Troubleshooting Guide

TB120
diesel – gasoline – LPG

PRO100
diesel – gasoline – LPG

PRO126
diesel – gasoline – LPG

Snorkel

OmniQuip Snorkel INTERNATIONAL

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P/N 0191681
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GENERAL INFORMATION

This manual contains procedures for locating and correcting the majority of problems which may develop on the "Snorkelift" **TB120, PRO100** and **PRO126** aerial platforms.

For Troubleshooting the EMS System a separate diagnostic kit (P/N 0191548SRV) is available through your Snorkel dealer.

Since the majority of malfunctions experienced on equipment in the aerial platform industry are associated with the hydraulic and electrical systems, great effort has been made to develop a guide which insures that procedures regarding these areas are given the fullest possible attention and detail. As a result of these efforts, the aerial platform has been divided into eleven distinct groups with each group covered by an individual section. The Sections are as follows:

1.) Engine Diagnostics
2.) Hydraulic Pump Diagnostics
3.) Steering System Diagnostics
4.) Drive System Diagnostics
5.) Emergency Power System Diagnostics
6.) Swing System Diagnostics
7.) Platform Rotation System Diagnostics
8.) Platform Leveling System Diagnostics
9.) Boom Elevation System Diagnostics
10.) Fuel System Diagnostics
11.) Accessories Diagnostics

NOTES, CAUTIONS AND DANGERS

The terms ***NOTE***, ***CAUTION***, and ***DANGER*** appear throughout this manual and have specific meanings.

A ***NOTE*** provides additional or special information to make a step or procedure easier or clearer. Disregarding a ***NOTE*** might cause inconvenience, but would not cause equipment damage or personal injury.

A **⚠CAUTION** is provided in a procedure wherever minor personal injury or equipment damage could result. Disregarding a ***CAUTION*** could cause damage to the machine; however serious personal injury is unlikely.

⚠DANGER is the most serious and emphasizes areas where personnel injury and even death could result from negligence. Permanent mechanical damage is also highly probable. ***DANGER*** signs are to be taken seriously. In some cases, serious injury or death has resulted from disregarding a ***DANGER.***

NOTE: Engine maintenance and troubleshooting information not contained in this manual may be found in the engine maintenance manual originally provided with the machine, or from the Engine Manufacture/Dealer Network.

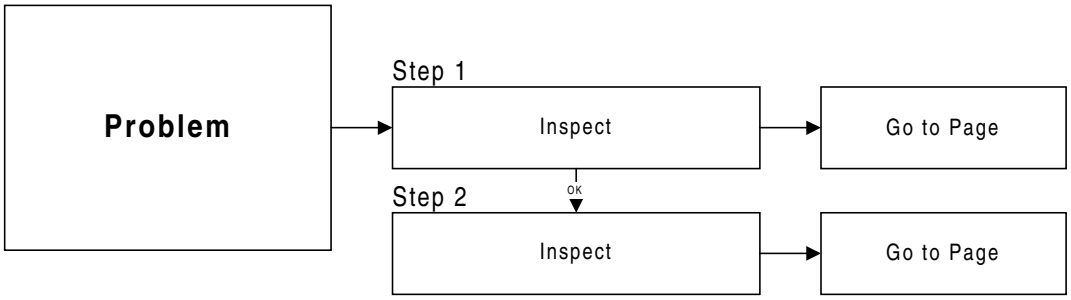
It should be recognized that every person who performs testing and diagnostic procedures and every person supervising any of these functions must be properly trained and qualified. If a problem should occur which is not covered by this manual or which cannot be corrected using the listed corrective actions, technically qualified guidance from the Service Department of Snorkel International Inc., should be obtained prior to proceeding further. Tel: (816) 364-0317

NOTE: Diagnostic procedures basically consist of a logical process of elimination. For this reason, it is very important that the steps be performed in the order in which they are presented. Always begin by localizing the problem and defining the symptoms as accurately as possible. When the problem has been localized, make sure to completely read and comprehend the appropriate flow chart. Do not attempt to make shortcuts.

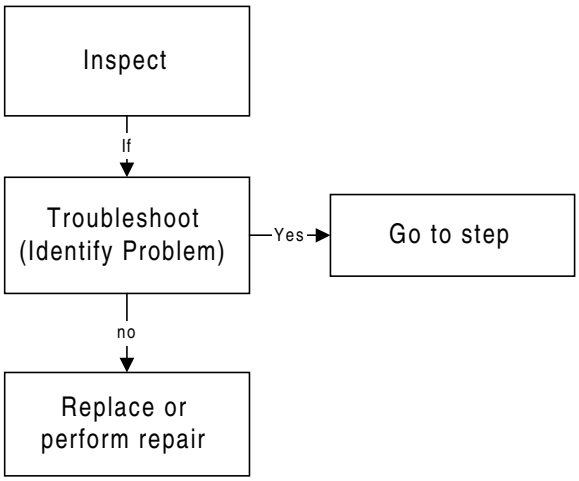
MANUAL DESIGN

Each symptom described is followed by a list of inspections to be performed. Each inspection is in the form of a flowchart. A set of detailed checks are then performed at the component and/or related areas which confirm or decline the outcome. If the inspection is declined the flowchart will refer to the next step to be performed until the problem is confirmed. The diagnosis then enables a determination.

Example: Problem Solving Procedure



Example: Flowchart Procedure



EQUIPMENT NEEDED:

Multimeter: A meter designed to read voltage, amperage and resistance.

Pressure Test Gauge: A pressure gauge rated for 0 - 1000 psi.

A pressure gauge rated for 0 - 5000 psi.

Tachometer: A meter designed to measure engine RPM on gas and/or diesel.

(Photo Tachometer is recommended)

Flowmeter: A meter designed to measure fluid flow.

Stopwatch: A tool designed to measure time.

SYMPTOM ***PAGE NUMBER***

Section One - Engine Diagnostics

Section Two - Hydraulic Diagnostics

Section Three - Steering System Diagnostics

SYMPTOM ***PAGE NUMBER***

Section Four - Drive System Diagnostics

Section Five - Emergency Power System Diagnostics

Section Six - Swing System Diagnostics

SYMPTOM **PAGE NUMBER**

Section Seven - Platform Rotation System Diagnostics

Section Eight - Platform Leveling System Diagnostics

Section Nine - Boom Elevation System Diagnostics

Section Ten - Fuel System Diagnostics

Section Eleven - Accessories Diagnostics

SECTION ONE: ENGINE DIAGNOSTICS

Chart 1

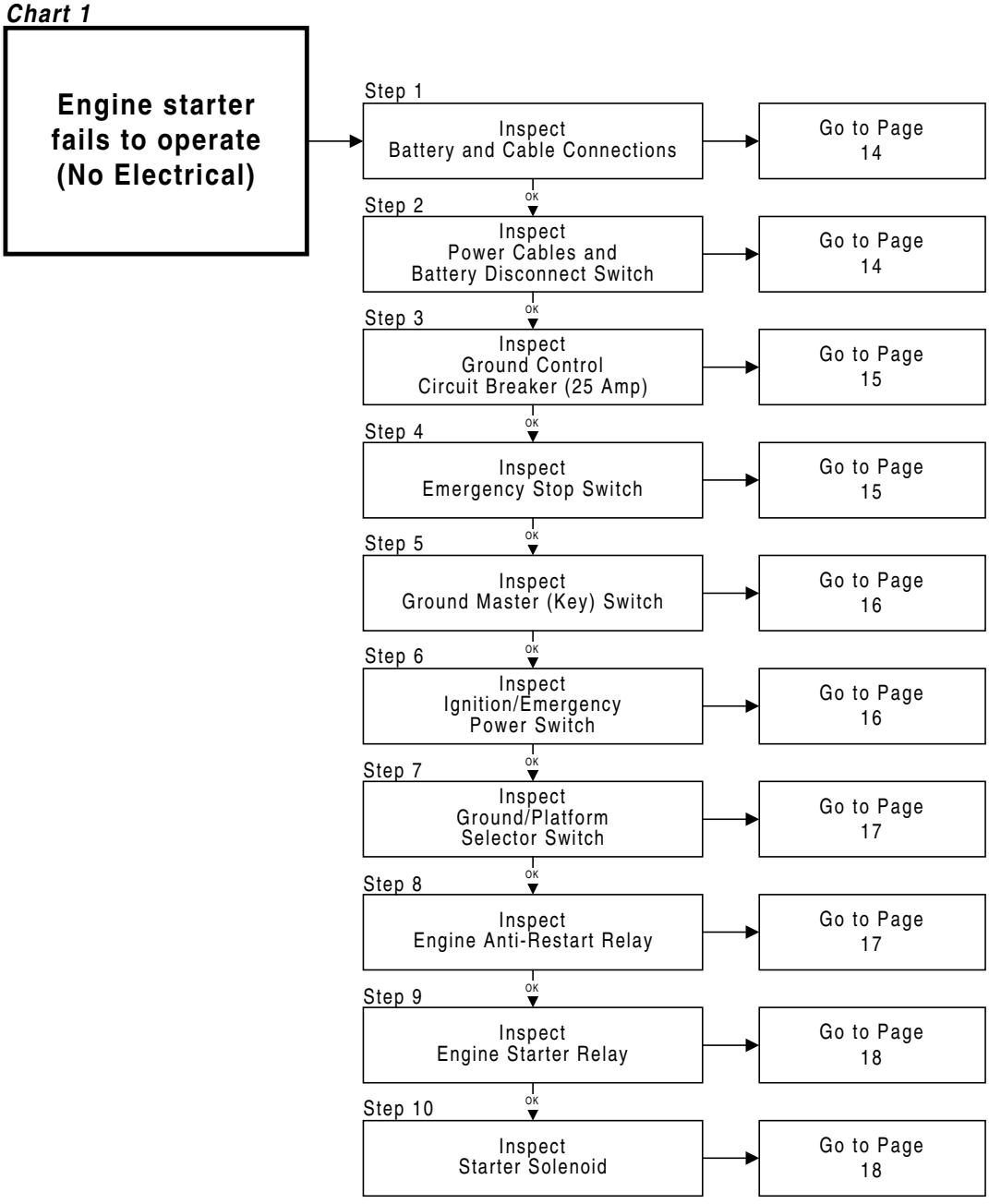


Chart 2

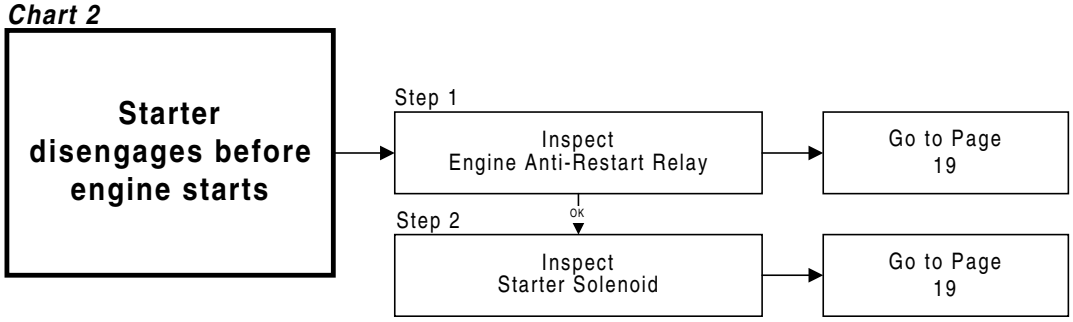
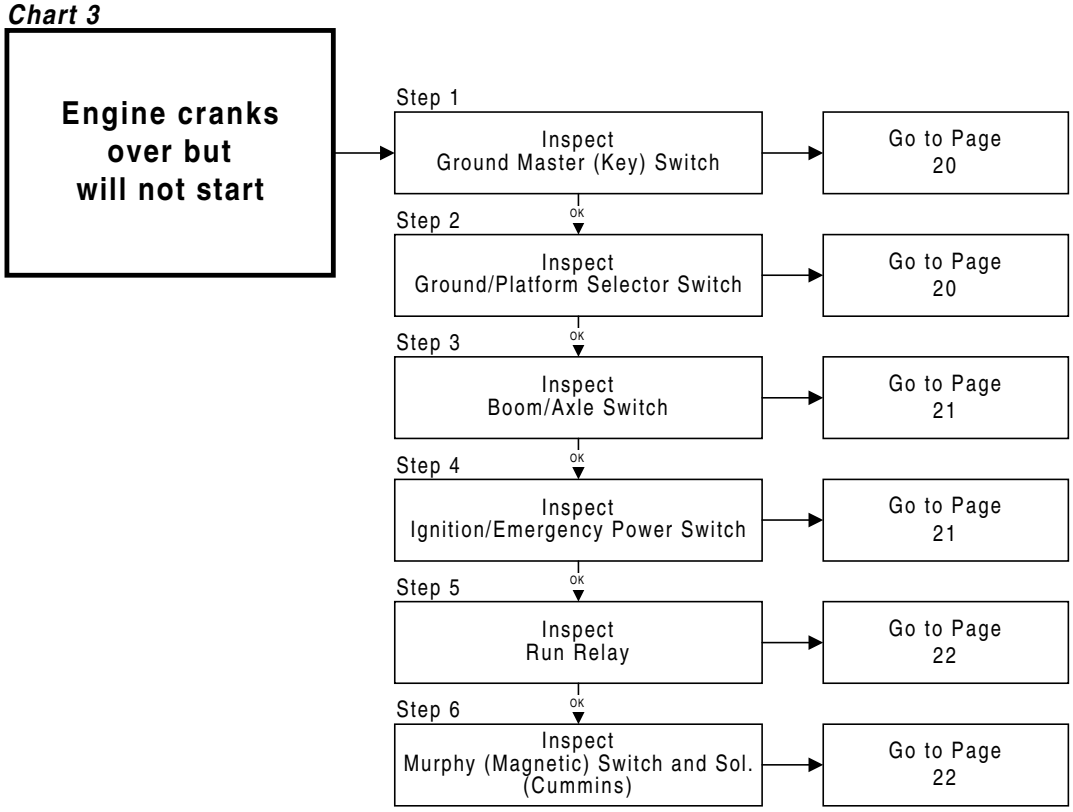


Chart 3



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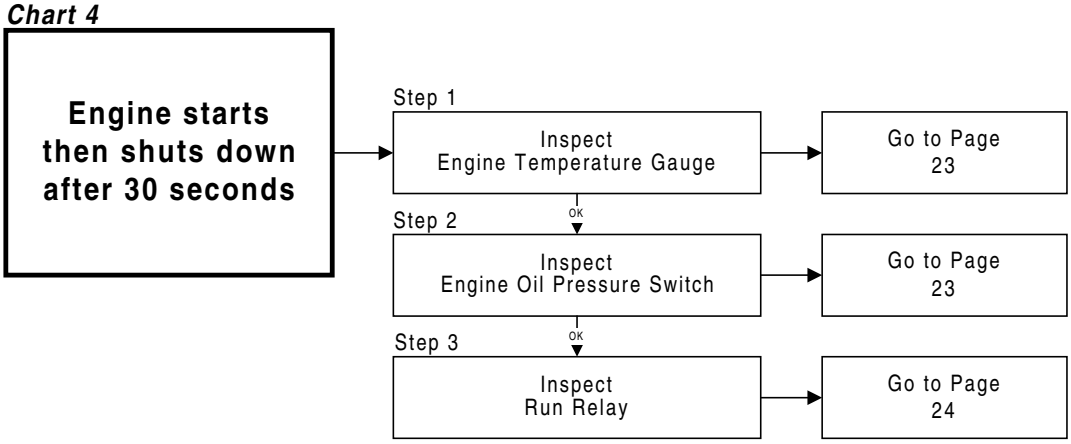

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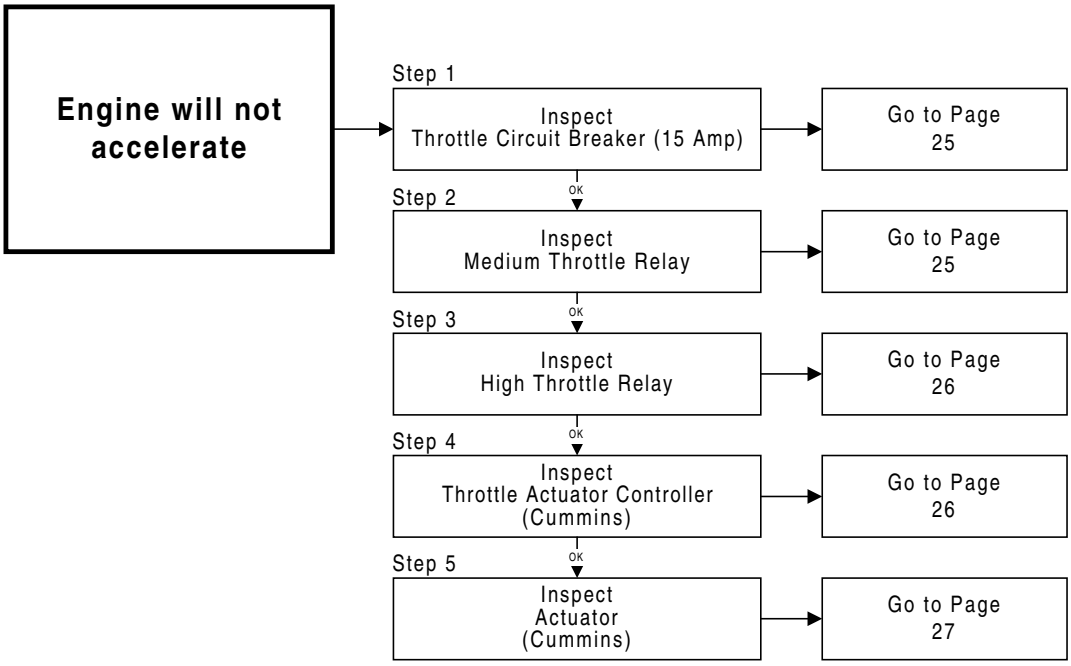

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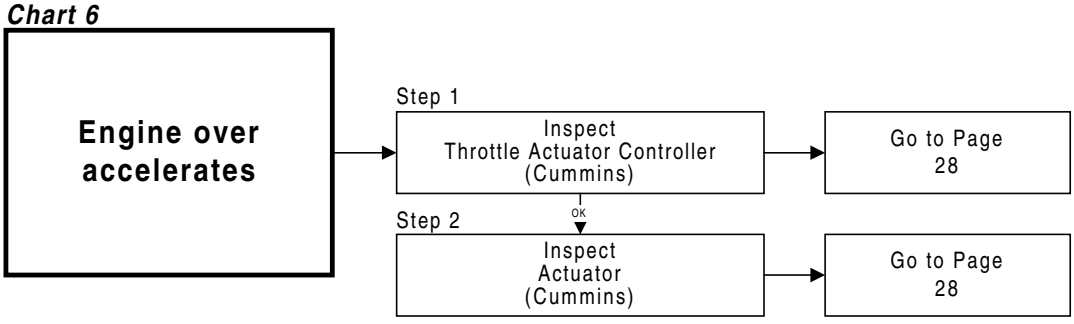

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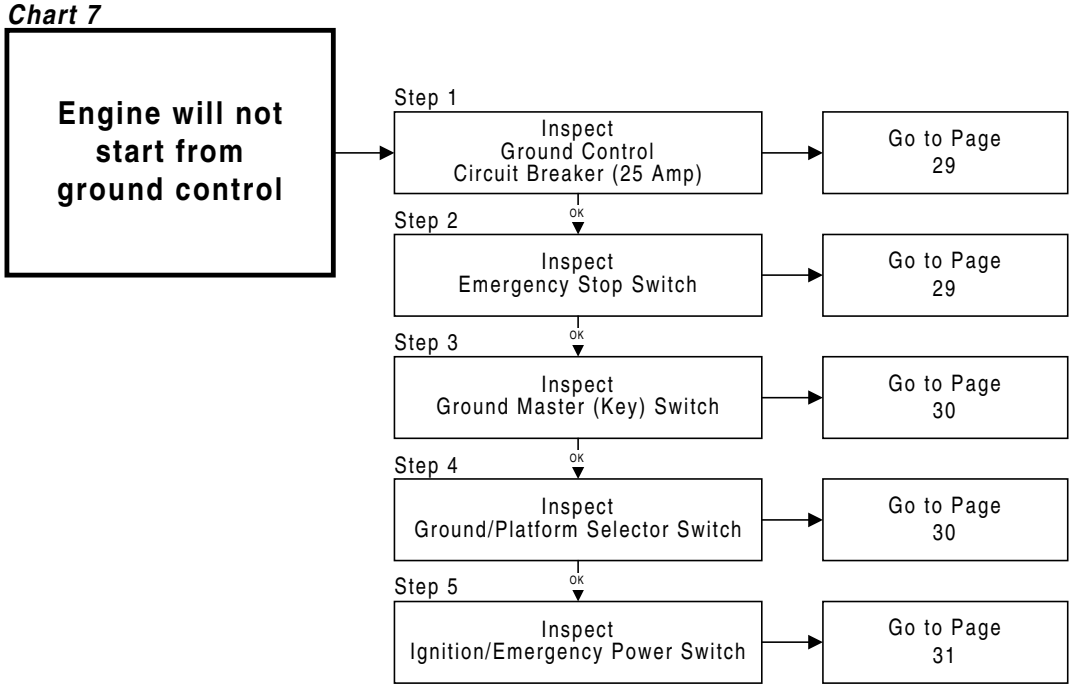

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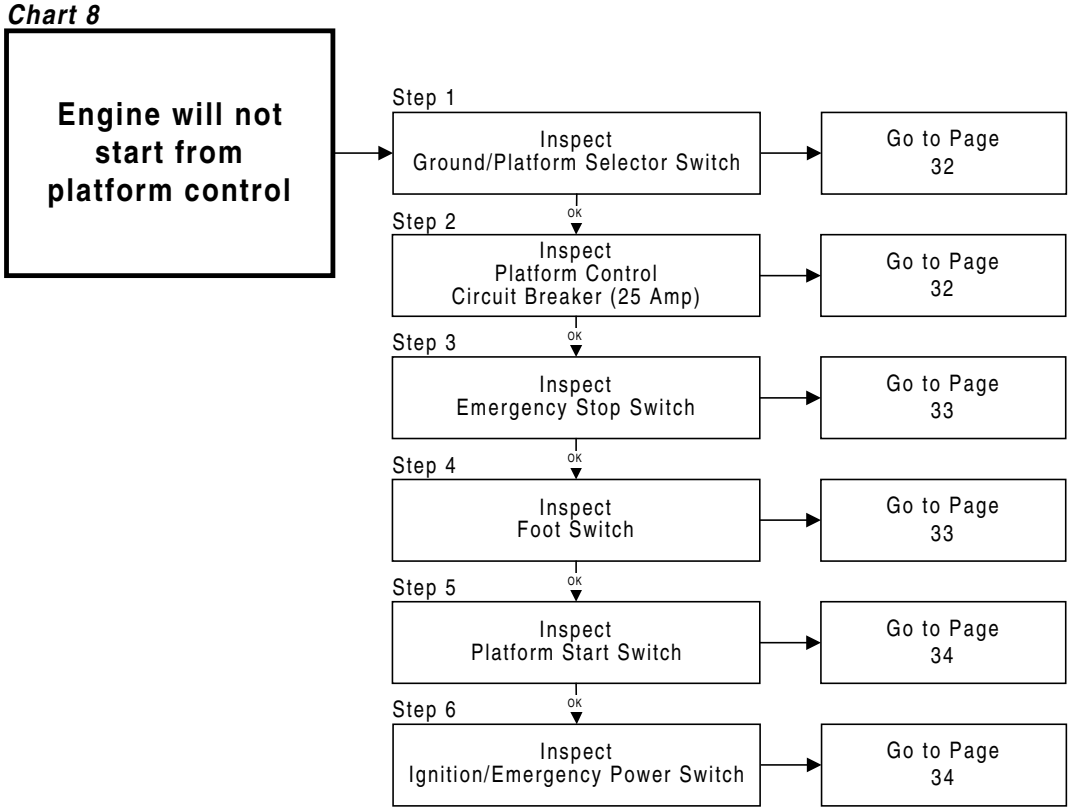

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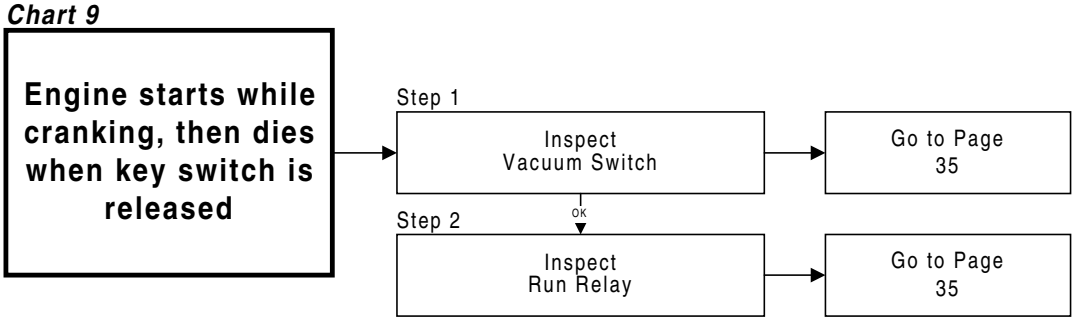
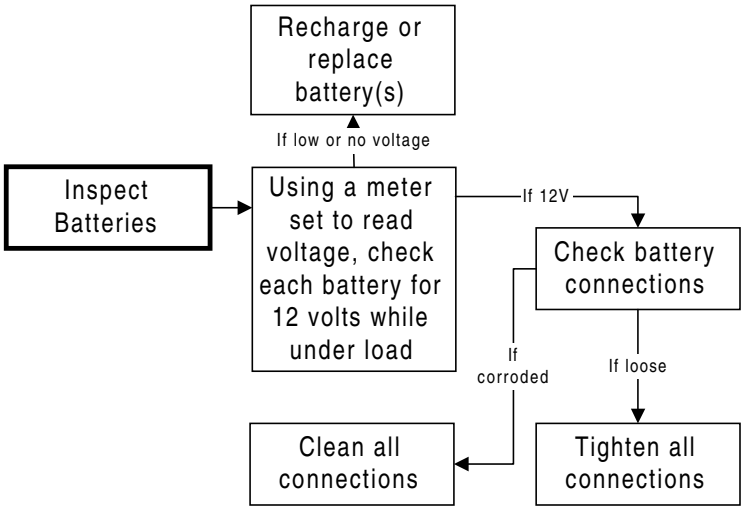


Engine starter fails to operate (No Electrical)

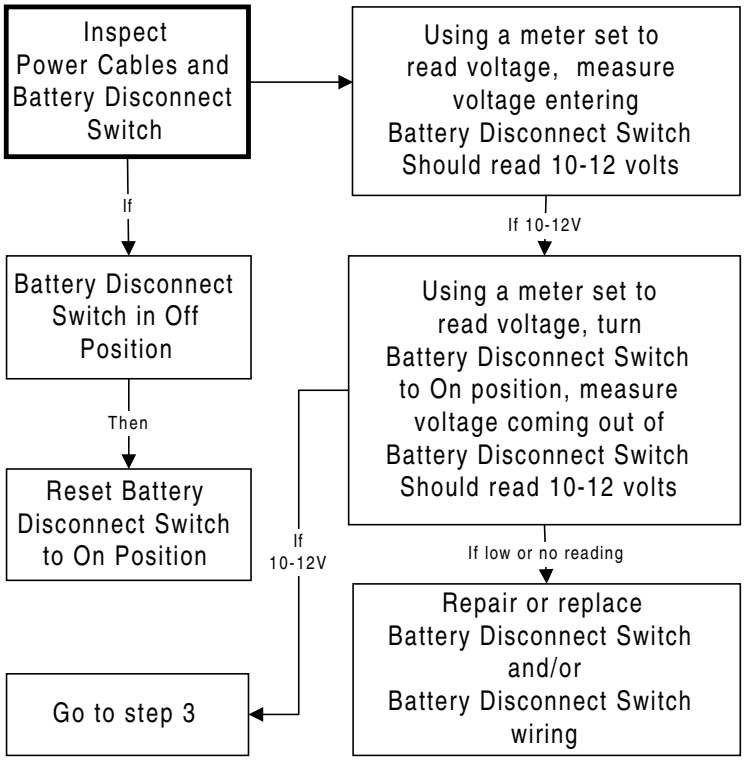
⚠DANGER

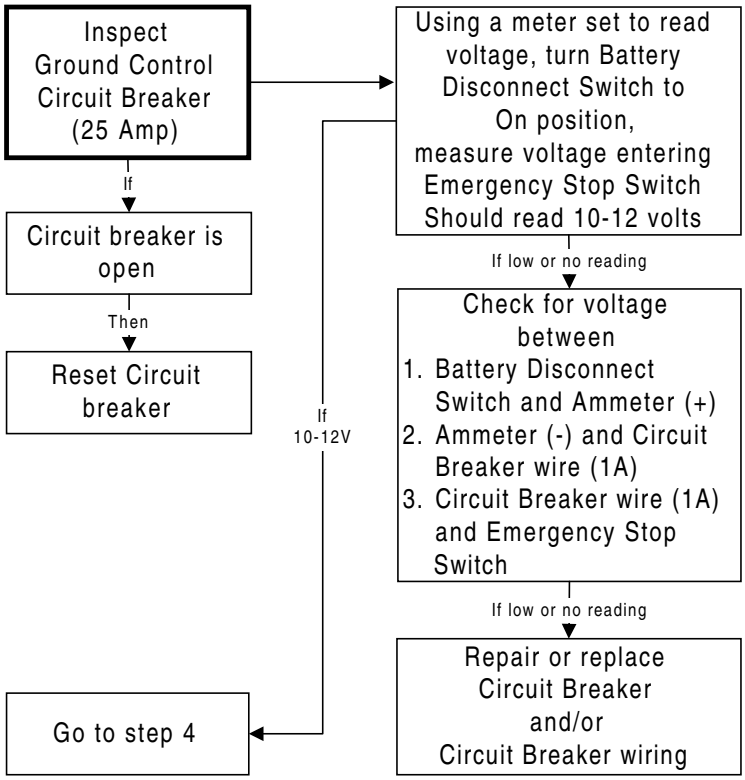
Batteries omit hydrogen and oxygen elements that can combine explosively. Do not smoke or permit open flames or sparks when checking batteries



