RIG 108

Engine Inspection

NAME Broken Arrow

Work Order No.

JOB TITLE Mechanic

DATE MAINTENANCE STARTED: 11/25/2018 **COMPLETED** 11/25/2018

EQUIPMENT DESCRIPTION: 3512C GENSETS w/ KATO 1205 KW GENERATORS

SERIAL NUMBER:

Travel Time to Rig 2 **FROM:** ☑ HOME ☐ SHOP

Time from Rig 2 **FROM:** ☑ HOME ☐ SHOP

Time at Rig:

ASSET # :

#1 Engine 22-787

#1 Gen. 24-409

#2 Engine 22-786

#2 Gen. 24-408

#3 Engine 22-788

#3 Gen. 24-410

Other _____ engine
Asset # Position

_____ gen
Asset # Position

Other _____ engine
Asset # Position

_____ gen
Asset # Position

Other _____ engine
Asset # Position

_____ gen
Asset # Position

Other _____ engine
Asset # Position

_____ gen
Asset # Position

ACTON ITEMS

Scheduled Engine Inspections

Rig: 108

Date: 11/25/2018

Antifreeze: ☑ Red ☐ Green

Freeze point:

If antifreeze is green test the NA-Cool level

Engine Position:	1
Make:	CAT
Model:	3512
Serial Number:	LLA00113
Asset Number:	22-787
Hours:	46311

For 3512's: Radiator pass -50

Aftercooler pass -45

- ☐ Tighten pan bolts on D-379, 398, 399.
- ☑ Ensure D-3508 and D-3512 individual gauge panels has been silicone to prevent water entry.
- ☑ Clean water passages on water cooled turbos (one time only).
- ☑ Run overhead valvetrain.
- ☑ Grease fan hub bearings and idler bearings.
- ☑ Inspect and clean radiators. Note: Wash in oppisite direction of air flow. (You should be able to see clearly through the radiators fins.)
- ☑ Test shutdown system and install new belts.
- ☑ Check and clean auxiliary oil filter.
- ☑ Make sure crank case filters are being serviced (on 3508,3512).

Record belt #'s, radiator fan brg.,idler brg., shaft size, and pulley sizes.

Generator position:	1	Torque converter	
Make:	KATO	Oiler chain	
Model:	aa27673008	Clutch size	
Asset Number:	24-409	Hrs since last P.M.	
KW:	1204	RPM:	

2-BRG

Review service procedures for engines with rig personell.

- ☑ Grease and inspect for wear.
- ☑ Clean generator and blow out if necessary.

Check and Grease Drive Couplings, Plug and Remove all Grease Fittings, Install New Rubbers and O-Ring Yearly!!!, (3)7L-5589 Rubber, (1) 9H846 O-Ring, (3) Tubes 5N5561 Compound Rubber Coupling,

Comments:

everything looked good

Scheduled Engine Inspections

Rig: 108

Date: 11/25/2018

Antifreeze: ☑ Red ☐ Green

Freeze point:

If antifreeze is green test the NA-Cool level

Engine Position:	2
Make:	CAT
Model:	3512
Serial Number:	LLA00116
Asset Number:	22-786
Hours:	47487

For 3512's: Radiator pass -40

Aftercooler pass -38

- ☐ Tighten pan bolts on D-379, 398, 399.
- ☑ Ensure D-3508 and D-3512 individual gauge panels has been silicone to prevent water entry.
- ☑ Clean water passages on water cooled turbos (one time only).
- ☑ Run overhead valvetrain.
- ☑ Grease fan hub bearings and idler bearings.
- ☑ Inspect and clean radiators. Note: Wash in oppisite direction of air flow. (You should be able to see clearly through the radiators fins.)
- ☑ Test shutdown system and install new belts.
- ☑ Check and clean auxiliary oil filter.
- ☑ Make sure crank case filters are being serviced (on 3508,3512).

Record belt #'s, radiator fan brg.,idler brg., shaft size, and pulley sizes.

