

SPECIFICATION RT57-09-05-02

30 TON CRAWLER MOUNTED HYDRAULIC EXCAVATORS

COMPLY / NOT COMPLY

1. DESCRIPTION

A diesel powered 30 ton crawler mounted hydraulic Excavator
With an operating weight including backhoe attachments of not less than 27 000 kg

2. ENGINE

A direct injection type, water cooled turbo charged diesel engine.

The engine should deliver a net power of at least 150kW.

The engine should be suitable for operation with RSA specification diesel fuel (500ppm) and tank must last at least 10 hours

The engine shall be flexibly mounted to minimise noise and vibration.

3. HYDRAULICS

The maximum hydraulic pressure in the main circuit shall not be higher than 38.0 MPa.

A hydraulic system of sound design and basic simplicity will receive preference.

The hydraulic pumps shall be of the variable displacement piston type and the control system shall permit automatic variation of pressure and flow to meet demand.

Full flow heavy duty hydraulic oil filters shall be provided, able to screen out min 10 micron and larger particles.

Each filter unit shall preferably incorporate a magnetic core to attract metallic particles.

Oil coolers suitable for a 40°C ambient temperature shall be fitted.

Controls shall operate through hydraulic servo-mechanisms and shall require minimum operator effort.

A warning buzzer operated by excessive oil temperature and low oil pressure shall be fitted.

4. SUPERSTRUCTURE AND CAB

The superstructure shall be mounted on a slewing ring which rotates on roller bearings and fitted with slew brake.

It shall be possible to lock the slewing action for transport.

Steps and handrails shall be provided to facilitate the operator for entering the cab and for maintenance and repair work.

Access to all necessary points shall thus be obtained.

Floodlights of 200 W rating shall be mounted on the boom and rear of the machine to enable independent operation at night.

All cables, wires and pipes shall be protected where exposed on the superstructure.

The cab shall be ROPS / FOPS.

The cab shall be rubber mounted and lined with acoustic insulation wherever possible.

An air conditioning system shall be fitted.

Internal lighting in the cab is required.

Window protection grills must be fitted.

The operator's seat should be suspended and adjustable.

An instrument panel should be fitted in clear view of the operator, warning the operator with a light and audible warning horn if a problem occurs.

The system should monitor at least Low engine oil pressure, High engine coolant temperature, High hydraulic oil temperature, Low change in system pressure.

An alternator malfunction warning device, hour meter and fuel gauge should also be fitted.

5. UNDERCARRIAGE

Undercarriage width between track shoe extremities shall not be less than 2 900 mm.

Minimum track shoe width shall be 600 mm

Track shoes shall be of the triple grouser extreme service type and be suitable for quarry operations

Minimum track length shall be 5 000 mm

Track chain guides shall be fitted

Track tension shall be adjusted hydraulically. In addition, a shock absorber to reduce impact loading on the tracks shall be provided.

It is preferred to install drive sprockets without removing the track frames. Details of such operations shall be supplied.

The travel motors shall be protected by rock guards.

Minimum travel speed shall be 5.0 kph.

A self-adjusting travel brake shall be fitted.

The minimum ground clearance shall not be less than 500 mm.

6. ATTACHMENTS

The bulk buckets shall have a minimum capacity, measured according to SAE standards of 1.6 m³, digging in material with loose density of not less than 1 800 kg/m³.

The bucket shall be of the extreme service type with a lip plate of 50 mm thickness having a hardness of 500 brinell or equivalent, designed for heavy duty applications and shall have a minimum mass of 1600 kg. Bucket width (bite) shall be approximately 1 500 mm..

Bucket design shall incorporate heavy duty boxed main beam and underbridge, two low profile inverted "T" type support beams inside the bucket in line with the centre teeth, 500 brinell hardness wear strips on the outside in a horizontal direction, sealed and floating pins and replaceable bushes, 30 mm cheek plates and grouser plate

protection on cheek and corners of 500 brinell hardness or equivalent.

Min of five teeth of the ESCO 35 R14-1 type or equivalent is required splayed in a spade nose formation with the centre teeth leading the corner teeth by 50 - 75 mm. Corner teeth shall be angled so as to project sideways further than any part of the bucket or protection plates. Half arrow wear plates are to be fitted between the teeth to protect the lip plate.

A lifting eye and vacuum release holes are required on the bucket.

The buckets shall be specifically designed for the duties described.

It is essential that maximum breakout force is developed within the parameters specified.

Boom, stick and bucket pins and bushes shall preferably be sealed to prevent ingress of dirt.

Sideways play on bucket pins shall be externally shimmed.

The excavators shall be able to perform all of the requirements given below with the buckets offered laden with material of loose density 1.8 t/m³ without exceeding 75% of their rated tipping loads.