Step 1

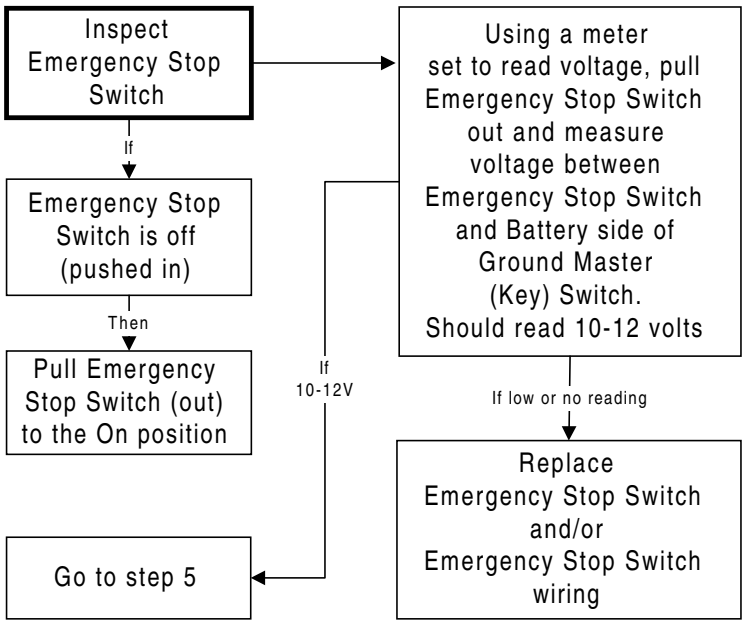
Step 2

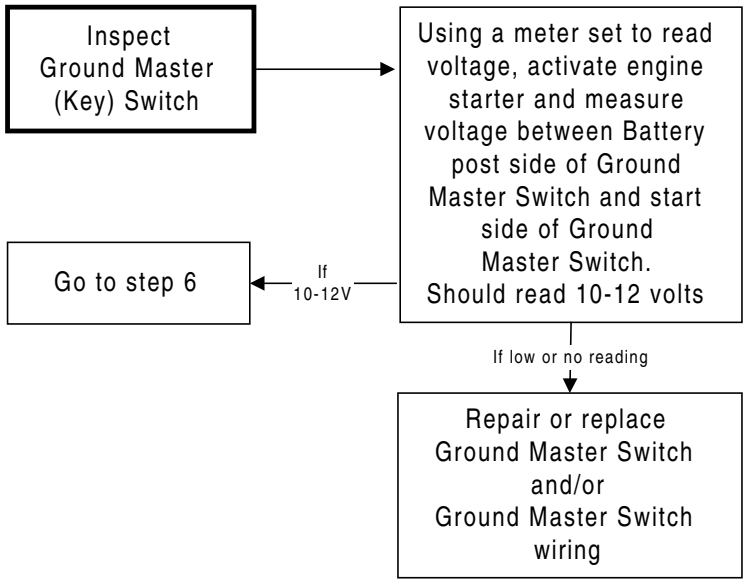




Step 3

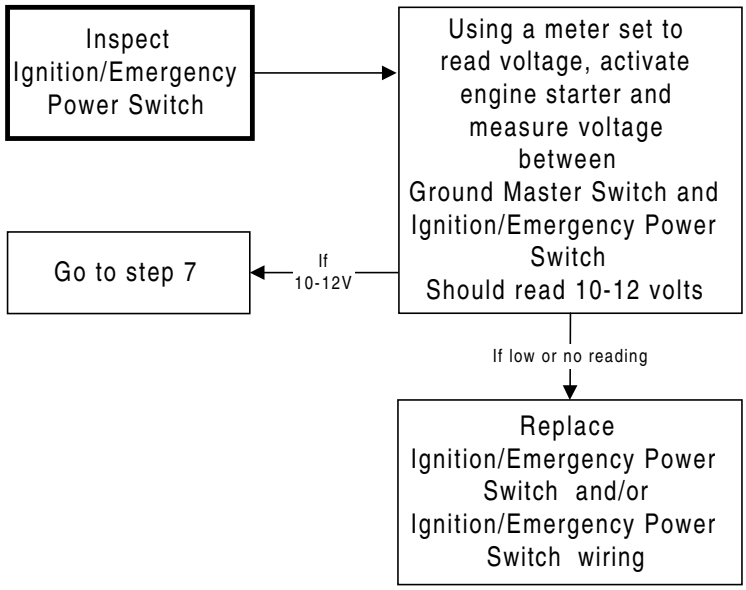
Step 4

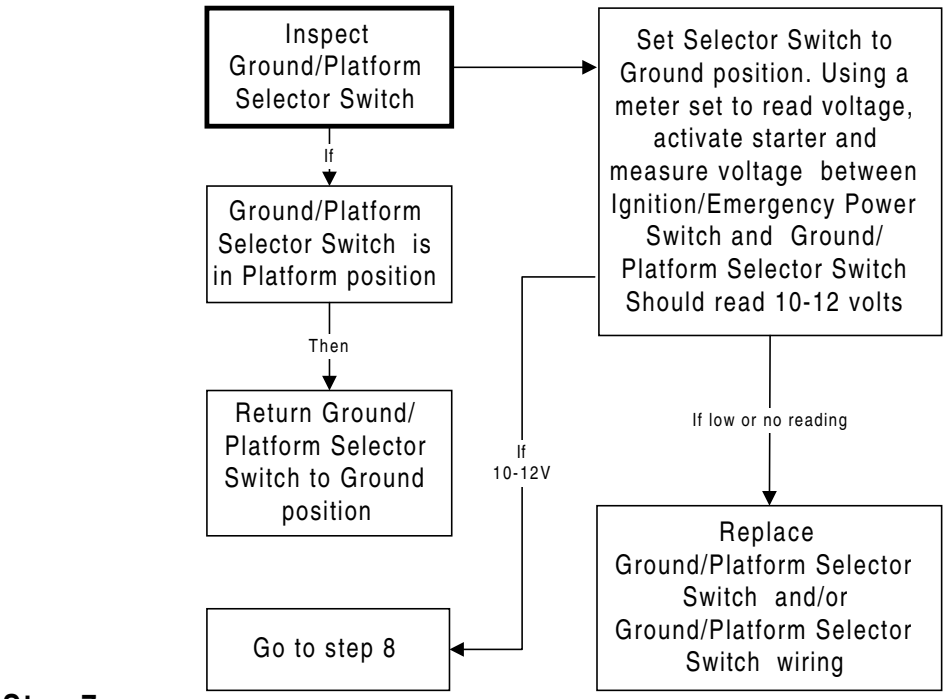




Step 5

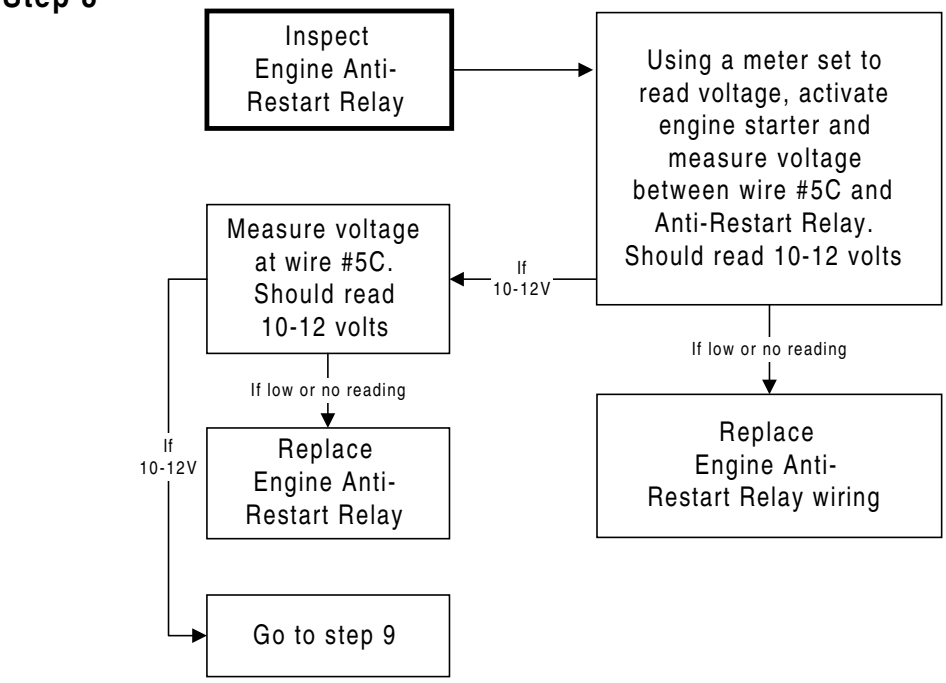
Step 6

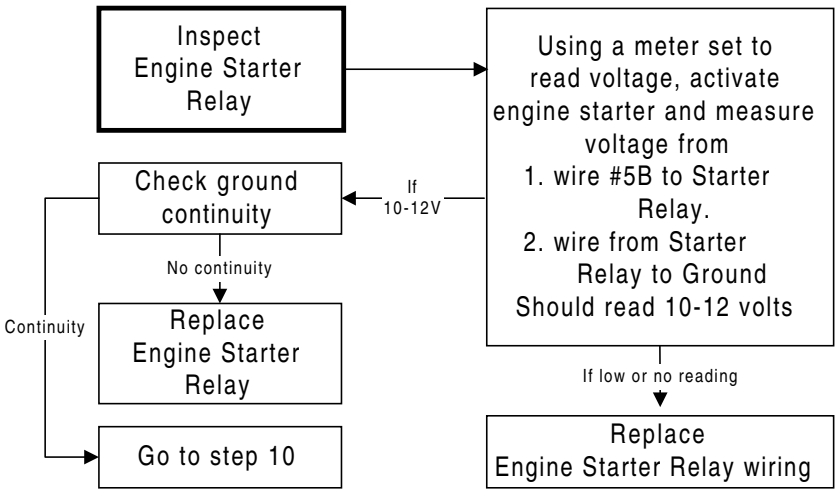




Step 7

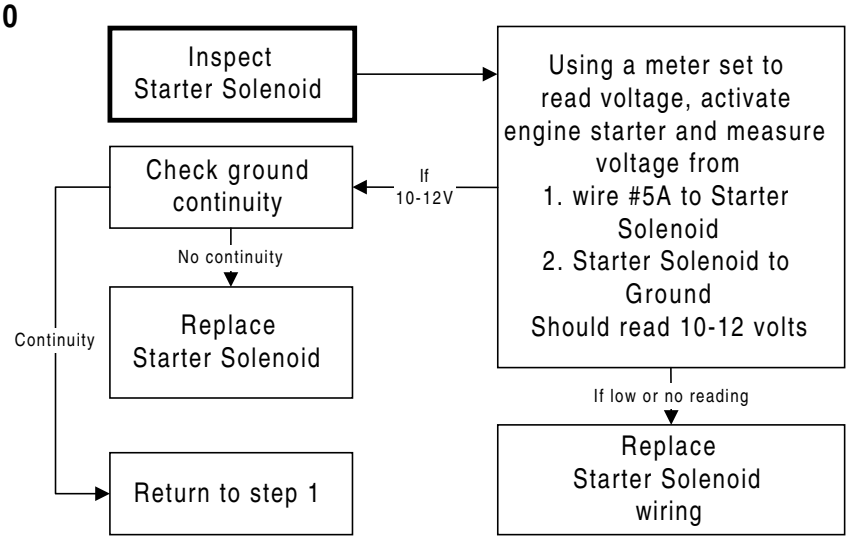
Step 8



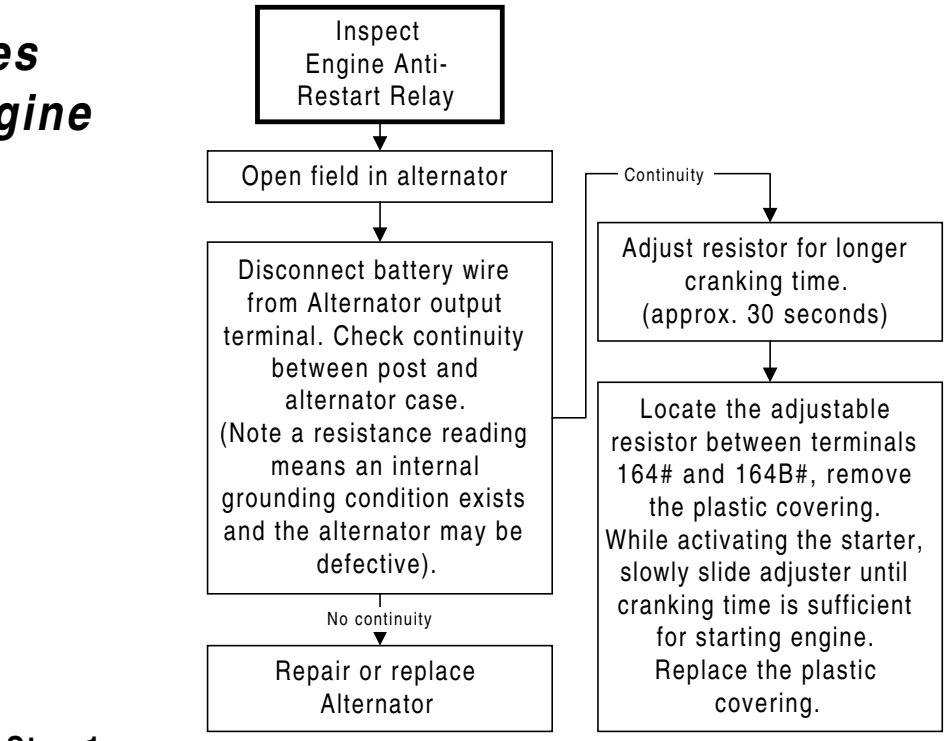


Step 9

Step 10

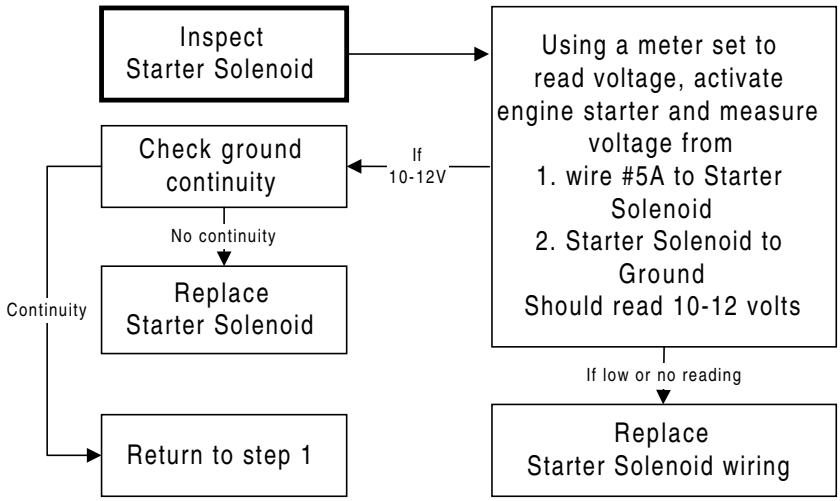


Starter disengages before engine starts

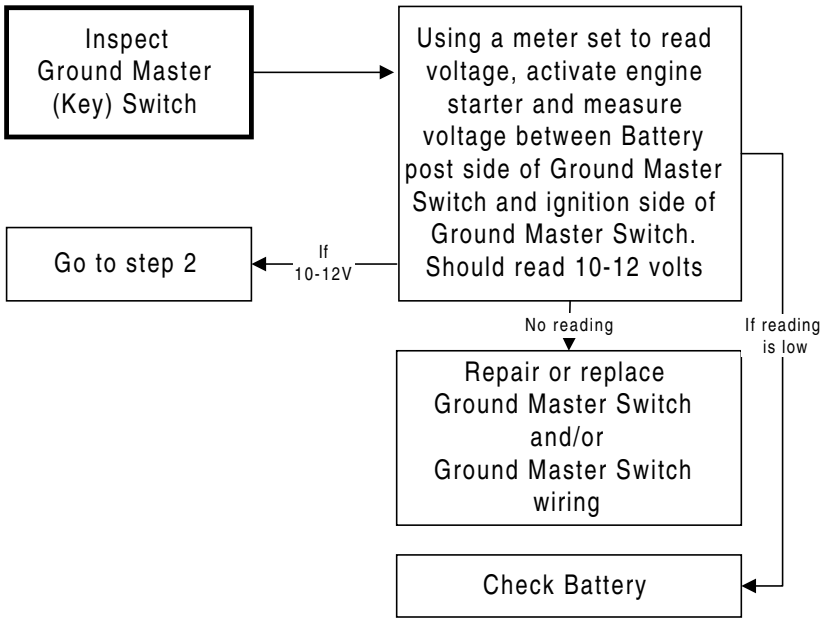


Step 1

Step 2

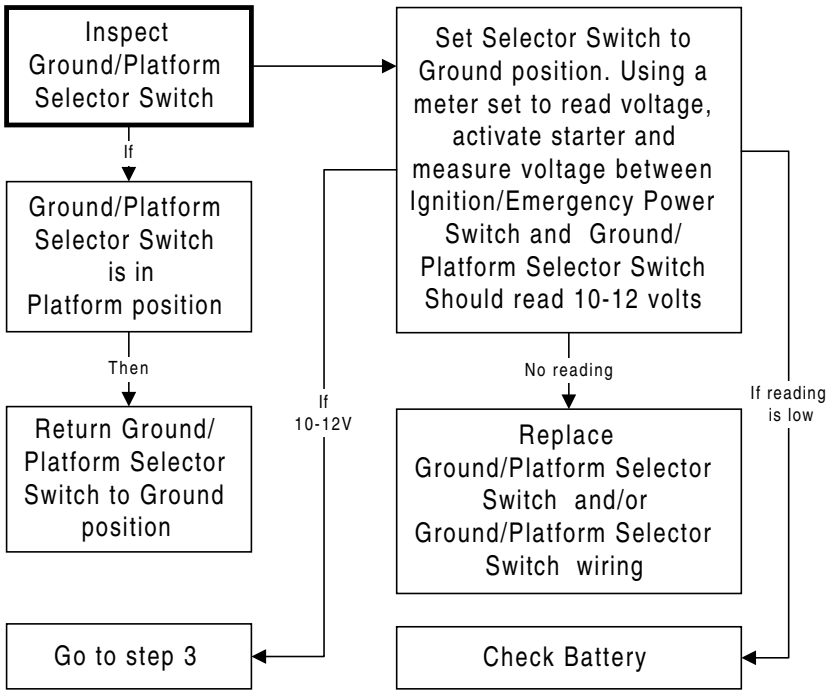


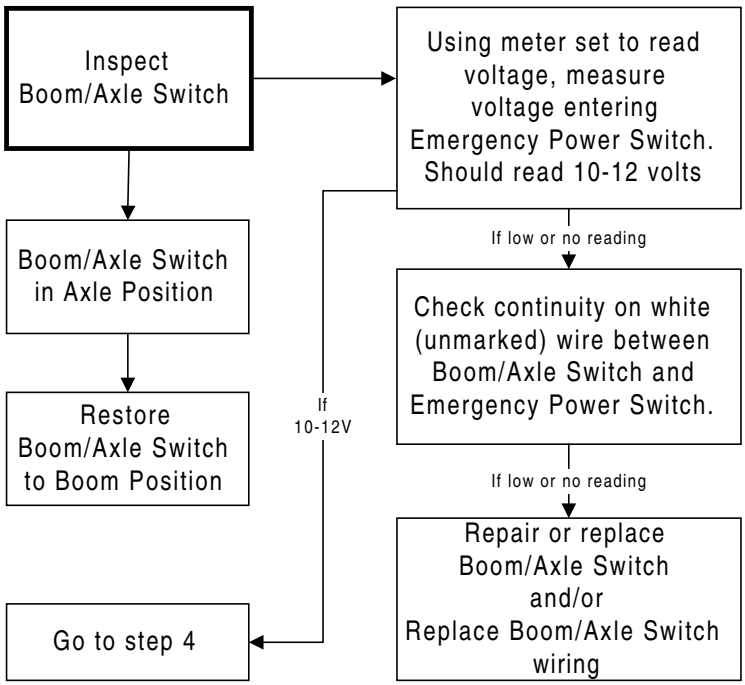
Engine cranks over but will not start



Step 1

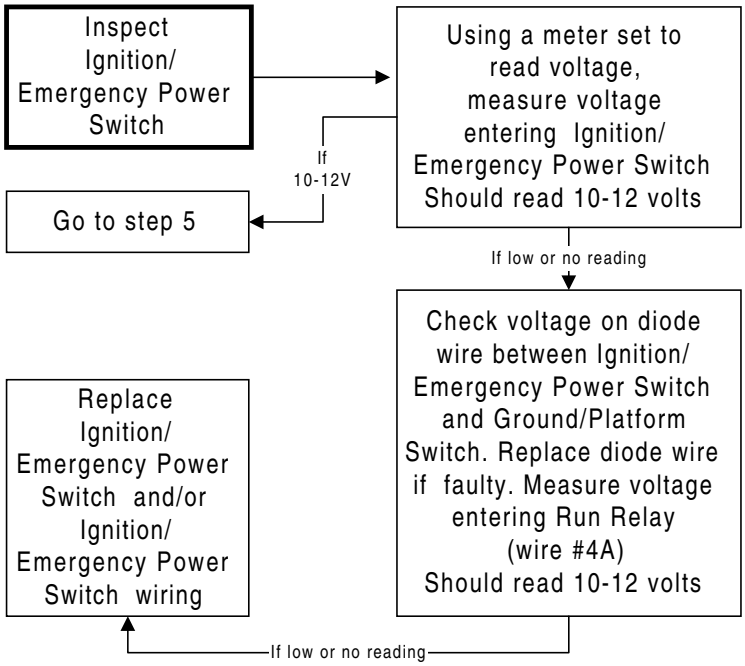
Step 2

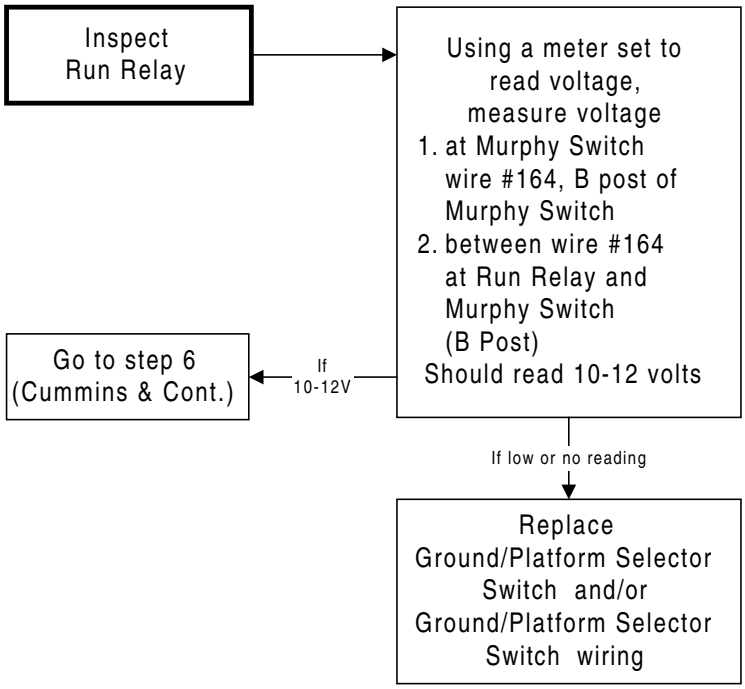




Step 3

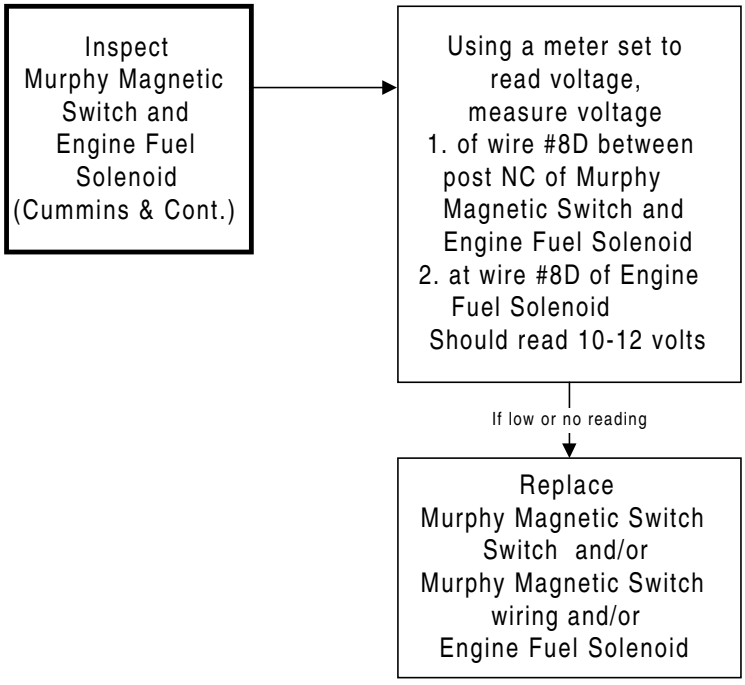
Step 4



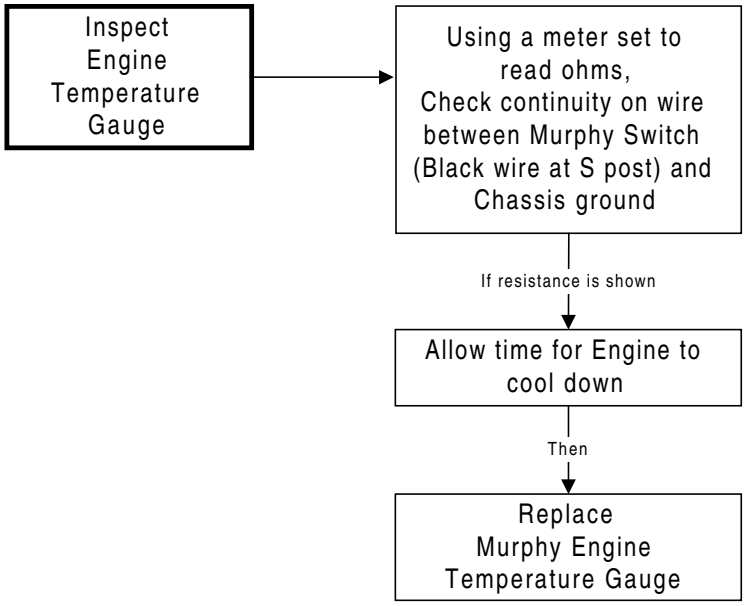


Step 5

Step 6

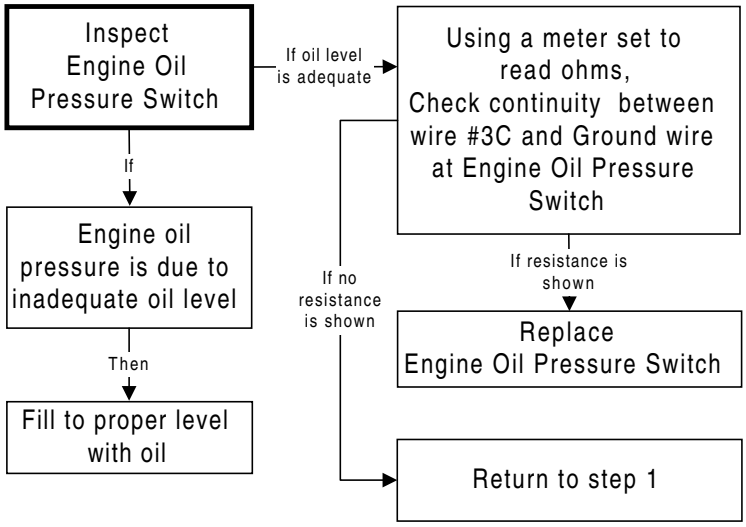


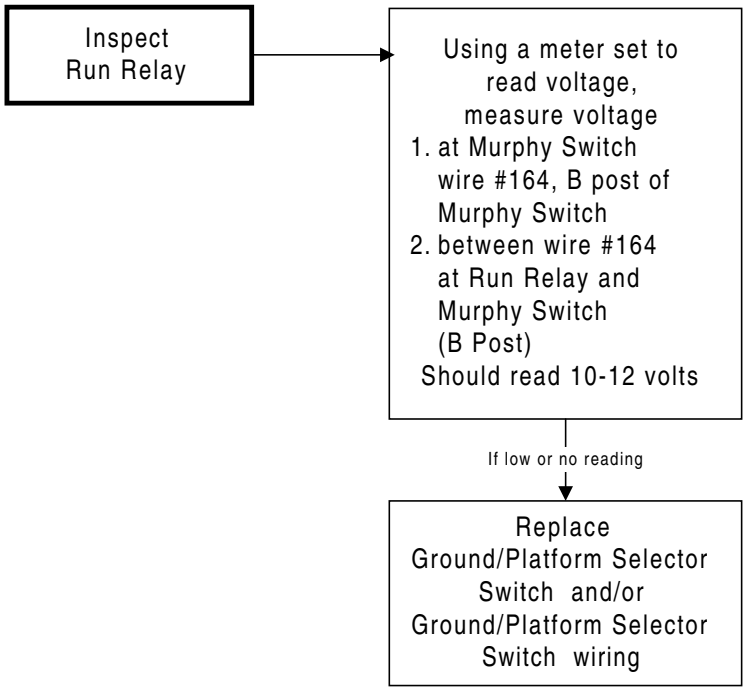
Engine starts then shuts down after 30 seconds



Step 1

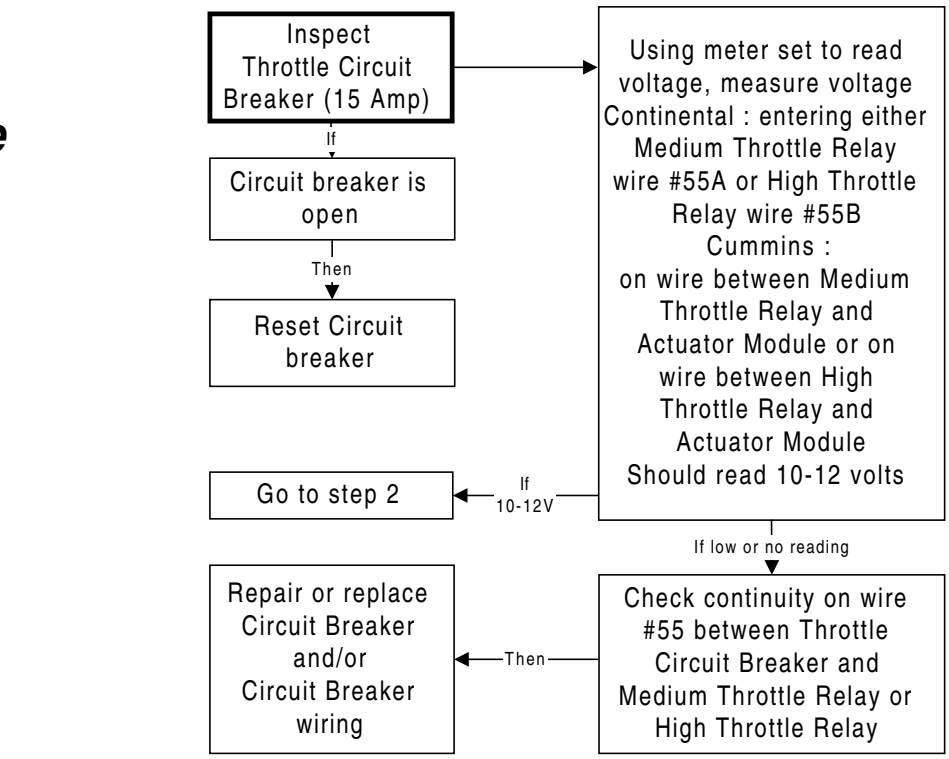
Step 2





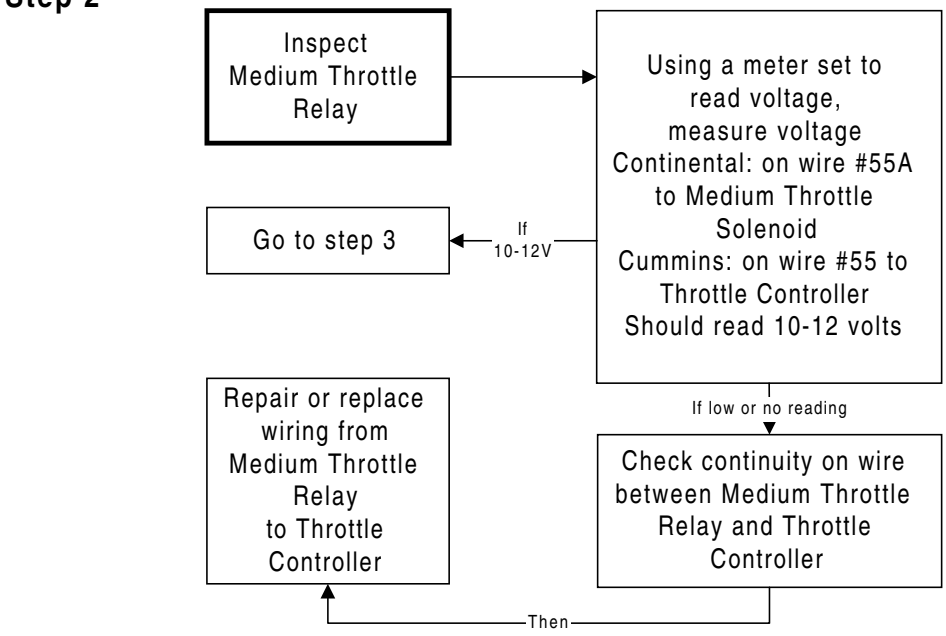
Step 3

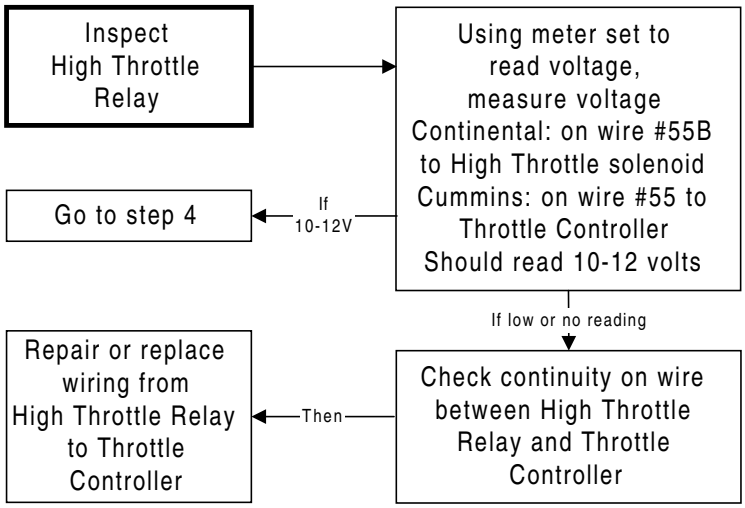
Engine will not accelerate



Step 1

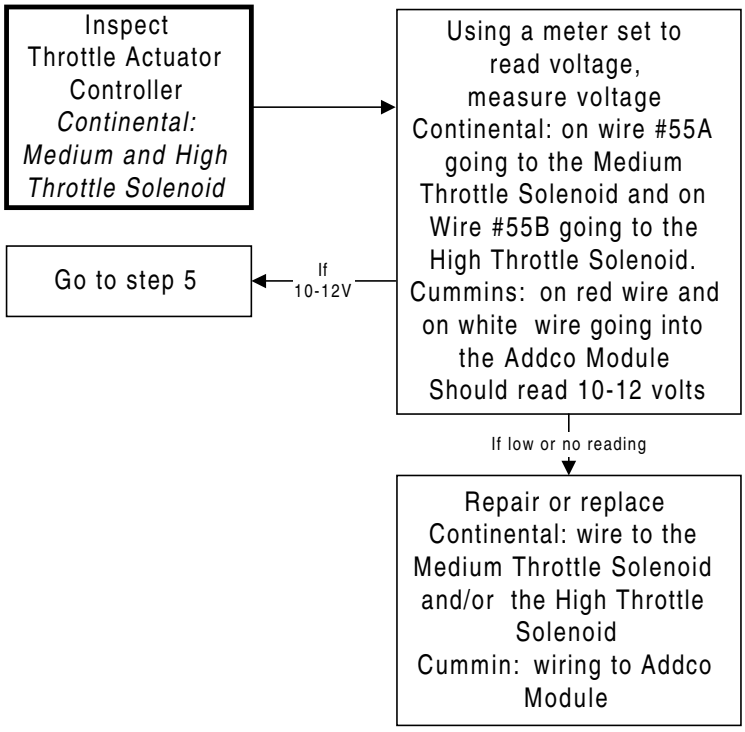
Step 2

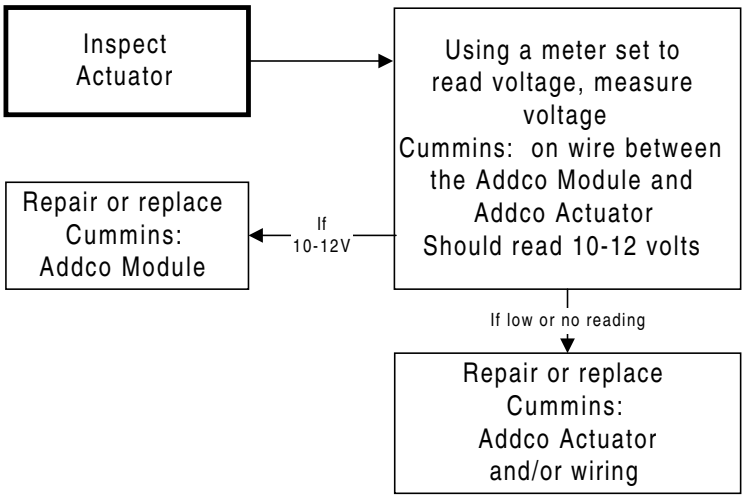




Step 3

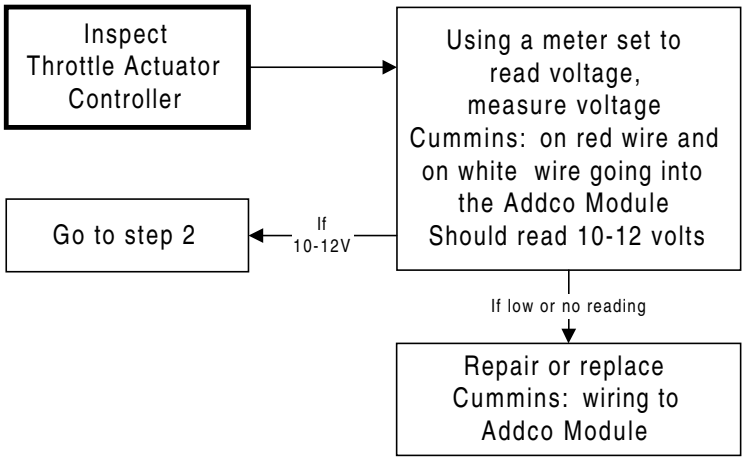
Step 4





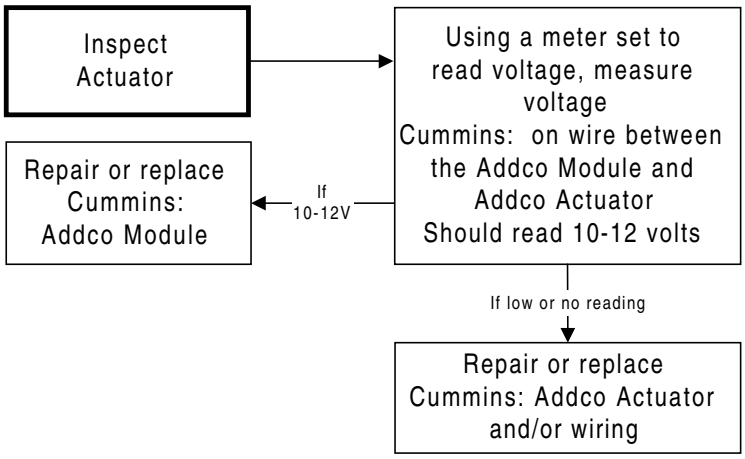
Step 5

Engine over accelerates

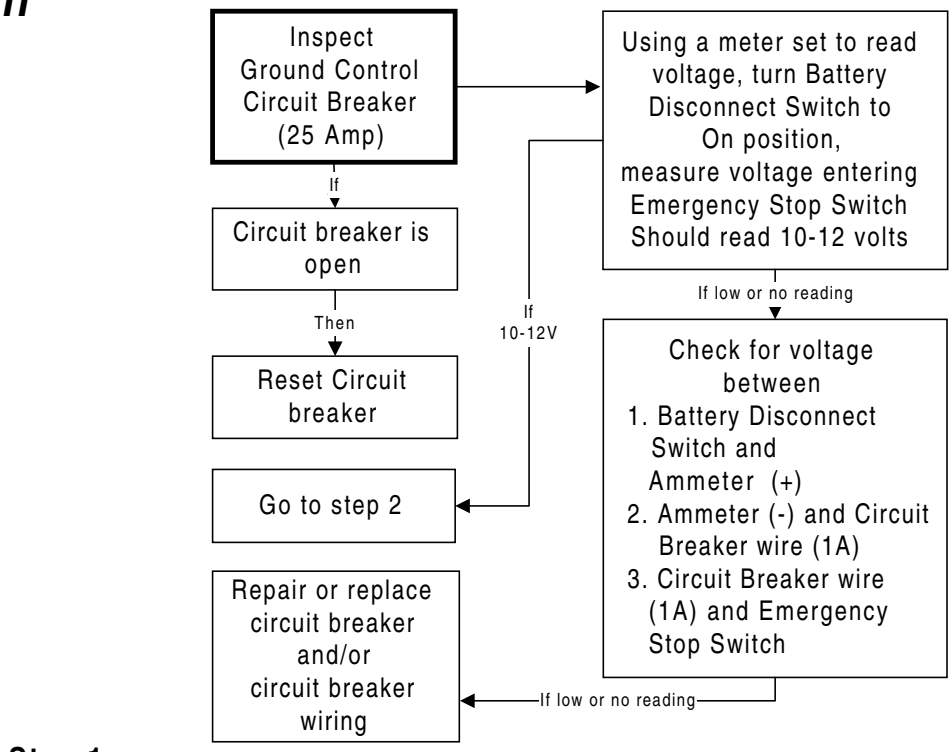


Step 1

Step 2

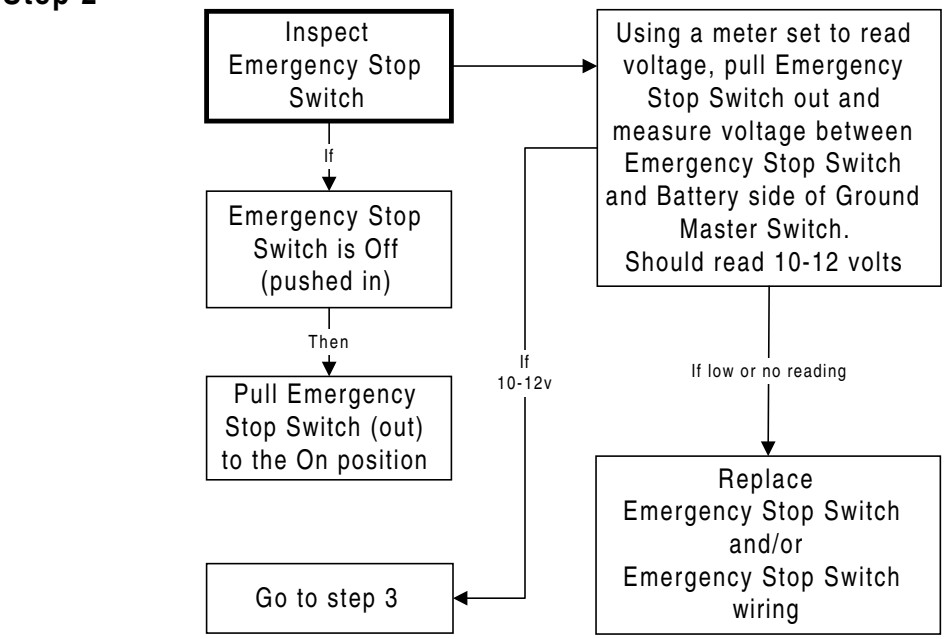


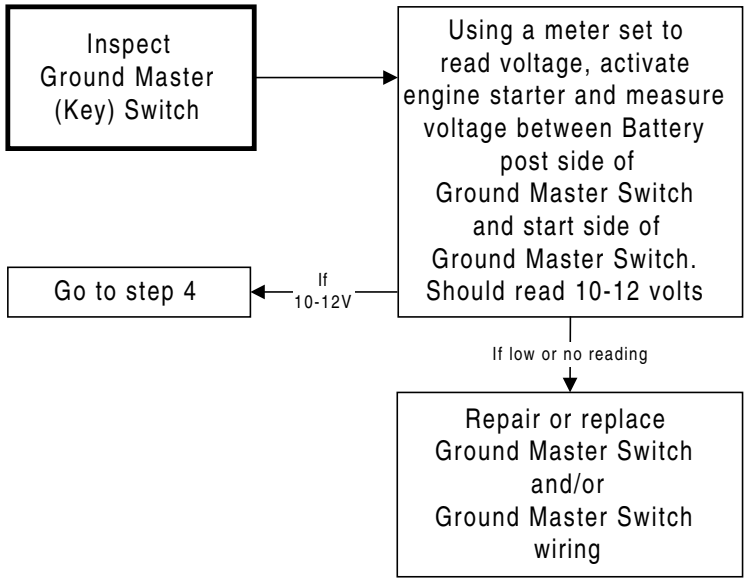
Engine will not start from ground control



Step 1

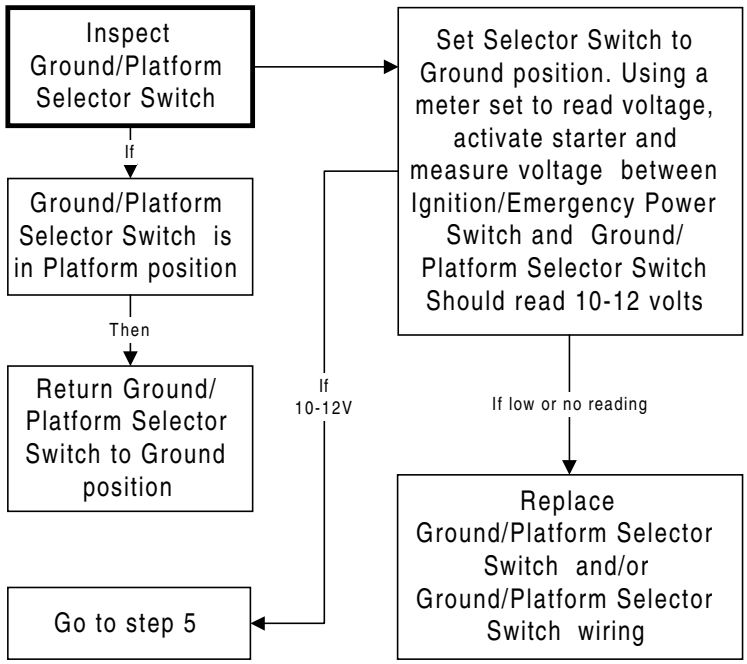
Step 2

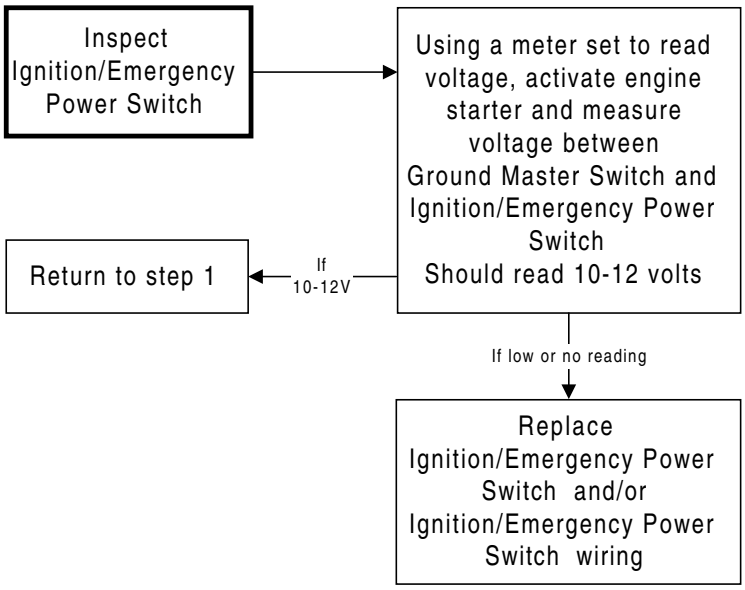




Step 3

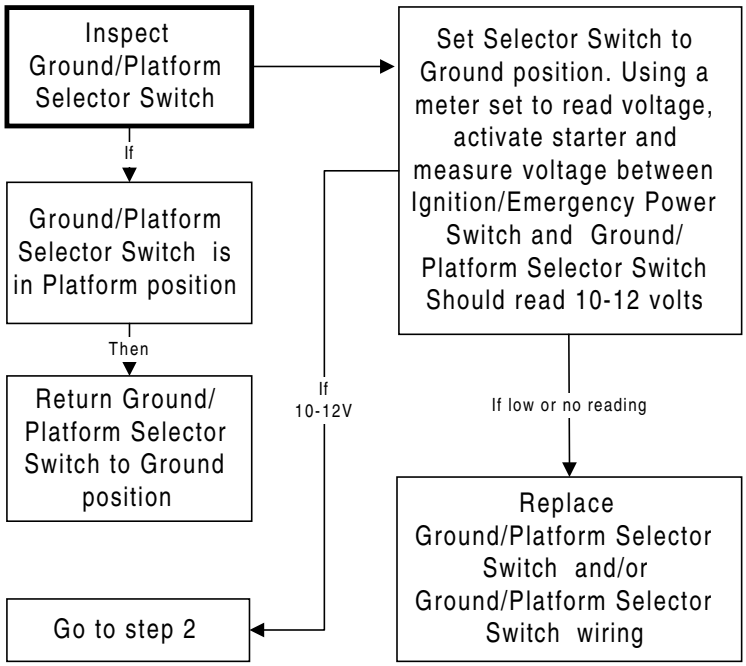
Step 4





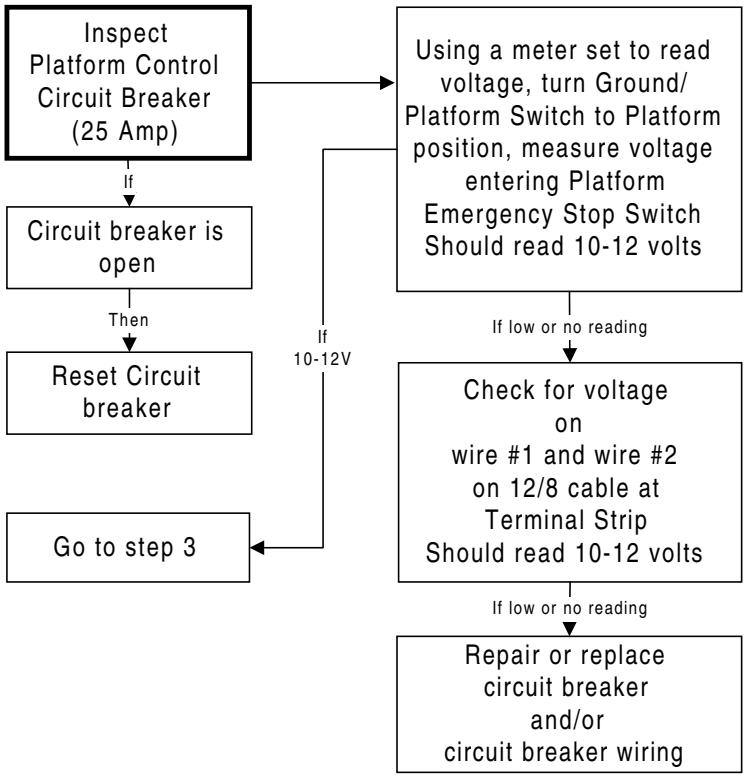
Step 5

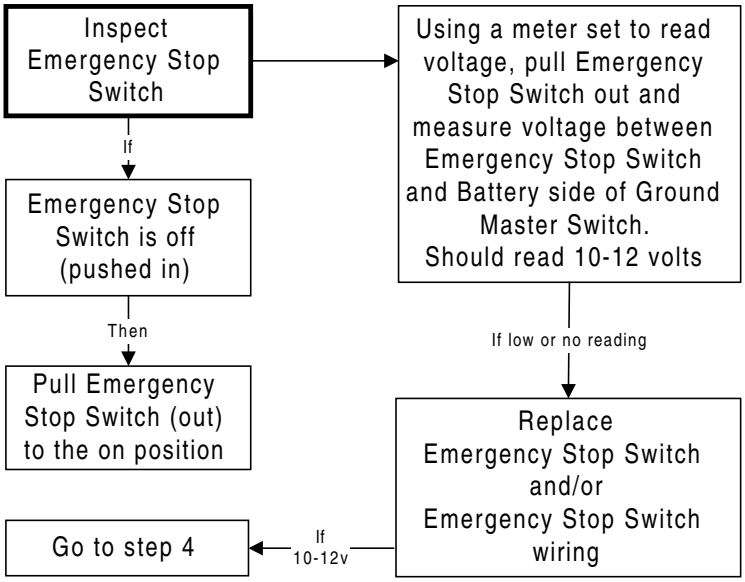
Engine will not start from platform control



