



LeTourneau, Inc.

SERVICE ALERT

SA 046.01

May 12, 2005

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TO: LeTourneau, Inc. Dealers and Users

FROM: LeTourneau, Inc. Service Department

SUBJECT: INSTALLATION OF PILOT CUTOFF SOLENOID KIT

MODELS: D950 #2001
L950 #2001 to #2003
L1350 #2001 to #2011
L1850 #2001 to #2021, #2023 and #2024

The purpose of this Service Alert is to detail the hydraulic (mechanical) and electrical installation of the pilot cutoff solenoid, SOL 25, on the 50-series machine S/Ns listed above

In the event of a solenoid coil failure (specifically short-to-ground) in solenoids 21, HB, HR, BB, or BR on any of the 50-series machine S/Ns listed above, the hoist, bucket, or float operations could experience non-commanded movement. This pilot cutoff solenoid kit is designed to block pilot pressure from the pilot control valves and float solenoid when no movement is being commanded by the operator. This adds redundancy protection, greatly reducing the possibility of non-commanded movement.

Installation of this kit is a mandatory requirement on all 50-series machine serial numbers listed above.

HYDRAULIC INSTALLATION

NOTE

For hydraulic component installation information, see attached Parts List, Diagrams and Schematics.

WARNING

For safety, ensure that air pressure has been released off of hydraulic tank and that pilot pressure is relieved from the pilot circuit through the pilot pressure bleed-down valves manifold located in front frame or by the operation of the auxiliary pilot pump.

CAUTION

Prior to commencement of the installation the machine shall be placed in a safe location on flat and level ground, the park brakes set, engine stopped, key switch OFF and the battery isolator turned OFF.

The machine shall be parked and isolated as per the mine site regulations.

NOTE

Reference flow direction of check valve stamped on housing of check valve.

ELECTRICAL INSTALLATION PROCEDURE

Due to the variation in machine layout, the installation location of SOL 25 will vary from machine to machine. The table below indicates which channel shall be used for each machine model and serial number

NOTE

The solenoid installation **REQUIRES** the installation of the updated supporting LINCSTM configuration, as listed in the table below.

Pilot Cutoff Solenoid (High Side) has been incorporated into the LINCSTM configurations as shown in following tables.

NOTE

1. System Update version 12.7 and related configurations are posted to LeTRAK Knowledge Base. Configurations below will require the 12.7 version update.
2. Configuration files marked with asterisk (*) in use by LeTourneau, Inc. Drive Systems Group for SR related updating (02/10/05).

DOZER	Version	CHANNEL
D950 SN 2001	03.2 02/11/05	1043

LOADER	Version	CHANNEL
L950 SN 2001	07.6 02/09/05	1033
L950 SN 2002	07.6 02/09/05	1033
L950 SN 2003	07.6 02/09/05	1033

LOADER	Version	CHANNEL
L1350 SN 2001	07.3 02/09/05	1043
L1350 SN 2002	10.2 02/09/05	1043
L1350 SN 2003	10.4 02/09/05	1043
L1350 SN 2004	04.8 02/09/05	1043
L1350 SN 2005	10.4 02/09/05	1043
L1350 SN 2006	05.4 02/09/05	1043
L1350 SN 2007 *	09.2 02/10/05	1043
L1350 SN 2008	07.0 02/09/05	1043
L1350 SN 2009	05.6 02/09/05	1043
L1350 SN 2010 *	04.5 02/10/05	1013
L1350 SN 2011 *	03.0 02/10/05	1013
L1350 SN 2012	03.2	RCM

LOADER	Version	CHANNEL
L1850 SN 2001	06.2 02/09/05	1043
L1850 SN 2002	04.8 02/09/05	1043
L1850 SN 2003	04.9 02/09/05	1043
L1850 SN 2004	04.9 02/09/05	1043
L1850 SN 2005	04.9 02/09/05	1043
L1850 SN 2006	05.7 02/09/05	1043
L1850 SN 2007	05.7 02/09/05	1043
L1850 SN 2008	05.7 02/09/05	1043
L1850 SN 2009	03.6 02/09/05	1043
L1850 SN 2010	03.6 02/09/05	1043
L1850 SN 2011	03.6 02/09/05	1043
L1850 SN 2012	03.1 02/09/05	1043
L1850 SN 2013	03.1 02/09/05	1043
L1850 SN 2014	03.1 02/09/05	1043
L1850 SN 2015	03.6 02/09/05	1043
L1850 SN 2016	03.3 02/09/05	1033
L1850 SN 2017	02.4 02/09/05	1033
L1850 SN 2018	02.8 02/10/05	1033
L1850 SN 2019	02.4 02/09/05	1033
L1850 SN 2020	01.8 02/09/05	1033
L1850 SN 2021	01.8 02/09/05	1033
L1850 SN 2023	01.8 02/09/05	1033
L1850 SN 2024	01.5 02/08/05	1033

