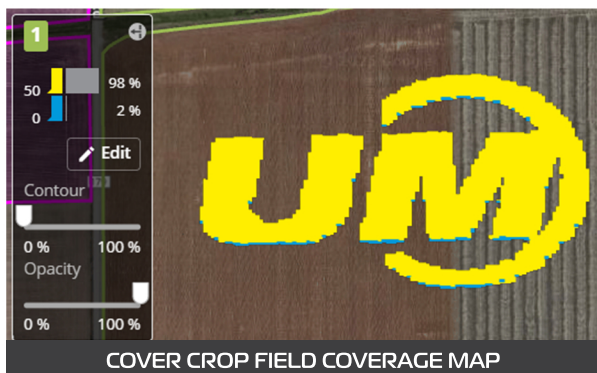




AIR COMMAND™ SECTION CONTROL FOR PRO-FORCE DRY SPREADERS



COVER CROP FIELD COVERAGE MAP



AIR COMMAND COVER CROP SPREAD RESULTS

**AIR COMMAND™ SECTION CONTROL FOR PRO-FORCE
DRY FERTILIZER SPREADER MAINTENANCE MANUAL**

FERTILIZER APPLICATION

**INNOVATING
THE FUTURE OF
AGRICULTURE**

UNVERFERTH MFG. CO., INC.
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Air Command Maintenance

WARNING

- TIPPING OR MOVEMENT OF THE MACHINE CAN CAUSE SERIOUS INJURY OR DEATH. BE SURE MACHINE IS SECURELY BLOCKED.
- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.
- KEEP HANDS CLEAR OF PINCH POINT AREAS.
- ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR FERTILIZERS AND/OR CHEMICALS. THIS EQUIPMENT INCLUDES, BUT IS NOT LIMITED TO: PROTECTIVE EYE WEAR, GLOVES, SHOES, SOCKS, LONG-SLEEVED SHIRT, AND LONG PANTS. ADDITIONAL PROTECTION MAY BE REQUIRED FOR MANY TYPES OF FERTILIZERS AND/OR CHEMICALS.
- AVOID BREATHING CHEMICALS AND FUMES.
- WASH HANDS BEFORE EATING, DRINKING, CHEWING GUM, OR USING TOILET.
- NEW HYDRAULIC SYSTEMS OR SYSTEMS THAT HAVE BEEN MAINTAINED MUST BE PURGED OF AIR BEFORE OPERATING OR MOVING MACHINE TO PREVENT SERIOUS INJURY OR DEATH.

CAUTION

- SHARP EDGES ON SPREADER CAN CAUSE SERIOUS INJURY. BE CAREFUL WHEN WORKING AROUND SPREADER.

Air Command Maintenance (continued)

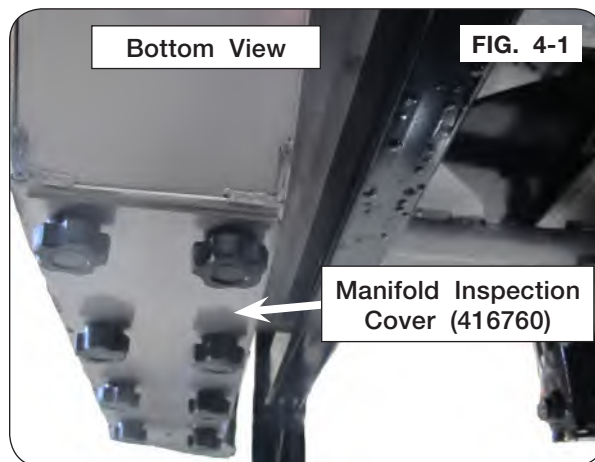
50-Hour Service

NOTE: Clean out section control manifold (417505) every 50 operating hours and end of season.

1. Park the empty spreader on a firm, level surface. Block the machine to keep it from moving. Set the tractor's parking brake, shut off the engine, remove the ignition key, disconnect hydraulics from the tractor to the spreader, and PTO, if equipped.



2. Unscrew 8 knobs from the bottom of section control manifold and remove manifold inspection cover (416760). Keep knobs and manifold inspection cover. (FIG. 4-1)
3. Use an air compressor to completely clean debris from fan, section control manifold, and material distribution manifold.
4. Completely wash machine thoroughly to remove corrosive fertilizer/chemicals inside and out before storing. When using pressure washers, maintain an adequate distance so not to blast water into bearings, hydraulic and fan seals, or electrical connections.
5. Reattach manifold inspection cover to the bottom of section control manifold using the 8 knobs. (FIG. 4-1)



NOTE: Hydraulic hoses and parts removed in FIG. 4-1 for illustration only.

- Inspect fan vanes and inside faces of the material distribution manifold for wear, replace before next season.
- After any period of unused time, unit should be operated to check function of hydraulic system and section control air valves move freely.

NOTE: Refer to “Dry Spreader Operator’s Manual” MAINTENANCE section for procedure to purge hydraulics and set hydraulic system flow.

Air Command Maintenance (continued)

Seasonal Storage

Refer to “Dry Spreader Operator’s Manual” and “Winterizing” outlined in MAINTENANCE section before storing the spreader in freezing climates.

Completely wash machine thoroughly to remove corrosive fertilizer/chemicals inside and out before storing. When using pressure washers, maintain an adequate distance so not to blast water into bearings, hydraulic and fan seals, or electrical connections.

- Check material flow is not obstructed.
- Repaint all areas where paint has been removed to keep rust from developing.
- Inspect machine for parts that may need to be replaced so they may be ordered in the off season.
- Check hydraulic hoses for weather cracks and replace accordingly.

Troubleshooting

PROBLEM	SOLUTION
ACTUATOR VT FAULT ERROR	1. PERFORM ACTUATOR TEST FUNCTION THROUGH RCM. REFER TO “ACTUATOR TEST PROCEDURE” IN THIS SECTION FOR DETAILS. 2. CYCLE KEY OFF/ON AND TEST ACTUATOR IN TEST SECTION TO VALIDATE ISSUE. 3. CHECK/VALIDATE ACTUATOR IS NOT PHYSICALLY FULLY EXTENDING/RETRACTING. 4. REMOVE LOWER MANIFOLD INSPECTION COVER (416760) TO ENSURE CORRECT VALVE IS MOVING AND NO DEBRIS IS OBSTRUCTING VALVE MOVEMENT. 5. DISSASSEMBLE ACTUATOR FROM VALVE AND CHECK VALVE ROTATION.
SPREAD PATTERN DOES NOT CHANGE WHEN SECTIONS SHUTOFF	1. VALIDATE SECTION CONTROL UNLOCK IS PRESENT IN VIRTUAL TERMINAL. 2. VALIDATE FAN PRESSURE IS 22–24 IN. H₂O WITH ALL SECTION VALVES CLOSED. 3. VALIDATE CORRESPONDING SECTION ACTUATORS ARE ALLOWING AIR WHEN SECTION IS OFF. 4. CHECK FOR DEBRIS/BLOCKAGE IN MATERIAL DISTRIBUTION MANIFOLD. 5. VALIDATE FLOW DIVIDER BLOCKER PLATE IS DOWN AND NOT OBSTRUCTING AIRFLOW.
CANNOT ACHIEVE 22–24 IN. H ₂ O	1. ENSURE ALL SECTION VALVES ARE CLOSED. 2. VALIDATE CORRECT SCV FLOW SETTING. 3. ENSURE FAN SCREEN IS FREE OF DEBRIS. 4. ADJUST FLOW RESTRICTOR VALVE (PF1222-669) ON UNIT. REFER TO “FLOW RESTRICTOR VALVE ADJUSTMENT” IN THIS SECTION FOR DETAILS.
NO FAN PRESSURE	1. ENSURE FAN IS SPINNING WHEN HYDRAULICS ARE MOVING IN CORRECT DIRECTION. 2. CHECK SENSOR WIRING. PINOUT: A=SUPPLY +12V (BROWN) B=GROUND (BLUE) C=SIGNAL (BLACK)

Actuator Test Procedure

WARNING

- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.
- KEEP HANDS CLEAR OF PINCH POINT AREAS.
- MOVING OR ROTATING COMPONENTS CAN CAUSE SERIOUS INJURY OR DEATH. ENSURE FEEDGATE DOOR, CHAIN/BELT COVERS AND SERVICE COVERS ARE IN PLACE BEFORE OPERATING THE SPREADER.

