INSTALLATION INSTRUCTIONS

1520 HOIST w/ SUBFRAME

⚠ WARNING

IF INCORRECTLY USED, THIS EQUIPMENT CAN CAUSE SEVERE INJURY. THOSE WHO USE AND MAINTAIN THE EQUIPMENT SHOULD BE TRAINED IN ITS PROPER USE, WARNED OF ITS DANGERS, AND SHOULD READ AND FULLY UNDERSTAND THE INSTALLATION INSTRUCTIONS AND THE OPERATOR'S MANUAL AND ANY OTHER INFORMATION PROVIDED WITH THIS VEHICLE BEFORE ATTEMPTING TO SET UP, OPERATE, ADJUST OR SERVICE THE EQUIPMENT.

KEEP THIS MANUAL FOR FUTURE REFERENCE.

⚠ IMPORTANT

FOR ADDITIONAL SAFETY AND OPERATION MESSAGES AND INSTRUCTIONS, SEE THE OPERATORS AND MAINTENANCE MANUAL INCLUDED WITH THIS UNIT.

TRUCK BODIES & EQUIPMENT INTERNATIONAL, Inc.

www.duraclass.com
www.tbei.com
www.tbeidumpbodyparts.com

DATE PURCHASED_____

HOIST SERIAL NUMBER _____

CYLINDER SERIAL NUMBER _____

DEALER _____

ADDRESS _____

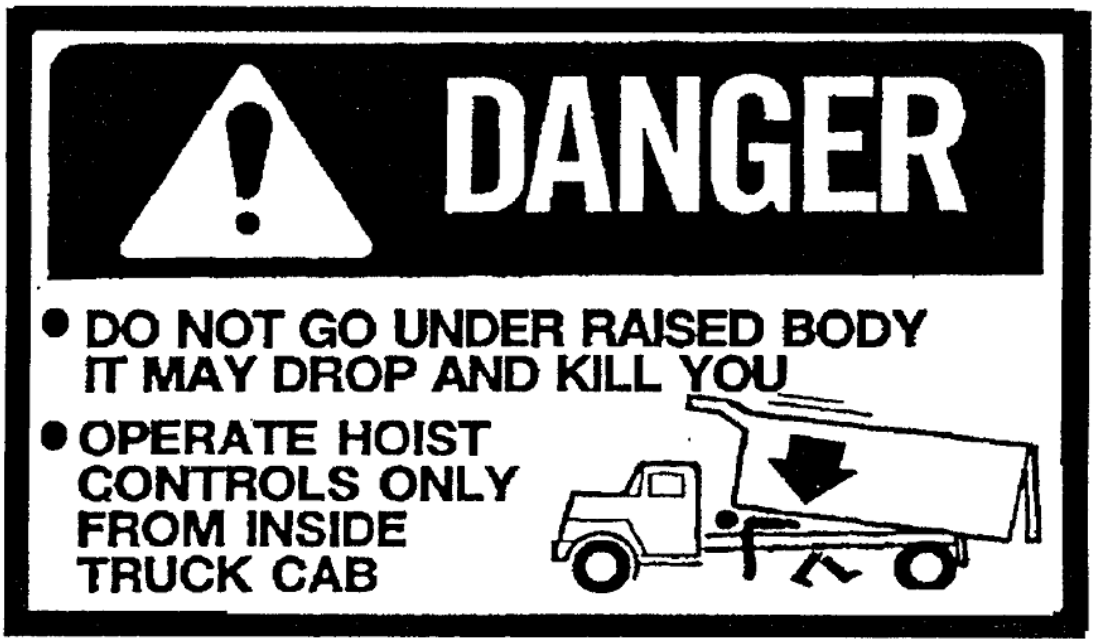
PHONE _____

FOREWORD

DuraClass's 1520 frame type hoists are designed and intended for use on single-axle trucks with cab-to-axle dimensions of 60 to 84 inches and body lengths of 8 to 11 feet.

This manual contains the information needed for the proper installation and operation of DuraClass's 1520 hoists. Study it carefully before attempting to mount or use any of these hoists. With proper installation, use, and regular maintenance, these hoists will give many years of trouble free service.

When ordering parts, be sure to give part number and serial number of hoist and cylinder. The serial number of the hoist is stamped into the hoist frame near the base end of the cylinder. The serial number of the cylinder is stamped on the barrel of the cylinder near the base. For future reference, copy these numbers NOW in the space provided above. Order parts by number and description as given in the parts listing in this manual.



