

SERVICE MANUAL
Model 1143 Air Compressor
(Dual Cooler - 10 GPM)

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SECTION 1

General Information

1-1. INTRODUCTION

This manual provides information on the installation, operation and repair of the IMT Model 1143-DC10 Hydraulic Air Compressor.

Three means are used throughout this manual to gain the attention of operating and service personnel. They are NOTES, CAUTIONS and WARNINGS and are defined as follows:

NOTE

A NOTE is used to either convey additional information or to provide further emphasis for a previous point.

CAUTION

A CAUTION is used when there is the strong possibility of damage to the equipment or premature equipment failure.

WARNING

A WARNING is used when there is the potential for personal injury or death.

Operate this equipment with respect and service it regularly. These two things can add up to a safer working environment and longer equipment life.

1-2. ORDERING INFORMATION

When placing orders or requesting assistance, refer to the information below:

TO BE COMPLETED BY DEALER	
CHASSIS INFORMATION	
TRANSMISSION MAKE:	MODEL:
PTO NUMBER:	PTO %:
COMPRESSOR AND HYDRAULIC PUMP INFORMATION	
COMPRESSOR MODEL:	SERIAL NUMBER:
PUMP MAKE:	MODEL:
RESERVOIR CAPACITY:	ENGINE RPM:

SECTION 2. Installation and Specifications

2-1. GENERAL

This section deals with the installation of the PTO and pump and the IMT hydraulic compressor. The instructions are intended as a guide to assist you with your particular installation. We can not cover every make, model and year of truck manufactured world-wide, so these instructions will provide only general information. Use this section as a guide only. Also listed in this section are the specifications for the air compressor.

2-2. PTO AND PUMP INSTALLATION

The pump may either be installed directly on the PTO or, as an optional method, it may be driven by a driveline.

2-2-1. PTO INSTALLATION

Power take-off manufacturers provide specific installation instructions for their products. Those instructions should be followed when installing a PTO. Some trucks may require modification of the transmission cross-member to provide clearance and the exhaust pipe may need modification. Check with the PTO manufacturer's representative for specific instructions regarding your particular make, model and year of vehicle. The following instructions are a guide in this application.

1. If the vehicle is new, drain the transmission oil into a clean container for reuse. If the vehicle is used, drain and dispose of the transmission oil.
2. Temporarily install the PTO with the proper gaskets and only two studs. Snug the PTO down and check the backlash for maximum allowance of 1/32" to 1/16". If the backlash is excessive, remove gaskets and check backlash again until it is corrected.
3. Remove the PTO and apply Permatex® to the gaskets. If the holes for the studs are tapped through the transmission housing, apply Permatex to the studs and tighten them down. Make certain that the studs do not interfere with the transmission gears.

CAUTION

Avoid contact of Permatex with automatic transmission fluid.

4. Install the PTO and gaskets. Torque the nuts to 30 - 35 ft-lbs (4.14 - 4.84 kg-m) for a 6-bolt PTO and 45 - 50 ft-lbs (6.22 - 6.91 kg-m) for 8-bolt PTO's. Recheck the backlash.
5. Install the shifter cable to suit conditions. Always allow for a slight overshift on lever or knob to ensure the PTO is fully disengaged.

CAUTION

It is important that adequate space be allowed for full engagement of the PTO. Modify the exhaust or other obstructions as needed.

CAUTION

Avoid sharp bends in the shifter cable. All bends should have at least a 6" radius. Tighter bends will cause difficult operation of the shifter knob.

6. Replace the transmission oil. If the PTO is located below the transmission oil level, an additional quantity of oil will be required.
7. Start the engine, engage the PTO and allow it to run for 5 - 10 minutes. Check for leaks, unusual noise and proper operation.
8. Retorque the mounting bolts.

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2-2-2. DRIVELINE AND PUMP INSTALLATION

The pump may be driven as shown in Figure B-2 as an optional method to the one shown in Figure B-1. The following steps are a guide in this application.

1. Install the PTO (refer to Paragraph 2-2-1).
2. Loosely bolt the pump mounting bracket (A) to the adjustable bracket (B).
3. Bolt the adjustable bracket to the frame at a point that will not exceed 48" (122 cm) from the PTO and will not cause a joint angle greater than 3 degrees.
4. Check pump rotation and install pump, pump end yoke and PTO end yoke.
5. Size, cut and weld the driveline to the necessary length. Ensure driveline balance. Allow 1" (2.54 cm) extra for PTO end yoke.
6. Install driveline, lock set screws and lubricate U-joints.
7. Ensure all mounting bolts are tight.

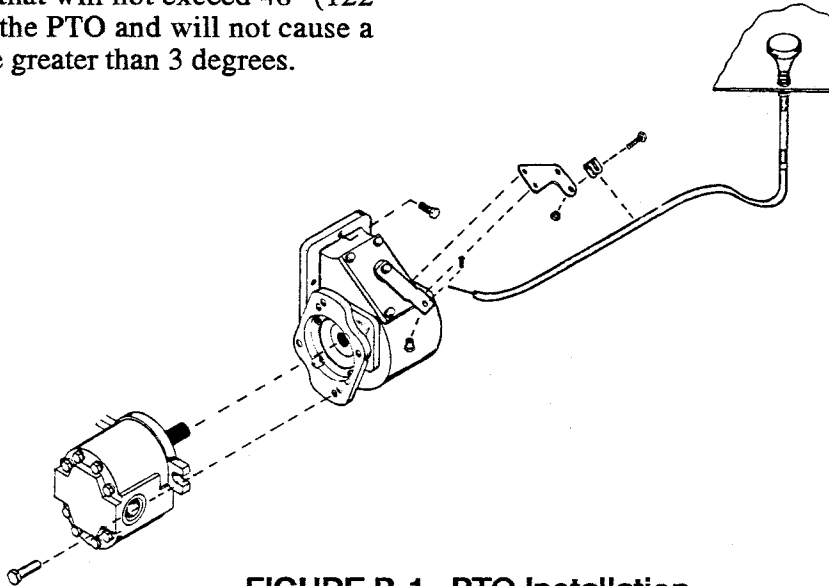


FIGURE B-1. PTO Installation

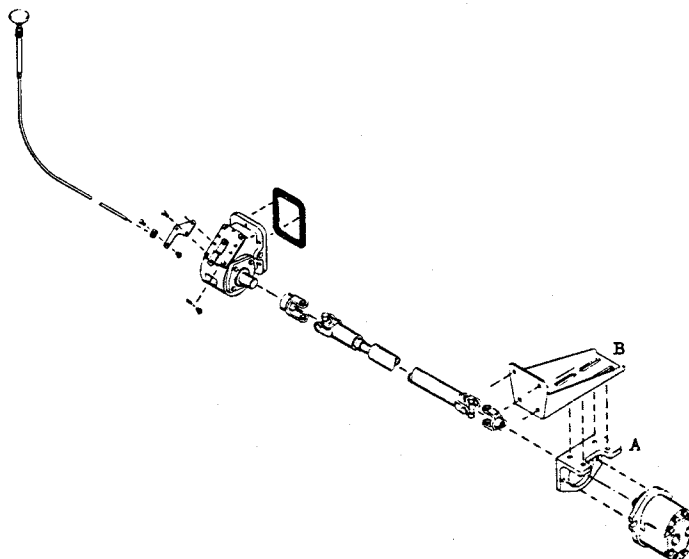


FIGURE B-2. Driveline and Pump Installation

2-3. COMPRESSOR INSTALLATION

1. Prepare the mounting location of the compressor by locating and drilling four (4) holes, 7/16" diameter, as shown in Figure B-3.
2. Position the rubber bumpers on these holes and lift the compressor into place.
3. Using the four (4) 3/8-16 X 2-1/2" cap screws and 3/8" wrought washers, secure the compressor in place by inserting the cap screws from below the mounting surface as shown in Figure E-1.
4. Electrical Connections
 - A. Connect the black wire to the vehicle frame or other suitable ground.
 - B. Mount the single throw toggle switch in a convenient location. Connect the red wire from the compressor to the switch. Connect the other terminal of the switch to the fuse holder and then to a 12 volt power supply as shown in Figure E-1.
 - C. The blue wire is to be connected to the speed control.

CAUTION

Damage may occur if the compressor is not connected to a speed control.

2-4. ELECTRIC SPEED CONTROL

An optional electric speed control (IMT part number 93091419) should be used. This unit is provided with mounting instructions. On units equipped with an electric speed control, the engine speed will automatically increase when the clutch is engaged, and decrease when the clutch is disengaged. See Figure B-3.

2-5. SPECIFICATIONS

The IMT Model 1143 air compressor is a single-stage, four-cylinder, hydraulically driven unit with a delivery rate of 25 CFM at 100 PSI. The compressor is designed for above-deck or below-deck mounting.

The magnetic clutch is engaged and disengaged by use of an air pressure sensing, electric switch. The pressure switch is preset on factory installed units at approximately 120 PSI to engage, and 150 PSI to disengage.

SPECIFICATIONS	
POWER SOURCE	HYDRAULIC MOTOR (10 GPM @ 2000PSI)
BORE	2-5/8"
STROKE	2"
DIMENSIONS	26"L X 18"H X 18"W
WEIGHT	200 LBS
DISPLACEMENT	37.5 CFM
DELIVERY	25 CFM @ 100 PSI
FAN DIAMETER	14"
RESERVOIR REQUIREMENT	12 GAL. MINIMUM

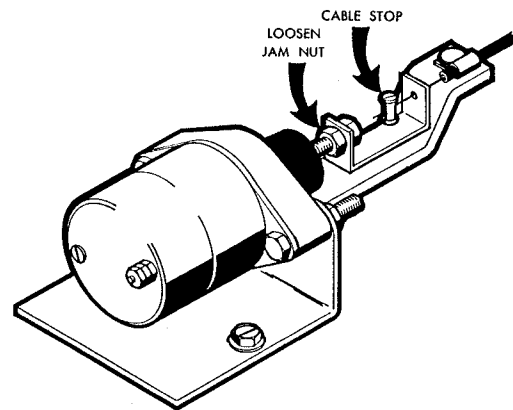


Figure B-3. Electric Speed Control

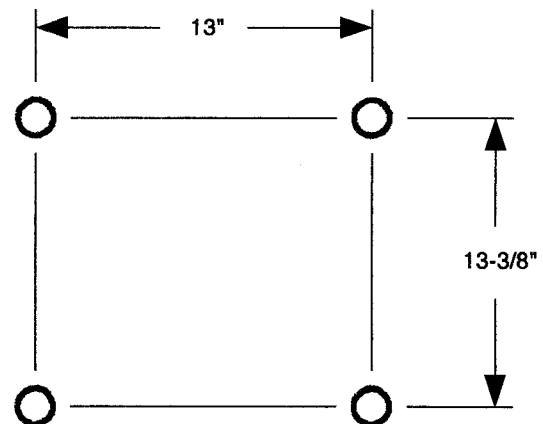


Figure B-4. Mounting Hole Dimensions

Section 3. Preventive Maintenance

3-1. GENERAL

The following table is a list of routine maintenance items, including service intervals. See Section 5 for parts identification and reference.

