



Installation Instructions

Hose Installation Kits for Cascade Attachments

This Manual provides installation instructions for Attachment general-purpose hose kits. The kits provide the necessary hoses and fittings to connect between the hydraulic system on a standard Cascade Attachment, and the hose terminals on the lift truck carriage.

Reuseable fittings are provided on the hoses to enable hoses to be cut to an exact length. Mounting brackets are provided when required for specific applications.

The following pages show hose and fitting location (back or driver's view), and part numbers for the contents of each kit. Control handle functions, bracket location, and instructions for reuseable fittings are located at the back of the Manual.

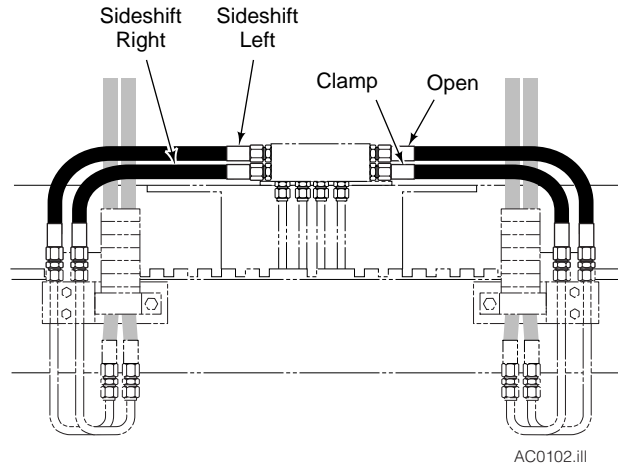
NOTE: General-purpose hydraulic supply kits are also available to connect between the lift truck auxiliary control valve and the mast carriage. Contact Cascade Customer Service for more information (see back page).

Attachment Models	Installation Kit Part Number	Parts Page
Clamps		
D-Series – Sideshifting Carton Clamps, 15D, 25D, 35D, 50D, Double, Appliance	659249	2
D & E-Series – Carton Clamps with Solenoid Adaption	659245	4
D-Series – Non-Sideshifting, 25D, 35D, 40D, 50D, 70D, 80D, 140D	659245	4
D-Series – Sideshifting, 25D, 35D, 40D, 50D, Turnafork,	659249	2
D-Series – Sideshifting, 70D, 80D, 140D, Turnaload	672442	3
D-Series – Sideshifting with Solenoid Adaption	659245	4
D-Series – Revolving, 35D, 50D, 70D, 140D	672442	3
D-Series – Revolving, No-Arm 140D, 200D	663598	8
D-Series – Revolving, with Solenoid Adaption	659245	4
E-Series – Sideshifting Carton Clamps, 30E	659249	2
Fork Positioners		
C-Series – 55C, 100C, 120C, 150C	659245	5
D-Series – Non-Sideshifting, 35D, 45D, 55D, 70D, 85D, 100D, 150D, 200D	659245	5
D-Series – Sideshifting, 35D, 45D, 55D, 70D, 85D, 100D, 150D, 200D	659249	5
F-Series – Non-Sideshifting, 55F, 100F	207372	5
F-Series – Sideshifting, 55F, 100F	207373	5
H-Series – Non-Sideshifting, 150H	218898	6
H-Series – Sideshifting, 150H	218899	6
Forward Bin Dumpers		
D-Series – Non-Sideshifting, 40D	659245	14
Load Stabilizers		
Non-Sideshifting, 35E	202127	7
Sideshifting, 35E	202126	7
Paper Roll Clamps		
D-Series – 100D	663598	8
F-Series – Fixed Frame, 25F	681061	8
F-Series – Fixed Frame, 45F, 100F, 130F	675158	9
F-Series – Fixed Frame, 60F	212904	9
F-Series – Fixed Frame, 77F, 90F	685474	9
F-Series – Swing Frame, 45F, 60F, 77F, 90F	675157	10
G-Series – Fixed Frame, 60G, 66G, 72G	212904	9
G-Series – Swing Frame	675157	10
Push/Pulls		
Non-Sideshifting, 35E, 45E	685558	11
Sideshifting, 35E, 45E	685559	11
Rotators		
D-Series 360° – 40D, 55D, 65D, 100D, 120D, 150D, 200D	659245	12
E-Series 360° – 30E	681061	12
F-Series 180° – 55F	222902	12
Sideshifters		
D-Series – 120D, 150D	209555	13
E-Series – 55E, 60E, 100E	205826	13
F-Series – 55F	205826	13
Single-Double Pallet Handlers		
D & E-Series – (Class II / III)	213574	14

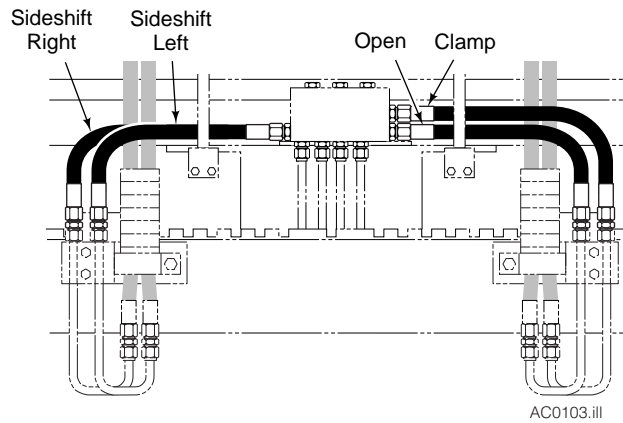
Clamps

25D – 50D Sideshifting

NOTE: All illustrations are shown as viewed from the driver's seat.

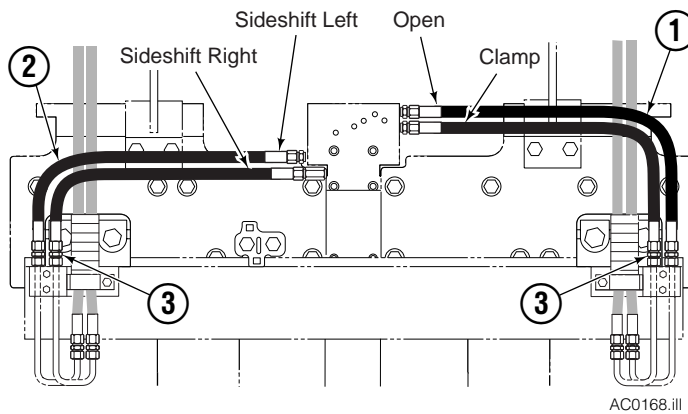


Carton Clamps D-Series



Carton Clamps E-Series

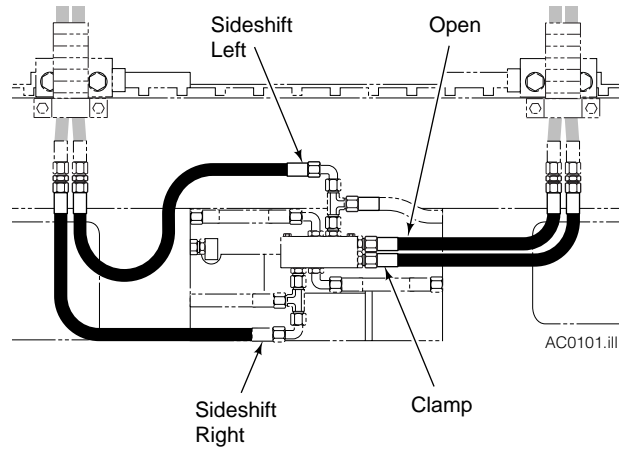
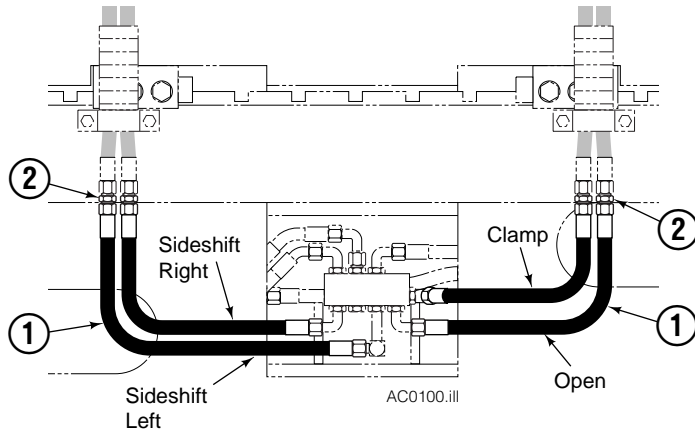
NOTE: E-Series Clamps can be plumbed from either side of valve to match truck supply.