Step 1

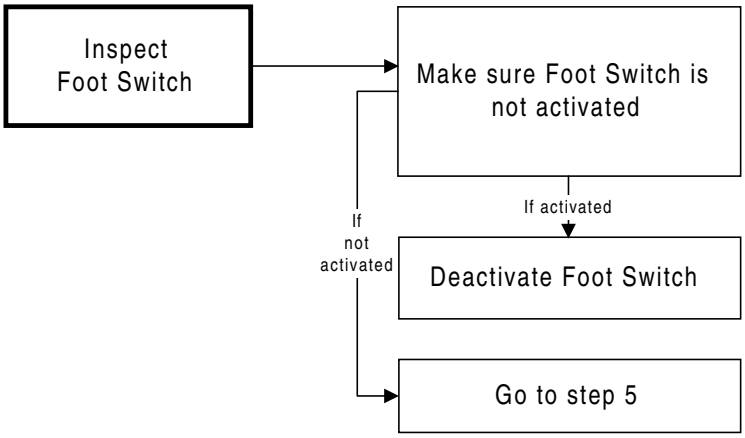
Step 2

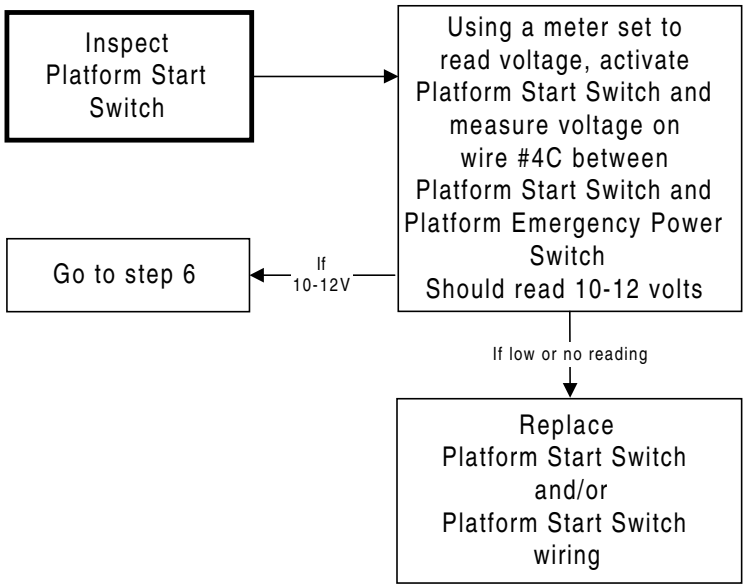




Step 3

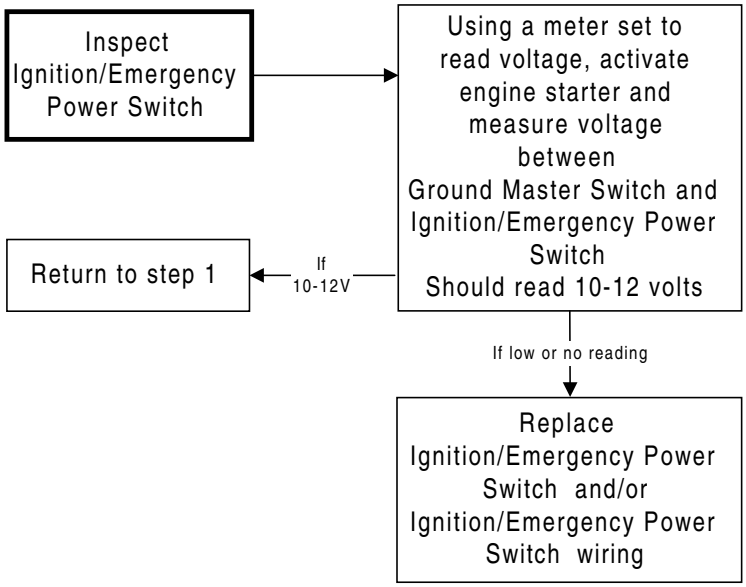
Step 4



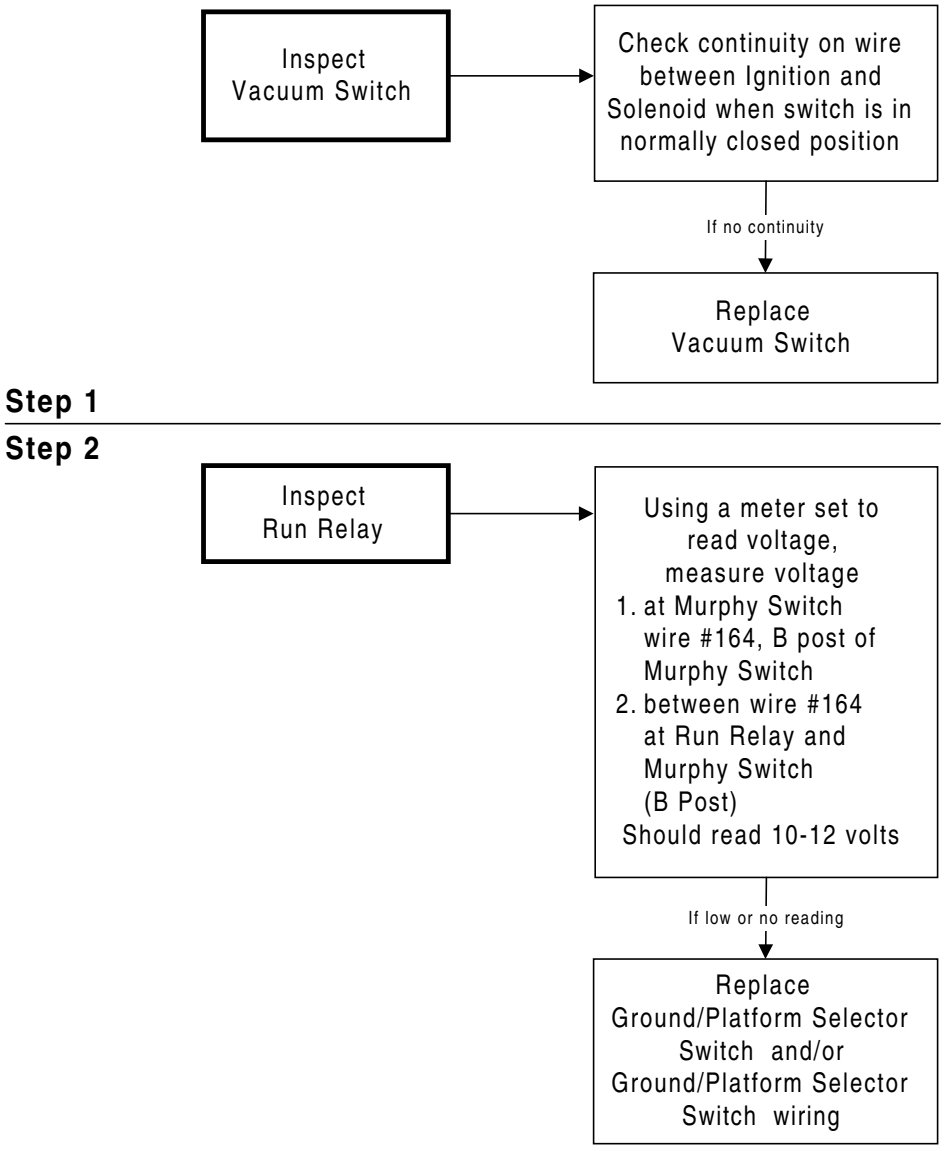


Step 5

Step 6



Engine starts while cranking, then dies when key switch is released



SECTION TWO:
HYDRAULIC DIAGNOSTICS

Chart 1

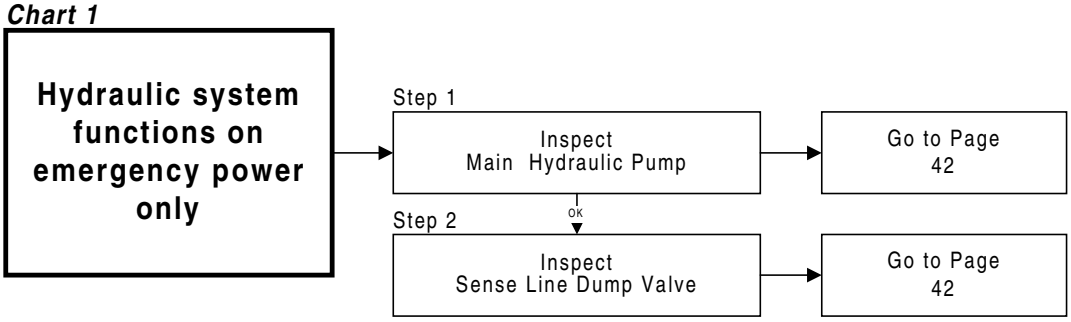


Chart 2

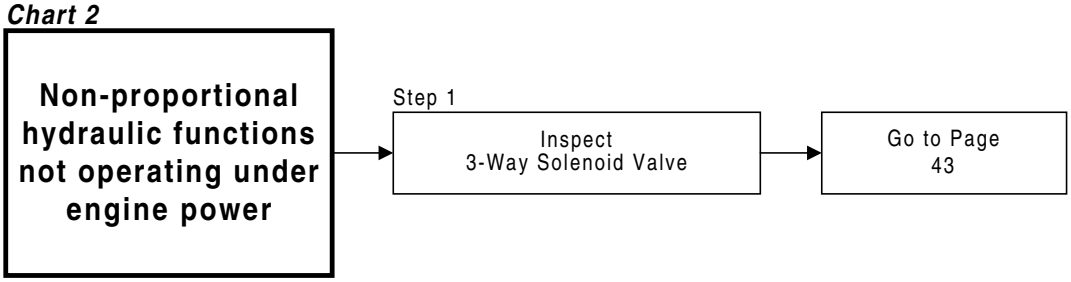


Chart 3

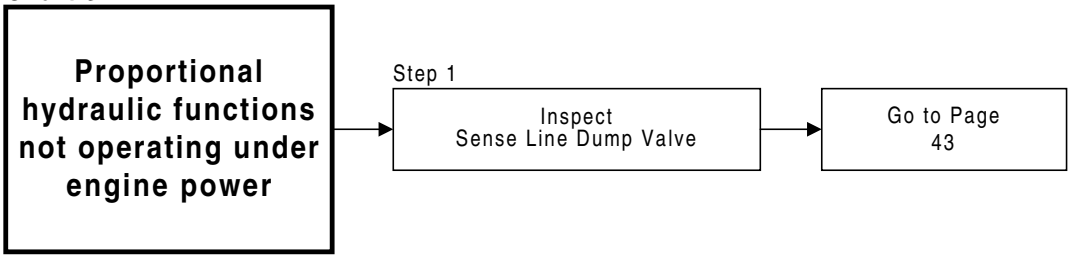


Chart 4

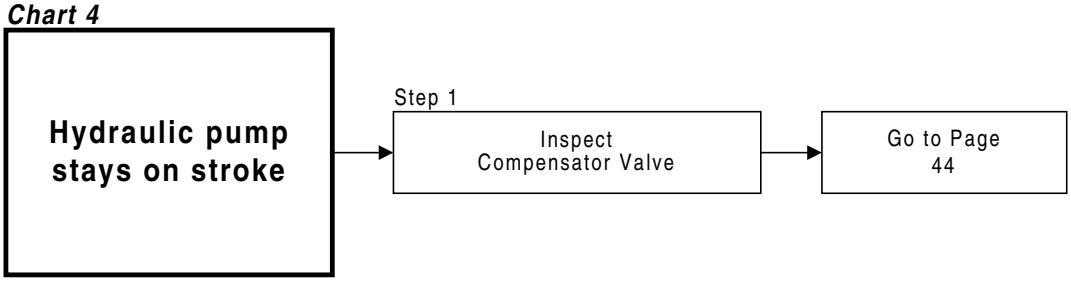


Chart 5

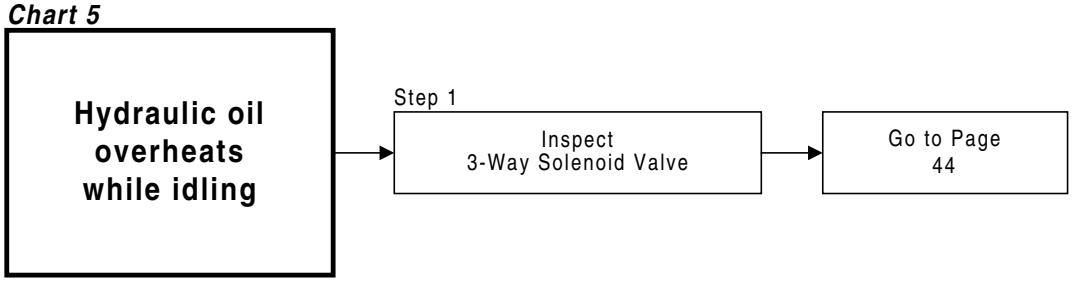


Chart 6

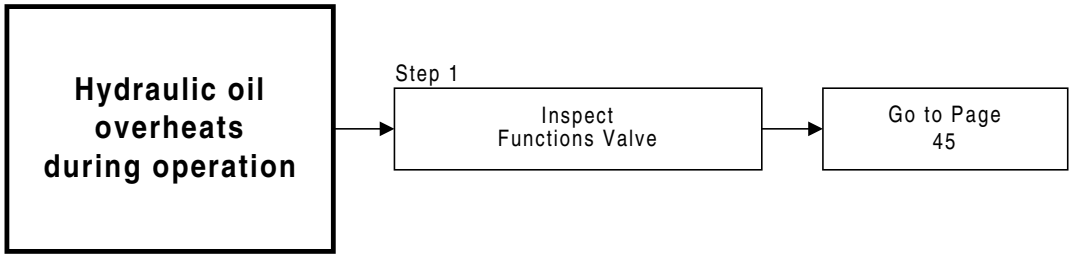


Chart 7

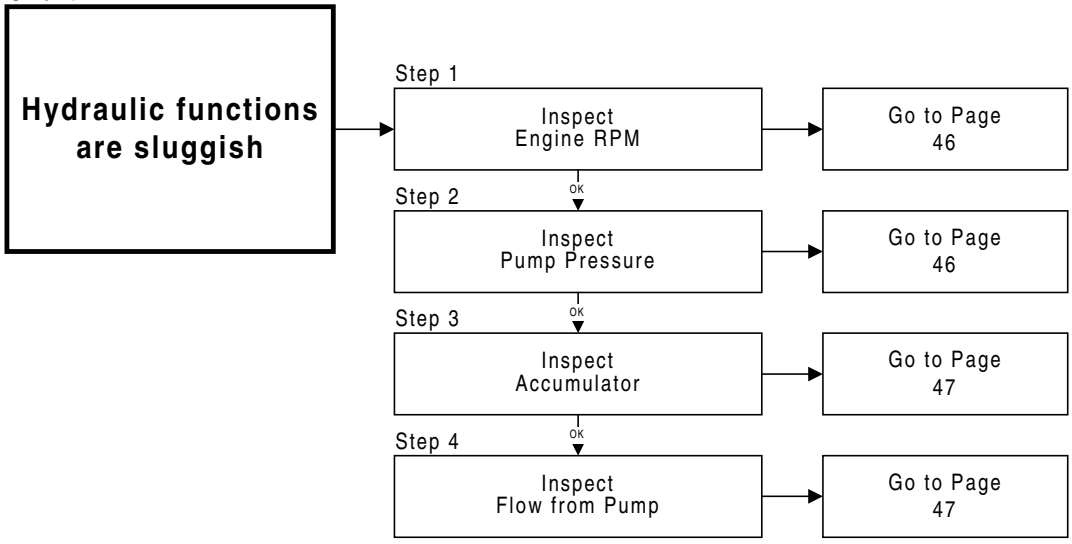


Chart 8

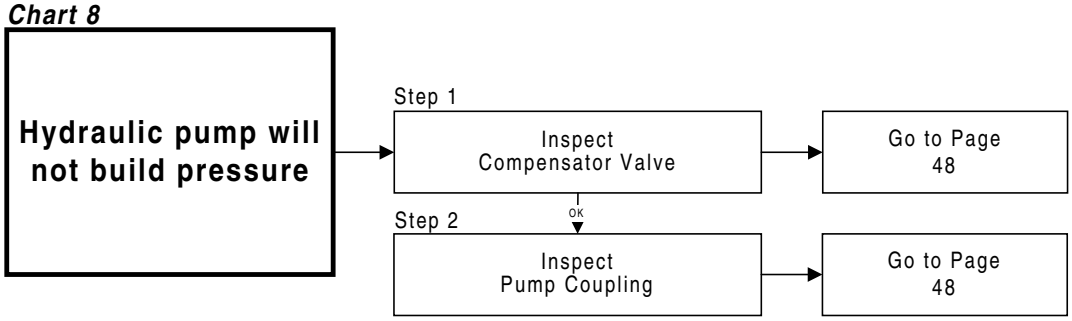


Chart 9

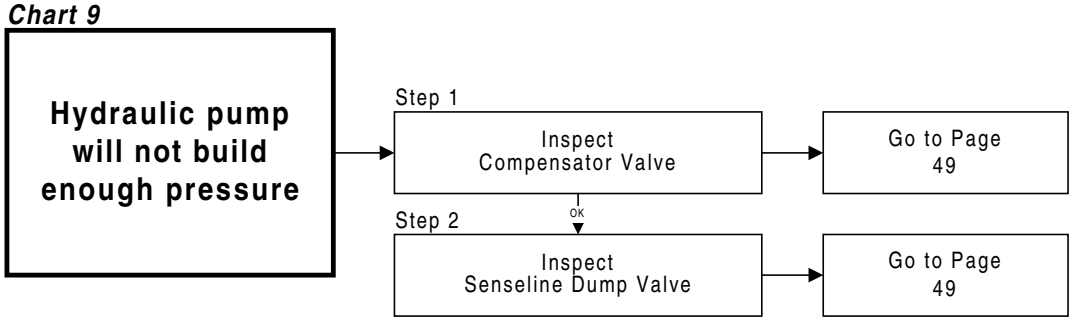


Chart 10

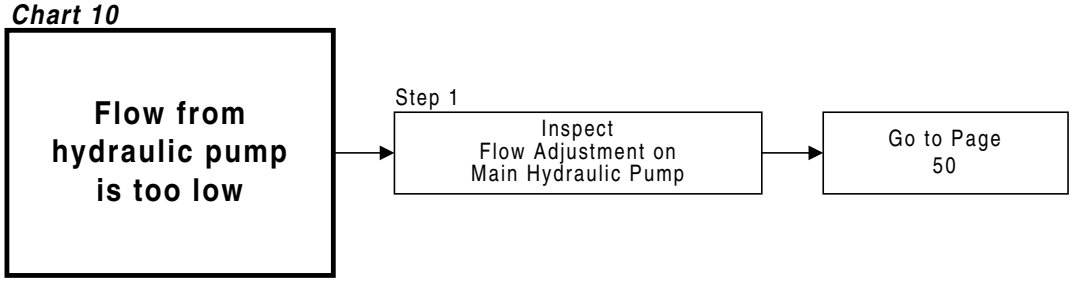
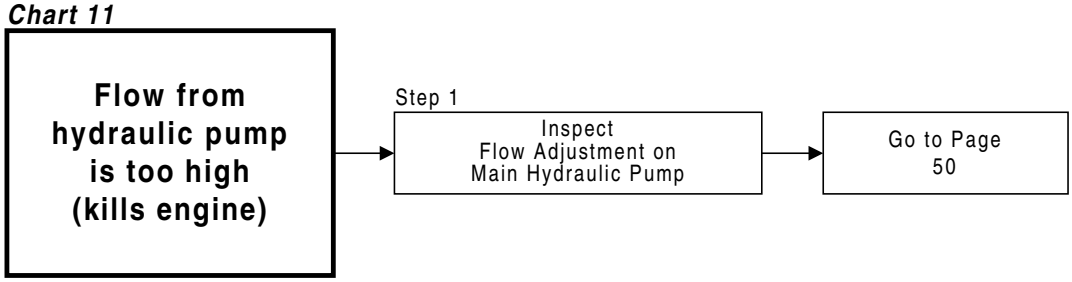
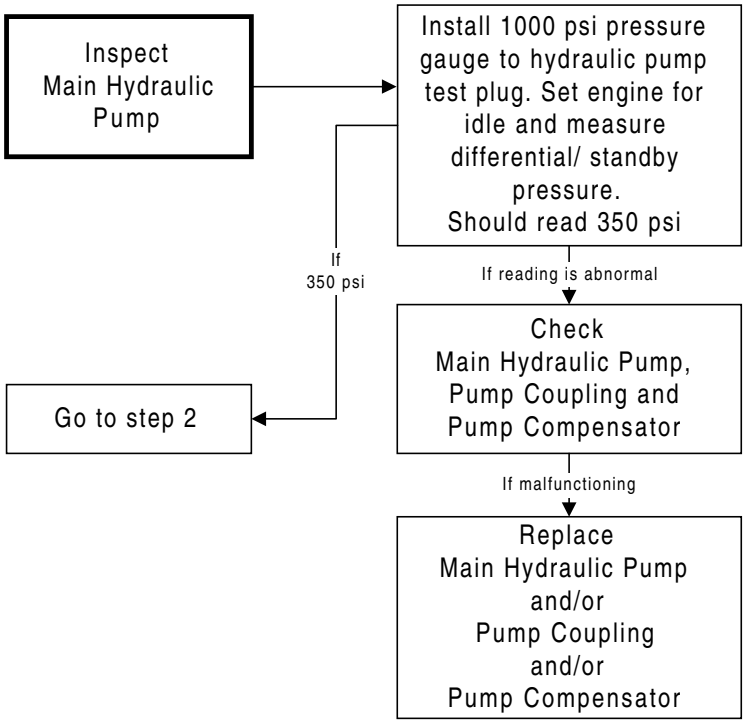


Chart 11

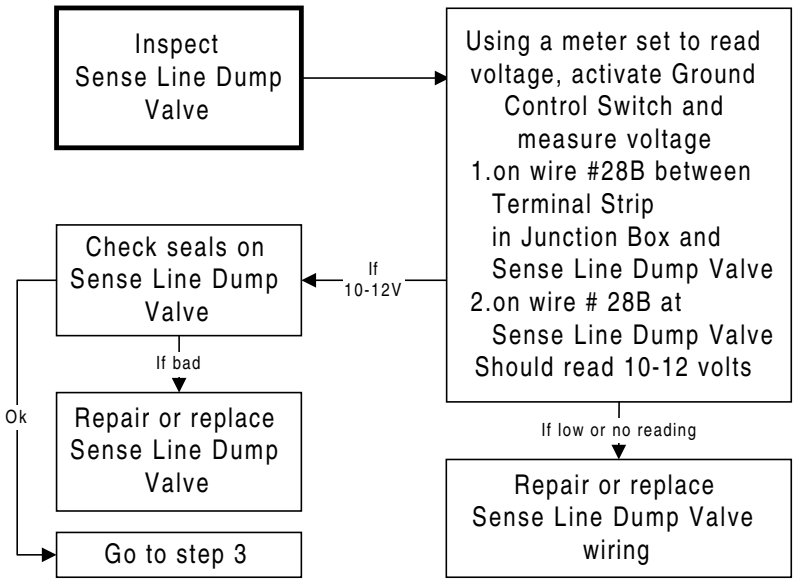


Hydraulic system functions on emergency power only

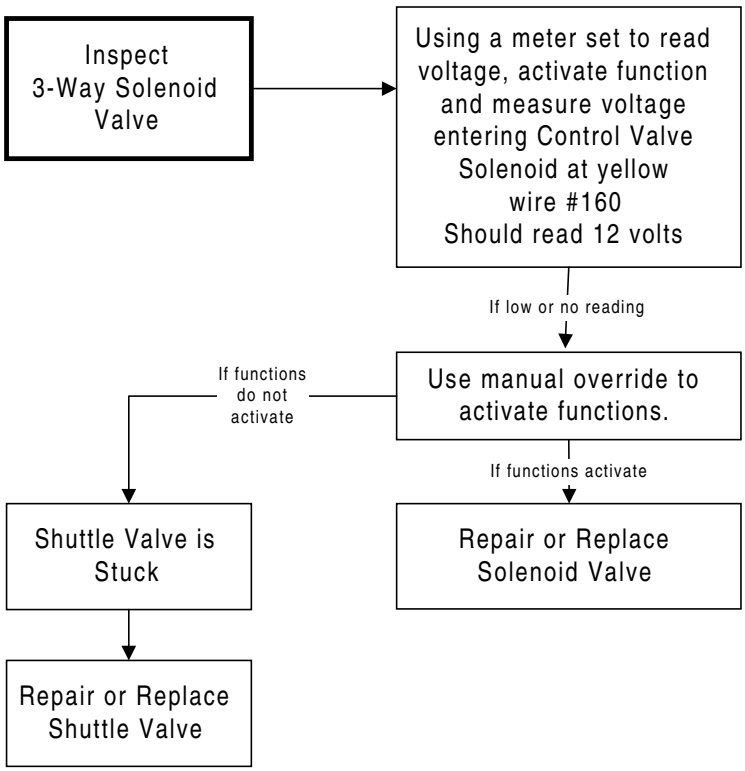


Step 1

Step 2



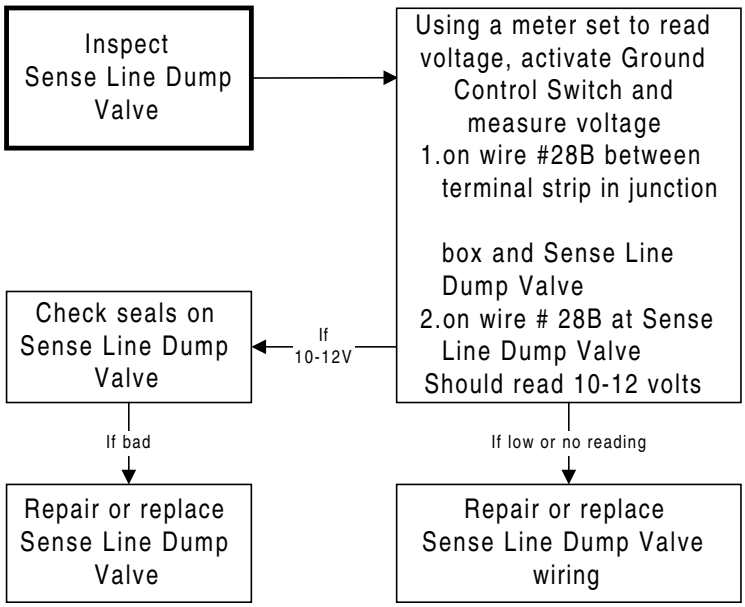
Non-proportional hydraulic functions not operating under engine power



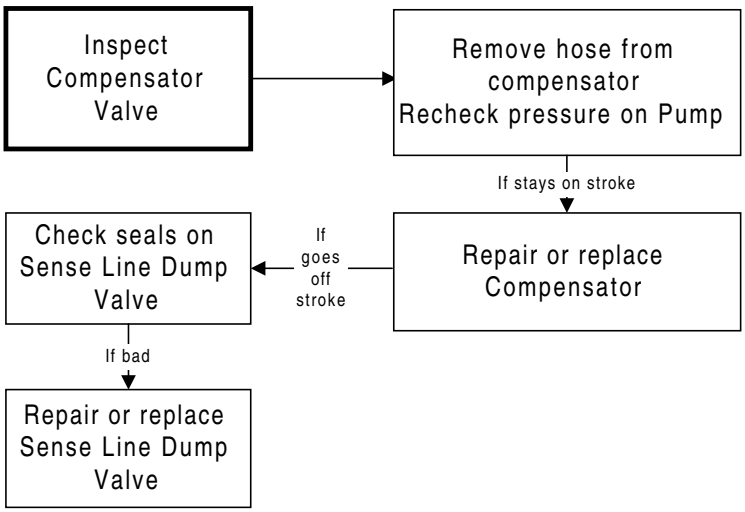
Step 1

Step 1

Proportional hydraulic functions not operating under engine power



Hydraulic pump stays on stroke

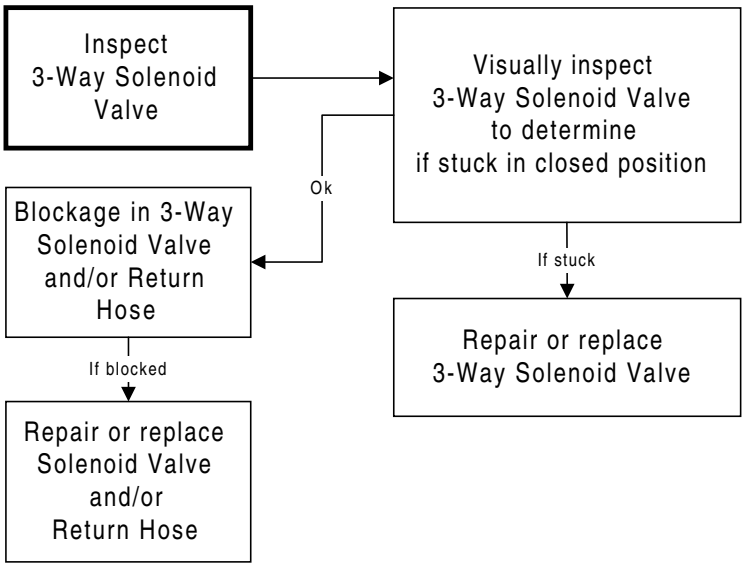


Step 1

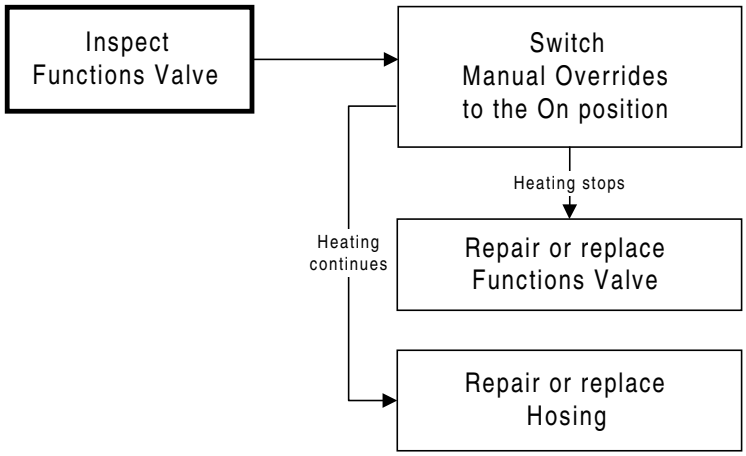
Hydraulic oil overheats while idling

Step 1

⚠CAUTION
Machine function will be moving when manual override is activated.

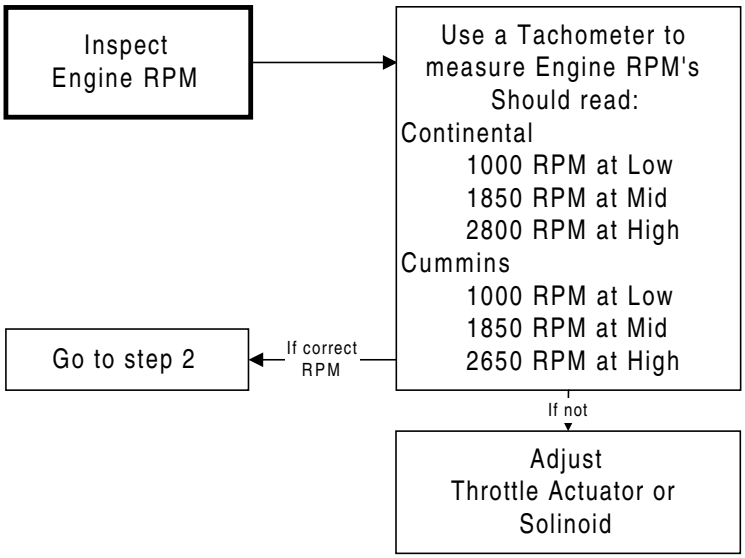


Hydraulic oil overheats during operation



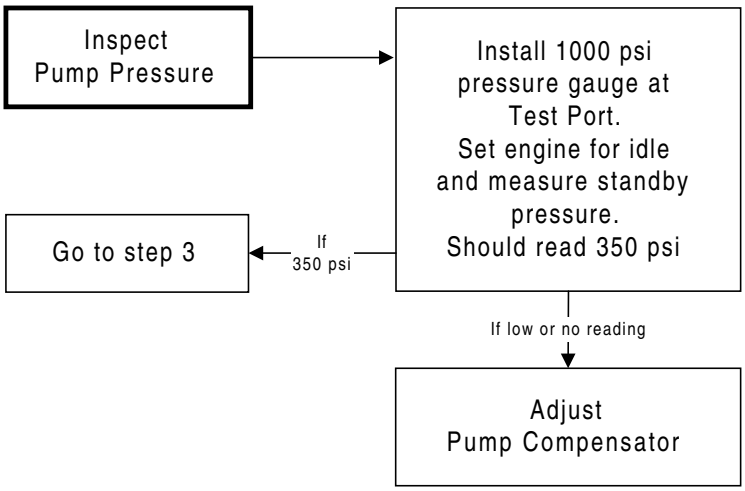
Step 1

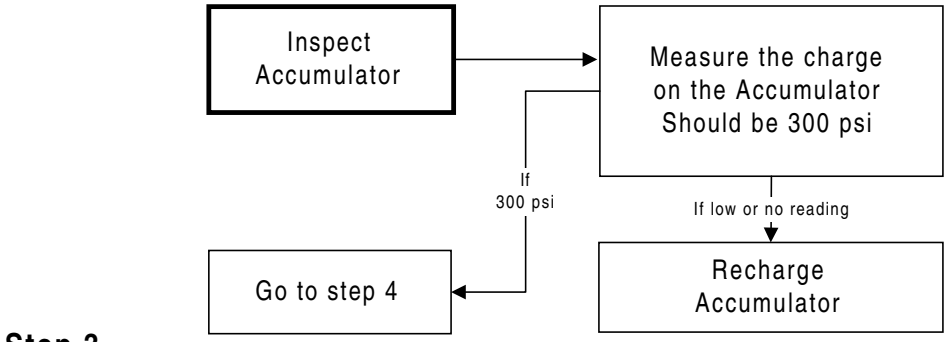
Hydraulic functions are sluggish



Step 1

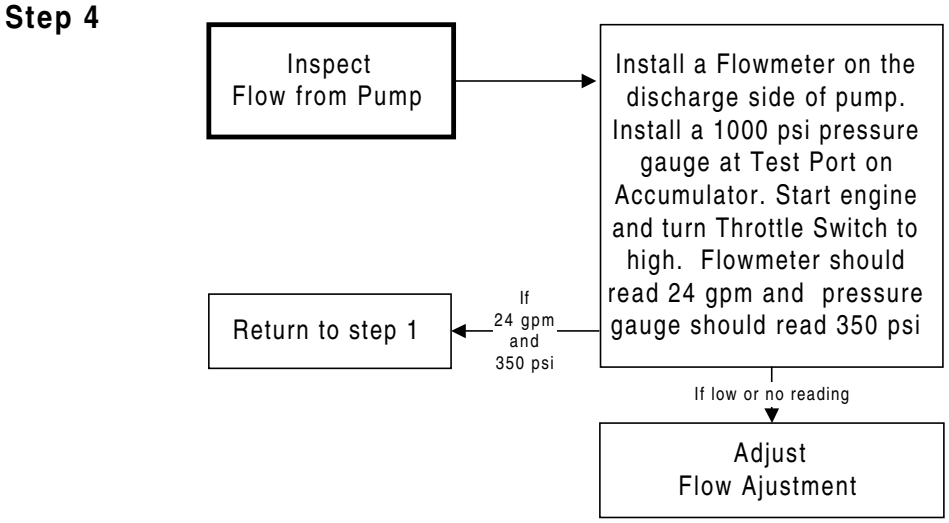
Step 2



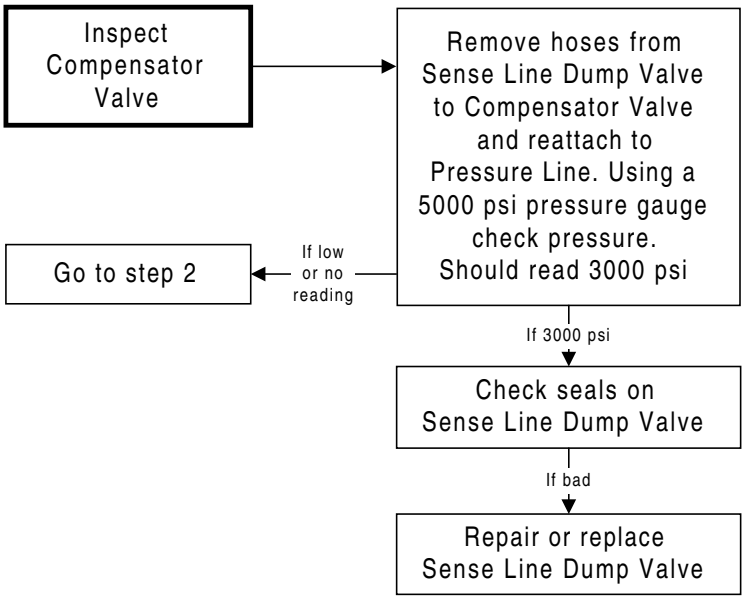


Step 3

Step 4

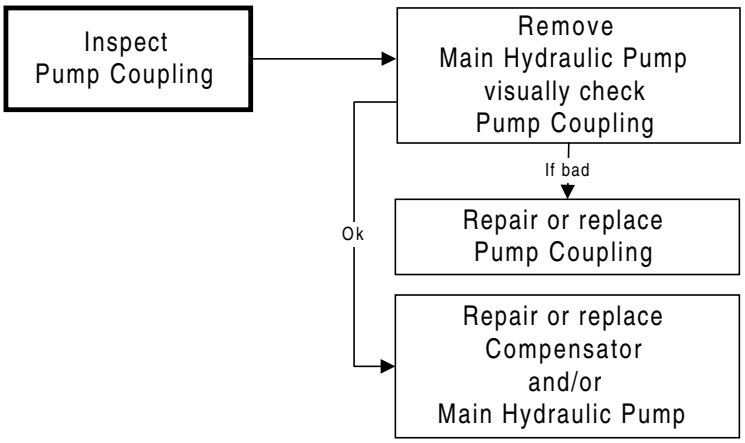


Hydraulic pump will not build pressure

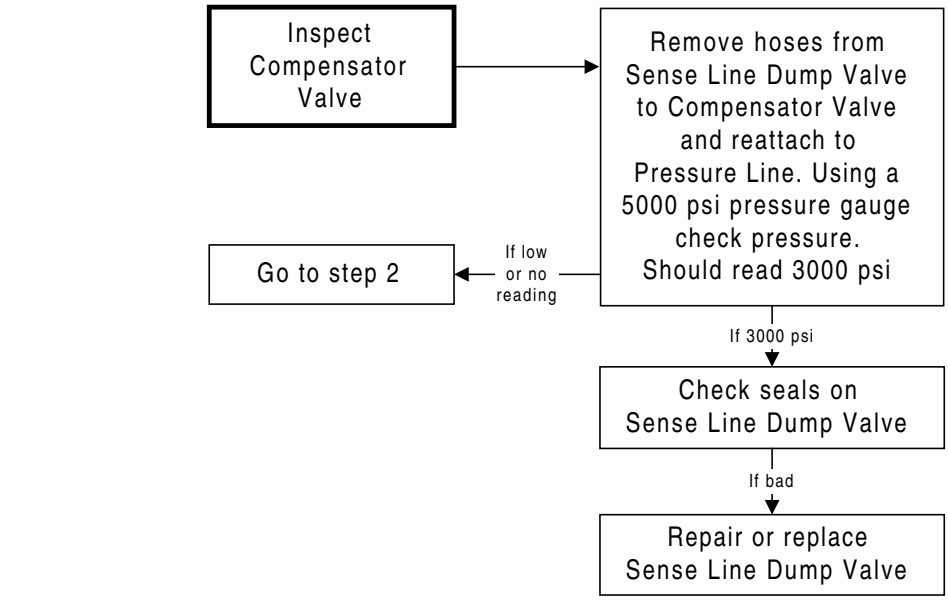


Step 1

Step 2

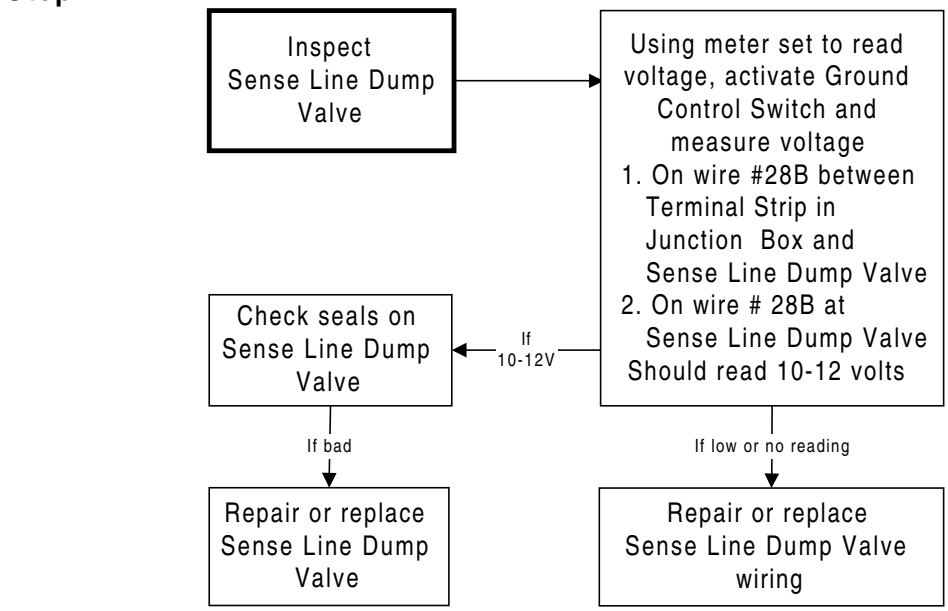


Hydraulic pump will not build enough pressure

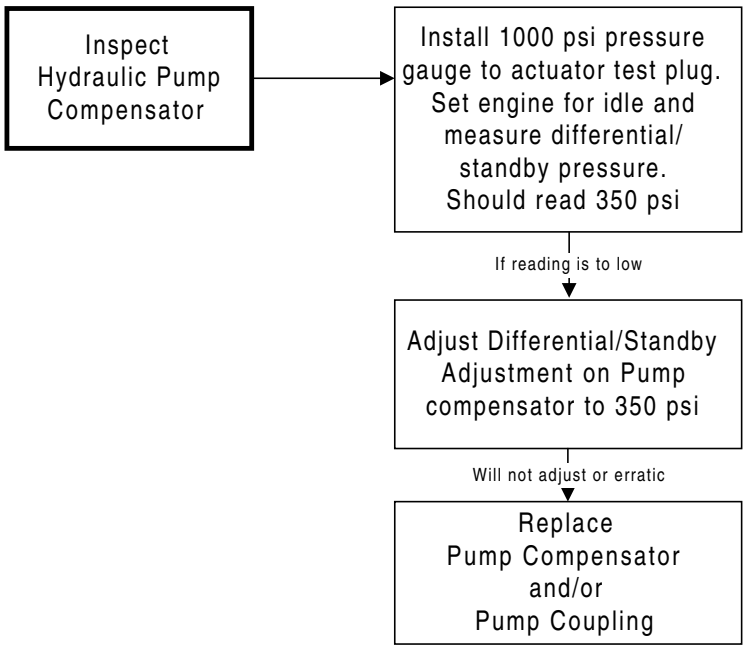


Step 1

Step 2



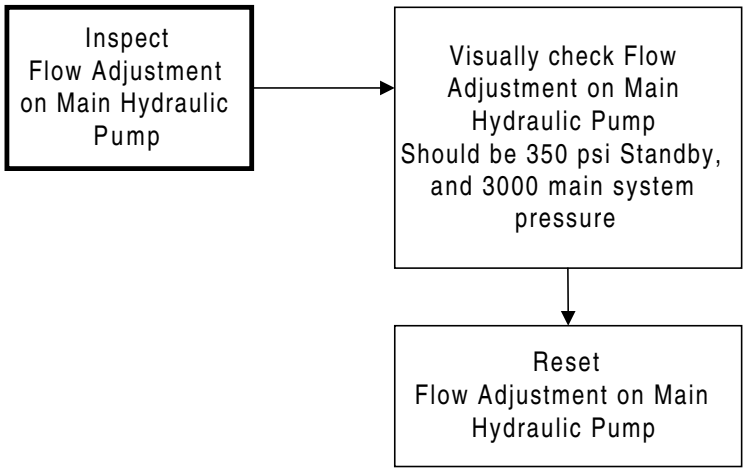
Flow from hydraulic pump is too low



Step 1

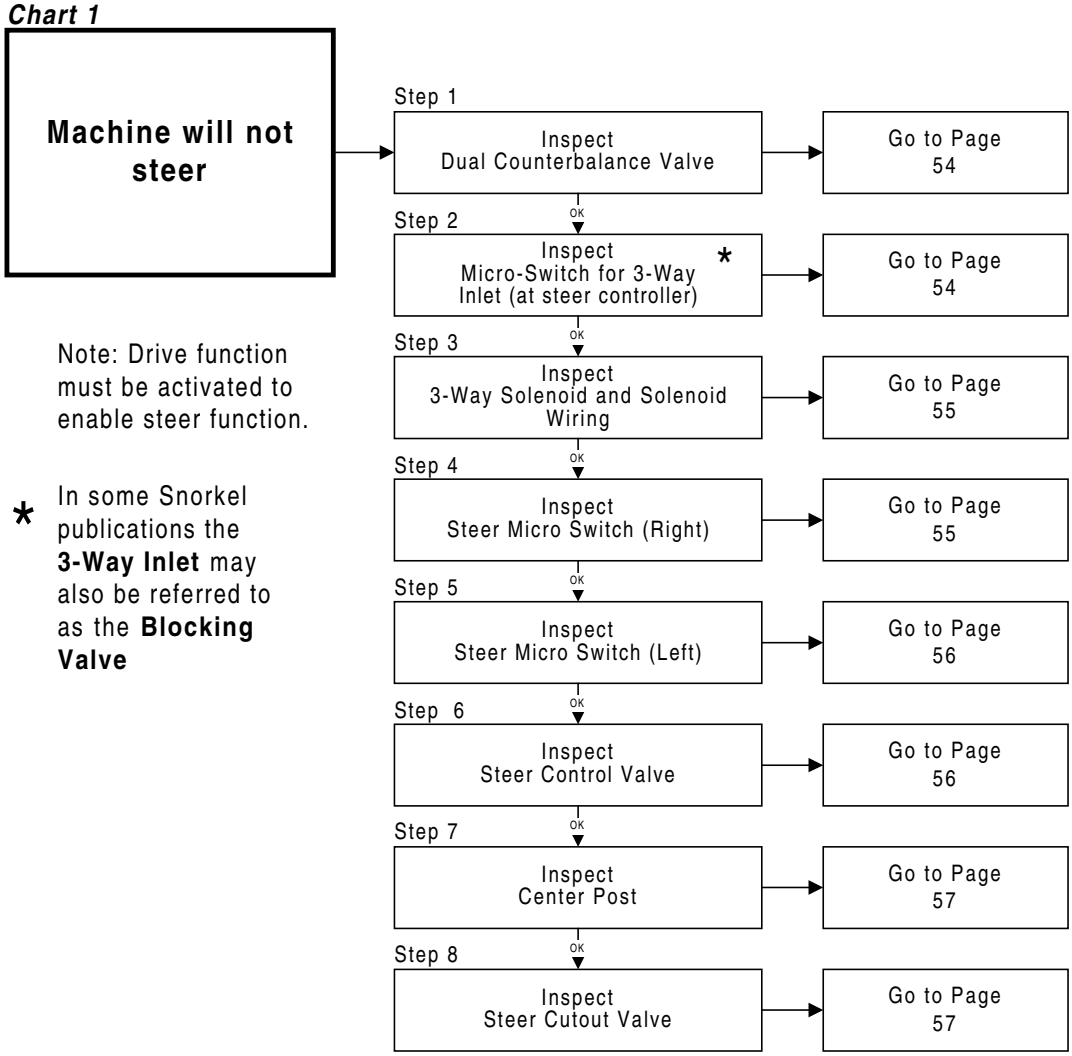
Step 1

Flow from hydraulic pump is too high (kills engine)



SECTION THREE:
STEERING SYSTEM DIAGNOSTICS

Chart 1

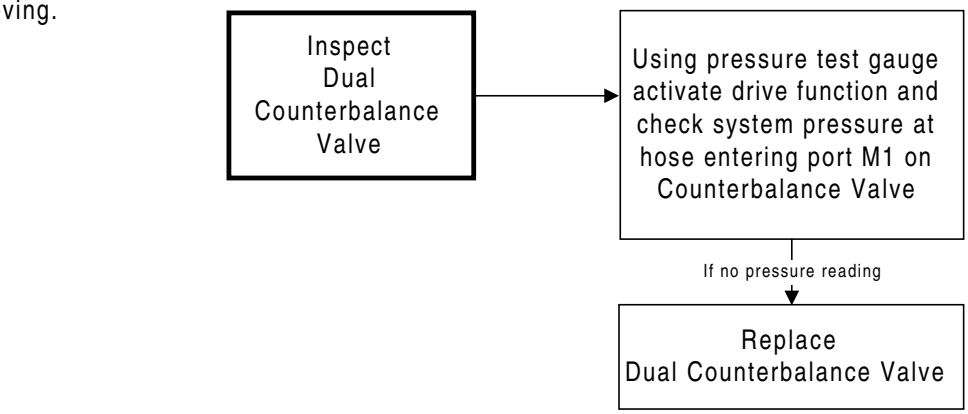


Note: Drive function must be activated to enable steer function.

* In some Snorkel publications the **3-Way Inlet** may also be referred to as the **Blocking Valve**

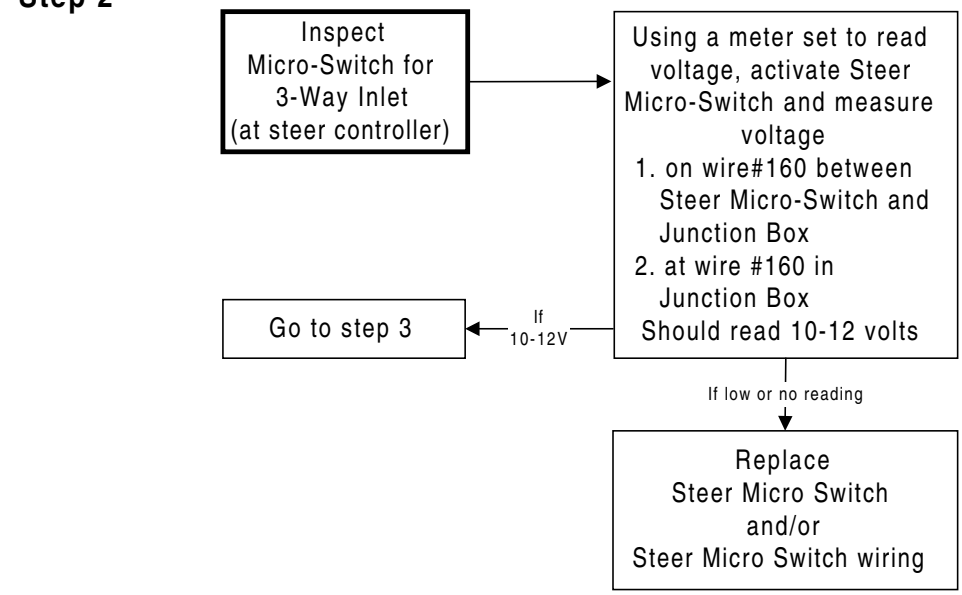
Machine will not steer

Note:
At this point the manual override may also be use to isolate the solenoid, however use caution as the machine will be moving.

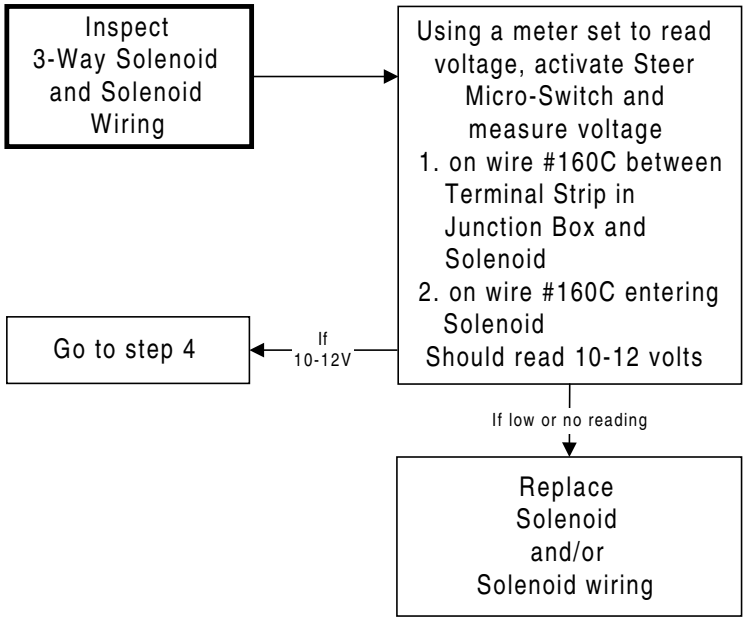


Step 1

Step 2

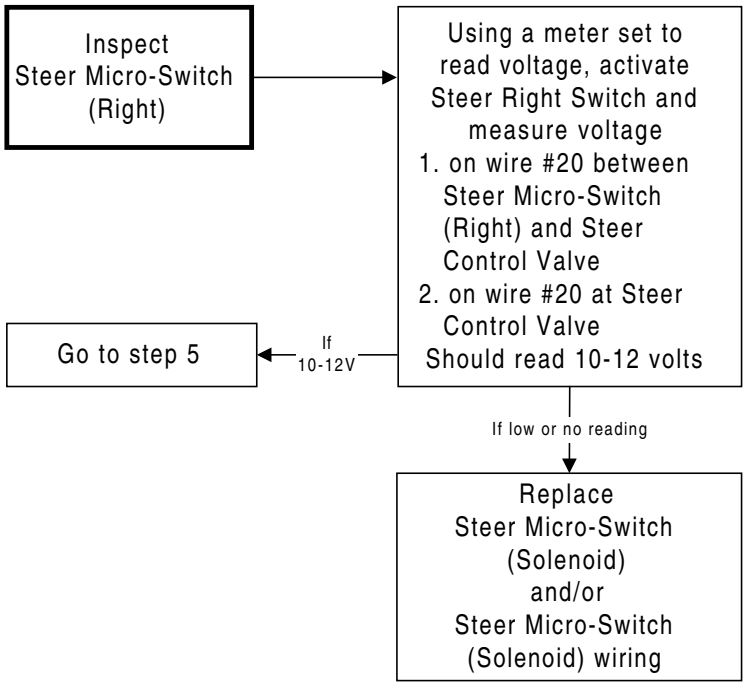


Note:
At this point the manual override may also be use to isolate the solenoid, however use caution as the machine will be moving.