ROUTINE MAINTENANCE CHECK LIST

Maintenance Operation	Service Intervals		
	Weekly	500/3	1000/6
Air intake - inspect and clean			
Crankcase oil level - check, add if needed			
Crankcase oil quality - check, change if necessary	SEE NOTE 1.		
Compressor valves - inspect and clean			
Cooling vanes (fins) - clean			
Safety valves - check operation			
Safety valves - clean			
Electric clutch - check operation			
Air receiver - drain condensation			
Receiver safety valves - check operation			
Tighten and check all valves			
Check all electrical connections			
Check fittings and air lines for leaks			
Inspect check valves for proper operation			
Inspect check valves for carbon buildup			
<p>Service intervals are listed as hours/months, whichever occurs first.</p> <p>Use only IMT's synthetic compressor oil. The use of any other oil causes excessive carbon buildup, and will void the warranty on the compressor.</p> <p>NOTE 1. Under normal operating conditions, oil changes are required every 12 months. It is advisable to check the oil quality at least every 6 months, especially when operating in a dirty environment. Change the oil more frequently as your particular operating conditions dictate.</p>			

Section 4. REPAIR

4-1. GENERAL

This section describes the disassembly and assembly procedures for the air compressor.

In all cases, remove the compressor from the vehicle and perform disassembly and repair within a clean environment. Refer to Figure E-3 for parts locations.

4-2. PISTON RING REPLACEMENT

1. Remove the pulsation tank.
2. Unscrew the head bolts and remove the heads.

NOTE

A rubber faced mallet will help when removing the head. Tap the sides of the head carefully until the head is loose. Lift off the heads.

3. Remove the cylinder bolts. Tap the sides of the cylinder several times to break it loose from the gasket. Rock the cylinder back and forth and lift until it is free. Lift it off the pistons.
4. Use a single edged razor blade, or sharp putty knife, to remove the old gasket material.

CAUTION

Do not allow the gasket material to fall into the crankcase. Do not nick the head, cylinder, or crankcase mating faces while removing the old gasket. Remove all of the old gasket material to provide a smooth, clean surface for the new gasket. Failure to follow this procedure may result in the need to reseal the unit later.

5. Hone the cylinder to break the glaze and to remove the buildup at the top of the cylinders.
6. Measure the inside diameter of the cylinder for roundness and excessive wear. The bore should be 2.625" (0.0025" tolerance). If the bore is oversized, the cylinder must be replaced.
7. With a ring expander, remove the compression and oil rings.

8. With the ring expander, install the new ring kit. Make certain that the oil ring is on the bottom and the beveled inside edge of the compression ring is toward the top of the piston.
9. Position the cylinder base gasket on the crankcase. Use a few drops of oil to hold it in position. Install the cylinder block spacer and gasket on the crankcase.
10. Rotate the rings so that the gaps of the three rings are 120 degrees apart. Lightly lubricate the inside of the cylinder. Rotate the crankshaft so that a piston is at the top of the stroke. Compress the rings with a ring compressor, and slide the cylinder over the piston. Repeat for the other piston.

CAUTION

Do not lubricate the rings. Use a light lubricant, such as WD-40 only, on the cylinder walls. Oiling the rings will prevent them from seating and cause excessive oil consumption.

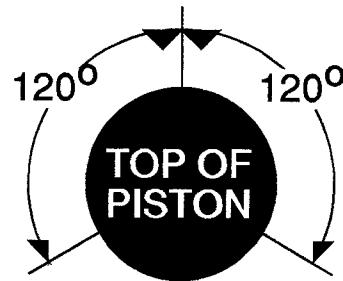


Figure D-1. Piston Ring Gap Orientation

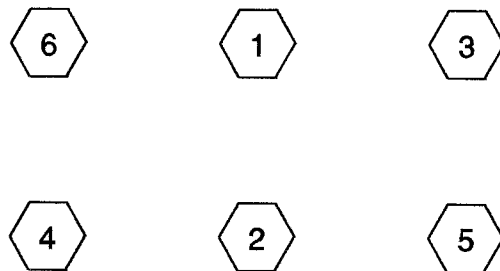


Figure D-2. Head Bolt Torque Sequence

11. Slide the cylinder down until it mates with the crankcase. Start all cylinder mounting bolts, until they are snug. Torque the bolts to 180 inch pounds in the sequence shown. Do not torque to the full 180 inch pounds all at once. Torque in 25 - 50 pound increments.
12. Position the gaskets and valve plate on top of the cylinder. Position the head on the cylinder and turn all of the bolts finger tight. Torque in the same manner described in step 11 (See Fig. D-2).

NOTE

Install the valve plate with the marked surface facing up.

13. Install the pulsation tank, and torque to 180 inch pounds.
14. Install the compressor, connect the wiring and the air lines. Test the unit.

NOTE

If pressure fails to build and the compressor is excessively noisy, check the valve plate. It may have been installed upside down.

4-3. OIL PUMP REPLACEMENT

1. Remove the bolts and lift off the pump cover.
2. With a single edged razor blade, or sharp putty knife, remove the old gasket material. Take care not to damage the machined surfaces.
3. Lift the pump out of the cavity.
4. Position a new gasket on the rear bearing housing.
5. Insert the pump into the cavity. Position the pump slightly to one side, using a common screwdriver. Wedge the pump into position so that it partially compresses the spring.
6. Place the pump cover into position and start two bolts (bolts must be diagonally opposed). Strike the pump cover with a rubber faced mallet to jar the pump loose. When the tension spring can be felt against the pump cover, the pump is loose.
7. Insert the two remaining bolts and torque to 180 inch pounds. The bolts should be torqued in a diagonal pattern.

4-4. CRANKSHAFT AND BEARING REPLACEMENT

If it is necessary to replace the crankshaft, related components must also be replaced. Replace both bearings, both races, the key, pump collar and pump drive pin.

NOTE

Depending on the condition of the crankshaft, bearing may be replaced without replacing the crankshaft. Replace the bearing races whenever the bearings are replaced.

1. Remove the pulsation tank, both heads, cylinders, and pistons.
2. Remove the bolts on the connecting rods, and lift them out. Reassemble the connecting rods to be certain that the matched parts remain together.
3. Remove the pump cover, oil pump, sleeve, spring, and rear bearing housing.
4. Remove the clutch and pulley assembly, and the front bearing housing.
5. Pull the crankshaft from the crankcase.
6. Remove all gasket material with a single edged razor blade, or sharp putty knife.

CAUTION

Do not gouge the machined surfaces when removing the gaskets. This may cause leaks.

7. Press the bearing races out of the bearing housing.
8. Press the tapered roller bearings off of the crankshaft if only the bearings are being replaced. If the crankshaft is to be replaced, discard the entire assembly.
9. Press the new bearings into position.

NOTE

The crankshaft should have new bearings installed. If not, press the new bearings into position on the crankshaft.

10. Generously oil the front bearing race and install the front bearing housing with gasket. Torque the bolts to 180 inch pounds. Torque the bolts as shown in Figure D-3.

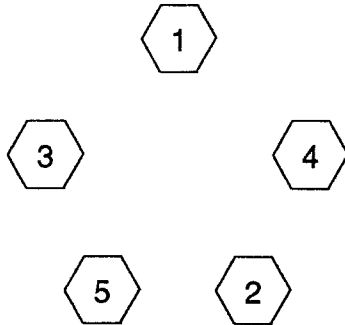


Figure D-3. Housing Torque Sequence

11. Slide the crankshaft into the crankcase. Generously lubricate the bearing race and install the rear bearing housing and gaskets.

NOTE

Gasket kits are supplied with two (2) each of .006, .010, .015, and .020 gaskets. Use these rear bearing gaskets in any combination and quantity to limit all play front to rear, but still allow the crankshaft to turn freely.

12. Install the oil pump.
 13. Install the connecting rods. Thoroughly oil the crankshaft and rods before installing them. When installing the rods, make certain that the tabs are aligned on the same side of the rod as shown below.
 14. Install the pistons, rings, heads and pulsation tank.

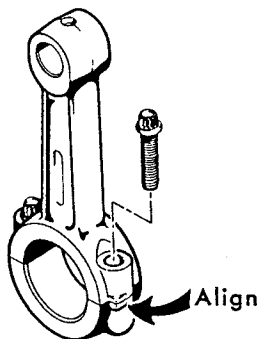


Figure D-4. Rod Alignment Tabs

4-5. CLUTCH REPLACEMENT

CAUTION

Clutch failure may be due to a leaking check valve. Make certain that the check valves are functioning properly before installing the new clutch. The check valves may be checked by pressurizing the tank and shutting off the compressor. There should be no air escaping from the unloader valve. If there is air escaping, the check valves are faulty.

The clutch assembly can be removed while the compressor is still on the vehicle. The following procedure should be used.

WARNING

Attempting to start the engine while the clutch is being removed will cause serious injury.

1. Turn on the ignition switch, and move the compressor switch to the on position. This will engage the clutch, and make for easier removal.
2. Remove the bolt in the center of the pulley and insert a 5/8-11 bolt.
3. Tighten the 5/8-11 bolt until the pulley is forced off the crankshaft.
4. Loosen the drive belt and remove the pulley.

NOTE

If the drive belt is loosened before the pulley is loose, it will be difficult to hold the pulley stationary while tightening the 5/8-11 bolt.

CAUTION

Do not use a wheel puller on the outer rim of the pulley. This can result in damage to the clutch bearing.

5. Remove the four (4) bolts holding the coil assembly to the front of the compressor.

To reinstall the clutch:

1. Position the magnetic coil assembly over the front bearing housing and secure the assembly with the 1/4-20 bolts. Torque to 85 - 120 inch pounds.
2. Insert the woodruff key into the crankshaft slot.
3. Slide the pulley, spacer, and lock washer onto the end of crankshaft. Be certain that the pulley slot aligns with the woodruff key. Secure them with the 5/16-18 bolts.
4. Rotate the pulley assembly manually to check for interference between the pulley and the coil. If there is interference, disassemble the clutch and repeat the procedure.
5. Install and tighten the drive belts.
6. Connect the coil wire to the air pressure switch.
7. Move the compressor switch in the cab to the on position to activate the clutch. Tighten the center bolt in the pulley.
8. Test the unit for proper operation.

NOTE

If there is excessive clearance between the coil and the pulley, the clutch will not engage. Use three 1/4" flat washer as shims between the coil and the front bearing housing. Retest the unit. If the clutch operates properly, order four spacers to replace the washer shims.

