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# OWNER'S MANUAL



## ***HEEL GRAPPLE***

### OPERATION, MAINTENANCE, AND PARTS

**CUSTOMER:** \_\_\_\_\_

**GRAPPLE MODEL: 106D0359**                      **SERIAL:** \_\_\_\_\_

**HEEL MODEL:** \_\_\_\_\_                      **SERIAL:** \_\_\_\_\_

**MACHINE MAKE/MODEL:** \_\_\_\_\_

**MACHINE SERIAL:** \_\_\_\_\_

**Parts / Product Support**

Toll Free (North America) 1-800-208-2217

Phone (250) 286-9500 | Fax (250) 286-9501

**Factory / Head Office**

5791 Duncan Bay Road

Campbell River, BC. V9H 1N6

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# T-MAR Attachments – Limited Warranty Certificate

**General Provisions** – T-MAR Industries Ltd. (hereinafter referred to as “T-MAR”) warrants its attachments (hereinafter referred to as the “Product”) against defects in material or factory workmanship, subject to all terms and conditions stated herein, to the T-MAR Authorized Dealer (hereinafter referred to as the “Dealer”).

**Warranty Coverage** – All parts of the T-MAR product covered by this warranty which proves to be defective in material or workmanship. This warranty applies to all used, maintained, and serviced as intended, in compliance with/as directed in all applicable guidelines and instructions as set forth in the product manual. This warranty applies for a period of twelve (12) months, from the first day in service, so long as the first day in service is not later than eighteen (18) months from delivery to the dealer.

The warranty includes the labor performed by T-MAR or T-MAR Dealer. Proof of defect must be submitted within ten (10) days from the date of failure or defect discovery and any claim must be submitted within thirty (30) days from the date of submission of proof of failure or defect. The warranty extends only to the original purchaser (hereinafter referred to as the “Buyer”) of the Product and not to other purchasers or transferees unless agreed to in writing by T-MAR.

**What is Not Warranted** – T-MAR is not responsible for the following: (1) used Products; (2) defects caused by an alteration or modification of the Product not approved in writing by T-MAR; (3) depreciation or damage caused by normal wear; lack of reasonable and proper maintenance; failure to meet/comply with specifications and guidelines outlined by T-MAR; misuse; lack of proper protection during storage; or accident; (4) normal maintenance parts, fluids and service; (5) labor in diagnosis of a breakdown; (6) any defects resulting from the modification of factory pre-set pressures; and (7) expenses for miles or kilometers travelled.

**Unintended or Unusual Use or Operation of the Product** – The Product is designed and manufactured by T-MAR for use in certain specific applications, by properly qualified and trained personnel, in compliance with T-MAR’s manuals and all controlling federal, provincial and industry guidelines and regulations. Any other such use(s) or operation of the product shall be approved beforehand in writing by T-MAR.

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**Warranty Service** – In the event of any failure caused by a defect in material or in factory workmanship covered by this warranty, the Buyer shall: (1) notify T-MAR of the nature of the problem without a delay; and (2) stop using or operating the Product, unless authorized in writing by T-MAR. All warranty service shall be performed at the point of purchase of the Product either by T-MAR or a T-MAR Dealer using parts provided by T-MAR.

If the product was purchased directly from T-MAR, the Buyer shall return the Product or the defective parts “prepaid” to T-MAR without delay. If T-MAR deems that the parts are defective, it shall repair or replace the parts.

If the product was purchased from a Dealer, T-MAR shall provide the replacement parts to the Dealer. The Dealer shall install the parts and return the replaced parts to T-MAR, “prepaid” by the Buyer, within thirty (30) days of the repairs. The parts and their installation shall be without charge to the Buyer providing that the replaced parts are proven defective to T-MAR’s satisfaction. In all cases, all costs related to the transportation of parts or the Product to and from T-MAR or the Dealer, any premium charged for overtime labor requested by the Buyer or for any service and/or maintenance shall be the sole responsibility of the Buyer.

All parts replaced under warranty shall remain the property of T-MAR.

If the buyer fails to follow any of the above procedures or if the parts are not proven to be defective to T-MAR’s satisfaction, the Buyer shall not benefit from the warranty.

**Limitation of Implied Warranties and Other Remedies** – To the extent permitted by law, T-MAR does not make any warranties, representations or promises as to the quality, performance, or freedom from defect of the Product covered by this warranty. Implied warranties of merchantability and fitness for a particular purpose, to the extent applicable shall be limited in duration to the applicable period of warranty set forth herein. The Buyer’s only remedies of any warranties implied by a provincial and/or state law as hereby limited, the foregoing warranty is exclusive and replaces all other warranties, guarantees, agreements and similar obligations of T-MAR with respect to the repair or replacement of any part. In no event shall T-MAR be liable for incidental or consequential damages.

**No Dealer Warranty** – The Dealer has no authority to make any representation or promise on behalf of T-MAR, or to modify the terms or limitations of the warranty in any way.

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# T-MAR Spare Parts (New & Remanufactured) – Limited Warranty Certificate

**General Provisions** – T-MAR Industries Ltd. (hereinafter referred to as “T-MAR”) warrants its Spare Parts (hereinafter referred to as the “Product”) against defects in material or factory workmanship, subject to all terms and conditions stated herein, to the T-MAR Authorized Dealer (hereinafter referred to as the “Dealer”).

**Warranty Coverage** – Structural component(s) of the T-MAR Product covered by this warranty which prove(s) to be defective in material or workmanship. This warranty applies to T-MAR manufactured components used, maintained and serviced as intended, in compliance with/as directed in all applicable guidelines and instructions as set forth in the product manual. This warranty applies for the period of six (6) months from the date of purchase. Proof of defect must be submitted within ten (10) days from the date of failure or defect discovery and any claim must be submitted within thirty (30) days from the date of submission of proof of failure/defect. The warranty extends only to the original purchaser (hereinafter referred to as the “Buyer”) of the Product and not to other purchasers or transferees unless agreed to in writing by T-MAR.

**What is Not Warranted** – T-MAR is not responsible for the following: (1) used Products; (2) defects caused by an alteration or modification of the Product not approved in writing by T-MAR; (3) depreciation or damage caused by normal wear; lack of reasonable and proper maintenance; failure to meet/comply with specifications and guidelines outlined by T-MAR; misuse; lack of proper protection during storage; or accident; (4) normal maintenance parts, fluids and service; (5) labor in diagnosis of a breakdown; (6) any defects resulting from the modification of factory pre-set pressures; and (7) expenses for miles or kilometers travelled.

**Unintended or Unusual Use or Operation of the Product** – The Product is designed and manufactured by T-MAR for use in certain specific applications, by properly qualified and trained personnel, in compliance with T-MAR’s manuals and all controlling federal, provincial/state and industry guidelines and regulations. Any other such use(s) or operation of the product shall be approved beforehand in writing by T-MAR.

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**Warranty Service** – In the event of any failure caused by a defect in material or in factory workmanship covered by this warranty, the Buyer shall: (1) notify T-MAR of the nature of the problem without a delay; and (2) stop using or operating the Product, unless authorized in writing by T-MAR. All warranty service shall be performed at the point of purchase of the Product either by T-MAR or by a Dealer using parts provided by T-MAR.

If the product was purchased directly from T-MAR, the Buyer shall return the Product or the defective parts “prepaid” to T-MAR without delay. If T-MAR deems that the parts are defective, it shall repair or replace the parts.

If the product was purchased from a Dealer, T-MAR shall provide the replacement parts to the Dealer. The Dealer shall install the parts and return the replaced parts to T-MAR, “prepaid” by the Buyer, within thirty (30) days of the repairs. The parts and their installation shall be without charge to the Buyer providing that the replaced parts are proven defective to T-MAR’s satisfaction. In all cases, all costs related to the transportation of parts or the Product to and from T-MAR or the Dealer, any premium charged for overtime labor requested by the Buyer or for any service and/or maintenance shall be the sole responsibility of the Buyer.

All parts replaced under warranty shall remain the property of T-MAR.

If the buyer fails to follow any of the above procedures or if the parts are not proven to be defective to T-MAR’s satisfaction, the Buyer shall not benefit from the warranty.

**Limitation of Implied Warranties and Other Remedies** – To the extent permitted by law, T-MAR does not make any warranties, representations or promises as to the quality, performance, or freedom from defect of the Product covered by this warranty. Implied warranties of merchantability and fitness for a particular purpose, to the extent applicable shall be limited in duration to the applicable period of warranty set forth herein. The Buyer’s only remedies of any warranties implied by a provincial and/or state law as hereby limited, the foregoing warranty is exclusive and replaces all other warranties, guarantees, agreements and similar obligations of T-MAR with respect to the repair or replacement of any part. In no event shall T-MAR be liable for incidental or consequential damages.

**No Dealer Warranty** – The Dealer has no authority to make any representation or promise on behalf of T-MAR, or to modify the terms or limitations of the warranty in any way.

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## T-MAR INDUSTRIES LTD.

