| ROTA | ARY S | CREV | / AIR (| COMPRES CHART | SSOR | MAINT | TENANCE |
|---------|--------|-------------|----------|------------------|-----------|--------|-----------|
| Rig | # | 12 | 20 | Oil Typ | ре | F | POA-46 |
| MODEL# | 50DG | H-TE | SERIAL# | 10J022 | | ASSET# | |
| HRS | 225 | 580 | W/O# | | | DATE | 8/21/2014 |
| COMPANY | UN | NIT DRILLIN | NG | TECHNICIAN | | RANDAL | L RAINS |
| | | Des | cription | of work and p | oarts use | ed | |
| NO | | | | FLUSHED OIL S | SYSTEM | | |
| YES | | | | CHANGED | OIL | | |
| YES | | | | CHANGED OIL | FILTER | | |
| YES | | | | CHANGED AIR | FILTER | | |
| YES | | | | CHANGED SEP | ERATOR | | |
| YES | | | | CLEANED RAD | | | |
| NO | | | AD | DED NEW OIL SA | | VE | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
| | | | | | | | |
| EV | ERYTHI | NG LOC | OKED G | OOD | | | |

| ROTARY SCREW AIR COMPRESSOR MAINTENANCE CHART | | | | | | | | |
|--|---------------------------|-------------|-----------|-----------------|-----------|--------|-----------|--|
| Rig | Rig # 120 Oil Type POA-46 | | | | | | POA-46 | |
| MODEL# | 50DG | H-TE | SERIAL# | 10J021 | | ASSET# | | |
| HRS | 226 | 371 | W/O# | | | DATE | 8/21/2014 | |
| COMPANY | UN | NIT DRILLIN | ٧G | TECHNICIAN | | RANDAL | L RAINS | |
| | | Des | scription | of work and p | oarts use | ed | | |
| NO | | | | FLUSHED OIL | SYSTEM | | | |
| YES | | | | CHANGED | OIL | | | |
| YES | | | | CHANGED OIL | . FILTER | | | |
| YES | | | | CHANGED AIR | FILTER | | | |
| YES | | | | CHANGED SEP | ERATOR | | | |
| YES | | | | CLEANED RAI | DIATOR | | | |
| NO | | | ΑC | DDED NEW OIL SA | | VE | | |
| | | | | | | | | |
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| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | EVERYTHING LOOKED GOOD | | | | | | | |



RIG 120

Engine Inspection

| NAME | josh broken arrow | | | Work Order No. | | | |
|--------------------|-------------------|----------|---------------|------------------------|------------------|-----------|--|
| | | | | JOB TITLE | E mechanic | | |
| DATE MAINTE | NANCE STARTED: | 9 |)/22/2016 | COMPLETED | 9/22/2 | 2016 | |
| EQUIPMENT DES | SCRIPTION: | | gensets | | | | |
| SERIAL | L NUMBER: | | | | | | |
| Travel Time to Rig | l | FROM: | ☐ HOME ☐ SHOP | | | | |
| Time from Rig | 9 | FROM: | ☐ HOME ☐ SHOP | | | | |
| Time at Rig: | | | | ASSET # : #1 Engine | e <u>22-1471</u> | _ | |
| | | | | #1 Ger | n. 24-959 | | |
| | ACTON | ITEMS | | | | | |
| | | | | #2 Engin | e <u>22-1470</u> | _ | |
| | | | | #2 Ger | n. <u>24-958</u> | _ | |
| | | | | #3 Engin | e <u>22-1469</u> | _ | |
| | | | | #3 Ger | n. <u>24-957</u> | _ | |
| | | | | Other | | engine | |
| | | | | Asset # | Position | | |
| | | | | Asset # | Position | gen on | |
| | | <u> </u> | | Other | | engine | |
| | | | | Asset # | Position | | |
| | | | | Asset # | Position | gen on | |
| | | | | Other | | engine | |
| | | | | Asset # | Position | | |
| | | | | Asset # | Position | gen | |
| | | | | Other | | engine | |
| | | | | Asset # | Position | | |
| | | | | Accet # | Decition | gen | |

| Rig: 1 | 20 | | | | | |
|--|--|---------------------------|-----------------|--------------------|--------------------------|---------------|
| | | Antifreeze: | ✓ Red ☐ G | Green | | |
| Date: 9/22 | /2016 | Freeze point: | | | | • |
| Engine Position: | 1 | | If antifreeze | is green test t | the NA-Cool level | |
| Make: | cat | - | | C | | |
| Model: | 3512c | | | | | |
| Serial Number: | lla2427 | - | For 3512's: | Radiator | pass-48 | |
| Asset Number: | 22-1471 | - | | _ | | |
| Hours: | 18940 | <i>-</i> - | A | Aftercooler | pass-50 | |
| ☐ Tighten pan bolts on ✓ Ensure D-3508 and D | D-379, 398, 399. D-3512 individual gauge pane | els has been silicone | to prevent wat | er entry. | | |
| | s on water cooled turbos (on | | • | , | | |
| Run overhead valveti | | s time om ₃₇ . | | | | |
| | ings and idler bearings. | | | | | |
| | | to direction of air flo | ··· (Vou should | l ha abla ta see (| clearly through the ray | distanctine) |
| | diators. Note: Wash in oppisit | e direction or air no. | W. (100 siloulu | De able to see o | deality tillough the ra- | |
| = | m and install new belts. | | | | | |
| Check and clean aux | • | | | | | |
| ✓ Make sure crank case | e filters are being serviced (or | n 3508,3512). | | | | |
| | Record belt #'s, rad | liator fan bro-idl | er hro shaf | t size and n | Illev sizes | |
| | record bott ii o, .aa | ator ian org., | or bry., oric. | 1 0120, 0110 p. | diey dizec. | |
| | | | | | | |
| | | | | | | |
| Generator position: | 1 | | Torque conv | verter | | |
| Make: | kato | - | Oiler chain | | | |
| Model: | aa276730 | 113 | Clutch size | | | |
| Asset Number: | 24-959 | | Hrs since las | st P.M. | | |
| KW: | 1204 | ļ | RPM: | | | |
| | | 2-B | BRG | _ | | |
| | Review serv | ice procedures f | or engines v | with rig perso | nell. | |
| ✓ Grease and inspect for the second ins | | • | | | | |
| Clean generator and | blow out if possessary | | | | | |
| ✓ Clean generator and | blow out if necessary. | | | | | |
| | Drive Couplings, Plug a 5589 Rubber, (1) 9H8 | | | | | |
| | | | | | | |
| | | Comr | ments: | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| everything looked go | and | | | | | |

