mercruiser STERN DRIVES & INBOARDS

service bulletin

TO: SERVICE MANAGER ☐ TECHNICIANS ☐
PARTS MANAGER ☐

No. 88-7

REVISED
3-9-89

Diesel Bravo Two/Inboard Engine Packages
MCM 530 D-TA 636 D-TA Bravo Two
MIE 530 D-TA 636 D-TA Inboard

Tune-Up Specifications

MODEL	D530	D636
*Horsepower @ 3800 RPM	150	180
*Kilowatts	111	132
Displacement	182 CID (3.0L)	219 CID (3.6L)
Engine Type – Diesel	5 Cylinder	6 Cylinder
Bore	3.622 in. (92mm)	
Stroke	3.543 in. (90mm)	
Compression Ratio	22:1	
Compression Pressure Max. Pressure Difference:	348 – 377 PSI (2399 – 2581 kPa) 72 PSI (496 kPa)	
Maximum Governed RPM @ WOT	4250	4350
Recommended Maximum RPM	3800	
Idle RPM in Forward Gear	750	
Fuel Injectors	Bosch	
Injector Firing Order	1-2-4-5-3	1-5-3-6-2-4
Timing BTDC	.034 in (0.86mm)	
Fuel Injection Pressure	2247 PSI (15492 kPa)	
Internal Pump Pressure	22.7 PSI (156 kPa) at 800 RPM	
	106.6 PSI (735 kPa) at 4200 RPM	
Turbocharge Air Pressure	12 – 14 PSI (83 – 97 kPa)	
Oil Pressure @ 750 RPM @ 3800 RPM	22 – 36 PSI (152 – 248 kPa) 50 – 94 PSI (344 – 648 kPa)	
Thermostat – Oil	180° F (82° C)	

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Tune-Up Specifications (cont. from page 1)

MODEL	D530	D636
*Total Oil Capacity	9.5 U.S. Qts (9L)	10.5 U.S. Qts. (10L)
△ Oil Pan Capacity	7.5 U.S. Qts. (7L)	8.5 U.S. Qts. (8L)
△ Oil Filter Capacity	1 Qt. (1L)	
△ Oil Cooler Capacity	1 Qt. (1L)	
Closed Cooling Capacity	11.5 U.S. Qts. (11L)	12.5 U.S. Qts. (12L)
Thermostats – Water	170° – 178° F (77° – 81° C)	
Valve Clearance Intake/Exhaust	.012 in. (0.3mm)	
Drive Unit Oil Capacity	2.5 U.S. Qts. (2.37L)	

*Always use dipstick to determine exact quantity of oil required.

△ Approximate

*Continuous effective braked output per DIN 6271, Part 1, Supplement 1.

Electrical Specifications

Electrical System	12-volt Negative (–) Ground
Alternator Rating	75 Amps
Recommended Battery Rating	12v, 110Ah Minimum 600 Amps Cold Cranking Amperage
Starter	12v, 2.7 kW

Identification Number	No Load Test					
	Volts	Min. Amps	Max. Amps	Min. RPM	Max. RPM	Brush Spring Length
801333980 (Bosch) 0001 362304	11.5	125			7000	21/64 in. (8.5mm)

Torque Specifications

Cylinder head bolts	118 lb. ft.	(160 N.m)
Side bolts	59 lb. ft.	(80 N.m)
Rocker arm bracket	81 lb. ft.	(110 N.m)
Connecting rods	62 lb. ft.	(83 N.m)
Flywheel	81 lb. ft.	(110 N.m)
Pulley nut, crankshaft	115 lb. ft.	(155 N.m)
Oil drain plug	59 lb. ft.	(80 N.m)
Engine suspension	37 lb. ft.	(50 N.m)
Oil pump	21 lb. ft.	(28 N.m)
Rear main bearing housing	21 lb. ft.	(28 N.m)
Flywheel housing	37 lb. ft.	(50 N.m)
Fuel injector nut	21 lb. ft.	(28 N.m)
Cap nuts of injection lines	159 lb. in.	(18 N.m)
Exhaust manifold	25 lb. ft.	(33 N.m)
Intake manifold	25 lb. ft.	(33 N.m)
Main bearing flanges	32 lb. ft.	(43 N.m)
Valve cover	89 lb. in.	(10 N.m)
Oil pan	97 lb. in.	(11 N.m)
Water manifold	80 lb. in.	(9 N.m)
Turbocharger	18 lb. ft.	(24 N.m)
Oil supply lines between cooler and crankcase	18 lb. ft.	(24 N.m)
Oil thermostat	71 lb. in.	(8 N.m)
Injection pump gear	66 lb. ft.	(90 N.m)
Glow plugs	18 lb. ft.	(24 N.m)
Injection pump fastening nuts	23 lb. ft.	(31 N.m)
Exhaust clamp	21 lb. ft.	(28 N.m)
Alternator, pulley fastening nut	43 lb. ft.	(58 N.m)
Alternator bolt, lower	39 lb. ft.	(53 N.m)
Alternator bolt, upper	78 lb. ft.	(105 N.m)
Alternator armature	35 lb. ft.	(48 N.m)