REF	QTY	PART NO.	DESCRIPTION
		659249	Installation Hose Kit
1	2	213539	Hose, 8 (24.5 in.)
2	2	200016	Hose, 6 (24.25 in.)
3	2	2347	Fitting, 6-6
	2	674294	Fitting, 6-8
	2	2348	Fitting, 8-8

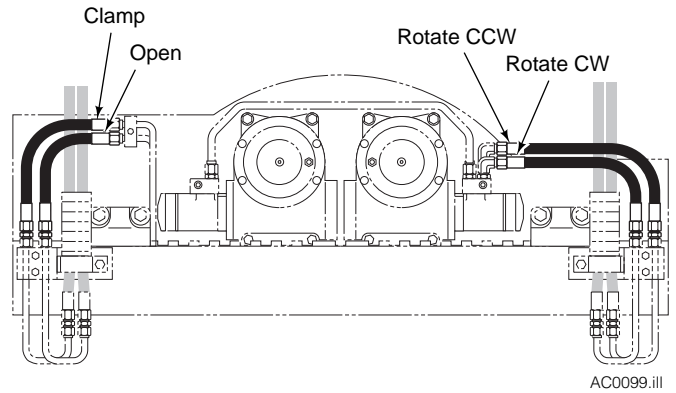
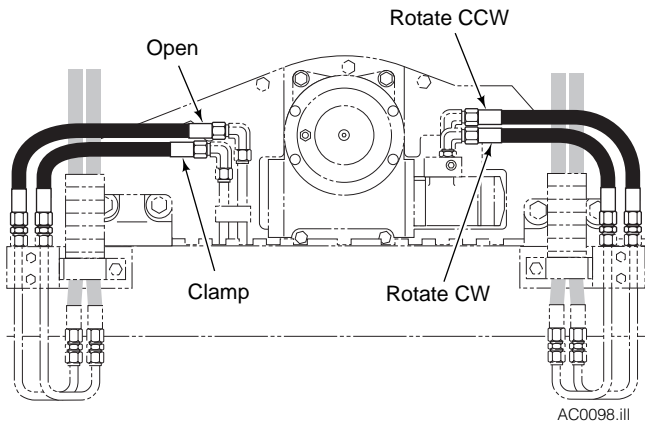
Clamps

70D – 140D Sideshifting



Revolving Clamps

D-Series

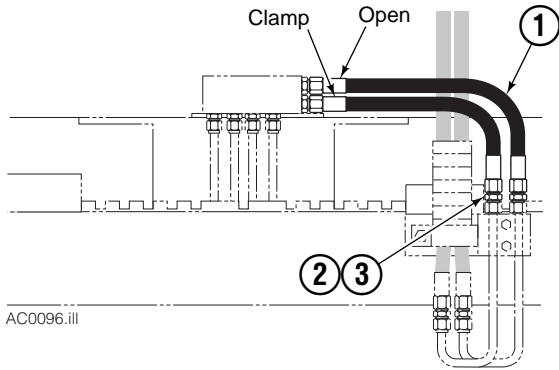


REF	QTY	PART NO.	DESCRIPTION
		672442	Installation Hose Kit
1	4	2246	Hose, 8 (24 in.)
2	4	674294	Fitting, 8-6
	4	2348	Fitting, 8-8

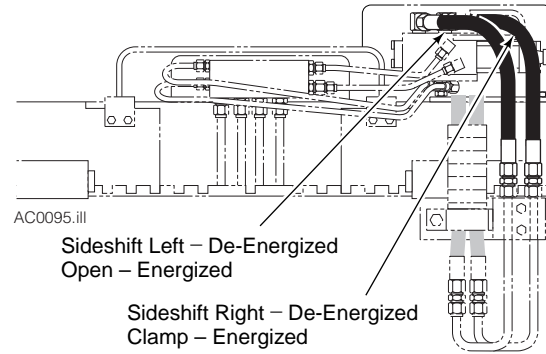
Reference: SK-4761.

Clamps

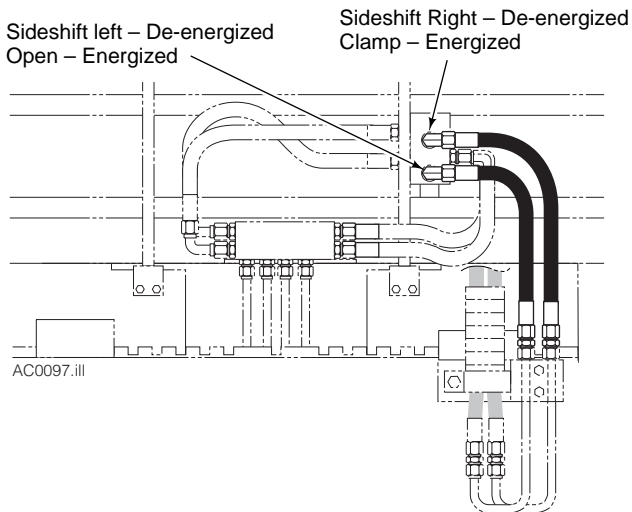
D-Series Non-Sideshifting



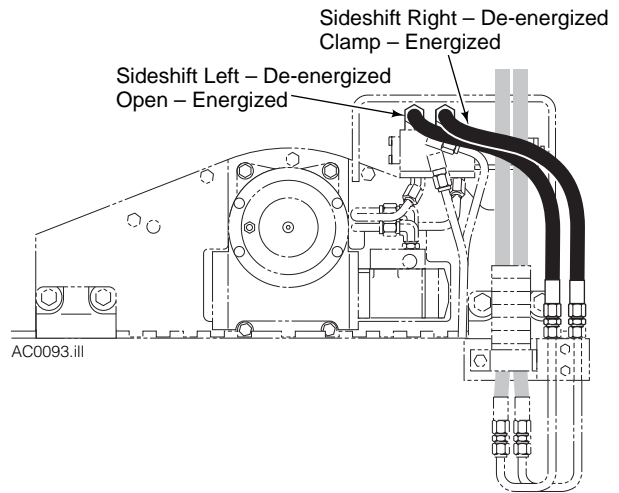
D-Series Sideshifting with Solenoid Adaption



D & E-Series Carton Clamps with Solenoid Adaption



D-Series Revolving Clamps with Solenoid Adaption

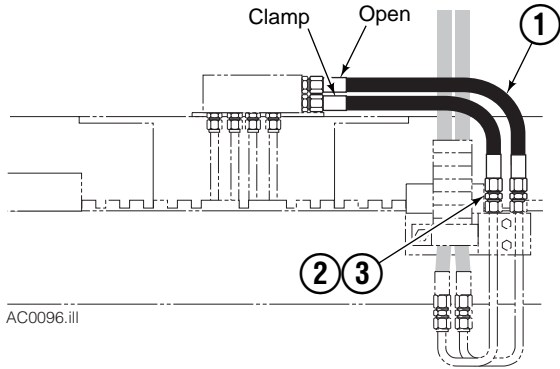


REF	QTY	PART NO.	DESCRIPTION
		659245	Hose Installation Kit
1	2	213539	Hose, 8 (24.5 in.)
2	2	2348	Fitting, 8-8
3	2	674294	Fitting, 8-6

Reference: SK-4761, 4748

Fork Positioners

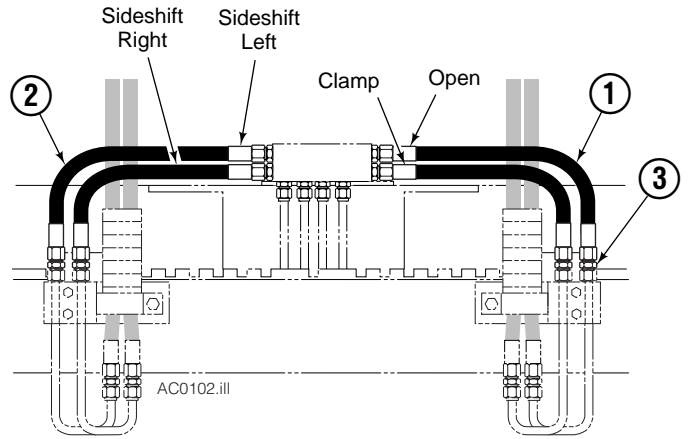
C & D-Series Non-Sideshifting



REF	QTY	PART NO.	DESCRIPTION
		659245	Hose Installation Kit
1	2	213539	Hose, 8 (24.5 in.)
2	2	2348	Fitting, 8-8
3	2	674294	Fitting, 8-6