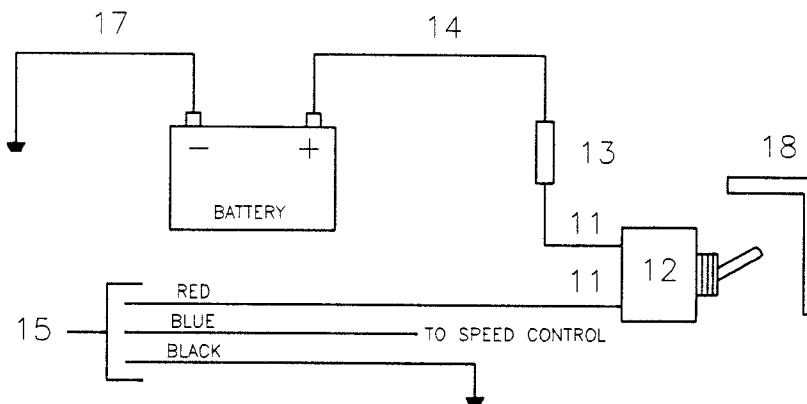
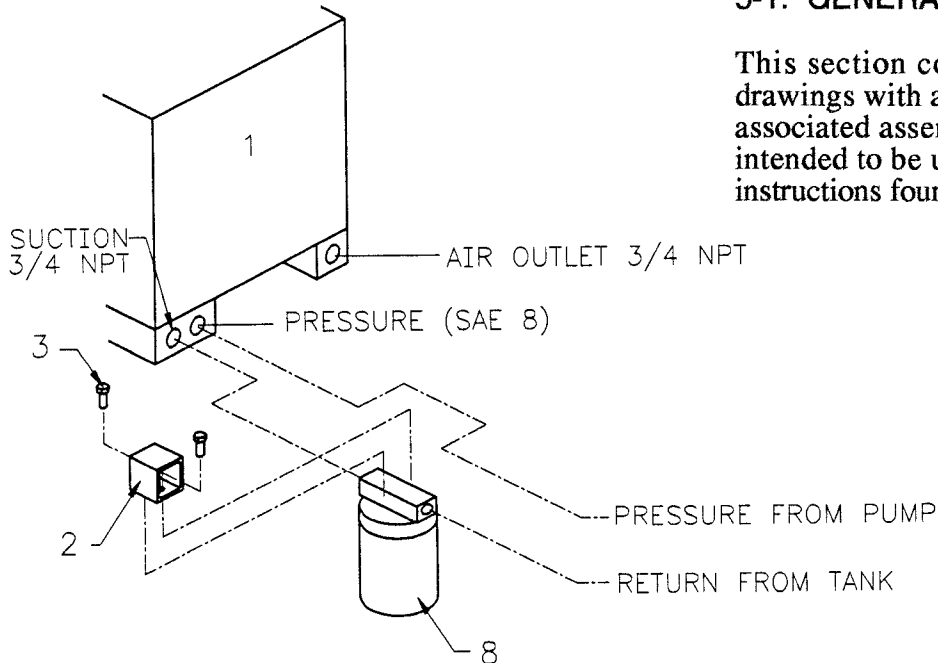
4-6. TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE
Low oil pressure	Low oil level
	Loose pipe plug on oil pump cover
	Worn or defective oil pump
	Crack or scratch on oil pump cover
No oil pressure	Defective oil pump
	Blocked oil passage
	Damaged oil pump drive pin
Compressor will not engage	Blown fuse
	Defective clutch
	Defective pressure switch or underhood switch
Compressor engages but will not pressurize air tank	Air leak in plumbing
	Worn piston rings or valve plates
	Defective check valve
Compressor does not recover pressure as fast as it should	Defective check valve
	Dirty filters
	Air leak in plumbing
	Worn valve plates or piston rings

Section 5. PARTS

5-1. GENERAL

This section contains the exploded parts drawings with accompanying parts lists for associated assemblies. These drawings are intended to be used in conjunction with the instructions found elsewhere in this manual.



ITEM	PART NO.	DESCRIPTION	QTY
1.	51709571	COMPRESSOR - MODEL 1143 DC10 (SEE DRAWING)	1
2.	60110673	FILTER BRACKET	2
3.	72060023	CAP SCR 5/16-18X3/4 HH GR5	4
4.	51709743	FILTER 100-MESH	1
5.	72060052	CAP SCR 3/8-16 X 2-1/2 HH GR5	4
6.	99900380	MANUAL	1
7.	72063003	WASHER 3/8 WRT	4
8.	73052000	FILTER 10-MICRON	1
9.	76391527	RUBBER BUMPER	4
10.	77040048	BUTT CONNECTOR 16-14GA	2
11.	77040000	TERMINAL SPD #10 16-14GA	2
12.	77041004	TOGGLE SWITCH ST	1
13.	77041056	IN-LINE FUSE 20AMP	1
14.	89044233	CABLE 14GA BRN	24"
15.	89044371	CABLE 14GA 3WIRE	25"
16.	77040052	TERMINAL RING 3/8 12-10GA	1
17.	89044274	WIRE 14GA BLK	24"
18.	60103535	SWITCH BRACKET	1

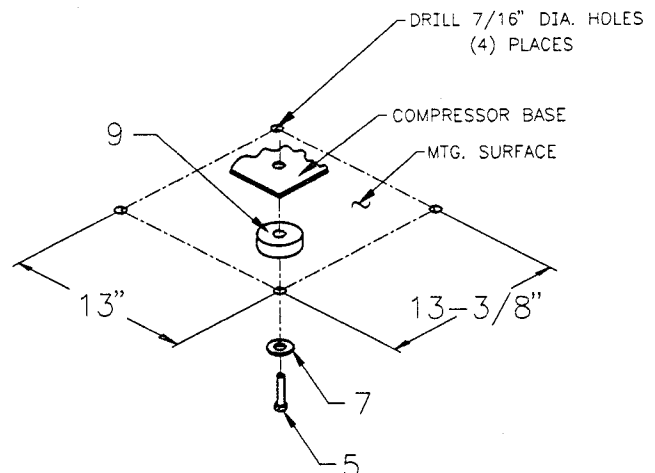


Figure E-1. COMPRESSOR - MODEL 1143 DC10 COMPLETE (23114310)

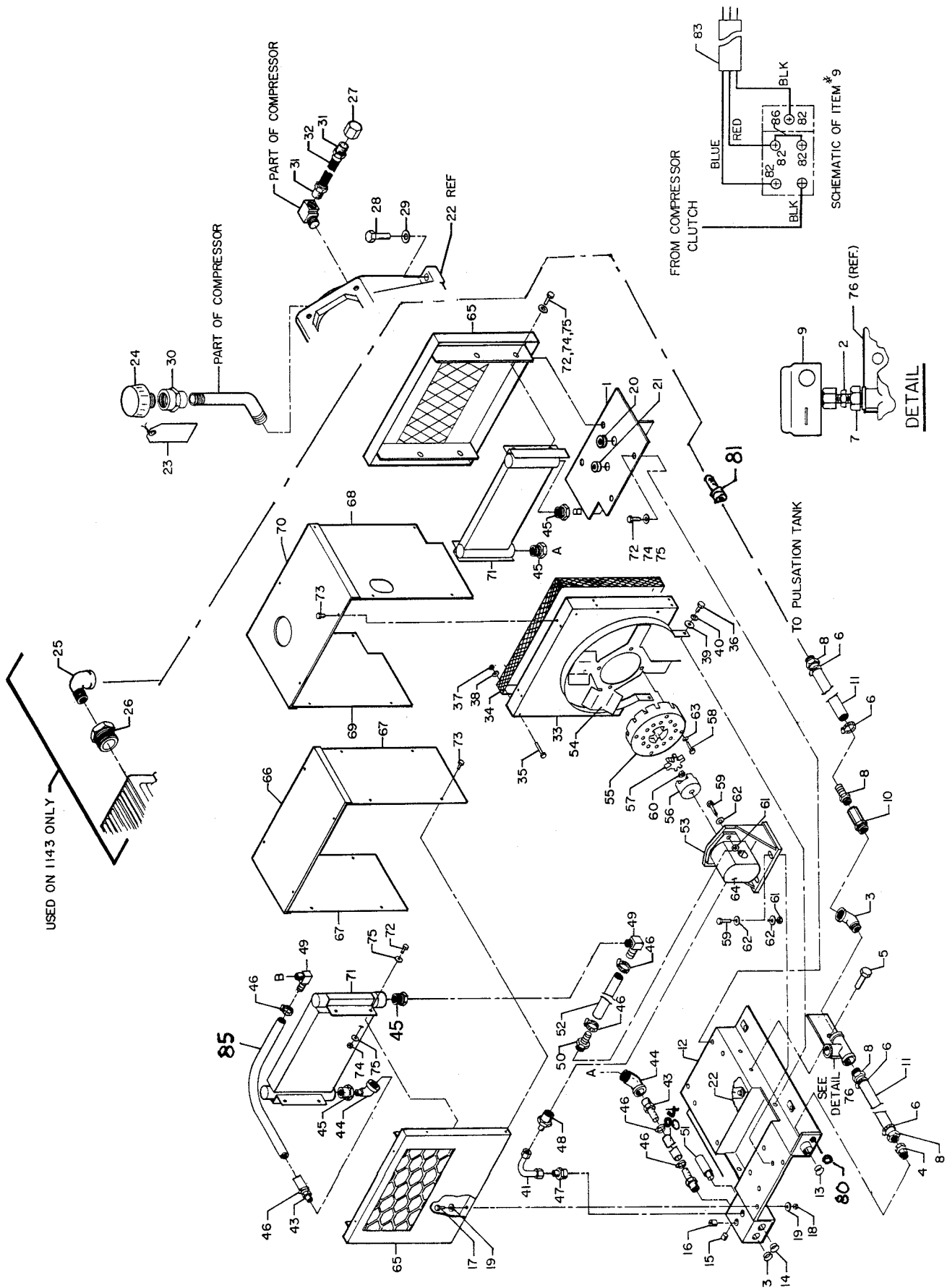


Figure E-2. 1143 DC10 Compressor Assembly (Part Number 51709571)

