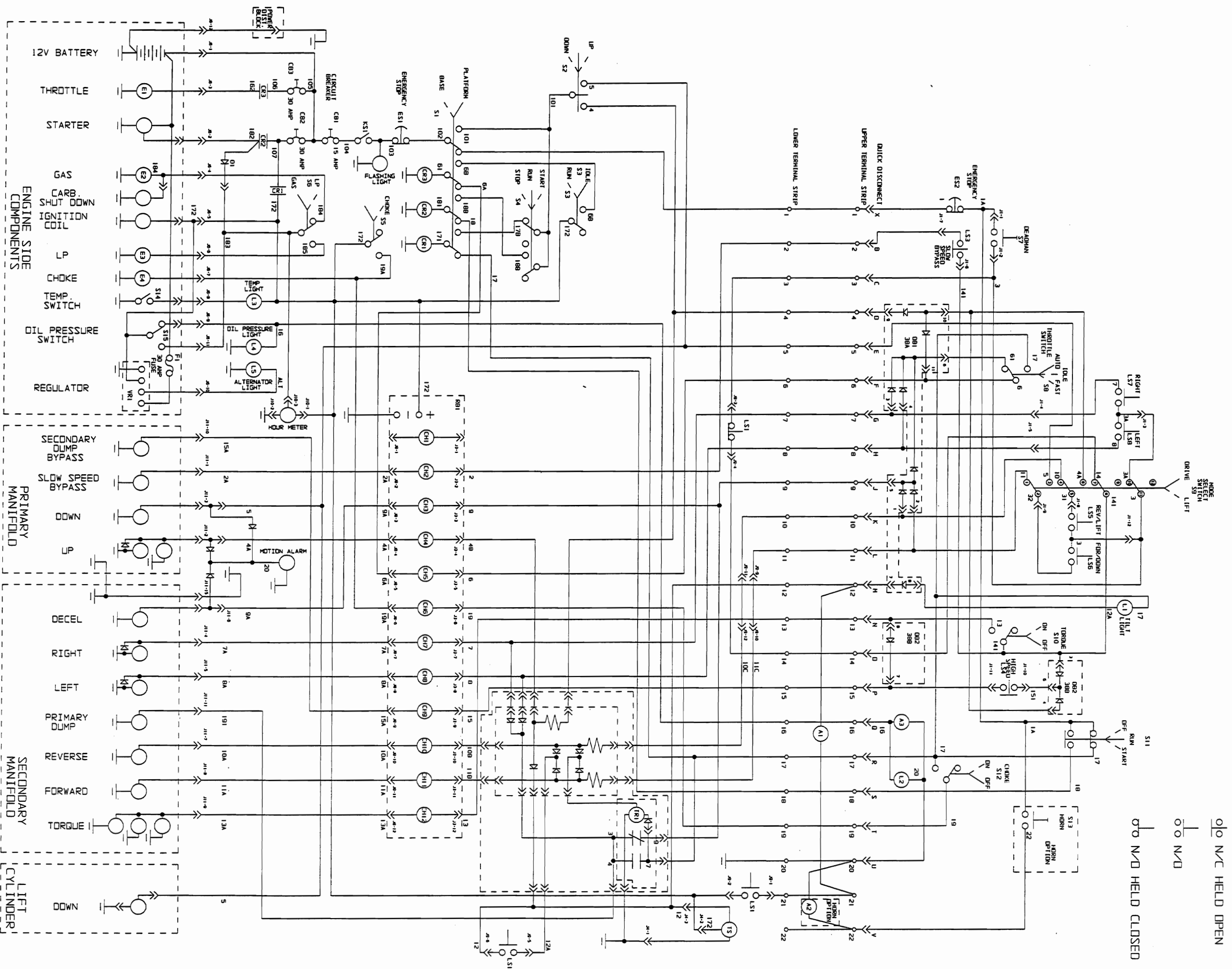


# 3072 4WD ELECTRICAL SCHEMATIC



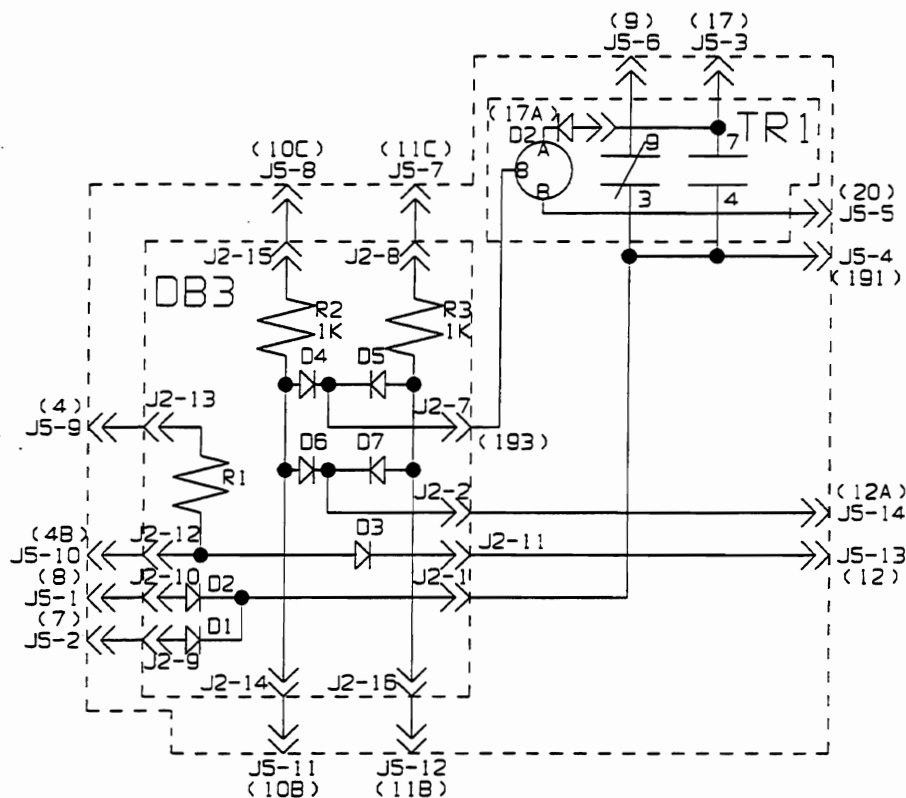
o/o N/C

o/o N/C HELD OPEN

o/o N/O

o/o N/O HELD CLOSED

THE J5 CONNECTOR CONNECTS THE MAIN WIRE HARNESS TO THE DIODE BOARD (9193) THROUGH THE J2 CONNECTOR AND 12V ONE SEC TIME DELAY (9208) WITH .250 FEMALE PUSHINS



1. LS1 TO BE SET AT SPECIFIED HEIGHT.
2. LS2 TO BE SET AT SPECIFIED HEIGHT.
3. S1 MAKES CONTACT TO THE RIGHT SET OF CONTACTS WHEN THE SWITCH IS PLACED IN THE PLATFORM POSITION.
4. S2 MAKES CONTACT TO THE RIGHT SET OF CONTACTS WHEN THE SWITCH IS HELD IN THE UP POSITION.
5. S3 MAKES CONTACT TO THE RIGHT SET OF CONTACTS WHEN THE SWITCH IS PLACED IN THE PLATFORM POSITION.
6. S4 MAKES CONTACT TO THE RIGHT SET OF CONTACTS WHEN THE SWITCH IS PLACED IN STOP POSITION, MAKES CONTACT TO THE LEFT WHEN HELD IN THE START POSITION, MAKES CONTACT TO OPPOSITES DIRECTION WHEN PLACED IN THE RUN POSITION.
7. S5 MAKES CONTACT TO THE RIGHT SET OF CONTACTS WHEN THE SWITCH IS HELD IN THE CHOKE ON POSITION.
8. S6 MAKES CONTACT TO THE RIGHT SET OF CONTACTS WHEN THE SWITCH IS PLACED IN THE LP POSITION.
9. S8 MAKES CONTACT TO THE LOWER SET OF CONTACTS WHEN THE SWITCH IS PLACED IN THE AUTO POSITION, DOES NOT MAKE CONTACT WHEN PLACED IN THE IOLE POSITION.
10. S9 MAKES CONTACT TO THE LOWER SET OF CONTACTS WHEN THE SWITCH IS PLACED IN THE DRIVE POSITION.
11. S10 MAKE CONTACT TO THE UPPER SET OF CONTACTS WHEN THE SWITCH IS PLACED IN THE TORQUE OFF POSITION.
12. S11 BREAKS CONTACT TO THE UPPER SET OF CONTACTS WHEN THE SWITCH IS PLACED IN OFF POSITION, MAKES CONTACT TO THE UPPER WHEN PLACED IN THE RUN POSITION, MAKES CONTACT TO BOTH WHEN PLACED IN THE START POSITION.

