EJC ENERJET COMBINATION BURNER

WARNING

These instructions are intended for use only by experienced, qualified combustion start-up personnel. Adjustment of this equipment and its components by unqualified personnel can result in fire, explosion, severe personal injury, or even death.

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These instructions are intended to serve as guidelines covering the installation, operation, and maintenance of Hauck equipment. While every attempt has been made to ensure completeness, unforeseen or unspecified applications, details, and variations may preclude covering every possible contingency. **WARNING: TO PREVENT THE POSSIBILITY OF SERIOUS BODILY INJURY, DO NOT USE OR OPERATE ANY EQUIPMENT OR COMPONENT WITH ANY PARTS REMOVED OR ANY PARTS NOT APPROVED BY THE MANUFACTURER.** Should further information be required or desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, contact Hauck Mfg. Co.

WARNING

This equipment is potentially dangerous with the possibility of serious personal injury and property damage. Hauck Manufacturing Company recommends the use of flame supervisory equipment and fuel safety shutoff valves. Furthermore, Hauck urges rigid adherence to National Fire Protection Association (NFPA) standards and insurance underwriter's requirements. Operation and regular preventative maintenance of this equipment should be performed only by properly trained and qualified personnel. Annual review and upgrading of safety equipment is recommended.

A. GENERAL INFORMATION

The Hauck EJC Enerjet Combination Burner is designed for application on industrial furnaces, ovens, and kilns where high velocity recirculation of the heated gases is desired to obtain maximum heat distribution. They are engineered to operate efficiently using either gas, light oils, or a combination of gas and oil. The exhaust velocity of the EJC at high fire capacity is a nominal 500 ft/sec (152 m/sec) and is regulated by adjusting the temperature and volume of the gases issuing from the burner. The high exhaust velocity provides temperature distribution without the need for large quantities of excess air or costly high temperature recirculating fans.

B. RECEIVING AND INSPECTION

Upon receipt, check each item on the bill of lading and/or invoice to determine that all equipment has been received. A careful examination of all parts should be made to ascertain if there has been any damage in shipment.

IMPORTANT

If the installation is delayed and the equipment is stored outside, provide adequate protection as dictated by climate and period of exposure. Special care should be given to all motors and bearings, if applicable, to protect them from rain or excessive moisture.

C. BURNER CAPACITIES

			MODEL NUMBER			
SPECIFICATIONS			115	120	130	140
HIGH FIRE	**Max. Input @ 10% Excess Air**	**(Btu/hr)**	**400**	**690**	**1,550**	**3,310**
	Primary Air Flow @ 16 osig	(scfh)	540	720	1,140	2,280
	Secondary Air Flow	(scfh)	3,600	6,420	14,940	31,980
	Air Orifice ΔP	("wc)	13.5	10.7	9.2	16.5
	Static Gas Pressure	("wc)	13.0	9.0	14.9	9.8
	Gas Orifice ΔP	("wc)	3.1	2.7	3.5	2.2
	Max. Excess Air	(%)	170	140	280	360
	Flame Length	(in)	11.0	11.0	23.0	36.0
	Flame Diameter	(in)	1.7	2.5	4.0	7.0
LOW FIRE	**Max. Input @ 10% Excess Air**	**(Btu/hr)**	**80**	**180**	**320**	**630**
	Primary Air Flow @ 16 osig	(scfh)	540	720	1,140	2,280
	Secondary Air Flow	(scfh)	360	1,060	2,150	4,270
	Air Orifice ΔP	("wc)	0.1	0.3	0.2	0.3
	Static Gas Pressure	("wc)	0.5	0.6	0.6	0.4
	Gas Orifice ΔP	("wc)	0.2	0.2	0.2	0.1

NOTES:

1. Capacities based on natural gas with HHV of 1034 Btu/ft^3, 0.59 S.G., and a stoichiometric air/gas ratio of 9.74:1 with burner firing into chamber under no pressure.
2. Air and gas flows based on 60°F @ sea level.
3. Static air pressures measured at the burner air inlet pressure tap.
4. Flame lengths measured from the end of the burner tile.
5. All data based on industry standard air and gas piping practices.
6. A lean air/fuel ratio is recommended at low fire.
7. Burners can be operated up to a static air pressure of 20 osig; consult Hauck.

Table 1. Capacities - Natural Gas Operation

C. BURNER CAPACITIES (Continued)

			MODEL NUMBER			
SPECIFICATIONS			115	120	130	140
HIGH FIRE	**Max. Input @ 20% Excess Air**	**(Btu/hr)**	**360**	**640**	**1,410**	**2,910**
	Primary Air Flow @ 16 osig	(scfh)	540	720	1,140	2,280
	Secondary Air Flow	(scfh)	3,780	6,900	15,600	32,400
	Air Orifice ΔP	("wc)	15.0	12.5	10.0	17.5
	No. 2 Oil Flow	(gph)	2.6	4.6	10.2	21.1
	Max. Excess Air	(%)	230	440	450	400
	Flame length	(in)	14.0	18.0	25.0	42.0
	Flame Diameter	(in)	3.0	4.0	6.0	9.0
LOW FIRE	**Max. Input @ 20% Excess Air**	**(Btu/hr)**	**70**	**140**	**240**	**610**
	Primary Air Flow @ 16 osig	(scfh)	540	720	1,140	2,280
	Secondary Air Flow	(scfh)	350	910	1,580	4,940
	Air Orifice ΔP	("wc)	0.1	0.3	0.2	0.4
	No. 2 Oil Flow	(gph)	0.5	1.0	1.7	4.4

NOTES:

1. Capacities based on No. 2 fuel oil with LHV of 36.99 MJ/liter, 0.87 S.G., and a stoichiometric ratio of 9.70 nm^3 air/liter No. 2 fuel oil with burner firing into chamber under no pressure.
2. Air flows based on 0°C @ sea level and oil flows based on 15.5°C @ sea level; capacities for preheated air will differ from those shown.
3. Static air pressures measured at the burner air inlet pressure tap.
4. Flame lengths measured from the end of the burner tile.
5. All data based on industry standard air and oil piping practices.
6. A lean air/fuel ratio is recommended at low fire.
7. Excess fuel firing not recommended on No. 2 fuel oil.
8. Burners can be operated up to a static air pressure of 8620 Pa; consult Hauck.

Table 2. Capacities - No. 2 Fuel Oil Operation

C. BURNER CAPACITIES (Continued)

			MODEL NUMBER			
SPECIFICATIONS			115	120	130	140
HIGH FIRE	**Max. Input @ 10% Excess Air**	**(kW)**	**110**	**190**	**420**	**910**
	Primary Air Flow @ 68.9 mbar	(nm^3/hr)	14	19	31	61
	Secondary Air Flow	(nm^3/hr)	96	172	400	857
	Air Orifice ΔP	(mbar)	33.6	26.6	22.9	41.0
	Static Gas Pressure	(mbar)	32.3	22.4	37.1	24.4
	Gas Orifice ΔP	(mbar)	7.7	6.7	8.7	5.5
	Max. Excess Air	(%)	170	140	280	360
	Flame Length	(mm)	280	280	580	580
	Flame Diameter	(mm)	40	60	100	180
LOW FIRE	**Max. Input @ 10% Excess Air**	**(Btu/hr)**	**20**	**50**	**90**	**170**
	Primary Air Flow @ 68.9 mbar	(nm^3/hr)	14	19	31	61
	Secondary Air Flow	(nm^3/hr)	10	28	58	114
	Air Orifice ΔP	(mbar)	30	80	50	80
	Static Gas Pressure	(mbar)	120	150	150	100
	Gas Orifice ΔP	(mbar)	50	50	50	30

NOTES:

1. Capacities based on natural gas with LHV of 36.74 MJ/nm^3, 0.59 S.G., and a stoichiometric air/gas ratio of 9.74:1 with burner firing into chamber under no pressure.
2. Air and gas flows based on 0°C @ sea level.
3. Static air pressures measured at the burner air inlet pressure tap.
4. Flame lengths measured from the end of the burner tile.
5. All data based on industry standard air and gas piping practices.
6. A lean air/fuel ratio is recommended at low fire.
7. Burners can be operated up to a static air pressure of 8620Pa; consult Hauck.

