### WITS Record 9 MWD Advanced Downhole Drilling Mechanics (ADDM)

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| **WITS Record ID:** 09 | **Logical Record Type:** 159 | **Auto/Manual:** Automatic |
| **Trigger:** [TIME], [DEPTH] or [TIME/DEPTH] Transmit at specified time interval (secs), depth interval (feet or meters) based on hole depth when drilling new hole or making a new pass, or a combination of these | | |
| **Data Source:** Data acquired in real-time and computed over the trigger interval. Record transmitted and computations reset when triggering interval occurs. If the data is DEPTH-triggered, only on-bottom data is included in computations. Record is not sent if not circulating or tool is not operating. | | |
| **Data Typology:** Reference (Ref), Date\_Time\_Stamp(Dts), Real-time-Measure (Rtm), Real-time-Signal (Rts), Limit (Lim), Set-Point (Spt), Calculation (Cal), Distribution (Dis), Command (Com), Parameter (Par), Synthetic Value (Syn), Alarm (Alm), Interpreted (Int), Modeled (Mod), Observed (Obs), Code (Cod), Count (Cnt), Cumulative (Cml), Status (Sta), Expected (Exp), Estimated (Est), Downhole Measurement (Dhm) | | |
| **Data Field Types:** A = Alphanumeric String, L = 32 bit 2's complement signed integer, S = 16 bit 2's complement signed integer, F = 32 bit IEEE single precision floating point, E = Engineering, B = Boolean (1 if True and 0 if False), D = Date, T = Time, V = Variant, IL = Integer List, FL = Float List, EL = Engineering List, TL = Text List | | |
| **Reserved Characters:** Comma (,) - Separates Fields, Semi Colon (;) - Separates Items in a Standard Record, Colon (:) - Separates items in Date and Time Fields, Ampersand (&) - Separates items in a List | | |
| **Data Mnemonic Abbreviations:** Raw (Raw), Average (Avg), Max (Max), Min (Min), Mean (Men), Root-Mean-Square (Rms), Percent (Pct), Error (Err), Correlation (Cor), Probability (Prob), Variance (Var), Spread (Spd), Mean-Absolute-Deviation (Mad), Ratio (Rat), Standard Deviation (Std), Mode (Mod), Weighted Mean (Wtm), Dispersion (Dis), Product (Pro), Sum (Sum), Cumulative Sum (Csm), Corrected (Cor), Adjusted (Adj), Instantaneous (Ins), State (Sta), Observed (Obs), Expected (Exp), Observed-Cumulative (ObC), Expected-Cumulative (ExC), Total (Tot), Reported (Rep), Interpolated (Itp), Period (Per), Currency (Cur) | | |

| WITS  Record / Item | Description | STD WITS Long Mnemonic | Operator Mnemonic for WITSML & OSIsoft PI & ODA | Field Type | Length | Typology | Transmit Units (FPS) | Transmit Units (Metric) | | Data System  Type |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0901 | Well Identifier | WELLID | WELLID | A | 16 | Ref | ~~~ | ~~~ | Unique Well ID | |
| 0902 | Sidetrack/Hole Sect No. | STKNUM | STKNUM | S | 2 | Ref | ~~~ | ~~~ | Unique Wellbore ID | |
| 0903 | Record Identifier | RECID | RECID | S | 2 | Ref | ~~~ | ~~~ | Identification | |
| 0904 | Sequence Identifier | SEQID | SEQID | L | 4 | Ref | ~~~ | ~~~ | Identification | |
| 0905 | Date | DATE | DATE | L | 4 | Dts | ~~~ | ~~~ | Date | |
| 0906 | Time | TIME | TIME | L | 4 | Dts | ~~~ | ~~~ | Time | |