| Rig: | 12 | 20 | Antifreeze: | ✓ Red 🔲 0 | Green | | |
|------------|------------------|-------------------------------|-------------------------|-----------------|--------------------|-------------------------|--------------------|
| 9. | | | Freeze point: | | | | _ |
| Date: | 9/22/ | 2016 | | | | | |
| - | | | | If antifreeze | e is green test t | he NA-Cool level | |
| Engine Po | sition: | 2 | _ | | | | <u>-</u> |
| Make: | • | cat | _ | | | 40 | |
| Model: | , | 3512c | _ | For 3512's: | Radiator | pass-46 | |
| Serial Nur | | lla2441 | _ | | A 64 1 | naaa 40 | |
| Asset Nur | nber: | 22-1470 | _ | , | Aftercooler | pass-48 | - |
| Hours: | • | 19088 | _ | | | | |
| Tighten | pan bolts on I | D-379, 398, 399. | | | | | |
| ☐ Ensure | D-3508 and D- | -3512 individual gauge pane | els has been silicone | e to prevent wa | ter entry. | | |
| | | on water cooled turbos (or | | | . | | |
| _ | erhead valvetra | | 3, | | | | |
| | | igs and idler bearings. | | | | | |
| | | iators. Note: Wash in oppisi | ite direction of air fl | ow (You should | t he able to see (| clearly through the ra | diators fins) |
| | | and install new belts. | ite direction of all fr | ow. (Tou should | a be able to see t | sicarry unrough the ra- | diators inis.j |
| | and clean auxili | | | | | | |
| | | • | 2500 2512) | | | | |
| ✓ Make si | ure crank case | filters are being serviced (c | on 3508,3512). | | | | |
| | | Record belt #'s, rad | diator fan bratio | ller hra sha | ft size, and nu | ıllev sizes | |
| | | 1100014 5011 11 0, 141 | arator rarr brg.,re | nor brg., ona | 11 0120, and po | 3110 y 01200. | |
| | | | | | | | |
| | | | | | | | |
| Generator | position: | 2 | | Torque con | verter | | |
| Make: | | kato | | Oiler chain | | | |
| Model: | • | aa276730 | 013 | Clutch size | | | |
| Asset Nur | nber: | 24-958 | 3 | Hrs since la | st P.M. | | |
| KW: | • | 1204 | | RPM: | _ | | |
| IXVV. | • | | 2- | BRG | _ | | |
| | | Poviow con | vice procedures | for engines | with rig parea | noll | |
| Crosss | and increat fo | | nce procedures | ioi engines | with hig perso | nen. | |
| □ Grease | and inspect fo | i wear. | | | | | |
| ✓ Clean g | enerator and b | plow out if necessary. | | | | | |
| | | | | | | | |
| Check a | | Orive Couplings, Plug | | | | | |
| | (3)/L | -5589 Rubber, (1) 9H8 | 546 O-King, (3) | Tubes Sivos | o i Compoun | u Rubbei Coupili | ıg, |
| | | | Com | monto | | | |
| | | | Com | ments: | | | |
| | | | | | | | |
| | | | | | | | |
| Replaced | fanshaft an | d bearings, removed a | and welded up e | expansion ioi | nt running to | muffler, everythin | a else looked aood |

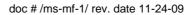
| Rig: 12 | 20 | Antifreeze: | ✓ Red ☐ Green | | |
|--|---|---|---------------------------|-----------------------|----------------|
| | | Freeze point: | | | |
| Date: 9/22/ | /2016 | | | | |
| | | | If antifreeze is green to | est the NA-Cool level | |
| Engine Position: | 3 | <u> </u> | | | |
| Make: | cat | <u>-</u> | _ | | |
| Model: | 3512c | <u> </u> | For 3512's: Radiato | r pass-48 | |
| Serial Number: | lla2423 | <u> </u> | | _ | |
| Asset Number: | 22-1469 | _ | Aftercooler | pass-50 | |
| Hours: | 19023 | _ | | | |
| Clean water passages Run overhead valvetr Grease fan hub bearir Inspect and clean rad Test shutdown systen Check and clean auxil | p-3512 individual gauge pane s on water cooled turbos (on rain. Ings and idler bearings. diators. Note: Wash in oppisit on and install new belts. liary oil filter. | ne time only). ite direction of air flo | | | diators fins.) |
| Generator position: | 3 | | Torque converter | | |
| - | kato | | • | | _ |
| Make: | - | | Oiler chain | | |
| Model: | aa276730 | | Clutch size | - | |
| Asset Number: | 24-957 | <u> </u> | Hrs since last P.M. | | |
| KW: | 1204 | | RPM: BRG | | |
| ✓ Grease and inspect fo | | /ice procedures | for engines with rig pe | ersonell. | |
| ✓ Clean generator and I | blow out if necessary. | | | | |
| Check and Grease | Drive Couplings, Plug a 5589 Rubber, (1) 9H8 | 846 O-Ring, (3) | | | |
| | | Com | ments: | | |

