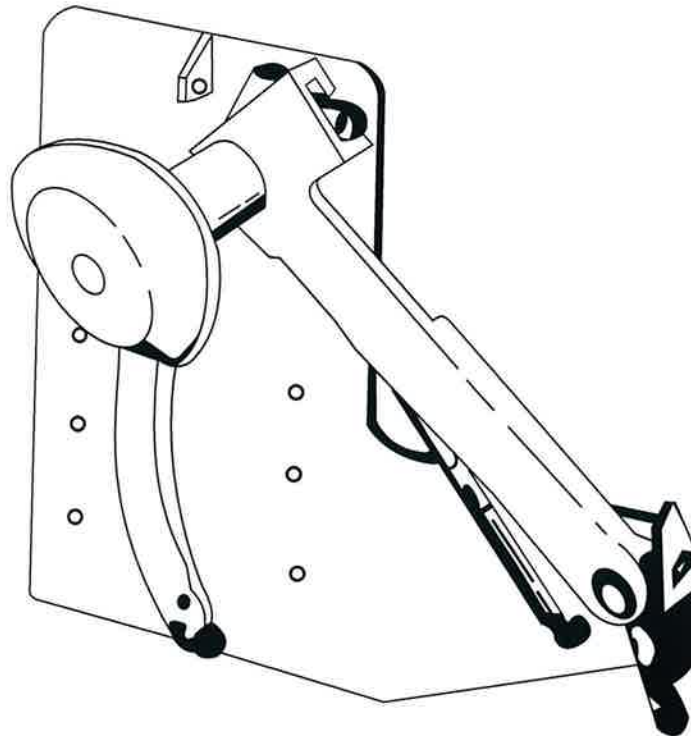


STAR[®] TRUK STOP[®] Vehicle Restraint

STAR[®] 4 — Low Profile w/403 Control Module



This manual applies to vehicle restraints manufactured beginning November 2005 with the serial numbers 10,219,276 and higher. *thru 6/07* ~~and higher.~~ *thru 10242301*

WARNING

Do not install, operate or service this product unless you have read and understand the Safety Practices, Warnings, and Installation and Operating Instructions contained in this manual. Failure to do so could result in death or serious injury.

User's Manual

Installation, Operations, Maintenance and Parts

Part No. 5546 R6

TROUBLESHOOTING

WARNING

Do not service this product unless you have read and followed the Safety Practices, Warnings, and Operation instructions contained in this manual. Failure to follow these safety practices could result in death or serious injury.

If inside and outside lights all cease to function, check for RED LED indicating "Signal Light Circuit Short" on face of control module. (See page 30) Eliminate short, RED LED will go out, lights will again function.

In case of power failure, when power is resumed:
The inside and outside lights will both flash RED. Either the **HITCH** or **RELEASE** push-button must be used to reset the proper lights inside and outside. **Enter vehicle on green inside light only.**

MANUAL OPERATION selected by leaving jumper from terminal 21 to 22 control module.

I Hitches:

	INSIDE	OUT*	AUX	ALARM
A) Vehicle hitch made and up pressure made	green	red	on	off
1) Hitch lost	red flash	red	off	on
a) Remake hitch.....	green	red	on	off
2) VERRIDE push-button locked out				
3) A release must be performed	red	green	off	off
B) Hitch made, no up pressure, 30 sec. time out made.....	green	red	on	off
1) VERRIDE push-button locked out				
2) A release must be performed.....	red	green	off	off
C) No hitch made, no up pressure, 30 sec. time out made.....	red flash	red	off	on
1) RELEASE push-button locked out				
2) Override must be performed which sends the hook down	red/grn alt flash	red	on	off
a) HITCH push-button is locked out				
b) A release must be performed.....	red	green	off	off
D) No hitch made, up pressure made	red flash	red	off	on
1) RELEASE push-button locked out				
a) Remake hitch.....	green	red	on	off
2) Override must be performed which sends the hook down	red/grn alt flash	red	on	off
3) HITCH push-button is locked out				
4) A release must be performed.....	red	green	off	off
II Releases:				
A) Hook releases, down pressure made	red	green	off	off
B) Down pressure made, hook does not release.....	solid red/grn flash	red	on	off
1) HITCH push-button locked out				
2) Hook must be corrected				
C) Hook releases, down pressure made	red	green	off	off

* OUTSIDE LIGHTS ALWAYS FLASH

TROUBLESHOOTING, continued

SEMI-AUTOMATIC OPERATION selected by replacing jumper wire from terminals 21 to 22 on control module with wires from dock leveler mounted, lip actuated limit switch wired as shown on page 30.

