

# ***Ditch Witch***<sup>®</sup>



## **8/60JT-RS860**

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For Replacement Copy Order **P/N 053-423**

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This manual contains information concerning the following models:  
**8/60JT Directional Drilling System & RS860 Rock System**

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# IDLER/CHAIN LOCK

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	106-561	1	LOCKNUT (M8-1.25, PRV TRQ,10.9)	
2.	106-345	1	SCREW (M20-2.50 X 50mm)	
3.	110-081	1	CLEVIS PIN (1/4" X 1-1/8")	
4.	115-506	2	KLIP RING (.500")	
5.	125-430	2	BRONZE BUSHING (.502")	
6.	110-575	1	ROD END (5/16-NF,FM)	
7.	184-064	1	TAPERED INSERT (2.000")	
8.	361-578	2	SHIFT PADDLE	
9.	175-726	1	SPROCKET (120A16)	
10.	106-523	2	WASHER (2-1/16")	
11.	115-896	2	EXTERNAL SNAP RING (3.875")	
12.	180-685	1	SHIFT COLLAR	
13.	180-691	1	SPROCKET HUB	
14.	125-808	3	COMPOSITION BUSHING (2.000")	
15.	183-850	1	TAPERED PIN (50.8mm X 370mm)	
16.	183-851	1	PIN (12.7mm X 224mm)	
17.	356-350	1	SHIFT YOKE PIVOT	
18.	356-348	1	IDLER CHAIN LOCK	
19.	106-387	3	FLANGE LOCKNUT (M10-1.50)	
20.	183-871	1	PIN	
21.	361-165	2	WASHER (.515")	
22.	106-559	2	SCREW (M12-1.75 X 25mm)	
23.	106-340	8	SCREW (M16-2 X 50mm)	
24.	106-341	2	SCREW (M16-2.00 X 70mm)	
25.	106-355	12	FLG NUT (M16-2.00, 10.9)	
26.	106-063	1	SCREW (M8-1.25 X 40mm, 10.9)	
27.	357-081	1	ALARM/LIGHT MOUNT	
28.	106-382	2	FLG LOCK SCREW (M10-1.50 X 20mm)	
29.	106-079	3	SCREW (M10-1.5 X 30mm)	
30.	105-526	1	COTTER PIN (3/32" X 1/2")	
31.	151-075	1	CYLINDER (1.1" X .312" X 1.00")	
32.	106-077	2	NUT (M16-2.00, 10.9)	
33.	106-341	2	SCREW (M16-2.00 X 70mm)	FOR ROCK SYSTEM
34.	105-384	1	WASHER (3/4")	

## FOOTNOTES

1. REF NO.'S 2, 7, 15 AND 34 USED IN PLACE OF REF NO.'S 20, 21 AND 22 WITH HOIST OPTION.

# REAR STABILIZER

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	105-273	2	SCREW (M12-1.75 X 30mm)	
2.	105-998	8	SCREW (M16-2.00 X 40mm)	
3.	106-355	12	FLG NUT (M16-2, 10.9)	
4.	115-483	8	KLIP RING (1-1/4")	
5.	118-007	4	INTERNAL SNAP RING (1.250")	
6.	125-771	4	COMPOSITION BUSHING (1.250")	
7.	151-065	2	CYL (2" X 1.25" X 20")	
8.	180-559	2	PULL PIN (1" X 4.625")	
9.	181-982	2	TAPERED INSERT (1.250")	
10.	183-721	2	MOUNT PIN (1.25" X 2.55")	
11.	357-017	2	UPPER STABILIZER TUBE	
12.	357-018	2	LOWER STABILIZER PLATE	
13.	357-019	2	STABILIZER PAD	
14.	357-020	2	REAR STABILIZER MOUNT	
15.	183-863	2	TAPERED PIN (31.7mm X 128mm)	
16.	183-862	2	PAD PIN	
17.	356-297	2	STABILIZER CAP	
18.	106-551	4	CLIP NUT (M8-1.25)	
19.	106-083	4	SCREW (M8-1.25 X 20mm)	
20.	110-128	2	SPRING CLIP PIN (5/32" X 1")	
21.	106-540	4	SCREW (M16-2.00 X 130mm)	

FOOTNOTES

# ROLLER

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	356-451		ROLLER PARTS ASS'Y	INCL REF NO.'S 1-8
1.	106-356	2	FLG NUT (M20-2.50, 10.9)	
2.	110-039	2	MACHINERY BUSHING (1-1/8")	
3.	115-474	2	EXTERNAL SNAP RING (1.125")	
4.	115-509	2	INTERNAL SNAP RING (2.440")	
5.	157-604	2	INTERNAL SEAL (1.181")	
6.	356-506	1	ROLLER SHELL	PACK WITH GREASE
7.	356-505	1	ROLLER SHAFT	
8.	125-089	2	BALL BEARING (1.181")	PACK WITH GREASE