| Rig: | 120 | Antifreeze: Red Green |
|----------------|-------------------------------|--|
| | | Freeze point: |
| Date: | 9/22/2016 | If antifreeze is green test the NA-Cool level |
| Engine Positio | on: | if affilineeze is green test the twa-coortever |
| Make: | | |
| Model: | | For 3512's: Radiator |
| Serial Number | | |
| Asset Number | r: | Aftercooler |
| Hours: | | |
| Tighten pan | bolts on D-379, 398, 399. | |
| Ensure D-350 | 08 and D-3512 individual ga | auge panels has been silicone to prevent water entry. |
| Clean water | passages on water cooled t | urbos (one time only). |
| Run overhea | d valvetrain. | |
| Grease fan h | ub bearings and idler bear | ings. |
| ☐ Inspect and | clean radiators. Note: Wash | n in oppisite direction of air flow. (You should be able to see clearly through the radiators fins.) |
| Test shutdov | wn system and install new b | pelts. |
| Check and cl | lean auxiliary oil filter. | |
| Make sure cr | rank case filters are being s | erviced (on 3508,3512). |
| | Record bei | t #'s, radiator fan brg.,idler brg., shaft size, and pulley sizes. |
| Generator pos | sition: | Torque converter |
| Make: | | Oiler chain |
| Model: | | Clutch size |
| Asset Number | r: | Hrs since last P.M. |
| KW: | | RPM: |
| | | 2-BRG |
| | | iew service procedures for engines with rig personell. |
| Grease and i | nspect for wear. | |
| Clean genera | ator and blow out if necessa | ary. |
| Check and G | | s, Plug and Remove all Grease Fittings, Install New Rubbers and O-Ring Yearly!!!, (1) 9H846 O-Ring, (3) Tubes 5N5561 Compound Rubber Coupling, |
| | | Comments: |
| | | |

| Rig: 120 | | Antifreeze: Red Green | |
|-------------|--------------------------------|--|--------------|
| - | 9/22/2016 | Freeze point: | |
| Date: | 9/22/2010 | If antifreeze is green test the NA-Cool level | |
| Engine Pos | ition: | | |
| Make: | | | |
| Model: | | For 3512's: Radiator | |
| Serial Numb | | | |
| Asset Numb | oer: | Aftercooler | |
| Hours: | | | |
| Tighten p | oan bolts on D-379, 398, 399. | | |
| Ensure D | -3508 and D-3512 individual (| gauge panels has been silicone to prevent water entry. | |
| Clean wat | ter passages on water cooled | turbos (one time only). | |
| Run over | head valvetrain. | | |
| Grease fa | n hub bearings and idler bea | arings. | |
| Inspect a | nd clean radiators. Note: Was | sh in oppisite direction of air flow. (You should be able to see clearly through the radia | ators fins.) |
| Test shut | down system and install new | belts. | |
| Check and | d clean auxiliary oil filter. | | |
| Make sure | e crank case filters are being | serviced (on 3508,3512). | |
| | Dogard he | the state of the base of the base short size and pulley sizes | |
| | Record be | elt #'s, radiator fan brg.,idler brg., shaft size, and pulley sizes. | |
| | | | |
| | | | |
| Generator p | osition: | Torque converter | |
| Make: | | Oiler chain | |
| Model: | | Clutch size | |
| Asset Numb | oer: | Hrs since last P.M. | |
| KW: | | RPM: 2-BRG | |
| | Rei | - | |
| ☐ Grease ar | Re\ nd inspect for wear. | view service procedures for engines with rig personell. | |
| | • | | |
| Ulcan ger | nerator and blow out if necess | sary. | |
| Check and | | gs, Plug and Remove all Grease Fittings, Install New Rubbers and Orr, (1) 9H846 O-Ring, (3) Tubes 5N5561 Compound Rubber Coupling, | |
| | | Comments: | |
| | | | |
| | | | |
| | | | |

| Rig: 120 | | Antifreeze: Red Green | |
|-------------|--------------------------------|--|--------------|
| - | 9/22/2016 | Freeze point: | |
| Date: | 9/22/2010 | If antifreeze is green test the NA-Cool level | |
| Engine Pos | ition: | | |
| Make: | | | |
| Model: | | For 3512's: Radiator | |
| Serial Numb | | | |
| Asset Numb | oer: | Aftercooler | |
| Hours: | | | |
| Tighten p | oan bolts on D-379, 398, 399. | | |
| Ensure D | -3508 and D-3512 individual (| gauge panels has been silicone to prevent water entry. | |
| Clean wat | ter passages on water cooled | turbos (one time only). | |
| Run over | head valvetrain. | | |
| Grease fa | n hub bearings and idler bea | arings. | |
| Inspect a | nd clean radiators. Note: Was | sh in oppisite direction of air flow. (You should be able to see clearly through the radia | ators fins.) |
| Test shut | down system and install new | belts. | |
| Check and | d clean auxiliary oil filter. | | |
| Make sure | e crank case filters are being | serviced (on 3508,3512). | |
| | Dogard he | the state of the base of the base short size and pulley sizes | |
| | Record be | elt #'s, radiator fan brg.,idler brg., shaft size, and pulley sizes. | |
| | | | |
| | | | |
| Generator p | osition: | Torque converter | |
| Make: | | Oiler chain | |
| Model: | | Clutch size | |
| Asset Numb | oer: | Hrs since last P.M. | |
| KW: | | RPM: 2-BRG | |
| | Rei | - | |
| ☐ Grease ar | Re\ nd inspect for wear. | view service procedures for engines with rig personell. | |
| | • | | |
| Ulcan ger | nerator and blow out if necess | sary. | |
| Check and | | gs, Plug and Remove all Grease Fittings, Install New Rubbers and Orr, (1) 9H846 O-Ring, (3) Tubes 5N5561 Compound Rubber Coupling, | |
| | | Comments: | |
| | | | |
| | | | |
| | | | |