- A) **HITCH** push-button and all other hitch conditions of I are the same.
- B) **OVERRIDE** push-button and all alarm reset conditions of I are the same.
- C) **RELEASE** push-button is locked out whenever the lip is extended.

	INSIDE	OUT*	AUX	ALARM
D) Extending the lip causes a hitch				
1) Hitch made, up pressure made	green	red	on	off
a) Hitch lost	red flash	red	off	on
b) Remake hitch	green	red	on	off
2) Override is locked out				
3) Release is locked out when lip is extended				
E) Extending the lip causes a hitch				
1) Hitch made, no up pressure made; 30 sec. pump time out made.....	green	red	on	off
2) OVERRIDE push-button locked out				
3) RELEASE push-button locked out when lip is extended				
F) Extending the lip causes a hitch				
1) No hitch made; no up pressure made; 30 sec. pump time out made.....	red flash	red	off	on
2) RELEASE push-button locked out when lip is extended				
3) Enable Override (sends hook down)	red/grn alt flash	red	on	off
4) RELEASE push-button still locked out				
5) HITCH push-button locked out				
6) Storing lip allows normal RELEASE button to function ...	red	green	off	off
G) Extending the lip causes a hitch				
1) No hitch made, up pressure made	red flash	red	off	on
2) RELEASE push-button is locked out when lip is extended				
3) Remake hook	green	red	on	off
4) Enable Override (sends hook down)	red/grn alt flash	red	on	off
5) RELEASE push-button still locked out				
6) HITCH push-button locked out				
7) Storing lip allows normal RELEASE button to function	red	green	off	off
H) Extending the lip causes a hitch	green	red	on	off
Storing the lip allows normal RELEASE button to function				
I) Extending the lip causes a hitch.....	green	red	on	off
Storing the lip allows normal RELEASE button to function				
1) Down pressure made, hook release not made	solid red/grn flash	red	on	off
a) HITCH push-button is locked out				
b) Hook must be corrected				
2) Hook releases, down pressure made	red	green	off	of

* OUTSIDE LIGHTS ALWAYS FLASH

FUNCTIONAL TEST SPECIFICATIONS (Control module used in manual mode and RED/ GREEN switch Position)

PRESS THE HITCH PUSH-BUTTON:

- The inside RED LIGHT will flash and the hook will raise.
- The outside flashing GREEN LIGHT will turn OFF and the RED LIGHT will flash.
- The cylinder rod fully extends.
- Pump shuts off at 650 (+/-25) PSIG (UP PORT).
- If the sensor bar is deflected the inside GREEN LIGHT will turn ON and the flashing RED LIGHT will turn off.
- If the sensor bar is not deflected the inside RED LIGHT will continue to flash and alarm will sound.
- If the sensor bar is deflected and released two seconds will elapse before lights change.

PRESS THE OVERRIDE PUSH-BUTTON: (Sensor bar not deflected)