### FOOTNOTES

# HYDRAULIC AND FUEL TANKS

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	110-008	1	FILLER BREATHER (2-1/8")	INCL REF NO. 10
2.	105-214	17	FLG SCREW (#10-24 X 1/2")	
3.	116-218	1	SIGHT GLASS (2")	INCL REF NO. 4
4.	360-849	1	REFLECTOR	
5.	115-320	1	GROMMET (1-1/2")	
6.	356-759	1	HYDRAULIC RESERVOIR	
7.	356-760	1	FUEL TANK	
8.	110-010	1	FUEL CAP (1-1/2")	
9.	110-132	1	FILLER NECK	
10.	165-626	2	FILLER NECK GASKET	
11.	217-510	1	FUEL SENDER	
12.	156-239	2	S/O SHUT-OFF (02N-05H90)	
13.	155-138	1	PLUG (16S)	
14.	106-333	2	SCREW (M12-1.75 X 40mm)	
15.	106-031	2	LOCKNUT (M12-1.75, NLK)	
16.	106-383	4	FLG LOCK SCREW (M10-1.50 X 30mm)	
17.	106-266	4	FLG NUT (M10-1.50)	
18.	106-386	2	FLG LOCKNUT (M8-1.25)	
19.	106-083	2	SCREW (M8-1.25 X 20mm)	
20.	115-915	1	SOUND INSULATION	
21.	115-914	1	SOUND INSULATION	
22.	183-978	2	PIN (9.5mm X 45mm)	
23.	364-213	1	FUEL CAP LOCK STRAP	
24.	364-212	1	HYDRAULIC CAP LOCK STRAP	
25.	105-535	2	ROLL PIN (1/8" X 5/8")	

## FOOTNOTES

# CONSOLE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	357-406		CONTROL CONSOLE ASSEMBLY	SEE FOOTNOTE 1
1.	357-073	1	CONSOLE TOP PANEL	
2.	106-551	6	CLIP NUT (M8-1.25)	
3.	106-162	8	FLG SCREW (M8-1.25 X 20mm)	
4.	357-128	1	CABLE COVER	
5.	110-383	1	KNOB (3/8-NC, BLACK)	
6.	106-349	3	BOLT (#8-32 X 3/4", PAN)	
7.	106-350	3	NUT (#8-32)	
8.	110-333	1	BOLT-ON CLAMP (1")	
9.	106-386	2	FLG LOCKNUT (M8-1.25)	
10.	356-680	1	CONSOLE SUPPORT	
11.	110-212	1	CONDUIT CLAMP (5/16")	
12.	357-074	1	CONSOLE BOTTOM	
13.	110-647	2	HANDLE (3/8-NC, YELLOW)	
14.	106-542	8	SCREW (M5-0.80 X 16mm, PHLPS)	
15.	159-151	2	JOYSTICK (CONTROL LEVER)	INCL REF NO. 16
16.	116-574	2	DUST COVER (CONTROL LEVER)	

### FOOTNOTES

1. INCL REF NO.'S 1, 10, 13, 14, 16, ELECTRONIC COMPONENTS AND HARNESS SHOWN ON PAGE TITLED "ELECTRICAL DIAGRAM-CONSOLE HARNESS" AND ASSOCIATED DECALS AND HARDWARE.

## ENGINE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	195-854	1	AIR FILTER	
2.	195-656	2	MOUNTING CLAMP (6-1/2")	
3.	106-551	4	CLIP NUT (M8-1.25)	
4.	106-162	4	FLG SCREW (M8-1.25 X 20mm)	
5.	195-428	1	DISCHARGE VALVE	
6.	195-690	1	ELEMENT (PRIMARY)	
7.	195-809	1	ELEMENT (SAFETY)	
8.	195-815	2	WING NUT (7/16-NF)	
9.	195-823	1	ACCESS COVER	
10.	116-516	1	AIR INTAKE HOSE	
11.	105-117	2	WASHER (5/16")	
12.	170-093	1	BELT (1/A-50.000")	
13.	105-178	4	BOLT (5/16-NC X 2-1/2", GD8)	
14.	105-091	4	LOCK WASHER (5/16")	
15.	194-721	1	FAN (22")	
16.	195-869	1	FAN SPACER	
17.	194-717	1	EXHAUST SILENCER	
18.	105-876	4	SCREW (M10-1.50 X 35mm)	
19.	106-387	4	FLG LK NUT (M10-1.50)	
20.	196-009	3	U-BOLT CLAMP (2.500")	
21.	196-191	1	EXHAUST PIPE (FRONT)	
22.	196-192	1	EXHAUST PIPE (REAR)	
23.	194-713	1	EXHAUST ADAPTER	
24.	105-053	2	NUT (3/8-NC)	
25.	105-150	3	BOLT (3/8-NC X 1-3/4")	
26.	357-133	1	DEFLECTION PANEL	
27.	356-520	1	AIR BAFFLE	
28.	110-169	2	WORM CLAMP (2.812" TO 3.750")	
29.	105-072	2	LOCK WASHER (3/8")	
30.	357-170	1	BRACKET	
31.	156-228	1	ELBDW (02NF-02NF90)	
32.	155-150	1	S/O COUPLER (02N-02H)	
33.	116-192	AR	BULK HOSE (7/64", SOLD PER 1")	USE 1 @ .-----"
34.	215-150	1	RESTRICTION INDICATOR(20",H2O)	
35.	165-755	1	EXHAUST MUFFLER GASKET	
36.	194-750	1	OIL FILL TUBE	
37.	105-098	1	BOLT (3/8-NC X 3")	
38.	196-185	1	"NS" ENGINE JOHN DEERE	
-	195-873	-	ENGINE OIL FILTER (SPIN-ON)	
-	195-897	-	STARTER	
-	194-718	-	DIPSTICK	
-	194-709	-	OIL FILLER CAP	
-	194-719	-	WATER PUMP	
-	195-890	-	WATER PUMP	
-	165-850	-	GASKET, WATER PUMP	
-	194-720	-	FUEL PUMP	
-	165-786	-	FUEL PUMP GASKET	
-	217-775	-	FUEL SHUT-OFF SOLENOID	
-	217-825	-	STARTER SOLENOID	
-	165-755	4	EXHAUST MUFFLER GASKET	
-	165-769	-	AIR INLET GASKET	
-	159-231	1	FUEL FILTER ELEMENT (SPIN-ON)	
-	194-493	1	PRIMARY FILTER SEDIMENT BOWL	
-	194-814	1	ELBOW FITTING (VALVE COVER)	