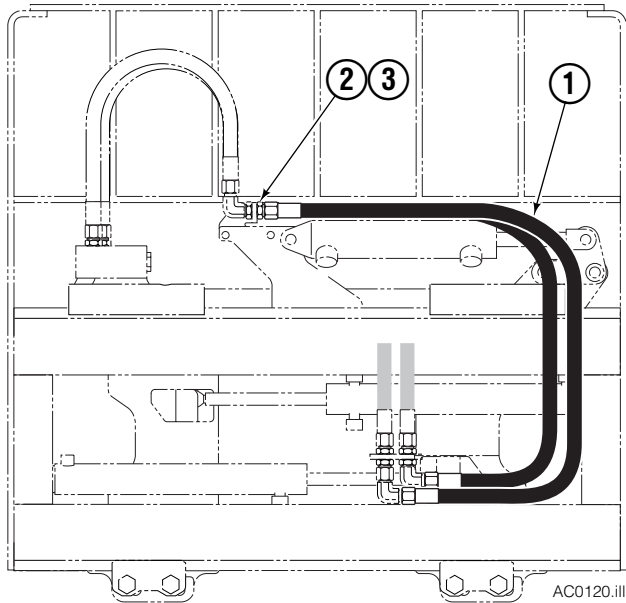
Reference: SK-4761, 4748

D-Series Sideshifting



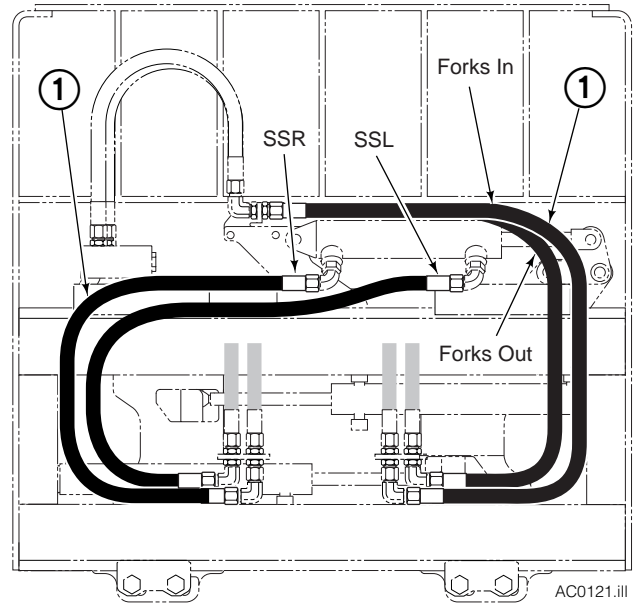
REF	QTY	PART NO.	DESCRIPTION
		659249	Installation Hose Kit
1	2	213539	Hose, 8 (24.5 in.)
2	2	200016	Hose, 6 (24.25 in.)
3	2	2347	Fitting, 6-6
	2	674294	Fitting, 6-8
	2	2348	Fitting, 8-8

F-Series Non-Sideshifting



REF	QTY	PART NO.	DESCRIPTION
		207372	Installation Hose Kit
1	2	208978	Hose, 6 (48 in.)
2	2	2347	Fitting, 6-6
3	2	672026	Fitting, 6-4

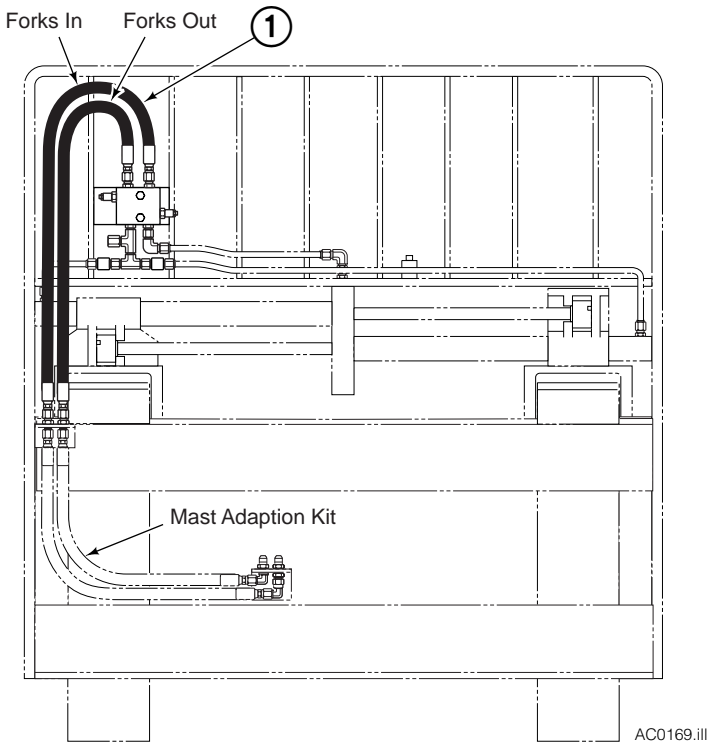
F-Series Sideshifting



REF	QTY	PART NO.	DESCRIPTION
		207373	Installation Hose Kit
1	4	208978	Hose, 6 (48 in.)
2	4	2347	Fitting, 6-6

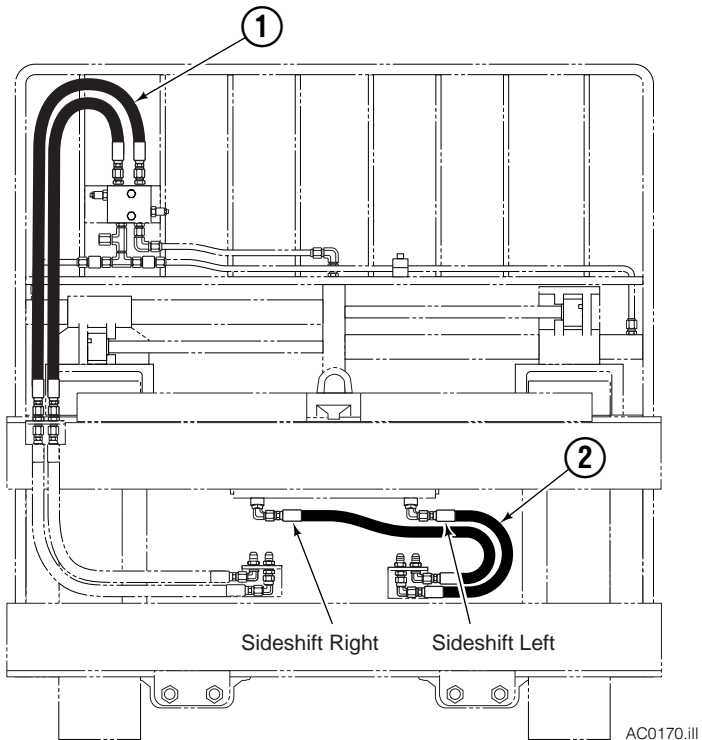
Fork Positioners

150H Non-Sideshifting



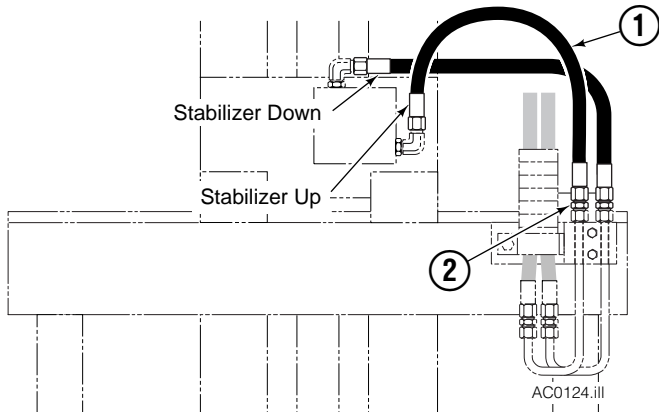
REF	QTY	PART NO.	DESCRIPTION
		218898	Hose Installation Kit
1	2	679916	Hose, 6 (28.75 in.)

150H Sideshifting



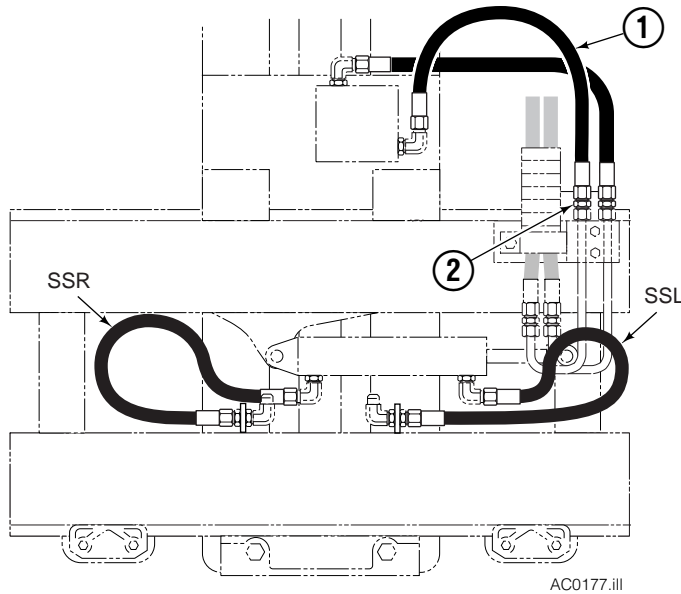
REF	QTY	PART NO.	DESCRIPTION
		218899	Hose Installation Kit
1	2	679916	Hose, 6 (28.75 in.)
2	2	207425	Hose, 6 (24 in.)