### FORESTRY ATTACHMENTS WARRANTY REGISTRATION

#### **IMPORTANT:**

*This form must be completed and on file at T-MAR for warranty claims to be considered –  
EMAIL TO: [warranty@t-mar.com](mailto:warranty@t-mar.com)*

#### **ATTACHMENT**

MODEL NUMBER:	SERIAL NUMBER:
CARRIER MAKE & MODEL:	SERIAL NUMBER:
<b>DELIVERY/FIRST USE DATE:</b>	

#### **DEALER**

NAME:	BRANCH:
CONTACT:	PHONE NUMBER:

#### **OWNER**

NAME:	CITY:
CONTACT:	PHONE NUMBER:

#### **DEALER ACKNOWLEDGEMENT**

Dealer: The Warranty Registration, signed by the End User, must be submitted within 30 **days** of the Delivery Date to register the attachment in the T-MAR warranty system. Along with a copy of Bill of Sale, Rental agreement or other supporting document. Claims will not be considered without registration. The Warranty period begins on first use or delivery to customer.

#### **OWNERS ACKNOWLEDGEMENT**

I confirm that the above identified attachment, was delivered complete with:

Warranty Certificate \_\_\_\_

Operator, Maintenance & Parts Manual \_\_\_\_

The safe and proper operation and maintenance of the attachment and the correct use of all controls has been completely explained including how to flush the system before installing the attachment.

I have read and understand both the Certificate and the Registration.

Customer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print Name: \_\_\_\_\_

## FLUSH SYSTEM BEFORE CONNECTING GRAPPLE

The following steps will replenish the hydraulic lines with fresh oil and deliver any contaminants to the return filter on the machine. This procedure should be performed any time a new attachment is fitted on a machine.

1. Connect the open and close hoses together at the tip of the stick.
2. Run the open or close function for thirty (30) seconds in one direction.
3. Repeat steps 1 & 2 with the rotation hoses.

Additional steps should be taken when a failed hydraulic component is replaced on an attachment. In this case, the lines should be looped where they would normally attach to the failed component, such that the entire circuit is flushed back to tank before the replacement component is installed. If a failed component introduced metal contamination to the open-close system, both cylinders should also be disassembled and thoroughly cleaned to remove and accumulated contamination.

**SYSTEM CONTAMINATION IS THE LEADING CAUSE OF COMPONENT FAILURE. MOST OIL IN THE GRAPPLE CIRCUIT DOES NOT CIRCULATE BACK TO THE TANK DURING REGULAR OPERATION.**

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## SAFE OPERATION

- **Operators must read and understand the information provided in this manual before attempting to operate this attachment.**
- **Failure to follow these instructions may void warranty and may result in equipment damage and/or injury or death.**
- **This attachment and the machine to which it is attached should only be operated by trained personnel who are familiar with the use of this type of equipment.**
- **Do not lift, carry or suspend loads near people or equipment, or in a way that a dropped load could strike a person or equipment.**
- **Do not operate this equipment near overhead powerlines.**
- **Do not operate this equipment under the influence of drugs or alcohol.**
- **The attachment and base machine shall be inspected before every use. Any deficiencies found during inspection that could affect the safe use of the system shall be corrected before the machine is used.**
- **This attachment is designed for the handling of felled logs in a timber harvesting application. The attachment is not designed for any other use.**
- **The rotation motor is intended for grapple positioning only. Do not use the rotate function while handling logs.**



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## LOAD HOLDING VALVES

- **This attachment is equipped with counterbalance type load holding valves to reduce the chance of undesired grapple leg movement in case of hose rupture, etc.**
- **Replacement with any load holding valves other than those approved by the factory will void the grapple warranty.**
- **The grapple should never be forced into the ground unless the legs are fully open and the “grapple open” function is held active.**
- **Never swing the grapple legs or the load being held by the grapple into a fixed object.**
- **This grapple was not designed for the removal of stumps (stump pulling).**
- **This grapple was not designed to assist in machine positioning. The heel rack may be used for this purpose.**
- **Failure to follow these instructions may void warranty, and may result in equipment damage, injury, or death.**



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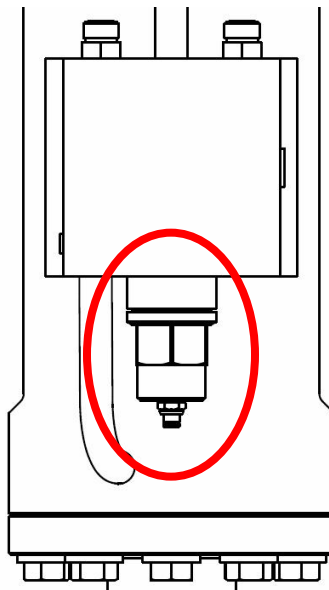


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## COUNTERBALANCE LOAD HOLDING VALVES

- Counterbalance valves will hold applied and induced pressures inside the grapple cylinders up to a set pressure limit.
- Fluid will relieve when this limit is exceeded.
- This is designed to prevent cylinder damage and mechanical failure.
- If the load exceeds the design limit of the grapple this system can cause undesired grapple leg movement which may result in loads being released.



**COUNTERBALANCE VALVE**

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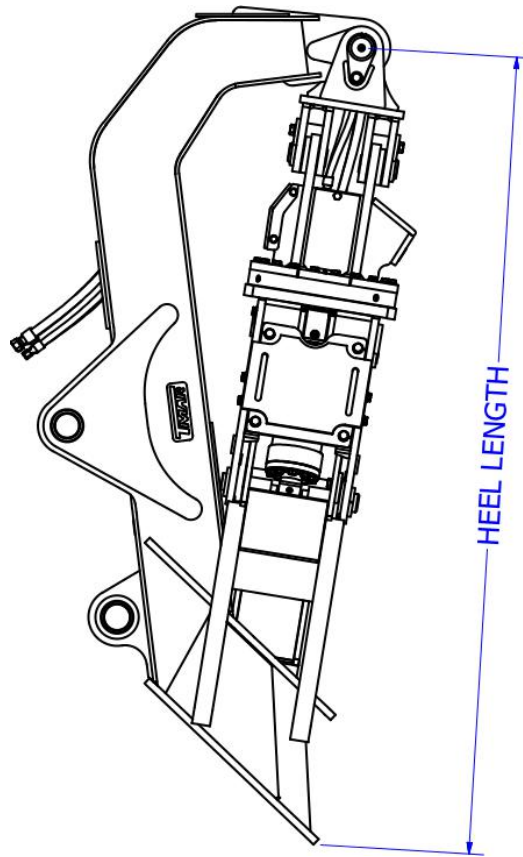
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## HEEL LENGTH



GRAPPLE		SOLID LINK	PASSTHRU LINK
106D0359	HD60S	99"	103"

- Optimal heel length is listed for the grapple.
- A heel length 10% or more shorter than the listed value is generally not acceptable.
- Consult T-MAR engineering department for further information.

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# INSPECTION

- **The attachment and base machine shall be inspected before every use. Any deficiencies found during inspection that could affect the safe use of the system shall be corrected before the machine is used.**
- **Check all surfaces and weld joints for signs of cracks or deformation.**
- **Ensure that all guards are installed.**
- **Check that all fasteners are present and tight.**
- **Inspect all pin bores for bushing wear. Signs or wear include excess clearance between the pin and the bushing or an oval shaped bore.**
- **Ensure that all grease fittings are present, undamaged and functional.**
- **Inspect the hydraulic fittings and components for any signs of leakage.**
- **Inspect the hydraulic hoses for wear or deformation.**

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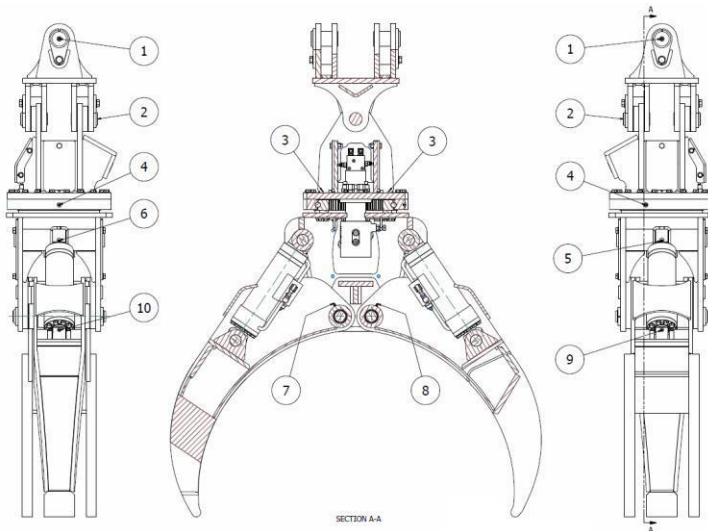
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# MAINTENANCE

- Regular maintenance is essential to the longevity and safe use of this attachment. Failure to follow these instructions voids warranty and may result in equipment damage, injury, or death.
- Never attempt a repair that you are not qualified to perform or do not fully understand.
- It is recommended that only T-MAR genuine parts are used in the repair and maintenance of this attachment. Use of unapproved components may void warranty.
- All components must be lubricated with moly EP grease at the intervals in the below chart:

## PASS THRU LINK



LUBRICATION CHART			
ITEM	QTY	DESCRIPTION	INTERVAL
1	2	Link to Heel Pin	Twice Daily
2	2	Link to Tophead Pin	Twice Daily
3	2	Tophead Bearing Gear	Twice Daily
4	4	Bearing	Once Daily
5	1	Wide Leg Cylinder Tailhold Pin	Twice Daily
6	1	Narrow Leg Cylinder Tailhold Pin	Twice Daily
7	2	Narrow Leg Pivot Pin	Twice Daily
8	2	Wide Leg Pivot Pin	Twice Daily
9	1	Wide Leg Cylinder Rod End Pin	Twice Daily
10	1	Narrow Leg Cylinder Rod End Pin	Twice Daily