| 0907 | Activity Code | ACTCOD | ACTCOD | S | 2 | Cod | ~~~ | ~~~ | Rig Activity Code | |
| 0908 | Depth Hole (meas) | DEPTMEAS | DEPTMEAS | F | 4 | Obs | Foot (ft) | Meter (m) | Depth | |
| 0909 | Depth Hole (vert) | DEPTVERT | DEPTVERT | F | 4 | Cal | Foot (ft) | Meter (m) | Depth | |
| 0910 | Depth Bit (meas) | DEPTBITM | DEPTBITM | F | 4 | Obs | Foot (ft) | Meter (m) | Depth | |
| 0911 | Depth Bit (vert) | DEPTBITV | DEPTBITV | F | 4 | Cal | Foot (ft) | Meter (m) | Depth | |
| 0912 | Bottom Hole Assembly Run or BHA Pass Number | PASSNUM | BHAPASSNUM | S | 2 | Cnt | ~~~ | ~~~ | BHA Run Number | |
| 0913 | MWD Transverse 1 Accelerometer X Radial Raw Realtime Cont (RRRC) | AX\_MWD\_CONT | GRAVTRAN1\_RRRC | F | 4 | Dhm | milliG | milliG | MWD Raw Radial | |
| 0914 | MWD Transverse 2 Accelerometer Y Radial Raw Realtime Cont (RRRC) | AY\_MWD\_CONT | GRAVTRAN2\_RRRC | F | 4 | Dhm | milliG | milliG | MWD Raw Radial | |
| 0915 | MWD Axial Accelerometer Z Raw Radial Realtime Cont (RRRC) | AZ\_MWD\_CONT | GRAVAXIAL\_RRRC | F | 4 | Dhm | milliG | milliG | MWD Raw Radial | |
| 0916 | MWD Transvers1 Magnetometer X Radial Raw Realtime Cont (RRRC) | BX\_MWD\_CONT | MAGTRAN1\_RRRC | F | 4 | Dhm | nT | nT | MWD Raw Radial | |
| 0917 | MWD Transvers 2 Magnetometer Y Radial Raw Realtime Cont (RRRC) | BY\_MWD\_CONT | MAGTRAN2\_RRRC | F | 4 | Dhm | nT | nT | MWD Raw Radial | |
| 0918 | MWD Axial Magnetometer Z Radial Radial Raw Realtime Cont (RRRC) | BZ\_MWD\_CONT | MAGAXIAL\_RRRC | F | 4 | Dhm | nT | nT | MWD Raw Radial | |
| 0919 | MWD Temperature – Radial Raw Realtime Cont (RRRC) | MWD\_TEMP\_CONT | MWD\_TEMP\_RRRC | S | 2 | Dhm | degF | degC | MWD Raw Radial | |
| 0920 | Downhole Bottomhole Pressure | BOTHOLEPRESS | BHP | S | 2 | Dhm | Psi | kPa | Downhole Pressure | |
| 0921 | Downhole ECD | ECD\_PWD | ECD\_PWD | F | 4 | Cal | lbm/galUS | Kg/m3 | Downhole Pressure | |
| 0922 | Stick Slip Level | STICKSLIPLEV | STICKSLIP\_LEV | F | 4 | Cod | unitless | unitless | BHA Vibration & Loads | |
| 0923 | Axial Vibration Level | AXIALVIBLEV | AXIAL\_VIB\_LEV | F | 4 | Dhm | unitless | unitless | BHA Vibration & Loads | |
| 0924 | Lateral Vibration Level | LATERALVIBLEV | LAT\_VIB\_LEV | F | 4 | Dhm | unitless | unitless | BHA Vibration & Loads | |
| 0925 | Bending Moment | BEND\_MOMENT | BEND\_MOMENT | F | 4 | Dhm | ft.lbf | N.m | BHA Vibration & Loads | |
| 0926 | Whirl | WHIRL | WHIRL | F | 4 | Cod | unitless | unitless | BHA Vibration & Loads | |
| 0927 | Bit Bounce | BIT\_BOUNCE | BIT\_BOUNCE | F | 4 | Cod | unitless | unitless | BHA Vibration & Loads | |
| 0928 | Oxy Drilling Dynamcis Downhole (ODD) | ODDDH | ODD | F | 4 | Cal | kPsi | kPsi | Energy | |
| 0929 | Downhole Mechanical Specific Energy (MSE) | MSEDH | MSE | F | 4 | Cal | kPsi | kPsi | Energy | |
| 0930 | Downhole Drilling Specific Energy (DSE) | DSEDH | DSE | F | 4 | Cal | kPsi | kPsi | Energy | |
| 0931 | Downhole WOB | MWOBAV | WOB\_DH\_AVG | F | 4 | Dhm | klbf | kdaN | BHA Load & Speed | |
| 0932 | Downhole Torque | MTORQAV | TQ\_DH\_AVG | F | 4 | Dhm | Kft.lbf | kN.m | BHA Load & Speed | |