1. Park the empty spreader on a firm, level surface. Block the machine to keep it from moving. Set the tractor's parking brake, shut off the engine, remove the ignition key, disconnect hydraulics from the tractor to the spreader, and PTO, if equipped.



2. Go to Main Home Screen and click "Diagnostic" button. (FIG. 4-2)
3. In the "Diagnostic" page, select the "Tests" tab. (FIG. 4-3)

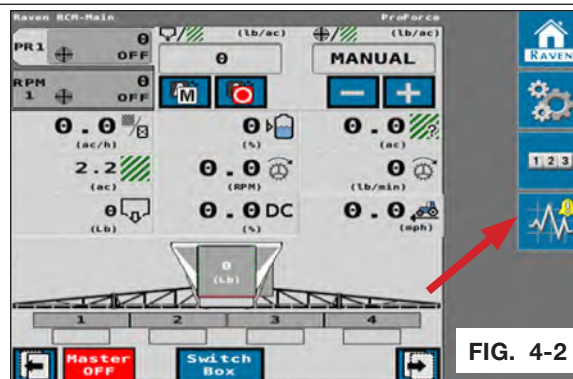


FIG. 4-2

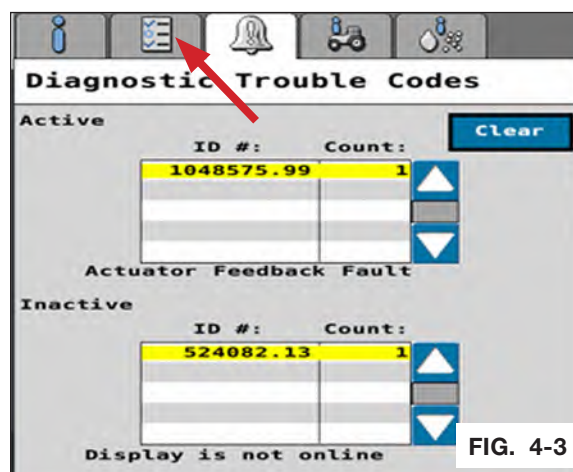


FIG. 4-3

4. After selecting "PR1" box, click drop down box. (FIG. 4-4)

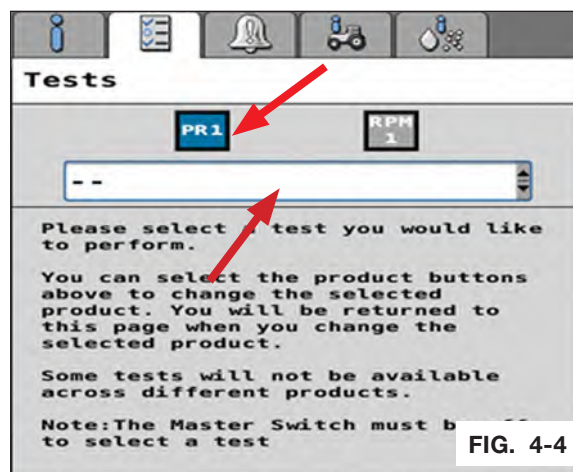
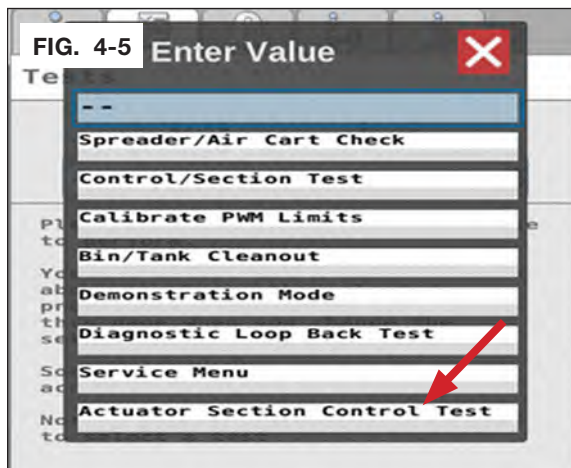


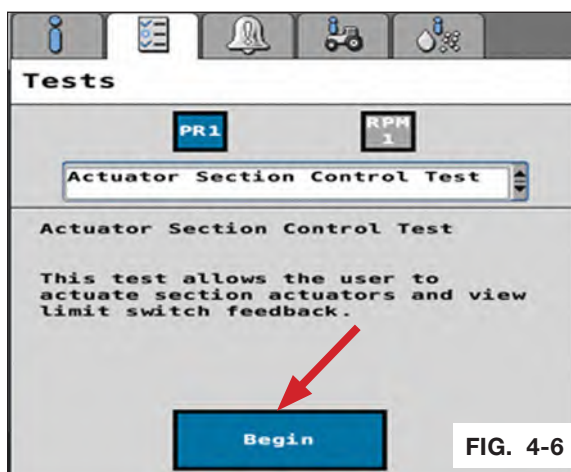
FIG. 4-4

Actuator Test Procedure (continued)

5. Select “Actuator Section Control Test” from the list. (FIG. 4-5)

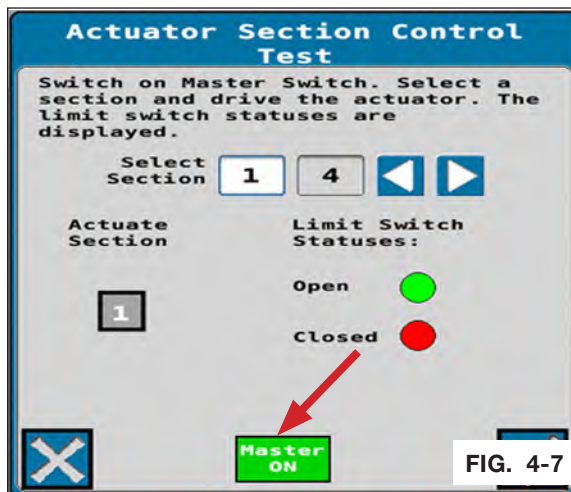


6. Click “Begin” button. (FIG. 4-6)



7. Turn master switch “ON”. (FIG. 4-7)

(Continued on next page)



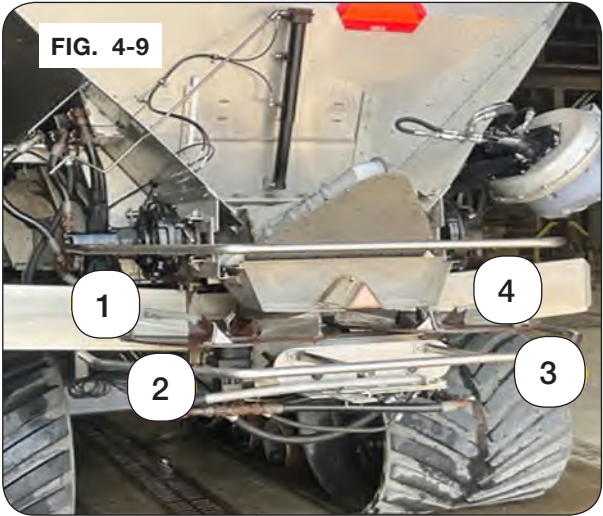
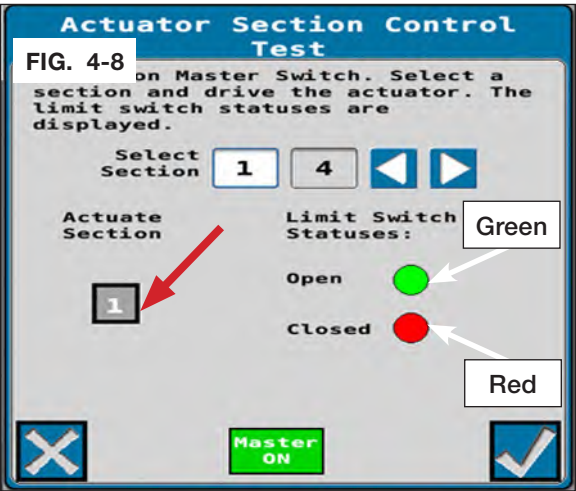
Actuator Test Procedure (continued)

8. Click “Actuate Section” button to cycle the actuator. (FIG. 4-8)

NOTE: When “Actuate Section” is clicked, button alternates between gray and blue. (FIG. 4-8)

NOTE: When function is cycled, actuator is extended when “Open” light is green and retracted when “Closed” light is green. (FIG. 4-8)

NOTE: Figure 4-9 and charts show the actuator and corresponding section overview.

