

1. SPECIFICATION OF STEAM TURBINE AND ACCESSORIES

1-1 Number of Set :

Quantity supplied : One (1) set

1-2 Type of Steam Turbine :

Type : Horizontal, impulse, multi-stage, single valve, axial flow and back pressure with reduction gear

Manufacture's model No. : B6-R4-R

1-3 Output :

Rated continuous output at reduction gear : 5000 HP

1-4 Guarantee Point :

Inlet steam pressure : 900 PSIG

Inlet steam temperature : 740 ° F

Exhaust steam pressure : 15 PSIG

Inlet steam consumption : 62610 Lb/h at 5000 HP

(*) The measured steam consumption figures are subject to the tolerance margin of 3 % for unavoidable errors of measuring instrument and personal errors.

1-5 Reduction Gear :

Type : Horizontal
Reduction : Single reduction
Helical : Single helical
Service factor : AGMA 2.0
Input speed : 7492 rpm
Output speed : 1150 rpm
Gear ratio : 1/6.515
Applied standards : Manufacture's standard and AGMA
Quantity : One (1) set / One unit

1-6 Emergency Stop Valve :

Type : Oil pressure acting and hand operateable type, with steam strainer and limit switch for indication of open.
Quantity : One (1) set / One unit

1-7 Journal Bearing :

Type : Forced lube and plain metal type
Quantity : One (1) set / One unit

1-8 Thrust Bearing :

Type : Multi-segment Michell type
Quantity : One (1) set / One unit

1-9 Speed Governor :

Type	: 011 relay type
Model No.	: WOODWARD PG-PL
Adjustable speed range	: 100 / 74 % of rated speed (1150-851rpm)
Max. speed regulation	: 0.5 %
Max. speed rise	: Less than 7 %
Control air signal	: 3 psig 851 rpm 15 psig 1150 rpm

1-10 Overspeed Governor :

Type	: Mechanical eccentric trip weight
Tripping speed	: 110 ±1% of rated speed
Quantity	: One (1) set / One unit

1-11 Governor Valve :

Type : Single valve type

Quantity : One (1) set / One unit

1-12 Insulating and Jacketting :

Turbine casing and emergency stop valve are insulated and jacketed to maintain jacket temperature below 167 ° F.

1-13 Coupling :

Coupling between turbine and gear : Gear and force feed lubrication type

Coupling between gear and shredder : Supplied by purchaser

1-14 Base Plate :

Type : Integral with oil reservoir
steel plate welding type

1-15 Turning Device :

Type : Electric motor driven,
cyclo drive speed reducer
manually engage and automatically
dis-engage type

Turning speed : Approx. 29.5 rpm at turbine speed

Electric source - Voltage : 480 V

- Frequency : 60 Hz

- Phase : Three (3)

Electric motor - Output : 10 HP

- Speed : 1750 rpm

- No. of poles : 4

Quantity : One (1) set / One unit

1-16 Gland Steam Ejector :

Inlet steam pressure : 900 PSIG
Inlet steam temperature : 740 ° F
Steam consumption : 154 Lb/h
Quantity : One (1) set / One unit

1-17 Oil Reservoir :

Type : Integral with turbine baseplate
Full capacity : Approx. 1400 Liter (Full capacity)
Quantity : One (1) set / One unit

Reservoir is furnished with oil level indicator, drain valve, oil charging nozzle, gas escaper, and suction strainer for main and auxiliary oil pump

1-18 Main Oil Pump :

Type : Gear type, mounted on wheel gear shaft end of reduction gear
Capacity : 79.2 GPM (18 m³/h)
Discharge pressure : 64 PSIG (4.5 kg/cm²g)
Speed : Approx. 856 rpm
Quantity : One (1) set / One unit

1-19 Auxiliary Oil Pump :

Type : Gear type, mounted on oil reservoir
and driven by AC electric motor

Capacity : 70.4 GPM (16 m³/h)

Discharge pressure : 64 PSIG (4.5 kg/cm²g)

Speed : 1750 rpm

Quantity : One (1) set / One unit

1-20 Electric Motor for Auxiliary Oil Pump :

Type : Totally enclosed and fan cooled type

Electric source - Voltage : AC 480 V

- Frequency : 60 Hz

- Phase : Three (3)

Output : 7.5 HP

No. of poles : 4

Speed : 1750 rpm

Quantity : One (1) set / One unit

1-21 Oil Cooler :