Table 3. Metric Capacities - Natural Gas Operation

C. BURNER CAPACITIES (Continued)

			MODEL NUMBER			
SPECIFICATIONS			115	120	130	140
HIGH FIRE	**Max. Input @ 10% Excess Air**	**(kW)**	**100**	**170**	**390**	**790**
	Primary Air Flow @ 68.9 mbar	(nm^3/hr)	14	19	31	61
	Secondary Air Flow	(nm^3/hr)	101	185	418	868
	Air Orifice ΔP	(mbar)	37.3	31.1	24.9	43.5
	No. 2 Oil Flow	(L/hr)	9.8	17.4	38.6	79.9
	Max. Excess Air	(%)	230	440	450	400
	Flame length	(mm)	360	460	640	1070
	Flame Diameter	(mm)	80	100	150	230
LOW FIRE	**Max. Input @ 20% Excess Air**	**(kW)**	**20**	**40**	**60**	**170**
	Primary Air Flow @ 68.9 mbar	(nm^3/hr)	14	19	31	61
	Secondary Air Flow	(nm^3/hr)	9	24	42	132
	Air Orifice ΔP	(mbar)	30	80	50	100
	No. 2 Oil Flow	(L/hr)	1.9	3.8	6.4	16.7

NOTES:

1. Capacities based on No. 2 fuel oil with LHV of 36.99 MJ/liter, 0.87 S.G., and a stoichiometric ratio of 9.70 nm^3 air/liter No. 2 fuel oil with burner firing into chamber under no pressure.
2. Air flows based on 0°C @ sea level and oil flows based on 15.5°C @ sea level; capacities for preheated air will differ from those shown.
3. Static air pressures measured at the burner air inlet pressure tap.
4. Flame lengths measured from the end of the burner tile.
5. All data based on industry standard air and oil piping practices.
6. A lean air/fuel ratio is recommended at low fire.
7. Excess fuel firing not recommended on No. 2 fuel oil.
8. Burners can be operated up to a static air pressure of 8620 Pa; consult Hauck.

Table 4. Metric Capacities - No. 2 Fuel Oil Operation

D. DIMENSIONS

See appropriate Dimension sheet for detailed dimensional information.

E. INSTALLATION

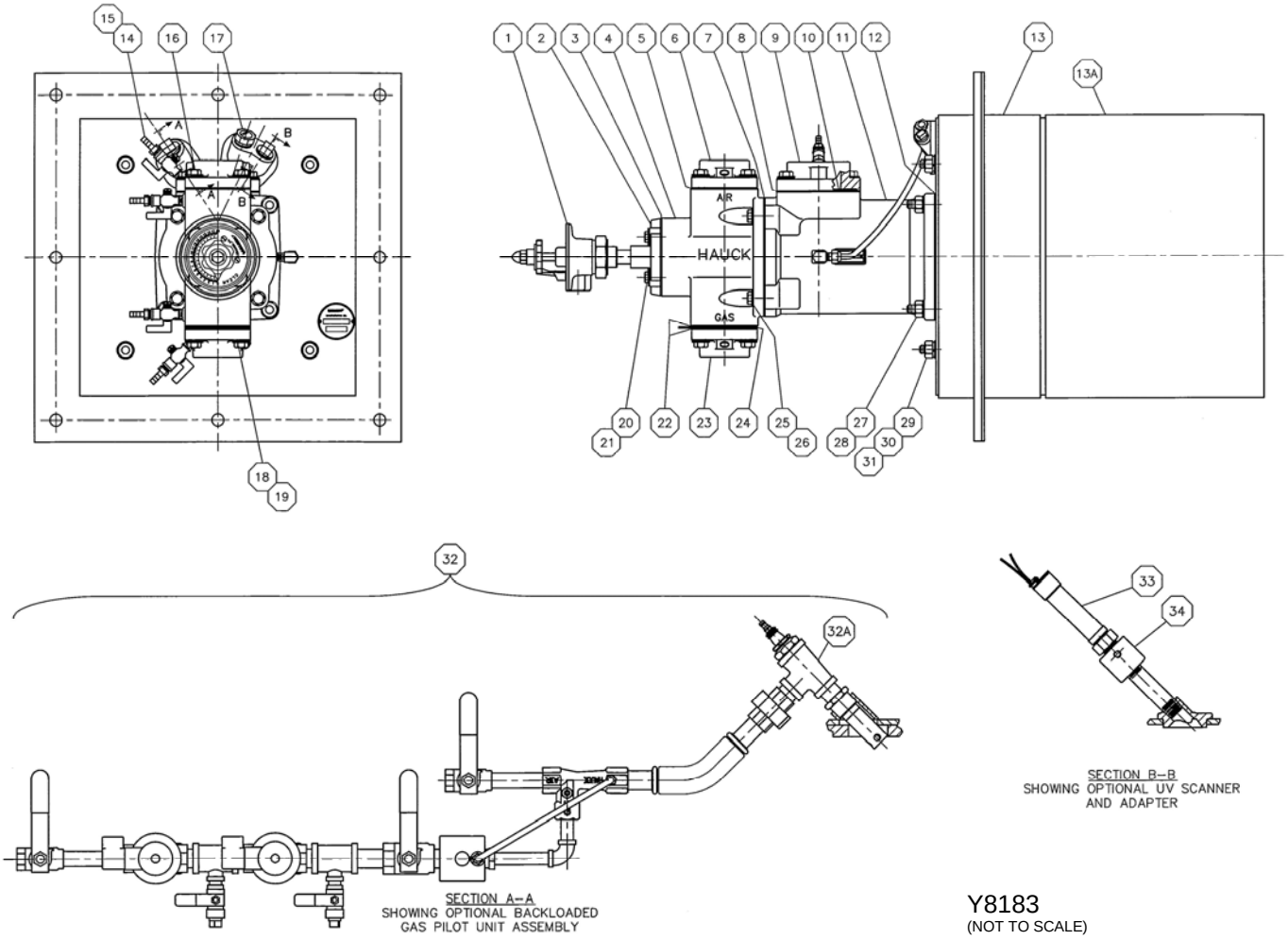


Figure 1. Components Identification for Installation

Numbers in parentheses indicate items shown in Figure 1.

1. To ensure long refractory life with pressurized tiles as used on the EJC burner, it is **very important** that the ignition tile be tightly constrained on all sides (reference Figure 2 or 3). The best procedure is to fit the refractory wall around the burner block after installing the burner. Soft wall furnaces may require either stainless steel shells or special refractory supports to accomplish this. Since EJC burners can fire in any position, they can be installed through the roof, walls, or bottom of the furnace.

IMPORTANT

The burner, mounting plate, and tile should be installed as an assembly. The mounting plate and ignition tile are factory assembled with high temperature cement between them. Should it become necessary to replace the tile, please contact Hauck.

2. Inspect the mounting assembly. Be sure all hex nuts (27) connecting the burner to the mounting plate and all hex nuts (29) connecting the mounting plate to the tile are securely fastened.

3. Insert the tie into the furnace wall. The burner/tile assembly can be mounted in the furnace wall with the ignition port in the 12 o'clock, 3 o'clock, or 9 o'clock position. (Placing the ignition port in the 6 o'clock position **is not recommended** as debris or other material may accumulate in the scanner port and interfere with scanner operation). **If the unit is equipped with a mounting flange, proceed with step 4. If it does not have a mounting flange:**

   A. Cover the outside surfaces of the tile with a 1/8" thick layer of high temperature cement or bonding mortar.
   B. Be sure that the tile is adequately constrained on all sides by the furnace wall and that a good seal exists between the tile and furnace wall. Fill in all voids between the tile and furnace wall (on both the hot face and furnace shell) with cement or mortar as required.

> **IMPORTANT**
> Ensure that any portion of the burner assembly protruding from the furnace wall is adequately supported by an external means.

   C. Proceed to step 5.

4. If the assembly is equipped with a mounting flange, proceed as follows:

   A. Install a high temperature gasket against the back of the burner mounting flange so that when the tile is fully inserted, the gasket will be positioned between the furnace wall and the mounting flange.
   B. Insert the tile into the furnace wall, making sure that the tile is adequately supported on all sides by the wall. The best procedure is to install refractory tightly around the tile after it has been put into the furnace wall (reference Figure 2 or 3).
   C. Bolt the mounting flange to the furnace wall.
   D. Ensure that a complete seal exists between the mounting assembly, the tile, and the furnace wall.
   E. This type of an installation does not take into account relative movement between the shell and the external wall. Separate consideration must be given to this type of design.

> **IMPORTANT**
> The burner mounting plate is designed to support the weight of the burner only. Ensure that all piping is adequately supported by an external means other than the mounting assembly. The use of flexible connections is recommended in the air and fuel lines.

> **IMPORTANT**
> For maximum metering accuracy, a minimum of six diameters of straight piping (free of elbows and fittings) should be placed immediately upstream of the metering orifices.