Machine/Serial No.	LINCS™ Channel	Procedure
L950		
L950 (All)	1043	#3
L1350		
L1350 (S/N #2001 to #2009)	1043	#4 or #5
L1350 (S/N #2010 and up)	1013	#2
L1850		
L1850 (S/N #2001 to #2015)	1043	#4 or #5
L1850 (S/N #2016 and up)	1033	

ELECTRICAL INSTALLATION PROCEDURE

This procedure shall be completed following the installation of the hydraulic section of the modification. Following the electrical installation, a LINCS™ configuration update will be required.

This installation shall only be completed by a qualified technician.

PROCEDURE #1:

1. Remove the blanking plug from the #3 connector of the breakout box fitted to I/O connector #3 on remote module #10 (Front Frame #1).



PHOTO #1

2. Install the P/N 425-3977 Turck to DIN cable supplied in the kit into the #3 connector on the breakout box mentioned above. Connect the DIN connector to the SOL 25 coil.

NOTE

The Turck cable supplied with this kit is for high side switching operation of a solenoid and as such is wired differently than the standard Turck to DIN cables (P/N: 4245971 and 4251862). The high side DIN connector is visibly identified by white paint on the top of the connector.

3. Neatly restrain any excess cabling using cable ties.

PROCEDURE #2:

1. Remove the blanking plug from the #3 connector of the breakout box fitted to I/O connector #1 on remote module #10 (Front Frame #1).



2. Install the P/N 425-3977 Turck to DIN cable supplied in the kit into the #3 connector on the breakout box mentioned above. Connect the DIN connector to the SOL 25 coil.

NOTE

The Turck cable supplied with this kit is for high side switching operation of a solenoid and as such is wired differently than the standard Turck to DIN cables (P/N: 4245971 and 4251862). The high side DIN connector is visibly identified by white paint on the top of the connector.

3. Neatly secure any excess cabling using cable ties.

PROCEDURE #3:

1. Remove the blanking plug from the #3 connector of the breakout box fitted to I/O connector #4 on remote module #10 (Front Frame #1).
2. Install the P/N 425-3977 Turck to DIN cable supplied in the kit into the #3 connector on the breakout box mentioned above. Connect the DIN connector to the SOL 25 coil.

PROCEDURE #4:

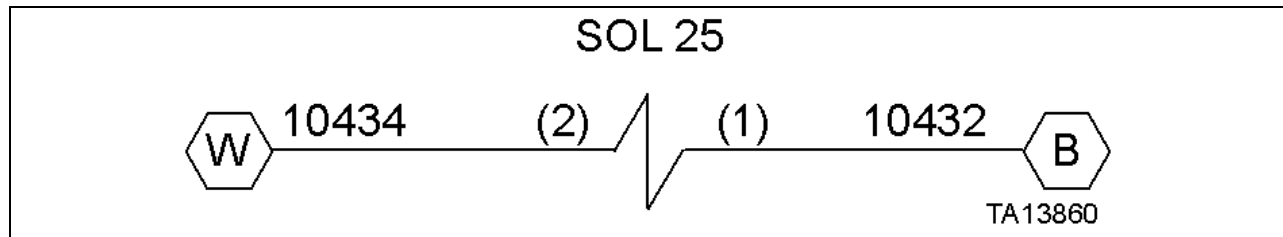
This option may be used if the spare channel cables on I/O connector #4 of remote module #10 have not been cut from the I/O harness.

1. Locate the #3 channel cable from the spare cables connected to I/O connector #4 of remote module #10 (Front Frame #1).
2. Trim the channel cable to an appropriate length. Expose approximately 2" of the inner wires by cutting away the outer grey insulation from the end of the cable.
3. Using a multimeter verify the correct selection of the #1043 channel cable by performing a continuity check between:
 - (a) Pin "W" of the harness I/O connector and the orange wire conductor.
 - (b) Pin "B" of the harness I/O connector and the black wire conductor.



