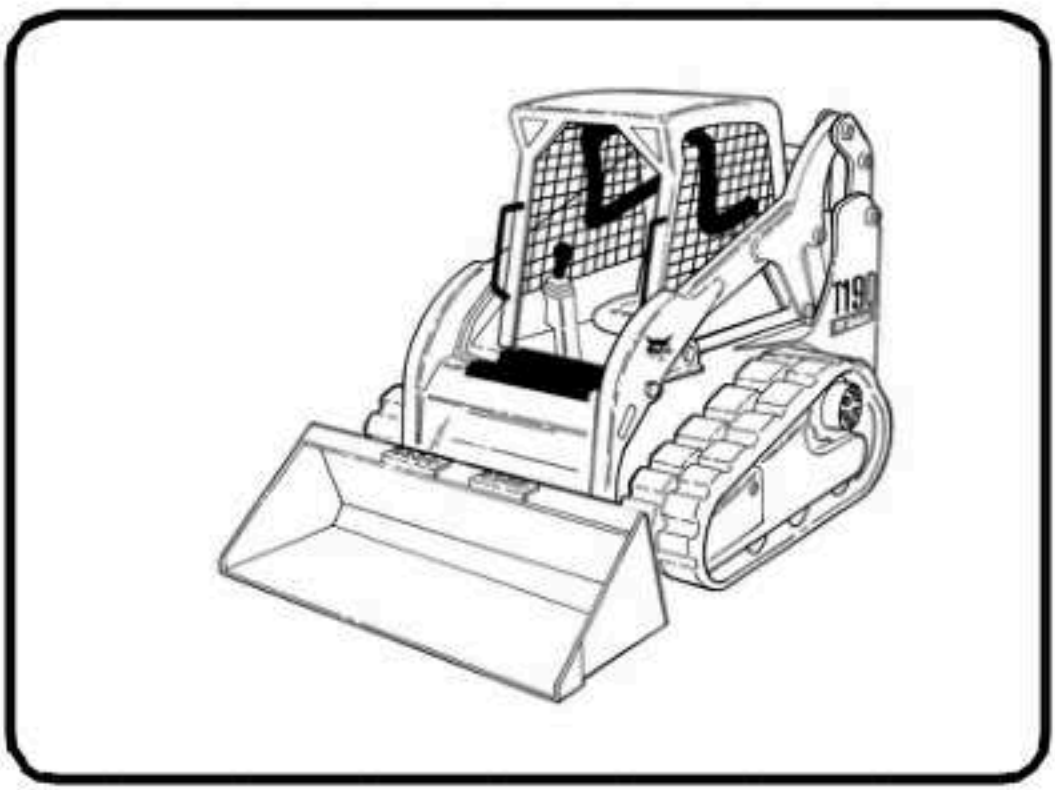
Bobcat®

# Service Manual
# T190 Track Loader

**S/N 531611001 - 531659999**
**S/N 531711001 - 531759999**



**EQUIPPED WITH BOBCAT INTERLOCK CONTROL SYSTEM (BICS)**

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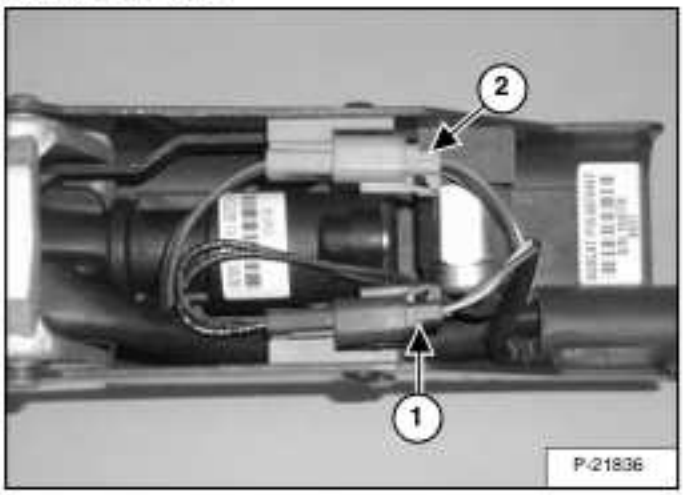


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### Handle Lock Solenoid Removal And Installation