| 0933 | Downhole BHA RPM | RPMBHADOWNHOLE | RPM\_BHA\_DH | F | 4 | Dhm | RPM | RPM | BHA Load & Speed | |
| 0934 | Continuous MWD Inclination Calculated Downhole without Qualification | INCMWD\_DHRAW | INCL\_MWD\_RAW | F | 4 | Dhm | Deg | Deg | Directional Survey - Raw | |
| 0935 | Continuous MWD Azimuth Calculated Downhole without Qualification | AZIMMWD\_DHRAW | AZI\_MWD\_RAW | F | 4 | Dhm | Deg | Deg | Directional Survey - Raw | |
| 0936 | RSS\_Inc (Rotary Steerable) Calculated Downhole without Qualification | INCRSS\_DHRAW | INCL\_RSS\_RAW | F | 4 | Dhm | Deg | Deg | Directional Survey - Raw | |
| 0937 | RSS\_Azimuth (Rotary Steerable) Calculated Downhole without Qualification | AZIMRSS\_DHRAW | AZI\_RSS\_RAW | F | 4 | Dhm | Deg | Deg | Directional Survey - Raw | |
| 0938 | Motor\_Inc (Instrumented Logging While Drilling Mud Motor) Calculated Downhole without Qualification | INCMOTOR\_DHRAW | INCL\_LWDM\_RAW | F | 4 | Dhm | Deg | Deg | Directional Survey - Raw | |
| 0939 | Motor\_Azimuth (Instrumented Logging While Drilling Mud Motor) Calculated Downhole without Qualification | AZIMMOTOR\_DHRAW | AZI\_LWDM\_RAW | F | 4 | Dhm | Deg | Deg | Directional Survey - Raw | |
| 0940 | Near-Bit Sub Inclination Calculated Downhole without Qualification | INCNEARBITSUB\_DHRAW | INCL\_NBSUB\_RAW | F | 4 | Dhm | Deg | Deg | Directional Survey - Raw | |
| 0941 | Near-Bit Sub Azimuth Calculated Downhole without Qualification | AZIMNEARBITSUB\_DHRAW | AZI\_NBSUB\_RAW | F | 4 | Dhm | Deg | Deg | Directional Survey - Raw | |
| 0942 | Near Bit BHA Inclination Calculated Downhole with Data Qualification | INCNBDH | INCL\_NB\_QUAL | F | 4 | Dhm | Deg | Deg | Directional Survey - Raw | |
| 0943 | Downhole Differential Pressure | DIFFPRESS\_DH | DIFFPRES\_DH | F | 4 | Dhm | Psi | kPa | BHA Pressure | |
| 0944 | Bottom-hole annulus press | MBHPANN | MWD\_BHP\_\_ANN | F | 4 | Dhm | Psi | kPa | BHA Pressure | |
| 0945 | Bottom-hole internal press | MBHPINT | PRES\_MWD\_INT | F | 4 | Dhm | Psi | kPa | BHA Pressure | |
| 0946 | Rotary Steerable Pad A Pressure Downhole | RSSPRESS\_PADA | RSS\_PRES\_PADA | F | 4 | Dhm | Psi | kPa | BHA Pressure | |
| 0947 | Rotary Steerable Pad B Pressure Downhole | RSSPRESS\_PADB | RSS\_PRES\_PADB | F | 4 | Dhm | Psi | kPa | BHA Pressure | |
| 0948 | Rotary Steerable Pad C Pressure Downhole | RSSPRRESS\_PADC | RSS\_PRES\_PADC | F | 4 | Dhm | Psi | kPa | BHA Pressure | |
| 0949 | Rotary Steerable Pad D Pressure Downhole | RSSPRESS\_PADD | RSS\_PRES\_PADD | F | 4 | Dhm | Psi | kPa | BHA Pressure | |
| 0950 | Downhole Motor RPM – (Downhole Measured - Average) | MMMRPM | RPM\_PDM\_AVG | F | 4 | Dhm | Rpm | Rpm | BHA Speed | |
| 0951 | MWD Tool Alternator Voltage | MALTVOLT | MWD\_ALT\_VOLT | F | 4 | Dhm | Volt | Volt | Voltage | |
| 0952 | Wt-on-Bit (WOB) Downhole Strain-Gage Measured (DHSGM)- Average | MWOBA | WOB\_DHSGM\_AVG | F | 4 | Dhm | klbf | kdaN | BHA Loads | |
| 0953 | Wt-on-Bit (WOB) Downhole Strain-Gage Measured DHSGM - (Max) | MWOBX | WOB\_DHSGM\_MAX | F | 4 | Dhm | klbf | kdaN | BHA Loads | |
