

## Contents

MKV	Page
Features and benefits	1
Range and part numbers	4
Spares	5
Installation	7
Operation	14
Maintenance and troubleshooting	18

HLD	Page
Features and benefits	21
Range and part numbers	22
Spares	23
Installation	24
Operation	31
Maintenance and troubleshooting	35



SAF-HOLLAND Group

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## HOLLAND MARK V™ SERIES LANDING GEAR



## INDUSTRY-LEADING STANDARD FEATURES

**Heavy-Duty Gearbox**

- Gearbox with low-temperature premium lube rated for service for -65°F to 225°F

**Double-D Crank Handle Connection**

- Shaft with double-D end means a stronger more stabilized cranking connection

**Large 5 1/8" Square Upper Tube Housing**

- Large size tube with radius corners provides maximum strength to meet heavy-duty application demands

**Heavy-duty One Piece Inner Tube**

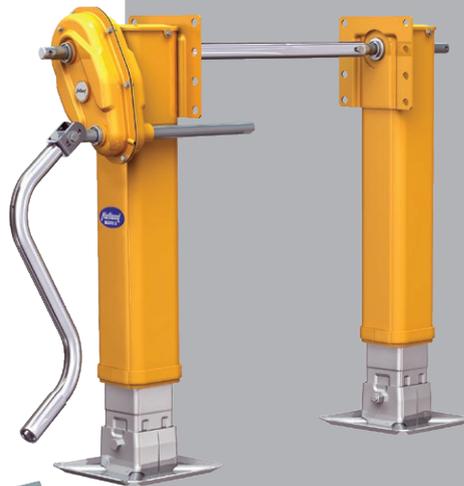
- One piece inner tube for maximum strength when the leg is in the extended position

**Black Armour Metal Treatment**

- Treatment process, unlike paint or powder coating, means the ultimate in corrosion protection with no rust creep

\*Product supplied is black (not yellow as pictured).

## SIDE LOAD CAPACITY 32,000 LBS.



## CAPACITIES

62,500 lbs. Lift Capacity  
(100 ft./lbs. Input Torque)  
200,000 lbs. Load Capacity  
32,000 lbs. Side Load Capacity

## GEARING

2.5 Turns Per Inch - High Gear  
33.7 Turns Per Inch - Low Gear

All specified capacities are tested in accordance with AAR M-931.

**STANDARD 5-YEAR WARRANTY**

HOLLAND Mark V models are available with standard 5-year warranty.

5-year warranty covers defects in materials and workmanship only.

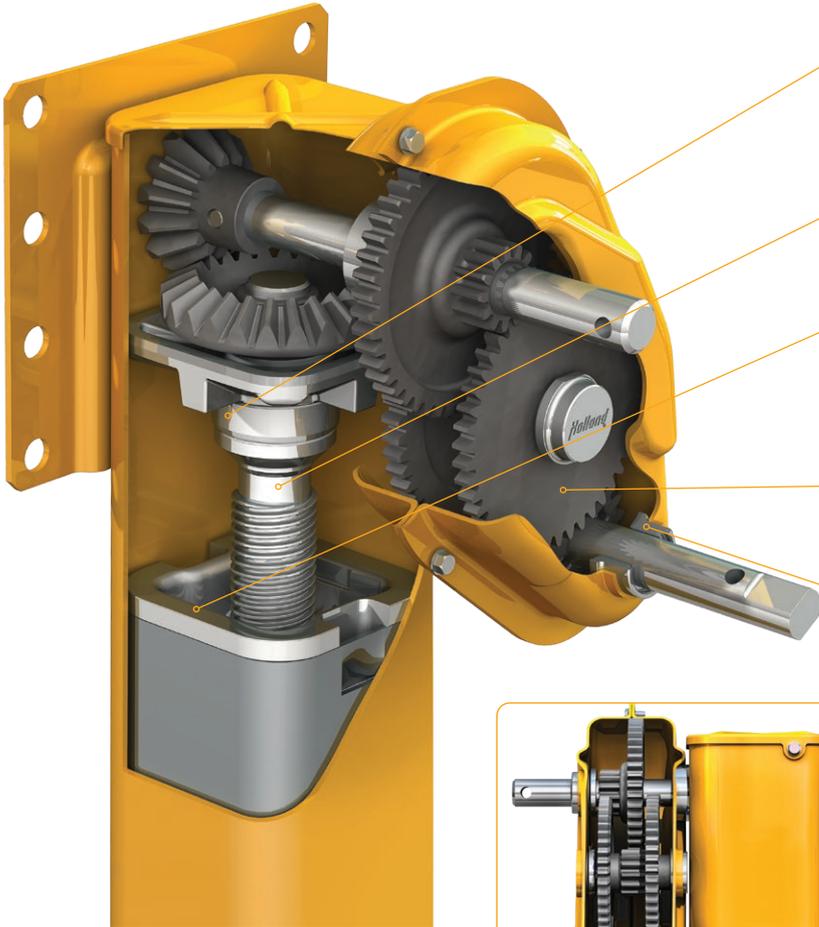
Recommended protection practices for your HOLLAND landing gear include routine greasing at **6 month intervals**.

For a copy of the warranty click [here](#)



## HOLLAND MARK V™ SERIES LANDING GEAR

### BUILT-IN DURABILITY FOR ROBUST PERFORMANCE



**Heavy-Duty Thrust Bearings**

Maintains smooth elevating screw and bevel gear operation. Heavy-duty MARK V™ model utilizes tapered roller bearings.

**Double Lead Elevating Screw**

1-5/8" diameter, rolled threads for added strength and smooth lift.

**Riser Nut with Deep Grease Reservoir**

Abundant grease source means constant lubrication of the elevating screw.

**A Durable Ductile Gears**

Three large, in-line, heat-treated ductile iron spur gears for robust performance.

**Powdered Metal Shaft Bushings**

Self-lubricating shaft bushings for increased service life.

**Shaft Seals (standard)**

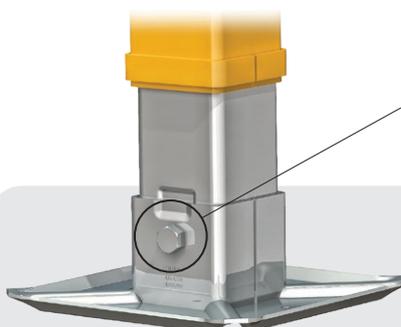
All driveshaft and crankshaft bushings include shaft seals to prevent water, dirt and other contaminants from entering the gearbox and upper leg.

### Optional RCF

**(Removable Cushion Foot)**

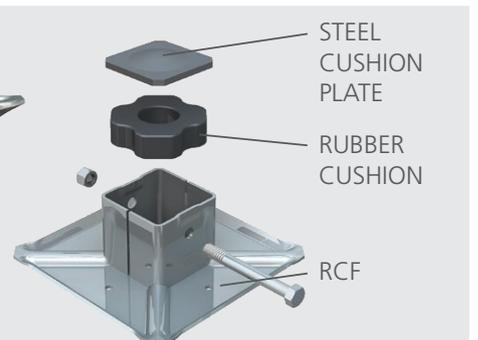
HOLLAND MARK V™ landing gear are available with an optional, patented removable cushion foot (RCF). A proven, innovative landing gear foot that has won the respect and recognition of our industry.

The RCF footwear option utilizes a heavy-duty rubber cushion that absorbs 50% more shock than conventional footwear.



The RCF feature allows easy removal of a damaged foot by simply extracting a single bolt. No cutting or welding is required.

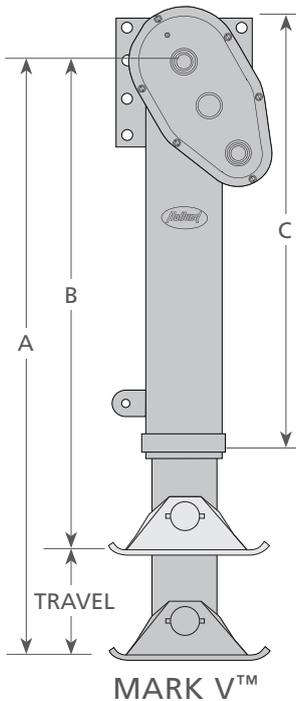
RCF technology simply transmits the shock from the entire load in compression from steel-to-rubber-to-steel. That means reduced wear and damage to the cargo, trailer, and landing gear.



**HOLLAND MARK V™ SERIES LANDING GEAR**

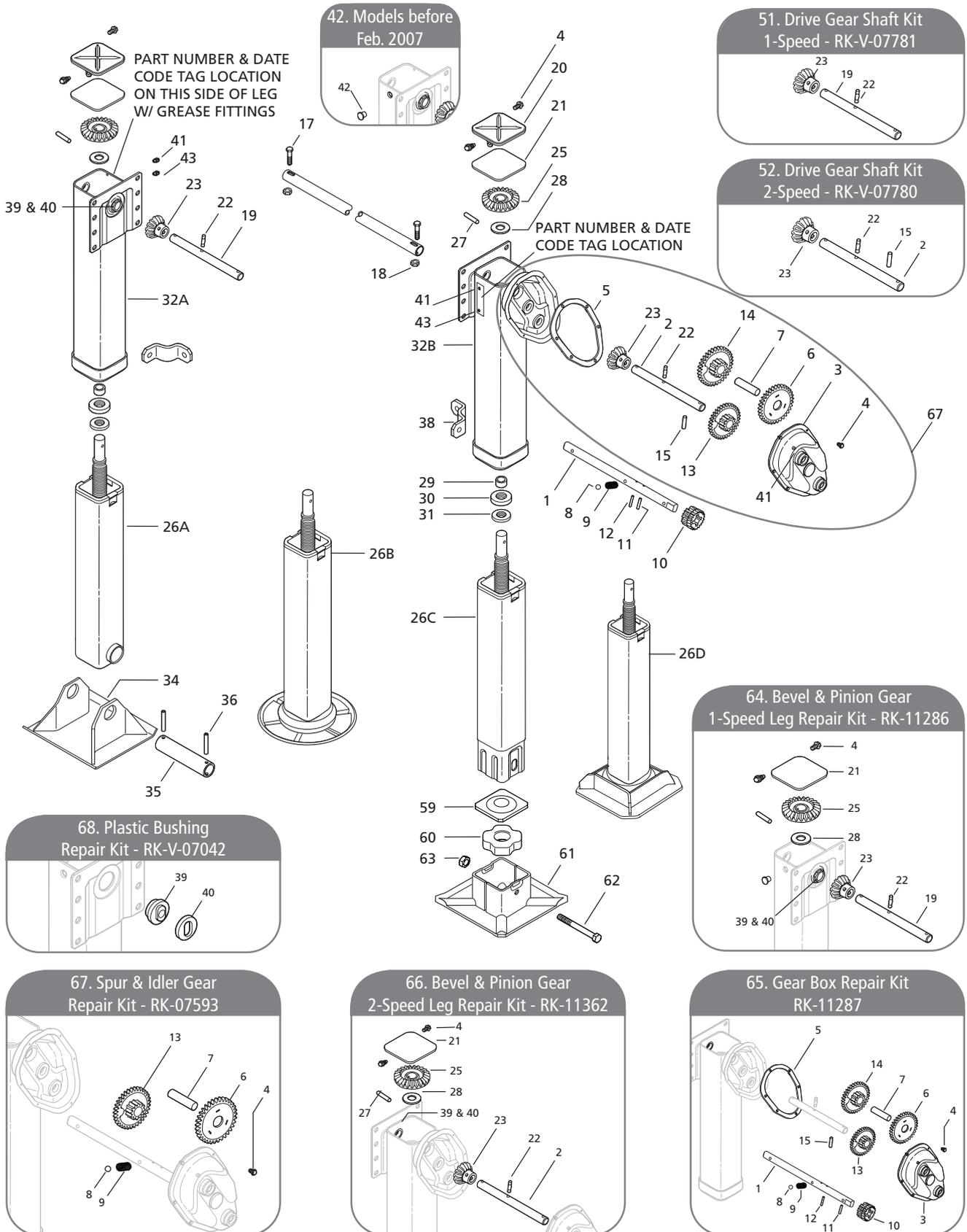
MARK V™ SPECIFICATIONS

MARK V™							
DIMENSIONS	TRAVEL	EXTENDED LENGTH (A)	RETRACTED LENGTH (B)	UPPER LEG (C)	PART NUMBER KIT	WEIGHT (Kg)	DRAWING
<b>SELF LEVELING FOOT</b>							
 FOOT CODE - 01	13.5"	41.3"	27.8"	25.9"	LGS-1A001	94	<a href="#">click here for drawing</a>
	17.6"	49.5"	31.9"	30.0"	LGS-4A001	105	
	18.7"	51.8"	33.1"	31.1"	LGS-5A001	108	
<b>SAND SHOE</b>							
 FOOT CODE - 05	13.5"	42.2"	28.7"	25.9"	LGS-1A105	93	<a href="#">click here for drawing</a>
	17.6"	50.5"	32.9"	30.0"	LGS-4A105	100	
	18.7"	52.7"	34.0"	31.1"	LGS-5A105	102	
<b>REMOVABLE CUSHION FOOT</b>							
 FOOT CODE - 24	13.5"	41.1"	27.6"	25.9"	LGS-1A024	95	<a href="#">click here for drawing</a>
	17.6"	49.3"	31.7"	30.0"	LGS-4A024	103	
	18.7"	51.5"	32.8"	31.1"	LGS-5A024	105	



REPLACEMENT LEGS COMPLETE		
MKV SET	Complete gearbox leg	Complete N/Gearbox leg
LGS-1A001	XA-S8-1A001	XA-S9-1A001
LGS-4A001	XA-S8-4A001	XA-S9-4A001
LGS-5A001	XA-S8-5A001	XA-S9-5A001
LGS-1A105	XA-S8-4A105	XA-S9-4A105
LGS-4A105	XA-S8-4A105	XA-S9-4A105
LGS-5A105	XA-S8-5A105	XA-S9-5A105
LGS-1A024	XA-S8-1A024	XA-S9-1A024
LGS-4A024	XA-S8-4A024	XA-S9-4A024
LGS-5A024	XA-S8-5A024	XA-S9-5A024