UNIT OF MEASUREMENT
in. (mm)

Internal Engine Specifications

CYLINDER BORE

Model	530 D-TA	636 D-TA
Diameter	3.622 (92)	
Out of Round	.004 (0.1) Max.	

PISTON

Clearance		.010 (0.25) Max.
Piston Wear		.004 (0.1) Max.
Diameter Standard Size	VERSION A	3.618 – 3.6185 (91.900 – 91.910)
	B	3.6185 – 3.619 (91.910 – 91.920)
Diameter First Over-size	A	3.6429 – 3.6432 (92.530 – 92.540)
	B	3.6432 – 3.6436 (92.540 – 92.550)
Max. Weight Diff. Between Pistons in One Engine.		5 grams
Piston Protrusion From Upper Edge of Cranckcase / Gasket Size * Used	.056 (1.42)	.019 – .022 (0.48 – 0.57)
	.060 (1.52)	.023 – .026 (0.58 – 0.67)
	.064 (1.62)	.027 – .030 (0.68 – 0.77)

*When replacing all gaskets on a single engine, use size .060 (1.52mm) gasket.

If replacing an individual gasket, use the same size removed.

PISTON RINGS

Compression	Groove Side Clearance	Production	TOP	Tapered			
			2nd	.003 (.082)			
		Service		.0035 (0.09)			
	Gap	Production	TOP	.016 (0.40)			
			2nd	.010 (0.25)			
		Service	TOP	.025 (0.65)	2nd	.018 (0.45)	
Oil	Groove Side Clearance	Production		.001 (0.30)			
		Service		.003 (0.070)			
	Gap	Production		.010 (0.25)			
		Service		.023 (0.58)			

PISTON PINS

Diameter	1.1807 – 1.1809 (29.990 – 29.996)
Clearance	.00095 – .00178 (0.024 – 0.045)

CRANKSHAFT

Main Journal	Diameter	Front	2.4801 – 2.4807 (62.995 – 63.010)
		Center	2.4805 – 2.4811 (63.005 – 63.020)
		Rear	2.755 – 2.7559 (69.985 – 70.000)
Main Brg. Cleatrance	Clearance	Front	.002 – .0045 (0.050 – 0.115)
		Center	.0011 – .0029 (0.030 – 0.073)
		Rear	.0016 – .00275 (0.040 – 0.070)
Main Journal Wear			.0039 (0.10) Max.
Crankshaft End Play			.0048 – .0127 (0.121 – 0.323)
Connecting Rod Journal			2.1236 – 2.1242 (53.940 – 53.955)

RODS

Color	Letter Code	Con Rod Weight*
Sky Blue	C	1120 – 1130 gr.
White	D	1130 – 1140 gr.
Yellow	E	1140 – 1150 gr.
Red	F	1150 – 1160 gr.
Green	G	1160 – 1170 gr.
Blue	H	1170 – 1180 gr.
Rod Bearing Clearance		.00078 – .0029 (0.020 – 0.074)

*Max. difference in weight of connecting rods must not exceed 10 gr. in one engine.

CAMSHAFT

Lobe Lift	Intake	1.7992 (45.70)
	Exhaust	1.7771 (45.14)
Journal Diameter		2.106 – 2.1066 (53.495 – 53.510)
Run-Out		.0019 (0.05)

VALVE SYSTEM

Lifter Type			Solid
Valve Lash		Intake	.012 (0.30)
		Exhaust	.012 (0.30)
Face Angle		Intake	55°
		Exhaust	45°
Seat Angle		Intake	55°
		Exhaust	45°
Seat Width		Intake	.1075 – .1354 (2.73 – 3.44)
		Exhaust	.0965 – .1189 (2.45 – 3.02)
Stem Clearance		Intake	.0015 – .0028 (0.040 – 0.073)
		Exhaust	.0024 – .0032 (0.060 – 0.083)
Valve Spring	Free Length		1.70078 (43.20)
	Height Spring @ Test Load	Closed @ 75 lbs. (33 – 35 kg)	1.457 (37)
		Open @ 200 lbs. (88 – 94 kg)	1.048 (26.61)