OPERATION AND USE

1. Engage PTO from cab and adjust engine speed to fast idle.
2. ALWAYS operate the hoist from inside the cab of the truck.
3. If the hydraulic hose connections are correct, the hoist should raise when the hoist control lever is pulled back, hold when the lever is in the center detent, and lower when the lever is pushed forward.
4. To raise the hoist, pull the control lever back. To hold the body in a raised position, place the control lever in its center detent position. To lower the hoist, push the control lever forward.
5. ALWAYS return the hoist control lever to its center detent position after each use.
6. When the hoist cylinder reaches the end of the stroke, oil will flow through the automatic bypass valve built into the piston inside the cylinder and return to the reservoir.
7. It is advisable to run the PTO to "power down" or lower the hoist because this will act as a hydraulic lock to hold the hoist in the lowered position. It is not necessary to do this, however, because the reservoir has sufficient capacity whether or not the hoist is powered down. You will benefit from the advantages of the double acting hoist only if you power down.
8. To make use of the hydraulic lock feature, place the hoist control lever in the center hold position after the hoist is powered down. This places the pressure on the valve, where it belongs, not on the pump.
9. DO NOT LEAVE THE PTO IN GEAR WHILE TRANSPORTING. THIS CAN CAUSE SEVERE DAMAGE TO THE PTO OR HYDRAULIC PUMP.
10. The hydraulic system should e drained, flushed and refilled with proper hydraulic fluid at regular intervals. CAUTION: NEVER use hydraulic BRAKE FLUID in the hydraulic system.
11. After adding or replacing the hydraulic fluid, cycle the hoist several times to remove air from the cylinders and hydraulic hoses.

SOME DO'S AND DON'TS FOR SAFE AND LONG SERVICE

1. Use the proper hydraulic fluid. KEEP IT CLEAN. Remember to change it regularly.
2. Lubricate all grease fittings every 100 cycles or every two months. Infrequent or insufficient lubrication will cause hoist failure and possibly injury or death.
3. ALWAYS carefully block up the body, using the body prop, before working under it.
4. Do not "race" the engine when unloading.
5. Do not load the hoist beyond its capacity.
6. DO NOT tamper with the hydraulic relief valve. This will void the warranty. It can cause severe damage to the hoist and cylinder.
7. Never leave the PTO in gear while transporting. It could ruin the hydraulic pump the PTO or the transmission.
8. Check all bolts and fittings regularly. Keep them tight. See table on page 4 for torque values.
9. Always operate hoist on a firm and level surface.
10. Always make sure area around truck is clear and safe for hoist operation and dumping.

TABLE OF CONTENTS

INSTALLATION INSTRUCTIONS

GENERAL INFORMATION

It is a good idea to look through these installation instructions before beginning to mount the hoist and hydraulic system.

When welding, protect the truck's electrical, air and brake systems by disconnecting, removing or covering. Tighten all nuts and bolts to a consistent level. Use the following table for torque values.

Size	Grade 2 Torque	Grade 5 Torque	Grade 8 Torque
			
1/4-20	3-4 lb-ft	6-7 lb-ft	10-11 lb-ft
1/4-28	4-5 lb-ft	8-9 lb-ft	11-12 lb-ft
5/16-18	8-9 lb-ft	14-15 lb-ft	21-22 lb-ft
5/16-24	9-10 lb-ft	15-16 lb-ft	21-22 lb-ft
3/8-16	17-18 lb-ft	24-26 lb-ft	37-40 lb-ft
3/8-24	19-20 lb-ft	28-30 lb-ft	40-43 lb-ft
1/2-13	38-42 lb-ft	60-65 lb-ft	90-100 lb-ft
1/2-20	43-47 lb-ft	70-75 lb-ft	95-105 lb-ft
5/8-11	75-80 lb-ft	122-130 lb-ft	180-190 lb-ft
5/8-18	85-90 lb-ft	145-150 lb-ft	200-210 lb-ft
3/4-10	132-140 lb-ft	220-230 lb-ft	315-330 lb-ft
3/4-16	152-160 lb-ft	250-260 lb-ft	355-370 lb-ft

The following abbreviations are used in describing hydraulic fittings.

ORBM	O-Ring Boss - Male Thread
NPTM	Pipe - Male Thread
NPTF	Pipe - Female Thread
JICM	JIC 37° - Male Thread
JICF	JIC 37° - Female Thread

INSTALLATION INSTRUCTIONS

LOCATE HOIST-SUBFRAME ASSEMBLY ON TRUCK

The hoist-subframe assembly is normally mounted to the truck before attaching it to the body.