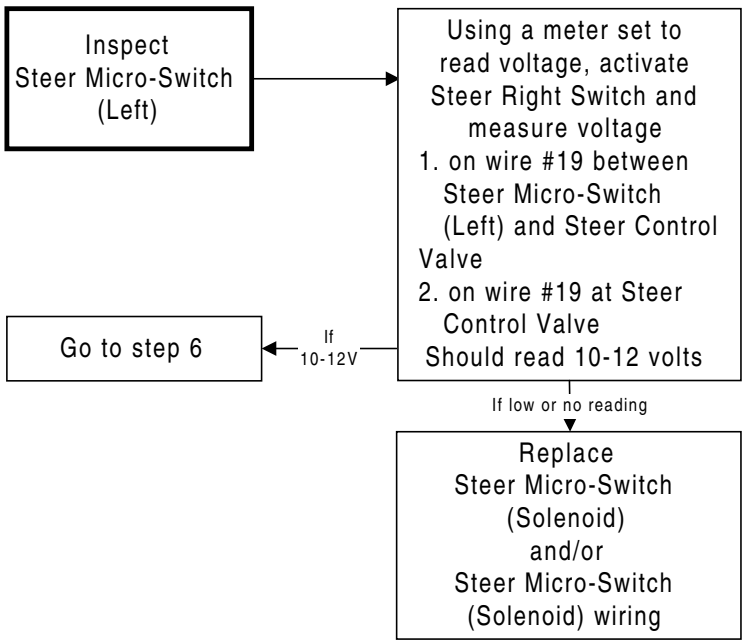


Step 3

Step 4

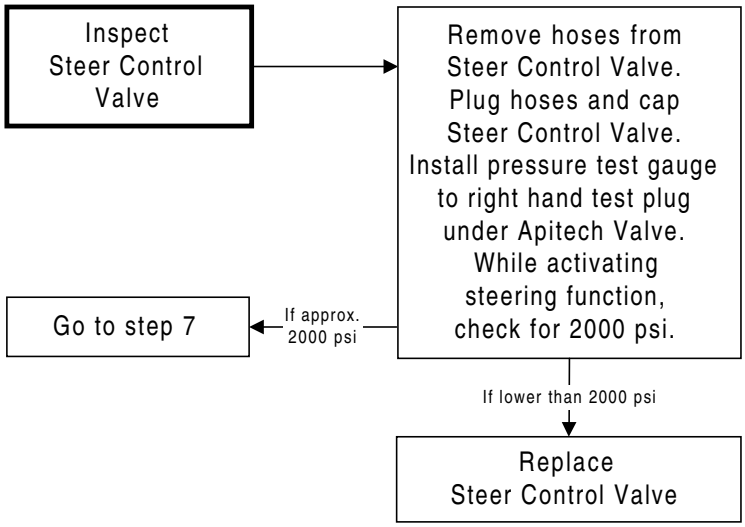


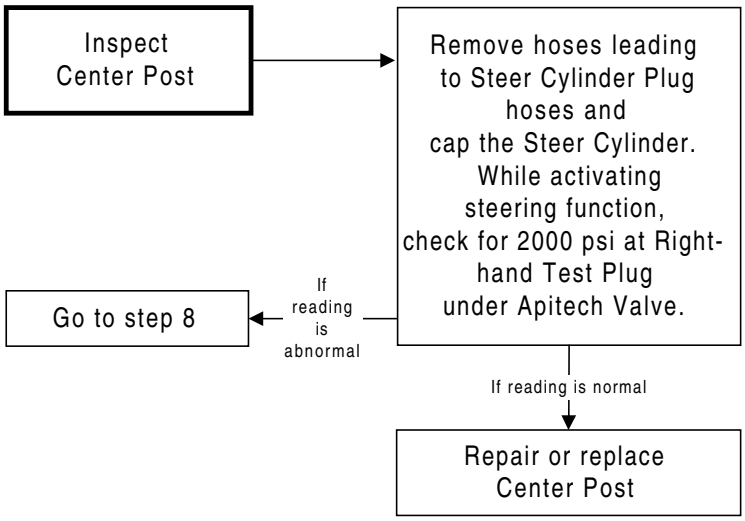
⚠CAUTION
During activation of steering function the machine will be moving.



Step 5

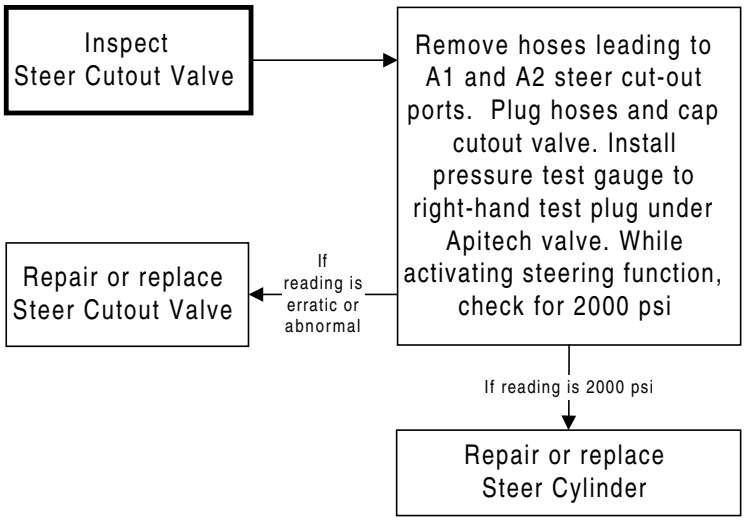
Step 6





Step 7

Step 8



SECTION FOUR:
DRIVE SYSTEM DIAGNOSTICS

Chart 1

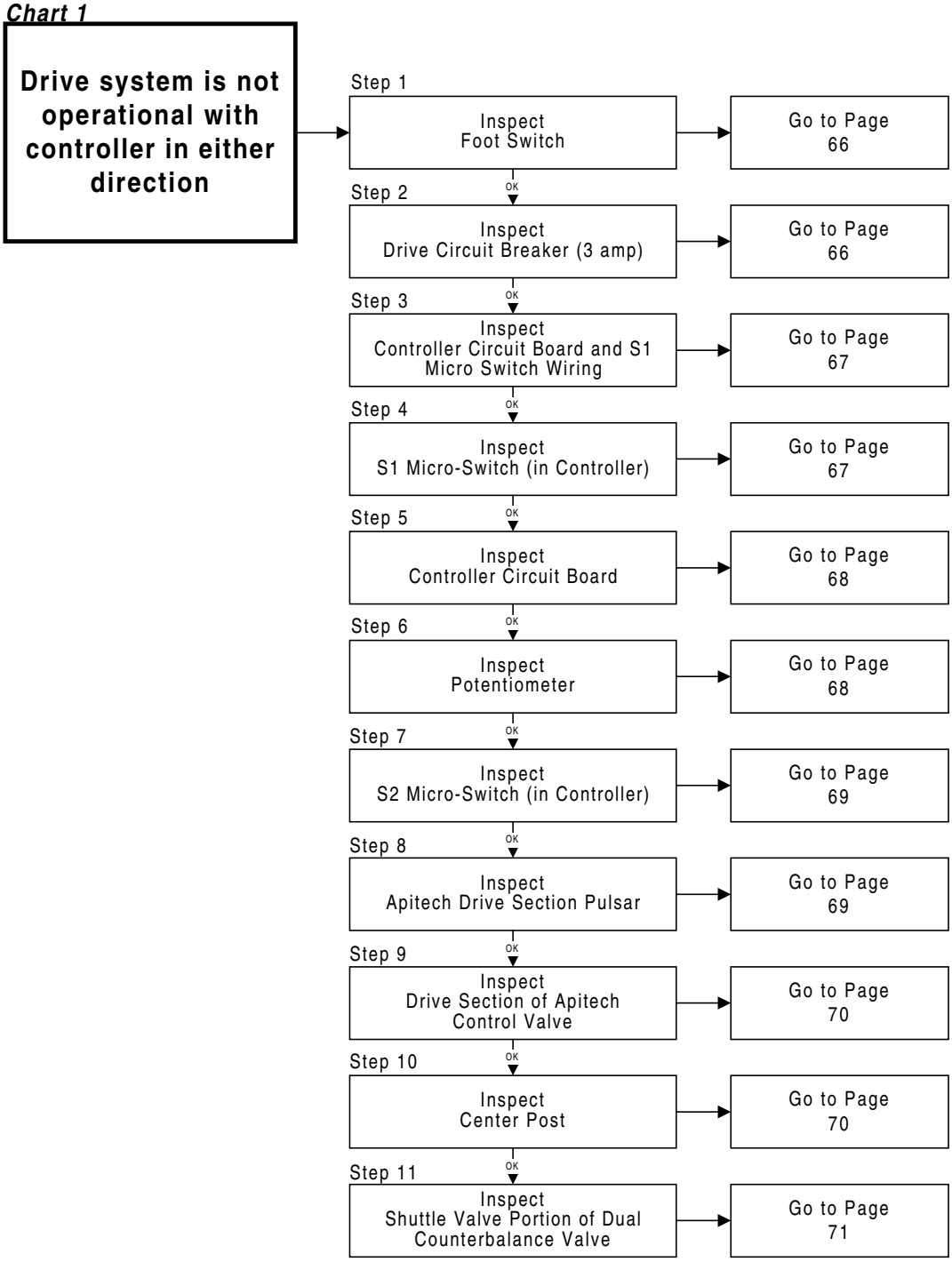


Chart 2

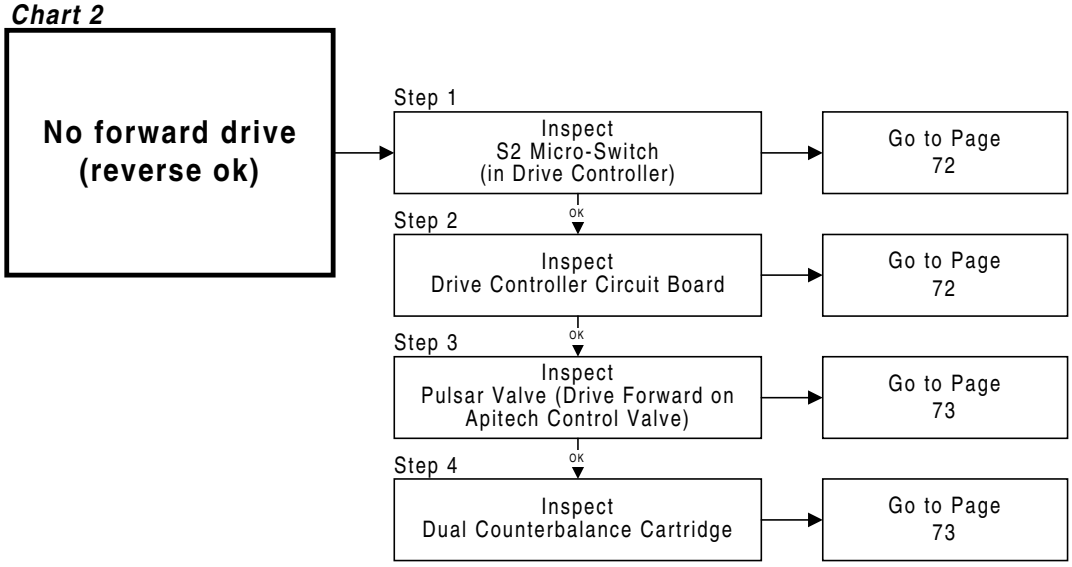


Chart 3

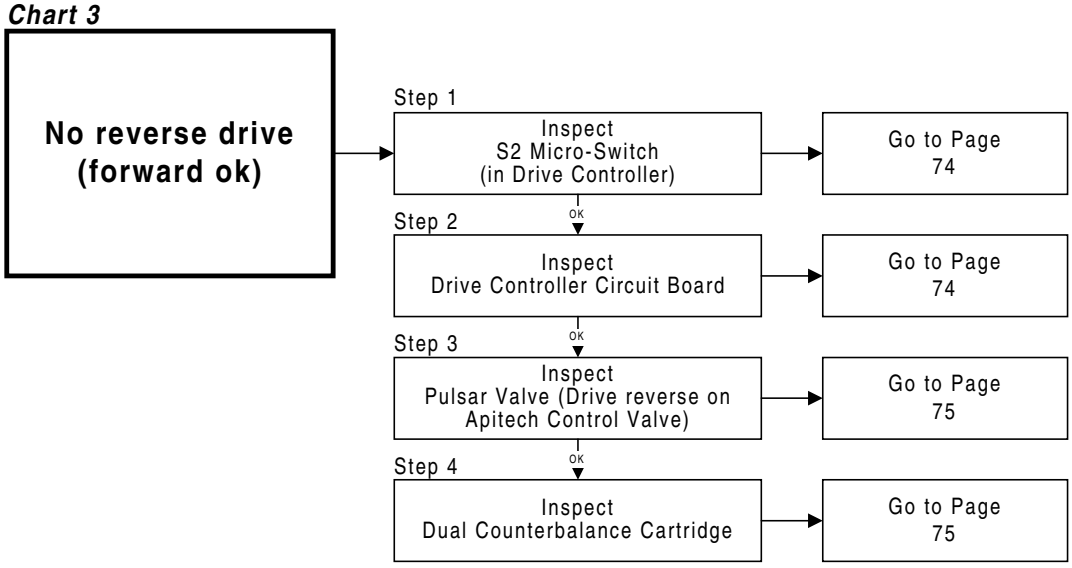


Chart 4

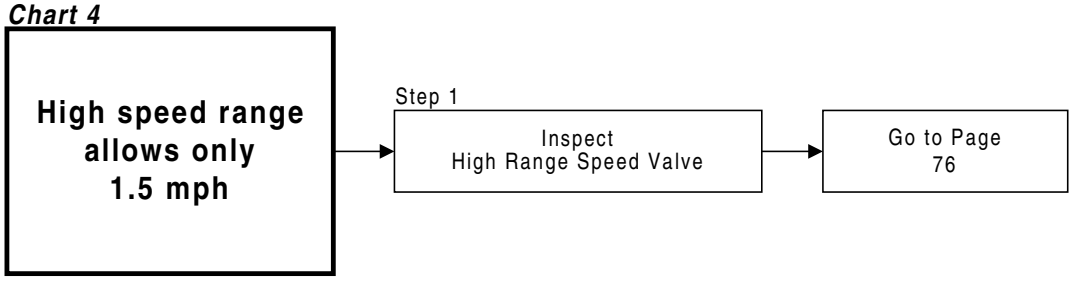


Chart 5

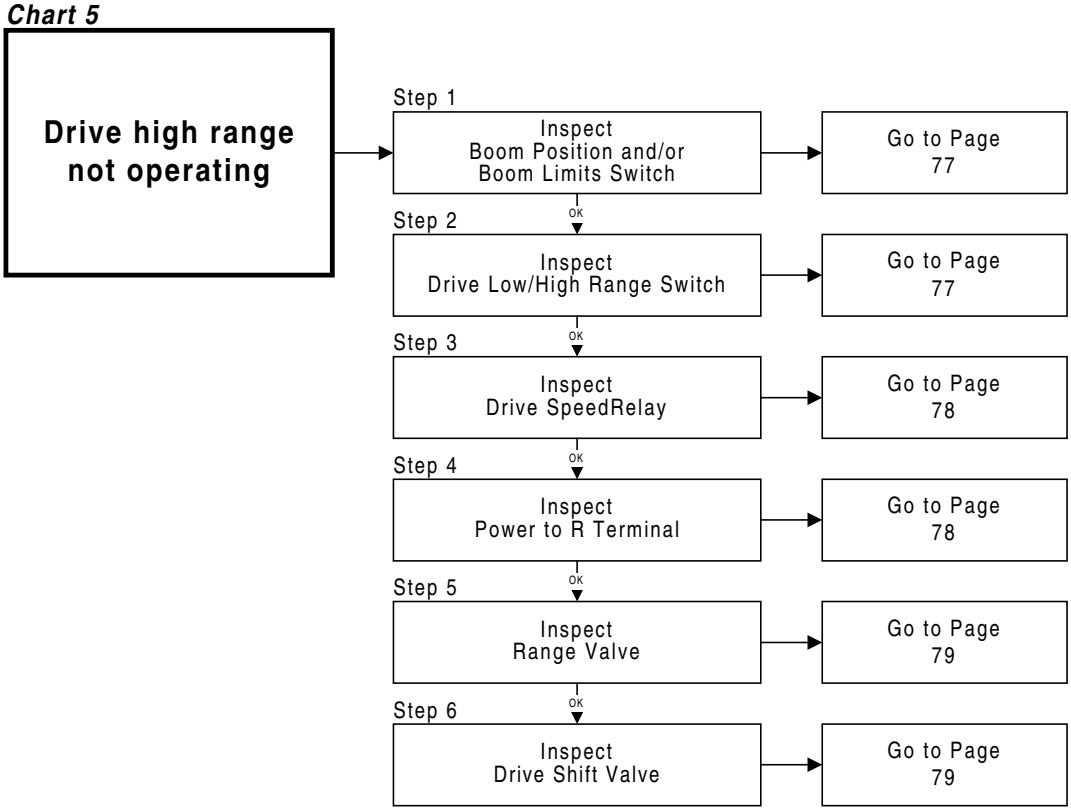


Chart 6

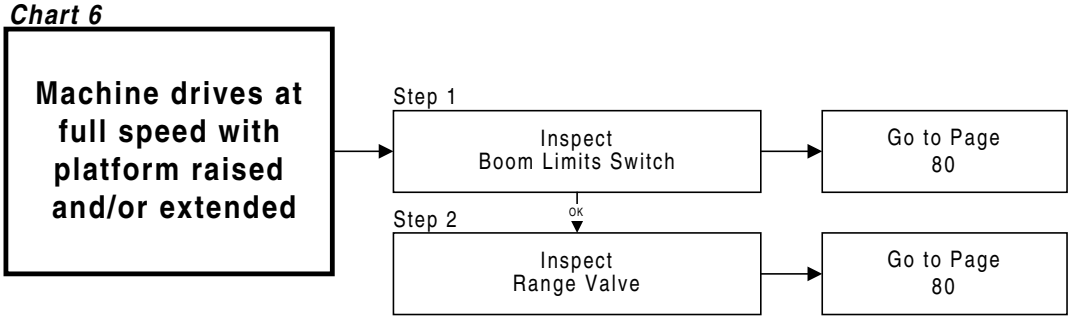


Chart 7

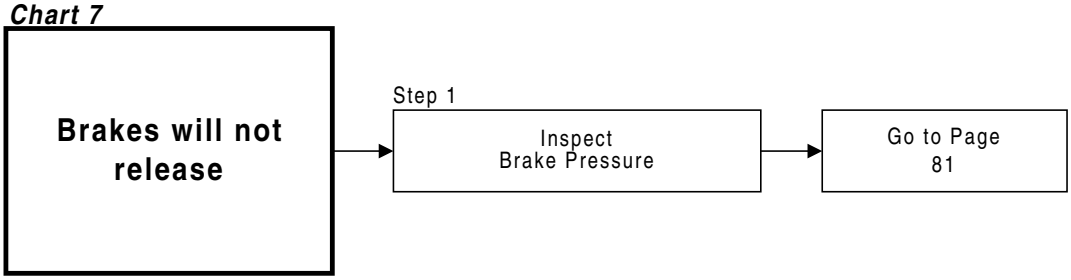


Chart 8

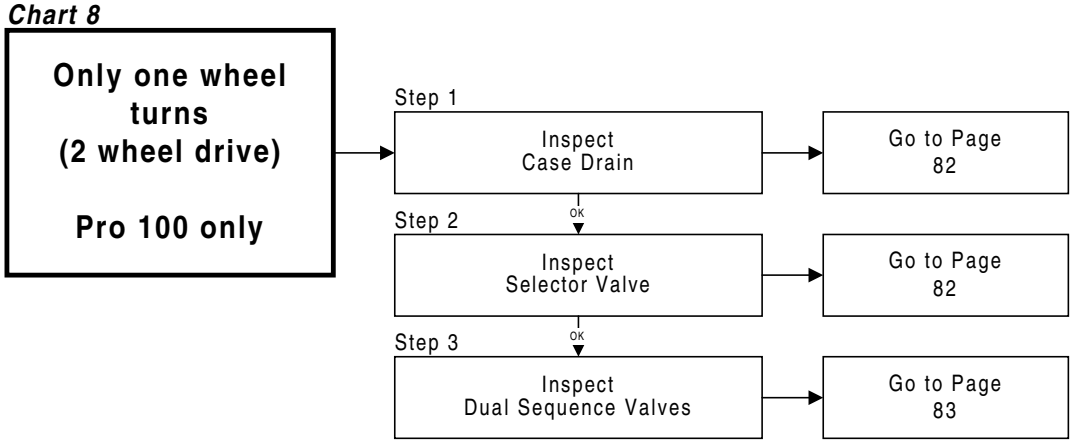


Chart 9

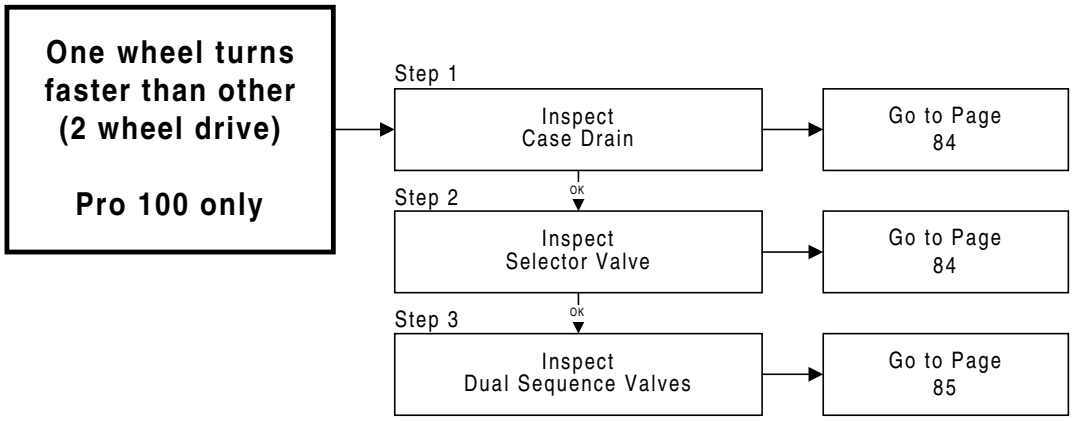


Chart 10

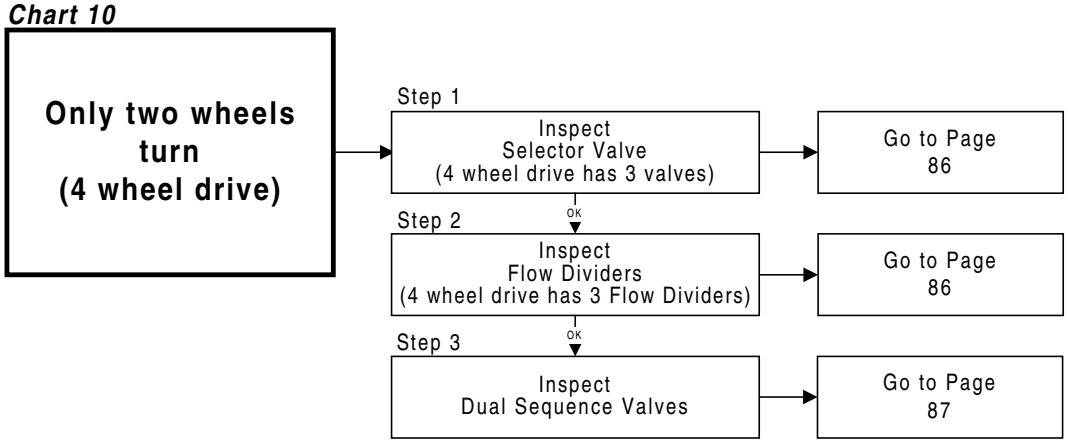
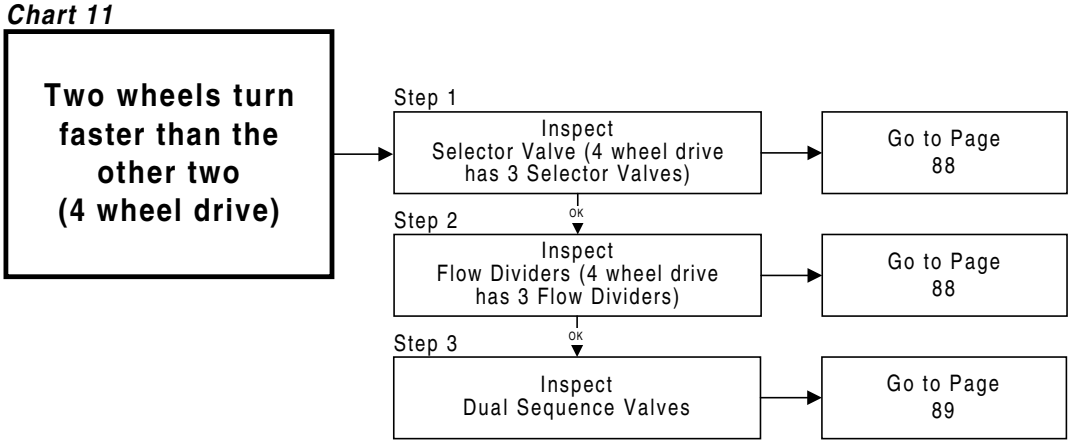
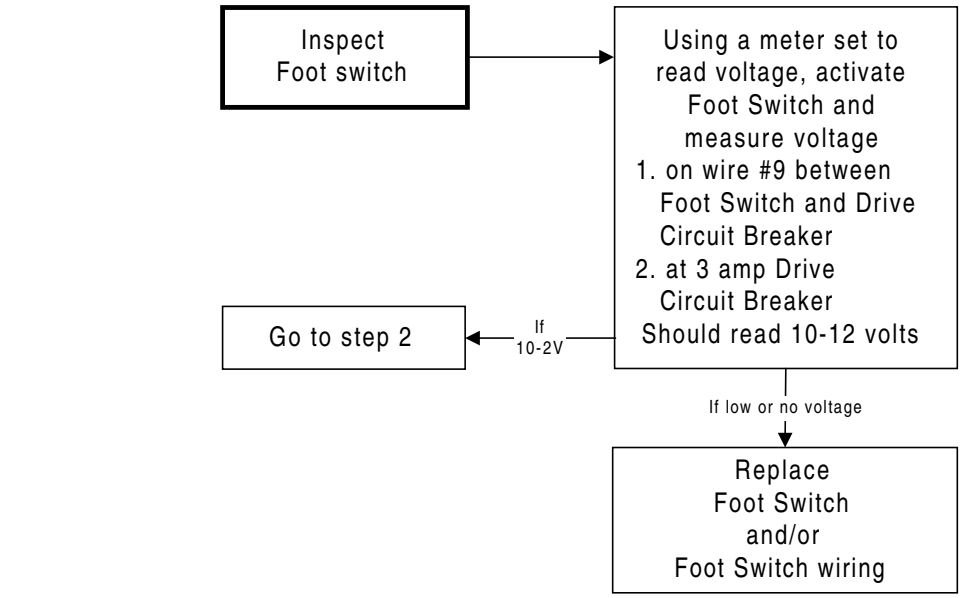


Chart 11

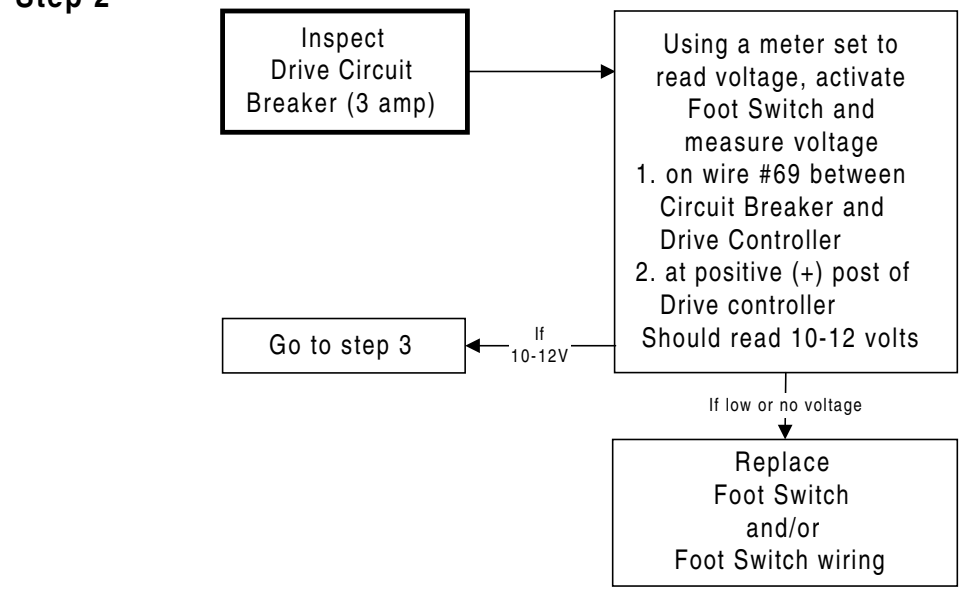


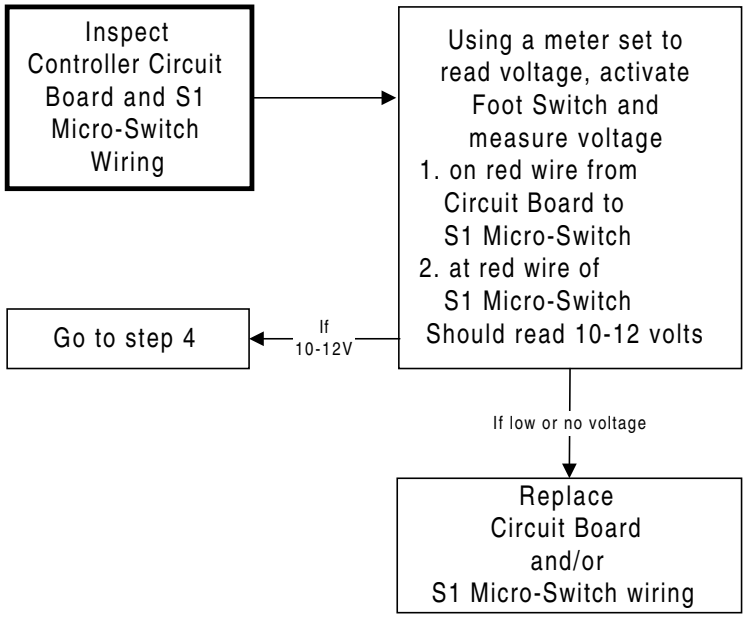
Drive system is non-operational with controller in either direction



Step 1

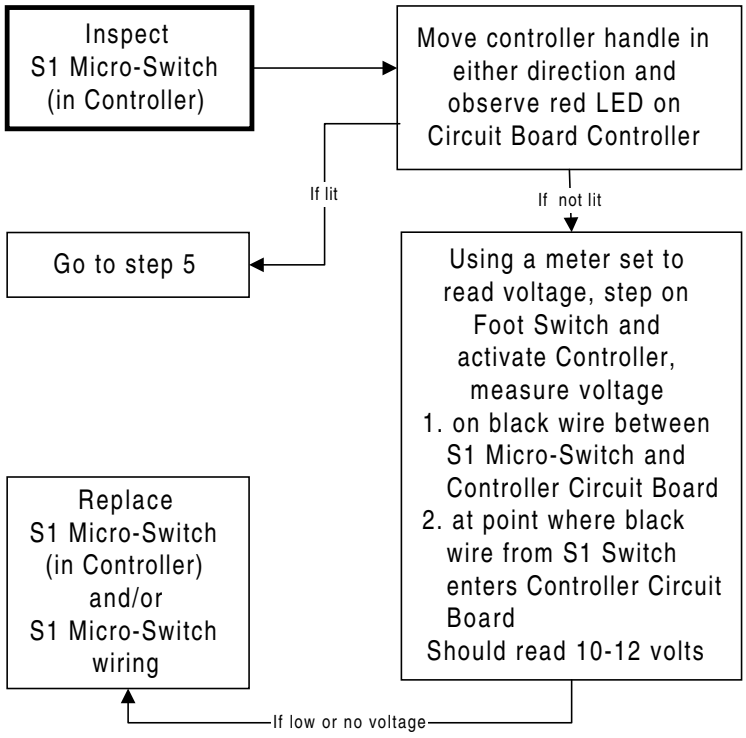
Step 2

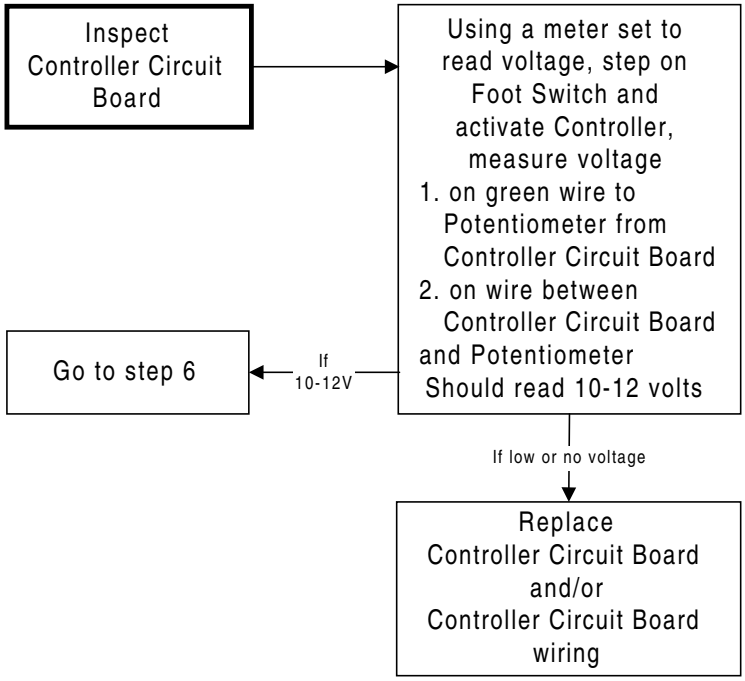




Step 3

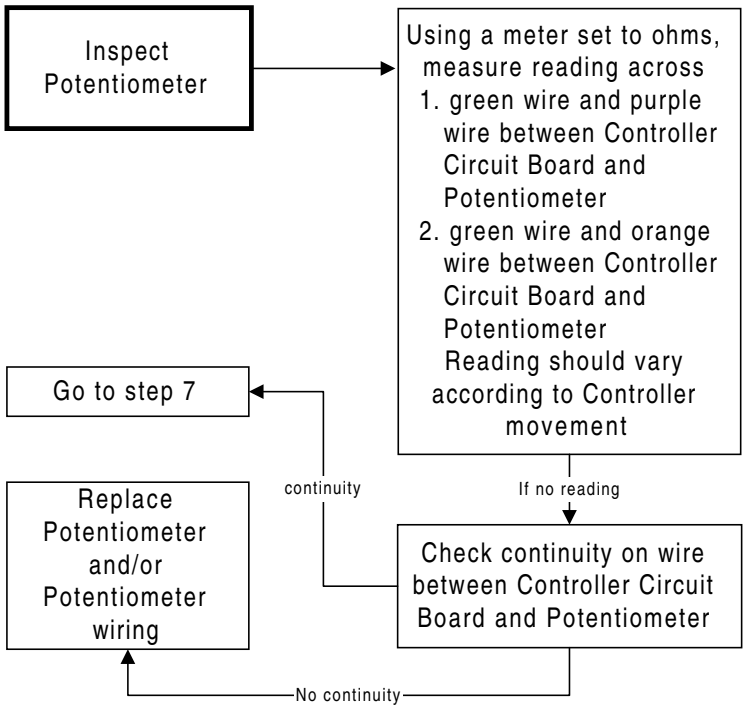
Step 4



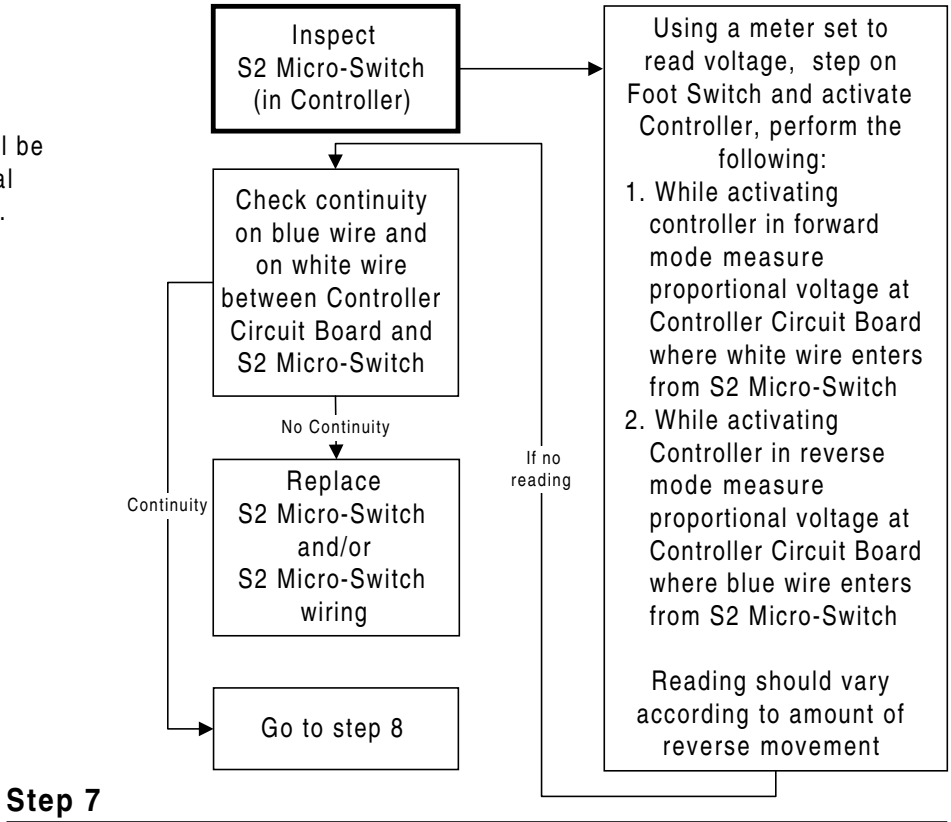


Step 5

Step 6

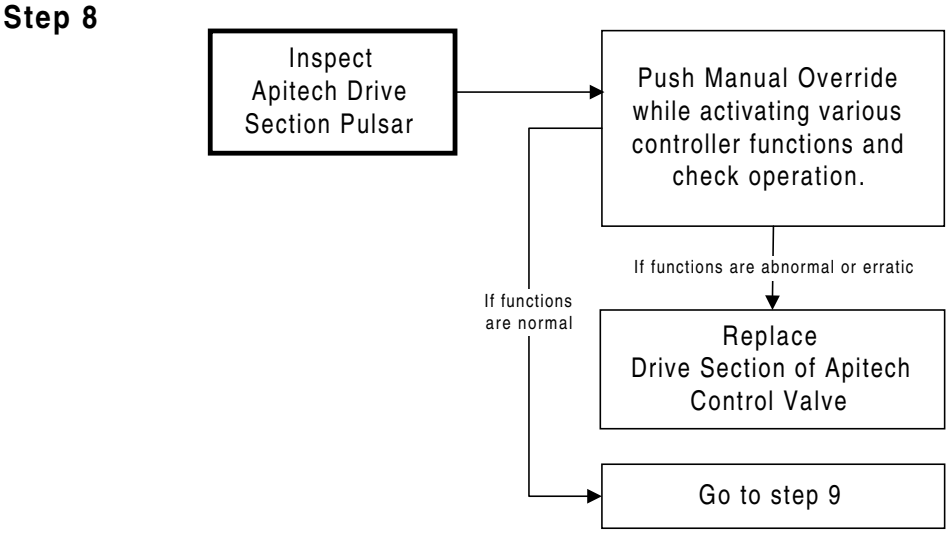


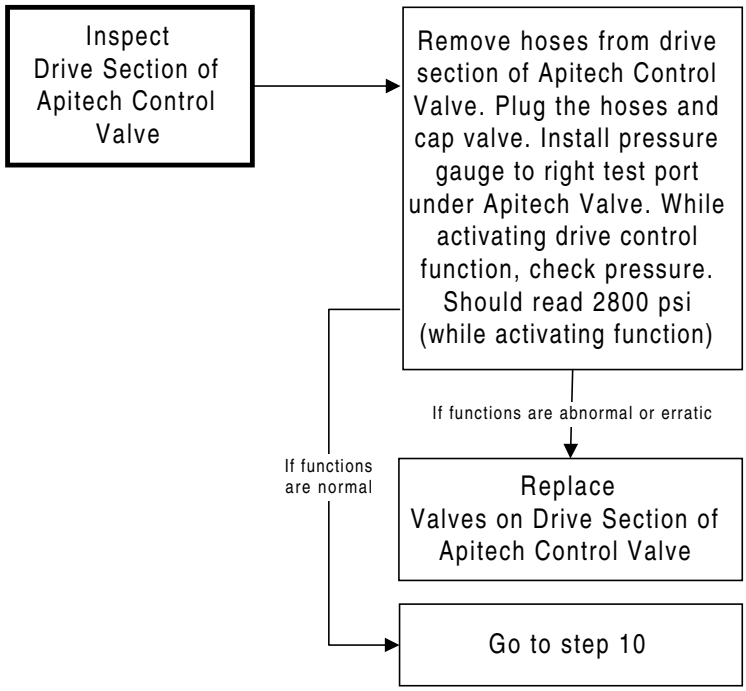
⚠CAUTION
Machine function will be moving when manual override is activated.



Step 7

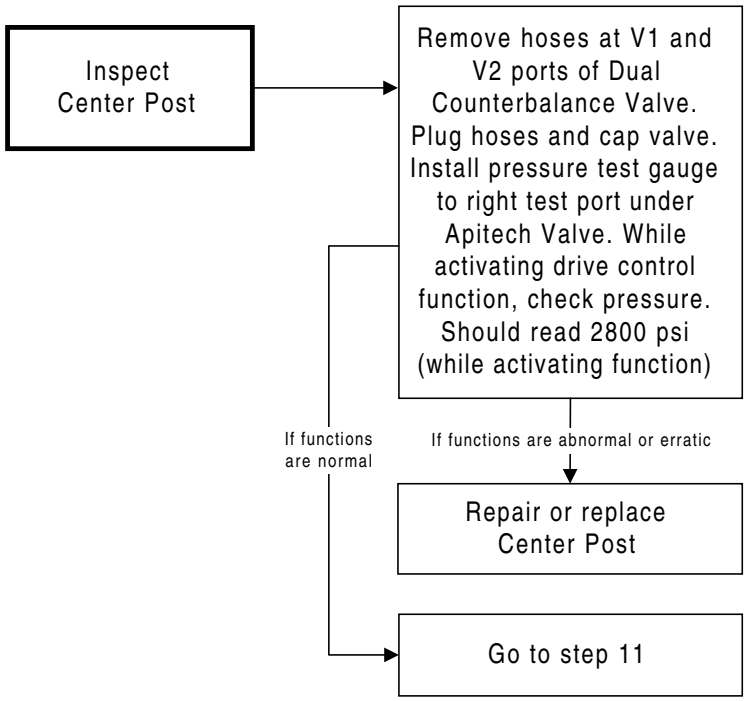
Step 8

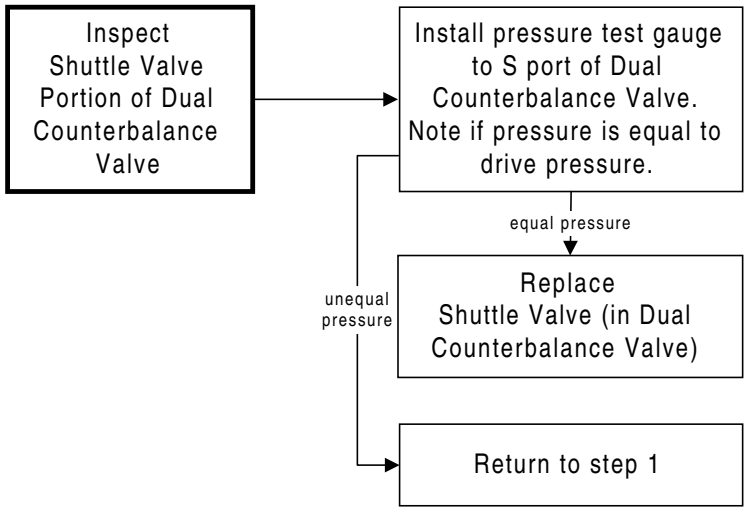




Step 9

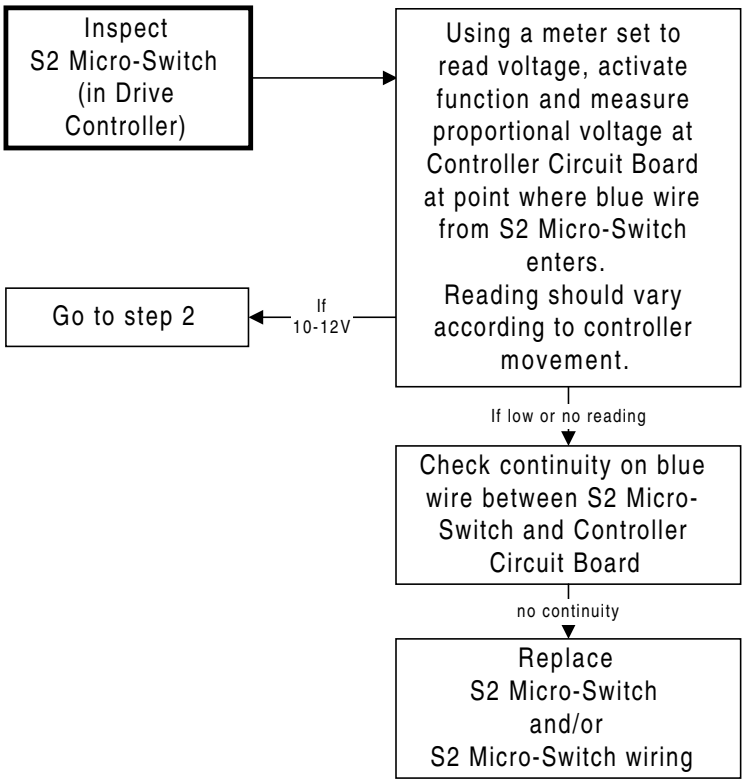
Step 10





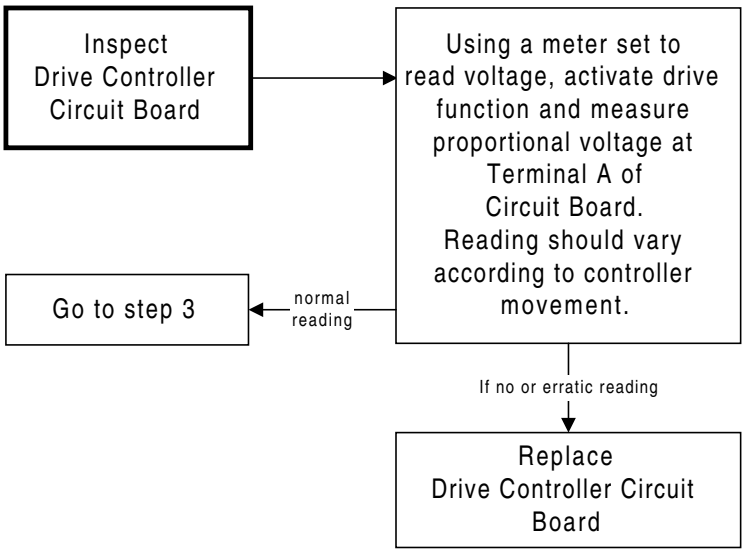
Step 11

No forward drive (Reverse Ok)

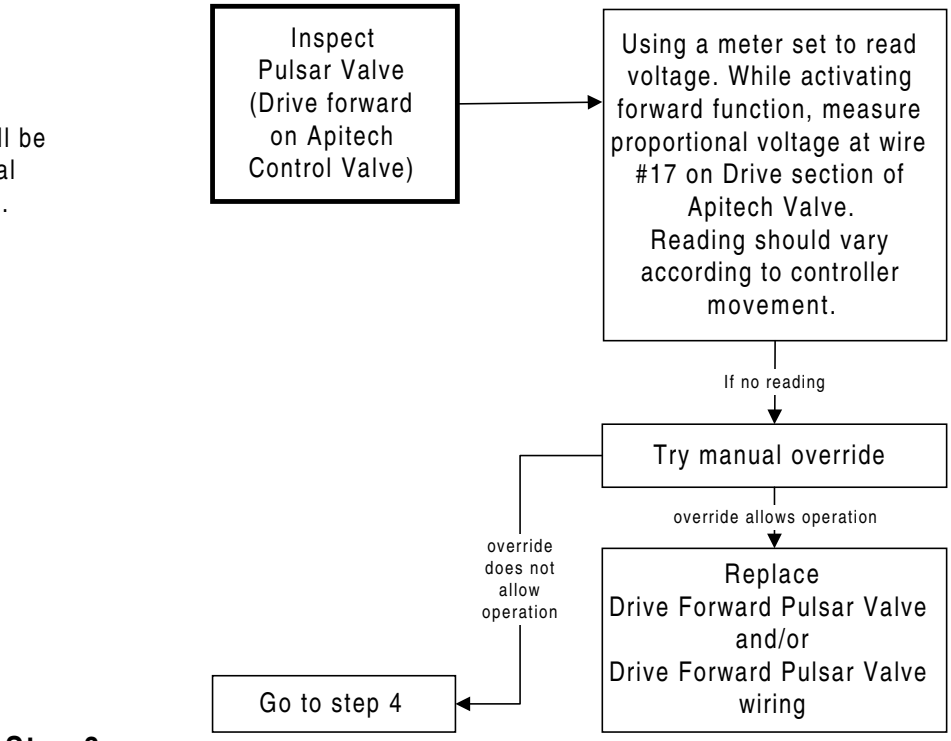


Step 1

Step 2

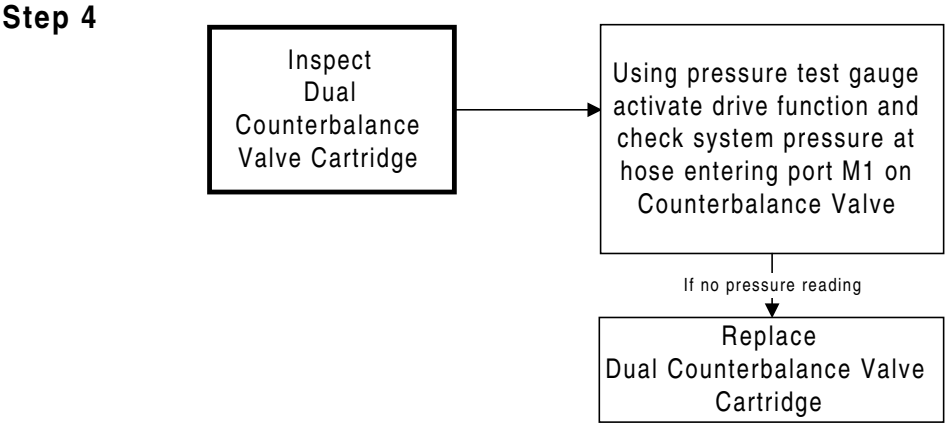


⚠CAUTION
Machine function will be moving when manual override is activated.