Load Stabilizers 35E Non-Sideshifting



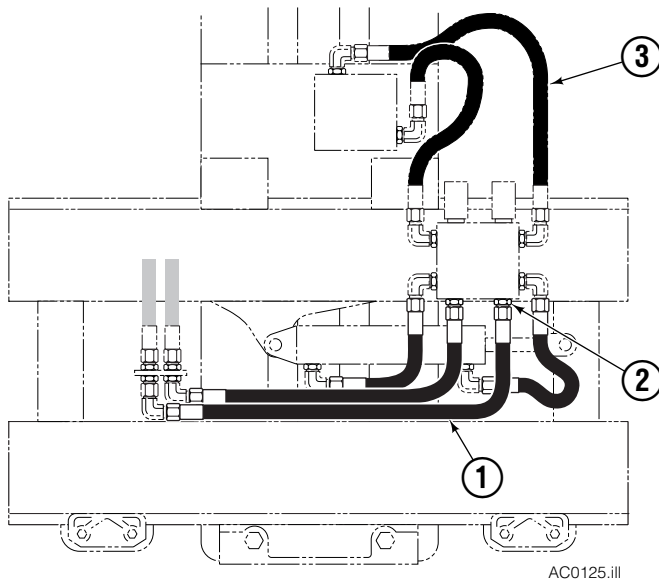
REF	QTY	PART NO.	DESCRIPTION
		202127	Hose Installation Kit
1	2	612801	Hose, 6 (54 in.)
2	2	2347	Fitting, 6-6

35E Sideshifting



REF	QTY	PART NO.	DESCRIPTION
		202126	Hose Installation Kit
1	4	612801	Hose, 6 (54 in.)
2	2	2347	Fitting, 6-6

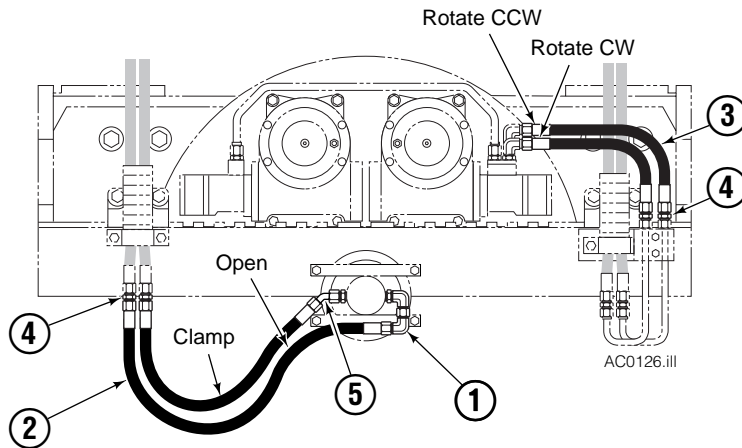
35E Sideshifting with Solenoid



REF	QTY	PART NO.	DESCRIPTION
		202126	Hose Installation Kit
1	4	612801	Hose, 6 (54 in.)
2	2	2347	Fitting, 6-6

REF	QTY	PART NO.	DESCRIPTION
		202127	Hose Installation Kit
2	2	2347	Fitting, 6-6
3	2	612801	Hose, 6 (54 in.)

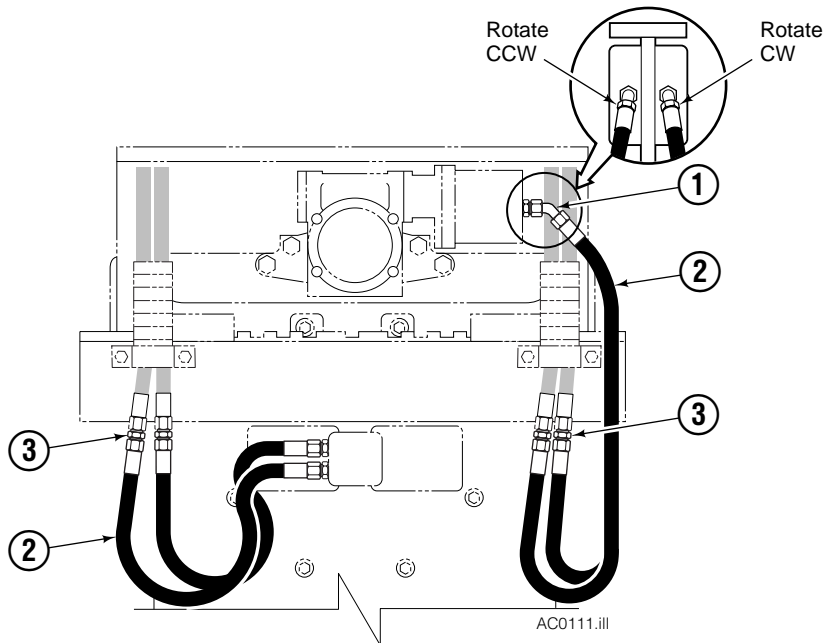
100D Paper Roll Clamp 140D, 200D Revolving Clamp



REF	QTY	PART NO.	DESCRIPTION
		663598	Installation Hose Kit
1	2	605761	Fitting-SW, 8-8
2	2	2241	Hose, 8 (102 in.)
3	2	671455	Hose, 8 (44 in.)
4	4	2348	Fitting, 8-8
5	1	605948	Fitting, 45, 8-8

Reference: SK-4195.

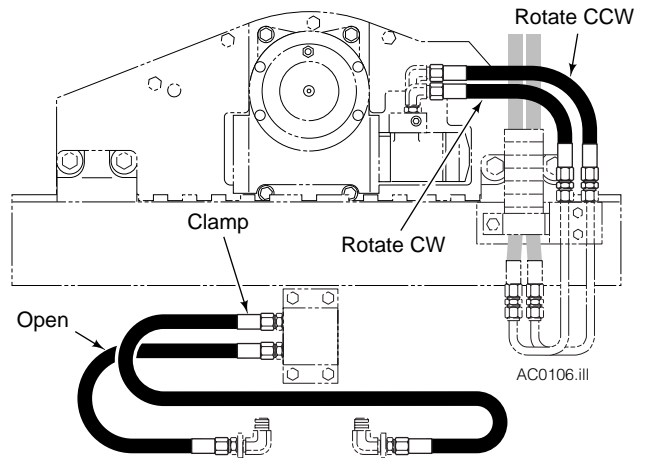
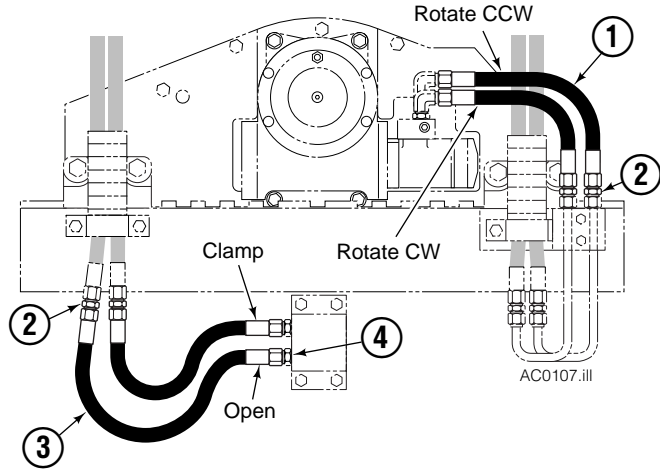
25F Paper Roll Clamp



REF	QTY	PART NO.	DESCRIPTION
		681061	Installation Hose Kit
1	2	605230	Fitting-45, 6-6
2	4	679916	Hose, 6 (28,75 in.)
3	4	2347	Fitting, 6-6

Reference: SK-5289.

Paper Roll Clamps F-Series Fixed-Frame



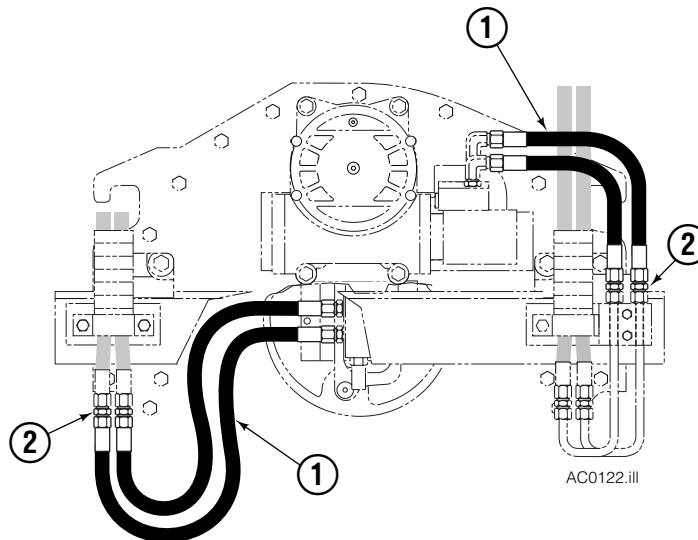
77F, 90F			
REF	QTY	PART NO.	DESCRIPTION
		685474	Installation Hose Kit
1	2	2246	Hose, 8 (24 in.)
2	4	2348	Fitting, 8-8
3	2	2264	Hose, 8 (26 in.)
4	2	662187	Fitting, 8-6

Reference: SK-5030.