PHOTO #2

4. Using heatshrink insulate the end of the red and brown wires. Fold the red and brown wires back against the outer grey insulation and retain with heatshrink or electrical tape.
5. Connect the DIN connector supplied to the orange and black wires as per the diagram below. The orange wire shall be connected to the "2" terminal of the DIN connector and the black wire shall be connected to the "1" terminal.

**PROCEDURE #5:**

This option may be used on machines where no other channels are used on the #4 I/O connector on RCM module Front Frame #1 or if the spare channels on the same connector have been cut short and terminated. The Turck wiring system is a modular system used for low voltage interconnection on new 50 series machines.

1. Mount the Turck breakout box to an existing bolt block on the right hand wall of the front frame, close to the cutoff solenoid and connect to the I/O connector #4 of RCM module - Front Frame #1.
2. Install the P/N 425-3977 Euro to DIN cable supplied in the kit into the #3 connector on the Turck breakout box mentioned above. Connect the Euro to DIN harness supplied to the SOL 25 coil. This cable can be identified with the top of the DIN plug being painted white.

NOTE

The Turck cable supplied with this kit is for high side switching operation of a solenoid and as such is wired differently than the standard Turck to DIN cables (P/N: 424-5971 and 42-1682). The high side DIN connector is visibly identified by white paint on the top of the connector.

OPERATIONAL TESTING

NOTE

Service level access (“I” button access) is necessary to perform testing.

NOTE

The solenoid installation **REQUIRES** the installation of the updated supporting LINCS™ configurations.

The function of the pilot cutoff solenoid should not normally affect the operation of the machine. The purpose of the solenoid is to protect against uncontrolled movement due to a solenoid failure in either the float or hoist/bucket pilot circuit.

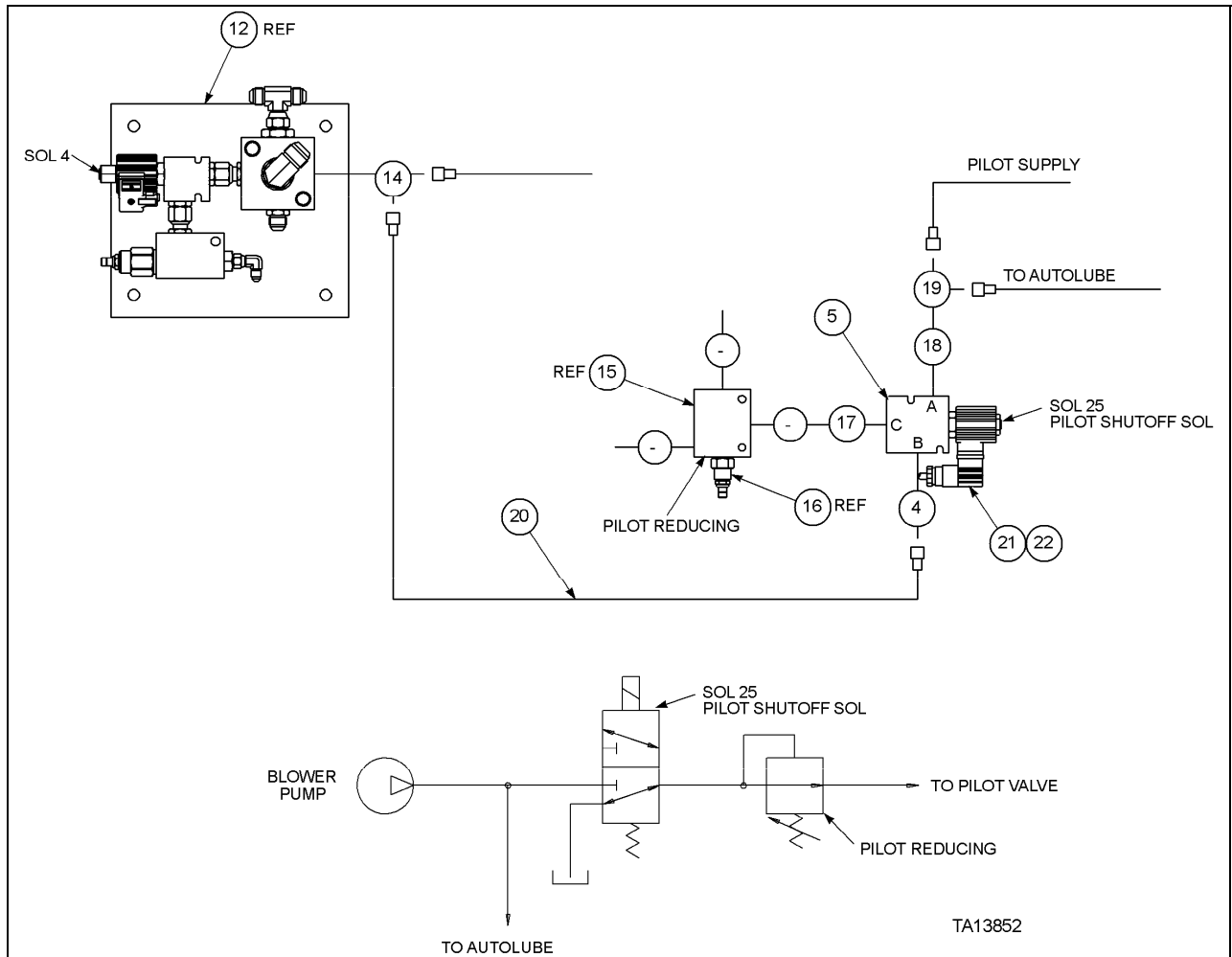
The verification of the pilot cutoff solenoid requires abnormal actions to be performed using the Force Outputs functions within the LINCS™ menu system. The technician testing the machine shall be competent in the navigation of the LINCS™ menu system and shall have a sound understanding of the inherent risks in using the Force Outputs functionality within LINCS™.

