
6400	854
6600	881
6800	908
7000	935
7200	961
7400	988
7600	1015
7800	1042
8000	1069
8200	1095
8400	1123
8600	1149
8800	1176
9000	1207
9200	1238
9400	1260
9600	1287
9800	1314
10000	1330

## Pressure Regulator Assembly



7. Turn the Thumbscrew counterclockwise until you are below the pressure you require. (Depress the remote control button to advance and check the gauge pressure to make sure you are. Once there release the button on the remote. Let Oil return to pump and then shut pump off from the remote.)
8. Turn the pump on, depress and hold Button on remote and while holding the button in the advance position, turn the Thumbscrew on the HP Regulator, CLOCKWISE to build pressure. Once the pressure has been seen at the gauge, turn the locknut (firmly hand-tight). Lock pressure in at desired pressure.
9. Release button and then re-pressurize to double check that the pressure has been set properly. If you are still below where you want to be, Loosen the Lock Nut and continue to build pressure to the proper setting. If over the point you want to be, let go the advance button, back off the pressure a bit and then depress the button until the proper pressure is achieved.



**BE SURE TO TIGHTEN THE LOCK NUT.**

**You are now ready to proceed to the next step.**

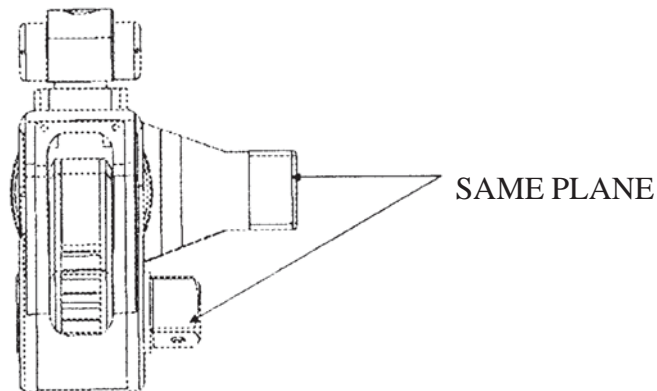
### Setting the pressure For Loosening:

1. Follow the same procedure as for Torque setting. While your Titan Technologies Hydraulic Torque Wrench is engineered to work at full pressure, it is a good rule of thumb to set the torque to 80%-90% of the tools capacity. By using the largest Titan Technologies Tool that fits on the job, you will get much longer tool life. If you can not develop enough torque to loosen the nut at 80%-90% of the tools capacity, chances are you need the next size Titan Technologies tool. Consult your Titan Technologies representative.

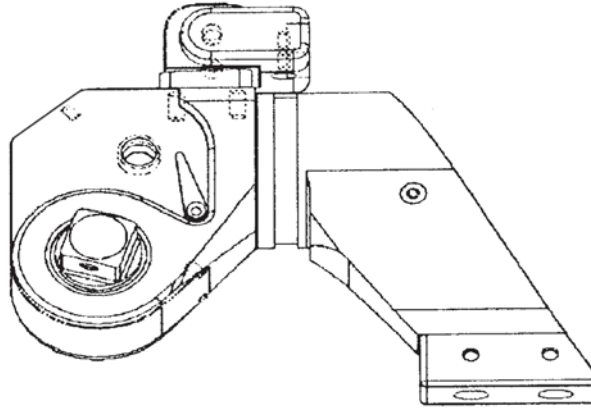
### Hydraulic Torque Wrench “set up” on the application:

1. Use only the proper size and drive, high quality Impact Socket for the nut. Using a socket that is too large is dangerous. Use the proper size socket. If you do not have the proper socket, STOP and get the correct one before proceeding.
2. When using a Hydraulic Wrench, standard depth sockets usually provide the best reaction point for your tool.
3. Using a locking pin and ring, properly retain the socket to the drive of your Titan Technologies Tool.
4. Place the Titan Technologies Tool and socket on the nut. Make sure the Reaction Arm safely abuts against a stationary object (adjacent seated nut the best). Make sure the drive is fully engaged in the tool. And that the drive is fully engaged in the socket, and the socket is fully engaged with the nut. Always **react in plane** with the nut you are turning. See Illustration.
5. Make sure hoses, Tru-Swivel™ and quick connects, etc. are clear from any obstruction. Do not use them as your reaction point.
6. Apply momentary pressure to the tool to ensure proper placement.
7. **DANGER! Never place your hand on the reaction arm, while the tool is in operation.**

#### PROPER REACTION POINT



## IMPROPER REACTION POINT



### Operating the Titan Technologies Hydraulic Torque Wrench

1. Depress the button to advance.
2. Make sure you have a safe reaction (see Illustration)
3. The Titan Technologies Pump delivers Hydraulic Pressure to the tool. .
4. The Pumps have a 4-Way Directional Control Valve. It is set up so that the operator needs to depress the 3-Way Remote to advance the cylinder.
5. The act of “letting go” of the button automatically switches the valve on the pump to the retract mode. Therefore **you must depress the advance button and keep it depressed until you have reached the end of your stroke.**
6. The piston is attached to a Ratchet Pawl System, which drives the Socket via the Sq. Dr.
7. The piston will use whatever pressure it takes to reach the end of its stroke.
8. Once you reach the end of your stroke, let go of the advance and wait for the oil to return to the pump.
9. Continue this process until the process is complete. (For Torque up, that is when the tool stalls after successive strokes and you have reached your preset pressure. For Loosening, after the nut is loosened).
10. **Shut pump motor off from the remote control pendant** and proceed to set up on the next nut to be turned.

## **Basic Preventative and Corrective Tool Maintenance:**

### **Preventative T-Series Tool Maintenance:**

Dirt and grit will result in friction, which reduces the life of the tool and affect tool performance.

- You should periodically clean all parts and lubricate with Dow Corning GN Metal Assembly paste.
- Periodicity of this maintenance will vary and will depend on the amount of use the tools see and the environment the tools are used in. Use common sense to determine your tool preventative maintenance periodicity.
- Re-lubrication and cleaning of the tool is recommended to be done to each tool at **least once a year** for tools exposed to normal use. If you use the tool in Extreme conditions such as multiple shift use and/or at consistent use at or near tool capacity, it is recommended that preventative maintenance be performed on a 3-6 month cycle
- If your work environment is subject to excessive dirt and grit, or corrosive environment, it is recommended that you put the tools on a shorter preventative maintenance cycle.
- You may order the proper moly-paste lubricant from Titan Technologies. (Part # 090300).
- All Tools should be re-calibrated after re-lubrication. Note: **Do not substitute lubricants.** If you lubricate with a lubricant other than the one specified, you **MUST** have the tool re-calibrated. Different lubricants will result in different torque output. Torque output of the tool is a function of area, pressure and friction. Lubricants of a greater or lesser coefficient of friction will result in greater or lesser torque output. Your Titan Technologies Torque Charts are based on the coefficient of friction when using Dow Corning Metal Assembly paste in its tools.
- **Recommended Calibration Cycle:** We recommend a re-calibration cycle of one year for the Titan-T Series and Hydraulic Gauges. Your calibration periodicity may vary due to the amount and conditions of use, or to adhere to your own calibration procedure. To have your tools re-certified please contact your Titan Technologies authorized representative. You may also contact Titan Technologies to arrange the calibration and/or preventative maintenance of the tools. A copy of our recommended calibration procedure will be provided upon request.