| Rig: 120 | | Antifreeze: Red Green | |
|-------------|--------------------------------|--|--------------|
| - | 9/22/2016 | Freeze point: | |
| Date: | 9/22/2010 | If antifreeze is green test the NA-Cool level | |
| Engine Pos | ition: | | |
| Make: | | | |
| Model: | | For 3512's: Radiator | |
| Serial Numb | | | |
| Asset Numb | oer: | Aftercooler | |
| Hours: | | | |
| Tighten p | oan bolts on D-379, 398, 399. | | |
| Ensure D | -3508 and D-3512 individual (| gauge panels has been silicone to prevent water entry. | |
| Clean wat | ter passages on water cooled | turbos (one time only). | |
| Run over | head valvetrain. | | |
| Grease fa | n hub bearings and idler bea | arings. | |
| Inspect a | nd clean radiators. Note: Was | sh in oppisite direction of air flow. (You should be able to see clearly through the radia | ators fins.) |
| Test shut | down system and install new | belts. | |
| Check and | d clean auxiliary oil filter. | | |
| Make sure | e crank case filters are being | serviced (on 3508,3512). | |
| | Dogard he | the state of the base of the base short size and pulley sizes | |
| | Record be | elt #'s, radiator fan brg.,idler brg., shaft size, and pulley sizes. | |
| | | | |
| | | | |
| Generator p | osition: | Torque converter | |
| Make: | | Oiler chain | |
| Model: | | Clutch size | |
| Asset Numb | oer: | Hrs since last P.M. | |
| KW: | | RPM: 2-BRG | |
| | Rei | - | |
| ☐ Grease ar | Re\ nd inspect for wear. | view service procedures for engines with rig personell. | |
| | • | | |
| Ulcan ger | nerator and blow out if necess | sary. | |
| Check and | | gs, Plug and Remove all Grease Fittings, Install New Rubbers and Orr, (1) 9H846 O-Ring, (3) Tubes 5N5561 Compound Rubber Coupling, | |
| | | Comments: | |
| | | | |
| | | | |
| | | | |





| RIG 12 | 20 |
|--------|----|
|--------|----|

Pump Inspection

| NAME | Evan Casper | | | |
|--------------------------|--------------|-----------------|----------------------------------|------------|
| JOB TITLE: | | | Mech | |
| DATE MAINTENANCE STARTED | : 11/20/2016 | _ co | MPLETED: | 11/24/2016 |
| EQUIPMENT DESCRIPTION: | | | | |
| SERIAL NUMBER: | | _ | #1 Asset 38-319 Make Model | |
| Travel Time to Rig | | From: HOME SHOP | Make | |
| Time at Rig: | | _ | #3 Asset | |
| Travel Time from Rig | | To: HOME SHOP | Model | |
| | | ACTON ITEMS | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | ndividu | al Pump Insp | pections | | |
|--------------------------------------|----------|--------------|------------------------|----------|---------------------------------------|----------|
| Company/Division: | | | | Asset # | 38-319 | |
| Rig: | | | | | | |
| Pump#:1 | | | | | | |
| Field Inspection Report - | <u>I</u> | Make: | | Mode | l: | |
| | | | | | | |
| Recommended Running Clearances | | Inches | ı | T | | |
| | | Min. | Max. | | General | |
| Crosshead to slide - Left | | .020 | .045 | 0.028 | Check all oil lines | <u> </u> |
| Crosshead to slide - Center | | .020 | .045 | 0.028 | Check all tied Bolts | ✓ |
| Crosshead to slide - Right | | .020 | .045 | 0.030 | Drain & check Cleanouts | ✓ |
| Main Bearing - Left | | .005 | .020 | 0.010 | Check and clean, gear end | |
| Main Bearing - Right | | .005 | .020 | 0.010 | with diesel if needed | |
| Pinion Shaft Bearing - Left | | .002 | .015 | 0.007 | Pony Rod Alignment | ✓ |
| Pinion Shaft Bearing - Right | | .002 | .015 | 0.007 | Check pony rods for cracks | ✓ |
| Crosshead Pin Bearing - Left | | .002 | .005 | 0.002 | and wear (replace if necessary) | |
| Crosshead Pin Bearing - Center | | .002 | .005 | 0.002 | Check piston rods for cracks | ✓ |
| Crosshead Pin Bearing - Right | | .002 | .005 | 0.002 | and wear (replace if necessary) | |
| Connecting Rod to Eccentric Bearing | - LH | .002 | .020 | 0.005 | Check clamps for wear | ^ |
| Connecting Rod to Eccentric Bearing | - CTN | .002 | .020 | 0.006 | (replace if necessary) | |
| Connecting Rod to Eccentric Bearing | - RH | .002 | .020 | 0.005 | Check all bearings w/ mirror | \ \ |
| Oil Pump Pinion to Main Gear - Backl | ash | .010 | .025 | 0.015 | for pitting and flaking | |
| Pinion Shaft to Main Gear - Backlash | | .010 | .050 | 0.030 | Check all oil pump screens | > |
| Bull Gear Wear | | | | good | Check pillow block bearings | √ |
| Pinion Gear Wear | | | | good | on independent pump | |
| Extension Rods | | | | good | On inspection replace pony | ✓ |
| | | | • | | rod seals (Regardless if the | |
| | Com | ments: | | | 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 | | | Gardner Denver | | Continental Emsco | |
| Check troughs | П | Oil pressu | re and Gauge | | Oil pressure and Gauge | V |
| Check crosshead's for cracks | | Oil Filter | o and Gauge | | Check pony rod wiper if equipped | |
| at pony rod clamp | | | ar for crossheads | | if not equipped with wipers get parts | |
| Check pony rod clamp | | | ee if correct pony | | to correct | |
| on bolts on crosshead's | Ш | | stalled by gauging | | Check to see if baffle plates | V |
| Loosen pony rod clamp bolts and | | | etween it and oil | | are doweled in pump | |
| tighten pony rod then retorque bolts | | stop plate. | etween it and on | | are doweled in pump | |
| lighten pony for then retorque boils | l | Oil pump S | Poroon | | ╡ | |
| | | | ters are not there get | | ╡ | |
| | | | _ | | | |
| | | parts to ins | Action Items: | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | I | ndividu | al Pump Insp | pections | | |