For Ford trucks, with a 40 gallon rear fuel tank, and GM trucks, with a 32 gallon rear fuel tank, place the center of the rear hinge at roughly 45 inches behind the center of the rear axle.

For Dodge trucks, with a 52 gallon tank, place the end of the subframe 3 inches ahead of the end of the truck frame.

For GM trucks with dual fuel tanks, mark the truck frame 36 inches behind the center of the rear axle. This will be 96 inches back from the truck cab for 60 inch CA trucks; 120 inches back for 84 inch CA trucks. The truck frame will be cut off at this mark

NOTE: For GM trucks with a single 40 gallon, or larger, rear fuel tank, DuraClass recommends that no hoist be installed.

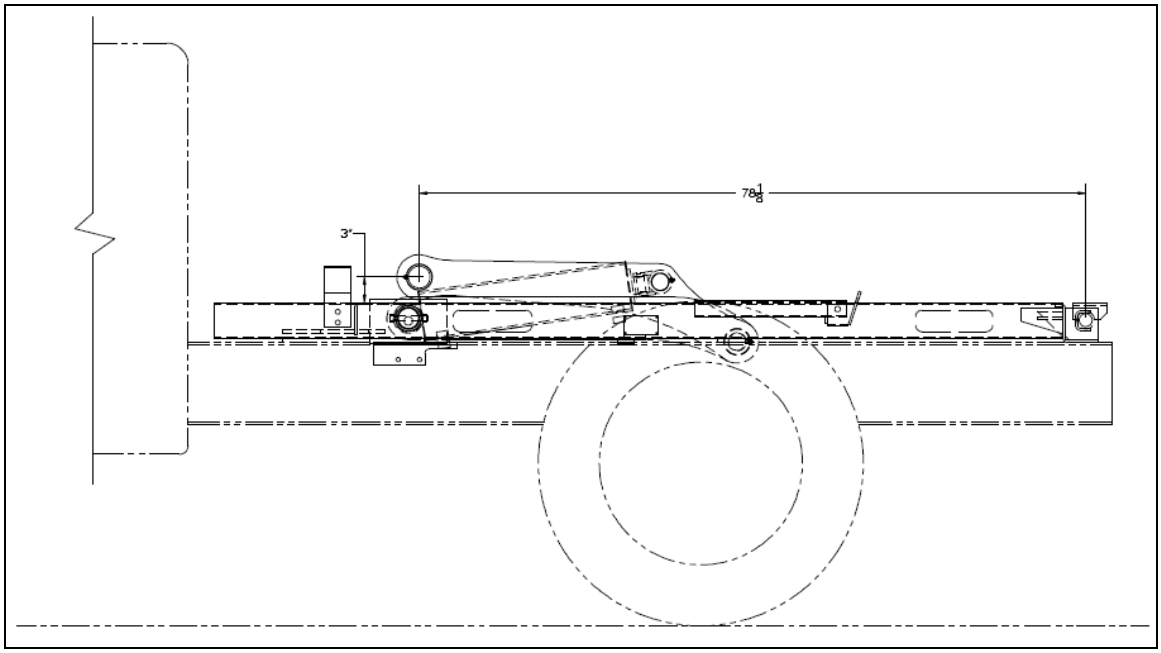


Figure 1

Make sure the marks are accurate for cutting the truck frame and even from side to side. Cut off the truck frame and grind the ends smooth. Place the subframe on the truck making sure it is even with the end of the truck frame, centered side to side and square with the truck frame. There should be 3 or 3 ½ inches clearance between the back of the cab and the front end of the subframe.

NOTE: If the truck frame has rivets in the top flange, add spacers between the truck frame and subframe, or counter sink the rivet heads into the subframe by drilling holes in the subframe. Do not remove the rivet heads!

MOUNT HOIST-SUBFRAME ASSEMBLY TO TRUCK

Frame extensions are provided with bodies 9' and longer. A portion of the frame extension must be bolted to the front of the hoist subframe to support the body. The entire extension will be used with 11' bodies, while 12" will need to be removed for a 10' body and 24" for a 9' body. See figure 2. Mounting angles are provided with cutouts to clear spring hangers. Position them directly under the hoist lower mount and bolt brackets to lower mount with ½"-13NC x 1.5" grade 5 hex head cap screws and hex lock nuts, if possible. Drill the truck frame using the mounting angles as guides.