**1143 - DC10 COMPRESSOR ASSEMBLY
PART NUMBER 51709571**

ITEM NO.	PART NO.	DESCRIPTION	QTY	ITEM NO.	PART NO.	DESCRIPTION	QTY
1.	52709542	REAR COOLER MTG PLATE	1	41.	70143157	TUBE ASM	1
2.	72053517	ADAPTER 1/4MPT X 1/4MPT	1	43.	72053458	BARB NIPPLE 3/4NPT X 3/4	3
3.	72053535	STREET ELBOW 3/4 X 45 ⁰	1	44.	72053535	STREET ELBOW 3/4 X 45 ⁰	2
4.	72053645	ADAPTER 3/4MPT X 3/4FPT SWVL	1	45.	72053559	REDUCER BUSHING 1" X 3/4	4
5.	72060046	CAP SCREW 3/8-16 X 1 HH GR5	1	46.	72066000	HOSE CLAMP 1/2 X 1-1/4 SAE#12	6
6.	72066000	HOSE CLAMP 1/2 - 1-1/4 SAE#12	4	47.	72532358	ADAPTER 3/4MSTR X 3/4MJIC	1
7.	72531831	REDUCER BUSHING 3/4 X 1/4	1	48.	72532360	ADAPTER 1-1/16MSTR X 3/4MJIC	1
8.	72532832	HOSE FITTING 3/4 X 3/4	4	49.	72533116	ELBOW 3/4MPT X 3/4 BARB	2
9.	77041369	PRESSURE SWITCH	1	50.	72533117	BARB NIPPLE	1
10.	77041392	LOAD GENIE	1	51.	73054583	RELIEF VALVE	1
11.	89392349	HOSE 3/4 300PSI X 7"	1	52.	60350006	HOSE 3/4 100R4 X 4-1/2"	1
12.	52707036	BASE	1	53.	52706924	MOTOR MOUNT	1
13.	70034293	PLASTIC PLUG 3/4NPT	2	54.	60015015	FAN	1
14.	70034294	PLASTIC PLUG 3/4STR	1	55.	60025506	CLUTCH ADAPTER	1
15.	72053241	PIPE PLUG 1/4 HOL HEX	1	56.	60110379	MOTOR ADAPTER	1
16.	72053243	PIPE PLUG 1/2 HOL HEX	1	57.	70143145	SPIDER	1
17.	72060025	CAP SCREW 5/16-18 X 1 HH GR5	2	58.	72060030	CAP SCREW 5/16-18 X 2-1/4 HH GR5	4
18.	72062109	NUT 5/16-18 LOCK	2	59.	72060048	CAP SCREW 3/8-16 X 1-1/2 HH GR5	6
19.	72063002	WASHER 5/16 WRT	4	60.	72062038	NUT 7/16-20 HEX	1
20.	76391173	RUBBER GROMMET	1	61.	72062103	NUT 3/8-16 LOCK	6
21.	76393038	GROMMET 7/16	1	62.	72063003	WASHER 3/8 WRT	10
22.	51707079	COMPRESSOR (SEE DRAWING)	1	63.	72063050	WASHER 5/16 LOCK	4
23.	70039124	TAG - SYNTHETIC OIL	1	64.	73051505	MOTOR 10GPM	1
24.	70143495	BREATHING CAP	1	65.	52707034	FRONT ENCLOSURE PANEL	2
25.	72053295	STREET ELBOW 3/4 X 90 ⁰	1	66.	60110354	HALF ENCLOSURE PANEL - TOP	1
26.	72053559	REDUCER BUSHING 1" X 3/4	1	67.	60110356	HALF ENCLOSURE PANEL - RH	2
27.	72053819	PIPE CAP 3/8	1	68.	60113798	SIDE PANEL - LH	1
28.	72060048	CAP SCREW 3/8-16 X 1-1/2 HH GR5	4	69.	60113799	SIDE PANEL - RH	1
29.	72063051	WASHER 3/8 LOCK	4	70.	60113800	TOP PANEL	1
30.	72531856	REDUCER COUPLING 3/4 X 1/2	1	71.	70143144	OIL COOLER	2
31.	72532555	HOSE FITTING 3/8 X 3/8 TYPE O	2	72.	72060025	CAP SCREW 5/16-18 X 1 HH GR5	12
32.	89392426	HOSE 3/8 200PSI X 10"	1	73.	72061096	SELF TAPPING SCREW #12-12 X 1/2	24
33.	52707035	FAN SHROUD	1	74.	72062109	NUT 5/16-18 LOCK	12
34.	60110392	FAN GUARD	1	75.	72063002	WASHER 5/16 WRT	24
35.	72060009	CAP SCREW 1/4-20 X 2-1/4 HH GR5	4	76.	52709541	MOUNTING BRACKET - PR SW	1
36.	72060044	CAP SCREW 3/8-16 X 3/4 HH GR5	2	77.	51086090	SYNTHETIC COMPRESSOR OIL-1 QT	2
37.	72062104	NUT 1/4-20 LOCK	4	78.	7002911	PLACARD-IDENT (NOT SHWN)	1
38.	72063001	WASHER 1/4 WRT	4	79.	72066340	POP RIVET 1/8 (NOT SHOWN)	2
39.	72063003	WASHER 3/8 WRT	2	80.	76392227	GROMMET - RUBBER	1
40.	72063051	WASHER 3/8 LOCK	2	81.	72053645	ADAPTER MPT/FPT SWVL 3/4	1
				82.	77040050	TERMINAL - SPADE #10STUD	6
				83.	89044371	CABLE 14GA/3WIRE	2'
				84.	60350007	HOSE 3/4 100R4 X 17-1/2"	1
				85.	60350008	HOSE 3/4 100R4 X 31"	1
				86.	89044232	WIRE 14GA RED	3"

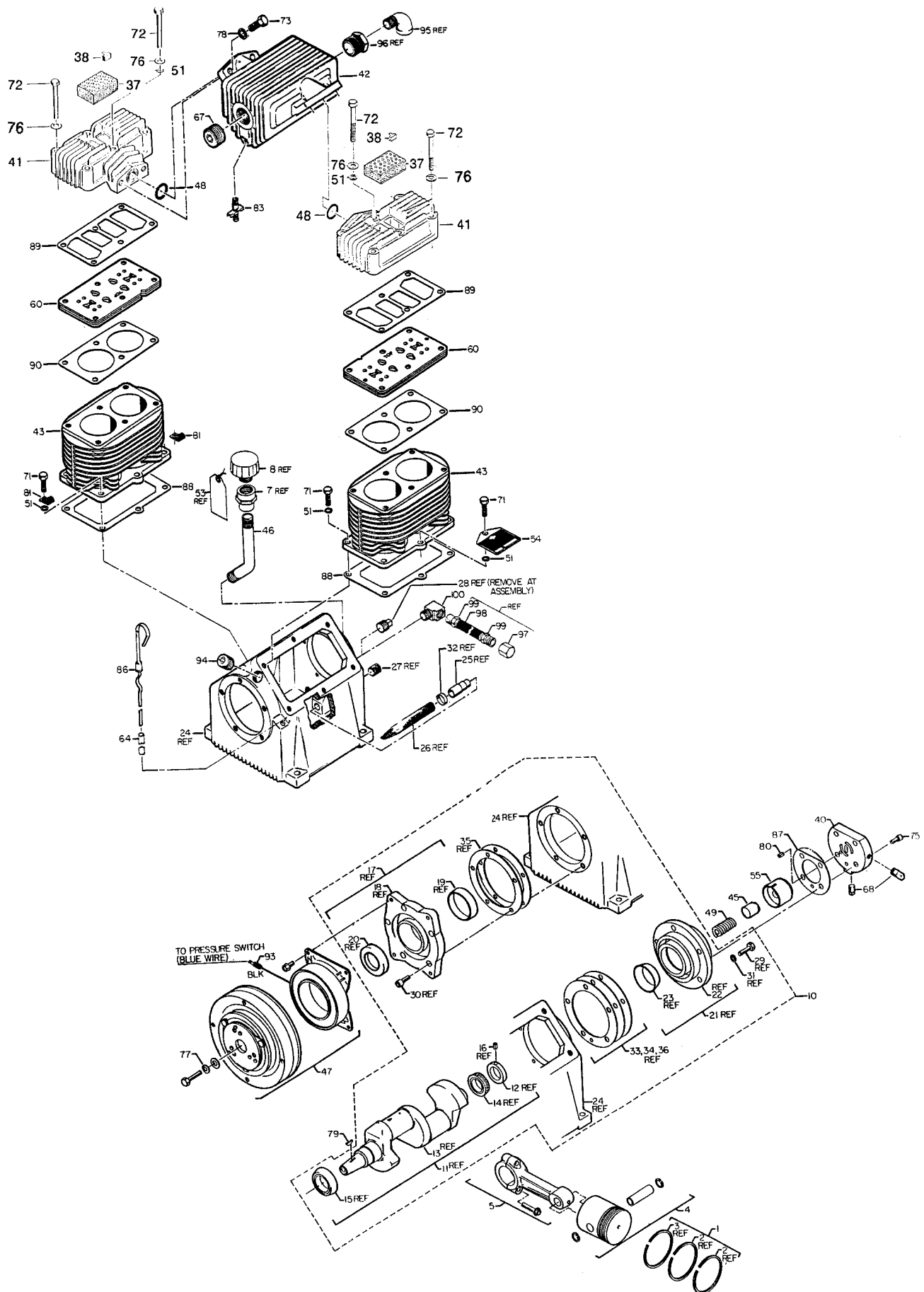
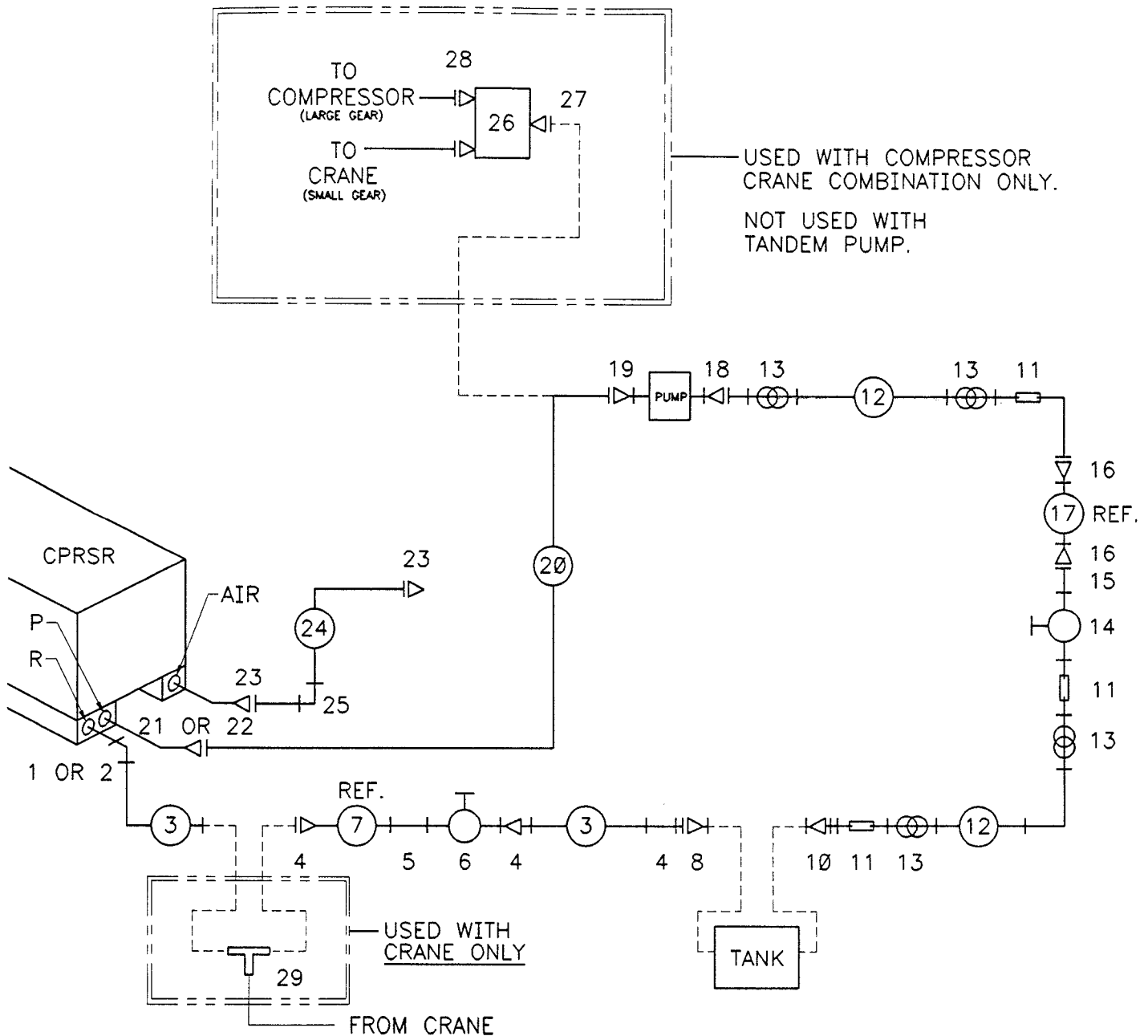


Figure E-3. 1143 COMPRESSOR UNIT (51707079)