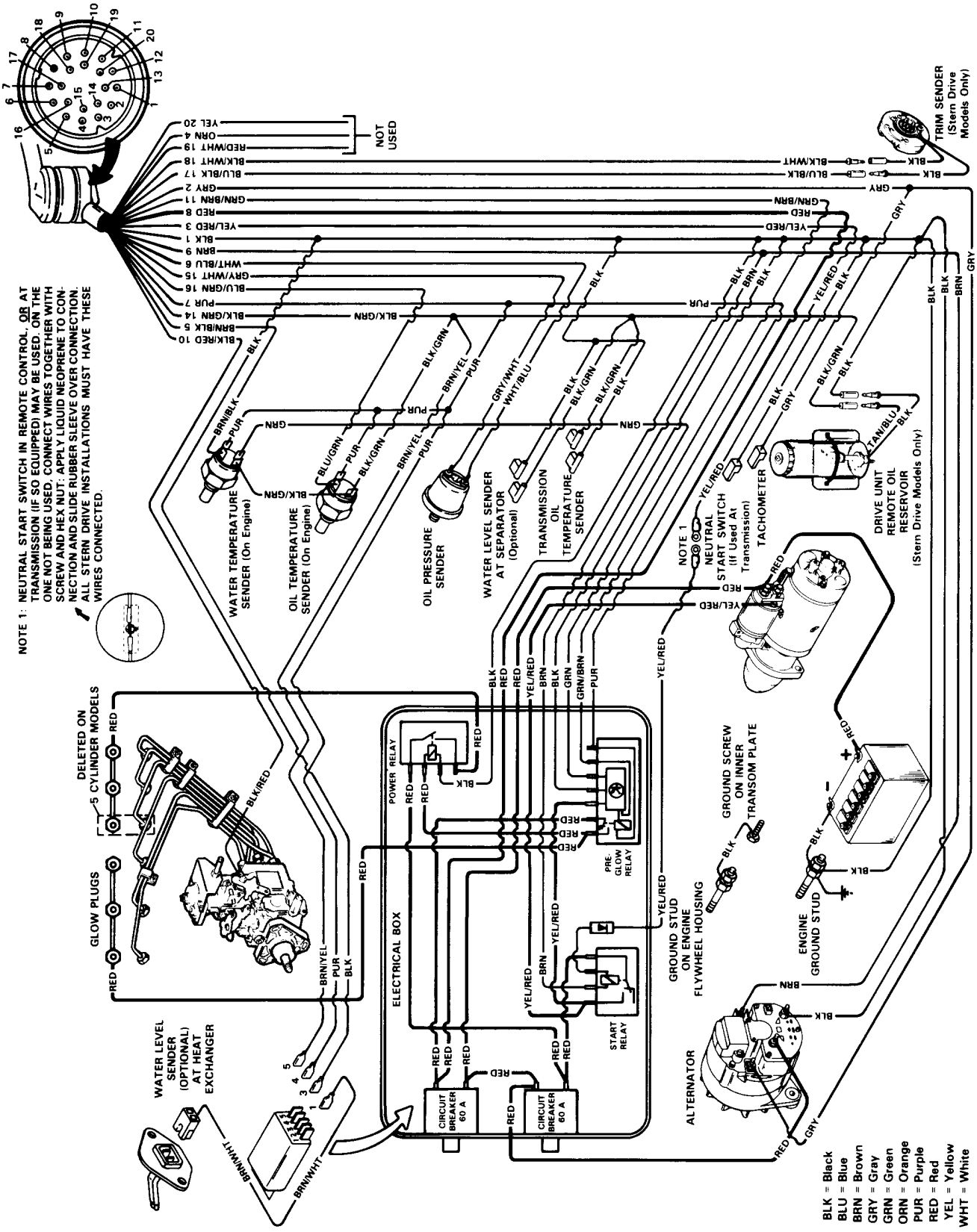
CYLINDER HEAD

Height of Cyl. Head	3.543 + -.002 (90 ± 0.05)
Refacing Head	Max. .0079 (0.20)