## **Diagnosing a problem:**

### **#1. Check all quick connects. Make sure all connections are properly and fully seated.**

- Check to see that the quick connects are configured as described in the Basic System Assembly subheading of this manual. Any change in the configuration will cause the tool to malfunction or not function at all.

### **#2. Check power supply.**

- Inadequate or incorrect voltage, amperage, will cause the Electric Pump to malfunction. Inadequate air supply to the e Titan P+ Air/ Hydraulic Power Unit or a dirty Air Supply can be the cause most common problems. **MAKE SURE YOU USE THE Filter Lubricator Regulator with your Titan Technologies Air Pump.**

### **#3. When applicable, segregate the systems parts to determine if the problem is a tool malfunction**

**or a pump malfunction. (For Example, if the pump does not build pressure with the tool disconnected, you know the problem is a pump problem and not the tools. Conversely, if the pump builds pressure with the tool disconnected from the system, but does not with the tool attached, the problem is with the tool). This simple procedure will save valuable time in diagnosing the cause of the problem.**

## Titan Technologies T-Series Corrective Maintenance:

# QUICK REFERENCE Trouble Shooting Guide

## For your Titan Technologies Hydraulic Torque Wrench System

<b>Problem</b>	<b>Probable Cause</b>	<b>Solution</b>
Tool will not advance	<ol style="list-style-type: none"><li>1. Quick Connect not mated properly.</li><li>2. Damaged Connect</li><li>3. Foreign material in directional-control valve at pump.</li></ol>	<ol style="list-style-type: none"><li>1. Tighten Connection Until fully secure.</li><li>2. Replace</li><li>3. Disassemble &amp; clean</li></ol>
Tool will not retract	Same as above	Same as above
Tool cannot be removed	<ol style="list-style-type: none"><li>1. Holding (2 nd ) Pawl is engaged.</li><li>2. Cylinder did not retract</li></ol>	<ol style="list-style-type: none"><li>1. Pressurize the tool and while keeping the button depressed on the remote control, GENTLY pull back the Pawl Release Lever on the side of the tool. Release the button on the remote &amp; let the piston retracts.</li><li>2. Check Quick Connects. as described above.</li></ol>
Tool will not build Pressure	<ol style="list-style-type: none"><li>1. Quick Connect on Gauge is</li><li>2. Motor Coupling on Pump is damaged.</li><li>3. Seal Damage in Cylinder</li><li>4. Seal Damage in Tru-Swivel</li></ol>	<ol style="list-style-type: none"><li>1. Fully secure Quick Loose. Connect.</li><li>2. Replace</li><li>3. Replace seals.</li><li>4. Replace seals.</li></ol>
Tool leaks oil	<ol style="list-style-type: none"><li>1. Damaged “O” Rings.</li></ol>	<ol style="list-style-type: none"><li>1. Replace Seals</li></ol>
Tool advances in “Retract” Mode or “Visa Versa”	<ol style="list-style-type: none"><li>1. Quick Connects installed in improper sequence.</li></ol>	<ol style="list-style-type: none"><li>1. Make sure Connects are set up as described on page 6&amp; 7 of this Manual.</li></ol>
Ratchet returns on retract Stroke.	<ol style="list-style-type: none"><li>1. Missing or broken Holding (2 nd ) Pawl</li><li>2. Missing or defective Holding Pawl</li></ol>	<ol style="list-style-type: none"><li>1. Replace</li><li>2. Replace (2 nd ) Pawl Spring.</li></ol>
Tool will not take successive Strokes	<ol style="list-style-type: none"><li>1. Lose or defective Quick Connect.</li><li>2. Operator is depressing Advance before Oil has a chance to return to reservoir, thus preventing the piston from fully returning before taking the next stroke.</li></ol>	<ol style="list-style-type: none"><li>1. Fully Tighten or replace Connects on retract side.</li><li>2. Wait for Oil to return to and for the cylinder to fully retract before taking the next Stroke.</li></ol>

<b>Problem</b>	<b>Probable Cause</b>	<b>Solution</b>
	<ul style="list-style-type: none"> <li>3. Defective Drive Pawl Spring</li> <li>4. Broken Drive Pawl</li> </ul>	<ul style="list-style-type: none"> <li>3. Replace the Spring.</li> <li>4. Replace the Pawl.</li> </ul>
No pressure reading on Gauge	<ul style="list-style-type: none"> <li>1. Defective Gauge</li> <li>2. Loose Connect</li> <li>3. Defective Seals</li> <li>4. Defective Motor coupling</li> </ul>	<ul style="list-style-type: none"> <li>1. Replace Gauge</li> <li>2. Tighten Connect</li> <li>3. Inspect all seals and replace any defective seals.</li> <li>4. Replace Motor Coupling.</li> </ul>
Erratic Pressure Readings	<ul style="list-style-type: none"> <li>1. Improper or Defective Gauge</li> <li>2. Defective High Pressure Regulator</li> <li>3. Foreign Material in 4-way Valve</li> </ul>	<ul style="list-style-type: none"> <li>1. Replace with properly Dampened Titan gauge.</li> <li>2. Replace High Pressure Regulator.</li> <li>3. Clean. Note: Do not use Teflon Tape, Use Pipe dope.</li> </ul>
Electric Pump builds Pressure but will not switch to retract.	<ul style="list-style-type: none"> <li>1. Voltage Drop</li> </ul>	<ul style="list-style-type: none"> <li>1. Use heavier extension cord or plug directly to proper power source.</li> </ul>
Air Pump builds Pressure but will not switch to retract.	<ul style="list-style-type: none"> <li>1. Pump starved for air</li> </ul>	<ul style="list-style-type: none"> <li>1. Use minimum 1" dia. air hose. Need 50 cfm. 100 psi. air source.</li> </ul>
Pump will not build pressure.	<ul style="list-style-type: none"> <li>1. Inadequate power supply.</li> <li>2. Pump starved for air</li> <li>3. Defective High Pressure Regulator</li> <li>4. Defective internal HP Regulator</li> <li>5. Defective Gauge</li> <li>6. Dirty Oil</li> <li>7. Clogged Oil Filter</li> <li>8. Clogged FLR</li> </ul>	<ul style="list-style-type: none"> <li>1. Use proper power Source.</li> <li>2. Use minimum 1" dia. air hose. Need 50 cfm. 100 psi. air source</li> <li>3. Replace</li> <li>4. Adjust or replace.</li> <li>5. Replace</li> <li>6. Clean Reservoir and replace oil.</li> <li>7. Replace Filter.</li> <li>8. Replace FLR.</li> </ul>
Air Pump Sluggish	<ul style="list-style-type: none"> <li>1. Pump starved for Air</li> <li>2. Dirt in Air Motor</li> <li>3. Dirty Oil Filter</li> </ul>	<ul style="list-style-type: none"> <li>1. Use minimum 1" dia. air hose. Need 50 cfm. 100 psi. air source</li> <li>2. Flush Motor with solvent, clean, dry and lubricate.</li> <li>3. Clean or replace.</li> </ul>
Air Motor Frozen	<ul style="list-style-type: none"> <li>1. FLR missing or broken</li> <li>2. Rotor Bearings frozen.</li> <li>3. Obstruction in Air Valve</li> <li>4. Improperly installed Remote -Control hoses.</li> <li>5. Defective Remote-Control Hoses</li> <li>6. Defective Remote Button</li> </ul>	<ul style="list-style-type: none"> <li>1. Replace FLR.</li> <li>2. Inspect &amp; Replace</li> <li>3. Inspect, Clean.</li> <li>4. Ensure 3-hose system is Connected properly. (color coded).</li> <li>5. Replace.</li> <li>6. Replace spring.</li> </ul>
The tool pops off nut.	<ul style="list-style-type: none"> <li>1. Improper Reaction</li> </ul>	<ul style="list-style-type: none"> <li>1. Always React in plane with the nut you are turning. Consult your Titan Representative to see if a custom reaction or another Titan Technologies Tool is better suited for the particular application.</li> </ul>