## HOLLAND MARK V™ SERIES LANDING GEAR – EXPLODED VIEW



## HOLLAND MARK V™ SERIES LANDING GEAR – PARTS LIST

NO.	DESCRIPTION	PART NO.	SPEED		NO.	DESCRIPTION	PART NO.	SPEED	
			ONE	TWO				ONE	TWO
1	Shift Shaft RH - Universal	XA-V-06625-A	-	1	41	Lube Fitting	XB-767	1	2
	- I-Beam	XA-V-06625-C	-	1	42	Plastic Plug - Models before Feb. 2007	XB-01789	1	1
	- Extended I-Beam	XA-V-06625-F	-	1	43	Lube Fitting w/Extension	XB-767-L	1	1
	- Conventional	XA-V-06625-C	-	1	47	Crankshaft Bracket (Optional)	XA-V-971	-	1
	- Reverse	XA-V-06625-B	-	1	48	Crank Hanger (Optional)	XB-V-1915	-	1
2	Jack Shaft RH - Universal	XA-V-06624-A	-	1		Crank Hanger (Optional)	XB-LG0085	-	1
	- I-Beam	XA-V-06624-D	-	1	49	Extension Shaft - Long (Optional) - 15.44"	XA-V-1916	-	1
	- Extended I-Beam	XA-V-06624-F	-	1		- Short (Optional) - 8.94"	XA-V-1916-1	-	1
	- Conventional & Reverse	XA-V-06624-C	-	1	50	Crankshaft Coupling (Optional)	XA-V-630-2	-	1
3	Gearbox Cover Assembly	XA-V-06618	-	1	51	Drive Gear Shaft Kit - 1-Speed	RK-V-07781	-	1
4	Thread Rolling Screw	XB-06372	2	8	52	Drive Gear Shaft Kit - 2-Speed	RK-V-07780	-	1
5	Gearbox Gasket	XB-V-06621	-	1	53	Groove Pin - .38" x 1.38" (Optional)	XB-GP-38-138-5	-	2
6	Idler Gear	XA-V-06602	-	1	54	Locknut - .25"-28 (Optional)	XB-3103	-	3
7	Idler Gear Shaft	XA-V-07085	-	1	55	HHCS - .25"-28 x 3" (Optional)	XB-07618	-	3
8	Ball	XB-BAL-023-01	-	1	56	Extension Bracket - Long - 15.56"	XA-V-07601-1	-	1
9	Spring	XB-SPG-020-02	-	1		- Short - 9.06"	XA-V-07601-2	-	1
10	Input Gear - Low	XA-V-06604-1	-	1	57	Extension Bracket & Shaft Kit - Long - 15.56"	RK-V-07602-1	-	1
11	Pin - .25" x 1.44"	XA-CRP-V-06633	-	1		- Short - 9.06"	RK-V-07602-2	-	1
12	Spring Pin - .22" x 1.50"	XB-21-S-218-1500	-	1	58	Extension Bracket & Shaft Kit - Long - 15.44"	RK-V-1997-1	-	1
13	Input Gear - High	XA-V-06606	-	1		- short - 8.94"	RK-V-1997-2	-	1
14	Output Gear	XA-V-06603	-	1	59	Cushion Foot Plate	LG1829	1	1
15	Pin - .38" x 1.5"	XA-CRP-V-06634	-	1	60	Rubber Cushion	XB-LG0713	1	1
17	HHCS - .38"-16 x 2.00"	XB-V-444-4	1	1	61	Removable Cushion Foot	XA-V-796-RCF	1	1
18	Lock Nut - .38"-16	XB-338	1	1	62	Hex Head Screw - .63"-11 x 6" - GR2	XB-HHC-050-114	1	1
19	Jack Shaft LH - Universal	XA-V-06623-A	1	-	63	Top Lock Nut - .63"-11 - GR.C	XB-06179-2	1	1
	- I-Beam	XA-V-06623-D	1	-	64	Bevel & Pinion Gear Repair Kit	RK-11286	1	1
	- Extended I-Beam	XA-V-06623-F	1	-	65	Gear Box Repair Kit	RK-11287	-	1
	- Conventional	XA-V-06623-C	1	-	66	Black Armour™ Touchup Kit (not shown)	RK-10919	1	1
	- Reverse	XA-V-06623-B	1	-	67	Gearbox Assembly	XA-V-08571	1	1
20	Upper Leg Cover	XA-V-06611	1	1					
21	Gasket	XB-V-07054	1	1					
22	Groove Pin .38" x 1.50"	XB-GP-38-1-12-E	1	1					
23	Pinion Gear	XA-V-06600	1	1					
25	Bevel Gear	XA-V-06601	1	1					
27	Pin - .38" x 2"	XA-CRP-V-06635	1	1					
28	Washer	XB-V-06632	1	1					
29	Bushing	XB-V-06630	1	1					
30	Thrust Bearing	XB-V-647	1	1					
30	Thrust Bearing - Heavy Duty	XB-V-647-1	1	1					
31	Collar	XA-V-06629	1	1					
32A	Upper Leg - 1-Speed	NA	1	-					
	- 1-Speed Heavy Duty (Not Shown)	NA	1	-					
32B	Upper Leg - 2-Speed	NA	-	1					
	- 2-Speed Heavy Duty (Not Shown)	NA	-	1					
34	Skid Foot - 4.5" x 12" x 11.5"	LG0050	1	1					
	- 2.0" x 12" x 11.5"	LG0051	1	1					
	- 3.8" x 10" x 11.5"	XA-V-796-WS	1	1					
	- 2.0" x 10" x 11.5"	LG0056	1	1					
	- 4" x 12" x 16"	XA-HV-796	1	1					
35	Standard Axle	XA-V-1901-1	1	1					
	Solid Axle	XA-V-1903-1	1	1					
36	Rollpin - .38" x 3"	XB-21-S-375-3000	2	2					
38	Brace Lug	XA-V-1938	1	1					
39	Bearing	XB-LG0559	2	1					
40	Retainer	XB-LG1570	2	1					

* Standard Crank Handle:	XA-V-90-0	1
* Longer Crank Handle:	XA-V-90-10	1
* Cross Shaft:	LG0094	1
* Crank Holder:	RK-V-06388	1
* Brace Ears:	XA-V-1938	2



## HOLLAND MARK V™ SERIES LANDING GEAR – INSTALLATION, OPERATION AND MAINTENANCE

### MARK V™



## HOLLAND MARK V™ SERIES LANDING GEAR – INSTALLATION, OPERATION AND MAINTENANCE

## 1. Safety Instructions

## General and Servicing Safety Instructions

- Read and observe all Warning and Caution hazard alert messages. The alerts provide information that can help prevent serious personal injury, damage to components, or both.

**⚠ WARNING** Failure to follow the instructions and safety precautions in this manual could result in improper servicing or operation leading to component failure which, if not avoided, could result in death or serious injury.

- All maintenance should be performed by a properly trained technician using proper/special tools, and safe procedures.

**NOTE:** In the United States, workshop safety requirements are defined by federal and/or state Occupational Safety and Health Act (OSHA). Equivalent laws may exist in other countries. This manual is written based on the assumption that OSHA or other applicable employee safety regulations are followed by the location where work is performed.

**IMPORTANT:** Verify before installation that the landing gear selected will withstand the load and have the correct travel/extension requirements for the trailer.

- DO NOT operate the landing gear if it is cracked, bent, or any other damage is present. Using damaged landing gear could result in death or serious injury.

**⚠ WARNING** Failure to check condition of landing gear prior to operating could result in unexpected performance which, if not avoided, could result in death or serious injury.

**⚠ WARNING** Using damaged landing gear could result in unexpected performance which, if not avoided, could result in death or serious injury.

- Properly support and secure the vehicle from unexpected movement when servicing the landing gear.

**NOTE:** If possible, unload the trailer before performing any service procedures.

**⚠ WARNING** Failure to secure the trailer from rolling, when operating the landing gear, could result in death, serious injury or property damage.

**⚠ WARNING** Failure to properly support and secure the trailer during installation of landing gear could create a crush hazard which, if not avoided, could result in death or serious injury.

- DO NOT walk/crawl underneath a trailer during coupling/uncoupling.
- If possible, unload the trailer before performing any maintenance or service procedures.

**⚠ WARNING** Failure to keep clear from underneath the trailer could create a crush hazard which, if not avoided, could result in death or serious injury.



## HOLLAND MARK V™ SERIES LANDING GEAR – INSTALLATION, OPERATION AND MAINTENANCE

### 2. Model Identification

#### Mark V

The Mark V and Heavy Duty Mark V identification code is located, behind the grease fittings of each landing gear leg (**Figure 1**). The first number is the serial number, described below, and the second number is the part number. In order to properly identify the HOLLAND® landing gear and its components when communicating with SAF-HOLLAND or a dealer, please record the part and serial numbers below and refer to them when ordering replacement parts.

#### Part Number

**XA - S8 - 3 A 0 2 4 - 7**

#### Grease

- Blank - Standard Low Temp Grease
- 1 - Arctic Grease
- 7 - No Lube™ (Lifetime Warranty)

#### Footware

- 01 - Self Leveler 12" DIA
- 02 - Shock Foot 10" DIA
- 03 - Wheels 9" DIA
- 05 - Sandshoe 4.5"x 10"x 12"
- 06 - Sandshoe 5.0"x 14"x 12"
- 07 - Sandshoe 5.0"x 20"x 12"
- 08 - Sandshoe 5.0"x 16.5"x 14"
- 09 - Wheeled Sandshoe 3.8"x 10"x 16"
- 10 - No Footware
- 12 - Heavy Duty Self Leveler 14"x 14" Sandshoe 5.0"x 12"x 16"
- 13 - Sandshoe 2.0"x 10"x 12"
- 14 - Cushion Foot 2.4"x 10"x 12"
- 15 - Sandshoe 3.8"x 10"x 10"
- 23 - Sandshoe 2.0"x 10"x 10"
- 24 - R.C.F. 10"x 10"
- ZZ - Special

#### Axle Type

- 0 - No Axle
- 1 - Hollow Axle
- 3 - Solid Axle

#### Mounting

- A - Universal Mount - .66" Ø Holes
- B - Inside Mount - .66" Ø Holes
- C - Outside Mount - .66" Ø Holes
- D - I-Beam Mount - .66" Ø Holes
- F - Extended I-Beam Mount - .66" Ø Holes
- Z - Special

#### Travel

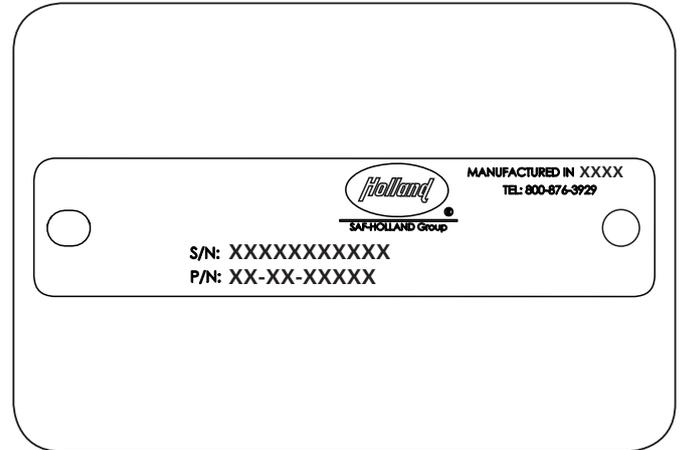
- 0 - 12.5" (10.0" for Skid Foot Models)
- 1 - 13.5"
- 2 - 15.0"
- 3 - 16.5"
- 4 - 17.6"
- 5 - 18.7"
- Z - Special

\*Contact SAF-HOLLAND for Heavy Duty Travel Lengths

#### Model

- XA-S8 – Standard Duty Mark V 2-Speed Leg
- XA-S9 – Standard Duty Mark V Single Speed Leg

Figure 1



Part No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Purchase date: \_\_\_\_\_

## HOLLAND MARK V™ SERIES LANDING GEAR – INSTALLATION

## 3. Pre-Installation Instructions

Prior to installation of the landing gear, correctly size the legs to the trailer. It is recommended to have 12" (305 mm) minimum ground clearance when the landing gear is fully retracted.

Ensure that the legs have sufficient travel to raise the trailer from the fifth wheel a minimum of 1" (25 mm), preferably 3" (76 mm) without over-extension. DO NOT attempt to force the landing gear past its stops.

**CAUTION** Failure to prevent maximum extension or retraction including repeated winding to its physical stops could cause hard cranking which, if not avoided, could result in minor/ moderate injury or component damage.

**IMPORTANT** Provide adequate clearance between the jack shaft bushings, jack shaft, shift shaft and the trailer frame. If the bushings or shafts are tight against the frame, damage and hard cranking will result (**Figure 2**).

**CAUTION** Failure to provide adequate clearance between the jack shaft bushings, jack shaft, shift shaft, and the trailer could cause hard cranking and wear which, if not avoided, could result in minor/moderate injury or component damage.

Before installation of the landing gear, ensure that both legs are in the fully retracted position. Both landing gear legs **MUST** be extended equally at all times.

**WARNING** Failure to extend the legs evenly could cause trailer to tip over, which, if not avoided, could result in death, serious injury, or property damage.

**WARNING** Failure to extend the legs evenly could increase the potential for landing gear spring back, which, if not avoided, could result in death or serious injury.

Ensure that the cross-shaft is of adequate length for the application. When installed, the cross-shaft should have 1/8" (3 mm) to 3/8" (9.5 mm) of side to side free play. It should also rotate freely with the jack shaft when installed (**Figure 3**). A cross shaft which is too long will cause binding resulting in stiff operation and excessive bushing wear.

**CAUTION** Failure to ensure that the cross-shaft is installed at adequate length and has free play could result in stiff operation which, if not avoided, could result in property damage.

Figure 2

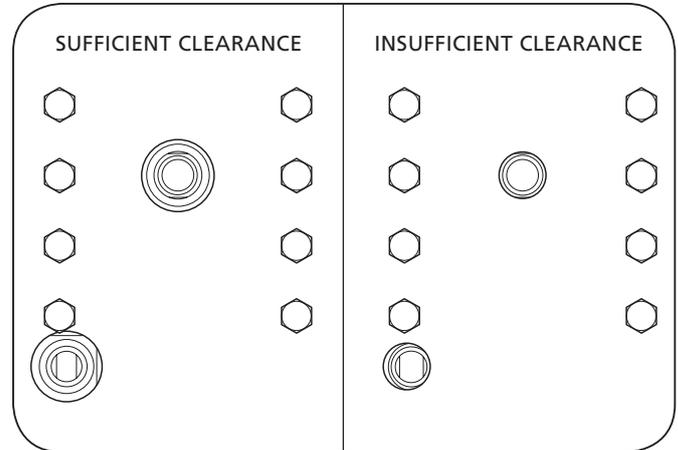
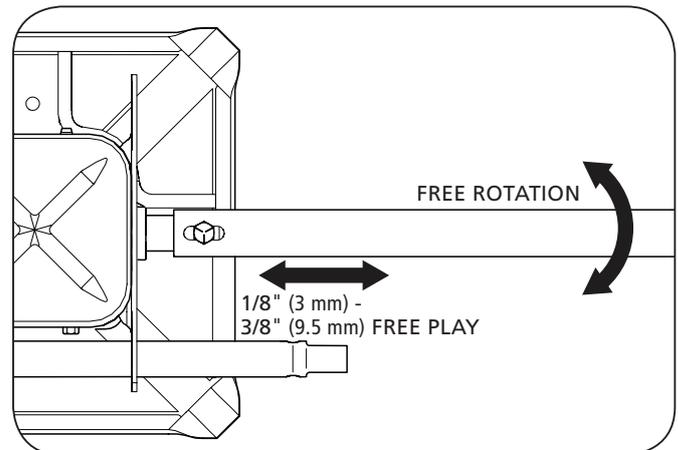


Figure 3



## HOLLAND MARK V™ SERIES LANDING GEAR – INSTALLATION

### 4. Recommended Bracing

Installers are responsible to ensure that the mounting structure and mounting method are adequate for the intended imposed loads, use and application in accordance with trailer design specifications.

Published ratings are based on physical tests wherein the mounting plate of the tested landing gear legs was attached to a rigid fixture using Grade 8, 5/8" diameter bolts and nuts with hardened washers. The lower end of the upper housing tubes were rigidly braced in a lateral and longitudinal direction. All fasteners were torqued according to the fastener manufacturer's recommendations.

**NOTE:** DO NOT install strut brackets in the center of the housing without proper backing (**Figure 4**).

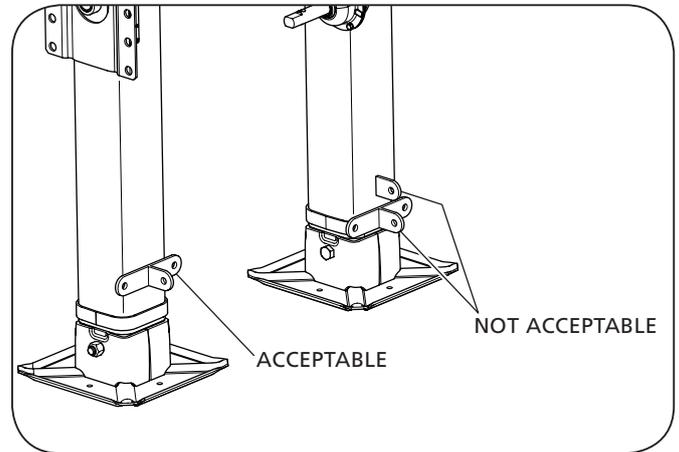
**NOTE:** Install the brackets as low as possible on the housing. DO NOT install the brackets to the housing leg band (**Figure 4**).