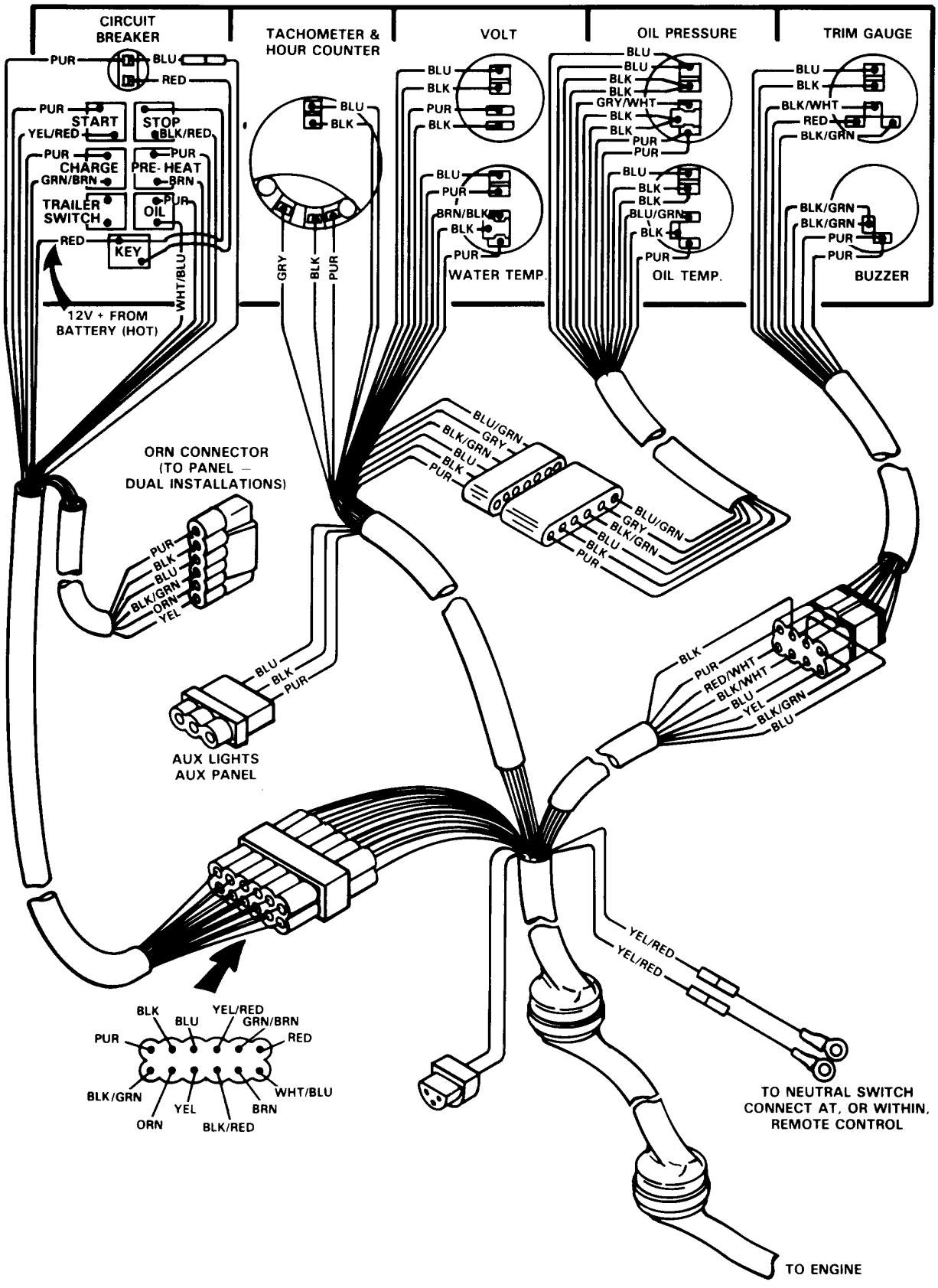
FLYWHEEL

Runout – Face	.004 (0.10)
Runout – Bore	.004 (0.10)

Wiring Diagram
(530 D-TA/636 D-TA Engine)



Wiring Diagram
(Old Style MCM Instrumentation)