## **Titan Technologies T-Series Preventative Maintenance:**

### **Basic Pump Maintenance:**

- Dirt and grit will reduce the life of the pump.
- Change oil after every 40 hours of use. Oil Filter should be changed; dirt and grit must be cleaned from the reservoir.
- All Quick Connects must be cleaned or changed prior to use.
- Inspect all Brushes for wear and replace periodically to prevent damage to the motor.
- Use Only Grade 46 Hydraulic Oil. Proper Hydraulic Oil is available from Titan Technologies.

## **Titan Technologies Pump Test Procedure**

- You will need two 10, 000-psi liquid filled gauges to test the pump. One for the high pressure (Advance) Port and one for the return (Low Pressure) port.
- Remove all hoses from the Titan Pump.
- Make sure all Quick Connects are clean and free of dirt and grit.
- Attach Gauges to ports.
- Check Oil Level on Pump Reservoir. Ensure Oil is filled to proper levels.
- Remove the screws that hold the pump to the Pump Reservoir (fig. 10).
- Set Toggle switch to “On Position”.
- Using the Remote Control, advance the 3-Way Rocker Switch all the way forward. Holding the button down turn the High Pressure Regulator Assemblies Thumbscrew clockwise and build pressure. See if advance side achieves 10,000 psi.

While Remote control button is in Advance Mode, check the pressure on the return side. It should read Zero.

- Release button on Remote pendant to the middle position (Retract). Check the gauge. It should read 1,500- 2,000 psi.
- Shut the pump off from the Remote Control Switch.

1. If the pump shows pressure on the return side while the pump is in the advance position, your problem is probably a sub plate assembly. See Basic Pump assembly schematic.
2. If the pump does not start, see:
  - Electric Control Assembly
  - Universal Motor Assembly
3. If Pump does not switch from Retract side.
  - First check voltage
  - Check Electric Control Assembly
  - Check Solenoid Assembly
4. If Pump does not build pressure or builds pressure too slowly, see:
  - Valve Assembly
  - Pressure Regulator Assembly
  - Basic Pump Assembly

**Titan Technologies International, Inc.**  
**T-Series**

**Basic Tool Disassembly and Assembly**

1. Disconnect tool from the Hoses
2. Remove the Shroud (Allen Key)
3. Depress the button on the Drive Retainer and then pulling the drive out of the tool.
4. Remove Drive Sleeves by using a flat screwdriver or punch.
5. Remove Plugs from both sides of housing
6. Retract piston to align Piston Retention Pin with holes on side of housing.
7. Using a punch, drive the retention pin from the assembly.
8. Remove Mechanical Assembly