1. Place the machine on flat and level ground, in an open area well away from personnel and other equipment. Set the park brake. Do not shut down the engine.
2. Set the machine to the “Service Level” of security to allow for navigation to the Force Outputs menu selection on the LINCS™ display. This requires “I” button access.
3. Set the engine to high throttle, leaving the park brake set.
4. Check for the normal function of the following hydraulic functions. Normal operation indicates correct operation of the pilot cutoff solenoid. A failure of ALL functions indicates a possible problem with the installation of the solenoid kit, LINCS™ configuration or both:
 - Hoist Raise (joystick)
 - Power Down (joystick)
 - Bucket Rollback (joystick)
 - Bucket Dump (joystick)
 - Bucket Rollback (thumbwheel)
 - Bucket Dump (thumbwheel)
 - Hoist Detent
 - Float/Auto Level
5. Force the following outputs to 100% command, one at a time. Forcing each output should provide no movement of the hoist or bucket hydraulics. Ensure that NO movement of the right hand joystick is commanded at this time. This test ensures no movement occurs unless the pilot cutoff solenoid is energized. Release ALL forces following the completion of each test to ensure that only one channel is forced at a time:
 - Hoist Raise Valve
 - Hoist Lower Valve
 - Bucket Roll Back Valve
 - Bucket Roll Forward Valve