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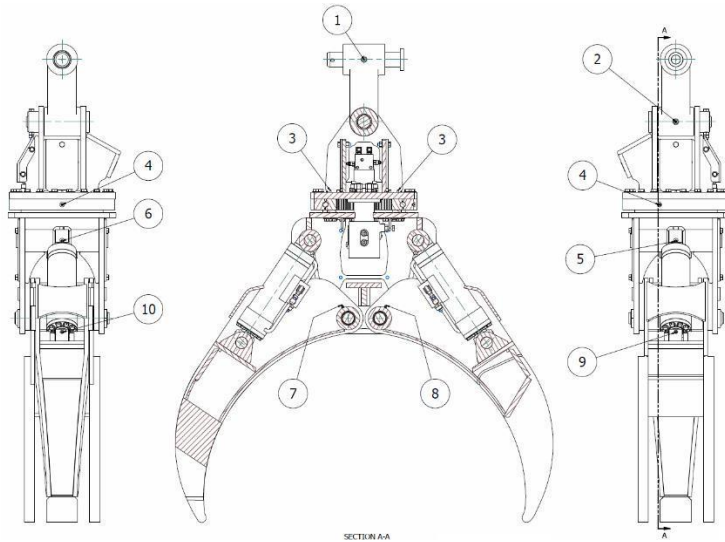
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# MAINTENANCE CONT'D

## SOLID LINK



LUBRICATION CHART			
ITEM	QTY	DESCRIPTION	INTERVAL
1	1	Link to Heel Pin	Twice Daily
2	1	Link to Tophead Pin	Twice Daily
3	2	Tophead Bearing Gear	Twice Daily
4	4	Bearing	Once Daily
5	1	Wide Leg Cylinder Tailhold Pin	Twice Daily
6	1	Narrow Leg Cylinder Tailhold Pin	Twice Daily
7	2	Narrow Leg Pivot Pin	Twice Daily
8	2	Wide Leg Pivot Pin	Twice Daily
9	1	Wide Leg Cylinder Rod End Pin	Twice Daily
10	1	Narrow Leg Cylinder Rod End Pin	Twice Daily

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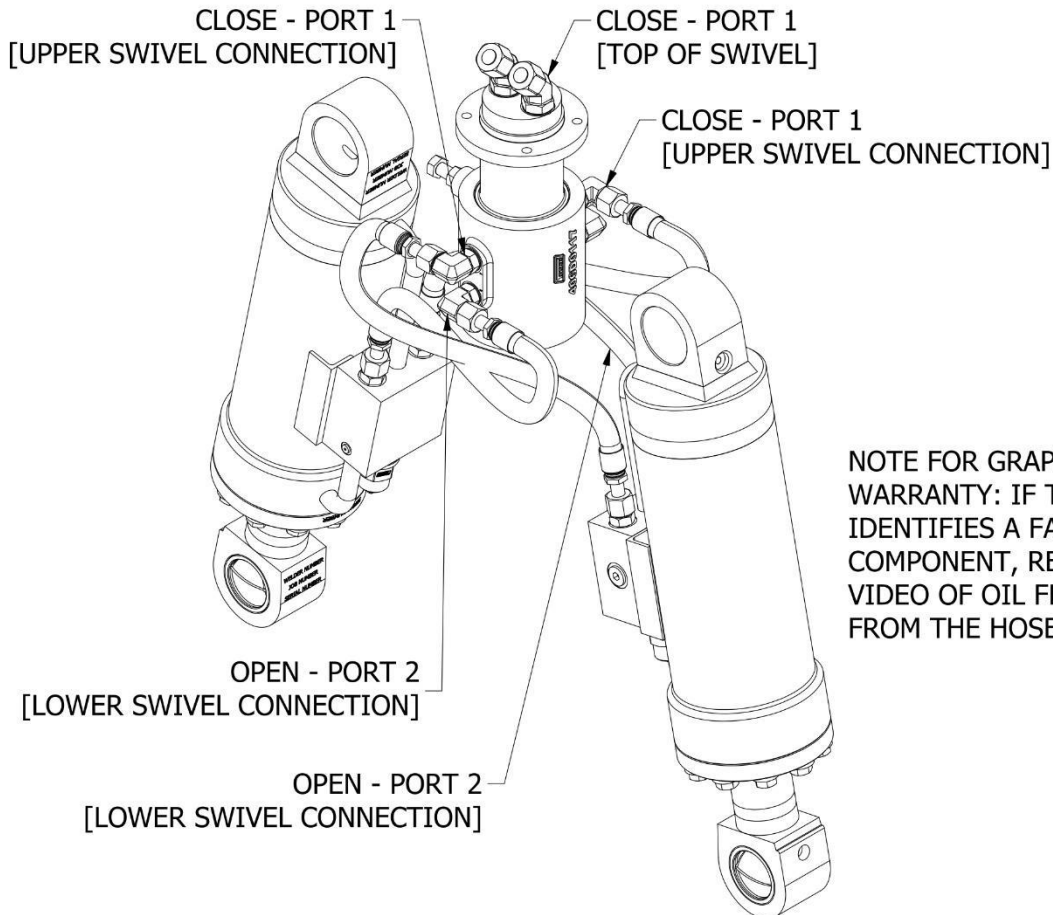
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# TESTING HYDRAULIC OPEN/CLOSE CIRCUIT

## T-MAR GRAPPLES - WHEN LEGS DRIFT DOWN FROM FULLY OPEN



NOTE FOR GRAPPLES UNDER WARRANTY: IF THIS TEST IDENTIFIES A FAILED COMPONENT, RECORD A VIDEO OF OIL FLOWING FROM THE HOSE OR FITTING

BRING MACHINE HYDRAULIC OIL UP TO OPERATING TEMPERATURE BEFORE STARTING TEST

1. FULLY OPEN GRAPPLE AND PLACE LEGS ON FIRM GROUND
  2. DISCONNECT "GRAPPLE CLOSE" HOSE FROM FITTING ON TOP OF SWIVEL [PORT 1]. CAP FITTING & PLUG HOSE
  2. DISCONNECT "GRAPPLE CLOSE" HOSES FROM GRAPPLE CYLINDERS, LEAVE CONNECTED TO SWIVEL
  3. LEAVE "GRAPPLE CLOSE" FITTINGS ON CYLINDERS UNCAPPED
  4. PULL "GRAPPLE CLOSE" HOSE ENDS OUT THROUGH SIDE DOORS AND SECURE ENDS INTO EMPTY PAILS
  5. CAREFULLY RUN GRAPPLE OPEN FUNCTION. **CAUTION:** A LARGE VOLUME OF HIGH PRESSURE OIL MAY EJECT FROM THE "GRAPPLE CLOSE" HOSES IF THE SWIVEL HAS FAILED. STAND CLEAR AND WEAR APPROPRIATE PPE
- IF OIL FLOWS INTO PAIL FROM GRAPPLE OPEN HOSES, SWIVEL WILL NEED TO BE REBUILT OR REPLACED  
 -IF OIL FLOWS OUT OF GRAPPLE CLOSE FITTING ON ONE OR BOTH OF THE CYLINDERS, CYLINDER IS BYPASSING INTERNALLY AND WILL NEED TO BE REBUILT OR REPLACED  
 -IF NO OIL FLOWS FROM OPEN HOSES & FITTINGS, PERFORM FOLLOWING TEST:
1. DISCONNECT "GRAPPLE OPEN" HOSE FROM FITTING ON TOP OF SWIVEL [PORT 2]. CAP FITTING & PLUG HOSE
  2. RECONNECT "GRAPPLE CLOSE" HOSES FROM SWIVEL TO GRAPPLE CYLINDERS
  3. LIFT THE GRAPPLE UP FROM THE GROUND WITH THE MACHINE
- IF LEGS DO NOT DRIFT DOWN, CHECK MACHINE CONTROL VALVE FOR OIL BYPASS

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**Assembly, 60" Heavy Duty Grapple**

Ref. No:

**606B1242**

Rev. 0

**Note: All fasteners are steel, and grade 8/10.9 minimum, unless explicitly noted.**

Item	Part No.	Description	Qty.
---	106D0359	Assembly, 60" Heavy Duty Grapple	---
1	206D0324	Top Head	1
2	206D0280	Mid Section Assembly	1
3	206B1204	High Pressure Swivel Assembly	1
4	206B0717	60" Wide Leg Assembly (Shovel Logging)	1
5	206B0722	60" Narrow Leg Assembly (Shovel Logging)	1
6	270C0105	HD HP Grapple Cylinder Assembly	2
7	340B0307	Pin, Upper Cylinder, Bolt-On Retainer	2
8	340B0305	Pin, Lower Cylinder, Wide Leg, Bolt-On Retainer	1
9	340B0306	Pin, Lower Cylinder, Narrow Leg, Bolt-On Retainer	1
10	306B0201	Leg Pin	2
11	306B1106	Tophead Pin	1
12	306B0198	Pinion Gear	1
13	333A0094	Weld-On Serial Plate	1
14	343B0011	Grapple Slew Bearing	1
15	271B0277	Cross-Port Manifold Assembly	1
16	371B0016	Rotate Motor Assembly	1
17	---	REMOVED	1
18	406A0738	D-Style Pin Retainer	2
19	406A0204	Pin Stop	2
20	406B1117	Pin Retainer	1
21	5650-8-8	Straight Fitting, -8 MORB to -8 MORF	2
22	5652-8-8	Elbow 90, -8 MFFO to -8 MORB	4
23	58C-8	Cap, -8 FFFO	2
24	---	REMOVED	1
25	5652-8-10	Elbow 90, -8 MFFO to -10 MORB	4
26	5651-12-12	Elbow, 45, -12 MORB to -12 MORF	2
27	58C-12	Cap, -12 FFFO	2
28	FCP532-212	COTTER PIN 5/32 X 2 1/2	1
29	---	REMOVED	1

