mercruiser
STERN DRIVES & INBOARDS

service bulletin

NUMBER: 83-13

A. "Oildyne" Power Trim Pump Used on Current Models
B. Filling "Oildyne" Power Trim Pump and Bleeding System
C. New Power Trim System Parts and Repair Kits
D. Trim Pump Rebuild Kit (99073)
E. Testing "Oildyne" Power Trim Pump and Trim System
F. Troubleshooting Power Trim Systems Equipped with "Oildyne" Pump

CIRCULATE TO:
SERVICE MANAGER ☐
PARTS MANAGER ☐
MECHANICS ☐
"Place in a Service Bulletin Binder"

A. "OILDYNE" POWER TRIM PUMP USED ON CURRENT MODELS

All MerCruiser Stern Drives (with transom assembly serial numbers shown below) will be equipped with an "Oildyne" Power Trim pump. (Figure 1)

MCM 120R-thru-260R Models - Serial Number 6216687 and Above
MCM TR & TRS Models - Serial Number 6037486 and Above

The "Oildyne" Power Trim pump has internal valving that eliminates the need for an external reverse lock on the engine, as was required in the past. The pump generates a higher volume, but a lower pressure than previous pumps. This, in conjuntion with larger ID hydraulic hoses (gimbal housing to pump) and larger ID trim cylinders, should allow the drive unit to kick-up easier if an underwater object is struck.

CAUTION: Due to differences in internal valving, the "Oildyne" trim pump cannot be used to replace an earlier "Prestolite" pump, or vise-versa. Use of incorrect pump will affect trim operation and may cause damage to trim system.

The "Oildyne" pump is fitted with two solenoids as standard equipment. This eliminates the need for an additional solenoid kit when installing "In-the-Handle-Trim" type remote controls, as was required in the past (on MC-1 models).

The pump motor is protected from overheating by an internal circuit breaker (in the field), which interrupts the ground circuit to the solenoids if an overheating condition is sensed. Electrical current overload protection is afforded to the pump by a 110 amp fuse. Pump also is equipped with a 20 amp circuit breaker (on older pumps) or a 20 amp fuse (on newer pumps) which serves to protect the trim control and harness from an overload. Refer to wiring diagram at back of bulletin.

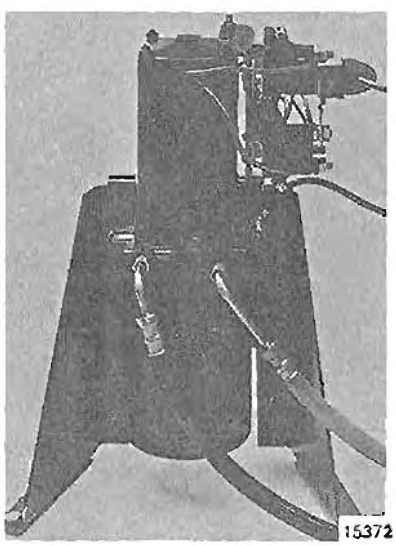


Figure 1. "Oildyne" Power Trim Pump

B. FILLING "OILDYNE" POWER TRIM PUMP and BLEEDING SYSTEM

1. Place stern drive unit in the full "Down" ("In") position.
2. Remove "Fill/Vent" screw (Figure 2) from Power Trim pump and wipe off dipstick with a CLEAN LINT-FREE cloth.
3. Check oil level using dipstick. DO NOT THREAD "FILL/VENT" SCREW INTO PUMP. If necessary, add SAE 10W-30 or SAE 10W-40 motor oil (thru "Fill/Vent" screw hole) to bring level up to "FULL" (top) mark on dipstick. DO NOT OVERFILL.

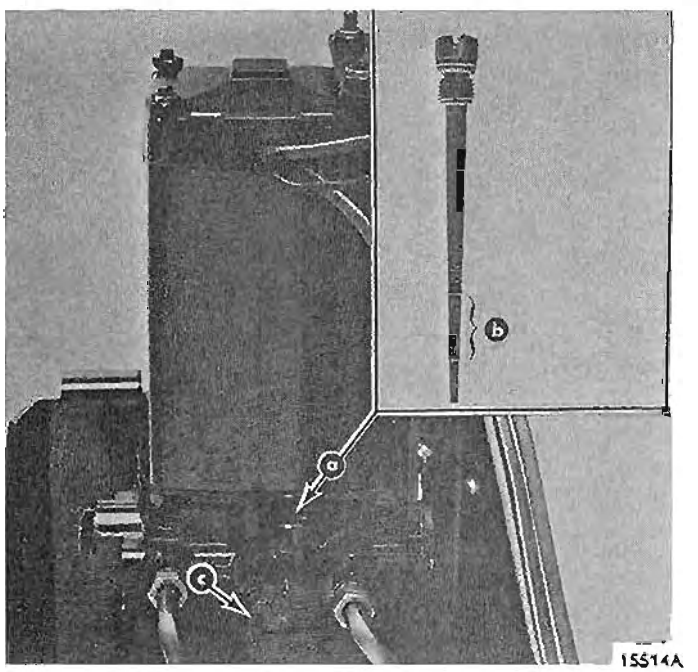
   NOTE: In tropical areas, single-viscosity SAE 30 motor oil may be used, if SAE 10W-30 or 10W-40 is not available.

4. Raise and lower drive unit 2 times; then, recheck oil level (with drive unit fully "Down") and add oil, if necessary.
5. If air has entered hydraulic system (indicated by fluctuations in trim pump motor speed when raising or lowering drive unit), bleed air from system, as follows:
   a. Raise drive unit to full "Up" position.

      NOTE: It may be necessary to apply a slight amount of downward pressure on drive unit to get it moving, in next step.

   b. Turn "Manual Tilt Knob" (Figure 2) COUNTERCLOCKWISE until drive unit starts moving (approximately 3 turns); then, turn knob CLOCKWISE until drive unit JUST stops moving. DO NOT allow drive unit to move downward more than necessary, as additional air will be introduced into the system.
   c. Lower drive unit to the full "Down" ("In") position, using trim control.
   d. Recheck oil level and add oil, if necessary.
   e. Close "Manual Tilt Knob" and repeat procedure until all air has been removed from system.
6. Reinstall "Fill/Vent" screw by turning it all-the-way in and backing it out one (1) turn.