Generator position:	2	Torque converter	
Make:	KATO	Oiler chain	
Model:	AA27673008	Clutch size	
Asset Number:	24-408	Hrs since last P.M.	
KW:	1204	RPM:	

2-BRG

Review service procedures for engines with rig personell.

- ☑ Grease and inspect for wear.
- ☑ Clean generator and blow out if necessary.

Check and Grease Drive Couplings, Plug and Remove all Grease Fittings, Install New Rubbers and O-Ring Yearly!!!, (3)7L-5589 Rubber, (1) 9H846 O-Ring, (3) Tubes 5N5561 Compound Rubber Coupling,

Comments:

Scheduled Engine Inspections

Rig: 108

Date: 11/25/2018

Antifreeze: ☑ Red ☐ Green

Freeze point:

If antifreeze is green test the NA-Cool level

Engine Position:	3
Make:	CAT
Model:	3512
Serial Number:	LLA00115
Asset Number:	22-788
Hours:	47616

For 3512's: Radiator pass -38

Aftercooler pass -40

- ☐ Tighten pan bolts on D-379, 398, 399.
- ☑ Ensure D-3508 and D-3512 individual gauge panels has been silicone to prevent water entry.
- ☑ Clean water passages on water cooled turbos (one time only).
- ☑ Run overhead valvetrain.
- ☑ Grease fan hub bearings and idler bearings.
- ☑ Inspect and clean radiators. Note: Wash in oppisite direction of air flow. (You should be able to see clearly through the radiators fins.)
- ☑ Test shutdown system and install new belts.
- ☑ Check and clean auxiliary oil filter.
- ☑ Make sure crank case filters are being serviced (on 3508,3512).

Record belt #'s, radiator fan brg.,idler brg., shaft size, and pulley sizes.

Generator position:	3	Torque converter	
Make:	KATO	Oiler chain	
Model:	AA27673008	Clutch size	
Asset Number:	24-410	Hrs since last P.M.	
KW:	1204	RPM:	

2-BRG

Review service procedures for engines with rig personell.

- ☑ Grease and inspect for wear.
- ☑ Clean generator and blow out if necessary.

Check and Grease Drive Couplings, Plug and Remove all Grease Fittings, Install New Rubbers and O-Ring Yearly!!!, (3)7L-5589 Rubber, (1) 9H846 O-Ring, (3) Tubes 5N5561 Compound Rubber Coupling,

Comments:

everything looked good

☐ [illegible] ☐ [illegible] ☐ [illegible] to see clearly through the radiators fins.)

ROTARY SCREW AIR COMPRESSOR MAINTENANCE CHART

Rig #	108	Oil Type	PAO-46

MODEL#	50DGF-TE	SERIAL#	05G068	ASSET#	2-368
HRS	52132	W/O#		DATE	11/25/2018
COMPANY	UNIT DRILLING	TECHNICIAN	RANDALL RAINS		

Description of work and parts used

NO	FLUSHED OIL SYSTEM
YES	CHANGED OIL
YES	CHANGED OIL FILTER
YES	CHANGED AIR FILTER
YES	CHANGED SEPERATOR
YES	CLEANED RADIATOR
NO	ADDED NEW OIL SAMPLE VALVE

everything looked good

ROTARY SCREW AIR COMPRESSOR MAINTENANCE CHART

Rig #	108	Oil Type	PAO-46

MODEL#	50DGF-TE	SERIAL#	05L069	ASSET#	2-376
HRS	4165	W/O#		DATE	11/25/2018
COMPANY	UNIT DRILLING	TECHNICIAN	RANDALL RAINS		

Description of work and parts used

NO	FLUSHED OIL SYSTEM
YES	CHANGED OIL
YES	CHANGED OIL FILTER
YES	CHANGED AIR FILTER
YES	CHANGED SEPERATOR
YES	CLEANED RADIATOR
NO	ADDED NEW OIL SAMPLE VALVE

everything looks good

RIG **108**

Pump Inspection

NAME CASPER INSPECTION TEAM

JOB TITLE: **mechanics** **Work Order No.**

DATE MAINTENANCE STARTED: 11/25/2018 **COMPLETED:** 11/25/2018

EQUIPMENT DESCRIPTION:

SERIAL NUMBER:

#1 Asset 38-284
Make
Model 1600

#2 Asset 38-282
Make
Model 1600

#3 Asset
Make
Model

Travel Time to Rig 1hr From: ☐ HOME ☐ SHOP

Time at Rig: 12hrs

Travel Time from Rig 1hr To: ☐ HOME ☐ SHOP

ACTON ITEMS

Individual Pump Inspections

Company/Division:		**Asset #**	38-284
Rig:	**108**		
Pump#:1			
Field Inspection Report -	**Make:**	**Model:**	1600
Recommended Running Clearances	Inches		

	Min.	Max.	Actual
Crosshead to slide - Left	.030	.045	0.035
Crosshead to slide - Center	.030	.045	0.035
Crosshead to slide - Right	.030	.045	0.035
Main Bearing - Left	.005	.020	0.012
Main Bearing - Right	.005	.020	0.007
Pinion Shaft Bearing - Left	.002	.015	0.006
Pinion Shaft Bearing - Right	.002	.015	0.007
Crosshead Pin Bearing - Left	.002	.005	0.003
Crosshead Pin Bearing - Center	.002	.005	0.002
Crosshead Pin Bearing - Right	.002	.005	0.003
Connecting Rod to Eccentric Bearing - LH	.002	.020	0.006
Connecting Rod to Eccentric Bearing - CTN	.002	.020	0.008
Connecting Rod to Eccentric Bearing - RH	.002	.020	0.005
Oil Pump Pinion to Main Gear - Backlash	.010	.025	0.018
Pinion Shaft to Main Gear - Backlash	.010	.050	0.036
Bull Gear Wear			good
Pinion Gear Wear			good
Extension Rods			good

Comments:

General	
Check all oil lines	☑
Check all tied Bolts	☑
Drain & check Cleanouts	☑
Check and clean, gear end with diesel if needed	☐
Pony Rod Alignment	☐
Check pony rods for cracks and wear (replace if necessary)	☑
Check piston rods for cracks and wear (replace if necessary)	☑
Check clamps for wear (replace if necessary)	☑
Check all bearings w/ mirror for pitting and flaking	☑
Check all oil pump screens	☑
Check pillow block bearings on independent pump	☐
On inspection replace pony rod seals (Regardless if the rig says they have already been changed seals still need to be checked) replace gaskets if need do not use silicone unless need to fill a void. (do not use to excess because it gets into gear end)	☑

National	
Check troughs	☐
Check crosshead's for cracks at pony rod clamp	☐
Check pony rod clamp on bolts on crosshead's	☐
Loosen pony rod clamp bolts and tighten pony rod then retorque bolts	☐

Gardner Denver	
Oil pressure and Gauge	☐
Oil Filter	☐
Oil spray bar for crossheads	☐
Check to see if correct pony rods are installed by gauging distance between it and oil stop plate.	☐
Oil pump Screen	☐
If new floaters are not there get parts to install floating seals	☐

Continental Emsco	
Oil pressure and Gauge	☑
Check pony rod wiper if equipped if not equipped with wipers get parts to correct	☑
Check to see if baffle plates are doweled in pump	☑

Action Items:

Individual Pump Inspections

Company/Division:		**Asset #**	38-282
Rig:	**108**		
Pump#:2			
Field Inspection Report -	**Make:**	**Model:**	1600
Recommended Running Clearances	Inches		