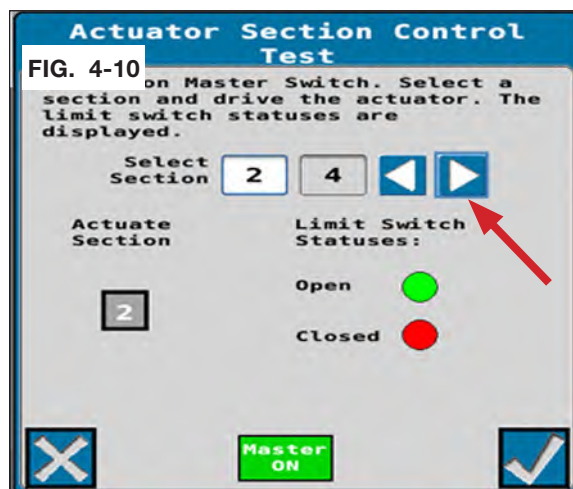


SECTION	CORRESPONDING ACTUATOR LOCATION
SECTION 1	Top Left
SECTION 2	Bottom Left
SECTION 3	Bottom Right
SECTION 4	Top Right

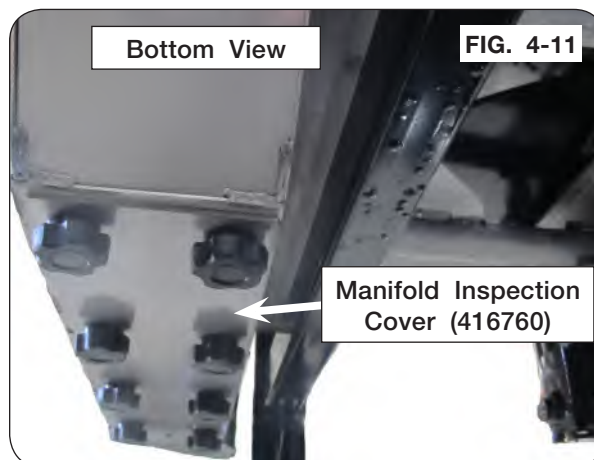
ACTUATOR POSITION	VALVE POSITION	SECTION STATUS
Extended	Open (Getting Air)	SECTION OFF
Retracted	Closed (Not Getting Air)	SECTION ON

Actuator Test Procedure (continued)

9. Click “arrows” to select next actuator.
(FIG. 4-10)
10. Repeat steps 8 and 9 until all 4 actuators are verified operational in both directions.



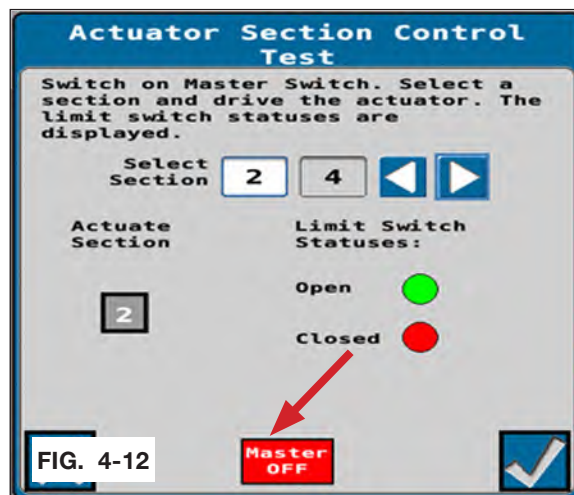
11. Unscrew 8 knobs from the bottom of section control manifold and remove manifold inspection cover (416760). Keep knobs and manifold inspection cover. (FIG. 4-11)
12. Verify proper sections move on the manifold when actuated on the display.
13. Reattach manifold inspection cover to the bottom of section control manifold using the 8 knobs. (FIG. 4-11)



NOTE: Hydraulic hoses and parts removed in FIG. 4-11 for illustration only.

14. Turn master switch “OFF”. (FIG. 4-12)

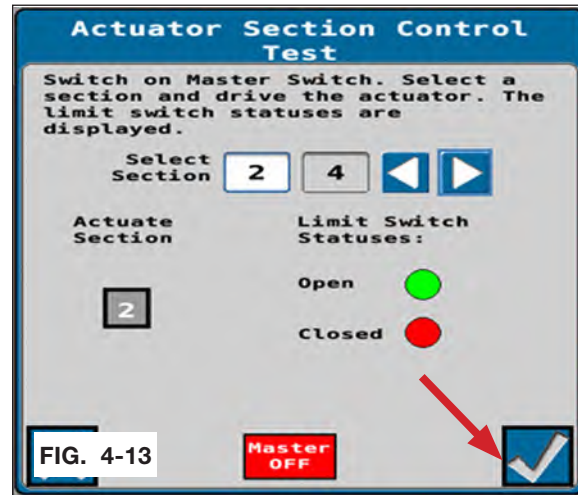
(Continued on next page)



Actuator Test Procedure (continued)

15. Click “check mark” to finish test. (FIG. 4-13)

NOTE: Actuators fully retract once the “check mark” is clicked.



Fan Speed Control

⚠ WARNING

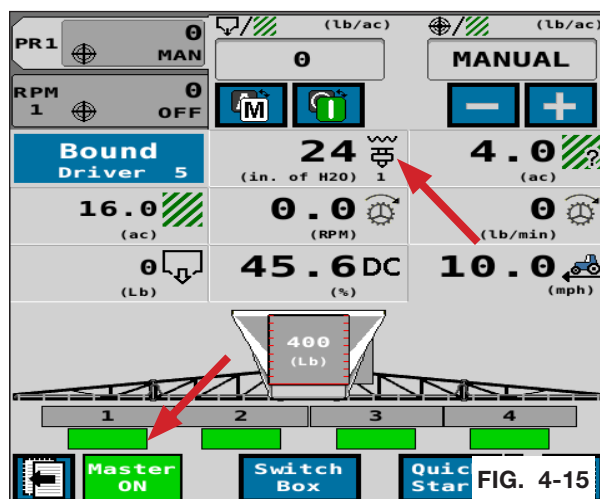
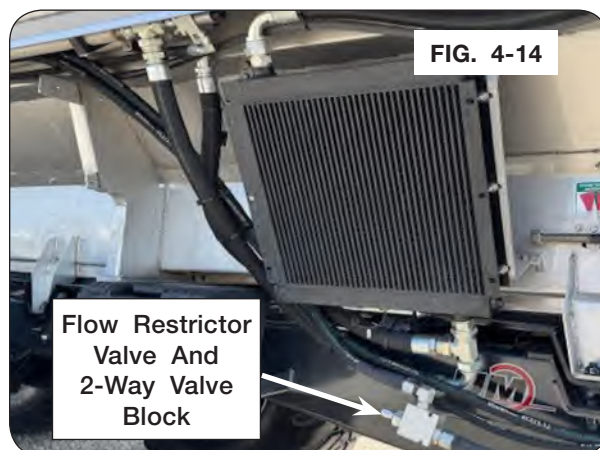
- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.
- KEEP HANDS CLEAR OF PINCH POINT AREAS.
- HIGH-PRESSURE FLUIDS CAN PENETRATE THE SKIN AND CAUSE SERIOUS INJURY OR DEATH. LEAKS OF HIGH-PRESSURE FLUIDS MAY NOT BE VISIBLE. USE CARDBOARD OR WOOD TO DETECT LEAKS IN THE HYDRAULIC SYSTEM. SEEK MEDICAL TREATMENT IMMEDIATELY IF INJURED BY HIGH-PRESSURE FLUIDS.
- MOVING OR ROTATING COMPONENTS CAN CAUSE SERIOUS INJURY OR DEATH. ENSURE FEEDGATE DOOR, CHAIN/BELT COVERS AND SERVICE COVERS ARE IN PLACE BEFORE OPERATING THE SPREADER.