**NOTE:** DO NOT allow weld for strut brackets to penetrate through the housing and make contact with the retract tube.

**⚠ WARNING** Failure to install proper bracing on the landing gear could create a crush hazard which, if not avoided, could result in death, serious injury or property damage.

**CAUTION** Failure to install proper bracing on the landing gear could cause faulty operation which, if not avoided, could cause property damage and void the warranty.

Figure 4



## HOLLAND MARK V™ SERIES LANDING GEAR – INSTALLATION

## 5. Welding Standards

### 5.1 Welding Standards

This specification applies to all components supplied by SAF-HOLLAND, and its products. The customer assumes full responsibility for weld integrity if weld material and procedures differ from those listed below.

### 5.2 Workmanship

All welding on SAF-HOLLAND products MUST be performed by a welder qualified according to the appropriate AWS standard for the weld being made or an equivalent standard. It is the responsibility of the customer to provide good workmanship when welding on SAF-HOLLAND products.

### 5.3 Material

Items to be welded that are made from low carbon or high-strength alloy steel are to be welded with AWS filler metal specification AWS A5.18, filler metal classification ER-70S-3, ER-70S-6 or equivalent unless specified on the installation drawing.

**NOTE:** Any substitution for filler material from the above standard MUST comply, as a minimum, with the following mechanical properties:

Tensile Strength - 72k psi (496 MPa)

Yield Strength - 60k psi (414 MPa)

Charpy V Notch - 20ft.-lbs. (27 N•m) at 0° F (-17.7° C)%

Elongation - 22%

The recommended welding gas for gas metal arc welding (GMAW) is 90% Argon / 10% CO<sub>2</sub>. If a different gas is used, welds MUST comply with penetration requirements illustrated (**Figure 5**). Where the installation drawing specifies different than above, the drawing shall prevail.

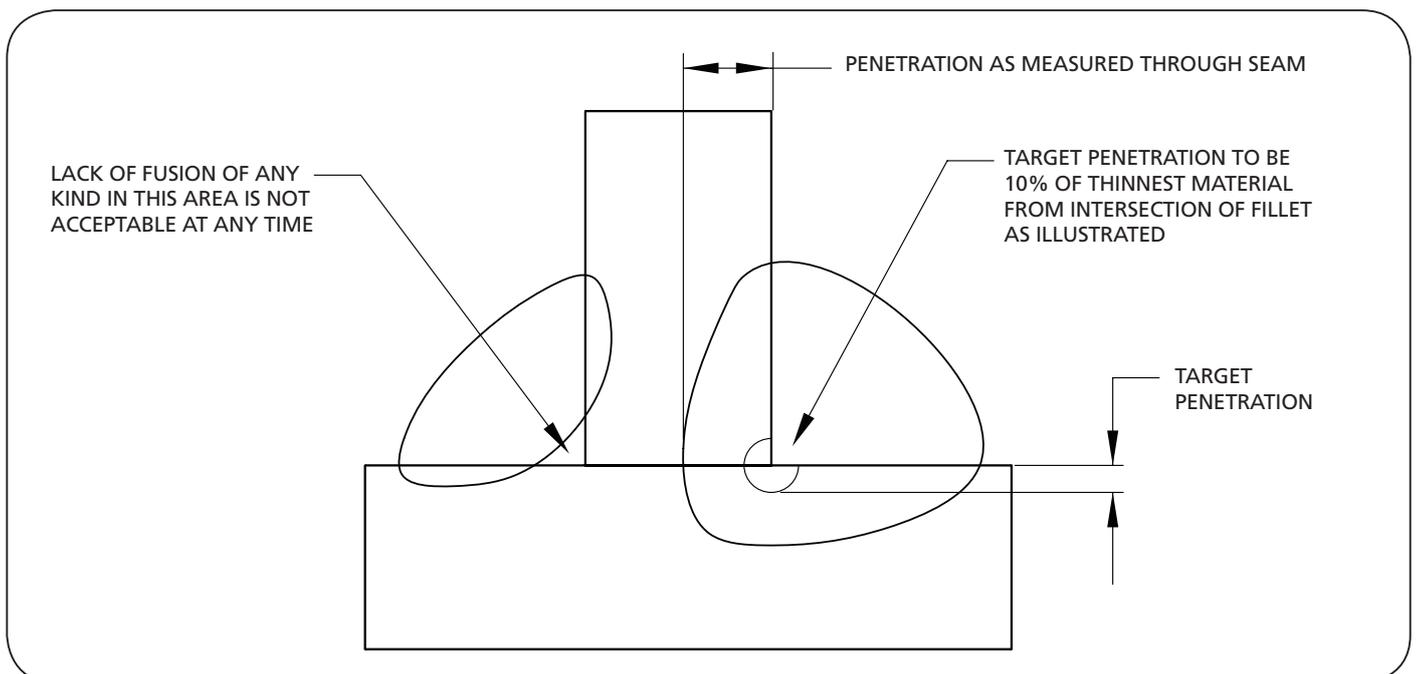
### 5.4 Procedures

Tack welds used for positioning components are to be located in the center of the final weld, where practical. Tack weld should be completely fused to the finish weld. DO NOT break arc at the end of the weld. Back up all finish welds at least 1/2" (12.7 mm) or a sufficient amount to prevent craters at the end of the weld. Where weld is shown to go around corners, it is assumed the corner represents a stress concentration area. DO NOT start or stop weld within 1" (25.4 mm) of the corner. Particular care should be taken to prevent undercutting in this area.

### 5.5 Weld Size

If weld size is NOT specified, the effective throat of the weld MUST be no smaller than the thinnest material being welded (**Figure 5**).

(Figure 5)



## HOLLAND MARK V™ SERIES LANDING GEAR – INSTALLATION

### 6. Installation Instructions

1. On a level surface, support the front of the trailer with either a kingpin stand, or while coupled to a tractor (**Figure 6**).
2. Set the parking brakes and chock the tires.

**⚠ WARNING** Failure to properly support the trailer and chock the tires during installation of landing gear could create a crush hazard which, if not avoided, could result in death or serious injury.

3. Using a square, check that the trailer landing gear mounting surfaces are perpendicular to the ground and parallel to each other.
4. Install the landing gear legs and cross-shaft to the trailer frame. Torque mounting bolts to manufacturer's specifications. Ensure the cross shaft lock nuts are snug, but cross-shaft is allowed side to side free-play.
5. Install the bracing. Refer to Section 4, (Recommended Bracing), for the minimum bracing requirements. Torque fasteners to manufacturer's specifications.

**IMPORTANT:** After installing the bracing, use a square to ensure that the legs have remained aligned with the trailer and each other as illustrated (**Figure 7**).

6. Install the crank handle onto the shift shaft. Position the washers on the outside of the crank handle. Insert the bolt through both the washers and the shaft, and secure with nut (**Figure 8**).
7. Ensure proper operation by extending and retracting the landing gear. Verify the crank handle is allowed to engage and disengage freely.
8. Extend the landing gear to ensure that both legs reach the ground simultaneously.

**⚠ WARNING** Failure to maintain two hand control of handle and release SLOWLY could cause spring back which, if not avoided, could result in death or serious injury.

9. Install the crank hanger, and ensure that the handle can be adequately secured.

**CAUTION** Failure to secure the crank handle when NOT in use could allow unplanned landing gear extension which, if not avoided could result in property damage.

10. Verify that all braces, crank handle and foot ware are properly attached and that all bolts are tightened to fastener manufacturer torque specifications.

Figure 6

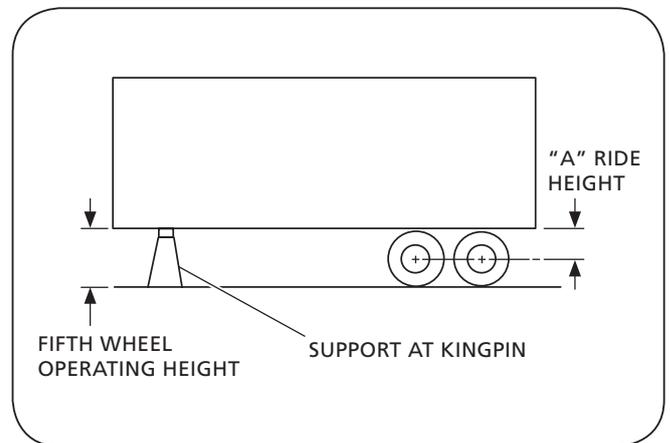


Figure 7

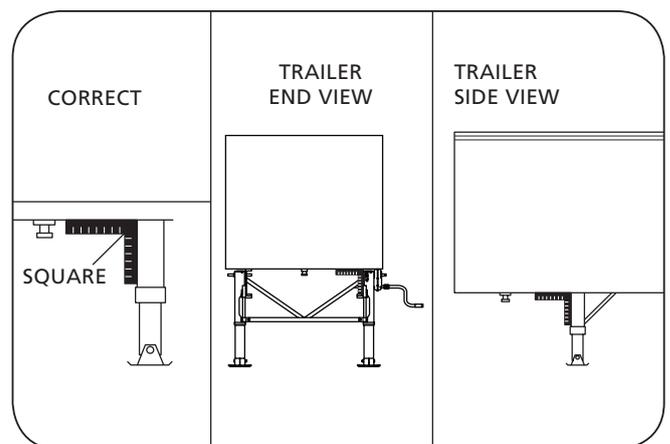
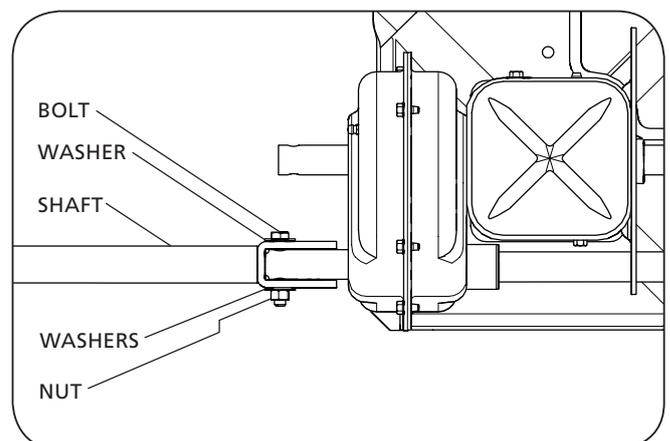


Figure 8



## HOLLAND MARK V™ SERIES LANDING GEAR – OPERATION

## 7. Landing Gear Operation

## 7.1 Pre-Operation Inspection

The landing gear should be visually inspected prior to use. Ensure that the legs are square to the trailer on both sides. Visually check for damaged, loose or broken components. Repair or replace the damaged landing gear.

**⚠ WARNING** Failure to check the condition of the landing gear prior to operating could result in use of damaged product which, if not avoided, could result in death or serious injury.

## 7.2 Landing Gear Orientation

Determine if the landing gear is an outside (conventional) or an inside (reverse) mount before operation. The mount determines how the landing gear operates.

Landing gear with an outside mount (**Figure 9**):

- Pull the crank handle out for high speed.
- Push the crank handle in for low speed.
- Turn the crank counter-clockwise to retract the leg.
- Turn the crank clockwise to extend the leg.

Landing gear with an inside mount (**Figure 10**):

- Pull the crank handle out for low speed.
- Push the crank handle in for high speed.
- Turn the crank counter-clockwise to extend the leg.
- Turn the crank clockwise to retract the leg.

Figure 9

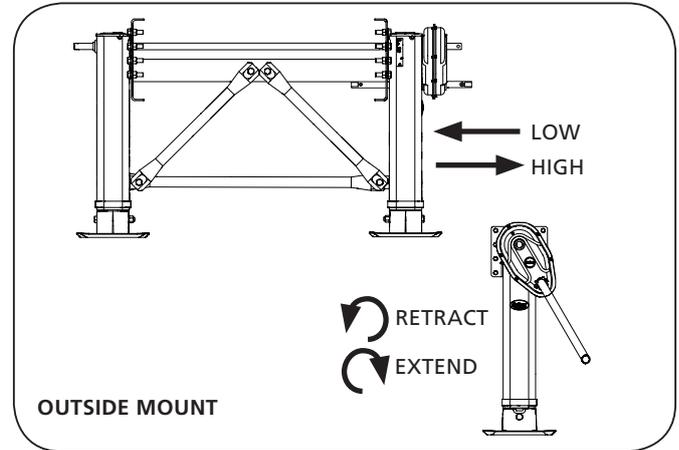
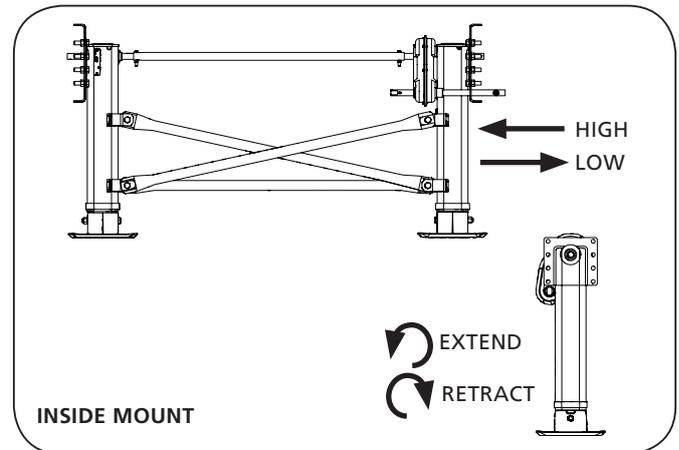


Figure 10



## HOLLAND MARK V™ SERIES LANDING GEAR – OPERATION

### 7.3 Landing Gear Operation During Coupling

**CAUTION** Failure to perform procedures in a lighted area that is clear of obstacles and personnel could lead to a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTE:** For specific coupling instructions relating to the fifth wheel, tractor, and the trailer, refer to the respective manufacturer's instructions.

1. Ensure that the coupling area is flat, level and clear of persons and obstacles.
2. Prepare the fifth wheel, tractor and trailer for coupling per the manufacturer's instructions.
3. Back up to the trailer per the fifth wheel, tractor, and trailer manufacturer's instructions, centering the kingpin with the throat of the fifth wheel as illustrated (**Figure 11**).

**IMPORTANT:** DO NOT attempt to couple until steps 4-6 are completed.

**IMPORTANT:** DO NOT couple the tractor and trailer at an angle.

**CAUTION** Failure to align the tractor and the trailer properly could result in damage to the landing gear.

4. Engage the tractor parking brake, and chock the trailer wheels. Connect the brake lines and the electrical connections. Support the slack in the line to prevent interference.
5. Ensure that the landing gear is in low gear and engage the crank handle (**Figure 12**).

**CAUTION** Failure to lift and lower the trailer in LOW GEAR could result in damage to the landing gear.

6. With two hands on the crank handle, adjust the trailer height according to the fifth wheel, tractor, and trailer manufacturer's recommendations.

**WARNING** Failure to maintain two hand control of the handle and release SLOWLY could cause spring back, which, if not avoided, could result in death or serious injury.

7. Release the tractor parking brake. Couple and verify that the fifth wheel jaws are locked per the fifth wheel manufacturer's recommendations.
8. Engage the tractor parking brake. While still in low gear, retract the landing gear until the pads just come off the ground (**Figure 13**).