CAUTION: "Fill/Vent" screw MUST BE backed out one (1) full turn (after bottoming out) to vent pump reservoir. FAILURE TO BACK SCREW OUT COULD CAUSE DAMAGE TO PUMP.



a - "Fill/Vent" Screw
b - Oil Must Be Maintained Within This Range
c - "Manual Tilt Knob"

Figure 2. Power Trim Pump "Fill/Vent" Screw

C. NEW POWER TRIM SYSTEM PARTS and REPAIR KITS

Listed below are common Power Trim system parts and repair kits for models equipped with "Oildyne" Power Trim pumps. You may want to consider stocking some of these items.

PART OR KIT	MODEL 120R thru 260R	MODEL TR & TRS
Hydraulic Trim Pump Assembly	88183A5	88183A5
Trim Pump Rebuild Kit	99073	99073
Pump Adaptor	41217	41217
Pump Motor Assembly	93692	93692
Fuse (110 Amp)	88-79023A10	88-79023A10
Fuse (20 Amp)	88-79091	88-79091
Circuit Breaker (20 Amp)	88-79149	88-79149
Solenoid	89-96158	89-96158
Port Trim Cylinder Assembly	98703A3	87411A3
Starboard Trim Cylinder Assembly	98704A3	87412A3
Trim Cylinder Seal Kit	25-87400A2	25-79871A1
Trim Cylinder Overhaul Kit	87399A1	86611A1
Port Trim Cylinder Outer Tube	*98703	87411
Starboard Trim Cylinder Outer Tube	*98704	87412
Cylinder End Cap	88035	88035
Trim Cylinder Hose Without Tube	32-99904	32-86036
Port Trim Cylinder Hose With Tube	32-99903	32-87558
Starboard Trim Cylinder Hose With Tube	32-99902	32-87559

**These parts were incorrectly identified on MerCruiser micro-fiche card #29, frame B-12 and in MerCruiser Parts Manual (90-99964), page 23. Please note this on your micro-fiche card or correct it in your Parts Manual.*

D. TRIM PUMP REBUILD KIT (99073)

Trim Pump Rebuild Kit (99073) contains the necessary parts to reseal ALL MerCruiser "Oildyne" Power Trim pumps. This kit was originally designated for use on outboard applications only, therefore, older kits will have only one dipstick in the kit. DO NOT use this dipstick on MerCruiser applications as it is the wrong length and an incorrect oil level reading will result. Newer kits will include 2 dipsticks. Use the longer of the 2 dipsticks on MerCruiser applications.

When using one of the older kits, the testing procedure at the back of the installations instructions should be ignored as it applies to outboards only. Installation instructions in newer kits will have testing instructions for both outboards and MerCruisers.

E. TESTING "OILDYNE" POWER TRIM PUMP and TRIM SYSTEM

Testing Power Trim Pump Only

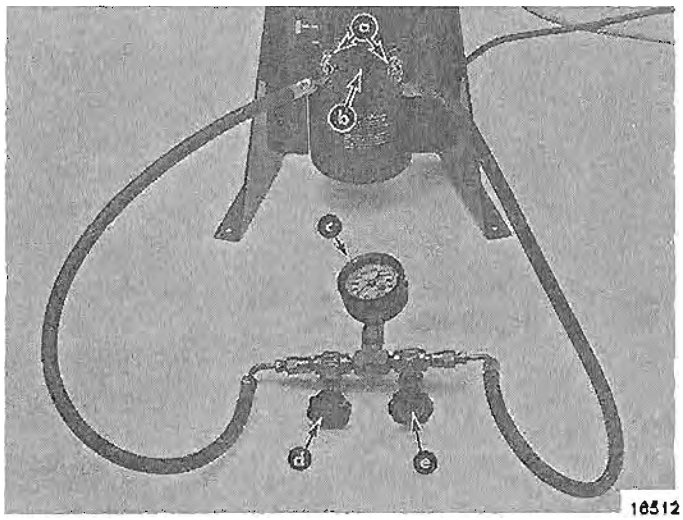
The following test requires the use of Hydraulic Test Gauge (91-52915A3). Gauge can be connected at the pump (Figure 3) or gimbal housing hydraulic connector (Figure 4), depending on which location is most accessible. If gauge is to be connected at pump, two fittings (22-77366) also are required. These fittings are included with newer Hydraulic Test Gauges and can be ordered separately for older gauges.

IMPORTANT: Make sure that "Manual Tilt Knob" (Figure 3) is completely closed and that Power Trim pump oil is up to proper level before proceeding with test.

1. Position stern drive unit in the full "Down" ("In") position.
2. Connect Hydraulic Test Gauge as explained following, using either "A" or "B":

A. Connecting Gauge to Pump (Figure 3)

1) Disconnect hydraulic hoses from pump.
2) Install caps (from Hydraulic Test Gauge) on both hoses to prevent oil from leaking out.
3) Connect Hydraulic Test Gauge to pump, as shown.

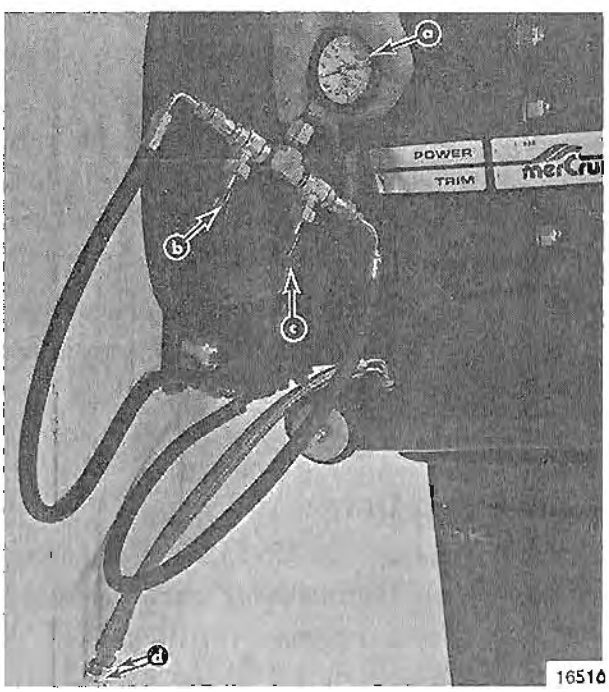


a - Fittings (22-77366) (From Hydraulic Test Gauge or Obtained Separately)
b - Manual Tilt Knob
c - Hydraulic Test Gauge
d - "Up Port Valve"
e - "Down Port Valve"