To disconnect the Drive Paul Assembly from the Mechanical Assembly

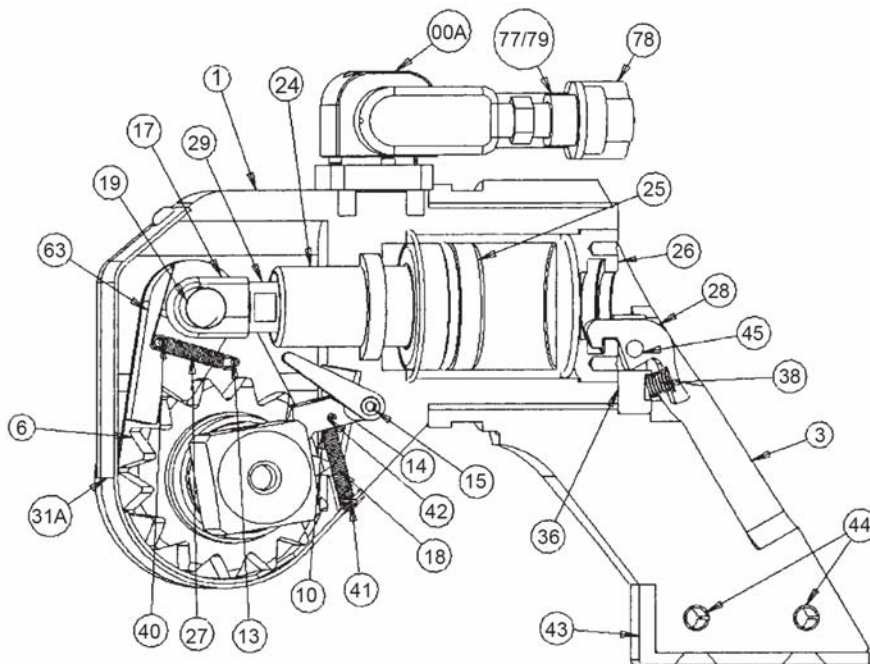
1. First disassemble the drive plates

To Remove the Cylinder End Cap

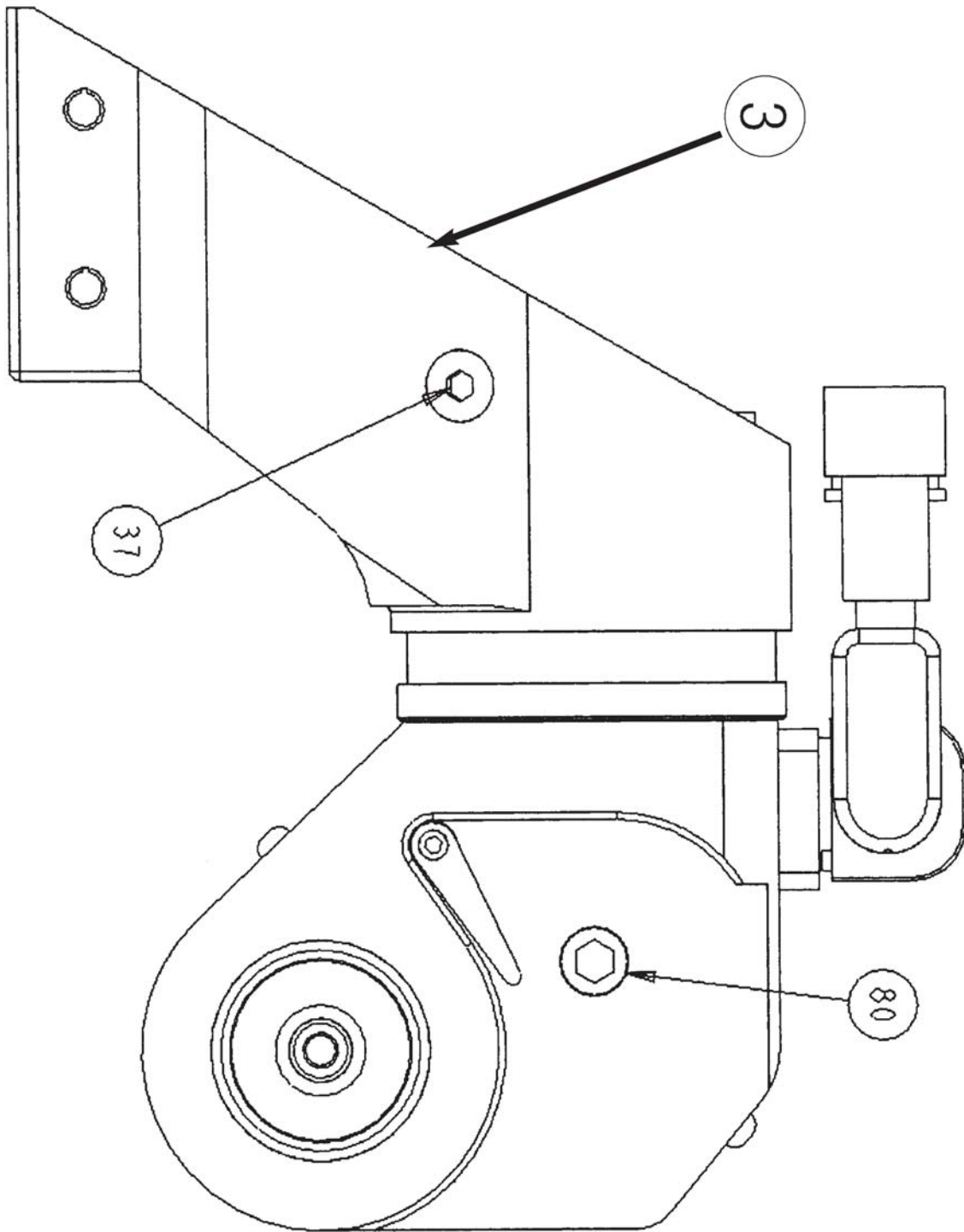
1. Remove the Reaction Arm
2. Using Special Spanner Tool Unscrew the Cylinder End Cap

To Remove Piston and Piston Sleeve

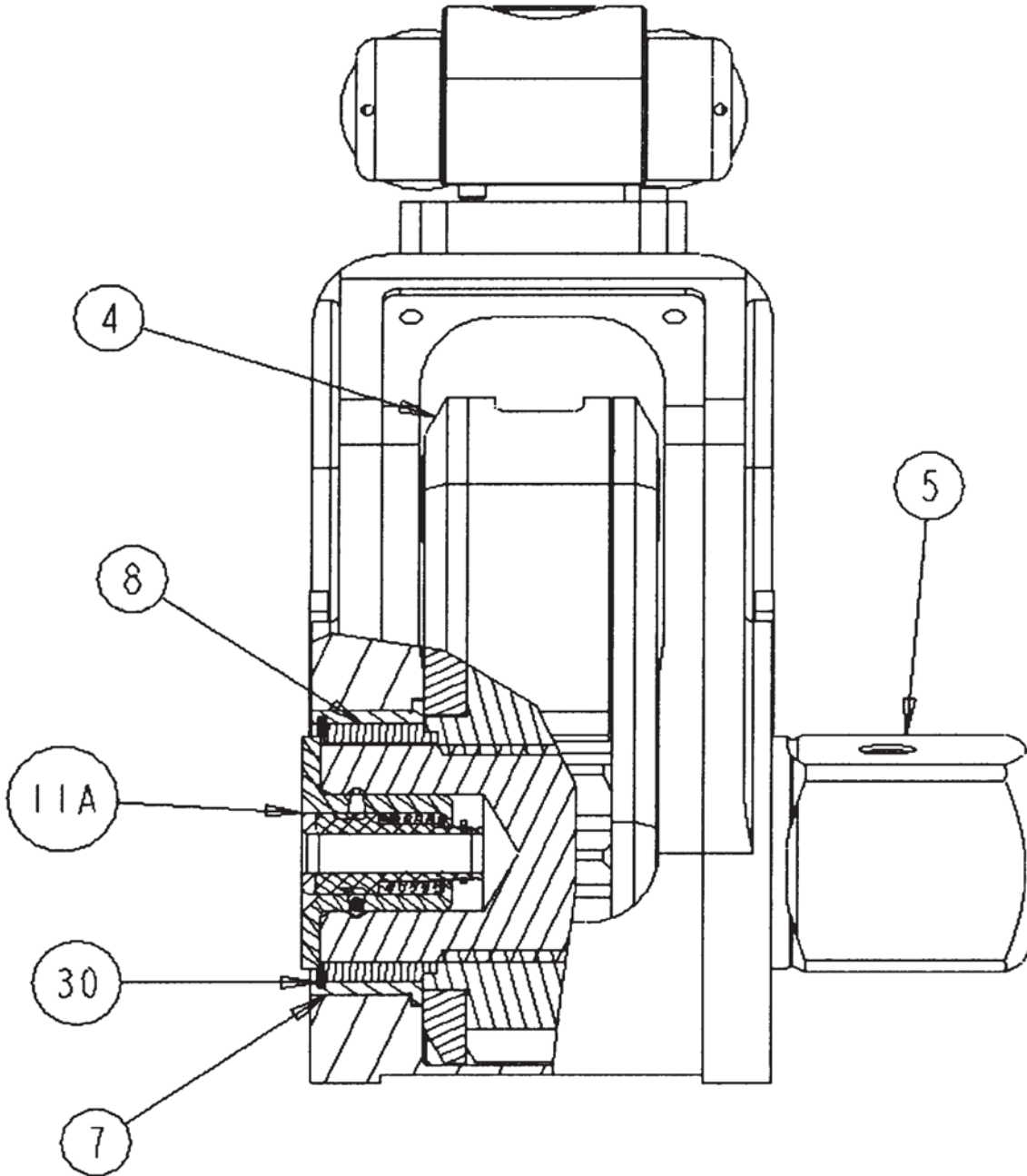
1. Remove Piston, Piston Sleeve and piston Rod by gently tapping using an Aluminum rod. Be careful not to damage the Piston rod or Housing during this process.