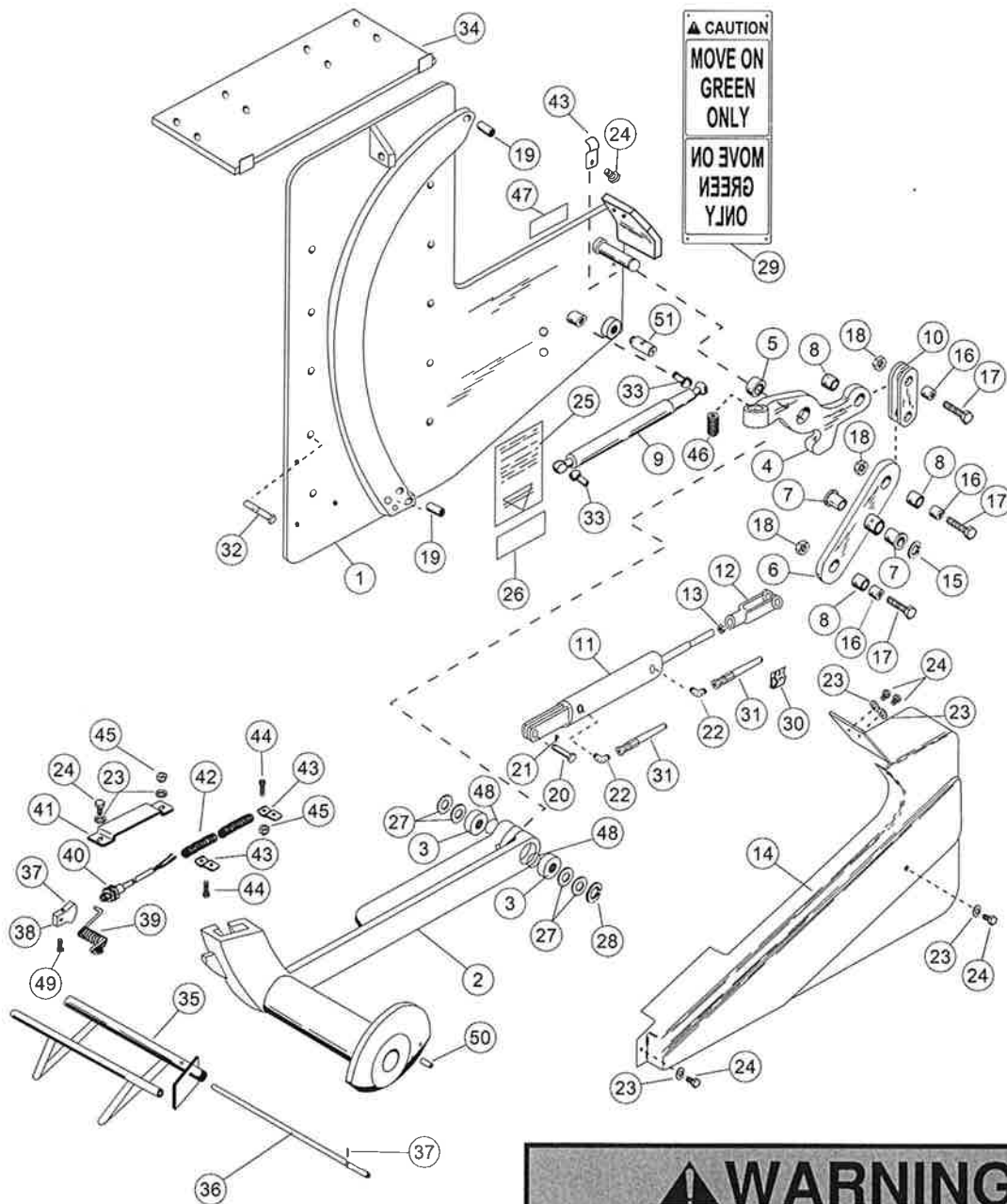
- The hook will return to the stored position and the flashing inside RED LIGHT will change to alternating GREEN/RED LIGHTS and alarm will silence.

PRESS THE RELEASE PUSH-BUTTON:

- The hook will return to the stored position and the inside GREEN LIGHT will turn OFF and the RED LIGHT will turn ON.
- The cylinder rod fully retracts.
- Pump shuts off at 650 (+/-25) PSIG (DN PORT).
- The outside flashing RED LIGHT will turn OFF and the GREEN LIGHT will flash.
- If the **VERRIDE** push-button was previously pressed, then the **RELEASE** push-button must be pressed to change the inside alternating GREEN/RED LIGHTS to a RED LIGHT and the outside flashing RED LIGHT to a flashing GREEN LIGHT.

PARTS LIST — STAR® 403 LOW PROFILE

Fig. 29



▲ WARNING

To ensure proper function, durability and safety of the product, only replacement parts that do not interfere with the safe, normal operation of the product must be used. Incorporation of replacement parts or modifications that weaken the structural integrity of the product, or in any way alter the product from its normal working condition at the time of purchase from KELLEY® could result in product malfunction, breakdown, premature wear, death or serious injury.