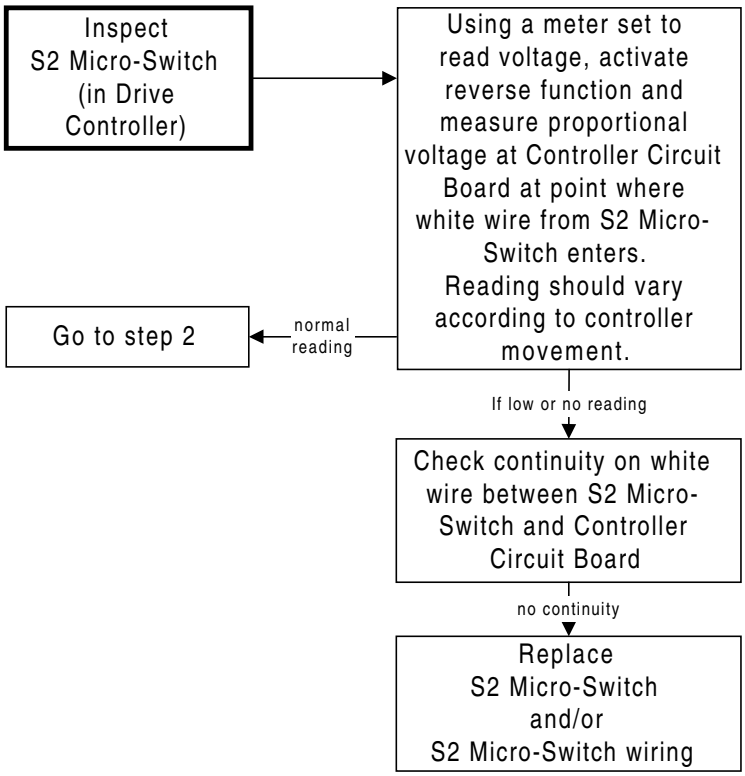


Step 3

Step 4

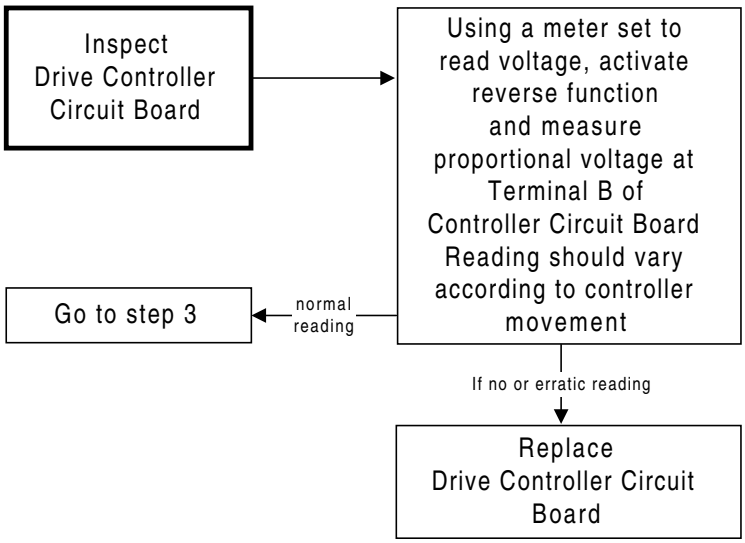


No reverse drive (Forward Ok)

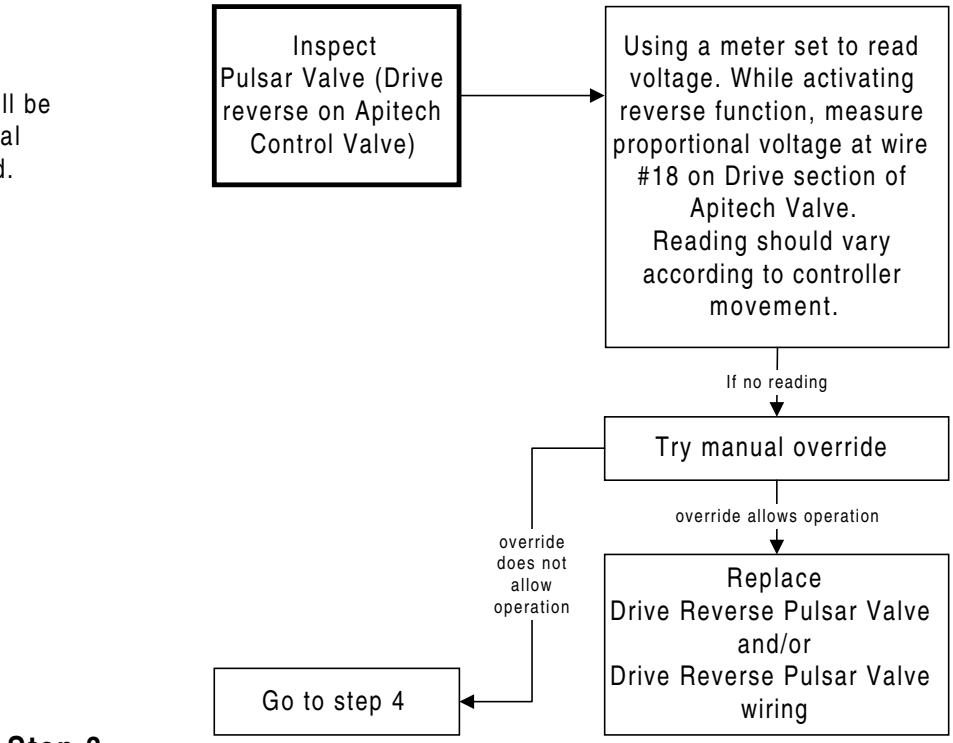


Step 1

Step 2

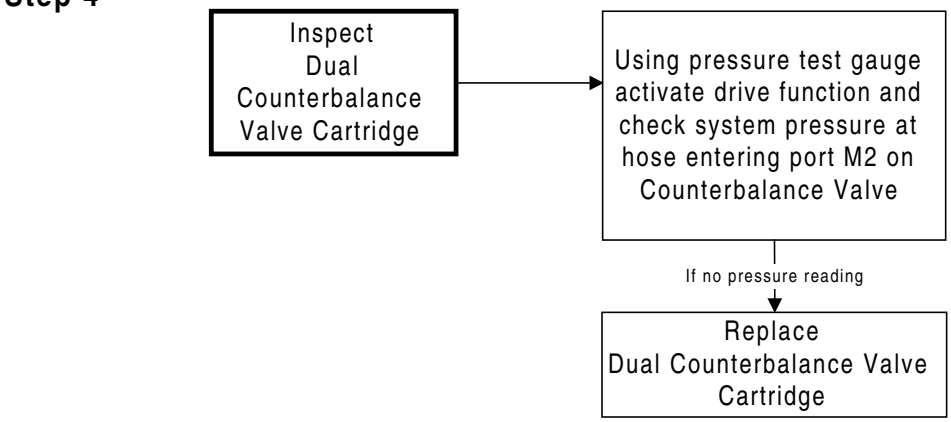


⚠CAUTION
Machine function will be moving when manual override is activated.

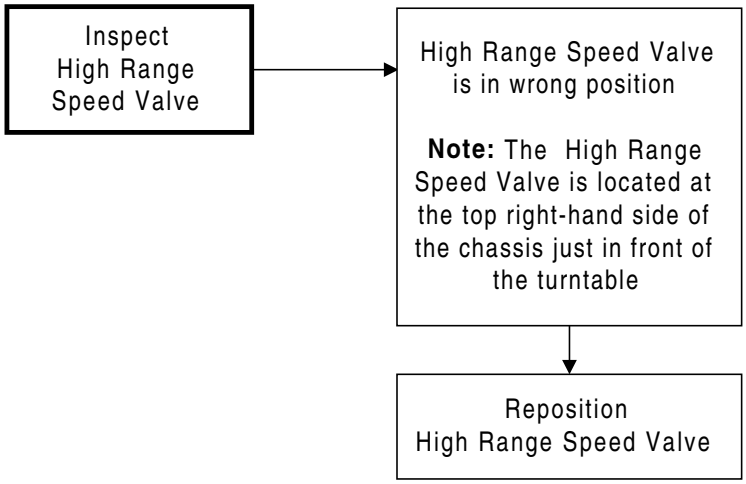


Step 3

Step 4

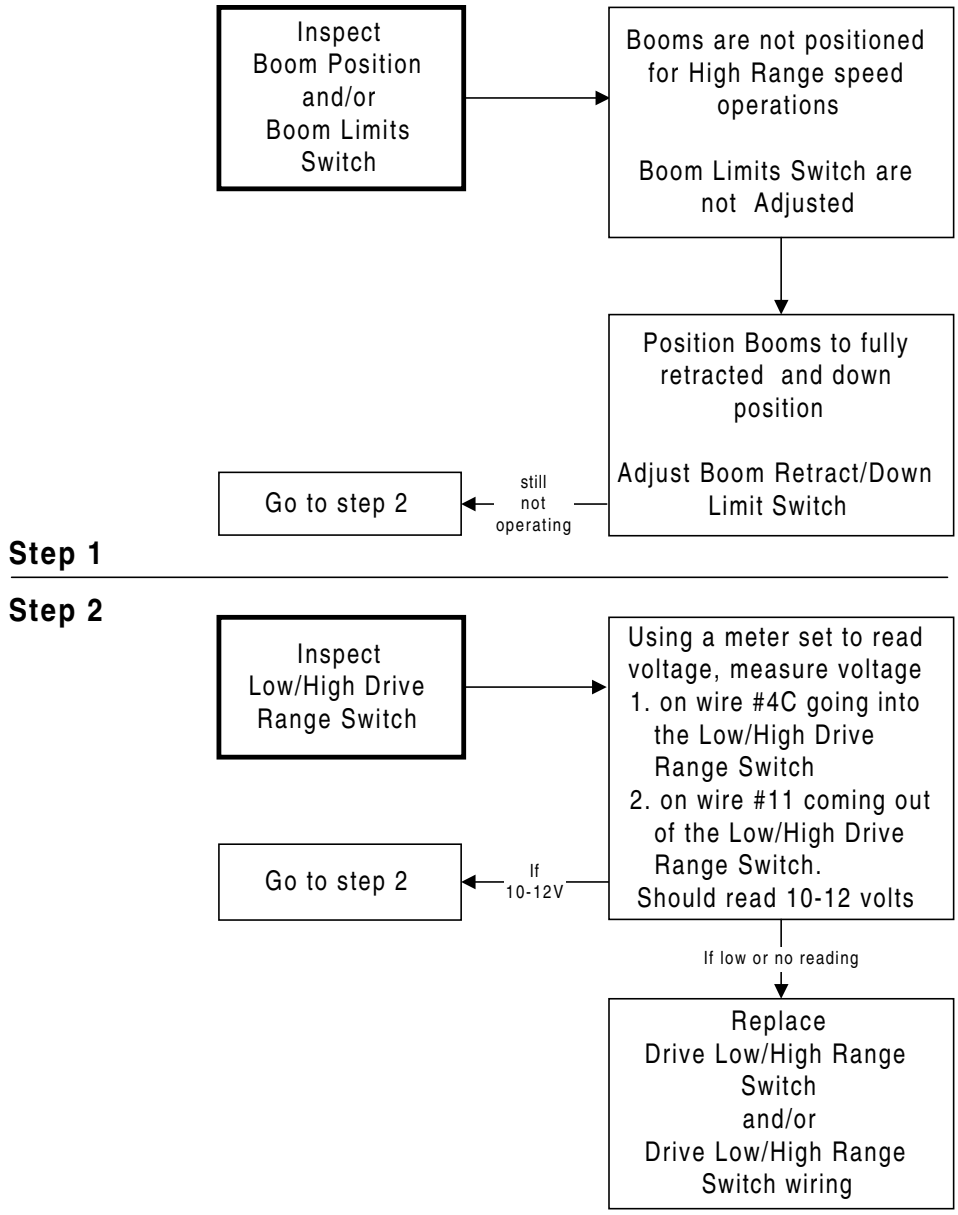


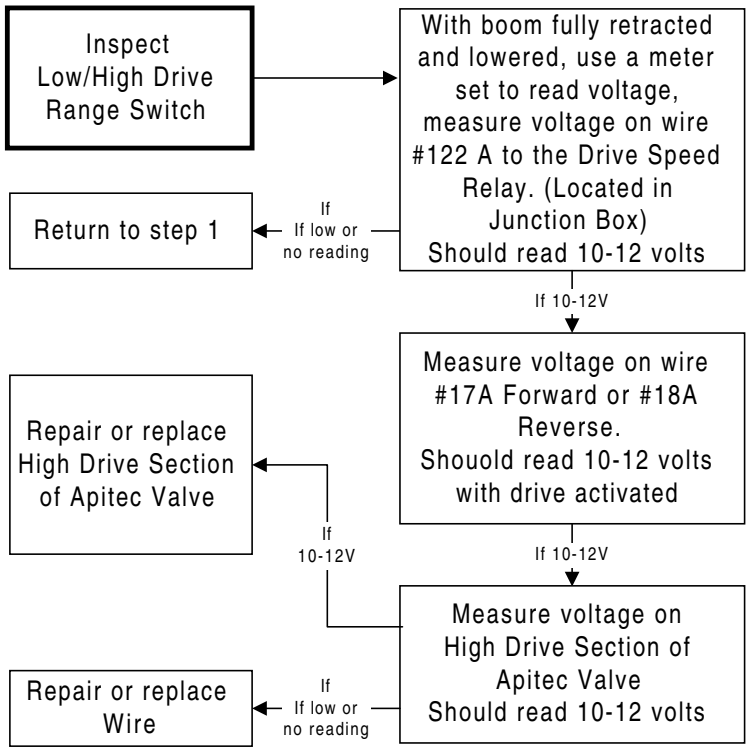
High speed range allows only 1.5 mph



Step 1

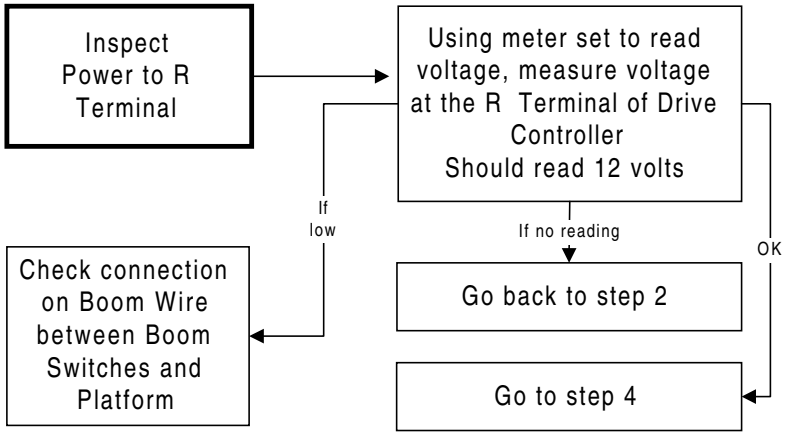
Drive high range not operating

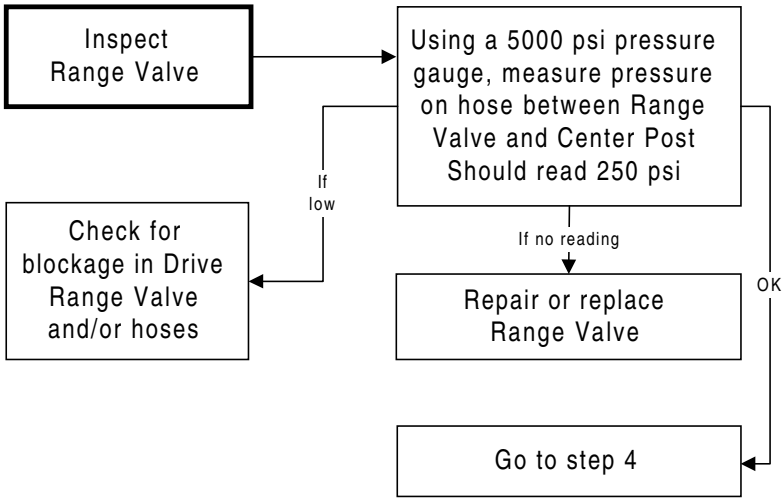




Step 3

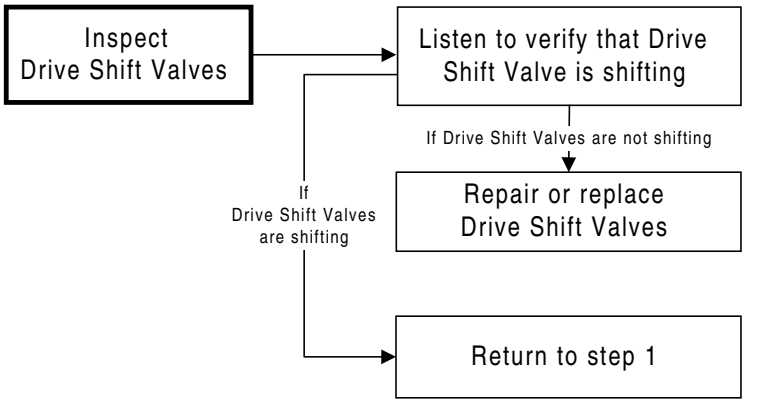
Step 4



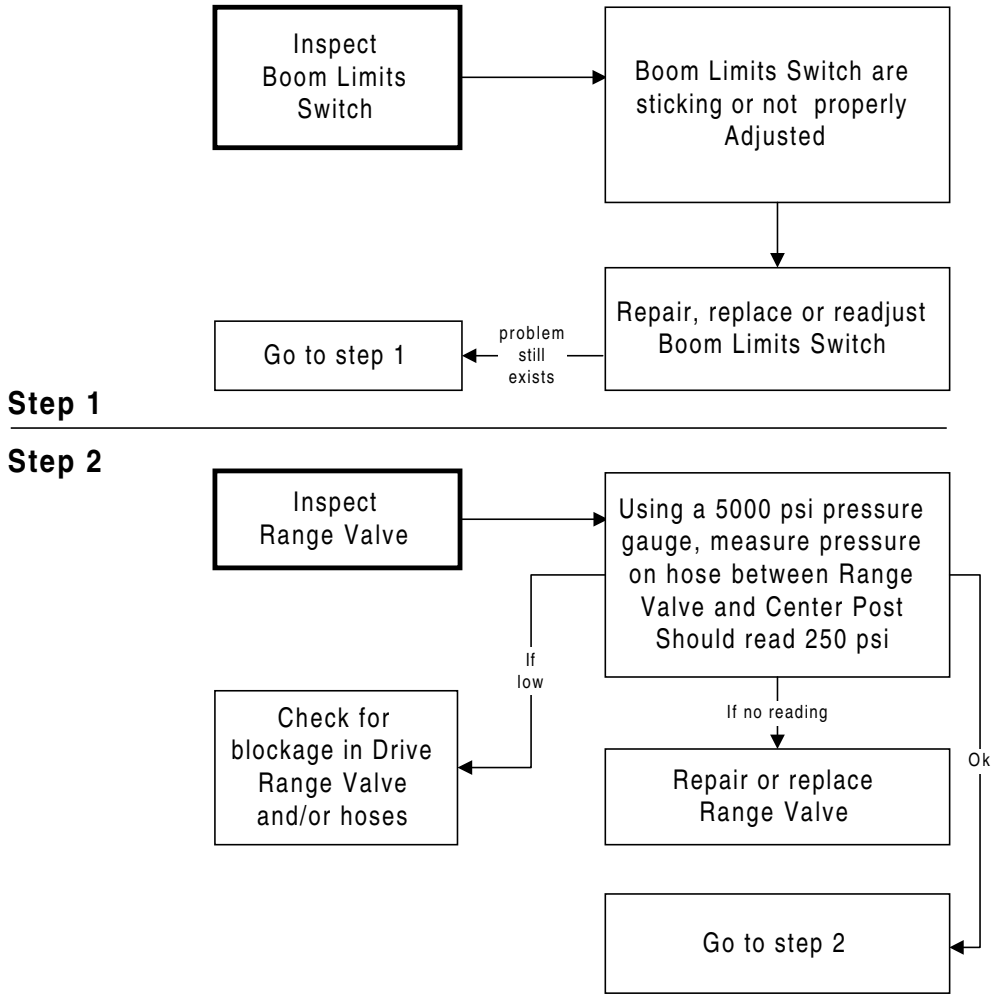


Step 5

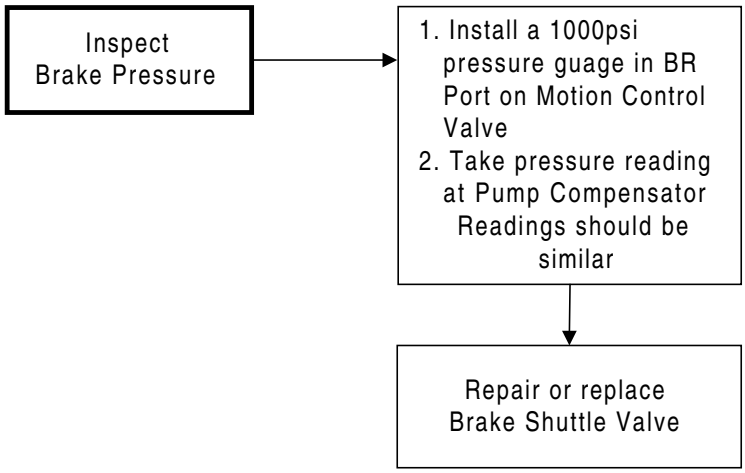
Step 6



Machine drives at full speed with platform raised and/or extended



Brakes will not release

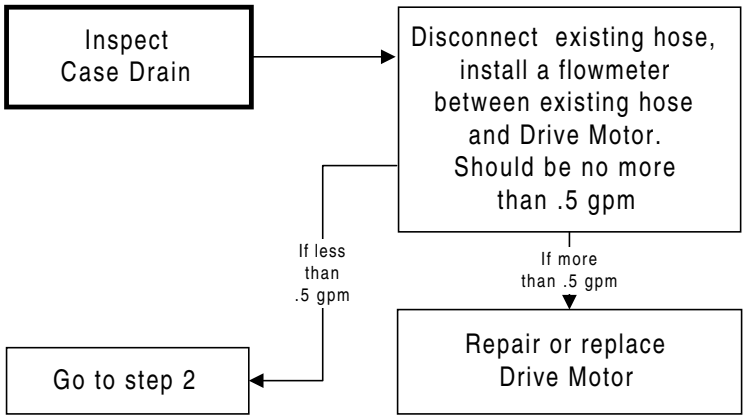


Step 1

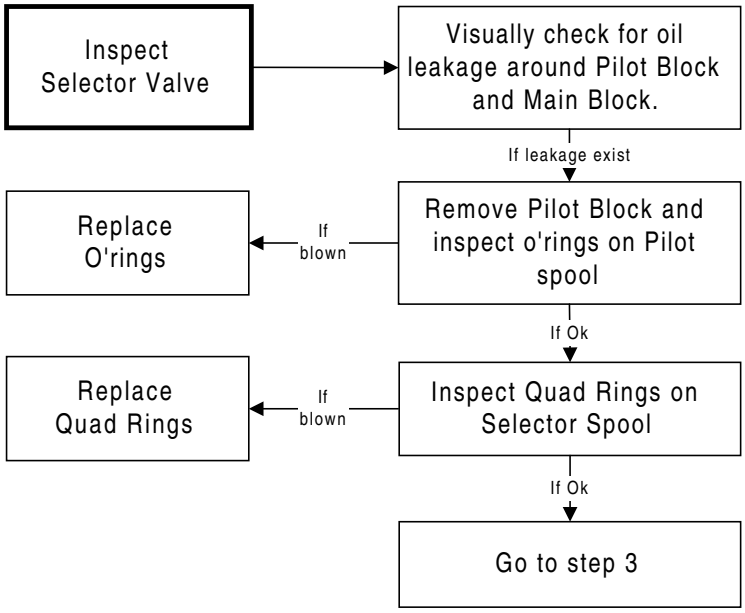
Only one wheel turns (2 wheel drive) Pro 100 only

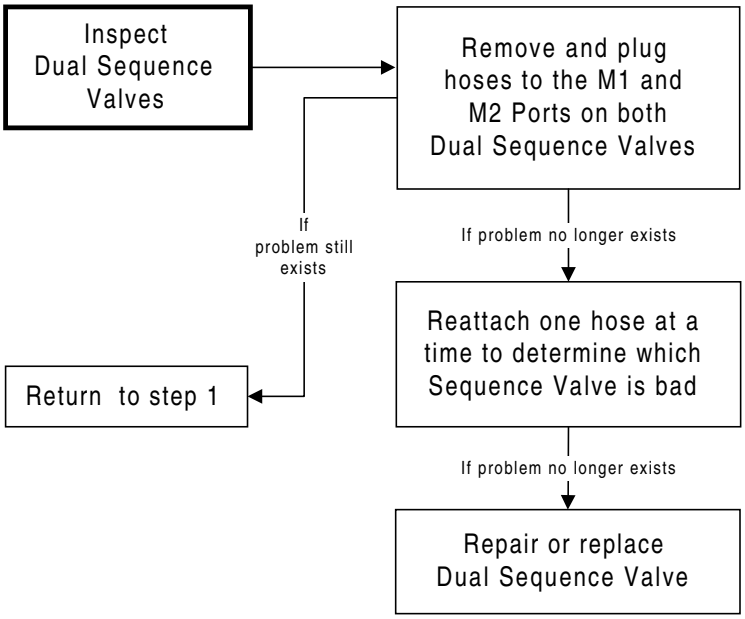
Note:
If machine is equipped with Tow Package Option make sure Hubs are engaged.

Step 1



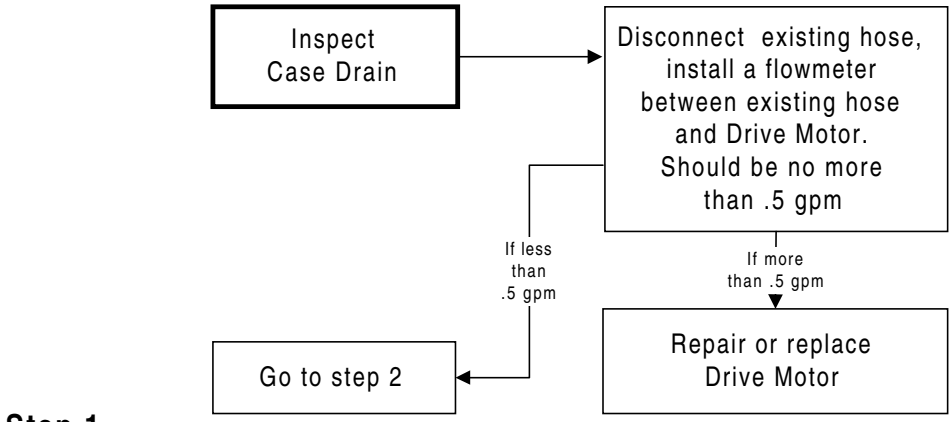
Step 2





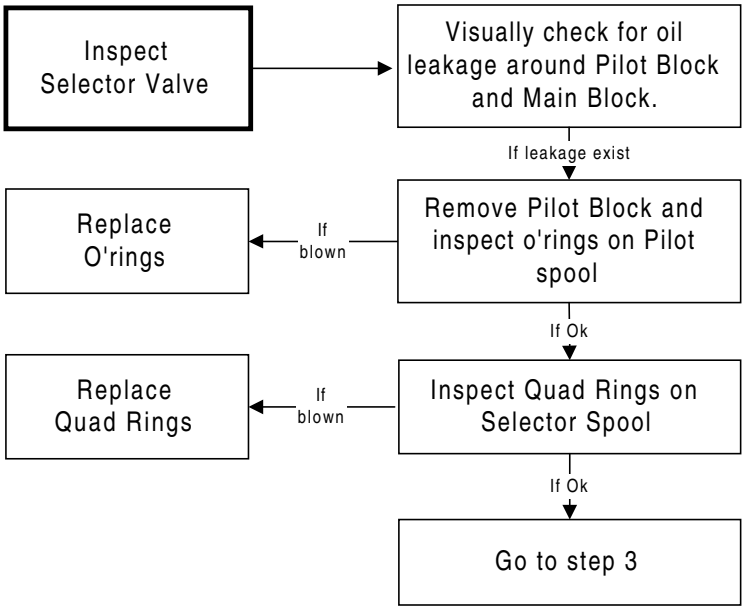
Step 3

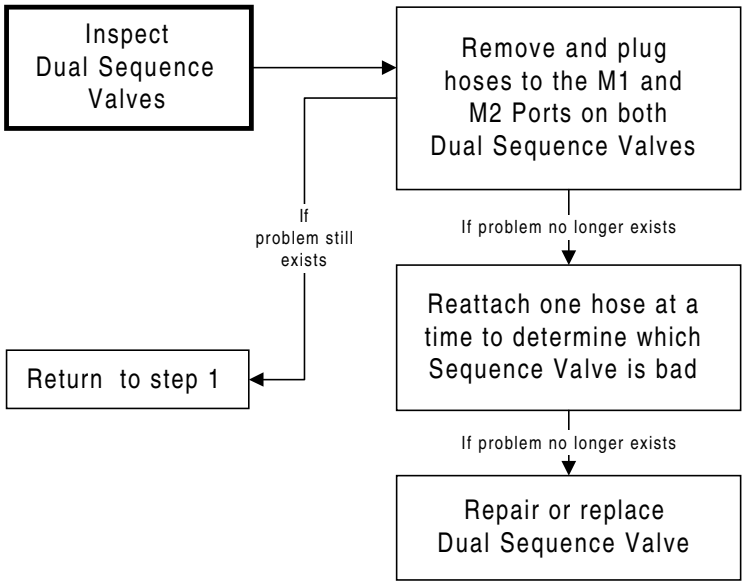
One wheel turns faster than other (2 wheel drive) Pro 100 only



Step 1

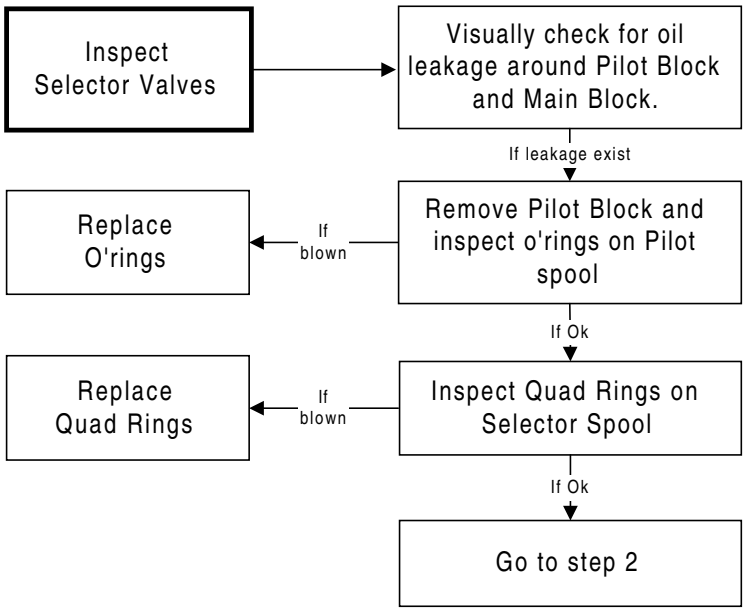
Step 2





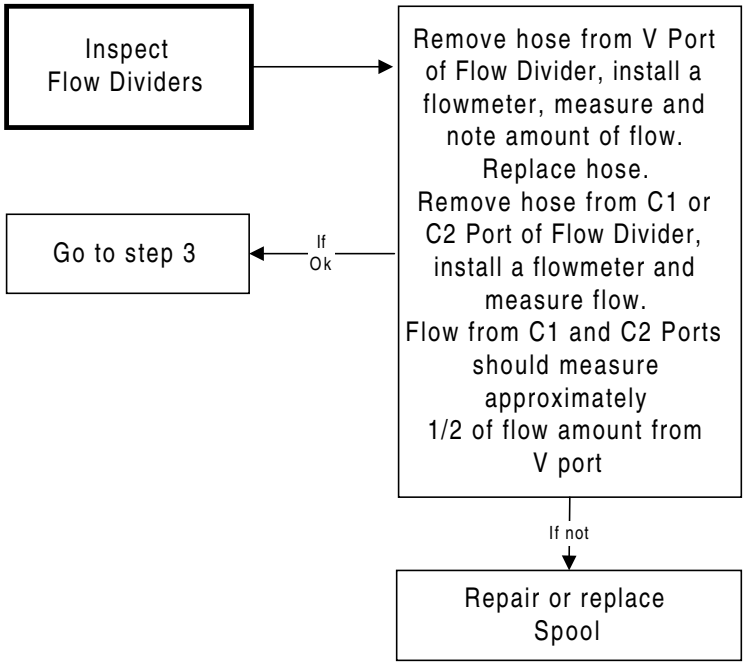
Step 3

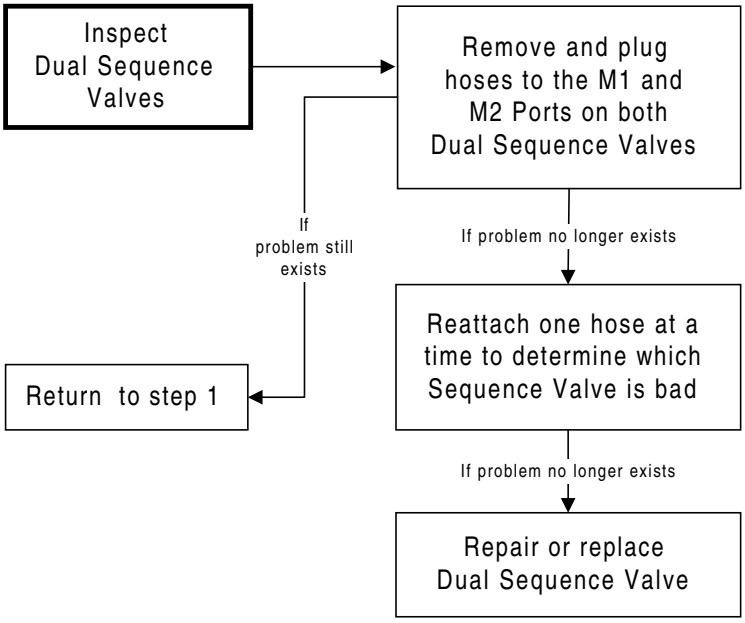
Only two wheels turn (4 wheel drive)



Step 1

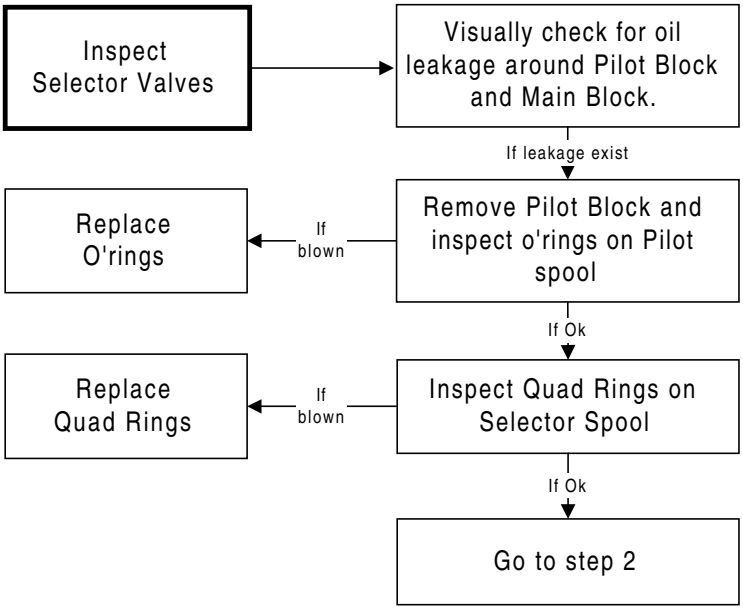
Step 2





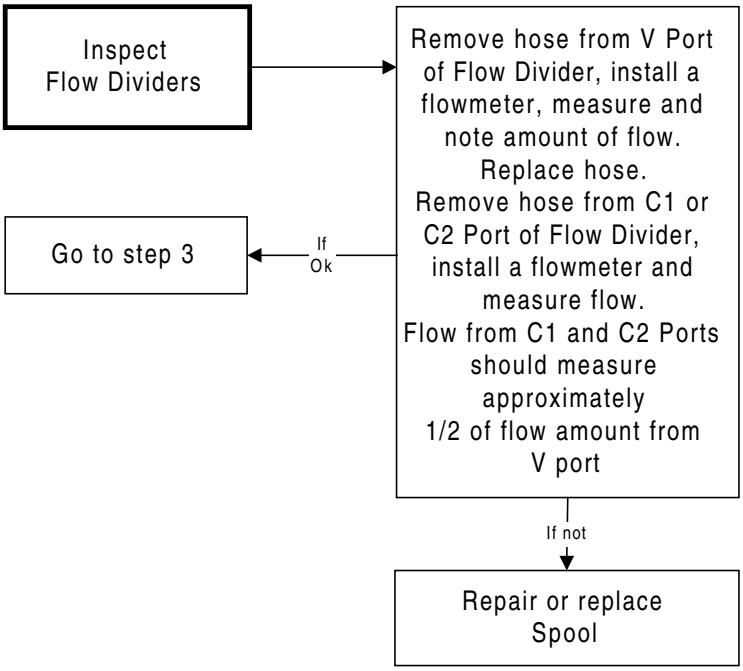
Step 3

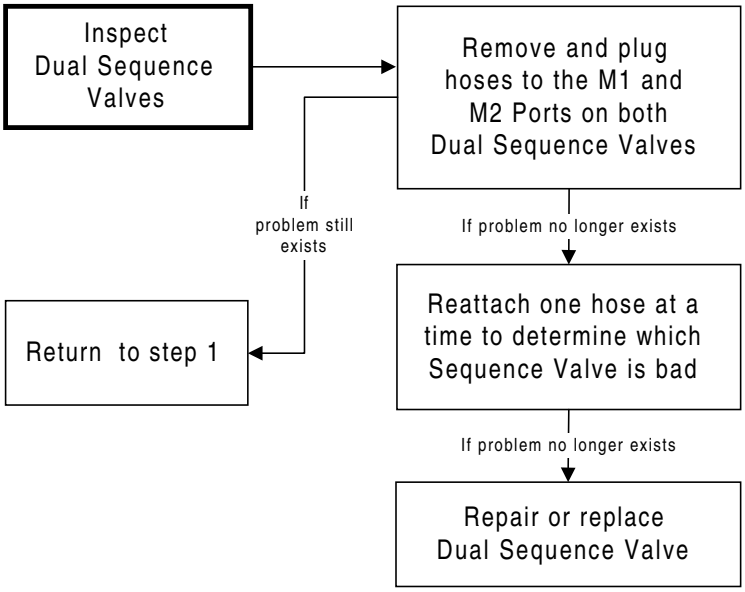
Two wheels turn faster than the other two (4 wheel drive)



Step 1

Step 2





Step 3

SECTION FIVE:
EMERGENCY POWER SYSTEM DIAGNOSTICS

Chart 1

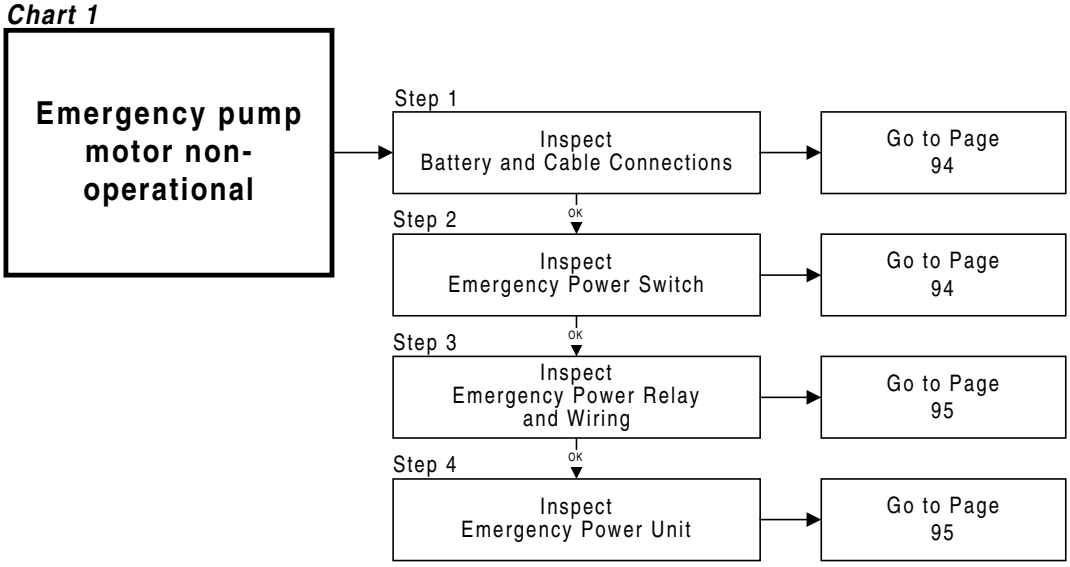


Chart 2

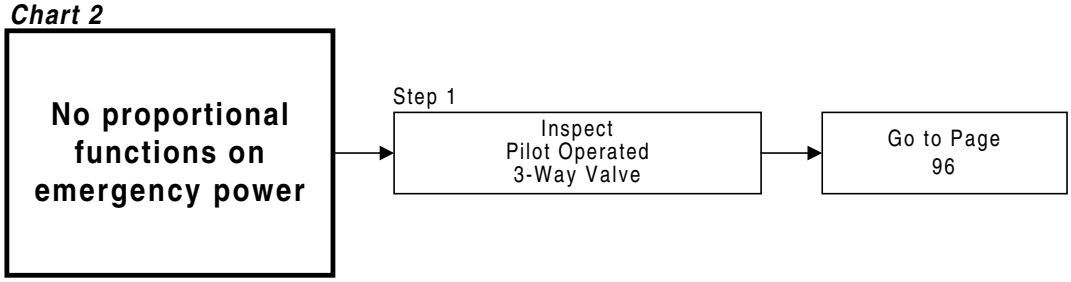
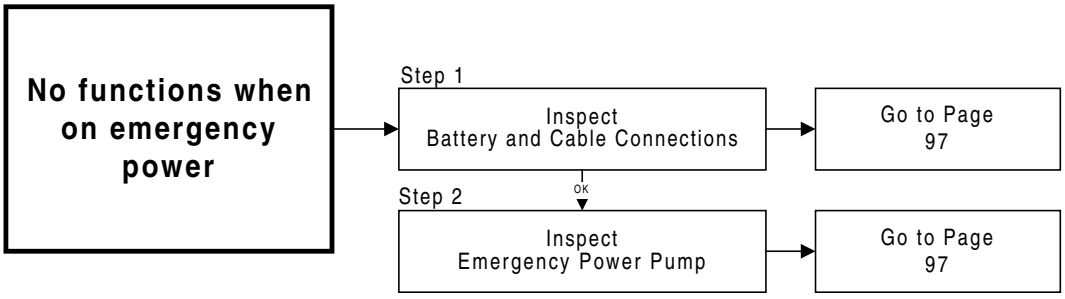