Figure 3. Hydraulic Test Gauge Connected to Pump

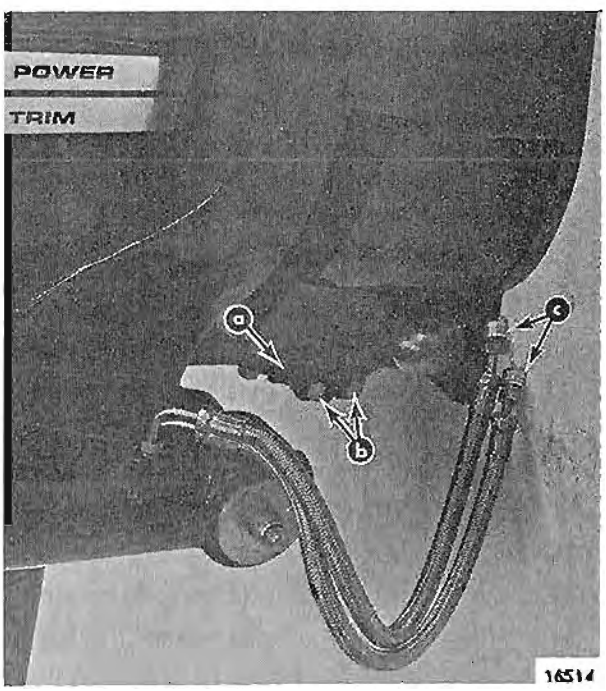
B. Connecting Gauge to Gimbal Housing Hydraulic Connector (Figures 4 and 5)

1) Disconnect trim cylinder hydraulic hoses from hydraulic connector.
2) Install caps (supplied with Hydraulic Test Gauge) on all 4 hoses.
3) Connect Hydraulic Test Gauge to connections on one side of hydraulic connector.
4) Plug hose connections on other side of hydraulic connector with plugs (supplied with Hydraulic Test Gauge).



a - Hydraulic Test Gauge
b - "Up Port Valve"
c - "Down Port Valve"
d - Caps (from Hydraulic Test Gauge)

Figure 4. Hydraulic Test Gauge Connected to Hydraulic Connector



a - Hydraulic Connector
b - Plugs (from Hydraulic Test Gauge)
c - Caps (from Hydraulic Test Gauge)

Figure 5. Hydraulic Hoses Disconnected from Hydraulic Connector

NOTE: In the following tests, valve on side of gauge that is attached to left connection on trim pump (Figure 3) or front connection on hydraulic connector (Figure 4) will be referred to as the "Up Port Valve". Valve on side of gauge that is attached to right connection on pump or aft connection on hydraulic connector will be referred to as the "Down Port Valve".

3. With both test gauge valves open, run pump in the "Up" and "Down" direction several times to purge air from system.
4. Observe test gauge (with both valves open) while running pump in the "Up" and "Down" direction. No pressure should be indicated on gauge. If pressure is indicated, the pump shuttle valve is sticking and pump adaptor requires replacement.
5. **Test "Up" pressure as follows:**
   A. Close "Down Port Valve" and open "Up Port Valve".
   B. Run pump in the "Up" direction until pressure reading stops rising. Pressure should be between 2200-2600 psi (15173-17932 kPa).
   C. Stop pumping "Up". Gauge reading will drop slightly, but should not fall below 1900 psi (13104 kPa).
   D. If pressure readings are not within specifications, proceed to Step 7.
6. **Test "Down" pressure, as follows:**
   A. Close "Up Port Valve" and open "Down Port Valve".
   B. Run pump in the "Down" direction until pressure reading stops rising. Pressure should be between 400-600 psi (2759-4138 kPa).
   C. Stop pumping "Down". Gauge reading will drop slightly, but should not fall below 350 psi (2414 kPa).
7. If pressure readings were not within specifications in Steps 5 and 6, proceed as follows:

   NOTE: If gauge readings were within specifications in Step 5-C and 6-C or if readings were low but held constant (did not drop), disregard Steps 7-A and 7-B and proceed to Step 7-C.

   A. Check for external oil leaks.
   B. If external leakage is not the cause, install "Trim Pump Rebuild Kit" and repeat test.
   C. If proper readings are still not obtained, replace pump adaptor.

Testing Power Trim System

The following test requires the use of Hydraulic Test Gauge (91-52915A3). Gauge can be connected at the pump (Figure 6) or hydraulic connector on gimbal housing (Figure 7), depending on which location is most accessible. If gauge is to be connected at the pump, fitting (22-77366) also is required. This fitting will be included with newer Hydraulic Test Gauges and can be ordered separately for older gauges.

NOTE: In the following tests, valve on side of gauge that is attached to trim pump or hydraulic connector will be referred to as "Valve A". Valve on side of gauge that is attached to gimbal housing hydraulic hose or trim cylinder hydraulic hose will be referred to as "Valve B".

IMPORTANT: Make sure that "Manual Tilt Knob" (Figure 6) is completely closed and that Power Trim pump oil is up to proper level before proceeding with test.