Figure 11

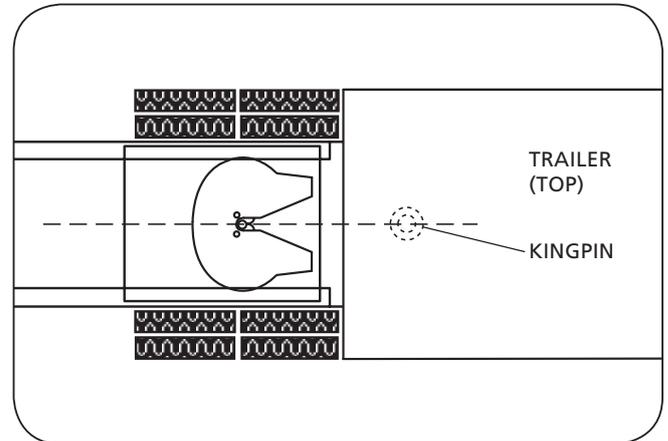


Figure 12

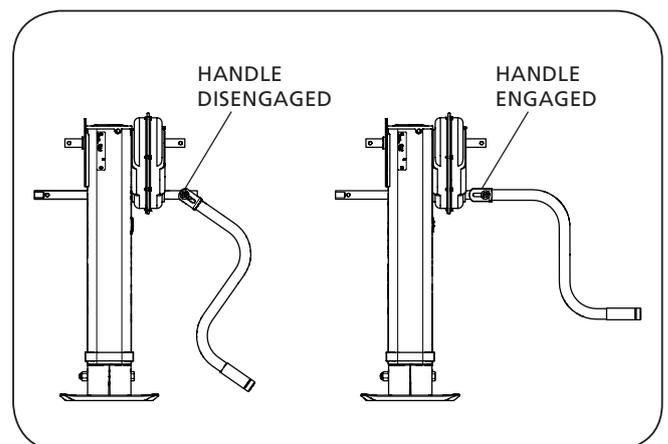
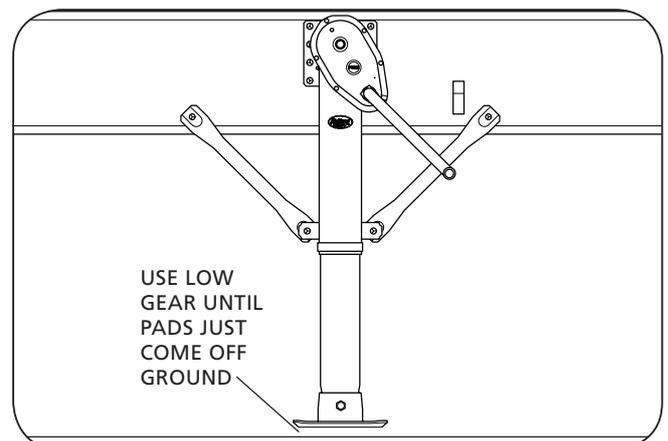


Figure 13



## HOLLAND MARK V™ SERIES LANDING GEAR – OPERATION

- Shift the landing gear into high gear and fully retract. Shift the landing gear into low gear and secure the crank handle (*Figure 14*).

**CAUTION** Failure to retract the landing gear fully before moving the trailer could result in property damage.

**CAUTION** Failure to secure the crank handle when NOT in use could allow unplanned landing gear extension which, if not avoided, could result in property damage.

- Complete all pre-trip inspection and operation procedures.

## 7.4 Landing Gear Operation During Uncoupling

**NOTE:** For specific uncoupling instructions relating to the fifth wheel, tractor, and trailer, refer to the respective manufacturer's instructions.

- Position the tractor and the trailer on a well lit level surface, clear of persons and obstacles. Verify that the surface beneath the landing gear is capable of supporting the trailer weight. Also ensure that the tractor and trailer are in line with each other.

**NOTE:** If necessary, place landing gear pads on a support plank to prevent the landing gear from sinking into the supportive surface. (This is especially important with liquid cargo, where a shift in the contents could overturn the trailer).

**CAUTION** Failure to align the tractor and trailer properly could result in damage to the landing gear.

**WARNING** Failure to rest the landing gear pads on a hard, flat surface, could result in trailer tip-over which, if not avoided, could result death or serious injury.

- Engage the trailer brakes. Slowly back tractor tightly against the trailer. Set the tractor brakes, and chock the trailer wheels.
- Engage the landing gear crank handle and shift to high gear (*Figure 15*).

Figure 14

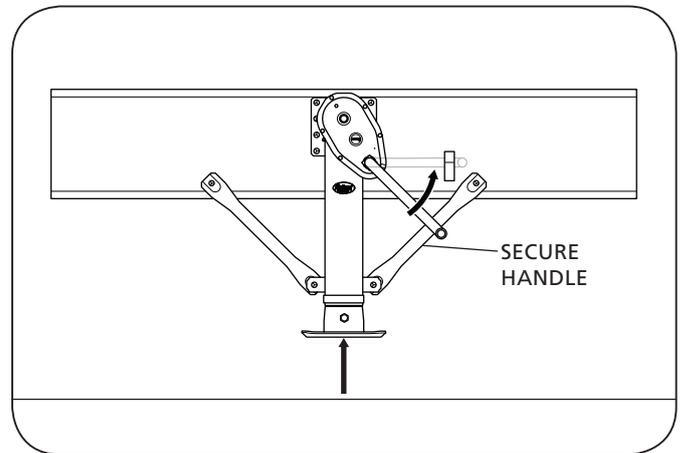
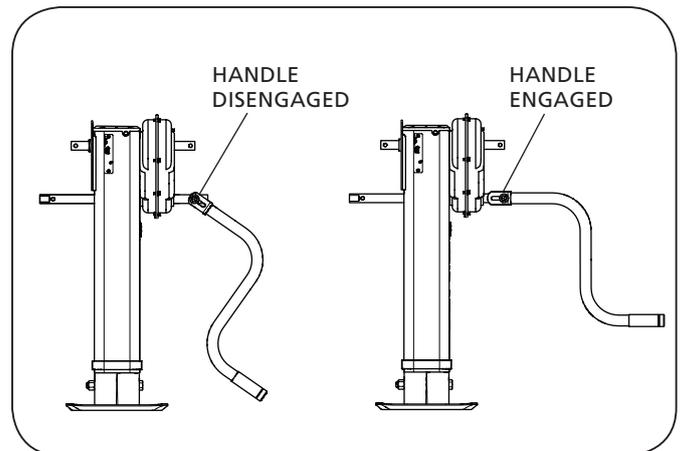


Figure 15



## HOLLAND MARK V™ SERIES LANDING GEAR – OPERATION

- Extend the landing gear until the pads just touch the ground. (**Figure 16**).

**CAUTION** Failure to prevent maximum extension or retraction including repeated winding to its physical stops could cause hard cranking which, if not avoided, could result in minor/moderate injury or component damage.

**WARNING** Failure to maintain two hand control of the handle and release SLOWLY could cause spring back which, if not avoided, could result in death or serious injury.

- Shift the landing gear into low gear and secure the crank handle in the crank hanger (**Figure 17**).

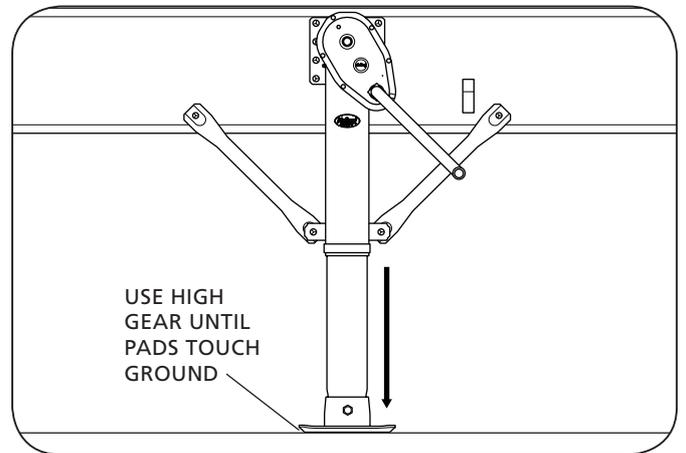
**CAUTION** Failure to secure the crank handle when NOT in use could, allow unplanned landing gear extension which, if not avoided, could result in property damage.

- Per the manufacturer's instructions, release the fifth wheel, disconnect the air lines and the electrical cord. Release the tractor brakes. Slowly drive away from the trailer until the fifth wheel disengages from the kingpin but remains under the trailer.
- Engage the tractor parking brake. Get out and inspect the landing gear and the support surface for proper trailer support.

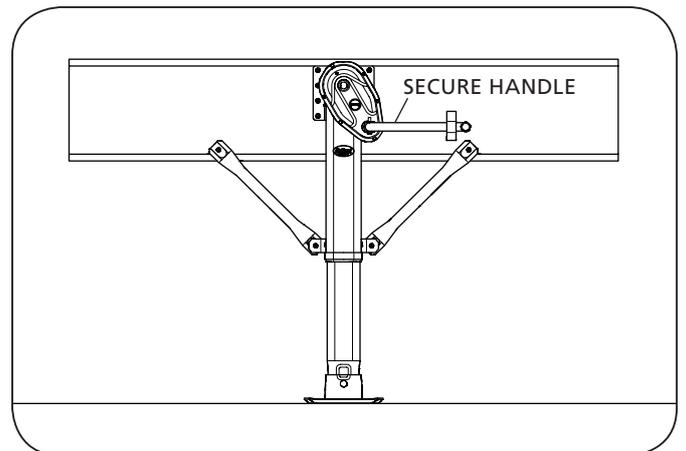
**WARNING** Failure to properly support the trailer could result in trailer instability which, if not avoided, could result in death, serious injury or property damage.

- Complete the uncoupling procedures per the fifth wheel, tractor, and trailer manufacturer's recommendations.

**Figure 16**



**Figure 17**



**HOLLAND MARK V™ SERIES LANDING GEAR – MAINTENANCE**

**8. Routine Service and Inspection**

**8.1 Landing Gear Inspection (Before Use)**

Before use, inspect the landing gear for cracks, bent components, or damaged/missing hardware, and any noticeable defects (**Table 1**). The landing gear **MUST** be repaired prior to operation to avoid damage and possible injury.

**⚠ WARNING** Failure to check the condition of landing gear prior to operating could result in use of damaged product which, if not avoided, could result in death or serious injury.

**8.2 Lubrication**

The landing gear requires lubrication whether it is used frequently or sits idle for extended periods of time. If left idle and un-greased, hard cranking could result. Use high quality grease for normal applications. For low temperature applications, use low temperature grease. Follow these steps to maintain expected performance (**Figure 18**):

**⚠ CAUTION** Failure to properly lubricate the landing gear when required could result in damage to the landing gear.

1. Place the trailer on level ground, chock the tires, and support the trailer independently of the landing gear.
2. Fully retract the landing gear, then using high gear, extend the leg 2-3 turns and lubricate the lift-screw assembly through grease fitting "A". Apply 1/2 lb. of grease.
3. Lubricate the gearbox, using grease fitting "B". Apply 1/4 lb. of grease
4. Lubricate the bevel gear using grease fitting "C". Apply 1/4 lb. of grease.
5. Distribute the lubrication by fully extending and retracting the leg several times.

**8.3 Cleaning**

No special cleaning of the landing gear is required; however, the landing gear should be cleaned with the rest of the vehicle.

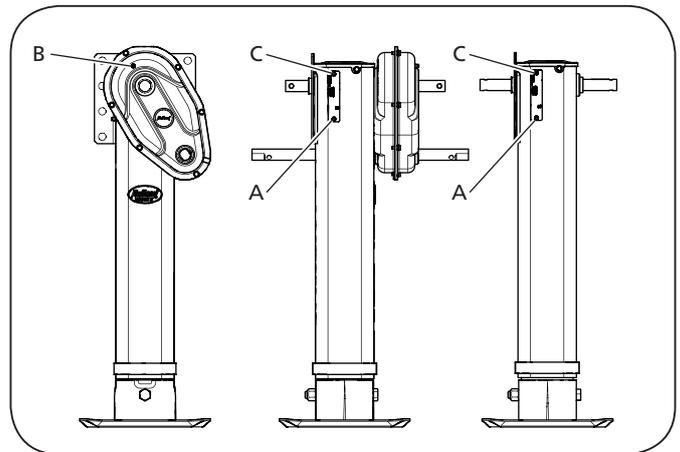
**NOTE:** DO NOT directly aim water at the landing gear shafts and bushings or up into the retract assembly. Water infiltration into the gearbox and housing may cause corrosion.

**⚠ CAUTION** Failure to prevent water infiltration into the shafts, bushings and retract assembly, could result in damage to the landing gear.

**Table 1**

Procedure	Interval	Notes
Landing Gear Inspection	Every use	Replacement/repair required if components visibly damaged, loose, or broken.
Hard to Crank	Every use	Replace/repair required
Lubrication	Every 6 months	More frequently in excessively moist and dusty conditions, as well as if not used for extended periods of time.
Cleaning	With the vehicle	
Hardware Inspection	Every 6 months	
Landing Gear Alignment	Every 6 months	Inspection required if landing gear are visibly bent or damaged.

**Figure 18**



## HOLLAND MARK V™ SERIES LANDING GEAR – MAINTENANCE

### 8.4 Hardware Inspection

Perform the following procedures to ensure the landing gear is in proper working order:

1. Tighten or replace the mounting bolts as necessary.
2. Inspect the mounting bracket for cracks or other signs of damage.
3. Repair or replace any broken or damaged part of the landing gear assembly or mounting structure.

**⚠ WARNING** Failure to repair or replace damaged landing gear components can result in unsafe product conditions which, if not avoided, could result in death or serious injury.

4. Inspect the crank handle bolt and the lock nut. Tighten or replace as necessary.
5. Inspect the crank handle. If the handle connecting tabs, tube or grip are bent or damaged, replace the handle.
6. Cross shaft connection bolts and lock nuts should be secure, but allow side-to-side play in the cross shaft.
7. Inspect the footware for damage and replace if the components are bent or cracked. If removable footware is present, ensure all mounting bolts and fasteners are tightened and footware is secure.
8. Check for proper shift shaft engagement in both high and low gear and proper shifting between gears. Rebuild if necessary.

**NOTE:** The crank shaft should shift approximately 1" between high and low gear.

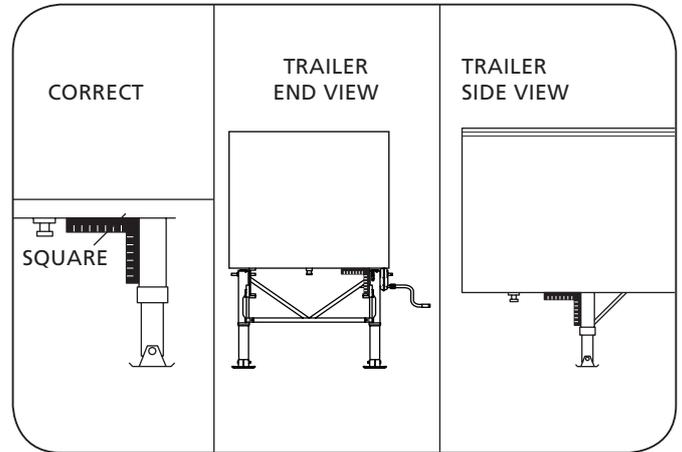
9. Rebuild or replace the landing gear with excessive play in the shafts and bushings.

