

## HYDRAULIC EXCAVATOR

*This Evaluation Guide for Skills Demonstration is to be used in the evaluation of an operator for certification on the specific piece of equipment stated above. It is intended that this Guide be followed closely during an evaluation, and the operator is expected to demonstrate competency in each of the items listed. However, variances may be made in some situations when, in the opinion of an evaluator, site conditions, operational constraints or the demonstrated skill of the operator requires that an item(s) be deleted or added to ensure a comprehensive evaluation. Documentation of any variance in the evaluation, and documentation of satisfactory completion of the evaluation and subsequent certification is to be made on the appropriate Certification Form.*

### **1. Performs a thorough pre-op inspection and daily/weekly preventive maintenance, as needed**

- Visually inspects exterior of machine for loose, leaking, hanging, or broken parts
- Enters cab using steps and grab handles for safety (3 point climbing procedure)
- Removes keys from ignition for safety
- Ensures that parking brake is applied
- Ensures that transmission is in neutral or lowest forward gear or reverse, as per policy
- Ensures that battery disconnect is turned off
- Checks that R297g is in the vehicle
- Reviews R297g for prior failures
- Completes R297g correctly (see attached Preventive Maintenance Checklist for relevant items)
- Makes note of deficiencies on EM3; completes EM3 correctly
- Performs general safety checks including unsecured objects
- Checks for presence of warning and safety decals
- Verifies vehicle is safe to operate
- States all safety warnings for machine
- Inspects the following machine components:

#### CARRIER

- Engine
  - \* Checks oil, coolant, power steering, clutch master cylinder and window washer levels (and fills as needed)
  - \* Checks the radiator and fins for cracks, distortion, debris and any signs of leakage
  - \* Checks fan for presence and distortion
  - \* Checks air restriction indicator (monometer) and cleans dust valve daily
  - \* Checks that oil and fuel filters are in good condition, secured tight and without leaks
  - \* Checks battery for corrosion and properly secured
  - \* Checks turbo charger for leaks and cracks
  - \* Inspects condition and tightness of belts

- Steering and Suspension
  - \* Checks springs, spring hangers and restraining chains for presence and damage
  - \* Checks that shocks are properly attached, are not damaged and are not leaking
  - \* Inspects pitman arm, drag link and tie rod ends for presence/condition
  - \* Checks power steering assist cylinder, if applicable, and steering box for leaks and that it is secured to frame
  - \* Checks tires for tread depth, proper inflation and obvious defects
  - \* Checks wheels/rims for tightness, cracks, valve stem alignment, slippage or any damaged, broken or missing parts
  
- Rear Axle and Suspension
  - \* Checks springs and spring hangers for presence and condition
  - \* Inspects drive shaft visually for damage, debris or any sign of failure
  - \* Checks tires for tread depth, proper inflation and obvious defects
  - \* Checks wheels/rims for tightness, cracks, valve stem alignment, slippage or any damaged, broken or missing parts
  - \* Checks fluid levels/filters, differentials, and planetary axles
  
- Exterior
  - \* Checks fuel tank for damage or leaks and fuel levels
  - \* Checks lights, warning lights and reflectors are clean and intact, properly attached and operating correctly
  - \* Checks exhaust system for presence and condition
  - \* Manually drains moisture from air tanks
  - \* Checks for secure stowage of boom and any auxiliary equipment or material
  - \* Checks for presence and condition of locking pin for bucket
  
- Cab Interior
  - \* Performs general safety check including unsecured objects
  - \* Inspects presence and condition of seat belts and other safety equipment, including horn, charged and secured fire extinguisher, first aid kit and emergency triangles
  - \* Inspects for excessive free play in the steering wheel
  - \* Inspects for 1-1/2" clutch free play
  - \* Inspects for clean and undamaged glass and mirrors, working wipers/washers and heater/defroster

## UPPERSTRUCTURE

- Engine
  - \* Radiator
  - \* Crank case
  - \* Battery

- \* Fuel tank
- \* Transmission
- \* Hydraulic fluid (with all cylinders collapsed as much as possible)
- \* Fuel/oil/hydraulic/air filters clean, not leaking
- \* Swing transmission oil level
- Interior
  - \* Performs general safety check including unsecured objects
  - \* Describes functions of controls
  - \* Inspects presence and condition of seat belts and other safety equipment, including horn, charged and secured fire extinguisher, first aid kit and emergency triangles
  - \* Inspects for excessive free play in the steering wheel/control lever
  - \* Inspects for clean and undamaged glass and mirrors, working wipers/washers and heater/defroster
  - \* Checks position of cab controlled brakes toggle (if equipped); does not unlock cab controlled brakes toggle until parking brake is applied
  - \* Checks position of steering selector valve knob (if equipped); does not move remove drive toggle from "engaged" position unless parking brake is applied
  - \* Checks that remote drive toggle is in "out" position for operation from carrier cab