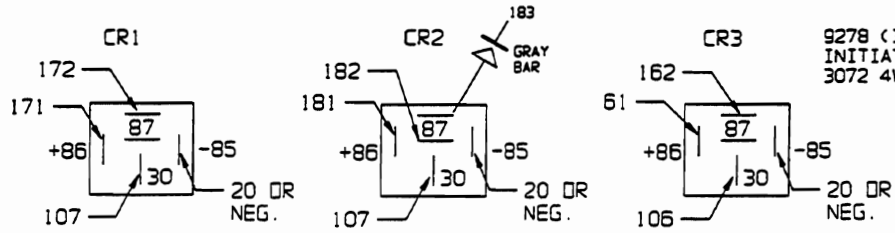
ITEM	PART NO.	QTY.	DESCRIPTION	FUNCTION	LOCATION
A1	7435	1	12V WARNING ALARM	TO WARN WHEN MACHINE HAS PASSED 4.5 DEG ABOVE 10 FEET	UNDER RIGHT SIDE OF PLATFORM
A2	14839	1	HORN OPTION PARTS	TO BEEP WHEN THE HORN SWITCH IS DEPRESSED	UNDER RIGHT SIDE OF PLATFORM
A3	9173	1	BATTERY, 10-48 VOLT DC	TO INFORM OPERATOR OIL PRESSURE IS LOW	ON CONTROL BOX
B1	6854	1	BATTERY, 12 VOLT STARTING	SUPPLY POWER	IN ENGINE CABINET ABOVE PUMP
B2	7235	1	CIRCUIT BREAKER-15 AMP MANUAL	TO FUSE CONTROL CIRCUITRY	LOWER CONTROL PANEL
B3	7447	1	CIRCUIT BREAKER-30 AMP MANUAL	TO FUSE STARTER AND BASE POWER	LOWER CONTROL PANEL
C1	6889	1	POWER RELAY 12 VOLT DC 25 AMP	TO FUSE THROTTLE SOLENOID	LOWER CONTROL PANEL
C2	6889	1	POWER RELAY 12 VOLT DC 25 AMP	TO TURN ON BASE POWER	BACK RIGHT WALL INSIDE ELECTRICAL CABINET
C3	6070	1	DIODE ASSEMBLY	TO TURN ON STARTER	BACK RIGHT WALL INSIDE ELECTRICAL CABINET
D1	9313	1	DIODE ASSEMBLY	TO TURN ON THROTTLE	FROM POWER RELAY CR2 TO WIRE 1B3
D2	7451	1	CIRCUIT BOARD - CONTROL BOX	ALLOW POWER UP OF THE FUEL SELECTED DURING START UP MODE	X
D3	9193	1	CIRCUIT BOARD - CONTROL BOX	THROTTLE UP DURING DRIVE / LIFT / STEER FLUCTUATIONS	INSIDE CONTROL BOX
E1	7398	1	FUEL PUMP KAWASAKI	TO ALLOW USE OF THE HIGH SPEED SWITCH	INSIDE CONTROL BOX
E2	6867	1	LP LOCKOFF VALVE	PICK UP DRIVE / LIFT SIGNALS FOR TIP CUT-OUT AND BRAKES	BACK RIGHT WALL INSIDE ELECTRICAL CABINET
E3	7397	1	SOLENOID, CHOKE	TO BRING ENGINE SPEED UP	BACK OF MOTOR NEAR AIR CLEANER
E4	7800	1	SWITCH STOP, ASSEMBLY	PUMP GASOLINE TO CARB	BACK LOWER WALL ENGINE CABINET
E5	7800	1	SWITCH STOP, ASSEMBLY	CUT-OFF LP BEFORE CARB	LEFT TOP OF MOTOR
F1	5936	1	SWITCH-KEY	TO PULL IN CHOKE ON CARB.	FRONT TOP OF MOTOR UNDER AIR CLEANER
L1	9188	1	LIGHT, BAYONET	STOP POWER TO BASE CONTROLS	LOWER CONTROL PANEL
L2	6906	1	INDICATOR LIGHT	STOP POWER TO CONTROL BOX CONTROLS	INSIDE CONTROL BOX
L3	6906	1	INDICATOR LIGHT	TO LOCK OUT POWER TO MACHINE CONTROLS	INSIDE CONTROL BOX
L4	6906	1	INDICATOR LIGHT	TO WARN WHEN MACHINE HAS PASSED 4.5 DEG	INSIDE CONTROL BOX
L5	6906	1	INDICATOR LIGHT	TO INFORM OPERATOR OIL PRESSURE IS LOW	INSIDE CONTROL BOX
L6	8932	1	SWITCH, LIMIT MICRO - V7	TO INFORM THAT ENGINE TEMP. IS TOO HOT	LOWER CONTROL PANEL
L7	8932	1	SWITCH, LIMIT MICRO - V7	TO INFORM THAT OIL PRESSURE IS LOW	LOWER CONTROL PANEL
L8	8932	1	SWITCH, LIMIT MICRO - V7	TO INFORM THAT ALTERNATOR IS NOT FUNCTIONING CORRECTLY	LOWER CONTROL PANEL
L9	8932	1	SWITCH, LIMIT MICRO - V7	ACTIVATE SLOW SPEED, AND TILT SENSOR CIRCUIT	REAR OF MACHINE AT BEAM BASE ATTACHMENT
L10	8932	1	SWITCH, LIMIT MICRO - V7	ACTIVATE THE SLOW SPEED BYPASS VALVE	INSIDE CONTROL BOX
L11	8932	1	SWITCH, LIMIT MICRO - V7	ACTIVATE THE SECONDARY DUMP BYPASS VALVE	INSIDE CONTROL BOX
L12	8932	1	SWITCH, LIMIT MICRO - V7	ACTIVATE THE REVERSE OR LIFT VALVE	INSIDE CONTROL BOX
L13	8932	1	SWITCH, LIMIT MICRO - V7	ACTIVATE THE FORWARD OR DOWN VALVE	INSIDE CONTROL BOX
L14	8932	1	SWITCH, LIMIT MICRO - V7	ACTIVATE THE RIGHT VALVE	INSIDE CONTROL BOX
L15	8932	1	SWITCH, LIMIT MICRO - V7	ACTIVATE THE LEFT VALVE	INSIDE CONTROL BOX
L16	8932	1	SWITCH, LIMIT MICRO - V7	SUPPLY THE COILS WITH POWER AFTER RECEIVING A FUNCTION SIGNAL	BACK LEFT WALL OF ELECTRICAL CABINET
L17	8932	1	SWITCH, LIMIT MICRO - V7	TO SELECT BASE OR PLATFORM CONTROLS	LOWER CONTROL PANEL
L18	8932	1	SWITCH, LIMIT MICRO - V7	TO SELECT LIFT OR LOWER AT THE BASE CONTROLS	LOWER CONTROL PANEL
L19	8932	1	SWITCH, LIMIT MICRO - V7	TO SELECT IDLE OR RUN AT THE BASE CONTROLS	LOWER CONTROL PANEL
L20	8932	1	SWITCH, LIMIT MICRO - V7	TO CHOOSE THE MOTOR AT THE BASE CONTROLS	LOWER CONTROL PANEL
L21	8932	1	SWITCH, LIMIT MICRO - V7	TO SELECT LP OR GAS AT THE BASE CONTROLS	LOWER CONTROL PANEL
L22	8932	1	SWITCH, LIMIT MICRO - V7	TO ALLOW OTHER CONTROLS TO BE USED AT THE PLATFORM CONTROLS	LOWER CONTROL PANEL
L23	8932	1	SWITCH, LIMIT MICRO - V7	TO SELECT IDLE / RUN / OR AUTO AT THE PLATFORM CONTROLS	INSIDE CONTROL BOX
L24	8932	1	SWITCH, LIMIT MICRO - V7	TO SELECT LIFT OR DRIVE AT THE PLATFORM CONTROLS	INSIDE CONTROL BOX
L25	8932	1	SWITCH, LIMIT MICRO - V7	TO SELECT TORQUE AT THE PLATFORM CONTROLS	INSIDE CONTROL BOX
L26	8932	1	SWITCH, LIMIT MICRO - V7	TO SELECT STOP / RUN / OR STOP AT THE PLATFORM CONTROLS	INSIDE CONTROL BOX
L27	8932	1	SWITCH, LIMIT MICRO - V7	TO CHOOSE THE MOTOR AT THE PLATFORM POSITION	INSIDE CONTROL BOX
L28	8932	1	SWITCH, LIMIT MICRO - V7	TO ACTIVATE THE HORN AT THE PLATFORM CONTROLS	INSIDE CONTROL BOX
L29	8932	1	SWITCH, LIMIT MICRO - V7	TO ACTIVATE WHEN TEMP IS HOT	LEFT SIDE OF MOTOR
L30	8932	1	SWITCH, LIMIT MICRO - V7	TO ACTIVATE WHEN TEMP IS LOW	RIGHT SIDE OF MOTOR
L31	8932	1	SWITCH, LIMIT MICRO - V7	TO ACTIVATE AT 4.5 DEG.	BACK LOWER RIGHT WALL OF ELEC. CABINET
L32	8932	1	SWITCH, LIMIT MICRO - V7	TO ACTIVATE AND HOLD THE BRAKES	BACK RIGHT WALL OF ELECTRICAL CABINET
L33	8932	1	SWITCH, LIMIT MICRO - V7	TO RECHARGE THE BATTERY	NEAR RADIATOR AT FRONT OF MOTOR CABINET
L34	8932	1	SWITCH, LIMIT MICRO - V7	X	X

ART1742 R3  
BM16067  
7/27/98

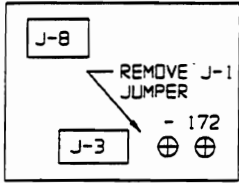
WIRE HARNESS ASSEMBLIES AND CABLES

0159	COVER ASSEMBLY WIRE HARNESS
9210	CONTROL BOX ASSEMBLY WIRE HARNESS
9215	3072 MAIN WIRE HARNESS ASSEMBLY
9211	18 GA 25 COND. CABLE ASSEMBLY
9158	UPPER CONTROL CDRD CABLE ASSEMBLY
9214	DOWN CABLE ASSEMBLY
9209	ENGINE WIRE HARNESS
9212	LIMIT SWITCH CABLE ASSY.
9213	DIODE BOARD / BRAKE WIRE HARNESS
9269	MANIFOLD HARNESS
9304	HARNESS, MOTION ALARM

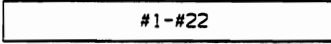
9278 (3X) RELAYS  
INITIATED AT SERIAL #:  
3072 4WD - 9200139



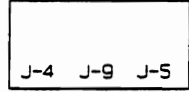
9021-RELAY BOARD



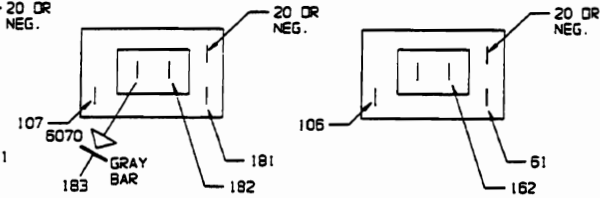
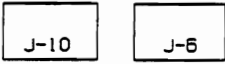
6947-TERMINAL STRIP