**1143 COMPRESSOR
PART NUMBER 51707079**

ITEM PART NO.	DESCRIPTION	QTY	ITEM PART NO.	DESCRIPTION	QTY
1. 51014947	RING SET (3) (INCL: 2 & 3)	1	41. 60025008	HEAD	2
2. 70014599	COMPRESSION RING (PART OF 1)	8 REF	42. 60025009	PULSATION TANK	1
3. 70014600	OIL RING (PART OF 1)	4 REF	43. 60025010	CYLINDER BLOCK	2
4. 51029285	PISTON ASM	4	45. 60101505	PLUNGER TRANSFER BUSHING	1
5. 51029196	CONNECTING ROD ASM	4	46. 60101507	OIL FILL BREATHER PIPE	1
7. 72531856	REDUCER COUPLING 3/4X1/2	1 REF	47. 51712861	CLUTCH	1
8. 70143495	BREATHER 1/4NPT	1 REF	48. 7Q072212	O-RING	2
10. 51705811	CRANKCASE /CRANKSHAFT ASM	1	49. 70014583	OIL PUMP SPRING	1
11. 51704321	CRANKSHAFT (INCL:12-16,PART OF 10)	1 REF	51. 70024122	WASHER .33X.50X.03	14
12. 60101269	OIL PUMP COLLAR (PART OF 11)	1 REF	53. 70039124	TAG - SYNTHETIC OIL	1 REF
13. 60101271	CRANKSHAFT (PART OF 11)	1 REF	54. 70039300	DECAL - COMPRESSOR PATENT	1
14. 70055009	CONE BEARING (PART OF 11)	1 REF	55. 70051006	OIL PUMP	1
15. 70055012	CONE BEARING (PART OF 11)	1 REF	60. 70073031	REED VALVE ASM	2
16. 72066307	ROLL PIN .16X.44 (PART OF 11)	1 REF	64. 70143153	DIPSTICK TUBE	1
17. 51705709	FRT BRG HSG ASM		67. 72053406	PIPE PLUG 1"NPT SH	1
	(INCL:18-20,PART OF 10)	1 REF	68. 72053411	PIPE PLUG 1/8NPT SQHD	2
18. 60025007	FRT BRG HSG (PART OF 17)	1 REF	71. 72060025	CAP SCR 5/16-18X1 HH GR5	12
19. 70055011	BEARING-CUP (PART OF 17)	1 REF	72. 72060032	CAP SCR 5/16-18X2-3/4 HH GR5	12
20. 76039119	SEAL (PART OF 17)	1 REF	73. 72060062	CAP SCR 7/16-14X1 HH GR5	4
21. 51705710	REAR BRG HSG ASM		75. 72060731	CAP SCR 5/16-18X3/4 SH	4
	(INCL:22 & 23) (PART OF 10)	1 REF	76. 72063001	WASHER 1/4 WRT	12
22. 60025005	REAR BEARING HOUSING (PART OF 21)	1 REF	77. 72063050	WASHER 5/16 LOCK	1
23. 70055010	BEARING - CUP (PART OF 21)	1 REF	78. 72063052	WASHER 7/16 LOCK	4
24. 60025012	CRANKCASE (INCL:25-36) (PART OF 10)	1 REF	79. 72066267	WOODRUFF KEY .16X5/8	1
25. 60101270	OIL SCREEN TUBE (PART OF 10)	1 REF	80. 72066307	ROLL PIN .16X7/16	1
26. 70014610	OIL SCREEN (PART OF 10)	1 REF	81. 72066537	J-CLIP	2
27. 72053403	PIPE PLUG 3/8NPT SH (PART OF 10)	1 REF	83. 73054026	DRAIN COCK VALVE 1/8	1
28. 72053413	PIPE PLUG 3/8NPT SQHD(PART OF 10)		86. 73731843	DIPSTICK ASM	1
	SEE NOTE 1	1 REF	87. 76039093	PUMP COVER GASKET	1
29. 72060025	CAP SCR 5/16-18X1 HH GR5		88. 76039111	CYL BLOCK BOTTOM GASKET	2
	(PART OF 10)	5 REF	89. 76039113	VALVE COVER GASKET	2
30. 72060731	CAP SCR 5/16-18X3/4 SH (PART OF 10)	5 REF	90. 76039114	CYL BLOCK TOP GASKET	2
31. 72063050	WASHER 5/16 LOCK (PART OF 10)	5 REF	93. 77040050	TERMINAL - SPRSPD #10 16-14GA	1
32. 72066008	OIL SCREEN CLAMP (PART OF 10)	1 REF	94. 72053404	PIPE PLUG 1/2NPT SH	1
33. 76039092	REAR BRG HSG GASKET .006		95. 72053295	STREET ELBOW 3/4 X 90°	1 REF
	(PART OF 10)	1 REF	96. 72053559	REDUCER BUSHING 1NPT X 3/4NPT	1 REF
34. 76039094	REAR BRG HSG GASKET .010		97. 72053819	PIPE CAP 3/8NPT	1 REF
	(PART OF 10)	1 REF	98. 89392426	HOSE 3/8 200PSI X 10"	1 REF
35. 76039112	FRT BRG HSG GASKET (PART OF 10)	2 REF	99. 72532890	HOSE FITTING - TYPE T 3/8 X 3/8	2 REF
36. 76039144	REAR BRG HSG GASKET .020		100. 72053590	STREET ELBOW 3/8 90°	1
	(PART OF 10)	4 REF			
37. 70393506	FILTER-AIR INTAKE	2			
38. 70014626	CLIP-AIR FILTER	8			
40. 60025006	REAR BRG HSG COVER	1			

NOTE 1. ITEM 28 (3/8 PIPE PLUG), ALTHOUGH A PART OF 51705811, IS NOT USED ON THIS ASSEMBLY (51707079). REMOVE AT ASSEMBLY.



ITEM	PART NO.	DESCRIPTION	QTY
1.	72531427	ELBOW 3/4MPT #12MJIC	1
2.	72053676	ADAPTER 3/4MPT #12MJIC	2
3.	51707317	HOSE ASM 3/4X100	2
4.	72053676	ADAPTER 3/4MPT#12MJIC	3
5.	72053141	PIPE NIPPLE 3/4NPT X CL	1
6.	73054129	GATE VALVE 3/4NPT	1
7.	73052000	RETURN FILTER 10-MICRON	1REF
8.	72053180	REDUCER BUSHING 1-1/4 3/4	1
9.	72532658	ELBOW #8MJIC #8FJIC (NOT SHOWN)	2
10.	72053377	REDUCER BUSHING 1-1/4 1	1
11.	72531549	BARB NIPPLE 1MPT 1HOSE	3
12.	89039481	HOSE 1" 100R4	14'
13.	72066515	HOSE CLAMP 1" 2-BOLT	4
14.	73054001	GATE VALVE 1NPT	1
15.	72053185	PIPE NIPPLE 1 X CLOSE	1
16.	72053377	REDUCER BUSHING 1-1/4 1	2
17.	51709743	FILTER ASM 100-MESH	1REF

ITEM	PART NO.	DESCRIPTION	QTY
18.	72532712	BEAD NIPPLE #16MSTR 1" 45°	1
19.	72532360	ADAPTER #12MSTR #8MJIC	1
20.	51703614	HOSE ASM 1/2X240	1
21.	72532358	ADAPTER #8MSTR #8MJIC	1
22.	72532666	ELBOW #8MSTR #8MJIC XLG	1
23.	72053676	ADAPTER 3/4MPT #12MJIC	2
24.	51703945	HOSE ASM 3/4X17	1
25.	72532696	ELBOW #12MJIC #12FJIC	1
26.	73054685	ROTARY FLOW DIVIDER (PART OF 30)	1REF
27.	72532358	ADAPTER (PART OF 30)	3REF
28.	72532376	HOSE FITTING (PART OF 30)	4REF
29.	72532695	TEE MJIC (PART OF 30)	1REF
30.	93710121	INSTALLATION KIT W/CRANE (INCL: 26-29)	1REF

**Figure E-4. OPTIONAL HYDRAULIC INSTALLATION KIT (91707052)
OPTIONAL INSTALLATION KIT WITH CRANE (93710121)**

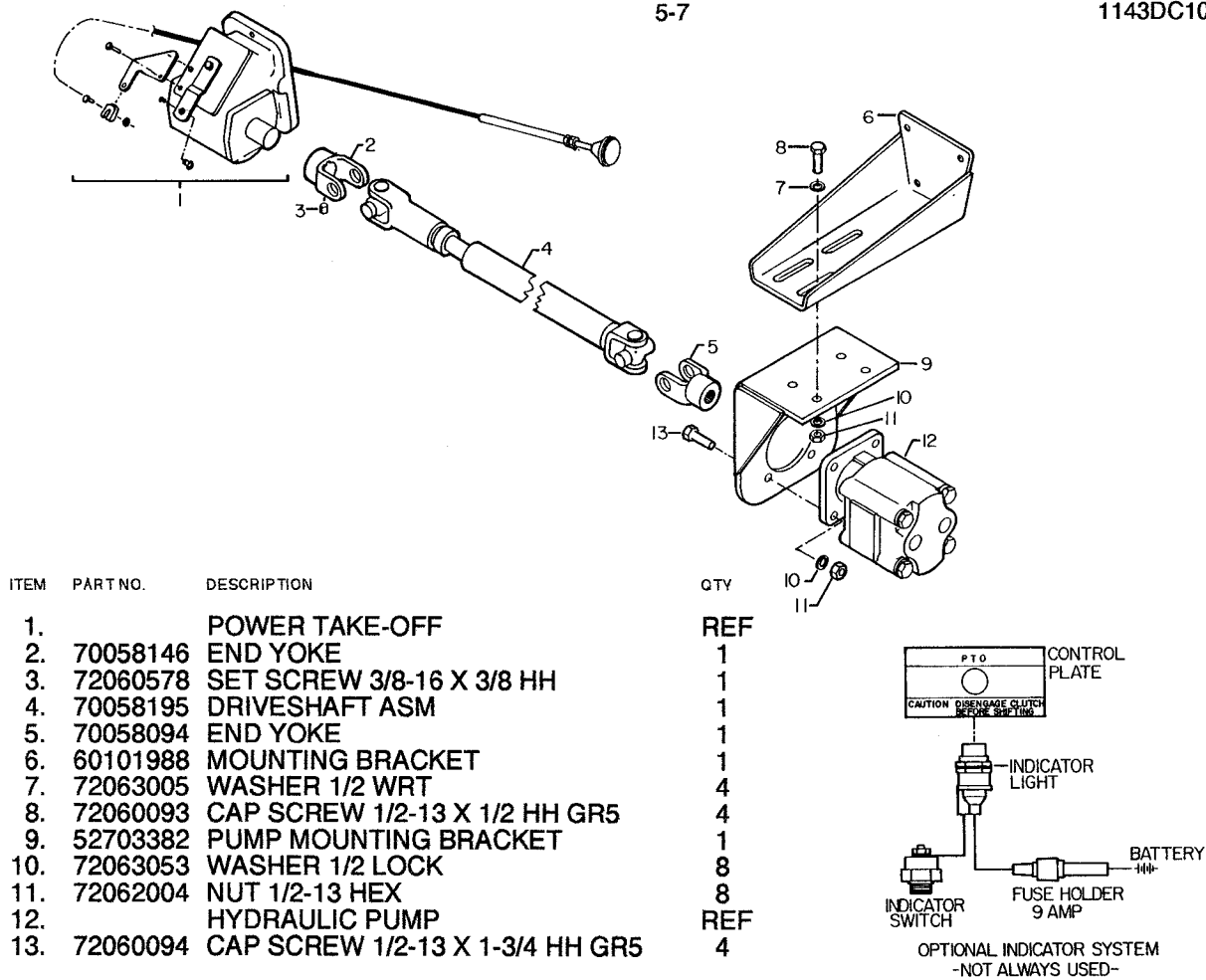


Figure E-5. DRIVELINE MOUNTING OPTION (31701761)