5. Install the secondary air line at the burner connection (9). If required due to the placement of the air piping, the air inlet (9) can be rotated from a 12 o'clock position to any of 3 additional positions. When selecting a new position, be sure the ignition port (Section A-A) is not obstructed by the secondary air inlet. To rotate the inlet:

    A. Remove the four hex nuts (27) which hold the burner assembly to the mounting plate.
    B. Rotate the entire burner assembly to the allowable position which best suits the required piping connections.
    C. Replace and securely tighten the hex nuts.

6. If desired or necessary, the primary air/gas body (4) may be rotated as follows:

    A. Remove the four hex nuts (25) holding the burner primary air/gas body to the secondary body.
    B. Rotate the air/gas body to the desired position.
    C. Make sure the gasket between the air/gas body and the secondary burner body is properly seated.
    D. Replace and securely tighten the hex nuts.

7. Install and connect the primary air (6) and gas (23) lines.

8. Install the oil line at the oil inlet connection (1) of the control valve. A flex connection in the oil line is recommended, and installation of a quick disconnect flexible oil hose close to the burner for ease of maintenance and cleaning. An oil flow meter should be installed parallel to the main oil supply line to allow for ease of burner start-up and to check oil flow rates during operation. If the air/gas body was repositioned as per step 6, the oil valve may be rotated as necessary by accomplishing the following:

    A. Remove the oil line from the control valve (if already attached).
    B. Remove the four hex cap screws (20) from the atomizer backplate.
    C. Completely remove the backplate/oil tube/atomizer assembly and rotate it as required.
    D. Reinsert the assembly into the atomizer body. (Ensure the gasket is properly seated).
    E. Replace the four hex cap screws in the atomizer backplate and securely tighten them.
    F. Connect the oil line to the oil inlet connection.

9. Install the spark ignited gas pilot as follows:

    A. Remove the pipe plug from the ignition port (Section A-A).
    B. Remove the pilot (32A) from the pilot unit (32) by loosening the union.
    C. Thread the pilot tip (32A) into the ignition port (Section A-A) and properly orient the air/gas inlet in order that the pilot manifold will not interfere with the burner air or gas piping.
    D. Secure the pilot manifold to the pilot by fastening the union.

10. Install the UV scanner, if used, as follows:

    A. Remove the pipe plug from the UV scanner port (Section B-B).
    B. Install the UV scanner adapter assembly (34) into the UV scanner port (Section B-B).
    C. Determine the appropriate air purge tube to be used (the longer of the two air purge tubes supplied is used when the air inlet is at either the 6 o'clock or 12 o'clock position. If the air inlet is at the 3 o'clock or 9 o'clock position, the shorter purge tube supplied will be used).
    D. Install the compression fittings provided into the connection on the burner body (11) and the UV scanner connection (Section B-B).

E. Install the appropriate length air purge tube.
F. Install the UV scanner (33) on to the UV scanner adapter assembly (34).

11. Install the four orifice metering cocks (14) and couplings (15) provided (see Figure 1).

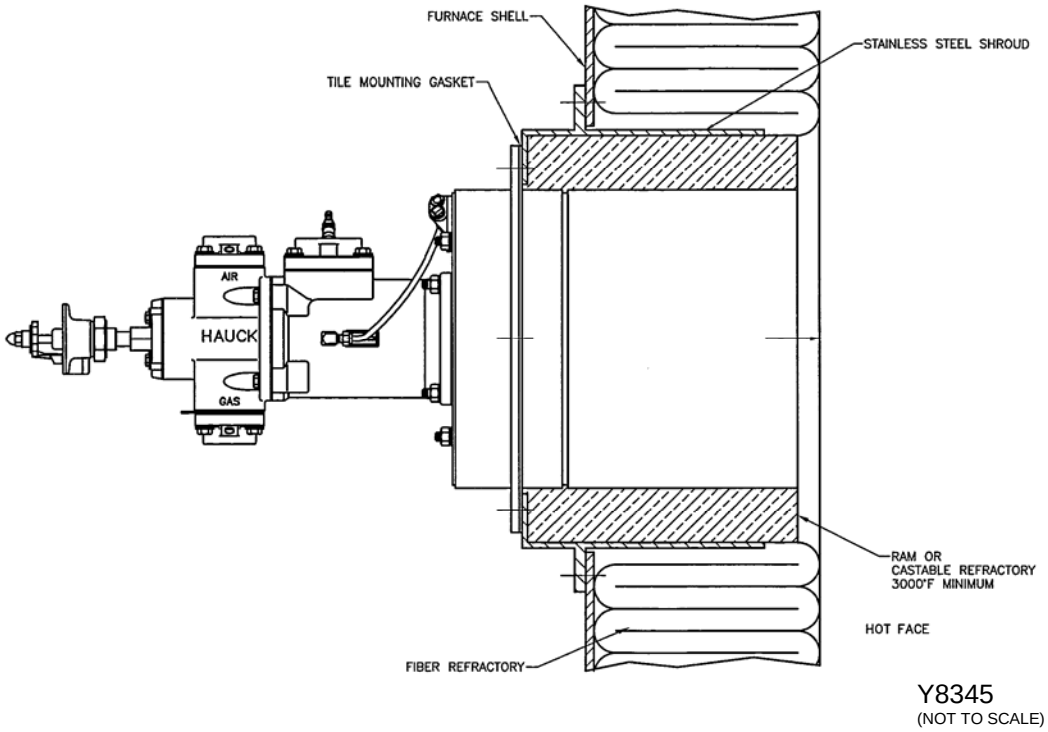


Figure 2. Burner Installation in Fiber Lined Wall

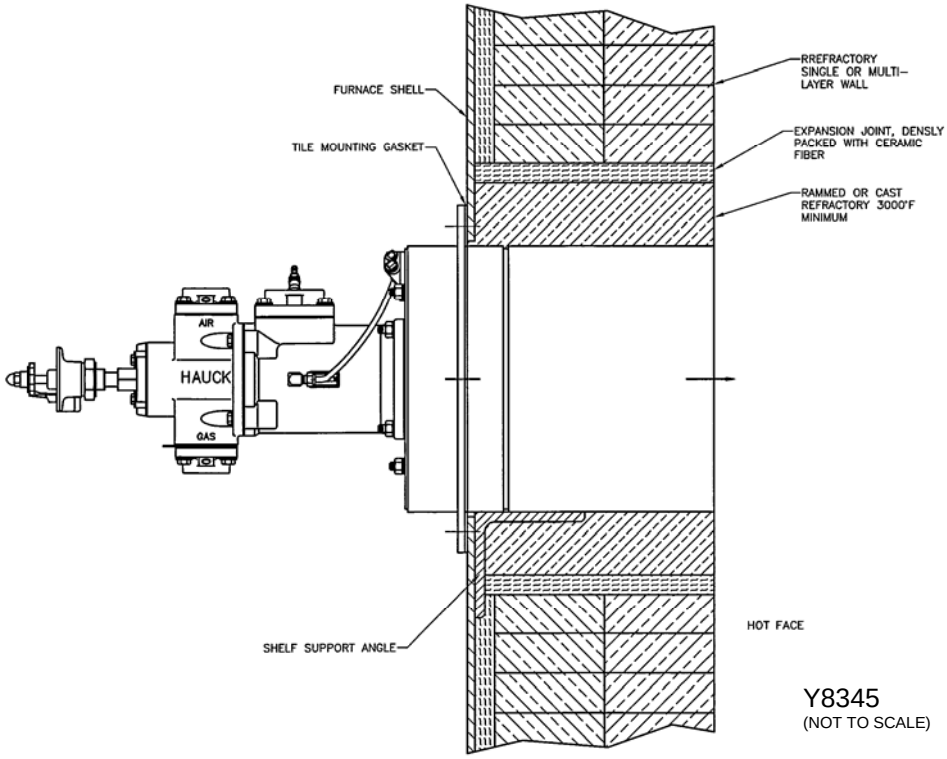


Figure 3. Burner Installation in Hard Refractory Wall

F. IGNITION

Ignition of the EJC burner is accomplished by a spark ignited gas pilot. A 5000/6000 volt standard coil type ignition transformer or a half-wave "spark blind" solid state type transformer can be utilized. Both transformers yield satisfactory results, however, the standard coil type transformer provides reliable ignition over a wider range of air/fuel ratios than the half-wave type. For detailed operating instructions on the pilot, see Hauck sheet IPG-9.

G. INITIAL SET-UP

Upon completing the installation and pilot set-up, the burner is ready for initial setup. Typically, the EJC burner will be operated with an automatic control system. Begin the initial setup by completing all necessary interfacing with the control system. The specific operation of the burner will depend on the individual system components in the entire combustion system. Refer to the instruction sheets that accompany each individual component.