**Assembly, 60" Heavy Duty Grapple**

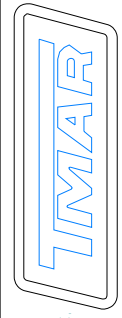
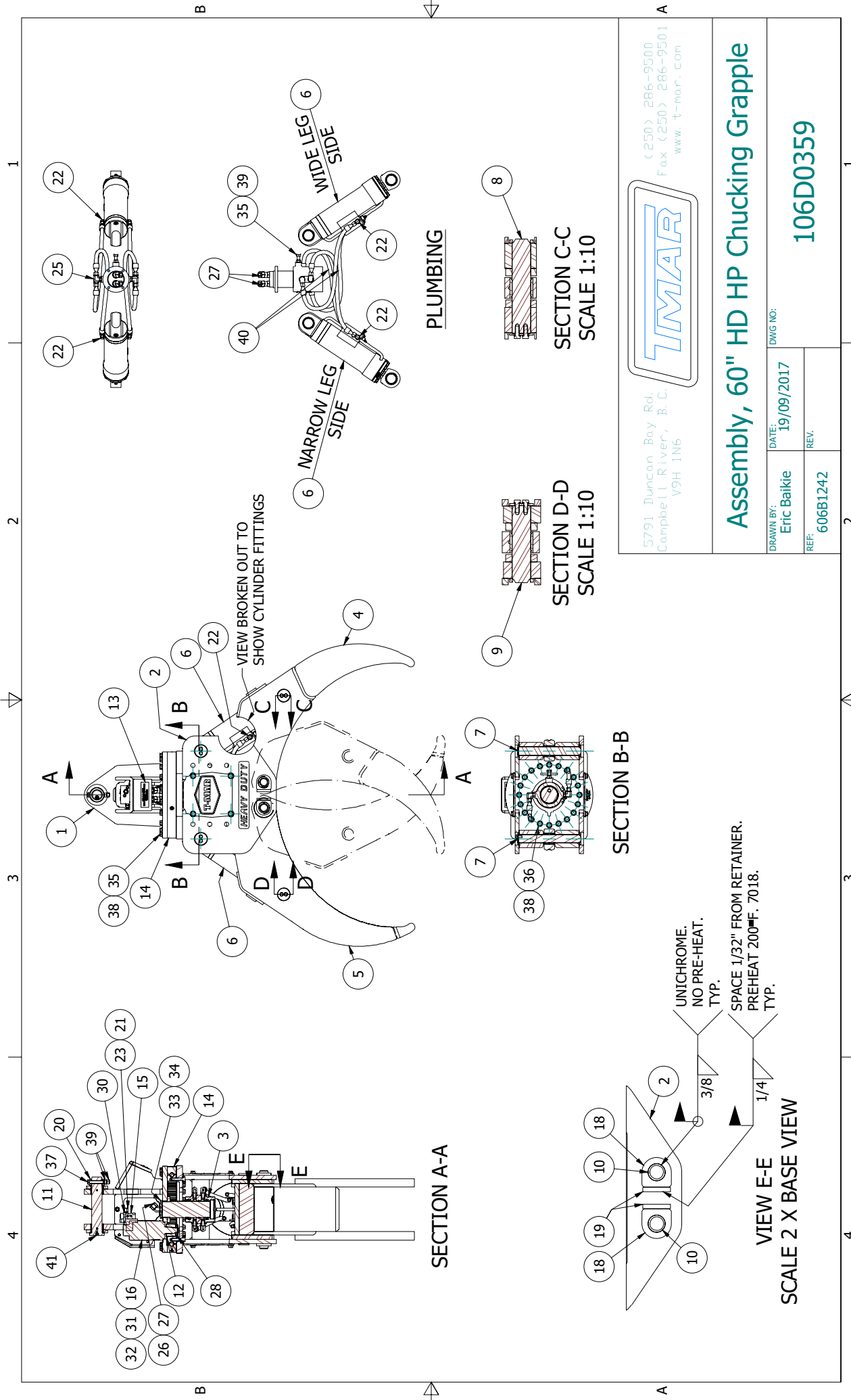
Ref. No:

**606B1242**

Rev. 0

**Note: All fasteners are steel, and grade 8/10.9 minimum, unless explicitly noted.**

<b>Item</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty.</b>
30	SHP.23310	HEX SOCKET HD CAPSCREW 3/8 - 16 UNC X 1 3/4	4
31	345A0187	FLANGE 12-POINT CAPSCREW 1/2 - 13 UNC X 1 3/4	4
32	345A0015	Washer 1/2 X .15 Thick	4
33	---	HEX HD CAPSCREW M14 X 2.0 X 50	4
34	SHP.40255	LOCKWASHER M14	4
35	SHP.0122078	HEX HD CAPSCREW M16 X 2.0 X 60	21
36	SHP.40762	HEX HD CAPSCREW M16 X 2.0 X 70	20
37	SHP.40768	HEX HD CAPSCREW M16 X 2.0 X 120	1
38	SHP.34882	FLAT WASHER M16, HARD	40
39	SHP.90711	HEX NUT M16 X 2	3
40	72A6039 CL28	Hose Assembly	4
41	345A0068	1/8" NPT Grease Fitting	2
42	306A0197	Shim 1/16", Cylinder Ends	A.R.
43	306A0198	Shim 1/8", Legs and Cylinders	A.R.
44	206A0671	Fastener Kit, HD HP	1
45	206A0675	Fitting Kit, HD HP	1
46	340B0301	Bolt-On Pin Retainer, Cylinder Pins	REF
47	SHP.40714	HEX HD CAPSCREW M12 X 1.85 X 30 (Pin Retainers)	REF
48	SHP.40254	LOCKWASHER, M12 (Pin Retainers)	REF

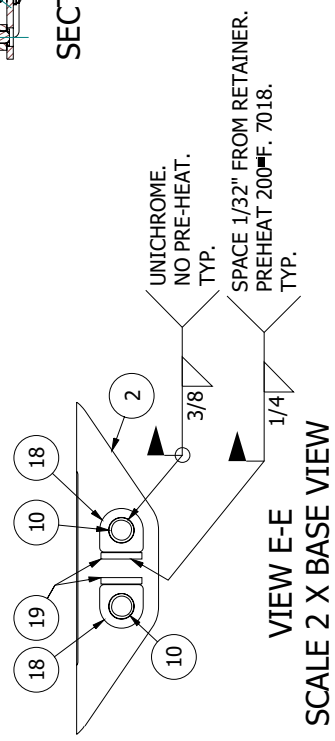


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# Assembly, 60" HD HP Chucking Grapple

DRAWN BY: Eric Baikie		DATE: 19/09/2017	DWG NO: 106D0359
REF: 606B1242		REV:	