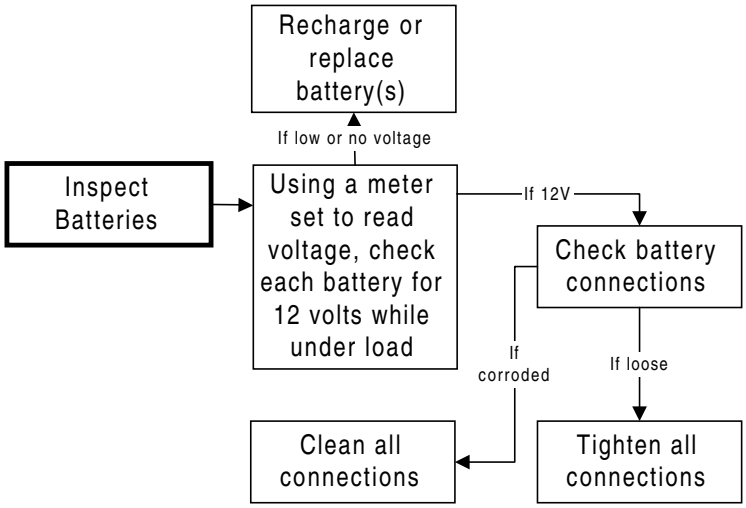
Chart 3



Emergency pump motor non-operational

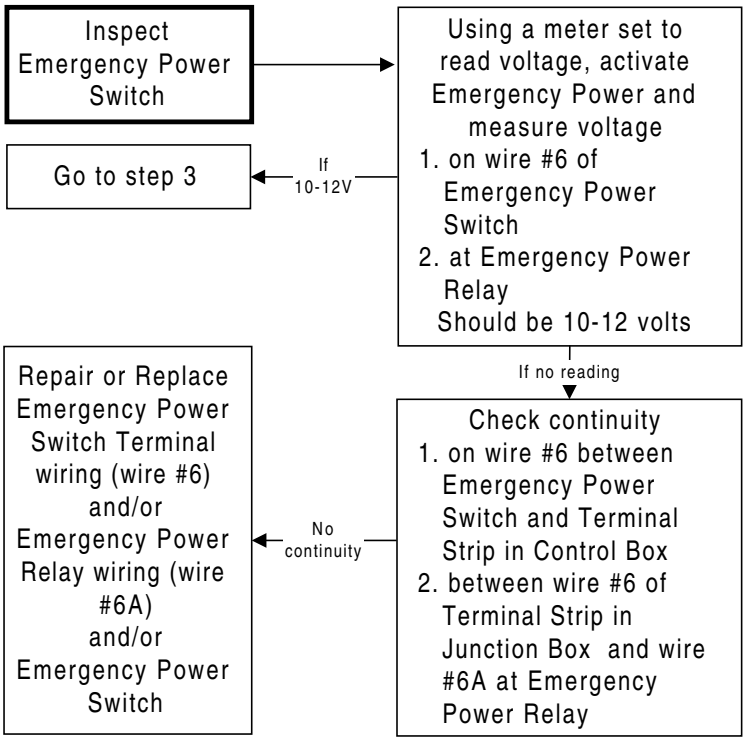
⚠DANGER

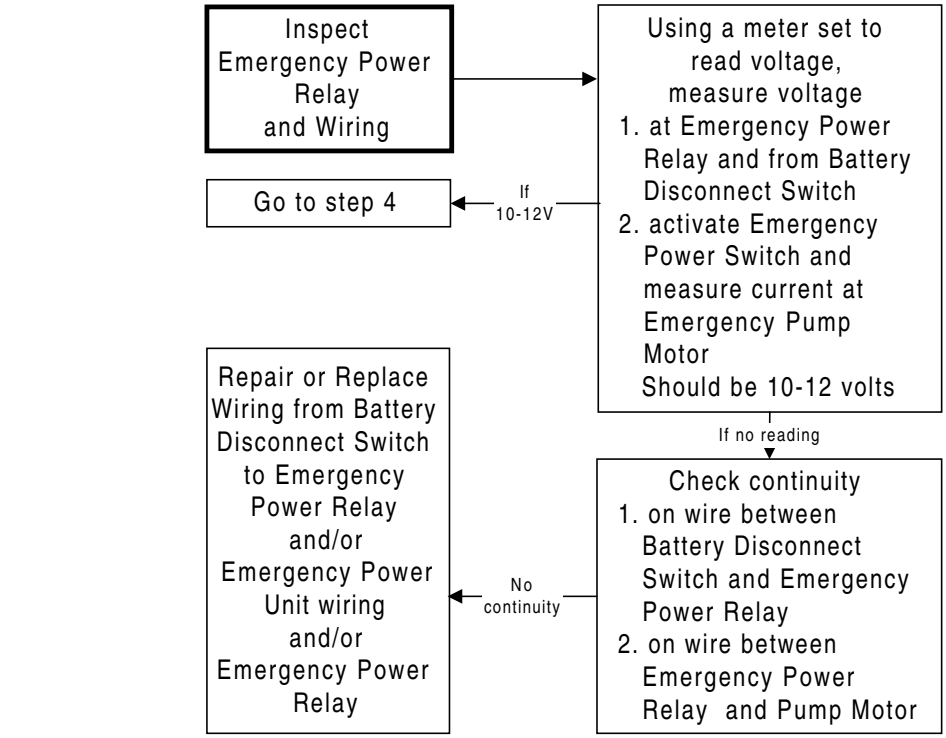
Batteries omit hydrogen and oxygen elements that can combine explosively. Do not smoke or permit open flames or sparks when checking batteries



Step 1

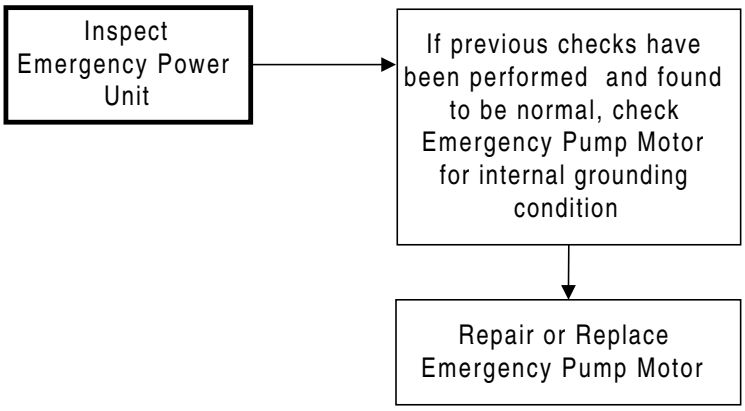
Step 2



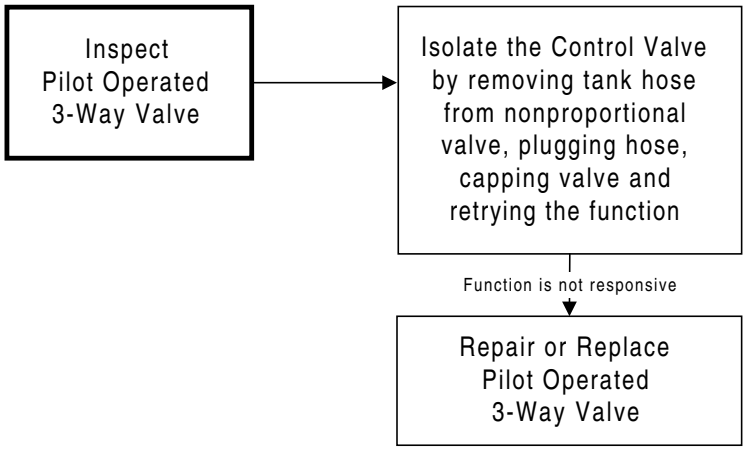


Step 3

Step 4



No proportional functions on emergency power

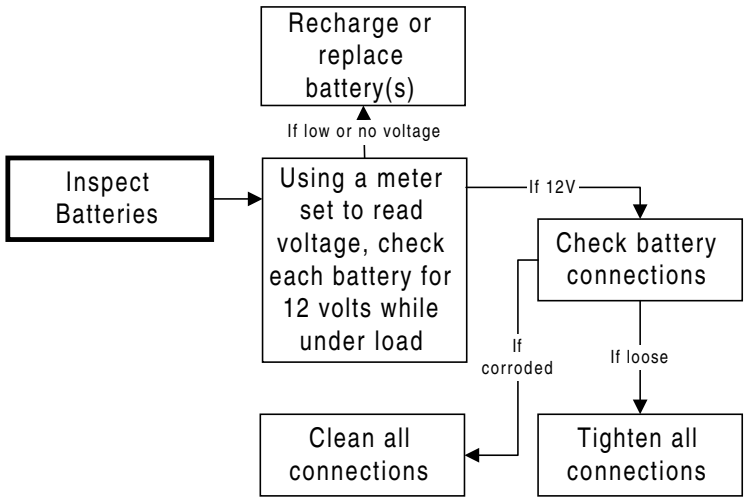


Step 1

No functions when on emergency power

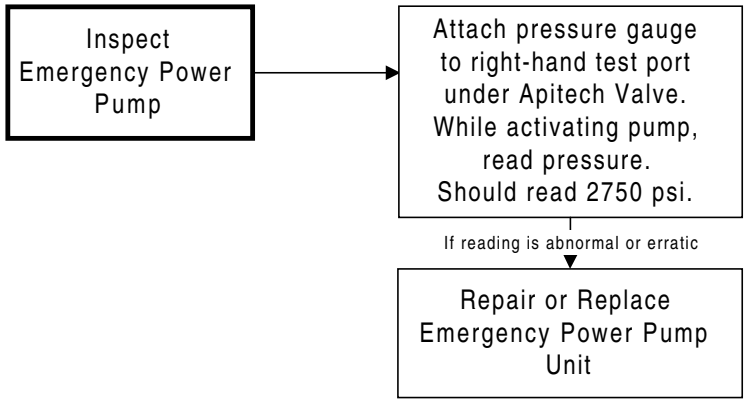
⚠DANGER

Batteries omit hydrogen and oxygen elements that can combine explosively. Do not smoke or permit open flames or sparks when checking batteries



Step 1

Step 2



SECTION SIX:
SWING SYSTEM DIAGNOSTICS

Chart 1

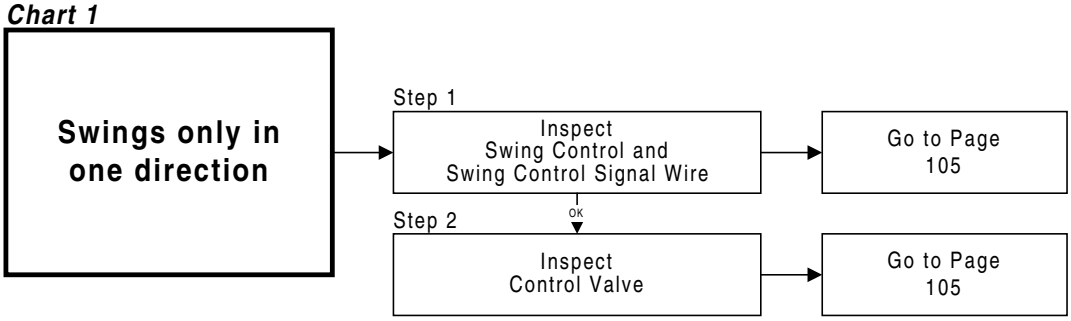


Chart 2

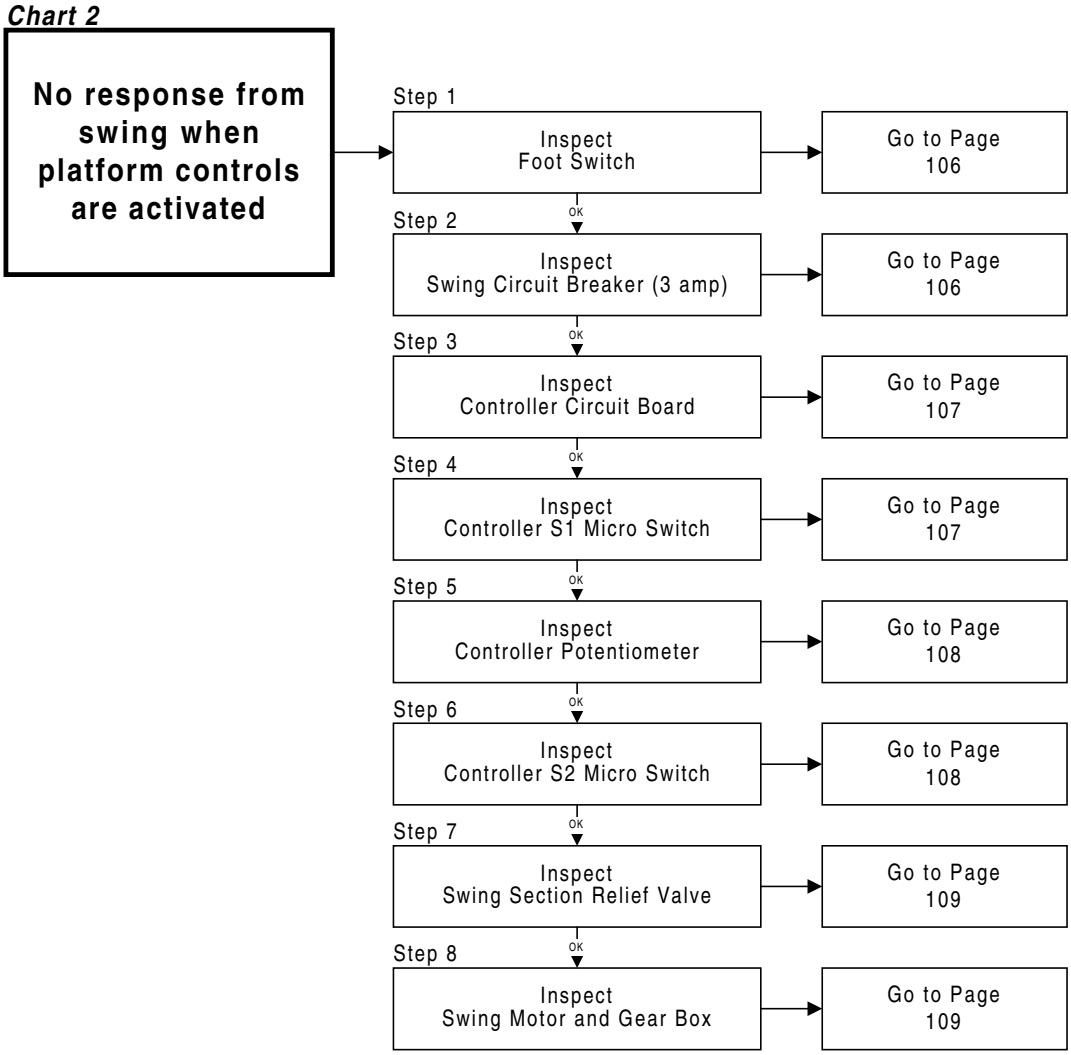


Chart 3

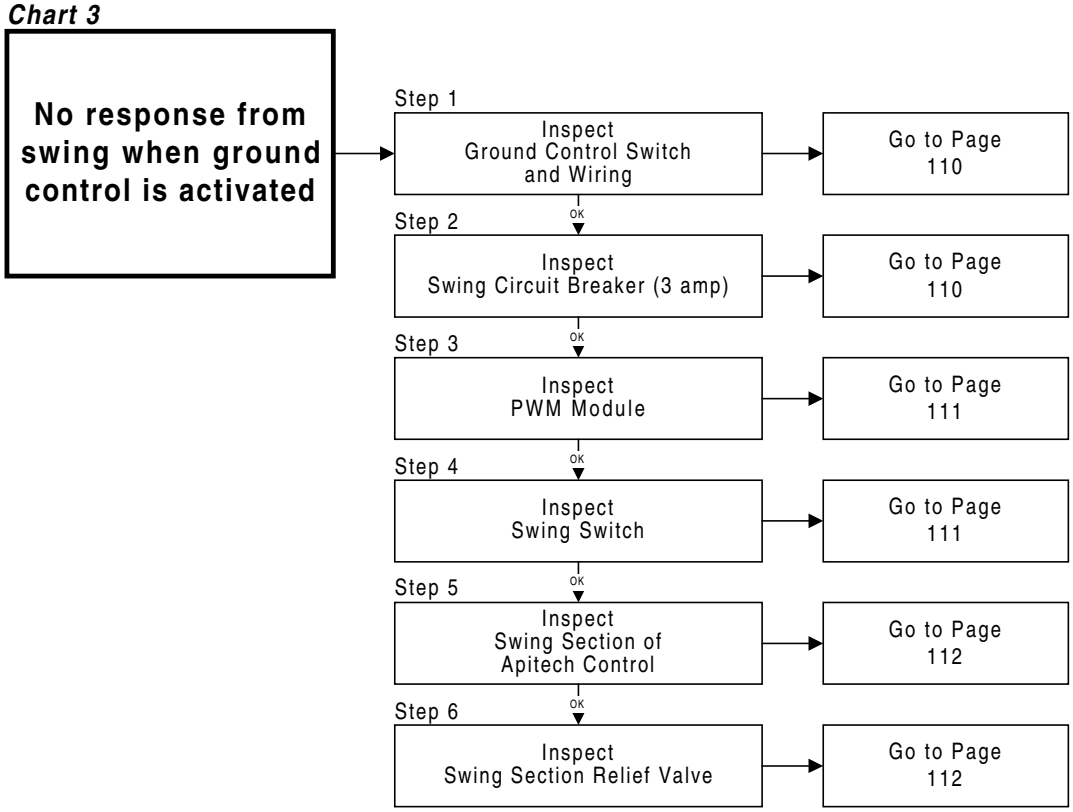


Chart 4

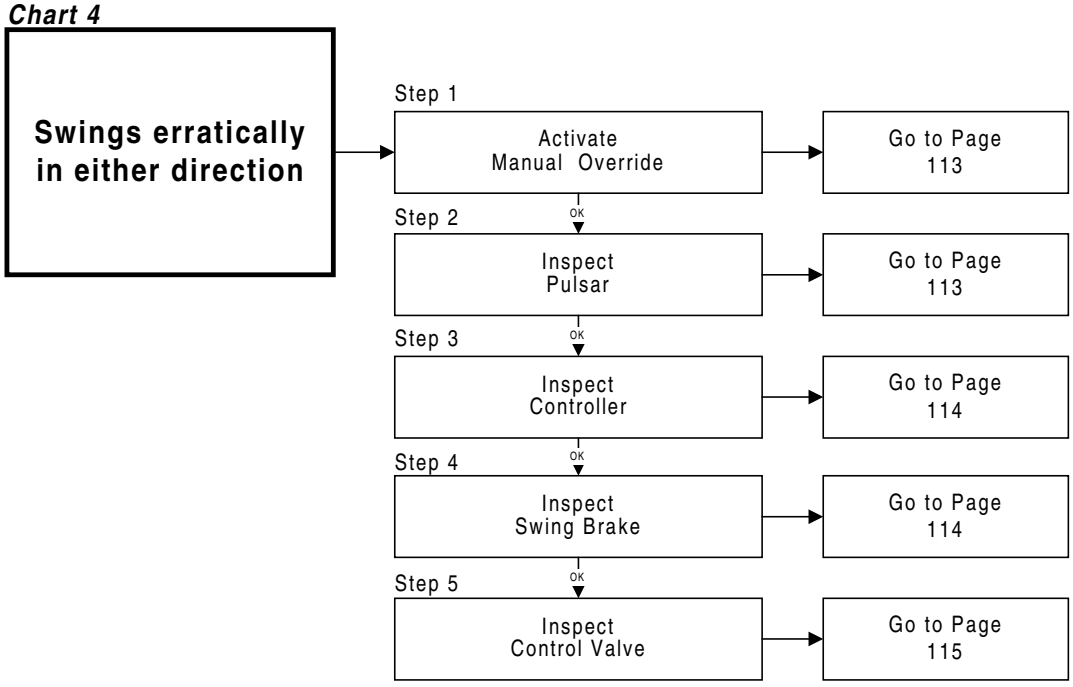


Chart 5

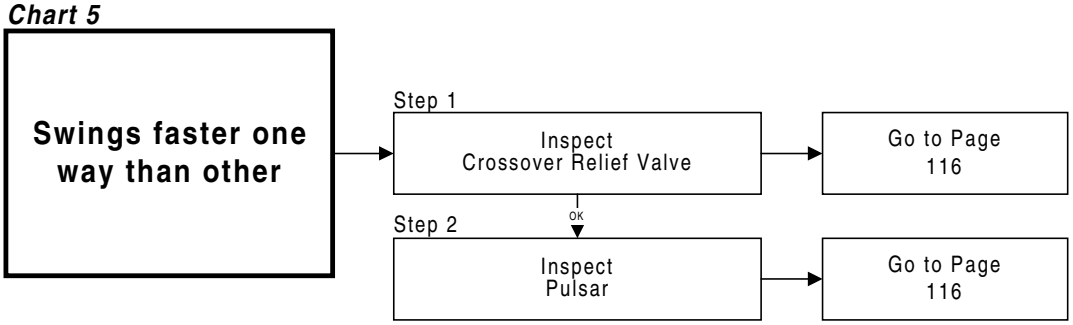


Chart 6

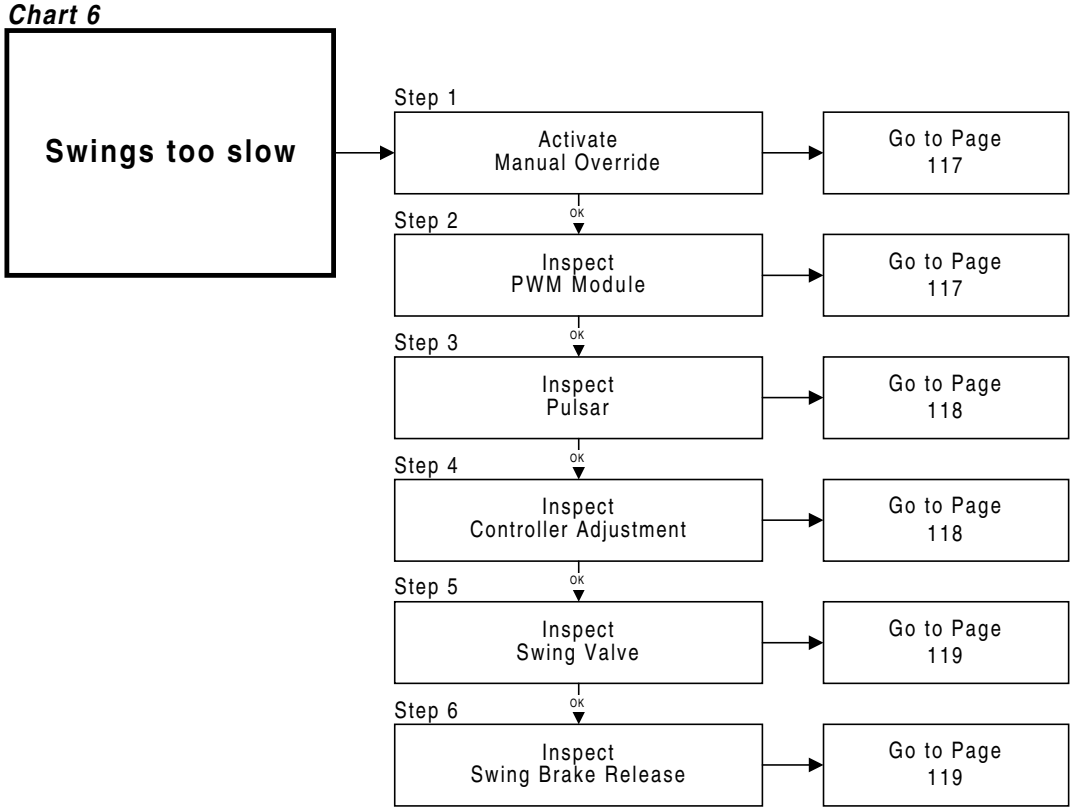
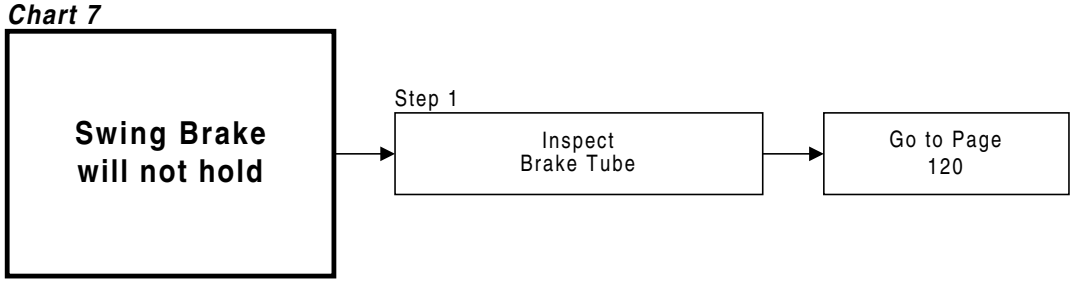


Chart 7



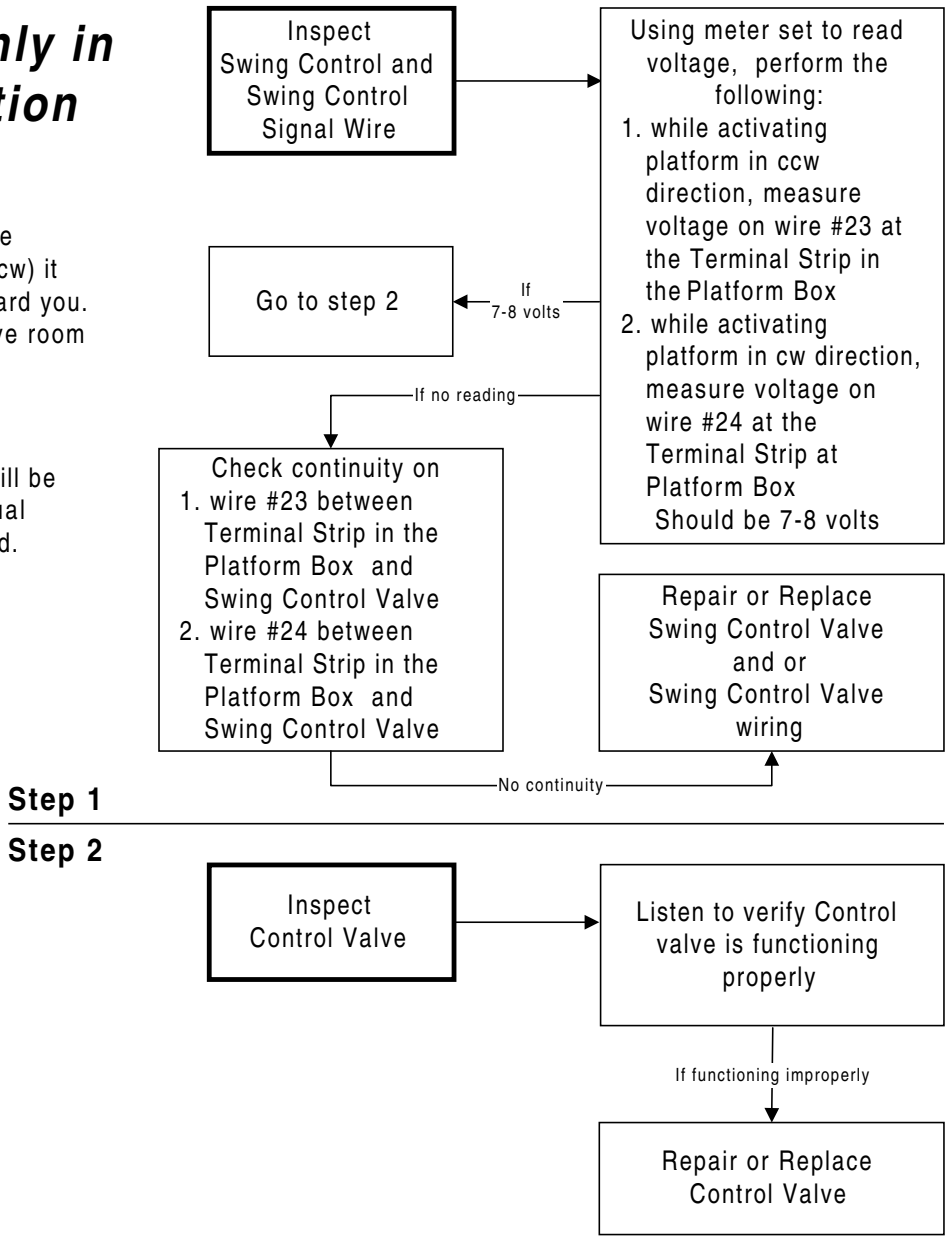
Swings only in one direction

⚠DANGER

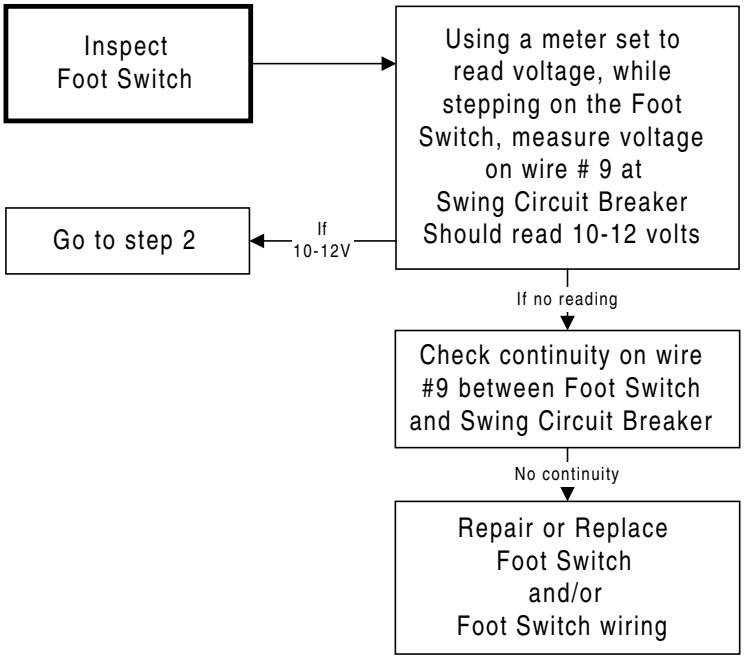
When the turn table rotates clockwise (cw) it will be moving toward you. Make sure you have room to step backward.

⚠CAUTION

Machine function will be moving when manual override is activated.

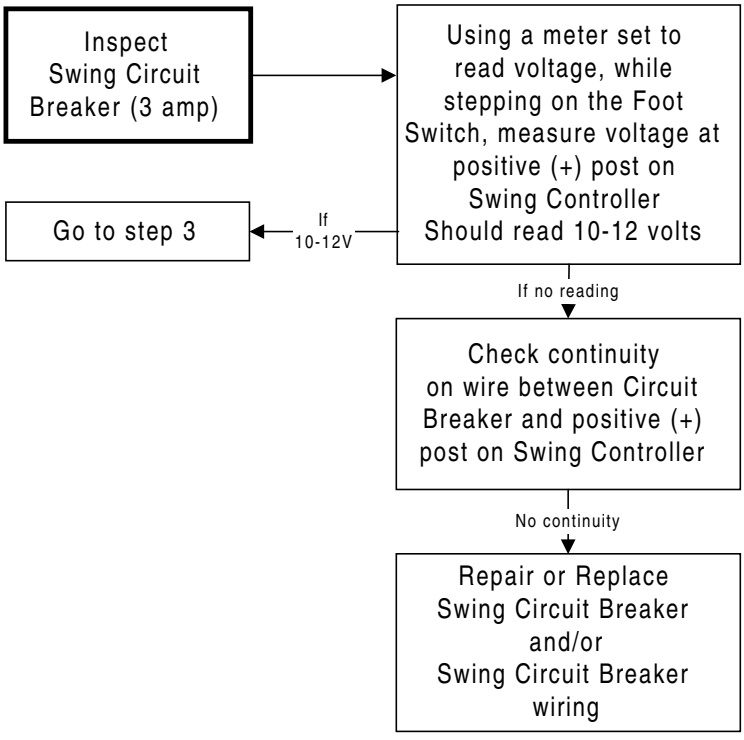


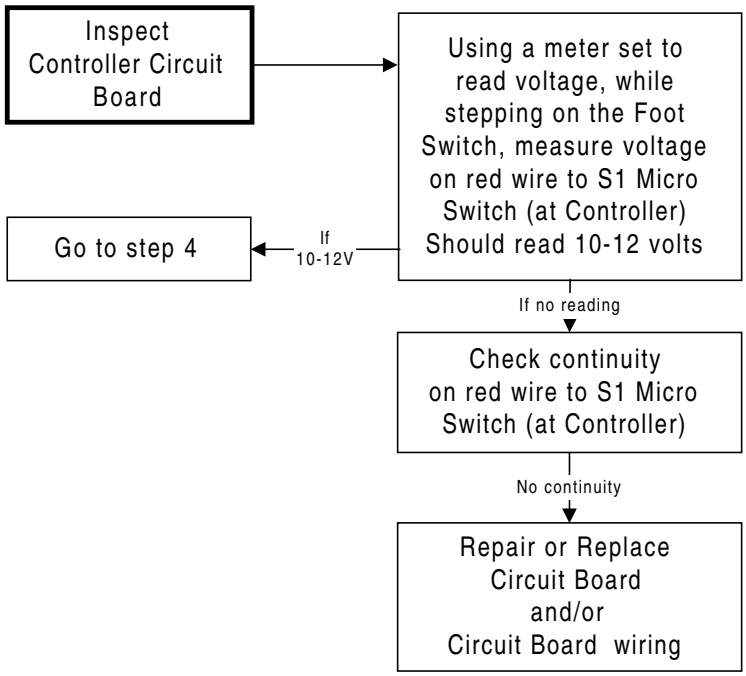
No response from swing when platform controls are activated



Step 1

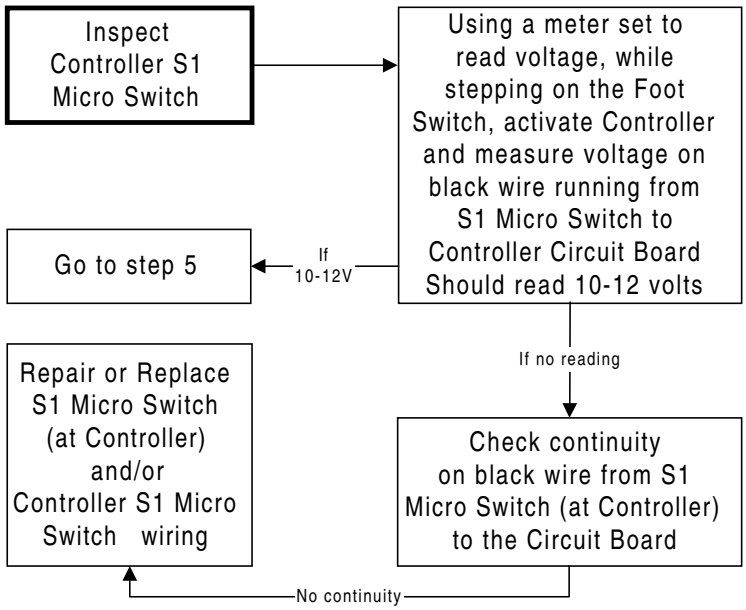
Step 2

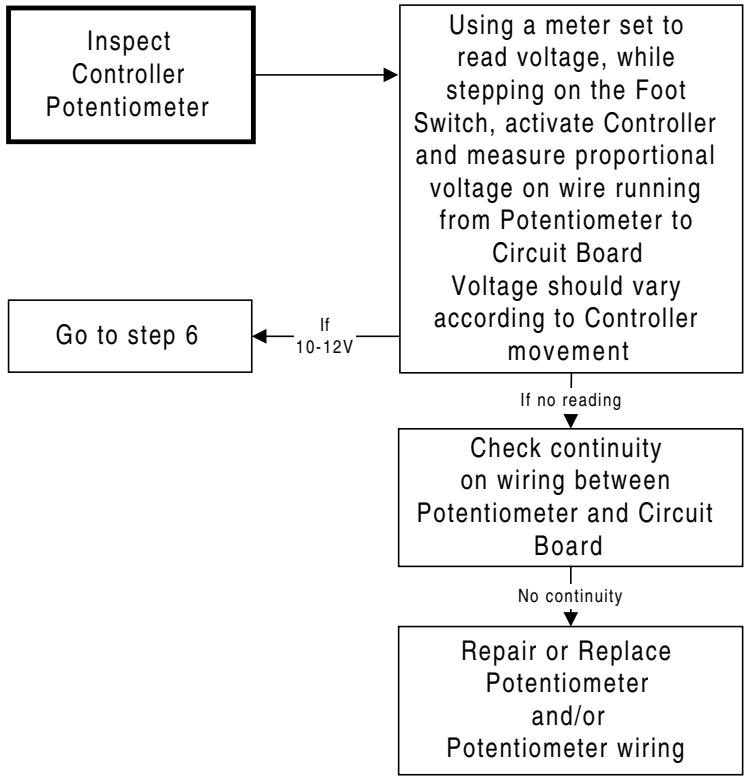




Step 3

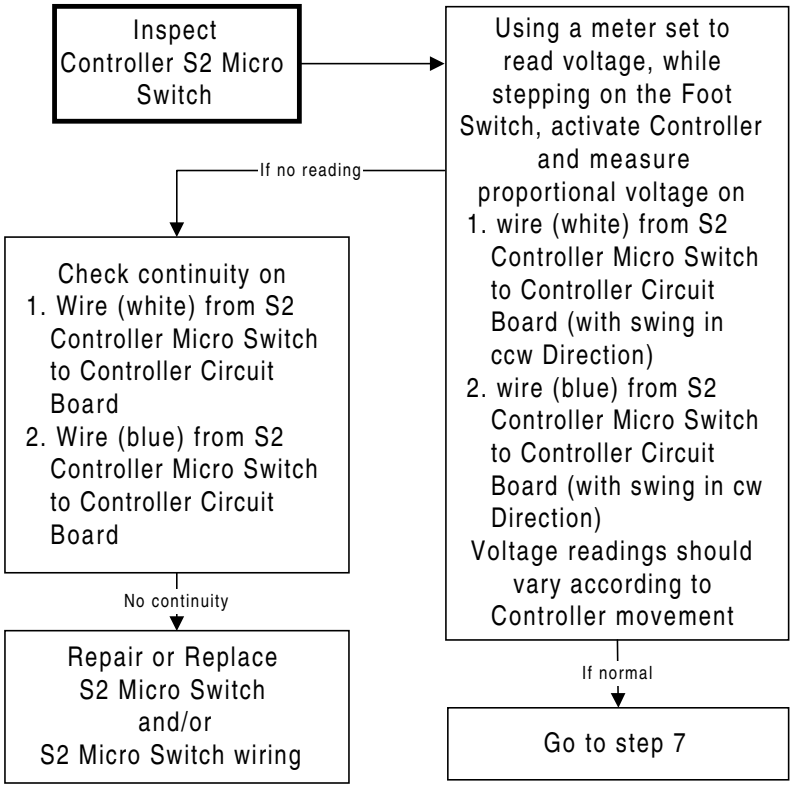
Step 4

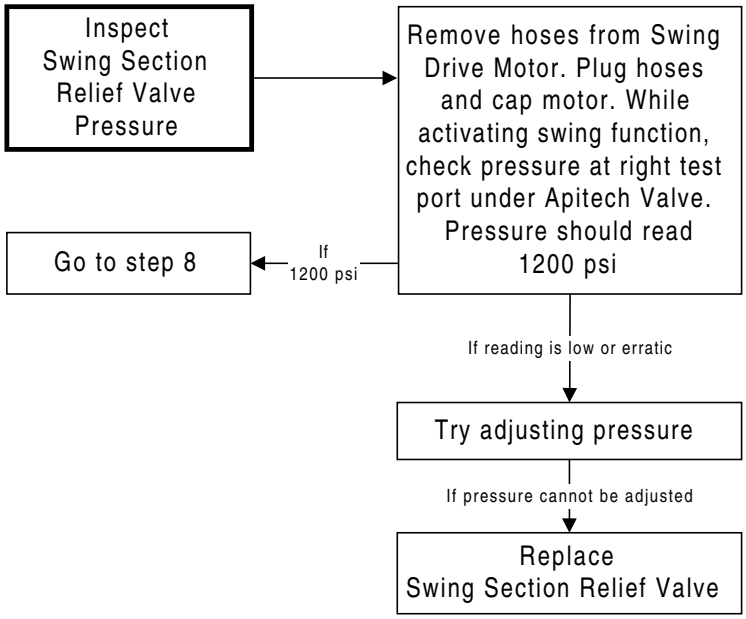




Step 5

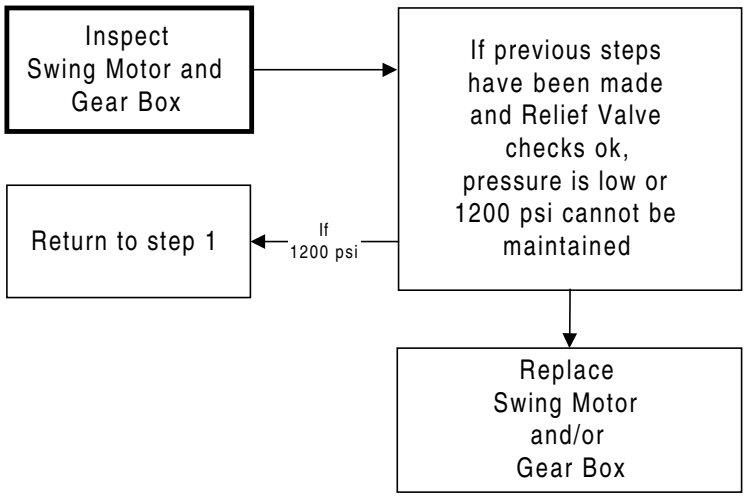
Step 6





Step 7

Step 8

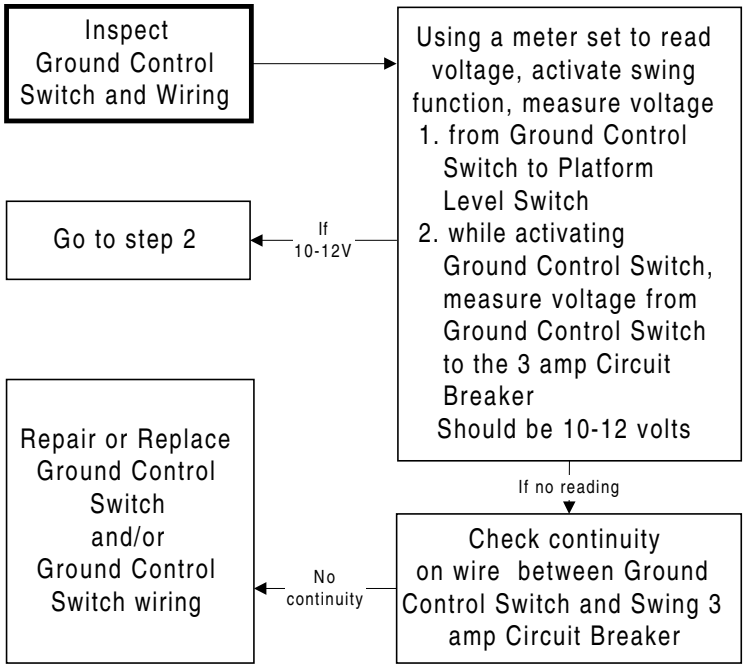


No response from swing when ground controls are activated

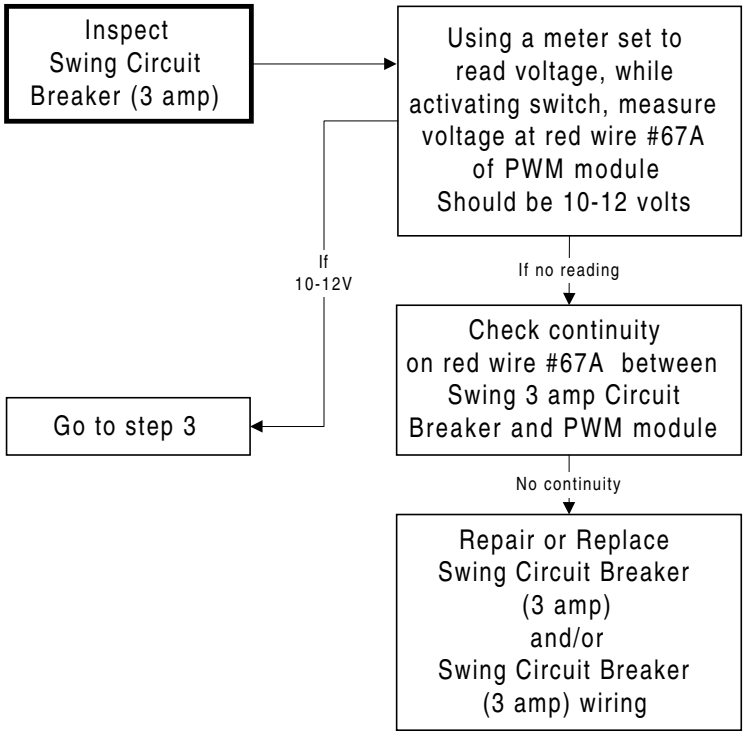
⚠DANGER

When the turn table rotates clockwise (cw) it will be moving toward you. Make sure you have room to step backward.

Step 1

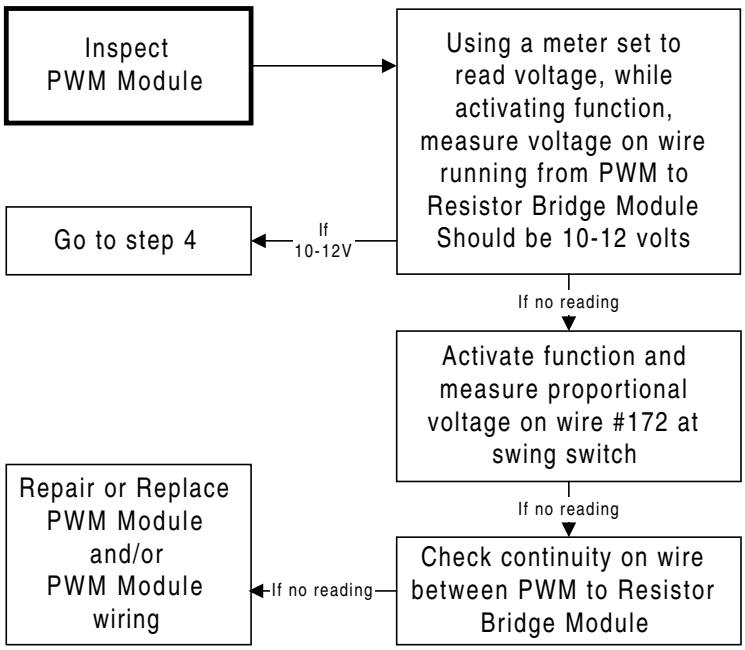


Step 2



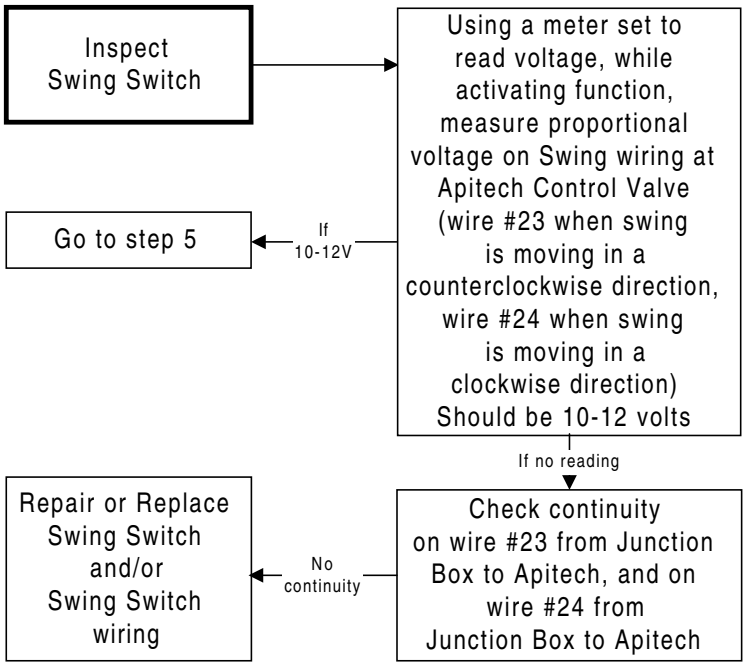
⚠DANGER

When the turn table rotates clockwise (cw) it will be moving toward you. Make sure you have room to step backward.