PARTS LIST — STAR® 403 LOW PROFILE, continued

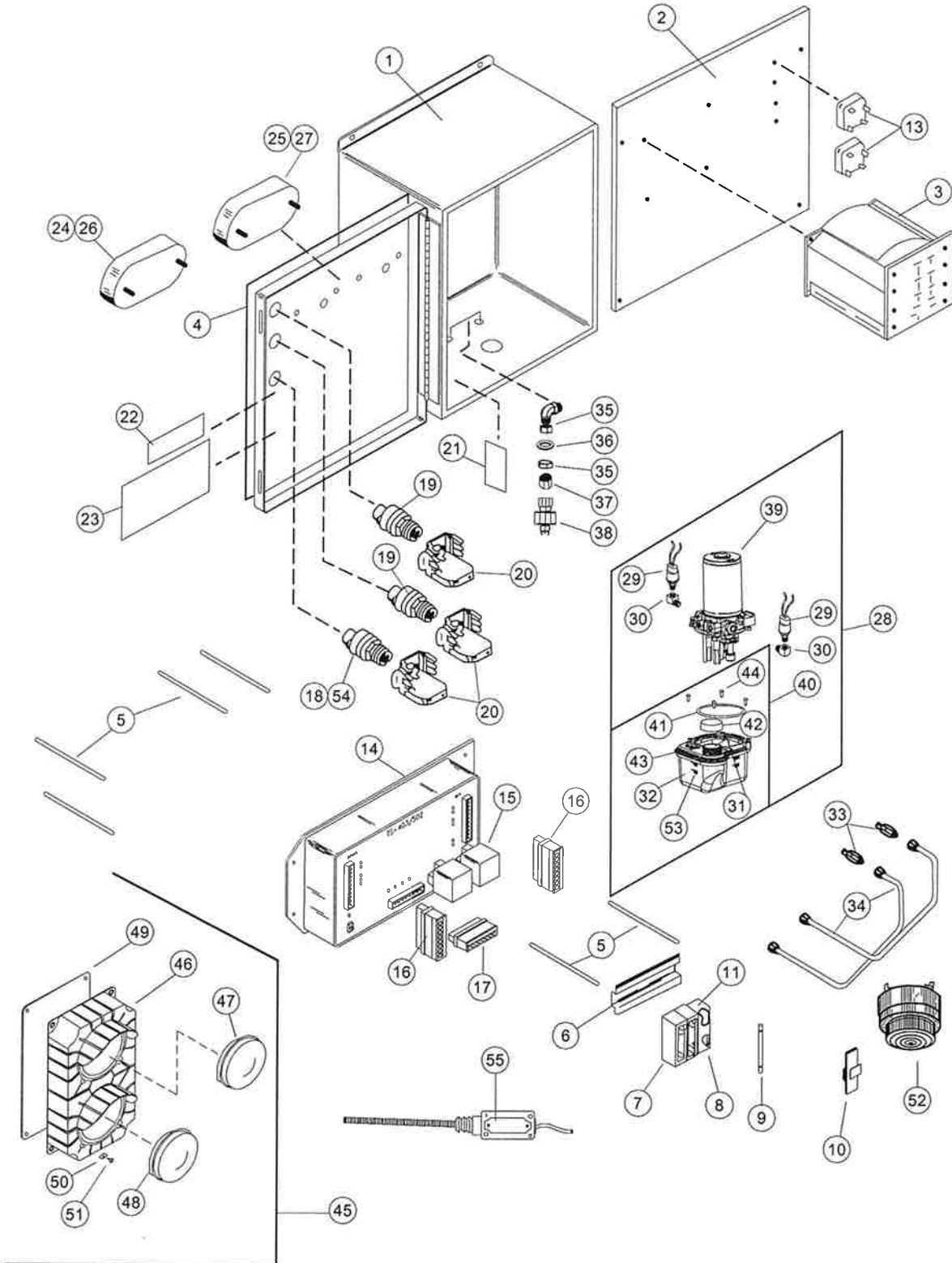
Item	Quantity	Description	Part Number
1	1	Back Plate Weldment Plated	713-397
2	1	Hook Arm, w/Bearing Plated	675-411
3	2	Bearing, Ball (Included w/ item 2)	091-097
4	1	Lever Ass'y., Hook Actr. (Includes 1 of item 8) Plated	675-412
5	1	Bearing, Sleeve (Included w/item 4)	153-106
6	1	Lever Ass'y., Cylinder (Includes 2 of item 8) Plated	675-413
7	2	Bearing, Flange (Included w/item 6)	091-100
8	3	Bearing, Sleeve	091-099
9	1	Gas Spring w/Ball Stud Ends (Includes item 33)	709-472
10	2	Link, Hook Actuator Plated	675-493
11	1	Cylinder Ass'y. - Hydraulic	710-556
12	1	Clevis, Cylinder (Included w/item 11) Green Paint	710-709
13	1	Nut, Hex Jam 7/16-20 (Included w/item 11)	000-142
14	1	Cover, Hydraulic Cylinder	155-990
15	1	Klipring, 3/4 dia.	049-063
16	3	Bushing, 1/2 ID x 3/4 OD x 9/16 lg	154-485
17	3	Screw, Hx. Hd. Cap, 1/2-13 x 1-3/4 lg	131-370
18	3	Nut, Hex Lock, 1/2-13	000-035
19	2	Pin, Roll 1/2 dia. x 1-1/4 lg	035-100
20	1	Pin, Clevis 1/2 dia. x 1-1/2 lg	705-882
21	1	Pin, Cotter 1/8 dia. x 1-1/4 lg.	035-036
22	2	Straight Thread Elbow 90 deg.	031-130
23	6	Washer, Flat 3/8	000-214
24	6	Screw, Cap 3/8-16 x 1/2 lg.	000-310
25	1	Decal, STAR® TRUK STOP® Logo	709-624
26	1	Serial Tag	138-822
27	A/R	Washer, 1-1/2 OD x 1-1/32 ID	000-064
28	1	Klipring, 1 dia.	049-064
29	1	Sign, "MOVE ON GREEN ONLY"	709-832