**PLUMBING**

**SECTION C-C  
SCALE 1:10**

**SECTION D-D  
SCALE 1:10**

**SECTION B-B**

**SECTION A-A**

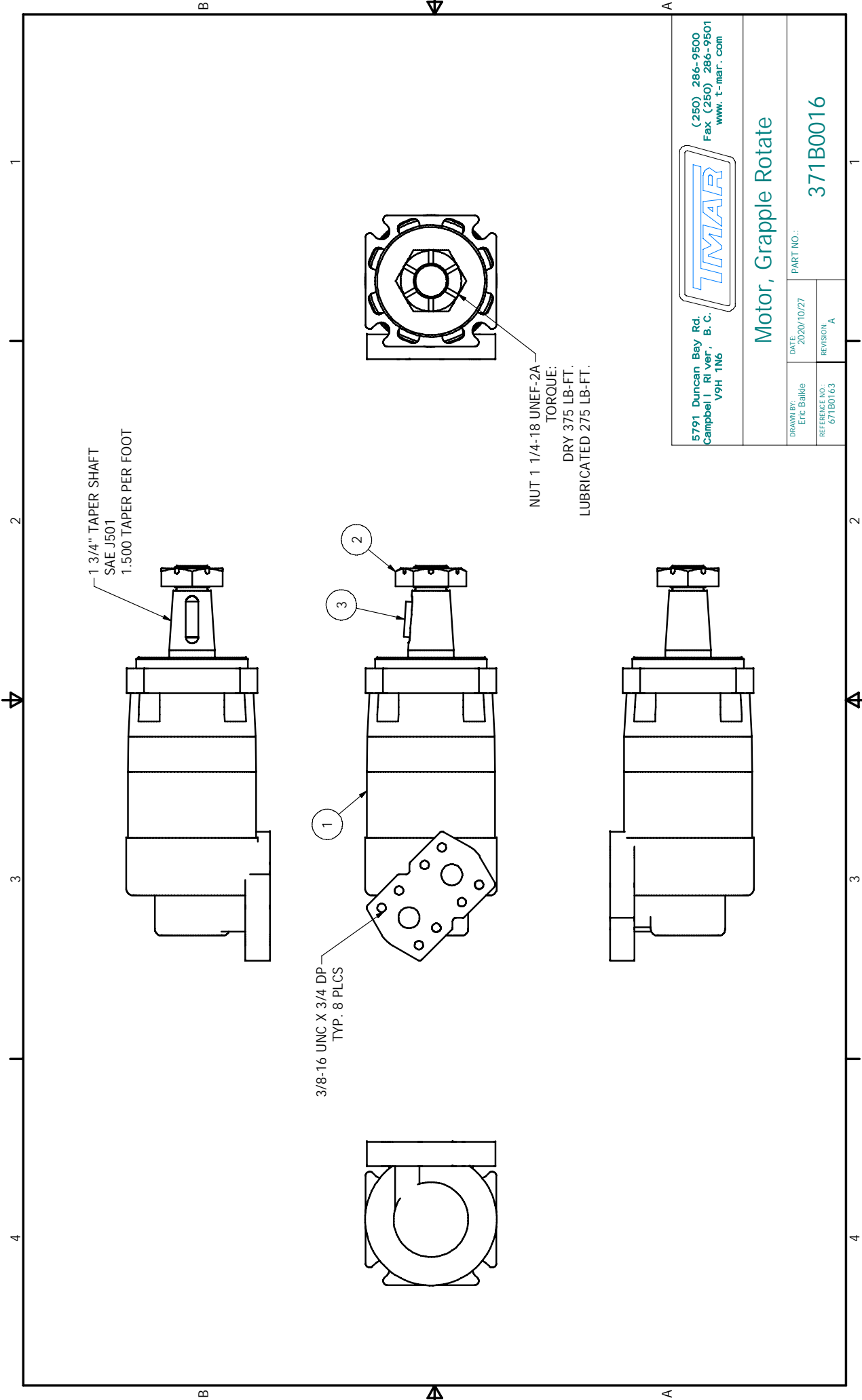
**VIEW E-E  
SCALE 2 X BASE VIEW**

**Assembly, Rotation Motor**  
**Applicable Serial Numbers:**

All Units

**Ref. No:** **671B0163**  
**Rev. A**

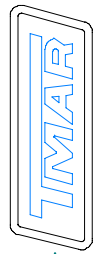
<b>Ref.</b>	<b>Part No:</b>	<b>Description</b>	<b>Qty.</b>
---	371B0016	Complete Assembly	---
1	---	Motor, Char Lynn	1
2	---	Nut, 1 1/4 - 18 UNEF, Castelated	4
3	---	CF. Square, 7/16" x 1 1/4" Long	1



1 3/4" TAPER SHAFT  
SAE J501  
1.500 TAPER PER FOOT

3/8-16 UNC X 3/4 DP  
TYP. 8 PLCS

NUT 1 1/4-18 UNEF-2A  
TORQUE:  
DRY 375 LB-FT.  
LUBRICATED 275 LB-FT.



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Motor, Grapple Rotate

DRAWN BY: Eric Baillie	DATE: 2020/10/27	PART NO.:
REFERENCE NO.:	REVISION:	
671B0163	A	371B0016

**Assembly, Top Head**

**Ref. No: 606B1128**

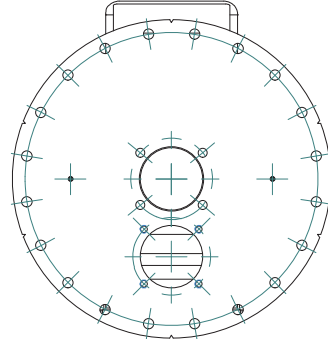
**Rev. \_**

<b>Ref.</b>	<b>Part No:</b>	<b>Description</b>	<b>Qty.</b>
---	206D0324	Complete Assembly	---
1	306D0325	Top Head	1
2	306B1264	Motor Guard	1
3	406B1120	Side Guard	2
4	342B0057	Bushing, 3 OD x 2 1/2 ID x 2 LG	2
5		HEX HD BOLT M14 X 2 X 40	4
6		FLAT WASHER M14, HARD	4
7		HEX HD BOLT M16 X 2 X 50	2
8	SHP.90711	HEX NUT M16 X 2	2
9	345A0068	1/8" NPT Grease Fitting	2
10	206D0324-FK	Fastener Kit (Includes Items 4-9)	1

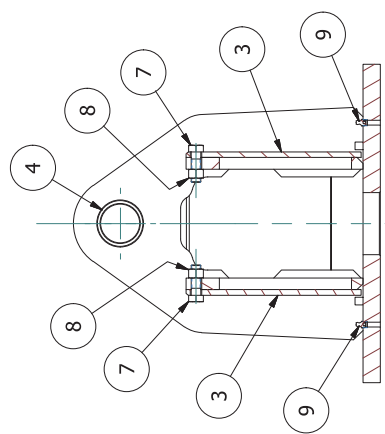
**Notes:**

- 1.) Use with Hydraulic Swivels with 4" pilot only.

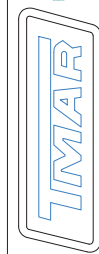
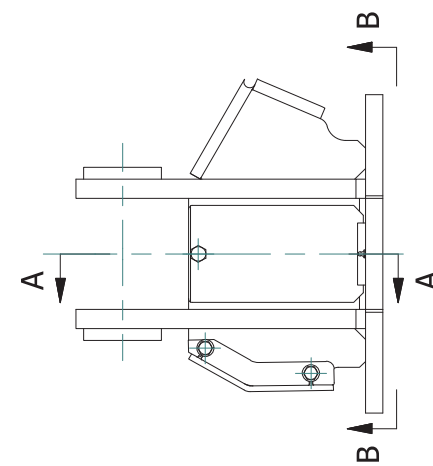
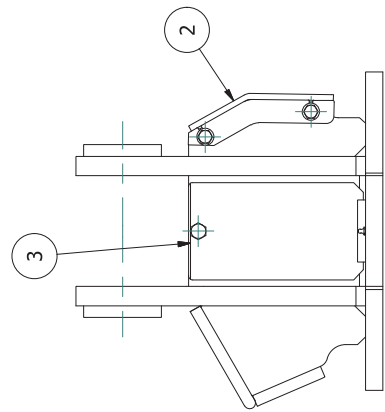
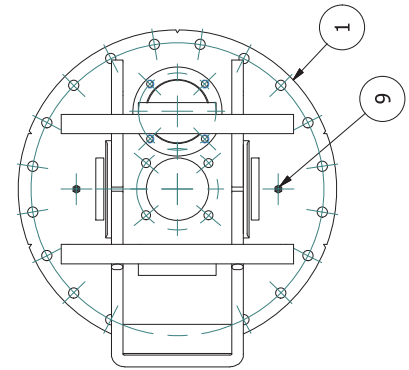
1 2 3 4



VIEW B-B



SECTION A-A



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### Top Head Assembly, MKIII

DRAWN BY: Eric Baikie	DATE: 09/05/2016	PART NO.:
REFERENCE NO.:	206D0324	
606B1128		

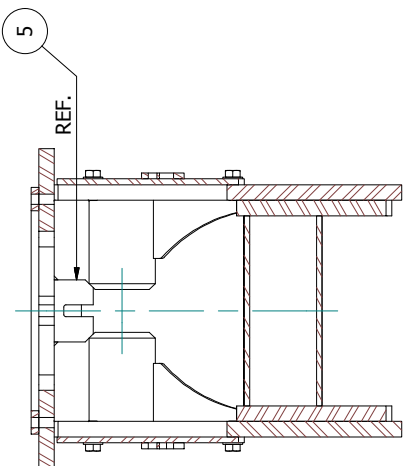
1 2 3 4

**Assembly, HD Mid Section**

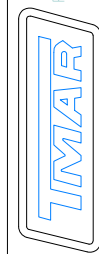
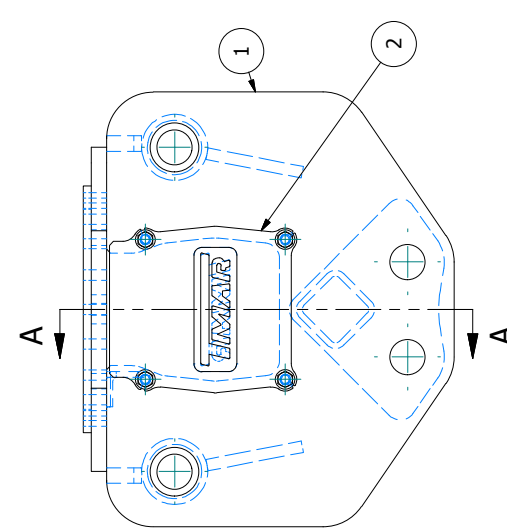
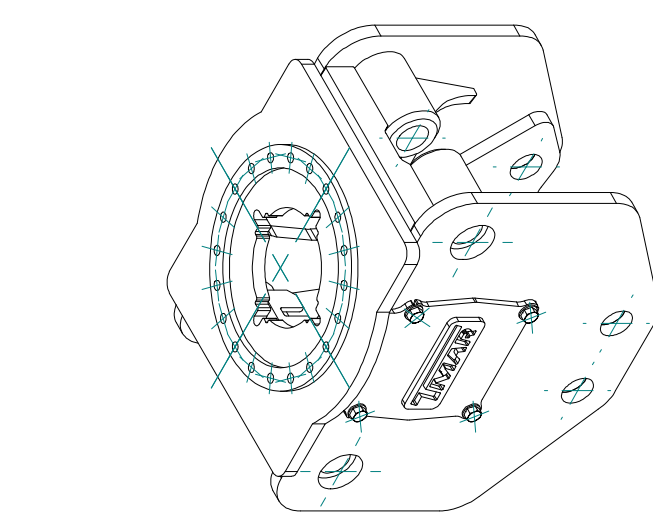
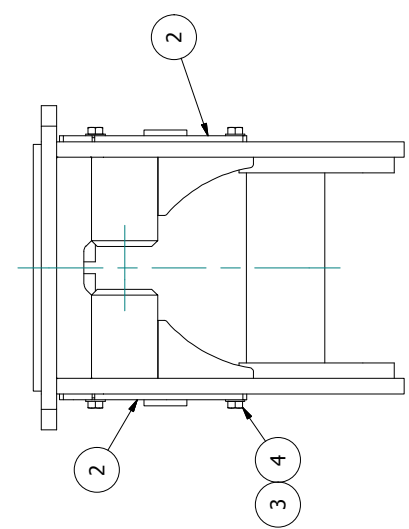
**Ref. No: 606B0957**