Type : Shell and tube, fixed tube bundle type

Cooling surface area : 482 Ft² (45 m²)

Cooling water - kind : Fresh water

- Temperature : 90 ° F (inlet) (32.2 °C)

- Quantity : 242 GPM (55 m³/h)

Quantity : One (1) set / One unit

Tube side mechanical design : 71 PSIG (5 kg/cm²g)

1-22 Lube Oil Filter :

Type : Duplex with change over cock & magnet
Filtration : 200 mesh
Quantity : One (1) set / One unit

1 23 Oil Pressure Adjusting Valve :

Type : Self acting type
Setting pressure - Lube oil : 14.2 PSIG (1 kg/ cm²)
- Control oil : 57 PSIG (4 kg/ cm²)
Quantity : One (1) set / One unit

3. MATERIAL LIST

3-1 Steam Turbine :

Turbine casing	: Cast steel
Turbine rotor	: Mo 3% Cr forged alloy steel
Blades	: Mo 13% Cr stainless steel
Nozzles	: Mo 13% Cr stainless steel
Diaphragm	: Carbon steel
Journal bearing	: Carbon steel lined with babbitt metal
Thrust bearing	: Carbon steel lined with babbitt metal
Bearing housing	: Cast iron
Labyrinth packing	: Ni-Pb-Bronze

3-2 Emergency Stop Valve :

Body	: Cast steel
Valve	: Stainless steel
Valve seat	: Stainless steel
Strainer	: 18-8 stainless steel

3-3 Governor Valve :

Body	: Cast steel
Valve	: Stainless steel
Valve seat	: Stainless steel

3-4 Reduction Gear :

Casing	: Cast iron
Pinion	: Forged alloy steel
Wheel gear	: Forged alloy steel
Wheel shaft	: Forged carbon steel
Journal bearing	: Steel lined with babbitt metal
Thrust bearing	: Steel lined with babbitt metal

3-5 Oil Cooler :

Shell	: Carbon steel plate
Tube	: Stainless steel
Tube sheet	: Carbon steel plate
Water chamber	: Carbon steel plate

3-6 Gland Steam Ejector :

Nozzle	: Stainless steel
Diffuser	: Carbon steel
Mixing chamber	: Carbon steel

3-7 Oil Pump :

Casing	: Cast iron
Gear	: Carbon steel
Shaft	: Carbon steel
Bearing	: Anti-friction bearing

3-8 Oil Filter :

Casing : Cast iron

Element : 18-8 stainless steel

3-9 Oil Reservoir :
(with base plate)

: Carbon steel plate

3-10 Base Plate :
(with oil reservoir)

: Carbon steel plate

3-11 Piping :

Pipe for inlet steam line : Carbon steel

Pipe for exhaust steam line : Carbon steel

Pipe for leakage : Carbon steel

Pipe for lube, and control
oil line : Carbon steel

ITEM NO.

STEAM CONSUMPTION FOR

5000 HP SHREDDER TURBINE



MODEL NO : R6-R4-R

MFG NO. HCS-BE-10659

M. NO. 17876

OUTPUT

SPEED

STEAM
PRESSURE

STEAM
TEMP.

EXHAUST
PRESSURE

5000

7492/1150

900

740

15

(HP)

(r.p.m)

(P.S.I.G)

(°F)

(P.S.I.G)

(HP)

(P.S.I.G)

(°F)

(P.S.I.G)

(HP)

(P.S.I.G)

(°F)