PARTS LIST — STAR® 403 LOW PROFILE, continued

Item	Quantity	Description	Part Number
30	6	Hose Clamp	709-683
31	2	Hose Ass'y, Hyd. 1/4	710-621
32	1 pkg.	Anchors, 14 per package	287-510
33	2	Rod End (Included w/item 9)	708-829
34	1	Horizontal Mounting Plate Green Paint	709-470
35	1	Weldment, Sensor Bar	712-914
36	1	Shaft, Sensor Bar	155-643
37	1	Screw, Soc. Hd. #10-24 x 5/8 lg.	131-250
38	1	CAM, Proximity Switch	155-642
39	1	Spring, Torsion - Sensor Bar	101-079
40	1	Switch, Proximity - 12 Volt	061-551
41	1	Bracket, Proximity Switch	154-134
42	6 ft.	Tubing, Flexible, Liquid Tight	154-201
43	3	Clip, Wire	154-202
44	2	Bolt, Hex Hd. 3/8-16 x 1-1/4 lg.	000-003
45	2	Nut, Lock, Elastic 3/8-16	000-253
46	1	Screw, Socket Hd., Set 1/2-13 x 1-1/4	131-519
47	1	Label, Safety Products	711-266
48	2	Lock Ring (Included w/item 2)	049-067
49	1	Screw, Socket Hd. 1/4-20 x 3/8" lg.	131-471
50	1	Pin, Roll 3/8" Dia. x 1-1/2" lg.	035-031
51	1	Pin, Lever Pivot, Threaded	155-621