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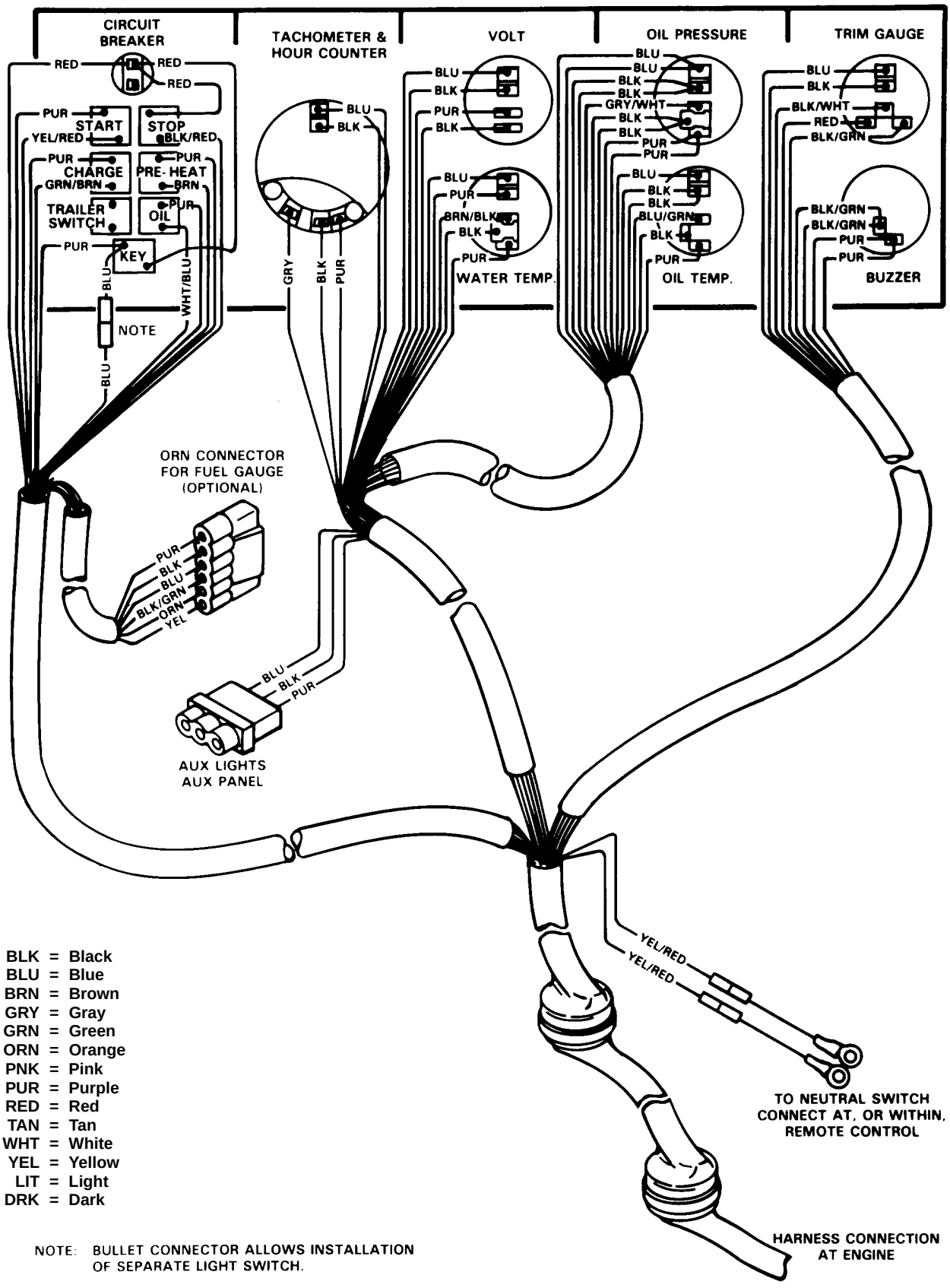
Wiring Diagram
(New Style MCM Instrumentation)



BLK = Black
BLU = Blue
BRN = Brown
GRY = Gray
GRN = Green
ORN = Orange
PNK = Pink
PUR = Purple
RED = Red
TAN = Tan
WHT = White
YEL = Yellow
LIT = Light
DRK = Dark

NOTE: BULLET CONNECTOR ALLOWS INSTALLATION OF SEPARATE LIGHT SWITCH.

