

ELECTRIC TRACTOR DRIVE

MANUAL TC-680

Revised 8/01

INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS



READ THIS MANUAL BEFORE USING THESE PRODUCTS.

This manual contains important safety, installation, operation and maintenance information. Make this manual available to all persons responsible for the operation, installation and maintenance of these products.



FAILURE TO FOLLOW THESE PRECAUTIONS MAY RESULT IN DEATH, SEVERE INJURY OR PROPERTY DAMAGE:

I. SAFETY PRECAUTIONS:

THIS TRACTOR IS DESIGNED FOR SAFE OPERATION WITHIN THE LIMITS OF ITS DESIGN CAPACITY AND ADJUSTMENT RANGE. THE TRACTOR SHOULD BE OPERATED ONLY BY QUALIFIED PERSONNEL WHO HAVE BEEN TRAINED IN THE SAFE OPERATION OF THIS EQUIPMENT. LISTED BELOW ARE SOME SUGGESTED PRECAUTIONS:

1. DO NOT OPERATE THE UNIT WITH MALFUNCTIONING OR DAMAGED COMPONENTS.
2. DO NOT USE THE TRACTOR TO TRANSPORT HUMAN CARGO.
3. DO NOT TRANSPORT LOADS OVER PERSONNEL.
4. DO MAKE SURE THE SUPPORTING STRUCTURE IS SUITED FOR THE INTENDED LOADS.
5. DO NOT ATTEMPT TO MOVE MORE THAN THE RATED CAPACITY OF THE TRACTOR.
6. DO ALLOW ONLY QUALIFIED PERSONNEL TO OPERATE THIS EQUIPMENT.
7. DO AVOID JOGGING, QUICK REVERSING OR SWINGING OF THE LOAD.
8. DO NOT LEAVE A LOAD SUSPENDED IN THE AIR UNATTENDED.
9. LIMIT SWITCHES WHEN PROVIDED ARE EMERGENCY DEVICES AND ARE NOT INTENDED TO STOP THE TRACTOR IN NORMAL OPERATION.
10. DO ALWAYS DISCONNECT AND PROPERLY LOCKOUT THE POWER TO THE UNIT BEFORE SERVICING OR MAKING ADJUSTMENTS.
11. DO ALWAYS USE MANUFACTURERS REPLACEMENT PARTS WHEN REPAIR PARTS ARE NEEDED.
12. DO NOT OPERATE THE UNIT ON A BEAM FOR WHICH IT IS NOT INTENDED.
13. DO NOT USE THE TRACTOR IN A MANNER FOR WHICH IT WAS NOT INTENDED OR IN AN UNSAFE MANNER.

II. INSTALLATION INSTRUCTIONS

A. GENERAL INSTRUCTIONS:

1. THE POWER SUPPLY SHOULD BE WITHIN PLUS OR MINUS 10% OF THE VOLTAGE SPECIFIED.
2. SUPPORTING STRUCTURES AND ALL EQUIPMENT MUST BE CAPABLE OF SUPPORTING ALL LOADS INCLUDING EQUIPMENT WEIGHT AND RATED CAPACITY.
3. CHECK LUBRICATION LEVEL IN THE TRACTOR GEARBOX.
4. CHECK THE UNIT FOR SHIPPING DAMAGE.
5. READ AND UNDERSTAND THIS MANUAL PRIOR TO INSTALLATION.

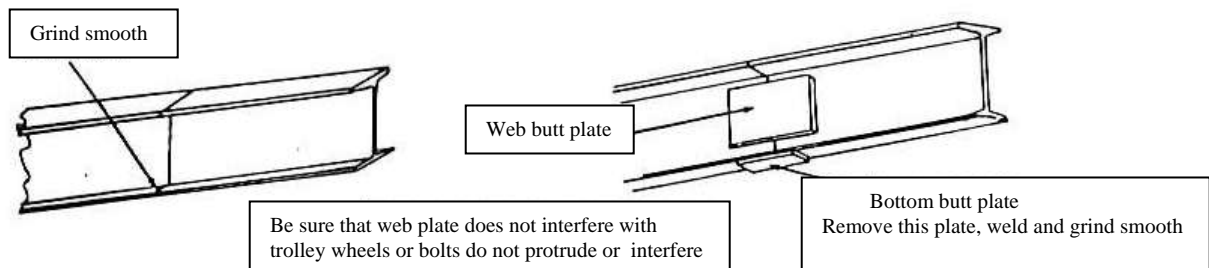
B. BEAM PREPARATION:

FOR PROPER OPERATION THE TROLLEY OR CRANE MUST MOVE FREELY ALONG THE ENTIRE LENGTH OF THE BEAM. THE BEAM RUNNING SURFACE MUST BE SMOOTH AND FREE OF DIRT OR OTHER OBSTRUCTIONS. CHECK EACH BEAM SPLICE TO INSURE THERE IS NO MISALIGNMENT. IF NECESSARY, REALIGN THE BEAMS AND GRIND THE SPLICE SMOOTH. IF WEB BUTT PLATES OR SPLICE PLATES ARE USED AT THE BEAM CONNECTIONS, CHECK TO BE SURE THEY WILL NOT INTERFERE WITH THE MOVEMENT OF THE CARRIER OR THE TRACTOR.

THE TRACTOR WILL NOT OPERATE PROPERLY IF BOTTOM BUTT PLATES ARE USED AT BEAM JOINTS. IF YOUR RUNWAY BEAM HAS THIS TYPE OF JOINT DO NOT ATTEMPT TO OPERATE THIS TRACTOR ON THIS BEAM. CONSULT A STRUCTURAL ENGINEER TO DETERMINE IF THE BOTTOM BUTT PLATES CAN BE REMOVED TO PROVIDE A SMOOTH OPERATING SURFACE FOR THE TRACTOR DRIVE WHEEL.

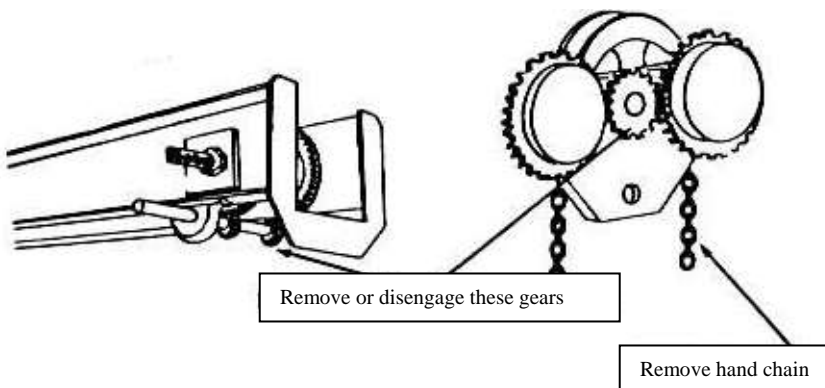


MAKE CERTAIN THE BEAM AND METAL TRACTOR WHEELS ARE FREE OF PAINT TO ASSURE AN ELECTRICAL GROUND PATH.