Step 3

Step 4

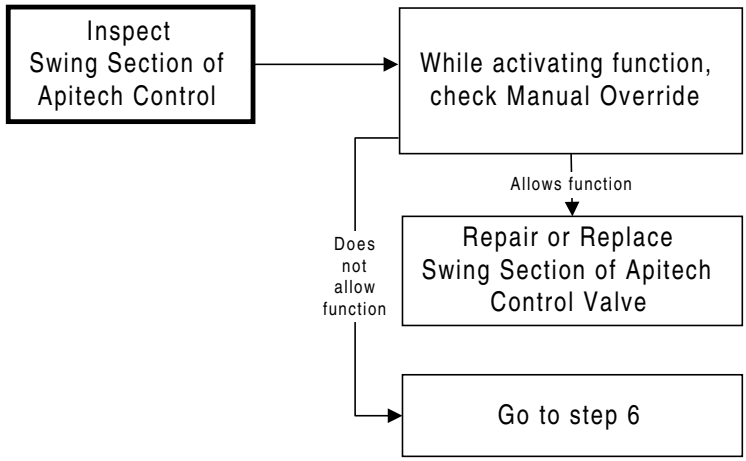


⚠DANGER

When the turn table rotates clockwise (cw) it will be moving toward you. Make sure you have room to step backward.

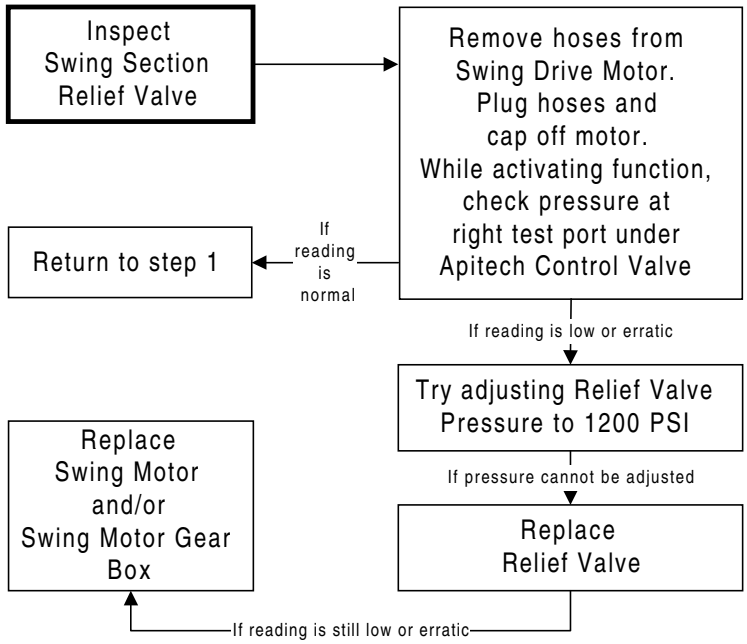
⚠CAUTION

Machine function will be moving when manual override is activated.



Step 5

Step 6



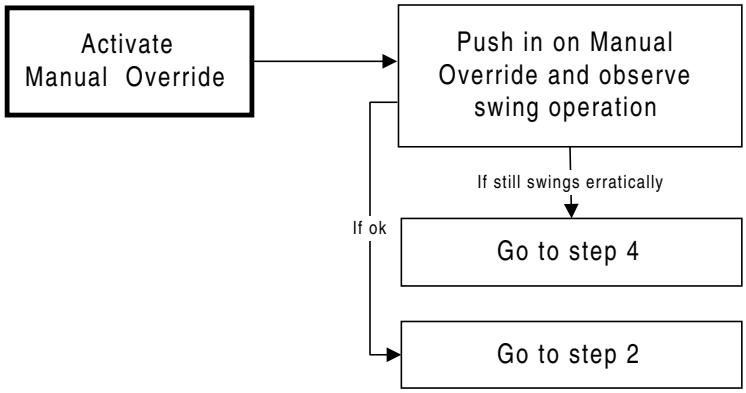
Swings erratically in either direction

⚠DANGER

When the turn table rotates clockwise (cw) it will be moving toward you. Make sure you have room to step backward.

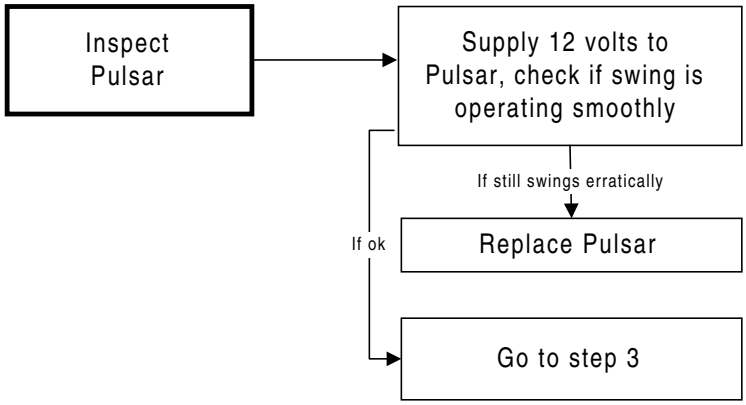
⚠CAUTION

Machine function will be moving when manual override is activated.



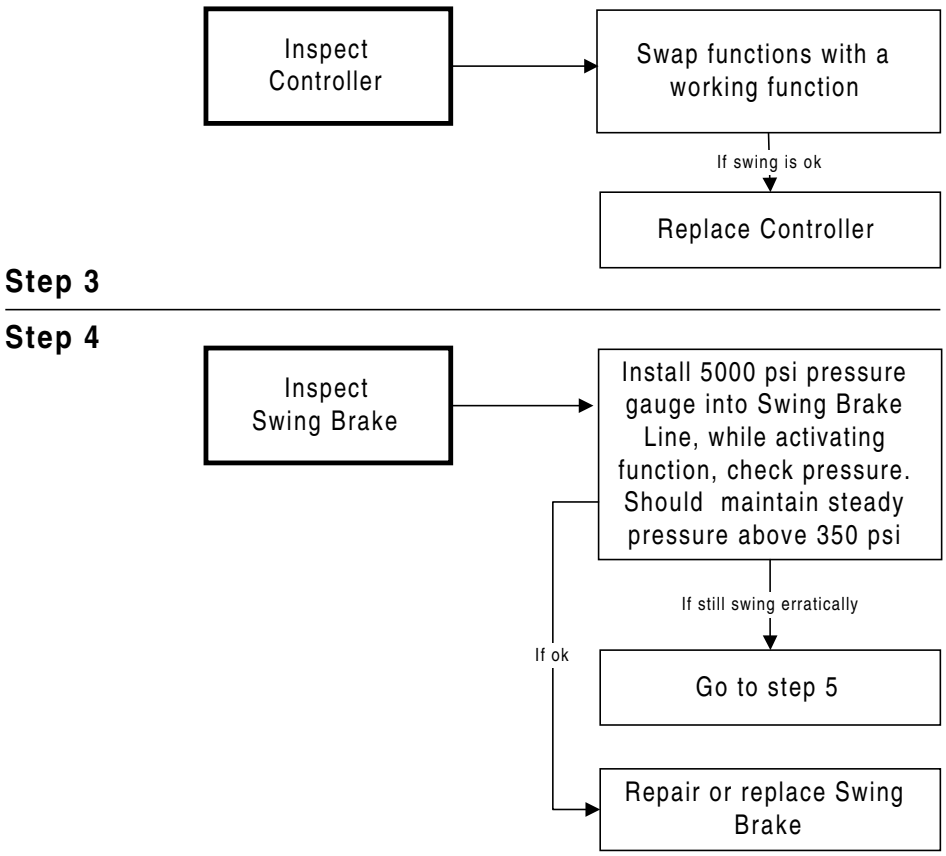
Step 1

Step 2



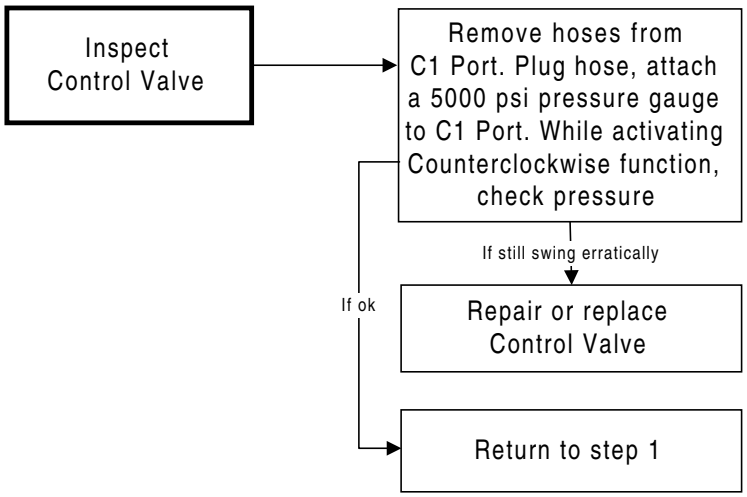
⚠DANGER

When the turn table rotates clockwise (cw) it will be moving toward you. Make sure you have room to step backward.



Step 3

Step 4

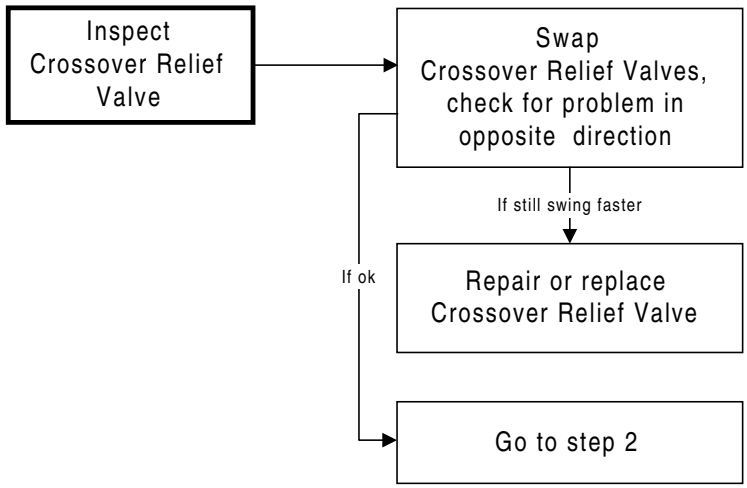


Step 5

Swings faster one way than other

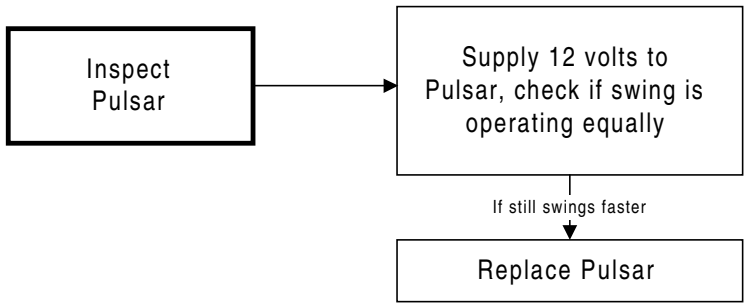
⚠DANGER

When the turn table rotates clockwise (cw) it will be moving toward you. Make sure you have room to step backward.



Step 1

Step 2



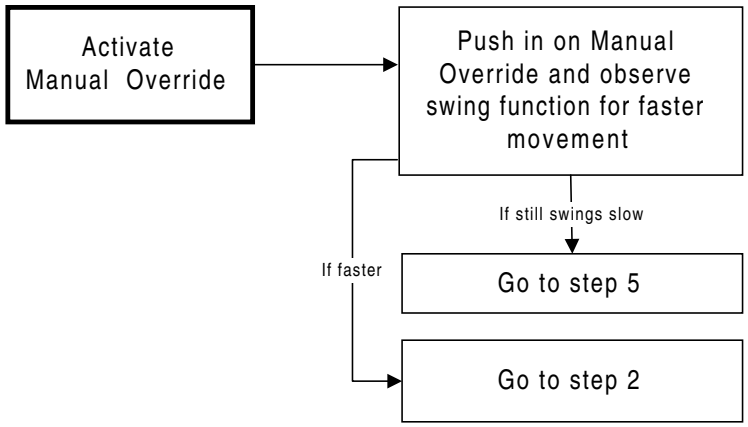
Swings too slow

⚠DANGER

When the turn table rotates clockwise (cw) it will be moving toward you. Make sure you have room to step backward.

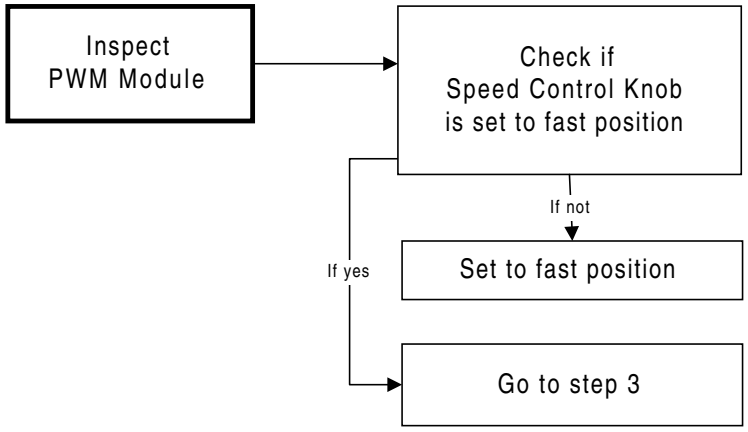
⚠CAUTION

Machine function will be moving when manual override is activated.



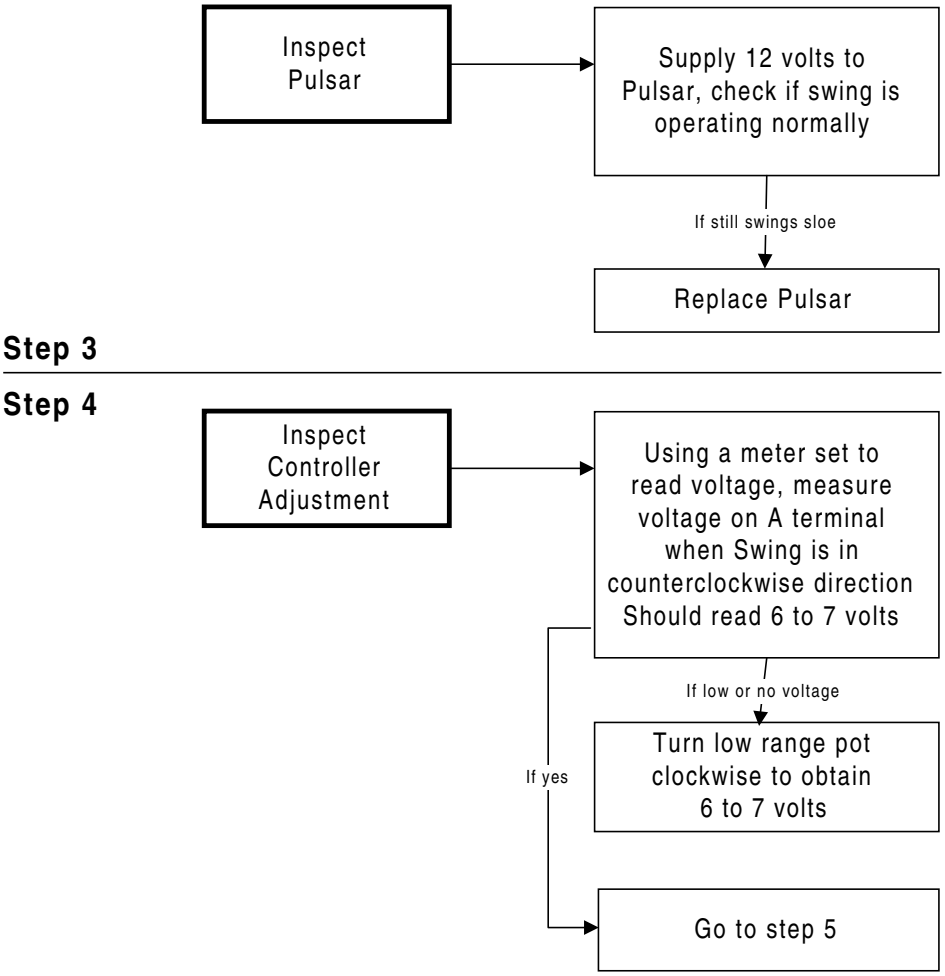
Step 1

Step 2



⚠DANGER

When the turn table rotates clockwise (cw) it will be moving toward you. Make sure you have room to step backward.

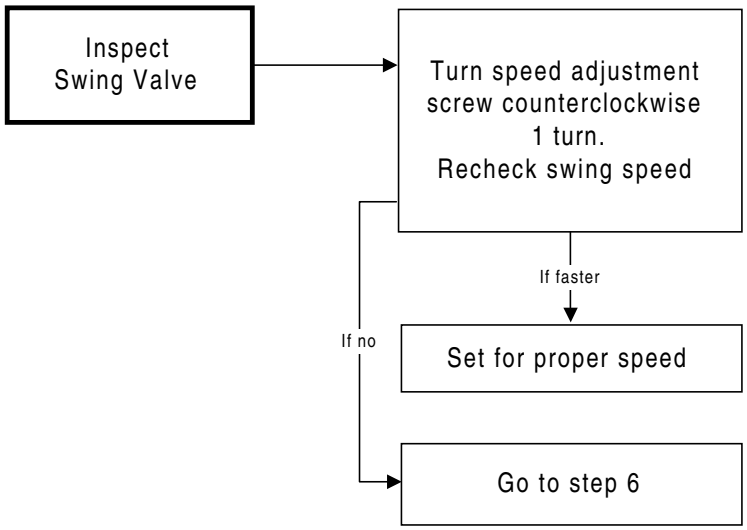


Step 3

Step 4

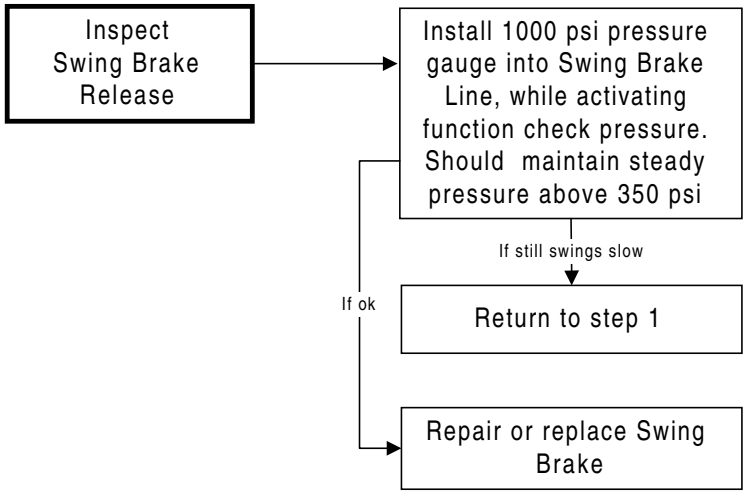
⚠DANGER

When the turn table rotates clockwise (cw) it will be moving toward you. Make sure you have room to step backward.

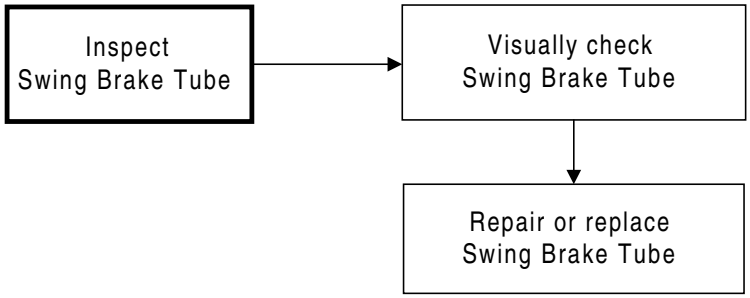


Step 5

Step 6



Swing brake will not hold



Step 1

SECTION SEVEN:
PLATFORM ROTATION SYSTEM DIAGNOSTICS

SECTION SEVEN
PLATFORM ROTATION SYSTEM DIAGNOSTICS

Chart 1

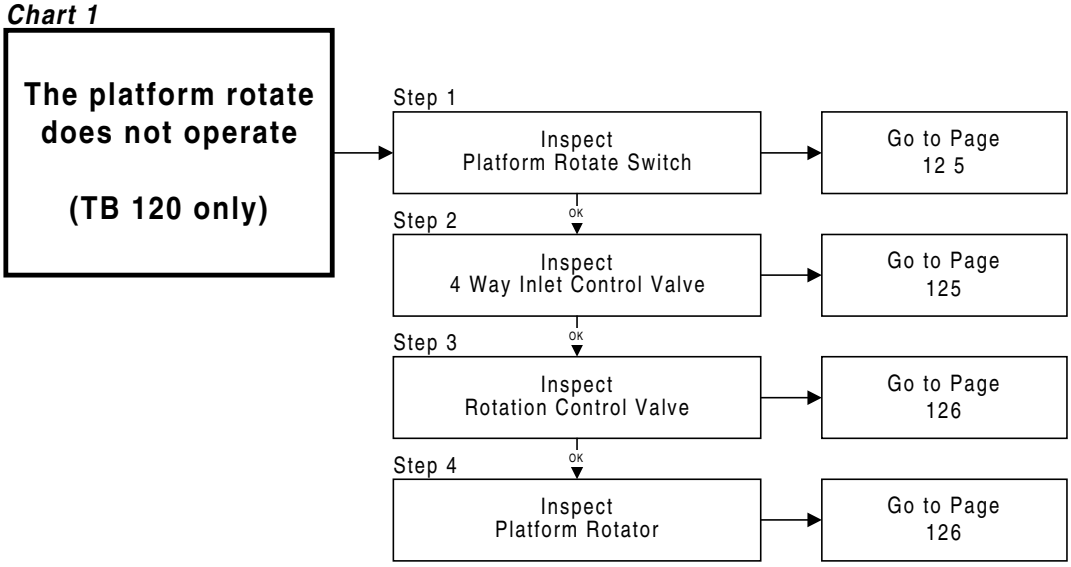


Chart 2

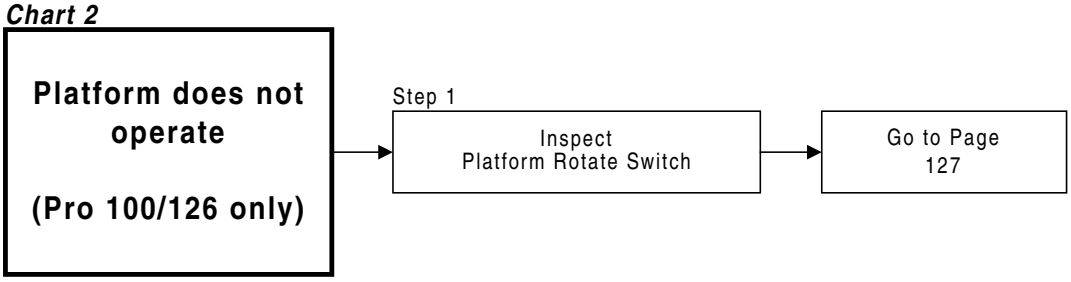


Chart 3

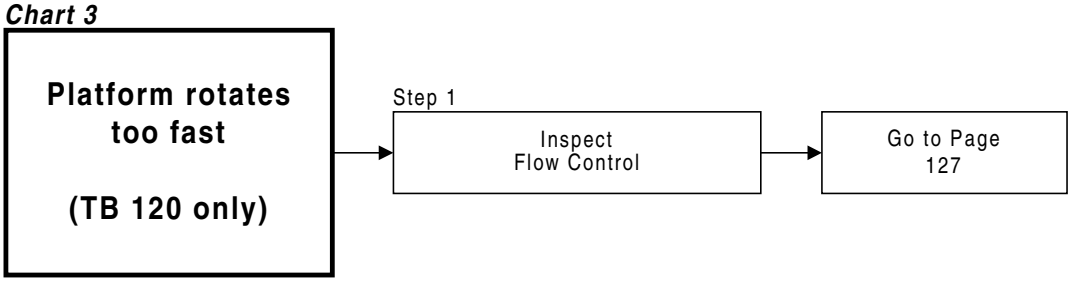


Chart 4

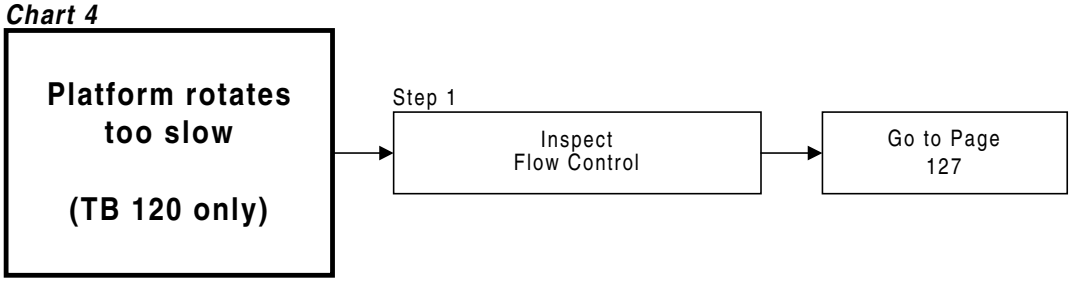
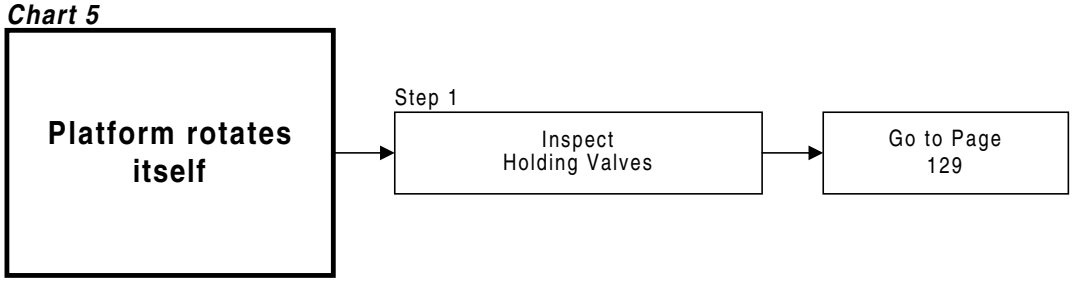
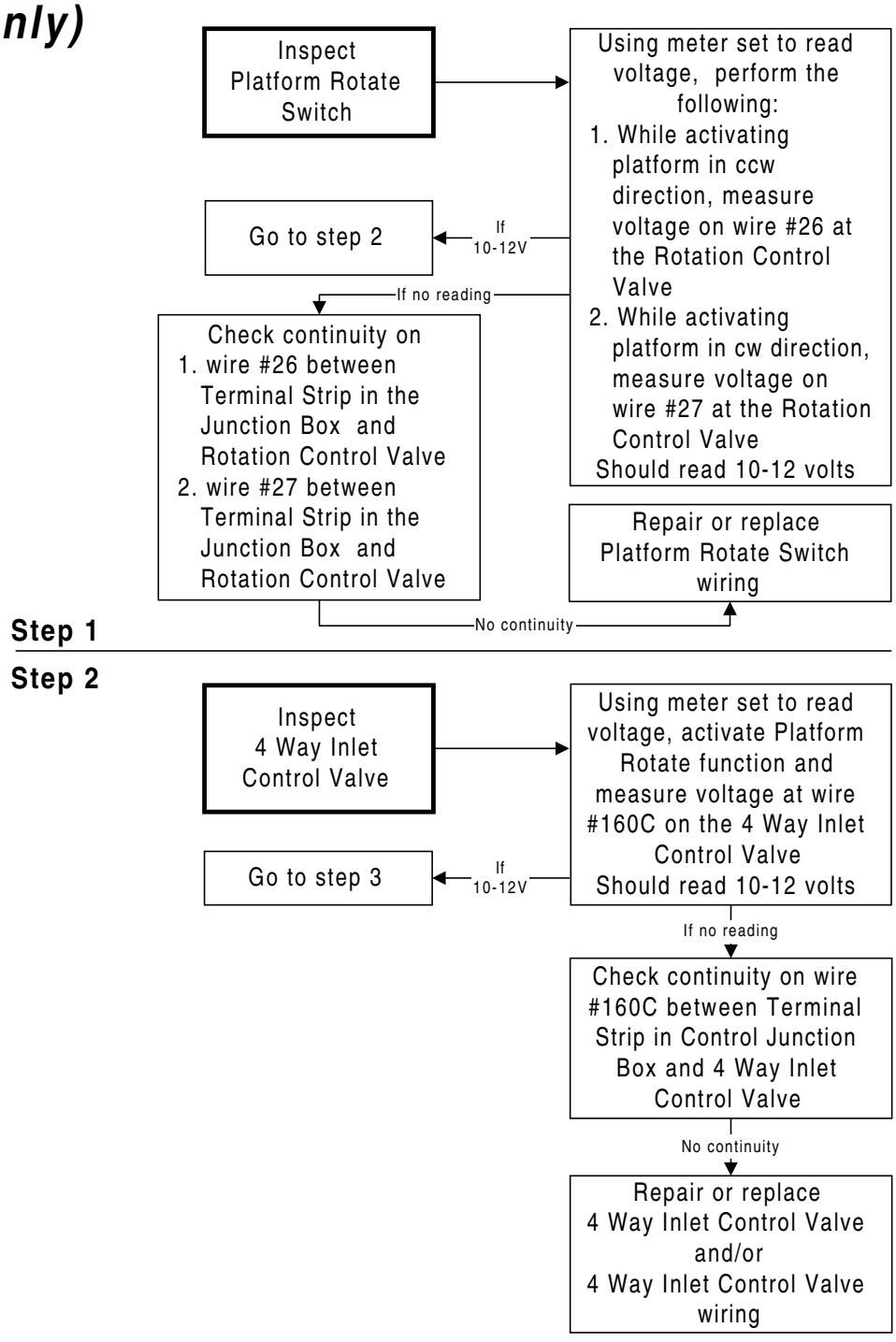


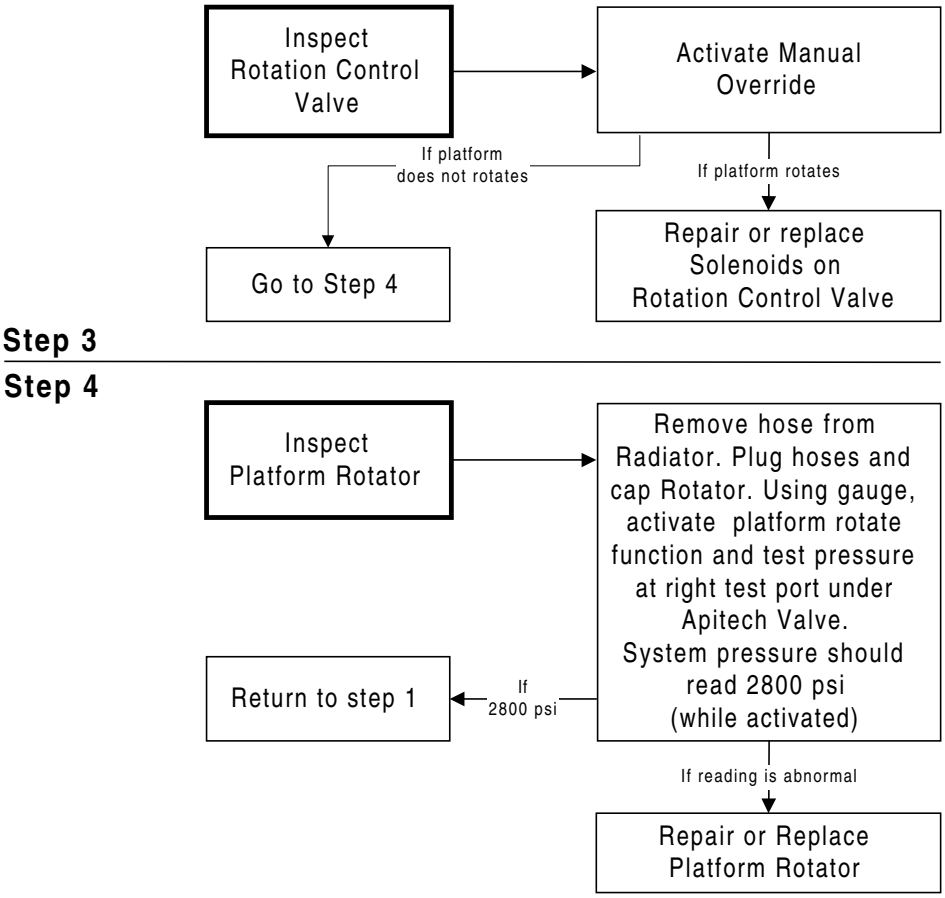
Chart 5



Platform rotate does not operate (TB 120 only)



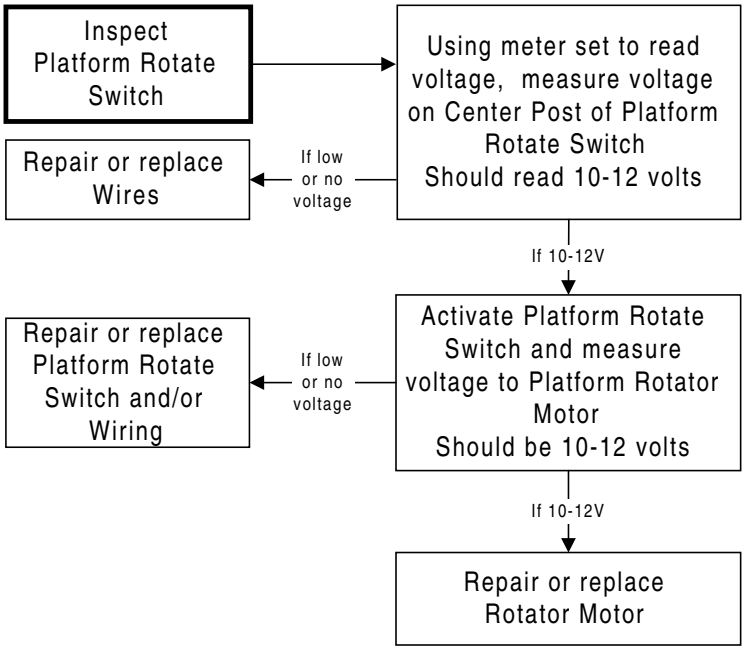
⚠CAUTION
Machine function will be moving when manual override is activated.



Step 3

Step 4

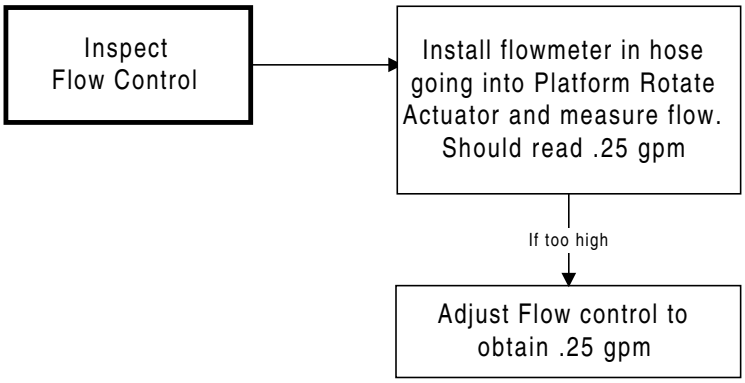
Platform rotate does not operate (PRO 100/126 only)



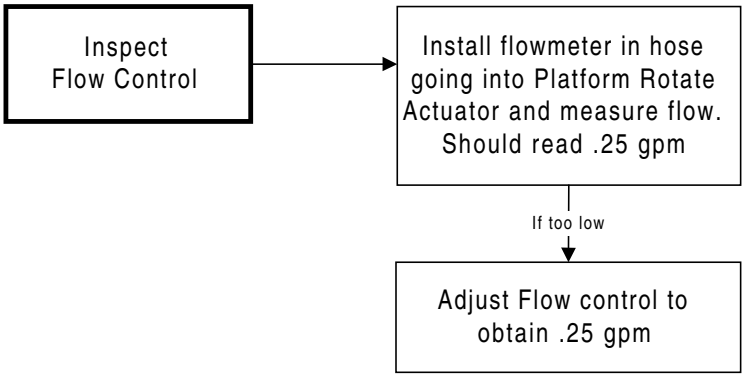
Step 1

Step 1

Platform rotates too fast (TB 120 only)



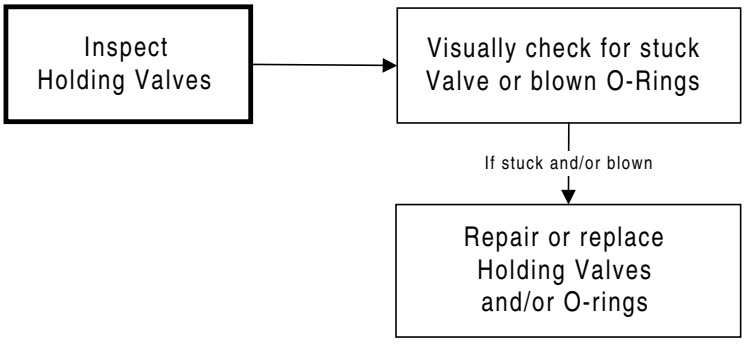
Platform rotates too slow (TB 120 only)



Step 1

Step 1

Platform rotates itself



SECTION EIGHT:
PLATFORM LEVELING SYSTEM DIAGNOSTICS

Chart 1

Platform will not level as boom raise or lowers

Step 1
Inspect Hydraulic Oil
→ Go to Page 134

OK ↓

Step 2
Inspect Holding Valves in Non Proportional Control Valve
→ Go to Page 134

Chart 2

Platform will not maintain level

Step 1
Inspect Holding Valves in Slave Level Cylinder
→ Go to Page 135

Chart 3

No response when platform level switch is activated (electrical related)

Step 1
Inspect Ground Control Switch
→ Go to Page 136

OK ↓

Step 2
Inspect Platform Level Switch
→ Go to Page 136

OK ↓

Step 3
Inspect Platform Level Valve Solenoid
→ Go to Page 137

Chart 4

No response when platform level switch is activated (hydraulic related)

Step 1
Inspect Hydraulic Pump and/or Emergency Pump
→ Go to Page 138

Chart 5

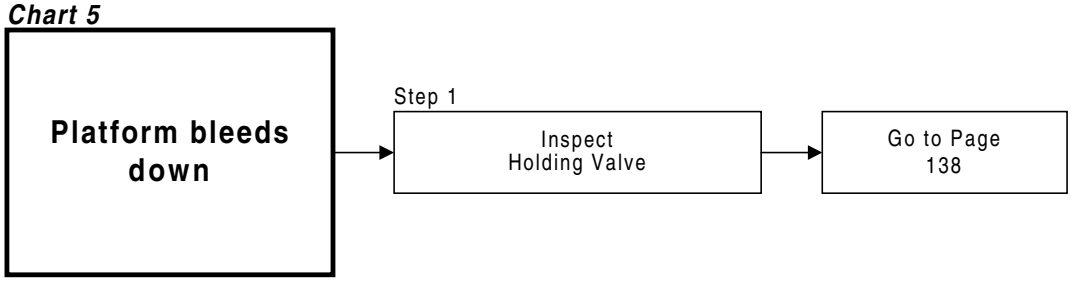


Chart 6

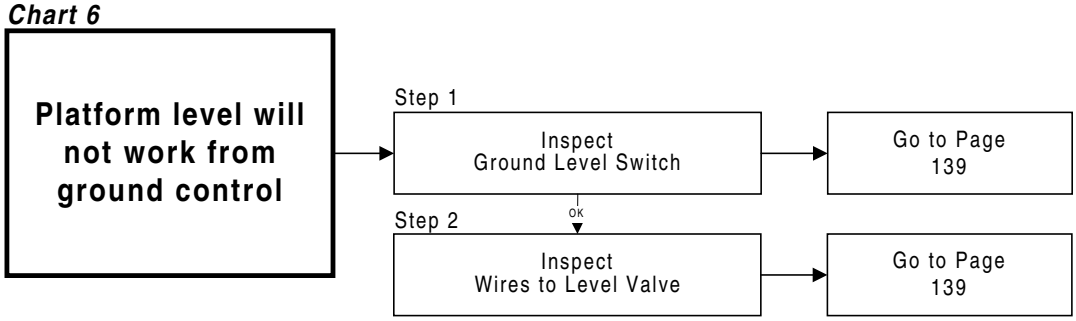


Chart 7

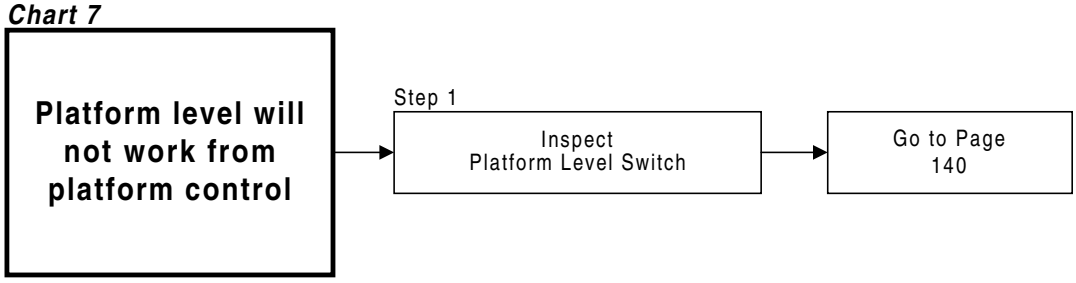


Chart 8

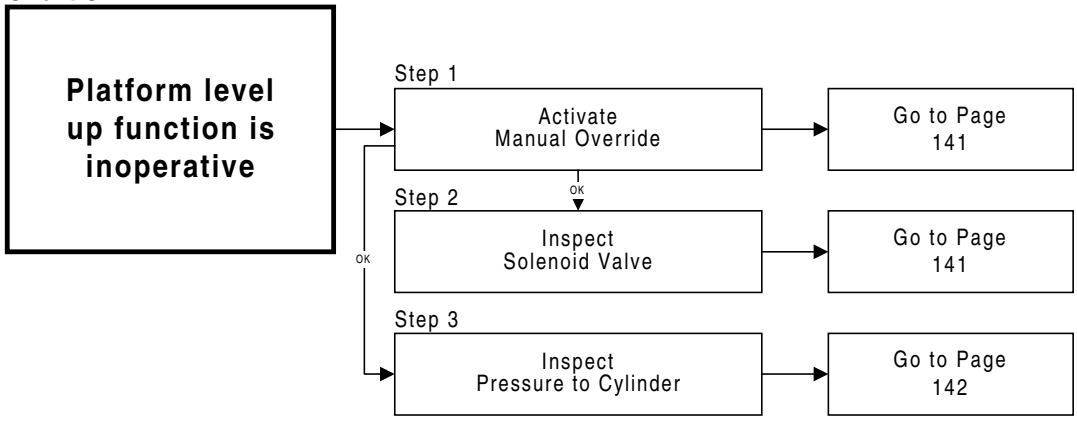
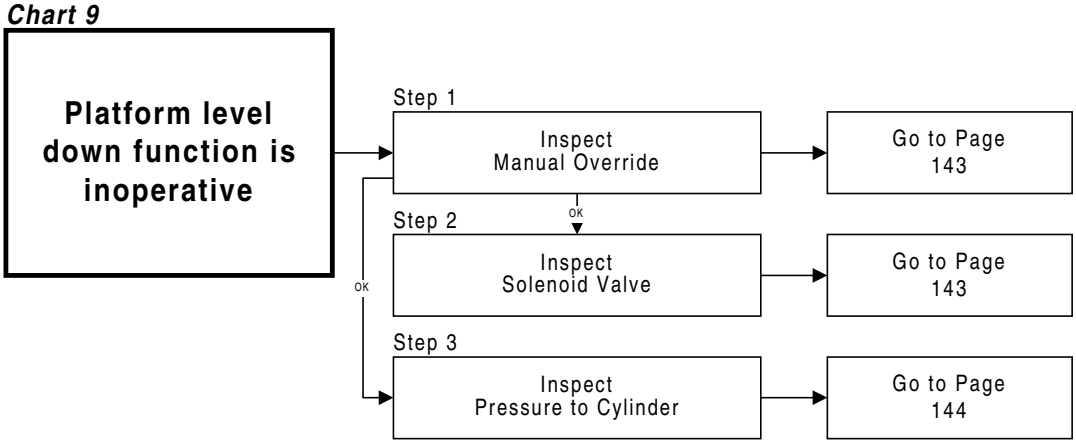
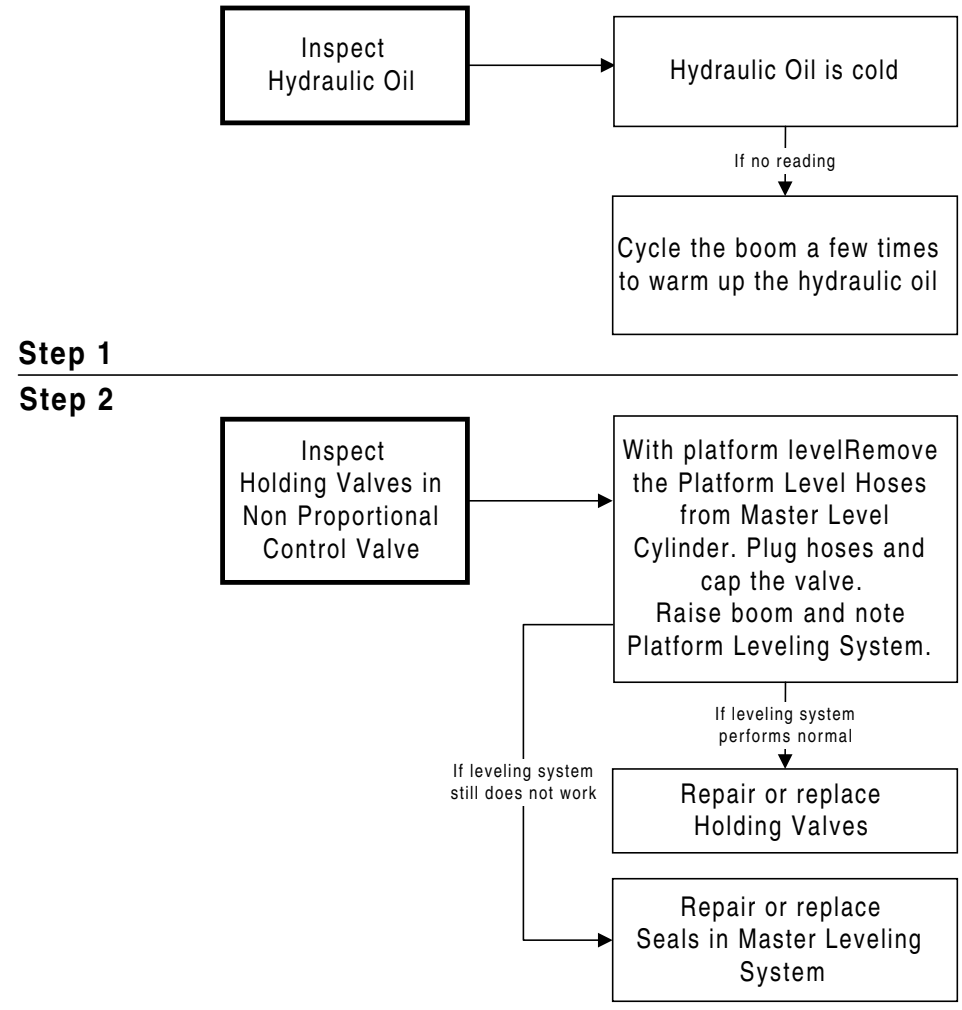