45F, 100F, 130F			
REF	QTY	PART NO.	DESCRIPTION
		675158	Installation Hose Kit
1	2	2246	Hose, 8 (24 in.)
2	2	2348	Fitting, 8-8
3	2	2161	Hose, 6 (24 in.)
4	2	2347	Fitting, 6-6

Reference: SK-5030.

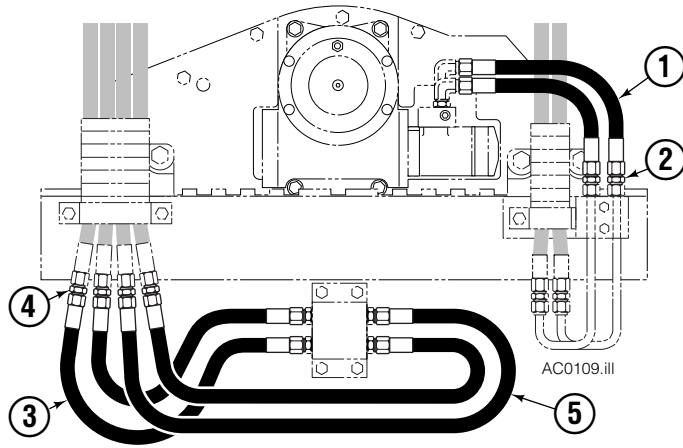
F & G-Series Fixed-Frame



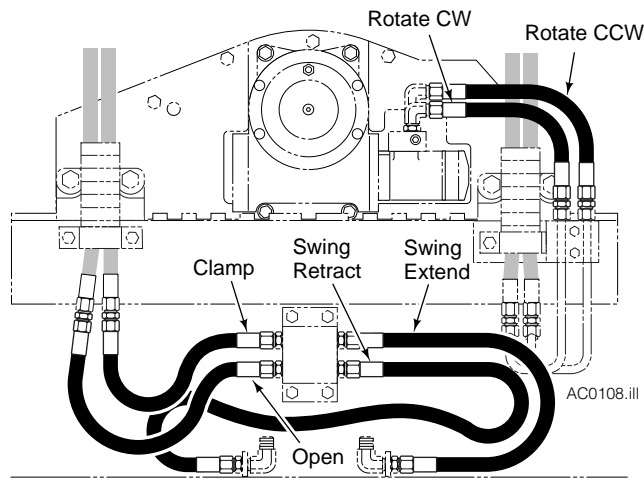
60F, 60G, 66G, 72G			
REF	QTY	PART NO.	DESCRIPTION
		212904	Installation Hose Kit
1	4	213539	Hose, 8 (24.5 in.)
2	4	2348	Fitting, 8-8

Paper Roll Clamps

F & G-Series Swing-Frame



Hose Reels



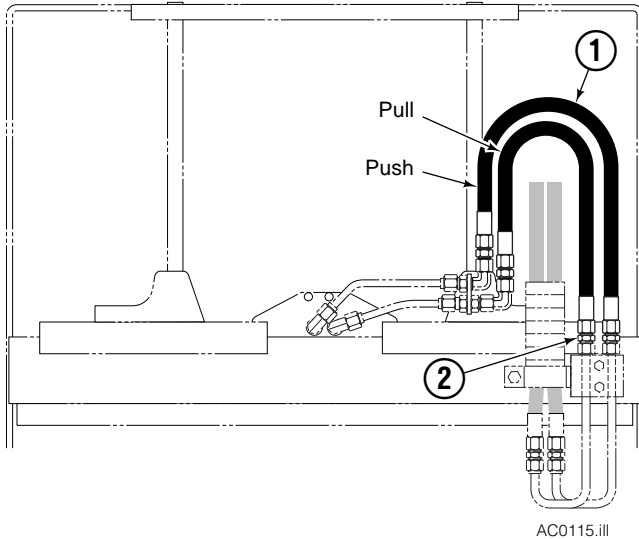
IHR Connection

REF	QTY	PART NO.	DESCRIPTION
		675157	Installation Hose Kit
1	2	2246	Hose, 8 (24 in.)
2	2	2348	Fitting, 8-8
3	2	2161	Hose, 6 (24 in.)
4	4	2347	Fitting, 6-6
5	2	2139	Hose, 6 (40 in.)

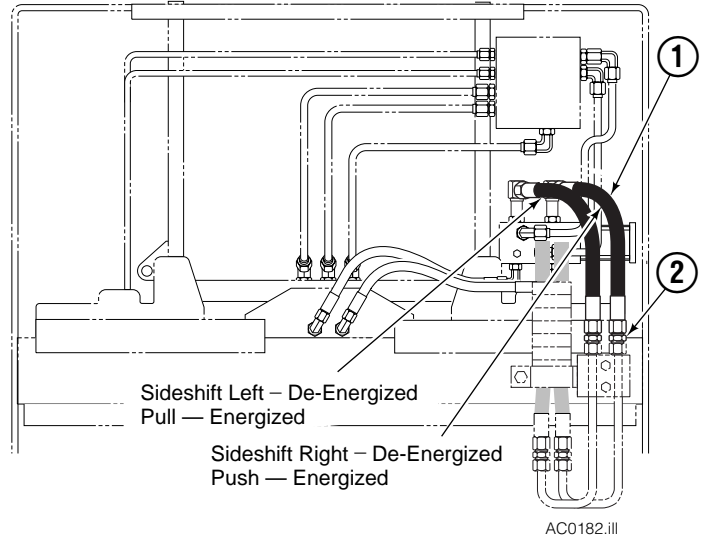
Reference: SK-5030.

Push/Pulls

E-Series Non-Sideshifting



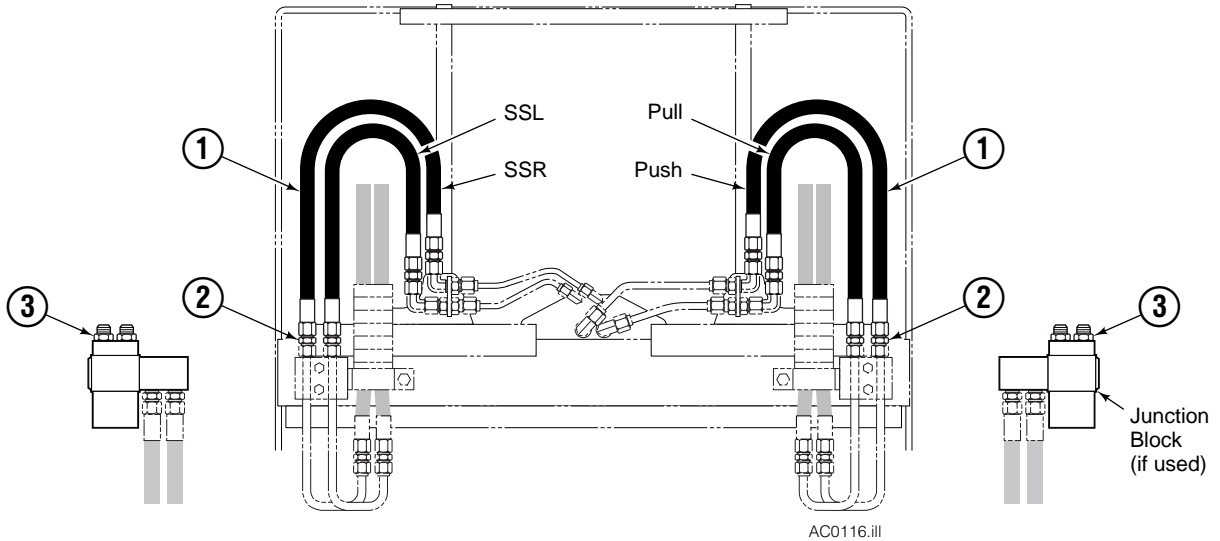
E-Series Sideshifting with Solenoid Adaption



REF	QTY	PART NO.	DESCRIPTION
		685558	Installation Hose Kit
1	2	2161	Hose, 6 (24 in.)
2	2	2347	Fitting, 6-6
3	2	611288	Fitting, 6-8

Reference: SK-5449.