	Min.	Max.	Actual
Crosshead to slide - Left	.030	.045	0.025
Crosshead to slide - Center	.030	.045	0.021
Crosshead to slide - Right	.030	.045	0.025
Main Bearing - Left	.005	.020	0.010
Main Bearing - Right	.005	.020	0.009
Pinion Shaft Bearing - Left	.002	.015	0.006
Pinion Shaft Bearing - Right	.002	.015	0.007
Crosshead Pin Bearing - Left	.002	.005	0.002
Crosshead Pin Bearing - Center	.002	.005	0.003
Crosshead Pin Bearing - Right	.002	.005	0.003
Connecting Rod to Eccentric Bearing - LH	.002	.020	0.008
Connecting Rod to Eccentric Bearing - CTN	.002	.020	0.017
Connecting Rod to Eccentric Bearing - RH	.002	.020	0.006
Oil Pump Pinion to Main Gear - Backlash	.010	.025	0.016
Pinion Shaft to Main Gear - Backlash	.010	.050	0.027
Bull Gear Wear			good
Pinion Gear Wear			good
Extension Rods			good

Comments:

General	
Check all oil lines	☑
Check all tied Bolts	☑
Drain & check Cleanouts	☑
Check and clean, gear end with diesel if needed	☐
Pony Rod Alignment	☐
Check pony rods for cracks and wear (replace if necessary)	☑
Check piston rods for cracks and wear (replace if necessary)	☑
Check clamps for wear (replace if necessary)	☑
Check all bearings w/ mirror for pitting and flaking	☑
Check all oil pump screens	☑
Check pillow block bearings on independent pump	☐
On inspection replace pony rod seals (Regardless if the rig says they have already been changed seals still need to be checked) replace gaskets if need do not use silicone unless need to fill a void. (do not use to excess because it gets into gear end)	☑

National	
Check troughs	☐
Check crosshead's for cracks at pony rod clamp	☐
Check pony rod clamp on bolts on crosshead's	☐
Loosen pony rod clamp bolts and tighten pony rod then retorque bolts	☐

Gardner Denver	
Oil pressure and Gauge	☐
Oil Filter	☐
Oil spray bar for crossheads	☐
Check to see if correct pony rods are installed by gauging distance between it and oil stop plate.	☐
Oil pump Screen	☐
If new floaters are not there get parts to install floating seals	☐

Continental Emsco	
Oil pressure and Gauge	☑
Check pony rod wiper if equipped if not equipped with wipers get parts to correct	☑
Check to see if baffle plates are doweled in pump	☑

Action Items:

RIG 108

Rig Inspection

NAME CASPER INSPECTION CREW

JOB TITLE MECHANIC

DATE MAINTENANCE STARTED: 11/25/2018 **COMPLETED** 11/25/2018

EQUIPMENT DESCRIPTION:

SERIAL NUMBER: ASSET # :

Travel Time to Rig 3HRS **FROM:** ☐HOME ☐SHOP

Time at Rig: 30HRS

Time from Rig 3HRS **FROM:** ☐HOME ☐SHOP

ACTON ITEMS

YOU NEED TO HAVE SIGNATURE'S AND TIME FILLED OUT ON FIRST PAGE

Rig: 108

Date: 11/25/2018

Scheduled Rig Inspection Check List

Air Hoist:

- [x] Check oil in air motor.
- [x] Check grease in gear case.
- [x] Grease throttle valve.
- [x] Check brake system for wear.
- [x] Check cable for fraying.

#1 ASSET 27- 465

#2 ASSET 27- 530

#3 ASSET 27- N/A

Comments:

EVERYTHING LOOKED REALLY GOOOD

Blocks:

- [x] Check grooves for wear.
- [x] Check smoothness of roll.
- [x] Check for play in bearings.
- [x] Ensure bolts are in place.
- [x] Grease all zerks.

ASSET # 5- 51

ASSET # 67- COMBO

Comments:

BLOCKS JUST CAME BACK FROM FOREMANS AFTER THE RIGS 5 YEAR

Brakes:

Hydromatic Brakes:

- [x] Jack bearings.
- [x] Inspect couplings.
- [x] Grease all zerks.