### 8.5 Landing Gear Alignment

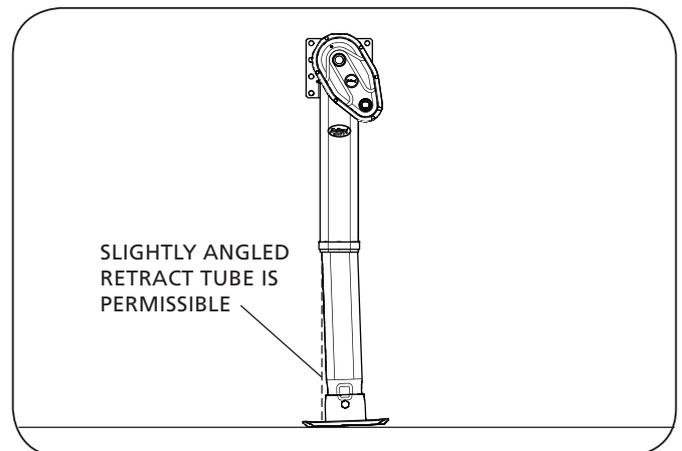
Check to make sure the landing gear is in alignment with the trailer and parallel with each other using a square (**Figure 19**). Bent or damaged legs are an indication of possible damage to the lift screw, lift nut or other internal components and should be replaced.

**NOTE:** A retract tube that appears to be angled slightly compared to the upper housing DOES NOT constitute a damaged leg (**Figure 20**). However, if the landing gear housing shows signs of fracture or cracking around the band area, the landing gear must be replaced.

**Figure 19**



**Figure 20**



## HOLLAND MARK V™ SERIES LANDING GEAR – MAINTENANCE

## 9. Troubleshooting

PROBLEM	POSSIBLE CAUSE	RESOLUTION
Hard to Crank Landing Gear	Turning the crank in the wrong direction	Refer to "Landing Gear Operation" for proper crank rotation.
	Attempting to raise or lower trailer in high gear.	Shift into low gear. DO NOT ATTEMPT TO LIFT OR LOWER IN HIGH GEAR. Doing so could result in damage to the landing gear.
	Cross shaft binding.	Inspect cross shaft bolts. Back off bolts to allow lateral (side to side) movement of the cross shaft. Straighten or shorten cross shaft to eliminate binding.
	Misaligned landing gear legs.	Legs MUST be parallel and extend and retract evenly. Disconnect cross drive shaft and adjust landing gear legs to same height.
	Lack of grease.	Grease landing gear legs as provided in the "Lubrication" section.
	Damaged lift screw or nut.	Check landing gear for signs of impact (accident) damage. Disconnect cross shaft and crank legs individually to determine which leg is damaged. Replace entire retract assembly or damaged leg.
	Interference between powder metal bushing or jackshaft of gearbox and trailer mounting surface.	Trailer mounting surface may need to be modified to ensure no interference between bushing or jackshaft and trailer surface.
	Upper housing or retract tube may be bent.	Replace damaged part(s) or landing gear.
	Excessive wear or damage to pinion, bevel, input, idler and/or output gears.	Replace damaged gears.
Weld blow through where strut bracket is welded to housing.	Grind weld as required and re-weld. (With no-load on landing gear, the retract tube should have free play inside the housing.)	
Hard to crank landing gear under load only.	Damaged thrust bearing.	Replace the thrust bearing.
Crankshaft jams or skips while turning.	Inner leg screw damaged.	Examine the lift nut and screw of the inner leg assembly for impact (accident) damage. Replace components or leg as necessary.
	Worn, broken, or damaged gears (missing teeth).	Examine pinion, bevel pinion and all gearbox gears for missing teeth or other signs of damage or wear. Replace components as necessary.
Gearbox leg operates but opposite leg DOES NOT.	Broken/damaged cross drive shaft bolt.	Replace cross drive shaft bolt.
	Broken/damaged cross drive shaft.	Replace cross drive shaft.
	Bevel gear pin/pinion gear pin sheared in non-gearbox leg.	Remove upper leg cover. Check for damaged or missing pins under bevel gear, or in pinion gear and replace as necessary.
Non-gearbox leg operates, but gearbox leg DOES NOT.	Bevel gear/pinion gear damaged in non-gearbox leg.	Remove upper leg cover. Check for damaged gears and replace as necessary.
	Bevel gear pin/pinion gear pin sheared in gearbox leg.	Remove upper leg cover. Check for damaged or missing pins under bevel gear, or in pinion gear and replace as necessary.
Both legs will NOT operate, shift shaft will turn but output shaft DOES NOT turn.	Bevel gear/pinion gear damaged in gearbox leg.	Remove upper leg cover. Check for damaged gears and replace as necessary.
	Damaged input, idler, and/or output gear.	Remove gearbox cover. Inspect and replace broken gears.
Both legs will NOT operate, but shift shaft and output shaft turn.	Gear pin(s) sheared in gearbox.	Remove gearbox cover. Inspect and replace broken pins.
	Bevel gear pin/pinion gear pin sheared in both legs.	Remove upper leg covers. Check for damaged or missing pins under bevel gear, or in pinion gear and replace as necessary.
Legs locked and will NOT turn	Bevel gear/pinion gear damaged in both legs.	Remove upper leg covers. Check for damaged gears and replace as necessary.
	Bent retracting screw or damaged riser nut and screw.	Check landing gear for signs of impact (accident) damage. Disconnect cross shaft and attempt to crank legs individually to determine which leg is damaged. Replace entire retract assembly or damaged leg.
Gearbox leg will NOT crank in high gear, but will in low gear.	Lack of lube on idler shaft.	Remove gearbox cover. Inspect and add grease to idler shaft.



## HOLLAND HLD30 LANDING GEAR

- 80.0T vertical static load
- 30.0T lifting capacity
- 15.4T side load

### Strengthened mounting plate

Lengthened mounting plate which is made of high strength steel, enhanced side load capacity.

HLD 30 length of mounting plate is 430mm.

### Standard high quality shaft seals

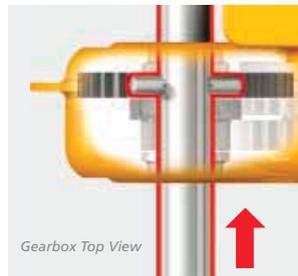
Specially designed shaft seals within gearbox and upper housing keep water out and grease in.

### Durable upper and lower leg housings

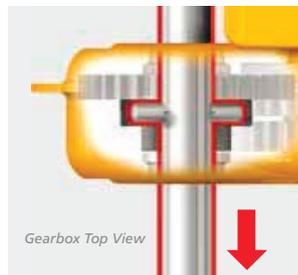
Upper and lower housings manufactured from high strength 80,000 lb yield steel.

### Kompensating feet as standard fitment

### Patented constant mesh gearbox design



Crankshaft engaged in high drive gear



Crankshaft engaged in low drive gear

Gearing capacity	HLD 30
Lifting height	5.6mm
Lifting height / turn (low gear)	0.66mm
Lifting capacity	30.0 T
Side load	15.4 T
Vertical static load	80.0 T

\*12-months warranty

### \*12-months warranty

12-months warranty covers defects in materials and workmanship only. Operational wear and tear and damages are not covered by warranty.

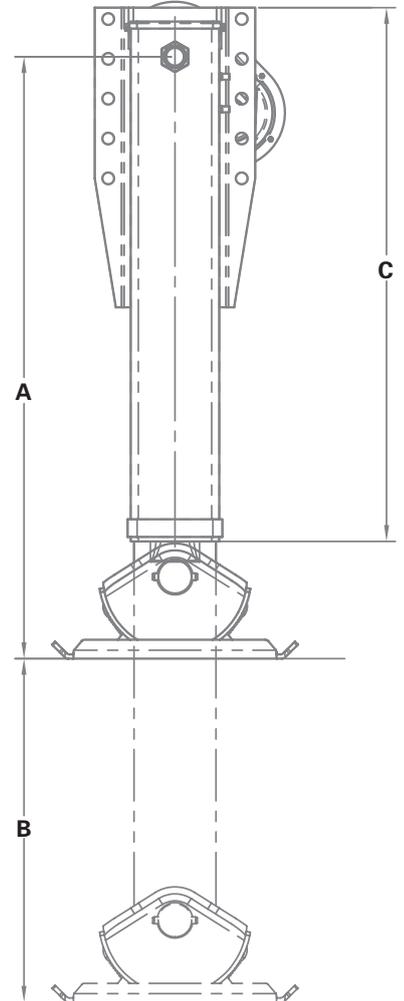


\*Actual set is painted black

### Patented Floatingnut™ with twin-bulkhead



**HOLLAND HLD30 LANDING GEAR**



Part number	A	B	C	Weight (Kg)	Drawing
H30B2V-30E	734mm	343mm	658mm	99	<a href="#">click here for drawing</a>
H30B2V-70E	800mm	430mm	722mm	102	

**HLD30 LANDING GEAR components**

Part number	Description
114005	HLD Brace Ear
PXM5020000110	HLD Crank handle
XB-LG0085	HLD Crank Holder
113399	HLD Shaft cross drive 1300mm

**HLD 30 Set**

Part number	Complete gearbox leg	Complete N/Gearbox leg
H30B2V-30E	H30B2V-32E000000	H30B2V-31E000000
H30B2V-70E	H30B2V-72E000000	H30B2V-71E000000



## HOLLAND HLD30 LANDING GEAR - INSTALLATION, OPERATION AND MAINTENANCE

### 1. Safety Instructions

#### General and Servicing Safety Instructions

- Read and observe all Warning and Caution hazard alert messages. The alerts provide information that can help prevent serious personal injury, damage to components, or both.

**⚠ WARNING** Failure to follow the instructions and safety precautions in this manual could result in improper servicing or operation leading to component failure which, if not avoided, could result in death or serious injury.

- All maintenance should be performed by a properly trained technician using proper/special tools, and safe procedures.

**NOTE:** In the United States, workshop safety requirements are defined by federal and/or state Occupational Safety and Health Act (OSHA). Equivalent laws may exist in other countries. This manual is written based on the assumption that OSHA or other applicable employee safety regulations are followed by the location where work is performed.

**IMPORTANT:** Verify before installation that the landing gear selected will withstand the load and have the correct travel/extension requirements for the trailer.

- DO NOT operate the landing gear if it is cracked, bent, or any other damage is present. Using damaged landing gear could result in death or serious injury.

**⚠ WARNING** Failure to check condition of landing gear prior to operating could result in unexpected performance which, if not avoided, could result in death or serious injury.

**⚠ WARNING** Using damaged landing gear could result in unexpected performance which, if not avoided, could result in death or serious injury.

- Properly support and secure the vehicle from unexpected movement when servicing the landing gear.

**NOTE:** If possible, unload the trailer before performing any service procedures.

**⚠ WARNING** Failure to secure the trailer from rolling, when operating the landing gear, could result in death, serious injury or property damage.

**⚠ WARNING** Failure to properly support and secure the trailer during installation of landing gear could create a crush hazard which, if not avoided, could result in death or serious injury.

- DO NOT walk/crawl underneath a trailer during coupling/uncoupling or while it is supported by the landing gear/kingpin stand.
- If possible, unload the trailer before performing any maintenance or service procedures.

**⚠ WARNING** Failure to keep clear from underneath the trailer could create a crush hazard which, if not avoided, could result in death or serious injury.



**HOLLAND HLD30 LANDING GEAR - INSTALLATION, OPERATION AND MAINTENANCE**

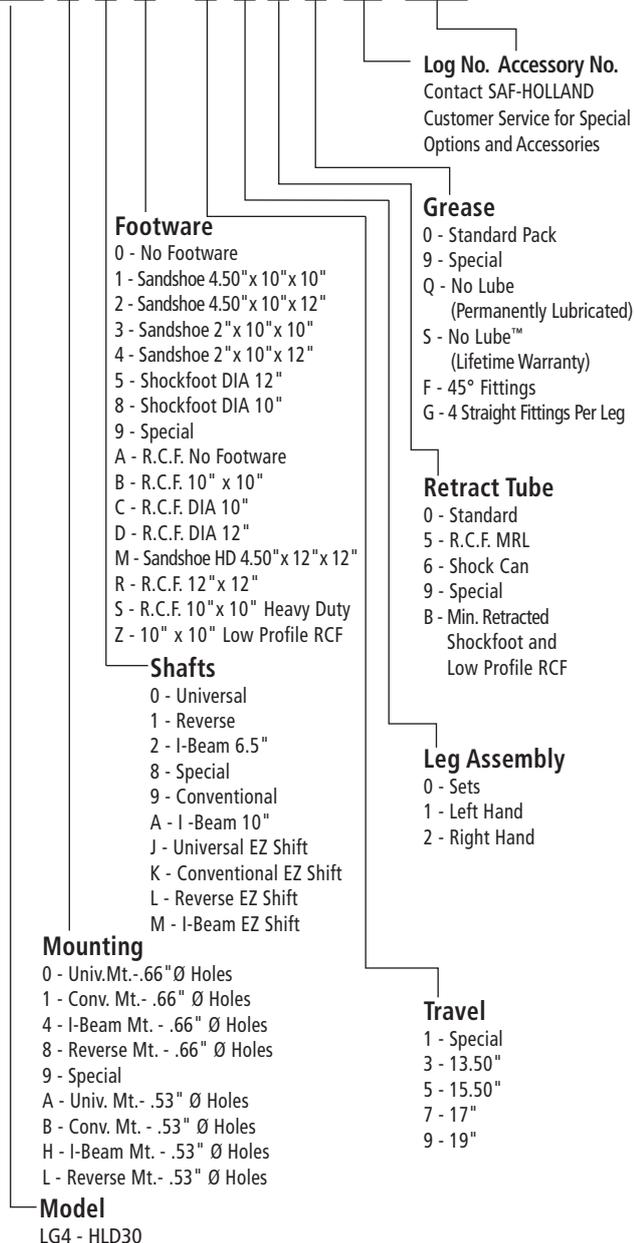
**2. Model Identification**

**HLD30**

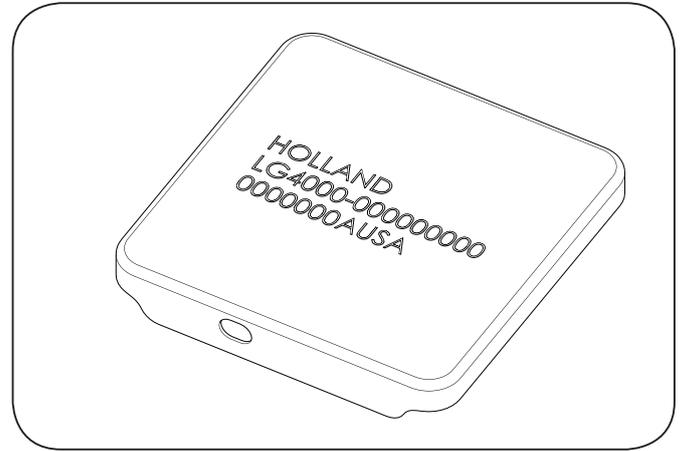
The HLD30 identification code is located on the top cover or on the side, behind the grease fittings of each landing gear leg (Figure 1 and 2). The first number is the part number, described below, and the second number is the serial number. In order to properly identify the HOLLAND® landing gear and its components when communicating with SAF-HOLLAND or a dealer, please record the part and serial numbers below and refer to them when ordering replacement parts.

**Part Number**

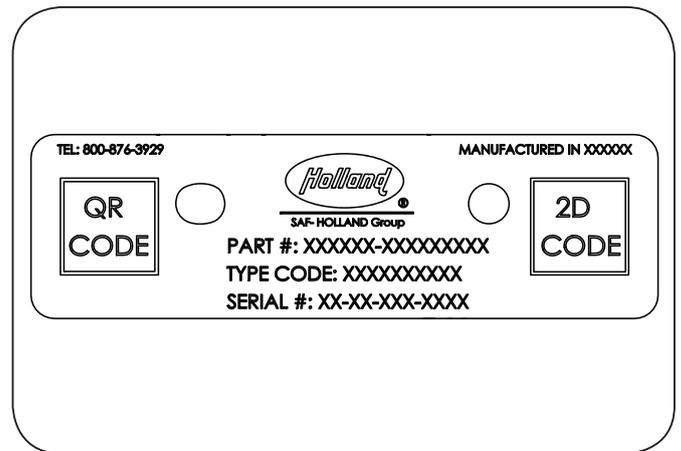
**LG4 0 0 1 - 7 0 0 0 00 000**



*Figure 1*



*Figure 2*



Part No: \_\_\_\_\_

Serial No: \_\_\_\_\_

Purchase Date: \_\_\_\_\_

## HOLLAND HLD30 LANDING GEAR - INSTALLATION

### 3. Pre-Installation Instructions

Prior to installation of the landing gear, correctly size the legs to the trailer. There **MUST** be 12" (304.8 mm) minimum ground clearance, when the landing gear is fully retracted.