TROLLEY OR CRANE PREPARATION:

CHECK THE TROLLEY OR CRANE FOR FREE MOVEMENT ALONG THE ENTIRE LENGTH OF THE RUNWAY BEAM. IF THE CARRIER IS HAND GEARED, REMOVE THE DRIVE PINIONS AND HAND CHAIN FROM THE OLD DRIVE MECHANISM TO ALLOW THE CARRIER TO OPERATE AS A PLAIN PUSH-TYPE UNIT. CHECK AND RELUBRICATE THE CARRIER WHEEL BEARINGS AND BE CERTAIN THAT THEY OPERATE FREELY AND ARE IN GOOD CONDITION. FINALLY, CHECK THE TRAVEL OF THE CARRIER ALONG THE ENTIRE BEAM LENGTH, FIRST WITH NO LOAD AND THEN UNDER LOAD TO INSURE THE CARRIER WILL ROLL FREELY AND NOT INTERFERE WITH THE TRACTOR OPERATION.



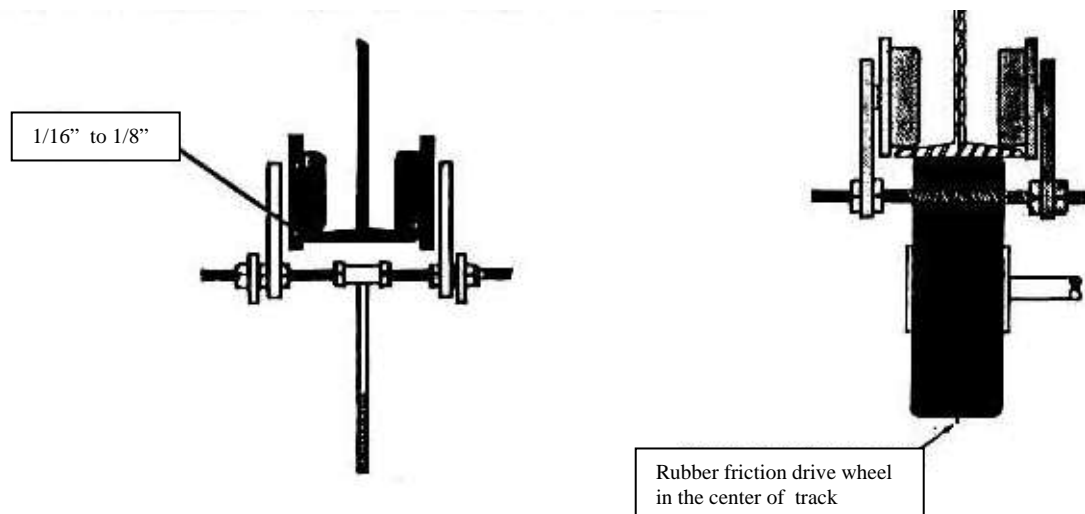
ADDITIONAL BEAM NOTES:

THE BEAM MUST BE FREE OF DIRT, OIL AND GREASE FOR THE TRACTOR TO OPERATE PROPERLY. THE STANDARD UNIT IS ADJUSTABLE FOR STANDARD I-BEAMS AND FLAT FLANGE BEAMS FROM 3.38" TO 8" WIDE. THE MAXIMUM FLANGE THICKNESS IS .62" FOR THE STANDARD UNIT. THE MINIMUM CURVE FOR THE STANDARD UNIT IS 36" RADIUS. FOR BEAMS OUTSIDE THIS ADJUSTMENT RANGE OR FOR PATENTED OR CUSTOM TRACK APPLICATIONS CONSULT THE FACTORY. DO NOT ATTEMPT TO OPERATE A STANDARD TRACTOR ON A BEAM FOR WHICH IT IS NOT DESIGNED.

C. TRACTOR INSTALLATION:

THE EASIEST INSTALLATION OF THE TRACTOR ONTO A BEAM IS TO SLIDE THE UNIT ONTO AN OPEN BEAM END. NOTE: BE SURE TO REINSTALL THE BEAM STOPS BEFORE OPERATING THE UNIT. IF AN OPEN BEAM END IS NOT AVAILABLE, THE UNIT CAN BE INSTALLED IN THE MIDDLE OF A BEAM BY REMOVING ONE OF THE TROLLEY SIDE PLATES AND REASSEMBLING THE UNIT ON THE BEAM.

REGARDLESS OF WHICH INSTALLATION METHOD IS TO BE USED, THE TRACTOR SHOULD BE ADJUSTED PRIOR TO BEING PLACED ON THE BEAM TO PROVIDE .062" TO .125" TOTAL CLEARANCE BETWEEN THE BEAM AND THE VERTICAL FLANGE OF THE WHEEL. THE UNIT SHOULD BE ADJUSTED TO POSITION THE DRIVE WHEEL IN THE CENTER OF THE BEAM. REMOVE THE TENSION SPRING FROM THE TENSIONER EYEBOLT TO ALLOW THE DRIVE WHEEL TO DROP BELOW THE BEAM. INSTALL THE UNIT ONTO THE BEAM AND REINSTALL THE TENSION SPRING. ADJUST THE SPRING UP UNTIL THE DRIVE WHEEL JUST CONTACTS THE BOTTOM OF THE RUNWAY BEAM. TIGHTEN THE TENSION SPRING NUT TWO (2) TURNS TO APPLY PRESSURE TO THE DRIVE WHEEL. OPERATE THE TRACTOR THE ENTIRE LENGTH OF THE BEAM WITH NO LOAD. AFTER CONNECTING THE CARRIER TO THE TRACTOR, AGAIN OPERATE THE TRACTOR AND UNLOADED CARRIER THE ENTIRE LENGTH OF THE BEAM. OPERATE THE TRACTOR WITH INCREASING LOADS UP TO THE CAPACITY OF THE CARRIER. IF NECESSARY, TIGHTEN THE TENSION SPRING TO APPLY MORE FORCE TO THE DRIVE WHEEL. DO NOT TIGHTEN THE SPRING ANY MORE THAN IS NECESSARY TO MOVE THE LOAD SMOOTHLY DOWN THE BEAM. OVER TIGHTENING THE TENSION SPRING WILL ONLY INCREASE THE LOAD ON THE DRIVE WHEEL AND TROLLEY AND ACCELERATE WEAR OF THESE COMPONENTS. SOME SLIPPAGE IS NORMAL AT START-UP, BUT THE DRIVE WHEEL SHOULD NOT SLIP AFTER THE UNIT IS ROLLING. CHECK ALL ADJUSTING NUTS TO INSURE THEY ARE TIGHT BEFORE PLACING THE UNIT INTO SERVICE.



D. CONNECTING THE CARRIER:

THE TRACTOR IS DESIGNED TO BE ATTACHED TO THE CARRIER WITH THE CLEVIS AND PIN SUPPLIED ON ONE END OF THE UNIT. POSITION THE TRACTOR ON THE BEAM WITH THE CLEVIS PIN NEXT TO THE CARRIER. INSTALL A CONNECTING BRACKET TO THE CARRIER SO A CONNECTING LINK CAN BE USED TO ATTACH THE CARRIER AND THE TRACTOR. AFTER INSTALLATION, OPERATE THE UNIT UNDER LOAD AND OBSERVE THE LINKAGE. IF THE CONNECTING BRACKET OR CONNECTING LINK FLEXES, INCREASE THE SIZE OF THESE MEMBERS. REPEATED FLEXING WILL FASTIGUE THESE PARTS AND CAUSE PREMATURE FAILURE.