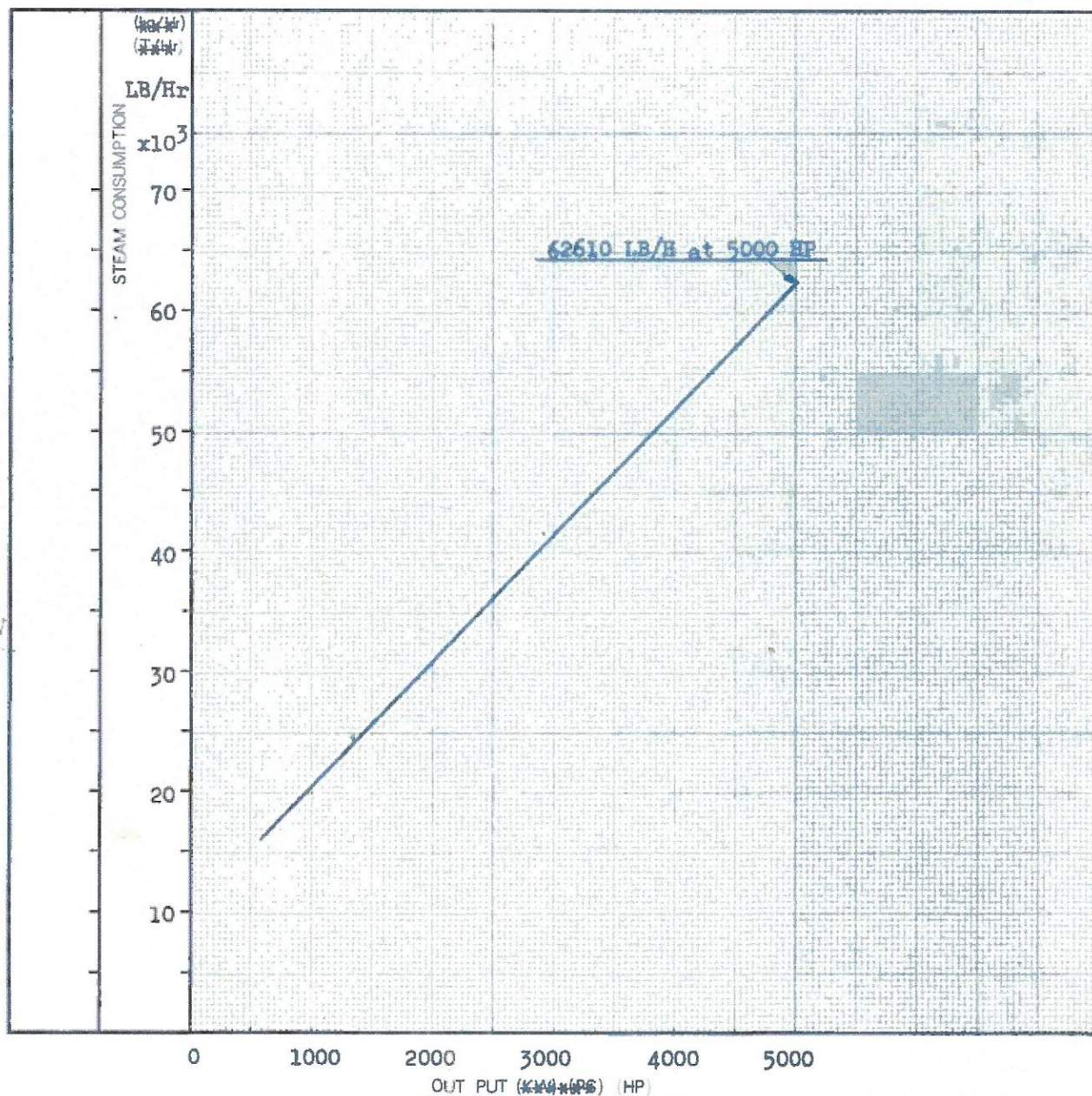
(P.S.I.G)

(HP)

(P.S.I.G)