TESTING "UP" CIRCUIT

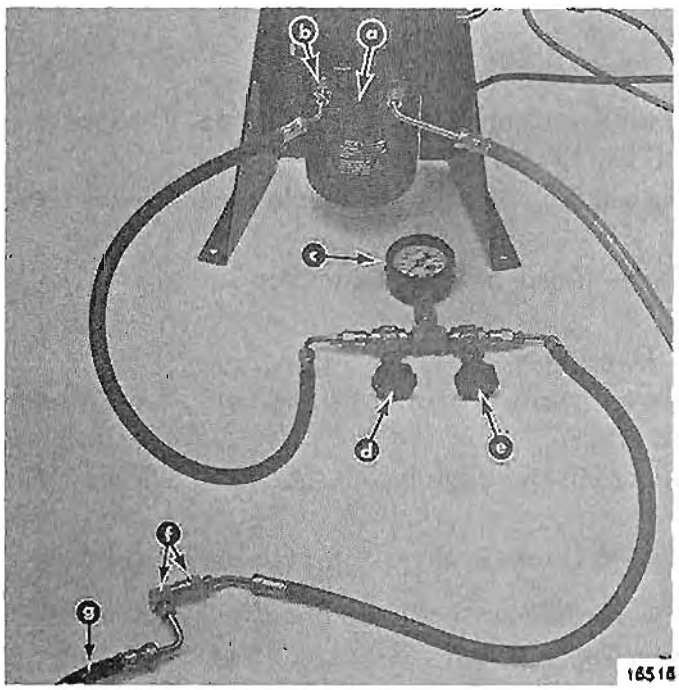
NOTE: Checking For Internal Trim Cylinder Leakage (Drive Unit Can Be Trimmed "Up", But Not "Down"): The following test will detect a leak past the trim cylinder floating piston, but not past the shock piston. To check for leakage past the shock piston, complete testing of both the "Up" and "Down" circuit (to ensure that Power Trim Pump is functioning properly), then disconnect trim cylinder aft ends from stern drive unit and fully extend cylinders. Run pump in the "Down"

direction until trim cylinders stop retracting. If a cylinder will not retract completely, the shock piston is probably leaking. Rebuild cylinder, using "Trim Cylinder Overhaul Kit". A bent trim cylinder piston rod or scored cylinder also may prevent cylinder from retracting.

1. Position stern drive unit in the full "Down" ("In") position.
2. Connect Hydraulic Test Gauge, as explained following, using either "A" or "B".

A. Connecting Gauge At Pump (Figure 6)

1) Disconnect <u>black</u> hydraulic hose from <u>left</u> connection on trim pump.
2) Connect test gauge with fittings, as shown.



a - "Manual Tilt Knob"
b - Fitting (22-77388) (From Hydraulic Test Gauge or Obtained Separately)
c - Hydraulic Test Gauge
d - "Valve A"
e - "Valve B"
f - Fittings (From Hydraulic Test Gauge)
g - Black Hydraulic Hose

Figure 6. Testing "Up" Pressure - Hydraulic Test Gauge Connected to Pump

B. Connecting Gauge At Gimbal Housing Hydraulic Connector (Figure 7)

1) Disconnect trim cylinder hoses from <u>front</u> connection on one side of hydraulic connector.
2) Connect test gauge, as shown.

3. With both test gauge valves open, run pump in the "Up" and "Down" direction several times to purge air from system.
4. Run pump in the "Up" direction until trim cylinders are fully extended and pressure reading remains constant. Pressure should be between 2200-2600 psi (15173-17932 kPa).
5. Stop pumping "Up". Pressure will fall slightly, but should not go below 1900 psi (13104 kPa).
6. If proper readings are not obtained, proceed as follows:

A. Test Gauge Connected at Pump

1) Close "Valve B" on test gauge and repeat Step 4 and 5.
2) <u>If readings are still not within specifications,</u> proceed as follows:

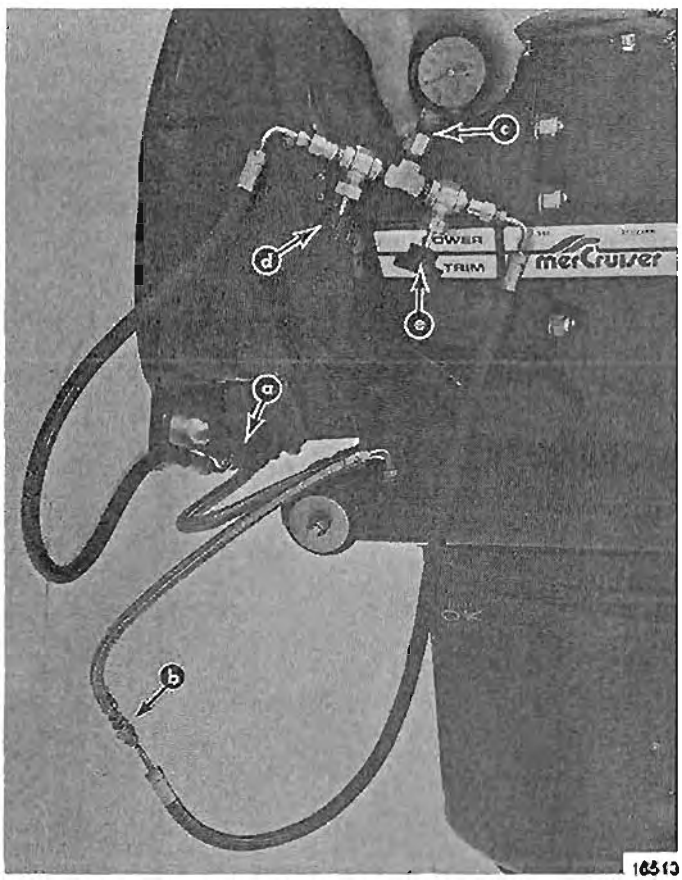
NOTE: Disregard "a" and "b" following, if pressure remained constant in Step 5.

a) Check for external oil leakage.
b) If external leakage is not the cause, install "Trim Pump Rebuild Kit" and repeat test.
c) If proper readings are still not obtained, install a new pump adaptor.

3) <u>If readings are now within specifications (after closing "Valve B")</u>, proceed as follows:
a) Disconnect trim cylinder aft pivot ends from stern drive unit.

b) Check trim cylinders for internal leakage, by disconnecting trim cylinder hoses from gimbal housing hydraulic connector (one side at a time). Plug hydraulic connections and cap hoses with fittings (supplied with gauge). (Figure 8) Open "Valve B" on test gauge and repeat Steps 4 and 5. If proper readings are now obtained, trim cylinder (disconnected at the time) is leaking internally. Replace cylinder or rebuild it using "Trim Cylinder Seal Kit".

c) If proper readings are not obtained by disconnecting trim cylinders, a leaking gimbal housing hydraulic connector or hydraulic hose is indicated.