E. ELECTRICAL CONNECTION:

THE TRACTOR IS SUPPLIED WITH A WIRING DIAGRAM IN THE CONTROL PANEL. REFER TO THIS DIAGRAM FOR ELECTRICAL CONNECTIONS. **WARNING:** ELECTRICAL HAZARD!!! USE PROPER LOCK-OUT/TAG-OUT PROCEDURES DURING INSTALLATION AND WHENEVER THIS USNIT IS SERVICED. VERIFY THAT ALL COMPONENTS ARE WIRED FOR YOUR INTENDED VOLTAGE. REFER TO MANUFACTURERS CONNECTION DIAGRAMS ON THE COMPONENTS FOR PROPER CONNECTIONS.

III. INSPECTION:

ADD THE TRACTOR TO THE INSPECTION LIST FOR THE HOIST. REFER TO THE ANSI B30.16 SPECIFICATION FOR INSPECTION AND RECORD KEEPING REQUIREMENTS. THE FOLLOWING ARE GENERAL INSPECTION GUIDELINES:

DAILY INSPECTION:

- a) INSPECT ALL CONTROLS FOR PROPER OPERATION.
- b) INSPECT ALL OPERATING MECHANISMS FOR PROPER OPERATION.

QUARTERLY INSPECTION:

- a) CHECK ALL ITEMS UNDER DAILY INSPECTION.
- b) CHECK FOR LOOSE BOLTS, NUTS AND SET SCREWS.
- c) INSPECT FOR WORN, DISTORTED, CORRODED OR DAMAGED PARTS.
- d) CHECK ELECTRICAL PARTS FOR EVIDENCE OF DETERIORATION OF CONTROLS, SWITCHES OR CONTROL PENDANTS.
- e) CHECK TRANSMISSION FLUID LEVEL.

ANNUAL INSPECTION:

- a) CHECK ALL ITEMS UNDER DAILY AND QUARTERLY INSPECTION.
- b) CHECK THE TROLLEY GEARBOX FOR EXCESSIVE BACKLASH IN THE WORM GEAR SET.
- c) INSPECT THE SUPPORTING STRUCTURE FOR CONTINUED ABILITY TO SUPPORT THE IMPOSED LOADS.

IV. MAINTENANCE:

A PREVENTIVE MAINTENANCE PROGRAM BASED ON THE FOLLOWING RECOMMENDATIONS SHOULD BE ESTABLISHED FOR THE TRACTOR. IT IS RECOMMENDED THAT RECORDS BE KEPT AND MADE AVAILABLE TO APPOINTED PERSONNEL.

NOTE: ONLY PARTS PURCHASED FROM THE MANUFACTURER SHOULD BE USED IN REPAIRING THIS EQUIPMENT.

A. MAINTENANCE PROCEDURE:

BEFORE ADJUSTMENT OR REPAIRS ARE BEGUN THE FOLLOWING PRECAUTIONS SHOULD BE TAKEN:

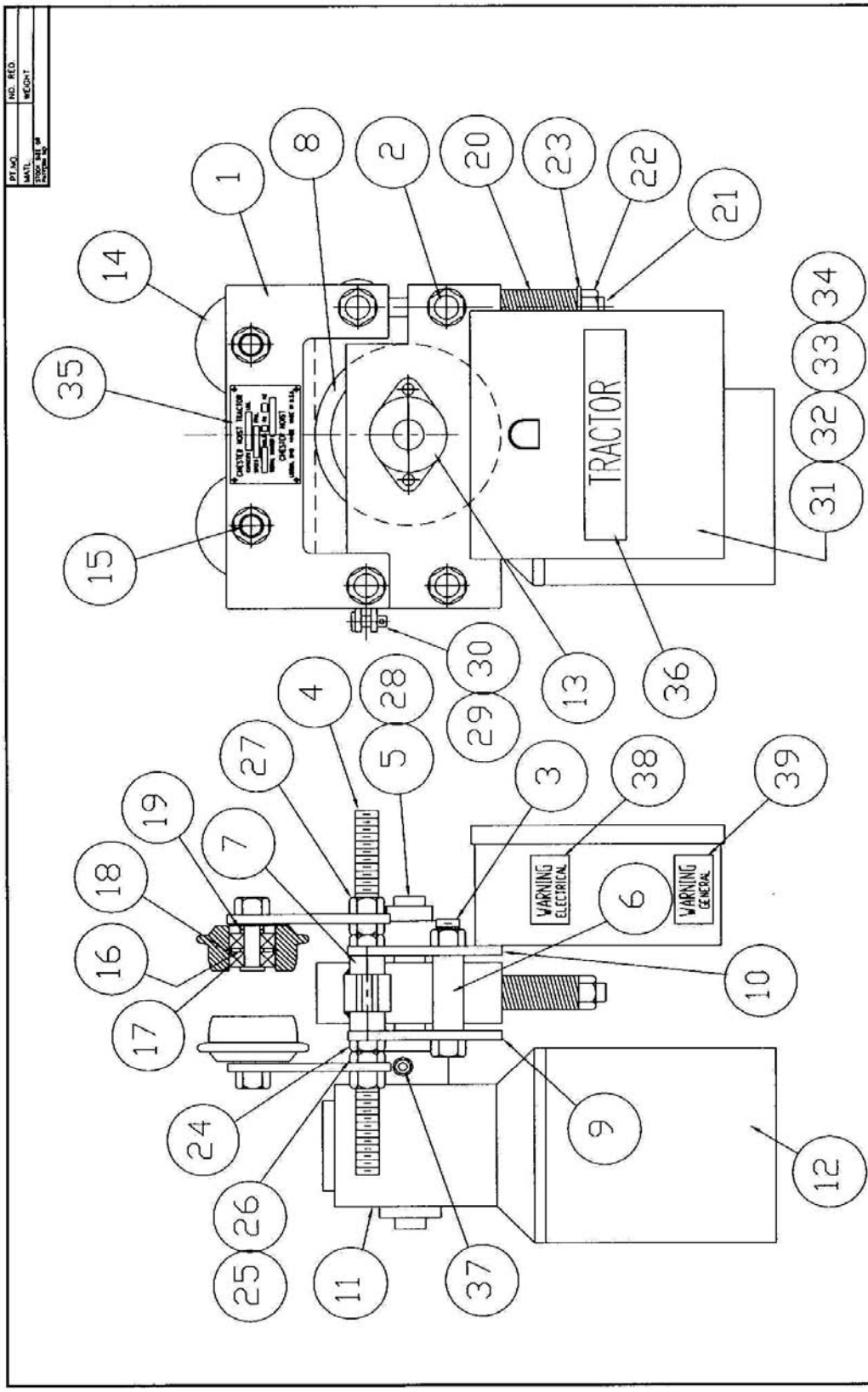
- 1. THE MAIN SWITCH ON THE LINE FEEDING THE TRACTOR SHOULD BE IN THE OPEN POSITION AND PROPERLY LOCKED-OUT/TAGGED-OUT.
- 2. WARNING AND "OUT OF ORDER" SIGNS SHOULD BE PLACED ON THE EQUIPMENT.
- 3. THE EQUIPMENT SHOULD BE LOCKED IN POSITION ON THE RUNWAY BEAM WITH NO LOAD BEING SUPPORTED TO AVOID INAVERTENT MOTION OF THE UNIT.
- 4. BEFORE PLACING THE EQUIPMENT BACK IN SERVICE, A DAILY INSPECTION SHOULD BE PERFORMED AS WELL AS A FUNCTIONAL TEST TO INSURE THE UNIT IS OPERATING PROPERLY.