## FOOTNOTES

# FUEL LINE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	110-528	4	SNAP-ON CLAMP (.531" TO .593")	
2.	116-108	AR	BULK HOSE (5/16", SOLD PER 1")	USE 11" AND 32"
3.	110-255	1	SEPARATOR CLIP	
4.	156-276	1	FERRULE (05T)	
5.	155-241	1	S/O COUPLER (02N-05H90)	
6.	156-275	1	TUBE CONNECTOR (04H-05T)	
7.	156-277	2	COMPRESSION NUT (05T)	
8.	159-111	1	FUEL FILTER ELEMENT	EARLY STYLE
9.	159-231	1	FUEL FILTER ELEMENT (SPIN-ON)	CURRENT PRODUCTION
10.	194-493	1	PRIMARY FILTER SEDIMENT BOWL	

## FOOTNOTES

# PUMP MOUNTING/NEUTRAL VALVE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	106-333	2	SCREW (M12-1.75 X 40mm)	
2.	157-041	1	O-RING (152 D70)	
3.	105-827	2	FLG LK BOLT (3/8-NC X 1-1/4")	
4.	158-306	1	HYDRAULIC PUMP	
	500-470		SEAL REPAIR KIT	
	158-455	1	HYDRAULIC PUMP	INCL REF NO. 12
	500-966		SEAL REPAIR KIT	
5.	158-888	1	TANDEM HYD PUMP (PISTON)	SEE FOOTNOTE 2
	158-737	1	TANDEM HYD PUMP (PISTON)	INCL REF NO. 12; SEE FOOTNOTE 1
	197-164		REBUILT 158-737	
	500-806	AR	SEAL REPAIR KIT	FOR CHARGE RELIEF
	165-837	1	SHIM	
6.	154-343	2	UNION (06S-060FX90)	
7.	154-221	2	CONNECTOR (06S-060)	
8.	154-220	2	CONNECTOR (040-06S)	
9.	154-226	2	CONNECTOR (040-06S90)	
10.	154-715	2	HOSE (040FX90-18"-3000)	
11.	158-661	2	HYD CONTROL VALVE	USED WITH ROCK SYSTEM
	500-757		SEAL REPAIR KIT	
12.	217-821	2	ELECTRIC DISPLACEMENT CONTROL	
13.	158-390	1	TANDEM HYD PUMP	
	158-447	1	TANDEM HYD PUMP	

FOOTNOTES

- SHAFT END OF PUMP IS FOR RIGHT TRACK AND ROTATION; REAR PUMP IS FOR THE LEFT TRACK AND THRUST.
- FORWARD\_ROT\_1 & BOTH\_THRUST\_RELIEF\_VALVE P/N\_516-025 (3625\_PSI)

NOTE

REFER TO O-RING CHART (800-301) IN BACK OF BOOK FOR REPLACEMENT OF O-RINGS.