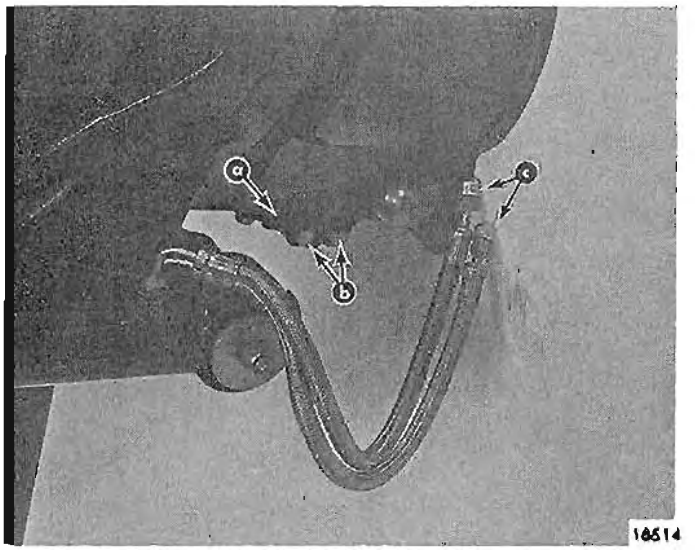


a - Hydraulic Connector
b - Coupling (Supplied with Hydraulic Test Gauge)
c - Hydraulic Test Gauge
d - "Valve A"
e - "Valve B"

Figure 7. Testing "Up" Pressure - Hydraulic Test Gauge Connected to Gimbal Housing Hydraulic Connector

B. Test Gauge Connected at Gimbal Housing Hydraulic Connector

1) Disconnect trim cylinder aft ends from stern drive unit.
2) Close "Valve B" on test gauge and repeat Steps 4 and 5. If readings are now within specifications, trim cylinder that is connected to gauge is leaking internally. Install "Trim Cylinder Seal Kit" and retest.
3) If proper readings are still not obtained (after closing "Valve B"), disconnect trim cylinder hoses from side of hydraulic connector opposite gauge. (Figure 8) Plug connections and cap hoses. With "Valve B" on gauge still closed, repeat Steps 4 and 5. If proper readings are now obtained, disconnected trim cylinder is leaking internally.
4) If proper readings are still not obtained (after disconnecting trim cylinder), a leaking gimbal housing hydraulic connector or hydraulic hose or a faulty trim pump is indicated. To determine which component is faulty, connect gauge at pump (as explained in Step 2-A) and proceed to Step 6-A.



a - Hydraulic Connector
b - Plugs (from Hydraulic Test Gauge)
c - Caps (from Hydraulic Test Gauge)

Figure 8. Trim Cylinder Hydraulic Hoses Disconnected from Hydraulic Connector

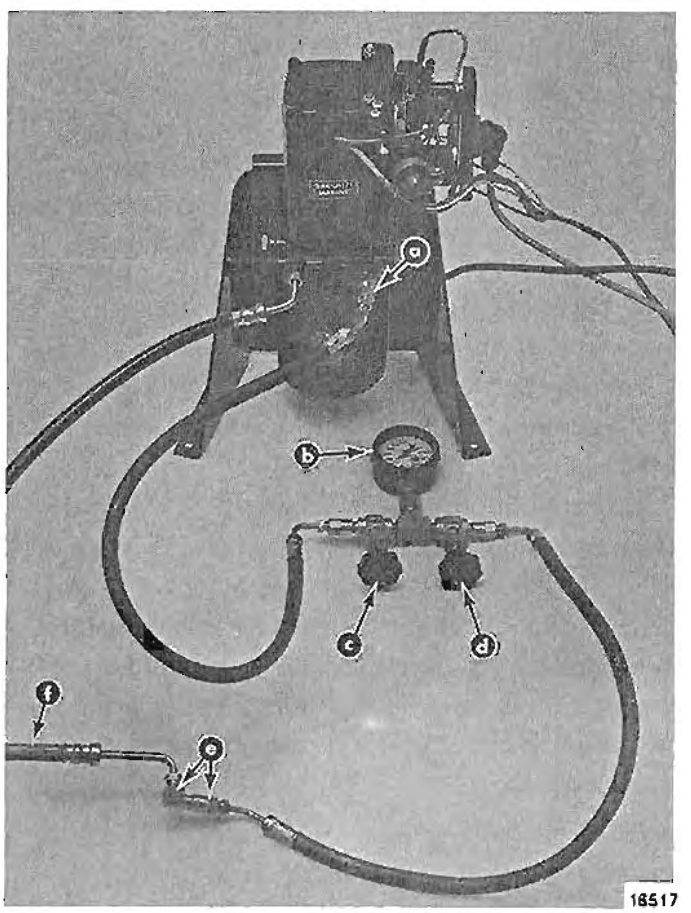
TESTING "DOWN" CIRCUIT

IMPORTANT: The following test assumes that trim cylinders are not leaking internally, as determined by performing tests outlined under "Testing Up Circuit", preceding.

1. Position stern drive unit in the full "Down" ("In") position.
2. Connect Hydraulic Test Gauge, as explained following, using either "A" or "B".

A. Connecting Gauge At Pump (Figure 9)

1) Disconnect gray hydraulic hose from right connection on trim pump.
2) Connect gauge with fittings, as shown.



a - Fitting (22-77368) (From Hydraulic Test Gauge or Obtained Separately)
b - Hydraulic Test Gauge
c - "Valve A"
d - "Valve B"
e - Fittings (From Hydraulic Test Gauge)
f - Gray Hydraulic Hose

Figure 9. Testing "Down" Pressure - Hydraulic Test Gauge Connected to Pump

B. Connecting Gauge At Gimbal Housing Hydraulic Connector (Figure 10)

1) Disconnect trim cylinder hose from all connection on one side of connector.
2) Connect gauge with fittings, as shown.