E-Series Sideshifting

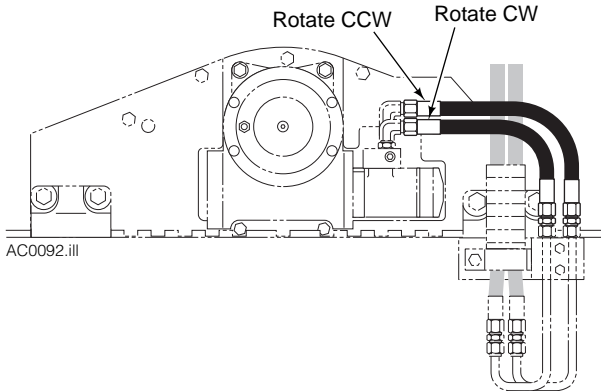


REF	QTY	PART NO.	DESCRIPTION
		685559	Installation Hose Kit
1	4	2161	Hose, 6 (24 in.)
2	4	2347	Fitting, 6-6
3	4	611288	Fitting, 6-8

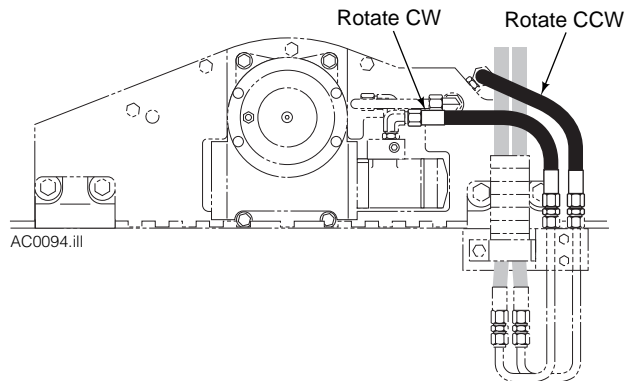
Reference: SK-5449.

Rotators

D-Series Rotators



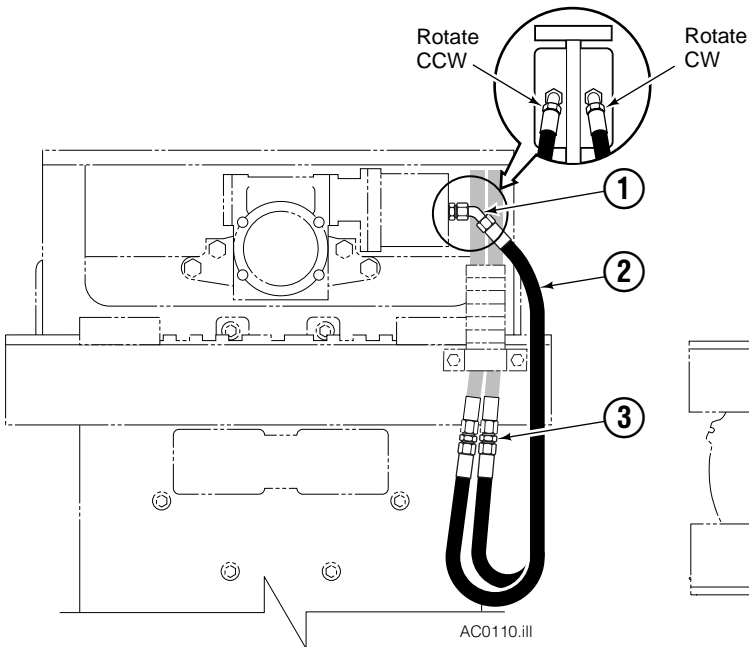
D-Series with 180-Degree Stop



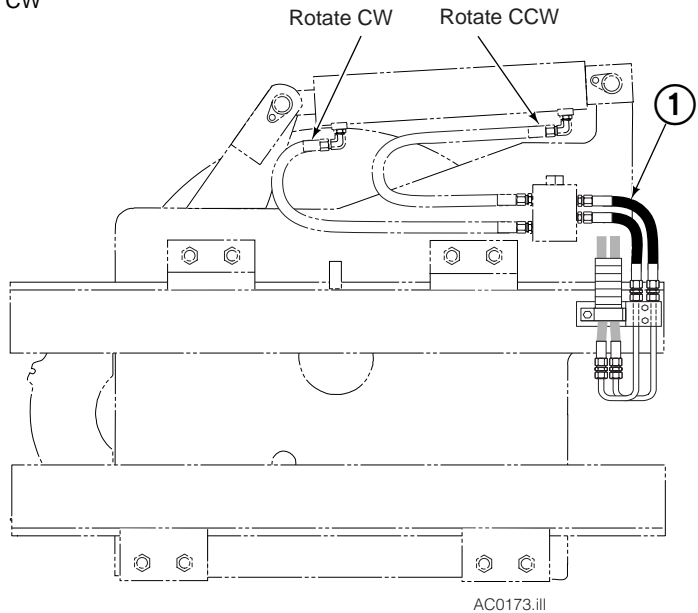
REF	QTY	PART NO.	DESCRIPTION
		659245	Installation Hose Kit
1	2	2246	Hose, 8 (24.5 in.)
2	2	2348	Fitting, 8-8
3	2	674294	Fitting, 8-6

Reference: SK-4761, 4748.

30E Rotator



55F 180-Degree Rotator



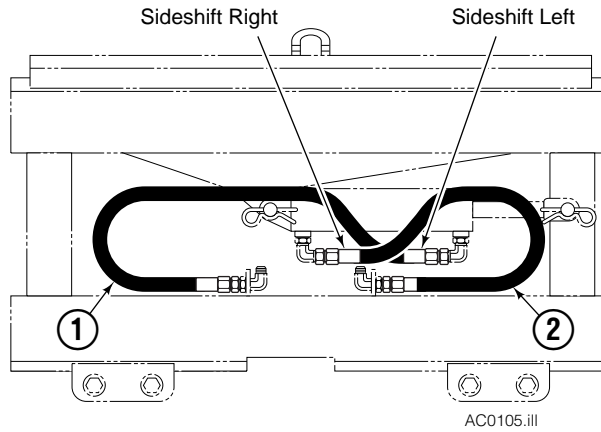
REF	QTY	PART NO.	DESCRIPTION
		681061	Installation Hose Kit
1	2	605230	Fitting-45, 6-6
2	4	679916	Hose, 6 (28,75 in.)
3	4	2347	Fitting, 6-6

Reference: SK-5289.

REF	QTY	PART NO.	DESCRIPTION
		222902	Hose Installation Kit
1	2	675952	Hose, 6 (18 in.)

Sideshifters

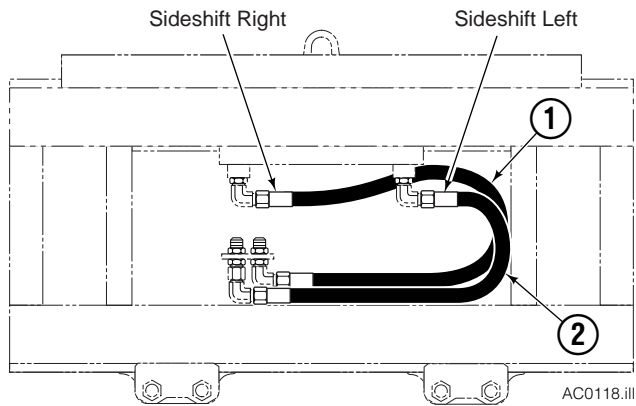
120D, 150D Sideshifters



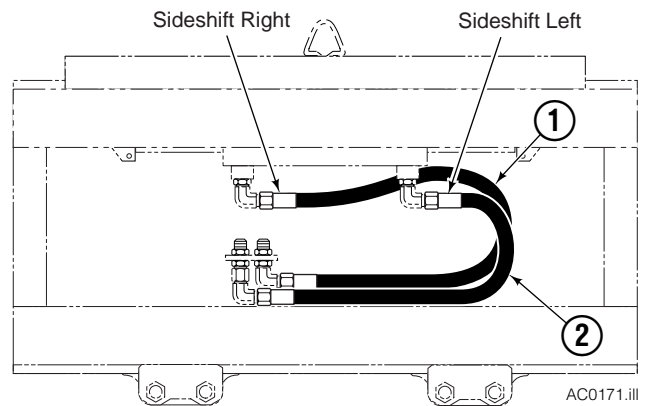
REF	QTY	PART NO.	DESCRIPTION
		209555	Installation Hose Kit
1	1	209556	Hose Assy, 6 (28.25 in.)
2	1	209557	Hose Assy, 6 (18.25 in.)

REF	QTY	PART NO.	DESCRIPTION
		223987	Installation Hose Kit (4000 psi)
1	1	223988	Hose Assy, 6 (28.25 in.)
2	1	223989	Hose Assy, 6 (18.25 in.)