| Company/Division: | | | | Asset # | 38-336 | |
|---------------------------------------|-------|-----------------|---------------------|-------------------|---------------------------------------|----------|
| Rig: | | | | | | |
| Pump#:2 | | | | | | |
| Field Inspection Report - | Make: | | Model | | | |
| | | | | | | |
| Recommended Running Clearances | | Inches | 1 | | 1 | |
| | | Min. | Max. | Actual | General | |
| Crosshead to slide - Left | | .020 | .045 | 0.028 | Check all oil lines | _ |
| Crosshead to slide - Center | | .020 | .045 | 0.029 | Check all tied Bolts | ✓ |
| Crosshead to slide - Right | | .020 | .045 | 0.028 | Drain & check Cleanouts | ✓ |
| Main Bearing - Left | | .005 | .020 | 0.010 | Check and clean, gear end | |
| Main Bearing - Right | | .005 | .020 | 0.010 | with diesel if needed |] |
| Pinion Shaft Bearing - Left | | .002 | .015 | 0.007 | Pony Rod Alignment | ✓ |
| Pinion Shaft Bearing - Right | | .002 | .015 | 0.006 | Check pony rods for cracks | ~ |
| Crosshead Pin Bearing - Left | | .002 | .005 | 0.002 | and wear (replace if necessary) | |
| Crosshead Pin Bearing - Center | | .002 | .005 | 0.002 | Check piston rods for cracks | ~ |
| Crosshead Pin Bearing - Right | | .002 | .005 | 0.002 | and wear (replace if necessary) | |
| Connecting Rod to Eccentric Bearing - | LH | .002 | .020 | 0.006 | Check clamps for wear | V |
| Connecting Rod to Eccentric Bearing - | CTN | .002 | .020 | 0.006 | (replace if necessary) | |
| Connecting Rod to Eccentric Bearing - | RH | .002 | .020 | 0.007 | Check all bearings w/ mirror | V |
| Oil Pump Pinion to Main Gear - Backla | ash | .010 | .025 | 0.015 | for pitting and flaking | |
| Pinion Shaft to Main Gear - Backlash | | .010 | .050 | 0.030 | Check all oil pump screens | ✓ |
| Bull Gear Wear | | | | good | Check pillow block bearings | ✓ |
| Pinion Gear Wear | | | | good | on independent pump |] |
| Extension Rods | | | | good | On inspection replace pony | |
| | g | | | | rod seals (Regardless if the | |
| | Comm | ents: | | | rig says they have already | |
| | | | | | been changed seals still | 7 |
| | | | | | need to be checked) | Ů |
| | | | | | 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 | | Gardner Denver | | Continental Emsco | | |
| Check troughs | | Oil pressure a | and Gauge | | Oil pressure and Gauge | > |
| Check crosshead's for cracks | | Oil Filter | | | Check pony rod wiper if equipped | |
| at pony rod clamp | | Oil spray bar | for crossheads | | if not equipped with wipers get parts | ✓ |
| Check pony rod clamp | | Check to see | if correct pony | | to correct | |
| on bolts on crosshead's | | rods are insta | alled by gauging | | Check to see if baffle plates | ✓ |
| Loosen pony rod clamp bolts and | | distance betw | veen it and oil | | are doweled in pump | |
| tighten pony rod then retorque bolts | | stop plate. | | | | |
| | | Oil pump Scr | een | | | |
| | | If new floaters | s are not there get | | | |
| | | parts to instal | II floating seals | | | |
| | | | Action Items: | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Γ | | | | | | |
| | Ir | ndividual | l Pump Insp | ections | | |
| Company/Division: | | | • | Asset # | | |

| Rig: | | 120 | | | | | |
|--------------------------------------|--------|------------------|-----------------------|----------------------------|---------------------------------------|---|--|
| Pump#:3 | | | | | | | |
| Field Inspection Report - | • | Make: | | Mode | l: | | |
| | | . . | | | | | |
| Recommended Running Clearances | Inches | | | T 0 | | | |
| Crosshead to slide - Left | | Min. Max020 .045 | | Actual | General Check all oil lines | | |
| Crosshead to slide - Center | | .020 | .040 | | Check all tied Bolts | | |
| | | - | | | | | |
| Crosshead to slide - Right | | .020 | .045 | | Drain & check Cleanouts | | |
| Main Bearing - Left | | .005 | .020 | | Check and clean, gear end | | |
| Main Bearing - Right | | .005 | .020 | | with diesel if needed | | |
| Pinion Shaft Bearing - Left | | .002 | .015 | | Pony Rod Alignment | | |
| Pinion Shaft Bearing - Right | | .002 | .015 | | Check pony rods for cracks | | |
| Crosshead Pin Bearing - Left | | .002 | .005 | | and wear (replace if necessary) | | |
| Crosshead Pin Bearing - Center | | .002 | .005 | | Check piston rods for cracks | | |
| Crosshead Pin Bearing - Right | | .002 | .005 | | and wear (replace if necessary) | | |
| Connecting Rod to Eccentric Bearing | | .002 | .020 | | Check clamps for wear | | |
| Connecting Rod to Eccentric Bearing | | .002 | .020 | <u> </u> | (replace if necessary) | | |
| Connecting Rod to Eccentric Bearing | | .002 | .020 | | Check all bearings w/ mirror | | |
| Oil Pump Pinion to Main Gear - Backl | ash | .010 | .025 | | for pitting and flaking | _ | |
| Pinion Shaft to Main Gear - Backlash | | .010 | .050 | | Check all oil pump screens | | |
| Bull Gear Wear | | | | | Check pillow block bearings | | |
| Pinion Gear Wear | | | | | on independent pump | | |
| Extension Rods | | | | On inspection replace pony | | | |
| | | | | | rod seals (Regardless if the | | |
| | Com | nents: | | | 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 | | Gardner Denver | | | Continental Emsco | | |
| Check troughs | | Oil pressure | e and Gauge | | Oil pressure and Gauge | | |
| Check crosshead's for cracks | | Oil Filter | | | Check pony rod wiper if equipped | | |
| at pony rod clamp | | Oil spray ba | ar for crossheads | | if not equipped with wipers get parts | | |
| Check pony rod clamp | | Check to se | ee if correct pony | | to correct | | |
| on bolts on crosshead's | | rods are ins | stalled by gauging | | Check to see if baffle plates | | |
| Loosen pony rod clamp bolts and | | | tween it and oil | | are doweled in pump | | |
| tighten pony rod then retorque bolts | | stop plate. | | | | | |
| | • | Oil pump So | creen | | 7 | | |
| | | | ers are not there get | | 7 | | |
| | | | tall floating seals | | | | |
| | | | Action Items: | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |



Rig Inspection

| NAME _ | NAME Brian Monger JOB TITLE mechanic | | _ | | | | |
|---------------------------|---------------------------------------|-------|---------------|---------------------|---------------|------------|--|
| JOB TITLE | | | _ | Work Order I | No. <u>53</u> | 8848-55081 | |
| DATE MAINTENANCE STARTED: | | 7/2 | 21/2016 | COMPLET | ED _ | 9/2/2016 | |
| EQUIPMENT DESCRIPTION: | | | jc 50 draw to | ol and traveling ed | quipmenyt | | |
| SERIAL NUMBER: | | | | ASSET #: | | 15-156 | |
| | 4 | FROM: | ✓ HOME | | SHOP | | |
| Time at Rig: _ | 4 | FROM: | ✓ HOME | | SHOP | | |
| | | ACTO | ON ITEMS | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |

Doc# /ms-mf-1.1/ Rev.Date 11-11-2011 YOU NEED TO HAVE SIGNATURE'S AND TIME FILLED OUT ON FIRST PAGE

| Rig: | 120 | | | | |
|--------------|--|--|-------------------------|-------------|--|
| Date: | 9/2/2016 | | | | |
| | | Scheduled Rig Inspection Che | ck List | | |
| Air H | loist: | | | | |
| ✓ Check oil | in air motor. | | #1 ASSET | 27- | |
| ✓ Check gre | ease in gear case. | | #2 ASSET | 27- | |
| Grease the | rottle valve. | | #3 ASSET | 27- | |
| Check bra | ke system for wear. | | | | |
| ✓ Check cab | le for fraying. | | | | |
| | | Comments: | | | |
| | | hyd cat heads could find asse | et numbers | | |
| Blo | cks: | | | | |
| | ooves for wear. | | ASSET# | 5- 133 | |
| ✓ Check sm | oothness of roll. | | ASSET # | 67- | |
| ✓ Check for | play in bearings. | | <u> </u> | COMBO | |
| ✓ Ensure bo | Its are in place. | | | | |
| ✓ Grease all | zerks. | | | | |
| | | Comments: | | | |
| | | | | | |
| Bra | kes: | | | | |
| | | Hydromatic Brakes: | | | |
| Jack beari | ings. | | ASSET # | 66- | |
| ☐ Inspect co | ouplings. DS | | ODS | | |
| Grease all | zerks. | | | | |
| | | Comments: | | | |
| | | n/a | | | |
| | | Electric Brakes: | | | |
| | rake Only: | | | 66- | |
| | umbing (must meet Ur ap reading. | nit Drillings Specifications) Note: contact the mainte | nance department for in | structions. | |
| | ap reading. ass shifting collars susp | Reading: end off of sleeve OD. | | | |
| | nts are in place and cle | an. | | | |
| Grease all | zerks. aring clearance | DS | ODS | | |
| | aring cicaranec | Comments: | | | |
| | | n/a | | | |