- B. ADJUSTMENTS AND REPAIRS:
ANY UNSAFE CONDITIONS DISCLOSED BY INSPECTION SHOULD BE CORRECTED BEFORE OPERATION OF THE UNIT RESUMED. ADJUSTMENTS AND REPAIRS SHOULD BE PERFORMED ONLY BY QUALIFIED PERSONNEL. ADJUSTMENTS SHOULD BE MADE AFTER PARTS ARE REPLACED OR MALFUNCTIONS DETECTED TO INSURE PROPER OPERATION OF THE UNIT.
- C. REPAIRS OR REPLACEMENTS:
REPAIRS OR REPLACEMENTS SHOULD BE PROVIDED PROMPTLY AS NEED FOR PROPER OPERATION. THE FOLLOWING ARE EXAMPLES:
1. REPLACE ALL PARTS THAT ARE WORN EXCESSIVELY, CRACKED, DISTORTED OR BROKEN.
 2. REPLACE PITTED OR BURNED ELECTRICAL CONTACTS IN SETS ONLY.
 3. KEEP PUSHBUTTON CONTROL STATIONS CLEAN AND THE FUNCTION LABELS LEGIBLE.
 4. REPLACE MISSING OR ILLEGIBLE WARNING LABELS.
- D. LUBRICATION:
PROPER LUBRICATION IS ESSENTIAL FOR THE OPERATION OF THIS TRACTOR. THE FOLLOWING PARTS NEED TO BE LUBRICATED:
1. GEARBOX – SHOULD BE KEPT FULL TO THE LEVEL PLUG JUST BELOW THE TOP OF THE GEARBOX JUST BELOW THE WORM SHAFT BEARING CAP. THE VENT PLUG MUST BE INSTALLED IN THE FILLER HOLE IN THE TOP OF THE GEARBOX NEXT TO THE BEARING CAP. USE MOBILGEAR #634 OR EQUIVALENT. GEARBOX CAPACITY IS 16 FL. OZ. AND SHOULD BE CHANGED ANNUALLY OR MORE FREQUENTLY FOR HARD USE.
 2. DRIVE SHAFT BEARING – THIS BEARING IS PROVIDED WITH A GREASE FITTING FOR EASY LUBRICATION. RELUBRICATE THIS BEARING QUARTERLY WITH A NLGI NO. 2 GREASE.
 3. TROLLEY WHEEL BEARINGS – THESE BEARINGS ARE SEALED AND PERMANENTLY LUBRICATED AND NORMALLY REQUIRE NO FURTHER LUBRICATION. HOWEVER, IF DESIRED, THE BEARINGS CAN BE RELUBRICATED BY REMOVING THE BEARINGS AND ONE SEAL AND RELUBRICATING WITH A NLGI NO. 2 GREASE.
- V. FUNCTIONAL TESTING:
AFTER THE UNIT HAS BEEN REPAIRED OR ADJUSTED, THE SYSTEM SHOULD BE OPERATED TO INSURE THE PROPER FUNCTION OF ALL CONTROLS AND OPERATING MECHANISMS. THIS TEST SHOULD BE PERFORMED UNDER UNLOADED AND LOADED CONDITIONS. THE EQUIPMENT SHOULD NOT BE RETURNED TO SERVICE UNTIL THIS TEST HAS BEEN PERFORMED BY A QUALIFIED PERSON.
- VI. ILLUSTRATED PARTS LIST:
- GENERAL: THE ILLUSTRATED PARTS LIST ATTACHED IS INTENDED TO HELP YOU IDENTIFY REPLACEMENT PARTS FOR YOUR TRACTOR DRIVE UNIT. IF ASSISTANCE IS REQUIRED IN THE USE OF THIS MANUAL, PLEASE CONTACT THE FACTORY.
- HOW TO USE THIS PARTS LIST: TO IDENTIFY A PART FROM YOUR TRACTOR, LOCATE THE PART ON THE ILLUSTRATION FOR THE AFFECTED SECTION OF THE UNIT. AN ARROW WILL POINT TO THE PART WITH AN ITEM NUMBER. THIS ITEM NUMBER WILL CORRESPOND TO A PART DESCRIPTION, PART NUMBER AND QUANTITY REQUIRED ON THE PARTS LIST.

WHEN ORDERING PARTS, PLEASE PROVIDE THE FOLLOWING INFORMATION:

1. SERIAL NUMBER AND MODEL NUMBER OF THE TRACTOR
2. YOUR POWER SUPPLY (VOLTAGE, PHASE AND CYCLES.
3. PART NUMBER, PART NAME AND NUMBER REQUIRED.

NOTE: AUTHORIZATION FOR RETURN MUST BE RECEIVED FROM CHESTER HOIST BEFORE RETURNING ANY EQUIPMENT FOR INSPECTION OR WARRANTY REPAIR.



TRACTOR PARTS LIST

QTY	ANS	TR	CA	AP
SCALE	HOME	DATE	5-23-96	
REV	REV	REV		

Dwg. No. C-38549

REV	DESCRIPTION	DATE
1	ADDED ITEM 39	8-11-96
	REVISIONS	

TOL. +/- 1/64" ON FRACTIONAL DIM.

CHESTER HOIST - P.O. BOX 449 - LISBON, OHIO 44432 - PH: 330-424-7248

TRACTOR PARTS LIST

Use With Drawing C-38549

<u>Item</u>	<u>Part Number</u>	<u>Description</u>	<u>Qty</u>
1	C-38255	Trolley side plate	2
2	C-38257	Tensioner cross piece	1
3	15-.75-4.0	Drive assembly separator bolt	1
4	C-38259	Trolley separator stud	2
5	C-41220	Drive wheel axle	1
6	C-38262	Drive assembly pipe spacer	1
7	C-38263	Pipe spacer with tongue	1
8	C-38264	Drive wheel	1
9	C-38256-1	Drive side frame plate	1
10	C-38256-2	Control side frame plate	1
11	AD965	Gearbox (50:1) (55 FPM)	*
11	AD964	Gearbox (40:1) (70 & 35 FPM)	*
11	AD962	Gearbox (25:1) (105 FPM)	*
12	863K2069	Motor (1/2 HP @ 1800) (105,70,55 FPM)	*
12	863K2040	Motor (1/4 HP @ 900) (35 FPM)	*
13	GVFTD-1	Drive axle bearing	1
14	C-37000-1	Trolley wheel	4
15	C-9110-0025	Trolley axle	4
16	C-23854-R1	Bearing spacer	4
17	C-9107-005	Trolley wheel bearing	8
18	N5000-137	Wheel snap ring	4
19	C-9303-0025	Wheel spacer	20
20	AD-905	Tensioner spring	1
21	AD-906	Tensioner eyebolt	1
22	83-.62-2	.62 nylok full nut for eyebolt	1
23	3-.62	.62 flat washer for eyebolt	1
24	108-.75-2	.75 nylok jam nut for frame	2
25	H-4142	.75 internal tooth lock washer	13
26	97-.75-2	.75 jam nut for trolley adjustment	7
27	71-.75-2	.75 full nut for trolley adjustment	4
28	H-4261C	Drive axle key (.25 x .25 x 2.0)	2
29	AD-907	.37 x 1.0 clevis pin	1
30	135-.15-1.0	.15 x 1.0 cotter pin for clevis pin	1
31	as required	Trolley control (less mtg. bkt.)	1
32	15-.25-.62	.25 x .62 control mounting bolt	2
33	1-.25	.25 control mounting lockwasher	2
34	71-.25-2	.25 control mounting nut	2
35	C-38459	Serial number tag	1
36	AD-854-S	Chester Hoist label	1
37	672-.25-.375	.25 x .375 socket hd. 1/2 dog set screw	2
38	EW-1	Electrical hazard warning label	1
39	C-38846	General warning label	1
	Gearbox lubricant	Mobilgear 634 or equivalent	16 oz.