## **2. Makes sure the work site is suitable for Excavator operation**

- Checks area around the worksite for obstacles, smoothness, overhead wires, indicators of underground lines and pipes and contacts UFPO if uncertain
- Identifies dangerous site conditions

## **3. Starts engine and prepares vehicle for operation**

- Checks that transmission is in neutral and parking brake is applied
- Starts engine according to procedure in operator's manual for engine type
- Observes oil pressure gauge; stops engine if gauge remains on zero for more than 10 seconds
- Observes voltmeter, water temperature and oil pressure gauges frequently
- Recognizes unusual noises or vibrations when present
- Avoids prolonged idling
- Does not release parking brake or move carrier while low air warning light is on
- Verifies brake system pressure is in proper range by observing air pressure gauge
- Tests parking brake by trying to move carrier in first gear and low range
- Tests service brake
- Checks operation of steering while carrier is moving slowly in first gear
- Tests horn, turn signals, back-up alarm and any other warning devices
- Checks to make sure there is sufficient clearance around machine to swing boom

#### **4. Shifts transmission and auxiliary transmission in a smooth and efficient manner**

- With clutch pedal depressed, shifts auxiliary transmission or transfer case to desired power/speed range and engages or disengages front wheel drive as required
- Releases clutch slowly and smoothly to move carrier forward without bucking or stalling engine
- Double-clutches when required to engage gears smoothly and without clatter
- Maintains a light, even pressure on the gearshift when shifting synchronized gears to allow gears to mesh fully without clashing
- Shifts up and down through all gears smoothly and at the proper time
- Does not allow engine to overspeed when downshifting or traveling downhill

#### **5. Prepares carrier for remote control operation**

- Places transmission in proper gear
- Waits for full air brake system pressure before engaging remote control
- Properly transfers control of carrier to upperstructure according to operator's manual for specific type of equipment

#### **6. Prepares upperstructure for remote control operation**

- Makes sure travel and steer levers are in neutral position
- Makes sure auxiliary brake is applied
- Starts upperstructure engine and waits for full air brake system pressure
- Makes sure power take-off is fully engaged. (Adjusts upperstructure engine to idle speed and gently engages travel lever to cause a slight rotation of power take-off gear. The gears should not clash and the engine should not reduce speed)
- Makes sure upperstructure swing brake functions properly and is applied before moving carrier
- Puts front axle stabilizer switch in proper setting
- Makes sure there is a clear path for carrier, boom and counterweight before starting to move

#### **7. Controls machine to effectively perform various digging operations**

- Properly positions vehicle(s) within the work zone for safe, efficient operation
- Manipulates all controls without error to accurately move the upperstructure, bucket and boom in the intended direction
- Operates machine slowly through first few complete digging cycles to warm the hydraulic oil throughout the system
- Swings upperstructure and boom in a smooth, continuous motion from the digging position to the unloading position at the spoil location or into the hauling truck
- Loads spoil material into hauling truck without striking truck and with minimal spillage
- Maximizes the efficiency of the digging cycle by using several controls simultaneously

- Uses the bucket action while retracting the boom to dig and shape a ditch in one operation
- Maintains an effective grade in cleaned ditches
- Maintains an even cut and smooth finish in excavations
- Uses appropriate bucket for task, such as a smaller bucket for excavating hard material

## **8. Prepares carrier for conventional operation**

- Applies parking brake
- Shifts transmission to neutral
- Shifts auxiliary transmission to appropriate gear for driving conditions
- Shifts transfer case to appropriate range and engages or disengages front driving axle as required for driving conditions
- Transfers control of upperstructure back to carrier

### **Prepares upperstructure for conventional operation**

- Retracts boom allowing clearance between bucket and carrier cab; positions boom in rest and secures as necessary
- Allows upperstructure engine to cool by running at idle speed for a few minutes before stopping
- Makes sure travel and steer controls are in neutral position
- Applies auxiliary brake or emergency/parking brake

## **9. Parks and shuts down equipment using proper procedure**

- Stops vehicle in appropriate parking area
- Applies parking brake
- Stows boom in cradle in a manner that prevents damage to cab
- Uses proper engine shutdown procedure (Idles machine 3-5 minutes)
- Shifts transmission to parking position according to policy
- Fills fuel tank to minimize condensation
- Locks carrier and upperstructure cab; installs protective window covers if available
- Installs bucket locking pin when equipped
- Cleans and secures vehicle as appropriate
- Completes Post Operational check
- Completes all necessary paperwork (ie., equipment report, R 297g, etc.)