<b>Ref.</b>	<b>Part No.</b>	<b>Rev.</b>	<b>Description</b>	<b>Qty.</b>
---	206D0280		Complete Assembly	---
1	306D0267	C	Mid Section	1
2	306B0714		Front Guard Plate Weldment	2
3	---		FLAT WASHER 5/8	8
4	---		HEX HD BOLT 5/8 - 11 UNC X 1 1/2 GR8	8
5	406A0644		Anti-Rotation Tab (REF.)	1

1 2 3 4



SECTION A-A



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**Assembly, HD Mid Section**

DRAWN BY: Al Lee  
 DATE: 2013/07/29  
 REFERENCE NO.: 606B0957

PART NO.: 206D0280

**HD Cylinder Assembly**Ref. No: **670B0308**

Rev. D

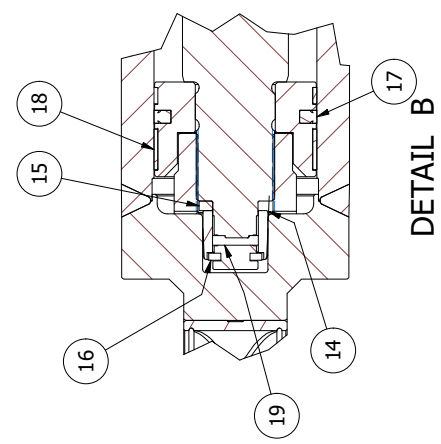
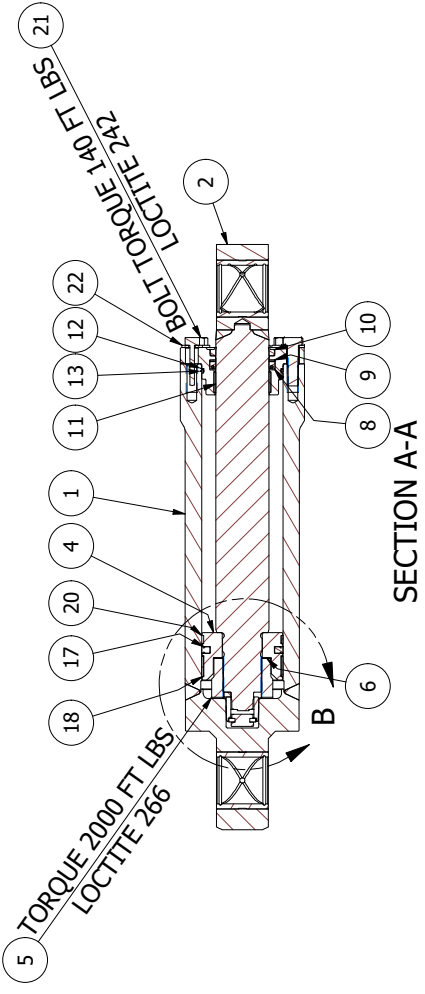
**Note: All fasteners are steel, and grade 8/10.9 minimum, unless explicitly noted.**

Item	Part No.	Description	Qty.
---	270C0105	HD Cylinder Assembly	---
1	370D0127	Cylinder Barrell Weldment	1
2	370B0118	Cylinder Rod Weldment	1
3	370C0104	Gland	1
4	370B0273	Piston	1
5	370B0110	Piston Nut	1
6	370A0074	Shim	1
7	371A0401	Counterbalance Valve Assembly	1
8	347A0383	Rod Seal c/w Energizer	1
9	347A0382	Back-Up Ring	1
10	347A0378	Rod Wiper	1
11	347A0181	Wear Ring	1
12	347A0183	Backup Ring	1
13	347A0182	O-Ring	1
14	370A0065	Ring, Cushion	1
15	370A0069	Ring Spacer	1
16	370A0068	Stopper	2
17	347A0352	Piston Seal	1
18	347A0353	Wear Ring	1
19	347A0180	Cushion Seal	1
20	347A0354	Wear Ring	1
21	---	HEX HD CAPSCREW M14 X 2.0 X 50	10
22	---	FLAT WASHER M14, HARD	10
23	50HP-6	Hex Socket Plug, -6 ORB	2
24	50HP-4	Hex Socket Plug, -4 ORB	1
25	372B0581	Cartridge Retainer	1
26	SHP.40694	HEX HD CAPSCREW M10 X 1.5 X 30	1
27	SHP.40223	FLAT WASHER M10	1
28	270A0114	Seal Kit, Includes Items 8-13, 17, 18, 20	1
29	270A0100	Fastener Kit	1

**Notes:**

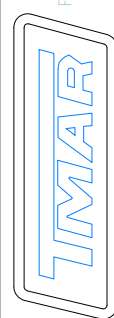
1. Exchange cylinders are available on a cost-of-repair basis.

1 2 3 4



DETAIL B  
SCALE 2 X BASE VIEW

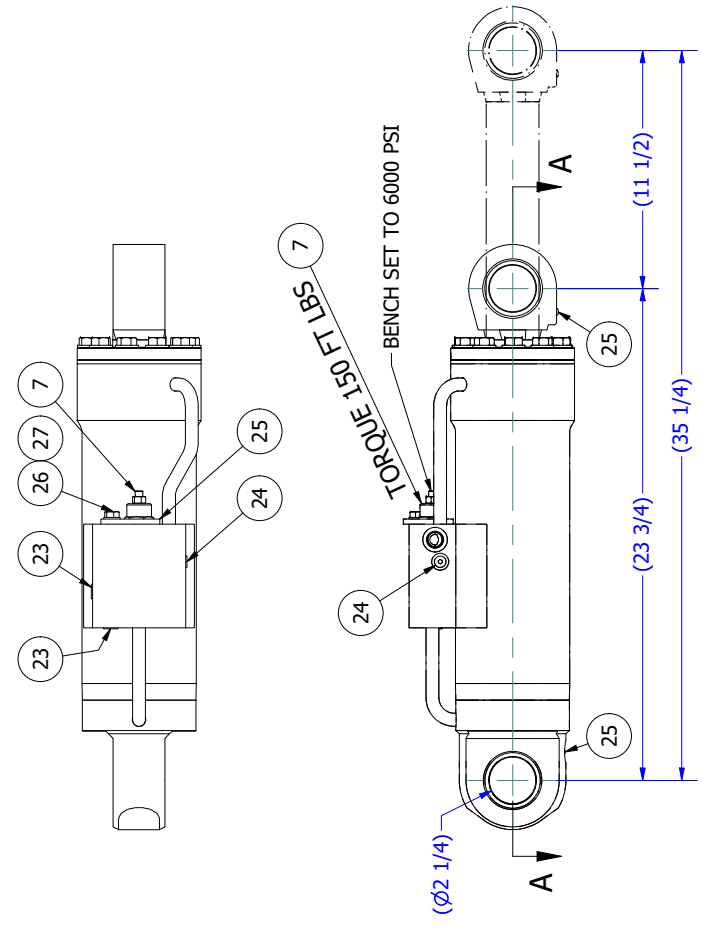
- CYLINDER SPECS:
- Barrel Bore: Ø100mm
  - Rod: Ø65mm
  - Retracted Length: 23 3/4 in
  - Stroke: 11 1/2 in
  - Maximum Operating Pressure: 5500 psi