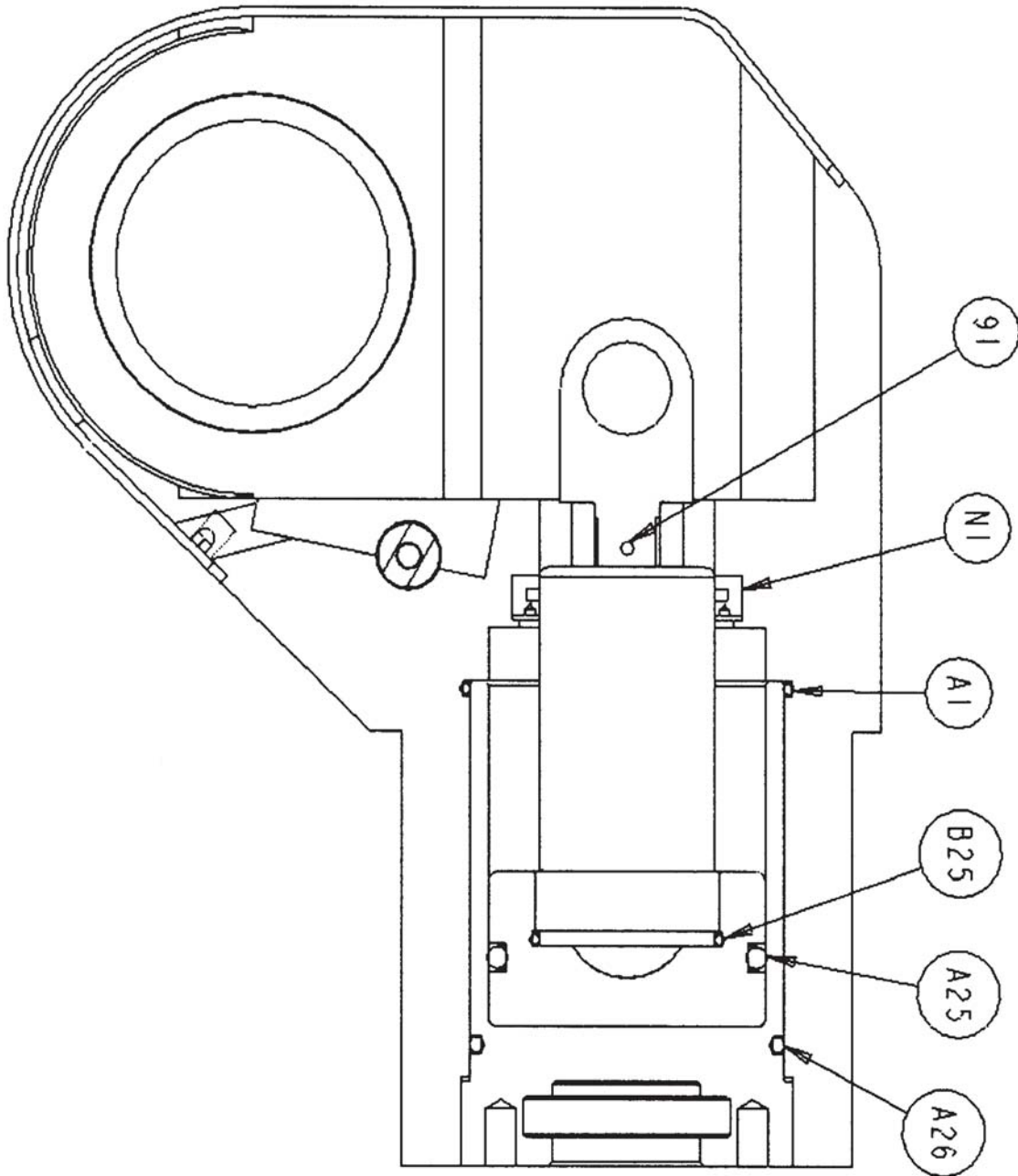
T-Series Assembly Drawing #2



T-Series Assembly Drawing #3

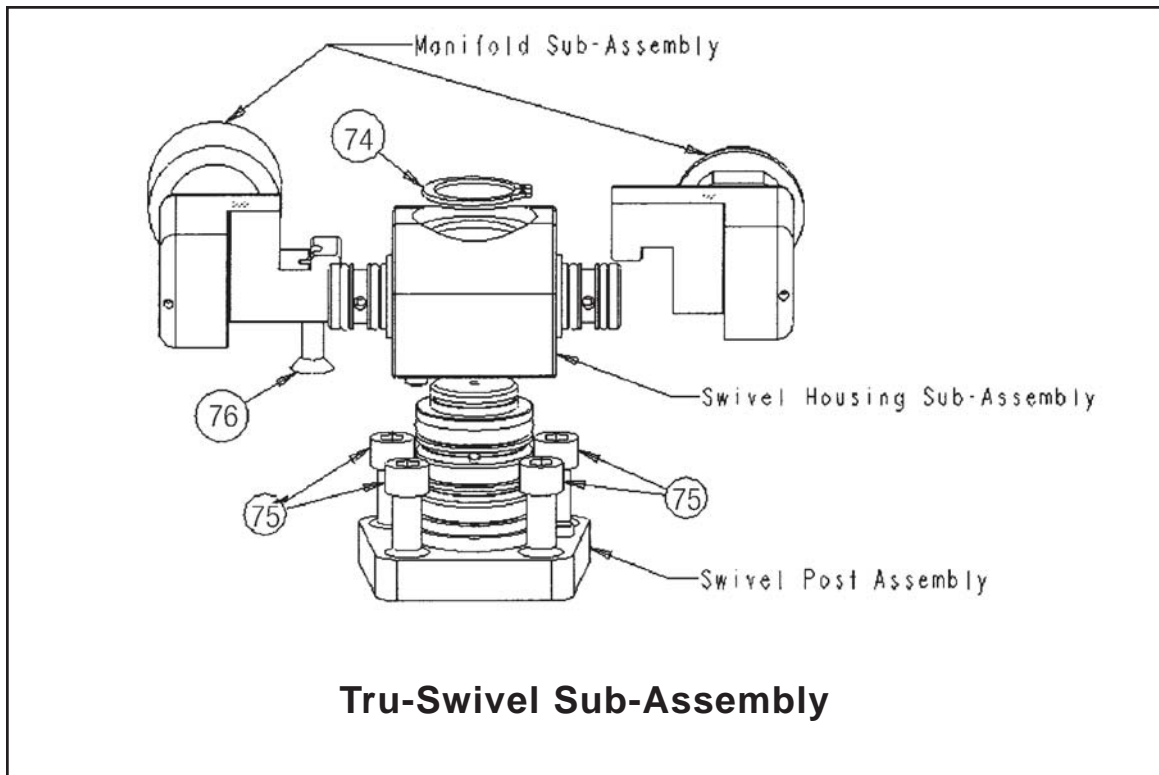


T-Series Assembly Drawing #4



#	Description	Qty	T1	T3	T5	T8	T10
1	Housing	1	T1-01	T3-01	T5-01	T8-01	T10-01
3	Reaction Arm	1	T1-03	T3-03	T5-03	T8-03	T10-03
4	Drive Plate	2	T1-04	T3-04	T5-04	T8-04	T10-04
5	Square Drive Spline	1	T1-05	T3-05	T5-05	T8-05	T10-05
6	Rachet Spline	1	T1-06	T3-06	T5-06	T8-06	T10-06
7	Drive Bushing for B.A. Sleeve	2	T1-07	T3-07	T5-07	T8-07	T10-07
8	Drive Sleeve Through	2	T1-08	T3-08	T5-08	T8-08	T10-08
10	Reaction Pawl	1	T1-10	T3-10	T5-10	T8-10	T10-10
11	Drive Retainer Body	1	T1-11	T3-11	T5-11	T8-11	T10-11
12	Drive Retainer Pushlock	1	T1-12	T3/8-12	T3/8-12	T3/8-12	T10/25-12
12B	Drive Retainer Ball Bearing	3	T1-12B	T3/8-12B	T3/8-12B	T3/8-12B	T10/25-12B
12C	Drive Retainer Spring	1	T1-12C	T3/8-12C	T3/8-12C	T3/8-12C	T10/25-12C
12D	Drive Retainer Snap Ring	1	T1-12D	T3/8-12D	T3/8-12D	T3/8-12D	T10/25-12D
13	Drive Plate Roll Pin	1	T1-13	T3-13	T5-13	T8-13	T10-13
14	Pawl Release Lever Assembly	1	T1-14	T3-14	T5-14	T8-14	T10-14
15	Lever	2	T1-15	T3-15	T5-15	T8-15	T10-15
17	Piston Rod Connector	1	T1-17	T3-17	T5-17	T8-17	T10-17
18	Reaction Pawl Spring	1	T1-18	T3-18	T5-18	T8-18	T10-18
19	Rod Pin	1	T1-19	T3-19	T5-19	T8-19	T10-19
24	Piston Sleeve	1	T1-24	T3-24	T5-24	T8-24	T10-24
25	Piston	1	T1-25	T3-25	T5-25	T8-25	T10-25
26	Cylinder End Cap	1	T1-26	T3-26	T5-26	T8-26	T10-26
27	Drive Pawl Spring	2	T1-27	T3-27	T5-27	T8-27	T10-27
28	Steel Reaction Arm Lever	1	T1/3-28	T1/3-28	T5/10-28	T5/10-28	T5/10-28
29	Piston Rod	1	T1-29	T3-29	T5-29	T8-29	T10-29
30	Drive Bushing Snap Ring	2	T1-30	T3-30	T5-30	T8-30	T10-30
31	Shroud	1	T1-31	T3-31	T5-31	T8-31	T10-31
32	Shroud Screws	4	T1-32	T3/25-32	T3/25-32	T3/25-32	T3/25-32
36	Reaction Arm Plate	1	T1-36	T3-36	T5-36	T8-36	T10-36
37	Reaction Arm Screws	2	T1-37	T3-37	T5-37	T8/25-37	T8/25-37
38	Reaction Arm Lever Spring	1	T1/3-38	T1/3-38	T5/10-38	T5/10-38	T5/10-38
39	Lever Screw	2	T1-39	T3-39	T5-39	T8-39	T10-39