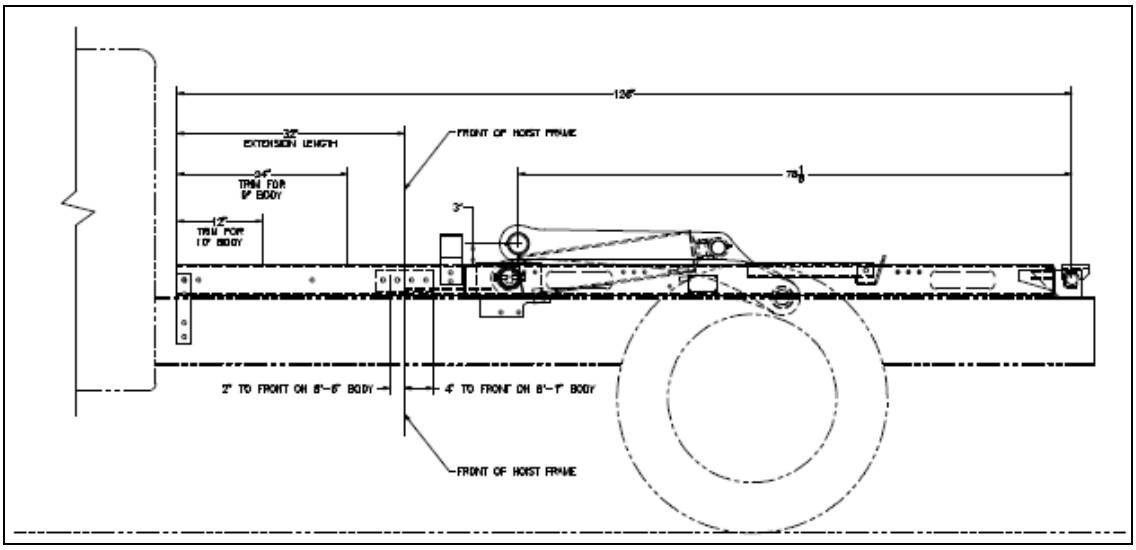


Figure 2

CAUTION: BE CAREFUL OF BRAKELINES, WIRING, ETC. INSIDE THE TRUCK FRAME WHEN DRILLING THE TRUCK FRAME.

Drill 17/32 holes through the truck frame and bolt the mounting angles to the truck frame with ½"-13NC x 1.5" grade 5 hex head cap screws and hex lock nuts. Make sure the subframe is correctly positioned front to back, centered side to side, and square with the truck frame. Weld the subframe to the bolted mounting angles if you were not able to bolt them as indicated above.

Drill a 41/64" hole through the top flange in the chassis rail through the rear hinge apron. Bolt the rear hinge apron to the chassis with two 5/8"-11NC x 2" grade 5 hex head cap screws and hex lock nuts.

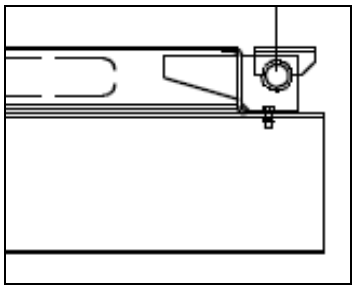


Figure 3 Rear Bolts

SUPPORT FUEL FILL TUBE

There are knock-outs in the left (driver's side) subframe rail for routing the fuel tank fill tube to the outside of the truck frame on 8' and 10' frames for Chevrolet and GMC trucks. Route the fill tube through one of the holes in the subframe. On Ford and Dodge trucks, the fill tube passes through a hole in the truck frame. After the body has been installed, construct a support for the fuel tank fill tube. Construct the support so that it does not interfere with any portion of the body or hoist operation.

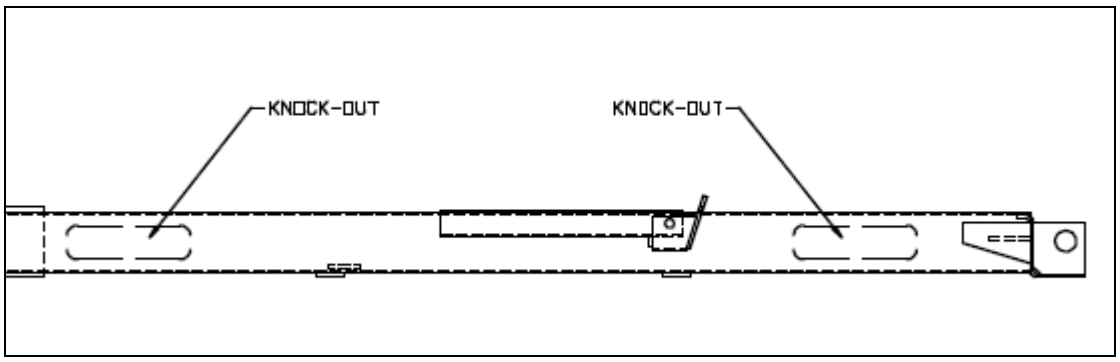


Figure 4

HYDRAULIC PUMPS

DuraClass offers three different hydraulic systems for use with the 1520 hoists. Mounting instructions can be found on the page shown:

MOUNT GEAR PUMP

The gear pump has an SAE 'A' mounting configuration, a 9-tooth splined shaft and a two-bolt mounting flange, and is assembled for counterclockwise rotation. NOTE: This pump will mount directly to Chelsea's output type 'XE' or Muncie's output type 'R'. DuraClass recommends a PTO ratio of 100-120%. This assures a minimum pump operating speed of 600 RPM. CHECK THE ROTATION OF THE PTO! If it is opposite of the engine, then the pump can be used as it is. If the PTO rotation is the same as the engine, then the pump will need to be reversed. (See instructions included with the pump.) Bolt the gear pump to the PTO output flange using 3/8 x 1" cap screws and lock washers.

MOUNT RESERVOIR/VALVE ASSEMBLY

The reservoir/valve assembly is intended to be mounted just behind the cab, between the longbeams of the body with the control valve to the passenger side of the truck. Bolt the reservoir/valve assembly to this mounting bracket using 3/8" x 3/4" cap screws, flat washers and hex lock nuts.

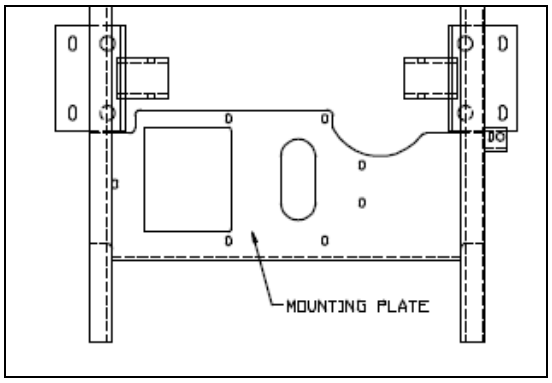


Figure 5 Mounting Plate

INSTALL HOSES

Study Fig. 6 very carefully before connecting the hoses. Install a ¾" pipe coupling, 3" long ¾" pipe nipple and a 90 degree street elbow in the suction port on the bottom of the reservoir. Fittings are supplied to allow the use of either the rear or side ports on the pump. Straight fittings are required for the rear ports and elbows for the side ports. A ¾" suction hose is installed from the tank to the pump and a 3/8" pressure hose is run to the valve.

Install pipe nipples (two different lengths) and 90 degree elbows in the work ports of the control valve. Connect the shorter 3/8" hose from the 'B' port on the control valve to the base and port on the cylinder; connect the longer 3/8" hose from the 'A' port to the rod end port.

NOTE: The 'A' port is the 'power-down' port and has a relief pressure of only 500 PSI; the 'B' port has full system pressure.