14848-HARNES BRACKET

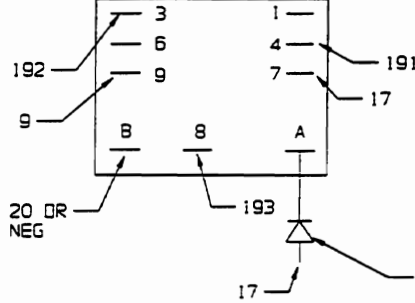


14848-JUNCTION PLATE

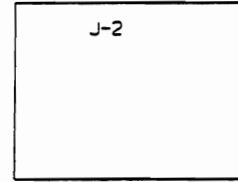


6889 (3X) RELAYS

9208-BRAKE RELAY



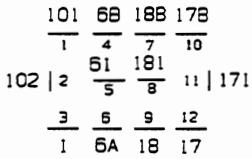
9193-CIRCUIT BOARD



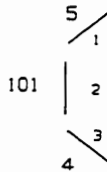
7552 TIP SENSOR



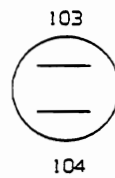
S1  
BASE/PLATFORM  
SWITCH



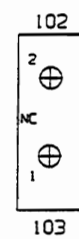
S2  
UP/DOWN  
SWITCH



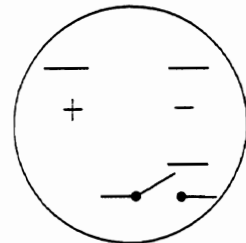
KS1  
KEY SWITCH



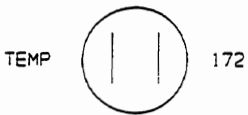
ES1  
E-STOP  
SWITCH



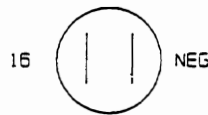
HOUR  
METER



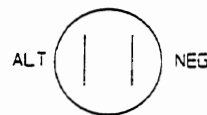
L3  
TEMP  
LIGHT



L4  
OIL  
LIGHT



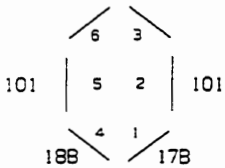
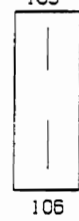
L5  
ALT  
LIGHT



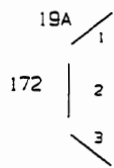
15 AMP  
CB1



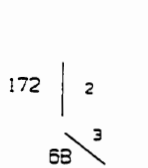
30 AMP  
CB3



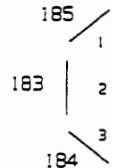
START/RUN/STOP  
S4



CHOKE  
S5



IDLE/RUN  
S3



LP/GAS  
S6

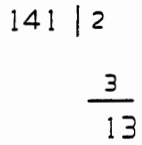


30 AMP  
CB 2

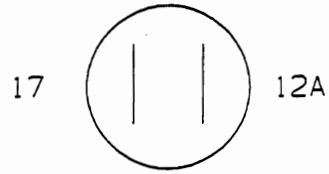
3072 4WD LOWER CONTROL PANEL  
VIEW FROM BACK OF SWITCHES