40	Drive, Reaction, Reaction Pawl Housing Pin	3	T1-40-41-42	T3-40-41-42	T5-40-41-42	T8-40-41-42	T10-40-41-42
43	Reaction Arm Boot	1	T1-43	T3-43	T5-43	T8-43	T10-43
44	Reaction Arm Boot Pin	2	T1-44	T3-44	T5-44	T8-44	T10-44
45	Reaction Arm Lever Pin	1	T1-45	T3-45	T5-45	T8/10-45	T8/10-45
63	Drive Pawl	1	T1-63	T3-63	T5-63	T8-63	T10-63
70	Swivel Post	1	T1-70	T3/25-70	T3/25-70	T3/25-70	T3/25-70
71	Swivel Housing	1	T1-71	T3/25-71	T3/25-71	T3/25-71	T3/25-71
72	Manifold Actuate	1	T1-72	T3/25-72	T3/25-72	T3/25-72	T3/25-72
73	Manifold Retract	1	T1-73	T3/25-73	T3/25-73	T3/25-73	T3/25-73
74	Swivel Snap Ring	1	T1-74	T3/25-74	T3/25-74	T3/25-74	T3/25-74
75	Screw for Unswivel to Post	4	T1-75	T3/25-75	T3/25-75	T3/25-75	T3/25-75
76	Swivel Arm Screw	1	T1-76	T3/25-76	T3/25-76	T3/25-76	T3/25-76
77	Actuate Manifold Coupling	1	090103	090101	090101	090101	090101
78	Retract Manifold Quick Connect	1	090156-1	090156	090156	090156	090156
79	Actuate Manifold Quick Connect Nipple	1	090155	090155	090155	090155	090155
80	Swivel Housing Hex Plug 1/16"	2	T1/25-80	T1/25-80	T1/25-80	T1/25-80	T1/25-80
81	Tru-Swivel Housing Dowel Pin	2	T1-81	T3/25-81	T3/25-81	T3/25-81	T3/25-81
85	Housing Cap	2	T1-85	T3/5-85	T3/5-85	T8-85	T10-85
91	Jamming Plastic Rod	1	T1-91	T3-91	T5/8-91	T5/8-91	T10/25-91
Al	Housing / End Cap O-Ring	1	T1-01-027	T3-01-031	T5-01-034	T8-01-142	T10-01-146
A25	Piston / End Cap O-Ring	1	T1-25-120	T3-25-219	T5-25-223	T8-25-327	T10-25-329
A26	End Cap / Housing O-Ring	1	T1-26-122	T3-26-129	T5-26-135	T8-26-139	T10-26-143
A70	Swivel Post / Housing O-Ring	2	T1-70-006	T3/25-70-010	T3/25-70-010	T3/25-70-010	T3/25-70-010
A71	Swivel Housing / Body	4	T1/25-71-013	T1/25-71-013	T1/25-71-013	T1/25-71-013	T1/25-71-013
B25	Piston Sleeve O-Ring	1	T1-25-018	T3-25-022	T5-25-223	T8-25-126	T10-25-128
B70	Swivel Housing O-Ring	3	T1-70-014	T3/25-70-210	T3/25-70-210	T3/25-70-210	T3/25-70-210
C70	Swivel Post / Housing O-Ring, Large	1	N/A	T3/25-70-120	T3/25-70-120	T3/25-70-120	T3/25-70-120
Nl	Cylinder Housing / Piston Rod Lip Seal	1	T1-01-N	T3-01-N	T5-01-N	T8-01-N	T10-01-N
N25	Piston to End Cap Lip Seal	1	N/A	N/A	N/A	N/A	N/A