WARNING

Adjustment of this equipment by unqualified personnel can result in fire, explosion, severe personal injury, or even death.

CAUTION

For safety reasons, it is recommended that the burner be ignited under low fire conditions.

1. Secondary Air should be set at the combustion air control valve. Typically settings will be specific to the application with 16 or 20 osig (6.9 or 8.6 kPa) at the secondary air inlet of the burner being the nominal secondary air pressure (see Section C – Capacity Tables for burner air flows).

2. Primary Air should be set at the primary air valve. Manually set the primary air valve to obtain 16 osig (6900 Pa) at the primary air inlet at the burner for oil firing.

3. Manually rotate the pointer on the micro oil valve to the fully closed position, i.e., valve position ‘0’ (readjustment of this valve may be necessary for final burner set-up). The micro oil valve can be easily cleaned by rotating the pointer to the ‘clean’ position on the dial and then rotating the pointer back to the original position. While the burner is firing, the oil flow can be read on the oil flow meter.

CAUTION
Do not attempt to clean the micro oil limiting valve while the burner is firing.

4. Manually adjust the limiting gas valve in the gas line to the burner to the fully closed position (readjustment of this valve to achieve high fire gas flow will occur during final burner set-up).

5. Once the gas pilot is properly set, and the initial gas, oil and air adjustments are made, the burner can be ignited. Proceed to Oil Firing and/or Gas Firing section as follows:

H. GAS FIRING

1. Open all manual shutoff valves in the gas supply line to the burner.

2. Open all valves in the air supply lines to the burner and pilot.

3. Ensure that the limiting gas valve is in the fully closed position.

4. Turn on the combustion air blower and bring the secondary air supply to the low fire position.

5. Ignite the gas pilot.

6. Start gas flow to the burner by opening the automatic safety shutoff valves in the main gas supply line.

7. Slowly open the limiting gas valve until the burner ignites.

8. After all burners in a zone have been ignited, bring the secondary air pressure to the high fire input. Ensure that the air pressure at each burner does not exceed the ratings shown in Section C – Capacity Tables. To fine tune the high fire secondary air flow, measure the differential air pressure across the burner air inlet orifice and compare to the specific air flange orifice calibration curve (see Appendices).

9. Readjust the limiting gas valve to the high fire gas capacity. To fine tune the high fire gas flow, measure the differential gas pressure across the burner gas inlet orifice and compare to the specific gas flange orifice calibration curve (see Appendices).

10. If possible, check the air/fuel ratio by completing an exhaust gas analysis in the furnace stack. Adjust the ratio if required. Note: Excess air in the exhaust gas for gas firing should typically be at 15% excess air (approximately 3% oxygen).

11. Repeat steps 8 and 9 until the desired high fire flame characteristics are achieved.

12. Drive the burner to the low fire position and verify that the settings are consistent. If any adjustments to the gas ratio regulator are made at low fire, verify that the high fire settings have not changed by driving the burners to high fire position and checking the air/fuel ratio via exhaust gas analysis.

13. To shut down the burner system, accomplish the following:

    A. Return the burner to the low fire position.
    B. Close the gas shutoff valves.
    C. Close the gas shutoff valve to the gas pilot.
    D. Allow the furnace to cool to 800°F (427°C) or less before shutting off the combustion air blower to avoid damage to the burner.
    E. Turn off the blower.

I. OIL FIRING

1. Close the micro oil valve located at the back of the burner.

2. Close any manual shutoff valves in the oil supply line to the burner.

3. Open all valves in the air supply lines to the burner and pilot.

4. Turn on the combustion air blower and bring the secondary air supply to the low fire position.

5. Ignite the gas pilot.

6. Open the automatic safety shutoff valves and any other manual shutoff valves in the main oil supply to the burner to start oil flowing to the burner micro oil valve. Ensure that the oil is at the required viscosity, normally 40 SSU (4.6×10^{-6} m^2/s), for proper atomization at the burner.

7. Slowly open the burner micro oil valve until the burner ignites.

8. After all burners in a zone have been ignited, bring the secondary air pressure to the high fire input. Ensure that the air pressure at each burner does not exceed the ratings in Section C – Capacity Tables. To fine tune the high fire secondary air flow, measure the differential air pressure across the burner air inlet orifice and compare to the specific air flange orifice calibration curve (see Appendices).

9. Readjust the micro oil valve to the high fire oil capacity. To fine tune the high fire oil flow, measure the oil inlet pressure to the micro oil valve and compare to the specific micro oil valve flow characteristics curve (see Appendices).

10. If possible, check the air/fuel ratio by completing an exhaust gas analysis in the furnace stack. Adjust the ratio if required. Note: Excess air in the exhaust gas for oil firing should typically be at 25% excess air (approximately 4.5% oxygen).

11. Repeat steps 8 and 9 until the desired high fire flame characteristics are achieved.

12. Drive the burner to the low fire position and verify that the settings are consistent (refer to procedure outlined in instruction sheet MRO-9). If any adjustments are made at low fire, verify that the high fire settings have not changed by driving the burners to high fire position and checking the air/fuel ratio via exhaust gas analysis.

13. To shut down the burner system, accomplish the following:

A. Return the burner to the low fire position.
B. Close the burner micro oil valve, and all oil shutoff valves.
C. Close the gas shutoff valve to the gas pilot.
D. Allow the furnace to cool to 800°F (427°C) or less before shutting off the combustion air blower to avoid damage to the burner.
E. Turn off the blower.

J. OPERATION

Once properly installed, ignited and fired, the burner is ready for operation. The operation of the burner will depend on the specific items in the combustion control system and the application of the burners. Refer to the instruction sheet that accompanies each item. The burner should be ignited at low fire conditions. When the burner is firing, the gas pilot can be shut off since the burner is designed to maintain ignition of the air/fuel mixture. In any case, gas pilot cooling air should remain on to ensure optimum gas pilot service life.

CAUTION

The ignition tile should **not** be subjected to rapid heat increases at initial start-up. **Allow low fire drying for at least 6-8 hours before exposing the system to normal firing operation.** Thereafter, if the ignition tile is exposed to excessive moisture or extended periods of dampness, allow **at lest 30 minutes** of low fire drying before beginning normal operation. Failure to do so will allow any moisture present to expand rapidly causing the refractory to spall.

The EJC burner is designed to operate with the air, oil and gas pressures best suited to the application. Consult the appropriate technical sheets for the curves used to compute the flow values to be measured using the built-in orifice meters for secondary air and natural gas.

It is recommended that the burner be ignited under low fire conditions. When the burner is operating, the ignition transformer can be shut off since the burner is designed to maintain ignition of the fuel air mixture.

In normal daily operation, keep the burner in the low fire position for at least 30 seconds on oil, 10 seconds on gas in order to allow the ignition tile to warm-up so the flame will not blow out. On fully automatic control, it is necessary to incorporate a low fire time delay to keep the burner at low fire for at least the specific minimum warm-up times.

K. MAINTENANCE

The EJC series burners have been carefully engineered to provide dependable performance while requiring low maintenance. As with any product, it is very important to follow operating instructions and all procedures carefully to obtain optimum performance. Please refer to the applicable EJC burner parts list to become familiar with the various components of the burner.

CAUTION

Be sure burner internals have cooled sufficiently before attempting to disassemble any components. Use care when separating gasket surfaces to avoid damage to the gaskets.