ART759 R2  
BM16647  
7/27/98

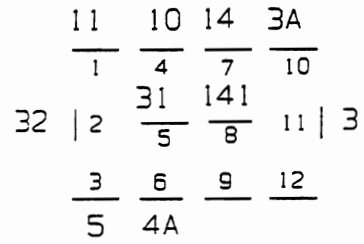
TORQUE



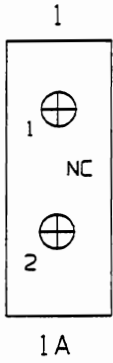
TIP LIGHT



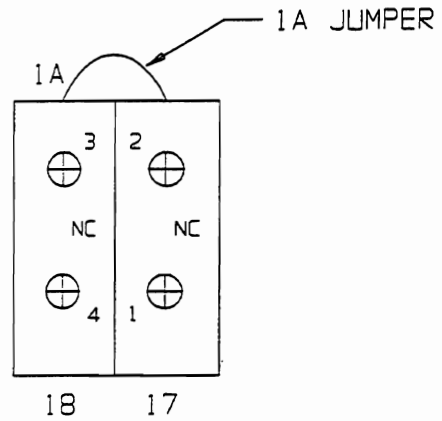
LIFT/DRIVE



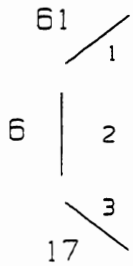
E-STOP



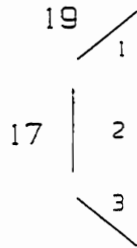
START/RUN/STOP



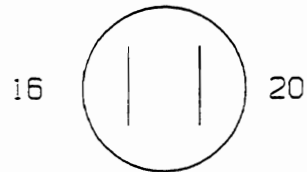
THROTTLE



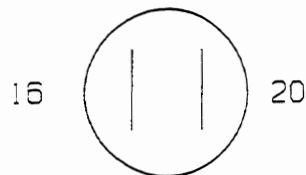
CHOKE



OIL LIGHT

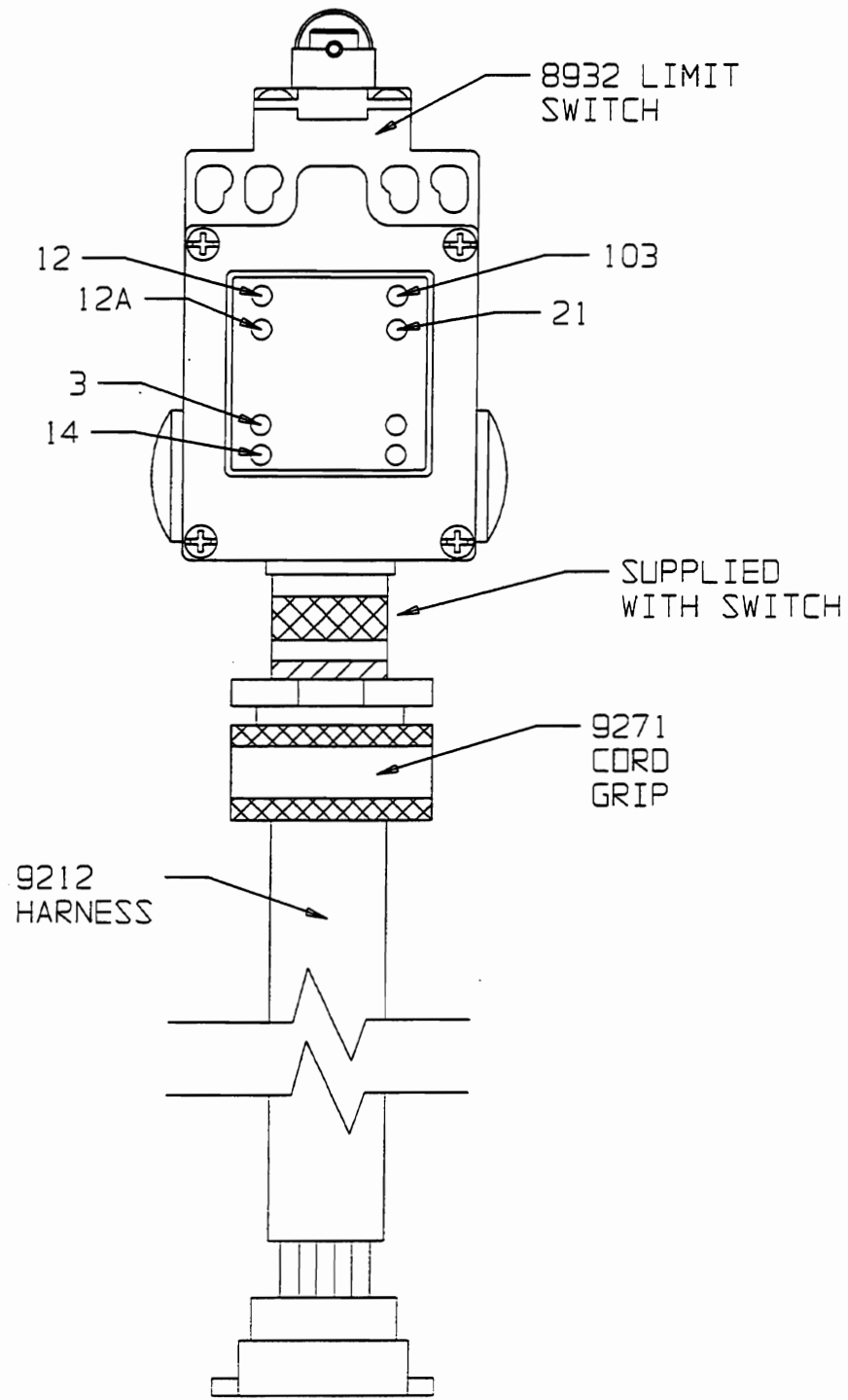


BUZZER



3072 4WD CONTROL BOX  
VIEW FROM BACK OF SWITCHES

ART759 R2  
BM16647  
7/27/98



14943 - LIMIT SWITCH ASSEMBLY

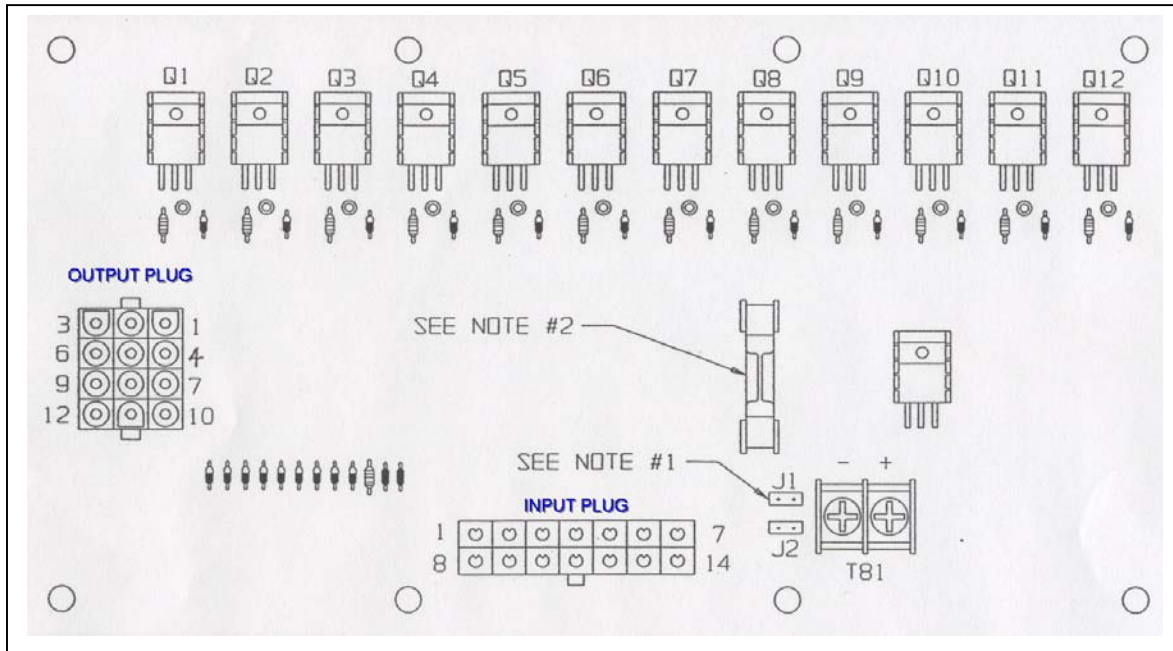


Aerial Work Platforms

## 9021 Relay Board (new style)

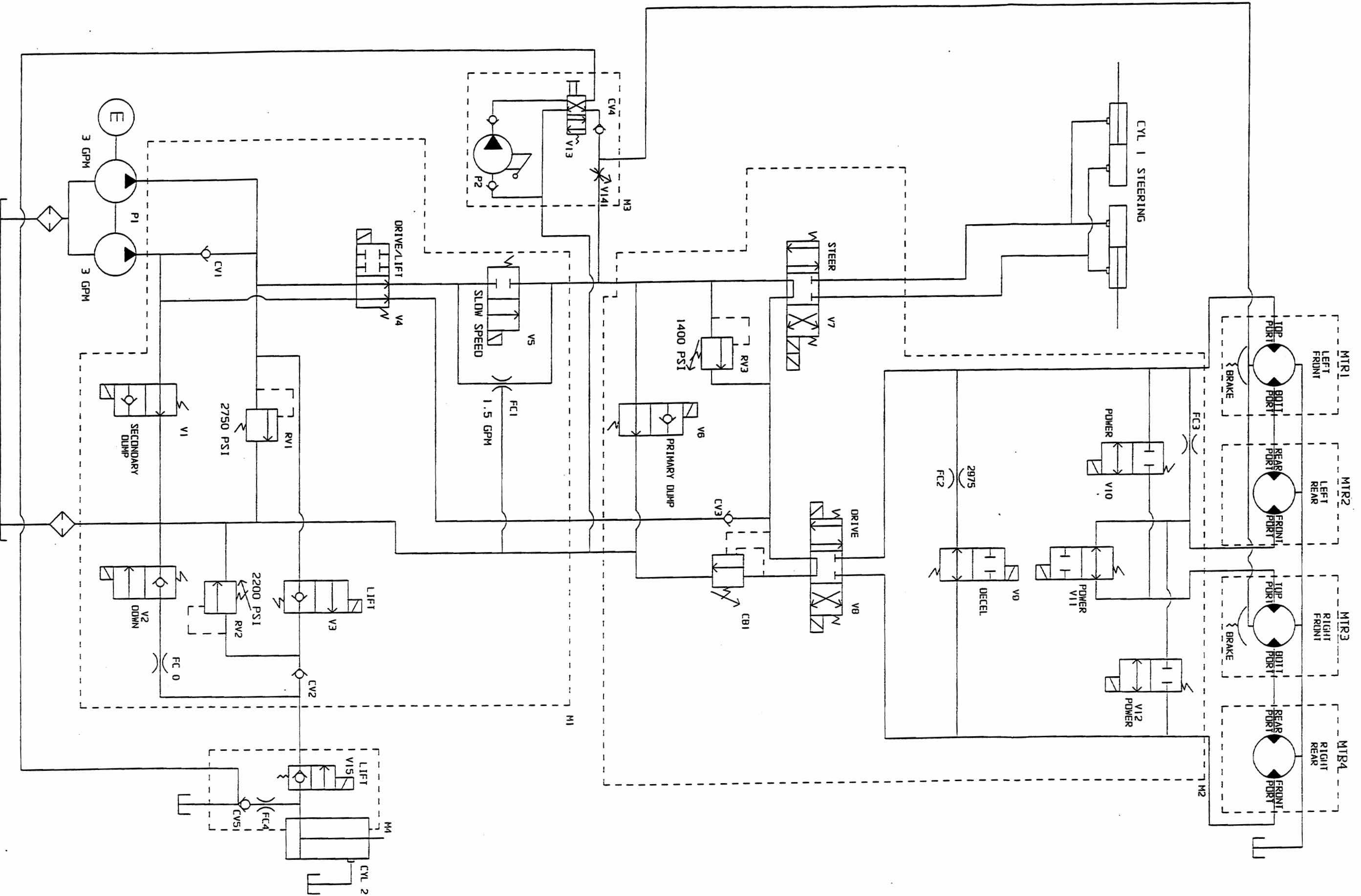
When replacing (p/n 9021) circuit board on **Quadrex 25/33 RT** series or **3072** series or **2558DF** (Kawasaki eng), it will be necessary to pull jumper J1 (note 1 on diagram). Jumper J1 programs the throttle and choke control circuits. Leave jumper in place for **2558D** w/Kohler engine only.

**NOTE:** J1 is very small, use needle-nosed pliers to pull it from the board.



For diagnostic purposes, the chart below lists the input and output terminals, and LED for the respective function. Match the column on the chart with your specific model.

INPUT	LED	OUTPUT	FUNCTION 25, 33 RT	FUNCTION 25,33 SRT	FUNCTION 3072	FUNCTION 2558D	FUNCTION 2558DF
1	1	1	Up	Not used	Up to 9200486 - Start From 9200487- Not used	Not used	Not used
2	2	2	Down	Slow Speed	Slow	Slow	Slow
3	3	3	Bypass – Decel	Brake - Decel	Decel – Pri. Dump	Brake – Decel	Brake – Decel
4	4	4	Torque	Up	Up	Up	Up
5	5	5	Throttle	Not used	Throttle	Not used	Throttle
6	6	6	Choke Pre-heat (diesel)	Throttle	Choke Pre-heat (diesel)	Throttle	Choke
7	7	7	Forward	Right	Right	Right	Right
8	8	8	Reverse	Left	Left	Left	Left
9	9	9	Steer Left	Sec. Dump	Sec. Dump	Sec. Dump	Sec. Dump
10	10	10	Steer Right	Reverse	Reverse	Reverse	Reverse
11	11	11	Steer Bypass	Forward	Forward	Forward	Forward
12	12	12	A.C. Generator (opt)	Torque	Torque	Torque	Torque