IMPORTANT

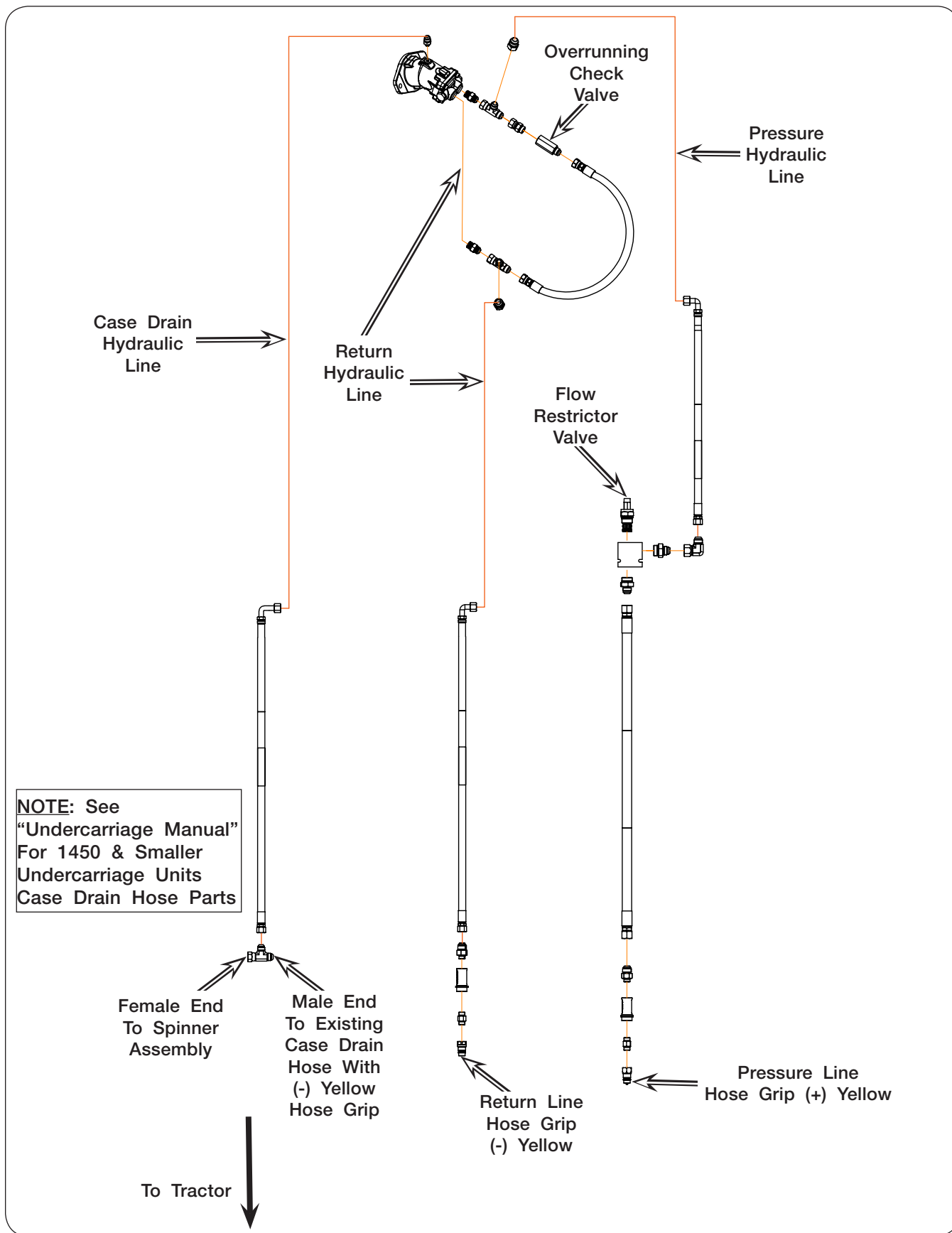
- The hydraulic fan is designed to provide 22–24 inches of H_2O pressure. Run the fan between 22–24 inches of H_2O pressure. DO NOT exceed 30 in. of H_2O pressure. Damage to fan, housing, and machine may result.

NOTE: The flow restrictor valve (PF1222-669) and 2-way valve block (PF1222-112) protects the fan from spinning too fast. (FIG. 4-14)

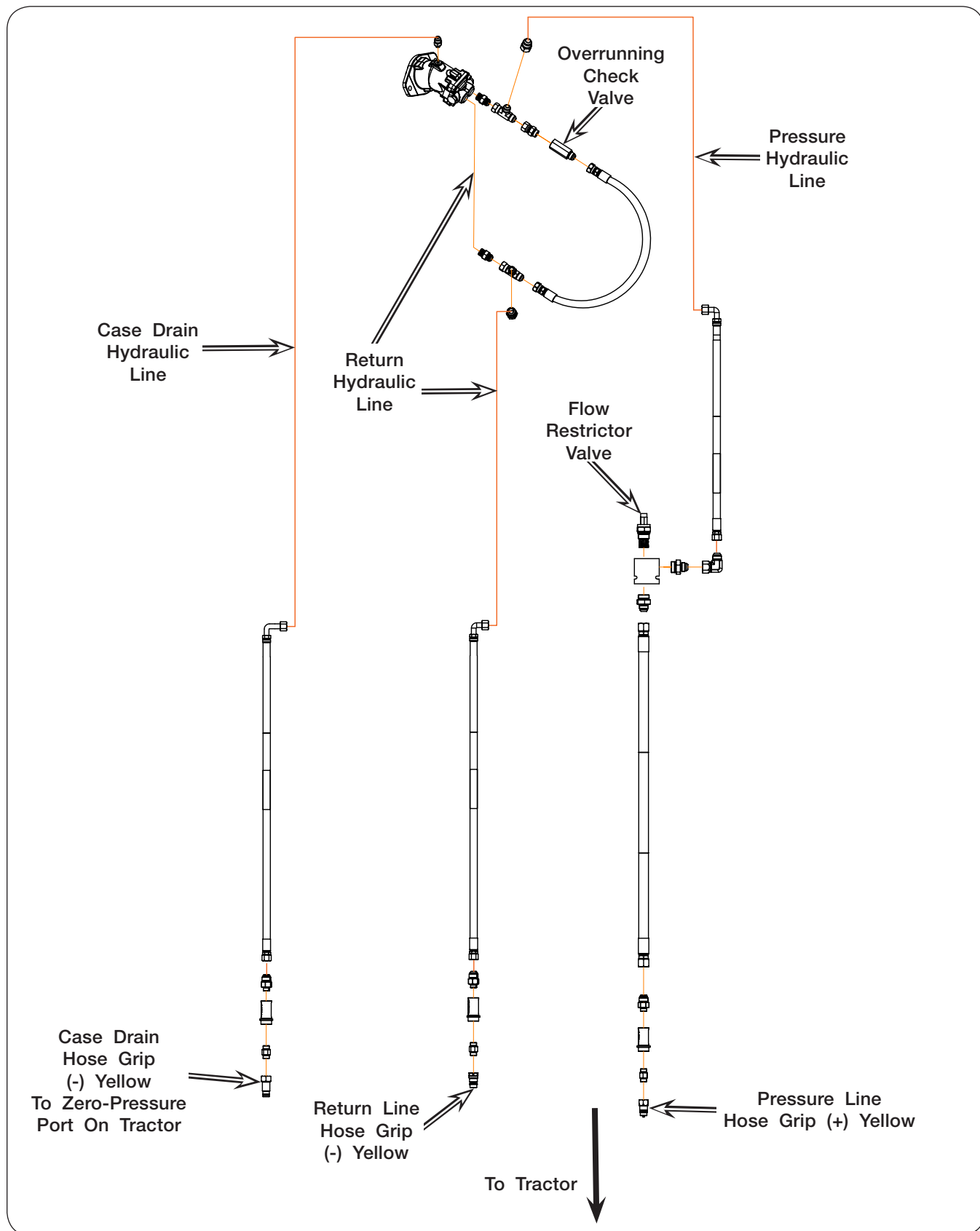
1. Park the empty spreader on a firm, level surface. Block the machine to keep it from moving. Set the tractor's parking brake. Start tractor and keep the key in the ON position.
2. Engage tractor SCV fan hydraulics into constant flow.
3. Adjust SCV flow to achieve 22–24 in. of H_2O pressure.
4. If SCV flow will not achieve 22–24 in. of H_2O , use the following procedure to adjust the flow restrictor valve.
5. On the ISO product control screen, ensure the bottom boxes turn green and master is ON. (FIG. 4-15)
6. Remove protective cap from flow restrictor valve. (FIG. 4-14)
7. Turn restrictor valve counter clockwise to increase pressure to 22–24 in. of H_2O OR turn valve clockwise to lower pressure to 22–24 in. of H_2O . (FIG. 4-14)
8. Reattach protective cap to flow restrictor valve. (FIG. 4-14)