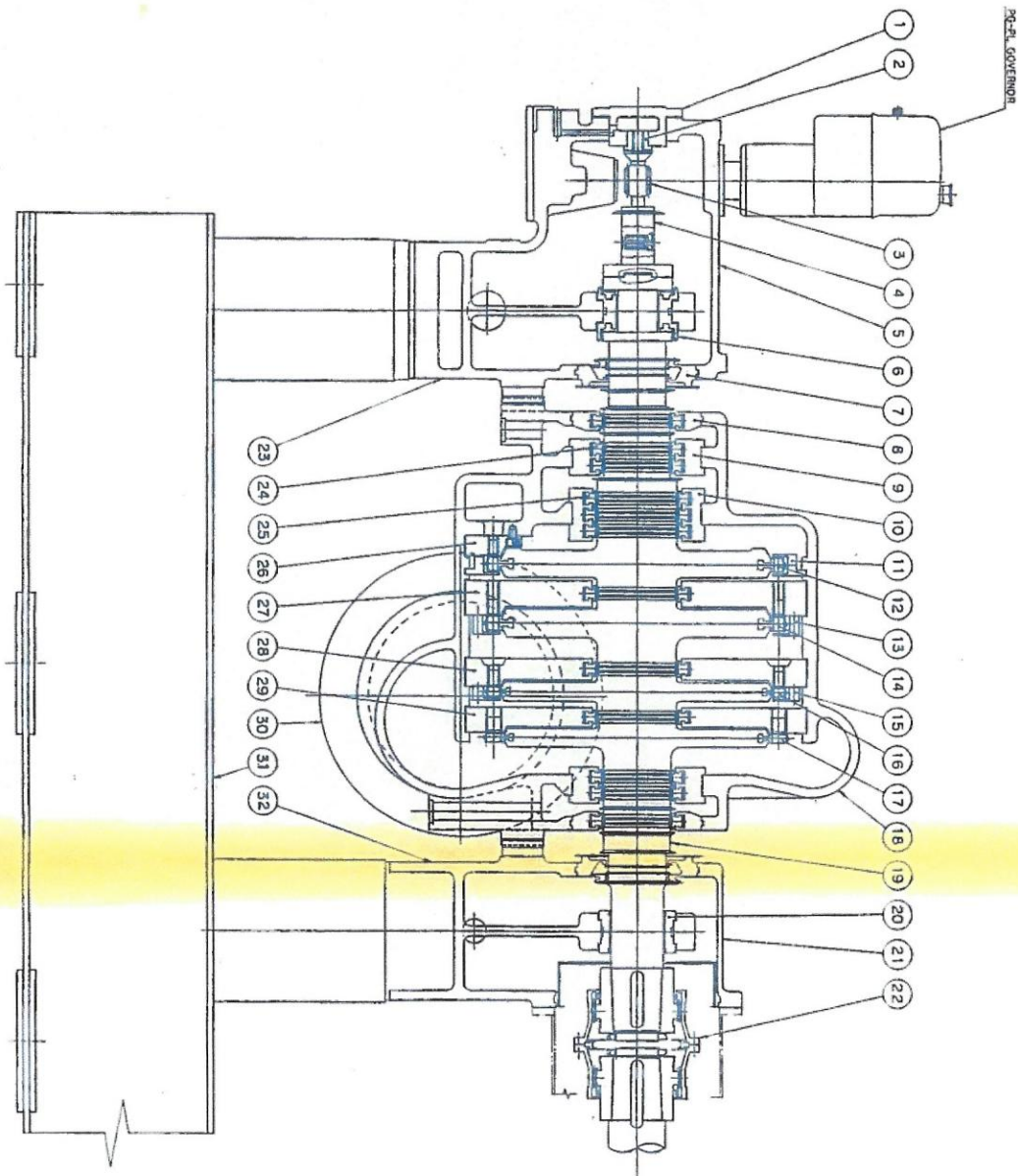
(°F)

(P.S.I.G)



(REMARKS)

(REDUCTION GEAR OUTPUT SHAFT)



Part No.	Name of Part	Material	Qty	Remarks
1	COVER	FC-25	1	
2	BEARING	BR	1	
3	WORM & WORM WHEEL	BR	1	
4	BOX DRIVE SHAFT	BR	1	
5	BEARING COVER	FC-25	1	
6	THROAT BEARING	BR	1	
7	OIL SEALER	BR	1	
8	Packing Box	BR	1	
9	Packing Box	BR	1	
10	Packing Box	BR	1	
11	1st BLADE CONE	BR	1	
12	1st MOVING BLADE	BR	1	
13	2nd BLADE CONE	BR	1	
14	2nd MOVING BLADE	BR	1	
15	3rd BLADE CONE	BR	1	
16	3rd MOVING BLADE	BR	1	
17	4TH MOVING BLADE	BR	1	
18	UPPER CLAMP	BR	1	
19	TURBINE ROTOR	BR	1	
20	AXIAL BEARING	BR	1	
21	BEARING COVER	FC-25	1	
22	GEAR COUPLER	BR	1	
23	BEARING HOUSING	BR	1	
24	LUBRICANT PUMP	BR	1	
25	1st NOZZLE	BR	1	
26	2nd NOZZLE	BR	1	
27	3rd NOZZLE	BR	1	
28	4TH NOZZLE	BR	1	
29	LOWER CLAMP	BR	1	
30	BACK PLATE	BR	1	
31	BEARING HOUSING	BR	1	
32	BEARING HOUSING	BR	1	