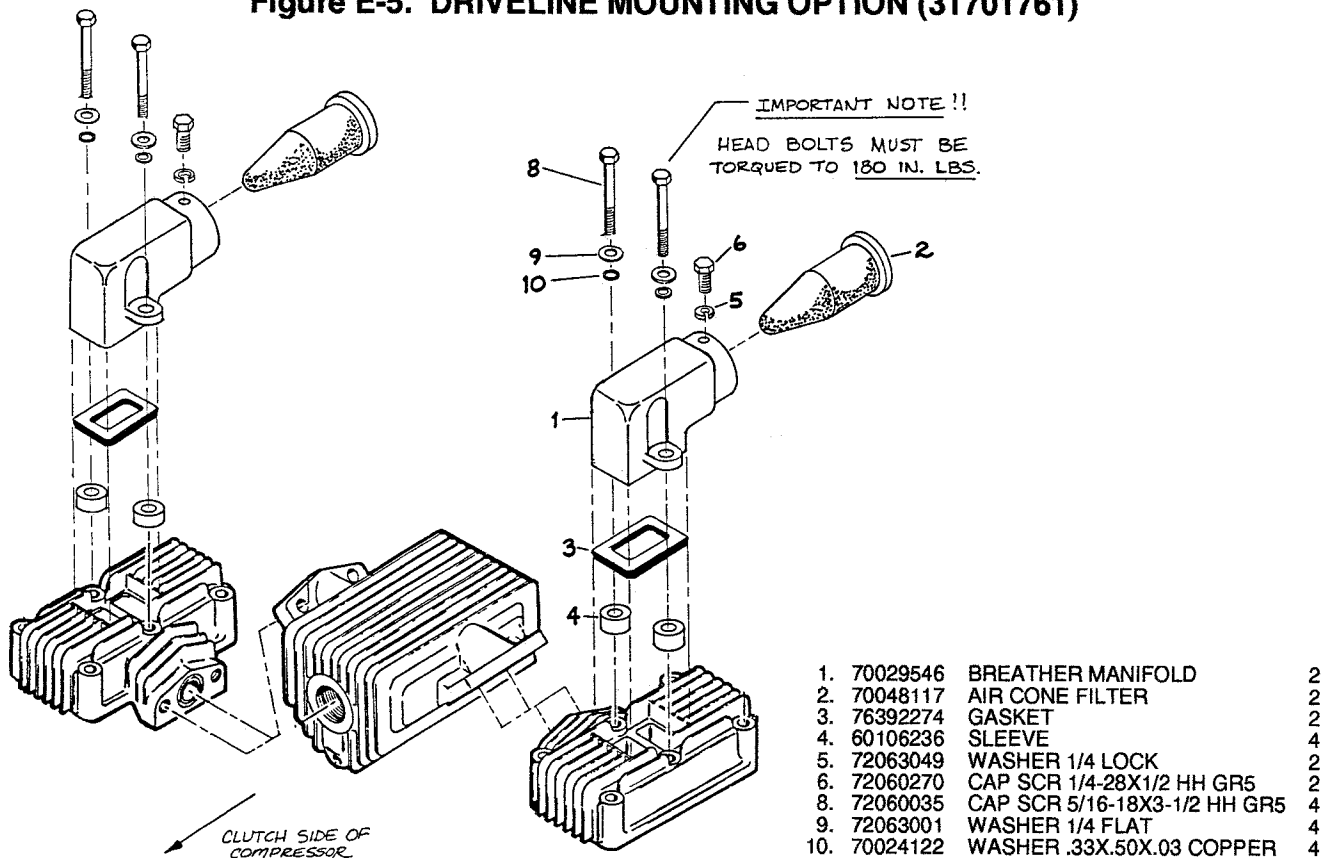


Figure E-6. OPTION - AIR FILTER KIT (95709998)

REPAIR KITS

GASKET KIT - 51039013

7Q072212	O-RING	2
76039092	GASKET-REAR BRG HSG .006	2
76039093	GASKET-PUMP COVER	1
76039094	GASKET-REAR BRG HSG .010	2
76039111	GASKET-CYL BLOCK BOTTOM	2
76039112	GASKET-FRT BRG HSG	2
76039113	GASKET-VALVE COVER	2
76039114	GASKET-CYL BLOCK TOP	2
76039119	SEAL	1
76039143	GASKET-REAR BRG HSG .015	2
76039144	GASKET-REAR BRG HSG .020	2

PISTON RING SET - 51014947

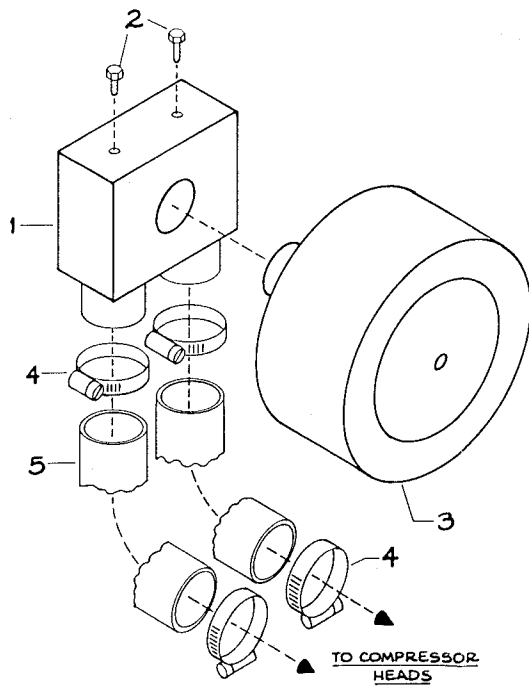
70014599	COMPRESSION RING	8
70014600	OIL RING	4

CRANKSHAFT KIT - 51070708

51705655	CRANKSHAFT ASM (INCL:KEY & CRANK)	1
70055010	BEARING-REAR CUP	1
70055011	BEARING-FRT CUP	1
70055012	BEARING-FRT CONE	1
70055009	BEARING-REAR CONE	1
72066307	DRIVE PIN	1
60101269	OIL PUMP COLLAR	1

CHECK VALVE KIT - 51704358

7Q073017	O-RING	1
70029377	CHECK VALVE INSERT	1
70029468	SHIM .53 ID X .94 OD X .005 THK	1
72066426	BALL .594 DIA	1
76393085	O-RING	1



1.	51707706	AIR INTAKE MANIFOLD ASM	1
2.	72061004	SHT MTL SCR #14X3/4	2
3.	70048007	SOLBERG FILTER	1
4.	72066001	HOSE CLAMP #24	4
5.	76391332	HOSE	2

Figure E-7. OPTION - AIR FILTER KIT - SOLBERG (51709435)

1.	77041378	RELAY BOARD	1
2.	77041383	RELAY	8
3.	77041100	FUSE 20AMP	1
4.	72601576	SHT MTL SCR #10 X 1-1/2	4
5.	99900661	INSTALLATION INSTRUCTIONS	1

NOTE: THIS OPTION IS REQUIRED WHEN COMPRESSOR IS COMBINED WITH CRANE INSTALLATION.

Figure E-8. OPTION - RELAY BOARD KIT (51711092)

Section 6. RELAY BOARD OPERATION

6-1. INTRODUCTION

To understand how the relay board operates, it is necessary to understand how the individual relays function.

The Bosch relay (part number 77041251) is a normally open relay between terminals 30 and 87 and normally closed between terminals 30 and 87a. Terminals 85 and 86 energize the relay through the coil. See Figure F-1 and F-2.

Figure F-3 shows the relay board with eight relays identified with the letters "A" through "G" and by their basic function. Example: Relay "A" is the "Power ON/OFF" relay, "C" is the "Compressor Speed Control", etc. The small numbers shown on the individual terminals of the relay indicate where that terminal is connected through the circuit board, to the terminal bar. Example: Relay "A" top terminal (#9) is connected to terminal 9 of the terminal bar. The terminal bar is provided with 16 individual terminals of which the last two (15 and 16) are not used. Wires connected to the terminal bar have been identified according to their function in the circuit. The number of terminals used vary with each application. Solid lines between relay terminals indicate existing wiring connections, through the circuit board.

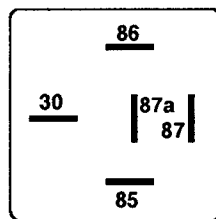


Figure F-1.
BOTTOM VIEW OF RELAY

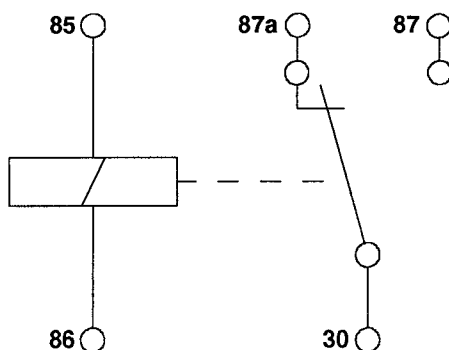


Figure F-2.
INTERNAL WIRING

The relay board is primarily used on vehicles with remote controlled cranes and remote control cranes and compressors. The circuitry prevents remote starting of the truck engine unless the brakes are applied and the PTO is engaged. It also isolates the crane speed control from the compressor speed control.

6-2. OPERATION

6-2-1. IGNITION "ON"

When the ignition switch of the vehicle is turned "ON", terminal 9 of the terminal bar is "HOT". The coil of relay "A" is energized and voltage from terminal 1 of the terminal bar becomes present at terminals "A" of relays "A", "B", "E" and "H". See Figure F-4.

6-2-2. REMOTE STARTING THE VEHICLE

The vehicle can be remotely started from the remote control handle after the power is turned "ON" at the handle.

To start the vehicle, the engine start switch at the handle must be depressed. When this is accomplished, terminal 11 of the terminal block becomes "HOT". See Figure F-6.

The truck starter is energized when terminals 11 and 12 of the terminal bar are connected through the relay board. When terminal 11 is "HOT", the coil in relay "F" is energized connecting relay terminal 12 and "B" on relays "F" and "G". If terminal 14 of relay "H" and terminal 13 of relay "G" are grounded (brakes and PTO engaged) terminals "B" of relays "F" and "G" are "HOT". Since terminal "B" of relay "F" is "HOT", the truck starter solenoid is activated. Energized circuits are shown as bold in Figure F-6.

6-2-3. REMOTE ENGINE STOP

When the engine stop button is depressed on the remote control handle, voltage is applied to terminal 6 of the terminal block and of relay "D". The coil in relay "D" is energized and the ground of the fuel solenoid/distributor coil is interrupted because current can no longer flow from terminal 7 to 8. Relay "D" is normally closed between terminals 7 and 8. See Figure F-3.