E-Series Sideshifters

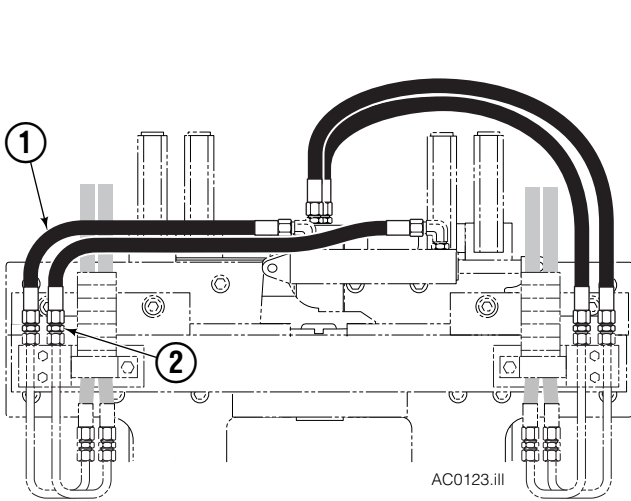


F-Series Sideshifters

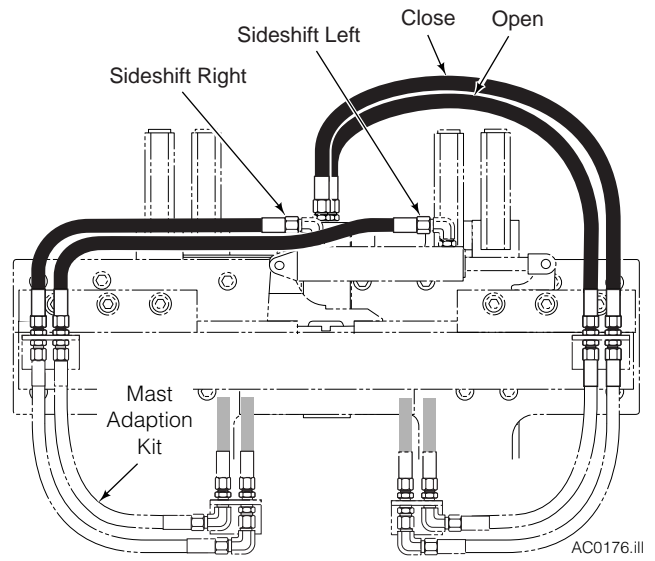


REF	QTY	PART NO.	DESCRIPTION
		205826	Installation Hose Kit
1	1	200016	Hose, 6 (24.25 in.)
2	1	208027	Hose, 6 (15.25 in.)

Single-Double Pallet Handlers



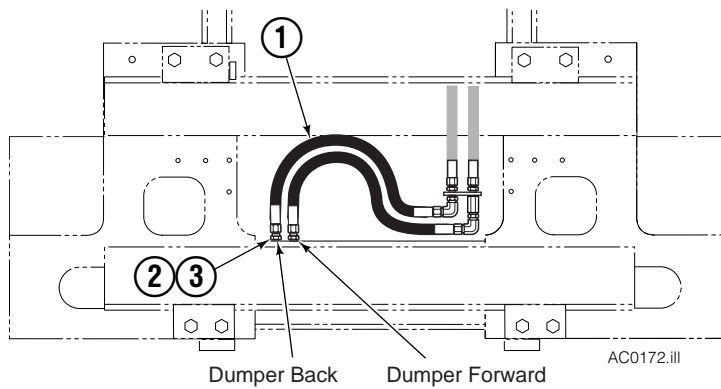
Hose Reels



Internal Hose Reeving

REF	QTY	PART NO.	DESCRIPTION
		213574	Installation Hose Kit
1	4	200016	Hose 6, (24.25 in.)
2	4	2347	Fitting, 6-6

Forward Bin Dumper



REF	QTY	PART NO.	DESCRIPTION
		659245	Hose Installation Kit
1	2	213539	Hose, 8 (24.5 in.)
2	2	2348	Fitting, 8-8
3	2	674294	Fitting, 8-6

Reference: SK-4761, 4748

Lift Truck Lever or Handle Type Controls

This Table lists the hydraulic control configuration for lift trucks as stated in the voluntary consensus standard ASME B56.1: *Safety Standards for Powered Industrial Low and High Lift Trucks*.

These standards are included in OSHA Regulations 1910.178 for the safe operation and maintenance of industrial trucks.

IMPORTANT: Hoses should always be hooked up to provide the following functions in the manner indicated:

Function in sequence of location from driver outward	Direction of load or equipment	Typical motion of driver's hand when actuating control handle while facing the load ①
Hoist	Up Down	Rearward or up Forward or down
Reach	Retract Extend	Rearward ② Forward
Tilt	Rearward Forward	Rearward or up ② Forward or down
Sideshift	Right Left	Rearward or up Forward or down
Push-Pull	Rearward Forward	Rearward ② Forward
Rotate Laterally	Clockwise Counterclockwise	Rearward or up Forward or down
Rotate Longitudinally	Rearward Forward	Rearward or up Forward or down
Load Stabilizer	Down Up	Rearward or up Forward or down
Swing	Right Left	Rearward or up Forward or down
Slope	Clockwise Counterclockwise	Rearward or up Forward or down
Fork Position	Together Apart	Rearward or up Forward or down
Clamp	Clamp Release	Rearward or up Forward or down

① Exception: For high lift order picker trucks and center control pallet trucks, predominant motion of operator's hand when actuating the control handle when facing away from the load.

② The sense of rotation of the control handle is intended to be in the same direction as the desired motion of the mast or load.

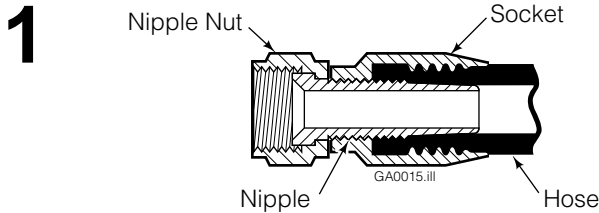
Reusable Hose Fittings

Kit hoses are equipped with reusable fittings to enable hoses to be modified to the exact length required for installation.

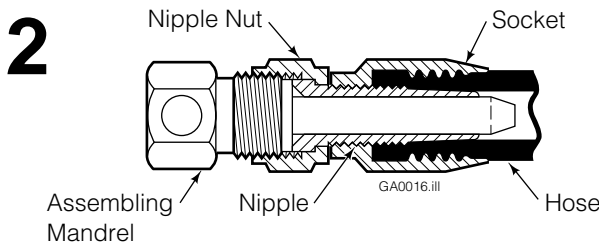
IMPORTANT: Do not shorten hoses to the point where they will be stretched or kinked when installed. When routing hoses, make sure they will not be pinched, rubbed, twisted, or otherwise damaged throughout their full range of movement. Use hose clamps to secure hoses if required.

Fitting Removal

To shorten a hose, remove either end-fitting using the following procedures:

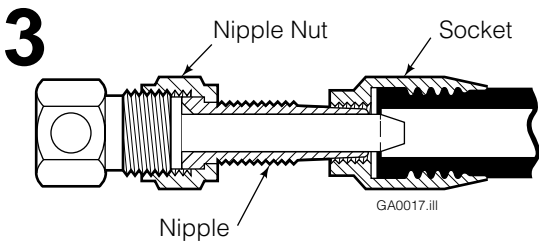


Clamp the fitting socket in a vise.

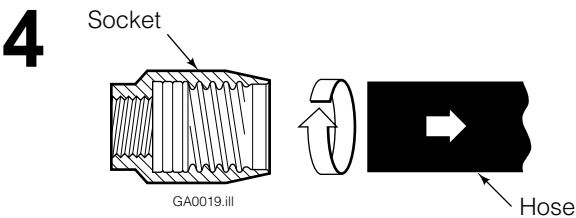


Lubricate an assembling mandrel* with hydraulic fluid. Slide the mandrel into the nipple and engage the nipple nut threads. Using two wrenches, screw the mandrel into the nipple nut.

* Stratoflex PN : 2701-9-18S (#6 hose), 2071-12-16S (#8 hose).



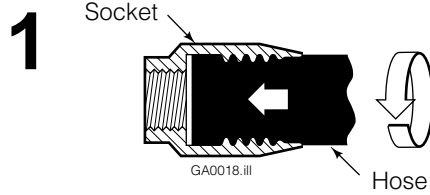
With a wrench on the nipple nut, unscrew the nipple from the hose socket.



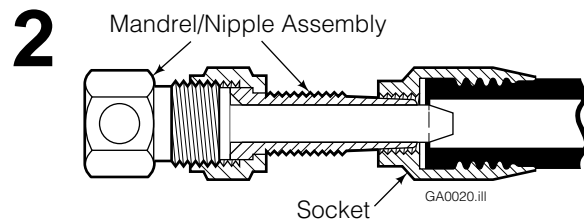
Clamp the socket in a vise and manually turn the hose **clockwise** (CW) to remove it from the socket. For long hoses, clamp the hose in a vise and turn the socket CW to remove it from the hose.

Hose Reassembly

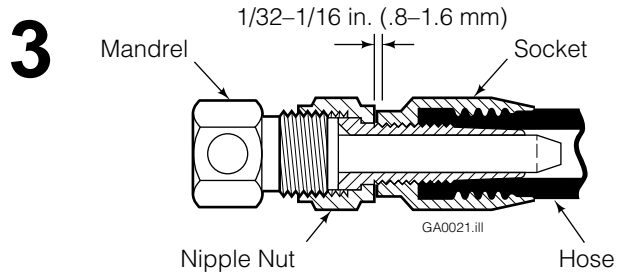
Cut the hose to the desired length using a fine-toothed hacksaw or hose cutoff machine. Make sure the hose is not cut too short for proper installation.