Ensure that the legs have sufficient travel to raise the trailer from the fifth wheel 1-3" (25.4 - 76.2 mm) without over-extension. **DO NOT** force the landing gear past its stops.

**CAUTION** Failure to operate the landing gear within the maximum extension or retraction including repeated winding to its physical stops could, if not avoided, cause damage to the landing gear.

**IMPORTANT** Provide adequate clearance between the jack shaft bushings, jack shaft, shift shaft and the trailer frame. If the bushings or shafts are tight against the frame, damage and hard cranking will result (**Figure 7**).

**CAUTION** Failure to provide adequate clearance between the jack shaft bushings, jack shaft, shift shaft, and the trailer frame could cause hard cranking and wear which, if not avoided, could result in minor/moderate injury or component damage.

Before installation of the landing gear, ensure that both legs are in the fully retracted position. Both landing gear legs **MUST** be extended equally at all times.

**WARNING** Failure to extend the legs evenly could cause trailer to tip over, which, if not avoided, could result in death, serious injury, or property damage.

**WARNING** Failure to extend the legs evenly could increase the potential for landing gear spring back, which, if not avoided, could result in death or serious injury.

Ensure the cross-shaft is of adequate length for the application. When installed, the cross-shaft should have 1/8" (3 mm) to 3/8" (9.5 mm) of side to side free play. It should also rotate freely with the jack shaft when installed (**Figure 8**). A cross shaft which is too long will cause binding resulting in stiff operation and excessive bushing wear.

**CAUTION** Failure to ensure the cross-shaft is installed at adequate length and has free play could result in stiff operation which, if not avoided, could result in property damage.

Figure 7

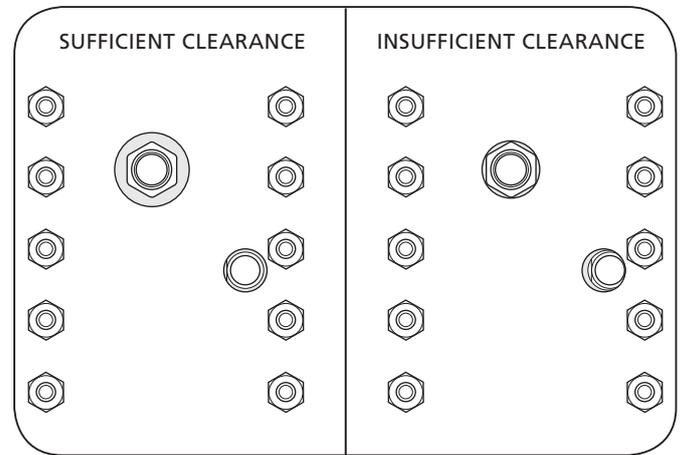
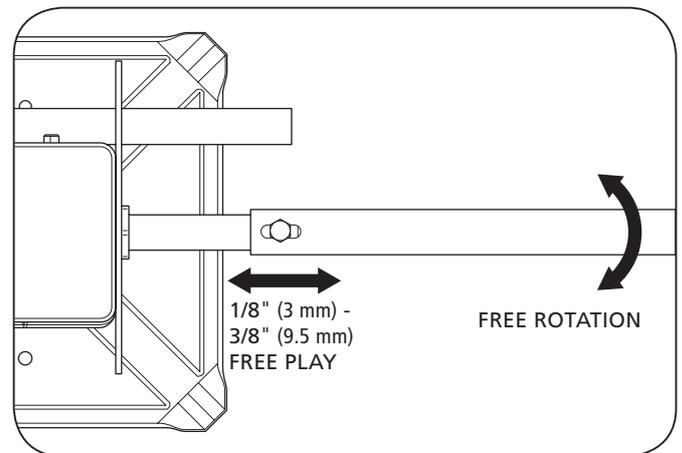


Figure 8



## HOLLAND HLD30 LANDING GEAR - INSTALLATION

## 4. Recommended Bracing

Installers are responsible to ensure that the mounting structure and mounting method are adequate for the intended imposed loads, use and application in accordance with trailer design specifications.

Published ratings are based on physical tests wherein the mounting plate of the tested landing gear legs was attached to a rigid fixture using eight (8) Grade 8, 5/8" (16 mm) diameter bolts and nuts with hardened washers. The lower end of the upper housing tubes were rigidly braced in a lateral and longitudinal direction. All fasteners were torqued according to the manufacturer's recommendations.

The following are the minimum bracing requirements to meet AAR-931 Side Load Requirements:

- Hardware: 5/8" (16 mm) Grade 8 bolts for all brace attachment.
- Strut Bracket: "W" Bracket (LG0266), 3/8" (9.5 mm) thick x 2" (51 mm) wide (minimum) or equivalent.

**NOTE:** DO NOT install strut brackets in the center of the housing without proper backing and DO NOT attach the brackets to the housing band (**Figure 11**).

**NOTE:** DO NOT allow weld for strut brackets to penetrate through the housing and make contact with the retract tube.

**⚠ WARNING** Failure to follow the installation instructions and bracing recommendations in this manual could create a crush hazard which, if not avoided, could result in death, serious injury or property damage.

**CAUTION** Failure to install, the landing gear per the preceding instructions and recommendations could cause faulty operation which, if not avoided, could cause property damage and void the warranty.

- Strut Brace: 1-1/2" (38 mm) Schedule 80 pipe or 1.900 outside diameter x 8 GA. Wall x 50,000 p.s.i. yield or equivalent. Flatten the pipe on both ends to accommodate fasteners and attachment to the brackets/trailer.

**NOTE:** DO NOT completely flatten the end of the pipe. ONLY flatten the area around the bolt hole. A completely flat end can buckle.

**⚠ WARNING** Use of strut braces that DO NOT meet these requirements may result in brace failure which, if not avoided, could result in death, serious injury or property damage.

The minimum bracing configuration to be used: A-type bracing laterally, with an additional straight cross member. Longitudinal bracing should consist of two braces mounted rearward of the landing gear, one for each leg as illustrated (**Figures 9 and 10**).

Figure 9

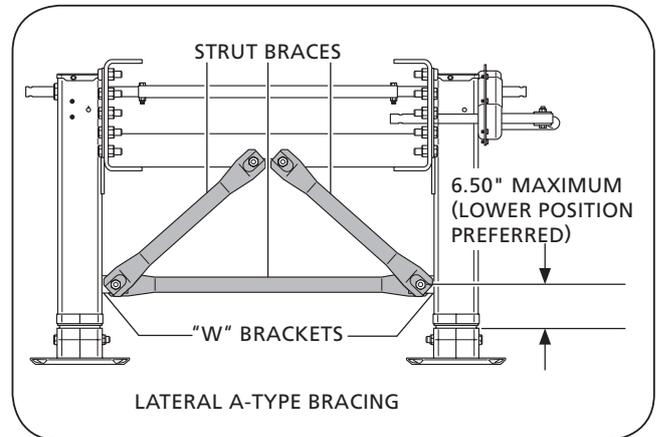


Figure 10

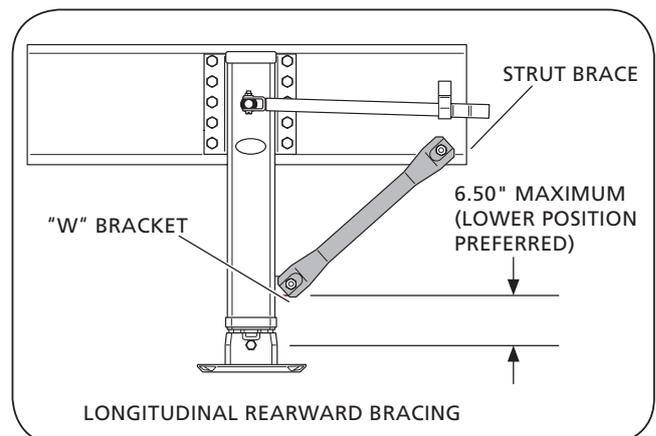
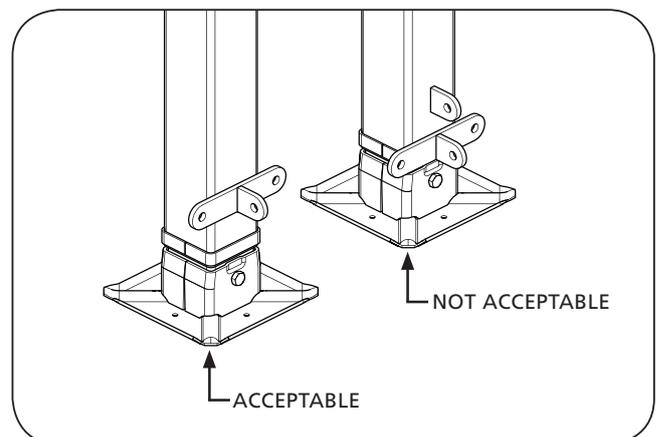


Figure 11



## HOLLAND HLD30 LANDING GEAR - INSTALLATION

### 5. Welding Standards

#### 5.1 Welding Standards

This specification applies to all components supplied by SAF-HOLLAND, and its products. The customer assumes full responsibility for weld integrity if weld material and procedures differ from those listed below.

#### 5.2 Workmanship

All welding on SAF-HOLLAND products MUST be performed by a welder qualified according to the appropriate AWS standard for the weld being made or an equivalent standard. It is the responsibility of the customer to provide good workmanship when welding on SAF-HOLLAND products.

#### 5.3 Material

Items to be welded that are made from low carbon or high-strength alloy steel are to be welded with AWS filler metal specification AWS A5.18, filler metal classification ER-70S-3, ER-70S-6 or equivalent unless specified on the installation drawing.

**NOTE:** Any substitution for filler material from the above standard MUST comply, as a minimum, with the following mechanical properties:

- Tensile Strength - 72k psi (496 MPa)
- Yield Strength - 60k psi (414 MPa)
- Charpy V Notch - 20ft.-lbs. (27 N•m) at 0° F (-17.7° C)%
- Elongation - 22%

The recommended welding gas for gas metal arc welding (GMAW) is 90% Argon / 10% CO<sub>2</sub>. If a different gas is used, welds MUST comply with penetration requirements illustrated (**Figure 12**). Where the installation drawing specifies different than above, the drawing shall prevail.

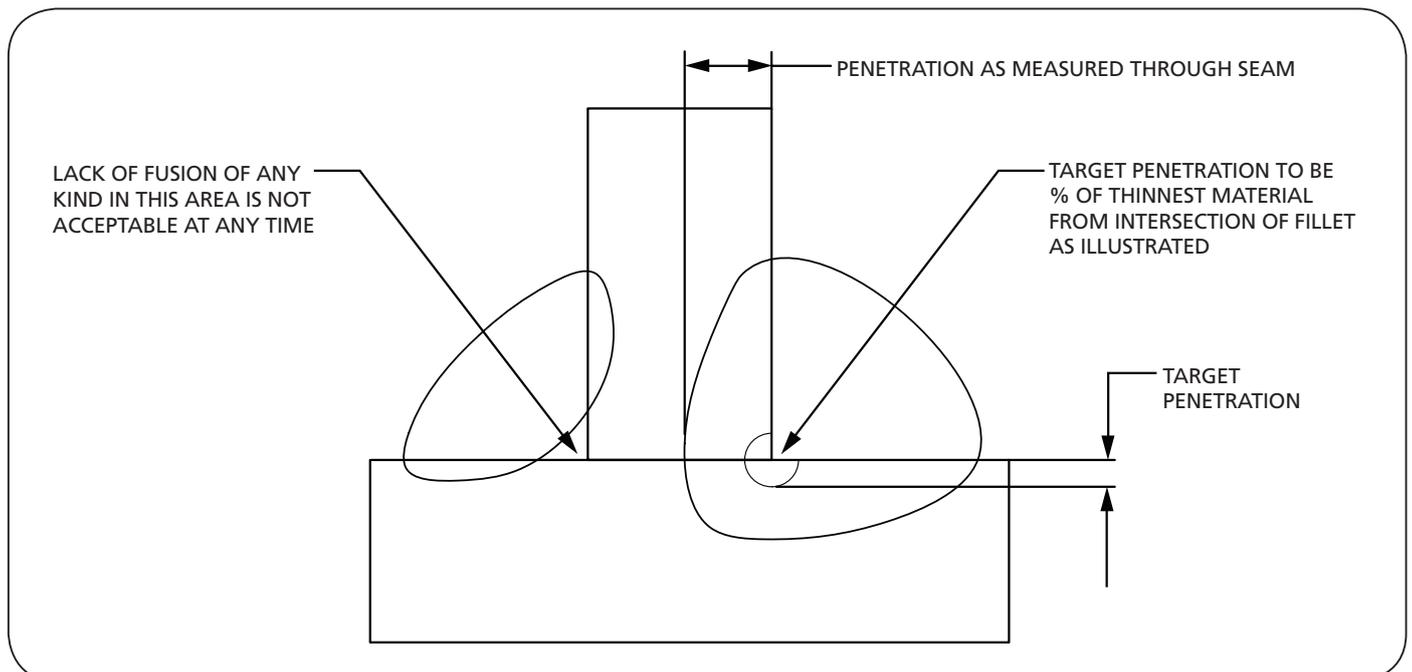
#### 5.4 Procedures

Tack welds used for positioning components are to be located in the center of the final weld, where practical. Tack weld should be completely fused to the finish weld. DO NOT break arc at the end of the weld. Back up all finish welds at least 1/2" (12.7 mm) or a sufficient amount to prevent craters at the end of the weld. Where weld is shown to go around corners, it is assumed the corner represents a stress concentration area. DO NOT start or stop weld within 1" (25.4 mm) of the corner. Particular care should be taken to prevent undercutting in this area.

#### 5.5 Weld Size

If weld size is NOT specified, the effective throat of the weld MUST be no smaller than the thinnest material being welded (**Figure 12**).

Figure 12



## HOLLAND HLD30 LANDING GEAR - INSTALLATION

## 6. Installation Instructions

1. On a level surface, support the front of the trailer with either a kingpin stand, or while coupled to a tractor (**Figure 13**).
2. Set the parking brakes and chock the tires.

**WARNING** Failure to properly support the trailer and chock the tires during installation of landing gear could create a crush hazard which, if not avoided, could result in death or serious injury.

3. Using a square, check that the trailer landing gear mounting surfaces are perpendicular to the ground and parallel to each other.
4. Install the landing gear legs and cross-shaft to the trailer frame. Torque mounting bolts to manufacturer's specifications. Ensure the cross shaft lock nuts are snug, but cross-shaft is allowed side to side free-play.
5. Install the bracing. Refer to Section 4, (Recommended Bracing), for the minimum bracing requirements. Torque fasteners to manufacturer's specifications.

**IMPORTANT:** After installing the bracing, use a square to ensure that the legs have remained aligned with the trailer and each other as illustrated (**Figure 14**).

6. Install the crank handle onto the shift shaft. Position the washers on the outside of the crank handle. Insert the bolt through both the washers and the shaft, and secure with nut (**Figure 15**).
7. Ensure proper operation by extending and retracting the landing gear. Verify the crank handle is allowed to engage and disengage freely.
8. Extend the landing gear to ensure that both legs reach the ground simultaneously.

