

# ML2000 TYPICAL APPLICATION DRAWING (FOR REFERENCE ONLY)

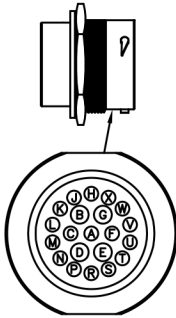
DRAWING SHOWN BELOW IS TYPICAL USAGE ONLY, INPUTS AND OUTPUTS CAN BE CONFIGURED BY THE USER FOR MULTIPLE APPLICATIONS. SEE MPC-20 OPERATIONS MANUAL FOR DETAILS.

ENGINE CONNECTOR

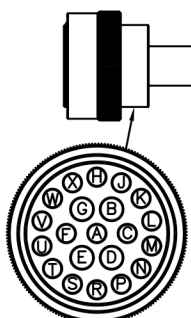
- [V] CAN HI
- [U] CAN LO
- [F] CAN SHIELD
- [E] BATT (-) 14 GA.
- [B] BATT (+) 14 GA.
- [D] RLY1 (START SOL) 16 GA.
- [G] RLY2 (FUEL/EQU) 16 GA.
- [J] RLY2 (ALT EXCITE)
- [Y] FREQ INPUT
- [S] DO6 (THROTTLE INC)
- [R] DO5 (THROTTLE DEC)
- [L] AN OUT, 0-5V (ANALOG THROTTLE)
- [W] AN2 (COOLANT TEMP, SENDER)
- [X] AN1 (OIL PRESSURE, SENDER)