| ✓ Grease all z | | DS | 0.007 | | ODS | | | |
|--|--|--|---|-------------|--------------|-------------------|--------------|---|
| _ | between reaction plat | • | | 0.501 | | 2.0 | | |
| | antity of discs | rtodding. | х уар | | Y gap | | Z gap | 2 |
| _ | n Brake Temp Gauges | Number of discs | | | | | | |
| | | Drillers Console | Х | | At the Bra | ke | х | |
| | akes Auto Safety Syst | em | Follow Eat | on & Hydrai | | Check Shee | | |
| Tolerances: | Otylof | 17-1-11 | | | Test | with 25 psi of ai | ir pressure | _ |
| Disc Size | Qty of WC Discs | X new | X max (Adjustment) | Y new | Y min | Z new | Z min | |
| | 1 | 0.12 | 0.54 | 2.75 | 2.31 | | - | |
| 36 | 3 | 0.24 0.36 | 0.66 0.78 | 2.75 | 2.31 | 2.75 | 2.31 | - |
| | 4 | 0.48 | 0.90 | 2.75 | 2.31 | 2.75 | 2.31 | - |
| | | | Comments: | | | | | |
| Dry Co ✓ Flush Dry C | Cooler | | | | | 78- | | |
| ✓ Clean Strair ✓ Check wate | | Inlet | 15 | | Outlot | | 5 | |
| | | | | | Outlet | | J | |
| - onook wate | er Pressures | | | | | | | |
| Draww | | | | | | | | |
| | | | Drum Shaft: | | | | | |
| Draww ✓ Grease all z | rorks: rerks. Change all filter | s and clean screens. | Drum Shaft: | | ET# | 15- 156 | | |
| Draww ✓ Grease all z | rorks: rerks. Change all filter | | Drum Shaft: | | | | | |
| Draww ✓ Grease all z ✓ Inspect oil | rorks: rerks. Change all filter | s and clean screens. & oil quality. Clean pickup | Drum Shaft: | | | | | |
| Draww Grease all z Inspect oil | terks. Change all filter | s and clean screens. & oil quality. Clean pickup pressure. | Drum Shaft: | | | | | |
| Draww Grease all z Inspect oil | terks. Change all filter lines. Check oil level & tches for wear and air | s and clean screens. doil quality. Clean pickup pressure. vear and grease. | Drum Shaft: | | | | | |
| Draww Grease all z Inspect oil Inspect clut Inspect tigh | terks. Change all filter lines. Check oil level & tches for wear and air | s and clean screens. doil quality. Clean pickup pressure. vear and grease. | Drum Shaft: o screens. | | | | | |
| Draww Grease all z Inspect oil Inspect cluf Inspect tigh | eerks. Change all filter lines. Check oil level & tches for wear and air at member teeth for v | s and clean screens. doil quality. Clean pickup pressure. vear and grease. | Drum Shaft: o screens. bearing readings | | | | | |
| Draww Grease all z Inspect oil Inspect clut Inspect tight | terks. Change all filter lines. Check oil level & tches for wear and air at member teeth for v | s and clean screens. doil quality. Clean pickup pressure. vear and grease. Jack | Drum Shaft: o screens. bearing readings 0.013 | | | | | |
| Draww Grease all z Inspect oil Inspect clut Inspect tigh | terks. Change all filter lines. Check oil level & tiches for wear and air at member teeth for v | s and clean screens. doil quality. Clean pickup pressure. vear and grease. Jack | Drum Shaft: o screens. bearing readings 0.013 0.016 | | | | | |
| Draww Grease all z Inspect oil Inspect tight Inspec | terks. Change all filter lines. Check oil level & tches for wear and air not member teeth for v | s and clean screens. doil quality. Clean pickup pressure. vear and grease. Jack | Drum Shaft: Do screens. Dearing readings 0.013 0.016 Dow drum016 Downdrum.012 | ASS | | | | |
| Draww Grease all z Inspect oil Inspect tight Inspec | terks. Change all filter lines. Check oil level & tches for wear and air not member teeth for volume. | s and clean screens. doil quality. Clean pickup pressure. vear and grease. Jack | Drum Shaft: o screens. bearing readings 0.013 0.016 ow drum016 | ASS | | | | |
| Draww Grease all z Inspect oil Inspect tight | terks. Change all filter lines. Check oil level & tches for wear and air not member teeth for volume. | s and clean screens. doil quality. Clean pickup pressure. vear and grease. Jack | Drum Shaft: Do screens. Dearing readings 0.013 0.016 Dow drum016 Downdrum.012 | ASS | | | | |
| Draww Grease all z Inspect oil Inspect tight Inspec | terks. Change all filter lines. Check oil level & tches for wear and air not member teeth for volume. DS ODS Other Other Other | s and clean screens. doil quality. Clean pickup pressure. vear and grease. Jack | Drum Shaft: Do screens. Dearing readings 0.013 0.016 Dow drum016 Downdrum.012 | ASS | | | | |
| Draww Grease all z Inspect old Inspect tight Inspect tight | terks. Change all filter lines. Check oil level & tches for wear and air at member teeth for v DS ODS Other Other Other Other | s and clean screens. oil quality. Clean pickup pressure. vear and grease. Jack | Drum Shaft: Do screens. Dearing readings 0.013 0.016 Dow drum016 Downdrum.012 | ASS | | 15- 156 | <u> </u> | |
| Draww Grease all z Inspect oil Inspect tight Inspec | terks. Change all filter lines. Check oil level & tches for wear and air at member teeth for volume to the company of the comp | s and clean screens. doil quality. Clean pickup pressure. vear and grease. Jack h fr | Drum Shaft: Do screens. Dearing readings 0.013 0.016 Dow drum016 Downdrum.012 | ASS | | | <u> </u> | |
| Draww Grease all z Inspect clut Inspect tigh Inspect tigh Grease all z Inspect tigh Inspect tigh Inspect tigh Inspect tigh | terks. Change all filter lines. Check oil level & tches for wear and air at member teeth for very level of the level of th | s and clean screens. doil quality. Clean pickup pressure. vear and grease. Jack h ge is tight. und wear. | Drum Shaft: Do screens. Dearing readings 0.013 0.016 Dow drum016 Downdrum.012 | ASS | | 15- 156 | <u> </u> | |
| Draww Grease all z Inspect clut Inspect tight Inspect tight Grease all z Inspect bread | terks. Change all filter lines. Check oil level & tches for wear and air at member teeth for very level. The company of the level of the level. The company of the level of the level. The level of the level of the level. The level of the level of the level of the level. The level of the leve | ge is tight. a oil quality. Clean pickup pressure. Jack h ge is tight. ure bolts are tight. | Drum Shaft: Do screens. Dearing readings 0.013 0.016 Dow drum016 Downdrum.012 | ASS | | 15- 156 | <u> </u> | |
| Draww Grease all z Inspect clut Inspect tight Inspect tight Grease all z Inspect bread | terks. Change all filter lines. Check oil level & tches for wear and air at member teeth for very level. The company of the level was all the level was all the level. The level was all the level was all the level. The level was all the level was all the level was all the level. The level was all | ge is tight. a oil quality. Clean pickup pressure. Jack h ge is tight. ure bolts are tight. | Drum Shaft: Do screens. Dearing readings 0.013 0.016 Dow drum016 Downdrum.012 | ASS | | 15- 156 | | |