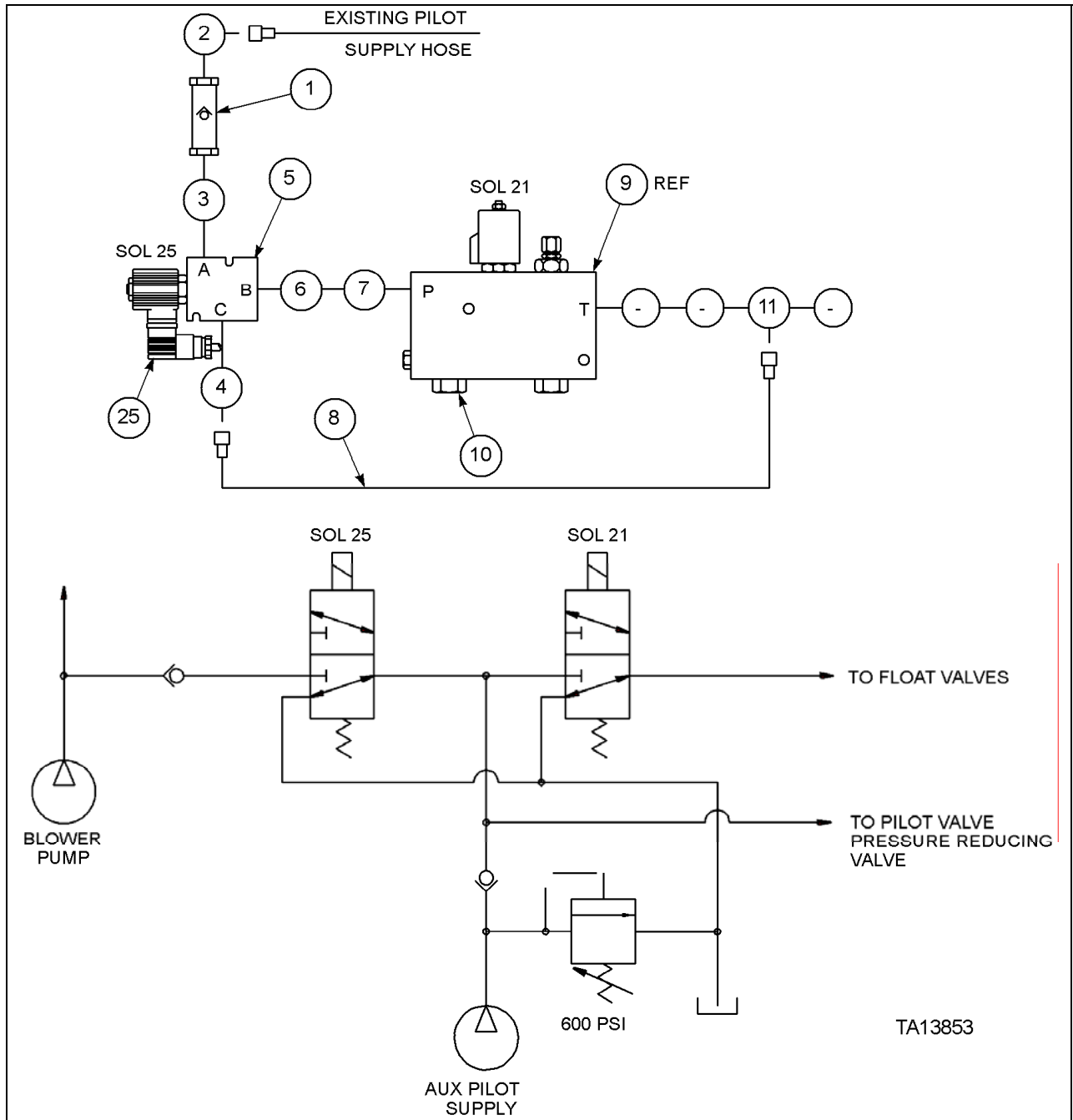
- Float Valve
6. On the completion of the tests above, return the machine to normal operation.