**WARNING** Failure to maintain two hand control of handle and release SLOWLY could cause spring back which, if not avoided, could result in death or serious injury.

9. Install the crank hanger, and ensure that the handle can be adequately secured.
  - Locate Hanger on right-hand side of leg centerline for outside mount.
  - Locate Hanger on left-hand side of leg centerline for inside mount.

**CAUTION**

Failure to secure the crank handle when NOT in use could, allow unplanned landing gear extension which, if not avoided, could result in property damage.

Figure 13

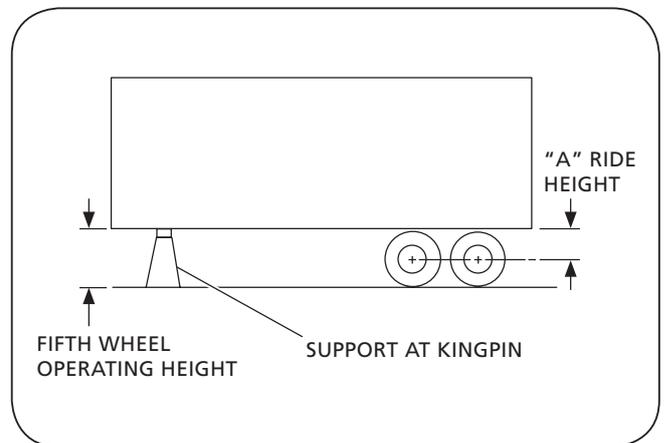


Figure 14

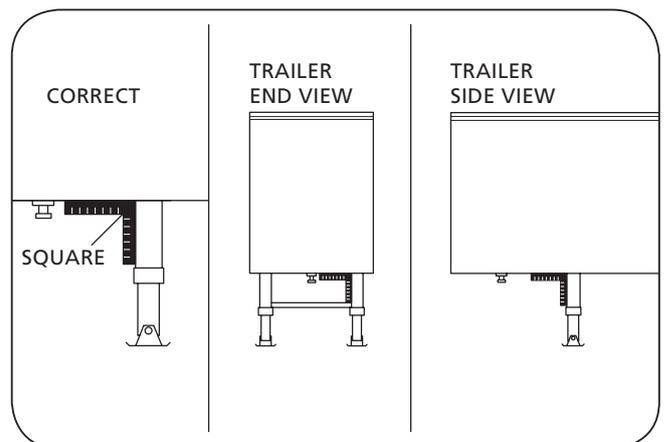
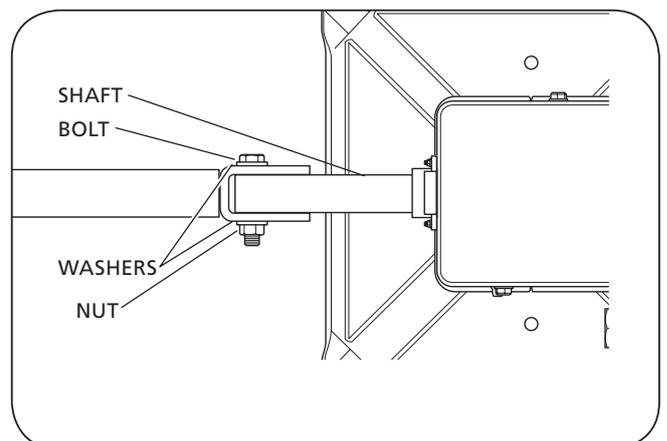


Figure 15



## HOLLAND HLD30 LANDING GEAR - OPERATION

- Verify that all braces, crank handle and foot ware are properly attached and that all bolts are tightened to fastener manufacturer torque specifications.

### 7. Landing Gear Operation

#### 7.1 Pre-Operation Inspection

The landing gear should be visually inspected prior to use. Make sure the legs are square to the trailer on both sides. Visually check for damaged, loose or broken components. Repair or replace the damaged landing gear.

**⚠ WARNING** Failure to check the condition of the landing gear prior to operating could result in use of damaged product which, if not avoided, could result in death or serious injury.

#### 7.2 Landing Gear Orientation

Determine if the landing gear is an outside (conventional) or an inside (reverse) mount before operation. The mount determines how the landing gear operates.

Landing gear with an outside mount (**Figure 16**):

- Push the crank handle in for high speed.
- Pull the crank handle out for low speed.
- Turn the crank clockwise to retract the leg.
- Turn the crank counter-clockwise to extend the leg.
- Crank storage hanger should be located on right-hand side of leg centerline.
- Always stow handle in hanger while in low gear (pull out).

Landing gear with an inside mount (**Figure 17**):

- Push the crank handle in for low speed.
- Pull the crank handle out for high speed.
- Turn the crank clockwise to extend the leg.
- Turn the crank counter-clockwise to retract the leg.
- Crank storage hanger should be located on left-hand side of leg centerline.
- Always stow handle in hanger while in low gear (push in).

Figure 16

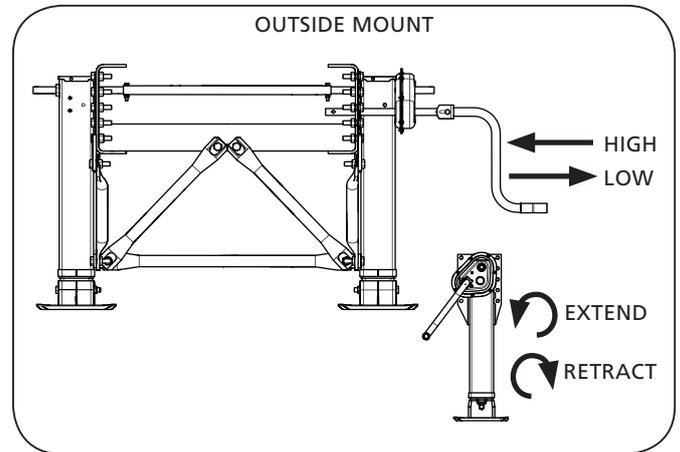
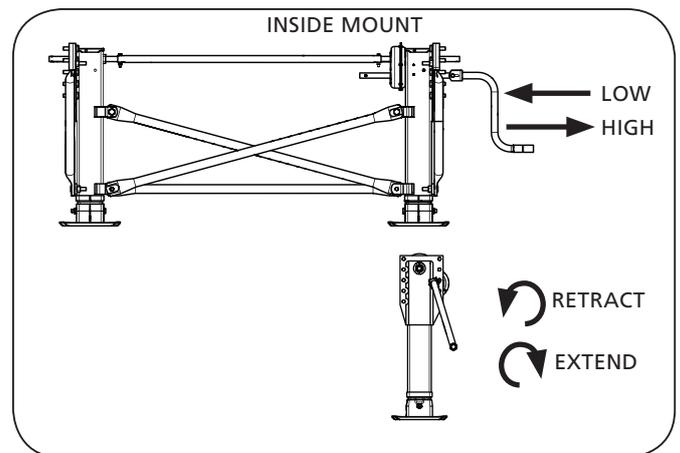


Figure 17



## HOLLAND HLD30 LANDING GEAR - OPERATION

## 7.3 Landing Gear Operation During Coupling

**CAUTION** Failure to perform procedures in a lighted area that is clear of obstacles and personnel could lead to a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTE:** For specific coupling instructions relating to the fifth wheel, tractor, and trailer, refer to the respective manufacturer's instructions.

1. Make sure the coupling area is flat, level and clear of persons and obstacles.
2. Prepare the fifth wheel, tractor and trailer for coupling per the manufacturer's instructions.
3. Back up to the trailer per the fifth wheel, tractor, and trailer manufacturer's instructions, centering the kingpin with the throat of the fifth wheel as illustrated (**Figure 18**).

**IMPORTANT:** DO NOT attempt to couple until steps 4-6 are completed.

**IMPORTANT:** DO NOT couple the tractor and trailer at an angle.

**CAUTION** Failure to align the tractor and the trailer properly could result in damage to the landing gear.

4. Engage the tractor parking brake, and chock the trailer wheels. Connect the brake lines and the electrical connections. Support the slack in the line to prevent interference.
5. Make sure that the landing gear is in low gear and engage the crank handle (**Figure 19**).

**CAUTION** Failure to lift and lower the trailer in LOW GEAR could result in damage to the landing gear.

6. With two hands on the crank handle, adjust the trailer height according to the fifth wheel, tractor, and trailer manufacturer's recommendations.

**WARNING** Failure to maintain two hand control of the handle and release SLOWLY could cause spring back, which, if not avoided, could result in death or serious injury.

7. Release the tractor parking brake. Couple and verify that the fifth wheel jaws are locked per the fifth wheel manufacturer's recommendations.
8. Engage the tractor parking brake. While still in low gear, retract the landing gear until the pads just come off the ground (**Figure 20**).

Figure 18

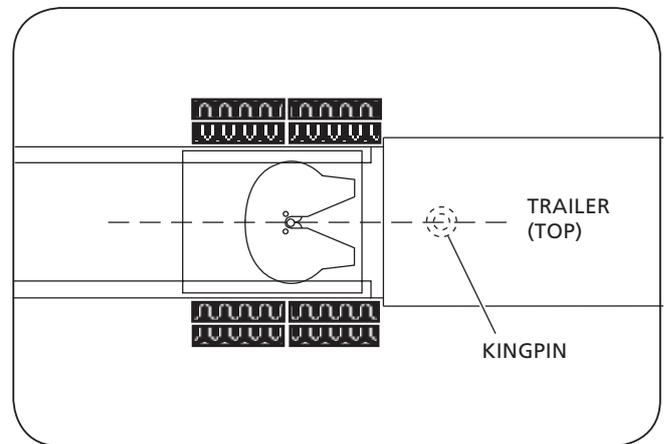


Figure 19

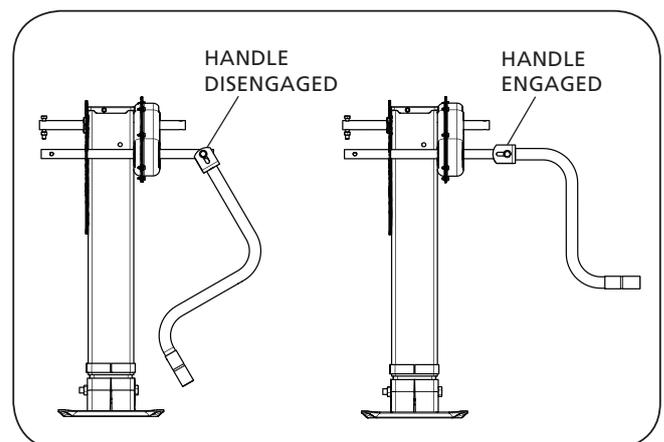
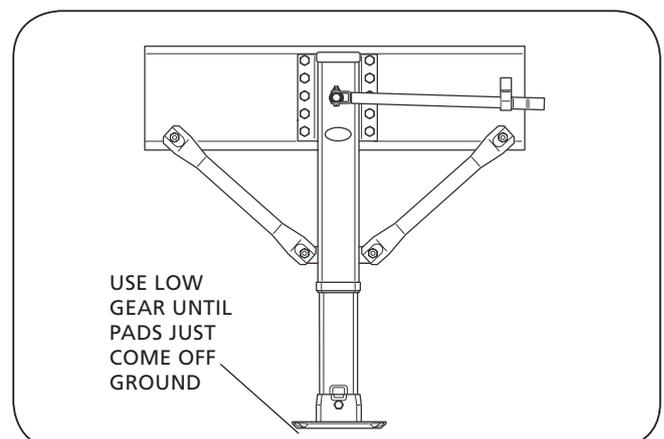


Figure 20



## HOLLAND HLD30 LANDING GEAR - OPERATION

9. Release the tractor parking brake. Re-verify that the fifth wheel jaws are locked per the fifth wheel manufacturer's recommendations. Reapply the tractor parking brake.
10. Shift the landing gear into high gear and fully retract. Shift the landing gear into low gear and secure the crank handle. For outside mount use **Figure 21**, for inside mount use **Figure 22**.

**CAUTION** Failure to retract the landing gear fully before moving the trailer could result in property damage.

**CAUTION** Failure to secure the crank handle when NOT in use could allow unplanned landing gear extension which, if not avoided, could result in property damage.

11. Complete all pre-trip inspection and operation procedures.

### 7.4 Landing Gear Operation During Uncoupling

**NOTE:** For specific uncoupling instructions relating to the fifth wheel, tractor, and trailer, refer to the respective manufacturer's instructions.

1. Position the tractor and the trailer on a well lit, level surface, clear of persons and obstacles. Verify that the surface beneath the landing gear is capable of supporting the trailer weight. Also ensure that the tractor and trailer are in line with each other.

**NOTE:** If necessary, place landing gear pads on a support plank to prevent the landing gear from sinking into the supportive surface. (This is especially important with liquid cargo, where a shift in the contents could overturn the trailer).

**CAUTION** Failure to align the tractor and trailer properly could result in damage to the landing gear.

**WARNING** Failure to rest the landing gear pads on a hard, flat surface, could result in trailer tip-over which, if not avoided, could result in death or serious injury.

2. Engage the trailer brakes. Slowly back tractor tightly against the trailer. Set the tractor brakes, and chock the trailer wheels.
3. Engage the landing gear crank handle and shift to high gear (**Figure 23**).

Figure 21

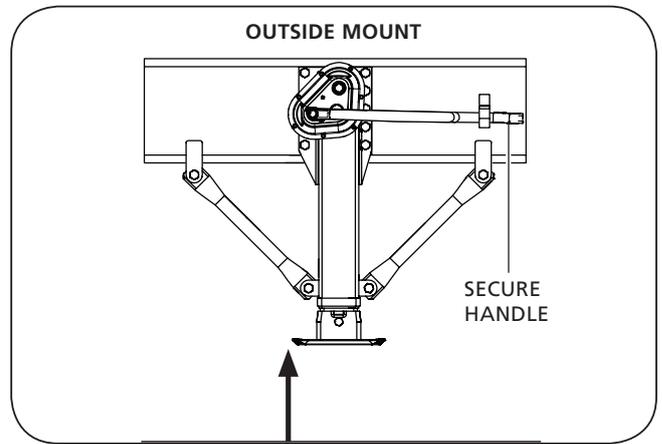


Figure 22

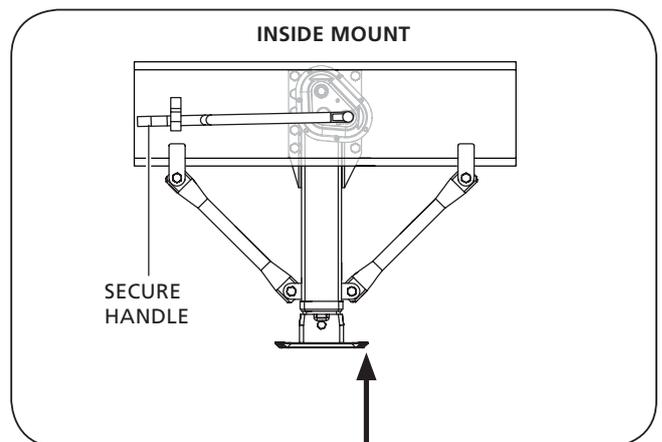
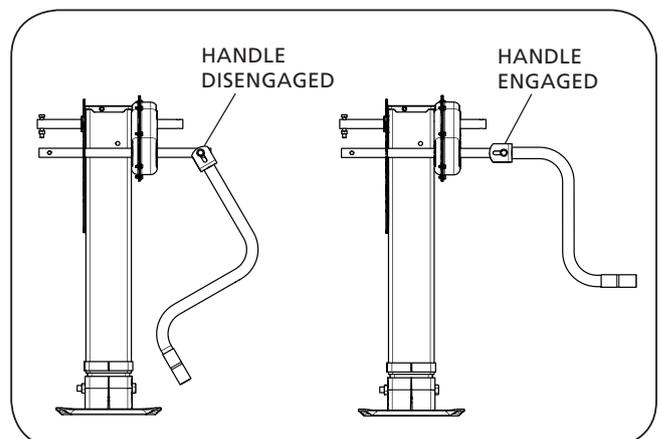


Figure 23



## HOLLAND HLD30 LANDING GEAR - OPERATION

- Extend the landing gear until the pads just touch the ground (**Figure 24**).