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# Assembly, HD Cylinder

DRAWN BY: Eric Baikie		DATE: 2023/09/14	DWG NO:
REF: 670B0308		REV: D	270C0105



**Assembly, Swivel (HP)**

**Ref. No: 606B1314**

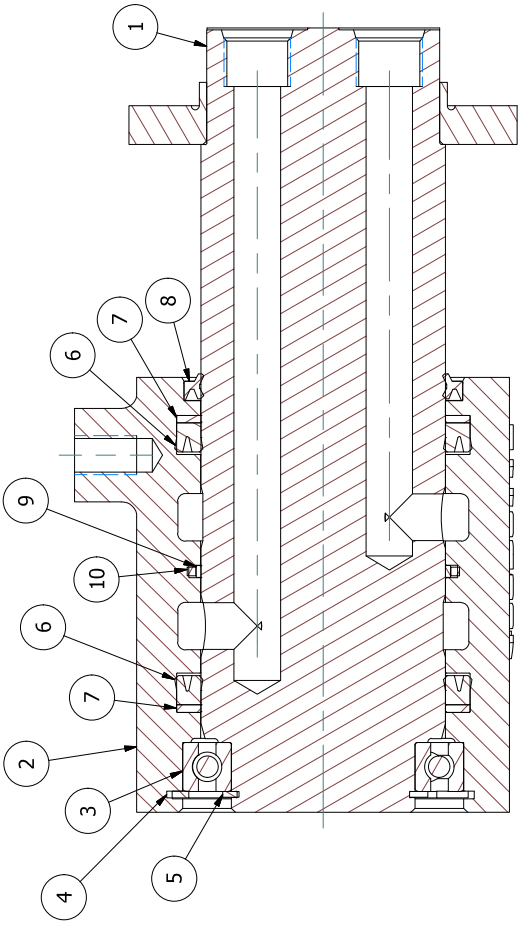
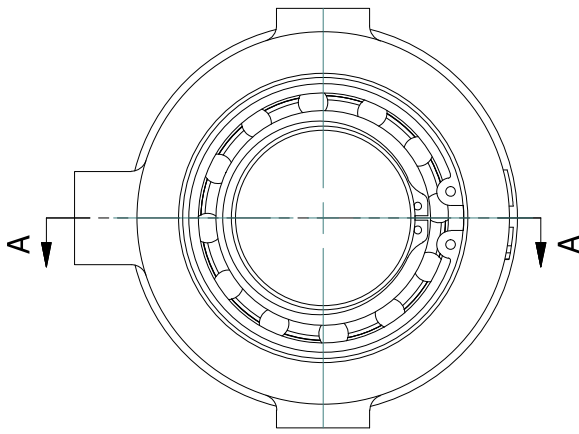
**Rev. 0**

<b>Ref.</b>	<b>Part No:</b>	<b>Rev.</b>	<b>Description</b>	<b>Qty.</b>
---	206B1204		Complete Assembly	---
1	306B0512		Swivel Core Weldment	1
2	306D0351		Housing, Swivel Outer	1
3	343A0015		Bearing	1
4	348A0023		Retaining Ring, Internal	1
5	348A0012		Retaining Ring, External	1
6	347A0013		Seal, U-Cup	2
7	347A0014		Backup Ring	2
8	347A0015		Wiper, Metal Clad	1
9	347A0188		Seal Ring, Carbon Teflon	1
10	347A0189		Seal, Square Ring	1
11	206A0658		Seal Kit (Includes Items 4-10)	1

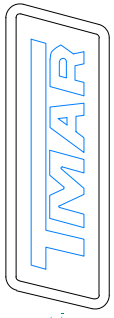
**Notes:**

- 1.) Exchange swivels are available on a cost-of-repair basis.
- 2.) Swivel core top ports: -12 ORB x 2.
- 3.) Swivel housing side ports: -10 ORB x 4.
- 4.) Mounting Hardware:
  - SHP.40738 (M14 X 2.0 X 50) x 4
  - SHP.40386 (M14 lock washer) x 4
  - GTSOR-10 #10 ORB O-rings x 4
  - GTSOR-12 #12 ORB O-rings x 2

1 2 3 4



SECTION A-A



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# Assembly, Swivel (HP), -10 Ports

DRAWN BY: Eric Baikie	DATE:	05/07/2018	DWG NO:  206B1204
	REF:	606B1314	

**Assembly, 60" Narrow Leg**

**Ref. No: 606B0959**

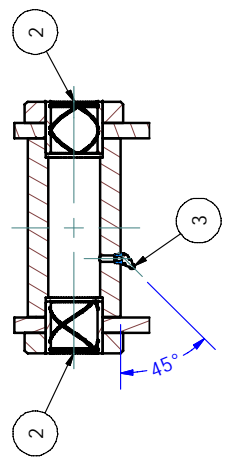
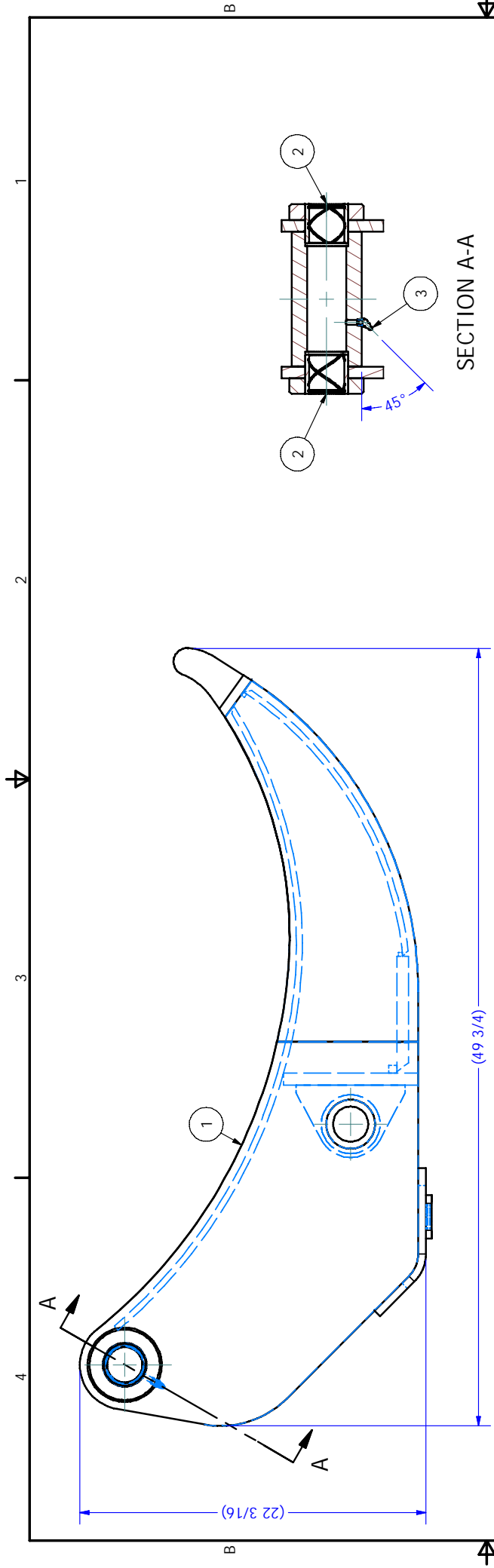
**Applicable Serial Numbers:** All Units

**Rev. A**

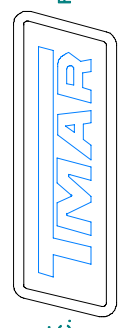
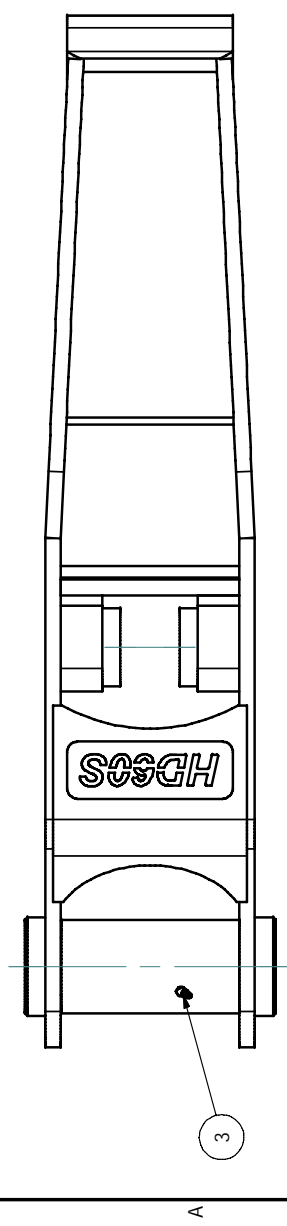
<b>Ref.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty.</b>
---	206B0717	Complete Assembly	---
1	306D0212	Narrow Leg Weldment	1
2	342A0025	Bushing	2
3	372A0074	Grease Fitting, 1/8 NPT, 45°	1

**Notes:**

1. Grapples with a serial number before 16666 use spacer 306A0196 between bushings



SECTION A-A



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Assembly, 60" Narrow Leg

REF:	606B0959	DATE:	2013/07/29	DWG NO:	206B0722
DRAWN BY:	Al Lee	REV:	A		

**Assembly, 60" Wide Leg**

**Ref. No: 606B0961**

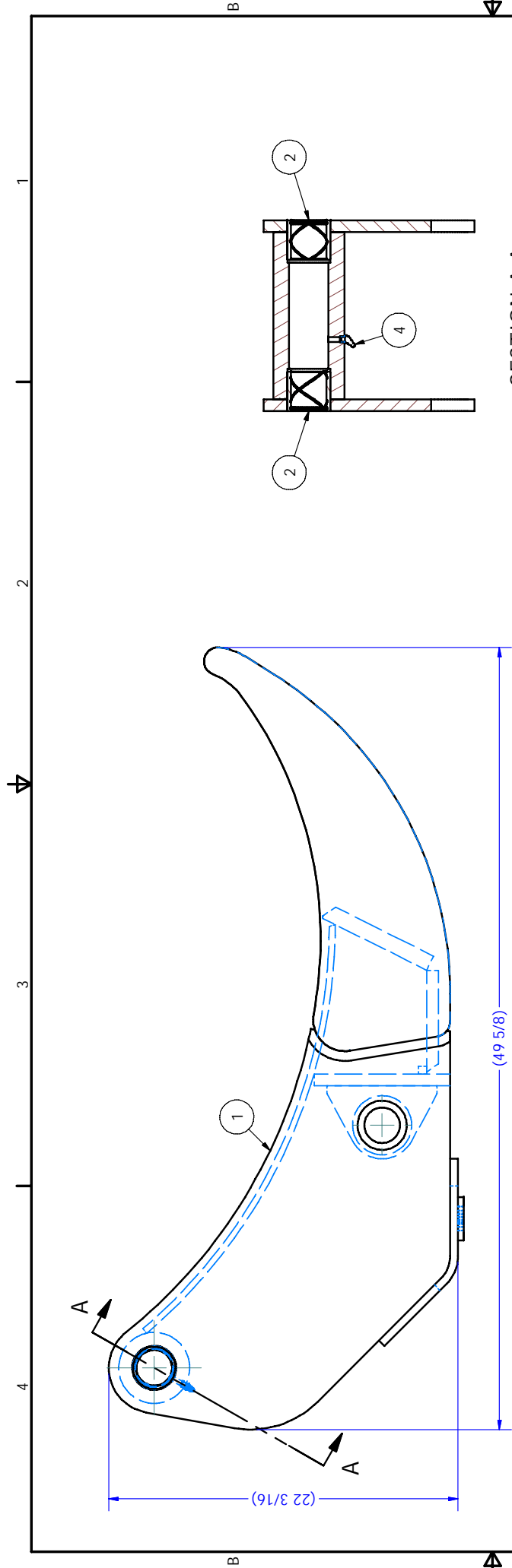
**Applicable Serial Numbers:** All Units