3. With both test gauge valves open, run pump in the "Up" and "Down" direction several times to purge air from system.
4. Run pump in the "Down" direction until pressure reading stops rising. Pressure should be between 400-600 psi (2759-4138 kPa).
5. Stop pumping "Down". Pressure reading will fall slightly, but should not go below 350 psi (2414 kPa).
6. If readings are not within specifications, proceed as follows:

A. Test Gauge Connected at Pump

1) Close "Valve B" on test gauge and repeat Step 4 and 5.
2) If readings are still not within specifications, proceed as follows:

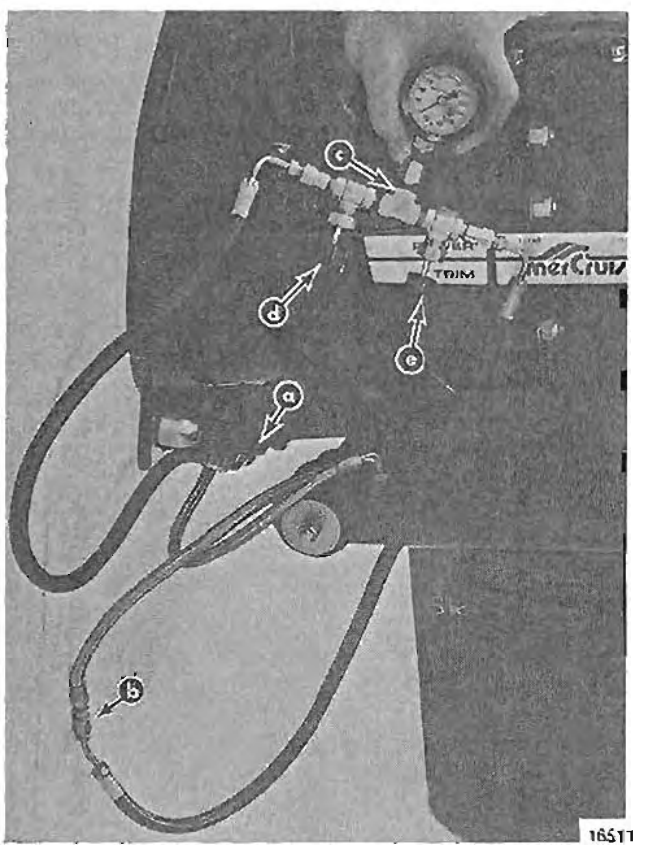
NOTE: Disregard "a" and "b" following, if pressure remained constant in Step 5.

a) Check for external oil leakage.
b) If external leakage is not the cause, install "Trim Pump Rebuild Kit" and repeat test.
c) If proper reading is still not obtained, install a new pump adaptor.

3) If proper readings are obtained by closing "Valve B", an external oil leak is indicated.

B. Test Gauge Connected at Gimbal Housing Hydraulic Connector

1) A faulty trim pump or an external oil leak is indicated. To help locate faulty component, connect gauge at pump (as explained in Step 2-A) and proceed to Step 6-A.



a - Hydraulic Connector
b - Coupling (From Hydraulic Test Gauge)
c - Hydraulic Test Gauge
d - "Valve A"
e - "Valve B"

Figure 10. Testing "Down" Pressure - Hydraulic Test Gauge Connected to Gimbal Housing Hydraulic Connector

F. TROUBLESHOOTING POWER TRIM SYSTEMS EQUIPPED WITH "OILDYNE" PUMP

The following troubleshooting charts should be of assistance in diagnosing Power Trim problems on models with "Oildyne" pumps. When troubleshooting a malfunction, it is first necessary to determine if the problem is electrical or hydraulic. After this has been established, refer to the appropriate troubleshooting chart and find the symptom (listed under "Problem") that corresponds to your problem. The "Possible Causes" are listed on the basis of frequency and ease of checking.