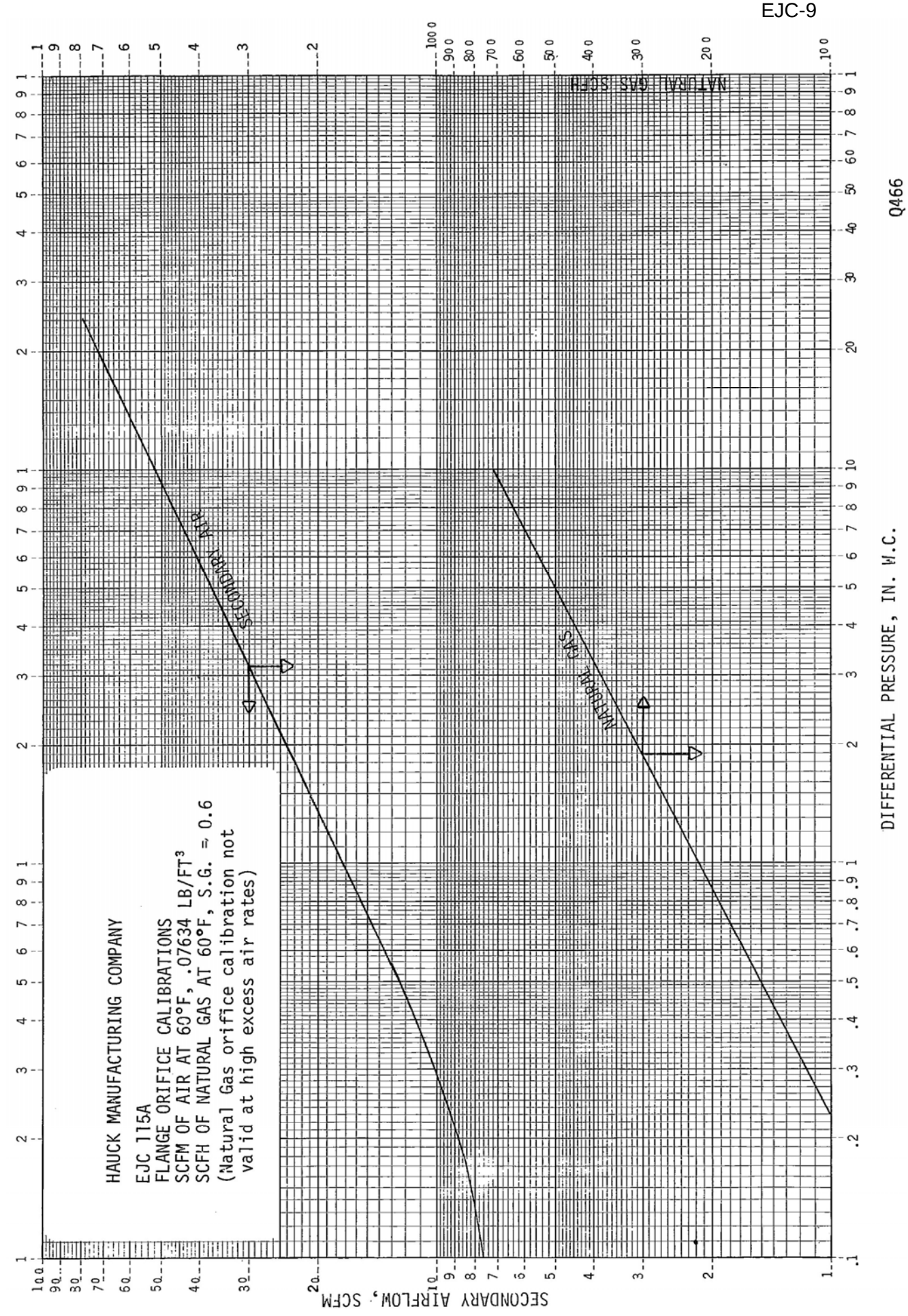
If it becomes necessary to clean the oil valve/atomizing assembly, accomplish the following:

1. Disconnect the oil line at the control valve inlet (if required).
2. Remove all of the screws on the atomizer backplate.
3. Extract the entire oil assembly.
4. Clean off all of the particles and residue using kerosene and a soft-wire brush.
5. Reinsert the assembly into the atomizer body.
6. Ensure that the backplate gasket is in good condition and properly seated in place.
7. Replace all of the screws on the atomizer backplate.
8. Reconnect the oil line at the control valve (if required).
9. Check and securely tighten (if required) the four hex nuts securing the mounting plate to the tile - **do not exceed 25 ft-lb (34 N-m).** Thereafter, periodically check and tighten as required.

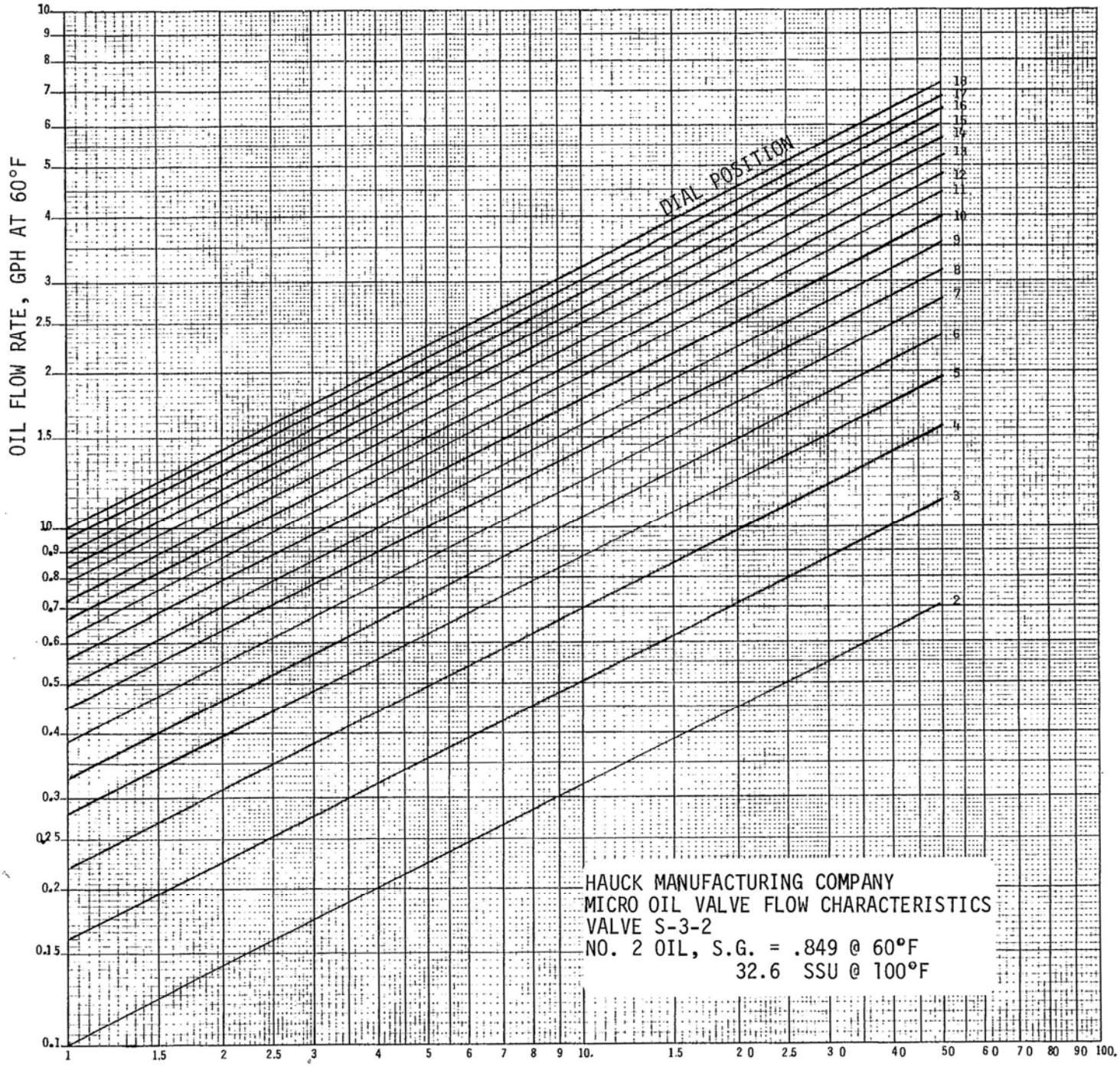
L. RECOMMENDED SPARE PARTS

Item	Qty.	Part Number	Description
1	1	30337	Pilot Assembly
2	1	See Parts List	Oil Atomizer Assembly
3	1	See Parts List	UV Scanner (If Applicable)