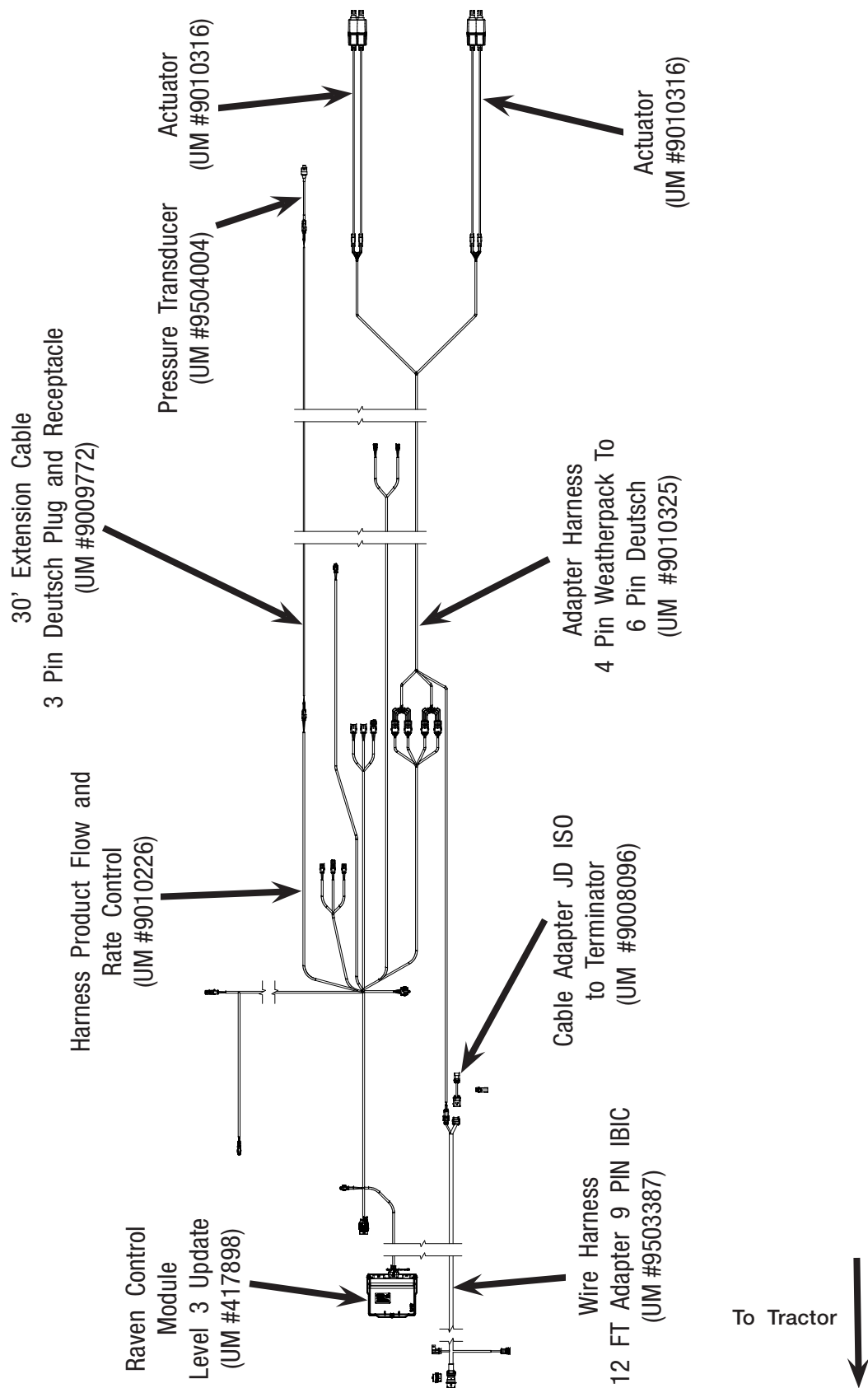
Hydraulic Schematic — Fan Hydraulics (1450 & Smaller Models)



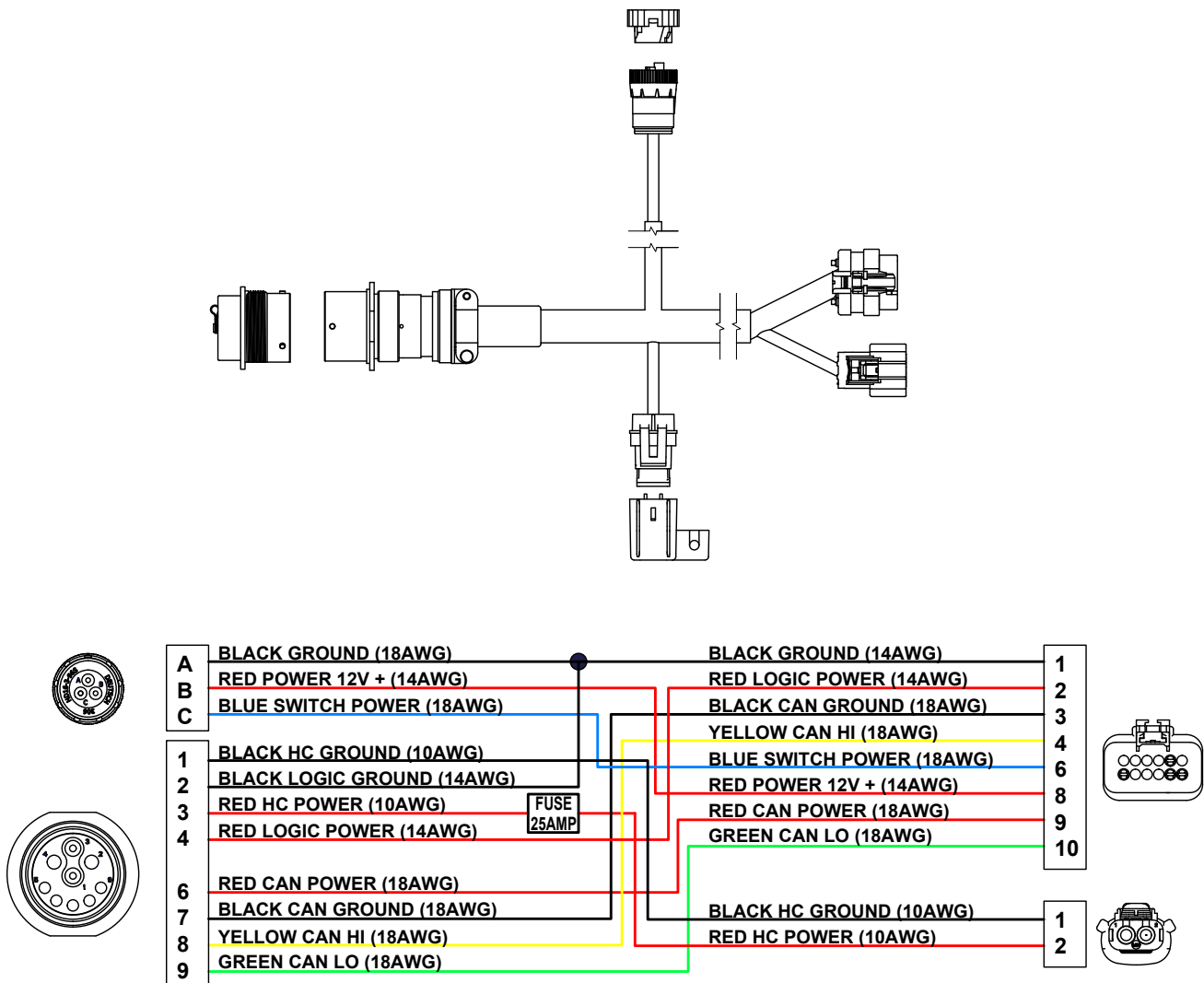
Hydraulic Schematic — Fan Hydraulics (1850 & 2250 Models)