# STATIONARY CLAMP HYDRAULICS WITH SEQUENCE VALVE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	154-226	4	CONNECTOR (040-06S90)	
2.	515-305	1	HOSE (040FX90-21"-5000)	
3.	515-340	1	HOSE (040FX90-18"-5000)	
4.	115-777	2	ABRASION SLEEVE (1.59" X 15")	
5.	154-220	2	CONNECTOR (040-06S)	
6.	154-799	2	HOSE (040FX90S-44"-5000)	
7.	154-255	1	UNION (040-040FX90)	
8.	159-192	1	DIVIDER MANIFOLD (DOUBLE)	
	159-237	1	DIVIDER MANIFOLD (SINGLE)	
9.	515-304	1	HOSE (040FX90-15"-5000)	
10.	515-307	2	HOSE (040FX90-19"-5000)	
11.	115-737	1	ABRASION SLEEVE (1.59" X 40")	
12.	154-379	1	UN BR TEE (040FX-040-040)	
13.	158-813	1	FLOW CHECK VALVE (06S-060)	
14.	154-228	1	UNION (060-060FX90)	
15.	154-373	1	REDUCER (040-060F)	
16.	154-265	1	UN RUN TEE (040FX-040-040)	
17.	159-156	1	QDC ADAPTER (02-040F)	
	159-148		DUST CAP (178")	
18.	154-278	6	CONNECTOR (04S-040)	

### FOOTNOTES

NOTE  
REFER TO O-RING CHART (800-301) IN BACK OF THE BOOK FOR REPLACEMENT OF O-RINGS.

# 5-VALVE, MANIFOLD

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	159-190		5-VALVE MANIFOLD ASSEMBLY	INCL. REF. NO.'S 1 THRU 3
1.	158-632	5	SOLENOID VALVE	USE SEAL REPAIR KIT 500-756
2.	110-264	2	EXPANDER PLUG	
3.	159-130	1	MANIFOLD BLOCK	
4.	154-220	8	CONNECTOR (040-06S)	
5.	154-385	2	CONNECTOR (040-06S, ORF)	
6.	154-222	2	CONNECTOR (060-08S)	

FOOTNOTES

## PILOT VALVE CIRCUIT ROCK SYSTEM

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	154-226	3	CONNECTOR (040-06S90)	
2.	154-672	1	HOSE (040FX-15"-3000)	
3.	154-263	3	CONNECTOR (04S-04045)	
4.	159-194	1	CHARGE MANIFOLD	
5.	154-316	2	RUN TEE (04S-040-040)	
6.	515-002	1	HOSE (040FX45-9.5"-3000)	
7.	156-273	2	CONNECTOR (02N-04090)	
8.	154-693	1	HOSE (040FX-44"-3000)	
9.	515-283	1	HOSE (040FX45-62"-3000)	
10.	154-728	1	HOSE (040FX90-36"-3000)	
11.	105-839	2	SCREW (M10-1.5 X 55MM)	
12.	106-387	2	FLG LOCKNUT (M10-1.50)	
13.	155-260	1	BK QDC ADAPTER (02-040)	SEE FOOTNOTE 1
14.	154-702	1	HOSE (040FX-30"-3000)	
15.	154-265	3	UNION RUN TEE (040FX-040-040)	
16.	115-811	2	ABRASION SLEEVE (1.59" X 20")	
17.	159-148	1	DUST CAP (1/8")	
18.	154-220	2	CONNECTOR (040-06S)	
19.	154-401	2	CONNECTOR (04S-04090, ORF)	
20.	154-235	1	CONNECTOR (08S-08090)	
21.	515-210	2	HOSE (040FX90-28"-3000)	
22.	515-002	2	HOSE (040FX45-9.5"-3000)	
23.	158-555	2	SOLENOID CONTROL VALVE	OBSOLETE, NO REPLACEMENT PARTS AVAILABLE
	150-4087	2	SOLENOID CONTROL VALVE	USE REPLACEMENT COIL 217-948, WILL NOT FIT OBS VALVE
24.	105-843	2	SCREW (M6-1.00 X 80MM)	
25.	106-388	14	WASHER (M6)	
26.	106-353	2	FLG NUT (M6-1.00)	
27.	155-133	2	CONNECTOR (04J-04S)	
28.	155-254	2	REDUCER (06S-04SF)	

NOT SHOWN:

FOOTNOTES:

1. USE QDC BODY (02-04NF) 159-146 WITH THIS TEST PORT.

NOTE:

REF TO O-RING CHART (800-301) IN BACK OF THE BOOK FOR REPLACEMENT OF SAP AND ORS O-RINGS.