| 0954 | Wt-on-Bit (WOB) Downhole Strain-Gage Measured (DHSGM) - (RMS) | MWOBRMS | WOB\_DHSGM\_RMS | F | 4 | Dhm | klbf | kdaN | BHA Loads | |
| 0955 | Motor Torque (TQ) Downhole Strain-Gage Measured (DHSGM) - Average | MTQ\_PDM\_AV | MTQ\_PDM\_AVG | F | 4 | Dhm | Kft.lbf | kN.m | BHA Loads | |
| 0956 | Motor Torque (TQ) Downhole Strain-Gage Measured (DHSGM) – Max | MTQ\_PDM\_MAX | MTQ\_PDM\_MAX | F | 4 | Dhm | Kft.lbf | kN.m | BHA Loads | |
| 0957 | Motor Torque (TQ) Downhole Strain-Gage Measured (DHSGM) - RMS | MTQ\_PDM\_RMS | MTQ\_PDM\_RMS | F | 4 | Dhm | Kft.lbf | kN.m | BHA Loads | |
| 0958 | MWD Transverse 1 Accelerometer X Tangential Raw Realtime Cont (TRRC) | AX\_MWDTANG | GRAVTRAN1\_TRRC | F | 4 | Dhm | milliG | milliG | MWD Raw Tangential | |
| 0958 | MWD Transverse 2 Accelerometer Y Tangential Raw Realtime Cont (TRRC) | AY\_MWDTANG | GRAVTRAN2\_TRRC | F | 4 | Dhm | milliG | milliG | MWD Raw Tangential | |
| 0960 | MWD Axial Accelerometer Z Raw Tangential Raw Realtime Cont (TRRC) | AZ\_MWDTANG | GRAVAXIAL\_TRRC | F | 4 | Dhm | milliG | milliG | MWD Raw Tangential | |
| 0961 | MWD Transvers1 Magnetometer X Tangential Raw Realtime Cont (TRRC) | BX\_MWDTANG | MAGTRAN1\_TRRC | F | 4 | Dhm | nT | nT | MWD Raw Tangential | |
| 0962 | MWD Transvers 2 Magnetometer Y Tangential Raw Realtime Cont (TRRC) | BY\_MWDTANG | MAGTRAN2\_TRRC | F | 4 | Dhm | nT | nT | MWD Raw Tangential | |
| 0963 | MWD Axial Magnetometer Z Radial Tangential Raw Realtime Cont (TRRC) | BZ\_MWDTANG | MAGAXIAL\_TRRC | F | 4 | Dhm | nT | nT | MWD Raw Tangential | |
| 0964 | MWD Temperature – Radial Raw Tangential Raw Realtime Cont (TRRC) | MWDTANG\_TEMP | MWD\_TEMP\_TRRC | F | 4 | Dhm | degF | degC | MWD Raw Tangential | |
| 0965 | BHA Torque (AVG) Downhole Strain-Gage Measured (DHSGM) – No Motor or Above Motor in BHA | TQ\_BHA\_AV | TQ\_BHA\_AVG | F | 4 | Dhm | Kft.lbf | kN.m | BHA Loads | |
| 0966 | BHA Torque (MAX) Downhole Strain-Gage Measured (DHSGM) – No Motor or Above Motor in BHA | TQ\_BHA\_MAX | TQ\_BHA\_MAX | F | 4 | Dhm | Kft.lbf | kN.m | BHA Loads | |
| 0967 | BHA String Torque (RMS) Downhole Strain-Gage Measured (DHSGM) – No Motor or Above Motor in BHA | TQ\_BHA\_RMS | TQ\_BHA\_RMS | F | 4 | Dhm | Kft.lbf | kN.m | BHA Loads | |
| 0968 | No-Load Positive Displacement Motor Speed Ratio (Revolution per Gallon or Revolution per Liter) | PDM\_SPEED | PDM\_SPEED | F | 4 | Ref | Rev/GalUS | Rev/L (Liter) | Motor Reference Value | |
| 0969 | Positive Displacement Motor Max Recommended Operational Differential Pressure | PDM\_DIFFPRES\_MAX | PDM\_DIFFPRES-MAX | F | 4 | Ref | Rev/GalUS | Rev/L (Liter) | Motor Reference Value | |
| 0970 | Positive Displacement Motor Output Torque at Max Recommended Operational Differential Pressure | PDM\_TQMAX | PDM\_TQMAX | F | 4 | Ref | Rev/GalUS | Rev/L (Liter) | Motor Reference Value | |
| 0971 | Spare 1 | Spare1 | Spare1 |  |  |  |  |  |  | |
| 0972 | Spare 2 | Spare2 | Spare2 |  |  |  |  |  |  | |
| 0973 | Spare 3 | Spare3 | Spare3 |  |  |  |  |  |  | |
| 0974 | Spare 4 | Spare4 | Spare4 |  |  |  |  |  |  | |
| 0975 | Spare 5 | Spare5 | Spare5 |  |  |  |  |  |  | |