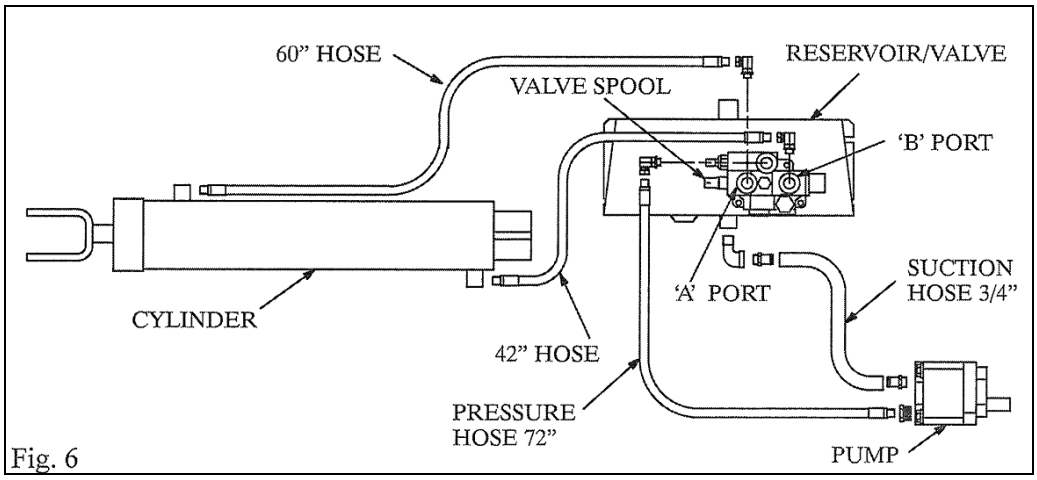


Fig. 6

ELECTRIC PUMP MOUNTING – GENERAL

The electric pump is intended to be mounted just behind the cab, between the longbeams of the body (see figure 5). Bolt the pump to the bracket provided using the 3/8 x 3/4 cap screws and lock washers. The tank end is secures with another 3/8-16NC x ¾ cap screw and hex lock nut.

For rated performance, the voltage at the power unit must be a minimum of 12VDC. This should be measured between the large terminal of the start solenoid (where the battery cable is connected) and the power unit base, where it is bolted to the mounting bracket. NOTE: Grounding of the power unit is just as important as the installation of the positive battery cable. It is easier to get a good ground by using a second battery cable.

Connect the large terminal on the motor start solenoid to the positive terminal on the battery with a #0 gauge battery cable. Grounding of the power unit can be completed either through the vehicle chassis or by a second battery cable. If grounding through the vehicle chassis, be sure to replace the light ground strap between the battery and the vehicle chassis with a #0 gauge cable. If grounding with a second battery cable, connect the negative terminal on the battery to the grounding hole on the power unit base using a #0 size battery cable. See Figure 7. Check the voltage between the large terminal on the start solenoid and the power unit base.

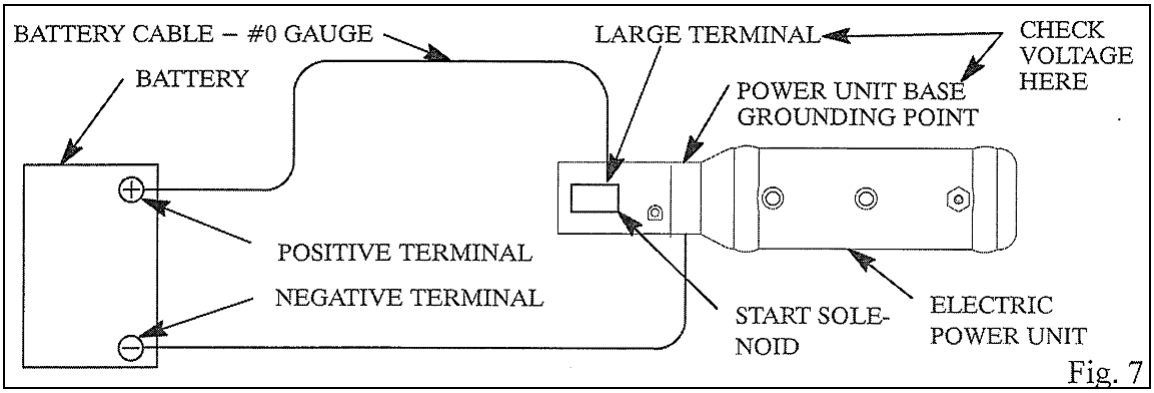


Fig. 7

Locate the push-button control in the cab and route the cable out of the cab through a hole in the back of the cab. Connect the push-button control to the electric power unit using the 3- or 4-pin connector set.

ELECTRIC PUMP INSTALLATION – SINGLE-ACTING

Install a 9/16 ORBM x 3/8 NPT adapters in the power port on the pump; install a 3/8" NPT 90 degree adapter on this adapter. Install a ¼ NPT x 3/8" NPT male elbow in the port on the top of the reservoir. Connect the shorter hose from the power port on the pump to the base end port on the cylinder; connect the longer hose from the port on the top of the reservoir to the rod end port on the cylinder.