# HYDRAULIC CYLINDER

## 4.0" ID BARREL X 2.25" OD ROD X 12.0" STROKE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	151-048		CYL (4.0" X 2.25" X 12")	
1.	190-177	1	SEAL REPAIR KIT (4.0" X 2.25")	SEE FOOTNOTE 2
2.	149-303	1	LOCK RING (4")	
3.	150-298	1	CYLINDER BARREL (4")	
4.	106-146	1	BOLT (1-1/8-NC X 2-1/2", GD8)	SEE FOOTNOTE 1
5.	106-147	1	WASHER (1-1/8")	
6.	150-993	1	CYLINDER PISTON (4" X 2.25")	INCL MOLDED-ON WEAR RING
7.	150-757	1	CYLINDER HEAD (4.0 X 2.25)	
8.	150-430	1	CYLINDER ROD	

NOT SHOWN:

	259-040		U-SEAL INSTALLER (1.5" - UP)	
	259-240		WIPER/SEAL INSTALLER (2.25")	
	259-246		PISTON SEAL INSTALLER (4")	
	259-247		PISTON INSTALLER (4")	
	259-188		CYL HEAD SPANNER - TWO PIN	

FOOTNOTES

- USE LOCTITE 277, TORQUE TO 770-850 FT-LBS (1045-1150 N.M)
- REF. TO 051-013 INSTALLATION DIAGRAM

# DUMP VALVE HYDRAULICS

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	159-348	1	DUMP MANIFOLD	BEGINS WITH S/N
2.	154-246	2	CONNECTOR (06S-080)	
3.	154-674	2	HOSE (080FX-24"-3000)	
4.	154-322	1	CONNECTOR (080-10S90)	
5.	154-253	1	CONNECTOR (06S-08090)	
6.	155-189	1	REDUCER ((16S-16NF)	
7.	115-276	1	REDUCER (16N-08NF)	
8.	116-080	AR	BULK HOSE (1-1/4", SOLD PER 1")	USE 1 @ 24"
9.	155-149	2	S/O COUPLER (16S-20H90)	
10.	154-266	1	UN RUN TEE (080FX-080-080)	
11.	154-272	1	REDUCER NUT (080F)	
12.	154-248	1	REDUCER (040-080F)	
13.	154-702	1	HOSE (040FX-30"-3000)	
14.	155-260	1	BK QDC ADAPTER (02-040)	USE P/N 159-146 (QDC BODY) WITH THIS TEST PORT
15.	106-330	2	SCREW (M8-1.25 X 70mm)	
16.	106-386	2	FLG LOCKNUT (M8-1.25)	
17.	159-148	1	DUST CAP (1/8")	
18.	154-221	2	CONNECTOR (06S-060)	

FOOTNOTES

NOTE  
REFER TO O-RING CHART (800-301) IN BACK OF THE BOOK FOR REPLACEMENT OF O-RINGS

# CASE DRAIN MANIFOLD HYDRAULICS

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	159-170	1	HYD MANIFOLD	
2.	155-146	1	S/O COUPLER (12S-16H90)	
3.	116-460	AR	HOSE (1", SOLD PER 1')	USE 1 @ 71"
4.	110-353	2	WORM CLAMP (3/4" TO 1-1/2")	
5.	154-418	1	UNION (08S-080FX90)	
6.	154-234	1	CONNECTOR (080-12S)	
7.	154-235	2	CONNECTOR (08S-08090)	
8.	154-381	2	PLUG (08S)	
9.	154-256	2	UNION (080-080FX90)	
10.	154-279	2	CONNECTOR (080-10S)	
11.	154-716	1	HOSE (080FX90-48"-3000)	
12.	515-003	1	HOSE (080FX90-31"-3000)	
13.	105-883	1	FLG LOCK BOLT (3/8-NC X 2")	
14.	356-295	1	SPACER MOUNT	
15.	106-331	1	SCREW (M10-1.50 X 50mm)	

### FOOTNOTES

NOTE  
REFER TO O-RING CHART (800-301) IN BACK OF THE BOOK FOR REPLACEMENT OF O-RINGS

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# HYDRAULIC MOTOR

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	158-739		HYDRAULIC MOTOR	INCL REF NO.'S 1 THRU 4; SEE FOOTNOTE 1
1.	157-625	1	INTERNAL SEAL	
2.	157-097	1	O-RING	
3.	500-804	1	SHAFT	
4.	500-805	1	GASKET	

### FOOTNOTES

1. USED ON BOTH THRUST AND ROTATION DRIVE.

# HYDRAULIC MOTOR TAPERED KEYED SHAFT 1-1/4"

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	155-579		HYDRAULIC MOTOR	INCL REF NO.'S 1 THRU 6, SEE FOOTNOTES 1 AND 4
	155-580		HYDRAULIC MOTOR	INCL REF NO.'S 1 THRU 5, SEE FOOTNOTES 2 AND 3
	153-280		HYDRAULIC MOTOR	INCL REF NO.'S 1 THRU 5, SEE FOOTNOTE 2
1.	500-347	1	SEAL REPAIR KIT	INCL REF NO.'S 2 AND 3, SEE FOOTNOTE 4
2.	155-771	3	O-RING (011 D70)	
3.	155-760	1	O-RING (904 D90)	
4.	165-915	1	KEY (5/16" X 1")	
5.	105-418	1	LOCKNUT (1-20 NEF)	
6.	105-501	1	COTTER PIN (1/8" X 2")	

NOT SHOWN:

FOOTNOTES:

1. USED ON ROTO WITCH II BORING UNITS.
2. USED ON ROTO WITCH III AND IV BORING UNITS.
3. SHAFT AND BEARING KIT- 500-1469
4. USE SEAL KIT 500-347 FOR MOTOR VERSION 002, 003, 004 & 005. SEAL KIT 500-658 IS TO BE USED WITH VERSION 006 MOTORS.