| In | put Shaft: | | | |
|--------------|---------------------------|--------------------------|------------|---------|
| ✓ Inspe | ect for leaking seals. | | 15- 156 | 6 |
| ✓ | DC | Jack bearing readings | | |
| ✓ | DS | 0.007 | | |
| | ODS | 0.008 | | |
| | Other | | | |
| | Other | Comments: | | |
| | | | | |
| | street Objets | 1 | | |
| | se all zerks and inspe | pet all custom | | |
| Ŭ Glea | ise ali zerks ariu irispe | Jack bearing readings | | |
| V | DS | 0.008 | | |
| V | ODS | 0.009 | | |
| \checkmark | Other | ds barrel sprocket .012 | | |
| V | Other | ods0211 | | |
| | | Comments: | | 1 |
| | | | | |
| F | Rotary Counter S | Shaft: | | |
| | ase all zerks and inspe | | | |
| | | Jack Bearings (Findings) | | |
| \checkmark | DS | 0.004 | | |
| \checkmark | ODS | 0.004 | | |
| | Other | output003 | | |
| | Other | | | |
| | Other | | | |
| | Other | | | |
| | | Comments: | | |
| | | | | |
| (| Cat Shaft: | | | |
| Grea | se all zerks and inspe | ect oil system. | | |
| ☐ Grea | se cathead with 4 sh | 9 | | |
| | | Jack bearing readings | | |
| | DS | | ASSET # MU | 68- n/a |
| | ODS | | ASSET # BO | 68- n/a |
| | Other | | | |
| | Other | | | |

| Compound: | | | 15- 156 | |
|--------------------------------|---------------------|----------|------------|---|
| | 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 | | | |
| #4 DC | Pump sheave shaft: | | | |
| #1 DS _ | #1 ODS | | | |
| #2 DS | | | | |
| Grease all zerks and inspec | • | | | |
| Inspect all chains for wear. | | | | |
| Ensure all oil pumps are wo | | | | |
| Change all filters and clean | screens. Comments: | | | |
| | Comments. | | | |
| | diesel-electric | | | |
| Hook: | | ASSET# | 28- | |
| Check oil in snubber. | | ASSET# | 67- | _ |
| Grease all zerks. | | <u> </u> | COMBO | _ |
| ☐ Visually check for cracks or | r wear. | | | |
| Rotate hook and feel for sn | | | | |
| Ensure lock is working prop | | | | |
| | Comments: | | | |
| | n/a | | | |
| | 11/a | | | |
| Kelly Spinner: | | | | |
| Run spinner and check bea | | ASSET # | 69- | _ |
| Ensure air pressure is 90 P | SI. | | | |
| Grease all zerks. | | | | |
| | Comments: | | | |
| | n/a | | | |
| Mud Pumps: | | | | |
| ✓ Fill out pump inspection rep | port. | ASSET# | #1 38- 481 | |
| Check piston rods and repla | • | ASSET# | #2 38- 482 | _ |
| ✓ Check rod clamps and repla | | | | _ |
| | Comments: | ASSET# | #3 38- | |
| | | - 4 4 | | |
| | completed on 7-15 | o-14 | | |

| 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: | | | | |
| Roll clutch and check oil. | | | | |
| Check seals for leaks. Note: identify leak found in comment | ts section.) | | | |
| Service clutch and grease splines. | | | | |
| Changed Oil | | | | |
| | Comments: | | | |
| | n/a | | | |
| | | | | _ |
| Pipe Spinners: | | | | |
| Ensure Spinner is hung level with drill pipe. | | ASSET # | 41- 168 | _ |
| Inspect drive chains and rollers for wear. (clean if necessar | y) | | | |
| Grease all zerks and check hanger spring. | | | | |
| | Comments: | | | |
| | | | | |

| Rotary Table: | | | | |
|--|--------------------------|------------------|---------|--|
| Pull top off and wash mud out of table. | | ASSET# | 44- 276 | |
| Inspect through bore. | | | | |
| Record main bearing play. | Reading | j | 0.04 | |
| Record pinion bearing play. | Reading | <u> </u> | 0.006 | |
| Record backlash play in gears. | Readin | 9 | 0.015 | |
| ✓ Check quality of oil | | · | _ | |
| | Comments: | | | |
| | | | | |
| 0.00 | | | | |
| Swivel: Clean mud accumulation around top seals | and install mud guard | | | |
| _ | s and install mud guard. | ASSET # | 50- | |
| Roll check swivel for smoothness of roll. | | | | |
| Record endplay readings. Radial run out. | Reading | | | |
| Check quality of oil | Comments: | | | |
| | | Î | | |
| | can rig intergrate | <u>a</u> | | |
| Crown: | | | | |
| ✓ Inspect grooves for wear. | | ASSET# | 10- 120 | |
| √ Check for play in bearings. | | | | |
| ✓ Check for smoothness of roll. | | | | |
| ✓ Grease all zerks. | Commenter | | | |
| | Comments: | | | |
| | | | | |
| Fail Safe System: | | | | |
| ✓ Test System | | | | |
| | | | | |
| ST-80 | (| Comments | | |
| Test operation & check leaks | | | | |
| □ B 6 07 00 L 11 5 | | | | |
| Perform ST-80 Inspection Form | | | | |
| Service ST-80 HPU | | | | |
| | | | | |
| HPU | (| Comments | | |
| ✓ Run HPU & check leaks | | | | |
| _ | charged | hpu bottles to 5 | 80 psi | |
| Change all filters | | | | |

Insure Rig Manager knows to change HPU oil once a year

UNIT DRILLING RIG 120 GENERAL LAYOUT

Last Revision: 1/13/2016