ASSET # 66- 115

DS 0.005 ODS 0.006

Comments:

NEW BRAKE BANDS WERE INSTALLED AN THE OLD ONE HAD GOTTEN INTO THE FLANGE A 1/16"

Electric Brakes:

Electric Brake Only:

66-

- [ ] Inspect plumbing (must meet Unit Drillings Specifications) Note: contact the maintenance department for instructions.
- [ ] Take air gap reading. Reading:
- [ ] Ensure brass shifting collars suspend off of sleeve OD.
- [ ] Ensure vents are in place and clean.
- [ ] Grease all zerks.
- [ ] Inspect bearing clearance DS ODS

Comments:

N/A

Eaton Brake Only:

66-

- [ ] Grease all zerks.
- [ ] Inspect bearing clearance — DS _____ ODS _____
- [ ] Check gap between reaction plates — Reading: X gap _____ Y gap _____ Z gap _____
- [ ] Record Quantity of discs — Number of discs _____
- [ ] Check Eaton Brake Temp Gauges — Drillers Console _____ At the Brake _____
- [ ] Function brakes Auto Safety System — Follow Eaton & Hydraulic Weekly Check Sheet

Tolerances: Test with 25 psi of air pressure

Disc Size	Qty of WC Discs	X new	X max (Adjustment)	Y new	Y min	Z new	Z min
36	1	0.12	0.54	2.75	2.31	—	—
	2	0.24	0.66	2.75	2.31	—	—
	3	0.36	0.78	2.75	2.31	2.75	2.31
	4	0.48	0.90	2.75	2.31	2.75	2.31

Comments:

N/A

Dry Cooler:

78-

- [ ] Flush Dry Cooler
- [ ] Clean Strainer
- [ ] Check water Pressures — Inlet _____ Outlet _____

Drawworks:

Drum Shaft:

ASSET # 15- 86

- [x] Grease all zerks. Change all filters and clean screens.
- [x] Inspect oil lines. Check oil level & oil quality. Clean pickup screens.
- [x] Inspect clutches for wear and air pressure.
- [x] Inspect tight member teeth for wear and grease.

Jack bearing readings

- [x] DS — 0.008 DRUM SHAFT
- [x] ODS — 0.013 DRUM SHAFT
- [ ] Other _____
- [ ] Other _____
- [ ] Other

Comments:

Brake Linkage:

15- 86

- [x] Grease all zerks and insure linkage is tight.
- [x] Inspect break bands for cracks and wear.
- [x] Check brake block bolts and ensure bolts are tight.
- [x] Check brake block thickness, record thinnest block measurement. DS 1 1/4" ODS 1 1/4"
- [x] MPI Inspection on brake Linkage (brake bands, slack adjusters, equalizer without removal).

Comments:

NEW BRAKE BANDS INSTALLED

Input Shaft:

☑ Inspect for leaking seals. 15- 86

Jack bearing readings

☑	DS	0.008
☑	ODS	0.01
☐	Other	
☐	Other	

Comments:

LOOKS GOOD

Output Shaft:

☑ Grease all zerks and inspect oil system.

Jack bearing readings

☑	DS	0.007
☑	ODS	0.009
☐	Other	
☐	Other	

Comments:

LOOKS GOOD

Rotary Counter Shaft:

☑ Grease all zerks and inspect oil system.

Jack Bearings (Findings)

☑	DS	0.004
☑	ODS	0.004
☐	Other	
☐	Other	
☐	Other	
☐	Other	

Comments:

EVERYTHING LOOKED GOOD

Cat Shaft:

☑ Grease all zerks and inspect oil system.

☑ Grease cathead with 4 shots of grease.

Jack bearing readings

☑	DS	0.009	ASSET # MU	68- 273
☑	ODS	0.006	ASSET # BO	68- 115
☐	Other			
☐	Other			

Compound:

15- 86

Engine shafts:

#1 DS		#1 ODS	
#2 DS		#2 ODS	
#3 DS		#3 ODS	

Pump drive shaft:

#1 DS		#1 ODS	
#2 DS		#2 ODS	

Pump sheave shaft:

#1 DS		#1 ODS	
#2 DS		#2 ODS	

- [ ] Grease all zerks and inspect oil system.
- [ ] Inspect all chains for wear.
- [ ] Ensure all oil pumps are working properly.
- [ ] Change all filters and clean screens.