CAN HI  
CAN LO  
CAN SHIELD

ENGINE ECU  
REFER TO ENGINE  
MANUFACTURER  
DOCUMENTATION



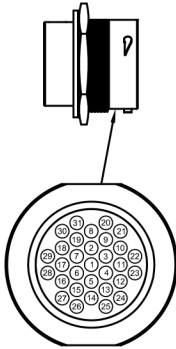
21 POSITION CONNECTOR  
DEUTSCH: HDP24-24-21PE  
FW MURPHY: 00-00-7681



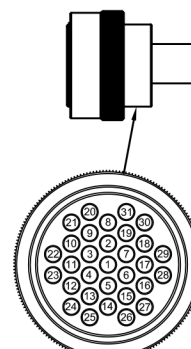
21 POSITION CONNECTOR  
DEUTSCH: HDP26-24-21SE  
FW MURPHY: 00-00-8788

ML2000  
CONNECTORS  
PANEL SIDE

ML2000  
CONNECTORS  
HARNES SIDE



31 POSITION CONNECTOR  
DEUTSCH: HDP24-24-31PE  
FW MURPHY: 00-00-9286



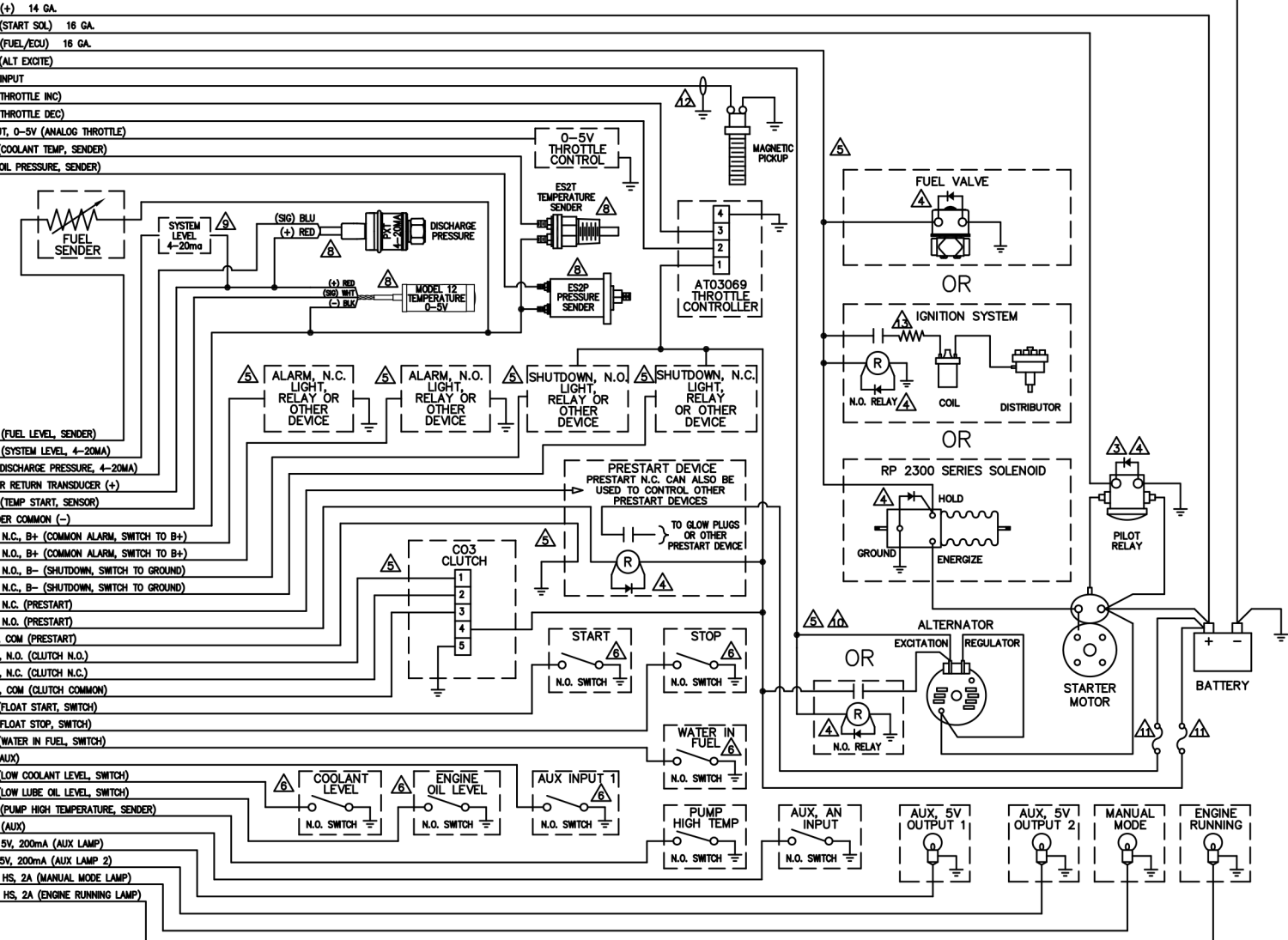
31 POSITION CONNECTOR  
DEUTSCH: HDP26-24-31SE  
FW MURPHY: 00-00-9287

- [28] AN6 (FUEL LEVEL, SENDER)
- [28] AN4 (SYSTEM LEVEL, 4-20MA)
- [8] AN3 (DISCHARGE PRESSURE, 4-20MA)
- [1] SENDER RETURN TRANSDUCER (+)
- [12] AN7 (TEMP START, SENSOR)
- [27] SENDER COMMON (-)
- [2] RLY3, N.C., B+ (COMMON ALARM, SWITCH TO B+)
- [8] RLY3, N.O., B+ (COMMON ALARM, SWITCH TO B+)
- [6] RLY4, N.O., B- (SHUTDOWN, SWITCH TO GROUND)
- [5] RLY4, N.C., B- (SHUTDOWN, SWITCH TO GROUND)
- [4] RLY6, N.C. (PRESTART)
- [7] RLY6, N.O. (PRESTART)
- [11] RLY6, COM (PRESTART)
- [19] RLY5, N.O. (CLUTCH N.O.)
- [18] RLY5, N.C. (CLUTCH N.C.)
- [17] RLY5, COM (CLUTCH COMMON)
- [23] DI2 (FLOAT START, SWITCH)
- [14] DI3 (FLOAT STOP, SWITCH)
- [22] DI6 (WATER IN FUEL, SWITCH)
- [21] DI1 (AUX)
- [29] DI4 (LOW COOLANT LEVEL, SWITCH)
- [20] DI5 (LOW LUBE OIL LEVEL, SWITCH)
- [10] AN5 (PUMP HIGH TEMPERATURE, SENDER)
- [25] AN8 (AUX)
- [15] DO1, 5V, 200mA (AUX LAMP)
- [16] DO2, 5V, 200mA (AUX LAMP 2)
- [13] DO3, HS, 2A (MANUAL MODE LAMP)
- [24] DO4, HS, 2A (ENGINE RUNNING LAMP)

NOTES:

1. ALL WIRE 18 GA WHITE UNLESS OTHERWISE NOTED.
2. TWISTED WIRES OR SHIELDED, TWISTED WIRES. APPROXIMATELY ONE TWIST PER INCH.
3. A PILOT RELAY MUST BE USED TO ENGAGE STARTER. RELAY COIL MUST DRAW LESS THAN 10 AMPS.
4. INSTALL FLY BACK DIODES AS SHOWN TO REDUCE THE POTENTIAL OF VOLTAGE SPIKES DAMAGING SOLID STATE COMPONENTS.
5. MAXIMUM CURRENT 10AMP FOR EACH RELAY RLY1 TO RLY6. RLY1, RLY2 AND RLY3 COMBINED CURRENT NOT TO EXCEED 15AMP.
6. ALTERNATIVELY, FOR DIGITAL INPUTS 1, 2, 3, 4, 5, 6 (DI1, DI2, DI3, DI4, DI5, DI6), THE GROUND (-) CONTACT ON THE SWITCH CAN BE REPLACED WITH BATTERY POSITIVE.

- 7. NUMBERS & LETTERS IN [ ] REFER TO CONNECTOR POSITION.
- 8. RECOMMENDED FW MURPHY TRANSDUCERS.
- 9. CUSTOMER SUPPLIED 4-20MA LEVEL TRANSDUCER.
- 10. AN ALTERNATOR EXCITATION DIODE IS INSTALLED INSIDE PANEL. IF ALTERNATOR EXCITATION DRAWS MORE THAN 1 AMP, A RELAY MUST BE USED.
- 11. INSTALL APPROPRIATELY SIZED FUSE OR CIRCUIT BREAKER.
- 12. CONNECT SHIELD OF MAGNETIC PICKUP WIRE TO GROUND.
- 13. USE BALLAST RESISTOR OF 0.85 - 1.82 OHMS.
- 14. DO NOT RUN AC AND DC WIRES TOGETHER IN SAME BUNDLE.
- 15. N.O. = "NORMALLY OPEN".
- 16. N.C. = "NORMALLY CLOSED".



sales@murcal.com 661-272-4700

DRAWN BY: WW/JCB	E.R.NO. IPD
DATE: 07/01/2015	CHKD. BY: AU
MODEL: APPLICATION DRAWING ML2000	APPD. BY: AU
DRAWING NO. 00-02-0970	SIZE C
	REV. A