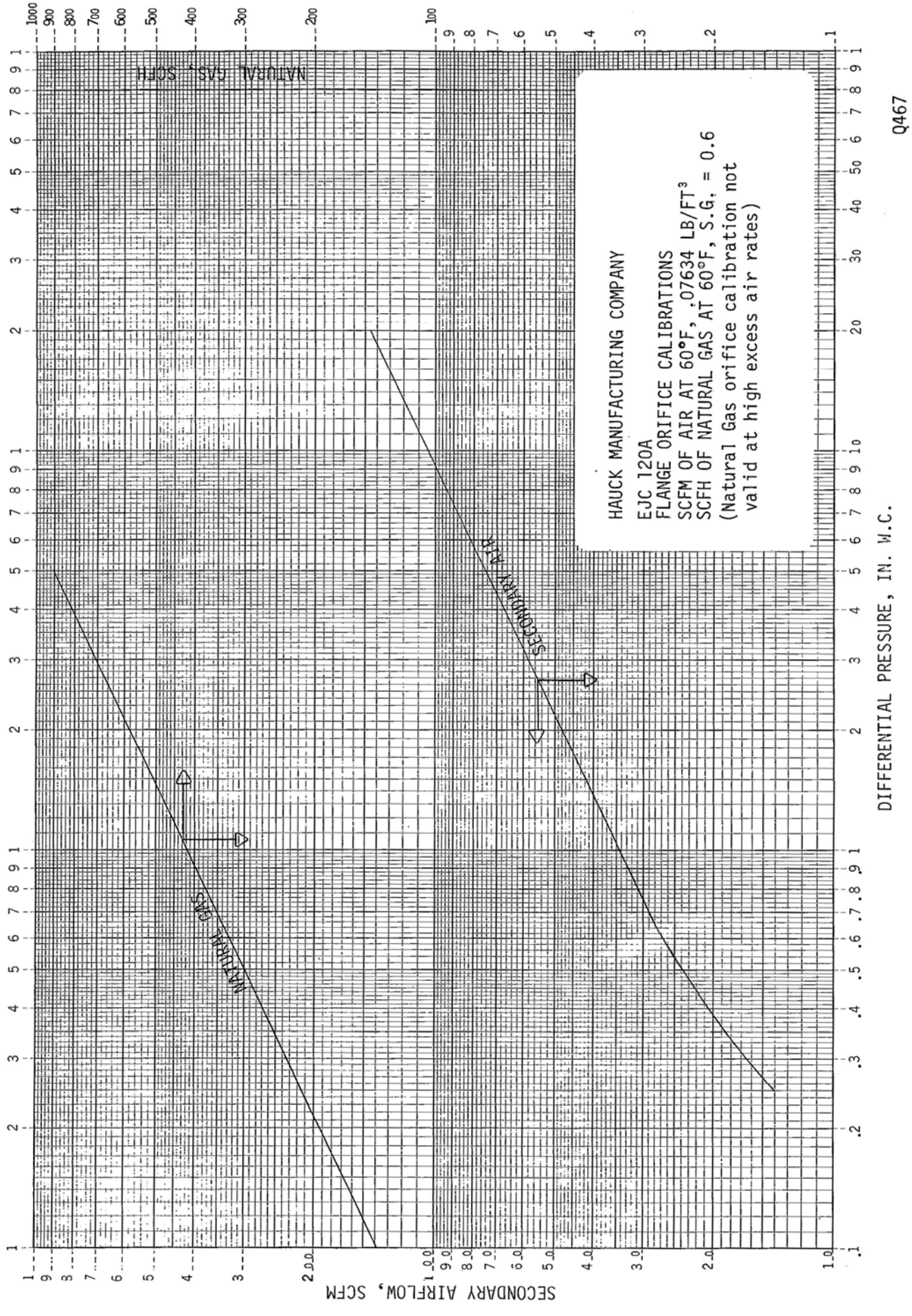
Table 5. Recommended Spare Parts

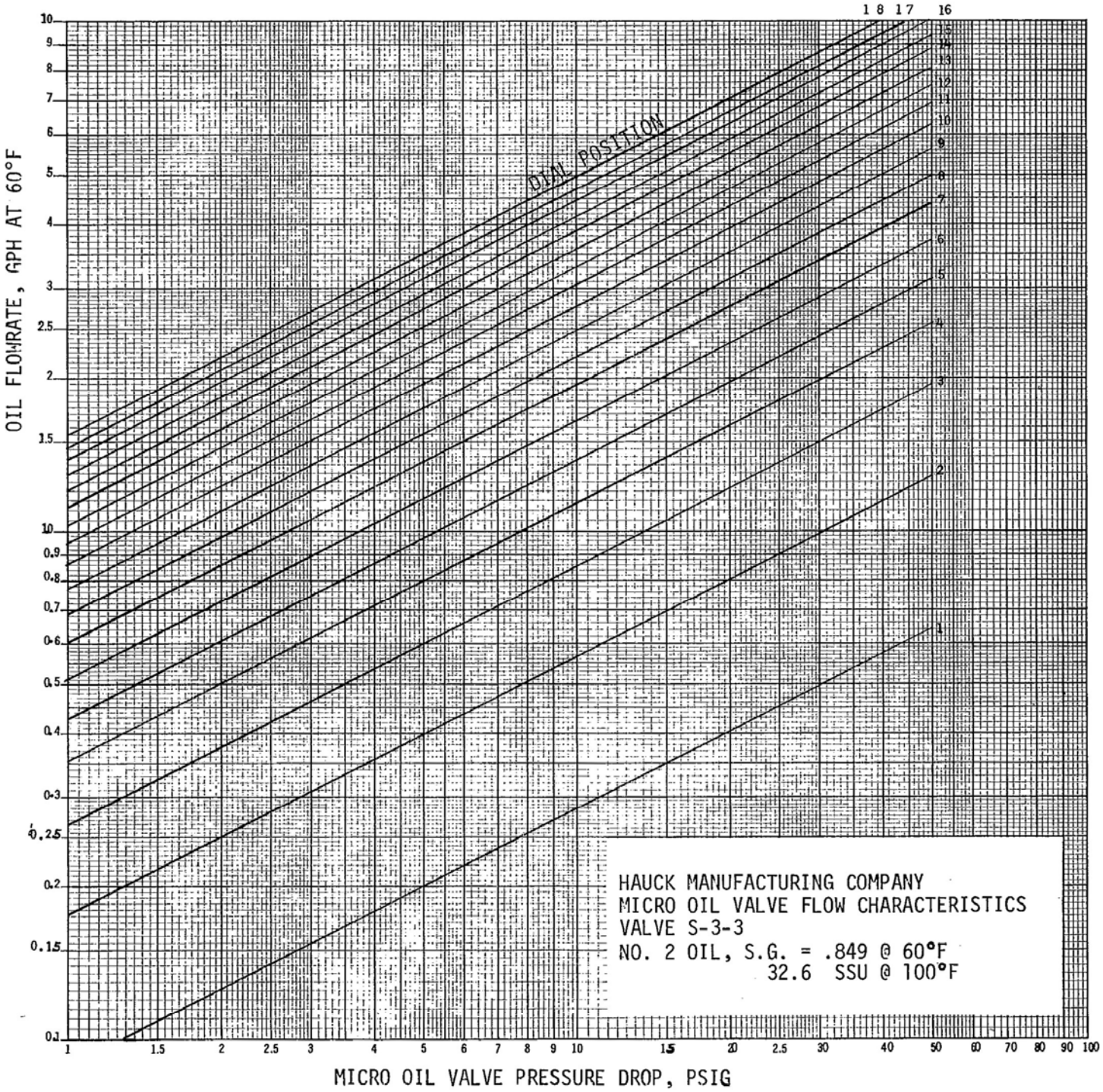

HAUCK MANUFACTURING COMPANY
EJC 115A
FLANGE ORIFICE CALIBRATIONS
SCFM OF AIR AT 60°F, .07634 LB/FT³
SCFH OF NATURAL GAS AT 60°F, S.G. = 0.6
(Natural Gas orifice calibration not valid at high excess air rates)
SECONDARY AIR
NATURAL GAS
SECONDARY AIRFLOW, SCFM
NATURAL GAS SCFH
DIFFERENTIAL PRESSURE, IN. W.C.