NOTE:

# HYDRAULIC CYLINDER

## 2" X 1.25" X 20"

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	151-065		CYL (2.0" X 1.25" X 20")	INCL REF NO.'S 1 THRU 7
1.	190-169	1	SEAL REPAIR KIT (2" x1.25")	
2.	150-778	1	LOCK RING (2")	
3.	152-011	1	CYLINDER BARREL (2")	
4.	106-097	1	FLG BOLT (5/8-NC X 1-3/4", GD8)	SEE FOOTNOTE 1
5.	150-771	1	CYLINDER PISTON (2.0" X 1.25")	INCL MOLDED-ON WEAR RING
6.	150-770	1	CYLINDER HEAD (2.0" X 1.25")	
7.	150-439	1	CYLINDER ROD	

NOT SHOWN:

259-100	U-SEAL INSTALLER (1" - 1.499")
259-236	WIPER INSTALLER (1.25")
259-239	WIPER/SEAL INSTALLER (2")
259-241	PISTON INSTALLER (2")
259-188	CYL HEAD SPANNER - TWO PIN

FOOTNOTES

1. LUBRICATE WITH WD-40 OR EQUAL; TORQUE TO 180-200 FT LBS (245-270 N.M)

# **ELECTRICAL**

# ELECTRICAL STRIKE CONTROL MODULE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	106-378	3	FLG LK SCREW (M6-1.00 X 12MM)	
2.	106-538	3	PRVLG TRQ HX LOCKNUT (M6-1.00)	
3.	362-620	1	LIGHT COVER	
4.	217-041	1	STROBE LIGHT	
5.	105-185	3	SCREW (#10-24 X 1/2, RH SLT)	
6.	363-089	1	LIGHT BASE	
7.	106-048	3	LOCKNUT (#10-24)	
8.	214-218	1	ESS POWER HARNESS	
9.	110-254	1	PULL PIN (5/16" X 2-5/8")	
10.	106-670	4	NUTSERT (M6-1.00)	
11.	214-429	1	CONTROL MODULE	
12.	106-640	4	SCREW (M6-1.00 X 20MM, SOC BUT)	
13.	106-386	2	FLG LOCKNUT (M8-1.25)	
14.	306-602	1	BACKUP ALARM	
15.	357-863	1	ESS STAND	
16.	106-330	2	BOLT (M8-1.25 X 70MM)	
17.	217-017	1	FEMALE CONNECTOR (4-WAY)	
18.	105-836	2	FLG LK BOLT (1/4-NC X 1/2")	
19.	105-832	2	FLG LOCKNUT (1/4-NC)	
20.	354-754	1	SUPPORT BAT	

FOOTNOTES



# ELECTRICAL DIAGRAM

## HOIST HARNESS

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	214-013	1	HOIST HARNESS	
2.	356-637	1	HOIST (WINCH)	
3.	214-454	1	HOIST/FRAME CABLE (368 LG)	

FOOTNOTES

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# ELECTRICAL SCHEMATIC

## 860JT

CKT NO.	WIRE COLOR	FUNCTION	REMARKS
90	YEL/GRN	ROTATION/RIGHT TRACK JOYSTICK TO SOLENOID AND RELAY MODULE	
91	YEL/BRN	ROTATION/RIGHT TRACK JOYSTICK TO SOLENOID AND RELAY MODULE	
92	LT BLU/GRN	THRUST/LEFT TRACK JOYSTICK TO SOLENOID	
93	LT BLU/BRN	THRUST/LEFT TRACK JOYSTICK TO SOLENOID	
94	ORG/YEL	VALVE CONTROLLER TO FUSE BLOCK	
94A	ORG/YEL	FUSE BLOCK TO HOIST SWING VALVE	
95	BLU	JMPR BET LATCH RELEASE RLY AND SPNDL LK LATCH RLY	
96	BLU	HYD ENABLE RELAY TO VALVE CONTROLLER	
97	TAN/LT GRN	HOIST SWING SWITCH LEFT TO HOIST SWING LEFT RELAY	
98	TAN/LT BLU	HORN SWITCH TO HORN	
99	ORG/BLU	IGNITION CIRCUIT TO ENGINE KILL RELAY	
100	TAN/LT BLU	FLUID FLOW DISPLAY TO UMBILICAL CONNECTOR	
100A	PUR	UMBILICAL CABLE FLUID FLOW DISPLAY CIRCUIT	
101	LT BLU/ORG	SPINDLE LOCK LATCH RELAY TO SPINDLE LOCK VALVE	
102	RED	FUSED BATTERY TO HOIST	
103	RED/WHT	DIODE TO BORE ENABLE RELAY #1	
104	BLK/YEL	DIODE CATHODES TO LIGHT TEST RELAY	
105	BLU	JMPR BET TEMP FUEL RLY & TEMP LIGHT TEST RLY	
106	GRA	HYDRAULIC FILTER LIGHT CIRCUIT	
107	PUR/ORG	DELAY MODULE TO DIVERSION VALVE	
108	WHT/ORG	RELAY MODULE TO RIGHT NEUTRAL CENTERING VALVE	
109	WHT/BRN	RELAY MODULE TO LEFT NEUTRAL CENTERING VALVE	