#	Description	Qty	T25	T50
1	Housing	1	T25-01	T25-01
3	Reaction Arm	1	T25-03	T50-03
4	Drive Plate	2	T25-04	T50-04
5	Square Drive Spline	1	T25-05	T50-05
6	Rachet Spline	1	T25-06	T50-06
7	Drive Bushing for B.A. Sleeve	2	T25-07	T50-07
8	Drive Sleeve Through	2	T25-08	T50-08
10	Reaction Pawl	1	T25-10	T50-10
11	Drive Retainer Body	1	T25-11	T50-11
12	Drive Retainer Pushlock	1	T25/50-12	T25/50-12
12B	Drive Retainer Ball Bearing	3	T25/50-12B	T25/50-12B
12C	Drive Retainer Spring	1	T25/50-12C	T25/50-12C
12D	Drive Retainer Snap Ring	1	T25/50-12D	T25/50-12D
13	Drive Plate Roll Pin	1	T25-13	T50-13
14	Pawl Release Lever Assembly	1	T25-14	T50-14
15	Lever	2	T25-15	T50-15
17	Piston Rod End Connector	1	T25-17	T50-17
18	Reaction Pawl Spring	1	T25-18	T50-18
19	Rod Pin	1	T25-19	T50-19
24	Piston Sleeve	1	T25-24	T50-24
25	Piston	1	T25-25	T50-25
26	Cylinder End Cap	1	T25-26	T50-26
27	Drive Pawl Spring	2	T25-27	T50-27
28	Steel Reaction Arm Lever	1	T25/50-28	T25/50-28
29	Piston Rod	1	T25-29	T50-29
30	Drive Bushing Snap Ring	2	T25-30	T50-30
31	Shroud	1	T25-31	T50-31
32	Shroud Screws	4	T3/25-32	T3/25-32
36	Reaction Arm Plate	1	T25-36	T50-36
37	Reaction Arm Screws	2	T8/25-37	T8/25-37
38	Reaction Arm Lever Spring	1	T25/50-38	T25/50-38
39	Lever Screw	2	T25-39	T50-39
40	Drive, Reaction, Reaction Pawl Housing Roll Pin	3	T25-40-41-42	T50-40-41-42
43	Reaction Arm Boot	1	T25-43	T50-43
44	Reaction Arm Boot Pin	2	T25-44	T50-44
45	Reaction Arm Lever Pin	1	T25-45	T50-45
63	Drive Pawl	1	T25-63	T50-63
70	Swivel Post	1	T3/25-70	T3/25-70
71	Swivel Housing	1	T3/25-71	T3/25-71
72	Manifold Actuate	1	T3/25-72	T3/25-72
73	Manifold Retract	1	T3/25-73	T3/25-73
74	Swivel Snap Ring	1	T3/25-74	T3/25-74
75	Screw for Unswivel to Post	4	T3/25-75	T3/25-75
76	Swivel Arm Screw	1	T3/25-76	T3/25-76
77	Actuate Manifold Coupling	1	90101	90101
78	Retract Manifold Quick Connect	1	90156	90156
79	Actuate Manifold Quick Connect Nipple	1	90155	90155
80	Swivel Housing Hex Plug 1/16"	2	T1/25-80	T1/25-80
81	Tru-Swivel Housing Dowel Pin	2	T3/25-81	T3/25-81
85	Housing Cap	2	T25-85	T50-85
91	Jamming Plastic Rod	1	T10/25-91	T50-91
A1	Housing / End Cap O-Ring	1	T25-01-238	T50-238
A25	Piston / End Cap O-Ring	1	T25-25-233	T50-25-233
A26	End Cap / Housing O-Ring	1	T25-26-338	T50-26-338
A70	Swivel Post / Housing O-Ring	2	T3/25-70-010	T3/25-70-010
A71	Swivel Housing / Body	4	T1/25-71-013	T1/25-71-013
B25	Piston Sleeve O-Ring	1	T25-25-138	T50-25-138
B70	Swivel Housing O-Ring	3	T3/25-70-210	T3/25-70-210
C70	Swivel Post / Housing O-Ring, Large	1	T3/25-70-120	T3/25-70-120
N1	Cylinder Housing / Piston Rod Lip Seal	1	T25-01-N	T50-01-N
N25	Piston to End Cap Lip Seal	1	T25-25-N	T50-25-N



**To Remove and repair the Titan Tru-Swivel™**

1. Remove the Snap Ring on the top of the Swivel Post

**To remove and repair the TITAN Tru-Swivel™**

1. Remove the Snap Ring on the top of the Swivel Post.
2. Using a puller, pull the Swivel Assembly Off the post.
3. Remove Allen Screws
4. Inspect Post and Swivel Assembly for damage.
5. Inspect Quick Connects and Couplers for damage.
6. Replace any damaged Parts or Connections.
7. Check “O” Rings for wear or Damage.
8. Replace any damaged or worn “O” Rings. A little TITAN Hydraulic Oil will prove helpful in the installation process and provide needed lubrication to the “O” Rings.
9. Secure Post to Housing by torquing the Allen Screws
10. Using a Rubber or Sand Hammer Gently tap the Tru-Swivel™ into Position.
11. Lock Snap Ring in Place.

## **OPERATING INSTRUCTIONS AT A GLANCE**

### Before operating Pump:

1. Be sure the electrical connection is grounded. Check that your power supply agrees with the motor nameplate.
2. Use only torque wrench, hoses and equipment rated at 10,000 PSI.
3. Make sure all hose and fitting connections are tight and secure. Hoses cannot be kinked or twisted.
4. Oil level should be 1 to 2" from the reservoir plate.
5. Loosen lock nut and back out relief valve to prevent unintended pressure build-up.
6. Never operate the pump with the directional control valve in advance or retract at 10,000 PSI without wrench movement for more than 1 minute. Leaving the valve in the advance or retract position without the wrench moving will overheat the oil.

### After Completing the job:

1. Before disconnecting hoses, fitting, etc., first be sure the wrench is retracted and unloaded, than unplug the power cord.
2. Store the pump in a clean, dry area.

### Periodic Maintenance :

1. Completely change the hydraulic oil and clean the oil filter screen and magnet [located in the reservoir] twice a year. [Use TITAN oil only, Model # AO1, 1 gallon]. Change the oil more frequently when used in extremely dusty areas or when the oil has been overheated. Using oil other than TITAN brand voids the pump warranty.

## SAFETY

### Working Pressure:

The pump maximum working pressure is 10,000 PSI [700 kg/cm]. Your Titan Technologies hydraulic wrenches are also rated at 10,000 PSI as are all hydraulic wrenches supplied by Titan.

***If using alien equipment, please make sure that all hydraulic equipment such as wrenches, hoses, etc. used with this pump are rated at 10,000 PSI operating pressure.***

### Hydraulic Connections:

Never disconnect or connect any hydraulic hoses or fitting without first unloading the wrench, than unplug the electrical cord of the pump. Double check the gauge to assure pressure has been released.

When making connections with quick disconnect couplings, make sure the couplings are fully engaged. Threaded connections such as fittings, gauges, etc. must be securely tightened and leak free.