*Select Motor and Gearbox to suit proper speed
Always Specify Tractor Serial Number When Ordering Parts.

TROLLEY TRANSMISSION ASSY- FRONT VIEW

ASSEMBLY NUMBER AD-965 50:1 RATIO

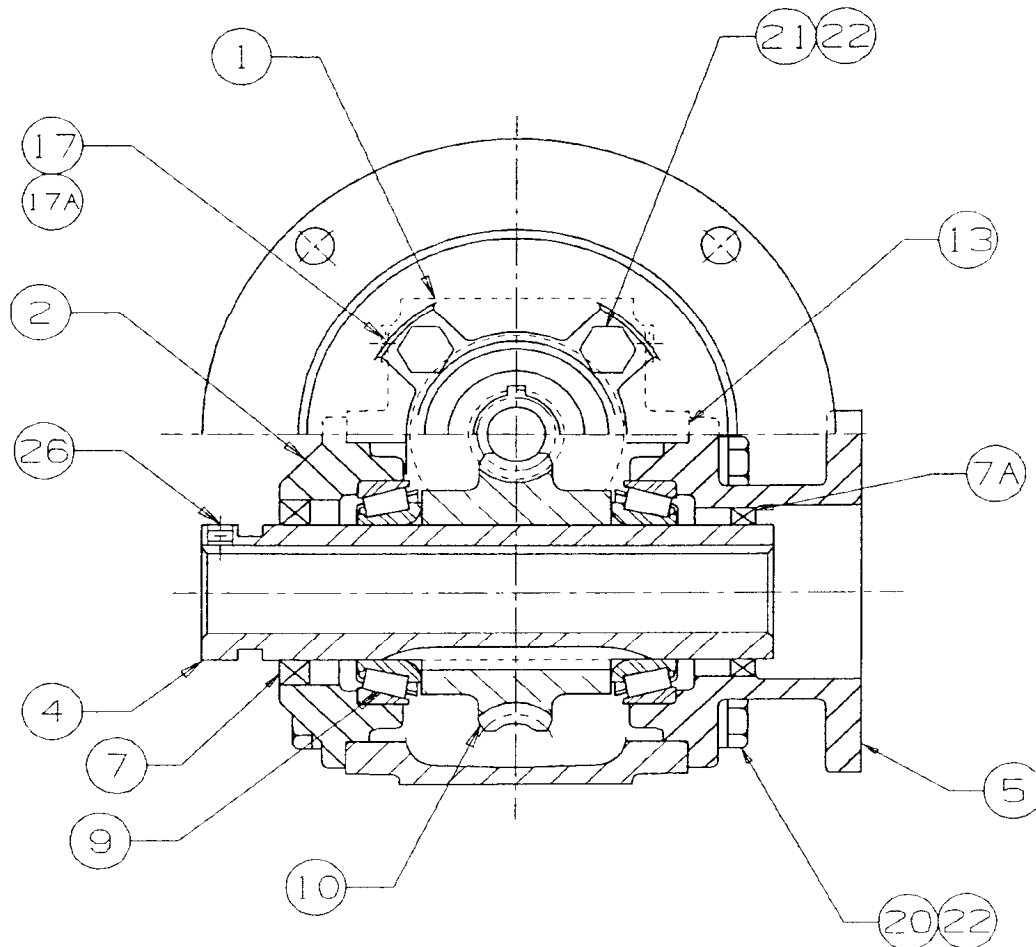


FIG.NO. DESCRIPTION

1	HOUSING
2	SLOW SPEED COVER
4	SLOW SPEED SHAFT
5	SLOW SPEED COVER AND FLANGE
7	SLOW SPEED OIL SEAL
7A	SLOW SPEED OIL SEAL
9	SLOW SPEED BEARING (CUP AND CONE)
10	SLOW SPEED WORM GEAR
13	SLOW SPEED GASKET
17	1/8 PIPE PLUG WITH VENT
17A	VENT PIN
20	5/16-18 X 7/8" LG. HHCS
21	5/16-18 X 1 1/4" LG. HHCS
22	5/16" LOCK WASHER
26	SET SCREWS

QTY.

PART#

1	AD965-1
1	AD965-2
1	AD965-4
1	AD965-5
1	AD965-7
1	AD965-7A
2	AD965-9
1	AD965-10
2	AD965-13
1	AD965-17
1	AD965-17A
8	AD965-20
4	AD965-21
12	AD965-22
2	AD965-26