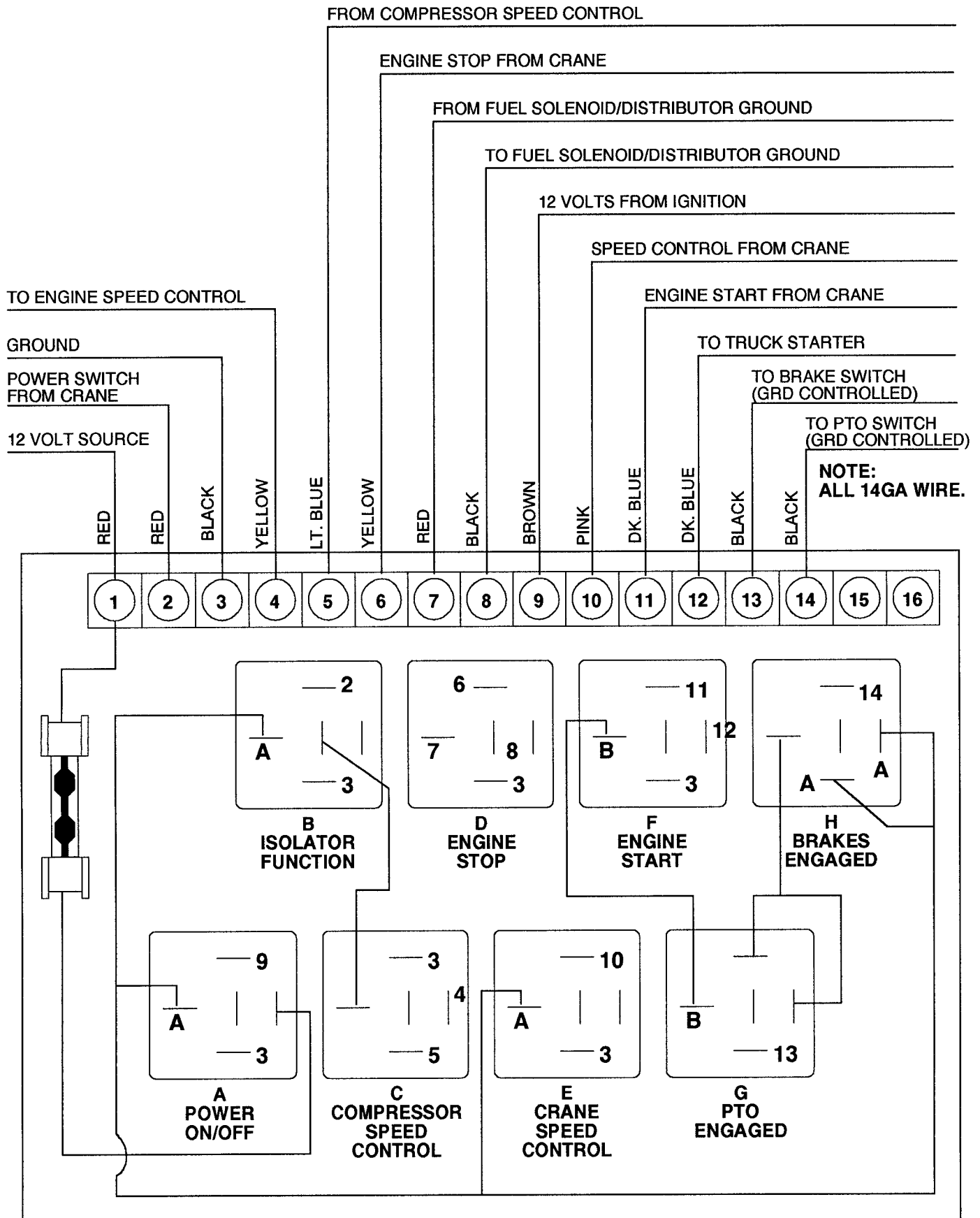


Figure F-3. RELAY BOARD - COMPONENTS & WIRING

6-2-4. REMOTE ENGINE SPEED (FROM CRANE)

Engine speed can be controlled from the remote control handle. When the engine speed switch is activated, voltage is applied at terminal 10 of relay "E". The coil of relay "E" is energized and current is allowed to flow to the "Synchro-Start" speed control coil. The speed of the engine will remain higher as long as the engine speed switch in the remote control handle is allowed to remain in the same position. If this switch is returned to its original position, the engine speed control coil will be de-energized through relay "E".

6-2-5. COMPRESSOR ENGINE SPEED CONTROL (COMPRESSOR ONLY)

When the compressor "kicks in" or goes into the charging mode, the engine speed of the vehicle is increased; when it "kicks out" or goes in the unloading mode, the engine speed is reduced.

When the compressor goes into the charging mode, terminal 5 of relay "C" energizes the coil in the relay, connecting terminal 4 to terminal "C" of the relay which is "HOT" from relay "B". Reference Figure F-7 showing circuits energized (in bold) when engine speed is increased by the compressor.

6-2-6. ENGINE SPEED CONTROL WHEN BOTH CRANE AND COMPRESSOR ARE USED SIMULTANEOUSLY

When the engine speed has been increased from the remote control handle to operate the crane, it (the speed) will remain unchanged regardless of the speed signals received from the compressor.

If, however, the crane is operated at slow engine speed simultaneously with the compressor, the speed increase signals from the compressor will increase engine speed. To prevent the compressor from unexpectedly increasing the engine speed when handling a load with the crane, an isolator (relay "B") has been placed in the circuit. This relay "B" is energized separately from the crane compartment.

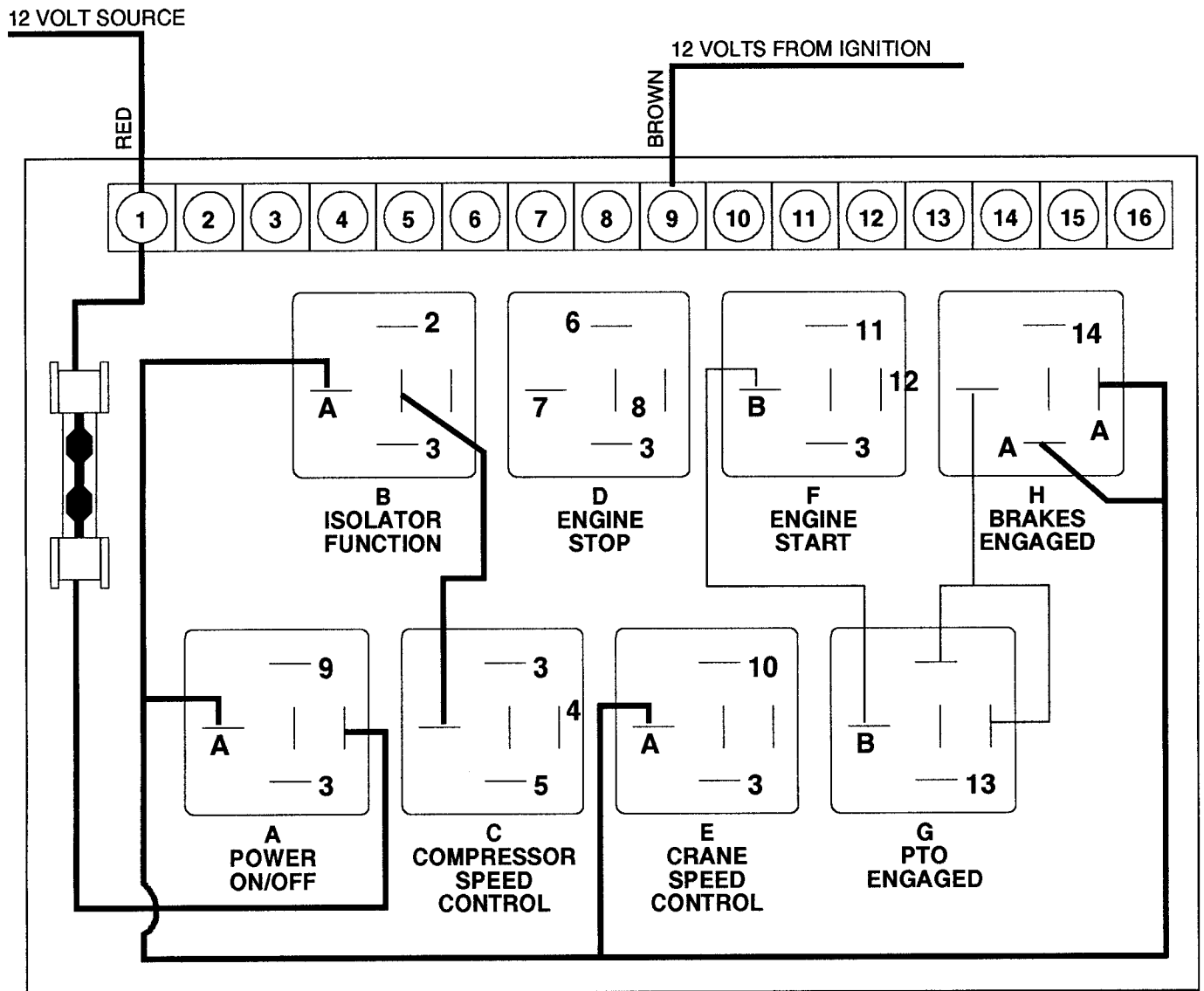


Figure F-4. IGNITION "ON"