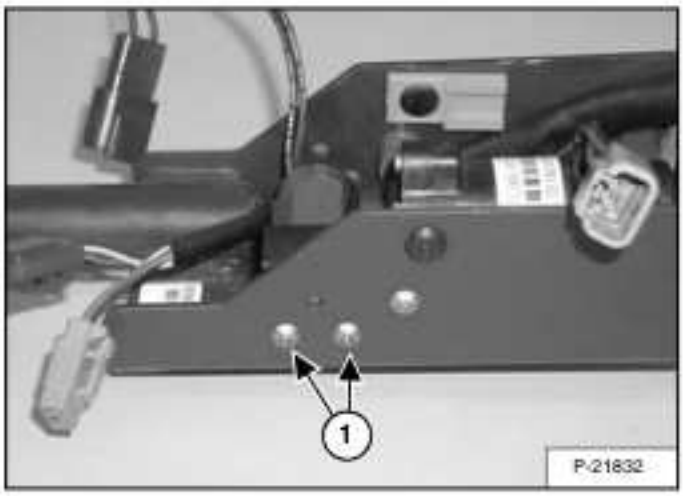
**Figure 60-130-24**




Disconnect the harness connector (Item 1) **[Figure 60-130-24]** from the handle sensor connector.

Disconnect the harness connector (Item 2) **[Figure 60-130-24]** from the handle lock solenoid connector.

**Figure 60-130-25**



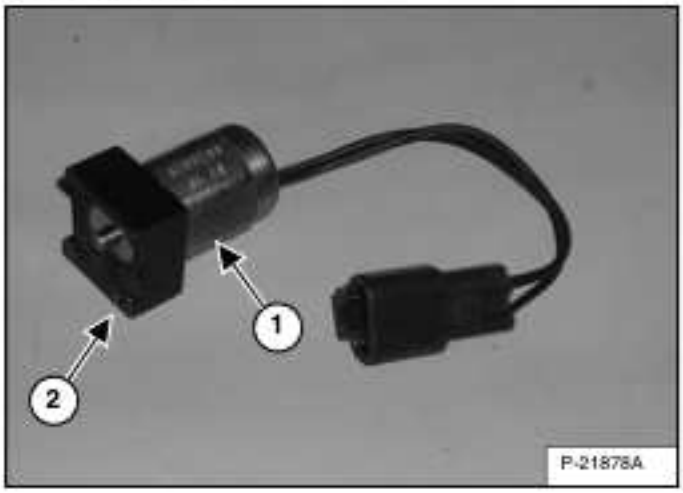

Remove the two screws (Item 1) **[Figure 60-130-25]** holding the handle lock solenoid to the handle.

***Installation:*** Tighten the screws to 32 - 38 in.-lb. (3,6 - 4,3 N•m) torque.

Remove handle lock solenoid assembly from handle.

### Handle Lock Solenoid Disassembly And Assembly

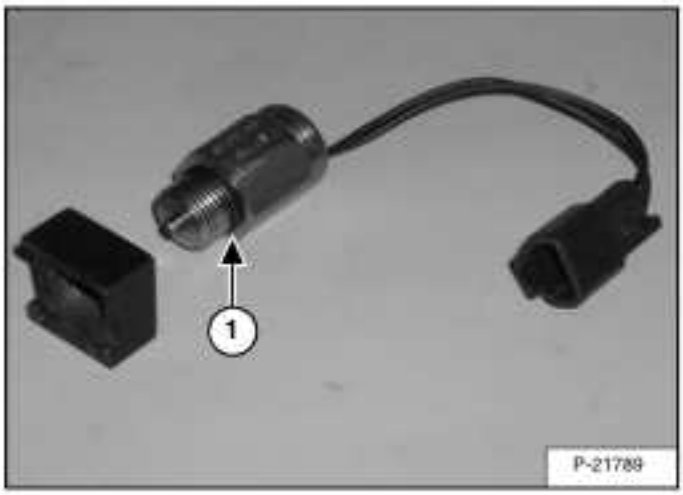
**Figure 60-130-26**




Remove solenoid (Item 1) from the solenoid mount (Item 2) **[Figure 60-130-26]**.

***Installation:*** Apply a drop of oil to the solenoid threads and tighten solenoid to 35 - 40 ft.-lb. (47 - 54 N•m) lubed torque.

**Figure 60-130-27**




Check the O-ring (Item 1) **[Figure 60-130-27]** for damage. Replace as necessary.