# PIPE GRABBER

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	357-259		PIPE GRABBER ASSEMBLY	INCL REF NO.S 1 THRU 10
	359-145		PIPE GRABBER ASSEMBLY	USED ON ROCK SYSTEM, SEE FOOTNOTE 1
1.	356-400	1	GRABBER BODY	
2.	356-418	2	SIDE STRUT	
3.	356-421	4	TOGGLE LINK	
4.	356-422	1	GRABBER FINGER	
5.	356-425	1	UPPER LINK	
6.	110-289	1	ANCHOR SHACKLE (5/16")	
7.	110-679	1	GRIP (1/4" X 3/4, BLACK)	
8.	106-537	1	SHLD BLT (M6 X 40MM, M5-0.80)	
9.	106-536	6	SHLD BLT (M8 X 20MM, M6-1.00)	
10.	106-538	7	LOCKNUT (M6-1.00, PRV TRQ, 10.9)	

### FOOTNOTES

1. NO SERVICEABLE PARTS

# DRILL PIPE CENTER SUPPORT

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
	190-571		DRILL PIPE CENTER SUPPORT KIT	INCL REF NO.'S 1-20 & INSTALLATION INSTRUCTIONS
1.	357-410	1	CENTER SUPPORT ARM	
2.	106-739	6	SHLD BOLT (M12 X 20MM,M10-1.50)	
3.	184-561	8	BUSHING	
4.	125-030	4	BALL BEARING (.669")	
5.	105-522	8	ROLL PIN (3/16" X 3/4")	
6.	183-973	2	PIN (12.7MM X 57MM)	
7.	115-506	10	KLIP RING (.500")	
8.	183-969	1	PIN	
9.	125-465	12	BRONZE BUSHING	
10.	357-415	4	LINK MOUNT	
11.	357-416	2	ARM MOUNT	
12.	183-974	2	PIN	
13.	357-441	2	LINK BAR	
14.	125-461	4	FLG BRONZE BUSHING (.500")	
15.	357-417	2	LINK BAR	
16.	184-560	2	SPACER	
17.	357-414	2	HANDLE PLATE	
18.	106-381	2	FLG LK SCREW (M8-1.25 X 25MM)	
19.	357-412	1	CENTER SUPPORT HANDLE	
20.	106-389	AR	WASHER (M8)	

NOT SHOWN:

FOOTNOTES:

NOTE:

# SAVER SUB - 860JT

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	106-005	2	SCREW (M8-1.25 X 16MM, SOC)	USE "LOCKTITE 242" OR EQUIVALENT
2.	359-343	1	SPINDLE SHAFT (1.81" FM API, DS)	
3.	357-227	1	SAVER SUB (1.81" M X FM-API, DS)	
	357-249	1	SAVER SUB (1.81" X2.06"-API, DS)	

NOT SHOWN:

FOOTNOTES:

- 357-249 SAVER SUB AND MATING DRILL PIPE 358-880 AND 357-244 ARE NOT COMPATABLE WITH OLD STYLE "INTERNAL " CHECK VLAVE MACHANISM

NOTE:



# PIPE LOADER ARM ROCK SYSTEM

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	106-389	16	WASHER (M8)	
2.	106-729	2	SHLD BLT(M12 X 45MM, M10-1.50)	
3.	106-329	8	SCREW (M8-1.25 X 50MM)	
4.	362-842	2	LOADER GUARD - LEFT	
5.	106-397	2	WASHER (M12, HARDENED)	
6.	357-832	8	JAW INSERT - UHMW	
7.	106-469	4	FLG SCREW (M12-1.75 X 30MM)	
8.	106-354	2	FLG NUT (M12-1.75)	
9.	106-561	10	LOCKNUT (M8-1.25, PRV TRQ, 10.9)	
10.	105-894	2	LOCKNUT (M10-1.50, PRV TRQ, 10.9)	
11.	106-538	6	LOCKNUT (M6-1.00, PRV TRQ, 10.9)	
12.	106-333	2	SCREW (M12-1.75 X 40 MM)	
13.	502-651	4	SCREW (M6-1.00 X 35MM)	
14.	357-800	2	LOADER ARM	
15.	151-075	2	CYL (1.1" X .312" X 1.00")	
16.	105-115	2	JAM NUT (5/16-NF)	
17.	110-575	2	ROD END (5/16-NF,FM)	
18.	362-843	2	LOADER GUARD - RIGHT	
19.	116-556	2	CYLINDER COVER	
20.	357-449	2	BAR	
21.	106-570	2	SCREW (M8-1.25 X 60MM)	
22.	106-093	2	SCREW (M6-1.00 X 45MM)	
23.	105-095	4	WASHER (1/4")	
24.	357-829	1	BRACKET	USE ON LOWER ARM
25.	106-079	2	SCREW (M10-1.50 X 30MM)	USE ON LOWER ARM
26.	106-387	4	FLG LOCKNUT (M10-1.50)	USE ON LOWER ARM
27.	106-331	1	SCREW (M10-1.50 X 50MM)	USE ON LOWER ARM