Comments:

N/A

Hook:

ASSET # 28-

ASSET # 67-
COMBO

- [ ] Check oil in snubber.
- [ ] Grease all zerks.
- [ ] Visually check for cracks or wear.
- [ ] Rotate hook and feel for smoothness of roll.
- [ ] Ensure lock is working properly.

Comments:

N/A

Kelly Spinner:

ASSET # 69-

- [ ] Run spinner and check bearings.
- [ ] Ensure air pressure is 90 PSI.
- [ ] Grease all zerks.

Comments:

N/A

Mud Pumps:

ASSET # #1 38-

ASSET # #2 38-

ASSET # #3 38-

- [ ] Fill out pump inspection report.
- [ ] Check piston rods and replace if worn.
- [ ] Check rod clamps and replace if worn.

Comments:

ON PUMP INSPECTION REPORT

Independent Pump Drive #1:

- [ ] Inspect belts and sheave grooves for wear.
- [ ] Inspect chains and chain sprockets for wear.
- [ ] Inspect clutch and clutch drum.
- [ ] Check air lines and record PSI. PSI _____
- [ ] Record bearing play on engine side of shaft. Reading _____
- [ ] Record bearing play on pump side of shaft. Reading _____

Comments

N/A

Independent Pump Drive #2

- [ ] Inspect belts and sheave grooves for wear.
- [ ] Inspect chains and chain sprockets for wear.
- [ ] Inspect clutch and clutch drum.
- [ ] Check air lines and record PSI. PSI _____
- [ ] Record bearing play on engine side of shaft. Reading _____
- [ ] Record bearing play on pump side of shaft. Reading _____

Comments:

N/A

Over running clutch:

- [x] Roll clutch and check oil.
- [x] Check seals for leaks. Note: identify leak found in comments section.)
- [x] Service clutch and grease splines.
- [x] Changed Oil

Comments:

EVERYHTING LOOKED GOOD

Pipe Spinners:

- [x] Ensure Spinner is hung level with drill pipe. ASSET # 41-
- [x] Inspect drive chains and rollers for wear. (clean if necessary)
- [x] Grease all zerks and check hanger spring.

Comments:

EVERYTHING LOOKED GOOD

Rotary Table:

- [x] Pull top off and wash mud out of table.
- [x] Inspect through bore.
- [x] Record main bearing play.
- [x] Record pinion bearing play.
- [x] Record backlash play in gears.
- [x] Check quality of oil

ASSET # 44- 66

Reading UP-DOWN .010

Reading SIDE-SIDE .010

Reading IN-OUT .015

Comments:

EVERYTHING LOOKS GOOD

Swivel:

- [x] Clean mud accumulation around top seals and install mud guard.
- [x] Roll check swivel for smoothness of roll.
- [x] Record endplay readings. Radial run out.
- [x] Check quality of oil

ASSET # 50- 177

Reading 0.012

Comments:

JUST GOT BACK FROM FOREMANS FOR 5YEAR

Crown:

- [x] Inspect grooves for wear.
- [x] Check for play in bearings.
- [x] Check for smoothness of roll.
- [x] Grease all zerks.