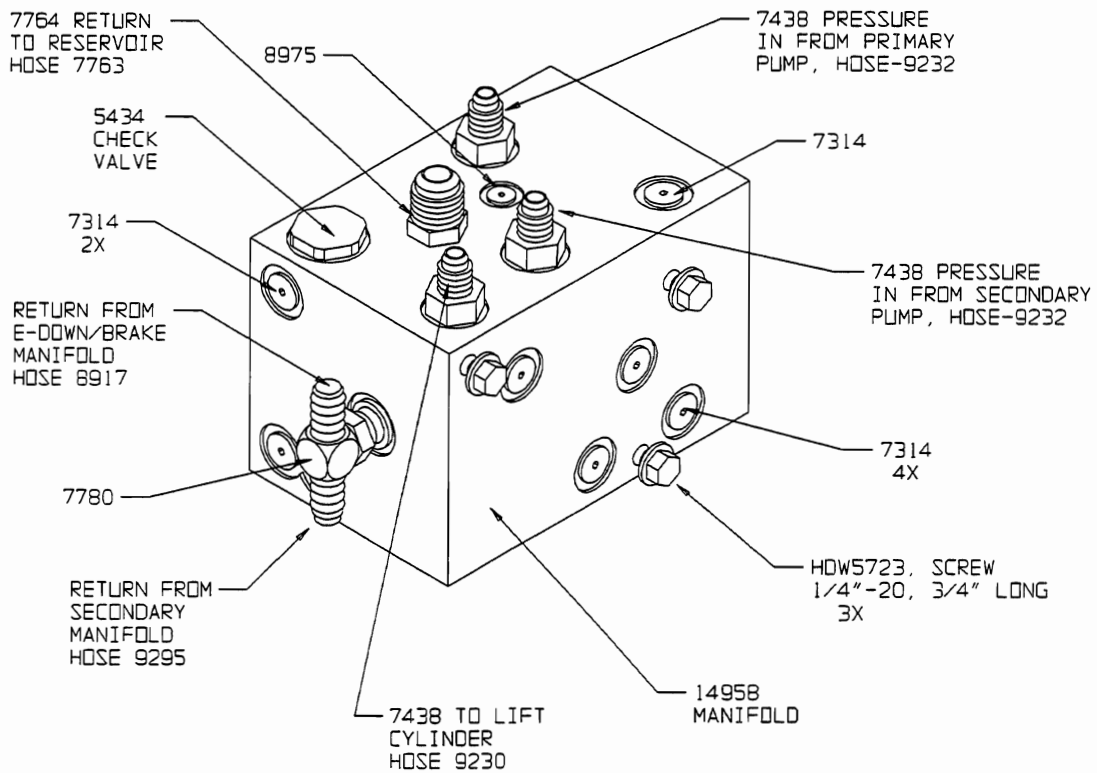
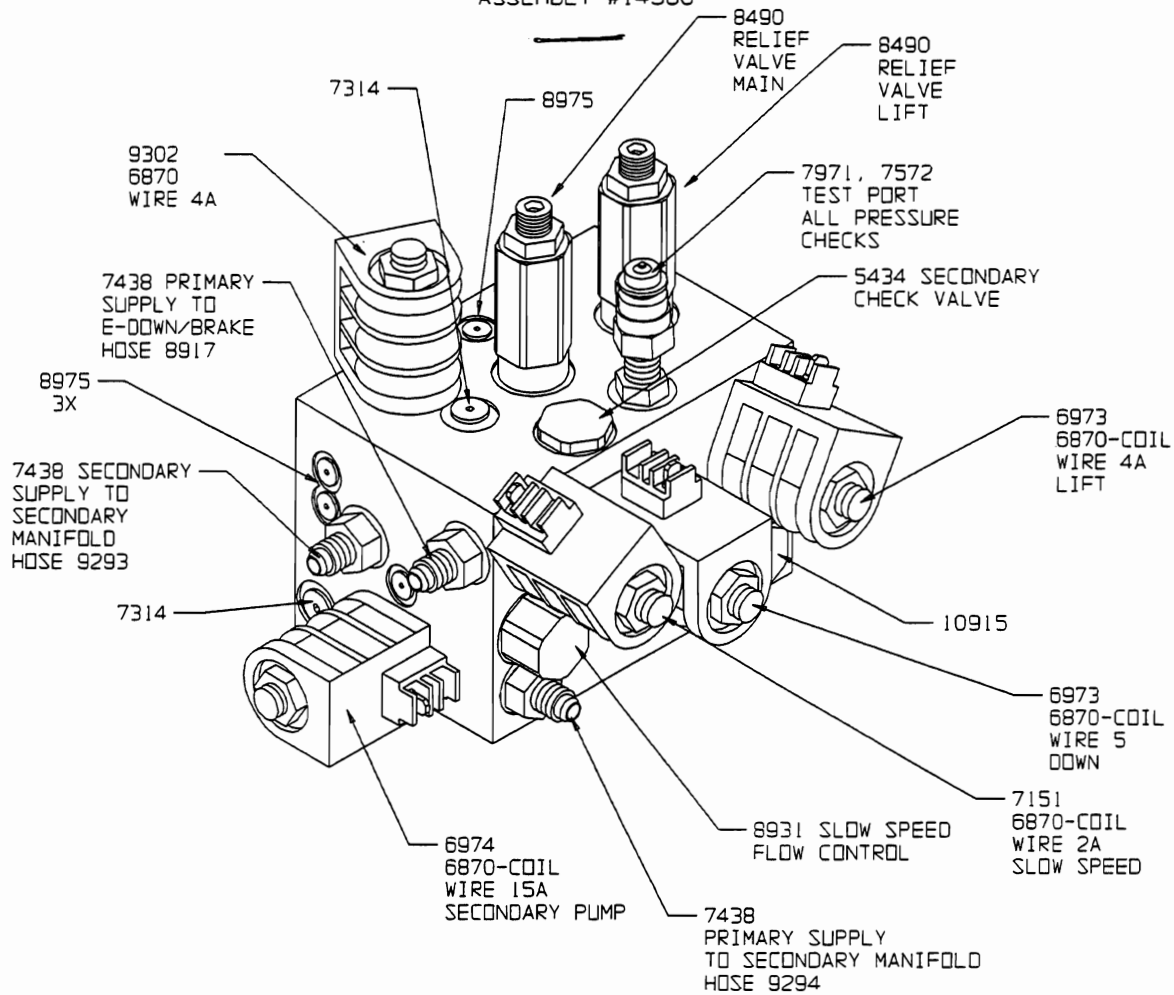
PRESSURE SETTINGS	
MAIN RELIEF	2750 PSI
LIFT	2200 PSI
STEERING	1500 PSI

AR1755 R0  
 BM16522  
 5/28/98

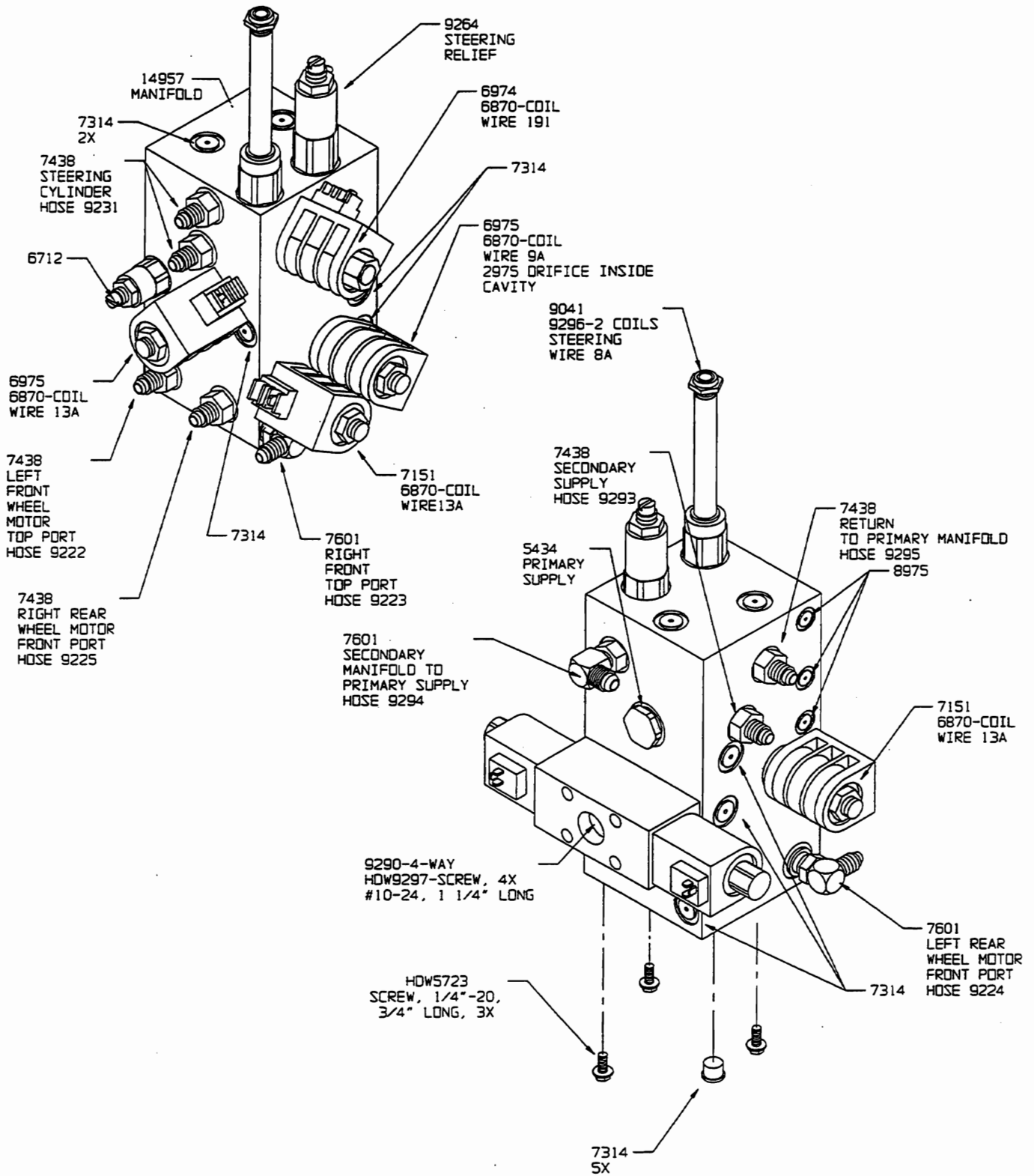


ITEM	PART #	WIRE #	DESCRIPTION
P1	6855		HYD PUMP-
MTR1	8843		HYD. WHEELMOTOR #46 W/BRAKE
MTR2	7300		HYD WHEEL MOTOR 45 3/IN
MTR3	8843		HYD. WHEELMOTOR #46 W/BRAKE
MTR4	7300		HYD WHEEL MOTOR 46 3/IN
CYL1	10329		STEERING CYLINDER ASSY
CYL2	8809		CYLINDER 3068
M1	14958		PRIMARY MANIFOLD
CV1	5434		VALVE,CHECK-IN LINE
CV2	5434		VALVE,CHECK-IN LINE
FC0	10915		METERING PLUG
FC1	8931		VALVE, PRIORITY FLOW 1.5 GPM
RV1	8490		VALVE PRESSURE RELIEF 4000 PSI
RV2	8490		VALVE PRESSURE RELIEF 4000 PSI
V1	6974	15A	VALVE NO POPPET 2/W
V2	6973	5A	VALVE N.C. POPPET 2 WAY
V3	6973	4A	VALVE N.C. POPPET 2 WAY
V4	9291, 9302	4A	VALVE, 4WAY, 2POS DELTA
V5	7151	2A	VALVE 2 WAY N.C. SPOOL
M2	14957		SECONDARY MANIFOLD
CB1	6712		COUNTER BALANCE VALVE
CV3	5434		VALVE,CH
RV3	9264		VALVE, PRESSURE RELIEF 1500PSI
V6	6974	191	VALVE NO POPPET 2/W
V7	9041	7A/8A	VALVE, 4 WAY, 3 POSITION
V8	9290	10A/11A	VALVE, DO1, 4WAY, 3 POS
V9	6975	9A	VALVE N.O. SPOOL 2 WAY
V10	7151	13A	VALVE 2 WAY N.C. SPOOL
V11	6975	13A	VALVE N.O. SPOOL 2 WAY
V12	7151	13A	VALVE 2 WAY N.C. SPOOL
M3	14510		MANIFOLD EMERGENCY DOWN
CV4	5434		VALVE, CHECK-IN LINE
V13	8848		VALVE, MANUAL PULL 4-WAY
V14	8855		VALVE, MANUAL ADJ FLOW CONTROL
P2	8849		VALVE, HYD. HAND PUMP
M4	14523		MANIFOLD LIFT CYLINDER
CV5	7445		VALVE, PILOT OPER. BALL CHECK
FC4			DRILLED ORFICE, NON SERVICEABLE
V15	6973	5A	VALVE N.C. POPPET 2 WAY