Q466

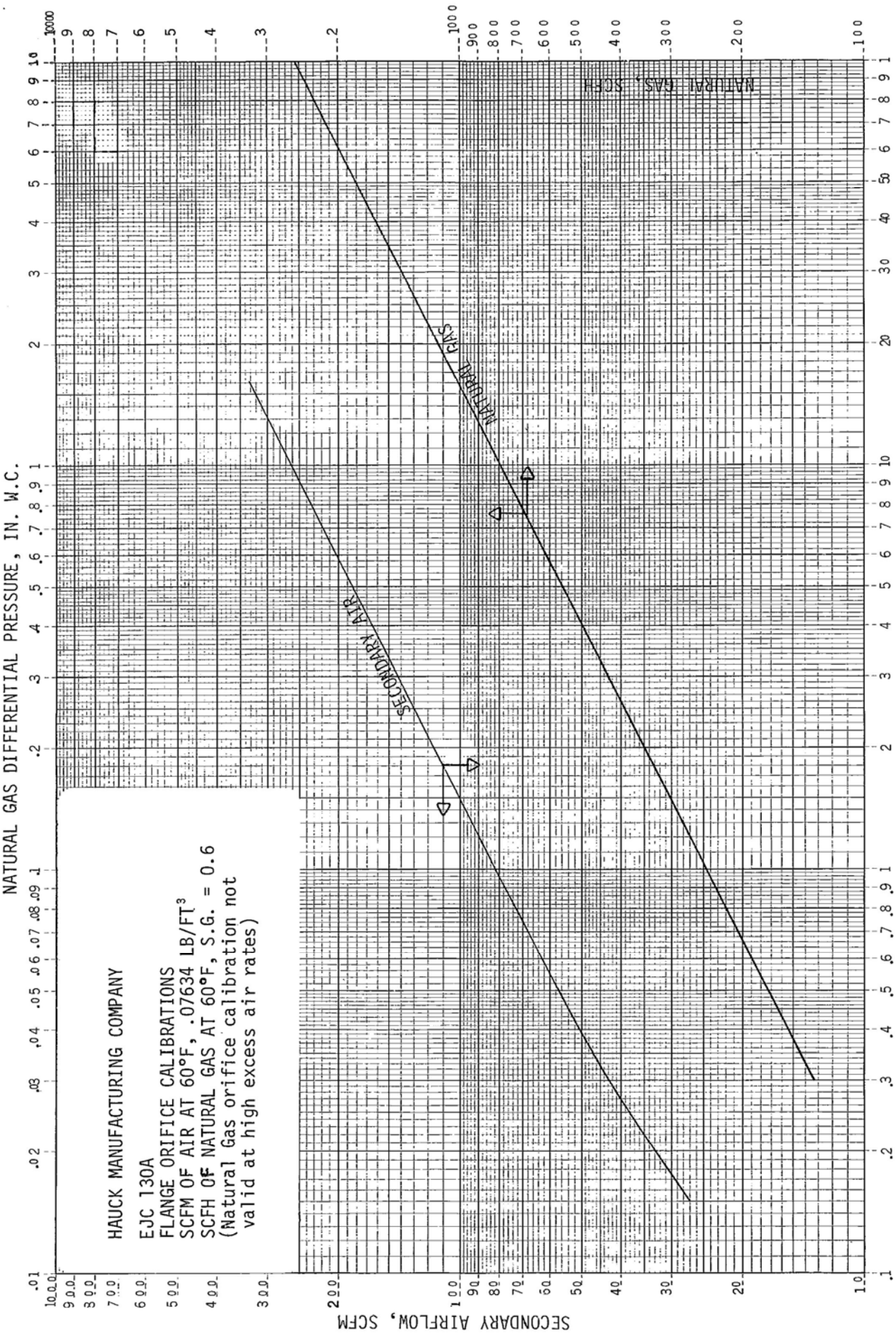

OIL FLOW RATE, GPH AT 60°F
DIAL POSITION
HAUCK MANUFACTURING COMPANY
MICRO OIL VALVE FLOW CHARACTERISTICS
VALVE S-3-2
NO. 2 OIL, S.G. = .849 @ 60°F
32.6 SSU @ 100°F
MICRO OIL VALVE PRESSURE DROP, PSIG

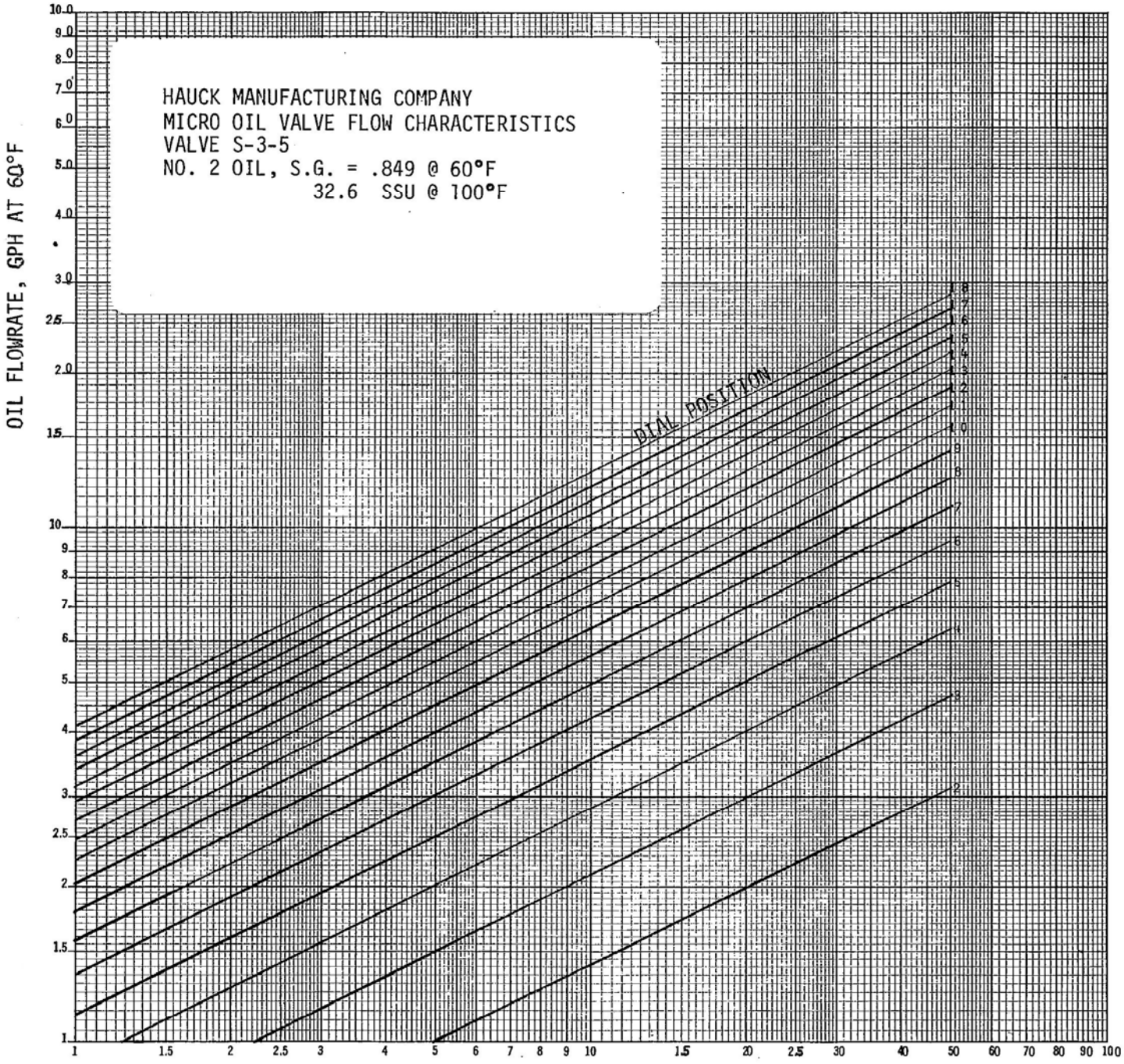
Q551


HAUCK MANUFACTURING COMPANY
EJC 120A
FLANGE ORIFICE CALIBRATIONS
SCFM OF AIR AT 60°F, .07634 LB/FT³
SCFH OF NATURAL GAS AT 60°F, S.G. = 0.6
(Natural Gas orifice calibration not valid at high excess air rates)
NATURAL GAS
SECONDARY AIR
NATURAL GAS, SCFH
SECONDARY AIRFLOW, SCFM
DIFFERENTIAL PRESSURE, IN. W.C.
Q467