Troubleshooting Power Trim Electrical System

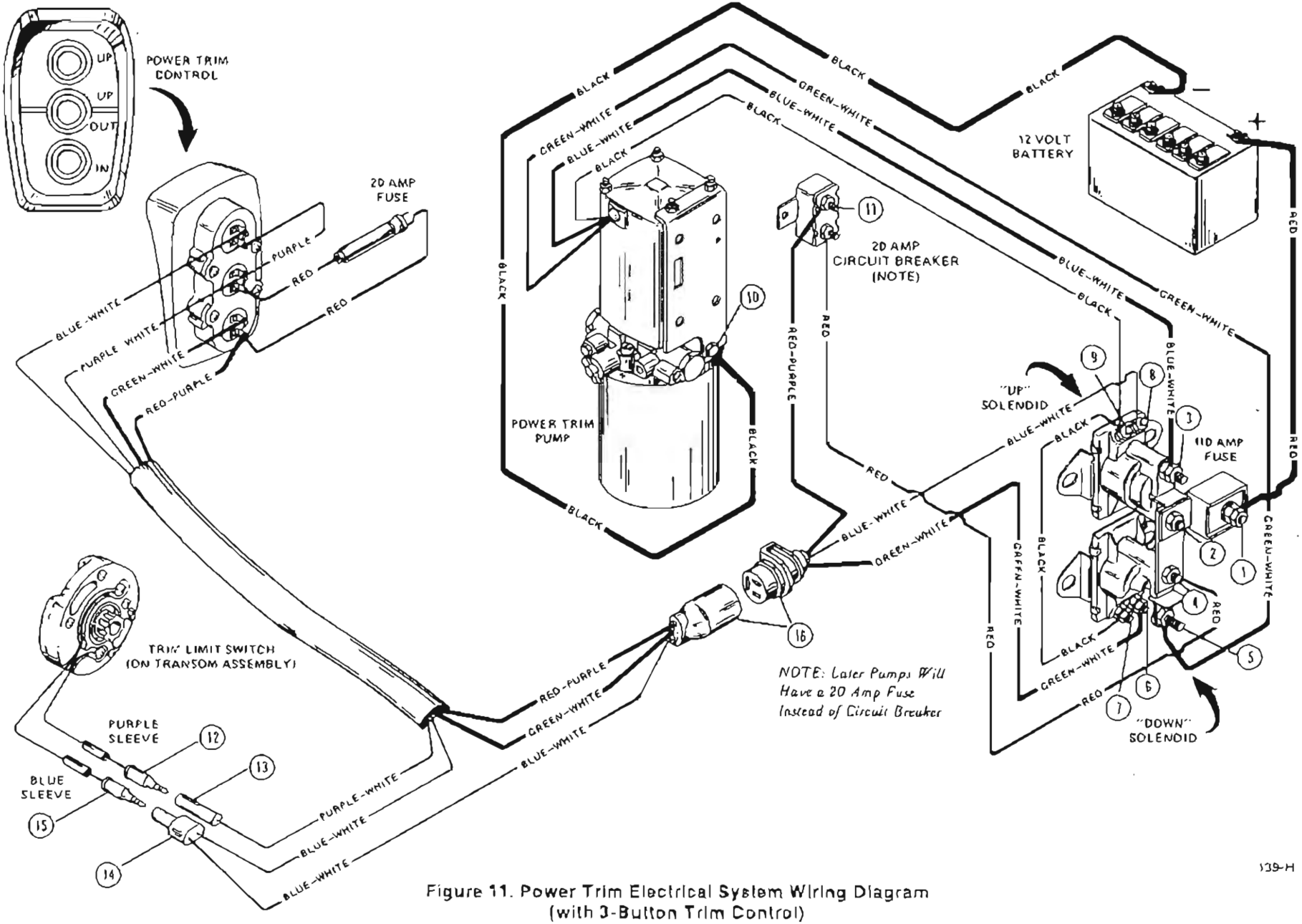
Problem	Possible Cause	Remedy
Power Trim Pump Motor Will Not Run In The "Up" or "Down" Direction-- Solenoids Do Not Click	1. *20 amp circuit breaker tripped or fuse blown (as applicable).	1. Check if circuit breaker reset button is protruding from case or if in-line fuse is blown. If so, determine cause for interruption and correct, then reset circuit breaker or replace fuse. Check circuit breaker for an open condition by testing for voltage at terminal "11" (Figure 11). *NOTE: If circuit breaker trips or fuse blows while trimming "Up" ("Out") or raising drive unit, problem may be due to a grounded trim limit switch lead. Grounded condition may be due to insulator (on switches so equipped) being missing between trim limit switch and gimbal ring. To check for grounded condition, disconnect trim limit switch leads at bullet connectors "12", "13", "14" and "15" (Figure 11). If drive unit can now be raised (using "Trailer" switch), trim limit switch or leads are grounded.
	2. Power Trim pump battery cables corroded or loose.	2. Clean and/or tighten connections, as necessary.
	3. Trim control wiring harness connector loose or corroded.	3. Clean and secure connection "16" (Figure 11), as necessary.
*Does not apply to an intermittent problem.	4. *110 amp fuse blown.	4. Check for voltage at terminal "2" (Figure 11). If no voltage is indicated, determine cause for blown fuse and correct, then replace fuse. (Trimming "Up" and "Down" simultaneously will blow fuse.)
	5. Open circuit in trim control wiring harness.	5. Check for battery voltage at terminal "8" (Figure 11) while trimming "Up" and at terminal "6" while trimming "Down". If no voltage is indicated, check trim control for a loose or corroded connection or a damaged power supply lead in harness.
	6. Faulty thermo circuit breaker in pump motor.	6. Connect a jumper wire between terminals "9" and "10" (Figure 11). If pump now operates, thermo circuit breaker is faulty and field and frame must be replaced.
	7. Faulty solenoids.	7. Replace both solenoids.
Power Trim Pump Motor Will Not Run In The "Up" or "Down" Direction -- Solenoids Click	1. Loose or dirty solenoid connections.	1. Check connections "2", "3", "4", and "5" (Figure 11). Clean and/or tighten, as necessary.
	2. Faulty solenoids.	2. Check for battery voltage at terminal "4" (Figure 11) while trimming "Down" and at terminal "2" while trimming "Up". If no voltage is indicated, replace solenoids.
	3. Power Trim pump harness or trim control harness shorted between "Up" and "Down" circuit (pump trying to run in "Up" and "Down" simultaneously).	3. Disconnect blue-white lead from solenoid terminal "8" (Figure 11). If pump motor will now run in the "Down" direction, a short in harness exists. Repair or replace harness, as necessary.
	4. Pump motor brushes stuck, corroded or worn out.	4. Clean or replace, as required.
	5. Armature commutator dirty.	5. Clean or replace armature, as required.
	6. Armature faulty.	6. Test for shorted, open or grounded condition and replace if bad.

Problem	Possible Cause	Remedy
	7. Field and frame faulty	7. Check for open or grounded condition.
	8. Pump gears froze.	8. Replace pump adaptor.
Power Trim Pump Motor Runs In The "Up" Direction, But Not In The "Down" Direction -- "Down" Solenoid Does Not Click	1. Loose or dirty solenoid connections.	1. Check connections "6" and "7" (Figure 11) and clean and/or tighten as required.
	2. Open "Down" circuit in trim control or pump wiring harness	2. Check for battery voltage at terminal "6" (Figure 11) while trimming "Down". If no voltage is indicated, check for a loose or corroded "Down" circuit connection, damaged "Down" circuit lead or a faulty "Down" trim switch. Repair or replace, as required.
	3. Solenoid faulty.	3. Replace solenoid.
Power Trim Pump Motor Runs In The "Up" Direction But Not In The "Down" Direction -- "Down" Solenoid Clicks	1. Loose or dirty solenoid connection.	1. Check connections "4" and "5" (Figure 11). Clean and/or tighten, as necessary.
	2. Faulty solenoid.	2. Check for battery voltage at terminal "5" while trimming "Down". If no voltage is indicated, replace solenoid.
	3. Faulty "Down" field winding.	3. Replace field and frame.
Power Trim Pump Motor Runs In "Down" Direction, But Not "Up" Direction (Both Trim and Trailer Switches Inoperative) -- "Up" Solenoid Does Not Click	1. Loose or dirty solenoid connections.	1. Check connections "8" and "9". (Figure 11) Clean and/or tighten, as necessary.
	2. Open "Up" circuit in trim control or pump wiring harness.	2. Check for battery voltage at terminal "8" (Figure 11) while trimming "Up". If no voltage is indicated, check for a loose or corroded "Up" circuit connection, blown fuse (if trim control is so equipped), damaged "Up" circuit lead, or a faulty "Up" trim switch. Repair or replace, as necessary.
	3. Solenoid faulty.	3. Replace solenoid.
Power Trim Pump Motor Runs In "Down" Direction, But Not "Up" Direction (Both Trim and Trailer Switches Inoperative) -- "Up" Solenoid Clicks	1. Loose or dirty solenoid connection.	1. Check connections "2" and "3" (Figure 11) and clean and/or tighten, as necessary.
	2. Faulty solenoid.	2. Check for battery voltage at terminal "3" (Figure 11) while trimming "Up". If no voltage is indicated, replace solenoid.
	3. Faulty "Up" field winding.	3. Replace field and frame.
Trim Control "Up" Trim Switch Inoperative -- Trailer Switch Operates	1. Trim limit switch lead bullet connectors loose or corroded.	1. Clean and/or tighten connections "12", "13", "14", and "15" (Figure 11), as necessary.
	2. Trim limit switch or leads faulty.	2. Disconnect trim limit switch leads from trim harness. Connect a continuity meter between leads "12" and "15". (Figure 11) Continuity should be indicated with drive unit in full "Down" position. If not, check for a damaged lead or poor connections. If this is not the cause replace limit switch.
	3. Open in trim control "Up" circuit.	3. Check for a loose or corroded "Up" circuit connection, damaged "Up" circuit lead or faulty "Up" trim switch. Repair or replace, as necessary.
Trim Control Trailer Switch Inoperative - Trim "Up" Switch Functions	1. Open in trim control trailer circuit.	1. Check for a faulty trailer switch, loose or corroded connections or damaged trailer circuit lead.
Trim System Functions While Unattended	1. Faulty trim or trailer switch.	1. Replace switch.
	2. Shorted trim pump harness or trim control harness	2. Repair or replace, as required.