FOOTNOTES

# OIL FILTER HYDRAULICS ROCK SYSTEM

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	155-280	1	BR TEE (20S-16H90-06SF-06SF-06SF)	
2.	154-253	1	CONNECTOR (06S-08090)	
3.	515-014	1	HOSE (08DFX-348"-3000)	
4.	105-825	2	FLANGE LOCK SCREW (3/8-NC X 3/4")	
5.	110-353	6	WORM CLAMP (3/4" TO 1-1/2")	
6.	116-080	AR	BULK HOSE (1-1/4", SOLD PER 1")	USE 1 @ 16"
7.	154-682	1	HOSE (04DFX-17"-3000)	LPT2
8.	154-226	1	CONNECTOR (040-06S90)	
9.	154-278	1	CONNECTOR (04S-040)	
10.	116-460	AR	BULK HOSE (1", SOLD PER 1')	USE 1 @ 80"
11.	159-081	1	HYDRAULIC OIL FILTER (20SF-20SF)	INCL REF NO'S 16 AND 17
12.	155-279	1	S/O RUN TEE (20S-20H-20H)	
13.	116-080	AR	BULK HOSE (1-1/4", SOLD PER 1")	USE 1 @ 23"
14.	155-168	1	S/O COUPLER (120S-20H90)	
15.	156-731	1	S/O TEE (16S-20H-08SF-04SF-04SF)	
16.	159-079	1	FILTER ELEMENT (1-1/2-UNF)	
17.	217-765	1	INDICATOR SWITCH	

FOOTNOTES

NOTE:

REF TO O-RING CHART (800-301) IN BACK OF THE BOOK FOR REPLACEMENT OF SAE AND ORS O-RINGS.

# HOIST HYDRAULICS NEW STYLE

REF NO.	PART NUMBER	QTY	DESCRIPTION	REMARKS
1.	154-252	4	CONNECTOR (04S-04090)	
2.	115-776	1	ABRASION SLEEVE (1.59" X 7")	
3.	154-702	2	HOSE (040FX-30"-3000)	
4.	154-364	2	CONNECTOR (040-06S90 ORF)	
5.	154-668	2	HOSE (040FX-32"-3000)	
6.	515-289	1	HOSE (060FX-7.5"-3000)	
7.	154-221	2	CONNECTOR (06S-060)	
8.	154-228	3	UNION (060-060FX90)	
9.	154-342	1	CONNECTOR (06S-06090)	
10.	154-365	1	CONNECTOR (02N-040)	
11.	156-273	1	CONNECTOR (02N-04090)	
12.	154-816	2	HOSE (060FX-120"-3000)	
13.	115-713	1	ABRASION SLEEVE (1.59" X 24")	
14.	515-290	1	HOSE (060FX-6.5-3000)	
15.	154-783	1	HOSE (040FX-24-3000)	
16.	115-811	1	ABRASION SLEEVE (1.59" X 20")	
17.	159-191	1	3-VALVE MANIFOLD	
18.	115-754	2	ABRASION SLEEVE (1.59" X 30")	
19.	154-652	1	HOSE (040FX-20"-3000)	
20.	159-230	1	SHIFT MANIFOLD	
21.	155-125	2	PLUG (04S)	
22.	154-345	1	RUN TEE (06S-060-060)	
23.	154-263	2	CONNECTOR (04S-04045)	
24.	154-401	2	CONNECTOR (04S-04090, ORF)	(ORIFICED TO .032")
25.	155-254	2	REDUCER (06S-045F)	
26.	154-344	1	UN RUN TEE (060FX-060-060)	
27.	154-255	1	UNION (040-040FX90)	
28.	106-386	2	FLG LOCKNUT (M8-1.25)	
29.	106-160	2	FLG LK SCREW (M8-1.25 X 120MM)	
30.	106-382	1	FLG. LK. SCREW (M10-1.5 X 20MM)	
31.	106-383	1	FLG. LK. SCREW (M10-1.5 X 30MM)	
32.	115-777	1	ABRASION SLEEVE (1.59" X 15")	(FOR ELECTRICAL WIRING)

FOOTNOTES

NOTE:  
REF TO O-RING CHART (800-301) IN BACK OF THE BOOK FOR REPLACEMENT OF O-RINGS.

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