The excavators shall be fitted with attachments which comply with the following requirements:

With backhoe:

(a) Maximum digging reach at ground level: 10.0 m

(b) Maximum digging depth: 6.0 m

(c) Maximum dumping height: 6.5 m

(d) Stick length not less than: 3.5 m

(e) Boom length: 6.0 m

Maximum breakout force shall not be less than 200 kN

Maximum digger stick force shall not be less than 180 kN

Cylinder forces shall be quoted.

The crowd force shall not exceed 0, 75 X operating mass.

7. AIR CLEANER

The engine should be fitted with a dual element, dry type air cleaner.

8. FILTERS

Full flow disposable fuel and lubricating oil filters as well as a fuel/water separator must be fitted.

The fuel/water separator must be positioned where it can be inspected on a regular basis, and thus easily accessible for maintenance.

9. COOLING SYSTEM

Must be water and oil cooled with fan.

Radiator cores must have large spaces between them, for efficient cooling and easy cleaning.

10. PAINT

The roller must be painted with a durable 2K paint.

Colour: Golden Yellow

The bonnet must be painted with a durable 2K paint.

Colour: Brunswick Green

11. OPERATOR AND MACHINE PROTECTIVE EQUIPMENT

The equipment should be fitted with the following safety equipment like: -

Backup alarm, forward warning horn, seatbelt, rotating beacon light, front and rear working lights.

OPTIONAL EXTRAS

A. BUCKET SIZES

Addition sizes of the following must be catered
for: -

- I. 1.8 m³
- II. 2.0 m³
- III. 1.6m³ reinforced bucket for rocks

TECHNICAL SCHEDULE

1. DESCRIPTION

Make _____

Model _____

Manufacture _____

DUTY

Backhoe

(a) Peak production _____ t/h

(b) Average production _____ t/h

(c) Cycle time _____ s

MASS

(a) Operating mass _____ kg

(b) What must be removed for road transport? _____

2. ENGINE

(a) Make _____

(b) Model _____

(c) Net power output (as specified) _____ kW

(d) Rated speed _____ rpm

(e) Capacity _____ ℓ

(f) Fuel consumption at full load _____ ℓ/h

(g) Fuel tank capacity _____ ℓ

(h) Type of shut down device for high water temperature _____

(i) Type of shut down device for low oil pressure _____

3. HYDRAULICS

(a) Oil renewal time – full flow _____ seconds

(b) Overall pump efficiency _____ %

(c) Test pressures – Cylinders _____ MPa

Hydraulic hoses _____ MPa

(d) Pump hydraulic power - max _____ kW

- (e) Pump type _____
- (f) Maximum system pressure _____MPa
- (g) Oil change intervals _____h
- (h) Number of pumps _____
- (i) Type of pump _____
- (j) Filter screening size _____micron
- (k) Type of cooler fan drive _____
- (l) Hydraulic oil reservoir capacity _____ℓ
- (m) Type of control servo mechanism _____

4. **SUPERSTRUCTURE AND CAB**

- (a) Type of slewing ring bearings _____
- (b) Is slewing brake offered? YES / NO
- (c) Is cab rubber mounted? YES / NO
- (d) Is centralized greasing offered? YES / NO
- (e) Number of floodlights and power _____
- (f) Slewing speed _____rpm
- (g) Mass of counterweight _____kg

5. **UNDERCARRIAGE**

- (a) Overall width _____mm
- (b) Track shoe width _____mm
- (c) Track length _____mm
- (d) Type of track shoe _____
- (e) Number of track rollers _____
- (f) Number of track rollers _____
- (g) Travel speed _____kph
- (h) Is travel brake fitted? YES / NO
- (i) Type of track adjuster _____
- (j) Ground pressure _____kph

(k) Ground contact area _____m²

6. ATTACHMENTS

(a) Bucket capacity (CECE) _____m³

(b) Type of steel _____

(c) Manufacturer _____

(d) Tooth manufacturer _____

(e) Tooth type _____

(f) Length of boom _____m

(g) Length of stick _____m

(h) Percentage of tipping load at maximum reach _____%

(i) Maximum dumping height _____m

(j) Maximum digging depth _____m

(k) Maximum digging reach _____m

(l) Crowd force (penetration force) _____kN

(m) Breakout force _____kN

(n) Bucket width mm _____mm

(o) Bucket tip radius (pin to point) mm _____mm

7. AIR CLEANER

Make and model _____

Serviceable safety element? YES / NO

Are safety elements locally made? YES / NO

Service Indicator? YES / NO

8. FILTERS

Details

Position of Separator

Type of water drain

9. COOLING SYSTEM

Water / Oil Cooled Radiator cores

Fan fitted

Yes/No

10. PAINT

Body paint

Paint Type

Colour

Bonnet paint

Paint Type

Colour

11. OPERATOR AND MACHINE PROTECTIVE EQUIPMENT

Full details of Safety Equipment