Troubleshooting Power Trim Hydraulic System

Problem	Possible Cause	Remedy
Drive Unit Cannot Be Trimmed "Up" ("Out")	1. Power Trim pump oil level low. 2. "Manual Tilt Knob" not completely closed. 3. Insufficient pump pressure or pump shuttle valve stuck. 4. Trim cylinder(s) binding. 5. Gimbal housing-to-trim pump hydraulic hose pinched.	1. Check for cause of low oil level and correct. Add oil and bleed trim system. 2. Close valve completely. 3. Test, as explained preceding (use "Testing Power Trim Pump Only"). If low, replace pump adaptor. 4. Check for cause of binding (bent piston rod, scored cylinder, etc.). Repair or replace, as necessary. 5. Replace hose
Drive Unit Cannot Be Raised To Full "Up" Position	1. Power trim pump oil level low. 2. Trim cylinder(s) binding.	1. Check for cause of low oil level and correct. Add oil and bleed trim system. 2. Check for cause of binding (bent piston rod, scored cylinder, etc.). Repair or replace, as necessary.
Drive Unit Raises with Jerky Movements	1. Air in trim system. 2. Hoses reversed on one cylinder only 3. Trim cylinder(s) binding.	1. Check for cause of entry and correct. Add oil to pump and bleed trim system. 2. Connect hoses correctly. 3. Check for cause of binding (bent piston rod, scored cylinder, etc.). Rebuild or replace cylinder, as necessary.
Drive Unit Cannot Be Lowered From "Up" Position or Lowers with Jerky Movements	1. Air in trim system. 2. Insufficient "Down" pressure or shuttle valve stuck. 3. Trim cylinder(s) or connector block leaking internally. 4. Trim cylinder(s) binding. 5. Gimbal housing-to-trim pump hydraulic hose pinched. 6. Hoses reversed on one trim cylinder only. 7. Drive unit binding in gimbal ring.	1. Check for cause of entry. Fill and bleed trim system. 2. Test, as explained preceding (use "Testing Power Trim Pump Only") If low, replace pump adaptor. 3. Test, as explained preceding (use "Testing Power Trim System"). Rebuild or replace cylinder, as necessary. 4. Check for cause of binding (bent piston rod, scored cylinder, etc.). Repair or replace, as necessary. 5. Replace hose. 6. Reconnect hoses correctly. 7. Check for cause of binding (bent gimbal ring, drive shaft housing, etc.) and replace.
Drive Unit Will Not Stay In Full "Up" Position For Extended Periods	1. External leakage 2. Pump "Up" circuit leaking internally. 3. Trim cylinder(s) leaking internally and pump "Down" circuit leaking internally (both must be faulty to cause this problem).	1. Check for cause and correct. Add oil to pump and bleed trim system. 2. Test as explained preceding (use "Testing Power Trim System"). Install repair kit or replace adaptor, as required. 3. Rebuild cylinders. Install pump rebuild kit or replace pump adaptor, as required.

Problem	Possible Cause	Remedy
Drive Unit Will Not Stay In Trimmed "Out" Position When Underway	1. Air in trim system. 2. External leakage. 3. Pump "Up" circuit leaking internally. 4. Trim cylinder(s) leaking internally and pump "Down" circuit leaking internally (both must be faulty to cause this problem).	1. Check for cause of entry. Fill and bleed system. 2. Check for cause and correct. Add oil to pump and bleed trim system. 3. Test as explained preceding (use "Testing Power Trim System"). Install repair kit or replace adaptor, as required. 4. Rebuild cylinder(s). Install pump rebuild kit or replace pump adaptor, as required.
Drive Unit Trails "Out" on Deacceleration or When Shifting Into Reverse (Unit Thumps When Shifting)	1. Air in trim system. 2. Trim cylinder(s) leaking internally. 3. Trim pump "Down" circuit leaking internally or reverse lock valve set too low.	1. Determine cause for air entry and correct. Add oil to pump and bleed trim system. 2. Test as explained preceding (use "Testing Power Trim System"). Rebuild or replace cylinders, as necessary. 3. Test as explained preceding (use "Testing Power Trim System"). Install pump rebuild kit or replace pump adaptor, as necessary.
Oil Foams Out of Pump "Fill/Vent" Screw	1. Contaminated oil. 2. Oil level low.	1. Flush system with clean oil, refill pump and bleed trim system. 2. Check for cause of low oil level and correct. Add oil to pump and bleed system.



139-H

Figure 11. Power Trim Electrical System Wiring Diagram (with 3-Button Trim Control)