PILOT CUTOFF SOLENOID KIT PARTS LIST

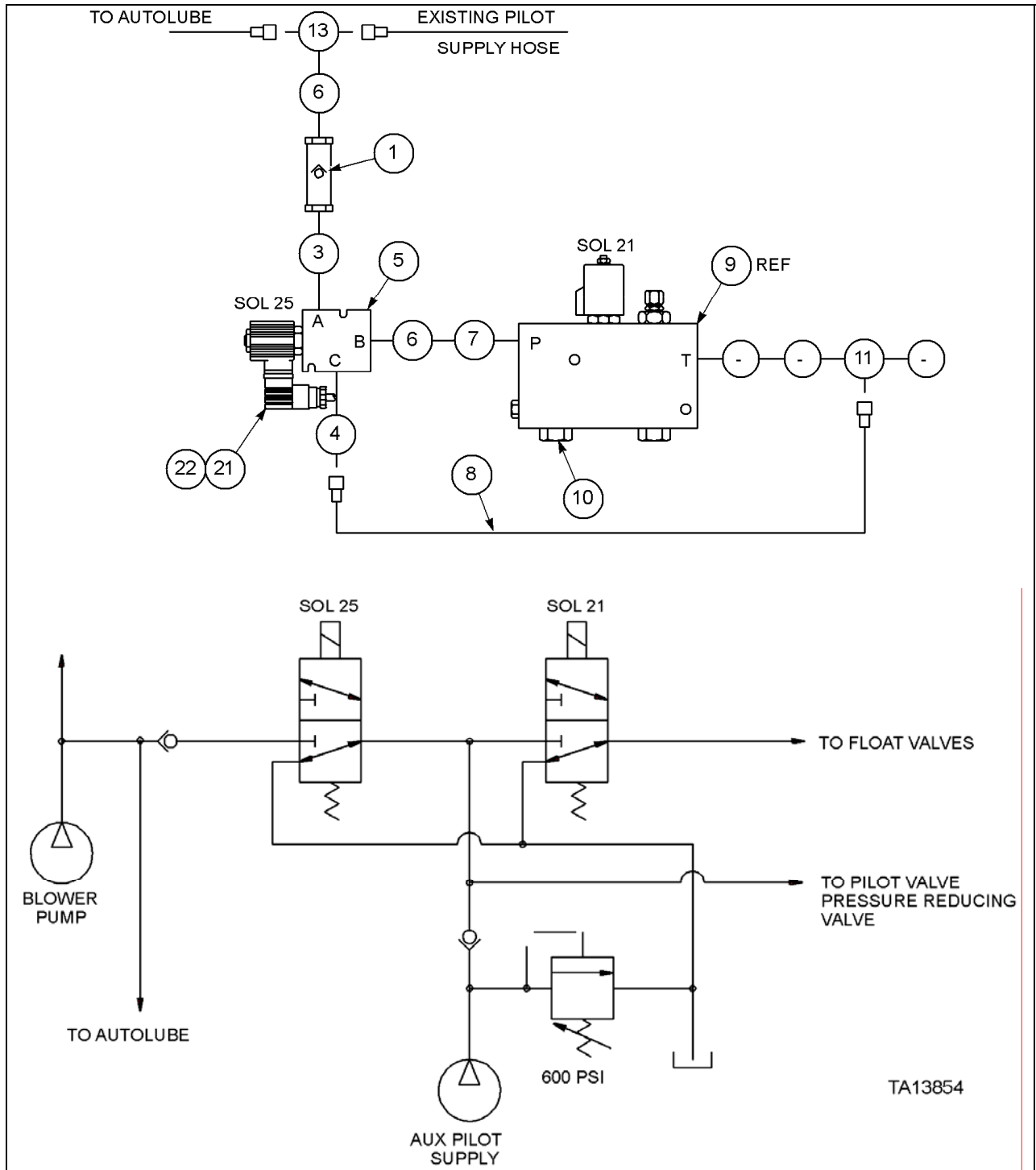
ITEM #	PART NUMBER	DESCRIPTION
1	411-6734	Check Valve ½ SAE Kepner
2	401-7400	Hydraulic Fitting 90 6 MJ 8 MO Jump
3	403-0078	Hydraulic Fitting 0 8 MJ 8 MO
4	400-2455	Hydraulic Fitting 0 8 MJ 8 MO
5	413-3473	Solenoid Cartridge Assy. 3 Way
6	410-3836	Hydraulic Fitting 0 8 MO 6 FO
7	400-2454	Hydraulic Fitting 0 6 MJ 6 MO
8	415-5738	Hose – A -8 – 28 – OJ – OJ – 2000 PSI
9	423-6994	Pilot Supply Valve Assy.
10	418-9344	Plug Sun T-5A Cavity
11	407-8968	Hydraulic Fitting TE 8 MJ 8 FJ 8 MJ
12	424-8653	Press/Return Panel Bracket. Assy. (Do not order – Existing equipment -Shown for component positioning reference only)
13	404-3019	Hydraulic Fitting TE 6 MJ 6 MJ 6 MJ
14	402-0762	Hydraulic Fitting TE 8 MJ MO 8 MJ
15	417-2012	Relief Valve Body Shuttle Valve (Do Not Order – Existing equipment -Shown for component positioning reference only)
16	424-1498	Pressure Reducing Pilot Operation Valve (Do not order – Existing equipment - Shown for component positioning reference only)
17	411-6765	Hydraulic Fitting 0 8 MO 8 FJ
18	402-0771	Hydraulic Fitting 0 6 MJ 8 MO
19	413-1486	Hydraulic Fitting TE 6 MJ 6 FJ 6 MJ
20	408-2861	Hose – A – 8 – 38 – OJ – OJ – 2000 PSI
21	425-3977	1 Meter ACTR Cable With High Side
22	425-1687	10M Extension on ACTR Cable
23	424-5972	Breakout Box Harness Assembly (not shown)
24	424-5973	SNSR/ACTR Cable w/Male Conn. 6.0M (not shown)
25	401-8727	Cable Ties 7-1/4" (50 each) (not shown)
26	424-0140	DIN Connector



PILOT CUTOFF INSTALLATION - L-950



PILOT CUTOFF INSTALLATION
L-1350 #2001-2009
L-1850



**PILOT CUTOFF INSTALLATION
L-1350 #2010 AND UP**