PRIMARY MANIFOLD IDENTIFICATION AND PARTS BREAKDOWN  
ASSEMBLY #14960



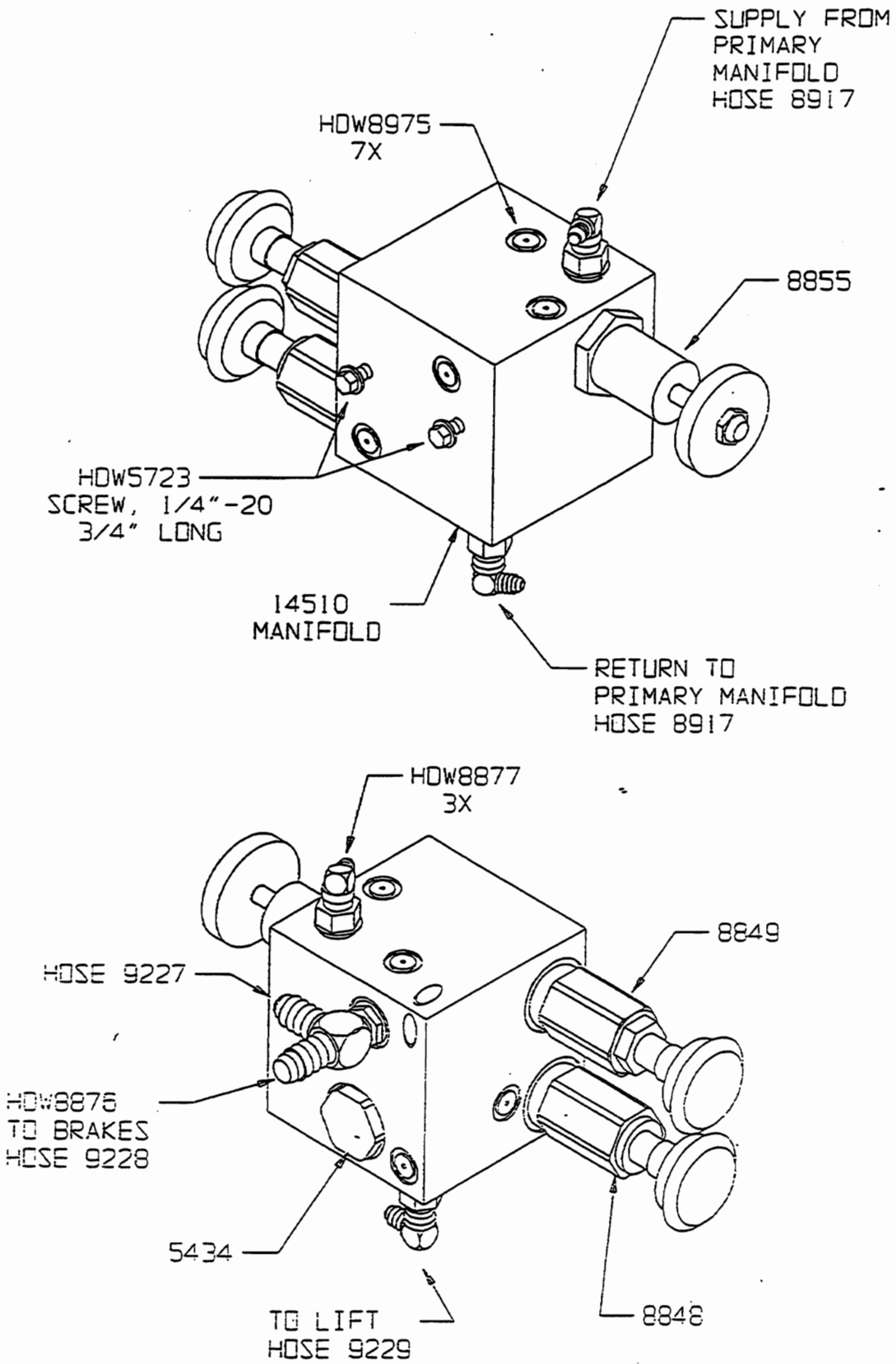
SECONDARY MANIFOLD IDENTIFICATION AND PARTS BREAKDOWN  
 ASSEMBLY # 14961



ART 738 R1  
 BM16058  
 8/21/98

Figure 7-4. 3072 4WD Secondary Manifold

# 14485 - EMERGENCY DOWN/BRAKE MANIFOLD



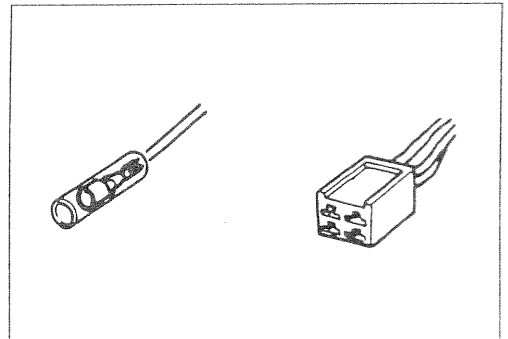
**Figure 7-5 3072 4WD Emergency Down/Brake Manifold**

## Precautions

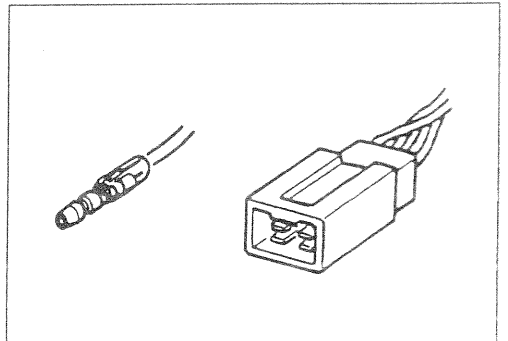
There are a number of important precautions that are musts when servicing electrical systems. Learn and observe all the rules below.

- Do not reverse the battery lead connections. This will burn out the diodes in the electrical parts.
- Always check battery condition before condemning other parts of an electrical system. A fully charged battery is a must for conducting accurate electrical system tests.
- The electrical parts should never be struck sharply, as with a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- To prevent damage to electrical parts, do not disconnect the battery leads or any other electrical connections when the engine switch is on, or while the engine is running.
- Because of the large amount of current, never keep the engine switch turned to the start position when the starter motor will not turn over, or the current may burn out the starter motor windings.
- Take care not to short the leads that are directly connected to the battery positive (+) terminal to the chassis ground.
- Troubles may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the failure. If the failure was brought on by some other item or items, they too must be repaired or replaced, or the replacement part will soon fail again.
- Make sure all connectors in the circuit are clean and tight, and examine wires for signs of burning, fraying, etc. Poor wires and bad connections will affect electrical system operation.
- Measure coil and winding resistance when the part is cold (at room temperature).
- Electrical Connectors:

Female Connectors



Male Connectors



## 7-10 ELECTRICAL SYSTEM

### Charging System

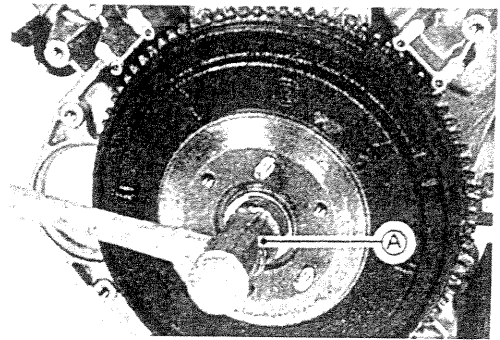
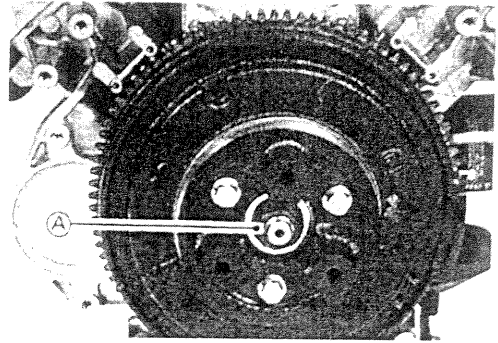
#### Alternator Rotor and Stator Removal

- Remove the followings.
  - Radiator
  - Cooling Fan
  - Starter Motor
  - Pulser Coils
  - Fan Drive Sheave/Hub
- Hold the rotor (flywheel) with a suitable tools, remove the flywheel mounting nut.
- Alternator rotor (Flywheel):
- Using a flywheel puller, remove the flywheel.
  - A. Flywheel Nut

#### NOTE

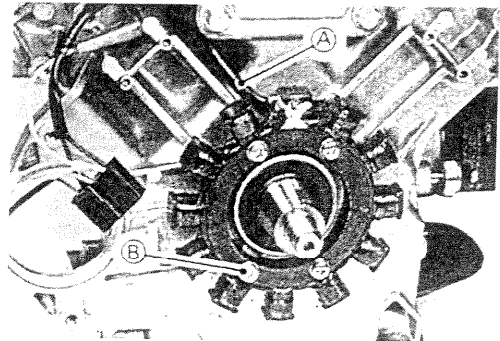
- If a flywheel puller is not available, screw the flywheel mounting nut flush with the shaft end to prevent damaged shaft end threads and tap sharply and squarely on the nut to break the flywheel loose. Flywheel will loosen.