**Rev. A**

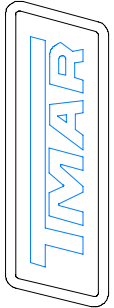
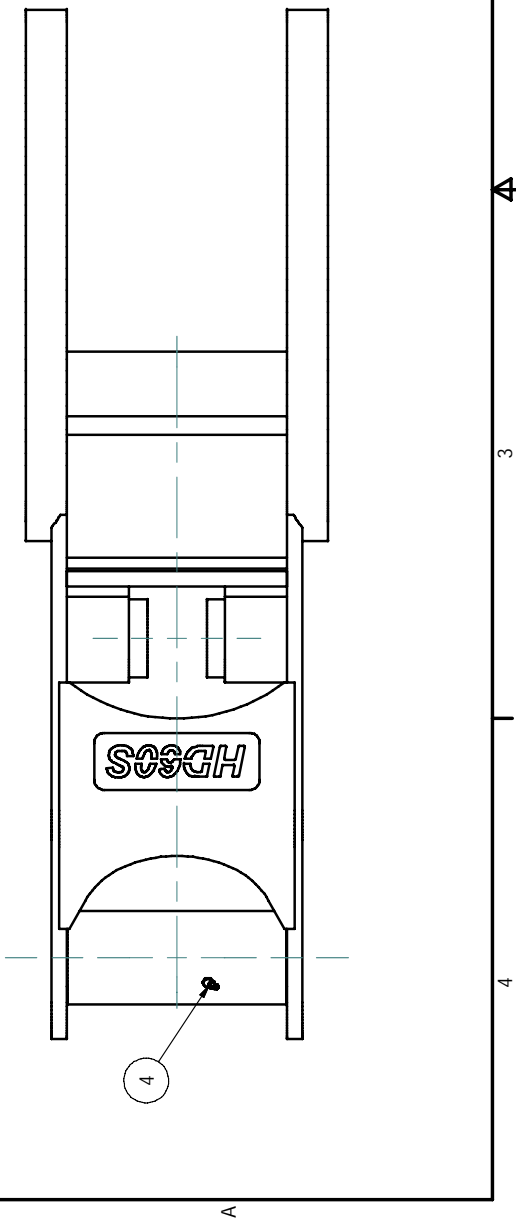
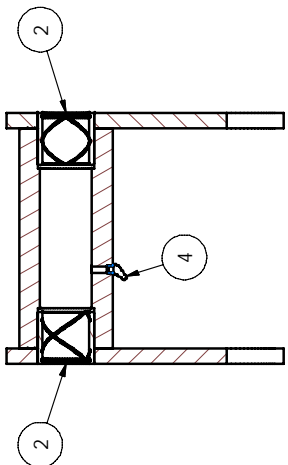
<b>Ref.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty.</b>
---	206B0717	Complete Assembly	---
1	306D0211	Wide Leg Weldment	1
2	342A0025	Bushing	2
3	372A0074	Grease Fitting, 1/8 NPT, 45°	1

**Notes:**

1. Grapples with a serial number before 16666 use spacer 306A0196 between bushings



SECTION A-A

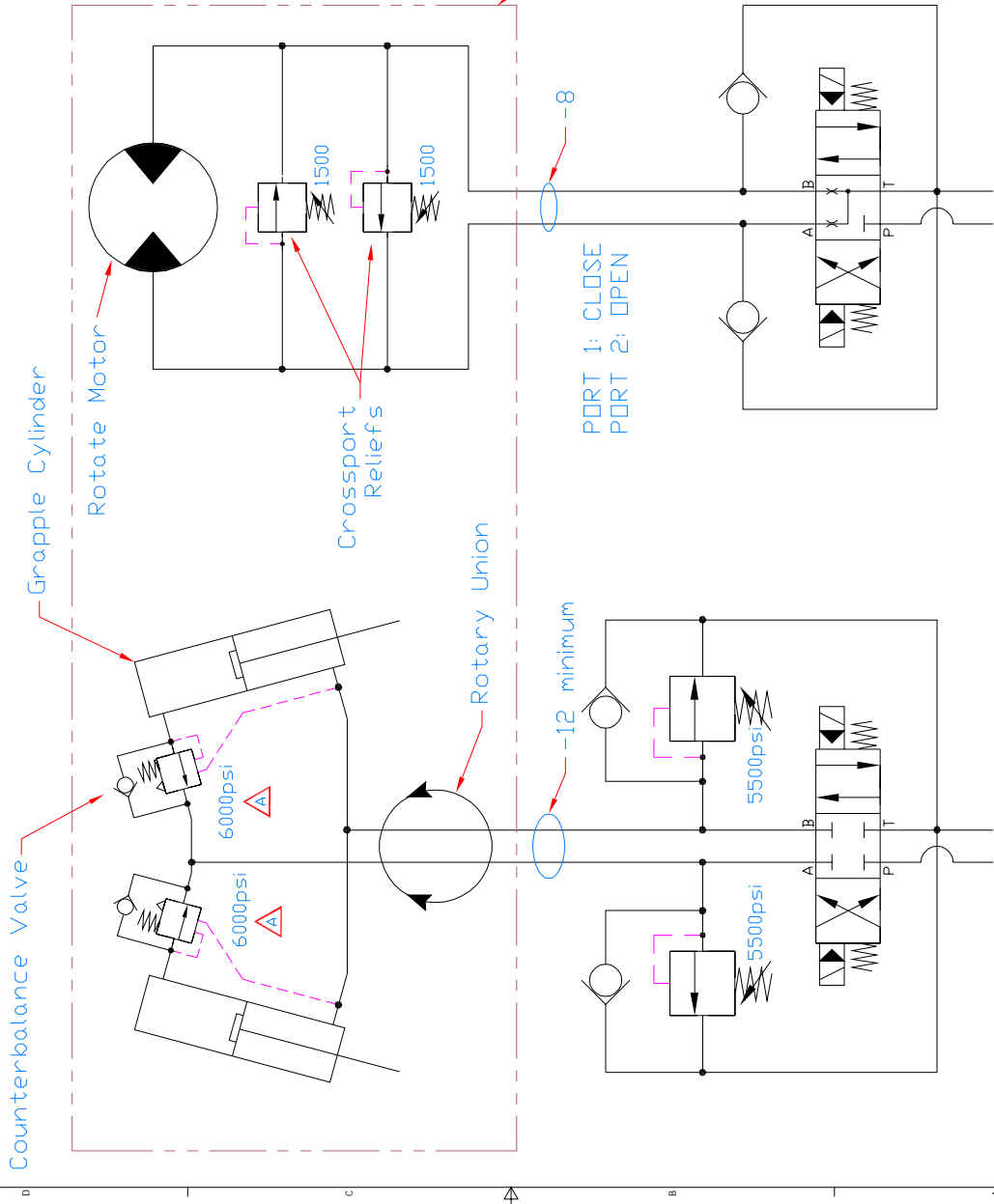


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Assembly, 60" Wide Leg

REF: 606B0961	DATE: 2013/07/29	DWG NO: 206B0717
REV: A		



Pressure and Flow Recommendations  
 Dual Cylinder Heavy Duty Grapples

- Open / Close Circuit  
 Maximum Recommended Flow - 60 GPM  
 Recommended System Pressure - 4000 PSI  
 Maximum System Pressure - 5000 PSI  
 Maximum Part Relief Setting - 5500 PSI  
 Minimum Piping Size - -12 (-16 Preferred)  
 Counterbalance Valve Setting - 6000PSI
- Grapple Rotate Circuit  
 Recommended Flow - 8-12 GPM, 12 GPM Max.  
 Recommended System Pressure - 1000 PSI  
 Maximum System Pressure - 1300 PSI  
 (Crossport Reliefs Factory Set at 1500 PSI)

Components Supplied as Part of the Grapple

Flow should be set to 37-60 GPM to achieve a closing time of 1.2-2.0 seconds. 50 GPM recommended.

TIMAR

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5791 Duncan Bay Rd.  
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DRAWN BY: A|Lee  
 DATE: 2015/03/26  
 REF: 606B1035

DWG NO: 506B0768  
 REV: A

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### Hydraulic Schematic, HD Grapple (HP)

Port Reliefs and Makeup Checks must be provided as noted.