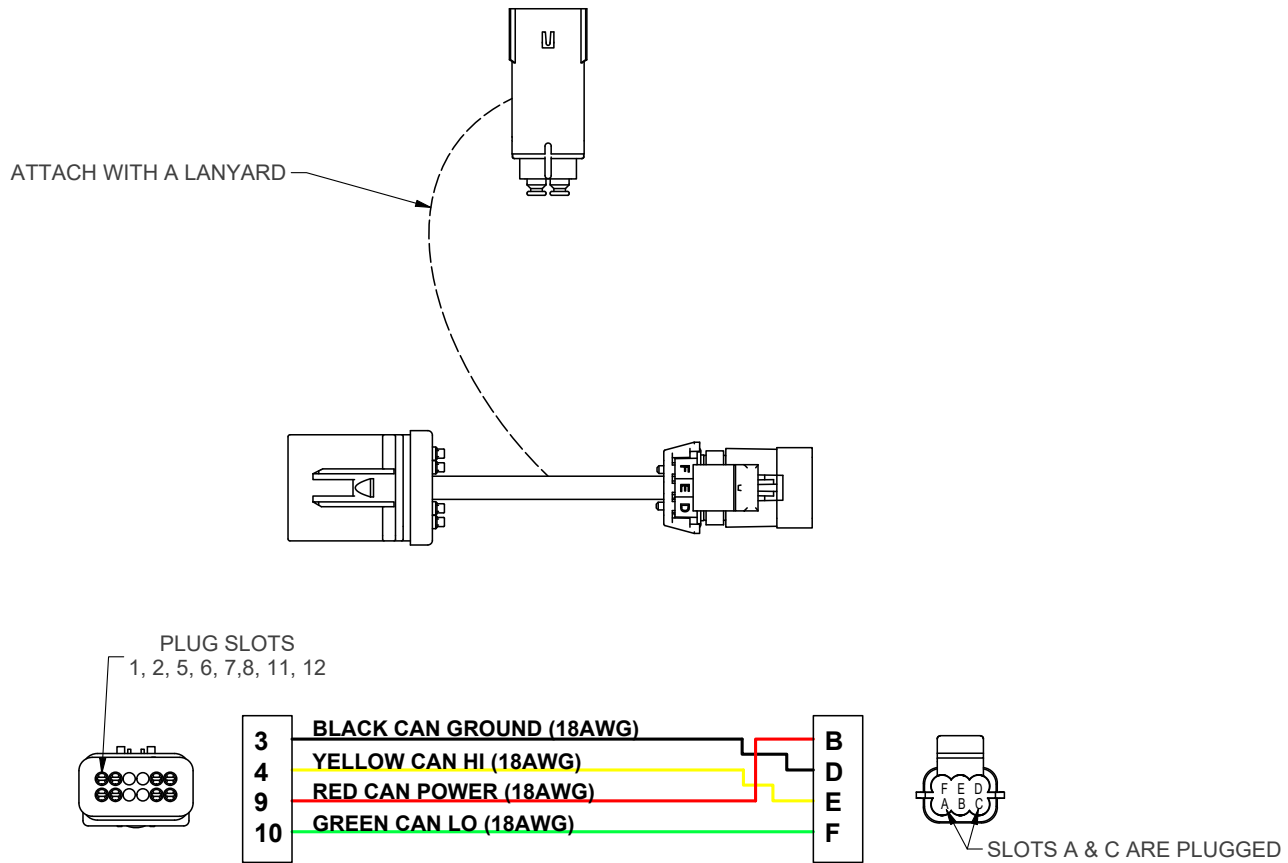
Electrical Schematic — Wiring Harness Overview Layout



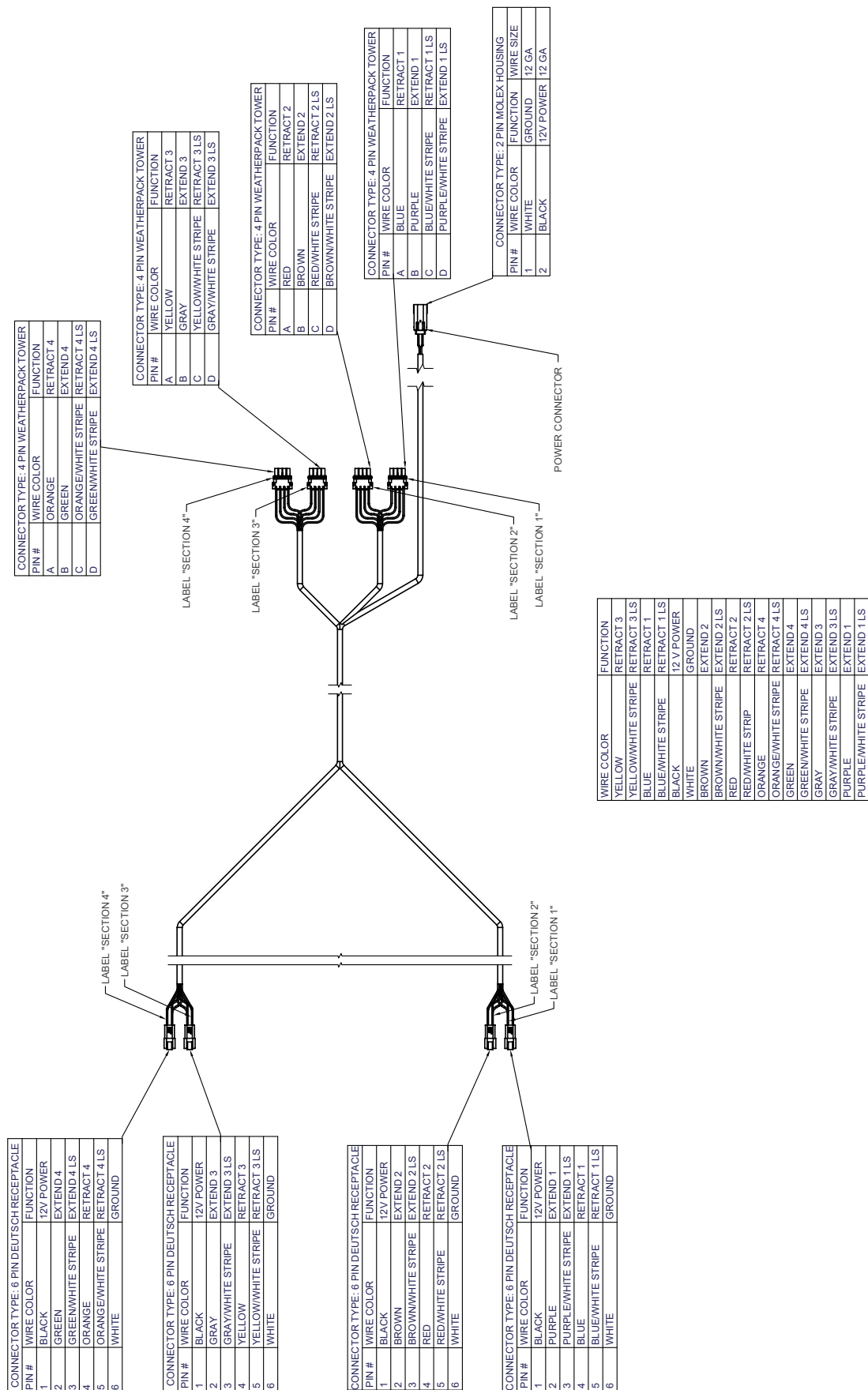
Schematic — Adapter Harness, 9-Pin IBIC Hitch #9503387