TROLLEY TRANSMISSION ASSY- RIGHT VIEW

ASSEMBLY NUMBER AD-965 50:1 RATIO

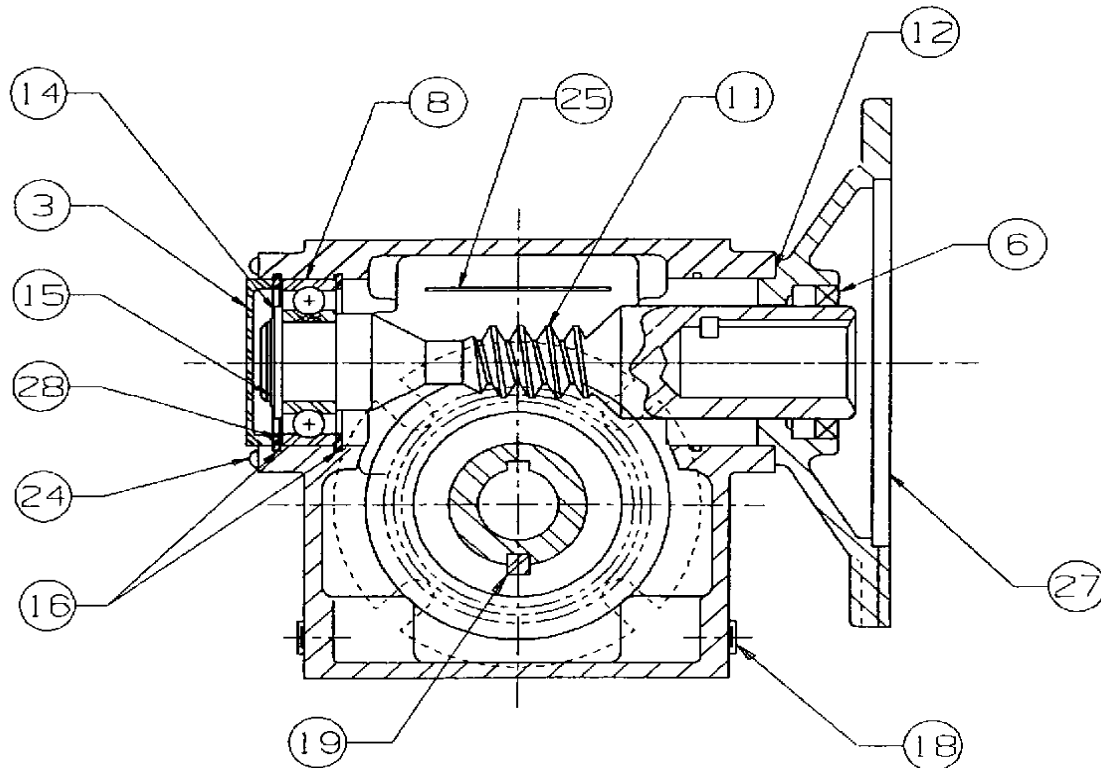


FIG.NO.	DESCRIPTION	QTY.	PART#
3	HOUSING PLUG	1	AD965-3
6	HIGH SPEED OIL SEAL	1	AD965-6
8	HIGH SPEED BEARING	1	AD965-8
11	HIGH SPEED WORM ON SHAFT	1	AD965-11
12	HIGH SPEED GASKET	1	AD965-12
14	HIGH SPEED SPACER	1	AD965-14
15	HIGH SPEED RING	1	AD965-15
16	HIGH SPEED RET. RING	2	AD965-16
18	1/8 PIPE PLUG	5	AD965-18
19	SLOW SPEED KEY	1	AD965-19
24	5/16-18 BUTTON PLUG	4	AD965-24
25	VENT SHIELD	1	AD965-25
27	MOTOR ADAPTER 56C	1	AD965-27
28	SHIM H.S. 1.50 X 2.03 X .001THK.	1	AD965-28A
	SHIM H.S. 1.50 X 2.03 X .002THK.	1	AD965-28B
	SHIM H.S. 1.50 X 2.03 X .005THK.	1	AD965-28C
	SHIM H.S. 1.50 X 2.03 X .010THK.	1	AD965-28D

TROLLEY TRANSMISSION ASSY- FRONT VIEW

ASSEMBLY NUMBER AD-964 40:1 RATIO

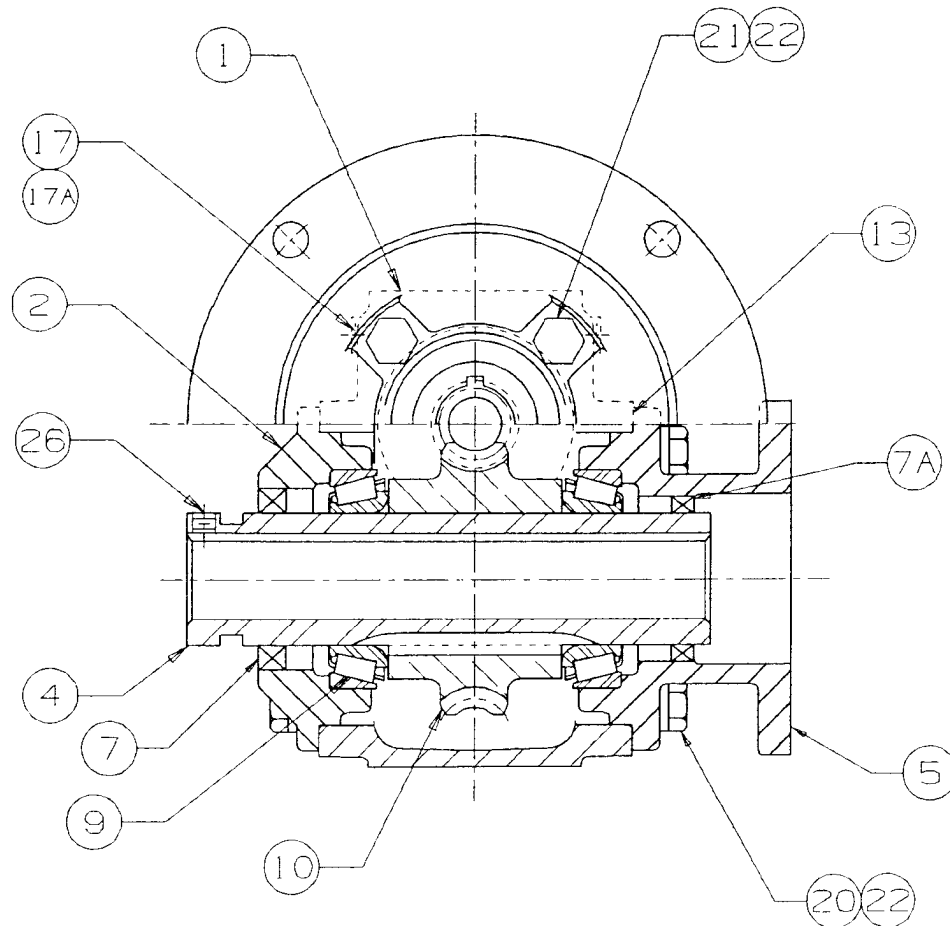


FIG.NO. DESCRIPTION

1	HOUSING
2	SLOW SPEED COVER
4	SLOW SPEED SHAFT
5	SLOW SPEED COVER AND FLANGE
7	SLOW SPEED OIL SEAL
7A	SLOW SPEED OIL SEAL
9	SLOW SPEED BEARING (CUP AND CONE)
10	SLOW SPEED WORM GEAR
13	SLOW SPEED GASKET
17	1/8 PIPE PLUG WITH VENT
17A	VENT PIN
20	5/16-18 X 7/8" LG. HHCS
21	5/16-18 X 1 1/4" LG. HHCS
22	5/16" LOCK WASHER
26	SET SCREWS

QTY.

PART#

1	AD964-1
1	AD964-2
1	AD964-4
1	AD964-5
1	AD964-7
1	AD964-7A
2	AD964-9
1	AD964-10
2	AD964-13
1	AD964-17
1	AD964-17A
8	AD964-20
4	AD964-21
12	AD964-22
2	AD964-26