PARTS LIST — CONTROL BOX

Fig. 30



PARTS LIST — CONTROL BOX, continued

Item	Quantity	Description	Part Number
-	-	Control Box Assembly (Contains items 1 through 37, 52 and 53)	908-937
1	1	Control Box w/Holes	712-598
2	1	Sub-Panel w/Holes	711-393
3	1	Transformer 120-12.5/12.5 Volts	061-571
4	1	Label, Instructions	711-363
5	6	Standoff 5/16" Hex x 4" lg.	154-211
6	1	Channel, Mounting	061-748
7	2	Terminal Block - 600V	061-509
8	1	Fuse Holder Block	061-510
9	1	Fuse - 1-1/4 Amp	061-820
10	1	Fuse Puller	061-513
11	1	End Barrier - Fuse Block	061-515
12	2	Clip, Retaining (Not Shown)	061-512
13	2	Rectifier, Bridge - 35 Amp	061-507
14	1	Control Module (Contains item 15)	908-870
15	2	Relay, 12V, SPDT, 40 Amp (Included in item 14)	061-558
16	2	Connector, 10 Pin	061-579
17	1	Connector, 8 Pin	061-578
18	1	Push-button, White	061-563
19	2	Push-button, Black	061-562
20	3	Contact Block	061-566
21	1	Label, Fuse	-----
22	1	Label, Caution	138-607
23	1	Label, Electrical Schematic	712-887
24	1	Light, Marker - w/Red Lens	AP2771
25	1	Light, Marker - w/Green Lens	AP2770
26	2	12VDC Red LED LRU	637-140
27	2	12VDC Green LED LRU	637-142
28	1	Pump/Motor Assembly (Includes items 38 and 39 and Pump)	710-614
29	2	Pressure Switch	061-552
30	2	Elbow, Street 90 degree, 1/8" NPT	205-223
31	1	Caplug	709-686
32	A/R	*Hydraulic Fluid – 5606	152-002
33	2	Straight Connector, 1/4" Tube	031-129
34	2	Tube Assembly	711-387
35	2	Bulkhead Elbow, 90 degree, 1/4" Tube	031-131
36	2	Washer, Flat 3/8"	000-051

PARTS LIST — CONTROL BOX ASSEMBLY, continued

Item	Quantity	Description	Part Number
37	2	Cap, 37 Degree Flare, 1/4" Tube	031-133
38	2	In-Line Filter	710-684
39	1	Motor (Separate)	709-753
40	1	Reservoir Kit (Includes items 40 through 45)	714-035
41	1	"O" Ring	711-442
42	1	Cap	714-036
43	1	Reservoir	714-037
44	4	Screw	714-038
45	1	Red/Green 12VDC LED Light Assembly (Includes items 46 through 51)	713-231
46	1	Housing, Light	155-821
47	1	Lens/ Housing - Red LED	6001544
48	1	Lens/ Housing - Green LED	6001545
49	1	Gasket, Mounting	155-824
50	4	Clip, Lens	131-494
51	4	Screw, Rd. Hd. 3/8" lg.	131-493
52	1	Alarm Continuous 12V	061-560
53	1	5606 Hydraulic Oil Decal	138-751
54	1	Key Switch (Note: Item 54 contained in Kit No. 184-374)	061-575
55	1	Limit Switch (Note: Item 55 (not pictured) contained in Kit No. 908-877 - to be used on Kelley lug hinge dock levelers only)	712-922
		Limit Switch (Note: Item 55 (pictured) contained in Kit No. 901-817 - to be used on all piano hinge dock levelers, including Kelley EOD)	706-435
	1	Stanchion Weldment (Not shown)	711-391

* Acceptable Hydraulic Oils:

Mobil Aero HFA (49011)
 Exxon Unavis Grade JI3
 Texaco Aircraft Oil #1554
 U.S. Oil Co., Inc. #ZFI-5606 (Low Temp.)