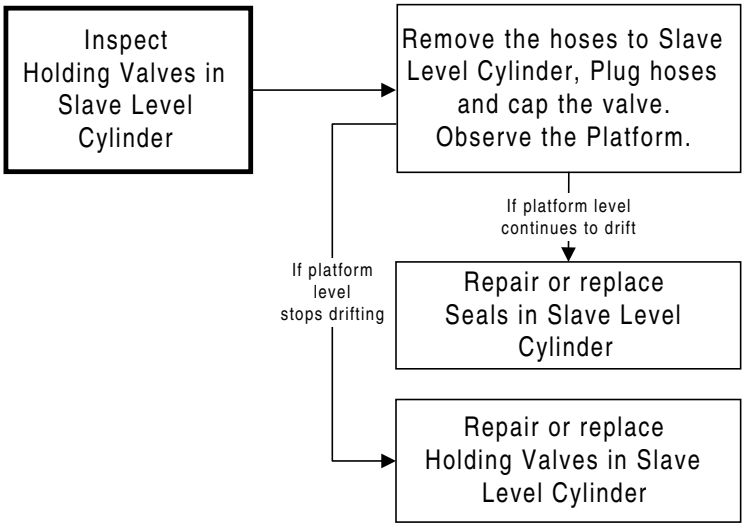
Chart 9



The platform does not level as boom raise or lowers

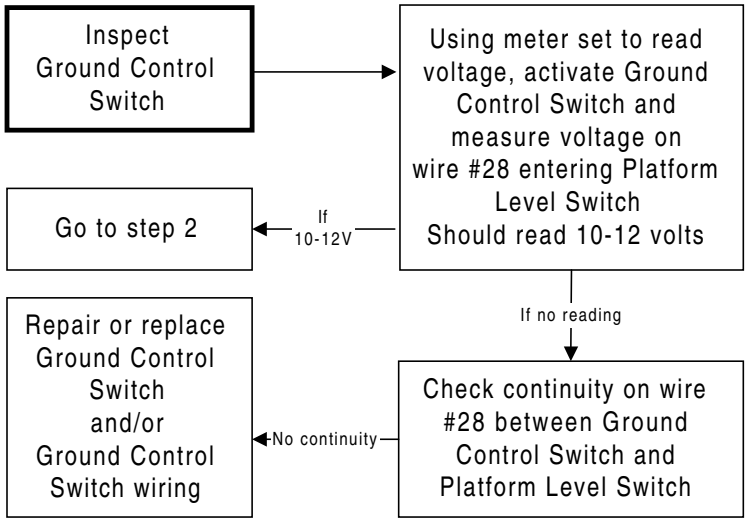


The platform will not maintain level



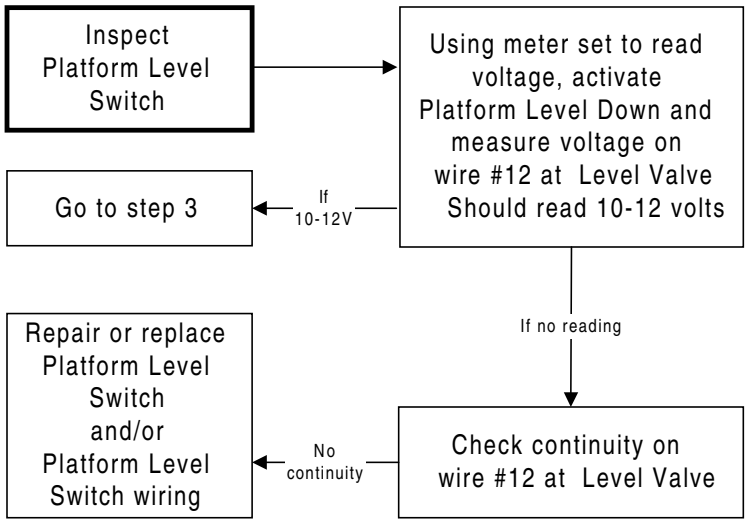
Step 1

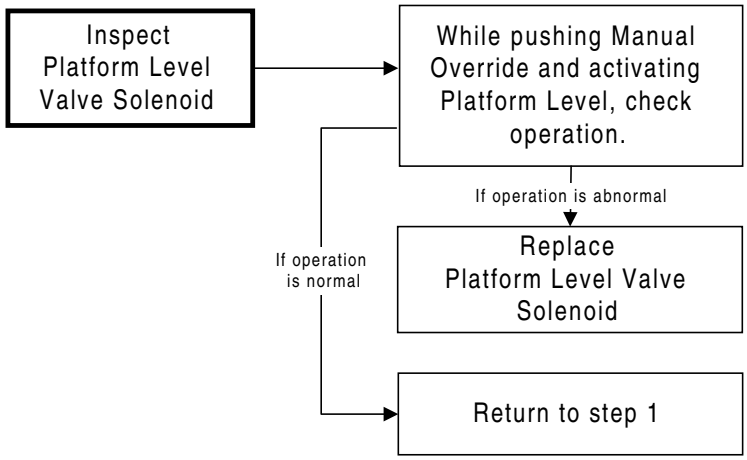
No response when platform level switch is activated (electrical related)



Step 1

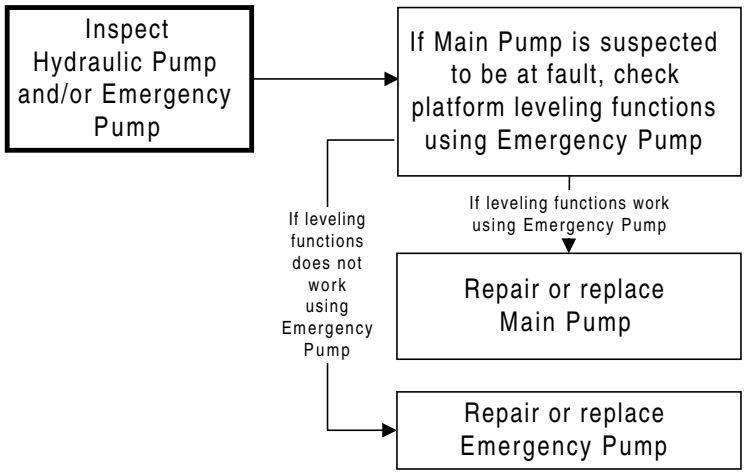
Step 2





Step 3

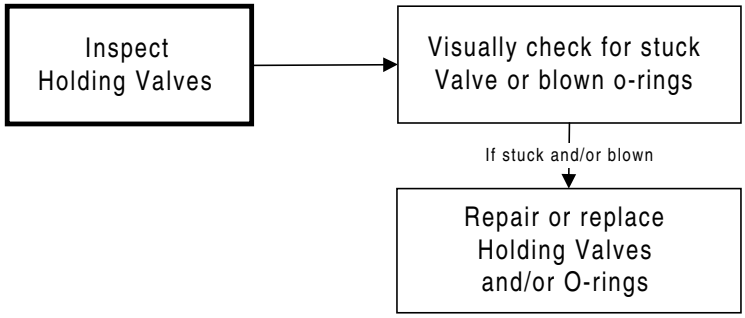
No response when platform level switch is activated (Hydraulic Related)



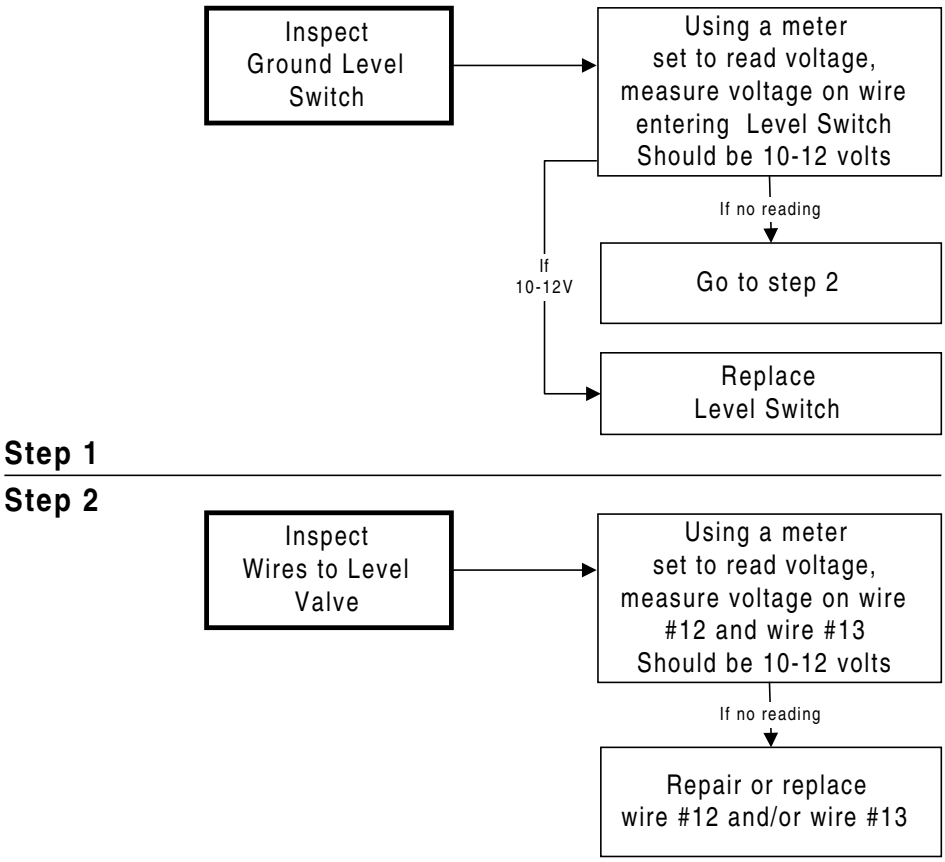
Step 1

Step 1

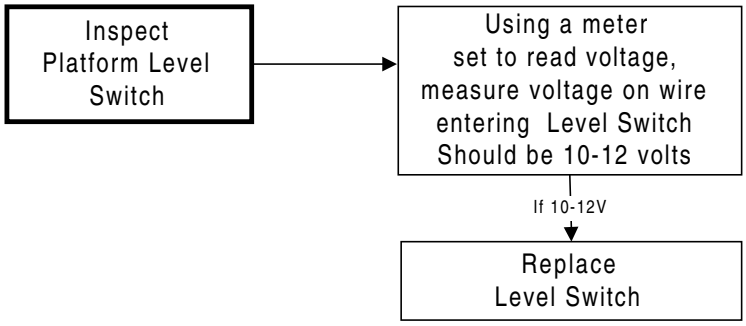
Platform bleeds down



Platform level will not work from ground control



Platform level will not work from platform control

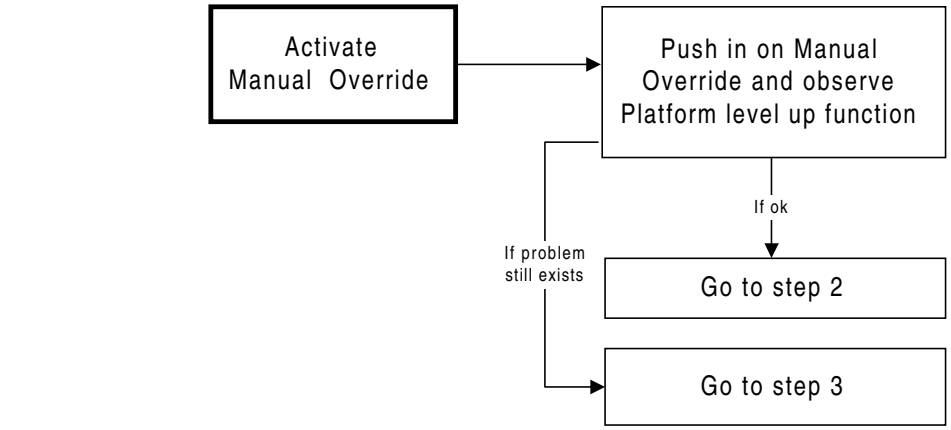


Step 1

Platform level up function is inoperative

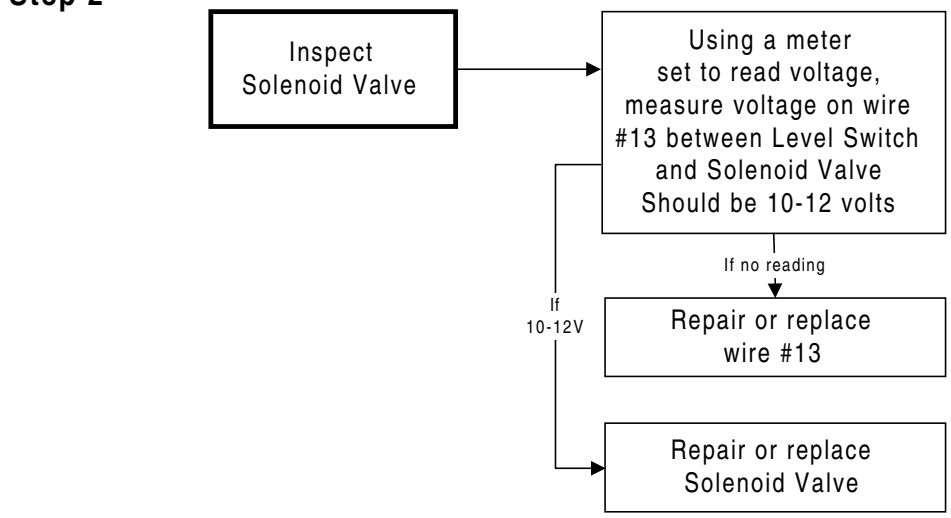
⚠CAUTION

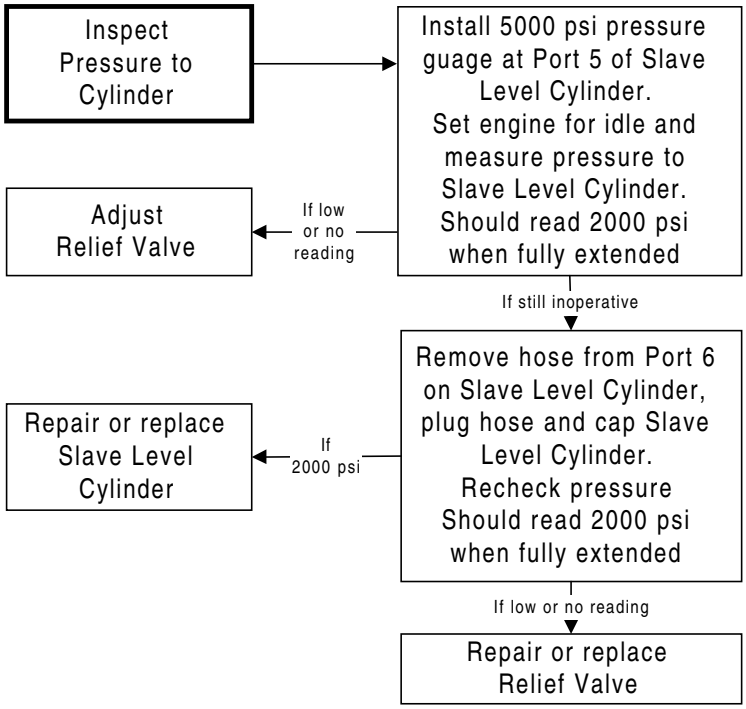
Machine function will be moving when manual override is activated.



Step 1

Step 2



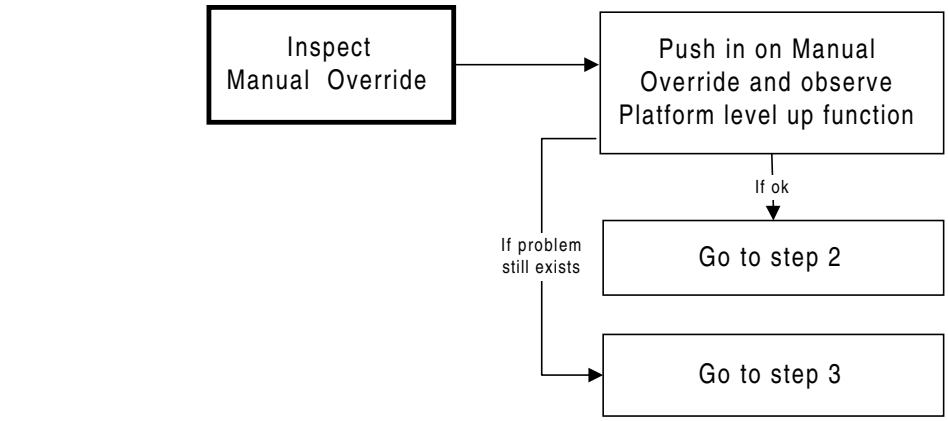


Step 3

Platform level down function is inoperative

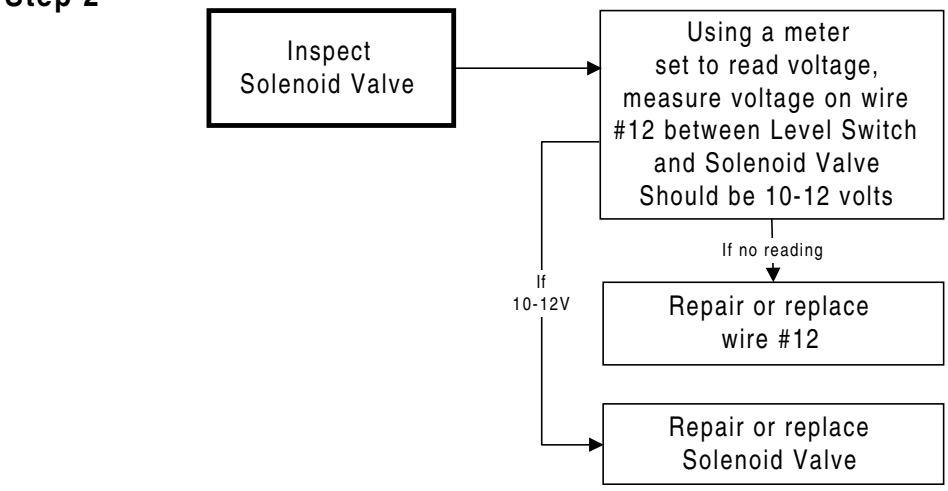
⚠CAUTION

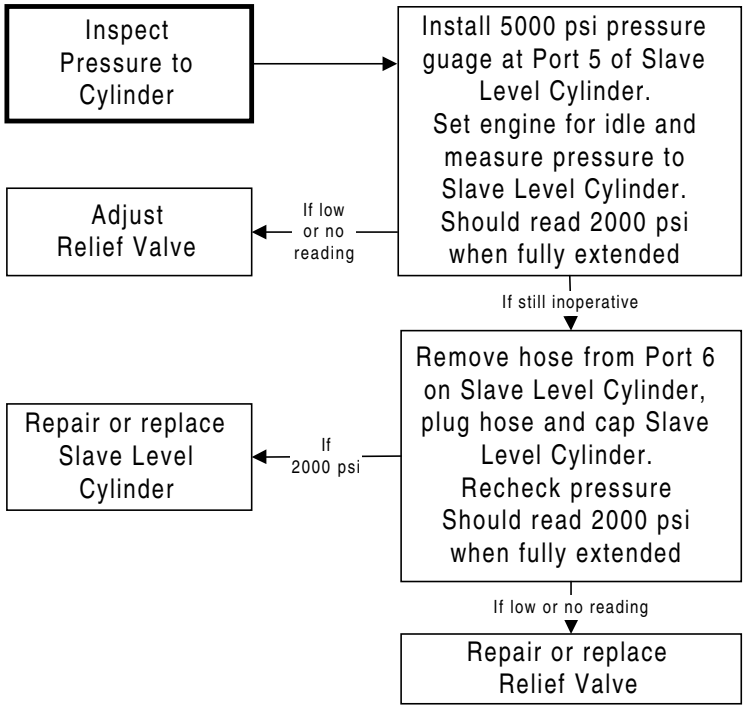
Machine function will be moving when manual override is activated.



Step 1

Step 2

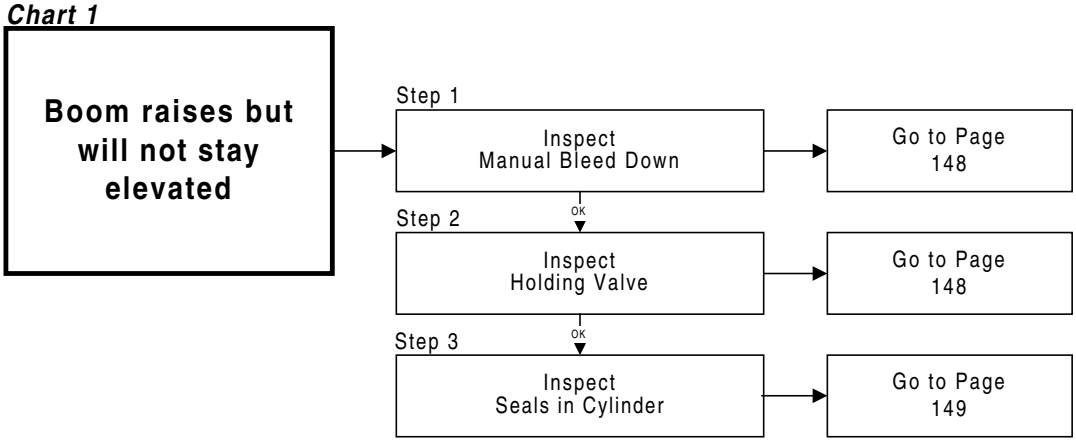




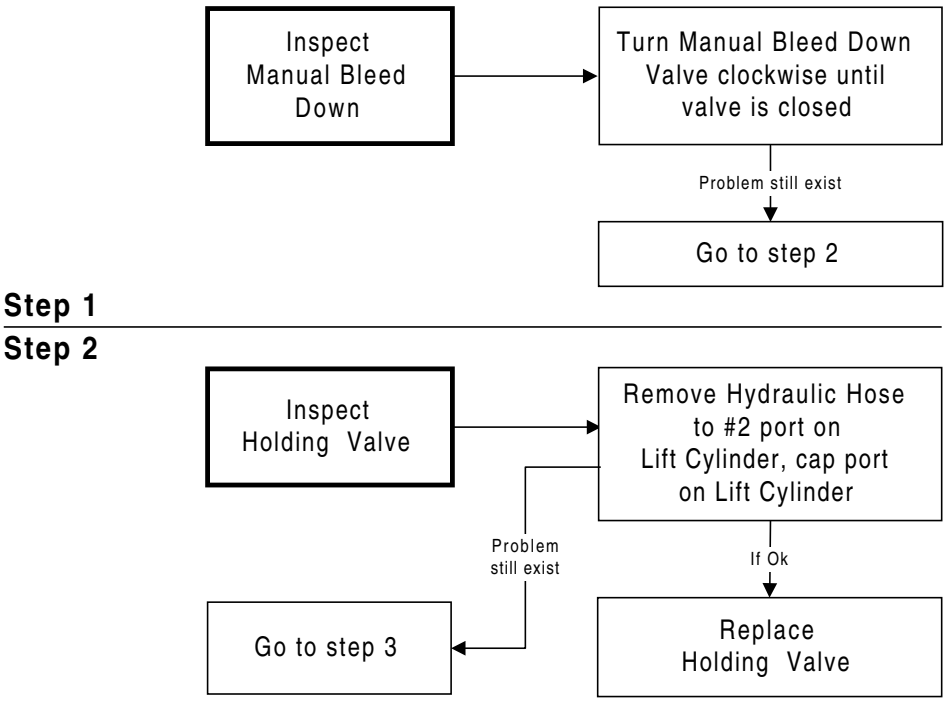
Step 3

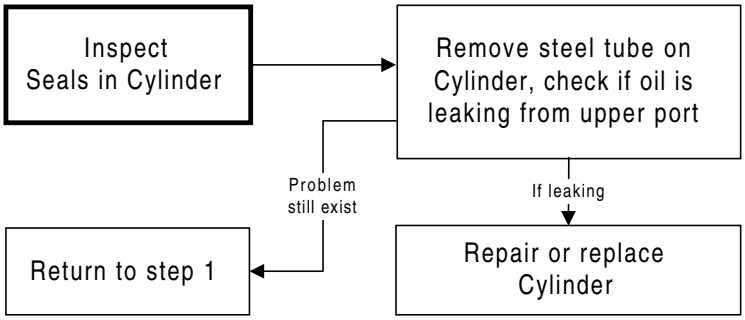
SECTION NINE:
BOOM ELEVATION SYSTEM DIAGNOSTICS

Chart 1



Boom raises but will not stay elevated





Step 3

SECTION TEN:
FUEL SYSTEM DIAGNOSTICS

Chart 1

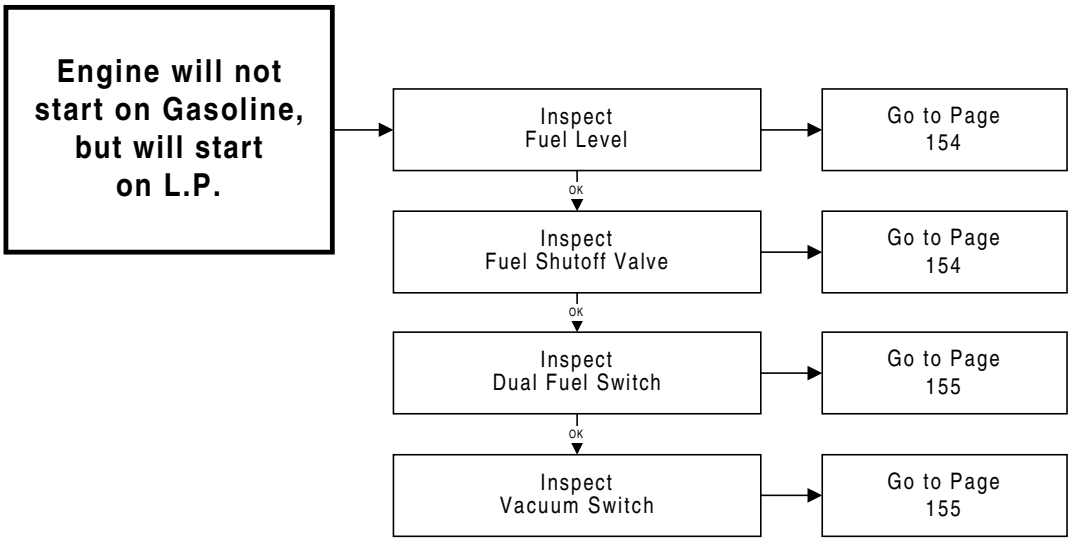
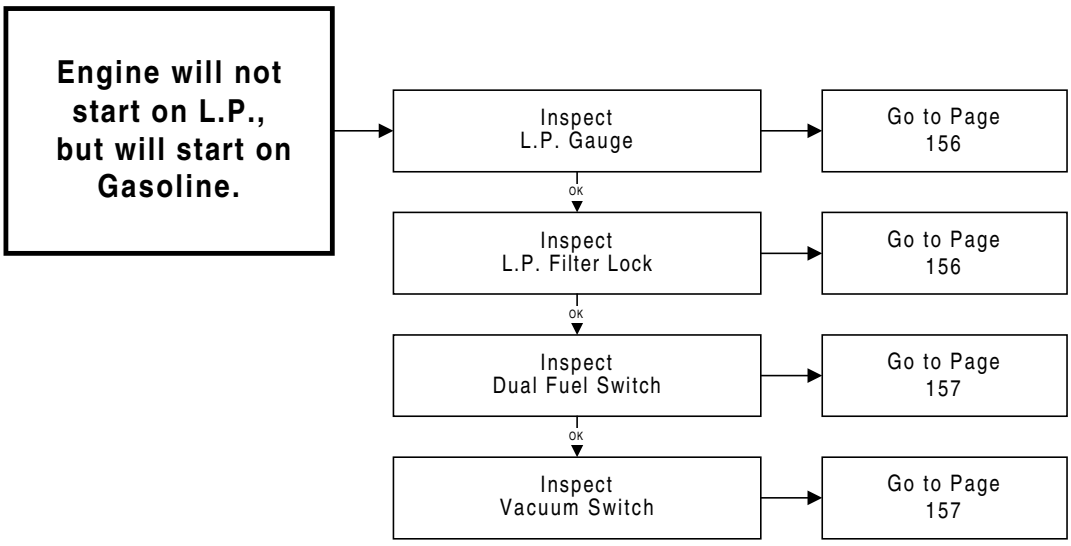
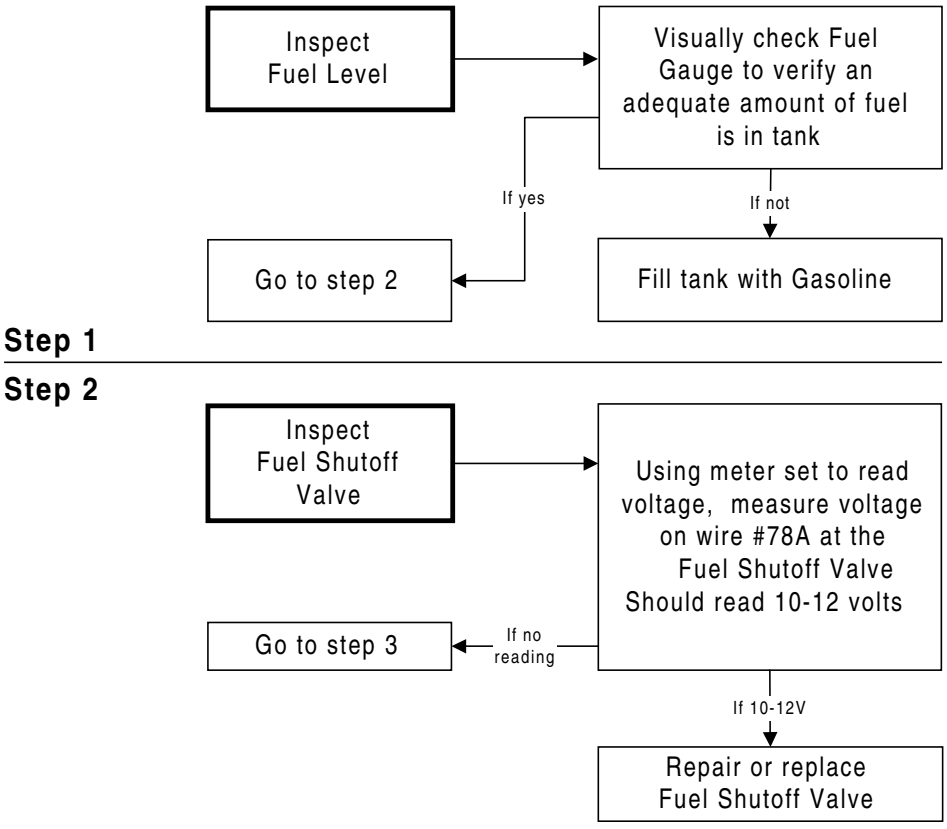
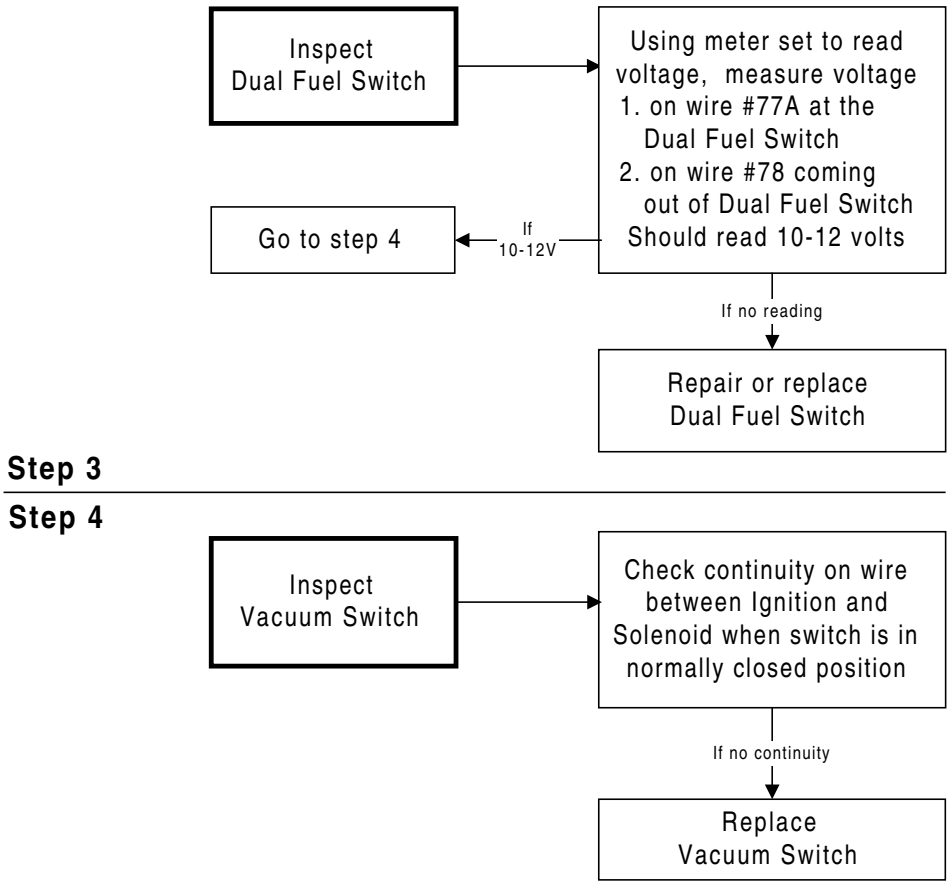


Chart 2



Engine will not start on Gasoline, but will start on L.P.

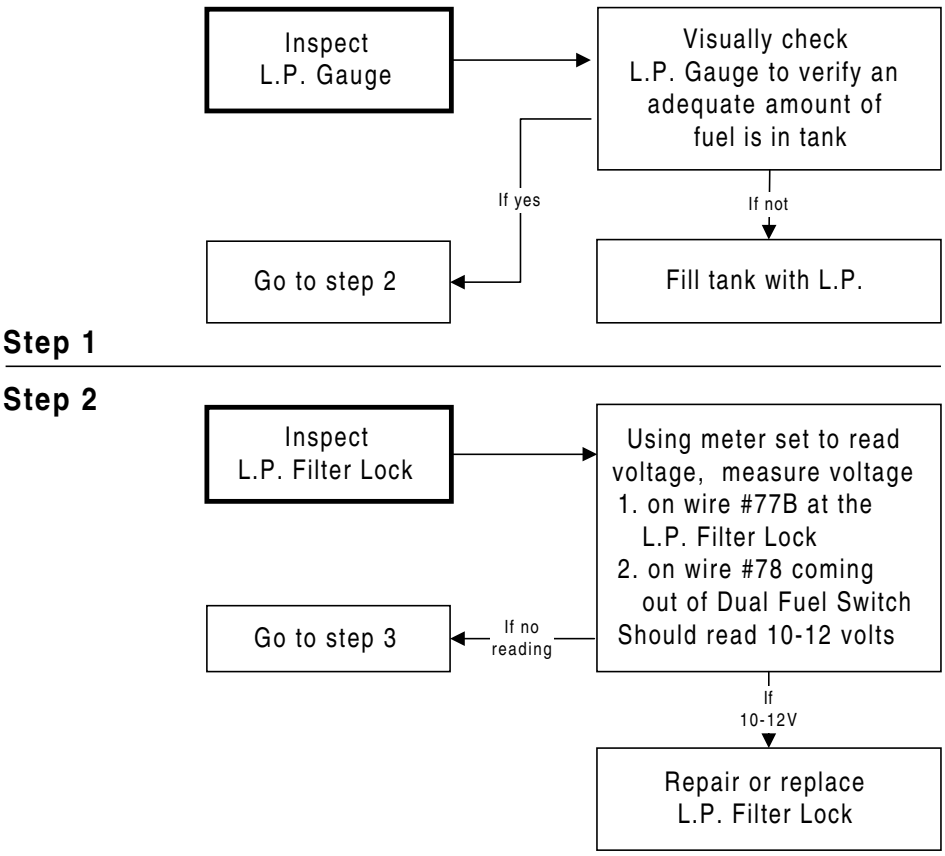


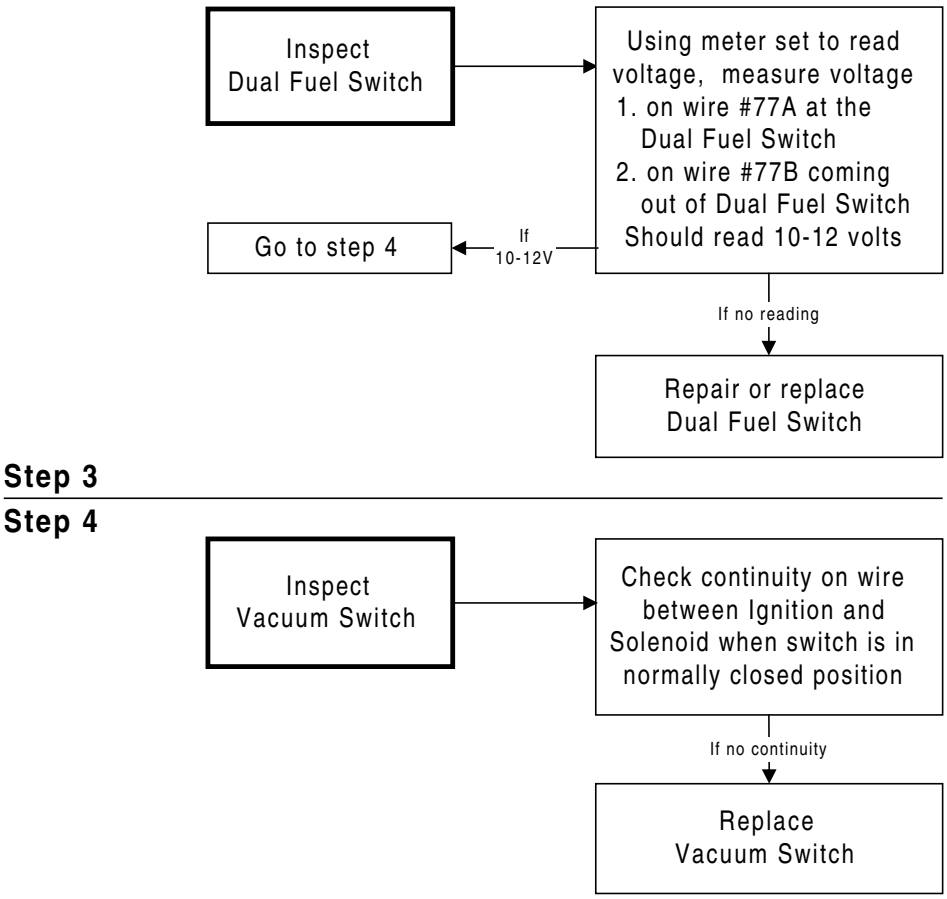


Step 3

Step 4

Engine will not start on L.P., but will start on Gasoline.





Step 3

Step 4

SECTION ELEVEN: ACCESSORIES DIAGNOSTICS

Chart 1

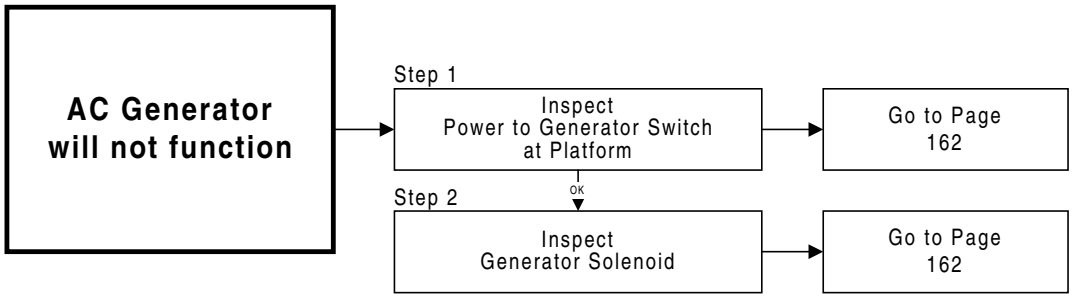
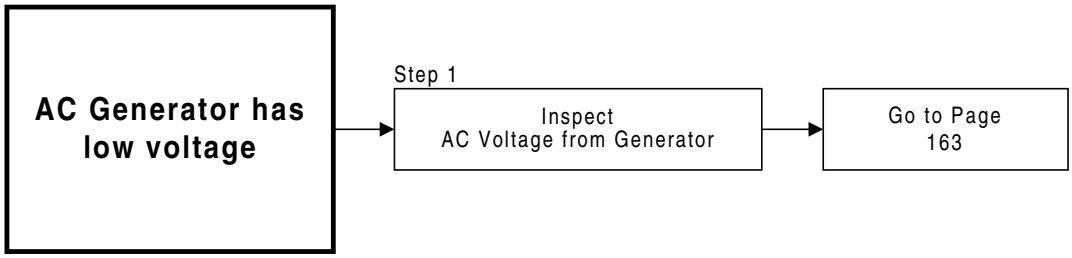
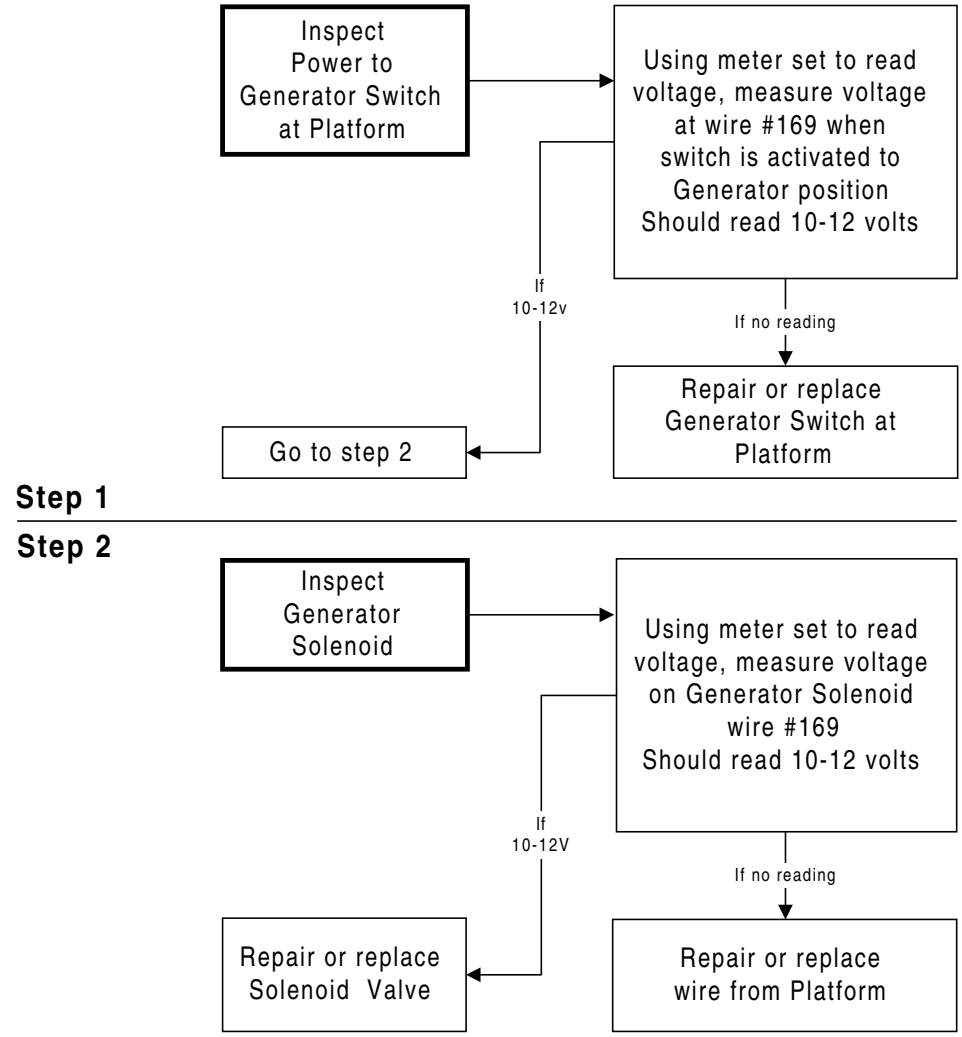


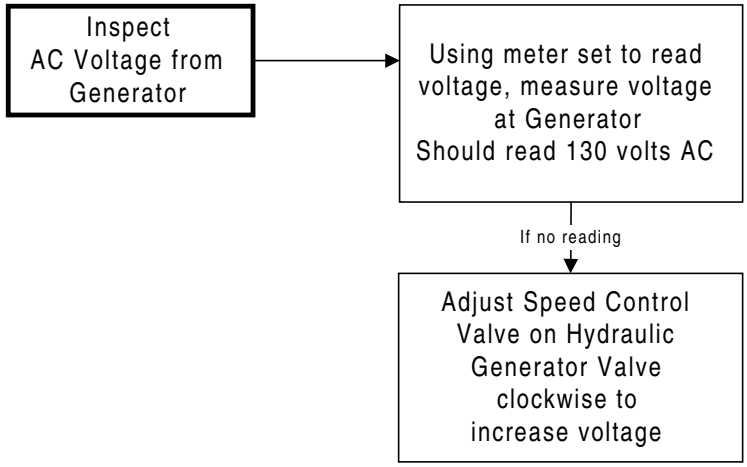
Chart 2



AC Generator will not function



AC Generator has low voltage



Step 1