### **!! CAUTION !!**



Loose or improperly threaded fittings can be potentially dangerous if pressurized, however, severe over tightening can cause premature thread failure. Fittings need to be tightened secure & leak free. Never hold or stand directly in line with any hydraulic connections while pressurizing. Never grab, touch or in any way come in contact with a hydraulic pressure leak. Escaping oil can penetrate the skin and a serious injury can result.

Do not subject the hose to potential hazard such as sharp surfaces, extreme heat or heavy impact. Do not allow the hose to kink & twist. Inspect each hose for wear before it is used.

### Electrical Power:

1. Check for proper electrical supply before connecting.
2. This motor may spark. Do not operate in an explosive atmosphere or in the presence of conductive liquids.
  - a. Do not use a power or extension cord that is damaged or has exposed wiring.
  - b. All single phase motor come equipped with a three prong grounding type plug to fit the proper grounded type electrical outlet. Do not use a two prong ungrounded extension cord as the pumps motor must be grounded.

## INSTRUCTIONS BEFORE USE



Read carefully. Most malfunctions in new equipment are the result of improper operation and/or improper setup assembly.

Preparation: Remove pump from shipping container — but do not remove any plugs or valves until the unit is ready to be fully assembled to prevent dirt or foreign matter from contaminating system.

Inspection: Visually inspect all components for shipping damage. If any damage is found, notify carrier immediately.

### Electrical Connections:

Compare motor nameplate against power availability to prevent motor burnout or dangerous electrical overloading.

Minimize the length of extension cords and be sure they are of adequate wire size, with grounded connections.

### Hydraulic Connections:

Check hydraulic oil level to prevent possible pump burnout. Open the red plastic fill plug located on the reservoir plate. Oil level should be approximately 2" from top of reservoir plate — with cylinders retracted and motor off. Add TITAN oil as necessary. Do not mix different grade of oil.

Loosen lock nut and back out (turn counterclockwise ) relief valve to prevent unintended pressure buildup. Make sure all desired gauge, hose and quick coupler connections are tight and secure before operating. The pumps pressure ports are located just below the control valve.

## OPERATION

### Pump Operation:

1. Check all system fittings and connections to be sure they are tight and leak free.
2. Check oil level in reservoir. Oil level should be 1" to 2" from the top of the reservoir plate.
3. Be sure that the pump is "OFF"
4. Be sure the electrical connection is grounded. Check that your power agrees with the motor name-plate.

Plug power cord into outlet.

5. Press "ON" on the pump switch to turn power on. Pressing the "ON" activates the electrical circuit, but does not turn the motor on. The pump motor is activated by the pendant switch.
6. Pendants supplied with the pumps have a momentary switch. Press momentary switch for "ADVANCE". Release "ADVANCE" and torque wrench piston will retract.

**NOTE:** The electrical motor stays running after pump has stopped. Within 15 seconds of your last command from the pendant, motor will turn off, preventing heat buildup.

### Air removal:

When the wrench is first connected to the pump, To ensure smooth and safe operation, remove air by cycling wrench several times without load. Cycle unit wrench advances and retracts without hesitation.

### Pressure torque setting:

**!! WARNING !!** Make these adjustments **BEFORE** putting torque wrench on nut or bolt head.



The pump pressure setting may be above the pressure needed to provide the required torque for your application. Exceeding required torque will cause equipment damage and may lead to serious personal injury.

1. See torque wrench instructions for amount of pressure required to produce desired torque.
2. Loosen lock nut and back out relief valve to prevent unintended pressure build-up.
3. Turn pump on. Press and hold the "ADVANCE" switch, and read pressure gauge.
4. While holding the switch, turn relief valve in (clockwise) to increase pressure or out (counterclockwise) to decrease maximum pressure. Repeat until correct pressure is obtained.
5. Tighten lock nut on the relief valve to maintain setting.
6. Run pump several times to test this setting.

REFER TO TORQUE WRENCH INSTRUCTIONS FOR WRENCH OPERATING PROCEDURE.



## MAINTENANCE

**WARNING: THE ELECTRICAL POWER CORD MUST BE DISCONNECTED FROM ELECTRICAL OUTLETS BEFORE PERFORMING MAINTENANCE OR REPAIR PROCEDURES.**

### Maintain oil level:

Check hydraulic oil level every 30 hours of operation. Add TITAN oil when necessary. Oil level should be no more than 2" from top of reservoir plate.

Completely change oil at least twice a year. The following conditions require more frequent oil changes:

- a. Rigorous duty, where oil temperature may reach 140 F.
- b. High humidity environment and extreme changes in temperature that can result in condensation inside the reservoir.
- c. Dirty or dusty environments that may contaminate the oil.

### Clean oil Filter Screen Once a Year

- a. Loosen and remove reservoir plate bolts. Lift pump unit off the reservoir, being careful not to damage the gasket.
- b. Unscrew screen from the bottom of pump unit and clean with nonflammable solvent.
- c. Blow dry and reassemble.

Keep areas around pump unobstructed to provide good air flow around the motor and pump.  
Keep the motor and pump as clean as possible.

### Flushing the Pump:

If you suspect your pump has been contaminated or discover sludge or other deposits on internal components, you should thoroughly flush the pump.

- a. Remove the old oil from the reservoir, then thoroughly clean the reservoir and refill with a clean, nonflammable flushing oil.
- b. Reassemble the pump and motor to the reservoir.
- c. Now run the pump in no pressure for 1 or 2 minutes maximum.
- d. Unplug the pump and remove the motor and pump assembly again. Now drain the flushing oil and reclean the inside of the reservoir. (Make sure flushing fluid is also drained from pump assembly). Refill the reservoir with TITAN hydraulic oil and reassemble the pump.

## SECTION V

### PUMP TROUBLESHOOTING

If the procedures listed below do not remedy the problem — the pump will require service and should be taken to an authorized Titan service center for repair

Problem	Cause - Solution
Motor Will Not Start	Be sure power cord is not damaged. Check for tripped circuit breaker—be sure breaker is of adequate size. Have qualified electrician inspect for loose or faulty wiring. Have motor checked for defective motor capacitor. Be sure electrical supply and extension cords are adequate.
Noisy Operation	<ol style="list-style-type: none"><li>1. Air in system. (See Troubleshooting procedure).</li><li>2. Be sure the oil reservoir is filled to normal level.</li><li>3. Check all points where air might leak into system.</li></ol>
Pump Oil is Over Heating	<ol style="list-style-type: none"><li>1. Oil viscosity too high. Replace with Titan #9.</li><li>2. Check for high pressure leakage on upper pressure plate. (Leaking at plug).</li><li>3. Oil level is low. Fill reservoir to normal level, or refit the pump with larger reservoir.</li></ol>
Pump Runs but Will Not Pump Oil	<ol style="list-style-type: none"><li>1. Pump is not primed. Run pump a few minutes tipping from side to side.</li><li>2. Check to make sure that externally adjustable relief valve set properly. Check internal relief valve.</li><li>3. Damaged O-Rings. Take to nearest Titan service center for repair.</li><li>4. Defective control valve. (Troubleshoot separately).</li></ol>

Please contact your local representative:



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OP\_T\_V4 December 20, 2009