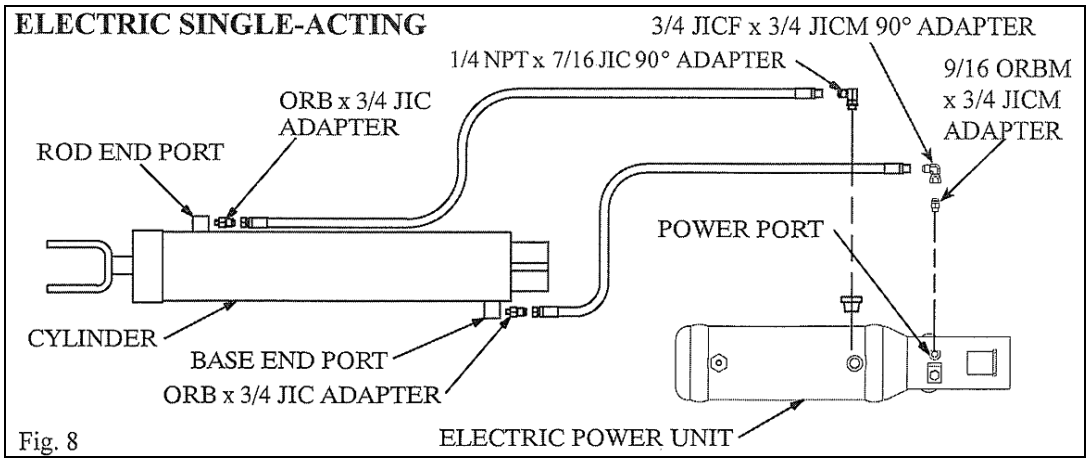


Fig. 8

ELECTRIC PUMP INSTALLATION – DOUBLE-ACTING

Install 9/16 ORB x 3/8 NPT adapters in both work ports on the electric pump. If needed, for good hose routing, install 3/8" elbows to both of these adapters. Connect the shorter 3/8 ID hose from the 'C1" port on the pump to the base end port on the cylinder. Connect the longer 3/8" ID hose from the 'C2' port to the rod end port. *NOTE:* The 'C2' port is the power down port and has only 500 PSI maximum pressure.

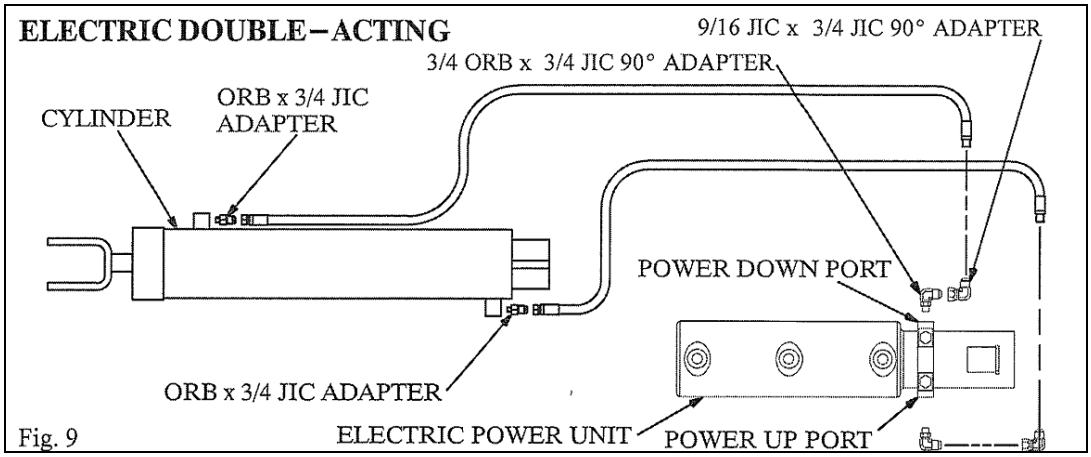


Fig. 9

ADD HYDRAULIC OIL

Use a quality hydraulic fluid of 150 SSU @ 100 deg F which contains corrosion and oxidation inhibitors and a foam depressant. This is approximately the equivalent of SAE 10W or lighter weight oil. Dexron automatic transmission fluid should be used in the electric pumps. Fill the hydraulic reservoir using the following table.

Standard Gear Pump w/Valve Tank . . . . . 9 Qts.
Electric – Single Acting . . . . . 7 Qts.
Electric – Double Acting . . . . . 7 Qts.

KEEP THE OIL CLEAN. USE CLEAN CONTAINERS, FUNNELS AND OTHER EQUIPMENT!

INSTALL DURACLASS BODY ON TRUCK

Place the DuraClass body on the truck and install the upper mount tube through the body longmember tubes and the top of the scissor assembly. Retain the upper mount tube with one 5/8"-11NC x 4" cap screw and locknut. Align the body longbeams to the subframe rails with the hoist fully collapsed and the body longmembers flat on the hoist frame. Securely weld the rear hinge brackets to the longbeams.

DO NOT WORK UNDER A RAISED BODY UNLESS THE BODY IS SECURELY BLOCKED OR PROPPED IN THE RAISED POSITION.