**CAUTION**

Failure to operate the landing gear within the maximum extension or retraction including repeated winding to its physical stops could, if not avoided, cause damage to the landing gear.

**WARNING**

Failure to maintain two hand control of the handle and release SLOWLY could cause spring back which, if not avoided, could result in death or serious injury.

- Shift the landing gear into low gear and secure the crank handle in the crank hanger (**Figure 25**).

**CAUTION**

Failure to secure the crank handle in low gear when NOT in use could, allow unplanned landing gear operation which, if not avoided, could result in property damage.

- Per the manufacturer's instructions, release the fifth wheel, disconnect the air lines and the electrical cord. Release the tractor brakes. Slowly drive away from the trailer until the fifth wheel disengages from the kingpin but remains under the trailer.
- Engage the tractor parking brake. Get out and inspect the landing gear and the support surface for proper trailer support.

**WARNING**

Failure to properly support the trailer could result in trailer instability which, if not avoided, could result in death, serious injury or property damage.

- Complete the uncoupling procedures per the fifth wheel, tractor, and trailer manufacturer's recommendations.

Figure 24

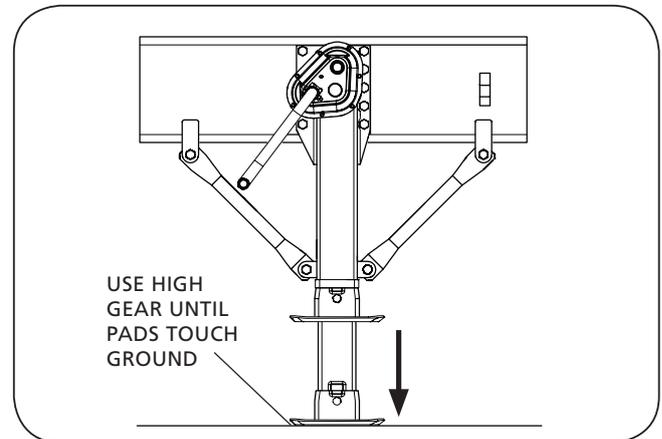


Figure 25

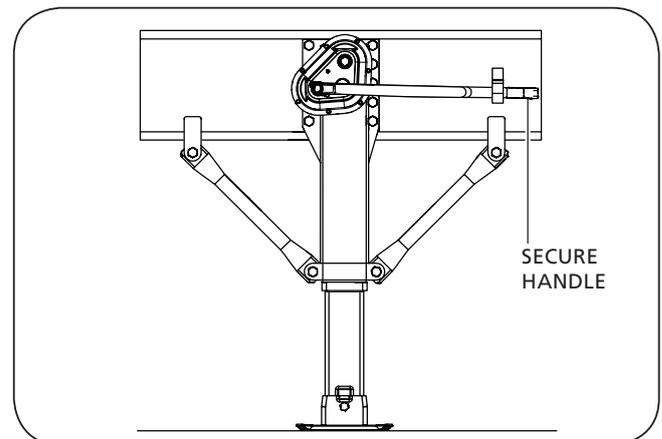
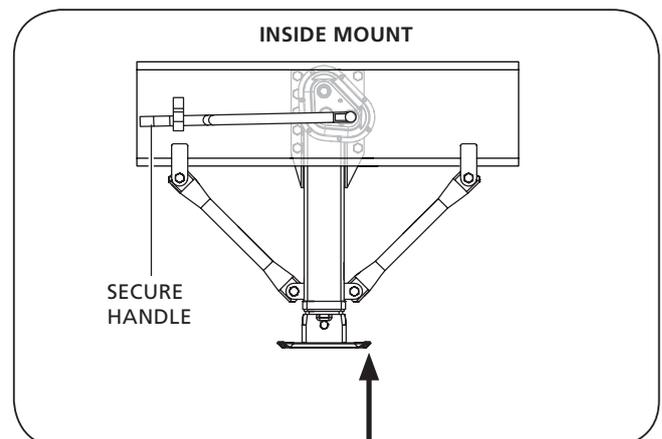


Figure 26



## HOLLAND HLD30 LANDING GEAR - SERVICE

### 8. Routine Service and Inspection

Table 1

Procedure	Interval	Notes
Landing Gear Inspection	Every use	Replacement/repair required if components visibly damaged, loose, or broken.
Lubrication*	Every 3 months	More frequently in excessively moist and dusty conditions, as well as if not used for extended periods of time.
Cleaning	With the vehicle	
Hardware Inspection	Every 6 months	
Landing Gear Alignment	Every 6 months	Inspection required if landing gear are visibly bent or damaged.

\*DO NOT use lubrication containing Teflon.

#### 8.1 Landing Gear Inspection (Before Use)

Before use, inspect the landing gear for cracks, bent components, or damaged/missing hardware, and any noticeable defects. The landing gear must be repaired prior to operation to avoid damage and possible injury.

**⚠ WARNING** Failure to check the condition of landing gear prior to operating could result in use of damaged product which, if not avoided, could result in death or serious injury.

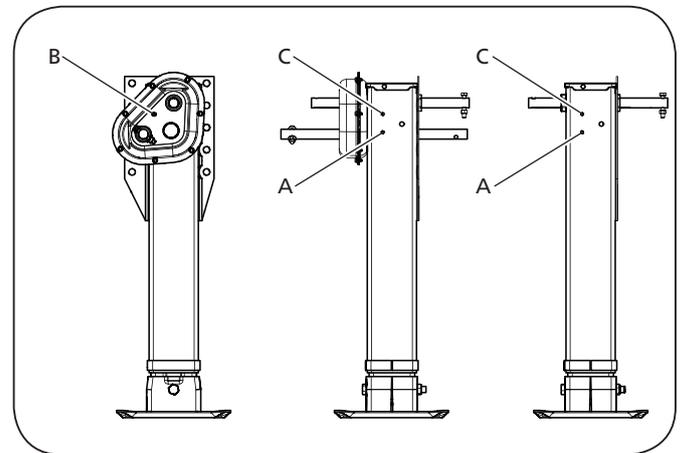
#### 8.2 Lubrication

The landing gear requires lubrication whether it is used frequently or sits idle for extended periods of time. If left idle and un-greased, hard cranking could result. Use SAF-HOLLAND True Lube™ (per XL-LG20039SL-en-US) grease for optimum performance. Follow these steps to maintain expected performance (**Figure 27**):

**⚠ CAUTION** Failure to properly lubricate the landing gear when required could result in damage to the landing gear.

1. Place the trailer on level ground, chock the tires, and support the trailer independently of the landing gear.
2. Fully retract the landing gear, then using high gear, extend the leg 2-3 turns and lubricate the lift-screw assembly through grease fitting "A". Apply 1/2 lb. of grease.
3. Lubricate the gearbox, using grease fitting "B". Apply 1/4 lb. of grease.
4. Lubricate the bevel gear, using grease fitting "C". Apply 1/4 lb. of grease.
5. Distribute the lubrication by fully extending and retracting the leg several times.

Figure 27



## HOLLAND HLD30 LANDING GEAR - SERVICE

## 8.3 Cleaning

No special cleaning of the landing gear is required; however, the landing gear should be cleaned with the rest of the vehicle.

**NOTE:** DO NOT directly aim water at the landing gear shafts and bushings or up into the retract assembly. Water infiltration into the gearbox and housing could cause corrosion.

**CAUTION** Failure to prevent water infiltration into the shafts, bushings and retract assembly, could result in damage to the landing gear.

## 8.4 Hardware Inspection

Perform the following procedures to ensure the landing gear is in proper working order:

1. Tighten or replace the mounting bolts as necessary.
2. Inspect the mounting bracket for cracks or other signs of damage.
3. Repair or replace any broken or damaged part of the landing gear assembly or mounting structure.

**WARNING** Failure to repair or replace damaged landing gear components can result in unsafe product conditions which, if not avoided, could result in death or serious injury.

4. Inspect the crank handle bolt and the lock nut. Tighten or replace as necessary.
5. Inspect the crank handle. If the handle connecting tabs, tube or grip are bent or damaged, replace the handle.
6. Cross shaft connection bolts and lock nuts should be secure, but allow side-to-side play in the cross shaft.
7. Inspect the footware for damage and replace if the components are bent or cracked. If removable footware is present, ensure all mounting bolts and fasteners are tightened and footware is secure.
8. Check for proper shift shaft engagement in both high and low gear and proper shifting between gears. Rebuild if necessary.

**NOTE:** The crank shaft should translate approximately 5/8" between high and low gear.

9. Rebuild or replace the landing gear with excessive play in the shafts and bushings.

## 8.5 Landing Gear Alignment

Check to make sure the landing gear legs are in alignment with the trailer and parallel with each other using a square (**Figure 28**). Bent or damaged legs are an indication of possible damage to the lift screw, lift nut or other internal components and should be replaced.

**NOTE:** HLD30 and iM landing gear utilize a floating nut retract tube design. A retract tube that appears to be angled slightly compared to the upper housing DOES NOT constitute a damaged leg (**Figure 29**). However, if the landing gear housing shows signs of fracture or cracking around the band area, the landing gear must be replaced.

Figure 28

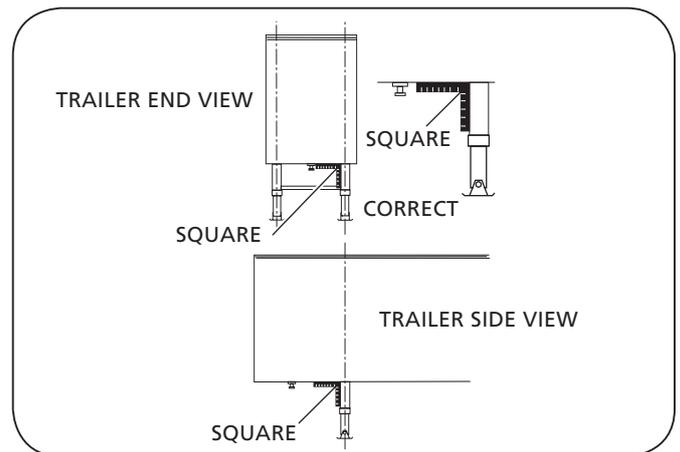
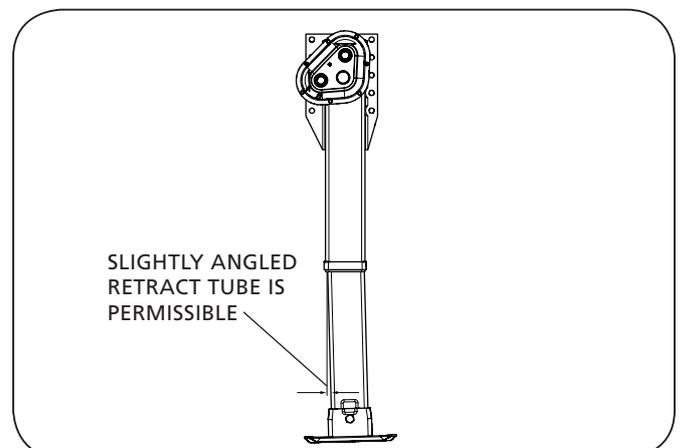


Figure 29



## HOLLAND HLD30 LANDING GEAR - SERVICE

### 9. Troubleshooting

PROBLEM	POSSIBLE CAUSE	RESOLUTION
Hard to Crank Landing Gear	Turning the crank in the wrong direction	Refer to "Landing Gear Operation" for proper crank rotation.
	Attempting to raise or lower trailer in high gear.	Shift into low gear. DO NOT ATTEMPT TO LIFT OR LOWER IN HIGH GEAR. Doing so could result in damage to the landing gear.
	Cross shaft binding.	Inspect cross shaft bolts. Back off bolts to allow lateral (side to side) movement of the cross shaft. Straighten or shorten cross shaft to eliminate binding.
	Misaligned landing gear legs.	Legs MUST be parallel and extend and retract evenly. Remove cross driveshaft and adjust landing gear legs to same height.
	Lack of grease.	Grease landing gear legs as provided in the "Lubrication" section.
	Damaged lift screw or nut.	Check landing gear for signs of impact (accident) damage. Disconnect cross shaft and crank legs individually to determine which leg is damaged. Replace entire retract assembly or damaged leg.
	Interference between powder metal bushing or jackshaft of gearbox and trailer mounting surface.	Trailer mounting surface may need to be modified to ensure no interference between bushing or jackshaft and trailer surface.
	Upper housing or retract tube may be bent.	Replace damaged part(s) or landing gear.
	Excessive wear or damage to pinion, bevel, input, idler and/or output gears.	Replace damaged gears.
	Bearing boss is pushed inside housing.	Replace jackshaft and O-ring with jackshaft repair kit designed for landing gear models sold after January 2013.
Hard to crank landing gear under load only.	Weld blow through where strut bracket is welded to housing.	Grind weld as required and re-weld. (With no-load on landing gear, the retract tube should have free play inside the housing.)
	Damaged collar.	Replace the collar
Crankshaft jams or skips while turning.	Damaged thrust bearing.	Replace the thrust bearing.
	Inner leg screw damaged.	Examine the lift nut and screw of the inner leg assembly for impact (accident) damage. Replace components or leg as necessary.
Landing gear will NOT shift between gears.	Worn, broken, or damaged gears (missing teeth).	Examine pinion, bevel pinion and all gearbox gears for missing teeth or other signs of damage or wear. Replace components as necessary.
	Low input gear is frozen or binding on the shift shaft.	Follow procedures in the Troubleshooting Guide XL-LG11424TS-en-US to restore easy shifting.
Gearbox leg operates but opposite leg DOES NOT.	Broken/damaged cross driveshaft bolt.	Replace cross driveshaft bolt.
	Broken/damaged cross driveshaft.	Replace cross driveshaft.
	Bevel gear pin/pinion gear pin sheared in non-gearbox leg.	Remove upper leg cover. Check for damaged or missing pins under bevel gear, or in pinion gear and replace as necessary.
	Bevel gear/pinion gear damaged in non-gearbox leg.	Remove upper leg cover. Check for damaged gears and replace as necessary.
Non-gearbox leg operates, but gearbox leg DOES NOT.	Bevel gear pin/pinion gear pin sheared in gearbox leg.	Remove upper leg cover. Check for damaged or missing pins under bevel gear, or in pinion gear and replace as necessary.
	Bevel gear/pinion gear damaged in gearbox leg.	Remove upper leg cover. Check for damaged gears and replace as necessary.
Both legs will NOT operate, shift shaft will turn but output shaft DOES NOT turn.	Damaged input, idler, and/or output gear.	Remove gearbox cover. Inspect and replace broken gears.
	Gear pin(s) sheared in gearbox.	Remove gearbox cover. Inspect and replace broken pins.
Both legs will NOT operate, but shift shaft and output shaft turn.	Bevel gear pin/pinion gear pin sheared in both legs.	Remove upper leg covers. Check for damaged or missing pins under bevel gear, or in pinion gear and replace as necessary.
	Bevel gear/pinion gear damaged in both legs.	Remove upper leg covers. Check for damaged gears and replace as necessary.
Legs locked and will NOT turn	Bent retracting screw or damaged riser nut and screw.	Check landing gear for signs of impact (accident) damage. Disconnect cross shaft and attempt to crank legs individually to determine which leg is damaged. Replace entire retract assembly or damaged leg.