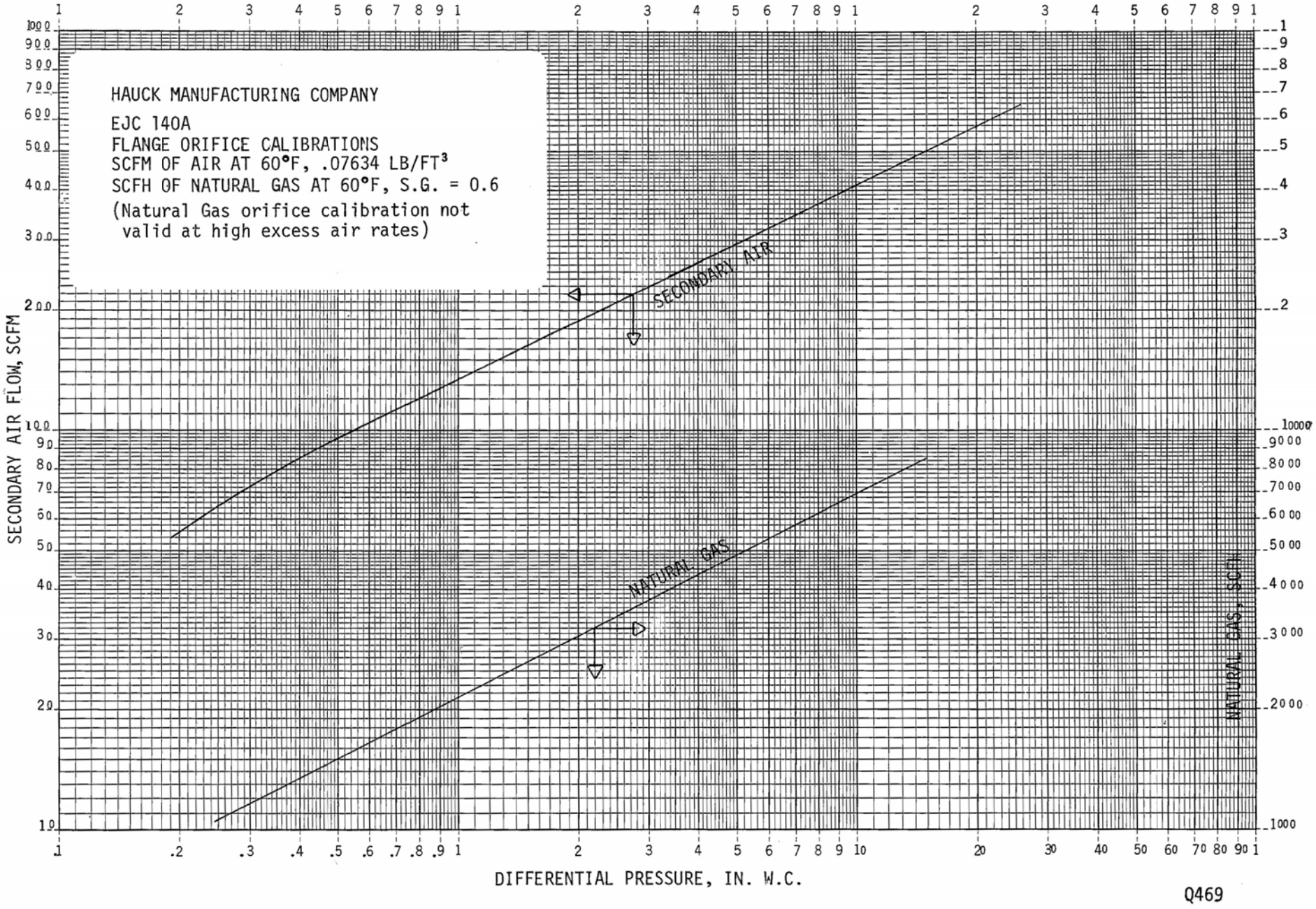

OIL FLOWRATE, GPH AT 60°F
DIAL POSITION
18 17 16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
10
9
8
7
6
5
4
3
2.5
2
1.5
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.25
0.2
0.15
0.1
1
1.5
2
2.5
3
4
5
6
7
8
9
10
15
20
25
30
40
50
60
70
80
90
100
MICRO OIL VALVE PRESSURE DROP, PSIG
HAUCK MANUFACTURING COMPANY
MICRO OIL VALVE FLOW CHARACTERISTICS
VALVE S-3-3
NO. 2 OIL, S.G. = .849 @ 60°F
32.6 SSU @ 100°F

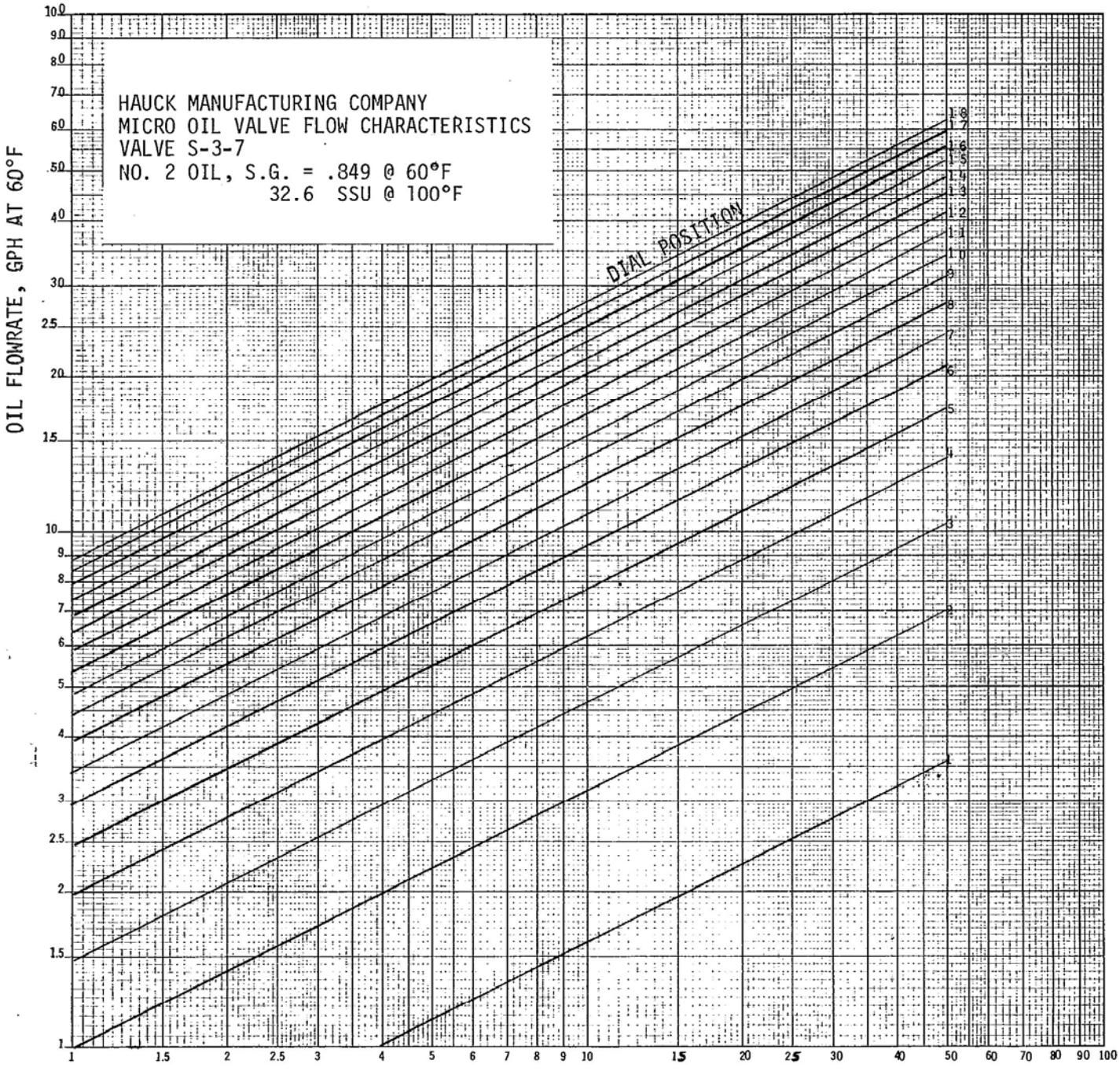
Q470


NATURAL GAS DIFFERENTIAL PRESSURE, IN. W.C.
HAUCK MANUFACTURING COMPANY
EJC 130A
FLANGE ORIFICE CALIBRATIONS
SCFM OF AIR AT 60°F, .07634 LB/FT³
SCFH OF NATURAL GAS AT 60°F, S.G. = 0.6
(Natural Gas orifice calibration not valid at high excess air rates)
SECONDARY AIRFLOW, SCFM
NATURAL GAS, SCFH
SECONDARY AIR
NATURAL GAS
SECONDARY AIR DIFFERENTIAL PRESSURE, IN. W.C.
Q468


HAUCK MANUFACTURING COMPANY
MICRO OIL VALVE FLOW CHARACTERISTICS
VALVE S-3-5
NO. 2 OIL, S.G. = .849 @ 60°F
32.6 SSU @ 100°F
DIAL POSITION
OIL FLOWRATE, GPH AT 60°F
MICRO OIL VALVE PRESSURE DROP, PSIG

Q471


HAUCK MANUFACTURING COMPANY
EJC 140A
FLANGE ORIFICE CALIBRATIONS
SCFM OF AIR AT 60°F, .07634 LB/FT³
SCFH OF NATURAL GAS AT 60°F, S.G. = 0.6
(Natural Gas orifice calibration not valid at high excess air rates)
SECONDARY AIR
NATURAL GAS
SECONDARY AIR FLOW, SCFM
NATURAL GAS FLOW, SCFH
DIFFERENTIAL PRESSURE, IN. W.C.
Q469


HAUCK MANUFACTURING COMPANY
MICRO OIL VALVE FLOW CHARACTERISTICS
VALVE S-3-7
NO. 2 OIL, S.G. = .849 @ 60°F
32.6 SSU @ 100°F
DIAL POSITION
OIL FLOWRATE, GPH AT 60°F
MICRO OIL VALVE PRESSURE DROP, PSIG

Q472

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