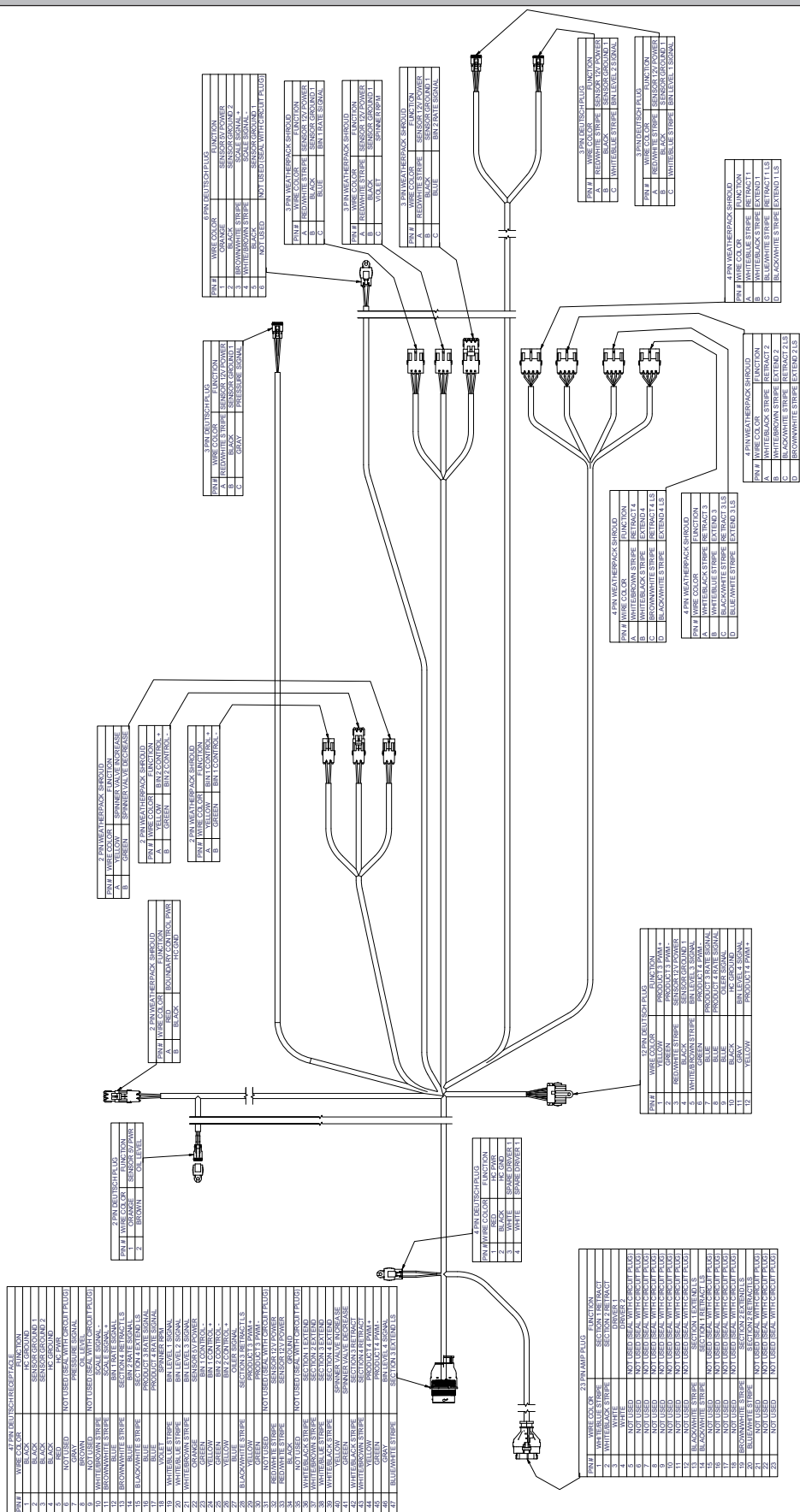
Schematic — Adapter Cable, JD ISO To Terminator #9008096



Schematic — Adapter Harness, #9010325
4 Pin Weatherpack To 6 Pin Deutsch

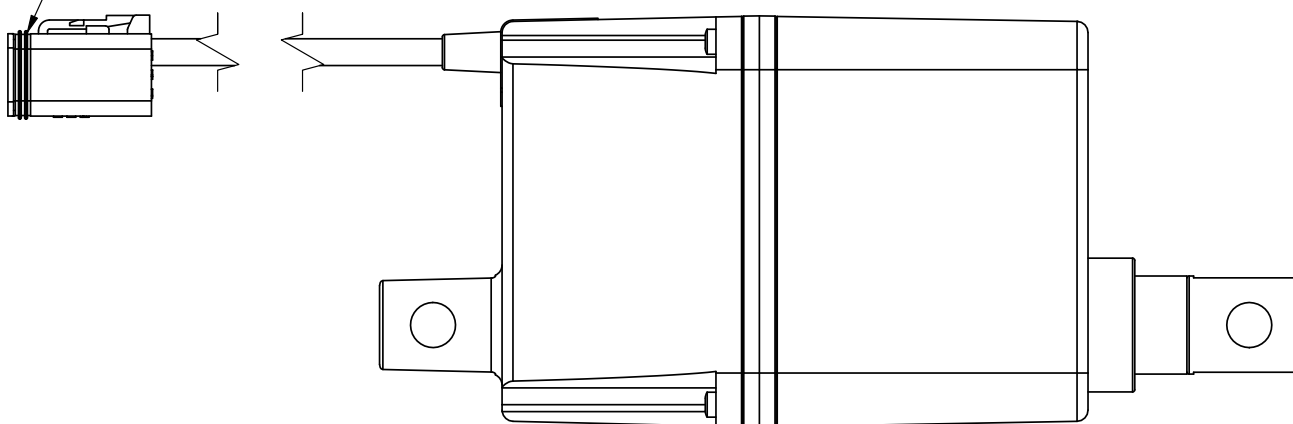


Schematic — Product Flow & Rate Control Harness #9010226



Schematic — Actuator #9010316

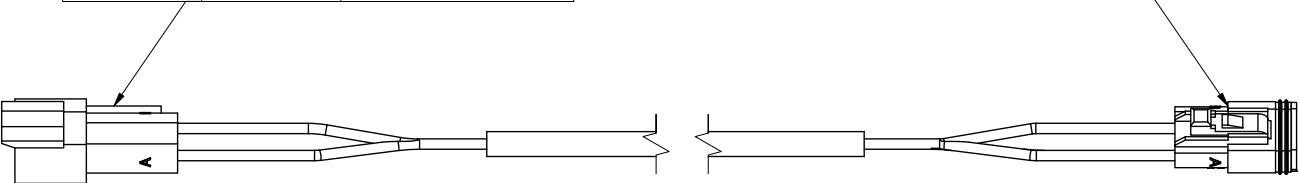
CONNECTOR TYPE: 6 PIN DEUTSCH PLUG		
PIN #	WIRE COLOR	FUNCTION
1	RED	12V POWER
2	VIOLET	EXTEND CONTROL
3	BLUE	EXTEND FEEDBACK
4	ORANGE	RETRACT CONTROL
5	BROWN	RETRACT FEEDBACK
6	BLACK, GREY	GROUND



Schematic — Pressure Transducer 30' Extension Cable,
#9009772

CONNECTOR TYPE 3 PIN DEUTSCH RECEPTACLE		
PIN #	WIRE COLOR	FUNCTION
A	BROWN	+12V
B	BLUE	GROUND
C	BLACK	SIGNAL

CONNECTOR TYPE: 3 PIN DEUTSCH PLUG		
PIN #	WIRE COLOR	FUNCTION
A	BROWN	+12V
B	BLUE	GROUND
C	BLACK	SIGNAL

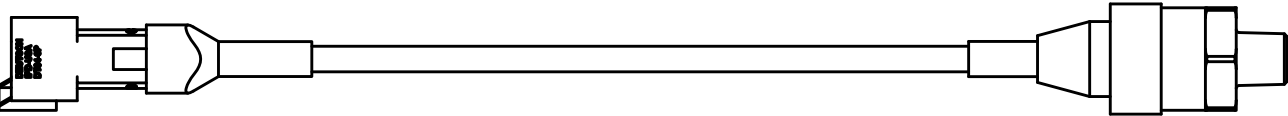


Schematic — Pressure Transducer #9504004

To 30' Extension Cable

PINOUT:
A=SUPPLY +12V (BROWN)
B=GROUND (BLUE)
C=SIGNAL (BLACK)

To Fan



Complete Torque Chart

Stainless Steel Capscrews - ASTM F593

IMPORTANT

- Stainless steel hardware has a natural tendency to cold weld/gall when installed/uninstalled at high speeds and/or high torques. It is recommended to apply a thread lubricant approved for stainless steel such as graphite-based anti-seize or molybdenum disulfide based anti-seize when performing an assembly/disassembly of stainless steel hardware. Unverferth PN 9504206 or equivalent.
- The torque recommendations below are for lubricated stainless steel hardware.