TROLLEY TRANSMISSION ASSY- RIGHT VIEW

ASSEMBLY NUMBER AD-964 40:1 RATIO

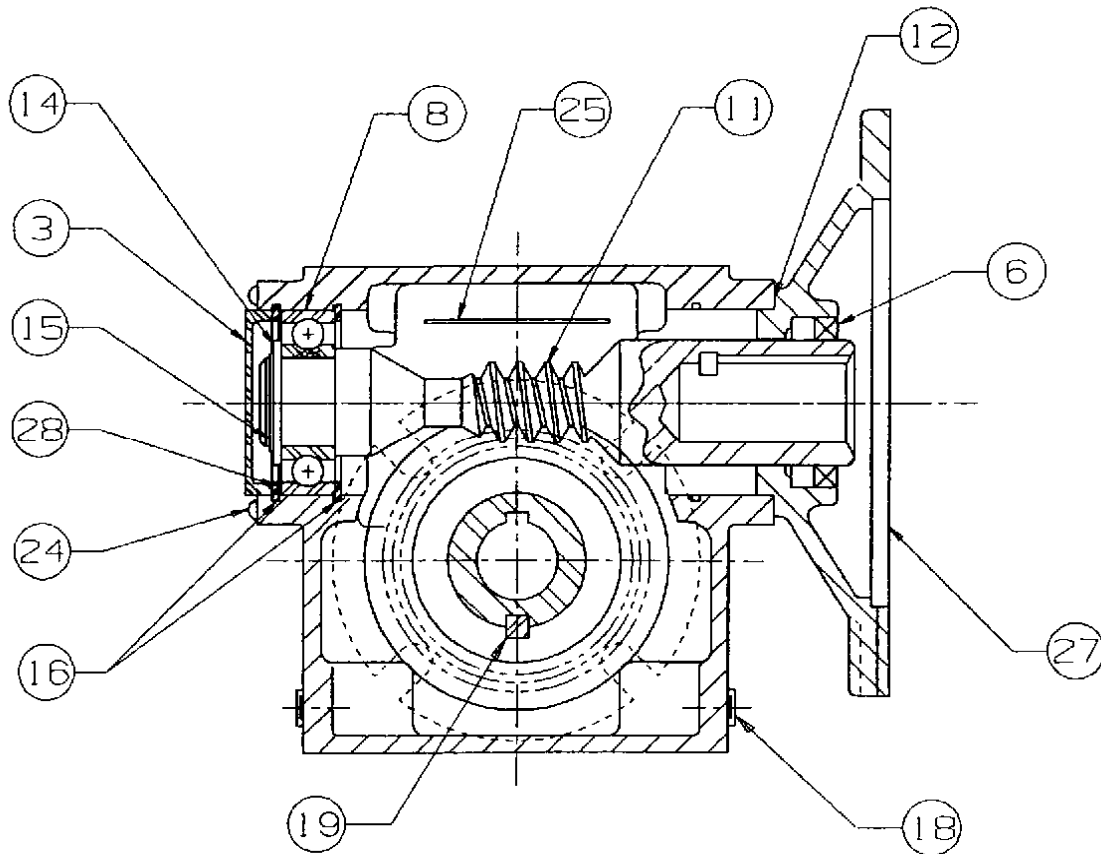


FIG.NO.	DESCRIPTION	QTY.	PART#
3	HOUSING PLUG	1	AD964-3
6	HIGH SPEED OIL SEAL	1	AD964-6
8	HIGH SPEED BEARING	1	AD964-8
11	HIGH SPEED WORM ON SHAFT	1	AD964-11
12	HIGH SPEED GASKET	1	AD964-12
14	HIGH SPEED SPACER	1	AD964-14
15	HIGH SPEED RING	1	AD964-15
16	HIGH SPEED RET. RING	2	AD964-16
18	1/8 PIPE PLUG	5	AD964-18
19	SLOW SPEED KEY	1	AD964-19
24	5/16-18 BUTTON PLUG	4	AD964-24
25	VENT SHIELD	1	AD964-25
27	MOTOR ADAPTER 56C	1	AD964-27
28	SHIM H.S. 1.50 X 2.03 X .001THK.	1	AD964-28A
	SHIM H.S. 1.50 X 2.03 X .002THK.	1	AD964-28B
	SHIM H.S. 1.50 X 2.03 X .005THK.	1	AD964-28C
	SHIM H.S. 1.50 X 2.03 X .010THK.	1	AD964-28D

TROLLEY TRANSMISSION ASSY- FRONT VIEW

ASSEMBLY NUMBER AD-962 25:1 RATIO

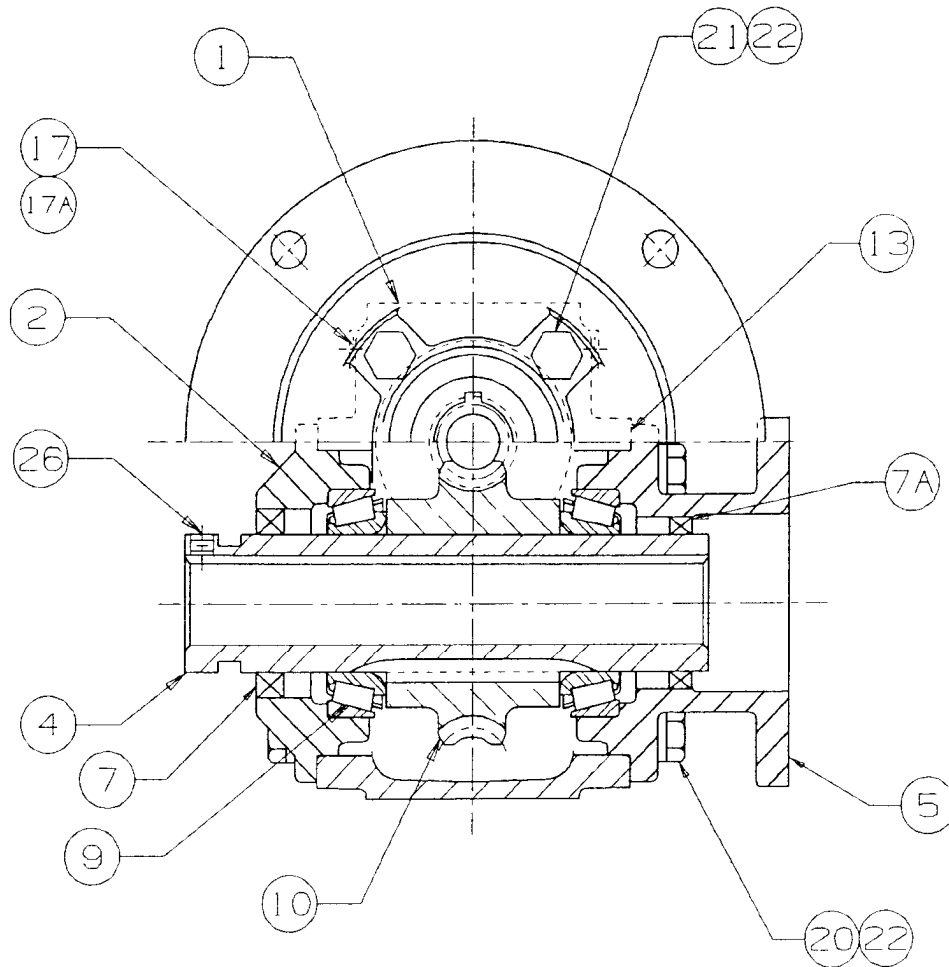


FIG. NO.	DESCRIPTION	QTY.	PART#
1	HOUSING	1	AD962-1
2	SLOW SPEED COVER	1	AD962-2
4	SLOW SPEED SHAFT	1	AD962-4
5	SLOW SPEED COVER AND FLANGE	1	AD962-5
7	SLOW SPEED OIL SEAL	1	AD962-7
7A	SLOW SPEED OIL SEAL	1	AD962-7A
9	SLOW SPEED BEARING (CUP AND CONE)	2	AD962-9
10	SLOW SPEED WORM GEAR	1	AD962-10
13	SLOW SPEED GASKET	2	AD962-13
17	1/8 PIPE PLUG WITH VENT	1	AD962-17
17A	VENT PIN	1	AD962-17A
20	5/16-18 X 7/8" LG. HHCS	8	AD962-20
21	5/16-18 X 1 1/4" LG. HHCS	4	AD962-21
22	5/16" LOCK WASHER	12	AD962-22
26	SET SCREWS	2	AD962-26