ASSET # 10- 108

Comments:

JUST GOT BACK FROM FOREMANS 5 YEAR

Fail Safe System:

- [ ] Test System

ST-80

Comments

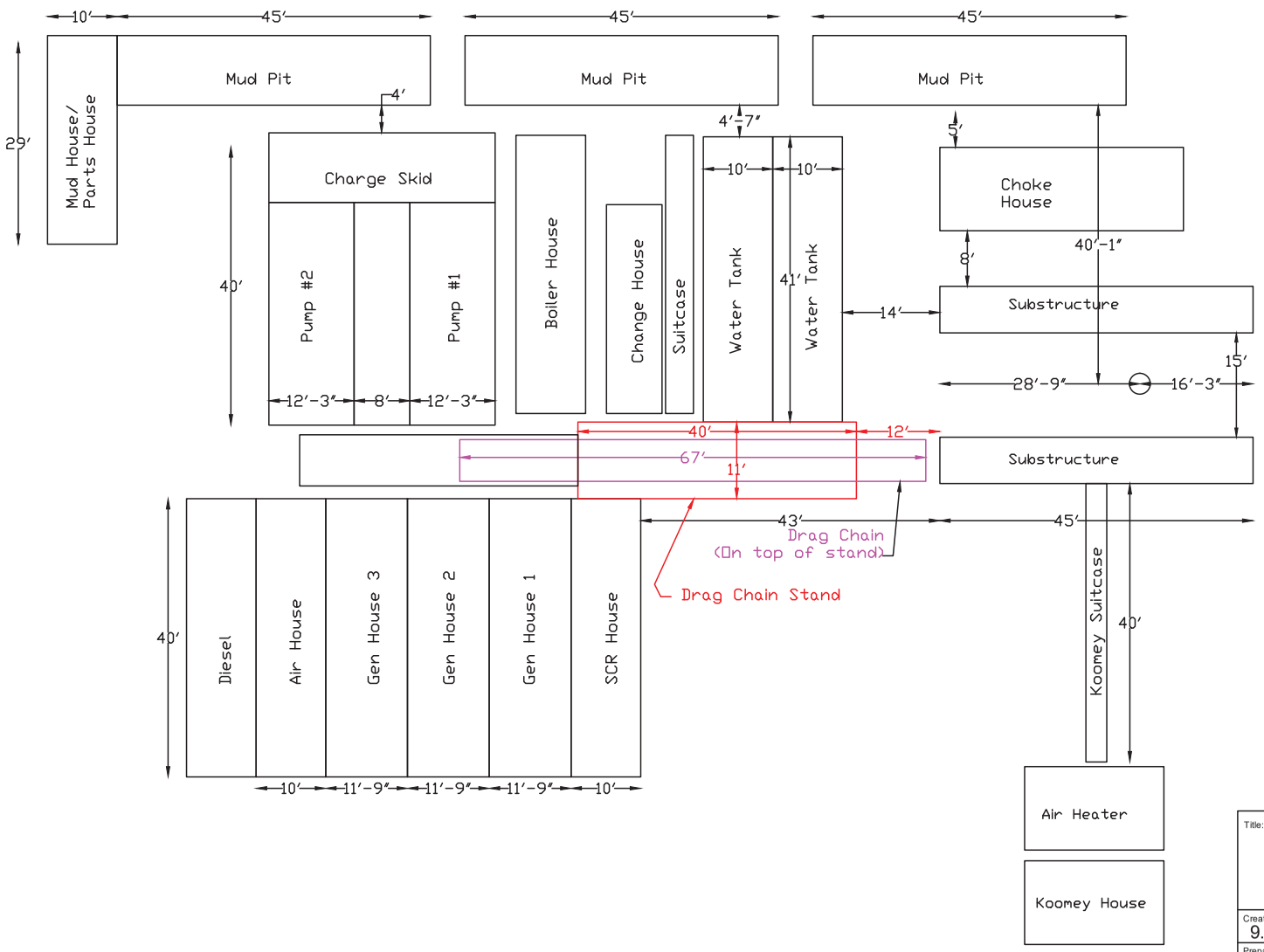
- [ ] Test operation & check leaks
- [ ] Perform ST-80 Inspection Form
- [ ] Service ST-80 HPU

HPU

Comments

- [ ] Run HPU & check leaks
- [ ] Change all filters

Insure Rig Manager knows to change HPU oil once a year



Title:

Rig 108

Layout

Created:	Revised:
9.11.08	9.23.08
Prepared By: M Weigt	Unit Drilling