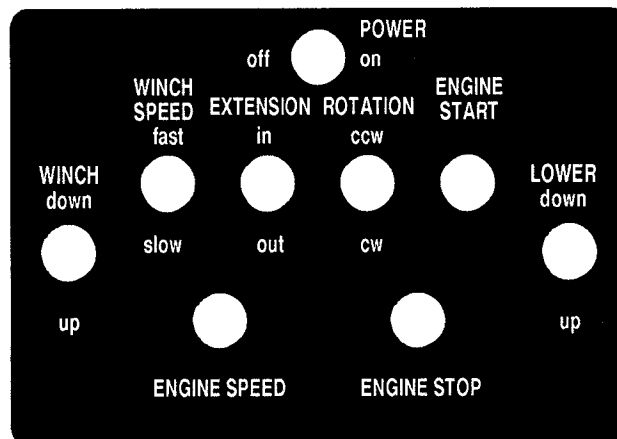


Figure F-5. REMOTE CONTROL HANDLE - TYPICAL



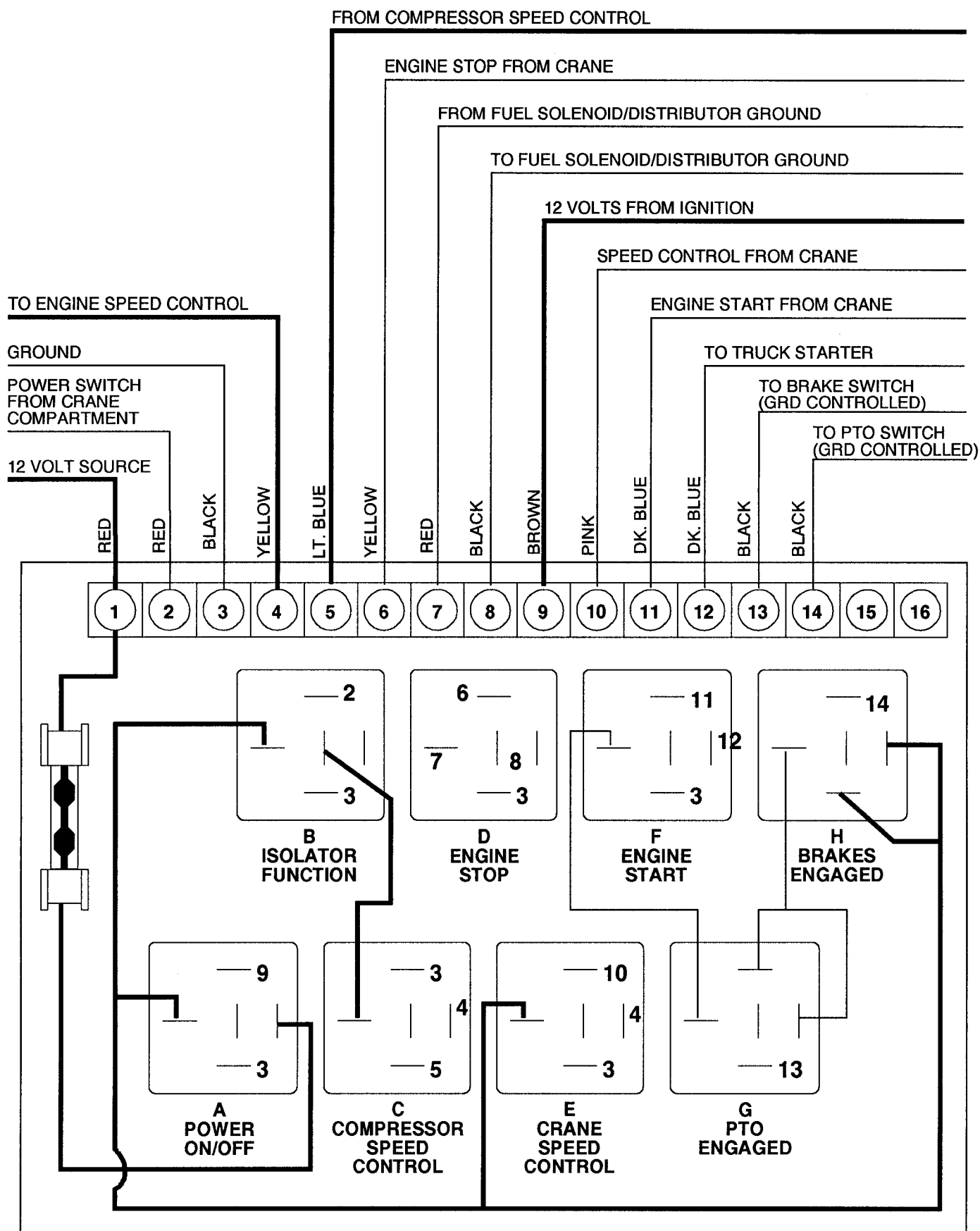


Figure F-7. SPEED CONTROL - COMPRESSOR ONLY

6-3. INSTALLATION

1. Locate an area in the engine compartment that will both provide some protection against damage and accessibility for wiring.
2. Provide adequate space between the mounting surface and the back of the circuit board in order to prevent electrical contact. Failure to do so will cause erratic operation and/or circuit board failure.
3. Connect control wiring as indicated in Wiring Chart.
4. Jumper wires connections:
 - 4-1. Jumper wires must connect J to K, and L to M for 12 volts excited systems. Remove the connecting wires between I to J and M to N.
 - 4-2. Jumper wires must connect I to J, and M to N for ground excited systems*. Remove the connecting wires between J to K and L to M.

WARNING

Failure to remove the extra connecting wire will cause the relay board to fail. Check jumper wire connections of relay board being replaced. (Most relay boards are wired as stated in item 4-1.)

* NOTES

- Circuits that could be ground excited are 6 - 10 & 11.
- Quick Check: (Before connecting wires to circuit board)
Activate the engine stop switch from the crane. If terminal 6 is hot, wire per 4-1. If not, wire per 4-2.

WIRING CHART

TERM	WIRING CONNECTION
1	12-VOLT
2	POWER SWITCH FROM CRANE
3	GROUND
4	TO SPEED CONTROL
5	SPEED CONTROL FROM COMPRESSOR
6	ENGINE STOP FROM CRANE
7	FROM FUEL SOLENOID / DISTRIBUTOR GROUND
8	TO FUEL SOLENOID / DISTRIBUTOR GROUND
9	12-VOLT FROM IGNITION
10	SPEED CONTROL FROM CRANE
11	ENGINE START FROM CRANE
12	TO TRUCK STARTER
13	TO BRAKE SWITCH, CONTROLLED
14	TO PTO SWITCH, CONTROLLED
15	NC
16	NC

RELAY	FUNCTION
A	ON / OFF, POWER
B	ISOLATION, SPEED CONTROL
C	COMPRESSOR, SPEED CONTROL
D	ENGINE STOP
E	CRANE SPEED CONTROL
F	ENGINE START
G	BRAKE SWITCH, CONTROLLED
H	PTO SWITCH

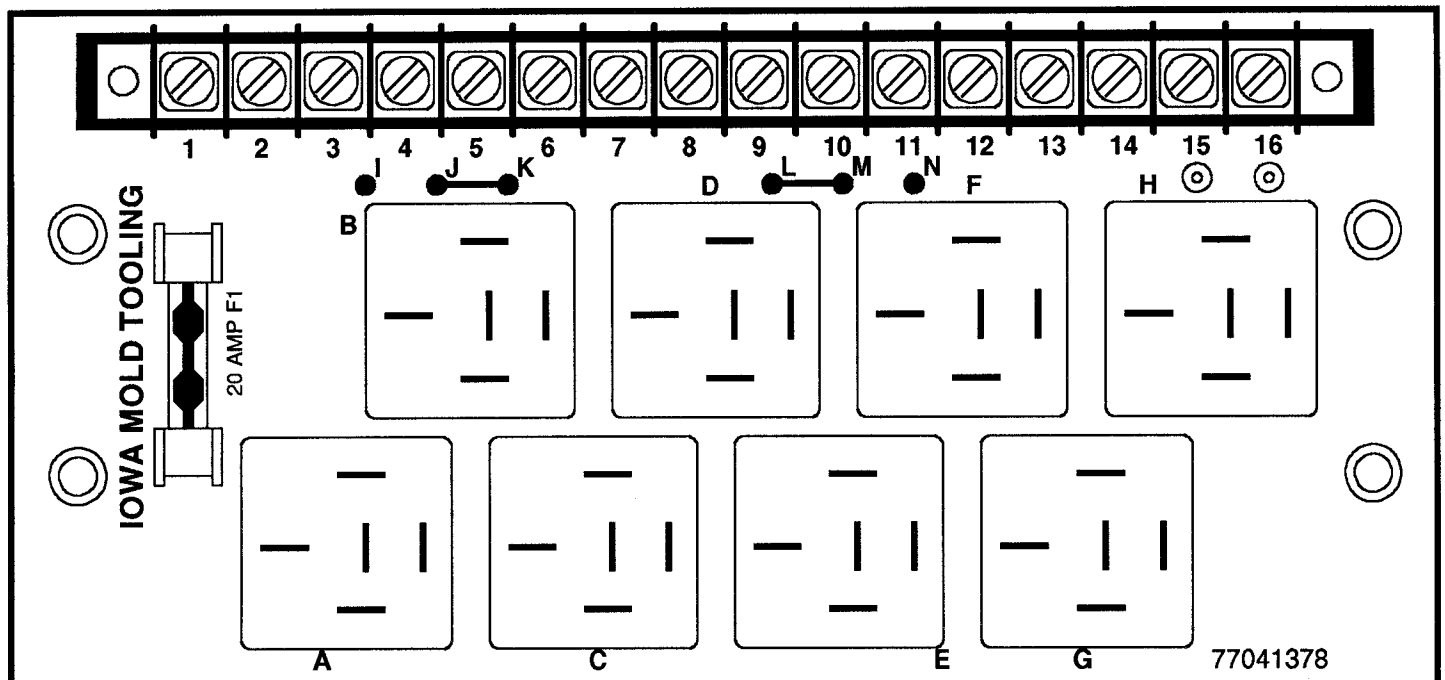


Figure F-8. RELAY BOARD (77041378) WIRING INSTRUCTIONS

The information within this manual has been compiled and checked but errors do occur. To provide our customers with a method of communicating those errors we have provided the Manual Change Request form below. In addition to error reporting, you are encouraged to suggest changes or additions to the manual which would be of benefit to you. We cannot guarantee that these additions will be made but we do promise to consider them. When completing the form, please write or print clearly. Submit a copy of the completed form to the address listed below.

MANUAL CHANGE REQUEST

DATE	PRODUCT MANUAL	1143-DC10	MANUAL PART NO.	99900380-11/90
SUBMITTED BY				
COMPANY				
ADDRESS				
CITY, STATE, ZIP				
TELEPHONE				

☐

ERROR FOUND

LOCATION OF ERROR (page no.): _____

DESCRIPTION OF ERROR: _____

☐

REQUEST FOR ADDITION TO MANUAL

DESCRIPTION OF ADDITION: _____

REASON FOR ADDITION: _____

MAIL TO: IOWA MOLD TOOLING Co., Inc.
Box 189,
Garner IA 50438
ATTN: Technical Publications

MANUFACTURER'S LIMITED WARRANTY

WARRANTY COVERAGE - Products manufactured by Iowa Mold Tooling Co., Inc. (IMT) are warranted to be free from defects in material and workmanship, under proper use, application and maintenance in accordance with IMT's written recommendations, instructions and specifications as follows:

1. Ninety (90) days; labor on IMT workmanship from the date of delivery to the end user.
2. One (1) year; original IMT parts from the date of delivery to the end user.

IMT's obligation under this warranty is limited to, and the sole remedy for any such defect shall be the repair or replacement (at IMT's option) of unaltered parts returned to IMT, freight prepaid, provided such defect occurs within the above stated warranty period and is reported within fourteen (14) days of its occurrence.

IMPLIED WARRANTY EXCLUDED - This is the only authorized IMT warranty and is in lieu of all other express or implied warranties or representations, including any implied warranties of merchantability or fitness for any particular purpose or of any other obligations on the part of IMT.

ITEMS EXCLUDED - The manufacturer gives no warranty on any components or parts purchased by the manufacturer, and such components as are covered only by the warranties of their respective manufacturers.

WARRANTY CLAIMS - Warranty claims must be submitted and shall be processed in accordance with IMT's established warranty claim procedure.

WARRANTY SERVICE - Warranty service will be performed by any IMT distributor authorized to sell new IMT products of the type involved or by any IMT Service Center authorized to service the type of product involved or by IMT in the event of direct sales made by IMT. At the time of requesting warranty service, the purchaser must present evidence of the date of delivery of the product. The purchaser shall pay any premium for overtime labor requested by the purchaser, any charge for making service calls and for transporting the equipment to the place where warranty work is performed.

WARRANTY VOIDED - All obligations of IMT under this warranty shall be terminated: (1) if service other than normal maintenance or normal replacement of service items is performed by someone other than an authorized IMT dealer, (2) if product is modified or altered in ways not approved by IMT.

PURCHASER'S RESPONSIBILITY - This warranty covers only defective material and workmanship. It does not cover depreciation or damage caused by normal wear, accident, improper protection in storage, or improper use. The purchaser has the obligation of performing the care and maintenance duties discussed in IMT's written recommendations, instructions and specifications. Any damage which results because of purchaser's failure to perform such duties shall not be covered by this warranty. The cost of normal maintenance and normal replacement of service items such as filters, belts, etc. shall be paid by the purchaser.

CONSEQUENTIAL DAMAGES - The only remedies the purchaser has in connection with the breach or performance of any warranty on IMT products are those set forth above. In no event will the dealer, IMT or any company affiliated with IMT, be liable for business interruptions, loss of sales and/or profits, rental or substitute equipment, costs of delay or for any other special, indirect, incidental or consequential losses, costs or damages.

REPRESENTATIONS EXCLUDED - IMT products are subject to no expressed, implied or statutory warranty other than herein set forth, and no agent, representative or distributor of the manufacturer has any authority to alter the terms of this warranty in any way whatsoever or to make any representations or promises, express or implied, as to the quality or performance of IMT products other than those set forth above.

CHANGE IN DESIGN - IMT reserves the right to make changes in design or improvements upon its products without imposing any obligation upon itself to install the same upon its products theretofore manufactured.

Effective January, 1984

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