TROLLEY TRANSMISSION ASSY- RIGHT VIEW ASSEMBLY NUMBER AD-962 25:1 RATIO

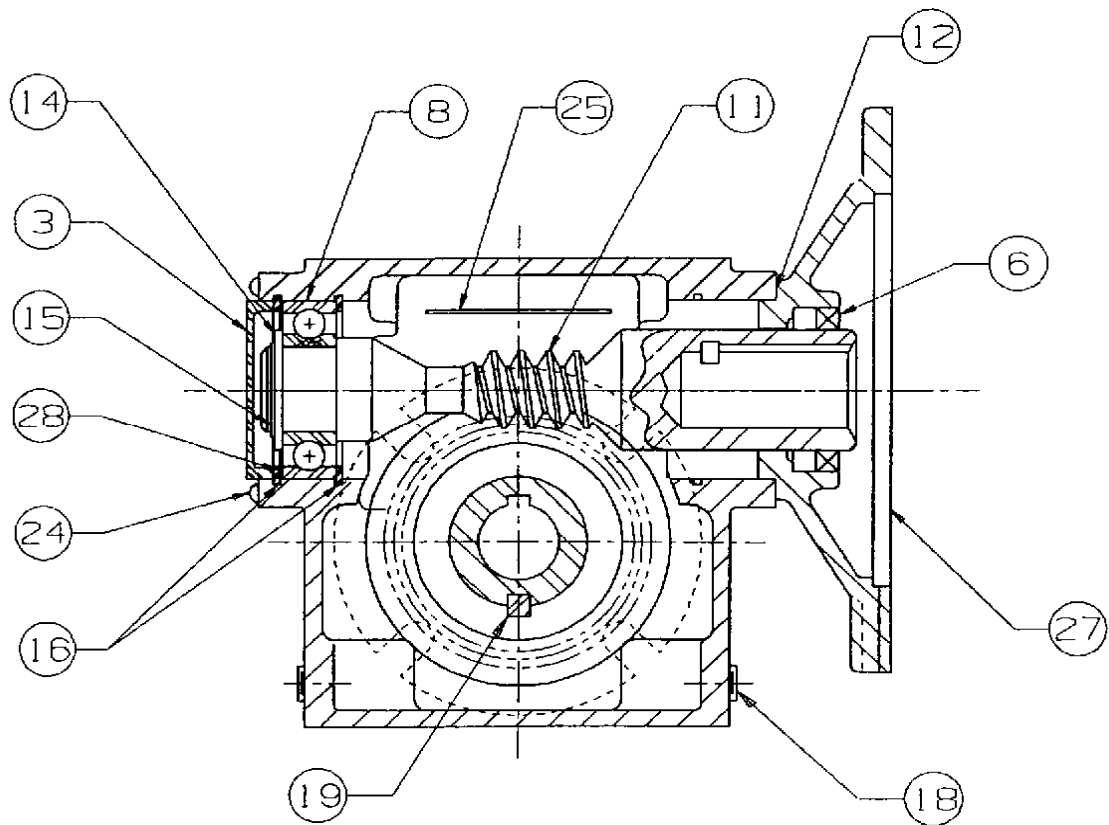


FIG. NO. DESCRIPTION

3	HOUSING PLUG
6	HIGH SPEED OIL SEAL
8	HIGH SPEED BEARING
11	HIGH SPEED WORM ON SHAFT
12	HIGH SPEED GASKET
14	HIGH SPEED SPACER
15	HIGH SPEED RING
16	HIGH SPEED RET. RING
18	1/8 PIPE PLUG
19	SLOW SPEED KEY
24	5/16-18 BUTTON PLUG
25	VENT SHIELD
27	MOTOR ADAPTER 56C
28	SHIM H.S. 1.50 X 2.03 X .001THK.
	SHIM H.S. 1.50 X 2.03 X .002THK.
	SHIM H.S. 1.50 X 2.03 X .005THK.
	SHIM H.S. 1.50 X 2.03 X .010THK.

QTY.

PART#

1	AD962-3
1	AD962-6
1	AD962-8
1	AD962-11
1	AD962-12
1	AD962-14
1	AD962-15
2	AD962-16
5	AD962-18
1	AD962-19
4	AD962-24
1	AD962-25
1	AD962-27
1	AD962-28A
1	AD962-28B
1	AD962-28C
1	AD962-28D



THIS EQUIPMENT IS INTENDED FOR INDUSTRIAL USE ONLY AND IS NOT INTENDED FOR TRANSPORTING HUMAN CARGO OR FOR TRANSPORTING MOLTEN METAL.



USE OF REPLACEMENT PARTS OTHER THAN SUPPLIED BY THE MANUFACTURER MAY LEAD TO DANGEROUS OPERATION. ACCORDINGLY, THE MANUFACTURER CANNOT BE RESPONSIBLE IN SUCH CASES AND OUR WARRANTY WILL BE VOIDED.

WARRANTY

All goods sold by SELLER hereunder are sold with only the following warranty: SELLER warrants that the goods shall be free from defects in material and workmanship under normal use and service. SELLER'S obligation under this warranty is limited to reworking or replacing at its option, any goods, which, within the time stated herein, shall be returned to it at its place of business at the address set forth herein with two-way packaging and shipping costs prepaid, and which upon examination and determination by SELLER, shall be found to have been thus defective. The rework, repair or replacement of defective goods under this warranty will be made without charge for material or labor. This warranty shall remain in force and be valid on goods manufactured by SELLER, or manufactured by others to SELLER'S detailed design for 12 months from the date of shipment by SELLER to BUYER. THE WARRANTY PROVIDED IN THIS ARTICLE 1, THE OBLIGATIONS AND LIABILITIES OF SELLER HEREUNDER AND THE RIGHTS AND REMEDIES OF BUYER HEREUNDER ARE EXCLUSIVE AND IN SUBSTITUTION FOR, AND BUYER HEREBY WAIVES, ALL OTHER WARRANTIES, GUARANTEES, OBLIGATIONS, LIABILITIES, RIGHTS AND REMEDIES, EXPRESSED OR IMPLIED, ARISING BY LAW OR OTHERWISE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OR MERCHANTABILITY, ANY IMPLIED WARRANTY ARISING FROM COURSE OR PERFORMANCE, COURSE OF DEALING OR USAGE OF TRADE, ANY IMPLIED WARRANTY OF FITNESS AND ANY OBLIGATION OR LIABILITY OF SELLER ARISING FROM TORT, OF FOR LOSS OF USE, REVENUE OR PROFIT, OR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. SELLER SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR MORE THAN THE REPLACEMENT OR REFUND OF THE PURCHASE PRICE ON DEFECTIVE GOODS. Goods, which are allegedly defective, may not be returned to SELLER without prior written approval of SELLER. SELLER, at its option, may first request samples for inspection purposes. The provisions of this warranty shall not apply to, nor is any other warranty given on, goods which have not been used or maintained in accordance with SELLER'S instructions or which have been subject to misuse, negligence or accident or which have been repaired, altered or modified in any way by anyone other than the SELLER. SELLER makes no warranty, expressed or implied (including without limiting the generality of the foregoing, any warranties of merchantability or fitness) with respect to any (accessory) goods not manufactured by SELLER. With respect to any such goods sold by SELLER to BUYER hereunder, including purchased goods incorporated in goods manufactured by SELLER, BUYER agrees to look solely to the manufacture of such goods for any warranty. BUYER waives all claims other than claims based on SELLER'S expressed warranty or the added cost of replacement due to SELLER'S failure to deliver the goods purchased hereunder. Such waived claims shall include but not be limited to claims based on strict tort liability and other economic losses such as loss of profits, loss of business opportunity and loss of goodwill. Upon request, SELLER will furnish such technical advice or assistance as it has available in reference to the use of the goods; however, it is expressly understood that (i) SELLER assumes no obligation or liability for the advice or assistance given or results obtained, (ii) all such advice or assistance is given and accepted at BUYER'S risk, and (iii) such advice or assistance shall not increase or alter SELLER'S liability as herein defined and limited.