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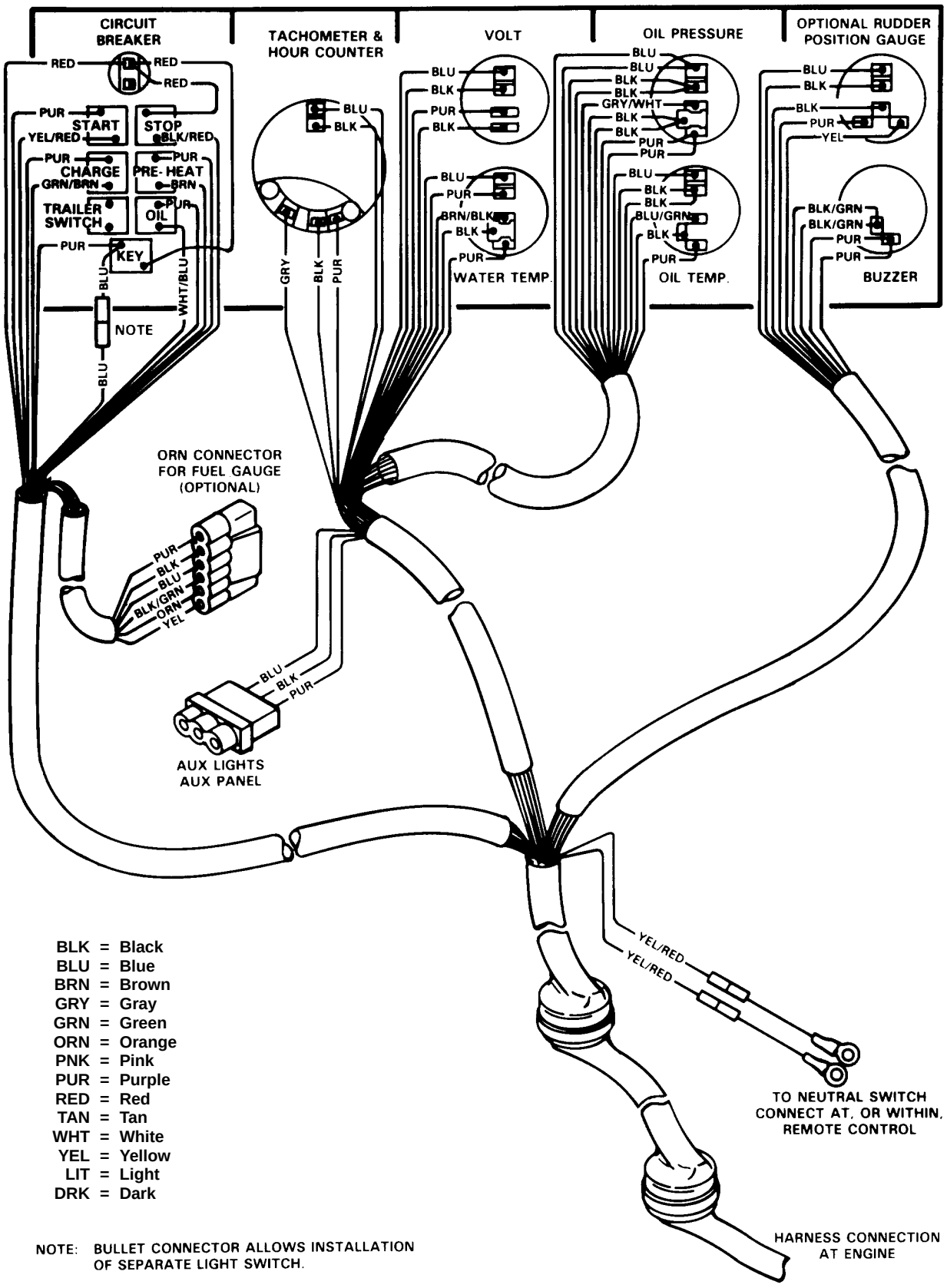