WELD NOTE

ALL STRUCTURAL WELDING DONE IN THE INSTALLATION OF THE HOIST AND BODY SHOULD BE PERFORMED USING ONLY THE FOLLOWING RECOMMENDED WELD ELECTRODE AND WIRE.

ELECTRODE – E-7018 (THIS IS A LOW HYDROGEN ROD, AND MANUFACTURER'S RECOMMENDATIONS MUST BE FOLLOWED.)

WIRE – E-70S-3 (WIRE MANUFACTURER'S RECOMMENDATIONS MUST BE FOLLOWED.)

ADJUST BODY PROP LEG FOR PROPER OPERATION

The body prop is designed and intended to support an EMPTY truck body in the raised position. Using the body prop permits service work to be performed safely beneath a raised body. It is mounted on the outside of the subframe on the driver's side.

1. Raise the body more than half way up.
2. Raise the prop arm to a free standing position by allowing the prop arm to rest against the adjustment bolt in the prop pivot bracket. The top of the prop arm will swing in under the "bullet" located next to the longbeam. Adjust bolt for proper engagement.
3. Slowly lower the body until the "bullet" rests in the body prop tube. To operate the body prop, raise the body to the desired height, shut off all power, raise the prop arm to a free standing position. Lower the body slowly until the "bullet" rests in the body prop tube. DO NOT POWER HOIST DOWN!
4. To place the body prop in the storage position, raise the body to clear the "bullet", lower the body prop to the storage position and lower the body.

INSTALL BODY GUIDES

Two body guides have been included and should be mounted near the front of the scissor assembly. Bolt the body guides to the outside of the subframe. The body guide should be tight against the outside of the longbeams of the body.

LOCATE GREASE ZERKS AND LUBRICATE HOIST

Lubricate the hoist in the following locations:

Upper Crosstube . . . . . 2 Fittings
Cylinder Base Pivot . . . . . 1 Fitting
Lower Crosstube . . . . . 2 Fittings
Cylinder Rod Pivot . . . . . 1 Fitting
Scissor Pivot . . . . . 1 Fitting
Rear Hinge . . . . . 2 Fittings

Lubricate all fittings at regular intervals, at least each time the truck chassis is lubricated. There are extremely high forces on the bearings surfaces within the hoist frame. It pays to be generous in lubricating the hoist to insure proper operation and long life.

ONE OF THE MOST COMMON REASONS FOR HOIST PROBLEMS IS FAILURE BY THE OPERATOR TO LUBRICATE THE HOIST.

INSTALL DECALS

Install the following decals on the dash of the truck:

WARNING decal #212A735 – 1.875" x 4.5"
CAUTION decal #212A1104 – 1.875" x 4.5"
CAUTION decal #212A1170 – 1.875" x 4.5"
WARNING decal #212A1373 – 1.875" x 4.5"
CAUTION decal #212A1166 – 3.875" x 5.5"

Install the following decals on the hoist frame near the body prop(s):

CAUTION decal #212A1103 – 3.5" x 9"
CAUTION decal #212B1171 – 7" x 8.25"

Install the following decal on the front left hand corner of the body:

CAUTION decal #212A1131 – 4.75" x 5"

IMPORTANT SAFETY NOTICE

Proper installation, service, and repair are important to the safe reliable operation of DuraClass' products. Installation and service procedures recommended by DuraClass are described in this service manual and are effective for performing installation and service operations. Some of these operations may require the use of tools or blocking devices specially design for the purpose. Special tools should be used when recommended. It is important to note that some warnings against the use of specific methods that can cause damage to the product or render it unsafe are stated in this manual. It is also important to understand these warnings are not exhaustive. DuraClass could not possibly know, evaluate, and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, DuraClass has not undertaken any such broad evaluations. Accordingly, anyone who uses installation and service procedures or tools which are not recommended by DuraClass must first satisfy himself thoroughly that neither his safety nor the product safety will be jeopardized by the method he selects.

DuraClass, as a manufacturer of the equipment that is covered by this manual, is providing a product to the user who has acknowledged to have superior knowledge of the conditions of the use to which the product will be put. DuraClass relies upon the user's superior knowledge in specifying any changes or modifications including, but not limited to, the inclusion or non-inclusion of options that are required by the user and the DuraClass product, and for the particular application of the user relative to the DuraClass product.

The information and specifications included in this publication were in effect at the time of approval for printing. DuraClass reserves the right, however, to discontinue or change specifications or design at any time without notice and without incurring any obligation whatsoever.