- A. Tap sharply and Squarely



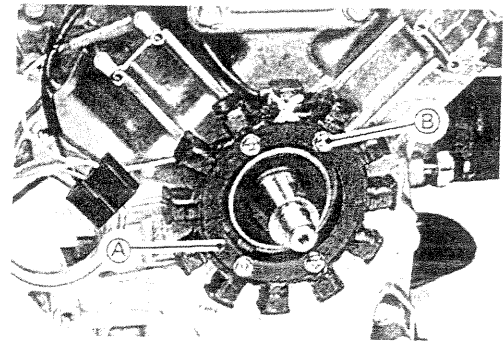
#### Alternator Stator (Charging Coil):

- Note the charging coil output leads position for reinstalling the charging coil.
- Unscrew the coil mounting screws and remove the charging coil.
  - A. Charging Coil Output Leads
  - B. Mounting Screws



#### Alternator Rotor and Stator Installation

- Clean the inside of the flywheel and end of the crankshaft or the taper will not fit snugly.
- Fit the flywheel onto the crankshaft taper so that the woodruff key fits in the key way in the hub of the flywheel.
- Torque the following.
  - Alternator Rotor Nut
- Tighten the nut to the specified torque once, loosen it, and then retighten it to the specified torque (see Exploded View).
  - Alternator Stator
- To reset the charging coil core onto the mounting flanges, firmly push the charging coil assembly against the mounting flanges and tighten the screws securely.
  - A. Mounting Flanges
  - B. Mounting Screws



*Charging System Operational Inspection*

- Check battery condition.

**NOTE**

○ Always check battery condition before condemning other parts of the charging system. The battery must be fully charged in order to conduct accurate charging system tests.

- Warm up the engine to bring the components up to their normal operating temperatures.
- Measure regulated output voltage at various engine speeds.
- Connect a voltmeter across the battery terminals.
- ★ The readings should show nearly battery voltage when the engine speed is low, and as the engine speed rises, the readings should also rise. But they must stay within the specified range.
- ★ If the output voltage is much higher than the specification, the regulator is defective, or the regulator leads are loose or open.
- ★ If the output voltage does not rise as the engine speed increase, the regulator is defective or the alternator output is insufficient for the loads.

**Regulated Output Voltage**

**Battery Voltage to 15 VDC**

*Stator Coil Resistance*

- Disconnect the PACKARD 6P connector.
- Measure the stator coil resistance.
- Connect an ohmmeter between stator pins.

**Stator Coil Resistance**

**0.11 to 0.18  $\Omega$**

- ★ If the meter does not read as specified, replace the alternator stator.
- ★ If the coil has normal resistance, but the voltage inspect showed the alternator to be defective; the rotor magnets have probably weakened, and the rotor must be replaced.

1. To Stator
2. Ohm Meter
3. PACKARD 6P connector

- Check for continuity between each stator pin and ground. There should be no continuity (infinite ohm).

- ★ If the stator coil fails any of these tests, replace the coil with a new one.

1. To Stator
2. PACKARD 6P Connector

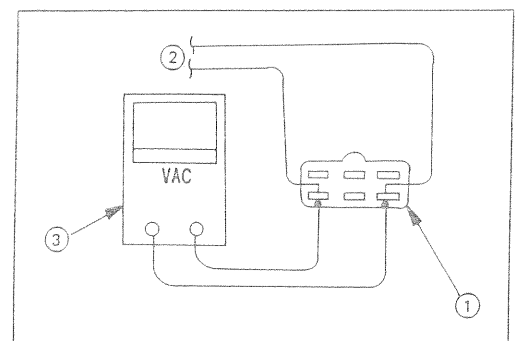
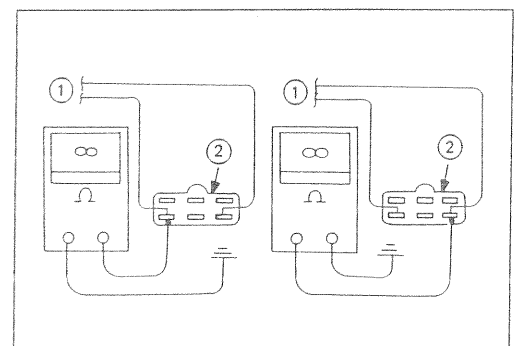
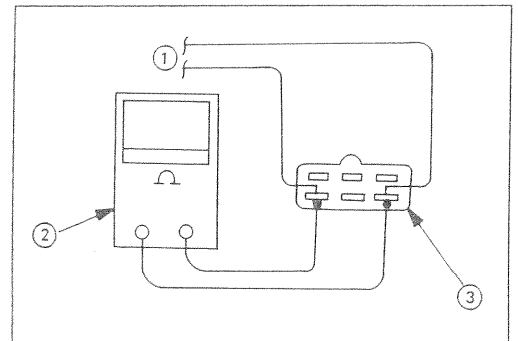
*Unregulated Stator Output*

- Disconnect the PACKARD 6P connector.
- Connect AC voltmeter to the stator pins.
- Start the engine. Run the engine at the 3 000 rpm speed.
- Voltage reading should be minimum 26 VAC/3 000 rpm.
- ★ If the AC voltage reading is less than the specification replace the stator.

**Unregulated Stator Output (MIN)**

**26 VAC/3 000 rpm**

1. PACKARD 6P Connector
2. To Stator
3. AC Voltmeter



## 7-12 ELECTRICAL SYSTEM

### Regulator Resistance

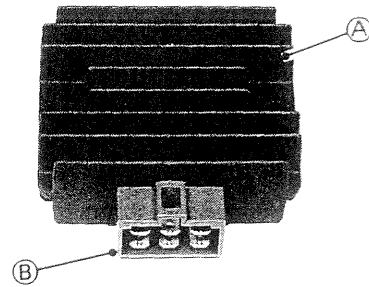
- Set the KAWASAKI multimeter selector switch to the R x 100 Ω position.
- Connect the test leads to the points shown on the chart and read the resistance.
- ★ If the resistance is not as specified replace the regulator.

#### NOTE

○ This voltage regulator is an open type one.

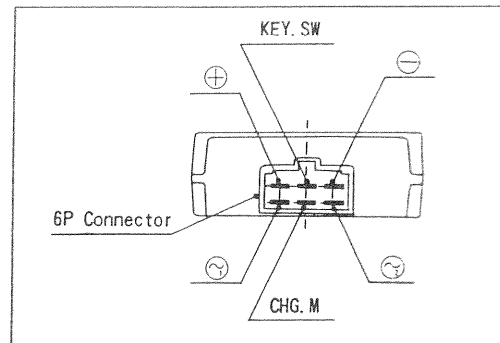
A. Regulator

B. 6P Connector



Range: R x 100 Ω By KAWASAKI TESTER

(-) TESTER (+)	~ 1	~ 2	+	-	Key.SW	CHG.M
~ 1	--	10kΩ ~ 1MΩ	∞	50Ω ~ 5kΩ	1kΩ ~ 200kΩ	1kΩ ~ 200kΩ
~ 2	10kΩ ~ 1MΩ	--	∞	50Ω ~ 5kΩ	1kΩ ~ 200kΩ	1kΩ ~ 200kΩ
+	∞	∞	--	∞	∞	∞
-	10kΩ - 1MΩ	10kΩ 1MΩ	∞	--	500Ω ~ 50kΩ	500Ω ~ 50kΩ
Key.SW	∞	∞	∞	∞	--	∞
CHG.M	10kΩ ~ 1MΩ	10kΩ ~ 1MΩ	∞	50Ω ~ 5kΩ	1kΩ ~ 200kΩ	--

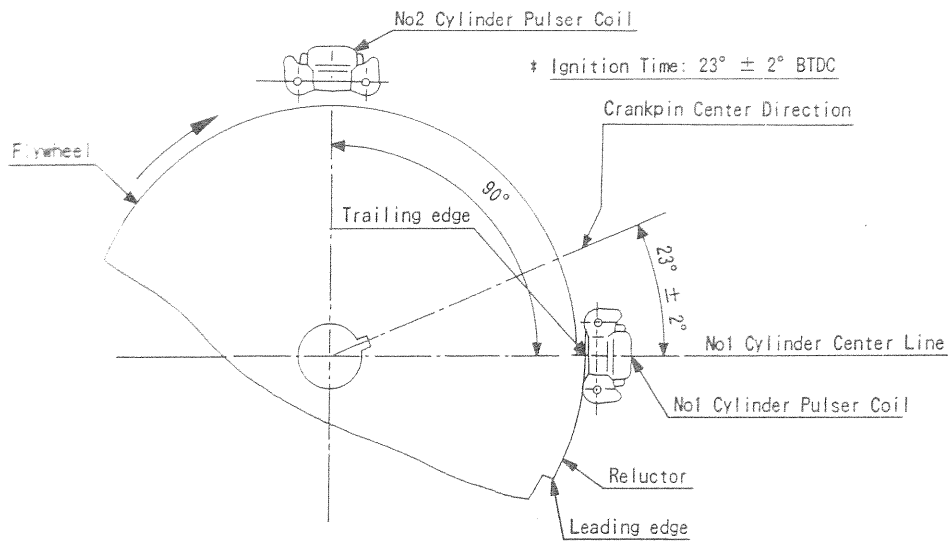
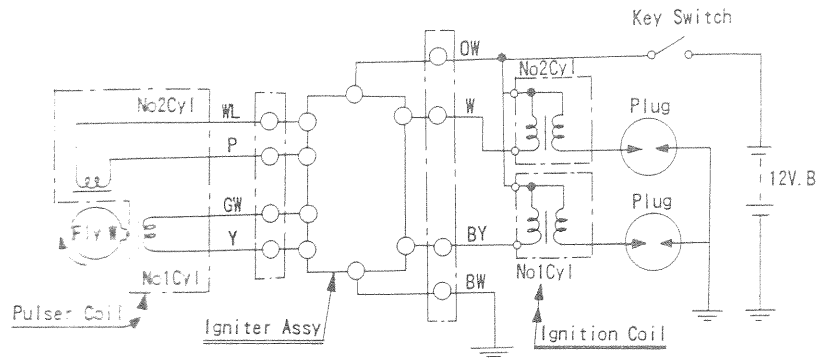


#### NOTE

○ Resistance value may vary with individual meters.



## Ignition System



Transistor controlled battery ignition system is used in this engine. This ignition system is essentially a battery-ignition coil system where the battery supplies the current to the primary circuit in the system. This ignition system is transistorized and controls the current for the primary circuit by use of an electronic switching unit integrated into the igniter. The switching unit is triggered by the pulser coils (pick up coils) on each cylinder and contains no mechanical parts. This system consists of the following components.