KIT INSTRUCTIONS

INSTALLATION INSTRUCTIONS

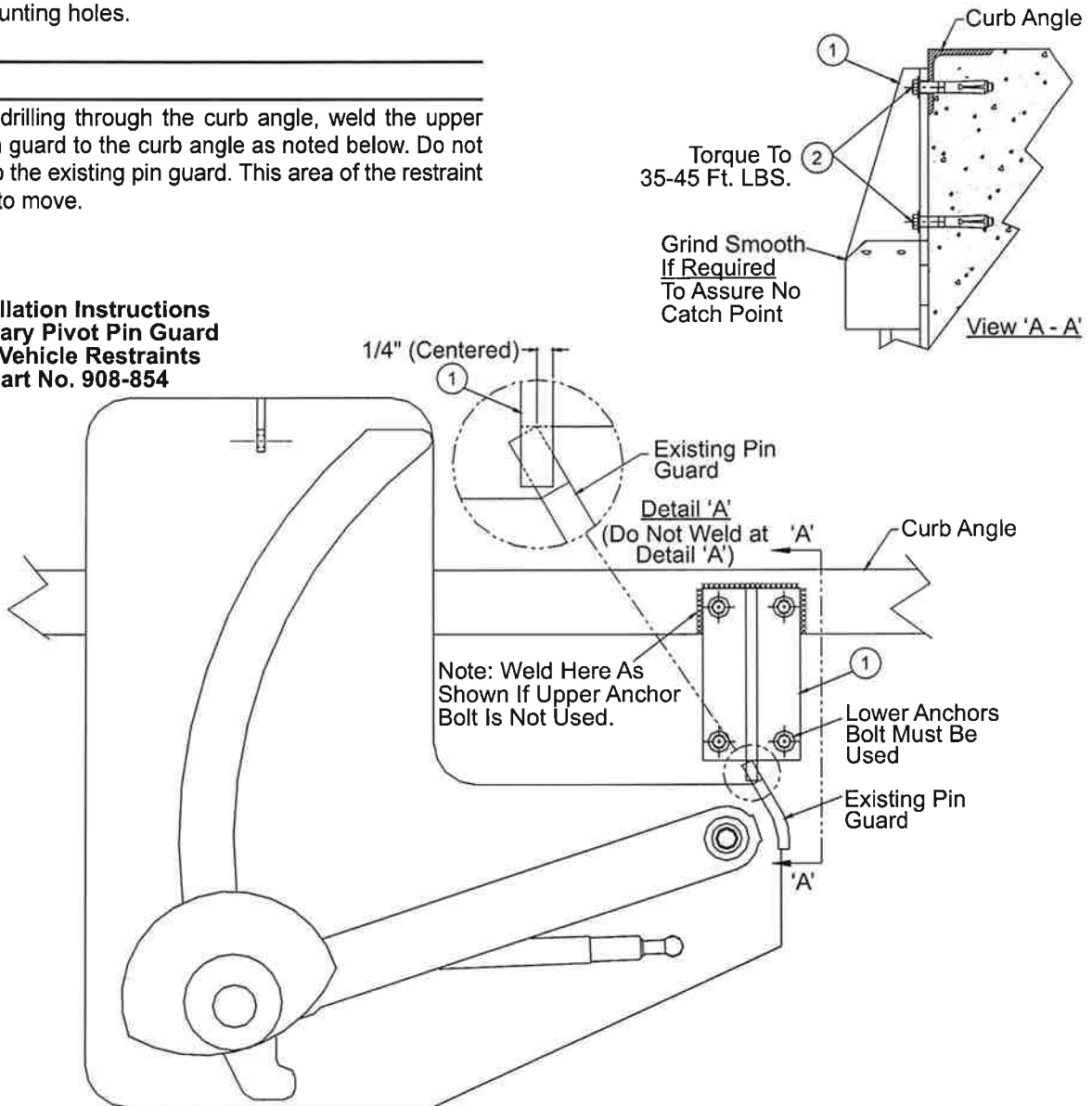
1. Place hook in the down position.
2. Located Item 1 directly above the existing pin guard. (See Fig. 31.) with its bottom edge aligned as shown in detail 'A'.
3. Using Item 1 as a template drill four 1/2" dia. x 3-1/2" deep mounting holes.
4. Fasten Item 1 to the dock face using the 4 anchor bolts (two anchor bolt if welding) torqued to 35-45 ft-lbs.
5. Grind smooth the mating surfaces of Item 1 and existing pin guard. Repaint this area and any welds to prevent rust.

NOTE:

To Eliminate drilling through the curb angle, weld the upper end of the pin guard to the curb angle as noted below. Do not weld Item 1 to the existing pin guard. This area of the restraint must be free to move.

Fig. 31

Installation Instructions Auxiliary Pivot Pin Guard For Vehicle Restraints Part No. 908-854



Item	Quantity	Description	Part Number
1	1	Guard, Pivot Pin	712-634
2	4	Anchor Bolt, 1/2 x 3-3/4	131-260