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## Engine Specifications (Cont'd)

***All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parentheses.***

### Cylinder Liner

| | |
|---|---|
| Cylinder Bore I.D. | 3.4252 - 3.4261 (87,000 - 87,022) |
| Allowable Limit | +0.0059 (+0,15) |
| Oversized Cylinder Liner (Bore) I.D. | 3.4350 - 3.4359 (87,250 - 87,272) |
| Allowable Limit | +0.0059 (+0,15) |

### Piston Rings

| | |
|---|---|
| Ring Gap (Top Ring) | 0.0079 - 0.0138 (0,2 - 0,35) |
| Allowable Limit | 0.0492 (1,25) |
| Ring Gap (2nd Ring) | 0.0157 - 0.0217 (0,4 - 0,55) |
| Allowable Limit | 0.0492 (1,25) |
| Ring Gap (Oil Ring) | 0.0098 - 0.0177 (0,25 - 0,45) |
| Allowable Limit | 0.0492 (1,25) |
| Side Clearance of Ring Groove: | |
| Second Ring | 0.0037 - 0.0050 (0,093 - 0,128) |
| Allowable Limit | 0.20 (0,0079) |
| Oil Ring | 0.0008 - 0.0021 (0,02 - 0,060) |
| Allowable Limit | 0.0059 (0,15) |

### Pistons

| | |
|---|---|
| Piston Pin Bore | 0.9843 - 0.9848 (25,0 - 25,013) |
| Allowable Limit | 0.9862 (25,05) |

### Connecting Rod

| | |
|---|---|
| Piston Pin O.D. | 0.9843 - 0.9847 (25,002 - 25,011) |
| Small End Bushing I.D. | 0.9852 - 0.9858 (25,025 - 25,04) |
| Clearance Between Piston Pin & Small End Bushing | 0.0006 - 0.0015 (0,014 - 0,038) |
| Allowable Limit | 0.0059 (0,15) |
| Connecting Rod Alignment Allowable Limit | 0.002 (0,05) |

### Oil Pump

| | |
|---|---|
| Oil Pressure @ Rated RPM | 43-64 PSI (294-441 kPa) |
| Allowable Limit | 36 PSI (245 kPa) |
| Idle Speed Allowable Limit | 7 PSI (49 kPa) |
| Clearance Between Inner Rotor & Outer Rotor | 0.0012 - 0.0055 (0,03 - 0,14) |
| Clearance Between Outer Rotor & Pump Body | 0.0043 - 0.0075 (0,11 - 0,19) |
| End Clearance Between Inner Rotor & Cover | 0.0041 - 0.0059 (0,105 - 0,15) |



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**Gauge Pressure Related Troubleshooting**

Normal compressor suction (low side) and discharge (high side) pressure at ambient temperatures of 86-96 degrees F (30-38 degrees C) and compressor speed of approximately 2000 RPM are:

**High pressure side pressure: 210-265 PSI**

**Low pressure side pressure: 15-33 PSI**

**As a rule of thumb, the high side pressure will be around eight times greater than the low side pressure.**

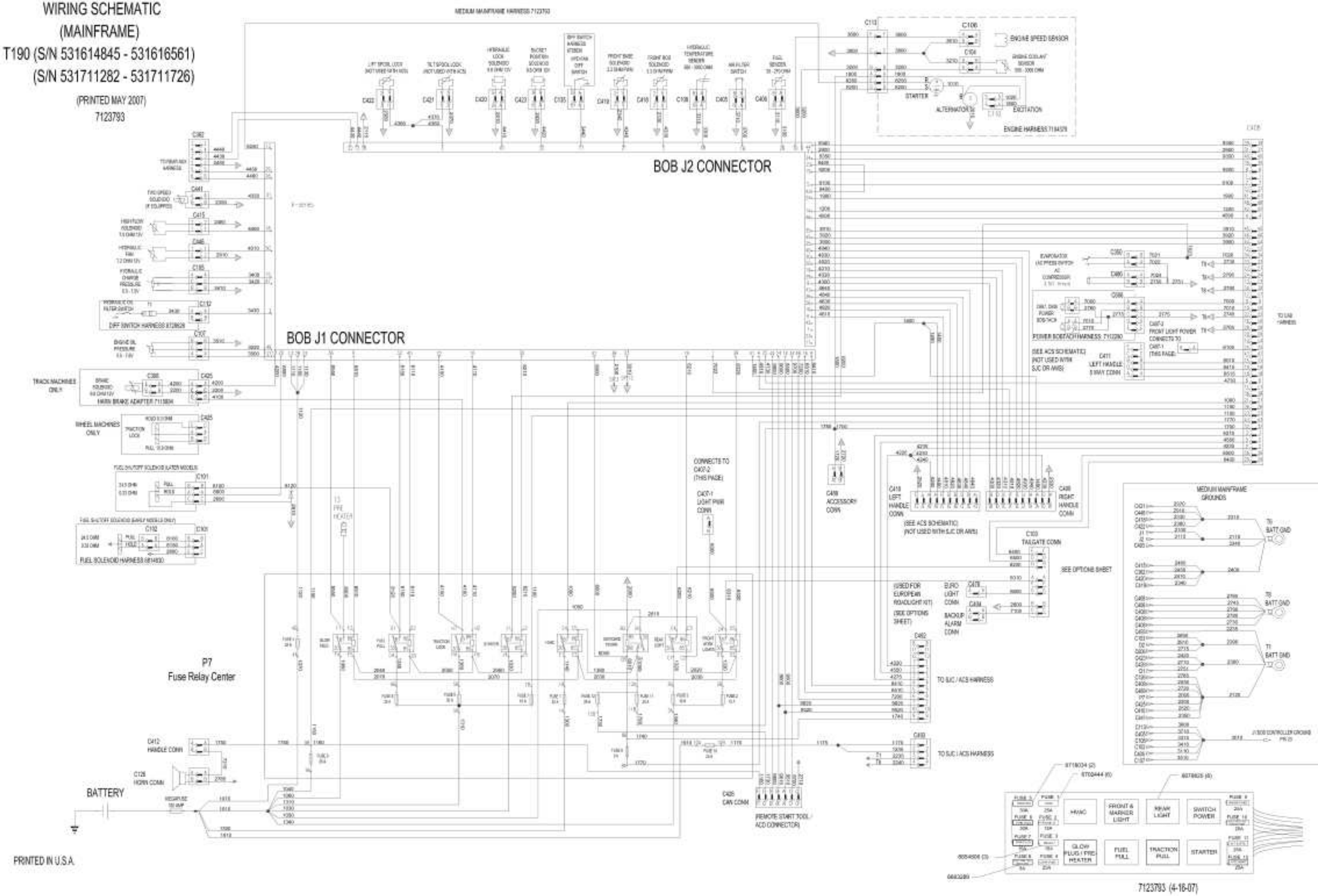
| Possible Cause | Inspection | Solution |
|---|---|---|
| **Low pressure side too high.** | The low pressure side pressure normally becomes too high when the high pressure side pressure is too high. As this is explained below, the following inspection is only used when the low pressure side is too high. | |
| 1. Expansion valve opens too far. | Frost is present on the suction hose. | Replace expansion valve. |
| 2. Defective compressor. | The high and low pressure side gauge pressures equalize when the compressor is engaged. | Replace compressor. |
| **Low pressure side Too low.** | | |
| 1. Low refrigerant charge. | The high side pressure will be low and bubbles may be present in sight glass on receiver drier. | Repair any leaks and recharge the refrigerant to the correct level. |
| 2. Clogged or closed expansion valve. | The expansion valve's inlet side is frosted. Moisture or other Contaminants can be the cause. | Clean or replace the expansion Valve. |
| 3. Restriction between drier and expansion valve. | Frost on the line between drier and expansion valve. A Negative low pressure reading may be shown. | Flush system or replace hose. |
| **High pressure side Too high.** | | |
| 1. Poor condenser performance. | Dirty or clogged condenser fins. Condenser fans not Operating. | Clean fins, and/or repair the fan. |
| 2. Excessive refrigerant. | The high pressure side pressure will be high. | Use refrigerant recovery equipment to capture excess refrigerant. Charge to the correct refrigerant level. |
| 3. Excessive oil charge. | The high pressure side will be high. | Evacuate system. Remove oil from condenser and compressor. Measure oil from compressor and add correct oil charge back into compressor. Flush system with nitrogen. Replace drier. |
| 4. Air in system. | Pressure is high on both high and low sides. | Evacuate and recharge with Refrigerant. |
| 5. Restriction in drier, condenser or high pressure line. | High pressure side will be high, and low pressure side will be low. | Evacuate and flush system replacing defective parts. |
| **High pressure side Too low.** | | |
| 1. Low refrigerant charge. | The high side pressure will be low and bubbles may be present in sight glass on receiver drier. | Repair any leaks and recharge the refrigerant to the correct level. |



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# WIRING SCHEMATIC
## (MAINFRAME)
## T190 (S/N 531614845 - 531616561)
## (S/N 531711282 - 531711726)

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