- Ignition coil units
- Igniter (ignition Control Unit)
- Flywheel reluctor
- Pulser coils (pick up coils)
- 12 V Battery
- Spark plugs

As the starter turns the flywheel, the reluctor in the flywheel runs past the pulser coils, this creates a magnetic field in the pulser coils and close the switching unit in the igniter and allow the current flow through the primary circuit in the ignition coils.

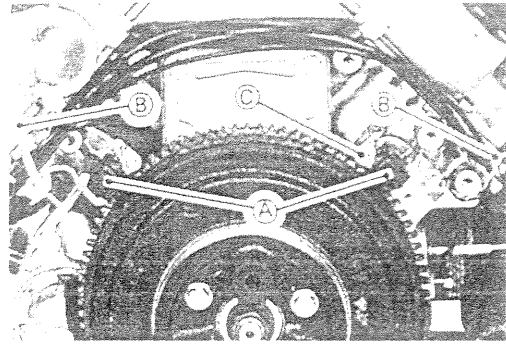
As the flywheel turns, the trailing reluctor passes under pulser coils, opening switching unit in the igniter and causing the primary coil current to stop suddenly. This creates an induced high voltage in a secondary coil windings, which fire the spark plugs.

Each spark plug fires every time the piston rises. When a spark does jump across the electrodes during the exhaust stroke, it will not affect on engine operation, since there is no compression and no combustible fuel/air mixture. The transistor controlled ignition system contains no mechanical parts, no wear occurs and no periodic maintenance is required except for the spark plug.

## Pulser Coil Removal

- Remove:
  - Radiator and its Brackets
  - Flywheel Cover
  - Cooling Fan and its Brackets
- Disconnect the wire ties.
- Unscrew the pulser coil mounting screws and pull the pulser coils out of the cylinder block and leave them there.
- Disconnect the 4P coupler of the pulser coil leads end.
- Take off the pulser coils and its wire leads together.

- A. Pulser Coils
- B. Wire Tie
- C. Mounting Screws



## Installation Notes

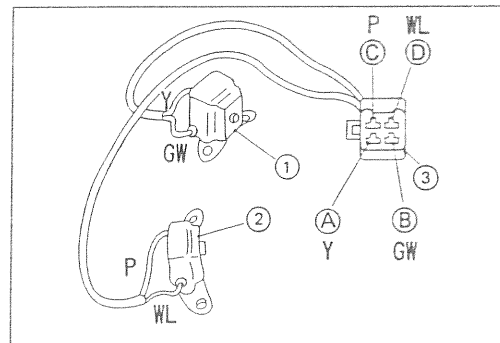
- Installation is the reverse of removal.
- The pulser coils are mounted in a fixed position on each cylinder. No adjustment of the coil air gaps are required.
- When installing the coils on each cylinder, do not take the coil for another noting the wire color (see Wiring Diagram in this chapter).

### Pulser Coil Air Gap (STD)

0.3 to 1.2 mm (0.012 to 0.05 in.)

## Pulser Coil Resistance

- Set the KAWASAKI multimeter selector switch to the  $R \times 1 \Omega$  position.
- Connect the test leads to the points shown on the chart and read the resistance.
- ★ If the resistance is not as specified replace the pulser coil.



Resistance Between	
[A] and [B]	[C] and [D]
85 $\Omega$ to 270 $\Omega$	85 $\Omega$ to 270 $k\Omega$
←----- R $\times$ 1 $\Omega$ ----->	

### NOTE

○ Resistance value may vary with individual meters.

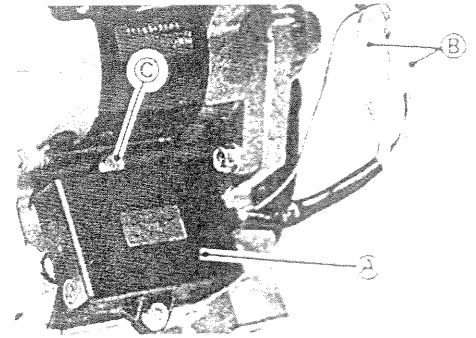
#### Wire Color

- Y : Yellow
- P : Pink
- GW : Green/White
- WL : White/Blue

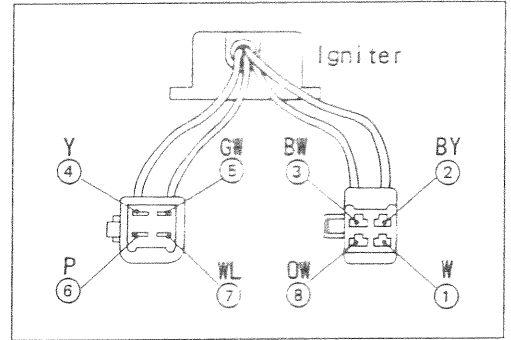
**Igniter Inspection**

- Remove the igniter.
- Unfasten the igniter lead connectors.
- Unscrew the mounting screws and remove the igniter.

- A. Igniter
- B. Lead Connectors (4P Couplers)
- C. Mounting Screws



- To inspect the igniter resistance, perform the following.
- Set the KAWASAKI multimeter selector switch to the R x 1 kΩ position.
- Connect the test leads to the points shown on the chart and drawing and read the resistance.
- ★ If the meter readings are not as specified, replace the igniter.



**CAUTION**

Use only Kawasaki hand tester (special tool: 57001-983) for this test. A tester other than the Kawasaki hand tester may show different readings.  
If a megger or a meter with a large-capacity battery is used, the igniter will be damaged.

Meter Range : kΩ  
Ambient Temperature (20 °C)

kΩ	Terminal	Tester (+) Terminal (Red)							
		1	2	3	4	5	6	7	8
(-)*	1	-	∞	1 ~ 8kΩ	4 ~ 16	2 ~ 8	4 ~ 16	2 ~ 8	2 ~ 10
	2	∞	-	1 ~ 8	4 ~ 16	2 ~ 8	4 ~ 16	2 ~ 8	2 ~ 10
	3	∞	∞	-	1 ~ 6	0	1 ~ 6	0	0.5 ~ 2
	4	∞	∞	1 ~ 6	-	0	3 ~ 12	1 ~ 6	2 ~ 8
	5	∞	∞	0	1 ~ 6	-	1 ~ 6	0	0.5 ~ 2
	6	∞	∞	1 ~ 6	3 ~ 15	0.5 ~ 2	-	1 ~ 6	1 ~ 6
	7	∞	∞	0	1 ~ 6	2 ~ 8	1 ~ 6	-	0.5 ~ 2
	8	∞	∞	0.5 ~ 2	2 ~ 8	0.5 ~ 2	2 ~ 8	0.5 ~ 2	-

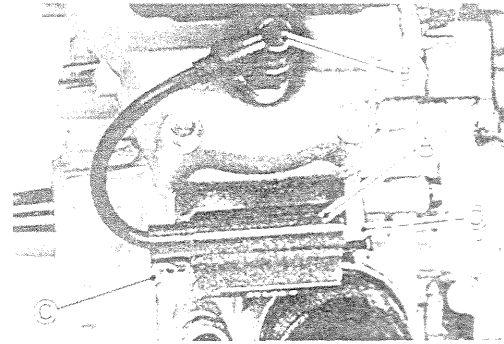
(-)\*: Tester (-) Terminal (Black)

Wire Color	
W:	White
BY:	Black/yellow
BW:	Black/White
Y:	Yellow
GW:	Green/White
P:	Pink
WL:	White/Blue
OW:	Orange/White

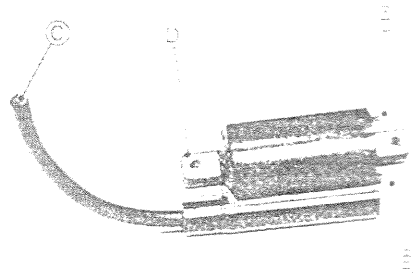
*Ignition Coil Inspection*

- Remove the ignition coils.
- Disconnect the plug caps.
- Disconnect the primary coil lead terminals.
- Unscrew the mounting bolts and take off the ignition coils.

- A. Ignition Coils
  - B. Plug Caps
  - C. Mounting Bolts
  - D. Primary Coil Lead Terminals
- (Not Cylinder's Ignition Coil Shown)

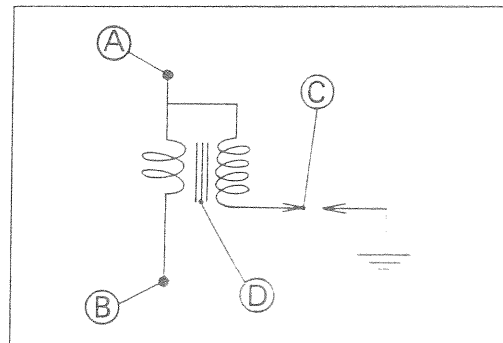


- Unfasten the plug cap from the high tension lead.
- Set the KAWASAKI multimeter selector switch to the specified range.
- Connect the test leads to the points shown on the chart and drawing and read the resistance. If the meter reading falls within the values shown in the chart, the coil is functioning properly.



Resistance Between	
[A] and [B]	[A] and [C]
3.4 Ω to 4.6 Ω	10.4 Ω to 15.6 kΩ
←----- R × 1 Ω -----→	←----- R × 1 kΩ -----→

Resistance Between	
[A (or[B])] and [D]	[C] and [D]
∞	∞
←----- R × 1 kΩ -----→	



- ★ If the meter does not read as specified, replace the coil.
- ★ If the meter reads as specified, the ignition coil windings are probably good. However, if the ignition system still does not perform as it should after all other components have been checked, replace the coil with one known to be good.
- Check the spark plug lead for visible damage.
- ★ If the spark plug lead is damaged, replace the coil.

*Spark Plug Cleaning and Inspection*

- Carefully pull the plug cap from the spark plug, and remove the spark plug.
- ★ If the plug is oily or has carbon built up on it, clean the plug using a high flash-point solvent and a wire brush or other suitable tool.
- ★ If the spark plug electrodes are corroded or damaged, or if the insulator is cracked, replace the plug. Use the standard spark plug or its equivalent.

- 1. Insulator
- 2. Center Electrode
- 3. Plug Gap
- 4. Side Electrode