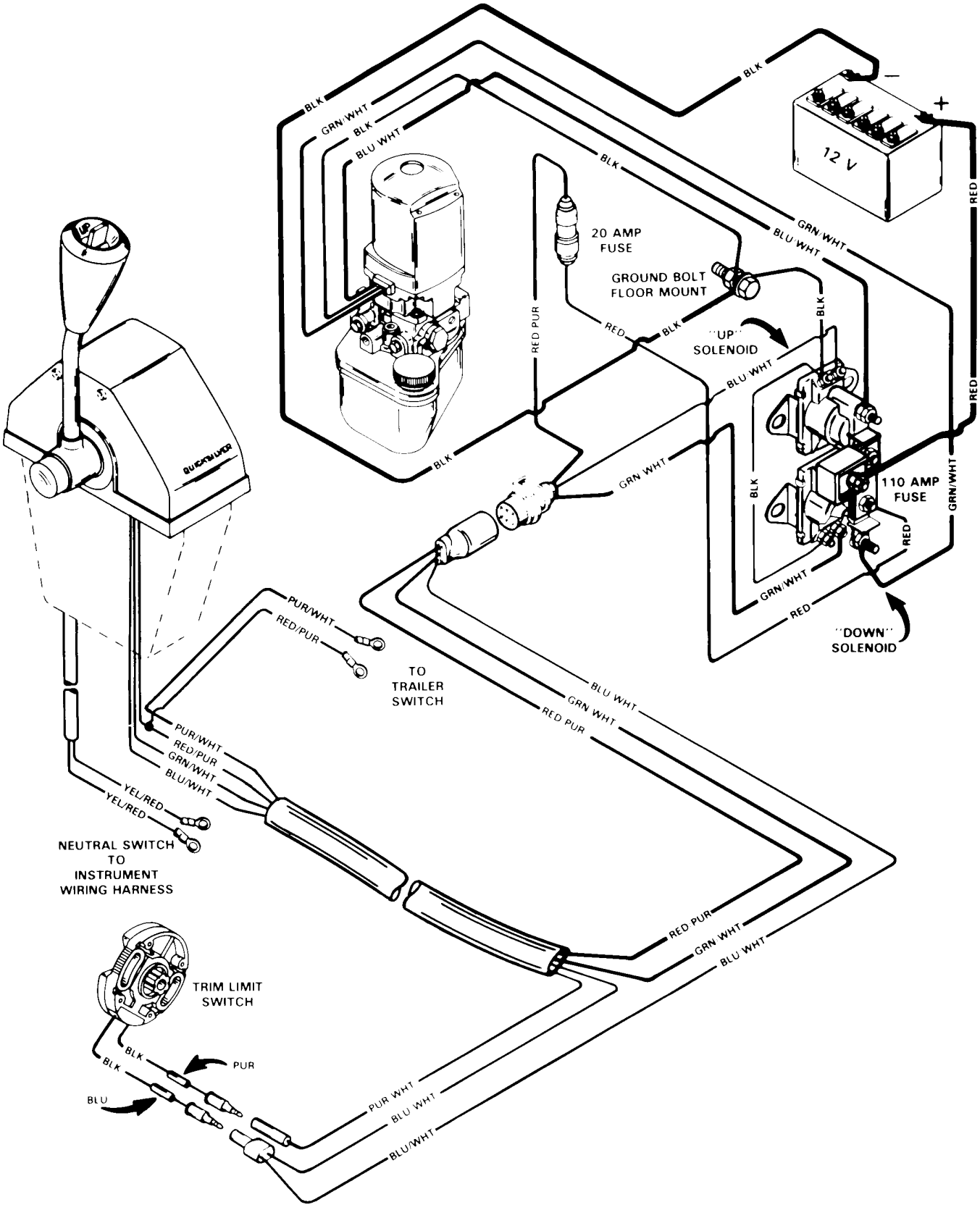
Wiring Diagram
(MIE Instrumentation)