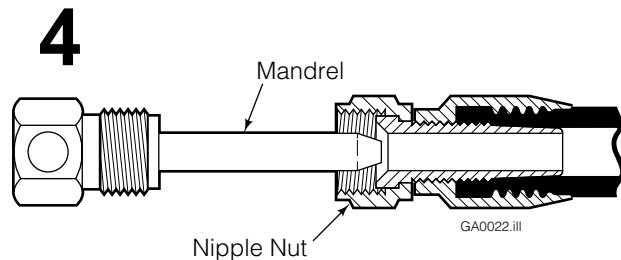
Clamp the socket in a vise and turn the hose into the socket **counterclockwise** (CCW) until it bottoms. For long hoses, clamp the hose in a vise and turn the socket CCW onto the hose. Back the hose out 1/4-turn.



Lubricate the mandrel/nipple assembly and the inside of the hose with hydraulic fluid. Insert the nipple into the hose, making sure it moves in and out freely.



With a wrench on the mandrel, screw the nipple into the fitting socket. Leave 1/32 to 1/16-in. (.8 to 1.6 mm) clearance between the nipple nut and socket so the nut swivels freely.




Using two wrenches, remove the mandrel from the nipple nut.

IMPORTANT: Inspect the hose for proper assembly. Sight down the fitting ID to assure that the nipple did not scarf a piece of hose material that might prevent free flow. If damage is found, remove the fitting and cut away the damaged hose. Reassemble the hose as in Steps 1 through 4. Use compressed air to clear the hose of debris.

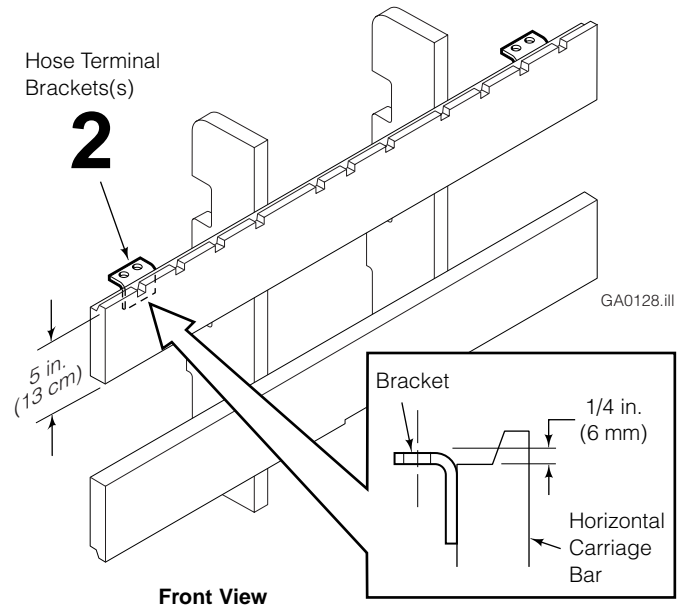
Bracket Welding Specifications

The illustrations on this page show where to weld hose terminal mounting brackets on the mast carriage bar.

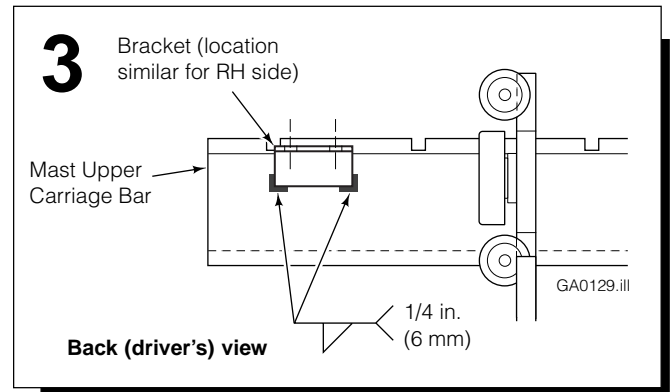
- 1 Clean all surfaces to be welded. Remove any paint, oil, grease or other contaminants.
- 2 Position the bracket(s) on the back side (driver's view) of the mast upper carriage bar. Assure that the brackets do not extend beyond the end of the bar. Clamp in place.



WARNING: Cascade Corporation recommends that a qualified welder experienced in this type of work be used for best quality.



- 3 Weld the brackets to the mast carriage using the following weld procedures:
 - Protect hoses and adjacent areas from weld splatter.
 - Preheat weld areas to 70° F (21° C).
 - **WELD METHOD A – FCAW (Flux-Cored Arc Weld).** Attach ground wire to carriage. Weld using AWS E70T-1 1/16 in. (1.6 mm) or 5/64 in. (2 mm) diameter wire with 100% CO² shielding gas at 35–50 CFH. Set welding amps per manufacturer's recommendations. Apply weld holding a close arc. Do not oscillate or use a wash bead pattern. Let welds normal air-cool.
 - **WELD METHOD B – SMAW (Stick Welding).** Attach ground wire to carriage. Weld using E-7018 low hydrogen 1/8 in. (3.2 mm) or 5/32 in. (4 mm) diameter electrodes. Set welding amps per manufacturer's recommendations. **Do not use electrodes exposed to moisture without first re-drying them at 200° F (75° C) for 2 hours.** Apply weld holding a close arc. Do not oscillate or use a wash bead pattern. Let welds normal air-cool.
- 4 Remove all slag and weld splatter and inspect the welds.



Do you have questions you need answered right now? Call your nearest Cascade Service Department.

**Cascade Corporation
U.S. Headquarters**
2201 NE 201st
Fairview, OR 97024-9718
Tel: 800-CASCADE (227-2233)
FAX: 888-329-8207

Cascade Canada Inc.
5570 Timberlea Blvd.
Mississauga, Ontario
Canada L4W-4M6
Tel: 905-629-7777
FAX: 905-629-7785

Cascade GmbH
D-41199 Monchengladbach
Klosterhofweg 52
Germany
Tel: 21-66-602091
FAX: 21-66-680947

Cascade Finland
01370 Vantas
Finland
Tel: 358-0-836-1925
FAX: 358-0-836-1935

**Cascade N.V.
European Headquarters**
P.O. Box 3009
1300 El Almere
Damsluisweg 56
1332 ED Almere
The Netherlands
Tel: 31-36-5492911
FAX: 31-36-5492964

**Cascade N.V.
Benelux Sales and Service**
P.O. Box 3009
1300 El Almere
Damsluisweg 56
1332 ED Almere
The Netherlands
Tel: 31-36-5492950
FAX: 31-36-5492974

Cascade (UK) Ltd.
15, Orgreave Crescent
Dore House Industrial Estate
Handsworth
Sheffield S13 9NQ
England
Tel: 742-697524
FAX: 742-695121

**Cascade Scandinavia
Hydraulik A.B.**
Muskötgatan 19, E8-9
S25466 Helsingborg
Sweden
Tel: 42-151135
FAX: 42-152997

Cascade Norway
Østerliveien 37A
1153 Oslo
Norway
Tel: 47-22-743160
FAX: 47-22-743157

Cascade France S.A.R.L.
11, Rue Jean Charcot
Zone Industrielle Sud or
B.P. 22
91421 Morangis Cedex
France
Tel: 1- 64547501
FAX: 1-9790584

Cascade Hispania S.A.
Avenida De La Fabregada, 7
Hospitalet De Llobregat
Barcelona
Spain
Tel: 3-335-5158
FAX: 3-335-4756

Cascade Japan Ltd.
5-5-41,
Torikai Kami
Settsu, Osaka
Japan, 566
Tel: 81-726-53-3490
FAX: 81-726-53-3497

Cascade Korea
Room 508, Pum Yang Bldg.
750-14, Bang Bac-Dong
Se-Cho Ku, Seoul
Korea
Tel: 2599-7131 ext. 512
FAX: 2533-8089

HYCO-Cascade Pty. Ltd.
87 Antimony Street
Carole Park,
Brisbane 4300
Australia
Tel: 7-271-1966
FAX: 7-271-3830

HYCO-Cascade (NZ) Ltd.
15 Ra Ora Drive, East Tamaki
P.O. Box 38-440
Howick, Auckland
New Zealand
Tel: 9-273-9136
FAX: 9-273-9137

Cascade (Africa) Pty. Ltd.
P.O. Box 625, Isando 1600
60A Steel Road
Sparton, Kempton Park
South Africa
Tel: 975-9240
FAX: 394-1147

Cascade-Xiamen
Wanshan No. 1 Workshop
Huli Road
Xiamen 361006
Fujian, PRC
Tel: 592-562-4600
FAX: 592-562-4671

**Cascade (Singapore)
Trading Co.**
Four Seasons Park
Autumn Block - Apt. 1802
12 Cascaden Walk
Singapore
Tel: 65-834-1935
FAX: 65-834-1936



For Technical Support . . .

Call: 1-800-CASCADE (227-2233)

Fax: 1-888-329-8207

Write: Cascade Corporation, PO Box 20187, Portland, OR 97294

To Order Parts . . .

Call: 1-888-CASCADE (227-2233)

Fax: 1-888-329-0234

Write: Cascade Corporation, 2501 Sheridan Ave., Springfield, OH 45505