SIZE	INCH POUNDS	NEWTON METERS
1/4-20	62	7
1/4-28	71	8
5/16-18	128	15
5/16-24	142	16

SIZE	FOOT POUNDS	NEWTON METERS
3/8-16	19	26
3/8-24	21	29
7/16-14	30	41
7/16-20	34	46
1/2-13	46	63
1/2-20	52	71
9/16-12	67	91
9/16-18	74	100
5/8-11	92	125
5/8-18	104	141
3/4-10	113	153
3/4-16	126	171
7/8-9	182	247
7/8-14	201	273
1-8	273	370
1-14	306	415
1 1/4-7	545	739
1 1/4-12	604	819
1 3/8-6	715	970
1 3/8-12	813	1102
1 1/2-6	949	1287
1 1/2-12	1067	1447

Complete Torque Chart (continued)**Capscrews - Grade 5****NOTE:**

- Grade 5 capscrews can be identified by three radial dashes on the head.
- Capscrews have a yellow or clear appearance.



SIZE	FOOT POUNDS	NEWTON METERS
1/4-20	8-10	11-13
1/4-28	9-11	12-15
5/16-18	15-17	20-23
5/16-24	17-19	23-26
3/8-16	25-28	34-38
3/8-24	28-31	38-42
7/16-14	40-45	54-61
7/16-20	45-50	61-68
1/2-13	62-68	84-92
1/2-20	68-75	92-102
9/16-12	90-98	122-133
9/16-18	100-110	134-148
5/8-11	120-135	162-183
5/8-18	124-137	168-186
3/4-10	200-220	270-300
3/4-16	210-230	285-310
7/8-9	330-350	425-475
7/8-14	360-380	460-515
1-8	500-525	675-710
1-14	540-560	730-760
1 1/8-7	600-635	815-860
1 1/8-12	665-700	920-950
1 1/4-7	850-895	1150-1215
1 1/4-12	940-990	1275-1340
1 3/8-6	1125-1175	1525-1590
1 3/8-12	1280-1335	1735-1810
1 1/2-6	1500-1560	2035-2115
1 1/2-12	1685-1755	2285-2380

IMPORTANT

- Follow these torque recommendations except when specified in text.

Hydraulic Fittings – Torque and Installation

WARNING

- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING THE IMPLEMENT.
- HIGH-PRESSURE FLUIDS CAN PENETRATE THE SKIN AND CAUSE SERIOUS INJURY OR DEATH. LEAKS OF HIGH-PRESSURE FLUIDS MAY NOT BE VISIBLE. USE CARDBOARD OR WOOD TO DETECT LEAKS IN THE HYDRAULIC SYSTEM. SEEK MEDICAL TREATMENT IMMEDIATELY IF INJURED BY HIGH-PRESSURE FLUIDS.
- HYDRAULIC SYSTEM MUST BE PURGED OF AIR BEFORE OPERATING TO PREVENT SERIOUS INJURY OR DEATH.
- RELIEVE HYDRAULIC SYSTEM OF ALL PRESSURE BEFORE ADJUSTING OR SERVICING. SEE TRACTOR OPERATOR'S MANUAL FOR PROPER PROCEDURES.



Tightening O-Ring Fittings

1. Inspect components for damage or contamination. Do not connect any other type of fitting to an O-ring fitting.
2. For adjustable fittings, ensure the jam nut and washer are fully backed up.
3. Lubricate the O-ring and threads on the fitting with hydraulic oil.
4. Turn the fitting into the port until it is finger tight.
5. For adjustable fittings, set in the desired position.
6. Using a wrench, torque the fitting to the value in the below table. For adjustable fittings the jam nut will be tightened.

NOTE: Never use a power tool to install a fitting.

Dash Size	Thread Size	Straight Stud Torque (Ft-Lbs)	Adjustable Stud Torque (Ft-Lbs)
-5	1/2-20	14-19	10-14
-6	9/16-18	18-24	12-16
-8	3/4-16	27-43	20-30
-10	7/8-14	36-48	30-36
-12	1-1/16-12	65-75	44-54
-14	1-3/16-12	75-99	53-70
-16	1-5/16-12	85-123	59-80
-20	1-5/8"-12	115-161	75-100
-24	1-7/8"-12	125-170	105-125

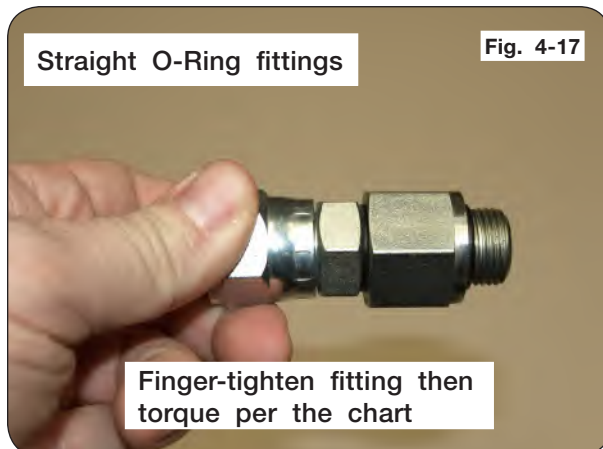
O-Ring fittings

Fig. 4-16



Straight O-Ring fittings

Fig. 4-17



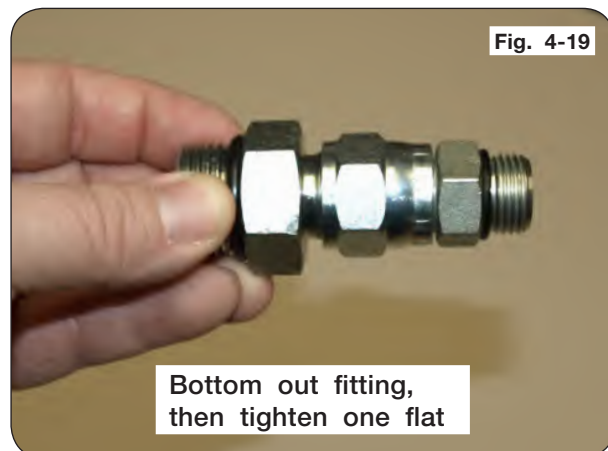
Finger-tighten fitting then torque per the chart

Hydraulic Fittings - Torque and Installation (continued)

Tightening JIC Fittings

1. Inspect all components for damage or contamination. Do not connect any other type of fitting to a JIC fitting.
2. Lubricate the threads with hydraulic oil.
3. Turn the fitting into the port until it bottoms out.
4. Use one wrench on the fixed hex on the hose to prevent twisting and a second on the swivel. Tighten the fitting another 60 degrees (or one flat)

NOTE: Never use a power tool to install a fitting



Steel 37° JIC Adapters		
DASH SIZE	FLARED THREAD SIZE	TORQUE FT.-LBS
-6	9/16"-18	18-20
-8	3/4"-16	27-39
-10	7/8"-14	36-63
-12	1 1/16"-12	65-88
-14	1 3/16"-12	75-103
-16	1 5/16"-12	85-113
-20	1 5/8"-12	115-133
-24	1 7/8"-12	125-167