Wiring Diagram
(MCM Power Trim)



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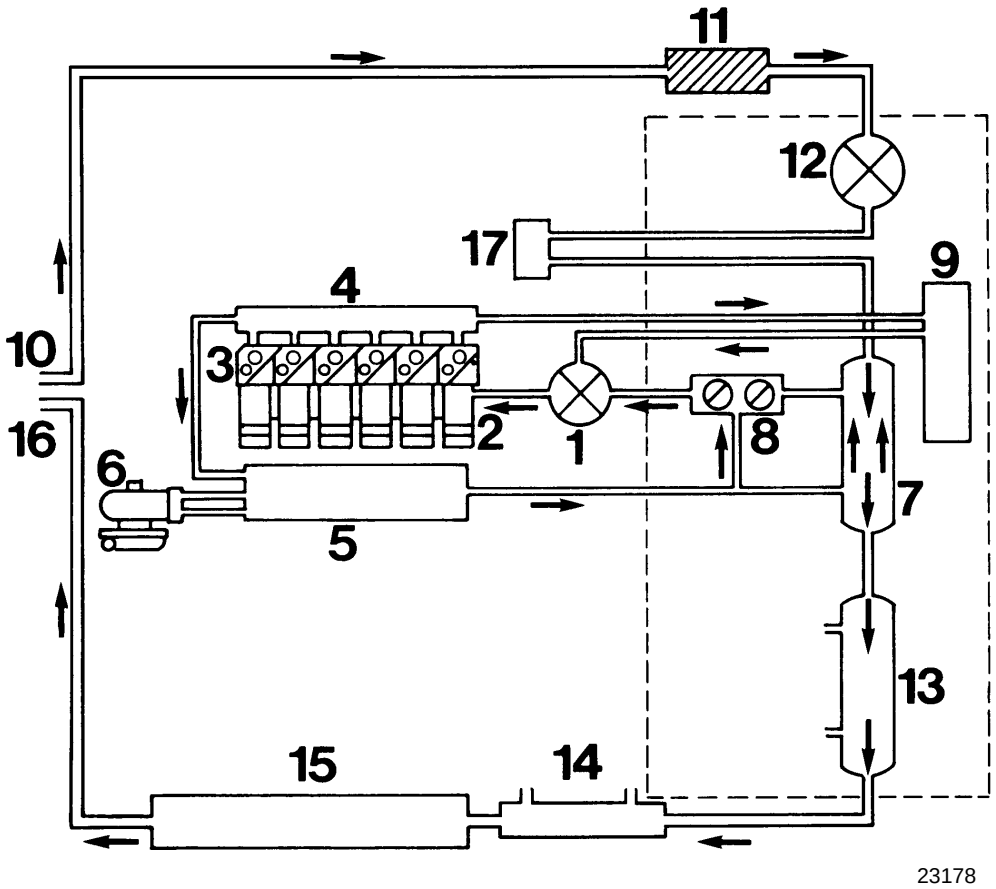
Water Flow Diagram



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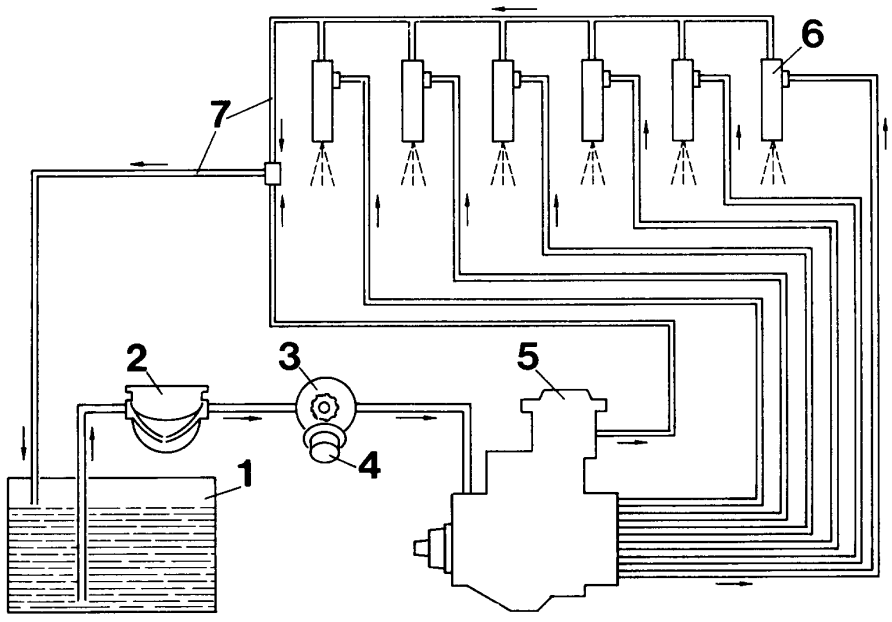
COOLING SYSTEM

1. - Fresh water pump
2. - Engine block (upper section of liners)
3. - Cylinder heads
4. - Water manifold
5. - Exhaust manifold
6. - Exhaust-gas turbine
7. - Heat exchanger
8. - Thermostats
9. - Expansion tank
10. -Seawater inlet
11. -Seawater filter
12. -Seawater pump
13. -Heat exchanger; Water/oil
14. -Power Steering Fluid Cooler
15. -Exhaust pipe (water sleeve)
16. -Seawater outlet
17. -Intercooler

Fuel System Flow Diagram



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FUEL SYSTEM FLOW DIAGRAM

1. - Fuel tank
2. - Fuel pump with hand priming
3. - Fuel filter
4. - Hand primer
5. - Injection pump
6. - Injection nozzle
7. - Fuel return line